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9/27/93

USAID RAPID START HOUSING PROJECT  
FOR GAZA AND THE WEST BANK

REVIEW OF ENGINEERING AND IMPLEMENTATION ISSUES

Prepared by  
CENTER FOR FINANCIAL ENGINEERING AND DEVELOPMENT

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Draft Report

## Introduction

The detailed scope of work for this review, including elaboration on the scope and specific guidance from AID/W, are included in this report as ANNEX 1. The scope includes 7 specific tasks and an eighth one which provides for general assistance as may be needed. Following is a brief statement of the substance of each task, and how that task was carried out, for easy reading.

### 1. Review construction plans, specifications and cost estimates and suggest modifications until these are ready for bidding.

I reviewed the plans, specifications, bill of quantities, and cost estimates for the first six buildings to be constructed at the Jabalia housing site in the Gaza strip and which are called "Karama Towers." The different components of the bid package had been prepared by different firms. The construction plans had been completed by the architect Mohy Farra of Gaza. Farra and his team, which included structural, electrical, mechanical, and sanitary engineers, had won the competition held by the Palestine National Council (PHC) for the design of the 13 buildings at the Jabalia site.

I reviewed the plans immediately upon my arrival and compiled a list of suggested modifications to be incorporated to provide sufficient detail suitable for bidding. This list is shown as Annex 2. I also made spot checks of the structural adequacy of concrete columns, beams, floor slabs, and spread footings (foundations) based on accepted minimum requirements stipulated in codes, e.g. the minimum area of reinforcing steel required as a percentage of the total cross-sectional area of a column. In each case, I found the sections adequately designed. The Palestinian engineers I consulted with told me that there is no seismic requirements in the West Bank and Gaza, and doubted that there are in Israel, for nine story buildings. Because of the limited time available, I could not investigate this matter further. I did mention it to Dr. Rami Abdulhadi, head of Center for Engineering and Planning (CEP), whose firm had assisted the PADCO team, and will continue to provide the AAOs with engineering support for the short term, and he promised to look into it before the plans are finalized.

One of the engineers of CEP, Daoud Abu-Ghannam, and I also marked a set the plans with a red pencil where such marking was more clear than the written word. I also found out that the PADCO team had given the architect a three page list of suggestions to improve the plans. PADCO's list, however, focused more on conceptual design modifications that would have resulted in some savings (e.g. a rectangular instead of circular fire escape staircase, three exposed walls instead of four, etc.)

The Regional Contracting Officer (RCO) Ken Kennedy, FSN (Morocco) Taher Barrata, Salah Sakka, the USAID engineer in Gaza, and I met with the architect and some of his team on 11/15/93 in Jerusalem at the offices of the PHC. The chairman of the PHC, Dr. Ibrahim Shabaan, also attended the meeting. The purpose of the meeting was to review the status of the architect's agreement with PHC after he had won the competition. (We also discussed the direct USAID contracting mode during this meeting about which the PHC had some reservations.) We found out that the architect's team had been entitled to a contract as follow-up to the competition in order to finalize the plans. The contract was valued at \$63,000 and nothing had been done about it and provide architectural services during construction. The architect's team had been reluctant to continue with the development of the plans because the PHC did not have funding for their contract. The RCO stated that USAID would consider funding the development of the plans, subject to the approval of the AAO/Gaza. The architect agreed to proceed actively with developing the plans further until they become suitable for bidding.

We made an appointment with him and his team to meet in Gaza on 11/18/93 and go over the plans sheet by sheet to incorporate our comments. The RCO, Ken Kennedy, Daoud and I traveled to Gaza as planned and spent most of the day going over the plans. We also left behind the set of plans that we had marked in red for the architect team's reference. Daoud and I returned to Gaza on 11/22/93 to review the modified plans. We again met with the architect's team and found that the bulk of our suggestions had been incorporated in the plans. We suggested further refinements which the architect's team will incorporate by 11/26/93. Daoud is to follow up after my departure. With the inclusion of these minor refinements, I believe that the plans will meet USAID's requirements. (Discussion of the specifications and cost estimates is included in Task #3 below.)

