



Impact of D.B.M. Best practices on Community Rehabilitation Projects

**{Verbalize and Articulate policies
under items (2-5) and (2-7) to
function best practice database
management to facilitate the
implementation of Iraq National
Housing Policy}**

Dr. Rafid Abdul Latif Abdul Kadir

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Introduction

The Iraq Iranian war in 1980's, and the economic situation at that time, directed Iraqi government resources and strategies to war and military investment. Thus, the government ignored the provision of housing for the majority of Iraqis, with limited supply of water and sanitation. Not only wars but distorted housing policies that privileged the military officer and excluded the rest of the population have contributed to the exacerbation of the Housing problem and rise of numbers of deteriorated housing stock and as well the rise of slums. Over centralized policies with limited housing provision, and exclusion of private housing development continued until 2003 and its impact is still ongoing. Thus the government

represented in both the Ministry of construction and housing and the ministry of municipality and public works, the lead in development a comprehensive approach to improving the living conditions of the majority of marginalized deteriorated housing stock and slum dwellers.

While most of the housing stock in urban Iraq is in good or fair condition, between 30% and 50% of the housing older, central city areas is in poor condition (needing major structural rehabilitation) or uninhabitable. To improve the condition of this substantial portion of the housing stock, more financing for housing repair and rehabilitation is required.

About 90 percent of landlords reportedly make no investment in maintenance or rehabilitation whatsoever.¹ The poor condition of private housing (which accounts for more than 90 percent of the urban rental housing stock) is complemented by the poor quality of services to the housing. Moreover, in the tight housing market that prevails in many Iraqi cities, renters are at a particular disadvantage as owners have little incentive to repair units to attract or retain tenants. Deteriorating conditions decrease area property values while potentially undermining public health.⁽³⁾

Pilot projects are needed as "Government will increase inspections of private rental housing units, using innovative and community-based pilot efforts, to improve compliance with minimum housing

¹ These figures and subsequent figures are from the IHMS study of 2006 and are based on household surveys in Mosul, Sulaimaniya, Baghdad, Hilla, Najaf, and Basrah.



standards", and in order to achieve that Project required activities in terms of Human, Technical and Financial resources, such activities to be undertaken are:

- 1- Encouraging community Decision Making:
- 2- Empowerment of Neighborhood Advisory council status and other involved partners.
- 3- Working towards initiating community groups' workshops:
- 4- Encouraging Employment with local Contractors
- 5- Carry on huge Community Rehabilitation works and demolishing under special circumstances that makes it entirely different from any other typical rehabilitation works.

Each of the above mentioned activities has its own criteria and requirements, models and lessons learned concerning the first four activities are quiet covered and available in the literatures, while the technical problem lies on the fifth activity that its speedy and accurate implementation will certainly affect the success of the other four activities and the success of the implementation of the project as a whole.

Based on above, this research will concentrate on the fifth activity to secure applied model that can serve as appropriate for that purpose.

Therefore / **The Problem** lies on the / Absence of a set up for special design database management (D.B.M.) that serve the arisen needs and characteristics of such type of projects knowing that other project software has no such capability to manage and control this kind of projects.

The Goal will go towards / the provision of a technical database manager model (that is newly designed and tailored for such kind of projects) which can be scaled up and be a

core element for smooth and accurate implementation of the redevelopment and Upgrading future strategy to serve the implementation of the related issues and policies stated in the National Housing policy.

And its Methodology will be concentrated on the / Overview of the needs and criteria for developing such database model in order to be tested on implementation of pilot project to assure its compliance with required methods for such projects as noted to serve the implementation of items lies under 2-5 and 2-7 in the Iraqi Housing policy.

Iraq Housing Policy

Iraq Housing Policy was developed to achieve several objectives and one of its important objectives is to improve the ability of homeowners to improve and expand existing shelter, accordingly, the item 2-5 in the Iraq Housing Policy concentrated on Management and Maintenance of Housing.

This item refers that While most of the housing stock in urban Iraq is in good or fair condition, between 30% and 50% of the housing older, central city areas is in poor condition (needing major structural rehabilitation) or uninhabitable. To improve the condition of this substantial portion of the housing stock, more financing for housing repair and rehabilitation management is required.⁽¹⁾

The above has its impacts on Landlords, as about 90 percent of landlords reportedly make no investment in maintenance or rehabilitation whatsoever.^٢ The poor

^١ These figures and subsequent figures are from the IHMS study of 2006 and are based on household surveys in Mosul, Sulaimaniya, Baghdad, Hilla, Najaf, and Basrah.



condition of private rental housing (which accounts for more than 90 percent of the urban rental housing stock) is complemented by the poor quality of services to the housing. Fully one-half of households complain of poor water supply and one-quarter about the water quality itself. Moreover, in the light housing market that prevails in many Iraqi cities, renters are at a particular disadvantage as owners have little incentive to repair units to attract or retain tenants. Deteriorating conditions decrease area property values while potentially undermining public health.(4)

Conditions for renters are of particular concern as Iraq revitalizes the sector. The historic reliance on rental housing in a variety of settings is an important resource that adds needed flexibility to the overall housing mix in urban Iraq. Yet the rental market is now out of balance owing to slow or even negative growth in supply in recent years and a shift in demand as incomes fell and many families were displaced. Rent control has artificially suppressed prices for some rental housing at below-market levels; revenues from rent-controlled housing are insufficient to ensure adequate maintenance.

The 5-10% of the rental stock that belongs to the Government is beset by a different set of concerns. First, many of these units are in high-rise buildings for which maintenance is more complicated and potentially costly. Second, rents are low and generally bear no relationship to the underlying value of the property or even its recurrent costs. Third, the implicit subsidy that results is not targeted to low-income or vulnerable groups, distorting the rental market overall and eliminating any opportunity to generate revenue for maintenance and expansion of the housing stock. (1)

Based on above,

Iraq Housing policy figures out a set of policies that need to be endorsed and implemented in order to secure appropriate management for the maintenance required to take place for the housing stock in Iraq which lead in its impacts on the landlord's incentives to improve and expand existing shelter and that will lead certainly towards the benefit of Housing in Iraq.

The policies in this regard were concentrated on the following :(1)

1- In the tight housing market that prevails in many Iraqi cities, renters are at a particular disadvantage as owners have little incentive to repair units to attract or retain tenants. Deteriorating conditions decrease area property values while potentially undermining public health, the private rental housing stock is deteriorated owing to very low expenditures on maintenance, therefore, Government will increase inspections of private rental housing units, using innovative and community-based pilot efforts, to improve compliance with minimum housing standards.

2- As maintenance of public rental housing could benefit in the long run from increased contracting to the private sector, therefore, Government will encourage the privatization of maintenance services for all government entities managing housing stock.

Addition to the above, the item 2-7 of Informal Housing refers that Iraq has historically enjoyed a low level of informal housing development. In recent years, however, there has been an increase in informal housing, including squatting in public buildings and proliferation of small informal settlements. This is a result of the war, consequent internal displacement of some people, and a relaxation of development controls. This is an anomalous



condition specific to this period in Iraqi history. While diverse, informal settlements in Iraq have in common the characteristic of having been developed outside the law: residents either do not have use rights to the land, or the buildings have been constructed without government approval.

