REINFORCED CONCRETE
1. DESIGN IS TO BS 8110
2. CONCRETE GRADES ARE TO BE AS
   FOLLOWING WITH FIGURES IN BRACKET
   DENOTING MAXIMUM SIZE AGGREGATE:
   - FLOOR: 30Kg/m³
   - COLUMNS: 30Kg/m³
   - BEAMS & SLABS: 30Kg/m³
3. UNLESS OTHERWISE INDICATED, REINFORCEMENT SHALL BE HIGH
   YIELD TYPE 2, DESIGNATED BY "Y", HAVING CHARACTERISTIC
   STRONGER NOT LESS THAN 410N/MM²
4. COVER TO REINFORCEMENT SHALL BE:
   - FLOOR: 50MM (BOTTOM) 75MM (SIDES)
   - COLUMNS: 25MM
   - BEAMS: 25MM
   - SLABS: 20MM
5. DRAWINGS MUST BE READ IN CONJUNCTION WITH THE
   RELEVANT ARCHITECTURAL DRAWINGS AND IN CASE OF ANY DISCREPANCY
   REFER TO THE DESIGN ENGINEER FOR CLARIFICATION.
6. DIMENSIONS ARE IN MILLIMETRE (MM) AND MUST NOT BE SCALED AT ANY
   TIME.
7. FOUNDATION WAS DESIGNED FOR AN ASSUMED ALLOWABLE SOIL BEARING
   PRESSURE OF 150KN/M²
8. THIS DESIGN ENGINEER WILL NOT TAKE RESPONSIBILITY FOR ANY JOB NOT
   SUPERVISED BY HIM.

BLOCKWORK
1. Hollow block walls below ground slab level are to be filled with mass
   concrete, back filling is to be carried out simultaneously on both sides.
2. The wall thickness of the blocks should not be more than 200mm.
3. The maximum crushing strength of the hollow block is to be 20N/MM².
4. Blockwork ties between blockwork wall and columns/stands are to be
   provided at every course, ties to be 6MM BAR STRAPS 700MM LONG INTO
   THE BLOCKWORK.
5. Maximum pour height for all filled block blockwork to be 2 COURSES AT A
   TIME.
6. ALL SERVICE PIPES SHALL ONLY BE PUT INSIDE BLOCKWORK AFTER THE
   FOUNDATION AND FRAMEWORK ARE COMPLETELY CONSTRUCTED AND
   CERTIFIED BY THE STRUCTURAL ENGINEERS. PUTTING SERVICE PIPES INSIDE
   LOAD BEARING BLOCKWORK CORNERS MUST BE AVOIDED.

GENERAL NOTES
1. Issued for Tender

HOMES FOR NGARANNAM,
MAFA LGA, BORNO.
**Foundation Details** (Section 2-2)

- **450x450x15mm Base Plate** welded to UC H-Column connected with 4No. 20mm Dia. Long HD Bolts and washer and 350x350x8mm Anchor Plate at the bottom.

- **Column footing of 1200 x 1200mm**
- **Blinding of 50mm thick** and footing depth of 350mm

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**General Notes**

1. **Design** is to BS 8110
2. Concrete grades and to be as shown below
3. **Foundation** to be designed for an assumed allowable soil bearing pressure of 150kN/m²
4. **Ground Level**
5. **1:50 Scale:**
6. **Sheets:**
7. **Foundation Details**
8. **Drawing Title:**
9. **In Issued for Tender:**
10. **No.**
11. **Revision/Notes:**
12. **Date:**
13. **CAD Design:**
14. **Checked:**
15. **Drawings and archtectural drawings and in case of any discrepancy refer to the design engineer for clarification.
16. **Dimensions are in millimeter (mm) and must not be scaled at any time.
17. **Foundation was designed for an assumed allowable soil bearing pressure of 150kN/m².
18. Cover to reinforcement shall be the following for foundation:
   - **Bottom:** 50mm
   - **Sides:** 75mm
   - **Columns:** 25mm
   - **Beams:** 25mm
   - **Slabs:** 20mm
19. **Reinforcement shall be high yield steel (type 2), denoted by “Y”, having characteristic strength not less than 410N/mm².
20. **Concrete Grades are to be as follows with figures in bracket denoting maximum size aggregate:**
   - **Foundations:** 30(25)
   - **Columns:** 30(20)
   - **Beams & Slabs:** 30(20)
21. **Cover to reinforcement shall be the following for columns:**
   - **Reinforcement to be high yield steel (type 2), denoted by “Y”, having characteristic strength not less than 410N/mm².
22. **Blinding of 50mm thick and footing depth of 350mm.
23. **Drawing must be read in conjunction with the relevant architectural drawings and in case of any discrepancy refer to the design engineer for clarification.
24. **Service pipes shall only be put inside blockwork after due consultation with structural engineers. Putting service pipes inside long bearing blockwork corners must be avoided.
25. **Homes for Ngarannam, Mafa LGA, Borno.**

