A new UNDP building replacing UNDSS old building

United Nations Development Programme (UNDP)
1. Demolition for the two story building.
2. Demolition for the floor tiles then reinstall a new interlock tiles.
3. Dismantling for the revolve door.
4. Demolition for the walls.
5. Demolition the walls and Dismantling the windows in order to be door in all floors except ground floor.
6. dismantle the HESCO to install temporary gate then reinstall the HESCO.
7. Make an opening on the wall as an alternative access to the old building.
8. Demolition for the Plant pit.

A new temporary partition with one layer razor wire
Demolition for the walls
Location: Sana'a, Yemen
Project: UNDP Engineering Unit
Design By: UNDP Engineering Unit
Drawing Type: Architecture
Status: Tender
Date: 13 April 2022

Survey

A New Building Replacing UNDSS Old Building
<table>
<thead>
<tr>
<th>Specification Number</th>
<th>Symbol</th>
<th>Width</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>D5</td>
<td></td>
<td>1.00m</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.20m</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>D3</td>
<td></td>
<td>2.20m</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.90m</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>D2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3,5</td>
<td></td>
</tr>
<tr>
<td></td>
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<td>1,94</td>
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</tr>
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<tr>
<td></td>
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<td>2,7</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0,70</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2,00m</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0,70</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2,00m</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2,00m</td>
<td></td>
</tr>
</tbody>
</table>

**Schedule of Doors**

<table>
<thead>
<tr>
<th>Number</th>
<th>Specification</th>
<th>Width</th>
<th>Height</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Swinging wooden door</td>
<td>1.00m</td>
<td>2.00m</td>
<td>2</td>
</tr>
<tr>
<td>D2</td>
<td>Swinging armored door</td>
<td>0.90m</td>
<td>2.00m</td>
<td>4</td>
</tr>
<tr>
<td>D3</td>
<td>Sliding door</td>
<td>1.00m</td>
<td>2.00m</td>
<td>4</td>
</tr>
<tr>
<td>D4</td>
<td>Sliding door</td>
<td>0.90m</td>
<td>2.00m</td>
<td>1</td>
</tr>
<tr>
<td>D5</td>
<td>Accordion wooden door</td>
<td>0.70m</td>
<td>2.00m</td>
<td>1</td>
</tr>
</tbody>
</table>
Schedule of Materials

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Habash stone</td>
</tr>
<tr>
<td>2</td>
<td>Gray Stucco textured plastering with 2.5cm thickness</td>
</tr>
<tr>
<td>3</td>
<td>White Stucco textured plastering with 2.5cm thickness</td>
</tr>
<tr>
<td>4</td>
<td>White Stucco textured plastering with 5cm thickness</td>
</tr>
<tr>
<td>5</td>
<td>White Mullion Stone with 7.5cm thickness</td>
</tr>
<tr>
<td>6</td>
<td>Red stone with 5cm thickness</td>
</tr>
<tr>
<td>7</td>
<td>Red stone with 10cm thickness</td>
</tr>
</tbody>
</table>

Material Symbol

1 2 3 4 5 6 7
OUTSIDE
MOSQUITO NET
3 TRACK CHANNEL
FIXED GLASS DOUBLE WITH THIK. 6MM for EACH SIDE
ALUMINUM FRAME
OUTSIDE
INSIDE
SECTION A-A

W1 - (1.50m X 1.00m)

OUTER ELEVATION

ALUMINUM FRAME
GLASS WITH THIK. 6MM
MOSQUITO NET
3 TRACK CHANNEL
WALL

PLAN

DETAIL - A

OUTSIDE
MOSQUITO NET
3 TRACK CHANNEL
FIXED GLASS DOUBLE WITH THIK. 6MM for EACH SIDE
ALUMINUM FRAME
OUTSIDE
INSIDE
SECTION B-B

W2 - (1.50m X 1.60m)

OUTER ELEVATION

ALUMINUM FRAME
MOSQUITO NET
3 TRACK CHANNEL
FIXED GLASS DOUBLE WITH THIK. 6MM for EACH SIDE

ALUMINUM FRAME

INSIDE
MOSQUITO NET
3 TRACK CHANNEL
FIXED GLASS DOUBLE WITH THIK. 6MM for EACH SIDE

ALUMINUM FRAME

DRAWING TITLE: Windows Details

DATE: 13 April 2022

DRAWING No.: 13

PROJECT: A New Building Replacing UNDSS Old Building

UNDP Engineering Unit

Location: Sana’a Yemen

UNDP Development Project Programme

DESIGN BY: UNDP Engineering Unit

DRAWING TYPE: Architecture

SITE: Tender
Windows Details

Location: Sana'a - Yemen
Project: UNDP Engineering Unit
Drawing Title: A New Building Replacing UNDSS Old Building
Design By: UNDP Engineering Unit
Drawing Type: Architecture
Status: Tender
Date: 13 April 2022

