

MAKERERE



UNIVERSITY

COLLEGE OF ENGINEERING, DESIGN, ART AND TECHNOLOGY
(CEDAT)

SCHOOL OF BUILT ENVIRONMENT DEPARTMENT OF CONSTRUCTION
ECONOMICS AND MANAGEMENT MASTERS OF SCIENCE IN CONSTRUCTION
MANAGEMENT

CMG 8203: MASTERS PROJECT REPORT (PLAN B)

ASSESSING THE IMPACT OF SCOPE CREEP AND LOCAL SKILLED LABOR
CONSTRAINTS ON SCHEDULE DELAYS: A CASE STUDY OF THE SAFARI 2
APARTMENTS PROJECT, HODAN DISTRICT, MOGADISHU, SOMALIA

PREPARED BY: ABDIRAHMAN DAHIR ALI

REG.NO: 2024/HD08/24886E

STD NO: 2400724886

SUPERVISOR: DR. NATHAN KIBWAMI

A PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENT FOR THE AWARD OF THE MASTER OF SCIENCE IN
CONSTRUCTION MANAGEMENT OF THE COLLEGE OF ENGINEERING,
DESIGN, ART AND TECHNOLOGY AT MAKERERE UNIVERSITY

MAY 2026

DECLARATION

I, Abdirahman declare that this report is purely my own work with the exception of acknowledged citations and has never been submitted to any other institution by any other person for any purpose.

Signature: GA Ali

Date: 15/06/2026

Abdirahman Dahir Ali

CERTIFICATION

This work has been carried out under my supervision and is now ready for submission to the Department of Construction Economics and Management, College of Engineering, Design, Art, and Technology, Makerere University, with my approval.

Signature: _____

Dr. Nathan Kibwami

Date: _____

15/05/20

Supervisor



Digitisation and Self-Archiving Consent Agreement: Theses

Agreement between Makerere University & Students (Authors of Theses / Dissertations / Reports)

1. The author is a student of Makerere University and author of the thesis / dissertation / report titled:
Assessing the Impact of Scope Creep and local Skilled labor Constraints on schedule Delays: A case study of the SAFARI 2 Apartments Project, Hodan District, Mogadishu, Somalia
2. The author grants to the University:
 - a. The right to deposit the electronic version of the Thesis / Dissertation / Report into Makerere University Institutional Repositories (Mak IR) or (Mak UD); and
 - b. The right to store the thesis / dissertation / report in Mak IR / Mak UD and make it permanently available to the general public via the Internet at no cost to the general public after a grace period (if any is specified). **Choose one of the three options below (c, d, or e):**
 - c. The Author may opt for immediate open access to the public ✓
 - d. Or Restrict access indefinitely:
 - e. Or Restrict access for the specified number of years:
 - f. Reason for restriction:
3. The author warrants that to the best of the authors knowledge and belief:
 - a. The thesis / dissertation / report is an original work;
 - b. The author is the owner of all the intellectual property in the thesis / dissertation or
 - c. The Author is entitled to deal with the intellectual property in the thesis / dissertation / report by publishing it on the Internet
 - d. The Author has the right, power and authority to enter into this Agreement and to grant the University the rights contained in this Agreement; and
 - e. The University's use of the thesis / dissertation / report pursuant to this Agreement will not infringe the intellectual property rights of any third party.
4. The Author acknowledges and agrees that the University is not responsible or liable for any breach of the intellectual property rights in the thesis / dissertation / report, in particular any breach of copyright, as a result of the use of the thesis / dissertation / report pursuant to this Agreement.
5. The University acknowledges that the rights granted by the Creator in clause 2 of this Agreement, do not cause any transfer or assignment of any proprietary rights in the intellectual property in the article to the University.

Signed by the Author as confirmation that the Author has read and accepted the terms of this Agreement:

Name: Abdirahman Dahir ALi

College: CEDAT

School: Built Environment

(Tick) Type of Degree: (Undergraduate / PGD / Masters / PhD), Reg. No.: 2024/HD08/24886 E

Tel No.: 0744 58 33 72

E-Mail: maan178178@gmail.com

Signature: Att

Date: 14/08/2026

Supervisor's endorsement: [Signature]

ACKNOWLEDGEMENTS

I would like to extend my gratitude to Dr. Nathan Kibwami for his guidance and support throughout this project report. Special thanks to my highly respected lectures throughout my study journey at Makerere university.

Lastly, I am grateful to my family and colleagues for their encouragement and support.

Table of Contents

DECLARATION.....	ii
CERTIFICATION.....	iii
ACKNOWLEDGEMENTS	iv
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF ABBREVIATIONS	xii
ABSTRACT.....	xiii
CHAPTER 1.0 INTRODUCTION	1
1.1 Background	1
1.2 Problem statement.....	2
1.3 Main objective.....	2
1.4 Specific objectives.....	3
1.5 Specific questions.....	3
1.6 Scope of the study	3
1.6.1 Geographical scope.....	3
1.6.2 Time scope.....	3
1.6.3 Contents scope.....	3
1.7 Significance of the study	4
1.8 Methodology	4
1.8.1 Objective 1: To examine how the scope expansion from 15 to 17 floors affected project timelines.	4

1.8.2 Objective 2: The impact of local skilled labor constraints and the workforce transition on schedule delay	5
1.8.3 Objective 3: Strategies and recommendations to mitigate schedule delays in future high-rise projects in Mogadishu.....	5
1.8.4 How the impact was assessed.....	6
1.9 Project Description.....	7
1.10 Authors involvement in the project.....	8
CHAPTER 2.0 LITERATURE REVIEW.....	9
Introduction	9
2.1 Schedule delays in construction projects	9
2.2 Types of Delay in Construction Projects.....	10
2.3 Construction schedule delay causes	12
2.3.1 Owner-Related Causes of Delay.....	12
2.3.2 Contractor-Related Causes of Delay	12
2.3.3 Material & Equipment-Related Causes of Delay	14
2.3.4 Design-Related Causes of Delay	14
2.3.5 Externally Related Causes of Delay	15
2.4 Effects of delays in African construction.....	16
2.5 Scope creep as construction projects delay driver	16
2.6 Labor skill constraints as construction project delay driver.....	17
2.7 Research gaps.....	18

2.7.1 Absence of construction schedule delay research specific to Mogadishu and post-conflict Somalia.....	18
2.7.2 Absence of delay mitigation strategies and frameworks adapted to weak institutional environments like Somalia.	19
CHAPTER 3:0 PROJECT DESCRIPTION	20
3.1 project overview.....	20
3.2 Project details	21
3.3 Project Scope.....	21
3.4 Project Lifecycle	22
3.5 Procurement Approach.....	24
3.6 key project events and timelines	25
3.7 Author's involvement in the project	26
CHAPTER 4.0 RESULTS AND DISCUSSIONS	27
4.1 Introduction	27
4.2 Analysis of project scheduling: baseline vs revised schedule vs actual status.....	27
4.2.1 Quantified Schedule Deviation.....	27
4.2.2 Schedule overrun time-based analysis.....	28
4.2.3 Critical Path Analysis (as planned vs as built)	29
4.3 Delay responsibility and Delay classification	30
4.4 SAFARI 2 Apartments Project Site Observation Results	31
4.4.1 International workforce transition and labor availability	31
4.4.2 Scope Creep: Addition of two floors.....	32

4.4.3 External Factors (Mogadishu’s security challenges and Somali labor skill constraints).....	32
4.5 key findings of research objectives	33
4.5.1 How did the scope expansion from 15 to 17 floors affect project timelines? ...	33
4.5.2 How did the local skilled labor constraints and the Turkish and Indian teams’ transition affect the project’s schedule delay?	34
4.5.3 What strategies and recommendations should be implemented to mitigate the schedule delays of high-rise projects like SAFARI 2 Apartments in Mogadishu?	35
CHAPTER 5.0 LESSONS LEARNED, CONCLUSION AND	
RECOMMENDATION.....	38
5.1 Lessons Learned.....	38
5.2 Conclusion.....	39
5.3 Recommendations	41
5.3.1 Assigning an experienced and competent project management team	41
5.3.2 Workforce training and development	42
5.3.3 Effective project planning and scheduling	42
5.3.4 Proactive Risk Management.....	42
5.3.5 Technological integration	43
5.3.6 Stakeholder communication and collaboration	43
5.3.7 Engaging a Consulting Engineering Firm:	44
5.4 Limitations	44
REFERENCES.....	45

APPENDICES	54
Appendix I: Architectural designs.....	54
Appendix II: Site progress images	59
Appendix III: Safari 2 apartments baseline construction plan	62
Appendix IV: Safari 2 apartments revised construction plan	70

LIST OF TABLES

Table 3.1: Project details.....	21
Table 4.2:Baseline vs Revised Plan Vs Actual Status	27
Table 4.3: Delay Responsibility attribution and classification	30

LIST OF FIGURES

Figure 2.1: Types of Delay in Construction Project: Source:(Tawfek & Bera, 2018)	10
Figure 3.2: Traditional Procurement Approach. Source: (Masterman, 2013)	24
<i>Figure 4.3: Project delay sources and their contribution</i>	28
Figure 4.4: Baseline plan critical path	29
Figure 4.5: Revised Plan critical path	29
Figure 6: Basement 02 Floor Plan	54
Figure 7:Basement 01 Floor Plan	55
Figure 8:Ground Floor Plan	56
Figure 9:Typical Floor Plan	57
Figure 10:Roof Floor Plan	58
Figure 11:Elevation.....	59
Figure 12:Showing raft foundation, columns and beams	59
Figure 13:Showing outside structure	60
Figure 14:Entire building structure	60
Figure 15: Showing Interior finishes	61
Figure 16: Showing front View	61

LIST OF ABBREVIATIONS

BIM: Building Information Modelling

CPA: Critical Path Analysis

CPD: Construction Project Delays

CPM: Critical Path Method

EC: Excusable Compensable

EF: Early Finish

EN: Excusable Non-compensable

EOT: Extension of Time

ES: Early Start

EVM: Earned Value Management

LF: Late Finish

LS: Late Start

NN: Non-excusable No-compensable

PERT: Program Evaluation and Review Technique

RC: Reinforced Concrete

SV: Schedule Variance

USD: United States Dolls (currency)

ABSTRACT

Somalia's construction projects are suffering major delays. Most construction projects take longer than planned. Therefore, this study assessed the impact of scope creep and local skilled labor constraints on schedule delays in the Safari 2 Apartments Project, a 17-story residential development in Hodan District, Mogadishu, Somalia. This study adopted a single-project case study investigation grounded in project documentation, site observation records, and established schedule analysis techniques. The study found a cumulative schedule overrun of 14.5 months, representing 40% overrun of the original 36-month planned duration. Three causes of delay were identified: scope creep (the addition of two floors beyond the original scope, 38% of the total project delay), workforce transition (a five-month work stoppage caused by a contractual breakdown between the main contractor and Turkish sub-contractor, a 34% of the total project delay), and external factors (comprising Mogadishu's security challenges and low local construction labor productivity, a 28% of the total project delay). The study suggests that assigning an experienced and competent project management team, workforce training and development, effective project planning and scheduling, proactive risk management, technological integration, stakeholder communication and collaboration and engaging a consulting engineering firm are the corresponding mitigation mechanisms of delay for Somalia's construction projects.

CHAPTER 1.0 INTRODUCTION

1.1 Background

Project schedule overruns in the construction industry are global phenomenon (Mukuka et al., 2015). Alkhathami (2004) defines schedule overruns as the extra time required to complete a construction project beyond its original planned duration, whether or not it is compensated. Assaf and Al-Hejji (2006) defined schedule overrun as the time overrun beyond the completion date specified in a contract or the agreed delivery date for a project. Schedule delays are among the most critical and common risk factors confronting the global construction industry.

Gashahun (2020) examined research across 17 African countries and presents critical causes of delay, including ineffective project planning, poor communication, and material price fluctuations. Countries in East Africa, such as Ethiopia, Kenya, and Uganda, face similar problems. For example, in Uganda, major delays caused in construction projects include changes to the scope of work, delayed payments, poor monitoring and control, the high cost of capital, and political insecurity and instability (Alinaitwe et al., 2013).

Similarly, Somalia's construction projects face constant challenges, including cost overruns and schedule delays (Osman & Mohamud, 2022). Specifically, in the capital city of Mogadishu, which operates in a post-conflict environment after decades of instability and civil war, with rapid reconstruction and a shift toward modern building developments, alongside limited institutional regulatory capacity and a heavy reliance on informal practices that can cause project delays and negatively impact project stakeholders.

Therefore, this report assesses the impact of scope creep and local skilled labour constraints on schedule delays in the Safari 2 Apartments Project, Hodan District, Mogadishu, Somalia, as a case study. Despite the fact that the project's planned timeline was from

January 2022 to December 2024, as of March 2026, the project is in the finishing phase, with only exterior paint remaining, but it has not yet been handed over to the client due to two main factors: (1) Scope creep through the increase from 15 to 17 floors. (2) local skilled labour constraints, including the workforce transition that contributed to a five-month work stoppage.

1.2 Problem statement

Construction schedule delays are a persistent challenge that leads to time and cost overruns, disputes, and reduced project outcomes (Durdyev & Hosseini, 2020). While delays are documented globally, there is a practical need for Somalia and Mogadishu-specific case evidence that explains how local skilled labour constraints and scope creep contribute to schedule delays in complex projects. In the Safari 2 Apartments Project, the delay has been particularly severe. The project's planned schedule was to start in January 2022 and finish in December 2024, yet over a full year later, it remains incomplete. Two major contributing factors identified are the expansion of the scope from 15 to 17 floors and a local skilled labour shortage following the contractor's Turkish workforce's exit due to contractual misunderstandings. Work stopped for five months until new Indian specialists were sourced.

Therefore, this report provides a practice-based assessment of how scope creep and local skilled labour constraints affected the project schedule and identifies strategies to mitigate similar risks in future projects in Mogadishu, Somalia.

1.3 Main objective

To assess the impact of scope creep and local skilled labour constraints on schedule delays in the Safari 2 Apartments Project, Hodan District, Mogadishu, Somalia, and to develop practical mitigation strategies for similar high-rise developments in Somalia.

1.4 Specific objectives

1. To examine how the scope expansion from 15 to 17 floors affected project timelines.
2. To analyze the impact of local skilled labor constraints and the changeover between Turkish and Indian technical teams on the project's schedule.
3. To propose strategies and recommendations for minimizing schedule delays in future high-rise residential projects in Mogadishu.

1.5 Specific questions

1. How did the scope expansion from 15 to 17 floors affect project timelines?
2. How did local skilled labour constraints and the Turkish and Indian teams' transition affect the project's schedule?
3. What strategies and recommendations should be implemented to mitigate the schedule delays of high-rise projects in Mogadishu?

1.6 Scope of the study

1.6.1 Geographical scope

The geographical scope of this study will be limited to the SAFARI 2 APARTMENTS site in the Hodan district of Mogadishu, Somalia.

1.6.2 Time scope

This study will cover the period from the commencement of construction activities at the SAFARI 2 apartments site to the completion of the project.

1.6.3 Contents scope

The scope of this study will be limited to the scope creep and labor constraints that occurred during the construction phase of the SAFARI 2 apartments project.

1.7 Significance of the study

Understanding how scope creep and local labour constraints affect the project schedule and project success can help project managers and contractors to strengthen change management and resource planning. This report can help workforce development institutions to align workforce skills with market demand. Overall, the results of this report will help minimise the negative effects and increase the project's likelihood of success.

1.8 Methodology

This study adopted a single-project case study design, the most appropriate approach for an in-depth, practice-based investigation of construction management challenges within a specific real-world project. The Safari 2 Apartments Project is a selected case study project because it has experienced scope creep and skilled labour constraints, which affected the project timeline and cost. The researcher obtained relevant data from project reports, including scheduling records, drawings, progress reports, site meetings, specifications, and field observations, to explore the causes and effects of schedule delays. The following outlines how each specific objective was achieved, how the impact was measured, and the methods that were used.

1.8.1 Objective 1: To examine how the scope expansion from 15 to 17 floors affected project timelines.

This objective was achieved through a comparison of the planned versus actual schedule. The original baseline plan for the 15 upper floors was compared against the revised plan produced after the scope expansion to 17 upper floors. Key data sources were the project's scheduling records and project drawings. The analysis quantified the additional activities, activity durations, and total extension attributed to additional floors by comparing critical path activities in both planned and actual project timelines. The impact of scope creep on schedule was measured by calculating the net increase in planned project duration (in

months) between the baseline and revised plan, and by identifying which critical path activities were extended, or added as a direct consequence of the scope change.

1.8.2 Objective 2: The impact of local skilled labor constraints and the workforce transition on schedule delay

This objective was achieved through a labor productivity analysis by comparing:

- ❖ Productivity before Turkish labor exit.
- ❖ Low productivity gap during workforce absence.
- ❖ Productivity recovery after Indian labor mobilization.

The delay attributable to the workforce transition was measured by calculating the total duration of activities that recorded zero or low progress during the stoppage and mobilization periods on the critical path. Delays were classified to determine responsibility and the basis for any extension of time entitlement. The combined schedule impact of the labor disruption was expressed as a number of months of critical path delay attributable to this cause.

1.8.3 Objective 3: Strategies and recommendations to mitigate schedule delays in future high-rise projects in Mogadishu

This objective was attained through a synthesis of findings from Objectives 1 and 2, combined with a critical review of mitigation strategies documented in the literature and construction management practices. For each identified cause of delay, the study proposed a corresponding practical mitigation measure appropriate to Mogadishu's construction environment, while accounting for the limitations of local institutional capacity. Recommendations were evaluated against the criteria of feasibility, cost-effectiveness, and alignment with international best practice in construction project management.

1.8.4 How the impact was assessed

The impact of scope creep and labour constraints on the project schedule was assessed using the following four methods applied in construction project management practices:

Planned vs Actual Schedule Comparison: The baseline plan and actual project progress were compared period-by-period to calculate schedule variance (SV) for each work package. This was quantified in months, the cumulative delay at each stage of the project. The method was applied to both the pre-scope-change baseline and the post-scope-change revised plan.

Critical Path Analysis (CPA): Critical path activities were identified from the project schedule for both the original 15-floor design and the revised 17-floor design. CPA was used to determine which activities directly affected the project's overall completion date and traced how scope-driven additions and labor-driven stoppages altered the critical path.

Delay Classification and Attribution: Each identified delay event was classified according to the construction delay framework (excusable, non-excusable, compensable, non-compensable or concurrent) outlined by Tawfek and Bera (2018). Attribution analysis was assigned responsibility for each delay period to either the client, the contractor, or shared/neutral causes. This classification was essential for determining the legal and contractual implications of each delay event and for establishing which delays entitled the contractor to an extension of time and or additional compensation.

