Nile Higher Institute for Engineering & Technology

Department of Civil Engineering

“Construction ProjectManagement”

مشروع ادارة مشروعات

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2022

Nile Higher Institute for Engineering & Technology

Department of Civil Engineering

"NEW TANTA SURGYING HOSPITAL"

"مستشفي جراحات جامعه طنطا"

"By"

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بسم الله الرحمن الرحيم

Thanks and appreciation

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We thank and appreciate our professor **Dr. Tamer Al-Korany**, who has preferred to supervise this research, and for all his support, guidanceand guidance to complete this work as it is, he has the best words of praise and appreciation.

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We thank and appreciate the engineer **Sameh Makram** and **Mohammed Wajih** who are supervising the project with

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ABSTRACT

In brief, construction project management is the process of managing construction projects. But when you‘re talking about managing a construction project in comparison to other types of projects, the distinction is mostly that construction is mission-based. That means that the project‘s organization ends with the end of the project build.

While generally project management is defined as managing resources over the life cycle of a project through various tools and methodologies to control scope, cost, time, quality, etc.—when working in the construction industry your outlook must be broader. It usually includes a wider variety of constraints to considerthat are specific to the design and build of construction projects. Construction project management can interact with a variety of different disciplines in the lifetime of a project as well, from architecture to engineering to publicworks to city planning.

CHAPTER01

1.PROJECT DEFINITION

There are a variety of different types of construction projects, depending on the different construction sectors. There are two sectors in construction: residential and commercial. Depending on the sector, there can be up to four different types of projects:

- Residential home building and renovation
- Heavy industrial construction
- Commercial and institutional construction
- Engineering construction

The Construction Project Manager

Construction project management is run by a construction project manager. This person is tasked with the planning, coordination, budgeting and supervision of the construction project.

Construction project manager responsible for the following tasks:

- Estimate and negotiate project costs
- Formulate budget
- Create schedule and work timetables
- Manage work orders
- Determine which methods and strategies are appropriate for the project
- Communicate with clients and stakeholders, re. budget, progress, etc.
- Lead or interface with workers, teams and other construction professions on technicaland contract details
- Work with building, construction and regulatory specialists

1.1 THE PROBLEM

- Final finishing of FFAE (Fixed Furniture &Equipment).
- The site‘s clearance and rough site grading
- Internal finishes of tenant‘s office and commercial spaces
- Water & electricity supplies and available services prior to enabling the work

1.2 STUDY OBJECTIVES

- the employer shall provide Water & electricity supplies and available services prior to enabling the work
- The employer shall exert its effort to obtain necessary permits and required

approvals to allow foreign personnel.

- The employer shall hand over the construction site cleared from any obstacles and leveled graded.

1.3 EXISTING SOLUTIONS

Providing everything in the right quantities and at the right time

1.4 DESIGN CONSTRAINTS

1.4.1 Economic

- 1.commencement date of each package is not later than 15th December 2017, the latest date of completion of any package shall not exceed 31th march 2021(except foriconic tower shall be completed before 30th June 2021)
- 2.time for completion of the work is 1203 days
- 3.not less than 35% of the contract price shall be obtained by the Chinese market including engineering, labor, material and plant & equipment for permanent work
- 4. The total price of any package is not exceeded by more than 10% or not reduced by more than 15% in the subsequent addenda.
- 5. The contract price shall be paid in both US dollars and EGY pound based on currency ratio of 85% (US$) and 15% (LE), and the 15% (LE) shall constitute the advanced payment.

6. No adjustment shall be made to the contract price for fluctuation in the rate of the exchange between local and foreign currencies.

1.4.2 Environmental

The project aim to create a good investment and investment environment for the new administrative capital, and effectively promote the economic development of the neighboring regions. It would also support the development of 'Belt and Road Initiative' in Egypt

The project covered an area of estimated 1,612,850 square meters; the project includes 385-meter-high Iconic Tower, 12 high-rise commercial office buildings, 5 high-rise apartment buildings and 2 high-end hotels as well as supporting municipal projects.

1.4.3 Sustainability

No Sustainability constraints

1.4.4 Ethical

No Ethical constraints

1.4.5 Health and Safety

1- It‘s the policy to take all the possible steps to ensure the health, safety of all employees and other persons engaged in the work for the organization and any third parties who come into contact with the business.

2-It‘s the duty of each employee to comply with the safety policy and to cooperate with the management of the company to ensure that the work place remains as safe as possible

3-If any person is in doubt as to whether anything is safe or unsafe then they must assume that it is unsafe until further guidance has been given by their manager or by the safety manager

1.4.6 Social and Political

Cooperation between the two countries, Egypt and China, to improve relations between them

1.4.7 Development

effectively promote the economic development of the neighboring regions. It would also support the development of 'Belt and Road Initiativ

CHAPTER02

INTRODUCTION

Construction project management handles the planning, coordination, and execution of a construction project, whether in the agricultural, residential, commercial, institutional, industrial, civil, or environmental industries.

Construction projects typically include hundreds of tasks and multiple phases that require a deep knowledge of the building process and ability to problem-solve to keep the project on track. Due to the complex, often shifting nature of construction projects, the role of a construction project manager is to keep the project moving according to plan.

The goal is to manage the project so that it finishes on time and on budget, while still delivering a final product that meets codes, plans, and specifications. Some of the construction project manager's responsibilities include project management planning and cost, quality, and safety management.

The management of construction projects requires knowledge of modern management as well as an understanding of the design and construction process. Construction projects have a specific set of objectives and constraints such as a required time frame for completion. While the relevant technology, institutional arrangements or processes will differ, the management of such projects has much in common with the management of similar types of projects in other specialty or technology domains such as aerospace, pharmaceutical and energy developments.

Project management is the art of directing and coordinating human and material resources throughout the life of a project by using modern management techniques to achieve predetermined objectives of scope, cost, time, quality and participation satisfaction.

Managing Construction Documentation:

Project management, in general, requires documentation, not only to keep the project on track but also to serve as a historical reference for future projects. However, with construction project management, documentation can be overwhelming.

From project plans to submittals, and daily reports to change orders and progress payments, keeping it all organized can be the difference between projects that closeout smoothly and those that drag on for year

Here are five tips to better manage your documentation:

Increase control: Implement repeatable processes for team members and stakeholders to submit and manage documentation. This will help to ensure that teams follow a consistent workflow, so you can better track and manage documentation.

Automate workflows: Reduce manual effort with a work execution tool like Smartsheet, that has built-in process automation and dashboards, to capture and manage all necessary documentation in one centralized location. Use notifications to alert you when new documents are submitted.

Keep teams connected: Enable your team to submit documentation, like site inspections, change order requests, and more from the field using their mobile app. Create project specific forms to streamline the submittal process and reduce time spent on tedious documentation management.

Create an audit trail: Generate one system of record for all project-specific documentation, and then share it with everyone to help your team and other stakeholders quickly access key documentation.

Improve transparency: With a single source of project documentation, you keep work moving forward and make sure everyone is in the loop. That way, when a question comes up, everyone has access to the documentation and can see what decision was made, when, and why.

CHAPTER 03

DESCRIBTION

Description of Project

Project name:
Construction of a building for surgeries in university hospitals

Site location: Dr. Negati Street, Tanta (Section 2), Tanta, Gharbia

Owner: Tanta University

Contractor: National Organization for Military Production

The project Consist of

- One building Includes
- Basement Floor
- Ground Floor
- 1st & 2nd & 3rd & 4th & 5th & 6th & 7th & 8th & 9th
- Roof Floor
- underground tank

Civil Designer:
Dr Ayman Ahmed Slema
Dr Hamdy Mohye Eldeen Afifi

Architectural Designer: Dr Hosni Ahmed Dower

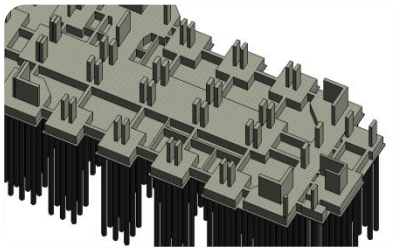
Expected cost: 485000000 LE

Type of Contract: Unit Price

Type of Tender: Direct Order

Structural consultant:
Engineering Consulting and Research Center, Faculty of Engineering, Tanta University

Foundation System: Consists of reinforced concrete PILE CAP



The structural system :

Consists of reinforced concrete flat slab at columns

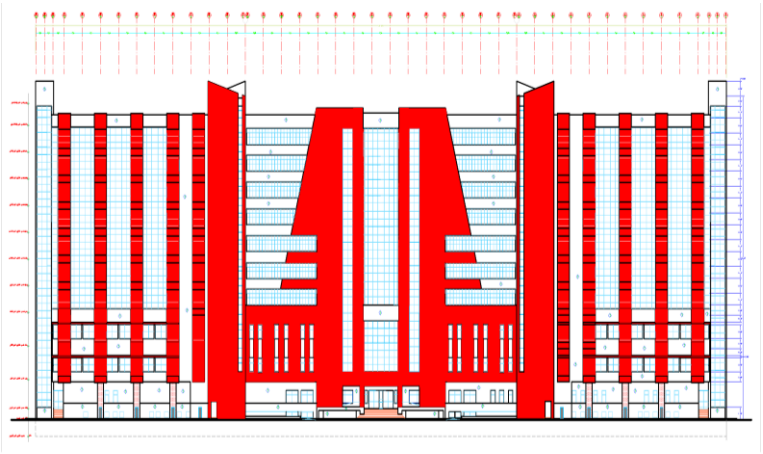
Project Objective :

It was agreed to build a surgical building in university hospitals on the basis of the government's statement and political leadership directives on the establishment of service units for university students (hospitals - universities - colleges ...) to reduce the density of students in colleges, improve the performance of faculty and university management, improve the quality

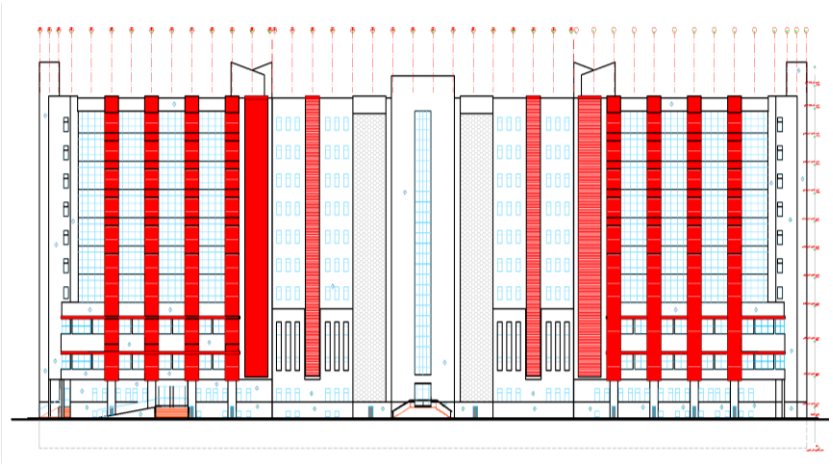
LOCATION FROM THE GOOGLE EARTH:

LOCATION FROM THE INTERNET

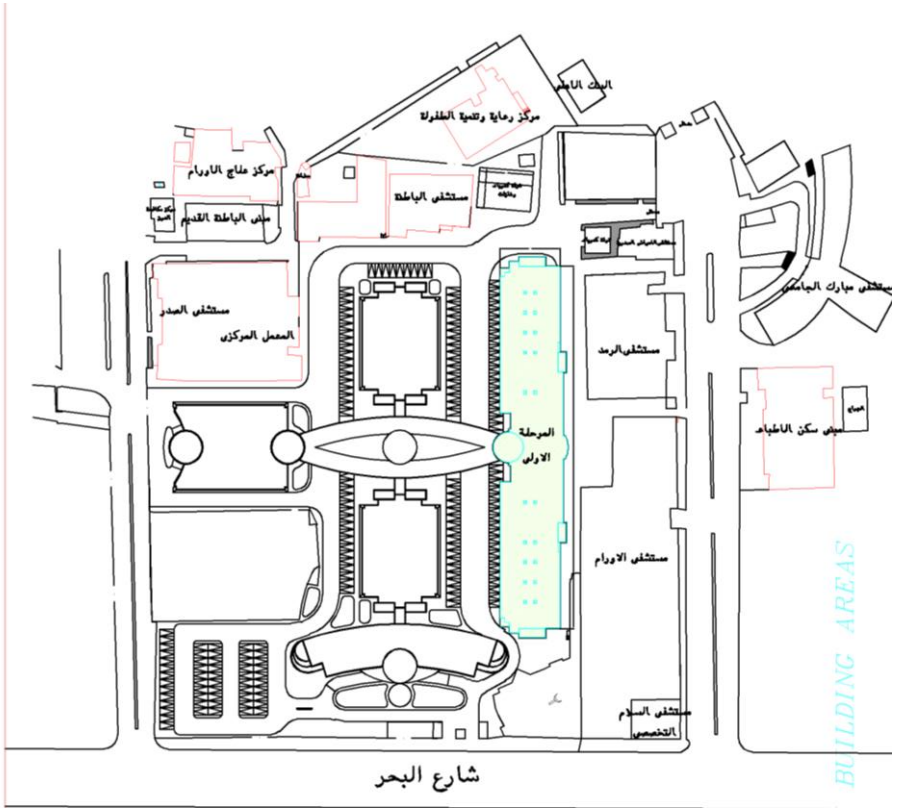
MAIN FAÇADE



REAR FAÇADE



GENERAL LOCATION


البنك الاهلي
مركز رعاية وتنمية الطفولة
مركز علاج الاورام
مستشفى الباطنة
مبنى الباطنة القديم
مستشفى الصدر
المعمل المركزي
مستشفى مبارك الجامعي
مستشفى الرمد
المرحلة الاولى
مبنى سكن الاطباء
مستشفى الاورام
مستشفى السلام التخصصي
شارع البحر
BUILDING AREAS

CHAPTER 04

CONTRACT ANALYSIS

On the other hand, most construction projects are carried out by specialists and are called construction contractors. So that the owner pays financial dues to the contractor under the terms of the contract in exchange for the latter carrying out the work of the project and handing it over to the owner in his approved image. It should be noted that the prevailing method in the field of contracting is that the owner announces in the general means of the project to choose the right contractor to implement the project based on many factors, the most important of which is the experience of the contractor, the required cost of the contract, and the previous works successfully completed by the contractor.

What is construction contract?

Construction contract agreement is a document that sets the scope and terms of work for a construction project.

It is an agreement between the contractor (National Organization for Military Production) doing the construction and the Owner (Tanta university)

The agreement should contain several sections of clauses defining the scope, terms, and conditions of the project, **including:**

- What work will be done?
- When it will start and be completed by?
- Which parties will participate in the construction process?
- The cost of labor and materials.
- How the parties will communicate?
- Procedures for changing the scope of work or other parts of the agreement.
- How disputes will be resolved?

Types of Documents in a Construction Contract:

The different types of documents in a construction contract are as follows

- General conditions
- Special conditions
- Drawings and specifications

- B.O.Q (bill of quantity)
- Letter of acceptance

Types of Construction Contracts :

- Lump-sum contract
- Unit price contract
- Cost-plus contract
- Target cost contract
-

Price-based Construction Contracts:

1. **Lump-Sum Construction Contract**

- In this type, the contractor bids a single fixed price for overall activities in the project scope. The contractor is responsible for estimating project costs from drawings then adds overhead and his profit to determine the value of the project.
- All risks are assigned to the contractor, and there isn't any risk carried by the owner.
- The contractor has an incentive in this contract as he is rewarded for an early finish, and there is a penalty for a late finish.
- This contract is ideal when the project scope is well defined at the design stage because there is limited flexibility for modifying the design during the construction period.

2. **Unit Price Construction Contract**

- The total price of the project in the unit price contract is based on the price of each item's unit. The contractor is paid as per the rates of items specified in the bill of quantity.

- The risk is shared with the contractor and the owner. This type of contract has more flexibility for design changes than the lump sum contract.

- The construction of the project can be started before finishing the designs, so the total cost of the project will be uncertain at the early stages of the project.

Cost-based Construction Contracts

1. **Cost Plus Construction Contract:**

- The contractor is paid based on the actual cost of the project, including direct and indirect costs, plus a specific fee. This fee could be a fixed fee or percentage of costs.

- All risks are assigned to the owner, and he gets involved with the contractor in the management of the project. The contractor has no risk in case of increasing the cost of the project; also, there isn't any incentive for an early finish

- This type of contract is ideal when the project scope is uncertain in the early stages of the project. The contractor can start the execution of the project before finishing the design. It is impossible to estimate the cost of the project before the construction has been completed.

2. Target Cost Construction Contract :

- Target cost contract has common features of the lump sum and cost-plus contracts. The contractor is paid based on the actual costs plus a certain fee either fixed or percentage of total cost in case of the cost of the project doesn't exceed certain target cost specified by the owner.
- There is a risk carried by the contractor in case of an increase in the cost of construction projects. The contractor is also rewarded a percentage of any savings between target and actual cost.
- Owner and contractor obligations.

Owner and contractor obligations:

Owner (Tanta University)	Contractor (National Military Production Authority)
❖ Notifying the IRS of the contracting process and taking licensing procedures ❖ Appoint a body for technical supervision and follow-up to review the work carried out by the other party. ❖ Payment of financial extracts within 60 days from the date of approval of the extract and payment of social insurance in accordance with the text of article 85 of the Executive Regulations of Law 89 of 1998.	❖ Implementation of the construction of the surgical building to university hospitals University of Tanta in accordance with the chair of technical conditions and specifications with a total value of (485000000 pounds) and that within a period of twenty-four months starting from the date of receipt of the site free of obstacles. ❖ It is deducted from 5% final insurance from the value of the down payment of EGP 24250,000. ❖ Use on the job a number of qualified engineers and are restricted to the union of engineers according to the stages of the work which is adopted by the project consultant as mentioned. ❖ Review all the designs submitted by the owner consultant.

❖ Applying the delay fines stipulated in the Tenders and Bidding Act issued by Law No. 89 of 1998 and its executive regulations issued by the Decision of the Minister of Finance No. 1367 of 1998 when delaying the completion of the work and handing over the project on time. ❖ Providing a water source and electricity suitable for the project. ❖ Acknowledging that the address described in this contract is the address used for correspondence and offices.	❖ Review all the drawings and documents of the project and choose the first party in time with the notes on them. ❖ Use the necessary tasks and equipment in the help of the supervisory body to complete his duties. ❖ To build an office at the site of the operation on the terms described in the contract. ❖ Providing the number of four cars for mobility to the project consultant gentlemen with the specifications specified in the contract and if the cars are not provided 3000 pounds per month is spent on each car. ❖ Following police regulations, health, regulation, workers' laws and other regulations and obliging his agents and workers to follow them. ❖ Take all measures and precautions to prevent what is happening in the course of the work as a matter of course of this contract. ❖ Repairing all defects that appear or damage arising from any cause in general, whether before or after the adoption of the part of the work in which the damage was done by the first party. ❖ Comply with all the requirements, technical specifications, engineering drawings and quantities supplied by estimated quantities and list of manufacturers of various equipment, which is an integral part of the contract and obtain the approval of the Civil Defense for the fire work provided by the consultant of the first party. ❖ The procedure of insurance for the assigned works in an amount equivalent to the value of these works, deducting from them the value of the foundations and insurance for workers and complying with all laws concerning social insurance on its workers. ❖ The contractor shall receive the period of guarantee and maintenance of the origin starting from the date and duration of one year from the date of the initial receipt, and that without violating the duration of the guarantee stipulated in civil law or any other law.

	❖ Notify the administrative body in writing to make an appointment for inspection well before the expiry of the warranty period to ensure that the works have been carried out in accordance with the specifications and in case he is ready to complete the final delivery process. ❖ Providing the tasks for the work required of him to count them well during the course of the work if asked by the engineer of the first party to do so. ❖ Following all laws and regulations of government and local and all that is mentioned in the Egyptian law and adhering to the opinion of the General Assembly of the fatwa and legislation sections only when disputes occur. ❖ Acknowledging that the address described in this contract is the address used for correspondence and sent offices.

From studying the obligations of the owner and contractor we find that this contract is a contract of acquiescence, since the contractor has most obligations as well as all risks, and it was better to balance the obligations and risks between the owner and the contractor so that the contract is fair.

Study the terms of the contract :

By studying the terms of the contract signed between the two parties, we note that the contract has overlooked some parts such as :

1. There is no explicit clause stating whether it is permissible to waive by the contractor (National Military Production Authority) for others (contractor sole) for the works in place of this contract in whole or in part.
2. He did not mention the review of the drawings and designs submitted by the owner's consultant by the contractor.

By reading the text of the contract, we note that the contract focuses heavily on the obligations due to the contractor.

The contractor did not provide for the right to receive any compensation for the owner's delay in paying the contractor's dues, nor did he specify the fine that would fall on the contractor in the event of any delay in the implementation of the terms of

the works, but was given the freedom to take the necessary measures in accordance with the law, and from this we note that the text, formula and terms of the contract could have been better than that::

1. We note that there are many items that talk about the contractor's obligations, so it was better to put one item named Contractor's obligations and "write under it all the obligations of the contractor"

Introduction to FIDIC Contracts and detention

- FIDIC (federation Internationale des ingenieurs-conseils) is the international Federation of consulting engineers.
- FIDIC Contracts have been developed over 50 years as the international standard for the Consulting Industry.
- They are recognised and used globally in many jurisdictions, on all types of projects.
- The key ingredient for their success as industry standard lies in their balanced approach to the roles and responsibilities of the main parties, as well as the allocation and management of risk.
- For this reason, the fundamental principle behind the FIDIC contracts is the use of General Conditions of Contract, deemed to be suitable in all cases, based on thousands of successful projects around the world .
- The FIDIC organization was founded in 1913 by France, Belgium and Switzerland.

- Contract analysis Chapter FIDIC published in 1995 first editions of four new standard forms of contract .
    - Red book for construction projects.
    - Yellow book for Design-Build projects.
    - Green book for short formagreements.
    - Silver book for EPC-turnkey projects.

FIDIC Types

- **Red book**

  Red FIDIC (Building and engineering construction contract conditions

The first edition of which was drawn up in 1956 is used for work on which the design (almost completely) is done by the employer, the layout of which has been designed by the employer.

The risks of the parties are balanced and the payment for work is based on the BOQ or the lump sums for work items.

- **Yellow Book**

Recommended for the provision of electrical and/or mechanical plant and for

The design and the execution of building or engineering works in this type the

Contractor design and construct the works in the accordance with the owner.

- **Green Book**

Recommended for buildings or engineering works of small capital value.

- **Silver Book**

Recommended for the provision on a turnkey basis of a process or power

Contract analyses by FIDIC:

Clause	Our contract	FIDIC	Comment
1-Claims ,Disputes Amicable settlement & Arbitration	Claims : (Clause 10) -The contractor has no right to claim an extension of the contract from the specified time or to submit any request to amend an Clause as it was initially agreed on all this Friendly disputes and settlement Not stated Arbitration: (Clause 14) -The General Assembly of the fatwa and legislation sections of the Council of State is competent to consider disputes and the opinion is binding on both parties.	Claims : (clause 20.1) if you consider the same contractor is to extend the period of delivery or any additional payment to send the claim within 28 days from the problem's day. Disputes &amicable settlement: (Clause 20.5) is the resolution of disputes by the council of the resolution of disputes issued a notice of dissatisfaction, it should be on both sides try to resolve the dispute amicably. Arbitration : (clause 20.6) The contract should include provisions for the resolution by international arbitration of any disputes which are not resolved amicably	None of the claims and friendly settlement were mentioned in our contract, but this could lead to : 1- Delay in the project. 2- Disputes between the owner and the contractor.
2-the contract price (clause 14.1)	Agrees on the price of the contract or determines on the basis of the evaluation of the Clauses in terms of quantity and the price of the Clause through a committee organized for that and subject to partial adjustment according to the contract	-The contract price shall be agreed or determined under sub clause 12.3 (evaluation) &be subjected to adjustment in accordance with the contract -the contractor shall pay all taxes, duties and fees required to be paid by	: The contract price in our contract is exactly the same as the FIDIC contract.

	The contractor pays all the taxes, fees and fees that he is required to pay under the contract. -The contract price may not be adjusted for any of (taxes, fees and fees) except for the amendment due to the change in legislation - any quantities indicated in the sales rule or other tables are resident quantities and are not taken as actual and correct quantities .	him under the contract. -contract price shall not be adjusts for any of (taxes, duties and fees) except adjustment for change in legislation -Any quantities set out in the BOQ or the other schedules are estimated quantities and are not being taken as the actual and the correct quantities .	
3-payments	Advance payment (Clause 5.3) -The owner pays the contractor's down payment of 25% of the contract value Interim payment : (Clause 5.3) -The other party shall make a bank guarantee letter in accordance with article 69 of the Executive Regulations of Law 89 of 1998, with the payment of the extracts due to be settled at the same rate as the down payment. final payment (9.2) -A final extract will be made between the two parties as soon as the second party finishes the work after the formation of a committee by the first party and the editing of an official minute and	Advance payment (clause 14.2) The employer shall pay to the contractor -advanced payment within 42 days after letter of acceptance Interim payment (clause 14.6) - the amount certified in each interim payment within 56 days after the engineer receives the statement final payment (clause 14.13) -the amount certified in final payment certificate within 56 days after the employer receives this payment certificate	: No specific number of days has been specified for the final payment, but linking it to the first party receipt process after the formation of a committee by the first party.

	the receipt of a certified copy of the preliminary receipt and the final conclusion of the second party .		
4-the contractor	General contractor obligations (Clause 12) -The contractor designs, executes, completes and repairs any defects in accordance with the contractor's provisions, and must provide all supervision, employment, materials and all other things as mentioned in the contract. Unexpected material conditions: (Clause 5.6) -In works where technical necessity requires the implementation of new Clauses by the other party, they are contracted to be implemented with the consent of the competent authority of the parties and that is in the manner of direct agreement and provided that the prices of these Clauses are appropriate for the market price .	Contractor's general obligations (clause 4.1) -The Contractor shall design (to the extent specified in the Contract) execute and complete the works accordance with the contract &engineer's instructions. - the contractor shall provide the plant specified in the contract ,other things and services whether of a temporary or permanent nature required in design and execution . unforeseeable physical conditions clause (4.12) in this sub-clause physical conditions means natural physical conditions and manmade and other physical obstructions which the contractor encounters at the site when executing the work -if the contractor encounters adverse physical conditions, the contractor shall give a notice to the engineer as soon as practicable .	Our contract is similar to FIDIC in terms of the contractor's general obligations and unexpected material conditions .
5-increase or decrease of cost	Clause 5.2 and Clause 5.5) -These amounts are added to or deducted from the contract price in relation to the high or low cost of	Clause (13.8) The amount payable to the contractor shall be adjusted for rises or falls in the cost of labor, goods and other inputs to the works by the addition or deduction of the	: Our contract is similar to FIDIC in the event of an increase or decrease in cost and the contract price will be changed.

	working on materials or any other issues affecting the cost of carrying out the works.	amounts determined by the formulae prescribed in this sub-clause the Accepted Contract Amount shall be deemed to have included amounts to cover the contingency of other rises and falls in costs.	
6-Risk & Responsibility	Compensation (Clause 8) : To make up for it. The contractor is the employer and is cleared of damage to the employer's employees and agents for damages, losses and expenses in relation to: (a) physical injury, illness or death. (b) Damage to any property, real estate or personality, or the occurrence of fires, theft or other damages so that this negligence is the result of the contractor or one of his workers without the intervention of the first party in that negligence. Taking care of the contractor for work : The contractor is fully responsible for taking care of the following -Work from the start date to the date mentioned in the receipt certificate (final receipt) -The contractor is responsible for any loss or damage caused by any action it performs	Indemnities (clause 17.1) the contractor shall indemnify & hold harmless for the employer , employer's personnel &their respective agents against damages, losses & expenses in respect of: a)bodily injury, sickness, disease or death by the reason of the contractor's design b)damage to any property, real or personal *the employer shall indemnify & hold harmless to contractor against claims. Damages, losses & expenses which is attributable to any negligence ,willful act or breach of the contract by the employer . -contractor's care of the work (clause 17.2) the contractor shall take full responsibility for the care of -the work from the commencement date until the date stated in a taking over certificate -the contractor shall be liable for any loss or damage caused by any action performed by him after the taking over certificate has been issued .	Our contract is exactly the same as the ransom contract in terms of compensation and the contractor's care of the work.

	after issuing the receipt certificate		
7-insurance of work	People's Injury Insurance (Clause 8) The contractor must insure against this liability and continue this insurance throughout the time used by any persons in the works -The contractor bears direct responsibility without interruption from the owner for any deaths, injuries, illness or fire research . Insurance for employees, contractors and equipment : -Insurance is carried out by the contractor on the works assigned to him in an amount equivalent to the value of these works, deducting the value of the foundations. -The insurance mentioned continues and is not undermined until the temporary receipt is received. Compliance with all laws on social insurance for workers .	Insurance against injury to persons (clause 18.3) the insuring party shall insure against each party's liability for any loses ,damage ,death or bodily injury which may occur to any physical property. Insurance for works& contractor's equipment (clause 18.2) the insurance party shall insure the works, plant, materials & documents for not less than the full reinstatement cost including the costs of demolition -the insurance shall be effective from the date by which the evidence is to be submitted until the date of issue of taking over certificate for the work -the insuring party shall insure the contractor's equipment for not less than the full replacement value including delivery to site	Our contract and FIDIC ensure that the contractor is responsible for the people and equipment.
8-Commencement delays and suspension	Start of works (Clause 4) : -This will take effect for a decade from the date of receipt of the down payment associated with receiving the site	Commencement of works (clause 8.1) The Engineer shall give the contractor not less than 7 days' notice of the commencement date. unless otherwise stated in the particular	: Here is a difference in our contract with ransomware in the program Clause where the duration in our contract is 14 days and in the

	free of obstacles and obstacles under a receipt from the representative of the second party . Program Clause (Clause 7): -The second party offers a 14-day program for the duration of the implementation, which is approved by the first party . Duration of extension for completion : -Not stated .	condition the commencement date shall be within 42days after the contractor receives the LOA . Programme clause (8.3) The contractor shall submit a detailed time programme to the Engineer within 28 days after receiving the notice. The contractor shall also submit a received programme whenever the previous programme is inconsistent with actual progress or with the contract's obligations –unless the engineer, within 21 days after receiving a programme, gives notice to contractor stating to which it does not comply with the contract, the contractor shall proceed in accordance with the programme, -If, At any time, the Engineer gives notice to the contractor that a programme fails to comply with the contract or to be consistent with actual progress and the contractor's stated intentions , the contractor shall submit a received programme to the engineer in accordance . Extension time for completion (Clause 8.4) the contractor shall be entitled to an extension of the time for completion is or will be delayed by any of the following	ransom contract is 28 days .

		causes: a) Variation or other substantial change in the quantity of an item of work included in the contract. b) Exceptionally adverse climate conditions c) unforeseeable shortages in the availability of persons and goods -The Engineer shall review the previous determinations and may increase.	
9-Suspension and Termination by contractor	Contractors eligible to stop work : Not stated	Contractor Entitlemen to suspend work (clause 16.1) If the Engineer fails to certify or the Employer fails to comply , the contractor may, after giving not less than 21 days' notice to the employer, suspend work unless the contractor has received the payment certificate . Termination by contractor (clause 16.2) The contractor shall be entitled to terminate the contract if 1- The contractor does not receive the reasonable evidence within 42 days after giving notice 2- the engineer fails within 56 days after receiving a statement and supporting documents 3- The contractor does not receive the amount due to under an interim payment certificate within 42 days after the expiry of the time .	

Chapter 05

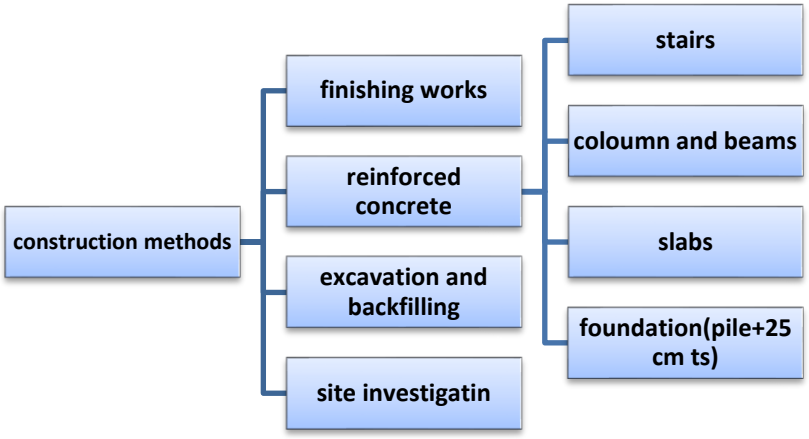
Quantity survey

دفتر حصر الاعمال								
رقم البند	البند	عدد	مقاسات			كميات	
			طول	عرض	ارتفاع	اضافة	خصم
اعمال الحفر و الردم & الخرسانات							
١	**هدم اي مباني قائمة بالموقع تعوق العمل**		**بالمقطوعيه**				
		١				١.٠٠	
	اجمالي البند	**1**					
٢	**حفر فى تربه عاديه**		**المتر المكعب**				
	من منسوب التاسيس الى منسوب الارض الطبيعيه	١	٢٨٨١.٤٧		٥.١٠	١٤٦٩٥.٥٠	
	لزوم اعمال الخزان الارضي	١				٤٨٠٤.٥٠	
	اجمالي البند	**19499.997**					
٣	**الردم برمال نظيفه**		**بالمتر المكعب**				
		٤٥٠٠				٤٥٠٠.٠٠	
	اجمالي البند	**4500**					
٤	**خرسانة عادية**		**بالمتر المكعب**				
	لزوم خرسانة اللبشة العادية للخزان	١	٣٤٢.١٠		٠.٣٠	١٠٢.٦٣	

		١	١.٩٥	٠.٦٠	١.١٧	
	لزوم خرسانة اللبشة العادية للمبني	١	٢٨٨١	٠.٢٠	٥٧٦	
	اجمالي البند	**680.094**				
٥	**خرسانة عادية اعلي الطبقة العازلة**	**بالمتر المسطح**				
		1	2703.92		2703.92	
	اجمالي البند	**2703.92**				
٦	**خرسانة ميول لزم المطر**	**بالمتر المسطح**				
		1	2703.92		2703.92	
	اجمالي البند	**2703.92**				
٧	**دكة خرسانة عادية لارضية الحمامات**	**بالمتر المسطح**				
	لزوم حمامات الدور البدروم	1	70.00		70.00	
	لزوم حمامات الدور الارضي	1	125.00		125.00	
	لزوم حمامات الدور الاول و الثاني	2	85.00		170.00	
	لزوم حمامات الدور المتكرر	7	170.00		1190.00	
	اجمالي البند	**1555.00**				
٨	**الخوازيق الحاملة للأساسات**	**بالمتر الطولي**				
		858		16.50	14157.00	
	اجمالي البند	**14157.00**				

Chapter 06

CONSTRUCTION METHO



Site investigation:

- DESK STUDY

This is essentially the collection of a wide variety of information relating to the site.

eg : maps, drawings,local authority information; geological maps, memoirs, records;

- SITE RECONNAISSANCE
- An early examination of the site by appropriate experts is most desirable. Geologist, land surveyor, soils engineer, hydrologist etc. Information should be collected on the overall site layout, topography, basic geology; details of access, entry and height restrictions. Local conditions should be examined, such as climate, stream flows, groundwater conditions, site utilization related to weather and time of year. Where possible photographic records should be kept.
- SITE EXPLORATION & SAMPLING

  Investigation of detailed geology and sub-surface soil conditions using surface surveys, trial pits, headings, boreholes, sounding, geophysical methods, as appropriate; survey of groundwater conditions over a signification period of time (Maybe even after completion of works); examination of existing and adjacent structures or cavities, buried pipes, services, etc.; provision of samples for further examination and laboratory testing.
- FIELD TEST / INSITU TEST

  Test carried out on the site either prior to or during the construction process; ground test such as shear-vane, standard penetration, cone penetration, plate bearing, pressure meter; structure loading test, such as test on piles, proof loading; displacement observation.
- LABORATORY TESTING

  Tests on disturbed and undisturbed samples submitted from the site team; test on soils (as specified) for classification, quality, permeability, shear strength, compressibility,etc.; test on rock cores and samples for strength and durability; test on constructional materials, such as California Bearing Ratio; test on groundwater, chemical and petro graphic analyses.

- REPORT WRITING

Details of geological study, including structures, stratigraphy and mapping; results of borings, etc., including log, references for samples and stratigraphy interpretations as requested; comments and recommendations relating to the design and construction of the proposed works; recommendations relating to further investigating or testing, and to ongoing or post-completion monitoring.

****

Excavation and backfilling:

Earthwork in excavation and backfilling of soil up to required depth is required for construction of foundation and trenches. The proper sequence of excavation and backfilling is required to optimise the process and prevent safety issues. Excavation and backfilling of soil is a very important part of construction process, and care must be taken while excavation in safety perspective. Different soil layers may be encountered while excavation, dewatering may be needed sometimes. These points must be kept in mind to take necessary action during excavation and backfilling. Correct measurement of excavation and backfilling is required because excavation cost is major part of the foundation construction.

Materials and Tools Used for Excavation:

The following are the equipment's used for the earthwork for foundation:

1.Hydraulic excavator 2.Pickaxe

3.Tractor / trucks 4. Spade

5.Kassi 6. Crowbar Rammer

7.Wedge 8.Boning Rod

Drawings required for excavation

- Centerline Drawing
- Layout Plan

Scope of Work for Excavation and Backfilling of Soil

1. Setting out of corner benchmarks.
2. Survey for ground levels.
3. Survey for top levels
4. Excavation to approved depth.
5. Dressing of loose soil.
6. Making up to cut off level
7. Constructing dewatering wells and interconnecting trenches.
8. Marking boundaries of the building.
9. Constructing protection bunds and drains

Working Procedure for Soil Excavation

The extent of soil and rock strata is found by making trial pits in the construction site. The excavation and depth is decided according to the following guidelines in the site.

- For Isolated footing the depth to be one and half times the width of the foundation.
- For adjacent footings with clear spacing less than twice the width (i.e.) one and half times the length.
- 1.5m in general and 3.5 m in black cotton soils.

Backfilling and Removal of Excess Soil

Estimate the excavated stuff to be re-utilized in filling, gardening, preparing roads, etc. As far as possible try to carry excavation and filling simultaneously to avoid double handling. Select and stack the required material in such a place that it should not obstruct other construction activities. The excess or unwanted material should immediately be carried away and disposed off by employing any of the following methods.

1. Labor
2. Tractor
3. Trucks

Quality Checks for Excavation

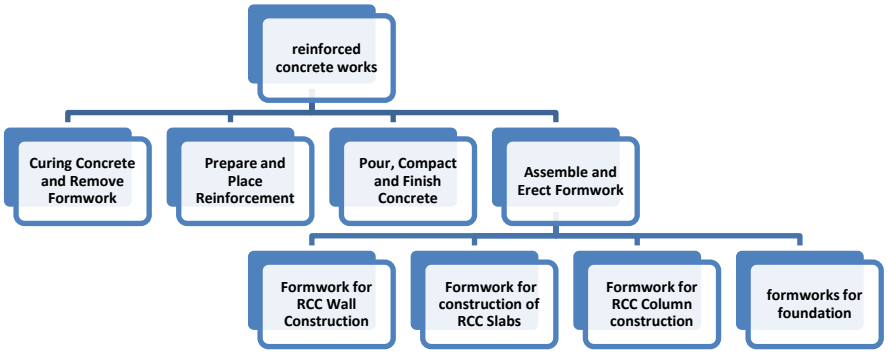
- ✓ Recording initial ground level and check size of bottom.
- ✓ Disposal of unsuitable material for filling.
- ✓ Stacking suitable material for backfilling to avoid double handling.
- ✓ Strata classification approval by competent authority.
- ✓ Dressing bottom and sides of pits as per drawing with respect to centerline.
- ✓ Necessary safety measures observed.

Quality Checks for Backfilling

- ✓ Recording initial ground level
- ✓ Sample is approved for back filling.
- ✓ Necessary marking/ reference points are established for final level of backfilling.

- ✓ Back filling is being carried out in layers (15cm to 20cm).
- ✓ Required watering, compaction is done

Reinforced concrete



❖ Formworks

Types of Formwork (Shuttering) Based on Structural Member:

Formworks are used in construction of reinforced concrete foundations, columns, slabs, walls etc., and these are named as follows:

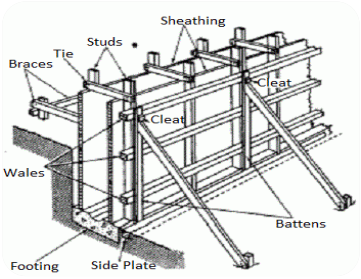
- Footing Forms – Formworks for foundation
- Column Forms – Formwork for RCC Column construction
- Wall Forms – Formwork for RCC wall construction
- Floor Forms – Formwork for construction of RCC Slabs

Footing Forms – Formworks for Foundation:

The first step for any concrete construction starts with the construction of foundation. Foundation can be for columns or walls. So, based on type of structural member, the shape and size of footing are designed. Thus formwork size and shape depends on the type and dimension of the footing.

Column Forms – Formwork for Concrete Column Construction

Reinforced concrete column forms are subjected to lateral pressure because of their small cross section, large heights and relatively high rates of concrete placement. Thus It is necessary to provide tight joints and strong tie support to the formwork. As the sizes of concrete column increases, the stiffness of the formwork must be increased by either increasing thickness of sheathing or vertical stiffeners must be added to prevent sheathing deflection.



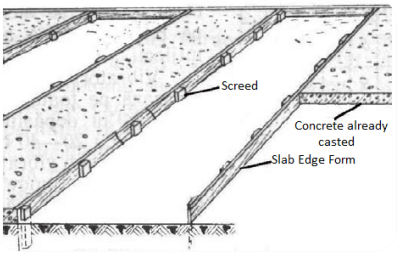
Wall Forms – Formwork for RCC Wall Construction

Formwork for wall construction is subjected to relatively lower lateral pressure than column forms due to their large cross-sectional area

The components of wall forms are:

- Panel sheathing – It is used to shape the wall and retain the concrete until it sets.

- Studs - to support the sheathing or Wales by forming a framework to keep the forms aligned and support the studs.
- Braces – It is used to prevent deflection of forms under lateral pressure and keep the formwork erect.
- Ties and spreaders – These are used to hold the sides of the forms at the correct spacing.



Floor Forms – Formwork for construction of RCC Slabs

Formwork for reinforced concrete slabs depends on the type of slabs to be constructed. The floor slabs can be structural slabs supported on a steel or concrete structural frame, or slab-on-grade. The design of formwork varies with the type of slab.

Structural Slab Formwork assembly is carried out as follows:

- Positioning of the girder or beam form at the bottom.
- Girder side forms overlap the bottom form and rests on the shore heads and the sides of the column form.

- Side forms is held in place by ledger strips nailed to the shore heads with double-headed nails.
- Larger girders should have the side forms vertically stiffened to prevent buckling.
- When constructing the girder and beam forms each part must be removed without disturbing the remainder of the form; strike-off formwork will commence with the beam and girder sides, followed later by the column forms, and finally by the beam and gird bottoms.

Slab-on-Grade Forms are forms for concrete slabs placed on grade. These slab formworks are usually quite simple as concrete is placed on compacted earth or gravel leveled base. Thus no support is required for concrete at the bottom.

Slab-on-Grade Formwork assembly is carried out as follows:

- Plank, plywood, or steel forms are used for forming / supporting the open edges of concrete.
- These forms are held in place by supporting with wooden pegs.
- The reinforcement in slab (if specified in the structural drawing) should be placed on its proper location according to the drawing on chairs, bolsters, and spacers made of either metal or concrete.
- If the slab is to be casted in sections, construction joints must be provided between them, which will transmit shear from one to the other. The details of construction joints should be followed as per structural drawing.

❖ **Concrete cast**

Materials and Machinery for Slab Casting

- Batching plant
- Transit mixer
- Concrete pump
- Vibrators
- Slump tray
- Slump cone and other associated tools
- Rubber hammer
- Chute and CI Pipes
- power float machine
- shovel

Slab Pre-concreting Checks

There are many checks that need to be performed prior to concreting of reinforced concrete slab:

- Checking Slab Formwork
- Check whether the formwork is fixed properly or not for example sleeves and supports.
- Damaged materials employed for formwork or shutter should not be utilized.
- All formwork surfaces in contact with concrete need to be treated with shuttering

oil and dampen with water sometime prior to concrete placement.

- check the level of the projected top surface of the slab and place level strips if necessary to mark the exact level.

Checking Slab Reinforcement

- Check and approve that reinforcements are fixed as per the approved drawings.
- Examine reinforcement spacing (including vertical and horizontal spacing) and cover.
- Ensure that adequate support for reinforcements are provided to prevent any movement during concreting process.
- Loose ties along the splices of reinforcement bars must be tightened again

Other pre-concreting checks

- Ensure that workers use safety tools and equipment for example safety helmet, safety shoes, goggles, gloves, and vest.
- Safety devices and safety warnings should be provided from site entrance to the casting area.
- Check whether adequate lighting is provided in case of night concreting.

Slab Concreting Work Procedure

1. Providing Construction Joint

The construction joint shall be pre-decided and fixed prior to start of the concreting. It is planned to have two construction joints for main building as decided. In case of

major break down of the Batching plant, the additional Construction joint may be left. The location of the construction joint shall be at the one-third span. Construction joint shall be straight and have profile of 'L'shape so that successive layer of concrete shall be perfectly bonded with previous laid layer. Preparation of construction joint shall include roughening, removing all laitance adhering to the joint and application of thick slurry before start of the new concrete.

2. Production of Concrete

Stock of material shall be sufficient to start the concrete. It shall be ensured by stores/purchase dept that concreting is not stopped on account of materials. All plant and machinery are checked and made in working conditions.

3. Concrete Pouring

- Proper walkways/platforms shall be arranged so that the supports of the pipeline and manpower are not directly stand on reinforcement.
- Sufficient carpenters along with supervisor shall inspect the behavior of supports below the slab during the casting.
- Extra Props shall be stocked below slab to provide additional supports in case of any failure of supports.
- Before discharging concrete from the mixer, concrete shall be inspected and acceptance shall be conducted like slump tests.
- Required number of concrete specimens shall be taken for compressive strength test and other tests.
- It is recommended to discharge the concrete within 90 minutes from the batching plant loading time.
- Compact the concrete properly by using mechanical vibrators, extra vibrator shall be

available in case of any shortage or mechanical problems.

4. Finishing Concrete Surface

Use the power float for the smooth finish surface purpose.

The casted area or member shall be protected by placing barricade to prevent plants and machineries damaged the concrete.

Concrete pour card shall be filled by Quality Engineer and to be submitted to the Engineer including concrete delivery notes, this task will be done whenever required

5. Curing Concrete

The curing shall be started immediately after thumb set of the concrete laid. Hessian clothe /Plastic shall be covered over the set concrete to reduce moisture evaporation from the concrete during hardening and thus to minimize shrinkage crazy cracks. These cracks are inheriting property of the concrete specially appears during casting of flat surfaces. Final curing shall be done by ponding and stacking water for minimum period of 7 days.

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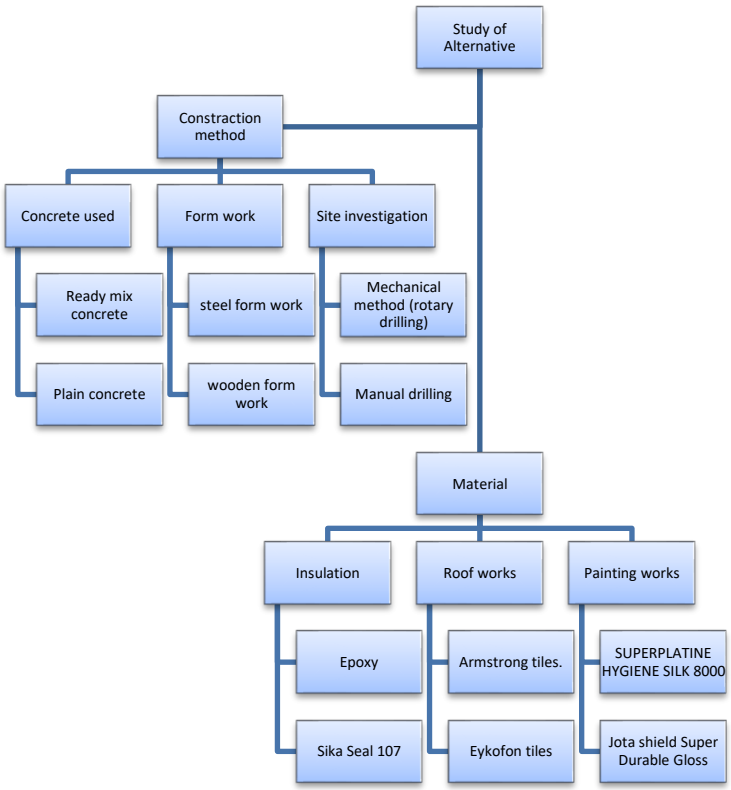
❖ **Prepare and Place Reinforcement**

Prior to the placement of reinforcement for concrete floor slab construction, inspect and check forms to confirm that the dimensions and the location of the concrete members conform to the structural plans. Added to that, the forms shall be properly cleaned and oiled but not in such amount as to run onto bars or concrete construction joints. Design drawings provides necessary reinforcement details, so it only needs understanding to use designated bar size, cutting required length, and make necessary hooks and bents. After preparation is completed, steel bars are placed into their positions with the provision of specified spacings and concrete cover. The concrete cover and spacing for floor slabs can be maintained by introducing spacers and bars supporters. Wires are used to tie main reinforcement and shrinkage and temperature

Chapter 07

value engineering



What is Value?

- Value is the ratio of function to cost.
- Value can therefore be increased by either improving the function or reducing the cost (without affecting performance, reliability, quality and safety).

What Is the Value Engineering

Value engineering is all about making the best use of the available budget .Doing so requires know-how, teamwork and reliable construction cost data . For a deep dive into how to effectively value engineer.

- A Systematic problem solving process.
- An analysis of the functions of a project, product or service.
- Can be applied to any type of product, project or investment.

But it's not :

A cost cutting process:

It does not cut cost by sacrificing needed quality, reliability or performance.

Routinely done on all designs:

It is not a part of the normal design process

When should we apply VE?

Technically speaking, there’s no wrong time to value engineer .

But the closer the process is to the schematic stage, the better .

Planning and design are the two stages of the building lifecycle where value analysis creates the most, well, value .

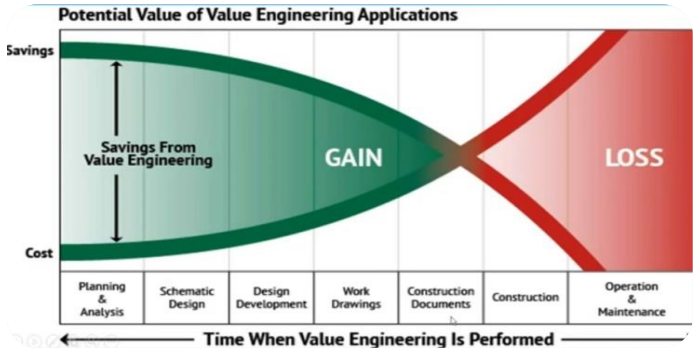
If value engineering becomes rework or causes project delays, it is no longer beneficial to the project .

This graph shows when value engineering moves from presenting a financial gain to a financial loss.

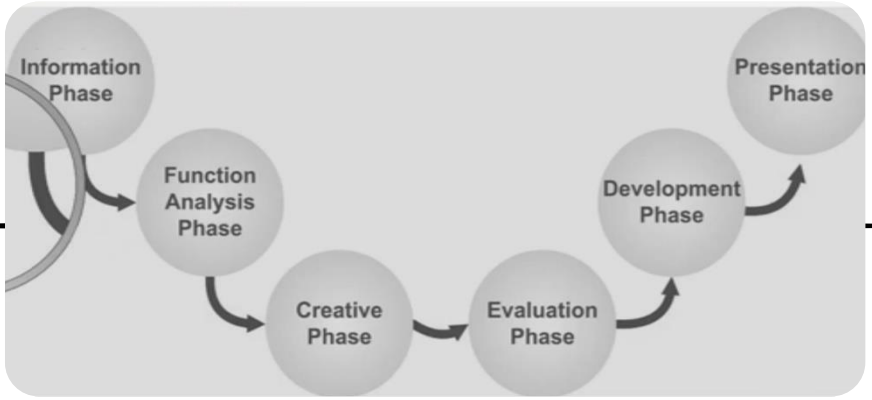
It’s important to note—value engineering isn’t simply a knee-jerk reaction to avoid going over budget.

The goal isn’t to trim the bottom line, but to maximize function at the lowest possible cost.

Value engineering is a methodology that ensures the owner is not over-paying for quality when an equally effective, less expensive option exists. Product quality remains the ultimate goal.



Phases of Value Engineering:



Study of Alternative:

1. Construction method:

- Site investigation
- Concrete Used.
- Form Work

1- Site investigation

Comparison	Mechanical method (rotary drilling):	Manual drilling :
Use	The mechanical drilling machine is characterize by the ability to drill in the rocky soil the Pont nit is used to cool the penetrating tools for soiling and	This method is used in the case of the soil of the spandex or which does not contain rocks or where the depth of the

	facilitate the penetration process and support the sides of the drilling to the drilling hole taking the plasters.	body is small.
Work rate	The rate of work is fast.	You take a lot of time in execution and you need a lot of labor.
Cost	Cost per meter = 20 L.E .	Same cost price
Risks	Lowest risk .	The risk is medium

Value Engineering:

Using the method of weighted evaluation method taking 4 criteria:

- Cost
- Work rate
- Risk
- Advantage

- Cost of 1m Mechanical method / cost of 1m Manual drilling 20/20=1
- Rate Mechanical method /Rate Manual drilling =5/1= 5
- Risk Mechanical method / Manual drilling =2/1=2

Matrix of importance in the project :

	A	B	C	D	SUM
A		-	-	-	
B	A-1	-	-	-	
C	A-2	c-3	-	-	
D	A-2	B-2	C-2	-	
SUM	5	5	2	0	12

%	41 %	41 %	18 %	0 %	100 %

USING Mechanical method As Alternative in this project is better than manual drilling as less cost and efficient.

2- Concrete Used :

Comparison	Plain concrete	Ready mix concrete
Advantage	• The quality of concrete depends on the quality of the workers on site. • Quality is relatively low.	• Accuracy in materials. • There is no contamination of materials either in the process of transportation or storage. • The quality is high.
production rate:	Relatively slow 40 m3 per day .	Casting is performed as soon as possible at 100 cubic meters per day

Cost	Low 350 G.M	The cost varies depending on some of the variable factors, including : •The distance you travel to reach the site. •The location or location of the concrete producing company. •The location of the worker. •The price is high 725 pounds per cubic meter .
safety	Entering the human element, which sometimes goes wrong in some mixing ratios.	• segregation. • Concrete must reach the site during the initial period of uncertainty.

Value Engineering

Using the method of weighted evaluation method taking 4 criteria:

- Cost.
- Production rate.
- Safety.
- Advantage.

cost of 1m3 of ready mix concrete / cost of 1m3 of plain concrete 725/350=2.07

Rate ready mix /Rate plain concrete =(100m3/day) /(40m3/day)= 2.5

Safety ready mix concrete/plain concrete=4

Matrix of importance in the project :

	A	B	C	D	SUM
A		-	-	-	
B	A-1	-	-	-	

C	A-2	B-3	-	-	
D	A-2	B-3	C-2	-	
SUM	5	6	2	0	13
%	0.38	0.46	0.16		100%

	A	B	C	D	SUM
%	38%	46%	16%	0%	
Ready mix concrete	1	2.5	4	0	
score	38	115	64	0	217
Plain concrete	2.7	1	1	0	
score	102.6	46	16	0	164.46

Using Ready mix concrete As Alternative Plain concrete in this project.

3- Alternative of formwork (Wooden form & steel-wooden form)

Comparison	Wooden Formwork	steel-wooden form
usage	The max high is 4 m	Can be use in case of high placing roof
Durability	Less durable	More durable Short time for built up about 3 times
Rate	Long time for built up	Short time for built up about 3 times
Quality of surface	Poor quality	High quality
Stability of form	Less stiff	More stiff
Labor	More labor	Less labor
Waste	More waste and piece of	Less waste

	wood	
Load capacity	Can canary limited load	Carry high load
Risk In site	High Risk (failure, fire)	Low risk
	Scrap value= 0% waste value= present value- scrap value/N.O uses waste value = (337,500-0)/40 = 8437 L.E	Serape value= 7%= 90,090 LE waste value= present value- Scrap value/ N.O uses waste value= (1,287,000-90,090)/ 400 = 2992 L.E The cost of steel form is 3 time the cost of

		wooden form.

Value Engineering

Using the method of weighted evaluation method taking 4 criteria:

- Waste value
- rate of erection
- Moisture absorption
- Risk.

Matrix of importance in the project :

	A	B	C	D	SUM
A		-	-	-	
B	A-3	-	-	-	
C	A-1	B-3	-	-	
D	A-1	B-1	C-2	-	
SUM	5	4	2	0	11
%	45.45%	36.36%	18.18%	0%	100%

	A	B	C	D	SUM
%	45.45%	36.36%	18.18%	0%	
Woodenform	1	1	0	1	

score	45.45	36.36	27	0	81.8
Steal form	2.82	3	1	2	
score	128.17	109	18.18	0	255.35

USING Steel formwork As Alternative in this project is better than wooden as less cost and efficient and the contractor can use it many times latter.

2- Material

- Insulation
- Roof works
- Painting works

Is epoxy or Sika Seal 107 better at isolating moisture

Comparison	Epoxy:	Sika Seal
Description of the article	Master Protect 180 It's a credit to resin insulation. The water tank, which is	Sika Seal 107 is a polymeric cement paint with

	not toxic, comes in the form of two compounds: foundation paint and canned mixed using the taner and produced by the German company BASF under this name.	High flexibility for protection and water insulator is used for concrete and soft constructions to prevent water leaching.
use	For the internal insulation of the drinking water tank as well as . • chemical and oil tanks. •Used in protection and decoration inside walls and floors . • Laboratories used in garages for cover. •Resistant to chemicals from jazz and steam. •Oil refineries as well as paper factories .	•Sewage treatment projects include concrete deposition tanks, garages and analysis tanks. •Basements, balconies and bridges exposed to moisture and leaching . •Support walls and walls exposed to seawater. •Small flat surfaces and

		swimming pools.
Advantage	•Provides a glossy surface •As a result of surface softness prevents the growth of microbes and fungi between the results, which is an important feature in the water safes. •Easy to clean the tank as it is indispensable for the ceramic. •It has a high cohesion force with concrete up to more than 2.5 N/2mm .	Easy to use. •Emulsion texture or can be mixed in the form of a mono. •High adhesion power to strong healthy surfaces. •Non-waterproof, high and non-toxic flexibility. •High resistance to frosting and salts melting ice . Spraying can be used in its implementation.
Consumption rate	Package is 5 kidneys 3.5kg epoxy paint 1.5 kg of crucifixion after mixing we need from 0.5 kg /m² per	Average consumption rate ranges from 1 to 1.5

	face	kg/m² for the first face to 0.8 to 1 kg/m² for the second face .
Time of repair	1.5 to 2 hours .	6-2 hours .
Density	After mixing the average density becomes 1.45 kg/L .	1.7 kg/m
Cost of package	The 5 kilos group at a price of 620 pounds •Price per ton 124,000 .	•The price of the cheque is 450 pounds •ton price 12500
Cost per square meter:	About 160 G.M./M².	About 50 G.M./M².

Value Engineering:

Using the method of weighted evaluation method taking 4 criteria:

- Cost
- 1 m 2 per package
- Smoothing
- Hardening time

Cost of 1m2 of epoxy / cost of 1m2 of SIKA 160/50=3.2

Rate /Rate Epoxy = (1.5 Kg/m2) /(0.8 Kg/m2)= 1.87

Smoothing Epoxy / Smoothing SIKA= 3/1=3

Harden Time Epoxy/ SIKA=6/2=3

Matrix of importance in the project :

	A	B	C	D	SUM
A		-	-	-	
B	A-2	-	-	-	
C	A-1	c-1	-	-	
D	A-3	B-3	C-2	-	
SUM	6	2	3	0	11
%	54 %	18 %	27 %	0 %	100 %

	A	B	C	D	SUM
%	54 %	18 %	27 %	0 %	
Sika seal	3.2	1	1	1	
score	172.8	18	27	0	217
Epoxy	1	1.87	3	3	
score	54	33	81	0	168

USING SIKA SEAL As Alternative in this project is better than Epoxy as less cost and efficient.

2- Roof works

Comparison	Eykofon tiles	Armstrong tiles.
Description	100% glass wool does not absorb water.	Manufactured from non-flammable materials.
Noise absorption	85% according to ASTMC423	90% sound isolates
Humidity	It bears 95	Ranging from

resistance and temperature .	percent at 30 degrees C without any curvature or curvature on the edges of the tiles.	70 to 100% depending on the degree used .
Reverse and spread lighting	Products reflect at least 84% and publish 99% of the lights reflected on the surface.	90% light reflects
Cost	120L.E	160 L.E

Value Engineering:

Using the method of weighted evaluation method taking 4 criteria:

- Cost
- Noise absorption
- Reverse and spread lighting
- Advantage

Cost of 1mArmstrong tiles./ cost of 1m Eykofon tiles 160/120=1.33

Noise absorption Armstrong tiles. / Noise absorption Eykofon tiles =90/85= 1.05

Matrix of importance in the project :

	A	B	C	D	SUM
A		-	-	-	
B	A-1	-	-	-	
C	A-2	B-2	-	-	
D	A-3	B-3	C-1	-	
SUM	6	5	1	0	12
%	50%	38%	12%	0%	100%

	A	B	C	D	SUM
%	50%	38%	12%	0%	
Armstrong tiles.	1	1.05	1.07	0	
score	50	39.99	12.84	0	102.74

USING Eykofon tiles As Alternative in this project is better than Armstrong tiles as less cost and efficient.

3- Painting works

Comparison	Jota shield Super Durable Gloss	SUPERPLATINE HYGIENE SILK 8000
Description	This product is a superior quality, exterior water based paint. Based on extremely durable, 100% pure silicon acrylic emulsion.	Super Platine Hygiene Silk is a 100% pure acrylic based emulsion paint formulated to give a high end luxurious Silk finish. It is produced with best in class acrylic polymers and special additives that prevent fungus and bacterial growth.
Features and benefits	Its unique formulation protects concrete from	-Luxurious Silk Finish Deep and long lasting colors Excellent weather

	carbonation (Acts as ant carbonation coating). The unique UV protected colors offer outstanding protection against destructive effect of UV rays present in Sunlight. The special binder provides durable and long lasting gloss finish with low dirt pick up. The gloss retention of the coating lasts for several years. Specially designed to withstand	resistance High wash ability Anti. -Fungus and Ant-Bacterial. -Superior Opacity. -Non-Yellowing

	the harsh middle east climate and weather conditions.	
Packaging size	9L	9L
Drying time	At 23°c & 50% R.H Final dry: 8 hours	At 25°c & 50% R.H Initial drying time: 30 minutes. Re-coating time: 4 hours. Final dry: 4 hours .
Package price	1050 L.E	: 650 L.E
price of one meter	1m = 12 L.E	1m = 8 L.E

Value Engineering:

Using the method of weighted evaluation method taking 4 criteria:

- Cost
- Drying time
- Features and benefits
- Risk

Cost of 1m Jota shield Super Durable Gloss/ cost of 1m 12/8= 1.5

Rate Jota shield Super Durable Gloss /Rate Epoxy =8/4=2

Features and benefits Jota shield Super Durable Gloss = 2/1=1

Matrix of importance in the project :

	A	B	C	D	SUM
A		-	-	-	
B	A-2	-	-	-	
C	A-1	c-1	-	-	
D	A-2	B-2	C-2	-	
SUM	5	3	2	0	10
%	50%	30%	20%	0%	100%

	A	B	C	D	SUM
%	5	3	2	0	

	0 %	0 %	0 %	%	
Jota shield Super Durable Gloss	1	0 . 5	2	1	
score	5 0	1 5	4 0	0	1 0 5
SUPERPLA TINE HYGIENE SILK 8000	1 . 5	1	1	3	
score	7 5	3 0	2 0	0	1 2 5

USING SUPERPLATINE HYGIENE SILK 8000 As Alternative in this project is better than Jota shield Super Durable Gloss as less cost and efficient.

Chapter 08

WORK BREAK DOWN STRUCTURE

What is a Work Breakdown Structure?

Breaking work into smaller tasks is a common productivity technique used to make the work more manageable and approachable. For projects, the Work Breakdown Structure (WBS) is the tool that utilizes this technique and is one of the most important project management documents. It singlehandedly integrates scope, cost and schedule baselines ensuring that project plans are in alignment.

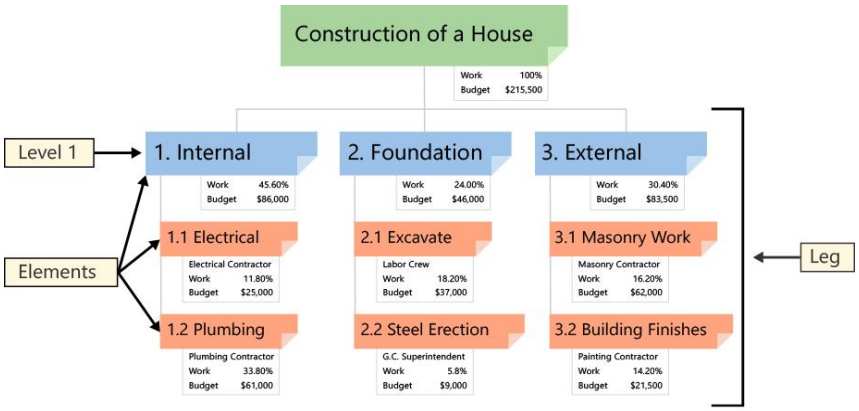
The Project Management Institute (PMI) Project Management Book of Knowledge (PMBOK) defines the Work Breakdown Structure as a "deliverable oriented hierarchical decomposition of the work to be executed by the project team." There are two types of WBS:

1) Deliverable-Based
2) Phase-Based.

The most common and preferred approach is the Deliverable-Based approach. The main difference between the two approaches are the Elements identified in the first Level of the WBS.

Deliverable-Based Work Breakdown Structure

A Deliverable-Based Work Breakdown Structure clearly demonstrates the relationship between the project deliverables (i.e., products, services or results) and the scope (i.e., work to be executed). Figure 1 is an example of a Deliverable-Based WBS for building a house. Figure 2 is an example of a Phase-Based WBS for the same project.

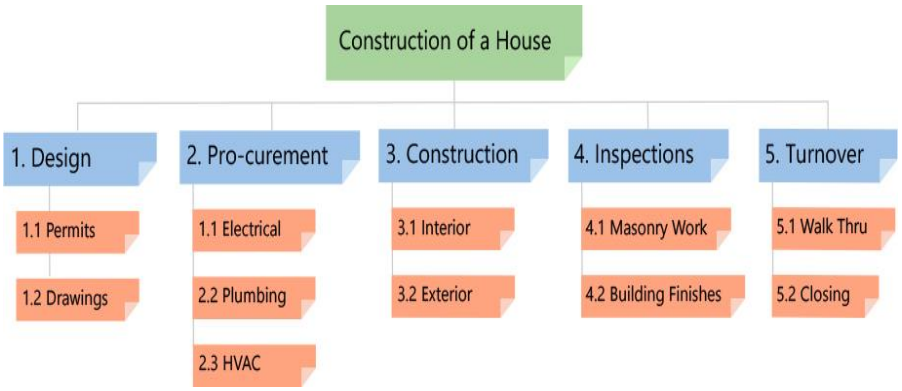


DELIVERABLE BASED WORK BREAKDOWN STRUCTURE

the Level 1 Elements are summary deliverable descriptions. The Level 2 Elements in each Leg of the WBS are all the unique deliverables required to create the respective Level 1 deliverable.

Phase-Based Work Breakdown Structure

In Figure 2, a Phase-Based WBS, the Level 1 has five Elements. Each of these Elements are typical phases of a project. The Level 2 Elements are the unique deliverables in each phase. Regardless of the type of WBS, the lower Level Elements are all deliverables. Notice that Elements in different Legs have the same name. A Phase-Based WBS requires work associated with multiple elements be divided into the work unique to each Level 1 Element. A WBS Dictionary is created to describe the work in each Element.



PHASE BASED WORK BREAKDOWN STRUCTURE

A good WBS is simply one that makes the project more manageable. Every project is different; every project manager is different and every WBS is different. So, the right WBS is the one that best answers the question, “What structure makes the project more manageable?”

How to Make a Work Breakdown Structure

A good Work Breakdown Structure is created using an iterative process by following these steps and meeting these guidelines:

- GATHER CRITICAL DOCUMENTS

  a) Gather critical project documents.

  b) Identify content containing project deliverables, such as the Project Charter, Scope Statement and Project Management Plan (PMP) subsidiary plans.

- IDENTIFY KEY TEAM MEMBERS

  a) Identify the appropriate project team members.

  b) Analyze the documents and identify the deliverables.

- DEFINE LEVEL 1 ELEMENTS

A) Define the Level 1 Elements. Level 1 Elements are summary deliverable descriptions that must capture 100% of the project scope.

B) Verify 100% of scope is captured. This requirement is commonly referred to as the 100% Rule.

- DECOMPOSE (BREAKDOWN) ELEMENTS

a) Begin the process of breaking the Level 1 deliverables into unique lower Level deliverables. This "breaking down" technique is called Decomposition.

b) Continue breaking down the work until the work covered in each Element is managed by a single individual or organization. Ensure that all Elements are mutually exclusive.

c) Ask the question, would any additional decomposition make the project more manageable? If the answer is "no", the WBS is done.

- CREATE WBS DICTIONARY

a) Define the content of the WBS Dictionary. The WBS Dictionary is a narrative description of the work covered in each Element in the WBS. The lowest Level Elements in the WBS are called Work Packages.

b) Create the WBS Dictionary descriptions at the Work Package Level with detail enough to ensure that 100% of the project scope is covered. The descriptions should include information such as, boundaries, milestones, risks, owner, costs, etc.

- CREATE GANTT CHART SCHEDULE

a) Decompose the Work Packages to activities as appropriate.

b) Export or enter the Work Breakdown Structure into a Gantt chart for further scheduling and project tracking.

How to Use a Work Breakdown Structure

The Work Breakdown Structure is used for many different things. Initially, it serves as a planning tool to help the project team plan, define and organize scope with deliverables. The WBS is also used as the primary source of schedule and cost estimate activities. But, its biggest contributions to a project are is use as a description all of the work and as a monitoring and controlling tool.

WORK PACKAGES

Figure 3 shows the House Project Work Breakdown Structure expanded to Level 1, 2, and 3 Elements. The lowest Levels of each Leg and Branch of the WBS are called Work Packages. Work Packages cover information related to the deliverable, such as owner, milestones, durations, resources, risks, etc. This information is described in the WBS Dictionary.

PLANNING PACKAGES

There is another type of Work Package called a Planning Package. When the project management plan is approved, scope is known, but not necessarily all of the details. In order to apply the 100% Rule and capture all of the scope, Planning Packages are created. It is understood that as details are defined, the Planning Packages eventually evolve to Work Packages. In the House Project, the project manager knows that the house will have fixtures, but at the time construction begins, there is only a fixture allowance and no fixtures identified. Once the fixtures are determined, the associated

Planning Package becomes a Work Package. This planning process is call Rolling Wave Planning and is a from of Progressive Elaboration.