- **W3** - (0.80m x 1.00m)
- **W4** - (1.00m x 1.40m)
- **W5** - (3.20m x 8.00m)

FIXED GLASS DOUBLE WITH THIK. 6MM for EACH SIDE
ALUMINUM FRAME

FIXED GLASS WITH THIK. 6MM
HEDGE

PLAN

INSIDE
OUTSIDE
SECTION C-C

PLAN

INSIDE
OUTSIDE
SECTION D-D

PLAN

INSIDE
OUTSIDE
SECTION E-E
Doors Details

Location: Sana'a- Yemen
Project: UNDP Engineering Unit
Drawing Title: United Nations Development Programme (UNDP)
Design By: A New Building Replacing UNDSS Old Building
Status: Tender

Drawing No.: 13
Date: 13 April 2022

---

**D1** - (1.00m X 2.20m)

**D2** - (0.90m X 2.20m)
1. Blast-Resistant External Frame size 100 cm X50cm X6mm X 2
2. Blast-Resistant Internal Frame size 50 X100 X3mm.
3. Steel door full metal plate 8 mm two sides (16mm thickness).
4. 45mm *150mm *3 Heavy Weight Hinge / Welded Knuckles / reinforced by steel plate from/to door steel frame.
5. Door closer.
6. A Tube with size 50 mm *50 mm * 3 mm to distribute it each 40 cm horizontal and vertical.
7. Hex Bolt on Concrete Anchor size D 20mm * 20 cm * 6 in all directions
8. Electrical locked
9. Manual lock inside 3* 400mm*30mm *2 in both side with handle and covering the grooves by plate 4mm.
10. Four side sealing strip smoke protection.
11. Handles with steel pipe 1 in Dia
Doors Details

Location: Sana'a- Yemen
Project: UNDP Engineering Unit
Design By: UNDP Engineering Unit
Status: Tender
Date: 13 April 2022

1. Blast-Resistant External Frame size 10 cm X50 cm X6mm X 2.
2. Blast-Resistant Internal Frame size 50 X100 X3mm.
3. Steel door full metal plate 8 mm two sides (16mm thickness).
4. 45mm *150mm *8 Heavy Weight Hinge / Welded Knuckles / reinforced by steel plate from/to steel frame.
5. door closer.
6. A Tube with size 50 mm *50 mm * 3 mm to distribute it each 40 cm horizontal and vertical.
7. Hex Bolt on Concrete Anchor size D 20mm* 20 cm* 6 in all directions each 25 cm.
8. Electrical locked.
9. Manual lock inside 3* 400mm*30mm *2 in both side.
10. Four side sealing strip smoke protection.
11. Handles with pipe 1 in Dia.
12. Glass with 4 cm thickness

D6 -1.5x2.5m
Doors Details

Location: Sana’a - Yemen
Project: UNDP Engineering Unit
Date: 13 April 2022

D7 - (1.00m X 1.00m)

D8 - (1.00m X 2.20m)
Details

Location: Sana'a - Yemen
Project: UNDP Engineering Unit
Drawing Title: A New Building Replacing UNDSS Old Building

Status: Tender

Drawing No.: 13
Date: 2022 April 13

Architecture

Floor Detail

- Ceramic skirt 10cm
- Ceramic tiles 1cm thickness
- Mortar cement 2cm
- Sand 4cm
- Plain concrete 10cm
- Rubble stone masonry 15cm
- Compacted Soil

Roof Detail

- Mosaic skirt 10cm
- Mosaic tiles 2.5cm thickness
- Mortar cement 2cm
- Felt and asphalt insulation
- Plain concrete, not less than 3cm in drain point
- Hollow block slab concrete 30cm thickness
- Plastering 2cm thickness
- water painting

Bathroom Floor Detail

- Wall ceramic tiles 1cm thickness
- Ceramic tiles 1cm thickness
- Mortar cement 3cm
- Sand 15cm
- Bitumen rolls insulator with 4mm thickness
- Plain concrete 10cm
- Rubble stone masonry 15cm
- Compacted Soil

Wall Detail

- Solid cement block (20x20x40cm)
- Concrete lintel (20x20cm)
- Plastering 2cm
- Wall painting
- Window
**Stair Landing Detail**

- **Handrail**
- **Marble tiles 3cm thickness**
- **Slip**
- **Concrete float**
- **Plastering 2cm thickness**
- **Water painting**
- **Marble tiles 2cm thickness**

**Stairs Detail**

- **Handrail**
- **Plate with thickness 3mm**
- **Four bolts**

**Details**

- **Slab concrete 20cm thickness**
- **Plastering 2cm thickness**
- **Water painting**

**Stairs Roof Detail**

- **Reinforced concrete 10cm**
- **Felt 4mm**
- **Wooden plate 16mm**
- **Wooden temper 7x15cm**

**Location:** Sana'a - Yemen

**Project:** UNDP Engineering Unit

**Design By:** UNDP Engineering Unit

**Date:** 13 April 2022
Entrance Stairs Detail

Marble tiles 2cm thickness
Mortar cement 3cm
Slip
Marble tiles 2cm thickness
Mortar cement 1cm
Plain concrete with 10cm thickness
Solid block (15x20x40)cm