2. Identify the source and origin of materials to be used in the construction of the first six buildings at the Jabalia site and determine the need for waivers. Also determine the practicality of importing materials from Jordan and Egypt, their value, and the advantages and constraints of such action. Provide justification of waiving U.S. source and origin where applicable. (Israel is an eligible source and origin.)

1. Summary of Source and Origin of Materials: All materials to be used in the construction of the six buildings will be either manufactured in Gaza and the West Bank or in Israel. Based on my cursory investigation within the limited time available, the origin of these materials is either the West Bank, Gaza, Israel, Europe or other 935 countries. I understand that Israel imports raw materials for its factories such as aluminum ingots for window frames, copper for electric fixtures, steel ingots for reinforcing

steel, lumber for woodwork and so forth. It manufactures cement, paint, plastics, light weight construction bricks, and glass. The West Bank and Gaza manufacture stone, cement brick, floor tiles and some electrical fixtures. All of these materials have their source and origin in the West Bank and Gaza, Israel or code 935 countries. It appears that, with the exception of the elevators and related hardware, and the generators and related hardware, there would be no need for a waiver.

2. Elevators and Generators: These could attract U.S. suppliers. There are 12 elevators and 6 generators required for the first six buildings, with an estimated value of \$600,000. It is doubtful that such a small package would attract U.S. suppliers directly, but it certainly would attract their agents in Israel, if these agents exist. I would therefore recommend that the source of these two items be Israel and the origin be the U.S. I did not have time to investigate whether elevators and generators manufactured in the U.S. are available in Israel.

3. Materials from Jordan and Egypt: I concluded that it would be possible to realize some savings if two construction items were imported from either Jordan and Egypt: cement and reinforcing steel. I computed the required cement and steel for the six buildings at the Jabalia site to be 4,500 tons of cement and 200 tons of steel. The prices of these two commodities are substantially less in the two countries than in Israel. For example, steel in Jordan costs about \$255 per ton as compared with \$485 per ton in Israel. Cement costs \$70 per ton delivered to the site, and in Jordan it is about half that. There is a potential savings of about \$100,000 if these two items were imported from either Jordan or Egypt.

But Israel does not permit the importation of these or any other materials into the West Bank and Gaza from Jordan or Egypt. To import them for the project would require the Embassy and the AAOs to approach the CIVAD for permits which could be time-consuming and could delay the project. Additionally, importing and storing these materials may be a cumbersome task for the PHC and could result in losses and damage while in storage. Another fact that argues against importing these commodities at this time is that most construction jobs in the West Bank and Gaza buy the concrete they need from Israeli companies. These companies design the mix, protect its integrity while in transit and assist in placing it. This is an efficient and economical method and I recommend that it be used for the first six buildings at least.

3. Assist the RCO in finalizing the bid packages and in obtaining a list of potential contractors.

1. Conditions of Contract and General and Particular Specification reviewed three sets of specification and general

conditions prepared. The first set was prepared by the PHC in Arabic. The other two were prepared by the CD Middle East and by Technical Engineering and General contracting Company of Gaza (both in English). I reviewed the specifications proposed by the PHC using the other two sets as a reference. I found the PHC volumes complete and easy to follow, but lacked a few minor items that the other two sets contained. Daoud, the engineer from the CEP in Ramallah, the firm which will provide engineering back-stopping until the construction manager come on board, will incorporate these minor refinements to the contract conditions, general specifications and particular specifications. With these refinements by the CEP, these documents are complete and meet USAID's requirements.

2. Bill of Quantities: I reviewed the Bill of Quantities prepared by the PADCO team in collaboration with the CEP. I spot-checked a couple of concrete and masonry items and found the quantities accurate. I also made some minor editorials which were incorporated. I found, however, one major item missing, the generators that will provide standby power for the elevators and common areas of the first six buildings of the Jabalia site. Apparently there has been a question regarding including these generators in the bid package and, although the PADCO team mentioned the generators in their report, they did not include them in the Bill. I recommended that the generators be included in the upcoming construction contracts and that a place for them be identified on the plans, including a well-ventilated area for the storage of fuel. The cost of one 35KVA generator per building will increase the estimate by \$25,000 per building, or a total of \$150,000 for the six buildings. Otherwise the Bill is well organized and includes all of the materials that will go into the buildings. I believe that the Bill of Quantities meets the requirements of USAID.

