ENVIRONMENTAL IMPACT ASSESSMENT REPORT

FOR PROPOSED 8 STOREY COMMERCIAL BUILDING AT LOT 10318, HULHUMALE, PHASE 1

PROPONENT

MUNI ENTERPRISE PVT LTD

3 December 2023

ECO-TECH CONSULTANCY

EF ENFARM

Prepared by

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IV. CONSULTANTS DECLARATION

We hereby declare that the statements made in this EIA report are true, complete and correct to the best of our knowledge and available information at the time of writing the report.

Name: Mohamed Musthafa (Lead-Consultant)

Date: 29th November 2023

Sign:

Name: Ibrahim Rashihu Adam (Lead-Consultant)

Date: 29th November 2023

Sign:

Name: Mahfooz Abdul Wahhab (Co-Consultant)

Date: 29th November 2023

Sign:

V. LETTER OF COMMITMENT AND DECLARATION OF PROPONENT

بسم الله الرحمن الرحيم

Reg No: C 236/2000

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Mr Ibrahim Naeem
Director General
Environment Protection Agency
Republic of Maldives

30 November 2023

DECLARATION AND COMMITMENT

Dear Ibrahim Naeem

Sub: EIA for the Proposed Construction of 8 Storey Commercial Building at LOT 10318, Hulhumale Phase 1

As the proponent and the developer of the captioned project we confirm that we have read the EIA report, and to the best of our knowledge all non-technical information provided in the EIA report are complete and accurate.

We would also like to confirm our commitment to implement all impact mitigation measures and monitoring program as specified in the EIA report during and post construction stage

Thanking you

Yours Sincerely

Ahmed Shiham
Director

"Get your ideas on paper and study them. Do not let them go to waste!"

VI. ސާދާ ޚުލާސާ

މި ރިޕޯޓަކީ މުޅި އެންޓަރޕްރައިސަސް ޕްރައިވެޓް ލިމިޓެޑް އިން ހުޅުމާލޭ ފޭސް 1 ގެ ސިނާއީ ސަރަހައްދުގައި އިމާރާތް ކުރުމަށް ހަމަޖެހިފައިވާ 8 ފަންގިފިލާ ހިމެނޭ އިމާރާތެއް (ކޮމާރޝަލް ބިލްޑިންގ) އެޅުމުން ވެށްޓަށް ކުރާނެ ނޭދެވޭ އަސަރު ދެނެގަތުން، އެ އަސަރުތަކަށް ކުޑަކުރުން ގޮތްތައް ދެނެގަތުމާއި އަދި އެ މަސައްކަތްތަކުގެ ކުރިއަށް ގެންދިއުމުން ވެށްޓަށް ކުރާނެ ނޭދެވޭ އަސަރު ދެނެގަތުން، އެ އަސަރުތަކަށް ކުޑަކުރުން ގޮތްތައް ދެނެގަތުމަށްޓަކައި 27-އާރު /2012 (އީ.އައި.އޭ ގަވާއިދު) ދަށުން އެކުލަވާލެވިފައިވާ "ތިމާވެއްޓަށް އަސަރުކުރާ މިންވަރު ބަލާނެ އުސޫލާ" ރިޕޯޓެކެވެ. މި ރިޕޯޓުގެ މައިގަނޑު ބައިތަކުގެ ތެރޭގައި ހިމެނިފައިވަނީ ރިޕޯޓުގެ ތައާރަފު، މަޝްރޫއާ ގުޅުންހުރި ސިޔާސަތުތަކާއި، ގާނޫނު، ގަވާއިދު އަދި އުސޫލުތައް، މަޝްރޫއުގައި ހިމެނިފައިވާ ބައިތަކާއި މަޝްރޫއު ކުރިއަށް ގެންދާނެ ގޮތުގެ ތަފްސީލު، މަޝްރޫއު ކުރިއަށް ގެންދާ ސަރަހައްދުގެ ތިމާވެށީގެ ހާލަތު ދިރާސާކުރުމަށް ބޭނުންކުރެވުނު މެތަޑޮލޮޖީ އަދި އެ ސަރަހައްދުގެ ތިމާވެށީގެ ހާލަތު، މަޝްރޫއުގެ ސަބަބުން ތިމާވެއްޓަށް ކުރާނެ އަސަރުތައް، މި އަސަރުތައް ކުޑަކުރުމަށް އަޅަންޖެހޭ ފިޔަވަޅުތައް، މަޝްރޫއު ކުރިއަށް ގެންދިއުމުގައި ތިމާވެށީގައި އަންނަމުންދާ ބަދަލުތައް ދެނެގަންނަން ގޮތުގެ ޕްލޭން އަދި ނިންމުމެވެ.

މާލޭގައި ދިރިއުޅުން އަންނަ ބިޒްނަސާއި އަދި އެކި ބޭނުންތަކަށް ރަށްރަށުން ހިޖުރަކޮށް މާލޭގައި ގިނަ އަދަދަކަށް މީހުން ދިރިއުޅެން ޖެހިފައިވުމުގެ ސަބަބުން މާލެވަނީ މިހާރު މުޅިންހެން ތޮއްޖެހި، ޖާގައިގެ ދަތިކަން އިންތިހާއަށް ބޮޑުވެފައެވެ. މިކަމަށް ހައްލެއް ހޯދުމުގެ ގޮތުން ސަރުކާރުން ވަނީ ހުޅުމާލެ ހިއްކުމުގެ ބިޔަ މަޝްރޫއު 1997 ގައި ފަށާ ފުރަތަމަ ފިޔަވަހިން 188 ހެކްޓަރުގެ ބިން ހިއްކާފައެވެ. ހުޅުމާލެ ހިއްކުމުގެ ދެވަނަ ފިޔަވަހި 2015 ވަނައަހަރު 244 ހެކްޓަރުގެ ބިން ވަނީ ހިއްކާފައެވެ. ހުޅުމާލެ ހިއްކުމުގެ މި މަޝްރޫއުތަކުން ހިއްކާފައިވާ ބިންތަކުގެ ބޭނުން ހިފުމުންދަނީ ގެދޮރު (ފްލެޓް) އެޅުމަށާއި، މިސްކިތްތައް ބިނާކުރުމާއި، ފިހާރަ، ސިނާއީ، އިޖްތިމާއީ އަދި ތައުލީމީ މަރުކަޒުތައް އެޅުމަށެވެ. ހުޅުމާލެ ހިއްކާ ތަރައްގީ ކުރުމުގެ މައިގަނޑު ބޭނުމަކީ، މާލެއަށް އައިސްފައިވާ ތޮއްޖެހުން ކުޑަކޮށް ހުޅުމާލެއަކީ ވިޔަފާރީގެ މައި ހަބަކަށް ހެދުމެވެ. މިފަދަ މަސައްކަތް ކުރުމަށް ހުޅުމާލެއަށްވެސް ލިބިފައިވާ އެންމެބޮޑު ފުރުސަތަކީ ބައިނަލްއަގުވާމީ ވައިގެ ބަނދަރާއި އެއްގަމުން ގުޅިފައިވާތީ ހުޅުމާލެއަކީ ވަރަށް ބޮޑު ޕޮޓެންޝަލްތަކެއްގެން ތިމާވެއްޓަށް އިސްކަންދީ ދެމެހެއްޓެނިވި މިސްރާބަކަށް ތަރައްގީ ކުރެވިގެން އަންނަ ސިޓީއަކަށް ވާނެއެވެ. މި ސަބަބުތަކަށްޓަކައި ސަރުކާރުން މަސައްކަތްކުރަމުން އަންނަނީ ހުޅުމާލެއަކީ މާދަމާގެ ވިޔަފާރީގެ ހިސާބެއްގެ ގޮތުގައި ތަރައްގީ ކުރުމަށެވެ.

މުނީ އެންޓަރ ޕްރައިސް ޕްރައިވެޓް ލިމިޓެޑުން ހުޅުމާލޭގައި އިމާރާތްކުރުމަށް ހަމަޖެހިފައިވާ 8 ފަންގިފާޅީގެ އިމާރާތް (ކޮމާރޝަލް) އެޅުމަށް ހަމަޖެހިފައިވާ ލޮޓް ނަމްބަރ 10318 (އެމް 4 -07 (10318)) ހުޅުމާލޭގެ ފުރަތަމަ ފިޔަވަޅުގެ ސިޓީއި ސަރަހައްދުގައެވެ. އެޗް.ޑީ.ސީ (އާރބަންކޯ) އިން މުނީ އެންޓަރ ޕްރައިސް ޕްރައިވެޓް ލިމިޓެޑަށް އެއްބަސްވުމެއްގެ ދަށުން 15 އަހަރަށް ކުއްޔަށްދީފައިވާ މި ބިމުގެ ބޮޑު މިނަކީ 4419.87 އަކަ ފޫޓެވެ. 8 ފަންގިފަޅަށް އިމާރާތްކުރެވޭ މި އިމާރާތް ބޭނުންކުރުމަށް ހަމަޖެހިފައިވަނީ ވިޔަފާރީގެ ބޭނުމަށެވެ. ހޯލްސޭލް އިމްޕޯޓް ފުޑް ވެއަރހައުސްކުރުމެވެ. މިހެން ދިރިއުޅުމާއި، ސިޓީއި މަސައްކަތް ކުރުމާއި ނުރައްކާތެރި މާއްދާތަކާއި ގުދަން ކުރުންފަދަ ކަންކަން ކުރުމަކީ މަނާކަމެކެވެ. އެޗް.ޑީ.ސީ އާއި މުނީ އެންޓަރ ޕްރައިސް ލިމިޓެޑާއި ދެމެދު ވެފައިވާ އެއްބަސް ވުމުގެ ދަށުން އިމާރާތް ކުރުމަށް އެއްބަސް ވެފައިވަނީ 6 ފަންގިފާޅީގެ އިމާރާތެކެވެ. އެހެންނަމަވެސް މަޝްވަރާގެ އިދާރާއިން ނިންމާފައިވަނީ 8 ފަންގިފާޅީގެ އިމާރާތެއް އެޅުމަށެވެ. މިކަމަށް ބަދަލުގެނައުމަށް ކުރިން އާރބަންކޯއިންވެސް ވަނީ ފާސްކޮށްފައެވެ. އެހެންކަމުން މަސައްކަތް ފެށުމުގެ ކުރިން، އެޗް.ޑީ.ސީ މިހާރުގެ އާރބަންކޯ އާއިއެކު ހަދާފައިވާ އެއްބަސްވުން އިސްލާހުކުރުމަށް ފެށިއެވެ.

މި އީ.އައި.އޭގައި ކުރެވުނު ދިރާސާތަކުން 8 ބުރީގެ އިމާރާތް އެޅުމަށް ހަމަޖެހިފައިވާ ސަރަހައްދުގެ ސާރވޭއެއް ނޮވެމްބަރ 19 ގައި ވަނީ ކުރެވިފައެވެ. މި ސާރވޭގައި ބިމުގެ ފެނުގެ ކޮލިޓީ ދެނެގަތުމަށް ފެން ސާމްޕަލް ކުރުމާއި، މި ސަރަހައްދުގައި 2023 އަޑު ހުރި މިންވަރާއި، ދުއްވާ ތަކެތި ދަތުރުކުރާ މިންވަރު އަދި ޖޮގްރަފީ އެ ސަރަހައްދުގެ ފެހިގެ މައިގަނޑު ބައިތައް ވަނީ ދެނެގަނެފައެވެ. މި ދިރާސާގައި ބަލައިލެވުނު ކަންކަމުގެ ތެރެއިން ބަލާލާފައިވާ މަޝްވަރާގެ ކުރިއަރާ ނެގުން ދިރުމުން ލިބޭނެ ފައިދާ އަދި ގެއްލުންތަކާއި، އެހެން ބަޔަކުގައި މަޝްވަރާ ހިންގުމުގެ ބޭނުމުގައި އިމާރާތުގެ ފައުންޑޭޝަން އެޅުމުގައި ބޭނުން ކުރެވޭނެ އެހެނިހެން ގޮތްތަކާއި، އިމާރާތްކުރުމަށް މިހާރު ރާވާފައިވާ ކޮންސްޓްރަކްޝަނުގެ ބަދަލުތަކުގައި ދަނޑުވެރި އަދި ޕްރޮޖެކްޓުގެ މޮނިޓަރިންގ ބޭނުންކުރެވޭނެ އިމާރާތްކުރުން ވަނީ ބަލާފައެވެ.

މި މަޝްރޫއުގެ ސަބަބުން ތިމާވެއްޓަށް ކުރާނެ އަސަރު ބޮޑު ނޫނެވެ. އަސަރަކީ ކޮންސްޓްރަކްޝަނުގެ މަރުޙަލާގައި އިމާރާތްކުރާ ސަރަހައްދުގެ ވައި ނުސާފުވުމާއި، އިމާރާތްކުރާ ސައިޓުގެ ބިމަށް ތެޔޮ އޮހި ބިން އަދި ބިމުގެ ފެން ތަޣައްޔަރުވުމާއި، މިސަރަހައްދުގައި އަޑުގަދަވުމުގެ ސަބަބުން އާއްމުންނަށް ދިމާވެދާނެ ދަތިތަކެވެ. އަދި މަސައްކަތު ކުރިއަށް ދާއިރު މިސަރަހައްދުގެ މަގުތައް ބަންދުވުމުގެ ސަބަބުން ޓްރެފިކް ޖާމްޖެހުމާއި އުނދަގޫތައް ކުރިމަތިވުން ކަމަށް ފާހަގަ ކުރެވިފައެވެ. މީގެ އިތުރުން އެކްސްކަވޭޝަން ޑީވޯޓަރިންގ ކުރުމުގެ ސަބަބުން މިސަރަހައްދުގެ ބިމުގެ ފެނާއި އިމާރާތްތަކަށް ގެއްލުން ލިބިދާނެއެވެ. މި އަސަރުތައް ކުޑަކުރުމަށް އަޅާނެ މައިގަނޑު ފިޔަވަޅުތަކަކީ، ހިރަފުސް އަރުން މަދުވާނެ ގޮތަށް މަޝްރޫއުގެ މަސައްކަތް ކުރުމާއި، ވިހާކޮށްފައި ހުންނަ ތަކެތި

މެއިންޓެއިން ކުރުމާއި، ބޭކާރުގޮތުގައި ބަރު ވެހިކަލްތައް ބޭނުންކުރުމާއި، މަގު ބަންދުކޮށްގެން ކުރާ މަސައްކަތްތައް [illegible] ބާރުބޮޑު ނުވާ ގަޑިތަކުގައި ހާއްސަކުރުމާއި، ތޮއް އަދި ރޭގަނޑު އުފުލުން އަދި ބޭނުންކުރުމުގައި ހުންނަ އުސޫލުތަކަށް ސަމާލުކަން ދިނުމާއި، ހާދިސާއެއް ހިނގައިފިނަމަ އެކަން ހައްލުކުރުމަށް ޓީމް ތައްޔާރަށް ބެހެއްޓުމާއި، މަސައްކަތްތެރިންނަށް [illegible] ސޭފްޓީ ވަސީލަތްތައް ބޭނުންކުރުމާއި، މަޝްރޫއުގެ ހިނގާ މަސައްކަތް އެއްގައި ގަވާއިދުތަކާއި އެއްގޮތަށް މެނޭޖުކުރެވޭނެއެވެ.

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VII. EXECUTIVE SUMMARY

The purpose of this EIA is to critically analyse and assess the potential environmental impacts associated with the proposed development of a 8 storey commercial building and analyse the solutions and preferred alternatives as well as mitigation measures to minimize negative impacts whilst trying to derive the maximum positive impacts from the project.

The centralization of capital city of Maldives - Male' over the recent decades has led to the immigration of locals from outer Atolls to Male', where (outer atolls) the basic necessities are inefficient. As a result of migrated locals and living foreigners, Male' is now one of the most congested cities in the world. In order to provide a solution for this, Hulhumale' reclamation project was initiated in 1997, the official inauguration of the city occurred in 2004. Reclamation of 188 ha of land of Hulhumale' phase 1 was completed on 2002. The city has become home to some major commercial developments, providing 137,268.51 sqft of commercial space. Hulhumale' phase 1 was developed with an open space index of 2.50, to ensure a healthy lifestyle. Including parks, green strips and open sports areas, Hulhumale' provides a total of 50,000 sqft of open space areas. In the continued expansion and creation of land - Hulhumale Phase II land reclamation was begun on 15 Jan 2015. Under the Phase II reclamation 244ha of land has been created. Hulhumale Phase I and Phase II is developed under a master plan on various land uses that includes commercial, residential, small and medium industrial, institutional, leisure and educational.

One of the key objectives of hulhumale development is to release pressure in Male and to build a strong commercial base. The advantages of Hulhumale over Male City include its location close to international airport connected by land, availability of land and well planned developments etc. Also, Hulhumale is being developed in a sustainable way, which means that it is expected to have a lower environmental impact than Male city. As a result of these factors, Hulhumale is increasingly being seen as the Maldives's premier commercial hub. The government is committed to developing Hulhumale into a world-class business destination, and a number of major companies have already invested in the city.

The proposed 08 storey commercial building at LOT No. 10318 (M4-07 (10318) at industrial zone in Phase 1 facing Reethigas Magu is to be used for commercial use only. The proponent of the project is Muni Enterprise Pvt Ltd. The land area of 4419.87Sq.Ft has been leased to Muni Enterprize for a period of 15 years (Agreement no: HDC/LDL/2022/19, dated 30th March 2022).

The construction work has been contracted with Batch Pvt Ltd – one of the leading construction companies in Maldives. The building will be used for commercial purpose allowed to display of products for sale including furniture, sanitary wares and appliances. The supporting facilities include admin office, meeting room, staff room, inventory storage, parking and toilets. Under the signed agreement it is prohibited to set it for accommodation, industrial use, store flammables materials/substances etc. Also under the Hulhumale Development Guideline – Showroom Development Guideline annexed to the agreement signed between Muni Enterprise Pvt Ltd and HDC it says the maximum building height from the pavement level to terrace slab level is 18.5m (6 floors). However, the approved drawing for the proposed commercial building is on 8 floors (8 storey commercial building), which requires approval from the land "Lessor (HDC)" and bring an amendment to the contract before commencing proposed construction work.

A full baseline air quality was established at the proposed development area as it is predicted to impact negatively on the air quality particularly during construction. In addition to this, noise level, groundwater quality and traffic flow of the area were surveyed.

The major regulatory requirements for the project involve obtaining the EIA decision statement to go ahead with the project as per the EIA regulation, following with the legislations pertaining to building works, waste management and other utility service provision. In order to assess the existing environment of the project site, various aspects were studied under the EIA. Some of them are air quality, noise, socioeconomic environment, traffic and water quality. Additionally, this study also involved identification of alternative options in place of the proposed development. The considered options were no project scenario, moving project location and alternative types of foundation.

Air and noise pollution arising specially from vibrations, operation of heavy machinery as well as disturbances on the traffic flow due to road blocks are the most significant negative impact which would arise during the construction phase of the project. Additionally, during the operational phase, it is anticipated that there will be increase in traffic flow in the area while also improvement on landscape and scenery of the location. Major mitigation measures proposed in the construction phase include measures taking dust suppression actions such as spraying water on ground, ensuring shortest vehicle route in mobilization, vehicles are maintained properly, avoiding unnecessary use of vehicles, planning road closure in such a way that it wouldn't over burden the traffic, following oil and chemical handing procedures, having emergency spill clean-up crew at site and following best practices in waste management at all phases of the project.

The socioeconomic benefits during the operations far outweigh the negative impacts. It is expected that the proposed development will provide convenient shopping space for residents in Male and Hulhumale' which will directly benefit for the proponent and the communities living in. Considering the positive impact that will gain from the development and the insignificant negative impacts it is recommended to proceed with the construction of the 8 storey commercial building as planned while addressing mitigation measures, recommendations and conditions set in this EIA report.

1. INTRODUCTION

1.1 Structure of the EIA

This Environmental Impact Assessment (EIA) addresses the potential impacts of the proposed development on the physical, biological, environmental and socio-economic aspects of the development area in addition to providing safeguards to reduce any environmental effects.

In addition to forming a basis for the assessment and approval of the proposed project, this EIA provides the community and government authorities with information on all aspects of the proposal. The EIA has been divided into following sections;

- **Section I - III**: CONTENTS- Provides hyperlinks to various sections, figures and tables of the EIA report.
- **Section IV - V**: DECLARATIONS- Provides the Proponent and Consultant's declaration for the EIA report.
- **Section VI - VII**: EXECUTIVE SUMMARY- Provide a brief non-technical summary of key finding of the EIA report.
- **Section 1**: INTRODUCTION- Provides an outline of the structure and purpose of the EIA as well as objectives of the proposed development.
- **Section 2**: METHODOLOGY- Describes the detailed methods used for data collection on the existing environment and baseline conditions.
- **Section 3**: STATUTORY REQUIREMENTS- Outlines the relevant legislative requirements pertaining to the proposed project.
- **Section 4**: PROJECT DESCRIPTION- Describes the proposed development in detail.
- **Section 5**: EXISITING ENVIRONMENT- Describes the present conditions of the physical components of the study area and sets baseline conditions.
- **Section 6**: STAKEHOLDER CONSULTATION- Provides details on the consultation process and parties consulted for this study.
- **Section 7**: POTENTIAL IMPACT ANALYSIS- Describes the prevailing environmental characteristics and constraints of the site and locality being investigated and an assessment of the potential environmental impacts associated with the proposed development.

- **Section 8:** OPTIONS ASSESSMENT- Discusses all the available alternatives for the project and justifies the preferred option.
- **Section 9:** MITIGATION MEASURES- Outlines the mitigation measures that would be implemented to reduce any potentially adverse impacts.
- **Section 10**: ENVIRONMENTAL MONITORING- Outlines the environmental management monitoring parameters that would be used to monitor the changes.
- **Section 11**: JUSTIFICATION AND CONCLUSION- The conclusions drawn from the proposed project and impact analysis with the justification of the preferred options.
- **Section 12**: ACKNOWLEDGEMENTS- Highlights the parties which had contributed to the preparation of this EIA report.
- **Section 13**: APPENDICES- Supporting documents and information are provided as appendices to this EIA.

1.2 Project Objectives

The primary objective of the proposed project is to construct a 8 story commercial building at LOT 10318 (M4- 7 (10318)), Hulhumale Phase 1

1.3 Need for the Project

Hulhumale is one of the most, if not the most developing part of the Greater Male Region and it continues to be a hub of real estate economic activities from both government and private investors. Therefore, it is understood that the demand for housing and economic ventures in Hulhumale is exponentially increasing.

As such, an agreement was signed between Muni Enterprises Pvt Ltd (proponent) and HDC (now URBANCO), the plot M4-7 (10318) was handed over to Muni Enterprise Pvt Ltd on 30th March 2022 under a signed agreement (Agreement No: HDC/LDL/2022/19) . The proponent wishes to construct 8-storey commercial building on the land which will be used for commercial and purposes in the form of lease agreements.

1.4 Summary of Impact Assessment Methodology

The approved ToR was issued on the 19th November 2023 (the approved ToR is attached in appendix section Appendix C) upon submission of the EIA application form.

Based on the approved ToR the proponent and the consultants have conducted a risk-based environmental review as part of the planning process. Data has been drawn from a wide range of sources, including existing similar project EIA reports, baseline data, consultations with stakeholders, existing legislations, professional judgement and expertise of the consultants. Impacts were identified based on the locations of the project components as well as type of service to be provided. The detailed impact assessment methodology is described under chapter 7.

1.5 List of similar project EIAs reviewed

As part of relevant literature review for impact prediction as mentioned in the above section the following project EIAs were reviewed;

- EIA for for the Proposed Apollo 1000 Housing Units Development Project at Hulhumale' Lot N3-55B, Kaafu Atoll
- EIA for the Proposed Apollo 1000 Housing Units Development Project at Hulhumale' Lot N3-55C, Kaafu Atoll
- EIA for development of 05 storey building in Munich Villa
- EIA for development of 13 storey building in G.Dailywork
- EIA for development of 10 storey bilding in G.Ottaru
- EIA for development of 11 storey building at H.Hithigasdhoshuge
- EIA for construction of Villa College south wing tower at Ma. Male' Higher Education School

1.6 Purpose of this EIA

The purpose of this EIA is to critically analyze the environmental and socio-economic impacts which may arise due to the construction and operation of the proposed project. After analyzing the impacts, it would be then possible to suggest proper mitigation measures to prevent/reduce any negative impacts and to enhance any positive impacts. The study involves evaluation of baseline conditions, prediction of the likely impacts, stakeholder consultation and design mitigation measures.

1.7 The EIA Process

The EIA process in the Maldives is coordinated by the Environmental Protection Agency (EPA) of the Maldives in order to ensure that environmental considerations are included in decisions regarding projects which may have an adverse impact on the environment.

The first step in the process involves screening (for the projects that may have significant impacts on the environment which are listed as projects requiring an EIA under appendix D of the EIA regulation 2012, an EIA application shall be provided to EPA and upon review EPA will call for the scoping meeting) of the project to determine whether a particular project warrants preparation of an EIA. Based on this decision, the EPA then decides the scope of the EIA which is conferred to the project proponents, the consultants as well as any relevant stakeholders to the project at a scoping meeting. A document ideally encompassing the issues and impacts that have been identified during the scoping meeting will then be issued known as the Terms of Reference (ToR). The consultant then prepares the EIA in accordance with the ToR and/or the range of issues identified during the scoping process. Once the findings of the EIA has been reported to the EPA, it gets reviewed following which an EIA Decision Statement (DS) is issued to the proponent who is responsible for implementing the project according to the DS and undertake appropriate environmental monitoring if required and report to the EPA.

1.8 The Consultant

The EIA was prepared by Mohamed Mustafa jointly with Eco Tech Consultancy - an environmental and information technology consultancy firm registered in the Maldives on 2021. The company specializes in providing environmental solutions to clients. However, the company's services are not just limited to Environmental Impact Assessment, Environmental Monitoring Reports and Environment Management Systems, with their partners they provide land surveying and IT solutions as well. Within the short period Eco-Tech Consultancy has completed a total of 46 assignments that includes Environmental Impact Assessment reports, Environmental Monitoring Reports and RO Plant registrations.

The following registered EIA Consultants of Eco-Tech Consultancy were involved in the preparation of this EIA report;

- Mohamed Musthafa (Lead Consultant), Consultant registration no: EIA P20/2016
- Ibrahim Rashihu Adam, Consultant registration no: P06/2017 (Eco Tech Consultancy)

- Mahfooz Abdul Wahhab, Consultant registration no: P22/2016 (Eco Tech Consultancy)

1.9 The Proponent and Contractor

The proponent for the project is Muni Enterprise Pvt Ltd.

1.9.1 Contact details of Focal Point of the Proponent

Name:	Ali Shaathir
Designation:	Manager, Projects
Mobile No:	7773078/7959955
Land Line:	331513
E-mail:	shaathir@muni.com.mv

2. METHODOLOGY

This chapter describes the EIA report formulation method and the methods used to collect and analyze site-specific baseline data along with the potential limitations and uncertainty in data collection methods.

2.1 EIA report formulation

The three main guiding principles that was utilized in the formulation of this EIA report was the Environment Impact Assessment Regulation 2012, the approved Terms of Reference, and the EIA writing guideline 2012. Supporting principles were adopted from the UNEP EIA Training Resource Manual 2002 and AS/NZS ISO 3100:2009 Risk management principles and guidelines. Lastly project information was used in determining the locations for baseline studies.

The contents in the chapters of this EIA report were as per the appendix E of the EIA regulations 2012 and the approved ToR. The EIA layout and structure is as per the EIA writing guideline. The baseline data which was collected in accordance with the ToR and EPA data collection guidelines as much as possible. The detailed methodology employed for baseline data collection is described in the following section 2.2.

All the legislation pertaining to the proposed development was studied through the published legislations under the Maldivian governments gazette and relevant government body's websites.

Stakeholder consultations were done via public hearing for the EIAs that require public consultations and through face-to-face meeting or online meetings or via email communications.

The potential impacts were identified and analysed as per the method described in chapter 7.

Alternative were analysed based on its technical viability, economic feasibility, legal compliance, environmental practicability and social acceptability.

Preferred mitigation measures were determined based on the most significant impacts, where the mitigation measures would mitigate the adverse impacts or amplify the positive impacts further.

Similarly monitoring parameters were also determined based on the most significant impacts that could have adverse impacts to the environment.

Conclusion was justified by comparing the project need and the envisaged environmental impacts associated with the project.

2.2 Site-specific baseline data collection methods

All site-specific data was collected on 19th November 2023. The climatic conditions at the sampling times were gentle breeze winds from NNE at speeds averaging 4.4 Knots. Humidity was at 86% with 45% cloud cover.

2.2.1 Water quality

2 groundwater samples were collected. 1 groundwater sample was taken from an existing well and 1 from a dug well on project site during the survey. The groundwater table was measured using a measuring tape during low tide (almost 152.5 cm below MSL). The sampling locations and their respective GPS coordinates are provided in Table 2 and Figure 3. Samples were collected in 500 mL plastic and 300 mL glass bottles. Before collecting the sample, the bottles were first rinsed with the sampling water three times. Groundwater samples were collected on 20th November 2023 between 15:45 to 16:30 hours.

Samples were then sent to Maldives Water and Sewerage Company's (MWSC) water quality assurance laboratory in an ice box for testing.

2.2.2 Noise

Noise level was measured using a sound meter. Sound was measured for 1 minute at the desired location and the maximum and minimum was recorded on 19th November 2023 between 15:45 to 16:45 hours (Refer to Table 2 and Figure 3 for sampling locations and respective GPS coordinates).

2.2.3 Structural Environment

The structural environment of the proposed project site was visually inspected and qualitative notes were taken on the type, number and quality of existing infrastructure.

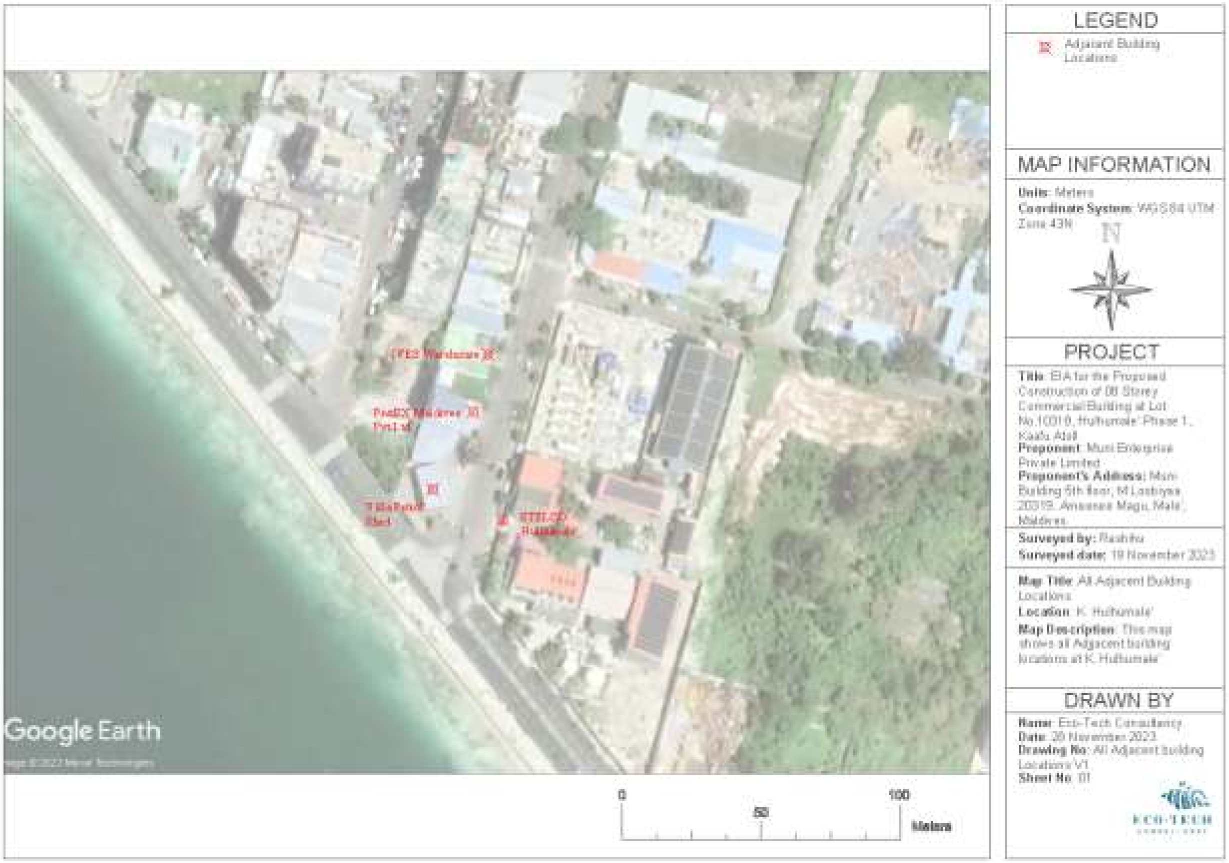


Figure 1: Shows all adjacent building locations surveyed near project area.

2.2.4 Traffic Flow

To give an indication of the traffic flow around the project site, the frequency of vehicles passing through a given point at the road was recorded for a given duration. As such an imaginary line (Figure 2) was drawn across the road on 2 roads, Reethigas Magu and Kashimaa Hingun. When a vehicle crosses the line, it was tallied. Likewise, the frequency of the vehicles passing was noted for a period of 30 minutes. Vehicle frequency was recorded between 16:10 to 16:40. (Refer to Table 2 and Figure 3 for sampling locations and respective GPS coordinates).

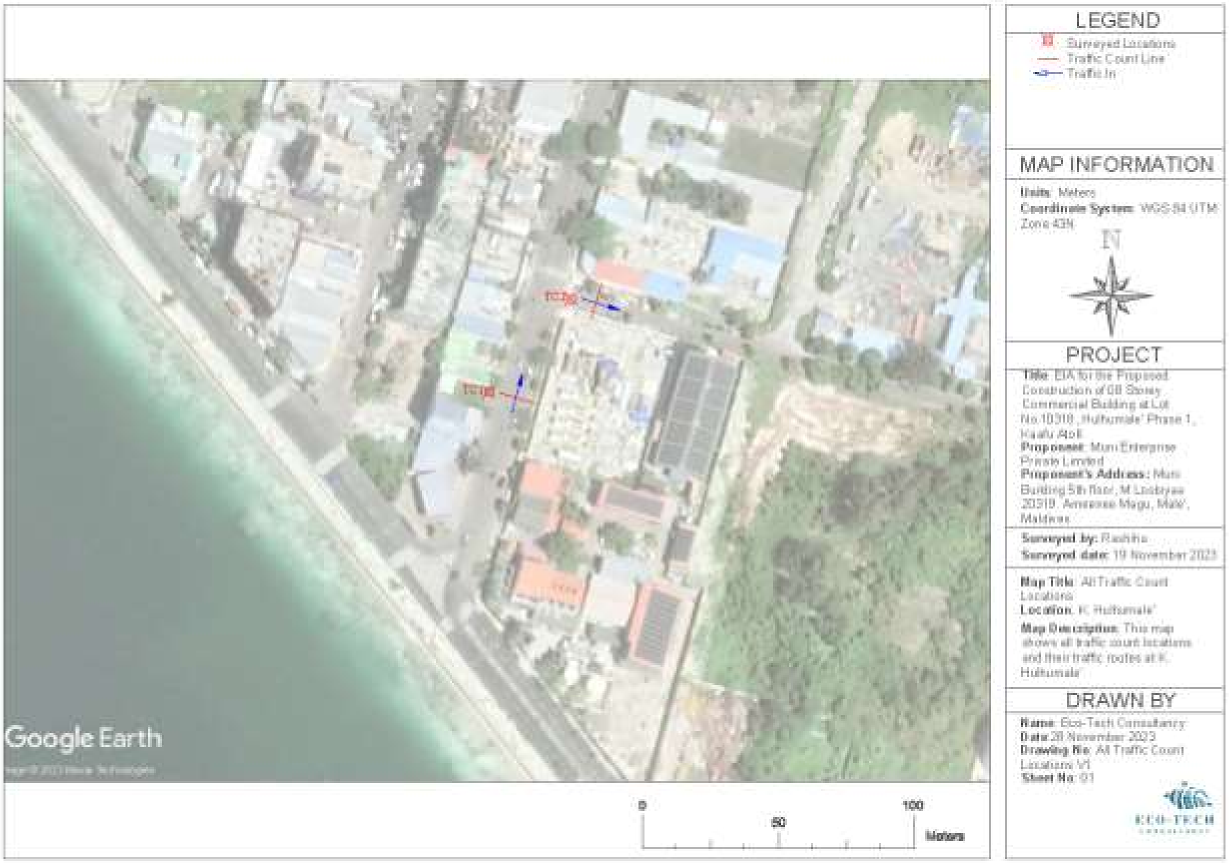


Figure 2: Location for vehicle frequency near the project area

2.2.5 Air Quality

Air quality was measured using a hand-held temperature / humidity / PM2.5 / PM10 / HCHO / TVOC / CO / CO_2 / AQI Air Detector. To avoid any bias from the surveyor the meter was left at each site for at least one minute to acclimatise before taking the reading. Outdoor and indoor readings were recorded on 19th November 2023 between 15:45 to 16:45 hours (Refer to Table 2 and Figure 3 for sampling locations and respective GPS coordinates).

2.2.6 Socioeconomic Environment

The most recent socio-economic data was obtained from HDC (Urbanco), Maldives Population and Housing Census 2022 and 2014, which was used to describe the demography and possible social impacts.

2.2.7 Hazard Vulnerability

The vulnerability of the proposed project site to storms, cyclonic winds, storm surge, seismic activity and tsunami were determined based on the disaster risk profile for Maldives 2006 and multi-hazard risk atlas of Maldives 2020. Risk of flooding was determined by analysing available rainfall data from the nearest meteorological station.

2.3 Limitations in data collection methods

There are several sources of uncertainty and limitations in any data collection method, some of which we aren't even aware of it. Nonetheless, the possible sources of uncertainty and limitations for the methods used to collect data for this EIA is described below.

Firstly, the water quality tests were not done on-site, therefore the results may not reflect the actual physical parameters of water for example temperature.

Air quality and noise measurements were taken only at one time. These parameters may change depending on the time and the season. Furthermore, the air quality reference ranges to which the collected data are compared to are for averages for a set time (1 hour or 8 hour) but the readings that was taken is a one time reading.

Noise measurements were taken for a short period of time and during daytime only. The noise levels may differ at night time.

During heavy traffic, vehicles might get unaccounted for in-between the time of recording and observing of incoming and outgoing vehicles.

Data for income situation and distribution on an island level was not available. So, had to use atoll level information to estimate the income status of island. Hence, the obtained representation of income situation and distribution for the island might not reflect the actual situation.

2.4 Data gaps

The most contrasting data gap is the lack of long-term site-specific data and the data that was taken under this EIA was also a snapshot of the full environmental setting as can be seen evidently from the above section. Namely, these data gaps include; lack of site-specific hazard risk analysis, climatic conditions, air quality and noise at different time periods.

2.5 Uncertainty in data

The first and foremost uncertainty in any data arises from the data collection method as it is impossible to devise a sampling method that is devoid of error. Hence any physical, chemical or biological parameter that is measured will have an error or uncertainty from the data collection method itself as no method by nature is 100% accurate. Additional uncertainties to the sampling method arises from the instrument used, these include the instruments resolution, accuracy and precision errors. Thirdly the human error that will be imposed when a person measures a parameter using a specific sampling method by using a particular instrument. Other factors include the time and environment.

Some of the results presented in this report are given with a confidence interval. The confidence interval is calculated at 95%, which means that we are 95% confident that the true value lies within the range given. Uncertainty could be calculated like this for certain parameters as some of the results provided are from third party data which does not have information of accuracy and precision. And in other cases, it is not possible to calculate as the measurements are only discreet data describing a varying parameter. In these types of cases the initial value obtained is given. Caution must be taken when using this type of data, as it is this type of data that usually warrants long-term studies.

2.6 Management of Uncertainties and Data Gaps

Due to the abovementioned limitations, data gaps and uncertainties, the following assumptions were made;

Table 1: uncertainties and data gaps in collected data and how it was managed

Data	**Sources of Uncertainty**	**Data Gap**	**Assumption (how it was managed)**
Hazard risk	Modelling errors due to imperfect understanding of the natural setting and lack of long-term data	No site-specific data	The available broad scale hazard risk analysis of the Maldives was used to determine the site-specific hazard risk at the proposed project site
Temperature, rainfall, wind	Equipment precision errors Human error	No site-specific data	Regional climatic conditions from the meteorological center for wind, rain, temperature was assumed true for the proposed project location
Water quality parameters	Off-site testing Equipment precision errors	Data lacking for both seasons	The tested water quality parameters (except for

	Human error		temperature) in the laboratory was assumed to be the onsite conditions.

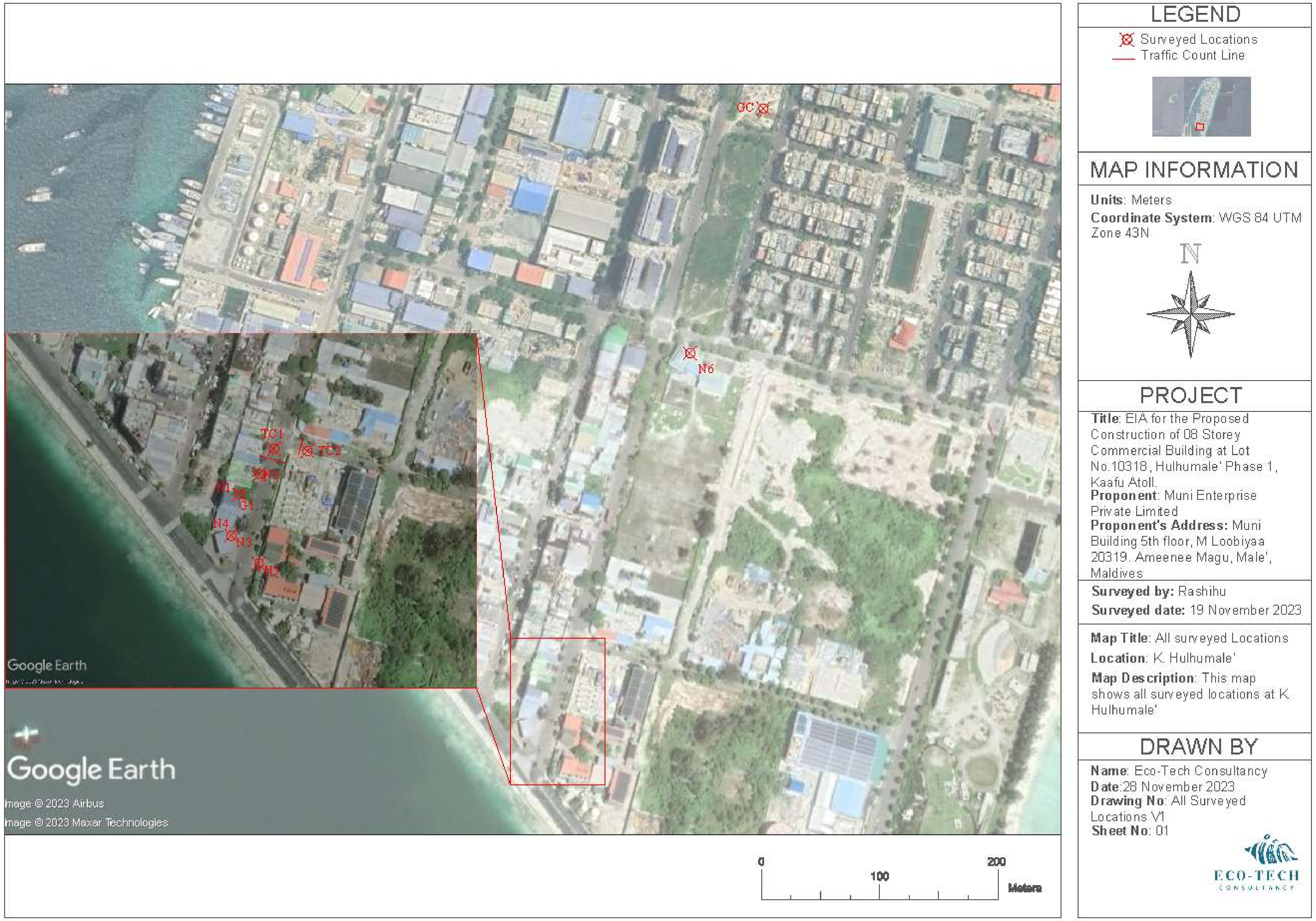
2.7 Geographic Coordinates for all sampling locations

All the sampling locations were geo-referenced using a GPS. The coordinates for all sampling locations are shown in Table 2 and Figure 3 below.

Table 2: Geographic coordinates for all sampling location at Hulhumale' Phase I

Code	Type	Location	GPS Coordinates	
			Easting	Northing
G1	Ground water sample at location G1	(Project Construction site) Within the project site	337724.00	464917.00
GC	Ground water sample at location GC	(Control site) Near Almoza shop	337937.00	465457.00
N1	Refers to location N1 of Noise measurement	(Project Construction site) Within project site	337724.00	464917.00
N2	Refers to location N2 of Noise measurement	(Near project site) Near the front garage doors of IVES Godown	337733.00	464925.00
N3	Refers to location N3 of Noise measurement	(Near project site) Villa petrol shed Hulhumale'	337715.00	464875.00
N4	Refers to location N4 of Noise measurement	(Near project site) Inside Villa petrol shed store	337716.00	464893.00
N5	Refers to location N5 of Noise measurement	(Near project site) Infront of STELCO entrance	337737.00	464866.00
N6	Refers to location N6 of Noise measurement	(Control site) Masjid Zaid Bin Al-Saabith	337859.76	465220.59
AQ1	Refers to location AQ1 of Noise measurement	(Project Construction site) Within project site	337724.00	464917.00
AQ2	Refers to location AQ2 of Noise measurement	(Near project site) Near the front garage doors of IVES Godown	337733.00	464925.00
AQ3	Refers to location AQ3 of Noise measurement	(Near project site) Villa petrol shed Hulhumale'	337715.00	464875.00
AQ4	Refers to location AQ4 of	(Near project site)	337716.00	464893.00

	Noise measurement	Inside Villa petrol shed store		
AQ5	Refers to location AQ5 of Noise measurement	(Near project site) Infront of STELCO entrance	337737.00	464866.00
AQ6	Refers to location AQ6 of Noise measurement	(Control site) Masjid Zaid Bin Al-Saabith	337859.76	465220.59
TC1	Refers to location TC1 of Traffic Count	Reethigas Magu	337739.00	464912.00
TC2	Refers to location TC2 of Traffic Count	Kashimaa Hingun	337773.00	464950.00



LEGEND

☒ Surveyed Locations
— Traffic Count Line

MAP INFORMATION

Units: Meters
Coordinate System: WGS 84 UTM Zone 43N

PROJECT

Title: EIA for the Proposed Construction of 08 Storey Commercial Building at Lot No.10318, Hulhumale' Phase 1, Kaafu Atoll.
Proponent: Muni Enterprise Private Limited
Proponent's Address: Muni Building 5th floor, M Loobiyaa 20319. Ameenee Magu, Male', Maldives
Surveyed by: Rashihu
Surveyed date: 19 November 2023
Map Title: All surveyed Locations
Location: K. Hulhumale'
Map Description: This map shows all surveyed locations at K. Hulhumale'

DRAWN BY

Name: Eco-Tech Consultancy
Date:28 November 2023
Drawing No: All Surveyed Locations V1
Sheet No: 01

Figure 3: sampling locations at K. Hulhumale' Phase I

3. STATUTORY REQUIREMENTS

This section describes the statutory requirements relevant to the proposed proposal. Section 3.1 describes all the relevant laws, policies and strategic action plans that must be complied to for this proposal. Section 3.2 describes all the pertinent regulations, section 3.3 all the guidelines and section 3.4 describe all the international conventions that the Maldives are a party to.

3.1 Laws, Policies and Strategic Action Plans

This section describes the applicable laws, policies and strategic action plans pertaining to the proposed development.

3.1.1 Environmental Protection and Preservation Act (4/93)

The Environmental protection and Preservation Act of the Maldives was enacted to protect the environment and its resources for the current and future generations. Relevant articles under this law pertaining to the proposed project are:-

- Article 2 states that the instructions for environmental protection will be given from the competent authority and everyone must respectfully follow these instructions;
- Article 3 states that all matters relating to environmental protection and preservation must be handled by the Ministry of Planning, Human Resource and Environment (MPHRE);
- Article 4 states that MPHRE must declare protected sites and species and formulate the regulations to manage them. If any other party wants to declare a protected site or species they must be registered in the MPHRE and managed according to regulations made by the Ministry;
- Article 5 states that any projects which pose significant impacts to the environment, an EIA report has to be made and submitted to the MPHRE. The projects which require an EIA and the regulation must be made by MPHRE;
- Article 6 states that if any project is found to cause significant adverse impacts, MPHRE have the right to stop the project;
- Article 7 states that any waste, oil or hazardous gas must not be dumped into any part of the Maldives, however, if strictly needs to be disposed it should be disposed of in

an area designated by the Government. If such hazardous gas, waste or oil is to be disposed by combustion, it should be done in a way it does not impact human health and environment;

- Article 8 states that any hazardous waste must not be disposed into any part of the Maldives. Before trans-boundary transfer of such waste, approval must be taken from the Ministry of Transport and Communication by writing to the Ministry at least 3 months beforehand.
- Article 9 states that any party who violates this law or any regulation under this law is punishable to no more than MVR 100 million according to the offence. The fine will be applied by the MPHRE.
- Article 10 states that any offence to this law or any regulation under this law or any action resulting in environment damage, the compensation for such damages can be taken through judicial processes.

3.1.1.1 1st addendum to Environmental Protection and Preservation Act (4/93) law no 12/2014

Article 3 and 11 of the Environmental Protection and Preservation Act (4/93) of Maldives is amended as follows:-

Under article 3, all matters relating to environmental protection and preservation must be handled by the Ministry charged with implementation of environmental policy.

3.1.2 Law on General Public Services (4/96)

Under this law, the general public services are electricity, telephone, water and sewerage services. Relevant articles under this law pertaining to the proposed project are:-

- Article 3 states that any party can provide general public services only after getting registered in the competent authority and according to its regulations;
- Article 4 states that any public service must be provided after a contract agreement has been made between the service provider and the customer. The agreement must be made according to the regulations put forward by the competent authority;
- Article 5 states that a transfer of service between customers must be made only after a contract has been made between the customers according to the service providers regulations. If the customer fails to comply with the agreement, the service provider can discontinue service only after approval from competent authority;

- Article 7 states that the service provider can permanently discontinue its services according to regulation mentioned in article 3 of this law. However temporary discontinuation can be made after giving prior notification to the customers and according to the agreement made between the service provider and the customer;
- Article 8 states that the tariffs for the services must be approved from the competent authority prior to implementation. Further, any amendments to tariff structure also must be approved from the competent authority before implementation; and
- Article 9 states that any damage made to service provider's facilities by anyone, he can be charged with 10-year prison penalty or banishment. Further, any action against this law (excluding what is mentioned in article 9 (a) of this law) can be charged between MVR 100 to MVR 5000 by the competent authority.

3.1.3 Waste management policy

With the implementation of waste management policy 2015, the 2011 and 2007 policy is void. The waste management policy which came into effect on 2015 is to ensure that the Maldivians are well aware of the waste management techniques and maintains cleanliness as well as the natural aesthetics and clean air quality of the country is well maintained. Under this policy, all the inhabited islands need to implement a waste management plan and manage all the wastes generated from that island in accordance with that policy.

3.1.4 Waste management act (24/2022)

The waste management act came into force in 18th December 2022 with the main objectives of implementing sustainable waste management, establish waste management standards, minimize negative impacts from waste to the environment and human health. The act outlines the principles for waste management, roles and responsibilities of the relevant institutions.

3.1.5 Maldives Energy Act (18/2021)

The Maldives Energy Act was published on 11th October 2021 with the aims to regulating power production, power usage, electricity services, protecting the rights of customers, detailing the rights and responsibilities of service providers, upkeeping the quality of services, regulating power tariff rates, promoting renewable energy, facilitate sustainable development of the energy industry in a manner that is environmentally friendly, resilient to the impacts of climate change, facilitate reduction in GHG emissions, economically feasibility. Relevant notable articles under this law pertaining to the proposed project are:-

- Chapter 1 – Introduction. the following are some aspects highlighted under the chapter.
  - Energy sector policy:
    - Shall be formulated and gazetted.
    - All involved in electricity service provision shall adhere to it.
    - Policy shall be reviewed and revised in every 5 years.
  - Energy sector plan:
    - 10-year plan on the energy sector development shall be formulated.
    - All licensees for electricity service provision shall provide a plan on service provision to the Ministry.
- Chapter 2 relates to the Roles and Responsibilities of the institutions, under which the following are highlighted:
  - Responsibility of the Ministry:
    - Facilitation of electricity services at an affordable rate in all inhibited islands, facilitating the investments for the sector,
    - Provision of technical assistance to island councils,
    - Implementing the international commitments relative to the sector,
    - Formulation of regulations and ensuring sustainable levels of electricity services are received to all inhibited islands.
  - The Authority and Responsibility of the Regulator:
    - Enforcement of regulations,
    - Licensing,
    - Tarrif setting,
    - Monitoring and revision,
    - Regulating of service providers,
    - Formulating of standards relevant to the sector etc.
  - Roles and responsibilities of island councils.
  - Responsibility of other entities to provided assistance for the enforcement of the act.

- Chapter 3 is regarding the renewable energy. The following are discussed in the chapter
    - Ownership
    - Development
    - Target setting
    - utilising the space required for renewable energy
    - providing preference to renewable energy.
- Chapter 4 deals with petroleum and petroleum products. It details the following aspects regarding petroleum and petroleum products
    - Licensing and its relevant details
    - Quality Assurance
    - Stock Management
    - Environmental protection and general public health safety
    - Regulatory aspects for vessels carrying petroleum and petroleum product
- Chapter 5 deals with production of power and provision of its services, the following are some aspects highlighted under the chapter
    - Service provider and customer rights
    - Provision of services
    - Licensing
    - Responsibilities of service providers
    - Provision of services for personals with financial vulnerabilities
    - Monitoring
    - Inspections
    - Tariff settings
    - Application of services
    - Quality assurance
    - Termination of services
    - Emergency power cut
    - Vandalism and disruption of services
    - Ownership
- Chapter 6 deals with economising electricity and its efficient use, the following are some aspects highlighted under the chapter
    - Energy saving and its efficiency

  - Information collection
  - Formulation of regulation and guidelines
  - Energy efficiency certifications
  - Energy auditing
  - Annual energy report
  - Ill practices in electricity usage
- Chapter 7 highlights regarding the transition from previous legal framework of the energy sector.

3.1.6 Water and sewerage Act (8/2020)

The water and sewerage Act was published on 05th August 2020 with the aims to provide safe water and sanitation services to the general public by implementing guidelines for providing water and sanitation service, operation and maintenance of water and sewer facilities, and other related guidelines. Relevant articles under this law pertaining to the proposed project are:-

- Article 5 states that, to provide the water and sanitation services entitled for every citizen of Maldives, it is the duty of the government to implement the following;
  - establishing facilities required to provide water and sanitation services sustainably
  - ensuring that safe water and adequate sanitation services are provided
  - overcoming any hindrance to provide water and sanitation service
  - establishing standards for water and sanitation service
  - ensuring that the water and sanitation service providers follow the set standards
  - researching and developing the water and sanitation sector
- Article 6 states that the water and sanitation policies shall be declared by the Minister as advised by the President. These policies shall be made available to the general public. All parties involved in the water and sanitation sector must fully comply with these policies.
- Article 7 states that Utility Regulatory Authority shall be responsible to implement this law.
- Article 8 states the duties of the Ministry in detail. These include drafting the polices, laws and regulations required to implement this law, establishing water and sanitation facilities in all inhabited Islands of the Maldives within 05 years of implementation of

this law, ensuring that proper sewerage facilities are established on tourist and other industrial islands, and all the works to develop the water and sanitation sector.

- Article 9 states that the Council has the authority to declare the fees that could be taken from the water and sanitation service in accordance with the Utility Regulatory Authority and Governments policies and regulations. Additional responsibilities of the Council include; monitoring the third party water and sanitation service provider, monitoring environmental impacts due to water and sewer systems, providing information about water and sanitation service on the Island to the Competent Authorities, ensuring that enough water is available to the living population of the Island, and providing water and sanitation service via a licensed third party.
- Article 10 states the points that must be included in the third party agreement mentioned in article 9.
- Article 11 states the duties of Utility Regulatory Authority, which is to give licenses to all water and sewerage facilities in the Maldives and monitoring them.
- Article 15 states that the licensed all water and sanitation service providers must submit a plan to provider water and sanitation service annually with an implementation report which specifies; (1) water quality, (2) lost water, (3) service interruption, (4) costs, (5) revenue generated, and (6) CSR activities.
- Article 18 states that the groundwater presents in Tourism, Industrial and Reclaimed Islands are protected.
- Article 19 states that the groundwater presents in Tourism, Industrial and Reclaimed Islands cannot be used for commercial purposes. For existing agricultural Island a period of 2 years must be given for them to install RO plants and for inhabited islands, RO plants must be installed for agricultural field larger than 10,000 m^2.
- Article 20 states that any activity that contaminates the ground water is prohibited. Exclusive of this clause is using fertilizer for agricultural purpose and installing septic tanks in households. The article further states that fuel and other chemicals must be handled properly such that spills do not occur and if a spill occurs, the proponent must be responsible for clean-up. Finally, it is prohibited to dispose water which contains fuel and chemicals from Engine maintenance to the sea.
- Article 21 states that dewatering must be done in accordance with the regulations made under this law.

- Article 22 states that it is prohibited to dispose brine into ground or wetlands. Further, mixing of permeate water and rain water must be done according to set guidelines of the Utility Regulatory Authority.
- Article 24 states that there must be 05 days of water stored in case of emergency by all the service providers. Emergency water storage must be allocated in reference to the living population on the island, available water, and land availability for water storage.
- Article 25 states that operating license for water and sanitation service must be issued after the EIA process.
- Article 27 states that power required for the operation of RO plants must be from renewable energy sources. However, a period of 05 years shall be given to existing RO plants for transition. Nonetheless during an emergency situation due to a disaster on in case of renewable energy system failure, power from Diesel generators could be used.
- Article 28 states that rain water must be included as much as possible in the provision of Desalinated water.
- Article 29 states that it is the duty of the water and sanitation service provider to do all works required to provide the service in the assigned region for them. Additional responsibilities include; providing reports to Utility Regulatory Authority, upgrading water and sewerage facilities according to new technology, providing the first house connection free of charge, and water testing to ensure quality of water.
- Article 30 states that the water and sanitation service provider reserved the right to prohibit certain substances being disposed into the sewer system, installing meters, and entering households and commercial places.
- Article 31 states that the water facilities on inhabited islands of the Maldives must be established in accordance with MFDA's regulations. Additional points under this article include; the established water systems must have the capacity to test for water quality and disinfect, and it is the responsibility of the building's owner to establish measure to manage pressure in tall buildings, if a license for providing water has already been issued to an inhabited Island a second RO plant by another party could be installed with the approval of the Utility Regulatory Authority.
- Article 32 states that the Ministry shall declare publicly the Islands which require an STP and duration for establishing STP's on these Islands. On the islands where the Ministry has declared that an STP is required, on these islands sewerage services must

only be provided with an STP. However, during an emergency situation due to flooding, disposal of this storm water is allowed without the involvement of an STP. Additional points include; Disposing of water from dewatering to the sewerage network is prohibited and technical specification for sewerage facilities must be made by the Utility Regulatory Authority.

- Article 34 states that an agreement must be made prior to giving approval to any water and sanitation service provider and this agreement must be registered in the Utility Regulatory Authority.
- Article 35 states that all water and sewer systems in the Maldives must be operated after registering in the Utility Regulatory Authority.
- Article 36 states that water and sewer services in inhabited Islands of the Maldives must be given after taking the operating license from the Utility Regulatory Authority.
- Article 37 states that an exclusive operating license could only be given after getting the written approval from the president as advised by the Parliament if it is needed for the betterment of the country.
- Article 38 states the requirements of the operating license, these include; operation and maintenance of water and sewer systems in accordance with the regulations set by the Utility Regulatory Authority, implementing the business plan mentioned in article 41(a-2), reporting, and fulfilling other requirements set by the Utility Regulatory Authority.
- Article 41 states that the procedures for obtaining the operating license must be publicly made available. The article further details the information the service provider must submit while applying for the operating license.
- Article 42 states that the fees for water and sewer for inhabited Islands will be declared by the Utility Regulatory Authority.
- Article 43 states that the service provider must submit a performance report to the Utility Regulatory Authority, Council, and Ministry annually
- Article 44 states that customers have the right to report any complaints regarding the service provider to the Utility Regulatory Authority.
- Article 45 states that the Utility Regulatory Authority has the right to investigate the service provider of any misconduct or even if the Utility Regulatory Authority deems necessary.

- Article 60 states that if there are any overlaps with other laws regarding water and sanitation, this law shall take precedence.
- Article 61 states that with the implementation of this law, the articles pertaining to water and sanitation services under the law on general public services (4/96) is void.

3.1.7 Utility Regulatory Authority Law (26/2020)

This Utility Regulatory Authority Law was drafted to establish an Authority that will oversee the general public services given in the Maldives. The specific objectives of this law include;

- Ensure that the general public services given in the Maldives are provided sustainably
- Ensure that general public services are given efficiently and with minimal damage to the environment
- Ensure that general public services are given at adequate standards
- Create a competitive environment to develop general public services in the Maldives
- Draft and implement regulations on general public services
- Regulate the general public service providers
- Create awareness on the rights of the customers and the service providers

This law has 16 chapters. Chapter 1 states the objectives of the law, Chapter 2 states the responsibilities of the Utility Regulatory Authority, Chapter 3 states how the board of directors are to be established and their responsibilities, Chapter 4 states the organizational structure of the Utility Regulatory Authority, Chapter 5 states the responsibilities of the Minister, Chapter 6 states details about operating licenses, Chapter 7 states how tariffs are to be implemented, chapter 8, 9 and 12, 13, 14 sates the rights of the Utility Regulatory Authority in relation to monitoring service providers, Chapter 10 states the discipline that the Utility Regulatory Authority must have, Chapter 11 states guides on conflict resolution, Chapter 15 states the budget and reporting by the Utility Regulatory Authority, Chapter 16 states the changes in existing institutional framework such as the transfer of Maldives Energy Authority and EPA Water, Sanitation and Waste section to the Utility Regulatory Authority. Relevant articles under this law pertaining to the proposed project are:-

- Article 4 states all the responsibilities of the Utility Regulatory Authority. The most important responsibilities include; giving operating license to service providers, implementing all laws and regulations pertaining to general public services and ensuring that the service providers abide by them, implementing tariff, drafting and implementing regulation and guidelines for providing general public services.

- Article 23 states that a license must be obtained in order to provide any general public service in the Maldives.
- Article 24 states that the license for general public services will be given by the Utility Regulatory Authority.
- Article 25 states that an exclusive operating license will only be given after getting the written approval from the president as advised by the Parliament if it is needed for the betterment of the country.
- Article 29 states that the fees taken for general public services must be as per the approved tariffs from the Utility Regulatory Authority.
- The Service providers must strictly follow the directions of the Utility Regulatory Authority as mentioned in chapters 8, 9, 12, 13, and 14.

3.1.8 Public Health Protection Act (7/2012)

The purpose of this act is to establish policies for protection of public health, identify persons responsible for protection of public health, define how public health protection policies will be implemented and establish policies to limit basic rights ensured under the Maldives Constitution to Maldivians and people living in Maldives to necessary extents to protect public health. Chapter 5 of the act outlines health hazards, eliminating risk, reporting health hazards, and order of things that can be done and not done in relation to a building. Chapter 6 of the act outlines the procedures for declaring state of emergency.

3.1.9 Immigration Act (1/2007)

This act lays down the rules for the departure and entry of Maldivian Nationals and foreign Nationals. Relevant articles under this regulation pertaining to the proposed project are:-

- Article 3; all persons shall enter the Maldives from an authorised port, unless a person is compelled to do otherwise, due to sudden natural causes, or an emergency which is beyond the control of the person. Persons departing from the Maldives shall also depart from an authorised port unless in cases of emergency as stated above.
- Article 7; (a) A foreign national may enter the Maldives if he/she can produce a valid passport and a valid permit of entry. (b) A foreign national may leave the Maldives

provided that he/she has a valid passport. (c) Pursuant to subsection (a), a foreign national may enter the Maldives, unless as stated otherwise in the Regulations made under this Act, by filling a disembarkation form as specified in the Regulations and by submitting it with the passport to an immigration officer, and upon the leave to grant a permit of entry for the Maldives. (d) A foreign national may depart from the Maldives, unless as stated otherwise in the Regulations made under this Act, by filling an embarkation form as specified in the Regulations, and submitting it with the passport to an immigration officer and upon the leave to grant departure.

- Article 8; (a) For the purposes of this Act, permits to remain in the Maldives shall be divided into the following eight types;

  (1) Tourist Visa
  (2) Diplomatic Visa
  (3) Student Visa
  (4) Business Visa
  (5) Dependant Visa
  (6) Work Visa
  (7) Resident Visa
  (8) Special Visa

  (b) The permits specified in subsection (a) are subject to the Regulations made under this Act.

3.1.10 Anti-Human Trafficking Act (12/2013)

This act was enacted to combat human trafficking in the Maldives in order to protect human rights and human dignity. As per international best practices this act includes three main components of criminalization, prevention and rehabilitation of victims, making human trafficking a criminal offense in the Maldives. The law also strictly prohibits forced labor and fraudulent recruitment. The main objective of this act include;

- Preventing human trafficking in the Maldives
- Establish crimes of human trafficking and prescribe the punishments
- Provide for prosecution of perpetrators under this act
- Providing protection and assistance to victims of human trafficking

- Promote and protect the human rights of trafficked victims
- Engage in cooperation with local and international NGOs working against human trafficking to combat human trafficking

3.1.11 Climate Emergency Act (9/2021)

Climate Emergency Act was enacted in the Maldives in order to tackle the dangers that Maldives and its citizens face due to climate change. This act aims to bring forth regulations and mitigation measures to face the impacts of climate change, and to make Maldives a leading nation in advocating for action on climate change. It also aims to make the country carbon neutral while reaching its sustainable development goals.

- Article 2 states that Maldives should be a carbon neutral country by the year 2030, offsetting the same amount of carbon as those emitted. Any changes to the regulations can only be brought in consideration of new scientific findings and changes in international climate mitigation policies.
- Article 5 states that an action plan must be created to analyse the current situation and strategies to reach the climate goas in the country. The action plan must include regulations to make the country carbon neutral and resilient to climate change, adaptation and mitigation measures to respond to climate impacts, implementation of climate adaptation and mitigation in developmental plans, methods of monitoring of greenhouse gas emissions, development and implementation of renewable energy and its storage, and the roles of the government and other related bodies in strategizing and reaching climate mitigation goals.
- Article 7 states that any emissions from flights and ships travelling through Maldives under circumstances not stated in the law will not be considered when calculating total national emissions.

3.2 Regulations

This section describes the applicable regulations pertaining to the proposed development.

3.2.1 Environmental Impact Assessment Regulation 2012 (2012/R-27)

The EIA Regulation, which came into force in 2007, has been revised and this revised EIA Regulation is currently in force since May 2012. The Regulation sets out the criteria to determine whether a development proposal is likely to significantly affect the environment and is therefore subject to an EIA. Schedule D of the EIA Regulation defines the type of projects that would be subject to EIA. The main purpose of this Regulation is to provide step-by-step guidance for proponents, consultants, government agencies and general public on how to obtain approval in the form of an Environmental DS. Relevant articles under this regulation pertaining to the proposed project are:-

- Article 6 states that when government agencies propose a project, while finalizing the location for the project, they should reflect on the criteria's mentioned in Schedule B of this regulation. Furthermore, they should reflect on all the laws and regulations pertaining to environmental protection in the Maldives as well as international conventions, plans and programs to which Maldives is a party to.
- Article 7 states that the proponent must apply for an Environmental DS prior to commencement of any developmental project in accordance with article 8 of this regulation.
- Article 8 states that the proponent must apply for a screening if the developmental project is not listed in the inclusive list for EIAs (Schedule D of this regulation). If the proposed developmental project is listed under Schedule D of this regulation, then the proponent must submit an EIA application form.
- Article 11 states that a scoping meeting must be conducted and a ToR must be agreed upon by the proponent and the competent authority.
- Article 12 states that the EIA report must be written as per the approved ToR and the report must be a technical report with scientifically proven alternatives, impacts, and mitigations.
- Article 13 states that the competent authority must assign two independent reviewers to review the submitted EIA report and within 28 working days the competent authority must issue an Environmental DS or for additional information.
- Article 14 states that the Environmental DS must be; (1) Approval with the condition that the proponent follows the proposed mitigation measures (2) EIA report rejection due to poor quality of the report (3) Rejection of the proposal by the competent

authority due to potential irreversible negative impacts. The approval has a validity of 1 year. If the proponent could not start the works within one year of the approval due to force major, then the competent authority could give an extension.

- Article 15 states that if the proponent is not contented with the DS, then the proponent may apply to review the DS.

Since the enactment of the EIA regulation in 2012 there have been five amendments to the regulation. These five amendments are discussed below;

3.2.1.1 1st amendment to the Environmental Impact Assessment Regulation 2012 (2013/R-18)

The first amendment to the EIA regulation 2012 involved the establishment of a guideline for fining environmental offences under article 20. According to the guideline fines are as follows; (1) MVR 20,000 for first offence (2) MVR 60,000 for second offence (3) MVR 120,000 for 3rd offence (4) MVR 200,000 for repeated offences after the 3rd time.

3.2.1.2 2nd amendment to the Environmental Impact Assessment Regulation 2012 (2015/R-174)

With the 2nd amendment to the environmental impact assessment regulation 2012, there were some procedural changes made to the EIA process. The most important was the shifting of tourism related development projects EIAs to the Ministry of Tourism (article 4). The detailed amendments made to the relevant articles are discussed below;

- Article 7 was amended to have three categories of review period as follows; (1) MVR 5000 for a 15 day review period, (2) MVR 5000 for a 10 day review period, (3) MVR 5000 for a 05 day review period
- Article 8 was amended to have 5 categories of Environmental DS for screening as follows; (1) Environment Management Plan, (2) Initial Environmental Examination, (3) Environmental Impact Assessment, (4) Approval to go forth with the screened project, and (5) Approval to go forth with the project according to the mitigation measures proposed by EPA.
- Article 9 was amended to have 3 categories of Environmental DS for an IEE as follows; (1) Environmental Impact Assessment report if the project is anticipated to have major environmental impacts, (2) Environment Management Plan, (3) Approval

to go forth with the project if the project is not anticipated to have major environmental impacts.

- Article 14 was amended to have a guideline for extending the Environmental DS as follows; (1) Extension for Environmental DS must be applied by the proponent with the justification for the delay, (2) If extension was applied before the deadline for Environmental DS, an extension shall be granted without a fine, (3) If extension was applied within one month of the deadline for Environmental DS, a fine of MVR 5000 will be charged, (4) If extension was applied within 2 month of the deadline for Environmental DS, a fine of MVR 10,000 will be charged, (5) an extension shall not be granted if applied after 2 months of the deadline for Environmental DS, (6) extension for environmental DS shall be granted for a maximum of 1 year and only once. Further points were added to article 14 to set out the guideline for applying, review and issuing Environment DS for addendums. In this regard a proponent can apply for an addendum for an approved EIA report if; (1) it has not been 5 years since the Environmental DS was issued, (2) scope change, (3) works within 500 m of the proposed project.
- Schedule D of the regulation was amended to exclude all tourism related projects and some further changes to the list of project were also made.
- Schedule U was added to the regulation. For the projects under this schedule, approval to go ahead with the project will be granted once the proponent submits a commitment to implement the mitigation measures prescribed by EPA. There project are; (1) maintenance dredging without any changes to the initial footprint, (2) removing vegetation by local plot owners, (3) clearing roads for new housing plots after getting approval from island Council, (4) drilling borehole on land for extracting water.

3.2.1.3 3rd amendment to the Environmental Impact Regulation 2012 (2016/R-66)

One of the major amendments to the EIA regulation with this amendment is that the EIA consultants are classified into 2 categories (article 16). To be eligible for a category A consultant, the applicant should hold a minimum of level 7 qualification in an environment related field recognized by the Maldives National Qualification Framework. Likewise, to be eligible for a category B consultant, the applicant should hold a minimum of level 7 qualification in specific fields relevant for the nature of the project recognized by the Maldives National Qualification Framework. Additional detailed amendments made to the relevant articles are discussed below;

- Article 5 was amended to mention the implementing agency to be EPA on behalf of the Ministry.
- Article 6 was amended such that except for EMP and Environmental monitoring reports, all other reports under this regulation shall be made by a registered EIA Consultant. Further points were added to the article which mentions to submit data which could be used for environmental monitoring and the proponent must inform the Ministry in writing prior to commencement of the project once the approval has been granted for a project.
- Article 11 was amended such that while applying for EIA, the ToR must be submitted in an editable format along with the application form and project brief. Furthermore, it is now mentioned that that the ToR must be agreed upon during the scoping meeting and that only another registered EIA Consultant could replace the projects EIA Consultant if he cannot attend the scoping meeting, and the proponent could apply for an extension on the validity of the ToR during a 1-year period from the scoping meeting date.
- Article 13 was amended to include more guidelines on how to manage the EIA review process. An additional point was also added which gives the authority to EPA to conduct a review meeting with the Consultant and Proponent if they deem necessary.
- Article 14 was amended to include 2 more points which states that the Environmental DS must have the parameters for the environmental monitoring report and the schedule. The Ministry could ask the proponent to submit environmental monitoring reports up to 5 years or more if the Ministry deems necessary. Additionally, the proponent must share the Environmental DS with the Contractor ad a copy of this Environmental DS and a copy of the approved EIA report must be made available at the project site.
- Article 20 was amended to include the guideline on how to penalize offences under this regulation.

3.2.1.4 4th amendment to the Environmental Impact Regulation 2012 (2017/R-7)

Under this amendment the Schedule U which was added under the 2nd amendment to the EIA regulation (2015/R-174) was amended to include two more type of projects; (5) all projects except for the projects mentioned in point N of this schedule for newly reclaimed areas on natural islands until three years from the reclaimed date, (6) all projects except for the projects mentioned in point N of this schedule for newly reclaimed islands until three years from the reclamation date. The projects mentioned in point N of this schedule are any project that involves dangerous chemicals, oil storage, incinerators, release of toxic chemicals to atmosphere, and fiber works. However, if the reclaimed lands were to be populated then any major developmental project shall be subjected to EIA.

3.2.1.5 5th amendment to the Environmental Impact Regulation 2012 (2018/R-131)

With this 5th amendment, Tourism related developments are again included under this regulation. Additionally, the Schedule D was amended to include tourist resort development and tourist hotel developments in the inclusive list for EIAs.

3.2.2 Waste Management Regulation (2013/R-58)

The waste management regulation dictates the principles needed to follow when handling waste. The aim is to minimize adverse impacts to the environment and human health from waste. Under this regulation, island councils are required to make a waste management plan and submit it to the competent authority. This plan must be reviewed at least every five years. Relevant articles under this regulation pertaining to the proposed project are:-

- Article 8 states that hazardous waste are specified in Schedule J and under no circumstance should it be burned or disposed off in any area of the Maldives. While transporting hazardous waste, it must be in a closed container without any leaks. Further a sign must be on the container, specifying that it is hazardous waste. The import of any hazardous waste mentioned in Schedule J to Maldives is an offense.
- Article 11 states that waste generated at islands must be disposed off in areas specified for the purpose or areas approved by competent authority. Disposal of waste to following areas is prohibited under this regulation and is an offense;
  - Mangroves
  - Island Lagoon
  - Reef
  - Lagoon(falhu)
  - Finolhu
  - Beach
  - Vegetation line

- Harbor
- Park
- Road

Approval to dispose waste to areas not approved by competent authority will be given under following circumstances;

1. Waste is disposed as a measure to protect human health
2. Situation created by natural disaster or a state of emergency

Approval to manage waste at household level is not required for the following actions;

1. Waste segregation at household
2. Composting at household

- Article 12 states that anybody responsible for public sites must place and manage a dustbin. The waste in these dustbins must be managed according to this regulation. Disposal of waste to public sites (besides the dustbin) is an offense.
- Article 16 states that approval must be taken from the competent authority for the following waste management works
    1. Waste collection
    2. Transportation of waste by land and sea
    3. Waste treatment
    4. Storage of waste
    5. Management of waste disposal sites
    6. Landfill
    7. Handling of hazardous waste

The number of waste management approvals for a particular area or areas will be decided by the competent authority based on the following;

1. Waste generation
2. Economic gains from waste management actions
3. Environmental protection requirements for the area

- Article 25 states that waste must be transported from one place to another in accordance with the standards set in schedule A of this regulation. If waste is to be removed from an Island, it should be taken to a regional waste management facility.

3.2.2.1 1st amendment to waste management regulation (2014/R-10)

This amendment only included the amendment of dates to start implementing articles of this regulation (article 4).

3.2.2.2 2nd amendment to waste management regulation (2014/R-10)

This amendment also only included the amendment of dates to start implementing articles of this regulation (article 4). The date to implement the articles 13, 14, and 16 were amended to 05th October 2014.

3.2.2.3 3rd amendment to waste management regulation (2017/R-90)

This amendment included amendments to the schedule A and K of this regulation. Further article 25 was amended to include that action will be taken against parties which does not transport waste according to the standards set under this regulation.

3.2.2.4 4th amendment to waste management regulation (2018/R-63)

With this amendment the most notable, was the establishment of a system for fining offences under this regulation under Schedule N. Further article 25 was amended such that waste that needs to be removed from an Island must be taken to the nearest waste management center.

3.2.2.5 5th amendment to waste management regulation (2021/R-109)

With this amendment the most notable, was that waste management responsibility can be assigned to Councils and waste management plans need to be made at Island level.

3.2.3 Regulation on Environmental Liabilities (2011/R-9)

This regulation was made in order to emphasize on sustainable development according to Article 22 of the Constitution of the Republic of Maldives 2008 and penalize environmental offences to the regulations made under Environmental Protection and Preservation Act (4/93) in the intention to prevent such offences. Relevant articles under this regulation pertaining to the proposed project are:-

- Article 5 states that this regulation will be implemented by the EPA on behalf of the Ministry of Environment, Climate change and Technology.

- Article 7 states that, if there is a potential environmental damage or if there was an environmental damage due to a project, then the proponent must report to the Competent Authority and take measures to prevent such damages. The Competent Authority must assert to the proponent to implement mitigation measures.
- Article 8 states that, instead of the proponent under following circumstances the Competent Authority reserves the right to implement measures to prevent or mitigate environmental damages;
    - In an emergency
    - The proponent did not implement the mitigation measures prescribed by the Competent Authority under article 7
    - The proponent must bear the cost of implementing the mitigation measures mentioned in article 7 and for inspection visits from the Competent Authority
- Article 9 states that, for potential environmental damages imposed for works done by getting written approval from a government institution or advice, the cost of mitigation measures implemented maybe reclaimed from the government institution that gave the approval.
- Article 10 and 11 states that, if the Competent Authority found that there were environmental damages due to the actions of anybody, the Competent Authority could ask them to submit the mitigation measures that could be implement along with the information mentioned in Schedule 6 of this regulation.
- Article 12 states that the proponent has the right to review the decisions of the Competent Authority to the Minister if;
    - The environmental damages were not due to the actions of the proponent
    - If the decisions of the Competent Authority regarding the environmental damages were questionable by the proponent
    - If the environmental damage was imposed due to the proponent following a regulation
    - If the environmental damage was imposed due to a third party while the proponent was diligently following all the mitigation measures
- Article 13 states that the Competent Authority has the right to visit and inspect the project sites, take copies of the documents photographs, and samples.

- Article 14 states that when inquired by the Competent Authority about information regarding any investigations under this regulation, correct information must be provided by the inquired entity or person.
- Article 15, 16 and 17 states the procedures for fining offences for environmental liabilities.

3.2.4 Regulation on Safety Standards for Construction Work (2019/R-156)

This regulation was made under the Building Act (4/2017) with the aims to improve working conditions for laborers and to protect the general public from potential health hazards due to construction activities. Relevant articles under this regulation pertaining to the proposed project are:-

- Article 5 states that the following are Contractors responsibilities;
  - If the contractor's work exceeds MVR 1,500,000 a health and safety plan has to be prepared and followed for the safety of employees as well as the public.
  - While handling construction materials, must ensure the safety of the workers and the general public
  - Informing the workers of any potential health hazards during construction works
  - Have an emergency response plan
  - Ensure that works are proceeding in accordance with the health and safety plan
  - Providing personal protective equipment for workers and they must be trained to use the equipment
  - Ensure construction site is safe for the workers and general public
  - Ensure that there is no disturbance to the general public from the construction site
  - Ensure waste is managed properly at the worksite
  - Ensure that the construction materials are properly stored
  - Ensure that safety boards and signs are installed around the construction site
- Article 6 states that if the contractor's work exceeds MVR 1,500,000 an emergency response plan must be made and the following must be fulfilled accordingly;
  - Emergency response plan must be made available at the constructions site
  - Inform the workers on the emergency response plan and its protocols

  - Have at least 2 emergency response drills every year
  - Ensure that a first aid personnel is always available at all times at the construction site
  - First aid kit must be readily available at the construction site
  - Ensure that the equipment's in the first aid kit is in proper condition
  - Installing safety boards at the construction site
  - Contacts for Emergencies must be available on a notice board at the construction site
- Article 7 states that the contractor must appoint a safety supervisor with more than five years of experience for the project.
- Article 8 states that the responsibilities of the site safety supervisor is to carrying out daily site inspections to ensure the proper measures are being taken to ensure safety and to report to the contractor/Competent Authority if the measures are not being implemented.
- Article 9 states that if the contractor's work exceeds MVR 5,000,000, the contractor must have an insurance policy taken to compensate for any damages to the workers and the surrounding people.
- Article 10 states that all contractor's must ensure that the general public is protected from the construction site by doing the following;
  - Installing pedestrian detour boards
  - Ensure construction materials and equipment's are stored in a way that does not pose any difficulties to the general public
  - Installing safety boards, fences, tapes, sheets to protect the general public
- Article 11 states that the contractor should ensure that workers are always using personal protective equipment when on site. These include safety helmets, safety boots, safety goggles, noise cancellation headphones, gloves, masks, safety belt, and other safety equipment's necessary as per the type of work.
- Article 12 states that all construction sites must be fenced off. The article also explains in details how the fence must be erected.
- Article 13 states that the contractor must ensure the required safety equipment's are provided to the works if they are handling hazardous substances.
- Article 14 explains in detail the safety procedures that must be followed while working at higher than 3 m.

- Article 15, 16, and 17 explains in detail the safety measures that must be taken while working on an overhead platform, roofs, and ladders.
- Article 18, 19 explains how scaffolding are to be used.
- Article 20, 21, 22, 23 states the safety measures that must be followed for using electrical equipment's,
- Article 24 states that the contractor must implement a chemical handling procedure for handling chemicals. The article also explains in details what is to be included in the chemical handling procedure.
- Article 25, 26, 27, 28 states the safety measures that must be followed while working with asbestos, gas cutters, and compressed gas welding.
- Article 29 states that, if there are flammable materials at the construction site, fire prevention equipment must be made available.
- Article 30, 31, and 32 states the safety measures that must be followed for using equipment's powered by mechanical power and electricity, cranes,
- Article 33 states the safety measures that must be followed for while working in closed spaces.
- Article 34 states the measures that must be followed while decommissioning a building.
- Article 35 states the construction materials must be stored within a close area. Approval must be taken from the Competent Authority to store at the designated area and the approval must be shown on a board.
- Article 36 states the measures that must be followed while loading and unloading materials to a construction site.
- Article 37 and 38 explains the requirements for the safety board and other signs that must be installed at construction sites.
- Article 39 states that, when an accident occurs at a construction site, it must be immediately reported to the police. The record of accidents must be maintained by the contractor.
- Article 49 states that, if there is no entity responsible for implementing the measures mentioned under this regulation, then the proponent shall be responsible for implementing the measures. The proponent must report any offences against this regulation to the Ministry.

- Article 50 states that with the enforcement of this regulation the Male' Planning Regulation Chapter 3 is void.

3.2.5 Groundwater extraction and disposal regulation (2021/R-20)

The groundwater extraction and disposal regulation is enacted with aim of minimizing impacts to groundwater while carrying out dewatering activities. Relevant articles under this regulation pertaining to the proposed project are:-

- Article 4 and 5 states that for any building construction or industrial use can only extracted and used after getting written approval from the competent authority, however, water can be extracted for domestic wells placement and cleaning
- Article 6 states that dewatering must be done only after getting the necessary approval from the competent authority. The proponent must inform the people living with 100 meters of the dewatering activity via the council using the application form mentioned in annex 1 of this regulation.
- Article 7 states that an administrative fee of MVR 100 has to be paid to the competent authority when submitting the form mentioned in article 7.
- Article 8 states that water samples must be tested from a certified laboratory and their results attached with the form in this regulations annex 1. The results must not be more than 45 days old from the tested date. The following parameters must be tested;
    - pH
    - Temperature, ^{0}C
    - TDS, mg/l
    - Dissolved Oxygen, mg/l
    - Electrical Conductivity, µS/cm
    - Turbidity, NTU
    - Salinity, ppm
    - Ammonia, mg/l
    - Fecal Coliforms 0/100
    - Hydrogen Sulphide, mg/l
    - Nitrates, mg/l
    - Phosphates, mg/l
    - Hydrocarbon, mg/l

- Oil and grease, mg/l

If any of the parameters cannot be tested, then it should be mentioned in writing from the laboratory.

