Quality Assurance: What does it take?

An Office Renovation Project in the West Bank

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Summary

The project described in this paper is the renovation of a seven-story apartment building in the West Bank. The building was converted into office space for an international institution with offices located in over ninety countries. The renovation of the building followed the standard practice in which the needs of a client were translated into a project.

An internal facilities management group within the institution managed the project. A project manager within this group was assigned responsibility for the project from inception through to project completion. In reviewing the history of the project, best practices become apparent as well as lessons that can be learned from this experience. The issues and lessons learned must be remembered and integrated into guidelines for future projects within the institution. These issues are:

- With offices located in over ninety countries, the constraints of identifying an appropriate property which responds to all the institutional requirements is often an elusive and unachievable goal. Managers as well as policy makers must understand this; make allowances for it within the policy; recognise and learn how to adapt to local conditions while remaining informed and knowledgeable in their decision making.
- There are country and regional specific problems that require flexibility and adaptability on the part of the institutional management as well as the client/user and the project manager if a quality project is to be delivered.
- The quality and expectations of a project must be defined from the beginning.
- Management and clients must recognise that a quality result differs from one country to another due to construction processes and methods, availability of materials and the presence of a skilled labour force.
- Policy makers and clients must be educated by the facility managers on the implications of cost and time when major changes in the scope of work occur after a project has started.
- Quality results are proportional to the amount of time dedicated at the beginning of a project to develop the detailed project scope and design program and time spent communicating with the client and the consultants during the design stage.
- To increase the odds of ensuring a quality result, the client must allow sufficient advance lead time when initiating a project to ensure that the delivery of the project corresponds to a realistic schedule.
- The issues encountered on this one project are multiplied by the number of projects a project manager is working on. Realistic management of his/her time can assist in eliminating some of these issues before they become problems.

Introduction

All construction projects provide lessons to learn and best practices to observe for future projects. Many of the issues encountered in this project are typical of most construction projects, within whichever country they may be located. Solutions vary and are most often based on local construction standards or processes as well as cultural influences. It is in the approach to solve these issues where different solutions become apparent, though with often similar results.

This paper will provide policy makers, managers and clients with a description of a project cycle for a fairly typical construction project within this institution. Highlighting the diversity of issues which can be encountered, due not only to the local construction processes but also to the internal culture of the institution itself, illustrates how decisions and

actions in a construction project are all interconnected. They all influence and affect the outcome of a project.

The role of the construction project manager in this institution is more than that of organising a project; it is assuming the role of a creative problem solver and facilitator. Often "standard" solutions which might be available or applicable in more industrialised nations are not possible. As a result, the project manager is faced with the unknown and a process of risk assessment is required where he/she has no other alternative than to rely heavily on previous experience.

Facts

The renovation project pictured above is the local office of an international organisation with offices in over ninety countries. Due to a decentralisation of the work program from the main headquarter office, relocation of many of the country department initiatives have been transferred to the local office. As a result, the existing office of 350 square meters was no longer sufficient to respond to the office's mandated work program due to an increase in staff. The new program initiatives increased the office size to over 1200 square meters to accommodate these new requirements. Consequently, this project evolved out of the simple and basic need for additional office space which could not be accommodated in the office's existing building.

Other than the local architectural/engineering consulting firm engaged to produce the bid documents and the local contractors awarded the contract for the renovation, the main participants in this project were principally internal to the institution itself.

Project Description

The project is located in the Middle East, specifically in the West Bank, an area known throughout history as Palestine. The building is located in an Arab town called Beit Hanina, a suburb of Jerusalem. It is neither part of the state of Israel nor in an independent Palestinian state. It is in a semi-autonomous area controlled and administered by both the Israeli government and the Palestinian Authority. Though it is located in a town, there is no real municipality overseeing and controlling the development, zoning or infrastructure of the area.

It is the standard practice for this institution to lease office space, which it then renovates to its requirements. In certain cases, due either to the local real estate market or for financial considerations, a building is purchased and renovated or a building is designed and built. Due to the particular economic, cultural and political circumstances of this region, there were no office buildings available on the market to lease.

A thorough market analysis was required to identify a suitable building. Evaluation criteria was established to provide a focus on the specific requirements. The parameters are established but they may vary from country to country depending on the program requirements and local conditions. For this project, there were two market analyses undertaken.

An exhaustive search was conducted over a period of a year to identify a building. An empty building designed as a garment factory was determined as the most suitable to respond to the program requirements. Though it did not meet the total space requirements, it did provide a finished open space with six meter regular column bays which would allow the space to be easily converted into a space-efficient office building. The project scope was developed by the project manager and client; architectural consultants were interviewed by the project manager; a consulting firm was selected and engaged and a lease agreement was negotiated with the landlord.