Interlock Tiles
Sand 10cm
Compacted Soil

Habash Stone

Basement wall Detail

Plain Concrete With 10cm Thickness

Basalt Stone 50cm thickness

Interlock Tiles
Sand 10cm
Compacted Soil

Habash Stone
Rump Detail

Handrail Stainless Steel bar with (D=50mm)
Handrail Stainless Steel bar with (D=30mm)

Joam Stone with thickness 15cm

Cement Curb

Plain Concrete 10cm with steel bars Ø10mm in both direction

Solid Cement Block with thickness 15cm
Solid Cement Block with thickness 20cm
UNDP/United Nations Development Programme (UNDP)

Project: A New Building Replacing UNDSS Old Building

Location: Sana'a, Yemen

Drawing Title: Perspective

Design By: UNDP Engineering Unit

Drawing Type: Architecture

Status: Tender

Date: 13 April 2022

Drawing No.: 28
Location: Sana'a - Yemen
Project: UNDP Engineering Unit
Drawing Title: Plumbing Work for Basement
Design By: UNDP Engineering Unit
Drawing Type: Architecture
Status: Tender
Date: 13 April 2022
Location: Sana'a - Yemen
Project: UNDP Engineering Unit
Design By: UNDP Engineering Unit
Status: Tender
Date: 13 April 2022

Drainage for Rainwater
Slope 0.50 %
Slope 0.50 %
Slope 0.50 %
Slope 0.50 %
Slope 0.50 %
Slope 0.50 %
Slope 0.50 %
Slope 0.50 %
Slope 0.50 %
Slope 0.50 %
Slope 0.50 %
Slope 0.50 %
Slope 0.50 %
Slope 0.50 %

Architecture
Concrete mixture ingredients shall conform to the Specifications in the table:

<table>
<thead>
<tr>
<th>Concrete Mixture Specifications</th>
<th>Mixture Ingredients</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Concrete</td>
<td>aggregate</td>
<td>ASTM C33M</td>
</tr>
<tr>
<td>Aggregate</td>
<td>aggregate</td>
<td>ASTM C33M</td>
</tr>
<tr>
<td>Water reduction &amp; setting</td>
<td>aggregate</td>
<td>ASTM C33M</td>
</tr>
<tr>
<td>Reading &amp;Checking</td>
<td>aggregate</td>
<td>ASTM C33M</td>
</tr>
<tr>
<td>Reinforcement educts</td>
<td>aggregate</td>
<td>ASTM C33M</td>
</tr>
</tbody>
</table>

Concrete Production:
- Equipment for mixing and transporting concrete shall conform to ASTM C94M or ASTM C685M
- Ready-mix and site mixed concrete shall be batched, mixed, and delivered in accordance with ASTM C94M or ASTM C685M

Preparation Of Equipment And Place Of Deposit:
Preparation before concrete placement shall include:
- All equipment for mixing and transporting concrete shall be clean;
- Forms shall be properly coated;
- Masonry filler units that will be in contact with concrete shall be well-drenched;
- Reinforcement shall be thoroughly clean of corrosion;
- Water shall be removed from place of deposit before concrete is placed.

Mixing Of Concrete:
- All concrete shall be mixed until there is a uniform distribution of materials and shall be discharged completely before mixer is recharged.
- Ready-mix concrete shall be mixed and delivered in accordance with requirements of Standard Specification for Ready-Mix Concrete (ASTM C 94M) or Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing (ASTM C 685M).

Conveying Of Concrete:
- Concrete shall be conveyed from mixer to place of final deposit by methods that will prevent separation or loss of materials.
- Conveying equipment shall be capable of providing a supply of concrete at site of placement without separation of ingredients and without interruptions sufficient to permit loss of plasticity between successive increments.

Depositing Of Concrete:
- Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to rehandling or flowing.
- Concrete shall be carbonized at such a rate that concrete is at all times plastic and flows ready into spaces between reinforcement.
- Concrete that has partially hardened or been contaminated by foreign materials shall not be deposited in the structure.
- Retempered concrete or concrete that has been remixed after initial set shall not be used unless approved by the Engineer.
- Concrete that has been remixed by suitors after placement shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.