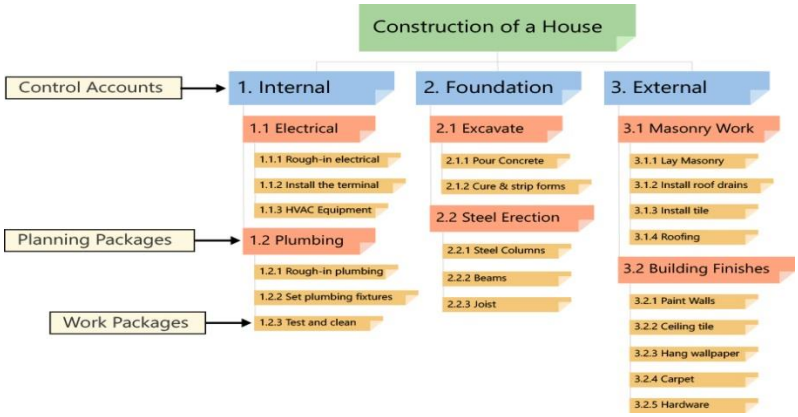


FIGURE 3 – WBS WORK PACKAGES AND CONTROL ACCOUNTS

CONTROL ACCOUNTS

The other application of the WBS is as a monitoring and controlling tool. This is accomplished by defining Control Accounts. Control Accounts are WBS Elements at which the project plans to monitor and report performance. The Control Accounts can be any Element in the WBS. In the House Project, the project manager decides that the project risks associated with using subcontractors can be better managed if the project reports performance for each subcontractor. To monitor their performance, Elements 3.1, 3.2 and 3.3 have been identified as Control Accounts. However, the remaining work in Elements 1.0 and 2.0 will be performed by company resources with less risk and the project does not feel like monitoring and controlling is needed at lower Levels. To assist with the monitoring and reporting, project management information tools are used to collect, analyze and report information at any Element within the WBS.

Chapter 09

time estimation

Definitions:

Construction duration can be defined as one or a combination of the following:

- The construction duration arising from critical path in which duration for items of work or activity in sequence cannot be reduced further (Barrie and Paulson, 1992).
- Duration means the time required to complete a specified task or activity. And, construction duration is the time determined by the owner's needs to occupy, utilize, or rent the completed space of the project (Callahan et al., 1992).
- Construction duration is a duration resulting from an examination of one or more methods of carrying out the works on the basis of minimum cost, it is usually estimated in the first instance for normal condition (Pilcher, 1992).
- Construction duration refers to a given time to execute and complete item(s) of work using all project information and resources within an estimated or predicted cost (Kwaku, 1994).
-
- **Forecasting Construction Duration**

Inputs required:

1. **The basic inputs for project scheduling are**:

- contract
- drawings

- specification

2. Resource scheduling:

The scheduler or planner has to allocate the resources, i.e. materials and manpower (or working team) to each activity or task at the proper time they are needed .

Thus, the resource schedule deals with leveling and allocation of all necessary resources (Peurifoy and Ledbetter, 1985).

3. Other judgments:

They also have to provide timing for preliminary works, e.g. construction plant, and mobilization (Peurifoy and Ledbetter, 1985). This often includes time for remedial works and site clearing after completing the construction.

Estimation Methods:

1. **Analogous Estimating**:

Analogous estimating is a technique that involves using either historical data or the experience of estimators to determine the expected duration of an activity. It is also referred to as top-down estimating.

2. **Parametric Estimating**:

The Parametric estimating technique makes use of historical data and statistical approaches to predict the durations of planned activities.

This can be one of the most accurate methods if the data availability, quality and statistical correlations are strong. However, it may require some efforts and resources to perform the estimation.

3. **Bottom-Up Estimating:**

As duration estimations relate to activities, the bottom-up estimation technique is implicitly the main approach for activity durations. Activities are typically the most granular planning components of a project. However, even activities can be further broken up, e.g. into steps or procedures, to increase the accuracy of an estimate.

The technique suggests that those who are responsible for the execution of work are also estimating the duration of that work.

Chapter 10

COST estimation

What is Construction Cost ?

Construction cost estimation is a conventional practice both the project owner and contractor initially research on before making any project commitments. No one wants to lose money, so both parties do their own analysis on the financial impact of expenditure overrun, failure of completion, and the profitability of the potential project.

Essentially, an accurate estimate will not only prevent a contractor from losing money but also help the project owner avoid overpaying

.

Why we need to estimate it ?

For the owners, they use the estimates to determine the project's scope and feasibility and to allocate budget costs. For owners planning extensive projects, they often look for multiple cost estimates, including those prepared by general contractors and those evaluated by independent estimators. Owners generally choose the lowest bid that satisfies the standards and project requirements they specify.

For the contractors, however, accurate construction estimates win jobs. They use estimates to decide whether to bid on a project, ideally with architects and engineers' inputs, to ensure that the project will meet the financial feasibility and scope requirements. It also provides a price for project owners, so they know if they want to work with a particular contractor or not.

What does the accuracy of the cost of construction depend on?

The accuracy of construction cost estimate will rely upon a number of factors:

- The quality of the project plan.
- The level to which the estimator defines the project.
- The skill and experience of the estimator.
- The accuracy of the cost information.
- The quality of the tools and procedures the estimator uses.

The 2 Key Components of Construction Cost Estimate:

There are many ways to classify construction project expenditures, but great and experienced estimators will categorize it into two key components – direct and indirect costs.

- **Direct Costs** are ex3penses and costs directly allocated for a specific activity in the construction operation .

Some examples of directs costs are the following:

- Materials
- Labor
- Equipment

- **Indirect costs** are expenses of items that are not directly associated with construction work.

Here are some of the examples of indirect costs:

- Administrative cost
- Land acquisition
- Permits
- Design fees
- Temporary on-site utilities
- Mobilization
- Security cost
- Quality control
- Legal fees

Why Construction Cost Estimates Are Important?

❖ **Improves Plans:**

By reviewing the plans and specifications that produce estimates, you can find errors and omissions before you begin building. In this way, you can also identify gaps in scope or overlap among trade subcontractors .

❖ **Saves Money:**

The estimating process can highlight opportunities for value engineering, which refers to the process of making changes to the design, material, or construction method to reduce costs without sacrificing usability .

- **Allows You to Make Better Bid Comparisons:**

Owners who have construction cost estimates are able to evaluate contractor bids with more insight .

These estimates allow owners to calculate how much of a profit margin a contractor is incorporating into their bid.

Once you have the ability to figure out profit margins, then you can determine which bids are fair and realistic.

- **Reduces Risk:**

When owners are able to plan for the cost and timing of construction, they are able to optimize the financing of a building and, thus, reduce the risk to their overall business .

And when your projected completion dates and costs are more dependable, you can manage your real estate more efficiently. For example, a company with an accurate construction estimate can schedule the smooth relocation of employees into the new building .

With a solid estimate, the company knows whether to sell or give up leases on the old property, so it does not have to carry unneeded space.

With this knowledge, the company can also determine when to start hiring staff and acquiring inventory for a new store location without increasing costs prematurely .

Using accurate estimates, contractors can reduce the risk of underbidding or making unrealistic commitments that would otherwise require overtime.

❖ **Cuts Down on Change Orders:**

With a robust cost estimate, your project brings fewer surprises, requests for information (RFI), and change orders.

This way, you increase the likelihood of staying on time and on budget.

For more on RFIs, see "How to Write and Respond to Construction RFIs Effectively".

For details on change orders, including templates, see "The Complete Collection of Free Change Order Forms and Templates".

Methods of Estimating :

Two Major Approaches

- **Top-Down Budgeting (Rough-Cut Cost Estimation):**

❖ Based on managerial judgment, and historical data**.**

❖ History can include actual costs from similar projects, adjusted for differences and for inflation.

❖ Start at the top, and allocate down through the WBS.

- **Bottom-Up Budgeting (Detailed Cost Estimation):**

❖ Starts at the bottom of the WBS, with the people who do the work.

❖ Then costs are aggregated upward.

❖ Overhead, project reserves, and profit have to be added in

ESTIMATION

Activity Name	Quantity	Unit	Resources		Resource Cost one/D	Prod/Day	No Of Crew	Total Pro. Rate	Duration	Cost Cum	`
Tanta Surgery Hospital											
s											
Mobilization			supervisor	1	150		1		1	150	330
			Unskilled	2	90					180	
Site Clean			supervisor	1	150		1		1	150	330
			Unskilled	2	90					180	
Temporary Facilities			Carpenter	2	150		2		2	1200	2400
			Assistant	3	100					1200	
Site Investigation			Sub-Contractor	1	600000		1		2	600000	600000
Surveying Works			Surveyor	1	170		1		1	170	270
			helper	1	100					100	
Demobilization			supervisor	1	150		1		1	150	330
			Unskilled	2	90					180	
Tank Works											
Soil Tank Works											
Excavation Works	4804.5	M3	Excavator	1	1500	150	3	450	8	36000	107520
			Loader	1	800					19200	
			Dump Trucks	2	1000					48000	
			Unskilled	2	90					4320	
Insulation Works	1724.95	M2	Insulation Workers	2	150	75	6	450	4	7200	46530
			Petumen	5175	7.6					39330	
Plain Concrete Works											
Erect Formworks P.C.Tank	103.8	M3	Carpenter	3	150	103.8	1	103.8	1	450	830
			Unskilled	2	90					180	
			Assistant	2	100					200	
Pouring P.C.Tank	103.8	M3	Worker for pipe of pump	1	120	320	1	320	1	120	75850
			Forman	1	120					120	
			assistant	1	100					100	
			ready mix concrete	104	725					75400	
			Vibrator	1	110					110	
Deshuttering Formworks P.C.Tank	103.8	M3	Unskilled	3	90	103.8	1	103.8	1	270	270
Reinforced Concrete Raft											
Erect Formworks RFT Tank Raft	193.03	M3	Carpenter	3	150	50	1	50	4	1800	3320
			Unskilled	2	90					720	
			Assistant	2	100					800	
Blacksmithing Works RFT Tank Raft	193.03	M3	commando	1	150	18.75	3	56.25	4	1800	231310
			Fixer	2	150					3600	
			assistant	2	100					2400	
			Steel	19	11650					221350	
			unskilled	2	90					2160	
Pouring RFT Tank Raft	193.03	M3	Worker for pipe of pump	1	120	320	1	320	1	120	140375
			Forman	1	120					120	
			assistant	1	100					100	
			ready mix concrete	193	725					139925	
			Vibrator	1	110					110	
Deshuttering Formworks RFT Tank Raft	193.03	M3	Unskilled	3	90	36	3	108	2	1620	1620
Reinforced Concrete Walls											
Erect Formworks RFT Tank Walls	215.13	M3	Carpenter	3	150	5	8	40	6	21600	39840
			Assistant	2	100					9600	
			unskilled	2	90					8640	
Blacksmithing Works RFT Tank Walls	215.13	M3	commando	1	150	18.75	3	56.25	4	1800	266260
			Fixer	2	150					3600	
			assistant	2	100					2400	
			Steel	22	11650					256300	
			unskilled	2	90					2160	
Pouring RFT Tank Walls	215.13	M3	Worker for pipe of pump	1	120	320	1	320	1	120	156325
			Forman	1	120					120	
			assistant	1	100					100	
			ready mix concrete	215	725					155875	
			Vibrator	1	110					110	
Deshuttering Formworks RFT Tank Walls	215.13	M3	Unskilled	3	90	36	3	108	2	1620	1620

The cost was

estimated in the same way and placed in the appendx

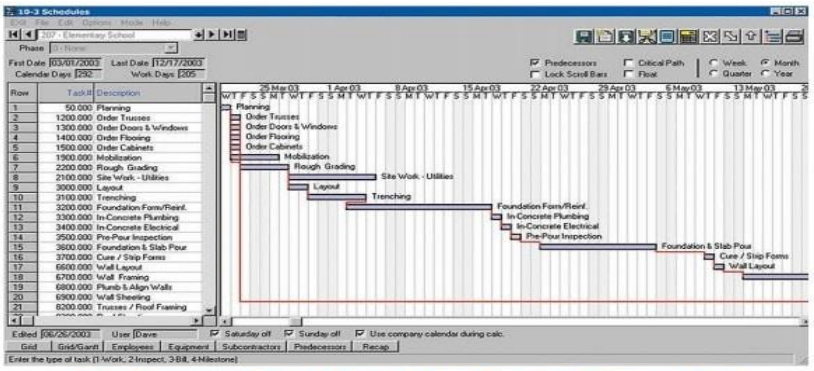
Chapter 11

planning & scheduling

It is the process of selecting a particular method and the order of work to be adopted for a project from all the possible ways and sequences in which it could be done. It essentially covers the aspects of ‘What to do’ and ‘How to do it’.

b) Scheduling in Construction Management:

Scheduling is the fitting of the final work plan to a time scale. It shows the duration and order of various construction activities. It deals with the aspect of when to do it

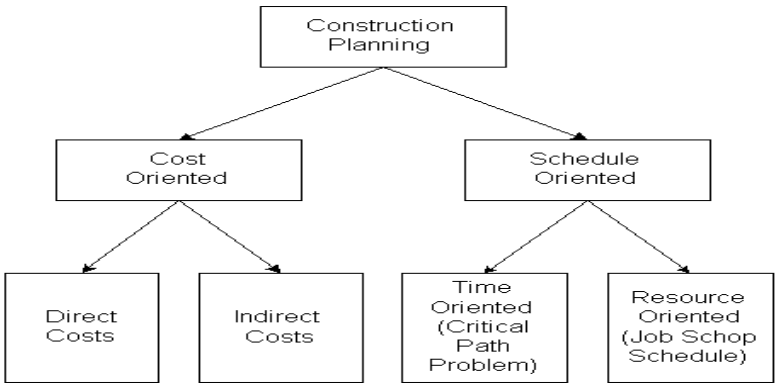


Visual representation of the schedule lets you quickly see where you're ahead—or behind—on each project.

Why construction planning and scheduling are important?

Proper construction planning and scheduling are important in ensuring that your construction project gets completed on time and within budget. A thoroughly planned construction schedule not only outlines the pace of your work but it dictates how your work gets done. It also helps define your processes, methods, and sequences for when materials are put in place.

What are the first steps in planning a construction project?



Construction planning may be cost or expense oriented, or schedule oriented. With cost-oriented project planning, there is a distinction between costs incurred directly in the performance of an activity and indirectly for the accomplishment of the project. Indirect costs may include borrowed expenses for project financing and overhead items. For schedule oriented planning, the emphasis is on the schedule of project

activities over time, and this is considered critical.

The planning is focused on ensuring that proper precedences among activities are followed and maintained and that scheduling of resources is done in an efficient manner. This results in critical path scheduling procedures (the maintenance of seamless workflows) and job shop scheduling processes (the efficient use of resources over time). Whichever your construction planning is centred on, effective delivery, schedule, and budget is always intertwined and are both major concerns.

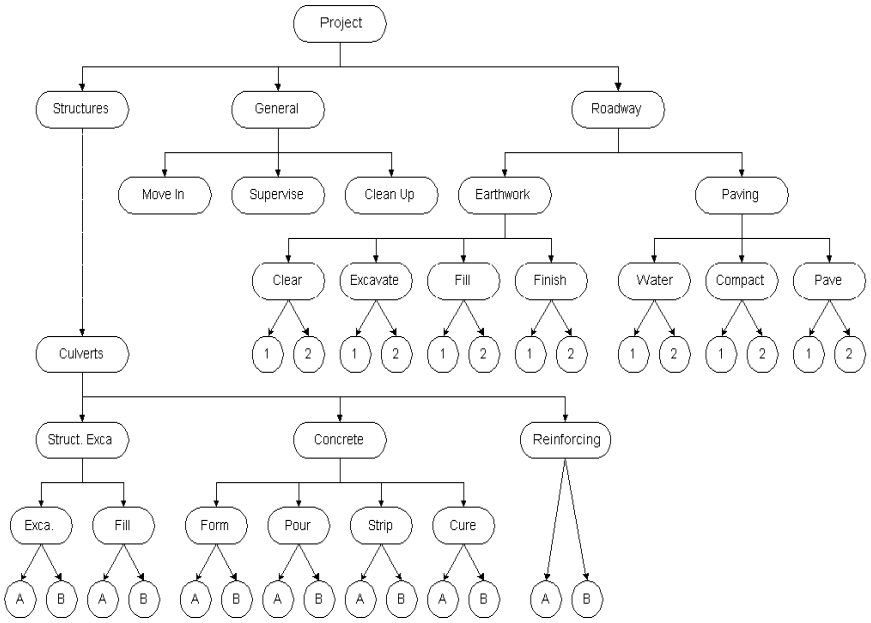
Once you have figured out your planning emphasis, it is time to consider all other functional requirements for your construction planning.

1. Choosing which technology and construction methods to utilize.

Your choice of the right technology and construction methods are critical aspects in the success of your project execution. Your decision whether to make concrete structures on site or order pre-fabricated ones will directly affect the cost and duration of tasks involved in the construction process. Finding the right digital solution for your project will be decisive for how productive your team is as it will directly affect the time it takes for the various activities to be completed and the flow from one activity to another by cutting down on unnecessary administrative tasks.

2. Defining work tasks and activities.

Because construction planning determines your construction scheduling, defining various work tasks is vital in framing the schedule of your construction activities. In that way, you can estimate the resources needed and timetable the required sequences and critical paths among tasks. Defining appropriate work tasks is tedious but a necessity in applying formal scheduling processes and in standardizing specific tasks. Once tasks are defined correctly, a hierarchy of activities emerge which can be visualized like this example of activities in a roadway project plan:



3. Defining relationships and critical flow among activities.

After work activities are defined, you can now specify the relationships among them. Precedence relations between tasks and activities mean that activities must happen in particular sequences. Numerous natural sequences exist for construction activities due to requirements for structural integrity, regulations, and other technical requirements.

4. Estimating activity durations.

Remember, each work activity is associated with time duration and these durations are the bases for preparing the schedule. All formal scheduling relies on duration estimates as well as the defined precedence relations. A realistic estimation coupled with historical records of particular tasks and activities is critical in avoiding delays.

5. Estimating resource requirements for work activities.

Besides precedence relations and time durations, resource requirements are also estimated for each activity. By correctly estimating resource requirements per activity based on their comprehensive definitions, particular resource requirements for the

entirety of the project can be also defined while avoiding issues with resource

6. Establishing a coding system.

Having a coding system for each of the identified activities allows for better integration of organization efforts and better information flow. A coding system allows you to standardize definitions and categories of items and activities between projects and among project stakeholders. Coding systems also make it easy to retrieve historical data of cost, productivity, and duration of your activities. Couple this with a construction management software that keeps all your data in a central location makes your coding system even more efficient.

These steps are needed to develop a proper construction plan and allow you to transform your plan into a schedule. Construction planning is not limited to the period after you have been awarded a contract. It should be an essential and continuous activity even during your facility design.

ACTIVITY CODING

Activity ID	Activity Name	Planned Duration	Early Start	Early Finish	Budget Total Cost	Total Float
Tanta Surgery Hospital		617	29/May/2021	17/May/2023	93,107,424.86 LE	0
Key Dates		617	29/May/2021	17/May/2023	0.00 LE	0
A1000	Start Of The Project	0	29/May/2021		0.00 LE	617
A1010	Start Of Construction Work	0	29/May/2021		0.00 LE	0
A1020	End Of Construction Work	0		17/May/2023	0.00 LE	0
A1030	End Of The Project	0		17/May/2023	0.00 LE	0
Mobilization & Demobilization Works		617	29/May/2021	17/May/2023	63,660.00 LE	0
A1040	Mobilization	1	01/Jun/2021	01/Jun/2021	330.00 LE	1
A1050	Site Clean	1	29/May/2021	29/May/2021	330.00 LE	0
A1060	Temporary Facilities	2	01/Jun/2021	02/Jun/2021	2,400.00 LE	0
A1070	Site Investigation	2	30/May/2021	31/May/2021	60,000.00 LE	0
A1080	Surveying Works	1	03/Jun/2021	03/Jun/2021	270.00 LE	0
A1090	Demobilization	1	17/May/2023	17/May/2023	330.00 LE	0
Tank Works		69	05/Jun/2021	23/Aug/2021	1,326,483.86 LE	4
Soil Tank Works		69	05/Jun/2021	23/Aug/2021	154,048.86 LE	4
A1100	Excavation Works	8	05/Jun/2021	13/Jun/2021	107,520.00 LE	4
A1110	Insulation Works	4	19/Aug/2021	23/Aug/2021	46,528.86 LE	4
Plain Concrete Works		3	14/Jun/2021	16/Jun/2021	76,950.00 LE	4
A1120	Erect Formworks P.C.Tank	1	14/Jun/2021	14/Jun/2021	830.00 LE	4
A1130	Pouring P.C.Tank	1	15/Jun/2021	15/Jun/2021	75,850.00 LE	4
A1140	Deshuttering Formworks P.C.Tank	1	16/Jun/2021	16/Jun/2021	270.00 LE	4
Reinforced Concrete Raft		19	17/Jun/2021	08/Jul/2021	376,625.00 LE	4
A1150	Erect Formworks RFT Tank Raft	4	17/Jun/2021	21/Jun/2021	3,320.00 LE	4
A1160	Blacksmithing Works RFT Tank Raft	4	26/Jun/2021	29/Jun/2021	231,310.00 LE	4
A1170	Pouring RFT Tank Raft	1	30/Jun/2021	30/Jun/2021	140,375.00 LE	4
A1180	Deshuttering Formworks RFT Tank Raf	2	07/Jul/2021	08/Jul/2021	1,620.00 LE	4
Reinforced Concrete Walls		18	10/Jul/2021	29/Jul/2021	464,045.00 LE	4
A1190	Erect Formworks RFT Tank Walls	6	10/Jul/2021	15/Jul/2021	39,840.00 LE	4
A1200	Blacksmithing Works RFT Tank Walls	4	17/Jul/2021	20/Jul/2021	266,260.00 LE	4
A1210	Pouring RFT Tank Walls	1	21/Jul/2021	21/Jul/2021	156,325.00 LE	4
A1220	Deshuttering Formworks RFT Tank Wa	2	28/Jul/2021	29/Jul/2021	1,620.00 LE	4
Reinforced Concrete Slab		17	31/Jul/2021	18/Aug/2021	254,815.00 LE	4
A1230	Erect Formworks Tank Slab	5	31/Jul/2021	04/Aug/2021	16,600.00 LE	4
A1240	Blacksmithing Tank Slab	3	05/Aug/2021	08/Aug/2021	168,080.00 LE	4
A1250	Pouring Tank Slab	1	09/Aug/2021	09/Aug/2021	69,325.00 LE	4

Activity ID	Activity Name	Planned Duration	Early Start	Early Finish	Budget Total Cost	Total Float
A1260	Deshuttering Formworks Tank Slab	1	18/Aug/2021	18/Aug/2021	810.00 LE	4
Sub Structure Works		451	05/Jun/2021	12/Nov/2022	31,822,510.00 LE	11
Soil Works		80	29/Aug/2021	29/Nov/2021	920,110.00 LE	0
A1270	Excavation Works	13	29/Aug/2021	12/Sep/2021	465,920.00 LE	0
A1280	Back filling Works	3	27/Nov/2021	29/Nov/2021	293,520.00 LE	0
A1290	Footing Insulation	7	18/Nov/2021	25/Nov/2021	160,670.00 LE	0
Concrete Works For Foundation		165	05/Jun/2021	13/Dec/2021	25,093,050.00 LE	0
Plain Concrete Foundation		3	13/Sep/2021	15/Sep/2021	420,140.00 LE	0
A1300	Erect Formworks P.C.F	1	13/Sep/2021	13/Sep/2021	830.00 LE	0
A1310	Pouring P.C.F	1	14/Sep/2021	14/Sep/2021	418,500.00 LE	0
A1320	Deshuttering Formworks P.C.F	1	15/Sep/2021	15/Sep/2021	810.00 LE	0
Reinforced Concrete Foundation		143	05/Jun/2021	17/Nov/2021	24,142,705.00 LE	0
A1330	Piles Works	45	05/Jun/2021	26/Jul/2021	19,500,000.00 LE	0
A1340	Piles Head Breaking	15	16/Sep/2021	03/Oct/2021	54,000.00 LE	0
A1350	Erect Formworks R.C.F	13	04/Oct/2021	18/Oct/2021	129,480.00 LE	0
A1360	Blacksmithing R.C.F	10	19/Oct/2021	30/Oct/2021	2,775,750.00 LE	0
A1370	Pouring R.C.F	4	31/Oct/2021	03/Nov/2021	1,664,575.00 LE	0
A1380	Deshuttering Formworks R.C.F	7	10/Nov/2021	17/Nov/2021	18,900.00 LE	0
Deckind Slab R.C for B.F		12	30/Nov/2021	13/Dec/2021	530,205.00 LE	0
A1390	Erect Formworks Deckind Slab R.C for	6	30/Nov/2021	06/Dec/2021	44,820.00 LE	0
A1400	Blacksmithing Deckind Slab R.C for B.	3	07/Dec/2021	09/Dec/2021	303,700.00 LE	0
A1410	Pouring Deckind Slab R.C for B.F	1	11/Dec/2021	11/Dec/2021	179,525.00 LE	0
A1420	Deshuttering Formworks Deckind Slab	2	12/Dec/2021	13/Dec/2021	2,160.00 LE	0
Basement floor Works		283	18/Dec/2021	12/Nov/2022	5,809,350.00 LE	11
Concrete Works B.F		46	18/Dec/2021	08/Feb/2022	3,266,570.00 LE	13
Reinforced Concrete Columns		25	18/Dec/2021	15/Jan/2022	2,173,815.00 LE	0
A1430	Erect Formworks 3 sides B.F.Col	10	18/Dec/2021	28/Dec/2021	132,800.00 LE	0
A1440	Blacksmithing B.F.Col	5	29/Dec/2021	03/Jan/2022	1,423,700.00 LE	0
A1450	Close Formworks Fourth side B.F.Col	4	04/Jan/2022	08/Jan/2022	33,200.00 LE	0
A1460	Pouring B.F.Col	2	09/Jan/2022	10/Jan/2022	578,175.00 LE	0
A1470	Deshuttering Formworks B.F.Col	2	13/Jan/2022	15/Jan/2022	5,940.00 LE	0
Reinforced Concrete Slab		21	16/Jan/2022	08/Feb/2022	1,092,755.00 LE	13
A1480	Erect Formworks B.F.Slab	5	16/Jan/2022	20/Jan/2022	66,400.00 LE	0
A1490	Blacksmithing B.F.Slab	3	22/Jan/2022	24/Jan/2022	701,490.00 LE	0
A1500	Electrical Works B.F.Slab	3	25/Jan/2022	27/Jan/2022	30,000.00 LE	0
A1510	Pouring B.F.Slab	2	29/Jan/2022	30/Jan/2022	291,625.00 LE	0
A1520	Deshuttering Formworks B.F.Slab	1	08/Feb/2022	08/Feb/2022	3,240.00 LE	13

Activity ID	Activity Name	Planned Duration	Early Start	Early Finish	Budget Total Cost	Total Float
Finishing Works B.F		59	05/Sep/2022	12/Nov/2022	2,542,780.00 LE	11
A1530	Brick Works B.F	7	05/Sep/2022	12/Sep/2022	166,097.00 LE	0
A1540	Install Frames of windows and doors B.	3	13/Sep/2022	15/Sep/2022	230,940.00 LE	19
A1550	Erect Primary Electrical Works.B.F	7	13/Sep/2022	20/Sep/2022	70,000.00 LE	15
A1560	Primary Plumbing Works B.F	10	14/Sep/2022	25/Sep/2022	100,000.00 LE	11
A1570	Insulation W.c Works B.F	1	13/Sep/2022	13/Sep/2022	2,400.00 LE	11
A1580	Plastering Works B.F	10	26/Sep/2022	06/Oct/2022	469,164.00 LE	11
A1590	Ceiling Works B.F	5	09/Oct/2022	13/Oct/2022	195,780.00 LE	11
A1600	Cladding Works B.F	5	26/Oct/2022	31/Oct/2022	318,952.00 LE	11
A1610	Install Ceramics Works B.F	10	15/Oct/2022	25/Oct/2022	310,595.00 LE	11
A1620	Painting Works B.F	1	08/Oct/2022	08/Oct/2022	14,032.00 LE	11
A1630	Alumital Fixtures B.F	2	01/Nov/2022	02/Nov/2022	36,680.00 LE	11
A1640	Finishing Plumbing Fixtures B.F	7	03/Nov/2022	10/Nov/2022	200,000.00 LE	11
A1650	Finishing Electrical Fixtures B.F	5	03/Nov/2022	08/Nov/2022	130,000.00 LE	13
A1660	Finishing Carpentary Works B.F	2	03/Nov/2022	05/Nov/2022	297,960.00 LE	16
A1680	Cleaning and Closing B.F	1	12/Nov/2022	12/Nov/2022	180.00 LE	11
Super Structure Works		396	03/Feb/2022	10/May/2023	57,084,085.00 LE	1
Ground Floor Works		257	03/Feb/2022	29/Nov/2022	6,073,537.00 LE	13
Concrete Works G.F		44	03/Feb/2022	26/Mar/2022	2,588,135.00 LE	12
Reinforced Concrete Columns		18	03/Feb/2022	23/Feb/2022	1,117,145.00 LE	0
A1690	Erect Formworks 3 sides G.F.Col	5	03/Feb/2022	08/Feb/2022	70,550.00 LE	0
A1700	Blacksmithing G.F.Col	3	09/Feb/2022	12/Feb/2022	730,570.00 LE	0
A1710	Close Formworks Fourth side G.F.Col	2	13/Feb/2022	14/Feb/2022	18,260.00 LE	0
A1720	Pouring G.F.Col	1	15/Feb/2022	15/Feb/2022	294,525.00 LE	0
A1730	Deshuttering Formworks G.F.Col	4	20/Feb/2022	23/Feb/2022	3,240.00 LE	0
Reinforced Concrete Slab		26	24/Feb/2022	26/Mar/2022	1,470,990.00 LE	12
A1740	Erect Formworks G.F.Slab	7	24/Feb/2022	03/Mar/2022	92,960.00 LE	0
A1750	Blacksmithing G.F.Slab	4	05/Mar/2022	08/Mar/2022	958,560.00 LE	0
A1760	Electrical Works G.F.Slab	3	09/Mar/2022	12/Mar/2022	30,000.00 LE	0
A1770	Pouring G.F.Slab	1	13/Mar/2022	13/Mar/2022	385,150.00 LE	0
A1780	Deshuttering Formworks G.F.Slab	4	22/Mar/2022	26/Mar/2022	4,320.00 LE	12
Finishing Works G.F		67	13/Sep/2022	29/Nov/2022	3,485,402.00 LE	13
A1790	Brick Works G.F	12	13/Sep/2022	26/Sep/2022	364,123.00 LE	0
A1800	Install Frames of doors G.F	2	27/Sep/2022	28/Sep/2022	338,760.00 LE	20
A1810	Erect Primary Electrical Works.G.F	7	27/Sep/2022	04/Oct/2022	70,000.00 LE	15
A1820	Primary Plumbing Works G.F	10	28/Sep/2022	09/Oct/2022	100,000.00 LE	10
A1830	Plastering Works G.F	9	10/Oct/2022	19/Oct/2022	437,168.00 LE	11

Activity ID	Activity Name	Planned Duration	Early Start	Early Finish	Budget Total Cost	Total Float
A1840	Insulation W.c Works G.F	1	27/Sep/2022	27/Sep/2022	4,200.00 LE	10
A1850	Install Ceramics Works G.F	9	30/Oct/2022	08/Nov/2022	407,495.00 LE	13
A1860	Ceiling fixtures Works G.F	5	24/Oct/2022	29/Oct/2022	164,880.00 LE	13
A1870	Installation of metal and aluminum wor	3	17/Nov/2022	20/Nov/2022	45,670.00 LE	13
A1880	Painting Works G.F	3	20/Oct/2022	23/Oct/2022	29,924.00 LE	13
A1890	cladding works G.F	7	09/Nov/2022	16/Nov/2022	305,702.00 LE	13
A1900	Finishing Plumbing Fixtures G.F	7	21/Nov/2022	28/Nov/2022	200,000.00 LE	13
A1910	Finishing Electrical Fixtures G.F	5	21/Nov/2022	26/Nov/2022	130,000.00 LE	15
A1920	Finishing Carpentary G.F	3	21/Nov/2022	23/Nov/2022	328,040.00 LE	17
A1930	Finishing The Floor G.F	2	21/Nov/2022	22/Nov/2022	559,260.00 LE	18
A1940	Cleaning and Closing G.F	1	29/Nov/2022	29/Nov/2022	180.00 LE	13
First Floor Works		228	17/Mar/2022	07/Dec/2022	6,773,525.00 LE	22
Concrete Works 1_st		46	17/Mar/2022	09/May/2022	2,683,275.00 LE	12
Reinforced Concrete Columns		20	17/Mar/2022	09/Apr/2022	1,212,285.00 LE	0
A1950	Erect Formworks 3 sides 1_st.Col	6	17/Mar/2022	23/Mar/2022	74,700.00 LE	0
A1960	Blacksmithing 1_st.Col	3	24/Mar/2022	27/Mar/2022	788,820.00 LE	0
A1970	Close Formworks Fourth side 1_st.Col	3	28/Mar/2022	30/Mar/2022	24,900.00 LE	0
A1980	Pouring 1_st.Col	1	31/Mar/2022	31/Mar/2022	320,625.00 LE	0
A1990	Deshuttering Formworks 1_st.Col	4	05/Apr/2022	09/Apr/2022	3,240.00 LE	0
Reinforced Concrete Slab		26	10/Apr/2022	09/May/2022	1,470,990.00 LE	12
A2000	Erect Formworks 1_st.Slab	7	10/Apr/2022	17/Apr/2022	92,960.00 LE	0
A2010	Blacksmithing 1_st.Slab	4	18/Apr/2022	21/Apr/2022	958,560.00 LE	0
A2020	Electrical Works 1_st.Slab	3	23/Apr/2022	25/Apr/2022	30,000.00 LE	0
A2030	Pouring 1_st.Slab	1	26/Apr/2022	26/Apr/2022	385,150.00 LE	0
A2040	Deshuttering Formworks 1_st.Slab	4	05/May/2022	09/May/2022	4,320.00 LE	12
Finishing Works 1_st		62	27/Sep/2022	07/Dec/2022	4,090,250.00 LE	22
A2050	Brick Works 1_st	9	27/Sep/2022	06/Oct/2022	308,881.00 LE	0
A2060	Install Frames of doors 1_st	2	08/Oct/2022	09/Oct/2022	312,360.00 LE	20
A2070	Erect Primary Electrical Works 1_st	7	08/Oct/2022	15/Oct/2022	70,000.00 LE	15
A2080	Primary Plumbing Works 1_st	10	10/Oct/2022	20/Oct/2022	100,000.00 LE	10
A2090	Plastering Works 1_st	10	22/Oct/2022	01/Nov/2022	479,449.00 LE	10
A2100	Insulation W.c Works 1_st	1	08/Oct/2022	08/Oct/2022	2,100.00 LE	11
A2110	Install Ceramics Works 1_st	6	15/Nov/2022	21/Nov/2022	321,827.00 LE	14
A2120	Cladding works 1_st	5	22/Nov/2022	27/Nov/2022	1,367,081.00 LE	15
A2130	Ceiling fixtures Works 1_st	9	05/Nov/2022	14/Nov/2022	242,710.00 LE	11
A2140	Installation of metal and aluminum wor	1	28/Nov/2022	28/Nov/2022	21,640.00 LE	16
A2150	Painting Works 1_st	2	02/Nov/2022	03/Nov/2022	54,082.00 LE	11

Activity ID	Activity Name	Planned Duration	Early Start	Early Finish	Budget Total Cost	Total Float
A2160	Finishing Plumbing Fixtures 1_st	7	29/Nov/2022	06/Dec/2022	200,000.00 LE	16
A2170	Finishing Electrical Fixtures 1_st	5	29/Nov/2022	04/Dec/2022	130,000.00 LE	20
A2180	finishing Carpentry works 1_st	2	29/Nov/2022	30/Nov/2022	274,760.00 LE	26
A2190	Finishing The Foor 1_st	5	29/Nov/2022	04/Dec/2022	205,180.00 LE	20
A2200	Cleaning and Closing 1_st	1	07/Dec/2022	07/Dec/2022	180.00 LE	22
Second Floor Works		203	01/May/2022	22/Dec/2022	7,053,733.00 LE	10
Concrete Works 2_nd		46	01/May/2022	22/Jun/2022	2,694,925.00 LE	9
Reinforced Concrete Columns		20	01/May/2022	23/May/2022	1,223,935.00 LE	0
A2210	Erect Formworks 3 sides 2_nd.Col	6	01/May/2022	07/May/2022	74,700.00 LE	0
A2220	Blacksmithing 2_nd.Col	3	08/May/2022	10/May/2022	800,470.00 LE	0
A2230	Close Formworks Fourth side 2_nd.Col	3	11/May/2022	14/May/2022	24,900.00 LE	0
A2240	Pouring 2_nd.Col	1	15/May/2022	15/May/2022	320,625.00 LE	0
A2250	Deshuttering Formworks 2_nd.Col	4	19/May/2022	23/May/2022	3,240.00 LE	0
Reinforced Concrete Slab		26	24/May/2022	22/Jun/2022	1,470,990.00 LE	9
A2260	Erect Formworks 2_nd.Slab	7	24/May/2022	31/May/2022	92,960.00 LE	0
A2270	Blacksmithing 2_nd.Slab	4	01/Jun/2022	05/Jun/2022	958,560.00 LE	0
A2280	Electrical Works 2_nd.Slab	3	06/Jun/2022	08/Jun/2022	30,000.00 LE	0
A2290	Pouring 2_nd.Slab	1	09/Jun/2022	09/Jun/2022	385,150.00 LE	0
A2300	Deshuttering Formworks 2_nd.Slab	4	19/Jun/2022	22/Jun/2022	4,320.00 LE	9
Finishing Works 2_nd		66	08/Oct/2022	22/Dec/2022	4,358,808.00 LE	10
A2310	Brick Works 2_nd	9	08/Oct/2022	17/Oct/2022	306,815.00 LE	0
A2320	Install Frames of doors 2_nd	2	18/Oct/2022	19/Oct/2022	312,360.00 LE	21
A2330	Erect Primary Electrical Works 2_nd	7	18/Oct/2022	25/Oct/2022	70,000.00 LE	16
A2340	Primary Plumbing Works 2_nd	10	22/Oct/2022	01/Nov/2022	100,000.00 LE	10
A2350	Plastering Works 2_nd	10	02/Nov/2022	13/Nov/2022	479,449.00 LE	10
A2360	Insulation W.c Works 2_nd	1	18/Oct/2022	18/Oct/2022	2,100.00 LE	12
A2370	Install Ceramics Works 2_nd	6	27/Nov/2022	03/Dec/2022	321,827.00 LE	10
A2380	Cladding Works 2_nd	7	04/Dec/2022	11/Dec/2022	1,625,091.00 LE	10
A2390	Ceiling fixtures Works 2_nd	9	16/Nov/2022	26/Nov/2022	242,710.00 LE	10
A2400	Installation of metal and aluminum wor	2	12/Dec/2022	13/Dec/2022	37,780.00 LE	10
A2410	Painting Works 2_nd	2	14/Nov/2022	15/Nov/2022	51,216.00 LE	10
A2420	Finishing Plumbing Fixtures 2_nd	7	14/Dec/2022	21/Dec/2022	200,000.00 LE	10
A2430	Finishing Electrical Fixtures 2_nd	5	14/Dec/2022	19/Dec/2022	130,000.00 LE	12
A2440	finishing Carpentry works 2_nd	2	14/Dec/2022	15/Dec/2022	274,760.00 LE	15
A2450	Finishing The Floor 2_nd	5	14/Dec/2022	19/Dec/2022	204,520.00 LE	12
A2460	Cleaning and Closing 2_nd	1	22/Dec/2022	22/Dec/2022	180.00 LE	10
Third Floor Works		176	14/Jun/2022	04/Jan/2023	5,181,063.00 LE	12

Activity ID	Activity Name	Planned Duration	Early Start	Early Finish	Budget Total Cost	Total Float
Concrete Works 3_rd		45	14/Jun/2022	04/Aug/2022	2,425,795.00 LE	9
Reinforced Concrete Columns		17	14/Jun/2022	03/Jul/2022	899,030.00 LE	0
A2470	Erect Formworks 3 sides 3_rd.Col	5	14/Jun/2022	19/Jun/2022	53,950.00 LE	0
A2480	Blacksmithing 3_rd.Col	3	20/Jun/2022	22/Jun/2022	585,790.00 LE	0
A2490	Close Formworks Fourth side 3_rd.Col	2	23/Jun/2022	25/Jun/2022	18,260.00 LE	0
A2500	Pouring 3_rd.Col	1	26/Jun/2022	26/Jun/2022	238,600.00 LE	0
A2510	Deshuttering Formworks 3_rd.Col	3	30/Jun/2022	03/Jul/2022	2,430.00 LE	0
Reinforced Concrete Slab		28	04/Jul/2022	04/Aug/2022	1,526,765.00 LE	9
A2520	Erect Formworks 3_rd.Slab	9	04/Jul/2022	13/Jul/2022	97,110.00 LE	0
A2530	Blacksmithing 3_rd.Slab	4	14/Jul/2022	18/Jul/2022	993,510.00 LE	0
A2540	Electrical Works 3_rd.Slab	3	19/Jul/2022	21/Jul/2022	30,000.00 LE	0
A2550	Pouring 3_rd.Slab	1	23/Jul/2022	23/Jul/2022	401,825.00 LE	0
A2560	Deshuttering Formworks 3_rd.Slab	4	01/Aug/2022	04/Aug/2022	4,320.00 LE	9
Finishing Works 3_rd		68	18/Oct/2022	04/Jan/2023	2,755,268.00 LE	12
A2570	Brick Works 3_rd	18	18/Oct/2022	07/Nov/2022	275,309.00 LE	0
A2580	Install Frames of doors 3_rd	2	08/Nov/2022	09/Nov/2022	305,760.00 LE	21
A2590	Erect Primary Electrical Works 3_rd	7	08/Nov/2022	15/Nov/2022	70,000.00 LE	16
A2600	Primary Plumbing Works 3_rd	10	09/Nov/2022	20/Nov/2022	100,000.00 LE	12
A2610	Plastering Works 3_rd	7	21/Nov/2022	28/Nov/2022	351,150.00 LE	12
A2620	Insulation W.c Works 3_rd	1	08/Nov/2022	08/Nov/2022	5,100.00 LE	12
A2630	Install Ceramics Works 3_rd	10	10/Dec/2022	20/Dec/2022	575,421.00 LE	12
A2640	Cladding Works 3_rd	3	21/Dec/2022	24/Dec/2022	96,988.00 LE	12
A2650	Ceiling fixtures Works 3_rd	7	01/Dec/2022	08/Dec/2022	135,900.00 LE	12
A2660	Painting Works 3_rd	2	29/Nov/2022	30/Nov/2022	15,700.00 LE	12
A2670	Installation of metal and aluminum wor	2	25/Dec/2022	26/Dec/2022	36,130.00 LE	12
A2680	Finishing Plumbing Fixtures 3_rd	7	27/Dec/2022	03/Jan/2023	200,000.00 LE	12
A2690	Finishing Electrical Fixtures 3_rd	5	27/Dec/2022	01/Jan/2023	130,000.00 LE	14
A2700	finishing Carpentry works 3_rd	2	27/Dec/2022	28/Dec/2022	158,760.00 LE	17
A2710	Finishing The Floor 3_rd	4	27/Dec/2022	31/Dec/2022	298,870.00 LE	15
A2720	Cleaning and Closing 3_rd	1	04/Jan/2023	04/Jan/2023	180.00 LE	12
Fourth Floor Works		160	27/Jul/2022	29/Jan/2023	5,181,063.00 LE	10
Concrete Works 4_th		45	27/Jul/2022	17/Sep/2022	2,425,795.00 LE	9
Reinforced Concrete Columns		17	27/Jul/2022	15/Aug/2022	899,030.00 LE	0
A2730	Erect Formworks 3 sides 4_th.Col	5	27/Jul/2022	01/Aug/2022	53,950.00 LE	0
A2740	Blacksmithing 4_th.Col	3	02/Aug/2022	04/Aug/2022	585,790.00 LE	0
A2750	Close Formworks Fourth side 4_th.Col	2	06/Aug/2022	07/Aug/2022	18,260.00 LE	0
A2760	Pouring 4_th.Col	1	08/Aug/2022	08/Aug/2022	238,600.00 LE	0

Activity ID	Activity Name	Planned Duration	Early Start	Early Finish	Budget Total Cost	Total Float
A2770	Deshuttering Formworks 4_th.Col	3	13/Aug/2022	15/Aug/2022	2,430.00 LE	0
Reinforced Concrete Slab		28	16/Aug/2022	17/Sep/2022	1,526,765.00 LE	9
A2780	Erect Formworks 4_th.Slab	9	16/Aug/2022	25/Aug/2022	97,110.00 LE	0
A2790	Blacksmithing 4_th.Slab	4	27/Aug/2022	30/Aug/2022	993,510.00 LE	0
A2800	Electrical Works 4_th.Slab	3	31/Aug/2022	03/Sep/2022	30,000.00 LE	0
A2810	Pouring 4_th.Slab	1	04/Sep/2022	04/Sep/2022	401,825.00 LE	0
A2820	Deshuttering Formworks 4_th.Slab	4	13/Sep/2022	17/Sep/2022	4,320.00 LE	9
Finishing Works 4_th		71	08/Nov/2022	29/Jan/2023	2,755,268.00 LE	10
A2830	Brick Works 4_th	18	08/Nov/2022	28/Nov/2022	275,309.00 LE	0
A2840	Install Frames of doors 4_th	2	29/Nov/2022	30/Nov/2022	305,760.00 LE	22
A2850	Erect Primary Electrical Works 4_th	7	29/Nov/2022	06/Dec/2022	70,000.00 LE	17
A2860	Primary Plumbing Works 4_th	10	30/Nov/2022	11/Dec/2022	100,000.00 LE	13
A2870	Plastering Works 4_th	7	12/Dec/2022	19/Dec/2022	351,150.00 LE	13
A2880	Insulation W.c Works 4_th	1	29/Nov/2022	29/Nov/2022	5,100.00 LE	13
A2890	Install Ceramics Works 4_th	10	03/Jan/2023	14/Jan/2023	575,421.00 LE	10
A2900	Cladding Works 4_th	3	15/Jan/2023	17/Jan/2023	96,988.00 LE	10
A2910	Ceiling fixtures Works 4_th	7	26/Dec/2022	02/Jan/2023	135,900.00 LE	10
A2920	Painting Works 4_th	2	24/Dec/2022	25/Dec/2022	15,700.00 LE	10
A2930	Installation of metal and aluminum wor	2	18/Jan/2023	19/Jan/2023	36,130.00 LE	10
A2940	Finishing Plumbing Fixtures 4_th	7	21/Jan/2023	28/Jan/2023	200,000.00 LE	10
A2950	Finishing Electrical Fixtures 4_th	5	21/Jan/2023	25/Jan/2023	130,000.00 LE	12
A2960	finishing Carpentry works 4_th	2	21/Jan/2023	22/Jan/2023	158,760.00 LE	15
A2970	Finishing The Floor 4_th	4	21/Jan/2023	24/Jan/2023	298,870.00 LE	13
A2980	Cleaning and Closing 4_th	1	29/Jan/2023	29/Jan/2023	180.00 LE	10
Fifth Floor Works		138	08/Sep/2022	15/Feb/2023	5,180,623.00 LE	8
Concrete Works 5_th		45	08/Sep/2022	30/Oct/2022	2,425,355.00 LE	9
Reinforced Concrete Columns		17	08/Sep/2022	27/Sep/2022	898,590.00 LE	0
A2990	Erect Formworks 3 sides 5_th.Col	5	08/Sep/2022	13/Sep/2022	53,950.00 LE	0
A3000	Blacksmithing 5_th.Col	3	14/Sep/2022	17/Sep/2022	585,790.00 LE	0
A3010	Close Formworks Fourth side 5_th.Col	2	18/Sep/2022	19/Sep/2022	18,260.00 LE	0
A3020	Pouring 5_th.Col	1	20/Sep/2022	20/Sep/2022	238,160.00 LE	0
A3030	Deshuttering Formworks 5_th.Col	3	25/Sep/2022	27/Sep/2022	2,430.00 LE	0
Reinforced Concrete Slab		28	28/Sep/2022	30/Oct/2022	1,526,765.00 LE	9
A3040	Erect Formworks 5_th.Slab	9	28/Sep/2022	08/Oct/2022	97,110.00 LE	0
A3050	Blacksmithing 5_th.Slab	4	09/Oct/2022	12/Oct/2022	993,510.00 LE	0
A3060	Electrical Works 5_th.Slab	3	13/Oct/2022	16/Oct/2022	30,000.00 LE	0
A3070	Pouring 5_th.Slab	1	17/Oct/2022	17/Oct/2022	401,825.00 LE	0

Activity ID	Activity Name	Planned Duration	Early Start	Early Finish	Budget Total Cost	Total Float
A3080	Deshuttering Formworks 5_th.Slab	4	26/Oct/2022	30/Oct/2022	4,320.00 LE	9
Finishing Works 5_th		68	29/Nov/2022	15/Feb/2023	2,755,268.00 LE	8
A3090	Brick Works 5_th	18	29/Nov/2022	19/Dec/2022	275,309.00 LE	0
A3100	Install Frames of doors 5_th	2	20/Dec/2022	21/Dec/2022	305,760.00 LE	17
A3110	Erect Primary Electrical Works 5_th	7	20/Dec/2022	27/Dec/2022	70,000.00 LE	12
A3120	Primary Plumbing Works 5_th	10	21/Dec/2022	01/Jan/2023	100,000.00 LE	8
A3130	Plastering Works 5_th	7	02/Jan/2023	09/Jan/2023	351,150.00 LE	8
A3140	Insulation W.c Works 5_th	1	20/Dec/2022	20/Dec/2022	5,100.00 LE	8
A3150	Install Ceramics Works 5_th	10	21/Jan/2023	31/Jan/2023	575,421.00 LE	8
A3160	Cladding Works 5_th	3	01/Feb/2023	04/Feb/2023	96,988.00 LE	8
A3170	Ceiling fixtures Works 5_th	7	12/Jan/2023	19/Jan/2023	135,900.00 LE	8
A3180	Painting Works 5_th	2	10/Jan/2023	11/Jan/2023	15,700.00 LE	8
A3190	Installation of metal and aluminum wor	2	05/Feb/2023	06/Feb/2023	36,130.00 LE	8
A3200	Finishing Plumbing Fixtures 5_th	7	07/Feb/2023	14/Feb/2023	200,000.00 LE	8
A3210	Finishing Electrical Fixtures 5_th	5	07/Feb/2023	12/Feb/2023	130,000.00 LE	10
A3220	finishing Carpentry works 5_th	2	07/Feb/2023	08/Feb/2023	158,760.00 LE	13
A3230	Finishing The Floor 5_th	4	07/Feb/2023	11/Feb/2023	298,870.00 LE	11
A3240	Cleaning and Closing 5_th	1	15/Feb/2023	15/Feb/2023	180.00 LE	8
Sixth Floor Works		119	22/Oct/2022	08/Mar/2023	5,180,623.00 LE	9
Concrete Works 6_th		45	22/Oct/2022	12/Dec/2022	2,425,355.00 LE	9
Reinforced Concrete Columns		17	22/Oct/2022	09/Nov/2022	898,590.00 LE	0
A3250	Erect Formworks 3 sides 6_th.Col	5	22/Oct/2022	26/Oct/2022	53,950.00 LE	0
A3260	Blacksmithing 6_th.Col	3	27/Oct/2022	30/Oct/2022	585,790.00 LE	0
A3270	Close Formworks Fourth side 6_th.Col	2	31/Oct/2022	01/Nov/2022	18,260.00 LE	0
A3280	Pouring 6_th.Col	1	02/Nov/2022	02/Nov/2022	238,160.00 LE	0
A3290	Deshuttering Formworks 6_th.Col	3	07/Nov/2022	09/Nov/2022	2,430.00 LE	0
Reinforced Concrete Slab		28	10/Nov/2022	12/Dec/2022	1,526,765.00 LE	9
A3300	Erect Formworks 6_th.Slab	9	10/Nov/2022	20/Nov/2022	97,110.00 LE	0
A3310	Blacksmithing 6_th.Slab	4	21/Nov/2022	24/Nov/2022	993,510.00 LE	0
A3320	Electrical Works 6_th.Slab	3	26/Nov/2022	28/Nov/2022	30,000.00 LE	0
A3330	Pouring 6_th.Slab	1	29/Nov/2022	29/Nov/2022	401,825.00 LE	0
A3340	Deshuttering Formworks 6_th.Slab	4	08/Dec/2022	12/Dec/2022	4,320.00 LE	9
Finishing Works 6_th		68	20/Dec/2022	08/Mar/2023	2,755,268.00 LE	9
A3350	Brick Works 6_th	18	20/Dec/2022	09/Jan/2023	275,309.00 LE	0
A3360	Install Frames of doors 6_th	2	10/Jan/2023	11/Jan/2023	305,760.00 LE	18
A3370	Erect Primary Electrical Works 6_th	7	10/Jan/2023	17/Jan/2023	70,000.00 LE	13
A3380	Primary Plumbing Works 6_th	10	11/Jan/2023	22/Jan/2023	100,000.00 LE	9

Activity ID	Activity Name	Planned Duration	Early Start	Early Finish	Budget Total Cost	Total Float
A3390	Plastering Works 6_th	7	23/Jan/2023	30/Jan/2023	351,150.00 LE	9
A3400	Insulation W.c Works 6 _th	1	10/Jan/2023	10/Jan/2023	5,100.00 LE	9
A3410	Install Ceramics Works 6_th	10	11/Feb/2023	21/Feb/2023	575,421.00 LE	9
A3420	Cladding Works 6_th	3	22/Feb/2023	25/Feb/2023	96,988.00 LE	9
A3430	Ceiling fixtures Works 6_th	7	02/Feb/2023	09/Feb/2023	135,900.00 LE	9
A3440	Painting Works 6_th	2	31/Jan/2023	01/Feb/2023	15,700.00 LE	9
A3450	Installation of metal and aluminum wor	2	26/Feb/2023	27/Feb/2023	36,130.00 LE	9
A3460	Finishing Plumbing Fixtures 6_th	7	28/Feb/2023	07/Mar/2023	200,000.00 LE	9
A3470	Finishing Electrical Fixtures 6_th	5	28/Feb/2023	05/Mar/2023	130,000.00 LE	11
A3480	finishing Carpentry works 6_th	2	28/Feb/2023	01/Mar/2023	158,760.00 LE	14
A3490	Finishing The Floor 6_th	4	28/Feb/2023	04/Mar/2023	298,870.00 LE	12
A3500	Cleaning and Closing 6_th	1	08/Mar/2023	08/Mar/2023	180.00 LE	9
Seventh Floor Works		100	04/Dec/2022	29/Mar/2023	5,180,623.00 LE	4
Concrete Works 7_th		45	04/Dec/2022	24/Jan/2023	2,425,355.00 LE	6
Reinforced Concrete Columns		17	04/Dec/2022	22/Dec/2022	898,590.00 LE	0
A3510	Erect Formworks 3 sides 7_th.Col	5	04/Dec/2022	08/Dec/2022	53,950.00 LE	0
A3520	Blacksmithing 7_th.Col	3	10/Dec/2022	12/Dec/2022	585,790.00 LE	0
A3530	Close Formworks Fourth side 7_th.Col	2	13/Dec/2022	14/Dec/2022	18,260.00 LE	0
A3540	Pouring 7_th.Col	1	15/Dec/2022	15/Dec/2022	238,160.00 LE	0
A3550	Deshuttering Formworks 7_th.Col	3	20/Dec/2022	22/Dec/2022	2,430.00 LE	0
Reinforced Concrete Slab		28	24/Dec/2022	24/Jan/2023	1,526,765.00 LE	6
A3560	Erect Formworks 7_th.Slab	9	24/Dec/2022	02/Jan/2023	97,110.00 LE	0
A3570	Blacksmithing 7_th.Slab	4	03/Jan/2023	07/Jan/2023	993,510.00 LE	0
A3580	Electrical Works 7_th.Slab	3	08/Jan/2023	10/Jan/2023	30,000.00 LE	0
A3590	Pouring 7_th.Slab	1	11/Jan/2023	11/Jan/2023	401,825.00 LE	0
A3600	Deshuttering Formworks 7_th.Slab	4	21/Jan/2023	24/Jan/2023	4,320.00 LE	6
Finishing Works 7_th		68	10/Jan/2023	29/Mar/2023	2,755,268.00 LE	4
A3610	Brick Works 7_th	18	10/Jan/2023	30/Jan/2023	275,309.00 LE	0
A3620	Install Frames of doors 7_th	2	31/Jan/2023	01/Feb/2023	305,760.00 LE	13
A3630	Erect Primary Electrical Works 7_th	7	31/Jan/2023	07/Feb/2023	70,000.00 LE	8
A3640	Primary Plumbing Works 7_th	10	01/Feb/2023	12/Feb/2023	100,000.00 LE	4
A3650	Plastering Works 7_th	7	13/Feb/2023	20/Feb/2023	351,150.00 LE	4
A3660	Insulation W.c Works 7_th	1	31/Jan/2023	31/Jan/2023	5,100.00 LE	4
A3670	Install Ceramics Works 7_th	10	04/Mar/2023	14/Mar/2023	575,421.00 LE	4
A3680	Cladding Works 7_th	3	15/Mar/2023	18/Mar/2023	96,988.00 LE	4
A3690	Ceiling fixtures Works 7_th	7	23/Feb/2023	02/Mar/2023	135,900.00 LE	4
A3700	Painting Works 7_th	2	21/Feb/2023	22/Feb/2023	15,700.00 LE	4

Activity ID	Activity Name	Planned Duration	Early Start	Early Finish	Budget Total Cost	Total Float
A3710	Installation of metal and aluminum wor	2	19/Mar/2023	20/Mar/2023	36,130.00 LE	4
A3720	Finishing Plumbing Fixtures 7_th	7	21/Mar/2023	28/Mar/2023	200,000.00 LE	4
A3730	Finishing Electrical Fixtures 7_th	5	21/Mar/2023	26/Mar/2023	130,000.00 LE	6
A3740	finishing Carpentry works 7_th	2	21/Mar/2023	22/Mar/2023	158,760.00 LE	9
A3750	Finishing The Floor 7_th	4	21/Mar/2023	25/Mar/2023	298,870.00 LE	7
A3760	Cleaning and Closing 7_th	1	29/Mar/2023	29/Mar/2023	180.00 LE	4
Eighth Floor Works		81	16/Jan/2023	19/Apr/2023	5,182,030.00 LE	5
Concrete Works 8_th		42	16/Jan/2023	05/Mar/2023	2,425,355.00 LE	6
Reinforced Concrete Columns		14	16/Jan/2023	31/Jan/2023	898,590.00 LE	0
A3770	Erect Formworks 3 sides 8_th.Col	5	16/Jan/2023	21/Jan/2023	53,950.00 LE	0
A3780	Blacksmithing 8_th.Col	3	22/Jan/2023	24/Jan/2023	585,790.00 LE	0
A3790	Close Formworks Fourth side 8_th.Col	2	25/Jan/2023	26/Jan/2023	18,260.00 LE	0
A3800	Pouring 8_th.Col	1	28/Jan/2023	28/Jan/2023	238,160.00 LE	0
A3810	Deshuttering Formworks 8_th.Col	3	29/Jan/2023	31/Jan/2023	2,430.00 LE	0
Reinforced Concrete Slab		28	01/Feb/2023	05/Mar/2023	1,526,765.00 LE	6
A3820	Erect Formworks 8_th.Slab	9	01/Feb/2023	11/Feb/2023	97,110.00 LE	0
A3830	Blacksmithing 8_th.Slab	4	12/Feb/2023	15/Feb/2023	993,510.00 LE	0
A3840	Electrical Works 8_th.Slab	3	16/Feb/2023	19/Feb/2023	30,000.00 LE	0
A3850	Pouring 8_th.Slab	1	20/Feb/2023	20/Feb/2023	401,825.00 LE	0
A3860	Deshuttering Formworks 8_th.Slab	4	01/Mar/2023	05/Mar/2023	4,320.00 LE	6
Finishing Works 8_th		68	31/Jan/2023	19/Apr/2023	2,756,675.00 LE	5
A3870	Brick Works 8_th	18	31/Jan/2023	20/Feb/2023	274,309.00 LE	0
A3880	Install Frames of doors 8_th	2	21/Feb/2023	22/Feb/2023	305,760.00 LE	14
A3890	Erect Primary Electrical Works 8_th	7	21/Feb/2023	28/Feb/2023	70,000.00 LE	9
A3900	Primary Plumbing Works 8_th	10	22/Feb/2023	05/Mar/2023	100,000.00 LE	5
A3910	Plastering Works 8_th	7	06/Mar/2023	13/Mar/2023	351,150.00 LE	5
A3920	Insulation W.c Works 8_th	1	21/Feb/2023	21/Feb/2023	5,187.00 LE	5
A3930	Install Ceramics Works 8_th	10	25/Mar/2023	04/Apr/2023	575,421.00 LE	5
A3940	Cladding Works 8_th	3	05/Apr/2023	08/Apr/2023	96,988.00 LE	5
A3950	Ceiling fixtures Works 8_th	7	16/Mar/2023	23/Mar/2023	135,900.00 LE	5
A3960	Painting Works 8_th	2	14/Mar/2023	15/Mar/2023	15,700.00 LE	5
A3970	Installation of metal and aluminum wor	2	09/Apr/2023	10/Apr/2023	36,130.00 LE	5
A3980	Finishing Plumbing Fixtures 8_th	7	11/Apr/2023	18/Apr/2023	200,000.00 LE	5
A3990	Finishing Electrical Fixtures 8_th	5	11/Apr/2023	16/Apr/2023	130,000.00 LE	7
A4000	finishing Carpentry works 8_th	2	11/Apr/2023	12/Apr/2023	161,080.00 LE	10
A4010	Finishing The Floor 8_th	4	11/Apr/2023	15/Apr/2023	298,870.00 LE	8
A4020	Cleaning and Closing 8_th	1	19/Apr/2023	19/Apr/2023	180.00 LE	5

Activity ID	Activity Name	Planned Duration	Early Start	Early Finish	Budget Total Cost	Total Float
Ninth Floor Works		68	21/Feb/2023	10/May/2023	5,180,623.00 LE	1
Concrete Works 9_th		42	25/Feb/2023	13/Apr/2023	2,425,355.00 LE	0
Reinforced Concrete Columns		14	25/Feb/2023	12/Mar/2023	898,590.00 LE	0
A4030	Erect Formworks 3 sides 9_th.Col	5	25/Feb/2023	01/Mar/2023	53,950.00 LE	0
A4040	Blacksmithing 9_th.Col	3	02/Mar/2023	05/Mar/2023	585,790.00 LE	0
A4050	Close Formworks Fourth side 9_th.Col	2	06/Mar/2023	07/Mar/2023	18,260.00 LE	0
A4060	Pouring 9_th.Col	1	08/Mar/2023	08/Mar/2023	238,160.00 LE	0
A4070	Deshuttering Formworks 9_th.Col	3	09/Mar/2023	12/Mar/2023	2,430.00 LE	0
Reinforced Concrete Slab		28	13/Mar/2023	13/Apr/2023	1,526,765.00 LE	0
A4080	Erect Formworks 9_th.Slab	9	13/Mar/2023	22/Mar/2023	97,110.00 LE	0
A4090	Blacksmithing 9_th.Slab	4	23/Mar/2023	27/Mar/2023	993,510.00 LE	0
A4100	Electrical Works 9_th.Slab	3	28/Mar/2023	30/Mar/2023	30,000.00 LE	0
A4110	Pouring 9_th.Slab	1	01/Apr/2023	01/Apr/2023	401,825.00 LE	0
A4120	Deshuttering Formworks 9_th.Slab	4	10/Apr/2023	13/Apr/2023	4,320.00 LE	0
Finishing Works 9_th		68	21/Feb/2023	10/May/2023	2,755,268.00 LE	1
A4130	Brick Works 9_th	18	21/Feb/2023	13/Mar/2023	275,309.00 LE	0
A4140	Install Frames of doors 9_th	2	14/Mar/2023	15/Mar/2023	305,760.00 LE	9
A4150	Erect Primary Electrical Works 9_th	7	14/Mar/2023	21/Mar/2023	70,000.00 LE	4
A4160	Primary Plumbing Works 9_th	10	15/Mar/2023	26/Mar/2023	100,000.00 LE	0
A4170	Plastering Works 9_th	7	27/Mar/2023	03/Apr/2023	351,150.00 LE	0
A4180	Insulation W.c Works 9_th	1	14/Mar/2023	14/Mar/2023	5,100.00 LE	0
A4190	Install Ceramics Works 9_th	10	15/Apr/2023	25/Apr/2023	575,421.00 LE	0
A4200	Cladding Works 9_th	3	26/Apr/2023	29/Apr/2023	96,988.00 LE	1
A4210	Ceiling fixtures Works 9_th	7	06/Apr/2023	13/Apr/2023	135,900.00 LE	0
A4220	Painting Works 9_th	2	04/Apr/2023	05/Apr/2023	15,700.00 LE	0
A4230	Installation of metal and aluminum wor	2	30/Apr/2023	01/May/2023	36,130.00 LE	1
A4240	Finishing Plumbing Fixtures 9_th	7	02/May/2023	09/May/2023	200,000.00 LE	1
A4250	Finishing Electrical Fixtures 9_th	5	02/May/2023	07/May/2023	130,000.00 LE	3
A4260	finishing Carpentry works 9_th	2	02/May/2023	03/May/2023	158,760.00 LE	6
A4270	Finishing The Floor 9_th	4	02/May/2023	06/May/2023	298,870.00 LE	4
A4280	Cleaning and Closing 9_th	1	10/May/2023	10/May/2023	180.00 LE	1
Roof Floor Works		46	14/Mar/2023	06/May/2023	916,642.00 LE	0
A4290	Brick Works For Roof	9	14/Mar/2023	23/Mar/2023	360,027.00 LE	22
A4300	Plastering Works For Roof	6	04/Apr/2023	10/Apr/2023	180,491.00 LE	13
A4310	Insulation Works For Roof	5	25/Mar/2023	29/Mar/2023	149,400.00 LE	23
A4320	Instal Ceramic Works For Roof	9	26/Apr/2023	06/May/2023	226,724.00 LE	0
Stairs and Facing Works		38	04/Apr/2023	17/May/2023	2,223,026.00 LE	0

Activity ID	Activity Name	Planned Duration	Early Start	Early Finish	Budget Total Cost	Total Float
A4330	Flooring Works For Stairs	7	07/May/2023	14/May/2023	753,346.00 LE	0
A4340	Finishing Stairs	3	15/May/2023	17/May/2023	483,330.00 LE	0
A4350	Exterior Plastering	16	04/Apr/2023	22/Apr/2023	669,770.00 LE	22
A4360	External Painting	10	06/Apr/2023	17/Apr/2023	316,580.00 LE	26
Final Finishing Works		2	11/May/2023	13/May/2023	557,660.00 LE	4
A4370	Finishing Works	2	11/May/2023	13/May/2023	557,660.00 LE	4
Site Coordination Works		5	11/May/2023	16/May/2023	30,000.00 LE	1
A4380	Coordination Works	5	11/May/2023	16/May/2023	30,000.00 LE	1

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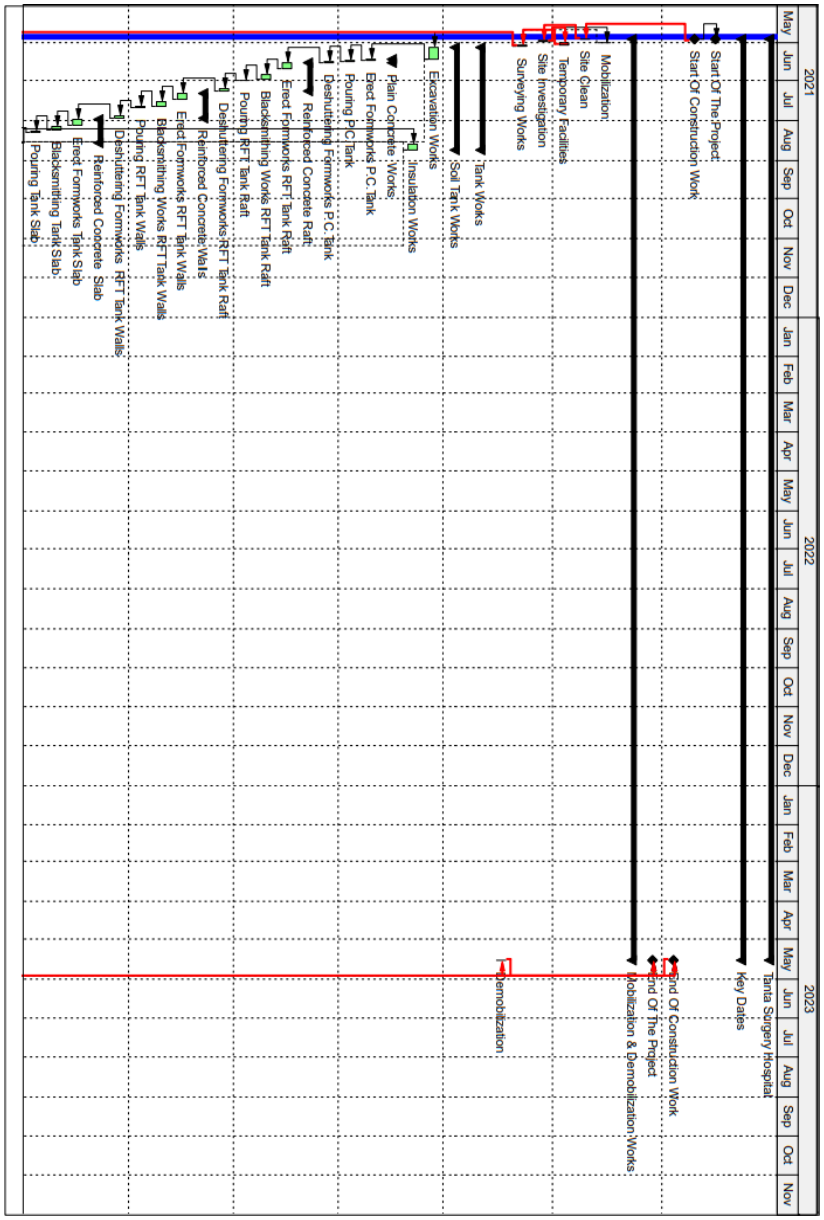

