

Construction Process in Palestine

Planning Strategy for Low-cost Housing in Gaza

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Abstract

Housing is the biggest problem after famine and malnutrition, so the shelter rehabilitation programme ranks next to the food and clothes as basic human needs and provision of shelter not only fulfils the social needs of a family, but also improves and upgrades the quality of human life in all aspects

Introduction

Aim of the Paper

The main objective of this paper to analyse the construction process from design stage to completion of the project including briefing stage which represent 80% of the total construction process as endorsed in the course given in Lund University, Sweden 2000 which over that deepen our knowledge and add to our expertise extra information about construction management.

By using the mention project in this paper as a case study to analyse and find out the means and ways to obtain the low cost housing with good quality and right time. And how to reduce the construction cost in the first instant by pruning standards without sacrificing safety and quality.

Background

Gaza Strip is a small historic land and lies on Mediterranean Sea, it is a southern part of Palestine and as we know Palestine, is one of the most historic places in the world. Its importance is due to three great religions inside it, Islam, Christianity and Judaism. It is called the holy land; over that Palestine joins Asia with Africa. It has been the scene of many of invasions, migration and conflicts.

Gaza Strip measuring only 365 square kilometres in area, 46 kilometres long and 6–10 kilometres wide with total population 1.1 million is located on the south-eastern coastal of Mediterranean Sea, and more than 805,000 of them registered refugees over 40 percent of the total population, or 55% of the registered refugee population live in eight densely, crowded refugee camps, while comprising less than six percent of the total surface area of the occupied territories. So, there are as many as 2700 inhabitants per square kilometre of the Gaza Strip and with more than half the population residing in and around Gaza town. The density of population in the Gaza strip is very high and its one of the highest in the world in the refugee camps, and for example some 72,888

refugees live in Beach Camp whose area is less than one square kilometre. The density reflects on other aspects, over that the problem of over crowding are added those of scant economic resources, poverty, and inadequate infrastructure with additional burdens brought about by more than 25 years of Israel occupation.

The Gaza Strip has enveloped into a congested urban area characterised by poverty, poor environmental health condition, low income, few formal employment opportunities and extremely limited participation by women in the labour force.

The population of Gaza Strip is predominately young and growing at a rate of 4.5 percent annually, while 51 percent of the population is under the age of 15 and 21 percent 4 years old. Over that less than 10 percent of women belong to the labour force, most of them working only informally in cottage industries or as vendors. Minimum of them worked in offices as clerk and secretary and teacher, rarely as civil engineer. Taken to gather, these figures indicate that the labour force comprises only 20 percent of the resident of the Gaza Strip. To make matters worse the majority of working age are either unemployed or under employed.

UNRWA and Gaza Strip

The United Nation relief and work agency for Palestine refugees in the Near East began operations in May 1950 with emergency assistant to the hundreds of thousands of Palestinians displaced by the Arab Israel conflict of 1948.

In the Gaza Strip UNRWA provides services to 805,000 refugees. For example, Basic Education, Health and Relief service Environmental Health, Development and Planning, Command Operation Services.

When UNRWA took over responsibility for services in the camps in 1950 to replace the tent in which the refugees were living with simple shelters of one to three rooms (10–25 m²). The shelters were built of mud block with timber trusses roofing frames covered with tiles and cement floor.

To day where they still exist, they are in dilapidated condition, walls are poorly in structurally unsound, cracks, unhealthy, over that ventilation is inadequate, the shelter is damp, too cold in winter, very warm in summer, unsafe, according to these reason, moreover families have grown and half of them are living in over crowded condition with five person or more sleeping in one room (9 m² area), kitchen, toilet and washing facilities are commonly rudimentary high priority in UNRWA'S expanded programme of assistant is to ensure that the Palestinians are living in eight refugee camps without a signatory environment and decent accommodation.

Therefore, a housing rehabilitation programme has commenced in the 1989 on three fronts.

- Rebuilding of shelters with 30–35 square m².
- Minor repaired to avoid renovation more costly work later.
- Major repair to prevent deterioration to the point of irreparability.

But as we see the work executed under UNRWA shelter rehabilitation programme was limited in scope, owing primarily to the scant resources available for this purpose. Accordingly dwelling were reconstructed with only room, kitchen, but due to extended families including brothers sons, their wives and children often share the same residence, and in many cases as many as 17 persons occupy one room.

In so far as many as the shelter rehabilitation programme failed to address the problem of over crowding, UNRWA deem it inadequate.

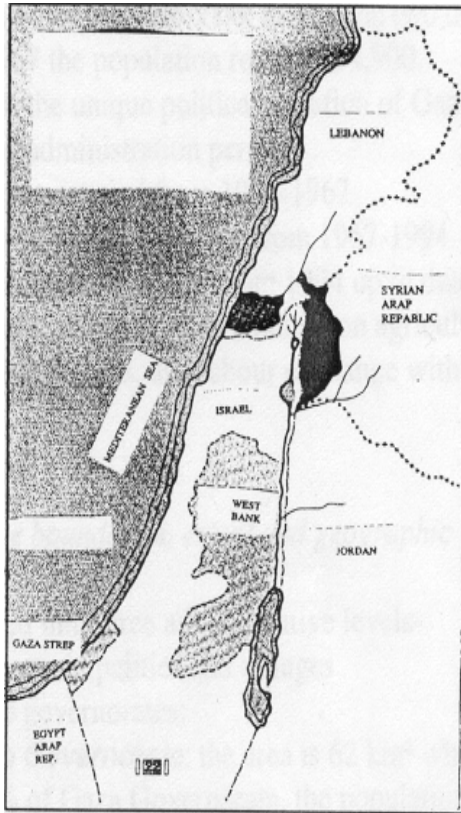
In May 1994 UNRWA has decided to tailor the real needs of the refugee depending on the size of the family and the condition of the existing shelter.