Labor Productivity Analysis: Workforce output was assessed across three distinct phases:

- ❖ Productivity before Turkish labor exit
- ❖ Low productivity gap during workforce absence
- ❖ Productivity recovery after Indian labor mobilization

The productivity loss during the transition period was expressed as an output deficit and translated into equivalent months of schedule delay. This method provided a quantitative basis for isolating the schedule impact of the labour disruption from that of the scope change, enabling independent attribution of each variable's contribution to the overall delay.

Together, these four methods constituted a mixed-method impact assessment framework combining qualitative delay classification with quantitative schedule and productivity analysis. Their combined application provided a well-evidenced answer to the central research question of how scope creep and labour constraints affected the project's schedule, and by how much each factor independently contributed to the overall delay.

1.9 Project Description

The Safari 2 Apartments is a high-rise, modern building development located in the Hodan District of Mogadishu, Somalia. The project was initiated to serve the growing demand for modern, secure housing driven by Somali diaspora investment and ongoing urban development in the capital. The project consists of two basement levels, a ground floor, 17 upper residential floors, and a roof level. The project site area (including garden space) is 2475 m². The original approved design was 2 basement levels, a ground floor and 15 upper floors. The original planned project timeline was a 36-month construction period from January 2022 to December 2024, with an initial cost estimate of USD 9.5 million, later increasing to USD 11 million. After construction started, the project scope expanded from 15 to 17 floors, and the project also experienced a major skilled labour disruption, including a five-month work stoppage during the transition from Turkish to Indian technical teams. As of March 2026, only exterior painting remains, and has not been formally handed over to the client. The project is executed by Mogadishu Stars Construction Company.

1.10 Authors involvement in the project

I served as the Project Coordinator on the SAFARI 2 Apartments Project from the commencement of construction in January 2022 up to the end of the originally planned construction period in December 2024, see Appendix III. In this role, I acted as the main coordination link between the client representatives, the contractor's site team, the international technical staff, and the office-based management team to ensure that information flowed clearly and site activities were properly aligned with project objectives.

My responsibilities included monitoring site progress against the baseline programme, tracking schedule performance, maintaining progress records, and preparing regular project updates for management review. I also coordinated communication on site issues, followed up implementation of instructions from management, and helped ensure that delays, changes, and site constraints were properly documented for decision-making.

During the project, I was actively involved in reviewing the effects of scope changes, workforce transitions, and other factors affecting progress. I participated in site visits, observed construction progress, and maintained direct contact with the project team, especially during university holiday periods when I returned to Mogadishu. This position gave me practical access to project records and site information, which supported my assessment of schedule delays and made me well placed to analyze how scope creep and skilled labour constraints affected project completion.

CHAPTER 2.0 LITERATURE REVIEW

Introduction

Many studies have examined the causes and effects of delays in construction projects across different developing countries, including Africa. Several articles have discussed the causes of delay in construction projects in numerous ways. Some studies identified the main causes of delay across several countries and project types, while others discussed delay analysis methods and ways to mitigate it. Thus, this chapter reviews the existing research on delays in construction project schedules, with a specific focus on scope creep and local skilled labour constraints as key drivers.

2.1 Schedule delays in construction projects

Construction projects represent complex human undertakings requiring rigorous planning and effective control to achieve success (Gashahun, 2020). Across industries and regions worldwide, such projects consistently present significant challenges for project teams and stakeholders. Common difficulties include schedule delays, cost overruns, deficiencies in quality control, and reduced profitability (Gashahun, 2020). In addition, the construction sector is inherently characterized by high levels of risk.

Multiple studies from multiple regions consistently highlight the issue of schedule overruns in construction projects. Love et al. (2005) investigated 161 construction projects in Australia and found an average time overrun of 20.7%. Similarly, Doloi et al. (2012) states that construction projects in India experienced an average schedule overrun of 55% beyond planned durations. study from South Africa also states a high prevalence of delays, with approximately 55% of construction projects affected (Motlhatlhedhi, 2019). Assaf and Al-Hejji (2006) define schedule overrun as the time overrun either beyond completion date specified in a contract, or beyond the date that the parties agreed upon for delivery of a project.

A study by Fashina et al. (2021) investigates the key factors influencing delays in construction projects in Hargeisa, Somalia, with road and building projects serving as the baseline for analysis, and the results show that delay in honoring payment progressively, underestimation or overestimation of the project cost, and delay in the approval of major changes in the work scope were ranked as the three major causes of delays in construction projects in Hargeisa. Similarly, a study by Osman and Mohamud (2022) investigated the relationship between schedule delays and cost overruns in construction projects in Mogadishu, Somalia, and found that schedule delays have significant cost impacts such as increased project costs, reduced quality, design changes, disputes and conflicts among project parties.

2.2 Types of Delay in Construction Projects

Completion within the specified time in the contract is the primary objective of construction projects. Any delay in the project completion date results in a negative value for the contract, regardless of the cause or the responsible party. There are different types of delay, see Figure 2.1.

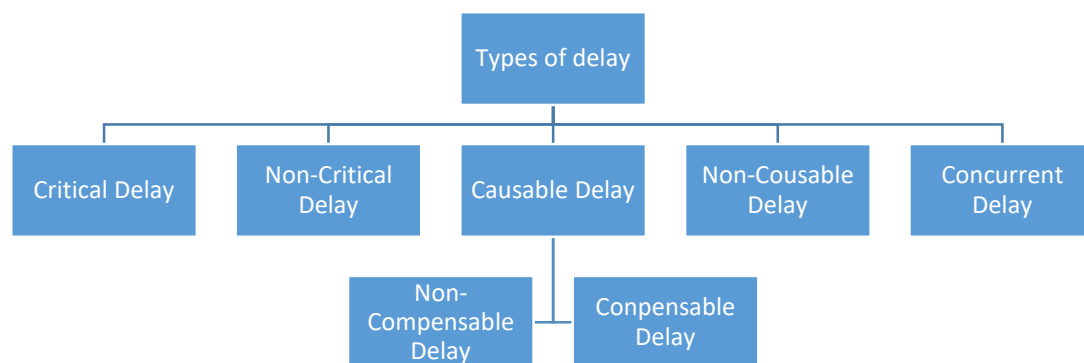


Figure 2.1: Types of Delay in Construction Project: Source:(Tawfek & Bera, 2018)

2.2.1. Critical Delay: It is the type of delay that affects the project completion time or date. This type of delay occurs on a critical activity (the critical path) in CPM scheduling.

2.2.2. Non-Critical Delay: It is the type of delay that does not affect the project's completion date because it occurs in a non-critical activity in CPM scheduling, but it affects the progress of the activities.

2.2.3. Excusable Delay: It is the type of delay that occurs due to an unexpected event which can be controlled by either the contractor or the subcontractor. The following events are responsible for excusable delay (Flood, Fire, Acts of God, General labour strikes, usually severe weather, etc.) Under this type of delay, there are two subtypes.

2.2.3.1. Compensable Delay: Compensable delays are caused by the proprietor or the proprietor's agents. The contract carefully identifies the types of delays that are compensable, so for those types, contractors are entitled to an extension of time (EOT) and additional compensation.

2.2.3.2. Non-Compensable Delay: This type of delay is caused by the other party. Neither the contractor nor the client's fault, no one is responsible for these types of delays. The contract carefully identifies the types of delay that are non-compensable, so for those types, the contractor is entitled to an extension of time only, without any compensation for delay harms.

2.2.4. Non-excusable Delay: Non-excusable delay is the occurrence of foreseeable events within the contractor's control. Examples of this type of delay include late delivery of materials by the supplier, late execution of work by subcontractors, execution of work in the wrong way by the contractor or subcontractor, shortage of labour and equipment, and labour strikes due to the contractor's intention to delay or stop wages.

2.2.5. Concurrent Delay: Concurrent delay occurs when two or more delay events occur either simultaneously or at different times, but their effects are felt simultaneously; for

instance, the Owner fails to provide access to the site, and the Contractor has no resources mobilised to implement any work.

2.3 Construction schedule delay causes

There are many causes of delays because construction projects are very complex and require integrating the concerns and priorities of various stakeholders, encompassing multiple tasks and taking a long time to reach a conclusion. The main causes of construction project delays are mentioned below:

2.3.1 Owner-Related Causes of Delay

The project owner can affect the construction project schedule. Shahsavand et al. (2018) identified numerous causes of delay in the Iranian construction industry, categorized into seven groups, with client-related causes being the most important, followed by labor and equipment, and contractor-related causes. Likewise, a research by Aziz and Abdel-Hakam (2016) indicates that the owner's economic capacity is the single most critical factor in causing project delays. The study identified other factors, including contractor, design, equipment, and material-related factors. Similarly, Al-Kharashi and Skitmore (2009) and Aziz (2013) agreed that client-related factors are the primary cause of delay. Client-related factors include payment delays, slow decision-making, scope changes, approval delays, unrealistic timelines, poor communication, contract issues, etc. In the SAFARI 2 apartments project, the client increased the project scope from 15 to 17 floors, which affected both the schedule and cost overruns.

2.3.2 Contractor-Related Causes of Delay

Several delay factors are related to the contractor, who is responsible for executing a construction project and managing its schedule. The owners and contractors cited similar causes, such as vandalism and permits from authorities (Banobi & Jung, 2019). Research

by Ogunlana et al. (1996) identifies material management problems, organizational deficiencies, planning, scheduling, and equipment allocation problems, financial difficulties, and inadequate site inspection as contractor-related causes of delays. Similarly, Amoah et al. (2024) find that the contractor-related factors are the most influential contributors to schedule delays, whereas Shahsavand et al. (2018) state that client-related causes are the most important. Key issues related to the contractor include poor site management, inadequate planning and scheduling, weak financial capacity, and low labor productivity.

Likewise, research by Sambasivan and Soon (2007) states the delay factors and their impact on project completion in the Malaysian construction industry. The results indicate that the ten from a list of 28 different causes of delay were: contractor's improper planning; contractor's poor site management; inadequate contractor experience; client's inadequate financial resources and payments for completed work; problems with subcontractors; shortage in material; labor supply; equipment availability and failure; lack of communication between parties; and mistakes during the construction stage. Similarly, a research by Durdyev and Hosseini (2020) identifies seventeen (17) causes of delay to the contractor, consisting of improper planning, bad team experience, lack of modern equipment, wrong time estimates, inconsistent cost estimates, poor site management, lack of defined monitoring/control procedure, poor labor relations, undefined construction methods, lack of funds, lack of training for the project teams, poor contract management, excessive overtime, material waste, absence of site inspection, lack of competent subcontractors or vendors and lack of team requisite skills. Thus, the Safari 2 Apartments Project faced local skilled labor constraints, which contributed to the project's schedule delay, and it is the contractor's responsibility.

2.3.3 Material & Equipment-Related Causes of Delay

Material delivery and procurement are critical issues that must be controlled to avoid delays in construction project execution. While (Amoah et al., 2024; Durdyev & Hosseini, 2020) state that client and contractor related are the most critical factors that causes project delays on the other hand, a research by Al Maktoumi et al. (2020) reveals that equipment-related factors, and material related factors have a significant impact on the completion delay in construction projects and mentioned threat equipment related factors were existing low productive equipment, unskillful equipment operator, breakdown of equipment and outdated equipment and material related factors were delay in supply of raw materials, non-availability of materials, change of materials during construction, non-availability of accessories and damaged materials.

Vaardini and Subramanian (2015) identify that the most significant and highly ranked material-related delays in the construction industry of Pakistan are the quality of materials, shortage of materials, delays in material supply, late delivery, rising material prices, and inadequate materials.

Similarly, Indhu et al. (2020) examine the essential factors related to the causes and effects of delays in construction projects, ranking material delays as a major delay issue from contractors' and independent consultants' perspectives. Likewise, material-related factors that cause delays include late ordering of materials, unavailability of specified materials in the market, material shortages, and the use of outdated equipment (Tafesse, 2021).

2.3.4 Design-Related Causes of Delay

Poor design is common and often causes schedule delays in construction projects. Research by Gashahun (2020) identifies that design-related causes of construction delay were insufficient data collection and survey before design/site investigation, mistakes &

discrepancies in the design document, inadequate design team experience, delays in producing design documents, non-use of advanced modern engineering design software, the complexity of project design, and misunderstanding of the owner's requirements. Similarly, Khatib et al. (2018) identifies the following problems related to design: design changes and modifications, errors, delays, shop drawings' slow preparation and approval, and erroneous sources of information.

2.3.5 Externally Related Causes of Delay

External factors are those that cause delays and are not within the control of the project stakeholders. Wuala and Rarasati (2020) define external delays as natural risks, including weather and geological systems, political risks, wars, civil disorder, and strained industrial relations. Additionally, Fashina et al. (2021) have identified multiple external factors, including political instabilities, project locations, and geological conditions. Alongside this, Amoah et al. (2024) state in their study that external factor-related delays are the least essential categories of concern. Thus, price escalation, inclement weather, labor disputes, worker strikes, strict regulations, permit bureaucracy, civil unrest, and acts of God are external factors that can cause project delay (Alsuliman, 2019).

Therefore, a more comprehensive study by Durdyev and Hosseini (2020) reviewed prior studies on construction project delays (CPD) published between 1985 and 2018. The findings from their study identified 149 factors that influence CPD across 97 selected articles. The ten most common CPDs identified by the authors are weather / climate conditions, poor communication, lack of coordination and conflicts between stakeholders, ineffective or improper planning, material shortages, financial problems, payment delays, equipment / plant shortage, lack of experience / qualification / competence among project stakeholders, labour shortages and poor site management.

2.4 Effects of delays in African construction

A construction project is an objective to be undertaken to create a unique facility, within the specified scope, quality, time and cost. In practice, however, most construction projects experience delays. There are various consequences of construction delays on project performance. The delay in construction projects has huge impacts on time and cost overrun. Time and cost overruns, as well as poor construction quality, are the major effects of delays (Gashahun, 2020). Time overrun, cost overrun, wastages and underutilization of manpower, reduced profits, arbitration, litigation, disputes between parties, reduced economic growth, frustration and dissatisfaction of clients, tying down of client capital due to non-completion and total abandonment of projects are found to be the major effects of delay on African construction industry (Khair et al., 2016; Nyoni, 2018). However, cost overrun is considered the most significant effect which may suspend or even terminate the project before completion. Therefore, cost overruns, time overruns, and poor work quality are the most significant effects on all participants.

2.5 Scope creep as construction projects delay driver

According to PMBOK, “scope creep is uncontrolled expansion to product or project scope without adjustments to time, cost, and resources”. Therefore, Scope creep continues to pose significant challenges for construction projects worldwide, irrespective of size, complexity, or geographical location (Wanjiku & Omwenga, 2025). For instance, empirical findings suggest that nearly two-thirds of all construction projects experience some form of scope creep, with approximately half experiencing moderate to severe deviations from planned activities (Kerzner, 2025). Thus, scope creep is among the leading causes behind project failure. Similarly, Flyvbjerg et al. (2018) state that one of the major aspects of project scope creep is time and cost overruns. Similarly, research by Famiyeh et al. (2017) shows that in construction project management, schedule overruns often lead to corresponding cost

overruns. As a result, scope creep has several consequences for overall project success, including changes in requirements, quality issues, project delays, changes or cancellations in plans, failure to meet customer expectations, poor communication, and reduced motivation (Kumari & Pillai, 2014).

The existing literature reveals the consequences of scope creep; most of these studies are conducted in environments with mature planning regulations, established change-control processes, procurement paths, and standard contract strategies. Very few studies examine scope creep in a post-conflict country construction context, such as Somalia, where contractors and clients do not follow standard procurement paths, standard contracts, construction management policies, or design and building approval procedures, leading to uncontrolled scope creep. The scope creep of the Safari 2 Apartments project illustrates this, and this report assesses its impact on schedule delays.

2.6 Labor skill constraints as construction project delay driver

The success of any construction project depends on the skill and competence of the executing workers, as the industry is labor-intensive. Currently, many problems are due to labor shortages (KMBC et al., 2022). The construction industry in Somalia is a primary economic engine for post-conflict recovery. The industry is transitioning from small-scale to high-rise buildings, and it suffers from local labor shortages, including a shortage of certified structural engineers and skilled technicians, often requiring the import of foreign staff. Hassan and Riaz (2025) find that the two most important characteristics of skilled labor are technical competence and the ability to handle tools and equipment. The shortage of these skills has caused many construction projects to experience delays, cost overruns, and reduced quality, thereby negatively impacting overall project performance (Sambasivan & Soon, 2007). Projects facing a shortage of skilled labor generally have tight

schedules to meet project targets (Karimi et al., 2018). Similarly, research by (Obodoh et al., 2024) finds that unskilled workers generally exhibit lower productivity, resulting in extended timelines and increased downtime as they frequently require corrections or wait for instructions. Likewise, the Safari 2 Apartments project faced local labor skill constraints, necessitating the import of international staff to perform critical work, such as operating cranes, which delayed the project.

Hussain et al. (2020) examined labor skills and project performance and concluded that unskilled labor can have a significant negative impact on project performance, whereas skilled labor has a significant positive impact. Therefore, no study identified in this review specifically investigates the schedule implications of transitioning between two international specialist teams in a post-conflict environment where local skilled labor is limited. This is precisely the scenario encountered in the Safari 2 Apartments Project, underscoring a specific empirical gap that the present case study seeks to address.

2.7 Research gaps

The literature reviewed in this chapter reveals the following significant gaps that justify this study and distinguish it from existing studies:

2.7.1 Absence of construction schedule delay research specific to Mogadishu and post-conflict Somalia

There is no peer-reviewed study that specifically examines the interaction between scope creep and labor constraints on schedule performance in the high-rise construction sector of Mogadishu. This creates the need for locally grounded empirical evidence of the kind this study provides.

2.7.2 Absence of delay mitigation strategies and frameworks adapted to weak institutional environments like Somalia.

In environments like Mogadishu, where institutions such as professional regulatory bodies and functioning procurement frameworks are nascent or absent, there is a pressing need for context-specific mitigation strategies to minimize schedule delays.

Therefore, the Safari 2 Apartments Project offers an opportunity to examine these gaps through a single, documented case study, making it a particularly valuable contribution to the construction management literature on developing and fragile countries like Somalia

CHAPTER 3:0 PROJECT DESCRIPTION

3.1 Project overview

The Safari 2 Apartments is a privately owned project and a high-rise, modern building development located in the Hodan District of Mogadishu, Somalia. The project was initiated to serve the growing demand for modern, secure housing driven by Somali diaspora investment and ongoing urban development in the capital. The project consists of two basement levels, a ground floor, multiple upper residential floors, and a roof level. The project site area is 2475 m², including landscaped and external circulation areas. The original approved design was 2 basement levels, a ground floor and 15 upper floors.