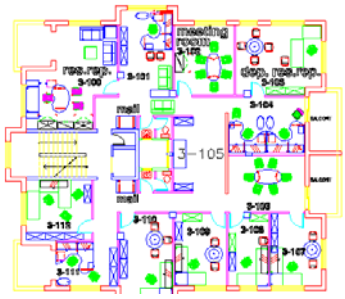
During the period due diligence was conducted on the lease, specifications were prepared and tender documents were completed in order to advance the project schedule. Unfortunately, by the completion of this stage, the lease had not been signed, as there was an issue of land ownership. It was discovered that though the landlord had financed and built the building, he was not the sole owner of the land underneath the building. There were in reality two plots of land on which the building had been constructed. Due to inheritance, over thirty different people owned the land. Many of the owners had left the region many years ago and due to particular land ownership regulations in Israel, and

the absence of many records, the issue of signing a lease with multiple and absent landlords became an insurmountable task to resolve. As a result, this building project was cancelled, the consultants compensated for the design work they had completed to date and a new search began for another building.

After a further exhaustive search by the local office and the consultants, an uncompleted seven-story apartment building was identified. The project manager visited the building and determined that it would meet the program requirements.

There were no legal issues on the lease for this building as it was determined early in the process that there was only one sole owner of the land and the building. A ten year lease was entered into with the landlord agreeing to reduce the annual rent by 50%, since the institution would be completing the civil works on the building. He also agreed that the institution could sub-lease space to other tenants upon his approval.

A typical floor plan of the final office is shown below.



There were several issues regarding the building which are described below.

- The building was an empty shell. Only the exterior walls and exposed concrete floor slabs were in place with windows only unfinished openings in the external walls. In addition, plumbing, electrical and mechanical infrastructures were not in place. As a result, the project scope would require a complete interior build out of the building as well as completing the exterior shell.
- The building exceeded the office's overall space requirements. With 250 square meters per floor, five floors were more than sufficient to meet all the program requirements but the landlord would only lease the building in its entirety. Two floors remained empty with the intention that they would be sub-leased at some time in the future. For the present they would be renovated to a completed open space finish. This became an issue during the construction phase and ultimately led to significant delays in the renovation schedule when sub-tenants leased the two floors.
- The building was designed as an apartment building, not an office. This became an issue in the planning and design phase to convert spaces designed as kitchens, bathrooms, living rooms, dining rooms and bedrooms, into offices. The final layout of the office design was compromised by the column grids and the placement and sizes of windows. Both of which were designed for a residential purpose.
- The landlord insisted that when and if the office closed down, the interior renovation of the building should be designed so that it could easily be converted into apartments in the future. This requirement necessitated some technical solutions not normally considered for an office renovation project. To the extent possible, electrical installations were installed along the exterior walls and not in internal partitions which might be removed in the future. The installation of the heating and air conditioning had to consider how the future apartments would be laid out and co-ordinated with the placement of fan coil units. A decision was made not to install a suspended ceiling with recessed lighting, as it would necessitate major demolition work should the building be converted back into apartments. Lighting fixtures were suspended from the concrete slab and with lighting points located, to the extent possible, to be adaptable for both office and residential use. Since there were no suspended ceilings, all electrical conduits were installed under the finished floor with connections made along the exterior perimeter wall.

As part of the institution's effort to standardise office space and to provide the same level of working environment in all offices of the institution, no matter where they are located, the issue of office size became a major hurdle to overcome. Technical solutions do not always correspond to institutional space standards. The generic space requirements based on predetermined space allocations are often difficult to implement due to the variety of building configurations. A hierarchy of what governs must be established.

Economy

The economy of the region is closely intertwined with the political agendas of its' inhabitants. There are dual economies existing side by side. One is developed though requiring substantial outside aid to maintain some balance of peace. The second is underdeveloped requiring a substantial dedication of funds to develop the private sector and improve the living standards of its inhabitants.

Whenever private funds are available to construct, the priority is for housing and apartment buildings. There are no speculative office development projects though there is a growing need for this type of building. This is true not only in this region but also in many other non-industrial areas of the world. The investment in office buildings is negligible when the priority is housing.

Cultural

The culture of the region is as diverse and complicated as any area of the world. Three of the world's major religions and cultures are represented, the Jewish faith, Christianity and Islam. Within the Arabic culture, both Christianity and the Islamic faith are practised. The Jewish and Arabic cultures permeate all levels of society.

Political Conditions

Based on the Oslo Peace Accords, the West Bank is divided into three zones, A, B and C. According to the peace agreement, it is the intent that the Israeli government will eventually return to the Palestinians all these zones which partition the West Bank. At present, the West Bank is divided into areas controlled completely by the Palestinians, areas controlled by both the Israelis and Palestinians and areas occupied by the Palestinians but still controlled by the Israeli government. This project is located in the latter. The existence of these zones presented obstacles to a timely completion of the renovation project.

There was also a problem of availability of quality goods which often unavailable in the West Bank due to the political environment. Not all contractors had access to the Israeli markets thus limiting the quality of materials they could provide as well the quantity of materials which were available.

Design Stage

Project Organisation

The project was organised according to the internal procedures and requirements of the institution for which the project was undertaken. The institution is comprised of a central General Services Department responsible for all facilities of the organisation whether located at the headquarters office or abroad. Within this department, there is a Facilities Management division within which there is a Global Real Estate section. This administrative unit is mandated to carry out the establishment, renovation or construction of field offices on behalf of the institution. It is a classic example of an in-house facilities management unit responsible for the project management in the renovation or construction of facilities It is comprised of six project managers.