- Article 10 states that the approval for dewatering will be issued from the competent authority. Dewatering approval will be given for 28 consecutive days including public holidays. It also states that approval of discharge of groundwater to the sea must be given only in places where groundwater recharge is not feasible or where recharging might result in damage to the residents and the environment. For larger projects involving dewatering at different places, the places from where dewatering can be started with 28 consecutive days must be submitted as a single approval. The period of approval will be decided based on the following;
  - Size of proposed water discharge area
  - Water quality
  - Work schedule
  - Method of water discharge
  - Water discharge area
  - Article 11 states that designated impact radius from water discharge is 30 meters from the discharge point if the the water is not recharged within the aforementioned radius. The proponent must inform the houses within this radius by writing before 24 hours. During dewatering activities if a damage is caused to any of the houses within this radius, the proponent has to take responsibility and also if any of the houses face any difficulties getting groundwater from their wells the proponent has to provide no more than 250 liters of water per household or equivalent amount in payment.
- Article 11 states that an option other than draining water into the ground will be considered if the water quality tests mentioned in article 9 of this regulation shows that the waters quality is not adequate. Furthermore, it is stated that if a pipeline is to be established for the dewatering, the pipeline pathway shall be approved by the council. Moreover, ti is the responsibility of the proponent to maintain and decommission the pipeline after the dewatering period is over.
- Article 13 states that for any reason if the site engineer believes that the dewatering works will not be finished within the approval period, then the proponent must fill the

form on annex 3 of this regulation and submit to competent authority before 3 days (the 3 days will be counted excluding public holidays) of approval deadline. Upon receival of the form and associated documents the competent authority will issue the approval within 2 working days. However, extension will be granted if the original approval granted under article 10 of this regulation is less than 6 months old, if more than 6 months then a new approval must be requested.

- Article 14 states that a non-refundable fee has to be paid to the competent authority according to following principle;
  - For the first 28-day approval MVR 500 per day
  - For the first addition of days to the approval MVR 1000 per day
  - For the second addition of days to the approval MVR 1500 per day
  - For the third addition and onwards with an increasing rate of MVR 2000 per day

However, if the works were delayed due to a natural hazard or bad weather, without any fee days will be added. These types of days will be decided by considering the information from the respective authority.

- Article 14 states that the competent authority has to maintain records about the dewatering approvals they give. If a sewerage service provider gives service of water discharging from dewatering activities, then they must provide those dewatering activity details before the 10 of each month for the previous month's activities.
- Article 15 states that the competent authority has the full discretion to stop any dewatering activities ongoing via formal documentation. Furthermore, it also states that the authority shall be indemnified from any claims arising from the halting of works.

Article 16 states that competent authority must inform the proponent via writing if they go against regulations.

3.2.6 Regulation on uprooting, cutting and transportation of palms and trees

This regulation was implemented on 1 February 2006 by the Ministry of Environment, Climate change and Technology, Energy and Water. The primary purpose of the regulation is to control and regulate large-scale uprooting, removal, cutting and transportation of palms and trees from one island to another. According to the regulation, certain types of trees and plants that have unique attributes are prohibited to be removed from its natural environment. Also, uprooting and removal of a vast number of trees and palms are subjected to an EIA, which is required to be submitted to the EPA and written approval is required prior to implementation of the project. Relevant articles under this regulation pertaining to the proposed project are:-

- Article 3 states that the following types of vegetation is prohibited to be removed;
    - Vegetation found from 15 m inland of the vegetation line
    - Vegetation found on and around 15 m of wetlands and mangroves
    - Vegetation found on any protected areas of the Maldives
    - Any protected trees
    - Vegetation which has environmentally unique characteristics
- Article 5 (a) states that, to clear large number of trees for any purpose, an EIA must first be done and approval from the competent authority must be obtained. Article 5 (b) states that, if trees are to be transported with soil, the allowable limit is an 8-inch x 10-inch black bag. Article 5 (e) states that, trees larger than what is mentioned in article 8 (a) of this regulation, must be transported with only the soil in their root balls. Article 5 (f) states that, if machinery is to be used for uprooting trees, no damages must be done to any trees besides the trees concerned for uprooting.
- Article 6 states that, if the total number of a particular species of tree is less than 05 on an island, then this species of tree can only be transported with a special permit from the Ministry of Environment, Climate change and Technology. Furthermore, this applies to trees on which birds roost or live in inhabited and uninhabited islands.
- Article 7 states that, the maximum number of trees which could be removed from an island shall be declared by the Ministry of Environment, Climate change and Technology, based on the existing numbers of trees on the Island.
- Article 8 states that, coconut trees taller than 15 feet and other trees taller than 8 feet, their limit for removal is 10 trees, to uproot greater than 10 trees require an approval from Ministry of Environment, Climate change and Technology. Smaller trees could be removed by taking an approval from Island Council and the limit for uprooting is less than 1/3rd of the trees present in the area. For any purpose uprooting and transport of trees must be done under the supervision of the Island Council on inhabited Island; personnel responsible to manage the island in case of uninhabited Island.
- Article 9 states that, after uprooting trees, the holes must be backfilled with soil. It is prohibited to put in any waste into the holes.

- Article 10 states that, any offences against this regulation will be punishable under Act 4/93 accordingly.

3.2.6.1 1st amendment to regulation on uprooting, cutting and transportation of palms and trees (2014/R-7)

The amendment to this regulation has specified a set of categories and any tree falling under these categories is not allowed to be removed unless it is a project of the government, approved by the parliament. Relevant articles under this law pertaining to the proposed project are:-

- Article 3 was amended such that the prohibited trees for removal could be removed for a project approved by the parliament with the condition that the proponent must plant 6 trees for each tree removed instead of 2. Furthermore, a monitoring plan must be made and the proponent must implement it.
- Article 11 was amended to mention that this regulation will be enforced by the EPA on behalf of the Ministry of Environment, Climate change and Technology.

3.2.7 Regulation on management and conservation of water resources (2021/R-22)

This regulation has been formulated under the Article 17,18,19,20 and 23 of the Water and Sewerage Act (08/2020). The main purpose of the regulation is to ensure sustainable use, conservation, protection, improvement, and beneficial use of the water resources. Relevant articles under this regulation pertaining to the proposed project is:

Article 6:

- None shall do any harm or damage to the water resources.
- Groundwater and other naturally occurring water resources on the islands, shall not be utilised for any economic or business use.
- Dewatering for building construction shall be carried out as per the relevant regulation.

Article 10: All activities shall be carried out in a manner that would not contaminate the water resources in accordance to the clause 20 of the water and sewerage act (08/2020)

Article 12: Spillage of any oil and chemical to the ground is prohibited. Oil and chemical shall be store in shaded, appropriately bunded areas and in a manner that even if the total volume of the dedicated storage is leaked, the leaked volume is able to be recovered without contamination of the soil or the groundwater. Transfer of oil and chemical on land must be carried out with appropriate safety measures to prevent spillage. Discarding of waste oil and chemicals must be carried out in a manner that does not contaminate any of the water resource, and at a facility that is approved by the regulator.

Article 17: All responsibilities of rectification of a polluted groundwater resource from spillage of oil and chemicals shall be borne by the polluter. Any incidence of groundwater pollution from oil and chemical spillage should be reported to the regulator within 24 hours. The rectification works shall be carried as per the instruction of the regulator.

3.2.8 Regulation on Construction Material Import and Production Control

The purpose of the regulation is to control the quality of imported and produced materials that are used in the construction industry. The regulation specifies the materials which would be controlled under the regulation in its annex 1. Furthermore, the regulation details out the registration requirements, permits, procedures, quality controls and applicable fine of those that breach the regulation.

3.2.9 Regulation on Construction Material and Construction materials testing facilities

Under the regulation all contractors involved in the construction industry are to be registered. The regulation includes the requirements of contractor's registration, grading, implications on participating in international tenders, insurance, project licenses, Joint venture registrations, responsibilities of the registered contractors and applicable fine for breaching the regulation.

3.2.10 Regulation on protection of old trees

This regulation was made under article 4 of the Environmental Protection and Preservation Act (4/93) in order to declare standards to manage protected trees in the Maldives. The regulation states the criteria for trees to be protected; (1) trees older than 50 years, (2) trees that are threatened to extinction locally, (3) ecologically important species, and (4) due to the request of public. Relevant articles under this regulation pertaining to the proposed project are:

- Article 6 and 7 states that a radius of 2 m from the crown of the protected tree shall be protected and while allocating land of purposes special attention must be given to not disturb such trees. Further any activities that may cause damage to the trees shall not be undertaken.

3.2.11 Regulation on Preserving greenery and Vegetation in the Maldivian Islands (2022/R-92)

The purpose of this regulation is to encourage to plant more trees and increase greenery in the islands, protection of old trees, decentralisation of the approval process for removal of vegetation, reduction of environmental impact from vegetation removal and strengthen the reporting process of vegetation removal. According to the regulation, any tree beyond the age of 50 is protected under the regulation. The registry of trees must be maintained by the council. In islands leased for tourism and other economic ventures, the proponent must report the vegetation details annually to EPA. Furthermore, coastal vegetation belt of 20 meters must be ensured in each island. For any activity that involves removal 50-200 trees, approval of the agency must be acquired and for any activity that involves removal of more than 200 trees, an EIA must be carried out.

3.2.12 Regulation on Use, Handling, and Storage of Oil

The purpose of the regulation is to reduce fire hazards caused by the mishandling of oil, to raise awareness on the proper handling methods of oil and to standardize the infrastructure of oil handling and storage facilities.

- Article 2 of the regulation details out all the aspects of vehicles that handle and transport oil on land.
- Article 3 deals with all the aspects of petrol handling in storage areas and service centres.
- Article 4 highlights the aspects of fuel handling in diesel and kerosene service centres.

Article 5 highlights the aspects of fuel pipeline from storage to meters

3.2.13 Built environment regulations

This regulation underlines the general guidelines for inhabited islands, uninhabited islands and islands used for other purposes to plan the development accordingly based on population, size, the type of works done on the island and other factors that should be taken into account. All islands are categorized according to the above-mentioned factors to regulate the development activities. Relevant articles under this regulation pertaining to the proposed project are:-

- Article 1.2 states that the Ministry of Housing and Urban Development shall be responsible for monitoring and implementation of Land Use Planning under this regulation with the directions from other relevant government Authorities.
- Article 12 states that if there are any environmentally sensitives sites on any island it shall be protected. However, this does not mean that these areas should be left untouched without any use, rather these areas shall be made use for recreational purposes or some other beneficial purpose without damaging these sites.
- Article 12.2 states that a 20 m buffer zone must be set around all Islands from the coast. However, at harbor area or other commercial areas, if adequate land is unavailable this buffer zone could be reduced.

Annex 1 of the regulation;

- Article 5.4 states that a minimum of 200 feet buffer zone must be set from an STP to residential areas, recreational areas, parks, social spaces, or any places that produce food or drink (fish drying, water storage tank).
- 5.5.1 states that maximum area that can be allocated for a powerhouse is 45m x 45m.
- 5.5.2 states that a distance of at least 200ft shall be kept between the residential area and the powerhouse.
- 5.5.3 states that if the criteria mentioned above is not met for the island, the Ministry of Housing and Urban Development shall be consulted.
- Article 5.6 states that land for Desalination plants shall be allocated by the Ministry of Housing and Urban Development as advised by Ministry of Environment, Energy and Water.

3.2.14 Maldives National Building Code (2019/R-1020)

The Maldives National Building Code R-1020 has been published in the year 2019 and consists of the following chapters.

Part I: building code for type 1 buildings.

- Clause A1 (Classified users): For the purposes of this building code, Type 1 Buildings are classified according to type, under seven categories. A building with a given classified use may have one or more intended uses. The seven categories are:
    - Housing
    - Communal residential
    - Communal non-residential
    - Commercial
    - Industrial
    - Outbuildings
    - Ancillary
- Clause A2 (Interpretation): In PART II of building code unless the context otherwise requires, words shall have the meanings given under this Clause
- Clause B1 (Structure): The objective of this provision is to:
    - Safeguard people from injury caused by structural failure,
    - Safeguard people from loss of amenity caused by structural behaviour, and
    - Protect other property from physical damage caused by structural failure
- Clause B2 (Durability): The objective of this provision is to ensure that a Type 1 Building will, throughout its life, continue to satisfy the other objectives of this code
- Clause C1(means of escape): The objective of this provision is to:
    - Safeguard people from injury or illness from a fire while escaping to a safe place
    - Facilitate fire rescue operation
- Clause C2 (spread of fire): The objective of this provision is to:
    - Safeguard people from injury or illness when evacuating a Type 1 Building during fire.
    - Provide protection to fire service personnel during firefighting operations.
    - Protect adjacent household units and other property from the effects of fire.
    - Safeguard the environment from adverse effects of fire

- Clause C3 (structural stability during a fire): The objective of this provision is to:
    - Safeguard people from injury due to loss of structural stability during fire, and
    - Protect household units and other properties from damage due to structural instability caused by fire.
- Clause C4 (access & facilities for the fire services): The objective of this provision is to:
    - Provide reasonable facilities to assist fire fighters in the protection of life
    - Enable fire appliances to gain access to the building.
- Clause D1(access routes): The objective of this provision is to:
    - Safeguard people from injury during movement into, within and out of Type 1 buildings,
    - Safeguard people from injury resulting from the movement of vehicles into, within and out of Type 1 buildings, and
    - Ensure that people with disabilities are able to enter and carry out normal activities and functions within Type 1 buildings.
- Clause D2 (mechanical installations for access): The objective of this provision is to:
    - Safeguard people from injury and loss of amenity while using mechanical installations for movement into, within and out of Type 1 buildings,
    - Safeguard maintenance personnel from injury while servicing mechanical installations for access, and
    - Ensure that people with disabilities are able to carry out normal activities and processes within Type 1 buildings
- Clause E1(surface water): The objective of this provision is to:
    - Safeguard people from injury or illness, and other property from damage, caused by surface water
    - Protect the outfalls of drainage systems.
- Clause E2 (external moisture): The objective of this provision is to safeguard people from illness or injury which could result from external moisture entering the Type 1 building
- Clause E3 (internal moisture): The objective of this provision is to:
    - Safeguard people against illness or injury which could result from accumulation of internal moisture

  - Protect household units and other properties from damage caused by free water from occupancy in the same building.
- Clause F1(hazardous agents on site): The objective of this provision is to safeguard people from injury or illness caused by hazardous agents or contaminants on a site
- Clause F2 (hazardous building materials): The objective of this provision is to safeguard people from injury and illness caused by exposure to hazardous building materials.
- Clause F3 (hazardous substances and processes): The objective of this provision is to safeguard people from injury or illness, and other property from damage, caused by hazardous substances or processes in buildings
- Clause F4 (Safety from Falling): The objective of this provision is to safeguard people from injury caused by falling
- Clause F5 (Construction and Demolition hazards): The objective of this provision is to safeguard people from injury, and other property from damage, caused by construction or demolition site hazards.
- Clause F6 (lighting for emergency) : The objective of this provision is to safeguard people from injury due to inadequate lighting being available during an emergency
- Clause F7 (warning systems) : The objective of this provision is to safeguard people from injury or illness due to lack of awareness of an emergency
- Clause F8 (signs) : The objective of this provision is to:
  - Safeguard people from injury or illness resulting from inadequate
  - identification of escape routes, or of hazards within or about the Type 1 building,
  - Safeguard people from loss of amenity due to inadequate direction, and
  - Ensure that people with disabilities are able to carry out normal activities and processes within buildings
- Clause G1(personal hygiene) : The objective of this provision is to:
  - Safeguard people from illness caused by infection or contamination,
  - Safeguard people from loss of amenity arising from the absence of appropriate personal hygiene facilities, and
  - Ensure people with disabilities are able to carry out normal activities and processes within Type 1 buildings.
- Clause G2 (laundering) : The objective of this provision is to ensure:

  - Adequate amenities for people to do laundering, and
  - That people with disabilities are able to carry out normal activities and processes within Type 1 buildings
- Clause G3 (food preparation and prevention of contamination) : The objective of this provision is to:
  - Safeguard people from illness due to contamination,
  - Enable hygienic food preparation without loss of amenity, and
  - Ensure that people with disabilities are able to carry out normal activities and processes within Type 1 buildings
- Clause G4 (ventilation) : The objective of this provision is to safeguard people from illness or loss of amenity due to lack of fresh air.
- Clause G5 (interior environment) : The objective of this provision is to:
  - Safeguard people from illness caused by excessive air temperature,
  - Safeguard people from injury or loss of amenity caused by inadequate activity space,
  - Ensure that people with disabilities are able to carry out normal activities and processes within Type 1 buildings
- Clause G6 (airborne and impact sound) : The objective of this provision is to safeguard people from illness or loss of amenity as a result of undue noise being transmitted between abutting occupancies
- Clause G7 (Natural Light): The objective of this provision is to safeguard people from illness or loss of amenity due to isolation from natural light and the outside environment.
- Clause G8 (Artificial light): The objective of this provision is to safeguard people from injury due to lack of adequate lighting.
- Clause G9 (Electricity): The objective of this provision is to ensure that: In Type 1 buildings supplied with electricity, the electrical installation has safeguards against outbreak of fire and personal injury
- Clause G10 (Piped service) : The objective of this provision is to safeguard people from injury or illness caused by extreme temperatures or hazardous substances associated with building services.
- Clause G11(gas as an energy source): The objective of this provision is to:
  - Safeguard people from injury arising from the use of gas as an energy source,

  - Safeguard people and other property from the risk of fire or explosion, and
  - Safeguard people from loss of amenity due to the gas supply being inadequate for the intended use.
- Clause G12 (water supplies): The objective of this provision is to:
  - Safeguard people from illness caused by infection from contaminated water or food,
  - Safeguard people from injury due to the explosion of a pressure vessel or from contact with excessively hot water,
  - Ensure that people with disabilities are able to carry out normal activities and functions within Type 1 buildings
- Clause G13(Foul water) : The objective of this provision is to:
  - Safeguard people from illness due to infection or contamination resulting from personal hygiene activities, and
  - Safeguard people from loss of amenity due to the presence of unpleasant odours or the accumulation of offensive matter resulting from foul water disposal
- Clause G14 (industrial liquid waste) : The objective of this provision is to safeguard people from injury or illness caused by infection or contamination resulting from industrial liquid waste
- Clause G15 (solid waste) : The objective of this provision is to safeguard people from injury or illness caused by infection or contamination from solid waste
- Clause H1 (energy efficiency) : The objective of this provision is to facilitate efficient use of energy.

3.3 Guidelines and Technical Specifications

This section describes the applicable guidelines and technical specifications pertaining to this proposed project.

3.3.1 Guideline for Uprooting, Cutting and Transportation of Palms and Trees (published on 06th June 2017)

This guideline was made under Article 5(a) of the regulation on uprooting, cutting and transportation of palms and trees, to specify the guideline for giving approval to uprooting, cutting and transportation of trees. Relevant articles under this guideline pertaining to the proposed project are:-

- Article 3 states that while giving approval for uprooting, cutting and transportation of trees for any project, the following must be fulfilled;
    - The project strictly requires land clearance
    - The budget for the project has been approved
    - Approval from the relevant government body for the project
- Article 4 states that, in order to obtain approval for uprooting, cutting and transportation of trees under this guideline, the proponent must apply for approval from EPA through the application form on Schedule 1.
- Article 5 states the procedure for giving approval for uprooting, cutting and transportation of trees. The first step is for the proponent to submit information on the type, size, numbers and location of trees to EPA. If there are no prohibited trees to be removed in the area and if the total number of trees to be removed is less than 200 or the land clearance area is less than 8250 m^2, then approval shall be given under this guideline with a set of mitigation measures to be followed by the proponent.

3.3.2 Requirement for Fire Prevention Equipment in the building

This is a guideline enforced by the Ministry of Defense and National Security of the Maldives which sets out a list of requirements and standards that need to be met in fire prevention equipment provided in buildings prone to fire hazards. As the whole guideline pertains to any power generating facility, hence to this project, the main points have been highlighted as follows:-

- **Hose reel**: Should comply with the specified standards under the guideline. The overall width of the reel should be no more than 850mm. The overall height of the Reel should be less than 850mm including Hose and integral Flexi guide for hose withdrawal guide. The overall depth of the hose reel should be no more than 150mm. The colour of the Reel should be Red, fitted with an operating instruction plate. The Hose Reels nozzle retainer or hose guide and the inlet valve should be fitted at a height of about 900mm above floor level;
- **Hose reel cabinets**: The hose reel cabinet should be Recess mounting type with or without glass-paneled door for use with the above-mentioned sized Hose Reels. Hose

Reel Cabinet dimension should be no more than 900mm in width, 900mm in height, 160mm in depth (including door). The colour of the cabinet should be Red. Special permission should be taken for other Colour. Recessed Latch Type handle should be installed. Hose reel signage should be in accordance with BS 5499 or any other equable International Standard. Fixing hole should be provided;

- **Water supply for hose reel system**: Should be such that when the two topmost reels in the building are used simultaneously, each should provide a jet of about 6 m in length and will deliver less than 0.5 L. Minimum storage required for the hose reel is 2275 L and 1137.5 L up to a maximum of 9100 L for each additional reel. Tanks supplying water for domestic purposes should not be used as a suction tank for hose reel installation. The pipings for the supply of water for hose reel should be in and out galvanized schedule 40. Diameter of the piping should not be less than 50 mm;
- **Hose reel booster pump system**: Hose reel booster pump set, complete with in and out galvanized steel pipework with or without expansion vessels;
- **Fire extinguishers**: 2kg CO_2 stored pressure Extinguisher approved to BS EN 3. Aluminium Alloy Body approved to BS5045 Part 3 or any other equable International Standard. Red body with black band or Black colored head cap, swivel Horn, English screen. Fully charged. 6 Kg DCP Extinguisher (Gas Cartridge Type) approved to BS EN 3 or any other equable International Standard. Blue Body Headcap, English Screen, Fully charged. 9 Liter Water Extinguisher (Gas Cartridge Type) approved to BS EN 3 or any other equable International Standard. Red Body Headcap, English Screen, Fully charged. Fire Extinguishers should be located in conspicuous positions on brackets or stands where they will be readily seen by person. The carrying handle of larger heavier extinguishers should be about 01m from the floor level. But smaller extinguishers should be mounted so as to position the handle 1.5m from the floor level;
- **Cabinets for fire extinguishers**: Cabinets for fire extinguishers should be of stainless steel with or without glass-fronted doors. The colour of the cabinet should be Red or to suit the requirements of architectural surroundings. Recessed Latch Type handle should be installed. Fire Extinguisher Single Cabinets dimension should be no more than 190mm in width, 640mm in height, 180mm in depth (including door). Fire Extinguisher Double Cabinets dimension should be no more than 440mm in width, 640mm in height, 180mm in depth (including door);

- **Fire Blankets**: Fire Blankets should be certified to BS EN 1869: 1997 or any other equable International Standard. Fire Blankets should be extremely flexible and drape easily the slim pack of fire blanket should be Red or White;
- **Dry riser gate valve**: Dry riser gate valve to BS 5041/2, or any other equable International Standard, Gunmetal c/w Padlock strap, blank cap and chain. Inlet 2 ½" ASA 150 F/F. Outlet 2 ½" Inst. Female couplings to BS 336. Colour red;
- **Dry riser outlet box**: Dry riser outlet box for Dry Riser gate valve. Construction should be similar to BS 5041. Standard finish colour Red. Dry Riser outlet cabinet dimension should be as specified in the guideline;
- **Pumping in breeching**: Twin pumping in breeching, approved to BS 5041, or any other equable International Standard, Gunmetal inlets 2 x 2 ½" BS Instantaneous Male Coupling c/w non-return valves. Outlet 4" ANSI 150 F/F flange;
- **Dry riser inlet box**: Dry Riser inlet box for horizontal/vertical pattern. Double inlet to BS 5041 or any other equable International Standard finish color Red. Dry riser inlet cabinet dimension for flush mounting should be as specified in the guideline.
- **Air release valve**: Air release valve, Gunmetal, Inlet 1" BSP Male;
- **Piping for dry riser system**: The Piping for Dry Riser System should be In and Out Galvanized schedule 40. The diameter of the Piping should be not less than 100mm.
- **Fire doors**: All fire doors should be opened to the direction of the flow of people while on emergency. These doors should be installed with a self-closing device including the Panic Latch. These Panic Latch devices should conform to BS 5725 Pt 1 or any other equable International Standard. Fire doors conforming to the method of construction as stipulated in the guideline;
- **Fire exit signs**: Photoluminescent Fire exit signs should sign each Fire Exit Door. The Symbol height should be no more than 100mm;
- **Fire detection and alarm system**: Fire Detection and Alarm System should conform to BS 5839 or any other equable International Standard. Fire Detection and Alarm System should be Analogue Addressable System with mimic diagram. A system in which signals from each detector and/or call point are individually identified at the control panel. Fire Detection and Alarm System should consist of Automatic Detectors, Manual Call Points, Control and Indicating equipment, etc. It should also cover System capable of providing signals to initiate, in the event of fire, the operation of ancillary services such as fixed fire extinguishing systems and other

precautions and actions. Main Fire Control Panel should be located at the reception and the Repeater Panel should be located in the guardroom;

- **Installation and testing of wet riser system**: Wet rising systems shall be provided in every building in which the topmost floor is more than 30.5 meters above the fire appliance access level. A hose connection shall be provided in each firefighting access lobby. Wet risers shall be of minimum 152.4 millimeters diameter and shall be hydrostatically tested at a pressure 50% above the working pressure required and not less than 14 bars for at least twenty-four hours. Each wet riser outlet shall comprise standard 63.5 millimeters instantaneous coupling fitted with a hose of not less than 38.1 millimeters diameter equipped with an approved typed cradle and a variable fog nozzle. A wet riser shall be provided in every staircase which extends from the ground floor level to the roof and shall be equipped with a three-way 63.5 millimeters outlet above the roofline. Each stage of the wet riser shall not exceed 61 metres unless expressly permitted by D.G.F.S but in no case exceeding 70.15 meters;
- **Wet or dry rising systems for buildings under construction**: Where either wet or dry riser system is required, at least one rise shall be installed when the building under construction has reached a height of above the level of the fire brigade pumping inlet with connections thereto located adjacent to a useable staircase. Such riser shall be extended as construction progress to within two floors of the topmost floor under construction and where the designed height of the building requires the installation of wet riser system fire pumps, water storage tanks, and water main connections shall be provided to serve the riser;
- **Wet riser booster pump system**: Wet riser booster pump set, complete with In and Out galvanized steel pipework with or without expansion vessel and specified in the guideline;
- Symbols, as well as installation of firefighting systems on the basis of building usage, are outlined on the table in the guideline; and
- All equipment mentioned above should be approved by the Maldives National Defense Force (MNDF) fire and rescue services before installation. Special permission should be taken if different from the guideline specifications.

3.4 International Conventions, Plans and Programs

This section describes international conventions, plans and programs that are relevant to the proposed development.

3.4.1 United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol

UNFCCC is the first binding international legal instrument that deals directly with the threat of climate change. It was enacted at the 1992 Earth Summit in Rio de Janeiro and came into force on the 21st of March 1994.

Signatory countries have agreed to take action to achieve the goal outlined in Article 2 of the Convention which addresses the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system," Thus all Parties to the Convention are committed under Article 4 to adopt national programs for mitigating climate change, promote sustainable management and conservation of greenhouse gas (GHG) sinks such as coral reefs, to develop adaptation strategies, to address climate change in relevant social, economic and environmental policies, to cooperate in technical, scientific and educational matters and to promote scientific research and exchange of information.

The Kyoto Protocol entered into force on the 16th of February 2005 and is an international and legally binding agreement to reduce GHG emissions globally. It strengthens the Convention by committing Annex I Parties to individual, legally-binding targets to achieve limitations or reductions in their GHG emissions. Maldives has signed and ratified both the Convention and the Protocol.

3.4.2 Paris Agreement

The Paris Agreement is also an agreement within the framework of the UNFCCC dealing with GHG emission mitigation, adaptation and finance proposed to start in the year 2020. Upon opening for signatories on 22 April 2016, 180 UNFCCC members have signed the treaty (including Maldives), however, only 22 of which ratified it so far which is not enough for the treaty to enter into force yet. The aim of the convention as described in Article 2 of the treaty is "enhancing the implementation" of the UNFCCC through:-

i. Holding the increase in global average temperature to well below 2° C above pre-industrial level and to pursue efforts to limit the temperature increase to 1.5° C above pre-industrial levels, recognising that this would significantly reduce the risk and impacts of climate change;
ii. Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and lower GHG emissions development in a manner that does not threaten food production; and
iii. Making finance flows consistent with a pathway towards low GHG emissions and climate resilient development.

3.4.3 Agenda 21

Agenda 21 is a non-binding voluntary implemented action plan of the United Nations (UN) with regards to sustainable development. It is a comprehensive plan of actions taken globally, nationally and locally by organizations of the United Nations System, Governments and Major Groups in every area in which humans impact on the environment. It is also an outcome of the Earth Summit (UN Conference of Environment and Development) held in Rio De Jeneiro, Brazil in 1992. Maldives is among the 178 countries which adopted this action plan. Out of the 4 sections it is grouped into, the proposed development pertains to:-

i. Section I: *Social and Economic Dimensions* which is directed towards combating poverty, especially in developing countries, changing consumption patterns, promoting health, achieving a more sustainable population and sustainable settlement in decision making; and
ii. Section II: *Conservation and Management of Resources for Development* which includes atmospheric protection, combating deforestation, protecting fragile environments, conservation of biodiversity, control of pollution and the management of biotechnology and radioactive wastes.

3.4.4 Sustainable Development Goals

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.

The Sustainable Development Goals are:

- No Poverty
- Zero Hunger
- Good Health and Well-being
- Quality Education
- Gender Equality
- Clean Water and Sanitation
- Affordable and Clean Energy
- Decent Work and Economic Growth
- Industry, Innovation, and Infrastructure
- Reducing Inequality
- Sustainable Cities and Communities
- Responsible Consumption and Production
- Climate Action
- Life Below Water
- Life On Land
- Peace, Justice, and Strong Institutions
- Partnerships for the Goals

3.5 Required Permits and Approvals

The following permits and approvals shall be obtained from the relevant authority prior to commencement of construction phase of the project:-

Table 3. Permits and Approvals required for the proposed development

Permits/Approvals	Approving Agency/Authority	Status
Approval of Architectural Drawings	MNPHI	Approved
Structural Drawing	MNPHI	Approved
EIA Decision Statement	EPA	Ongoing through the current EIA

3.6 Compliance of the Proposed Proposal to Statutory Requirements

All statutory requirements pertaining to this project shall be adhered to by the proponent during detail design phase, construction and operational phase. Furthermore, any changes to the legislative framework shall be considered and required changes shall be brought to project components as necessary.

4. PROJECT DESCRIPTION

This chapter describes the specific components of the proposed project in detail as per the approved ToR which is given the appendix section **Error! Reference source not found.** of this IA report.

4.1 Project overview

It is proposed to build a 08 storey commercial building. The total area of the site is 410.62 sqm. The proposed built up area is 291.88 sqm. Furthermore, the building includes a 1basement floor. The proposed foundation is 1800mm from the natural ground level and the lift pit foundation is at 3150 from ground level.

4.2 Project Justification

Muni Enterprise Pvt Ltd (proponent) has contracted Batch Pvt Ltd (construction contractor) to build a 08 storey commercial building at Lot 10318 in South Area Commercial Stretch located in Hulhumale Phase 1. The building will be used for commercial purpose allowed to display of products for sale including furniture, sanitary wares and appliances. The supporting facilities include admin office, meeting room, staff room, inventory storage, parking and toilets. Under the signed agreement it is prohibited to set it for accommodation, industrial use, store flammables materials/substances etc.

4.3 Location, study area and surrounding

The study area for the project is Hulhumale Lot 10318 and its surroundings. As such the environmental studies such as water quality and structural environment were restricted to the lot and surrounding area itself. Socio-economic impacts, on the other hand, were undertaken for the whole island population as the whole island will be affected. The road blockage area anticipated for the project is the "reethigas magu" to the extent of the block. The overview of the lot location is presented in the figures below.

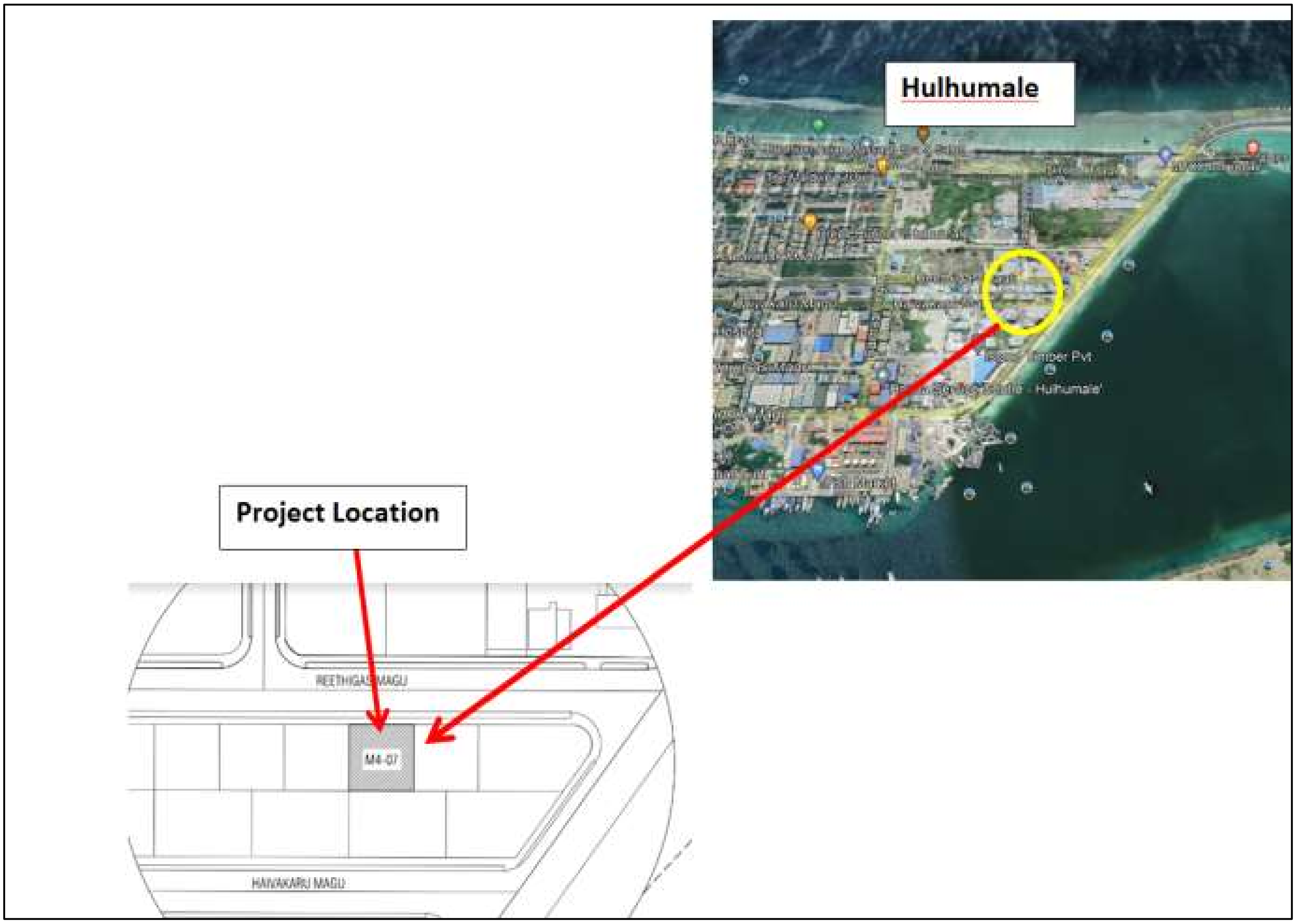


Figure 4: Partial print of the location of proposed lot

4.4 Project components

This section describes in detail the project activities that are likely to cause significant impacts to the environment.

4.4.1 Proposed Design

The proposed structural drawings of the building have already been approved by the Ministry of Housing (now the Ministry of Construction and Infrastructure). The approved structural drawings are attached in **Error! Reference source not found.** of this report. Descriptions of the roposed facilities under this project include.

4.4.1.1 Basement floor

The basement floor consists of a 10,000ltr water tank, pump room, cargo lift, passenger lift, loading and unloading area, 44 dedicated parking lots for motor cycles, 5 dedicated parking lots for cars, a visitor parking lot of capacity for 5 motor cycles and 1 car, garbage areas, utility meters and vehicle ramp. The parking area of the basement is 235.30 sqm and the garbage area is 6.38 sqm.

Figure 5: Partial print of basement floor layout

4.4.1.2 Ground floor

The ground floor consists of show room (231.17 sqm) which is mechanically ventilated, main entrance with slope for better accessibility, lifts and ramp to basement.

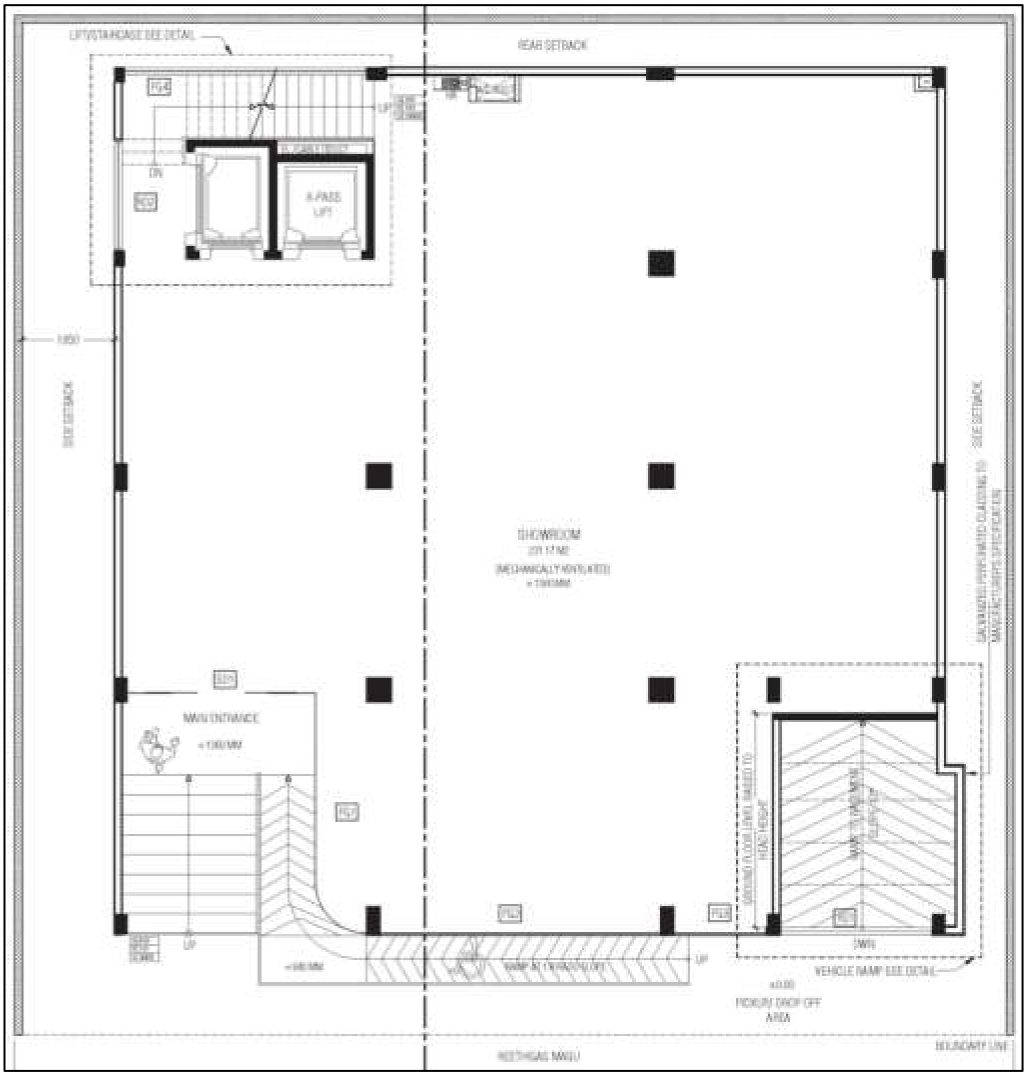


Figure 6: Partial print of proposed layout at ground floor

4.4.1.3 1st Floor

The first floor contains; the showroom of 265.45 sqm which is mechanically ventilated the cargo lift, passenger lift, two customer toilet of 10.35 sqm.

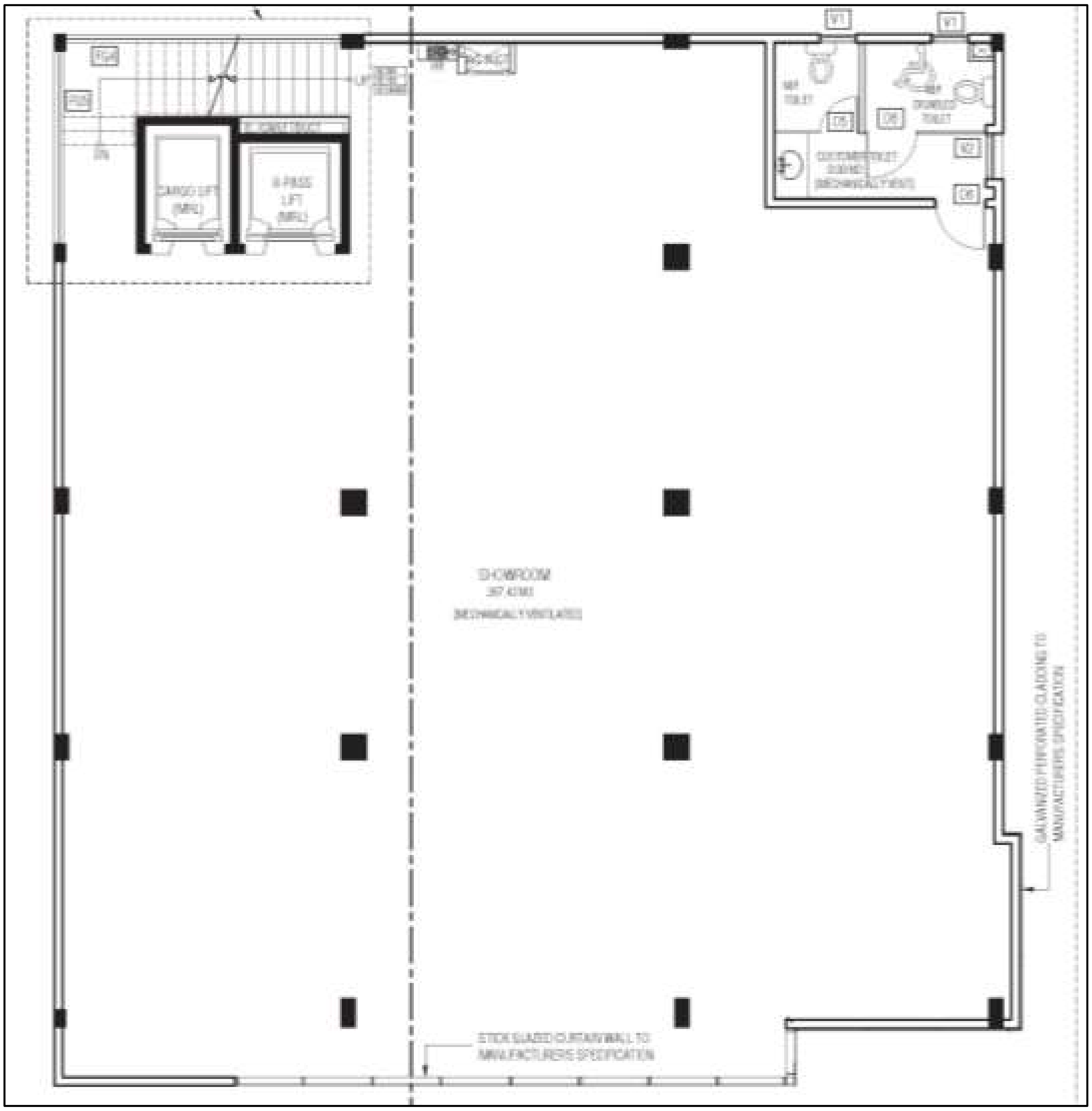


Figure 7: Partial print of proposed layout at first floor

4.4.1.4 2nd and 3rd Floor

The second and third floor contains; the showroom of 276.80 sqm which is mechanically ventilated the cargo lift and passenger lift.

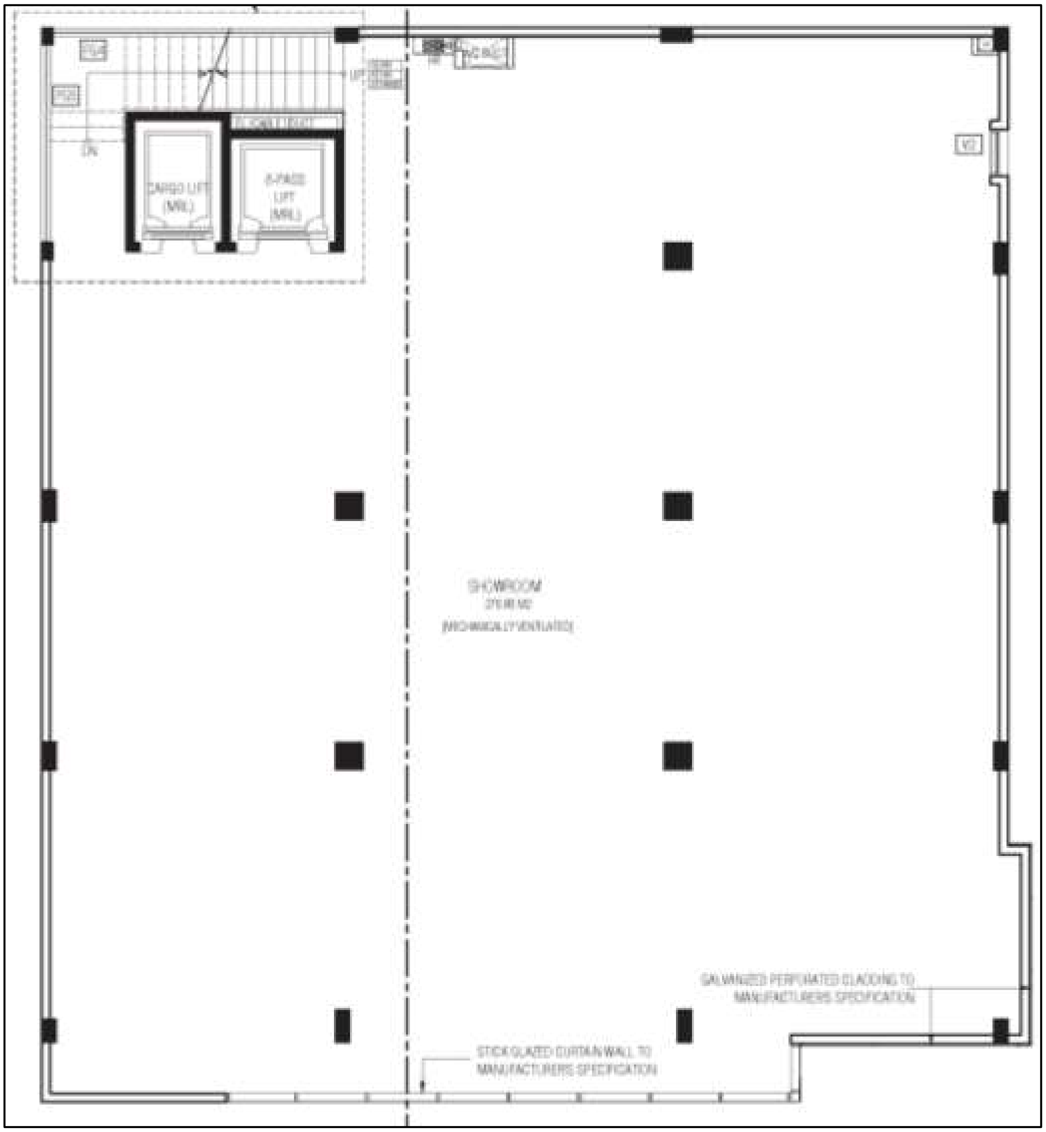


Figure 8: Partial print of proposed layout at second and third floor 1

4.4.1.5 Fourth to Sixth Floor

The fourth to sixth floor contains; the showroom of 259.19 sqm which is mechanically ventilated the cargo lift and passenger lift.

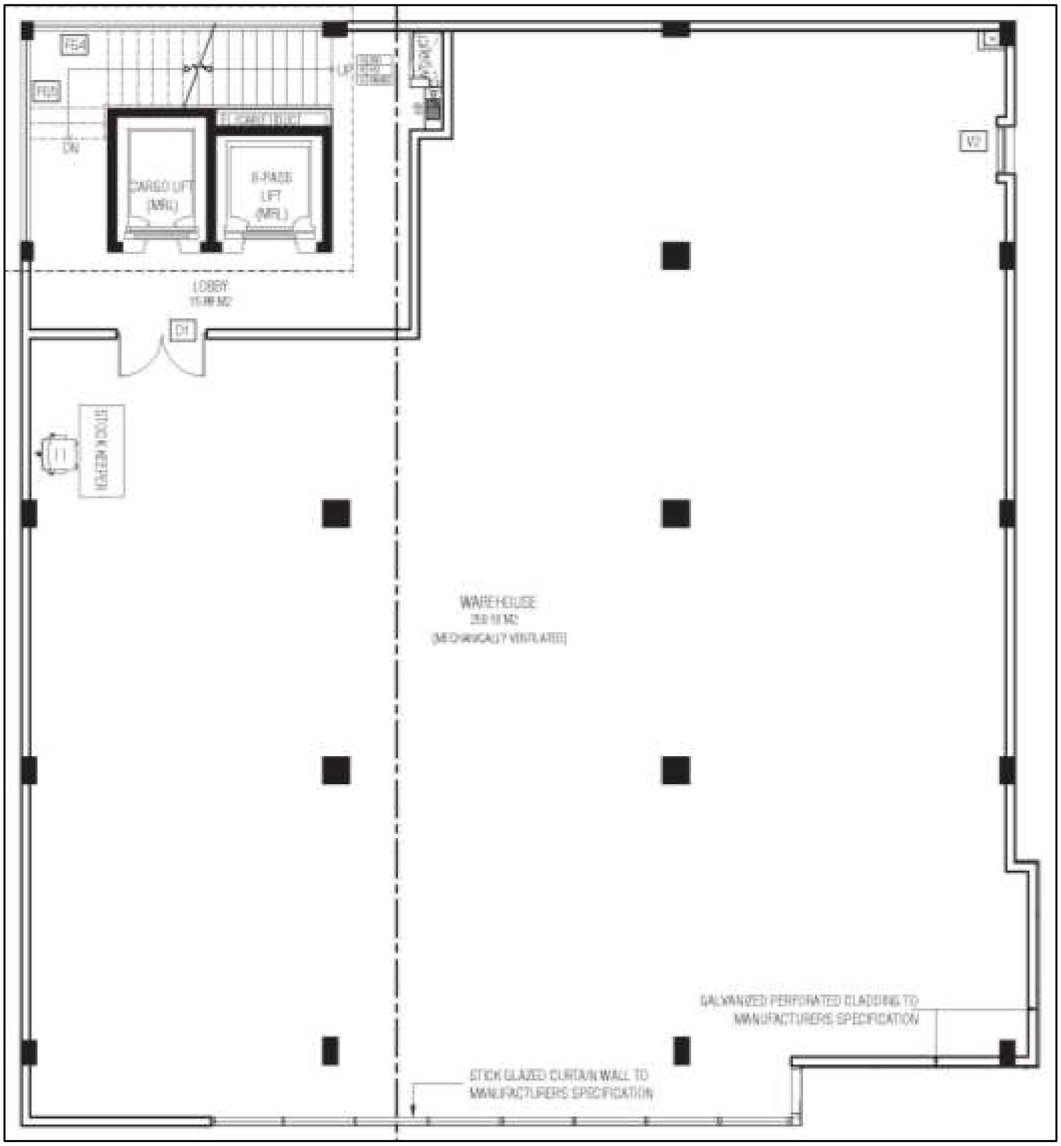


Figure 9: Partial print of proposed layout at forth to sixth floor

4.4.2 Seventh floor

The seventh floor contains; the showroom of 157.17 sqm which is mechanically ventilated, the cargo lift, passenger lift, meeting room of 16.01 sqm, staff tea room of 9.23 sqm, staff toilet of 6.29sqm and admin office of 65.91 sqm.

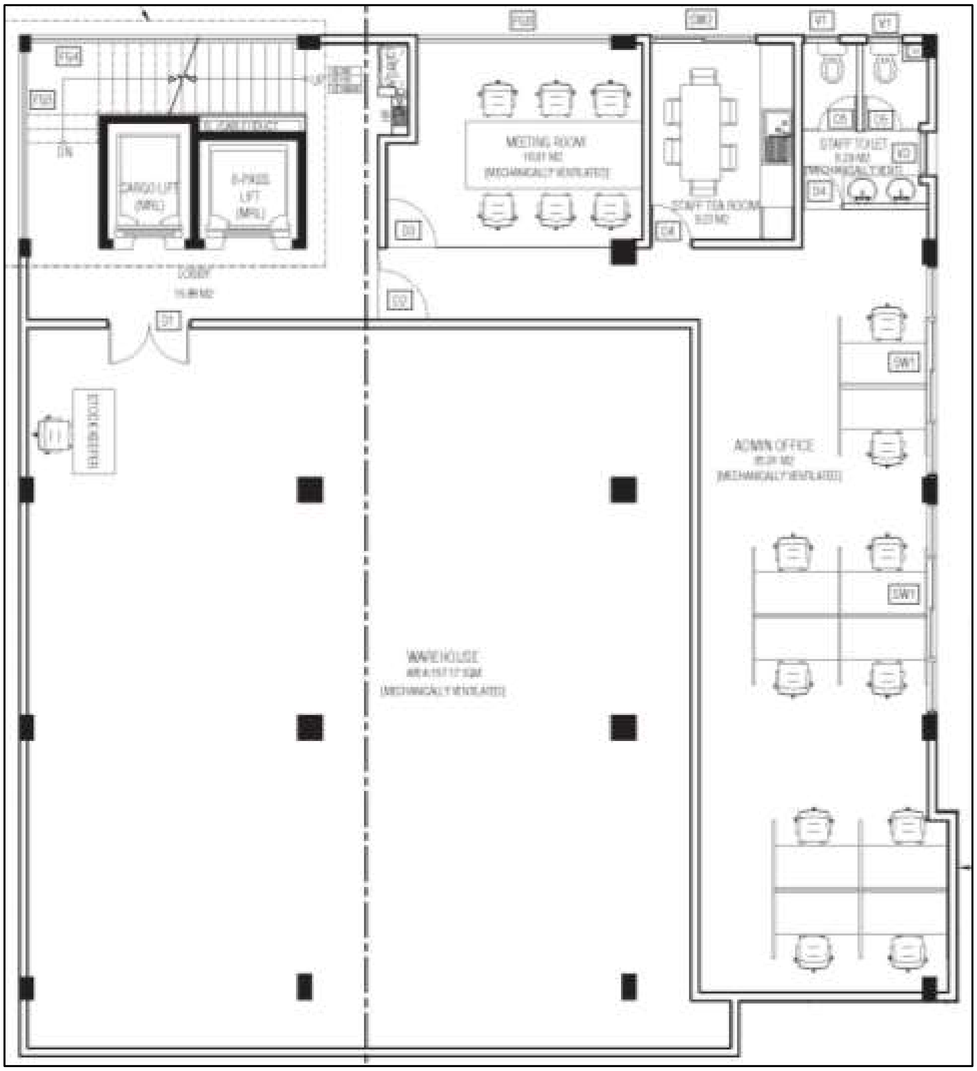


Figure 10: Partial print of proposed layout at seventh floor

4.4.3 Terrace floor

The terrace floor contains; free area of 145.52 sqm, admin office of 104.74sqm, staff toilet of 6.29sqm and the lifts (cargo and passenger).

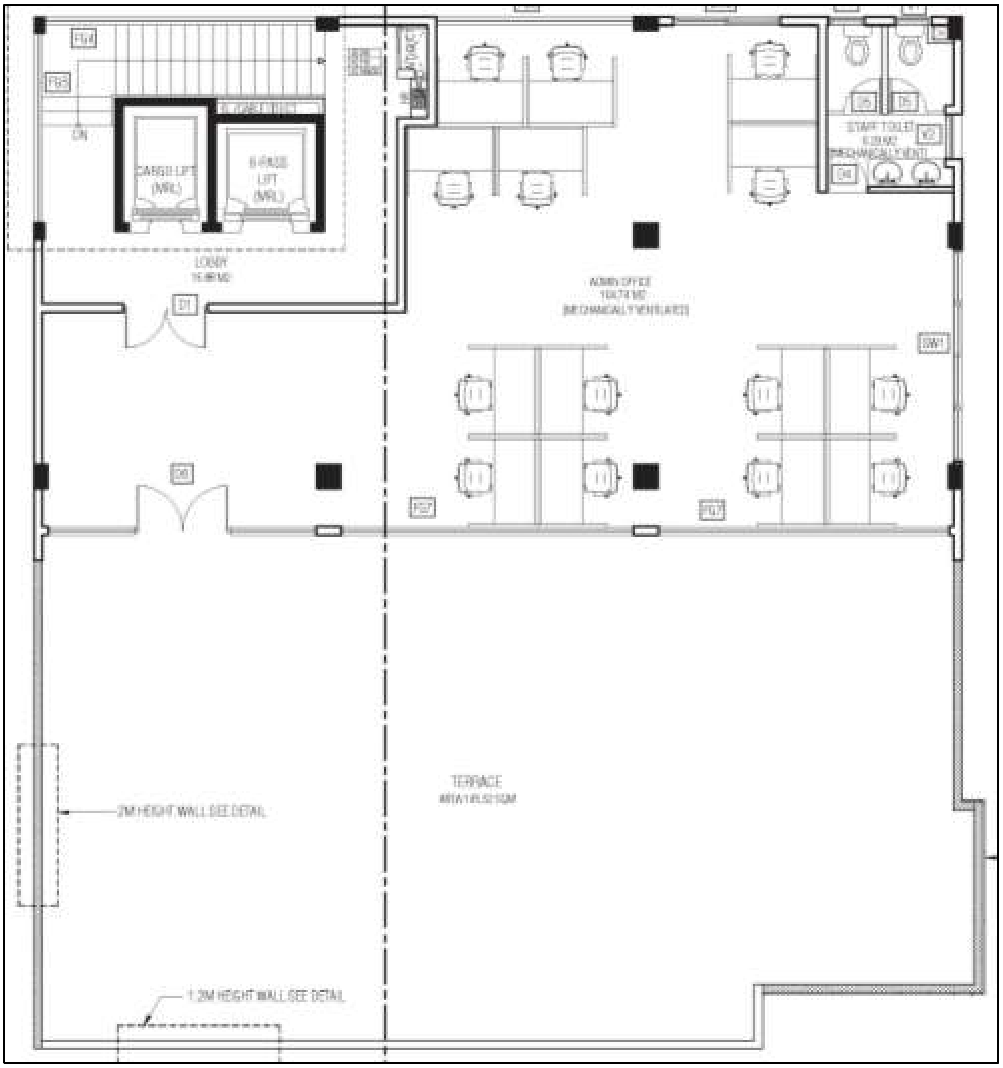


Figure 11: Partial print of terrace floor layout

4.4.4 Building Construction

4.4.4.1 Mobilisation

The materials and equipment required for the project including heavy machinery will be brought to the project site on a need basis. That is adequate materials for foundation will be brought just prior to commencement and materials will be again brought to project site for the construction of each floor separately. The materials shall be temporarily stock-pilled on the project site. Major materials, equipment and machinery required for the project is provided in Appendix I.

4.4.4.2 Decommissioning

Once the project has been completed, contractor leaves the site after performing the required site clearance. Any temporary project facilities will be demolished and the waste will be transported to Thilafushi for disposal.

All heavy machinery brought in by the contractor will be demobilized

4.4.4.3 Project Management

During the construction phase, the following work profile will be utilized.

Table 4: Work profile required for implementation of the proposed project

Designation	responsibility
Project manager	Overall responsibility for the implementation of the project
Project engineer	Ensure that works are in accordance to drawings and specifications
Surveyors	Provide layout and levels
Site manager	In charge of site work implementation and coordination
Implementation Supervisors	Ensures that works are carried out according to project managers instructions
Safety supervisors	Assess risk and ensure that everyone follows the safety rules and regulations.
Laborers	Carries out all the tasks

Necessary permits shall be taken from the relevant authority for road blocks during the foundation and flooring works.

4.4.4.4 Construction work regime

All the civil structures will be built using normal construction materials with least possible alterations to the natural environment. The construction waste shall be properly managed and shipped routinely to Thilafushi for disposal. Proper construction sign boards shall be placed for the safety of the workers and general public who use the road.

4.4.4.5 Temporary facilities

Temporary project site setup: a small area within the project site itself will be dedicated for the temporary site setup prior to foundation laying works. Once the first two floors are constructed the ground floor shall be used for this purpose.

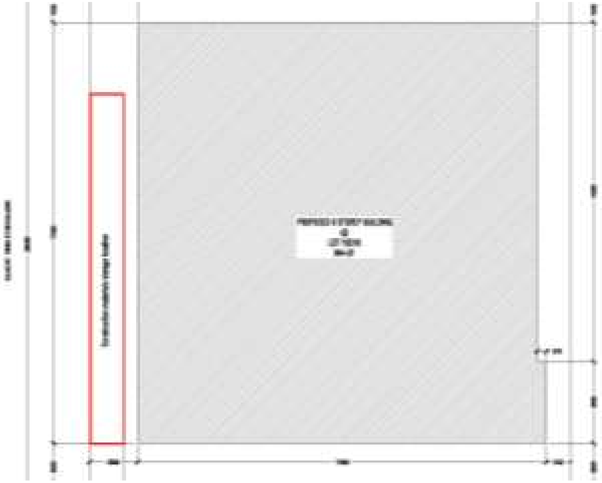


Figure 12: Partial print of temporary site location at project area (in red)

Staff accommodation: will be accommodated in the existing housing facilities in Male' City.

Temporary Power: power will be taken from the local utility after getting the approval from them.

Water for construction; water will be taken from the local utility after getting the approval from them.

4.4.4.6 Site preparation and vegetation clearance

Table 5 shows the approximate number of vegetation that needs to be removed for this project.

Table 5: Approximate vegetation that needs to be removed

Species	Number	Storey	Building
Panicum maximum	2 small patches	Ground	Project site
Ricinus communis	3	0-2m	Project site
Leucaena leucocephala	2 small patches	Ground	Project site
Leucaena leucocephala	1	2-4m	Project site

4.4.4.7 Construction of building

Area, depth and volume required for excavation; Excavation area for dewatering is the total building footprint area which is 291.8 m2. The depth is -1800mm from ground level. Excavation volume is 525.24m^3.

Excavated earth disposal method and location; Excavation work by excavator. Size of excavator is middle and small. The excavated sand will be used for backfilling later.

Estimated number of days required for dewatering; the dewater period is 55 days.

Dewatered water disposal method and location; Dewatering by water pump (Big water pump for dewatering while small water pump for controlling the level of water). The water will be pumped via temporary pipeline into the sea, through the dewatering route designated by URBANCO. The dewatering pump specifications are given in Appendix G of this EIA report. Furthermore, the filtration method proposed for the dewatering is provided in Appendix H.

Compensation plan for construction and dewatering related damages; condition of adjacent buildings will be inspected by engineer prior to commencement of construction every day. If any damages are caused due to this project, the damages would be rectified by the contractor.

Methodology for protection of adjacent foundations during excavation works: A 600mm wide 1200mm long pit can be excavated at a time along the adjoining buildings. The foundation can be supported by construction of 150mm thick solid block retaining wall, which starts at 300mm below the proposed foundation depth up to the underside of adjoining foundation. To provide lateral stiffness, 16mm reinforced bars at 600mm centers should be planted inside the wall vertically and plastered on side. This foundation protection process will be continued until all the adjoining buildings foundations are supported.

The above stated methodology can only be applied if the adjoining building owner permits or else the lateral pressure on the material adjacent to the excavation could be prevented materially by means of proper and careful placement of sheeting and bracing i.e, around the property line, 6mm tick steel sheets may be driven down to a depth of 600mm below the proposed foundation depth. To provide lateral stiffness these sheets shall be braced sing 50mm * 3mm thick steel L-angle sections in all feasible directions. Onsite close observation, frequent measurements and recording of vertical and lateral movements and behaviour of the sheeting and bracing should be done to provide early warning of unfavourable development which might cause settlement of the adjacent property. De-watering will be continued throughout the excavation process and until casting of foundation, if the proposed foundation depth s below the water table. Illustrations shown in figure below.

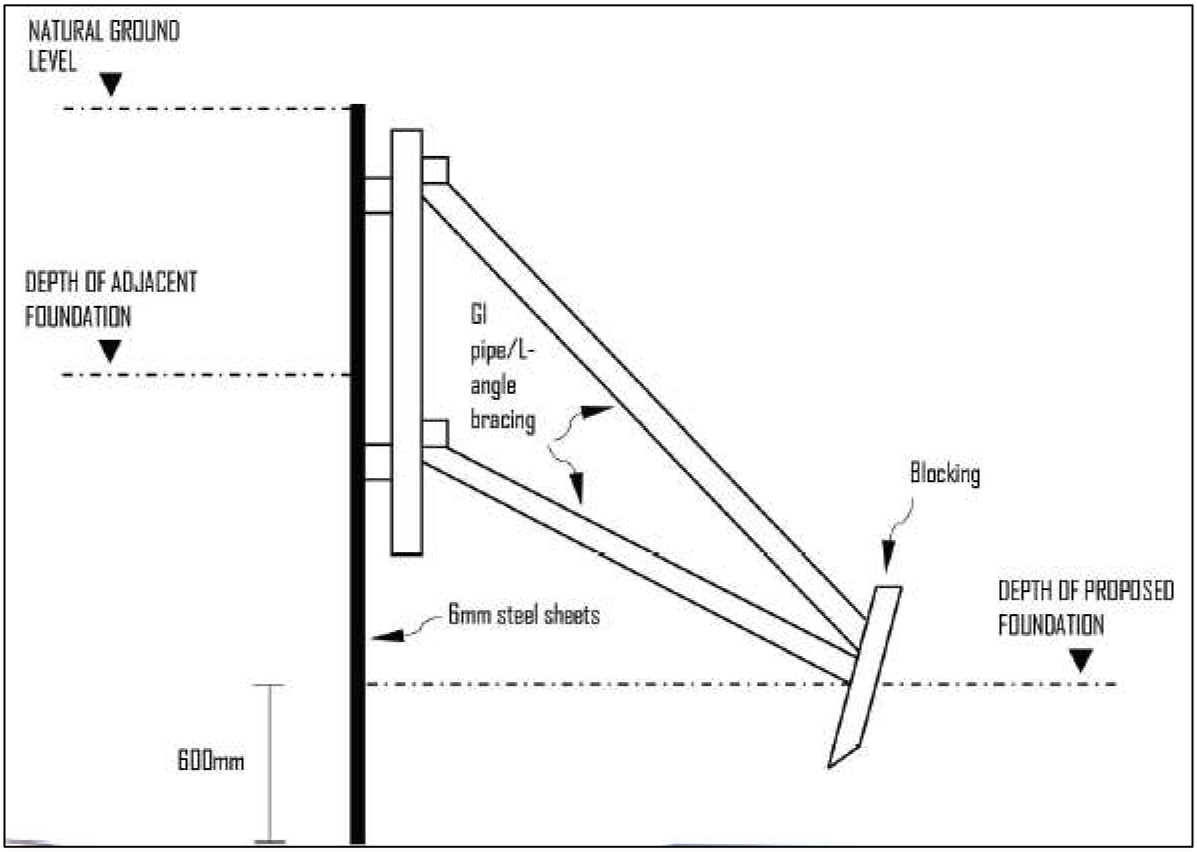


Figure 13: Schematic diagram of protection method

Shoring methods; Site closed for construction. Steel pipe as support considering the deep excavation. The detail drawings for the shoring method is given in **Error! Reference source not ound.** of this report.

Type of foundation and foundation depth; Raft foundation slab as type of foundation. First formwork will be laid with reinforcing bar. Then concrete will be poured into the formwork.

Concrete batching process and transportation method; Ready mix concrete will be used for the project and will be outsourced to ready mix concrete providers and transportation method will be mixer trucks with pump and boom truck.

Finishing; once the concrete works are finished: workers will use general construction tools for the blocks and masonry works. Electricians will then install all the electrical wires and equipment's. Finally, the interior designers will do the finishing works.

4.4.4.8 Installation of Utilities

Water, sewer and electricity for the building will be installed in accordance with the regulations and guidelines set forth by the relevant utility companies which is MWSC and STELCO.

4.4.4.9 Construction and operational phase waste management

Any construction waste shall be properly managed and shipped routinely to Thilafushi for disposal. Proper construction sign boards shall be placed for the safety of the workers and general public who use the road.

Fuel and chemical management are to be handled with utmost care as spillage and contamination of the groundwater is prohibited under the new Water and Sewerage Act (08/2020). Spillage control mechanisms will be in place prior to execution of works and labour force will be trained prior to commencement of the work. A dedicated environmental and social safeguards officer will be employed by the proponent to ensure the safety checks are in place to ensure the implementation of the mitigation and monitoring measures specified in the current report.

If a spill does occur, following actions shall be followed;

- Spill clean-up kits are to be readily available at site
- Works are to be halted immediately and alert all the staff in the vicinity of the spill
- Staff are to take relevant personal protective measures to be ready for spill clean up
- Find the root cause of spill and mend effectively
- Clean up the spill
- Report the incident

4.4.4.10 Project Operation

Once the building is completed the building will be handed over to the proponent operations department which will be in-charge of operationalizing the building as and when required.

4.4.4.11 Project duration and schedule of implementation

The construction will commence once the EIA process have been completed. Estimated date is December 2023. Construction works is expected to be completed by February 2025. Refer to **Error! Reference source not found.** for a detailed work plan of the proposed project.

4.4.4.12 Tasks already completed

No tasks in relation to project construction have been completed as of yet. However, all the detail drawings for the building has been completed and approved by the respective Government Authorities.

4.5 Project inputs and outputs

The following two tables details the estimated project inputs and outputs for the works to be undertaken in the proposed project. The detailed material list is provided in Appendix I of this EIA report.

Table 6: Major project inputs

Input resource(s)	Source/ type	Qty/Volume	Source of resource
Man power	expatriate	Large numbers	Contractor
Construction material	**Temporary site setup**: Galvanized pipes, roofing sheets, toilet units, toilet fittings, cement, sand, timber, spun piles	Small quantities	Local purchase or import
	Concrete works: reinforcement steel bars, river sand, cement, aggregates	Large quantities	Local purchase or import
	Roofing: Timber; Thatch, prefabricated materials.	Large quantities	Local purchase or import
	Electrical: electrical cables and wires, DBs, MMCBs and MCBs, PVC pipes, light weight, telephone cable CAT 5, PVC conduits, 4 core armored cables, PP-R pipe, Multi pump, UPVC (T1000, T600) for sewerage grid	Large quantities	Local purchase or import
	Water and Sewer: HDPE pipes, pumps, control panels, inspection chambers	Large quantities	Local purchase or import
	Finishing: floor and wall tiles, gypsum boards, calcium silicate boards, zinc coated corrugated metal roof, paint, varnish, lacquer, thinner, dry walls, carpet etc.	Large quantities	Local purchase or import
Machinery and equipment	Excavator, Truck, Concrete mixer, General construction tools, Small lorry, forklift, Barge, Dewatering pump, total station, level gage, Crane	Large quantities	Contractor
Water	Desalinated water	Large quantities	MWSC
Fuel for operation	Petrol	Large quantities	Local purchase
Power	Electricity	Large quantities	STELCO

Table 7: Major project outputs

Project outputs	Method of generation/Qty	Method of control
Waste water	From workers	Discharged to sea via the existing sewer network in the island
Construction wastes	Waste oils Packaging waste	Waste oil stored in closed labeled containers and transferred to Thilafushi for disposal Packaging waste stored in an area and routinely transferred to Thilafushi for disposal
Noise	Localized to the project site	Unavoidable, but could be minimized by limiting working hours to daytime only and completing the project within the earliest possible duration.

4.6 Health and Safety, and Emergency Provisions

All the relevant health and safety measurements and emergency provisions such as fire extinguishers, fire proof blankets, fire alarms, gas leakage detectors etc. are to be provided in each floor with respect to the use of the floor space.

4.6.1 Fire emergency evacuation plan

The following is the fire emergency evacuation plan for the building.

Sound of the Alarm

The sound of the Alarm will be:

A continuously ringing bell or a continuous warning siren. If the alarm system fails, the sign will be a shouted warning.

Raising the alarm

If the event of a fire:

If the fire is discovered by one of the staff or guest, they shall notify the building maintenance staff and the alarm will be raised by: activation of the nearest call point or commencing manual warning (Whistle, shout etc.)

If fire is detected by automatic detectors, this will trigger the fire alarm

Actions staff should take on hearing the alarm

The following actions will be taken upon the fire alarm being sounded/raised:

- The designated staff on duty of building maintenance will take charge and lead in the fire evacuation.
- The aforementioned staffs shall be adequately trained to undertake such a task and drills shall be carried out annually. This information shall be informed and sensitized to staff members.
- Dial 118 and request attendance by the MNDF Fire and Rescue Service. Staff member gives their name, name of building, building address, contact number and details of fire.
- Staff will commence evacuation of the building– ensuring this is done in a calm and orderly manner, providing assistance to those needing additional help in evacuating.
- Lifts are not to be used for evacuation
- Staff to sweep building to ensure all areas are clear, if safe to do so and ensure all doors are closed on the way out
- If safe to do, electrical mains should be switched off before leaving the building. The location of these shall be made annexed to this plan after the detailed electrical drawings of the building is finalized.
- The staff shall ensure nobody re-enters the building until confirmed safe to do so by the Fire Service
- Meet at assembly point and check all inhabitants are accounted for.
- The staff to liaise with Fire Service upon their arrival

Escape routes

- From each floor to the nearest stairwell and out of the building
- The exit signs shall be properly place with adequate visibility to be located even in

case of low visibility due to smoke, absence of light,etc.

- In case the stair case is blocked due to the fire, the staff and occupants are to proceed in accordance to the instructions of the fire and rescue service experts on site

Fighting fires – extinguisher use

Fire extinguishers will only be used where:

- Staff have received training and feel confident in their use
- Where it is deemed safe to do so i.e. there is a clear means of escape, fire is small

Personal safety always takes priority, and if any doubt, staff or occupants should not attempt to extinguish a fire

The locations of the following key safety hazard or other fire related equipment shall be properly maintained by building staffs

- Main fuse box
- Main water inlet
- Gas cylinders
- Location of fire alarm panel
- Location of extinguishers and other firefighting equipment

Responsibilities of the proponent
Ensuring the plan is up to date
Ensuring adequate staff are on duty to carry out the evacuation plan
Training staff on the evacuation plan and in their roles and responsibilities
Short awareness program run annually for all residents/tenants to keep everyone informed

4.6.2 Measures to protect human health during construction and operation

The proponent and the contractor are responsible for the safety of the staff, and visitors; health and safety rules must be followed strictly.

- The project site and the work area must be fenced.
- Safety signs and boards must be installed at work site.
- Fire extinguishers must be installed at site.
- The proponent and the contractor will ensure that all the supervisors are trained and qualified to identify, report, response to, and mitigate any health code violation on site.
- The proponent, contractor and other supervisory bodies will ensure all the health and safety procedures are followed while in the project site.
- All the precautions and steps will be taken to ensure the safety of the employees. Safety gear will be worn all the time.
- The proponent must ensure that the contractor provides numerous first aid kits on site. This is of the uttermost importance as the island has a health centre and the closet hospital is at best 40 minutes away in the atoll capital.
- The proponent must ensure that the contractor trains enough staffs in basic first aid drills both terrestrial and marine. Hence making these staff available throughout the project work hours while setting the duty roster.
- The proponent must ensure that the contractor reports all medical emergencies to the hospitals.
- If the use of the equipment requires licenses or special permits, the contractor should ensure the staffs are licensed.
- All tools and equipment will be handled by competent staff.
- All staff must be trained to follow the emergency plan
- Health checks and safety checks will be administered before commencement of work.
- All project activities will be carried out in the presence of a qualified supervisor.
- The staff will be trained in fire extinguishing drills and appropriate fire extinguishing equipment will be placed at easily accessible points.
- Flammable material if stored on site, will be stored at site appropriately.
- Any tools stored on site will be stored appropriately.
- Oils, grease and lubricants will be stored as specified above in section.

Furthermore, must ensure that; Mosquitoes, high temperature and drowning prevention measures are taken on site. Drugs are sprayed and mosquito nets are used in the accommodation area; appropriate drugs are prepared in case of heatstroke. To prevent drowning, a strict management system is to be formulated and performed under supervision. Additionally, fencing the project site, set up entrance and exit, and arranges safety and civilization management personnel for on-site management.

Basic first aid facilities and safety gears shall be made readily available by the contractor during the construction phase of the project as per the regulation on safety standards for construction work. In emergencies the workers shall be taken to nearest hospital - (IGMH / Tree top / ADK / Dharumavantha/ Hulhumale' hospital).

Special consideration will be given to take all possible preventive measures of any pandemic (e.g. Covid-19) during the construction and operation phase of the project. As such, the recommendations of the Health Protection Agency will strictly be enforced whilst sensitisation sessions will be undertaken to internal controls of health and safety to all the work force

During the operational phase basic first aid facilities and safety gears shall be made readily available to the working staff at the facilities. Occupation health and safety guidelines shall be strictly followed by all personnel

4.6.3 Potential accident and hazard scenarios and how to manage them

Potential hazard scenarios during this project include oil/chemical spills, injury to workers etc. These potential hazard scenarios and how to manage them are detailed in the emergency preparedness and response plan and the health and safety plan.

4.6.3.1 Emergency plan in case of spills

The proponent must ensure that the contractor has an emergency plan, an emergency coordinator and the alternative emergency coordinator.

4.6.4 Overall emergency plan

The overall emergency plan must be site specific and drafted upon by the contractor and the proponent considering the features of the island and the available facilities of the island. The emergency plan must be understood and followed by all staff. A typical emergency plan must include the following.

- The emergency plan should be followed and executed without delay in case of an emergency.
- Safety Sign Boards and Safety lights must be installed at the work site.
- Fire Extinguishers must be installed at work site.
- All staff must learn the basis of the emergency plan.
- Assembly points must be decided prior to mobilization
- Points of relief must be equipped with medical kits and fire safety kits
- Spill kits must be installed near the storage sites and in easily accessible areas.
- Alarms must be installed and tested
- Informed drills must be carried out at a schedule.
- All staff must be informed that they could call in an alarm.
- All emergency coordinators should be trained well with the alternative.
- In case of an emergency the point of reference must be the coordinator or the alternative.
- In case of an emergency, the emergency coordinator or the alternative must be informed primarily
- All staff must strictly follow the instructions of the emergency coordinator.
- Authorities must be informed by the coordinator or the alternative
- The contractor is required to take the following measures in order to ensure minimal pollution in case of a spill.
- Use serviced machinery to reduce toxic emissions
- Service the machines in use during the work process.
- Keep spill kits on the island and portable spill kits on the machines
- Bund all necessary lubricants and oils stored on site.

4.6.5 Emergency plan for spill response at the proposed project location

Spills on construction sites can have drastic consequences to people and the environment. After a thorough analysis of the action in hand, the responsible party is to follow the action plan as specified. However, the best form of action is prevention therefore the following spill prevention measures must be implemented on site.

General Precautions

The following general precautionary measures shall be applied to all construction works areas to minimize the risk of accidental spillage;

- Maintain good site housekeeping practices and ensure all materials, chemicals and wastes are properly stored and placed in appropriate disposal areas onsite at the end of each day.
- Avoid disorder and storage of unnecessary materials in working areas.
- Open flames and smoking shall be prohibited within the construction site; smoking may be permitted only at designated smoking areas.
- Stacked containers should be secured from falling.
- Large / heavy containers should be stored on the floor as far as possible to prevent falling.
- Warning signs, fences and locks where appropriate should be deployed for storage place of hazardous materials, chemicals, fuel and oil, etc.

Chemicals, Oils and Fuels

For chemicals, oils and fuels (if used for the excavators, etc.) required and used onsite, the following measures shall be applied:

For procurement;

- Label all chemical storage containers and tanks in accordance with the EPD 'Code of Practice on the Package, Labeling and Storage of Chemical Wastes'.
- An up to date list of chemicals, chemical waste and fuel oil should be maintained.

For storage;

- Suitable containers should be used which are resistant to the stored oil fuel, chemical / chemical waste to avoid leakage.
- Containers should be checked before use and container lids should be closed tightly to avoid leakage of chemicals and chemical waste.
- Chemical waste storage areas should be located in a designated area that is sheltered on at least 3 sides and the top, and is locked and kept clean and free from obstruction.
- Incompatible chemicals should be separated.

- Chemical, oil and fuel containers should be kept under eye level as far as possible.
- Drip trays or bunds should be used for storage containers of chemicals and oil / fuel tanks and should have a capacity equal to 110 % of the storage capacity of the largest tank.
- Chemical storage area and drip trays should be inspected daily to ensure the containers are in good condition and there are no openings which oil / chemicals can possibly leak out. Any damage / openings to the storage area and drip trays should be repaired or replaced immediately.
- Where chemicals are temporarily taken outside the sheltered chemical storage area, the chemicals including the drip trays / bund should be covered by waterproof tarpaulins and kept free of rainwater.

For transfer / transport;

- Pumps should be used to transfer large quantities of oil, fuel, chemical / chemical wastes instead of pouring.
- Oil, fuel, chemical / chemical wastes should be transferred slowly to prevent spillage or overfilling.
- Suitable trolley should be used to transport chemicals / chemical wastes to other location.

For use;

- Chemical quantities / dosage required during each use shall be carefully calculated / measured to prevent any excess chemicals being generated and released.
- Drilling fluid used in drilling activities should be reconditioned and reused as far as possible.

Spill response

Effective spill response comes down to the reediness of the contractor to a potential event. This in effect enables the contractor to respond to any related unidentified event as well. Spill response simplified can be shown in as below.

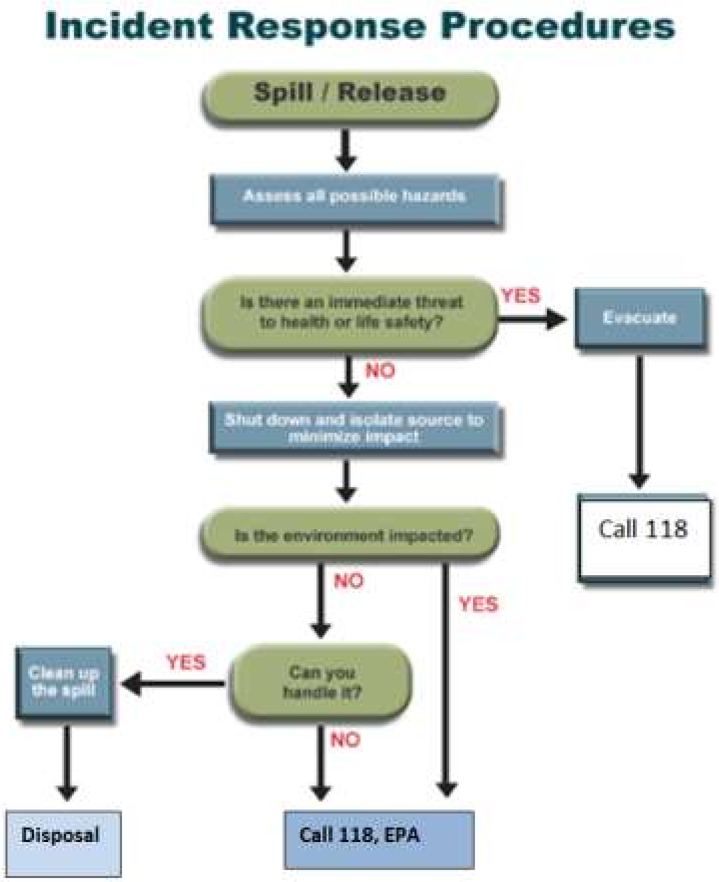


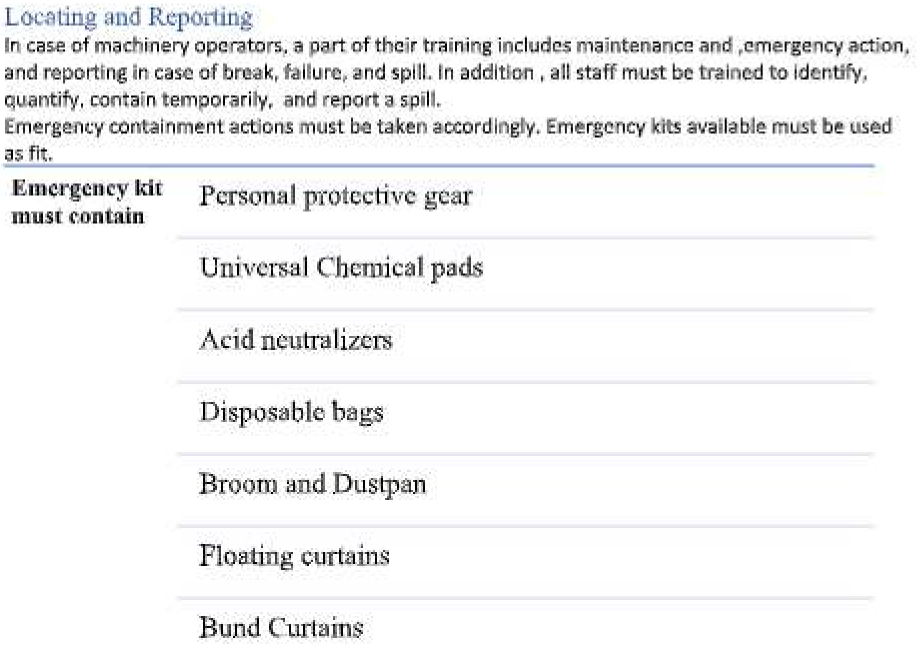
Figure 14: spill response procedure

In this specific project, three major types of spills involved are listed.