The building is constructed using a reinforced concrete frame structural system consisting of reinforced concrete foundations, columns, beams, slabs, shear walls, and staircases, see appendix I and II. The development incorporates residential apartment units, lift systems, mechanical and electrical services, plumbing systems, external works, and architectural finishing works. The project was designed and executed to provide modern residential facilities that meet contemporary urban housing standards.

The original planned project timeline was a 36-month construction period from January 2022 to December 2024, see Appendix III, with an initial cost estimate of USD 9.5 million, later increasing to USD 11 million. After construction started, and we completed the reinforced concrete works on the 14th floor, the client decided to expand the building from 15 to 17 floors, as all the apartment units had been sold and new ones were needed. This scope expansion was approved without a formal revision to the project schedule or a corresponding adjustment to the contract value at the time of instruction. the project scope expanded from 15 to 17 floors, and the project also experienced a major skilled labour disruption, including a five-month work stoppage during the transition from Turkish to Indian technical teams. As of March 2026, only exterior painting remains, and has not been

formally handed over to the client. The project is executed by Mogadishu Stars Construction Company, see Table 3.1 project details.

3.2 Project details

Table 3.1: Project details

Project Name	Safari 2 Apartments
Client	Nur Ali
Funding institution	IBS Bank
Contractor	Mogadishu stars
Supervising Engineer	Eng. Adan Abdirizak
Commencement Date	January 2022
Project duration	36 Months
Expected completion date	December 2024
Actual completion date	March 2026 exterior painting only remaining
Initial project cost	9 million USD
Amended project cost	11 million USD
Project Location	KM5, Hodan, Mogadishu, Somalia
Original floors	2 basements, Ground floor and 15 upper floors
Revised floors	2 basements, Ground floor and 17 upper floors

Note. Source: Project's data

3.3 Project Scope

The scope of the Safari 2 Apartments Project comprised the complete construction of a high-rise residential apartment building together with all associated structural,

architectural, mechanical, electrical, plumbing, and external works required for occupancy.

The project scope included the following major work packages:

1. Site preparation and mobilization works, including site clearance and preparation, site establishment and temporary facilities, surveying and setting out works, and mobilization of construction equipment and personnel
2. Substructure works, including excavation and earthworks, foundation preparation, reinforced concrete raft foundation construction, basement retaining walls, foundation columns, lift shaft walls, and ground floor slab construction.
3. Superstructure works, including reinforced concrete columns, reinforced concrete beams, reinforced concrete floor slabs, staircase construction, lift shaft construction, and structural works from the ground floor to roof level.
4. Mechanical, electrical and plumbing works, including water supply installations, drainage and sewer systems, electrical conduit installations, power distribution systems, lighting systems, mechanical service installations, and lift installations from the basement floor to roof level.
5. Architectural and finishing works, including internal plastering, external plastering, floor finishes, ceiling finishes, painting works, doors and windows installation and external façade finishing from the basement to the roof floor.
6. External works including landscaping works, external paving works, drainage works and site access and circulation facilities.

3.4 Project Lifecycle

The delivery of the SAFARI 2 Apartments Project followed a conventional construction lifecycle consisting of the following phases:

- A. **Project Inception:** This comprised creating project briefs, calling and attending meetings, offering guidance on procurement policy, rights, limitations, and permissions, defining the work scope.
- B. **Conceptualization and Viability:** During this planning phase, a strategic roadmap was developed to guide the project to completion. The team created concept designs based on available site data and coordinated design interfaces among various consultants. Preliminary cost estimates were generated using historical data from similar projects, and site development plans were submitted for approval
- C. **Design Development:** The outcomes of the concept/schematic design phase are gathered and advanced through design development. This stage finalized structural, architectural, and MEP (Mechanical, Electrical, and Plumbing) drawings, specifying materials and finishes to provide a complete framework for construction. Dimensioned floor plans, structural drawings, MEP drawings, exterior elevations with a suggested basis of design openings and finishes, more building sections, and any other elements to form a framework for design products were among the deliverables at this stage. In order to direct construction activity, it also included creating comprehensive cost estimates, commonly referred to as specifications and bills of quantities.
- D. **Construction Stage:** This phase involved physical execution of all construction activities. Construction activities included substructure works, superstructure works, MEP installations, finishing works, and external works. Progress was monitored against the baseline schedule through regular site inspections and progress reviews.
- E. **Close out:** Site handover, inspection, and defect correction were all planned to be included; however, as of March 2026, only exterior painting remains, and thereafter, the completed project will be handed over to the client.

3.5 Procurement Approach

The construction industry employs a variety of procurement procedures, and selecting an appropriate one depends on factors such as the nature of the project, the scope of work, the resources available, and the client's prior experience. Each procurement process type has unique characteristics, and the customer, who should bear primary responsibility for the project's success, should choose the appropriate one.

Procurement techniques that are frequently used include Design and Build, Management Contracting, and Traditional Procurement.

In the SAFARI 2 Apartments Project, the traditional approach was utilized, wherein the client requested design data from the design team, and the contractor was accountable for the materials, labor, and subcontractors, while the client was still in charge of the design and performance of his consultants. This arrangement established a clear separation between design and construction responsibilities. See Figure 3.2.

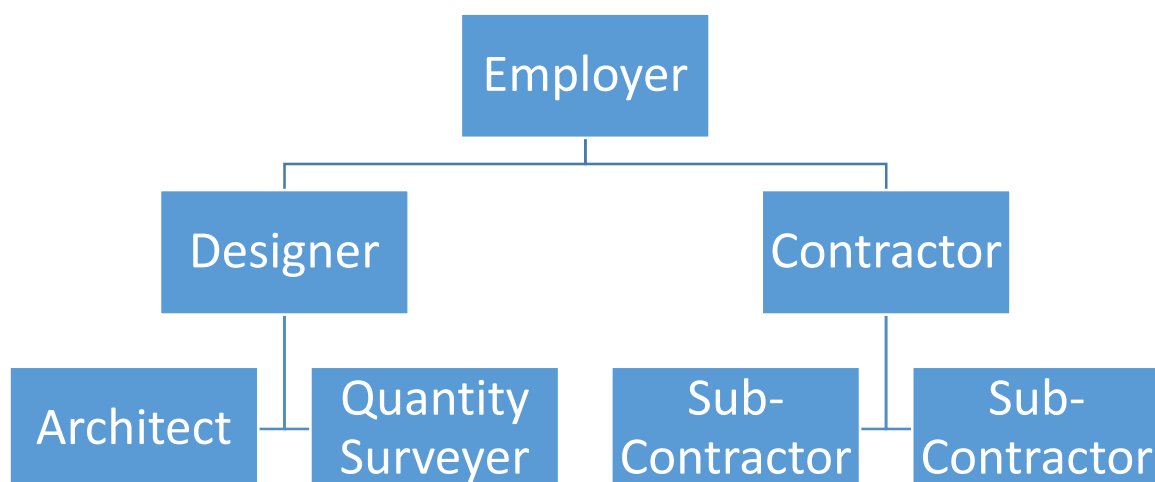


Figure 3.2: Traditional Procurement Approach. Source: (Masterman, 2013)

3.6 key project events and timelines

The project experienced two major disruptions. First, the project experienced skilled labor disruption when the Turkish technical team, engaged to execute critical structural and mechanical works, left the project following a contractual breakdown between the contractor and the Turkish subcontractor. This exit was sudden and unplanned, and because no local workforce possessed the equivalent technical competencies, particularly for crane operation, critical structural and mechanical works and high-rise concrete works, the project came to a complete standstill. The work stoppage lasted five months, during which no construction progress was recorded on critical path activities, until a new Indian technical team was brought in.

Second, during the construction phase, the client decided to expand the building from 15 to 17 floors after all the apartment units were sold out and new units were needed. This scope expansion was approved without a formal revision to the project schedule or a corresponding adjustment to the contract value at the time of instruction. The expansion required procurement of additional materials, additional time and additional cost, none of which were accounted for in the original baseline plan. The revised contract cost following the scope expansion increased to USD 11 million, representing a cost escalation of approximately 15.8% above the original estimate.

As of March 2026, only exterior paint remains and has not been formally handed over to the client, representing a delay of approximately (15) months beyond the original planned completion date.

3.7 Author's involvement in the project

I served as the Project Coordinator on the SAFARI 2 Apartments Project from the commencement of construction in January 2022 up to the end of the originally planned construction period in December 2024, see Appendix III. In this role, I acted as the main coordination link between the client representatives, the contractor's site team, the international technical staff, and the office-based management team to ensure that information flowed clearly and site activities were properly aligned with project objectives.

My responsibilities included monitoring site progress against the baseline programme, tracking schedule performance, maintaining progress records, and preparing regular project updates for management review. I also coordinated communication on site issues, followed up implementation of instructions from management, and helped ensure that delays, changes, and site constraints were properly documented for decision-making.

During the project, I was actively involved in reviewing the effects of scope changes, workforce transitions, and other factors affecting progress. I participated in site visits, observed construction progress, and maintained direct contact with the project team, especially during university holiday periods when I returned to Mogadishu. This position gave me practical access to project records and site information, which supported my assessment of schedule delays and made me well placed to analyze how scope creep and skilled labour constraints affected project completion.

CHAPTER 4.0 RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the findings and discussion of this case study report on the SAFARI 2 Apartments project in the Hodan district of Mogadishu, Somalia. The project experienced schedule delays and remains incomplete beyond its original deadline. The findings presented in this chapter are derived from the project baseline plan, revised project schedule plan, site observation, project documents, and construction management techniques.

4.2 Analysis of project scheduling: baseline vs revised schedule vs actual status

Standard construction performance metrics, including schedule variance analysis and overrun percentages, are utilized to quantify deviations.

4.2.1 Quantified Schedule Deviation

Table 4.2: Baseline vs Revised Plan Vs Actual Status

Activity	Baseline Plan finish	Revised Plan/Actual finish	Actual status	Delay (Months)
Sub-structure (Excavation – Ground Slab)	06 May 2022	06 May 2022	Completed on time	0
Floors 1–5	17 Mar 2023	17 Mar 2023	Completed on time	0
WORKFORCE TRANSITION STOPPAGE	N/A	Aug 2023 restart	5 months gap recorded	5 months
Floors 6–15	05 Dec 2024	07 May 2025	Completed	5 months
16th and 17 th Floor (Scope Creep)	N/A	20 October 2025	Completed	5.5 months
Other delay causes (Security & labour productivity)	N/A	Critical activities Completed Nov 2025	Ongoing delay	4 months
Practical Completion date	31 Dec 2024	15 Nov 2025	Not achieved by March 2026	14.5 months delay

Table 4.2 shows how each specific event contributed to the 14.5-month delay in the project. The project began with high efficiency and recorded 0 months of delay. However, the project experienced a work stoppage due to an international staff transition, resulting in a 5-month gap in critical structural activities. And then, after the 14th floor concrete work was completed and all the planned units were sold out, the client decided to add 2 additional floors, requiring an additional 5.5 months of work on the critical path, see appendix IV. Similarly, ongoing external factors, including Mogadishu's volatile security environment, low productivity of local Somali labor, and material import processes, added four (4) months of delay.

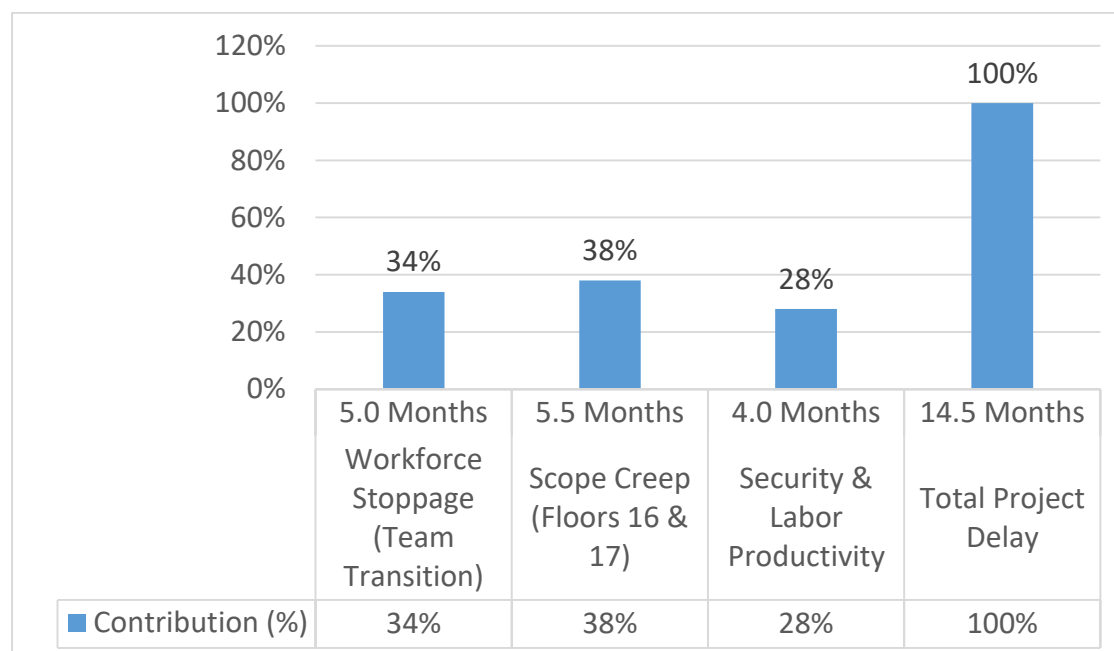


Figure 4.3: Project delay sources and their contribution

Figure 4.3 demonstrates that scope creep (additional floors 16 and 17) was the largest delay driver, at 38%, followed by workforce transition stoppage, at 34%. These two issues account for 72 per cent of the total project time overrun.

4.2.2 Schedule overrun time-based analysis

Schedule overrun is calculated by comparing actual project progress against the planned project schedule using either time-based differences or earned value management (EVM)

metrics. In this case study project, time-based calculations are used to determine the project schedule overrun.

Time overrun (month) = actual finish date-planned finish date equation 1, $50.5-36=14.5$ months behind schedule.

Percentage overrun = $\frac{\text{actual duration}-\text{planned duration}}{\text{planned duration}} \times 100$ equation 2, $\frac{50.5-36}{36} \times 100 = 40\%$

overrun. This is caused by international workforce transition, project scope creep and external environmental factors, including security challenges and local labour skill constraints.

4.2.3 Critical Path Analysis (as planned vs as built)

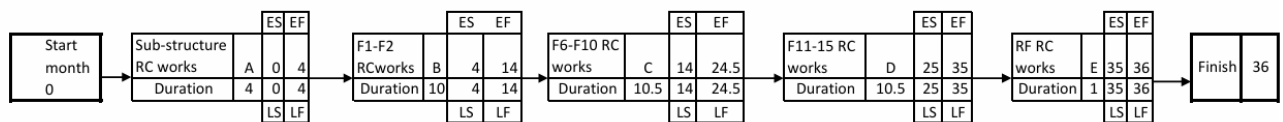


Figure 4.4: Baseline plan critical path

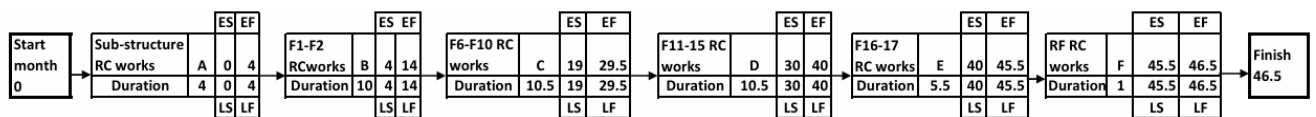


Figure 4.5: Revised Plan critical path

The comparison between the two CPM network diagrams reveals that the project's critical path was extended by 10.5 months (from 36 to 46.5 months) solely within the structural phase, with further delays accumulating in the finishing stages.

As shown in Figure 4.4, the original path moved seamlessly from the floor substructure works to the roof Floor. On the other hand, as shown in Figure 4.5, the RC works for Floors 1–5 (Node B) were completed at Month 14. However, the subsequent critical activity (F6–F10 RC works, Node C) did not commence until Month 19. This 5-month gap represents a total work stoppage caused by the technical team transition. Additionally, the structural

critical path was physically extended by adding Node E (RC works for Floors 16 and 17). The baseline critical path (Figure 4.4) concluded with the Roof RC works (Node E) at Month 36. However, the revised plan includes the addition of Floors 16 and 17, adding 5.5 months. This converted a 36-month duration into a 46.5-month duration. While the critical path activities (Reinforced Concrete works) are 100% completed as of Month 46.5, the project remains incomplete. This indicates that the Primary Critical Path (RC works) has been completed, but a Secondary Critical Path (some finishing works) has emerged. Because of low labour productivity and security-related stand-downs, it will require several additional months beyond the 46.5-month structural milestone.

4.3 Delay responsibility and Delay classification

Delays in construction are mainly categorized into three:

1. Excusable compensable (EC) client caused: contractor entitled to time + cost.
2. Non-excusable no-compensable (NN) contractor caused: no extension, no compensation.
3. Excusable non-compensable (EN) force majeure / external factors: time extension only.

Delay Factor	Delay Type	Responsible Party	Duration	Impact
International staff transition	Non-excusable no-compensable (NN)	Contractor	5 Months	Critical
Scope Creep	Excusable compensable (EC)	Client	5.5 Months	Critical
External Factors (security and low local labor productivity)	Excusable non-compensable (EN)	Neutral	4 Months	Moderate

Table 4.3: Delay Responsibility attribution and classification

Table 4.3 above shows the responsible party for each delay during this project. The work stoppage caused by the international staff transition arose from the contractor's failure to manage its sub-contractors; it is a non-excusable, non-compensable delay, and the contractor bears the full five-month delay with no entitlement to a time extension or cost recovery from the client.

The client's instruction to add floors 16 and 17 is excusable and compensable; the client caused the delay, and the contractor is entitled to both time and the additional costs incurred. External factors (security and local labor productivity). Composite of external security (Excusable) and local labor productivity issues (Non-excusable). In such cases, the contractor typically receives a time extension for the security portion but remains responsible for the productivity deficit.

4.4 SAFARI 2 Apartments Project Site Observation Results

4.4.1 International workforce transition and labor availability

Site observations confirmed that the main contractor had hired Turkish staff to execute critical structural and mechanical works. This team demonstrated a high level of productivity during substructure through the 5th floor, consistent with the on-schedule performance recorded in the baseline plan.

In early 2023, a contractual disagreement between the contractor and the Turkish subcontractor led to the Turkish subcontractor and Turkish staff exiting the project. This exit was sudden and unplanned, and because no local workforce possessed the equivalent technical competencies, particularly for crane operation, critical structural and mechanical works and high-rise concrete works, the project came to a complete standstill. This work stoppage is directly evident in the revised schedule data, which shows a 5-month gap between the completion of the 5th floor (March 2023) and the commencement of the 6th

floor (August 2023). During this period, the site remained largely inactive, with only minimal finishing and security activities continuing. After that, the contractor engaged Indian staff to replace the Turkish staff, and after five months, the Indian staff resumed work.