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**Reinforced Concrete**

1. Design is to BS 8110
2. Concrete grades are to be as shown below
3. Foundation to be designed for an assumed allowable soil bearing pressure of 150kN/m²
4. Dimensions are in millimeter (mm) and must not be scaled at any time.
5. Foundation was designed for an assumed allowable soil bearing pressure of 150kN/m².
6. Design engineer will not take responsibility for any job not supervised by him.
7. Hollow blockwalls below ground slab level are to be filled with mass concrete. Back filling is to be carried out simultaneously on both sides.
8. The maximum crushing strength of the hollow block is to be 20N/mm² of gross area of block at 28 days.
9. Blockwork ties between blockwork wall and columns/stand are to be provided at every course. Ties to be 6mm x 90mm x 90mm long into the blockwork.
10. Maximum pour height for all filled block blockwork to be 2 courses at a time.
11. All service pipes shall only be put inside blockwall after due consultation with structural engineers. Putting service pipes inside long bearing blockwork corners must be avoided.

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**Blockwork**

1. Issued for Tender
2. Homes for Ngarannam, Mafa LGA, Borno.
1.5mm thick Anti-Rust coated roofing sheet

TOWER FRAME TOP

127 x 76 x 13 UB
Secondary Beams

152 x 89 x 16 UB
Primary Beams

8mm thick Anti-Rust Coated Steel Sheet
Connection Details

6mm thick Gusset plate welded to H-column, Bracer Beam and bracing

125 x 70 x 10 UB
Bracer Beam

50 x 50 x 4mm thick Angles
Bracings

152 x 152 x 37 UB
Stanchion

450 x 450 x 15mm Base Plate welded to UC H-Column connected with 4No. 20mm Dia. Long HD Bolts and washer and 350 x 350 x 8mm Anchor Plate at the bottom

450 x 450 x 15mm Base Plate welded to H-column, Bracer Beam and bracing

50 x 50 x 4mm thick Angles
Bracings

6mm thick Gusset plate

50 x 50 x 4mm thick Angles
Bracings
HOMES FOR NGARANNAM, WATCH TOWER WELFARE FACILITY MAFA LGA, BORNO.

ISSUED FOR CONSTRUCTION
NOTE
Figured dimensions must be taken in preference to unfigured dimensions.
Contractors, subcontractors and suppliers must verify all dimensions on site before commencing any work or making any shop drawings.
All timber to be pressure treated with anti-fungal and anti-insect on approved treatment.
All Internal Doors to have 25mm undercut to avoid internal pressure build-up.

HOMES FOR NGAARRAMNAM, MAFIA LGA, BORNO.
ISSUED FOR CONSTRUCTION

WATCH TOWER WELFARE FACILITY FLOOR AND ROOF PLANS
SECTIONS A-A AND B-B

Scale: 1:25
Date: JANUARY 2022
Drawn No. A435-12-205
Suff A

1 : 25
GROUND FLOOR PLAN
1
1 : 25
ROOF PLAN
2
1 : 25
SECTION A-A
3
1 : 25
SECTION B-B
4

REVISION A
13/01/2022
50 X 50 X 2MM HOLLOW PIPES AND ANGLE IRON TO BE USED FOR THE COLUMNS, FRAMING, BRACING AND ALSO ROOF MEMBERS INSTEAD OF TIMBER
Scale: 1 : 25

Date: JANUARY, 2022

HOMES FOR NGARANNAM, MAFA LGA, BORNO.