Minimum Clear Concrete Cover to Reinforcing Steel:

<table>
<thead>
<tr>
<th>Concrete Cover</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Exposure</td>
<td>Minimum</td>
</tr>
<tr>
<td>Normal Concrete</td>
<td>40</td>
</tr>
<tr>
<td>Exposure to weather or in contact with ground</td>
<td>No. 25 through No. 57 bars</td>
</tr>
<tr>
<td>Not exposed to weather or in contact with ground</td>
<td>No. 40 bars and No. 57 bars</td>
</tr>
<tr>
<td>Bedding</td>
<td>Reinforcement, reinforcement, and rebar</td>
</tr>
</tbody>
</table>

Concrete Class For Structural Members:

<table>
<thead>
<tr>
<th>Concrete Class For Structural Members</th>
<th>Concrete Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Cover</td>
<td>Minimum</td>
</tr>
<tr>
<td>Concrete Exposure</td>
<td>Specifications</td>
</tr>
<tr>
<td>Concrete Exposure</td>
<td>Normal Concrete</td>
</tr>
<tr>
<td>Concrete Exposure</td>
<td>Specifications</td>
</tr>
<tr>
<td>Concrete Exposure</td>
<td>ASTM C33M</td>
</tr>
</tbody>
</table>

Design Criteria:

- Design and construction are in accordance with the JI Standard Slabbing Code Requirements for Reinforced Concrete Structures (ACI 318M-11) & Uniform Building Code (UBC-97) & ASTA
### Table for Mat Foundation

<table>
<thead>
<tr>
<th>Name</th>
<th>Dimensions</th>
<th>Reinforcement Bars</th>
<th>Location</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>On Short Dir.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>On Long Dir.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>On Short Dir.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>On Long Dir.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Table for Isolated Footing

<table>
<thead>
<tr>
<th>Name</th>
<th>Dimensions</th>
<th>Reinforcement Bars</th>
<th>Location</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>On Short Dir.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>On Long Dir.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>On Short Dir.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>On Long Dir.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Notes:

- The table for the Mat Foundation includes columns for Name, Dimensions, Reinforcement Bars, and Location. The quantities are provided in various units, including cm and mm.
- The table for the Isolated Footing follows a similar format, with additional columns for the location and total quantity.
TABLE REINFORCEMENT FOR THE BEAMS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Length (m)</th>
<th>Diameter (cm)</th>
<th>Lower (cm)</th>
<th>Mid</th>
<th>Edge</th>
</tr>
</thead>
<tbody>
<tr>
<td>GB1</td>
<td>20</td>
<td>8</td>
<td>125</td>
<td></td>
<td></td>
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<tr>
<td>GB2</td>
<td>30</td>
<td>8</td>
<td>150</td>
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<td>GB3</td>
<td>30</td>
<td>8</td>
<td>300</td>
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<td>GB4</td>
<td>30</td>
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<td>150</td>
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<td>GB5</td>
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<td>GB8</td>
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<td>GB9</td>
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<td>GB12</td>
<td>30</td>
<td>8</td>
<td>150</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTES:
1. The reinforcement is designed for the beams in the building.
2. The reinforcement is provided in conformance with the project requirements.
3. The reinforcement is designed to withstand the loadings specified in the project.
4. The reinforcement is designed to comply with the relevant standards and codes.
A New Building Replacing UNDSS Old Building

Status: Tender

Drawing Title: Ground Beam and Roof for Tunnel

Design By: UNDP Engineering Unit

Drawing Type: Structure

Date: 13 April 2022
**Detail for Footing and Shear Wall**

- **Dimensions:**
  - Height: 1175mm
  - Width: 700mm
  - Length: 1175mm

- **Steel Details:**
  - 3 Ø 14 for Kwabel
  - 1 Ø 10 each every two bars
  - S shape steel
  - 12 Ø 14

- **Stirrups:**
  - 6 Ø 10

- **Notes:**
  - Additional notes and specifications for the footing and shear wall design.

---

**UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)**

- **Location:** Sana'a, Yemen
- **Design By:** UNDP Engineering Unit
- **Drawing Title:** Detail for Footing and Shear Wall
- **Drawing Type:** Structure
- **Status:** Tender
- **Date:** 13 April 2022
- **Drawing No.:** 7
### Table Reinforcement for Columns in the Basement and Ground Floors

<table>
<thead>
<tr>
<th>Symbol</th>
<th>QTY.</th>
<th>Section</th>
<th>At column middle</th>
<th>At both column ends</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>4</td>
<td>Ø8/120</td>
<td>700mm</td>
<td>1000mm</td>
</tr>
<tr>
<td>C2</td>
<td>4</td>
<td>Ø8/120</td>
<td>700mm</td>
<td>1000mm</td>
</tr>
<tr>
<td>C3</td>
<td>5</td>
<td>Ø8/120</td>
<td>700mm</td>
<td>1000mm</td>
</tr>
<tr>
<td>C4</td>
<td>4</td>
<td>Ø8/120</td>
<td>700mm</td>
<td>1000mm</td>
</tr>
<tr>
<td>C5</td>
<td>2</td>
<td>Ø8/120</td>
<td>700mm</td>
<td>1000mm</td>
</tr>
</tbody>
</table>

**Column for the Basement and Ground Floor**
Detail for the Concrete cornice.

Detail for the ground slab

UNDP Engineering Unit

Sana'a - Yemen

Location:

Project:

Drawing Title: Details for Beams

Design By: UNDP Engineering Unit

Drawing Type: Structure

Date: 13 April 2022

Drawing No.: 24
Solid slab with wooden temper with 10 cm thickness
A New Building Replacing UNDSS Old Building