Construction Phase		
Spill Types	Land Based Activities	Marine based Activities
Fuel/ Oli	✓	✓
Chemicals	✓	✓
Fill materials	✓	✓

Locating and Reporting

In case of machinery operators, a part of their training includes maintenance and, emergency action, and reporting in case of break, failure, and spill. In addition, all staff must be trained to identify, quantify, contain temporarily, and report a spill. Emergency containment actions must be taken accordingly. Emergency kits available must be used as fit.

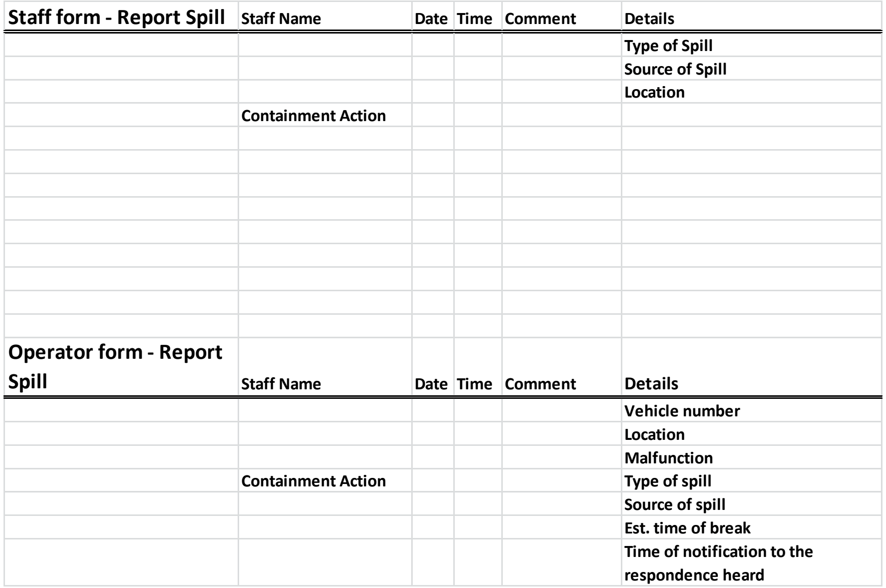


Locating and Reporting

In case of machinery operators, a part of their training includes maintenance and ,emergency action, and reporting in case of break, failure, and spill. In addition , all staff must be trained to identify, quantify, contain temporarily, and report a spill.
Emergency containment actions must be taken accordingly. Emergency kits available must be used as fit.

Emergency kit must contain	Personal protective gear
	Universal Chemical pads
	Acid neutralizers
	Disposable bags
	Broom and Dustpan
	Floating curtains
	Bund Curtains

Reporting must have the following parameters;



Staff form - Report Spill	**Staff Name**	**Date**	**Time**	**Comment**	**Details**
					Type of Spill
					Source of Spill
					Location
	Containment Action				
Operator form - Report Spill	**Staff Name**	**Date**	**Time**	**Comment**	**Details**
					Vehicle number
					Location
					Malfunction
	Containment Action				**Type of spill**
					Source of spill
					Est. time of break
					Time of notification to the respondence heard

After reporting, the response head must follow directions from the government to the fullest extent

5. EXISTING ENVIRONMENT

This chapter describes the existing environmental conditions of the proposed project site. Sections 5.1 describes the general environmental condition of the Maldives and 5.2 outlines the general climatic conditions by analyzing data from the meteorological center of the Maldives. Sections 5.3 to 5.4 details the specific environmental conditions at the proposed project site.

5.1 The Maldivian Setting

Maldives, officially known as the Republic of Maldives and sometimes referred to as the Maldive Islands, is an island nation (Zahid, 2011) consisting of nearly 1192 islands on a double chain of 26 natural atolls (administratively divided into 20 atolls), 80-120 km wide, in the Laccadive Sea in the Indian Ocean (State of the Environment 2004, 2004). Elevating less than 3 meters above mean sea level, with 80% of land area less than 1 m, Maldives is the flattest country in the world. The total area is about 107,500 km^2 of which roughly 300 km^2 of landmass (Zahid, 2011), with a population of about 338, 434 (as per September 2014 census) (Maldives' Population Dynamics: Policy Prospects for Human Growth and Opportunity, 2016) spread over 194 inhabited islands (Statistical Yearbook of Maldives 2010, 2010). Stretching 860 km from latitude 7°6"35"N, crosses the Equator to 0°42"24"S, and lies between 72°32"19"E and 73°46"13"E longitude (Zahid, 2011). These coral Atolls are located on the 1600 km long Laccadives-Chagos submarine ridge extending into the central Indian Ocean from the SW coast of the Indian sub-continent (State of the Environment 2004, 2004).

The Atolls vary greatly in shape and size as well as the characteristics of the Atolls, reefs and reef islands vary considerably from north to south. The northern atolls are broad banks, discontinuously fringed by reefs with small reef islands and with numerous patch reefs and faros in the Lagoon whereas in the southern atolls, faros and patch reef are rarer in the Lagoon, continuity of the atoll rim is greater and a larger proportion of the perimeter of the Atolls is occupied by islands. The islands also differ depending on location, form and topography. The islands vary in size from 0.5 km^2 to around 5.0 km^2 and in shape from small sandbanks with sparse vegetation to elongated strip islands. Many have storm ridges at the seaward edges and a few are characterized by swampy depressions in the center (State of the Environment 2004, 2004).

Located on the equator, Maldives experiences a warm, humid tropical climate or a monsoonal climate with two distinct seasons known as the northeast monsoon (dry season) from January to March and southwest monsoon (wet season) from May to November (State of the Environment 2004, 2004). The southwest season brings in torrential rain (Zahid, 2011) and rainfall varies from north to south along the atoll chain, with a drier north and wetter south (State of the Environment 2004, 2004). Rainfall varied from 1,407 mm to 2,707 mm interannually over the last 30 years. May, August, September and December are the wettest months and January to April the driest (State of the Environment 2004, 2004).

The annual and seasonal temperatures vary very little with a mean annual temperature of 28°C (State of the Environment 2004, 2004); however, the diurnal temperature fluctuates from 31°C during the day to 23°C at night. This is associated with the small size of the islands and the tempering of the hot days by cooling sea breezes surrounding the islands (Zahid, 2011). The highest and lowest temperatures on record are 36.8°C on May 1991 and 17.2°C on April 1978 respectively (State of the Environment 2004, 2004).

Ocean currents are driven by the monsoon winds with the westerly flowing currents dominating the northeast monsoon and easterly currents dominating the southwest monsoon. Changes in current flow patterns occur in April and December corresponding to the transition periods of the southwest and northeast monsoons respectively. Currents near the shoreline slightly differ from oceanic currents depending on the location, orientation and morphology of the reefs and underwater topography (Zahid, 2011).

Sea surface temperature (SST) is reasonably constant throughout the year and ranges between 28 to 29 °C. Mean monthly SST rises from December/January to April/May. However, May 1998 experienced a mean monthly SST of 30.3 °C which is expected to occur every 20 years. Furthermore, temperature drops rapidly to below 20 °C at a depth of 90-100 m (State of the Environment 2004, 2004).

5.1.1 Geology and Geomorphology

Earth's crust, called the lithosphere, consists of 15 to 20 moving tectonic plates. The plates can be considered as cracked shell that rest on the hot and molten rock of Earth's mantle and fit closely against one another. The heat from radioactive processes within the planet's interior causes the plates to move toward and away from each other which is known as tectonic shifts (NOAA, 2021).

Maldives in located on the Indo-Australian plate which is among the 7 major plate tectonic boundaries found on Earth. The Indo-Australia plate which is a combination Australian and Indian Plates covering a total area of about 58,900,000km2. However, they are generally considered to be two separate plates (Earthhow, 2021).

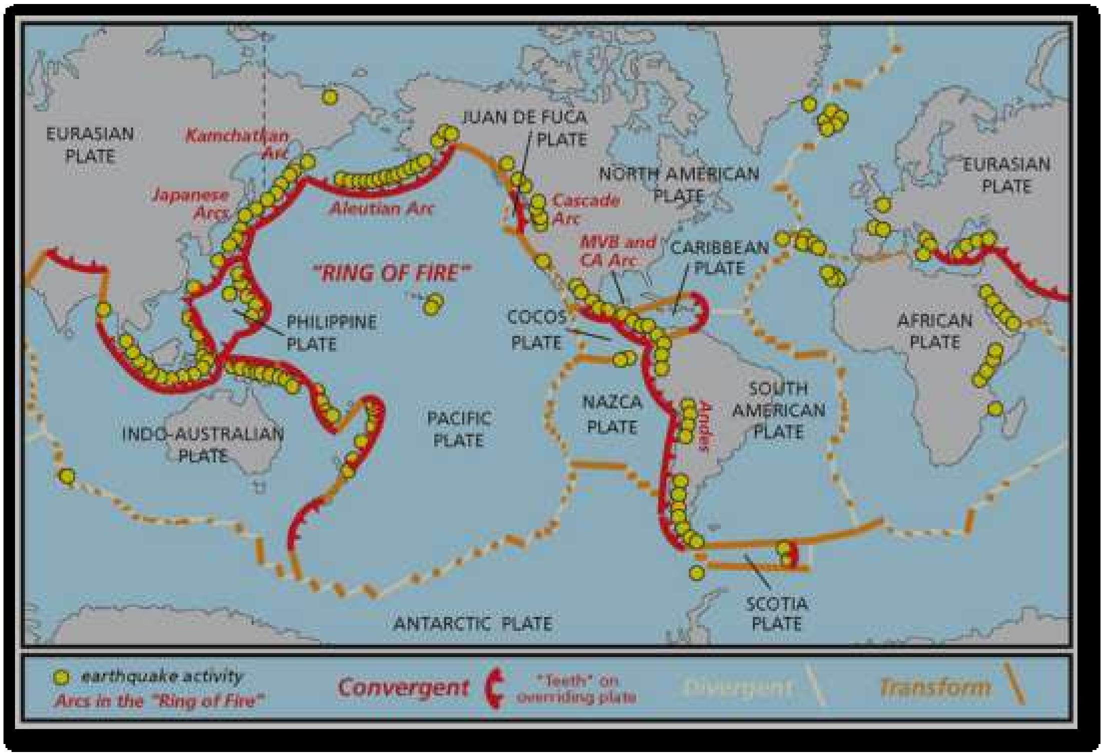


Figure 15 : Shows all the major tectonic plates and their general movements

Maldives is an archipelago of islands. Maldives is made up of 26 natural chain of atolls covering over 90000 square kilometer in the sea. The islands stretch for 822 km from north to south, with the greatest width from west to east being 130km. The land area of all the islands amounts to 298km2 (Belopsky & Droxler, 2004).

The inner sea of the atolls mostly has shallow depths compared to the rest of the outer sea with depths ranging from 300 to 500m (Purdy & Bertram, 1993). The following figure shows a general bathymetric map highlighting the changes in depth within and outside waters in and around Maldives.

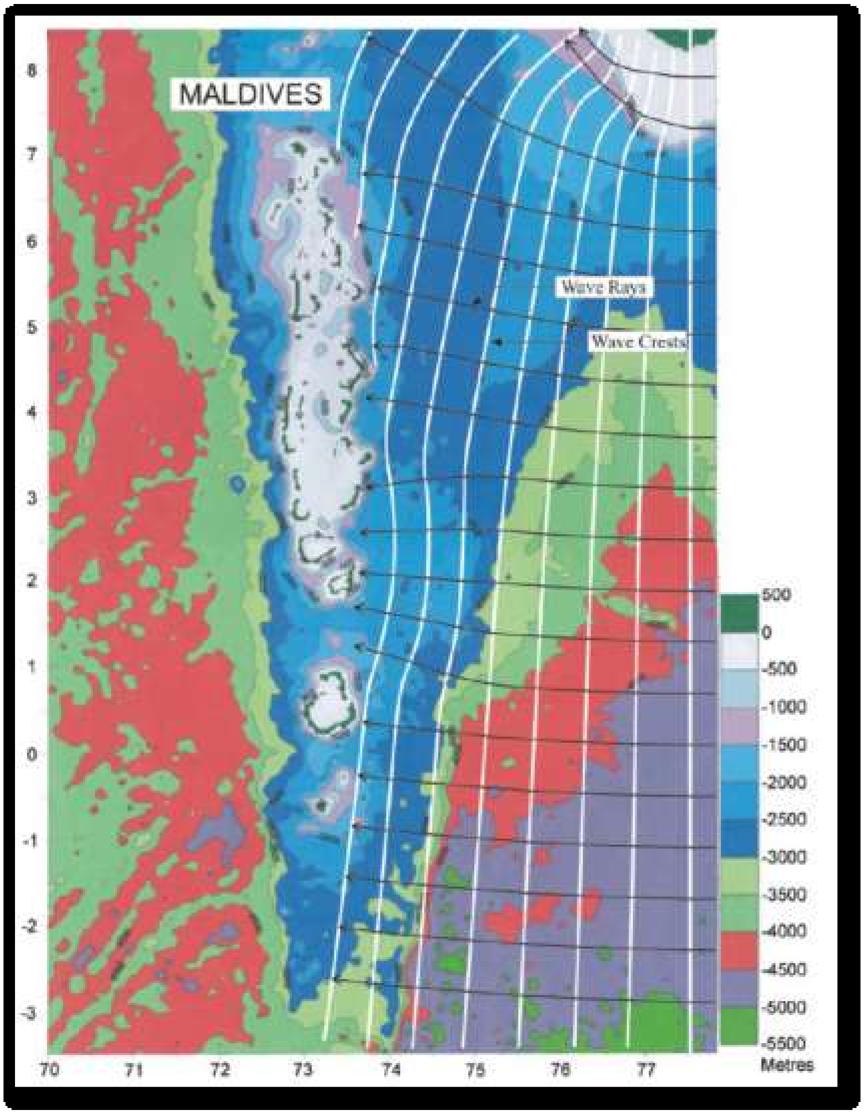


Figure 16: Shows the general bathymetry of Maldives (riyan Pte.Ltd, 2013)

Most of the islands have high peripheral storm berms formed due to over wash with maximum elevations of 2.2m above mean sea level (MSL). The present-day beach is deposited against the vegetation line of the island. The seaward boundary is defined by a distinct break in slope associated with the transition from unconsolidated beach sediment to the fixed reef flat substrate in which beach and shoreline move freely. Beach width varies considerably for each individual island (Kench, P S; Brander, R W, 2006).

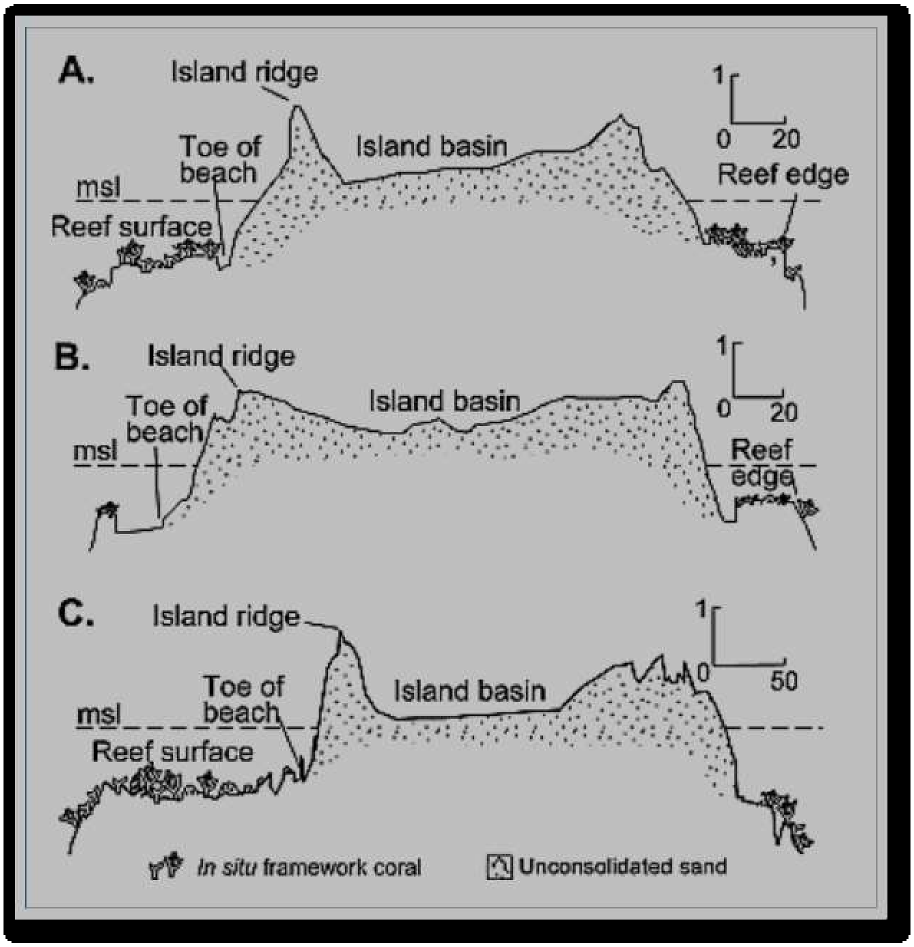


Figure 17: Shows some morphological features in an island system (Kench, P S; Brander, R W, 2006).

5.2 Climatic Conditions

The Bureau of Meteorology of Maldives has compiled a range of climate variables since 1975 from five different meteorological stations located across the Maldives. Climate variables including temperature, rainfall, and wind were analyzed for the nearest meteorological station to K. Hulhumale', which is Hulhule' meteorological center at geographic coordinates of 336864.00 m E, 463615.00 m N, about 2.34 Km from K. Hulhumale'. Location of Hulhule' meteorological center with respect to K. Hulhumale' is shown on Figure 18 below.

Figure 18: Location of K. Hulhumale' with respect to Hulhule' meteorological center

5.2.1 Temperature

Analysis of temperature data shows that the variation in temperature throughout the year is generally very minimal, however, daily temperature ranges from 34.9°C during the day to 19°C at night. Looking at the monthly variation in temperature, the highest temperature was recorded for the month of April from the meteorological station in Hulhule' reading 31.8°C over the past 48 years. With regards to the minimum temperature, the lowest temperature at Hulhule', 25.4°C was recorded for November.

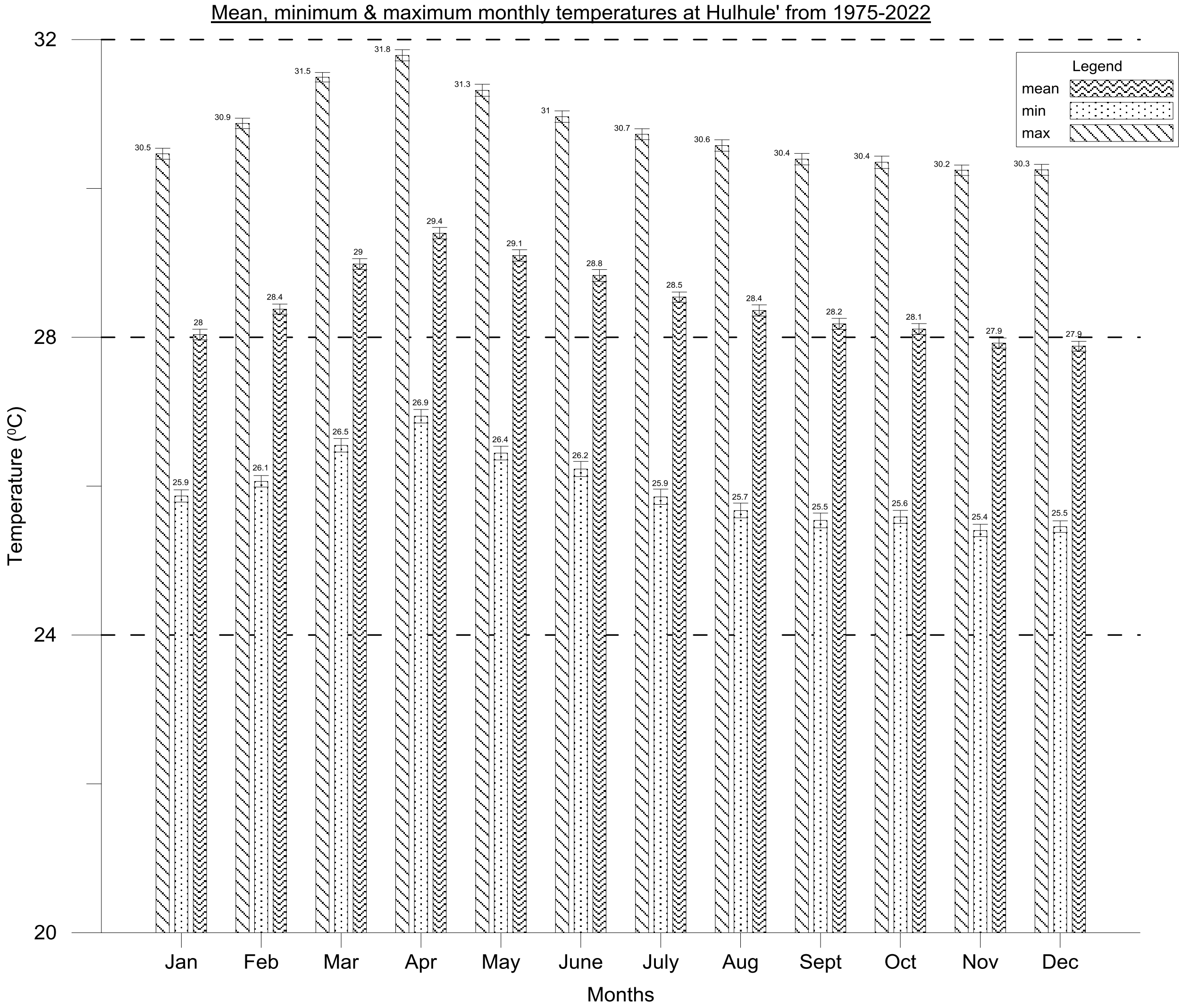


Figure 19. Mean, minimum, and maximum monthly temperatures for Hulhule' from 1975 to 2022 (Data obtained from the Maldives Meteorological Service)

5.2.2 Rainfall

Maldives experiences a monsoonal climate due to it being located on the equator. The wet season (Northeast monsoon) marked from mid-May to November and the dry season (Southwest monsoon) from January to March used to see distinct rainfall patterns. Climate change has made the monsoons and rainfall patterns slightly unpredictable the past few years, but the trends have stayed fairly similar. Analysis of rainfall data from 1975 to 2022 at Hulhule' meteorological station shows that the mean monthly rainfall follows the traditionally defined seasons with most rain occurring from May to December and little rain falling outside these months. The highest amount of rain was observed during the month of October with approximately 237 mm of rain on average and the lowest rain was experienced in February, averaging only about 40.3 mm of rain over the past 48 years.

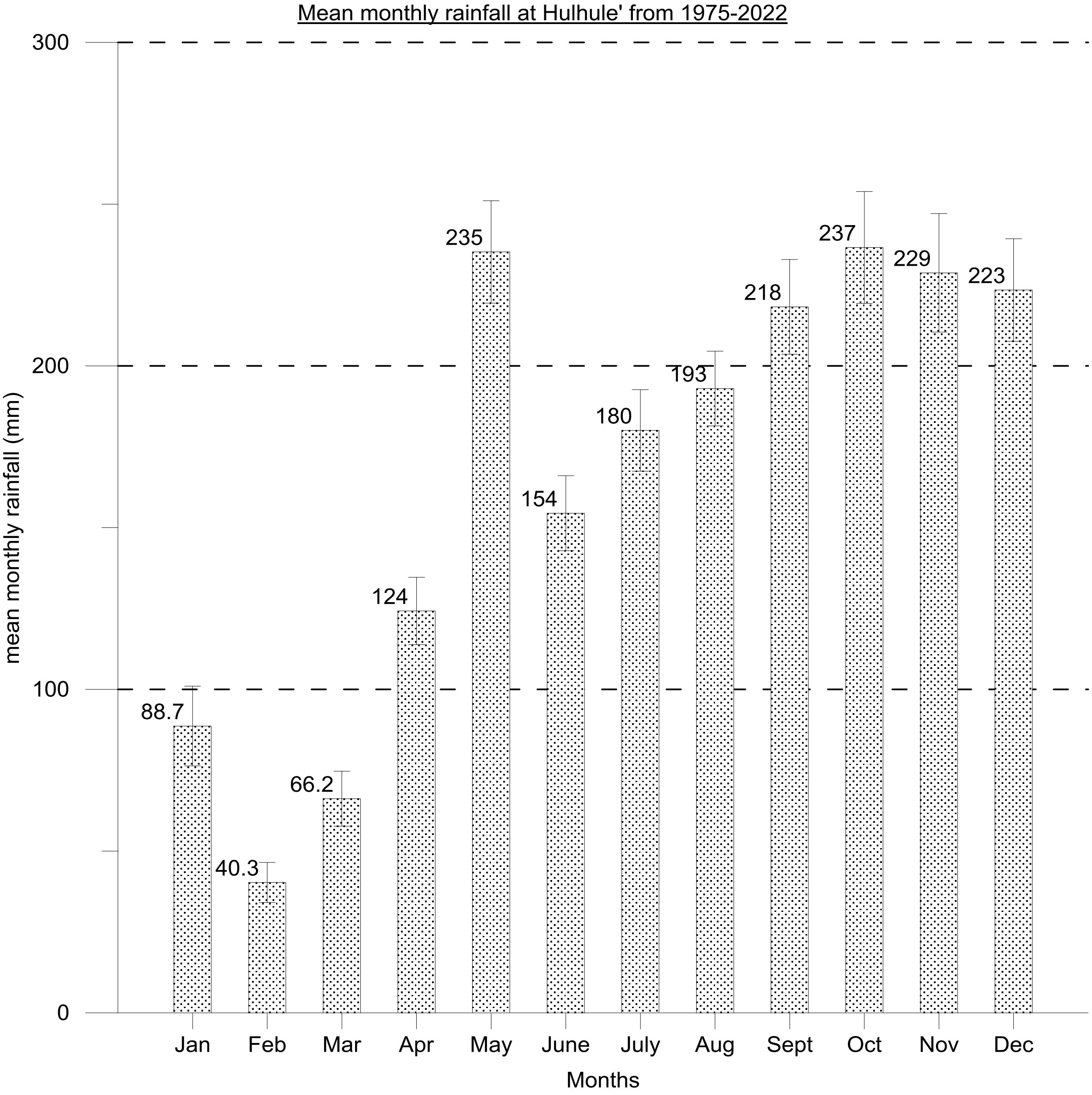


Figure 20. Mean monthly rainfall (mm) for Hulhule' from 1975 to 2022 (Data obtained from the Maldives Meteorological Service)

5.3 General Setting of Hulhumale'

Hulhumalé, located in the southern part of the North Male' Atoll at geographic coordinates of 338033.00 m E and 465710.00 m N. The reef system hosts Hulhule' apart from Hulhumale'. The land area of K. Hulhumale' is about 400 Ha.

Hulhumalé is a reclaimed island. This artificial landmass is constructed through the process of dredging and depositing sand from the ocean floor. Its development serves to address the present and future demands for housing, industrial, and commercial spaces in the Malé area, while also acting as a response to the escalating threat of rising sea levels. On May 12, 2004, President Maumoon Abdul Gayoom officially inaugurated the settlement.

The responsibility for the development and administration of Hulhumalé rests with a government-owned entity known as the Housing Development Corporation. This corporation, initially established as the Hulhumalé Development Unit and later rebranded firstly, as the Housing Development Corporation, which was formally incorporated on March 23, 2005. On the occasion of its 22nd anniversary, Housing Development Corporation (HDC) rebranded once more as Urbanco.

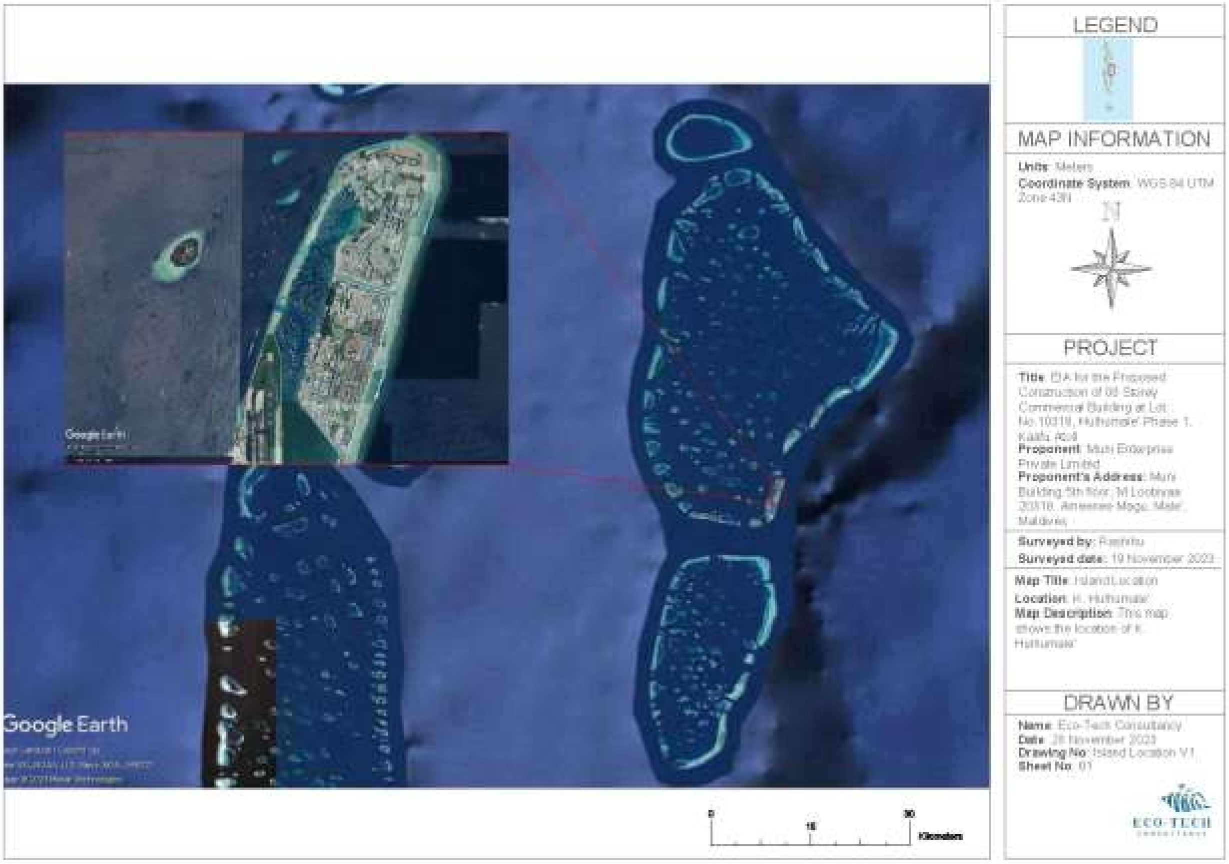


Figure 21. Location of Hulhumale' in Kaafu atoll

5.4 Terrestrial Environment of Hulhumale'

This section describes the site-specific terrestrial environmental conditions of the proposed project site. The structural environment, ground condition, noise levels, air quality, vegetation and ground water quality results are presented.

5.4.1 Structural Environment at Project Site

The condition and use of the project area is summarized on the Table 8

Table 8: Condition and use of buildings near and on project site

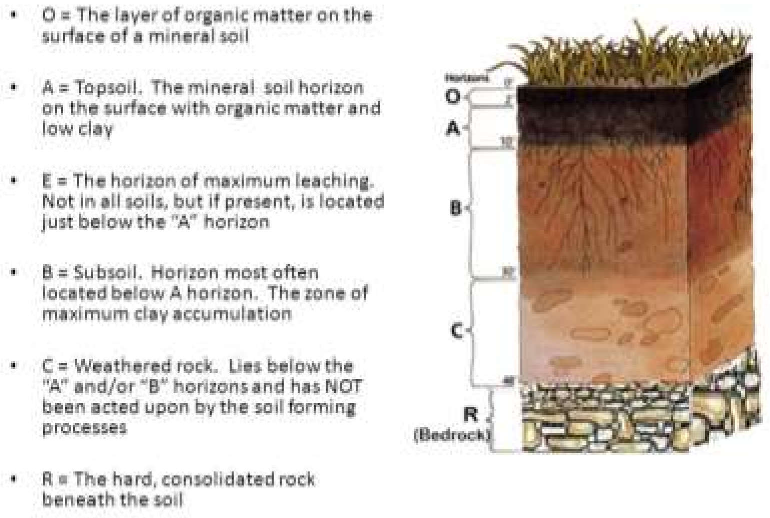
Building or Road Name	Location	Condition	Use	Pictures
IVES Warehouse	(Near project site) North of project site	Satisfactory condition No major damages but slightly rusted tin sheets were observed	Storage warehouse	
PestEX Maldives Pvt Ltd	South of Project site	Good condition Some cracks were observed on the ground level wall	Chemical warehouse	

Villa Petrol Shed	South of project site	Good condition No damages were observed	Refueling station	
STELCO Hulhumale'	South East of project site	Good condition No damages were observed	Powerhouse	 
Reethigas Magu	(project site) Road at which project site is located	In good condition No damages were noticed	For Transportation	 

Kashimaa Hingun	(Near project site) North east of project site	In good condition No damages were noticed	For Transportation	

5.4.2 Ground Condition

Ideally, soil has 5 different master horizons or layers which is O, A, E, B, and C, where O is the organic horizon (Soil Management, n.d.), A-horizon which contains significant organic matter, E-horizon which is the eluviation zone where organic matter accumulation has not occurred, B-horizon which is the zone of maximum clay accumulation, C-horizon which is a subsurface layer of soil forming parent materials which could be weathered rock, unconsolidated sediments or loose sands, and R-horizon which is not soil and is the hard bedrock (Figure 22)



- O = The layer of organic matter on the surface of a mineral soil
- A = Topsoil. The mineral soil horizon on the surface with organic matter and low clay
- E = The horizon of maximum leaching. Not in all soils, but if present, is located just below the "A" horizon
- B = Subsoil. Horizon most often located below A horizon. The zone of maximum clay accumulation
- C = Weathered rock. Lies below the "A" and/or "B" horizons and has NOT been acted upon by the soil forming processes
- R = The hard, consolidated rock beneath the soil

Figure 22: Typical soil profile

Soil profile was taken from the well that was dug to obtain the groundwater samples at site G1. At G1 1 distinct horizon was visible, which was C horizon. Ground water level was at 152.5 cm.

Figure 23: soil profile at site G1

5.4.3 Ground Water Quality

Ground water quality was compared with the EPA supply water quality standard guideline value as follows:-

Table 9: ground water quality optimal ranges

Parameter	Optimal Range	Reference
Temperature(^{0}C)	NA	URA
pH	6.5-8.5	URA
Electrical Conductivity (max allowable range)	<1000 µs/cm	URA
Electrical Conductivity (recommended range)	300 - 700 µs/cm	URA
Salinity	NA	URA
Total Dissolved Solids (max allowable range)	<500 mg/L	URA
Total Dissolved Solids (recommended range)	150 - 350 mg/L	URA
Total Petroleum Hydrocarbon	0 mg/L	URA
Dissolved Oxygen	NA	URA

Groundwater test results from MWSC water quality assurance laboratory is attached in Appendix D of this report.

All the tested samples were within optimal ranges.

Table 10: Groundwater quality test results (parameters exceeding EPA standards are highlighted in red)

Location	G1	GC
Temperature(^{0}C)	24	24
pH	8.1	7.6
Conductivity (µS/cm)	463	663
Salinity (%)	2.2	3.2
Total Dissolved Solids (mg/L)	239	331
Dissolved Oxygen (mg/L)	7.38	1.66
Total Petroleum Hydrocarbon(mg/L)	0.257	<0.036

**Ex-situ temperature readings*

5.4.4 Vegetation

3 different types of vegetation species were found at the project sites, the scientific name and Dhivehi names of these are listed in Table 11. At the site there was only one *Leucaena leucocephala* reaching heights of 2-4 m. small patches of *Leucaena leucocephala* and *Panicum maximum* were found at ground level.

Table 11: Scientific names and Dhivehi name for vegetation species encountered on Hulhumale' plot 10318

Dhivehi name	**Scientific name**
Ipil-ipil	*Leucaena leucocephala*
Onuhui	*Panicum maximum*
Aamanaka	*Ricinus communis*

5.4.5 Air Quality

Air pollution can become an environmental problem in the future, primarily as a byproduct of increasing number of vehicles, increase in construction sites and increase in population. Furthermore, with gradual increase in population density, the impact on air quality due to pollution of the island would gradually increase. Hence, it is very important to monitor air quality on an island level when tourism is a major contributor to the island's economy. Eight major air pollutants are highlighted in this study to monitor the air quality. These are Methyl aldehyde or Formaldehyde (HCHO), Total Volatile Organic Compounds (TVOC), PM2.5, PM10, Carbon Monoxide (CO), Carbon dioxide (CO2), Sulfur Dioxide (SO2), and Nitrogen Dioxide (NO2).

5.4.5.1 HCHO

Formaldehyde is an organic compound with the chemical formula HCHO. This compound is widely used in cosmetics, clothing, construction materials, disinfectants and preservatives (Friedman, 2022). This gas can also be generated by smoking indoors. The expected health effects due to prolonged exposure to formaldehyde and the recommendation optimal ranges are provided in Table 10.

5.4.5.2 TVOC

TVOC is the measure of total amount of volatile organic compounds in the air. A volatile organic compound (VOC) is a substance that has high vapor pressure but low water solubility (Chen, 2022), which means that VOC is a solid or liquid compound that can emit gases due to its volatile nature. Anthropogenic sources of VOCs are paint, lacquers, pesticides, cleaning supplies, building materials and furnishings, printers, adhesives, varnishes, nail polish, wax, organic solvents, disinfectants, air fresheners etc. VOCs are also naturally emitted from biological activity in the marine environment.

5.4.5.3 PM2.5 and PM10

Particulate matter or PM gives an indication of the level of pollution in the air. PM is a mixture of solid particles and liquid droplets found in the air; aerosols. Particles which are large or dark enough particles such as dust, dirt, soot or smoke can be seen via naked eye. Others, however, are so small they can only be detected using an electron microscope. Aerosols or PM originate from both natural and anthropic sources.

Primary natural sources are emitted directly and are usually large (>1 µm), these include volcanic eruptions, forest fires, mineral dust, sea salt, pollen and biological debris (Millero, 2013). Primary anthropogenic sources are also emitted directly and are also usually large (>1 µm), these include powerhouses, automobiles, agricultural lands, construction sites, unpaved roads, fields, smoke stacks or fires (United States Environmental Protection Agency, n.d.). Whether the particles were anthropogenic or natural in origin, they sometimes undergo gas reactions and gas to particles conversion in the atmosphere to form fine (<100 nm) particles also known as photochemical smog, which is a secondary source of particles in the atmosphere. Additional secondary sources of particles come from biological activity in the marine environment such as Sulfates from Dimethyl sulphide and Organic aerosol from biogenic Volatile Organic Compounds (VOC). Among all the sources sea salt by far contributes to the atmospheric PM the most. This should be especially prevalent in the Maldivian setting as the sea would be always less than 500 m from any given location.

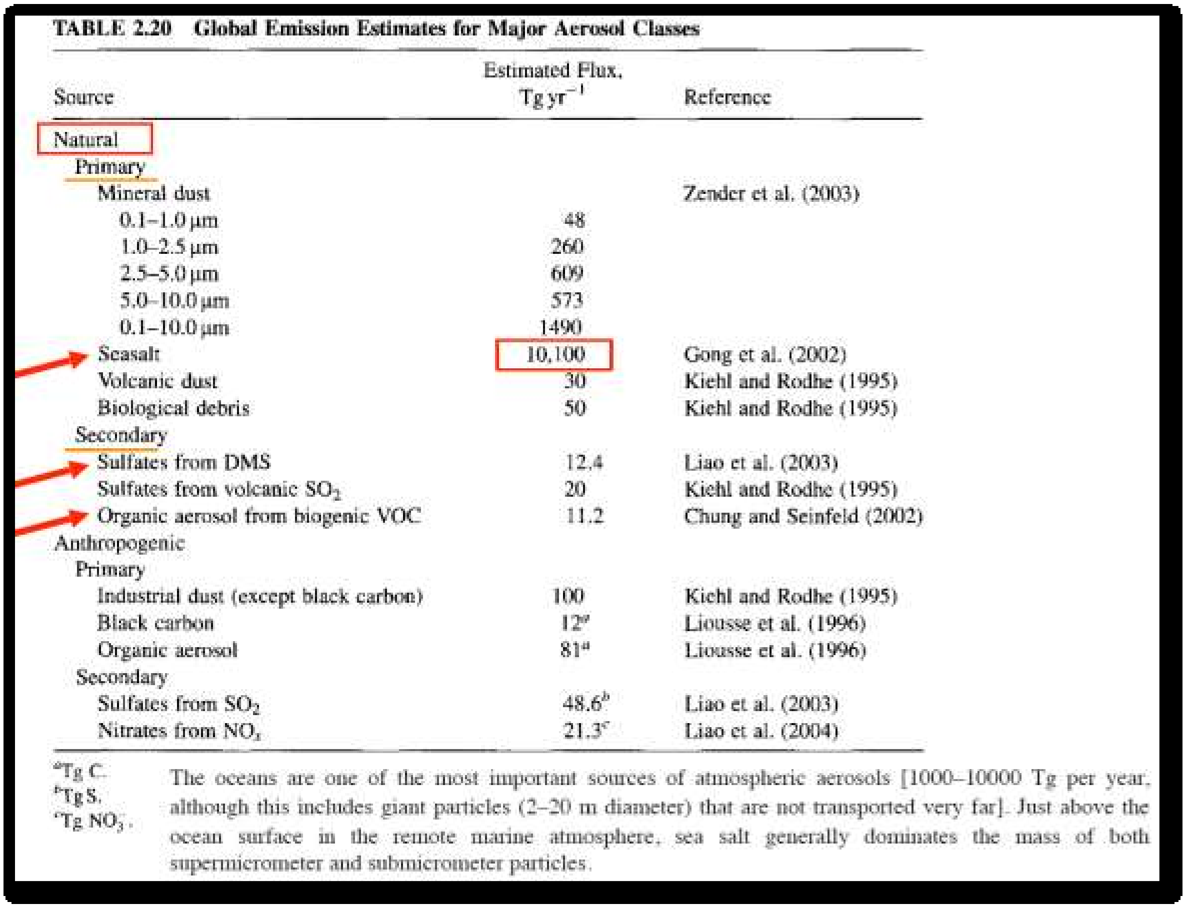


TABLE 2.20 Global Emission Estimates for Major Aerosol Classes

Source	Estimated Flux, $Tg\ yr^{-1}$	Reference
Natural		
Primary		
Mineral dust		Zender et al. (2003)
0.1–1.0 μm	48	
1.0–2.5 μm	260	
2.5–5.0 μm	609	
5.0–10.0 μm	573	
0.1–10.0 μm	1490	
Seasalt	10,100	Gong et al. (2002)
Volcanic dust	30	Kiehl and Rodhe (1995)
Biological debris	50	Kiehl and Rodhe (1995)
Secondary		
Sulfates from DMS	12.4	Liao et al. (2003)
Sulfates from volcanic SO_2	20	Kiehl and Rodhe (1995)
Organic aerosol from biogenic VOC	11.2	Chung and Seinfeld (2002)
Anthropogenic		
Primary		
Industrial dust (except black carbon)	100	Kiehl and Rodhe (1995)
Black carbon	12[a]	Liousse et al. (1996)
Organic aerosol	81[a]	Liousse et al. (1996)
Secondary		
Sulfates from SO_2	48.6[b]	Liao et al. (2003)
Nitrates from NO_x	21.3[c]	Liao et al. (2004)

[a] Tg C.
[b] Tg S.
[c] Tg NO_3^-.

The oceans are one of the most important sources of atmospheric aerosols [1000–10000 Tg per year, although this includes giant particles (2–20 m diameter) that are not transported very far]. Just above the ocean surface in the remote marine atmosphere, sea salt generally dominates the mass of both supermicrometer and submicrometer particles.

Figure 24: global estimated of major aerosol classes, figure adopted from (Ferrero, 2018)

Therefore, when we measure PM, it would always show the natural and anthropogenic sources together. Furthermore, (Budhavant, et al., 2015) have shown that transboundary pollution is much more prevalent than local pollution in the Maldives. However, this is not to say that there are no local sources of pollution as one study conducted by (Colombo, et al., 2014) showed that Persistent Organic Pollutants (POPs) were present in Maldivian soil exceeding international guidelines which originated from waste combustion. Hence it is very important to monitor the changes during construction and operational stage of the projects to determine whether there is an influx of anthropogenic PM.

The potential for health problems caused by PM is directly related to the size of the PM. Small particles which are less than 10μm in diameter pose the greatest problem as they can penetrate deep into the lungs and even enter the blood stream. Numerous scientific studies have linked exposure to PM to variety of health problems to lungs and heart. They include:-

- Premature death in people with respiratory or heart diseases;
- Myocardial infarction;
- Arrhythmias;
- Decreased lung function;
- Aggravated asthma; and
- Increased respiratory symptoms, such as irritation of the airways, coughing or difficulty in breathing (United States Environmental Protection Agency, n.d.)

Particles can be carried over long distances by wind and then settle on ground or water surfaces. Depending on their chemical composition, this settling can lead to:-

- Making open water sources acidic;
- Changing nutrient balance in coastal waters;
- Depleting nutrients in soil;
- Damaging sensitive forests and farm crops;
- Affecting the diversity of ecosystems; and
- Contributing to acid rain effects.

Measure of particle pollution includes:-

- PM_{10}: inhalable particles, with diameters that are generally 10µm or smaller; and
- $PM_{2.5}$: fine inhalable particles with diameters that are generally 2.5µm and smaller (United States Environmental Protection Agency, n.d.).

5.4.5.4 CO

Carbon monoxide is an odorless gas that is deadly if inhaled. The most common source of CO is combustion either from fires or appliances that burn gas, wood or oil. Symptoms of CO poisoning include headache, dizziness, confusion, shortness of breath, chest and muscle pain (Carbon monoxide poisoning, 2022) etc.

5.4.5.5 CO2

Carbon dioxide is a colorless, odorless gas. The gas is naturally produced by all living things via respiration. Anthropogenic main source is via combustion. The outdoor concentration of CO2 is dependent on the traffic and industrial activity levels. While indoor concentration depends on the number of people and ventilation of the building. Hence this is a good indicator to determine the indoor air quality of buildings (MNDOLI, 2022).

5.4.5.6 SO2

Sulphur dioxide is the indicator gas from the group of sulfur oxides (SO_x) and is of the greatest concern as this is the component that is found in the highest concentration in the atmosphere and control measures that reduce SO2 also reduce all other gaseous sulfur oxides (EPA, Sulfur Dioxide Basics, 2022). The largest anthropogenic source of the gas is from combustion at power plants. Smaller sources are from vehicles that burn fuel with high sulfur content. Natural sources are from volcanoes. Short-term expose to the gas can damage the respiratory system and the effect can be more prevalent in asthma patients and children. Higher emissions of the gas can lead to the formation of photochemical smog forming small particulate matter that can contribute to PM pollution. Higher concentration of SO2 in the atmosphere can also cause acid rain.

5.4.5.7 NO2

Nitrogen dioxide belongs to a group of highly reactive gases known as nitrogen oxides (NO_x) where NO_2 gas is used as the indicator. Compounds in this group include nitrous acid and nitric acid. Primary anthropogenic source for this gas is combustion from vehicles and power plants (Nitrogen Dioxide (NO2) Pollution, 2022). Short exposure to the gas can induce respiratory symptoms such as coughing, wheezing or difficulty breathing, and asthma. Long exposure can lead to development of asthma and respiratory infections. NO_2 with other NO_x can react with other chemicals in the atmosphere to form ozone, particulate matter and cause acid rain.

5.4.5.8 Air quality optimal ranges

Currently there are no air quality standards established in the Maldives, therefore the standards set by the US EPA has been used to compare the data collected from the surveyed locations as given below.

Table 12: air quality optimal ranges

Pollutant	Optimal Range	Reference
Carbon Monoxide (CO)	<9 ppm	US EPA (EPA, NAAQS Table, 2022)
Carbon dioxide (CO_2)	<10,000 ppm indoors and Roughly 400 ppm	US (Minnesota) (MNDOLI, 2022)

	outdoors	
TVOC	<0.5 mg/m^3 (500 µg/m^3) given only for indoors	US Green Building Council (Chen, 2022)
Nitrogen Dioxide (NO_2)	<0.053 ppm	US EPA (EPA, NAAQS Table, 2022)
HCHO	<0.1 ppm (120 µg/m^3) given only for indoors	USA (California) (Friedman, 2022)
$PM_{2.5}$	<12.0 µg/m^3	US EPA (EPA, NAAQS Table, 2022)
PM_{10}	<150 µg/m^3	US EPA (EPA, NAAQS Table, 2022)
Sulfur Dioxide (SO_2)	<0.5 ppm	US EPA (EPA, NAAQS Table, 2022)

The above table is a simplified version of the detailed reference ranges (of US EPA given below) in order for ease of comparison due to the limited quality of the data collected because of the lack of data collection time and equipment employed for this survey.

The US EPA has identified two types of national ambient air quality standards; primary standards that relate to public health protection for example sensitive groups of asthmatics, children and elderly and secondary standards that relate to protection of physical environment for example buildings, vegetation, crops, animals, and decreased visibility.

Periodically these standards are reviewed and revised. The most recently established standards are listed below (accessed on December 2022).

The units of measure for the standards are parts per million (ppm), parts per billion (ppb), micrograms per cubic meter of air (µg/m^3)

Table 13: detailed air quality reference ranges

Pollutant	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)	primary	8 hours	9 ppm	Not to be exceeded more than once per year
		1 hour	35 ppm	
Carbon Dioxide (CO2)	Indoor	8 hour	10,000 ppm	Average concentration should not exceed 10,000 ppm and average concentration over 15minute period should not exceed 30,000 ppm. >5000 ppm exposure for prolonged periods can cause headache, dizziness, nausea. >40,000 ppm is immediately dangerous to life as it can cause asphyxiation.
	Outdoor	Not given	About 400 ppm	Depends on traffic and industrial activity Concentration at Mauna Loa on 28th November 2022 was at 417.31 ppm (NOAA, 2022)
TVOC (Total amount of Volatile organic compounds)	Indoor	Not given	<0.5 mg/m^3 (500 µg/m^3)	<0.3 mg/m^3 = low concern 0.3-0.5 mg/m^3 = Acceptable 0.5-1.0 mg/m^3 = Marginal 1-3 mg/m^3 = High, could cause

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
					Eye, nose and throat irritation, headaches, damage to liver, kidney and central nervous system etc..
HCHO (Formaldehyde gas)		Indoor	Not given	<0.1 ppm	0.1-3.68 ppm detected indoors >0.01 ppm = mid irritation or allergic sensitization in some people >0.5 ppm = irritation to eyes & mucous membranes > 1.0 ppm = possible nasopharyngeal cancer 3.0 ppm = respiratory impairment and damage Approx. 0.0001 mg/m3 = Cancer risk level of 1 in 1-million 0.004 mg/m3 = ATSDR chronic MRL 203 mg/m3 = LC-50: Lethal concentration for rats 400 mg/m3 = LC-50: Lethal concentration for mice
		Outdoor	Not given	Not given	11-20 ppb detected outdoors in urban areas
Lead (Pb)		primary and secondary	Rolling 3 month average	0.15 µg/m^3	Not to be exceeded
Nitrogen Dioxide (NO$_2$)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb (0.053 ppm)	Annual Mean
Ozone (O$_3$)		primary and secondary	8 hours	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	PM$_{2.5}$	primary	1 year	12.0 µg/m^3	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m^3	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM$_{10}$	primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO$_2$)		primary	1 hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

5.4.5.9 Air quality at surveyed locations

Among the tested indicator pollutants, only PM2.5 was above the optimal range at all locations. The optimal range for PM2.5 is below 12µg/m^3 while all measured locations (including indoors) exhibited concentration of 20µg/m^3 and above. SO2 at locations AQ2 and AQ3 recorded readings have exceeded the recommended levels. It can be due to the intense traffic that both locations experienced during the time of the recording. Inside the Villa store, exceeding amounts of HCHO, TVOC and CO were observed. The high HCHO and TVOC readings can be the result of some products like preservatives, air fresheners or cleaning supplies found within the store. The CO concentration recorded was most likely due to insufficient ventilation within the small closed store space. The exceeded concentration of CO at AQ6 may be triggered by the traffic fumes in the area.

Table 14: ambient air quality at surveyed locations (exceeded parameters from optimal range are in red)

Code	Location	Parameters										Remarks
		Temp. (°C)	Humidity (%(RH)	HCHO (mg/ m3)	TVOC (mg/ m3)	PM2.5 (ug/m3)	PM10 (ug/m3)	CO (ppm)	CO2 (ppm)	SO2 (ppm)	NO2 (ppm)	
AQ 1	(Project Construction site) Within project site	31	77	0.003	0.038	28	36	2	402	0	0	Open area Construction works
AQ 2	(Near project site) At garage doors of IVES Godown	30	78	0.002	0.005	24	31	3	407	0.8	0	Semi open area
AQ 3	(Near project site) Villa petrol shed Hulhumale'	31	77	0.003	0.008	28	36	2	408	0.5	0	Open area
AQ 4	(Near project site) Inside Villa petrol shed store	32	72	0.262	1.703	21	27	79	1862	0.3	0	Indoors
AQ 5	(Near project site) Infront of STELCO entrance	32	77	0.002	0.007	21	27	3	404	0.3	0	Open area
AQ 6	(Control site) Masjid Zaid Bin Al-Saabith	33	71	0.051	0.439	21	27	11	400	0	0	Open area

5.4.6 Noise

Noise, defined as unwanted sound, is perceived as an environmental stressor and nuisance and is associated with physical, mental and psychological stresses in humans. Exposure to continuous noise over 85-90 dB over a lifetime can lead to progressive hearing loss with an increased threshold of hearing sensitivity. Indirect effects of noise pollution include inducing non-auditory effects such as sleep disturbance and annoyance which eventually lead to stress responses, then symptoms and possibly illness. Noise exposure during sleep may increase blood pressure, heart rate and finger pulse amplitude as well as body movements. Physiological symptoms associated with noise exposure include nausea, headache, argumentativeness, mood changes and anxiety (Stansfeld & Matheson, 2003).

Noise levels requisite to protect public welfare and health against hearing loss, annoyance and activity interference as identified by the EPA of the United States specified noise levels of 70 dB as the level of environmental noise which will prevent any measurable hearing loss over a lifetime. Likewise, levels of 55 dB outdoors and 45 dB indoors are identified as preventing activity interference and annoyance. The latter are considered those which will permit spoken conversation and other activities such as sleeping, working and recreation which are part of the daily human activities (EPA Identifies Noise Levels Affecting Health and Welfare, 2016).

Children in particular are extremely vulnerable to both auditory and non-auditory health effects of noise. Studies of children exposed to environmental noise have consistently found effects on cognitive performance, decreased motivation, cardiovascular effects, endocrine disturbances as well as noise annoyance (Stansfeld & Matheson, 2003).

Table 15 shows the ambient noise level near the proposed project area and control location. The geographic coordinates for the locations are given in Figure 3 and Table 2. The maximum noise recorded was at site N1 and N2 at 78.8 dB due the noise from a nearby operating excavator. Noise from traffic or construction were relatively consistent in most locations during the survey period.

Table 15: ambient noise levels in K.Hulhumale' Phase I

Code	Time	Location	Noise level (dB)			Observations
			Min	Max	Avg	

N 1	15:56	(Project Construction site) At project site	77.3	78.8		Noise from the excavator Traffic noise
N2	15:56	(Near project site) Near the front garage doors of IVES Godown	77.3	78.8		Noise from the excavator Traffic noise
N3	16:05	(Near project site) Villa petrol shed Hulhumale'	70.5	76		Traffic noise Construction works
N 4	16:10	(Near project site) Inside Villa petrol shed store	49.8	56.1		Slight traffic noise
N 5	16:20	(Near project site) Infront of STELCO entrance	69.2	40.6		Traffic noise Generator noise
N6	16.41	(Control site) Masjid Zaid Bin Al-Saabith	64.4	71		Traffic noise

5.4.7 Traffic flow

In general, there are 3 periods where traffic flow would be at its peak in Hulhumale'. First, between 06:30 and 08:00 hours when the schools and offices start. Second, at the afternoon when school session changes. Lastly, during late afternoon and evening where school and offices usually ends. The traffic count survey was carried out at during one of the peak hours of the day which is between late afternoon and evening time period.

There are 2 roads around the project site. Both of these roads are 1 way roads. This area of Hulhumlae has very high traffic. For the duration of the survey, Reethigas Magu had the most traffic count (4589 vehicles) with the highest cycle count of 4,232 vehicles. The traffic count observed in Kashimaa Hingun had a total of 153 vehicles. The traffic count for the repective roads are provided below.

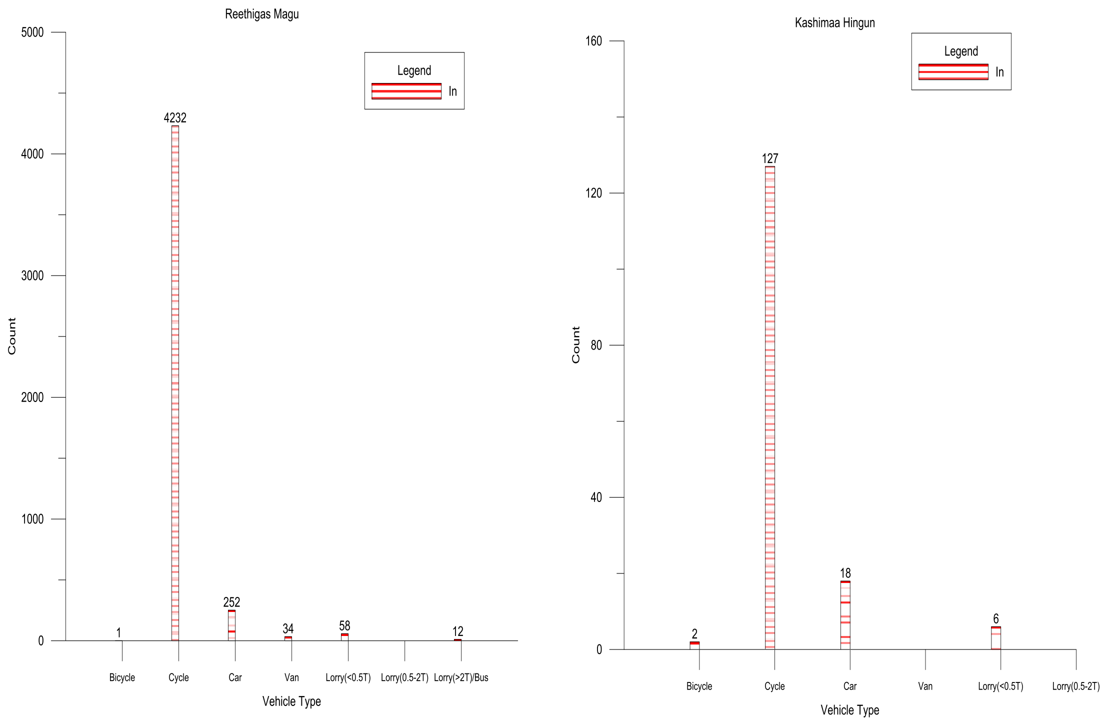


Figure 25: Traffic count from the 2 adjacent roads at Hulhumale' Phase I

5.5 Socioeconomic Environment

This section describes the socioeconomic environment of K. Hulhumale' Phase I. Information on socioeconomic status was obtained from Maldives Population and Housing Census 2022 and 2014 and Isles website.

5.5.1 Demography

From 2014 to 2022 the population has increased gradually at an intercensal population growth rate of 9.2%. The population from year 2014 to 2022 increased from 17,149 to 35,859. Among the 35,859 people, 14,715 are females and 21,144 are males.

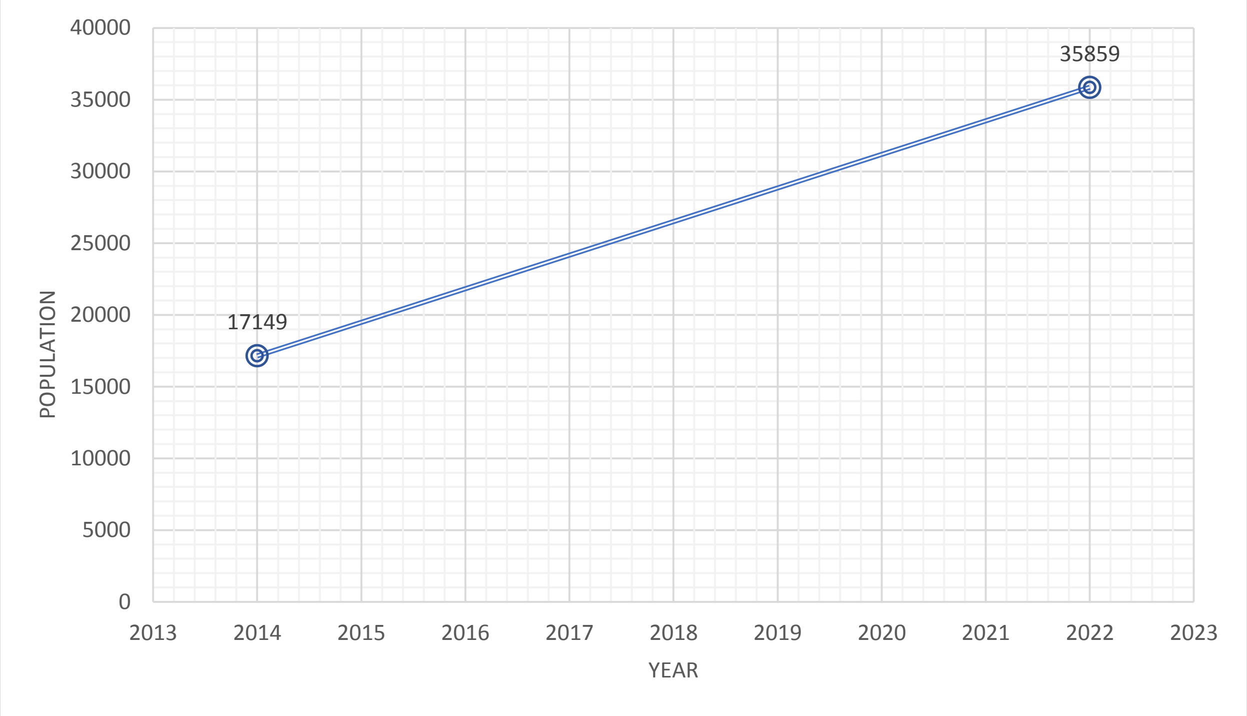


Figure 26: population of K. Hulhumale' Phase I from 2014 to 2022

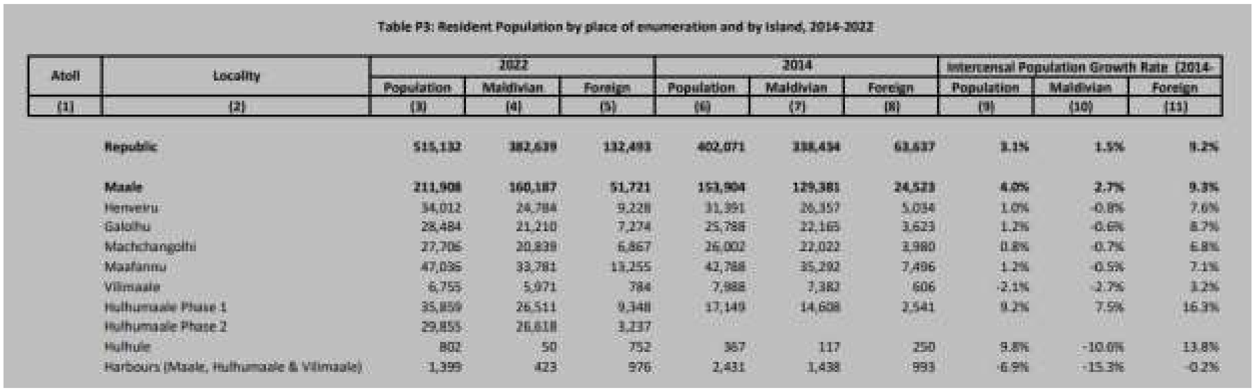


Table P3: Resident Population by place of enumeration and by Island, 2014-2022

Atoll	Locality	2022			2014			Intercensal Population Growth Rate (2014-		
		Population	Maldivian	Foreign	Population	Maldivian	Foreign	Population	Maldivian	Foreign
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Republic	**515,132**	**382,639**	**132,493**	**402,071**	**338,434**	**63,637**	**3.1%**	**1.5%**	**9.2%**
	Maale	**211,908**	**160,187**	**51,721**	**153,904**	**129,381**	**24,523**	**4.0%**	**2.7%**	**9.3%**
	Henveiru	34,012	24,784	9,228	31,391	26,357	5,034	1.0%	-0.8%	7.6%
	Galolhu	28,484	21,210	7,274	25,788	22,165	3,623	1.2%	-0.6%	8.7%
	Machchangolhi	27,706	20,839	6,867	26,002	22,022	3,980	0.8%	-0.7%	6.8%
	Maafannu	47,036	33,781	13,255	42,788	35,292	7,496	1.2%	-0.5%	7.1%
	Vilimaale	6,755	5,971	784	7,988	7,382	606	-2.1%	-2.7%	3.2%
	Hulhumaale Phase 1	35,859	26,511	9,348	17,149	14,608	2,541	9.2%	7.5%	16.3%
	Hulhumaale Phase 2	29,855	26,618	3,237						
	Hulhule	802	50	752	367	117	250	9.8%	-10.0%	13.8%
	Harbours (Maale, Hulhumaale & Vilimaale)	1,399	423	976	2,431	1,438	993	-6.9%	-15.3%	-0.2%

Figure 27:Population details of K. Hulhumale' Phase I (statistics, 2022)

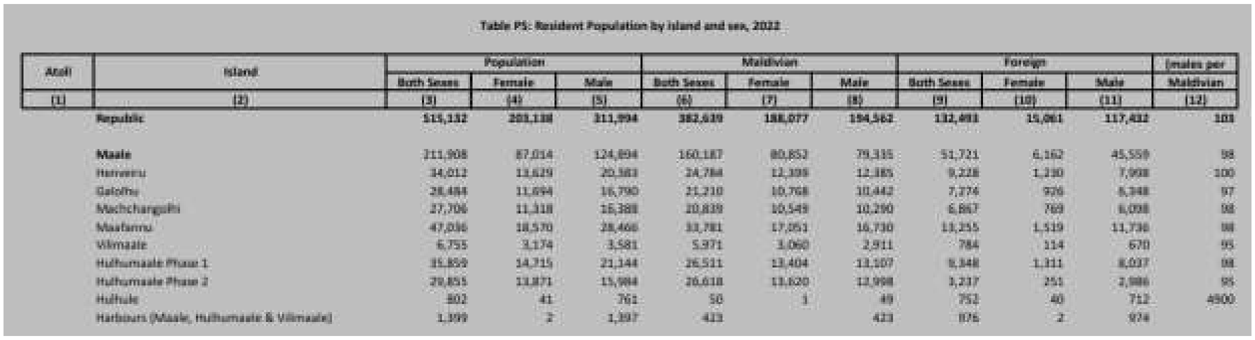


Table P5: Resident Population by island and sex, 2022

Atoll	Island	Population			Maldivian			Foreign			(males per
		Both Sexes	Female	Male	Both Sexes	Female	Male	Both Sexes	Female	Male	Maldivian
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Republic	**515,132**	**203,138**	**311,994**	**382,639**	**188,077**	**194,562**	**132,493**	**15,061**	**117,432**	**103**
	Maale	211,908	87,014	124,894	160,187	80,852	79,335	51,721	6,162	45,559	98
	Henveiru	34,012	13,629	20,383	24,784	12,399	12,385	9,228	1,230	7,998	100
	Galolhu	28,484	11,694	16,790	21,210	10,768	10,442	7,274	926	6,348	97
	Machchangolhi	27,706	11,318	16,388	20,839	10,549	10,290	6,867	769	6,098	98
	Maafannu	47,036	18,570	28,466	33,781	17,051	16,730	13,255	1,519	11,736	98
	Vilimaale	6,755	3,174	3,581	5,971	3,060	2,911	784	114	670	95
	Hulhumaale Phase 1	35,859	14,715	21,144	26,511	13,404	13,107	9,348	1,311	8,037	98
	Hulhumaale Phase 2	29,855	13,871	15,984	26,618	13,620	12,998	3,237	251	2,986	95
	Hulhule	802	41	761	50	1	49	752	40	712	4900
	Harbours (Maale, Hulhumaale & Vilimaale)	1,399	2	1,397	423		423	976	2	974	

Figure 28: Population distribution between sexes at K. Hulhumale' Phase I (statistics, 2022)

5.5.1.1 Population of adjacent buildings

There are no adjacent households near the project site as the project site is located in the industrial zone.

5.5.2 Main Economic Activities

Hulhumalé has emerged as a focal point for affordable tourism and the establishment of guesthouses. Presently, it's estimated that the island hosts around 100 guesthouses, with a combined capacity to accommodate approximately 2,000 guests at any given time. Hulhumalé is also a sought-after destination for domestic tourism, attracting many locals for weekend getaways and holidays, primarily from Malé. The water sports facilities along Hulhumalé's beachfront are especially popular among both residents and weekend visitors (Ali, 2023).

In recent years, the number of upscale dining establishments, including international brands, has seen a significant increase in Hulhumalé. These dining options have gained popularity among both local residents and visitors from the Greater Malé region (Ali, 2023).

Hulhumalé offers a diverse range of development opportunities, including a business park, an IT hub, a cruise terminal, a water-themed park, as well as major hotels, shopping centers, and office buildings. The various distinct projects planned for the city are expected to yield favorable returns for investors, developers, and the local populace. With its promise of rapid economic growth, Hulhumalé is anticipated to generate approximately 85,000 job opportunities for the local population (Ali, 2023).

5.5.3 Income Situation and Distribution

With the unavailability of sufficient data regarding the income situation and distribution of the island specifically, Maldives population and Housing Census 2014 and Household Income & Expenditure Survey (HIES) 2016 report published by National Bureau of Statistics were used to reflect on the current income status in terms of atoll locality.

According to Census 2006, manufacturing industry provided the most employment opportunities to the residents of Maldives. However, tourism being the most rapidly expanding industry and being the highest contributing sector to the Maldivian GDP, the results of Census 2014 revealed its vital role in creating employment opportunities for the country. More than a fifth of the employed Maldivians are engaged in the tourism industry and of the total employed, 27,837 or 14 percent work in the resorts (Maldives Population & Housing Census, 2014).

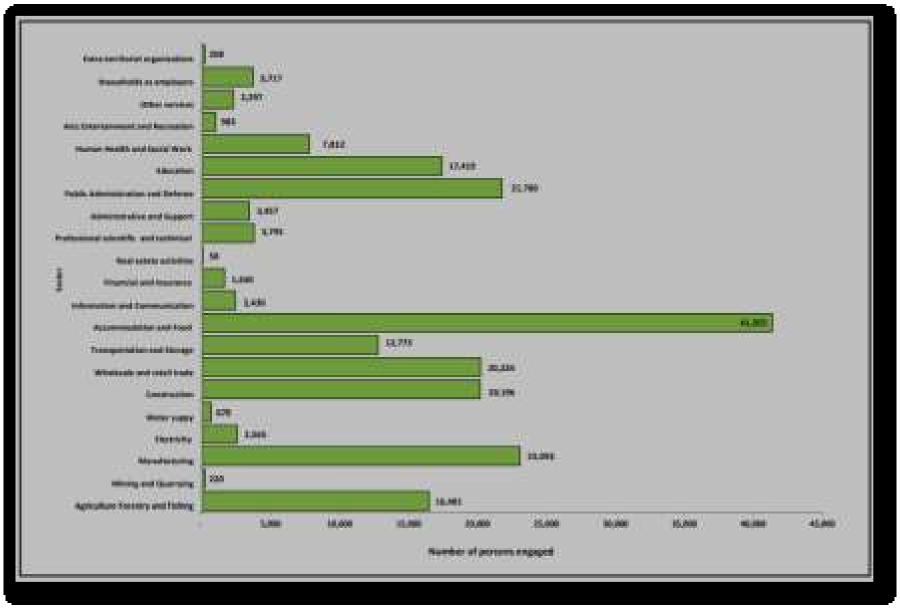
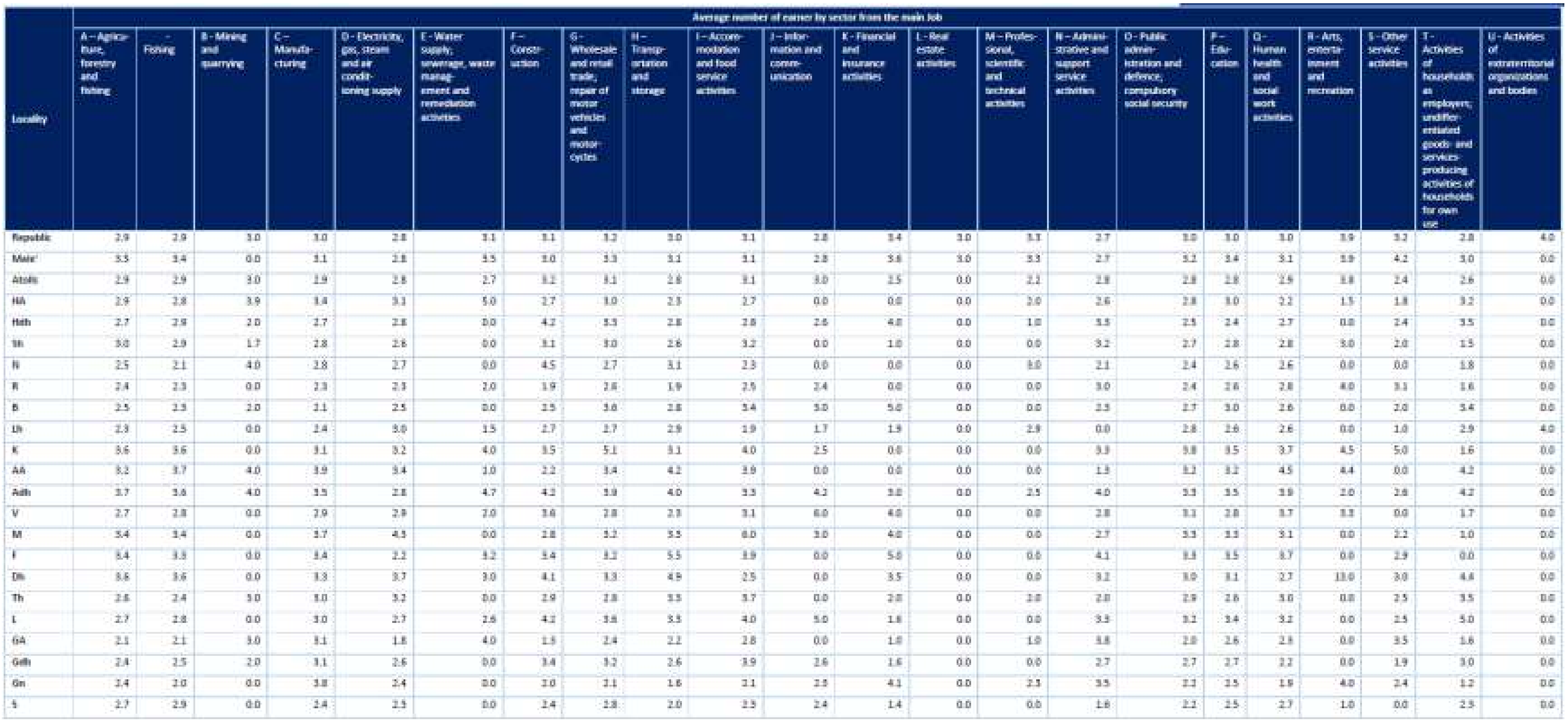


Figure 29: resident employed population by sector (Maldives Population & Housing Census, 2014)

HIES 2016 report states that out of the working age population (15 years and above) of Maldives, 66 percent were income earners. Earners also include those people not in employment but receives transfer incomes (eg: basic pension for the elderly). The report highlighted that on average 5.1 earners of Kaafu Atoll generates income in wholesale and retail trade, repair of motor vehicles and moto cycles and 5.0 from other service activities (Household Income and Expenditure Survey (HIES) Analytical Report: Household Income, 2016). This might not reflect

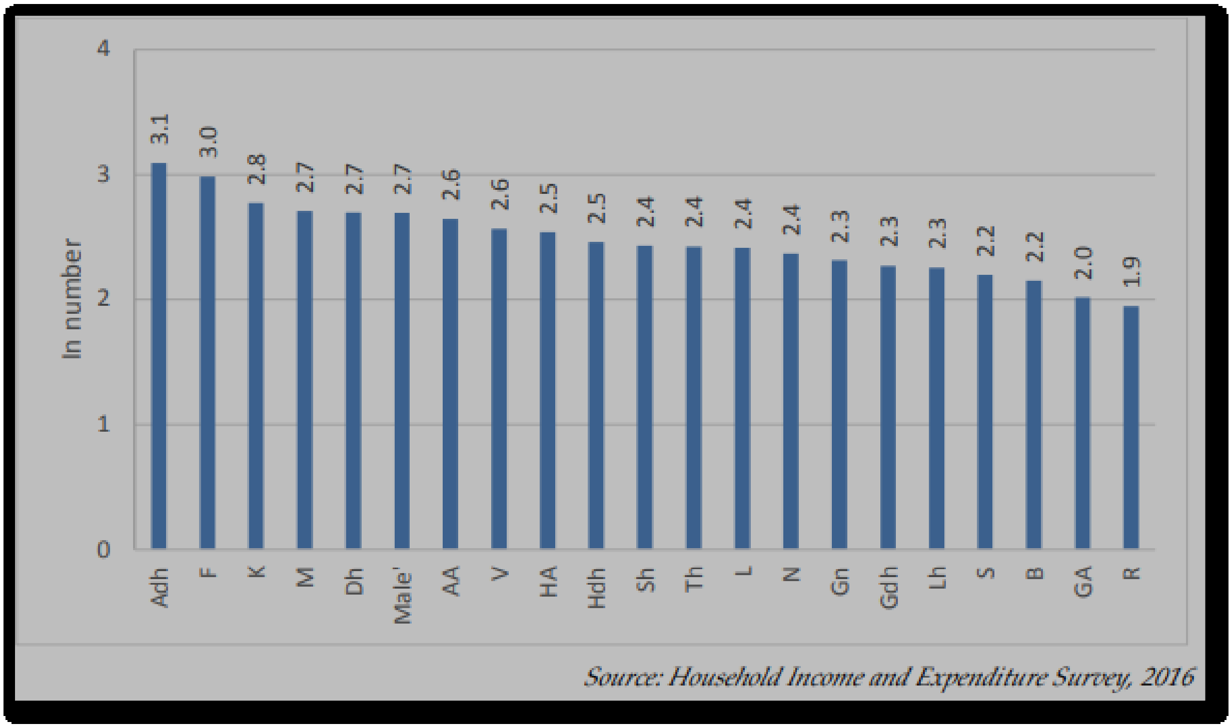
Kaafu atoll income distribution specifically as the atoll is more diverse, but a rough estimate can be determined of how the income generated is distributed in the atoll. The details of earner distribution on an atoll level are provided below.



Locality	Average number of earner by sector from the main Job																					
	A – Agricul-ture, forestry and fishing	- Fishing	B - Mining and quarrying	C – Manufa-cturing	D - Electricity, gas, steam and air condit-ioning supply	E - Water supply; sewerage, waste manag-ement and remediation activities	F – Constr-uction	G – Wholesale and retail trade; repair of motor vehicles and motor-cycles	H – Transp-ortation and storage	I – Accom-modation and food service activities	J – Infor-mation and comm-unication	K - Financial and insurance activities	L - Real estate activities	M – Profes-sional, scientific and technical activities	N – Admini-strative and support service activities	O - Public admin-istration and defence; compulsory social security	P – Edu-cation	Q – Human health and social work activities	R - Arts, enterta-inment and recreation	S - Other service activities	T - Activities of households as employers; undiffer-entiated goods- and services-producing activities of households for own use	U - Activities of extraterritorial organizations and bodies
Republic	2.9	2.9	3.0	3.0	2.8	3.1	3.1	3.2	3.0	3.1	2.8	3.4	3.0	3.3	2.7	3.0	3.0	3.0	3.9	3.2	2.8	4.0
Male'	3.5	3.4	0.0	3.1	2.8	3.5	3.0	3.3	3.1	3.1	2.8	3.6	3.0	3.3	2.7	3.2	3.4	3.1	3.9	4.2	3.0	0.0
Atolls	2.9	2.9	3.0	2.9	2.8	2.7	3.2	3.1	2.8	3.1	3.0	2.5	0.0	2.2	2.8	2.8	2.8	2.9	3.8	2.4	2.6	0.0
HA	2.9	2.8	3.9	3.4	3.1	5.0	2.7	3.0	2.3	2.7	0.0	0.0	0.0	2.0	2.6	2.8	3.0	2.2	1.5	1.8	3.2	0.0
Hdh	2.7	2.9	2.0	2.7	2.8	0.0	4.2	3.3	2.8	2.8	2.6	4.0	0.0	1.0	3.3	2.5	2.4	2.7	0.0	2.4	3.5	0.0
Sh	3.0	2.9	1.7	2.8	2.6	0.0	3.1	3.0	2.6	3.2	0.0	1.0	0.0	0.0	3.2	2.7	2.8	2.8	3.0	2.0	1.5	0.0
N	2.5	2.1	4.0	2.8	2.7	0.0	4.5	2.7	3.1	2.3	0.0	0.0	0.0	3.0	2.1	2.4	2.6	2.6	0.0	0.0	1.8	0.0
R	2.4	2.3	0.0	2.3	2.3	2.0	1.9	2.6	1.9	2.5	2.4	0.0	0.0	0.0	3.0	2.4	2.6	2.8	4.0	3.1	1.6	0.0
B	2.5	2.3	2.0	2.1	2.5	0.0	2.5	3.6	2.8	3.4	3.0	5.0	0.0	0.0	2.3	2.7	3.0	2.6	0.0	2.0	3.4	0.0
Lh	2.3	2.5	0.0	2.4	3.0	1.5	2.7	2.7	2.9	1.9	1.7	1.9	0.0	2.9	0.0	2.8	2.6	2.6	0.0	1.0	2.9	4.0
K	3.6	3.6	0.0	3.1	3.2	4.0	3.5	5.1	3.1	4.0	2.5	0.0	0.0	0.0	3.3	3.8	3.5	3.7	4.5	5.0	1.6	0.0
AA	3.2	3.7	4.0	3.9	3.4	1.0	2.2	3.4	4.2	3.9	0.0	0.0	0.0	0.0	1.3	3.2	3.2	4.5	4.4	0.0	4.2	0.0
Adh	3.7	3.6	4.0	3.5	2.8	4.7	4.2	3.9	4.0	3.3	4.2	3.0	0.0	2.5	4.0	3.3	3.5	3.9	2.0	2.6	4.2	0.0
V	2.7	2.8	0.0	2.9	2.9	2.0	3.6	2.8	2.3	3.1	6.0	4.0	0.0	0.0	2.8	3.1	2.8	3.7	3.3	0.0	1.7	0.0
M	3.4	3.4	0.0	3.7	4.3	0.0	2.8	3.2	3.5	6.0	3.0	4.0	0.0	0.0	2.7	3.3	3.3	3.1	0.0	2.2	1.0	0.0
F	3.4	3.3	0.0	3.4	2.2	3.2	3.4	3.2	5.5	3.9	0.0	5.0	0.0	0.0	4.1	3.3	3.5	3.7	0.0	2.9	0.0	0.0
Dh	3.6	3.6	0.0	3.3	3.7	3.0	4.1	3.3	4.9	2.5	0.0	3.5	0.0	0.0	3.2	3.0	3.1	2.7	13.0	3.0	4.4	0.0
Th	2.6	2.4	5.0	3.0	3.2	0.0	2.9	2.8	3.3	3.7	0.0	2.0	0.0	2.0	2.0	2.9	2.6	3.0	0.0	2.5	3.5	0.0
L	2.7	2.8	0.0	3.0	2.7	2.6	4.2	3.6	3.3	4.0	5.0	1.6	0.0	0.0	3.3	3.2	3.4	3.2	0.0	2.5	5.0	0.0
GA	2.1	2.1	3.0	3.1	1.8	4.0	1.3	2.4	2.2	2.8	0.0	1.0	0.0	1.0	3.8	2.0	2.6	2.3	0.0	3.5	1.6	0.0
GDh	2.4	2.5	2.0	3.1	2.6	0.0	3.4	3.2	2.6	3.9	2.6	1.6	0.0	0.0	2.7	2.7	2.7	2.2	0.0	1.9	3.0	0.0
Gn	2.4	2.0	0.0	3.8	2.4	0.0	3.0	2.1	1.6	3.1	2.3	4.1	0.0	2.3	3.5	2.2	2.5	1.9	4.0	2.4	1.2	0.0
S	2.7	2.9	0.0	2.4	2.3	0.0	2.4	2.8	2.0	2.3	2.4	1.4	0.0	0.0	1.6	2.2	2.5	2.7	1.0	0.0	2.3	0.0

Figure 30: average number of earner by sector from the main Job (Household Income and Expenditure Survey (HIES) Analytical Report: Household Income, 2016).