3. Engineer's Cost Estimate: I reviewed the cost estimate prepared by PADCO and the CEP. I questioned the unit prices assigned some items when compared with similar or related work units. For example, the price of (structural) excavation and compacted back-fill were the same. In each case, Daoud, who had taken the lead in developing the estimate, allayed my concerns by showing me backup data and explaining the logic of a particular price level that may appear high or low. The prices included in the estimate conform to those unit prices used by the PHC in Gaza. The price of the generators and associated costs should be added to the estimate. With that, the engineer's estimate meets USAID requirements

4. Pre-qualification Questionnaire: I revised the standard USAID host country contracting questionnaire (from Handbook 11) to reflect a direct USAID contracting mode. Also, I helped translate the questionnaire from English to Arabic, maintaining meanwhile the substance.

5. Construction Manager Draft RFP: I reviewed and provided comments to the RCO on the draft scope of work to be included in the RFP to be sent to potential construction management firms.

6. Scope and Budget for the Services of the Architect's Team: I developed a detailed scope of work and a budget estimate for the use of the RCO in securing the services of the architect's team to develop the plans further until they become suitable for bidding.

The remaining documents that will be included in each bid package are boiler-plate items that the RCO will provide. Harry Birnholz has asked the CEP to continue to provide engineering support to the RCO until the Construction Management Consultant is on board. I endorse this action and believe it vital to the successful completion of the project.

I discovered that the PADCO team had compiled a list of potential contractors for the housing project based on a list provided to PADCO by PHC. The list includes 33 contractors from the West Bank and Gaza. I believe that the list reflects the best available information at this time. I asked for an independent list from Salah Sakka from Gaza and he provided a list that contained many of the same names. PADCO's and Salah's lists are shown in annex 3.

#### 4. Review the status of the site development contract.

I first approached the subject of plans and specifications for this contract in our first meeting with the PHC and with the architect's team. I found that nothing had been done. After consulting with the architect's team, and after thoroughly inspecting the site, I am of the opinion that there is no need for a site development contract for the Jabalia housing site because:

1. The site is relatively flat with a gentle slope and there would be no need for earthwork prior to the entry of the building contractors on the site.

2. There is a need for a retaining wall on the north boundary of site to extend partly into the east boundary, but constructing it before the building contractors come on the site may restrict their operations and the wall may be damaged during their work.

3. Access to the site exists. It is traditional in Gaza for contractors to worry about site fencing and security arrangements, and the Bill of Quantities includes a site preparation pay item for each of the building contracts. That should be adequate at this time.

In my judgement, it would make a lot more sense to award a finishing and landscaping contract later on when the building contractors complete their work. The retaining wall could be part

of the landscaping contract. The landscaping contract could also include paving of access roads and other work for which the need may become clear after the buildings are constructed.

I therefore recommend that the AAO/Gaza, after consulting with PHC, instruct the architect's team to stop working on such plans. This would give the RCO more time to devote to the building and construction management contracts.

5. Review the status of the well that is to be bored at the Jabalia Housing site to augment the city water supply.

In brief, nothing has been done toward boring this well. The PHC has a vague idea that USAID would be willing to fund such a well, but no one had taken the initiative to consult with the municipality, apply for permits, or do any planning at all. I recommend that the AAO/Gaza take this matter up with the PHC and urge them to begin planning for boring the well.

The modified Fixed Amount Reimbursement (FAR) method of financing may be a suitable way for sinking this well. I believe that the PHC would like this method where USAID would be out of the contracting process. A sizable advance, however, would have to be made to the PHC in order to begin work in order to relieve their liquidity situation.