The following size shelters are constructed:

- 1 Room shelter comprising 1 room+kitchen+shower/wc (gross area 30–35 m²)
- 2 Room shelter comprising 2 rooms+kitchen+shower/wc (gross Area 45–55 m²)
- 3 Room shelter comprising 3 room+kitchen+shower/wc (gross Area 65–85 m²)
- In exceptional cases 4 Room shelter are also constructed, i.e. 4 room+kitchen+ shower/WC (gross area 70–100 m²)

Net Area of Room is 12 m²

Net Area of Kitchen is 8–10 m²
Net Area of Shower is 4–6 m²



Map 1: Palestine

Map (1) Palestine



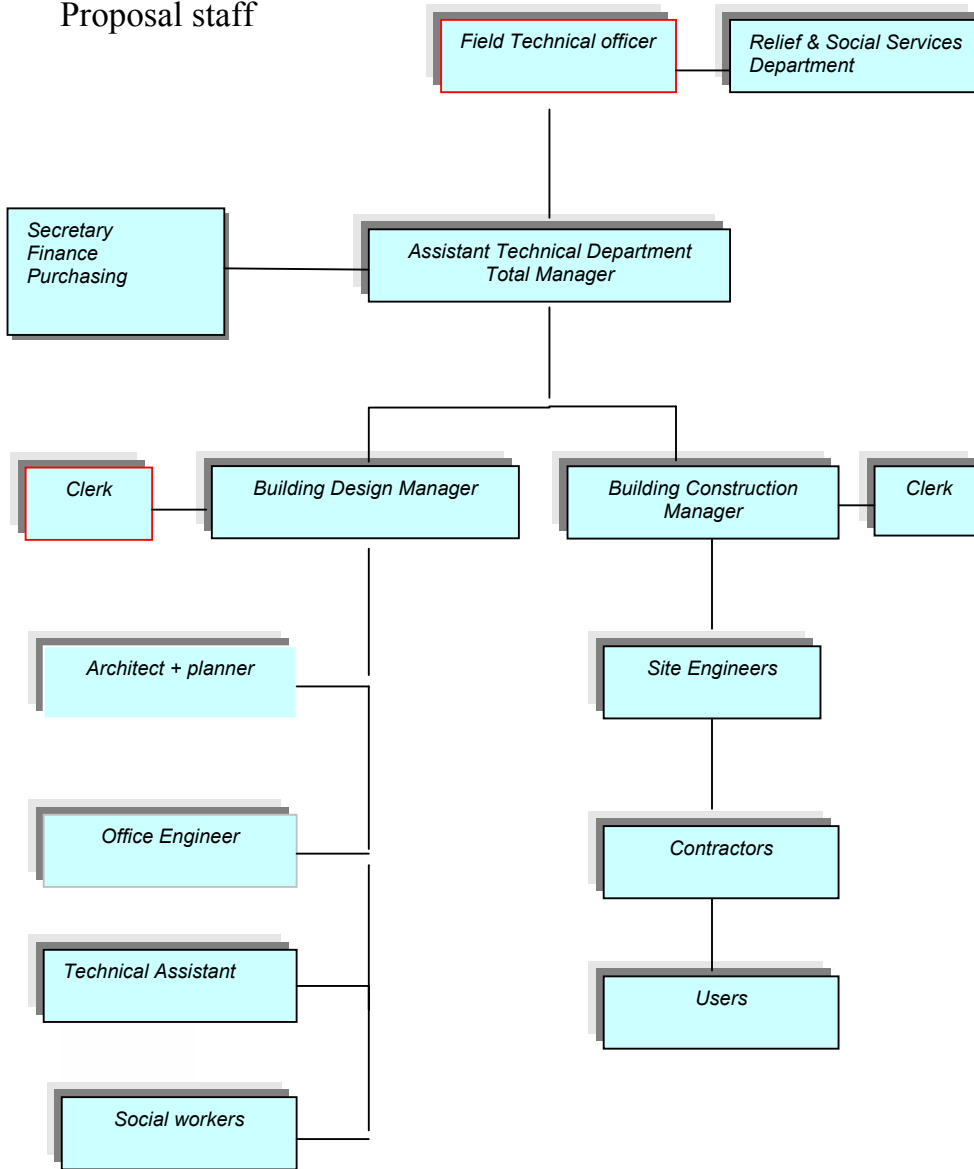
Map (2) Gaza Strip

Design Stage

Project Organisation

Organisation Plan without Human Beings

Proposal staff



The field technical officer is the head of the team since he makes all decisions regarding the projects and staff, also co-ordinate with relief and social services department. Organisation structure showing the communication channels for the project as indicated in the organisation chart, especially communication assistant technical department (Total Manager) with design building manager and construction manager due to important tasks that total manger makes it as schedule, purchase, distribution of tasks, etc. And also as indicated in the chart, the building design engineering (project engineer for design and tendering) co-ordinated with total manager in the budget and in execution the schedule additional to his responsibility for architects and office engineers to complete the design and to estimate the bill of

quantities and procedures of procurement. After awarding of tenders the total manager gives the authority for building construction manager (project engineer) to follow up the project with his staff to control contractor's compliance.

Project Planning

Plan quality control and following of the project are the most important elements for successful completion the project

Staff of UNRWA'S field and field Relief & Social Services department administrates the programme in Gaza strip jointly. The projects planning and schedules usually are done as proposals to receiving funds from the donors and these schedules may be used during design stage although variation may occur especially if the funds are received at the same time, other side the staff may start in the design stage as design the shelters, estimate bill of quantities to create work to the staff before receiving the funds from donors. There are meeting every two weeks to follow up the progress of work in the design stage and execution process.