The major participants in the project are described below:

Project Manager

The project managers are architects or engineers, responsible for all field office projects from inception through to completion. The project manager represents the institution ensuring a consistent standard for all field offices throughout the world. It is the role of the project manager to:

- Conduct a site evaluation mission to the country;
- Identify potential office sites;
- Prepare a site evaluation report with recommendations;
- Develop a project scope and program;
- Develop a project budget;
- Engage a local A/E consulting firm;
- Review specifications and bid documents for compliance to standards and internal requirements;
- Review bids and assist the procurement office in the award of construction contracts;
- Ensure quality in the project;
- Manage the architectural/engineering consulting firm;
- Manage the client and user's expectations;
- Conduct site supervision missions;
- Mangage the project budget, accounting and payments;
- Provide a turn-key service; and
- Ensure institutional standards are observed.

Client

The client within this institution is the region, country department or local office for whom the project is managed. There are six regions, each of which has a vice presidential unit within which there is a chief administrator's office. In most cases this is the client for the project as the Chief Administrative officer is ultimately responsible for and allocated the capital budget for the project.

User

The user in this project is the local country office for the West Bank/Gaza country department in the Middle East and North Africa region of the institution. The director of the local office is always assigned on a rotational basis from the headquarters office. The director was the principal contact for the project manager during the course of the project.

Budget Department

The Corporate Resource Management Group is responsible for approving and allocating the capital budget for projects. They evaluate a Region's request for funding based on the site evaluation report prepared by the project manager and determine whether the project responds to the criteria established for capital budgets.

Legal Department

The Legal Department is responsible for ensuring that due diligence is observed in all contractual agreements into which the institution enters. They review the conditions of leases and advise on whether the institution can enter into a particular lease agreement. They also review documents related to purchase of buildings or land.

Information Services
The Information Solutions Group is assigned the task to ensure a uniform system of institutional communication systems are installed in all the field offices. They review the office floor plans and prepare communication specifications which are provided to the architectural consultants.

Security Office
The Security Office reviews all office floor plans to ensure that the security of the staff is protected to the extent possible at all times. This includes a review of controlled access into the building, intrusion and fire safety as well as recommendations on equipment and procedures. The recommendations related to the civil works are included in the program provided to the architectural consultants.

Architectural/Engineering Consultant
Based on interviews conducted by the project manager, a local architectural/engineering firm is engaged to translate the program requirements into a set of specifications and tender documents. A consultant is selected directly by the project manager if their fees are below a threshold determined by the institution. Above this threshold, the consultants are selected through a more structured approach, a Request for Proposal. The consultant, once selected, reports directly to the project manager receiving all instructions from them unless otherwise directed. The consultant is responsible for providing detailed specifications, pre-qualifying contractors, issuing the bid documents, reviewing the bids, making recommendation for the award of contract, conducting on-site supervision and reviewing and making recommendations for progress payments to the contractors.

Contractor
The local contractor is hired as a result of a competitive bidding process with the contract awarded to the lowest evaluated bidder responding to the project requirements. Contingent upon the estimated value of the contract, the contractors are short-listed by the consultant or qualified by a pre-qualification exercise conducted by the institution's Procurement Office.

Procurement Office
The project manager initiates procurement for all actions whether they are for goods or for contractual services. The project manager formulates a procurement plan based on his/her assessment of the project requirements. These requirements are then submitted to a central Procurement Department and, in particular, a unit within this office which deals exclusively with all forms of procurements related to the field offices. The procurements include, but are not limited to; Requests for Proposals, contracts for architectural/engineering firms, pre-qualification of contractors, tendering, award of contract as well as the procurement of goods such as furniture and office technology. A standard procurement process is adhered to with bids received from 3-5 firms depending on the amount of the procurement. Procurements under a certain sum can be obtained through telephone calls but a minimum of three bids are still required.

Project Planning
The project planning is developed by the project manager in consultations with the client, the user and the consultants. A space program is developed based the staffing requirements, adhering to institutional standards. Both medium to long-term staffing requirements are determined in order to plan for the anticipated growth of the office in the future. There are generic guidelines which have been established for the planning of field offices and, to the extent possible, these are implemented where feasible. Due to the fact that the field offices are located in 90 different countries representing a wide range of building types, from villas to modern high rise office buildings, it is often difficult to implement these guidelines across the board to insure parity with other offices. This is one area where policy makers and managers must understand the process to allow flexibility and not enforce standards that can not be adapted to all buildings.

The West Bank project was planned adhering to the basic steps in the development of a project: (1) A building was identified, (2) a project scope was developed, (3) consultants were interviewed and hired, (4) specifications were prepared, (5) the project was tendered, and (6) a contract was awarded.

In this project there was one difference which separated it from the normal procedure. After the contract was awarded, the user identified two tenants to lease the empty floors. As lease agreements are primarily the responsibility, and paid from the budget of the user, the user agreed with the two tenants undertake and manage the renovation of their two floors under the umbrella of the building renovation project. The lease agreement stipulated that the sub-tenants would advance to the user the funds required to renovate the floors to their requirements. All direct costs for the renovation were transferred by the sub-tenants through the local office's administrative budget and not through the capital budget for "the project". The sublease agreements were managed by the local office but the contractual agreement between the consultants and the general contractor became the responsibility of the project manager to provide a contractual framework for the contractor and consultants.