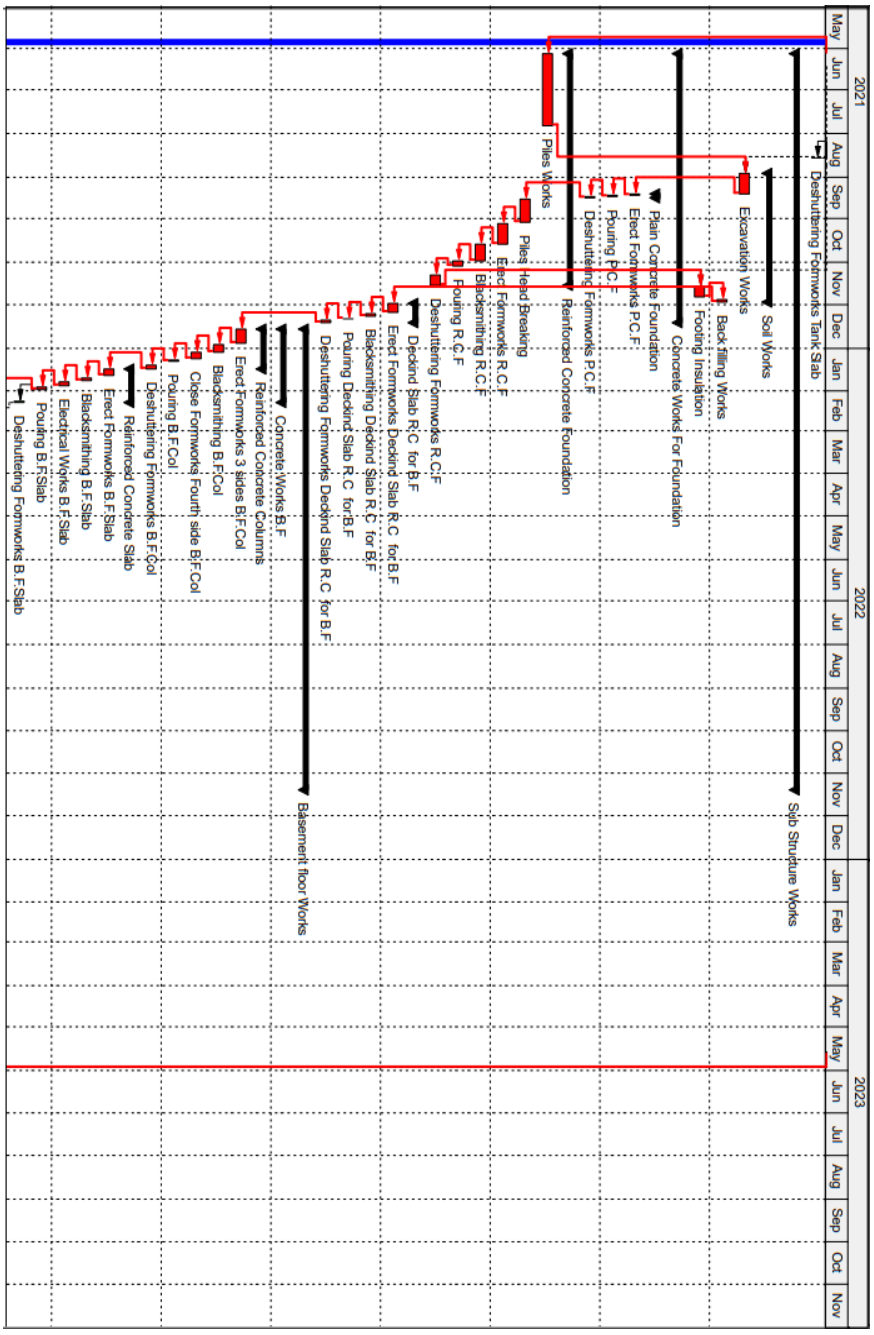
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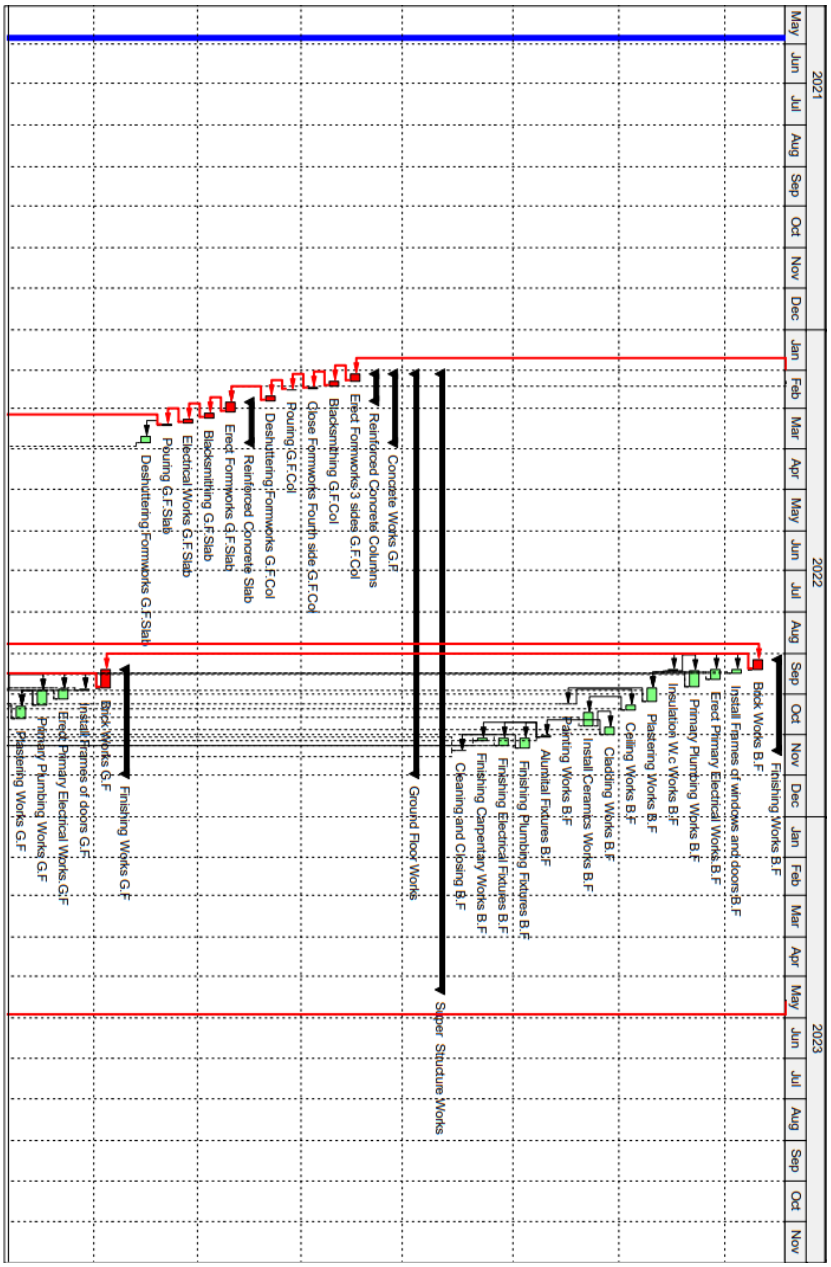
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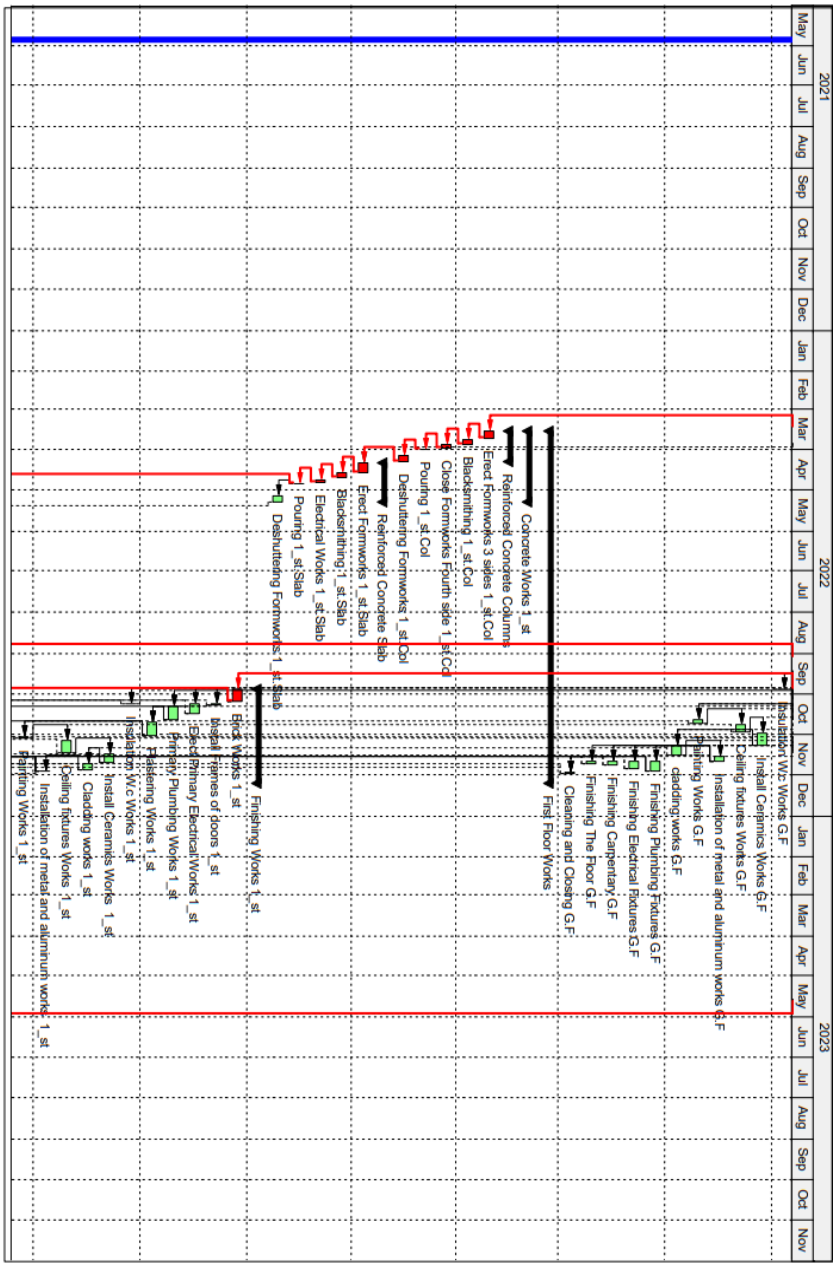
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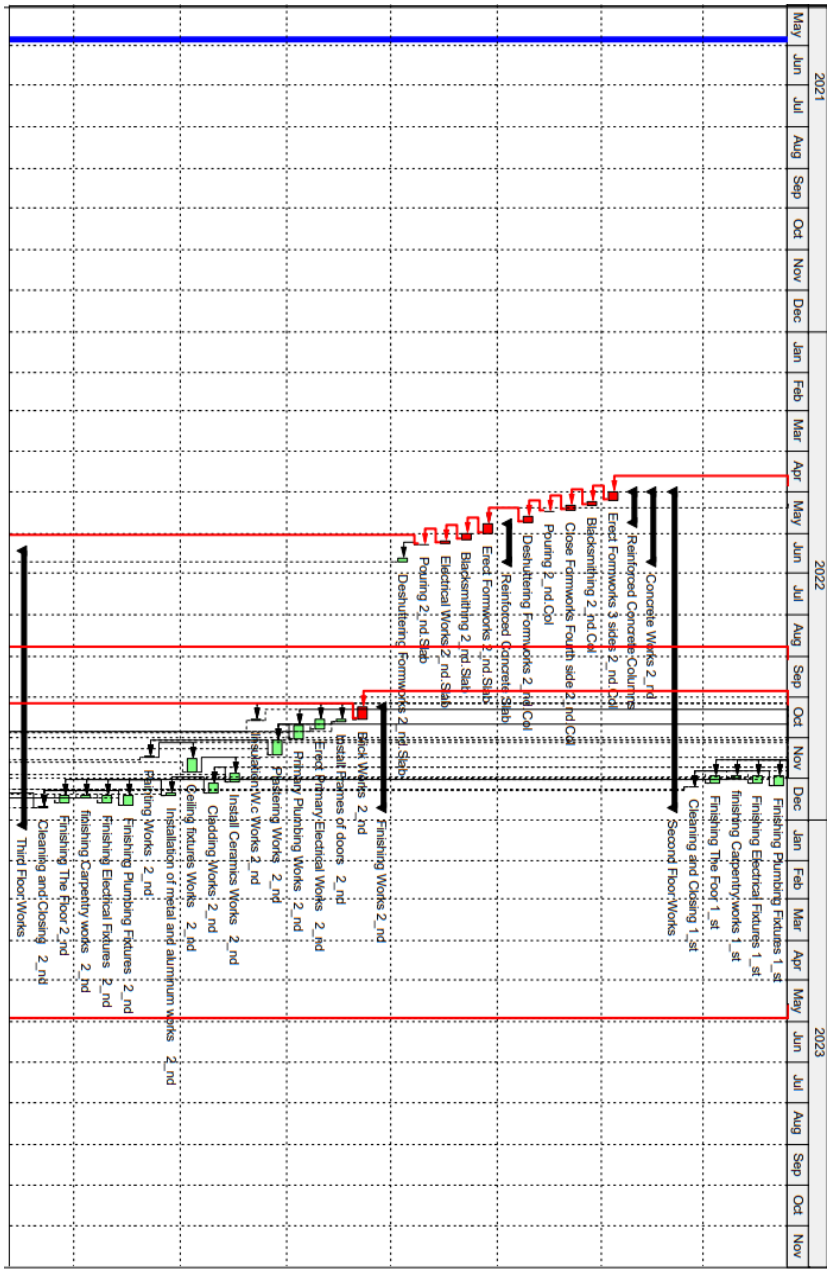
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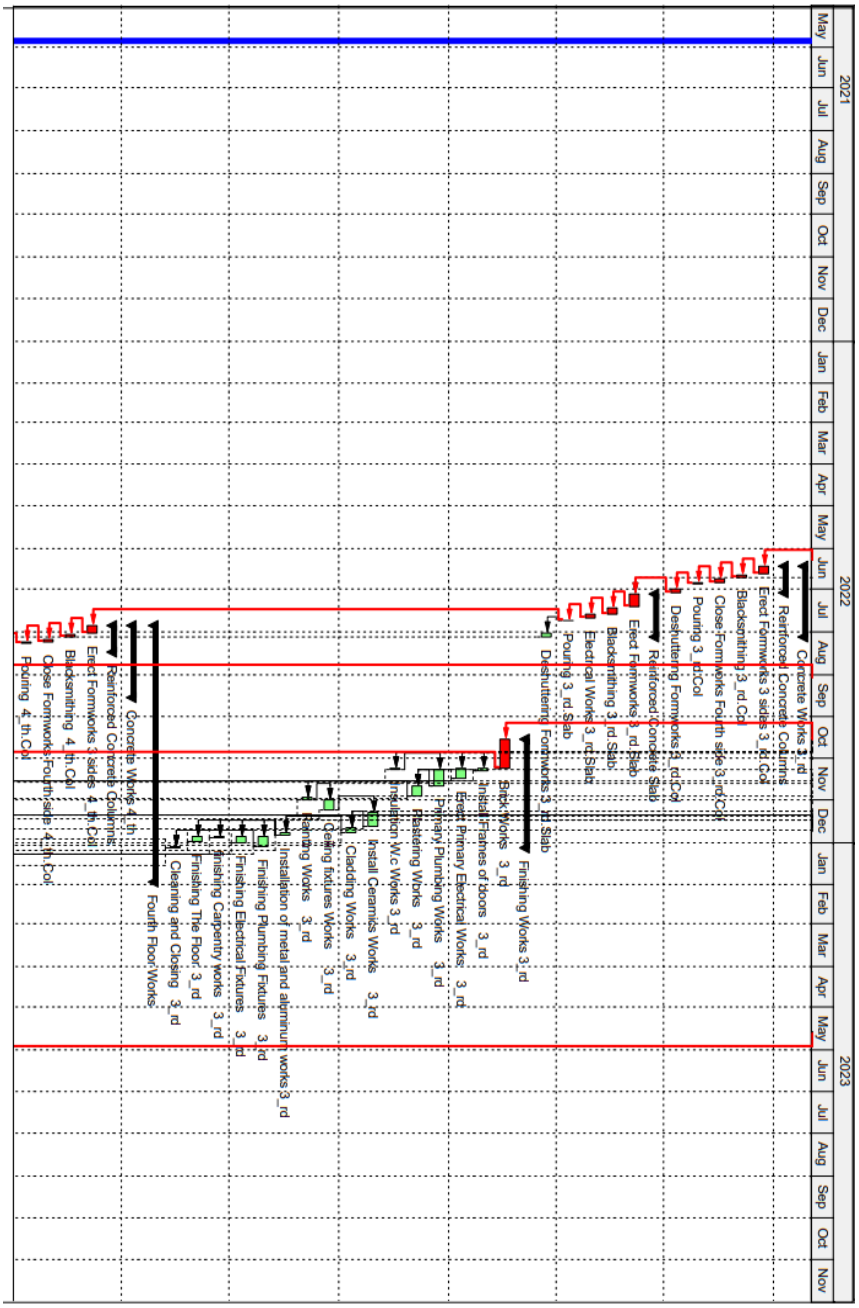
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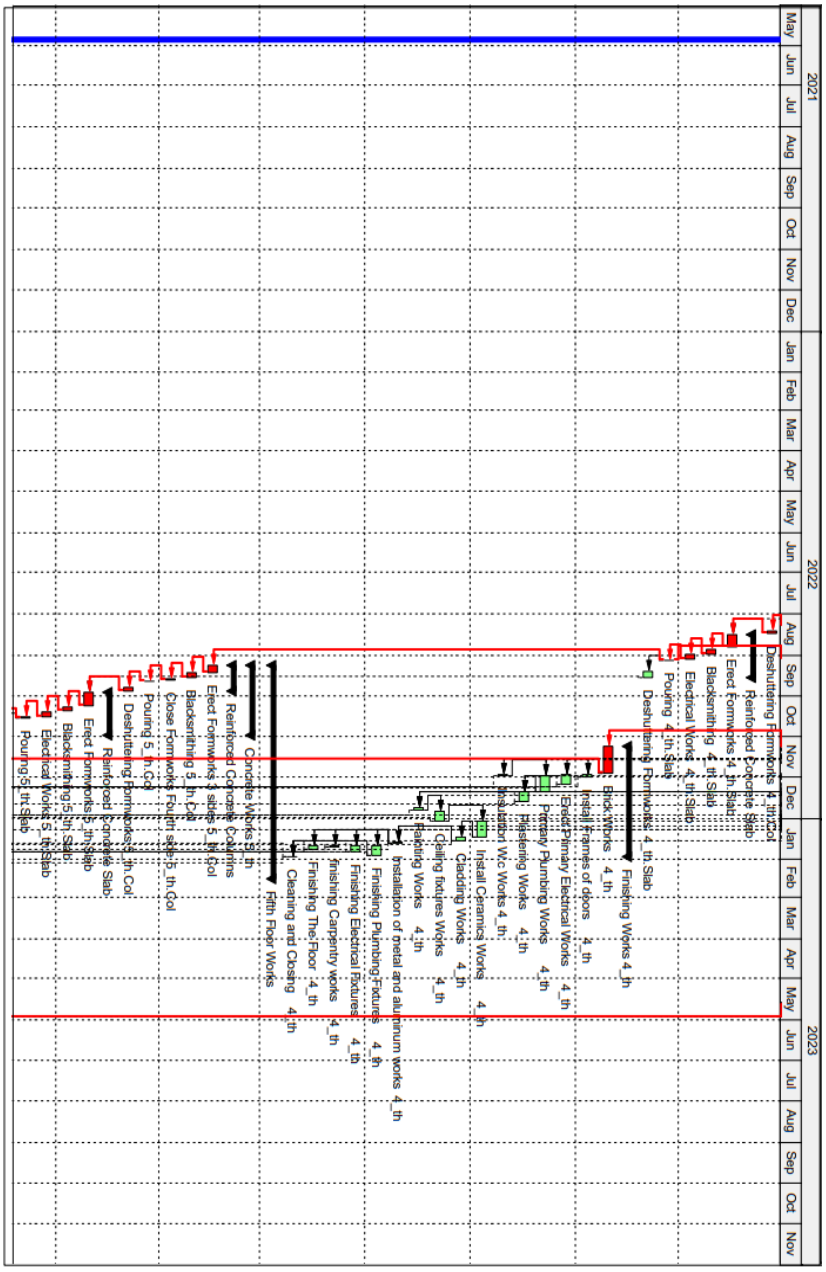
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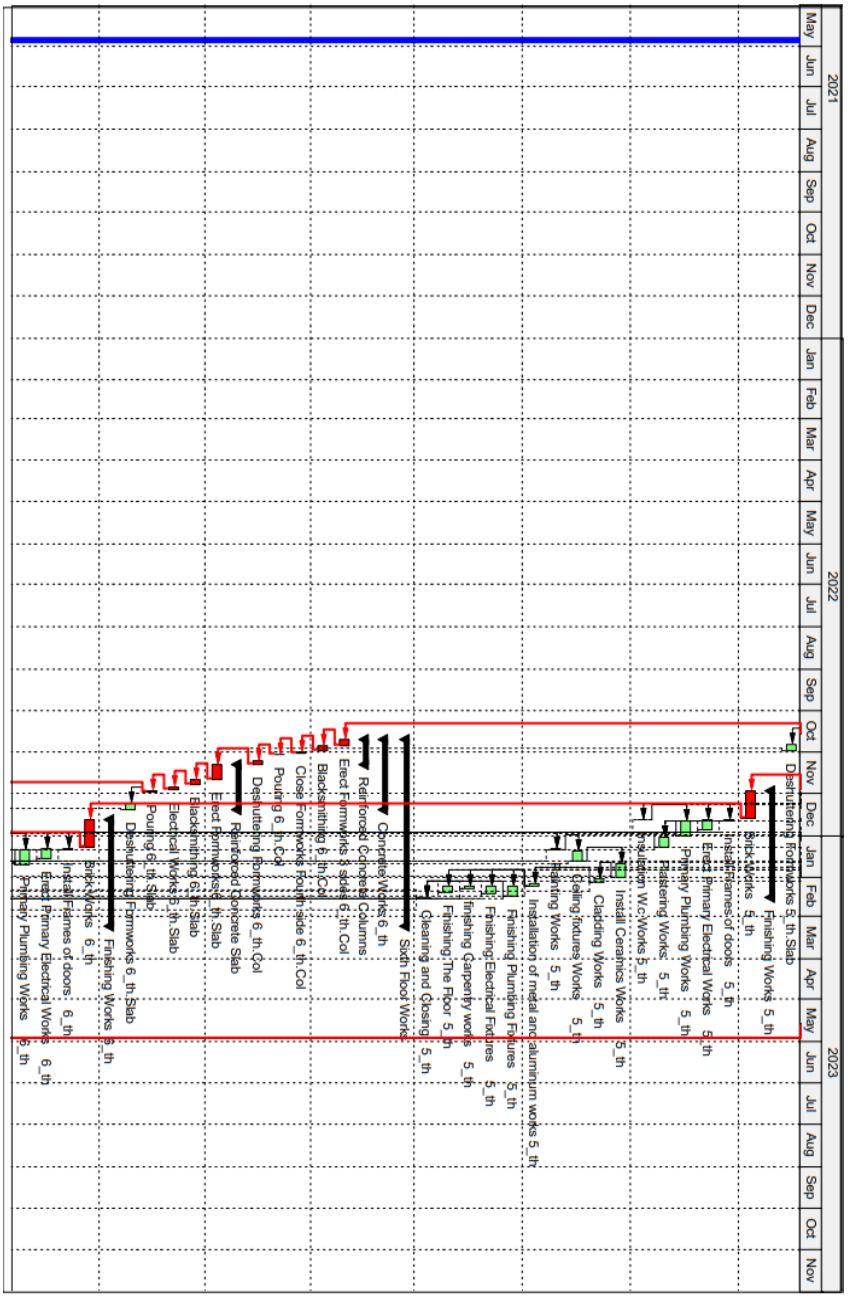
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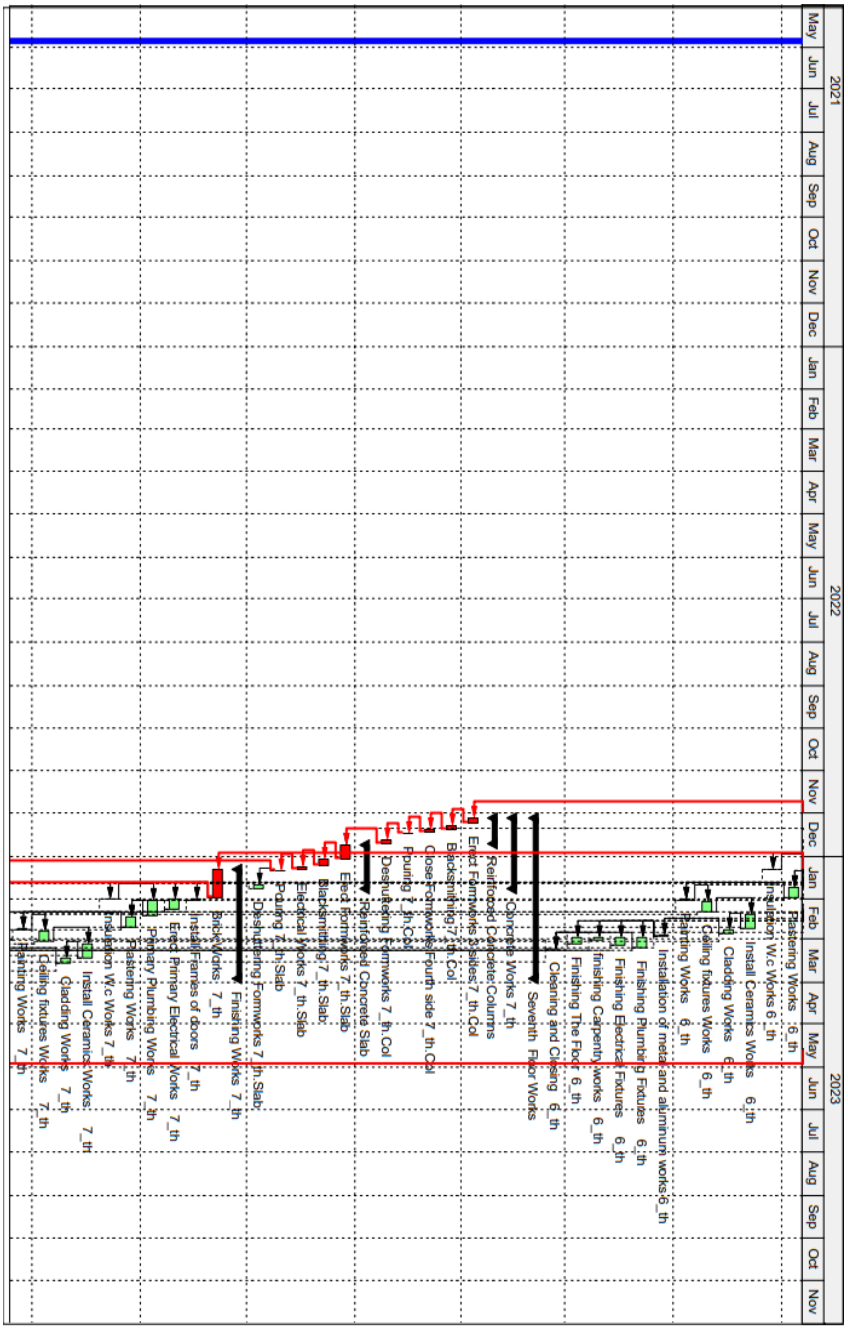
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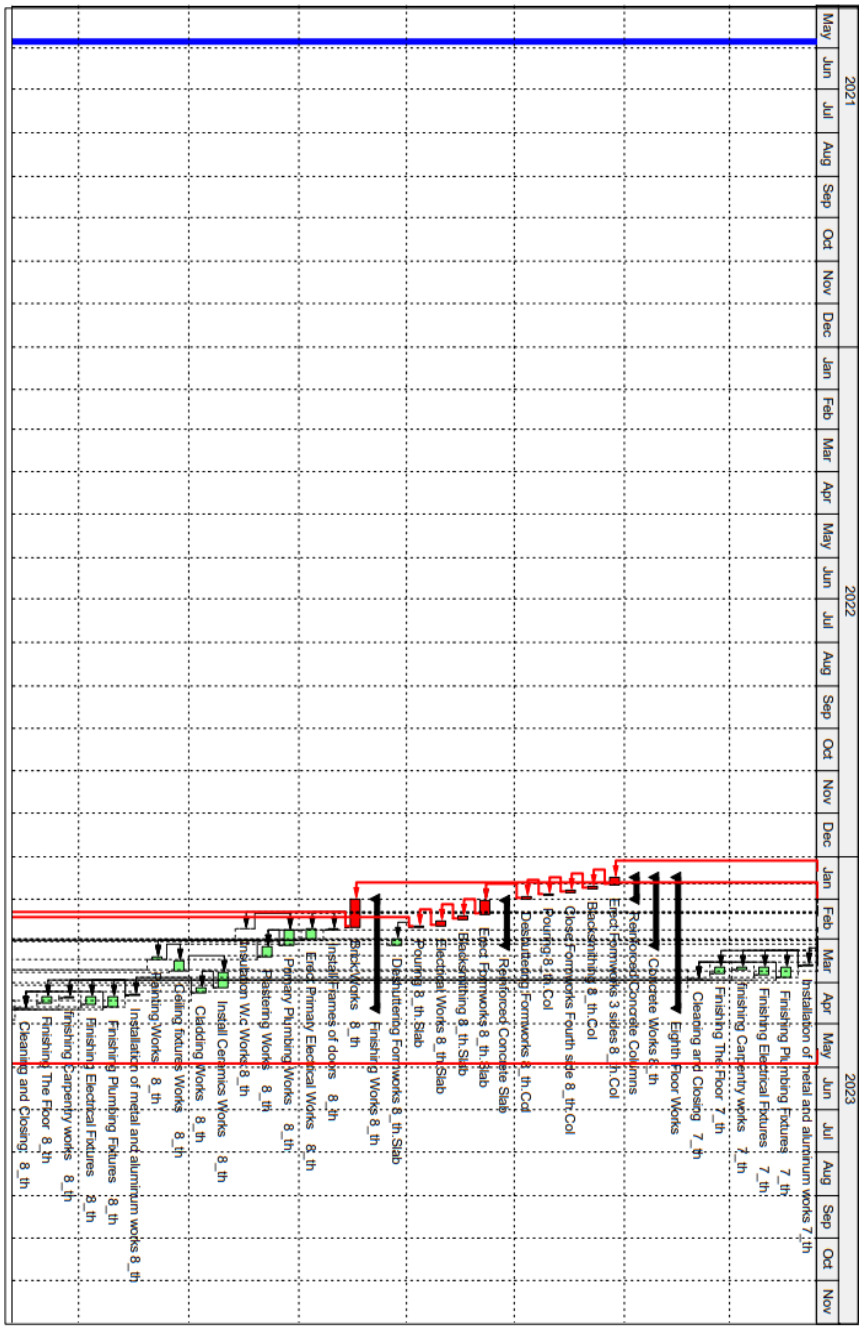
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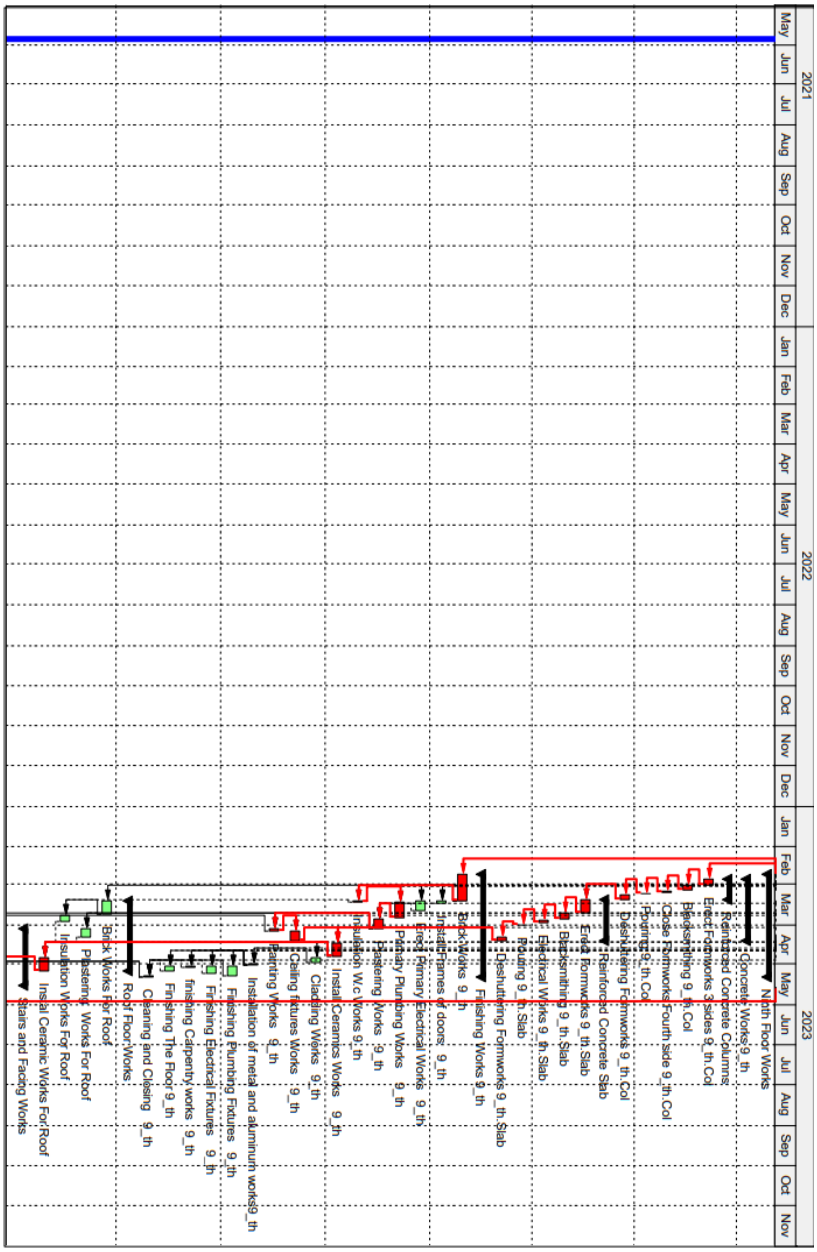
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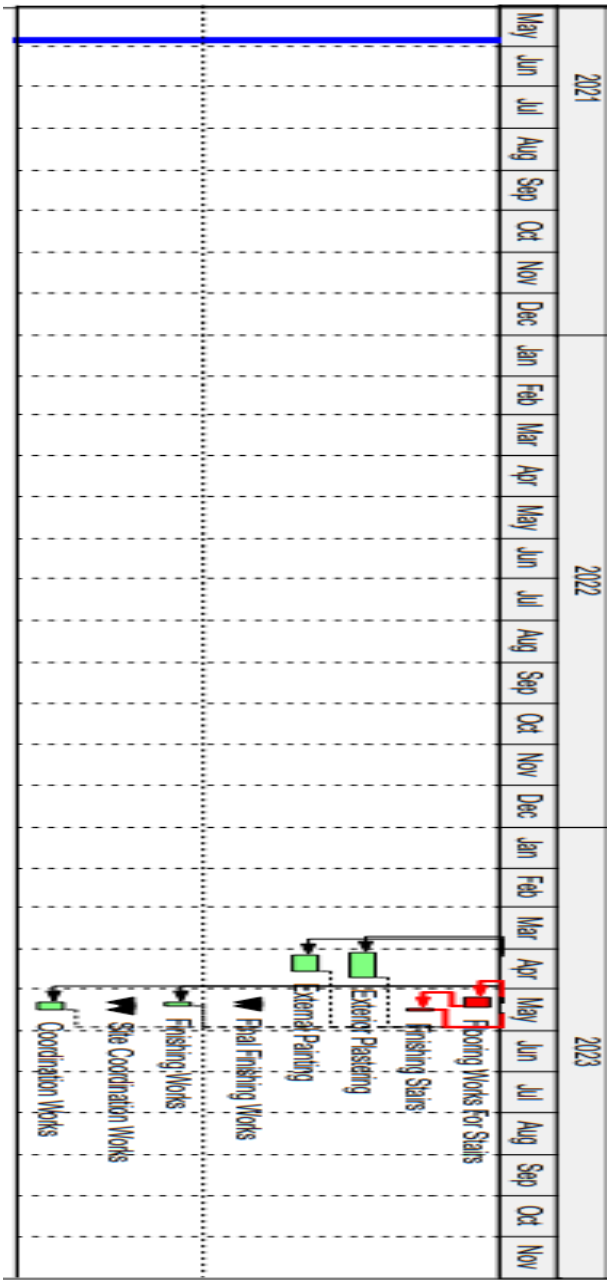
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Exterior Plastering
External Painting
Final Finishing Works
Finishing Works
Site Coordination Works
Coordination Works

Chapter 12

resource

Most contractors use both owned and leased construction equipment, as confirmed by a recent study .

The allocation of resources of different types to a construction project is a difficult managerial problem, particularly when construction equipment has to be shared among a number of project sites .

Timing adequately the use of different pieces of equipment on a given project is an important cost control issue, since an inadequate allocation and scheduling of resources can lead to equipment idleness and consequently higher costs of leased equipment, due to the inefficient use of both leased and owned equipment.

The purpose of this paper is to plan and schedule construction activities according to an optimal resource allocation scheme. This scheme is derived by using a model that minimizes the cost of leased resources (equipment, and possibly labor) over the project life, given a certain level of resources available, such as owned equipment.

The model can be used by both private contractors and departments of public works, in that :

1. All resource types can be envisioned.
2. The objective function and the constraints are relevant for the organization of any construction project.

What is Construction Resource Management, and why is it important ?

Construction resource management is a comprehensive process that entails proactive planning, scheduling, and managing of enterprise-wide resources for the construction industry .

It helps to accomplish every task with precision and meet the project objectives within time. It allows managers to deliver projects successfully by fulfilling project resource demands on time. Effective resource management also maximizes productive utilization.

With this approach, the construction firms can also avoid mistakes such as hiring too many workers, project delays due to late delivery of supplies, etc.

Let’s delve deep and find out which are the essential resources needed for construction projects.

Techniques:

One resource management technique is resource leveling and aims to facilitate the inventory of available resources, and reduce redundancy Both stocks and shortfalls.

The data required are: requests for different resources, which are predicted for a period of time in the future as much as reasonable, as well as the resource formations required in those requests, and the presentation of resources, which are predicted again for a period of time in the future as much as reasonable.

The goal is to achieve 100% utilization but this is very unlikely, when weighted by important measures subject to restrictions, for example: meeting the minimum level of service, but otherwise reducing the cost.

The principle here is to invest in resources as stored capabilities, and then to unleash capacity on demand. Resource development is yet to be included in resource management through which investment in resources can be retained through a smaller additional investment to develop a new capacity required, in an investment less than disposing of existing resources and replacing them with another with the required capacity.

Resource management is a set of practices related to maintaining the integrity of natural systems.

Examples of this form of management include air resource management, soil conservation, forestry, wildlife management and water resource management. The broad term for this type of resource management is natural resource management (NRM)

Resource leveling

What is resource leveling?

Resource leveling, by definition, is a resource optimization technique that answers when the project can be finished with the available resources without overbooking them or spreading them too thin. Resource leveling will generally aim to distribute work between resources fairly, which not only contributes to a healthy work environment, but also makes the project schedule realistic and achievable.

Putting your current bandwidth front and center, resource leveling can either compress the schedule or loosen it. By making only a few tweaks to your resource allocation plan, the end date of the project will change, but that's okay. What resource leveling is mainly for is to get the idea when the project can be accomplished without necessarily adding capacity to the resource pool.

Resource leveling examples :

An obvious example of resource leveling would be moving start and end dates of tasks to balance the workloads and avoid over- or under-allocation of resources. Here's what is meant exactly by those terms. While over-allocated resources have more work than they can complete within their normal 8-hour schedule, under-allocated resources have spare time to dedicate to the project and tasks. Resource leveling will straighten out over-allocation by relocating task start and end dates

Resource leveling vs. resource smoothing :

Even though they're sometimes used interchangeably, resource leveling and resource smoothing aren't the same things. Let's see what PMBOK® , the Bible of project management, has to say in regards to the distinction:

" Resource leveling is a technique in which start and finish dates are adjusted based on resource limitation with the goal of balancing the demand for resources with the available supply".

"Resource smoothing is a technique that adjusts the activities of a schedule model such that the requirements for resources on the project do not exceed certain predefined resource limits".

The objective of resource smoothing, therefore, is uniform resource utilization, as it aims to complete the work by the specified date while avoiding ebbs and flows of resource demand. Most of the time, resource smoothing is used after resource leveling. It makes sure that people don't land with a lion's share of work after change requests and other project 'peaks and troughs' come in from the stakeholders.

It won't hurt to repeat that resource leveling is mainly used when your main constraint is resources. In contrast, resource smoothing is more appropriate when the time constraint takes the priority, and as the project end date cannot be changed, it's

more about optimization. Sometimes they are even called resource-constrained scheduling (RCS) and time-constrained scheduling (TCS) respectively.

Resource allocation:

Resource allocation answers the question of who (and when) can be allocated to the project during the planning phase.

Therefore, it defines project resource requirements and commits people with certain roles to the project .

This is done considering a myriad of factors, such as resource availability, skills, rate cards, etc.

Rental equipment utilization:

In equipment and tool rental companies, use is the basic way in which asset performance is measured and business success determined.

Basically, it is a measure of the actual revenues that assets have generated against potential revenues that they could have earned.

Rental use is divided into a number of different accounts, and not all companies work exactly the same way. In general, there are two main calculations: the physical use of the asset, which is measured based on the number of days available for rental against the number of days already rented (This can also be measured by hours for certain types of equipment), and the financial use of the asset (referred to in North America as u.S. dollar use) which is measured as rental income realized over a period of time against potential income that could have been achieved on he basis of an un

discounted target or standard rate

Physical use is also sometimes referred to as immediate use, as the leasing company considers its current use of assets based on a single moment of time.

Variations in rental utilization calculations:

Usage calculations may vary based on many different factors .

For example:

A company with equipment requiring preventive maintenance activities every two weeks may decide that the number of days available per month is decreasing because it will not be available due to maintenance for two days of each month.

Some rental companies give "free days" on lease bills, for example on a national

or public holiday, and therefore This equipment makes no money on those days, even if it is financially leased.

Some companies charge minimum prices, for example they may rent an excavator for one day, but a minimum three-day fee is charged. So the physical use will be 100% a day, but financial use is actually 300% where you got 3 days of revenue for a day of work.

Leased programs are usually required to help management teams measure and calculate usage numbers.

Asset tracking software may also be important in increasing or management.

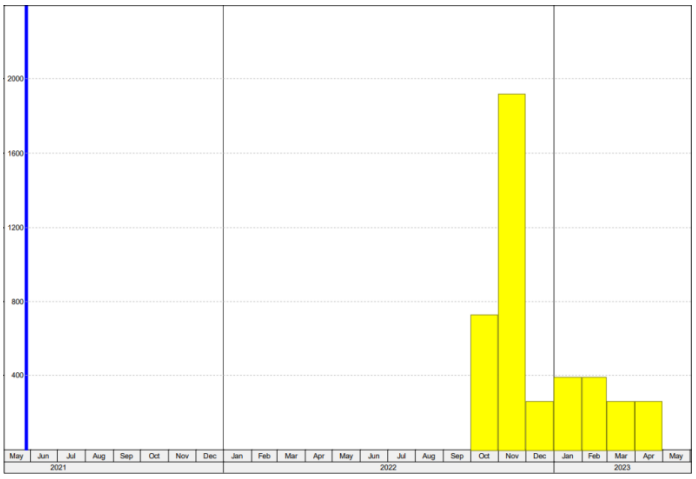
Resource costing of project

material cost		
material	price	unit
steel	11650	LE/TON
ready mix CONCRETE	725	LE/M3
SAND	60	LE/M3
CEMENT	850	LE/TON
WHITE CEMENT	1730	LE/TON
BRICKS	1000	LE/1000
Petumen	7.6	LE/kg
water	33	LE/M3
Membren	300	LE/ROLL
Ecophone tiles	120	LE/M2
Aquastatic tiles	130	LE/M2
METAL TILES	150	LE/M2
Lavage gypsum panel	150	LE/M2
Armstrong tiles	160	LE/M2
Marbel 2cm	135	LE/M2
Marbel 3cm	150	LE/M2
Marbel	140	LE/M2
Ceramics Tiles	50	LE/M2
Porcelain Tiles& Laser	270	LE/M2
Ceramic High Res. Tiles	70	LE/M2
Moziko	70	LE/M2
putty	5	LE/CANE
acrylic paint	53	LE/M2
Lead Sheets	50	LE/M2
epoxy Paste	5	LE/M2
epoxy	40	LE/M2
Plastic paint	17	LE/M2
HYGIENE paint	60	LE/M2
venile rolls	100	LE/ROLL
KOREAN	1200	LE/M2
Jaraniat Tiles	360	LE/M2
glue	80	LE/CANE
primer paint	22	LE/M2
GEOTEX	210	LE/CANE
SILICON	75	LE/CANE
mosky wood	3300	EACH
alumital	550	LE/M2
Wood	5800	M
Curtains	220	M
steel forforgaa	275	M2
Curtains	440	M2
MDF	375	
Shesh hasera	750	
stanless steel	800	M
M.T	100	M2
M.T	80	M
Head chair	516	EACH
class chair	150	EACH
glass mirror	80	m2
OUTER PAINT	77	LE/M2

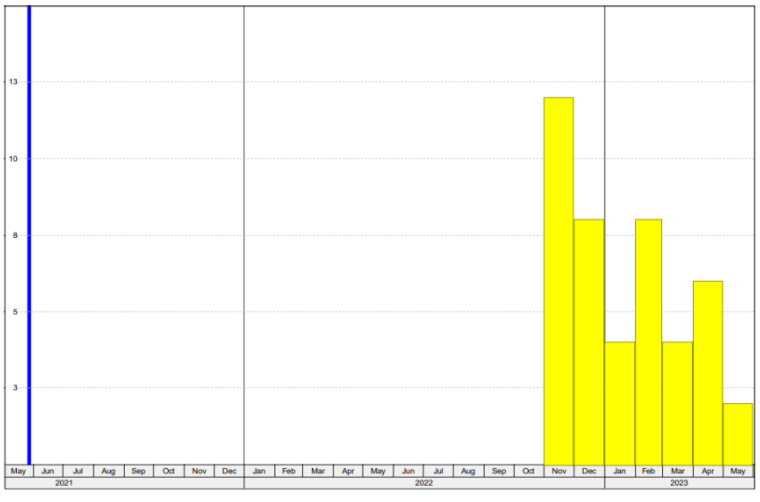
equipments cost		
machine	price	unit
excavator	1500	once/day
loader	800	once/day
vibrator	110	once/day
scraper	600	once/day
Dump Trucks	1000	once/day

labbors cost						
task	crew	main labbor	fixer	assistant	unskilled	total cost
concrete works						
mobilization + site clean+demobilization	1supervisor+2unskilled	150	0	0	180	330
Temporary Facilities	2carpenter+3asistant	300	0	300	0	600
surveing crew	surveyor+helper	170	0	100	0	270
insulation crew	2insulation workrs	300	0	0	0	300
excavation crew	2unskilled	0	0	0	180	180
Blacksmithing crew	1commando+2fixer+2assistant +2unskilled	150	300	200	180	830
Deshuttering Formworks crew	3 unskilled	0	0	0	270	270
Pouring crew	worker+assistant+forman	120	0	120	100	340
Erect Formworks crew	3carpenter+2asistant+2unskilled	450	0	200	180	830
back filling crew	2 unskilled	0	0	0	180	180
Piles Head Breaking crew	2 sculptor	240	0	0	0	240
finishing works						
task	crew	worker	assistant	unskilled		total cost
Tiles crew	1tiles worker+2asistant	150	200	0		350
Painting Works crew	1Paint worker+1asistant	150	100	0		250
Tehch crew	technical+2assistant	170	200	0		370
Brick Works crew	1builder+2assistant	170	200	0		370
carpentry works crew	2carpenter+2asistant	340	200	0		540
cleaning crew	2unskilled	0	0	180		180
Plastering crew	2worker+4asistant	300	400	0		700

Resource profile of project



acrylic paint



Alumital fixures

The time of use of raw materials was determined in the same way and placed in the appendix

CHAPTER 13

CASH FLOW

Project Cash Flow

It is the project manager's responsibility to ensure that the construction company is paid for all completed work on the project.

The project manager assures that the prime contractor will be paid on time by following all of the pay provisions of the contract, by submitting pay applications on time, and by monitoring prompt payment by the owner or prime contractor.

The project manager forecasts the cash flow requirements of the projects by projecting both anticipated progress payments and expenditures for labor, material, equipment, subcontracts, and general condition costs.

Cash in - Cash receipt - income

Engineering project contracts typically provide that the owner shall make progress payments of the contract amount to the prime contractor as the work progresses.

Components of cash in

- Value of work actually performed in the field.
  The total value of work done to date is obtained in different ways, depending on the type of contract
- Material stored on the site, but not yet incorporated into work, as well as any prefabrication or pre assembly work that the contractor may have done at some location other than the job site.

Contract Provision that Impact Cash in

- Advanced payment
- Progress payment
- Materials stored on the site
- Final Payment
- Retention

✓ **Retention**

A prescribed percentage of each progress payment is usually retained by the owner in accordance with the terms of the contract.

The retention may be held by the owner until the work receives final certification the owner accepts the project.

Final payment is then made to the contractor, including the accumulated retainage

✓ **Final Payment**

After the work has been finalized and all deficiencies remedied, the owner makes formal written acceptance of the project and the contractor presents his application for final payment.

Under a lump-sum form of contract, the final payment is the final contract price less the total of all previous payment installments made.

With a unit-price contract, the final total quantities of all payment items are measured and the exact final contract price is determined. Final payment is again equal to the contract price less the sum of all progress payments previously made.

In all cases, final payment by the owner includes all retainage that has been held by him.

Cash out = payment of costs = expense

Engineering projects can make substantial demands on a contractor's cash.

Principal components of cash out

- "Up-front" costs = initial expenses = start-up costs are costs necessary to start the project such as costs of moving in workers and equipment; erecting field offices, storage sheds, fences; job layout; installation of temporary electrical, water, telephone, sanitary, and other services; bonds; permits and project insurance.
- Payment of direct job costs. These include costs associated with payrolls, materials, equipment, and subcontractor payments.
- Payments for filed overhead expense and tax.

Net Cash Flow

The net cash flow is the difference between cash out and income at any point in time.

A negative net flow means expense is exceeding income, a normal situation on even a highly profitable project during the greater part of its duration.

A determination of the future rates of cash outs and cash income together with their combined effect on the project cash balance is called a "cash flow forecast".

Need to Forecast Contract Cash Flow

To determine the negative cash flow and how to cover It.

To determine the positive cash flow and how to use it (the positive cash flow of one contract may be used to handle the negative cash flow of another).

Contract Revenue / Income Curve

- Produce an activity schedule in bar chart or time-scaled form. If adjustments have been made to effect allocation or leveling of resources, the schedule should reflect these adjustments.
- Determine the value/price of each activity per week.
- Sum up the activities weekly and then the monthly revenue in case of the admeasurement contract, or sum up the activities weekly and then the periodic revenue in case of lump sum contract.
- Adjust the revenue for advanced payment and retention.
- Draw cumulative adjusted revenue versus time curve.
- Shift the above curve by the lag between submitting payment requests and receiving revenue to get the income curve.

Contract Cost / Expense Curve

When the mark-up is uniformly spread throughout the contract, the cost/expense curve can be derived as follows:

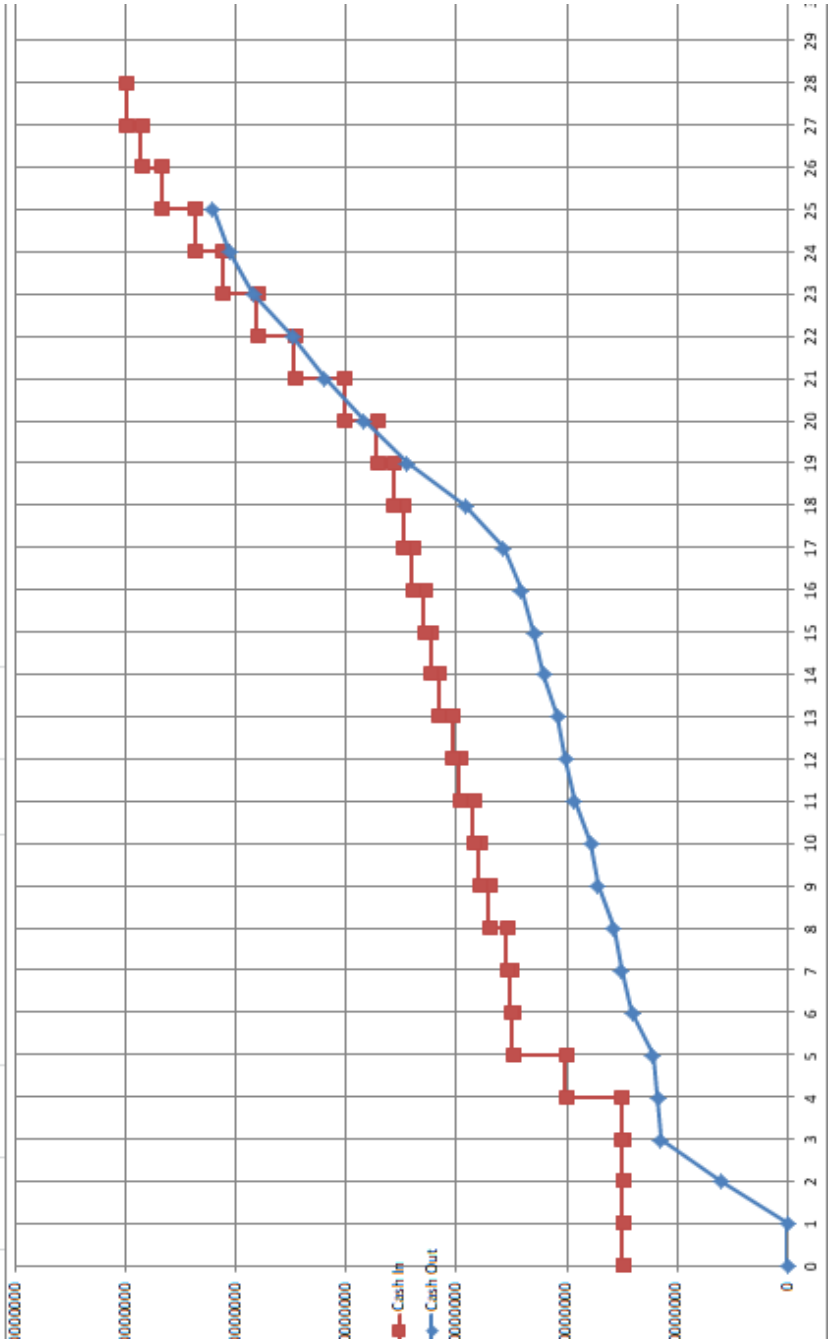
- If the mark-up; M, is expressed as a percentage of tender price, then: Cumulative cost = cumulative revenue * (1- M)
- Draw cumulative cost versus time curve.
- Group cost headings that have the same payment delay between incurring the cost and making the payment.
- Calculate the proportion of costs due to each group.
- Shift the cumulative cost of each group by the specified amount to get its cumulative expense.
- Sum up contract cumulative expenses.
- Draw cumulative expense curve.

Factors That Minimize Contractor's Negative Cash Flow

- Front end rate loading: earlier items in bill of
- quantities carry a higher markup than later items. This reduces negative cash flows in contract early stages.
- Reduction of delays in receiving revenue.
- Adjustment of work schedule to late start timing.
- Coinciding the timing of delivery of large materials orders with the submittal of the contractor's monthly pay estimate.
- Delay in paying labor, plant hirers, materials suppliers, and subcontractors.
  This would reduce negative cash flows but undermine commercial confidence in the company.
- Increasing the mark-up and reducing the retentions.
- Increasing advance payment.

Months	Direct Cost	In Direct Cost	Cash Out	CUM Cash Out	Revenue	Adjusted Rev.	Cash In	CUM Cash IN
0	0	0	0	0	0	0	29980590.8	29980590.8
1	60,330.00	7239.6	67,569.60	67,569.60	77705.04	58278.78	0	29980590.8
2	10,529,141.67	1263497	11,792,638.67	11,860,208.27	13561534.47	10171150.85	0	29980590.8
3	10,002,318.33	1200278.2	11,202,596.53	23,062,804.80	12882986.01	9662239.507	58278.78	30038869.58
4	405,543.86	48665.2632	454,209.12	23,517,013.92	522340.4917	391755.3688	10171150.85	40210020.43
5	825,340.00	99040.8	924,380.80	24,441,394.72	1063037.92	797278.44	9662239.507	49872259.94
6	3,328,573.75	399428.85	3,728,002.60	28,169,397.32	4287202.99	3215402.243	391755.3688	50264015.31
7	1,728,991.25	207478.95	1,936,470.20	30,105,867.52	2226940.73	1670205.548	797278.44	51061293.75
8	1,225,015.00	147001.8	1,372,016.80	31,477,884.32	1577819.32	1183364.49	3215402.243	54276695.99
9	2,561,050.00	307326	2,868,376.00	34,346,260.32	3298632.4	2473974.3	1670205.548	55946901.54
10	1,173,505.00	140820.6	1,314,325.60	35,660,585.92	1511474.44	1133605.83	1183364.49	57130266.03
11	2,626,915.00	315229.8	2,942,144.80	38,602,730.72	3383466.52	2537599.89	2473974.3	59604240.33
12	1,469,910.00	176389.2	1,646,299.20	40,249,029.92	1893244.08	1419933.06	1133605.83	60737846.16
13	1,321,215.00	158545.8	1,479,760.80	41,728,790.72	1701724.92	1276293.69	2537599.89	63275446.05
14	2,275,440.00	273052.8	2,548,492.80	44,277,283.52	2930766.72	2198075.04	1419933.06	64695379.11
15	1,567,225.00	188067	1,755,292.00	46,032,575.52	2018585.8	1513939.35	1276293.69	65971672.8

16	1,960,810.00	235297.2	2,196,107.20	48,228,682.72	2525523.28	1894142.46	2198075.04	68169747.84
17	2,963,460.93	355615.3116	3,319,076.24	51,547,758.96	3816937.678	2862703.258	1513939.35	69683687.19
18	6,204,137.94	744496.5528	6,948,634.49	58,496,393.46	7990929.667	5993197.25	1894142.46	71577829.65
19	9,428,202.20	1131384.264	10,559,586.46	69,055,979.92	12143524.43	9107643.325	2862703.258	74440532.91
20	6,894,996.51	827399.5812	7,722,396.09	76,778,376.01	8880755.505	6660566.629	5993197.25	80433730.16
21	6,505,815.80	780697.896	7,286,513.70	84,064,889.71	8379490.75	6284618.063	9107643.325	89541373.48
22	5,131,373.58	615764.8296	5,747,138.41	89,812,028.12	6609209.171	4956906.878	6660566.629	96201940.11
23	6,341,879.77	761025.5724	7,102,905.34	96,914,933.46	8168341.144	6126255.858	6284618.063	102486558.2
24	3,819,735.48	458368.2576	4,278,103.74	101,193,037.20	4919819.298	3689864.474	4956906.878	107443465.1
25	2,756,498.78	330779.8536	3,087,278.63	104,280,315.83	3550370.429	2662777.821	6126255.858	113569720.9
							3689864.474	117259585.4
							2662777.821	119922363.2
SUM	93,107,424.85	11,172,890.98	104,280,315.83	104,280,315.83	119922363.2	89941772.41	119922363.2	119922363.2


Cash In
Cash Out

Chapter 14

Risk management process

Risk definitions:

- The threat or possibility that an action or event will adversely or beneficially affect an organization's ability to achieve its objectives.
- An uncertain event or condition that, if it occurs, has a positive or negative effect on a projects objectives.
- The identification, analysis, assessment, control, and avoidance, minimization, or elimination of unacceptable risks.

Risk identification:

The objectives of risk identification are to identify and categorize risks that could affect the project and document these risks. The outcome of risk identification is a list of risks. What is done with the list of risks depends on the nature of the risks and the project. On noncomplex,low-cost projects with little uncertainty (few risks), the risks may be kept simply as a list of red flag items. The items can then be assigned to individual team members to watch throughout the project development process and used for risk allocation purposes, as described later in this document. On complex, high-cost projects that are by nature uncertain, the risks can feed the rigorous process of assessment, analysis, mitigation and planning, allocation, and monitoring and updating described in this document.

The risk identification process should stop short of assessing or analyzing risks so that it does not inhibit the identification of "minor" risks. The process should promote creative thinking and leverage team experience and knowledge. In practice, however, risk identification and
risk assessment are often completed in a single step, a process that can be called risk assessment. For example, if a risk is identified in the process of interviewing an expert, it is logical to pursue information on the probability that it will occur, its consequences/impacts, the time associated with the risk (i.e., when it might occur), and possible ways of dealing with it.

The latter actions are part of risk assessment, but they often begin during risk
identification. This document, however, will treat the two activities of risk identification and
assessment discretely for clarity.

Identification techniques:

- Brainstorming

Brainstorm is employed as a general data-gathering and creativity technique which identifies risks, ideas, or solutions to issues. Brainstorming uses a group of team
members or subject-matter experts spring boarding off each others' ideas, to generate new ideas.

- Delphi Technique

The Delphi technique gains information from experts, anonymously, about the likelihood of future events (risks) occurring. The technique eliminates bias and prevents any one expert from having undue influence on the others.

- Interviewing

Interviewing in a face-to-face meeting comprised of project participants, stakeholders, subject-matter experts, and individuals who may have participated in similar, past projects is a technique for gaining first-hand information about and benefit of others' experience and knowledge.

- Root cause identification

  Root cause identification is a technique for identifying essential causes of risk.

- Using data from an actual risk event, the technique enables you to find out what happened and how it happened, and understand why it happened, so that you can devise responses to prevent recurrences.
- S.w.o.t analysis
- Checklist analysis

  Checklists list all identified or potential risks in one place. Checklists are commonly developed from historical information or lessons learned. The Risk Breakdown Structure (RBS) can also be used as a checklist. Just keep in mind that checklists are never comprehensive, so using another technique is still necessary.

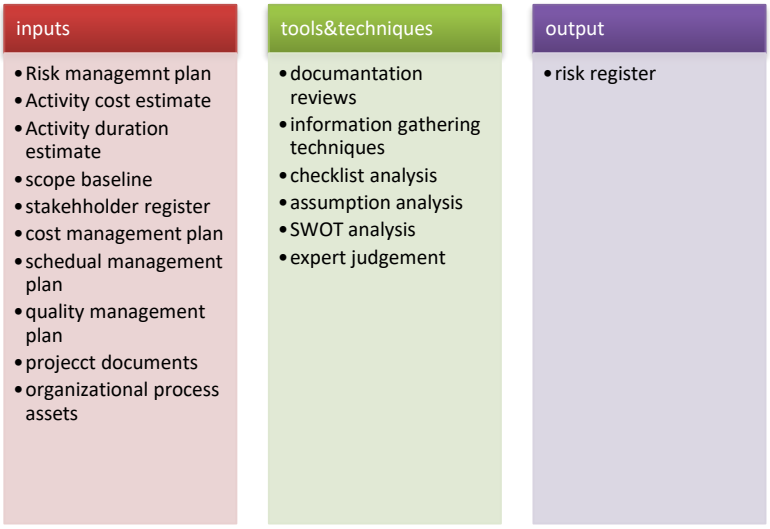
Risk management process

- **Risk Identification:**

Identify risks is the process of determining which risks may affect the project and documenting their characteristics.

Participation on risk identification activities can include (project manager–project team members–subject matter experts–other project managers–risk management team **(if assigned)** –stakeholders–end users) all project personnel should be encouraged to identify risks.

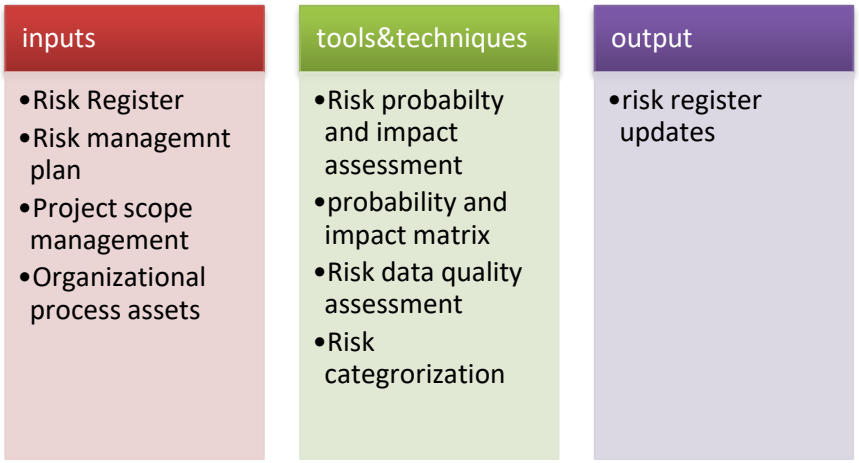
Identify risks is an iterative process throughout the project life cycle.



• Perform Qualitative Risk Analysis

Perform qualitative risk analysis is the process of prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact. Qualitative risk analysis is a subjective analysis of the risks identified. To perform this analysis, the following are determined

- The probability of each risk occurring, using a standard scale such as Low, Medium, High or 1 to 10.
- The impact (amount at stake, or consequences, positive or negative) of each risk occurring, using standard scale such as Low, Medium, High or 1 to 10



Perform Quantitative Risk Analysis

- Perform quantitative risk analysis is the process of numerically analyzing the effect of identified risks on overall project objectives.
- Perform quantitative risk analysis is performed on the risks that have been prioritized by the perform Qualitative Risk Analysis Process.

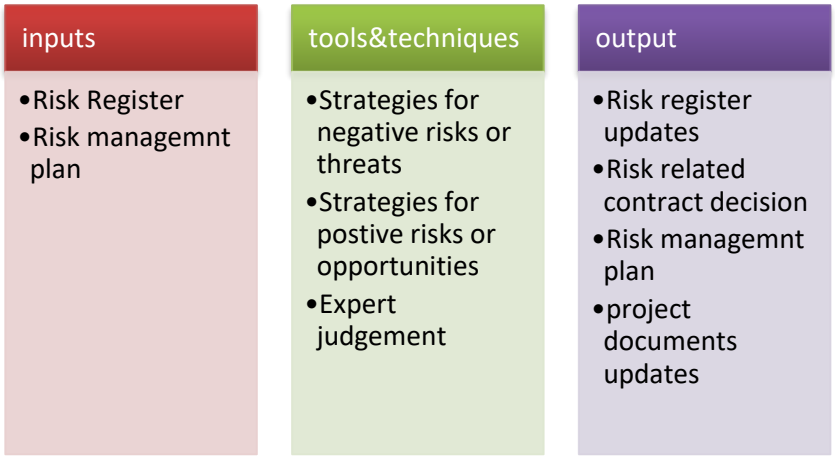
inputs	tools&techniques	output
•Risk Register •Risk managemnt plan •cost management plan •schedual management plan •Organizational process assets	•data gathering and representation technique •quantitative risk analysis and modeling technique •expert judgement	•risk register updates

Plan Risk Responses

• A plan risk response is the process of developing options and actions to enhance opportunities and to reduce threats to project objectives.

• A plan risk response includes the identification and assignment of one person (the "risk response owner") to take responsibility for each agreed-to and funded risk response.

• Plan risk response addresses the risks by their priority, inserting resources and activities into the budget, schedule, and project management plan as needed.



Types of Risk Response

Once risks have been identified and assessed, all techniques to manage the risk fall into one or more of these four major categories:

• Avoidance (eliminate, withdraw from or not become involved)
• Reduction (optimize – mitigate)
• Sharing (transfer – outsource or insure)
• Retention (accept and budget)

✓ Risk avoidance

This includes not performing an activity that could carry risk. An example would be not buying a property or business in order to not take on the legal liability that comes with it. Another would be not flying in order not to take the risk that the airplane were to be hijacked. Avoidance may seem the answer to all risks, but avoiding risks also means losing out on the potential gain that accepting (retaining) the risk may have allowed. Not entering a business to avoid the risk of loss also avoids the possibility of earning profits.

✓ Hazard Prevention

Hazard prevention refers to the prevention of risks in an emergency. The first and most effective stage of hazard prevention is the elimination of hazards. If this takes too long, is too costly, or is otherwise impractical, the second stage is mitigation.

✓ Risk reduction

Risk reduction or "optimization" involves reducing the severity of the loss or the likelihood of the loss from occurring. For example, sprinklers are designed to put out a fire to reduce the risk of loss by fire. This method may cause a greater loss by water damage and therefore may not be suitable. Halon fire suppression systems may mitigate that risk, but the cost may be prohibitive as a strategy.

Acknowledging that risks can be positive or negative, optimizing risks means finding a balance between negative risk and the benefit of the operation or activity; and between risk reduction and effort applied. By an offshore drilling contractor effectively applying HSE Management in its organization, it can optimize risk to achieve levels of residual risk that are tolerable.

Modern software development methodologies reduce risk by developing and delivering software incrementally. Early methodologies suffered from the fact that they only delivered software in the final phase of development; any problems encountered in earlier phases meant costly rework and often jeopardized the whole project. By developing in iterations, software projects can limit effort wasted to a single iteration.

Outsourcing could be an example of risk reduction if the outsourcer can demonstrate higher capability at managing or reducing risks. For example, a company may outsource only its software development, the manufacturing of hard goods, or customer support needs to another company, while handling the business management itself. This way, the company can concentrate more on business development without having to worry as much about the

✓ Risk sharing

It’s briefly defined as "sharing with another party the burden of loss or the benefit of gain, from a risk, and the measures to reduce a risk."
The term of 'risk transfer' is often used in place of risk sharing in the mistaken belief that you can transfer a risk to a third party through insurance or outsourcing. In practice if the insurance company or contractor go bankrupt or end up in court, the original risk is likely to still revert to the first party.

As such in the terminology of practitioners and scholars alike, the purchase of an insurance contract is often described as a "transfer of risk." However, technically speaking, the buyer of the contract generally retains legal responsibility for the losses "transferred", meaning that insurance may be described more accurately as a postevent compensatory mechanism. For example, a personal injuries insurance policy does not transfer the risk of a car accident to the insurance company. The risk still lies with the policy holder namely the person who has been in the accident. The insurance policy simply provides that if an accident (the event) occurs involving the policy holder then some compensation may be payable to the policy holder that is commensurate to the suffering/damage.

Some ways of managing risk fall into multiple categories. Risk retention pools are technically retaining the risk for the group, but spreading it over the whole group involves transfer among individual members of the group. This is different from traditional insurance, in that no premium is exchanged between members of the group up front, but instead losses are assessed to all members of the group.

✓ **Risk retention**

Involves accepting the loss, or benefit of gain, from a risk when it occurs. True selfinsurance falls in this category. Risk retention is a viable strategy for small risks where the cost of insuring against the risk would be greater over time than the total losses sustained. All risks that are not avoided or transferred are retained by default. This includes risks that are so large or catastrophic that they either cannot be insured against or the premiums would be infeasible. War is an example since most property and risks are not insured against war, sothe loss attributed by war is retained by the insured.