4.4.2 Scope Creep: Addition of two floors

After completing the reinforced concrete works on the 14th floor, the client decided to expand the building from 15 to 17 floors, as all the apartment units had been sold and new ones were needed. This scope expansion was approved without a formal revision to the project schedule or a corresponding adjustment to the contract value at the time of instruction. The expansion required procurement of additional materials, additional time and additional cost, none of which were accounted for in the original baseline plan. No formal change order was observed to have been issued that explicitly revised the project completion date or allocated additional contingency time at the point of scope approval. The two additional floors required an additional 5.5 months of work on the critical path activities.

4.4.3 External Factors (Mogadishu's security challenges and Somali labor skill constraints)

Mogadishu faces security challenges, including targeted assassinations, bombings of hotels and government facilities, and explosions that are targeted in public places. Site observations recorded multiple instances during the construction period in which security incidents, including explosions, occurred around the site, prompting site personnel to evacuate or suspend work for periods. While the cumulative delay directly attributable to specific security incidents is difficult to isolate with precision from the available project records, these events contributed to the reduced productivity. Site observations confirm a significant deficit in locally available skilled construction labor in Mogadishu. And this

necessitates hiring an international staff to execute critical structural works. Site observations noted increased rework and quality control failures on certain activities performed by Somali labor, adding unplanned time to individual tasks and contributing to delays during the construction phase. The skill gap is contextualized by Somalia's post-conflict reconstruction context, in which decades of civil conflict severely disrupted formal technical and vocational education and training systems. The absence of an established local construction industry workforce has led projects of this scale to rely almost entirely on foreign technical labor for specialist roles, creating chronic vulnerability in the workforce supply.

4.5 key findings of research objectives

The following are how the findings of this study answer each research objective and question:

4.5.1 How did the scope expansion from 15 to 17 floors affect project timelines?

The scope expansion from 15 to 17 floors is directly quantifiable as a 5.5-month schedule delay, as derived from the revised construction work plan. This represents 38% of the total project delay. This finding is based on the direct comparison between the Baseline Construction Work and the Revised Construction Work Plan. The expansion was approved without a formal change order. In the case of Safari 2 Apartments, the absence of a formally revised plan at the time of the scope change instruction led to construction on Floors 16 and 17 proceeding without an agreed-upon revised completion date, a state of affairs that persisted until the Revised Work Plan was prepared. This finding aligns strongly with the literature on owner-related causes. Osman and Mohamud (2022) identified changes in the scope of work as a leading delay driver in Somalia's construction sector, a finding directly supported by this study's results. The informal manner in which the scope expansion was instructed without a formal change order is consistent with what Assaf and Al-Hejji (2006)

described as an inadequate change management procedure, which they identified as one of the most common delay factors in construction projects.

4.5.2 How did the local skilled labor constraints and the Turkish and Indian teams' transition affect the project's schedule delay?

The international workforce transition from the Turkish team to the Indian team resulted in a 5-month delay. This represents 34% of the total project delay. The stoppage affected all subsequent floors without scheduled recovery, confirming that no acceleration measures were implemented after recommencement. The absence of a locally available skilled workforce meant that when the Turkish team departed, there was no local labor to fill the gap, necessitating a lengthy international recruitment and mobilization process. Additionally, ongoing external factors, including Mogadishu's volatile security environment, low productivity of local Somali labor, and material import processes, added four (4) months of delay. This represents 28% of the total project delay. This findings of labor constraints in this study aligns with the broader literature on construction delays in Africa. Durdyev and Hosseini (2020) identified 17 causes of delays related to the contractor, including subcontractor management failures and workforce shortages. The SAFARI 2 project workforce transition precisely aligns with this; the Turkish team's departure was the contractor's failure to manage its subcontractors, which is contractor-attributable delay risk under no excusable non-compensable delay (Tawfek & Bera, 2018).

The findings of this case study, therefore, have implications beyond the individual project; they point to a sector-level gap in local technical capacity that warrants strategic attention.

4.5.3 What strategies and recommendations should be implemented to mitigate the schedule delays of high-rise projects like SAFARI 2 Apartments in Mogadishu?

The causes of the schedule delay for the SAFARI 2 Apartments project, according to the findings, are scope creep, labor shortages, and security challenges. The following mitigation strategies and recommendations are proposed that can be applied in high-rise construction projects like SAFARI 2 Apartments:

4.5.3.1 Assigning an experienced and competent project management team

For a project like SAFARI 2 Apartments, an experienced and competent project management team is fundamental to success. My direct observation of the site operations has made clear that the SAFARI 2 project management team lacked the necessary skills and knowledge to effectively lead a project of this scale. For instance, ineffective communication with the international staff, lack of proactive management, most of the management interventions were only initiated when errors or delays had already occurred, and informal meetings were frequently held without a structured agenda, no formal records, or action items were documented. Therefore, it is essential to have a management team who possess the required competent and knowledge to manage projects through documented and proactive planning.

4.5.3.2 Workforce training and development

The SAFARI 2 APARTMENTS project highlighted the risks of relying entirely on foreign technical expertise. When the Turkish technical team left due to a contractual dispute, the project stopped for five months because no qualified local workforce was available to continue critical activities. The project resumed only after a new international team was mobilized. This demonstrates the need to develop local technical capacity to reduce dependence on foreign experts, improve productivity, minimize rework, and prevent project delays.

4.5.3.3 Effective project planning and scheduling

The SAFARI 2 APARTMENTS project revealed significant planning weaknesses, including failure to account for Mogadishu's security challenges, shortage of skilled local labor, and dependence on foreign technical teams. The project schedule remained static and lacked proactive monitoring and contingency measures. When the Turkish technical team departed, the project stopped because no alternative plan was in place. High-rise projects like SAFARI 2 Apartments should adopt risk-adjusted schedules, dynamic milestones, contingency planning, and digital project management tools that integrate CPM schedules with daily site reporting to enable real-time monitoring and timely corrective action.

4.5.3.4 Proactive Risk Management

The SAFARI 2 APARTMENTS project demonstrated the consequences of weak risk management. Risks were addressed only after they became problems, due to the absence of a formal risk register, inadequate consideration of local uncertainties, and a lack of regular risk review meetings. Failure to integrate risk management into project monitoring contributed to schedule overruns. For a project like SAFARI 2 APARTMENTS, should adopt a proactive risk management framework with continuous risk assessment, regular reviews, and mitigation planning throughout the project lifecycle.

4.5.3.5 Technological integration

For the SAFARI 2 APARTMENTS, the project must adopt modern construction technologies as a core management tool. For example, BIM implementation enables the creation of detailed 3D models of buildings, facilitating planning and coordination among stakeholders, and cloud-based collaboration, transitioning to a shared digital platform, ensures that all international and local staff have access to the latest, approved design documentation in real-time, eliminating the risk of working from obsolete prints.

4.5.3.6 Stakeholder communication and collaboration

The SAFARI 2 APARTMENTS project has suffered significantly from fragmented and verbal communication. When communication is relegated to verbal, undocumented agreements, it inevitably leads to uncontrolled scope creep and misalignment among stakeholders. A primary example of this failure was the instruction to add two additional floors to the building. This directive was issued and implemented without any prior formal schedule assessment or impact analysis, and this has created several issues, including undocumented scope changes, the absence of formal reporting, and a lack of a structured communication plan.

Establishing effective stakeholder communication and collaboration ensures that all stakeholders are fully aligned, thereby eliminating the informal scope creep that has affected the delivery of the SAFARI 2 APARTMENTS.

4.5.3.7 Engaging a Consulting Engineering Firm:

The SAFARI 2 APARTMENTS project design was initially sourced from a professional design team based in Kenya; the engagement effectively ended at the point of purchase. Because the client simply bought the designs after providing site information, there was no transition to a supervision phase. This left the project without an on-site, independent consulting engineer to interpret the designs, ensure quality control, or monitor progress during construction. And this caused a lack of independent supervision. To achieve the desired success of a project like SAFARI 2 APARTMENTS, it is necessary that the client appoints on site consulting engineering firm to provide full-time supervision, Act as the Owner's Representative.

CHAPTER 5.0 LESSONS LEARNED, CONCLUSION AND RECOMMENDATION

5.1 Lessons Learned

The Safari 2 Apartments Project provides several important lessons for construction management practice in Somalia, particularly for high-rise developments in Mogadishu. From this study, in relation to the author's participation in the project, the lessons learned include:

5.1.1 Effective scope control is essential: The expansion from 15 floors to 17 floors without formal change control significantly increased the workload, extended the critical path, and resulted in project delay, and this was a violation of the fundamental construction management principle of integrated change control. The construction project management practices emphasise that any change must undergo a rigorous impact analysis to determine its effect on the Triple Constraint (Time, Cost, and Scope). The lack of a formal change request process meant that the project team had no empirical basis to reject the change, leading to inevitable delays. Effective scope control requires that every change be documented, assessed for its impact on the critical path, and formally approved by all stakeholders before implementation.

5.1.2 Local labour development is necessary for long-term project resilience: The SAFARI 2 project's five-month stoppage following the departure of the Turkish technical team illustrates the risks of relying heavily on foreign expertise rather than building local capacity. When the foreign team exited due to contractual disputes, the project stopped because the local workforce lacked the technical skills required to continue critical reinforced concrete works. According to human resource management theories, project success depends on effective capacity building. A sustainable project should prioritize workforce upskilling as a risk mitigation

strategy. Long term project resilience requires institutionalizing technical knowledge within the local workforce. Training local labor is not only a social benefit but also a critical operational safeguard against the uncertainties associated with international staffing arrangements.

5.1.3 Risk management must be proactive, not reactive: The SAFARI 2 project management team consistently responded to issues only after they had occurred. Security risks, labor shortages, and productivity challenges were not anticipated during planning and were instead treated as unforeseen external events. As a result, the project remained in a constant state of crisis recovery. Risk management should be an integral part of project governance, decision-making, and operational processes. According to the ISO 31000 Risk Management Framework, risks should be identified, analyzed, evaluated, treated, documented, and monitored through a Risk Register from the planning stage onward. Therefore, project managers must anticipate the "known unknowns" of the Mogadishu construction environment. By maintaining a dynamic Risk Register and conducting regular monthly risk reviews, the project team can implement mitigation measures before risks materialize into issues, thereby protecting the project schedule and budget.

The main lesson from this project is that the successful delivery of high-rise construction project like SAFARI 2 in Somalia requires disciplined scope management, stable labor planning, strong coordination, and early risk control. Without these, even a well-designed project like SAFARI 2 Apartments can experience significant overruns and remain incomplete long after the planned finish date.

5.2 Conclusion

This study assessed the impact of scope creep and local skilled labor constraints on schedule delays in the Safari 2 Apartments Project, a 17-story residential development in

Hodan District, Mogadishu, Somalia. The construction schedule delay is a global issue (Durdyev & Hosseini, 2020), yet its specific drivers and post-conflict environment, such as Mogadishu, Somalia, remain under-researched. This study fills that gap through a practice-based, single-project case study investigation grounded in project documentation, site observation, and established schedule analysis techniques.

The researcher analyzed the project baseline plan, revised project schedule plan, site observation, and project documents, using established Schedule delay analysis techniques, including As-Planned versus As-Built analysis and the Critical Path Method, and found a cumulative schedule overrun of 14.5 months, representing a 40% overrun of the original 36-month planned duration. This overrun was a product of three distinct delay causes, each attributable to a defined responsible party under the standard delay classification framework.

The workforce transition caused by the contractual breakdown between the main contractor and its Turkish subcontractor resulted in a five-month work stoppage on all critical structural activities, representing 34% of the total project delay and classified as a non-excusable, non-compensable delay for which the contractor bears full responsibility.

The client instructed scope creep to add two additional floors (16th and 17th floors), after all designed and planned fifteen-story apartment units were fully sold out, which added 5.5 months on the critical path activities and representing 38% of the total project delay, and it is the single largest delay driver, classified as an excusable compensable delay entitling the contractor to both time extension and recovery of additional costs.

A composite of external environmental factors, including Mogadishu's volatile security and low productivity of locally available construction labor, contributed to an additional four months of project delay, representing 28% of the total schedule overrun. Classified as a composite of excusable and non-compensable and non-excusable delay causes for which the contractor receives a time extension for security disruptions and remains responsible for the labor productivity.

Together, these three causes transformed a project that started in January 2022 into one that had not achieved practical completion by March 2026, almost fifteen months beyond its planned completion date of December 2024. The findings confirm that the delay was not the result of planning failure, as the project's early phases were completed without delay, but rather the compounding impact of risk events for which no contingency or formal management response was prepared.

5.3 Recommendations

Based on the findings of this study, the following recommendations are proposed to mitigate the impact of scope creep, labor constraints and external environmental factors on schedule delays in high-rise construction projects like SAFARI 2 in Mogadishu and Somalia's construction industry in general:

5.3.1 Assigning an experienced and competent project management team

For a project like SAFARI 2 Apartments, an experienced and competent project management team is fundamental to success. My direct observation of the site operations has made clear that the SAFARI 2 project management team lacked the necessary skills and knowledge to effectively lead a project of this scale. For instance, ineffective communication with the international staff, lack of proactive management, most of the

management interventions were only initiated when errors or delays had already occurred, and informal meetings were frequently held without a structured agenda, no formal records, or action items were documented. Therefore, it is essential to have a management team who possess the required competent and knowledge to manage projects through documented and proactive planning.

5.3.2 Workforce training and development

The SAFARI 2 APARTMENTS project highlighted the risks of relying entirely on foreign technical expertise. When the Turkish technical team left due to a contractual dispute, the project stopped for five months because no qualified local workforce was available to continue critical activities. The project resumed only after a new international team was mobilized. This demonstrates the need to develop local technical capacity to reduce dependence on foreign experts, improve productivity, minimize rework, and prevent project delays.

5.3.3 Effective project planning and scheduling

The SAFARI 2 APARTMENTS project revealed significant planning weaknesses, including failure to account for Mogadishu's security challenges, shortage of skilled local labor, and dependence on foreign technical teams. The project schedule remained static and lacked proactive monitoring and contingency measures. When the Turkish technical team departed, the project stopped because no alternative plan was in place. High-rise projects like SAFARI 2 Apartments should adopt risk-adjusted schedules, dynamic milestones, contingency planning, and digital project management tools that integrate CPM schedules with daily site reporting to enable real-time monitoring and timely corrective action.

5.3.4 Proactive Risk Management

The SAFARI 2 APARTMENTS project demonstrated the consequences of weak risk management. Risks were addressed only after they became problems, due to the absence

of a formal risk register, inadequate consideration of local uncertainties, and a lack of regular risk review meetings. Failure to integrate risk management into project monitoring contributed to schedule overruns. For a project like SAFARI 2 APARTMENTS, should adopt a proactive risk management framework with continuous risk assessment, regular reviews, and mitigation planning throughout the project lifecycle.

5.3.5 Technological integration

For the SAFARI 2 APARTMENTS, the project must adopt modern construction technologies as a core management tool. For example, BIM implementation enables the creation of detailed 3D models of buildings, facilitating planning and coordination among stakeholders, and cloud-based collaboration, transitioning to a shared digital platform, ensures that all international and local staff have access to the latest, approved design documentation in real-time, eliminating the risk of working from obsolete prints.

5.3.6 Stakeholder communication and collaboration

The SAFARI 2 APARTMENTS project has suffered significantly from fragmented and verbal communication. When communication is relegated to verbal, undocumented agreements, it inevitably leads to uncontrolled scope creep and misalignment among stakeholders. A primary example of this failure was the instruction to add two additional floors to the building. This directive was issued and implemented without any prior formal schedule assessment or impact analysis, and this has created several issues, including undocumented scope changes, the absence of formal reporting, and a lack of a structured communication plan.

Establishing effective stakeholder communication and collaboration ensures that all stakeholders are fully aligned, thereby eliminating the informal scope creep that has affected the delivery of the SAFARI 2 APARTMENTS.

5.3.7 Engaging a Consulting Engineering Firm:

The SAFARI 2 APARTMENTS project design was initially sourced from a professional design team based in Kenya; the engagement effectively ended at the point of purchase. Because the client simply bought the designs after providing site information, there was no transition to a supervision phase. This left the project without an on-site, independent consulting engineer to interpret the designs, ensure quality control, or monitor progress during construction. And this caused a lack of independent supervision. To achieve the desired success of a project like SAFARI 2 APARTMENTS, the client must appoint an on-site consulting engineering firm to provide full-time supervision and act as the owner's representative.

5.4 Limitations

This study, while providing evidence-based analysis of the SAFARI 2 apartment project delay, is subject to a limitation that must be acknowledged in order to present a credible conclusion. As a single project case study, the generalizability of the findings, including the proportional contribution of each delay cause, is limited to this project. The 34%, 38%, and 28% attributions to workforce transition, scope creep, and external factors, respectively, reflect the specific circumstances of the SAFARI 2 Apartments project and should not be interpreted as representative distributions for all high-rise construction projects in Mogadishu or Somalia.

REFERENCES

- Al-Kharashi, A., & Skitmore, M. (2009). Causes of delays in Saudi Arabian public sector construction projects. *Construction Management and Economics*, 27(1), 3-23.
- Al Maktoumi, I. S., Khan, F. R., & Al Maktoumi, A. R. (2020). Assessing the factors causing project completion delays in the construction sector of Oman using SEM-PLS. *Al Maktoumi, IS, Khan, FR, Al Maktoumi, AR (2020). Assessing the Factors Causing Project Completion Delays in the Construction Sector of Oman Using SEM-PLS. Humanities & Social Sciences Reviews*, 8(3), 900-912.
- Alinaitwe, H., Apolot, R., & Tindiwenzi, D. (2013). Investigation into the causes of delays and cost overruns in Uganda's public sector construction projects. *Journal of Construction in Developing Countries*, 18(2), 33.
- Alkhathami, M. M. (2004). *Examination of the correlation of critical success and delay Factors in construction projects in the kingdom of Saudi Arabia* University of Pittsburgh].
- Alsuliman, J. A. (2019). Causes of delay in Saudi public construction projects. *Alexandria Engineering Journal*, 58(2), 801-808.
- Amoah, K. B., Okere, G., & Deshpande, A. (2024). Construction delay analysis: causes, impacts, and mitigation strategies. *J Civil Eng Res*, 14(1), 1-9.
- Assaf, S. A., & Al-Hejji, S. (2006). Causes of delay in large construction projects. *International journal of project management*, 24(4), 349-357.
- Aziz, R. F. (2013). Ranking of delay factors in construction projects after Egyptian revolution. *Alexandria Engineering Journal*, 52(3), 387-406.
- Aziz, R. F., & Abdel-Hakam, A. A. (2016). Exploring delay causes of road construction projects in Egypt. *Alexandria Engineering Journal*, 55(2), 1515-1539.