REVISION A
13/01/2022

50 X 50 X 2MM HOLLOW PIPES AND ANGLE IRON TO BE USED FOR THE COLUMNS, FRAMING, BRACING AND ALSO ROOF MEMBERS INSTEAD OF TIMBER

NOTE
Figured dimensions must be taken in preference to dimensions.

Contractors, subcontractors and suppliers must verify all dimensions on site before commencing any work or making any shop drawings.

All timber to be pressure treated with anti-fungal and anti-infection on approved treatment.

All internal doors to have 25mm undercut to avoid internal pressure build up.

Issued for construction.
**GENERAL NOTES.**

1. **Issued for Tender**

2. **Project:**
   - HOMES FOR NGARANNAM, MAFA LGA, BORNO.

3. **Drawing Title:**
   - SECTION Y-Y

**REINFORCED CONCRETE**

1. DESIGN IS TO BS 8110
2. CONCRETE GRADES ARE TO BE AS FOLLOWS WITH FIGURES IN BRACKET DENOTING MAXIMUM SIZE OF AGGREGATE:
   - FOUNDATION: 30(25)
   - COLUMNS: 30(20)
   - BEAMS & SLABS: 30(20)
3. UNLESS OTHERWISE INDICATED, REINFORCEMENT SHALL BE HIGH YIELD STEEL (TYPE 2), DENOTED BY ‘Y’, HAVING CHARACTERISTIC STRENGTH NOT LESS THAN 410N/MM²
4. COVER TO REINFORCEMENT SHALL BE THE
   - FOUNDATION: 50MM (BOTTOM) 75MM (SIDES)
   - COLUMNS: 25MM
   - BEAMS: 25MM
   - SLABS: 25MM
5. BLOCKWORK TIES BETWEEN BLOCKWORK WALL AND COLUMNS/STANCHIONS ARE TO BE PROVIDED AT EVERY COURSE. TIES TO BE 6MM BAR STRAPS 700MM LONG INTO THE BLOCKWORK.
6. MAXIMUM POUR HEIGHT FOR ALL FILLED BLOCK BLOCKWORK TO BE 2 COURSES AT A TIME.
7. ALL SERVICE PIPES SHALL ONLY BE PUT INSIDE BLOCKWORK AFTER THE CONCRETE IS CURED. ALL SERVICE PIPES INSIDE LOAD BEARING BLOCKWORK CORNERS MUST BE AVOIDED.
GENERAL NOTES:

1. DESIGN IS TO BS 8110
2. CONCRETE GRADES ARE TO BE AS
   FOLLOWING:
   - FOUNDATION: 30(25)
   - COLUMNS: 30(20)
   - BEAMS & SLABS: 30(20)
   - UNLESS OTHERWISE INDICATED, REINFORCEMENT SHALL BE HIGH YIELD STEEL(TYPE 2), DENOTED BY ‘Y’, HAVING CHARACTERISTIC STRAIN LIMIT NOT LESS THAN 45000.
3. COVER TO REINFORCEMENT SHALL BE
   - FOUNDATION: 75MM
   - BARRIER & BARRIERS: 25MM
   - DRAWINGS MAY BE RENDEZVOUS COLLECTION
   - DIMENSIONS ARE TO BE IN MILLIMETRES, ALL LENGTHS ARE TO BE IN METRES.
   - DRAWINGS MAY BE RENDEZVOUS COLLECTION
   - DIMENSIONS ARE TO BE IN MILLIMETRES, ALL LENGTHS ARE TO BE IN METRES.
   - DRAWINGS MAY BE RENDEZVOUS COLLECTION
   - DIMENSIONS ARE TO BE IN MILLIMETRES, ALL LENGTHS ARE TO BE IN METRES.
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   - DIMENSIONS ARE TO BE IN MILLIMETRES, ALL LENGTHS ARE TO BE IN METRES.
   - DRAWINGS MAY BE RENDEZVOUS COLLECTION
   - DIMENSIONS ARE TO BE IN MILLIMETRES, ALL LENGTHS ARE TO BE IN METRES.
4. DRAWINGS MUST BE READ IN CONJUNCTION WITH THE RELEVANT ARCHITECTURAL DRAWINGS
   - BLOCKWORK TIES BETWEEN BLOCKWORK WALL AND COLUMNS/STANIONS ARE TO BE PROVIDED AT EVERY COURSE. TIES TO BE 6MM BAR STRAPS 700MM LONG INTO THE BLOCKWORK.
   - MAXIMUM POUR HEIGHT FOR ALL FLOOLED BLOCKWORK TO BE 2 COURSES AT A TIME.
   - ALL SERVICE PIPES SHALL ONLY BE PUT INSIDE BLOCKWORK AFTER CONCRETE PLACEMENT.
   - ALL REINFORCEMENT DETAILS ARE TO BE PROVIDED.
5. FOUNDATIONS AND REINFORCEMENT ARE TO BE PROVIDED.
   - THE DESIGN ENGINEER WILL NOT TAKE RESPONSIBILITY FOR ANY JOB NOT SUPERVISED BY HIM.
6. DIMENSIONS ARE IN MILLIMETRES AND MUST NOT BE SCALDED AT ANY TIME.
7. FOUNDATION WAS DESIGNED FOR AN ASSUMED ALLOWABLE SOIL BEARING PRESSURE OF 150KN/M2
8. BASIS OF DESIGN IS AS UNIVERSITY OF LONDON.
9. GENERAL NOTES:
   - BLOCKWORK:
   - 1. HOLLOW BLOCKWALLS BELOW GROUND SLAB LEVEL ARE TO BE FILLED WITH MASS CONCRETE. BACK FILLING IS TO BE CARRIED OUT SIMULTANEOUSLY ON BOTH SIDES.
   - 2. THE WALL THICKNESS OF THE BLOCKS SHOULD NOT BE MORE THAN 25MM.
   - 3. THE MAXIMUM CRUSHING STRENGTH OF THE HOLLOW BLOCKS IS TO BE 20N/MM2 OF GROSS AREA OF BLOCK AT 28 DAYS.
   - 4. BLOCKWORK TIES BETWEEN BLOCKWORK WALL AND COLUMNS/STANIONS ARE TO BE PROVIDED AT EVERY COURSE. TIES TO BE 6MM BAR STRAPS 700MM LONG INTO THE BLOCKWORK.
   - 5. MAXIMUM POUR HEIGHT FOR ALL FLOOLED BLOCKWORK TO BE 2 COURSES AT A TIME.
   - 6. ALL SERVICE PIPES SHALL ONLY BE PUT INSIDE BLOCKWORK AFTER CONCRETE PLACEMENT.
   - ALL REINFORCEMENT DETAILS ARE TO BE PROVIDED.
GENERAL NOTES:

1. Issued for Tender

HOMES FOR NGARANNAM,
MAFA LGA, BORNO.

REINFORCED CONCRETE

1. DESIGN IS TO BS 8110
2. CONCRETE GRADES ARE TO BE AS
   FOLLOWED WITH FIGURES IN BRACKET DENOTING MAXIMUM SIZE
   AGGREGATE
   FONDATION: 30(25)
   COLUMNS: 30(20)
   BEAMS & SLABS: 30(20)
3. UNLESS OTHERWISE INDICATED, REINFORCEMENT SHALL BE HIGH YIELD
   STEEL (TYPE 2), DESIGNATED BY “Y” (YIELD CHARACTERISTIC STRAIGHT NOT LESS
   THAN 410N/MM²)
4. COVER TO REINFORCEMENT SHALL BE:
   FOUNDATION: 50MM (BOTTOM) 75MM (SIDES)
   COLUMNS: 25MM
   BEAMS: 25MM
   SLABS: 20MM
5. DRAWINGS MAY BE USED FOR CONSTRUCTION LIMITED TO THE DETAILS AND
   DIMENSIONS SHOWN ONLY. ALL OTHER ITEMS ARE TO BE CONSIDERED AS
   DESIGN ENGINEER FOR CLARIFICATION.
   DIMENSIONS ARE TO BE LUMBERING.
6. FOUNDATION AREA DESIGNED FOR AN ASSUMED ALLOWABLE SOIL BEARING PRESSURE OF
   150KN/M²
7. THIS DESIGN ENGINEER WILL NOT TAKE RESPONSIBILITY FOR ANY JOB NOT SUPERVISED BY
   HIM.

