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Presented and defended by:
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Theme: The Impact of Communication between Stakeholders on Schedule Management. A Case Study of 61 Residential Units, Biskra.

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DEDICATION

This dissertation work is dedicated to my beloved family especially my dear parents, who have always stood by my side with love and unwavering support. To my dear sisters Nesrine, Afaf, and Ibtissem , and my wonderful brothers Ahmed Okba, Mohamed Amine, Sami, and Saif Eddine, thank you for being my strength and inspiration.

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Abstract

This dissertation explores the impact of communication between stakeholders on the effective management of project schedules in the residential construction sector. It is based on a concrete case study involving the completion of 61 housing units, thus providing a practical perspective for analyzing the dynamics of interactions and their influence on project deadlines. Effective communication is identified as a fundamental element for aligning expectations, reducing misunderstandings, and anticipating potential delays. The main results reveal that the adoption of structured communication frameworks, regular progress meetings, and the use of collaborative digital tools significantly improve stakeholder alignment and adherence to deadlines. The study also highlights best practices for fostering transparent and continuous communication, thereby facilitating the rapid identification and resolution of problems. In conclusion, this study demonstrates that robust communication strategies are essential for the successful management of schedules in residential construction. The recommendations proposed are intended to guide project managers and all stakeholders in optimizing their communication practices, thereby strengthening their ability to successfully complete projects while maximizing client satisfaction.

Keywords: Communication, Stakeholders, Schedule Management, Residential Sector.

Résumé

Ce travail explore l'impact de la communication entre les parties prenantes dans la gestion efficace des délais de projet dans le secteur de la construction résidentielle. Elle s'appuie sur une étude de cas concrète portant sur la réalisation de 61 logements, offrant ainsi une perspective pratique pour analyser la dynamique des interactions et leur influence sur les délais du projet. La communication efficace est identifiée comme un élément fondamental pour aligner les attentes, réduire les malentendus et anticiper d'éventuels retards. Les principaux résultats révèlent que l'adoption de cadres de communication structurés, la tenue de réunions régulières de suivi, ainsi que l'utilisation d'outils numériques collaboratifs améliorent notablement l'alignement des parties prenantes et le respect des échéances. L'étude met également en évidence les meilleures pratiques pour favoriser une communication transparente et continue, facilitant ainsi l'identification et la résolution rapide des problèmes. En conclusion, cette étude démontre que des stratégies de communication robustes sont essentielles à la réussite du management des délais dans la construction résidentielle. Les recommandations proposées visent à guider les chefs de projet et l'ensemble des acteurs dans l'optimisation de leurs pratiques communicationnelles, renforçant ainsi leur capacité à mener à bien leurs projets tout en maximisant la satisfaction client.

Mots-clés : Communication, Parties prenantes, Management de délais, Secteur résidentiel.

الملخص

تستكشف هذه الدراسة تأثير التواصل بين مختلف الأطراف الفاعلة في الإدارة الفعالة للجداول الزمنية للمشاريع ضمن قطاع البناء السكني مع التركيز بشكل خاص على دراسة حالة تتعلق بإنجاز 61 مشروعا″ سكنيا″ مما يوفر منظورا″ عمليا″ لتحليل ديناميكية التفاعلات بين الأطراف وأثرها على مواعيد إنجاز المشروع. يُحدد التواصل الفعال كعنصر أساسي لتوحيد التوقعات، وتقليل سوء الفهم، والاستباق في مواجهة أي تأخيرات محتملة. تكشف النتائج الرئيسية أن اعتماد أطر تواصل منظمة، وإجراء اجتماعات متابعة دورية، بالإضافة إلى استخدام أدوات رقمية تعاونية، يحسن بشكل ملحوظ توافق أصحاب المصلحة والتزامهم بالأجال التنفيذية. كما تسلط الدراسة الضوء على أفضل الممارسات لتعزيز التواصل الشفاف والمستمر، مما يسهل الكشف عن المشاكل وحلها بسرعة.

وفي الختام، تثبت هذه الدراسة أن استراتيجيات التواصل القوية ضرورية لنجاح إدارة الجداول الزمنية في قطاع البناء السكني. وتهدف التوصيات المقترحة إلى إرشاد مدراء المشاريع وجميع المعنيين إلى تحسين ممارساتهم التواصلية، مما يعزز قدرتهم على إنجاز مشاريعهم بنجاح.

الكلمات المفتاحية: التواصل، الأطراف الفاعلة، إدارة الجداول الزمنية، القطاع السكن.

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Introductory chapter

1. General Introduction

In construction project management, effective communication among stakeholders is crucial for ensuring projects are completed on schedule. Due to the diversity of parties involved and the complexity of operations, construction projects often present challenges in coordinating activities and meeting deadlines. Stakeholders including project managers, contractors, clients, investors, designers, suppliers, workers, and regulatory agencies must collaborate closely to navigate the intricacies of project timelines, deliverables, and risks. Poor communication can lead to delays, miscoordination, and increased costs, which may affect project quality and the professional reputation of those involved.

Research highlights the significant role of stakeholder engagement in project success, directly affecting performance and the ability to meet deadlines (Magassouba et al., 2019; Stakeholders Engagement and Project Performance: A Case of Inspire, Educate, and Empower Rwanda, 2023). Early and ongoing involvement of stakeholders helps identify potential risks and uncertainties, enabling project teams to take corrective actions. Enhanced communication also contributes to reducing delays by creating a collaborative environment where issues can be addressed swiftly, which is particularly important during the implementation phase, where deadline management can be challenging (Bullock et al., 2012). Furthermore, the use of modern technologies, such as cognitive assistants and project management software, can streamline communication and improve coordination, increasing productivity and agility in construction projects (Mutis & Ramachandran, 2021).

In addition to communication, the strategies used for stakeholder involvement have a direct impact on deadline management. Targeted communication techniques are essential for addressing the unique needs of different stakeholders, allowing project managers to adjust their communication approach to improve understanding and alignment (Bourne, 2016). Clear communication channels and protocols ensure that stakeholders are informed and engaged throughout the project lifecycle, reinforcing the relationship between stakeholder engagement and time management (Conraud et al., 2014; Yang et al., 2011). In large, complex projects, where multiple parties are involved, communication gaps can cause significant delays. Minor setbacks can accumulate, leading to disruptions in workflows, design modifications, and material deliveries, highlighting the importance of maintaining continuous, accurate communication.

Effective communication is not simply about exchanging information; it involves clearly defining responsibilities, ensuring timely delivery of information, and using appropriate tools to manage these processes. This research will explore how improved communication practices can enhance time control in construction projects and help overcome the challenges that can negatively affect project timelines. Through a detailed case study of a 61 unit housing project, this dissertation will offer insights into best practices for stakeholder communication and deadline management, focusing on modern techniques and tools that can ensure successful project execution within the specified timeframe.

2. Problem Statement

The residential construction sector in Algeria faces significant challenges, particularly regarding adherence to project timelines. Despite increased efforts from both public and private stakeholders, a majority of projects experience substantial delays, jeopardizing on time delivery and often the overall success of the project. Among the possible causes of these delays, the management of communication between the various stakeholders plays a crucial role. Ineffective or inadequate communication can lead to misunderstandings, errors, and a lack of coordination, which in turn directly affect timely project completion. However, few studies have precisely analyzed how the quality, fluidity, and coordination of communication concretely influence time management in these residential projects.

The 61unit housing project in Biskra, for instance, exceeded its scheduled delivery date and serves as a clear example of this challenge. This dissertation therefore aims to explore this topic in depth, with the goal of identifying ways to enhance deadline management within the sector.

3. Research Question:

Based on these observations and the ensuing reflections, it becomes essential to formulate a research question to clarify the underlying issue. The main research question is: '**To what extent can effective communication between stakeholders help to reduce delays in residential construction projects in Algeria'?**

4. Research objectives

In order to address the research question posed in this study, we have defined a set of specific objectives designed to guide and structure our research approach. These objectives are as follows:

- To examine the impact of communication between stakeholders on schedule management in the 61 residential construction project.
- To identify the main communication barriers among stakeholders in the 61 residential project, as well as the key factors that facilitate effective communication.
- To develop operational recommendations aimed at optimizing communication management, with the goal of reducing delays and ensuring compliance with project delivery deadlines.

5. Research methodology

To achieve these objectives, our research adopts a qualitative methodology structured around two complementary approaches. The first consists of an in depth review of the existing literature on communication management in construction projects, with the aim of establishing a theoretical framework and gaining a better understanding of current issues and practices. The second approach is based on field investigation, through the study of a concrete residential case, allowing for the observation and analysis of communication dynamics in a real world context.

The subject of this study is thus addressed in its entirety, seeking to accurately describe the project implementation processes in order to better understand the current situation and the factors influencing schedule control. Our approach is primarily aimed at identifying communication factors that have a significant impact on time management and at capturing the perceptions of the various stakeholders regarding these practices.

6. Dissertation structure

The dissertation begins with an **introductory chapter** that presents the central issue: the management of deadlines in the residential sector and the importance of effective communication among all stakeholders. The research objectives are defined, notably the analysis of the impact of smooth communication on meeting deadlines. The overall structure of the study is also outlined to guide the reader in understanding the work.

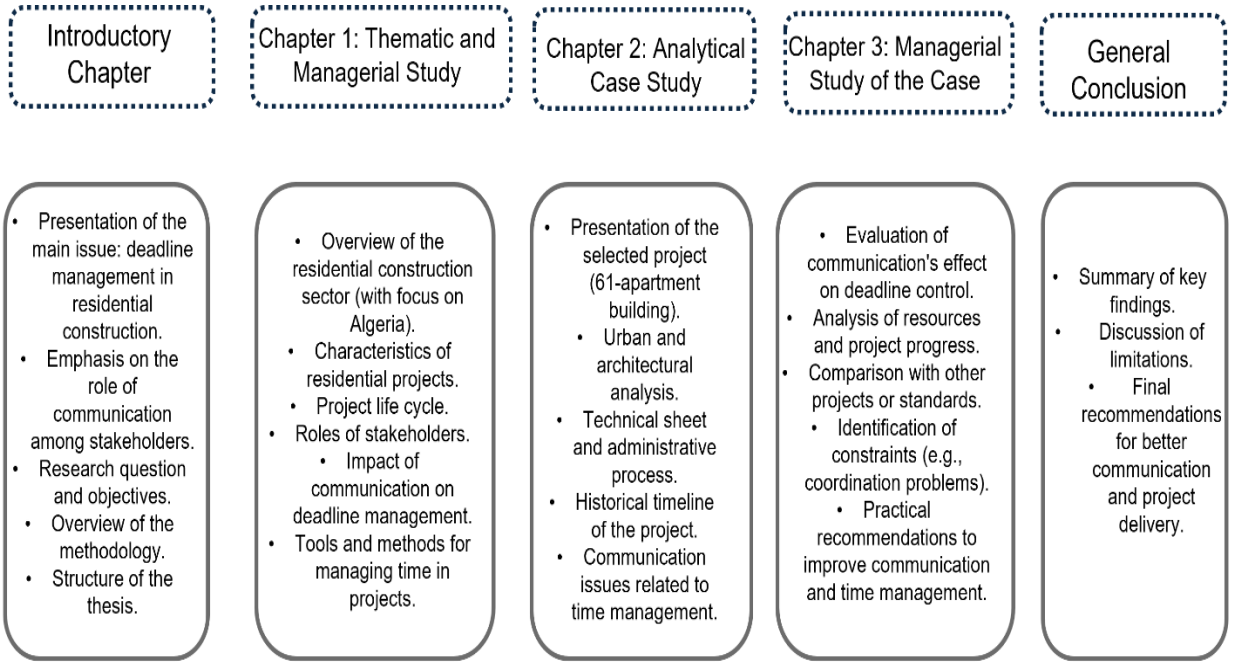
The first chapter offers a thematic and managerial study of the residential sector, particularly in Algeria. It describes the characteristics of residential projects, the project life cycle, and details the roles of the various actors involved. Emphasis is placed on deadline management and the influence of effective communication, along with the tools and methods of management that help better control timelines.

The second chapter is dedicated to the analytical study of a concrete case. It analyzes the residential project from urban and architectural perspectives, presents the technical sheet and administrative process, and then traces the project's history. This chapter highlights communication challenges among stakeholders, especially regarding time adherence.

The third chapter focuses on the managerial study of the case. It assesses how communication impacts deadline control by analyzing resources, the progress of work, and comparing it with other projects or standards. Constraints encountered, such as coordination issues, are examined to formulate recommendations for improving communication and optimizing deadline management.

The general conclusion synthesizes the main findings, discusses the limitations of the research, and offers recommendations.

7. Dissertation structure



First chapter

Thematic and Managerial study

Introduction

The residential sector in Algeria occupies a central place in the country's social and economic policy, with major public programs aimed at meeting the growing demand for housing and improving living conditions (Benali, 2022; Ministry of Housing, 2023). The wilaya of Biskra exemplifies this dynamic, particularly through the 61-unit housing project, which highlights the challenges of schedule management and coordination among stakeholders (National Housing Agency, 2024). To understand these issues, it is essential to clarify project concepts, identify stakeholders, and master project management principles especially time management, which is crucial for operational success (PMI, 2021).

This chapter, therefore, proposes a structured approach, successively addressing the presentation of the residential sector, identification of the case study, definition of key concepts, presentation of national programs, definition and characteristics of a project, the roles of stakeholders, project management principles, the specifics of schedule management, as well as the tools and methods for optimizing schedule management in residential projects in Algeria.

I Presentation of the residential sector (Housing sector)

The residential sector refers to the segment of the construction and real estate industry that is concerned with the development, sale, and management of housing units intended for people to live in. This sector encompasses a variety of housing types, including single-family homes, multi-family apartments, condominiums, and other dwellings designed for permanent or semi-permanent residence (United Nations, 2021).

I.1 Definition of concepts

I.1.1 The habitat

Habitat refers to the environment in which humans live, interact, and organize their daily lives, encompassing not only physical dwellings but also the social, economic, ecological, and cultural factors that sustain and shape settlements. This concept is dynamic and considers the interplay between built environments and the broader geographical and social context (Wu, 2025; Bourdin, 2015).

I.1.2 The Habitation

Habitation is the physical structure or place where individuals or groups reside, either permanently or temporarily, providing shelter and the material basis for domestic life. It includes all forms of dwellings, such as houses, apartments, or shelters, and is recognized as a fundamental component of human well-being and social inclusion (Henilane, 2016).

I.1.3 Residential Neighborhood

A residential neighborhood is a spatially defined area within a city or town that is primarily composed of housing, where residents share a sense of community and daily life. The concept is shaped both by physical characteristics (such as housing types and urban form) and by residents' perceptions of social cohesion, identity, and satisfaction (Allen, 2018).

I.1.4 Accommodation

Accommodation refers to any space, building, or group of rooms where individuals may live or stay, either temporarily or permanently. In the context of housing studies, accommodation includes both permanent dwellings and temporary solutions, such as shelters or post-disaster housing, which provide minimum conditions of privacy, dignity, and protection (Félix et al., 2015).

I.1.5 Housing

Housing is defined as a building or part of a building intended for human residence, providing essential functions such as shelter, safety, and privacy. Housing is a key determinant of living standards, social security, and economic activity, and its adequacy is fundamental to physical and mental health (Henilane, 2016; Callejo et al., 2025).

I.1.6 The Ministry of Habitat, Urban, and City Development:

Ministry of Habitat, Urban, and City Development is a governmental body in Algeria responsible for implementing national policy on housing, urban planning, and city development. Its main functions include planning, regulating, and overseeing urbanization, promoting housing construction, improving living conditions in urban areas, and preserving architectural and cultural heritage (Ministère de l'Habitat, de l'Urbanisme et de la Ville, 2023).

I.1.7 Directorate of habitat:

The Directorate of Habitat is an administrative division within the Ministry, tasked with developing, evaluating, and executing national housing policy. Its responsibilities include setting objectives and actions for housing programs, ensuring technical quality standards, managing housing finance policies, and proposing legislative and regulatory measures related to housing, including the reduction of substandard housing (Ministère de l'Habitat, de l'Urbanisme et de la Ville, 2021).

I.2 Housing typology

In Algeria, housing is generally divided into three main categories:

I.2.1 Individual Housing

This type consists of standalone houses designed for a single family. Each occupant, whether they are the owner or the tenant, has personal access to their home. A single family home is located immediately on a piece of natural land that is its direct extension and is used exclusively by its occupants. (Bensaad, 2012; Bouzidi & Tacherift, 2019).

I.2.2 Semi-collective Housing

Between individual and group habitat, it is a form of dwelling. Another name for this type of dwelling is intermediate habitat. It aims to provide as many individual dwelling attributes as possible to the collection of homes. It is distinguished by having two residences arranged vertically, each with separate access. Semi-collective housing is characterized by independent dwellings organized by superposition or juxtaposition, typically limited to two stories (Bensaad, 2012).

I.2.3 Collective Housing

Collective housing refers to structures where several families share private or common spaces, including social housing, rent to own, or public housing units. This model responds to rapid urban growth, but requires appropriate community management to ensure comfort and proper functioning (Remali et al., 2016).

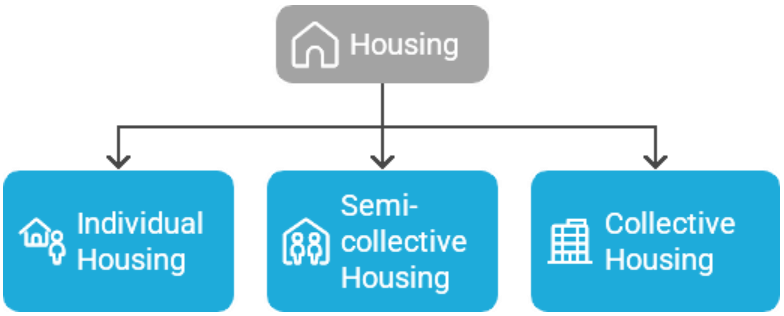


Figure I.1: Housing typology (Source: Author, 2025).

I.3 Different Habitat Programs in Algeria

Housing initiatives in Algeria are structured into several key programs, each governed by specific regulations and targeting distinct population segments:

I.3.1 Rent to Own Housing

This program allows beneficiaries to acquire property through a rent-to-own scheme, granting full ownership upon completion of the rental period as stipulated in the signed contract. The final price of the dwelling is determined by the total construction cost, including land acquisition, as well as technical and administrative management fees calculated based on the time required for property

transfer. This framework is established by Executive Decree No. 01-105 of April 23, 2001 (Government of Algeria, 2001).

I.3.2 Subsidized Social Housing

As outlined in official government publications (Government of Algeria, 2013), subsidized social housing refers to new dwellings constructed by real estate developers in accordance with technical standards and predetermined budgetary requirements. Targeted at middle-income households, this program provides state assistance to eligible applicants, combining direct financial aid, subsidized loans where necessary, and personal contributions.

I.3.3 Public Rental Housing

Governed by Executive Decree No. 08-142 of May 11, 2008, public rental housing is allocated to individuals from the most economically disadvantaged backgrounds or those living in precarious conditions. These dwellings are developed by real estate promotion and management agencies within defined budgetary limits (Government of Algeria, 2008).

I.3.4 Public Promotional Housing

In accordance with Executive Decree No. 14-203 of July 15, 2014, public promotional housing is a state supported program designed for households whose combined monthly income (including that of spouses) is between six and twelve times the national minimum wage. This initiative aims to address the needs of middle to upper middle income groups (Government of Algeria, 2014).

I.3.5 Rural Housing

Established by Executive Decree No. 10-235 of October 7, 2010, rural housing forms part of the broader rural development policy. It seeks to stabilize rural populations by supporting households in the self construction of adequate homes within their communities, thereby encouraging local development (Government of Algeria, 2010).

I.3.6 Housing Cooperatives

In cooperative housing schemes, beneficiaries contribute their own resources and actively participate in the construction and completion of the project. Eligibility for state subsidies in rural housing construction requires meeting specific criteria as defined by relevant legislation (Government of Algeria, 2001; Government of Algeria, 2010).

Figure I.2: Algerian Housing Programs (Source: Author, 2025).

I.4 Habitat programming process in Algeria

The process begins with the municipality, which identifies the need for a project. This need is then communicated to the Wali (provincial governor), who sends a notification of necessity to the Ministry of Habitat and Urban Development . The Ministry is responsible for implementing a program for each wilaya (province).

Subsequently, the Wali delegates the project owner to an appointed project manager. The wilaya proceeds with land registration and selection, and also chooses the technical design office and

construction company. The signing of the contract marks the official launch of the program, which concludes with the implementation phase and the commencement of construction works.

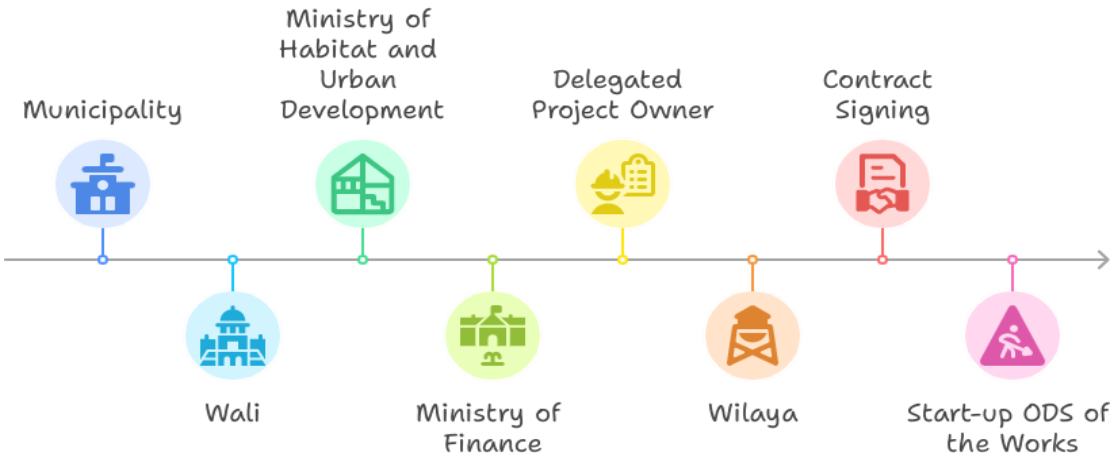


Figure I.3: The process of habitat programming in Algeria
Source: Real Estate Promotion and Management Office Biskra + author processing.

II Identification of case study

II.1 Public promotional habitat

Public promotional habitat in Algeria is a state funded urban housing initiative designed for individuals who do not own real estate and whose monthly income is greater than six times and less than or equal to twelve times the guaranteed national minimum wage. This housing formula is distinguished by a set of technical and architectural requirements mandated by legislation, which must be considered during the preparation of architectural studies (Bouzidi & Tacherift, 2019). The primary objective of these criteria is to ensure the delivery of high-quality housing that guarantees comfort and well-being for beneficiaries (Remali et al., 2016). By targeting a specific income bracket and enforcing rigorous standards, public promotional habitat aims to bridge the gap between social housing and market rate developments, offering a sustainable solution for middle-income households (Bensaad, 2012).

II.2 Characteristics of public promotional habitat

The public promotional habitat scheme is characterized by several features that distinguish it from other housing programs. Firstly, it is designed to be reasonably priced, thereby making it accessible to individuals and families with moderate financial resources (Bouzidi & Tacherift, 2019). Beyond affordability, the scheme ensures the provision of public facilities and amenities, which enhance the quality of life for residents. Government support is a fundamental aspect of this program, with significant assistance provided throughout all phases, from planning to implementation. Additionally, the construction of primary and secondary roads, as well as other essential infrastructure networks, is financed by the state budget, ensuring comprehensive development and connectivity within these residential areas (Remali et al., 2016; Bensaad, 2012).

II.3 Identification of Habitat Programs

II.3.1 Spatial Organization of Public Promotional Habitat

The spatial organization of Public Promotional Habitat projects in Algeria adheres to specific typological standards, as stipulated in Article 30 of the decision dated January 24, 2015. The program offers three principal housing types F3, F4, and F5 with a permissible size variation of plus or minus five percent (5%). The standard surface areas for each type are as follows:

- **F3 Type Housing:** 80 m²
- **F4 Type Housing:** 100 m²
- **F5 Type Housing:** 120 m²

Each housing unit is composed of a set of functional spaces, tailored to the number of bedrooms:

- **F3 Type Housing:** the F3 type housing unit is thoughtfully designed to accommodate the essential needs of residents. It comprises a spacious living room, two bedrooms, a kitchen, a bathroom, and a separate washroom. Additionally, the layout includes a hallway (clearance gap) that facilitates movement within the unit, ample storage spaces for convenience, and a dedicated laundry or dryer area. This configuration ensures both functionality and comfort for occupants, making it suitable for small families or individuals seeking a well organized living environment.

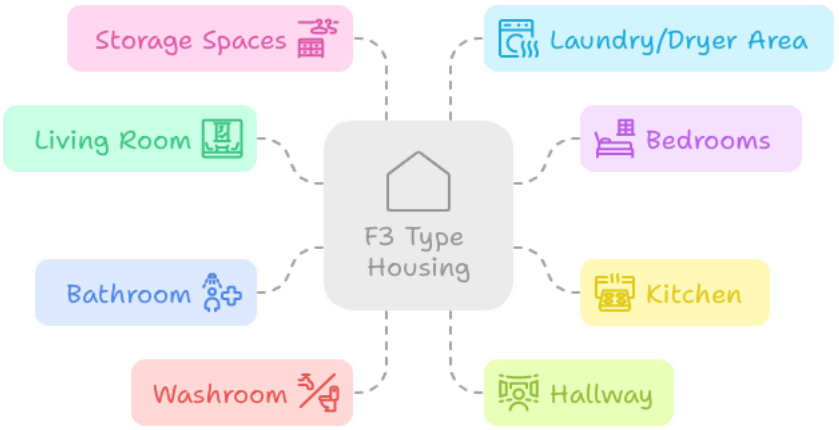


Figure I.4: Components of an F3 type housing (Source: Author, 2025).

- **F4 Type Housing:** the F4 type housing unit is designed to provide enhanced living space and comfort for residents. It features a living room, three bedrooms, a kitchen, a bathroom, and a separate washroom. The layout also incorporates a hallway (clearance gap) to facilitate easy movement throughout the unit, as well as designated storage spaces and a laundry or dryer area. This arrangement is ideal for medium-sized families, offering both practicality and a well-organized environment to meet daily living needs.

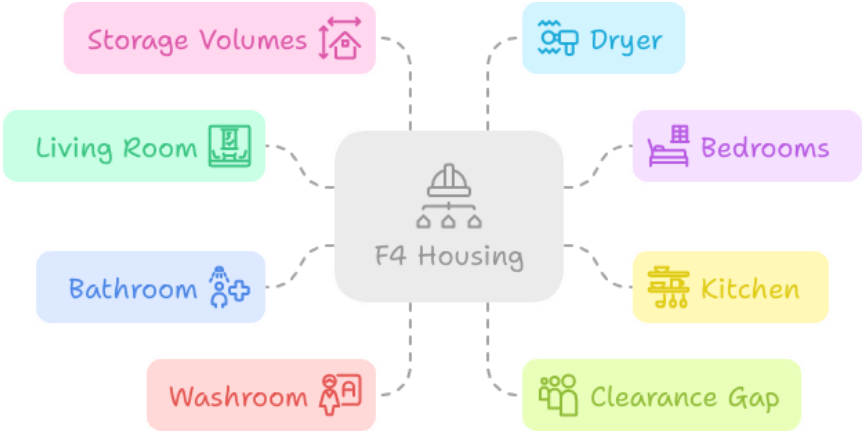


Figure I.5: Components of an F4 type housing (Source: Author, 2025).

- **F5 Type Housing: t**he F5 type housing unit is designed to accommodate larger families or those requiring additional living space. It comprises a living room, four bedrooms, a kitchen, a bathroom, and a separate washroom. The layout also includes a hallway (clearance gap) to ensure easy circulation within the unit, ample storage volumes for convenience, and a dedicated laundry or dryer area. This configuration provides a spacious and functional environment, meeting the diverse needs of residents while ensuring comfort and practicality.

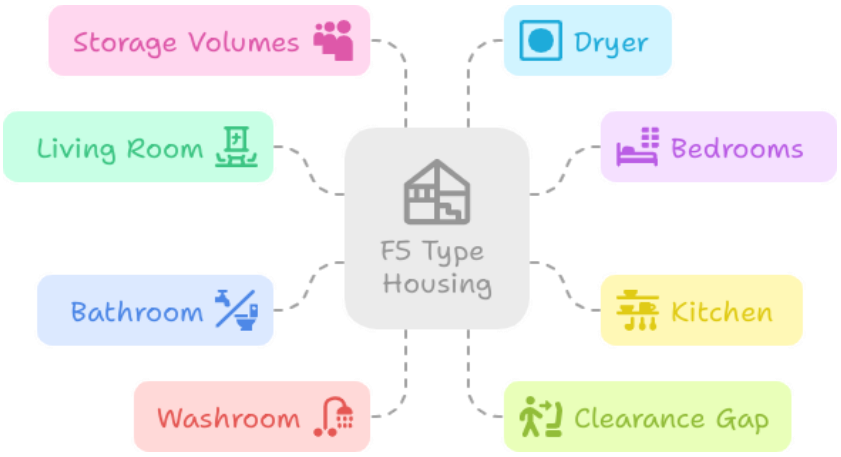


Figure I.6: Components of an F5 type housing (Source: Author, 2025)

2.3.2. Functional Organization of Public Promotional Habitat

According to the Government of Algeria (2015), the orientation of housing units must ensure that sunlight reaches the living room, kitchen, and at least part of the bedrooms, while the overall design should also take into account the climate, terrain, views, and prevailing winds to maximize comfort. A minimum ceiling height of 2.90 meters is required, and the living room must have at least 22 square meters of space (Article 35).

Each bedroom should be no less than 12 square meters, with proportions and window placement optimized for occupancy and natural light (Article 36). Kitchens must accommodate meal consumption, with minimum areas set at 12 m² for F3, 14 m² for F4, and 16 m² for F5 units, while bathrooms require at least 4 m² for F3, 5 m² for F4, and 6 m² for F5, each equipped with a standard bathtub. Restrooms must be at least 1.5 m², designed for unobstructed access and door operation (Articles 39–40), and, unless otherwise constrained, bathrooms should have natural lighting and ventilation. Circulation spaces such as halls and corridors must constitute at least 10% of the dwelling's living area, facilitating efficient distribution and contributing to the interior spatial quality (Article 41).

Storage space, excluding the kitchen, should be approximately 2 m² for F3, 3 m² for F4, and 4 m² for F5 units, and terraces, loggias, or balconies must connect to the living area and at least one bedroom, with their combined area comprising 12–15% of the total living space (Article 42). Additionally, a drying area of at least 1.40 meters in width must be accessible from the kitchen, providing sunlight while concealing laundry from external view and potentially serving as an auxiliary kitchen space. Both the living room and the master bedroom must be equipped with two air conditioning units, with all electrical installations discreetly concealed from outside view, ensuring both comfort and aesthetic integrity.

2.3.3. Project programming of Public Promotional Habitat

The programming phase of this project begins with the proposal from the Housing Directorate to the Ministry of Habitat and Urban Planning. Secondly, after the ministry approves the project, it is included in the annual program. Thirdly, the governor of the province is informed about the project's inclusion in the provincial program. Fourthly, the province proposes a piece of land located in the new urban pole in the western region of Biskra municipality to the Provincial Agency for Real Estate and Urban Management of Biskra. Fifthly, the Provincial Agency for Real Estate and Urban Management conducts a general study of the land and its location and selects it to accept the offer. Upon acceptance of the offer, the Real Estate and Urban Management Agency prepares for the architectural competition and the tender.

THE MANAGERIAL STUDY

I Project

I.1 Definition

According to ISO 10006, a project is defined as a unique process consisting of a set of coordinated and controlled activities, with defined start and end dates, carried out to achieve a specific objective that meets particular requirements, including time, cost, and resource constraints (Afitep, 2010).

The APM Body of Knowledge (2012) describes a project as a single, transient endeavor undertaken to accomplish planned objectives, which can be expressed in terms of deliverables, outcomes, or benefits. A project is generally considered successful if it achieves its objectives in accordance with specified acceptance criteria within an agreed timeframe and budget (Bronte-Stewart, 2018). For PMI (Project Management Institute), a project is a temporary undertaking aimed at creating a unique product, service, or result (PMBOK, 2017).

The AFNOR X50-105 standard defines a project as a specific approach that systematically structures a future reality and involves an objective to be achieved with available resources (AFITEP-AFNOR, 1991).

I.2 Key Characteristics of a Project

Projects are distinct from routine operations due to a set of defining characteristics that guide their management and execution. According to leading project management frameworks and recent literature, the main characteristics of a project include:

Temporary Nature: Every project has a clearly defined start and end. Projects are not ongoing activities; they exist to achieve specific objectives within a set timeframe and are closed once those objectives are met (Project Management Institute, 2021; Kerzner, 2022).

Uniqueness: Each project delivers a unique product, service, or result. Unlike regular operations, projects are not repetitive and are designed to address specific needs or problems, resulting in outcomes that are distinct from previous efforts (Kerzner, 2022; Project Management Institute, 2021).

Defined Objectives and Goals: Projects are initiated to achieve well-defined goals and objectives. These objectives guide the planning, execution, and evaluation of the project and provide a benchmark for measuring success (Kerzner, 2022; Wilson, 2014).

Specific Requirements and Scope: Projects operate within a defined scope, which outlines the boundaries of what will and will not be delivered. This scope is agreed upon at the outset and managed throughout the project lifecycle (Project Management Institute, 2021; Kerzner, 2022).

Resource Constraints: Projects must be completed using limited resources, including time, budget, personnel, and materials. Effective resource management is critical to project success (Kerzner, 2022; Wilson, 2014).

Cross-Functional Collaboration: Projects often require the involvement and collaboration of multiple departments, teams, or stakeholders, each contributing different skills and expertise to achieve the project's objectives (Rajhans, 2018; Kerzner, 2022).

Risk and Uncertainty: Projects inherently involve a degree of risk and uncertainty, as they often venture into new territory or involve complex challenges. Risk management is therefore a core component of project management (Kerzner, 2022; Project Management Institute, 2021).

Phased Lifecycle: Projects progress through a series of phases, typically including initiation, planning, execution, monitoring and controlling, and closure. This lifecycle provides structure and helps ensure the project stays on track (Project Management Institute, 2021; Kerzner, 2022).