• Monitor and Control Risks

The process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.

inputs	tools&techniques	output
•Risk Register •Risk managemnt plan •Work performance information •Performance reports	•Risk reassessment •Risk audits •status meeting	•Risk register updates •Organizational process assets •change requests •Risk managemnt plan •project documents updates

Case study (tanta surgery hospital)

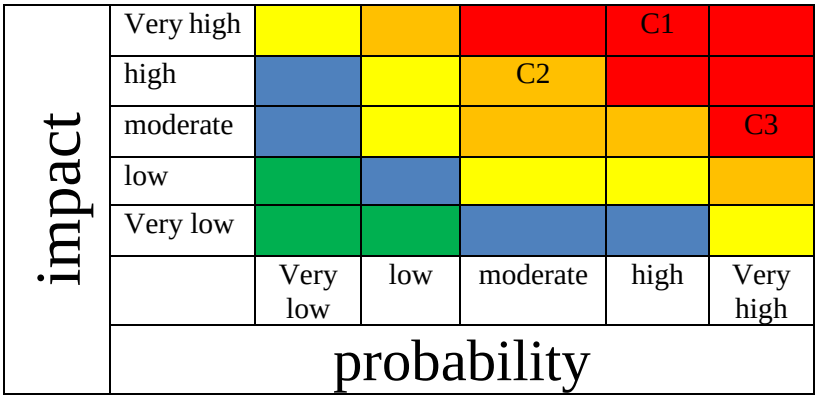
RISK ID	IDENTIFIED RISK	IMPACT	PROBABILTY	IMPACT SCORE	PROBABILTY SCORE	RISK SCORE
	CONTRACT RISK					
C1	unrealaistic project time	V HIGH	HIGH	9	0.7	6.3
C2	unclear contract term	HIGH	MODERATE	7	0.5	3.5
C3	variation order	MODERTE	V HIGH	5	0.9	4.5
C4	disputes and claims	V LOW	V LOW	1	0.1	0.1
	catastrophe force majeure					
FM1	wars,revolution	V HIGH	MODERATE	9	0.5	4.5
FM2	earthquakes	HIGH	LOW	7	3	21
	economical and finanncial risk					
EC1	delay in contractors payment	LOW	HIGH	3	0.7	2.1
EC2	Fluctuation in Exchange Rate	V LOW	V LOW	1	0.1	0.1
EC3	Cost Overruns	HIGH	HIGH	7	0.7	4.9
EC4	Increase in Material Cost	V HIGH	MODERATE	9	0.5	4.5
EC5	Inadequate Project Budget	HIGH	HIGH	7	0.7	4.9
EC6	Inflation	HIGH	MODERATE	7	0.5	3.5
EC7	Change in Legislation	HIGH	V LOW	7	0.1	0.7
	Design risks					
D1	Change in Design	HIGH	HIGH	7	0.7	4.9
D2	Change in drawings	HIGH	HIGH	7	0.7	4.9
	Labor risks					
L1	Unavilability of skilled Labors	HIGH	MODERATE	7	0.5	3.5
L2	Drop of Labor Productivity	HIGH	HIGH	7	0.7	4.9
L3	Shortage of Skilled Sub-contractors	V HIGH	HIGH	9	0.7	6.3
L4	Workers' Injuries	V HIGH	LOW	9	0.3	2.7
	Equipment Risk					
E1	Equipments Breakdowns	HIGH	HIGH	7	0.7	4.9
E2	Unavilability of Equipments	V HIGH	LOW	9	0.3	2.7
E3	Heavy Equipments Accidents	V HIGH	V LOW	9	0.1	0.9
E4	Crane Overturning	V HIGH	V LOW	9	0.1	0.9
	Material Risk					
MA1	Unavilability Of Materials	HIGH	LOW	7	0.3	2.1
MA2	Defects of Materials	MODERATE	HIGH	5	0.7	3.5
	Construction Risks					
CONC1	Instability of Inclination of soil during Excavation	MODERATE	HIGH	5	0.7	3.5
CONC2	Concrete Mix Inaccuracy	HIGH	MODERATE	7	0.5	3.5
CONC3	Failure to Install and Handle Precast Frames	V HIGH	V LOW	9	0.1	0.9
CONC4	Failure of Formwork	V HIGH	LOW	9	0.3	2.7
CONC5	Excavation Prodcutivity Drop	MODERATE	MODERATE	5	0.5	2.5

Qualitative risk Analysis:

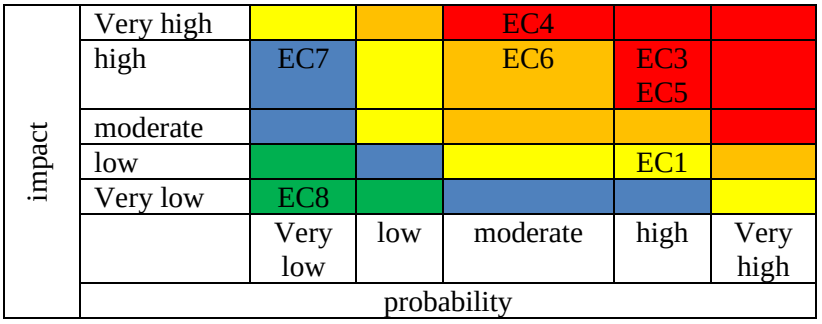
- Probability Criteria
- Very Low Less than 10%
- Low It ranges from 10-35%
- Moderate It ranges from 35-65%
- High It ranges from 65-85%

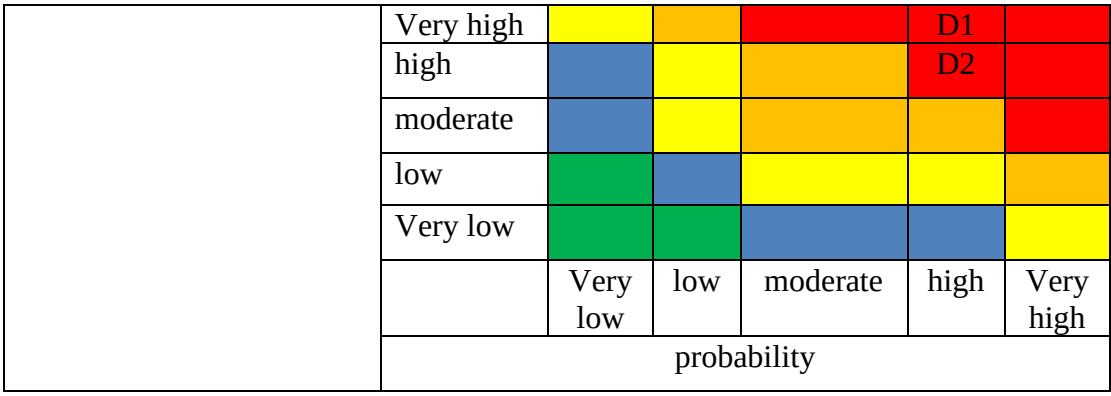
CONTRACT RISK:

Economical & Financial risk:



Design Risks:





Labor Risks:

impact	Very high		L4		L3	
	high			L1	L2	
	moderate					
	low					
	Very low					

Equipment Risks:

Construction Risks

impact	Very high					
	high		MA1			
	moderate				MA2	
	low					
	Very low					
		Very low	low	moderate	high	Very high
	probability					

CHAPTER 15

QUALITY MANAGEMENT

Quality management:

Construction projects span a number of functions across a number of specialty parties and trades, but the one thing they all share in common is their desire to deliver quality work - on time and on budget.

Quality management is a key pillar of overall construction project management, and is often the difference between company's success and failure.

Quality management in construction is the policies, processes and procedures put in place (typically by management) to improve an organisation's ability to deliver quality to its customers - whether those customers are clients/owners, contractors or subcontractors - on a consistent and constantly improving basis.

While every construction company on earth wants to deliver quality on every phase of works and every project, it is the establishing of these internal and external principles and guidelines which actually results in quality.

Why Is Quality Important in Construction?

Perhaps most critically, construction quality affects your bottom line. Completing projects with a high level of quality can win you repeat business and protect you from costly mistakes requiring rework on a job. Conversely, low quality construction projects can damage your reputation and lose you business in the future, both from potential repeat clients, as well as anyone else that has heard of the poor quality of your work.

Types of Quality Management

- ***Quality Planning :***

Quality Planning involves identifying which quality standards are relevant to the

project and determining how to satisfy them. It is one of the most important

processes in the during project planning and should be performed regularly and in

- ***Quality assurance and quality control :***

Quality assurance (QA) and quality control (QC) both sit within the broader category of quality management in construction, but they do have different roles and outputs than one another.

At a high level, quality assurance covers activities from design, development, production and installation and is designed to ensure your customers 'know' your work will be quality; while quality control is more focused on monitoring the actual quality of finished products through objective measurements and numbers.

Both quality assurance and quality control form critical elements of quality management. Without quality assurance, it's hard to build confident working relationships with other parties who rely on your quality assurance and quality plans to make decisions about whether or not to work with you. And without quality control, it's hard to understand how you are tracking in terms of quality - and impossible to make data driven decisions about what needs to be improved.

You also need this quality control data to feed into your quality assurance plans and objectives in order to facilitate the feedback loop and enable improvement.

Project Quality Policy is a statement of a high-level strategic governance model for identifying project quality goals and constituting the general direction of the quality management process. It is a strategic vision of an organization regarding formal expectations and requirements of project quality being achieved during the process implementation .

- ***quality policy :***

The project quality policy statement gives a common description of all low-level (tactical) elements of the governance model, such as standards, plans, guidelines, approaches, activities and procedures.
The project quality policy statement is often an unalterable document that is never changed. The development of the project quality policy document is the primary process within project quality planning and management that is undertaken at the Project Planning Phase when subsidiary plans for managing a project are to be designed and approved. The quality policy statement is a foundation for developing a project quality management plan which is a sequence of tasks and activities aimed at putting the policy in practice and producing operational results.

- ***Quality Improvement :***

Quality improvement is a structured approach to evaluating the performance of systems and processes, then determining needed improvements in both functional and operational areas. Successful efforts rely on the routine collection and analysis of data.
A quality improvement plan describes an ongoing, or continuous, process through which an organization’s stakeholders can monitor and evaluate initiatives and results.

Quality Management Plan :

The quality management plan should describe how the project management team will implement its quality poliIt should describe the project quality system which is Organizational structure, responsibilities, procedures ,processes, and resources needed to implement quality management.

Authorities and Responsibilities:

Authorities:

Quality Management Organization that monitors quality and quality Security functions must have sufficient regulatory authority and freedom Identify quality problems, start, recommend, supply and verification Implement the solution.

Responsibilities:

Quality Management Organization should be responsible for performing the following tasks :

- ❖ Continuous daily inspection.
- ❖ Conduct phased inspections on daily basis.
- ❖ Perform all testing required under the technical provisions of the specifications.
- ❖ Prepare daily Quality Control (QC) reports as required in contract.
- ❖ Review, Approve and submit all shop drawings, brochures and samples as required for approval by the Design Consultant.
- ❖ Inspect materials as they are delivered to site to ensure compliance with approved shop drawings and contract requirements.
- ❖ An off-site inspection of supplies and materials to be integrated At work.
- ❖ Keep records of all quality control activities and submit them to the project manager at specific intervals.

Here's a summary of each member's responsibilities participating in the project:

Owner's responsibilities:

- Supervising the quality management activities of the contractor to ensure Commitment to building quality control (CQC) and compliance plan with contract documents.
- Notify the contractor immediately of notable irregularities or deficiencies at work .
- Supervising the construction department of the contractor including Scheduling, invoices, review of executive charts.

Contractor responsibilities:

- The contractor is solely responsible for achieving the quality of the project and has to do so.It is fully responsible for the quality of all construction work The contractor must conduct quality management activities that include Examination and testing of materials and other new activities chosen by the contractor.
- ***Responsibilities of project manager :***
- Coordinate internal resources and third parties/vendors for the flawless execution of projects
- Ensure that all projects are delivered on-time, within scope and within budget
- Assist in the definition of project scope and objectives, involving all relevant stakeholders and ensuring technical feasibility
- Ensure resource availability and allocation
- Develop a detailed project plan to monitor and track progress
- Manage changes to the project scope, project schedule and project costs using appropriate verification techniques .
- Measure project performance using appropriate tools and techniques
- Report and escalate to management as needed
- Manage the relationship with the client and all stakeholders
- Perform risk management to minimize project risks
- Establish and maintain relationships with third parties/vendors
- Create and maintain comprehensive project documentation
- Meet with clients to take detailed ordering briefs and clarify specific requirements of each project
- Delegate project tasks based on junior staff members' individual strengths, skill sets and experience levels
- Track project performance, specifically to analyze the successful completion of short and long-term goals
- Meet budgetary objectives and make adjustments to project constraints based on financial analysis
- Develop comprehensive project plans to be shared with clients as well as other staff members
- Use and continually develop leadership skills
- Attend conferences and training as required to maintain proficiency
- Perform other related duties as assigned
- Develop spreadsheets, diagrams and process maps to document needs.

The Quality Manager:

- Ensure the implementation of the works according to the required specifications and raise the project manager.
- Ensure the quality of the supplied materials and their adoption and raise it.
- Ensure that samples are taken and approved for testing and testing.
- Reporting on the evaluation of the work done in the project and the extent to which it conforms to specifications and quantities.

Quality Assurance (QA) Engineer job description Job duties and responsibilities

Quality Assurance (QA) Engineer job description should contain the following duties and responsibilities:

- Test current products and identifying deficiencies

- Suggest solutions to identified product problems
- Investigate product quality in order to make improvements to achieve better customer satisfaction
- Plan, create and manage the overall Quality Planning strategy
- Collaborate with the Product Development team to ensure consistent project execution
- Identify quality assurance process bottleneck and suggest actions for improvement
- Oversee continuous improvement projects
- Collect quality data
- Identify key KPIs for product quality
- Prepare and present reports and metrics to Senior Management

Quality Control Engineer Responsibilities and Duties :

- Design, develop and implement best quality practices and processes for product developments.
- Maintain, monitor and ensure highest quality in services or products.
- Develop and initiate quality standards for tests, inspections and evaluations.
- Design and develop forms and instructions for evaluating, assessing, reporting and documenting on quality standards in products or services.
- Develop strategies to evaluate precision and accuracy of analytical equipment, tests & measurements and production equipment.
- Troubleshoot and resolve problems relating to quality control aspects.
- Lead, direct and assist technical, professional staff n measuring and testing a product or a service.
- Tabulate and document data relating to products, processes, materials, its qualities and reliabilities.
- Research, study, compile and prepare material on quality control activities, processes and procedures.
- Train staff, technicians and professionals on the aspects of quality control activities.

How to Assure Quality:

Preconstruction Meeting:

- During the meeting a mutual understanding of the details of the system The government has also established a national health service to ensure that the health of the poor is addressed Work, quality control program for contractors.
- The results of the meeting are prepared and signed by both Construction manager and owner consultant.
- Previous construction meeting:
- You have to meet the contractor before you start building Meet the owner's advisor or pre-construction consultant It has to be.
- The subject of a pre-construction meeting.
- Quality management system proposed by the contractor.
- These results were included as part of contract files
- Additional conferences can be called at any time for reaffirmation Mutual understanding.

Construction observer:

During construction, QCD will appoint a construction controller By holding a daily record of the project and being in the field office in a year Work on site every day to monitor construction and reports Straight to THE QC.

Weekly construction report:

The Department of Country Assessment will issue a weekly report describing the following Construction Progress to the previous week, results of any physical test and any Unusual incidents.

Contractor project schedule:

- The Implementation Manager will monitor and determine the timetable for progress on a weekly basis to comply with the project schedule.
- QCD staff familiar with many CPM programs and sometimes you creates CPM programs to deliver to the contractor at first point for scheduling the work of the contract.
- Architects and engineers are building and have a good opinion Time for different constructions.

Field office:

- Project designers should be used as much as possible in the field Inspectors.
- The Ministry of Interior's support will be ready to prepare for any major field change Demand.
- During construction, offices will be established at temporary work sites for the field Office He will receive full support from the technical design team at the head office.
- Field office services will also include building inspections and documentation of daily progress in construction Regular field reports are distributed to the owner, consultant, contractor and local office .

Labor:

- The QC will be responsible for the performance of the workers to ensure this Complete the required quality tasks.
- The QCD will prepare rehabilitation training for new and mentored workers to do the right thing.
- The Quality Control Authority regularly checks recruitment using machinery or equipment.
- To increase their performance and teach them new techniques.
- The QC will be responsible for preparing monthly employment reports Productivity.

Equipment:

- The QCD applies periodic maintenance of all equipment.
- The QCD periodically examines lifting equipment to prevent any of them from happening Damage.
- The QCD will hire well-experienced operators.

Material test:

- Materials should be stored in a clean place away from any source of damage.
- All materials must be treated safely to prevent damage and abuse Or deterioration.
- All handling operations must be as recommended by the manufacturer, supplier or in In accordance with accepted practice procedures.
- To ensure proper handling, appropriate equipment must be provided It is operated by trained, competent and licensed staff

Sample test :

- The QCD is responsible for taking concrete and other construction Samples of materials for testing.
- Local laboratories will be used or any materials consultants will be used in the project for these tests.

Photographs:

- Digital images will be taken during all stages of construction.
- QCD will deliver these images as an electronic version to future customers Reference.
- These images will fully refer to all facilities and hidden construction.

Home Support Office:

- Designers will conduct on-site inspections and prepare written reports Documenting progress in construction and any defects to be made it's been corrected.
- Any questions asked to the contractor must be documented by requesting information (requesting information).
- QCD will have actual designers to examine operational plans and be ready for consultation.
- The original designers were assigned to answer these questions through that information request process.

Documents:

The contractor must undertake the following:

- Daily records of quality control operations.
- Do activities and tests.
- The work of suppliers and contractors.

These records will be including:

- The type and number of activities and tests involved.
- Results of surveillance activities or tests.
- Proposed therapeutic procedure.
- Description of the professions working on the project, the number of employees in the project and the weather conditions they faced.

General Work Conditions

- The first party appoints a technical supervision and follow-up body to review the work carried out by the second party.
- The second party is also committed to using during the work a number of qualified engineers and is enrolled in the union of engineers according to the stages of the work which is adopted by the project consultant.
- The quality of cement and large marble is determined according to the report of the soil.
- The concrete mixtures are designed in the materials testing laboratory at Tanta University College of Engineering according to the types of debris supplied by the contractor so that it achieves the technical and mechanical properties of concrete.

The Quality Control Plan shall be adhered to and remain in effect until the work has been substantially completed with phased inspections which should function as follows:

- Preparatory Inspections: Before starting any of the work segments Drawings, specs. , materials, existing conditions and controls shall be checked .

- Initial Inspection: Results shall be checked as the initial work segments have been completed .

- Follow-up Inspection: Inspections that shall be performed frequently as required ensuring continued compliance to specified requirements .

- Final Inspection: Inspection that should be carried out to correct any deficient works before requesting formal inspection from Supervision Consultants.

Specific Work Conditions:

Earth Works Package:

- Cubic meters, clean sand supplied from off-site from sand soil free of impurities, organic matter and salts.
- Spray well with water and blood on layers that do not exceed 25 cm thick.
- Conduct the necessary tests to ensure that the required blood score is reached in accordance with the technical specifications, Egyptian code and advisory instructions in full .

Concrete Works Package:

Materials :

- **Cement** :

  - ✓ The quality of cement and large debris is determined according to what is contained in the soil report.
  - ✓ It should be noted that unless otherwise stated, the cement used is plain Portland cement.
  - ✓ All the requirements contained in the construction drawings are complementary to the items and the quality of cement is determined in accordance with the recommendations of the existing laboratory design mixing.

- **Aggregates:**

  - ✓ The quality of large debris is determined according to what is contained in the soil report.
  - ✓ The quality of large debris is also determined in accordance with the recommendations of the existing laboratory design mixing.

- **All the work of reinforced concrete.**

- **Bricks:**

  - ✓ Solid baby bricks or solid concrete bricks must be of a type that is not more than 1.6 kg/m3 and does not increase the density of perforated child bricks and empty bricks by 1.4 kg/m3.
  - ✓ The sizes of all the above-mentioned brick types and the sizes specified in the drawings must also correspond to the need to take the approval of the consultant to use any of these types in terms of the extent to which the building's construction designs can withstand their quality weights.
  - ✓ Samples of all types of bricks are adopted before supply.
  - ✓ The work of the buildings is carried out in accordance with the dimensions, heights and fish described in the drawings .

Building concert

The proportions of the components of the Concrete Mixture used in the construction are as follows :

- ✓ A 300kg cement pond per cubic meter sand for baby brick and cement buildings below the insulating layer and buildings likely to be exposed to leaking wastewater.
- ✓ Concrete Mixture consisting of 250 kg cement per cubic meter sand for the buildings of limestone, Sand and child bricks of both types .

Among the acts of isolation :

In the insulation work, it is taken into account to follow the instructions of the producing company accurately and to conduct the necessary tests to ensure the quality of insulation in accordance with the instructions of the project consultant.

Total metalwork and aluminu :

The sections of doors, windows, wheels and other aluminum sector jumbo techno or similar according to the required color and according to the sizes described on the drawings and the contractor must provide complete operating drawings for doors and windows in which the electrolytes are verified and their types are indicated for each of the business units according to the technical specifications .

CHAPTER 16

UPDATING AND PROGRESS CONTROL

management in engineering projects can be summarized in two main stages. The first is developing plans and schedules, and of course thus will be before the implementation begins. The second stage will be the follow-up and monitoring of these plans and schedules to determine the extent of their discipline. And developing solutions when any delay or deviation occur.

Also, project planning is an important and necessary matter, so follow up the project in time is no lrss important.

Studying the progress of work for all activities, updating the timetables, and making an adjustment is a common thing that occurs during the implementation of engineering projects.

- updating time

Update time is definedas the time at the end of the update process , it's necessary at this time to know the quantities of work remaining and ssess the potential productivity, as well as an estimate of the expected periods of time to complete the project.

The steps for the update procedure for the timeline can be summarized. As follows:

1-the time of all completed activities is set equal to zero

2-the activities that are currently being implemented are defined with the setting of the early start time equal to the date of update, and the implementation time is the remaining time which is given in the update report.

3-the time of all future activities is set as given in the update report

4-the project completion time is calculated using the normal critical path method.

Strategies for overcoming and updating schedule delays

there are number of reactions that can be taken to overcome schedule delays as:

1-using new construction methods that have a high degree of success

2-redistribution of work resources.

3- Reducing and compressing the time for completing future activities by work to increase the productivity of the resources, the resources allocated to them, or increase the number of resources.

4- paying attention to the existence of equipment maintenance on the site with finding equipment for which spare parts are available to reduce and reduce the effects of equipment breakdown and find good ways to facilitate the operation of the equipment.

Planning:

One of the most common sets of activities in the management is planning. Very simply put, planning is setting the direction for something -- some system -- and then guiding the system to follow the direction. There are many kinds of planning in organizations. Common to these many kinds of planning are various phases of planning and guidelines for carrying them out as effectively as possible. Information in this document can be referenced as a basis from which to carry out various kinds of planning, ranging from highly complex to simple and basic.

Guidelines for Successful Planning and Implementation

- Step-by-Step Procedure-Involve the Right People in the Planning Process
- Write Down the Planning Information and Communicate it Widely Goals and Objectives Should Be SMARTER
- Build in Accountability (Regularly Review Who's Doing What and By When?)
- Note Deviations from the Plan and Replan Accordingly
- Evaluate the Planning Process and the Plan

• CHAPTER 17

TIME CONTROL

What is time control construction?

Project time control is the process of monitoring the status of project activities, which include updating the project progress and managing changes to the schedule baseline to achieve the plan. This process is beneficial as it provides the means to recognise deviation from the actual plan in order to take corrective and preventive measures to reduce risk. The duration of time it takes for the execution of a project is, most of the time, very important to the parties involved However, project delays are common globally, especially in developing and underdeveloped countries

The limited objective of project control deserves emphasis. Project control procedures are primarily intended to identify deviations from the project plan rather than to suggest possible areas for cost savings. This characteristic reflects the advanced stage at which project control becomes important. The time at which major cost savings can be achieved is during planning and design for the project. During the actual construction, changes are likely to delay the project and lead to inordinate cost increases. As a result, the focus of project control is on fulfilling the original design plans or indicating deviations from these plans, rather than on searching for significant improvements and cost savings. It is only when a rescue operation is required that major changes will normally occurring in the construction plan.

Project time control process

The process of project time control involves three main parameters, which are input, tools and techniques and output . The input are project management plans, the project schedule, work performance data, the project calendar and organisation process assets. The tools and techniques used in project time control are performance reviews, project management software, resource optimisation techniques, modelling techniques, leads and lags, schedule compression and use of scheduling tools , while the output that is expected from these processes are work performance information, schedule forecasts, change request, project management plan updates, project document updates and the organisational process assets updates

Keep the project schedule at the forefront

1. Prioritize your task list
2. Delegate tasks as needed
3. Conduct actionable meetings
4. Communicate clearly and effectively
5. Use the right tools

Characteristics of construction project:

1.Unique

2.High variability:
due major number of individuals whom have different goals, high number of resources (material, labor, equipment, money, information) There must be a lot of problems in construction projects.

3.Low reliability:
it is very difficult to depend on the results of previous project:
o Due to these reasons construction industry needs very high control o Control is a part of management.

Management = Organization + Planning +Directing +Control

1-**Organizing**:

it concerns mostly with:

- Staff
- Responsibilities and duties
- Authorities
- Communication

2-Planning:
Proposed program of work

3-Directing
Directing action when there is a problem

4-Control
Measurement of the actual results and comparing it with actual

Control = Monitor + Compare + Analyses + Act

Due to large time in construction projects we must keep attention to it as:

1- Increasing time increases indirect cost

2- There may be milestones in project to be respected steps of time control

Problems that may Arise During Construction

In construction, no project, almost, is executed as planned. Control needs to be carried out due to the dynamic nature of the construction process. Controlling after project finish is trivial and updates are usually done periodically. Controlling can be done for project schedule and/or project cost. As the construction stage of project starts, the project mostly will face delays and/or cost overruns.

The following is a list of the factors that may cause such problems:

- Change in activity durations and quantities.
- Sudden changes of the availability of resources.
- Change orders.
- Accidents.
- Procurement delays.

Schedule Updating

Construction typically involves a deadline for work completion, so contractual agreements will force attention to schedules. More generally, delays in construction represent additional costs due to late facility occupancy or other factors. Just as costs incurred are compared to budgeted costs, actual activity durations may be compared to expected durations. In this process, forecasting the time to complete particular activities may be required.

It is important to devise efficient and cost effective methods for gathering information on actual project accomplishments. Generally, observations of work completed are made by

inspectors and project managers and then work completed is estimated. Once estimates of work complete and time expended on particular activities are available, deviations from the original duration estimate can be estimated.

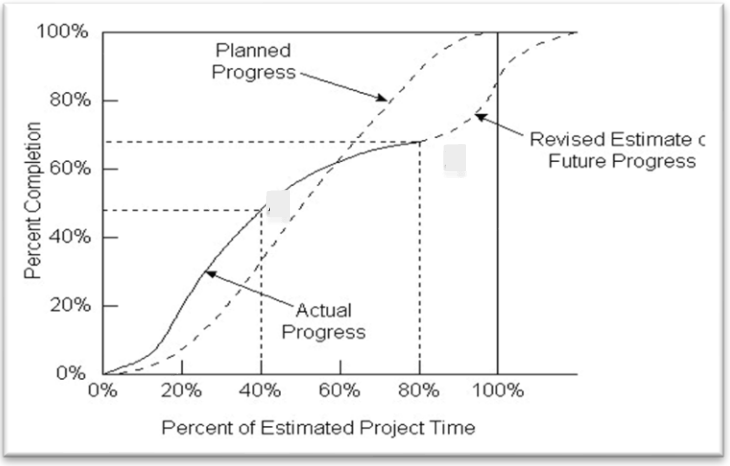
For example, Figure 10.1 shows the originally scheduled project progress versus the actual progress on a project. This figure is constructed by summing up the percentage of

each activity which is complete at different points in time; this summation can be weighted by the magnitude of effort associated with each activity. In Figure the project was ahead of the original schedule for a period including point A, but is now late at point B by an amount equal to the horizontal distance between the planned progress and the actual progress observed to date.

In evaluating schedule progress, it is important to bear in mind that some activities possess float, whereas delays in activities on the critical path will cause project delays. In

particular, the delay in planned progress at time t may be soaked up in activities' float (thereby causing no overall delay in the project completion) or may cause a project delay.

As a result of this ambiguity, it is preferable to update the project schedule to devise an accurate portrayal of the schedule adherence. After applying a scheduling algorithm, a new project schedule can be obtained.



Planned versus actual progress over time on a project

It is common that actual durations of activities differ from those estimated. Furthermore, there may be additions or deletions to the scope of the contract that will affect the time at which activities can be started or completed. Schedule updating is a procedure for introducing the latest progress information into the schedule.

Data have to be collected on the actual progress of completed activities and those under execution. A completely new estimate of the amount of work remaining to be done should be made for each activity. The probable output of various resources should be assessed. If the job is found to be behind schedule, corrective actions must be made to retrieve position.

A procedure for manual schedule updating can be summarized in the following steps:

-Change the duration of all completed activities to zero.

-Identify all activities on which work is currently processing as Live Activities.

-Put early start time of live activities equals the updating date and their durations equal remaining duration.

-Change duration of future activities as given in the update report.

-Carry-out network analysis in the normal way and prepare a new activity schedule.

To illustrate the above hand procedure for schedule updating, consider the following example with the planning data given in Table 10.1. The corresponding precedence

Delays Analysis

Work changes mean changes in the volume and duration of work to be performed from that envisaged at the start of the contract. Variation in the form of addition and deduction result in more or less cost and time to execute the varied item. On the other hand, omissions mean less cost but not necessarily less time. It might result in wasting resources. For instance, if the quantity of work in a critical activity is increased by x% then the duration of the activity will be extended by The direct cost of the activity should be increased by the same ratio while the indirect cost of the contract might be increased for the extended period.

Types of Delays

Delays can be divided into the following categories:

Those over which the client has control; compensable delays;

Those over which the contractor has control; non-excusable delays; - Those over which the neither party has any control; excusable delays; and - Concurrent delays.

A brief description of each category is given below.

Compensable delays

A delay is deemed compensable to the contractor when it's within the control of, is the fault of, or is due to the negligence of the client. Examples include:

- late possession of site;
- faulty design;
- incomplete drawings and specification;
- changes in scope;
- suspension of work;
- differing site conditions;
- late delivery of client-supplied materials; and
- client's failure to disclose information vital to the contractor.

For this type of delays, the conditions of contract should allow the contractor to be entitled to a time extension and to monetary recompense for extra costs associated with the delay.

Non-excusable delays

In this category, the contractor's own actions or inactions have caused the delay. The contractor is entitled neither time extensions nor monetary recompense from the client. He/she may pay liquidated damages according to the contract.

Excusable delays

These are occurrences over which neither the client nor the contractor has any control. Example includes:

- unforeseen future events which the contractor has not been aware;
- impracticable things which the contractor can only do at an excessive cost;

- **Concurrent delays**

Concurrent delays are two or more delays that occur at the same time, either of which, if it occurred alone, would have affected contract completion date. They can be classified as follows:

- excusable delays and non-excusable delays;
- excusable delays and compensable delays;
- excusable delays and compensable delays and non-excusable delays; and - compensable delays and non-excusable delays.

Concurrent delays with an excusable delay will generally be considered as excusable delays. For these delays, the contractor is entitled to time extension if the delays are on the critical path. This protects him from any resulting liquidated damages. For concurrent compensable and non-excusable delays, the contractor is allowed a time extension for completion with each party suffering his/her own losses. The terms of the contract should declare the method of evaluation of such claims.

The As-Built Schedule

The as-planned schedule of a contract is its initial schedule. The as-built schedule will show the time status of the contract and the causes of all the time changes that happen.

Both schedules will be drawn as time-scaled diagrams.

The as-built schedule provides a complete record of the work as-built.

It shows all delays encountered and the actual starting and finishing dates of every activity. When compared with the initial schedule, it gives the date for the evaluation of each time delays encountered during construction. The following legend will be used to draw the as-built schedule; “o” to represent compensable delays; “c” to represent non-excusable delays and “n” to represent excusable delays. This schedule will now become the basis for analysis of the effect of different types of delays of the contractor’s progress.

Analysis of The As-Built Schedule

If the as-built schedule contains more than one equally delayed critical path, each of them will be examined in turn to determine its net working duration. This is the actual time in which all the activities along a path could have been completed if there had been no work changes or delays affecting the path. This can be found as follows:

A path net working duration = its total duration – all delay times lying on it

The net working duration may be less than the estimated contract duration given by the as-planned schedule. This means that the contractor has performed the contract within the estimated time. On the other hand, it may exceed the contract duration. Then the contractor’s original estimates were incorrect. Having examined all apparent critical paths, the scheduler can determine the primary path(s) as that (those) with the longest net working duration.

Analysis of Concurrent Delays

The difference between the as-planned schedule duration and the as-built primary critical path duration can be portioned out as follows:

- The number of days in which the contractor's and the client's delays are concurrent are those days where the two type of delays occurred; one delay affected a primary critical path and the other affected the other primary critical path on the same day(s).
- The number of days of concurrent delays with an excusable delay is those days where an excusable delay occurred on any primary critical path and a contractor's delay, a client's delay, or both delays occurred on other primary critical path(s) on the same day(s).
- Excluding delays number 1 and 2 above, the number of days a contractor should be assessed for liquidate damages is the smallest number of days of inexcusable delays on all primary critical paths.
- Excluding delays number 1 and 2 above, the number of days a contractor should be reimbursed for additional overhead expense plus a time extension is the smallest number of days of compensable delays on all primary critical paths.
- Finally, the number of days a contractor should be given a time extension is the difference between the total delay duration and the summation of all the above four delays duration.

CHAPTER 18

COST CONTORL

In construction almost all clients are interested in obtaining fully functional facilities completed in time, cost, quality and scope.

A builder who is able to construct within the estimated time and budget, to the right standards and scope is an excellent builder.

Cost control is a process where the construction cost of the project is managed through the best methods and techniques so that the contractor does not suffer losses when carrying out the activities of the project.

One of the aims of cost control is to construct at the cheapest possible costs consistent with the project objectives.

Ultimately the decision of the manager that something should be done differently and the translation of that decision into practice are the actions to achieve control.

Most project managers and contractors find difficulty in controlling costs on their construction sites due to a number of problems which include poor project preparation, lapse in management and control, over budgeting, poor materials, labor shortages, increased cost of materials, delays in deliveries, wastage of materials, unexpected weather changes, loss of materials, insecurity and poor communication.

This results into cost and time overruns, conflicts, and sometimes abandoning projects.

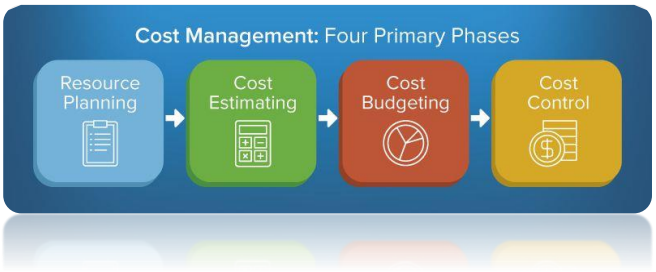
This study was therefore carried out to identify the cost control techniques.

So we looked at problems faced by the contractors in controlling the costs on site, studied the cost control techniques commonly used by the contractors during the construction stage and proposed remedies to be used by contractors on sites to control their costs.

The Cost Management Process

The four cost management processes are:

- Resource Planning
- Cost Estimating
- Cost Budgeting
- Control Costs



Resource Planning Process

During this process, the project manager and other members of the project team will work together to create a plan to determine the budget, estimate costs, and manage costs over the course of the project from start to finish.

The cost management plan is the primary output for the plan cost management process. It details how to manage the project costs and budget. Three key areas of this stage are life cycle costing, total cost of ownership, and value engineering.

Life Cycle Costing

- Life cycle costing is a process that involves compiling all the costs that the owner or producer of an asset will incur over the asset's lifespan. Consider how often you replace your cell phone. Generally, you replace or upgrade every two years because that's the technological product's life cycle. That's why it's important to consider the total cost of ownership on all products or services that are purchased over the course of the project.
- Total Cost of Ownership For instance, when purchasing a vehicle, you have the cost of the vehicle itself, but that's only a portion of the total cost of ownership. Other costs to consider include: taxes and insurance, tag and title fees, fuel, and regular maintenance to extend its lifetime. Some vehicles, particularly those that require specialized parts or service, will have a higher total cost of ownership.
- Using the total cost of ownership analysis allows a business to find the lowest total lifetime cost for purchasing and operating goods and services. Though it isn't necessary to subject all purchases to a total cost of ownership analysis, it is crucial to do it for any purchase that will bring rather significant operating and maintenance costs over a long usable life. The total cost of ownership analysis is commonly used when it comes to purchasing things such as: vehicles, property, computer systems and software, machines and other equipment.

Value Engineering

Value engineering is doing the same work in a more affordable way. For example, if you're planning a construction project and find that you'll need a bulldozer for about two months, it makes more sense to rent the bulldozer rather than buy one – unless of course you'll continue to use the bulldozer in a number of other projects in the future. In that case, it may make more sense to purchase it.

However, when you consider the cost of renting the bulldozer means you're not responsible for the necessary maintenance and upkeep, it is often more budget-friendly option to rent it. The total cost of ownership for a single bulldozer could mean you have to have multiple high dollar projects that require plenty of bulldozer use before the purchase pays for itself.

To determine which the better option is, define the lifetime costs and the cost components. Bring in the relevant stakeholders, the people who requested the purchase, and a financial controller. Meet with them to create the possible scenarios, and then compare those with various financial ratios such as return on investment, payback period, and so on. Choose the best fitting scenario and implement it.

Cost Estimating Process

During this phase, you'll estimate costs for each project activity, including the tools, materials, and equipment needed to accomplish every activity. Then, based on these cost estimates, you'll be able to estimate the overall project budget.

Searching for cost information means the buyer determines the cost of components they need – from the materials, machines, and labor that's used to manufacture their final projects. In cost calculation, the direct cost is determined by combining material and labor costs. There's also indirect cost, or overhead, that are costs not directly related to the manufacturing process, such as staff resources, office space, taxes, etc.

Projects will have different types of costs. You'll have fixed costs, which are things like office rent. This cost remains the same regardless of how many project resources you'll need. You'll also have variable costs, which are things like personnel expenses and material costs. These costs will vary depending on the number of people or the amount of materials.

Making sure you have all the inputs is critical because all cost estimations is based on the inputs and missing an input, or having inaccurate estimates for any of the inputs can throw off the entire budget. Depending on how accurate you need everything to be, you must plan accordingly. This may mean spending more time gathering quotes from suppliers and service vendors.

As you select suppliers for everything you need to complete project activities, it's important to make sure the agreed price is fair. It's important to calculate cost to determine whether the price is right, and where it is necessary to focus efforts to reduce extra costs.

A lot of companies have increased their outsourcing, so they heavily depend on the cost and performance of their suppliers. By effectively managing those costs, buyers can contribute more to company profits.

Cost Budgeting Process

In this phase of cost management, after all the estimates are complete, the cost estimations are combined to determine the overall project budget. The project budget is comprised of several components. In addition to the entire activity cost estimate, contingency reserves are added to pad the budget to accommodate risks that may occur during the project.

Control Costs Process

This is the final process in the cost management knowledge area. This is designed to control the project expenses as the project moves forward, and seeks to complete the project within the determined budget.

Progress Reporting

Progress reporting is a vital part of cost management because it is based on the previous expenses and the project schedule. To make sure everything stays in line with the original plan, it is important to regularly evaluate whether or not the remaining project activities will be completed within the remaining budget and timeline. The progress needs to be reported to all the relevant stakeholders. If deviations from the original plan are expected, this provides the chance to take corrective action to get the project back on track to meet the estimated budget.

Cost Estimation steps

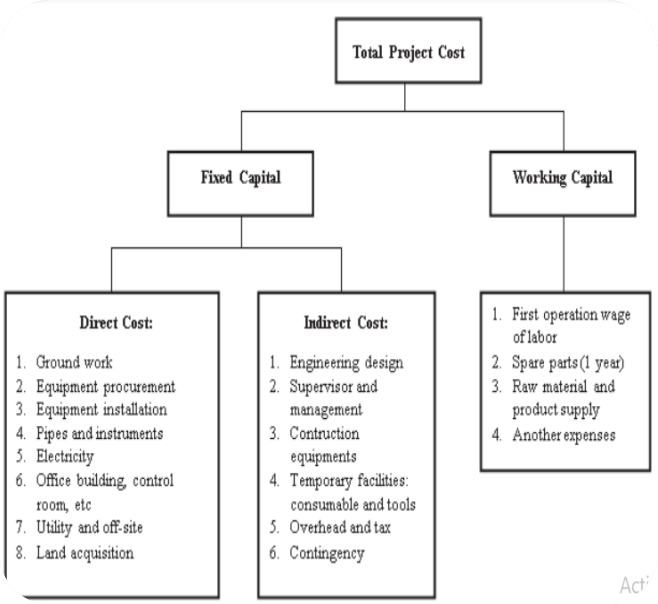
- Agree on estimating basis Before starting with the actual estimate, the parties involved must agree on the way the estimate is set up. This includes determining the cost estimating software, methodology, labor productivity, labor rates, equipment/material pricing, MTOs, allowances, indirect costs, engineering and the scope allocation. All inputs to the estimate and required outputs should be identified at this point. If requirements are not clear, meetings should be held to obtain alignment.

- Collect scope documentation Scope documents delivered to the estimate team have to be frozen; otherwise decisions are not based on costs that honestly reflect the design. Revision control is critical for this to work. Collecting and interpreting all scope documents such that your estimate covers the entire project can be challenging.

- Estimate direct cost Based on the scope you estimate the quantities and cost of the required resources. Depending on project type, size and the current phase of a project’s lifecycle, different tools and techniques may be used.

- Estimate indirect cost and other costs Other cost types like allowances, indirect costs and overhead costs are often calculated with the direct costs as basis. The estimate is further adjusted to project-specific conditions by applying location and productivity factors. At this point information from risk management and finance are used to determine the proper amount of contingency and escalation funds to be added.
- Finalize basis of estimate report and send estimate for approval Preparation of the basis of estimate document while the estimate is being prepared is preferred to completing it after the estimate when time is short and key information may have been forgotten or gone missing along with personnel that is no longer available. Stating the planned sources of estimating basis such as project historical data is important for obtaining owner and contractor alignment and confirming validity. This also applies to the estimating tools, processes, and estimator qualifications.

- During the project, scope changes and information gets updated continuously. Likewise, the estimator is never done predicting the cost outcome of the project. Estimating is always a continuous process.



What is Cost Control ?

Cost control is the task of overseeing and managing project expenses and preparing for potential financial risks.

This is typically the project manager's responsibility that keeps expenses under control by managing labor, material, and overhead costs to ensure that the project finishes on budget.

Cost control can be achieved by selecting the right man for the right job, the right equipment and tools for the right work and the right quality of materials, in the right quantity, from the right source, at the right price and delivered at the right time.

Cost control involves managing the budget, as well as planning, and preparing for potential risks.

Risks can set projects back and sometimes even require unexpected expenses.

Preparation for these setbacks can save your team time and potentially, money.

Schedule Control

In addition to cost control, project managers must also give considerable attention to monitoring schedules.

Construction typically involves a deadline for work completion, so contractual agreements will force attention to schedules.

More generally, delays in construction represent additional costs due to late facility occupancy or other factors. Just as costs incurred are compared to budgeted costs, actual activity durations may be compared to expected durations.

In this process, forecasting the time to complete particular activities may be required.

Material Cost Control - Quantity Control

If there was no waste on the project, the purchased quantity would be equal to the quantity required by the design documents.

However, waste does occur and project management must work hard to minimize the amount of waste.

The following recommendations will assist project management in minimizing waste.

- Purchase correct quantities
- Order optimal material sizes
- Verify quantities ordered, received, and billed
- Verify quantities
- Verify quantities billed
- Protect materials on-site
- Eliminate rework

Unit Price Control

Lowest Bid from a Qualified Vendor

The goal of purchasing is to buy the correct quantities of the specified materials for delivery when and where they are needed at the lowest possible price.

Material Expediting

Late delivery of materials results in extra costs as work is delayed.

In order to make-up this lost time the planned work sequences need to be altered and/or the work must be accelerated at additional cost.

To ensure on time delivery the contractor must monitor the progress of each purchase order. This monitoring is known as material expediting.

Custom fabricated materials progress though the following sequence:

- Submittal process that includes shop drawings, catalog information, samples, and/or erection drawings
- Fabrication
- Shop testing and inspections
- Shipping and receiving

Material Cost Reports

The material cost report is the tool the contractor uses measure material cost performance.

The report compares the material budget for each account or purchase order to the forecasted final cost.

The forecasted final cost is the total dollar value of purchase orders written (committed dollars) plus the dollar value of all forecasted purchases.

A variance analysis can be performed to determine how much of the difference between forecasted and budgeted costs are due to a difference in quantities and how much are due to a difference in unit costs.

Subcontract Scope

The subcontract scope definition is the most important provision in the subcontract agreement.

Most subcontract problems are caused by inadequate subcontract scope definitions.

Scope definition problems begin with the evaluation of subcontractor bids.

Often the scope definition included with the subcontractor bid is cursory and lacking detail.

Subcontract Agreement

The Subcontract Agreement is a legally enforceable document.

It spells out precisely what each party has agreed to. An exact scope definition is critical for a good subcontract.

The subcontract agreement should be a standard form.

Some of the standard terms to be included in the contract are: the rights of each party, payment terms, remedies for non-performance or non-payment, and flow-through clauses.

A flow through clause binds the subcontractor to the provisions of the prime contract.

Subcontract agreements can be drafted by the prime contractor or the subcontractor, or negotiated by the two.

Forecast Quantity

The first step in controlling costs is developing an accurate budget.

The labor budget is based upon the original estimate.

The estimated quantities become the budgeted quantities.

Budget quantities are fixed for the entire project unless there is a change in the scope of the contract.

Actual performance is measured by comparing the actual costs to the budgeted costs for the same scope of work.

We are all aware that sometimes the original estimate is based upon an inaccurate quantity take off.

This creates a problem in measuring progress and realistically forecasting the cost of the project.

Measuring Labor Input

Labor is one of the resources that the contractor supplies to complete the work in each cost account.

It is measured by the number of work hours expended on each individual cost account.

The work hours are multiplied by the corresponding wage rates to calculate the labor cost expended by account.

The bare labor wage rate is the gross direct wages paid to the worker.

In addition to the bare wage rate the employer must also pay the labor burden.

The labor burden includes the fringe benefits plus taxes and insurances that the employer pays based on labor payroll.

The gross direct wages paid to the worker plus the labor burden equals the burdened labor.

Because state taxes and workers compensation insurance rates vary by state, the labor burden varies by state.

Measuring Labor Output

The quantities produced are the output of the construction process.

Unlike construction inputs that have the common unit of measurement the output cannot be measured with a common unit of measure.

Consequently, a large number of cost accounts are used for construction outputs.

Examples of the units of measure for these accounts include cubic yards of excavation, square feet of concrete formwork, tons of structural steel, lineal feet of pipe, and number of electrical terminations.

Cost control requires matching each unit of output to the input that produced each unit of output.

Earned Value Method

Once the actual inputs and outputs are measured, the project management team compares the actual inputs and outputs to the project budget inputs and outputs.

This comparison occurs at both the cost code and project levels (or at any level in the work breakdown structure).

CHAPTER 19

SAFETY

Occupational safety and health is a set of procedures, rules and regulations within a legislative framework aimed at keeping the human being.

From the risk of injury and preserving property from the risk of damage and loss, which is a science that is concerned with maintaining the safety and health of the human being in the field of work.

by providing a safe working environment free of the causes of accidents, injuries or occupational diseases and maintains tasks, components and working environment, so the concept of safety and professional health is.

What is Construction Safety?

Construction safety is a principle adhered to and enforced by construction safety managers. It is the result of safe equipment usage, worker protection from hazards, regular site inspections and risk assessments. And key component of construction safety is compliance with the safety and health regulations of the region.

Benefits of Safety Planning:

- Improve Workers attendance.
- Reduced expenses related to injuries and illnesses.
- Improve employee's morale.
- Reduced insurance costs.
- Decrease employees complaints.

Health, Safety and Environmental Policy (HSE)

The HSE is the national independent watchdog for work-related health, safety and

Illness .

We are an independent regulator and act in the public interest to reduce work-related death and serious injury across Great Britain's workplaces .

This is achieved through investigation and enforcement, research, introducing new or revised regulations and codes of practice, alerting duty holders to new and emerging risks, and, proactive measures including: stakeholder engagement, communications programmes and the provision of information and advice.

We are committed to :

- Implementing energy saving technologies and initiatives.
- Adopting strategies to minimize the environmental impacts of business travel.
- Using utilities in a responsible and economic way to minimize negative impacts on the environment.
- Managing waste according to our duty of care, minimizing volumes going to landfill, by re-use and recycling wherever possible.
- Purchasing supplies wherever possible which are recycled and recyclable, and whose production and use minimizes the consumption of natural resources.
- Conserving resources by ensuring that buildings and fittings are properly maintained and reflect appropriate eco guidance.
- Communicating this policy and our environmental performance to appropriate people working for or on behalf of the organization.
- Using contractors / suppliers who perform the services in accordance with the government's environmental policy, demonstrating commitment to the
- Continuous improvement of environmental performance and the management and prevention of pollution from the activities they undertake.

Safety Control:

1- Engineering Controls :

Where possible and appropriate, the first and best strategy is to control risks from their source.

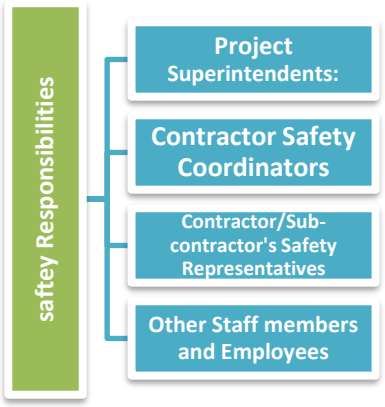
Engineering controls are unlike other controls that generally focus on a vulnerable employee rather than its source.

The work environment and the function itself must be designed to remove risks Or at least reduce it.

2-Administrative Controls:

It includes exercise breaks and rotation of workers .These types of controls are

usually used in conjunction with other controls.



Responsibilities

Project Superintendents:

- Responsible for site safety, Ensure the overall jobsite is safe for workers and visitors as well as manage compliance with established company safety policies.
- All contractors and subcontractors must assist in pre-planning their operations to prevent personal injury and property damage.
- Monthly safety activities should be monitored and accelerated
- Minutes of meetings and reporting functions. Project-related safety bulletins must be issued whenever necessary.
- All safety correspondence and copies of all incident reports must be received.
- The project must be checked regularly to ensure safety compliance.
- Contractor safety coordinators who will assist the contractor or subcontractors must be approved.

Contractor Safety Coordinators:

- At least one full project safety check per week must be carried out with a written report to the supervisors responsible for the project.
- Immediate corrective action must be implemented with regard to non-compliance With the project safety program and/or state and local laws and regulations.
- The contractor and subcontracting must check safety representatives in Conduct safety matters.
- Assistance must be provided in the talks of the contractor and subcontracting tool Box if ask.
- All incidents must be investigated as instructed by the supervisor types.
- All minutes of safety meetings, safety bulletins and other safety items must be distributed and published.

Contractor/Sub-contractor's Safety Representatives:

- Safety awareness must be promoted among all staff.
- You must attend monthly project safety meetings.
- The President must speak as necessary with the toolbox with a written report and copies to Safety coordinator in question .
- Staff must be advised and directed to perform their activities in a safe manner Increased ability to identify other risks and risks .
- Safety issues must be reported to project managers and The coordinator in question .

Other Staff members and Employees:

- Safety precautions must be taken to prevent accidents from occurring to them co-workers or themselves.
- Must attend Tool Box talks.
- Workers must be alerted to unsafe risks and actions.

Here are some examples of controlling safety like crane and equipment, vehicles, working at highest places and emergency Medical Services:

Crane operations responsibilities：

Many parties are involved in crane operations and they share different responsibilities considering the safety of these operations and they include：

1. Crane Owner

- Providing a crane that meets the user’s requested configuration and capacity.
- Providing all applicable load rating charts and diagrams and additional technical information when requested by crane user; field assembly/disassembly; operation; maintenance info; and placards and warning decals supplied by the manufacturer.
- Establishing inspection, testing and maintenance procedures, and informing the crane user.
- Designating qualified personnel for maintenance, repair, transport, assembly/disassembly and inspections.

- Maintaining data for the rope currently installed on each drum of the crane.

Crane User

ASME defines the “crane user” as the party that arranges the crane’s presence at the site and controls the crane while on site, including ensuring only qualified operators who meet ASME’s standard B30.5 requirements operate the crane.

The crane user also ensures all members of the lift team are aware of their roles and responsibilities.

Other responsibilities include:

- Ensuring compliance with requirements of the current ASME volume.
- Ensuring the crane is operating according to manufacturer’s requirements and the worksite regulations.
- Using only qualified supervisors and operators.

Site Supervisor

The site supervisor is described by ASME as the party that exercises supervisory control over the worksite and the work currently being performed.

In some cases, the site supervisor and the lift director may be the same person.

Other responsibilities include:

- Ensuring the operator meets requirements of the applicable ASME volume.
- Ensuring the crane meets inspection requirements prior to initial use.
- Determining which regulations are applicable to crane operations.
- Ensuring a qualified lift director is designated, rigging is supervised by a qualified person and maintenance is performed by a designated person.
- Ensuring crane operations are coordinated with other jobsite activities.
- Ensuring the area for the crane is adequately prepared, including access roads, sufficient room to assemble/disassemble the crane, ground conditions, proximity to power lines and other hazards and traffic control.

Lift Director

The lift director is described by ASME as the party that directly oversees the work being performed by the crane and the associated rigging crew. According to ASME B30.5, a lift director must be onsite for all lifting operations.

Responsibilities include:

- Halting crane operations if alerted to an unsafe condition.
- Ensuring area preparations are completed before crane operations commence.
- Ensuring necessary traffic controls are in place.
- Ensuring workers understand their responsibilities and the associated hazards.
- Appointing signal people and ensuring they meet the applicable requirements.
- Allowing crane operations near power lines only when applicable requirements are met.

Information and Training :

Workers must be adequately and appropriately :

Inform them of the potential safety and health risks they may experience in their workplace.

Instructions and trainer on the measures available for prevention, control and protection against such threats.

Training :

- Though most of a construction worker's skills can be gained on the job, safety is one skill set that is best learned before works enter the construction site .
- The Occupational Safety and Health Administration (OSHA) and other organizations publish some resources to help businesses train their new laborers on standard safety and security practices, including pamphlets, worksheets, training videos, and even on-site training opportunities.
- Experienced workers should be expected to refresh their knowledge of standard safety by attending regular training sessions throughout the year .
- These training sessions can go over simple things such as fall protection and proper use of ladders, but the goal is to make sure everyone is adequately trained .
- Leaving these training sessions, workers should know what safety measure to do in the case of an incident.

For Vehicles safety measures :

- All lifts will be performed in a safe manner by experienced and trained staff.
- No lifts are performed near the building, services or roads unless the crane rating is reduced to 66% of the codified load at the operating radius.
- All vehicles must only be operated by authorized persons.
- All motorists must have a valid driver's license.
- Do not drive any vehicle within the site at speeds of more than 15 km/h' .
- All vehicles, including a larger pickup, must have a practical backup alarm

- All vehicles entering and exiting the work site with loads that may contain dust and dirt must be properly secured so that no vehicle materials leave.

For working at heights safety measures:

- Workers will be protected at lower levels of tools and falls equipment.
- Workers must use safety belts and helmets.
- All tools and equipment used are properly secured to avoid accidental falls.
- All tools and equipment will be dropped after work is suspended or completed.
- The appropriate ladder is used to access the platform.
- You should not place stairs near the door or on the passenger road.
- Workers must use both hands while climbing or disembarking from the work platform.
- Hand tools and equipment must be carried with a ope or by any other means.

Emergency Medical Services :

- Medical emergency services must be available to every employee in The location of the work.
- One medical program must be created on the job site.
- Appropriately trained staff must be present in sufficient numbers and be responsible for providing first aid procedures in case of injury Employee or any other emergencies.
- At least one first aid kit must be provided to each crew saved in an air-resistant container.
- The contents of the kit must be examined Regularly to ensure that expired items are replaced immediately, these contents must be arranged to be found quickly and remain healthy
- First aid bandages must be kept in an independent and sterile sealed package for each item.
- Other supplies and equipment provided in accordance with the documented recommendations of a licensed and accredited doctor depending on the extent and type of emergency medical care to be provided Given based on the nature of the injury or illness and the ability to transport the injured Person for medical care.

- Medications, disinfectants, eye irrigation solutions and other types of medications will not be included in the first aid package unless they are specifically approved by a licensed and accredited doctor.
- Each employee must be informed of the procedures to be followed in case of injury or illness.
- Appropriate equipment must be provided to transport the injured person to the hospital or doctor, or an effective communication system to contact hospitals or other medical facilities.
- Emergency laundry facilities where anyone's eyes or body can be treated and cleaned must be exposed to hazardous and easily accessible materials.

Personal Protective Equipment:

Head Protection:

Workers shallwear hard hats when there is a potential risk of any injury to the head that can be caused by falling object or any other hazards.

Eye and face Protection:

Safety glasses or face shields are worn at work operations that can cause objects getting into the eye or harming the face of the employee. These protections are selected according to the type of activity and its potential hazards.

Foot Protection

Safety boots should be worn at all times to prevent injuries resulting from working around heavy machinery and presence of metals or glass on ground of the sit.

Hand Protection:

Workers should wear gloves which are appropriate to their specific jobs.

Safety signs:

We can reduce workplace accidents and promote construction site safety by:

1-Awareness:

- Before any worker — no matter his or her role or experience level — can set foot on a construction site, he or she must be fully aware of the possible hazards .
- Ignorant workers are perhaps the biggest dangers in any industry, as their unknowing mistakes put everyone else at risk .
- Understanding of perils at hand and sustaining a perpetual state of alertness is perhaps the number-one best way to prevent accidents.
- To become aware of such risks and how to avoid them, see OSHA Safety Check Lists.
- Every single person that steps foot onto a construction site should be aware of the risks associated with the job and how to prevent them with their knowledge of construction site safety.

2- Construction Site Safety Precautions You Might Be Skipping:

1-Fall protection — residential construction

Standard 29 CFR 1926.501(b) (13):

- There's a much higher risk of falls from roofs in the residential construction sector than in any other sector. Residential contractors must provide the same fall protection as commercial contractors — for example, safety nets, guard rails, personal fall arrest systems — for anyone working 6 feet or more above lower levels.
- Any fall protection program, for residential construction or otherwise, should begin with a site-specific job hazard analysis, which will determine what kind of safety equipment, including fall protection equipment, is needed. Training workers on the equipment is just as important as providing it. (See number 5 on this list.)

2- Portable ladders not extended 3 feet above landing

Standard n29 CFR 1926.1053(b) (1) (1,452):

- Among construction workers, about 80 percent of fall injuries treated in an emergency room involve a ladder.
- If the ladder is too short to meet the 3-foot requirement, the top of the ladder must be fastened to a secure support and the employer must add a grab rail or similar grasping device to the ladder to help workers mount and dismount it.

3- Eye and face protection

Standard CFR 1926.102(a) (1):

- Dust, grit, tiny pieces of flying metal or wood, splashing chemicals, welding arc — all can damage the eyes. In addition to providing eye and face protection (and conducting a job hazard analysis to determine what protection is needed), employers must ensure that workers who wear prescription lenses either incorporate that prescription into safety glasses or use safety eyewear that fits over their glasses.
- See this article for some helpful PPE tips.

4-Fall protection – unprotected sides and edges

Standard 29 CFR 1926.501(b) (1):

- Falls are the most common cause of fatal injury in construction, and preventing them often involves multiple targeted measures. Any working/walking surface that's 6 feet or more above a lower level must be protected by guardrail systems, safety net systems or personal fall arrest systems.

5-Fall protection – training

Standard 29 CFR 1926.503(a) (1):

- Employers must give training to any employee who might be exposed to fall hazards. Check out OSHA's Fall Prevention Training Guide for tips on providing fall prevention training.
- For more information, watch this quick fall prevention video.

6-Head protection

Standard CFR 1926.100(a):

- " Struck by object" makes the "fatal four" list of construction accidents that cause the most fatalities, as does "electrocution." Hard hats provide some protection against both. Employees who are in danger of head injuries from construction debris, falling objects or electrical shock must wear hardhats or other acceptable protective head gear.

7- Aerial lifts – fall protection

Standard 29 CFR 1926.453(b) (2) v:

- Some two dozen workers die each year in aerial lift-related accidents. Many of those accidents involve falls, so not using fall protection equipment is a major mistake. When working from an aerial lift, employees must wear a body belt attached to either the boom or basket.

8- Fall protection – roofing work on low-sloped roofs

Standard 29 CFR 1926.501(b) (10):

- An employer must provide fall protection to any employee working on a low-slope roof with unprotected edges that are 6 feet or more above lower levels.

9- General safety and health provisions – inspections by a competent person

Standard 29 CFR 1926.20(b) (2):

- The burden to prevent workplace accidents lies with employers. As part of an accident prevention program, employers must assign a competent person to conduct regular inspections of jobsites, materials and equipment to make sure hazards are eliminated or managed.

CHAPTER20

BIM

BIM: building information modeling

Building information modeling (BIM) is one of the most promising recent developments in the architecture, engineering, and construction (AEC) industry.

With BIM technology, an accurate virtual model of a building is digitally constructed.

This model, known as a building information model, can be used for planning, design, con-struction, and operation of the facility.

It helps architects, engineers, and constructors visualize what is to be built in a simulated environment to identify any potential design, construction, or operational issues.

BIM represents a new paradigm within AEC, one that encourages integration of the roles of all stakeholders on a project. In this paper, current trends, benefits, possible risks, and future challenges of BIM for the AEC industry are discussed. The findings of this study provide useful information for AEC industry practitioners considering implementing BIM technology in their project.

From Blueprints to CAD to BIM

In the past, blueprints and drawings were used to express information about a particular building plan. This 2D approach made it very difficult to visualize dimensions and requirements. Next came CAD (Computer Aided Design), which helped drafters see the benefit of plans in a digital environment. Later on, CAD turned 3D, which brought more realistic visuals to blueprints. Now, BIM (Building Information Modeling) is the standard— but it is much more than just a 3D model.

What Is BIM ?

BIM is an acronym for Building Information Modeling or Building Information Management. It is a highly collaborative process that allows architects, engineers, real estate developers, contractors, manufacturers, and other construction professionals to plan, design, and construct a structure or building within one 3D model It can also span into the operation and management of buildings using data that building or structure owners have access to (hence the Building Information

Management). This data allows governments, municipalities, and property managers to make informed decisions based on information derived from the model— even after the building is constructed .

BIM Objects

BIM objects, the components that make up a BIM model, are intelligent, have geometry, and store data. If any element is changed, BIM software updates the model to reflect that change. This allows the model to remain consistent and coordinated throughout the entire process so that structural engineers, architects, MEP engineers, designers, project managers, and contractors can work in a more collaborative environment.

What is BIM used for ?

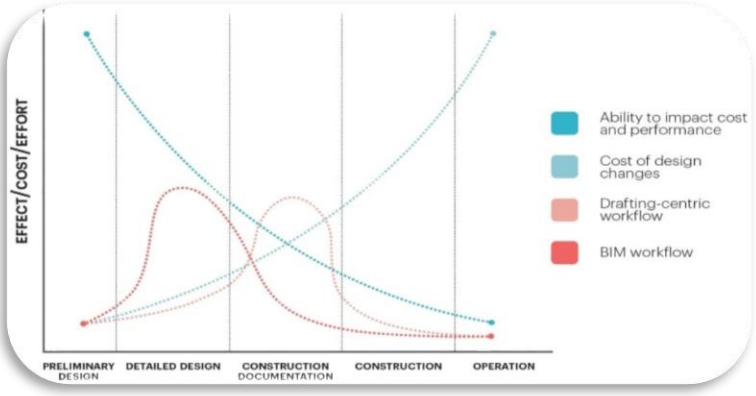
BIM is used to design and document building and infrastructure designs. Every detail of a building is modeled in BIM. The model can be used for analysis to explore design options and to create visualizations that help stakeholders understand what the building will look like before it’s built. The model is then used to generate the design documentation for construction

Why is BIM important ?

According to the UN, by 2050 the world's population will be 9.7 billion. The global AEC industry must look to smarter, more efficient ways to design and build not just as a means to keep up with global demand but to help create spaces that are smarter and more resilient too.

BIM not only allows design and construction teams to work more efficiently, but it allows them to capture the data they create during the process to benefit operations and maintenance activities. This is why BIM mandates are increasing across the globe As the red line in the graph demonstrates, by dynamically connecting design, analysis, and documentation in a BIM

Workflow, most of the effort in a design project is shifted back into the detailed design phase, when the ability to impact project performance is high and the cost of making design changes is low. This allows engineers to spend more time evaluating what-if scenarios to optimise the design, and less time generating construction documentation.



What is the process of BIM ?

The process of BIM supports the creation of intelligent data that can be used throughout the lifecycle of a building or infrastructure project.

- **Plan**

Inform project planning by combining reality capture and real-world data to generate context models of the existing built and natural environment.

- **Design**

During this phase, conceptual design, analysis, detailing and documentation are performed. The preconstruction process begins using BIM data to inform scheduling and logistics.

- **Build**

During this phase, fabrication begins using BIM specifications. Project construction logistics are shared with trades and contractors to ensure optimum timing and efficiency.

- **Operate**

BIM data carries over to operations and maintenance of finished assets. BIM data can be used down the road for cost-effective renovation or efficient deconstruction too.

Now that we've covered what BIM is and how it can be used, let's move on to BIM levels.

What are BIM Levels?

Different levels of BIM can be achieved for various types of projects. Each level represents a different set of criteria that demonstrates a particular level of 'maturity.' BIM levels start with 0 and go to 4D, 5D, and even 6D BIM. The purpose of these levels is to gauge how effectively, or how much information is being shared and managed throughout the entire process.

So what does each level involve, and how can you identify which at which level you're working? Below are brief descriptions of the first three levels and an explanation of what criteria is involved at each stage.

Level 0 BIM

Paper-based drawings + zero collaboration

Level 0 BIM refers to not operating collaboratively at all. If you're using 2D CAD and working with drawings and/or digital prints, you can safely say you're at level 0. Today, most of the industry is working above this level, although not every professional in the industry has sufficient BIM training and some projects do not include the use of BIM in contract specifications.

Level 1 BIM

This is the level at which many companies are currently operating. This typically comprises a mixture of 3D CAD for concept work, and 2D for drafting of statutory approval documentation and Production Information. CAD standards are managed to BS 1192:2007, and electronic sharing of data is carried out from a common data environment (CDE), often managed by the contractor. Models are not shared between project team members.

Level 2 BIM:

Teams work in their own 3D models

Level 2 BIM begins to add in a collaborative environment. BIM Level 2 was actually made a mandatory requirement in April of 2016 on all publicly tendered projects in the UK. France followed shortly after with their own mandate in 2017.

At level 2, all team members use 3D CAD models but sometimes not in the same model. However, the way in which stakeholders exchange information differentiates it from other levels. Information about the design of a built environment is shared through a common file format.

When firms combine this with their own data, they save time, reduce costs, and eliminate the need for rework. Since data is shared this way, the CAD software must be capable of exporting to a common file format, such as IFC (Industry Foundation Class) or COBie (Construction Operations Building Information Exchange) .

BIM level 3 (full integration)

BIM level 3 is the final goal for the construction sector.

The main purpose of this level is to obtain a full integration of information in a cloud-based environment. This is possible using a common shared model that will be available to all the stakeholders of the project who can add or modify their own information.

This model in IFC format is the mile stone that can be shared and preserved in a cloud, so that all the agents can have access to the same information. The project team verifies in real time the effects of the single action on the model.

In this way the entire life cycle of a building, from its designing to its construction and maintenance can be managed. This is a future implementation but the majority of AEC markets all over the world keep focusing on support, formation and education to obtain BIM maturity level 2 capacities.

Future advantages of BIM

BIM level 3 brings important advantages for the construction sector. Here are some of them:

Increased productivity. Sharing information in an easy and fast way allows a substantial increase of productivity. The collaborative working reduces the time to add and modify new information. Greater productivity means lower costs and greater efficiency in terms of project planification.

Big Data. BIM technology offers a help in managing an enormous quantity of data. A more efficiently management of Big Data will change the way in which a lot of professionals work in the construction sector.

New possibilities in smaller markets. BIM technology can optimize the construction process. This element allows the opening and development of new markets that till now did not have the right tools to expand. Thanks to a full or a partial

integrated collaborative model, they will be able to deal with the difficulties that they encounter at the moment.

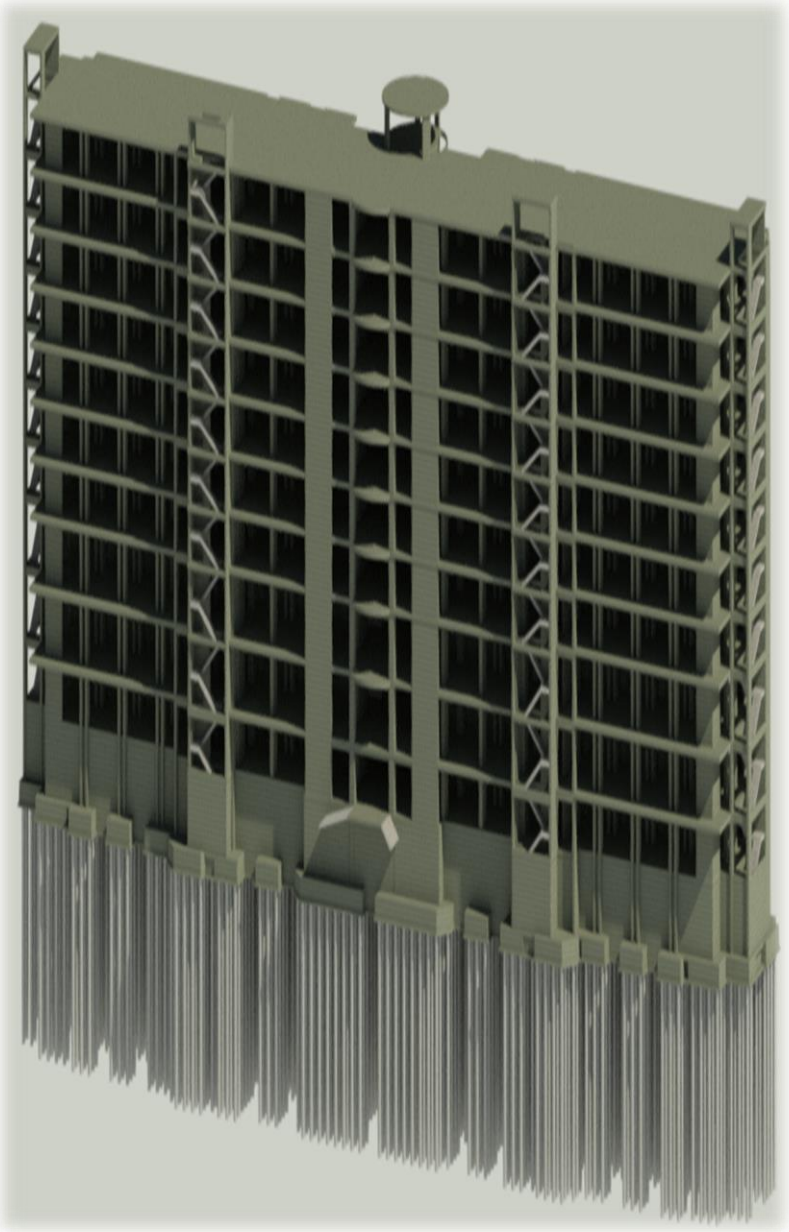
Buildings of higher quality. The ability to manage more precisely a bigger quantity of data allows an outstanding improvement of the quality of buildings. In other words, in the future more complex buildings that have much more to offer to their residents will be designed and built. The environment and modernization of the designed structures can be easily taken in consideration during the construction process.

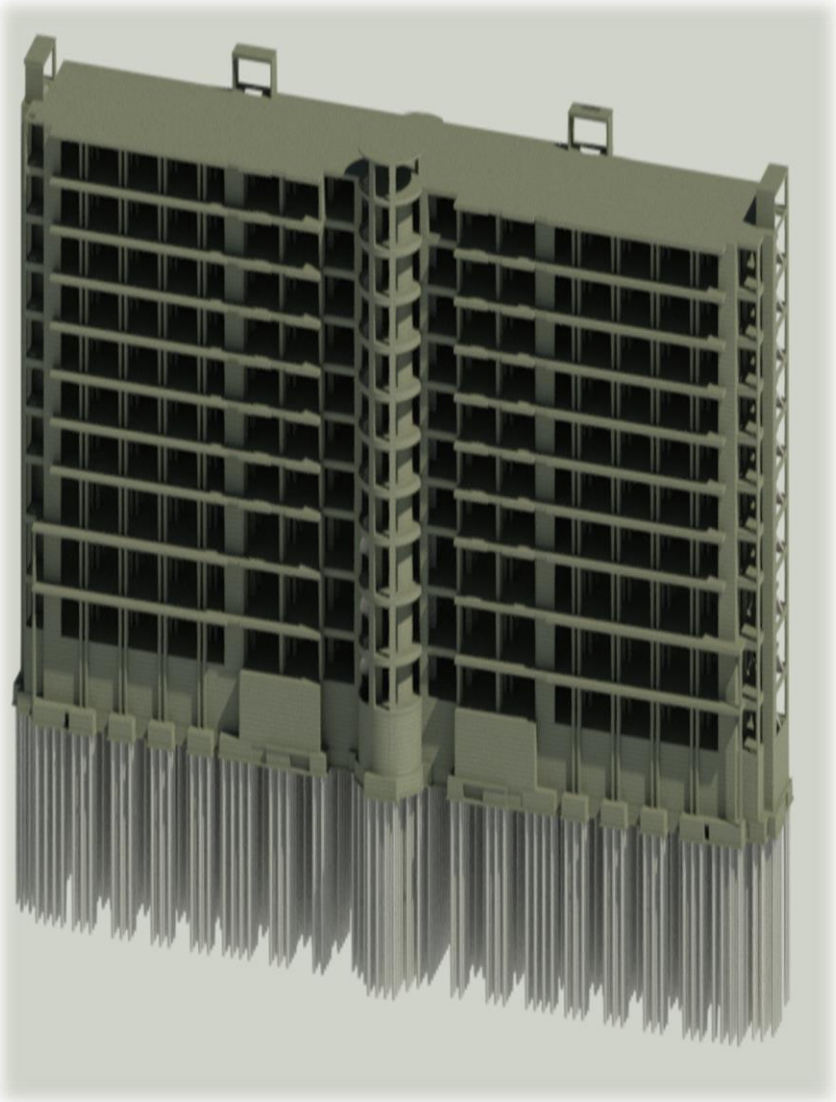
Improved clash detection. Thanks to BIM, the clash detection process is improved drastically. Clash refers to potential errors that emerge during the designing and construction of a building. This process can be managed through BIM technology and IFC files to increase project efficiency.

BIM technology introduces the concept of interoperability in the construction sector.

