

Technical Requirements and Scope of Works

Introduction.

UNDP, in their emergency task entrusted to them by the Dutch Government, is in the process of organizing the execution of roof repairs/rebuilds damaged and blown off by hurricane Irma. The more roofs that can be repaired /rebuild according to a “build back better” principle, before entering a new hurricane season, the better. UNDP has committed itself to a close cooperation with local authorities, in this case with the Ministry of VROMI (Housing, Spatial planning and the Environment). Some 500 houses are listed up till now from which 150 houses have been assessed by VROMI to start with. This tender will focus only on 75 houses that have been assessed. UNDP will start a parallel procurement to that of VROMI for roof repairs based on a combined procurement of materials and contractors. The selection of dwellings for roof repairs is based on the existing VROMI list. The present document entails the specifications of the works and deliveries in a three (3) LOT procurement system, with each lot representing construction of roofs for 25 houses.

Definition of the works

Purpose of the present document.

To give clear guidance in the form of a general works description by which the contractor(s) can provide and formulate their bidding prices for the works/services to be carried out.

To successfully execute the works and deliveries needed to repair/rebuild the damaged roofs with a higher hurricane resistance standard.

Contract buildup

The contract is divided into three (3) separate LOTS of equal quantities:

LOT 1a: ROOF REPAIR/REBUILD -25 HOUSES

LOT 1b: ROOF REPAIR/REBUILD -25 HOUSES

LOT 1c: ROOF REPAIR/REBUILD -25 HOUSES

The houses are in the following district identified in the table 1 below:

Table 1- Number of houses by Location

Sint Maarten Districts	Number of houses
Cay Bay	3
Cole Bay	7
Cul de sac	7

Sint Maarten Districts	Number of houses
Dutch Quarter	4
Middle Region	6
Philipsburg	6
South Reward	15
St. Peters	16
Sucker Garden	11
	75

Building and construction material are to be provided to the awarded contractor/s.

UNDP will be sourcing all required building and construction materials which will be stored in a central storage location in Cole Bay. Awarded contractors will then have to a) visit the site, b) collect debris c) transport debris to disposal location, c) collect materials, d) transport to site.

A tenderer may apply simultaneously for one or more lots, depending upon their equipment range, capacity and resources available.

UNDP may award more than one (1) LOT to one or more contractors.

Duration

The execution time per lot will be determined individually; however, the Program closing date is June 30th, 2018. (meaning that all construction works must be completed prior to this date).

Deliverables and works

LOT 1a to LOT 1c. To execute the roof repairs/rebuilds of selected roofs in accordance with the specifications indicated in the specifications and construction drawings.

Scope of Works: LOT1a to LOT 1c

General specifications

It is custom on the island of Sint Maarten and in many other countries that labor costs are priced on a m2 house surface price. The m2 unit prices requested in this RFQ represents all the labor activities that can be required, dependent on the condition of the roofs to be repaired/rebuild.

This however, does not mean that one can simply add all items of the labor activities to have the total price/m2. If any of the labor elements from (a) to (h) on the price schedule are not part of the final works on the roof, no payment would be made on that labor element.

Contractors would be paid the m2 unit prices any of the labor elements from (a) to (h) on the price schedule of based on identified, actual labor activities conducted on each roof, of each LOT.

The following conditions must be met by all contractors:

- The selected contractor(s) will, prior to the start of work at each roof to be repaired/rebuild, must be familiar with the structures, the vicinity and sometimes small free space available for doing the work and storage of materials of construction.
- The contractor, once collected and signed off for the materials he needs for the execution of the approved roofing plan in the VROMI depot, is fully responsible for its security and proper use.
- All damaged roof material must be removed from site to a designated located location, approved by VROMI
- No debris should be left, once the repairs/rebuild of the roof is finished and approved
- The contractor must possess the right equipment to carry out the works as specified.
- Contractor must exercise full coordination with respective local councils and UNDP representatives at all stages of work.

Laying out of the roof

The laying out of the roof elements must be done with the appropriate equipment, such as levels, tape, measures, squares etc., in accordance to the drawing provided.