Deliverables and Milestones: Projects are measured by the delivery of specific outputs (deliverables) and the achievement of key milestones, which mark significant points of progress along the project timeline (Kerzner, 2022; Project Management Institute, 2021).

Stakeholder Involvement: Projects are designed to meet the needs of specific stakeholders, including customers, sponsors, and end users. Stakeholder engagement and communication are essential throughout the project (Shahzad et al., 2017; Ukoha, 2022).

Figure I.7: Key characteristics of a Project (Source: Source: Author, 2025)

I.3 The Life Cycle of the Project

The set of stages that a project goes through from the beginning to the end is known as the project life cycle. The generic project life cycle is defined as follows by the PMBOK:

Figure I.8: General life cycle structure (Source: PMBOK Guide, 3rd Edition)

I.4 Project constraints

Project constraints are the fundamental limitations and requirements that define the boundaries within which a project must operate and by which its success is ultimately measured (Kerzner, 2022; Project Management Institute [PMI], 2021). These constraints are critical considerations in project planning, execution, and evaluation, as they directly influence scope, quality, schedule, and outcomes (Pacagnella et al., 2022).

The classic model of project management identifies time, cost, and scope as the "triple constraints" or "iron triangle," emphasizing the need to balance these three factors to achieve project success (Kerzner, 2022; PMI, 2021; Pacagnella et al., 2022). However, contemporary frameworks, such as PRINCE2 and the PMBOK® Guide, recognize a broader set of constraints that also include quality, risk, resources, and benefits (Bronte-Stewart, 2018; PMI, 2021).

According to the Project Management Institute (PMI), project management involves identifying requirements, addressing the diverse needs and expectations of stakeholders, and balancing competing project constraints-including time, cost, scope, quality, resources, and risk-throughout the project life cycle (PMI, 2021). The International Project Management Association (IPMA) further highlights that project success is closely linked to the ability to deliver the project within the agreed scope, time, cost, and quality parameters (IPMA, 2015). Additionally, the Association for Project Management (APM) emphasizes that clear goals, stakeholder engagement, appropriate governance, and effective communication are essential management practices for navigating these constraints and achieving project success (APM, 2019).

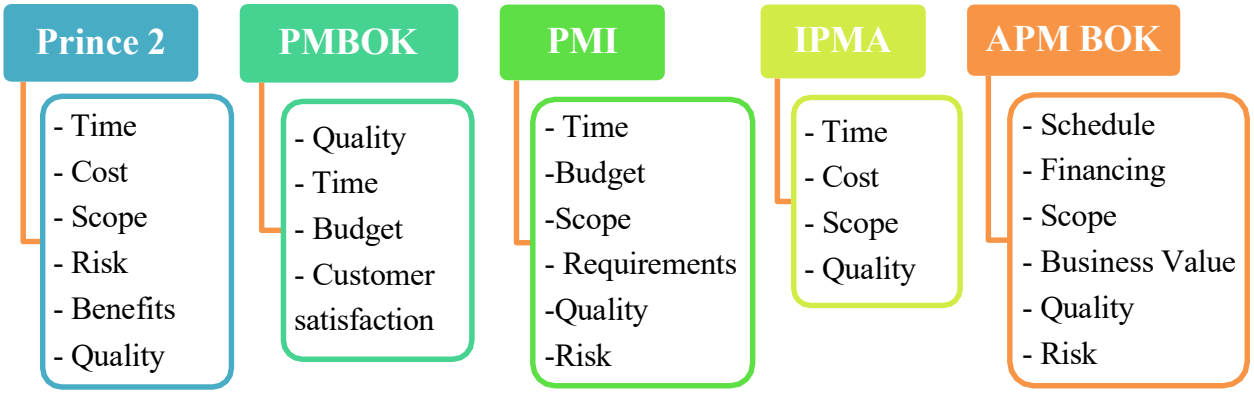


Figure I.9 : Project constraints (Source : Chan & Chan, 2004).

I.5 The Project Triptych

In project management, the term "triptych" typically refers to the three fundamental and interdependent pillars that determine project performance: cost, quality, and time (Abdelali, 2018; IJSRM, 2017). The Project Triptych or the iron triangle, also known as the triple constraint triangle, the performance triangle or the golden triangle, is ‘a representation of the most basic criteria for measuring project success.

Figure I.10: The Golden Triangle (Source: Author,2025)

- **Cost:** The project must operate within a predetermined budget, which includes all study, execution, operational, and closure expenses. Exceeding this budget can render the project economically unviable or politically unacceptable. Effective management of financial constraints is essential for project success (Petrenko, 2023; Fapohunda & Stephenson, 2010).
- **Time:** Every project is bound by a specific deadline. Delays can reduce the relevance or value of the project, making adherence to the project schedule a critical factor in project management (Hart, 2024; Islam, 2023).
- **Quality:** Quality refers to meeting the technical and functional requirements set by the client. A successful project not only fulfills initial needs but also anticipates changes, ensures consistent performance, and provides comprehensive documentation. Maintaining quality often requires balancing it with time and cost constraints (Kavishe, Chileshe, & Haupt, 2022; Osei-Kyei & Chan, 2017).

I.6 Project life cycle

The project life cycle is the series of phases that a project goes through from its initiation to its closure. According to the PMBoK Guide, project management can be structured into five distinct process groups:

- **Project Initiation Phase:** this is the first stage of the project life cycle. Its purpose is to define the project's scope and objectives, analyze needs, clarify the requirements, and assess the feasibility and relevance of the project (Project Management Institute, 2021).

- **Planning Phase:** his is the preparation and detailed development phase of the project. It involves planning and scheduling tasks, allocating the necessary resources for their completion, and defining the strategy for executing them (Nyandongo & Davids, 2016; Leach, 1999).
- **Execution Phase:** this phase involves implementing the project plan. It includes carrying out the tasks using the resources identified in the project plan, while adhering to cost, time, and quality criteria (Fapohunda & Stephenson, 2010; Barker & Cole, 2015).
- **Monitoring and Control Phase:** this phase occurs regularly in parallel with the execution phase. It consists of continuously tracking the progress of work and comparing it to the planned schedule in order to measure performance and identify necessary corrective actions (Osei-Kyei & Chan, 2017).
- **Project Closure Phase:** this phase involves delivering the final outputs to the client, releasing resources, and formally closing the project (Project Management Institute, 2021; Alias et al., 2014).

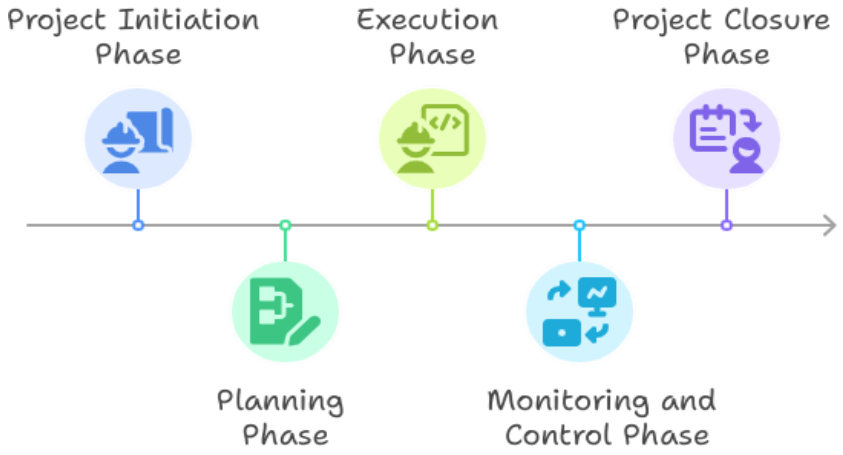


Figure I.11: Project life cycle phases (Source : Author, 2025).

I.7 Project stakeholders

I.7.1 Definition

Project stakeholders are broadly defined as individuals, groups, or organizations that have an interest in a project and can affect or be affected by its outcomes, decisions, or activities. This definition, widely supported in the project management literature, emphasizes the multifaceted and dynamic nature of stakeholder involvement throughout the project lifecycle (Boddy & Paton, 2004, as cited in PMI, 2010; Project Management Institute, 2017, as cited in Pirozzi, 2019). According to the Project Management Institute (PMI), a project stakeholder is “an individual, group, or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project, program, or portfolio” (PMI, 2017, as cited in Pirozzi, 2019; Wikipedia, 2024). This broad conceptualization includes both internal stakeholders such as project managers, team members, and sponsors and external stakeholders, including clients, suppliers, regulatory bodies, and community members (Pirozzi, 2019; Ullah et al., 2023).

In project management, stakeholders are defined as individuals, groups, or organizations that have an interest or stake in a project and can affect or be affected by its outcomes. The concept of stakeholder management has evolved significantly, emphasizing the critical role stakeholders play over the entire project lifecycle, from initiation through to completion and evaluation (Ullah et al., 2023; Khan et al., 2014).

I.7.2 The Project Owner

There are several terms in the construction industry that might be confusing, and "client" is one of them. The definition given by the French standard is "natural or legal person designated by this term in the contract documents and on whose behalf the works or projects are executed.

Table I.1: The project owner's role during the project. (Source: Author,2025)

UPSTREAM	PROJECT
Owner of the project: financial authority	Phase of operation: project owner
- Create reflections to translate many perspectives (e.g., land use planning, policy, service requirements, equipment, etc.). - Indicate the project's perspective (priority, need).	**Define the project** - Address the implementation's requirements, goals, and limitations. - Make the program official. - define the constraints (cost, delays) - create the regulatory documents - finalize the projected financial envelope and secure the funding. - define the implementation process **Lead the project** - define and implement the appropriate organization (financial means, technical expertise, resources...)

A delegated project manager, whose occupation is project management, may be called upon when the project owner lacks the requisite professional competence to oversee the project. This is known as project management assistance, or PMA for short. In order to assist the project owner in clearly defining their goals and to confirm with the project manager whether the goal is technically possible, the delegated project management, also known as DPM, is in charge of serving as an intermediary between the two parties. The project owner is not replaced by the delegated project management, hence there is no direct accountability between the two parties.

I.7.3 The Project Manager

In order to guarantee the architectural, technical, and economic compliance of the project under contract, oversee the execution of work contracts, propose their settlement, and support them during acceptance operations and the perfect completion warranty period, the project manager a public or private individual or entity—is appointed by the project owner or their representative based on their technical expertise. The project manager's name and address are mentioned in the particular contract terms. The person who is uniquely qualified to represent the project manager, especially when it comes to signing service orders, is designated by the project manager if it is a legal entity.

I.7.4 Engineering

Only experts can fully grasp the intricacy of the increasingly sophisticated processes used in modern construction. As a result, these experts are inevitably and organically included in the project management team to help them in one or more areas. The project manager's involvement is enhanced by that of technical consultants. Surveying, soil mechanics, reinforced and restressed concrete, thermal engineering, renewable energy, hydraulic and sanitary installations, electricity, signaling, sound systems, acoustics and sound insulation, lighting design, roads and various networks, and landscaping are some of the disciplines it covers.

I.7.5 The technical inspector

Technical inspectors are people or organizations that conduct technical inspections. Because technical inspectors are tasked with a wide range of activities, their roles can occasionally be unclear.

I.7.6 Company

The Algerian legislator defined the building contractor through Article 3 of Law No. 11-04, which governs the profession of real estate developer, as: "Any natural or legal person registered in the commercial register under the activity title of construction works, as a craftsman or a company possessing the qualifications."

II Project management

According to the PMBOK Guide, 6th Edition, project management is defined as the application of knowledge, skills, tools, and techniques to project activities to meet project requirements, achieved through the appropriate application and integration of project management processes tailored to each project, thereby enabling organizations to execute projects efficiently (PMI, 2017). Similarly, ISO 10006 emphasizes that project management involves planning, organizing, monitoring progress, and controlling all aspects of a project in a continuous process to achieve its objectives (ISO, 2017). The discipline of project management encompasses the establishment of requirements, the definition of clear and attainable objectives, and the balancing of competing demands related to cost, schedule, scope, and quality. It also requires the adaptation of plans, specifications, and strategies to address emerging challenges throughout the project lifecycle (PMI, 2005). Project management processes are logically grouped into five categories: initiation, planning, execution, monitoring and controlling, and closing, each with specific objectives, deliverables, and outcomes essential to project success. The project manager is responsible for leading these processes, ensuring that resources and timelines are coordinated to meet the project's goals within defined constraints. Depending on an organization's approach, these processes may be implemented in a more structured or adaptive manner, providing a flexible yet comprehensive framework for managing projects from inception to completion (PMI, 2017; ISO, 2017).

II.1 Project management process groups

The project management process is systematically organized into five distinct process groups, each of which plays a critical role in guiding a project from inception to completion. These process groups provide a structured framework for managing project activities, ensuring that objectives are met efficiently and effectively within the defined constraints of scope, time, cost, and quality (Project Management Institute, 2017; Turner, 2014).

II.1.1 Initiating

The Initiating process group involves defining a new project or a new phase of an existing project by obtaining authorization to start the project or phase. This stage focuses on identifying stakeholders, clarifying project objectives, and securing the necessary approvals and resources to proceed. Effective initiation ensures alignment between the project's objectives and the organization's strategic goals (PMI, 2017).

II.1.2 Planning

The Planning process group is dedicated to establishing the total scope of the project, defining and refining objectives, and developing the course of action required to attain those objectives. This group encompasses the creation of detailed project management plans, schedules, budgets, risk management strategies, and resource allocation. Comprehensive planning is essential for anticipating challenges and setting a clear roadmap for execution (Kerzner, 2022).

II.1.3 Executing

The Executing process group involves coordinating people and resources to carry out the project management plan and deliver the project's outputs. This stage is characterized by the implementation of planned activities, management of stakeholder expectations, and assurance of quality standards. Effective execution is critical for achieving project deliverables and meeting stakeholder requirements (PMI, 2017; Turner, 2014).

II.1.4 Monitoring and control

The Monitoring and Controlling process group tracks, reviews, and regulates the progress and performance of the project. It involves identifying any areas where changes to the plan are required and initiating the corresponding modifications. This group ensures that project objectives are being met and that performance aligns with the project management plan, allowing for timely corrective actions (Kerzner, 2022).

II.1.5 Closing

The Closing process group finalizes all project activities, formally completes the project or phase, and ensures that all contractual obligations are met. This includes obtaining formal acceptance of deliverables, releasing project resources, and documenting lessons learned for future projects. Proper closure ensures that the project's outcomes are fully realized and that organizational knowledge is captured (PMI, 2017).

II.2 Project management knowledge areas

Project management knowledge areas, as defined by the PMBOK Guide (Project Management Body of Knowledge) of the Project Management Institute (PMI), constitute an essential framework that covers all critical aspects of a project and ensures its success. According to the 6th edition of the PMBOK®, there are ten knowledge areas, each grouping processes, tools, and techniques specific to a project management discipline:

- **Project Integration Management:** Coordination of the various elements of the project to ensure their coherence and alignment with overall objectives.
- **Project Scope Management:** Definition and control of what is included or excluded from the project to precisely meet client needs.
- **Project Schedule Management:** Planning, estimating, and tracking activities to meet deadlines.
- **Project Cost Management:** Estimating, budgeting, and controlling costs to keep the project within the approved budget.
- **Project Quality Management:** Implementation of processes and criteria to ensure the project meets defined quality requirements.
- **Project Resource Management:** Identification, acquisition, and management of human and material resources necessary for project completion.
- **Project Communications Management:** Planning and managing the flow of information among stakeholders to ensure understanding and alignment with project objectives.
- **Project Risk Management:** Identification, analysis, and planning of responses to risks that may affect the project.
- **Project Procurement Management:** Procedures for contracting, purchasing goods and services from external suppliers.
- **Project Stakeholder Management:** Identification, analysis, and management of stakeholder expectations and engagement throughout the project.

Each knowledge area is transversal to the five process groups of project management (initiating, planning, executing, monitoring and controlling, closing), thus ensuring a structured and integrated approach to project management (Project Management Institute, 2017; Kerzner, 2022).

Figure I.12: Project management knowledge areas (Source: Author, 2025).

II.3 Communication management

II.3.1 Definition

Communication management in project environments involves the systematic planning, execution, and control of information flow to ensure effective and timely communication among team members, stakeholders, and other relevant parties (ProjectManagement.com, 2016). It is a strategic organizational approach that facilitates both internal communication among staff and external communication with stakeholders, supporting the achievement of project and organizational objectives (Adobe, 2025). Research highlights that managers spend a significant portion of their time often estimated at half or more on communication activities, underscoring the critical importance of communication proficiency, particularly for those in leadership roles (Jovanovska & Davitkovska, 2023).

At its core, communication management encompasses the systematic planning, coordination, and control of communication resources and processes. Steyn (2003) conceptualizes corporate communication strategy as a functional strategy aligned with overall corporate goals, enabling organizations to effectively convey their mission and objectives to stakeholders while fostering engagement and collaboration (Steyn, 2003). Effective communication management not only ensures the dissemination of relevant information but also enhances stakeholder engagement, which is essential for building mutual understanding, minimizing misunderstandings, and achieving project success (Jovanovska & Davitkovska, 2023; Steyn, 2003).

The Project Management Institute further emphasizes that project communication management includes the processes required for the timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information, thereby creating a bridge between diverse stakeholders and supporting project execution and outcomes (PMI, 2016).

II.3.2 The different types of communication (Project Management Body of Knowledge)

- **Based on Direction (Flow of Communication)**
  - Internal Communication: Within the project team or organization.
  - External Communication: With clients, suppliers, government authorities, or external stakeholders.
  - Upward Communication: From team members to project managers or upper management.
  - Downward Communication: From management or project manager to team members.
  - Horizontal Communication: Between peers or departments at the same organizational level.
  - Diagonal Communication: Between individuals across different levels and departments without direct authority links.
- **Based on Method (Mode of Communication)**
  - Oral (Spoken): Meetings, phone calls, video conferences, casual conversations.
  - Written: Emails, reports, letters, memos, contracts.
  - Non-verbal: Body language, facial expressions, gestures, site signage.
  - Based on Medium (Channel/Technology Used)
  - Face-to-face: Ideal for resolving complex issues and building trust.
  - Electronic: Email, messaging apps, video conferencing (Zoom, Teams, etc.).
  - Printed Documents: Contracts, reports, manuals in physical (hard copy) format.
  - Visual Media: Charts, graphs, Gantt charts, diagrams, BIM models.
- **Based on Formality**
  - Formal Communication: Structured and documented: reports, contracts, meeting minutes, official letters.
  - Informal Communication: Casual, quick, and often verbal: chats, instant messages, hallway conversations. (Project Management Institute. (2021)

II.3.3 Objectives of project communication management

The objectives of project communication management are multifaceted and essential for ensuring project success. Primarily, communication management processes are designed to clearly define the communication needs of a project, which involves identifying what information is required, by whom, and at what stage of the project lifecycle (Aga et al., 2016). A critical component of this process is stakeholder analysis, which seeks to determine who the stakeholders are, their roles and interests, and the potential impact they may have on the project or the impact the project may have on them. Based on this analysis, a stakeholder management plan is developed to facilitate targeted and effective communication (Aaltonen, 2011).

Furthermore, project communication management involves defining the necessary messages, selecting appropriate media and communication channels, assigning communication responsibilities, and determining optimal timing for message dissemination. This structured approach ensures that information flows efficiently within the project team and to all relevant stakeholders, thereby supporting informed decision-making and proactive issue resolution (Meng, 2012). Ultimately, the overarching objective is to ensure that the right people receive the right information at the right time, thereby meeting project needs, aligning stakeholder expectations, and contributing to the achievement of project goals (Aga et al., 2016; Meng, 2012).

II.3.4 Communication management process

The PMBOK Guide states that project communication management consists of the subsequent procedure:

- Identify the stakeholders: It is the process of identifying all the people or organizations concerned with the project, and documenting the relevant information about their interests, their involvement, and their impact on the success of the project.
- Manage communications: It is the process of determining the information needs of the project stakeholders and defining an approach for communications.
- Mastering communications: It is the process of making the necessary information available to the project stakeholders, as planned.

II.3.5 Group decision-making techniques and tools

II.3.5.1 Brainstorming

Definition: Creative group technique to generate ideas without judgment
Usage: To explore creative solutions or ideas.
Benefits: Stimulates creativity and encourages participation.
Precautions: Avoid criticism during the session to keep ideas flowing freely.
Steps (Approach):

- Present the topic.
- Encourage free expression of ideas.
- Write down all suggestions.
- Analyze them later.

II.3.5.2 Reverse Brainstorming

Definition: Technique to identify the root causes of a problem by thinking about how to create failure.
Usage: To discover potential causes of a problem.
Benefits: Helps uncover hidden issues by flipping the perspective.
Precautions: Needs careful facilitation to avoid confusion.
Steps (Approach):

- Rephrase the problem in reverse.
- Generate ideas about how to create failure.
- Reverse those to find real solutions.

II.3.5.3 Delphi Technique

Definition: Structured process of gathering expert opinions through multiple rounds of anonymous questionnaires.
Usage: To reach expert consensus on complex issues.
Benefits: Promotes informed consensus while reducing influence bias.
Precautions: Time-consuming and requires thoughtful planning.
Steps (Approach):

- Send an initial questionnaire to experts,
- Summarize the responses,
- Send a revised version for feedback,
- Repeat until consensus is reached.

II.3.5.4 Six Thinking Hats

Definition: Parallel thinking technique where each “hat” represents a different thinking mode.
Usage: To explore an issue from multiple structured perspectives.
Benefits: Promotes complete analysis by separating types of thinking (emotional, logical, etc.)
Precautions: May feel artificial if participants are unfamiliar with the method.
Steps (Approach):

- Assign a “hat” (color) to each thinking mode.
- Analyze the problem one mode at a time.
- Combine insights for a balanced decision.

II.3.5.5 Nominal Group Technique

Definition: Structured process for idea generation and prioritization while minimizing dominant voices.
Usage: To make group decisions while ensuring equal participation.
Benefits: Encourages equal contribution and produces a clear idea ranking.
Precaution: Can seem rigid and needs disciplined facilitation.
Steps (Approach):

- Each participant writes down ideas individually,

- Votes to prioritize.

II.3.5. 6Weighted Voting with Points

Definition: Prioritization method where each participant gets a fixed number of points to distribute among options.

Usage: To rank options or ideas in a group.

Benefits: Supports collective decision-making and reflects group preferences.

Precaution: Ensure participants understand all options clearly to allocate points meaningfully.

Steps (Approach):

- Present the options.
- Assign fixed points to each participant.
- Have them distribute points by preference.
- Sum the results to create a ranking.

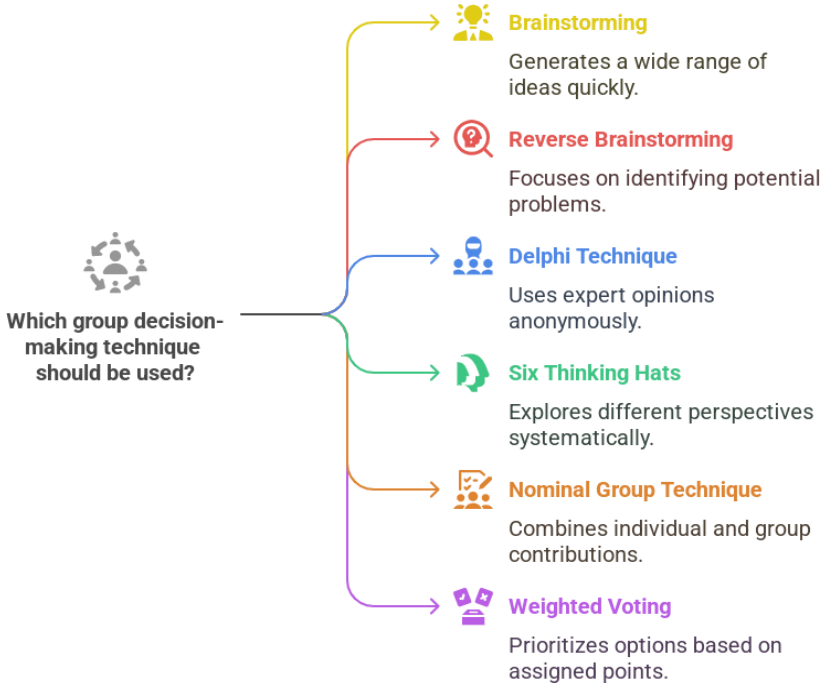


Figure I.13: Group decision-making techniques and tools (Source: Author, 2025).

II.4 Stakeholders' management

II.4.1 Definition

Process required to identify the individuals, groups, or organizations likely to affect or be affected by the project, to analyze the stakeholders' expectations and their impact on the project, but also to develop appropriate management strategies to effectively engage stakeholders by involving them in the project decisions and execution. These processes allow the project team to analyze the expectations of stakeholders, assess the extent to which they affect or are affected by the project, and develop strategies to effectively involve them in project decision-making as well as in the planning and execution of the project PMBOOK 6.

II.4.2 Key concepts for stakeholder management

Every project has stakeholders who are impacted by or can impact the project in a positive or negative way. Some stakeholders may have a limited ability to influence the project's work or outcomes; others may have significant influence on the project and its expected outcomes. Academic research and analyses of high-profile project disasters highlight the importance of a structured approach to the identification, prioritization, and engagement of all stakeholders. The ability of the project manager and team to correctly identify and engage all stakeholders in an appropriate way can mean the difference between project success and failure. To increase the chances of success, the

process of stakeholder identification and engagement should commence as soon as possible after the project charter has been approved, the project manager has been assigned and the team begins to form.

Stakeholder satisfaction should be identified and managed as a project objective. The key to effective stakeholder engagement is a focus on continuous communication with all stakeholders, including team members, to understand their needs and expectations, address issues as they occur, manage conflicting interests, and foster appropriate stakeholder engagement in project decisions and activities.

II.4.3 Stakeholder Management Process

Project Stakeholder Management includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution.

The processes support the work of the project team to analyze stakeholder expectations, assess the degree to which they impact or are impacted by the project, and develop strategies to effectively engage stakeholders in support of project decisions and the planning and execution of the work of the project. The Project Stakeholder Management processes are:

- **Identify Stakeholders**: The process of identifying project stakeholders regularly and analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success.
- **Plan Stakeholder Engagement:** The process of developing approaches to involve project stakeholders based on their needs, expectation, interests, and potential impact on the project.
- **Manage Stakeholder Engagement:** The process of communicating and working with stakeholders to meet their needs and expectations, address issues, and foster appropriate stakeholder engagement involvement.
- **Monitor Stakeholder Engagement:** The process of monitoring project stakeholder relationships and tailoring strategies for engaging stakeholders through the modification of engagement strategies and plans.

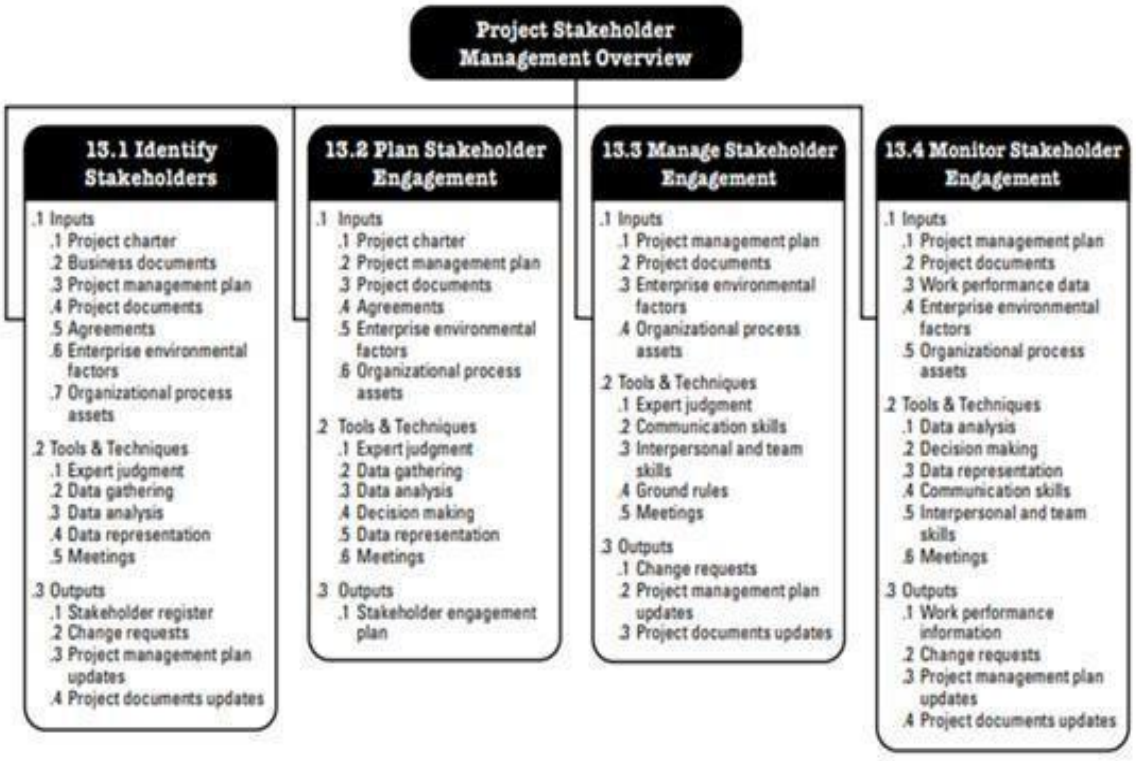


Figure I.14 : Project Stakeholder Management processes (Source: PMBoK).

II.4.4 Stakeholder management techniques, Project, actors, and change management

II.4.4.1 Stakeholder Engagement Assessment Matrix

Definition: Tool to assess the level of stakeholder engagement in a project.
Usage: Identify key stakeholders and their level of involvement.
Benefits: Facilitates expectation management and targeted communication.
Precaution: Requires accurate information about each stakeholder.
Steps (Approach):

- List stakeholders.
- Assess their level of engagement.
- Develop strategies to boost involvement.

II.4.4.2 Stakeholder Positioning Matrix

Definition: Diagrams that place stakeholders based on their power and interest.
Usage: Prioritize communication and engagement efforts.
Benefits: Helps allocate stakeholder management resources effectively.
Precautions: Must be updated regularly as dynamics change.
Steps (Approach):

- Identify stakeholders.
- Assess their power and interest.
- Place them on the matrix.
- Define suitable actions.

II.4.4.3 Dominance Model 3 set Venn Diagram

Definition: Visualizes interactions between three key project dimensions.
Usage: Analyze areas of overlap and divergence.
Benefits: Provides a holistic view of project dynamics.
Precautions: Can be hard to interpret without proper training.
Steps (Approach):

- Define the three dimensions.
- Identify overlap zones.
- Analyze their impact on the project.

II.4.4.4 Performance Prism

Definition: Framework for evaluating project performance from multiple perspectives.
Usage: Assess overall project performance.
Benefits: Enables multidimensional evaluation.
Precautions: Risk of subjective evaluation if criteria are not clear.
Steps (Approach):

- Determine performance axes.
- Collect relevant data.
- Analyze results per dimension.

II.4.4.5 Grief Curve

Definition: Model describing emotional stages during a change.
Usage: Understand individual reactions to change.
Benefits: Helps anticipate and manage resistance.
Precaution: Avoid generalizing; each person reacts differently.
Steps (Approach):

- Identify grief stages.
- Observe stakeholder responses.
- Adjust communication and support accordingly.

II.4.4.6 Kano Model

Definition: Tool to analyze customer satisfaction based on product or service features.

Usage: Prioritize features based on their impact on satisfaction.
Benefits: Guides product development to align with customer expectations.
Precautions: May require in-depth market research.
Steps (Approach):
- Identify features.
- Categorize according to Kano's model.
- Adjust product strategy accordingly

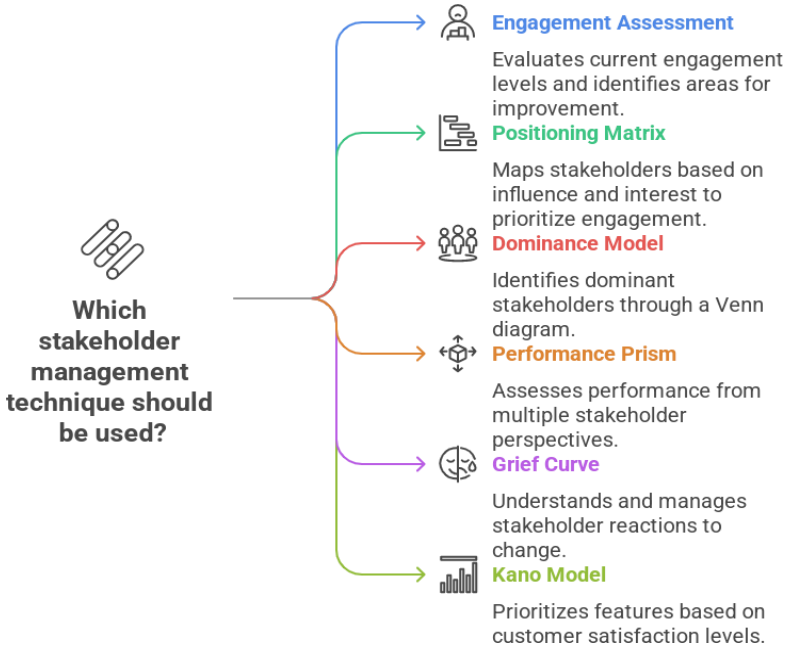


Figure I.15: Stakeholder management techniques and tools (Source: Author, 2025).

Among these tools, the tool selected for this purpose is Stakeholder Engagement Assessment Matrix.

II.4.5 Stakeholder Engagement Assessment Matrix (the selected tool)

II.4.5.1 Definition

A stakeholder engagement assessment matrix is a structured tool used to analyze and prioritize stakeholders involved in a project or organization. It helps in understanding the level of influence, interest, and impact each stakeholder has on the project's outcomes. By assessing stakeholders through this matrix, you can identify key players who require more attention, tailor communication strategies accordingly, allocate resources efficiently, and mitigate risks effectively. This method ensures that stakeholders are engaged in a way that supports project success and fosters positive relationships throughout the project lifecycle.

The Stakeholder Engagement Assessment Matrix is a strategic tool designed to facilitate the identification, analysis, and management of stakeholders in various contexts, including project planning and implementation. It serves as a framework for assessing stakeholder involvement, ensuring their needs and perspectives are effectively integrated into project processes. The concept of stakeholder engagement revolves around the active collaboration and participation of stakeholders throughout the project lifecycle, enhancing overall project success.