As in other parts of the Middle East and North Africa, informal settlements often mimic formal settlements, using simple street layouts and standard plot sizes and building setbacks. Conditions in informal settlements vary, as some lack piped water, sewage networks, electricity, solid waste collections and paved roads while in others four-fifths of residents enjoy electrical power and piped water supply. The variety of conditions obtaining in Iraq's informal settlements makes it important to have a range of policy responses.

The overarching policy with regards to informal settlements is to adopt a case-by-case approach to informal settlements. Blanket policies will not prove successful, given the range of conditions obtaining in informal settlements. The essential choice is between upgrading the settlements or redeveloping them.⁽¹⁾

Upgrading informal settlements consists of *in situ* development, in which most houses and residents will remain in place. Physical improvements to infrastructure such as water supply, sanitation, drainage, roads and power are part of the upgrading processes. Land tenure is also often regularized. Upgrading works are best when there is extensive consensus and collaboration between residents, land owners, local governments, and infrastructure providers.

Redevelopment of informal settlements involves removal of most or all existing buildings and construction of new ones,

often with more high-yield land uses (e.g., commercial) and higher densities. Redevelopment usually entails relocation of part or all of the existing residents, although some schemes provide them with new on-site dwelling units. Resettled residents are accommodated in other areas by the entity in charge of redevelopment through providing serviced plots, dwelling units and/or financial compensation.

As Iraq is facing a housing deficit, informal settlements are often a result of the inability of the government or markets to provide housing. They represent a significant contribution to the housing stock. Demolishing them would exacerbate the housing deficit. In situ upgrading of these existing settlements will facilitate improvement of living conditions for local residents. This in turn could help alleviate the housing deficit. Pre-feasibility studies on a given settlement will use the following criteria to select the upgrading or redevelopment approach :⁽¹⁾

- 1- Suitability of the proposed upgrading area for long-term residential use;
- 2- Redevelopment potential of the site, as measured by the economic return on similar parcels in the same town with other land uses (retail, office, industrial, etc.) or developed at a higher density (e.g., blocks of flats), in comparison with the current economic return generated by the informal housing settlement.
- 3- Willingness of the community to participate actively in an upgrading activity or to be relocated to another site in the case of redevelopment;
- 4- Institutional capacity in the public and/or private sectors to undertake an upgrading (difficult) or redevelopment (very difficult) project.

Accordingly, living conditions in informal settlements are substandard: low availability



of services, public health risks from inadequate liquid and solid waste collection and treatment, and poor transport links to off-site jobs and services; therefore, the following policy is set out for informal settlements:

Informal settlements will be upgraded or redeveloped on a case-by-case basis. A standardized assessment of the specific settlement will be used to select an approach and design tailored interventions for each settlement.

Therefore, and as recommended in the Iraq housing policy key principles guide, that in addition to the systemic issues addressed in the Policy, specific pilot approaches for implementation in the immediate term are necessary to take place, in order to test and to figure out the required principle guides for the sake of transferability and up scaling to National level.

Pilot Project for facilitating the implementation of policies under items (2-5) and (2-7)

A pilot project became of high importance to adjust and test the policies mentioned above in order to set a criteria that could be as future guideline for the implementation projects relative to the above mentioned policies. An area in Baghdad was decided to be the place for implementing the pilot project and in cooperation with governmental and international parties as main partners; the area was selected for pilot project implementation based on four criteria :(2)

- 1- It accommodates vulnerable groups.
- 2- Stable in terms of security and implementation can go smoothly accordingly.

3- Having an active local council that is able to encourage and stimulate citizen participation and take an active role in supporting design, planning and implementation.

The main objectives of the pilot projects that were achieved successfully are:(7)

- 1- To ensure the translation of lessons learnt into the upgrading strategy of Iraq.
- 2- To provide a participatory model (that is new to Iraq) that can be scaled up and be a core element of the Upgrading and redevelopment strategy.
- 3- Improving the living conditions for the people in this area.
- 4- Community involvement in decision making towards building and empowering local community and their leaders.
- 5- To provide a technical database model (that is new designed and tailored for such projects) which can be scaled up and be a core element for smooth and accurate implementation of the redevelopment and Upgrading future strategy drawn by the Iraqi Housing policy.

The criteria and characteristics for area selection as a pilot project, were as follows :(8)

- 1- Beneficiaries who do not have minimum shelter requirements.
- 2- Low-income families that have no ability to improve or rehabilitate their dwelling units.
- 3- Widow-headed families.
- 4- High-density families (i.e. large number of people occupying small covered area, which became sometimes more than fifteen persons per one unit).

In order to achieve that Project, activities in terms of Human, Technical and Financial resources, are required to be fulfilled in



order to go in line with above mentioned policies, the following activities were undertaken, tested and several issues were concluded:(6)

1- Encouraging community Decision Making:

People's participation strengthens the democratic process and assures them of their right to be involved in the decisions that affect their living conditions. Poor people and especially women had been empowered to participate effectively in decision-making processes. As well, participation of private sector organizations and civil society in decision-making and monitoring at all levels was encouraged to ensure transparency and accountability and prevent market distortions.

2- Empowerment of Neighborhood Advisory council status and other involved partners:

In that respect, capacity building was undertaken to build confidence and ability of their technical, management and needed abilities for leadership so that they can undertake more responsibilities and play a pro-active role in problem resolution at the local level.

3- Working towards initiating community groups' workshops:

One of the main activities under taken is to set community groups at workshops based on jobs needs and raised special cases that makes the participatory of the community for self house mechanism to be as one of the training conducted with inhabitants.

4- Encouraging Employment with Contractor:

This issue became one of the important achievements in the project as some of the people, who live within the site area of the project and/or around, had been employed

by the contractor. This activity had created new interactions with the beneficiaries, which added financial and social benefits for them through sharing the implementation process together with other local workers to improve their houses, by themselves.

5- Demolishing Model:

A unique case was achieved through the assistance of the contractor, when the contractor for the project led to demolish one of the worst houses in the area right to the ground. The house of 60 meter square came completely with good standard of living.

6- Typical Rehabilitation works:

In general, the works included replacing the old critical roofs, the damaged tiles (for the indoors and the roofing surfaces), fixing or repairing of steel doors and windows, sanitary fixtures, electrical works ...etc in addition of rehabilitating the street lateral water and sewage network pipes. For example, for Roofs, 19% of the assessment and implementation works are related to roof. Please refer to Annex (9), 15% of the assessment and implementation works are sanitation works, 4% of the assessment and implementation works are electrical works, 19% of the assessment and implementation works are related to walls and its cracks, plastering, 18% of the assessment and implementation works are related to doors and windows, and 15% of the assessment and implementation works are related to doors and windows.

The aim of this pilot project was to test and figure out the main obstacles, and featuring problems related to the implementation of above activities and how those problems are affecting the achieving of the objectives that were set for this pilot project.



As for the activities 1-5 related to the objectives 1-4, and due to the available literature (models implemented in all around the world) the following outcomes were figured out through working on those activities which positively achieved the objectives 1-4 mentioned:

1- Awareness concerning the importance of community participation led to a better social interaction and increase of participation in decision making and implementation.

