

Water Supply Project for Alsheikh Zayed City

Intake and Booster Pumping Stations Project
Study Sector “Abroad & Foreign”

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Summary

This paper will describe and analyse the “Water Supply Project for Alsheikh Zayed City “Intake & Booster Pumping Stations” carried out by Société Egyptienne D’Entreprises “Moukhtar Ibrahim” (SEDE) to cover the raw water demands for the treatment plant and irrigation purpose in a new area at an open desert in Egypt Alsheikh Zayed City. Focus will be given for some information about Egypt in the beginning of the 21st century, SEDE, and “Water Supply Project for Alsheikh Zayed City “Intake & Booster Pumping Stations with the procedures of studying tender and the final conclusions.

Introduction

Policies of housing, utilities and new urban communities are based on a commitment to the strategic goals of systematic expansion towards the desert out of the narrow Nile Valley, thus creating a topological balance all over the country that is, between population distribution and natural resources. These policies also aim at creating job opportunities, increasing the national product, raising living standards, preserving environment, maintaining agricultural lands and offering utility by providing land for housing, services, and industries and by so doing preserving agricultural land. Priority should be given to the implementation of new urban communities’ projects in the delta of the new valley, and structural plans of urban development in all cities

and villages of Egypt with special emphasis on cities of top priority. Every citizen is entitled to a decent accommodation appropriate to his needs and living. Potable water and sanitary drainage networks are to be erected in all cities and villages of Egypt, and waste of potable water is to be stopped. Local architectural style should be enhanced in harmony with Egypt's heritage and civilisation. Buildings of distinguished styles are to be maintained in the context of preserving the architectural styles and cultural heritage of Egypt. The development of architectural consulting bureaux is imperative, in order to assume their role in urban development. The contracting sector and trained technical labour are to be upgraded in order to take part in different projects. Issuing relevant policies and regulations should regulate the practices of building, means of protection and treatment must be available to deal with natural disasters in all forms.

Aim of the Paper

The aim of the paper is to present the procedures to be carried out in the construction management of project in Société Egyptienne d'Entreprises "Moukhtar Ibrahim" SEDE which during a long period, has executed major projects in each sector of potable water, waste water disposal, roads, bridges, land reclamation, irrigation, factories, buildings, electric power , tourist villages and housing in Egypt , as well as in each of kingdom of Saudi Arabia, Republic of Algeria, Libyan Arab Jamahiriya , state of Kuwait and State of United Arab Emirates. The company aims at participating in development of national economy within the framework of state's general policy. Especially in the fields of construction, trade, industry exports & import.

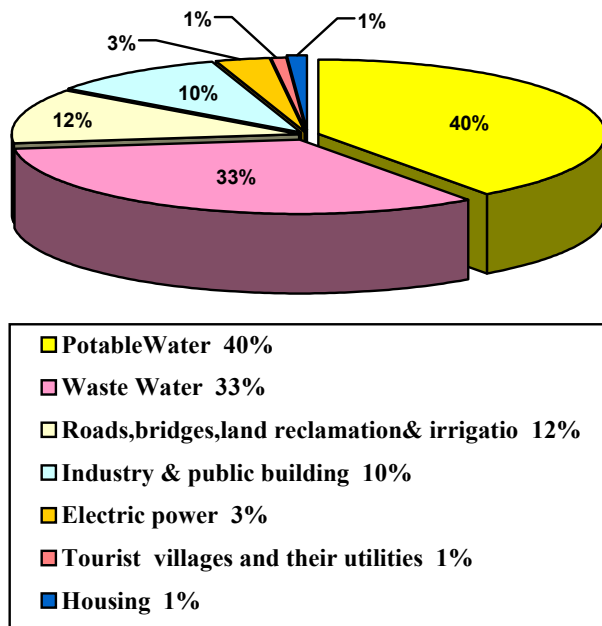
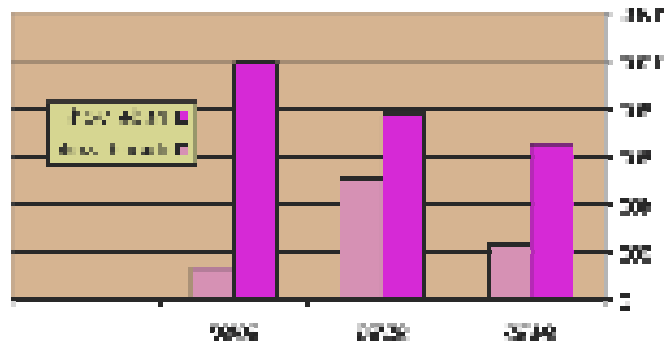


Figure 1: Showing the various Company activities

The Company is always endeavouring to enlarge its activities in the neighbouring Arab Countries. It has accomplished diverse Projects in several countries. The value of executed Projects and Projects in progress is L.E.3000million. A great Water Project Tender had been awarded to the Company at State of United Arab Emirates with value AD. 920 Mill. The Works include Twin Ductile IP. diam.1200mm to supply water to Al Ain City from El Taweala Water Station with length 126k.m. The Project was handed over 6 months ahead of Schedule. Presently, the Company also executes many other Projects.