HIES 2016 report further highlighted that, Kaafu Atoll has the Third highest number of earners on average with 2.8 person per household, earning approximately 8,390MVR per earner. The following figures provides the atoll level breakdown with respect to average number of earners and their average income (Household Income and Expenditure Survey (HIES) Analytical Report: Household Income, 2016).



Source: Household Income and Expenditure Survey, 2016

Figure 31: average number of earners by Atoll, 2016 (Household Income and Expenditure Survey (HIES) Analytical Report: Household Income, 2016).

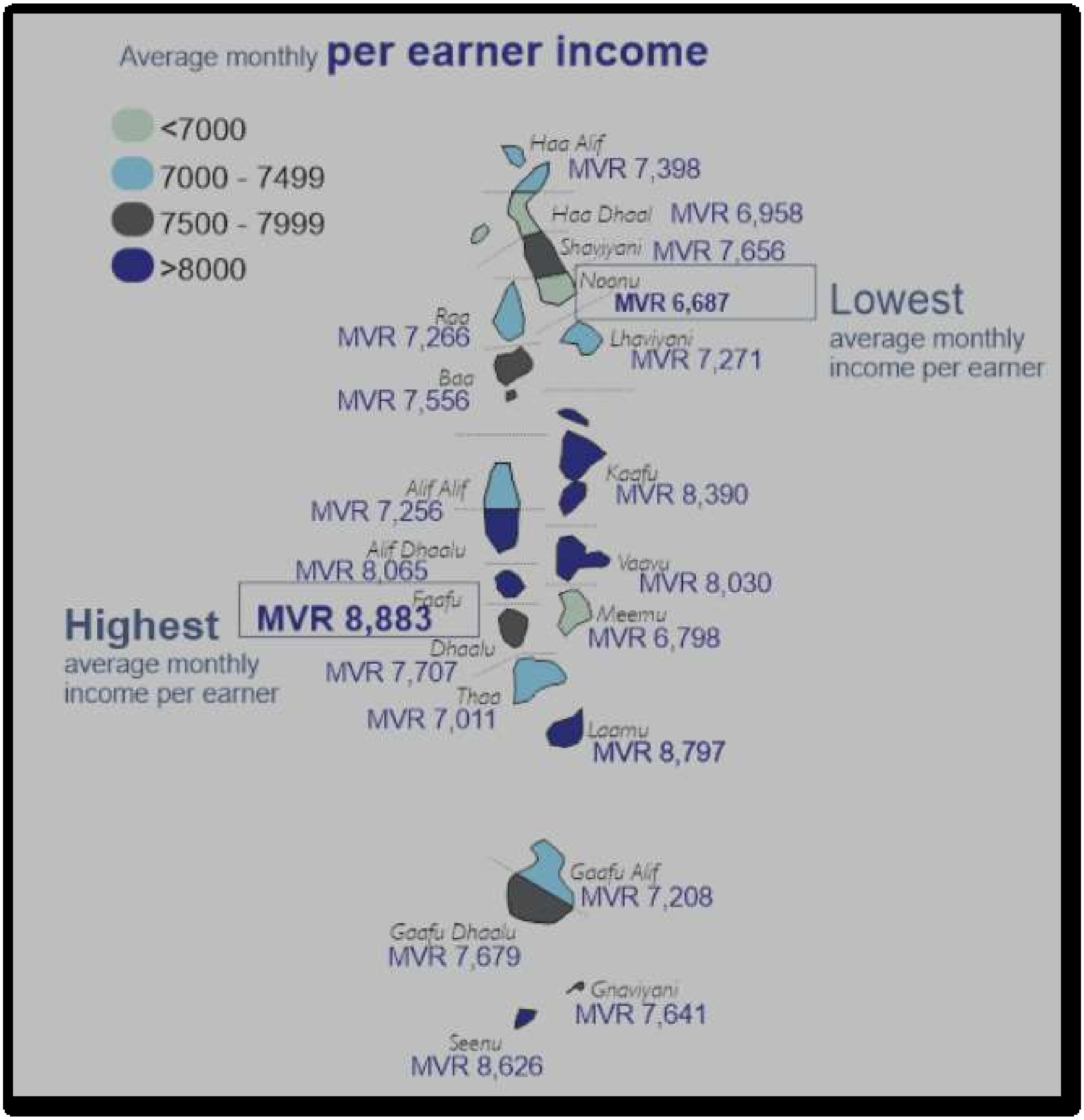
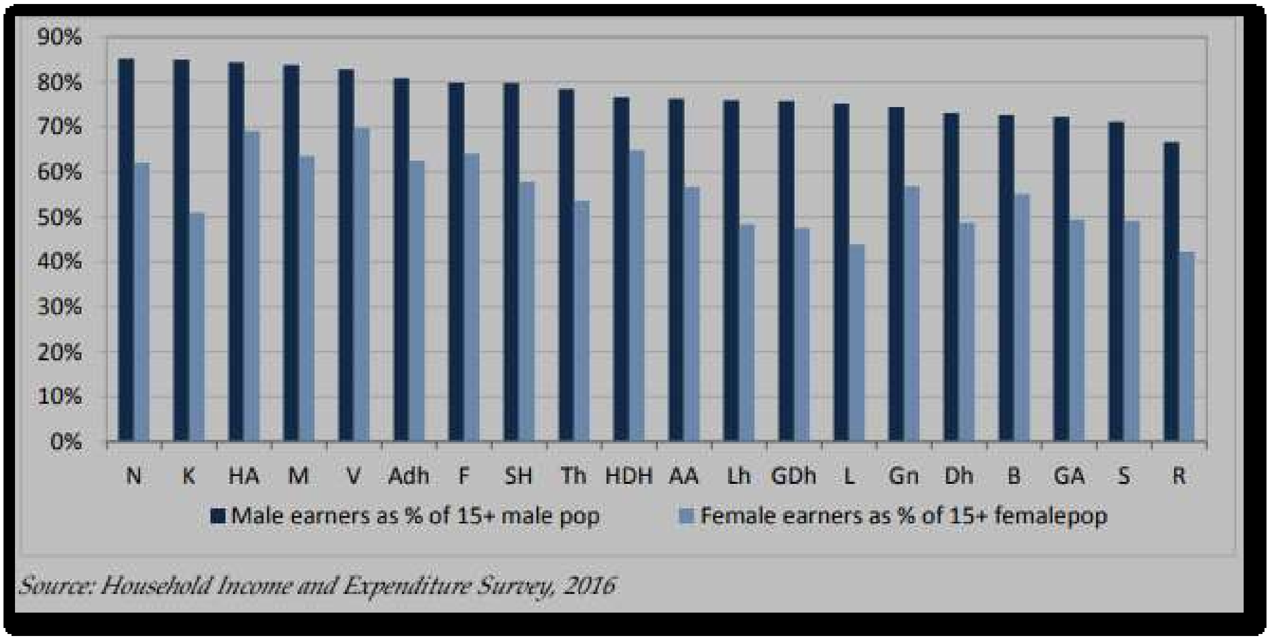


Figure 32: average monthly income per earner (Household Income and Expenditure Survey (HIES) Analytical Report: Household Income, 2016).

Moreover, figure provided below compares the earners by sex as a proportion of 15 years and above population of the respective sex. On average 79% of the 15 years and above male population are earners in Maldives. Kaafu Atoll is one of the atolls which reportedly have approximately 85% of 15 years and above male population as earners. Furthermore, it is reported that around 50% of 15 years and above female population in Kaafu Atoll were recorded as earners (Household Income and Expenditure Survey (HIES) Analytical Report: Household Income, 2016).



Source: Household Income and Expenditure Survey, 2016

Figure 33: earners aged 15 and above population by sex and locality, 2016 (Household Income and Expenditure Survey (HIES) Analytical Report: Household Income, 2016)

When it comes to unemployment rates, all the Atolls with the exception of Addu (S), Gnaviyani (Gn), Male' Atoll (K), Faadhippolhu (Lh) and Male' shows lower unemployment rates in 2014 compared to 2006. Kaafu Atoll reported an unemployment rate of approximately 9.8 % in 2014 according to HIES Analytical Report (Household Income and Expenditure Survey (HIES) Analytical Report: Household Income, 2016).

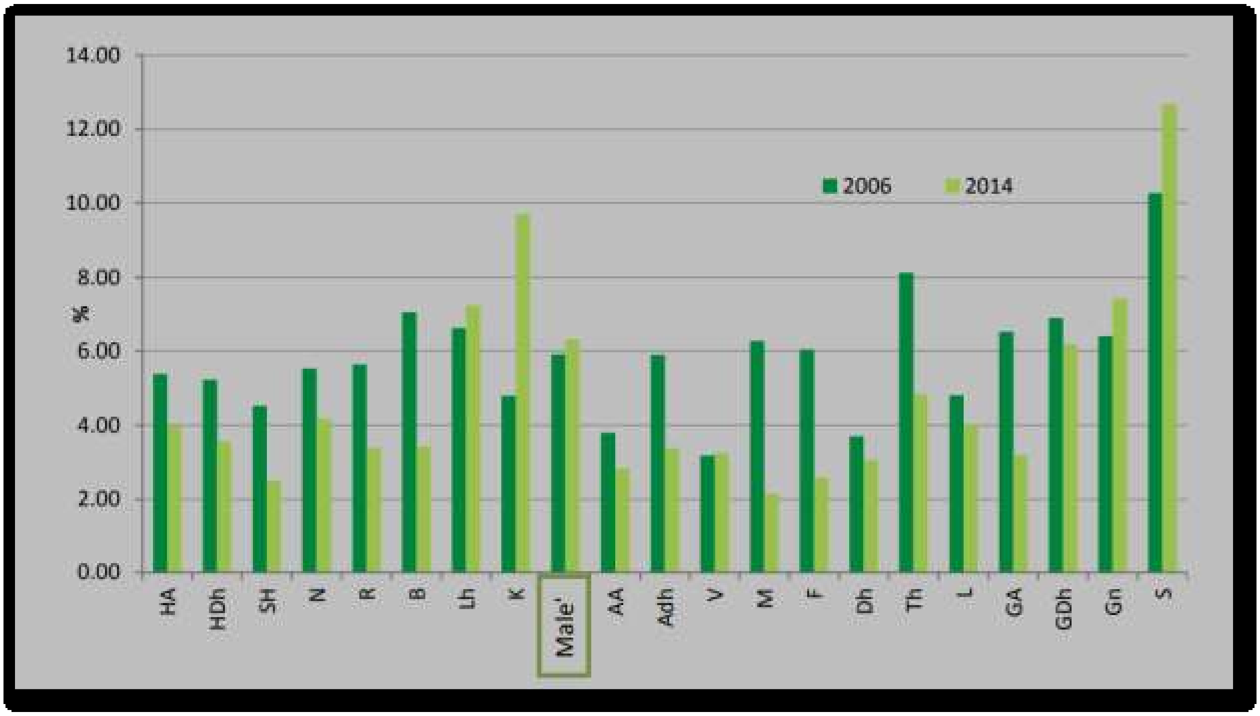


Figure 34: unemployment rate by locality, 2006 & 2014 (Maldives Population & Housing Census, 2014)

5.5.4 Healthcare Facilities

The following figure shows which regional and referral facility is available in each zone. Kaafu Atoll is located in zone 3. Zoning starts from the north.

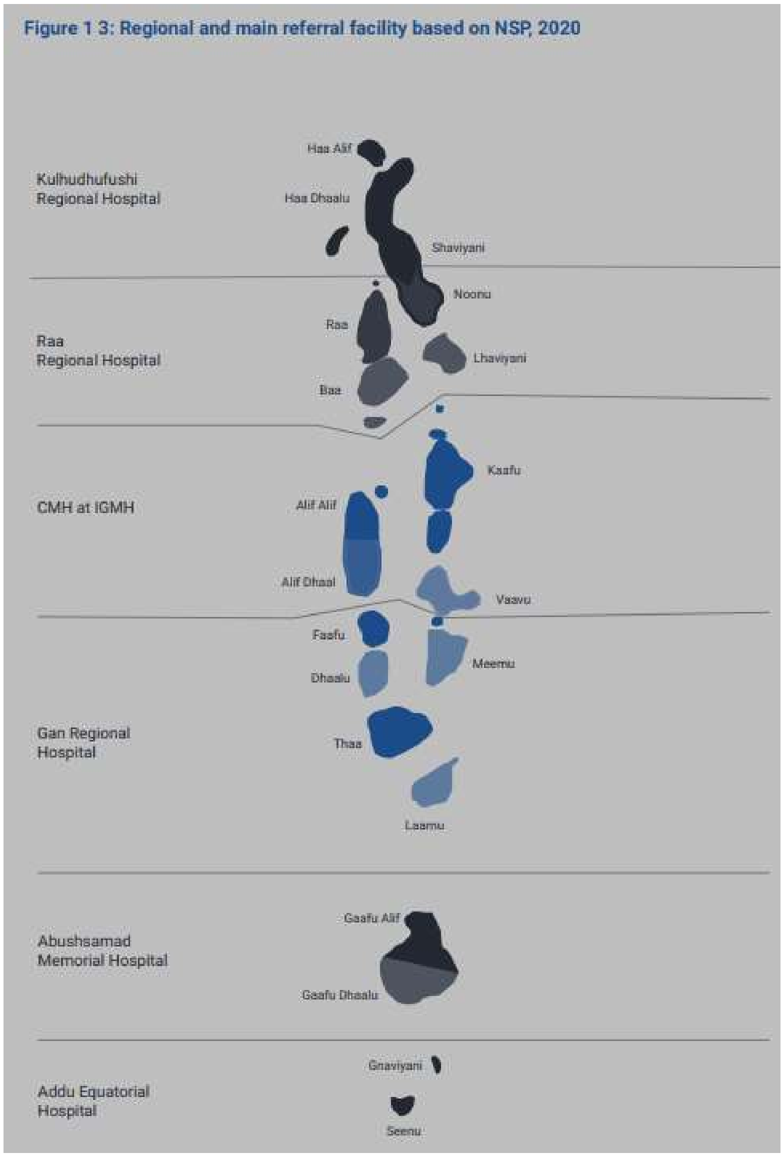


Figure 35: Regional and main referral facility found in each zone (Maldives Health Statistics, 2020).

Zone 3 where Kaafu Atoll is located have 38 public infrastructures with 6 hospitals, 31 healthcare centers and 1 allopathic clinic. In the private sector a total of 158 spread among Hospitals, clinics and service centers. Currently, Hulhumale' has two major hospitals in service. One is Hulhumale' Hospital and the other is Treetop hospital.

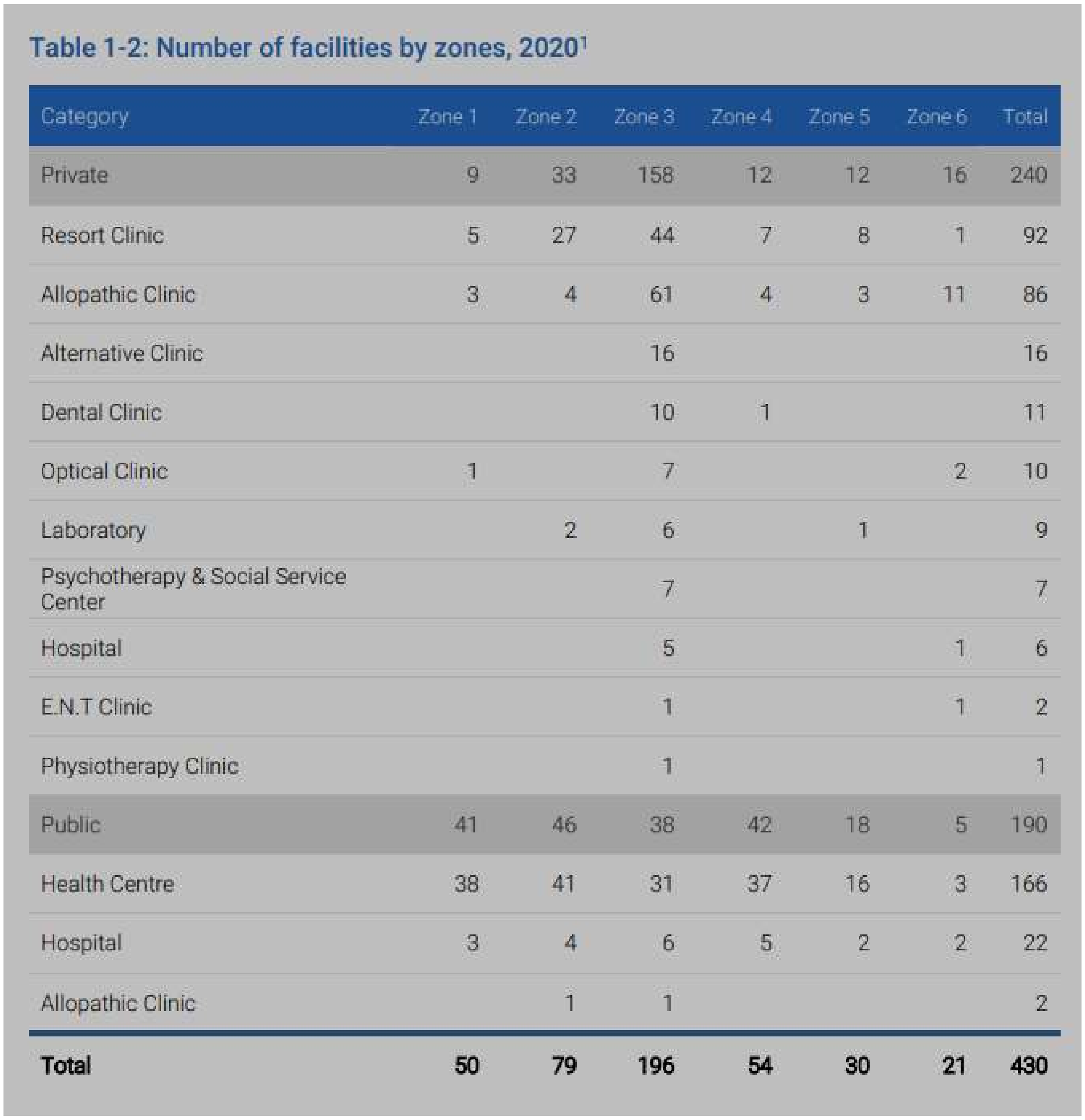


Table 1-2: Number of facilities by zones, 2020[1]

Category	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Total
Private	9	33	158	12	12	16	240
Resort Clinic	5	27	44	7	8	1	92
Allopathic Clinic	3	4	61	4	3	11	86
Alternative Clinic			16				16
Dental Clinic			10	1			11
Optical Clinic	1		7			2	10
Laboratory		2	6		1		9
Psychotherapy & Social Service Center			7				7
Hospital			5			1	6
E.N.T Clinic			1			1	2
Physiotherapy Clinic			1				1
Public	41	46	38	42	18	5	190
Health Centre	38	41	31	37	16	3	166
Hospital	3	4	6	5	2	2	22
Allopathic Clinic		1	1				2
Total	**50**	**79**	**196**	**54**	**30**	**21**	**430**

Figure 36: Healthcare facilities available in each zone (Maldives Health Statistics, 2020).

5.5.5 Accessibility and Public Transport

Hulhumalé offers a range of transportation options for travelers. The nearest airport is Velaanaa International Airport, providing convenient access for both domestic and international visitors. To reach Hulhumalé from Male', the capital of the Maldives, and the airport, visitors can make use of the efficient bus service. Alternatively, taxi and private car hire services are readily available for those seeking more personalized transportation. For a scenic journey, daily ferries operate between Male' and Hulhumalé, offering travelers a chance to enjoy the picturesque

Maldivian waters. For those in a hurry, speedboat services are also available for the Male' to Hulhumalé route. Additionally, travelers looking to explore other islands can take advantage of speedboat hire services, creating opportunities for swift travel to other local islands.

5.5.6 Power, Water and Waste Management Utilities

Electricity generation on Hulhumalé is currently facilitated by both diesel generator sets and solar panel systems managed by STELCO. However, HDC (Housing Development Corporation) will soon take over the responsibility of supplying continuous electricity for phase 2. Water supply relies on a combination of reverse osmosis and ultrafiltration systems, which purify rainwater collected on the island. Sewerage services are managed through a conventional gravity-based system operated by MWSC (Malé Water and Sewerage Company).

The responsibility of waste collection and handling fall on to Waste Management Cooperative known as WAMCO. Adjacent to STO Hotel on the western side of Hulhumalé Phase I, there exists a waste transfer facility managed by WAMCO. On a daily basis, waste is transported from this location to Thilafushi via Landing Crafts (Ali, 2023).

5.6 Hazard Vulnerability

The United Nations Development Program (UNDP) has compiled a very thorough study to develop a risk profile for the Maldives in order to determine the probability of hazards across different regions of Maldives based on geological evidence, historical data and projections derived from theoretical analysis (Developing a Disaster Risk Profile for Maldives, Volume 1: Main report, 2006). Likelihood of storm hazards for the island under concern are analyzed using this disaster risk management study done by the UNDP and likelihood of flooding is analyzed using rainfall data from the nearest meteorological center to each island. Some project site specific data are also obtained from consultation with the relevant stakeholders.

5.6.1 Storm Surge

According to the bathymetric surveys of the entire Maldives, the ocean slope towards the eastern side is steeper than the west coast which indicates that the eastern islands of the Maldives are more vulnerable to higher surge hazard compared to the western islands. Accordingly, the country has been divided into 5 broad storm surge hazard zones from 1-5, with 5 being the highest risk category. According to this zoning, K. Hulhumale' is in moderate risk zone (Developing a Disaster Risk Profile for Maldives, Volume 1: Main report, 2006).

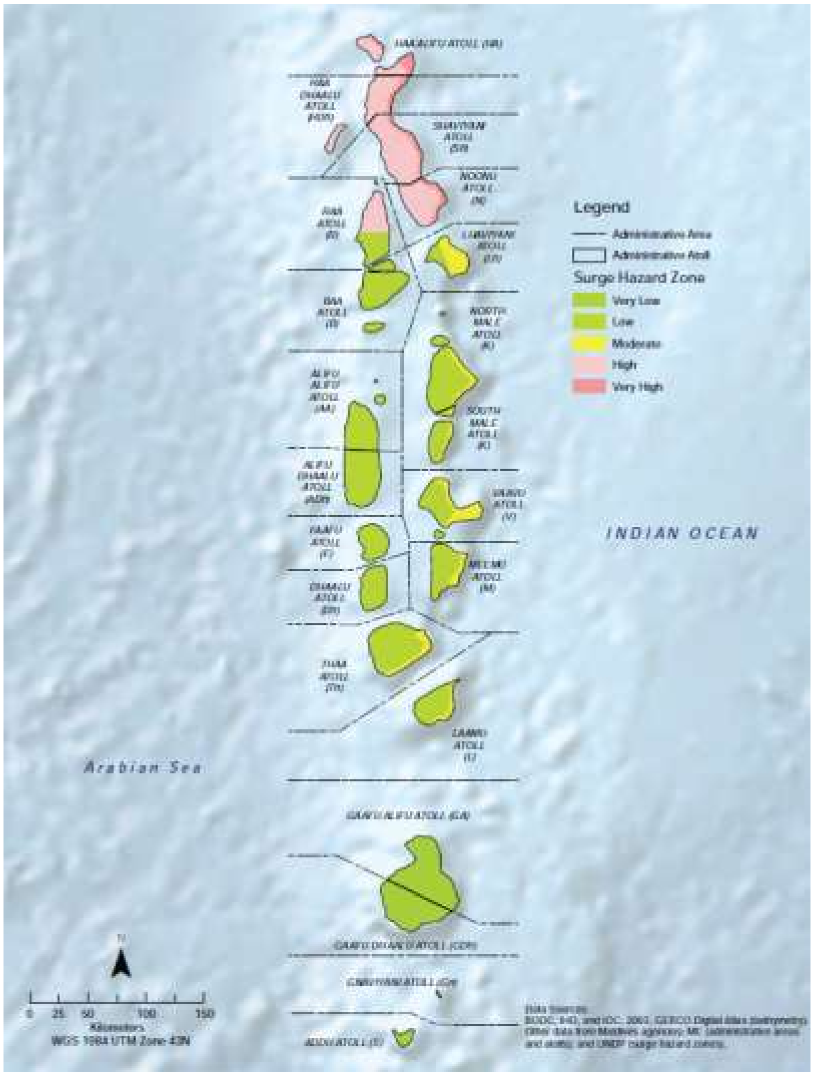


Figure 37: Storm hazard map of the Maldives from pink to green, pink being highest risk (Multihazard Risk Atlas of Maldives, 2020)

5.6.2 Flooding

Rainfall data from Hulhule' meteorological station representing the study area has been used to analyze the flood and drought years at this region. Data has been standardized against the overall mean. Deducing from standard deviation of rainfall from long-term mean, it can be concluded that if the difference between long-term mean and standard deviation is >1, that corresponding year is a flood year whereas if this difference is <-1 it may be considered a drought year.

Geographically, Hulhumale' is located at the central quadrant of the Maldives near Hulhule' meteorological station. Analysis of rainfall data from Hulhule' station showed that this part of the Maldives experienced more heavy rainfall (25) years than rain deficient (22) years. As for flooding, 7 years observed rainfall >1 standard deviation from the long-term mean (Figure 38) indicating that flooding is an uncommon occurrence at this part of the Maldives. The 10-year moving average predicts that 2023 will receive higher than normal rainfall.

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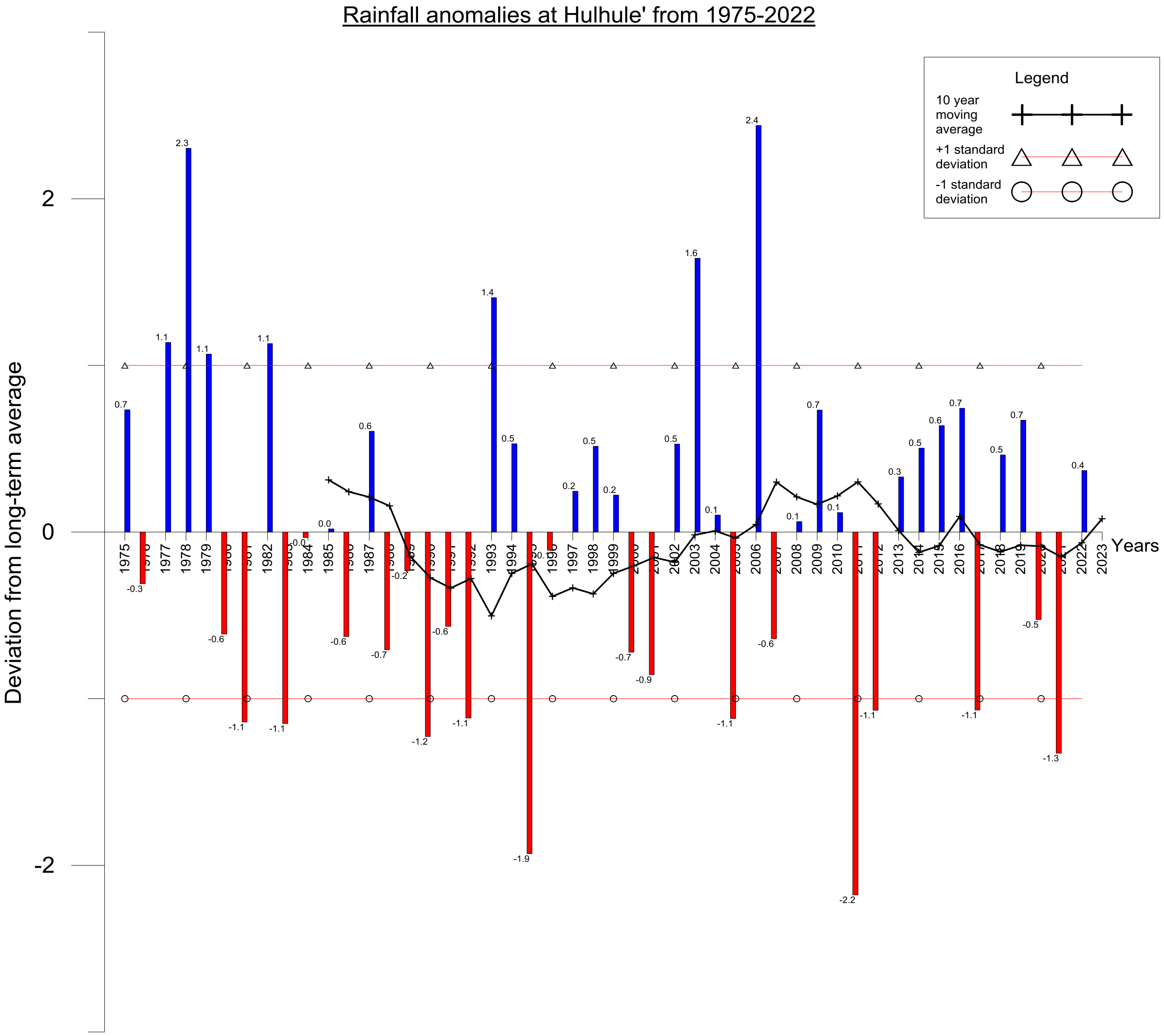

Figure 38: Rainfall anomalies for Hulhule' from 1975 to 2022 with the 10-year moving average. Red lines indicate +1 and -1 standard deviations from the mean. (Data obtained from the Bureau of Meteorology, Maldives).

However, there are other factors that greatly influence risk of flooding for instance, alterations to the islands size, width and topography, an island's risk to flooding may vary despite similar rainfall patterns.

5.6.3 Seismic Activity

Seismic waves are created when the earth's lithosphere releases a sudden burst of energy shaking the surface of the planet. Earthquakes are manifested when fault lines or tectonic plates move due to these seismic waves. When this occurs at large magnitudes at the seabed, it can cause tsunamis. Only three major events of magnitude above 7.0 had struck the region between 1979 and 2004 (Developing a Disaster Risk Profile for Maldives, Volume 1: Main report, 2006).

K. Hulhumale' is located in the Central region which is in the lowest risk zone.

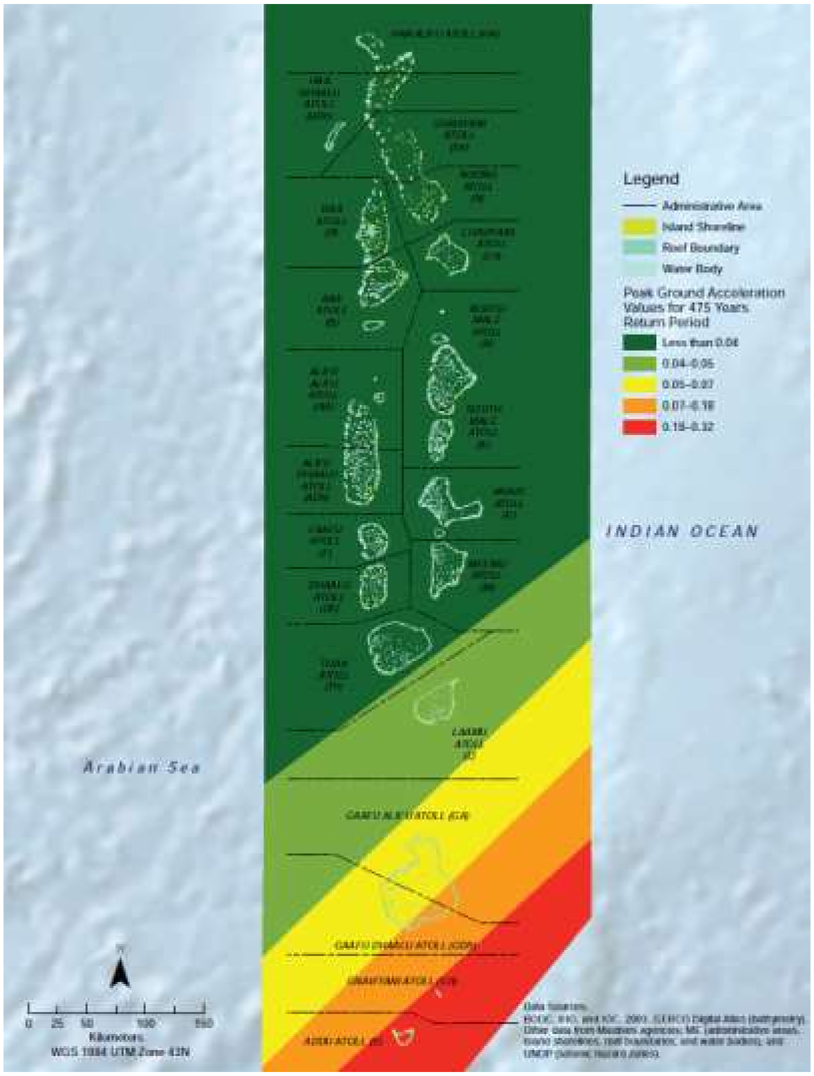

Figure 39 Seismic hazard zoning map of the Maldives from green to red, red being the highest at risk (Multihazard Risk Atlas of Maldives, 2020)

5.6.4 Tsunami

Tsunamis are destructive oceanic waves generated due to disturbances on the sea floor such as earthquakes, volcanic eruptions, underwater landslides, or even meteorite impacts.

In 2004 the second largest tsunamigenic earthquake globally recorded hit Indonesia and generated tsunamis 3-10 meters high travelling across the Indian Ocean striking Maldives with waves ranging 1.2-4.2 m. Out of 198 inhabited islands, 13 were destroyed, 56 sustained major physical damage, and 121 faced moderate damage from flooding.

95% of tsunamis that effect Maldives are generated from the eastern source zones. The risk is high for eastern fringe of eastern atolls, though eastern fringe of some western atolls is also at high risk. By observing bathymetric contours, the islands have been categorised into 5 zones with 1 being the lowest hazard level. K. Hulhumale' is in a very high-risk zone.

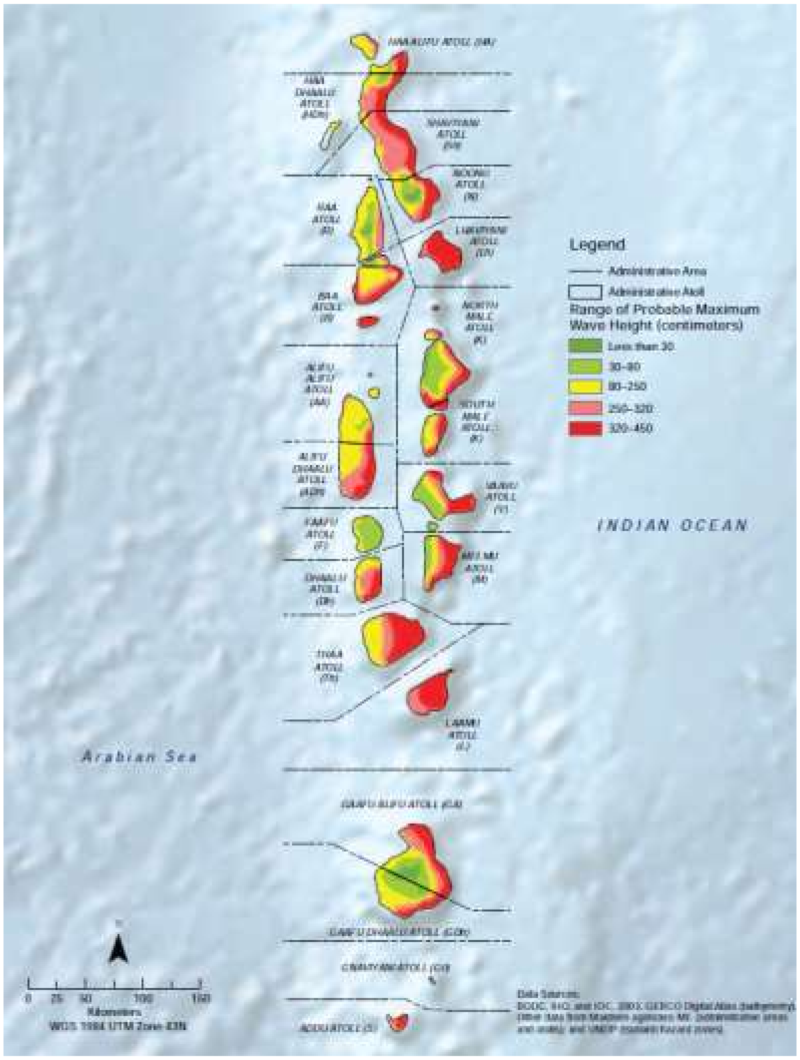

Figure 40: Tsunami hazard zoning map of Maldives (Multihazard Risk Atlas of Maldives, 2020)

6. STAKEHOLDER CONSULTATION

This section describes the stakeholder consultation method and the summary of the outcomes from each of the consulted stakeholders.

6.1 Consultation Method

An email request for stakeholder consultation was sent out to the relevant stakeholders with the approved ToR and a project brief. If the stakeholder wishes for a stakeholder consultation meeting, a meeting was supposed to be held at a convenient time and venue. An option was also given to provide the recommendations and suggestions regarding the proposed project to us in writing, whereby the stakeholder could send us an email highlighting their concerns and recommendations.

6.1.1 Invitations

An invitation for a consultation meeting was sent on 21st November 2023 through email to key stakeholders identified in the approved TOR that include STELCO, MWSC, WAMCO and URBANCO. The following table highlights the email requests sent out to stakeholders inviting for the stakeholder consultations and response. For the stakeholders that did not respond, the table shows the date at which the invitation was initiation sent and any follow up reminders. The proof for the invitations and reminders is given in the section 6.1.3 under the table Table 17.

6.1.2 Consultation details

The following table gives the consulted date, time and venues for each responded stakeholder(s).

Table 16: consultation date, time and venues

Stakeholders	Invitation sent by email	Responded by email	Details
STELCO	21/11/2023	23/11/2023	

			 **Mohamed Azim Waheed** Dear Mustafa, Please find below our comments and recommendation regarding the proposed eight storey commercial building (LOT10318 Muni Show Room) at Hulhumale P1. 1. The regulating body URA regulations and STELCO guidelines must be followed with regard to electrical services. 2. Electrical wiring for buildings must adhere to and comply with URA regulations. 3. If a medium voltage connection is required, all equipment specifications shall be approved by STELCO and URA. 4. Once a connection application has been submitted, electricity can be provided. If you have further clarifications, please do not hesitate to contact us. Kind Regards, Mohamed Azim Engineer Hulhumale Distribution, Transmission and Distribution Department
WAMCO	21/11/2023	23/11/2023	Consulted on phone by (at 10am, 23/11/2023) **Aminath Shafrath Adam,** Env. Social Safeguard Specialist Email: aminath.shafrath@wamco.com.mv Recommendations (a) Have a designated waste collection point within the building premises (b) Waste properly to be segregated in categories during construction and operation: Construction - food waste, plastic/wrappings, paper/wrappings, empty cans/drums (paint, protective chemicals, paint thinner, wall colour), timber/wood/iron bars left overs. Operation – food waste, plastic wrappings, paper wrappings and broken sales items (c) All hazardous waste (eg. empty paint drums/cans, used oil etc) shall be properly stored in a contained area with proper flooring until it get disposed (d) Waste collection point shall be easily accessible to service vehicles (e) Waste collection/stored area must be under a roofed shed with properly flooring to avoid ground/soil contamination from spills (f) Clean water must be accessible at waste collection area Response by proponent/consultant
URBANCO	21/11/2023		
MWSC	21/11/2023	26/11/2023	Consulted on Microsoft Team by (at 2pm, 26/11/2023) **Shahudh Naseem,** Customer Service Email: nahudhu.naseem@mwsc.com.mv

			Recommendations (a) If main line both water and sewer are not available the service provider will have to complete the work before giving access to both water and sewerage (b) All toilets shall be installed on ground level and above. (c) Make sure toilets are not installed at basement below the main sewer, as this may cause trouble getting access to sewer if the toilet happens to be below the main sewer line (d) MWSC will provide their services up to the boundary wall per water and sewerage service regulation (e) Booster pumps shall not be installed on basement as it may cause trouble in maintaining and also may cause damage if flooding occurs (f) MWSC will carry out a survey upon submission of application for service (g) Water meters must be at safe location within the premises on ground easily accessible to service provider. (h) For commercial establishments MWSC will charge at commercial rates

6.1.3 Proof of Invitations sent

The following table shows the proof of email invitations sent out for the stakeholders.

Table 17: proof of invitation sent out to stakeholders

Stakeholder	Partial print of invitations sent out
STELCO	EIA stakeholder consultation_8 storey commercial building construction_hulhumale **Mohamed Mustafa** Dear Sir We are undertaking an EIA for construction of an 8 storey commercial building at LOT No 10318, Hulhumale, Phase 1 under the **TOR (Ref No. 203-ECA/PRIV/2023/905) approved by EPA on 19th November 2023**. The **proponent of the project is Muni Enterprise Pvt.Ltd.** STELCO has been identified as one of the key stakeholders that require consultation regarding the proposed project. Hence, we would like to request for an online meeting with the relevant officials from STELCO or provide us opinion/comments/recommendations (if any) regarding the proposed construction of 8 storey commercial building before 26th November 2023. For your information and further consideration we have attached 1. Building design approved 2. TOR approved by EPA 3. Project brief Looking forward to hear you Regards Mohamed Mustafa EIA Consultant Mobile 7782303 **3 Attachments** · Scanned by Gmail
WAMCO	

	 EIA consultation_8 storey building construction_hulhumale **Mohamed Mustafa** Dear Sir We are undertaking an EIA for construction of an 8 storey commercial building at LOT No 10318, Hulhumale. Phase 1 under the **TOR (Ref No. 203-ECA/PRIV/2023/905) approved by EPA on 19th November 2023**. The **proponent of the project is Muni Enterprise Pvt.Ltd** WAMCO has been identified as one of the key stakeholders that require consultation regarding the proposed project. Hence, we would like to request for an online meeting with the relevant officials from WAMCO or provide us opinion/comments/recommendations (if any) regarding the proposed construction of an 8 storey commercial building before 28th November 2023. For your information and further consideration we have attached: 1. Building design approved 2. TOR approved by EPA 3. Project brief Looking forward to hear you Regards Mohamed Mustafa EIA Consultant Mobile 7782393 **3 Attachments** • Scanned by Gmail
MWSC	 EIA consultation_8 storey commercial building_hulhumale **Mohamed Mustafa** Dear Sir We are undertaking an EIA for construction of an 8 storey commercial building at LOT No 10318, Hulhumale. Phase 1 under the **TOR (Ref No. 203-ECA/PRIV/2023/906) approved by EPA on 19th November 2023**. The **proponent of the project is Muni Enterprise Pvt.Ltd** MWSC has been identified as one of the key stakeholders that require consultation regarding the proposed project. Hence, we would like to request for an online meeting with the relevant officials from MWSC or provide us opinion/comments/recommendations (if any) regarding the proposed construction of an 8 storey commercial building before 28th November 2023. For your information and further consideration we have attached: 1. Building design approved 2. TOR approved by EPA 3. Project brief Looking forward to hear you Regards Mohamed Mustafa EIA Consultant Mobile 7782393 **3 Attachments** • Scanned by Gmail
URBANCO	 EIA consultation_8 storey commercial building_hulhumale phase 1 **Mohamed Mustafa** Dear Sir We are undertaking an EIA for construction of an 8 storey commercial building at LOT No 10318, Hulhumale. Phase 1 under the **TOR (Ref No. 203-ECA/PRIV/2023/906) approved by EPA on 19th November 2023.** The **proponent of the project is Muni Enterprise Pvt.Ltd** HDC (Urbanco) has been identified as one of the key stakeholders that require consultation regarding the proposed project. Hence, we would like to request for an online meeting with the relevant officials from HDC (Urbanco) or provide us opinion/comments/recommendations (if any) regarding the proposed construction of an 8 storey commercial building before 28th November 2023. For your information and further consideration we have attached: 1. Building design approved 2. TOR approved by EPA 3. Project brief Looking forward to hear you Regards Mohamed Mustafa EIA Consultant Mobile 7782393 **3 Attachments** • Scanned by Gmail

6.2 Consultations Undertaken

The outcomes of the stakeholder consultations are as follows.

6.2.1 STELCO

The table below shows the instructions made by STELCO regarding the proposed project along with the proponents' responses for the concerns (if any) which were raised.

Table 18: outcomes of the consultation with STELCO

Instructions	Proponents Response
The regulating body URA regulations and STELCO guidelines must be followed with regard to electrical services.	Proponent will follow URA and STELCO regulations / guidelines.
Electrical wiring for buildings must adhere to and comply with URA regulations. If a medium voltage connection is required, all equipment specifications shall be approved by STELCO and URA.	All wiring and electrical equipment used in the building will comply to STELCO and URA specifications.
Once a connection application has been submitted, electricity can be provided.	Proponent will apply for a connection if electricity is required in the construction phase.

6.2.2 HDC (Urbanco)

The table below shows the concerns, suggestions and recommendations made by HDC (Urbanco) regarding the proposed project along with the proponents' responses for the concerns (if any) which were raised.

Table 19: outcomes of the consultation with HDC (Urbanco)

Concerns / Suggestions raised/comments	Proponents Response
Thoroughly reviewed the concept drawings and methodology consultant shared with URBANCO. Expressed that they do not have further comment on the proposed submission	noted
Additionally, we hope that the construction standards adhere to the necessary guidelines and regulations. It's crucial that all potential impacts, such as noise, dust, traffic, and the social implications on the local population, are comprehensively considered and accounted for within the Environmental Impact Assessment (EIA).	All standards, regulations and guidelines set by authorities will be followed and permission will be obtained from respective authorities where necessary.

6.2.3 MWSC

The table below shows the concerns, suggestions and recommendations made by MWSC regarding the proposed project along with the proponents' responses for the concerns (if any) which were raised.

Table 20: outcomes of the consultation with MWSC

Concerns / Suggestions raised	Proponents Response
Make sure toilets are not installed at basement below the level of main sewer, as this may cause trouble getting access to sewer if the toilet happens to be below the main sewer line	No toilet facilities planned
MWSC will provide their services up to the boundary wall per water and sewerage service regulation	Noted
Booster pumps shall not be installed on basement as it may cause trouble in maintaining and also may cause damage if flooding occurs	Noted
MWSC will carry out a survey upon submission of application for service	Noted
Water meters must be at safe location within the premises on ground easily accessible to service provider.	Will follow as instructed
For commercial establishments MWSC will charge at commercial rates	Will consult with MWSC further at the time of installation

7. POTENTIAL IMPACT ANALYSIS

The impacts from any project can be categorized into two broad categories; constructional and operational impacts. Constructional impacts are the potential impacts which might arise during the construction stage of the proposed project. Operational impacts are the potential impacts which might arise once the newly constructed project facilities become operational.

7.1 Impact Assessment Methodology

The proponent and the consultants have conducted a risk-based environmental review as part of the planning process (Risk Management-Principles and Guidelines, 2011). Data has been drawn from a wide range of sources, including existing similar EIA reports. Similar EIA reports reviewed for the formulation of this EIA include but not limited to the reports mentioned under section 1.8.

The impact assessment was conducted based on professional judgment and expertise of the consultants as well as evaluation of the baseline data and consultation with the stakeholders. This provides an outline on how to identify potential impacts associated with the proposal and evaluate the likelihood and consequences. The impact assessment methodology utilized was also consistent with the methodology outlined in AS/NZS ISO31000 (AS/NZS ISO 31000 : 2009 Risk management - Principles and guidelines, 2009).

The first stage of this methodology was to identify potential impacts. To ensure that all potential impacts were identified, it was important that any specific environment and/or community impact issues were determined based on the locations of the project components as well as type of service to be provided (Wild Environment, 2012). As such, the impacts identified were:-

1. Construction Phase Impacts:-
    - Mobilization impacts- Noise
    - Mobilization impacts- Dust
    - Mobilization impacts- Oil spills on ground
    - Mobilization impacts- workforce; covid episode, negative social impacts, illegal labor
    - Generation of site clearance, demolition and constructional waste
    - Vegetation clearance

- Vibration impacts
- Air Quality-GHGs
- Air Quality-Dust
- Noise Pollution
- Groundwater quality- oil and chemical spills
- Groundwater quality- salinization
- Impacts on marine environment
- Impacts on terrestrial environment- soil and ground
- Risk of accidents and pollution on workers and residents
- Impacts on landscape integrity and scenery
- Socio-economic impacts- Negative
- Socio-economic impacts- Positive

2. Operational Phase Impacts:-
    - Air Quality- GHGs
    - Noise Pollution
    - Ground and marine water quality- negative
    - Groundwater quality- positive
    - Impacts from waste
    - Impacts on landscape integrity and scenery
    - Socio-economic impacts - negative
    - Socio-economic impacts - positive
    - Risk of hazards; flooding
    - Risk of hazards; pest out break
    - Risk of hazards- storm surge
    - Risk of hazards- sea level rise
    - Risk of hazards- fire and other accidents

The significance of impacts was assessed using the following matrix (Table 21).

Table 21. Impact assessment matrix (Wild Environment, 2012)

Likelihood		**Consequences**				
		Minimal (1)	**Minor (2)**	**Moderate (3)**	**Major (4)**	**Catastrophic (5)**
	Remote (1)	Negligible	Negligible	Very low	Low	Medium
	Unlikely (2)	Negligible	Very low	Low	Medium	High
	Possible (3)	Very low	Low	Medium	High	Very high

	Likely (4)	Low	Medium	High	Very high	Significant
	Certain (5)	Medium	High	Very high	Significant	Significant

Characteristics of the impacts on Table 22 is used to determine the consequences (minimal (1), minor (2), Moderate (3), Major (4), Catastrophic (5)) of each identified impact. For each specific consequence there is 5 likelihood categories (Table 21). Therefore, if an impact has Moderate (3) consequence but a likelihood of Remote (1), then that impact would have "very low" significance. However, if the likelihood is Certain (5) then the impact would have "Very high" significance

Criteria used for assessing the identified impacts are as follows. Note that likelihood and consequences were judged based on the design consideration for the proposed development. These criteria were measured against the impact (if the impact occurred), to ecological and/or human health (Wild Environment, 2012):-

- Likelihood:-
    - Remote- May occur only in exceptional circumstances;
    - Unlikely- Could occur at some time;
    - Possible- Might occur at some time;
    - Likely- More likely to happen than not (i.e. a probability of > 50 %); and
    - Certain- Will probably occur in most circumstances.
- Consequences:-
    - Minimal- Impact has no significant risk to environment either short term or long term;
    - Minor- The impact is short term and causes very limited risk to the environment;
    - Moderate- Impact gives rise to some concern, may cause long term environmental problems but are likely short term and acceptable;
    - Major- Impact is long term, small scale and environmentally risky. Impact severely damages the environment; and
    - Catastrophic- Impact is long term and irreversible, large scale and detrimental to the environment.

The likelihood measures the probability of occurrence of an event whereas consequences evaluate the significance of impact on the environment in the event of an incident. Based on the likelihood and consequences for each of the identified impacts, the significance level is determined (Table 21).

Impact characteristics such as the type of impact, nature of the impact, impact range, impact duration as well as reversibility of the impacts were assessed using the grading scales for which are given on Table 22 below.

Table 22. Grading scale of the characteristics of impacts

Characteristic of impact	**Grading**	**Explanation**
Type	Direct	Direct impacts without intervening factors or intermediaries
	Indirect	Triggered by but not immediate effect of the proposed project
Nature	Positive	Impacts resulting in a desirable effect
	Negative	Impacts resulting in an undesirable effect
	Cumulative	Impacts of an action when combined with impacts from projects or actions that have been undertaken recently or will be carried out in the near future.
Range	Local	Impacts limited to project site
	Island	Impacts of importance at island level
	Atoll	Impact of importance at Atoll level
	Nation	Impacts of national character
Duration	Short-term	Occurring over a short period of time
	Intermittent	Impacts occurring at irregular intervals
	Long-term	Occurring over a long period of time
	Continuous	Impacts occurring continuously
Reversibility	Reversible	Previous state (or equivalent) can be restored
	Irreversible	Not able to alter the consequence of impact

7.2 Justification for selected Impact Prediction and Assessment Method

The most common methods of impact prediction include the usage of checklist, matrices, networks, overlays, GIS and computer expert systems. The use of any single method has its disadvantages for instance checklist maybe easy to understand and use but it does not distinguish between direct and indirect impacts (UNEP, 2002). Matrices are good for displaying EIA results and links actions to impacts however have the disadvantage of double-counting of impacts. Networks can distinguish between direct and indirect impacts but can be very complex. Overlays are good at displaying spatial impacts but does not address impact duration and probability. GIS and computer expert systems are good for impact identification and spatial analysis but require a lot of data.

The employed method in this EIA is a combination of all of the above-mentioned methods with the addition of profession judgment of the consultant from past experiences that provide an easy and simple method to analyze impacts with limited data. The method can distinguish between direct, indirect and cumulative impacts while linking project activities to impacts. The method distinguishes impacts that can realistically be detrimental to the environment by linking consequences of an impact to its probability of occurrence. Finally, this method consumes very less time and hence rapid assessments can be made which is especially advantageous in the Maldives where EIA consultants are expected to complete EIAs in a very short duration.

7.3 Limitations and Uncertainties in Impact Prediction and Assessment Method

Risks and uncertainties are inherent in any environmental and ecological problem-solving technique and needs to be acknowledged and incorporated in any decision-making process. Risk is the chance that an adverse outcome occurs while uncertainty arises from an imperfect understanding of a system due to uncertainty about facts (McAlpine, et al., 2010). Our understanding of the environment is limited mainly due to the lack of long-term data and complexity of the ecosystem. For example, the assessments were done during one season and impacts are predicted based on these assessments. However, how the magnitudes of these impacts and how they behave in nature during the other season is quite uncertain.

The potential environmental impacts from the proposed project are all predicted, hence there may be variables affecting the accuracy of these impacts due to natural variations such as site conditions and uncertainties in scales and magnitudes. While every attempt has been made to accurately predict the potential impacts from this project, there are unforeseen and uncertain factors which might cause deviations in the impacts outlined herein. For instance, a natural phenomenon.

Moreover, assessment of existing conditions requires a benchmark against which these conditions can be compared, however, lack of such benchmarks is a great hindrance to analyzing the environmental impacts in some instances. In addition to this, limited time availability and lack of available factual information are among major limitations to impact predictions. In the Maldives, more often than not, limited availability of published information on environmental and social environment of the islands has led to the dependency on verbal communication with locals and other stakeholders which are not always very accurate.

To add, a major uncertainty arises from the lack of information about the project activities from developers which leads to assumptions being made based on the experience of consultants, for example the proposed development will be designed and built conforming to international standards, the working staff at the facility will be well trained, will follow O&M procedures and operational plan diligently and the prescribed mitigation measures in this EIA report will be followed by the proponent

Anyhow, based on the risk assessment outlined above, the environmental impact assessment is set out below:-

7.4 Construction Phase Impacts

This section describes the significance (Table 23) and impact characteristics for the construction phase impacts.

Table 23. Predicted impacts and anticipated significance of impacts during construction phase of the project

Potential Impacts	**Likelihood**	**Consequence**	**Significance**
Mobilization impacts- Noise	Certain	Minor	High
Mobilization impacts- Dust	Certain	Minor	High
Mobilization impacts- Oil spills on ground	Possible	Major	High
Mobilization impacts- workforce; covid episode, negative social impacts, illegal labor	Possible	Moderate	Medium
Generation of site clearance, demolition and constructional waste	Possible	Moderate	Medium
Vegetation clearance	Unlikely	Minor	Low
Vibration impacts	Possible	Major	High
Air Quality-GHGs	Certain	Catastrophic	Significant
Air Quality-Dust	Certain	Moderate	Very High
Noise Pollution	Certain	Moderate	Very High
Groundwater quality- oil and chemical spills	Possible	Major	High
Groundwater quality- salinization	Certain	Major	Significant
Impacts on marine environment	Certain	Moderate	Very High
Impacts on terrestrial environment- soil and ground	Certain	Major	Significant
Risk of accidents and pollution on workers and residents	Possible	Catastrophic	Very High
Impacts on landscape integrity and scenery	Certain	Moderate	Very High
Socio-economic impacts- Negative	Certain	Major	Very High
Socio-economic impacts- Positive	Unlikely	Moderate	Low

Impacts during construction phase of the project are mainly anticipated to be short-term and reversible (Table 24) as most impacts will last only for the duration of the construction phase of the project.

Table 24. Characteristics of predicted impacts during the construction phase of the project

Potential Impact	**Type**	**Nature**	**Range**	**Duration**	**Reversibility**

Mobilization impacts- Noise	Direct	Negative	Local	Short-term	Reversible
Mobilization impacts- Dust	Direct	Negative	Local	Short-term	Reversible
Mobilization impacts- Oil spills on ground	Direct	Negative	Local	Short-term	Irreversible
Mobilization impacts- workforce; covid episode, negative social impacts, illegal labor	Direct	Negative	Island	Short-term	Reversible
Generation of site clearance, demolition and constructional waste	Direct	Negative	Local	Short-term	Reversible
Vegetation clearance	Direct	Negative	Local	Long-term	Reversible
Vibration impacts	Direct	Negative	Local	Intermittent	Reversible
Air Quality-GHGs	Direct	Negative	Nation	Long-term	Irreversible
Air Quality-Dust	Direct	Negative	Local	Intermittent	Reversible
Noise Pollution	Direct	Negative	Local	Intermittent	Reversible
Groundwater quality- oil and chemical spills	Direct	Negative	Local	Short-term	Irreversible
Groundwater quality- salinization	Direct	Negative	Local	Short-term	Irreversible
Impacts on marine environment	Indirect	Negative	Local	Short-term	Reversible
Impacts on terrestrial environment- soil and ground	Direct & Indirect	Negative	Local	Long-term	Irreversible
Risk of accidents and pollution on workers and residents	Direct	Negative	Local	Short-term	Irreversible
Impacts on landscape integrity and scenery	Direct	Negative	Local	Short-term	Reversible
Socio-economic impacts- Negative	Direct & Indirect	Negative	Local	Short-term	Reversible
Socio-economic impacts- Positive	Direct	Positive	Local	Short-term	Reversible

7.4.1 Mobilization impacts- Noise

Noise is expected to be generated due to the direct activities of the project from the mobilization of cranes, concrete mixing machine, lorries and other heavy vehicles, machinery and construction materials to the project site. The impact is expected to be negative as the noise generated will cause disturbance to people that use the nearby roads and the people residing within the nearby neighbourhoods. The range of the impact would be localized to the adjacent roads surrounding the project site where the proponent will use to mobilize. The impact is expected to be short-term as the mobilization will be completed within a short period of time. This impact is reversible as once the mobilization is over, the impact ceases. Considering the aforementioned characteristics of the impact, the consequences from the impact is minor as it does not cause any long-term environmental problems. The likelihood of this impact occurring is certain as noise would definitely be generated during the mobilization activities. Therefore, the significance score for this impact is high.

7.4.2 Mobilization impacts- Dust

Dust is expected to be generated when the construction materials like cement and sand are unloaded to the project site. The impact is negative as the dust generated may become a nuisance to the working staff and in some cases continued exposure to dust may cause allergic reactions in people who are sensitive to dust. The dust generated may also be a nuisance to the people using nearby roads. The range of the impact would be localized to a small area surrounding the project site. The impact is expected to be short-term as the mobilization will be completed within a short period of time. This impact is reversible as once the mobilization is over, the impact ceases. Considering the aforementioned characteristics of the impact, the consequences from the impact is minor as it does not cause any long-term environmental problems. The likelihood of this impact occurring is certain as dust would definitely be generated during the mobilization activities. Therefore, the significance score for this impact is high.

7.4.3 Mobilization impacts- Oil spills on ground

The potential for oil spills on ground arises due to the direct activities of this project from the operation of vehicles and heavy machinery on land. The impact is of negative nature as the groundwater would be polluted. However, the impact would be localized to the mobilization route. The impact is expected to be short-term as the mobilization would be completed on a short period of time. The impact is considered irreversible as contaminated groundwater takes a long time to recover and a lot of money have to be spent on rehabilitation. Considering the aforementioned characteristics of the impact, the consequences from the impact is major. The likelihood of this impact occurring is possible. The significance score for this impact is high.

7.4.4 Mobilization impacts- workforce; negative social impacts, illegal labour

There are three aspects of impacts that could arise due to mobilization of a workforce. Firstly, negative social impacts due to the workers not behaving as per the social norms and regulations of the Maldives. Secondly the implication due to illegal labour. Since the whole workforce maybe effected due to a disease outbreak spreading, the range of this impact is at Island level. The impact is expected to be short-term as the workforce will be mobilized for a set duration for the construction phase. The likelihood of this impact occurring is possible, hence the significance score for this impact is medium.

7.4.5 Generation of site clearance, demolition and constructional waste

Small quantity of green waste would be generated due to the direct activities of the project from the minor vegetation clearance for the construction of the required commercial building on the project site. No demolition waste is expected as there are no structures to be demolished at the project site. Large volume of excavated earth (sand), packaging waste and construction waste is expected to be generated during the construction of the proposed building. The impact is of negative nature as if not properly managed it is aesthetically not pleasing and has potential to pollute and contaminate surrounding roads. It is anticipated that only the project sites and surrounding areas will be impacted hence the range is local. The impact is short-term and reversible as will be alleviated once waste is removed. However still considering that improper management of waste could pollute the surrounding environment, the consequences were considered moderate. The likelihood of this impact occurring is possible as there is always potential for workers negligence to properly manage waste. The significance score for this impact is medium.

7.4.6 Vegetation clearance impacts

This impact arises due to the direct activities of the project which requires removal of vegetation for construction of the building on the project site. The impact is of negative nature as the vegetation cover of the Island will be reduced. The impact is of local level range as a minor area of vegetation is required to be removed in order to construct the building on the project site. The impact itself is short-term as the land clearance works will be completed in a short duration and due to the fact that the number of large trees required to remove is very less, the impact is considered reversible as the trees removed for the construction of this project can be easily replanted. Hence, the consequences from this impact were considered as moderate. The likelihood of this impact occurring is certain as trees on the footprint of the building will be cleared. The final significance score for this impact is very high.

7.4.7 Vibration impacts

This impact arises due to the direct activities of the project from the operation of vehicles and heavy machinery. The impact is of negative nature as the vibrations may damage any nearby buildings. The range of this impact is local as the buildings adjacent to any operating heavy vehicles or machinery will be impacted. This impact would be intermittent as vibration would be generated during operation of heavy vehicles and machinery only and will cease once the operation stops (reversible). Since vibrations could causes structural damages to buildings, the consequences from this impact were considered at major level. The likelihood of this impact occurring is possible as there are buildings adjacent to the project site. The final significance score for this impact is high.

7.4.8 Air quality impact

Impacts on air quality during the constructional phase is a direct impact generally credited to operation of machinery and equipment which require electricity and vehicles which burn fuel. The main contributor would be the operation of lorries/pickups or other heavy vehicles that will be used to transfer heavy machinery, construction materials and equipment to the project site. Additionally, the crane, excavator, concrete mixer, lorries and other machinery that use fuel for power during the construction works. The negative impact to air quality would be due to the release of GHGs and any other air pollutants to the atmosphere. Release of GHGs into the atmosphere during the construction phase is low when compared to the nations carbon budget but it would still contribute to the nations carbon budget. As such, the effects of the released GHGs concerns the entire Nation, the range of this impact was considered at National level. Even though GHGs will be released for a short period of time, regardless this would contribute to the GHG emission of the nation; hence the cumulative nature of this impact. And since the released GHGs will stay in the atmosphere for a long period of time this impact was considered long-term. The rise in concentration of GHGs in the atmosphere has been a huge global environmental issue which is responsible for global warming, ocean acidification and many other irreversible environmental issues. Considering the aforementioned characteristics of the impact, the consequences from the impact is considered catastrophic as it is long term, irreversible, large scale and detrimental to environment. The likelihood of this impact occurring is certain as GHGs would definitely be generated from the operation of machinery. Therefore, the significance score for this impact is significant.

7.4.9 Air Quality-Dust

Impacts on air quality during the construction phase also arise due to the release of dust during excavation for foundation. The impact is of negative nature as it pollutes the air and cause nuisance to workers and nearby residents. However, the range of the impact would be limited to a small area surrounding the project site. This impact would be intermittent as dust would be generated during operation of heavy machinery only. This impact is reversible as dust would not be generated once the construction works are completed. Therefore, the consequences from this impact are moderate. The likelihood of this impact occurring is certain as dust would definitely be generated from the operation of machinery. Therefore, the significance score for this impact is very high.

7.4.10 Noise Pollution

Similar to air quality, impacts on noise level during the constructional phase is a direct impact generally credited to operation of machinery, equipment and vehicles. The highest noise would most likely be generated from the lorries/pickups that would be used to load and unload the construction materials and equipment to the project site and operation of excavator, cranes, concrete mixer, lorries during foundation laying works. The impact is of negative nature as it has the tendency to disturb workers and residents nearby. The range of the impact will be localized to a small area surrounding the project site at irregular intervals as noise would be generated when heavy machinery is operational and would cease once operation of machinery stops, hence the consequences from this impact is deemed moderate. The likelihood of this impact occurring is certain and the final significance score for this impact is very high.

7.4.11 Groundwater quality- oil and chemical spills

Impacts to ground water quality during the constructional phase is a direct impact credited to the operation of land-based machinery that will be used during the construction of the proposed building. The impact arises from the potential for occurrence of oils and chemical spills during the operation of machinery and construction works. Even though it could be minimized with regular maintenance, in the event that oils and chemicals do spill, the impacts could have moderate to major negative effects on the groundwater quality due to porous nature of soil on the Island. The range of the impact will be localized to a small area surrounding the project site. The impact itself is expected to be short-term as construction of building will be completed in a short period of time, however if a spill does occur, the effects would be irreversible as contaminated groundwater takes a long time to recover. hence the consequences from this impact are deemed major. The likelihood of this impact occurring is possible and as such this impact scored a significance rating of high.

7.4.12 Groundwater quality- salinization

Another direct impact to groundwater quality arises due to dewatering for laying foundation for the proposed building, during construction of foundation. The impact is of negative nature as dewatering causes groundwater salinization. The range of the impact will be localized to a small area surrounding the project site where dewatering is carried out. The impact itself is expected to be short-term as dewatering will be completed in a short period of time, however the effects to groundwater is considered irreversible. hence the consequences from this impact are deemed major. The likelihood of this impact occurring is certain and as such this impact scored a significance rating of significant.

7.4.13 Impacts on marine environment

Impacts on the marine environment due to this project arises indirectly from the discharge of dewatering water to the lagoon. The negative impact is turbidity at the discharge point in to the lagoon. The impact would be localized to an area surrounding the discharge point in the lagoon environment. The impact would be short-term as this impact would cease once the dewatering is completed. Furthermore, the impact is considered reversible as the water quality would potentially return to normal after a few tidal cycles. The consequences from this impact are considered moderate as the lagoon environment where the dewatering water is to be discharged is already a very disturbed environment. The likelihood of this impact occurring is certain and the final significance rating is very high.

7.4.14 Impacts on terrestrial environment- soil and ground

Impacts to soil and ground are envisaged due to direct activities of the project. Compaction of ground is anticipated due to operation of heavy machinery. Excavation, trenching and paving works will also compromise the soil profile. The impact is of negative nature and with a range limited to the project site. While the impact itself is short-term as the construction works will be completed within a set period, the impacts from soil compaction are long-term. The impact was as such considered irreversible. Hence the consequences from this impact are deemed major. The likelihood of this impact occurring is certain and as such the final significance score for this impact is significant.

7.4.15 Risk of accidents and pollution on workers and residents

As typical of any construction project, there lies the risk of accidents and pollution on workers from this project as well due to the construction activities. There is always the inherent risk of health and safety due to workplace incidents like chemical spills or injuries. Risks to residents include falling of construction materials for people walking along the roadside. Furthermore, due to improper living conditions provided to the workers by the proponent as this is very common in the Maldives. The proponent must ensure that the workers are well taken care of. The impact is of negative nature as any accidents in work place or improper living conditions at provided will lead to health risks to workers. The range of the impact is limited to project site and small surrounding area; hence it is extremely important to monitor unauthorized access into the project sites. The impact itself is short-term and reversible as once construction is finished the impact is alleviated, however is considered irreversible as injuries to people can be fatal. Hence the consequences from this impact are deemed catastrophic. Since the likelihood of these impacts is possible given that proper mitigation measures would be followed, the final significance of this impact is very high.

7.4.16 Impacts on landscape integrity and scenery

Negative impacts to the landscape integrity and scenery are anticipated from the direct activities of the project, where the mobilization of materials and vehicles to the project site could cause the scenery to be compromised. The impact is of local level range as a small area surrounding the project site is anticipated to be affected. This impact is considered short-term and reversible as construction works will be completed within a short period. The overall consequence from this is moderate and with a likelihood of certain, giving it a final significance rating if very high.

7.4.17 Socio-economic impacts- Negative

Negative impacts to socio-economic environmental are anticipated due to the direct and indirect activities of the project. The indirect impact is due to the potential for mosquito growth in the excavated area due to delays in foundation laying works or due to containers that allow water to retain, that are left within the project site. Increase is mosquitoes may lead to spread of vector borne diseases. However, this impact is very unlikely to occur as the proponent will follow the construction schedule and proper waste management will be implemented. Direct impacts include hindrance to traffic flow during the mobilization works and road blocks during the construction of the foundation and flooring works. Furthermore, there is always the potential for damages to the roads during the operation of heavy machinery. However, besides the aforementioned impacts no impacts are anticipated to be caused to any cultural facilities or activities. The impact is of local level range as a small area surrounding the project site is anticipated to be affected. This impact is considered short-term and reversible as construction works will be completed within a short period. The overall consequence from this is moderate and with a likelihood of certain, giving it a final significance rating if very high.

7.4.18 Socio-economic impacts- Positive

This impact arises due to the direct activities of the project requiring labour force to carry out the works under the project. It is of positive nature as people have the opportunity to get temporary jobs. Since a limited number of people could potentially get the job, it is of local level range. The impact is short-term and reversible as one the project is completed the jobs will be done. The final consequences rating for this impact is moderate. The likelihood of this impact occurring is unlikely as the proponent will use their own workforce. Hence, the final significance rating for this impact is low.

7.5 Operational Phase Impacts

This section describes the significance (Table 25) and impact characteristics for the operational phase impacts.

Table 25. Predicted impacts and anticipated significance of impacts during operation phase of the project

Potential Impacts	Likelihood	Consequence	Significance
Air Quality- GHGs	Certain	Catastrophic	Significant
Noise Pollution	Certain	Moderate	Very High
Ground and marine water quality- negative	Unlikely	Major	Medium
Groundwater quality- positive	Certain	Major	Significant
Impacts from waste	Unlikely	Moderate	Low
Impacts on landscape integrity and scenery	Certain	Major	Significant
Socio-economic impacts - negative	Possible	Major	High
Socio-economic impacts - positive	Certain	Catastrophic	Significant
Risk of hazards; flooding	Unlikely	Major	High
Risk of hazards; pest out break	Unlikely	Moderate	Low
Risk of hazards- storm surge	Possible	Major	High
Risk of hazards- sea level rise	Unlikely	Major	Medium
Risk of hazards- fire and other accidents	Unlikely	Major	Medium

Unlike constructional impacts, operational impacts are anticipated to be more long-term but irreversible (Table 26). It should be noted that with the application of proper mitigation measures as outlined in section 9.1 of this report, almost every negative impact could be minimized.

Table 26. Characteristics of the predicted impacts during the operation phase of the project

Potential Impacts	Type	Nature	Range	Duration	Reversibility
Air Quality- GHGs	Indirect	Negative	Nation	Continous	Irreversible
Noise Pollution	Direct & Indirect	Negative	Local	Long-term	Reversible
Ground and marine water quality- negative	Direct & Indirect	Negative	Local	Long-term	Irreversible
Groundwater quality- positive	Direct	Positive	Island	Long-term	Reversible
Impacts from waste	Direct	Negative	Local	Long-term	Reversible
Impacts on landscape integrity and scenery	Direct	Positive	Local	Long-term	Irreversible
Socio-economic impacts - negative	Direct	Negative	Local	Long-term	Reversible
Socio-economic impacts - positive	Direct	Positive	Island	Long-term	Reversible
Risk of hazards; flooding	Direct	Negative	Island	Long-term	Irreversible
Risk of hazards; pest out break	Direct	Negative	Island	Long-term	Reversible
Risk of hazards- storm surge	Direct	Negative	Island	Long-term	Irreversible
Risk of hazards- sea level rise	Direct	Negative	Island	Long-term	Irreversible
Risk of hazards- fire and other accidents	Direct	Negative	Island	Long-term	Irreversible

7.5.1 Air Quality- GHGs

Impacts to air quality arises indirectly from the operation of the building as the increased demand for utilities and waste management is provided by the respective service provider. Increased demand for water and sewer will be catered by MWSC, electricity by STELCO and waste management by WAMCO. The negative impact to air quality would be due to the release of GHGs and any other air pollutants to the atmosphere by the respective service provider in catering for the increase demand. Release of GHGs into the atmosphere during the operational phase is low when compared to the nations carbon budget, however it would still contribute to the nation's overall carbon budget and hence the range of this impact was considered at national level. The impact would be continuously occurring as long as the building is in operational condition but would cease if the buildings operations stops or the service providers. However, the already released GHGs will stay in the atmosphere for a long period of time and would contribute to global warming, ocean acidification and other related cumulative environmental impacts, as such the impact was considered irreversible. Considering the aforementioned characteristics of the impact, the consequences from the impact is considered catastrophic as it is long term, irreversible, large scale and detrimental to environment. The likelihood of this impact occurring is certain, hence the significance score for this impact is significant.

7.5.2 Noise Pollution

Noise pollution arises due to the noise generated from the direct activities of the project from the operations of the building. These include noise from the customers that visit the showrooms and workers residing within the building or from vehicles that would be operated to transfer goods to and from the warehouses. The impact is of negative nature as the overall ambient noise level of the area will increase and the people in the vicinity will be impacted negatively. The impact range is localized to a small area surrounding the project site. This impact would be continuously occurring as long as the building is operational. The impact is reversible as noise generated would cease upon discontinuation of the operations. Hence, the consequences from this impact are moderate. The likelihood of this impact occurring is certain, hence the significance score for this impact is very high.

7.5.3 Ground and marine water quality- negative

Negative impacts to ground water quality arises due to the potential for leaks and spills to occur in the utilities established within the building. Furthermore, salinization if groundwater is extracted. Indirect impacts to marine water quality are anticipated due to the increased water demand and increased output of waste water from the operation of the building. Of course, these will be managed by the respective service provider. The negative impact would be the contamination of water due to the leakage of sewerage from the utilities. Impacts to the groundwater will be localized, however the impacts to marine water quality from increase waste water discharge could be considered at Island level. While the impact may occur for a short duration as the management would quickly rectify any leaks or spills, any unnoticed or unidentified leaks would continue to detriment water quality. Furthermore, as contaminated groundwater from any leaks would take a long time to recover and deterioration of marine water quality could lead to irreversible impacts, this impact was considered as a long-term and irreversible impact. As such the consequences from this impact is considered major but it is unlikely to occur as proper systems and mitigation measures would be installed and implemented at the utility systems within the building, hence the final significance rating for this impact is medium.

7.5.4 Groundwater quality- positive

Positive impacts to groundwater are envisaged from the operation of this project if IWRM principles are established.

7.5.5 Impacts from waste

This impact arises due to the direct operation of the building. Organic waste and non-organic waste will be generated during the operational stage of the building from the workers and packaging waste from the warehouses. The impact is of negative nature as if the organic waste is not managed properly it could lead to environmental issues. For example, bad odour from organic waste. The range of the impact will be local as the waste from the workers would be kept within the basement of the building. The impact will be long-term as waste would be generated as long as the building is operational and would cease once the operation of building stops. The consequences from this impact are moderate as decomposition of garbage within the basement may cause spread of diseases in addition to bad odour. Proper waste management principles will be established within the building, as this impact is unlikely to occur. Hence, the final significance score for this impact is low.

7.5.6 Impacts on landscape integrity and scenery

This impact arises from the direct activities of the project from the operation of the newly constructed building with all its facilities. The impact is of positive nature as the building will be incorporated with modern architecture that will greatly improve the aesthetics of the area. The range of this impact would be at local level as the surrounding area will be affected. The impact will be long-term and irreversible. Hence, the consequences envisaged are major and the likelihood of this impact occurring is certain, giving this impact a significance rating of significant.

7.5.7 Risk of hazards; flooding

Hulhumale' was developed as an Island that would not flood with the installation of proper drainages and elevation of the entire Island. Furthermore, the flood risk analysis also show that flooding is an uncommon occurrence in this region of the Maldives. However, if a flood does occur it may damage the utilities and parked vehicles in the basement. Which would cause long-term and irreversible impacts. The consequences from this impact are major. However, the likelihood of this impact occurring is unlikely assuming proper mitigation and designs will be followed, the significance of this impact is high.

7.5.8 Risk of hazards; pest out break

Species which could become pests like rats and cockroaches must be properly monitored. The impact is of negative nature as a pest outbreak could have indirect health implications as well in addition to damaging equipment of the building as rats could eat cables and other plastic accessories. An outbreak also has the potential to impact the entire building depending on the magnitude of the outbreak. The impact is considered long-term as may require sometime to control the rats if an outbreak occurs. The impact can be reversible as chemicals can be used to control. The consequences from this impact are moderate. The likelihood of this impact is unlikely as no organic waste will be in the open for a long duration, hence the significance of this impact is low.

7.5.9 Risk of hazards- storm surge

Hulhumale' is located at a moderate risk zone for local storm surges compared to the rest of Maldives. The impact is of negative nature as a storm surge event may cause elevated sea levels and with strong waves could damage the infrastructures of the building is flooding reaches up to the project location. While the impact maybe localized to the utilities of the building, any damages to these infrastructures could in turn impact the entire building as discontinuation of utility services would make the building unliveable. As such the impact range was considered to be at Island level. Any damages due to a storm surge event may be long-term and irreversible depending on the gravity of damages. The consequences from such an event are major but with the possible likelihood of occurrence, this impact significance is high.

7.5.10 Risk of hazards- sea level rise

With the accelerated sea level rise due to global warming, the risk of hazards due to an event like storm surge as described in the above section is more probable. While the impacts due to this hazard is evaluated for the proposed project, sea level rise could potentially impact the entire Island as such the range of this impact is considered at Island level. This hazard has long-term and irreversible environmental implications. The consequences from such an event are major but with the unlikely likelihood of occurrence as Hulhumale' is elevated higher, this impact significance is medium.

7.5.11 Risk of hazards- fire and other accidents

This impact arises due to the direct operations of the building. Potential accidents include electrocution during servicing of electrical equipment's, chemical spills during servicing of utilities and fire/explosions. All of these hazards are negative in nature as it poses health risk to workers and residents in addition to damages to the infrastructures. The impact is of Island level range, long-term and irreversible. The consequences from this impact are major but the likelihood of occurrence is unlikely as proper mitigation measures will be implemented in the building operations, hence the significance of these hazards is medium.

7.6 Impact Boundary

As shown in Figure 41 primary impact area for the project is the footprint of the proposed building. The secondary impact area will be areas that could have impact on air quality and noise disturbance during construction and operation.

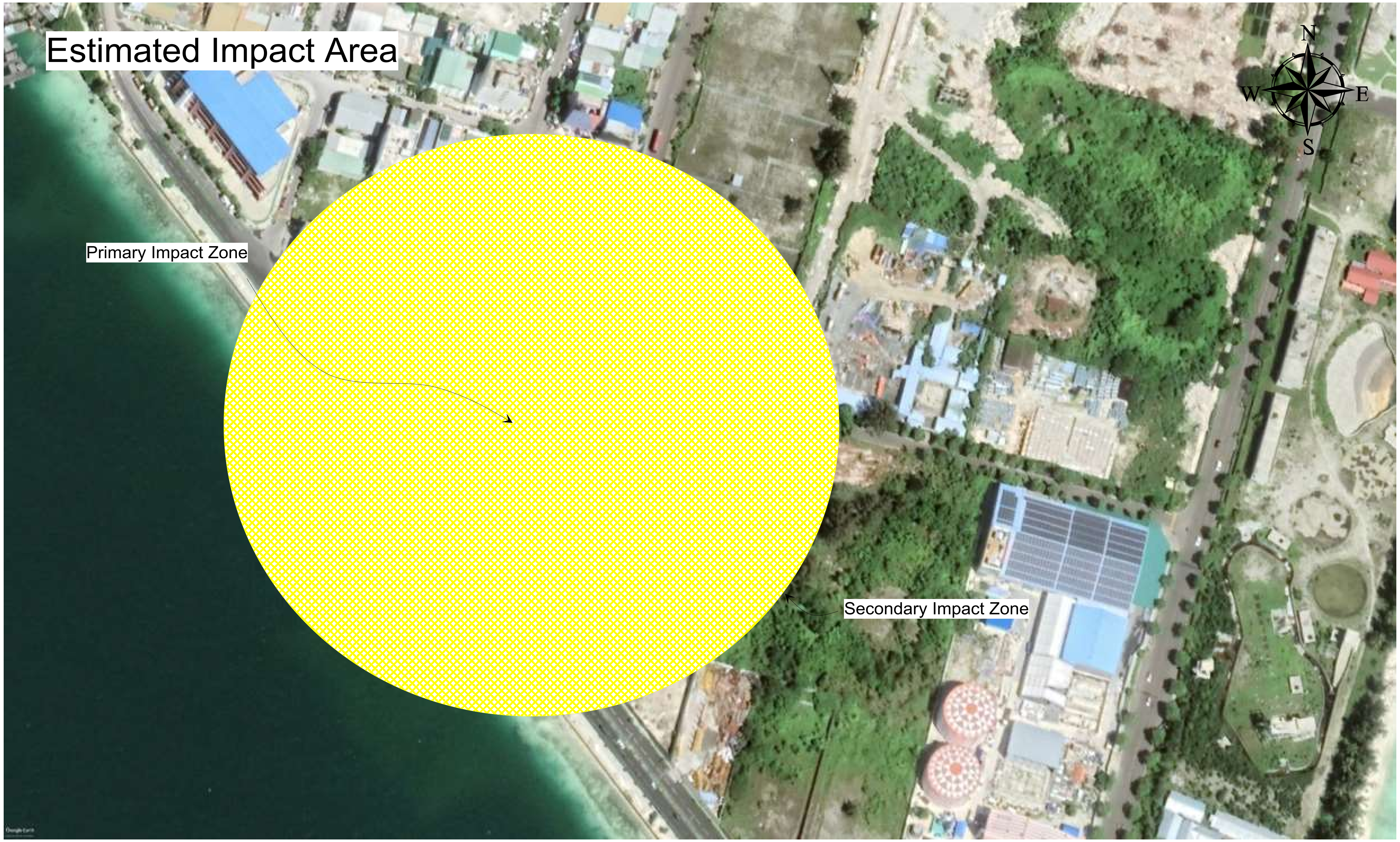

Figure 41: estimated impact boundary for the proposed project

8. OPTIONS ASSESSMENT

The possible causes of actions, in place of another that would meet the same purpose and need, otherwise known as alternatives, have been well considered in this study as alternatives are essential to a sound decision-making process and central to an effective EIA.

With due consideration to the purpose and need for the proposed project, there are four alternatives identified for this project, details of which are further discussed below:-

8.1 Options

This section describes the alternatives that were considered for the proposed development under this EIA.

8.1.1 Option 1: Maintain status-quo

The no project option means not going ahead with the entire project. This implies that there won't be any damages to the terrestrial environment of the project site and no disturbance to the neighbourhood but it also implies that the many social benefits anticipated from the project will not be available.

One of the main disadvantages faced by citizens living in Hulhumale and Male' will be loss of opportunity for convenient shopping from a reputed business. Having this commercial building built as planned will provide a convenient shopping opportunity for residents living in Male' and Hulhumale which in turn will directly benefit to the business owner. Due to the high social benefits and the direct benefit to the business envisaged from the proposed project, the "no project" scenario is not advisable for the proposed project.

8.1.2 Option 2: Alternative location

There is no option for an alternative location for this project as the current building location is the property of the proponent.

8.1.3 Option 3: Foundation type

An alternative method of laying foundation maybe an alternative to the project that maybe considered. The alternative method of foundation would be deep piling foundation. However, due to incidents of cracks in neighbouring buildings and vibration and noise-related inconveniences which occurred during the deep piling in the past in Male', deep piling is considered unsuitable for the congested areas. Therefore, the most commonly adopted method of laying foundations in the Maldives which is raft foundation method will be adopted in the construction of proposed project. Raft or mat foundations are often considered in situations where bearing capacity of the soil is poor, the load of the structure is to be distributed over a large area or the structure is constantly subjected to shocks or jerks. Although, since the soil is well-compacted heterogeneous material, it provides a very good base for raft foundations, there would be minimal disruption to adjacent structures. Raft foundations are also more economic when the structure includes a basement.

8.1.4 Option 4: Alternative material

The proposed commercial building as of now has been planned to construct using concrete structure. The alternative to the proposed material is to construct the building with steel structure and sandwich panels. The advantages of constructing the building using steel structure include that it takes less time for construction and design flexibility. While steel offers strength, speed, and design flexibility, it comes with higher costs and maintenance requirements.