I inquired about the costs, and found, based on recent experience in the Gaza Strip, that such a well would have to be sunk to the depth of about 80 meters at a cost of approximately \$100,000. Pumps, wiring, standby generators and a transformer would cost an additional \$130,000. The pump house and other civil works would cost an additional \$70,000 or a total of \$300,000. I consulted with the AAO/Gaza regarding the ability of the PHC or the Municipality of Jabalia to provide a local contribution toward sinking the well. He was of the opinion that neither had resources at the levels needed.

I, therefore, recommend that USAID fund the total amount of \$300,000 in order to insure the well will be sunk before the buildings are completed.

6. Review the management and administrative capabilities of implementing agencies based on PADCO's report.

I reviewed the relevant chapters and annexes of the PADCO report in order to determine the management and administrative capabilities of the respective implementing agencies:

1. PHC: The PADCO report does not include an institutional Analysis of the PHC nor an organizational chart. Although the RCO did share

an organizational chart of PHC with me, it is not clear how many of the positions on the chart are currently filled and how many of the positions are part time positions. I did not have adequate time to seek the information needed to conduct even a cursory review of the PHC's capabilities. I have the impression, however, from talking with some of the PHC's engineers in the field and the brief meeting with its leadership, and from being exposed to its program, that the PHC has the management and administrative capability to implement its project.

2. The Gaza Community Mental Health Cooperative (GCNHC): The PADCO report states that the GCNHC is yet to be established as a cooperative. The report recommends an extensive technical assistance (TA) package to the GCNHC to help it establish itself as a legal entity, set up management, operational and maintenance systems, set policy and implement it. In addition to engineers and architects, the TA package would include a contract specialist, a contract manager, and a cooperative development specialist. It is not clear whether the GCNHC has any permanent staff or with whom such a team of engineers and TA specialist would work. I believe that the GCNHC lacks the management and administrative capability to implement its \$2.0 million housing program.

3. The Jericho Suburb Cooperative Housing Society (JSCHS): The PADCO report contains descriptive analysis of the JSCHS. It was established in 1960 and has had its ups and downs since then. The weak point of the JSCHS seems to be the lack of resources to improve infrastructure, particularly water, but it has obtained a permit to dig a well. Its membership pays \$100 a year to repair its roads. I believe that the JSCHS has the capability to implement its \$569,000 infrastructure improvement project.

4. Community Development Organizations in Nusseirat and Jabalia: The institutional structure of the implementing agencies for the Neighborhood Upgrading program (NUP) in these two areas is not clear in the PADCO report. UNRWA, the Village Councils, the Nusseirat and Jabalia Municipalities, and Community Organizations would play a part in selecting hardship cases that would be given priority and in implementing the work. Close coordination between these organizations would be required. The PADCO report recommends a sizable TA package that includes, in addition to architects engineers and planners, legal experts, community relations development specialists, contract managers and work supervisors. It is not clear who would be the counterparts for these TA personnel. I believe that the roles of the different players need to be clarified before the NUP could be implemented.

7. Check and comment on the PADCO implementation schedules.

1. The PHC's first six buildings in Jabalia: The report projects that the invitation for bids (IFB) would be issued to pre-qualified



contractors by 1/15/94, contracts would be awarded by 2/1/94, and contractors would be mobilized and working by 3/15/94. By contrast, the RCO and I projected a slightly more ambitious schedule where the IFB would be issued to pre-qualified contractors by 12/22/94, bids would be received by 1/20/94, analysis of bids completed and contracts awarded by 1/26/94, and contractors mobilized and working by 2/15/94. I believe these are ambitious schedules, and persistent follow-up with the PHC would be needed to avoid slippage. The PADCO report projects substantial completion by 6/30/94. I believe that USAID should not realistically expect that this target would be met, but the target date should remain as is in order to introduce a sense of urgency and avoid unreasonable slippage.

2. Private Housing Program in Gaza: The PADCO report projects that the Gaza (mental health workers) program would start by mid-1994, but the report is silent on the time for completion. I believe that the target starting date is too ambitious; the report includes a long list of demanding actions that would have to be accomplished in the next six months. Based on my limited exposure to the proposed activities, I believe it would take substantially longer, perhaps a whole year, to complete these tasks. Intensive follow-up by USAID and the PHC will be required.