Fig 2: Showing Development of the volume of the Companies Works over the last years in Egypt and Arab countries (In million of Egyptian £s).



Société Egyptienne d' Entreprises "Moukhtar Ibrahim" SEDE

The company plays the role of main contractor and this executes only constructors works and the consultants do all designs as architectural, structural, mechanical, electrical, etc....

The types of projects handled by company are:

- Direct Commitment Orders For Projects By Government " Estimated Value And Duration "
- Tendered Projects for Government.
- BOOT

Construction Management procedure for Projects in Company:

1 – Pricing -

- Pre – Qualification.
- Tender Components.
- Tender Type " Lumsum and Turnkey "
- Agreement with foreigners, subcontractor, consortium and jointventure.
- Conditions Egyptian law 9, Fidic special.-
- Pricing Item, Material, Equipment, and Employers.
- Cash Flow Preparation.
- Managing Prices.
- Define the conditions with the Tender Documents.

2 – Execution:–

- Presentation of Insurance Policy.
 - Total Project Insurance-Employers Insurance-Third party insurance.
- Presentation of Advanced Payment Bond.
- Presentation of Detailed Schedule.
- Presentation of Prices Analysis.
- Define Communication System with Client and Consultant.
- Define Communication with Company Management.
- Choosing Project Manager.
- Facilitate Contract Signing.
- Preparation of Project Organisation Chart.
- Restudy of Tender and Preparation of Practical Budget.
- Preparation of Detailed Time Schedule.
- Define Method of Statement.
- Preparing Mobilisation.
- Preparing Procurement.
- Study of Technical Specification for all materials..
- Contracting or giving Purchasing and Supplying Order.
- Assignment of Organisation Chart.
- Execute mobilisation.
- Assignment of Subcontractors and supplying the needed Equipment.
- Execution until acceptance. Managing any delays.. Solving any problems faced during execution.
- Presentation of Performance Bond = 10 %

PROJECTS STUDY SECTOR:

Abroad & Foreign Department:

The step of study project “tendering stage”:

- Purchase the Suitable One.
- Visiting the site.
- Site Investigations “ trial holes , bore holes “
- Showing the drawing and site investigation to the consultant to :
Define method of upholding sides of excavation “ planking and strutting “with timber, steel sheeting or de-watering of the site of foundations including installation of well point system pumping or other system approved by the engineer to ensure keeping excavations free of water from water source arising.
- Studying the tender carefully to define which to done subcontractor or automotive “self operator” with taking all condition in our mind “ location, water resources, electricity.... etc.
- Sending tender items to the subcontractor attached with all documents “general and special conditions drawings and technical specifications.
- Revising the subcontractor offers then comparing with the study of the automotive and taking the lowest one.
- Quantity Surveying for: Materials. Manpower, Equipment’s & Subcontractor Pricing the Direct Coast.
- Prepare & attach the Technical Data & Catalogues.
- Ask the Bank for the Bid Bond.

The Most Difficulties:

- Insufficient Bid Documents Data
- Some Products may accept by Client refused by other.
- Extended Time between the Bid Data & the final decision.
- No Inflation Equation is respect.

Project:

Water Supply Project for Alsheikh Zayed City “Intake & Booster Pumping Stations”

At the beginning I have given a brief description about my project and it has the following original documents:

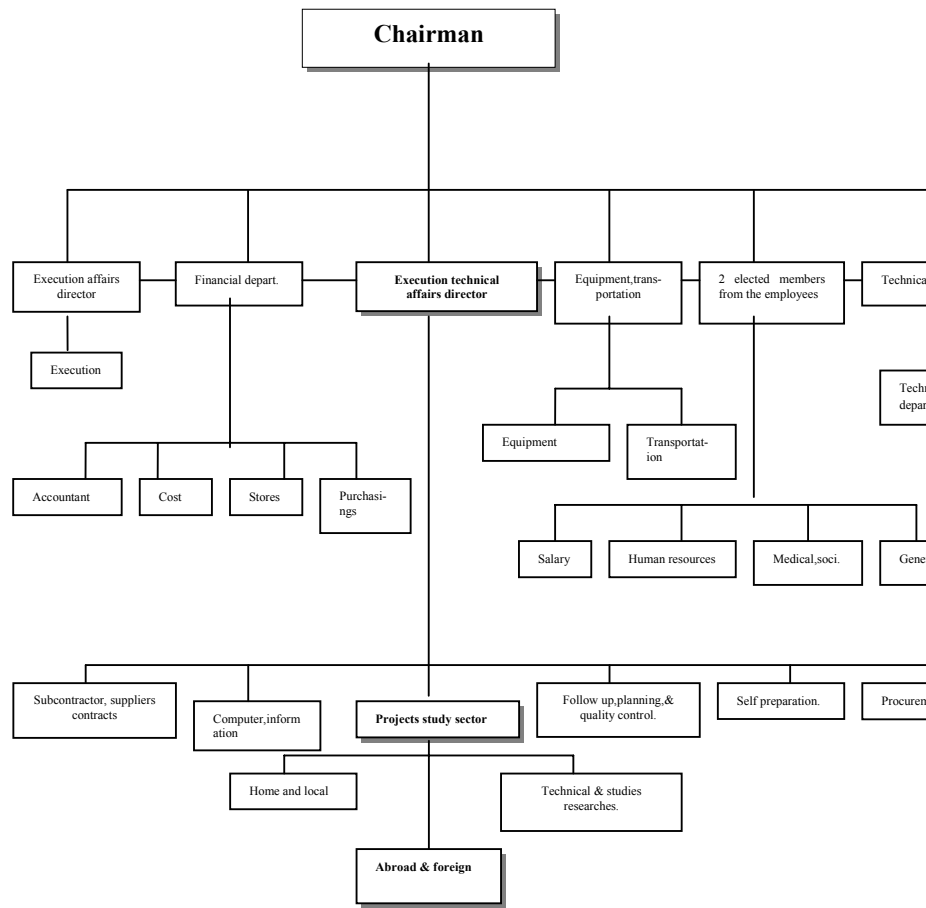
1 – Instructions to Tenders & Conditions of Contract:

Invitation to Tender as follow:

“The Ministry Of Housing, Utilities and New Communities through the Agency of the Research and Studies Organisation (R.S.O) invites selected Pre- Qualified Tender’s to submit tenders for “ Water Supply Project for Al Sheikh Zayed City. Intake and Booster Pumping Stations”

Tender whether in Joint Venture or As Main and Sub should have the party responsible for supply and erection of the Electro-Mechanical Equipment as the Main or in the leading position responsible for the whole project .The tenderers shall Submit two closed separate sealed envelopes at the Pre-Determined due date in the invitation letters by the (R.S.O.) as follows: -

- Technical Proposal Envelop.
 - Priced Proposal “Schedule Of Prices “ Envelope.
- The Technical Proposal shall be first evaluated then and the Financial Proposal Envelopes shall be opened in Public Ceremony only for the acceptable technically adequate proposals for financial appraisal.
- Tender Bond “during the tender opening ceremony the original bonds will be separated from other submissions for safekeeping by the (R.S.O)Financial officer, the Tender Bond shall be of an amount not less than two percent (2%)of Total Tendered Price in U.S.Dollars
 - Time completion” time of completion of the works shall be 24months “
 - Cost of performance bond” shall be in the form of a Bank Guarantee or a bond at the contractor’s option and the amount of a bank guarantee shall be ten percent ‘10%’ of the contract price
 - General and Special Conditions of Tender
 - Some definitions:
 - Government: the government of the Arab Republic of Egypt and its authorised agent.
 - Employer: new urban community’s authority.



- Engineer: consulting engineers.
- Contractor: the person or persons, firm or company whose tender has been accepted by the employer “SEDE” and includes the contractor’s authorised representatives, successors and permitted assigns.
- Subcontractor: person or persons firm or company entering into an agreement with the contractor for performance of work under the contract.
- Contract: the contract documents and include: conditions of contract, specification, drawings, schedules, tender, letter of acceptance and the written agreement entered into by employer and contractor and any modifications agreed thereon all of which are considered to be inter-related and which together form the contract documents.
- Tender price: the sum entered in the letter of acceptance.
- Contract price: the tender prices subject to such additions thereto or deductions therefrom as may be made under the provision state in the contract.
- CIF: cost, insurance and freight.
- C and F: cost and fright.
- Fob: free on board
- Insurance of works etc
- The works and the temporary works to the full replacement value
- The materials, contractor’s equipment and other things brought on to the site by the contractor to the replacement value of such materials, contractor’s equipment and other things.
- Any plant or materials imported by the contractor for inclusion in the permanent works shall be insured to the full C.I.F. value in the currency in which payment is to be made to the contractor for such plant or material.
- Third Party Insurance: before commencing the execution of the works, the contractor shall insure in his own name and that of engineer against any damage, loss or injury which may occur to any property including that of the

employer or to any person including an employee .The insurance shall cover risks both in Egypt and elsewhere.

- Insurance by Egyptian insurance company.
- Liquidated Damages” if the contractor shall fail to achieve completion of the works within the contract period then the contractor shall pay NUCA the employer` the sum of US\$ 7500 as liquidated damages for such default for every day or part of a day which shall elapse after the contractual completion of the works”
- Variations exceeding (\pm) twenty five per cent.
- Claim for additional payment for variations.