Staircase

1. 50 ø 16 L=3000 mm
2. 103 ø 16 L=3000 mm
3. 103 ø 16 L=1500 mm
4. 103 ø 16 L=6720 mm
5. 103 ø 16 L=2600 mm

Dimensions:
- 600mm
- 1500mm
- 1300mm
- 3000mm
- 1600mm
- 1800mm
- 300mm
- 5900mm

Date: 13 April 2022

United Nations Development Programme (UNDP)
Location: Sana'a, Yemen
Design By: UNDP Engineering Unit
Drawing Type: Structure
Status: Tender
Drawing No.: 49
1. Reinforced window frames with steel bolts (Hilti-rated) 12mm dia. And 120 mm length into concrete/stone wall each 20 cm.
2. Install (Anti-Shatter Resistance Films).
3. Installation frame catcher, as shown in detail 2.
4. Supply and installation of Metal grill for the windows.
5. Amord Door as shown in detail 1.
1. Reinforced window frames with steel bolts (Hilti-rated) 12mm dia. And 120 mm length into concrete/stone wall each 20 cm.
2. Install (Anti-Shatter Resistance Films).
3. Installation frame catcher, as shown in detail 2.
4. Supply and installation of Metal grill for the windows.
5. Armord Door as shown in detail 1.
1. Reinforced window frames with steel bolts (Hilti-rated) 12mm dia. And 120 mm length into concrete/stone wall each 20 cm.
2. Install (Anti-Shatter Resistance Films).
3. Installation frame catcher. as shown in detail 2.
4. Supply and installation of Metal grill for the windows.
5. Armord Door as shown in detail 1.
Detail 2 Frame Catcher
## ELECTRICAL DRAWINGS

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<tr>
<th>No.</th>
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<td>10</td>
<td>LIGHTING AND POWER SYSTEMS DBS (NON CRITICAL LOAD)</td>
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<td>HVAC SYSTEM ACDBS</td>
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<td>LIGHTING AND POWER SYSTEMS UDBS (CRITICAL LOAD)</td>
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<td>13</td>
<td>MCC SINGLE LINE DIAGRAM</td>
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<tr>
<td>19</td>
<td>EARTHING SYSTEM DETAILS</td>
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FIRST FLOOR
**Final Branch Circuit Panelboard**

**Main Building:**
- Voltage & Freq: 400V/230V - 50Hz
- Main Incomer: 40A - RCBO
- Main Cable Feeder: 4CX105Q.MM XLPE/PVC +E=10

**Location:** Basement Floor

**Panel Ref:** BF-DB
- Panel Type: 10 Way
- ISC: 16 KA

<table>
<thead>
<tr>
<th>Design of Load</th>
<th>Wire Size mm²</th>
<th>Phase Load IN VA R</th>
<th>Y</th>
<th>B</th>
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<th>Y</th>
<th>B</th>
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<td>Reserve</td>
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<td>540</td>
<td>16A</td>
<td>10A</td>
<td>Reserve</td>
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**Total KVA (Connected/Phase):**
- 2340 R Y B
- 2800 R Y B

**Total Connected Load:**
- 3.348 KVA

**Demand Factor:**
- 0.57

**Demand Load:**
- 4.748 KVA

**Circuit Breaker Capacity:**
- IN: 400A
- kVA: 400x1.15
- CB: 40A - RCBO

**Cable:**
- Cross Section Area (CCA) = 4x10 sq.mm XLPE/PVC +E=10

---

**UN Flowers**
- Location: SANAA - Yemen
- Drawing Title: LIGHTING AND POWER SYSTEMS BF-DB (NON CRITICAL LOAD)
- Design By: UNDP Engineering Unit
- Drawing Type: Electrical
- Date: 13 APRIL 2021
- Drawing No:

---

**UNDP**
- United Nations Development Programme (UNDP)
### Final Branch Circuit Panelboard

**Building:** MAIN BUILDING  
**Voltage & Freq:** 400V/230V - 50Hz  
**Main Incomer:** 40A - RCD  
**Main Cable Feeder:** 4X100mm² XLPE/PVC +E-10  
**Location:** GROUND FLOOR  
**Feed From:** MDB  
**Mounting:** RECESSED  
**Panel Ref.:** GF-DB  
**Panel Type:** 10 WAY  
**ISC:** 16 KA  

<table>
<thead>
<tr>
<th>Design of Load</th>
<th>Wire Size (mm²)</th>
<th>Phase Load (in VA)</th>
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<tbody>
<tr>
<td>R</td>
<td>Y</td>
<td>B</td>
<td>R</td>
<td>Y</td>
<td>B</td>
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<td>2340</td>
<td>2372</td>
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**Total KVA (Connected/Phase):** 8.348 KVA  
**Total Connected Load:** 8.348 KVA  
**Demand Factor:** 0.57  
**Demand Load:** 4.748 KVA