Now we will explain the procedures and steps, which are usually, executed for design any shelter from starting to completion.

Activities

Social

Social worker will prepare detailed information about the families to be assisted their needs and present circumstances and a uniform or disabled member of the household, will be taken into account in the design of the shelter and special design for these special cases.

Over that the social workers are explaining the project to the families and assessing what construction they them selves, their extended families, neighbours or charitable community might be able to make further improvement of their condition as painting for shelters or other rooms for large families or stair for second floor for the extended families.

Technical

The shelter rehabilitation unit is divided into two branches one branch for survey, design and tendering (design + tendering unit), and the other branch for supervision The work of Tendering and design unit begins in areas (eight camps) simultaneously to gather after social work study the case, the case is sent to technical department to be studied since the site engineer will assess the technical worked regard the case to be approved by Relief department.

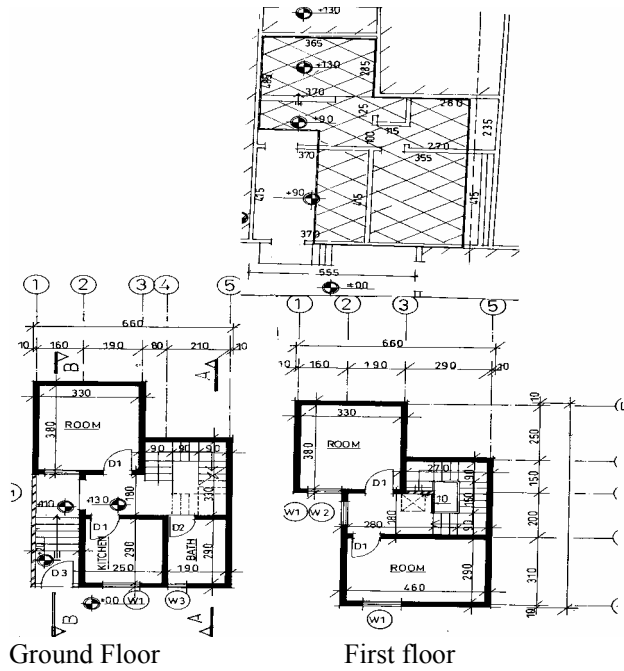
Based on the reports of the office engineer and social worker, the architect makes survey for the existing shelters or plots sketches and display his designs to be discussed with clients in presence of social workers taking some of client's ideas and his manners in the account completing the design by drawing the shelters by technical assistants, and all the previous process must be reviewed by building design manager (attached copies for existing shelter before demolition and the shelter after design for case consists of three room +kitchen +toilet (two story), the ground floor consists of one room+kichen+toilet and the first floor of two rooms with totally area 90m2), then the office engineer calculate the cost estimates depending on the briefing study , prepare the tender which includes the following documents: Tender form , building contract , particular conditions of contract and specification , safety measures , bill of quantities .note bene , preliminaries , schedule of basic cost and the drawings.

The tenders are invited by means of "open tendering" And invited by newspaper advertisement and notices posted on Agency notice boards. Then tender evaluation notes, contract proposal, quotation analysis, cost analysis are prepared by building design manager, which are checked by the total manager (Assistant Field Technical

Officer) and Field Technical Office, these will be analysed and recommendation screened by the field contract committee.

The successful bidders (almost the lowest bidder but may be the second or the third if there are strong justification) will enter into standard contracts with UNRWA and carry out the work which is supervised by site engineer and control by the project engineer, the social worker will be at the commencement and completion of the work to resolve any problem, may be available.