Special Conditions:

- Termination of sub-contracts: should the engineer determine for any reason that a sub-contractor is executing work or supplying material.
- Lists of sub-contracts proceeding: the contractor shall supply the engineer each month with duplicate lists of all sub-contracts in progress and such lists shall state the name of the subcontractor, the work on which he is engaged, the value of the work completed to date and the anticipated final value of the sub-contractor together with the date by which it is anticipated that the sub contractor will be completed.

General Information and Provisions

- Brief description of the project works:
 1. The raw water intake-pumping station.
 2. The raw water booster-pumping station.

The total capacity of each pumping station is 7040 L/S. from this capacity shall be conveyed to water treatment plant to produce 5720 L/S output treated water, and the remaining capacity of 1320 L/S shall be used to irrigate 3600acr. Both the intake and booster pumping stations shall transfer this total hydraulic design capacity of 7040l/s through pumping into twin pumping mains each of 1800mmdiameter.the intake pumping station shall be receive the raw water from a shore intake being established at El-Rayah El-behery through two conveyance tunnels each of internal diameter 2250mm to be built underneath the Manashy - Elkhatatba railway and El-Rayh El-Nasery and extension of Berqash road to the adjacent western side where there will be a shaft for tunnelling , which shall act as a collection chamber and shall be connected to the wet well of the raw water intake pumping station.

Description of the Intake Pumping Station Site

Intake pumping station building to cover the raw water demands for the treatment plant and irrigation purpose. Each pumping unit shall have a discharge of 880l/s at manometric head of 108m- the total hydraulic capacity of 7040l/s shall transmitted through twin pumping mains each of 1800mm diameter to ground reservoirs to be constructed at the booster pumping station site. The administration building for two step down power transformers to supply voltage 380v for auxiliaries, one duty and one standby. - Flow meter and delivery valves chambers. - The guard house, and the main gates in addition to the access roads to the site from the main road. - The sanitary works required for service water, fire fighting and domestic waste disposal. - Indoor and outdoor lighting system. - Landscaping of the site including the internal roads and parking. - The boundary R.C. and brick wall fence around the site.

Description of the Booster Pumping Station Site

The booster pumping station units shall be similar to R.W.P.S. in number and discharge, while the manometric head shall be 87m.these pumping units shall transfer the raw water from the booster pumping station to main distribution shaft inside the wastewater treatment plant at al sheikh Zayed city the diesel generation building which shall accommodate four (4) generating units each of 2,7mva capacity and synchronising system .the total capacity of the generating units shall represent about 50% of the total electric loads required for either the intake or booster pumping stations .Four outdoor fuel oil storage tanks each of 50m³ capacity shall be installed. Each unit shall be provided with indoors daily fuel tank of suitable capacity to cover 8 hours running period on full load. Transfer pumps (electrically and manually) shall be installed inside the generators building. The workshop and store building, for stocking the spare parts and running the emergency repairs .The

building shall be provided with an overhead electric travelling crane. The administration building. The electric power building for two step-down power transformers to supply 380volt for auxiliaries, one in duty and one as a standby. The boundary R.C. and brick wall fence around the site. The guard house, and main gates, in addition to the access roads to the site, from the main road. -The sanitary works required for service water, irrigation, fire fighting and domestic wastewater disposal. Indoor and outdoor lighting system. - Landscaping of the site including the internal roads and parking. - Two raw water ground reservoirs with hydraulic capacity of 12500m3 each reservoir shall be divided into two compartments to facilitate maintenance and repairs. - Two staff houses for employer operating and maintenance technical staff.

Location of the Project Site

The sites of the intake P.S. and intake structure are located 250m to north of Berqash Bridge El- Nasery canal (Rayah) north of Berqash village. Good paved road on the West Bank of El-Nasery canal leads to the site.

The booster pumping station site is located on the left side of an unpaved track along Al Gemal road, at a distance of about 5200m from the intake site.

Technical Specifications

Bills of Quantities” Schedules of Prices” “ The Conditions of contract, the Specifications and the Drawings shall be read in conjunction with the Bills of Quantities and all the relevant documentation before completing the schedules of prices .The Schedules of Prices also shall cover the prices for testing of equipment, civil works, service roads and pipe works and electro - mechanical works.

