ICRC WORK SPECIFICATIONS

IRAQ

WATER AND HABITAT

GOVERNORATE :	DISTRICT :	LOCATION :
NAINAWA	Hamdaniya	Bartella

GO code :	IRAKGENASSENG0	TITLE :	Mosul Response (2017) – Manarat Shabak BS / Rehabilitation
SO n° :	SO 02	WPA n°:	KIR17 0028

Job Owner :	The Ministry of Construction and Housing and Public municipalities
Supervision :	International Committee of the Red Cross (ICRC)

Work Specifications
All works, constructions material and equipment shall be according to the following work specifications, instructions of the ICRC Engineer[1] and in accordance with Iraqi "Ministry of Planning" Conditions and Specifications for Civil Works, parts I & II.

1. Introduction:
These specifications are considered as a supplemental commitment for both parties. It is also considered as a legal and technical document integral to the Bill of Quantities (BoQs) and Drawings.

The contractor is obliged to sign all the papers of these specifications. His signing of it presupposes that he has already read and understood all of its items and that he is obliged to implement it.

2. Demolishing Works:
Demolishing works includes the demolishing and removal off-site of all building parts that are mentioned in the drawings and BoQ, and according to instructions of ICRC engineer. Any reusable material shall be stored in a safe place with the intention to be reused in reconstruction work, as decided by ICRC engineer and as illustrated in article 19 items 1 & 2.

3. Excavation:
All the excavated materials should be kept away from the edge of excavation and all the works should be done in dry condition. For the old walls foundation removal (if needed), the price should include all

[1] The DoH, DoW (AND/OR) MoH, MoMPW concerned engineers have the right to give instructions, provided that these instructions are in accordance with the approved Work Specifications, the approved Bill of Quantities, the approved Drawings & Designs, and with the Iraqi "Ministry of Planning" Conditions and Specifications for Civil Works, parts I & II.

the necessary excavations required to remove these foundations. In case there is a need for supporting the excavations sides or edges, the contractor shall be responsible on that support without any additional price. If the contractor goes deeper than the required levels during excavation, he will be responsible of backfilling with sub-base and compaction to reach the required levels and according to specifications and article 4 bellow without any additional price.

In case a ground water comes out during excavation or removal of old building, the removal of that water shall be the responsibility of the contractor without any extra payment.

4. Backfilling:

Backfilling shall be done in 20 cm layers, compacted by hammers or mechanical means (where possible, by a wheel compacter), with the addition of water to improve compaction.

In case a weak spot(s) or area(s) discovered during removal of surface soil, backfilling or compacting, the contractor will be responsible on replacing the soil under this spot (and/or) area for the appropriate level without asking for reimbursement (**even if the depth is more than that required in excavation article**).

5. Foundation and Pavement Bases:

Very well fired, broken brick are to be used (wherever required); with a thickness of 8 cm broken bricks should be sprinkled with water and compacted. The used brick should be clean from woodworm and a chlordane should be spread on it before placing the concrete blinding layer.

6. Treating the Sub-Soil with Chlordane:

Along the walls (from both sides), a hole should be made each 30 cm with 10 cm depth and 2.5 cm diameter and then filled with chlordane of good quality and mixed with water according to the specifications of the manufacturer. Then a chlordane solution should be spread on the entire sub-base surface. This operation should be carried under the observation of ICRC engineer.

Also chlordane solution should be spread under the foundation before casting (i.e. over the broken brick layer AND/OR before casting the lean concrete layer).

7. Brick Work:

Brick used shall have plan surfaces free from gypsum (new brick), well-fired, with no cracks.

All bricks on fair face surfaces are to be perfect. Cracked bricks with chipped edges will be rejected. Walls are considered fair face on both sides. On both sides of the walls, it is not allowed to have a continuous joint in any two successive rows.

All brickwork shall be carried up evenly and no brickwork shall rise more than 1 meter above any adjoining work being executed at the same time.