Project Schedule
A preliminary project schedule was developed at the beginning of the project in consultation with the client. Project schedules are most often determined by the user's requirements. The user often comes to the project manager expecting a delivery date which is unrealistic, not realising the time required to initiate and complete a project cycle. As a result, the project schedule is often compressed to "make up for lost time". In this project the driving force behind the schedule was the impact on the operations of the existing office due to lack of space. In addition, the conditions of the

office and the surrounding neighborhood had deteriorated to an unhealthy state.

Primavera, and in the past Microsoft planning, have been used as scheduling tools for the projects. All activities monitored by the PM are indicated on the schedule and updated periodically.

Project Financing

Unlike private development or investment projects, the office renovation projects for this institution are funded through capital budgets allocated by the Corporate Resource Management group. Due diligence is required though in the project proposal, justifying the need for the project and the proposed project budget. This is achieved through the site evaluation report prepared by the project manager, endorsed and submitted by the client to the budget office accompanying the request for a capital budget.

A capital budget is allocated to the client region and managed by the project manager. The funds are available for three years though the period can be extended if necessary. The project budget includes not only the civil works but also office technology, communications, office furniture and equipment. Upon closing the capital budget, the client is charged back the cost of the project based on a pre-established depreciation table for all project categories. The depreciation categories range from 6 years to 50 years contingent upon the procurement. In reality, the capital budget is a no interest loan to the regional offices for the establishment or renovation of their field offices. The client has the budgetary authority for approving commitments against the budget but at completion of the project, it is the user who is charged the cost of the project and must repay it over the period of years specified in the depreciation table.

There is a prevailing atmosphere within the institution that often results in the client requesting a less than realistic project budget, often below what would be required for a fully satisfactory project. The review process for project budget approval is slow and requires a detailed analysis of the proposal. At times, the client is reluctant to request the full budget due to their perceived perception that it will be rejected or considered too expensive. This has the potential to lead to a less than satisfactory result.

Budget and Budget Control

The budget is established by the project manager in consultation with the client, the architectural/engineering consultants and the Information Technology department. The budget is reviewed by these departments and approved by them before it is submitted to request the project funding.

Upon approval of the budget and release of funds, the client or the project manager sets up a sub-project code assigning budget category code numbers for all the different types of procurements to be performed under the project. These codes also assign the depreciation category to the activity, establishing the payback period for these procurement actions.

Budget control is insured by a series of checks and balances with internal control systems. These controls are based on signatory authority for the funding. Though the project managers are responsible for managing the project, the client who is assigned the funding is ultimately responsible for how the funds are expensed and is also responsible for any cost overruns. It is however the project manager's responsibility to advise the client to ensure there will be no cost overruns.

The control mechanism is based on requisitions prepared by the project manager for the procurement of all goods and services on a project. Procurement requisitions are submitted to the client for authorisation to commit the funds. This action generates a purchase order either for goods or services. After the purchase order is issued, it is the joint responsibility of the procurement office and the project manager to follow up with the procurement until it is completed. The client is no longer involved once the requisition is approved. Upon completion of the procurement, the invoice is approved by the project manager and submitted to the accounting office for payment.

Information Technology

The role of information and technology in building projects has increased dramatically over the past fifteen years. The installation of a communication infrastructure is now a major component in the construction of all new office buildings.

One result directly related to the increased use of computers and communications is that more and more architectural consultants in the field now have more access to computers and electronic mail and have the skills to use this technology. The ability to send drawings and specifications as email attachments has helped tremendously in reducing the amount of time required to review and approve drawings. In addition, as communication is improved through the use of email, issues can be resolved quickly and more efficiently.

Experiences to Use in Future Projects

There were issues, which arose in the West Bank project during the project planning, and design stage, which ultimately affected the construction process, the budget, the project completion schedule and the maintenance of the building after completion. The issues encountered during this phase of the project were all interrelated and are outlined below:

- **Budget Envelope:** As discussed under the project's finances, the user is ultimately responsible for repaying to the institution the cost for the project. This is accomplished through the administrative budget for the office and based on the depreciation categories for the procurement of goods and services established when the

funding was allocated. During the initial planning period, the user indicated that as the local office would ultimately be responsible for repaying the funding for the project, the project budget should not exceed a certain limit determined by the user. As a result, decisions were made during the planning of the project which would ensure that it would remain within this amount. It was decided that a central air conditioning system would exceed the budget. Consequently, it was decided and supported by the user, that only a heating system using traditional cast iron radiators would be installed and not an air conditioning and heating system. This decision was reversed later in the project after the construction contract was awarded and it was determined there were sufficient funds to do the infrastructure for the air conditioning, though there were insufficient funds to procure the chiller.

Due to a close monitoring of the overall project costs as well as the provision for contingencies, the budget was not affected nor overrun. However as a result of the choices made to remain within the initial budget, the quality of the final project was compromised.

- **Lack of comprehension of the floor plan by the user**: The users were consulted during the preparation of the floor plan and provided input into the program requirements. During the preparation of the specifications they were presented the floor plans on several occasions for their comments and review. Adjustments were made wherever feasible. After completion of the bid documents and award of contract, the users were again given an opportunity to review and comment on the furniture plans before the order was placed. The users were provided both furniture plans and 3d drawings to enable them to understand what they would be receiving at the completion of the project. Despite these opportunities, when the partitions were installed, the users began to ask for changes in the plans that involved moving walls, enclosing open spaces, which ultimately affected the quality of the space and the furniture layout.