Legend:  
- **GF-DB** (Non-Critical Load)  
- **CONN VA**  
- **MTR.**  
- **S.G.**  
- **MSC.**  
- **TOTAL**

**Cable:**  
Cross Section Area (CCA) = 4x10sq.mm XLPE/PVC +E=10

**Circuit Breaker Capacity:**  
In = 4.748x1.15 = 5.389  
F = 5.389 x 1.3 Future Extension  
C = 40A-RCBO

**Date:** 13 April 2021  
**Design By:** UNDP Engineering Unit  
**Drawing Title:** LIGHTING AND POWER SYSTEMS  
**Drawing Type:** Electrical  
**Statue:** Tender
### Final Branch Circuit Panelboard

**Building:**
- Location: First Floor
- Panel Ref: FF-DB
- Panel Type: 10 Way
- Mounting: Reversed
- Feeder: NBD
- Voltage & Freq: 400V/230V - 50Hz
- Main Incomm: 40A - RCD0
- Main Cable Feeder: 4X10SQ.MM XLPE/PVC +E=10

### Design of Load

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<th>PHASE LOAD IN VA</th>
<th>WIRE SIZE mm²</th>
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<td>1</td>
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<tr>
<td>C2 Lighting</td>
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<td>392</td>
<td>1</td>
<td>6A</td>
</tr>
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<td>C3 Lighting</td>
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<td>476</td>
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<td>6A</td>
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<td>C9 Socket Outlet</td>
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<td></td>
<td>3x4</td>
<td>1440</td>
<td>17</td>
<td>6A</td>
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### Total KVA (Connected/Phase)

- 2340
- 2372
- 2456

### Total Connected Load

- 8.428 KVA

### Demand Factor

- 0.57

### Demand Load

- 4.828 KVA

**Circuit Breaker Capacity**

- SP160
- CR1.25x1.3 Future Extender
- CS: 40A - RCD0

**Cable**

- Cross Section Area (CCA): 4x10sq.mm XLPE/PVC +E=10
### FINAL BRANCH CIRCUIT PANELBOARD

**Building:**
- **Voltage & Freq:** 400V/230V - 50Hz
- **Main Incomer:** 40A - RCD0
- **Main Cable Feeder:** 4CX10SQ.MM XLPE/PVC +E=10

**Location & Panel Reference:**
- **Location:** Second Floor
- **Panel Reference:** SF-DB

**Design of Load & Wire Size:**

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<th>Design of Load</th>
<th>Wire Size mm²</th>
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<tr>
<td>C1 Lighting</td>
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<td>C2 Lighting</td>
<td>3x2.5</td>
</tr>
<tr>
<td>C3 Lighting</td>
<td>2x2.5</td>
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<tr>
<td>C4 Socket Outlet</td>
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</tr>
<tr>
<td>C5 Socket Outlet</td>
<td>3x4</td>
</tr>
<tr>
<td>C6 Socket Outlet</td>
<td>3x4</td>
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<td>3x4</td>
</tr>
<tr>
<td>C9 Socket Outlet</td>
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**Phase Load (in VA):**

<table>
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<tr>
<th>R</th>
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<th>B</th>
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<td>6A</td>
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<tr>
<td>3</td>
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<td>7</td>
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<td>9</td>
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<td>12</td>
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<td>13</td>
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<td>16A</td>
<td>16</td>
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<tr>
<td>17</td>
<td>18</td>
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**Phase Load (in VA):**

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<th>R</th>
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<tbody>
<tr>
<td>540</td>
<td>360</td>
<td>360</td>
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**Total KVA (Connected/Phase):**
- 2340
- 2372
- 2456

**Total Connected Load:**
- 2800
- 2732
- 2816

**Demand Factor:**
- 0.57

**Demand Load:**
- 4828 KVA

**Circuit Breaker Capacity:**
- 4828 KVA
- In: 400x1.75
- 8x1.25x1.3 Future Extension
- C3: 40A - RCBO

**Cable:**
- Cross Section Area (CCA)= 4x10sq.mm XLPE/PVC +E=10

**Notes:**
- ALL OUTGOING C.B's ARE MCB
- Demand Load: 4828KVA

---

**Details:**
- **Project:** UNDP - Yemen
- **Drawing Title:** LIGHTING AND POWER SYSTEMS SF-DB (NON CRITICAL LOAD)
- **Design By:** UNDP Engineering Unit
- **Drawing Type:** Electrical
- **Date:** 13 April 2021
- **Drawing No.:** 0
### Final Branch Circuit Panelboard

**Building:**
- **Location:** Basement Floor
- **Panel Ref.:** BF-ACDB
- **Panel Type:** 12 Way
- **Isc:** 16 KA

**Design of Load**

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<th>PHASE LOAD IN VA</th>
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<td>2400</td>
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<td>C5 Air Condition</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
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</table>