Roof shape

If a complete new roof has to be placed/constructed, the roof shape shall be preferably a hip shape with a roof slope angle of at least 26 degrees. This means that whenever possible an existing but very damaged gable roof will be replaced by a hip shape roof, which in turn means dismantling of the masonry top gable part.

Cutting off of an existing ring beam, connection of rafters and level up.

The cutting of the ring beam must be done with a jackhammer or cold chisel. The use of sledge hammer for cutting the ring beam is not allowed.

1. In case that a damaged house has an intact ring beam (no signs of fissures) placed on walls with intact concrete columns the ring beam should be cut off to such a level (min of 7 cm stirrups exposed) that the new to place rafters can be placed on top; connected to existing exposed stirrups by an 5/8" rod drilled through the rafter. Rafter should be placed at a max. of 60 cm spacing etc. See for details: drawing no. 01, 02, 03. In the case that the required roof slope (and thus the rafters) angle implies bending of the rafter bolt (bar) to connect to the stirrups (U-shape bending); this has to be executed.

2. In case that a damaged house has an intact ring beam (no signs of fissures) placed on masonry walls with no concrete columns present steel bars (3/8") should be introduced, after cutting of the ring beam (to a min. of 7 cm stirrups height exposed), and placed in drilled through holes of the ring beam into every 3rd masonry hole to a minimum of at least two masonry layers. The masonry steel bars will have to be fixed by concrete epoxy and the bent top to be connected to the exposed stirrups. This is then followed by the rafter connection procedure described in point 1. See for details: drawing no. 01, 02, 03
3. In case that no ring beam is present and only masonry walls are present, the procedure for a complete new ring beam (at least 40 cm height) follows the procedure as described in point 2 with respect to the introduction of steel bars into the masonry walls before the form work, the reinforcement (6 continuous bars ½" and stirrups 3/8" every 20 cm) and the rafter connection to the stirrups, takes place. See for details: drawing no. 01, 02, 03
4. After placing and connection of the masonry steel bars and the rafter steel bar, and before the pour can take place, form work shall be placed including the first connection of rafters to the ridge board and jack rafters to the hip rafter (roof framework). The preferred roof shape is a hip roof with a roof slope angle of at least 26 degrees. The contractor shall inform the Supervisor two working days in advance of the intended pour.
5. After all preparatory reinforcement works are ready, the rafters placed and bolted, and on a provisionally fastened to the ridge board and to the hip rafter and the form work placed, the concrete is to be poured according to existing practices (guarantee of continuous pouring). The ring beam concrete is to be poured onto the roof's plywood (top of rafter). As such all rafters shall be embedded and bolted into a ring beam of at least 40 cm height.
6. The concrete shall be properly compacted by vibrating. Test cubes of the pour shall be made for later UCS testing (UCS > than 3500 psi). After first 7 days of hardening the first roofing buildup works may start.

Buildup of the roof

The buildup of the roof shall be according to the drawings 01, 02 and 03. After 7 days of (21 days) hardening of the ring beam, the preliminary roof framework can be definitively fastened

1. After proper fastening of the roof frame work (truss), including the hurricane ties between rafters and ridge board, a rafter chord shall be inserted at 1/3 height from the ridge board connecting opposite rafters; only between those rafters perpendicular to the ridge board.
2. This is followed by the plywood, the felt, the battens and the roof sheets. Special attention should be paid to the rafter overhang of maximum 10 cm.

3. Cap sheets and flashings (fascia board to roof sheets) shall be installed and fastened. Screws of sufficient lengths shall be applied for all roof constructions; nails are not allowed.