2- Improvement led to an increase of returnees to the area of skilled and non skilled that assist in empowering local employment within the area.

3- Employment generation through the implementation of the project has led to the generation of employment for many skilled, semi-skilled and unskilled workers that are living in the same area and around.

4- Reduction of local crime in the area was clearly registered through the community involvement, employment, social upgrading and environmental improvements.

5- A harmonic set up of collaboration and coordination system was created between the locals and the contractor to initiate a package system through a team whose member work together within the allocated limited budget to reach the planned target.

This approach is one of main reasons to make the community be socially developed by improving their conditions and life standards accordingly.

6- Advisory council role for sustainability of the project was achieved obviously in levels regarding the assessment and implementation process.

Although the above outcomes achieved, but it is important to mention that the assessment process by itself was being done according to the technical priorities based on providing basic shelter needs and these priorities were discussed with the beneficiaries themselves as it was considered according to the limited budget allocated for each house.

Accordingly, wide discussions took place between consultants, beneficiaries, and contractor to figure out the most intervened activities needed for each dwelling within the allocated budget assigned, these priorities had been considered according to the consultants' technical analysis with the actual requirements for each unit to make the allocated limited budget cover the expenses and to reach as much as possible, the planned target, but due to worst condition for some of dwellings, unforeseen damages could be raised for the already hidden existed items which need to make a balance to cancel some of the figured item to implement and cover the new damages came out. Moreover, rehabilitation contracts and due to different aspects need to be tuned in a way to coincide with the condition of its place, and for Iraq and due to unstable security, special contractual needs and criteria that were figured out to fit accordingly.(10)

All these parameters (technical priorities, beneficiaries' requirements, unforeseen damages and the limited budget assigned) make this type of projects to be considered as entirely extraordinary rehabilitation projects.

Based on above, it was found through this pilot implementation that the above outcomes are importantly highly affected by the main activity which is considered as the core of that kind of projects, which is the rehabilitation works, as its management



whether bad or good, will simply affect the results and outcomes related to the complementary 1-5 activities that are listed. As a result, simply no awareness, employment generation, collaboration and coordination, improvement and sustainability of project can be achieved properly without effective successful management of the physical core of the project which is the rehabilitation works.

The need for Initiating a tailored designed database (D.B.) as a management tool that assist in girding policies under items (2-5) & (2-7) to facilitate its implementation

In order to control the implementation phase under such parameters mentioned above, a set up for a Criteria is required for designing tailored database management tool, as a special designed database to serve the arisen needs and characteristics which other software's has no such capability to manage and control for such type of community rehabilitation projects.

In this regard and to weight these projects in its products from an engineering view and documentation view as well, the result is so obvious that such type of projects need special treatments in the huge of information and paper work needed, For example, rehabilitating a school needs:

- One site to be visited
- One bill of Quantities
- One assessment form and report
- One client and/or beneficiary to deal with

While such type of Community rehabilitation project, will definitely needs:

- Hundreds of Houses locations to visit
- Hundreds of Bill of Quantities for those houses that need to be rehabilitated and/or demolished

- Hundreds of assessment forms related to houses visited
- Hundreds of beneficiaries, and
- Relatively wide diversity of standards

Therefore, certain principles as follows should be considered in creating such tailored designed system:

- 1- Rehabilitation works should be documented as a reservoir with all the information collected from the field to be used in reports and analyzed statistically reachable in quite fast act to be printed out on well presented reports.
- 2- It is needed to have a dashboard, which let the consultants of this project use this system in a time consuming way and without any problem, time simply is extremely valuable because the inhabitants can not leave their houses during rehabilitation due to their very low income that give them no ability to do this, therefore, the fast completion of the rehabilitation works is highly required to avoid implications and impacts that may occur if the rehabilitation time gets longer.
- 3- All the records about the project from general information to bill of quantities and financial information of each stage of progress for each house should be available and reachable in quite fast act to be printed out on well presented reports.
- 4- The designed system should have the capability of updating the data which will save hours and in some cases will save days of data entry process, if we take the traditional way in doing such updating.
- 5- The designed system should be a user friendly database where a user can use and navigate through, by entering data and retrieving reports without any difficulties even if the consultant has no



experience in the field of database, therefore. Simplicity to straightforward in using the system is required.

- 6- The reports of the designed system should be normally transferred into other formats such as Word or Excel, in case information need to be analyzed in Excel or used in Word reports.

In order to control the successful application of the above principles, set of rules should be considered in the designed system, those rules should deal with the main two issues that will affect the success of the designed system of database, bearing in mind that dealing with those two issues should secure the successful application mentioned in principle (5), and, :(6)

First issue is how to deal with the thousands of items that are listed in the hundreds of bill of quantities.

Second issue is how to deal with the hundreds of houses that the system should treat, as each house is considered as a separate project with its required bill of quantities.

Accordingly,

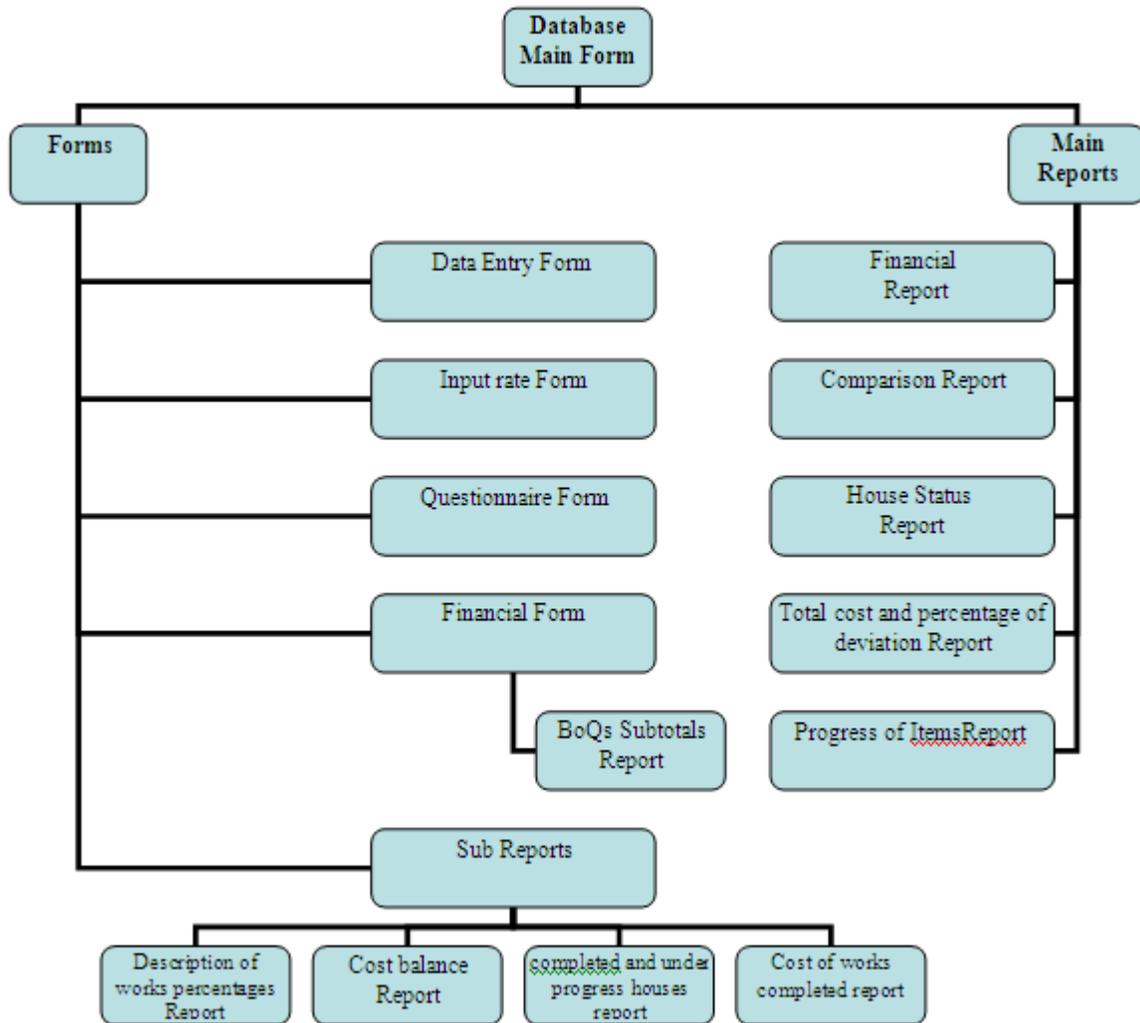
As for the first issue, during the pre assessment made to each house to formulate its bill of quantities, it was decided (and due to the common items of rehabilitation that is shared among all houses), to formulate a consolidated bill of quantity that can cover all items for all houses related to rehabilitation of civil, plumbing and electrical works, also it was considered in this consolidated bill of quantity other special items to be rehabilitated which exists in several numbers of houses.