BLOCKWORK

1. HOLLOW BLOCKWALLS BELOW GROUND SLAB LEVEL ARE TO BE FILLED WITH MASS
   CONCRETE. BACK FILLING IS TO BE CARRIED OUT SIMULTANEOUSLY ON BOTH SIDES.
2. THE WALL THICKNESS OF THE BLOCKS SHOULD NOT BE MORE THAN 250MM.
3. THE MAXIMUM CRUSHING STRENGTH OF THE HOLLOW BLOCK IS TO BE 20N/MM² OF GROSS
   AREA OF BLOCK AT 28 DAYS.
4. BLOCKWORK TIES BETWEEN BLOCKWORK WALL AND COLUMNS ARE TO BE PROVIDED AT EVERY COURSE. TIES TO BE 6MM BAR STRAPS 700MM LONG INTO THE BLOCKWORK.
5. MAXIMUM POUR HEIGHT FOR ALL FILLED BLOCK BLOCKWORK TO BE 2 COURSES AT A TIME.
6. ALL SERVICE PIPES SHALL ONLY BE PUT INSIDE BLOCKWORK AFTER CONCRETE CURED. PUTTING SERVICE PIPES INSIDE LOAD BEARING BLOCKWORK CORNERS MUST BE AVOIDED.

FOUNDATION LAYOUT

STOREY: 0 - LEVEL: -3.00m - SCALE: 1/50
**GENERAL NOTES.**

1. **DESIGN IS TO BS 8110**
2. **CONCRETE GRADES ARE TO MEET THE REQUIREMENTS OF**
   **BS 8110 WHERE THE M10 RIVER SAND IS TO BE USED AS**
   **AGGREGATE**
3. **UNLESS OTHERWISE INDICATED, REINFORCEMENT SHALL BE**
   **HIGH YIELD STEEL (TYPE 2) DESIGNATED BY “Y”**
   **HAVING A CHARACTERISTIC STRAINLESS STRENGTH NOT LESS**
   **THAN 410N/MM²**
4. **COVER TO REINFORCEMENT SHALL BE:**
   - **FOUNDATION:** 50MM (BOTTOM) 75MM (SIDES)
   - **COLUMNS:** 25MM
   - **BEAMS:** 25MM
   - **SLABS:** 20MM
5. **DRAWINGS MUST BE READ IN CONJUNCTION WITH THE**
   **RELEVANT ARCHITECTURAL DRAWINGS AND IN CASE OF ANY**
   **DISCREPANCY REFER TO THE DESIGN ENGINEER FOR**
   **CLARIFICATION.**
6. **DIMENSIONS ARE IN MILLIMETRE (MM) AND MUST NOT**
   **BE SCALABLE AT ANY TIME.**
7. **THE DESIGN ENGINEER WILL NOT TAKE RESPONSIBILITY FOR ANY JOB NOT SUPERVISED BY HIM.**

**BLOCKWORK**

1. **HOLLOW BLOCKWALLS BELOW GROUND SLAB LEVEL ARE TO BE FILLED WITH MASS CONCRETE.**
2. **WALL THICKNESS OF THE BLOCKS SHOULD NOT BE MORE THAN 20MM.**
3. **THE MAXIMUM CRUSHING STRENGTH OF THE HOLLOW BLOCK IS TO BE 20N/MM² OF GROSS AREA OF BLOCK AT 28 DAYS.**
4. **BLOCKWORK TIES BETWEEN BLOCKWORK WALL AND COLUMN/TYRES ARE TO BE PROVIDED AT EVERY COURSE. TIES TO BE 6MM BAR STRAPS 700MM LONG INTO THE BLOCKWORK.**
5. **MAXIMUM POUR HEIGHT FOR ALL FILLED BLOCK BLOCKWORK TO BE 2 COURSES AT A TIME.**
6. **ALL SERVICE PIPES SHALL ONLY BE PUT INSIDE BLOCKWORK AFTER DUE CONSULTATION WITH STRUCTURAL ENGINEERS. PUTTING SERVICE PIPES INSIDE LOW BEARING BLOCKWORK CORNERS MUST BE AVOIDED.**
GENERAL NOTES.