8.2 Preferred Alternative

The preferred alternative is to proceed with the project as currently proposed over the alternatives of the no project scenario, change of location and change of foundation type due to the reasons mentioned in the aforementioned subsections.

9. ENVIRONMENTAL MANAGEMENT

This section describes the environmental and operational management systems and plans for the proposed development including practical mitigation measures for all identified impacts, a risk management plan, measures for sustainable development as well as environmental monitoring programs.

9.1 Proposed Mitigation Measures

The mitigation measures outlined in Table 27 and Table 28 below is proposed with due consideration to their cost effectiveness and feasibility to be implemented. The mitigation measures mainly relate to handling practices, design and quality of the proposed development and appropriate trainings which would ensure that environmental impacts would be minimized as effectively as possible.

It is the responsibility of the implementing agency to adhere to the proposed mitigation measures and bear any costs related to establishing them. If the proponent hires a contractor, then it is the responsibility of the proponent to include these mitigation measures in the project contract.

9.1.1 Construction Phase

The following table describes the preferred mitigation measures for the identified impacts during the construction phase of the proposed project.

Table 27: proposed mitigation measures for the identified impacts during the construction phase of the proposed project

Impact	Mitigation Aspect	Proposed Mitigation Measures	Timing	Required manpower	Expertise	Equipment	Technology	Estimated Cost	Implementing Agency	Performance Indicator
Mobilization impacts- Noise	Reduce noise disturbance from mobilization of heavy vehicles, machinery and materials	Restrict mobilization to daytime except for when foundation and flooring works; in these two cases mobilization can be done at a later hour as advised by HDC/Urbanco	Continuous during construction phase	Project Manager, Drivers	Experienced project manager to plan mobilization activities	Computer	Project management software	The salary of a project manager would vary depending on the proponent, typical salary of a project manager can range from MVR 25,000 to MVR 50,000. The cost of a computer may vary depending on the brand and computing power, typically one could get a basic desktop computer from around USD 300 to USD 600. The price of Microsoft projects perpetual license is for about USD 620.	Proponent	Complains from public for disturbance
		Avoid unnecessary use of machinery			Diligent staff					Machinery in optimal condition
		Ensure shortest mobilization route is chosen			Experienced project manager to plan mobilization activities					Complains from public for disturbance
		Ensure mobilization in one go as much as possible to avoid repeated transfer of materials or vehicles			Experienced project manager to plan mobilization activities					Injuries to hearing among staff
Mobilization impacts- Dust	Minimize release of dust	Ensure shortest vehicle transfer routes are established and construction materials are offloaded inside the project site which is fenced off to avoid movement of dust into the nearby areas	Continuous during construction phase	Project Manager, Drivers	Experienced project manager to plan access routes	Computer	Aerial imagery of the Island with roads	The cost of a computer may vary depending on the brand and computing power, typically one could get a basic desktop computer from around USD 300 to USD 600.	Proponent	Extent of dust released
Mobilization impacts- Oil spills on ground	Minimise likelihood of oil spills occurring during operation of heavy vehicles and machinery. Contain any spills that does occur (if any).	Have emergency oil spill cleanup crew on standby	Continuous during construction phase	Oil spill cleanup crew, Operator	Vehicle operator that is able to detect leakages	Spill cleanup materials	Spill cleanup technology	The cost of spill cleanup operations can vary widely depending on the size, location of spill, type of substance spilled, etc. Small spills on land/water can cost from few thousand o tens of thousands of dollars.	Proponent	Water quality assessments to detect contamination
Mobilization impacts- workforce; covid episode, negative social impacts, illegal labor	minimize likelihood of a covid episode due to the mobilization of workforce, avoid social negative impacts and prevent illegal labor	Screening as per HPA guidelines	Prior to mobilization	HR staff	HR staff that can read PCR tests	PCR test kit	PCR testing at an HPA approved facility	The cost of PCR test may vary depending on the institution from which it is done, typical ranges are USD 30 to USD 100 per test	Proponent	Complains from public for disturbance
		Illegal or undocumented labors shall not be allowed	Prior to mobilization	HR staff	HR staff that is aware of immigration policies	Office	Office administration	The salary for an HR staff may vary depending on the proponent, typically a mid-level HR staff salary is from MVR 12,000 to MVR 18,000 per month		Verified immigration documents
		Laborers shall be supervised by the site supervisor to avoid any socially or culturally or legally unacceptable behavior	Prior to mobilization	Supervisor, HR staff	Capable supervisor	No additional equipment required	No additional technology required	The salary of a site supervisor can vary depending on the proponent, typical salary is from MVR 15,000 to MVR 25,000 per month		Number of Complains
		Laborers shall be made aware of the sociocultural and legally unacceptable behavior	Prior to mobilization	HR staff	HR staff that can conduct awareness sessions and that is aware of Maldivian sociocultural	Projector, Computer	Presentation	The salary of a site supervisor can vary depending on the proponent, typical salary is from MVR 15,000 to MVR 25,000 per month		Behavior of workers

					norms and legal setting					
Generation of site clearance, demolition and constructional waste	Prevent littering and pollution of surrounding environment	Ensure efficient planning of project activities to ensure minimal waste generation and management of any waste generated on-site by segregation, reuse, recycling as much as possible	Prior to mobilization	Project Manager, Drivers	Experienced project manager	Waste collection and transfer equipment	Waste reuse or recycling	The salary of a project manager would vary depending on the proponent, typical salary of a project manager can range from MVR 25,000 to MVR 50,000. The prices of waste collection and transfer equipment's are highly variable depending on the type, brand, specifications and size. A rear-loading garbage truck price is typically between USD 100,000 to USD 300,000. Compactors and balers are between USD 1000 for small portable units to 10k to 1000k USD for larger units. A 10 cubic yard skip container can cost between USD 1000 to USD 2000.	Proponent	No waste in the open
		Following existing waste management legislations	Continuous during construction phase							
		Ensure efficient waste transfers to minimize accidental disposal/spillage	Continuous during construction phase							
		Designate waste collection/storage areas to minimize littering	Continuous during construction phase							
		Solid waste, oil and hazardous materials needs to be carefully handled and transported in sealed containers	Continuous during construction phase							
Vegetation clearance	Reduce the number of trees removed and minimize number of trees completely removed from the Island	Removed vegetation should be disposed as green waste and excavated earth disposed off at a location approved by Urbanco/HDC or to Thilafushi	Prior to construction	Excavator operator, Lorry driver	Driver that can drive	Excavator, Lorry, Waste transfer vessel	Digging and uprooting trees	Price of excavators depend on brand, size and specifications. A mini excavator that is suitable for landscaping can be for USD 20,000 to USD 90,000. A pickup trucks price maybe between USD 20,000 to USD 50,000. A 70 feet waste transfer vessel can be between USD 500,000 to USD 2 million depending on the specifications.	Proponent	No waste in the open
		Replanting any trees that can be replanted	Continuous during construction phase	Excavator operator, Lorry driver	Operator that can uproot and plant trees	Excavator, Lorry, supports	Planting trees	Supports for trees can be either wooden or metal stakes. The prices will vary depending on the size. The prices maybe between USD 1 to USD 10 per stake.	Proponent	Number of trees replanted
		All vehicles and machinery must be restricted to the proposed access tracks and sites	Continuous during construction phase	Project Manager, Drivers	Experienced project manager to plan access routes	Computer	Aerial imagery of the Island	The cost of a computer may vary depending on the brand and computing power, typically one could get a basic desktop computer from around USD 300 to USD 600.	Proponent	Percentage of untouched vegetation on the Island
		Only removing plants on the footprint of development.	Prior to construction	surveyor	Surveyor that can establish boundaries of development footprint	GPS	RTK GPS	Rover RTK GPS prices maybe between USD 5000 to USD 20,000 depending on the brand and specifications. The salary of a surveyor may vary depending on the proponent, typical salary maybe between MVR 15,000 to MVR 35,000.	Proponent	Extent of vegetation cleared beyond development footprints
Vibration impacts	Minimize damage to buildings	Ensure the access routes for vehicles are not too close to existing buildings	Prior to construction	Project Manager, Drivers	Experienced project manager to plan access routes	Computer	Aerial imagery of the Island	The cost of a computer may vary depending on the brand and computing power, typically one could	Proponent	Complains from public for disturbance

					and delimiting boundaries of infrastructures			get a basic desktop computer from around USD 300 to USD 600.		
Air Quality-GHGs	Minimize release of GHGs	Use of fuel low sulfur content	Continuous during construction phase	Procurement Manager	Procurement of low sulfur content fuel.	Low sulfur fuel	Equipment and machinery should able to handle low sulfur fuel	The price difference between low sulfur content fuel and normal fuel can vary depending on the region. As of May 2023 the global average price for low sulfur fuel is around USD 1.1 to USD 1.5 per liter and the global average price for gasoline is around USD 1.2 to USD 1.6 per liter.	Proponent	Concentration of air pollutants in project area
		Avoid unnecessary use of machinery		Project Manager, Supervisor	Efficient planning of project activities. Supervising.	Computer	Project management software	The salary of a project manager would vary depending on the proponent, typical salary of a project manager can range from MVR 25,000 to MVR 50,000. The cost of a computer may vary depending on the brand and computing power, typically one could get a basic desktop computer from around USD 300 to USD 600. The price of microsoft projects perpetual license is for about USD 620.		Hours of operation
		Daily maintenance of vehicles and machinery		Mechanical Engineer	Capable of maintenance of vehicles and machinery	Spares and tools	Detection of faults and rectifying them	The approximate average salary of a mechanical engineer is MVR 290,000 per year. The cost of spares and tools required for the maintenance of machinery/equipment's is not known at this stage and should be included in the project value. The costs maybe obtained by consulting with the manufacturer or qualified service provider.		Vehicles in optimal condition
Air Quality-Dust	Minimize release of dust	Cover the waste on the transfer vehicles and ensure shorted transfer routes are taken	Continuous during construction phase	Laborer, Driver	Experienced Project Manager	Covering cloth, Waste Transfer Vehicles	No additional technology required	A rear-loading garbage truck price is typically between USD 100,000 to USD 300,000.	Proponent	Level of dust at construction sites
		spraying the ground before excavation works with water		Laborer	Laborer who is able to operate water horse	Water horse, water pump, water supply, Electricity	RO	Cost of RO plants may vary depending on brand, size and specifications. Typically the price of a 10T RO plant is from USD 5000 to USD 50,000.		
		Ensuring that the trenches are backfilled as soon as possible by finishing works efficiently		Project Manager, Laborers	Experienced Project Manager	Excavator	No additional technology required	A mini excavator that is suitable for landscaping can be for USD 20,000 to USD 90,000.		
Noise Pollution	Minimize noise generated and duration of noise generated. Limit the noise generation hours to times that will cause minimum disturbance	Usage of heavy machinery and equipment should be restricted to smaller areas (eg take the shortest route possible when accessing to work site)	Continuous during construction phase	Project Manager	Experienced project manager	Computer	Project management software	The salary of a project manager would vary depending on the proponent, typical salary of a project manager can range from MVR 25,000 to MVR 50,000. The cost of a computer may vary depending on the brand and computing power, typically one could get a basic desktop computer from around USD 300 to USD 600. The price of Microsoft projects perpetual license is for about USD 620.	Proponent	Measurement of noise levels around construction site
		Park the heavy machinery within the work site (if possible) to avoid unnecessary transfer								
		Ensure project is completed as soon as possible								
		Restrict working hours to daytime only								

Groundwater quality- oil and chemical spills	Minimize risk of oil and chemical spills	Establish Oil/chemical handling procedures and ensure no spills occur	Continuous during construction phase	Environmental safeguard officer and oil spill cleanup crew	Environmental officer	Oil spill cleanup kits and chemical handling procedures	Spill cleanup technology	The cost of spill cleanup operations can vary widely depending on the size, location of spill, type of substance spilled, etc. Small spills on land/water can cost from few thousand o tens of thousands of dollars. Medium spills on coastal waters can cost from tens of thousands to several hundred thousand dollars. Typical salary of an environmental safeguard officer is between MVR 15,000 to MVR 30,000 per month.	Proponent	Spills and remediation
		Workers should be well trained about proper use of machinery and equipment relevant to them								
		Have emergency oil spill cleanup crew on standby during construction								
		All machinery and equipment should be well maintained to avoid accidental spillage								
Groundwater quality- salinization	Minimize groundwater salinization from dewatering	Water extracted from dewatering should be recharged back to the ground to a designated area after checking the water quality as advised by HDC/Urbanco and EPA	Continuous during construction phase	Laborers, Environmental safeguard officer	Environmental officer	Pump, water horse	Water quality testing	Typical salary of an environmental safeguard officer is between MVR 15,000 to MVR 30,000 per month. Water testing costs are depended on the parameters being tested. The costs can be obtained from MWSC laboratory.	Proponent	Groundwater salinity
		Efficient planning of foundation to ensure least number of dewatering days	Prior to dewatering	Project Manager, Laborers	Experienced project manager	Computer	Project management software	The salary of a project manager would vary depending on the proponent, typical salary of a project manager can range from MVR 25,000 to MVR 50,000. The cost of a computer may vary depending on the brand and computing power, typically one could get a basic desktop computer from around USD 300 to USD 600. The price of Microsoft projects perpetual license is for about USD 620.	Proponent	Number of dewatering days
Impacts on marine environment	Control the spread of high turbid water during discharge of dewatering water into lagoon	Use silt screens and settling tanks prior to discharge to minimize the turbidity of the discharged water	Continuous during construction phase	Environmental safeguard officer, laborers	Environmental officer	silt screen	sediment control	Depending on the size, material and features of the silt screen the prices may vary. A basic silt screen made of polypropylene fabric maybe available for USD 0.50 per square foot, while reinforced PVC material screen may cost USD 2 to USD 3 per square foot.	Proponent	Extent of turbid water plume created
Impacts on terrestrial environment- soil and ground	Minimize area of ground compaction and extent of damages to soil profile	Ensure shortest accessibility to construction sites	Prior to construction	Experienced Project Manager	Project management skills	Computer	Project management software	The salary of a project manager would vary depending on the proponent, typical salary of a project manager can range from MVR 25,000 to MVR 50,000. The cost of a computer may vary depending on the brand and computing power, typically one could get a basic desktop computer from around USD 300 to USD 600. The price of Microsoft projects perpetual license is for about USD 620.	Proponent	Extent of ground compaction and soil profile compromised
		Plan for bulk transport of construction materials to ensure trips are more efficient and fewer trips are needed	Continuous during construction phase							
		Ensure number of waste transfer are low by making sure that vehicles are full	Continuous during construction							
Risk of accidents and pollution on workers and	Minimize risk of accidents to non-relevant personnel	Construction site fenced off	Prior to construction	Laborers	No additional expertise required	Aluminium sheets, metal poles	No additional technology required	The cost of a fence may vary highly depending on the materials used. An Aluminium fence may cost from USD 20 to USD 50 per linear foot.	Proponent	Unwanted entries to project site

residents		Unauthorized entry of unwanted people must be restricted	Prior to construction	Security guard	Experience in security management	Camera and other security management equipment	Camera system	The cost of a camera system may vary depending on the brand and specifications. Basic entry level camera system with 2-3 cameras may cost from USD 1000 to USD 300.		
		Sign boards at construction site	Prior to construction	Laborers	No additional expertise required	Sign boards	No additional technology required	Cost of sign boards will vary depending on size and material used. In general, a small sign board made from materials like PVC, metal or Aluminium will cost from USD 10 to USD 50.		
	Minimize risk of accidents to workers	All working staff must be well trained and advised on the importance of occupational health and safety	Prior to construction	Safety Officer	Environmental and safety officer	Safety, first aid kits and PPE equipment's	Safety and spill cleanup technology	The cost of PPE may vary depending on the type of equipment needed. Some approximate costs for common PPE are; Disposable masks: USD 0.20 to USD 1 per mask N95 masks: USD 2 to USD 5 per mask Face shields: USD 5 to USD 20 per shield Disposable gloves: USD 0.05 to USD 0.50 per pair Reusable gloves: USD 5 to USD 20 per pair Disposable gowns: USD 5 to USD 15 per gown Reusable gowns: USD 30 to USD 100 per gown. These prices may vary highly depending on the brand, quality and quantity purchased.	Proponent	Accidents and injuries to workers
		Ensure all workers are provided with PPE	Continuous during construction phase	Environmental Safeguard Officer						
		In case of oil/chemical spills, clean up kits shall be available at all times		Environmental Safeguard Officer						
		In case of accidents, workers should be taken to the nearest hospital immediately		Environmental Safeguard Officer						
		Firefighting equipment must be made available at work site		Safety Officer						
		Trenched and excavated material should be stockpiled at a designated area		Environmental Safeguard Officer						
		Safety lights at night to avoid people from falling into open trenches		Environmental Safeguard Officer						
		Shoring for adjacent buildings during excavation if there is any risk of collapse	Prior to construction	Environmental Safeguard Officer						
Impacts on landscape integrity and scenery	Minimize aesthetically displeasing view for any people that can see project area	Project area shall be fenced off and informing of the project construction works	Prior to construction	Laborers	No additional expertise required	Aluminium sheets, metal poles	No additional technology required	The cost of a fence may vary highly depending on the materials used. An Aluminium fence may cost from USD 20 to USD 50 per linear foot.	Proponent	Number of Complains
Socio-economic impacts-Negative	Minimize hindrances to traffic flow	During foundation and flooring works, mobilization can be done at a later hour as advised by HDC/Urbanco. In case roads need to be closed, permits should be obtained from relevant authority and road block signs should be enacted	Prior to construction	Project Manager	Experienced project manager to plan access routes and hours	No additional equipment required	No additional technology required	The salary of a project manager would vary depending on the proponent, typical salary of a project manager can range from MVR 25,000 to MVR 50,000.	Proponent/HDC/Urbanco	Number of complaints from public
	Minimize risk of mosquito growth	Implement proper waste management at project site such that no containers are left that can retain water	Continuous during construction phase	Project Manager, Drivers	Experienced project manager to plan efficient schedule of works	Waste collection and transfer equipment	No additional technology required	The salary of a project manager would vary depending on the proponent, typical salary of a project manager can range from MVR 25,000 to MVR 50,000. The cost of a computer may vary depending on the brand and computing power, typically	Proponent	Increased mosquito breeding grounds
		Ensure foundation laying works are completed in the shortest duration				Computer	Project management software		Proponent	

	Minimize damages to roads	Ensure shortest transfer routes are taken and that the drivers are well trained				No additional equipment required	No additional technology required	one could get a basic desktop computer from around USD 300 to USD 600. The price of Microsoft projects perpetual license is for about USD 620.	Proponent/Urbanco/HDC	Damages to roads
Socio-economic impacts-Positive	Increase the chance of local workers/ contractors being hired	Work with locals and local businesses so that the needs of the project can be addressed by them	Prior to construction	Project manager, HR/PR staff	People skills	Computer	Ads, presentations	The salary for an HR staff may vary depending on the proponent, typically a mid-level HR staff salary is from MVR 12,000 to MVR 18,000 per month	Proponent	Number of local workers hired
		Inform the local businesses about the construction works and its schedule	Prior to construction	Project manager, HR/PR staff	People skills	Computer	Ads, presentations			
		Give priority to local contractors	Prior to construction	HR staff	No additional expertise required	No additional equipment required	No additional technology required			

9.1.2 Operational Phase

The following table describes the preferred mitigation measures for the identified impacts during the operational phase of the proposed project.

Table 28: proposed mitigation measures for the identified impacts during the operation phase of the proposed project

Impact	Mitigation Aspect	Proposed Mitigation Measures	Timing	Required manpower	Expertise	Equipment	Technology	Estimated Cost	Implementing Agency	Performance Indicator
Air Quality-GHGs	Reduce volume of GHGs released	Incorporate renewable energy	Prior to operations	Technical staff	Technicians	Depends on the type of chosen renewable energy technology (most common is solar in Maldives)	Renewable energy technology	The price of solar panel can vary depending on the size, efficiency and the manufacturer. A general estimate is USD 100 to USD 500 or more for a single solar panel. However, the cost per watt is considered to be a more useful metric for comparing the cost of solar panels, which can range from USD 0.50 to USD 1.50 or more per watt, depending on the factors mentioned above.	Proponent	Percentage contribution of renewable energy
Noise Pollution	Minimize noise generated	Implementing guidelines for customers and visitors where they will be required to maintain certain level of noise	Continuous during operations	Operations Manager, Security guards	Management skills	Computer, leaflets, notices	Social management skills	A typical salary for an operations manager would be between MVR 15,000 to MVR 35,000 per month based on their qualifications and responsibilities.		Noise level
		Re-stocking of the warehouse and showrooms can be schedule to daytime	Continuous during operations	Operations Manager	Management skills	Computer	Operations management software			
Ground and marine water quality-negative	Minimize risk of leaks within the utility systems	Ensure that leak detection systems are working	Continuous during operations	Technical staff	Water and sewer technicians	No additional equipment required	Leak detection	Typical salary for technical staff maybe between MVR 10,000 to MVR 20,000. The cost of spares and specialized tools are highly variable and details are not available at this stage to provide an estimate as such these costs shall be included within the operational costs.	Proponent	Logs
		Routine maintenance and monitoring of the utility system	Continuous during operations	Technical staff	Water and sewer technicians	O&M equipment's	No additional technology required			Logs
Groundwater quality-positive	Encourage protection and preservation of groundwater resources	Implement IWRM principles	At the design stage	Design consultant	Engineering	Computer	IWRM concepts	The salary for a design consultant may vary depending on their experience, qualification and proponent. Typical salaries maybe from MVR 20,000 to MVR 35,000 per month	Proponent	water quality
Impacts from waste	Ensure waste is managed properly	Ensure that the waste collection systems are functioning properly	Continuous during operations	Operations Manager	Management skills	Computer	Operations management software	A typical salary for a operations manager would be between MVR 15,000 to MVR 35,000 per month based on their qualifications and responsibilities.	Proponent/WAMCO	Logs
		Ensure that organic waste and packaging waste is taken from the garbage collection area routinely by WAMCO	Continuous during operations							
Impacts on landscape integrity and scenery	Ensure that the infrastructures are operating at optimal conditions	Routine maintenance such that the outlook of the new infrastructures are at optimal condition	Continuous during operations	Technical staff	Technicians in relevant field	Spares, specialized tools and equipment's required for maintenance work	No additional technology required	The salary of technical staff may vary depending on the field. A general estimate is MVR 15,000 to MVR 30,000 per month.	Proponent	Outlook of infrastructures
Socio-economic impacts - negative	Reduce impacts to indoor and outdoor air quality	Ensure adequate ventilation systems are established	Project planning stage	Civil Engineer	Engineering	Computer	Designing software	A typical salary of a civil engineer maybe between MVR 10,000 to MVR 30,000 per month.	Proponent	Measure of indoor and outdoor air quality

	Reduce impacts to traffic flow	Ensure adequate parking and access routes are established	Project planning stage	Project Manager, Urban planner	Urban development skills	Computer	Urban resource use planning	A typical salary for a urban resource use planner maybe between MVR 20,000 to MVR 35,000 per month.	Proponent, HDC/Urbanco	Available parking space and level hindrance to traffic flow
Socio-economic impacts - positive	Ensure that the infrastructures and facilities are operating at optimal conditions	Routine maintenance such that the infrastructures and facilities are operational at optimal condition	Continuous during operations	Technical staff	Technicians in relevant field	Spares, specialized tools and equipment's required for maintenance work	No additional technology required	A typical salary for a natural resource use planner maybe between MVR 20,000 to MVR 35,000 per month.	Proponent	Condition of infrastructures and facilities
		All machinery and equipment's shall conform to international minimum standards and utilities must confirm to the respective service provider standards	Project planning stage	Procurement consultant	Knowledge in relevant field of water/sewer/waste/coastal	Computer	No additional technology required	A typical salary for a procurement consultant is roughly MVR 370,000 per year.	Proponent	
		Ensure that the utilities is designed as per URA and the service providers standards	Project planning stage	Design consultant	Consultant in relevant field of water/sewer/waste/electrical	Computer	Designing software	A typical salary for a design consultant maybe between MVR 20,000 to MVR 35,000 per month.	Proponent, URA	
		Ensure that in the design of the building, there is adequate access for vehicles to move	Project planning stage	Design consultant	Consultant in relevant field of urban planning	Computer	Designing software	A typical salary for a design consultant maybe between MVR 20,000 to MVR 35,000 per month.	Proponent	Accidents
		Have detailed operation and maintenance manuals for the utilities, air condition systems and lifts. Furthermore, ensure they are maintained routinely	Continuous during operations	Engineer, operations manager	Knowledge in relevant utility field	Obtain manuals from manufacturer	No additional technology required	A typical salary for an engineer maybe between MVR 20,000 to MVR 35,000 per month.	Proponent	O&M manuals, Logs
		Have a detailed health and safety, emergency response plans made to the building	Prior to operations	Health and Safety officer	Knowledge in emergency response	Computer	No additional technology required	A typical salary for a design consultant maybe between MVR 20,000 to MVR 35,000 per month.	Proponent	Health and safety manuals, Emergency Response plans
Risk of hazards; pest out break	Minimize risk of pest outbreaks	Ensure that organic waste is routinely transferred out and littering prevented	Continuous during operations	Workers	No additional expertise required	Pesticides	No additional technology required	A typical salary for non-technical staff maybe between MVR 10,000 to MVR 15,000 per month.	Proponent	Prevalence of pests like rats and cockroaches
Risk of hazards- storm surge	Minimize risk of flooding and minimize damages if a flood does occur	Ensure that electrical panel boards are elevated and install storm water pumps. Furthermore, ensure that the garages are waterproof and ground floor level is elevated	Project planning stage	Design consultant	Consultant in relevant field of water/sewer/waste/electrical	Computer	Designing software	A typical salary for a design consultant maybe between MVR 20,000 to MVR 35,000 per month.	Proponent	Extent of damages due to flooding and number of flood events
Risk of hazards; flooding										
Risk of hazards- sea level rise										
Risk of hazards- fire and other accidents	Minimise risk of fire and other accidents	Ensure all firefighting and lightning protection equipment's/systems are installed in all facilities and operational for example smoke detectors, fire extinguishers	Continuous during operations	Environmental safeguards officer	Health and safety, environmental science	PPE, Manuals	No additional technology required	Typical salary of an environmental safeguard officer is between MVR 15,000 to MVR 30,000 per month. Cost of PPE equipment's and manuals shall be included within operational	Proponent	Health and safety manuals, Emergency Response

		Ensure personal protective equipment is made available to all staff and they use them properly						costs.		plans, Chemical handling procedures, logs
		Establish emergency preparedness response plans, health and safety manuals								
		Ensure emergency procedures, O&Ms are readily available								
		Ensure staff are adequately trained for emergencies, health and safety procedures, oil/chemical handling								
		All personnel must strictly abide COVID 19 guidelines set by HPA – social distancing, wearing masks and regular hand washing or sanitization								

9.2 Justification for the selected mitigation measures

The abovementioned mitigation measures for the construction and operational phase of the project were selected as those mitigation measures requires the least additional manpower, expertise, equipment, technology, and costs. Additionally, because the mitigation measures fulfil the initial principle of avoidance followed by minimisation in the cases where the impact could not be avoided and lastly compensation in those cases where avoidance and minimisation were not possible.

9.3 Effectiveness of mitigation measures

The effectiveness of proposed mitigation measures in the Maldivian setting is very difficult to ascertain due to the lack of monitoring data that is available. As such the full effectiveness of the proposed mitigation measures will be determined by the follow-up surveillance of the performance indicators that is highlighted for each mitigation measure and by monitoring of the parameters that is highlighted in section 9.7.1 under the Table 29.

9.4 Risk Management and Incident Response

Risk management procedures in this project are strengthened by adopting a more systematic risk management approach to safety. This is achieved by identifying all foreseeable impacts (as stated in section 7 of this report), assessing the risk of each impact and providing a means to control the impacts (mitigation measures).

9.5 Sustainable Development Management Policy

The design and implementation of the project ensures that the proposed project is sustainable. As such, measures adopted to promote sustainable development include some guiding principles as well as components incorporated into the project design. These include: -

- Ensure environmental compliance with the Governmental policies and regulations;
- Protect people, property and the local environment;
- Reduce ecological impacts of the services provided; and
- Increase customer satisfaction.

9.6 Managing Uncertainties in Impact Prediction

Uncertainty is an integral part of an EIA as EIA preparation involves prediction. The two types of uncertainties associated with the EIA process include those associated with the process and those associated with predictions. With the former, the question is whether the most important impacts have been identified and whether the recommendations will be acted upon. In order to reduce such uncertainties, a wide range of stakeholders have been consulted (Section 6.2) in the EIA process in order to minimize the risk of missing important impacts. For the latter, the uncertainty is in the accuracy of the findings. This can be improved by research and quality of the survey, and by follow-up monitoring.

It should also be noted that even though EIA cannot give a precise picture of the future, it enables uncertainties to be better managed and is an aid to better decision making.

9.7 Environmental Monitoring

Monitoring is an essential part of the EIA and project implementation and serves 3 purposes: -

- Ensures that the proposed mitigation measures are being implemented;
- Evaluates whether the proposed mitigation measures are working effectively; and
- Validates the accuracy of models or projections that were used during impact assessment process.

The purpose of monitoring is to compare the predicted impacts with that of the actual impacts, particularly if the impacts are either very important or the scale of the impact cannot be predicted accurately. The results of monitoring can then be used to manage the environment, particularly to highlight problems early on so an action can be taken.

Monitoring should not be seen as an open-ended commitment to data collection and to minimize the expenses associated with collecting unnecessary data, the data collection should cease when the need for monitoring ceases. Therefore, it is important that a proper monitoring schedule is adhered to. Conversely, monitoring may also indicate the need for more intensive study. The information obtained from monitoring can be extremely useful for future EIAs in making them more accurate as well as more effective.

9.7.1 Monitoring Parameters

The baseline data collection for the proposed development was undertaken in November 2023. Baseline surveys were conducted to determine the reference range, so that comparisons can be made during the monitoring to determine the change.

All monitoring activities must be carried out under supervision of a registered EIA consultant. Details of the monitoring program are given in Table 29 below.

It is the responsibility of the implementing agency to adhere to the monitoring program and bear any costs related to reporting them.

Table 29. Environmental monitoring plan proposed for the proposed development

Parameter	Locations	Method	Indicators	Frequency	Cost / MRF	Staff requirement
CONSTRUCTION PHASE						
Ground water	Construction site and Control	Water quality test	Compare with baseline	Every 3 months during construction	4000	1 surveyor
Air quality	Outdoor	Air quality measurement	Compare with baseline	Every 3 months during construction	3000	1 surveyor
Traffic flow	Construction site	Traffic Count	Compare with baseline	Every 3 months during construction	2000	2 surveyors
Waste	Construction site	Visual inspection	Improper management of waste	Every 3 months during construction	500	1 surveyor
Accidents	Project site	Workplace accidents	Number of incidents	Every 3 months during construction	1000	1 surveyor
Noise	Project site and Control	Decibel meter or any other equipment that can measure sound levels	Compare with baseline	Every 3 months during construction	500	1 surveyor
OPERATIONAL PHASE						
Air quality	Indoor and outdoor	Air quality measurement	Compare with baseline	Every 3 months after construction for 1 year and annually for 5 years	5000	1 surveyor

Noise	Project site and Control	Decibel meter or any other equipment that can measure sound levels	Compare with baseline	Every 3 months after construction for 1 year and annually for 5 years	500	1 surveyor
Ground water	Project site and Control	Water quality test	Compare with baseline	Every 3 months after construction for 1 year and annually for 5 years	4000	1 surveyor
Waste	Waste collection area	Visual	Odour and littering	Every 3 months after construction for 1 year and annually for 5 years	1000	1 surveyor
Traffic flow	Construction site	Traffic Count	Compare with baseline	Every 3 months after construction for 1 year and annually for 5 years	2000	2 surveyors
Accidents	Project site	Number of accidents	Number of incidents	Every 3 months after construction for 1 year and annually for 5 years	1000	1 surveyor

9.7.2 Environmental Monitoring Report Submission Schedule

Monitoring reports must be submitted to the EPA as specified under the monitoring schedule below: -

Table 30. Monitoring schedule recommended for the proposed development assuming that the project commences in December 2023 and completes on February 2025

Description	Date
EIA Decision statement issued	December-23
Project commencement	December-23
Monitoring report during construction- 1	March-24
Monitoring report during construction- 2	June-24
Monitoring report during construction- 3	September-24

Monitoring report during construction- 4	December-24
Monitoring report during construction- 5	February-25
Monitoring report during operation- 1	March-25
Monitoring report during operation- 2	June-25
Monitoring report during operation- 3	September-25
Monitoring report during operation- 4	December-25
Monitoring report during operation- 5	March-26
Monitoring report during operation- 6	March-27
Monitoring report during operation- 7	March-28
Monitoring report during operation- 8	March-29
Monitoring report during operation- 9	March-30
Monitoring report during operation- 10	March-31

9.7.3 Environmental Monitoring Report Format

Following is the environmental monitoring report format expected for this project. The report will include the details of the methods used to collect data, sampling sites, sampling frequency, results and analysis. All data collected in the monitoring period shall be presented in the monitoring report without bias and data shall be compared with the baseline values presented in this EIA report. For the preparation of this monitoring report a surveyor and an environmental consultant will be required.

Introduction

    Purpose of the monitoring report

    Introduction of consultant and proponent

Methodology

    Describe the methods used to collect data

    Sampling sites

    Geographic coordinates

Results

    Present results for the monitoring period

    Comparison with baseline

Conclusion

    Specify if environmental thresholds are being exceeded

Propose any additional mitigation measures

10. JUSTIFICATION AND CONCLUSION

The purpose of this EIA is to critically analyse and assess the potential environmental impacts associated with the proposed development of an 8 storey commercial building and analyses the solutions and preferred alternatives as well as mitigation measures to minimize any negative impacts whilst trying to derive the maximum positive impacts from the project.

The centralization of capital city of Maldives, Male' over the past years has led to the immigration of locals from outer Atolls to Male', where the basic necessities are inefficient. As a result, Male' is now one of the most congested cities in the world. In order to provide a solution for this, Hulhumale' reclamation project was initiated in 1997, the official inauguration of the city occurred in 2004. Reclamation of 188 ha of land of Hulhumale' phase 1 was completed on 2002. The city has become home to some major commercial developments. Hulhumale' phase 1 was developed with an open space index of 2.50, to ensure a healthy lifestyle. Including parks, green strips and open sports areas, Hulhumale' provides a total of 50,000 sqft of open space areas.

One of the key objectives of hulhumale development is to release pressure in Male and to build a strong commercial base. The advantages of Hulhumale over Male City include its location close to international airport connected by land, availability of land and well planned developments etc. Also, Hulhumale is being developed in a sustainable way, which means that it is expected to have a lower environmental impact than Male city. As a result of these factors, Hulhumale is increasingly being seen as the Maldives's premier commercial hub. The government is committed to developing Hulhumale into a world-class business destination, and a number of major companies have already invested in the city.

The proposed 08 storey commercial building at LOT No. 10318 (M4-07 (10318) at industrial zone in Phase 1 facing Reethigas Magu is to be used for commercial use only. The proponent of the project is Muni Enterprise Pvt Ltd. The land area of 4419.87Sq.Ft has been leased to Muni Enterprize for a period of 15 years (Agreement no: HDC/LDL/2022/19, dated 30th March 2022). The construction work has been contracted with Batch Pvt Ltd – one of the leading construction companies in Maldives. The building will be used for commercial purpose allowed to display of products for sale including furniture, sanitary wares and appliances. The supporting facilities include admin office, meeting room, staff room, inventory storage, parking and toilets. Under the signed agreement it is prohibited to set it for accommodation, industrial use, store flammables materials/substances etc. Also under the Hulhumale Development Guideline – Showroom Development Guideline annexed to the agreement signed between Muni Enterprise Pvt Ltd and HDC it says the maximum building height from the pavement level to terrace slab level is 18.5m (6 floors). However, the approved drawing for the proposed commercial building is on 8 floors (8 storey commercial building), which requires approval from the land "Lessor (HDC)" and bring an amendment to the contract before commencing proposed construction work.

The major regulatory requirements for the project involve obtaining the EIA decision statement to go ahead with the project as per the EIA regulation, following with the legislations pertaining to building works, waste management and other utility service provision. In order to assess the existing environment of the project site, various aspects were studied under the EIA. Some of them are, air quality, noise, socioeconomic environment, traffic and water quality. Additionally, this study also involved identification of alternative options in place of the proposed development. The considered options were no project scenario, moving project location and alternative types of foundation and groundwater recharging option from access rainfall.

Air and noise pollution arising specially from vibrations, operation of heavy machinery as well as disturbances on the traffic flow due to road blocks are the most significant negative impact which would arise during the construction phase of the project. Additionally, during the operational phase, it is anticipated that there will be increase in traffic flow in the area while also improvement on landscape and scenery of the location. Major mitigation measures proposed in the construction phase include measures to take dust suppression actions such as spraying water on ground, ensuring shortest vehicle route in mobilization, vehicles are maintained properly, avoiding unnecessary use of vehicles, planning road closure in such a way that it wouldn't over burden the traffic, following oil and chemical handing procedures, having emergency spill clean-up crew at site and following best practices in waste management at all phases of the project.

The socioeconomic benefits during the operations far outweigh the negative impacts. It is expected that the proposed development will provide convenient opportunities for shoppers in Hulhumale' which will directly benefit for the proponent and the communities living in the area.

Therefore it is recommended to proceed with the construction of 8 storey commercial building as proposed by taking necessary mitigation measures prescribed and conditions set in the report.

11. ACKNOWLEDGEMENTS

Consultants would like to extend sincere gratitude to everyone who has contributed to this report. Thanks are due to the stakeholders who kindly contributed their expertise and fair judgment regarding this project. Representatives of proponent are highly appreciated for their generosity in providing any requested information for the compilation of this EIA report.

12. APPENDICES

APPENDIX A. REFERENCES

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APPENDIX B. LIST OF ABBREVIATIONS

Cases

AS/NZS : Australia / New Zealand Standard 159

AS/NZS ISO : Joint Australian New Zealand International Standard 28

CO : Carbon Monoxide 122

CO2 : Carbon dioxide 122

DS : Decision Statement 26

EIA : Environmental Impact Assessment 23

EPA : Environmental Protection Agency 26

GHG : Greenhouse gas 78

HCHO : Methyl aldehyde or Formaldehyde 122

HIES : Household Income & Expenditure Survey 136

IT : Information Technology 26

MFDA : Maldives Food and Drug Authority 44

MNDF : Maldives National Defense Force 77

MPHRE : Ministry of Planning, Human Resource and Environment 38

NO2 : Nitrogen Dioxide 122

PM10 : Particulate Matter less than 10 microns 122

PM2.5 : Particulate Matter less than 2.5 microns 122

RO : Reverse Osmosis 26

SDG : Sustainable Development Goal 79

SO2 : Sulfur Dioxide 122

ToR : Terms of Reference 26

TVOC : Total Volatile Organic Compounds 122

UN : United Nations 79

APPENDIX C. LAND HANDOVER DOCUMENT

urbanco

REM-2021-FRM-007 _ V 2.0

HANDOVER NOTE

Land Management Section

REAL ESTATE MANAGEMENT DEPARTMENT

Housing Development Corporation Limited
HDC Building, Hulhumalé, Republic of Maldives
Hotline 1516 T +960 333 3535
E hello@urbanco.mv W www.urbanco.mv

General Information

Handover Note No	H-IL/2023/15
Handover Date	21st May 2023

With regard to the agreement no HDC/LSL/2022/19 signed on 30th March 2022 between Housing Development Corporation Limited (HDC) and Muni Enterprises Pvt Ltd, HDC hands over the allocated land in Hulhumalé Phase 1, Industrial Lot-10318 (M4-07) with a total area of 4,419.87sqft to Muni Enterprises Pvt Ltd as per the conditions below.

- All demarcated coordinates must be checked and assessed for confirmation by the receiving party and should be submitted to this corporation within 7 (seven) days of handover.
- Please note that if the required documents are not submitted within working 7 (seven) days, we will process that our plotted coordinates have been accepted by the party.
- The developer will fence the plot within 14 (fourteen) days from the date of land handover.

Authorized By

Name: Shazim Saeed

Designation: Director

Date: 21st May 2023

I, hereby handover the aforementioned lot 10318 on behalf of HDC.

Handed Over By

urbanco

Name: Munaz Ibrahim

Designation: Assistant Estate Officer

Date: 21st May 2023

I, have inspected the aforementioned lot 10318 and hereby accept the plot on behalf of Muni Enterprises Pvt Ltd.

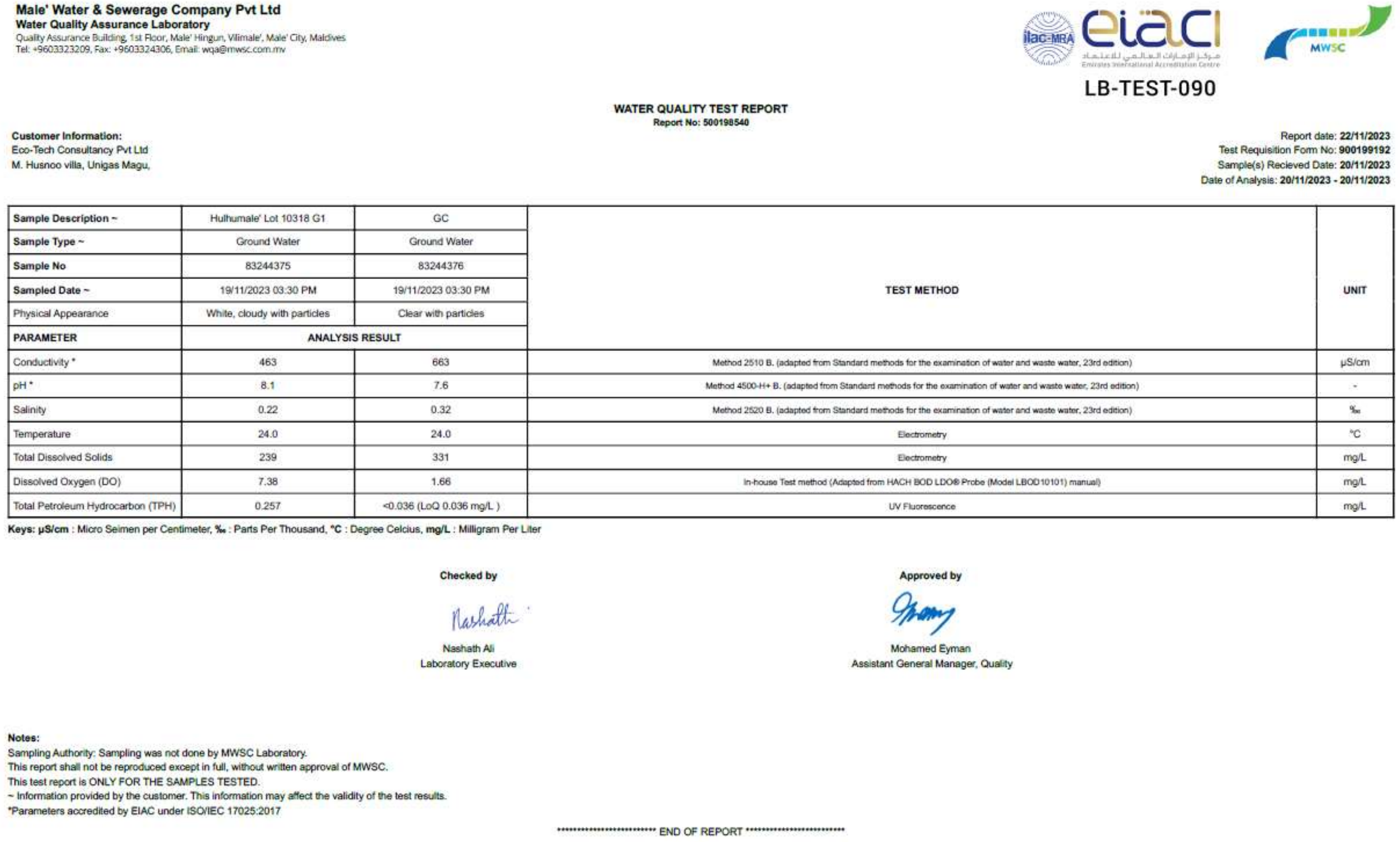
Inspected By

Name: ALI SHAATHIR

ID No: ASST MANAGER

Date: 21st May 2023

APPENDIX D. WATER QUALITY ASSESSMENT RESULTS



Male' Water & Sewerage Company Pvt Ltd
Water Quality Assurance Laboratory
Quality Assurance Building, 1st Floor, Male' Hingun, Vilimale', Male' City, Maldives
Tel: +9603323209, Fax: +9603324306, Email: wqa@mwsc.com.mv

LB-TEST-090

WATER QUALITY TEST REPORT
Report No: 500198540

Customer Information:
Eco-Tech Consultancy Pvt Ltd
M. Husnoo villa, Unigas Magu,

Report date: **22/11/2023**
Test Requisition Form No: **900199192**
Sample(s) Recieved Date: **20/11/2023**
Date of Analysis: **20/11/2023 - 20/11/2023**

Sample Description ~	Hulhumale' Lot 10318 G1	GC	**TEST METHOD**	**UNIT**
Sample Type ~	Ground Water	Ground Water		
Sample No	83244375	83244376		
Sampled Date ~	19/11/2023 03:30 PM	19/11/2023 03:30 PM		
Physical Appearance	White, cloudy with particles	Clear with particles		
PARAMETER	**ANALYSIS RESULT**			
Conductivity *	463	663	Method 2510 B. (adapted from Standard methods for the examination of water and waste water, 23rd edition)	µS/cm
pH *	8.1	7.6	Method 4500-H+ B. (adapted from Standard methods for the examination of water and waste water, 23rd edition)	-
Salinity	0.22	0.32	Method 2520 B. (adapted from Standard methods for the examination of water and waste water, 23rd edition)	‰
Temperature	24.0	24.0	Electrometry	°C
Total Dissolved Solids	239	331	Electrometry	mg/L
Dissolved Oxygen (DO)	7.38	1.66	In-house Test method (Adapted from HACH BOD LDO® Probe (Model LBOD10101) manual)	mg/L
Total Petroleum Hydrocarbon (TPH)	0.257	<0.036 (LoQ 0.036 mg/L)	UV Fluorescence	mg/L

Keys: µS/cm : Micro Seimen per Centimeter, **‰** : Parts Per Thousand, **°C** : Degree Celcius, **mg/L** : Milligram Per Liter

Checked by

Nashath

Nashath Ali
Laboratory Executive

Approved by

Mohamed Eyman
Assistant General Manager, Quality

Notes:
Sampling Authority: Sampling was not done by MWSC Laboratory.
This report shall not be reproduced except in full, without written approval of MWSC.
This test report is ONLY FOR THE SAMPLES TESTED.
~ Information provided by the customer. This information may affect the validity of the test results.
*Parameters accredited by EIAC under ISO/IEC 17025:2017

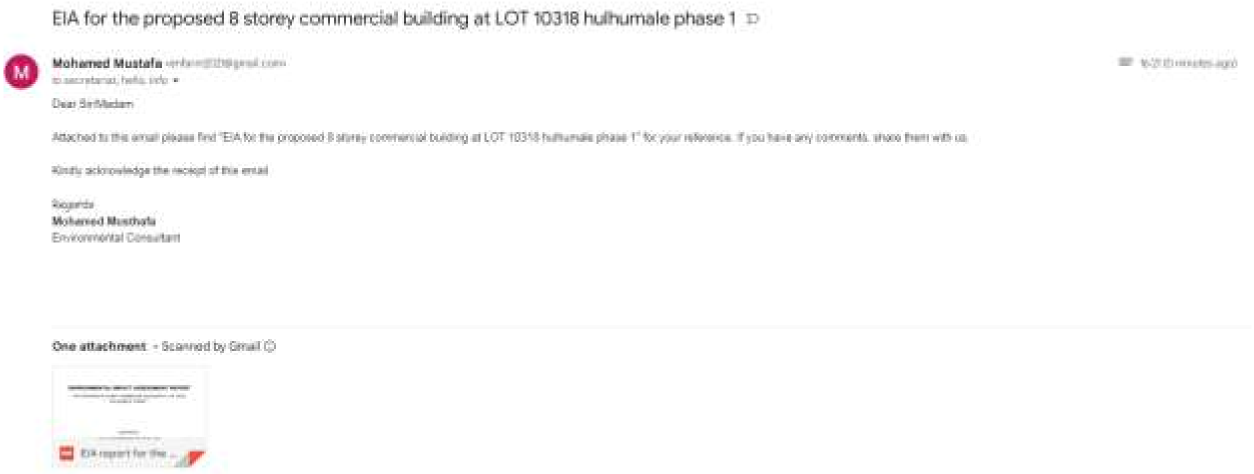
************************** END OF REPORT **************************

APPENDIX E. FORMAT FOR EMERGENCY PREPAREDENESS AND RESPONSE PLAN

Following is the emergency preparedness and response plan format expected for this project. The plan shall include the following;

1. Introduction
    a. Name and contacts of the applicable facility
    b. Major aims and objectives
2. Applicability and scope
3. Roles and responsibilities
    a. Organizational chart
    b. Describe in detail the responsibilities of each personnel
4. Emergency reporting procedures
    a. Communications hierarchy for reporting incidents
    b. Emergency communications methods
5. Emergency contact directory
6. Locations of important items
    a. Procedures for media inquiries
    b. Test, training and exercises
7. Emergency Protocols
    a. Identify and describe in detail how to tackle all the possible emergency scenarios for example;
    b. If someone is injured or ill
    c. Electrocution
    d. Failure or significant interruption in key system processes
    e. Chemical spill

APPENDIX F. EVIDENCE OF EIA REPORT SUBMISSION TO ATOLL COUNCIL, MALE' CITY AND HDC (URBANCO)



EIA for the proposed 8 storey commercial building at LOT 10318 hulhumale phase 1

Mohamed Mustafa
to secretariat, hello, info

Dear Sir/Madam

Attached to this email please find "EIA for the proposed 8 storey commercial building at LOT 10318 hulhumale phase 1" for your reference. If you have any comments, share them with us.

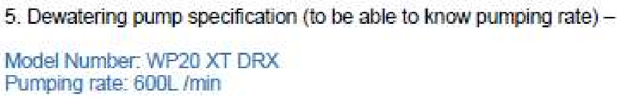
Kindly acknowledge the receipt of this email

Regards
Mohamed Musthafa
Environmental Consultant

One attachment • Scanned by Gmail

EIA report for the ...

APPENDIX G. DEWATERING PUMP SPECIFICATIONS

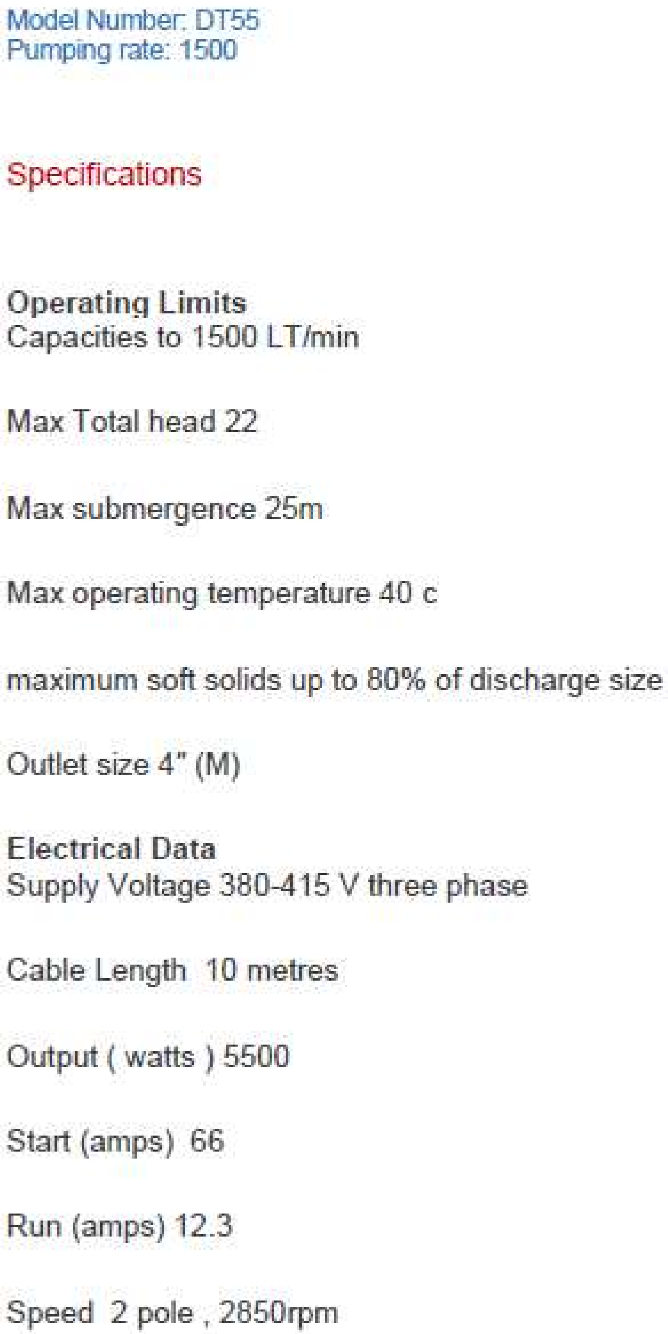


5. Dewatering pump specification (to be able to know pumping rate) –

Model Number: WP20 XT DRX
Pumping rate: 600L /min

Specifications

ENGINE	GX120
DISPLACEMENT (CC)	118cc
FUEL TYPE	Unleaded
FUEL TANK CAPACITY	2.5 litres
FUEL CONSUMPTION	1 l/hr
TOTAL HEAD	32m
SUCTION HEAD	8m
MAXIMUM PUMPING CAPACITY	600 litres
SUCTION PORT DIAMETER	50mm
DISCHARGE PORT DIAMETER	50mm
MAXIMUM PUMPING CAPACITY	600 l/min
SELF PRIMING TIME (AT 5m)	110 sec at 5m
PUMP TYPE	Centrifugal volume pump
OIL ALERT	Yes
DIMENSIONS	455 x 365 x 420
DRY WEIGHT (KG)	21
MOUNTING TYPE	Rubber
HOSE BAND/STAINER	Yes
PRICE	$699



Model Number: DT55
Pumping rate: 1500

Specifications

Operating Limits
Capacities to 1500 LT/min

Max Total head 22

Max submergence 25m

Max operating temperature 40 c

maximum soft solids up to 80% of discharge size

Outlet size 4" (M)

Electrical Data
Supply Voltage 380-415 V three phase

Cable Length 10 metres

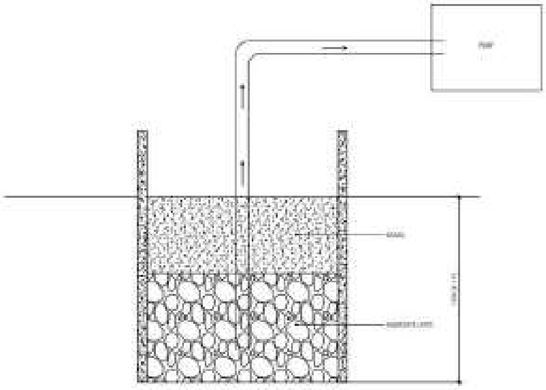
Output (watts) 5500

Start (amps) 66

Run (amps) 12.3

Speed 2 pole , 2850rpm

APPENDIX H. DEWATERING METHOD AND SCHEDULE



Hulhumale' 10318 - De watering work schedule

Sl.No	Description	Starting date	Completion date	Duration
1	Foundation precautionary work (Sheet piling work)	11-Dec-23	25-Dec-23	15
2	Excavation and lean concrete	26-Dec-23	4-Jan-24	10
3	Raft foundation concrete work (Reinforcement, formwork and concrete)	5-Jan-24	19-Jan-24	15
4	RC wall concrete work (Up to ground level)	20-Jan-24	3-Feb-24	15

APPENDIX I. MATERIAL LIST

Materials list to be used in construction

Sl.No	Description
1	Cement
2	M.Sand
3	Aggregate
4	Deformed bar
5	Binding wire
6	Laminated plywood
7	Timber
8	GI hollow section
9	Screw, nail and wire nail
10	Props
11	Maldivian rope
12	Props
13	Roofing sheet

APPENDIX J. CONTRIBUTORS TO EIA

Chapter	Contributor's	Signature
Chapter 1: Introduction	Mohamed Musthafa	
Chapter 2: Statutory Requirements	Mahfooz Abdul Wahhab	
Chapter 3: Project Description	Mahfooz Abdul Wahhab	
Chapter 4: Methodology	Ibrahim Rashihu Adam	
Chapter 5: Existing Environment	Ibrahim Rashihu Adam	
Chapter 6: Stakeholder Consultation	Mohamed Musthafa	
Chapter 7: Options Assessment	Mohamed Musthafa	
hapter 7: Potential Impacts Analysis	Mahfooz Abdul Wahhab	
Chapter 9: Environmental Management	Mahfooz Abdul Wahhab	
Chapter 10: Justification and Conclusion	Mohamed Musthafa	

APPENDIX K. DETAILED DRAWINGS

Attached

APPENDIX L. WORK SCHEDULE

Attached

APPENDIX M. TERMS OF REFERENCE

Attached

APPENDIX N. LEASE AGREEMENT

Attached

ARCHITECTURAL CHECKER'S CERTIFCATE

for architectural design compliance - category B1

1. I, *Umar Mohamed Saeed* being a registered checker, hereby certify that I have in accordance with Male' Planning Regulation and other applicable regulations relevant to planning, design and construction of buildings set out by the Government Authorities, have carried out an evaluation and review of the drawings of the building works attached and to the best of my knowledge and belief the drawings do not show any incompliance in the design of the building to be erected or by the works carried out in accordance with those drawings.
2. In arriving at my conclusion , I confirm that I have reviewed and checked the design in accordance with the relevant regulations using the following criteria:-
   a. rules and regulations set out by the authorities in relation to building design and construction;
   b. codes of practice adopted in the design;
   c. standards and specifications of materials;
   d. architectural design concept;
   e. architectural detailing;
   f. appropriate checklists set out by the authorities (included with this Certificate);
   g.
   h. others specify………………………………………………………………………………

Plot Name/No: M4-07, LOT 10318

City/Atoll/Island: HULHUMALE' CITY

Type of Building (use): COMMERCIAL

Plot Owner's Name: MUNI ENTERPRISES

Name of Architect: ZAFARULLA SHAKEEL

Date: 10 MAY 2022

Checker's Reg. Number: BPR2022015B1

Checker's Signature:

Ministry of National Planning, Housing & Infrastructure
ACCREDITED CHECKER
ARCHITECTURAL CHECKER B1
Name: Umar Mohamed Saeed VALIDITY: 23.03.22 - 22.09.23
Accredited No: BPR2022015B1
B1-2022-015-001

Official Stamp of the
Registered Architectural Checker

FOR OFFICIAL USE ONLY

Building Permit No.: ………………………………………………………………	Local Authority's Stamp

STRUCTURAL CHECKER’S CERTIFCATE

for structural design compliance - category A1

1. I, *Ihsaan Waheed* being a registered checker, hereby certifies that I have in accordance with Male’ Planning Regulation and other applicable regulations relevant to planning, design and construction of buildings set out by the Government Authorities, have carried out an evaluation and review of the drawings of the building works attached and to the best of my knowledge and belief the drawings do not show any incompliance in the design of the building to be erected or by the works carried out in accordance with those drawings.
2. In arriving at my conclusion, I confirm that I have reviewed and checked the design in accordance with the building regulations using the following criteria:-

    a. Codes of practice adopted in the design;

    b. Including wind load, construction load or dynamic load, (if applicable) checked;

    c. Standards and specifications of structural elements;

    d. Structural design concept and identification of the key structural elements;

    e. Structural analysis and design of all key structural elements including foundation systems;

    f. Stability of structural frame;

    g. Structural detailing;

    h. Others specify…………………………………………………………………………

Plot Name/No: Lot M4-07 (10318)

City/Atoll/Island: Hulhumale’

Type of Building (use): Commercial

Plot Owner’s Name: Muni Enterprises Pvt Ltd

Name of Engineer: Ahmed Sujith

Date: 9th May 2022

Checker’s Reg. Number: BPR2022021A1

Checker’s Signature:

Ministry of National Planning, Housing & Infrastructure
ACCREDITED CHECKER
STRUCTURAL CHECKER A1
Name: Ihsaan Waheed VALIDITY: 23.03.22 - 22.09.23
Accredited No: BPR2022021A1 A1-2022-021-001

Official Stamp of the
Registered Structural Checker

FOR OFFICIAL USE ONLY

Building Permit No.: …………………………………………………………	Local Authority’s Stamp

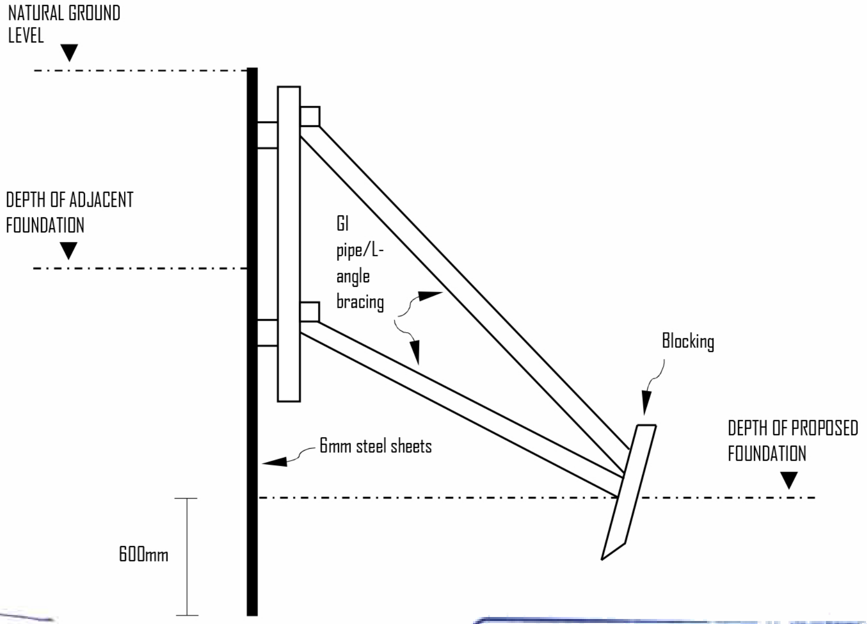
PROPOSED METHODOLOGY FOR PROTECTION OF ADJOINING FOUNDATIONS DURING EXCAVATION

Project	Construction of 08 storey building at LOT 10318/M4-07
Proposed foundation depth	1800 mm from the natural ground level
Date	28TH FEB 2023

A 600mm wide, 1200mm long pit can be excavated at a time along the adjoining buildings. The foundation can be supported by construction of 150mm thick solid block retaining wall, which starts at 300mm below the proposed foundation depth up to the underside of adjoining foundation. To provide lateral stiffness, 16mm Ø reinforced bars at 600mm centers should be planted inside the wall vertically and plastered on side. The retaining wall shall be braced using 50mm Ø x 3.0mm thick G.I pipes or 50x50x3.0mm thick steel L-angle sections in all feasible directions. This foundation protection process will be continued until all the adjoining buildings foundations are supported.

The above stated methodology can only be applied if the adjoining building owner permits or else the lateral pressure on the material adjacent to the excavation could be prevented materially by means of proper and careful placement of sheeting and bracing, i.e., around the property line, 6mm thick steel sheets may be driven down to a depth of 600mm below the proposed foundation depth. To provide lateral stiffness these sheets shall be braced using 50mm Ø x 3.0mm thick G.I pipes or 50x50x3.0mm thick steel L-angle sections in all feasible directions. Onsite close observation, frequent measurements and recording of the vertical and lateral movements and behavior of the sheeting and bracing should be done to provide early warning of unfavorable development which might cause settlement of the adjacent property. De-watering will be continued throughout the excavation process and until casting of foundation, if the proposed foundation depth is below the water table.

Schematic diagram, showing the above proposed protection method is shown below.



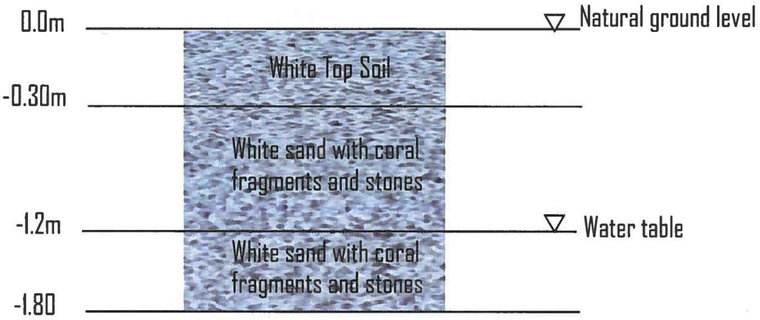
Ahmed Sujith
Civil Engineer
OPR201906LE

Ministry of National Planning, Housing & Infrastructure
ACCREDITED CHECKER
STRUCTURAL CHECKER A1
Name: Ihsaan Waheed VALIDITY: 23.03.22 - 22.09.23
Accredited No: BPR2022021A1 A1-2022-021-001

Visual Soil Inspection Report

PROJECT: 06 STOREY BUILDING IN LOT M4-07, HULHUMALE'
DATE: 9TH MAY 2022
TIME: 10.30

THE GROUND PROFILE ILLUSTRATED BELOW IS BASED ON TRIAL PITS DUG AT THE PROPOSED SITE.



- Ground consisted of white soil at top and white sand with coral fragments and stones at below portion.
- Ground water table is at a depth of 1.20m from natural ground level.
- The proposed foundation depth for this building is at 1.80m, so dewatering will be required.
- No indication of any organic material in the pit was found.

Ahmed Sujith
Civil Engineer

EIGHT STOREY COMMERCIAL USE BUILDING SCHEMATIC DETAILS

M4-07

LOT 10318, HULHUMALE'

CLIENT:

HDC(161)-M/DA/2022/0217

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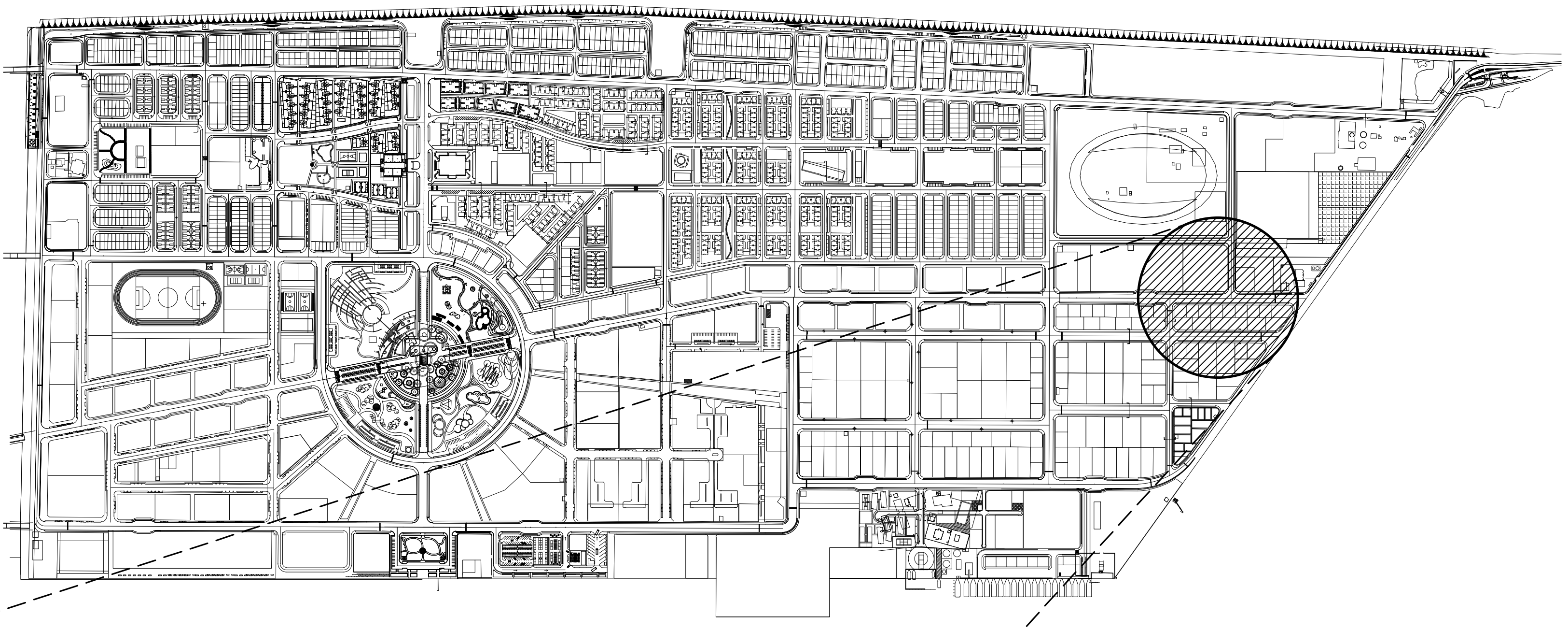
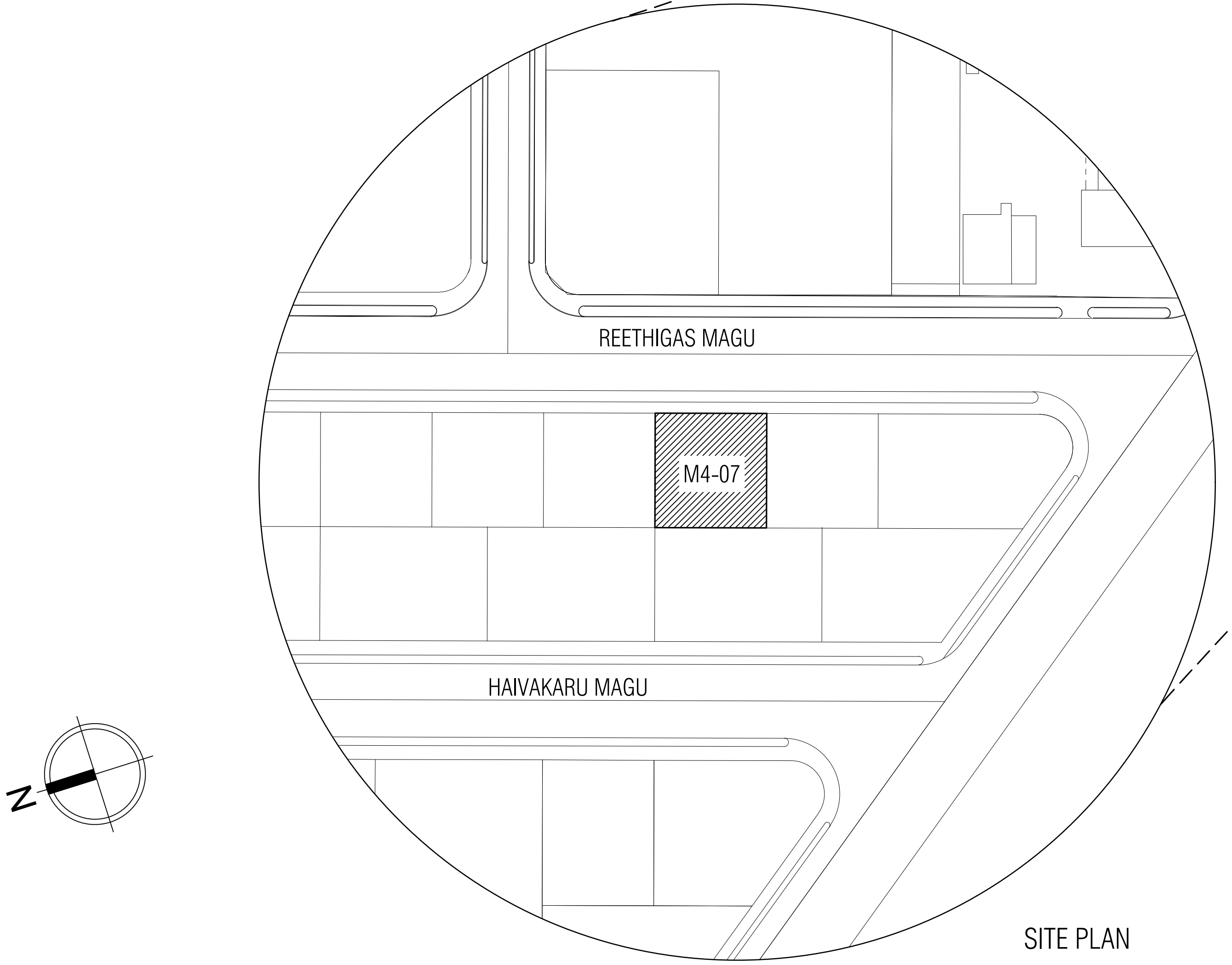
MUNI ENTERPRISES PVT LTD

DESIGN BY

YURT



HULHUMALE' MAP



SITE PLAN

ATION PLAN

SCALE NTS

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PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07
CLIENT:
MUNI ENTERPRISES PVT LTD

TITLE:
LOCATION PLAN

DESIGNED BY	ZAFARULLA SHAKEEL	**PAGE**	A - 01 /21
DRAWN BY	I.S.A	**DATE**	NOV-22
DRAWN NO	-	**SCALE**	AS GIVEN

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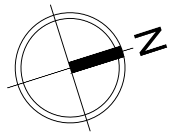


BUILT UP AREA CALCULATION

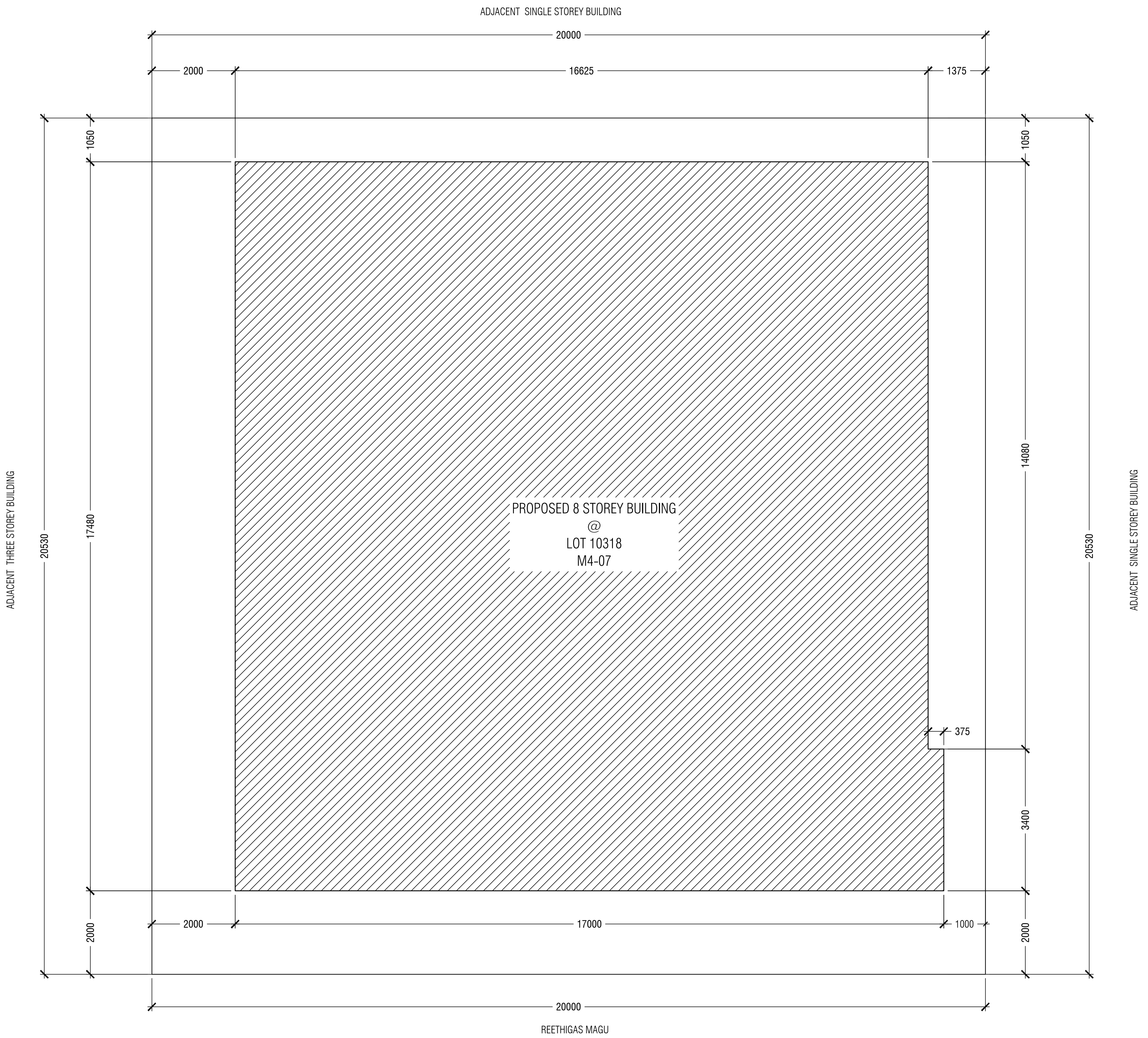
Ground Floor	291.88 m²	291.88 m²
First Floor	282.39 m²	
Second Floor	295.44 m²	
Third Floor	295.44 m²	
Fourth Floor	295.44 m²	
Fifth Floor	295.44 m²	
Sixth Floor	295.44 m²	
Seventh Floor	288.24 m²	
TOTAL BUILT-UP AREA(GFA)	2339.71 m²	

F.S.I. CALCULATION

Total Plot Area	410.62 m²
Total Built-up Area	2339.71 m²
F.S.I	5.69

PARKING AREA CALCULATION

TOTAL BUILT-UP AREA(GFA)	2339.71 m²
NOS OF CARS REQUIRED(500 m2)	4 NOS
NOS OF MOTORCYCLE REQUIRED(60 m2)	30 NOS
ADDITIONAL 10% OF TPA	41.06 m²



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PLAN

2 3 4 5

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TITLE:
SITE PLAN

PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07

CLIENT:
MUNI ENTERPRISES PVT LTD

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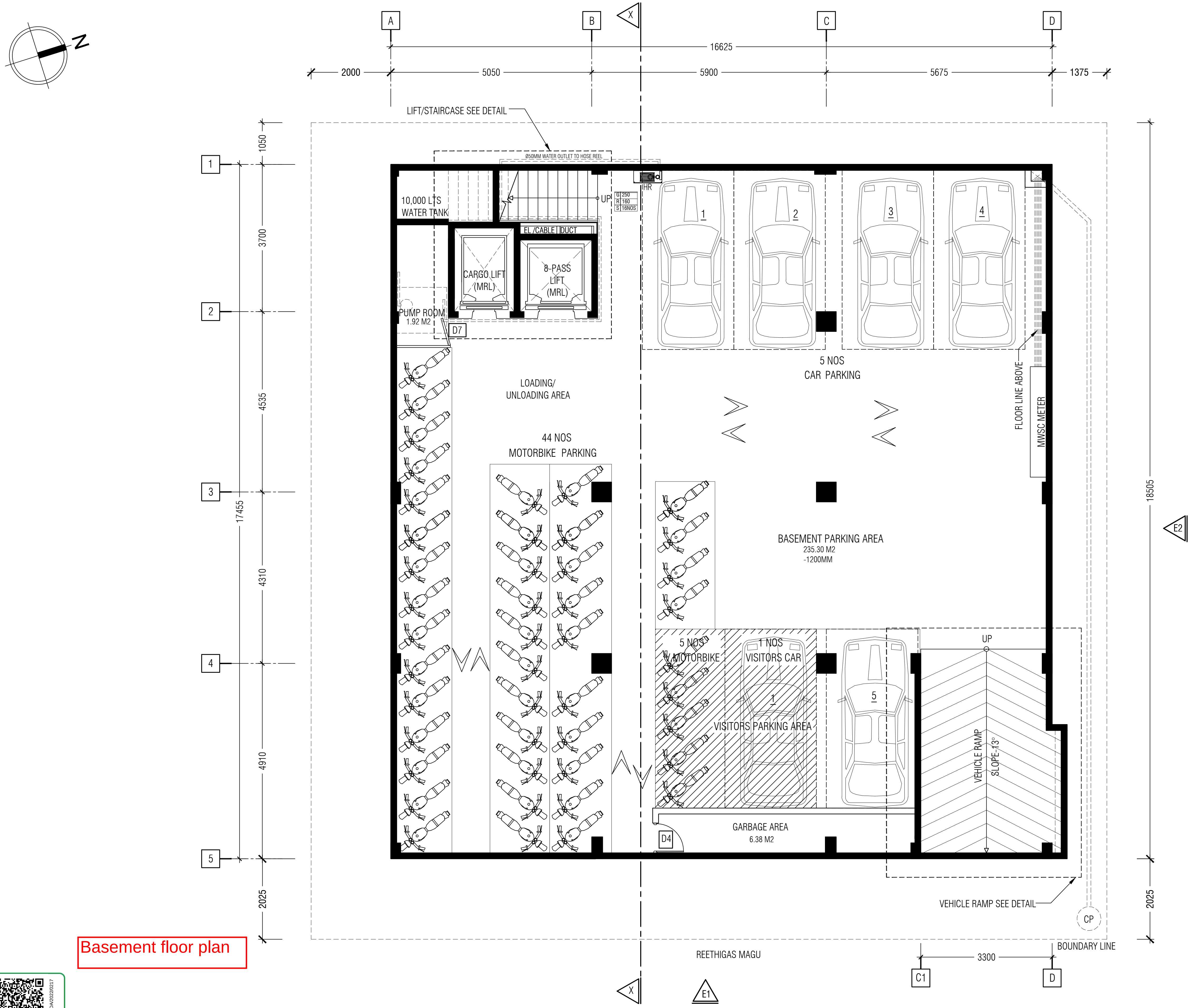

Basement floor plan

HDC[illegible]-M/DA/2022/0217

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MENT FLOOR PLAN

0 0.5 1 2 3 4 5

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PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07

CLIENT:
MUNI ENTERPRISES PVT LTD

TITLE:
FLOOR PLAN

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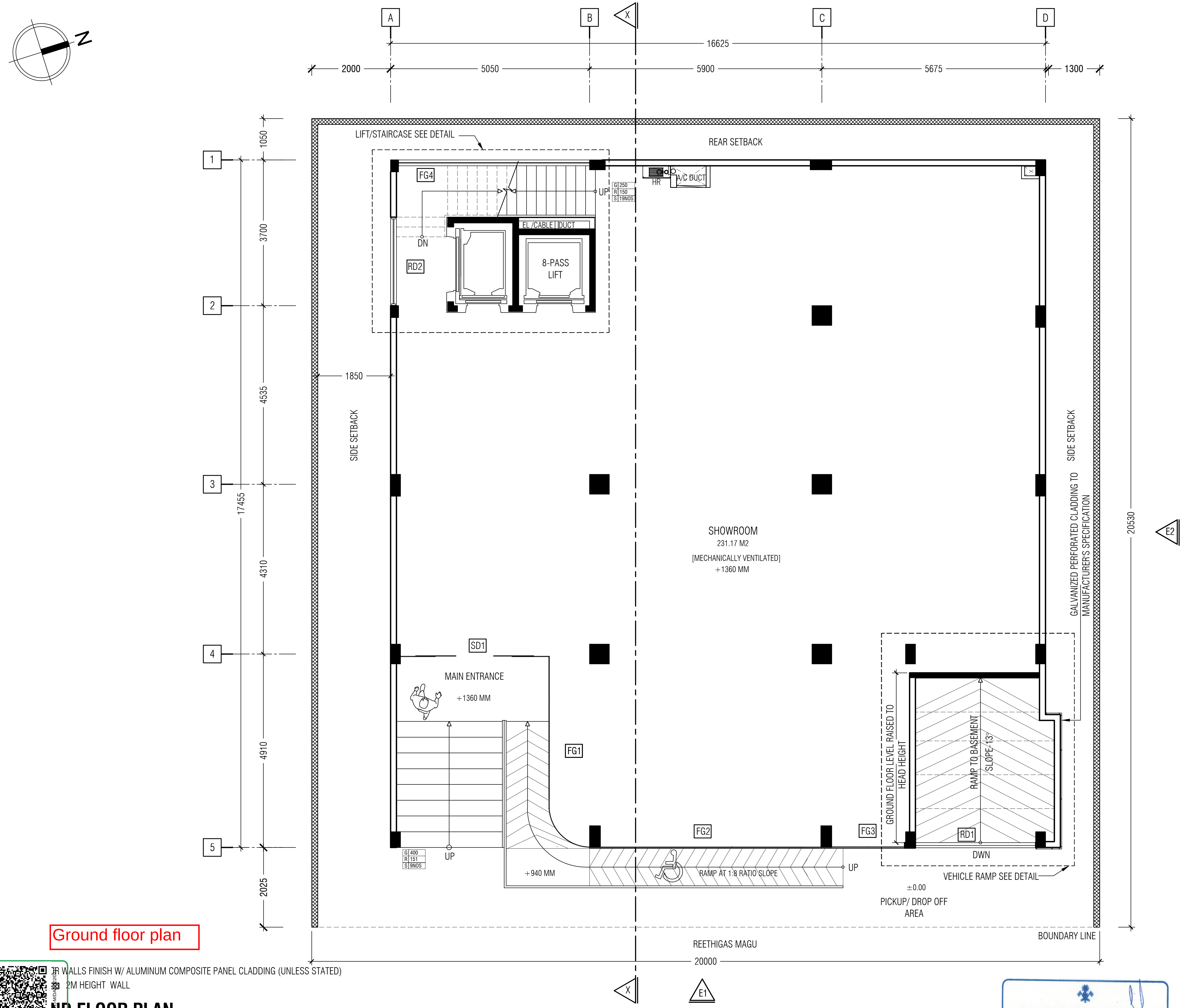
Ground floor plan