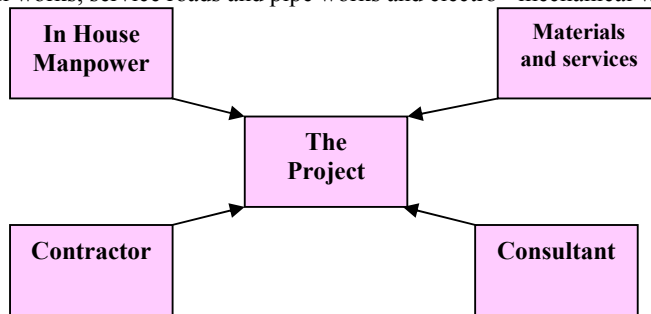


Fig.4 showing Resources drawn on by a project

Summation of Tender

Schedule number	Description	Total price US\$
A	Preliminaries	1740030
B	Day-works	20315
C	Mechanical equipment trenching	13660
D	Electrical measuring and control equipment trenching	23465
Civil Works :		
E1	Mechanical screen-site of intake pumping station	581335
E2	Pumping station building ,flow-meter chamber ,delivery valves chambers- site of intake pumping station	2906185
E3	Service transformer building- site of intake pumping station	33240
E4	Administration building- site of intake pumping station	33549
E5	Guard room- site of intake pumping station	8361
E6	Boundary wall-site intake pumping station	56704
E7	Ground tank , inlet and outlet chambers- site of booster pumping station	1346435
E8	Pumping station building , main inlet and by bass valves chamber ,flow-meter chamber ,delivery valves chamber-site of booster pumping station	1095542
E9	Administration building- site of booster pumping station	55974
E10	Residential house (a)- site of booster pumping station	307717
E11	Residential house(b) –site of booster pumping station	234162
E12	Generating building- site of booster pumping station	168223
E13	Serving transformer building- site of booster pumping station	33005
E14	Open store- site of booster pumping station	26980
E15	Workshop &store building-site of booster pumping station	77960
E16	Potable ground reservoir- site of booster pumping station	40452
E17	Main fuel tank , septic tank-site of booster pumping station	99843

E18	Guard room-site of booster pumping station	16583
E19	Boundary wall-site of booster pumping station	130752
	Saving on de-watering	(-) ⁵⁷⁷⁰⁸⁰
Site Works Trenchin: G1	Road works-site of intake pumping station	57667
G2	Domestic water supply and irrigation network-site of intake pumping station	4822
G3	Fighting network-site of intake pumping station	13671
G4	Wastewater drainage system-site of intake pumping station	4995
G5	Road works- site of booster pumping station	351600
G6	Domestic water supply and irrigation network-site of booster pumping station	12303
G7	Fire fighting network-site of booster pumping station	26655
G8	Wastewater drainage system-site of booster pumping station	42983
	Total	7490097
	Less 2% discount	149801
	Revised total	7340295
	Less stamp duty @ 2,4%	176167
	Grand total – US\$	7164128

Grand total “civil “works 7164128 us\$
 Grand Total “Civil, Mechanical and Electrical “ works 35000000 us\$
 Contractual period: 24 months
 Actual starting date: 3 – 8 – 1998
 Contractual completion date: 3 – 9 - 2000

The problem which faced the management concerning this project:

1. The discussion of the contract between the company “ SEDE “and “ Balfour Kilpatrick International Limited“ company, most of the discussion was about how to take the same rights, which have been taken by Balfour from the employer “Alsheikh Zayed City organisation”.
2. Method of upholding sides of excavation: tender study was configured by two options according to the consultant orders ,it were as follow :
 a – sheet piles system b- diaphragm wall system..
 After having the tender, the consultant confirmed that the 2nd option diaphragm wall system was the best, it has been really taken in the step of the installation after many discussions with “ Balfour Kilpatrick “ company.

Design Stage

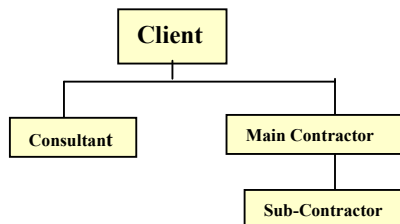


Fig 5: showing Standard approach

In standard approach:

- The Client procures consultant for the design activities
- The Client procures Main Contractor by the tender procedure.
- Main Contractor responsible for implementation of all construction works at the same time the work of subcontractor.

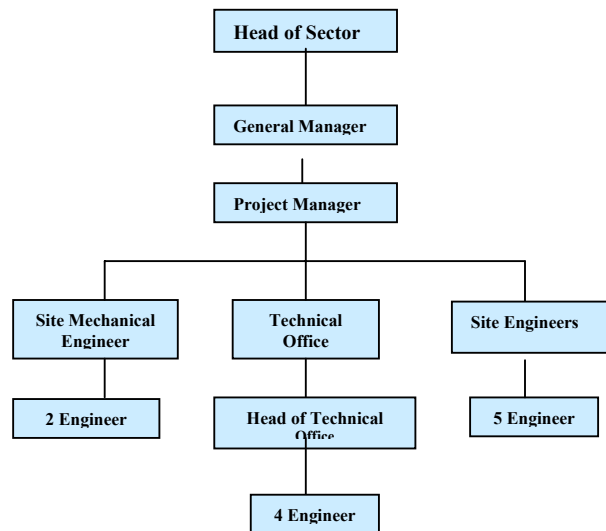


Fig 6: showing Project Organisation Chart

The General Manager is responsible for the total performance of the project within the budget and other instruction he gets from the general manager of the board and to report to the board.