Existing Shelter before Design & Demolition

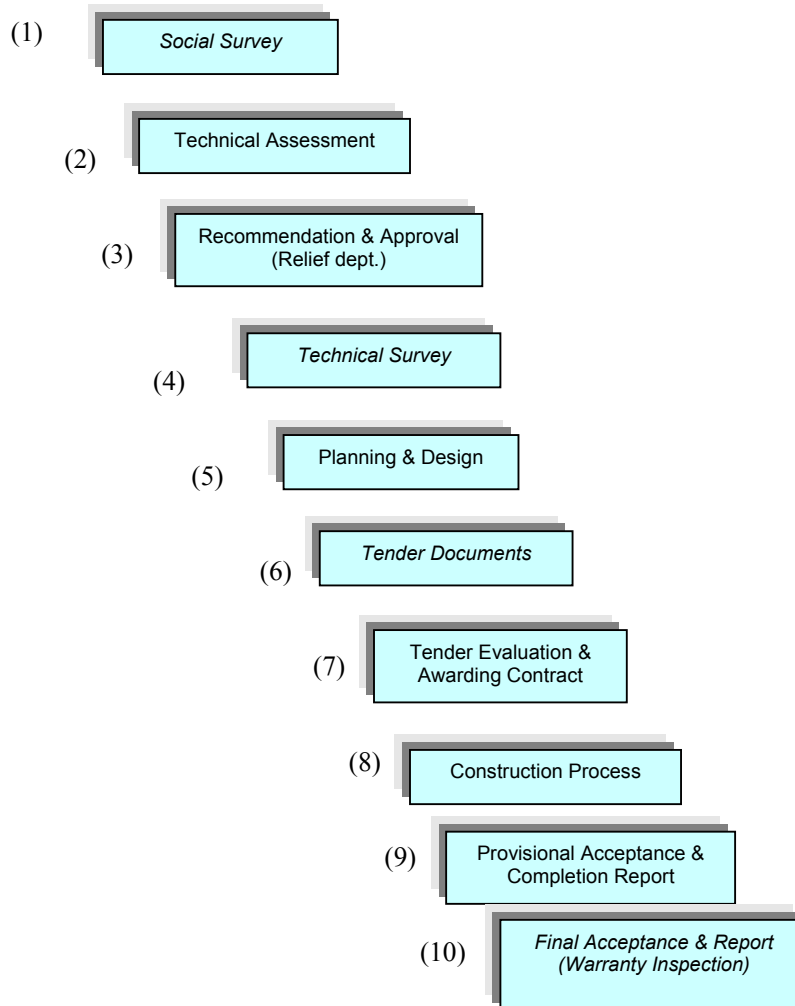


Shelter after Design



Shelter of two floors under construction, in beach camp, Palestine

Stages of Development Project



Project Financing

In Gaza Strip, contributions have been received from any donated country as for example the European Community, Italy, Kuwait, Sweden, Germany, United states of America and Saudi Arabia which were enough to rehabilitate 3115 shelters and repaired 3006 shelters by the end of March but still 2000 additional shelters are in a need to rehabilitation in the eight refugee camps in the Gaza Strip.

At the beginning of January 2000 the Saudi Arabia contribute US \$ 1.5 million for shelter rehabilitation programme, which will be enough to rehabilitate 160 shelters. Depending on briefing study, the cost of reconstruction the shelters with one room, kitchen and toilet is estimated at US \$ 5,400, with two room, kitchen and toilet at US \$ 8,000, with three room, kitchen and toilet at US \$ 10,000, with one room only at US \$ 2593 and with two room only at US \$ 5000

- Reconstruction of 30 shelters
With one room+kitchen+toilet 162,000
- Reconstruction of 34 shelters
With two rooms + kitchen + toilet 272,000
- Reconstitution of 66 shelters
With three rooms + kitchen + toilet 660,000
- Reconstruction of 11 shelters
One room only 28,000
- Reconstruction of 19 shelters
With two rooms only 95,000

Sub total	1,217,523
Site supervision 10%	121,752
Programme support cost (12%)	<u>160,713</u>
Total US \$	1,499,988 (US \$ 1,500,000)

The number of rooms to be built depend on the size of the family, one room for one to two persons, two rooms for three to six persons and three rooms for seven to nine persons, and the cost varies depending on the size of the shelter and site condition, but on a verge is in the order of \$140/m² based on gross area.

Disbursement Plan

During the construction phase, amount would be disbursed as follows:

Month no.	Amount US \$
Month 6	86,000
Month 7	173,933.21
Month 8	173,933.21
Month 9	173,933.21
Month 10	173,933.21
Month 11	173,933.21
Month 12	173,933.21
Month 13	87,923,74
Total US \$	1,271,523

(Excluding site supervision programme support costs)

Beneficiaries

Approximately 160 Palestine refugee families will benefit from the shelter rehabilitation programme while providing the shelter's occupants with a safe and sanitary, hygienic living space, also the programme aims to generate job opportunities for the workers in the building trades and fitting, for example the current project funded by Saudi Arabia US \$ 1.5 million is expected to generate a total of 20,748 man-days of temporary employment (see man-day table), 156 contracting firms are invited to tenders, and all the employ labours from the refugee camps, over that all the executed work is under supervision of UNRWA'S local site engineers. So, we note the programme aims through the construction process to the following:

- Reconstruction thousands of shelters and improvement environmental condition
- Promote the up grading of the economic condition of the families
- Improvement the quality of life by housing, training, job creation through construction processes.

Table 1: Man-days

Scope of Work	No. of Shelters	Man-Days	Total
Reconstruction of a shelter with one room, kitchen and toilet	30	101	3,030
Reconstruction of a shelter with two room, kitchen and toilet	34	141	4,794
Reconstruction of a shelter with three rooms, kitchen and toilet	66	169	11,154
Reconstruction of a shelter with one room only	11	45	495
Reconstruction of a shelter with two rooms only	19	69	1,311
Total	160	525	20,784

Procurement

Normal between five and ten shelters are included in each tenders are put out to bid locally and contractors are invited to the tender by means of open tendering (contractor registered with the Contract Unions in Gaza (First Category/classes (A&B) and second Categories) and or registered with Agency's Approved Lists of Contractor (categories A, B, C).

In Technical department there are committee for classification of contractors according to his ability and capacity also in order to eliminate or freeze any an unacceptable contractor.

Each tender will include the following:

1. Terms and condition of invitation to tender which includes the date of submission of tender.
2. Bank grantee valid.
3. The following documents: Tender form, Building contract with contract form, Particular condition of contract and specification, Preliminaries, Safety measures, Nota bene, Bill of quantities and drawings.

The building contract includes:

A- General Condition

- Documents and supervision, Security deposits -Valid Bank Guarantee.
- Commencement and completion of the work, Provisional and final acceptance of work.
- Liquidated Damages
- Variations.

The total cost of the work as shown in the drawings and bill of quantities shall not be divided form to and extent exceeding twenty five per Centrum (25%) except by agreement with contractor, and must be authorised by the director of work.

- Measurements and payment.
Payment under this contract shall be on basis of the quantities and the unit rate of the work actually ordered to be done and completed by contractor and not by way of a lump sum; the aforesaid payment shall be made in MONTHLY instalments, each payment being certified by the Director of the work. And the site engineer of UNRWA shall record all notes taken on site in presence of contractor or his representative if he so desires and all measurements shall be net with no allowances being made for waste. (Measure and value contract).
- Provisional of tools and materials
The contractor shall provide and transport all tools, equipment, plants, and materials to the site which are necessary for the execution of the work at his own risk and expense.
- Insurance to be Maintained by contractor
 - Workmen's Compensation Insurance.
 - Public liability Insurance
 - Fire Insurance
- Termination of Contract
Agency 's right to terminate contract if it's discovered that any gift or commission is given or if the contractor become insolvent, etc,

B- Particular Conditions

The things regard with drawing, meeting, materials, demolition, excavation and measurement & pricing for materials.