  It is apparent that there is a general lack of understanding of the final product. More constructive time should be spent with the users during the planning and design phases to ensure that they fully understand what they will be receiving at the end of the project. One possible solution is to require the consultants to prepare a study model of the office, with furniture, to assist the users in visualizing the space.

- **Change of Scope:** Due to this lack of comprehension of the floor plans as well as the change in scope on the air conditioning system, change orders were required to make the requested adjustments. As a result, after the award of contract and after the construction works began, the entire infrastructure for the electrical and mechanical installations were stopped while the design for a new mechanical system was being prepared. In addition, the two tenant floors became part of the overall building renovation after the renovation works had started. Both of these changes had a significant impact on the construction schedule.

  Client/users must be educated during the planning and design phases on the consequences of a major change in the scope of a project and the effect it will have on a project budget, schedule and ultimately the quality of the project.

- **Time schedule and Time management:** The introduction of changes to the floor plan, a change in the mechanical system and the introduction of two additional floors to renovate, all had a significant impact on the consultants. The consultants were required to provide the planning and specifications for what evolved as a fast track project. This was beyond their original scope of work. It required delaying some renovation works for the building's mechanical system as well as spending time with the tenants to design their floors. Additional time was also required of the project manager to sort out all the contractual agreements with the tenants, the consultants and the contractors as well as reviewing and approving changes to the specifications and the costs. As a result, the project completion was ultimately delayed by 3 ½ months.

  When there is insufficient time to devote to all the details on a project, they often become issues and problems which must be resolved latter on in the project. This is true whether it is for the project manager, the consultant or the client/user. Time invested at the beginning of a project to determine the project scope as well as time invested during the design stage can eliminate problems later in the project which can ultimately translate into cost savings.

  It must be recognised by managers and clients what the risks are to a project, both in quality and cost if there is insufficient time available for the project manager to dedicate to the project or if there is an unrealistic project schedule required by the institution.

- **Errors and Omissions/ Bills of Quantities:** Though specifications and bills of quantities prepared by the A/E consultant were reviewed in detail, revised and corrected to the extent possible, there were errors and omissions which became apparent during the renovation works. Though the overall costs to the civil works due to these errors and omissions were not significant, the quality and project schedule was ultimately affected.

  In accordance with the construction industry in the West Bank, insurance for the consultants for errors and omissions in the specifications were not available locally. In more industrialised areas of the world; this type of insurance would have been available for the consultant to subscribe to. Though they were minimal, there were increased costs for the project and to the client.

Conclusions

Best practices to be observed during the project planning and design stage are:

- *Continue the role of the project manager who is empowered to act on behalf of the client/user for the overall benefit of the institution. The project manager should be an experienced architect in order to deal with all the technical and design issues from details to interior design. In addition, the project manager must have experience in lease and contracting issues as well as budgeting and accounting.*
- *Ensure that the client/user fully understands the project including the floor plans and furniture plans. Spend more time with them to make sure they understand what they are getting. Most users do not understand a floor plan or furniture plan and can not read it. Explore more ways of presenting the project in three-dimensional drawings or include a scale model in consultant's contract, which will enable the client/user to visualise the project better.*
- *Discuss with the client, during the design stage, the implications on cost and time if any major changes in the scope of work occur during the construction phase.*

Production Stage

Tendering and Contract

Concurrent with the preparation of the bid documents, the consultants undertook a pre-qualification exercise to identify qualified contractors to participate in the bidding. As the cost of the project was estimated to be at a level under a pre-established threshold set by the institution, public advertising was not required. There was however, a requirement that each contractor complete a questionnaire prepared by the procurement office to determine whether they were qualified to participate according to the institutions internal requirements. Those determined to be qualified were invited to participate in the tendering for the project.

Four contractors were deemed qualified to participate in the bidding. The contractors were given three weeks to prepare and submit their bids. All four submitted bids accompanied by either a bid bond or cheque. The consultants evaluated the bids for correctness and responsiveness to the bid documents. After the bids were evaluated, the consultants recommended that the second lowest bidder be awarded the contract. As the difference between the lowest bidder and the second lowest bidder was approximately 20%, it was impossible to award it to the second lowest, given the internal rules within the institution. In addition, the second lowest bidder indicated that his offer was exclusive of the 17% vat while the lowest bid included VAT. In the opinion of the consultant, the second lowest bidder presented the lowest evaluated bid. However if the contract was awarded to them, the overall project budget would be exceeded. As a result, the award of contract went to the lowest bidder.

Although the bids were based on a bill of quantities, the contract was for a fixed price lump sum amount. A twenty-five percent mobilisation payment was agreed upon and paid upon signing of the contract. Often with smaller contractors in non-industrialised countries they do not have the financial means to begin a construction project, purchase materials and supplies without an advance at the beginning of the project. Progress payments were made periodically upon certification by the consultant that the percentage of works performed corresponded to the payment request.