This action produces one consolidated bill of quantity that had the sum of all quantities for all common items, for example, item of

rendering is repeated in hundreds of houses, then the quantities of all was consolidated under one item in the consolidated bill of quantity that covers the whole quantity assessed during the pre assessment done by the consultants. This provides a very simple but active solution to the designed system to work properly (for achieving the principles mentioned above), through having the item number and rate under its category of civil or plumbing works which will simply apply for all common ones and for all houses but in different quantities.

At the same time, and in order to achieve control of those consolidated items to be applied for all houses, the hundreds of houses were grouped into several groups, each group is presenting number of houses located in the same Zukak or street, of course such grouping is extremely important in terms of implementing the rehabilitation works as the small contractors who work on such kind of projects will not be feasible for them to work in scattered locations of different houses, it is ideal for those contractors to work on specific locations each time with certain number of houses to be completed in quiet fast process in order to move to other Zukak or street to take the rehabilitation of the other group and so on. This will extremely be useful for the designed system to control the mentioned above second issue in managing the design tool of the database required to fulfill the principles as mentioned.

Based on those two set of rules, the designed database will require dealing with main two core components to function accordingly, Forms and Reports. In regard of forms, the required forms are categorized into the following demonstration that gives basic ideas about the required functions:



Database Main Form:

The designed Main Form of the database is the main switchboard, which the user needs to navigate through the database.

The group of key buttons is representing five main forms, the data entry form, the special form, the report form, the projection information form and the Quit button which close the database.

Data Entry form:

This designed form window toolbars are well organized to serve the need of the

Implementation Database (Al-Abeed)

-  Data Entry Form
-  Special Form
-  Report Form
-  Project Information
-  Quit Database

database user, it is an important one that covers dominant required operational field issues as follows:



1- Different operational fields that should be filled in order to feed the houses table calculations that the database performs, in order to give the Consultant a look about the house cost as a warning from not exceeding the designated budget.

2- The Intervention field calculates the cost and the final cost automatically. If the intervention box is checked, the related activity will be included in the rehabilitation process and will be reflected later in the Intervention report.

Houses Form For Project No. : CR/BAG/003

Details Of Housing No: 1

House ID: 302/16/020/0
Project_num: CR/BAG/003
Mahala: 302
Zukak: 16
House No.: 20
Name of owner: **Ahmed Abdul Hajeed**
Consultant Name: Faris & Kareem

Engineer name: Faris Diab

Reporting Date mm/dd/yyyy
Date of First Report: 8/4/2005
Date of Second Report: 8/11/2005
Date of Third Report: 8/18/2005
Date of Forth Report:
Date of Fifth Report:
Status: Under Maintenance

Dates of Status mm/dd/yyyy
Starting date: 8/2/2005
Completion date: 8/18/2005
Date of work suspension:
Maintenance end date:
Note:
Number of people in house: 6
male members: 3
female members: 3
disable people: 0
Area: 100
Plot area: 60

Work Item Details

ID.no	House ID	Item number	Description	Unit Rate USD	B.O.Q. Qty	Total	1st report	2nd reprot	3th report	4th report	5th report
38	302/16/020/0	1-03	Remove damaged roof tiles and retile (f	\$20.00	10	\$200.00	0	0	0	0	0
39	302/16/020/0	1-08	Repair cracks & plaster with cement (m	\$10.00	10	\$100.00	0	0	0	0	0
40	302/16/020/0	1-12	Remove damaged floor tile and retile (m	\$23.00	4	\$92.00	0	0	1	0	0
41	302/16/020/0	1-14	Brick wall 12cm (m2)	\$14.00	14	\$196.00	0	0	0	0	0
42	302/16/020/0	1-16	Roof repairing (LS)	\$175.00	1	\$175.00	0	0	0	0	0
43	302/16/020/0	1-20	Steel doors one side plate (No.)	\$130.00	1	\$130.00	0	0	1	0	0
44	302/16/020/0	1-26	Replace glass (m2)	\$10.00	2	\$20.00	0	0	0.98	0	0
45	302/16/020/0	2-1	Oriental toilets with connections (No.)	\$75.00	1	\$75.00	0	0	1	0	0
46	302/16/020/0	2-3	Install wash basin (No.)	\$75.00	1	\$75.00	0	0	1	0	0
47	302/16/020/0	3-3	Light fittings (No.)	\$12.00	1	\$12.00	1	0	0	0	0
48	302/16/020/0	3-5	Socket 13 amp (No.)	\$15.00	3	\$45.00	1	0	0	0	0
484	302/16/020/0	3-4	Ceiling fan (No.)	\$35.00	0	\$0.00	1	0	0	0	0

It has many fields and it can generate automatic entries if the user gives a number the database will diagnose the number and input the equivalent text in the description field.

quantities in order to give a global look about the intervention items that each house need, before the consultants filter the items in order to meet the budget ceiling.

3- House Information, works as a reservoir of all the information collected from the field to be used in reports and analyzed statistically.

5- BoQ Subtotals, the sum of quantities of each activity individually is required in order to give a clear picture to the contractors about the total amount of work involved for each activity.