- Banobi, E. T., & Jung, W. (2019). Causes and mitigation strategies of delay in power construction projects: Gaps between owners and contractors in successful and unsuccessful projects. *Sustainability*, 11(21), 5973.
- Doloi, H., Sawhney, A., & Iyer, K. (2012). Structural equation model for investigating factors affecting delay in Indian construction projects. *Construction Management and Economics*, 30(10), 869-884.
- Durdyev, S., & Hosseini, M. R. (2020). Causes of delays on construction projects: a comprehensive list. *International journal of managing projects in business*, 13(1), 20-46.
- Famiyeh, S., Amoatey, C. T., Adaku, E., & Agbenohevi, C. S. (2017). Major causes of construction time and cost overruns: A case of selected educational sector projects in Ghana. *Journal of Engineering, Design and Technology*, 15(2), 181-198.
- Fashina, A. A., Omar, M. A., Sheikh, A. A., & Fakunle, F. F. (2021). Exploring the significant factors that influence delays in construction projects in Hargeisa. *Heliyon*, 7(4).
- Flyvbjerg, B., Ansar, A., Budzier, A., Buhl, S., Cantarelli, C., Garbuio, M., Glenting, C., Holm, M. S., Lovallo, D., & Lunn, D. (2018). Five things you should know about cost overrun. *Transportation research part A: policy and practice*, 118, 174-190.
- Gashahun, A. D. (2020). Causes and effects of delay on African construction projects: A state of the art review. *Civil and Environmental Research*, 12, 41-53.
- Hassan, A., & Riaz, A. (2025). Analysis of skilled labor shortage in the construction industry of developing countries. *Building Engineering*, 3(1), 2054-2054.
- Hussain, S., Xuotong, W., & Hussain, T. (2020). Impact of skilled and unskilled labor on project performance using structural equation modeling approach. *Sage Open*, 10(1), 2158244020914590.

- Indhu, B., Yogeswari, K., & Reddy, M. P. S. (2020). Review on delay factors due to improper construction equipment management. *Journal of Real Estate, Construction & Management*, 35(4), 27-35.
- Karimi, H., Taylor, T. R., Dadi, G. B., Goodrum, P. M., & Srinivasan, C. (2018). Impact of skilled labor availability on construction project cost performance. *Journal of construction engineering and management*, 144(7), 04018057.
- Kerzner, H. (2025). *Project management: a systems approach to planning, scheduling, and controlling*. John Wiley & Sons.
- Khair, K., Farouk, H., Mohamed, Z., & Mohammad, R. (2016). Causes and effects of delay factors in road construction projects in Sudan. *International journal of applied engineering research*, 11(18), 9526-9533.
- Khatib, B. A., Poh, Y. S., & El-Shafie, A. (2018). Delay factors in reconstruction projects: A case study of Mataf Expansion Project. *Sustainability*, 10(12), 4772.
- KMBC, P., KGAS, W., & RDWW, J. (2022). An Assessment of skill and competency gaps in the construction industry: the case of mechanical, electrical, and plumbing workers.
- Kumari, N., & Pillai, A. S. (2014). A study on project scope as a requirements elicitation issue. 2014 International Conference on Computing for Sustainable Global Development (INDIACom),
- Love, P. E., Tse, R. Y., & Edwards, D. J. (2005). Time–cost relationships in Australian building construction projects. *Journal of construction engineering and management*, 131(2), 187-194.
- Motlhatlhedhi, I. G. (2019). *Investigation of project delays in construction projects in the South African rail industry*. University of Johannesburg (South Africa).

- Mukuka, M., Aigbavboa, C., & Thwala, W. (2015). Effects of construction projects schedule overruns: A case of the Gauteng Province, South Africa. *Procedia Manufacturing*, 3, 1690-1695.
- Nyoni, T. (2018). An Empirical Assessment of Causes & Effects of Delay in Residential Construction Projects in Harare, Zimbabwe. *ARSEAM International Journal of Advances in Engineering & Scientific Research*, 5(1), 34-46.
- Obodoh, D. A., Nwaiwu-Odus, O. E., Uwenuyi, A. Y., Okolie, G. J., Ibe, E., & Chukwunwike, A. O. (2024). The Impact of Unskilled Labour on the Project Performance in the Construction Industry. <https://doi.org/DOI10.56201/ijebm.v10.no7.2024.pg14.21>
- Ogunlana, S. O., Promkuntong, K., & Jearkjirm, V. (1996). Construction delays in a fast-growing economy: comparing Thailand with other economies. *International journal of project management*, 14(1), 37-45.
- Osman, L. A., & Mohamud, A. O. (2022). The impact of time delay on construction projects cost overrun: a case study on some of construction projects in Mogadishu-Somalia. *Journal of Positive School Psychology*, 6(4).
- Sambasivan, M., & Soon, Y. W. (2007). Causes and effects of delays in Malaysian construction industry. *International journal of project management*, 25(5), 517-526.
- Shahsavand, P., Marefat, A., & Parchamijalal, M. (2018). Causes of delays in construction industry and comparative delay analysis techniques with SCL protocol. *Engineering, Construction and Architectural Management*, 25(4), 497-533.
- Tafesse, S. (2021). A review on the critical factors causing delay of delivery time in construction projects. *International Journal of Engineering Technologies IJET*, 6(4), 69-81.

- Tawfek, A. M., & Bera, D. (2018). Delay in construction projects: Types, causes and effects. *Project Management Practices, Chief Editor*, 184-192.
- Vaardini, U. S., & Subramanian, K. (2015). Identification of causes and impacts of time overrun in construction projects. *International journal of applied engineering research*, 10(19), 14253-14261.
- Wanjiku, K. M., & Omwenga, J. Q. (2025). SCOPE CREEP AND PERFORMANCE OF CONSTRUCTION PROJECTS IN KIAMBU COUNTY KENYA. *Journal of Applied Social Sciences in Business and Management*, 4(1), 199-214.
- Wuala, H., & Rarasati, A. (2020). Causes of delays in construction project for developing Southeast Asia countries. IOP Conference Series: Materials Science and Engineering,
- Al-Kharashi, A., & Skitmore, M. (2009). Causes of delays in Saudi Arabian public sector construction projects. *Construction Management and Economics*, 27(1), 3-23.
- Al Maktoumi, I. S., Khan, F. R., & Al Maktoumi, A. R. (2020). Assessing the factors causing project completion delays in the construction sector of Oman using SEM-PLS. *Al Maktoumi, IS, Khan, FR, Al Maktoumi, AR (2020). Assessing the Factors Causing Project Completion Delays in the Construction Sector of Oman Using SEM-PLS. Humanities & Social Sciences Reviews*, 8(3), 900-912.
- Alinaitwe, H., Apolot, R., & Tindiweni, D. (2013). Investigation into the causes of delays and cost overruns in Uganda's public sector construction projects. *Journal of Construction in Developing Countries*, 18(2), 33.
- Alkhathami, M. M. (2004). *Examination of the correlation of critical success and delay Factors in construction projects in the kingdom of Saudi Arabia* University of Pittsburgh].

- Alsuliman, J. A. (2019). Causes of delay in Saudi public construction projects. *Alexandria Engineering Journal*, 58(2), 801-808.
- Amoah, K. B., Okere, G., & Deshpande, A. (2024). Construction delay analysis: causes, impacts, and mitigation strategies. *J Civil Eng Res*, 14(1), 1-9.
- Assaf, S. A., & Al-Hejji, S. (2006). Causes of delay in large construction projects. *International journal of project management*, 24(4), 349-357.
- Aziz, R. F. (2013). Ranking of delay factors in construction projects after Egyptian revolution. *Alexandria Engineering Journal*, 52(3), 387-406.
- Aziz, R. F., & Abdel-Hakam, A. A. (2016). Exploring delay causes of road construction projects in Egypt. *Alexandria Engineering Journal*, 55(2), 1515-1539.
- Banobi, E. T., & Jung, W. (2019). Causes and mitigation strategies of delay in power construction projects: Gaps between owners and contractors in successful and unsuccessful projects. *Sustainability*, 11(21), 5973.
- Doloi, H., Sawhney, A., & Iyer, K. (2012). Structural equation model for investigating factors affecting delay in Indian construction projects. *Construction Management and Economics*, 30(10), 869-884.
- Durdyev, S., & Hosseini, M. R. (2020). Causes of delays on construction projects: a comprehensive list. *International journal of managing projects in business*, 13(1), 20-46.
- Famiyeh, S., Amoatey, C. T., Adaku, E., & Agbenohevi, C. S. (2017). Major causes of construction time and cost overruns: A case of selected educational sector projects in Ghana. *Journal of Engineering, Design and Technology*, 15(2), 181-198.
- Fashina, A. A., Omar, M. A., Sheikh, A. A., & Fakunle, F. F. (2021). Exploring the significant factors that influence delays in construction projects in Hargeisa. *Heliyon*, 7(4).

- Flyvbjerg, B., Ansar, A., Budzier, A., Buhl, S., Cantarelli, C., Garbuio, M., Glenting, C., Holm, M. S., Lovallo, D., & Lunn, D. (2018). Five things you should know about cost overrun. *Transportation research part A: policy and practice*, 118, 174-190.
- Gashahun, A. D. (2020). Causes and effects of delay on African construction projects: A state of the art review. *Civil and Environmental Research*, 12, 41-53.
- Hassan, A., & Riaz, A. (2025). Analysis of skilled labor shortage in the construction industry of developing countries. *Building Engineering*, 3(1), 2054-2054.
- Hussain, S., Xueting, W., & Hussain, T. (2020). Impact of skilled and unskilled labor on project performance using structural equation modeling approach. *Sage Open*, 10(1), 2158244020914590.
- Indhu, B., Yogeswari, K., & Reddy, M. P. S. (2020). Review on delay factors due to improper construction equipment management. *Journal of Real Estate, Construction & Management*, 35(4), 27-35.
- Karimi, H., Taylor, T. R., Dadi, G. B., Goodrum, P. M., & Srinivasan, C. (2018). Impact of skilled labor availability on construction project cost performance. *Journal of construction engineering and management*, 144(7), 04018057.
- Kerzner, H. (2025). *Project management: a systems approach to planning, scheduling, and controlling*. John Wiley & Sons.
- Khair, K., Farouk, H., Mohamed, Z., & Mohammad, R. (2016). Causes and effects of delay factors in road construction projects in Sudan. *International journal of applied engineering research*, 11(18), 9526-9533.
- Khatib, B. A., Poh, Y. S., & El-Shafie, A. (2018). Delay factors in reconstruction projects: A case study of Mataf Expansion Project. *Sustainability*, 10(12), 4772.
- KMBC, P., KGAS, W., & RDWW, J. (2022). An Assessment of skill and competency gaps in the construction industry: the case of mechanical, electrical, and plumbing workers.

- Kumari, N., & Pillai, A. S. (2014). A study on project scope as a requirements elicitation issue. 2014 International Conference on Computing for Sustainable Global Development (INDIACom),
- Love, P. E., Tse, R. Y., & Edwards, D. J. (2005). Time–cost relationships in Australian building construction projects. *Journal of construction engineering and management*, 131(2), 187-194.
- Masterman, J. W. (2013). *An introduction to building procurement systems*. Routledge.
- Motlhatlhedhi, I. G. (2019). *Investigation of project delays in construction projects in the South African rail industry*. University of Johannesburg (South Africa).
- Mukuka, M., Aigbavboa, C., & Thwala, W. (2015). Effects of construction projects schedule overruns: A case of the Gauteng Province, South Africa. *Procedia Manufacturing*, 3, 1690-1695.
- Nyoni, T. (2018). An Empirical Assessment of Causes & Effects of Delay in Residential Construction Projects in Harare, Zimbabwe. *ARSEAM International Journal of Advances in Engineering & Scientific Research*, 5(1), 34-46.
- Obodoh, D. A., Nwaiwu-Odus, O. E., Uwenuyi, A. Y., Okolie, G. J., Ibe, E., & Chukwunwike, A. O. (2024). The Impact of Unskilled Labour on the Project Performance in the Construction Industry. <https://doi.org/DOI10.56201/ijebm.v10.no7.2024.pg14.21>
- Ogunlana, S. O., Promkuntong, K., & Jearkjirm, V. (1996). Construction delays in a fast-growing economy: comparing Thailand with other economies. *International journal of project management*, 14(1), 37-45.
- Osman, L. A., & Mohamud, A. O. (2022). The impact of time delay on construction projects cost overrun: a case study on some of construction projects in Mogadishu-Somalia. *Journal of Positive School Psychology*, 6(4).

- Sambasivan, M., & Soon, Y. W. (2007). Causes and effects of delays in Malaysian construction industry. *International journal of project management*, 25(5), 517-526.
- Shahsavand, P., Marefat, A., & Parchamijalal, M. (2018). Causes of delays in construction industry and comparative delay analysis techniques with SCL protocol. *Engineering, Construction and Architectural Management*, 25(4), 497-533.
- Tafesse, S. (2021). A review on the critical factors causing delay of delivery time in construction projects. *International Journal of Engineering Technologies IJET*, 6(4), 69-81.
- Tawfek, A. M., & Bera, D. (2018). Delay in construction projects: Types, causes and effects. *Project Management Practices, Chief Editor*, 184-192.
- Vaardini, U. S., & Subramanian, K. (2015). Identification of causes and impacts of time overrun in construction projects. *International journal of applied engineering research*, 10(19), 14253-14261.
- Wanjiku, K. M., & Omwenga, J. Q. (2025). SCOPE CREEP AND PERFORMANCE OF CONSTRUCTION PROJECTS IN KIAMBU COUNTY KENYA. *Journal of Applied Social Sciences in Business and Management*, 4(1), 199-214.
- Wuala, H., & Rarasati, A. (2020). Causes of delays in construction project for developing Southeast Asia countries. *IOP Conference Series: Materials Science and Engineering*,