R WALLS FINISH W/ ALUMINUM COMPOSITE PANEL CLADDING (UNLESS STATED)

⊠ 2M HEIGHT WALL

ND FLOOR PLAN

2 3 4 5

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PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07

CLIENT:
MUNI ENTERPRISES PVT LTD

TITLE:
FLOOR PLAN

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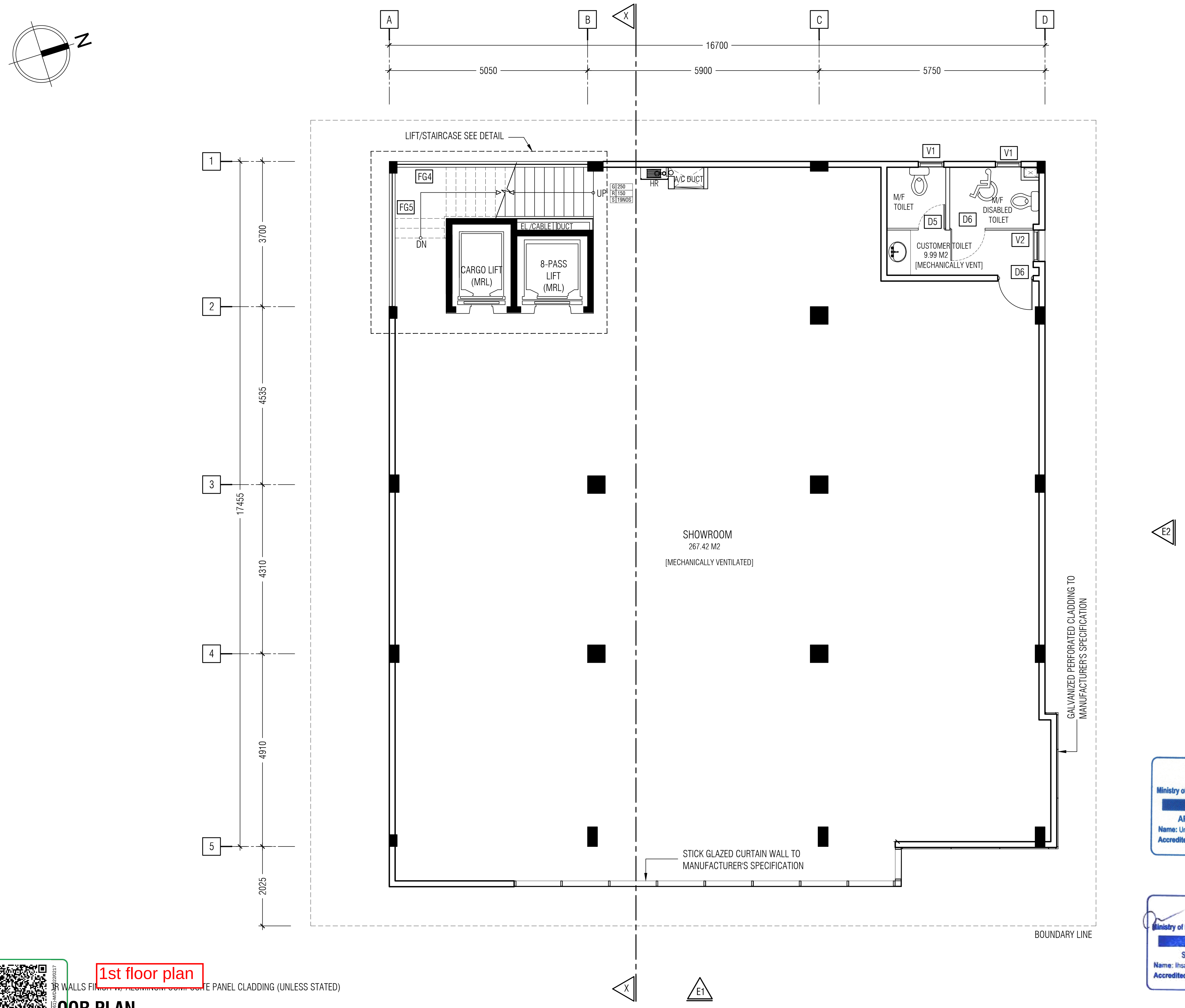

1st floor plan

R WALLS FINISH W/ ALUMINUM COMPOSITE PANEL CLADDING (UNLESS STATED)

OOR PLAN

2 3 4 5

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Accredited No: BPR2022021A1 A1-2022-021-001

PAGE	A - 05 /21
DATE	MAY-22
SCALE	AS GIVEN
DESIGNED BY	ZAFARULLA SHAKEEL
DRAWN BY	I.S.A
DRAWN NO	-

TITLE:
FLOOR PLAN

PROJECT:
PROPOSED 6 STOREY BUILDING @ LOT M4-07

CLIENT:
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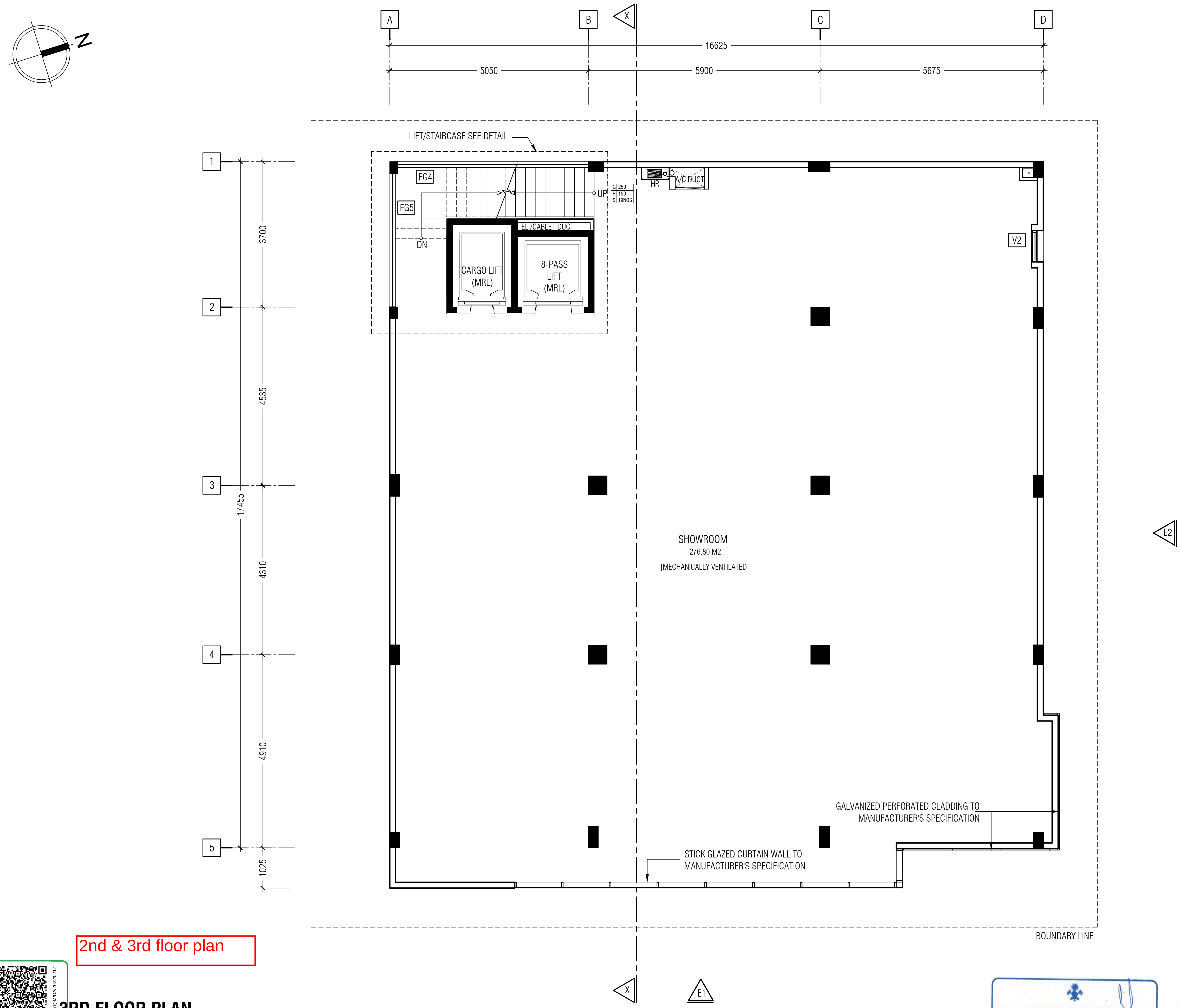

2nd & 3rd floor plan

3RD FLOOR PLAN

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MUNI ENTERPRISES PVT LTD

TITLE:
FLOOR PLAN

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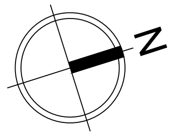

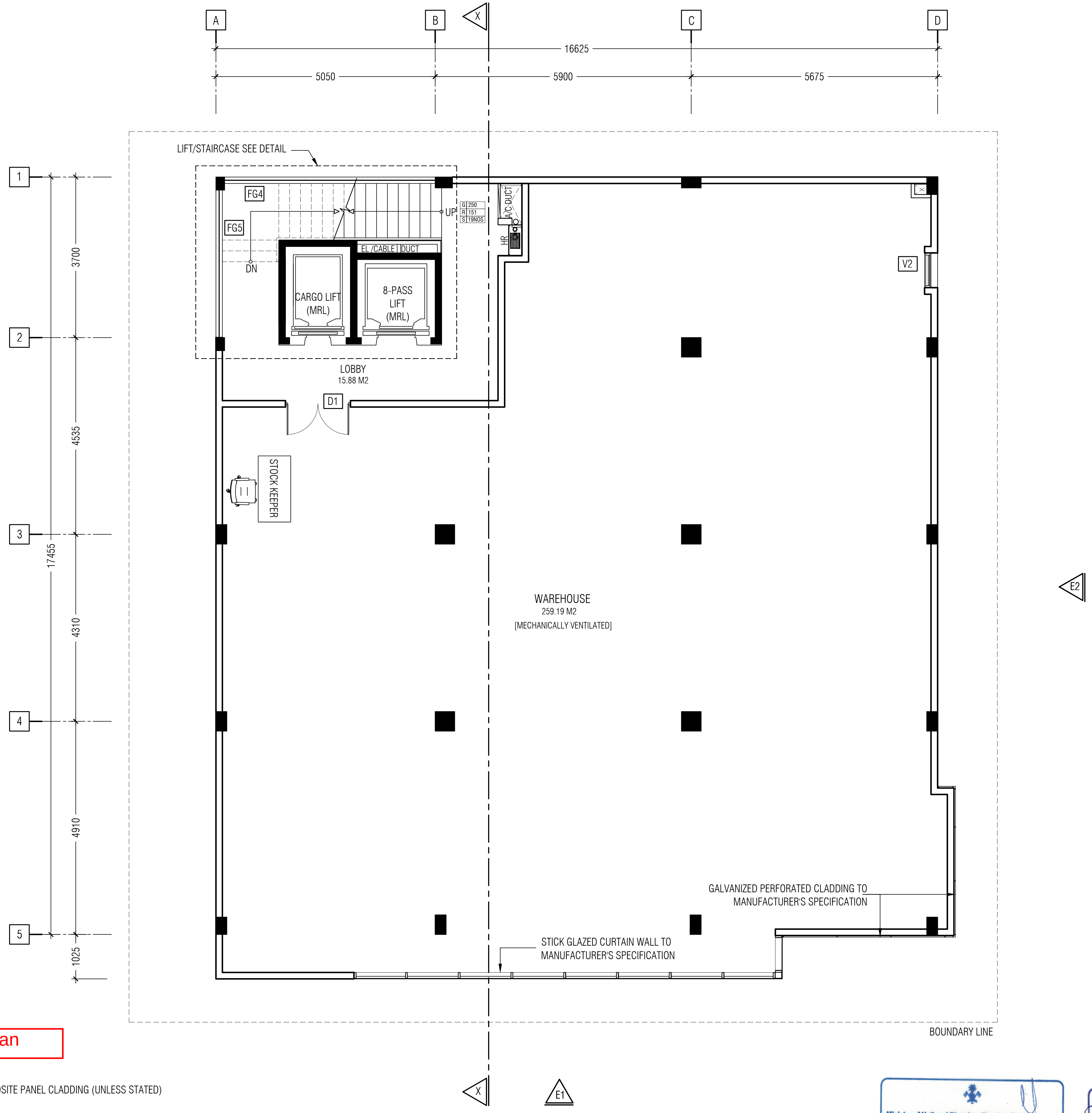

4th - 6th floor plan

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…R WALLS FINISH W/ ALUMINUM COMPOSITE PANEL CLADDING (UNLESS STATED)

…TH FLOOR PLAN

2 3 4 5

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ACCREDITED CHECKER
ARCHITECTURAL CHECKER B1
Name: Umar Mohamed Saeed VALIDITY: 23.03.22 - 22.09.23
Accredited No: BPR2022015B1 B1-2022-015-001

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ACCREDITED CHECKER
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Name: Ihsaan Waheed VALIDITY: 23.03.22 - 22.09.23
Accredited No: BPR2022021A1 A1-2022-021-001

PAGE	A - 07 /21
DATE	NOV-22
SCALE	AS GIVEN
DESIGNED BY	ZAFARULLA SHAKEEL
DRAWN BY	I.S.A
DRAWN NO	-

TITLE:
FLOOR PLAN

PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07

CLIENT:
MUNI ENTERPRISES PVT LTD

YURT PVT. LTD.
YURT PVT LTD / M.FUNAGASDHOSHUGE /5TH FLOOR /ISKANDHARU MAGU /20270 /MALE' /REP OF MALDIVES
M:(+960) 7757001 / M:(+960) 7792824 W: www.yu-rt.com / E: yurt.mv@gmail.com

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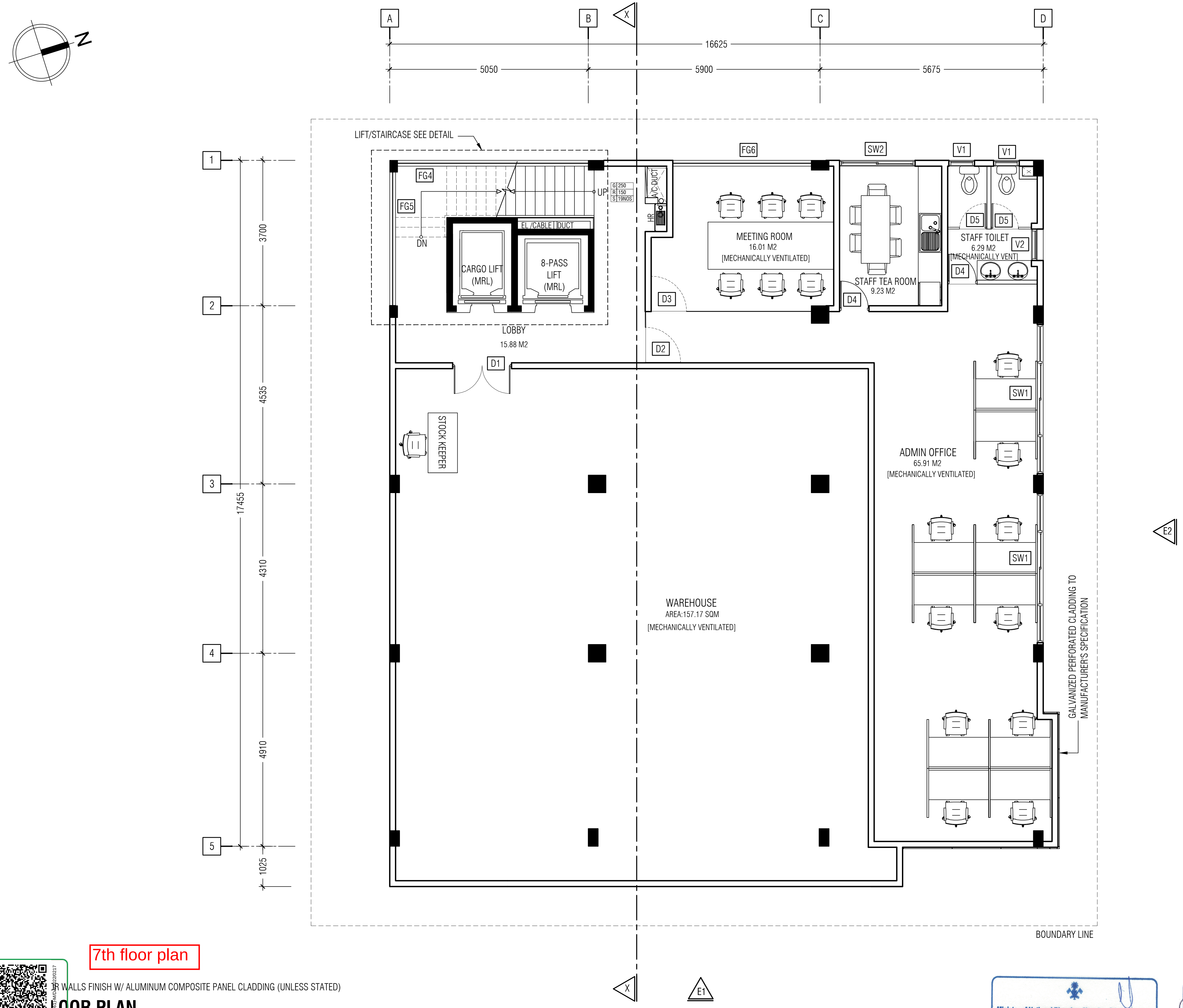

7th floor plan

HDC(161)-M/DA/2022/0217

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R WALLS FINISH W/ ALUMINUM COMPOSITE PANEL CLADDING (UNLESS STATED)

LOOR PLAN

0 0.5 1 2 3 4 5

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DATE	NOV-22
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DESIGNED BY	ZAFARULLA SHAKEEL
DRAWN BY	I.S.A
DRAWN NO	-

TITLE:
FLOOR PLAN

PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07

CLIENT:
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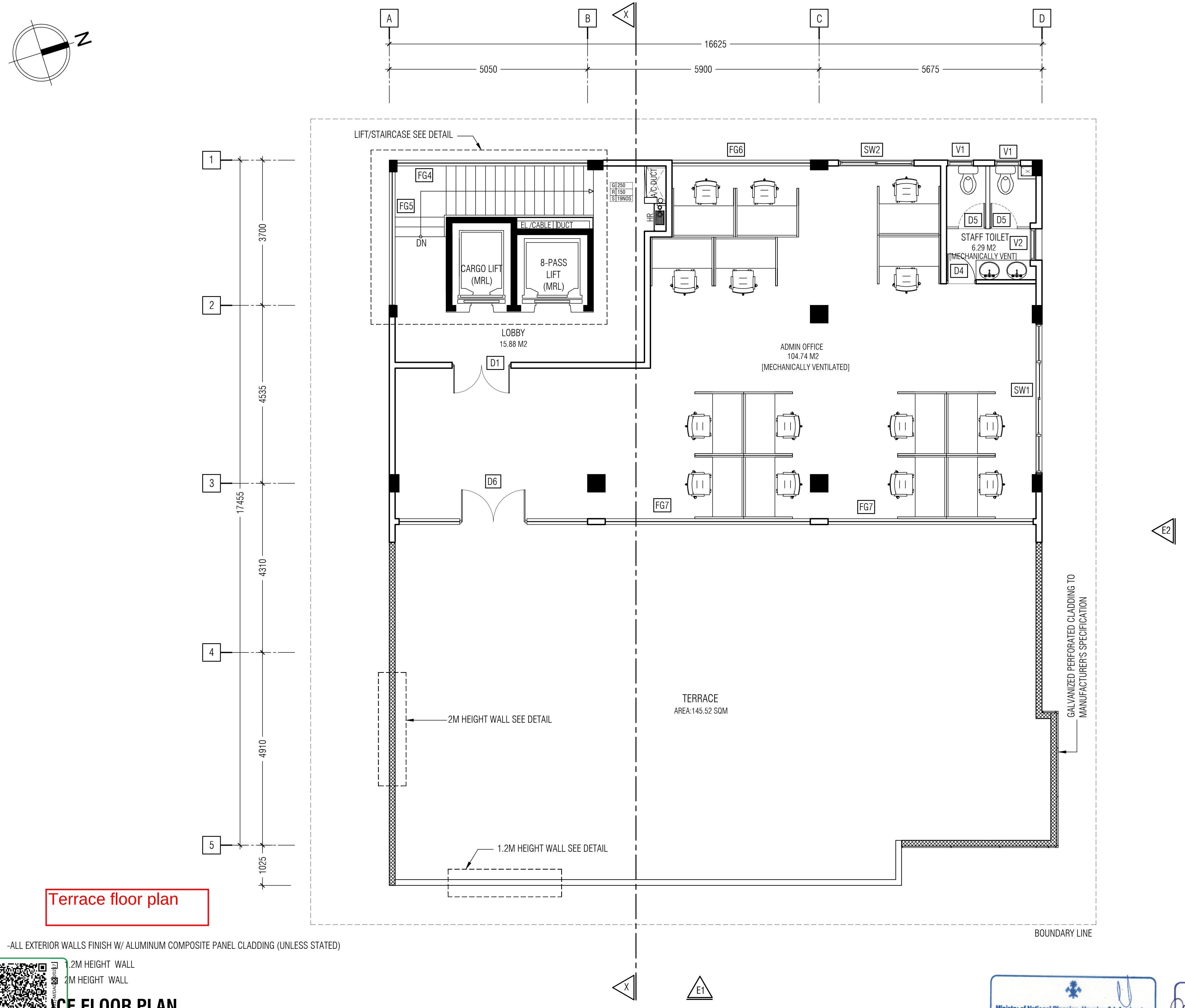

Terrace floor plan

-ALL EXTERIOR WALLS FINISH W/ ALUMINUM COMPOSITE PANEL CLADDING (UNLESS STATED)

☐ 1.2M HEIGHT WALL

☒ 2M HEIGHT WALL

CE FLOOR PLAN

2 3 4 5

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PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07

CLIENT:
MUNI ENTERPRISES PVT LTD

TITLE:
FLOOR PLAN

DESIGNED BY	ZAFARULLA SHAKEEL	**PAGE**	A - 09 /21
DRAWN BY	I.S.A	**DATE**	NOV-22
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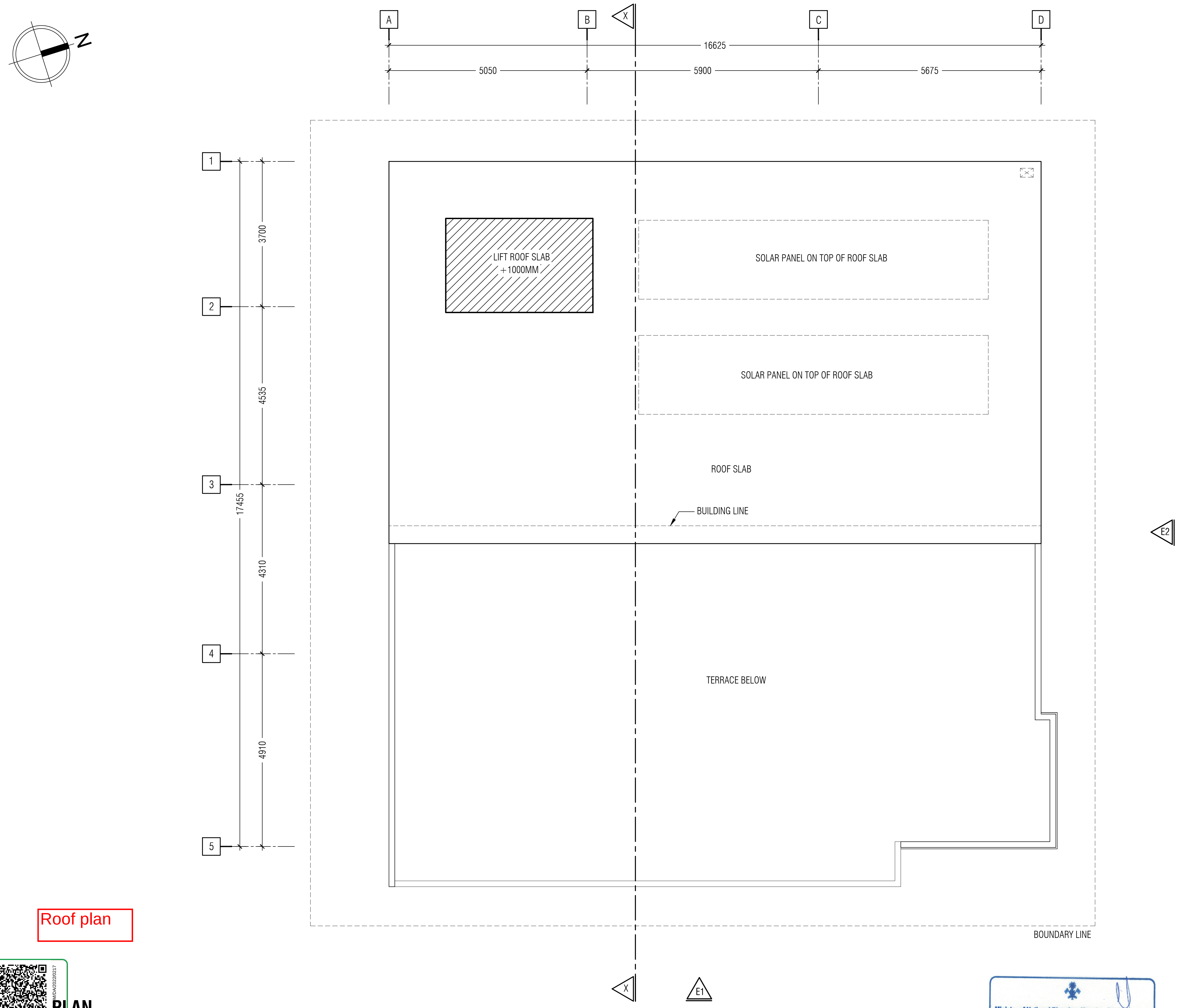

Roof plan

PLAN

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PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07

CLIENT:
MUNI ENTERPRISES PVT LTD

TITLE:
ROOF PLAN

DESIGNED BY	ZAFARULLA SHAKEEL	**PAGE**	A - 10 /21
DRAWN BY	I.S.A	**DATE**	NOV-22
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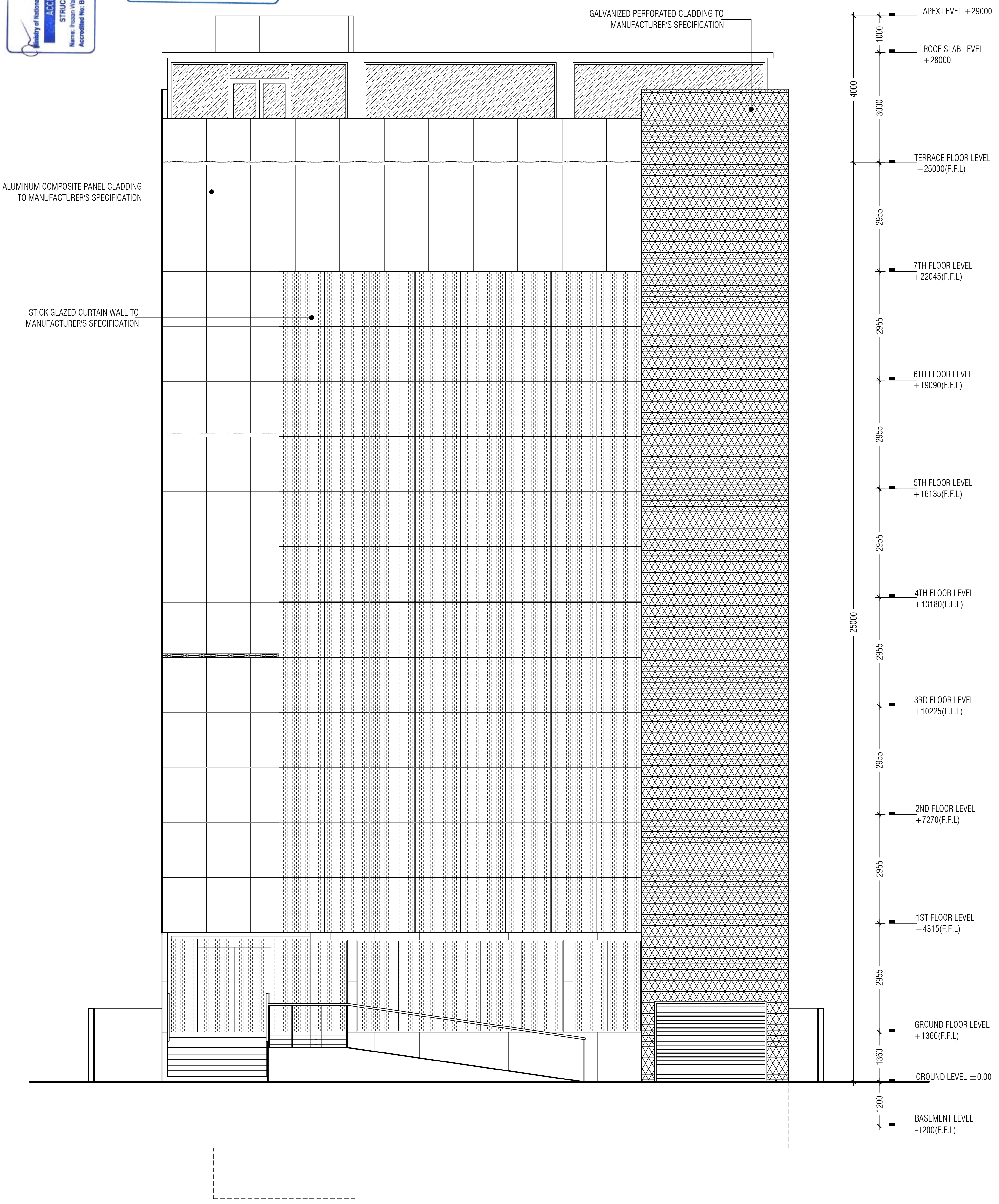

ELEVATION-E1

SCALE 1:100

0 0.5 1 2 3 4 5

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PROJECT: PROPOSED 8 STOREY BUILDING @ LOT M4-07	**TITLE:**	**DESIGNED BY**	ZAFARULLA SHAKEEL	**PAGE**	A - 11 /21
CLIENT: MUNI ENTERPRISES PVT LTD	ELEVATION	**DRAWN BY**	I.S.A	**DATE**	NOV-22
		DRAWN NO	-	**SCALE**	AS GIVEN

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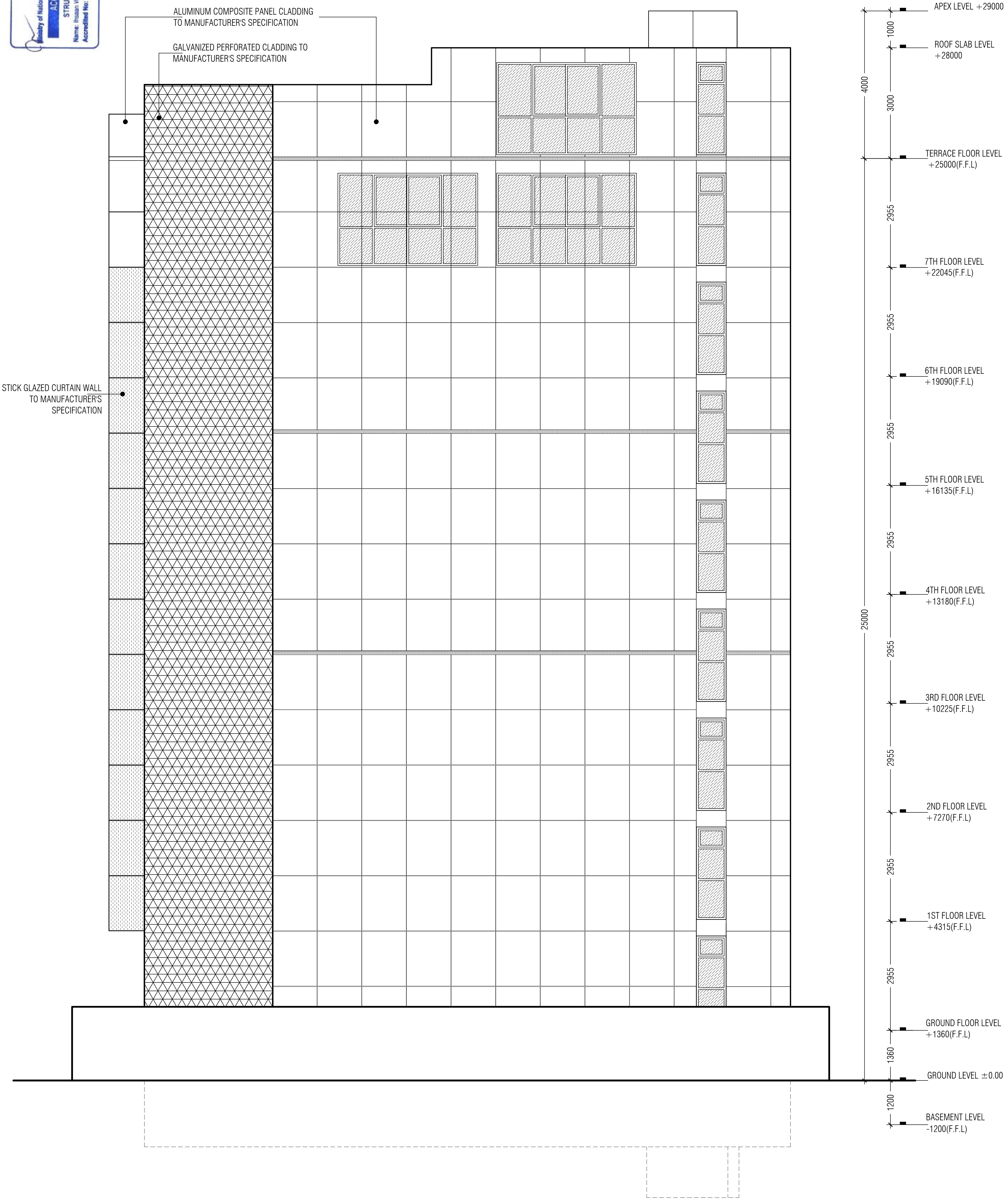

ELEVATION-E2

SCALE 1:100

0 0.5 1 2 3 4 5

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PROJECT: PROPOSED 8 STOREY BUILDING @ LOT M4-07	**TITLE:** ELEVATION	**DESIGNED BY**	ZAFARULLA SHAKEEL	**PAGE**	A - 12 /21
CLIENT: MUNI ENTERPRISES PVT LTD		**DRAWN BY**	I.S.A	**DATE**	NOV-22
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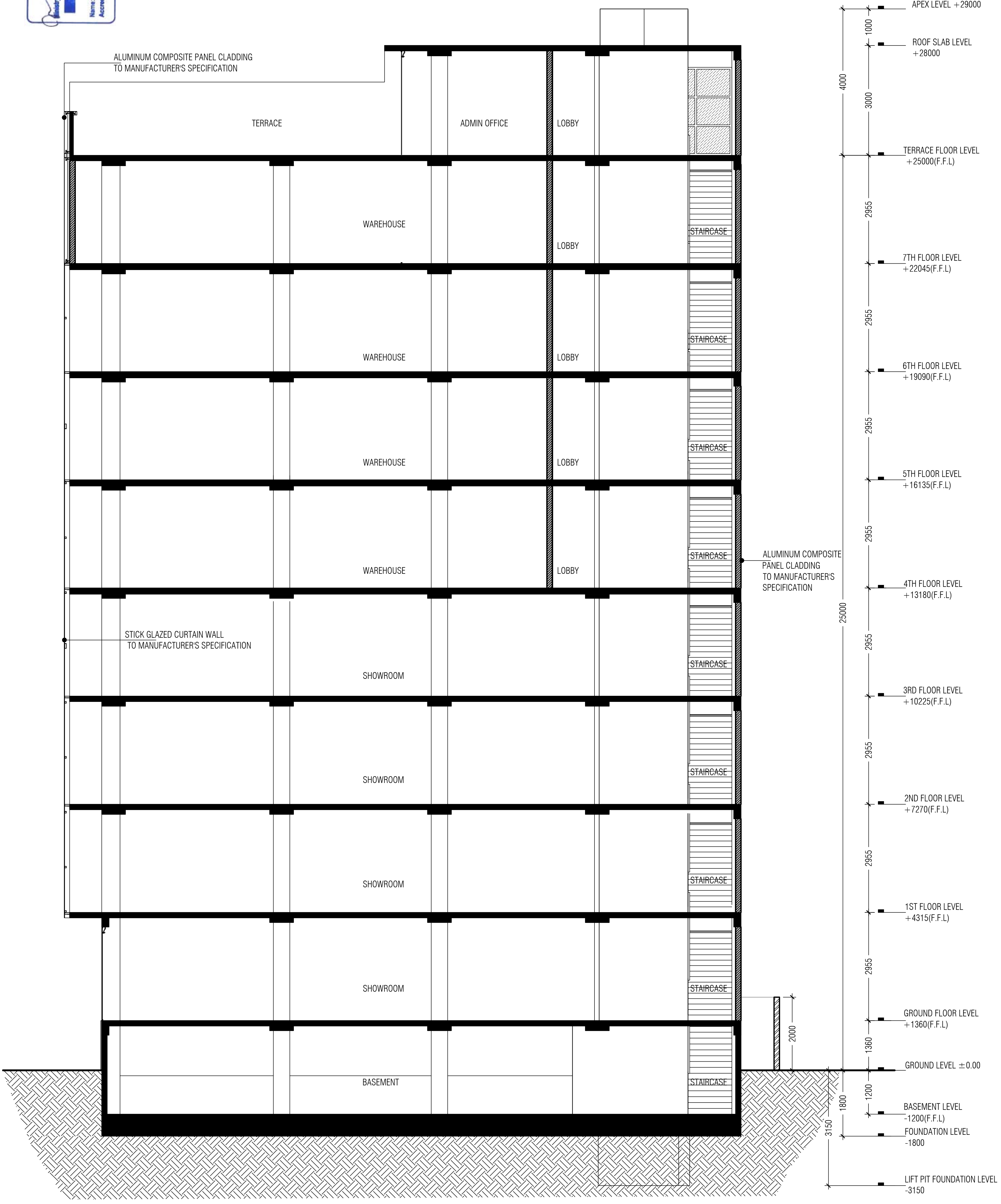

SECTION X-X

SCALE 1:100

0 1 2 3 4 5

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PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07
CLIENT:
MUNI ENTERPRISES PVT LTD

TITLE:
SECTION

DESIGNED BY	ZAFARULLA SHAKEEL	**PAGE**	A - 13 /21
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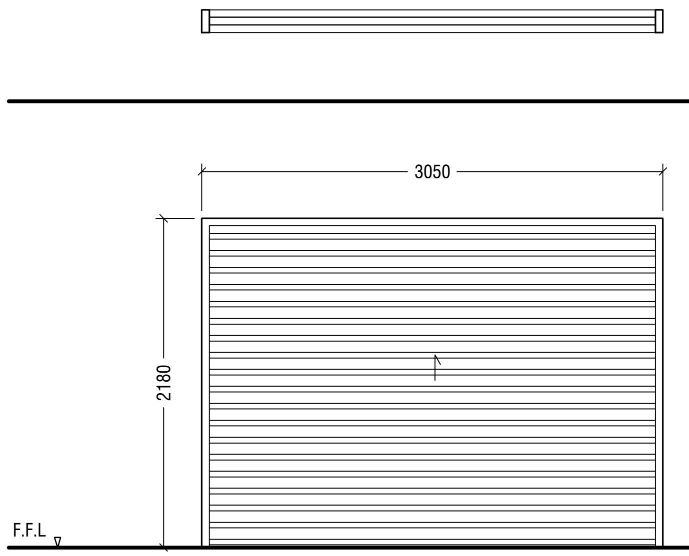
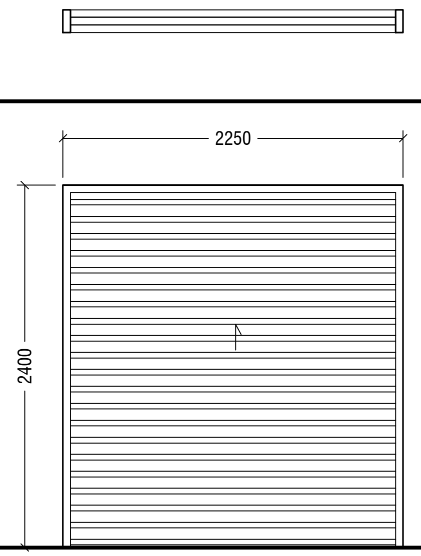
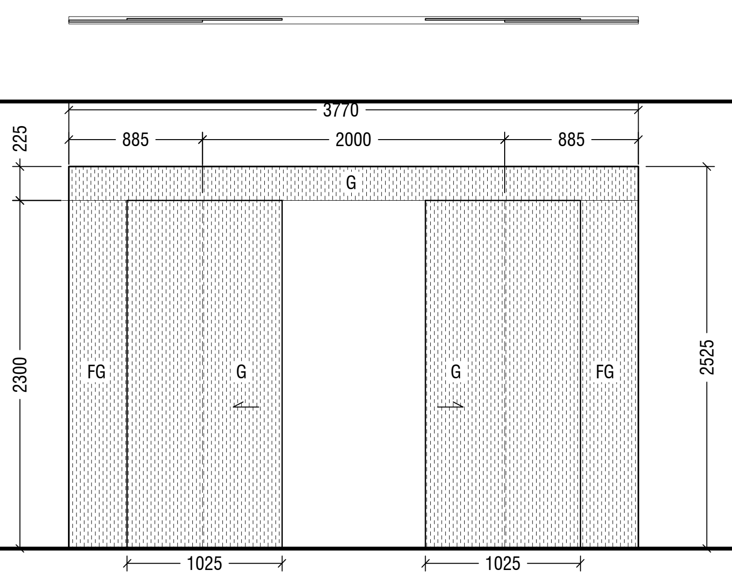


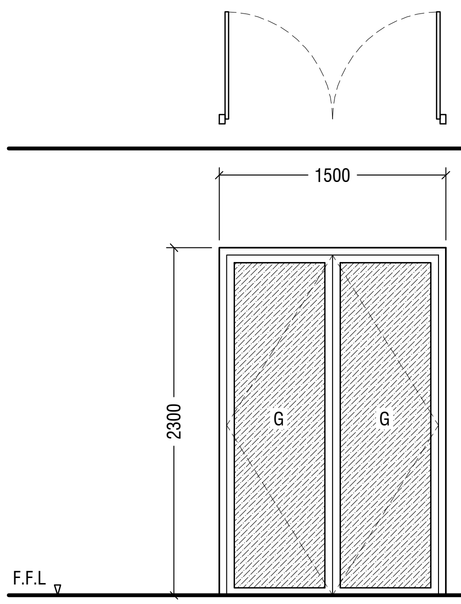
RD1 | ROLL-UP DOOR
ANODIZED ALUMINUM



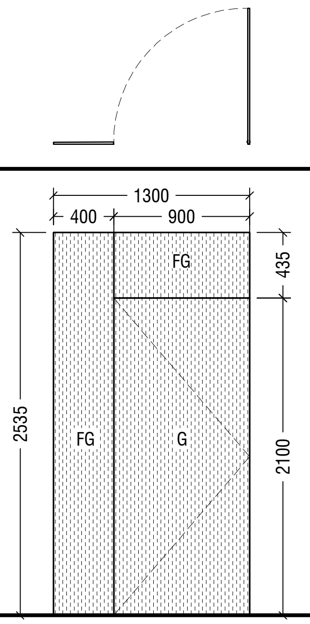
RD2 | ROLL-UP DOOR
ANODIZED ALUMINUM



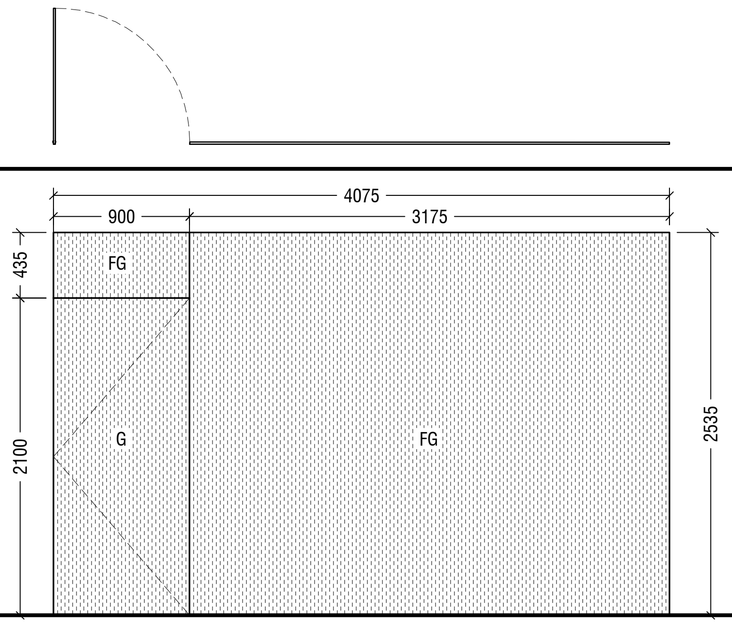
SD1 | SLIDING DOOR
GLASS



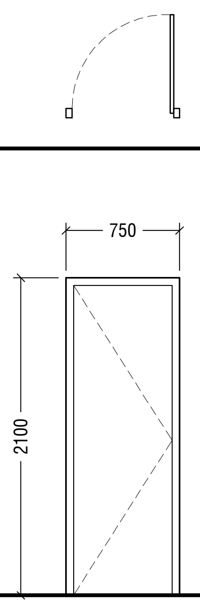
D1 | SWING DOOR
ANODIZED ALUMINUM



D2 | SWING DOOR



D3 | SWING DOOR



D4 | SWING DOOR
WPF

DOOR / WINDOW SCHEDULE-1

0.5 1 1.5 2 2.5

HDC(161)-I/DPA/2022/0217

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NOTES:-
1.ABBREVITIONS
- T-TIMBER
- G-GLASS
- FG-FIXED GLASS

2.ALL MEASUREMENTS TO BE CHECKED ON SITE PRIOR TO FABRICATION

3.HATCH

3.1 CLEAR	▨
3.2 FROSTED	▨
3.3 REFLECTIVE	▨

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PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07
CLIENT:
MUNI ENTERPRISES PVT LTD

TITLE:
DOOR/WINDOW SCHEDULE

DESIGNED BY	ZAFARULLA SHAKEEL	**PAGE**	A - 14 /21
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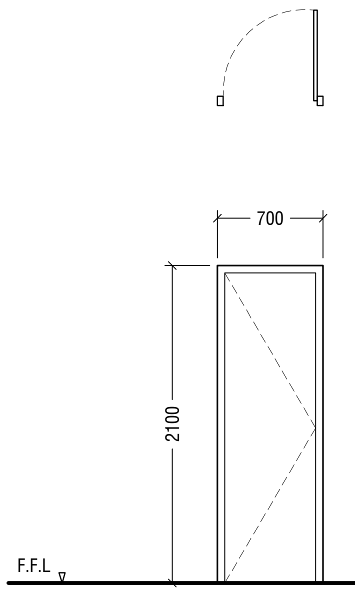
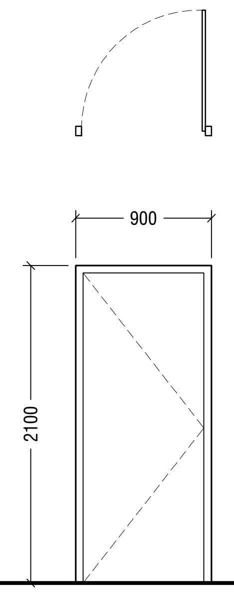
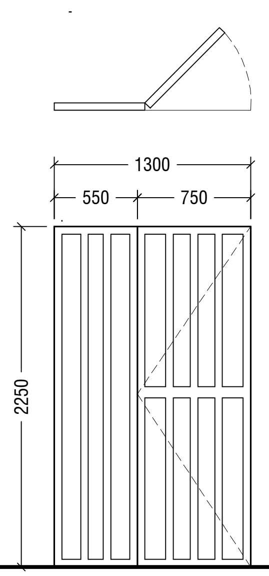


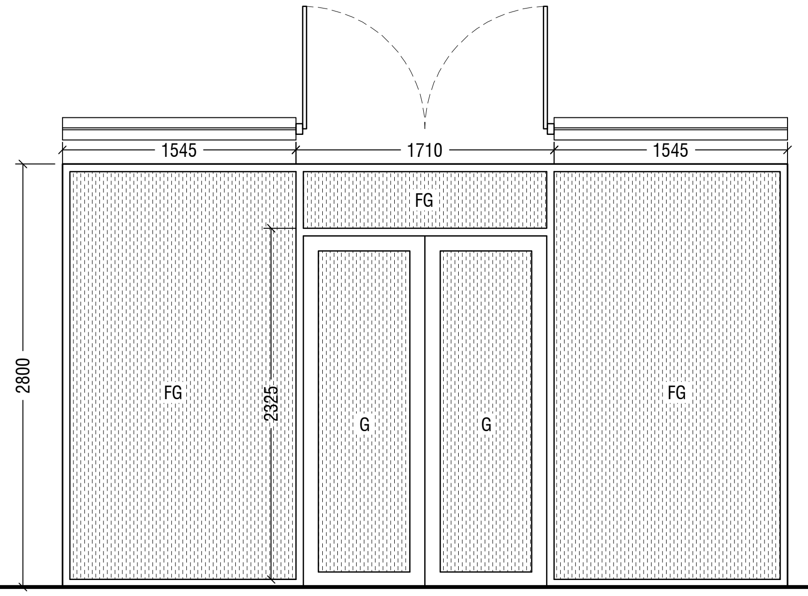
D5 | SWING DOOR
WPF



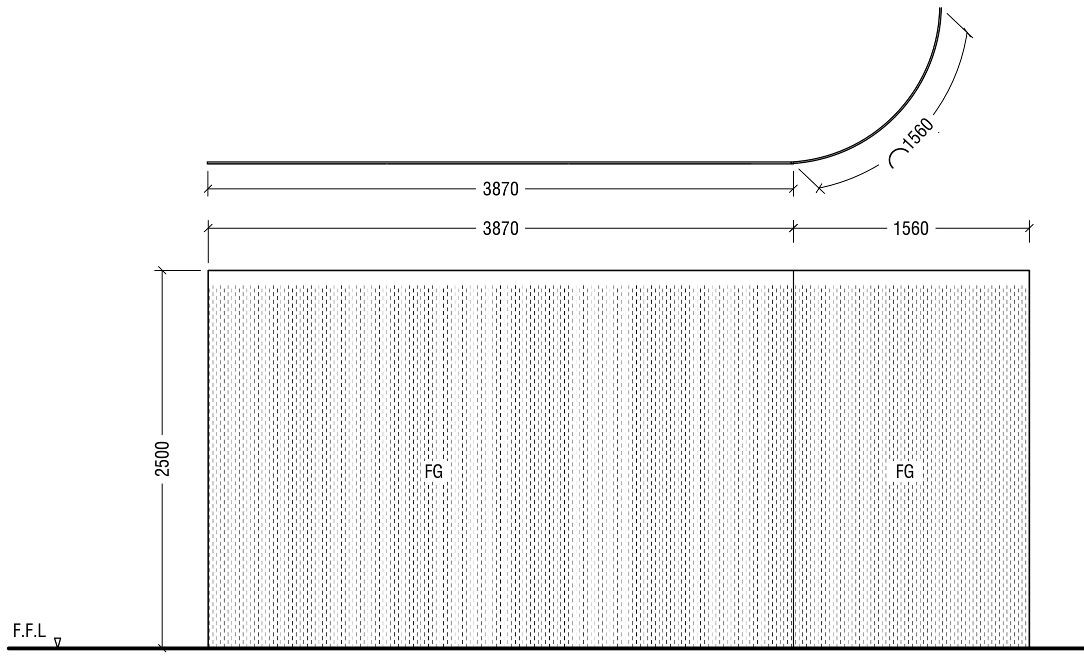
D6 | SWING DOOR
WPF



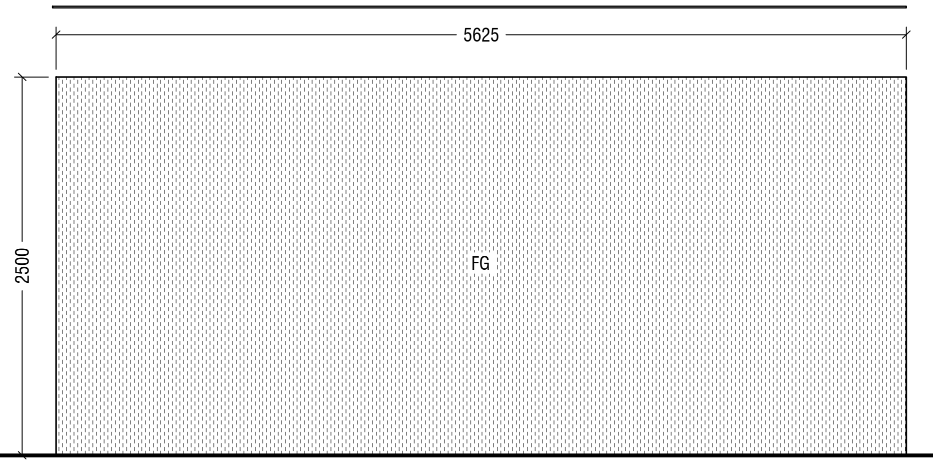
D7 | SWING DOOR
GI HOLLOW PIPE



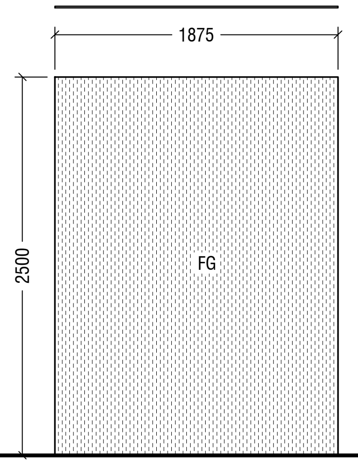
D8 | SWING DOOR W/ FIXED GLASS



FG1 | FIXED GLASS
TEMPERED GLASS



FG2 | FIXED GLASS
TEMPERED GLASS



FG3 | FIXED GLASS
TEMPERED GLASS

NOTES:-
1.ABBREVITIONS
T-TIMBER
G-GLASS
FG-FIXED GLASS

2.ALL MEASUREMENTS TO BE CHECKED ON SITE PRIOR TO FABRICATION

3.HATCH
3.1 CLEAR ▒
3.2 FROSTED ⁚
3.3 REFLECTIVE ▨

DOOR / WINDOW SCHEDULE-2

0 1 1.5 2 2.5

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DATE	NOV-22	**DRAWN BY**	I.S.A
SCALE	AS GIVEN	**DRAWN NO**	-

TITLE:
DOOR/WINDOW SCHEDULE

PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07

CLIENT:
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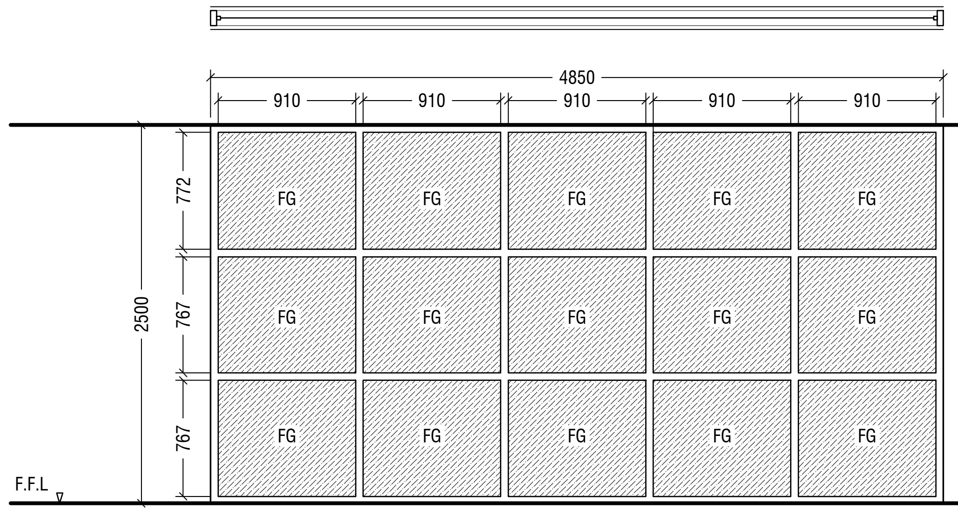
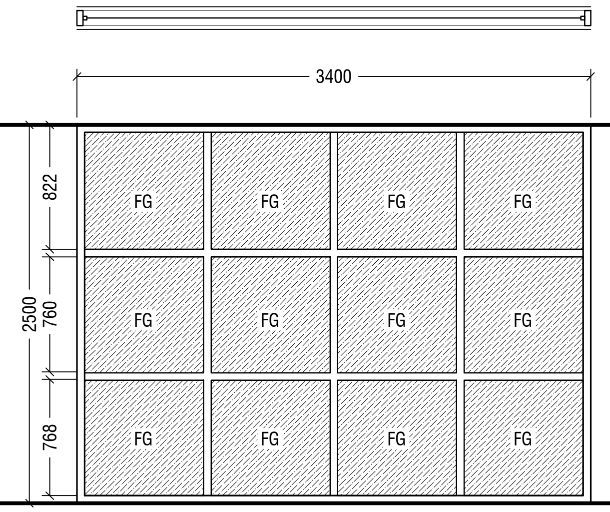
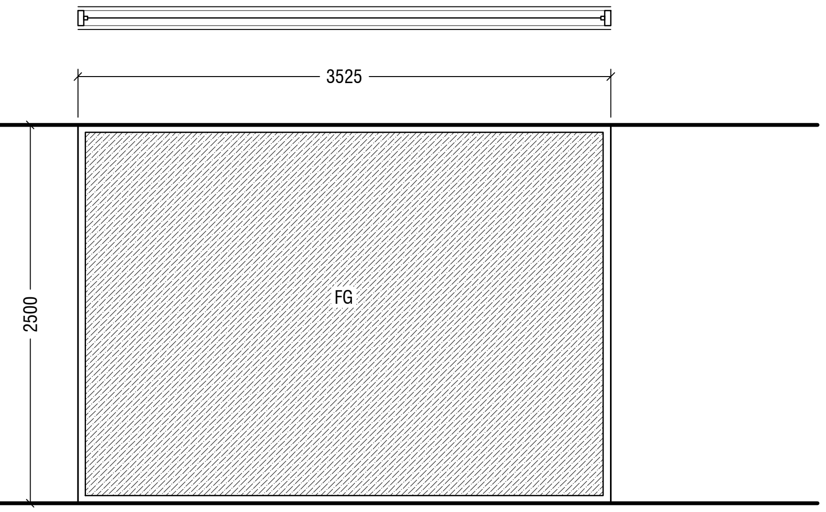


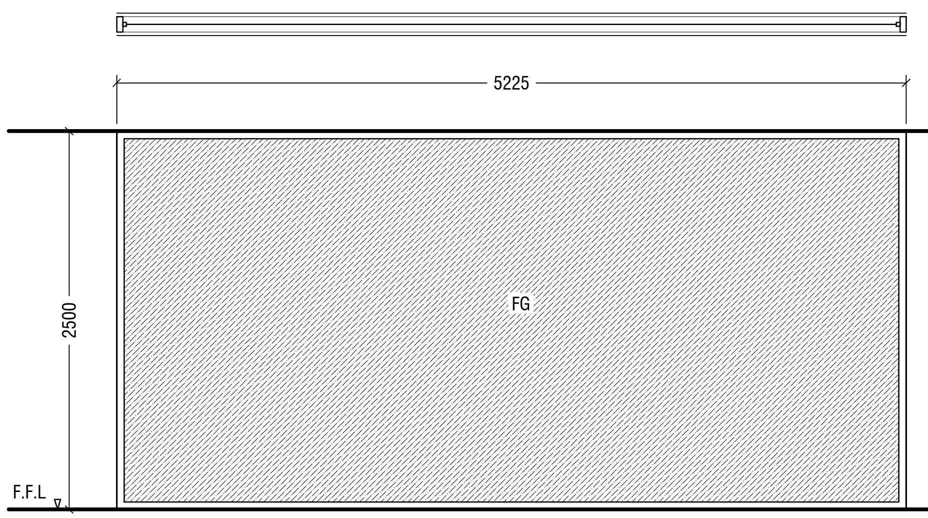
FG4 | FIXED GLASS
ALUMINUM



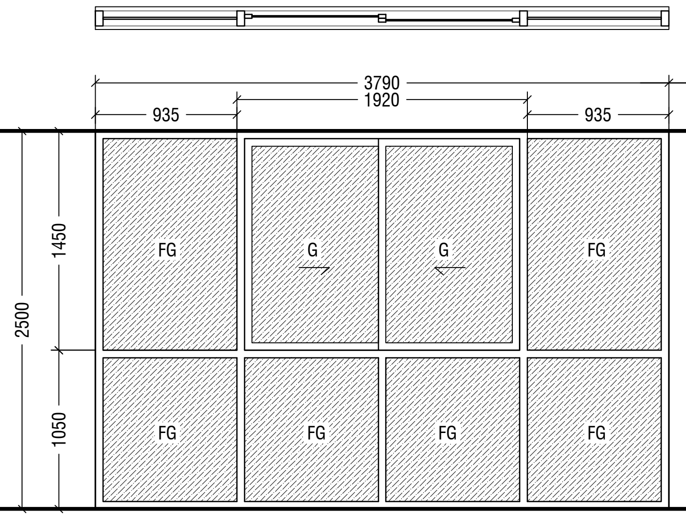
FG5 | FIXED GLASS
ALUMINUM



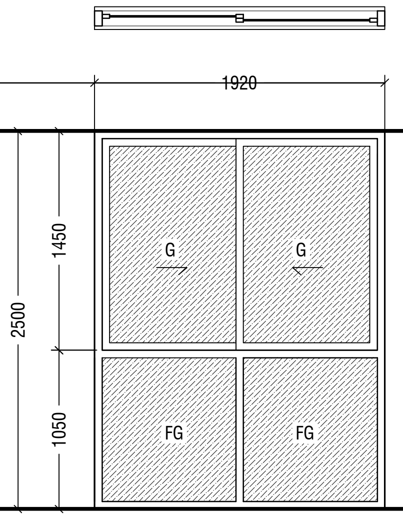
FG6 | FIXED GLASS
ALUMINUM



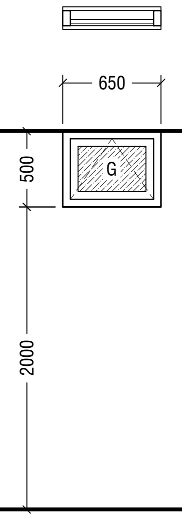
FG7 | FIXED GLASS
ALUMINUM



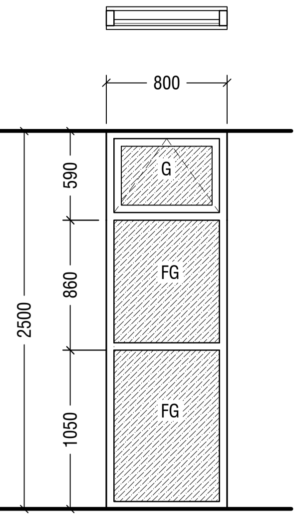
SW1 | SLIDING WINDOW
ALUMINUM



SW2 | SLIDING WINDOW
ALUMINUM



V1 | TOP HUNG WINDOW
ALUMINUM



V2 | TOP HUNG WINDOW
ALUMINUM

NOTES:-
1.ABBREVITIONS
T-TIMBER
G-GLASS
FG-FIXED GLASS

2.ALL MEASUREMENTS TO BE CHECKED ON SITE PRIOR TO FABRICATION

3.HATCH
3.1 CLEAR ▨
3.2 FROSTED ▨
3.3 REFLECTIVE ▨

DOOR / WINDOW SCHEDULE-3

0 .5 1 1.5 2 2.5

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Name: Umar Mohamed Saeed VALIDITY: 23.03.22 - 22.09.23
Accredited No: BPR2022015B1 B1-2022-015-001

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PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07
CLIENT:
MUNI ENTERPRISES PVT LTD

TITLE:
DOOR/WINDOW SCHEDULE

DESIGNED BY	ZAFARULLA SHAKEEL	**PAGE**	A - 16 /21
DRAWN BY	I.S.A	**DATE**	NOV-22
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ROOM NO :	DESCRIPTION :	ROOM AREA	D / W NO :	REQUIRED OPEN AREA	DESIGNED OPEN AREA
GROUND FLOOR					
SHOWROOM	SHOWROOM	227.10 SQM	-		MECHANICAL VENTILATION
FIRST FLOOR					
SHOWROOM	SHOWROOM	268.71 SQM	-		MECHANICAL VENTILATION
CUSTOMER TOILETS	TOILET	9.99 SQM	V1,V1,V2	-	MECHANICAL VENTILATION
SECOND-THIRD FLOOR					
SHOWROOM	SHOWROOM	277.69 SQM	-		MECHANICAL VENTILATION
FOURTH-SIXTH FLOOR					
GODOWN	GODOWN	124.03 SQM	-		MECHANICAL VENTILATION
SEVENTH FLOOR					
GODOWN	GODOWN	124.03 SQM	-		MECHANICAL VENTILATION
MEETING ROOM	MEETING ROOM	16.33 SQM	-		MECHANICAL VENTILATION
STAFF TEA ROOM	STAFF TEA ROOM	9.76 SQM	SW2	-	1.21 SQM
ADMIN OFFICE	ADMN OFFICE	60.90 SQM	-		MECHANICAL VENTILATION
STAFF TOILETS	TOILET	6.29 SQM	V1,V1,V2	-	MECHANICAL VENTILATION
TERRACE FLOOR					
ADMIN OFFICE	ADMIN OFFICE	105.54 SQM	SW1,SW1,SW2	-	MECHANICAL VENTILATION
STAFF TOILETS	TOILET	6.29 SQM	V1,V1,V2	-	MECHANICAL VENTILATION

SCHEDULE OF VENTILATION

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SCALE	AS GIVEN	**DRAWN NO**	-

TITLE:
SCHEDULE OF VENTILATION

PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07

CLIENT:
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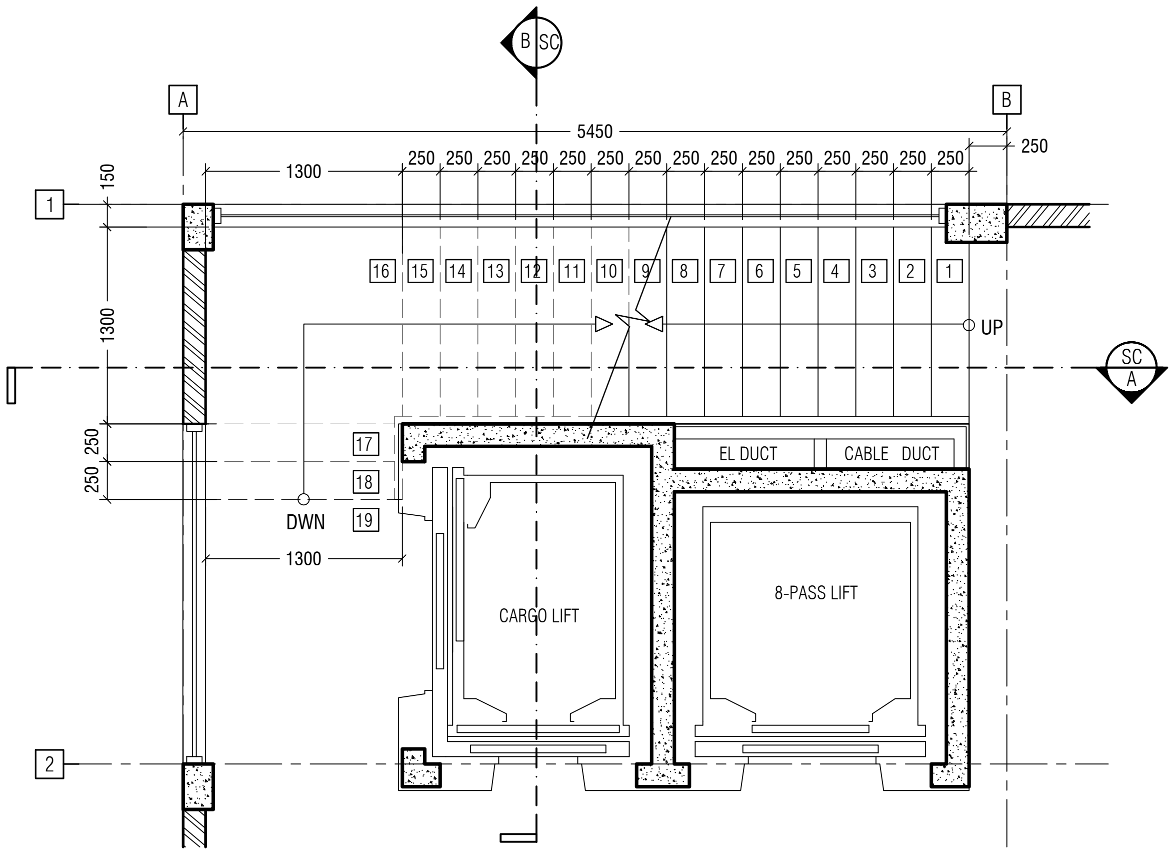
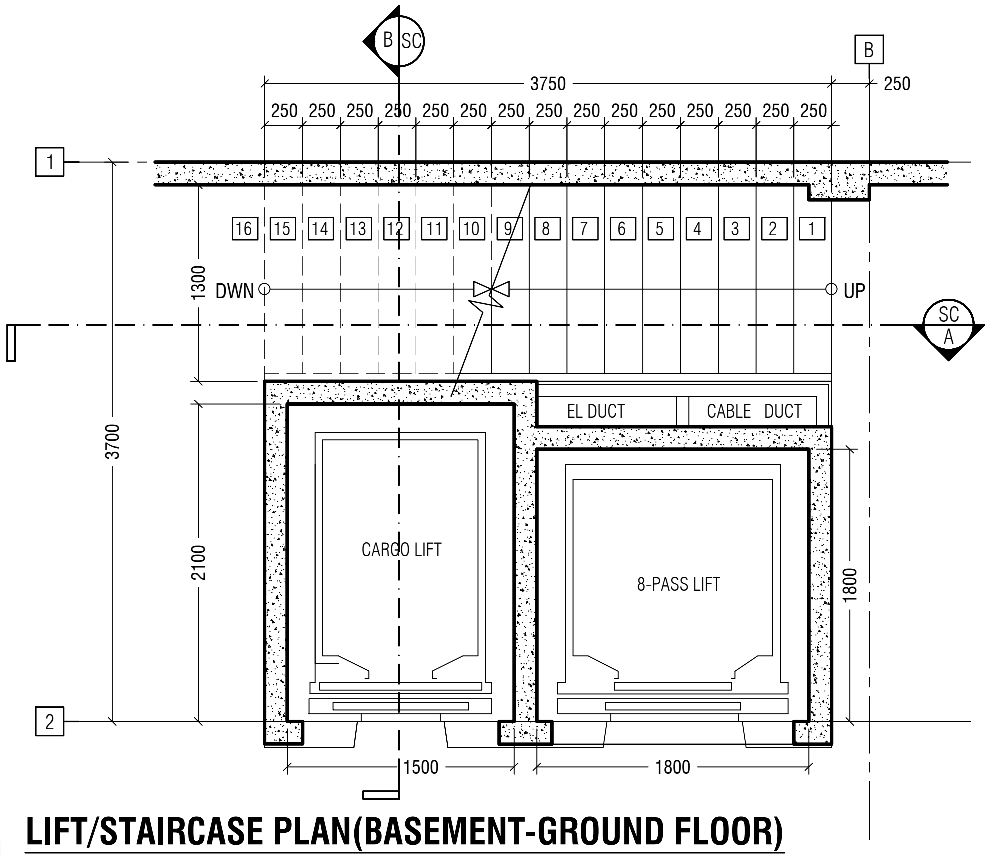


LIFT/STAIRCASE PLAN(GROUND FLOOR-TERRACE FLOOR)

SCALE 1:50

0 0.25 0.5 1 1.5 2 2.5



LIFT/STAIRCASE PLAN(BASEMENT-GROUND FLOOR)

SCALE 1:50

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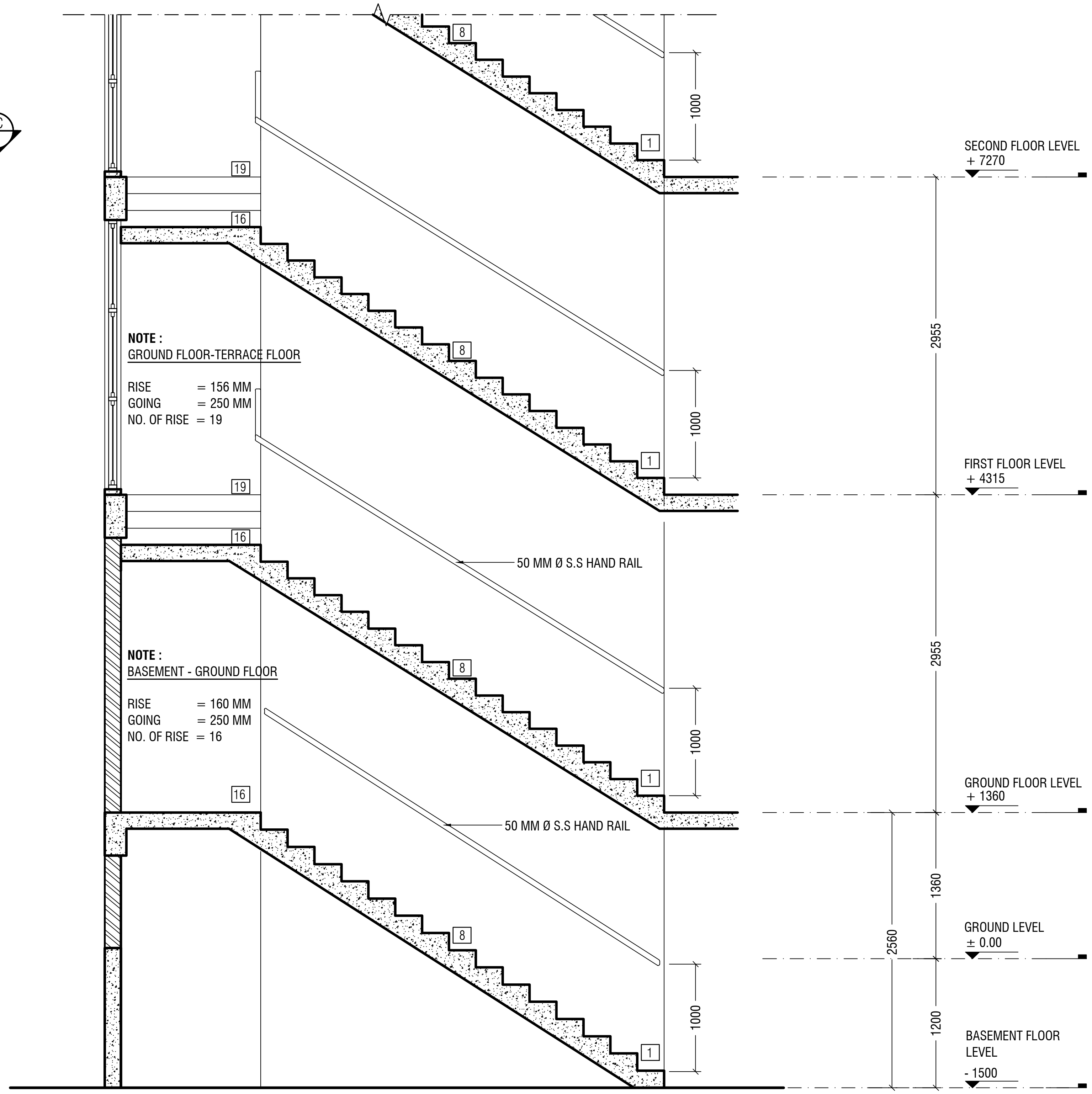

NOTE :

GROUND FLOOR-TERRACE FLOOR

RISE = 156 MM
GOING = 250 MM
NO. OF RISE = 19

NOTE :

BASEMENT - GROUND FLOOR

RISE = 160 MM
GOING = 250 MM
NO. OF RISE = 16

SECTION-A

SCALE 1:50

0 0.25 0.5 1 1.5 2 2.5

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PAGE	A - 18/21
DATE	NOV-22
SCALE	AS GIVEN
DESIGNED BY	ZAFARULLA SHAKEEL
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DRAWN NO	-

TITLE:
STAIRCASE DETAILS

PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07

CLIENT:
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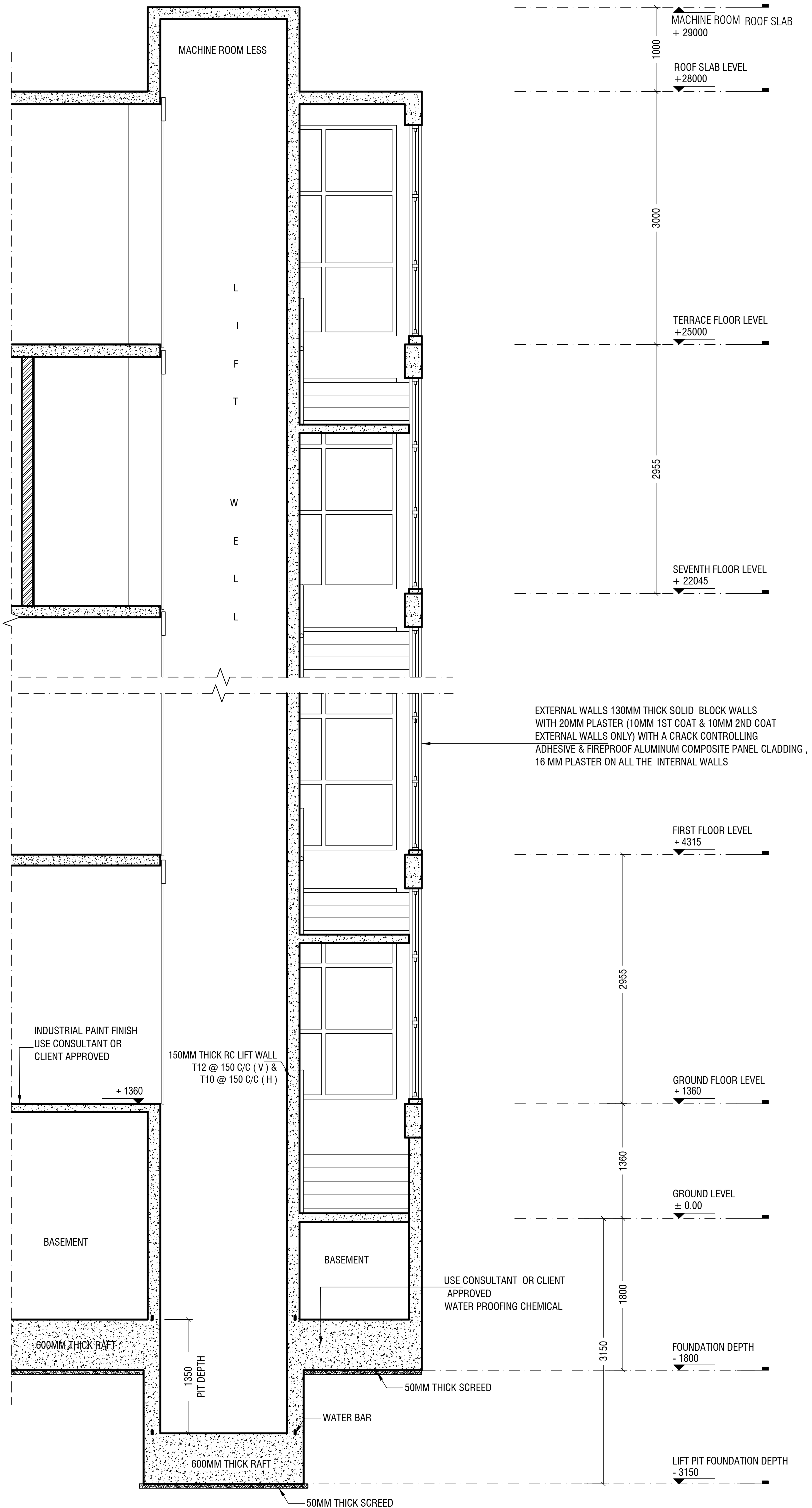

SECTION -B

SCALE 1:50

0 0.25 0.5 1 1.5 2 2.5

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PROJECT: PROPOSED 8 STOREY BUILDING @ LOT M4-07	**TITLE:** SECTION-B	**DESIGNED BY**	ZAFARULLA SHAKEEL	**PAGE**	A - 19 /21
CLIENT: MUNI ENTERPRISES PVT LTD		**DRAWN BY**	I.S.A	**DATE**	NOV-22
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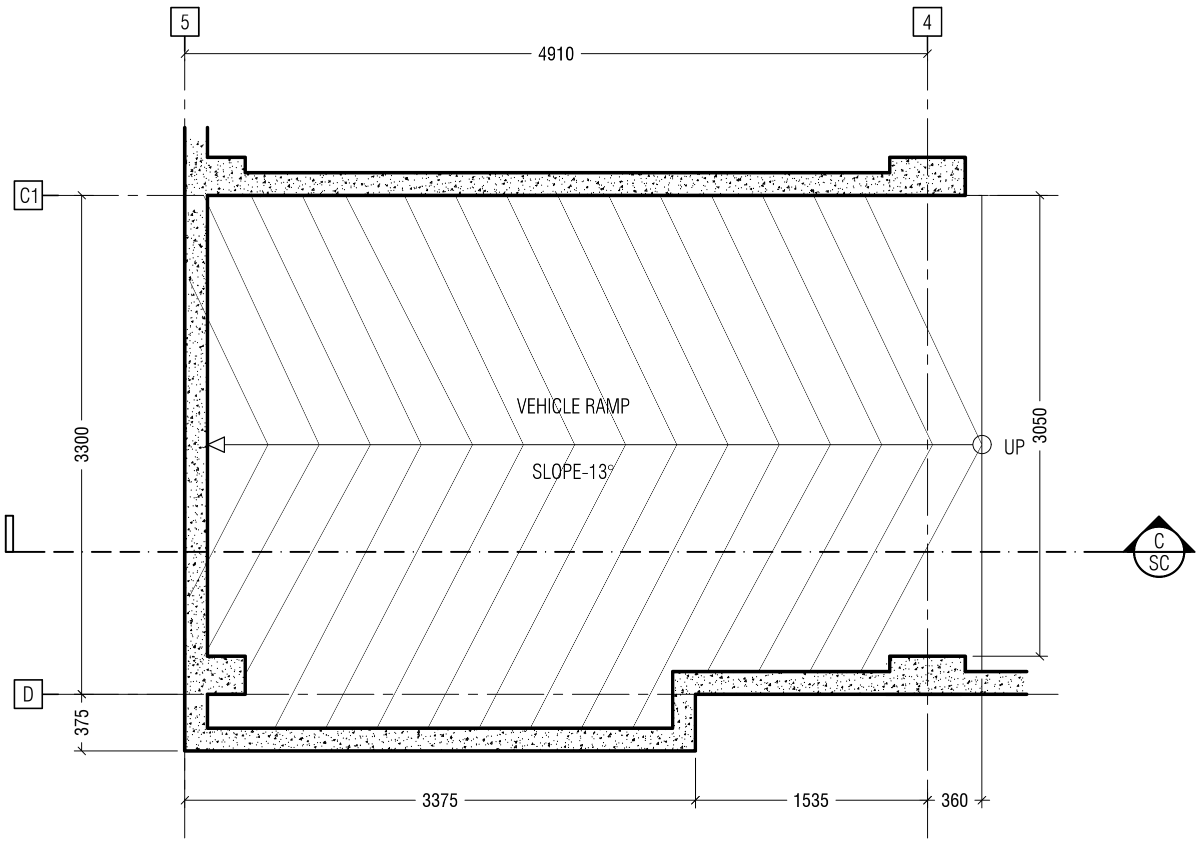