4- Assessment in view of BoQs, as this provides the user with the complete Bill of



Houses Form For Project No. : CR/BAG/003

Details Of Housing No: 1

House ID: 302/16/020/0
Project_num: CR/BAG/003
Mahala: 302
Zukak: 16
House No.: 20
Name of owner: **Ahmed Abdul Hajeed**
Consultant Name: Faris & Kareem

Engineer name: Faris Diab

Reporting Date: mm/dd/yyyy
Date of First Report: 8/4/2005
Date of Second Report: 8/11/2005
Date of Third Report: 8/18/2005
Date of Forth Report:
Date of Fifth Report:
Status: Under Maintenance

Dates of Status: mm/dd/yyyy
Starting date: 8/2/2005
Completion date: 8/18/2005
Date of work suspension:
Maintenance end date:
Note:
Number of people in house: 6
male members: 3
female members: 3
disable people: 0
Area: 100
Plot area: 60

Buttons: Find Record, New Record, Delete Record, Edit

Refresh

Qty.Completed to date of reporting

Total	1st report	2nd reprot	3th report	4th report	5th report	Completed work	Earned value	Perc. %	Notes	Status
\$200.00	0	0	0	0	0	0	\$0.00	0.00%	Canceled	Canceled
\$100.00	0	0	0	0	0	0	\$0.00	0.00%	Canceled	Canceled
\$92.00	0	0	1	0	0	1	\$23.00	25.00%		Completed
\$196.00	0	0	0	0	0	0	\$0.00	0.00%	Canceled	Canceled
\$175.00	0	0	0	0	0	0	\$0.00	0.00%	Canceled	Canceled
\$130.00	0	0	1	0	0	1	\$130.00	100.00%		Completed
\$20.00	0	0	0.98	0	0	0.98	\$9.80	49.00%		Completed
\$75.00	0	0	1	0	0	1	\$75.00	100.00%		Completed
\$75.00	0	1	0	0	0	1	\$75.00	100.00%		Completed
\$12.00	1	0	0	0	0	1	\$12.00	100.00%		Completed
\$45.00	1	0	0	0	0	1	\$15.00	33.33%		Completed
\$0.00	1	0	0	0	0	1	\$35.00	0.00%	Additional	Completed

Information analysis

This gives a record for a group of houses designated for contract after entering the House ID for the group of houses. It is important to mention that only the items that will be involved in the rehabilitation are listed in this case, after an automatic filtration process, conducted by the database. In this operational field, the Consultant can enter the ID's of all the houses included in the same Tender. A report containing all the mentioned houses and the grand total of each item will be generated.

b- Questionnaire form; this designed form is

6- BoQ Tender, as the BOQ tender provides the Contractor with a complete Bill of Quantity of all the activities that will be included in the rehabilitation process, this will provide a complete BoQ for Tendering, in order to be given to the contractors.

Special forms

This form is composed of three types of sub forms which are:

- a- Input rate form; this designed form is to add the new Unit Rate, which is necessary to add the updated price of each activity. the core of the data entry form as it deals

Updating Rate Form

View all the rates in the DB

Civil Works
 Plumbing and Sanitary Works
 Electrical Works
 Special items

1-01	1-08	1-14	1-19	1-24
1-02	1-09	1-15	1-20	1-25
1-03	1-10	1-16	1-21	1-26
1-04	1-11	1-17	1-22	1-27
1-05	1-12	1-18	1-23a	1-28
1-06	1-13		1-23b	
1-07				



with the progress of implemented activities during the life time of the project, each consultant and during his site visit to the rehabilitated houses, fill the form with the

updated information to be reflected later on progress reporting of the community rehabilitation work as a whole.

House Check Form (weekly report)

<p>Details Of Housing No. <input type="text" value="30"/></p> <p>House ID <input type="text" value="302/16/036/0"/></p> <p>Project ID <input type="text" value="CR/BAG/003"/></p> <p>Mahala <input type="text" value="302"/></p> <p>Zukak <input type="text" value="16"/></p> <p>Home No <input type="text" value="36"/></p> <p>Name of owner <input type="text" value="Hana'a Mahdi"/></p> <p>Consultant Name <input type="text" value="Ahmed & Harith"/></p> <p>Engineer name <input type="text" value="Ahmed Kamal"/></p>	<p>Reporting Date</p> <p>First report <input type="text"/></p> <p>Second report <input type="text"/></p> <p>Third report <input type="text"/></p> <p>Forth report <input type="text"/></p> <p>Fifth report <input type="text"/></p>																																																						
<p>Status</p> <p>Under Progress <input type="checkbox"/></p> <p>Completion <input type="checkbox"/></p> <p>Under maintenance <input type="checkbox"/></p>	<p>Dates of Status</p> <p>Starting date <input type="text"/></p> <p>Completion date <input type="text"/></p> <p>Work suspension <input type="text"/></p> <p>Maintenance end date <input type="text"/></p>																																																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Work Item Details</th> <th colspan="5">Quantity Completed</th> </tr> <tr> <th>ID.no (key)</th> <th>Item number</th> <th>Description</th> <th>Estimated Quantity</th> <th>1st report</th> <th>2nd report</th> <th>3th report</th> <th>4th report</th> <th>5th report</th> </tr> </thead> <tbody> <tr> <td>351</td> <td>1-08</td> <td>Repair cracks & plaster with cement (m2)</td> <td>12</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>352</td> <td>1-09</td> <td>Remove damaged cement plaster, repair cracks & replaster with cement (m2)</td> <td>21</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>353</td> <td>1-10</td> <td>Remove damaged concrete floor & recast (m2)</td> <td>20.25</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>509</td> <td>1-11</td> <td>Supply and install terrazzo tiles (m2)</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Work Item Details				Quantity Completed					ID.no (key)	Item number	Description	Estimated Quantity	1st report	2nd report	3th report	4th report	5th report	351	1-08	Repair cracks & plaster with cement (m2)	12						352	1-09	Remove damaged cement plaster, repair cracks & replaster with cement (m2)	21						353	1-10	Remove damaged concrete floor & recast (m2)	20.25						509	1-11	Supply and install terrazzo tiles (m2)	0					
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509	1-11	Supply and install terrazzo tiles (m2)	0																																																				

c- Financial form; this designed form is the concluded form that represents all financial calculated figures regarding the work progress of the activities implemented of each project, which is by the end concluded with accurate financial update reporting.

Item No.	Description	B.O.Q Qty	Unit price USD	Total	Completed work	Total price of completed	Per. completed of work
1-01	Construct of joist slab with brick (m2)	30.5			43.43	\$2,171.50	
1-02	Remove old roof & construct joist slab with brick (m2)	24.5	\$60.00	\$1,470.00	35.33	\$2,119.80	144.20%
1-03	Remove damaged roof tiles and retile (m2)	657	\$20.00	\$13,140.00	576.28	\$11,525.60	87.71%
1-04	Mastique replacement (m2)	96	\$6.00	\$576.00	84.56	\$507.36	88.08%
1-05	Supply and install roof tiles (m2)	9	\$17.00	\$153.00	112.92	\$1,919.64	1254.67%
1-06	Repair cracks and plaster with gypsum (m2)	158	\$8.00	\$1,264.00	305.9	\$2,447.20	193.61%
1-07	Remove old plaster, repair cracks & replaster with gypsum (m2)	150	\$9.00	\$1,350.00	104.63	\$941.67	69.75%
1-08	Repair cracks & plaster with cement (m2)	388	\$10.00	\$3,880.00	359.37	\$3,593.70	92.62%
1-09	Remove damaged cement plaster, repair cracks & replaster with cement (m2)	395	\$11.00	\$4,345.00	179.65	\$1,976.15	45.48%
1-10	Remove damaged concrete floor & recast (m2)	265	\$17.00	\$4,505.00	378.86	\$6,440.62	142.97%

Project information form; this designed form will have some basic information required for the project including the name of project, starting date, name of the contractor, number of completion of works in terms of weeks, because the follow up reporting on each project is required to be done on weekly basis along with financial progress of work achieved.