Information Technology

Agency and especially technical department innovative the building technology by:

- Receiving information, education technology.
- Holding training courses, practices, meetings, and seminars for Architect, Civil Engineers in order to improve the building process and increase their skills.

- All admistrators and clerks attend training courses in field of computer (Excel, Paradox, and Reality for materials, etc.)
- Every years, group of engineers travel to the other surrounding countries for attending conferences or exhibitions as International Construction exhibition and Earth Quick conference in Egypt or Jordan, and I am for example I attend this course (International Construction Management in Sweden) which insure that UNRWA participate in seminars, and conferences.

By using technology and computer system in planning, design and through construction process as MS project, CPM, PERT especially in the cost control, cost analysis and controls activities.

Conclusion

Planning and design of shelter programme should be geared so as to make the shelter programme successful, in Gaza Strip we try to reduce the cost of shelter in the stage of planning and design by the following:

- Procurement.
Between five and ten shelters are included in each tender are put out to bid locally and contractor are invited to the tender by means of open tendering. This will leads to more competitive between contractors, so the lowest bidder, also the local contractors will have cheaper labours (man power) which head to low cost.
- We planned in design to use the bearing wall system which doesn't need high and long inspections from site engineers so, minimise the time in the stage of execution
- During the stage of design, the architects display the sketches to be discussed with client in presence of social worker e.i the client participates in the briefing stage, for avoiding any problems may be available from families in the execution stage, so no obstacles or delays are available in the stage of execution, and firstly at starting of the project in 1989 most of people wanted the area of the room 16m² but now we could to convince the families with enough area for the room to be 12 m² instead of 16 m² which leading to decreasing in area of the shelter and the cost of it.
- We do cost and quotation analysis for each tender to put our hands on any mistake and weak points which will lead to correct any deviation, therefore minimising the cost
- Finally using the equipment and technology, which must be suitable and familiar with cheaper labours and local conditions for our country.

The above mention points will lead how to obtain housing with low cost, good quality and right time.

Production Stage

Production Planning

The schedule on the next page is a brief data and arrangement to indicate the procedures, which the contractor will do through the construction process. Therefore the construction building manager will check, modify, approve or reject

General

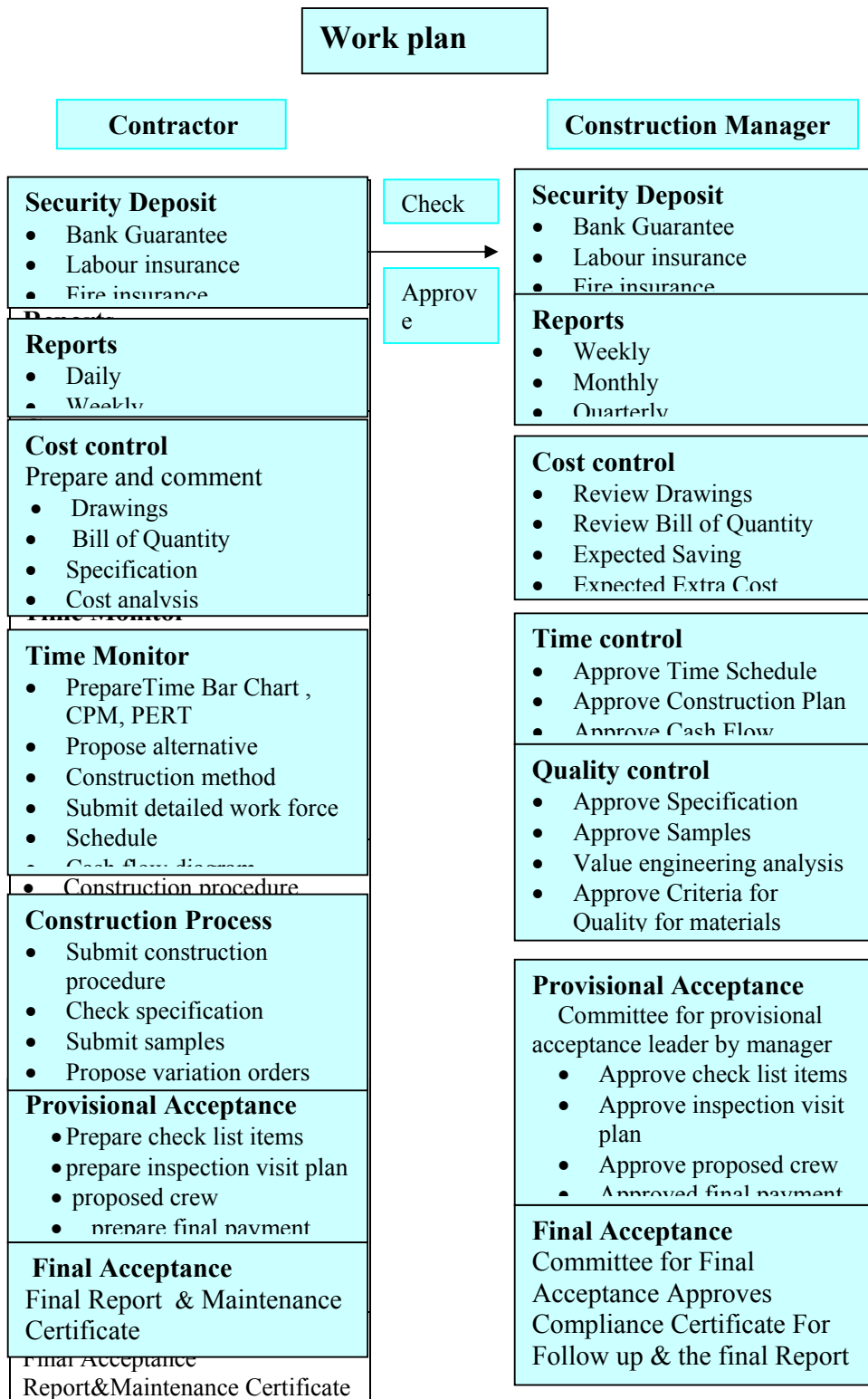
The way of managing the project during the operating stage of the project is very important especially that quality control and following up of the project are the most elements for successful of the project, but before explaining the procedures of construction process, we must know **the main actors** in the construction process.