General Remarks

Simultaneous works

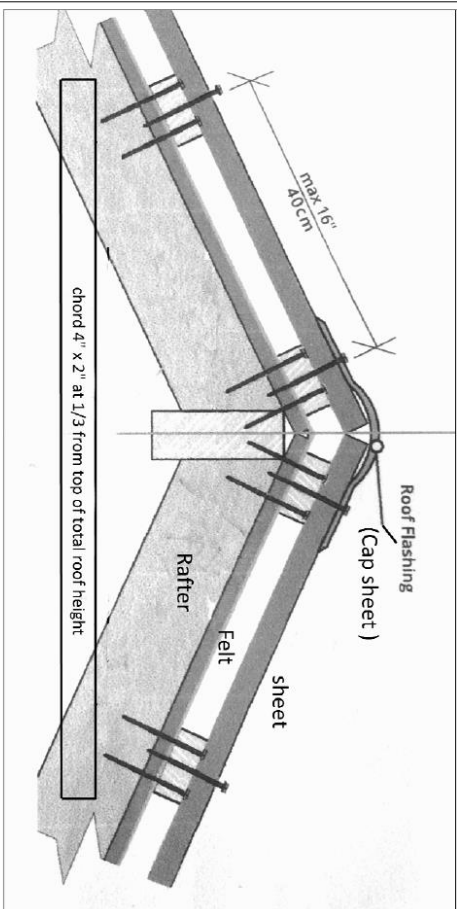
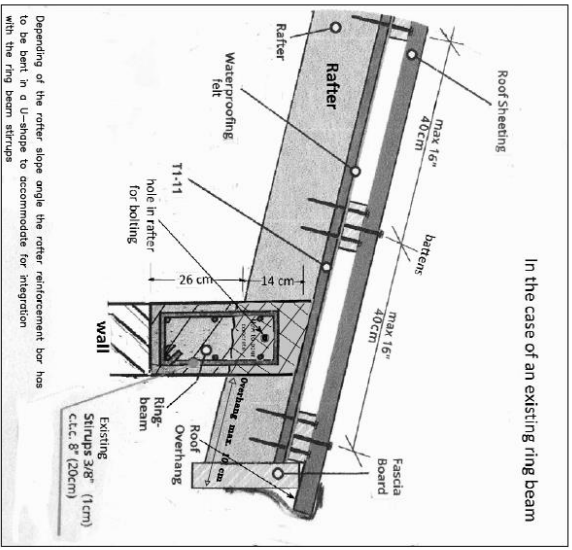
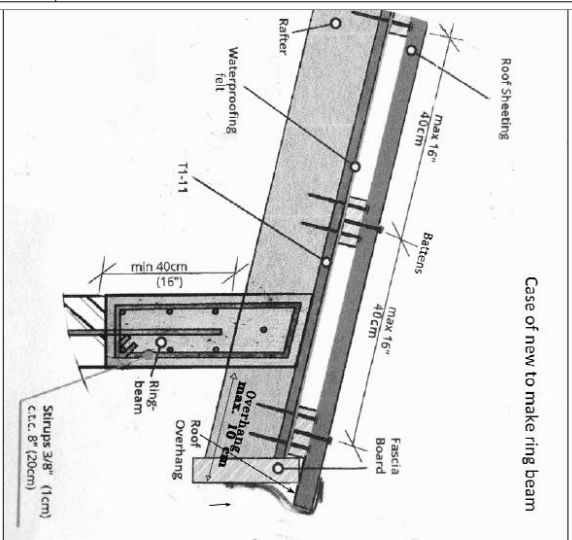
As the next hurricane season approaches quickly, a contractor may simultaneously work on different houses; i.e. in different areas of the island; but only on approved and selected houses. This means that he may collect simultaneously from the VROMI depot those materials needed for different repairs; always to be signed off for, including stating the applicable house

Reference to Detailed drawings

The detailed drawing specifications for the roof repairs/rebuild are given below.

This document forms part of the Tender documents and the Contractual Specifications

DETAILED DRAWINGS



Rafters

- All wood wolmanized / termite treated
- 2x4" (61 cm) on centers
- Rafter size:
 - For buildings inland and on not on hill slope:
 - Free span of less than 3 meters (10 ft): 3"x6"
 - Free span of less than 4.20 meters (14 ft): 3"x8"
 - For buildings close to coast and on hill slopes:
 - Free span of less than 2.5 meters (8.5 ft): 3"x6"
 - Free span of less than 3.9 meter (13 ft): 3"x8"

Roof Overhang: Max. 4" (10 cm)