II.4.5.2 Process of Stakeholder Engagement Assessment Matrix

The Stakeholder Engagement Assessment Matrix (SEAM) is a structured tool utilized in managing stakeholder interactions across various sectors, particularly within project management and organizational contexts. The development and application of this matrix involve several critical processes, all of which are informed by extensive literature on stakeholder engagement.

To initiate the stakeholder engagement process effectively, it is crucial to identify and categorize stakeholders according to their influence and interest concerning the project. This categorization informs the nature of the engagement and the strategies employed to involve these groups in decision-making processes. For instance, Tarode and Shrivastava explained the utilization of a structured approach to evaluate stakeholder incorporation effectively.

II.4.5.3 The importance of stakeholder engagement

Stakeholder engagement is crucial because it helps ensure the success of a project. Here's why:

1. **Builds support and trust:** Engaging stakeholders from the beginning helps build trust and support for the project. When people feel involved and heard, they are more likely to back the project and work towards its success.
2. **Identifies risks early:** By involving stakeholders, you can identify potential risks and issues early on. Stakeholders can provide valuable insights and feedback that help you anticipate and address problems before they escalate.
3. **Improves decision-making:** Stakeholders often have diverse perspectives and expertise. Engaging them can lead to better decision-making as you consider a wider range of viewpoints and solutions.
4. **Enhances communication:** Regular engagement keeps stakeholders informed and reduces misunderstandings. Clear communication ensures that everyone knows what is happening, why it's happening, and how it affects them.
5. **Increases project success:** Projects are more likely to succeed when stakeholders are actively involved and committed. Their input and support can help overcome obstacles and ensure that the project meets its goals and delivers value.
6. **Builds long-term relationships:** Effective stakeholder engagement helps build strong, long-term relationships. These relationships can be beneficial for future projects and ongoing collaboration.

II.4.5.4 Benefits and Limitations of the Stakeholder Assessment Matrix

a. Benefits

- **Strategic focus:** Provides a structured approach to identify and prioritize stakeholders based on their influence, interest, and impact. This ensures that resources and efforts are directed towards stakeholders who can significantly impact project outcomes.
- **Improved communication:** Enhances communication by tailoring messages and engagement strategies to meet the specific needs and expectations of different stakeholder groups. This fosters better relationships and increases stakeholder support.
- **Risk management:** Helps in identifying potential risks early by understanding stakeholder concerns and expectations. This proactive approach allows organizations to mitigate risks and avoid conflicts that could derail project progress.
- **Resource allocation:** Facilitates efficient allocation of resources by prioritizing engagement efforts. This ensures that limited resources such as time, budget, and personnel are used effectively to achieve project objectives.
- **Continuous improvement:** Enables organizations to monitor stakeholder dynamics over time and adjust strategies as needed. This adaptability ensures that engagement remains relevant and responsive to evolving project conditions and stakeholder needs.

b. Limitations

- **Subjectivity:** Scoring stakeholders based on influence, interest, and impact can be subjective and influenced by personal biases or limited information. This may lead to inconsistencies in stakeholder assessments.
- **Complexity:** Developing and maintaining a stakeholder engagement assessment matrix requires time and effort. It may be challenging to gather accurate data and ensure the matrix reflects current stakeholder dynamics, especially in large or complex projects.

- **Over-reliance:** There's a risk of over-relying on the matrix as a standalone tool without considering qualitative factors or stakeholder feedback. Effective stakeholder engagement requires a holistic approach that includes direct communication and relationship-building efforts.
- **Dynamic environment:** Stakeholder relationships and priorities can change rapidly, especially in dynamic environments. The matrix may need frequent updates to remain relevant and effective, which requires ongoing monitoring and adjustment.

II.5 Project Schedule management

II.5.1 Definition

Project schedule management is a critical knowledge area within project management that focuses on the processes required to ensure the timely completion of a project. This domain encompasses the planning, development, monitoring, and control of project timelines, ensuring that all project activities are completed within the defined time constraints (Project Management Institute, 2017). Effective schedule management begins with the identification and sequencing of project activities, followed by the estimation of the duration and resources required for each task. Advanced scheduling techniques, such as the Critical Path Method (CPM) and Program Evaluation and Review Technique (PERT), are frequently employed to optimize task sequencing and resource allocation, thereby minimizing delays and enhancing project efficiency (Kerzner, 2022; Iqbal et al., 2015).

A well-constructed project schedule serves as a roadmap for project execution, enabling project managers to track progress, anticipate potential bottlenecks, and implement corrective actions when necessary. Regular schedule monitoring and updating are essential for accommodating changes and uncertainties that may arise during the project lifecycle (Mir & Pinnington, 2014). Furthermore, effective communication of the schedule to all stakeholders is crucial for aligning expectations and ensuring coordinated efforts across project teams (Meng, 2012).

Recent research highlights the importance of integrating schedule management with risk management and resource management to achieve project objectives and enhance overall performance (Iqbal et al., 2015; Mir & Pinnington, 2014). Ultimately, robust project schedule management contributes significantly to project success by ensuring timely delivery, optimizing resource utilization, and supporting informed decision-making throughout the project.

According to Mubarak (2010), as cited in Bjarnason (2017), a good scheduling system in project management is based on three essential pillars:

- **The Human Factor:** A competent planner or planning team that understands the concepts, definitions, and applications of project scheduling.
- **Technology:** A good scheduling information system (software and hardware) along with competent IT support.
- **Management:** A dynamic, responsive, and supportive leadership that believes in the use of scheduling as part of the management effort.

These pillars collectively support the creation of a robust scheduling framework that enhances project predictability, facilitates proactive management, and contributes to overall project success (Mubarak, 2010, as cited in Bjarnason, 2017).

II.5.2 Schedule management process

The schedule management process is a fundamental aspect of project management that ensures all project activities are planned, organized, and executed within the agreed timeframe. This process begins with the development of a schedule management plan, which outlines the methods and tools to be used for scheduling and monitoring progress. It involves defining and sequencing project activities, estimating the resources and durations required, and developing a detailed project schedule that serves as a roadmap for the team. Throughout the project, the schedule is regularly monitored and updated to reflect actual progress, manage changes, and address any delays or risks that may arise. Effective schedule management enables project managers to allocate resources efficiently,

maintain stakeholder communication, and ensure that project milestones and deadlines are consistently met, ultimately contributing to the successful delivery of the project. The main steps in the schedule management process are as follows:

1. **Plan Schedule Management**: Define how the schedule will be managed, monitored, and controlled.
2. **Define Activities**: Identify and document all the tasks required to complete the project.
3. **Sequence Activities**: Determine the order and dependencies among tasks.
4. **Estimate Activity Resources**: Assess what resources (people, equipment, and materials) are needed for each task.
5. **Estimate Activity Durations**: Forecast the time required to complete each activity.
6. **Develop Schedule:** Create the project schedule, setting start and finish dates for each activity.
7. **Control Schedule**: Monitor progress, manage changes, and update the schedule as needed.

II.5.3 Techniques and Tools for schedule Control According to Their Phases of Use:

The techniques and tools used in time control have been categorized based on their type, usage, and phase of application into visualization, estimation, and planning tools:

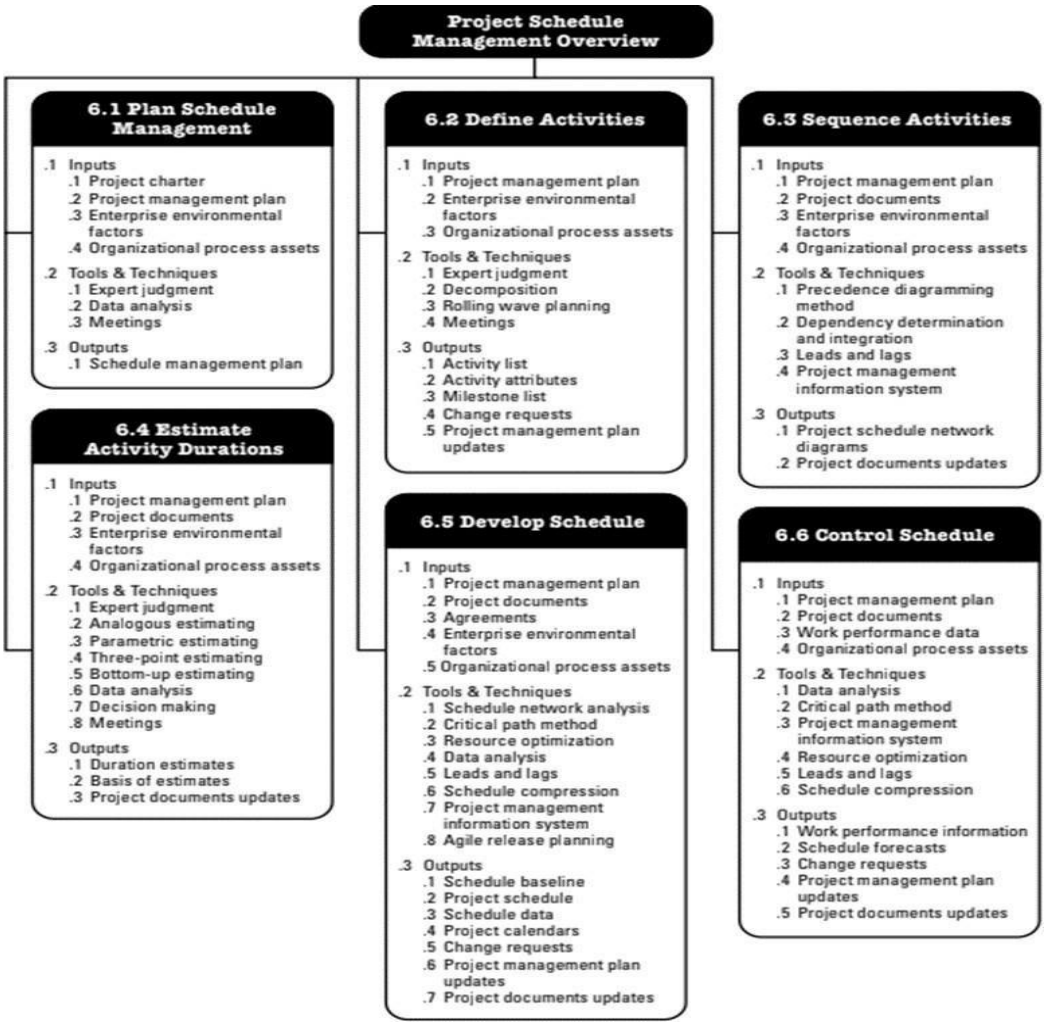


Figure I.16 : Project Schedule Management processes (Source: PMBoK).

II.5.4 Schedule management techniques and tools

II.5.4.1 Critical Path Method (CPM)

Definition: Technique used to identify the sequence of critical activities that determine the project duration.

Usage: Used to find the longest path of dependent tasks and highlight tasks with no flexibility (zero float).
Benefits: Identifies key tasks that must not be delayed and helps in resource and priority planning
Precaution: Assumes fixed durations (not suitable for uncertain environments).
Steps (Approach):
- List activities.
- Determine dependencies.
- Estimate activity durations.
- Build a network diagram
- Calculate earliest and latest start/finish times.
- Identify the critical path

II.5.4.2 Resource Optimization (Leveling & Smoothing)

Definition: Techniques that adjust the schedule based on resource constraints.
Usage: Used when resources are over-allocated or unevenly distributed.
Benefits: Balances workload and avoids resource conflicts.
Precautions: May extend project duration (especially in leveling) and require re-sequencing.
Steps Approach:
- Identify over-allocated resources
- Apply leveling to delay tasks without violating constraints
- Apply smoothing if flexibility (float) exists
- Update schedule
- Review effects on critical path

II.5.4.3 Schedule Compression (Crashing and Fast Tracking)

Definition: Techniques used to reduce the overall duration of the schedule without changing the project scope.
Usage: Applied when deadlines must be met despite delays.
Benefits: Helps meet fixed deadlines and provides flexibility in managing risks.
Precautions: Crashing increases costs and fast tracking increases risks and rework.
Steps Approach:
- Identify critical path activities
- Evaluate possibilities for parallel execution (fast tracking)
- Evaluate additional resources (crashing)
- Assess cost/time trade-offs
- Update and monitor schedule

II.5.4.4 Schedule Network Analysis

Definition: Technique to examine logical relationships between activities to optimize scheduling.
Usage: Used to model and refine the project timeline.
Benefits: Highlights dependencies and improves timeline accuracy.
Precautions: Complex networks may require software support and errors in logic can affect entire schedule.
Steps Approach:
- Define all project activities
- Identify relationships and dependencies
- Create a network diagram
- Analyze paths and constraints
- Validate and refine the model

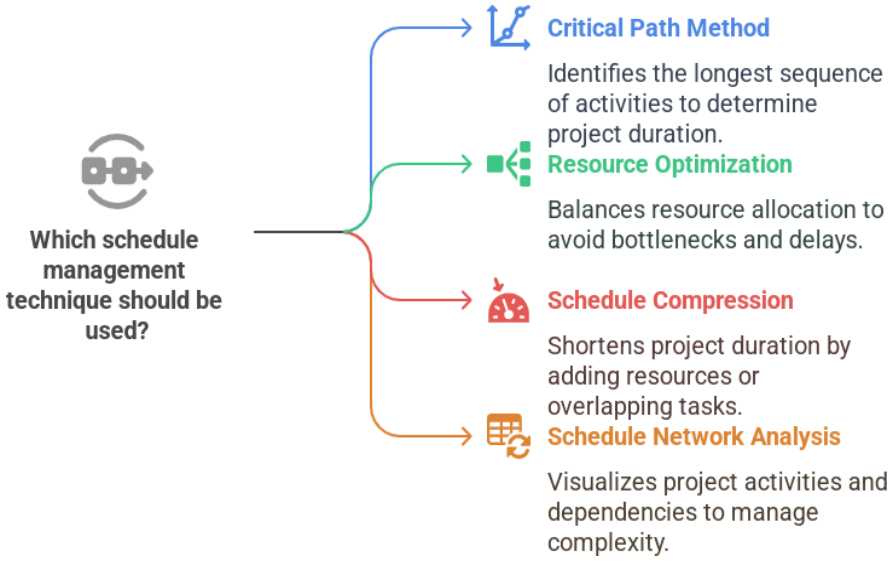


Figure I.17: Schedule management techniques and tools (Source: Author, 2025).

Conclusion

Schedule management process stands out as a cornerstone of effective project management, particularly within the context of Algeria's residential sector, where timely delivery is both a strategic and operational imperative1. By systematically planning, organizing, and controlling project timelines, schedule management enables stakeholders to anticipate challenges, allocate resources efficiently, and maintain clear communication throughout the project lifecycle. The structured approach beginning with the development of a schedule management plan and progressing through activity definition, sequencing, resource and duration estimation, schedule development, and ongoing control provides a robust framework for navigating the complexities inherent in construction projects.

However, as evidenced by the recurring delays in Algerian public projects, successful schedule management requires more than just technical tools; it demands realistic planning, transparent procedures, and proactive risk mitigation to address internal factors such as ineffective planning, payment delays, and coordination issues. Integrating advanced scheduling techniques, fostering collaboration among stakeholders, and investing in training and technology are essential for overcoming these challenges and achieving project objectives on time Ultimately, mastering the schedule management process not only increases the likelihood of project success but also contributes to sustainable development and improved living standards, reinforcing its critical role in the broader landscape of project management in Algeria.

Second chapter
Analytical Approach

Introduction

The project is a collective housing complex situated in the new urban area of Biskra, a rapidly developing region in Algeria. Designed to address the increasing demand for modern, affordable, and sustainable housing for middle-income families, the project consists of 61 housing units, complemented by 36 carpentry workshops and 16 service spaces, distributed across a land area of 5,380 m².

Supervised by the Real Estate Agency Biskra.and managed jointly by the architectural group ARCHI CONCEPT, this development incorporates residential and commercial functions within a modern urban framework. Its strategic location ensures proximity to essential amenities, including schools, healthcare facilities, and public transport, fostering accessibility and community vibrancy. Aligned with Algeria's national housing strategy, the project emphasizes affordability, high-quality construction standards, and efficient urban integration.

I Project Technical Data Sheet

- **Project Name:** 61 housing units, complemented by 36 carpentry workshops and 16 service spaces.
- **Location:** New urban area, Biskra, Algeria
- **Total Area:** 5,380 m².
- **Project Features:**
  Total Housing Units: 61 units.
  - F3 Units: 29 units.
  - F4 Units: 32 units.

  Workshops and Services:
  - 36 carpentry workshops.
  - 16 service spaces.
- **Project Management:** Real Estate Agency Biskra.
- **Design Firm:** ARCHI CONCEPT
- **The contractor:** Bouaziz saber / Ziyane Yousef
- **Expected Completion Date:** 20/04/2024 (30 months).

Figure II.18: Project overview (Source : Real Estate Agency Biskra)

II Urban Analysis

II.1 Contextual Overview

II.1.1.1 Geographic Location

The gateway to the desert, the capital of Zibans, Biskra, is located in the southeast of Algeria, in the eastern part of the northern Sahara. It serves as the transition between the folded Atlas Mountains in the north and the flat, desert expanses in the south.

II.1.1.2 Geographic location

Biskra is a municipality in the northeastern Algerian Sahara. It covers an area of 22,379.95 km2,

- Geographical coordinates of Biskra, Algeria:
- Latitude: 34° 51' 1" N
- Longitude: 5° 43' 40" E

Figure II.19: (a) et (b), Situation géographique de la ville de Biskra ; (c) carte de découpage administratif, wilaya . (Source : www.google.com)

II.1.2 Climatological analysis

The altitude of the city is an average of 88 m, above sea level. The climate of Biskra is subtropical desert, with mild winters (during which it can be cold at night) and very hot summers. hot, dry and sunny. In summer, the average temperature is 43.5 °C, the average relative humidity is 12%, and in winter (average minimum temperature 4 °C, average maximum relative humidity 89%). Rainfall is rare and does not exceed 31 days per year. Biskra is located in the arid region, in the Insolation side, The incident solar radiation is very intense and of the order of 7680 Wh/m2, on a horizontal plane during the month of July, which corresponds to a duration of 383 hours of sunshine.

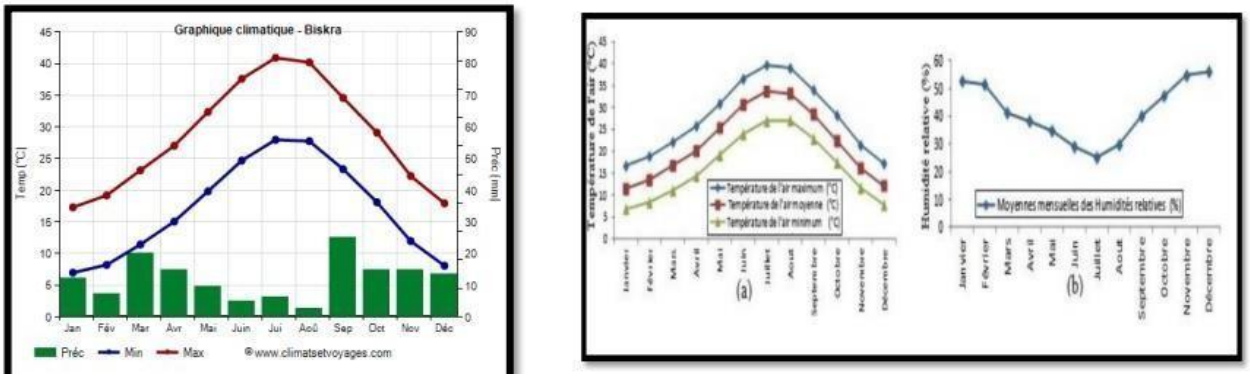


Figure II.20: Climate of the city Biskra (Source: meteonorme).

II.2 Urban Context

II.2.1 Project location

The project is located in the 2000 LPL housing site, a new urban pole, in the municipality of Biskra, Biskra province.

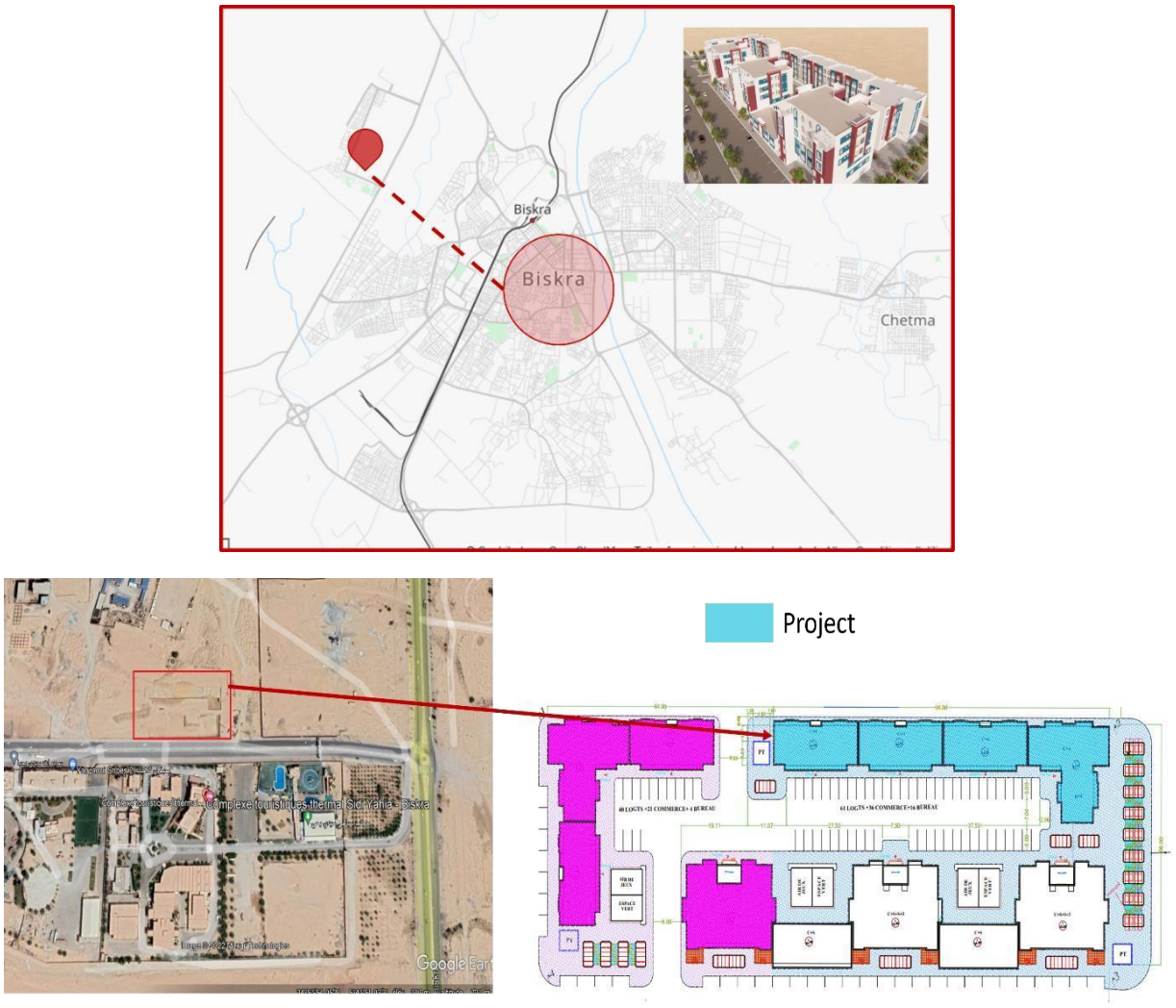


Figure II.21: Project location. (Source: design office Nebar Omar +Author treatment , 2025).

II.2.1.1 The site plot

The land has an area of 6 437.243m² with a rectangular shape

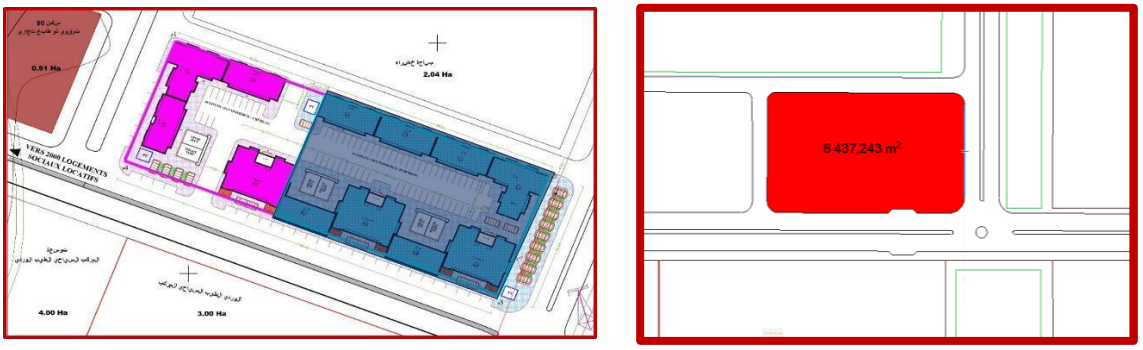


Figure II.22 : Site plot. (Source: design office Nebar Omar +Author treatment , 2025).

II.2.1.2 Environment of the project

The project is located near essential facilities, such as the Sidi Yahia Complex and schools, providing convenient access to key services. However, the surrounding area remains under development, with ongoing construction limiting the completion of the neighborhood's infrastructure and urban environment.

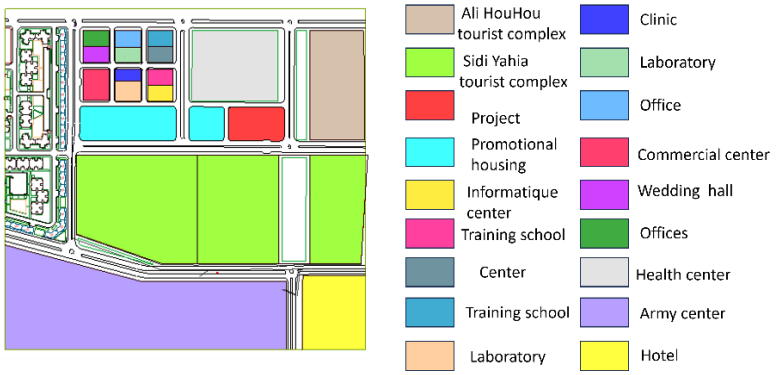


Figure II.23: Environment of the project. (Source: design office Nebar Omar +Author treatment , 2025).

II.2.1.3 Accessibility and Road Networks

The site enjoys a high level of accessibility due to its direct connection to the primary road network, including proximity to the national highway (RN03). Surrounded by main and secondary roads, the project is easily reachable from surrounding neighborhoods and urban centers. This advantageous positioning enhances its visibility, supports emergency and service vehicle access, and reinforces its integration into the wider urban fabric. The site's accessibility is a key asset for its functional efficiency and public reach.

Figure II.24: Accessibility and road networks of the site. (Source: design office Nebar Omar +Author treatment , 2025).

II.2.1.4 Mechanical access

The site demonstrates good mobility potential thanks to its integration within a structured road network that facilitates both pedestrian and vehicular circulation. The proximity to major axes such as the national road enhances regional connectivity, while the presence of secondary streets ensures smooth internal movement and access to the surrounding urban fabric. This multi-level connectivity supports efficient traffic flow, reduces congestion, and allows for the flexible movement of users, including emergency and service vehicles. The overall mobility framework contributes positively to the functionality, safety, and sustainability of the project.

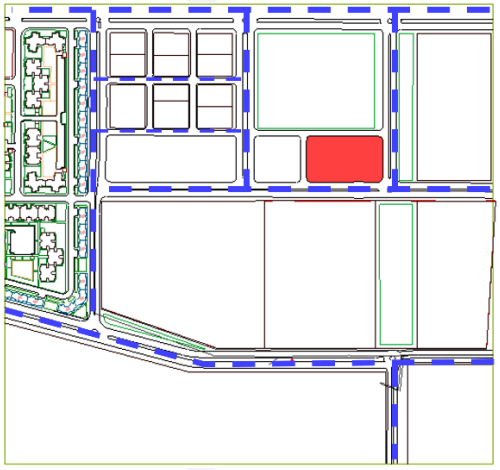


Figure II.25: Mechanical access. (Source: design office Nebar Omar +Author treatment , 2025).

II.2.1.5 Built and unbuilt system

Figure II.26: Built system. (Source: design office Nebar Omar +Author treatment , 2025).

II.2.1.6 Sun and wind

The orientation of the buildings minimizes sunlight exposure, taking into account Biskra's climate for natural heating and cooling.

Figure II.27: Sun and wind path of the site. (Source: design office Nebar Omar +Author treatment , 2025).

By analyzing the sun path, the project team determined the optimal positioning to limit direct sunlight penetration during the hottest hours of the day, thereby reducing heat gain inside the residences. This approach not only improves thermal comfort but also contributes to energy efficiency by lowering reliance on air conditioning. Similarly, consideration of the wind path ensures that prevailing breezes are harnessed to promote natural ventilation. Strategic placement of openings and building forms allows for the circulation of fresh air, further enhancing indoor comfort and air quality.

The combined analysis of sun and wind patterns provides a holistic foundation for sustainable building design, tailored to the environmental context of Biskra.

III Architectural Analysis

III.1 Site Plan and Mass Plan (Plan de Masse)

III.1.1.1 Placement of Buildings on the Site

The of 61 housing units, complemented by 36 carpentry workshops and 16 service spaces are distributed around the perimeter of the site, with a central parking area. This design optimizes space usage while keeping parking accessible to all residents.

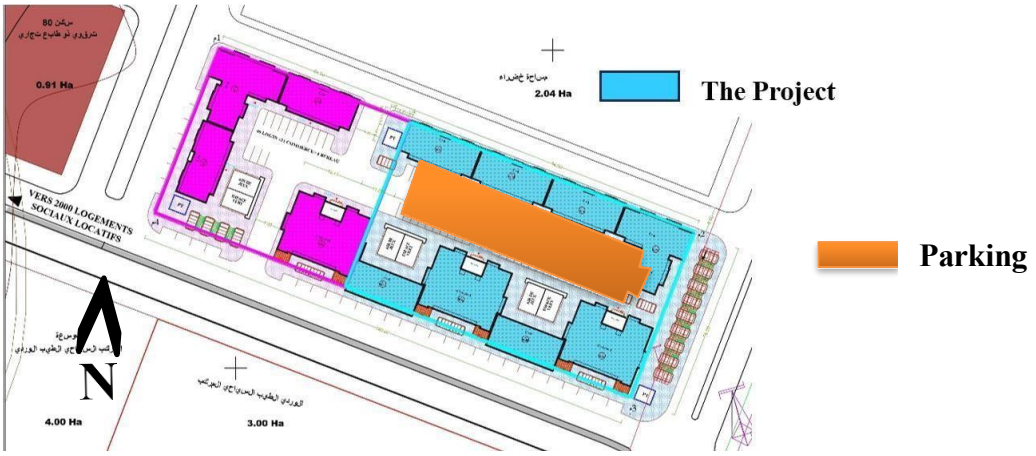


Figure II.28: Placement of Buildings on the Site (Source: design office Nebar Omar +Author treatment , 2025).

III.1.1.2 Circulation paths (vehicles, pedestrians)

Ensure easy access to the central parking area and roads surrounding the project. Vehicles able to move efficiently without congestion, and parking spaces logically distributed for all residents.

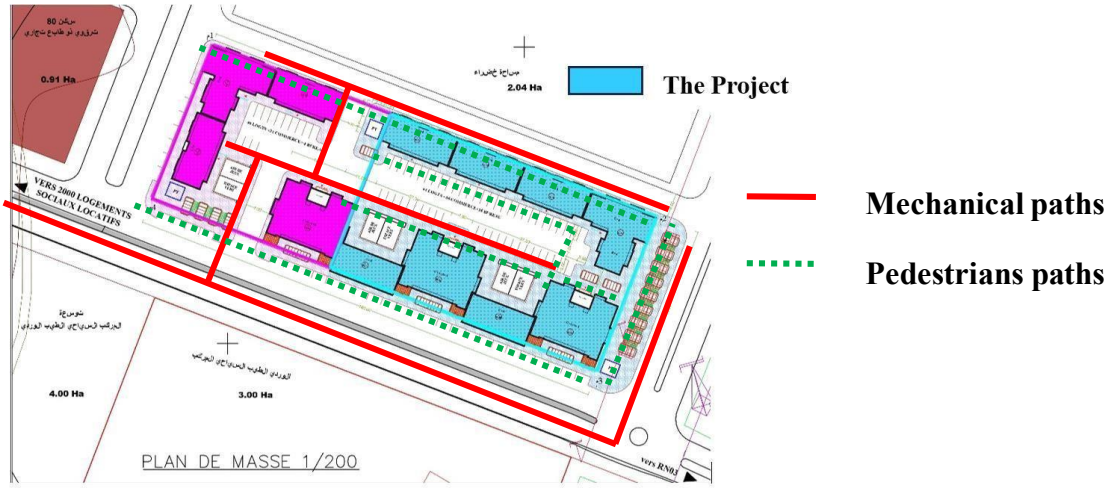
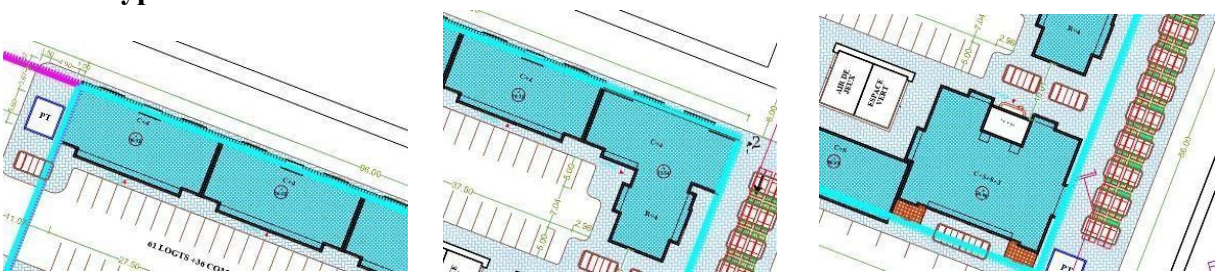


Figure II.29: Circulation Paths for Vehicles and Pedestrians (Source: design office Nebar Omar +Author treatment , 2025).