The standard contract employed for the majority of the projects undertaken by this institution are fixed price/lump sum contracts even when the offers are based on bills of quantities. Many contractors do not understand this when they sign their contract though there are clauses where this is clearly indicated. The standard draft contract also required several forms of insurance. In most industrialised countries, these insurances are readily available. However, often in some parts of the world these insurances or bonds are not available. In these instances a higher retention percentage is retained from progress payments to ensure some sort of protection for the client.

The contract also indicated a construction period of four months. However, as mentioned previously, there were two major changes in the scope of works: (1) a change in the HVAC system and (2) the introduction of two tenant floors to renovate. As a result, there were change orders, which did have a significant impact on the overall project completion schedule as well as the quality of the works.

The contract did not contain a penalty clause as experience has shown that these are often difficult to impose. Neither was there a liquidated damage clause which was an unfortunate oversight and was needed at the end of the project to force the contractor to absorb some costs incurred by the institution due to delays in the work.

One exceptional issue related to this institution is that it is exempt from the majority of the taxes required by private institutions. As a result the issue of Value Added Tax (VAT) often has a very important role in the overall project budget. In some countries there are mechanisms in place with the local government that allows the institution to submit a tax-exempt form. After processed by the relevant authority, all invoices from consultants or contractors are submitted without the VAT. In other countries, the VAT must be paid with the institution reimbursed later for the VAT portion after submission of the invoices. In these cases, some items might not be considered exempt from the VAT and the authorities will not reimburse for these items. In the case of the West Bank, as it is not a country but an authority, the issue of the VAT and its impact on the project budget is particularly troublesome. The institution is exempt but has paid for the VAT on all contract items. However due to the particular legal status of the West Bank, the

reimbursement of the VAT becomes almost impossible. At present, the outstanding VAT reimbursements represent over ten percent of the overall project budget. The issue of the VAT also comes into play when the contractors submit their bids. The tender documents require that the contractors indicate in their bids the VAT portion. Often the contractors are nebulous in their bids on this issue and leave the VAT ambiguous in order to play on this difference in anticipation of receiving the contract. However if they do not indicate the status of the VAT in their offer, they can be disqualified.

Production Planning / Construction Phase

Other than the construction schedule of four months which was required by the client in the construction contract, the planning during the construction phase of this project was left entirely to the contractor and his site foreman. There were many different issues during the construction phase that affected the final completion schedule and the quality of the project. All parties involved share some of the responsibility for these issues. The contractor, the consultant, the client as well as some unforeseen events and the political reality of the region all had an impact on the final outcome of the project.

Base Building Problems

There were some basic problems discovered early on in the construction of the base building. These issues were unforeseen and required time to resolve.

- Another contractor had built the core of the building with construction halted when the building was still an unfinished shell. Whether there was any construction supervision during the initial building construction is doubtful. It was discovered that the floor to ceiling height on one floor was different than the other floors. As a result the concrete slab poured for the staircase was at an unacceptable angle. There were two possibilities to solve this issue: (1) a substantial infill of gravel to raise the finished floor height on this level or (2) the concrete stair poured for the staircase between the two levels would be removed and a new staircase installed. It was decided the infill would be a better solution, as removing the staircase would have a severe impact on the works scheduled for the upper floors. The contractor did not have access to machinery that would allow the workers to access the upper floors from the outside.
- The building had originally been designed for two identical apartments on each floor. When the interior partitions for the office were being installed it was discovered that the column grid on one side of the building was not the same as the other side. It was thirty centimetres off. This had a major impact on the corridor and the toilets on one side of the building. As a result, the corridor was pushed back to the edge of the columns exposing them in the corridor while on the other side of the building they ran flush with the column in the corridor.

Contractor Errors

There were also errors made by the contractor in ignoring or misinterpreting some of renovation specifications. The construction manager for the contractor was an architect and on occasions made changes to the specifications which, in his opinion, offered better solutions. These changes were often made without discussion with the consultant.

- The contractor had the reputation of being one of the more qualified in the West Bank, especially in the installation of computer and communication networks. Nonetheless, each time the project manager conducted a site visit, it was discovered that the infrastructure for the communication network was not properly installed and did not follow the specifications. The institution has very specific instructions for these installations that were provided to the consultant to include in the specifications. In addition, the existing local office of the institution had the standard infrastructure installation for communications. The contractor was requested on several occasions to visit the office in order to duplicate the same installation in the new building. Furthermore, the local office had a communication expert on staff to advise on the communication installations. The consultant was also present and aware of the specifications. These issues should not have occurred.
- Due to a fairly restricted budget there were very few interior embellishments. Partitions were gypsum board, corridors local terrazzo tile and offices imported carpet tiles. Only two special finishes were used to give the interior a more upgraded look. These were both local materials, stone and hand made Armenian tile around doors, baseboards and in toilets. The tile was designed specifically for the project with a geometric pattern and two colors to co-ordinate with the interiors, furniture and carpeting. The contractor provided a sample tile that was approved. A local artisan produced these tiles. During one of the site visits, the project manager discovered that the majority of the tiles installed in the toilets were the incorrect color and the pattern did not repeat itself as it had been designed. In addition, the tiles had been baked too long with the result that the background was darker than what had been approved. The installation of the tiles was halted and the contractor was required to reproduce the tiles. However by this time the project was so advanced that removing the tiles in the toilets and replacing them would have caused an additional delay in delivering a project which was already at that time behind schedule. As a result the tiles in the toilets were left in place.
- Specific dimensions were also provided to the contractor for certain rooms and areas to ensure that the furniture, which was ordered for these spaces, would fit in the area allocated. In many instances when the furniture

was delivered and installed, it did not fit between the walls for the areas in which it was designed. This required reworking the furniture layout and in some cases ordering additional furniture.