For partition walls, the contractor will be paid just for the surface of the wall (from the elevation of the bottom of water proofing layer up to the partition end elevation). The price of laying and compacting broken brick and that of laying lean concrete (blinding) should be included in that price and will not be paid separately.

8. Doors and Windows:

1. For doors in new walls, the frame should be of **BROWN HARD WOOD** (jawi) of 3"x4" cross sectional dimensions, to be fixed during construction with not less than 3 pairs of connecters to the walls. The old frames are to be treated with sand paper and then painted as the new door frames. New door to be fixed on the old treated frame.
2. Aluminium Windows should be installed just after rendering the walls (before plastering for internal walls), after installing the windows, the walls to be plastered to close all possible gaps between the windows frames and the adjacent walls.
3. The aluminium used should be of 1mm section thickness and of the best quality; the colour of the aluminium should be the material colour not a painting or coating. The glass is normal glass 6mm thickness.
4. From outside, that gap should be filled by injecting a mixture of cement mortar and SBR according to manufacturer's specifications.

9. Concrete Works:

ICRC engineer shall inspect all structural concrete components once all shuttering and steel reinforcement is prepared, prior to casting of concrete. If concrete casting of any part done without written permission from Head of Project (HoP), the HoP have the right to demolish that part and the

contractor will be responsible on casting it again without any additional price for demolishing and re-casting.
All required tests on concrete should be done under supervision of ICRC engineer and on the contractor's expense as mentioned in standards.
Compression strength of all concrete should be **25 MPa**.
All concrete components shall follow the following specifications:

9.1. Cement

Sulfate-Resisting Cement (SRC) meeting Iraqi Organization of Standards IOS.6/1968 must be used in all parts under the water proofing layer (water proofing layer is included).
Portland Cement must meet Iraqi Organization of Standards IOS.5/1984. And it shall be used in all works over water proofing layer (unless otherwise mentioned).

9.2. Sand

Sand must be cleaned to be free from salts and abnormalities. Sand should be having Sulfate content not exceeding 0.5%. Grading of sand shall be according to IOS No.45/1984. The contractor is responsible on performing the required tests for the sand on his expense.

9.3. Gravel

Gravel must be washed to be free from dust and any abnormalities. Grading of gravel should be according to IOS No.23, with maximum size of 2 cm OR as required in the specific location. The contractor is responsible on performing the required tests for the gravel on his expense.

9.4. Steel Reinforcement

New reinforcing steel must comply with the following British Standards:

- Milled steel and hot-rolled high yield bars and hard-drawn wire: BS 4449.
- Cold worked steel bars: BS 4461.
- Steel fabric reinforcement: BS 4483.

Reinforcement used shall be according to the reinforcement details provided in project drawings. It should be new and shall be cleaned free from any paint, rust or abnormalities.
The columns and beams reinforcements should be interconnected together to provide the required fixity. This should be done under supervision from ICRC engineer.

9.5. Cover Over Reinforcement Bars

Minimum clear cover to reinforcement should be:

- Foundations and Concrete cast against and permanently exposed to earth 70mm
- Concrete not exposed to weather or in contact with ground:
    - Beam 40mm
    - Slabs 20mm

9.6. Mixing and Placing Concrete

All concrete work must follow the mentioned mixing ratio. All concrete for structural purposes must be mixed by machine mixer, for a minimum mixing time of not less than 5 minutes. Structural concrete must be vibrated by mechanical means. While placing the concrete, it shall not be dropped from a height more than 1.2 meters. Time elapsing between the mixture leaving the mixer and placing concrete in position should not exceed 20 minutes.

9.7. Shuttering:

Shuttering shall be either timber or steel and should be cleaned and adjacent one to another to prevent any seepage of water.
All shuttering forms must be designed to accommodate the weight of concrete, labourers and any equipment that they may have to support. Concrete works should be well treated with water after 12 hours of casting.

9.8. Use of Sulfate Resisting Cement (SRC):

For all parts that lie under WP layer (and will be backfilled) the used cement should be SRC. For the columns, they should be cast totally with SRC cement and must be painted with two layers of flint coat for the underground parts.