Construction project management handles the planning, coordination, and execution of a construction project, whether in the agricultural, residential, commercial, institutional, industrial, civil, or environmental industries.

Construction projects typically include hundreds of tasks and multiple phases that require a deep knowledge of the building process and an ability to problem-solve to keep the project on track. Due to the complex, often shifting nature of construction projects, the role of a construction project manager is to keep the project moving according to plan.





Appendix

Quantity survey

٩	خرسانة مسلحة للاساسات	بالمتر المكعب					
	لزوم الهامات						
	هـ 1	2	1.20	2.70	1.40	9.07	
	هـ 2	2	2.70	4.20	1.40	31.75	
	هـ 3	2	2.70	5.70	1.40	43.09	
	هـ 4	2	4.20	4.20	1.40	49.39	
	هـ 5	2	4.20	5.70	1.40	67.03	
	هـ 6	2	4.20	8.70	1.40	102.31	
	هـ 7	2	4.50	5.70	1.40	71.82	
	هـ 8	2	7.20	11.70	1.40	235.87	
	هـ 9	2	30.80		1.40	86.24	
	هـ 10	2	66.37		1.40	185.84	
	هـ 11	2	74.93		1.40	209.80	
	هـ 12	2	253.25		1.40	709.10	
	هـ 13	1	234.40		1.40	328.16	
	الإجمالي						2129.48
	لزوم السملات						
	B1	2	3.54	0.40	1.40	3.96	
	B2	2	2.71	0.40	1.40	3.04	

	15.41	1.40	0.40	3.44	8	B3	
	11.16	1.40	0.40	3.32	6	B4	
	8.76	1.40	0.40	3.91	4	B5	
	1.72	1.40	0.40	1.54	2	B6	
	0.67	1.40	0.40	0.30	4	B7	
	3.92	1.40	0.40	3.50	2	B8	
	0.43	1.40	0.40	0.38	2	B9	
	1.52	1.40	0.40	1.36	2	B10	
	2.79	1.40	0.40	2.49	2	B11	
	4.21	1.40	0.40	1.88	4	B12	
	2.55	1.40	0.40	2.28	2	B13	
	1.24	1.40	0.40	1.11	2	B14	
	1.13	1.40	0.40	1.01	2	B15	
	7.06	1.40	0.40	6.30	2	B16	
	6.09	1.40	0.40	2.72	4	B17	
	3.99	1.40	0.40	3.56	2	B18	
	3.18	1.40	0.40	2.84	2	B19	
	0.80	1.40	0.40	0.71	2	B20	
	0.54	1.40	0.40	0.48	2	B21	
	1.97	1.40	0.25	2.82	2	B22	
	1.09	1.40	0.25	1.55	2	B23	
	0.70	1.40	0.25	1.00	2	B24	
	0.93	1.40	0.25	1.33	2	B25	
	1.68	1.40	0.25	4.80	1	B26	
	0.45	1.40	0.25	1.28	1	B27	
	9.24	1.40	0.25	6.60	4	B28	

	1.25	1.40	0.25	3.58	1	B29	
	1.11	1.40	0.25	3.17	1	B30	
	1.84	1.40	0.25	5.26	1	B31	
	2.03	1.40	0.25	5.81	1	B32	
	3.10	1.40	0.25	4.43	2	B33	
	1.65	1.40	0.25	4.70	1	B34	
	1.67	1.40	0.25	4.77	1	B35	
	3.08	1.40	2.20		1	B36	
	0.92	1.40	0.40	0.55	3	b1	
	1.33	1.40	0.40	2.38	1	b2	
	3.99	1.40	0.40	3.56	2	b3	
	3.96	1.40	0.40	3.54	2	b4	
	3.09	1.40	0.40	2.76	2	b5	
	3.04	1.40	0.40	2.71	2	b6	
	3.21	1.40	0.40	2.87	2	b7	
	15.68	1.40	0.40	2.80	10	b8	
	2.04	1.40	0.40	0.91	4	b9	
	1.56	1.40	0.40	1.39	2	b10	
	1.48	1.40	0.40	1.32	2	b11	
	3.92	1.40	0.40	3.50	2	b12	
	0.78	1.40	0.40	0.70	2	b13	
	0.82	1.40	0.40	0.73	2	b14	
	0.06	1.40	0.40	0.10	1	b15	

	الإجمالي					161.84
	اجمالي البند					**2291.32**
١٠	**خرسانة اساسات الخزان**					**بالمتر المكعب**
	لزوم اللبشة المسلحة للخزان	1	319.30	0.60	191.58	
		1	1.21	1.20	1.45	
	اجمالي البند					**193.032**
١١	**خرسانه مسلحه حوائط و سقف الخزان**					**بالمتر المكعب**
	لزوم حوائط الخزان					
	ح1	3	18.00	0.40	4.70	101.52
	ح2	2	13.20	0.40	4.70	49.63
	ح3	1	13.20	0.40	5.10	26.93
	ح4	2	5.00	0.40	5.14	20.56
	ح5	2	9.70	0.50	0.60	5.82
	ح6	2	9.70	0.50	1.10	10.67
	اجمالي					215.13
	لزوم خرسانة سقف الخزان					
	خرسانة اسقف الخزان	1	319.63	0.30	95.89	
		1	1.21	0.30	0.36	
	تخصيم الفتحات	2	0.64	0.30		0.38
		1	2.88	0.30		0.86

	اجمالي						95.00
	اجمالي البند					**310.134**	
١٢	**خرسانه مسلحه لاعمده المبني وحوائط السند**					**بالمتر المكعب**	
	لزوم خرسانة الحائط السند للبدروم						
	R.Wحوائط المبني	1	255	0.25	4.60	293.14	
	لزوم الاعمده						
	البدروم						
	ع1	2	0.30	1.00	4.60	2.76	
	ع2	4	0.40	1.20	4.60	8.83	
	ع3	28	0.40	1.10	4.60	56.67	
	ع4	40	0.50	1.10	4.60	101.20	
	ع6	2	0.50	1.80	4.60	8.28	
	ع7	2	0.90	0.90	4.60	7.45	
	ع8	4	1.10	1.00	4.60	20.24	
	ع9	2	0.55		4.60	5.06	
	ع10	2	0.40	0.85	4.60	3.13	
	ع11	2	0.29		4.60	2.67	
	ع12	2	0.54		4.60	4.97	
	شمعة	2	0.50	0.50	4.60	2.30	
	ح1	6	0.60	2.00	4.60	33.12	
	ح2	2	0.40	2.46	4.60	9.05	

	10.12	4.60	2.75	0.40	2	ح3
	20.42	4.60	3.70	0.60	2	ح4
	16.56	4.60	3.00	0.30	4	ح5
	8.56	4.60	3.10	0.30	2	ح6
	18.40	4.60	5.00	0.40	2	ح7
	41.22	4.60		2.24	4	ح8
	20.98	4.60		2.28	2	ح9
	22.26	4.60		2.42	2	ح10
	15.82	4.60		1.72	2	ح11
	23.46	4.60		2.55	2	ح12
	2.76	4.60	1.00	0.30	2	ع ط1
	12.42	4.60	1.10	0.45	6	ع ط2
	16.70	4.60	1.10	0.55	6	ع ط3
	6.90	4.60	1.50	0.50	2	ع ط4
	502.31					الإجمالي
						الأرضي
	2.22	3.70	1.00	0.30	2	ع1
	7.10	3.70	1.20	0.40	4	ع2
	45.58	3.70	1.10	0.40	28	ع3
	81.40	3.70	1.10	0.50	40	ع4
	6.66	3.70	1.80	0.50	2	ع6
	5.99	3.70	0.90	0.90	2	ع7

	16.28	3.70	1.00	1.10	4	ع8	
	4.07	3.70		0.55	2	ع9	
	2.52	3.70	0.85	0.40	2	ع10	
	2.15	3.70		0.29	2	ع11	
	4.00	3.70		0.54	2	ع12	
	1.85	3.70	0.50	0.50	2	شنش	
	26.64	3.70	2.00	0.60	6	ح1	
	7.28	3.70	2.46	0.40	2	ح2	
	8.14	3.70	2.75	0.40	2	ح3	
	16.43	3.70	3.70	0.60	2	ح4	
	13.32	3.70	3.00	0.30	4	ح5	
	6.88	3.70	3.10	0.30	2	ح6	
	14.80	3.70	5.00	0.40	2	ح7	
	33.15	3.70		2.24	4	ح8	
	16.87	3.70		2.28	2	ح9	
	17.91	3.70		2.42	2	ح10	
	12.73	3.70		1.72	2	ح11	
	18.87	3.70		2.55	2	ح12	
	2.22	3.70	1.00	0.30	2	ع ط1	

	10.99	3.70	1.10	0.45	6	ع ط2	
	13.43	3.70	1.10	0.55	6	ع ط3	
	5.55	3.70	1.50	0.50	2	ع ط4	
	405.03					اجمالي خرسانه اعمده البدروم	
						الدور الاول والثاني	
	2.43	4.05	1.00	0.30	2	ع1	
	7.78	4.05	1.20	0.40	4	ع2	
	49.90	4.05	1.10	0.40	28	ع3	
	89.10	4.05	1.10	0.50	40	ع4	
	7.29	4.05	1.80	0.50	2	ع6	
	5.85	4.05	0.85	0.85	2	ع7	
	16.04	4.05	0.90	1.10	4	ع8	
	4.46	4.05		0.55	2	ع9	
	2.75	4.05	0.85	0.40	2	ع10	
	2.35	4.05		0.29	2	ع11	
	4.37	4.05		0.54	2	ع12	
	2.03	4.05	0.50	0.50	2	شنش	
	29.16	4.05	2.00	0.60	6	ح1	
	7.97	4.05	2.46	0.40	2	ح2	

	8.91	4.05	2.75	0.40	2	ح3	
	17.98	4.05	3.70	0.60	2	ح4	
	14.58	4.05	3.00	0.30	4	ح5	
	7.53	4.05	3.10	0.30	2	ح6	
	16.20	4.05	5.00	0.40	2	ح7	
	36.29	4.05		2.24	4	ح8	
	18.47	4.05		2.28	2	ح9	
	19.60	4.05		2.42	2	ح10	
	13.93	4.05		1.72	2	ح11	
	20.66	4.05		2.55	2	ح12	
	2.43	4.05	1.00	0.30	2	ع ط1	
	12.03	4.05	1.10	0.45	6	ع ط2	
	14.70	4.05	1.10	0.55	6	ع ط3	
	6.08	4.05	1.50	0.50	2	ع ط4	
	440.85					اجمالي اعمده الدور الواحد	
	881.71					اجمالي خرسانة اعمده الدورين	
						الدور الثالث و الرابع	
	1.70	3.15	0.90	0.30	2	ع1	

	5.29	3.15	1.20	0.35	4	ع2	
	38.81	3.15	1.10	0.40	28	ع3	
	62.37	3.15	1.10	0.45	40	ع4	
	5.10	3.15	1.80	0.45	2	ع6	
	4.03	3.15	0.80	0.80	2	ع7	
	11.09	3.15	0.80	1.10	4	ع8	
	3.47	3.15		0.55	2	ع9	
	2.14	3.15	0.85	0.40	2	ع10	
	1.83	3.15		0.29	2	ع11	
	3.40	3.15		0.54	2	ع12	
	22.68	3.15	2.00	0.60	6	ح1	
	6.20	3.15	2.46	0.40	2	ح2	
	6.93	3.15	2.75	0.40	2	ح3	
	13.99	3.15	3.70	0.60	2	ح4	
	11.34	3.15	3.00	0.30	4	ح5	
	5.86	3.15	3.10	0.30	2	ح6	
	12.60	3.15	5.00	0.40	2	ح7	
	28.22	3.15		2.24	4	ح8	
	14.36	3.15		2.28	2	ح9	

	15.25	3.15		2.42	2	ح10	
	10.84	3.15		1.72	2	ح11	
	16.07	3.15		2.55	2	ح12	
	1.89	3.15	1.00	0.30	2	ع ط1	
	7.28	3.15	1.10	0.35	6	ع ط2	
	9.36	3.15	1.10	0.45	6	ع ط3	
	3.78	3.15	1.50	0.40	2	ع ط4	
325.86						اجمالي اعمده الدور الواحد	
651.72						اجمالي خرسانة اعمده الدورين	
						الخامس والسادس	
	1.51	3.15	0.80	0.30	2	ع1	
	4.54	3.15	1.20	0.30	4	ع2	
	38.81	3.15	1.10	0.40	28	ع3	
	55.44	3.15	1.10	0.40	40	ع4	
	4.54	3.15	1.80	0.40	2	ع6	
	3.54	3.15	0.75	0.75	2	ع7	
	9.70	3.15	0.70	1.10	4	ع8	
	3.47	3.15		0.55	2	ع9	

	2.14	3.15	0.85	0.40	2	ع10	
	1.83	3.15		0.29	2	ع11	
	3.40	3.15		0.54	2	ع12	
	22.68	3.15	2.00	0.60	6	ح1	
	6.20	3.15	2.46	0.40	2	ح2	
	6.93	3.15	2.75	0.40	2	ح3	
	13.99	3.15	3.70	0.60	2	ح4	
	11.34	3.15	3.00	0.30	4	ح5	
	5.86	3.15	3.10	0.30	2	ح6	
	12.60	3.15	5.00	0.40	2	ح7	
	28.22	3.15		2.24	4	ح8	
	14.36	3.15		2.28	2	ح9	
	15.25	3.15		2.42	2	ح10	
	10.84	3.15		1.72	2	ح11	
	16.07	3.15		2.55	2	ح12	
	1.89	3.15	1.00	0.30	2	ع ط1	
	7.28	3.15	1.10	0.35	6	ع ط2	
	9.36	3.15	1.10	0.45	6	ع ط3	

	3.78	3.15	1.50	0.40	2	ع ط4	
	315.54					اجمالي اعمده الدور الواحد	
	631.09					اجمالي خرسانة اعمده الدورين	
						السابع والثامن	
	1.32	3.15	0.70	0.30	2	ع1	
	4.16	3.15	1.10	0.30	4	ع2	
	38.81	3.15	1.10	0.40	28	ع3	
	48.51	3.15	1.10	0.35	40	ع4	
	3.97	3.15	1.80	0.35	2	ع6	
	3.09	3.15	0.70	0.70	2	ع7	
	8.32	3.15	0.60	1.10	4	ع8	
	3.47	3.15		0.55	2	ع9	
	2.14	3.15	0.85	0.40	2	ع10	
	1.83	3.15		0.29	2	ع11	
	3.40	3.15		0.54	2	ع12	
	22.68	3.15	2.00	0.60	6	ح1	
	6.20	3.15	2.46	0.40	2	ح2	
	6.93	3.15	2.75	0.40	2	ح3	

	13.99	3.15	3.70	0.60	2	ح4	
	11.34	3.15	3.00	0.30	4	ح5	
	5.86	3.15	3.10	0.30	2	ح6	
	12.60	3.15	5.00	0.40	2	ح7	
	28.22	3.15		2.24	4	ح8	
	14.36	3.15		2.28	2	ح9	
	15.25	3.15		2.42	2	ح10	
	10.84	3.15		1.72	2	ح11	
	16.07	3.15		2.55	2	ح12	
	1.89	3.15	1.00	0.30	2	ع ط1	
	6.24	3.15	1.10	0.30	6	ع ط2	
	7.28	3.15	1.10	0.35	6	ع ط3	
	2.84	3.15	1.50	0.30	2	ع ط4	
	301.57					اجمالي اعمده الدور الواحد	
	603.15					اجمالي خرسانة اعمده الدورين	
						الدور التاسع	
	1.13	3.15	0.60	0.30	2	ع1	
	3.78	3.15	1.00	0.30	4	ع2	

	38.81	3.15	1.10	0.40	28	ع3	
	41.58	3.15	1.10	0.30	40	ع4	
	3.40	3.15	1.80	0.30	2	ع6	
	2.66	3.15	0.65	0.65	2	ع7	
	6.93	3.15	0.50	1.10	4	ع8	
	3.47	3.15		0.55	2	ع9	
	2.14	3.15	0.85	0.40	2	ع10	
	1.83	3.15		0.29	2	ع11	
	3.40	3.15		0.54	2	ع12	
	22.68	3.15	2.00	0.60	6	ح1	
	6.20	3.15	2.46	0.40	2	ح2	
	6.93	3.15	2.75	0.40	2	ح3	
	13.99	3.15	3.70	0.60	2	ح4	
	11.34	3.15	3.00	0.30	4	ح5	
	5.86	3.15	3.10	0.30	2	ح6	
	12.60	3.15	5.00	0.40	2	ح7	
	28.22	3.15		2.24	4	ح8	
	14.36	3.15		2.28	2	ح9	

	ح10	2	2.42		3.15	15.25	
	ح11	2	1.72		3.15	10.84	
	ح12	2	2.55		3.15	16.07	
	ع ط1	2	0.30	1.00	3.15	1.89	
	ع ط2	6	0.30	1.10	3.15	6.24	
	ع ط3	6	0.35	1.10	3.15	7.28	
	ع ط4	2	0.30	1.50	3.15	2.84	
	اجمالي خرسانه اعمده الدور	291.70					
	اعمده شخشيه السلم بالسطح						
	ع2	4	0.30	1.00	2.90	3.48	
	ع11	2	0.29		2.90	1.68	
	ع12	2	0.54		2.90	3.13	
	ح11	2	1.72		2.90	9.98	
	ح12	2	2.55		2.90	14.79	
	اجمالي اعمده الشخشيخه	33.06					
	اجمالي البند	**4292.90785**					
١٣	**خرسانه مسلحه لزوم البلاطات و الكمرات و السلالم**	**بالمتر المكعب**					

لزوم البلاطات الخرسانية							
	البدروم						
	بلاطة السلاملك	1	47.37		0.20	9.47	
		1	6.59		0.20	1.32	
	بلاطة الحمام	4	12.32		0.15	1.85	
		2	7.10		0.15	1.07	
	ss1	2	112.84		0.25	28.21	
	ss2	1	908.03		0.35	317.81	
	sr12	2	26.25		0.25	6.56	
	خصم الفتحات	2	1.57		0.25		0.79
	sr22	2	13.77		0.20	5.51	
	خصم الفتحات	2	1.15		0.20		0.23
	sr23	1	19.50		0.20	3.90	
	خصم الفتحات	1	2.61		0.20		0.52
	srr23	1	19.50		0.15	2.93	
	خصم الفتحات	1	3.14		0.15		0.47
	اجمالي الخصم و الاضافه					378.62	2.01
	اجمالي بلاطات البدروم					376.61	

						الدور الأرضي و الأول والثاني	
	9.47	0.20		47.37	1	بلاطة السلاملك	
	1.32	0.20		6.59	1		
	1.85	0.15		12.32	4	بلاطة الحمام	
	1.07	0.15		7.10	2		
	28.21	0.25		112.84	2	ss1	
	317.81	0.35		908.03	1	ss2	
	6.56	0.25		26.25	2	sr12	
0.79		0.25		1.57	2	خصم الفتحات	
	5.51	0.20		13.77	2	sr22	
0.23		0.20		1.15	2	خصم الفتحات	
	3.90	0.20		19.50	1	sr23	
0.52		0.20		2.61	1	خصم الفتحات	
	2.93	0.15		19.50	1	srr23	
0.47		0.15		3.14	1	خصم الفتحات	
	70.03	0.25		140.06	2	cantlevers	
0.08		0.25		0.33	1	خصم الفتحات	
	16.98	0.35		24.25	2	cantlevers	
2.09	465.63					اجمالي الخصم و الاضافه	

	اجمالي بلاطات الدور الواحد					**463.54**
	اجمالي بلاطات الارضي و الاول و الثاني					1390.61
	الأدوار المتكررة					
	بلاطة السلاملك	1	47.37	0.20	9.47	
		1	6.59	0.20	1.32	
	بلاطة الحمام	4	12.32	0.15	1.85	
		2	7.10	0.15	1.07	
	ss1	2	112.84	0.25	28.21	
	ss2	1	908.03	0.35	317.81	
	sr12	2	26.25	0.25	6.56	
	خصم الفتحات	2	1.57	0.25		0.79
	sr22	2	13.77	0.20	5.51	
	خصم الفتحات	2	1.15	0.20		0.23
	sr23	1	19.50	0.20	3.90	
	خصم الفتحات	1	2.61	0.20		0.52
	srr23	1	19.50	0.15	2.93	
	خصم الفتحات	1	3.14	0.15		0.47
	cantlevers	1	9.00	0.25	2.25	
	cantlevers	2	140.06	0.25	70.03	

	خصم الفتحات	1	0.33		0.25		0.08
	cantlevers	2	52.65		0.35	36.86	
	اجمالي الخصم و الاضافه					487.76	2.09
	اجمالي بلاطات الدور الواحد					**485.67**	
	اجمالي بلاطات المتكرر	3885.33					
	الدور الأخير						
	بلاطة السلالم	2	24.37		0.25	12.19	
		2	20.43		0.25	10.22	
	بلاطة السلالم	1	47.37		0.20	9.47	
		1	6.59		0.20	1.32	
	اجمالي بلاطه الدور الاخير	33.19					
	البلاطة الرابطة بين الهامات	1	987.80		0.25	**246.95**	
	اجمالي خرسانه البلاطات بالمبني	**5932.69**					
	لزوم الكمرات						
	البدروم						
	ك 1	8	3.15	0.25	0.60	3.78	
	ك 2	2	2.40	0.25	0.60	0.72	
	ك 3	2	2.70	0.25	0.60	0.81	

	1.40	0.60	0.25	4.65	2	ك 4	
	0.88	0.70	0.25	1.25	4	ك 5	
	1.04	0.60	0.48	1.80	2	ك 6	
	1.18	0.60	0.25	3.94	2	ك 7	
	0.57	0.60	0.25	1.90	2	ك 8	
	1.16	0.60	0.25	3.87	2	ك 9	
	0.90	0.60	0.25	1.50	4	ك 10	
	1.89	0.60	0.25	6.30	2	ك 11	
	2.61	0.60	0.25	4.35	4	ك 12	
	1.01	0.60	0.25	3.38	2	ك 13	
	0.52	0.60	0.25	3.45	1	ك 14	
	1.58	0.60	0.25	5.28	2	ك 15	
	0.29	0.70	0.12	3.50	1	ك 16	
	0.13	0.70	0.12	1.50	1	ك 17	
	1.40	0.50	0.25	5.59	2	ك 18	
	0.53	0.50	0.12	4.40	2	ك 19	
	1.02	0.60		0.85	2	ك 20	
	0.13	0.60		0.11	2	ك 21	

	0.35	0.60		0.30	2	ك 22	
	23.90					اجمالي كمرات البدروم	
						الأرضي والادوار المتكرره	
	3.78	0.60	0.25	3.15	8	ك 1	
	0.72	0.60	0.25	2.40	2	ك 2	
	1.62	0.60	0.25	2.70	4	ك 3	
	1.40	0.60	0.25	4.65	2	ك 4	
	0.88	0.70	0.25	1.25	4	ك 5	
	1.04	0.60	0.48	1.80	2	ك 6	
	1.18	0.60	0.25	3.94	2	ك 7	
	1.14	0.60	0.25	1.90	4	ك 8	
	0.90	0.60	0.25	1.50	4	ك 9	
	3.78	0.60	0.25	6.30	4	ك 10	
	2.61	0.60	0.25	4.35	4	ك 11	
	1.01	0.60	0.25	3.38	2	ك 12	
	1.55	0.60	0.25	3.45	3	ك 13	
	1.58	0.60	0.25	5.28	2	ك 14	
	0.29	0.70	0.12	3.50	1	ك 15	

	0.13	0.70	0.12	1.50	1	ك 16	
	1.40	0.50	0.25	5.59	2	ك 17	
	0.53	0.50	0.12	4.40	2	ك 18	
	1.02	0.60		0.85	2	ك 19	
	0.13	0.60		0.11	2	ك 20	
	0.35	0.60		0.30	2	ك 21	
	2.94	0.60	0.25	2.45	2	ك 22	
	7.76	0.60	0.25	6.47	2	ك 23	
	7.30	0.60	0.12	3.04	4	ك 24	
	6.71	0.60	0.12	5.59	2	ك 25	
	3.81	0.60	0.25	6.35	1	ك 26	
	3.98	0.60	0.25	3.32	2	ك 27	
	0.41	0.60		0.69	1	ك 28	
	4.64	0.60	0.25	3.87	2	ك 29	
	1.87	0.60		1.56	2	ك 30	
	66.47					اجمالي كمرات الدور الواحد	
	664.72					اجمالي كمرات الارضي و المتكرر	
						كمرات شخشيخه السلم بالدور الأخير	

	4.64	0.60	0.25	3.87	2	ك 29	
	7.76	0.60	0.25	6.47	2	ك 23	
	0.81	0.60	0.25	2.70	2	ك 3	
	3.78	0.60	0.25	6.30	4	ك10	
	0.45	0.60	0.25	1.50	2	ك9	
	0.41	0.60		0.69	1	ك 28	
	1.87	0.60		1.56	2	ك 30	
	1.02	0.60		0.85	2	ك 19	
	20.75					اجمالي كمرات الشخشيخه	
	709.37					**اجمالي خرسانه الكمرات بالمبني**	
لزوم السلالم							
	2337.00	2337.00			1		
	2337.00					**اجمالي خرسانه السلالم بالمبني**	
	8979.06					**اجمالي البند**	
بالمتر المكعب						**خرسانه مسلحه لزوم الاعتاب**	**١٤**
	100.00	100.00			1		
	100					**اجمالي البند**	

دفتر حصر الاعمال								
رقم البند	البند	عدد	مقاسات			كميات	
			طول	عرض	ارتفاع	اضافة	خصم
اعمال المباني							
مباني 25 سم							
	الدور البدروم						
	مباني I						
	محور هـ - هـ	١.٠	٢.٠٠٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٢.٠٠٠٠	
	محور ح-ح	١.٠	٣.٩٠٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٣.٩٠٠٠	
	محور3-3	١.٠	٦.٢٠٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٦.٢٠٠٠	
	محور 4-4	١.٠	٨.٢٥٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٨.٢٥٠٠	
	محور 11-11	١.٠	٦.٨٨٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٦.٨٨٠٠	
	محور 14-14	١.٠	٩.٠٥٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٩.٠٥٠٠	
	تخصيم الأبواب ب4	٢.٠	١.٠٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		١.١٠٠٠
	تخصيم الأبواب ب14	٢.٠	١.٢٠٠٠	٠.٢٠٠٠	٢.٢٠٠٠		١.٠٥٦٠
	تخصيم الأبواب ب3	١.٠	١.٨٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		٠.٩٩٠٠
	مبانى II						
	محور 1_1	١.٠	١٣.٣٠٠٠	٠.٢٥٠٠	٤.٠٠٠٠	١٣.٣٠٠٠	
	محور 4_4	١.٠	٤.٣٥٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٤.٣٥٠٠	
	محور 11 _ 11	١.٠	٤.٣٥٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٤.٣٥٠٠	
	محور 14 _ 14	١.٠	٨.٦٥٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٨.٦٥٠٠	
	محور 15 _ 15	١.٠	٥.٦٥٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٥.٦٥٠٠	
	محور هـ_هـ	١.٠	١٣.٨٥٠٠	٠.٢٥٠٠	٤.٠٠٠٠	١٣.٨٥٠٠	

	محور د_د	١.٠	٨.٦٦٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٨.٦٦٠٠	
	محور ح_ح	١.٠	٦.٩٢٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٦.٩٢٠٠	
	خصم ب4	٢.٠	١.٠٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		١.١٠٠٠
	خصم ب3	١.٠	١.٨٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		٠.٩٩٠٠
	مبانى III						
	محور 1_1	١.٠	٨.٥٧٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٨.٥٧٠٠	
	محور 4_4	١.٠	٨.٢٤٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٨.٢٤٠٠	
	محور 11 _ 11	١.٠	٦.٥٠٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٦.٥٠٠٠	
	محور 12 _ 12	١.٠	٦.٤٠٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٦.٤٠٠٠	
	محور هـ _هـ	١.٠	٢.٠٠٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٢.٠٠٠٠	
	محور ح_ح	١.٠	٣.٩٠٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٣.٩٠٠٠	
	بين محوري ب_ب ج_ج	١.٠	١.٥٠٠٠	٠.٢٥٠٠	٤.٠٠٠٠	١.٥٠٠٠	
	بين محوري 5_5 6_6	١.٠	٣.٥٠٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٣.٥٠٠٠	
	بين محوري 6_6 7_7	١.٠	٣.٩٥٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٣.٩٥٠٠	
	بين محوري9_9 10_10	١.٠	٤.٧٠٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٤.٧٠٠٠	
	بين محوري10_ 10 11_11	١.٠	٤.٠٠٠٠	٠.٢٥٠٠	٤.٠٠٠٠	٤.٠٠٠٠	
	خصم ب4	١.٠	١.٠٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		٠.٥٥٠٠
	خصم ب14	٢.٠	١.٢٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		١.٣٢٠٠
	خصم ب18	١.٠	١.٨٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		٠.٩٩٠٠
	خصم ب3	٢.٠	١.٨٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		١.٩٨٠٠
إجـمـــــــــــــالـيات						١٥٥.٢٧	١٠.٠٨
إجـمـــــــــــــالـي الدور البدروم						١٤٥.١٩	

	الدور الارضي						
	مبانى I						
	محور 1_1	١.٠	٦.٣٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٥.٧٤٨٨	
	محور 3_3	١.٠	٦.٣٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٥.٧٤٨٨	
	محور 4-4	١.٠	٦.٣٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٥.٧٤٨٨	
	بين محوري 5_5 6_6	١.٠	٢.٥٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٢.٢٨١٣	
	محور 8_8	١.٠	١.٥٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	١.٣٦٨٨	
	محور 10-10	١.٠	٢.٥٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٢.٢٨١٣	
	محور 11_11	١.٠	٥.٤٨٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٥.٠٠٠٥	
	بين محوري 12_12 13_13	١.٠	٢.٥٠٠٠	٠.٢٠٠٠	٣.٦٥٠٠	١.٨٢٥٠	
	محور 14-14	١.٠	٧.٨٤٥٠	٠.٢٥٠٠	٣.٦٥٠٠	٧.١٥٨٦	
	محور أ_أ	١.٠	١٧.٩٧٠٠	٠.٢٥٠٠	٣.٦٥٠٠	١٦.٣٩٧٦	
	بين محوري أ_أ ب_ب	١.٠	١.٢٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	١.٠٩٥٠	
	محور ج_ج	١.٠	١.٦٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	١.٦٤٢٥	
	بين محوري و_و ز_ز	١.٠	١.٨٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	١٥.٨٤٥٦	
	محور ز_ز	١.٠	١٧.٣٦٥٠	٠.٢٥٠٠	٣.٦٥٠٠	٢.٤٣٦٤	
	محور ح_ح	١.٠	٢.٦٧٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٤.٨٠٨٩	
	محور ط_ط	١.٠	٥.٢٧٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٠.٧٣٠٠	
	تخصيم ش6	٣.٠	٠.٨٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		١.٣٢٠٠
	تخصيم ش18	١.٠	١.٨٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		٠.٩٩٠٠
	مبانىII						
	حوائط السلم	١.٠	١٦.٨٣٠٠	٠.٢٥٠٠	٣.٦٥٠٠	١٥.٣٥٧٤	
	محور ج_ج	١.٠	٢.٦٨٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٢.٤٤٥٥	
	محورهـ_هـ	١.٠	١٧.٧٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	١٦.١٥١٣	

	محور ح_ح	١.٠	٤.١٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٣.٧٤١٣	
	محور ج_ج	١.٠	٢.٦٨٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٢.٤٤٥٥	
	محور 1_1	١.٠	٧.٤٥٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٦.٧٩٨١	
	محور 4_4	١.٠	٢.٠٤٠٠	٠.٢٥٠٠	٣.٦٥٠٠	١.٨٦١٥	
	محور 11_11	١.٠	١.٦٥٠٠	٠.٢٥٠٠	٣.٦٥٠٠	١.٥٠٥٦	
	محور 13_13	١.٠	٢.٢٣٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٢.٠٣٤٩	
	محور15_15	١.٠	٧.٨٥٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٧.١٦٣١	
	بين محوري و_و ز_ز	١.٠	٣.٧٥٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٣.٤٢١٩	
	بين محوري 5_5 6_6	١.٠	٤.٦٥٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٠.٧٣٠٠	
	تخصيم ش6	٣.٠	٠.٨٠٠٠	٠.٢٥٠٠	١.٧٠٠٠		٢.٩٣٢٥
	تخصيم ش4	٤.٠	٢.٣٠٠٠	٠.٢٥٠٠	١.٧٠٠٠		٣.٩١٠٠
	خصم ب 4	١.٠	١.٠٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		٠.٥٥٠٠
	مبانى III						
	محور أ_أ	١.٠	٢٣.٢٥٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٢١.٢١٥٦	
	محور ب_ب	١.٠	٣.٧٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٣.٣٧٦٣	
	محور ز_ز	١.٠	١٧.٧٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	١٦.١٥١٣	
	محور ح_ح	١.٠	٤.١٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٣.٧٤١٣	
	محور ط_ط	١.٠	٦.٧٥٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٦.١٥٩٤	
	محور 1_1	١.٠	٧.٤٥٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٦.٧٩٨١	
	محور 4_4	١.٠	٥.٦٦٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٥.١٦٤٨	
	محور 9_9	١.٠	٥.٦٦٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٥.١٦٤٨	
	محور 11_11	١.٠	٦.٠٠٠٠	٠.٢٥٠٠	٣.٦٥٠٠	٥.٤٧٥٠	

	محور12 _12	١.٠	٥.٩٨٠٠	٠.٢٥٠	٣.٦٥٠	٥.٤٥٦٨	
	محور 13 _13	١.٠	٢.٣٠٠٠	٠.٢٥٠	٣.٦٥٠	٢.٠٩٨٨	
	محور 14_14	١.٠	٦.٧٥٠٠	٠.٢٥٠	٣.٦٥٠	٠.٥٤٧٥	
	بين محوري و_و ز_ز	١.٠	٠.٦٠٠٠	٠.٢٥٠	٣.٦٥٠	٠.٤٥٦٣	
	بين محوري أ_أ ب_ب	١.٠	٠.٥٠٠٠	٠.٢٥٠	٣.٦٥٠	٠.٤٥٦٣	
	تخصيم ش6	١٤.٠	٠.٨٠٠٠	٠.٢٥٠	١.٧٠٠		٤.٧٦٠٠
	تخصيم ش16	١.٠	٠.٨٠٠٠	٠.٢٥٠	٣.٦٥٠		٠.٧٣٠٠
إجـمـــــــــــــالـيات						٢٢٦.٠٤	١٥.١٩٢٥
إجـمـــــــــــــالـي الدور الارضي						٢١٠.٨٤	
	الدور الاول						
	مبانىI						
	محور أ-أ	١.٠	٢٣.٥٧٠٠	٠.٢٥٠	٤.٢٥٠	٢٥.٠٤٣١	
	محور ب-ب	١.٠	٤.٩٦٠٠	٠.٢٥٠	٤.٢٥٠	٥.٢٧٠٠	
	محور د-د	١.٠	١٥.٢٥٠٠	٠.٢٥٠	٤.٢٥٠	١٦.٢٠٣١	
	محور ز-ز	١.٠	٢٧.٤٧٠٠	٠.٢٥٠	٤.٢٥٠	٢٩.١٨٦٩	
	محور ح-ح	١.٠	٣.٨٧٠٠	٠.٢٥٠	٤.٢٥٠	٤.١١١٩	
	محور ط-ط	١.٠	٦.٤٧٠٠	٠.٢٥٠	٤.٢٥٠	٦.٨٧٤٤	
	محور 1-1	١.٠	٦.٣٠٠٠	٠.٢٥٠	٤.٢٥٠	٦.٦٩٣٨	
	محور 2-2	١.٠	١.٩٥٠٠	٠.٢٠٠	٤.٢٥٠	١.٦٥٧٥	
	محور 3-3	١.٠	٦.٣٠٠٠	٠.٢٥٠	٤.٢٥٠	٦.٦٩٣٨	
	محور 4-4	١.٠	٥.٠٠٠٠	٠.٢٥٠	٤.٢٥٠	٥.٣١٢٥	
	محور 6-6	١.٠	٢.٥٠٠٠	٠.٢٥٠	٤.٢٥٠	٢.٦٥٦٣	

	محور 8-8	١.٠	٢.٥٠٠٠	٠.٢٥٠	٤.٢٥٠	٢.٦٥٦٣	
	محور 10-10	١.٠	٢.٥٠٠٠	٠.٢٥٠	٤.٢٥٠	٢.٦٥٦٣	
	محور 12-12	١.٠	٢.٥٠٠٠	٠.٢٥٠	٤.٢٥٠	٢.٦٥٦٣	
	محور 14-14	١.٠	٢.٥٠٠٠	٠.٢٥٠	٤.٢٥٠	٢.٦٥٦٣	
	تخصيم الأبواب ب4-ب2-ب11-ب8-ب8	٥.٠	١.٠٠٠٠	٠.٢٥٠	٢.٢٠٠		٢.٧٥٠٠
	تخصيم الأبواب ب3	١.٠	١.٨٠٠٠	٠.٢٥٠	٢.٢٠٠		٠.٩٩٠٠
	مبانى II						
	محور 1-1	١.٠	٦.٤٠٠٠	٠.٢٥٠	٤.٢٥٠	٦.٨٠٠٠	
	محور 2_2	١.٠	٩.٩٥٠٠	٠.٢٥٠	٤.٢٥٠	١٠.٥٧١٩	
	محور 4_4	١.٠	٨.٣٠٠٠	٠.٢٥٠	٤.٢٥٠	٨.٨١٨٨	
	محور11_11	١.٠	٤.٥٠٠٠	٠.٢٥٠	٤.٢٥٠	٤.٧٨١٣	
	محور 15_15	١.٠	٨.٦٥٠٠	٠.٢٥٠	٤.٢٥٠	٩.١٩٠٦	
	أعلي محور أ_أ	١.٠	٢٣.٦٥٠٠	٠.٢٥٠	٤.٢٥٠	٢٥.١٢٨١	
	بين محوري ب_ب ج_ج	١.٠	٦.٤٥٠٠	٠.٢٥٠	٤.٢٥٠	٦.٨٥٣١	
	محور ج_ج	١.٠	٢.٦٠٠٠	٠.٢٠٠	٤.٢٥٠	٢.٢١٠٠	
	محور د_د	١.٠	١١.٣٥٠٠	٠.٢٥٠	٤.٢٥٠	١٢.٠٥٩٤	
	محور ز_ز	١.٠	٩.٥٥٠٠	٠.٢٥٠	٤.٢٥٠	١٠.١٤٦٩	
	محور ح_ح	١.٠	١٣.٦٥٠٠	٠.٢٥٠	١.٢٠٠	٤.٠٩٥٠	
	خصم باب المصعد زوار	٢.٠	١.١٠٠٠	٠.٢٥٠	٢.٢٠٠		١.٢١٠٠
	خصم باب المصعد عمليات	١.٠	٣.١٠٥٠	٠.٢٥٠	٢.٢٠٠		١.٧٠٧٨
	خصم ش6	٢٠.٠	٠.٨٠٠٠	٠.٢٥٠	١.٧٠٠		٦.٨٠٠٠
	خصم ب4	٤.٠	١.٠٠٠٠	٠.٢٥٠	٢.٢٠٠		٢.٢٠٠٠
	مبانى III						
	محور 1-1	١.٠	١٠.٠٠٠٠	٠.٢٥٠	٤.٢٥٠	١٠.٦٢٥٠	

	محور 11_11	١.٠	٥.٦٥٠٠	٠.٢٥٠	٤.٢٥٠	٦.٠٠٣١	
	محور 12-12	١.٠	٦.٥٠٠٠	٠.٢٥٠	٤.٢٥٠	٦.٩٠٦٣	
	محور 13_13	١.٠	٣.٠٠٠٠	٠.٢٥٠	٤.٢٥٠	٣.١٨٧٥	
	محور 14_14	١.٠	٦.٥٠٠٠	٠.٢٥٠	٤.٢٥٠	٦.٩٠٦٣	
	محور أ_أ	١.٠	٢٣.٠٧٠٠	٠.٢٥٠	٤.٢٥٠	٢٤.٥١١٩	
	محور ب_ب	١.٠	٤.٠٠٠٠	٠.٢٥٠	٤.٢٥٠	٤.٢٥٠٠	
	محور ح_ح	١.٠	٣.٩٧٠٠	٠.٢٠٠	٤.٢٥٠	٣.٣٧٤٥	
	محور ط_ط	١.٠	٦.٥٠٠٠	٠.٢٥٠	٤.٢٥٠	٦.٩٠٦٣	
	محور ز_ز	١.٠	٢١.٠٠٠٠	٠.٢٥٠	٤.٢٥٠	٢٢.٣١٢٥	
	خصم ش 15	٣.٠	١.٠٠٠٠	٠.٢٥٠	١.٢٠٠		٠.٩٠٠٠
	خصم ب14	١.٠	١.٢٠٠٠	٠.٢٥٠	٢.٢٠٠		٠.٦٦٠٠
إجـمـــــــــــــالـيات						٣١٥.٩٧	١٧.٢١٧٨
إجـمـــــــــــــالـي الدور الاول						٢٩٨.٧٥	
	الدور الثالث						
	مبانى I						
	اعلي محور أ-أ	١.٠	١٨.٥٠٠٠	٠.٢٥٠	٣.٣٥٠	١٥.٤٩٣٨	
	محور أ-أ	١.٠	٦.٧٧٠٠	٠.٢٥٠	٣.٣٥٠	٥.٦٦٩٩	
	محور ب_ب	١.٠	٣.٤٥٠٠	٠.٢٥٠	٣.٣٥٠	٢.٨٨٩٤	
	محور د_د	١.٠	٢.٠٠٠٠	٠.٢٥٠	٣.٣٥٠	١.٦٧٥٠	
	بين محوري و_و ز_ز	١.٠	٢.٣٥٠٠	٠.٢٥٠	٣.٣٥٠	١.٩٦٨١	
	محور ز_ز	١.٠	١٣.٩٩٠٠	٠.٢٥٠	٣.٣٥٠	١١.٧١٦٦	
	بين محوري ز_ز ح-ح	١.٠	١١.٢٠٠٠	٠.٢٥٠	٣.٣٥٠	٩.٣٨٠٠	

	محور ح_ح	١.٠	٣.٨٧٠٠	٠.٢٠٠٠	٣.٣٥٠٠	٢.٥٩٢٩	
	محور ط_ط	١.٠	٥.٦٧٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٤.٧٤٨٦	
	محور 1_1	١.٠	٦.٣٠٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٥.٢٧٦٣	
	محور 2_2	١.٠	١.٩٥٠٠	٠.٢٥٠٠	٣.٣٥٠٠	١.٦٣٣١	
	محور 3_3	١.٠	٦.٣٠٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٠.٨٣٧٥	
	بين محور 13_13 14_14	١.٠	١.٠٠٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٨.٣٧٥٠	
	محور 14-14	١.٠	١٠.٠٠٠٠	٠.٢٥٠٠	٣.٣٥٠٠	١.٥٠٧٥	
	تخصيم الأبواب ب17	٦.٠	١.٨٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		٥.٩٤٠٠
	تخصيم الأبواب ب7	٤.٠	٠.٦٠٠٠	٠.٢٥٠٠	١.٨٥٠٠		١.١١٠٠
	تخصيم الأبواب ب17	٨.٠	١.٨٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		٧.٩٢٠٠
	خصم ش6	٢.٠	٠.٨٠٠٠	٠.٢٥٠٠	١.٧٠٠٠		٠.٦٨٠٠
	خصم ب2	١.٠٠٠٠	١.٠٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		٠.٥٥٠٠
	خصم ب3	١.٠٠٠	١.٨٠٠	٠.٢٥٠٠	٢.٢٠٠٠		٠.٩٩٠٠
	خصم ب14	٢	١.٢٠٠	٠.٢٥٠٠	٢.٢٠٠٠		١.٣٢٠٠
	مبانى II						
	محور أ-أ	١.٠	٢٢.٤٥٠٠	٠.٢٥٠٠	٣.٣٥٠٠	١٨.٨٠١٩	
	محور هـ _هـ	١.٠	١٢.٢٥٠٠	٠.٢٥٠٠	٣.٣٥٠٠	١٠.٢٥٩٤	
	محور ز_ز	١.٠	١٢.٦٥٠٠	٠.٢٥٠٠	٣.٣٥٠٠	١٠.٥٩٤٤	
	محور أ_أ	١.٠	١٢.٤٧٠٠	٠.٢٥٠٠	٣.٣٥٠٠	١٠.٤٤٣٦	
	محور ح_ح	١.٠	١٢.٥٥٠٠	٠.٢٥٠٠	٣.٣٥٠٠	١٠.٥١٠٦	
	محور 1_1	١.٠	١٦.٨٥٠٠	٠.٢٥٠٠	٣.٣٥٠٠	١٤.١١١٩	
	محور د_د	١.٠	١٠.٣٣٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٨.٦٥١٤	
	محور ز_ز	١.٠	٤.١٥٠٠	٠.٢٠٠٠	٣.٣٥٠٠	٢.٧٨٠٥	
	بين محور 3_3 4_4	١.٠	٢.٦٥٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٢.٢١٩٤	

	بين محور 5_5 6_6	١.٠	٨.٣٣٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٦.٩٧٦٤	
	بين محور 6_6 7_7	١.٠	١٢.٢٦٠٠	٠.٢٥٠٠	٣.٣٥٠٠	١٠.٢٦٧٨	
	بين محور ح_ح ط_ط	١.٠	٢.٤٢٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٢.٠٢٦٨	
	خصم ش6	١٢.٠	٠.٨٠٠٠	٠.٢٥٠٠	١.٧٠٠٠		٤.٠٨٠٠
	خصم ب4	٤.٠	١.٠٠٠٠	٠.٢٥٠٠	١.٨٥٠٠		١.٨٥٠٠
	تخصيم الأبواب ب17	٦.٠	١.٨٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		٥.٩٤٠٠
	مبانى III						
	محور 1_1	١.٠	٦.٥٠٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٥.٤٤٣٨	
	محور 2_2	١.٠	٢.٠٠٠٠	٠.٢٥٠٠	٣.٣٥٠٠	١.٦٧٥٠	
	محور 12_12	١.٠	٦.٥٠٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٥.٤٤٣٨	
	محور أ_أ	١.٠	٦.٤٧٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٥.٤١٨٦	
	أعلي محور أ	١.٠	١٦.٥٠٠٠	٠.٢٥٠٠	٣.٣٥٠٠	١٣.٨١٨٨	
	محور ب_ب	١.٠	٣.٧٠٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٣.٠٩٨٨	
	محور د_د	١.٠	٢.١٥٠٠	٠.٢٥٠٠	٣.٣٥٠٠	١.٨٠٠٦	
	محور و_و	١.٠	٢.١٥٠٠	٠.٢٠٠٠	٣.٣٥٠٠	١.٤٤٠٥	
	محور ز_ز	١.٠	١٤.٨٥٠٠	٠.٢٥٠٠	٣.٣٥٠٠	١٢.٤٣٦٩	
	محور ح_ح	١.٠	٤.٠٥٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٣.٣٩١٩	
	محور ط_ط	١.٠	٥.٦٧٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٤.٧٤٨٦	
	بين محوري و_و ز_ز	١.٠	٢.٦٥٠٠	٠.٢٥٠٠	٣.٣٥٠٠	٢.٢١٩٤	
	خصم ش6	١.٠	٠.٨٠٠٠	٠.٢٥٠٠	١.٧٠٠٠		٠.٣٤٠٠
	خصم ب7	٤.٠	٠.٦٠٠٠	٠.٢٥٠٠	١.٨٥٠٠		١.١١٠٠
	تخصيم الأبواب ب17	٦.٠	١.٨٠٠٠	٠.٢٥٠٠	٢.٢٠٠٠		٥.٩٤٠٠
إجـمـــــــــــــالـيات						٢٤٢.٣٤	٣٧.٧٧٠٠

إجـمـــــــــــــــــالــي الدور الثالث	٢٠٤.٥٧

مباني 12 سم							
الدور البدروم							
مباني I							
محور 6_6	١.٠	٦.٧٥٠٠		٤.٠٠٠٠	٢٧.٠٠٠٠		
محور 8_8	١.٠	٦.٧٥٠٠		٤.٠٠٠٠	٢٧.٠٠٠٠		
محور 9_9	١.٠	٦.٦٨٠٠		٤.٠٠٠٠	٢٦.٧٢٠٠		
محور10 _10	١.٠	٦.٦٥٠٠		٤.٠٠٠٠	٢٦.٦٠٠٠		
محور 12_12	١.٠	١٣.٥٤٠٠		٤.٠٠٠٠	٥٤.١٦٠٠		
محور ج_ج	١.٠	١٢.٦٥٠٠		٤.٠٠٠٠	٥٠.٦٠٠٠		
محور د_د	١.٠	١.٩٠٠٠		٤.٠٠٠٠	٧.٦٠٠٠		
بين محور ج_ج د_د	١.٠	٦.٦٥٠٠		٤.٠٠٠٠	٢٦.٦٠٠٠		
بين محور د_د هـ _هـ	١.٠	٥٦.٣٣٠٠		٢.٢٠٠٠	١٢٣.٩٢٦٠		
خصم ب4	٤.٠	١.٠٠٠٠		٢.٢٠٠٠		٨.٨٠٠٠	
خصم ب3	٤.٠	١.٨٠٠٠		٢.٢٠٠٠		١٥.٨٤٠٠	
مبانى II							
محور 2_2	١.٠	٢.٩٥٠٠		٤.٠٠٠٠	١١.٨٠٠٠		
محور 3_3	١.٠	٤.٦٥٠٠		٤.٠٠٠٠	١٨.٦٠٠٠		
محور 4_4	١.٠	٦.٧٣٠٠		٤.٠٠٠٠	٢٦.٩٢٠٠		
محور 5_5	١.٠	٤.٧٦٠٠		٤.٠٠٠٠	١٩.٠٤٠٠		
محور 6_6	١.٠	٥.٩٠٠٠		٤.٠٠٠٠	٢٣.٦٠٠٠		
محور 9_9	١.٠	٥.٨٣٠٠		٤.٠٠٠٠	٢٣.٣٢٠٠		
محور 10_10	١.٠	١٤.٤٠٠٠		٤.٠٠٠٠	٥٧.٦٠٠٠		

	محور 13_13	١.٠	١٠.٥٤٠٠		٤.٠٠٠٠	٤٢.١٦٠٠	
	بين محور د_د هـ_هـ	١.٠	٧٨.٩٣٠٠		٢.٢٠٠٠	١٧٣.٦٤٦٠	
	خصم ب4	٣.٠	١.٠٠٠٠		٢.٢٠٠٠		٦.٦٠٠٠
	خصم ب7	٤.٠	٠.٨٠٠٠		٢.٢٠٠٠		٧.٠٤٠٠
	مبانى III						
	محور 3_3	١.٠	٢.٩٥٠٠		٤.٠٠٠٠	١١.٨٠٠٠	
	محور 5_5	١.٠	٦.٤٢٠٠		٤.٠٠٠٠	٢٥.٦٨٠٠	
	محور 7_7	١.٠	٤.١٥٠٠		٤.٠٠٠٠	١٦.٦٠٠٠	
	محور ج_ج	١.٠	٦.٦٥٠٠		٤.٠٠٠٠	٢٦.٦٠٠٠	
	محور د_د	١.٠	٢.٦٥٠٠		٤.٠٠٠٠	١٠.٦٠٠٠	
	محور ه_ه	١.٠	٢.٦٥٠٠		٤.٠٠٠٠	١٠.٦٠٠٠	
	محور ح_ح	١.٠	٣.٠٠٠٠		٤.٠٠٠٠	١٢.٠٠٠٠	
	بين محور ه_ه و_و	١.٠	١٨.٦٥٠٠		٤.٠٠٠٠	٧٤.٦٠٠٠	
	بين محور ج_ج د_د	١.٠	١٥.٦٠٠٠		٢.٢٠٠٠	٣٤.٣٢٠٠	
	خصم ب4	٩.٠	١.٠٠٠٠		٢.٢٠٠٠		١٩.٨٠٠٠
	خصم ب7	٨.٠	٠.٨٠٠٠		٢.٢٠٠٠		١٤.٠٨٠٠
إجـمـــــــــــــالـيات						٩٨٩.٦٩	٧٢.١٦٠٠
إجـمـــــــــــــالـي الدور البدروم						٩١٧.٥٣	
	الدور الارضي						
	مبانىI						
	محور ج_ج	١.٠	٣٠.١٥٠٠		٣.٦٥٠٠	١١٠.٠٤٧٥	
	محور د_د	١.٠	١١.٢٠٠٠		٣.٦٥٠٠	٤٠.٨٨٠٠	

	محور ح_ح	۱.۰	۳.۳۵۰۰		۳.٦۵۰۰	۱۲.۲۲۷۵	
	محور 5_5	۱.۰	۹.٦۵۰۰		۳.٦۵۰۰	۳۵.۲۲۲۵	
	محور 6_6	۱.۰	۷.۱۵۰۰		۳.٦۵۰۰	۲٦.۰۹۷۵	
	محور 7_7	۱.۰	۱۱.۱۵۰۰		۳.٦۵۰۰	٤۰.٦۹۷۵	
	محور 8_8	۱.۰	۳.۷۵۰۰		۳.٦۵۰۰	۱۳.٦۸۷۵	
	محور 9_9	۱.۰	۲.۱۵۰۰		۳.٦۵۰۰	۷.۸٤۷۵	
	محور 10_10	۱.۰	۳.۷۵۰۰		۳.٦۵۰۰	۱۳.٦۸۷۵	
	محور11_11	۱.۰	٦.۳۵۰۰		۳.٦۵۰۰	۲۳.۱۷۷۵	
	محور12_12	۱.۰	٦.٦۵۰۰		۳.٦۵۰۰	۲٤.۲۷۲۵	
	محور13_13	۱.۰	٤.۱۵۰۰		۳.٦۵۰۰	۱۵.۱٤۷۵	
	خصم ب 4	۱۰.۰	۱.۰۰۰۰		۲.۲۰۰۰		۲۲.۰۰۰۰
	خصم ب 1	۱.۰	۱.۸۰۰۰		۲.۲۰۰۰		۳.۹٦۰۰
	مبانی II						
	محور ب_ب	۱.۰	۲٤.٤۰۰۰		۳.٦۵۰۰	۸۹.۰٦۰۰	
	محور ج_ج	۱.۰	۲۳.۸٦۰۰		۳.٦۵۰۰	۸۷.۰۸۹۰	
	محور د_د	۱.۰	۲۳.۸۸۰۰		۳.٦۵۰۰	۸۷.۱٦۲۰	
	محور ه_ه	۱.۰	۲۵.۳۰۰۰		۳.٦۵۰۰	۹۲.۳٤۵۰	
	محور ز_ز	۱.۰	۵.٤۱۰۰		۳.٦۵۰۰	۱۹.۷٤٦۵	
	محور ح_ح	۱.۰	۲۷.۵۸۰۰		۳.٦۵۰۰	۱۰۰.٦٦۷۰	
	محور 1_1	۱.۰	٦.۷٤۰۰		۳.٦۵۰۰	۲٤.٦۰۱۰	
	محور 2_2	۱.۰	۷.٤۳۰۰		۳.٦۵۰۰	۲۷.۱۱۹۵	
	محور 3_3	۱.۰	۳.٦۵۰۰		۳.٦۵۰۰	۱۳.۳۲۲۵	
	محور4_4	۱.۰	۱۰.۷٤۰۰		۳.٦۵۰۰	۳۹.۲۰۱۰	

	محور5_5	۱.۰	۵.۳۰۰۰		۳.۶۵۰۰	۱۹.۳۴۵۰	
	محور 6_6	۱.۰	۴.۷۸۰۰		۳.۶۵۰۰	۱۷.۴۴۷۰	
	محور 9_9	۱۰.۰	۵.۶۹۰۰		۳.۶۵۰۰	۲۰۷.۶۸۵۰	
	محور 10_10	۱.۰	۱۴.۶۳۰۰		۳.۶۵۰۰	۵۳.۳۹۹۵	
	محور 11_11	۱.۰	۵.۱۵۰۰		۳.۶۵۰۰	۱۸.۷۹۷۵	
	محور12.12	۱.۰	۸.۵۰۰۰		۳.۶۵۰۰	۳۱.۰۲۵۰	
	محور13.13	۱.۰	۵.۱۵۰۰		۳.۶۵۰۰	۱۸.۷۹۷۵	
	محور14.14	۱.۰	۴.۷۶۰۰		۳.۶۵۰۰	۱۷.۳۷۴۰	
	خصم ب 4	۸.۰	۱.۰۰۰۰		۲.۲۰۰۰		۱۷.۶۰۰۰
	خصم ب 3	۵.۰	۱.۸۰۰۰		۲.۲۰۰۰		۱۹.۸۰۰۰
	مبانیIII						
	محور ج_ج	۱.۰	۳۹.۱۵۰۰		۳.۶۵۰۰	۱۴۲.۸۹۷۵	
	محور د_د	۱.۰	۲۹.۶۵۰۰		۳.۶۵۰۰	۱۰۸.۲۲۲۵	
	محور ه_ه	۱.۰	۲۳.۸۸۰۰		۳.۶۵۰۰	۸۷.۱۶۲۰	
	محور ح_ح	۱.۰	۴.۵۵۰۰		۳.۶۵۰۰	۱۶.۶۰۷۵	
	محور 3_3	۱.۰	۹.۴۵۰۰		۳.۶۵۰۰	۳۴.۴۹۲۵	
	محور 4_4	۱.۰	۵.۰۵۰۰		۳.۶۵۰۰	۱۸.۴۳۲۵	
	محور 6_6	۱.۰	۴.۱۷۰۰		۳.۶۵۰۰	۱۵.۲۲۰۵	
	محور 7_7	۱.۰	۶.۲۰۰۰		۳.۶۵۰۰	۲۲.۶۳۰۰	
	محور 8_8	۱.۰	۴.۱۹۰۰		۳.۶۵۰۰	۱۵.۲۹۳۵	
	محور9_9	۱.۰	۴.۱۹۰۰		۳.۶۵۰۰	۱۵.۲۹۳۵	
	محور10_10	۱.۰	۴.۳۵۰۰		۳.۶۵۰۰	۱۵.۸۷۷۵	
	محور 12_12	۱.۰	۵.۷۷۰۰		۳.۶۵۰۰	۲۱.۰۶۰۵	
	بین محور ه_ه و_و	۱۰.۰	۲۹.۷۷۰۰		۳.۶۵۰۰	######	

	محور 4_4 5_5	١.٠	٧.٨٦٠٠		٣.٦٥٠٠	٢٨.٦٨٩٠	
	خصم ب 4	١.٠	١.٨٠٠٠		٢.٢٠٠٠		٣.٩٦٠٠
	خصم ب 1	١.٠	١.٨٠٠٠		٢.٢٠٠٠		٣.٩٦٠٠
	إجـمـــــــــــــالـيات					٢٩٥٥.٦٦	٧١.٢٨٠٠
	إجـمـــــــــــــالـي الدور الارضي					٢٨٨٤.٣٨	
	الدور الاول						
	مباني I						
	محور 2_2	١.٠	٢.١٥٠٠		٤.٢٥٠٠	٩.١٣٧٥	
	محور 4_4	١.٠	٣.٣٥٠٠		٤.٢٥٠٠	١٤.٢٣٧٥	
	محور11_11	١.٠	٨.٣٠٠٠		٤.٢٥٠٠	٣٥.٢٧٥٠	
	أعلي محور أ_أ	١.٠	٢١.٦٥٠٠		٤.٢٥٠٠	٩٢.٠١٢٥	
	محور ز-ز	١.٠	١.٩٧٠٠		٤.٢٥٠٠	٨.٣٧٢٥	
	محور ح_ح	١.٠	٣.٦٥٠٠		٤.٢٥٠٠	١٥.٥١٢٥	
	محور و_و	١.٠	٤.٤٥٠٠		٤.٢٥٠٠	١٨.٩١٢٥	
	محورد_د	١.٠	١.٩٠٠٠		٤.٢٥٠٠	٨.٠٧٥٠	
	بين محور ح_ح ط_ط	١.٠	١١.٣٥٠٠		٤.٢٥٠٠	٤٨.٢٣٧٥	
	بين محور د_د هـ _ هـ	١.٠	٢١.٢٥٠٠		٤.٢٥٠٠	٩٠.٣١٢٥	
	محور هـ _هـ و_و	١.٠	٢٥.٣٠٠٠		١.٢٠٠٠	٣٠.٣٦٠٠	
	خصم باب 16	٢.٠	٠.٨٠٠٠		٢.٢٠٠٠		٣.٥٢٠٠
	خصم ب5	٥.٠	١.٠٠٠٠		٢.٢٠٠٠		١١.٠٠٠٠
	خصم ب4	٥.٠	١.٠٠٠٠		٢.٢٠٠٠		١١.٠٠٠٠
	مبانى II						

	محور 1_1	۱.۰	۱۲.٦۳۰۰		٤.۲٥۰۰	٥۳.٦۷۷٥	
	محور 3_3	۱.۰	۲۷.۷۳۰۰		٤.۲٥۰۰	۱۱۷.۸٥۲٥	
	محور4_4	۱.۰	۱۷.۱۹۰۰		٤.۲٥۰۰	۷۳.۰٥۷٥	
	محور 5_5	۱.۰	۷.۸۷۰۰		٤.۲٥۰۰	۳۳.٤٤۷٥	
	محور6_6	۱.۰	۱۱.۳٤۰۰		٤.۲٥۰۰	٤۸.۱۹٥۰	
	محور 9_9	۱.۰	۱۰.۱٤۰۰		٤.۲٥۰۰	٤۳.۰۹٥۰	
	محور 11_11	۱.۰	٦.٦٤۰۰		٤.۲٥۰۰	۲۸.۲۲۰۰	
	محور 12_12	۱.۰	۲۳.۷٦۰۰		٤.۲٥۰۰	۱۰۰.۹۸۰۰	
	محور 14_14	۱.۰	۸.٥٦۰۰		٤.۲٥۰۰	۳٦.۳۸۰۰	
	محور أ_أ	۱.۰	۰.٦۷۰۰		٤.۲٥۰۰	۲.۸٤۷٥	
	محور ج_ج	۱.۰	٤.۸۹۰۰		۱.۲۰۰۰	٥.۸٦۸۰	
	محوره_ه	۱.۰	۱۲.۳۱۰۰		۲.۲۰۰۰	۲۷.۰۸۲۰	
	بين محور د_د ه_ه	۱.۰	۳۹.٦۷۰۰		۲.۲۰۰۰	۸۷.۲۷٤۰	
	خصم ب 3	۲.۰	۱.۸۰۰۰		۲.۲۰۰۰		۷.۹۲۰۰
	خصم ب 4	٤.۰	۱.۰۰۰۰		۲.۲۰۰۰		۸.۸۰۰۰
	مبانی III						
	محور 3_3	۱.۰	٥.۲٦۰۰		٤.۲٥۰۰	۲۲.۳٥٥۰	
	محور 4_4	۱.۰	۱٥.٦٥۰۰		٤.۲٥۰۰	٦٦.٥۱۲٥	
	محور6_6	۱.۰	۱٥.۳٥۰۰		٤.۲٥۰۰	٦٥.۲۳۷٥	
	محور10_10	۱.۰	۱٦.۷٥۰۰		٤.۲٥۰۰	۷۱.۱۸۷٥	
	محور12_12	۱.۰	٥.۲۰۰۰		٤.۲٥۰۰	۲۲.۱۰۰۰	
	محور 13_13	۱.۰	۲.۱٥۰۰		٤.۲٥۰۰	۹.۱۳۷٥	
	محور أ_أ	۱.۰	۲۹.۳٥۰۰		٤.۲٥۰۰	۱۲٤.۷۳۷٥	
	محور ج_ج	۱.۰	۱.٦٥۰۰		٤.۲٥۰۰	۷.۰۱۲٥	

	محور ز_ز	١.٠	١.٦٦٠٠		٤.٢٥٠٠	٧.٠٥٥٠	
	محور ح_ح	١.٠	٤.١٥٠٠		٤.٢٥٠٠	١٧.٦٣٧٥	
	محور د_د ه_ه	١.٠	٦٦.٣٢٦٠		١.٢٠٠٠	٧٩.٥٩١٢	
	خصم باب 3	٥.٠	١.٨٠٠٠		٢.٢٠٠٠		١٩.٨٠٠٠
	خصم ب11	٦.٠	١.٠٠٠٠		٢.٢٠٠٠		١٣.٢٠٠٠
	إجـمـــــــــــــالـيات					١٥٢٠.٩٩	٧٥.٢٤٠٠
	إجـمـــــــــــــالـي الدور الاول					١٤٤٥.٧٥	
	الدور الثالث						
	مبانى I						
	محور2_2	١.٠	٢.٠٠٠٠		٣.٣٥٠٠	٦.٧٠٠٠	
	محور 4_4	١.٠	٢١.٣٥٠٠		٣.٣٥٠٠	٧١.٥٢٢٥	
	محور 5_5	١.٠	٠.٦٥٠٠		٣.٣٥٠٠	٢.١٧٧٥	
	محور 6_6	١.٠	٥.٣٠٠٠		٣.٣٥٠٠	١٧.٧٥٥٠	
	محور 7_7	١.٠	٠.٦٥٠٠		٣.٣٥٠٠	٢.١٧٧٥	
	محور 8_8	١.٠	٥.٧٥٠٠		٣.٣٥٠٠	١٩.٢٦٢٥	
	محور ج_ج	١.٠	٦.٣٥٠٠		٣.٣٥٠٠	٢١.٢٧٢٥	
	محور د_د	١.٠	٢.٤٥٠٠		٣.٣٥٠٠	٨.٢٠٧٥	
	محور و_و	١.٠	٢.٠٥٠٠		٣.٣٥٠٠	٦.٨٦٧٥	
	بين محور ح_ح	١.٠	٣.٤٥٠٠		٣.٣٥٠٠	١١.٥٥٧٥	
	بين محور د_د هـ _هـ	١.٠	٥٩.٦٣٠٠		٣.٣٥٠٠	١٩٩.٧٦٠٥	
	بين محور ح_ح ط_ط	١.٠	١١.٣٥٠٠		٣.٣٥٠٠	٣٨.٠٢٢٥	
	خصم ب7	٨.٠	٠.٦٠٠٠		١.٧٠٠٠		٨.١٦٠٠

	خصم ب4	٨.٠	١.٠٠٠٠		١.٨٥٠٠		١٤.٨٠٠٠
		٦.٠	١.٨٠٠٠		٢.٢٠٠٠		٢٣.٧٦٠٠
	مبانى II						
	محورأ_أ	١.٠	٣.١٥٠٠		٣.٣٥٠٠	١٠.٥٥٢٥	
	محوره_ه	١.٠	٥.٦٥٠٠		٣.٣٥٠٠	١٨.٩٢٧٥	
	محور و_و	١.٠	٣.٥٤٠٠		٣.٣٥٠٠	١١.٨٥٩٠	
	محور1_1	١.٠	١٣.٩٧٠٠		٣.٣٥٠٠	٤٦.٧٩٩٥	
	محور 2_2	١.٠	٩.٦٦٠٠		٣.٣٥٠٠	٣٢.٣٦١٠	
	محور 3_3	١.٠	٨.٦٦٠٠		٣.٣٥٠٠	٢٩.٠١١٠	
	محور 4_4	١.٠	١٢.٦٩٠٠		٣.٣٥٠٠	٤٢.٥١١٥	
	محور 5_5	١.٠	٤.٦٠٠٠		٣.٣٥٠٠	١٥.٤١٠٠	
	محور 6_6	١.٠	١١.٠٤٠٠		٣.٣٥٠٠	٣٦.٩٨٤٠	
	محور د_د	١.٠	١٨.٨٧٠٠		٣.٣٥٠٠	٦٣.٢١٤٥	
	بين محور د_د هـ _هـ	١.٠	٢٦.٨٨٠٠		٣.٣٥٠٠	٩٠.٠٤٨٠	
	بين محور هـ _هـ و_و	١.٠	٧.٨٩٠٠		٣.٣٥٠٠	٢٦.٤٣١٥	
	خصم ب3	٣.٠	١.٨٠٠٠		١.٧٠٠٠		٩.١٨٠٠
	خصم ب4	٤.٠	١.٠٠٠٠		١.٨٥٠٠		٧.٤٠٠٠
	مبانى III						
	محور3_3	١.٠	٦.٠٥٠٠		٣.٣٥٠٠	٢٠.٢٦٧٥	
	محور 4_4	١.٠	١٥.٦٥٠٠		٣.٣٥٠٠	٥٢.٤٢٧٥	
	محور 5_5	١.٠	٧.٩٥٠٠		٣.٣٥٠٠	٢٦.٦٣٢٥	
	محور 7_7	١.٠	١١.٤٥٠٠		٣.٣٥٠٠	٣٨.٣٥٧٥	
	محور 9_9	١.٠	٨.٦٦٠٠		٣.٣٥٠٠	٢٩.٠١١٠	

	محور 11_11	١.٠	١٥.٦٦٠٠		٣.٣٥٠٠	٥٢.٤٦١٠	
	محور 12_12	١.٠	٥.٨٨٠٠		٣.٣٥٠٠	١٩.٦٩٨٠	
	محور 13_13	١.٠	٦.٠٠٠٠		٣.٣٥٠٠	٢٠.١٠٠٠	
	محور ج_ج	١.٠	١٣.٦٦٠٠		٣.٣٥٠٠	٤٥.٧٦١٠	
	محور د_د	١.٠	١٨.٨٧٠٠		٣.٣٥٠٠	٦٣.٢١٤٥	
	بين محور د_د هـ _هـ	١.٠	٥٥.٦٣٠٠		٣.٣٥٠٠	١٨٦.٣٦٠٥	
	بين محور هـ _هـ و_و	١.٠	٢٢.٥٤٠٠		٣.٣٥٠٠	٧٥.٥٠٩٠	
	خصم ب7	٨.٠	٠.٦٠٠٠		١.٧٠٠٠		٨.١٦٠٠
	خصم ب4	٨.٠	١.٠٠٠٠		١.٨٥٠٠		١٤.٨٠٠٠
		٦.٠	١.٨٠٠٠		٢.٢٠٠٠		٢٣.٧٦٠٠
إجـمـــــــــــــالـيات						١٤٥٩.١٩	١١٠.٠٢٠٠
إجـمـــــــــــــالـي الدور الثالث						١٣٤٩.١٧	

دفتر حصر كميات							
رقم البند	البند	عدد	مقاسات			كميات	
			طول	عرض	ارتفاع	اضافة	خصم
اعمال العزل و الفواصل							
١٩	بالمتر الطولي توريد و عمل فاصل تمدد						
	بين الاسقف بجميع الادوار	24	21.53			516.72	
	الاجمالي		516.72				
٢٠	بالمتر الطولي توريد و حشو فاصل						
	التمدد بالسطح	2	21.53			43.06	
	الاجمالي		43.06				

٢١	بالمتر الطولي توريد وعمل معالجه					
	لفواصل التمدد بالمبني					
	فواصل التمدد بالاسقف	24	21.53			516.72
	فواصل التمدد بالاعمده و الحوائط	10	43.95			439.5
	ف1	24	1			24
	ف2	24	1.5			36
	ف3	24	1.1			26.4
	ف4	24	1.1			26.4
	ف5	24	3			72
	الاجمالي				1141.02	
٢٢	بالمتر المسطح توريد و عمل طبقه					
	عازله لرطوبه الاساسات و حوائط					
	البدروم من الداخل و الخارج					
	مساحه القواعد المسلحه		1780.74		1780.74	
	المساحه الجانبيه للقواعد المسلحه		1082.6477		1082.6477	
	المساحه الجانبيه للسملات		921.91666		921.91666	
	مساحه السملات					
	سملات عرض 25 سم		20.77125			
	سملات عرض 40 سم		99.8			
	اجمالي مساحه السملات				120.57125	
	حوائط البدروم من الداخل و الخارج	2	361	2.8	2021.6	
	المساحه الجانبيه للاعمده		646.8	0.4	258.72	
	مساحه الاعمده		109.52			109.52
	تقابل السملات و القواعد	212	0.4	1.4		118.72
		46	0.25	1.4		16.1
	اجماليات الخصم و الاضافه				6186.19561	244.34
	اجمالي اعمال عزل الاساسات				5941.85561	
٢٣	بالمتر المسطح توريد و عمل طبقه					
	عازله لرطوبه الحمامات					
	حمامات الدور البدروم					
	T-0-1	1	3.17		3.17	