- One issue, which impacted the project schedule throughout construction, was the sequencing of works by the contractor. It also had an impact on material management on the site. One of the first items undertaken by the contractor was to complete the perimeter stone security wall around the site. Due to the configuration of the roads access to the site was severely restricted. It was impossible for large trucks to deliver materials. The time spent on building the wall could have been spent on the interior of the building with exterior works completed at the end of the construction. Instead the outside is completed and there are still many items left to be completed in the interior of the building as well as finishing the punch list.

Change of Scope

The issues listed above are fairly standard occurrences on a construction project, affecting both quality and schedule. However on this project the major impact on the quality and time schedule was the change in project scope when the HVAC system was changed and two additional floors to renovate were added to the renovation.

- After the construction contract was awarded, it was determined that there were sufficient funds still available in the overall project budget to upgrade the HVAC system. As a result, works were stopped on the installation of the infrastructure for a radiator heating system while the consultants completed the design for an air conditioning and heating system. The infrastructure for the electrical works was also halted as the new system would be with fan coils and would require a new design for the electrical system as well. As soon as the design was completed, costs were obtained from the contractor and the budget was reviewed again taking into account the items to be added and subtracted from the original construction contract. Based on these changes the original construction schedule of four months was no longer valid.
- During this same period in the construction schedule, there was inclusion of the two empty floors that were now leased. The design was undertaken concurrently with the redesign of the air conditioning system. The original specifications had provided for a finished open space for these two floors. Work was now halted while the tenants were providing a design program. Consequently, the change order for the air conditioning now had to be adapted to the new floor plans and partition layouts for the tenant floors. As a result of these changes in scope and stopping the work on the infrastructure, it was agreed that the project completion schedule would be extended by 1-½ months.
- As the renovation works advanced and partitions were put into place, the users began to visit the site. As a consequence, a month before the date given by the contractor as the official turnover date, a series of change orders initiated by the users started. Open spaces were closed and more rooms were created. There was also a change in ideas for the use of some of the rooms. Both of these issues had a potential impact on the schedule providing the contractor with additional reasons as to why the project was not completed.
- These last minute changes by the user also had an impact on the furniture that was ordered and how and where it was to be installed. Some open spaces had been specifically designed

Unforeseen Complications

Apart from all the issues listed above, there were also forces from the outside, beyond the control of the client, contractor or the consultant who also effected the project schedule.

- One issue, which affected the completion schedule, though to a smaller extent, was the “closures” of the borders. Due to the political situation in the region, free access across borders was often restricted. This prevented workers from having access to the site. In addition, due to the proximity of the site, across the street from the border with Israel, there were often soldiers and police controlling circulation in the area. On many occasions, workers were not allowed onto the site by the authorities and identification cards were controlled. This required intervention by the client with the authorities with many hours of discussion before the workers were allowed onto the site.
- The absence of any real cohesive municipal authority administering the area led to delays in the installation of basic utilities. For the installation of the sewage system, the road leading to the site was dug up in order to install the piping. This took several days during which materials could not be delivered to the site. In addition, no one would take responsibility to repave the road, which in the end was repaved and paid for by the client. It was also only through the intervention of the landlord for the building who was well connected with the responsible people in the utility company that the work was completed within a week. Otherwise, it would have taken much longer.

Implications of these issues

The issues outlined above all led to a delay of over three months before the building could be occupied. The contractor provided three dates for the official take over of the building. All these dates were superceded due to the lack of progress on the site. As a result, the client, as well as the sub-tenants, all incurred additional expenses due to the delay. Works continued in the building after the occupants moved in. Punch list items were never completed to the satisfaction of the users. The contractor was provided a

deadline for the completion of all punch list items. The contract amount will be reduced due to defective work and the contractor will be required to submit a Bank Guarantee for 5% of the completed works for one year. The final 10% retention funds will not be paid until the Bank Guarantee is submitted.

Quality Assurance, Control and Inspections

Quality assurance was provided to the extent possible by periodic reviews. The original project scope was developed together with the client. The client provided the staffing program from which the project manager developed a space program. This space program was then transferred to the building identified and a floor plan/furniture plan was developed. Before the plans were provided to the consultant, they were reviewed and approved by the client.

The program and floor plan approved by the client was in turn provided to the consultant as the program requirements. The program was expanded to include budget information, specifications for communication installations as well as a detailed project scope. During the preparation of the specifications, they were reviewed periodically by the project manager and all questions regarding the desired results of the project were addressed to and answered by him.

During the preparation of the specifications and before they were bid out, the client was provided another opportunity to review the plans and to make comments. To the extent possible, all comments were taken into consideration and adjustments made. Before the project was put out to bid, there was a final detailed review of the drawings and specifications by the project manager. Adjustments and changes were made in design details, in materials and their quantities. After these adjustments were made, the project was tendered.