Contractors

Most of contractors in Gaza strip are not qualified in understanding the construction process and administration and the figures qualified contractors don't hire qualified staff to assist in the tendering depending on permanent contracts for these staff but they rent them as job basis, and a lot of the contractors in need to good training course in the management of the construction process because up to date a lot of the contractors consider the project manager as unneeded.

Client

The client may be local authority ministry, education ministry, united nation, private company, social affairs ministry, private person, etc, and the client usually the consultant with data, brief information, about his project from previous or similar project. Therefore the consultant and his teams undertake to propose the solution according to the client needs and in any competitive tender for design and supervision there are two proposals, technical and financial. The financial tender is opened only if the technical proposal was over 70%.



Architects

The architects usually are in the office to provide the client with sketches and design according to manner, ideas and needs of the client and seldom the architect is in the sites and works as manager for the projects due to lack knowledge of economy and production process, therefor no architects on the construction sites, so I endorse the

view what mentioned in this course that, it is about time for architect to get themselves the necessary knowledge by visiting the sites on their own cost until their presence will be consider as absolutely necessary.

Quantity Surveyor and Site Engineer

It is not common on practise in Gaza Strip to find quantity surveyor to estimate bill of quantities in the tender document, due to all of technical people consider that these project are similar so, the civil engineer will be responsible for estimating the bill of quantities and final payment for the projects. But there is quantity surveyor in our department (united nation)

Social Services

In Gaza Strip day by day the people is more interested with social worker and his services especially in united nation due to his importance in solving the problems may be available through construction process and ability in contact with users and people.

Materials

Up to date there are not enough construction materials in the country due to the conflict and the occupation over that we affect with economy of Israel due to the most of raw materials from Israel and rarely the materials were manufactures locally but now the Palestinian local authorities try to improve and manufacture the construction materials.

Lands and Local Authorities

The high population densities and lack of land due to occupation of our land from Israel, is resulting in speculation and land prices booms. It is necessary to control of land use & prices and making laws for regulation to be reasonable with condition, especially the prices /m2 of land is very expensive in spite of a lot of flats and apartment in the towers are empty of people and useless. The first reason for expensive of prices for land due to only the surface area of Gaza 6% of the total area and the other reason is high density of people in Gaza strip. But after 1994 the local authorities start to do with role of regulation services and controlling development especially infrastructure services as construction new roads and maintain the olds, study for garbage collection, water, and sewer projects.

The Manager or Consultant

The manager in our case is responsible for any thing, performance of the project, budget, present time schedule, progress of the project, execute the decisions from board, propose organisation, and distribute task, etc... so. It is difficult to find manager who has knowledge with all these information and the client day by day starts to know the importance of the manager or consultant in the construction process which will lead to importance holding courses for management of the project in the local university or other countries, the importance of the manager back as mention in the course, Sweden 2000 that 80% of the project as briefing study. There for the manager is the first person who can to analyse the project. After we indicated the main actors in the construction process, we will mention overall the following procedures may be used during the various stages of the project.

- Reporting
- Construction procedure and quality management
- Quality control
- Cost and economic Control.
- Time monitor
- Final Acceptance

But I would like to draw attention that the implementation of the above elements depending on the Co-operation of the three parts's the contractor, client, and the manager. Therefore periodic meetings will be scheduled every time and after

completion of each stage of the work and the follow up of the work during period and after each stage is very important.

Reports

Reporting is a very important procedure that ensures good co-ordination and the best control of the work. There are, daily, weekly, and monthly progress reports.

Daily Report

Daily report is to be prepared by site engineer, including details of the activity, equipment, labour and tradesmen on site.

Weekly Report

To be prepared by the site engineers and checked and controlled by project engineer (construction building manager) including all activity, during the period of the week and any materials delivered, work executed, delay, obstacles, rains, variations, claims, visitors, progress of work on time wks+ / wk. - / % COM and any other comments.

Monthly Report

Monthly report is to be prepared by building construction manager, and checked by total manager, which summarises the following:

1. General Information
2. Project Names, names of contractors, job nr, period of project, precast
3. Major instruction, claims, problems, visitors, accidents, weather, obstacles,
4. Construction stage, progress of work (percentage), progresses on time, financial issues and any other relevant.
5. Technical view including
 - Materials and equipment
 - Labour (Labour planned and actual)
 - Time schedule (achieve and planned schedule)
 - List of submitted (approved and rejected)

Final Report

Which including the following:

- Actual bill of quantities, % of retention, financial issues, maintenance deposits to keep and financial completion report.
- Evaluation of the performance of the contractor.
- General information, project name and completion report.