III.1.1.3 Types of units



Type (A) Block Bar Type (B) Block angle Type (C)

Figure II.30: Type of units (Source: design office Nebar Omar +Author treatment , 2025).

III.2 Floor Plans and Spatial Layouts

III.2.1 Type (A) Bar Block

III.2.1.1 Ground floor

In this project, the ground floor of block bar (A) is entirely dedicated to commercial spaces. This design promotes economic activity and provides essential services for residents and the surrounding community. The commercial area enhances the integration of the project into the urban fabric, serving as an active and accessible hub.

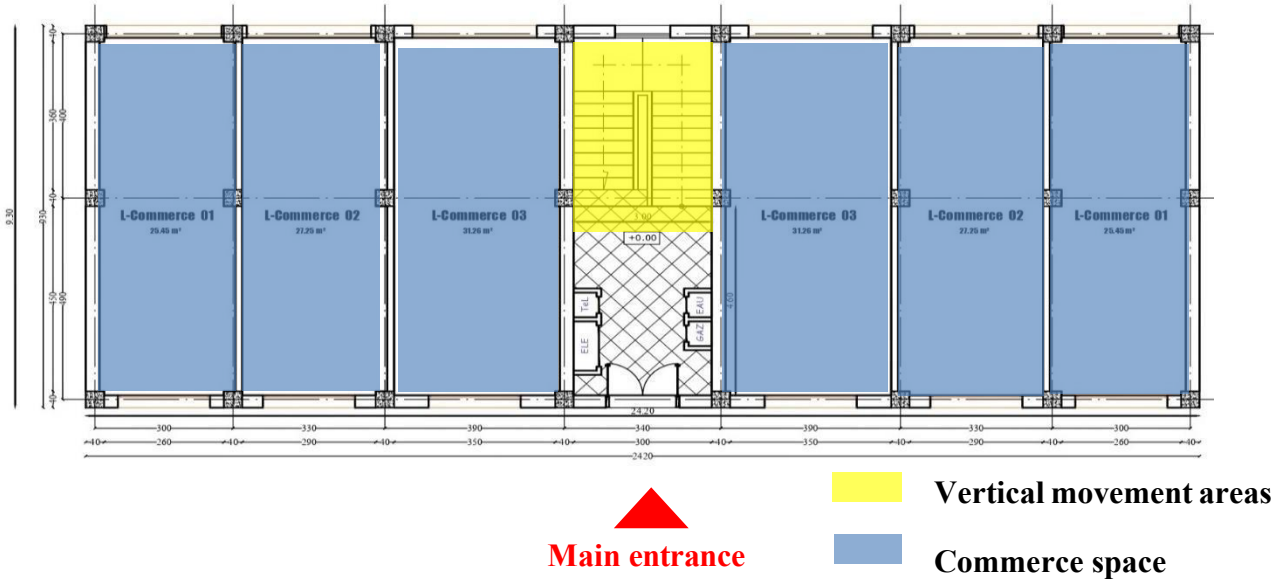


Figure II.31: Ground floor of bar block (Source: design office Nebar Omar +Author treatment , 2025).

III.2.1.2 Floors (+3.40/+6.63/+9.86/+13.09)

Each floor contains two separate F4 apartments, symmetrically arranged and separated by a vertical circulation core. This core includes a staircase, ensuring efficient and convenient access to both units while maintaining privacy for each apartment. This design maximizes the use of available space and supports functional living arrangements.

The design ensures a clear separation between wet areas (kitchens, bathrooms) and dry areas (living rooms, bedrooms). Wet zones are grouped together within the apartment layout for efficient plumbing and maintenance, while dry zones remain distinct to maintain comfort and functionality in living spaces. This arrangement enhances privacy and minimizes noise and moisture transfer between spaces.

The floor plan ensures that private areas (bedrooms) are well-separated from public spaces (living and dining areas). This separation provides a comfortable level of privacy for the residents, particularly by minimizing visibility and noise from the common areas.

Figure II.32: Floor of bar block (Source: design office Nebar Omar +Author treatment , 2025).

III.2.1.3 Facades and sections

The façade design adopts a simplified interpretation of the traditional Algerian architectural style, characterized by its balanced interplay of volumes and voids. The use of recessed and projected elements creates a dynamic visual rhythm, enhancing both depth and shadow play. Arches are subtly integrated, recalling the vernacular vocabulary while maintaining. This approach ensures a harmonious blend between cultural identity and modern construction standards

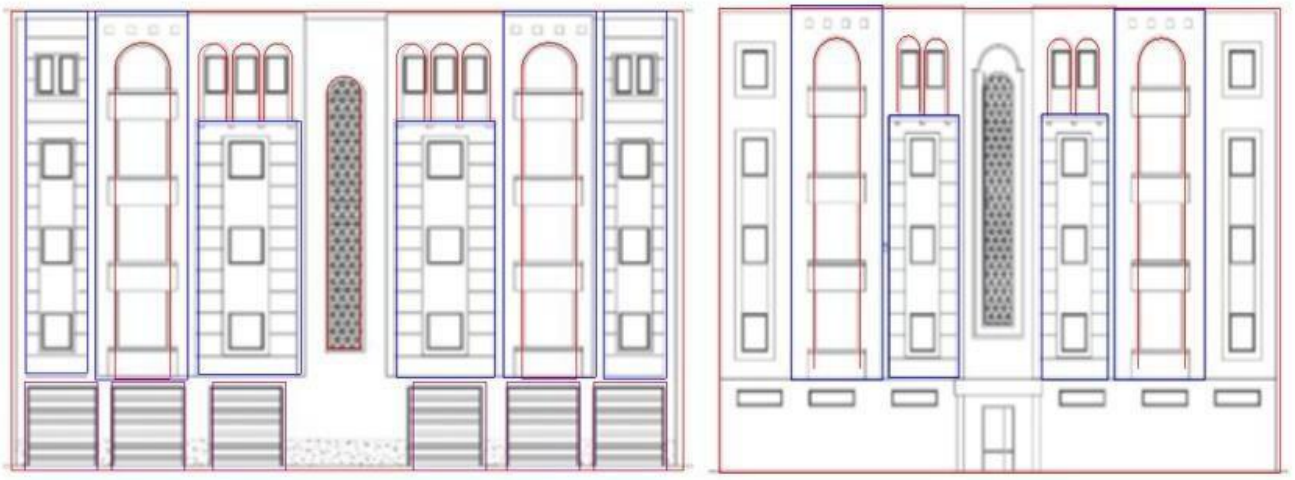


Figure II.33: Facades of bar block (Source: design office Nebar Omar +Author treatment , 2025).

III.2.1.4 Structural Sections

Cross-sections illustrate the building's structural system, including floor heights and the organization of spaces. These details provide valuable insights into the overall design coherence and the technical resolution of the building. The architect employed a traditional structural system known as the column beam system, which is based on a network of reinforced concrete columns and beams

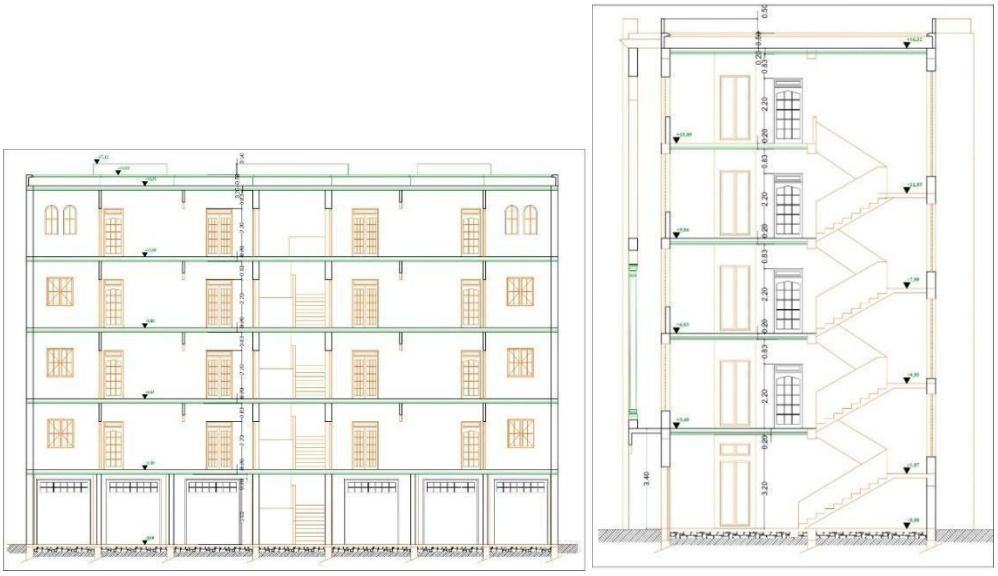


Figure II.34: Sections of bar block (Source: design office Nebar Omar +Author treatment , 2025).

III.2.2 Type (B) Corner Block

III.2.2.1 Ground floor

In the second type (block angle), the ground floor includes:

A F3 apartment for residential purposes, a space dedicated to commercial activities, ensuring functional diversity.

To maintain privacy and functionality: Separate entrances are provided for the commercial units and the residential building.

The layout ensures that commercial activities do not disrupt residential living, creating a clear distinction between public and private access.

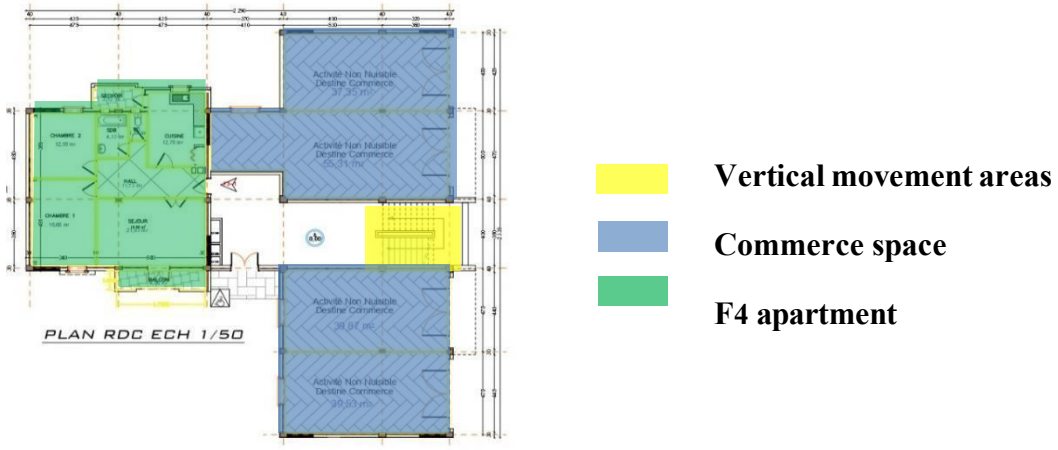


Figure II.35: Ground floor plan of Corner Block (Source: design office Nebar Omar +Author treatment , 2025).

III.2.2.2 Floors (+3.40/+6.63/+9.86)

Figure II.36: Typical Floor Plan of Corner Block (Source: design office Nebar Omar +Author treatment , 2025).

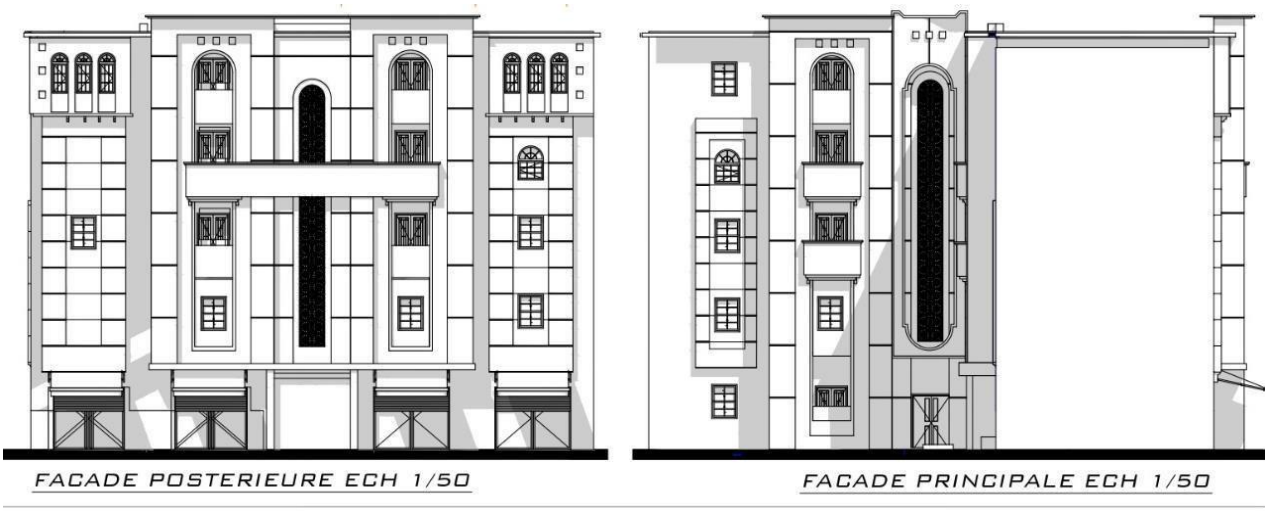


Figure II.37: Fronts of Corner Block (Source: design office Nebar Omar +Author treatment , 2025).

The façade design adopts a simplified interpretation of the traditional Algerian architectural style, characterized by its balanced interplay of volumes and voids. The use of recessed and projected elements creates a dynamic visual rhythm, enhancing both depth and shadow play. Arches are subtly integrated, recalling the vernacular vocabulary while maintaining.

III.2.2.3 Structural Sections

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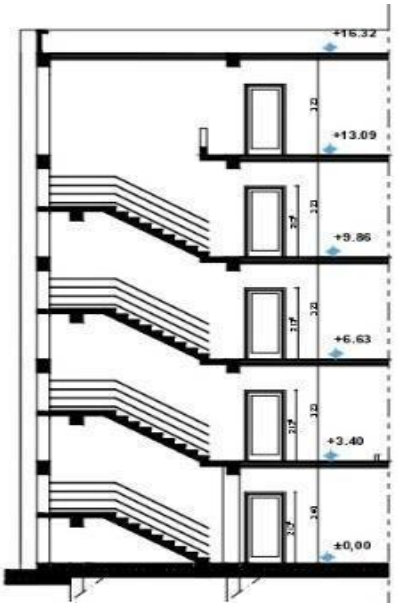

Figure II.38: Section of Corner Block (Source: design office Nebar Omar +Author treatment , 2025).

III.2.3 Type (C)

III.2.3.1 Ground floor

The third unit type is entirely dedicated to commercial spaces, featuring a high number of retail units to accommodate various businesses.

For safety and compliance with regulations: the design includes four staircases, strategically placed to ensure efficient evacuation and access in case of emergencies.

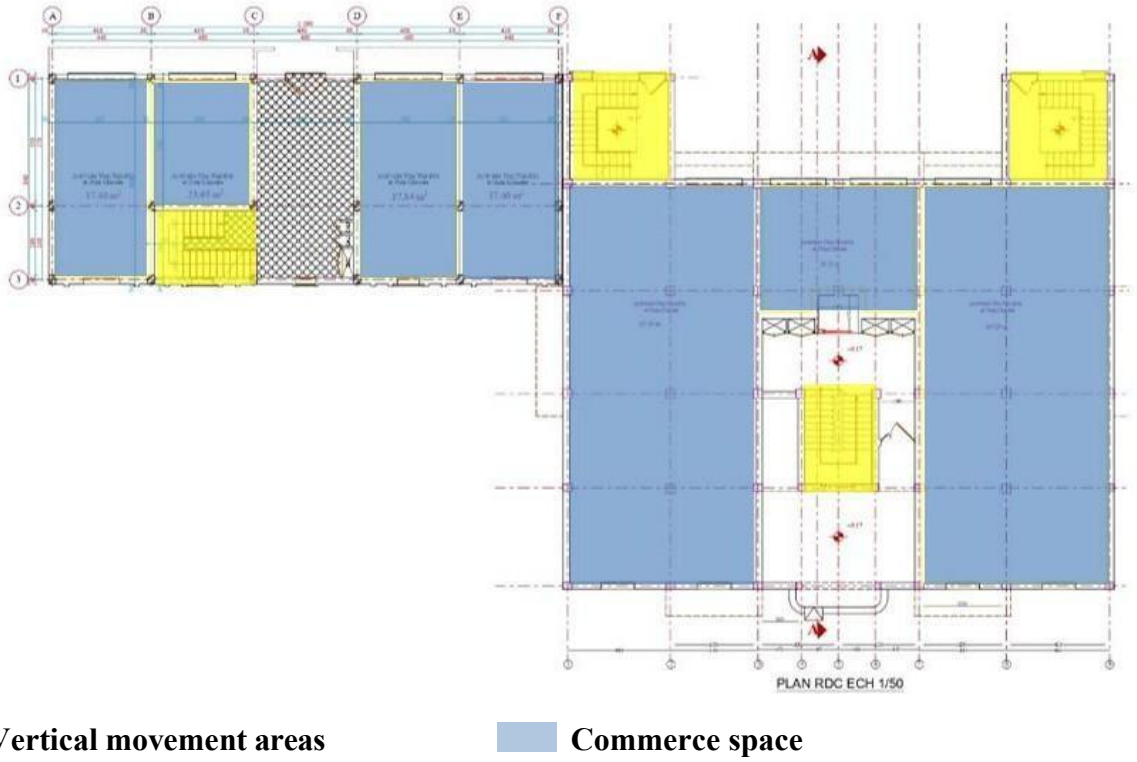

Figure II.39: Ground floor commerce space (Source: design office Nebar Omar +Author treatment , 2025).

III.2.3.2 Floors (+3.40/+6.63)

The first and second floors of this unit are fully dedicated to offices and various services. This design supports a wide range of professional and administrative functions, catering to the needs of the local community and businesses.

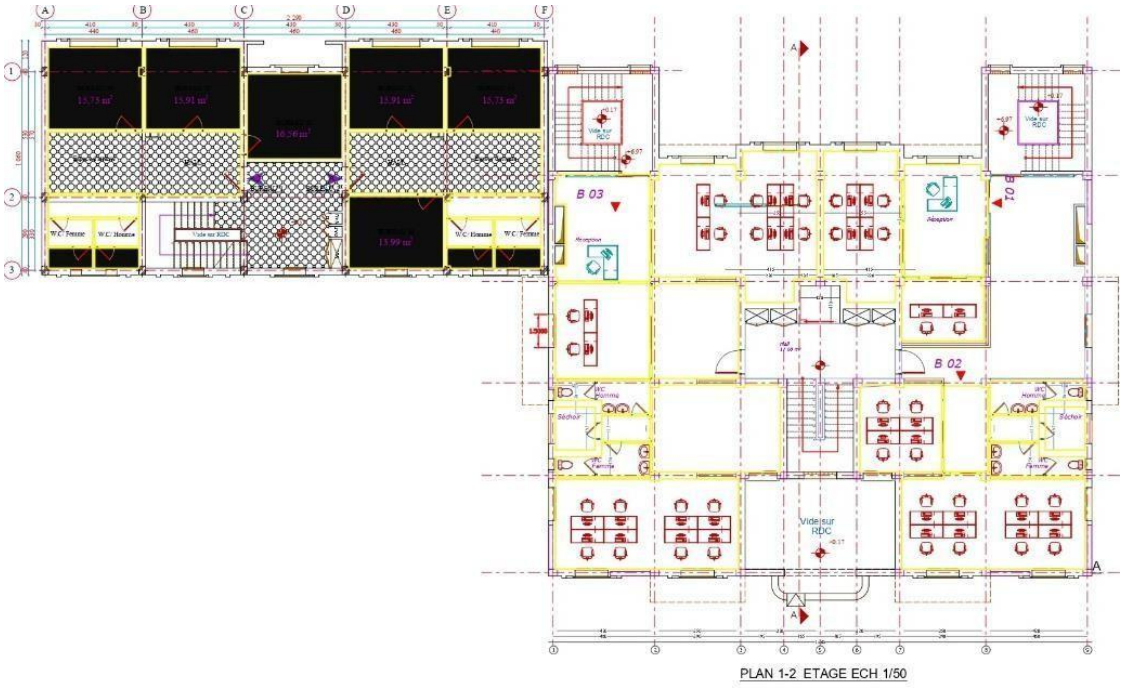

Figure II.40: First and Second Floor Plan (Source: design office Nebar Omar +Author treatment , 2025).

III.2.3.3 Floors (+6.63/+9.86/+13.26)

In the upper floors, part of the block is allocated to residential F3 and F4 apartments. Each floor contains four (4) apartments, symmetrically distributed around a central core that serves as the main point of circulation, including staircases.

Figure II.41: Third and fourth Floor Plan (Source: design office Nebar Omar +Author treatment , 2025).

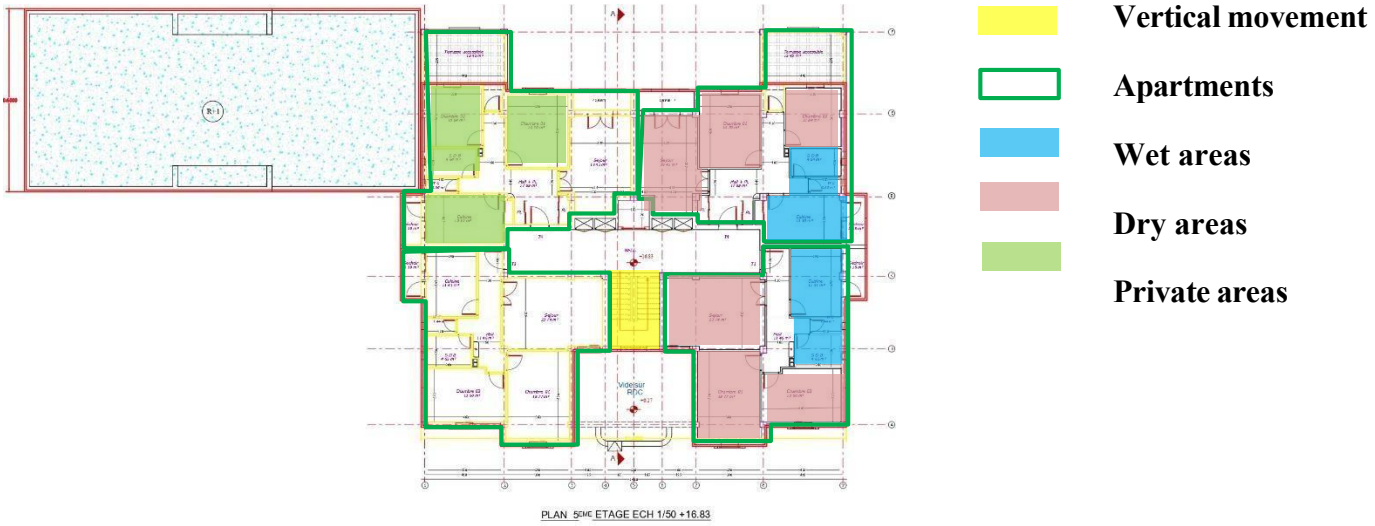

Figure II.42: Fifth Floor Plan (Source: design office Nebar Omar +Author treatment , 2025).

III.2.3.4 Facade and sections

The façade design adopts a simplified interpretation of the traditional Algerian architectural style,

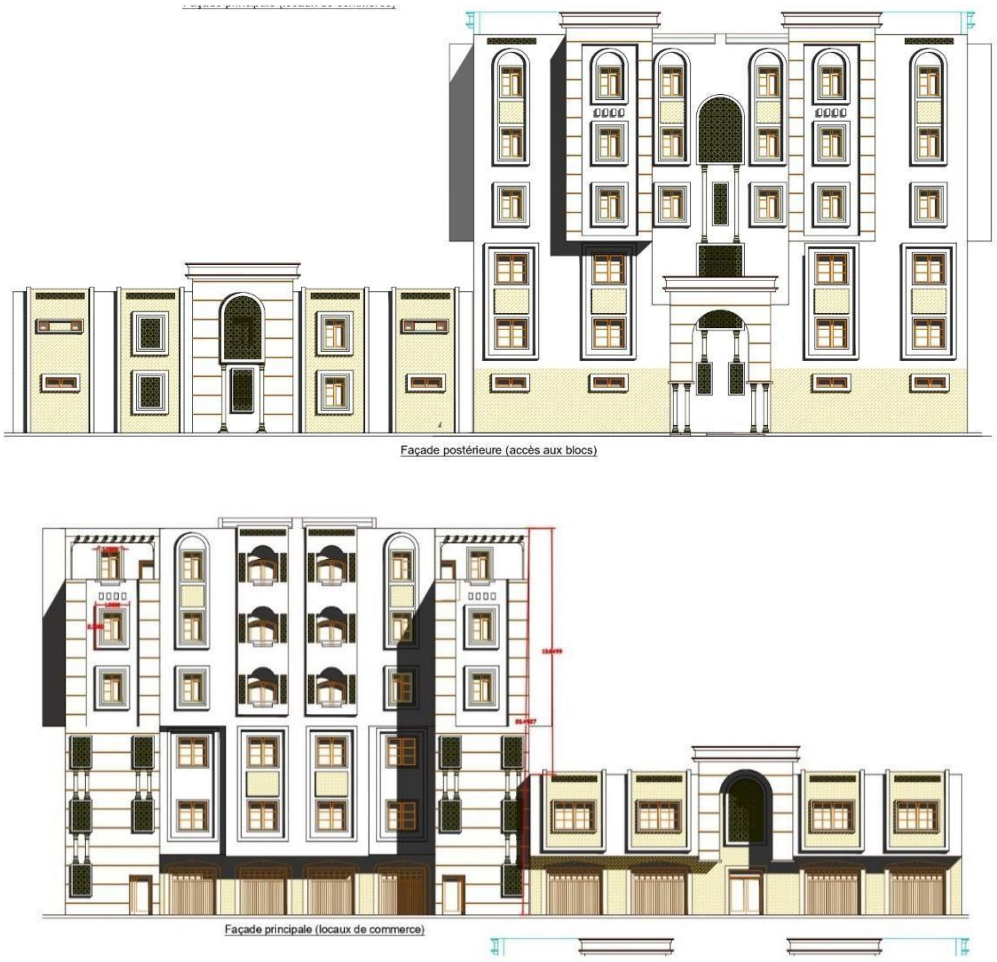

Figure II.43: Project facades (Source: design office Nebar Omar +Author treatment , 2025).

III.2.3.5 Structural Sections

Cross-sections illustrate the building's structural system, including floor heights and the organization of spaces. These details provide valuable insights into the overall design coherence and the technical resolution of the building. The architect employed a traditional structural system known as the column beam system, which is based on a network of reinforced concrete columns and beams.

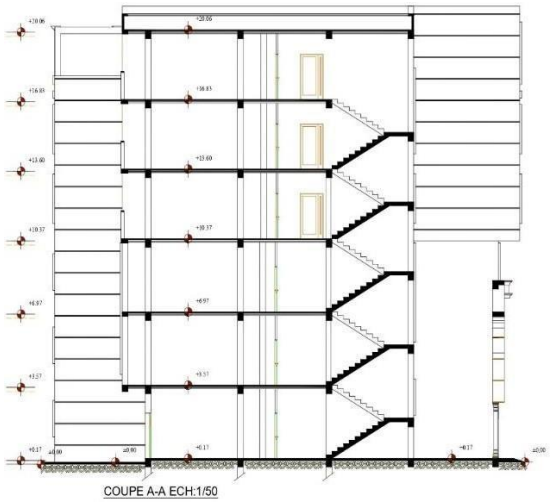

Figure II.44: Structural Sections (Source: design office Nebar Omar +Author treatment , 2025).

III.2.3.6 Floor Area Schedule for F3 and F4 Apartments

Table II.2: Floor Area Schedule for F3

F3 apartment	
kitchen	12.78
Living room	21.93
Bedroom 01	16.66
Bedroom 02	12.55
toilet	1.35
bathroom	4.13
Dryer	3.12
Totale : 72.52 m²	

Table II.3: Floor Area Schedule for F4

F4 apartment	
kitchen	13.16
Living room	18.74
Bedroom 01	12.68
Bedroom 02	15.25
Bedroom 03	13.33
toilet	1.81
bathroom	3.88
Dryer	4.33
Totale : 83.18 m²	

Table II. 4: Floor Area Schedule for Commerce (Source: Author, 2025).

Commerce	Area
01	39,35
02	39,87
03	55,31
04	37,35

IV Genesis of the project

The project subject to this operation consists of the realization of 61 Promotional Housing this phase of the operation consists of the realization of the program in all trades, including the lot for roads and various networks.

IV.1 Program and Planning

The 61 Promotional Housing Units development and construction project is part of an urban development program aimed at meeting the growing demand for modern and affordable housing. This program is included in the five-year real estate sector development plan.

IV.2 Initiation of the Awarding Process

The first stage consisted of a tender announcement published in the official newspapers (El Nasr and Le Courrier d'Algérie) on January 11, 2022, followed by the official announcement on January 20, 2022.

- Opening of bids: January 25, 2022
- Technical evaluation: January 31, 2022
- Financial evaluation: February 3, 2022
- Provisional award announcement: February 10, 2022
- Negotiation with the awarded company: February 15, 2022

IV.3 Project Award and Start of Works

The project was awarded to the following companies:

- Lot No. 01: Assigned to Bouaziz Saber Company (37/61 housing units + 22 commercial premises)
- Lot No. 02: Assigned to Ziane Youssef Company (24/61 housing units + 1 commercial premise + 16 service facilities)
- The project was officially registered on February 28, 2022.

IV.4 Execution of Works

- Order to start the works: April 5, 2022
- Suspension of works (first time): April 6, 2022
- Resumption of works (first time): June 20, 2022
- Meeting minutes were held on May 10, 2023, and an agreement was signed on May 18, 2023 to approve additional complementary works.
- Suspension of works (second time): June 14, 2023
- Resumption of works (second time): March 20, 2024

IV.5 Project Duration and Monitoring

- Estimated execution duration: 22 months
- Monitoring: Conducted by the officials of the Wilaya Agency for Urban Land Management and Regulation of Biskra.

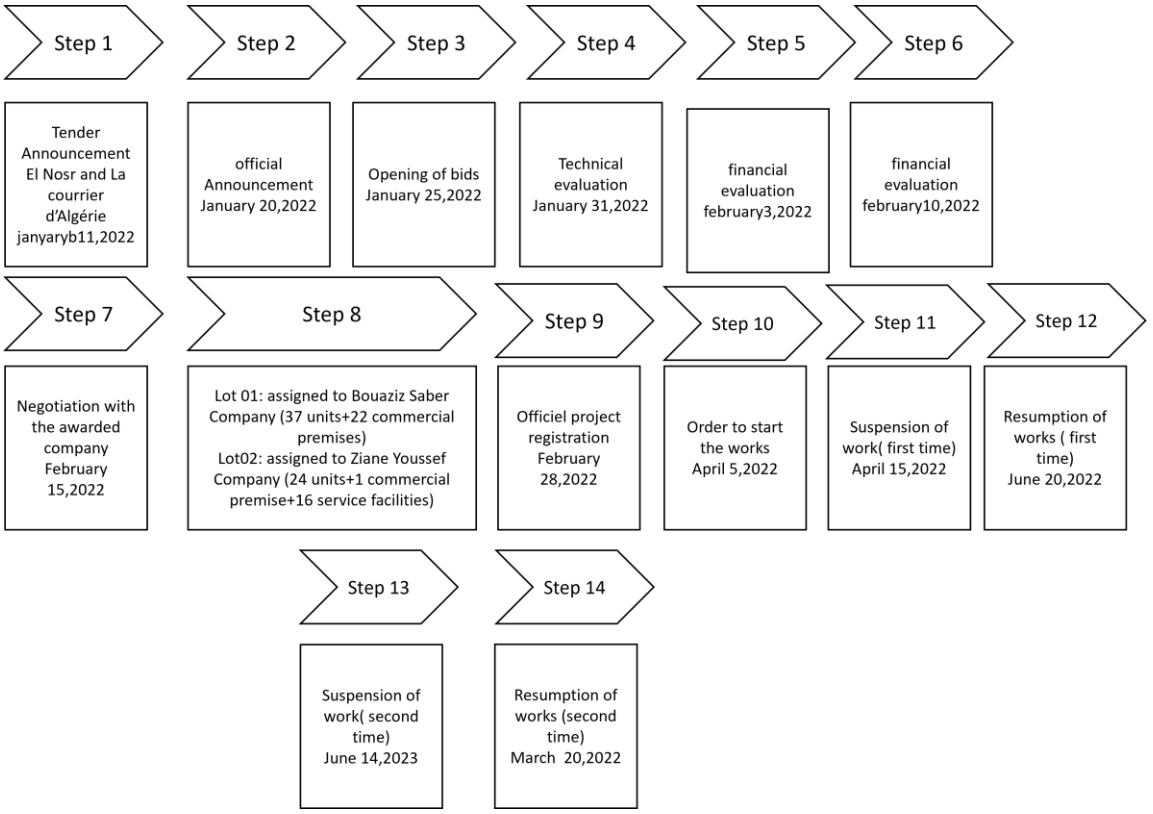

Figure II. 45: Genesis of the project (Source: Author, 2025).

V Synoptic table

Table II.4: Synoptic table (Source: Author, 2025).

PHASES	STEPS	LEGAL FRAMEWORK	RESPONSIBLE ENTITY	REMARKS	DATE
Phase of preliminary study and feasibility	Program The 61 Promotional Housing	/	Ministry of Habitat	/	2022
	Project Registration	Execution Contract 2022/14	Ministry of Habitat and wilaya	/	2022
	Launch of the Tender Process	Official Announcement	the officials of the Wilaya Agency for Urban Land Management and Regulation of Biskra	Published in El Nasr and Le Courrier d'Algérie	11/01/2022
	Publication of the Announcement	Newspaper Publication	the officials of the Wilaya Agency for Urban Land Management and Regulation of Biskra	Official dissemination	20/01/2022
	Opening of Bids	Opening Minutes	Bid Opening Committee	Analysis of submitted offers	25/01/2022
	Technical Evaluation	Evaluation Minutes	Technical Evaluation Committee	Examination of technical aspects	31/01/2022
	Financial Evaluation	Evaluation Minutes	Financial Evaluation Committee	Analysis of financial offers	03/02/2022
	Provisional Award	Award Minutes	Competent Authority	Notification to the selected company	10/02/2022
	Negotiation with the Contractor	Negotiation Minutes	Bouaziz Saber Company	Finalizing conditions	15/02/2022
Phase of realization	Service Order - Start of Works	Service Order	Bouaziz Saber Company	Commencement of works	05/04/2022
	Suspension of Works (1st time)	Administrative Decision	Bouaziz Saber Company	Suspension due to technical reason	06/04/2022
	Resumption of Works (1st time)	Work Resumption Minutes	Bouaziz Saber Company	Resumption after addressing the causes	20/06/2022
	Suspension of Works (2nd time)	Administrative Decision	Bouaziz Saber Company	Technical or financial issues	14/06/2023
	Resumption of Works (2nd time)	Work Resumption Minutes	Bouaziz Saber Company	Resumption for project completion	20/03/2024

The synoptic table details the various stages of the project for constructing 61 promotional housing units, highlighting the phases, the actions undertaken, the legal framework, the responsible entities, relevant remarks, and key dates. The synoptic table provides a clear and structured overview of the process of implementing a public real estate project, from programming to the management of contingencies during the execution phase. It underscores the importance of coordination between the

different entities, compliance with the legal framework, and the necessity of rigorous management of unforeseen events to ensure the successful completion of the project.