	26.32		13.16	2	T-0-2	
	26.48		13.24	2	T-0-3	
	7.92		0.66	12	shower	
					حمامات الدور الارضي	
	26.32		13.16	2	T-1-1	
	26.48		13.24	2	T-1-2	
	7.86		3.93	2	T-1-3	
	13.12		6.56	2	T-1-4	
	4.47		4.47	1	T-1-5	
	5.15		5.15	1	T-1-6	
	7		7	1	T-1-7	
	4.57		4.57	1	T-1-8	
	17.76		4.44	4	T-1-9	
	4.44		4.44	1	T-1-10	
					حمامات الدور الاول	
	4.69		4.69	1	T-1-1	
	8.38		4.19	2	T-1-2	
	4.7		4.7	1	T-1-3	
	30		15	2	T-1-4	
	9.5		9.5	1	T-1-5	
	13.18		6.59	2	T-1-6	
	6.84		3.42	2	T-1-7	
					حمامات الدور الثاني	
	4.69		4.69	1	T-2-1	
	8.38		4.19	2	T-2-2	
	4.7		4.7	1	T-2-3	
	30		15	2	T-2-4	
	9.5		9.5	1	T-2-5	
	13.18		6.59	2	T-2-6	
	6.84		3.42	2	T-2-7	
					حمامات الدور الثالث	
	46.2		3.85	12	T-3-1	
	24.96		3.12	8	T-3-2	

	8		4	2	T-3-3	
	8.82		4.41	2	T-3-4	
	52.64		13.16	4	T-3-5	
					حمامات الدور المتكرر	
	277.2		3.85	72	T-N-1	
	149.76		3.12	48	T-N-2	
	48		4	12	T-N-3	
	52.92		4.41	12	T-N-4	
	315.84		13.16	24	T-N-5	
	1319.98				الاجمالي	
					بالمتر المسطح توريد وعمل طبقة عازلة	٢٤
					للرطوبة لاساسات وحوائط وسقف الخزان	
					عزل اساسات الخزان	
	344		344	1	مساحه العاديه	
	23.844	0.3	79.48	1	المساحه الجانبيه للعاديه	
					عزل سقف الخزان	
	215.28		107.64	2	ف1	
	61.93		61.93	1	ف2	
					عزل الحوائط الخارجيه للخزان	
	153.909	6.3	24.43	1	W1-out	
	297.36	5.9	50.4	1	W2-out	
					عزل الحوائط الداخليه للخزان	
	451.2	4.7	48	2	W1	
	177.429	5.1	34.79	1	W2	
	1724.952				الاجمالي	
					بالمتر المربع توريد و عمل طبقه	**٢٥**
	2761.6654		2761.6654	1	افقيه عازله لرطوبه السطح	
	2761.6654				الاجمالي	
					بالمتر المربع توريد و عمل طبقه	٢٦
	2761.6654		2761.6654	1	عازله للحراره للسطح النهائي	
	2761.6654				الاجمالي	
	500			500 1	بالمتر الطولي توريد وتركيب ووتر ستوب	٢٧
	500				الاجمالي	

دفتر حصر كميات							
رقم البند	البند	عدد	مقاسات			كميات	
			طول	عرض	ارتفاع	اضافة	خصم
اعمال البياض							
٢٨	بالمتر المسطح توريد و عمل بياض تخشين لزوم الحوائط الداخليه و الاسقف						
	الدور البدروم						

	لزوم الاسقف	١.٠٠	٢٠٧٣.٨٠			٢٠٧٣.٨٠
	لزوم الحوائط	١.٠٠	١١٠٧.١٣		٤.٠٠	٤٤٢٨.٥٢
	تخصيم الأبواب ب4	٢.٠٠	١.٠٠		٢.٢٠	٤.٤٠
	تخصيم الأبواب ب14	٢.٠٠	١.٢٠		٢.٢٠	٥.٢٨
	تخصيم الأبواب ب3	١.٠٠	١.٨٠		٢.٢٠	٣.٩٦
	خصم ب4	٤.٠٠	١.٠٠		٢.٢٠	٨.٨٠
	خصم ب3	٤.٠٠	١.٨٠		٢.٢٠	١٥.٨٤
	خصم ب4	١.٠٠	١.٠٠		٢.٢٠	٢.٢٠
	خصم ب14	٢.٠٠	١.٢٠		٢.٢٠	٥.٢٨
	خصم ب18	١.٠٠	١.٨٠		٢.٢٠	٣.٩٦
	خصم ب3	٢.٠٠	١.٨٠		٢.٢٠	٧.٩٢
	خصم ب4	٩.٠٠	١.٠٠		٢.٢٠	١٩.٨٠
	خصم ب7	٨.٠٠	٠.٨٠		٢.٢٠	١٤.٠٨
	خصم ب4	٢.٠٠	١.٠٠		٢.٢٠	٤.٤٠
	خصم ب3	١.٠٠	١.٨٠		٢.٢٠	٣.٩٦
	خصم ب4	٣.٠٠	١.٠٠		٢.٢٠	٦.٦٠
	خصم ب7	٤.٠٠	٠.٨٠		٢.٢٠	٧.٠٤
	اجمالي البدروم					٦٣٨٨.٨٠
	الدور الارضي					
	لزوم الاسقف	١.٠٠	٢٠٨١.٦٣			٢٠٨١.٦٣
	لزوم الحوائط	١.٠٠	١١٠٣.٨١		٣.٦٥	٤٠٢٨.٩١
	تخصيم ش6	٣.٠٠	٠.٨٠		٢.٢٠	٥.٢٨
	تخصيم ش18	١.٠٠	١.٨٠		٢.٢٠	٣.٩٦
	خصم ب 4	١٠.٠٠	١.٠٠		٢.٢٠	٢٢.٠٠
	خصم ب 1	١.٠٠	١.٨٠		٢.٢٠	٣.٩٦
	تخصيم ش6	١٤.٠٠	٠.٨٠		١.٧٠	١٩.٠٤
	تخصيم ش16	١.٠٠	٠.٨٠		٣.٦٥	٢.٩٢
	خصم ب 4	١.٠٠	١.٨٠		٢.٢٠	٣.٩٦
	خصم ب 1	١.٠٠	١.٨٠		٢.٢٠	٣.٩٦
	تخصيم ش6	٣.٠٠	٠.٨٠		١.٧٠	٤.٠٨
	تخصيم ش4	٤.٠٠	٢.٣٠		١.٧٠	١٥.٦٤
	خصم ب 4	١.٠٠	١.٠٠		٢.٢٠	٢.٢٠
	خصم ب 4	٨.٠٠	١.٠٠		٢.٢٠	١٧.٦٠
	خصم ب 3	٥.٠٠	١.٨٠		٢.٢٠	١٩.٨٠

	اجمالي الدور الارضي					٥٩٨٦.١٤
	الدور الاول					
	لزوم الاسقف	١.٠٠	٢٣٩٩		٢٣٩٨.٥٤	
	لزوم الحوائط	١.٠٠	١٠٠٩.٥٤	٤.٢٥	٤٢٩٠.٥٥	
	تخصيم الأبواب ب4-ب2-ب11-ب8-ب8	٥.٠٠	١.٠٠	٢.٢٠		١١.٠٠
	تخصيم الأبواب ب3	١.٠٠	١.٨٠	٢.٢٠		٣.٩٦
	خصم باب 16	٢.٠٠	٠.٨٠	٢.٢٠		٣.٥٢
	خصم ب5	٥.٠٠	١.٠٠	٢.٢٠		١١.٠٠
	خصم ب4	٥.٠٠	١.٠٠	٢.٢٠		١١.٠٠
	خصم ش 15	٣.٠٠	١.٠٠	١.٢٠		٣.٦٠
	خصم ب14	١.٠٠	١.٢٠	٢.٢٠		٢.٦٤
	خصم باب 3	٥.٠٠	١.٨٠	٢.٢٠		١٩.٨٠
	خصم ب11	٦.٠٠	١.٠٠	٢.٢٠		١٣.٢٠
	خصم باب المصعد زوار	٢.٠٠	١.١٠	٢.٢٠		٤.٨٤
	خصم باب المصعد عمليات	١.٠٠	٣.١١	٢.٢٠		٦.٨٣
	خصم ش6	٢٠.٠٠	٠.٨٠	١.٧٠		٢٧.٢٠
	خصم ب4	٤.٠٠	١.٠٠	٢.٢٠		٨.٨٠
	خصم ب 3	٢.٠٠	١.٨٠	٢.٢٠		٧.٩٢
	خصم ب 4	٤.٠٠	١.٠٠	٢.٢٠		٨.٨٠
	اجمالي الدور الاول					٦٥٤٤.٩٧
	اجمالي الدور الثاني					٦٥٤٤.٩٧
	الدور الثالث					
	لزوم الاسقف	١.٠٠	٢٠٠٤.٢٨		٢٠٠٤.٢٨	
	لزوم الحوائط	١.٠٠	٩١٦.٨٠	٣.٣٥	٣٠٧١.٢٨	
	تخصيم الأبواب ب17	٦.٠٠	١.٨٠	٢.٢٠		٢٣.٧٦
	تخصيم الأبواب ب7	٤.٠٠	٠.٦٠	١.٨٥		٤.٤٤
	تخصيم الأبواب ب17	٨.٠٠	١.٨٠	٢.٢٠		٣١.٦٨
	خصم ش6	٢.٠٠	٠.٨٠	١.٧٠		٢.٧٢
	خصم ب2	١.٠٠	١.٠٠	٢.٢٠		٢.٢٠
	خصم ب3	١.٠٠	١.٨٠	٢.٢٠		٣.٩٦
	خصم ب14	٢.٠٠	١.٢٠	٢.٢٠		٥.٢٨
	خصم ب7	٨.٠٠	٠.٦٠	١.٧٠		٨.١٦
	خصم ب4	٨.٠٠	١.٠٠	١.٨٥		١٤.٨٠
		٦.٠٠	١.٨٠	٢.٢٠		٢٣.٧٦

	خصم ش6	١.٠٠	٠.٨٠		١.٧٠		١.٣٦
	خصم ب7	٤.٠٠	٠.٦٠		١.٨٥		٤.٤٤
	تخصيم الأبواب ب17	٦.٠٠	١.٨٠		٢.٢٠		٢٣.٧٦
	خصم ش6	١٢.٠٠	٠.٨٠		١.٧٠		١٦.٣٢
	خصم ب4	٤.٠٠	١.٠٠		١.٨٥		٧.٤٠
	تخصيم الأبواب ب17	٦.٠٠	١.٨٠		٢.٢٠		٢٣.٧٦
	خصم ب7	٨.٠٠	٠.٦٠		١.٧٠		٨.١٦
	خصم ب4	٨.٠٠	١.٠٠		١.٨٥		١٤.٨٠
		٦.٠٠	١.٨٠		٢.٢٠		٢٣.٧٦
	اجمالي الدور الثالث					٤٨٣١.٠٤	
	اجمالي المتكرر 4-9	6	٤٨٣١.٠٤			٢٨٩٨٦.٢٤	
	الاجمالي	٥٩٢٨٢.١٦					
٢٩	بالمتر المسطح توريد وعمل بياض مانع لنفاذيه الاشعه للاسقف و الحوائط لزوم حجرات الاشعه						
	الدور البدروم						
	لزوم الاسقف	١.٠٠	١٥٧.٠٠			١٥٧.٠٠	
	لزوم الحوائط	١.٠٠	١١٢.٠٠		٤.٠٠	٤٤٨.٠٠	
	D 15	٥.٠٠	١.٨٠		٢.٢٠		١٩.٨٠
	D 19	١.٠٠	٠.٨٠		٢.٢٠		١.٧٦
	الدور الاول و الثاني						
	لزوم الاسقف	٢.٠٠	١٦.٠٠			٣٢.٠٠	
	لزوم الحوائط	٢.٠٠	١٩.٥٠		٤.٢٠	١٦٣.٨٠	
	D 4	٢.٠٠	١.٠٠		٢.٢٠		٤.٤٠
	W 11	٢.٠٠	٢.٠٠		٣.٥٠		١٤.٠٠
	الاجمالي	٧٦٠.٨٤					
٣٠	بالمتر المسطح توريد وعمل بياض تخشين خارجي لزوم الواجهات						
		١.٠٠	٨٧٠٠.٠٠			٨٧٠٠.٠٠	
	الاجمالي	٨٧٠٠.٠٠					

دفتر حصر كميات					
رقم البند	البند	عدد	مقاسات		كميات
			طول	عرض	اضافة
أعمال الارضيات					
٣١	بالمتر المسطح توريد وتركيب بلاط سيراميك للأرضيات مقاس 30*30سم				
	البدروم				
	ممر C01-01-1	١.٠٠	١٥٧.٢٢		١٥٧.٢٢
	ممر C01-01-1	١.٠٠	١٥٧.٢٢		١٥٧.٢٢
	الدور الارضي				
	مدير المستشفي	١.٠٠	٣٦.٨٦		٣٦.٨٦
	اجتماعات	١.٠٠	٤٩.٩٣		٤٩.٩٣
	انتظار	١	١٣.٠٨		١٣.٠٨
	صالة المدخل	١	٢٩.٣٢		٢٩.٣٢
	استقبال	١	١٣.٠٨		١٣.٠٨
	استلام	١	٢٤.١٦		٢٤.١٦
	استلام كبير	١	٤٣.٤٠		٤٣.٤٠
	انتظار	١	١٨.٧٢		١٨.٧٢
	الدور الاول و الثاني				
	استقبال	٢	٤١.٥٨		٨٣.١٥
	قسم العمليات	٢	١٥.٣٩		٣٠.٧٨
	الادوار المتكررة				
	فصل دراسي 4-01-03	١٤	٦٠.٦١		٨٤٨.٤٨
	فصل دراسي4-01-02	٧	٨٥.١٣		٥٩٥.٩٠
	مما جمعيه بالمتر المسطح		٢١٠١		
٣٢	بالمتر المسطح توريد وتركيب بلاط سيراميك عالى المقاومة ومقاوم للحشرات والمواد الكيماوية مقاس 30 * 30 سم				
	البدروم				
	مخزن بجوار مصعد الخدمات	٢	٥.٥٢		١١.٠٤

	مخزن جاف 1-04-02	١	٣٢.٦٥	٣٢.٦٥
	مخزن جاف 1-04-02	١	٢٤.٨٤	٢٤.٨٤
	مخزن جاف 1-04-02	١	١٧.٨٠	١٧.٨٠
	المخازن الرئيسية 1-08-01	١	٩١.٣١	٩١.٣١
	مخزن بجوار السلم	٢	٥.١٣	١٠.٢٦
	تغيير ملابس عاملين بجوار الثلاجة	١	٢٢.٢٦	٢٢.٢٦
	حمام غرفة طبيب	١	٢.٩٨	٢.٩٨
	مخزن 1-06-03	١	٥٧.٦٤	٥٧.٦٤
	مطعم العاملين 1-01-04	١	٩٢.٨٥	٩٢.٨٥
	غرفة عمال وعاملين	٢	٥٤.٩٩	١٠٩.٩٧
	حمام 1-01-03	٢	١٣.٣٤	٢٦.٦٧
	غرفة تيار خفيف 2-01-S1	١	١٨.٧٢	١٨.٧٢
	مخزن ادوات نضافة 1-01-02	١	٦.٢٠	٦.٢٠
	غرفة كهرباء 1-01-S1	١	١١.٢٠	١١.٢٠
	الدور الارضي			
	مخزن 2-03-09	١	١٢.١٦	١٢.١٦
	اوفيس 2-02-04	١	٧.٣٤	٧.٣٤
	مهمات نظيفة 2-03-03	١	٦.٣٦	٦.٣٦
	مهمات ملوثة 2-03-02	١	٦.٣٦	٦.٣٦
	حمام 2-02-04	١	٦.٣٦	٦.٣٦
	حمام 2-02-04	١	٧.١٤	٧.١٤
	حمام 2-03-05	٢	٤.٥٠	٩.٠٠
	غرفة عينات 2-03-06	١	٥.٠٠	٥.٠٠
	مخزن كبير	١	٢٤.٣٠	٢٤.٣٠
	مخزن	١	٥.٦٦	٥.٦٦
	مخزن صغير	١	٤.١٥	٤.١٥
	مخزن بجوار غرفة تغيير الملابس	١	١١.٧٠	١١.٧٠
	حمام 2-05-09	٥	٤.٢٤	٢١.٢٠
	حمام 2-04-04	١	٤.٤٠	٤.٤٠
	غرفة كهرباء 2-05-07	١	٤.٣٠	٤.٣٠
	حمام 2-01-06	٢	١٤.٠٧	٢٨.١٤
	حمام 2-04-04	٢	٢.٢٦	٤.٥٢
	حمام 2-02-04	١	٤.٣٣	٤.٣٣

	مخزن 2-05-06	١	١٣.٤٣	١٣.٤٣
	مخزن 2-03-09	١	٣.٩٠	٣.٩٠
	غرفة تكييف 2-01-S1	١	٨.٠٥	٨.٠٥
	غرفة كهرباء 2-01-S1	١	١٥.٠٠	١٥.٠٠
	غرفة تغيير ملابس 2-05-10	١	٩.٨٧	٩.٨٧
	مخزن ادوات نضافة 2-01-05	١	٦.١٥	٦.١٥
	الدور الاول و الثاني			
	حمام 3-04-03	٢	٦.٩٠	١٣.٨٠
	حمام 3-04-03	٢	٥.٩٤	١١.٨٨
	حمام 3-04-03.	٢	٤.٥٩	٩.١٨
	حمام 3-04-03	٢	٣.٣٣	٦.٦٦
	حمام 3-04-03	٢	٣.٨٠	٧.٦٠
	حمام3-04-03	٢	٤.٦٤	٩.٢٨
	حمام3-02-04	٢	٣.٣٠	٦.٦٠
	حمام3-03-02	٢	٩.٢١	١٨.٤٢
	غرفة تكييف 3-01-S1	٢	٧.١٨	١٤.٣٦
	غرفة كهرباء3-01-S1	٢	١٠.٨٠	٢١.٦٠
	غرفة كهرباء 3-01-S1	٢	٤.٣٠	٨.٦٠
	الادوار المتكررة			
	حمام 4-02-04	٩٨	٧.٨٠	٧٦٤.٤٠
	حمام 4-02-04	٥٦	٢.٩٨	١٦٦.٨٨
	حمام 1-01-03	٧	١٣.٣٦	٩٣.٥٢
	حمام 4-02-03	١٤	٤.٢١	٥٨.٩٤
	حمام 1-01-03	٧	١٤.٥٩	١٠٢.١٣
	مخزن 4-02-07	٧	١٨.١٥	١٢٧.٠٥
	غرفة كهرباء 1-01-S1	٧	٩.٠٥	٦٣.٣٥
	اوفيس 1-01-01	٧	٦.٢٠	٤٣.٤٠
	التكييف	٧	٨.٠٦	٥٦.٤٢
	غرفة تكييف	٧	٨.٠٦	٥٦.٤٢
	مخزن ادوات نظافة 1-02-01	٧	٦.١٦	٤٣.١٢
	مما جمعيه بالمتر المسطح		٢٤٦٩	
٣٣	بالمتر المسطح توريد وتركيب بلاط بورسلين لميع للأرضيات 50×50سم			

	البدروم			
	امن ومراقبة	١.٠٠	٢٤.١٦	٢٤.١٦
	ميضة	١.٠٠	١١.٦٢	١١.٦٢
	انتظار 1-09-01	١.٠٠	٢٧.٨٦	٢٧.٨٦
	ثلاج موتي 1-09-03 + صالة تحضير	١.٠٠	٣٨.٨٧	٣٨.٨٧
	غرفة طبيب 1-09-04	١.٠٠	١٨.٨٠	١٨.٨٠
	مكتب ادارة 1-07-02	١.٠٠	٤٣.٨٩	٤٣.٨٩
	مكتب 1-07-02	١.٠٠	٢٦.٦٧	٢٦.٦٧
	مكتب 1-07-02	١	٣٢.٤١	٣٢.٤١
	المطبخ 1-04-04	١	١٥٤.١٦	١٥٤.١٦
	امن ومراقبه 1-04-01	١	٢٠.٧٧	٢٠.٧٧
	ثلاجة 1-04-03	١	٥٦.٣١	٥٦.٣١
	ادارة ومراقبة 1-05-02	١	١٤.١٩	١٤.١٩
	منطقة توزيع + اوتوكلاف 1-05-03	١	٣٦.٦٠	٣٦.٦٠
	منطقة التغليف 1-05-04	١	١٨.٣٧	١٨.٣٧
	منطقة استلام وغسيل 1-05-05	١	٨.٩٩	٨.٩٩
	التعقيم المركزي	١	١٧.٠٣	١٧.٠٣
	غسيل ترولیات 1-05-01	١	٢٢.٠٢	٢٢.٠٢
	منطقة العمل 1-06-02	١	٢٩.٨٧	٢٩.٨٧
	معمل 1-06-01	١	١١.٢٣	١١.٢٣
	مدير 1-06-04	١	١٧.٥٢	١٧.٥٢
	مواد مخدرة 1-06-05	١	٦.٠٤	٦.٠٤
	مخزن 1-02-02	١	٩.٠٠	٩.٠٠
	استلام 1-02-01	١	١٢.٨١	١٢.٨١
	المغسلة 1-02-03	١	١١٤.٢١	١١٤.٢١
	تسليم 1-02-01	١	١٢.٠٥	١٢.٠٥
	الدور الارضي			
	غرفة اشعة وفلوروسكوبي 2-05-05	١.٠٠	٣٥.٢٤	٣٥.٢٤
	غرفة اشعة وفلوروسكوبي 2-05-05	١.٠٠	٢٤.٣٣	٢٤.٣٣
	غرفة اشعة 2-05-05	٢.٠٠	٢٧.٦٤	٥٥.٢٨
	اشعة مقطعية 2-05-10	١.٠٠	٤٢.٨٧	٤٢.٨٧

	غرفة سونار وايكو 2-05-05	٢	١٧.٦٥	٣٥.٣٠
	عيادة 2-03-10	١	١٧.٨٩	١٧.٨٩
	عيادة 2-03-10	١	٢١.٠٠	٢١.٠٠
	مكتب 2-02-02	٢	٢٦.٨٤	٥٣.٦٨
	مكتب 2-02-02	١	١٢.٩٢	١٢.٩٢
	مكتب 2-02-02	١	١٧.٨٠	١٧.٨٠
	مكتب 2-02-02	١	٢٧.٤٧	٢٧.٤٧
	سجلات طبية 2-03-04	١	١٣.١٣	١٣.١٣
	عيادة 2-03-10	٢	١٢.٣٢	٢٤.٦٤
	عيادة 2-03-10	٢	١٣.١٦	٢٦.٣٢
	مخزن2-03-09	١	١٣.١٦	١٣.١٦
	صيدلية 2-03-08	١	١٣.٥٩	١٣.٥٩
	حجز تذاكر 2-03-08	١	١٣.٥٩	١٣.٥٩
	عيادات كشف مبدأي 2-03-10	١	١٣.١٦	١٣.١٦
	غرفة تحكم 2-05-05	١	٩.٨٥	٩.٨٥
	غرفة تحكم 2-05-05	١	٤.٦١	٤.٦١
	غرفة تحكم 2-05-05	١	٦.٤١	٦.٤١
	غرفة تحكم 2-05-05	١	٨.٥٧	٨.٥٧
	غرفة طبيب 2-05-08	٢	١٧.٦٥	٣٥.٢٩
	مخزن وغسيل ادوات 2-04-09	١	٤.٢٥	٤.٢٥
	معمل هيماتولوجي 2-04-06	١	٢٥.٤٧	٢٥.٤٧
	معمل هيماتولوجي + معمل اختبار دم + ثلاجة دم	٣	٢٦.٨٤	٨٠.٥١
	عيادة 2-03-10	١	١٧.٣٦	١٧.٣٦
	عيادة 1-05-18	١	١٧.١٩	١٧.١٩
	غرفة المراقبة الرئيسية 2-01-S1	١	٢٢.٣٦	٢٢.٣٦
	الخزينة 2-02-02	١	٢٥.٨٥	٢٥.٨٥
	انتظار 2-02-01	١	١٦.٨٣	١٦.٨٣
	سكرتارية 2-02-02	١	٢١.٢٩	٢١.٢٩
	استراحة 2-02-03	١	٨.٩٩	٨.٩٩
	امن + مكتب 2-01-03	٢	٦.٠٥	١٢.١٠
	سجلات طبية 2-01-04	١	٢٤.٣١	٢٤.٣١
	غرفة اعداد تقارير 2-05-03	١	٨.٠٣	٨.٠٣
	غرفة الفنيين 2-05-04	١	٨.٥٠	٨.٥٠
	غرفة تحكم 2-05-05	١	٦.١٧	٦.١٧

	غرفة عينات 2-04-05	١	١٥.٠٦	١٥.٠٦
	معمل كيمياء 2-04-06	١	٣٦.٢٠	٣٦.٢٠
	ممر 2-04-C01	١	٦٩.٢٤	٦٩.٢٤
	ممر 2-05-C01	١	٥٤.٨٣	٥٤.٨٣
	ممر 2-02-C01	١	٤٥.٧٢	٤٥.٧٢
	انتظار 2-03-07	١	٢٦.٠٥	٢٦.٠٥
	استقبال 2-03-01	١	١٣.٢٨	١٣.٢٨
	انتظار 2-03-07	١	٢٦.٥١	٢٦.٥١
	ممر 2-03-C01	١	٦٣.٤٨	٦٣.٤٨
	صالة المدخل 2-03-E1	١	٢٥.٤٧	٢٥.٤٧
	انتظار 2-03-07	١	١٠.٨٤	١٠.٨٤
	ممر 2-03-C01	١	٢٦.٨٠	٢٦.٨٠
	ممر اسفل الخزينة	١	٢٦.٥٦	٢٦.٥٦
	انتظار 2-05-01	١	٢٣.٢٤	٢٣.٢٤
	ممر اسفل غرفة العينات	١	١٦.٤٥	١٦.٤٥
	ممر اعلي غرفة العمليات	١	١٢.٧٩	١٢.٧٩
	غرفة اعداد تقارير 2-04-03	١	٧.٦٩	٧.٦٩
	الدور الاول و الثاني			
	غرقة العزل 3-04-07	٢	١٣.٠٢	٢٦.٠٣
	غرفة العزل 3-04-07	٢	٢٢.٣٧	٤٤.٧٥
	ممر 3-04-C01	٢	٢٣.٧٣	٤٧.٤٧
	قسم العناية المركزة+استقبال 3-04-01	٢	٤٥.٢١	٩٠.٤٢
	ممر بجانب السلم المبني اليمين	٢	١٢.٦٢	٢٥.٢٤
	غرفة تحضير المرضي 3-03-05	٢	١٤.٩٧	٢٩.٩٥
	غرفة تحضير مرضي 3-03-05	٤	١١.٤٤	٤٥.٧٨
	غرفة تحضير مرضي 3-03-05	٤	١٢.٤٤	٤٩.٧٥
	محطة تمريض 3-04-08 + عناية	٢	١٤١.٤٥	٢٨٢.٩٠
	مخزن 3-04-09	٢	١٧.٧٠	٣٥.٣٩
	ممر 3-04-C02	٢	٨٢.٦٥	١٦٥.٢٩
	ممر 3-04-C02	٢	٦٧.٣٢	١٣٤.٦٥
	مخزن 3-03-06	٢	٢٠.٥٢	٤١.٠٤
	مخزن ادوات معقمة 3-03-06	٢	٢٠.٠٨	٤٠.١٦
	تغيير ملابس ممرضات 3-02-05	٢	١٧.٧٥	٣٥.٥١
	تغيير ملابس اطباء 3-03-01	٢	٣١.٣٢	٦٢.٦٤

	غرفة الطبيب 3-04-06	٢	٢٨.١٧	٥٦.٣٣
	غرفة الممرضات 3-04-06	٢	٢١.٠٩	٤٢.١٨
	مخزن ادوات نظافة 3-01-04	٢	٦.١٥	١٢.٣٠
	تسجيل 3-04-02	٢	٩.٧١	١٩.٤٢
	معمل تحاليل 3-04-05	٢	١٥.٣٦	٣٠.٧٢
	اشعة متنقلة 3-04-04	٢	١٦.٠١	٣٢.٠٢
	انتظار 3-01-03	٢	٣٤.٧٨	٦٩.٥٦
	تسجيل 3-01-02	٢	١٠.٧٧	٢١.٥٤
	غرفة ممرضات 3-04-06	٢	١٠.٧٩	٢١.٥٧
	غرفة الجراحين 3-05-21	٢	١٧.٩٥	٣٥.٩١
	ممر	٢	٦٧.١٥	١٣٤.٣٠
	تعقيم سريع 3-02-07	٢	١٠.٩٧	٢١.٩٤
	مخزن ادوات نظافة 3-02-04	٢	٣.٩٣	٧.٨٥
	ممر غير معقم 3-03-C02	٢	٦٢.٣٨	١٢٤.٧٥
	ممر غير معقم 3-03-C02	٢	٩٠.٩٠	١٨١.٨٠
	تعقيم سريع 3-03-06	٨	٥.٣٦	٤٢.٨٨
	الادوار المتكررة			
	عنبر مرضي 4-02-02 (علوي)	١٤	٣٩.٥٤	٥٥٣.٥٨
	عنبر مرضي 4-02-02 (علوي)	١٤	٤٣.٣٧	٦٠٧.١١
	عنبر مرضي 4-02-02 (علوي)	١٤	٤٣.٤٩	٦٠٨.٧٩
	غرفة مزدوجة 4-02-02	١٤	١٩.٩٣	٢٧٨.٩٨
	غرفة مزدوجة 4-02-02	١٤	٢٠.٥١	٢٨٧.١٥
	مخزن ادوات 4-02-05	١٤	٨.٩٠	١٢٤.٦٤
	مهمات ملوثة 4-02-05	١٤	٧.١٨	١٠٠.٥٠
	مهمات نظيفة 4-02-05	١٤	٧.٦٥	١٠٧.١٠
	محطة تمريض 4-02-04	١٤	٥٦.٦٢	٧٩٢.٧١
	ممر (علوي)	١٤	٥٥.٤١	٧٧٥.٨٠
	ممر (جانب السلم)	١٤	٨٠.١١	١١٢١.٥٩
	عنبر مرضي 4-02-02 (سفلي)	١٤	٣٩.٦٤	٥٥٥.٠٠
	عنبر مرضي 4-02-02 (سفلي)	١٤	٤٣.٣٧	٦٠٧.١١
	عنبر مرضي 4-02-02 (سفلي)	١٤	٤٣.٤٩	٦٠٨.٧٩
	غرفة مزدوجة 4-02-02	١٤	١٨.٧٦	٢٦٢.٦٧
	غرفة مزدوجة 4-02-02	١٤	١٧.٨١	٢٤٩.٢٨
	غرفة العزل 4-02-06	١٤	٢٠.٣١	٢٨٤.٤٠

	ممر C02-04-3	١٤	٦٥.٧٦	٩٢٠.٦٧
	عنبر مرضي 02-02-4	١٤	٤٤.٥١	٦٢٣.١٩
	سكرتارية 02-02-2	١٤	١٣.٧٥	١٩٢.٤٥
	رئيس القسم	١٤	٣٦.٢٧	٥٠٧.٧٩
	ممر C02-04-3	١٤	٣٥.٨١	٥٠١.٣١
	عنبر مرضي 02-02-4	١٤	٥٥.٩٥	٧٨٣.٢٤
	عنبر مرضي 02-02-4	١٤	٥٦.٣٦	٧٨٨.٩٩
	ممر c1	١٤	٣١.٦٤	٤٤٣.٠٠
	انتظار 01-01-4	٧	١٦.٦٨	١١٦.٧٣
	مما جمعيه بالمتر المسطح		١٦٩٢٦	
٣٤	بالمتر المسطح توريد وتركيب رولات من الفينيل المقاوم للشحنات الاستاتيكية			
	الدور الاول و الثاني			
	العناية المركزة 08-04-3	٢	٥٥٣.٤٨	١١٠٦.٩٦
	غرفة عمليات مخصصة 04-03-3	٤	٣٢.٩٧	١٣١.٨٩
	غرفة عمليات مخصصة 04-03-3	٤	٣٤.٠٩	١٣٦.٣٥
	غرفة عمليات مخصصة 04-03-3	٤	٤١.٥٦	١٦٦.٢٥
	غرفة عمليات مخصصة 04-03-3	٢	٤٧.١٤	٩٤.٢٨
	غرفة عمليات مخصصة 04-03-3	٢	٤٢.٤٨	٨٤.٩٦
	ممر معقم C01-03-3	٢	١٥٤.٦٨	٣٠٩.٣٦
	غرفة افاقة 03-03-3	٢	٨٣.٥٥	١٦٧.١٠
	غرفة عمليات متخصصة 04-03-3	٢	٤٣.٠٣	٨٦.٠٦
	غرفة عمليات متخصصة 04-03-3	٢	٥٧.٥٩	١١٥.١٨
	مما جمعيه بالمتر المسطح		٢٣٩٨	
٣٥	بالمتر المسطح توريد وعمل خرسانة مسلحة ذات سمك 10 سم			
	البدروم			
	غرفه كهرباء	١.٠٠	١١.٢٠	١١.٢٠
	غرفة اللوحات الكهربية	١.٠٠	٦٧.٨١	٦٧.٨١
	غرفه تيار خفيف	١	١٨.٧٠	١٨.٧٠

	الدور الارضي			
	غرفه كهرباء	١	١٥.٠٠	١٥.٠٠
	الدور الاول و الثاني			
	غرفه كهرباء	٢	١٥.٠٠	٣٠.٠٠
	الادوار المتكررة			
	غرفه كهرباء	٧	٩.٠٠	٦٣.٠٠
	مما جمعيه بالمتر المسطح		٢٠٦	
٣٦	بالمتر المسطح توريد وتركيب بلاط موزايكو مقاس 20× 20× 2.5 سم			
	السطح	١.٠٠	٢٦٥٥.٨٥	٢٦٥٥.٨٥
	المصلي بالبدروم	١.٠٠	٤٥.٢٤	٤٥.٢٤
	مما جمعيه بالمتر المسطح		٢٧٠١	
٣٧	بالمتر المسطح توريد وتركيب بلاط جرانيت مقاس 60 * 60 سم			
	البدروم			
	بسطة سلم هروب St-02-1	١.٠٠	٨.٤٢	٨.٤٢
	بسطة سلم هروب St-02-1	١.٠٠	٨.٤٢	٨.٤٢
	بسطة سلم أسفل المبني	١.٠٠	١٦.٦٢	١٦.٦٢
	بسطة سلم هروب St-02-1	١.٠٠	٧.٩٩	٧.٩٩
	بسطة سلم أسفل المبني	١.٠٠	١٣.٠٨	١٣.٠٨
	بسطة سلم هروب St-02-1	١	٧.٩٩	٧.٩٩
	مدخل السلم الحلزوني + الممر	١	٧٩.٠٤	٧٩.٠٤
	بسطة سلم حلزوني	١	٢.٤٩	٢.٤٩
	الدور الارضي			
	بسطة سلم هروب St-02-1	١	٩.٣٢	٩.٣٢
	بسطة سلم هروب St-02-1	١	٩.٣٢	٩.٣٢
	بسطة سلم هروب St-02-1	١	١٤.٨٣	١٤.٨٣
	بسطة سلم هروب St-02-1	١	١٩.١٨	١٩.١٨
	بسطة سلم أسفل المبني يمين+م	١	١٩.٥٥	١٩.٥٥

	بسطة سلم أسفل المبني يسار	١	١٠.٣٦	١٠.٣٦
	بسطة سلم مدخل خلفي	١	٣٦.١٠	٣٦.١٠
	بسطة سلم مدخل أمامي	١	١٠.٢٢	١٠.٢٢
	بسطة سلم حلزوني داخلي	١	٢.٧١	٢.٧١
	سلم حلزوني خارجي	١	٩.٩٠	٩.٩٠
	مدخل السلم الحلزوني	١	١٤٤.٧٩	١٤٤.٧٩
	مدخل من البدروم للارضي (مزلقان)	٢	٥٠.٨٨	١٠١.٧٧
	الدور الاول والثاني			
	بسطة سلم هروب St-02-3	٢	٧.٤٧	١٤.٩٥
	بسطة سلم هروب St-02-3	٢	٥.٠٩	١٠.١٩
	بسطة سلم هروب St-02-3	٢	٥.٥٦	١١.١٢
	بسطة سلم هروب St-02-3	٢	٧.٥٢	١٥.٠٤
	مدخل السلم الحلزوني	٢	٣٩.٧١	٧٩.٤١
	بسطة سلم حلزوني	٢	١.٤٧	٢.٩٥
	الدور المتكرر			
	بسطة سلم هروب St-03-4	٨	١١.٤٨	٩١.٨٣
	بسطة سلم هروب St-03-4	٨	٨.٥٥	٦٨.٣٦
	بسطة سلم هروب St-03-4	٨	٧.٤٥	٥٩.٦٠
	بسطة سلم هروب St-03-4	٨	١٠.٢٣	٨١.٨١
	مدخل السلم الحلزوني + الممر	٧	٨٣.٥٤	٥٨٤.٧٧
	بسطة سلم حلزوني	٧	٣.١٣	٢١.٩٠
	مما جمعيه بالمتر المسطح		١٥٧٤	
٣٨	بالمتر الطولى توريد وتركيب كسوة درج جرانيت			
	البدروم			
	سلم هروب St-02-1	٢٨	١.٢٠	٣٣.٦٠
	سلم هروب St-02-1	٢٨	١.٢٠	٣٣.٦٠
	سلم أسفل المبني	٦	١.٧٠	١٠.٢٠
	سلم هروبSt-02-1	٢٢	١.٢٠	٢٦.٤٠
	سلم أسفل المبني	٦	٢.٣٠	١٣.٨٠
	سلم هروبSt-02-1	٢٢	١.٢٠	٢٦.٤٠
	سلم حلزوني	١٧	١.٥٠	٢٥.٥٠
	الدور الارضي			
	سلم هروب St-02-1	٢٦	١.٢٠	٣١.٢٠

	سلم هروب St-02-1	٢٦	١.٢٠	٣١.٢٠
	سلم أسفل المبني	١٨	١.٩٠	٣٤.٢٠
	سلم هروب St-02-1	٢٦	١.٢٠	٣١.٢٠
	سلم أسفل المبني	٩	١.٩٠	١٧.١٠
	سلم هروب St-02-1	٢٢	١.٢٠	٢٦.٤٠
	سلم حلزوني	٢٦	١.٥٠	٣٩.٠٠
	سلم حلزوني خارجي	٨	١.٢٠	٩.٦٠
	سلم مدخل أمامي	٨	٧.٠٠	٥٦.٠٠
	سلم مدخل خلفي	٩	٥.٦٠	٥٠.٤٠
	الدور الاول والثاني			
	سلم هروب St-02-3	٦٠	١.٢٠	٧٢.٠٠
	سلم هروب St-02-3	٦٠	١.٢٠	٧٢.٠٠
	سلم هروب St-02-3	٦٠	١.٢٠	٧٢.٠٠
	سلم هروب St-02-3	٥٨	١.٢٠	٦٩.٦٠
	سلم حلزوني	٦٠	١.٥٠	٩٠.٠٠
	الدور المتكرر			
	سلم هروب St-03-4	١٩٢	١.٢٠	٢٣٠.٤٠
	سلم هروب St-03-4	١٩٢	١.٢٠	٢٣٠.٤٠
	سلم هروب St-03-4	١٦٨	١.٢٠	٢٠١.٦٠
	سلم هروب St-03-4	١٦٨	١.٢٠	٢٠١.٦٠
	سلم حلزوني	١٦٨	١.٥٠	٢٥٢.٠٠
	مما جمعيه بالمتر الطولي		١٩٨٧	
٣٩	بالمتر المسطح توريد وتركيب بلاط أرضيات ملون من الانواع الفاخره (الانتر لوك)			
	لزوم الارصفه	١	٣٠٠٠.٠٠	٣٠٠٠.٠٠
	مما جمعيه بالمتر المسطح		٣٠٠٠	

رقم البند	البند	عدد	مقاسات			كميات	
			طول	عرض	ارتفاع	اضافة	خصم
اعمال التكسيات							
٤٠	بالمتر المسطح كسوه رخام جرانيت لزوم المدخل الرئيسي و الممرات الرئيسيه						
	الدور البدروم						
	لزوم المدخل و الممرات	١.٠٠	٤٨.٠٠		٣.٤٠	١٦٣.٢٠	
	الدور الارضي				٣.٥٥	٠.٠٠	
	لزوم المدخل الرئسي	١.٠٠	٥٢.٠٠		٣.٥٥	١٨٤.٦٠	
	لزوم المدخل و الممرات	١.٠٠	٧٠.٥٠		٣.٥٥	٢٥٠.٢٨	
	الدور الاول و الثاني						
	لزوم المدخل و الممرات الرئيسيه	٢.٠٠	٣٦.٠٠		٤.١٥	٢٩٨.٨٠	
	الدور المتكرر						
	لزوم المدخل و الممرات الرئيسيه	٧.٠٠	٤٨.٠٠		٤.١٥	١٣٩٤.٤٠	
	D4	١٥.٠٠	١.٠٠		٢.٢٠		٣٣.٠٠
	D3	٣٤.٠٠	١.٨٠		٢.٢٠		١٣٤.٦٤
	D9	٣٢.٠٠	١.٠٠		٢.٢٠		٧٠.٤٠
	D12	١.٠٠	١.٨٠		٢.٢٠		٣.٩٦
	الاجمالي	2049.2750					
٤١	بالمتر المسطح كسوة جرانيت مصري						
	لزوم اسفال الوجهات الخارجيه	١.٠٠	١٨٥٠.٠٠			١٨٥٠.٠٠	
	الاجمالي	1850.0000					
٤٢	بالمتر المسطح توريد و تركيب بلاط بورسلين لزوم الحوائط						
	بدروم						
	معمل	١.٠٠	١٣.٨٦		٣.٤٠	٤٧.١٢	
	ارضي						
	معمل كمياء	١.٠٠	٢٤.٨٠		٣.٥٥	٨٨.٠٤	
	معمل اختبار دم	١.٠٠	٢١.٧٢		٣.٥٥	٧٧.١١	

	معمل هيماتولجي	١.٠٠	٢١.٧٢	٣.٥٥	٧٧.١١	
	معمل هيماتولجي	١.٠٠	٢١.٣٠	٣.٥٥	٧٥.٦٢	
	الأدوار المتكررة					
	معمل تحاليل	٦.٠٠	١٩.٧١	٤.١٥	٤٩٠.٧٨	
	تخصيم الشبابيك	١٣.٠٠	٠.٨٠			٨.٣٢
	تخصيم الأبواب	٦.٠٠	٣.١٠			١٨.٦٠
	الاجمالي	828.8500				
٤٣	بالمتر المسطح بلاط السيراميك لزوم الحوائط					
	الدور الأرضي					
	حوائط مهامات نظيفة	١.٠٠	١٠.٨٧	٣.٥٥	٣٨.٥٩	
	حوائط مهامات ملوثة	١.٠٠	١٠.٨٧	٣.٥٥	٣٨.٥٩	
	الحمام	٤.٠٠	٨.٨٧	٣.٥٥	٣١.٤٩	
		١.٠٠	٩.٠٤	٣.٥٥	٣٢.٠٩	
		١.٠٠	٨.٣٩	٣.٥٥	٢٩.٧٨	
		١.٠٠	٩.٧٤	٣.٥٥	٣٤.٥٨	
		١.٠٠	١٠.٨٧	٣.٥٥	٣٨.٥٩	
		١.٠٠	١٢.٢٢	٣.٥٥	٤٣.٣٨	
		٢.٠٠	٢٥.٨٣	٣.٥٥	٩١.٧٠	
		٣.٠٠	٦.٦٤	٣.٥٥	٢٣.٥٧	
		١.٠٠	٨.٥٨	٣.٥٥	٣٠.٤٦	
	تخصيم الفتحات للابواب	٩.٠٠	٣.١٠			٢٧.٩٠
	تخصيم الفتحات للشبابيك	٣.٠٠	٠.٦٠			١.٨٠
	البدروم					
	الحمام	١.٠٠	٧.٧٠	٣.٤٠	٢٦.١٨	
		٢.٠٠	٢٨.٠٦	٣.٤٠	١٩٠.٨١	
	تخصيم الفتحات للابواب	٣.٠٠	٣.١٠	١.٠٠		٩.٣٠
	تخصيم الفتحات للشبابيك	٦.٠٠	٠.٦٠	١.٠٠		٣.٦٠
	تخصيم الفتحات للابواب	٦.٠٠	٢.١٠	٠.٦٠		٧.٥٦
	الدور الأول					
	الحمام	١.٠٠	٨.٧٩	٤.١٥	٣٦.٤٨	

		١.٠٠	٩.٥٩		٤.١٥	٣٩.٨٠	
		١.٠٠	٩.٣٢		٤.١٥	٣٨.٦٨	
		١.٠٠	٨.٧٩		٤.١٥	٣٦.٤٨	
		١.٠٠	٧.٤٩		٤.١٥	٣١.٠٨	
		١.٠٠	١٢.٤٩		٤.١٥	٥١.٨٣	
		١.٠٠	١٢.١٩		٤.١٥	٥٠.٥٩	
		١.٠٠	١١.٨٦		٤.١٥	٤٩.٢٢	
	تخصيم الفتحات للشبابيك	٥.٠٠	٠.٦٠	١.٠٠	٤.١٥		١٢.٤٥
	تخصيم الفتحات للابواب	٨.٠٠	٢.١٠	١.٠٠	٤.١٥		٦٩.٧٢
	الأدوار المتكررة						
	حوائط مهامات نظيفة	٢.٠٠	١١.٤٧		٣.٢٥	٧٤.٥٦	
	حوائط مهامات ملوثة	٢.٠٠	١١.٧٥		٣.٢٥	٧٦.٣٨	
	الحمامات	١٢.٠٠	٨.٤٨		٣.٢٥	٣٣٠.٧٢	
		٨.٠٠	٧.٧٠		٣.٢٥	٢٠٠.٢٠	
		٢.٠٠	٨.٧٠		٣.٢٥	٥٦.٥٥	
	تخصيم الفتحات للشبابيك	١.٠٠	٠.٦٠	١.٠٠	٣.٢٥		١.٩٥
	تخصيم الفتحات للابواب	٢٧.٠٠	٢.١٠	١.٠٠	٣.٢٥		١٨٤.٢٨
	الاجمالي	1403.8070					
٤٤	بالمتر المسطح توريد وتركيب بلاط بورسلين ليزر للحوائط						
	الدور البدروم						
	لزوم المطبخ و الممرات الخاصه به	١.٠٠	١٤٦.٠٠		٣.٤٠	٤٩٦.٤٠	
	لزوم غرف غسيل الاجهزه	١.٠٠	٩٤.٠٠		٣.٤٠	٣١٩.٦٠	
	لزوم اماكن التوزيع	١.٠٠	٢٤.٠٠		٣.٤٠	٨١.٦٠	
	الدور الارضي						
	لزوم غرف التحكم	١.٠٠			٣.٥٥	١٩٨.٠٥	
	لزوم غرف الغسيل	١.٠٠			٣.٥٥	٣٠.٨٩	
	D2	٤.٠٠			٢.٢٠		١٥.٨٤
	D3	٤.٠٠			٢.٢٠		٨.٨٠
	D4	٣.٠٠			٢.٢٠		٦.٦٠
	D11	١.٠٠			٢.٢٠		٢.٢٠

	D18	١.٠٠		٢.٢٠			٢.٦٤
	D19	٥.٠٠		٢.٢٠			٨.٨٠
	W9	٢.٠٠		٢.٣٠			٣.٦٨
	W8	١٣.٠٠		٠.٨٠			٨.٣٢
	W6	١.٠٠		١.٧٠			١.٣٦
	الاجمالي	1068.2995					
٤٥	بالمتر الطولي توريد وتركيب بلاطات من الفينيل لزوم الوزرة						
	ممر معقم C01-03-3	٢	١٠٢			٢٠٤.٠٥	٤٤.٠٠
	الاجمالي	160.0530					
٤٦	بالمتر الطولي توريد و تركيب بلاطات من الفينيل المقاوم للشحنات الاستاتيكيه لزوم الوزرة						
		٢	٦٠.٠٠٠			١٢٠.٠٠	٢٠.٠٠
	الاجمالي	100.0000					
٤٧	بالمتر الطولي توريد وتركيب وزرة من السيراميك						
	البدروم						
	غرفة تيار خفيف S1-01-2	١	٢٥.٠٤١			٢٥.٠٤	٢.٠٠
	غرفة كهرباء S1-01-1	١	١٩.٩٦٤			١٩.٩٦	٢.٠٠
	الدور الارضي						
	غرفة كهرباء 07-05-2	١	٢٢.٨٠٠			٢٢.٨٠	
	الدور الاول و الثاني						
	غرفة كهرباءS1-01-3	٢	١٤.٥٠٠			٢٩.٠٠	٢.٠٠
	غرفة كهرباء S1-01-3	٢	٨.٤٠٠			١٦.٨٠	٤.٠٠
	الادوار المتكررة						
	غرفة كهرباء S1-01-1	٧	١٤.١٣٠			٩٨.٩١	٧.٠٠

	اجماليات الخصم و الاضافه					٢١٢.٥١٤	١٧.٠٠٠
	الاجمالي	195.5143					
٤٨	المتر الطولي توريد وتركيب وزرة من البورسيلين						
	البدروم						
	مكتب ادارة 1-07-02	١.٠٠	٢٧.١٠٠			٢٧.١٠٠	١.٨٠٠
	مكتب 1-07-02	١.٠٠	٢٥.٠٤٠			٢٥.٠٤٠	١.٠٠٠
	مكتب 1-07-02	١.٠٠	٢٣.٦٤٩			٢٣.٦٤٩	١.٠٠٠
	مدير 1-06-04	١.٠٠	١٧.١١٠			١٧.١١٠	١.٠٠٠
	الدور الارضي						
	مكتب 2-02-02	٢.٠٠	٢١.٧٢٠			٤٣.٤٤٠	٢.٠٠٠
	مكتب 2-02-02	١.٠٠	١٤.٥٩٠			١٤.٥٩٠	١.٠٠٠
	مكتب 2-02-02	١.٠٠	١٧.٦٠٠			١٧.٦٠٠	١.٠٠٠
	مكتب 2-02-02	١.٠٠	٢١.١٢٠			٢١.١٢٠	١.٠٠٠
	حجز تذاكر 2-03-08	١.٠٠	١٤.٠٠٠			١٤.٠٠٠	١.٠٠٠
	الدور الاول و الثاني						
	تغيير ملابس ممرضات 3-02-05	٢.٠٠	٢٠.١٢٠			٤٠.٢٤٠	٦.٠٠٠
	تغيير ملابس اطباء 3-03-01	٢.٠٠	٣٠.٥٥٠			٦١.١٠٠	٦.٠٠٠
	غرفة الطبيب	٢.٠٠	٢٣.٣٩٩			٤٦.٧٩٨	٢.٠٠٠
	غرفة الممرضات 3-04-06	٢.٠٠	٢٣.٣٩٩			٤٦.٧٩٨	٢.٠٠٠
	تسجيل 3-04-02	٢.٠٠	١٣.١٥٥			٢٦.٣١٠	٢.٠٠٠
	تسجيل 3-01-02	٢.٠٠	١٣.٠٠٠			٢٦.٠٠٠	٢.٠٠٠
	الادوار المتكررة						
	انتظار	١٤.٠٠	١٧.٤٠٠			٢٤٣.٦٠٠	١٤.٠٠٠
	اجمالي الاضافات					٦٩٤.٤٩٥	٤٤.٨٠٠
	الاجمالي	649.6951					
٤٩	المتر الطولي توريد وتركيب وزرة من البورسيلين						
	الدور الارضي						
	انتظار	١.٠٠	٢٣.٣٩٩			٢٣.٣٩٩	١.٠٠٠
	صالة المدخل	١.٠٠	٢١.٨٧١			٢١.٨٧١	٣.٦٠٠
	استقبال	١.٠٠	١٤.٨٨٣			١٤.٨٨٣	١.٠٠٠

	استلام	١.٠٠	١٣.٠٠٠			١٣.٠٠٠	١.٠٠٠
	انتظار	١.٠٠	٣٧.٨٠٠			٣٧.٨٠٠	١.٠٠٠
	اجماليات الخصم و الاضافه					١١٠.٩٥٤	٧.٦٠٠
	الاجمالي	103.3535					
٥٠	بالمتر المسطح توريد و تركيب الواح رصاص لزوم حوائط غرف الاشعه						
	لزوم غرفه الاشعه	٢.٠٠	٢٢.٦٠٠		٣.٦٠٠	١٦٢.٧٢	
	لزوم غرفه الاشعه المقطعيه	١.٠٠	٢٦.٣٧٠		٣.٦٠٠	٩٤.٩٣	
	لزوم غرفه الاشعه و فلوروسكوبي	١.٠٠	١٩.٨٦٠		٣.٦٠٠	٧١.٥٠	
	لزوم غرفه الاشعه المتنقله	٢.٠٠	١٩.٥٠٠		٤.٢٠٠	١٦٣.٨٠	
	لزوم غرفه الاشعه و فلوروسكوبي	١.٠٠	٢٣.٨٠٠		٣.٦٠٠	٨٥.٦٨	
	D 15	٥.٠٠	١.٨٠٠		٢.٢٠٠		١٩.٨٠
	D 19	١.٠٠	٠.٨٠٠		٢.٢٠٠		١.٧٦
	D 4	٢.٠٠	١.٠٠٠		٢.٢٠٠		٤.٤٠
	W 11	٢.٠٠	٢.٠٠٠		٣.٥٠٠		١٤.٠٠
	الاجمالي	538.6680					
٥١	بالمتر المربع توريد وتنفيذ اعمال دهانات ايبوكسيه للحوائط لزوم غرف الافاقه و التحضير و العمليات المتخصصه						
	الدور الاول						
	لزوم غرف الافاقه	١.٠٠	٣٨.٠٠		٤.٠٠	١٥٢.٠٠	
	لزوم غرف تحضير المرضي	١.٠٠	٧٣.٨٠		٤.٠٠	٢٩٥.٢٠	
	لزوم غرف العمليات المتخصصه	١.٠٠	٢٦٩.٢٤		٤.٠٠	١٠٧٦.٩٦	
	D11	٢٠.٠٠	١.٠٠		٢.٢٠		٤٤.٠٠
	D10	١٠.٠٠	١.٨٠		٢.٢٠		٣٩.٦٠
	D3	٦.٠٠	١.٨٠		٢.٢٠		٢٣.٧٦
	W6	٤.٠٠	٠.٨٠		١.٧٠		٥.٤٤
	الدور الثاني						
	لزوم غرف الافاقه	١.٠٠	٣٨.٠٠		٤.٠٠	١٥٢.٠٠	
	لزوم غرف تحضير المرضي	١.٠٠	٧٣.٨٠		٤.٠٠	٢٩٥.٢٠	
	لزوم غرف العمليات المتخصصه	١.٠٠	٢٦٩.٢٤		٤.٠٠	١٠٧٦.٩٦	
	D11	٢٠.٠٠	١.٠٠		٢.٢٠		٤٤.٠٠
	D10	١٠.٠٠	١.٨٠		٢.٢٠		٣٩.٦٠
	D3	٦.٠٠	١.٨٠		٢.٢٠		٢٣.٧٦
	W6	٤.٠٠	٠.٨٠		١.٧٠		٥.٤٤
	الاجمالي	2822.7200					
٥٢	بالمتر المسطح توريد و تركيب تجاليد الكوريان من ماده اكليريكيه لحوائط غرف العمليات						
	الدور الاول						

	لزوم غرف العمليات المتخصصه	١.٠٠	٢٦٩.٢٤		٤.١٥	١١١٧.٣٥	
	D11	٢٠.٠٠	١.٠٠		٢.٢٠		٤٤.٠٠
	D10	١٠.٠٠	١.٨٠		٢.٢٠		٣٩.٦٠
	الدور الثاني						
	لزوم غرف العمليات المتخصصه	١.٠٠	٢٦٩.٢٤		٤.١٥	١١١٧.٣٥	
	D11	٢٠.٠٠	١.٠٠		٢.٢٠		٤٤.٠٠
	D10	١٠.٠٠	١.٨٠		٢.٢٠		٣٩.٦٠
	الاجمالي	2067.4920					
٥٣	بالمتر المسطح توريد وتركيب رولات من P.V.Cالمضغوط لتجاليد غرف المرضى						
	الدور الثالث						
	لزوم غرف مزدوجة	8	21.3		1.2	204.48	
	D4	8	1		1.2		٩.٦٠
	D5	8	1.2		1.2		١١.٥٢
	الدور المتكرر						
	لزوم غرف مزدوجة	48	21.3		1.2	1226.88	
	D4	48	1		1.2		٥٧.٦٠
	D5	48	1.2		1.2		٦٩.١٢
	الاجمالي	1283.5200					
٥٤	بالمتر المسطح توريد وتركيب تجاليد من الواح الالومنيوم للواجهات الخارجيه						
	الواجهه الاماميه						
	Rec 1 V.	٨.٠٠	٨٦.٨٠			٦٩٤.٤٠	
	Rec 2 V.	٢.٠٠	٨٤.٥٠			١٦٩.٠٠	
	Rec 3 H.	٤.٠٠	٧.٣٨			٢٩.٥٢	
	Rec 4 V.	٦.٠٠	٥.٠٠			٣٠.٠٠	
	FIG 1	٢.٠٠	٢٨٦.٥٤			٥٧٣.٠٨	
	FIG 2	١.٠٠	١١٣٠.٦٩			١١٣٠.٦٩	
	rec -1	٢.٠٠	٦٥.٦٠				١٣١.٢٠
	rec -2	١٢.٠٠	٥.١٢				٦١.٤٤
	الواجهه الخلفيه						
	Rec 1	٨.٠٠	٨٦.٦٤			٦٩٣.١٢	
	Rec 2	٢.٠٠	١٤٢.٨٨			٢٨٥.٧٦	
	Rec 3	٢.٠٠	٨٧.٩٥			١٧٥.٩٠	
	Rec 4	٤.٠٠	٩.٣٥			٣٧.٤٠	
	الاجمالي	3626.2300					
٥٥	بالمتر المسطح كسوه من الحجر الرملي						
	لزوم الحوائط	١.٠٠				٩٠٠.٠٠	
	الاجمالي	900.0000					

دفتر حصر كميات					
رقم البند	البند	عدد	مقاسات		كميات
			طول	عرض	اضافة
اعمال الاسقف					
٥٦	بالمتر المسطح توريد وتركيب بلاطات إيكوفون أو دايكن أو ما يماثلها				
	لزوم البدروم				
	غرفة التعقيم المركزي	١.٠٠	١٧.٢٦		١٧.٢٦
	لزوم الدور الارضي				
	ثلاجة دم	١.٠٠	٢٦.٦١		٢٦.٦١
	لزوم الدور الاول				
	عناية مركزة	١.٠٠	٥٦١.١٠		٥٣٨.٦٠
	غرف العمليات المتخصصة	١.٠٠	٣٣١.٠٣		٣٣١.٠٣
	غرف التعقيم السريع	١.٠٠	٣٤.٠١		٣٤.٠١
	محطات التمريض	١.٠٠	١٢٦		١٢٦.٠٢
	غرفة افاقة	١.٠٠	٨١		٨١.٣٢

	لزوم الدور الثاني			
	عناية مركزة	١.٠٠	٥٦١.١٠	٥٣٨.٦٠
	غرف العمليات المتخصصة	١.٠٠	٣٣١	٣٣١.٠٣
	غرف التعقيم السريع	١.٠٠	٣٤	٣٤.٠١
	محطات التمريض	١.٠٠	١٢٦.٠٢	١٢٦.٠٢
	غرفة افاقة	١.٠٠	٨١.٣٢	٨١.٣٢
	لزوم الدور الثالث			
	محطات تمريض	١.٠٠	١٩.٠١	١٩.٠١
	لزوم المتكرر 4-9			
	محطات تمريض	٦.٠٠	١٩	١١٤.٠٦
	الاجمالي		٢٣٩٩	
٥٧	بالمتر المسطح توريد وتركيب بلاطات اكواستاتيك مضادة للبكتريا			
	الدور البدروم			
	لزوم اماكن الانتظار	١.٠٠	٢٨.٤٠	٢٨.٤٠
	لزوم الممرات	١.٠٠	٣٢٠.٧٠	٣٢٠.٧٠
	الدور الارضي			
	لزوم اماكن الانتظار	١.٠٠	١٦٠.٩٣	١٦٠.٩٣
	لزوم الممرات	١.٠٠	٣٢٤.٩٩	٣٢٤.٩٩
	لزوم غرف العينات	١.٠٠	١١.٠٠	١١.٠٠
	الدور الاول			
	لزوم اماكن الانتظار	١.٠٠	٢٩.٤٤	٢٩.٤٤
	لزوم الممرات	١.٠٠	١٧٧.٩٥	١٧٧.٩٥
	لزوم غرف العزل	١.٠٠	٣١.٦٠	٣١.٦٠
	الدور الثاني			
	لزوم اماكن الانتظار	١.٠٠	٢٩.٤٤	٢٩.٤٤
	لزوم الممرات	١.٠٠	١٧٧.٩٥	١٧٧.٩٥
	لزوم غرف العزل	١.٠٠	٣١.٦٠	٣١.٦٠
	الدور الثالث			
	لزوم اماكن الانتظار	١.٠٠	١٦.٦٧	١٦.٦٧
	لزوم الممرات	١.٠٠	٣٣٢.٩٠	٣٣٢.٩٠
	لزوم غرف العزل	٢.٠٠	٢١.٦٩	٤٣.٣٨
	الدور المتكرر 4-9			
	لزوم اماكن الانتظار	٦.٠٠	١٦.٦٧	١٠٠.٠٠

	لزوم الممرات	٦.٠٠	٣٣٢.٩٠	١٩٩٧.٤٠
	لزوم غرف العزل	١٢.٠٠	٢١.٦٩	٢٦٠.٢٨
	الاجمالي	٤٠٧٥		
٥٨	بالمتر المسطح توريد وتركيب بلاطات معدنية			
	الدور البدروم			
	لزوم المطبخ و الممرات الخاصه به		١٧٢	١٧٢
	لزوم منطقه التوزيع		١٥	١٥
	لزوم منطقه التغليف		١٥.٦٦	١٥.٦٦
	لزوم منطقه الغسيل		٩.٣٠	٩.٣٠
	اوتوكلاف		١١.١٤	١١.١٤
	اداره ومراقبه		١٤.١٩	١٤.١٩
	غرفه تغير ملابس		٢٢.٢٥	٢٢.٢٥
	ثلاجه		٣١.٨٠	٣١.٨٠
	غرفه عاملين		٣٩.٤٠	٣٩.٤٠
	غرفه عاملات		٣٧.٢٥	٣٧.٢٥
	لزوم غرف المشرحه		٣٨.٨٧	٣٨.٨٧
	لزوم المغسله		١٤٨.٣٩	١٤٨.٣٩
	غسيل توريلات		١٢.٤٠	١٢.٤٠
	الدور الارضي			
	لزوم غرف التحكم	٣٦		٣٦
	الاجمالي	٦٠٣		
٥٩	بالمتر المسطح توريد وتركيب أسقف من الواح جبسية فرنساوى لافاج أو ما يماثلها لزوم أعمال أسقف الكونترات			
	الدور الارضي			
	لزوم العيادات	١.٠٠	١٢٣	١٢٢.٩٩
	لزوم عياده الكشف المبدئي	١.٠٠	١٣	١٣.١٦
	لزوم اماكن الاستلام	١.٠٠	٢٤	٢٣.٩٦
	لزوم حجرات الخزينه	١.٠٠	١٨	١٧.٧٨
	مدير المستشفي	١.٠٠	٣٧	٣٦.٨٤
	الدور الثالث			

	لزوم رئيس القسم	٢.٠٠	٣٦	٧٢.٨٠
	لزوم الفصل الدراسي	٣.٠٠	٦١	١٢١.٤٠
	لزوم الفصل الدراسي	١.٠٠	٨٢	٨١.٦٠
	الدور المتكرر 4:9			
	لزوم رئيس القسم	١٢.٠٠	٣٦.٤٠	٤٣٦.٨٠
	لزوم الفصل الدراسي	١٢.٠٠	٦١	٧٢٨.٤٠
	لزوم الفصل الدراسي	١.٠٠	٨٢	٨١.٦٠
	الاجمالي		١٧٣٧	
٦٠	بالمتر المسطح توريد وتركيب بلاطات جبسية أرمسترونج			
	لزوم البدروم			
	صيدلية	١.٠٠	١٢	١٢.٠٠
	مكتب ادارة	١.٠٠	٤٤	٤٣.٨٩
	مكتب	٢.٠٠	٣٢	٦٤.٦٠
	لزوم الدور الأرضي			
	صالة المدخل	١.٠٠	٥٥	٥٤.٧٨
	استقبال	١.٠٠	٢٦	٢٥.٧٩
	غرفة اجتماعات	١.٠٠	٥٠	٤٩.٩٥
	صيدلية	١.٠٠	١٣	١٣.٤١
	مكتب	١.٠٠	١١٢	١١١.٦٠
	لزوم الدور الاول			
	صالة المدخل	١.٠٠	١٩	١٨.٥٨
	استقبال	١.٠٠	٧٤	٧٤.٣٠
	لزوم الدور الثاني	١.٠٠	١٩	١٨.٥٨
	صالة المدخل	١.٠٠	٦٠	٥٩.٨٩
	اجمالي		٥٤٧	

دفتر حصر كميات

رقم البند	البند	عدد	مقاسات			كميات	
			طول	عرض	ارتفاع	اضافة	خصم

اعمال الدهانات							
٦١	بالمتر المسطح توريد ودهان أكليريك لزوم الحوائط الداخلية للغرف بالأدوار المختلفة						
	الدور الاول						
	لزوم الممر	١.٠٠	٨٦.٩٤		٤.٢٠	٣٦٥.١٥	
	D4	١.٠٠	١.٠٠		٢.٢٠		٢.٢٠
	لزوم الممر	١.٠٠	٧٠.٢٩		٤.٢٠	٢٩٥.٢٢	
	D4	١.٠٠	١.٠٠		٢.٢٠		٢.٢٠
	لزوم الممر الغير معقم	١.٠٠	٨٦.٩٩		٤.٢٠		
	D11	١.٠٠	١.٠٠		٢.٢٠		٢.٢٠
	لزوم الممر	١.٠٠	٧٧.٤٤		٤.٢٠	٣٢٥.٢٥	
	لزوم مخزن ادوات معقمة	١.٠٠	٢٠.٥٢		٤.٢٠	٨٦.١٨	
	D ELEVATOR	١.٠٠	٠.٨٨		٢.٢٠		١.٩٤
	D11	١.٠٠	١.٠٠		٢.٢٠		٢.٢٠
	الدور الثاني						
	لزوم الممر	١.٠٠	٨٦.٩٤		٤.٢٠	٣٦٥.١٥	
	D4	١.٠٠	١.٠٠		٢.٢٠		٢.٢٠
	لزوم الممر	١.٠٠	٧٠.٢٩		٤.٢٠	٢٩٥.٢٢	
	D4	١.٠٠	١.٠٠		٢.٢٠		٢.٢٠
	لزوم الممر الغير معقم	١.٠٠	٨٦.٩٩		٤.٢٠		
	D11	١.٠٠	١.٠٠		٢.٢٠		٢.٢٠
	لزوم الممر	١.٠٠	٧٧.٤٤		٤.٢٠	٣٢٥.٢٥	
	لزوم مخزن ادوات معقمة	١.٠٠	٢٠.٥٢		٤.٢٠	٨٦.١٨	
	D ELEVATOR	١.٠٠	٠.٩٠		٢.٢٠		١.٩٨
	D11	١.٠٠	١.٠٠		٢.٢٠		٢.٢٠
	الدور الأرضي						
	لزوم غرفة السونار والإيكو	٢	١٧		٤	١٢٥.٨٦	
	D4	٢.٠٠	١.٠٠		٢.٢٠		٤.٤٠
	لزوم غرفة الطبيب	٢	١٧		٤	١٢٥.٢٨	
	D4	١.٠٠	١.٠٠		٢.٢٠		٢.٢٠
	لزوم غرفة الاعداد والتقارير	١	١٢		٤	٤٣.٧٠	
	D4	١.٠٠	١.٠٠		٢.٢٠		٢.٢٠
	لزوم غرفة الفنين	١	١٢		٤	٤٤.٦٤	
	D4	١.٠٠	١.٠٠		٢.٢٠		٢.٢٠
	لزوم غرفة الاعداد والتقارير	١	١١		٤	٤١.٠٤	

	D4	١.٠٠	١.٠٠		٢.٢٠		٢.٢٠
	لزوم غرفة تكييف	١	١٤		٤	٥٠.٤٤	
	D9	١	١		٢		٢.٢٠
	لزوم غرفة الكهرباء	١	١٥		٤		
	D9	١	١		٢		٢.٢٠
	لزوم مخزن ادوات نظافة	١	٦		٤	٢٢.٦٨	
	D4	١.٠٠	١.٠٠		٢.٢٠		٢.٢٠
	لزوم الاستراحة	١	١٢		٤	٤٣.٤٩	
	D4	١.٠٠	١.٠٠		٢.٢٠		٢.٢٠
	لزوم المخزن	١	٢٢		٤	٧٨.٨٤	
	D2	١	١		٢		٢.٢٠
	D ELEVATOR	١.٠٠	٠.٨٨		٢.٢٠		١.٩٤
	الدور البدروم						
	لزوم غرفة الطبيب	١	٢١		٣	٦١.٥٠	
	D4	٣.٠٠	١.٠٠		٢.٢٠		٦.٦٠
	اجمالي الاضافه و الخصم					٢٧٨١	٥٤
	الاجمالي	٢٧٢٧					
٦٢	بالمتر المسطح توريد وعمل دهانات مضادة للبكرتريا والفطريات لزوم غرف الافاقه						
	الدور الاول						
	لزوم غرف الافاقه	١.٠٠	٣٨.٠٠		٤.١٥	١٥٧.٧٠	
	D3	١.٠٠	١.٨٠		٢.٢٠		٣.٩٦
	W6	٤.٠٠	٠.٨٠		١.٧٠		٥.٤٤
	الدور الثاني						
	لزوم غرف الافاقه	١.٠٠	٣٨.٠٠		٤.١٥	١٥٧.٧٠	
	D3	١.٠٠	١.٨٠		٢.٢٠		٣.٩٦
	W6	٤.٠٠	٠.٨٠		١.٧٠		٥.٤٤
	الاجمالي	٢٩٧					
٦٣	بالمتر المسطح توريد وعمل دهانات						
	للوجهات الخارجيه للمستشفي	١.٠٠	٩٠٠٠			٩٠٠٠	
	الاجمالي	٩٠٠٠					
٦٤	بالمتر المسطح توريد و دهان اكليريك للاسقف						
	الدور البدروم						

	لزوم اعمال المخازن	١.٠٠	٢٣٤		٢٣٤	
	لزوم حمامات الدور البدروم					
	ح1	١.٠٠	٣.١٧		٣.١٧	
	ح2	٢.٠٠	١٣.١٦		٢٦.٣٢	
	ح3	٢.٠٠	١٣.٢٤		٢٦.٤٨	
	الدور الارضي					
	لزوم اعمال المخازن	١.٠٠	٤٤.٥٠		٤٥	
	لزوم حمامات الدور الارضي					
		٢.٠٠	١٣		٢٦.٣٢	
		٢.٠٠	١٣		٢٦.٤٨	
		٢.٠٠	٤		٧.٨٦	
		٢.٠٠	٧		١٣.١٢	
		١.٠٠	٤		٤.٤٧	
		١.٠٠	٥		٥.١٥	
		١.٠٠	٧		٧.٠٠	
		١.٠٠	٥		٤.٥٧	
		٤.٠٠	٤		١٧.٧٦	
		١.٠٠	٤		٤.٤٤	
	لزوم غرف المهمات النظيفه	١.٠٠	٦		٦.٣٧	
	لزوم غرف المهمات الملوثه	١.٠٠	٦		٦.٣٧	
	الدور الاول					
	لزوم اعمال المخازن	١.٠٠	٤٢.٦٧		٤٣	
	لزوم حمامات الدور الاول					
		١.٠٠	٥		٤.٦٩	
		٢.٠٠	٤		٨.٣٨	
		١.٠٠	٥		٤.٧٠	
		٢.٠٠	١٥		٣٠.٠٠	
		١.٠٠	١٠		٩.٥٠	
		٢.٠٠	٧		١٣.١٨	
		٢.٠٠	٣		٦.٨٤	
	الدور الثاني					
	لزوم اعمال المخازن	١.٠٠	٤٢.٦٧		٤٣	
	حمامات الدور الثاني					
		١.٠٠	٥		٤.٦٩	
		٢.٠٠	٤		٨.٣٨	