Project manager tasks:

- To present time schedules and detailed budget and basic condition for the project.
- To propose organisation.
- To distribute tasks within the project organisation.
- To control invoices.

Different stages of a project:

Briefing – Designing - Constructing-Operation.

In briefing stage the project manager should:

- Make a project plan with Time Schedule and Quality Assurance.
- Help the Client to appoint the design team.
- Make a budget.
- Interpret the Client demands.
- Contact authorities.
- Integrate the users in the project.

Construction Stage

- After getting selected as the contractor for project and signing agreement with the Client, construction of the project was commenced, consultant handed the site and this date was recorded as the date of commencement of the project.
- The works of the project were carried out by using the workmen at company as well as by subcontractors. Subcontractors were selected by following the tender procedure and they were given an advance payment of 15%-20% of their contract value depending on the conditions given in the agreement and advance payment of 20%-30% for mechanical and electrical works.
- In Egypt now there is a general union construction contractors for Egypt classify all contractors to seven sets in all items of construction according to the experience and total value of work done by the contractor in this item, SEDE classify all contractors.

Purchasing – Procurement

- All suppliers and subcontractors selected by following the tender procedure and select the best suppliers and subcontractors.
- The project manager and the engineers of technical office study drawing and bill of quantities to prepare schedule for purchasing and list of items according to time schedule and also determine the suitable methods to execute each activity and determine the required to be done by sub contractors.
- There are two sector to carry out these works: Suppliers & Contractors Sector and Requests & Transfer Sector.

The contractor has to submit samples of materials to the consultant in order to set the approval. After the consultant gives the written approval for the sampler, the contractor makes arrangements to purchase.

Import of Materials

Being the contractor, SEDE has to import lot of material for various sites, the requirement sector purchases imported materials as well as local materials and study available alternatives between buying with foreign currency or from local market.

Production Planning

Planning includes forecasts of resource requirements such as people, materials, equipment and financial requirement.

Project planning procedure:

Using primavera computer program and with the technical office at the site:

- Studying well “Contract & Tender documents” the Specifications “ Drawings, the Bill of Quantities and Method of Statement
- Prepare a coding system for the main activities “earthworks, concrete work, painting, isolation etc.” and relationships between all activities.
- Calculate time duration and the total duration less than or equal client’s duration
- Draw a float, bar chart, and early and late dates.
- Prepare a coding system for resources for items in the bill of quantities, material, labourers and equipment to get cash flow and labours and equipment histograms.
- Clint and consultant approved the bar chart and monthly or weekly schedule.

Project Financing

- P.F. carried out by accountant manager as :Determine the cost of each activity including subcontractor ,Material ,Manpower ,Equipment,...etc
- Design Cash Flow” cash in, cash out” and redesign it according to the period of the project and to cover the negative period.
- We get bank facilities with the guarantee of the company’s budget and assets and as one of the working sector companies.
- The loan interest rate 11-12,5% and for the whole company.
- Insurance and taxes: (provisional insurance 5% of the total value of the project Final insurance 5% of the total of the project Insurance on manpower, equipment and project.- Contracting tax:5% of the total value of the project.- Stamp tax3,1% of the total value of the project.

Quality Assurance

- Quality Assurance Is the collective term for the formal activities and managerial processes that are planned and undertaken in an attempt to ensure those products and services that are delivered are at the required quality level, that attempts to ensure that the project cost and time function is fully integrated .
- The project manager needs to establish the administrative processes and procedures necessary to ensure and prove that the scope statement conforms to the actual requirements of the customer.
- The project manager must work with his team to determine which processes they will use to ensure that all stakeholders have confidence that the quality activities will be properly performed.
- All relevant legal and regulatory requirements must also be met. A good quality assurance system will identify objectives and standards-be multi- functional and prevention oriented-plan for collection and use data in a cycle of continuo improvement-plan for the establishment and maintenance of performance measures.

Quality Control

- The technical aspect of quality management. Project team members who have specific technical expertise on the various aspects of the project ply an active role in quality control.
- They set up the technical processes and procedures that each step of the project provides a quality output from design and development through implementation and maintenance.

- Each step's output must conform to the overall quality standards and quality plans. Q.C. in the project done as: a method of statement in which the procedure that was adopted in the construction works submitted by SEDE to the consultant for approval. The contractor purchasing material as specified in the specification. -Samples of materials test-engineer in the follow up department is responsible to monitor the quality.