Conclusion

The analytical approach adopted in this study has shed light on the essential dimensions of the collective housing complex project in Biskra, encompassing its urban context, architectural design, and execution phases. The project stands as a tangible response to Algeria's national housing strategy, effectively addressing the growing demand for affordable and high-quality residences. By incorporating commercial and service spaces, the complex not only meets residential needs but also contributes to the enhancement of urban functionality and vibrancy.

From an architectural and urban perspective, the project's design demonstrates a thoughtful integration with its surroundings. The orientation and layout of the buildings take into account local climatic conditions, optimizing natural light, ventilation, and shading to improve energy efficiency and user comfort. The inclusion of essential amenities and green spaces further supports community well-being and sustainability.

The analysis of the project's execution phases, as detailed in the synoptic table, reveals a systematic approach to construction management. Despite the occurrence of challenges such as work suspensions and technical delays, the project has maintained progress through effective coordination among stakeholders and careful scheduling of tasks. The sequencing of activities, with overlapping phases where possible, illustrates a proactive strategy aimed at minimizing downtime and ensuring continuity of work.

Third chapter

EVALUATION OF THE MANAGERIAL DIMENSION

Introduction

This chapter offers an analysis of project management applied to the construction of 61 housing units in Biskra. It examines management practices, stakeholder engagement, and the communication strategies implemented throughout the project. The chapter highlights the main obstacles encountered: administrative delays, poor coordination, weak communication, lack of effective monitoring, and insufficient resources. A comparison with a reference project (100 housing units in El Bayadh) reveals that success depends heavily on cooperation among stakeholders and the implementation of appropriate corrective measures.

I Presentation of the realization company (human resources + material resources)

- **Name the company:** Bouaziz Saber
- **Material and human resources of the company**

Table III.5 : Shows the material and human resources of the company

Type of means	The name of the means	Number
Human	Engineer	1
	Site manager	1
	Architect	1
	crane operators	2
	drivers	3
	scrappers	8
	cribbers	7
	Manœuvres	22
Materials	Truck 15 tannes	2
	Cement mixer	1
	grus turn	2
	Mobile crune	1
	mixer	1
	Door load	1
	retro charger	1
	grader	1

- **Company Material Resources**

Table III.6 : the company material resources

Designation	Number
Concrete pump	**01**
Berliet Truck	**02**
SNVI Truck	**03**
Charger	**03**
Grader	**01**
Excavator	**02**
Generator Croup	**01**

Crane	**02**
Shaanxi dump truck	**04**
YUJIN Truck	**01**
Mini Central	**01**
Cement mixer	**06**
Hyundai/ Passat	**02**
Compressor	**02**
Compactor	**01**
Lot of metal formwork panels	**01**
Scaffolding lot	**01**
Lot of formwork wood	**01**

II Progress of the project implementation work

II.1 December month

II.1.1 Commerce – Work Progress Table

Table III.7: Commerce work progress for December month (Source: Author, 2025).

Commerce						
N	**Tasks**	**Wing01**	**Wing02**	**Wing03**	**Wing04**	**Total**
	I) Earthworks	100%	100%	100%	100%	100%
	Main Structure					
	II) Infrastructure					
2	Foundation Slab (BP)	100%	100%	100%	100%	100%
3	Footing	100%	100%	100%	100%	100%
4	Column Starter	100%	100%	100%	100%	100%
5	Before Shear Wall	/	/	/	100%	100%
6	Beam	100%	100%	100%	100%	100%
7	Blinding Concrete	100%	100%	100%	100%	100%
8	Floating Slab	100%	100%	100%	100%	100%
9	Drainage	100%	100%	100%	100%	100%
Superstructure						
10	Columns	100%	100%	100%	100%	100%
11	Shear Wall	0%	0%	0%	100%	100%
12	Beams and Tie Beams	100%	100%	100%	100%	100%
13	Lintels	0%	0%	0%	0%	0,00%
14	Floor Slab	100%	100%	100%	100%	100%
15	Solid Slab	100%	100%	100%	100%	100%
Secondary Work						
16	Masonry and Coating	100%	100%	100%	100%	100%
17	Menuiserie	5%	5%	5%	5%	100%
18	Plomberie sanitaire	0%	0%	0%	0%	0,00%

N	TOTAL/TAUX	TOTAL -BLOCKS
1	Earthworks	100%
2	Main structure (Structural Work)	100%
3	Secondary work	35%
	General Average Project Progress	89%

The overall progress of the commercial area project is 89%, of which the earthwork is 100% complete, the main project is 100% complete, and the auxiliary project is 35% complete. This average reflects the overall progress of the project.

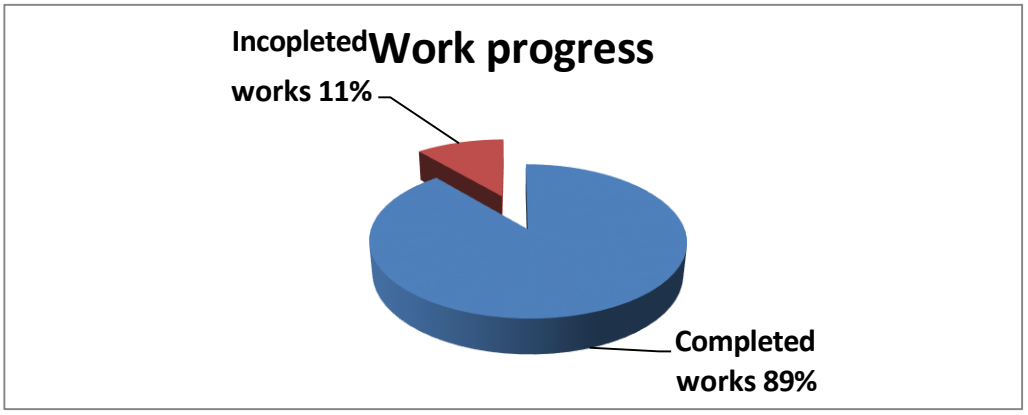

Chart III.1: Work progress (Source: Author, 2025).

The overall work progress shows that 89% of the construction works have been completed, while 11% remain unfinished. This reflects a significant advancement in the project execution.

II.1.2 Housing– Work Progress Table

Table III.8: Housing work progress for December month. (Source: Author, 2025).

Housing						
	Tasks	**wing 01**	**Wing02**	**wing03**	**Wing04**	**Total**
	Superstructure					
1st Floor						
1	Columns	100%	100%	100%	100%	**100%**
2	Shear Wall (voile)	0%	0%	0%	100%	**100%**
3	Beams and Chains	100%	100%	100%	100%	**100%**
4	Lintels	100%	100%	100%	100%	**100%**
5	Floor Slab	100%	100%	100%	100%	**100%**
6	Solid Slab	100%	100%	100%	100%	**100%**
Second Work (Finishes)						
8	Masonry and Coating	70%	80%	80%	60%	**72,50%**
9	Wood and Metal Joinery	100%	100%	100%	100%	**100%**

10	Sanitary Plumbing	80%	80%	80%	60%	**75,00%**
11	Electricity	60%	80%	80%	60%	**70,00%**
12	Painting	20%	60%	60%	20%	**40,00%**
2nd Floor						
13	Columns	100%	100%	100%	100%	**100%**
14	Shear Wall (voile)	0%	0%	0%	100%	**100%**
16	Beams and Chains	100%	100%	100%	100%	**100%**
17	Lintels	100%	100%	100%	100%	**100%**
18	Floor Slab	100%	100%	100%	100%	**100%**
19	Solid Slab	100%	100%	100%	100%	**100%**
Second Work (Finishes)						
20	Masonry and Coating	70%	80%	80%	70%	**75,00%**
22	Wood and Metal Joinery	100%	100%	100%	100%	**100%**
23	Sanitary Plumbing	80%	80%	80%	60%	**75,00%**
24	Electricity	80%	80%	80%	50%	**72,50%**
25	Painting	20%	50%	50%	20%	**35,00%**
3rd Floor						
26	Columns	100%	100%	100%	100%	**100%**
27	Shear Wall (voile)	0%	0%	0%	100%	**100%**
28	Beams and Chains	100%	100%	100%	100%	**100%**
29	Lintels	100%	100%	100%	100%	**100%**
30	Floor Slab	100%	100%	100%	100%	**100%**
31	Solid Slab	100%	100%	100%	100%	**100%**
Second Work (Finishes)						
32	Masonry and Coating	80%	80%	80%	80%	**80,00%**
33	Wood and Metal Joinery	100%	100%	100%	100%	**100%**
34	Sanitary Plumbing	80%	80%	80%	60%	**75,00%**
35	Electricity	80%	80%	80%	70%	**77,50%**
36	Painting	20%	50%	50%	20%	**35,00%**
4th Floor						
Second œuvre						
37	Masonry and Coating	80%	80%	80%	70%	**77,50%**
38	Waterproofing	90%	90%	90%	70%	**85,00%**
39	Wood and Metal Joinery	100%	100%	100%	100%	**100%**
40	Sanitary Plumbing	80%	80%	80%	70%	**77,50%**
41	Electricity	80%	80%	80%	70%	**77,50%**
42	Painting	20%	0%	10%	20%	**12,50%**
	Totale	**71,19%**	**74,05%**	**74,29%**	**74,52%**	**78,87%**

N	TOTAL/TAUX	TOTAL -BLOCKS
1	**Structural Work (Gros œuvre**	100%
2	**Finishing Work (Second work)**	59,58%
Overall Average Project Progress		79%

The table summarizes the overall progress of the construction project. The Structural Work (Gros œuvre) has been fully completed, reaching 100%. As for the Finishing Work (Second work), it is currently at 59.58% completion. Taking both parts into account, the overall average progress of the project stands at 79%.

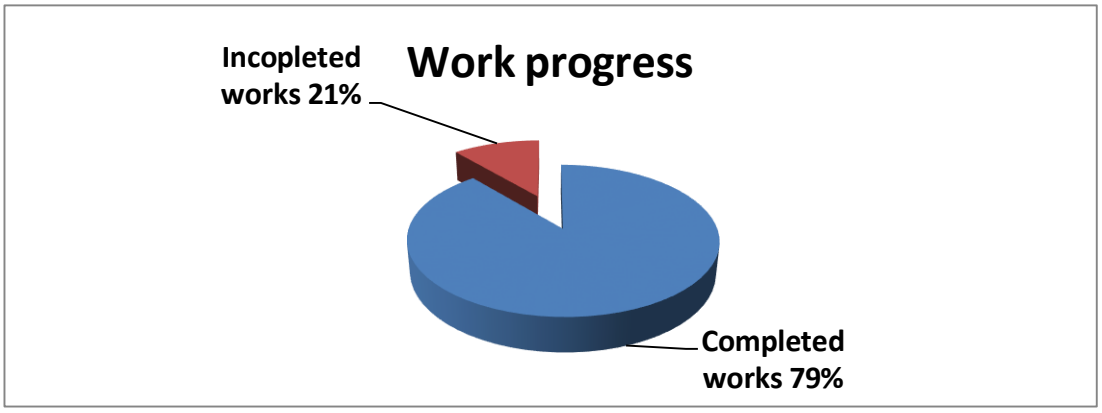

Chart III.2: Housing work progress

In the project, progress has reached 79%. This percentage is illustrated in a pie chart showing that 79% of the work has been completed, while 21% remains in progress.

II.1.3 Illustrated images

Figure III.46: Project advancement (Source: Author, 2024)

During this monitoring phase and in conclusion of the above we found the following:

- The structural works for wings 01/02/03/04 have been completed.
- The construction and internal plastering works for wings 01/02/03/04 have been completed.
- Waterproofing works for wings 01/02/03 have reached a progress rate of 90%.
- External plastering works for wings 01/02/03 have reached a progress rate of 50%.
- Electrical and sanitary plumbing works for wings 01/02/03/04 have reached a progress rate of 80%.
- Tiling works for wings 01/02/03 have reached a progress rate of 80%.
- The overall progress rate is 79%.

II.2 January month

II.2.1 Commerce – Work Progress Table

Table III.9: Commerce work progress for January month
(Source: Author, 2025)

Commerce						
N	**Tasks**	**Wing01**	**Wing02**	**Wing03**	**Wing04**	**Total**
	I) Earthworks	100%	100%	100%	100%	100%
	Main Structure					
	II) Infrastructure					
2	Foundation Slab (BP)	100%	100%	100%	100%	100%
3	Footing	100%	100%	100%	100%	100%
4	Column Starter	100%	100%	100%	100%	100%
5	Before Shear Wall	/	/	/	100%	100%
6	Beam	100%	100%	100%	100%	100%
7	Blinding Concrete	100%	100%	100%	100%	100%
8	Floating Slab	100%	100%	100%	100%	100%
9	Drainage	100%	100%	100%	100%	100%
superstructure						
10	Columns	100%	100%	100%	100%	100%
11	Shear Wall	0%	0%	0%	100%	100%
12	Beams and Tie Beams	100%	100%	100%	100%	100%
13	Lintels	0%	0%	0%	0%	0,00%
14	Floor Slab	100%	100%	100%	100%	100%
15	Solid Slab	100%	100%	100%	100%	100%
Secondary Work						
16	Masonry and Coating	100%	100%	100%	100%	100%
17	Menuiserie	100%	100%	100%	100%	100%
18	Plomberie sanitaire	100%	100%	100%	100%	100%

N	TOTAL/TAUX	TOTAL -BLOCKS
1	Earthworks	100%
2	Main structure (Structural Work)	100%
3	Secondary work	100%
	General Average Project Progress	100%

The commercial area project has made 100% progress, with the earthwork, main project, and auxiliary project all completed. These average measures the project's overall progress.

II.2.2 Housing– Work Progress Table

Table III.10: Housing work progress for January month.
(Source: Author, 2025).

Housing						
	Tasks	**wing01**	**Wing02**	**wing03**	**Wing04**	**Total**
	Superstructure					
1st Floor						
1	Columns	100%	100%	100%	100%	**100%**
2	Shear Wall (voile)	0%	0%	0%	100%	**100%**
3	Beams and Chains	100%	100%	100%	100%	**100%**
4	Lintels	100%	100%	100%	100%	**100%**
5	Floor Slab	100%	100%	100%	100%	**100%**
6	Solid Slab	100%	100%	100%	100%	**100%**
Second Work (Finishes)						
8	Masonry and Coating	100%	100%	100%	100%	**100%**
9	Wood and Metal Joinery	100%	100%	100%	100%	**100%**
10	Sanitary Plumbing	100%	100%	100%	100%	**100%**
11	Electricity	100%	100%	100%	100%	**100%**
12	Painting	100%	100%	100%	100%	**100%**
2nd Floor						
13	Columns	100%	100%	100%	100%	**100%**
14	Shear Wall (voile)	0%	0%	0%	100%	**100%**
16	Beams and Chains	100%	100%	100%	100%	**100%**
17	Lintels	100%	100%	100%	100%	**100%**
18	Floor Slab	100%	100%	100%	100%	**100%**
19	Solid Slab	100%	100%	100%	100%	**100%**
Second Work (Finishes)						
20	Masonry and Coating	100%	100%	100%	100%	**100%**
22	Wood and Metal Joinery	100%	100%	100%	100%	**100%**
23	Sanitary Plumbing	100%	100%	100%	100%	**100%**
24	Electricity	100%	100%	100%	100%	**100%**
25	Painting	100%	100%	100%	100%	**100%**

3rd Floor						
26	Columns	100%	100%	100%	100%	**100%**
27	Shear Wall (voile)	0%	0%	0%	100%	**100%**
28	Beams and Chains	100%	100%	100%	100%	**100%**
29	Lintels	100%	100%	100%	100%	**100%**
30	Floor Slab	100%	100%	100%	100%	**100%**
31	Solid Slab	100%	100%	100%	100%	**100%**
Second Work (Finishes)						
32	Masonry and Coating	100%	100%	100%	100%	**100%**
33	Wood and Metal Joinery	100%	100%	100%	100%	**100%**
34	Sanitary Plumbing	100%	100%	100%	100%	**100%**
35	Electricity	100%	100%	100%	100%	**100%**
36	Painting	100%	100%	100%	100%	**100%**
4th Floor						
Second œuvre						
37	Masonry and Coating	100%	100%	100%	100%	**100%**
38	Waterproofing	50%	100%	100%	100%	**87,50%**
39	Wood and Metal Joinery	90%	90%	90%	80%	**87,50%**
40	Sanitary Plumbing	60%	60%	60%	40%	**55,00%**
41	Electricity	70%	70%	70%	70%	**70,00%**
42	Painting	55%	70%	70%	30%	**56,25%**
43	Facade	40%	40%	40%	35%	**38,75%**

N	TOTAL/TAUX	TOTAL -BLOCKS
1	**Structural Work (Gros œuvre)**	100%
2	**Finishing Work (Second work)**	70,71%
	General Average Project Progress	93%

The table illustrates the overall status of the construction project. The Structural Work (structural work) has been completed entirely, attaining 100%. The Finishing Work (second work) is currently at 79.71% complete. Taking both sections into consideration, the project's average progress is 93%.

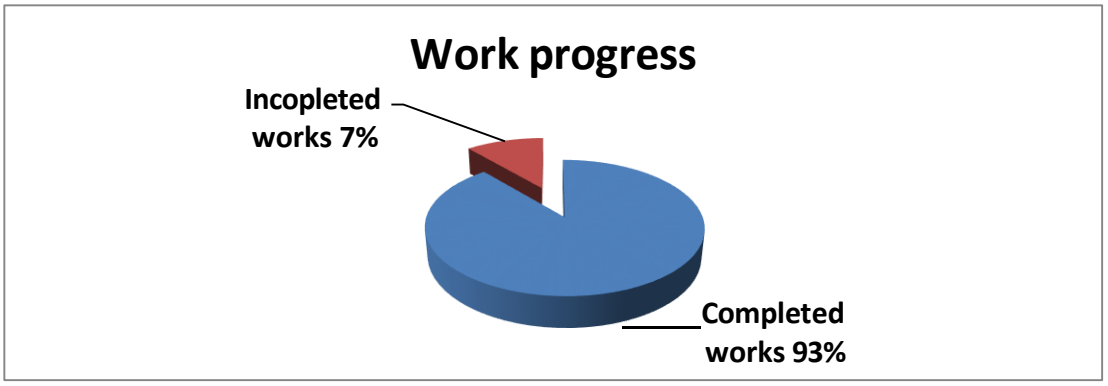

Chart III. 3 : Housing work progress (Source: Author, 2025)

The project's progress has reached 93%. This percentage is depicted in a pie chart, which shows that 93% of the work has been accomplished, with the remaining 7% still in process.

And in conclusion, we found the following:

- The overall progress rate is 93%.

Where the execution contractor must:

- The workshop is staffed with qualified workers.
- Increased the pace of work to make up for the recorded delay in progress.
- Respecting storage rules for materials used in concrete mix

II.2.3 Illustrated images:

Figure III.47: Project advancement (Source : Author, 2025).

II.3 February month

II.3.1 Housing– Work Progress Table

Table III. 11: Housing work progress for February month.
(Source: Author, 2025).

Housing						
	Tasks	**wing01**	**Wing02**	**wing03**	**Wing04**	**Total**
	Superstructure					
1st Floor						
1	**Columns**	**100%**	**100%**	**100%**	**100%**	**100%**
2	**Shear Wall (voile)**	**0%**	**0%**	**0%**	**100%**	**100%**
3	**Beams and Chains**	**100%**	**100%**	**100%**	**100%**	**100%**
4	**Lintels**	**100%**	**100%**	**100%**	**100%**	**100%**
5	**Floor Slab**	**100%**	**100%**	**100%**	**100%**	**100%**
6	**Solid Slab**	**100%**	**100%**	**100%**	**100%**	**100%**
Second Work (Finishes)						
8	**Masonry and Coating**	**100%**	**100%**	**100%**	**100%**	**100%**
9	**Wood and Metal Joinery**	**100%**	**100%**	**100%**	**100%**	**100%**
10	**Sanitary Plumbing**	**100%**	**100%**	**100%**	**100%**	**100%**
11	**Electricity**	**100%**	**100%**	**100%**	**100%**	**100%**
12	**Painting**	**100%**	**100%**	**100%**	**100%**	**100%**
2nd Floor						
13	**Columns**	**100%**	**100%**	**100%**	**100%**	**100%**
14	**Shear Wall (voile)**	**0%**	**0%**	**0%**	**100%**	**100%**

16	**Beams and Chains**	**100%**	**100%**	**100%**	**100%**	**100%**
17	**Lintels**	**100%**	**100%**	**100%**	**100%**	**100%**
18	**Floor Slab**	**100%**	**100%**	**100%**	**100%**	**100%**
19	**Solid Slab**	**100%**	**100%**	**100%**	**100%**	**100%**
Second Work (Finishes)						
20	**Masonry and Coating**	**100%**	**100%**	**100%**	**100%**	**100%**
22	**Wood and Metal Joinery**	**100%**	**100%**	**100%**	**100%**	**100%**
23	**Sanitary Plumbing**	**100%**	**100%**	**100%**	**100%**	**100%**
24	**Electricity**	**100%**	**100%**	**100%**	**100%**	**100%**
25	**Painting**	**100%**	**100%**	**100%**	**100%**	**100%**
3rd Floor						
26	**Columns**	**100%**	**100%**	**100%**	**100%**	**100%**
27	**Shear Wall (voile)**	**0%**	**0%**	**0%**	**100%**	**100%**
28	**Beams and Chains**	**100%**	**100%**	**100%**	**100%**	**100%**
29	**Lintels**	**100%**	**100%**	**100%**	**100%**	**100%**
30	**Floor Slab**	**100%**	**100%**	**100%**	**100%**	**100%**
31	**Solid Slab**	**100%**	**100%**	**100%**	**100%**	**100%**
Second Work (Finishes)						
32	**Masonry and Coating**	**100%**	**100%**	**100%**	**100%**	**100%**
33	**Wood and Metal Joinery**	**100%**	**100%**	**100%**	**100%**	**100%**
34	**Sanitary Plumbing**	**100%**	**100%**	**100%**	**100%**	**100%**
35	**Electricity**	**100%**	**100%**	**100%**	**100%**	**100%**
36	**Painting**	**100%**	**100%**	**100%**	**100%**	**100%**
4th Floor						
second œuvre						
37	**Masonry and Coating**	**100%**	**100%**	**100%**	**100%**	**100%**
38	**Waterproofing**	**100%**	**100%**	**100%**	**100%**	**100%**
39	**Wood and Metal Joinery**	**95%**	**95%**	**95%**	**85%**	**92,50%**
40	**Sanitary Plumbing**	**70%**	**70%**	**65%**	**55%**	**65,00%**
41	**Electricity**	**70%**	**70%**	**70%**	**70%**	**70,00%**
42	**Painting**	**85%**	**80%**	**90%**	**50%**	**76,25%**
43	**Facade**	**60%**	**60%**	**60%**	**45%**	**56,25%**

N	TOTAL/TAUX	TOTAL -BLOCKS
1	**Structural Work (Gros œuvre)**	100%
2	**Finishing Work (Second work)**	**80%**
	General Average Project Progress	**95%**

The table shows the overall status of the construction project. The Structural Work (structural work) has been completed totally, achieving 100%. The Finishing Work (second work) is currently 80 percent complete. Taking both sections into account, the project's average progress is 95%.

I.1.1 Illustrated images

Figure III.48: Project advancement (Source: Author, 2025).

I.2 March month

II.4.1.1 Housing– Work Progress Table

Table III.12 : Housing work progress for March month.
(Source: Author, 2025).

Housing						
	Tasks	**wing01**	**Wing02**	**wing03**	**Wing04**	**Total**
	Superstructure					
1st Floor						
1	**Columns**	**100%**	**100%**	**100%**	**100%**	**100%**
2	**Shear Wall (voile)**	**0%**	**0%**	**0%**	**100%**	**100%**
3	**Beams and Chains**	**100%**	**100%**	**100%**	**100%**	**100%**
4	**Lintels**	**100%**	**100%**	**100%**	**100%**	**100%**
5	**Floor Slab**	**100%**	**100%**	**100%**	**100%**	**100%**
6	**Solid Slab**	**100%**	**100%**	**100%**	**100%**	**100%**
Second Work (Finishes)						
8	**Masonry and Coating**	**100%**	**100%**	**100%**	**100%**	**100%**
9	**Wood and Metal Joinery**	**100%**	**100%**	**100%**	**100%**	**100%**
10	**Sanitary Plumbing**	**100%**	**100%**	**100%**	**100%**	**100%**
11	**Electricity**	**100%**	**100%**	**100%**	**100%**	**100%**
12	**Painting**	**100%**	**100%**	**100%**	**100%**	**100%**
2nd Floor						
13	**Columns**	**100%**	**100%**	**100%**	**100%**	**100%**
14	**Shear Wall (voile)**	**0%**	**0%**	**0%**	**100%**	**100%**
16	**Beams and Chains**	**100%**	**100%**	**100%**	**100%**	**100%**
17	**Lintels**	**100%**	**100%**	**100%**	**100%**	**100%**
18	**Floor Slab**	**100%**	**100%**	**100%**	**100%**	**100%**
19	**Solid Slab**	**100%**	**100%**	**100%**	**100%**	**100%**
Second Work (Finishes)						
20	**Masonry and Coating**	**100%**	**100%**	**100%**	**100%**	**100%**
22	**Wood and Metal Joinery**	**100%**	**100%**	**100%**	**100%**	**100%**
23	**Sanitary Plumbing**	**100%**	**100%**	**100%**	**100%**	**100%**

24	**Electricity**	**100%**	**100%**	**100%**	**100%**	**100%**
25	**Painting**	**100%**	**100%**	**100%**	**100%**	**100%**
3rd Floor						
26	**Columns**	**100%**	**100%**	**100%**	**100%**	**100%**
27	**Shear Wall (voile)**	**0%**	**0%**	**0%**	**100%**	**100%**
28	**Beams and Chains**	**100%**	**100%**	**100%**	**100%**	**100%**
29	**Lintels**	**100%**	**100%**	**100%**	**100%**	**100%**
30	**Floor Slab**	**100%**	**100%**	**100%**	**100%**	**100%**
31	**Solid Slab**	**100%**	**100%**	**100%**	**100%**	**100%**
	Second Work (Finishes)					
32	**Masonry and Coating**	**100%**	**100%**	**100%**	**100%**	**100%**
33	**Wood and Metal Joinery**	**100%**	**100%**	**100%**	**100%**	**100%**
34	**Sanitary Plumbing**	**100%**	**100%**	**100%**	**100%**	**100%**
35	**Electricity**	**100%**	**100%**	**100%**	**100%**	**100%**
36	**Painting**	**100%**	**100%**	**100%**	**100%**	**100%**
4th Floor						
Second Work						
37	**Masonry and Coating**	**100%**	**100%**	**100%**	**100%**	**100%**
38	**Waterproofing**	**100%**	**100%**	**100%**	**100%**	**100%**
39	**Wood and Metal Joinery**	**95%**	**95%**	**95%**	**85%**	**92,50%**
40	**Sanitary Plumbing**	**70%**	**70%**	**65%**	**55%**	**65,00%**
41	**Electricity**	**70%**	**70%**	**70%**	**70%**	**70,00%**
42	**Painting**	**85%**	**80%**	**90%**	**50%**	**76,25%**
43	**Facade**	**70%**	**70%**	**70%**	**50%**	**65,00%**

N	TOTAL/TAUX	TOTAL -BLOCKS
1	**Structural Work (Gros œuvre)**	100%
2	**Finishing Work (Second work)**	**80%**
	General Average Project Progress	**96%**

The construction project's overall status is shown in the table. The structure work has been completed in its entirety, attaining a 100% completion rate. As of right now, the second step, the finishing work, is 80% finished. The average project progress, accounting for both areas, is 96%.

II Work progress rate by time (Delays consumed)

II.1 December month

Table III.13 : Work progress rate by time for December month

Duration elapsed	Start date of work	Duration	Work progress	Delay rate
22 month	20/06/2022	22 month	81%	15%

Only 81% of the project is accomplished, and it has taken 8 months longer than the allotted period (including the extension). The 15% delay is a substantial amount.

II.2 January month

Table III.14: Work progress rate by time for January month.

Duration elapsed	Start date of work	Duration	Work progress	Delay rate
22 month	20/06/2022	31 month	93%	48%

The amount of time consumed is longer than anticipated:

- There was a delay since just 22 days were scheduled and 31 days were used.
- In comparison to the progress rate of 48%, the consumption rate of 93% is extremely high.
- This indicates that although the project has utilized almost all of the time allotted, less than half of the necessary work has been finished.

II.3 February month

Table III.15: Work progress rate by time for February month

Duration elapsed	Start date of work	Duration	Work progress	Delay rate
25 month	20/06/2022	31 month	95%	33%

II.4 March month

Table III.16: Work progress rate by time for March month.

Duration elapsed	Start date of work	duration	Work progress	Delay rate
25 month	20/06/2022	33 month	96%	36%

Only 96% of the project is accomplished, and it has taken 8 months longer than the allotted period (including the extension). The 36% delay is substantial

III Comparative Study with a Reference Project

As a case study model, the reference project is the development of 100 public rental housing units. Even though there were some executional delays, they were effectively reduced by better stakeholder cooperation and the application of efficient corrective measures. This project serves as a standard by which to measure how well the parties involved communicate and manage the timeline.

III.1 Project Technical Data Sheet:

- **Project Name:** 100 public rental housing units
- **Location :El** Bayadh , Algeria
- **Total Area:** 6897,00 m².
- **Project Management:** OPGI El Bayadh
- **Design Firm:** Bediare hamza
- **The contractor:** Alali ibrahim
- **Expected Completion Date:** 26/02/2024 (20 months)
- **The cost:** 309061273,16

III.2 A Comparative Analysis of the 100 Public Rental residence Project and the 61 residence Project

Table III.17 : Analysis of the 100 Public Rental residence Project and the 61 residence Project

	61 Housing Project	100 Public Rental Housing Project
Duration of Completion	A considerable delay that was not entirely resolved	encountered a brief delay, but it was effectively resolved
Causes of Delay	Administrative issues Delay in technical approvals (CTC) Poor communication Labor shortage	The approval of civil engineering and architectural plans is delayed. Delays in electrical and sanitation works
Stakeholder Communication	Weak and irregular, leading to work suspensions	Relatively effective, it enabled quickly catching up on the delay.
Planning	Lack of a clear and detailed implementation plan before project launch	A proper plan was developed, despite some initial shortcomings
Administrative Procedures	Slow and complex, including delays in contract adjustments and plan approvals	More flexible and responsive administrative processes
Human and Material Resources	Shortage of labor and equipment significantly affected work progress	Resource issues were resolved through emergency interventions
Final Outcome	The delay continued, and the deadline was not adhered to.	After corrective actions were taken, the project returned to its original timeline.

III.3 Comparative Analysis of Communication Practices

Table III.18 : Comparative Analysis of communication practices.

Type of communication	61 residence Project	100 Public Rental residence Project
Meetings (Daily, Weekly, Monthly)	Meetings were irregular and held only when problems arose leading to poor coordination.	Regular meetings (weekly and monthly) supported close monitoring and timely corrective decisions.
Reports (Report Status, Progress Report)	Weak in preparing and tracking reports, making it difficult to assess real progress.	Periodic and organized reports helped track progress and detect delays early.
Official Channels (Email)	Irregular use and delayed responses negatively affected coordination.	Effective and consistent use of official channels accelerated approvals and procedures.
Informal Communication (Daily On-site Talk)	Unrecorded and underutilized communication that failed to resolve daily issues effectively.	Effectively used for daily coordination, with key outcomes documented when necessary.

It is clear that the 61-housing project was affected by a set of complex factors, the most important of which are poor communication, inadequate planning, and delays in regulatory procedures. The lack of continuous coordination among the concerned parties is one of the main reasons for the project's failure to adhere to the timeline, unlike the reference project, which managed to partially overcome the delays thanks to effective communication and swift decisions.

III.4 Data Collection and Analysis Methodology

This study focused primarily on the 61 residential Project in the Wilaya of Biskra, where repeated field visits were conducted to observe the progress of work and the communication practices between various stakeholders directly. In addition, semi-structured interviews were carried out with several key stakeholders, including the project manager, engineers, contractors, and administrative personnel, to gather accurate insights regarding the nature of communication, challenges faced, and their impact on schedule adherence.

As for the 100 Public Rental Housing Project in the Wilaya of El Bayadh, due to the distance and limited access to the site, the analysis relied on official documents, follow-up reports, and available administrative records to construct a reference case for comparison—focusing on communication practices and schedule management outcomes.

This combination of direct field observation and document-based analysis allowed for a realistic comparison, highlighting differences in communication approaches and their influence on the success of residetial project realisation.

IV Constraints and causes encountered at the project level

IV.1 Identification of contraints

The identification of constraints in the project varies according to the nature and content of the project. Among the constraints observed in our project that led to delays in execution, we mention:

The identification of constraints in the project varies according to the nature and content of the project. Among the constraints observed in our project that led to delays in execution, we mention:

- Temporarily suspending the work pending approval from the National Technical Control Authority for Facilities (CTC) on the civil engineering plans.
- Lack of coordination between the concerned parties (administrative teams and the project owner).
- Weak coordination between different teams and administrative interests
- The long duration of the required administrative procedures.
- Lack of scheduling and coordination service.
- Lack of efficiency in project management.
- Lack of precise monitoring at the project level.