VEHICLE RAMP PLAN

SCALE 1:50
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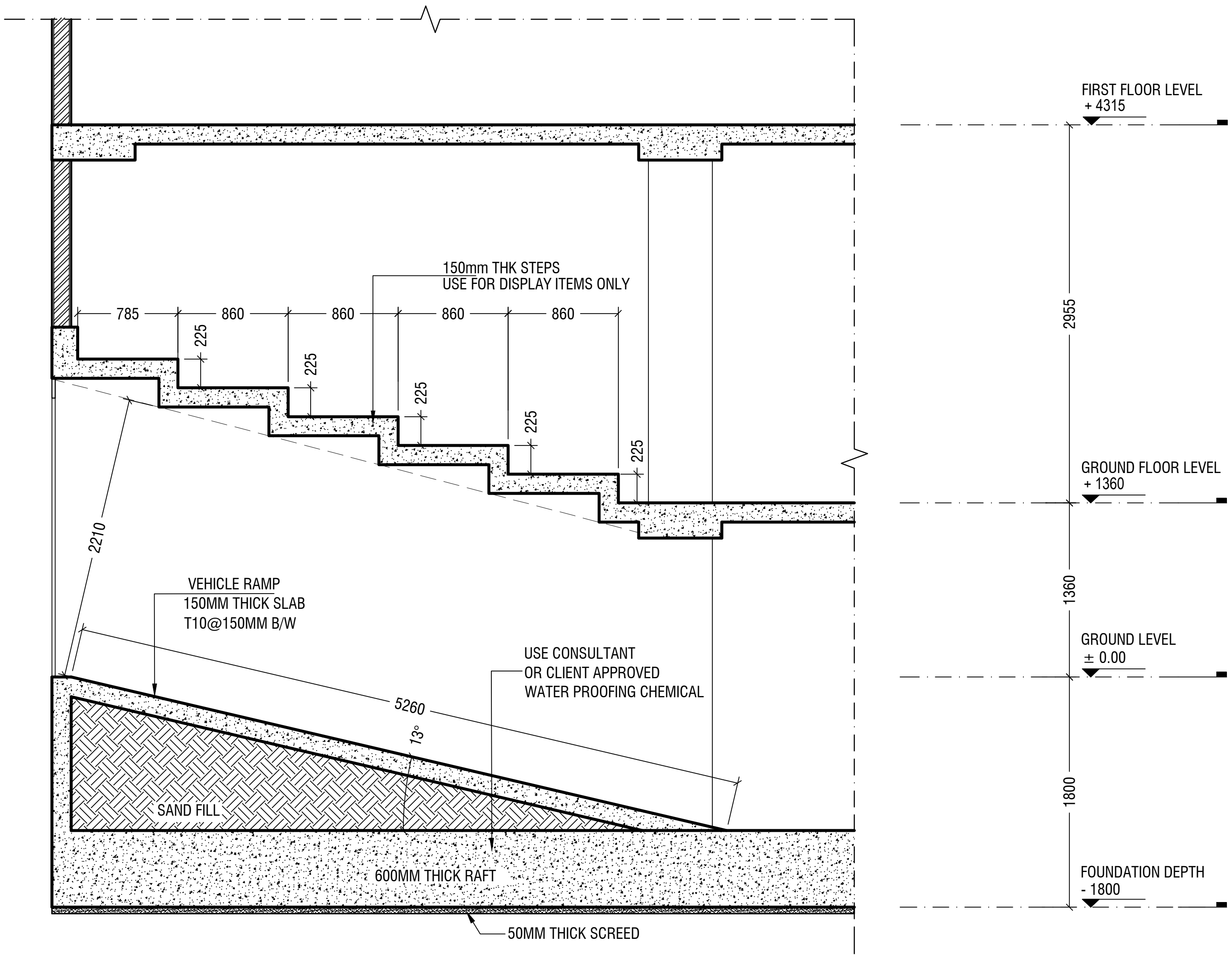

SECTION -C

SCALE 1:50
0 0.25 0.5 1 1.5 2 2.5

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PROJECT:	**TITLE:**	**DESIGNED BY**	ZAFARULLA SHAKEEL	**PAGE**	A - 20 /21
PROPOSED 8 STOREY BUILDING @ LOT M4-07	SECTION-C	**DRAWN BY**	I.S.A	**DATE**	NOV-22
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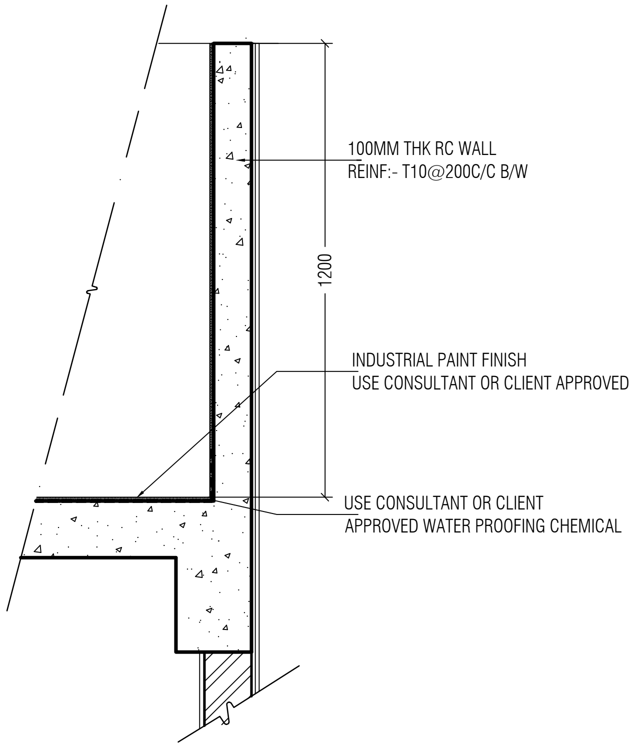
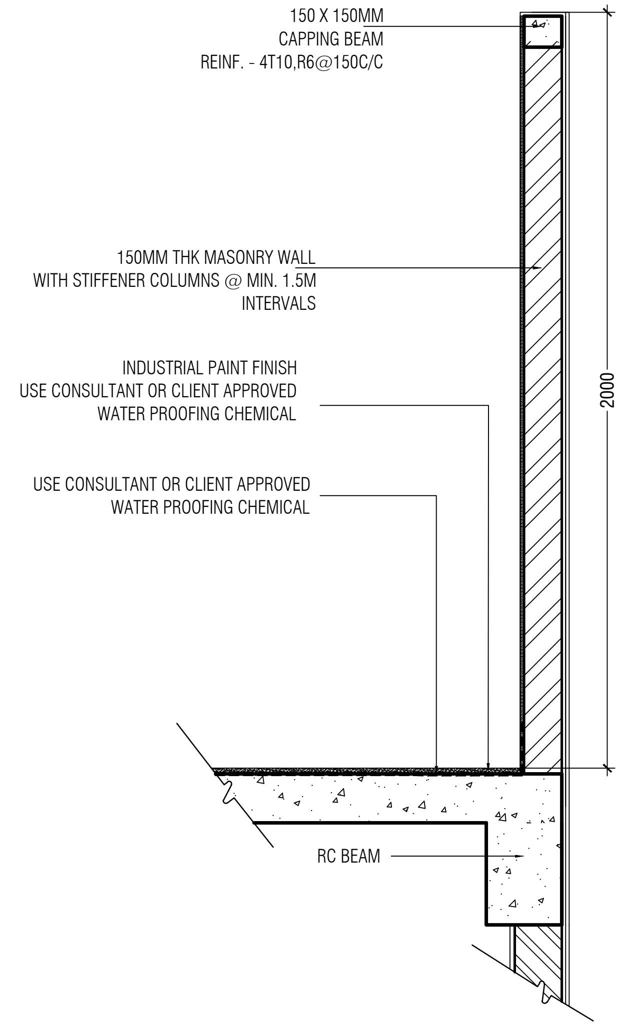


1.2M HEIGHT WALL DETAIL

SCALE 1:20

0 0.1 0.2 0.4 0.6 0.8 1



TERRACE 2M HEIGHT WALL DETAIL

SCALE 1:20

0 0.1 0.2 0.4 0.6 0.8 1

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PROJECT:
PROPOSED 8 STOREY BUILDING @ LOT M4-07
CLIENT:
MUNI ENTERPRISES PVT LTD

TITLE:
ARCHITECTURAL DETAIL

DESIGNED BY	ZAFARULLA SHAKEEL	**PAGE**	A - 21 /21
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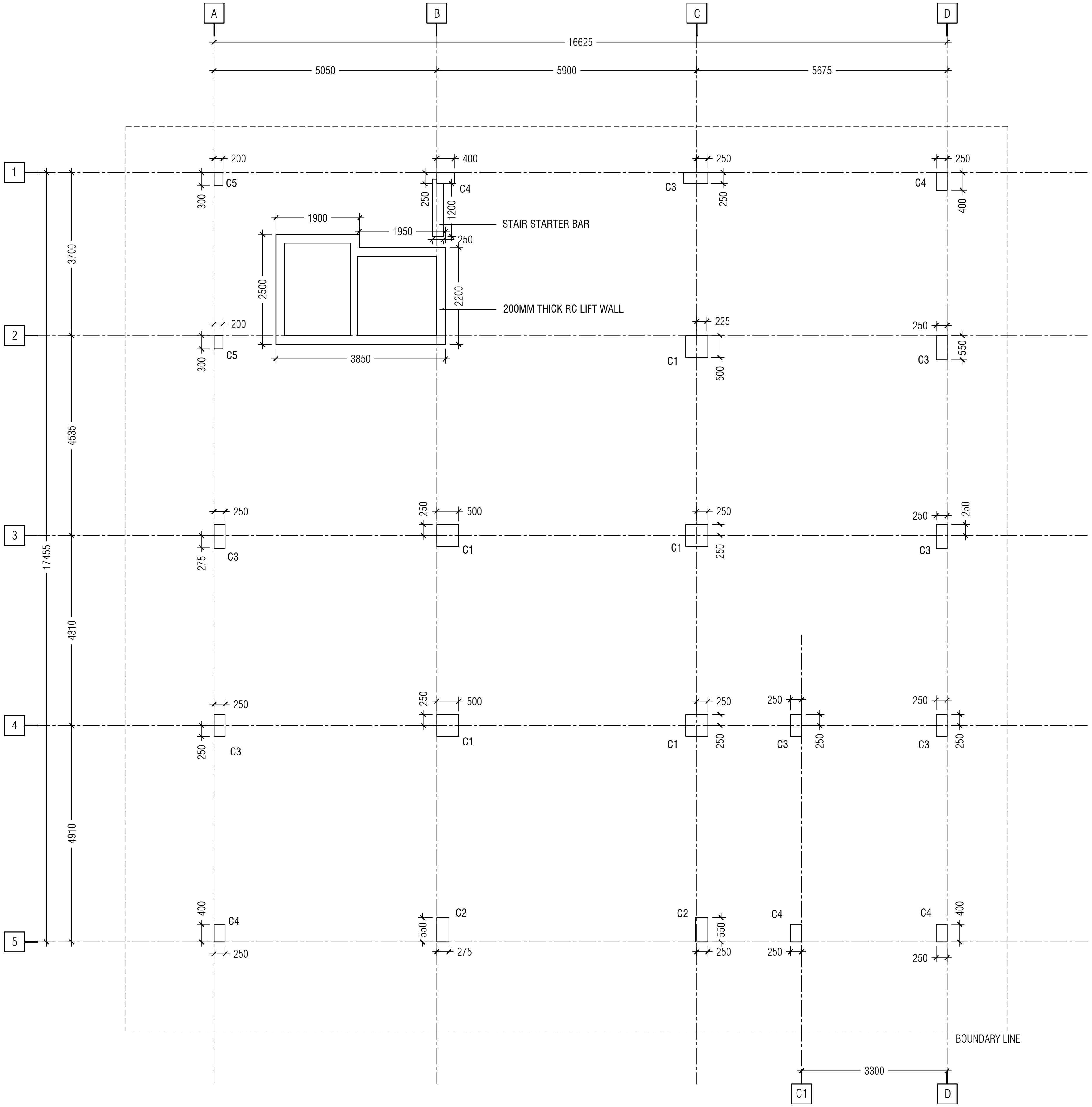

UMN SETTING-OUT PLAN

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PROJECT:
PROPOSED 6 STOREY BUILDING @ LOT M4-08

CLIENT:
MUNI ENTERPRISES PVT LTD

TITLE:
COLUMN SETTING-OUT PLAN

DESIGNED BY	AHMED SUJITH	**PAGE**	S - 01 /15
DRAWN BY	I.S.A	**DATE**	MAY-22
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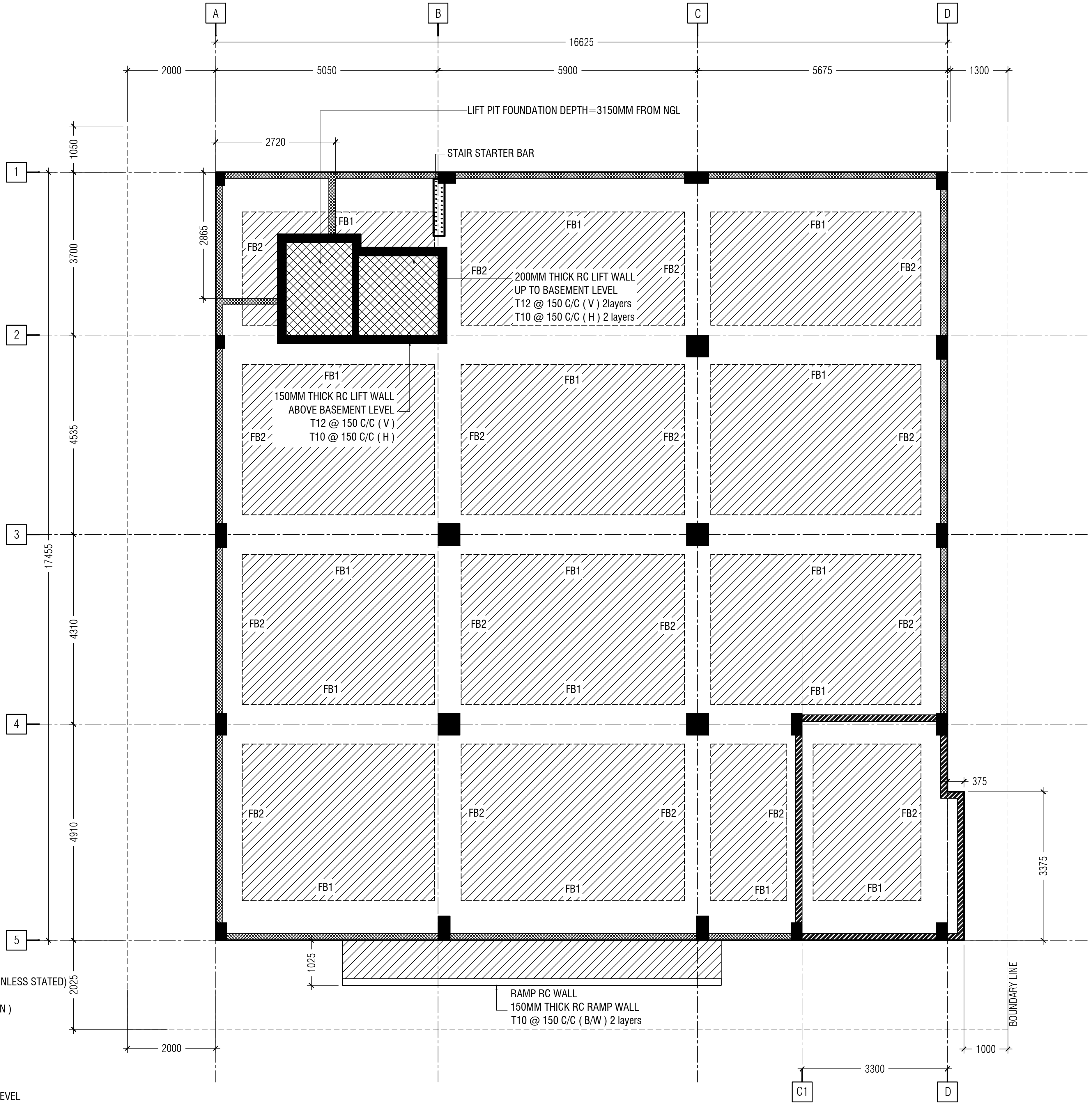

NOTE

- FOUNDATION DEPTH = -1800 MM FROM N.G.L (UNLESS STATED)
- RAFT THICKNESS = 600MM
- BOTTOM REINF. - T16@100C/C B/W (NOT SHOWN)
- TOP REINF. - T16@150C/C B/W (NOT SHOWN)
- CONCRETE GRADE = C35A (1:1.5:2)

▨ -175MM THICK RC WALL UP TO NATURAL GROUND LEVEL T10@ 150 C/C B/W 2 LAYERS

-175MM THICK RC WALL UP RAMP LEVEL T10@ 150 C/C B/W 2 LAYERS

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DATION PLAN

0 0.5 1 2 3 4 5

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PROJECT:
PROPOSED 6 STOREY BUILDING @ LOT M4-08

CLIENT:
MUNI ENTERPRISES PVT LTD

TITLE:
FOUNDATION PLAN

DESIGNED BY AHMED SUJITH
DRAWN BY I.S.A
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PAGE S - 02 /15
DATE MAY-22
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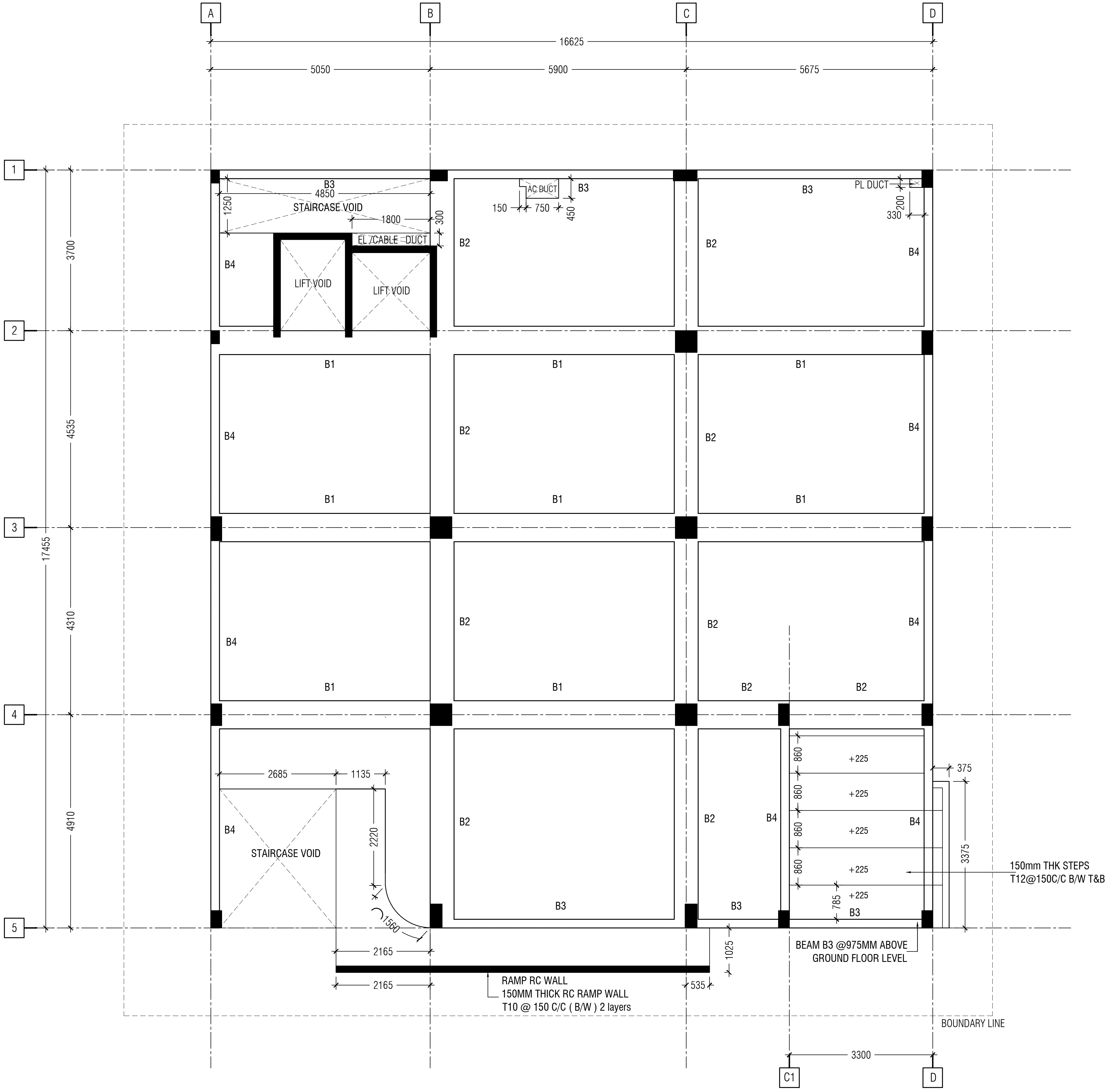

ROUND FLOOR BEAM PLAN

LE 1:100

0 0.5 1 2 3 4 5

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PROJECT:
PROPOSED 6 STOREY BUILDING @ LOT M4-08

CLIENT:
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TITLE:
BEAM PLAN

DESIGNED BY	AHMED SUJITH	**PAGE**	S - 03 /15
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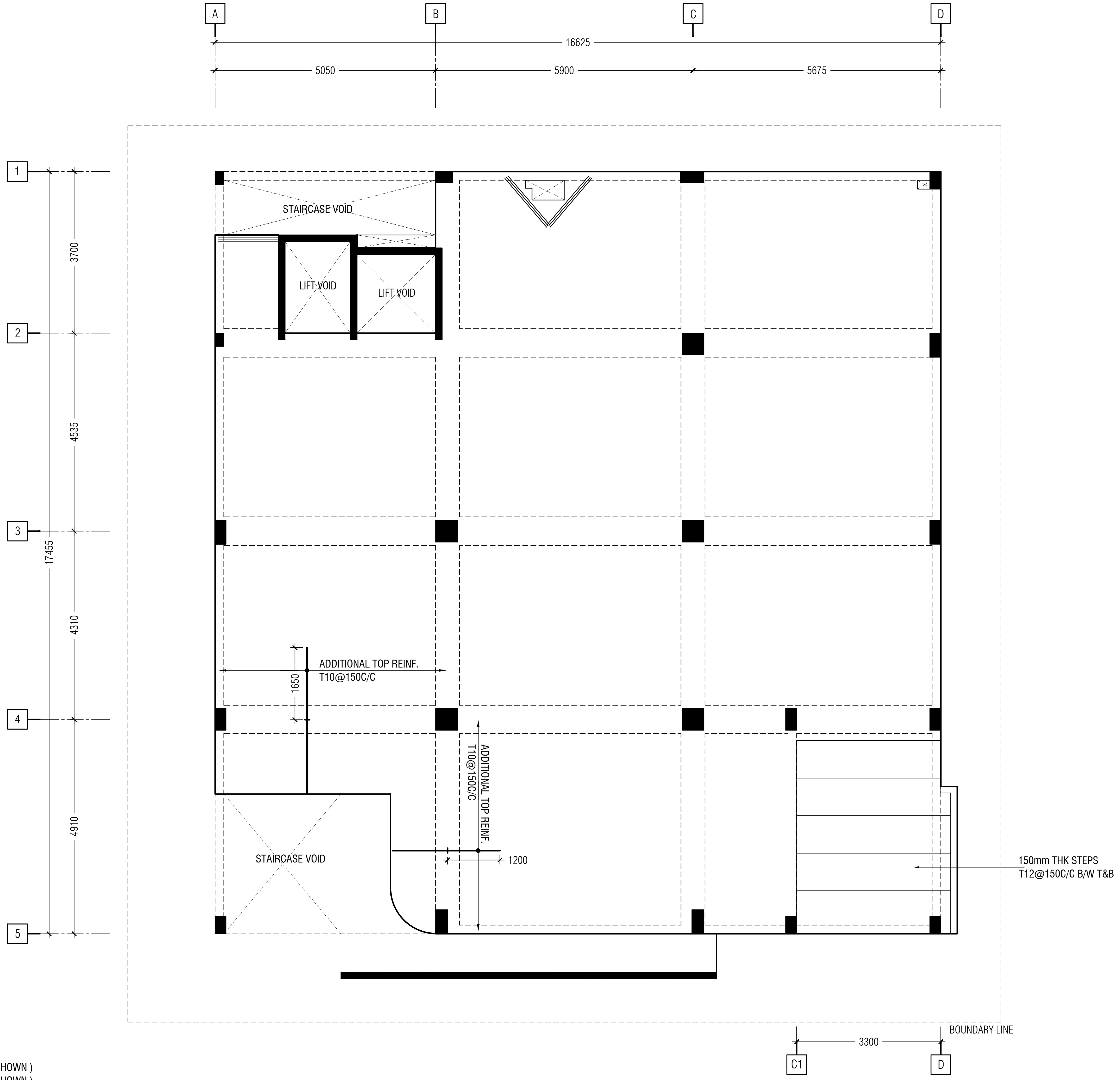

NOTE
- SLAB THICKNESS : 150MM
OT. REINF.: T10@150 C/C B/W (NOT SHOWN)
OP REINF.: T10@150 C/C B/W (NOT SHOWN)
ORNER BARS : 3T10@45 C/C T&B (AS SHOWN)

ROUND FLOOR SLAB REINFORCEMENT PLAN

LE 1:100

0 0.5 1 2 3 4 5

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TITLE:
SLAB PLAN

PROJECT:
PROPOSED 6 STOREY BUILDING @ LOT M4-08

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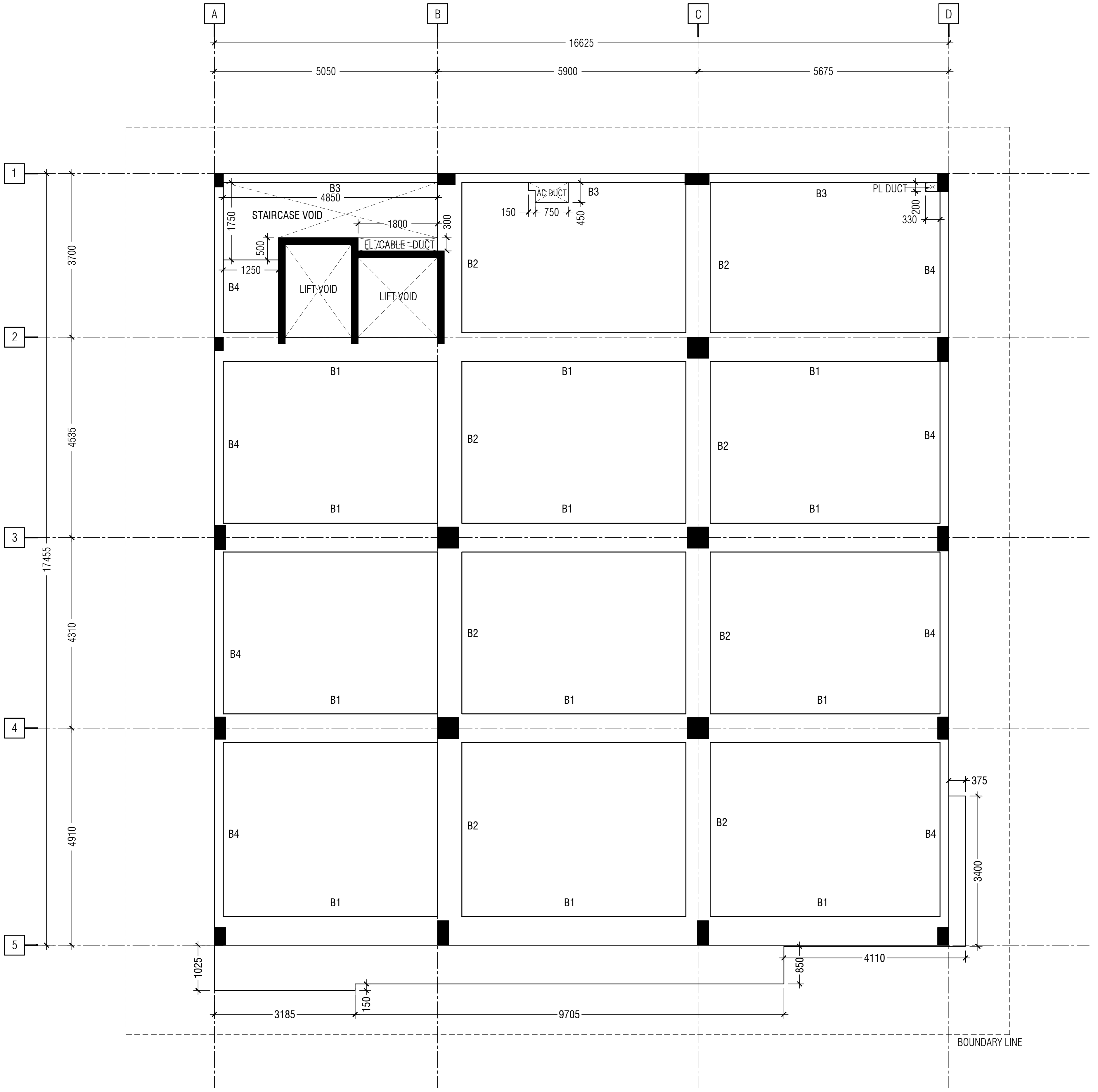

ST TO 3RD FLOOR BEAM PLAN

LE 1:100

0 0.5 1 2 3 4 5

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TITLE:
BEAM PLN

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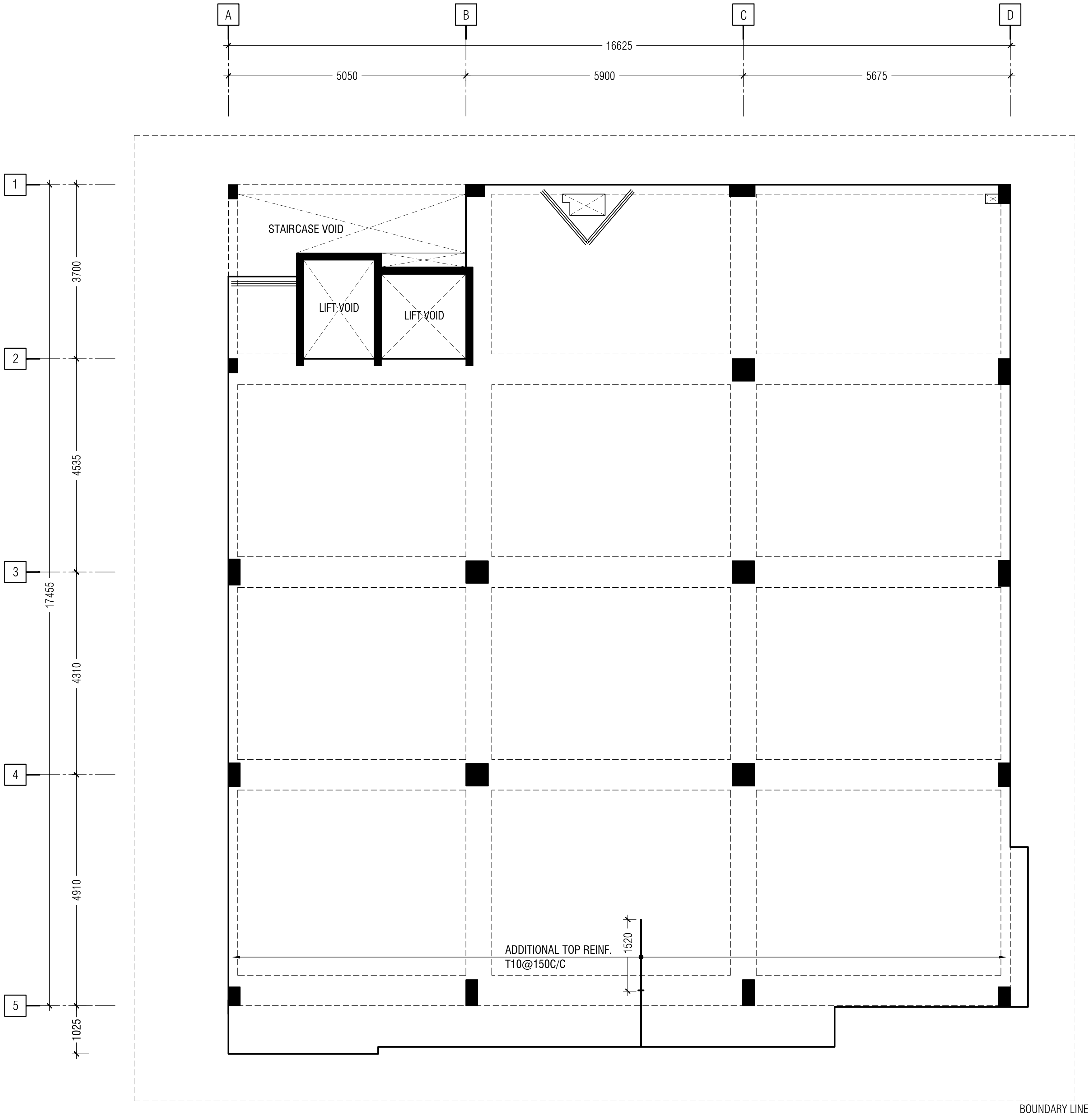

NOTE
- SLAB THICKNESS : 150MM
OT. REINF.: T10@150 C/C B/W (NOT SHOWN)
OP REINF.: T10@150 C/C B/W (NOT SHOWN)
ORNER BARS : 3T10@45 C/C T&B (AS SHOWN)

ST TO 3RD FLOOR SLAB REINFORCEMENT PLAN

LE 1:100

0 0.5 1 2 3 4 5

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PAGE S - 06 /15
DATE MAY-22
SCALE AS GIVEN

DESIGNED BY AHMED SUJITH
DRAWN BY I.S.A
DRAWN NO -

TITLE:
SLAB PLAN

PROJECT:
PROPOSED 6 STOREY BUILDING @ LOT M4-08

CLIENT:
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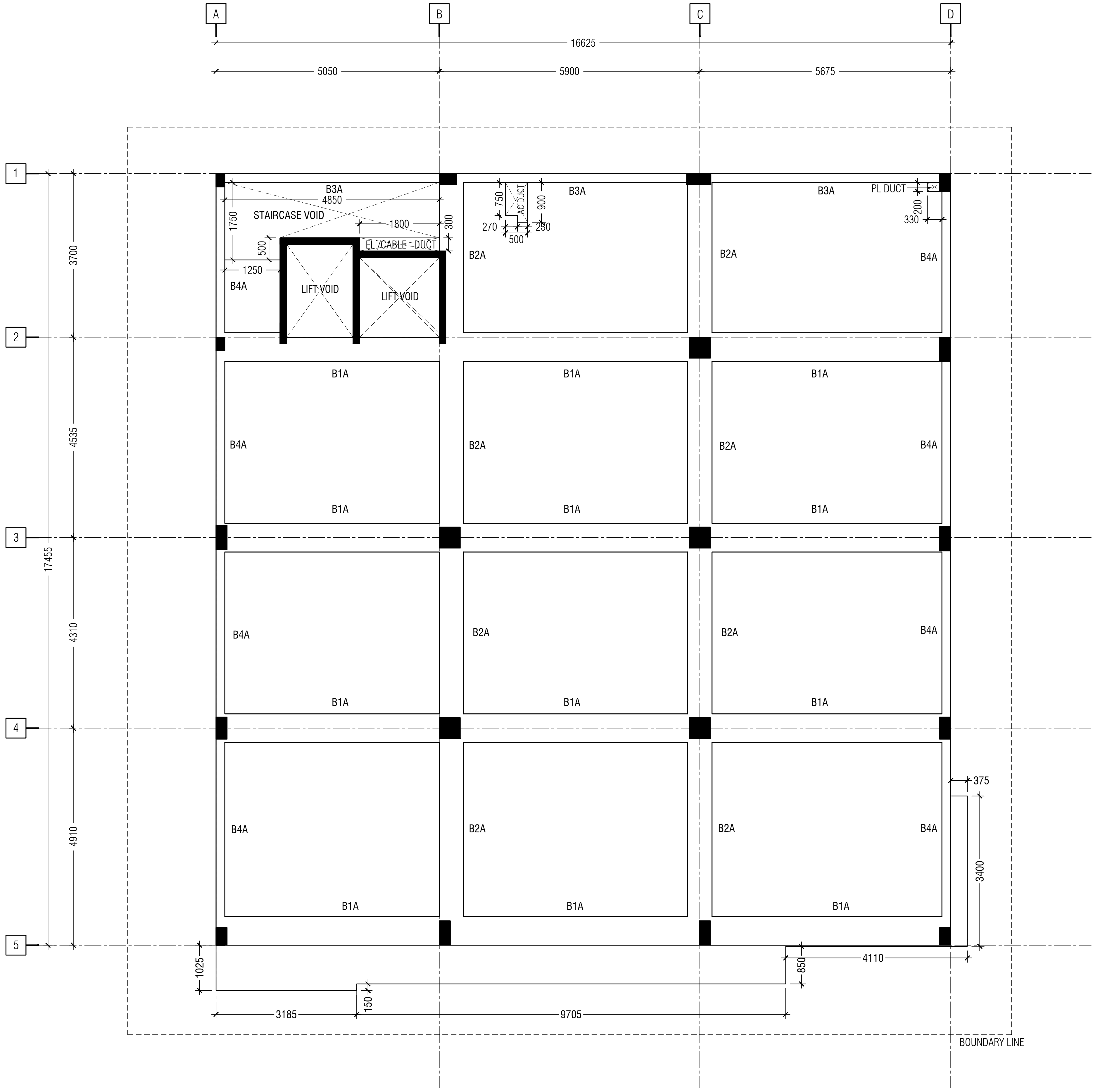
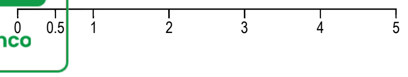


TH, 5TH, 6TH & 7TH FLOOR BEAM PLAN

LE 1:100



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SCALE	AS GIVEN
DESIGNED BY	AHMED SUJITH
DRAWN BY	I.S.A
DRAWN NO	-

TITLE:
BEAM PLAN

PROJECT:
PROPOSED 6 STOREY BUILDING @ LOT M4-08

CLIENT:
MUNI ENTERPRISES PVT LTD

YURT PVT. LTD.
YURT PVT LTD / M.FUNAGASDHOSHUGE /5TH FLOOR /ISKANDHARU MAGU /20270 /MALE' /REP OF MALDIVES
M:(+960) 7757001 / M:(+960) 7792824 W: www.yu-rt.com / E: yurt.mv@gmail.com

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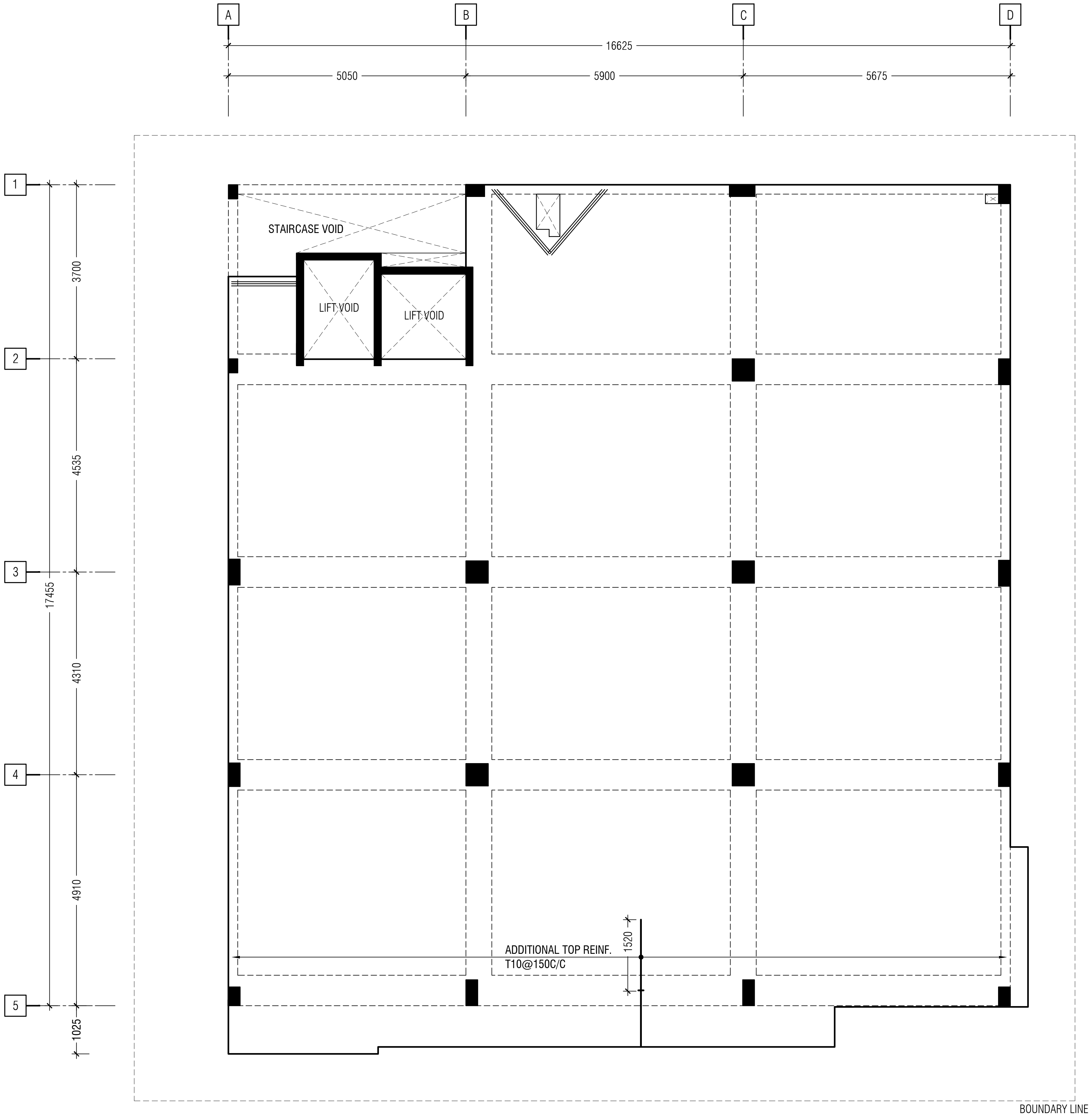

NOTE

SLAB THICKNESS : 170MM
BOT. REINF.: T10@150 C/C B/W (NOT SHOWN)
OP REINF.: T10@150 C/C B/W (NOT SHOWN)
ORNER BARS : 3T10@45 C/C T&B (AS SHOWN)

TH, 5TH, 6TH & 7TH FLOOR SLAB REINFORCEMENT PLAN

LE 1:100

0 0.5 1 2 3 4 5

APPROVED
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Ministry of National Planning, Housing & Infrastructure
ACCREDITED CHECKER
ARCHITECTURAL CHECKER B1
Name: Umar Mohamed Saeed VALIDITY: 23.03.22 - 22.09.23
Accredited No: BPR2022015B1 B1-2022-015-001

Ministry of National Planning, Housing & Infrastructure
ACCREDITED CHECKER
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Name: Ihsaan Waheed VALIDITY: 23.03.22 - 22.09.23
Accredited No: BPR2022021A1 A1-2022-021-001

PAGE	S - 08 /15
DATE	MAY-22
SCALE	AS GIVEN
DESIGNED BY	AHMED SUJITH
DRAWN BY	I.S.A
DRAWN NO	-

TITLE:
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PROJECT:
PROPOSED 6 STOREY BUILDING @ LOT M4-08

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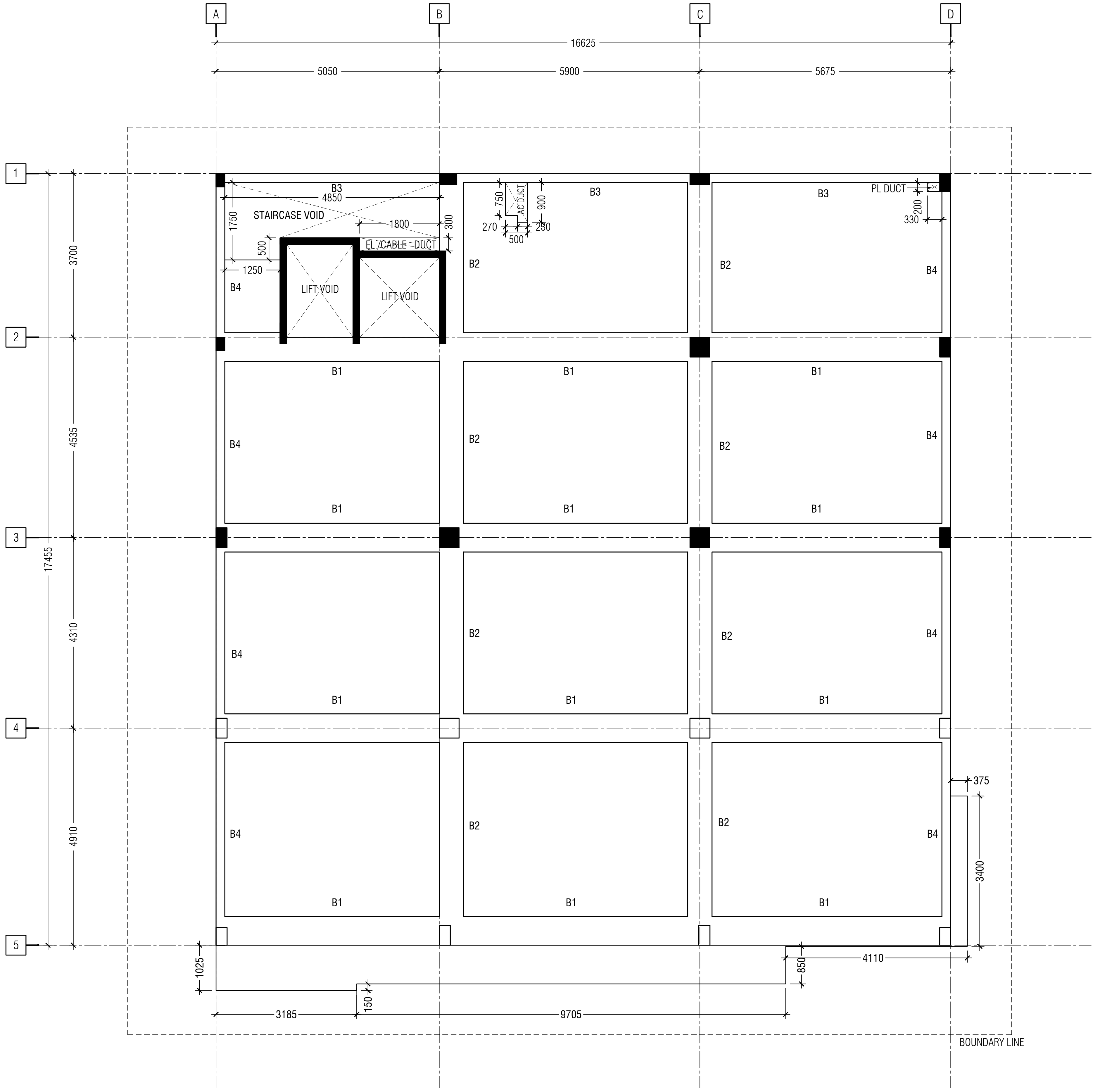

ERRACE FLOOR BEAM PLAN

LE 1:100

0 0.5 1 2 3 4 5

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BEAM PLAN

DESIGNED BY	AHMED SUJITH
DRAWN BY	I.S.A
DRAWN NO	-
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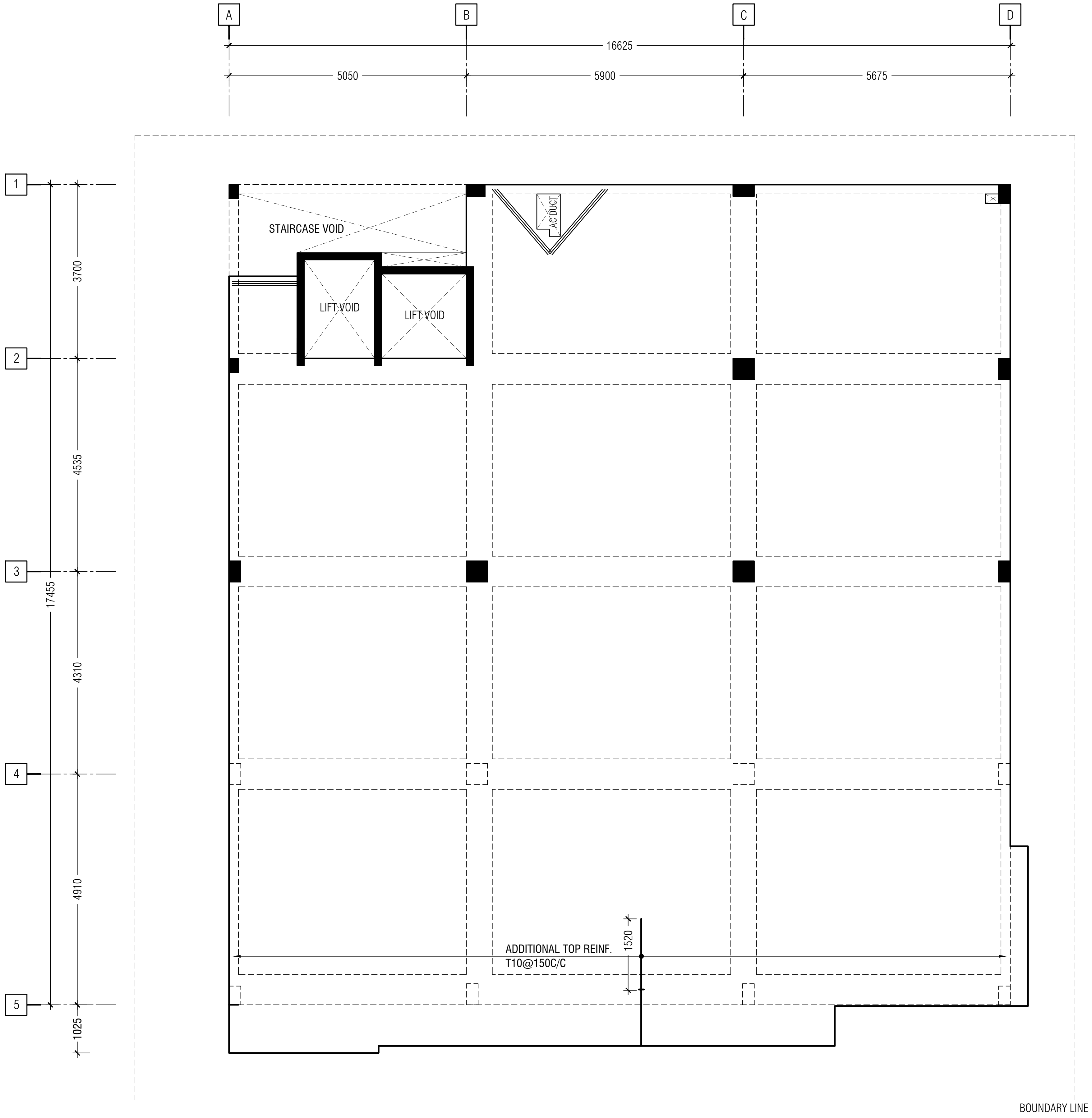

NOTE

- SLAB THICKNESS : 150MM
OT. REINF.: T10@150 C/C B/W (NOT SHOWN)
OP REINF.: T10@150 C/C B/W (NOT SHOWN)
ORNER BARS : 3T10@45 C/C T&B (AS SHOWN)

ERRACE FLOOR SLAB REINFORCEMENT PLAN

LE 1:100

0 0.5 1 2 3 4 5

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DRAWN BY	I.S.A	**DATE**	MAY-22
DRAWN NO	-	**SCALE**	AS GIVEN

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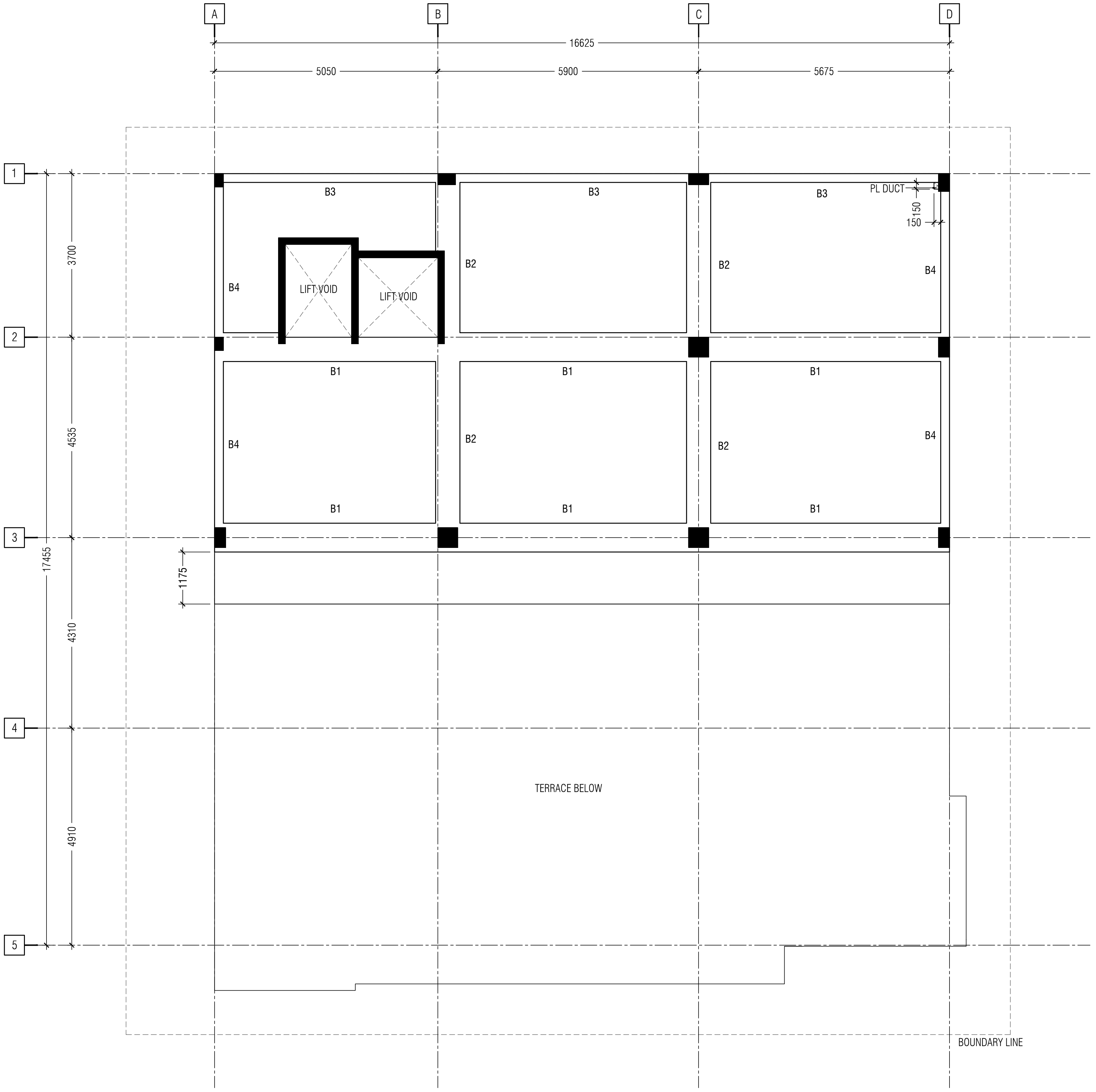

OOF BEAM PLAN

LE 1:100

0 0.5 1 2 3 4 5

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PROJECT:
PROPOSED 6 STOREY BUILDING @ LOT M4-08

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TITLE:
BEAM PLAN

DESIGNED BY	AHMED SUJITH	**PAGE**	S - 11 /15
DRAWN BY	I.S.A	**DATE**	MAY-22
DRAWN NO	-	**SCALE**	AS GIVEN

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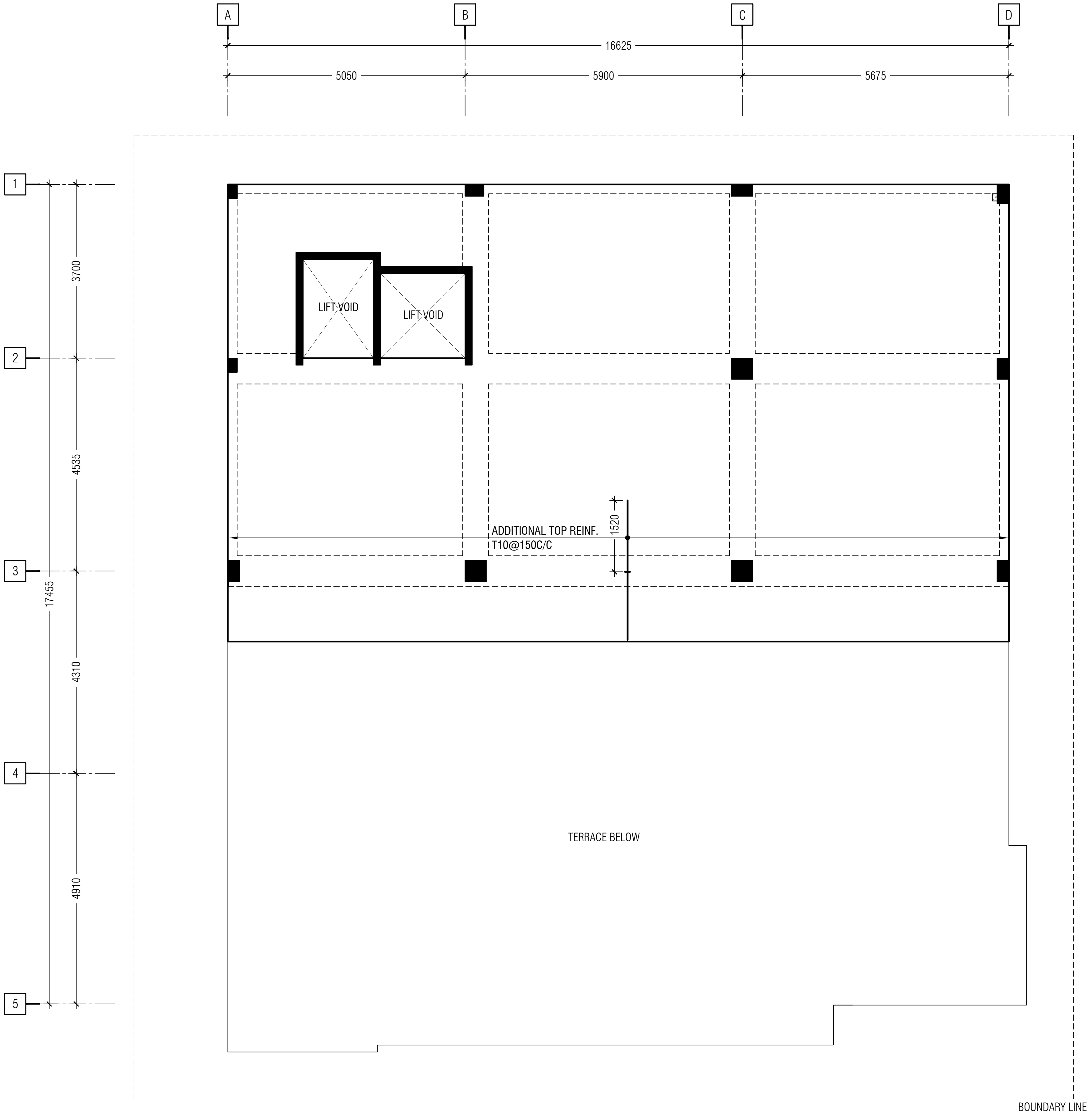

NOTE

- SLAB THICKNESS : 150MM
OT. REINF.: T10@150 C/C B/W (NOT SHOWN)
OP REINF.: T10@150 C/C B/W (NOT SHOWN)
ORNER BARS : 3T10@45 C/C T&B (AS SHOWN)

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OOF SLAB REINFORCEMENT PLAN

LE 1:100

0 0.5 1 2 3 4 5

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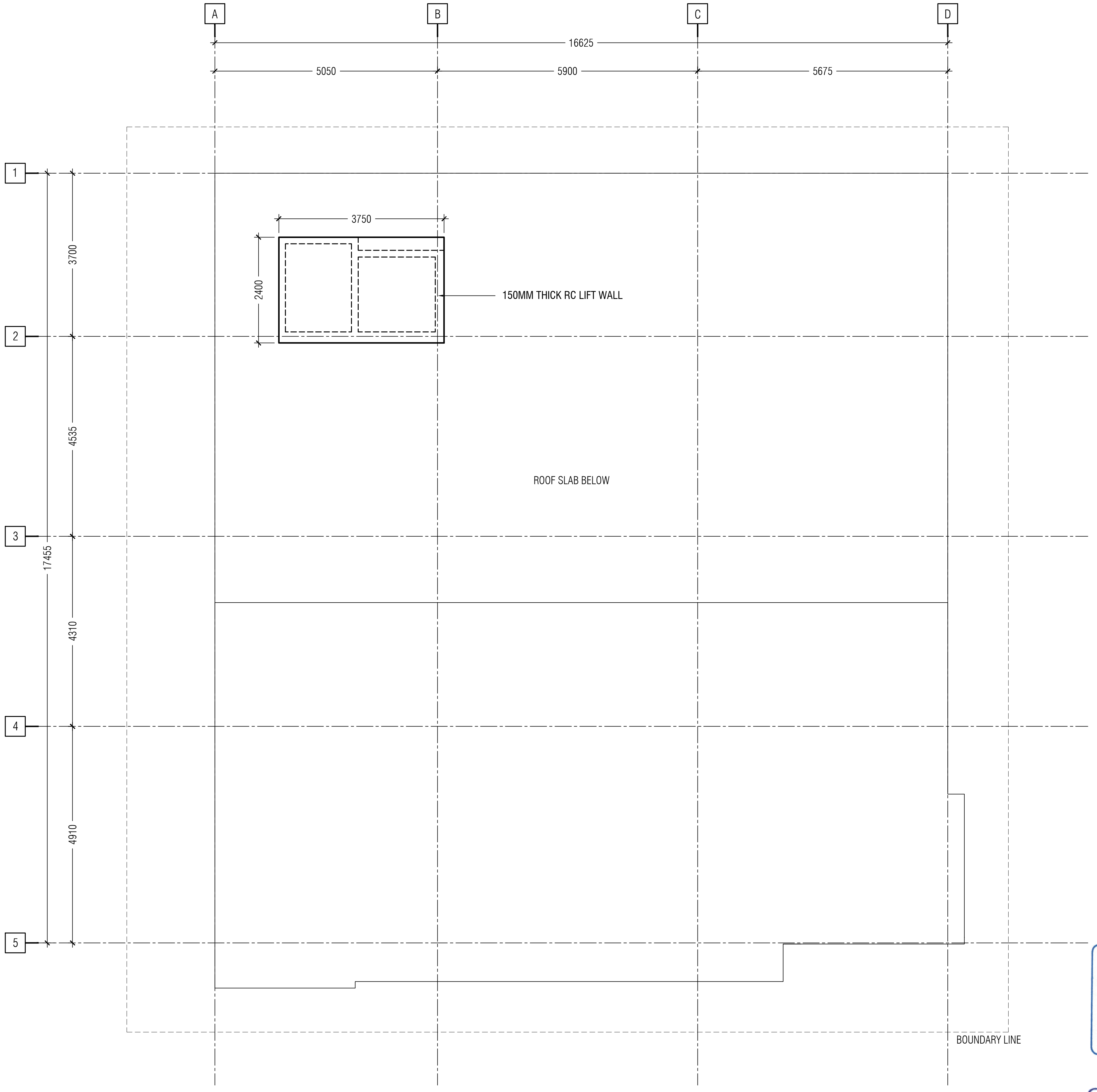

NOTE

LAB THICKNESS : 150MM

OT. REINF.: T10@150 C/C B/W (NOT SHOWN)

OP REINF.: T10@150 C/C B/W (NOT SHOWN)

LIFT ROOF SLAB REINF'T & BEAM PLAN

LE 1:100

0 0.5 1 2 3 4 5

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DRAWN NO	-

TITLE:
BEAM PLAN
SLAB PLAN

PROJECT:
PROPOSED 6 STOREY BUILDING @ LOT M4-08

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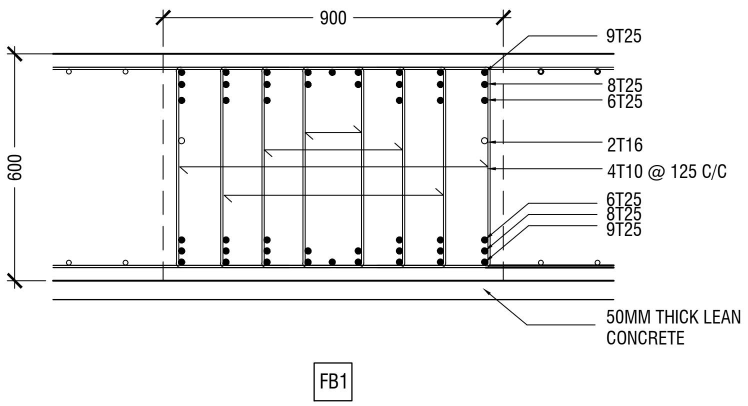

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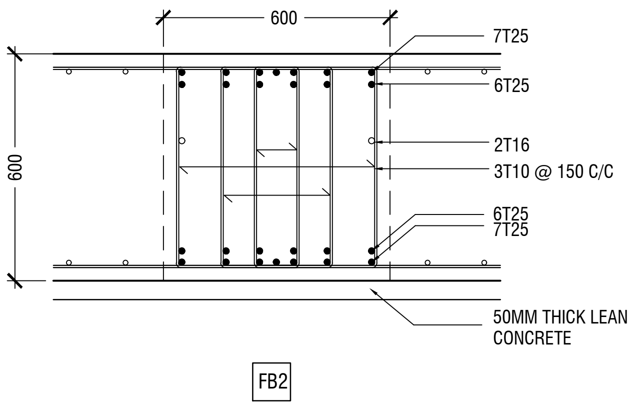
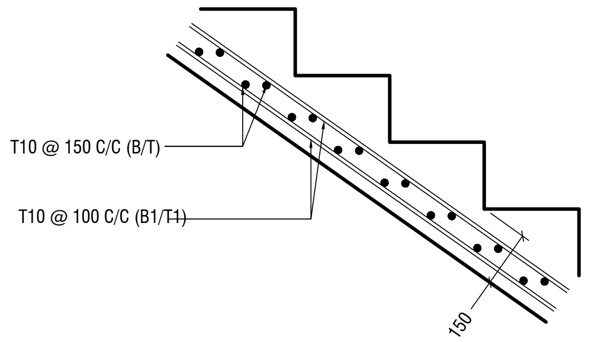


FB2

FOUNDATION BEAM DETAILS

SCALE 1:20

0 0.1 0.2 0.4 0.6 0.8 1



STAIRCASE REINF'T DETAIL

SCALE 1:20

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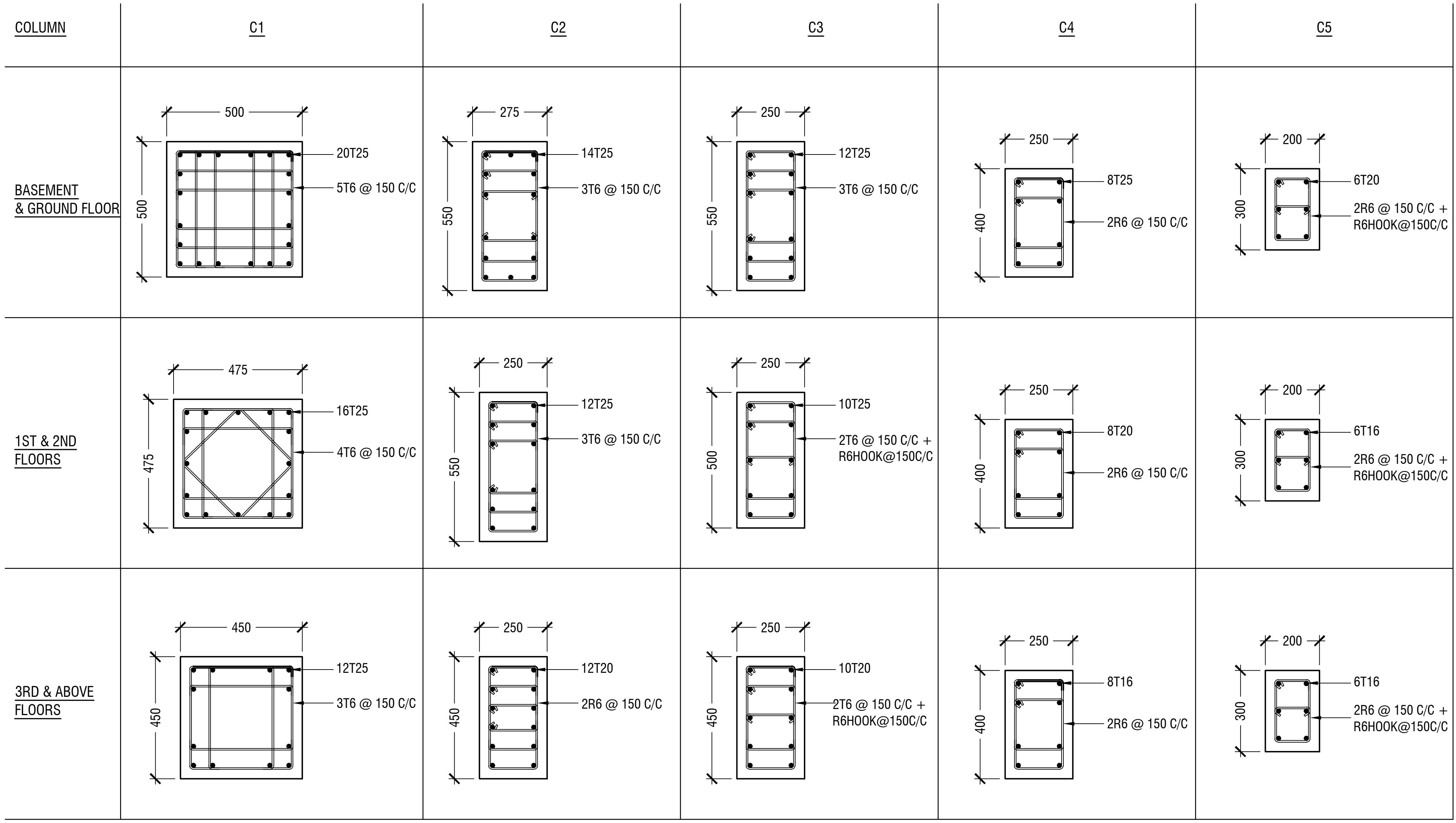

COLUMN	C1	C2	C3	C4	C5
BASEMENT & GROUND FLOOR	500 × 500 20T25 5T6 @ 150 C/C	275 × 550 14T25 3T6 @ 150 C/C	250 × 550 12T25 3T6 @ 150 C/C	250 × 400 8T25 2R6 @ 150 C/C	200 × 300 6T20 2R6 @ 150 C/C + R6HOOK@150C/C
1ST & 2ND FLOORS	475 × 475 16T25 4T6 @ 150 C/C	250 × 550 12T25 3T6 @ 150 C/C	250 × 500 10T25 2T6 @ 150 C/C + R6HOOK@150C/C	250 × 400 8T20 2R6 @ 150 C/C	200 × 300 6T16 2R6 @ 150 C/C + R6HOOK@150C/C
3RD & ABOVE FLOORS	450 × 450 12T25 3T6 @ 150 C/C	250 × 450 12T20 2R6 @ 150 C/C	250 × 450 10T20 2T6 @ 150 C/C + R6HOOK@150C/C	250 × 400 8T16 2R6 @ 150 C/C	200 × 300 6T16 2R6 @ 150 C/C + R6HOOK@150C/C

COLUMN DETAILS

SCALE 1:20

0 0.1 0.2 0.4 0.6 0.8 1

NOTE
- COVER TO FOUNDATION = 55MM
- COVER TO SLAB = 30MM
- COVER TO BEAM = 35MM
- COVER TO COLUMN = 40MM
- BEAMS BEND-UP BARS = 12XDIA
- ANCHOR BARS = 55XDIA
- LAPPING BARS = 45XDIA
- MID BARS = 0.85 X SPAN
- SUPPORT BARS = 1/3 X SPAN
- MIX RATIO = 1:2:3 (CEMENT : SAND : AGGREGATE) UNLESS STATED

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PAGE	S - 14 /15
DATE	MAY-22
SCALE	AS GIVEN
DESIGNED BY	AHMED SUJITH
DRAWN BY	I.S.A
DRAWN NO	-

TITLE: STRUCTURAL DETAILS

PROJECT: PROPOSED 6 STOREY BUILDING @ LOT M4-08

CLIENT: MUNI ENTERPRISES PVT LTD

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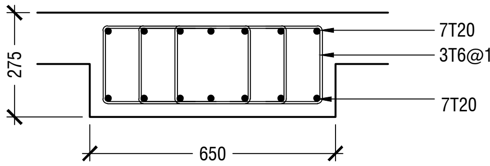
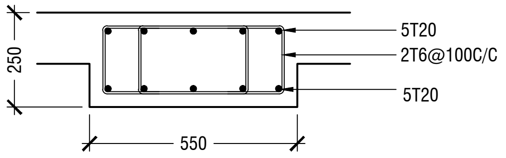
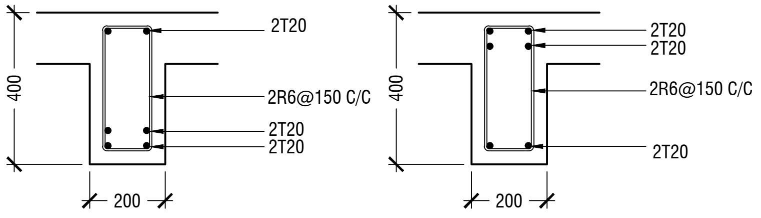


B1

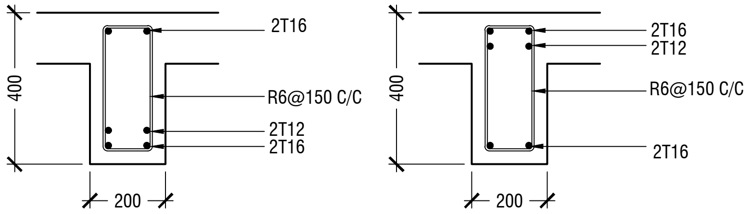


B2



MID SUPP

B3



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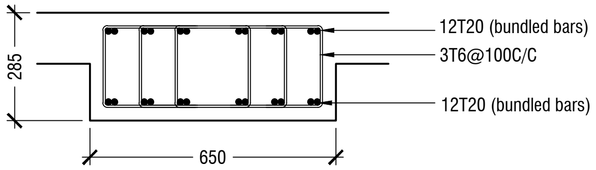
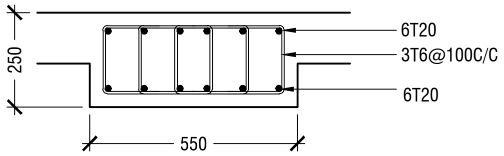
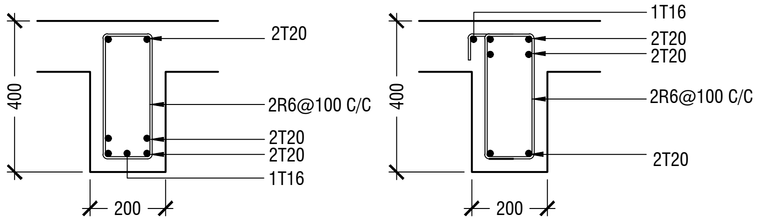


B1A

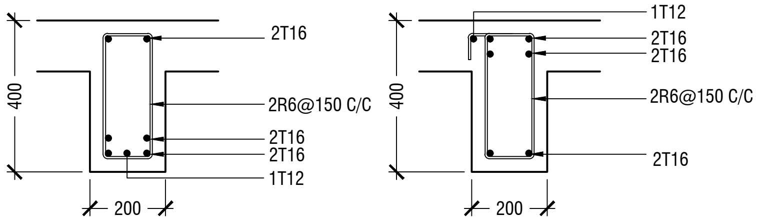


B2A



MID SUPP

B3A



MID SUPP

B4A

NOTE

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- COVER TO SLAB = 30MM
- COVER TO BEAM = 35MM
- COVER TO COLUMN = 40MM
- BEAMS BEND-UP BARS = 12XDIA
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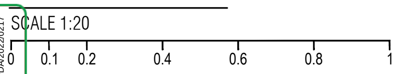
BEAM DETAILS

SCALE 1:20



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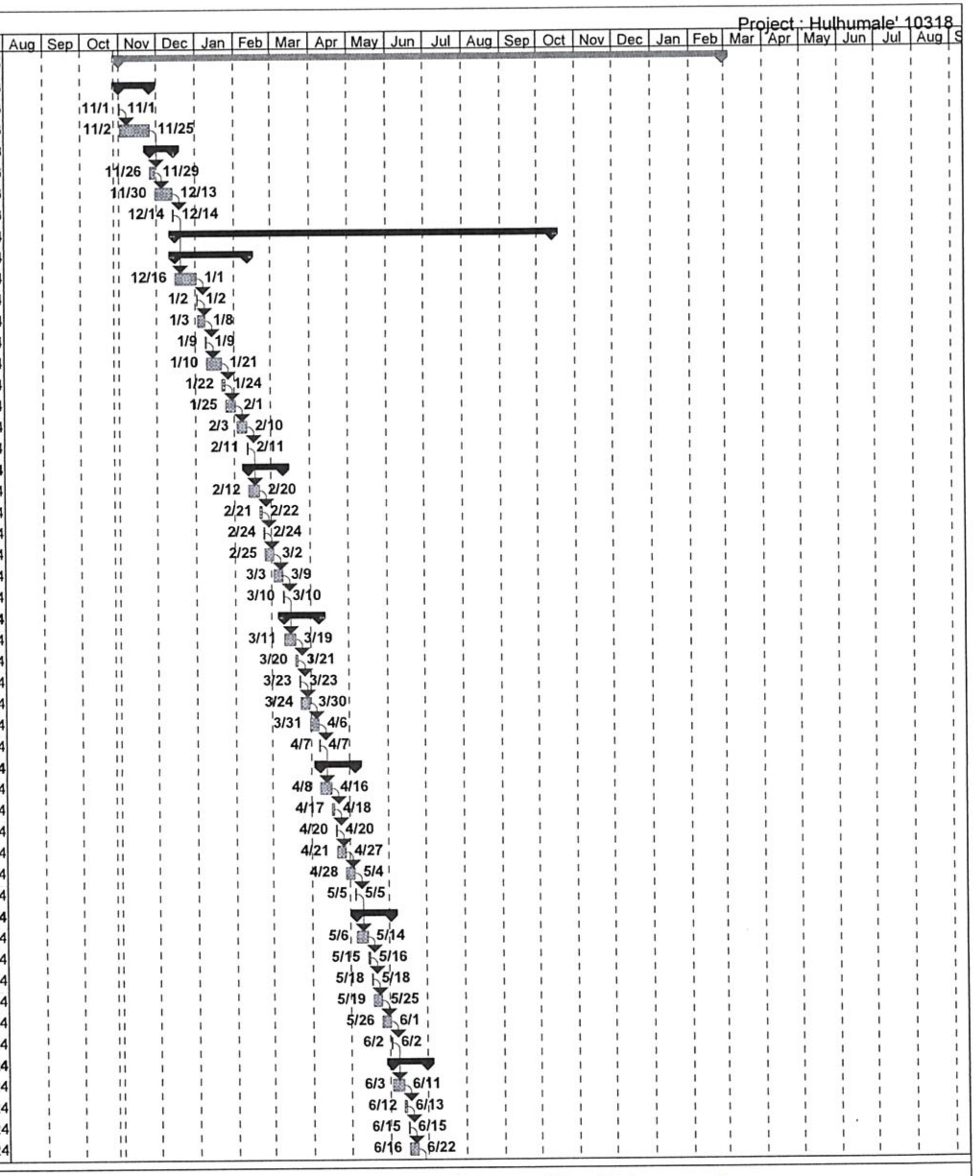
ID	Task Name	Duration	Start	Finish
0	**Work schedule**	**416 days**	**Wed 11/1/23**	**Thu 2/27/25**
1	**Preliminaries**	**21 days**	**Wed 11/1/23**	**Sat 11/25/23**
2	Site Handover to contractor	1 day	Wed 11/1/23	Wed 11/1/23
3	Mobilization	20 days	Thu 11/2/23	Sat 11/25/23
4	**Ground Works**	**17 days**	**Sun 11/26/23**	**Thu 12/14/23**
5	Excavation for foundation	4 days	Sun 11/26/23	Wed 11/29/23
6	Safety precaution for existing buildings	12 days	Thu 11/30/23	Wed 12/13/23
7	Lean concrete for Raft	1 day	Thu 12/14/23	Thu 12/14/23
8	**Concrete Works**	**260 days**	**Sat 12/16/23**	**Sun 10/13/24**
9	**Foundation & Basement**	**50 days**	**Sat 12/16/23**	**Sun 2/11/24**
10	Reinforcement works for Raft & Foundation beams	15 days	Sat 12/16/23	Mon 1/1/24
11	Shuttering etc for raft	1 day	Tue 1/2/24	Tue 1/2/24
12	Reinforcement for Columns	5 days	Wed 1/3/24	Mon 1/8/24
13	RCC for Raft	1 day	Tue 1/9/24	Tue 1/9/24
14	Reinforcement,Shuttering & RCC for columns & concrete wall	10 days	Wed 1/10/24	Sun 1/21/24
15	Reinforcement,Shuttering & RCC for stair & lift	3 days	Mon 1/22/24	Wed 1/24/24
16	Shuttering & Reinforcement for GF beams	7 days	Thu 1/25/24	Thu 2/1/24
17	Shuttering and Reinforcement for GF Slab	7 days	Sat 2/3/24	Sat 2/10/24
18	RCC for GF Slab & beams	1 day	Sun 2/11/24	Sun 2/11/24
19	**Ground floor**	**24 days**	**Mon 2/12/24**	**Sun 3/10/24**
20	Reinforcement, Shuttering & RCC for GF Columns	8 days	Mon 2/12/24	Tue 2/20/24
21	Shuttering and Reinforcement for Staircase & Lift	2 days	Wed 2/21/24	Thu 2/22/24
22	RCC for Stair & Lift	1 day	Sat 2/24/24	Sat 2/24/24
23	Shuttering and Reinforcement for 1F beams	6 days	Sun 2/25/24	Sat 3/2/24
24	Shuttering and Reinforcement for 1F Slab	6 days	Sun 3/3/24	Sat 3/9/24
25	RCC for 1F Slab incl. beams, stair	1 day	Sun 3/10/24	Sun 3/10/24
26	**First floor**	**24 days**	**Mon 3/11/24**	**Sun 4/7/24**
27	Reinforcement, Shuttering & RCC for 1F Columns	8 days	Mon 3/11/24	Tue 3/19/24
28	Shuttering and Reinforcement for Staircase & Lift	2 days	Wed 3/20/24	Thu 3/21/24
29	RCC for Stair & Lift	1 day	Sat 3/23/24	Sat 3/23/24
30	Shuttering and Reinforcement for 2F beams	6 days	Sun 3/24/24	Sat 3/30/24
31	Shuttering and Reinforcement for 2F Slab	6 days	Sun 3/31/24	Sat 4/6/24
32	RCC for 2F Slab incl. beams, stair	1 day	Sun 4/7/24	Sun 4/7/24
33	**Second Floor**	**24 days**	**Mon 4/8/24**	**Sun 5/5/24**
34	Reinforcement, Shuttering & RCC for 2F Columns	8 days	Mon 4/8/24	Tue 4/16/24
35	Shuttering and Reinforcement for Staircase & Lift	2 days	Wed 4/17/24	Thu 4/18/24
36	RCC for Stair & Lift	1 day	Sat 4/20/24	Sat 4/20/24
37	Shuttering and Reinforcement for 3F beams	6 days	Sun 4/21/24	Sat 4/27/24
38	Shuttering and Reinforcement for 3F Slab	6 days	Sun 4/28/24	Sat 5/4/24
39	RCC for 3F Slab incl. beams, stair	1 day	Sun 5/5/24	Sun 5/5/24
40	**Third Floor**	**24 days**	**Mon 5/6/24**	**Sun 6/2/24**
41	Reinforcement, Shuttering & RCC for 3F Columns	8 days	Mon 5/6/24	Tue 5/14/24
42	Shuttering and Reinforcement for Staircase & Lift	2 days	Wed 5/15/24	Thu 5/16/24
43	RCC for Stair & Lift	1 day	Sat 5/18/24	Sat 5/18/24
44	Shuttering and Reinforcement for 4F beams	6 days	Sun 5/19/24	Sat 5/25/24
45	Shuttering and Reinforcement for 4F Slab	6 days	Sun 5/26/24	Sat 6/1/24
46	RCC for 4F Slab incl. beams, stair	1 day	Sun 6/2/24	Sun 6/2/24
47	**Fourth Floor**	**24 days**	**Mon 6/3/24**	**Sun 6/30/24**
48	Reinforcement, Shuttering & RCC for 4F Columns	8 days	Mon 6/3/24	Tue 6/11/24
49	Shuttering and Reinforcement for Staircase & Lift	2 days	Wed 6/12/24	Thu 6/13/24
50	RCC for Stair & Lift	1 day	Sat 6/15/24	Sat 6/15/24
51	Shuttering and Reinforcement for 5F beams	6 days	Sun 6/16/24	Sat 6/22/24



Hulhumale' 10318

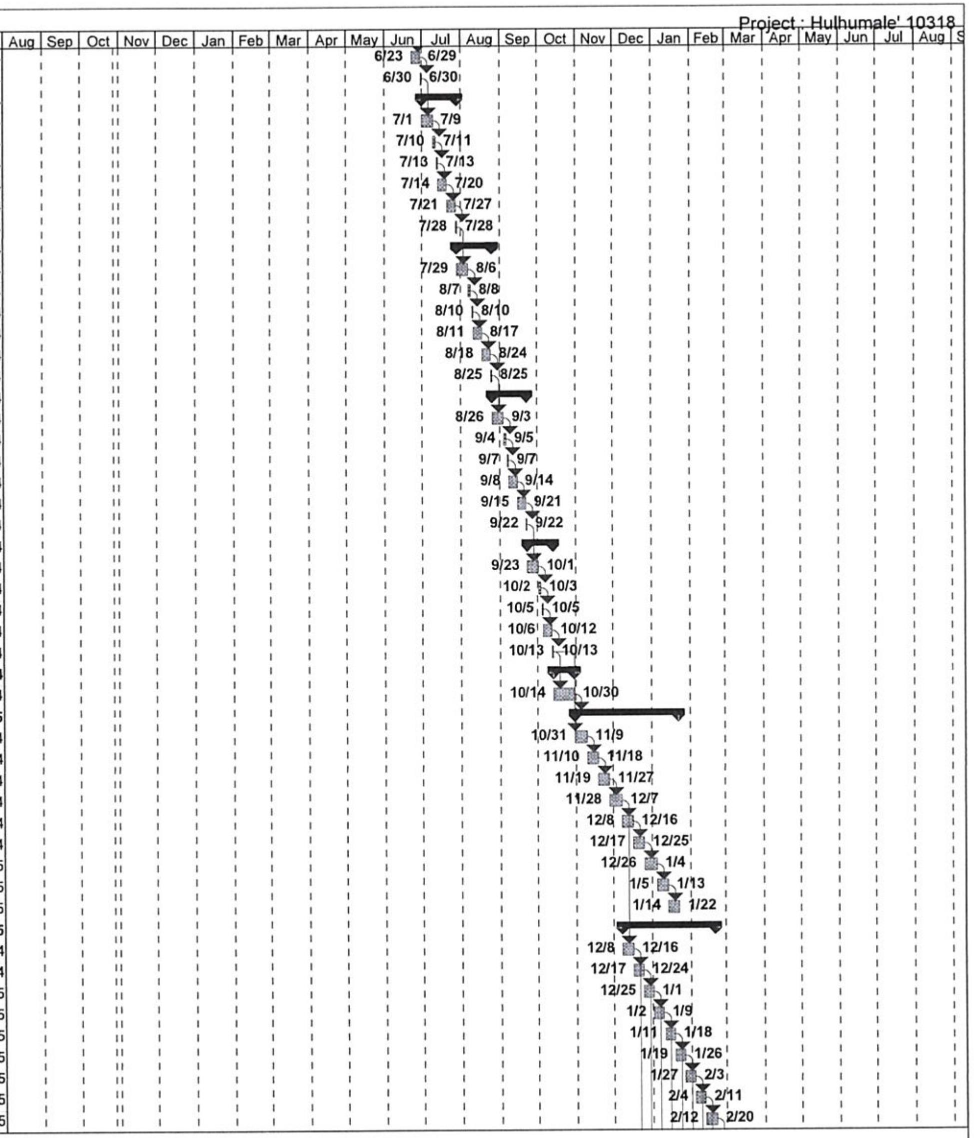
Task	▨	Rolled Up Progress	▬	Inactive Task	▬	Duration-only	┈
Milestone	◆	Split	┈	Inactive Milestone	◇	Manual Summary Rollup	◆
Summary	▬	External Tasks	▨	Inactive Milestone	☐	Manual Summary	◆
Rolled Up Task	▨	Project Summary	▬	Inactive Summary	┈	Start-only	
Rolled Up Milestone	◇	External Milestone	◆	Manual Task	◇	Finish-only	

External Tasks	◇
External Milestone	▨
Progress	▬
Deadline	⇩

BATCH C-604/2004

Project : Hulhumale' 10318

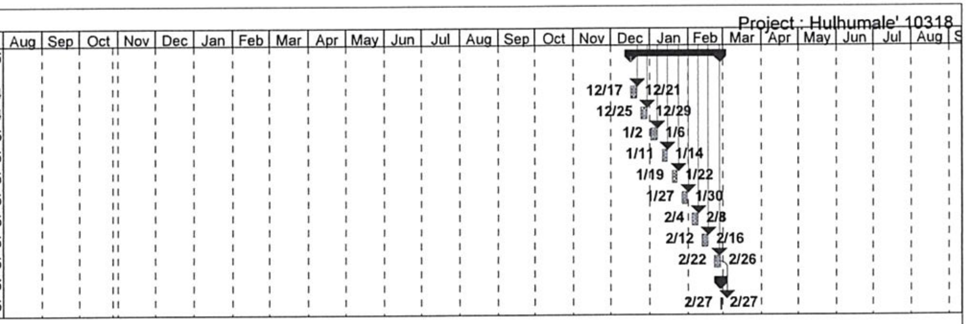
ID	Task Name	Duration	Start	Finish
52	Shuttering and Reinforcement for 5F Slab	6 days	Sun 6/23/24	Sat 6/29/24
53	RCC for 5F Slab incl. beams, stair	1 day	Sun 6/30/24	Sun 6/30/24
54	**Fifth Floor**	**24 days**	**Mon 7/1/24**	**Sun 7/28/24**
55	Reinforcement, Shuttering & RCC for 5F Columns	8 days	Mon 7/1/24	Tue 7/9/24
56	Shuttering and Reinforcement for Staircase & Lift	2 days	Wed 7/10/24	Thu 7/11/24
57	RCC for Stair & Lift	1 day	Sat 7/13/24	Sat 7/13/24
58	Shuttering and Reinforcement for 6F beams	6 days	Sun 7/14/24	Sat 7/20/24
59	Shuttering and Reinforcement for 6F Slab	6 days	Sun 7/21/24	Sat 7/27/24
60	RCC for 6F Slab incl. beams, stair	1 day	Sun 7/28/24	Sun 7/28/24
61	**Sixth Floor**	**24 days**	**Mon 7/29/24**	**Sun 8/25/24**
62	Reinforcement, Shuttering & RCC for 6F Columns	8 days	Mon 7/29/24	Tue 8/6/24
63	Shuttering and Reinforcement for Staircase & Lift	2 days	Wed 8/7/24	Thu 8/8/24
64	RCC for Stair & Lift	1 day	Sat 8/10/24	Sat 8/10/24
65	Shuttering and Reinforcement for 7F beams	6 days	Sun 8/11/24	Sat 8/17/24
66	Shuttering and Reinforcement for 7F Slab	6 days	Sun 8/18/24	Sat 8/24/24
67	RCC for 7F Slab incl. beams, stair	1 day	Sun 8/25/24	Sun 8/25/24
68	**Seventh Floor**	**24 days**	**Mon 8/26/24**	**Sun 9/22/24**
69	Reinforcement, Shuttering & RCC for 7F Columns	8 days	Mon 8/26/24	Tue 9/3/24
70	Shuttering and Reinforcement for Staircase & Lift	2 days	Wed 9/4/24	Thu 9/5/24
71	RCC for Stair & Lift	1 day	Sat 9/7/24	Sat 9/7/24
72	Shuttering and Reinforcement for TF beams	6 days	Sun 9/8/24	Sat 9/14/24
73	Shuttering and Reinforcement for TF Slab	6 days	Sun 9/15/24	Sat 9/21/24
74	RCC for TF Slab incl. beams, stair	1 day	Sun 9/22/24	Sun 9/22/24
75	**Terrace Floor**	**18 days**	**Mon 9/23/24**	**Sun 10/13/24**
76	Reinforcement, Shuttering & RCC for TF Columns	8 days	Mon 9/23/24	Tue 10/1/24
77	Shuttering and Reinforcement for Lift wall	2 days	Wed 10/2/24	Thu 10/3/24
78	RCC for Lift	1 day	Sat 10/5/24	Sat 10/5/24
79	Shuttering and Reinforcement for Lift Slab	6 days	Sun 10/6/24	Sat 10/12/24
80	RCC for Lift Slab	1 day	Sun 10/13/24	Sun 10/13/24
81	**Roofing work**	**15 days**	**Mon 10/14/24**	**Wed 10/30/24**
82	Roofing work	15 days	Mon 10/14/24	Wed 10/30/24
83	**Masonry work**	**72 days**	**Thu 10/31/24**	**Wed 1/22/25**
84	1st floor	8 days	Thu 10/31/24	Sat 11/9/24
85	2nd floor	8 days	Sun 11/10/24	Mon 11/18/24
86	3rd floor	8 days	Tue 11/19/24	Wed 11/27/24
87	4th floor	8 days	Thu 11/28/24	Sat 12/7/24
88	5th floor	8 days	Sun 12/8/24	Mon 12/16/24
89	6th floor	8 days	Tue 12/17/24	Wed 12/25/24
90	7th floor	8 days	Thu 12/26/24	Sat 1/4/25
91	Terrace floor	8 days	Sun 1/5/25	Mon 1/13/25
92	Ground floor	8 days	Tue 1/14/25	Wed 1/22/25
93	**Plastering work**	**65 days**	**Sun 12/8/24**	**Thu 2/20/25**
94	1st floor	8 days	Sun 12/8/24	Mon 12/16/24
95	2nd floor	7 days	Tue 12/17/24	Tue 12/24/24
96	3rd floor	7 days	Wed 12/25/24	Wed 1/1/25
97	4th floor	7 days	Thu 1/2/25	Thu 1/9/25
98	5th floor	7 days	Sat 1/11/25	Sat 1/18/25
99	6th floor	7 days	Sun 1/19/25	Sun 1/26/25
100	7th floor	7 days	Mon 1/27/25	Mon 2/3/25
101	Terrace floor	7 days	Tue 2/4/25	Tue 2/11/25
102	Ground floor	8 days	Wed 2/12/25	Thu 2/20/25



Hulhumale' 10318									
	Task	▨	Rolled Up Progress	━	Inactive Task	━	Duration-only	┈	External Tasks	◇
	Milestone	◆	Split	┈	Inactive Milestone	◇	Manual Summary Rollup	◆	External Milestone	▨
	Summary	━	External Tasks	▨	Inactive Milestone	▭	Manual Summary	◆	Progress	━
	Rolled Up Task	▨	Project Summary	━	Inactive Summary	┈	Start-only	━	Deadline	⇩
	Rolled Up Milestone	◇	External Milestone	◆	Manual Task	◇	Finish-only	━		

C-604/2004

ID	Task Name	Duration	Start	Finish
103	**Floor screeding , Screeding wiring work & external plastering work**	**62 days**	**Tue 12/17/24**	**Wed 2/26/25**
104	1st floor	4 days	Tue 12/17/24	Sat 12/21/24
105	2nd floor	4 days	Wed 12/25/24	Sun 12/29/24
106	3rd floor	4 days	Thu 1/2/25	Mon 1/6/25
107	4th floor	4 days	Sat 1/11/25	Tue 1/14/25
108	5th floor	4 days	Sun 1/19/25	Wed 1/22/25
109	6th floor	4 days	Mon 1/27/25	Thu 1/30/25
110	7th floor	4 days	Tue 2/4/25	Sat 2/8/25
111	Terrace floor	4 days	Wed 2/12/25	Sun 2/16/25
112	Ground floor	5 days	Sat 2/22/25	Wed 2/26/25
113	**Site handovering**	**1 day**	**Thu 2/27/25**	**Thu 2/27/25**
114	**Site handover to client**	1 day	Thu 2/27/25	Thu 2/27/25



Hulhumale' 10318	Task	▨	Rolled Up Progress	—	Inactive Task	—	Duration-only	....	External Tasks	◇
	Milestone	◆	Split	....	Inactive Milestone	◇	Manual Summary Rollup	◆	External Milestone	▨
	Summary	—	External Tasks	▨	Inactive Milestone	☐	Manual Summary	◆	Progress	—
	Rolled Up Task	▨	Project Summary	—	Inactive Summary	....	Start-only	—	Deadline	⇩
	Rolled Up Milestone	◇	External Milestone	◆	Manual Task	◇	Finish-only	—		

C-604/2004

بسم الله الرحمن الرحيم

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Environmental Protection Agency
EPA

No: 203-ECA/PRIV/2023/905

Terms of Reference for the Environmental Impact Assessment for the Proposed Construction of 08 Storey Commercial Building at Lot No. 10318, Hulhumale' Phase 1, Kaafu Atoll

This is the Terms of Reference (ToR) issued for undertaking the **Environmental Impact Assessment for the Proposed Construction of 08 Storey Commercial Building at Lot No.10318, Hulhumale' Phase 1, Kaafu Atoll.** The proponent of the project is **Muni Enterprise Private Limited** and the EIA Consultant for the project is **Mr. Mohamed Mustafa (EIA P0/2016).**

While every attempt has been made to ensure that this ToR addresses all of the major issues associated with development proposal, they are not necessarily exhaustive. They should not be interpreted as excluding from consideration matters deemed to be significant but not incorporated in them, or matters currently unforeseen, that emerge as important or significant from environmental studies, or otherwise, during the course of preparation of the EIA report

1. **Introduction and rationale** –Describe the purpose of the project and, if applicable, the background of the project and the tasks already completed**.** Clearly identify the rationale and objectives to enable the formulation of alternatives. Define the arrangements required for the environmental assessment and if relevant, including how work carried out under this contract is linked and sequenced with projects executed by other consultants, and how coordination between other consultants, contractors, government institutions will be carried out. List the donors, and the institutions the consultant will be coordinating with and the methodologies used. This should include (but should not be limited to) the following;

    - Name and contact details of the Proponent
    - Rationale and background to the project
    - Aims and objectives of the project

2. **Study area** – Submit a minimum A3-size scaled plan with indications of all the proposed infrastructures. Specify the agreed boundaries of the study area for the environmental impact assessment highlighting the proposed development location and size of the facility. The study area should include adjacent buildings and related infrastructure, nearby environmentally sensitive sites (e.g. mosque). Justification for site selection is required. Relevant developments in the areas must also be considered including residential areas, all economic ventures and cultural sites

3. **Scope of work**– Identify and number tasks of the project including preparation, construction and decommissioning phases.