3. Private Housing Program in Jericho: PADCO projects that it would take three months to prepare the bid package and select a construction contractor, and an additional 10 months to complete construction. Because the infrastructure package is rather modest and straight forward, I believe this schedule is reasonable.

4. Neighborhood Upgrading Program: The PADCO report projects completion of infrastructure upgrading plans would be completed by 6/30/94 and actual upgrading of infrastructure in the two target areas, Nusseirat and Jabalia, would be completed by 3/31/95. Simultaneously, rehabilitation plans for dwellings would begin 3/15/94 and rehabilitation would be completed by 10/31/95. I believe that these projections are rather ambitious and probably not achievable even with intensive follow-up by USAID because of the institutional arrangements of this project.

HASAN A. HASAN SCOPE OF WORK  
WITH NOTES FROM THE BRIEFING MEETING IN AID/W

The scope consists of eight tasks. Guidance from the AID/W briefing meeting was that if time was not enough to carry out all tasks, then to carry the tasks in the order of priority listed below:

"Consultant shall provide an engineer experienced in USAID construction procedures including contracting, construction management, inspection monitoring and reporting to assist the Regional Contracting Officer (RCO), the AID/AAO/Gaza and the AID/AAO/Jerusalem in developing the final construction contracting and monitoring plans.

Background: A PADCO team is presently preparing a report which will identify housing projects in Gaza and the West Bank that could be initiated immediately. After reviewing the PADCO team concept paper, the Bureau has decided to finance four major projects in the fiscal year as per the attached list. All these activities will be implemented using the direct USAID contracting mode except for the loan/voucher system program which may be implemented under a cooperative agreement with a U.S.-based PVO. The target date for initiating construction for the PHC component is February 1, 1993.

**TASK #1**

**Text:**

"Review architectural and engineering plans, specifications and general conditions of contracts for the Palestine Housing Council (PHC) component consisting of 6 blocks of apartments, each 9 stories high, to be on a site in Jabalia, Gaza Strip. The documents have been prepared by the PHC. Preliminary architectural plans and specifications have been reviewed by the PADCO team, therefore, the consultant's main responsibility is to confirm whether the plans have sufficient details to proceed to contracting now, if they require more detail, how long would it take the PHC to complete them?

(a) Review structural drawings to assure structural soundness including capability to withstand earthquake forces normally experienced in the region.

(b) Review electrical and mechanical drawings.

The above review should be in sufficient details to meet USAID requirements for the approval of plans and bid documents. Any deficiencies identified shall be discussed with PHC and the report should note actions the PHC would take."

**Notes and elaborations:**

--assure reasonableness of construction packages; is proposed two contracts, three buildings each, reasonable? Is three buildings too much given the capacity of local contractors?

-- Construction to begin on 2/1/94; do everything possible to meet that target date.

-- Pre-qualification of contractors is going to be the way to go; help begin the pre-qualification process as soon as possible.

-- Sit with PADCO in order to see what they plan to produce in terms of bidding documents.

-- Help define role of PHC given that the AID/W Core Group had decided on the direct AID contracting mode for construction.

-- Keep in mind that the construction management firm will be also a direct AID contract.

-- Also check the reasonableness of the engineer's cost estimate(s).

**TASK #2****Text:**

"Identify the source and origin of materials to be incorporated in the buildings, including their value, for each component of the project. Identify materials which are normally imported from Israel and the origin of materials imported from Israel that do not meet USAID's source/origin and componentary rules. Recommend the source and origin of the materials that do not meet the USAID rules (U.S. is the preferred source but if other code 935 countries are desirable sources (e.g. availability of services or spare parts in Gaza/West Bank or Israel) then provide detailed justification for a waiver of USAID's source and origin rules.

(a) If Jordan is made an eligible source for materials, identify materials (including their value) which would be competitive with materials from Israel source assuming normal business practices of importers in Gaza and West Bank. Identify any special concessions (such as imports of goods without duty or taxes) required.