Results and Conclusions

The above mentioned database entered the service and was tested through a pilot project and shows quiet good efficiency in responding to all needs and problems that occurs and/or required issues that were arisen during the implementation of the project.

The report form in the main database form was created to acquire main reports which are demonstrated in above. However, minor adjustments on the report form in order to produce other sub reports which were required to be added and as well some critical adjustments in the different kinds of reports were re-designed as the final version of this new database entered the service to another six pilot projects and were completely succeeded in responding to such kind of projects and to the requirements related to its implementation process.

The final result version is produced by a technical database model (that is considered as a newly designed and tailored for such projects) as it proves that it can give any kind of information for each activity for each house and for each group of houses at any stage during the life time of the implementation of the project which completely assist in the acceleration and extreme required facilitation of implementation in due of contractor's needs, consultant's needs and project needs as a whole, and it can be scaled up to be a core element for smooth and accurate implementation of the redevelopment and Upgrading future strategy drawn by the Iraqi Housing policy.

Implementation Database (Al-Abeed)

-  Financial Report
-  Financial report of each group
-  Progress of houses
-  Progress of Items
-  Go To Main Form

In this final explained version of specially designed database, several reports could be acquired from the database to follow up the quantities of the implemented items at any time during the implementation period, further to the financial reports which give an accurate rates and amount during any stage of the implementation phase, which completely assist to find out the progress of work and the stages that the contractors are deserved to be paid according to the contract assigned to them. Each report of the database can be converted into Word or Excel, in case the information need to be analyzed in Excel or used in reports in Word, Furthermore, the database is very flexible and it can generate so many reports for the related issues. Accordingly, this software opened the door widely to implement other replicable projects which the Iraq Housing policy is recommending, in an efficient and effective progress as needed.

As for the current needs of the pilot projects, the database design produces ten main reports which cover all information required for each rehabilitated and/or redeveloped unit dwelling, those reports can be printed out reflecting hundreds of houses with all



related calculations and information required.

The produced reports are:

- **The financial report** of the actual completed items (this report is basically considered to release the contractors' payments). Please refer to the sample of outcome results in running the database in Annex six.
- **Cost of the works completed** (this report demonstrates the costs of the works completed ordered by the categories civil, electrical, plumbing ...etc). Please refer to the sample of outcome results in running the database in Annex seven.
- **The house status report** (this report demonstrates the number of units, those who were completed, under progress or not been started).
- **Progress of items report** (this report demonstrates numbers of the categorized items which were not been started, under progress, canceled or implemented).
- **Balance report** (this report calculate the balance of the quantities for each item per each house). Please refer to the sample of outcome results in running the database in Annex three.
- **Comparison report** (this report demonstrates the comparison between actual and estimated cost for each completed house). Please refer to the sample of outcome results in running the database in Annex two.
- **Cost balance report** (this report calculate per each item, the differences costs and quantities between implementation and assessment phases).
- **Total cost and percentage of deviation** (this report calculate the actual costs and the estimated costs per each house, further to the percentage of deviation for the whole project). Please refer to the sample of outcome results in running the database in Annex four.
- **Total costs for the completed and under progress houses** (this report demonstrates the actual costs and the estimated costs for each item per each house, for the completed and under progress units). Please refer to the sample of outcome results in running the database in Annex five.
- **Number of beneficiaries** (this report demonstrate the number of people mails and females for each implemented). Please refer to the sample of outcome results in running the database in Annex one.
- **Description of works percentages** (this report demonstrate the cost of each activity –Item implemented and its percentages to the total cost of the project). Please refer to the sample of outcome results in running the database in Annex nine.

Recommendations

The following expected future developed issues are highly recommended which by its endorsement, a high level of professional implementation process will be achieved for the purpose of facilitating the policies implementation under 2-5 and 2-7 items in the Iraq Housing Policy:



1- Lessons should be considered in order that the project to be treated to include rehabilitation works with building capacity programs at one time, because of the importance of the building capacity in such kind of strategic projects which affect the Housing policy and Housing stock in Iraq. Based on that, the database to be developed to include links, question and answer, training modules that the user can highly get benefit throughout the working life time of each rehabilitated project.

2- The database could be developed to include rehabilitation works physical infrastructure (sewage and water), and social infrastructure that serves residential neighborhoods, in that case the community development may be upgraded as whole one package that include comprehensively such infra works along with housing rehabilitation works.

3- The database tool could be linked with GIS system; such link will certainly assist to upscale the community development in Nation wide approach. Linking it with GIS will produce professional attitude that will deal with areas which need to be developed in a matter that produce wide detailed mapping where the database used can be modified and adjusted upon its criteria and needs.

4- images and photos for the rehabilitated houses and infra services could be included in the developing design criteria in order to show before and after rehabilitation along with photo documentation that its link with the GIS will make the database serve as extremely effected tool that will develop and highly facilitate the eloquent of policies under items 2-5 and 2-7 mentioned in the Iraqi Housing Policy.

5- Transferability and Up scaling to highly technical tool at National level could be endorsed by concerned Ministries and academia for PhD developing researches in order to secure sustainability potentials to

the mainstreaming of the facilitation required for implementing policies related in the Iraqi Housing Policy.

6- Change in the legislation should prepared as a draft to be decided and approved by the Ministry of Construction and Housing to add a responsibility of slum upgrading in Iraq to the current responsibilities of the Ministry going in line with the proposed attitude of the National Housing Policy where the database management research topic considered as one of the sustainable facilitated implementing tools to be developed in this regard.

References

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4- Iraqi Household social and Economic Survey, COSIT, Ministry of Planning, 2007.

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6- A way forward Report for Community rehabilitation and National Slum Upgrading strategy in Iraq, May 2006.

7- Supportive Informational Report, Pilot projects on Al Maghrib Community Rehabilitation, July 2008.

8- National Workshop on City Slum Identification and Inhabitants Survey Results, April 2005.

9- Introductory Approach Towards A Housing Finance Strategy in Iraq, March 2005.

10- The Challenge of Slums, Global Report



on Human Settlements, United Nations
Human Settlements Programme, 2003 .

Human Settlements Programme, 2005 .