However, the main constraints recorded in our project generally relate to stakeholders and can be summarized as:

- Poor project management
- Regulatory constraints and licenses
- communication among stakeholders

These constraints had a detrimental impact on the smooth execution of the project and consequently, they had a harmful effect on the project's timeline.

IV.1.1 Poor project management (Delay in execution)

- The company ETP Bouaziz Saber was selected after the national tender launched on February 11/01/2022.
- Work Order for the start of the works on 04/05/2022
- The stop order issued on 04/06/2022 due to the temporary suspension of work pending the approval of the civil engineering plans by the National Authority for Technical Control of Installations (CTC).
- Delay in settling the additional period related to the contractual conditions of the design office
- Request for discussion on the prices of additional work, particularly heating work, which has caused a delay in their execution.

IV.1.2 Project communication

Project communication management includes the processes required to ensure, in a timely and appropriate manner, the creation, collection, dissemination, storage, retrieval, and final processing of project information. Effective communication creates a bridge between the various stakeholders involved in the project, connecting different cultural and organizational contexts, levels of expertise, perspectives, and interests in the execution of the project or its outcome.

It emerges from the theoretical approach that communication management is a necessary, if not mandatory, tool in the project process. The success of the latter depends heavily on this tool.

The evaluation of communication management in our case reveals that communication between the various project stakeholders is almost nonexistent. These elements that attest to this situation are:

- Absence of an appropriate communication management plan
- Absence of progress reports regarding the performance and status of the project.
- Absence of communication methods at the project level: (meetings, memos, reports…)
- Absence of a stakeholder register
- Absence of a competent authority to analyze the stakeholders

IV.2 Evaluation of the Stakeholder Engagement Assessment Matrix:

IV.2.1 Identify stakeholder

Table III.19: Identification of stakeholders

Stakeholders	Nom
Project owner	Project owner: The State Real Estate Agency for Real Estate and Urban Management and Organization
Project manager	Nabar Omar
Civil engineering engineer	Zouhair Ziyadi
Entrepreneur	Bouaziz Saber
Site manager	Hamdi mahdi
Construction Technical Control	CTC BISKRA

IV.2.1.1 Assess stakeholder interests and influence

Table III. 20: Assess stakeholder interests and influence

Stakeholder	Power	Interest	Appropriate Category in the matrix	Justification
Real Estate Agency	High	High	Manage Closely	Project owner; controls funding and decision-making; highly concerned with project success.
Project manager	Medium	High	Engage as Needed	Plays an important role in execution, but does not have final authority.
Civil engineer	Medium	High	Engage as Needed	Strong technical interest, but limited influence.
Entrepreneur	Medium	Medium	Keep Satisfied	The contractor has some influence over execution, but his interest may be limited (primarily profit-oriented).

Site manager	Low	Medium	Monitor	Has no real authority and does not influence strategic outcomes.
Construction Technical Control	High	Low	Keep Satisfied	Has high technical/oversight authority but limited concern beyond regulatory responsibility.

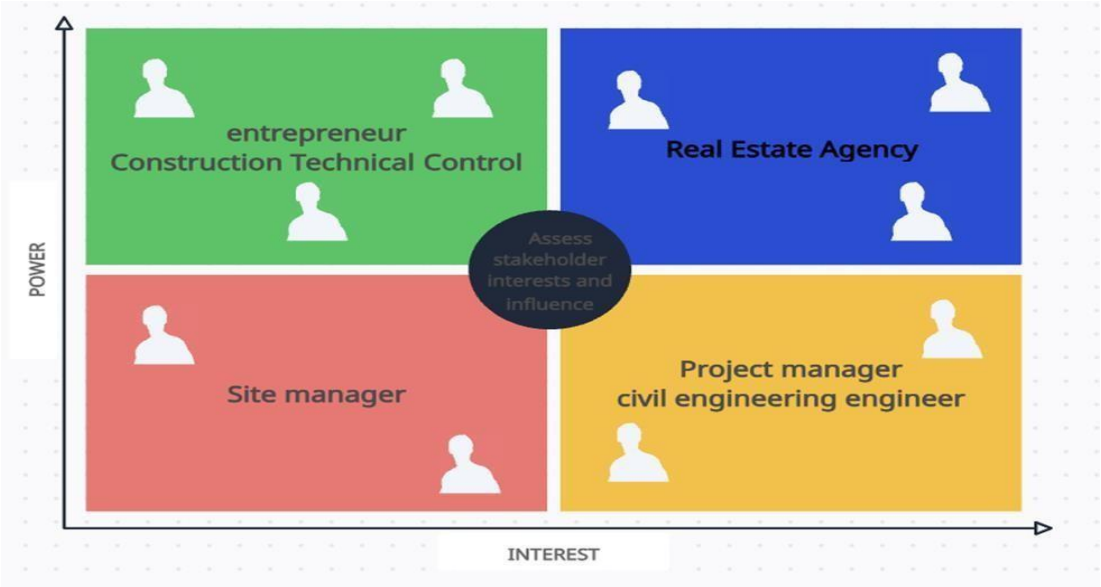

Figure III.49: Assessment of Stakeholder Interests and Influence in a61 residence Project

(Source : Author,2025)

IV.2.2 Identify strategies

Table III.21: Identification of strategies

Stakeholder	Strategy
Real Estate Agency	• Schedule regular strategic decision-making meetings. • Provide transparent progress reports and involve them in key approvals.
Project manager (Nabar Omar)	• Invite to all technical and coordination meetings. • Share relevant documentation and updates frequently.
civil engineering engineer (Ziyadi Zoheir)	• Involve in design reviews and technical problem-solving. • Assign leadership roles in technical execution.
Entrepreneur (Bouaziz Saber)	• Organize awareness sessions on project goals and expectations. • Clarify contract terms and establish clear communication channels.
Site Manager (mahdi hamdi)	• Provide orientation training about project scope and role expectations. • Offer weekly site updates and feedback opportunities.
CTC	• Engage early in planning inspection schedules. • Coordinate compliance checks and reporting procedures

Figure III.50: Develop engagement strategies in a 61 residence Project (Source: Author, 2025)

IV.3 Evaluation of Stakeholder Communication

Table III.22: Evaluation of Stakeholder Communication

Stakeholder	Impact on Project	Communication Needs	Preferred Method	Frequency
Real Estate Agency	Very High	Strategic decisions, progress updates	Formal reports, meetings	Bi-weekly
Project manager (Nabar Omar)	High	Technical alignment, design execution	Technical meetings, site visits	Weekly
civil engineering engineer (Ziyadi Zoheir)	High	Daily site coordination, structural updates	Phone, site reports	Daily/On demand
Bouaziz Saber (Contractor)	High	Task assignments, delays, contract terms	On-site meetings, written memos	2–3 times/week
Site Manager (mahdi hamdi)	Medium	Daily supervision, feedback, material updates	WhatsApp, checklists	Daily
CTC	Medium	Inspection coordination, compliance reports	Email, inspection reports	Per milestone phase

We summarize the above as follows

STAKEHOLDER	COMMUNICATION NEEDS	BI-WEEKLY	WEEKLY	DAILY	DAILY/ON DEMAND	2-3 TIMES/ WEEK	PAR MILESTONE PHASE
Real Estate Agency	Strategic decisions, progress updates	Formal reports, meetings					
Project manager (Nabar Omar)	Technical alignment, design execution		Technical meetings, site visits				
civil engineering engineer (Ziyadi Zoheir)	Daily site coordination, structural updates			Phone, site reports	Phone, site reports		
Bouaziz Saber (Contractor)	Task assignments, delays, contract terms					On-site meetings, written memos	
Site Manager (mahdi hamdi)	Daily supervision, feedback, material updates			WhatsApp, checklists			
CTC	Inspection coordination, compliance reports						Email, inspection reports

Figure III.51: Stakeholder Communication Plan in in a 61 residence Project (Source: Author, 2025).

Finally, we summarize

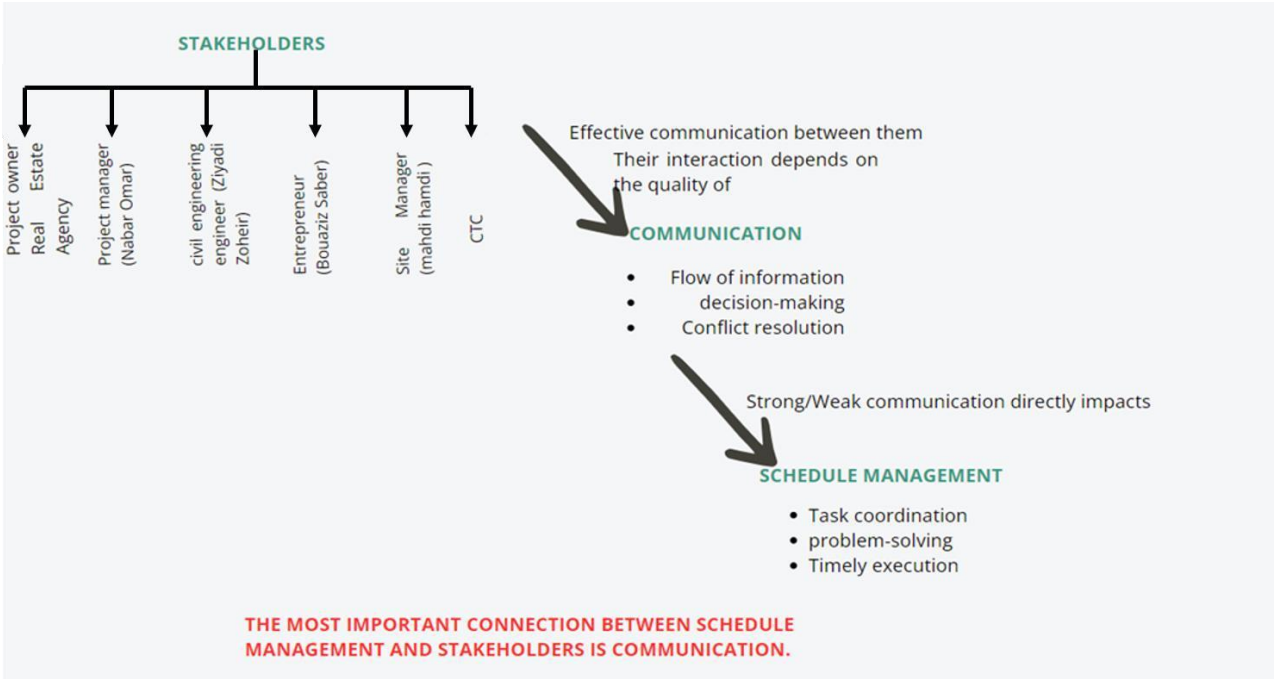

Figure III.52: Communication as the link between stakeholders and schedule management (Source : Author, 2025)

Conclusion

This chapter reflects the progress made in the construction project of 61 residential units, where all structural works have been completed at 100%, while some supplementary works are still underway. A number of factors have contributed to the project's delay, the most notable being poor coordination among parties, the absence of an effective communication plan, and the complexity of administrative procedures. By comparing it with a successful reference project, it becomes clear that effective communication, pre-planning, and cooperation among stakeholders play a pivotal role in overcoming challenges and meeting deadlines. Therefore, it is recommended to adopt a comprehensive project management strategy that includes improving follow-up mechanisms, clearly defining responsibilities, and enhancing coordination among all participants to ensure the smooth progress of the project and achieve its objectives on time.

General conclusion

1. Conclusion

Effective schedule management in the construction of 61 residential units is a critical factor directly impacting the success of the project. This importance is largely attributed to the quality of communication between the various stakeholders. Coordination among stakeholders at all stages of the project is essential to meet the requirements related to deadlines and quality, especially in public projects where these criteria are a top priority.

In this context, the managerial approach emerges as more than necessary it is indispensable. Through its tools, methods, and procedures, this approach enables full control over the project from beginning to end, covering the phases of site preparation, execution, monitoring of the work, and final acceptance.

For the case study of the "61 residential Units" project in Biskra, the implementation phase was subjected to a comparative analysis between the actual project management practices and the ideal managerial approach as it should have been applied.

Through this study, it became evident that communication among stakeholders plays a pivotal role in ensuring the success of schedule management, particularly in the construction sector, which is characterized by a multitude of actors and overlapping tasks. The case study demonstrated that poor coordination, lack of effective monitoring mechanisms, and the complexity of administrative procedures were all significant contributors to project delays and failure to meet the specified timelines.

Moreover, the absence of clear and organized communication channels between the various parties including administrative departments, technical teams, and the project owner negatively affected the decision-making process, time management, and the allocation of human resources. The lack of a dedicated coordination body for schedule management further exacerbated these challenges.

Based on the above, we assert that improving the quality of communication and coordination among stakeholders is not a secondary option, but an absolute necessity for any project aiming to achieve its objectives on time, within the required quality standards, and at a reasonable cost. Accordingly, this study recommends the integration of an effective communication system, the adoption of digital tools for project tracking, and the formation of qualified project management teams. These measures will contribute to improving overall performance and avoiding future delays.

2. Recommendations

- **the Stakeholder Management**

- Enhance Coordination among Various Actors: Establish coordination committees that include the Housing Directorate, design offices, contractors, and municipal services
- Develop a Clear Mechanism for Defining Roles and Responsibilities: Due to the overlapping responsibilities among different entities in Algeria.
- Strengthen the Role of Local Decision-Makers: Involve the Wali (Governor), district heads, and municipal councils in monitoring project progress.
- Establish Local Supervision Bodies for Major Projects: To facilitate quick decision-making and problem-solving.
- Encourage Direct Communication between Citizens and the Administration: By organizing regular meetings to update citizens on project progress.

- **The Communication Enhancement**

- Adopt Digital Communication Technologies: Such as creating digital platforms (e-communication) for better coordination among stakeholders.
- Mandatory Documentation of All Instructions and Official Correspondence: To prevent misunderstandings and accountability issues.
- Organize Joint Field Visits: Involving the project owner, design office, and contractor for direct site inspections.
- Establish a Dedicated Complaint Line for Housing Projects: To allow citizens to report obstacles

and concerns.

- Supportive Tools and Structures
- Create a Dedicated Monitoring and Scheduling Unit for Each Project: Within the local Housing Directorates.
- Implement Modern Project Planning Software: Such as MS Project or Primavera.
- Adopt Periodic Evaluation Forms for Citizens: To ensure satisfaction among end beneficiaries
- Strengthen the Communication and Coordination System Among All Project Stakeholders
- Establish Effective Project Governance Through Clear Definition of Roles and Responsibiliti

3. Research Limitations

- The study is limited to a single case study the 61 residential units project located in Biskra. Therefore, the results may not be fully generalizable to other regions or construction projects across Algeria with different contexts or stakeholder dynamics.
- The research focused primarily on the implementation phase of the project. Events occurring before or after this phase, such as initial planning or post-delivery evaluations, were not analyzed in detail.
- Some stakeholders were not always available for in depth interviews or site visits, which may have limited the scope of data collected. The research thus relied on secondary sources such as reports and progress documentation in some cases.
- The interpretation of interviews, observations, and documents is inherently subjective and may be influenced by the researcher's perspective, despite efforts to maintain objectivity and triangulate sources.
- The study did not include all possible stakeholders involved in the project due to time and accessibility constraints. Priority was given to key actors such as project managers, engineers, and contractors.

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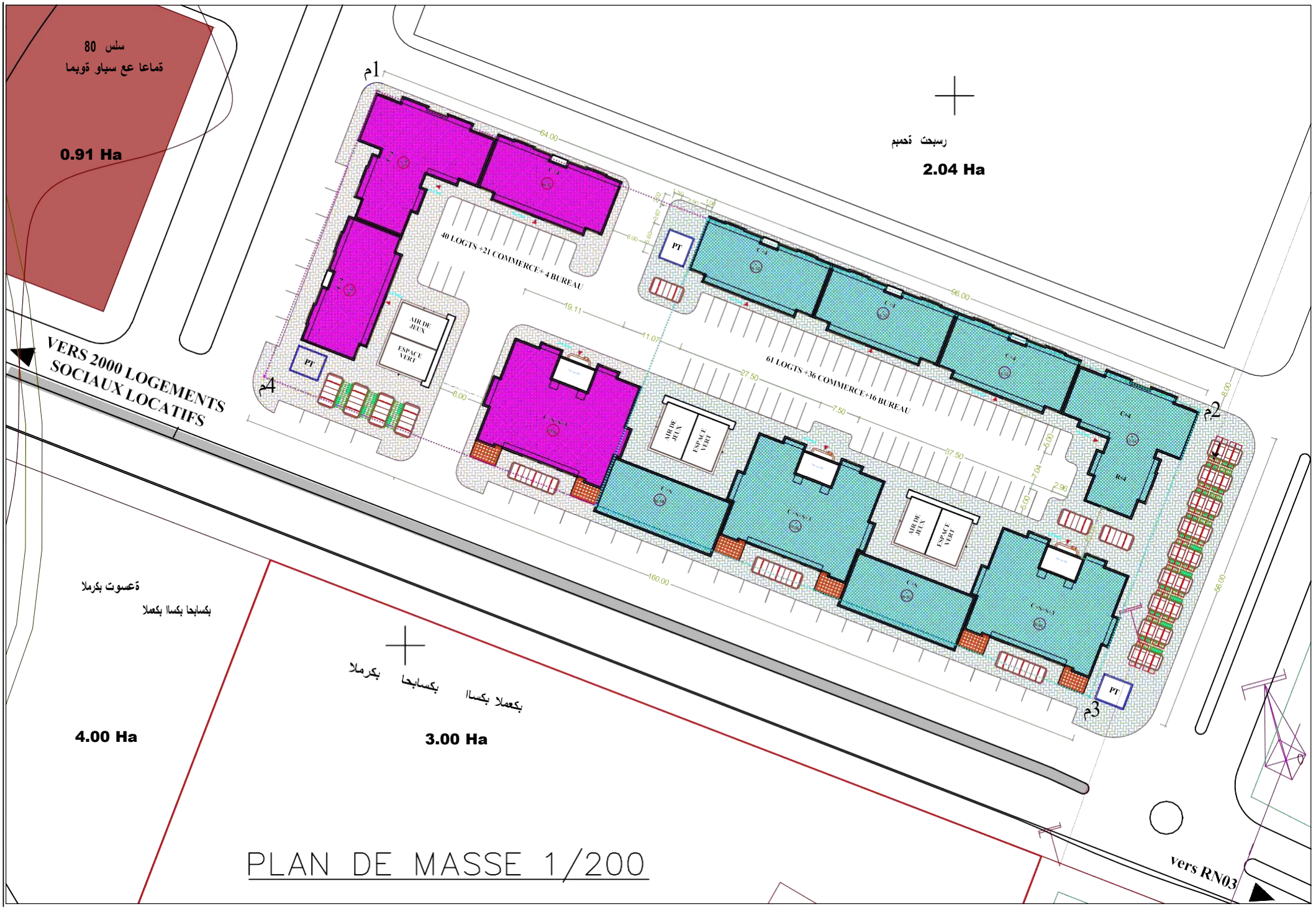
APPENDICES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رسبحت قحميم
2.04 Ha
1م
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4م
40 LOGTS +21 COMMERCE+4 BUREAU
61 LOGTS +36 COMMERCE+16 BUREAU
AIR DE JEUX
ESPACE VERT
PT
VERS 2000 LOGEMENTS SOCIAUX LOCATIFS
ةعسوت بكرملا
بكسابحا بكسا بكعملا
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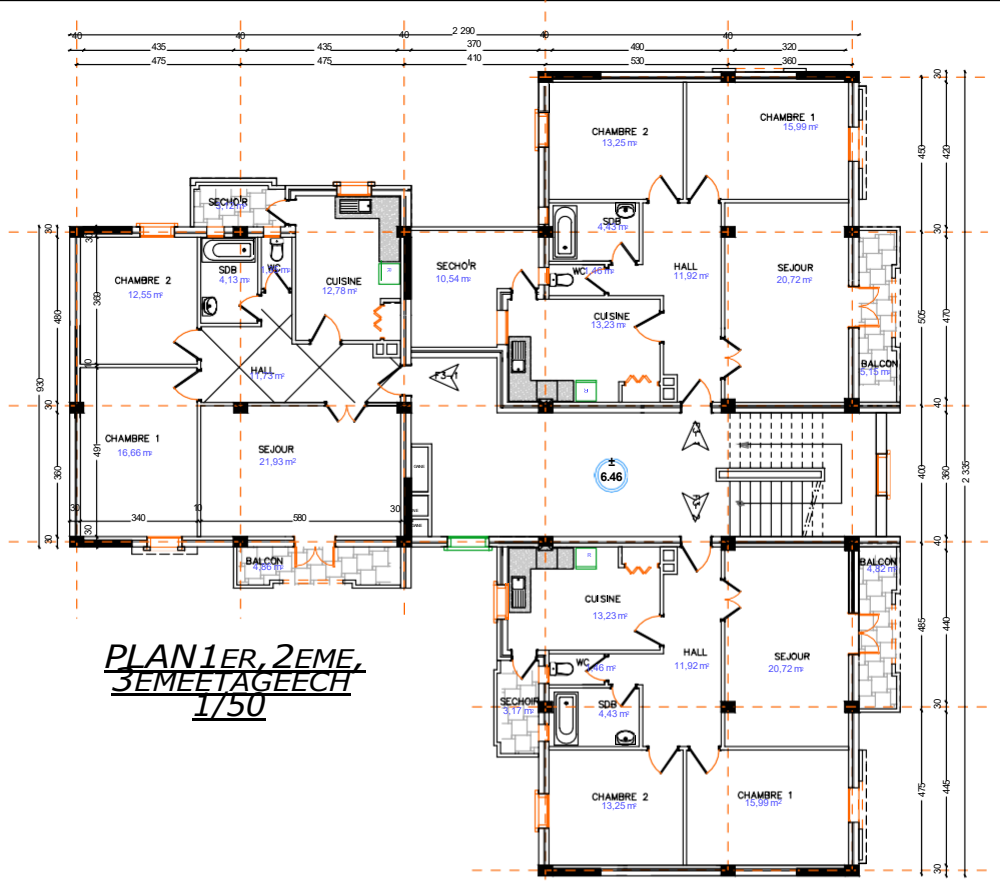
vers RN03
PLAN DE MASSE 1/200



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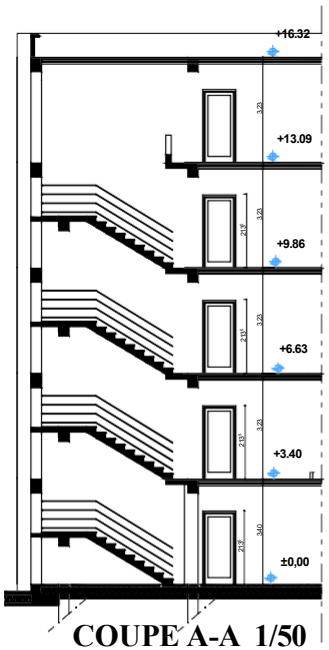
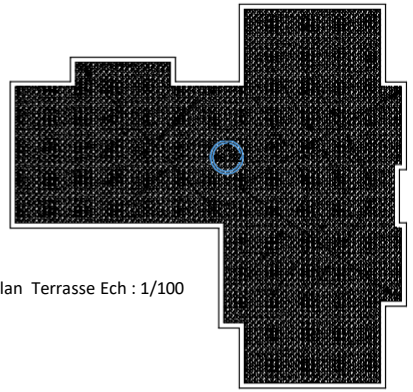


COUPE A-A 1/50



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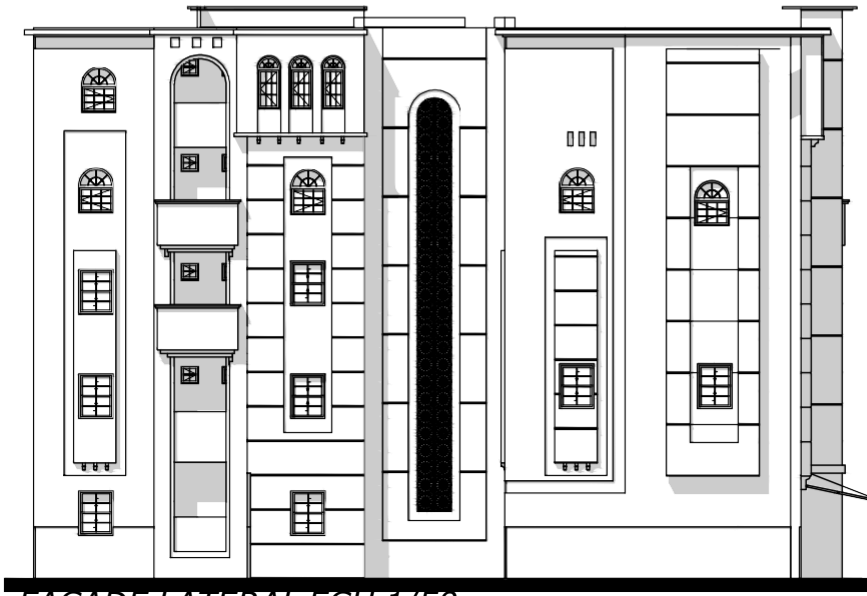

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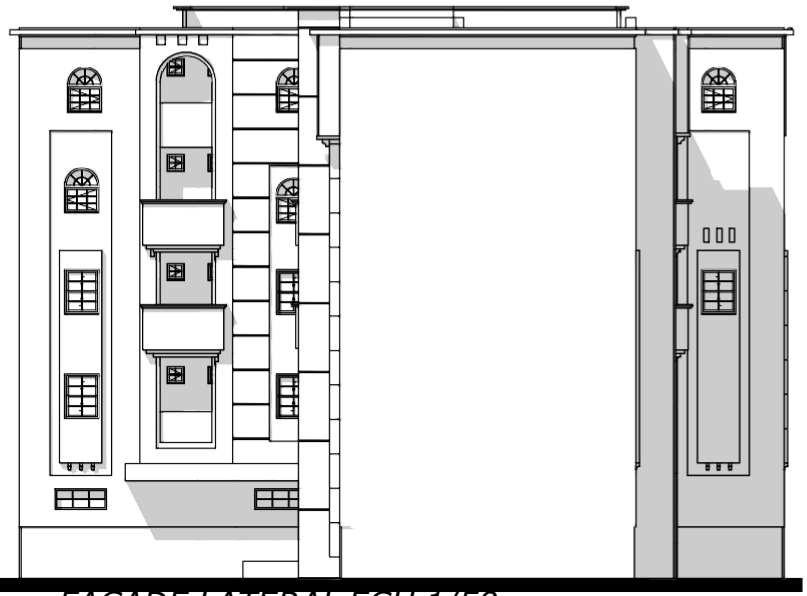

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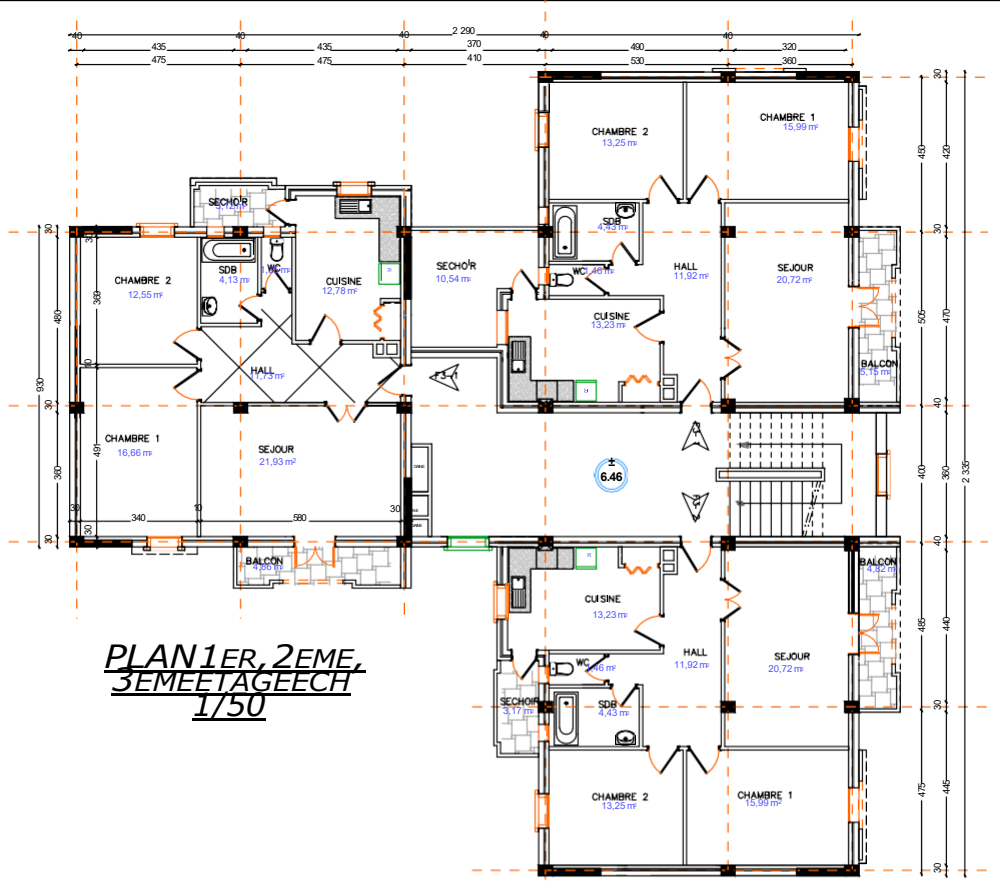
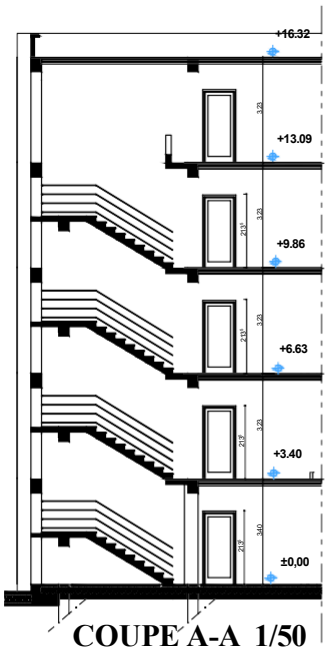
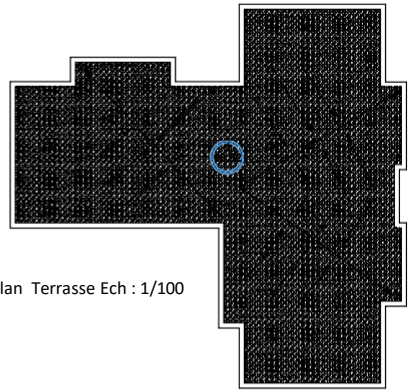


PLAN 1ER, 2EME, 3EME ETAGE ECH 1/50



COUPE A-A 1/50



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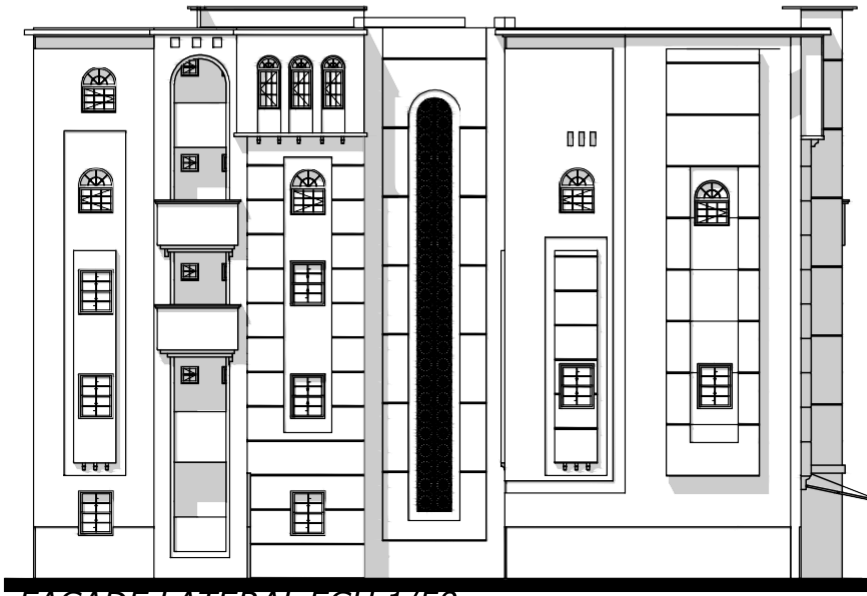

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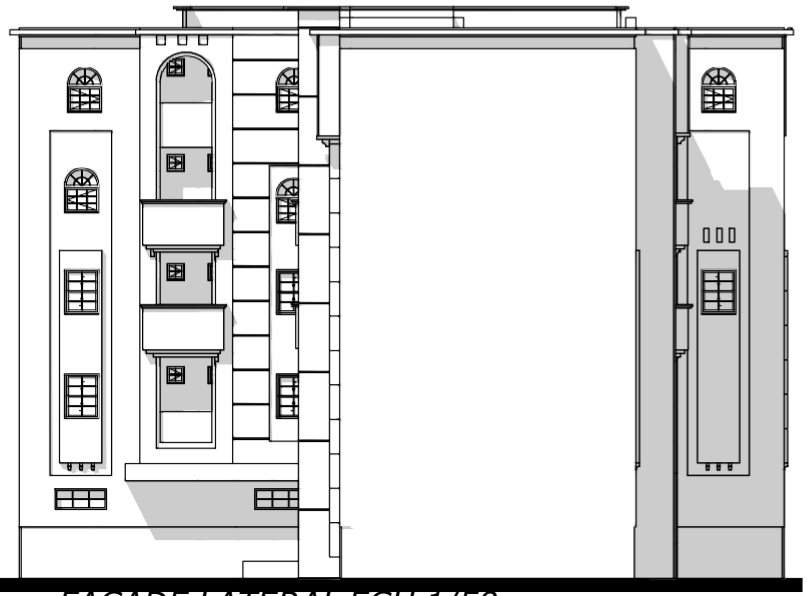