2"x4" Battens

- All wood wolmanized / termite treated
- Perpendicular to rafters, spacing 80 cm (32") on center
- Along roof edges: first 3 battens spaced 40 cm (16") on center
- Fastening: 2 x 4" long screws, diameter 5 mm, on every crossing with a rafter

Waterproofing

- Felt or other
- Fixation by 2"x4" battens

Ringbeam

- All rafters have to be anchored in a ringbeam
- Ring beam size minimum 40 cm (16") under rafter
- Steel reinforcement: minimum 6 bars diameter 3/8"
- Strups size 3/8", 20 cm (8") on center
- Strups have to continue between rafters space
- between rafters has to be filled with solid cast concrete
- Anchoring of rafters with continuous steel reinforcement bar, diameter 5/8", passing trough hole drilled in rafters, fully embedded in concrete, and anchored by the strups

Legend

NO	DATE	REVISION	BY	TO	SCALE	NOT TO SCALE
1	2018/05/01					
DRAWN BY: YOUSSEF						
PROJECT NO: 01						
DRAWING NO: 01						
DATE: 2018/05/01						
PROJECT: EMERGENCY HOUSING SITE MAINTENANCE						

Roofsheeting (corrugated sheets)

- Steel, galvanized , minimum thickness 0.75 millimeter (22 Gauge)

Fasteners: Screws diameter 6 mm (1/4")

Long 3" (75 mm) to penetrate at least 25 mm (1") into 2"x4" batten

Pre-drilled trough metal sheet

Screws with metal cap and rubber ring

Along roof edges: One screw every other wave approx. 15 cm (6") on centers

on every 2"x4"

Batten in roof field: One screw every fourth wave : approx. 30 cm (12") on centers, on every 2"x4" batten

Fascia Board

- All wood wolmanized/ termite treated
- 2"x8" for 3"x6" rafters, 2"x10" for 3"x8" rafters
- Fastened to rafters: 2 x 4" screws per rafter

Legend

Steel Metal Flashings

- On roof edges and ridges, galvanized,

metal thickness 0.75 mm (22 gauge)

Fastening: On roof: screws into bat 2"x4" batten,

screws 3" diameter 6 mm (1/4"),

on every other wave of the roofsheet below.

On roof side into fasciaboard, screws long 1" ,

2 screws each line, spacing 15 cm

T1-11 or Plywood (size 4'x8')

- All wood wolmanized / termite treated

- Minimum thickness 5/8" , Exterior quality.

- Placing pattern: Staggered

- Fastening: 3" screws, spacing 30 cm (12") on center,

- on each rafter, 27 screws per sheet.

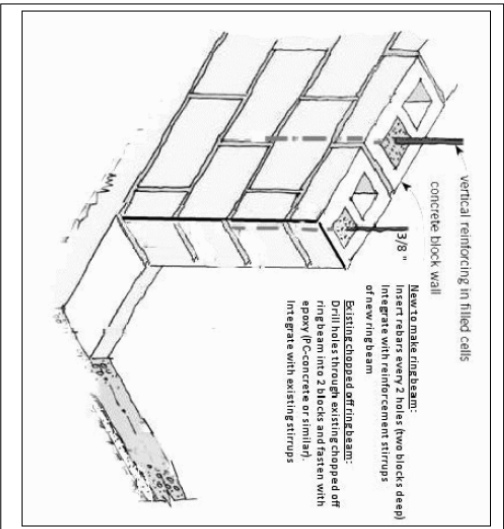
Guidelines for the reinforcement of existing masonry block walls

- Ring beams: all walls , exterior and interior, load bearing and non-loadbearing, to be built with reinforced concrete ring beams, at least 40 cm high);

- Hollow block masonry walls must have every other core filled with concrete and a steel reinforcement bar diameter 3/8"

- Openings in walls need reinforcement around openings

Legend



NO.	DATE	REVISION	SCALE	UNIT TO SCALE
1	11/27/10	000/000	1:100	1:100
DESIGN BY: T. B. B. B.				
PROJECT NO. 12				
DRAWING NO. 12				
UNIVERSITY OF THE SOUTH ALABAMA				