APPENDICES

Appendix I: Architectural designs



Figure 6: Basement 02 Floor Plan

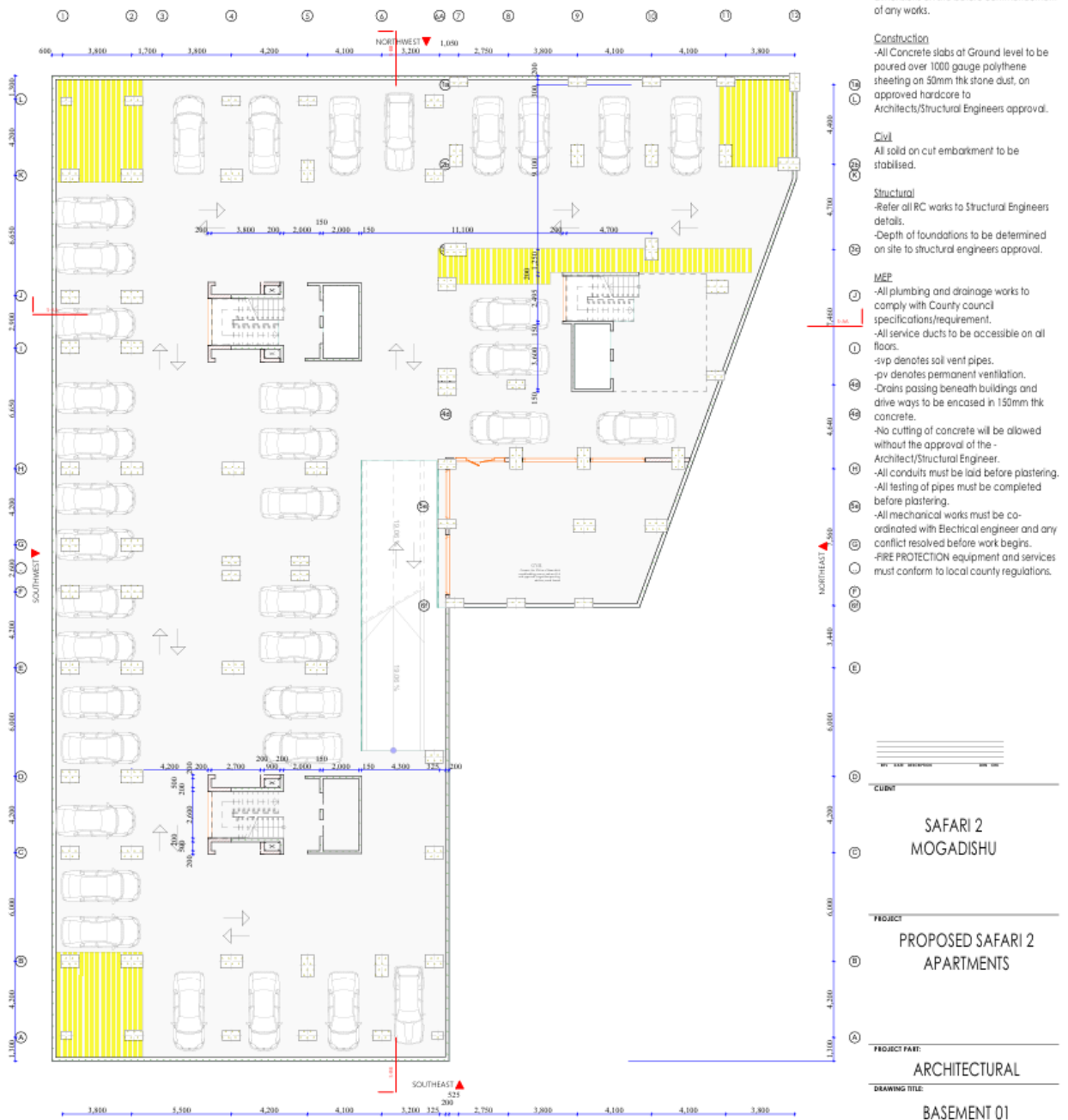


Figure 7:Basement 01 Floor Plan

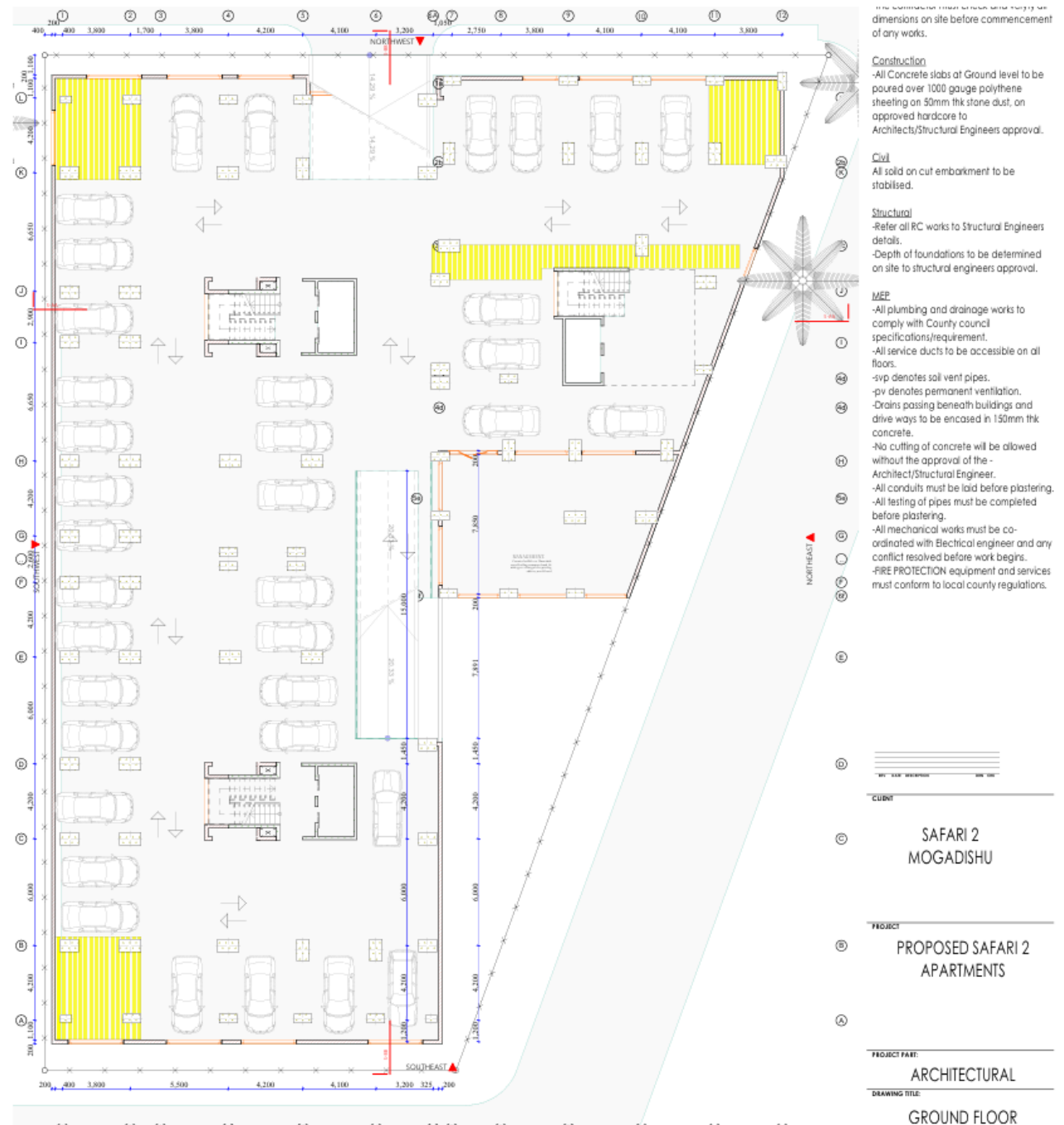


Figure 8:Ground Floor Plan

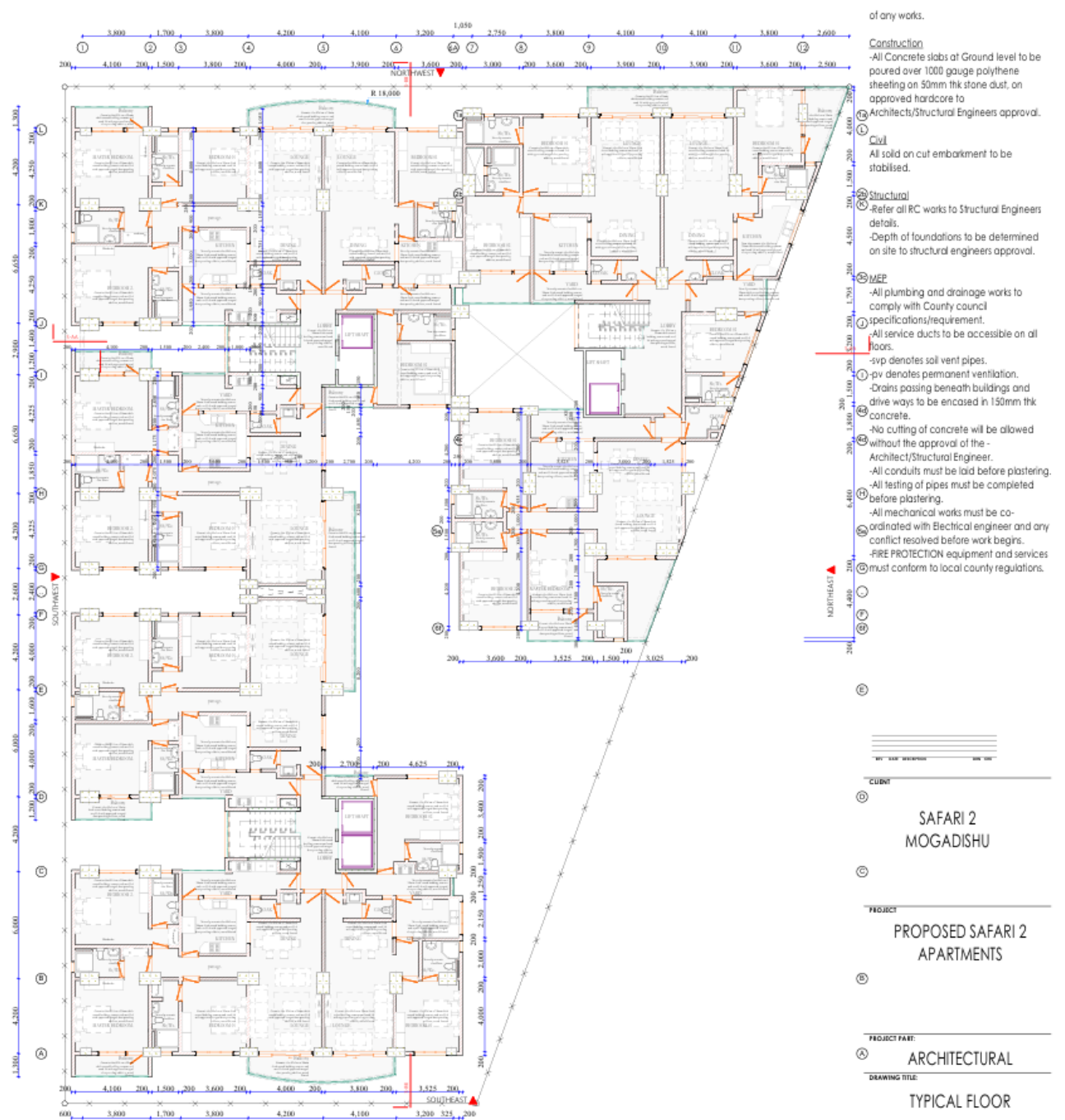


Figure 9: Typical Floor Plan

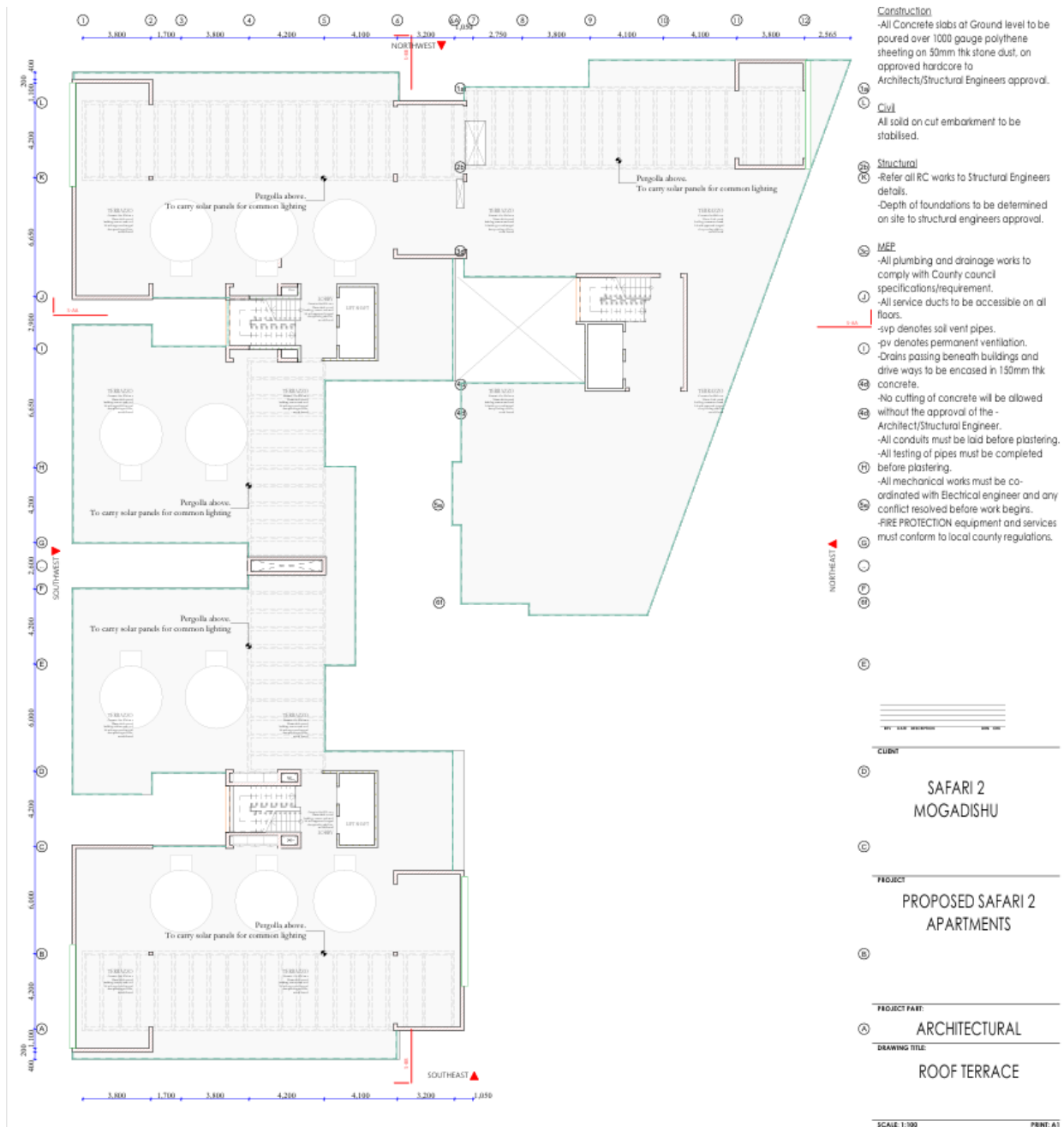


Figure 10:Roof Floor Plan

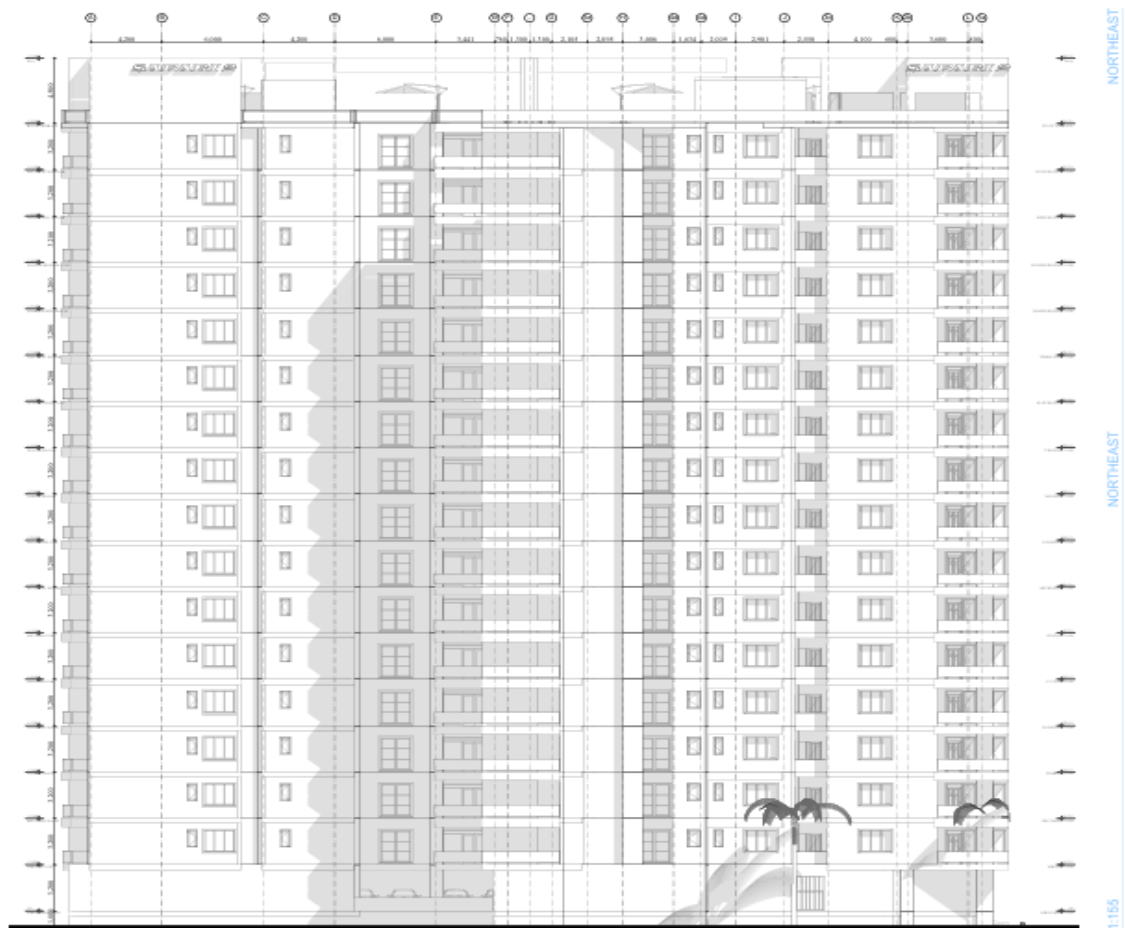


Figure 11:Elevation

Appendix II: Site progress images

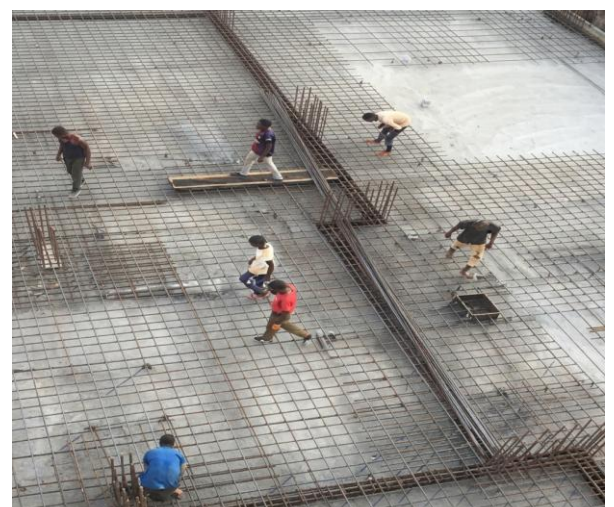


Figure 12:Showing raft foundation, columns and beams



Figure 13: Showing outside structure



Figure 14: Entire building structure



Figure 15: Showing Interior finishes



Figure 16: Showing front View

Appendix III: Safari 2 apartments baseline construction plan

	Task Name	Duration	Start	Finish
	SAFARI 2 APPARTMENTS BASELINE CONSTRUCTION PLAN	1095 days	1/1/2022	12/31/2024
🚧	A. SUB-STRUCTURE	126 days	1/1/2022	6/5/2022
🚧	EXCAVATION & EARTH WORKS	30 days	1/1/2022	30/1/2022
	Mobilization of material and equipments	3 days	1/1/2022	3/1/2022
	Site preparation	2 days	4/1/2022	5/1/2022
	Site setting out for boundary and corner establishment	7 days	6/1/2022	12/1/2022
	Bulk excavation for raft foundation	13 days	14/1/2022	26/1/2022
	Pit excavation for lift wall footing	5 days	27/1/2022	30/1/2022
🚧	CONCRETE WORKS	63 days	31/1/2022	31/3/2022
🚧	Plain concrete	2 days	31/1/2022	1/2/2022
	a) Under raft foundation & under lift wall foundation	2 days	1/2/2022	2/2/2022
🚧	Basement 2 Raft foundation C25 Reinforced concrete works	38 days	3/2/2022	12/3/2022
	a) Raft foundation perimeter formwork installation	22 days	3/2/2022	24/2/2022
	b) Dia 12mm, 16mm, 20mm deformed bar bending for raft, and foundation columns	7 days	25/2/2022	3/3/2022
	c) Raft foundation concrete casting	4 days	4/3/2022	7/3/2022
	d) Raft foundation curing and formwork deshuttering	5 days	8/3/2022	12/3/2022
🚧	Basement 1 Raft foundation C30 Reinforced concrete works	23 days	13/3/2022	3/4/2022
	a) Foundation Columns & lift wall formwork installation	14 days	13/3/2022	26/3/2022
	b) Foundation Columns & lift walls Concrete casting	6 days	27/3/2022	1/4/2022
	c) Foundation columns & lift wall formwork deshuttering	2 days	2/4/2022	3/4/2022
🚧	Ground floor beams & slab C25 and RC works	33 days	4/4/2022	6/5/2022
	a) dia 16mm, Dia 20mm, Dia 8mm deformed bar bending for ground floor	6 days	4/4/2022	9/4/2022
	b) Formwork installation for ground beams	10 days	10/4/2022	19/4/2022
	c) C25 ground beam concrete casting	2 days	20/4/2022	21/2/2022