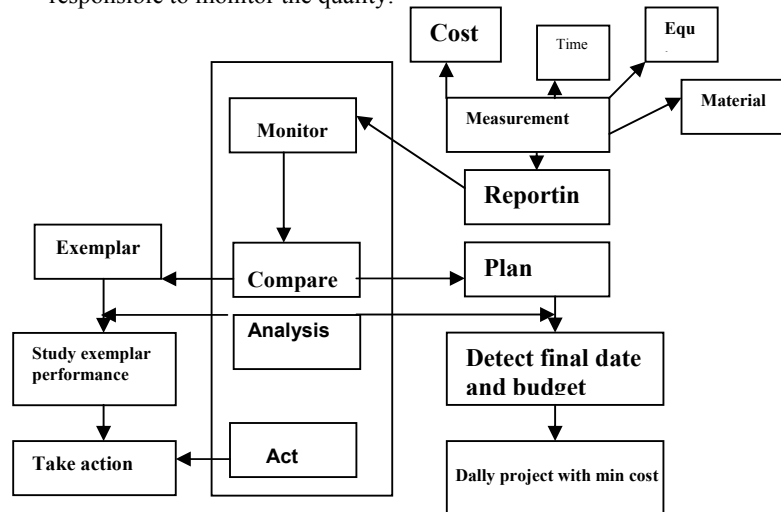


Fig 7: showing General project control cycle

Economic Control and Budgeted Control

- The cost of SEDE maintains separate fills for each project and a register to record expenditures as: material expenditure, service expenditure, financial expenditure and salaries.
- Following activities are carried out by SEDE to control the budget for all project as: Holding a comparison between what may be defined as goals in future and what have been actually achieved- Clarifying the variation between the defined goals and actual ones-Analysing these variations with the aim of defining the relevant causes-Drawing the attention of Management Sector for any deviation from the set plan to enable them to take any corrective action.

Penalty for delay

The Contractor has to complete the works of the project within the specific time.

- If the contractor fails to finish the work before the target date penalty delay is to be paid by the contractor.
- Amount of penalty delay is usually (up to 1st week 1%. -from 1st to 2nd week 1,5% -from 2nd to 3rd week 2%-from 3rd to 4th week 2, 5%-about 4th week 4%) of contract value, and according to the conditions of agreement the penalty should not exceed 15% of the total contract value and if the sub-contractor fall to perform his works within 3 weeks the second lowest tenderers is requested to do the balance work.

Project Completion

- After complete construction of the building at the target date, successfully tested, inspected and provisionally accepted, the client pays the contractor 5% of tender bond.
- During maintenance period (one year in Egypt) the contractor is responsible for correcting any defects which may emerge after this year the works of the building have been successfully tested and inspected and are finally accepted, the client paid 5% "final insurance" at this time it is responsibility of the client to maintain the building and the contractor is responsible for 10 years to attend to any technical defect after the provision date.

Property Management in Egypt

- The owners maintain the private houses.
- When the flats are rented to tenants, the money is collected from the occupants to maintain the building as the owner receives a very low rent.

- During a union, (which responsible about maintain the building) people Buy flat including the land by deposited in the bank.
- The Government allocates money from budget to maintain Government’s buildings.
- The private sector contributes with the governmental sector in the construction field to decrease the prices and costs of housing especially for low-income citizen.
- Governmental financial support to the youth by building the houses with high supported payment terms.

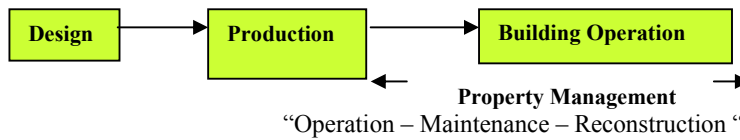
Life cycle economy

Actually the Life Period of the building is more longer than the Period Design and Construction for that we should take care for the maintenance of building by using accurate design and high quality and suitable material for the country, city, place and site.

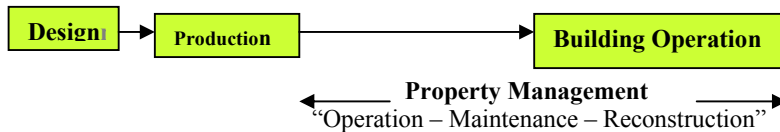
Fig 8:



1-Stage of construction project



2-Construction process including property management



3-Property management as a part of the construction process

Fig 8: showing that it is very important to take into consideration the life cycle economy at early stage of the project

Experience to use in future projects

Capacity building

There is no doubt the important effects of training on the performance of employees in any company. this training should include all the employees in any company on all levels, starting with normal works that perform mostly simple jobs to managers and engineers. We have to do some efforts to try to understand what is best for both the company and the employee at the same time. Motivating the employees to do there best, with all the possible is a very important issue. Even the social atmosphere in any working organisation can affect the production process, so a special attention should be paid for that.

Planning

Most of the new materials that I came in touch with during this course, especially the computer software, opened a wide range of ideas in my mind, some software, which was related to planning, was very handy and as well user friendly. I think it is a great idea to try to employ that software in the early stages of any project so we can have a better idea about lots of details concerning any project that we are using, specially costs and time plans.