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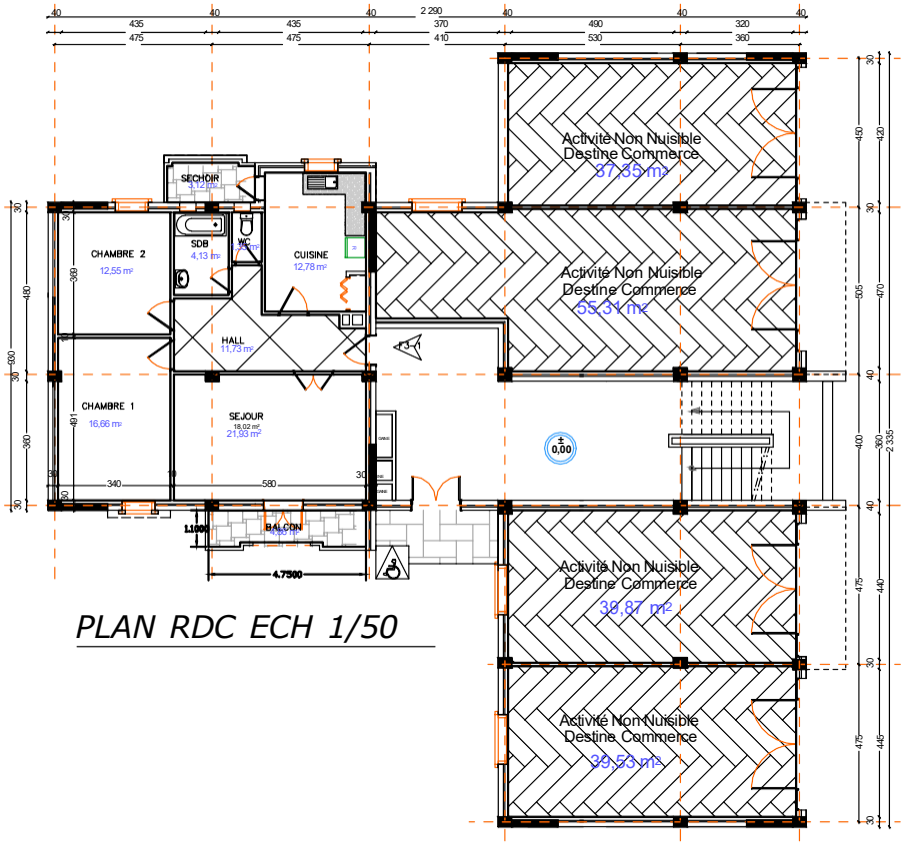

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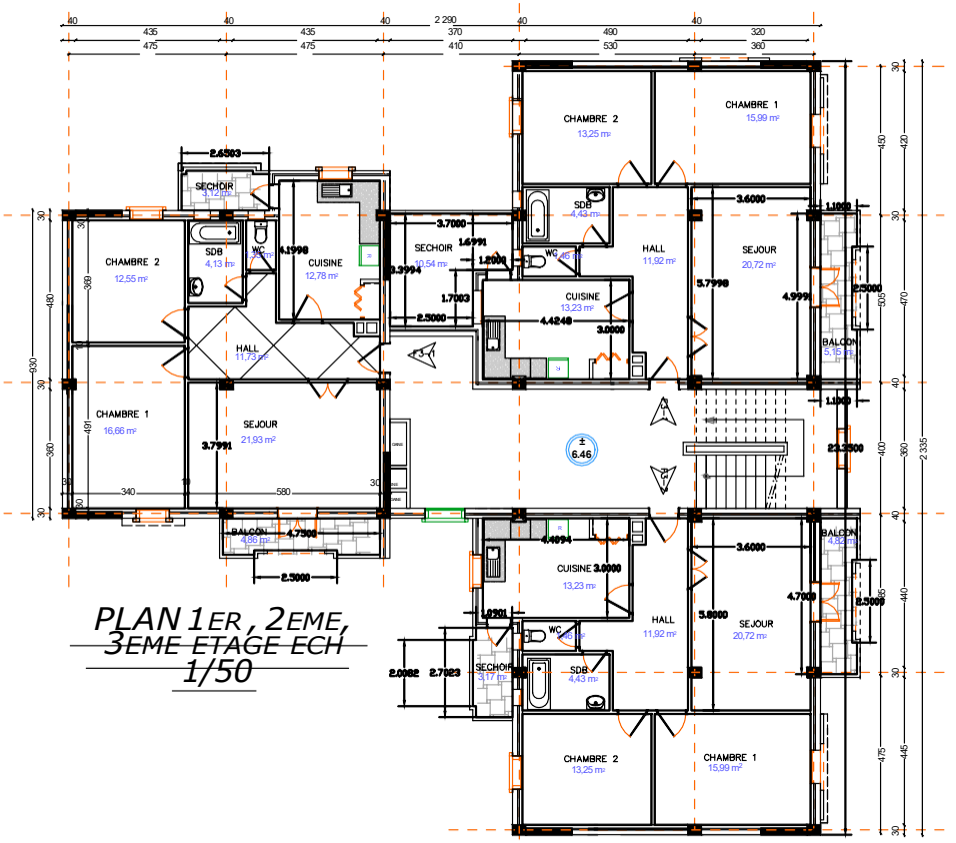
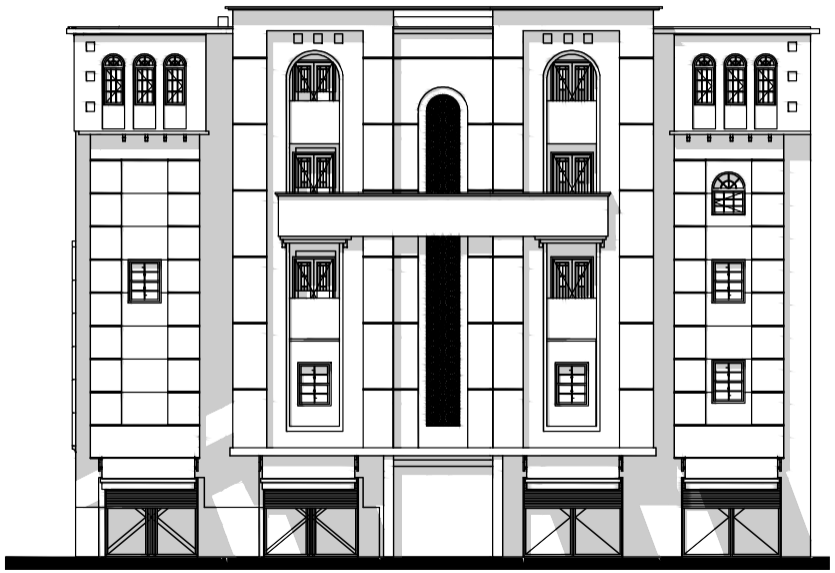


PLAN 1ER, 2EME, 3EME ETAGE ECH 1/50



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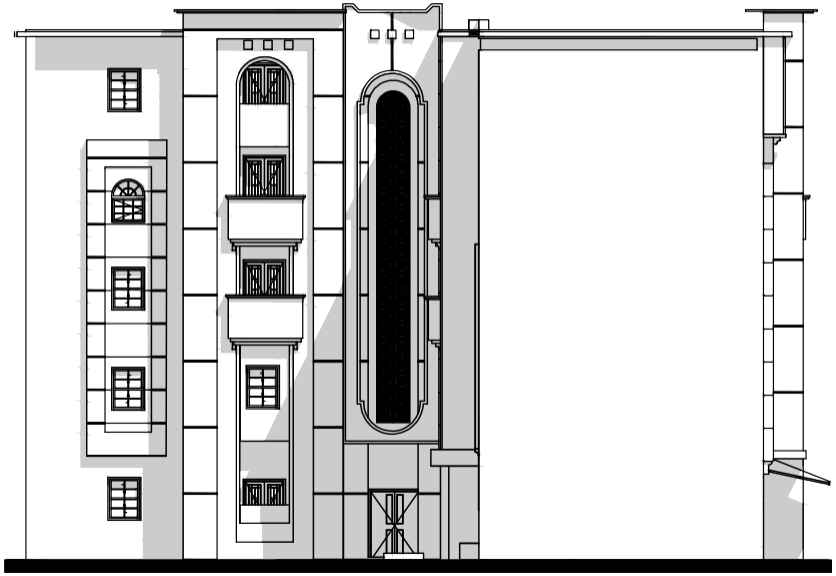

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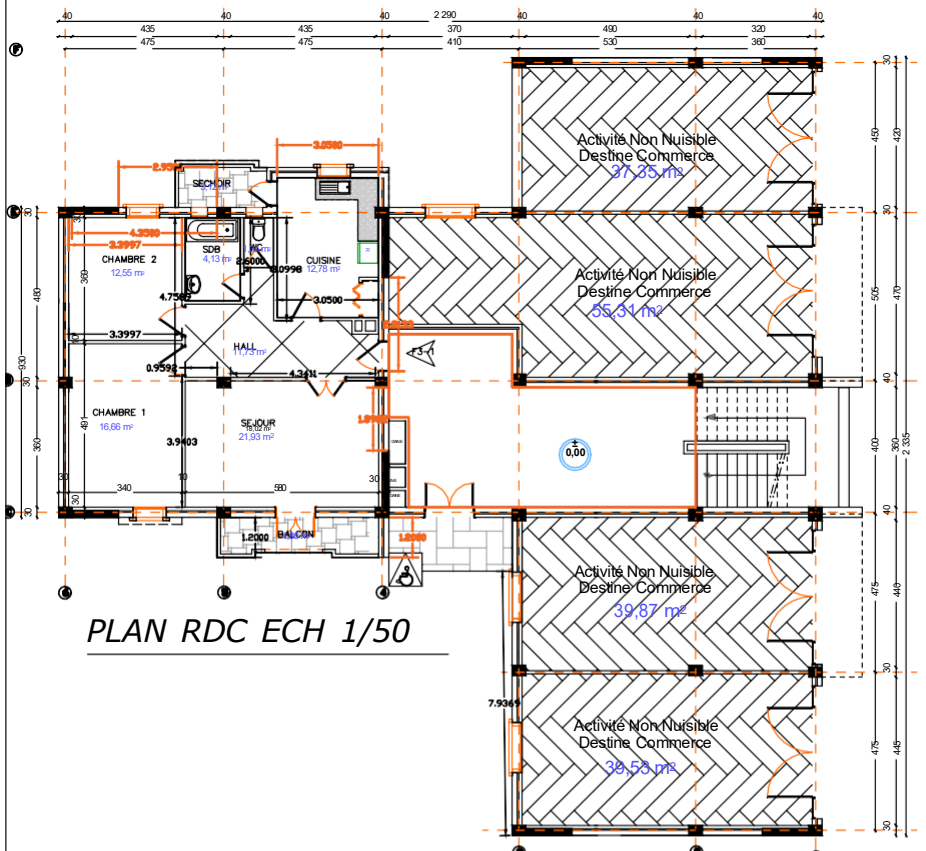

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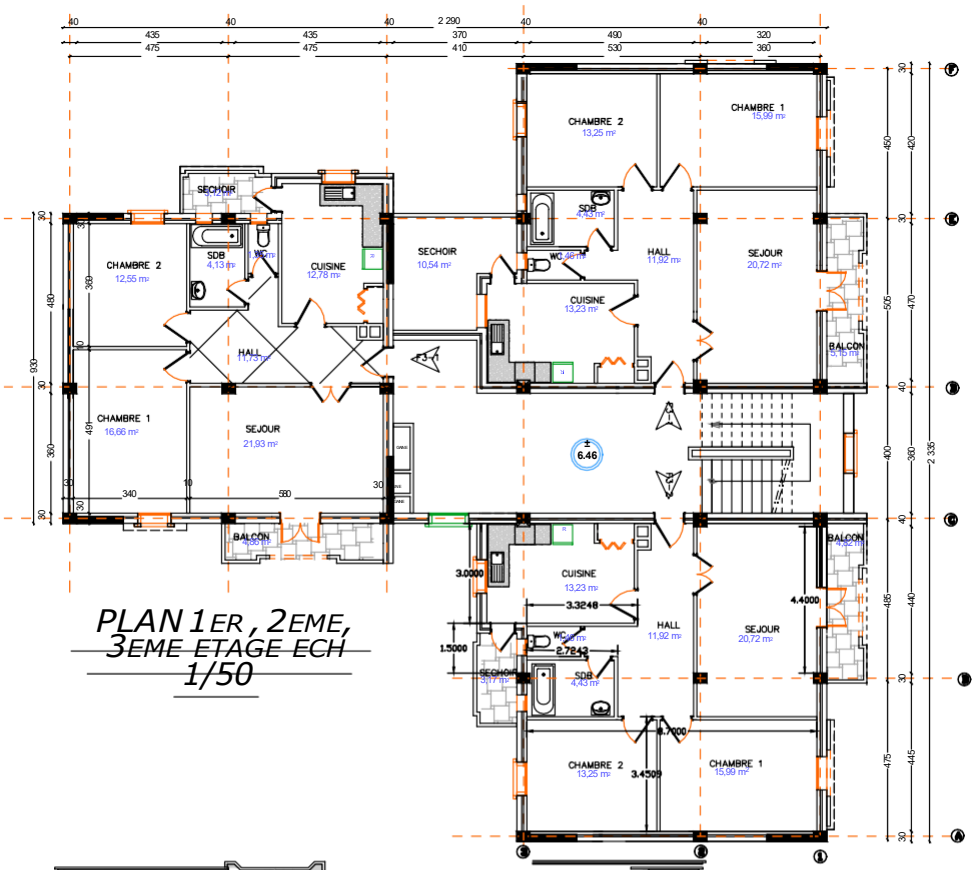

PLAN 1ER, 2EME, 3EME ETAGE ECH 1/50

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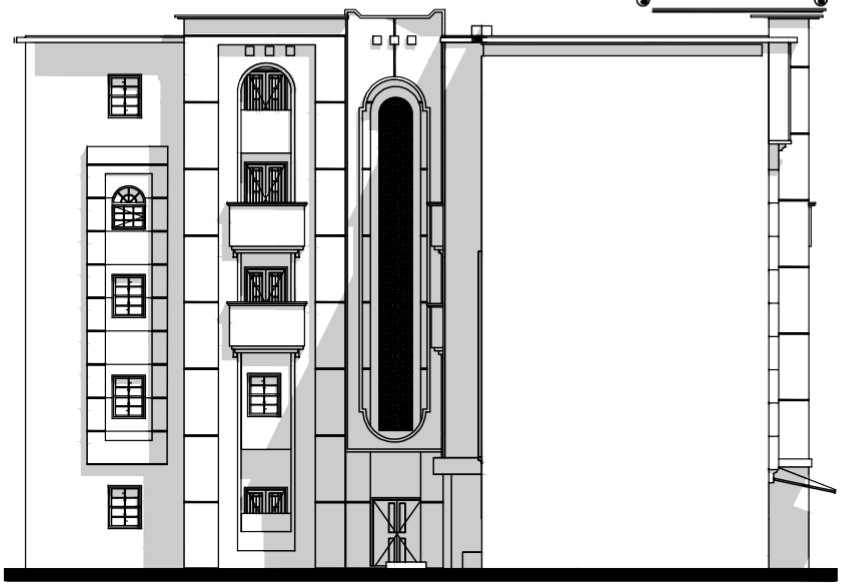

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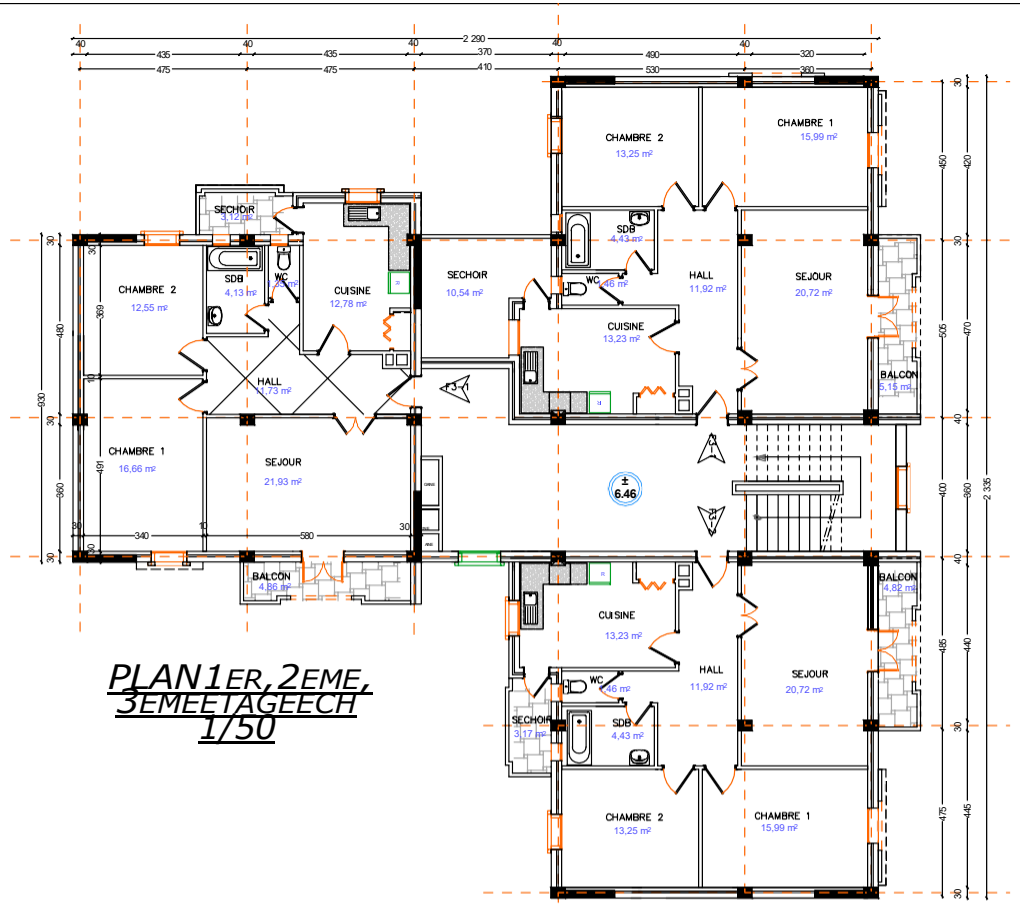

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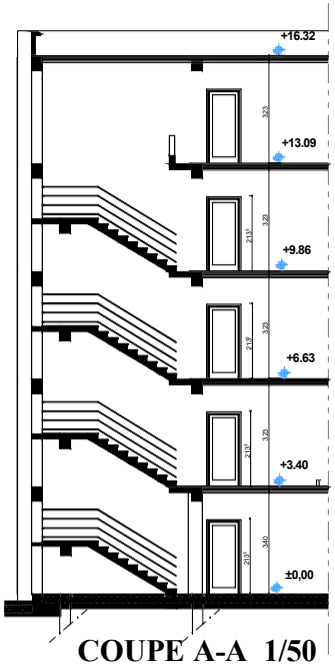
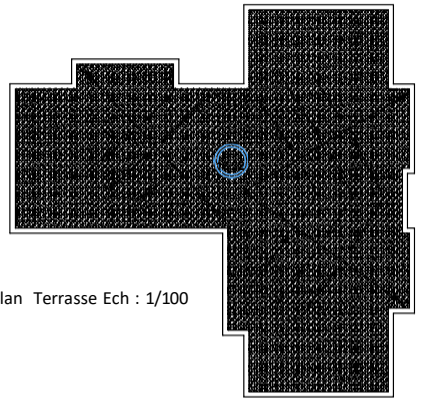


COUPE A-A 1/50



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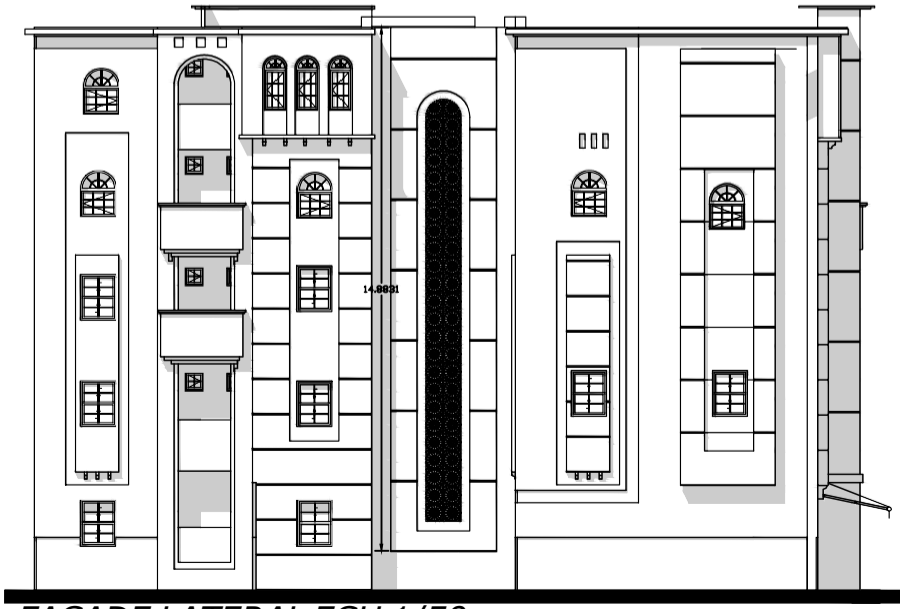

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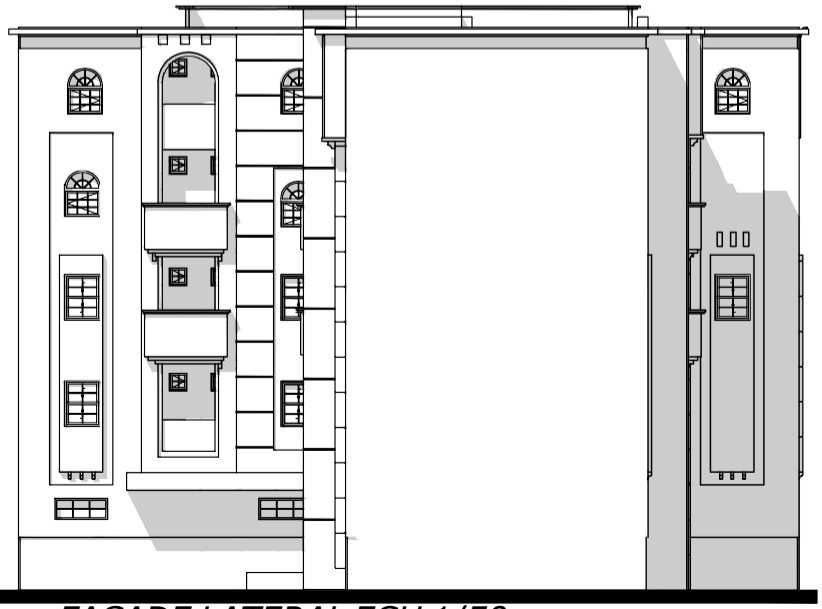

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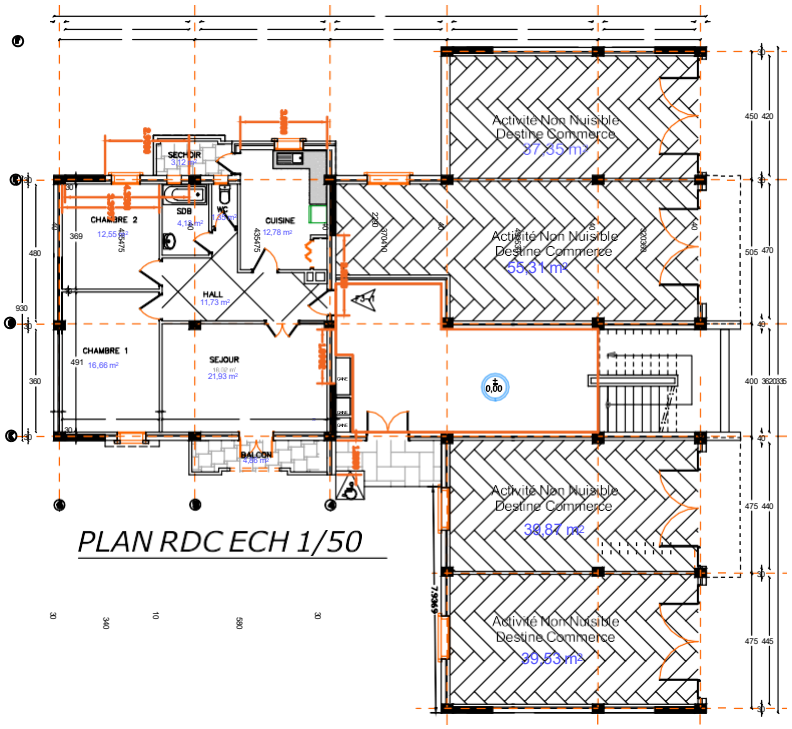