	d) Installation of Service ducts/ plumbing pipes for ground floor	8 days	22/4/2022	29/4/2022
	f) C25 concrete casting for ground floor slab and curing	7 days	30/4/2022	6/5/2022
	B-SUPER STRUCTURAL CONCRETE AND FINISHING WORKS	969 days	7/5/2022	31/12/2024
	CONCRETE WORK: 1st floor	63 days	7/5/2022	8/7/2022
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for first floor columns, stair & lift walls deformed bar	6 days	7/5/2022	12/5/2022
	b) First floor columns, stairs & lift walls formwork installation	7 days	13/5/2022	19/5/2022
	c) First floor columns, stairs & lift walls C25 concrete casting	2 days	20/5/2022	21/5/2022
	d) First floor columns, stairs & lift walls formwork deshuttering	1 day	22/5/2022	22/5/2022
	e) first floor slab and beams formwork installation	7 days	23/5/2022	29/5/2022
	f) Dia 20mm, 16mm, 12mm, 10mm & 8mm for first floor slab and beams rebars installation	5 days	30/5/2022	3/6/2022
	g) Plumbing and electricity conduit installation	3 days	4/6/2022	6/6/2022
	h) C25 concrete casting for the first floor slab and beam	2 days	7/6/2022	8/6/2022
	First-floor Interior Finishing	20 days	9/6/2022	28/6/2022
	First floor Exterior finishing	10 days	29/6/2022	8/7/2022
	CONCRETE WORK: 2nd floor	63 days	9/7/2022	9/9/2022
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for second floor columns, stair & lift walls deformed bar	6 days	9/7/2022	14/7/2022
	b) Second floor columns, stairs & lift walls formwork installation	7 days	15/7/2022	21/7/2022
	c) Second floor columns, stairs & lift walls C25 concrete casting	2 days	22/7/2022	23/7/2022
	d) Second floor columns, stairs & lift walls formwork deshuttering	1 day	24/7/2022	24/7/2022
	e) Second floor slab and beams formwork installation	7 days	25/7/2022	31/7/2022
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for Second floor slab and beams	5 days	1/8/2022	5/8/2022
	g) Plumbing and electricity conduit installation	3 days	6/8/2022	8/8/2022
	h) C25 concrete casting for the second-floor slab and beam	2 days	9/8/2022	10/8/2022
	Second-floor Interior Finishing	20 days	11/8/2022	30/8/2022
	Second Floor Exterior finishing	10 days	31/8/2022	9/9/2022
	CONCRETE WORK: 3rd floor	63 days	10/9/2022	11/11/2022

	a) Dia 20mm, 16mm, 12mm, 10mm & 8mm for third-floor columns, stair & lift walls deformed bar	6 days	10/9/2022	15/9/2022
	b) Third floor columns, stairs & lift walls formwork installation	7 days	16/9/2022	22/9/2022
	c) Third floor columns, stairs & lift walls C25 concrete casting	2 days	23/9/2022	24/9/2022
	d) Third floor columns, stairs & lift walls formwork deshuttering	1 day	25/9/2022	25/9/2022
	e) Third-floor slab and beams formwork installation	7 days	26/9/2022	2/10/2022
	f) Dia 20mm, 16mm, 12mm, 10mm & 8mm for the third-floor slab and beams	5 days	3/10/2022	7/10/2022
	g) Plumbing and electricity conduit installation	3 days	8/10/2022	10/10/2022
	h) C25 concrete casting for the third-floor slab and beam	2 days	11/10/2022	12/10/2022
	Third Floor Interior Finishing	20 days	13/10/2022	1/11/2022
	Third Floor Exterior finishing	10 days	2/11/2022	11/11/2022
	CONCRETE WORK: 4th floor	63 days	12/11/2022	13/1/2023
	a) Dia 20mm, 16mm, 12mm, 10mm & 8mm for fourth floor columns, stair & lift walls deformed bar	6 days	12/11/2022	17/11/2022
	b) fourth floor columns, stairs & lift walls formwork installation	7 days	18/11/2022	24/11/2022
	c) fourth floor columns, stairs & lift walls C25 concrete casting	2 days	25/11/2022	26/11/2022
	d) fourth floor columns, stairs & lift walls formwork deshuttering	1 day	27/11/2022	27/11/2022
	e) fourth floor slab and beams formwork installation	7 days	28/11/2022	4/12/2022
	f) Dia 20mm, 16mm, 12mm, 10mm & 8mm for the fourth floor slab and beams	5 days	5/12/2022	9/12/2022
	g) Plumbing and electricity conduit installation	3 days	10/12/2022	12/12/2022
	h) C25 concrete casting for the fourth-floor slab and beam	2 days	13/12/2022	14/12/2022
	Fourth Floor Interior Finishing	20 days	15/12/2022	3/1/2023
	Fourth Floor Exterior finishing	10 days	4/1/2023	13/1/2023
	CONCRETE WORK: 5th floor	63 days	14/1/2023	17/3/2023
	a) Dia 20mm, 16mm, 12mm, 10mm & 8mm for the fifth floor columns, stair & lift walls deformed bar	6 days	14/1/2023	19/1/2023
	b) fifth floor columns, stairs & lift walls formwork installation	7 days	20/1/2023	26/1/2023
	c) fifth floor columns, stairs & lift walls C25 concrete casting	2 days	27/1/2023	28/1/2023
	d) fifth floor columns, stairs & lift walls formwork deshuttering	1 day	29/1/2023	29/1/2023

	e) fifth-floor slab and beams formwork installation	7 days	30/1/2023	5/2/2023
	f) Dia 20mm, 16mm, 12mm, 10mm & 8mm for the fifth floor slab and beams	5 days	6/2/2023	10/2/2023
	g) Plumbing and electricity conduit installation	3 days	11/2/2023	13/2/2023
	h) C25 concrete casting for the fifth-floor slab and beam	2 days	14/2/2023	15/2/2023
	Fifth Floor Interior Finishing	20 days	16/2/2023	7/3/2023
	Fifth Floor Exterior finishing	10 days	8/3/2023	17/3/2023
	CONCRETE WORK: 6th floor	63 days	18/3/2023	19/5/2023
	a) Dia 20mm, 16mm, 12mm, 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	18/3/2023	23/3/2023
	b) sixth floor columns, stairs & lift walls formwork installation	7 days	24/3/2023	30/3/2023
	c) sixth floor columns, stairs & lift walls C25 concrete casting	2 days	31/3/2023	1/4/2023
	d) sixth floor columns, stairs & lift walls formwork deshuttering	1 day	2/4/2023	2/4/2023
	e) sixth-floor slab and beams formwork installation	7 days	3/4/2023	9/4/2023
	f) Dia 20mm, 16mm, 12mm, 10mm & 8mm for sixth floor slab and beams	5 days	10/4/2023	14/4/2023
	g) Plumbing and electricity conduit installation	3 days	15/4/2023	17/4/2023
	h) C25 concrete casting for the sixth-floor slab and beam	2 days	18/4/2023	19/4/2023
	Sixth Floor Interior Finishing	20 days	20/4/2023	9/5/2023
	Sixth Floor Exterior finishing	10 days	10/5/2023	19/5/2023
	CONCRETE WORK: 7th floor	63 days	20/5/2023	21/7/2023
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	20/5/2023	25/5/2023
	b) seventh floor columns, stairs & lift walls formwork installation	7 days	26/5/2023	1/6/2023
	c) seventh floor columns, stairs & lift walls C30 concrete casting	2 days	2/6/2023	3/6/2023
	d) seventh floor columns, stairs & lift walls formwork deshuttering	1 day	4/6/2023	4/6/2023
	e) seventh floor slab and beams formwork installation	7 days	5/6/2023	11/6/2023
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for seventh floor slab and beams	5 days	12/6/2023	16/6/2023
	g) Plumbing and electricity conduit installation	3 days	17/6/2023	19/6/2023
	h) C25 concrete casting for seventh floor slab and beam	2 days	20/6/2023	21/6/2023
	Seventh Floor Interior Finishing	20 days	22/6/2023	11/7/2023
	Seventh Floor Exterior finishing	10 days	12/7/2023	21/7/2023

	CONCRETE WORK: 8th floor	63 days	22/7/2023	22/9/2023
	a) Dia 20mm, 16mm, 12mm, 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	22/7/2023	27/7/2023
	b) eighth floor columns, stairs & lift walls formwork installation	7 days	28/7/2023	3/8/2023
	c) eighth floor columns, stairs & lift walls C25 concrete casting	2 days	4/8/2023	5/8/2023
	d) eighth floor columns, stairs & lift walls formwork deshuttering	1 day	6/8/2023	6/8/2023
	e) eighth-floor slab and beams formwork installation	7 days	7/8/2023	13/8/2023
	f) Dia 20mm, 16mm, 12mm, 10mm & 8mm for the eight-floor slab and beams	5 days	14/7/2023	18/8/2023
	g) Plumbing and electricity conduit installation	3 days	19/8/2023	21/8/2023
	h) C25 concrete casting for an eight-floor slab and beam	2 days	22/8/2023	23/8/2023
	Eighth Floor Interior Finishing	20 days	24/8/2023	12/9/2023
	Eighth Floor Exterior finishing	10 days	13/9/2023	22/9/2023
	CONCRETE WORK: 9th floor	63 days	23/9/2023	24/11/2023
	a) Dia 20mm, 16mm, 12mm, 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	23/9/2023	28/9/2023
	b) ninth floor columns, stairs & lift walls formwork installation	7 days	29/9/2023	5/10/2023
	c) ninth floor columns, stairs & lift walls C25 concrete casting	2 days	6/10/2023	7/10/2023
	d) ninth floor columns, stairs & lift walls formwork deshuttering	1 day	8/10/2023	8/10/2023
	e) ninth floor slab and beams formwork installation	7 days	9/10/2023	15/10/2023
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for ninth floor slab and beams	5 days	16/10/2023	20/10/2023
	g) Plumbing and electricity conduit installation	3 days	21/10/2023	23/10/2023
	h) C25 concrete casting for ninth floor slab and beam	2 days	24/10/2023	25/10/2023
	Ninth Floor Interior Finishing	20 days	26/10/2023	14/11/2023
	Ninth Floor Exterior finishing	10 days	15/11/2023	24/11/2023
	CONCRETE WORK: 10th floor	63 days	25/11/2023	26/1/2024
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	25/11/2023	30/11/2023
	b) tenth floor columns, stairs & lift walls formwork installation	7 days	1/12/2023	7/12/2023
	c) tenth floor columns, stairs & lift walls C25 concrete casting	2 days	8/12/2023	9/12/2023
	d) tenth floor columns, stairs & lift walls formwork deshuttering	1 day	10/12/2023	10/12/2023

	e) tenth floor slab and beams formwork installation	7 days	11/11/2023	17/12/2023
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for tenth floor slab and beams	5 days	18/12/2023	22/12/2023
	g) Plumbing and electricity conduit installation	3 days	23/12/2023	25/12/2023
	h) C25 concrete casting for tenth floor slab and beam	2 days	26/12/2023	27/12/2023
	Tenth Floor Interior Finishing	20 days	28/12/2023	16/1/2024
	Tenth Floor Exterior finishing	10 days	17/1/2024	26/1/2024
🔧	CONCRETE WORK: 11th floor	63 days	27/1/2024	29/3/2024
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	27/1/2024	1/2/2024
	b) eleventh floor columns, stairs & lift walls formwork installation	7 days	2/2/2024	8/2/2024
	c) eleventh floor columns, stairs & lift walls C25 concrete casting	2 days	9/2/2024	10/2/2024
	d) eleventh floor columns, stairs & lift walls formwork deshuttering	1 day	11/2/2024	11/2/2024
	e) eleventh floor slab and beams formwork installation	7 days	12/2/2024	18/2/2024
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for eleventh floor slab and beams	5 days	19/2/2024	23/2/2024
	g) Plumbing and electricity conduit installation	3 days	24/2/2024	26/2/2024
	h) C25 concrete casting for eleventh floor slab and beam	2 days	27/2/2024	28/2/2024
	Eleventh Floor Interior Finishing	20 days	29/2/2024	19/3/2024
	Eleventh Floor Exterior finishing	10 days	20/3/2024	29/3/2024
🔧	CONCRETE WORK: 12th floor	63 days	30/3/2024	5/31/2024
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	30/3/2024	4/4/2024
	b) twelfth floor columns, stairs & lift walls formwork installation	7 days	5/4/2024	11/4/2024
	c) twelfth floor columns, stairs & lift walls C25concrete casting	2 days	12/4/2024	13/4/2024
	d) twelfth floor columns, stairs & lift walls formwork deshuttering	1 day	14/4/2024	14/4/2024
	e) twelfth floor slab and beams formwork installation	7 days	15/4/2024	21/4/2024
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for twelfth floor slab and beams	5 days	22/4/2024	26/4/2024
	g) Plumbing and electricity conduit installation	3 days	27/4/2024	29/4/2024
	h) C25 concrete casting for twelfth floor slab and beam	2 days	30/4/2024	1/5/2024
	Twelfth Floor Interior Finishing	20 days	2/5/2024	21/5/2024
	Twelfth Floor Exterior finishing	10 days	22/5/2024	31/5/2024

🔴	CONCRETE WORK: 13th floor	63 days	1/6/2024	2/8/2024
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	1/6/2024	6/6/2024
	b) thirteenth floor columns, stairs & lift walls formwork installation	7 days	7/6/2024	13/6/2024
	c) thirteenth floor columns, stairs & lift walls C25 concrete casting	2 days	14/6/2024	15/6/2024
	d) thirteenth floor columns, stairs & lift walls formwork deshuttering	1 day	16/6/2024	16/6/2024
	e) thirteenth floor slab and beams formwork installation	7 days	17/6/2024	23/6/2024
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for thirteenth floor slab and beams	5 days	24/6/2024	28/6/2024
	g) Plumbing and electricity conduit installation	3 days	29/6/2024	1/7/2024
	h) C25 concrete casting for thirteenth floor slab and beam	2 days	2/7/2024	3/7/2024
	Thirteenth Floor Interior Finishing	20 days	4/7/2024	23/7/2024
	Thirteenth Floor Exterior finishing	10 days	24/7/2024	2/8/2024
🔴	CONCRETE WORK: 14th floor	63 days	3/8/2024	4/10/2024
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	3/8/2024	8/8/2024
	b) fourteenth floor columns, stairs & lift walls formwork installation	7 days	9/8/2024	15/8/2024
	c) fourteenth floor columns, stairs & lift walls C25 concrete casting	2 days	16/8/2024	17/8/2024
	d) fourteenth floor columns, stairs & lift walls formwork deshuttering	1 day	18/8/2024	18/8/2024
	e) fourteenth floor slab and beams formwork installation	7 days	19/8/2024	25/8/2024
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for fourteenth floor slab and beams	5 days	26/8/2024	30/8/2024
	g) Plumbing and electricity conduit installation	3 days	31/8/2024	2/9/2024
	h) C25 concrete casting for fourteenth floor slab and beam	2 days	3/9/2024	4/9/2024
	Fourteenth Floor Interior Finishing	20 days	5/9/2024	24/9/2024
	Fourteenth Floor Exterior finishing	10 days	25/9/2024	4/10/2024
🔴	CONCRETE WORK: 15th floor	63 days	5/10/2024	5/12/2024
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	05/10/2024	10/10/2024
	b) fifteenth floor columns, stairs & lift walls formwork installation	7 days	11/10/2024	16/10/2024
	c) fifteenth floor columns, stairs & lift walls C25 concrete casting	2 days	17/10/2024	18/10/2024
	d) fifteenth floor columns, stairs & lift walls formwork deshuttering	1 day	19/10/2024	19/10/2024

	e) fifteenth floor slab and beams formwork installation	7 days	20/10/2024	26/10/2024
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for the fifteenth floor slab and beams	5 days	27/10/2024	31/10/2024
	g) Plumbing and electricity conduit installation	3 days	01/11/2024	03/11/2024
	h) C25 concrete casting for the fourteenth floor slab and beam	2 days	04/11/2024	05/11/2024
	Fifteenth Floor Interior Finishing	20 days	06/11/2024	25/11/2024
	Fifteenth Floor Exterior finishing	10 days	26/11/2024	05/12/2024
	CONCRETE WORK: roof floor	26 days	6/12/2024	31/12/2024
	a) Dia 20mm, 16mm, 12mm, 10mm & 8mm for roof floor columns, stair & lift walls deformed bar	1 days	06/12/2024	06/12/2024
	b) Roof floor columns, stairs & lift walls formwork installation	1 days	07/12/2024	07/12/2024
	c) Roof floor columns, stairs & lift walls C25 concrete casting	1 day	08/12/2024	08/12/2024
	e) stair and lift walls' slab, and beams formwork installation	1 days	09/12/2024	09/12/2024
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for stair and lift wall's slab and beams	3 days	10/12/2024	12/12/2024
	g) Plumbing and electricity conduit installation	4 days	13/12/2024	16/12/2024
	h) C25 concrete casting for the stair and lift wall's slab and beam	1 day	17/12/2024	17/12/2024
	I) Laying hollow concrete blocks for a parapet wall at the edge of a roof.	4 days	18/12/2024	21/12/2024
	J) Roof Floor Interior Finishing	7 days	22/12/2024	28/12/2024
	K) Roof Floor Exterior finishing	3 days	29/12/2024	31/12/2024

Appendix IV: Safari 2 apartments revised construction plan

	Task Name	Duration	Start	Finish
	SAFARI 2 APPARTMENTS 2 REVISED CONSTRUCTION PLAN	1415 days	01/01/2022	15/11/2025
✚	A. SUB-STRUCTURE	126 days	1/1/2022	31/3/2022
✚	EXCAVATION & EARTH WORKS	30 days	1/1/2022	30/1/2022
	Mobilization of material and equipments	3 days	1/1/2022	3/1/2022
	Site preparation	2 days	4/1/2022	5/1/2022
	Site setting out for boundary and corner establishment	7 days	6/1/2022	12/1/2022
	Bulk excavation for raft foundation	13 days	14/1/2022	26/1/2022
	Pit excavation for lift wall footing	5 days	27/1/2022	30/1/2022
✚	CONCRETE WORKS	62 days	31/1/2022	31/3/2022
✚	Plain concrete	2 days	1/2/2022	2/2/2022
	a) Under raft foundation & under lift wall foundation	2 days	1/2/2022	2/2/2022
✚	Basement 2 Raft foundation C25 Reinforced concrete works	38 days	3/2/2022	12/3/2022
	a) Raft foundation perimeter formwork installation	22 days	3/2/2022	24/2/2022
	b) Dia 12mm, 16mm, 20mm deformed bar bending for raft, and foundation columns	7 days	25/2/2022	3/3/2022
	c) Raft foundation concrete casting	4 days	4/3/2022	7/3/2022
	d)Raft foundation curing and formwork deshuttering	5 days	8/3/2022	12/3/2022
✚	Basement 1 Raft foundation C25 Reinforced concrete works	22 days	13/3/2022	3/4/2022
	a) Foundation Columns & lift wall formwork installation	14 days	13/3/2022	26/3/2022

	b) Foundation Columns & lift walls Concrete casting	6 days	27/3/2022	1/4/2022
	c) Foundation columns & lift wall formwork deshuttering	2 days	2/4/2022	3/4/2022
✚	Ground floor beams & slab C25 and C25 RC works	33 days	4/4/2022	6/5/2022
	a) dia 16mm, Dia 20mm, Dia 8mm deformed bar bending for ground floor	6 days	4/4/2022	9/4/2022
	b) Formwork installation for ground beams	10 days	10/4/2022	19/4/2022
	c) C25 ground beam concrete casting	2 days	20/4/2022	21/2/2022
	d) Installation of Service ducts/ plumbing pipes for ground floor	8 days	22/4/2022	29/4/2022
	f) C25 concrete casting for ground floor slab and curing	7 days	30/4/2022	6/5/2022
✚	B-SUPER STRUCTURAL CONCRETE	1289 days	7/5/2022	15/11/2025
✚	CONCRETE WORK: 1st floor	63 days	7/5/2022	8/7/2022
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for first floor columns, stair & lift walls deformed bar	6 days	7/5/2022	12/5/2022
	b) First floor columns, stairs & lift walls formwork installation	7 days	13/5/2022	19/5/2022
	c) First floor columns, stairs & lift walls C25 concrete casting	2 days	20/5/2022	21/5/2022
	d) First floor columns, stairs & lift walls formwork deshuttering	1 day	22/5/2022	22/5/2022
	e) first floor slab and beams formwork installation	7 days	23/5/2022	29/5/2022
	f) Dia 20mm, 16mm, 12mm, 10mm & 8mm for first floor slab and beams rebars installation	5 days	30/5/2022	3/6/2022
	g) Plumbing and electricity conduit installation	3 days	4/6/2022	6/6/2022
	h) C25 concrete casting for first floor slab and beam	2 days	7/6/2022	8/6/2022
	First Floor Interior Finishing	20 days	9/6/2022	28/6/2022