1. Design is to BS 8110
2. Foundation beam details not to exceed the maximum size stated in the associated plans.
3. All dimensions are in millimeters and must not be scaled at any time.
4. All beams shall be rebared by the design engineer for clarification.
5. This design engineer will not take responsibility for any job not supervised by him.

REINFORCED CONCRETE

1. Design is to BS 8110
2. Foundation beam details not to exceed the maximum size stated in the associated plans.
3. All dimensions are in millimeters and must not be scaled at any time.
4. All beams shall be rebared by the design engineer for clarification.
5. This design engineer will not take responsibility for any job not supervised by him.

FOUNDATION BEAMS DETAILS

1. Issued for Tender
2. Homes for Ngarananam, Mafa LGA, Borno.
FLOOR BEAMS DETAILS

1. Issued for Tender

HOMES FOR NGARANNAM,
MAFA LGA, BORNO.
**GENERAL NOTES.**

1. **REINFORCED CONCRETE**
   - DESIGN IS TO BS 8110
   - CONCRETE GRADES ARE TO BE AS FOLLOWS WITH FIGURES IN BRACKET DENOTING MAXIMUM SIZE AGGREGATE
     - FOUNDATION: 30(25)
     - COLUMNS: 30(20)
     - BEAMS & SLABS: 30(20)
   - UNLESS OTHERWISE INDICATED, REINFORCEMENT SHALL BE HIGH YIELD STEEL TYPE 2, DESIGNATED BY "Y" HAVING CHARACTERISTIC STRAINLESS NOT LESS THAN 410N/MM²

2. COVER TO REINFORCEMENT SHALL BE THE FOUNDATION: 50MM(BOTTOM)50MM(SIDES)
   - COLUMNS: 25MM
   - BEAMS: 25MM
   - SLABS: 25MM
   - DRAWINGS MAY BE REPRODUCED FOR CONSTRUCTION PURPOSES BUT MUST BE CLEARLY IDENTIFIED AS A COPY AND MUST NOT BE Used AS A REFERENCE OR ACTION WITHOUT WRITTEN PERMISSION FROM THE DESIGN ENGINEER FOR CLARIFICATION
   - DIMENSIONS ARE TO BE USED TO LIMITE DIMENSIONS DESIGNATED BY "+0.30M" AS AN LIMITATION OF THE DESIGNER AND NOT TO BE USED AS A RULE
   - DRAWINGS ARE DESIGNED FOR AN ASSUMED ALLOWABLE SOIL BEARING PRESSURE OF 150KN/M²

3. THE DESIGNER WILL NOT TAKE RESPONSIBILITY FOR ANY JOB NOT SUPERVISED BY HIM.

**BLOCKWORK**

1. HOLLOW BLOCKWALLS BELOW GROUND SLAB LEVEL ARE TO BE FILLED WITH MASS CONCRETE, EXCEPT CELLS TO BE CARRIED OUT SIMULTANEOUSLY ON BOTH SIDES.

2. THE WALL THICKNESS OF THE BLOCKS SHOULD NOT BE MORE THAN 25MM.

3. THE MAXIMUM CRUSHING STRENGTH OF THE BLOCK IS TO BE 20N/MM² OF GROSS AREA OF BLOCK AT 28 DAYS.

4. BLOCKWORK TIES BETWEEN BLOCKWORK WALL AND COLUMNS ARE TO BE PROVIDED AT EVERY COURSE, TIES TO BE 6MM BAR STRAPS 700MM LONG INTO THE BLOCKWORK.

5. MAXIMUM POUR HEIGHT FOR ALL FILLED BLOCK BLOCKWORK TO BE 2 COURSES AT A TIME.

6. ALL SERVICE PIPES SHALL ONLY BE PUT INSIDE BLOCKWORK AFTER CONCRETE IS PLACED, PUTTING SERVICE PIPES INSIDE LOAD BEARING BLOCKWORK CORNERS MUST BE AVOIDED.

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**GROUND FLOOR LAYOUT & SLAB R. BAR DETAILS**

STOREY: 1 - LEVEL: +0.30M - SCALE: 1/50

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