10. Roofing:

1. The exposed roof slab surface should be cleaned very well from all debris and sand and should be washed.
2. Two layers of prime coat to be applied in opposite directions to the cleaned roof using brushes, each layer being given sufficient time to dry before applying the next layer.
3. The parapet work should be arranged with applying tar layers as shown in drawings and as illustrated in point 7.

4. A layer 0.5 cm thick of liquid tar (20-30) mixture should be applied in a hot condition on the prime coat. Care should be taken in spreading the tar layer in order to avoid any air bubbles from appearing. Any bubbles that do appear must be refilled with liquid tar.
5. Two layers of water proofing felt to be applied (4mm thickness each), between these two layers a liquid tar layer should be applied in hot conditions, with an overlap of 10 cm sealed by asphalt, then another layer of liquid tar is applied in a hot condition as mentioned in point 4 above.
6. The water proofing materials (20-30 Tar, Prime Coat and Felt) should be imported and tested in trusted laboratory to show compliance with NCCL 2001 materials specifications.
7. The waterproof must be raised and interconnected with the parapet, as shown in drawings.
8. Before applying the sand layer, a 5cm thickness corkboard (styroboard) layer to be arranged on the roof one beside the other avoiding any gap. Below that layer and over it, a layer of plastic sheets to be laid to protect the corkboards from bitumen and sand.
9. Dry clean river sand (according to roofing specifications) shall be spread throughout the surface to a minimum depth of 5 cm, properly graded to ensure proper slopes towards the new roof drains.
10. Joints to receive the bitumen sealant must be thoroughly cleaned by means of brushes and air blowers and coated by prime coat. The sealant-jointing compound used to fill the joints between the tiles must be of a good quality and perfectly ironed. The testing of this sealant is the responsibility of contractor and it is an essential test to be done before applying the sealant.
11. Before using any material for the roofing, that material should be approved by ICRC engineer. Otherwise, it will be rejected.

11. Rain water drains:
Drains shall be made of Galvanised steel; all openings shall have a strainer. If the old drainpipes are usable, then these pipes should be cleaned and reused again as illustrated in article 21, points 1 & 2.

12. Floors:
Ground under all paved areas shall be levelled and well compacted (refer to article 4), where tiling is to be used, blinding concrete layer shall be cast over the broken brick to a thickness of 5 cm, the surface of the concrete shall be level and ***shall be combed with a wire brush*** to receive the tiles.
If there is a need for backfilling under the tiles to reach the required level, this will be the responsibility of the contractor without any additional price and the refill materials should be clean sub-base and well compacted as illustrated in article 4.
Mosaic tiles shall be first grade tiles of the mechanically compressed type; 40x40 cm well shaped with straight edges perfectly flat and not grinded.
The price of applying tiles shall include grinding the surface 6 times (with 6 different stone degrees) with mechanical grinder to result in a smooth and polished surface.

13. Plumbing Work:
Supply and install new plastic pipes (the welded type) for cold water, main distribution system and branches with all accessories, fittings, valves unions, extensions.
All pipes are to be erected on the walls (using appropriate clamps) at a height of 25 cm. The contractor is requested to submit samples of pipes and fittings etc. for acceptance.
The holes in the walls should be made by proper drill to make the opening exactly as the required size, if the drilling results in bigger holes, the openings should be well filled with appropriate epoxy.

14. Pipe laying:
PVC pipes, (Sewage)
PVC sewage pipes should be laid after assuring the correct depth and slop on 100 mm thick compacted selected material (usually sand), as bed layer for sewage pipe then back filling between the sides of the trench and pipe with non-compacted layers of selected sand 75 mm in thickness. Tamp each layer firmly with a hand tamper until the level of the crown of the pipe is reached, taking care to ensure that no voids are left under the pipe. Displacement of the pipe should be prevented by the simultaneous filling and evening of compaction materials on either side of the pipe. Then the selected sand material should be placed in even and non-compacted layer of 150 mm in thickness over the entire width of the trench to a height of 300 mm above the crown of the pipe. All layers must be firmly tamped by hand. The remaining of the trench is filled in layers of 300 mm thickness;

excavated trench materials can be used. Each layer must be firmly tamped, the first layer by hand and then by mechanical means if ordered by ICRC engineer.