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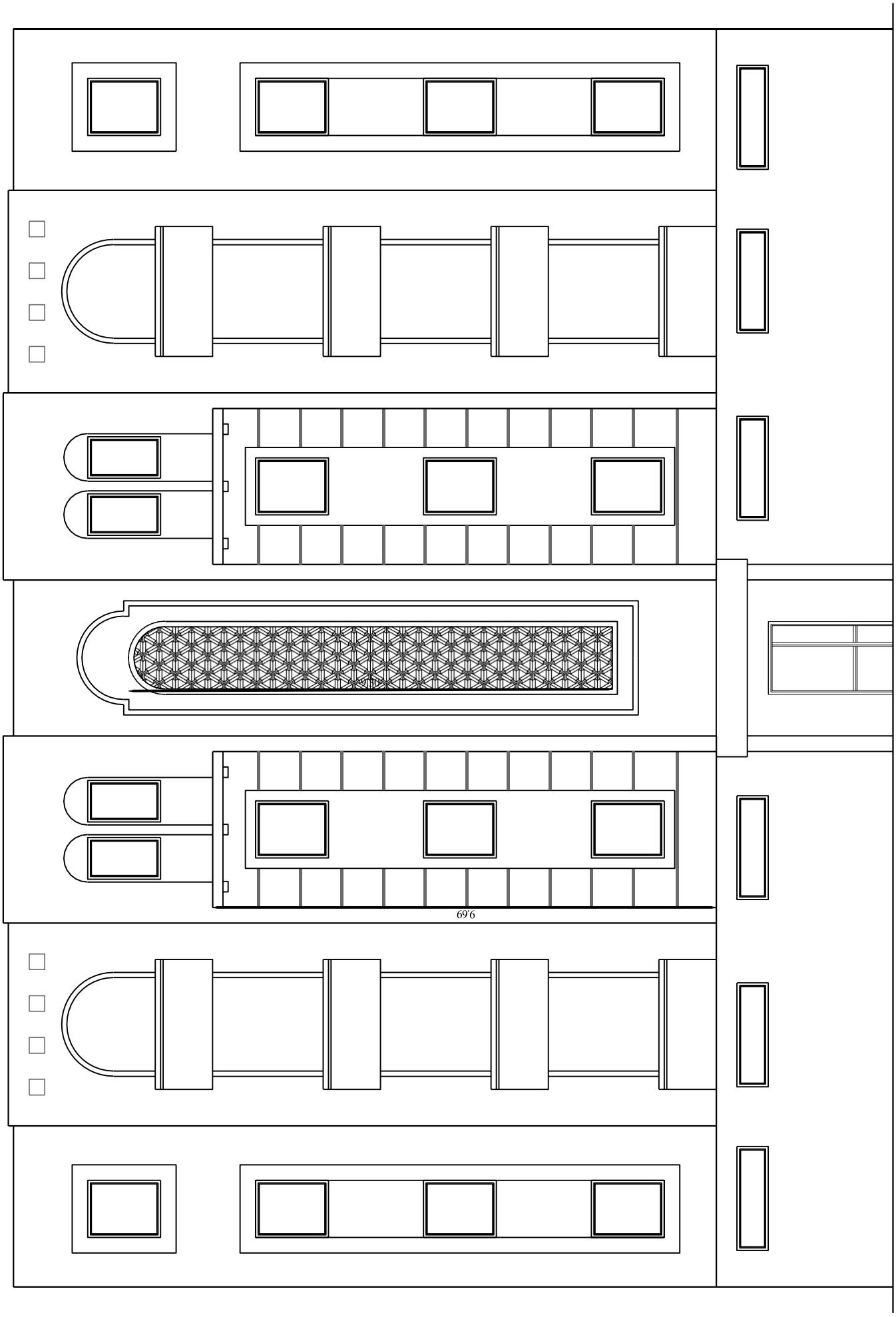
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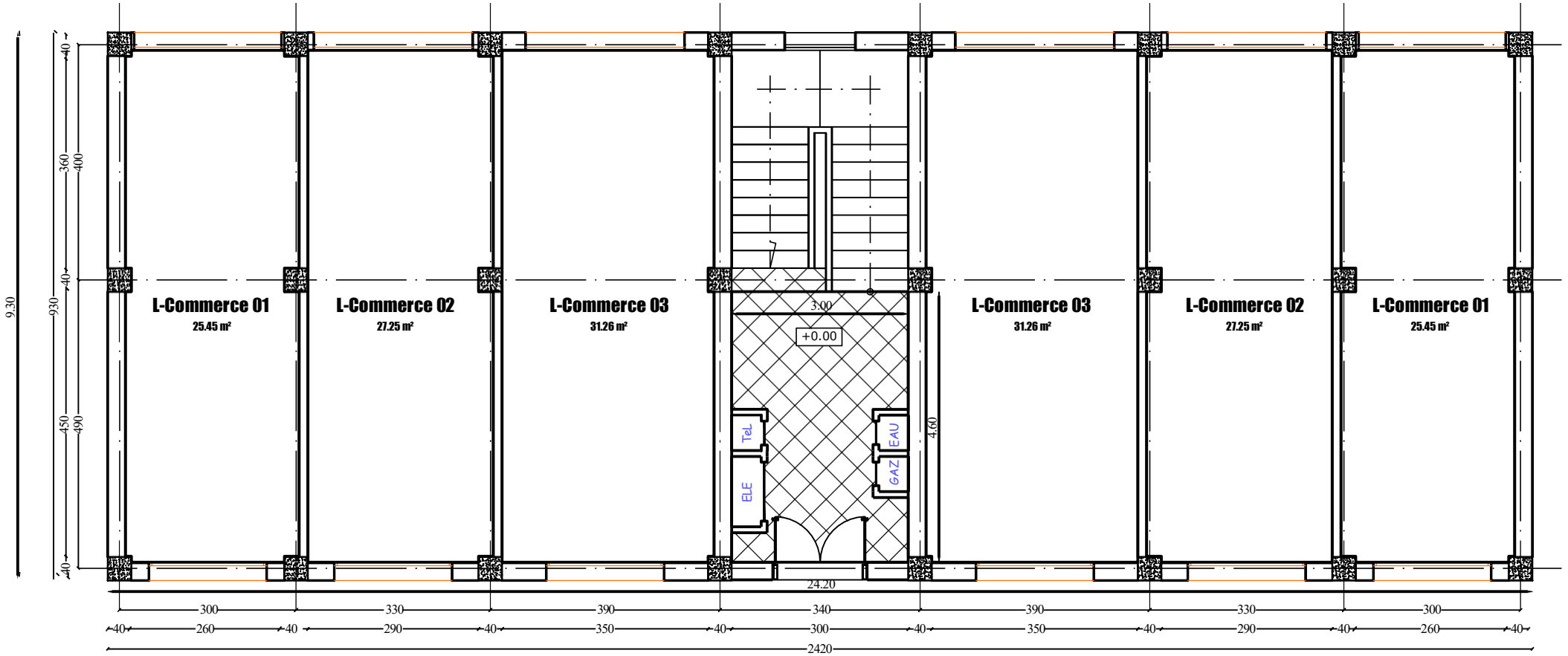
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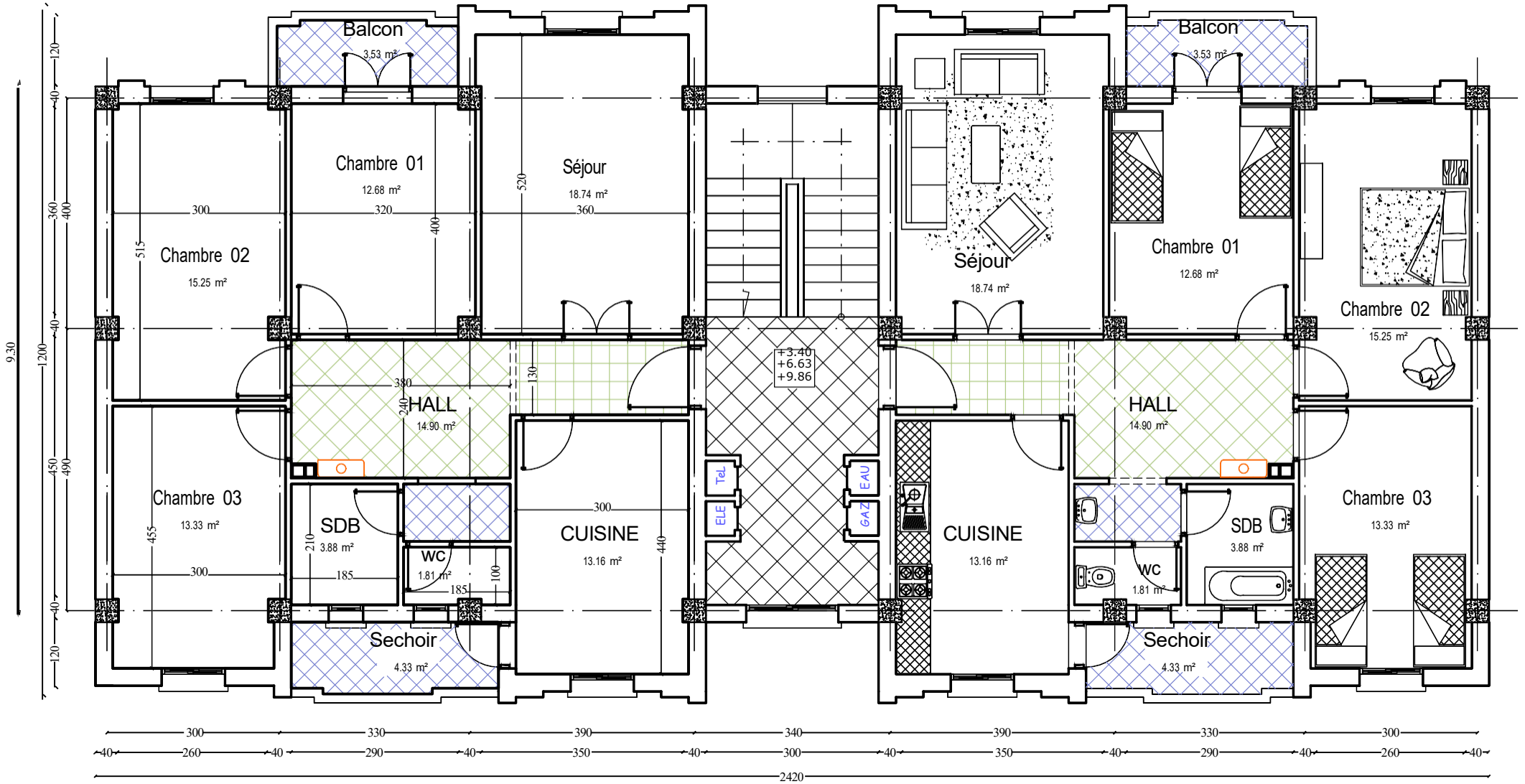
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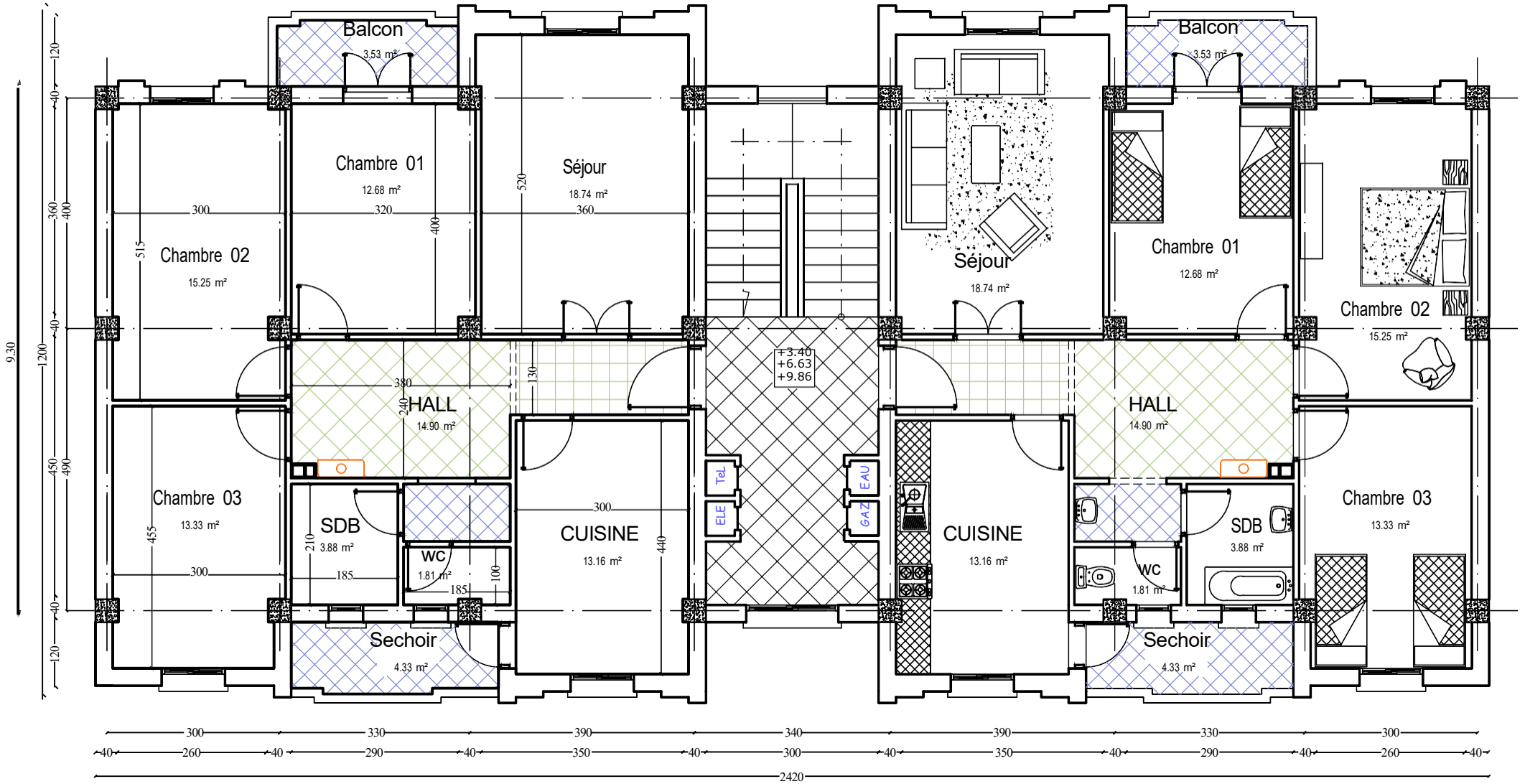
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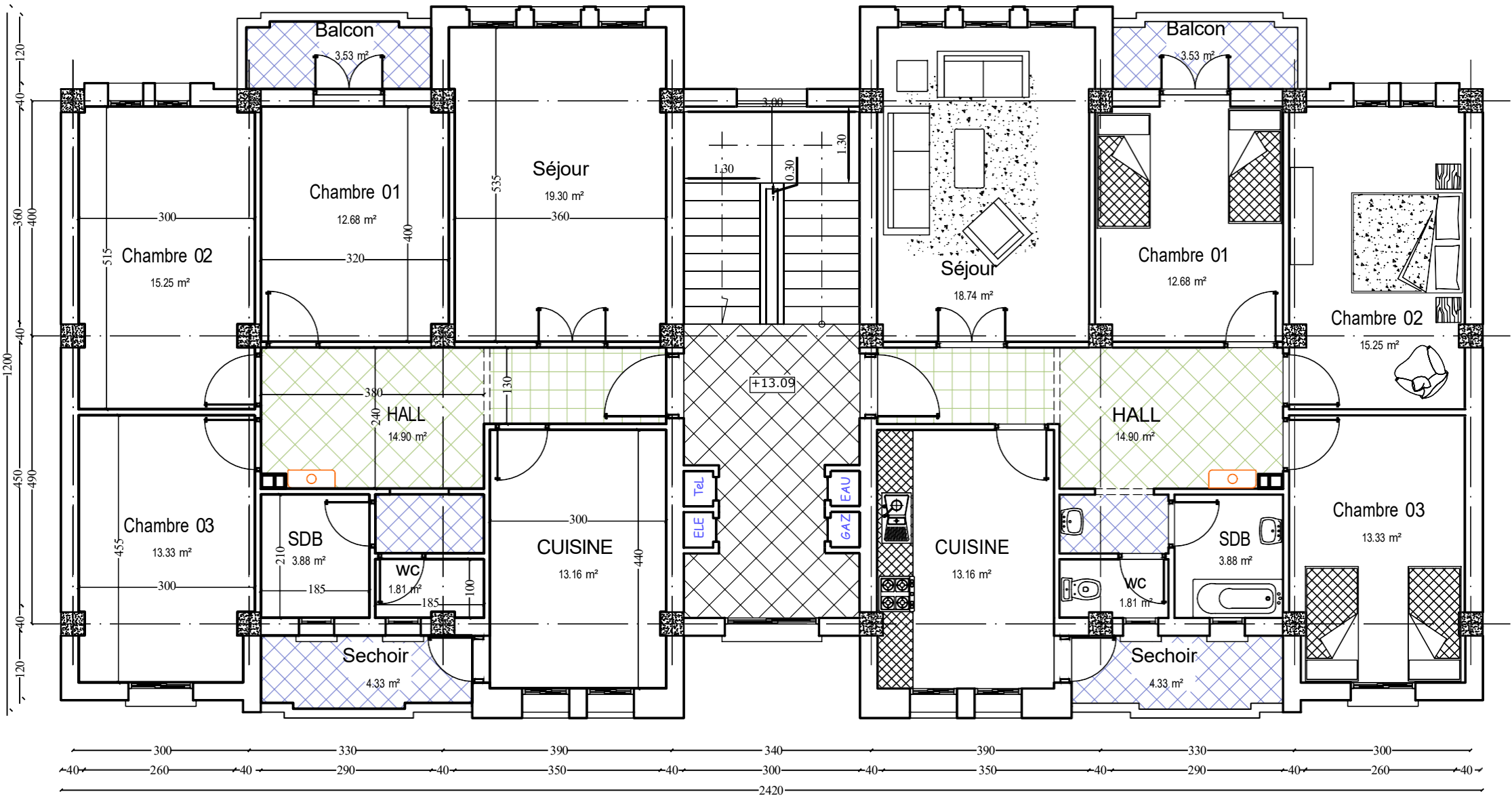
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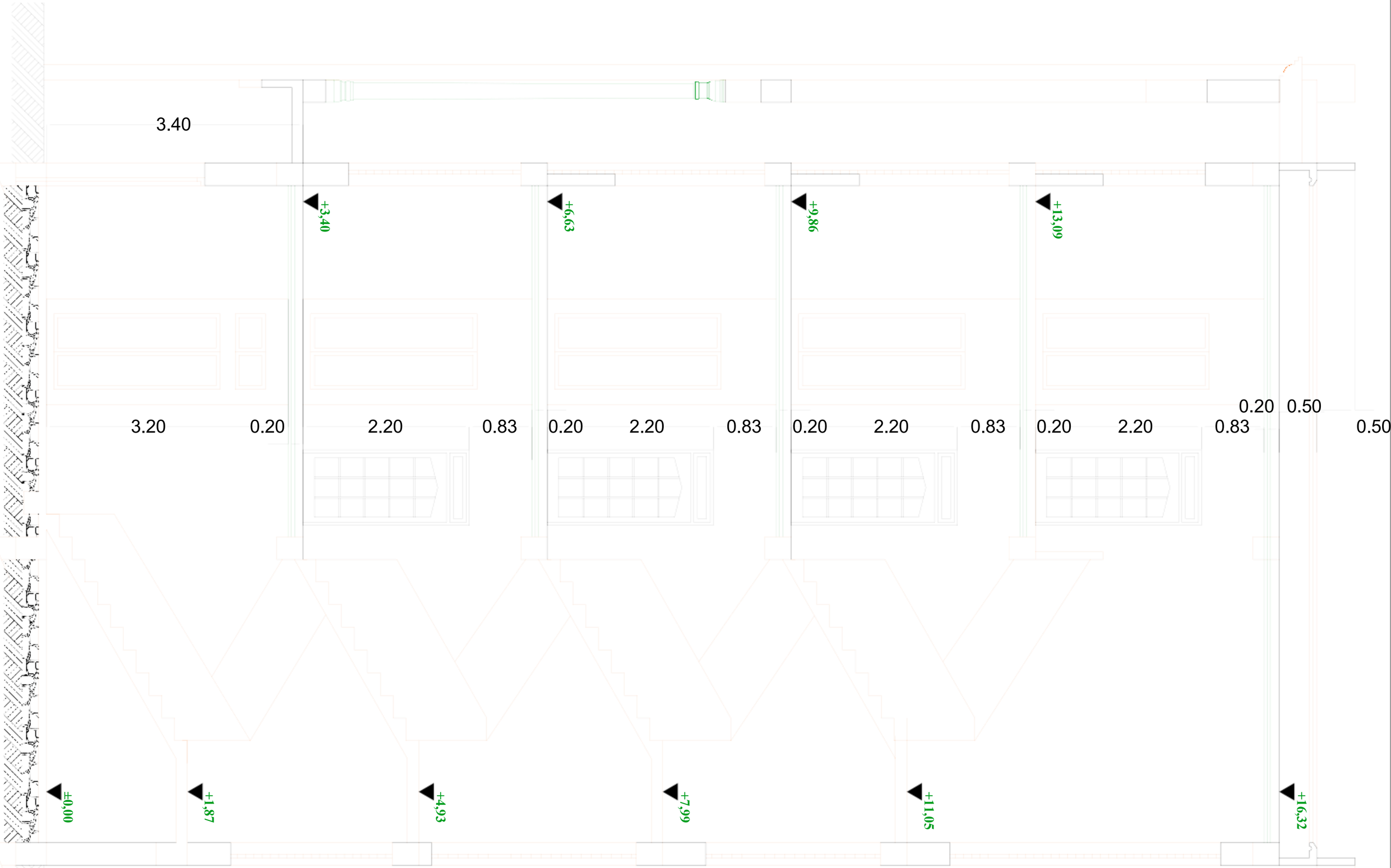
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±0,00
+1,87
+4,93
+7,99
+11,05
+16,32

الجمهورية الجزائرية الديمقراطية الشعبية

الوكالة الولائية للتسيير و التنظيم العقاري الحضري لولاية بسكرة

عقد انجـــاز

مشروع 61 سكن ترقوي جماعي+ 36 محل تجاري و 16 خدمات بالقطب الحضري الجديد في المنطقة الحضرية الغربية بسكرة مقسم إلى 02 حصص:

الحصة رقم 01 : 61/37 سكن ترقوي جماعي نوع F3/F4 + 22 محل تجاري.

مؤسسة أشغال البناء في مختلف مراحله تهيئة المساحات المسقية و تصريف المياه و الأشغال العمومية الكبرى و الري.

بوعزيـــز صابر

DEVIS QUANTITATIF ESTIMATIF

PROJET : REALISATION DE 61 LOGEMENTS PROMOTIONNELS COLLECTIFS + 36LOCAUX COMMERCIAUX ET 16 SERVICES SIS AU NOUVEAU POLE URBAIN DANS LA ZONE OUEST COMMUNE DE BISKRA

LOT N° 01 : REALISATION DE : 37/61/LOGEMENTS PROMOTIONNELS COLLECTIFS TYPE F3/F4 + 22 LOCAUX COMMERCIAUX

LOT : COMMERCE

N°	Désignation	U	Quantité	Prix Unit	Montant
	I) - TERRASSEMENT				
I.1	Décapage de la terre végétale et terrassement en grande masse	M3	296,000	300,00	88 800,00
I.2	Fouille en puits et en rigoles ou en tranchées	M3	1985,140	400,00	794 056,00
I.3	Remblais en terre ou TVN d'apport y compris compactage.	M3	1439,371	300,00	431 811,30
I.4	Evacuation des terres excédentaire à la décharge publique	M3	545,769	300,00	163 730,70
	Total TERRASSEMENT				1 478 398,00
	II) - GROS ŒUVRE				
	INFRASTRUCTURE (en H T S)				
II.1	Béton de propreté 250 kg/m3 sous semelles et longrines	M3	33,920	6 000,00	203 520,00
II.2	Gros béton dosé 250kg/m³ en ciment HTS	M3	131,572	6 000,00	789 432,00
II.3	Béton armé pour semelles dosé à 370kg/m³ en ciment HTS	M3	385,689	30 000,00	11 570 670,00
II.4	Béton armé pour amorces poteaux dosé à 370 kg/m³	M3	19,508	30 000,00	585 240,00
II.5	Béton armé pour longrines dosé à 370kg/m³	M3	87,570	30 000,00	2 627 100,00
II.6	Béton armée pour voile	M3	9,000	30 000,00	270 000,00
II.7	Hérisson âge en pierre sèche de 20cm d'épaisseur	M²	819,660	1 000,00	819 660,00
II.8	Dalle flottante en béton armé de 10cm d'épaisseur	M3	81,970	8 000,00	655 760,00
	Evacuation :				
II.9	a- Boite de branchement en béton armé de dimension 0.80x0.80	U	12	9 000,00	108 000,00
II.10	b- Boite de branchement en béton armé de dimension 0.60x0.60	U	30	8 000,00	240 000,00
II.11	b- Boite de branchement en béton armé de dimension 0.50x0.60	U	15	7 000,00	105 000,00
II.12	F/P Conduites enterrées en PVC de diamètre 160 PN 06	Ml	130,000	1200,00	156 000,00
II.13	F/P Conduites enterrées en PVC de diamètre 110	Ml	94,000	800,00	75 200,00
II.14	F/P : Cable de mise à la terre 28 mm2	Ml	360,000	500,00	180 000,00
	Total INFRASTRUCTURE (en H T S)				18 385 582,00
	III) - SUPERSTRUCTURE				
III.1	Béton armé pour poteaux et raidisseurs dosé à 350kg/m³ en ciment CPA	M³	48,96	30 000,00	1 468 800,00
III.2	Béton armé pour poutres et chainages dosé à 350Kg/m³	M³	88,030	30 000,00	2 640 900,00
III.4	Béton armé pour linteaux, appuis de fenêtres et corniche	M³	4,06	22 000,00	89 320,00
III.5	Plancher en corps creux 16+4cm en hourdis et poutrelles	M²	915,82	3 500,00	3 205 370,00
III.6	Dalle pleine en béton armé épaisseur 15cm	M³	3,16	30 000,00	94 800,00
III.7	Béton armée pour voile dosé à 350kg/m³	M³	16,20	30 000,00	486 000,00
	Total SUPERSTRUCTURE				7 985 190,00
	IV) - MAÇONNERIE ET REVETMENT				
IV.1	Construction de mur double parois en briques creuses de 30cm	M²	747,32	2 200,00	1 644 104,00
IV.2	Construction de mur simple parois en brique creuses de15cm	M²	370,00	1 200,00	444 000,00
IV.4	Construction élément décoratif en maçonnerie brique rouge pour façade quelque sois la forme	Ml	60,00	800,00	48 000,00
	Total MAÇONNERIE ET REVETMENT				2 136 104,00

AGENCE DE WILAYA DE GESTION & DE REGULARISATION FONCIERE URBAINE - BISKRA

DEVIS QUANTITATIF ESTIMATIF

PROJET : REALISATION DE 61 LOGEMENTS PROMOTIONNELS COLLECTIFS + 36LOCAUX COMMERCIAUX ET 16 SERVICES SIS AU NOUVEAU POLE URBAIN DANS LA ZONE OUEST COMMUNE DE BISKRA

LOT N° 01 : REALISATION DE : 37/61/LOGEMENTS PROMOTIONNELS COLLECTIFS TYPE F3/F4 + 22 LOCAUX COMMERCIAUX

RECAPUTILATION GENERAL

LOT	N°	TOTAL EN HORS TAXES	RABIE%		montant apres rabie	TVA		TOTAL EN T.T.C
LOT N° 01	37 Logts	121 532 449,60	/	/	/	9%	10 937 920,46	132 470 370,06
	22 Locaux	31 859 674,00	4,0	1 274 386,96	30 585 287,04	19%	5 811 204,54	36 396 491,58
MONTANT TOTAL EN T.T.C								168 866 861,64

Total en hors taxes (locaux+logement)	153 392 123,60
montant en hors taxes apres rabais	152 117 736,64
T.V.A(09 % +19%)	16 749 125,00
Total general en toutes taxes comprise	168 866 861,64

Arrête le présent recape generale en T.T.C a la somme de :

Cent soixante huit millions huit cent soixante six mille huit cent soixante et un Dinars Algerien et Soixante quatre Centimes

Biskra le: .....

Le service contractant

المدير
عفيصة حميد

Biskra le:17/02/2022

Le cocontractant

مؤسسة أشغال البناء في مختلف مراحله
تهيئة المساحات المغيبة وتصريف المياه
أشغال العمومية الكبرى والري
بوعزيز صابر
1231500107 ت.ت ولاية بسكرة

رقم التسجيل...13../2022

بيان العملية: مشروع إنجاز 61 سكن ترقوي جماعي + 36 محل تجاري و 16 خدمات بالقطب الحضري الجديد بالمنطقة الحضرية الغربية بلدية بسكرة
مقسم إلي 02 حصص:
الحصة رقم 01: 61/37 سكن ترقوي جماعي نوع F3/ F4 +22 محل تجاري
مقـــاولـة : بوعزيز صابر

أمـــر بالخدمة رقم: 01
ببدء الأشـغـال

السيـــد : بـوعزيز صـابر ، الحـائز علـى عقـد الإنجـاز رقـم:**2022/14** المـؤرخ فـي : **2022/02/28** المتعلـق **بمشـروع إنجـاز 61 سـكن ترقـوي جمـاعي + 36 محـل تجـاري و 16 خـدمات بالقطـب الحضـري الجديـد بالمنطقـة الحضرية الغربية بلدية بسكرة ، مقسم إلي 02 حصص:**

الحصة رقم 01: المتضمنة إنجاز 61/37 سكن ترقوي جماعي نوع F3/ F4 +22 محل تجاري

مدعو للانطلاق في الأشغال إبتداءا من اليوم الموالي لتاريخ استلام هذا الأمر .

هذا الأمر ببدء الأشغال يكون ساري المفعول عند المصادقة.

مسجلة تحت رقم:...13../2022، **إلى السيـــد:** بوعزيز صابر
من طرف السيـد: مدير الوكالة الولائية للتسيير والتنظيم العقاري الحضري لولاية بسكرة.

التأشيرة التقنية:

بسكرة في:...05...أفريل...2022
المدير:

المدير
فضيلة حميد

Chef de File
Nebbar Omar

رقم التسجيل...13../2022

بيان العملية: مشروع إنجاز 61 سكن ترقوي جماعي + 36 محل تجاري و 16 خدمات بالقطب الحضري الجديد بالمنطقة الحضرية الغربية بلدية بسكرة
مقسم إلي 02 حصص:
الحصة رقم 01: 61/37 سكن ترقوي جماعي نوع F3/ F4 +22 محل تجاري
مقـــاولـة : بوعزيز صابر

أنا الممضي أسفله السيد : بوعزيز صابر ، أصرح بأنني قد استلمت من طرف السيد / مدير الوكالة الولائية للتسيير والتنظيم العقاري الحضري لولاية بسكرة ، أمر ببدء الأشغال المؤرخ في...05...أفريل...2022...المسجل بالسجل المفتوح لهذا الغرض تحت رقم :...13../2022.

بسكرة في :...05...أفريل...2022

المقـــــاول:

رقم التسجيل...../2022

بيان العملية: مشروع إنجاز 61 سكن ترقوي جماعي + 36 محل تجاري و 16 خدمات بالقطب الحضري الجديد بالمنطقة الحضرية الغربية بلدية بسكرة
مقسم إلي 02 حصص:
الحصة رقم 01: 61/37 سكن ترقوي جماعي نوع F3/F 4
+22 محل تجاري
مقـــاولـة : بوعزيز صابر

أمـــر بالخدمة رقم: 02
بتوقيف الأشـغـال

السيـــد : بـوعزيز صـابر ، الحـائز علـى عقـد الإنجـاز رقـم:**2022/14** المـؤرخ فـي : **2022/02/28** المتعلـق **بمشـروع إنجـاز 61 سـكن ترقـوي جمـاعي + 36 محـل تجـاري و 16 خـدمات بالقطـب الحضـري الجديـد بالمنطقـة الحضرية الغربية بلدية بسكرة ، مقسم إلي 02 حصص:**

الحصة رقم 01: المتضمنة إنجاز 61/37 سكن ترقوي جماعي نوع F3/F 4+22 محل تجاري

مدعو لتوقيف الأشغال إبتداءا من اليوم الموالي لتاريخ استلام هذا الأمر .

السبب: في انتظار المصادقة على مخططات الهندسة المدنية من طرف الهيئة الوطنية للرقابة التقنية للمنشات.

هذا الأمر بتوقيف الأشغال يكون ساري المفعول عند المصادقة.

مسجلة تحت رقم:...../2022، إلى السيـــد: بوعزيز صابر
من طرف السيـد: مدير الوكالة الولائية للتسيير والتنظيم العقاري الحضري لولاية بسكرة.

التأشيرة التقنية:

بسكرة في:06 أفريل 2022
المدير:

رقم التسجيل...../2022

بيان العملية: مشروع إنجاز 61 سكن ترقوي جماعي + 36 محل تجاري و 16 خدمات بالقطب الحضري الجديد بالمنطقة الحضرية الغربية بلدية بسكرة
مقسم إلي 02 حصص:
الحصة رقم 01: 61/37 سكن ترقوي جماعي نوع F3/F 4
+22 محل تجاري
مقـــاولـة : بوعزيز صابر

أنا الممضي أسفله السيـد : بوعزيز صابر ، أصرح بـأنني قد استلمت من طرف السيد / مدير الوكالة الولائية للتسيير والتنظيم العقاري الحضري لولاية بسكرة ، أمر بتوقيف الأشغال المؤرخ في:06 أفريل 2022...المسجل بالسجل المفتوح لهذا الغرض تحت رقم :...../2022.

بسكرة في :06 أفريل 2022

المقـــاول:
بوعزيز صابر
RC N° 07/00-1231500

رقم التسجيل...29../2022

بيان العملية: مشروع إنجاز 61 سكن ترقوي جماعي + 36 محل تجاري و 16 خدمات بالقطب الحضري الجديد بالمنطقة الحضرية الغربية بلدية بسكرة
مقسم إلي 02 حصص:
الحصة رقم 01: 61/37 سكن ترقوي جماعي نوع F3/F 4
+22 محل تجاري
مقـــاولـة : بوعزيز صابر

أمـــر بالخدمة رقم: 03
باستئناف الأشغـال

السيـــد : بـوعزيز صـابر ، الحـائز علـى عقـد الإنجـاز رقـم:**2022/14** المـؤرخ فـي : **2022/02/28** المتعلـق **بمشـروع إنجـاز 61 سـكن ترقـوي جمـاعي + 36 محـل تجـاري و 16 خـدمات بالقطـب الحضـري الجديـد بالمنطقـة الحضرية الغربية بلدية بسكرة ، مقسم إلي 02 حصص:**

الحصة رقم 01: المتضمنة إنجاز 61/37 سكن ترقوي جماعي نوع F3/F 4+22 محل تجاري

مدعو لاستئناف الأشغال إبتداءا من اليوم الموالي لتاريخ استلام هذا الأمر .

هذا الأمر باستئناف الأشغال يكون ساري المفعول عند المصادقة.

مسجلة تحت رقم:...29../2022، إلى السيـــد: بوعزيز صابر
من طرف السيـد: مدير الوكالة الولائية للتسيير والتنظيم العقاري الحضري لولاية بسكرة.

التأشيرة التقنية:

بسكرة في:.....
المدير:

المدير
عفيصي حميد

Chef de File
Nebbar Omar

رقم التسجيل...29../2022

بيان العملية: مشروع إنجاز 61 سكن ترقوي جماعي + 36 محل تجاري و 16 خدمات بالقطب الحضري الجديد بالمنطقة الحضرية الغربية بلدية بسكرة
مقسم إلي 02 حصص:
الحصة رقم 01: 61/37 سكن ترقوي جماعي نوع F3/F 4
+22 محل تجاري
مقـــاولـة : بوعزيز صابر

أنا الممضي أسفله السيد : بوعزيز صابر ، أصرح بـأنني قد استلمت من طرف السيد / مدير الوكالة الولائية للتسيير والتنظيم العقاري الحضري لولاية بسكرة ، أمر باستئناف الأشغال المؤرخ في:...2022...المسجل بالسجل المفتوح لهذا الغرض تحت رقم :...29../2022.

بسكرة في :...2022...

المقـــاول:

مؤسسة أشغال البناء في مختلف مراحله
تهيئة المساحات المسقية وتصريف المياه
والأشغال العمومية الكبرى والري
بوعزيز صابر
1231500107 س.ت ولاية بسكرة

رقم التسجيل:...../2023

بيان العملية: مشروع إنجاز 61 سكن ترقوي جماعي + 36 محل تجاري و 16 خدمات بالقطب الحضري الجديد بالمنطقة الحضرية الغربية بلدية بسكرة
مقسم إلي 02 حصص:
الحصة رقم 01: 61/37 سكن ترقوي جماعي نوع F3/F 4
+22 محل تجاري
مقـــاولـة : بوعزيز صابر

أمـــر بالخدمة
توقيف الأشغـــال

السيـــد : بـوعزيز صـابر ، الحـائز علـى عقـد الإنجـاز رقـم:**2022/14** المـؤرخ فـي : **2022/02/28** المتعلـق **بمشـروع إنجـاز 61 سـكن ترقـوي جمـاعي + 36 محـل تجـاري و 16 خـدمات بالقطـب الحضـري الجديـد بالمنطقـة الحضرية الغربية بلدية بسكرة ، مقسم إلي 02 حصص:**

الحصة رقم 01: المتضمنة إنجاز 61/37 سكن ترقوي جماعي نوع F3/F 4+22 محل تجاري

مدعو لتوقيف الأشغال إبتداءا من اليوم الموالي لتاريخ استلام هذا الأمر .

السبب: تسوية المدة الإضافية للآجال التعاقدية الخاصة بمرحلة المتابعة لمكتب الدراسات.

هذا الأمر بتوقيف الأشغال يكون ساري المفعول عند المصادقة.

مسجلة تحت رقم:...../2023، إلى السيـــد: بوعزيز صابر
من طرف السيـد: مدير الوكالة الولائية للتسيير والتنظيم العقاري الحضري لولاية بسكرة.

بسكرة في: 14 جوان 2023

التأشيرة التقنية:

المـــــــدير:

رئيس مكتب المتابعة
عثامنيـــة يـاسـ

رئيس مصلحة الترقية العقارية
"بالنيابة"
امـــال عيشـاد

Chef de File
Nebbar Omar

رقم التسجيل:...../2023

بيان العملية: مشروع إنجاز 61 سكن ترقوي جماعي + 36 محل تجاري و 16 خدمات بالقطب الحضري الجديد بالمنطقة الحضرية الغربية بلدية بسكرة
مقسم إلي 02 حصص:
الحصة رقم 01: 61/37 سكن ترقوي جماعي نوع F3/F 4
+22 محل تجاري
مقـــاولـة : بوعزيز صابر

أنا الممضي أسفله السيد : بوعزيز صابر ، أصرح بـأنني قد استلمت من طرف السيد / مدير الوكالة الولائية للتسيير والتنظيم العقاري الحضري لولاية بسكرة ، أمر بتوقيف الأشغال المؤرخ في: 14 جوان 2023 .....المسجل بالسجل المفتوح لهذا الغرض تحت رقم :...../2023.

بسكرة في : 14 جوان 2023

المقـــاول:

مؤسسة أشغال البناء في مختلف مراحله
بوعزيز صابر
شارع الإخوة سعدية بلدية سيدي عقبة بسكرة
RC N° 07/00-1231500 A 07

رقم التسجيل...../2024

بيان العملية: مشروع إنجاز 61 سكن ترقوي جماعي + 36 محل تجاري و 16 خدمات بالقطب الحضري الجديد بالمنطقة الحضرية الغربية بلدية بسكرة
مقسم إلي 02 حصص:
الحصة رقم 01: 61/37 سكن ترقوي جماعي نوع F3/F 4 +22 محل تجاري
مقاولة : بوعزيز صابر

أمر بالخدمة
إستئناف الأشغال

السيد : بوعزيز صابر ، الحائز على عقد الإنجاز رقم:2022/14 المؤرخ في : 2022/02/28 المتعلق **بمشروع إنجاز 61 سكن ترقوي جماعي + 36 محل تجاري و 16 خدمات بالقطب الحضري الجديد بالمنطقة الحضرية الغربية بلدية بسكرة ، مقسم إلي 02 حصص:**

الحصة رقم 01: المتضمنة إنجاز 61/37 سكن ترقوي جماعي نوع F3/F 4 +22 محل تجاري

مدعو لاستئناف الأشغال إبتداءا من اليوم الموالي لتاريخ استلام هذا الأمر .

هذا الأمر باستئناف الأشغال يكون ساري المفعول عند المصادقة.

مسجلة تحت رقم:..... /2024، **إلى السيد:** بوعزيز صابر
من طرف السيد: مدير الوكالة الولائية للتسيير والتنظيم العقاري الحضري لولاية بسكرة.

التأشيرة التقنية:

بسكرة في:.....
المـــــدير:

20 MARS 2024

رقم التسجيل...../2024

بيان العملية: مشروع إنجاز 61 سكن ترقوي جماعي + 36 محل تجاري و 16 خدمات بالقطب الحضري الجديد بالمنطقة الحضرية الغربية بلدية بسكرة
مقسم إلي 02 حصص:
الحصة رقم 01: 61/37 سكن ترقوي جماعي نوع F3/F 4 +22 محل تجاري
مقاولة : بوعزيز صابر

أنا الممضي أسفله السيد : بوعزيز صابر ، أصرح بأنني قد استلمت من طرف السيد / مديرالوكالة الولائية للتسيير والتنظيم العقاري الحضري لولاية بسكرة ، أمر باستئناف الأشغال المؤرخ في.....المسجل بالسجل المفتوح لهذا الغرض تحت رقم :...../2024.

20 MARS 2024

بسكرة في :.....
المقـاول:

محضر إتفاق

في اليوم الثامن عشر من شهر ماي سنة ألفين و ثلاثة وعشرون 2023/05/18 تم الاجتماع بمقر الوكالة الولائية للتسيير والتنظيم العقاري الحضري بسكرة، برئاسة السيد عفيصة حميد مدير الوكالة الولائية للتسيير والتنظيم العقاري الحضري بسكرةّ ، وبحضور كل من السادة :

- عيـا د أمـــال — رئيس مصلحة الترقية العقارية
- عثامنية ياسين — رئيس مكتب المتابعة
- بوصيـاد حمزة — مهندس مكلف بمتابعة المشاريع.
- نبـار عمـــــار — مكتب الدراسات
- بوعزيز صـابر — مقاولة الإنجاز –المكلف بإنجاز الحصة رقم 01-

افتتحت الجلسة من قبل رئيسها مرحبا بالحاضرين بعدها تطرق إلى مناقشة الأسعار المتعلقة بأشغال التدفئة المركزية للسكنات لمشروع انجاز 61 سكن ترقوي جماعي + 36 محل تجاري و 16 خدمات بالقطب الحضري الجديد في المنطقة الحضرية الغربية– بســـــكرة- المقسم إلى حصتين :

- **الحصة رقم 01: 61/37 سكن ترقوي جماعي نوع F 3/F 4 22+ محل تجاري بالقطب الحضري الجديد بالمنطقة الحضرية الغربية بسكرة**

و بعد الدراسة و المناقشة تم الاتفاق على مايلي :

N°	Désignation	U	PRIX EN (HT)			
			Entreprise	Le maitre d'oeuvre	Le maitre de l´ovrage	Le prix convenu
01	F/P Applique multicouche en cuivre Male longue 11cm pour chaudiere avec tout accessoire y compris raccordement, fixation et main d'œuvre et toutes sujétion de bonne exécution.	U	2400.00	2200.00	2000.00	2000.00

أغلق المحضر في نفس اليوم والشهر والسنة المذكورين أعلاه .

رئيس مكتب المتابعة	رئيس مصلحة الترقية العقارية	المديـــــر
عثامنية ياسين	أمـــال عيـاد	عفيصة حميد

المكلف بمتابعة المشاريع	مكتب الدراسات	المقاولة
بوصياد حمزة		

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