The floor plans/furniture plans were reviewed a third time after the contract was awarded but before the furniture was ordered. Again, to the extent possible, questions and comments on the furniture layout were taken into consideration and adjusted before the furniture order was placed.

To control the quality of specific items, the project manager included in the project scope that certain items, such as office lighting and carpeting, would be specified and procured by the client and provided to the contractor for installation. The installation price was included in the specifications and bills of quantities.

During the renovation phase, it was the responsibility of the consultant to conduct daily or weekly visits to the site to control the works, answer questions and assure the quality of the results. Whenever the consultant could not provide an answer to a question from the contractor, the consultant would contact the project manager to resolve the issue. Due to the nature of the institution and the organisation of the work, it was impossible for the project manager to be on the site on a permanent basis. As a result, the project manager conducted periodic site visits every two months during the project and multiple site visits during the last six weeks and during the punch list period.

Economic Control – Budget Review and Reconciliation

The over-all project budget was developed by the project manager with input by the consultants and by the client/user. Upon approval of the capital budget there are a series of checks and balances to ensure the budget is controlled and expensed properly. The project manager maintains a spreadsheet indicating the approved budget with the cost assigned to each category. As commitments are made against these items, it is registered in the spreadsheet. Budgeted items not yet committed or items which were not originally part of the project budget are also monitored on this spreadsheet to provide a complete picture. During advancement of the project this spreadsheet is updated whenever there is a change or commitment. This is one reason why on this project, though there were substantial change orders, the project budget was not exceeded.

The spreadsheets maintained by the project manager are used internally within the manager's office to track expenses. The institution has a formal accounting system in place which has ultimate authority although, due to the particularities of the system and whether payments are made at headquarters or the local office, the official accounting system is often not current.

The official control mechanism requires that the client assigned the capital budget approve the costs for all goods and services through a requisition that commits the funds for a specific activity. The requisition is then sent to the procurement office to ensure compliance with internal regulations at which point a purchase order is created. The project manager initiates the majority of the requisitions for the procurement of goods and / or services. In addition, any change orders in a contract must follow the same procedures.

One difficulty encountered on this project was related to the tenant floors. The renovation of these two floors was undertaken outside the scope of the capital budget for the office renovation. The renovation costs were based on the contract prices and became part of the sub-lease agreement. Two separate contracts were required between both the sub-tenants and the contractor and consultant to perform the works associated with the renovation of the tenant floors. The costs for the tenant floor renovations were paid by the tenants through to the user's administrative budget with these costs remaining un-associated and distinct from the capital budget for the project.

Conclusions

The majority of the issues that impacted the construction phase were related to the change in scope with the resulting delay in project completion. The change in scope also had an impact on the specifications when items were eliminated

and new specifications added. There is always a strong possibility that some items will be overlooked and when a project is based on Bills of Quantities, this can lead to a potential abuse by the contractor. There were also issues of poor planning by the contractor as well as defective work. The consultant should have also spent more time on the site to prevent some of the defective work from being installed. The main lessons learned are:

- *Major changes in scope must be avoided once a construction contract is signed. Increased costs, often uncontrolled, plus construction delays and errors in specifications are inevitable.*
- *Consultants and project managers need to spend more time on the site to prevent errors and ensure quality.*
- *To ensure a quality project, a realistic project completion schedule must be agreed upon by all parties.*

Property Management and Maintenance

The role of the project manager in this institution is to provide a turn-key office project to the client. As soon as the project has been turned over to the client, the project manager's role is usually phased out. Traditionally, the role of property management and maintenance of the office is the responsibility of the local staff. This has evolved for many reasons:

- the majority of the buildings are leased and maintained by the landlord;
- the office sizes were in the past small, under 1000 square meters;
- the offices, located in over 90 countries, represent all building types imaginable from villas to office floors in high rise office buildings;
- different climates;
- electrical equipment varies as some local offices require generators, UPS systems or their own electrical substations.

Due to this diversity, the maintenance and management of the offices are left to the discretion of the user. The exceptions are in cases where the institution constructed or bought a building. Under this scenario, these buildings become an institutional asset and are incorporated into the maintenance and management programs developed for the headquarters office.

In the case of the office renovation project described in this paper, a maintenance program will be developed for the building at the institutional level. The reasons for this are that the office is a seven story building in which the institution has completed the interior build-out at its' cost. The building has been leased for ten years and the client has subleased two floors. As a result, the local office is now functioning as a landlord and will be responsible for the all the maintenance of the building. After completion of the final punch list, handing over of all technical and operating manuals and the formal turn over of the building to the client, the maintenance program will be developed.

The property management of the building will still be undertaken by the local users. The operational budget for running and maintenance expenses as well as recuperating the rent from the two tenant floors will be an internal budget responsibility for the local office.

Year 2000 Issue (Y2K)

One issue in which the institution is paying particular attention for all of its offices world wide is the potential impact of the Y2K issue. For the project described in this paper it will require a significant input of time and research by the local staff.

The institution has prepared a check list for each office. This check list will include verifying that all the new electrical and security equipment as well as heating and air conditioning will not be compromised due to the potential issues surrounding Y2K. Beyond the issues of maintaining and running the building, there is also the question of city electrical and water supplies and if they will continue to function. There is currently a team visiting all the offices to ensure that they are all in compliance.