(b) If Egypt is made an eligible source for materials, undertake the analysis described in (a) above."

**Notes and Elaborations:**

-- Source and origin of materials: Israel is an eligible source, distinguish between what is Israeli source and origin and what is Israeli source but 935 origin.

-- For possibility of making Jordan eligible source of materials, identify possible materials, their cost and potential cost savings, and the constraints to importing such materials from Jordan, e.g. permits from CIVAD. Materials include cement, rebar, hardware fixtures, electrical components, etc. Identify which materials Israel permits to be imported from Jordan in the normal course of events and how these may be utilized in the project.

-- Do the same thing for Egypt.

### TASK #3

#### Text:

"Assist USAID Regional Contracting Officer (RCO) in finalizing contract documents for the PHC component as requested by the RCO.

(a) If requested by the RCO assist in finalizing Pre-qualification Questionnaire for construction contractors and in the review of completed forms if they are received prior to Nov. 24. If they are delayed, review capabilities of contractors in West Bank and Gaza (eligible contractors) based on information available with PHC and other organizations such as Municipalities, UNDP, United Nations Relief and Works Agency in Gaza and Jerusalem or any other sources (to the extent that the organizations would share the information) and identify potential contractors for the PHC components.

(b) Review capabilities of contractors for site and services for at the Jabalia site and other components and identify potential contractors for other components."

#### Notes and Elaborations:

-- Informal survey of contractors to see if there are enough large contractors in Gaza and West Bank to handle three buildings each at Jabalia site. (Israeli firms can't be prime contractors.) Ask all prime contractors to list their subcontractors. If enough Israeli, Jordanian, and Egyptian subs appear on the primes' lists, then they may have to be included.

-- See if the PHC has a qualified list of contractors for construction and also for site development and preparation.

### TASK #4

#### Text:

"Review the status of the plans for the site and services contract at the Jabalia site. If PHC cannot complete the design in a timely manner, recommend a mechanism for completing the design and bid documents including specifications."

Notes and Elaborations:

-- If PHC is not able to complete plans within time-frame, ideas for helping them complete them on time.

TASK #5

Text:

"Review the status of drilling a water bore hole in Jabalia to augment the water supply to the PHC housing site. It is vital that the bore hole is drilled as soon as possible to assure adequate water supply when the buildings are completed. Recommend an appropriate mechanism for USAID's financing of the construction. (e.g. if PHC and the Municipality plan to undertake the construction, should USAID use the fixed amount reimbursement mechanism for disbursing the funds?)"

Notes and Elaborations:

-- Need adequate water supply. USAID has \$200,000 budgeted for the well. How could Municipality handle? Can they contract? Can PHC contract? Can we use the FAR method?

TASK #6

Text:

"Review the management and administrative capacities of the sponsoring agencies as required by the RCO.

Notes and Elaborations:

-- Review what PADCO has done in terms of institutional analysis of the institutions that will implement the Private Housing Program and the Neighborhood Upgrading Program.

TASK #7

Text:

"Prepare implementation schedule for starting construction for three activities identified in the attachment."

Notes and Elaborations:

-- Review what PADCO has done, if disagree then just put in report.

TASK #8

Text:

"Provide other engineering/construction assistance as time permits to the AAOs and the RCO."

A. GENERAL COMMENTS

1. Number and title all sheets--a list of the titles and numbers of all drawings in the package shown on the first or second sheet of the set.

2. The following sheets should be added to the plans:

a. A topographic map of the site with existing and finished contours.