    Task 1. Description of the proposed project – Provide a full description and justification of the relevant parts of the project, using maps at appropriate scales where necessary. All inputs and outputs related to the proposed activities shall be justified. Provide the following details.

Master plan design concept

a) Approved design of the building including architectural and engineering drawings (A3 sized).
b) Master plan concepts in A3 format for the proposed building.
c) Parking capacity and access.
d) Health and safety aspects of the building including Fire emergency evacuation plan.

Project development

Provide a schedule outlining the proposed phasing, sequencing and duration of components, including;

a) Need and justification for the proposed project.
b) Pre-construction, construction, operation, and decommissioning.
c) The activities to date, including baseline assessments.
d) Key factors controlling the schedule and uncertainties relating to the project.

Excavation and dewatering

a) Area, depth, volume required for excavation.
b) Excavated earth disposal method and location.
c) Dewatering plan.
d) Dewatered water disposal method and location(s).
e) Compensation plan for construction and dewatering related damages.
f) Shoring methods for particularly on sides with adjacent buildings.
g) Description and justification of any underground structures such as basement or wells.

Foundation and Concrete Works

a) Type of foundation and foundation depth.
b) Structural compliance requirement to National Building Code.
c) Construction process including concrete mixing at site or transportation method.

Construction Management

a) Constructional phase waste management.
b) Traffic flow and management.
c) Project site office and temporary storage area details.

Utilities

a) Description of the utility providers during construction and operation stage (Water, Sewerage, Electricity and Power).
b) Sewerage connection plan to the main network.
c) Water connection plan and water storage tank(s) details.
d) Waste management plan during operational phase.
e) Use of any energy conserving utilities.
f) Details of the back-up generator to be installed (if applicable).
g) Estimated consumption of water and electricity and their sources.

Temporary facilities

Describe construction methods, scheduling and operation of temporary facilities including power generation, oil storage, water supply, wastewater treatment, accommodation facilities, waste management and decommissioning.

Vegetation clearance and revegetation (if any)

a) Details of vegetation clearance, if any.
b) Details of the source of trees that will be used for revegetation.
c) If vegetation is to be supplied from inhabited islands, approvals from those island councils are required and details of the number of trees should be provided.

Project management: Include communication of construction details, progress, target dates, and duration of works, construction/operation/closure of labour camps, access to site, safety, equipment and material storage, water supply, waste management from construction operations (mainly dredged material), power and fuel supply temporary site setup.

Task 2. Description of the environment – Assemble, evaluate and present the environmental baseline study/data regarding the study area and timing of the project (eg: monsoon season). Identify baseline data gaps, and identify studies and level of detail to be carried out by the consultant. Consideration of likely monitoring requirements should be borne in mind during survey planning, so that data collected is suitable for use as a baseline. As such all baseline data must be presented in such a way that they will be usefully applied to future monitoring. The report should outline detailed methodology of data collection utilized.

The baseline data will be collected before construction and from at least two benchmarks.

All data must be collected as per the requirements of the EPA Data Collection Guideline (published on www.epa.gov.mv). The report should outline detailed methodology of data collection utilized.

All survey locations shall be referenced with Geographic Positioning System (GPS) including water sampling points, vegetation and noise levels for posterior data comparison. Information should be divided into the categories shown below:

Climate

- Temperature & rainfall.
- Hazard Vulnerability.

Physical parameters

- Groundwater quality assessment of the site and from at least 1 control location measuring the physical parameters, Temperature, Total Hydro Carbon, Salinity, pH, TDS and EC and DO.
- Ground condition assessment.
- Noise levels in the vicinity of the site including any noise sensitive locations.
- Traffic flow (size and direction) including pedestrian movements around the project site.
- Indoor and outdoor air quality in the project vicinity.

Structural environment

- State of adjacent buildings including photographic records of existing conditions of the buildings.
- Condition of the adjacent roads associated with the building.
- Existing structures/uses of the proposed site.
- Condition of the surrounding roads.
- Public facilities nearby.

Biological assessment

- Description of the terrestrial environment such as soil. Description of the status of the ground to include the condition of the soil and vegetation (if any is significant) shall be provided.

Socio-economic environment

- Demographic data for Hulhumale' and population of adjacent buildings.
- Brief description of social environment of Hulhumale' in general and adjacent residential units in particular.
- Identify types of vehicles and peak traffic hours in or near the project site.
- Possible social impact arising from construction activities.

Absence of facilities in the country to carry out the water quality tests will not exempt the proponent from the obligation to provide necessary data. The report should outline the detailed methodology of data collection utilized to describe the existing environment.

Task 3. Legislative and regulatory considerations – Identify the pertinent legislation, regulations and standards, and environmental policies that are relevant and applicable to the proposed project, and identify the appropriate authority jurisdictions that will specifically apply to the project. Legal requirements (but not limited to):

- Fuel storage, handling and transportation regulations of the Ministry of Defence.

Task 4. Potential impacts (environmental and socio-cultural) of proposed project incl. all stages– The EIA report should identify all the impacts, direct and indirect, during and after construction, and evaluate the magnitude and significance of each. Particular attention shall be given to impacts associated with the following:

Impacts on natural environment

- Impacts of noise, vibration and disturbance.
- Impacts on terrestrial flora and fauna and from land preparation works, if any.
- Impacts on groundwater table and quality as a result of proposed project activities.
- Impacts on soil.
- Impacts on landscape integrity/scenery.
- Contamination due fuel leakage.
- Impacts due to waste generation.
- Impacts on air quality.

Impacts on the socio-economic environment

- Impacts on employment and income such as job opportunities in the constructional and operational phase.
- Impacts on social values, norms and beliefs due to construction workers on local population.
- Disturbances to residents and cultural facilities/activities.
- Impacts on transportation/traffic.
- Impacts of increased demands on utility services especially water and energy and waste management.
- Impacts on nearby buildings.

Construction related hazards and risks

- Pollution of natural environment (e.g. oil spills, discharge of untreated waste water and solid waste including construction waster).
- Risk of accidents and pollution on workers and local populations.
- Impacts on social values, norms and belief due to construction workers on local population.
- Impacts due to dust and emission.
- Impacts due to foundation works.
- General public health and safety issues.
- Impact due to any traffic diversions.
- Mosquito growth.
- Fire and explosion risks.
- Chemical hazard risks.

The methods used to identify the significance of the impacts shall be outlined. One or more of the following methods must be utilized in determining impacts; checklists, matrices, overlays, networks, expert systems and professional judgment. Justification must be provided to the selected methodologies. The report should outline the uncertainties in impact prediction and also outline all positive and negative/short and long-term impacts. Identify impacts that are cumulative and unavoidable.

Task 5. Alternatives to Proposed Project – Describe alternatives including "*no action option"* should be presented. Determine the best practical environmental option. Alternatives examined for the proposed project that would achieve the same objectives including the "no action alternative". This should include alternative location, construction technologies, taking into account environmental, social and economic factors. The report should highlight how the location was determined. All alternatives must be compared according to international standards and commonly accepted standards as much as possible. The comparison should yield the preferred alternative for implementation. Mitigation options should be specified for each component of the proposed project.

Task 6. Mitigation and management of negative impacts – Identify possible measures to prevent or reduce significant negative impacts to acceptable levels. These will include both environmental and socio-economic mitigation measures. Measures for both construction and operation phases shall be identified. Cost the mitigation measures, equipment and resources required to implement those measures. The confirmation of the commitment of the developer to implement the proposed mitigation measures shall also be included. An environmental management plan for the proposed project, identifying responsible persons, their duties, and commitments shall also be given. In case where impacts are unavoidable arrangements to compensate for the environmental effect shall be given.

Task 7. Development of monitoring plan – Identify the critical issues requiring monitoring to ensure compliance to mitigation measures and present impact management and monitoring plan during and after completion of the proposed project. Reporting requirements shall be outlined. The baseline study described in task 2 of section 2 of this document is required for data comparison. Detail of the monitoring program including the physical and biological parameters for monitoring, cost commitment from responsible person to conduct monitoring in the form of a commitment letter, detailed reporting scheduling, costs and methods of undertaking the monitoring program must be provided.

Task 8. Stakeholder consultation, Inter-Agency coordination and public/NGO participation – Identify appropriate mechanisms for providing information on the development proposal and its progress to stakeholders, government authorities, NGOS, engineers/designers, development managers, staff and members of the general public. The EIA report should include a list of people/groups consulted and summary of major outcomes. The following parties should be consulted;

a) STELCO.
b) MWSC.
c) Owners and/or occupiers of adjacent buildings.
d) Nearby school(s) (if any).
e) Housing Development Corporation (Urbanco).
f) WAMCO

Summarize the issues identified during the consultation process, include responses by the proponent to the issues raised and discuss the stakeholder input that has been incorporated or addressed in the EIA. Concerns that were raised by the stakeholders but not considered in the EIA must be justified by the proponent.

Grievance Redress Mechanism: Provide the complaints management procedure formulated for the proposed project, with important roles and responsibilities identified clearly.

Presentation- The environmental impact assessment report, to be presented in digital format, will be concise and focus on significant environmental issues. It will contain the findings, conclusions and recommended actions supported by summaries of the data collected and citations f or any references used in interpreting those data. The environmental assessment report will be organized according to, but not necessarily limited by, the outline given in the Environmental Impact Assessment Regulations, 2012 and subsequent amendments.

Timeframe for submitting the EIA report – The developer must submit the completed EIA report within **6 months** from the date of this Term of Reference.

……………………………..

19th November 2023

HOUSING
DEVELOPMENT
CORPORATION

PARTICULAR TERMS AND CONDITIONS

IN RESPECT OF
LEASE OF LAND IN HULHUMALÉ FOR COMMERCIAL USE

BETWEEN

HOUSING DEVELOPMENT CORPORATION LIMITED
("LESSOR")

AND

MUNI ENTERPRISES PRIVATE LIMITED
("LESSEE")

AGREEMENT NO.: HDC/LDL/2022/19
DATE: 30 MARCH 2022
PLOT NO: M4-07(10318)

C-793/2003

1. PARTIES

This Agreement is made on 30 of March 2022 between:

Housing Development Corporation Limited, a company duly incorporated and existing under the laws of the Republic of Maldives bearing Registration No: C-793/2008 and having its registered address and principal place of business at 3rd floor, HDC Building, Hulhumalé, Republic of Maldives (hereinafter referred to as **"Lessor"**, which expression shall include its successors-in-title, liquidators, administrators and lawful assignees where the context so requires or admits); and

Muni Enterprises Private Limited, a company duly incorporated and existing under the laws of the Republic of Maldives bearing Registration No: C-236/2000 and having its registered address and principal place of business at 5th Floor, Muni Building, M. Loobiya, Ameenee Magu, Malé, Republic of Maldives (hereinafter referred to as **"Lessee"**, which expression shall include its successors-in-title, liquidators, administrators and lawful assignees where the context so requires or admits).

2. RECITALS

The Lessor is the legal owner of the Land (defined in Clause 10 of this Particular Terms and Conditions of the Agreement) and the Lessor has opened up opportunities for locals to undertake the development and operation of a showroom in Hulhumalé.

The Lessee has submitted a proposal dated 06th July 2021 for the development and operation of a showroom in Hulhumalé (hereinafter the "**Project**"); further to which HDC offered the Project to the Lessee vide letter no. HDC (161)-BSI/MIS/2021/1887 dated 6th October 2021 subject to the Lessee producing satisfactory evidence of financial commitment and subsequent to which both Parties have entered into extensive negotiations and reached mutual understanding with regard to the minimum requirements for the Project.

Now, the Parties wish to enter into this Agreement, to undertake the development and operation of a showroom in Hulhumalé, as per the terms and conditions of this Agreement.

NOW THEREFORE in consideration of the above premises and the mutual promises, covenants and Agreements herein set forth, the Parties agree as follows.

3. GENERAL TERMS AND CONDITIONS AND LESSOR'S GUIDELINES

General Terms and Conditions in Schedule 3 of this Agreement and the Lessor's Guidelines, which may be issued at the sole discretion of the Lessor, shall be deemed to form and be read and construed as an integral part of this Agreement. The Lessee hereby agree and acknowledge that the Lessee has received the General Terms and Conditions. The Lessee further agree and acknowledge that the Lessee has read, understood and agree to be bound by the General Terms and Conditions.

4. VARIATION OF LESSOR'S GUIDELINES

Lessor reserves the right to add, amend, alter or vary the Lessor's guidelines from time to time upon notification to the Lessee by publication of such addition/ amendment/ alteration/ or variation on the Lessor's official website and inform to the Lessee in writing to its registered address and email to the Lessee, before such addition/ amendment/ alteration/ or variation becomes effective. The Lessee will be deemed to have accepted without reservation such alteration upon using the Land after the date on which the same is to take effect as specified in such notification. If the Lessee does not accept such alteration the vacant possession of the Land must be returned to the Lessor for termination of Agreement before the date upon which such alteration is to take effect.

C-793/2008

5. OBJECTIVE OF THE AGREEMENT		The objective of this Agreement is to lease the Land to the Lessee to undertake the development and operation of a showroom in Hulhumalé, in accordance with the terms and conditions set forth herein and the General Terms and Conditions referred in Clause 3.
6. PERFORMANCE SECURITY	6.1	Notwithstanding Clause 4.1 of the General Terms and Conditions of this Agreement, Performance Guarantee receipt confirming payment of Performance Guarantee amount of MVR 1,079,836.90 (One Million and Seventy-Nine Thousand Eight Hundred Thirty-Six Rufiyaa Ninety Laari).
	6.2	Notwithstanding Clause 5.1 of the General Terms and Conditions of this Agreement, the Lessee shall ensure that the Performance Security is valid and enforceable throughout the Development Period and for an additional 3 (Three) months.
7. CONCEPT DRAWING		Notwithstanding Clause 4.2 of the General Terms and Conditions of this Agreement, Concept Drawing has been submitted by the Lessee and approved by the Lessor.
8. LEASE DEPOSIT	8.1	Notwithstanding Clause 4.3 of the General Terms and Conditions of this Agreement, the Lessee shall submit Lease Deposit receipt confirming payment of Lease Deposit amount of MVR 397,788.30 (Three Hundred Ninety-Seven Thousand Seven Hundred Eighty-Eight Rufiyaa Thirty Laari) within 7 (Seven) business days from the date of approval of Detailed Drawings and prior to handover of the Land.
	8.2	Notwithstanding Clause 18.3 of the General Terms and Conditions of this Agreement After relevant deductions, if any, the Lease Deposit will be returned to the Lessee (without interest) within 30 (Thirty) calendar days of the expiration of the Term or following permitted termination of the Agreement pursuant to the Agreement, and the vacation of the Land.
9. ACQUISITION FEE		The Lessee has paid an Acquisition Fee of MVR 600,000.00 (Six Hundred Thousand Rufiyaa).
10. LAND		The Land identified for the Project is M4-07(10318) measuring an area of 4,419.87 Sq Ft (Four Thousand Four Hundred Nineteen point Eight Seven Square Feet) defined by the boundary lines shown on the Land and Location Map attached in Schedule 1.
11. LAND USAGE		The Lessee agrees to use the Land only to develop and operate a showroom in Hulhumalé.
12. TERM		The duration of the lease shall be 15 (Fifteen) years commencing from the date of handover of the Land.
13. GRACE PERIOD		The Construction and Development Period shall be a grace period where no rent shall be payable by the Lessee to the Lessor. For avoidance of doubt, Grace Period shall be maximum 18 (Eighteen) months from the date of handover of the Land and shall not be extended with any extension granted for the Construction and Development Period.
14. RENT	14.1	The Lessee agrees to pay the monthly Rent as below:
		14.1.1 Monthly Rent for the Premises during the first year of the Term shall be MVR 30 (Thirty Rufiyaa) per Square Foot, which amounts up to MVR 132,596.10 (One Hundred Thirty-Two Thousand Five Hundred Ninety-Six Rufiyaa Ten Laari) per calendar month.

14.1.2 Monthly Rent for the Premises during the second year of the Term shall be MVR 32 (Thirty-Two Rufiyaa) per Square Foot, which amounts up to MVR 141,435.84 (One Hundred Forty-One Thousand Four Hundred Thirty-Five Rufiyaa Eighty-Four Laari) per calendar month.

14.1.3 Monthly Rent for the Premises during the third year of the Term shall be MVR 34 (Thirty-Four Rufiyaa) per Square Foot, which amounts up to MVR 150,275.58 (One Hundred Fifty Thousand Two Hundred Seventy-Five Rufiyaa Fifty-Eight Laari) per calendar month.

14.1.4 Monthly Rent for the Premises during the fourth and fifth of the Term shall be MVR 35 (Thirty-Five Rufiyaa) per Square Foot, which amounts up to MVR 154,695.45 (One Hundred Fifty-Four Thousand Six Hundred Ninety-Five Rufiyaa Forty-Five Laari) per calendar month.

14.2 The Rent shall be payable by monthly payments, no later than the 10th (Tenth) day of each calendar month. The Rent shall be paid by the Lessee into a bank account specified by the Lessor or paid in some other manner as instructed by the Lessor.

14.3 If the Lessee fails to pay Rent at the end of the 10th (Tenth) day, the Lessee shall pay the Rent due with a fixed penalty rate of 1% per total monthly rent payable, from the 11th (Eleventh) day onwards until the date of payment or until the date of leased Land being taken over by the Lessor.

14.4 If any fine incurred in accordance with this Agreement remains unpaid by the Lessee at the end of the month, that fine amount shall be charged to the following month's Rent.

14.5 If the Lessee has any outstanding fine payable to the Lessor, that fine amount shall be deducted from the next payment made by the Lessee.

14.6 If the Lessee has any outstanding fine or maintenance fee payable to the Lessor, that outstanding amount shall be deducted from the next payment, with the fine given precedence over maintenance fee.

14.7 After deducting the fine amount and maintenance fee (where applicable), if any amount remains from the payment made by the Lessee, this amount shall be deducted from the month's Rent.

14.8 The Rent shall be considered as paid, only when any incurred fine amount and maintenance fee (where applicable) is cleared along with the full settlement of Rent.

14.9 After the first five years, the Rent stated in Clause 14.1 of this Particular Terms and Conditions of the Agreement shall be revised every five years, based on inflation and market rates. Revised Rent is to be calculated by the following formula:

$P (1+i+5\%)$

where P is the Monthly Rent for the preceding year, i is the cumulative inflation for the previous five years (The inflation in this context refers to the inflation rate published by the Maldives Monetary Authority as the inflation for housing, water, electricity, gas and other fuel for Male' region).

15. LAND HANDOVER			Notwithstanding Clause 22.1 of the General Terms and Conditions of the Agreement, the Land shall be handed over to the Lessee within 7 (Seven) working days from the date of approval of Detailed Drawing in its as is status.
16. DETAILED DRAWINGS			Detail Drawings shall not be revised and submitted to HDC for more than twice.
			The Lessor shall inform the Lessee of approval or rejection of the submitted revised Detailed Drawings in writing.
			Subject to Sub-Clause 19.4.2 of the General Terms and Conditions of this Agreement, the Lessee's failure to submit the Revised Detailed Drawings within the given period shall be considered as a breach of this Agreement.
17. CONSTRUCTION AND DEVELOPMENT PERIOD			The Lessee shall construct and develop the showroom within 18 (Eighteen) months from the date of signing of this Agreement.
18. MANAGEMENT OF THE LAND AND DEVELOPED PROPERTY			The Lessee shall be liable for the management and administration of the Building, which includes and is not limited to operation, supervision, maintenance, effecting insurance, and providing full-time security of the showroom throughout the Term of this Agreement.
19. MORTGAGE RIGHTS			Mortgage rights of the Land can be granted as per HDC's Mortgage Policy.
20. DUTIES AND OBLIGATIONS OF THE LESSEE	**20.1**		In addition to the obligations stated in Clause 19 of the General Terms and Conditions of this Agreement, the Lessee agrees to do the following: -
		20.1.1	Comply with all the protocols and guidelines of the relevant authorities.
		20.1.2	The Lessee shall grant HDC the right to publish updates of the monthly progress reports submitted by the Lessee on My Hulhumalé Properties website.
		20.1.3	The Lessee shall in no circumstance amend the development usage of the Land.
		20.1.4	The Lessee shall ensure that any development on the Land shall be in compliance with Lessors' guidelines and the Hulhumalé Planning and Development Guidelines.
		20.1.5	The Lessee commence operation and service provision within 1 (One) calendar month from the date of completion of Constructions and Development.
		20.1.6	Lessee's failure to provide a regular service shall be considered as a breach of this Agreement.
21. DUTIES AND OBLIGATIONS OF THE LESSOR			In addition to the obligations stated in Clause 22 of the General Terms and Conditions of this Agreement, the Lessor agrees to do the following:
		21.1	The Lessor should not unreasonably withhold any approvals requested by the lessee in relation to the development and operation of the land.

		21.2	The Lessor shall provide right of access to the land for the Lessee, upon availability of land, to conduct surveys, soil testing or for any other accepted request related to the Project made by the Lessee during the drawing's stages
		21.3	The Lessor shall ensure the Land is free from any legal encumbrances prior to handover of the Land to the Lessee.
22. ASSIGNMENT OF QUALITY ASSURANCE CONSULTANT	**22.1**	The Lessee shall employ a locally registered independent project management consultant for quality assurance of the building until completion of the construction and development.	
	22.2	The requirements, duties and responsibilities of the independent project management consultant should be in accordance to the Quality Assurance Consultant Criteria.	
23. NO FAULT TERMINATION	**23.1**	Notwithstanding Clause 27 of the General Terms and Conditions of this Agreement, either of the Parties may terminate the Agreement by serving 6 (Six) months' written notice upon the other Party of its intention to do so for any reason whatsoever.	
	23.2	In the event of No-Fault Termination, the development cost of the Building shall be compensated to the Lessee after relevant deductions.	
24. CORRESPONDENCE ADDRESS		**<u>LESSOR</u>** Housing Development Corporation Limited 3rd Floor, HDC Building, Hulhumalé, Republic of Maldives. Tel: (960) 3353535, Fax: (960) 3358892 Email: estate@hdc.com.mv **<u>LESSEE</u>** Muni Enterprises Private Limited, 5th Floor, Muni Building, M. Loobiyaa, Ameenee Magu, Malé, Republic of Maldives Tel: +960 333 1512 Email: info@muni.com.mv	
25. SCHEDULES		Following schedules, which are attached to this Agreement, are incorporated in and shall be deemed to be an important and integral part of this Agreement:	
		Schedule 1	Land and Location Map
		Schedule 2	Hulhumalé Planning and Development Guideline
		Schedule 3	General Terms and Conditions
		Schedule 4	Land Handover Note
26. SIGNATORY		In Witness Whereof the parties have executed this Agreement on the respective dates specified below with effect from the date specified above.	

[signatories on the next page]

SIGNATORIES TO THE AGREEMENT

SIGNED FOR AND ON BEHALF OF HOUSING DEVELOPMENT CORPORATION LIMITED

AUTHORIZED SIGNATORY:

Name: Mr. Ahmed Athif

Designation: Deputy Managing Director

Date: 30 March 2022

....

Signature and stamp

C-793/2008
HOUSING
DEVELOPMENT
CORPORATION LTD

IN THE PRESENCE OF:

Name: Mr. Shazim Saeed

Designation: Director

Date: 30 March 2022

....

Signature

SIGNED FOR AND ON BEHALF OF MUNI ENTERPRISES PRIVATE LIMITED

AUTHORIZED SIGNATORY:

Name: Mr. Ahmed Shiham

Designation: Director, Business Development

Date: 30 March 2022

muni
ENTERPRISES PVT LTD

....

Signature and stamp

IN THE PRESENCE OF:

Name: Mr. Ali Shathir

Designation: Manager, Projects

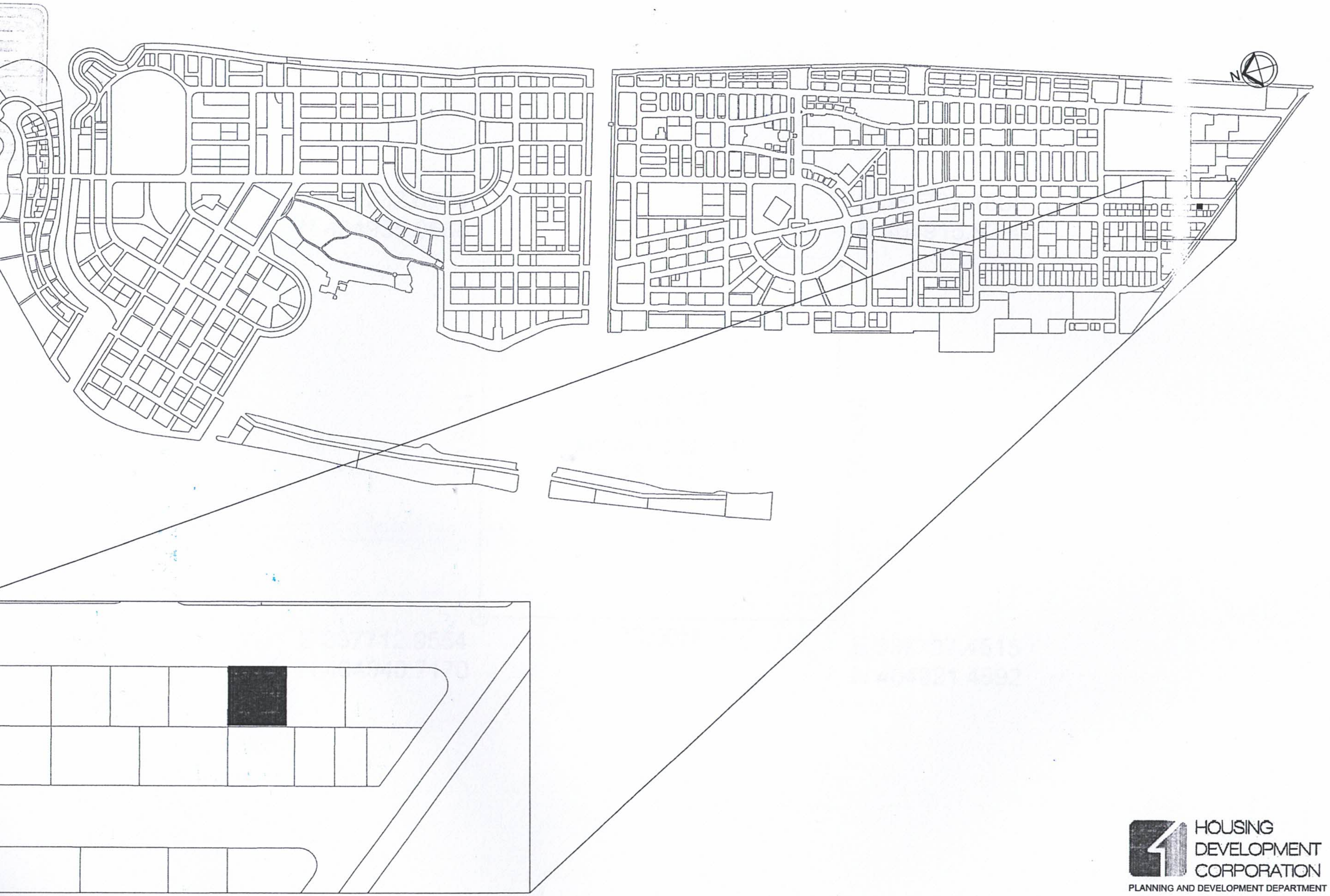
Passport/ID no: A008554

Date: 30 March 2022

....

Signature

SCHEDULE 1: LAND AND LOCATION MAP



ECT: M4-07 (LOT 10318)

DRAWING: LOCATION MAP

Drawn by: Jilan

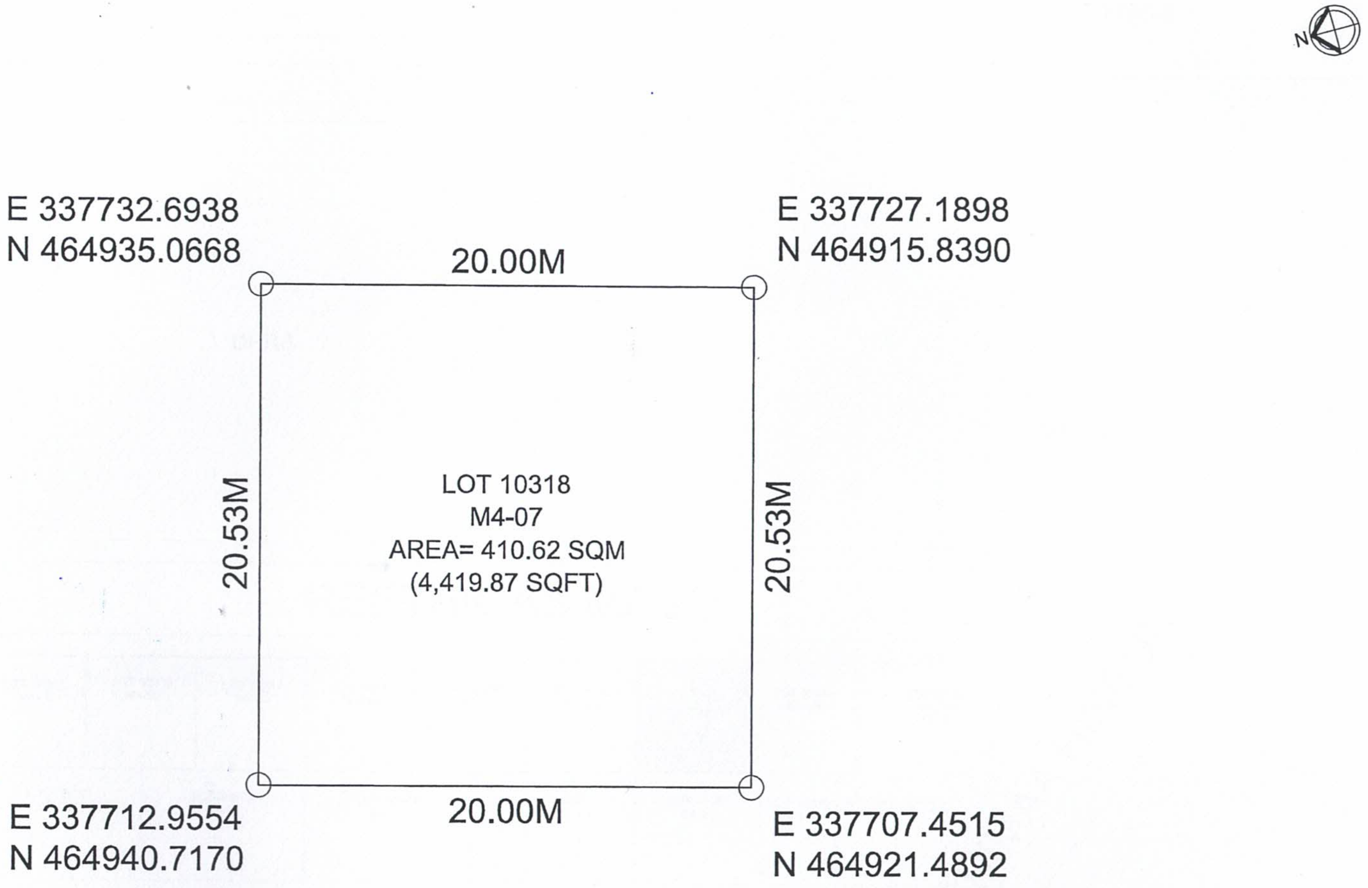
Checked by:

Date: 27th February 2020

Remarks:

HOUSING
DEVELOPMENT
CORPORATION
PLANNING AND DEVELOPMENT DEPARTMENT
3RD FLOOR, HDC BUILDING HULHUMALE'
REPUBLIC OF MALDIVES
TEL. +(960)3353535, FAX +(960)3358892
EMAIL : planning@hdc.com.mv

ENTERPRISES PVT LTD



CT: M4-07 (LOT 10318)

DRAWING: PLOT MAP

Drawn by: Jilan

Checked by:

Date: 27th February 2020

Remarks:

HOUSING DEVELOPMENT CORPORATION
PLANNING AND DEVELOPMENT DEPARTMENT
3RD FLOOR, HDC BUILDING HULHUMALE'
REPUBLIC OF MALDIVES
TEL. +(960)3353535, FAX +(960)3358892
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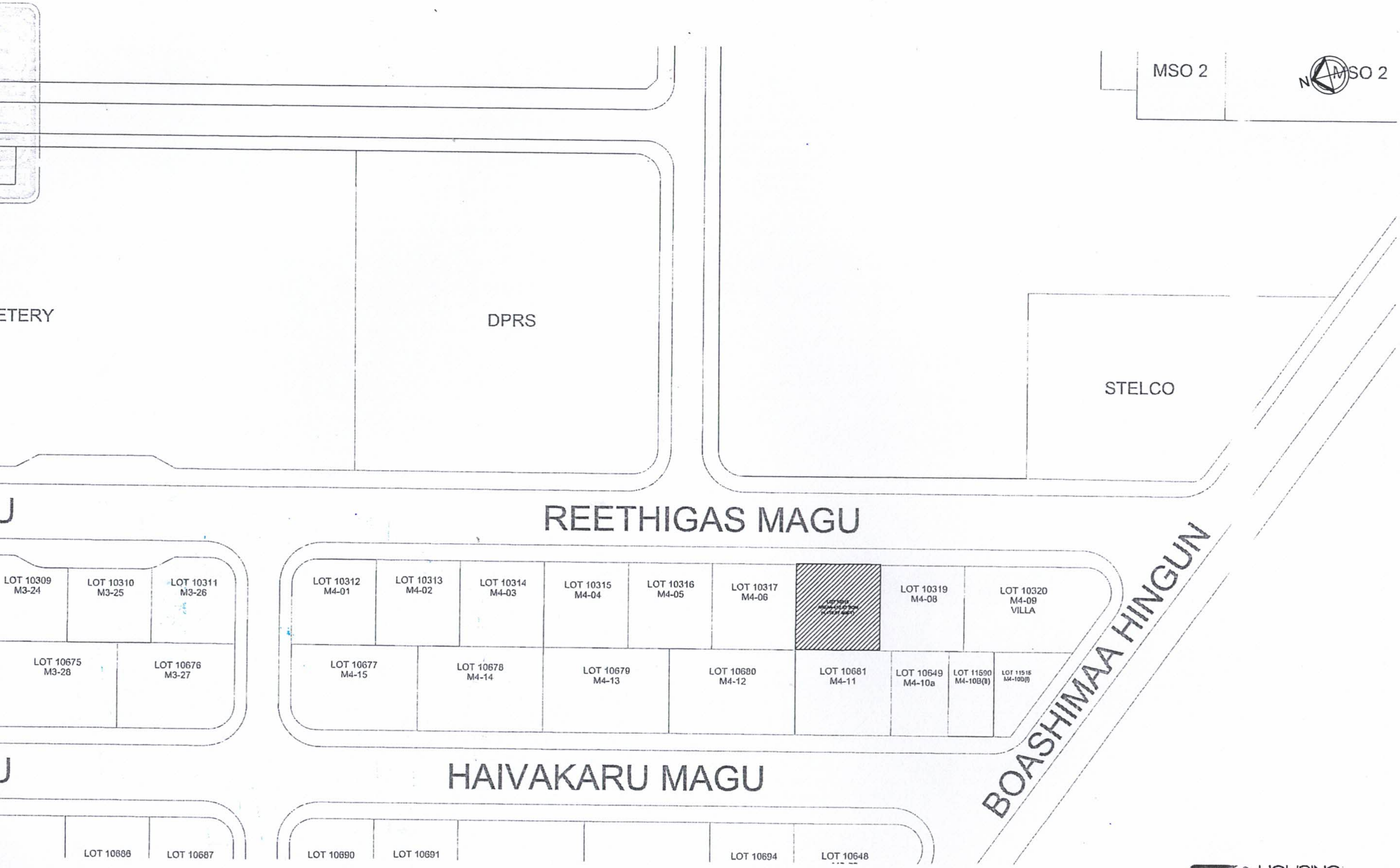

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REPUBLIC OF MALDIVES
TEL. +(960)3353535, FAX +(960)3358892
EMAIL : planning@hdc.com.mv

CT: M4-07 (LOT 10318)

DRAWING: SITE CONTEXT MAP

Drawn by: Jilan

Checked by:

Date: 27th February 2020

Remarks:

SCHEDULE 2: HULHUMALÉ PLANNING & DEVELOPMENT GUIDELINE

بسم الله الرحمن الرحيم

HOUSING
DEVELOPMENT
CORPORATION

HULHUMALÉ PLANNING & DEVELOPMENT GUIDELINE: SHOWROOM DEVELOPMENT GUIDELINE

1. INTRODUCTION

1.1 This guideline will be applicable to the commercial development at the South Area Commercial Stretch located in Hulhumalé Phase 1 (please refer to the attached drawings).

1.2 Prior drawing and construction approvals need to be obtained from HDC before the construction of any building in Hulhumalé.

1.3 Prior building permit for building use needs to be obtained from HDC once the construction works have been completed for any such building.

1.4 Concept level drawings (site plan showing the surrounding context, floor plans, conceptual sections and elevations, and 3D model), and spatial layout, showing the overall classifications and requirements of the development must be submitted to HDC for comments before proceeding to final architectural and structural drawings.

1.5 The final detail drawing approval and related construction approvals need to be obtained from HDC before the construction of any building in Hulhumalé.

1.6 The final detail drawing set should be signed and stamped by a registered local architect/structural engineer.

1.7 Under these guidelines, a building is defined to be a constructed dwelling that is not movable/portable within a given plot, and one that is finished using different materials and is constructed to a certain standard that is acceptable to HDC.

1.8 A detailed breakdown with the list of spaces and the area allocated for the spaces must be provided with each stage of the submission.

1.9 A parking calculation sheet is to be submitted with all stages of development.

2. USAGE OF LAND

2.1. These allocated land plots are to be used for commercial use limited to showrooms.

2.2. If 2 or more adjacent plots are combined and developed as one, the building height, F.S.I and setback should be maintained as given in this guideline.

2.3. Inclusion of a basement is mandatory at the development, wherein the primary use of it should be parking. However, it can accommodate service spaces if required.

2.4. 60% of the GFA of the developments will be allocated for commercial use, and 40% will be utilized for supporting facilities.

2.5. The commercial uses that will be allowed to carry out are:

  2.5.1. Displaying of products for sale;

    a) Automobiles;
    b) Furniture;
    c) Sanitaryware;
    d) Appliances etc.

2.6. The supporting facilities that will be included are:

  2.6.1. Administrative office;
  2.6.2. Meeting room;
  2.6.3. Staff tea room;
  2.6.4. Inventory storage;
  2.6.5. Parking;
  2.6.6. Toilets etc.

2.7. Following are prohibited uses within these developments:

  2.7.1. Accommodation will not be allowed in this area.

  2.7.2. Any industrial use, any use where flammable materials are used, any use where the public is disturbed from loud noises, smell or dust generating and carrying activities, constructing godowns, etc.

3. BUILDING HEIGHT, F.S.I AND SETBACK PLAN

1.1. The Floor Space Index (F.S.I) of the developments is 4.3.

$$\text{Floor Space Index (F.S.I)} = \frac{\text{Total area of building}}{\text{Total area of land}}$$

3.1. The maximum no. of floors for the developments are 6 floors (18.5 meters).

3.2. The maximum building height from the pavement level to the terrace slab level should be 18.5 meters. In addition, only a 2-meter height pitched roof will be allowed to give a total building height of 20.5 meters. In the case of terrace slab acting as a roof, the building height will remain as 18.5 meters.

3.3. An additional maximum 4-meter height from the terrace slab is allowed for a lift machine room, resulting in a total building height of 22.5 meters.

3.4. The minimum height between finished floor levels to ceiling soffit level is 2.7 meters.

3.5. Minimum clear height for basement should not be less than 2.7m.

3.6. The setback for the developments should be 3 meters from the front and 2 meters from the sides and rear.

3.7. If a pitched roof is included, the maximum length of roof eaves and gutters projected from the setback line of the building structure should not be more than 0.45 meters.

4. BOUNDARY WALL

4.1. No boundary wall or fence are allowed at the front setback of the developments.

4.2. The Boundary wall on the side and rear setback should be a maximum height of 2 meters from pavement level.

5. DEPTH OF FOUNDATION

5.1. Depth of foundation for each building would be determined by the structural engineer of the building.

5.2. Foundation protection method and visual soil inspection report should be submitted.

5.3. If the foundation of the structure is 1.8 meters or deeper, the developer should submit environmental impact assessment.

6. PARKING

6.1. The developments should accommodate a minimum vehicle parking of the following ratio:

  6.1.1. A car parking for every 500 m^2 of GFA

  6.1.2. A motorcycle parking for every 60 m^2 of GFA

  6.1.3. An Additional 10% of the total parking should be assigned for visitor parking for both car and motorcycle.

6.2. A parking calculation/justification must be submitted along with the drawing submission at all stages.

6.3. Parking spaces should be appropriately sized for movement in and around and should cater for people with disabilities and wheelchair users where considered necessary.

6.4. The entrance for the parking area should have a sufficient opening for easy entry and exit simultaneously.

7. ACCESS AND CIRCULATION

7.1. PEDESTRIAN

  7.1.1. A safe accessibility provision with ease of circulation should be provided as much as possible to all types of users.

7.2. VEHICULAR

  7.2.1. A convenient drop-off/pick-up area and a loading/unloading area must be included for the ease of access for vehicles and equipment.

8. GENERAL REQUIREMENTS

Intention: Requirements stated below are to help support the sustainable development of industrial areas in Phase 1 of Hulhumalé.

8.1. Ground floor should include a service area that is easily accessible for service providers.

8.2. A waste disposal mechanism with ease of loading needs to be established away from the common areas on the ground floor level.

8.3. A fire and safety system approved by the Ministry of Defence should be established within the development.

8.4. A minimum of 1 staircase and 1 lift should be provided within the common areas of the developments. Moreover, the staircase should be up to the emergency evacuation standards.

8.5. Male, female and disability access toilets must be provided at the development for visitors and staff separately.

8.6. It is encouraged for the development to be aesthetically designed consisting of different environmentally sustainable elements.

9. ATTACHMENTS

9.1. Location map of the showrooms

9.2. Site context plan of the showrooms

9.3. Setback plan of the showrooms

SCHEDULE 3: GENERAL TERMS AND CONDITIONS

HOUSING
DEVELOPMENT
CORPORATION

GENERAL TERMS AND CONDITIONS

IN RESPECT OF
LEASE OF LAND IN HULHUMALÉ FOR COMMERCIAL USE

1. DEFINITIONS

Unless the context shall otherwise require, the following terms shall have the following meanings and all capitalized terms not defined herein shall have the same meaning as set forth in the Particular Terms and Conditions of the Agreement, unless otherwise stated.

1.1 **"Agreement"** refers to Particular Terms and Conditions, General Terms and Conditions and the Lessor's guidelines in respect of lease of Land in Hulhumale' for commercial use, inclusive of the Schedules and Addendums signed between the Lessor and the Lessee.

1.2 **"Authority"** shall mean, without limit, the Maldives Government, and any Ministry, department, office, commission, delegate, instrumentality, agency, board, Authority or other organ of the Maldives Government whether statutory or otherwise.

1.3 **"Business Day"** shall mean any day other than Friday, Saturday, or public holiday as declared by the Maldives Government.

1.4 **"Concept Design"** shall mean the idea behind the design which is presented by a set of drawing proposals.

1.5 **"Construction Period"** shall be the period defined in the Particular Terms and Conditions of the Agreement, commencing from the date of approval of Detailed Drawings until the completion of construction works of the Project and obtaining of building usage permit from the Lessor, inclusive of any extension thereof.

1.6 **"Detailed Drawings"** shall mean the necessary drawings and documents required to approve the building design before on-site construction work can be permitted.

The drawings include:

Detailed Architectural and structural drawings.

Structural Calculations.

Environment Impact Assessment Report (if required as per Lessor's guidelines).

Soil Inspection Report.

Foundation Protection Report.

Fire Drawings approved by Maldives National Defense Force.

Services Drawings.

1.7 **"Development Period"** shall be the period commencing from the date of signing of the Agreement until the completion of construction works of the Project, inclusive of any extension thereof.

1.8 **"Hulhumale'"** shall mean the satellite island of Hulhumale' designated as a ward of Male'.

	1.9	**"Inflation"** shall mean the general increase in prices and fall of the purchasing power of money for goods and services. Inflation shall be determined based on the rates provided by the authorized Government Authority.
	1.10	**"Land Area"** shall mean total measured area of the Land allotted to the Lessee as specified in the Particular Terms and Conditions of the Agreement.
	1.11	**"Land"** shall mean the plot of Land defined by the boundary lines shown on the Land and location map attached in the Particular Terms and Conditions of the Agreement.
	1.12	**"Lessee"** shall be the Party leasing the Land from the Lessor and holding all the legal obligations specified in the Agreement including its successors in title, liquidators, administrators and lawful assignees where the context so requires or admits.
	1.13	**"Lessor"** shall be Housing Development Corporation Limited, the owner of the leased Land, which expression shall include its successors-in-title, liquidators, administrators and lawful assignees where the context so requires or admits.
	1.14	**"Maldives Law"** shall mean the laws of the Republic of Maldives. This shall include, but is not limited to, any and all existing legislation, rules, regulations and all amendments and/or revisions thereto from time to time.
	1.15	**"Performance Security"** shall mean a bank guarantee acceptable to the Lessor obtained from a bank by the Lessee.
	1.16	**"Personal Property"** shall mean everything that is the subject of ownership that does not come under the denomination of real property; any right or interest that an individual has in movable things.
	1.17	**"Premises"** shall mean the building constructed on the Land which shall be used for commercial use as stated in the Agreement.
	1.18	**"Project Plan and Schedule"** shall mean the timeline of the Project to be submitted by the Lessee and approved by the Lessor.
	1.19	**"Project"** shall mean the construction and development of the Premises on the Land as stipulated in the Agreement.
	1.20	**"Trade fixtures"** are removable personal property that a Lessee attaches to the Land and/or the Premises for business purposes, such as a display counter.
2. INTERPRETATIONS	2.1	Words denoting the singular shall include the plural and vice-versa.
	2.2	Words denoting persons shall, where the context so requires or admits, include individuals, firms, partnerships, trusts, corporations, governmental bodies, Authorities, agencies, unincorporated bodies of persons or associations, and any organization having legal capacity.
	2.3	Reference to a Clause or Schedule is a reference to a Clause of or a Schedule to the Agreement.

	2.4	Reference to any law are to be construed as reference to that law as from time to time amended, or to any law from time to time replacing, extending, consolidating or amending the same, or any regulation or rule made thereunder.
	2.5	Headings of Clauses are for convenience of reference only and shall not be deemed as part of the Agreement or an aid in its interpretation.
	2.6	Where a word is defined, other parts of speech or grammatical forms of that word shall have corresponding meanings.
	2.7	Reference to a Party to the Agreement shall include any successor in title or lawful assign or authorized representative or substitute or duly empowered attorney of that Party.
	2.8	Reference to an Agreement shall include any such Agreement as revised, amended, modified, novated, assigned or substituted.
	2.9	Every Schedule to the Agreement shall form an integral part of the Agreement and a reference to the Agreement includes a reference to the Schedules.
	2.10	If an event must occur on a certain date which is not a Business Day that date shall be amended to read as the next following Business Day.
	2.11	Time is of the essence with respect to all obligations under the Agreement.
3. OBJECTIVE OF THE AGREEMENT		The objective of the Agreement is to grant the Lessee the leasehold rights and the right to construct and develop a Premises on the Land for commercial use as per the terms and conditions set forth in the Agreement.
4. CONDITIONS PRECEDENT		Unless stated otherwise in the Particular Terms and Conditions, the Agreement will only be signed upon fulfilment of the following conditions precedent:
	4.1	Submission of Performance Security of value as stated in the Particular Terms and Conditions of the Agreement.
	4.2	Submission of Concept Design and obtaining approval from the Lessor.
	4.3	Submission of Lease Deposit receipt or bank guaranteed cheque confirming payment of Lease Deposit.
5. PERFORMANCE SECURITY	5.1	The Lessee shall ensure that the Performance Security is valid and enforceable throughout the Development Period and for an additional 2 (Two) months.
	5.2	The Performance Security will be released by the Lessor immediately on successful completion of the Project as per the "Project Plan and Schedule", and upon full settlement of all obligations of the Lessee in relation to the construction and development of the Premises on the Land under the Agreement. Failure by the Lessee to perform its obligations in relation to the construction and development of the Premises on the Land as specified under the Agreement, grants the Lessor the right to forfeit the Performance Security without any compensation to the Lessee.

	5.3	If Performance Security is not renewed before 1 (One) month of expiration of submitted Performance Security, the Lessor has the right to forfeit the Performance Security.
6. PROJECT	6.1	The Lessee agrees to finance the construction and development of the Project. For the avoidance of any doubt, it shall be the sole responsibility of the Lessee to raise and manage the finance required for the development of the Project and the Lessor shall not be liable towards any party in this regard under any circumstance whatsoever.
	6.2	The Project shall remain the responsibility of the Lessee. However, the construction works may be contracted to a third party by the Lessee with the written consent of the Lessor. For clarity, the Lessee shall be responsible for all obligations towards the Lessor even if components of the Project have been subcontracted to third parties by the Lessee.
7. FINANCING		The Land allocated for the Project can only be utilized as the primary security for financing the Project with the written consent of the Lessor.
8. CSR		If the Lessor obliges the Lessee to contribute an amount for Corporate Social Responsibility ("CSR") in the Particular Terms and Conditions of the Agreement, the components shall be finalized and stated in the Particular Terms and Conditions.
9. CONSTRUCTION AND DEVELOPMENT PERIOD	9.1	The Lessee shall proceed with construction and development on the Land as per the approved "Project Plan and Schedule" once the Detailed Drawings are approved by the Lessor.
	9.2	Subject to above, the Lessee agrees that construction and development of the Premises on the leased Land shall be completed within the duration specified in the Particular Terms and Conditions of the Agreement or any extension granted by the Lessor.
10.EXTENSION		Any extension to be granted under the Agreement shall be at the sole discretion of the Lessor.
11.DEVELOPMENT GUIDELINES AND DEVELOPMENT STANDARD	11.1	The construction and design of the Premises shall be consistent with the Lessor's guidelines annexed in the Particular Terms and Conditions.
	11.2	The Lessee agrees to construct and develop the Premises in accordance with the British Standard.
12.PROJECT INSPECTION		The Lessor, its representatives and agents shall have the right to inspect the Project works and shall have the right of access to the construction site at all reasonable times. The Lessor agrees to provide reasonable written notice of its desire to access the construction site, to enter the site with the representatives of the Lessee and to comply with all safety and other requirements of the Lessee with respect to the site. The Lessee undertakes to accommodate all reasonable requests made by the Lessor under this Clause, failing which the Lessor may, at its discretion enter the site on the notified dates without the representatives of the Lessee.
13.CONSULTATION		The Lessee shall consult with the Lessor throughout the entire Construction Period and Development Period.
14.PERMITS		The Lessee covenants to obtain all relevant permits and/or approvals from the relevant Authorities and comply with all laws of the Republic of Maldives, in undertaking the Project. The Lessor shall not be questioned nor held liable for the late or unobtainable permits from an Authority.

15.TITLE OF THE LAND			For all intents and purposes, the Lessor shall hold the title of the Land and the Lessee shall only be granted the leasehold rights and development rights with regard to the Land.
16.RENT	16.1		The Rent for the lease of the Land as outlined in the Particular Terms and Conditions of the Agreement shall be payable by monthly payments by no later than the 10th (Tenth) day of each calendar month. The Rent shall be paid by the Lessee into a bank account specified by the Lessor or paid in some other manner as instructed by the Lessor.
	16.2		If the Lessee fails to pay Rent at the end of the 10th (Tenth) day, the Lessee shall pay the Rent due with a fixed penalty rate of 1% per total monthly rent payable, from the 11th (Eleventh) day onwards until the date of payment or until the date of leased Premises being taken over by the Lessor.
	16.3		The Lessor has the discretion to review and amend the Rent stated in the Particular Terms and Conditions of the Agreement based on inflation and market rates. In such a case:
		16.3.1	The revised Rent shall be the Rent payable to the Lessor from the date of revision.
		16.3.2	If the revised Rent is not agreeable to the Lessee, the Lessee shall give the Lessor a 3 (Three) months' notice to terminate the Agreement. During such notice period, the Lessee shall pay Rent at the rate applied before such a revision.
17.OPTION TO RENEW TERM			The Lessor may at its discretion give the Lessee option to renew or extend the Term, provided that the Lessee requests to renew or extend the Term at least 6 (Six) months prior to expiration of the Term. However, such renewal or extension may be granted based on the Lessee's performance under the Agreement. The Lessor and the Lessee shall negotiate the new extension of the Term. In the event that the Lessor and the Lessee fail to reach mutual agreement with regard to the terms and conditions for renewal or extension of the Agreement latest by 3 (Three) months prior to expiration of the Term, then the Agreement shall expire at the end of the Term.
18.LEASE DEPOSIT	18.1		The Lease Deposit is to be held by the Lessor throughout the Term of the Agreement as a security against the Lessee's failure to pay the Rent, utility expenses or non-performance of its leasehold obligations laid down in the Agreement (excluding the Lessee's obligations in relation to the construction and development of the Premises) including, but not limited to any breach by the Lessee of its obligations as to the cleaning of the Premises.
	18.2		Where the Lessee fails to fulfill any of its leasehold obligation laid down in the Agreement, the Lessor may rectify and/or remedy such breach at its sole cost. In such instance, the Lessor shall have the right to set off such expenses against the Lease Deposit.
	18.3		After relevant deductions, if any, the Lease Deposit will be returned to the Lessee (without interest) within 60 (Sixty) calendar days of the expiration of the Term or following permitted termination of the Agreement pursuant to the Agreement, and the vacation of the Land.
	18.4		If the Lessee terminates the Agreement before the expiration of the Term without justified cause connected with the use and enjoyment of the Land and/or Premises or in breach of Clause 27 of this General Terms and Conditions, then the Lessor shall reserve the right to forfeit the Lease Deposit.

18.5 The Lease Deposit shall not to be used by the Lessee towards payments of Rent, utility bill or other expenses of the Lessee.

18.6 Where the Lease Deposit is insufficient for any relevant deduction as per the terms of the Agreement the Lessee agrees to reimburse the Lessor, upon submission of details of expenses borne by the Lessor. The Lessee shall, within 14 (Fourteen) calendar days reimburse the amount to the Lessor. The Lessor shall reserve the right to commence proceeding in Maldivian Court for failure to reimburse the amount within the time period specified by the Lessor.

19.DUTIES AND OBLIGATIONS OF THE LESSEE

The Lessee shall use the Land and/or the Premises in accordance with the objectives stated in the Agreement and in particular do the following:-

19.1 Pay the Rent at the time and in the manner as stated in the Agreement.

19.2 Utilize the leased Land only for the specific commercial usage, as stated in the Particular Terms and Conditions of the Agreement, and remain consistent in carrying out work.

19.3 Use the Land and/or Premises to provide facilities or services that conform to the rules and regulations and guidelines set by the Lessor which may be issued and/or modified from time to time, and the rules and regulations enforced by the relevant Authority or any other institution in charge of issuing of permits or authorizations.

19.4 Complete the structural and architectural drawings and structural calculations of the Project ("Detailed Drawings") in accordance with the Lessor's guidelines at its sole cost, and submit the Detailed Drawings for the approval of the Lessor within 60 (Sixty) calendar days from the date of signing of the Agreement.

19.4.1 Upon submission of the Detailed Drawings as per this Clause, the Lessor will give comments on the submitted Detailed Drawings within 14 (Fourteen) working days from the date of submission.

19.4.2 The Lessee further undertakes to make any alteration to the Detailed Drawings (Revised Detailed Drawings) and submit the same within 14 (Fourteen) working days from the date of comments given by the Lessor, at its sole cost. The Revised Detailed Drawings shall comply with all the specific requirements of the Lessor mentioned in the comments and Lessor's guidelines.

19.4.3 Upon the Detailed Drawings being finalized and approved by the Lessor, the Lessee shall grant exclusive right to the Lessor to utilize the Concept Design and Detailed Drawings in the event the Lessee fails to deliver the Project as agreed between the Parties. Under such circumstances, the Concept Design and the Detailed Drawings shall become the property of the Lessor and the Lessee shall not have any right or claim whatsoever in respect of the Concept Design or Detailed Drawings.

19.5 Submit the Project Plan and Schedule (which does not exceed Construction Period) timeline within 30 (Thirty) calendar days from the date of approval of Detailed Drawings by the Lessor. The Lessee further undertakes to make any alteration to the Project Plan and Schedule at its sole cost and submit to the Lessor, to comply with the requirements of the Lessor.

19.6 The Lessee agrees to submit the Bill of Quantity (BOQ) including the cost and Manpower plan within 30 (Thirty) calendar days from the date of approval of the Detailed Drawings. The BOQ must be agreed by both Parties within 14 (Fourteen) calendar days of its submission.

19.7 If required as per the Lessor's guidelines, the Lessee agrees to submit an Environmental Impact Assessment (EIA) Report approved by the Environmental Protection Agency (EPA), Maldives within 30 (Thirty) calendar days from the date of approval of Detailed Drawings. The Lessor will assist to expedite the process where necessary on written request from the Lessee. However, the Lessor does not guarantee any specific outcome.

19.8 The Lessee agrees to commence mobilization within 30 (Thirty) calendar days from the date of approval of Detailed Drawings.

19.9 Construct and develop the Premises in accordance with the Detailed Drawings and Project Plan and Schedule approved by the Lessor within the period specified in the Agreement and obtain written approval from the Lessor for any variation to the Detailed Drawings or for any structural alteration.

19.10 Obtain usage permit in writing from the Lessor before the establishment of the proposed work on the Land.

19.11 Obtain approval from the Lessor in writing if there is an interruption in providing services from the established commercial work on the Land.

19.12 Obtain all the utility services related to electricity, water & sewerage and telecommunication connections for the Land and/or Premises from the relevant Authorities.

19.13 Not to make any claims against the Lessor nor seek to be indemnified by the Lessor for or against any loss, liability or expense in connection with the above mentioned utility services obtained as outlined in Clause 19.12 of this General Terms and Conditions.

19.14 Make payments to the relevant Authorities for all utility services consumed or supplied inclusive of electricity meters, water meters and telecommunication connections to the Land and/or the Premises during the Term.

19.15 Keep the Premises in good repair, which include exterior and interior of the Premises.

19.16 Keep the interior of the Premises and all fixtures and fittings therein in good state and decorative condition and repair (reasonable wear and tear accepted).

19.17 Dispose of all waste and garbage in the appropriate manner set by the rules, regulations, policies and guidelines publicized by the relevant Authorities.

19.18 Dispose all construction waste in the appropriate manner set by the rules, regulations, policies and guidelines publicized by relevant Authorities.

19.19 Not to dispose any chemicals or any byproduct of a chemical to the waste disposal area or elsewhere in Hulhumalé.

19.20 Permit the Lessor or anyone authorized by the Lessor at reasonable hours upon prior notice (except in emergencies) to enter and view the Premises for any proper purpose (including the checking of compliance with the Lessee's obligation under the Agreement and during the last 3 (Three) months of the Term for the showing of the Land to prospective new Lessee).

19.21 Peacefully yield up, vacate the Land, remove all Lessee's Personal Property and Trade Fixtures, assets and handover the Land at the end of the Term or earlier termination and not seek any compensation from the Lessor in connection with the evacuation.

19.22 Be solely responsible for payment of tax of any kind whatsoever arising from or in connection with the Lessee's occupation in the Premises under the Agreement.

19.23 Be solely responsible for any damage to the Land and/or Premises or to any other adjoining building as a result of fire, flooding or any other negligent act or omission of the Lessee or any person occupying the Premises at any time within the term of the Agreement.

19.24 Ensure that any equipment installed or operated on the Land and any material stored on the Land are safe and harmless to the environment, property or human beings in every respect at all times during the Term.

19.25 Not to carry out any unlawful profession, trade or business on the Land or use it for any improper, immoral or illegal purpose, nor permit others to engage in such activities on the Land.

19.26 Not to cause or permit any damage or spoilage to the Land and keep the Land clean at all times.

19.27 Not to do or omit to do anything on the Land which may be or become a nuisance or annoyance to the Lessor or occupiers of adjoining or nearby buildings.

19.28 Not to keep goods belonging to Lessee or garbage outside the Premises and/or on the Land.

19.29 If storing any flammable product on the Land and/or Premises, to take necessary precautions with prior written approval from the Lessor.

19.30 If storing any material on the Land and/or Premises that cause dust or which smell potent or which may otherwise disturb the occupiers of adjoining or nearby buildings, to get prior written approval from the Lessor.

19.31 Not to assign, sublet, charge or part with or share possession or otherwise dispose of the Land or any of its rights, obligations, or responsibilities under the Agreement without the prior written consent of the Lessor.

19.32 Not to make any claim against the Lessor nor seek to be indemnified by the Lessor for or against any liability or expense in connection with the Land.

19.33 Submit monthly progress reports to the Lessor upon mobilization.

19.34 Install and maintain in the developed commercial building, at Lessee's sole cost, such fire protection system or equipment as is deemed necessary by governmental and insurance bodies.

20. FUNDAMENTAL OBLIGATIONS		Obligations stated in Clause 19.1, 19.2, 19.4, 19.9, 19.18, 19.19, 19.31, 19.33 and 19.34 must strictly be complied by the Lessee during the Term of the Agreement as they are fundamental terms applicable to the Lessee under the Agreement.
21. REPRESENTATIONS AND WARRANTIES OF LESSOR		The Lessor represents and warrants that the Lessor is the owner of the Land and is entitled to enter into the Agreement.
22. DUTIES AND OBLIGATIONS OF LESSOR		Subject to the Lessee paying the Rent and performing its obligations under the Agreement, the Lessor shall carry out the following throughout the Term of the Agreement:-
	22.1	Handover the Land to the Lessee on the date the Agreement becomes effective.
	22.2	Allow the Lessee to peacefully hold and enjoy the Land and/or Premises during the Agreement Term save for any lawful interruption from the Lessor.
	22.3	Not to unreasonably withhold or delay any permit or extension to be granted to the Lessee, provided the Lessee has no outstanding amount to be paid to the Lessor. For avoidance of doubt, the Lessor shall not be held responsible for any delays of permits to be granted by government or any Authority.
23. DISPUTE RESOLUTION	23.1	In the event of any dispute that may arise between the Parties, both Parties hereby agree and accept that they shall explore all means to resolve such disputes in a way that will be mutually beneficial and acceptable to both Parties and that, to the extent reasonably possible, gives effect to the terms and conditions of the Agreement. As such, both Parties expressly pledge that they shall resort to ways or methods that best assist in reaching a reasonable solution to any dispute, and to work on trying to come to solutions of mutual benefit to both Parties in the event of disputes. As such, any dispute arising out of or in connection with the Agreement shall be dealt with as follows:-
	23.1.1	In the first instance in good faith by mutual discussion and agreement.
	23.1.2	If the dispute cannot be resolved by mutual discussion, either Party may refer such dispute to the exclusive jurisdiction of the courts of the Republic of Maldives for final determination. The Parties hereby agree to refer such disputes to a relevant court of law.
24. TERMINATION FOR FAILURE TO PAY RENT	24.1	The Lessor may serve a 30 (Thirty) calendar days written notice to the Lessee to terminate the Agreement in the event the Lessee fails to pay the Rent and/or the penalty as per the terms of the Agreement for a period of 3 (Three) consecutive months.
	24.2	The Lessor may terminate the Agreement without any compensation payable to the Lessee in the event the Rent due and/or penalty remains unpaid at the end of the 30 (Thirty) calendar days written notice period referred to under Clause 24.1 of this General Terms and Conditions.
	24.3	If the Lessee clears the full outstanding amount including the penalty charges prior to the expiration of the 30 (Thirty) calendar days written notice period, the Agreement shall remain effective.
25. TERMINATION FOR FAILURE TO REMEDY A BREACH	25.1	Subject to Clause 26 below, apart from failure to pay Rent, if the Lessee fails to perform any of its obligation under the Agreement, the Lessee shall be granted a period to rectify the breach along with a fine amount between MVR 5,000.00 (Five Thousand Maldivian Rufiyaa) and MVR 100,000.00 (One Hundred Thousand Maldivian Rufiyaa), considering the degree of breach, to be determined at the sole discretion of the Lessor.

	25.2	If the Lessee fails to pay the fine and cure the breach within the extension period granted under Clause 25.1 of this General Terms and Conditions, the Lessor has the right to terminate the Agreement and give the Lessee a duration not less than 30 (Thirty) calendar days to vacate the Land and handover the Land to the Lessor.
26.IMMEDIATE TERMINATION		Notwithstanding Clause 25 above, the Lessor may terminate the Agreement immediately without any prior written notice, if the Lessee fails to perform any of the fundamental obligations referred in Clause 20 of this General Terms and Conditions of the Agreement, with the exclusion of Clause 19.1.
27.NO FAULT TERMINATION		The Lessee may terminate the Agreement by serving 6 (Six) months' written notice upon the Lessor of its intention to do so for any reason whatsoever.
28.FORMALITIES EFFECTING TERMINATION	28.1	Upon termination of the Agreement as outlined in the Agreement, the Lessee shall remove its Personal Properties and Trade Fixtures from the Land and/or Premises, and handover the Land to the Lessor together with the infrastructure and immovable assets therein. The Lessor shall not be required to pay any compensation whatsoever under such circumstances.
	28.2	If the Lessee fails to remove Personal Properties and Trade Fixtures on the Land and/or Premises at the end of the termination notice period, it shall be deemed that the Lessee abandoned the properties and shall grant the Lessor the right to appropriate such properties as the Lessor desires.
	28.3	The Lessee shall pay the Rent to the Lessor, the cost incurred by the Lessor in respect to clearance of Premises, any rental arrears and any payment for any penalty imposed in accordance with the terms and conditions of the Agreement before the end of the termination notice period, or handover of Land to the Lessor, whichever is later. This amount shall remain as a debt owed to the Lessor by the Lessee.
	28.4	The Lessee shall be responsible for all costs, expenses and charges incurred by the Lessor on a full indemnity basis.
	28.5	Any payment made by the Lessee after the expiration of termination notice period, shall be deemed to be payments made under Clause 28.3 of this General Terms and Conditions. The Lessor's receipt of the payments of such debts shall not be deemed as intention to revoke termination.
	28.6	A Party's election to terminate the Agreement shall not prejudice any other rights of the Party under the Agreement, provided always that any action brought about by the Party shall be as per the terms and conditions of the Agreement.
	28.7	In the event the Lessor terminates the Agreement in accordance with the Agreement, the Lessor may re-enter the Land and/or Premises (or any part thereof) upon the expiration of the termination notice period.
29.INDEPENDENT CONTRACTOR		It is expressly understood and agreed that the Lessee is and shall be at all times during the term of the Agreement, deemed to be an independent contractor and nothing in the Agreement shall in any way be deemed or construed to constitute the Lessee as an agent, employee of the Lessor nor shall the Lessee have the right or authority to act for, incur, assume or create any obligation, responsibility or liability, express or implied, on the Lessor's behalf or to bind it in anyway whatsoever or sign documents on its behalf.
30.ASSIGNMENT	30.1	The Lessee may not assign, sublet, charge or part with or share possession or otherwise dispose of the Land or any of its rights, obligations, or responsibilities under the Agreement without the prior written

		consent of the Lessor. Any such assignment or transfer of the Agreement, or any assignment or transfer of any interest of the Agreement by the Lessee other than as mentioned in this Clause shall be null and void and of no legal effect.
	30.2	In the event of transfer of shares of the Lessee, the Lessee shall inform the Lessor in writing within 14 (Fourteen) calendar days.
31.COMPLIANCE WITH LAWS		Each Party hereto agrees that it shall comply with all applicable laws, regulations, rules, directions and other requirements applicable from time to time, and shall not do or omit or permit to be done or omit to be done any act or thing by which any of the terms of the Agreement may be invalidated or become unenforceable partly or wholly.
32.LIABILITY	32.1	The Lessee will not be entitled to make any claim against the Lessor nor seek to be indemnified by the Lessor for or against any liability, loss or damage arising from any risk relating to the Agreement. It is the sole responsibility of the Lessee to effect insurance in order to protect itself from such losses.
	32.2	Notwithstanding the above, each Party further undertakes to fully indemnify and hold the other Party harmless from all loss, costs, damages, suits and claims arising from its breach or negligence.
33.CORPORATE AUTHORITY		Both Parties to the Agreement represent that each has taken all necessary corporate action to authorize the execution and consummation of the Agreement and will furnish the other Party with satisfactory evidence of this upon request. Each Party agrees to negotiate in good faith the execution of such other documents or agreements as may be necessary or desirable for the implementation of the Agreement and the effective execution of the transactions contemplated hereby.
34.FORCE MAJEURE	34.1	Parties to the Agreement shall be excused from performing its obligations under the Agreement if its performance is restricted or prevented by a Force Majeure. In such circumstances the Lessee shall inform the Lessor within 7 (Seven) calendar days of Force Majeure event. Performances of the Lessee shall be excused only to the extent of and during the reasonable continuance of such disability as agreed between the Parties in writing. In this context, "Force Majeure" shall mean a natural cause beyond reasonable control, limited to the following:-
		34.1.1 Act of God including tempest, fire, pandemic, epidemic, state of emergencies or natural disaster.
		34.1.2 War, civil war, act of terrorism.
35.WAIVER		The failure by any Party to exercise or enforce in any instance any of the terms or conditions of the Agreement, or to insist upon strict performance by the other Party of any of the provisions of the Agreement, shall not constitute or be deemed a waiver of that Party's rights thereafter to enforce each and every term and condition of the Agreement.
36.NOTICES	36.1	All notices, requests, demands or other communications to or upon the respective Parties to the Agreement shall be deemed to have been duly given or made when delivered personally or by registered letter or by email to the other Party at the addresses set out in the Agreement or at such other address as the Party concerned may hereafter specify to the other in writing or, in the case of email, to the published email of the addressee.

	36.2	Posted letters shall be deemed to have been delivered 7 (Seven) Business Days after posting (Fridays, Saturdays and Public Holidays excepted) and email messages shall be deemed to have been delivered at the time of dispatch unless they are received outside business hours of the recipient in which case they shall be deemed received at the opening of business on the next Business Day. If the address and email address of any Party stated in the Agreement is changed, the Party shall inform the other Party within 7 (Seven) Business Days.
37. INUREMENT		Agreement shall inure to the benefit of and be binding upon each of the Parties. Further, the Agreement shall inure to the benefit of and be binding upon the respective successors-in-title and permitted assigns of the Parties.
38. CONFIDENTIALITY		The Parties shall at all times keep confidential information acquired in consequence of the Agreement, except for information which the receiving Party already knows or receives from third Parties or which the receiving Party may be entitled or bound to disclose under compulsion of law or where required by regulatory agencies or to their professional advisors, investors and other Parties where reasonably necessary for the performance of their obligations under the Agreement. For the avoidance of doubt, the obligations in this Clause shall not apply to information in the public domain or information which the Parties own or acquired lawfully from other and which may be freely disclosed to other without breach of any obligation of confidence.
39. PARTIAL INVALIDITY		If at any time any provision hereof is or becomes illegal, invalid or unenforceable in any respect under the laws of Maldives, neither the legality, validity or enforceability of the remaining provisions hereof nor the legality, validity or enforceability of such provision under the laws of Maldives shall in any way be effected or impaired thereby. Notwithstanding the above, the Parties are at liberty to alter the provision or provisions so severed, with a view to bring it/them in conformity with the laws of the Republic of Maldives.
40. AMENDMENTS		Any amendment to the Particular Terms and Conditions of the Agreement shall be made in writing and agreed by both Parties to the Agreement.
41. GUIDELINES OF LESSOR		All relevant Lessor's guidelines shall be deemed as an important and integral part of the Agreement. The Lessor shall reserve the right to amend and/or vary the applicable Lessor's guidelines from time to time and the Lessee agrees to be bound by the amendment and/or variation.
42. ORDER OF PRIORITY		In the event of conflict between Particular Terms and Conditions of the Agreement and the terms of any other document forming part of the Agreement, the terms of the Particular Terms and Conditions shall prevail. In the event of conflict between the Lessor's guidelines and this General Terms and Conditions of the Agreement, the terms of the Lessor's guidelines shall prevail.
43. ENTIRE AGREEMENT AND COPIES	43.1	The Agreement constitutes the entire Agreement between the Parties with respect to the subject matter contemplated herein and supersedes all oral statements and prior writings with respect to the subject matter contemplated herein.
	43.2	The Agreement shall be executed simultaneously in two original copies, each of which when executed and delivered shall constitute an original, but all copies shall together constitute but one and the same instrument.

44. GOVERNING LAW	The Agreement shall be governed by, construed and enforced in accordance with the laws of the Republic of Maldives and both Parties hereby agree to submit to the exclusive jurisdiction of the Maldivian Courts in connection with any action or proceeding that may arise out of or in connection with the Agreement.

SCHEDULE 4: LAND HANDOVER NOTE