Construction Procedure and Quality Management

Quality control during field construction is concerned with ensuring that the work is accomplished in accordance with the requirements specified in the contract. The agency established criteria for construction and the quality control programme to ensure the contractor's compliance with contract standard. The following items will be checked during this stage:

- Construction procedure: The representative of agency has the right to approve or modify the contractors construction plans and method proposed for each major element of the project.
- Check Specifications: The agency or the representative of it will review the specification as stated in the contract and ensure the contractor's compliance.
- Samples Submitted: prior to each activity, the contractor will be asked to submit samples for approval for some samples .The manager will also visit some of the manufactures to ensure quality.
- Variations: variation during construction whether in some designed items or in bill of quantity, will be reviewed.

- Value Analysis: before agreeing on variations, the contractor has to submit value analysis sheet for new items to be included, extra items, or new proposed methods of construction. The construction building manager will check the viability and adequacy of this analysis.
- Testing procedure: The project engineer will observe the testing procedures, which is taken by site engineer to be followed in all stages of the project (materials, installations, etc.). Classification to the standard will be provided to the contractor to comply with.
- Materials control chart: quality control charts that shows general behaviour and deviations of testing results will be prepared by contractor and checked by project engineer. Plans to modify any negative trends will be proposed by construction building manager.

Quality Control and Management

During field construction the technical department will provide the criteria for construction and the quality control programme to ensure from performance of the contractor according to the specifications and standards, this includes:

- Specifications

Review specification, tenders, documents, bill of quantities, drawing, instruction for the contractor and contractor's compliance.

- Samples and Materials

Samples and materials will be approved by construction building manager who requires visits to manufactures and local markets and the cost analysis may be required from contractor.

- Variation and Cost Analysis

Variation during construction may be required for in some designed or in bill of quantities and the contractor must submit cost analysis sheets for new items, which must be approved by Field technical officer then the project engineer will check and follow up.

- Testing and Materials

In all stage of construction, testing for materials and project engineer will monitor and modify any negative result of testing for materials as concrete, tiles, steels, etc.

Cost Control

Cost analysis control including

- Review of all drawing, specification, design and bill of quantities.
- This will minimise variation order and reduces the cost.

Time Control

Time control will provide the following:

- Time Bar chart, Net work analysis (Critical Path Method CPM or Programme Evaluation and Review Technique PERT)
- Work force man-days including direct or indirect men.

Final Acceptance

The contractor has to submit a detailed maintenance before final acceptance and the project engineer to follow up it

The plan and final acceptance will include the following:

- Inspection visits
- Checklist items and notes.
- Maintenance deposit.
- Maintenance compliance certificate.
- Final Report.

Property Management

Life-cycle Economy

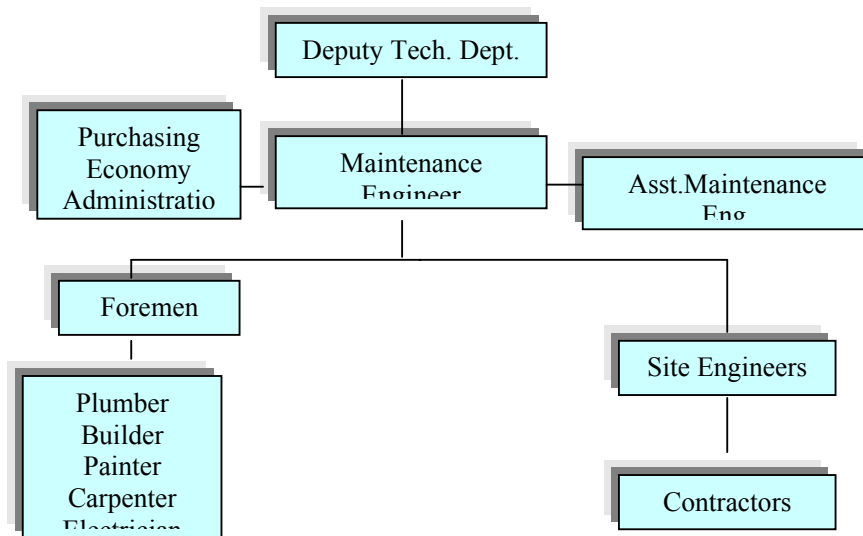
The way and the kind property management varies from country to country, and also inside the country the property management for any building varies from site to site, and from user to other, depending upon various factories such as location of building, strategic address, attractive of building, high of building, soil condition, climatic condition, intensity of usage, regulation of usage, carelessness in house keeping and the like, and who responsible for building after completion of the construction.

In Gaza strip property management and maintenance were not given the attention it deserved and most of present state houses and apartments are managed by owners of houses, so a lot of the building without external plastering, without planning for slope of roofs, without plasticized bituminous roofing so in the future these building will need to more cost for maintenance due to lack of maintenance through life cycle, which usually starts from erection of the building to the demolition the building but some of the buildings can be sold for the other users especially if there are strategic addresses, with appraise price so this is the way for property management is better, and users have the right to repair, or reconstruction their properties.

Maintenance Planning

There is no maintenance for shelter rehabilitation but there is a maintenance branch in our technical department for schools, and we will try to explain about this.

Organization Plan



Planning

We will indicate a brief idea about maintenance department planning in our country.