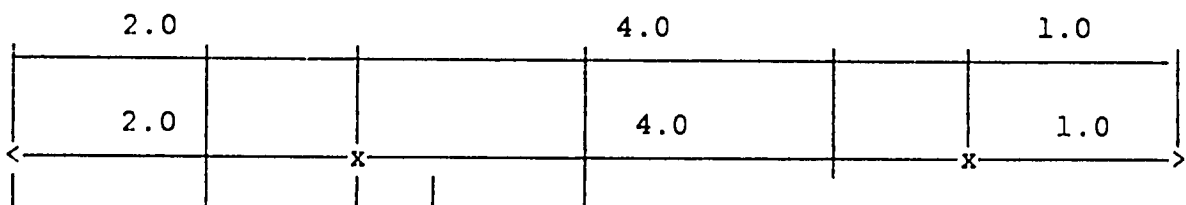
b. A sheet showing all borings and boring logs taken by Beir Zeit University. Such a sheet should include a clear note that the subsurface information shown is being provided to the contractors as received from the University and that the owner cannot guarantee accuracy.

c. A sheet showing the location of the site within the cities of Gaza and Jabalia. The site falls within the city of Jabalia, at the Gaza city line and access to it is through Gaza.

d. A sheet showing a glossary of terms, symbols and abbreviations used on the plans. For example the symbol shown for floor elevations could be confused with the locations of borings. The abbreviation "G.R." is used on the plans to indicate "guest room" on sheet #1-8-A4 and to mean "guard room" on sheet #A3. Other abbreviations used that raise a question include S.H., T.B., M.D.P.E., and G.S.H. Including such a sheet would provide an easy reference and would avoid confusion.

3. All lines shown on the plans have roughly the same consistency so that the lines indicating edges of buildings, dimensions, grids, and even individual parking space limits appear the same. Please vary the consistency of the lines so that they would be distinguishable from one another.

4. Dimensional lines do not appear to have limits (see the upper line below); please correct all dimensional lines to indicate the distances that correspond with the figures (see lower line below):



5. ~~The total dimensions shown on some sheets do not match the total of the smaller dimensions that the larger dimension includes. For example, sheet #A3, the total dimension at the bottom of the sheet is shown as 31.2 meters and yet when the smaller dimensions included within the 31.2 are added they total 31.0 meters. Another example is sheet # 1-8-A4; the smaller dimensions between the grid~~

12

lines B-C add up to 3.4 meters but the over-all dimension is shown as 3.5 meters. Similarly between grid lines D-E. Please review all dimensions on all sheets to assure consistency between dimensions.

6. Where plans, sections and details are typical for all six buildings please so indicate.

7. Please cross-reference sections and details taken on one sheet but shown on another sheet, e.g. for section A-A please see sheet 15. For example, all windows (W1, W2, W3, etc.) and doors (D1, D2, D3, etc.) are marked on sheets #1-8-A4 and #AR4, but all window and door details are shown on sheet #A8. But there is no indication on sheets #1-8-A4 and #AR4 that the details are on sheet A8 and vice versa. Another example, on sheet #A5 detail C is identified but is not shown nor referenced.

8. Please show all column and beam reinforcing details, including typical cross sections for all floors, together on one sheet instead of on different sheets.

#### B. SHEET-SPECIFIC COMMENTS

1. Sheet #A2: The elevations on the bottom floors shown on sheet #A2 indicate a fill section. This implies either that the spread footings (foundations) are going to be placed on fill sections, or that there would be long columns and substantial fill, the deepest about four meters, under these slabs. All foundations are to be placed on undisturbed earth. Ground floor slab elevations on this sheet should be adjusted downward to indicate the finished floor elevations roughly at existing elevations. All (deep) fills are to be eliminated.

2. Sheet # A2: All septic tanks and leaching pit locations should be shown on this general plan sheet.

3. Sheets #A5 and #AR5: Concrete thickness dimension is not shown on detail "E."

4. Sheets #A6-BB and #AR6-BB: "Section H" on both sheets should be labelled "Detail H" instead. The detail is of the fire escape. It should be so marked and all of the elements identified.

5. Sheet #A8: This sheet should be titled "Window and Door Details" instead of "Details." Also many sections are shown but are not marked-although some are obvious because of their location, others are not. Please identify all sections. Also "Detail I" is marked but not shown nor referenced. Please correct as necessary.

6. Sheet A9: Section 1-1, it is not clear if this section is taken from the kitchen plan or not. Please indicate by adding the arrows

14

to show the direction of the section and mark them 1-1. Also, the details of the kitchen are shown to the same scale as the general plans (1:100). Instead, the details should be shown to a larger scale, e.g. 1:20.