11- Financing Urban Shelter, Global Report
on Human Settlements, United Nations

Annex (1)

BENEFICIARIES

<i>House ID</i>	<i>Number of persons in the house</i>	<i>male</i>	<i>female</i>
302/09/000/y	7	4	3
302/09/036/0	4	1	3
302/09/036/1	7	5	2
302/09/036/2	4	2	2
302/09/036/3	6	4	2
302/09/036/4	5	3	2
302/09/036/b	1	0	1
302/09/038/0	3	1	2
302/09/040/0	5	3	2
302/09/040/1	5	3	2
302/09/042/0	9	5	4
302/09/044/0	7	4	3
302/09/044/1	4	2	2
302/09/046/0	1	0	1
302/09/048/0	13	7	6
302/09/050/0	6	3	3
302/09/052/0	5	2	3
302/09/054/0	5	2	3
302/09/054/1	6	4	2
302/09/056/0	11	6	5
302/09/058/0	6	3	3
302/09/060/0	8	2	6
302/09/062/0	5	3	2
302/09/064/0	6	3	3
302/09/066/0	3	2	1
302/09/068/0	11	4	7
302/14/001/0	5	3	2
302/14/003/0	8	4	4



302/14/005/0

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Annex (2)

Comparison between actual and estimated cost for Completed houses

<i>House ID</i>		<i>Activity Number</i>	<i>Est. Cost</i>	<i>Actual Cost</i>
<i>302/09/000 /y</i>				
<i>Total Est. Cost</i>	<i>Total Act. Cost</i>			
585.525	579.349			
<i>Defference</i>	-6.176			
		1-08	\$31.26	28.8113
		1-15	\$160.18	160.18
		1-19	\$24.03	15.0877
		2-2	\$100.12	100.12
		2-4	\$84.10	84.1
		3-1	\$16.02	16.02
		3-3	\$11.22	11.22
		3-4	\$36.04	36.04
		3-5	\$12.02	12.02
		3-6	\$10.42	15.63
		4-14	\$100.12	100.12
<i>302/09/036/0</i>				
<i>Total Est. Cost</i>	<i>Total Act. Cost</i>			
908.288	662.1806			
<i>Defference</i>	-246.1074			
		1-08	\$369.91	124.8837
		1-15	\$240.27	240.27
		1-16	\$48.06	48.06
		1-17	\$12.01	11.4114
		1-19	\$5.77	5.2855
		2-1	\$132.15	132.15
		2-2	\$100.12	100.12
<i>302/09/036/1</i>				
<i>Total Est. Cost</i>	<i>Total Act. Cost</i>			
1094.8475	1019.0826			
<i>Defference</i>	-75.7649			
		1-07	\$220.50	224.91
		1-15	\$240.27	240.27
		1-18	\$81.09	57.664
		1-20	\$216.25	121.0986
		2-1	\$132.15	132.15
		2-3	\$80.09	80.09
		3-1	\$16.02	16.02
		3-2	\$20.02	20.02
		3-3	\$16.83	16.83
		3-6	\$15.63	15.63
		4-12	\$56.00	94.4



Annex (3) Cost Balance

<i>Activity_Number</i>	<i>Unit rate</i>	<i>Differences</i>	<i>Cost Of Differences</i>
1-01	\$28.03	-2.1	-58.863
1-02	\$30.03	19.44	583.7832
1-03	\$9.21	-83.98	-773.4558
1-04	\$9.21	93.64	862.4244
1-05	\$4.41	33.62	148.2642
1-06	\$4.91	-137.05	-672.9155
1-07	\$4.41	511.36	2255.0976
1-08	\$5.21	192.16	1001.1536
1-09	\$8.41	100.35	843.9435
1-10	\$9.21	133.99	1234.0479
1-11	\$10.41	-76.72	-798.6552
1-12	\$16.02	16.206	259.62012
1-13	\$16.82	109.62	1843.8084
1-14	\$100.12	-3	-300.36
1-15	\$80.09	19	1521.71
1-16	\$48.06	-40	-1922.4
1-17	\$20.02	-53.64	-1073.8728
1-18	\$36.04	-11.23	-404.7292
1-19	\$9.61	-27.286	-262.21846
1-20	\$96.11	-24.292	-2334.70412
2-1	\$132.15	2	264.3



Annex (4)

Total Cost and percentage of Deviation

<i>House ID</i>	<i>Actual Cost</i>	<i>Estimated Cost</i>
<i>302/09/000 /y</i>	\$579.35	\$585.53
<i>302/09/036/0</i>	\$662.18	\$908.29
<i>302/09/036/1</i>	\$1,019.08	\$1,094.85
<i>302/09/036/2</i>	\$788.34	\$998.26
<i>302/09/036/3</i>	\$1,011.04	\$1,274.93
<i>302/09/036/4</i>	\$987.96	\$1,012.17
<i>302/09 /036/b</i>	\$883.38	\$949.66
<i>302/09/038/0</i>	\$179.91	\$1,020.06
<i>302/09/040/0</i>	\$805.95	\$932.60
<i>302/09/040/1</i>	\$899.17	\$1,113.25
<i>302/09/042/0</i>	\$744.92	\$919.54
<i>302/09/044/0</i>	\$1,208.68	\$1,094.29
<i>302/09/044/1</i>	\$984.07	\$801.69
<i>302/09/046/0</i>	\$908.19	\$968.47
<i>302/09/048/0</i>	\$775.12	\$942.30
<i>302/09/050/0</i>	\$479.00	\$914.71
<i>302/09/052/0</i>	\$1,273.37	\$1,054.79
<i>302/09/054/0</i>	\$902.49	\$1,087.88
<i>302/09/054/1</i>	\$1,010.17	\$1,100.87
<i>302/09/056/0</i>	\$755.96	\$1,086.43
<i>302/09/058/0</i>	\$1,341.88	\$994.63
<i>302/09/060/0</i>	\$1,056.95	\$831.47
<i>302/09/062/0</i>	\$312.28	\$363.63
<i>302/09/064/0</i>	\$680.87	\$527.90
<i>302/09/066/0</i>	\$1,127.18	\$1,198.98
<i>302/09/068/0</i>	\$905.76	\$795.81
<i>302/14/001/0</i>	\$1,061.82	\$1,123.56
<i>302/14/003/0</i>	\$983.61	\$716.84



Annex (5)

Total Cost for completed and under progress houses

<i>House ID</i>		<i>Item No.</i>	<i>Estimated Cost</i>	<i>Actual Cost</i>
<i>302/09/000 /y</i>	Under Maintenance			
<i>Total Act.</i>	\$579.35			
<i>Total Est.</i>	\$585.53			
		4-14	\$100.12	\$100.12
		3-6	\$10.42	\$15.63
		3-5	\$12.02	\$12.02
		3-4	\$36.04	\$36.04
		3-3	\$11.22	\$11.22
		3-1	\$16.02	\$16.02
		2-4	\$84.10	\$84.10
		2-2	\$100.12	\$100.12
		1-19	\$24.03	\$15.09
		1-15	\$160.18	\$160.18
		1-08	\$31.26	\$28.81
<i>302/09/036/0</i>	Under Maintenance			
<i>Total Act.</i>	\$662.18			
<i>Total Est.</i>	\$908.29			
		2-2	\$100.12	\$100.12
		2-1	\$132.15	\$132.15
		1-19	\$5.77	\$5.29
		1-17	\$12.01	\$11.41
		1-16	\$48.06	\$48.06
		1-15	\$240.27	\$240.27
		1-08	\$369.91	\$124.88
<i>302/09/036/1</i>	Under Maintenance			
<i>Total Act.</i>	\$1,019.08			
<i>Total Est.</i>	\$1,094.85			
		4-12	\$56.00	\$94.40
		3-6	\$15.63	\$15.63
		3-3	\$16.83	\$16.83
		3-2	\$20.02	\$20.02