		١.٠٠	٥			٤.٧٠	
		٢.٠٠	١٥			٣٠.٠٠	
		١.٠٠	١٠			٩.٥٠	
		٢.٠٠	٧			١٣.١٨	
		٢.٠٠	٣			٦.٨٤	
	الدور التالث						
	لزوم اعمال المخازن	١.٠٠	٣٤			٣٤	
	لزوم غرف المهمات النظيفه	٢.٠٠	٨			١٥.٢٨	
	لزوم غرف المهمات الملوثه	٢.٠٠	٧			١٤.٣٦	
	لزوم حمامات الدور الثالث						
		١٢.٠٠	٤			٤٦.٢٠	
		٨.٠٠	٣			٢٤.٩٦	
		٢.٠٠	٤			٨.٠٠	
		٢.٠٠	٤			٨.٨٢	
		٤.٠٠	١٣			٥٢.٦٤	
	لزوم غرف المهمات النظيفه	١٢.٠٠	٨			٩١.٦٨	
	لزوم غرف المهمات الملوثه	١٢.٠٠	٧			٨٦.١٦	
	الدور المتكرر 4-9						
	لزوم اعمال المخازن	٦.٠٠	٣٤			٢٠٤.٠٠	
	لزوم غرف المهمات النظيفه	٢.٠٠	٨			١٥.٢٨	
	لزوم غرف المهمات الملوثه	٢.٠٠	٧			١٤.٣٦	
	لزوم حمامات الدور المتكرر						
		٧٢.٠٠	٤			٢٧٧.٢٠	
		٤٨.٠٠	٣			١٤٩.٧٦	
		١٢.٠٠	٤			٤٨.٠٠	
		١٢.٠٠	٤			٥٢.٩٢	
		٢٤.٠٠	١٣			٣١٥.٨٤	
	لزوم غرف المهمات النظيفه	١٢.٠٠	٨			٩١.٦٨	
	لزوم غرف المهمات الملوثه	١٢.٠٠	٧			٨٦.١٦	
	الاجمالي	٢٣٤٢					

دفتر حصر كميات				
رقم البند	البند	عدد	مقاسات طول	كميات اضافة
	الاعمال الخشبيه			
٦٥	بالعدد توريد و تركيب باب خشب موسكي نموذج D2			
	الدور البدروم	٤.٠٠		
	الدور الارضي	٤.٠٠		
	الدور الاول	٣.٠٠		
	الدور الثاني	٣.٠٠		
	الدور الثالث	٤.٠٠		
	الدور المتكرر 4-9	٢٤.٠٠		
	الاجمالي	٤٢		
٦٦	بالعدد توريد و تركيب باب خشب موسكي نموذج D3			
	الدور البدروم	١٧.٠٠		
	الدور الارضي	٥.٠٠		
	الدور الاول	٢٤.٠٠		
	الدور الثاني	٢٤.٠٠		
	الدور الثالث	٥		
	الدور المتكرر 4-9	٣٠		
	الاجمالي	١٠٥		
٦٧	بالعدد توريد و تركيب باب خشب موسكي نموذج D4			
	الدور البدروم	٢٧		
	الدور الارضي	٦٤		
	الدور الاول	٣٣		
	الدور الثاني	٣٣		
	الدور الثالث	٤٣		
	الدور المتكرر 4-9	٢٥٨		
	الاجمالي	٤٥٨		
٦٨	بالعدد توريد و تركيب باب خشب موسكي نموذج D5			

	الدور الثالث	٣٠		
	الدور المتكرر 4-9	١٨٠		
	الاجمالي	٢١٠		
٦٩	بالعدد توريد و تركيب باب خشب موسكي نموذج D7			
	الدور البدروم	١٩		
	الدور الارضي	٢٠		
	الدور الاول	٢١		
	الدور الثاني	٢١		
	الدور الثالث	٣٥		
	الدور المتكرر 4-9	٢١٠		
	الاجمالي	٣٢٦		
٧٠	بالمتر الطولي توريد وتركيب بنشات المعامل			
	الدور البدروم	٢	١٤	٢٧
	الدور الارضي	٣	١٣	٣٩
		١	١٩	١٩
	الاجمالي	٨٥		

دفتر حصر كميات						
رقم البند	البند	عدد	مقاسات			كميات
			طول	عرض	ارتفاع	اضافة
الاعمال المعدنيه و الالومينيوم						
٧١	بالمتر المسطح توريد وتركيب شبابيك منزلقه من الالومنيوم					
	الدور البدروم					
	W8	50			0.8	32
	W9	4			2.3	7.36
	W16	6			0.6	2.16
	الدور الارضي					
	W3	4			1.7	20.4
	W4	4			2.3	15.64
	w6	58			0.8	78.88
	w7	6			0.6	2.16
	الدور الاول					
	w6	27			0.8	36.72
	w7	3			0.6	1.08
	w15	4			0.8	3.84
	w15	4			0.8	3.84
	الدور الثاني					
	w6	27			0.8	36.72
	w7	3			0.6	1.08
	w15	4			0.8	3.84
	الدور الثالث					

	w3	2		3	1.7	10.2
	w6	20		0.8	1.7	27.2
	w7	9		0.6	0.6	3.24
	المتكرر من 4-9					
	w3	12		3	1.7	61.2
	w6	120		0.8	1.7	163.2
	w7	54		0.6	0.6	19.44
	الاجمالي	530.2				
٧٢	بالمتر المسطح توريد و تركيب ابواب مفصليه من الالومنيوم					
	الدور البدروم					
	D17	1		1.8	2.2	3.96
	D18	3		1.8	2.2	11.88
	الدور الارضي					
	D1	7		1.8	3	37.8
	الدور الثالث					
	D17	32		1.8	2.2	126.72
	الدور المتكرر 4-9					
	D17	192		1.8	2.2	760.32
	الاجمالي	٩٤١				
٧٣	بالمتر الطولي درابزين من الاستانليس ستيل					
		1	600			600
	الاجمالي	٦٠٠.٠٠				
٧٤	بالمتر الطولي توريد و تركيب ستاير بارتفاع 2.20 حول اسره المرضي					
	الدور الارضي					
	لزوم سراير العيادات	9	3.5			31.5
	الدور الاول					
	لزوم سراير العنايه المركزه	42	8.78			368.76
	لزوم سراير العيادات	1	3.5			3.5
	الدور التاني					

	لزوم سراير العنايه المركزه	42	8.78			368.76
	لزوم سراير العيادات	1	3.5			3.5
	الدور التالت					
	لزوم عنابر المرضي	96	7.38			708.48
	الدور المتكرر 4-9					
	لزوم عنابر المرضي	576	7.38			4250.88
	الاجمالي	٥٧٣٥				
٧٥	بالمتر المسطح مثل البند السابق ولكن لشبابيك حجرات وعنابر المرضي و العنايه المركزه					
	الدور الاول					
	W1	19	13.8			262.2
	الدور الثاني					
	W1	19	13.8			262.2
	الدور الثالث					
	W1	18	13.58			244.44
	W6	12	0.8			9.6
	W10	2	2.46			4.92
	الدور المتكرر 4-9					
	W1	108	13.58			1466.64
	W6	72	0.8			57.6
	W10	12	2.46			29.52
	الاجمالي	2337.12				
٧٦	بالعدد توريد وتركيب شيش حصيره لزوم ابواب غرف الاقامه					
	الدور الثالث					
	D17	29				29
	الدور المتكرر 4-9					
	D17	174				174
	الاجمالي	203				
٧٧	بالعدد توريد وتركيب باب حديد صاج مفصلى					
	الدور البدروم					
	D9	2				2

	الدور الارضي					
	D9	6				6
	الدور الاول					
	D9	3				3
	الدور التاني					
	D9	3				3
	الدور التالت					
	D9	2				2
	الدور المتكرر 4-9					
	D9	12				12
	الاجمالي	٢٨				
٧٨	بالمتر المسطح توريد وتركيب لافته					
	رئيسية تركب على الواجهة الرئيسية	10				
	الاجمالي	١٠				
٧٩	بالمتر الطولي توريد وعمل االكونترات					
	للادوار و الاقسام المختلفه	50				50
	الاجمالي	٥٠				
٨٠	بالمتر المسطح توريد وتركيب لافته					
	رئيسية تركب على الواجهة الرئيسية	10				10
	الاجمالي	١٠				
٨١	بالمتر الطولي توريد وعمل االكونترات للادوار و الاقسام المختلفه					
	الدور البدروم					
		1	2.66			2.66
		2	6.62			13.24
		1	3.5			3.5
		1	4.73			4.73
	الدور الارضي					
		1	3.8			3.8

		1	5.5			5.5
		1	4.9			4.9
		1	2.8			2.8
	الدور الاول					
		1	5.5			5.5
		2	7			14
		1	4.5			4.5
		1	3.88			3.88
	الدور الثاني					
		1	5.5			5.5
		2	7			14
		1	4.5			4.5
		1	3.88			3.88
	الدور الثالث					
		2	4.2			8.4
	الدور المتكرر 4-6					
		12	4.2			50.4
	الاجمالي				155.69	
٨٢	بالعدد توريد وتركيب باب حديد صاج					
	مفصلى ضلفتين نموذج D10					
	الدور الاول					
	D10	10				10
	الدور الثاني					
	D10	10				10
	الاجمالي				20.00	
٨٣	بالمتر المسطح توريد وتركيب لوحات					
	داخلية للابواب وإرشادية بالطرقات		2500			2500
	الاجمالي				2500.00	
٨٤	بالمتر المسطح توريد وتركيب					
	لافتات لمفاتيح الادوار		50			50

	الاجمالي					50.00
٨٥	بالمتر المسطح توريد وتركيب لافتات					
	إرشادية خارجية من الصاج المجلفن		200			200
	الاجمالي					200.00
٨٦	بالعدد توريد وتركيب لافتات					
	مضيئة لزوم سلالم الهروب	100				100
	الاجمالي					100.00
٨٧	بالمتر المسطح توريد وتركيب لافتات					
	معلقة لزوم الممرات والطرقات					
	و اسماء الاقسام		30			30
	الاجمالي					30.00
٨٨	بالمتر المسطح توريد وتركيب لافتات					
	حائطيه لزوم اسماء الغرف		200			200
	الاجمالي					200.00
٨٩	بالمتر المسطح توريد وتركيب					
	مرآة بللور نمره 1		800			800
	الاجمالي					800.00
٩٠	بالمتر المسطح توريد وتركيب حديد					
	فورفورجيه حمايه لفتحات الدور الارضي		2000			2000
	الاجمالي					2000.00
٩١	بالمتر المسطح توريد وتركيب تكسية لحوائط القاعة					
	الدور الثالث		33.75		2.2	74.25
			30.6		2.2	67.32
			40		2.2	88

	الدور المتكرر 4-9			202.5	2.2	445.5
				183.6	2.2	403.92
				240	2.2	528
	الاجمالي				١٦٠٧	
٩٢	بالمتر المسطح توريد وتركيب					
	قواطيع سمارت وولز	1	800		800	
	الاجمالي				٨٠٠	
٩٣	بالعدد توريد كاونتر للمنصه					
	الدور الثالث	3				3
	الدور المتكرر 4-9	18				18
	الاجمالي				٢١	
٩٤	بالعدد توريد وتركيب كراسى طراز مسارح	1000				1000
	الاجمالي				١٠٠٠	
٩٥	بالعدد توريد وتركيب كراسى طراز مدير	30				30
	الاجمالي				٣٠	

دفتر حصر كميات				
رقم البند	البند	عدد	مقاسات	
			طول	عرض
	اعمال تنسيق الموقع			
٩٦	بالعدد توريد و تركيب اشجار تظليل	٥٠.٠٠		
	الاجمالي	٥٠.٠٠		
٩٧	بالعدد توريد وزراعه نخيل سيكس	٣٠.٠٠		
	الاجمالي	٣٠.٠٠		
٩٨	بالعدد توريد وزراعه نخيل افرنجي	٢٠.٠٠		

	الاجمالي			٢٠.٠٠
٩٩	بالمتر المربع توريد وزراعة مغطيات تربه	١.٠٠		١٠٠
	الاجمالي			١٠٠.٠٠
١٠٠	بالمتر الطولي توريد وزراعة نباتات تحديد	١.٠٠	١٠٠	
	الاجمالي			١٠٠.٠٠
١٠١	بالعدد توريد وزراعة صبارات	٥٠.٠٠		
	الاجمالي			٥٠.٠٠
١٠٢	بالمتر المسطح توريد وتركيب نجيله طبيعية	١.٠٠		٢٠٠
	الاجمالي			٢٠٠.٠٠
١٠٣	بالمتر الطولي توريد وتركيب بودره رصيف	١.٠٠	٢٥٠٠	
	الاجمالي			٢٥٠٠.٠٠
١٠٤	بالمتر الطولي توريد وتركيب بودره حدائق	١.٠٠	١٠٠٠	
	الاجمالي			١٠٠٠.٠٠

ESTIMATION

Activity Name	Quantity	Unit	Resources		Resource Cost one/D	Prod/Day	No Of Crew	Total Pro. Rate	Duration	Cost Cum	`
Tanta Surgery Hospital											
s											
Mobilization			supervisor	1	150		1		1	150	330
			Unskilled	2	90					180	
Site Clean			supervisor	1	150		1		1	150	330
			Unskilled	2	90					180	
Temporary Facilities			Carpenter	2	150		2		2	1200	2400
			Assistant	3	100					1200	
Site Investigation			Sub-Contractor	1	600000		1		2	600000	600000
Surveying Works			Surveyor	1	170		1		1	170	270
			helper	1	100					100	
Demobilization			supervisor	1	150		1		1	150	330
			Unskilled	2	90					180	
Tank Works											
Soil Tank Works											
Excavation Works	4804.5	M3	Excavator	1	1500	150	3	450	8	36000	107520
			Loader	1	800					19200	
			Dump Trucks	2	1000					48000	
			Unskilled	2	90					4320	
Insulation Works	1724.95	M2	Insulation Workers	2	150	75	6	450	4	7200	46530
			Petumen	5175	7.6					39330	
Plain Concrete Works											
Erect Formworks P.C.Tank	103.8	M3	Carpenter	3	150	103.8	1	103.8	1	450	830
			Unskilled	2	90					180	
			Assistant	2	100					200	
Pouring P.C.Tank	103.8	M3	Worker for pipe of pump	1	120	320	1	320	1	120	75850
			Forman	1	120					120	
			assistant	1	100					100	
			ready mix concrete	104	725					75400	
			Vibrator	1	110					110	
Deshuttering Formworks P.C.Tank	103.8	M3	Unskilled	3	90	103.8	1	103.8	1	270	270
Reinforced Concrete Raft											
Erect Formworks RFT Tank Raft	193.03	M3	Carpenter	3	150	50	1	50	4	1800	3320
			Unskilled	2	90					720	
			Assistant	2	100					800	
Blacksmithing Works RFT Tank Raft	193.03	M3	commando	1	150	18.75	3	56.25	4	1800	231310
			Fixer	2	150					3600	
			assistant	2	100					2400	
			Steel	19	11650					221350	
			unskilled	2	90					2160	
Pouring RFT Tank Raft	193.03	M3	Worker for pipe of pump	1	120	320	1	320	1	120	140375
			Forman	1	120					120	
			assistant	1	100					100	
			ready mix concrete	193	725					139925	
			Vibrator	1	110					110	
Deshuttering Formworks RFT Tank Raft	193.03	M3	Unskilled	3	90	36	3	108	2	1620	1620
Reinforced Concrete Walls											
Erect Formworks RFT Tank Walls	215.13	M3	Carpenter	3	150	5	8	40	6	21600	39840
			Assistant	2	100					9600	
			unskilled	2	90					8640	
Blacksmithing Works RFT Tank Walls	215.13	M3	commando	1	150	18.75	3	56.25	4	1800	266260
			Fixer	2	150					3600	
			assistant	2	100					2400	
			Steel	22	11650					256300	
			unskilled	2	90					2160	
Pouring RFT Tank Walls	215.13	M3	Worker for pipe of pump	1	120	320	1	320	1	120	156325
			Forman	1	120					120	
			assistant	1	100					100	
			ready mix concrete	215	725					155875	
			Vibrator	1	110					110	
Deshuttering Formworks RFT Tank Walls	215.13	M3	Unskilled	3	90	36	3	108	2	1620	1620
Reinforced Concrete Slab											
Erect Formworks Tank Slab	95	M3	Carpenter	3	150	5	4	20	5	9000	16600
			Assistant	2	100					4000	
			unskilled	2	90					3600	
Blacksmithing Tank Slab	95	M3	commando	1	150	18.75	2	37.5	3	900	168080
			Fixer	2	150					1800	
			Steel	14	11650					163100	
			assistant	2	100					1200	
			unskilled	2	90					1080	
Pouring Tank Slab	95	M3	Worker for pipe of pump	1	120	320	1	320	1	120	69325
			Forman	1	120					120	
			assistant	1	100					100	
			ready mix concrete	95	725					68875	
			Vibrator	1	110					110	
Deshuttering Formworks Tank Slab	95	M3	Unskilled	3	90	36	3	108	1	810	810
Sub Structure Works											
Soil Works											
Excavation Works	14695.5	M3	Excavator	1	1500	150	8	1200	13	156000	465920
			Dump Trucks	2	1000					208000	
			Unskilled	2	90					18720	
			Loader	1	800					83200	
Back filling Works	4500	M3	Loader	1	800	200	8	1600	3	19200	293520
			Unskilled	2	90					4320	
			Clean Sand	4500	60					270000	
Footing Insulation	5941.8	M2	Insulation Workers	2	150	75	12	900	7	25200	160670
			Petumen	17825	7.6					135470	
Concrete Works For Foundation											
Plain Concrete Foundation											
Erect Formworks P.C.F	576	M3	Carpenter	3	150	576	1	576	1	450	830
			Unskilled	2	90					180	
			Assistant	2	100					200	
Pouring P.C.F	576	M3	Worker for pipe of pump	1	120	320	2	640	1	240	418500
			Forman	1	120					240	
			assistant	1	100					200	

			ready mix concrete	576	725					417600	
			Vibrator	1	110					220	
Deshuttering Formworks P.C.F	576	M3	Unskilled	3	90	192	3	576	1	810	810
Reinforced Concrete Foundation											
Piles Works											
Bored and pouring piles	15000	M	Sub Cotractor	1	1300		1		45	19500000	19500000
Piles Head Breaking	858	unit	Sculptor	2	120	4	15	60	15	54000	54000
Erect Formworks R.C.F	2291.32	M3	Carpenter	3	150	15	12	180	13	70200	129480
			Assistant	2	100					31200	
			unskilled	2	90					28080	
Blacksmithing R.C.F	2291.32	M3	commando	1	150	18.75	13	243.75	10	19500	2775750
			Fixer	2	150					39000	
			assistant	2	100					26000	
			Steel	229	11650					2667850	
			unskilled	2	90					23400	
Pouring R.C.F	2291.32	M3	Worker for pipe of pump	1	120	320	2	640	4	960	1664575
			Forman	1	120					960	
			assistant	1	100					800	
			ready mix concrete	2291	725					1660975	
			Vibrator	1	110					880	
Deshuttering Formworks R.C.F	2291.32	M3	Unskilled	3	90	36	10	360	7	18900	18900
Deckind Slab R.C for B.F											
Erect Formworks Deckind Slab R.C for B.F	246.95	M3	Carpenter	3	150	5	9	45	6	24300	44820
			Assistant	2	100					10800	
			unskilled	2	90					9720	
Blacksmithing Deckind Slab R.C for B.F	246.95	M3	commando	1	150	18.75	5	93.75	3	2250	303700
			Fixer	2	150					4500	
			Steel	25	11650					291250	
			assistant	2	100					3000	
			unskilled	2	90					2700	
Pouring Deckind Slab R.C for B.F	246.95	M3	Worker for pipe of pump	1	120	320	1	320	1	120	179525
			Forman	1	120					120	
			assistant	1	100					100	
			ready mix concrete	247	725					179075	
			Vibrator	1	110					110	
Deshuttering Formworks Deckind Slab R.C for B.F	246.95	M3	Unskilled	3	90	36	4	144	2	2160	2160
Basement floor Works											
Concrete Works B.F											
Reinforced Concrete Columns											
Erect Formworks 3 sides B.F.Col	795.45	M3	Carpenter	3	150	5	16	80	10	72000	132800
			Assistant	2	100					32000	
			unskilled	2	90					28800	
Blacksmithing B.F.Col	795.45	M3	commando	1	150	18.75	9	168.75	5	6750	1423700
			Fixer	2	150					13500	
			Steel	119	11650					1386350	
			assistant	2	100					9000	
			unskilled	2	90					8100	
Close Formworks Fourth side B.F.Col	795.45	M3	Carpenter	3	150	20	10	200	4	18000	33200
			Assistant	2	100					8000	
			unskilled	2	90					7200	
Pouring B.F.Col	795.45	M3	Worker for pipe of pump	1	120	320	2	640	2	480	578175
			Forman	1	120					480	
			assistant	1	100					400	
			ready mix concrete	795	725					576375	
			Vibrator	1	110					440	
Deshuttering Formworks B.F.Col	795.45	M3	Unskilled	3	90	36	11	396	2	5940	5940
Reinforced Concrete Slab											
Erect Formworks B.F.Slab	400.51	M3	Carpenter	3	150	5	16	80	5	36000	66400
			Assistant	2	100					16000	
			unskilled	2	90					14400	
Blacksmithing B.F.Slab	400.51	M3	commando	1	150	18.75	1	18.75	3	450	701490
			Fixer	2	150					900	
			Steel	60	11650					699000	
			assistant	2	100					600	
			unskilled	2	90					540	
Electrical Works B.F.Slab	1	LS	subcontractor						3	30000	30000
Pouring B.F.Slab	400.51	M3	Worker for pipe of pump	1	120	320	1	320	2	240	291625
			Forman	1	120					240	
			assistant	1	100					200	
			ready mix concrete	401	725					290725	
			Vibrator	1	110					220	
Deshuttering Formworks B.F.Slab	400.51	M3	Unskilled	3	90	36	4	144	3	3240	3240
Finishing Works B.F											
Install Frames of windows and doors B.F	69	Each	carpentar	2	170		2		3	2040	230940
			assistant	2	100					1200	
			mosky wood	69	3300					227700	
Brick Works B.F	917.53	M2	Builder	1	170	27	5	135	7	5950	73428.5
			assistant	2	100					7000	
			Sand	28	60					1680	
			Cement	9	850					7650	
			Bricks	51	1000					51000	
			Water	4.5	33					148.5	
	145.19	M3	Builder	1	170	3	7	21	7	8330	92668.5
			assistant	2	100					9800	
			Sand	29	60					1740	
			Cement	9	850					7650	
			Bricks	65	1000					65000	
			Water	4.5	33					148.5	
Erect Primary Electrical Works.B.F	1	LS	Sub Contractor				1		7	70000	70000
Primary Plumbing Works B.F	1	LS	Sub Contractor				1		10	100000	100000
Insulation W.c Works	60	M2	Insulation Worker	2	150	100	1	100	1	300	2400

			Membren	7	300					2100	
Plastering Works B.F	6388.8	M2	Plastering Worker	2	150	69	10	690	10	30000	469164
			Assistant	4	100					40000	
			Cement	383	850					325550	
			Sand	1118	60					67080	
			Water	198	33					6534	
Ceiling Works	17.26	m2	Ecophone tiles	20	120	10	1	10	5	2400	4150
			worker	1	150					750	
			assistant	2	100					1000	
	349.1	m2	Aquastatic tiles	401	130	10	7	70	5	52130	64380
			worker	1	150					5250	
			assistant	2	100					7000	
	567.15	m2	Metal tiles	652	150	10	12	120	5	97800	118800
			worker	1	150					9000	
			assistant	2	100					12000	
	120.49	m2	Armstrong tiles	20	160	10	3	30	5	3200	8450
			worker	1	150					2250	
			assistant	2	100					3000	
Cladding Works B.F	171.36	M2	Marble Workers	1	150	35	1	35	5	750	25969.6
			Assistant	2	100					1000	
			Sand	0.3	60					18	
			Water	0.2	33					6.6	
			Cement	0.3	850					255	
			Marble	171	140					23940	
	1162.895	M2	Tiles Worker	1	150	25	10	250	5	7500	292982.4
			Assistant	2	100					10000	
			Ceramics Tiles	203	50					10150	
			Porcelain Tiles Laser	900	270					243000	
			Porcelain Tiles	61	270					16470	
			Sand	0.7	60					42	
			Water	3.8	33					125.4	
			Cement	6.7	850					5695	
Install Ceramics Works B.F	1681	M2	Tiles Worker	1	150	25	7	175	10	10500	310595
			Assistant	2	100					14000	
			Porcelain Tiles	785	270					211950	
			Ceramic Tiles	315	50					15750	
			Ceramic High Res. Tiles	536	70					37520	
			mozaiko	45	70					3150	
			Sand	151	60					9060	
			Water	5	33					165	
			Cement	10	850					8500	
Painting Works B.F	54.9	m2	putty	12	5	80	1	80	1	60	2271
			Acrylic paint	37	53					1961	
			Paint worker	1	150					150	
			assistant	1	100					100	
	289.98	m2	putty	64	5	80	4	320	1	320	11761
			Acrylic paint	197	53					10441	
			Paint worker	1	150					600	
			assistant	1	100					400	
Installation of metal and aluminum works B.F	64	m2	Technical	1	170		2		2	680	36680
			assistant	2	100					800	
			alumital	64	550					35200	
Finishing Plumbing Fixtures B.F	1	LS	Sub Contractor				1		7	200000	200000
Finishing Electrical Fixtures B.F	1	LS	Sub Contractor				1		5	130000	130000
finishing Carpentry works B.F	51.13	m	carpentar	2	170		2		2	1360	297960
			assistant	2	100					800	
			wood	51	5800					295800	
Cleaning and Closing B.F			unskilled	2	90		1		1	180	180
Super Structure Works											
Ground Floor Works											
Concrete Works G.F											
Reinforced Concrete Columns											
Erect Formworks 3 sides G.F.Col	405.03	M3	Carpenter	3	150	5	17	85	5	38250	70550
			Assistant	2	100					17000	
			unskilled	2	90					15300	
Blacksmithing G.F.Col	405.03	M3	commando	1	150	18.75	8	150	3	3600	730570
			Fixer	2	150					7200	
			Steel	61	11650					710650	
			assistant	2	100					4800	
			unskilled	2	90					4320	
Close Formworks Fourth side G.F.Col	405.03	M3	Carpenter	3	150	20	11	220	2	9900	18260
			Assistant	2	100					4400	
			unskilled	2	90					3960	
Pouring G.F.Col	405.03	M3	Worker for pipe of pump	1	120	320	2	640	1	240	294525
			Forman	1	120					240	
			assistant	1	100					200	
			ready mix concrete	405	725					293625	
			Vibrator	1	110					220	
Deshuttering Formworks G.F.Col	405.03	M3	Unskilled	3	90	36	3	108	4	3240	3240
Reinforced Concrete Slab											
Erect Formworks G.F.Slab	530.01	M3	Carpenter	3	150	5	16	80	7	50400	92960
			Assistant	2	100					22400	
			unskilled	2	90					20160	
Blacksmithing G.F.Slab	530.01	M3	commando	1	150	18.75	8	150	4	4800	958560
			Fixer	2	150					9600	
			Steel	80	11650					932000	
			assistant	2	100					6400	
			unskilled	2	90					5760	
Electrical Works G.F.Slab	1	LS							3	30000	30000

Pouring G.F.Slab	530.01	M3	Worker for pipe of pump	1	120	320	2	640	1	240	385150
			Forman	1	120					240	
			assistant	1	100					200	
			ready mix concrete	530	725					384250	
			Vibrator	1	110					220	
Deshuttering Formworks G.F.Slab	530.01	M3	Unskilled	3	90	36	4	144	4	4320	4320
Finishing Works G.F											
Install Frames of doors G.F	102	Each	carpentar	2	170		2		2	1360	338760
			assistant	2	100					800	
			mosky wood	102	3300					336600	
Brick Works G.F	2884.38	M2	Builder	1	170	27	9	243	12	18360	228715
			assistant	2	100					21600	
			Sand	86	60					5160	
			Cement	26	850					22100	
			Bricks	161	1000					161000	
			Water	15	33					495	
	210.48	M3	Builder	1	170	3	6	18	12	12240	135408
			assistant	2	100					14400	
			Sand	42	60					2520	
			Cement	13	850					11050	
			Bricks	95	1000					95000	
			Water	6	33					198	
Erect Primary Electrical Works.G.F	1	LS	Sub Contractor				1		7	70000	70000
Primary Plumbing Works G.F	1	LS	Sub Contractor				1		10	100000	100000
Plastering Works G.F	5986.14	M2	Plastering Worker	2	150	69	10	690	9	27000	437168
			Assistant	4	100					36000	
			Cement	359	850					305150	
			Sand	1048	60					62880	
			Water	186	33					6138	
Insulation W.c Works	110	M2	Insulation Worker	2	150	100	1	100	1	300	4200
			Membren	13	300					3900	
Install Ceramics Works G.F	1783	M2	Tiles Worker	1	150	25	1	25	9	1350	407495
			Assistant	2	100					1800	
			Porcelain Tiles	1325	270					357750	
			Ceramic Tiles	229	50					11450	
			Ceramic High Res. Tiles	229	70					16030	
			Sand	160	60					9600	
			Water	5	33					165	
			Cement	11	850					9350	
Ceiling fixtures Works G.F	26.61	m2				10	1	10	5	0	5470
			Ecophone tiles	31	120					3720	
			worker	1	150					750	
			assistant	2	100					1000	
	496.92	m2				10	10	100	5	0	91860
			Aquastatic tiles	572	130					74360	
			worker	1	150					7500	
			assistant	2	100					10000	
	36	m2				10	1	10	5	0	8050
			Metal tiles	42	150					6300	
			worker	1	150					750	
			assistant	2	100					1000	
	214.7269	m2				10	5	50	5	0	49550
			Lavage gypsum panels	247	150					37050	
			worker	2	150					7500	
			assistant	2	100					5000	
	255.53	m2				10	6	60	5	0	13700
			Armstrong tiles	20	160					3200	
			worker	1	150					4500	
			assistant	2	100					6000	
Painting Works G.F	549.828	m2	putty	121	5	80	3	240	3	605	22677
			Acrylic paint	374	53					19822	
			Paint worker	1	150					1350	
			assistant	1	100					900	
	174.41	m2	putty	38	5	80	1	80	3	190	7247
			Acrylic paint	119	53					6307	
			Paint worker	1	150					450	
			assistant	1	100					300	
cladding works G.F	448.875	M2	Marble Workers	1	150	35	2	70	7	2100	68763
			Assistant	2	100					2800	
			Sand	2	60					120	
			Water	1	33					33	
			Cement	1	850					850	
			Marble	449	140					62860	
	993.56	M2	Tiles Worker	1	150	25	6	150	7	6300	201279
			Assistant	2	100					8400	
			Porcelain Tiles	394	270					106380	
			Ceramics Tiles	420	50					21000	
			Porcelain Tiles Laser	180	270					48600	
			Sand	90	60					5400	
			Water	3	33					99	
			Cement	6	850					5100	
	545	M2	Technical	1	170	30	3	90	7	3570	35660
			Assistant	2	100					4200	
			Lead Sheets	545	50					27250	
			Glue	8 Can	80					640	
Finishing Plumbing Fixtures G.F	1	LS	Sub Contractor				1		7	200000	200000
Finishing Electrical Fixtures G.F	1	LS	Sub Contractor				1		5	130000	130000
Installation of metal and aluminum works G.F	79	m2	Technical	1	170		2		3	1020	45670
			assistant	2	100					1200	
			alumital	79	550					43450	
finishing Carpentry works G.F	56	m	carpentar	2	170		2		3	2040	328040
			assistant	2	100					1200	
			wood	56	5800					324800	
finishung the floor G.F	31.5	m	Technical	1	170		1		2	340	559260

			assistant	2	100					400	
			Curtains	32	220					7040	
	2000	m2	Smith	1	170		2		2	680	
			assistant	2	100					800	
			steel forforgaa	2000	275					550000	
Cleaning and Closing G.F			unskilled	2	90		1		1	180	180
First Floor Works											
Concrete Works 1_st											
Reinforced Concrete Columns											
Erect Formworks 3 sides 1_st.Col	440.85	M3	Carpenter	3	150	5	15	75	6	40500	74700
			Assistant	2	100					18000	
			unskilled	2	90					16200	
Blacksmithing 1_st.Col	440.85	M3	commando	1	150	18.75	8	150	3	3600	788820
			Fixer	2	150					7200	
			Steel	66	11650					768900	
			assistant	2	100					4800	
			unskilled	2	90					4320	
Close Formworks Fourth side 1_st.Col	440.85	M3	Carpenter	3	150	15	10	150	3	13500	24900
			Assistant	2	100					6000	
			unskilled	2	90					5400	
Pouring 1_st.Col	440.85	M3	Worker for pipe of pump	1	120	320	2	640	1	240	320625
			Forman	1	120					240	
			assistant	1	100					200	
			ready mix concrete	441	725					319725	
			Vibrator	1	110					220	
Deshuttering Formworks 1_st.Col	440.85	M3	Unskilled	3	90	36	3	108	4	3240	3240
Reinforced Concrete Slab											
Erect Formworks 1_st.Slab	530.01	M3	Carpenter	3	150	5	16	80	7	50400	92960
			Assistant	2	100					22400	
			unskilled	2	90					20160	
Blacksmithing 1_st.Slab	530.01	M3	commando	1	150	18.75	8	150	4	4800	958560
			Fixer	2	150					9600	
			Steel	80	11650					932000	
			assistant	2	100					6400	
			unskilled	2	90					5760	
Electrical Works 1_st.Slab	1	LS							3	30000	30000
Pouring 1_st.Slab	530.01	M3	Worker for pipe of pump	1	120	320	2	640	1	240	385150
			Forman	1	120					240	
			assistant	1	100					200	
			ready mix concrete	530	725					384250	
			Vibrator	1	110					220	
Deshuttering Formworks 1_st.Slab	530.01	M3	Unskilled	3	90	36	4	144	4	4320	4320
Finishing Works 1_st											
Install Frames of doors 1_st	94	Each	carpentar	2	170		2		2	1360	312360
			assistant	2	100					800	
			mosky wood	94	3300					310200	
Brick Works 1_st	1445.75	M2	Builder	1	170	27	6	162	9	9180	115474
			assistant	2	100					10800	
			Sand	53	60					3180	
			Cement	13	850					11050	
			Bricks	81	1000					81000	
			Water	8	33					264	
	298.75	M3	Builder	1	170	3	12	36	9	18360	193407
			assistant	2	100					21600	
			Sand	50	60					3000	
			Cement	19	850					16150	
			Bricks	134	1000					134000	
			Water	9	33					297	
Erect Primary Electrical Works 1_st	1	LS	Sub Contractor				1		7	70000	70000
Primary Plumbing Works 1_st	1	LS	Sub Contractor				1		10	100000	100000
Plastering Works 1_st	6544.97	M2	Plastering Worker	2	150	69	10	690	10	30000	479449
			Assistant	4	100					40000	
			Cement	393	850					334050	
			Sand	1145	60					68700	
			Water	203	33					6699	
Insulation W.c Works 1_st	50	M2	Insulation Worker	2	150	100	1	100	1	300	2100
			Membren	6	300					1800	
Install Ceramics Works 1_st	1176	M2	Tiles Worker	1	150	25	8	200	6	7200	311622
			Assistant	2	100					9600	
			Porcelain Tiles	1006	270					271620	
			Ceramic Tiles	57	50					2850	
			Ceramic High Res. Tiles	113	70					7910	
			Sand	106	60					6360	
			Water	4	33					132	
			Cement	7	850					5950	
	65	M2	Technical	1	170	33	1	33	6	1020	10205
			venile rolls	65	100					6500	
			Assistant	2	100					1200	
			Geotex	6 Can	210					1260	
			Silicon	3 Can	75					225	
Cladding works 1_st	1206.1805	M2	Marble Workers	1	150	35	7	245	5	5250	1295906.4
			Assistant	2	100					7000	
			Sand	5	60					300	
			Water	0.8	33					26.4	
			Cement	3	850					2550	
			korean	1049	1200					1258800	
			Marble	157	140					21980	
	255.8	M2	Tiles Worker	1	150	25	3	75	5	2250	23999.6
			Assistant	2	100					3000	
			Ceramics Tiles	356	50					17800	
			Sand	1	60					60	
			Water	1.2	33					39.6	
			Cement	1	850					850	
	965	M2	epoxy Paste	965	5	80	3	240	5	4825	47175
			ePoxy	965	40					38600	

			epoxy Workers	1	150					2250	
			Assistant	1	100					1500	
										0	
	1110.98	m2	Ecophone tiles	1278	120	10	12	120	9	153360	191160
			worker	1	150					16200	
			assistant	2	100					21600	
										0	
Ceiling fixtures Works 1_st	238.99	m2	Aquastatic tiles	275	130	10	3	30	9	35750	45200
			worker	1	150					4050	
			assistant	2	100					5400	
										0	
	92.88	m2	Armstrong tiles	20	160	10	1	10	9	3200	6350
			worker	1	150					1350	
			assistant	2	100					1800	
			putty	258	5					1290	
	1061.06	m2	Acrylic paint	773	53	80	7	560	2	40969	45759
			Paint worker	1	150					2100	
			assistant	1	100					1400	
			putty	98	5					490	
			Plastic paint	50	17					850	
Painting Works 1_st	148.3	m2	HYGIENE paint	26	60	80	1	80	2	1560	3400
			Paint worker	1	150					300	
			assistant	1	100					200	
			putty	26	5					130	
	119.96	m2	Acrylic paint	81	53	80	1	80	2	4293	4923
			Paint worker	1	150					300	
			assistant	1	100					200	
Finishing Plumbing Fixtures 1_st	1	LS	Sub Contractor				1		7	200000	200000
Finishing Electrical Fixtures 1_st	1	LS	Sub Contractor				1		5	130000	130000
			Technical	1	170					340	
Installation of metal and aluminum works 1_st	38	m2	assistant	2	100		2		1	400	21640
			alumital	38	550					20900	
			carpentar	2	170					1360	
finishing Carpentry works 1_st	46.88	m	assistant	2	100		2		2	800	274760
			wood	47	5800					272600	
			Technical	1	170					1700	
	372.26	m	assistant	2	100		2		5	2000	85760
finishing the floor 1_st			Curtains	373	220					82060	
			Technical	1	170					1700	
	262.2	m2	assistant	2	100		2		5	2000	119420
			Curtains	263	440					115720	
Cleaning and Closing 1_st			unskilled	2	90		1		1	180	180
Second Floor Works											
Concrete Works 2_nd											
Reinforced Concrete Columns											
			Carpenter	3	150					40500	
Erect Formworks 3 sides 2_nd.Col	440.85	M3	Assistant	2	100	5	15	75	6	18000	74700
			unskilled	2	90					16200	
			commando	1	150					3600	
			Fixer	2	150					7200	
Blacksmithing 2_nd.Col	440.85	M3	Steel	67	11650	18.75	8	150	3	780550	800470
			assistant	2	100					4800	
			unskilled	2	90					4320	
			Carpenter	3	150					13500	
Close Formworks Fourth side 2_nd.Col	440.85	M3	Assistant	2	100	15	10	150	3	6000	24900
			unskilled	2	90					5400	
			Worker for pipe of pump	1	120					240	
			Forman	1	120					240	
Pouring 2_nd.Col	440.85	M3	assistant	1	100	320	2	640	1	200	320625
			ready mix concrete	441	725					319725	
			Vibrator	1	110					220	
Deshuttering Formworks 2_nd.Col	440.85	M3	Unskilled	3	90	36	3	108	4	3240	3240
Reinforced Concrete Slab											
			Carpenter	3	150					50400	
Erect Formworks 2_nd.Slab	530.01	M3	Assistant	2	100	5	16	80	7	22400	92960
			unskilled	2	90					20160	
			commando	1	150					4800	
			Fixer	2	150					9600	
Blacksmithing 2_nd.Slab	530.01	M3	Steel	80	11650	18.75	8	150	4	932000	958560
			assistant	2	100					6400	
			unskilled	2	90					5760	
Electrical Works 2_nd.Slab	1	LS							3	30000	30000
			Worker for pipe of pump	1	120					240	
			Forman	1	120					240	
Pouring 2_nd.Slab	530.01	M3	assistant	1	100	320	2	640	1	200	385150
			ready mix concrete	530	725					384250	
			Vibrator	1	110					220	
Deshuttering Formworks 2_nd.Slab	530.01	M3	Unskilled	3	90	36	4	144	4	4320	4320
Finishing Works 2_nd											
			carpentar	2	170					1360	
Install Frames of doors 2_nd	94	Each	assistant	2	100		2		2	800	312360
			mosky wood	94	3300					310200	
			Builder	1	170					9180	
			assistant	2	100					10800	
	1445.75	M2	Sand	43	60	27	6	162	9	2580	113841
			Cement	13	850					11050	
			Bricks	80	1000					80000	
Brick Works 2_nd			Water	7	33					231	
			Builder	1	170					18360	
			assistant	2	100					21600	
	298.75	M3	Sand	60	60	3	12	36	9	3600	192974
			Cement	19	850					16150	
			Bricks	133	1000					133000	
			Water	8	33					264	

Erect Primary Electrical Works 2_nd	1	LS	Sub Contractor				1		7	70000	70000
Primary Plumbing Works 2_nd	1	LS	Sub Contractor				1		10	100000	100000
Plastering Works 2_nd	6544.97	M2	Plastering Worker	2	150	69	10	690	10	30000	479449
			Assistant	4	100					40000	
			Cement	393	850					334050	
			Sand	1145	60					68700	
			Water	203	33					6699	
Insulation W.c Works	50	M2	Insulation Worker	2	150	100	1	100	1	300	2100
			Membren	6	300					1800	
Install Ceramics Works 2_nd	1176	M2	Tiles Worker	1	150	25	8	200	6	7200	311622
			Assistant	2	100					9600	
			Porcelain Tiles	1006	270					271620	
			Ceramic Tiles	57	50					2850	
			Ceramic High Res. Tiles	113	70					7910	
			Sand	106	60					6360	
			Water	4	33					132	
			Cement	7	850					5950	
	65	M2	Technical	1	170	33	1	33	6	1020	10205
			venile rolls	65	100					6500	
			Assistant	2	100					1200	
			Geotex	6 Can	210					1260	
			Silicon	3 Can	75					225	
Cladding Works 2_nd	1521.45	M2	Marble Workers	1	150	35	7	245	7	7350	1512923
			Assistant	2	100					9800	
			Sand	8	60					480	
			Water	1	33					33	
			Cement	2	850					1700	
			korean	1208	1200					1449600	
			Marble	314	140					43960	
	255.8	M2	Tiles Worker	1	150	25	3	75	7	3150	23263
			Assistant	2	100					4200	
			Ceramics Tiles	256	50					12800	
			Sand	23	60					1380	
			Water	1	33					33	
			Cement	2	850					1700	
	1859	M2	epoxy Paste	1859	5	80	3	240	7	9295	88905
			ePoxy	1859	40					74360	
			epoxy Workers	1	150					3150	
			Assistant	1	100					2100	
Painting Works 2_nd	1061.06	m2	putty	233	5	80	7	560	2	1165	42878
			Acrylic paint	721	53					38213	
			Paint worker	1	150					2100	
			assistant	1	100					1400	
	148.3	m2	putty	97	5	80	1	80	2	485	3352
			Plastic paint	51	17					867	
			HYGIENE paint	25	60					1500	
			Paint worker	1	150					300	
			assistant	1	100					200	
	119.96	m2	putty	28	5	80	1	80	2	140	4986
			Acrylic paint	82	53					4346	
			Paint worker	1	150					300	
			assistant	1	100					200	
Finishing Plumbing Fixtures 2_nd	1	LS	Sub Contractor				1		7	200000	200000
Finishing Electrical Fixtures 2_nd	1	LS	Sub Contractor				1		5	130000	130000
Ceiling fixtures Works 2_end	1110.98	m2				10	12	120	9	0	191160
			Ecophone tiles	1278	120					153360	
			worker	1	150					16200	
			assistant	2	100					21600	
	238.99	m2				10	3	30	9	0	45200
			Aquastatic tiles	275	130					35750	
			worker	1	150					4050	
			assistant	2	100					5400	
	92.88	m2				10	1	10	9	0	6350
			Armstrong tiles	20	160					3200	
			worker	1	150					1350	
			assistant	2	100					1800	
Installation of metal and aluminum works 2_nd	66	m2	Technical	1	170		2		2	680	37780
			assistant	2	100					800	
			alumital	66	550					36300	
finishing Carpentry works 2_nd	46.88	m	carpentar	2	170		2		2	1360	274760
			assistant	2	100					800	
			wood	47	5800					272600	
finishing the floor 2_nd	372.26	m	Technical	1	170		2		5	1700	85540
			assistant	2	100					2000	
			Curtains	372	220					81840	
	262.2	m2	Technical	1	170		2		5	1700	118980
			assistant	2	100					2000	
			Curtains	262	440					115280	
Cleaning and Closing 2_nd			unskilled	2	90		1		1	180	180
Third Floor Works											
Concrete Works 3_rd											
Reinforced Concrete Columns											
Erect Formworks 3 sides 3_rd.Col	325.86	M3	Carpenter	3	150	5	13	65	5	29250	53950
			Assistant	2	100					13000	
			unskilled	2	90					11700	
Blacksmithing 3_rd.Col	325.86	M3	commando	1	150	18.75	6	112.5	3	2700	585790
			Fixer	2	150					5400	
			Steel	49	11650					570850	
			assistant	2	100					3600	
			unskilled	2	90					3240	
Close Formworks Fourth side 3_rd.Col	325.86	M3	Carpenter	3	150	15	11	165	2	9900	18260
			Assistant	2	100					4400	
			unskilled	2	90					3960	
Pouring 3_rd.Col	325.86	M3	Worker for pipe of pump	1	120	320	5	1600	1	600	238600

			Forman	1	120					600	
			assistant	1	100					500	
			ready mix concrete	326	725					236350	
			Vibrator	1	110					550	
Deshuttering Formworks 3_rd.Col	325.86	M3	Unskilled	3	90	36	3	108	3	2430	2430
Reinforced Concrete Slab											
Erect Formworks 3_rd.Slab	552.14	M3	Carpenter	3	150	5	13	65	9	52650	97110
			Assistant	2	100					23400	
			unskilled	2	90					21060	
Blacksmithing 3_rd.Slab	552.01	M3	commando	1	150	18.75	8	150	4	4800	993510
			Fixer	2	150					9600	
			Steel	83	11650					966950	
			assistant	2	100					6400	
			unskilled	2	90					5760	
Electrical Works 3_rd.Slab	1	LS							3	30000	30000
Pouring 3_rd.Slab	552.14	M3	Worker for pipe of pump	1	120	320	2	640	1	240	401825
			Forman	1	120					240	
			assistant	1	100					200	
			ready mix concrete	553	725					400925	
			Vibrator	1	110					220	
Deshuttering Formworks 3_rd.Slab	552.14	M3	Unskilled	3	90	36	4	144	4	4320	4320
Finishing Works 3_rd											
Install Frames of doors 3_rd	92	Each	carpentar	2	170		2		2	1360	305760
			assistant	2	100					800	
			mosky wood	92	3300					303600	
Brick Works 3_rd	1349.17	M2	Builder	1	170	13	6	78	18	18360	129641
			assistant	2	100					21600	
			Sand	40	60					2400	
			Cement	13	850					11050	
			Bricks	76	1000					76000	
			Water	7	33					231	
	204.57	M3	Builder	1	170	3	6	18	18	18360	145668
			assistant	2	100					21600	
			Sand	41	60					2460	
			Cement	13	850					11050	
			Bricks	92	1000					92000	
			Water	6	33					198	
Erect Primary Electrical Works 3_rd	1	LS	Sub Contractor				1		7	70000	70000
Primary Plumbing Works 3_rd	1	LS	Sub Contractor				1		10	100000	100000
Plastering Works 3_rd	4831.04	M2	Plastering Worker	2	150	69	10	690	7	21000	351150
			Assistant	4	100					28000	
			Cement	290	850					246500	
			Sand	845	60					50700	
			Water	150	33					4950	
Insulation W.c Works	130	M2	Insulation Worker	2	150	100	2	200	1	600	5100
			Membren	15	300					4500	
Install Ceramics Works 3_rd	2259	M2	Tiles Worker	1	150	25	9	225	10	13500	575421
			Assistant	2	100					18000	
			Porcelain Tiles	1828	270					493560	
			Ceramic Tiles	206	50					10300	
			Ceramic High Res. Tiles	225	70					15750	
			Sand	203	60					12180	
			Water	7	33					231	
			Cement	14	850					11900	
Cladding Works 3_rd	229.57	m2	carpentar	2	170		7		3	7140	96988
			assistant	2	100					4200	
			mdf	43	375					16125	
	271.5	M2	Marble Workers	1	150	35	3	105	3	1350	
			Assistant	2	100					1800	
			Sand	1.5	60					90	
			Water	0.203625	33					6.719625	
			Cement	1	850					850	
			Marble	272	140					38080	
	151.6607143	M2	Tiles Worker	1	150	25	3	75	3	1350	
			Assistant	2	100					1800	
			Ceramics Tiles	83	50					4150	
			Porcelain Tiles	68	270					18360	
			Sand	13.5	60					810	
			Water	0.8	33					26.4	
			Cement	1	850					850	
Ceiling fixtures Works 3_rd	19.01	m2	Ecophone tiles	22	120	10	1	10	7	2640	5090
			worker	1	150					1050	
			assistant	2	100					1400	
	392.947	m2	Aquastatic tiles	452	130	10	6	60	7	58760	73460
			worker	1	150					6300	
			assistant	2	100					8400	
	275.8	m2	Lavage gypsum panels	317	150	10	4	40	7	47550	57350
			worker	1	150					4200	
			assistant	2	100					5600	
Painting Works 3_rd	382.1	m2	putty	84	5	80	3	240	2	420	15700
			Acrylic paint	260	53					13780	
			Paint worker	1	150					900	
			assistant	1	100					600	
Finishing Plumbing Fixtures 3_rd	1	LS	Sub Contractor				1		7	200000	200000
Finishing Electrical Fixtures 3_rd	1	LS	Sub Contractor				1		5	130000	130000
Installation of metal and aluminum works 3_rd	63	m2	Technical	1	170		2		2	680	36130
			assistant	2	100					800	
			alumital	63	550					34650	

finishing Carpentry works 3_rd	27.4	m	carpentar	2	170		2		2	1360	158760
			assistant	2	100					800	
			wood	27	5800					156600	
finishing the floor 3_rd	708.48	m	Technical	1	170		2		4	1360	158720
			assistant	2	100					1600	
			Curtains	708	220					155760	
	258.96	m2	Technical	1	170		2		4	1360	116920
			assistant	2	100					1600	
			Curtains	259	440					113960	
	29		Technical	1	170		1		4	680	23230
			assistant	2	100					800	
			shesh hasera	29	750					21750	
Cleaning and Closing 3_rd			unskilled	2	90		1		1	180	180
Fourth Floor Works											
Concrete Works 4_th											
Reinforced Concrete Columns											
Erect Formworks 3 sides 4_th.Col	325.86	M3	Carpenter	3	150	5	13	65	5	29250	53950
			Assistant	2	100					13000	
			unskilled	2	90					11700	
Blacksmithing 4_th.Col	325.86	M3	commando	1	150	18.75	6	112.5	3	2700	585790
			Fixer	2	150					5400	
			Steel	49	11650					570850	
			assistant	2	100					3600	
			unskilled	2	90					3240	
Close Formworks Fourth side 4_th.Col	325.86	M3	Carpenter	3	150	15	11	165	2	9900	18260
			Assistant	2	100					4400	
			unskilled	2	90					3960	
Pouring 4_th.Col	325.86	M3	Worker for pipe of pump	1	120	320	5	1600	1	600	238600
			Forman	1	120					600	
			assistant	1	100					500	
			ready mix concrete	326	725					236350	
			Vibrator	1	110					550	
Deshuttering Formworks 4_th.Col	325.86	M3	Unskilled	3	90	36	3	108	3	2430	2430
Reinforced Concrete Slab											
Erect Formworks 4_th.Slab	552.14	M3	Carpenter	3	150	5	13	65	9	52650	97110
			Assistant	2	100					23400	
			unskilled	2	90					21060	
Blacksmithing 4_th.Slab	552.01	M3	commando	1	150	18.75	8	150	4	4800	993510
			Fixer	2	150					9600	
			Steel	83	11650					966950	
			assistant	2	100					6400	
			unskilled	2	90					5760	
Electrical Works 4_th.Slab	1	LS							3	30000	30000
Pouring 4_th.Slab	552.14	M3	Worker for pipe of pump	1	120	320	2	640	1	240	401825
			Forman	1	120					240	
			assistant	1	100					200	
			ready mix concrete	553	725					400925	
			Vibrator	1	110					220	
Deshuttering Formworks 4_th.Slab	552.14	M3	Unskilled	3	90	36	4	144	4	4320	4320
Finishing Works 4_th											
Install Frames of doors 4_th	92	Each	carpentar	2	170		2		2	1360	305760
			assistant	2	100					800	
			mosky wood	92	3300					303600	
Brick Works 4_th	1349.17	M2	Builder	1	170	13	6	78	18	18360	129641
			assistant	2	100					21600	
			Sand	40	60					2400	
			Cement	13	850					11050	
			Bricks	76	1000					76000	
			Water	7	33					231	
	204.57	M3	Builder	1	170	3	6	18	18	18360	145668
			assistant	2	100					21600	
			Sand	41	60					2460	
			Cement	13	850					11050	
			Bricks	92	1000					92000	
			Water	6	33					198	
Erect Primary Electrical Works 4_th	1	LS	Sub Contractor				1		7	70000	70000
Primary Plumbing Works 4_th	1	LS	Sub Contractor				1		10	100000	100000
Plastering Works 4_th	4831.04	M2	Plastering Worker	2	150	69	10	690	7	21000	351150
			Assistant	4	100					28000	
			Cement	290	850					246500	
			Sand	845	60					50700	
			Water	150	33					4950	
Insulation W.c Works	130	M2	Insulation Worker	2	150	100	2	200	1	600	5100
			Membren	15	300					4500	
Install Ceramics Works 4_th	2259	M2	Tiles Worker	1	150	25	9	225	10	13500	575421
			Assistant	2	100					18000	
			Porcelain Tiles	1828	270					493560	
			Ceramic Tiles	206	50					10300	
			Ceramic High Res. Tiles	225	70					15750	
			Sand	203	60					12180	
			Water	7	33					231	
			Cement	14	850					11900	
Cladding Works 4_th	229.57	m2	carpentar	2	170		7		3	7140	96988
			assistant	2	100					4200	
			mdf	43	375					16125	
	271.5	M2	Marble Workers	1	150	35	3	105	3	1350	
			Assistant	2	100					1800	
			Sand	1.5	60					90	
			Water	0.203625	33					6.719625	
			Cement	1	850					850	
			Marble	272	140					38080	
	151.6607143	M2	Tiles Worker	1	150	25	3	75	3	1350	
			Assistant	2	100					1800	
			Ceramics Tiles	83	50					4150	

			Porcelain Tiles	68	270					18360	
			Sand	13.5	60					810	
			Water	0.8	33					26.4	
			Cement	1	850					850	
Ceiling fixtures Works 4_th	19.01	m2	Ecophone tiles	22	120	10	1	10	7	2640	5090
			worker	1	150					1050	
			assistant	2	100					1400	
	392.947	m2	Aquastatic tiles	452	130	10	6	60	7	58760	73460
			worker	1	150					6300	
			assistant	2	100					8400	
	275.8	m2	Lavage gypsum panels	317	150	10	4	40	7	47550	57350
			worker	1	150					4200	
			assistant	2	100					5600	
Painting Works 4_th	382.1	m2	putty	84	5	80	3	240	2	420	15700
			Acrylic paint	260	53					13780	
			Paint worker	1	150					900	
			assistant	1	100					600	
Finishing Plumbing Fixtures 4_th	1	LS	Sub Contractor				1		7	200000	200000
Finishing Electrical Fixtures 4_th	1	LS	Sub Contractor				1		5	130000	130000
Installation of metal and aluminum works 4_th	63	m2	Technical	1	170		2		2	680	36130
			assistant	2	100					800	
			alumital	63	550					34650	
finishing Carpentry works 4_th	27.4	m	carpentar	2	170		2		2	1360	158760
			assistant	2	100					800	
			wood	27	5800					156600	
finishing the floor 4_th	708.48	m	Technical	1	170		2		4	1360	158720
			assistant	2	100					1600	
			Curtains	708	220					155760	
	258.96	m2	Technical	1	170		2		4	1360	116920
			assistant	2	100					1600	
			Curtains	259	440					113960	
	29		Technical	1	170		1		4	680	23230
			assistant	2	100					800	
			shesh hasera	29	750					21750	
Cleaning and Closing 4_th			unskilled	2	90		1		1	180	180
Fifth Floor Works											
Concrete Works 5_th											
Reinforced Concrete Columns											
Erect Formworks 3 sides 5_th.Col	325.86	M3	Carpenter	3	150	5	13	65	5	29250	53950
			Assistant	2	100					13000	
			unskilled	2	90					11700	
Blacksmithing 5_th.Col	325.86	M3	commando	1	150	18.75	6	112.5	3	2700	585790
			Fixer	2	150					5400	
			Steel	49	11650					570850	
			assistant	2	100					3600	
			unskilled	2	90					3240	
Close Formworks Fourth side 5_th.Col	325.86	M3	Carpenter	3	150	15	11	165	2	9900	18260
			Assistant	2	100					4400	
			unskilled	2	90					3960	
Pouring 5_th.Col	325.86	M3	Worker for pipe of pump	1	120	320	5	1600	1	600	238600
			Forman	1	120					600	
			assistant	1	100					500	
			ready mix concrete	326	725					236350	
			Vibrator	1	110					550	
Deshuttering Formworks 5_th.Col	325.86	M3	Unskilled	3	90	36	3	108	3	2430	2430
Reinforced Concrete Slab											
Erect Formworks 5_th.Slab	552.14	M3	Carpenter	3	150	5	13	65	9	52650	97110
			Assistant	2	100					23400	
			unskilled	2	90					21060	
Blacksmithing 5_th.Slab	552.01	M3	commando	1	150	18.75	8	150	4	4800	993510
			Fixer	2	150					9600	
			Steel	83	11650					966950	
			assistant	2	100					6400	
			unskilled	2	90					5760	
Electrical Works 5_th.Slab	1	LS							3	30000	30000
Pouring 5_th.Slab	552.14	M3	Worker for pipe of pump	1	120	320	2	640	1	240	401825
			Forman	1	120					240	
			assistant	1	100					200	
			ready mix concrete	553	725					400925	
			Vibrator	1	110					220	
Deshuttering Formworks 5_th.Slab	552.14	M3	Unskilled	3	90	36	4	144	4	4320	4320
Finishing Works 5_th											
Install Frames of doors 5_th	92	Each	carpentar	2	170		2		2	1360	305760
			assistant	2	100					800	
			mosky wood	92	3300					303600	
Brick Works 5_th	1349.17	M2	Builder	1	170	13	6	78	18	18360	129641
			assistant	2	100					21600	
			Sand	40	60					2400	
			Cement	13	850					11050	
			Bricks	76	1000					76000	
			Water	7	33					231	
	204.57	M3	Builder	1	170	3	6	18	18	18360	145668
			assistant	2	100					21600	
			Sand	41	60					2460	
			Cement	13	850					11050	
			Bricks	92	1000					92000	
			Water	6	33					198	
Erect Primary Electrical Works 5_th	1	LS	Sub Contractor				1		7	70000	70000
Primary Plumbing Works 5_th	1	LS	Sub Contractor				1		10	100000	100000
Plastering Works 5_th	4831.04	M2	Plastering Worker	2	150	69	10	690	7	21000	351150
			Assistant	4	100					28000	

			Cement	290	850					246500	
			Sand	845	60					50700	
			Water	150	33					4950	
Insulation W.c Works	130	M2	Insulation Worker	2	150	100	2	200	1	600	5100
			Membren	15	300					4500	
Install Ceramics Works 5_th	2259	M2	Tiles Worker	1	150	25	9	225	10	13500	575421
			Assistant	2	100					18000	
			Porcelain Tiles	1828	270					493560	
			Ceramic Tiles	206	50					10300	
			Ceramic High Res. Tiles	225	70					15750	
			Sand	203	60					12180	
			Water	7	33					231	
			Cement	14	850					11900	
Cladding Works 5_th	229.57	m2	carpentar	2	170		7		3	7140	96988
			assistant	2	100					4200	
			mdf	43	375					16125	
	271.5	M2	Marble Workers	1	150	35	3	105	3	1350	
			Assistant	2	100					1800	
			Sand	1.5	60					90	
			Water	0.203625	33					6.719625	
			Cement	1	850					850	
			Marble	272	140					38080	
	151.6607143	M2	Tiles Worker	1	150	25	3	75	3	1350	
			Assistant	2	100					1800	
			Ceramics Tiles	83	50					4150	
			Porcelain Tiles	68	270					18360	
			Sand	13.5	60					810	
			Water	0.8	33					26.4	
			Cement	1	850					850	
Ceiling fixtures Works 5_th	19.01	m2	Ecophone tiles	22	120	10	1	10	7	2640	5090
			worker	1	150					1050	
			assistant	2	100					1400	
	392.947	m2	Aquastatic tiles	452	130	10	6	60	7	58760	73460
			worker	1	150					6300	
			assistant	2	100					8400	
	275.8	m2	Lavage gypsum panels	317	150	10	4	40	7	47550	57350
			worker	1	150					4200	
			assistant	2	100					5600	
Painting Works 5_th	382.1	m2	putty	84	5	80	3	240	2	420	15700
			Acrylic paint	260	53					13780	
			Paint worker	1	150					900	
			assistant	1	100					600	
Finishing Plumbing Fixtures 5_th	1	LS	Sub Contractor				1		7	200000	200000
Finishing Electrical Fixtures 5_th	1	LS	Sub Contractor				1		5	130000	130000
Installation of metal and aluminum works 5_th	63	m2	Technical	1	170		2		2	680	36130
			assistant	2	100					800	
			alumital	63	550					34650	
finishing Carpentry works 5_th	27.4	m	carpentar	2	170		2		2	1360	158760
			assistant	2	100					800	
			wood	27	5800					156600	
finishing the floor 5_th	708.48	m	Technical	1	170		2		4	1360	158720
			assistant	2	100					1600	
			Curtains	708	220					155760	
	258.96	m2	Technical	1	170		2		4	1360	116920
			assistant	2	100					1600	
			Curtains	259	440					113960	
	29		Technical	1	170		1		4	680	23230
			assistant	2	100					800	
			shesh hasera	29	750					21750	
Cleaning and Closing 5_th			unskilled	2	90		1		1	180	180
Sixth Floor Works											
Concrete Works 6_th											
Reinforced Concrete Columns											
Erect Formworks 3 sides 6_th.Col	325.86	M3	Carpenter	3	150	5	13	65	5	29250	53950
			Assistant	2	100					13000	
			unskilled	2	90					11700	
Blacksmithing 6_th.Col	325.86	M3	commando	1	150	18.75	6	112.5	3	2700	585790
			Fixer	2	150					5400	
			Steel	49	11650					570850	
			assistant	2	100					3600	
			unskilled	2	90					3240	
Close Formworks Fourth side 6_th.Col	325.86	M3	Carpenter	3	150	15	11	165	2	9900	18260
			Assistant	2	100					4400	
			unskilled	2	90					3960	
Pouring 6_th.Col	325.86	M3	Worker for pipe of pump	1	120	320	5	1600	1	600	238600
			Forman	1	120					600	
			assistant	1	100					500	
			ready mix concrete	326	725					236350	
			Vibrator	1	110					550	
Deshuttering Formworks 6_th.Col	325.86	M3	Unskilled	3	90	36	3	108	3	2430	2430
Reinforced Concrete Slab											
Erect Formworks 6_th.Slab	552.14	M3	Carpenter	3	150	5	13	65	9	52650	97110
			Assistant	2	100					23400	
			unskilled	2	90					21060	
Blacksmithing 6_th.Slab	552.01	M3	commando	1	150	18.75	8	150	4	4800	993510
			Fixer	2	150					9600	
			Steel	83	11650					966950	
			assistant	2	100					6400	
			unskilled	2	90					5760	
Electrical Works 6_th.Slab	1	LS							3	30000	30000
Pouring 6_th.Slab	552.14	M3	Worker for pipe of pump	1	120	320	2	640	1	240	401825

			Forman	1	120					240	
			assistant	1	100					200	
			ready mix concrete	553	725					400925	
			Vibrator	1	110					220	
Deshuttering Formworks 6_th.Slab	552.14	M3	Unskilled	3	90	36	4	144	4	4320	4320
Finishing Works 6_th											
Install Frames of doors 6_th	92	Each	carpentar	2	170		2		2	1360	305760
			assistant	2	100					800	
			mosky wood	92	3300					303600	
Brick Works 6_th	1349.17	M2	Builder	1	170	13	6	78	18	18360	129641
			assistant	2	100					21600	
			Sand	40	60					2400	
			Cement	13	850					11050	
			Bricks	76	1000					76000	
			Water	7	33					231	
	204.57	M3	Builder	1	170	3	6	18	18	18360	145668
			assistant	2	100					21600	
			Sand	41	60					2460	
			Cement	13	850					11050	
			Bricks	92	1000					92000	
			Water	6	33					198	
Erect Primary Electrical Works 6_th	1	LS	Sub Contractor				1		7	70000	70000
Primary Plumbing Works 6_th	1	LS	Sub Contractor				1		10	100000	100000
Plastering Works 6_th	4831.04	M2	Plastering Worker	2	150	69	10	690	7	21000	351150
			Assistant	4	100					28000	
			Cement	290	850					246500	
			Sand	845	60					50700	
			Water	150	33					4950	
Insulation W.c Works	130	M2	Insulation Worker	2	150	100	2	200	1	600	5100
			Membren	15	300					4500	
Install Ceramics Works 6_th	2259	M2	Tiles Worker	1	150	25	9	225	10	13500	575421
			Assistant	2	100					18000	
			Porcelain Tiles	1828	270					493560	
			Ceramic Tiles	206	50					10300	
			Ceramic High Res. Tiles	225	70					15750	
			Sand	203	60					12180	
			Water	7	33					231	
			Cement	14	850					11900	
Cladding Works 6_th	229.57	m2	carpentar	2	170		7		3	7140	96988
			assistant	2	100					4200	
			mdf	43	375					16125	
	271.5	M2	Marble Workers	1	150	35	3	105	3	1350	
			Assistant	2	100					1800	
			Sand	1.5	60					90	
			Water	0.203625	33					6.719625	
			Cement	1	850					850	
			Marble	272	140					38080	
	151.6607143	M2	Tiles Worker	1	150	25	3	75	3	1350	
			Assistant	2	100					1800	
			Ceramics Tiles	83	50					4150	
			Porcelain Tiles	68	270					18360	
			Sand	13.5	60					810	
			Water	0.8	33					26.4	
			Cement	1	850					850	
Ceiling fixtures Works 6_th	19.01	m2	Ecophone tiles	22	120	10	1	10	7	2640	5090
			worker	1	150					1050	
			assistant	2	100					1400	
	392.947	m2	Aquastatic tiles	452	130	10	6	60	7	58760	73460
			worker	1	150					6300	
			assistant	2	100					8400	
	275.8	m2	Lavage gypsum panels	317	150	10	4	40	7	47550	57350
			worker	1	150					4200	
			assistant	2	100					5600	
Painting Works 6_th	382.1	m2	putty	84	5	80	3	240	2	420	15700
			Acrylic paint	260	53					13780	
			Paint worker	1	150					900	
			assistant	1	100					600	
Finishing Plumbing Fixtures 6_th	1	LS	Sub Contractor				1		7	200000	200000
Finishing Electrical Fixtures 6_th	1	LS	Sub Contractor				1		5	130000	130000
Installation of metal and aluminum works 6_th	63	m2	Technical	1	170		2		2	680	36130
			assistant	2	100					800	
			alumital	63	550					34650	
finishing Carpentry works 6_th	27.4	m	carpentar	2	170		2		2	1360	158760
			assistant	2	100					800	
			wood	27	5800					156600	
finishing the floor 6_th	708.48	m	Technical	1	170		2		4	1360	158720
			assistant	2	100					1600	
			Curtains	708	220					155760	
	258.96	m2	Technical	1	170		2		4	1360	116920
			assistant	2	100					1600	
			Curtains	259	440					113960	
	29		Technical	1	170		1		4	680	23230
			assistant	2	100					800	
			shesh hasera	29	750					21750	
Cleaning and Closing 6_th			unskilled	2	90		1		1	180	180
Seventh Floor Works											
Concrete Works 7_th											
Reinforced Concrete Columns											
Erect Formworks 3 sides 7_th.Col	325.86	M3	Carpenter	3	150	5	13	65	5	29250	53950
			Assistant	2	100					13000	
			unskilled	2	90					11700	

			commando	1	150					2700	
			Fixer	2	150					5400	
Blacksmithing 7_th.Col	325.86	M3	Steel	49	11650	18.75	6	112.5	3	570850	585790
			assistant	2	100					3600	
			unskilled	2	90					3240	
			Carpenter	3	150					9900	
Close Formworks Fourth side 7_th.Col	325.86	M3	Assistant	2	100	15	11	165	2	4400	18260
			unskilled	2	90					3960	
			Worker for pipe of pump	1	120					600	
			Forman	1	120					600	
Pouring 7_th.Col	325.86	M3	assistant	1	100	320	5	1600	1	500	238600
			ready mix concrete	326	725					236350	
			Vibrator	1	110					550	
Deshuttering Formworks 7_th.Col	325.86	M3	Unskilled	3	90	36	3	108	3	2430	2430
Reinforced Concrete Slab											
			Carpenter	3	150					52650	
Erect Formworks 7_th.Slab	552.14	M3	Assistant	2	100	5	13	65	9	23400	97110
			unskilled	2	90					21060	
			commando	1	150					4800	
			Fixer	2	150					9600	
Blacksmithing 7_th.Slab	552.01	M3	Steel	83	11650	18.75	8	150	4	966950	993510
			assistant	2	100					6400	
			unskilled	2	90					5760	
Electrical Works 7_th.Slab	1	LS							3	30000	30000
			Worker for pipe of pump	1	120					240	
			Forman	1	120					240	
Pouring 7_th.Slab	552.14	M3	assistant	1	100	320	2	640	1	200	401825
			ready mix concrete	553	725					400925	
			Vibrator	1	110					220	
Deshuttering Formworks 7_th.Slab	552.14	M3	Unskilled	3	90	36	4	144	4	4320	4320
Finishing Works 7_th											
			carpentar	2	170					1360	
Install Frames of doors 7_th	92	Each	assistant	2	100		2		2	800	305760
			mosky wood	92	3300					303600	
			Builder	1	170					18360	
			assistant	2	100					21600	
	1349.17	M2	Sand	40	60	13	6	78	18	2400	129641
			Cement	13	850					11050	
			Bricks	76	1000					76000	
Brick Works 7_th			Water	7	33					231	
			Builder	1	170					18360	
			assistant	2	100					21600	
	204.57	M3	Sand	41	60	3	6	18	18	2460	145668
			Cement	13	850					11050	
			Bricks	92	1000					92000	
			Water	6	33					198	
Erect Primary Electrical Works 7_th	1	LS	Sub Contractor				1		7	70000	70000
Primary Plumbing Works 7_th	1	LS	Sub Contractor				1		10	100000	100000
			Plastering Worker	2	150					21000	
			Assistant	4	100					28000	
Plastering Works 7_th	4831.04	M2	Cement	290	850	69	10	690	7	246500	351150
			Sand	845	60					50700	
			Water	150	33					4950	
Insulation W.c Works	130	M2	Insulation Worker	2	150	100	2	200	1	600	5100
			Membren	15	300					4500	
			Tiles Worker	1	150					13500	
			Assistant	2	100					18000	
			Porcelain Tiles	1828	270					493560	
Install Ceramics Works 7_th	2259	M2	Ceramic Tiles	206	50	25	9	225	10	10300	575421
			Ceramic High Res. Tiles	225	70					15750	
			Sand	203	60					12180	
			Water	7	33					231	
			Cement	14	850					11900	
			carpentar	2	170					7140	
	229.57	m2	assistant	2	100		7		3	4200	
			mdf	43	375					16125	
			Marble Workers	1	150					1350	
			Assistant	2	100					1800	
	271.5	M2	Sand	1.5	60	35	3	105	3	90	
			Water	0.203625	33					6.719625	
			Cement	1	850					850	
Cladding Works 7_th			Marble	272	140					38080	96988
			Tiles Worker	1	150					1350	
			Assistant	2	100					1800	
			Ceramics Tiles	83	50					4150	
	151.6607143	M2	Porcelain Tiles	68	270	25	3	75	3	18360	
			Sand	13.5	60					810	
			Water	0.8	33					26.4	
			Cement	1	850					850	
	19.01	m2	Ecophone tiles	22	120	10	1	10	7	2640	5090
			worker	1	150					1050	
			assistant	2	100					1400	
Ceiling fixtures Works 7_th	392.947	m2	Aquastatic tiles	452	130	10	6	60	7	58760	73460
			worker	1	150					6300	
			assistant	2	100					8400	
	275.8	m2	Lavage gypsum panels	317	150	10	4	40	7	47550	57350
			worker	1	150					4200	
			assistant	2	100					5600	
Painting Works 7_th	382.1	m2	putty	84	5	80	3	240	2	420	15700
			Acrylic paint	260	53					13780	