**Total KVA (Connected/Phase):**
- R: 7200
- Y: 7200
- B: 4800

**Total Connected Load:**
- 19.200 KVA

**Demand Factor:**
- 1.00

**Demand Load:**
- 19.200 KVA

**Cable:**
- Cross Section Area (CCA) = 4x16sq.mm XLPE/PVC +E=16

### Notes:
- **Demand Load:** 19.2 KVA
- **Circuit Breaker Capacity:**
  - 1250x1.3 Future Extension
  - 63A-MCCB
### Final Branch Circuit Panelboard

**Main Building Details:**
- **Voltage & Freq:** 400V/230V - 50Hz
- **Main Incomer:** 63A - MCCB
- **Main Cable Feeder:** 4X16SQ.MM XLPE/PVC +E=16

**Location:** Ground Floor

**Panel Ref:** GP-ACDB

**Panel Type:** 12 Way

**Mounting:** Receded

**ISC:** 16 KA

### Design of Load

<table>
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<th>Phase Load in VA</th>
<th>R</th>
<th>Y</th>
<th>B</th>
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<td><strong>C3</strong> Air Condition</td>
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<td>20A</td>
<td>20A</td>
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<td>20A</td>
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<td><strong>C6</strong> Air Condition</td>
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<td>6</td>
<td>20A</td>
<td>20A</td>
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</table>

**Total KVA (Connected/Phase):**
- 7200 VA
- 4800 VA
- 4800 VA

**Total Connected Load:**
- 19.200 KVA

**Demand Factor:**
- 1.00

**Demand Load:**
- 19.200 KVA

**LTG. MTR. S.O. MSC. TOTAL**
- 19,200
- 19,200

---

**Circuit Breaker Capacity:**
- 19200VA
- 4x125x1.3 Future Extension
- CB: 63A-MCCB

**Cross Section Area (CCA):**
- 4x16sq.mm XLPE/PVC +E=16
**Demand Load:** 21.6KVA

**Circuit Breaker Capacity:**

- 21600VA
- 400x1.75 \times 1.25\times 3 \text{Future Extension}
- CB 63A-MCB

**Cable:**

Cross Section Area (CCA) = 4x16 sq.mm XLPE/PVC +E=18
### Final Branch Circuit Panelboard

**Building:**
- Voltage & Freq: 400V/230V - 50Hz
- Main Incomer: 63A - MCB
- Main Cable Feeder: 4x165Q.MM XLPE/PVC +E=16

**Location:**
- Second Floor

**Panel Ref:**
- SF-ACDB

**Panel Type:**
- 12 Way

**Mounting:**
- Reeded

**ISC:**
- 16 KA

---

<table>
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<th>Design of Load</th>
<th>Wire Size (mm²)</th>
<th>Phase Load in VA</th>
<th>Phase Load in VA</th>
<th>Wire Size (mm²)</th>
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<td>C3 Air Condition</td>
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<td>3</td>
<td>20A</td>
<td>2400</td>
</tr>
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<td>C4 Air Condition</td>
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<td>2400</td>
<td>6</td>
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<td>9</td>
<td>20A</td>
<td>2400</td>
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**Total KVA (Connected/Phase):**
- 7200

**Total Connected Load:**
- 21,600 KVA

---

**Cables:**
- Cross Section Area (CCA) = 4x16 sq.mm XLPE/PVC +E=16

---

**Demand Load:**
- 21.6 KVA

**Circuit Breaker Capacity:**
- 21,600x1.3

**CB:** 63A - MCCB
**Final Branch Circuit Panelboard**

**Building:**
- Voltage & Frequency: 400V/230V - 50Hz
- Main Incomer: 40A - RCBO
- Main Cable Feeder: 4x10 SQ.MM XLPE/PVC +E=10

**Location:** Basement Floor

**Panel Ref.:** BF-UBDB

**Panel Type:** 18 Way

**Mounting:** Recessed

**D.C.:** 16 KA

**Design of Load**

<table>
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<th>Wire Size</th>
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<th>Phase Load In VA</th>
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<td>B</td>
<td>R</td>
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<tr>
<td>C2</td>
<td>Lighting</td>
<td>3x2.5</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>C3</td>
<td>Lighting</td>
<td>3x2.5</td>
<td>320</td>
<td>6A</td>
</tr>
<tr>
<td>C4</td>
<td>Lighting</td>
<td>3x2.5</td>
<td>1440</td>
<td>3x4</td>
</tr>
<tr>
<td>C5</td>
<td>Lighting</td>
<td>3x2.5</td>
<td>1440</td>
<td>3x4</td>
</tr>
<tr>
<td>C6</td>
<td>Lighting</td>
<td>3x2.5</td>
<td>1440</td>
<td>3x4</td>
</tr>
<tr>
<td>C7</td>
<td>Lighting</td>
<td>3x2.5</td>
<td>1440</td>
<td>3x4</td>
</tr>
<tr>
<td>C8</td>
<td>Lighting</td>
<td>3x2.5</td>
<td>1440</td>
<td>3x4</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>R 5708</td>
<td>Y 5200</td>
<td>B 6490</td>
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</table>