7. Sheet #A11: Change name of this sheet to read "Expansion Joint and Retaining Wall Details" to reflect what is shown on the sheet. Also, the dimension showing the height of the retaining wall is marked "varies"-should add "not to exceed ... meters" in order to avoid interpreting "varies" to mean "unlimited."

8. Sheets #C2 and #CR2: Details of the fire walls and elevator shafts are crowded, confusing, and hard to follow. The reinforcing steel details for the foundation (marked F3) and for the walls are shown in too small a scale. Please redo this sheet to provide clear and adequate detail.

9. Sheets #S1 and #SR1: These sheets should be renamed "Ground floor Drainage Plan" instead of "Drainage Layout" and should show all finished contours. Also should show details of storm water and wastewater lines. Water supply lines should be clearly indicated and distinguishable from wastewater lines.

10. Sheets #S2 and #SR2: The drainage details should include more information such as distances between manholes, slopes of drainage lines, and similar details.

11. Sheet #S4: This sheet, which contains typical septic tank and leaching pit details, should include more information as per Fred Zobrist's sketch and recommendations.

12. Sheet #E2: The typical apartment will have two air-conditioning outlets and two TV antenna outlets. Perhaps one outlet per apartment would be adequate. Also the guest "eastern" bathroom does not have an electrical outlet; it should have at least one.

13. Standby Generators: The location of the standby generator for each building is not shown on the plans. It should be located on the ground level of each building in a closed area near the main switch of the city's incoming power supply. An automatic switching mechanism should included. A well-ventilated fuel storage area for the standby generator should be shown.

14. Mechanical Plans: The plans contain no mechanical details to speak of. Even the elevators are not shown or mentioned on the plans. Mechanical details to the extent required for the guidance of the construction contractor should be provided.

/ 12



LIST OF QUALIFIED CONTRACTORS  
FOR PHC HOUSING PROJECTS  
PREPARED BY PADCO

1. Ahmad Hassan Abu-Dughaim
2. Arabic Company for General Contracting
3. Mushtaha and Hassunah for Trading and Contracting
4. Keshta Specialty for Construction and Rehabilitation
5. Jaffa Engineering Office
6. Abu-Laila for Contracting and Tiles Manufacturing
7. Abdullah Ali Alfarra
8. Office of Architectural Engineering and Contracting
9. Shakhisa and Sons Limited
10. Mohammad Nafeth Abu-Zaida
11. Arabic Construction Company
12. Kamel Hamdan for Contracting
13. Al-Ashqar for Contracting and Architecture
14. Masood and Ali for Engineering and Contracting
15. Tahya Sons
16. Engineers Company for Industry and Trading
17. Shehada for Contracting and General Trading
18. Al-Thafer Company for Contracting and General Trading
19. The Golden Company for Contracting and General Trading
20. Al-Aqsa Company for Contracting
21. Al-Arab Contractors Company
22. Mohammad Khalil Al-Yazouri for Contracting
23. Al-Majayda Company for Construction and Rehabilitation
24. Abu-Wardeh Company for Contracting
25. Abu-Samak Company
26. Asia Company for Engineering and Contracting
27. Ibrahim Muhanna Company
28. Sami Daoud Contracting Company
29. Reihan and Abu-Dayyah Company
30. Washah Contracting Company
31. Maghari Contracting Company
32. Ali Hussein Company for General Contracting

**LIST OF GAZA CONTRACTORS  
PROVIDED BY SALAH SAKKA**

1. Mushtaha and Hassunah Co. (on PADCO list)
2. Sakka and Khodary Co.
3. Osama Al-Khodary Co.
4. The Golden Contracting Co. (on PADCO list)
5. Omar Muhanna and Co.
6. Aamer Muhanna and Co.
7. Sakka and Zummo Co.
8. Arab Construction Company, Hatem Abu-Shabaan
9. General Construction Company, Abdul-Aziz Muhanna
10. Jawad Shehab
11. Jawad Khail
12. Mohammad Wishaa
13. Abdul-hakim Ismael
14. Abdul-Nasser Diab