	First Floor Exterior finishing	10 days	29/6/2022	8/7/2022
	CONCRETE WORK: 2nd floor	63 days	9/7/2022	9/9/2022
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for second floor columns, stair & lift walls deformed bar	6 days	9/7/2022	14/7/2022
	b) Second floor columns, stairs & lift walls formwork installation	7 days	15/7/2022	21/7/2022
	c) Second floor columns, stairs & lift walls C25 concrete casting	2 days	22/7/2022	23/7/2022
	d) Second floor columns, stairs & lift walls formwork deshuttering	1 day	24/7/2022	24/7/2022
	e) Second floor slab and beams formwork installation	7 days	25/7/2022	31/7/2022
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for Second floor slab and beams	5 days	1/8/2022	5/8/2022
	g) Plumbing and electricity conduit installation	3 days	6/8/2022	8/8/2022
	h) C25 concrete casting for Second floor slab and beam	2 days	9/8/2022	10/8/2022
	Second Floor Interior Finishing	20 days	11/8/2022	30/8/2022
	Second Floor Exterior finishing	10 days	31/8/2022	9/9/2022
	CONCRETE WORK: 3rd floor	63 days	10/9/2022	11/11/2022
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for third floor columns, stair & lift walls deformed bar	6 days	10/9/2022	15/9/2022
	b) Third floor columns, stairs & lift walls formwork installation	7 days	16/9/2022	22/9/2022
	c) Third floor columns, stairs & lift walls C25 concrete casting	2 days	23/9/2022	24/9/2022
	d) Third floor columns, stairs & lift walls formwork deshuttering	1 day	25/9/2022	25/9/2022
	e) Third floor slab and beams formwork installation	7 days	26/9/2022	2/10/2022
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for third floor slab and beams	5 days	3/10/2022	7/10/2022

	g) Plumbing and electricity conduit installation	3 days	8/10/2022	10/10/2022
	h) C25 concrete casting for third floor slab and beam	2 days	11/10/2022	12/10/2022
	Third Floor Interior Finishing	20 days	13/10/2022	1/11/2022
	Third Floor Exterior finishing	10 days	2/11/2022	11/11/2022
	CONCRETE WORK: 4th floor	63 days	12/11/2022	13/1/2023
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for fourth floor columns, stair & lift walls deformed bar	6 days	12/11/2022	17/11/2022
	b) fourth floor columns, stairs & lift walls formwork installation	7 days	18/11/2022	24/11/2022
	c) fourth floor columns, stairs & lift walls C25 concrete casting	2 days	25/11/2022	26/11/2022
	d) fourth floor columns, stairs & lift walls formwork deshuttering	1 day	27/11/2022	27/11/2022
	e) fourth floor slab and beams formwork installation	7 days	28/11/2022	4/12/2022
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for fourth floor slab and beams	5 days	5/12/2022	9/12/2022
	g) Plumbing and electricity conduit installation	3 days	10/12/2022	12/12/2022
	h) C25 concrete casting for fourth floor slab and beam	2 days	13/12/2022	14/12/2022
	Floor Fourth Interior Finishing	20 days	15/12/2022	3/1/2023
	Floor Fourth Exterior finishing	10 days	4/1/2023	13/1/2023
	CONCRETE WORK: 5th floor	63 days	14/1/2023	17/3/2023
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for fifth floor columns, stair & lift walls deformed bar	6 days	14/1/2023	19/1/2023
	b) Fifth floor columns, stairs & lift walls formwork installation	7 days	20/1/2023	26/1/2023
	c) Fifth floor columns, stairs & lift walls C25 concrete casting	2 days	27/1/2023	28/1/2023
	d) Fifth floor columns, stairs & lift walls formwork deshuttering	1 day	29/1/2023	29/1/2023

	e) Fifth floor slab and beams formwork installation	7 days	30/1/2023	5/2/2023
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for Fifth floor slab and beams	5 days	6/2/2023	10/2/2023
	g) Plumbing and electricity conduit installation	3 days	11/2/2023	13/2/2023
	h) C25 concrete casting for Fifth floor slab and beam	2 days	14/2/2023	15/2/2023
	Floor Fifth Interior Finishing	20 days	16/2/2023	7/3/2023
	Floor Fifth Exterior finishing	10 days	8/3/2023	17/3/2023
	5 months Work stopped			
	CONCRETE WORK: 6th floor	63 days	17/08/2023	18/10/2023
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	17/08/2023	22/08/2023
	b) sixth floor columns, stairs & lift walls formwork installation	7 days	23/08/2023	29/08/2023
	c) sixth floor columns, stairs & lift walls C25 concrete casting	2 days	30/08/2023	31/08/2023
	d) sixth floor columns, stairs & lift walls formwork deshuttering	1 day	01/09/2023	01/09/2023
	e) sixth floor slab and beams formwork installation	7 days	02/09/2023	08/09/2023
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor slab and beams	5 days	09/09/2023	13/09/2023
	g) Plumbing and electricity conduit installation	3 days	14/09/2023	16/09/2023
	h) C25 concrete casting for sixth floor slab and beam	2 days	17/09/2023	18/09/2023
	Floor sixth Interior Finishing	20 days	19/09/2023	08/10/2023
	Floor sixth Exterior finishing	10 days	09/10/2023	18/10/2023
	CONCRETE WORK: 7th floor	63 days	19/10/2023	20/12/2023
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	19/10/2023	24/10/2023
	b) seventh floor columns, stairs & lift walls formwork installation	7 days	25/10/2023	31/10/2023

	c) seventh floor columns, stairs & lift walls C25 concrete casting	2 days	01/11/2023	02/11/2023
	d) seventh floor columns, stairs & lift walls formwork deshuttering	1 day	03/11/2023	03/11/2023
	e) seventh floor slab and beams formwork installation	7 days	04/11/2023	10/11/2023
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for seventh floor slab and beams	5 days	11/11/2023	15/11/2023
	g) Plumbing and electricity conduit installation	3 days	16/11/2023	18/11/2023
	h) C25 concrete casting for seventh floor slab and beam	2 days	19/11/2023	20/11/2023
	Floor Seventh Interior Finishing	20 days	21/11/2023	10/12/2023
	Floor Seventh Exterior finishing	10 days	11/12/2023	20/12/2023
🚧	CONCRETE WORK: 8th floor	63 days	21/12/2023	21/02/2024
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	21/12/2023	26/12/2023
	b) eight floor columns, stairs & lift walls formwork installation	7 days	27/11/2023	02/01/2024
	c) eight floor columns, stairs & lift walls C25 concrete casting	2 days	03/01/2024	04/01/2024
	d) eight floor columns, stairs & lift walls formwork deshuttering	1 day	05/01/2024	05/01/2024
	e) eight floor slab and beams formwork installation	7 days	06/01/2024	12/01/2024
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for eighth floor slab and beams	5 days	13/01/2024	17/01/2024
	g) Plumbing and electricity conduit installation	3 days	18/01/2024	20/01/2024
	h) C25 concrete casting for eighth floor slab and beam	2 days	21/01/2024	22/01/2024
	Floor Eighth Interior Finishing	20 days	23/01/2024	11/02/2024
	Floor Eighth Exterior finishing	10 days	12/02/2024	21/02/2024
🚧	CONCRETE WORK: 9th floor	63 days	22/02/2024	24/04/2024

	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	22/02/2024	27/02/2024
	b) ninth floor columns, stairs & lift walls formwork installation	7 days	28/02/2024	05/03/2024
	c) ninth floor columns, stairs & lift walls C25 concrete casting	2 days	06/03/2024	07/03/2024
	d) ninth floor columns, stairs & lift walls formwork deshuttering	1 day	08/03/2024	08/03/2024
	e) ninth floor slab and beams formwork installation	7 days	09/03/2024	15/03/2024
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for ninth floor slab and beams	5 days	16/03/2024	20/03/2024
	g) Plumbing and electricity conduit installation	3 days	21/03/2024	23/03/2024
	h) C25 concrete casting for ninth floor slab and beam	2 days	24/03/2024	25/03/2024
	Floor Ninth Interior Finishing	20 days	26/03/2024	14/04/2024
	Floor Ninth Exterior finishing	10 days	15/04/2024	24/04/2024
	CONCRETE WORK: 10th floor	63 days	25/04/2023	26/06/2024
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	25/04/2024	30/04/2024
	b) tenth floor columns, stairs & lift walls formwork installation	7 days	01/05/2024	07/05/2024
	c) tenth floor columns, stairs & lift walls C25 concrete casting	2 days	08/05/2024	09/05/2024
	d) tenth floor columns, stairs & lift walls formwork deshuttering	1 day	10/05/2024	10/05/2024
	e) tenth floor slab and beams formwork installation	7 days	11/05/2024	17/05/2024
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for tenth floor slab and beams	5 days	18/05/2024	22/05/2024
	g) Plumbing and electricity conduit installation	3 days	23/05/2024	25/05/2024
	h) C25 concrete casting for tenth floor slab and beam	2 days	26/05/2024	27/05/2024
	Floor Tenth Interior Finishing	20 days	28/05/2024	16/06/2024

	Floor Tenth I Exterior finishing	10 days	17/06/2024	26/06/2024
	CONCRETE WORK: 11th floor	63 days	27/06/2024	28/08/2024
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	27/06/2024	02/07/2024
	b) eleventh floor columns, stairs & lift walls formwork installation	7 days	03/07/2024	09/07/2024
	c) eleventh floor columns, stairs & lift walls C25 concrete casting	2 days	10/07/2024	11/07/2024
	d) eleventh floor columns, stairs & lift walls formwork deshuttering	1 day	12/07/2024	12/07/2024
	e) eleventh floor slab and beams formwork installation	7 days	13/07/2024	19/07/2024
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for eleventh floor slab and beams	5 days	20/07/2024	24/07/2024
	g) Plumbing and electricity conduit installation	3 days	25/07/2024	27/07/2024
	h) C25 concrete casting for eleventh floor slab and beam	2 days	28/07/2024	29/07/2024
	Floor eleventh Interior Finishing	20 days	30/07/2024	18/08/2024
	Floor eleventh Exterior finishing	10 days	19/08/2024	28/08/2024
	CONCRETE WORK: 12th floor	63 days	29/08/2024	30/10/2024
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	29/08/2024	03/09/2024
	b) twelfth floor columns, stairs & lift walls formwork installation	7 days	04/09/2024	10/09/2024
	c) twelfth floor columns, stairs & lift walls C25 concrete casting	2 days	11/09/2024	12/09/2024
	d) twelfth floor columns, stairs & lift walls formwork deshuttering	1 day	13/09/2024	13/09/2024
	e) twelfth floor slab and beams formwork installation	7 days	14/09/2024	20/09/2024
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for twelfth floor slab and beams	5 days	21/09/2024	25/09/2024
	g) Plumbing and electricity conduit installation	3 days	26/09/2024	28/09/2024

	h) C25 concrete casting for twelfth floor slab and beam	2 days	29/09/2024	30/09/2024
	Floor Twelfth Interior Finishing	20 days	01/10/2024	20/10/2024
	Floor Twelfth Exterior finishing	10 days	21/10/2024	30/10/2024
	CONCRETE WORK: 13th floor	63 days	31/10/2024	31/01/2025
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	31/10/2024	05/11/2024
	b) thirteenth floor columns, stairs & lift walls formwork installation	7 days	06/11/2024	12/11/2024
	c) thirteenth floor columns, stairs & lift walls C25 concrete casting	2 days	13/11/2024	14/11/2024
	d) thirteenth floor columns, stairs & lift walls formwork deshuttering	1 day	15/11/2024	15/11/2024
	e) thirteenth floor slab and beams formwork installation	7 days	16/11/2024	22/11/2024
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for thirteenth floor slab and beams	5 days	23/11/2024	27/11/2024
	g) Plumbing and electricity conduit installation	3 days	28/11/2024	30/11/2024
	h) C25 concrete casting for thirteenth floor slab and beam	2 days	01/12/2024	02/12/2025
	Floor thirteenth Interior Finishing	20 days	03/12/2025	22/12/2025
	Floor thirteenth Exterior finishing	10 days	23/12/2025	01/01/2025
	CONCRETE WORK: 14th floor	63 days	02/01/2025	05/03/2025
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	02/01/2025	07/01/2025
	b) fourteenth floor columns, stairs & lift walls formwork installation	7 days	08/01/2025	14/01/2025
	c) fourteenth floor columns, stairs & lift walls C25 concrete casting	2 days	15/01/2025	16/01/2025
	d) fourteenth floor columns, stairs & lift walls formwork deshuttering	1 day	17/01/2025	17/01/2025
	e) fourteenth floor slab and beams formwork installation	7 days	18/01/2025	24/01/2025

	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for fourteenth floor slab and beams	5 days	25/01/2025	29/01/2025
	g) Plumbing and electricity conduit installation	3 days	30/01/2025	01/02/2025
	h) C25 concrete casting for fourteenth floor slab and beam	2 days	02/02/2025	03/02/2025
	Floor Fourteenth Interior Finishing	20 days	04/02/2025	23/02/2025
	Floor Fourteenth Exterior finishing	10 days	24/02/2025	05/03/2025
	CONCRETE WORK: 15th floor	63 days	06/03/2025	07/05/2025
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	6 days	06/03/2025	11/03/2025
	b) fifteenth floor columns, stairs & lift walls formwork installation	7 days	12/03/2025	18/03/2025
	c) fifteenth floor columns, stairs & lift walls C25 concrete casting	2 days	19/03/2025	20/03/2025
	d) fifteenth floor columns, stairs & lift walls formwork deshuttering	1 day	21/03/2025	21/03/2025
	e) fifteenth floor slab and beams formwork installation	7 days	22/03/2025	28/03/2025
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for fifteenth floor slab and beams	5 days	29/03/2025	02/04/2025
	g) Plumbing and electricity conduit installation	3 days	03/04/2025	05/04/2025
	h) C25 concrete casting for fifteenth floor slab and beam	2 days	06/04/2025	07/04/2025
	Floor Fifteenth Interior Finishing	20 days	08/04/2025	27/04/2025
	Floor Fifteenth Exterior finishing	10 days	28/04/2025	07/05/2025
	CONCRETE WORK: 16th floor	83 days	08/05/2025	29/07/2025
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	8 days	08/05/2025	15/05/2025
	b) sixteenth floor columns, stairs & lift walls formwork installation	9 days	16/05/2025	24/05/2025
	c) sixteenth floor columns, stairs & lift walls C25 concrete casting	2 days	25/05/2025	26/05/2025

	d) sixteenth floor columns, stairs & lift walls formwork deshuttering	1 day	27/05/2025	27/05/2025
	e) sixteenth floor slab and beams formwork installation	9 days	28/05/2025	05/06/2025
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixteenth floor slab and beams	7 days	06/06/2025	12/06/2025
	g) Plumbing and electricity conduit installation	5 days	13/06/2025	17/06/2025
	h) C25 concrete casting for sixteenth floor slab and beam	2 days	18/06/2025	19/06/2025
	Floor Sixteenth Interior Finishing	27 days	20/06/2025	16/07/2025
	Floor Sixteenth Exterior finishing	13 days	17/07/2025	29/07/2025
	CONCRETE WORK: 17th floor	83 days	30/07/2025	20/10/2025
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for sixth floor columns, stair & lift walls deformed bar	8 days	30/07/2025	06/08/2025
	b) seventeenth floor columns, stairs & lift walls formwork installation	9 days	07/08/2025	15/08/2025
	c) seventeenth floor columns, stairs & lift walls C25 concrete casting	2 days	16/08/2025	17/08/2025
	d) seventeenth floor columns, stairs & lift walls formwork deshuttering	1 day	18/08/2025	18/08/2025
	e) seventeenth floor slab and beams formwork installation	9 days	19/08/2025	27/08/2025
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for seventeenth floor slab and beams	7 days	28/08/2025	03/09/2025
	g) Plumbing and electricity conduit installation	5 days	04/09/2025	08/09/2025
	h) C25 concrete casting for seventeenth floor slab and beam	2 days	09/09/2025	10/09/2025
	Floor Seventeenth Interior Finishing	27 days	11/09/2025	07/10/2025
	Floor Seventeenth Exterior finishing	13 days	08/10/2025	20/10/2025
	CONCRETE WORK: roof floor	26 days	21/10/2025	15/11/2025
	a) Dia 20mm, 16mm, 12mm 10mm & 8mm for roof floor columns, stair & lift walls deformed bar	1 days	21/10/2025	21/10/2025

	b) Roof floor columns, stairs & lift walls formwork installation	1 days	22/10/2025	22/10/2025
	c) Roof floor columns, stairs & lift walls C25 concrete casting	1 day	23/10/2025	23/10/2025
	e) stair and lift walls' slab, and beams formwork installation	1 days	24/10/2025	24/10/2025
	f) Dia 20mm, 16mm, 12mm 10mm & 8mm for stair and lift wall's slab and beams	3 days	25/10/2025	27/10/2025
	g) Plumbing and electricity conduit installation	4 days	28/10/2025	31/10/2025
	h) C25 concrete casting for the stair and lift wall's slab and beam	1 day	01/11/2025	01/11/2025
	i) Laying hollow concrete blocks for a parapet wall at the edge of a roof	4 days	02/11/2025	05/11/2025
	j) Roof Floor Interior Finishing	7 days	06/11/2025	12/11/2025
	k) Roof Floor Exterior finishing	3 days	13/11/2025	15/11/2025