1. Administration and Economy
 - Administration
 - Salaries & Budget and Accounting
 - Planning and Supervision concerning with maintenance, purchasing, tenders, invoice, etc
2. Running operation
 - Cost of electric fees, water fees, etc are paid directly to municipality and no heating system is available

- Caretaker for any property of any building which almost rent buildings is responsible for guarding, cleaning of stairs, garbage collecting, contact with tenant for collecting money for electrical fees, water fees, garbage which are paid directly to the municipality. This kind of building may be rent association or the building is owned by some persons that have not time to manage their properties.
3. Maintenance Cost
- Continuous maintenance, e.g. to prevent the maintenance. The foreman is responsible for any small decision and work as caretaker with co-ordination with maint. Engineer as repainting windows, door, refixing broken glasses, handles, basin, sink etc, and the entire thing that must be replaced. And all these staff works as permanent jobs. Purchasing these items is done by co-ordination with supplier. And the foremen with estimates the cost for old and new items and monitors the purchase orders.
 - Routine maintenance. This is done by tendering which including repainting, broken glasses, etc for the schools as example each period and almost done in holiday of the summer holiday. And the site engineer estimates the cost for each property and keep to file.
 - Comprehensive maintenance. This is arranged also by open tendering and competitive contractors and this including extreme maintenance for the property, bitumen roofing, tiles, door, windows, floor, painting, plastering, and the cost is estimated by engineer for each tender with bill of quantities and final payment to be filed and keep.

Connection with Design Stage –Feedback

In the unit nation, meeting is hold every two weeks between the three branches maintenance branch, construction branch and design branch which is co-ordinated by field technical officer or his deputy and maint. Engineer manifest his comments and his advises according to his experience and problem may be available through maintenance of the property, therefor correct any deviation or mistake for any future projects either in the construction or design and the following tasks are the most common mistakes within property of management to be considered at the construction process and design stage to avoid any future defects:

- Stairs, paths and floors

The good quality materials must be adjusted to the use of the building as basalt or marble tiles in stead of terrazzo tiles especially for stairs and entrance to resist sticking, kicking and scratching and to choose durable material on floors where may people are passing every day and to choose floor materials to be easy to clean

- Doors and windows

Using too high wooden quality for doors to resist striking, kicking, not to use tight paints which has enclose the humidity and also the same condition concerning with the expansion joints between the structure and windows. And placing the windows in the walls with embrasure and with lintels in the out side and the doors should be protected in the best possible way by walls and roofs to be protected from rains.

- Roofs and pipes

Good plasticized bituminous roofing and good slope for roofs and to avoid a horizontal roofing which may be leaks and try to have external eaves in order to protect outer walls including the windows from rain.

Using good quality pipes and to be put in such a way that they be separated, repaired and changed without damaging the walls or roofs, etc.

- Bath rooms

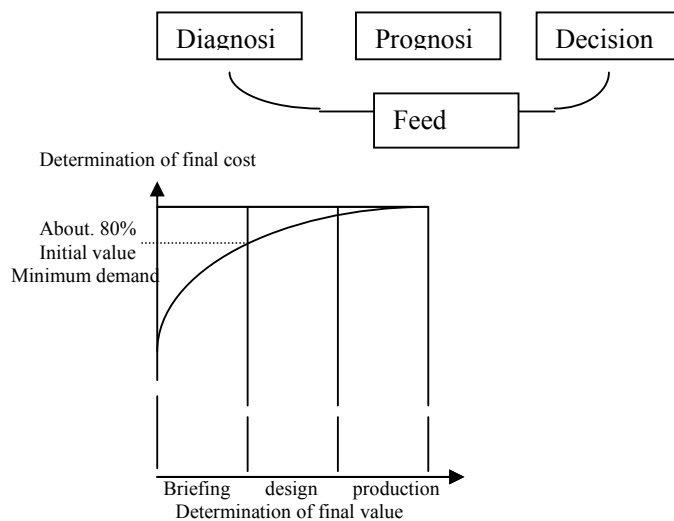
Most of leaks are in the kitchen and bath rooms, therefor these must have tight materials on the parts of the walls, where the water can reach and even tile surfaces are completely tight, therefor special attention must be made on the construction Behind the tiles to get the wall tight enough, also using bitumen layer before tiling.

Conclusion

Importance of the property management that, gives feed back to design stage, so we can correct any deviation or mistake happen through construction process or through property management for any future projects, therefor the decisions will be correct. And the above mention points ensure the importance of the property management and to get people in the construction process and design unit to understand the importance of property management.

Experience to be used in the future from the course

- Deepen our knowledge and add to our expertise extra information about management construction process as planning, design and implementation.
- The course encourage thinking and promote rethinking to obtain new ideas and not to deliver the latest technical information which lead to get up new ways and means.
- Deepen computer system and management of construction site, how to involve worker (force –man-days and sources) in the project (planning, scheduling with computer support), especially critical path method (CPM) and programme evaluation & review technique (PERT), which help to determine the critical task.
- Deepen model of analysis about property management by using integrated of organisation annual documents as indicated below:



- Deepen our knowledge to minimise the time with sharing the contractor at the stage design by using divided contract approach in procurement and endorsing the importance of briefing stage which represent 80% of the total process as indicated in the above figure.
- The course gives us a chance to meet over hundred persons from other different countries, which lead to increase to transport the experiences and technology from country to other as results of paper, presentation, and lectures.

Proposals and Recommendations

Using deeper computer programs in the main management building area, as design, construction, planning, budget, control building and property management.

- Increasing and improvement formal training in construction management.
- Formation teams to find out the means and ways to pruning standard without sacrificing safety and quality.
- Production community to effective in quality control aspects

- Reducing the time of projects in the design and execution stage using deeper computer programme as MS project, PERT, CPM.
- To be more interest with maintenance and property management by training office engineers and architects to be taken his accounts in the design especially regards quality materials because a lot of them have taken the production more than maintenance into consideration. Also I recommend in our country to make official book keeping records as diagnosis for information for each property from end of erection of the building to the date of demolition including kind of maintenance, estimate and cost to keep it as diagnosis for any future study.
- Changes should be avoided at production stage.

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