Annex (6)

Financial Report for Completed Items

<i>Item Earned No.</i>	<i>Description value</i>	<i>BOQ Qty. Per. of</i>	<i>Unit Price Work done USD</i>	<i>USD</i>	<i>Total completed</i>	<i>Work value</i>	<i>completed Work done</i>
1-01	Construct of joist slab with brick (m2)	71.5	\$28.03	\$2,004.15	69.4	\$1,945.28	97.06%
1-02	Remove old roof & construct joist slab with brick (m2)	47.2	\$30.03	\$1,417.42	66.64	\$2,001.20	141.19%
1-03	Remove damaged roof tiles and retile (m2)	252	\$9.21	\$2,320.92	168.02	\$1,547.46	66.67%
1-04	Supply and Install roof tiles (m2)	103.74	\$9.21	\$955.45	197.38	\$1,817.87	190.26%
1-05	Repair cracks and damages & plaster by gypsum (m2)	388.25	\$4.41	\$1,712.18	421.87	\$1,860.45	108.66%
1-06	Remove old plaster, repair cracks & replaster by gypsum (m2)	423	\$4.91	\$2,076.93	285.95	\$1,404.01	67.60%
1-07	Repair cracks & plaster with cement (m2)	1575	\$4.41	\$6,945.75	2086.36	\$9,200.85	132.47%
1-08	Remove damaged cement plaster, repair cracks & replaster with	1405	\$5.21	\$7,320.05	1597.16	\$8,321.20	113.68%
1-09	Remove damaged concrete floor & recast (m2)	490.75	\$8.41	\$4,127.21	591.1	\$4,971.15	120.45%
1-10	Supply and install terrazzo tiles (m2)	68.5	\$9.21	\$630.89	202.49	\$1,864.93	295.61%
1-11	Remove damaged floor tile and retile (m2)	169.25	\$10.41	\$1,761.89	92.53	\$963.24	54.67%

Annex (7)

Cost of works completed Category

<i>num</i>	<i>Category</i>	<i>Total cost B.O.Q</i>	<i>Earned value</i>	<i>Per. of completed work</i>
1	Civil Works	\$58,580.15	\$59,511.42	101.59%
2	Plumbing and Sanitary Works	\$4,860.00	\$4,855.00	99.90%
3	Electrical Works	\$6,003.00	\$4,184.00	69.70%
Total		\$69,443.15	\$68,550.42	98.71%



Annex (8)

Report Rate Group 1

<i>Item No.</i>	<i>Description</i>	<i>Unit Price</i>
1-01	Construct of joist slab with brick (m2)	\$28.03
1-02	Remove old roof & construct joist slab with brick (m2)	\$30.03
1-03	Remove damaged roof tiles and retile (m2)	\$9.21
1-04	Supply and Install roof tiles (m2)	\$9.21
1-05	Repair cracks and damages & plaster by gypsum (m2)	\$4.41
1-06	Remove old plaster, repair cracks & replaster by gypsum (m2)	\$4.91
1-07	Repair cracks & plaster with cement (m2)	\$4.41
1-08	Remove damaged cement plaster, repair cracks & replaster with cement (m2)	\$5.21
1-09	Remove damaged concrete floor & recast (m2)	\$8.41
1-10	Supply and install terrazzo tiles (m2)	\$9.21
1-11	Remove damaged floor tile and retile (m2)	\$10.41
1-12	Brick wall 24cm (m3)	\$16.02



Annex (9)

Description of works percentages

Activity Number	Description of works percentages for project CR/BAG/002 as an example for comparison needed	Total Price for each item	Percentage per the total cost
1	Civil works		
1-1	Construct of joist slab with brick (m2)	\$4,818.92	2.56%
1-2	Remove old roof & construct joist slab with brick (m2)	\$17,288.27	9.18%
1-3	Remove damaged roof tiles and retile (m2)	\$11,554.22	6.14%
1-4	Supply and Install roof tiles (m2)	\$1,728.90	0.92%
1-5	Repair cracks and damages & plaster by gypsum (m2)	\$3,465.29	1.84%
1-6	Remove old plaster, repair cracks & replaster by gypsum (m2)	\$3,246.54	1.72%
1-7	Repair cracks & plaster with cement (m2)	\$6,945.60	3.69%
1-8	Remove damaged cement plaster, repair cracks & replaster with cement (m2)	\$16,806.31	8.93%
1-9	Remove damaged concrete floor & recast (m2)	\$12,983.82	6.90%
1-10	Supply and install terrazzo tiles (m2)	\$13,764.76	7.31%
1-11	Remove damaged floor tile and retile (m2)	\$1,954.79	1.04%
1-12	Brick wall 24cm (m3)	\$968.60	0.51%
1-13	Brick wall 12cm (m2)	\$5,308.39	2.82%
1-14	Steel doors two side plate (No.)	\$4,004.80	2.13%
1-15	Steel doors one side plate (No.)	\$21,464.12	11.40%
1-16	Maintain steel doors (No.)	\$3,171.96	1.69%
1-17	Maintain steel windows (m2)	\$566.37	0.30%
1-18	Supply steel windows (m2)	\$1,386.10	0.74%
1-19	Replace damaged glass (m2)	\$1,220.78	0.65%
1-20	Supply new glass (m2)	\$3,315.80	1.76%
2	Sanitation works		
2-1	Oriental toilets with connections (No.)	\$15,065.10	8.00%
2-2	Install wash basin (No.)	\$5,306.36	2.82%
2-3	Install wash basin with connections (No.)	\$3,043.42	1.62%



2-4	Sink with connections (No.)	\$2,186.60	1.16%
2-5	Manhole maintenance (No.)	\$2,763.22	1.47%
3	Electrical works		
3-1	Rearrange electrical wiring (L.S)	\$576.72	0.31%
3-2	DB-40 amp, 3 way (L.S)	\$280.28	0.15%
3-3	Light fittings (No.)	\$1,318.35	0.70%
3-4	Ceiling fan (No.)	\$3,640.04	1.93%
3-5	Socket 13 amp (No.)	\$685.14	0.36%
3-6	Switches (No.)	\$692.93	0.37%
4	Special Items		
4-4	Sandwich Panel(m2)	\$2,311.20	1.23%
4-9	Roof Repairing	\$4,324.86	2.30%
4-10	Sandwich Panel(m2)	\$826.60	0.44%
4-12	Laying polyathilen sheets	\$2,125.98	1.13%
4-13	wooden door repair	\$420.45	0.22%
4-14	Roof Tiling Treatment (L.S)	\$100.12	0.05%
4-18	Supply and Install Tab Mixer	\$40.00	0.02%
4-19	Mastique replacement	\$1,756.95	0.93%
4-20	Roofing treatment(L.S)	\$100.52	0.05%
4-24	Demolish and reconstruct wall	\$306.60	0.16%
4-25	Roof surface repairing(m2)	\$4,396.00	2.34%
	Total Cost	\$188,231.78	100.00%