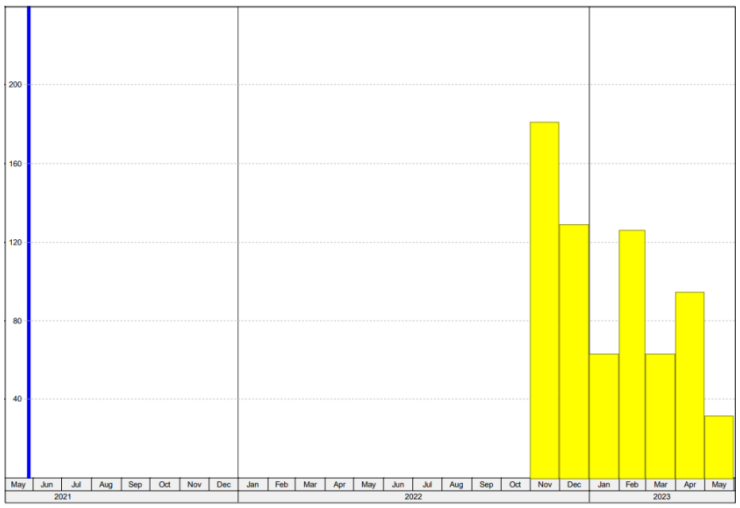
			Paint worker	1	150					900	
			assistant	1	100					600	
Finishing Plumbing Fixtures 7_th	1	LS	Sub Contractor				1		7	200000	200000
Finishing Electrical Fixtures 7_th	1	LS	Sub Contractor				1		5	130000	130000
Installation of metal and aluminum works 7_th	63	m2	Technical	1	170		2		2	680	36130
			assistant	2	100					800	
			alumital	63	550					34650	
finishing Carpentry works 7_th	27.4	m	carpentar	2	170		2		2	1360	158760
			assistant	2	100					800	
			wood	27	5800					156600	
finishing the floor 7_th	708.48	m	Technical	1	170		2		4	1360	158720
			assistant	2	100					1600	
			Curtains	708	220					155760	
	258.96	m2	Technical	1	170		2		4	1360	116920
			assistant	2	100					1600	
			Curtains	259	440					113960	
	29		Technical	1	170		1		4	680	23230
			assistant	2	100					800	
			shesh hasera	29	750					21750	
Cleaning and Closing 7_th			unskilled	2	90		1		1	180	180
Eighth Floor Works											
Concrete Works 8_th											
Reinforced Concrete Columns											
Erect Formworks 3 sides 8_th.Col	325.86	M3	Carpenter	3	150	5	13	65	5	29250	53950
			Assistant	2	100					13000	
			unskilled	2	90					11700	
Blacksmithing 8_th.Col	325.86	M3	commando	1	150	18.75	6	112.5	3	2700	585790
			Fixer	2	150					5400	
			Steel	49	11650					570850	
			assistant	2	100					3600	
			unskilled	2	90					3240	
Close Formworks Fourth side 8_th.Col	325.86	M3	Carpenter	3	150	15	11	165	2	9900	18260
			Assistant	2	100					4400	
			unskilled	2	90					3960	
Pouring 8_th.Col	325.86	M3	Worker for pipe of pump	1	120	320	5	1600	1	600	238600
			Forman	1	120					600	
			assistant	1	100					500	
			ready mix concrete	326	725					236350	
			Vibrator	1	110					550	
Deshuttering Formworks 8_th.Col	325.86	M3	Unskilled	3	90	36	3	108	3	2430	2430
Reinforced Concrete Slab											
Erect Formworks 8_th.Slab	552.14	M3	Carpenter	3	150	5	13	65	9	52650	97110
			Assistant	2	100					23400	
			unskilled	2	90					21060	
Blacksmithing 8_th.Slab	552.01	M3	commando	1	150	18.75	8	150	4	4800	993510
			Fixer	2	150					9600	
			Steel	83	11650					966950	
			assistant	2	100					6400	
			unskilled	2	90					5760	
Electrical Works 8_th.Slab	1	LS							3	30000	30000
Pouring 8_th.Slab	552.14	M3	Worker for pipe of pump	1	120	320	2	640	1	240	401825
			Forman	1	120					240	
			assistant	1	100					200	
			ready mix concrete	553	725					400925	
			Vibrator	1	110					220	
Deshuttering Formworks 8_th.Slab	552.14	M3	Unskilled	3	90	36	4	144	4	4320	4320
Finishing Works 8_th											
Install Frames of doors 8_th	92	Each	carpentar	2	170		2		2	1360	305760
			assistant	2	100					800	
			mosky wood	92	3300					303600	
Brick Works 8_th	1349.17	M2	Builder	1	170	13	6	78	18	18360	129641
			assistant	2	100					21600	
			Sand	40	60					2400	
			Cement	13	850					11050	
			Bricks	76	1000					76000	
			Water	7	33					231	
	204.57	M3	Builder	1	170	3	6	18	18	18360	145668
			assistant	2	100					21600	
			Sand	41	60					2460	
			Cement	13	850					11050	
			Bricks	92	1000					92000	
			Water	6	33					198	
Erect Primary Electrical Works 8_th	1	LS	Sub Contractor				1		7	70000	70000
Primary Plumbing Works 8_th	1	LS	Sub Contractor				1		10	100000	100000
Plastering Works 8_th	4831.04	M2	Plastering Worker	2	150	69	10	690	7	21000	351150
			Assistant	4	100					28000	
			Cement	290	850					246500	
			Sand	845	60					50700	
			Water	150	33					4950	
Insulation W.c Works	130	M2	Insulation Worker	2	150	100	2	200	1	600	5100
			Membren	15	300					4500	
Install Ceramics Works 8_th	2259	M2	Tiles Worker	1	150	25	9	225	10	13500	575421
			Assistant	2	100					18000	
			Porcelain Tiles	1828	270					493560	
			Ceramic Tiles	206	50					10300	
			Ceramic High Res. Tiles	225	70					15750	
			Sand	203	60					12180	
			Water	7	33					231	
			Cement	14	850					11900	
Cladding Works 8_th	229.57	m2	carpentar	2	170		7		3	7140	96988
			assistant	2	100					4200	
			mdf	43	375					16125	
	271.5	M2	Marble Workers	1	150	35	3	105	3	1350	
			Assistant	2	100					1800	

			Sand	1.5	60					90	
			Water	0.203625	33					6.719625	
			Cement	1	850					850	
			Marble	272	140					38080	
	151.6607143	M2	Tiles Worker	1	150	25	3	75	3	1350	
			Assistant	2	100					1800	
			Ceramics Tiles	83	50					4150	
			Porcelain Tiles	68	270					18360	
			Sand	13.5	60					810	
			Water	0.8	33					26.4	
			Cement	1	850					850	
Ceiling fixtures Works 8_th	19.01	m2	Ecophone tiles	22	120	10	1	10	7	2640	5090
			worker	1	150					1050	
			assistant	2	100					1400	
	392.947	m2	Aquastatic tiles	452	130	10	6	60	7	58760	73460
			worker	1	150					6300	
			assistant	2	100					8400	
	275.8	m2	Lavage gypsum panels	317	150	10	4	40	7	47550	57350
			worker	1	150					4200	
			assistant	2	100					5600	
Painting Works 8_th	382.1	m2	putty	84	5	80	3	240	2	420	15700
			Acrylic paint	260	53					13780	
			Paint worker	1	150					900	
			assistant	1	100					600	
Finishing Plumbing Fixtures 8_th	1	LS	Sub Contractor				1		7	200000	200000
Finishing Electrical Fixtures 8_th	1	LS	Sub Contractor				1		5	130000	130000
Installation of metal and aluminum works 8_th	63	m2	Technical	1	170		2		2	680	36130
			assistant	2	100					800	
			alumital	63	550					34650	
finishing Carpentry works 8_th	27.4	m	carpentar	2	170		2		2	1360	158760
			assistant	2	100					800	
			wood	27	5800					156600	
finishing the floor 8_th	708.48	m	Technical	1	170		2		4	1360	158720
			assistant	2	100					1600	
			Curtains	708	220					155760	
	258.96	m2	Technical	1	170		2		4	1360	116920
			assistant	2	100					1600	
			Curtains	259	440					113960	
	29		Technical	1	170		1		4	680	23230
			assistant	2	100					800	
			shesh hasera	29	750					21750	
Cleaning and Closing 8_th			unskilled	2	90		1		1	180	180
Ninth Floor Works											
Concrete Works 9_th											
Reinforced Concrete Columns											
Erect Formworks 3 sides 9_th.Col	325.86	M3	Carpenter	3	150	5	13	65	5	29250	53950
			Assistant	2	100					13000	
			unskilled	2	90					11700	
Blacksmithing 9_th.Col	325.86	M3	commando	1	150	18.75	6	112.5	3	2700	585790
			Fixer	2	150					5400	
			Steel	49	11650					570850	
			assistant	2	100					3600	
			unskilled	2	90					3240	
Close Formworks Fourth side 9_th.Col	325.86	M3	Carpenter	3	150	15	11	165	2	9900	18260
			Assistant	2	100					4400	
			unskilled	2	90					3960	
Pouring 9_th.Col	325.86	M3	Worker for pipe of pump	1	120	320	5	1600	1	600	238600
			Forman	1	120					600	
			assistant	1	100					500	
			ready mix concrete	326	725					236350	
			Vibrator	1	110					550	
Deshuttering Formworks 9_th.Col	325.86	M3	Unskilled	3	90	36	3	108	3	2430	2430
Reinforced Concrete Slab											
Erect Formworks 9_th.Slab	552.14	M3	Carpenter	3	150	5	13	65	9	52650	97110
			Assistant	2	100					23400	
			unskilled	2	90					21060	
Blacksmithing 9_th.Slab	552.01	M3	commando	1	150	18.75	8	150	4	4800	993510
			Fixer	2	150					9600	
			Steel	83	11650					966950	
			assistant	2	100					6400	
			unskilled	2	90					5760	
Electrical Works 9_th.Slab	1	LS							3	30000	30000
Pouring 9_th.Slab	552.14	M3	Worker for pipe of pump	1	120	320	2	640	1	240	401825
			Forman	1	120					240	
			assistant	1	100					200	
			ready mix concrete	553	725					400925	
			Vibrator	1	110					220	
Deshuttering Formworks 9_th.Slab	552.14	M3	Unskilled	3	90	36	4	144	4	4320	4320
Finishing Works 9_th											
Install Frames of doors 9_th	92	Each	carpentar	2	170		2		2	1360	305760
			assistant	2	100					800	
			mosky wood	92	3300					303600	
Brick Works 9_th	1349.17	M2	Builder	1	170	13	6	78	18	18360	129641
			assistant	2	100					21600	
			Sand	40	60					2400	
			Cement	13	850					11050	
			Bricks	76	1000					76000	
			Water	7	33					231	
	204.57	M3	Builder	1	170	3	6	18	18	18360	145668
			assistant	2	100					21600	
			Sand	41	60					2460	
			Cement	13	850					11050	

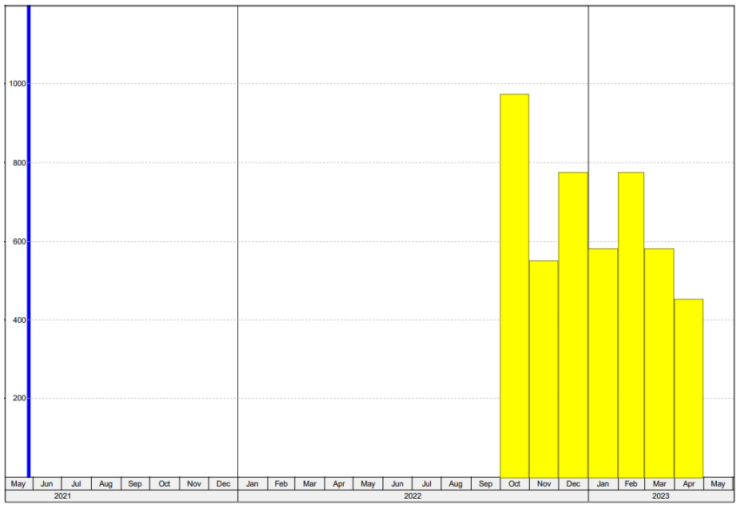
			Bricks	92	1000					92000	
			Water	6	33					198	
Erect Primary Electrical Works 9_th	1	LS	Sub Contractor				1		7	70000	70000
Primary Plumbing Works 9_th	1	LS	Sub Contractor				1		10	100000	100000
Plastering Works 9_th	4831.04	M2	Plastering Worker	2	150	69	10	690	7	21000	351150
			Assistant	4	100					28000	
			Cement	290	850					246500	
			Sand	845	60					50700	
			Water	150	33					4950	
Insulation W.c Works	130	M2	Insulation Worker	2	150	100	2	200	1	600	5100
			Membren	15	300					4500	
Install Ceramics Works 9_th	2259	M2	Tiles Worker	1	150	25	9	225	10	13500	575421
			Assistant	2	100					18000	
			Porcelain Tiles	1828	270					493560	
			Ceramic Tiles	206	50					10300	
			Ceramic High Res. Tiles	225	70					15750	
			Sand	203	60					12180	
			Water	7	33					231	
			Cement	14	850					11900	
Cladding Works 9_th	229.57	m2	carpentar	2	170		7		3	7140	96988
			assistant	2	100					4200	
			mdf	43	375					16125	
	271.5	M2	Marble Workers	1	150	35	3	105	3	1350	
			Assistant	2	100					1800	
			Sand	1.5	60					90	
			Water	0.203625	33					6.719625	
			Cement	1	850					850	
			Marble	272	140					38080	
	151.6607143	M2	Tiles Worker	1	150	25	3	75	3	1350	
			Assistant	2	100					1800	
			Ceramics Tiles	83	50					4150	
			Porcelain Tiles	68	270					18360	
			Sand	13.5	60					810	
			Water	0.8	33					26.4	
			Cement	1	850					850	
Ceiling fixtures Works 9_th	19.01	m2	Ecophone tiles	22	120	10	1	10	7	2640	5090
			worker	1	150					1050	
			assistant	2	100					1400	
	392.947	m2	Aquastatic tiles	452	130	10	6	60	7	58760	73460
			worker	1	150					6300	
			assistant	2	100					8400	
	275.8	m2	Lavage gypsum panels	317	150	10	4	40	7	47550	57350
			worker	1	150					4200	
			assistant	2	100					5600	
Painting Works 9_th	382.1	m2	putty	84	5	80	3	240	2	420	15700
			Acrylic paint	260	53					13780	
			Paint worker	1	150					900	
			assistant	1	100					600	
Finishing Plumbing Fixtures 9_th	1	LS	Sub Contractor				1		7	200000	200000
Finishing Electrical Fixtures 9_th	1	LS	Sub Contractor				1		5	130000	130000
Installation of metal and aluminum works 9_th	63	m2	Technical	1	170		2		2	680	36130
			assistant	2	100					800	
			alumital	63	550					34650	
finishing Carpentry works 9_th	27.4	m	carpentar	2	170		2		2	1360	158760
			assistant	2	100					800	
			wood	27	5800					156600	
finishing the floor 9_th	708.48	m	Technical	1	170		2		4	1360	158720
			assistant	2	100					1600	
			Curtains	708	220					155760	
	258.96	m2	Technical	1	170		2		4	1360	116920
			assistant	2	100					1600	
			Curtains	259	440					113960	
	29		Technical	1	170		1		4	680	23230
			assistant	2	100					800	
			shesh hasera	29	750					21750	
Cleaning and Closing 9_th			unskilled	2	90		1		1	180	180
Roof Floor Works											
Finishing Works Roof											
Brick Works Roof	621	M3	Builder	1	170	3	12	36	9	18360	360027
			assistant	2	100					21600	
			Sand	124	60					7440	
			Cement	40	850					34000	
			Bricks	278	1000					278000	
			Water	19	33					627	
Plastering Works Roof	2484	M2	Plastering Worker	2	150	69	6	414	6	10800	180491
			Assistant	4	100					14400	
			Cement	149	850					126650	
			Sand	435	60					26100	
			Water	77	33					2541	
Insulation Works	2761.66	M2	Insulation Worker	1	100	100	6	600	5	3000	50400
			Assistant	2	100					6000	
			Foam	276	150					41400	
	2761.66	M2	Insulation Worker	2	150	100	1	100	5	1500	99000
			Membren	325	300					97500	
Install Ceramics Works Roof	2655.85	M2	Tiles Worker	1	150	25	4	100	9	5400	226724
			Assistant	2	100					7200	
			moziko	2656	70					185920	
			Sand	239	60					14340	
			Water	8	33					264	
			Cement	16	850					13600	
Stairs and Facing Works											

Flooring Works	1574	M2	Marble Worker	1	150	25	10	250	7	10500	607365
			Assistant	2	100					14000	
			Jaraniat Tiles	1574	360					566640	
			Sand	126	60					7560	
			Water	5	33					165	
			Cement	10	850					8500	
	914	m2	Marble Worker	1	150	35	4	140	7	150	141931
			Assistant	2	100					5600	
			Sand	10	60					600	
			Water	2	33					66	
			Cement	2	850					1700	
			Marble 2 Cm	219	135					29565	
			Marble 3 Cm	695	150					104250	
finishing stairs	600	m	Technical	1	170		3		3	1530	483330
			assistant	2	100					1800	
			stanless steel	600	800					480000	
Exterior Plastering	8700	M2	Plastering Worker	2	150	50	11	550	16	52800	669770
			Assistant	4	100					70400	
			Cement	522	850					443700	
			Sand	1566	60					93960	
			Water	270	33					8910	
External Painting	9000	m2	putty	3960	5	80	11	880	10	19800	316580
			primer paint	1530	22					33660	
			outer paint	3060	77					235620	
			Paint worker	1	150					16500	
			assistant	1	100					11000	
Final Finishing Works											
Finishing Works	3000	m2	Technical	1	170		5		2	1700	303700
			assistant	2	100					2000	
			m.t	3000	100					300000	
	50	m	Technical	1	170		1		2	340	4740
			assistant	2	100					400	
			m.t	50	80					4000	
	800	m2	Technical	1	170		7		2	2380	5180
			assistant	2	100					2800	
	1000	Each	carpentar	2	170		6		2	4080	156480
			assistant	2	100					2400	
			chair	1000	150					150000	
	30	Each	carpentar	2	170		2		2	1360	17640
			assistant	2	100					800	
			chair	30	516					15480	
	800	m2	Technical	1	170		8		2	2720	69920
			assistant	2	100					3200	
			glass mirror	800	80					64000	
Site Coordination Works											
Coordination Works		Ls	Sub Contractor	1					5	30000	30000

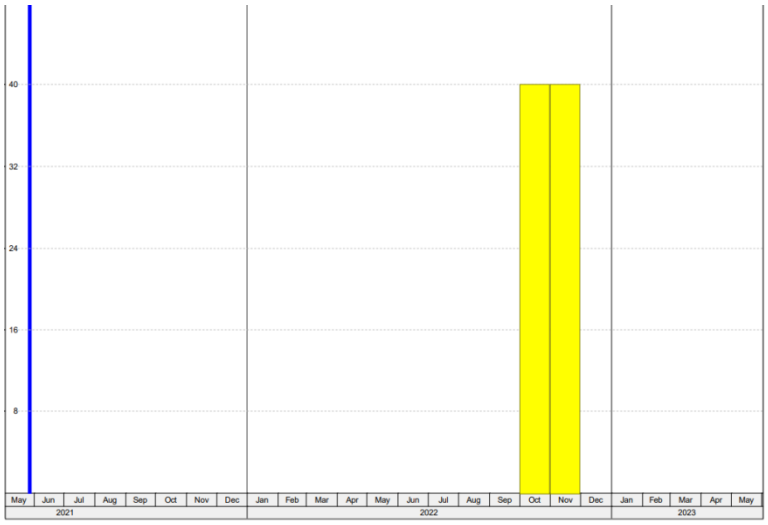
Resource profile of project



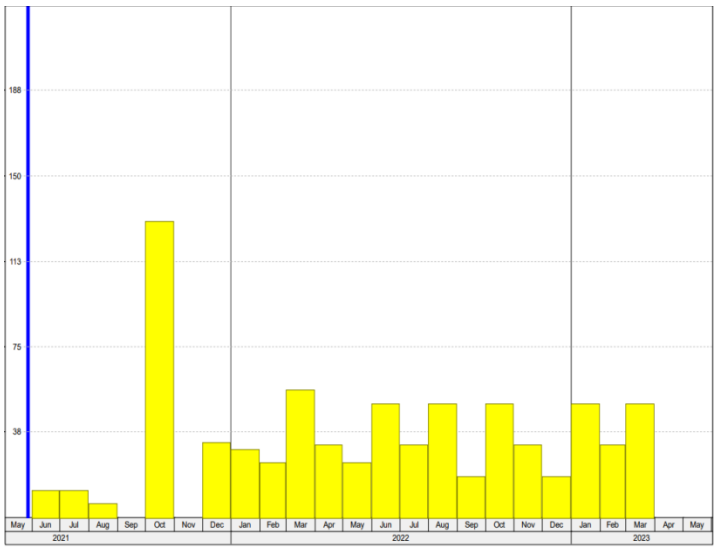
Alumital



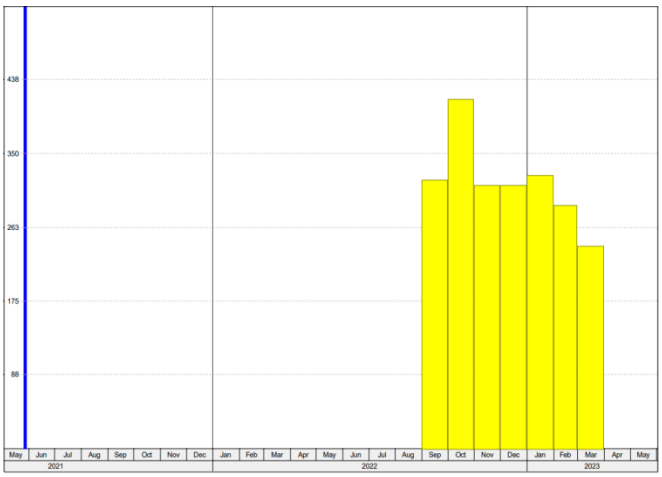
Aquasttatic Tiles



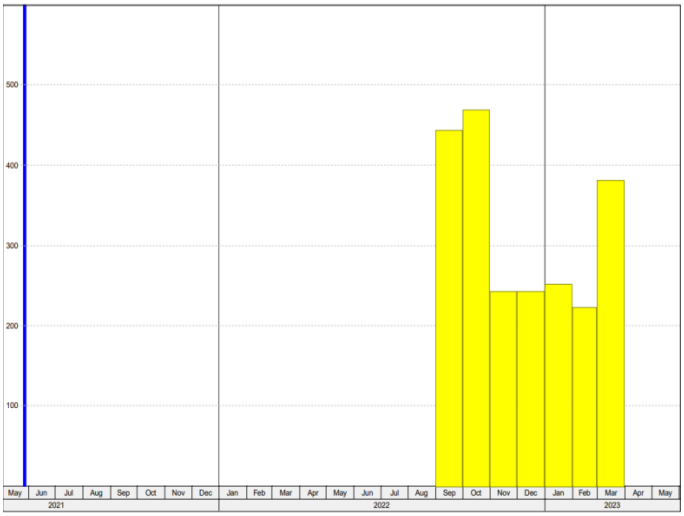
Armstrong Tiles



Blacksmithing Crew



Brick Works Crew



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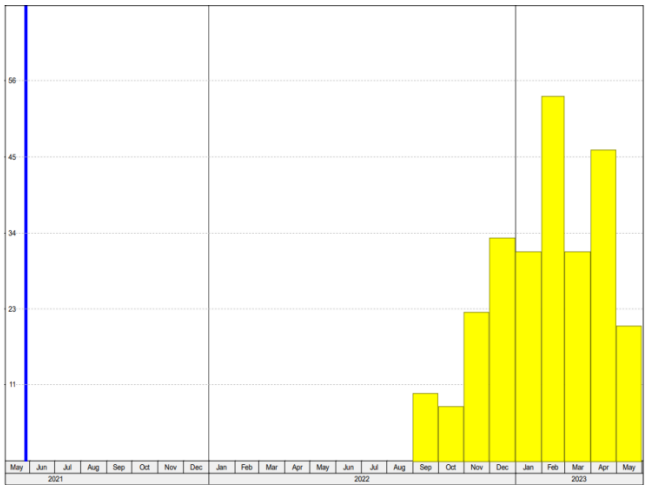
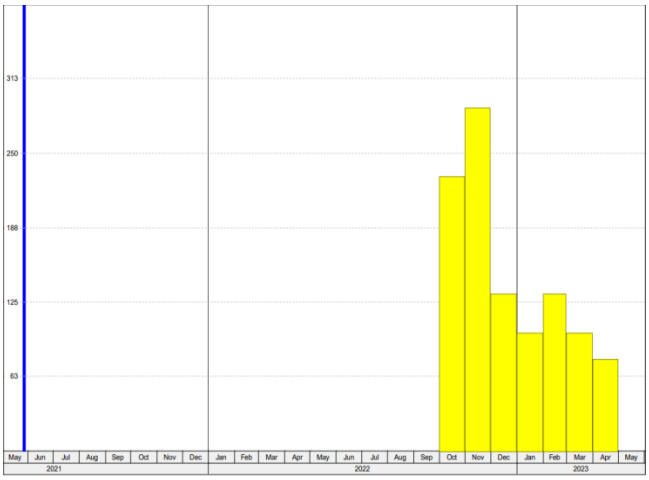
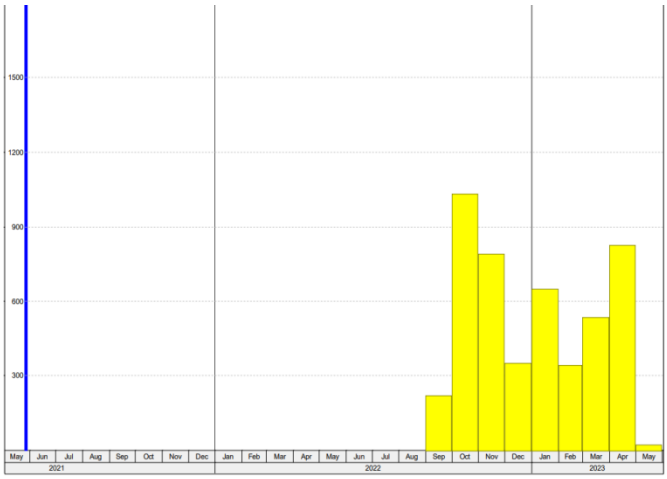


Carpentary Works Crew Finishing



Ceiling Crew



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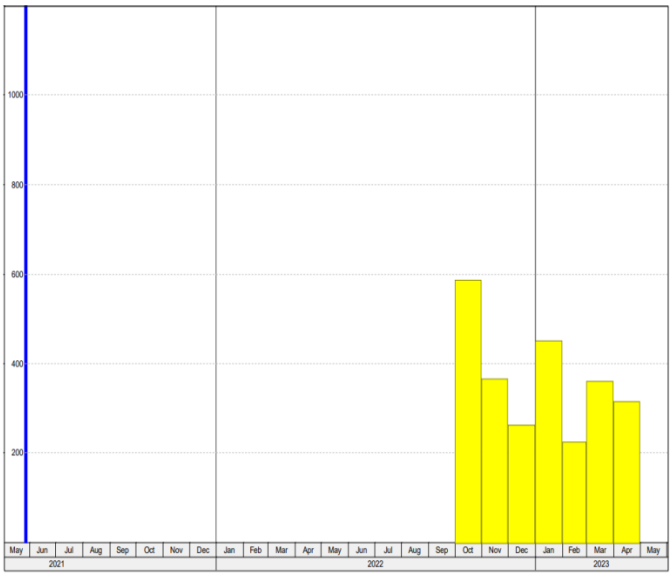
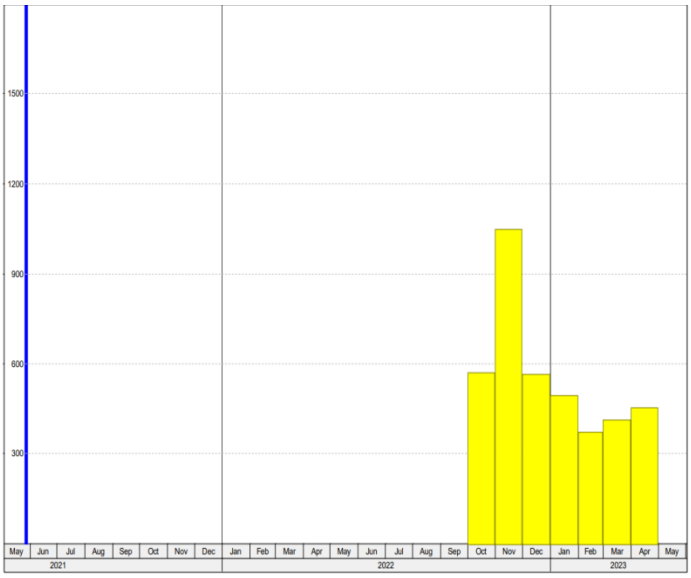


ceramic High Res



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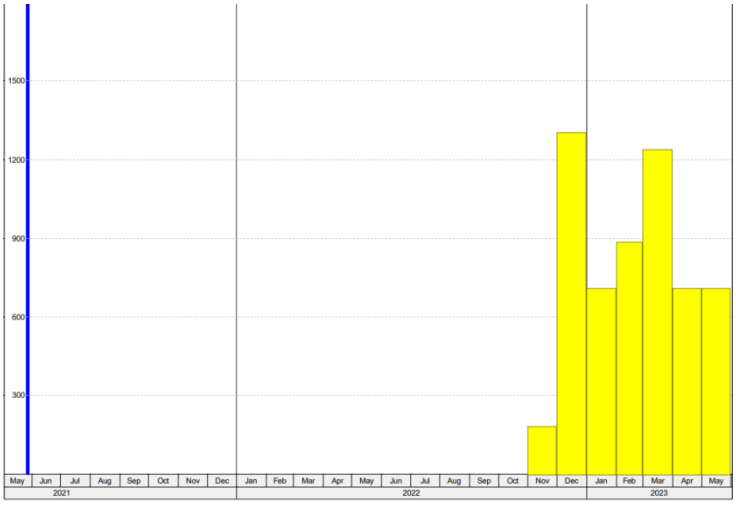

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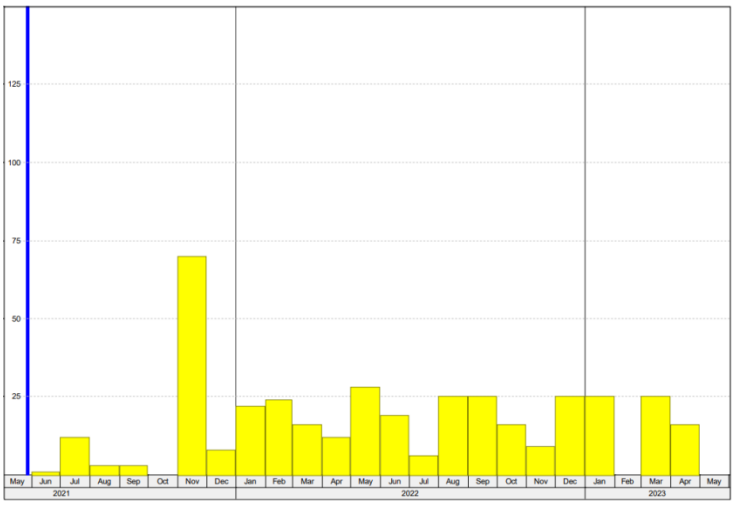
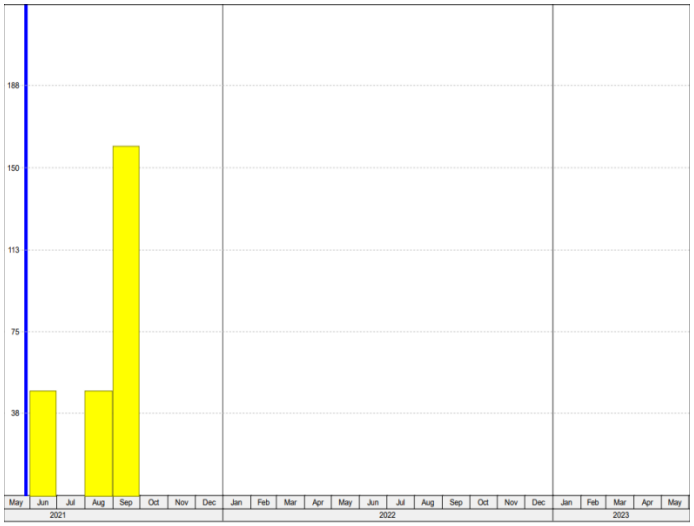


Deshuttering Formwork Crew



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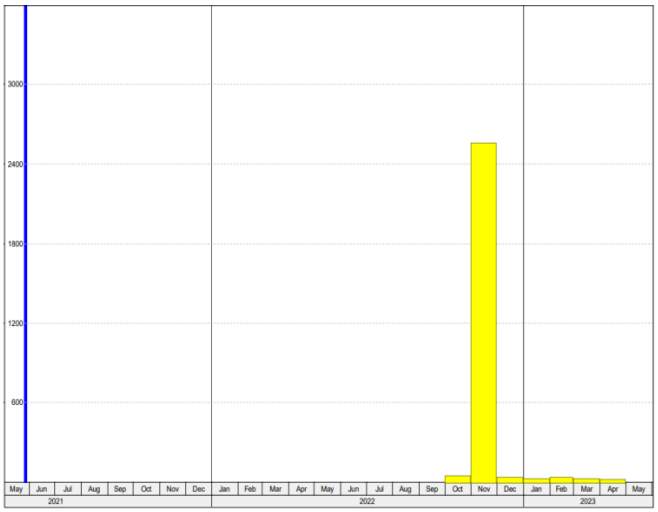

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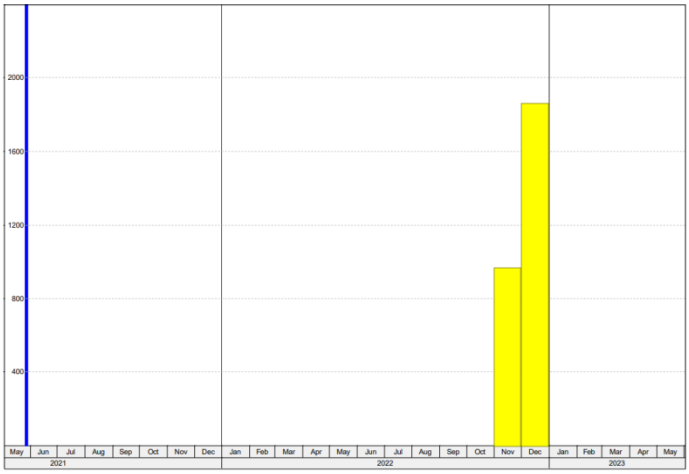

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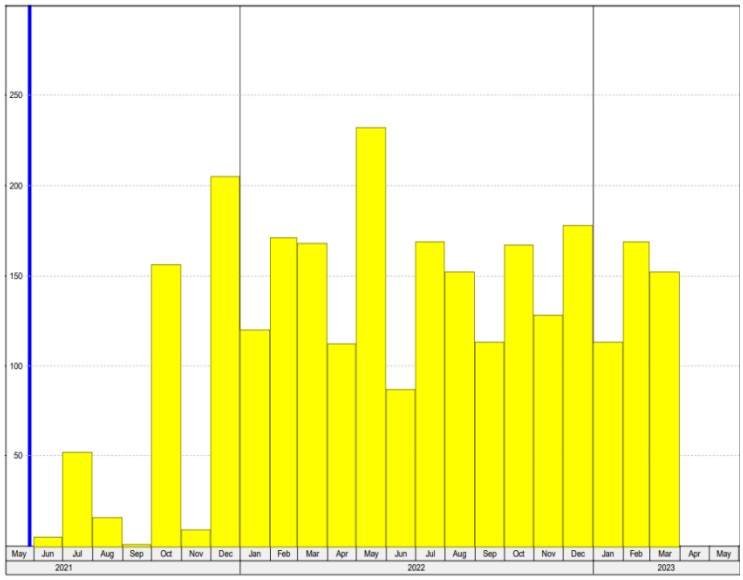
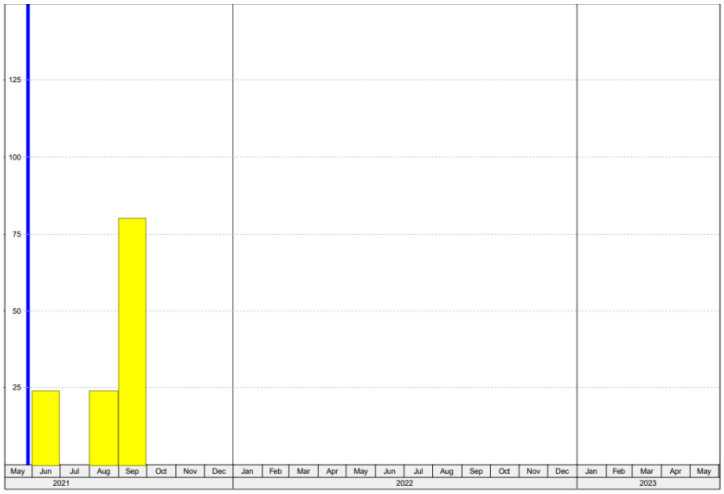
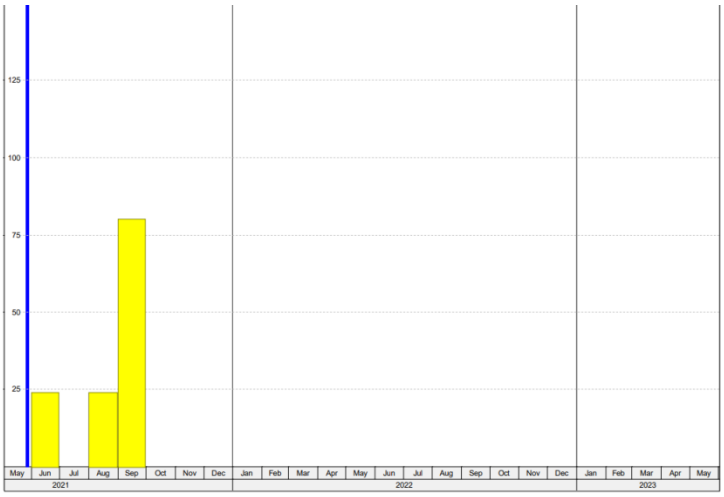


Erect FormWork Crew



exacavation crew



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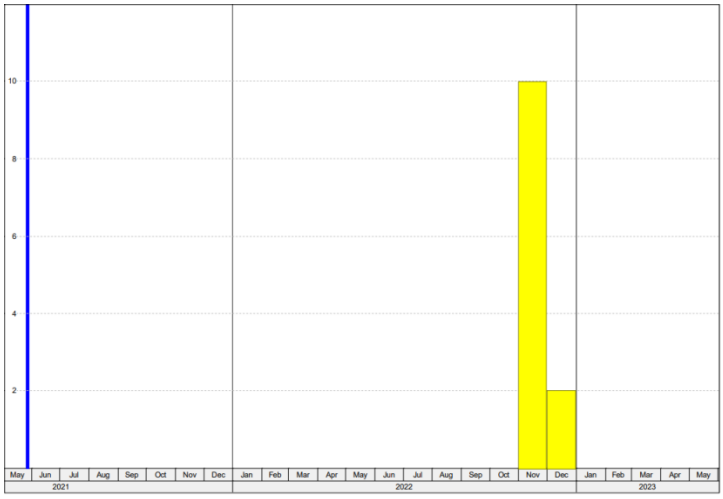

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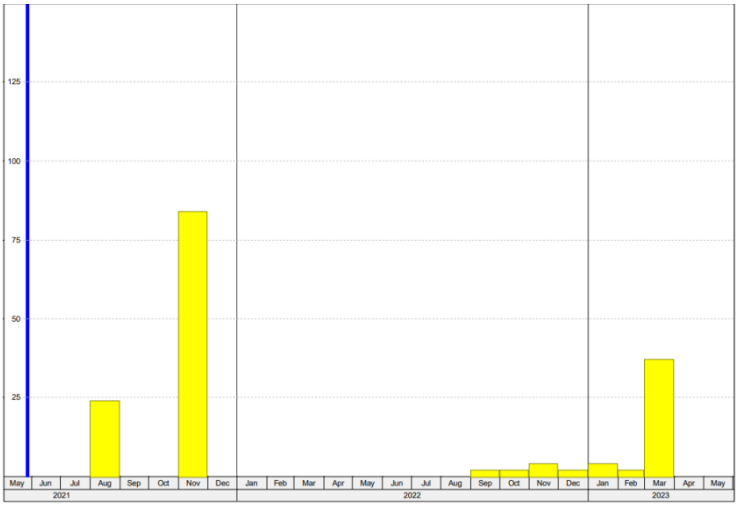
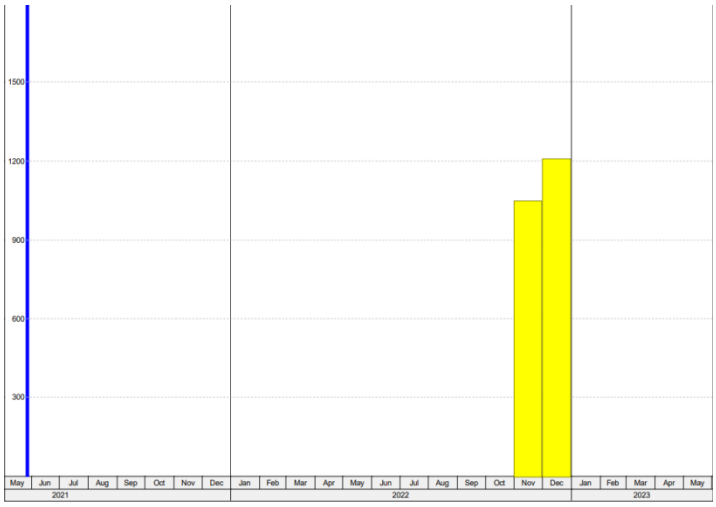


insulation crew



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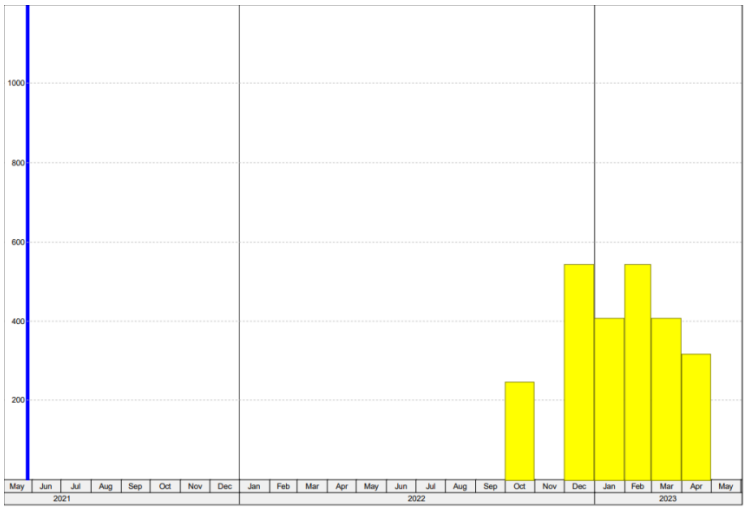
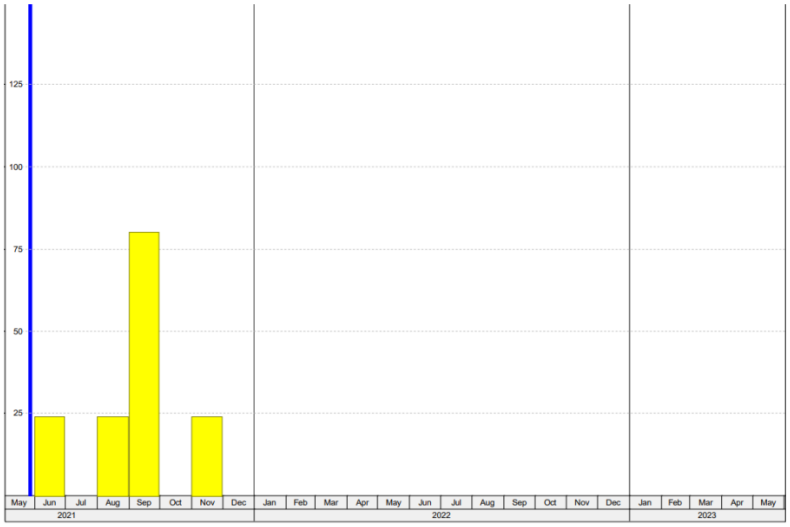


lavage gypsum panels



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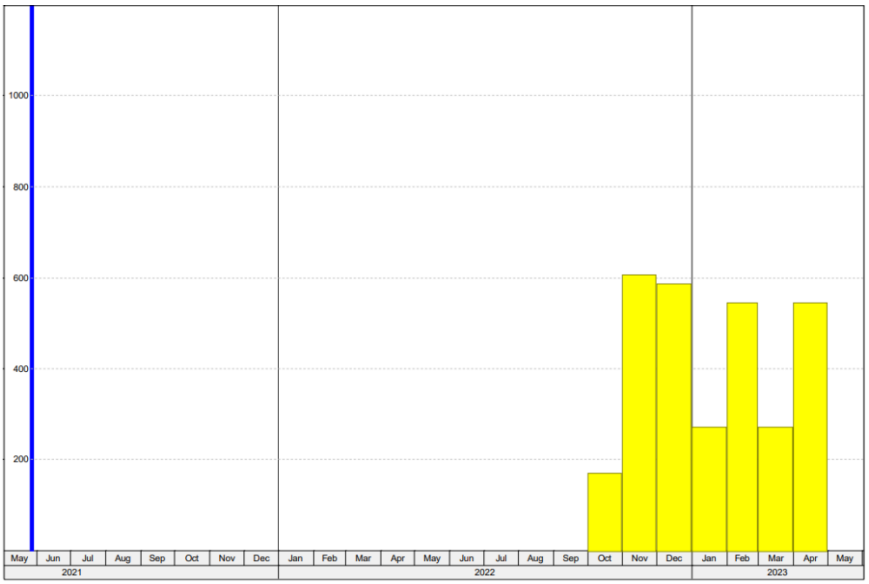
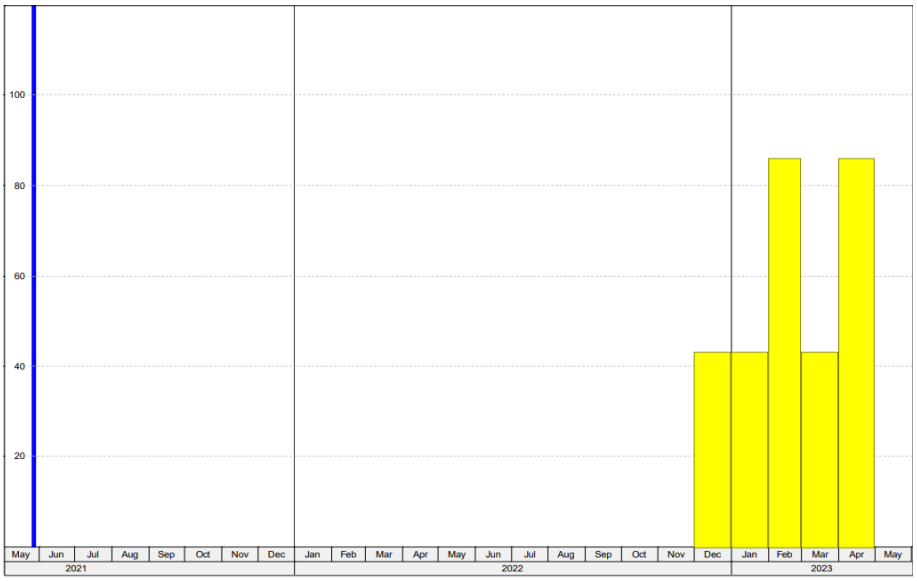

1000
800
600
400
200
May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May
2021
2022
2023

Marble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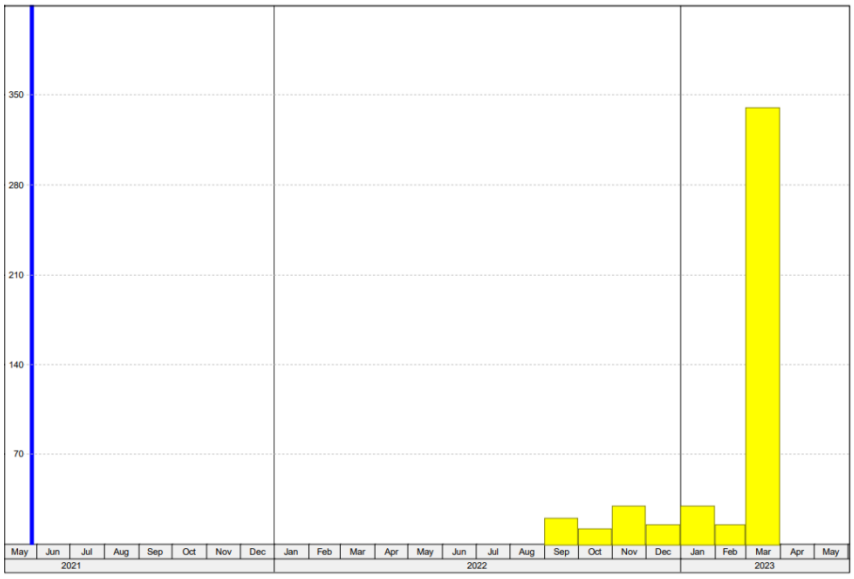
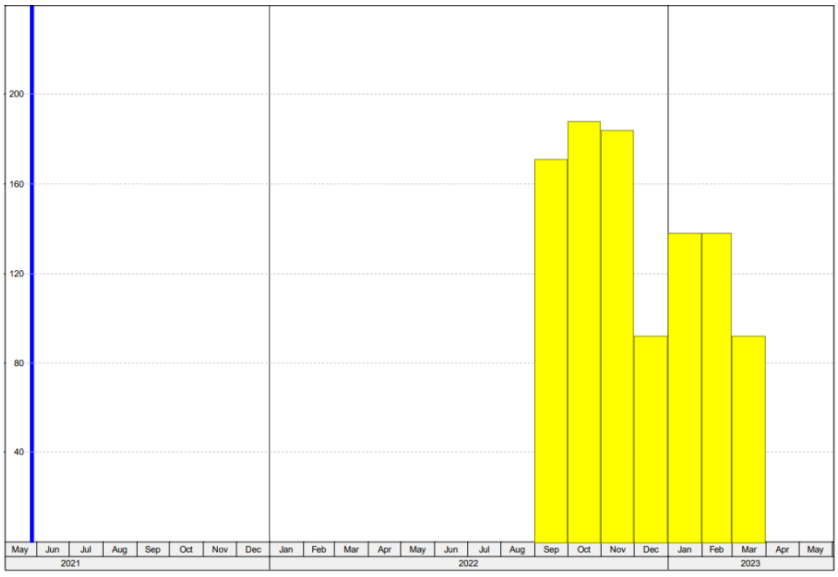
2023

MDF

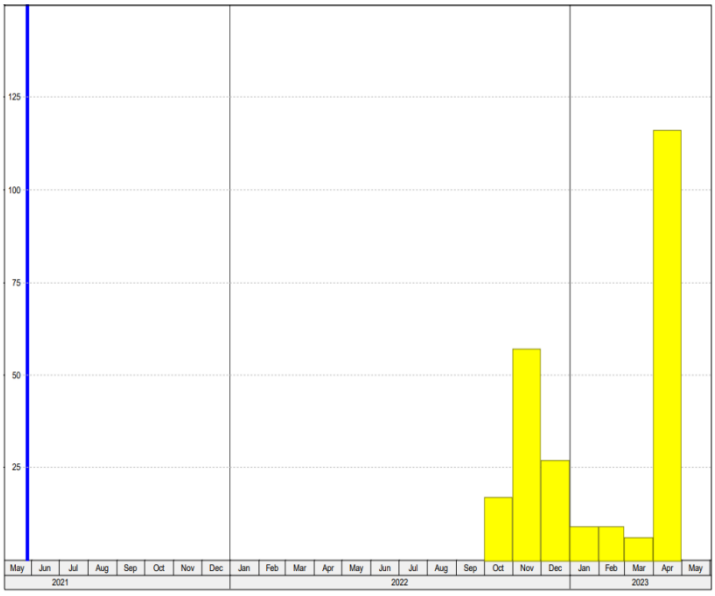


Membren

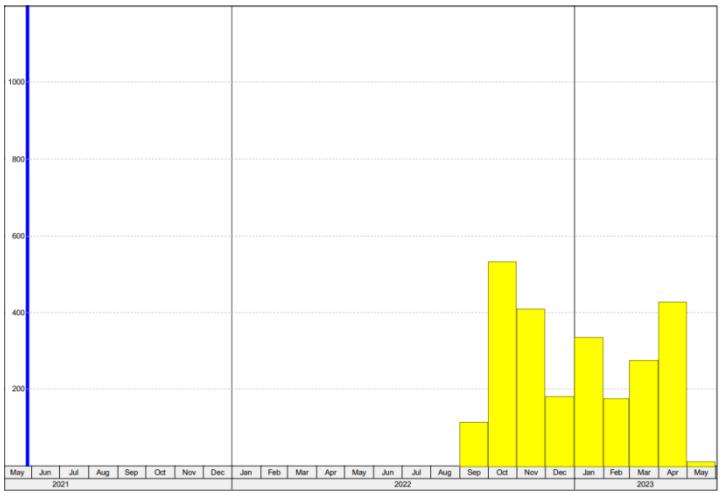


Mosky wood

Mozico



Painting Crew



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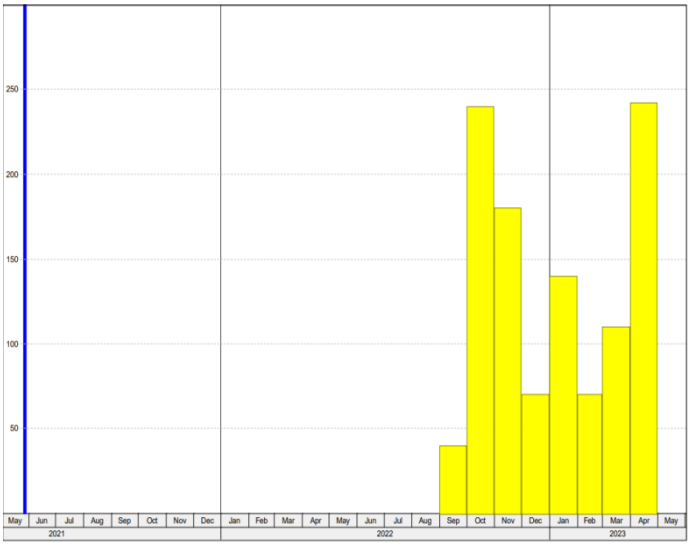
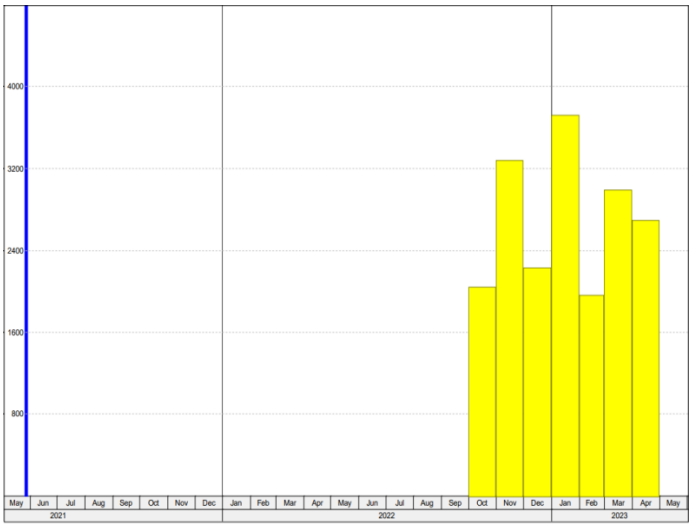


plastering crew



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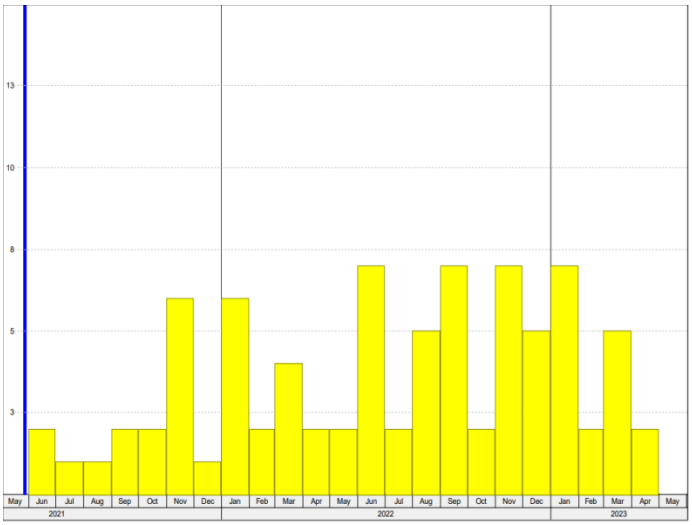
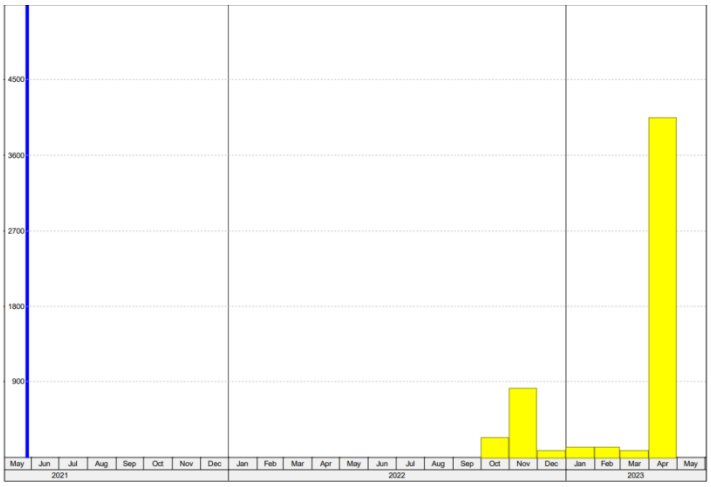


pouring crew



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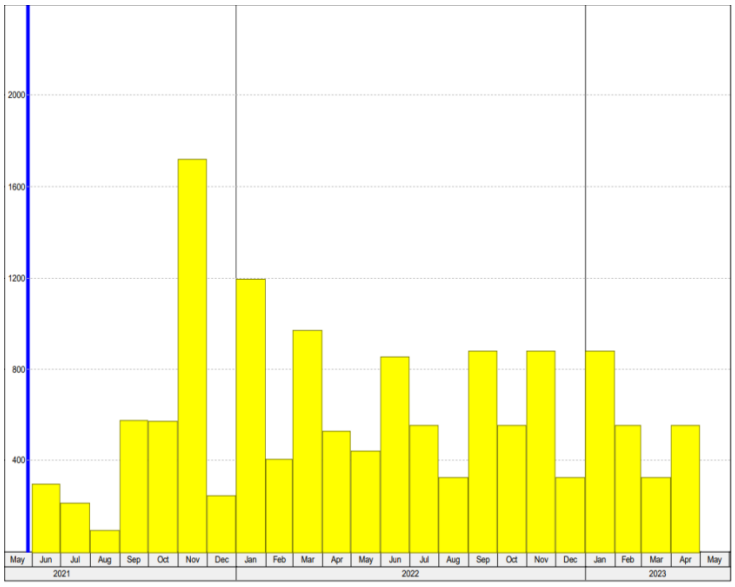
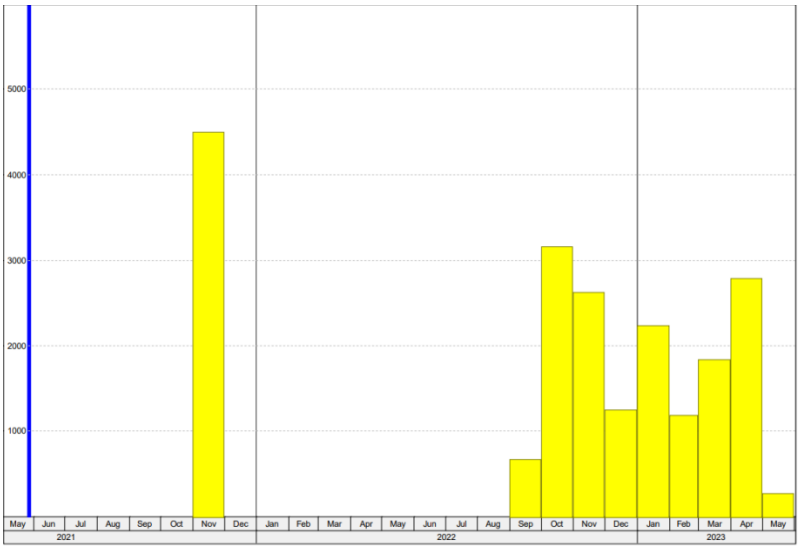


Ready Mix Concrete



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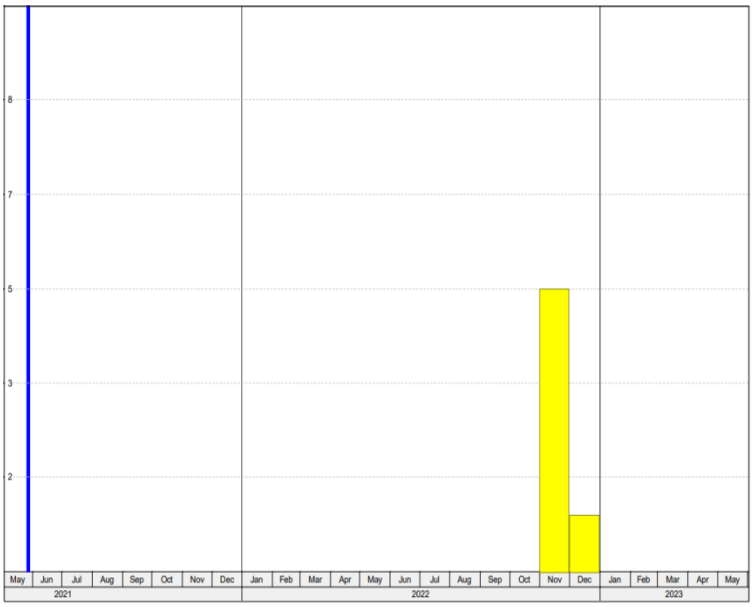

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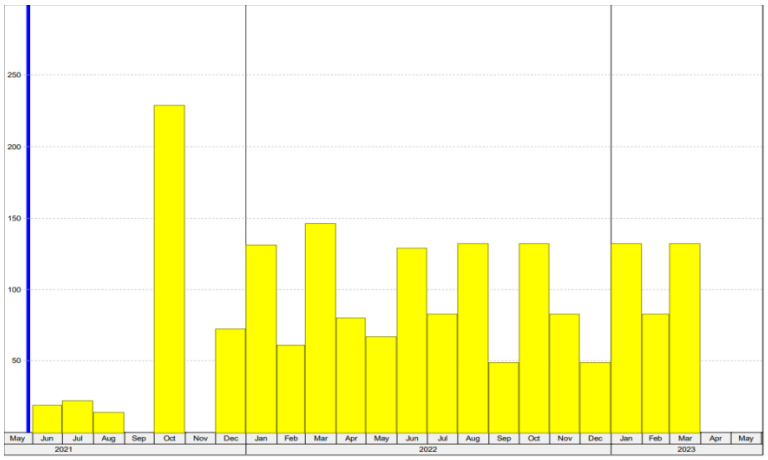
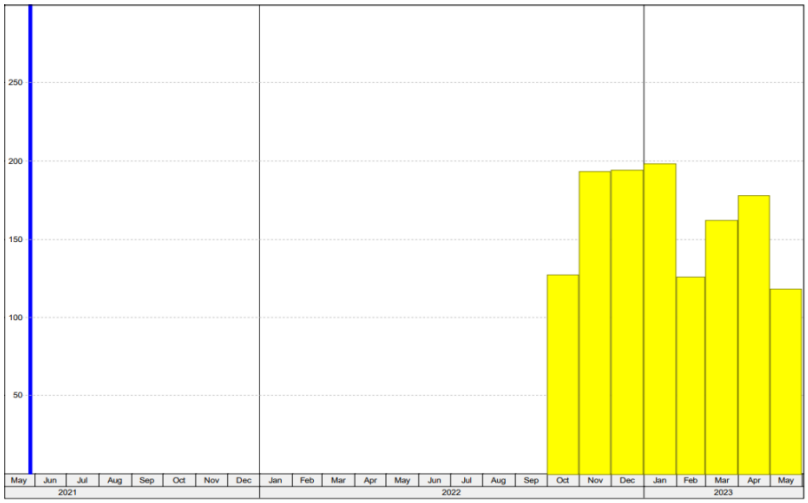


Steel



Tiles Crew

Conclusion

In brief, construction project management is the process of managing construction projects. But when you're talking about managing a construction project in comparison to other types of projects, the distinction is mostly that construction is mission-based. That means that the project's organization ends with the end of the project build.

While generally project management is defined as managing resources over the life cycle of a project through various tools and methodologies to control scope, cost, time, quality, etc.—when working in the construction industry your outlook must be broader. It usually includes a wider variety of constraints to consider that are specific to the design and build of construction projects. Construction project management can interact with a variety of different disciplines in the lifetime of a project as well, from architecture to engineering to public works to city planning.

Types of Construction Projects

There are a variety of different types of construction projects, depending on the different construction sectors. There are two sectors in construction: residential and commercial. Depending on the sector, there can be up to four different types of projects:

- Residential home building and renovation
- Heavy industrial construction
- Commercial and institutional construction
- Engineering construction

The Construction Project Manager

Construction project management is run by a construction project manager. This person is tasked with the planning, coordination, budgeting and supervision of the construction project.

Construction project manager responsible for the following tasks:

- Estimate and negotiate project costs
- Formulate budget
- Create schedule and work timetables
- Manage work orders
- Determine which methods and strategies are appropriate for the project
- Communicate with clients and stakeholders, re. budget, progress, etc.
- Lead or interface with workers, teams and other construction professions on technical and contract details
- Work with building, construction and regulatory specialists

REFERENCES

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2. Design-Build for electrical and mechanical plant, and for building works,designed by the Contractor First Edition 1999 (FIDIC yellow book)

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4. BIM handbook, a guide to building information modeling for owners,managers, designers, engineers and contractors by Imraan Saeed

5. Contract practice for surveyors fourth edition by Jack Ramus, MRICS SimonBirchall and Phil Griffiths

6. Project schedule rules: general accepted rules by PMI and DOD by NaderKhorammi Rad

7. Building Services Planning Manual: A guide to Project Planning &EquipmentInstallation related to Building Services by Al

Habtoor Engineering Planning Department

8. Post-tensioned Concrete for High-rise Apartments by Richard P. Martter

9. Central business district documents (contract – bill of quantities –specifications – drawings -method of statement)

10. DAR

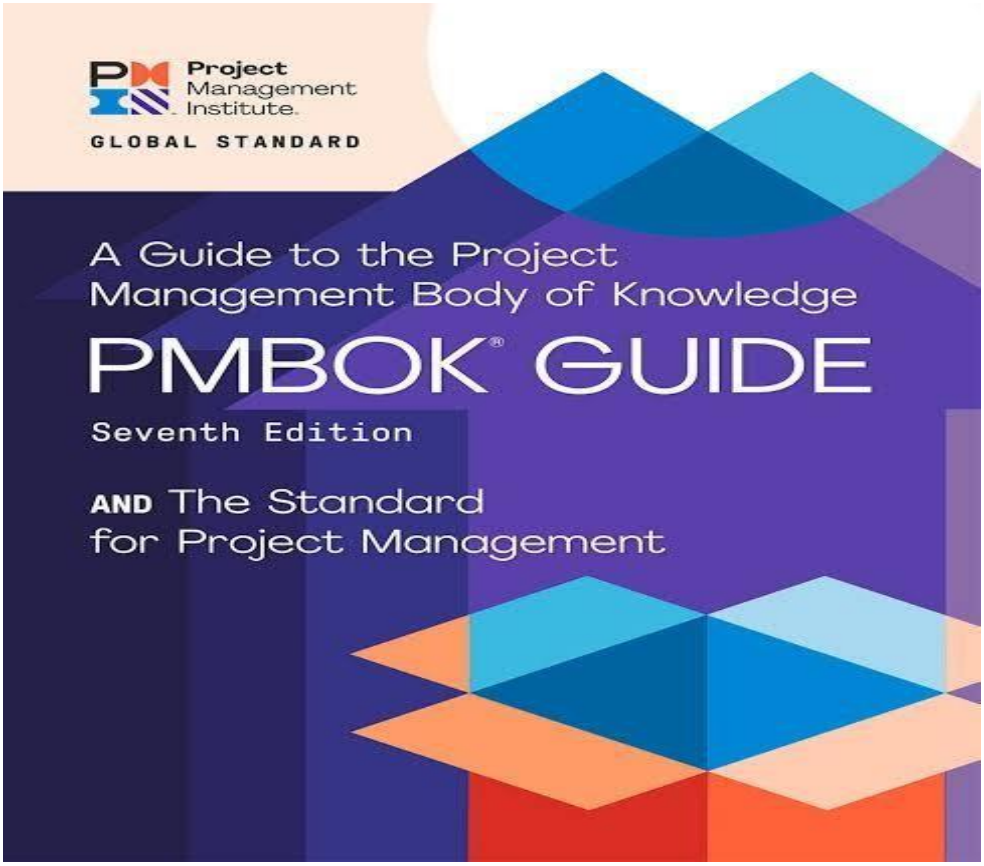
ELHANDASA

website11.CSCEC

website

STANDARDS

-Guide to the Project Management Body of Knowledge(PMBOK Guide)



Egyptian code for project management code (311-2009)

-The Project Management Body of Knowledge (PMBOK) is a document containing standard terminology, best practices and process guidelines around project management as defined by the Project Management Institute (PMI). Currently in its sixth edition, the body of knowledge wascreated to evolve over time and is internationally recognized as an essential resource for project managers. Referred to as the PMBOK, this guidebook outlines 49 processes that are categorized into five process groups and ten knowledge areas in a matrix structure**.**

Impact of the project on the community

– Health affects the community through the treatment of patients

–Encouraging local industries to use their products in implementation

– Providing job opportunities for citizens