15. Manholes:
Oven-backed clay bricks are used for the walls of the manholes, with cement mortar (1:3) mix as binding materials. Thickness of binding material should be 1-1.5 cm; bricks should be soaked in water for a period not less than 6 hours before being used. The manhole walls should be rendered both sides with cement mortar (SRC 1:3 mixing ratio) to result in a smooth surface.

16. Cast Iron Covers used in Septic Tanks and Manholes:
All covers and frames should be made of cast iron and should be manufactured in accordance with standards or equivalent specifications accepted by ICRC engineer medium duty covers and frames should be used and coated with bituminous paint after manufacture.

17. Electrical Work:
All works shall be done according to the following work specifications as well as in accordance with Iraqi Ministry of Planning "Conditions and Specifications for Electrical Works".

- All wiring installations are to be exposed using flat cable and hidden wiring.
- At all rest points, junction boxes and wherever splicing in necessary, electrical connection connectors shall be used (rather than insulation tape) this should be done according to instructions of ICRC engineer.
- For all electrical works, all the items means (even if not mentioned in BoQ) supply, install, connect, test and leave in good working conditions.
- For all wiring work, it should be recognized that the wiring should start from the nearest DB to the final destination.

18. Debris:
All debris is to be carried off site to an area accepted by the municipality and the respective Directorate.

19. General Conditions and Legal Obligations on the Tender Items:

1. Referring to the BoQ, any material that will be re-used, a reduction in the price of any item uses this material should be applied on the BoQ in agreement between the Head of Project and the Contractor.
2. For all materials that could be reused, the contractor should submit a separate list with two prices, price for new item (supply and install with all accessories) and another price for reused item (maintaining and re-install in its new location). After awarding the contract, if any material is reused without informing ICRC engineer, ICRC have the right to refuse that item or reduce its submitted price.
3. For the old building foundation removal, the price should include all the necessary excavations required to remove these foundations.
4. For the water supply pipes and for sewage pipes, any reusable parts should be maintained and reused again, the contractor should prepare a list for this material according to instructions and approval of ICRC engineer.
5. Any item that appears no more needed should be cancelled and according to instructions of ICRC engineer.
6. All the materials and tools have to be supplied by the contractor.
7. All the construction materials (sand, gravel, brick, etc…) must be new, best available in the market, in line with Iraqi specifications for civil works and tested according to the Nccl.
8. In the offer, new equipment, material must be detailed with its specifications (origin, brand, type and technical specifications).
9. ***All materials are to be approved by the ICRC engineer*** prior to use (samples of all materials are to be provided before supplying).
10. All items should be done according to instructions of HoP, even if not mentioned in BoQ.
11. The items description hereinafter means "supply of materials, manpower, transportation, equipment, tools, machinery, etc..." and all that is required to complete the works.
12. The quantities listed in the Bill of Quantities are not fixed. It is subject to change (increase or decrease and the contractor will be ***paid for the executed quantities only***).
13. The contractor must appoint specialized engineer(s) during the entire reconstruction period.
14. The contractor is to guarantee his work for a period of 12 months for rehabilitation works.

20. Abbreviations:

Following are the abbreviations that were used in this document (and in BoQ):

Abbreviation	***Description***
BoQ	Bill of Quantities
BS	British Standards
DoH	Directorate of Health
HoP	Head of Project (i.e. responsible ICRC engineer)
ICRC	International Committee of the Red Cross
IOS	Iraqi Organization of Standards
M.D.B.	Main Distribution Board
NCCL	National Center for Constructional Laboratories
R.C.	Reinforced Concrete
SRC	Sulfate Resistant Cement
STD	Standards
WP	Water Proofing