Environment

An important issue that we need to think about from all the possible sides, still in my country the invironmenr is a very crucial issue as a top priority in all our projects.

Information technology

The company must try to make the best use of the it revolution, and getting all the information about lots of things, market, the suppliers, the new items in construction branch, how it looks like out side our countries boarder and even for new ideas about doing traditional things in a new way. At the same time, the use of computer should be on a much larger scale than what we have today, and that will even include training to all the employees on all the levels that using computer can be useful for their work. Some times we face problem even because of the lack of an effective way of contact even between the different department within the same company, I think we have to reconsider about some of the management aspects concerning communication and bureaucracy.

Conclusions

- Use of computer is easy to :
- get the required information from different sites can be done easily compared with manual system. Important documents “ cash flow , life cycle and cost estimation.
- Property management is very important aspect to start with stage.
- ISO 9001,9002,9003 and 9004 is very important to improve:
 - Management responsibility
 - Quality system
 - Contract review
 - Design control
 - Document and data control'
 - Purchasing
 - Control of customer- supplied product
 - Product identification and tractability
 - Process control
 - Inspection and testing
 - Control of inspection, measuring and test equipment
 - Inspection and test status
 - Control of nonconforming product
 - Corrective and preventive action-handing,
 - Storage,packaging,preservation and delivery
 - Control of quality records
 - Internal quality audits
 - Training, servicing and statistical techniques.

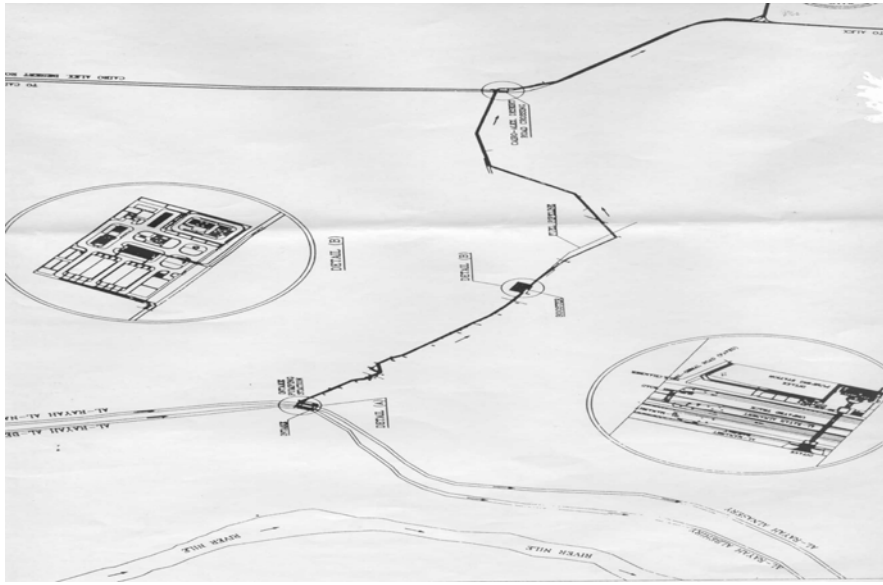


Fig.9: showing the location of the project, the Nile river at the bottom of the figure.

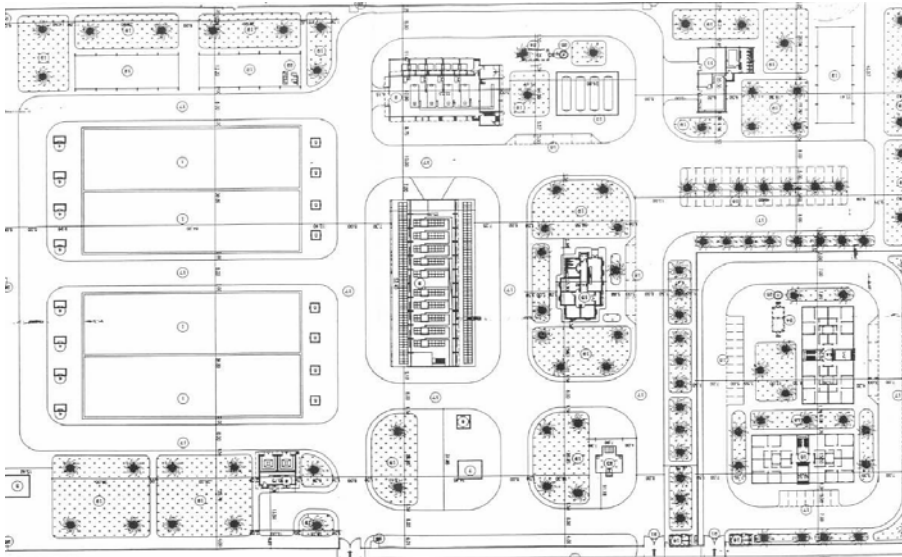


Fig.10: the layout of the project.