**Demand Load:** 6.069 KVA

**Circuit Breaker Capacity:**
- 4000x1.75 x 1.25x1.3 Future Extension
- CB: 40A-RCBO

**Cable:**
Cross Section Area (CCA) = 4x10 sq.mm XLPE/PVC +E=10

**Electrical**

**New Building Replacing UNDSS Old Building Lighting and Power Systems BF-UBDB (Critical Load)**
### Final Branch Circuit Panel Board

#### Design of Load

<table>
<thead>
<tr>
<th>Phase Load (in VA)</th>
<th>Wire Size mm²</th>
<th>Phase Load (in VA)</th>
<th>Wire Size mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>Y</td>
<td>B</td>
<td>R</td>
</tr>
<tr>
<td>C1 LIGHTING</td>
<td>3x2.5</td>
<td>300</td>
<td>6A</td>
</tr>
<tr>
<td>C2 LIGHTING</td>
<td>3x2.5</td>
<td>240</td>
<td>6A</td>
</tr>
<tr>
<td>C3 LIGHTING</td>
<td>3x2.5</td>
<td>320</td>
<td>6A</td>
</tr>
<tr>
<td>C4 SOCKET OUTLET</td>
<td>3x4</td>
<td>1440</td>
<td>6A</td>
</tr>
<tr>
<td>C5 SOCKET OUTLET</td>
<td>3x4</td>
<td>1440</td>
<td>6A</td>
</tr>
<tr>
<td>C6 SOCKET OUTLET</td>
<td>3x4</td>
<td>1440</td>
<td>6A</td>
</tr>
<tr>
<td>C7 SOCKET OUTLET</td>
<td>3x4</td>
<td>1440</td>
<td>6A</td>
</tr>
<tr>
<td>C8 SOCKET OUTLET</td>
<td>3x4</td>
<td>1440</td>
<td>6A</td>
</tr>
</tbody>
</table>

**Total Connected Load:**

- **Demand Load:** 5.776 KVA
- **Demand Factor:** 0.54
- **Demand Load:** 5.776 KVA

**LITG. MTR. S.O. MSC. TOTAL**

- LTG: 916
- MTR: 9,720.0
- S.O. 1
- MSC: 0.5
- TOTAL: 10636.0

**Cable:**

- **Cross Section Area (CCA):** 4x10 sq.mm XLPE/PVC +E=10

**Circuit Breaker Capacity:**

- **B: 40A-RCBO**
- **Future Extension:**
  - **I²t:** 2000x1.73
  - **CRC:** 2000x1.73

**Date:** 13 April 2021
Demand Load: 6.058 KVA

Circuit Breaker Capacity:

n = 6.058 / 40A = 0.154

Future Extension: 5 x 40A-RCBO

Cable:

Cross Section Area (CCA) = 4 x 10 sq.mm XLPE/PVC +E=10
**Demand Load**: 6.058KVA

**Circuit Breaker Capacity**: 

- **N=** 1.25 x 1.5 + Future Extension
- **CB 40A-RCBO

**Cable**

Cross Section Area (CCA) = 4x10 sq. mm XLPE/PVC + E=10
Location: SANAA - Yemen
Project: UNDP Engineering Unit
Drawing Title: United Nations Development Programme (UNDP)
Design By: UNDP Engineering Unit
Drawing Type: Electrical
Status: Tender
Date: 13 April 2021

SMDB
LOCATION: BASEMENT

Total Demand Load: 19.16KVA
Diversity Factor: 1
Total Load After Diversity: 19.16KVA

4CX35 SQ.MM-XLPE/PVC/CU.COND

400V, 25KA, SORH

SMDB - 25K SQUARE MM CU COND

To MDB

125A 4P MCCB

25KA

Electrical Design: NEW BUILDING REPLACING UNDSS OLD BUILDING
Total Demand Load: 30KVA
Diversity Factor: 1
Total Load After Diversity: 30KVA
Inrush: 3x0KVA x 1.25 x 1.3 Future Extension
CB: 125A-4P-MCCB

4x35 SQ.MM-XLPE/PVC/CU.COND

250A TPN+ E Gu BUSBAR
400V, 25KA, 50Hz
Total Demand Load: 130.72 KVA
Diversity Factor: 0.8
Total Load After Diversity: 104.58 KVA

E = \frac{104.58}{0.8} = 125 \times 1.3 \text{ Future Extension}

CB : 250A-4P-MCB

2x4x120 SQ.MM XLPE/PVC/SWA/CU COND - MULTI-CORE

Location: Basement

E = 1x70 SQ.MM CU COND

KVA

SANAA - Yemen

KVA

UNDP - Engineering Unit

KVA

United Nations Development Programme (UNDP)

Project: NEW BUILDING REPLACING UNDSS OLD BUILDING

Drawing Title: UNDP SINGLE LINE DIAGRAM

Design By: UNDP Engineering Unit

Drawing Type: Electrical

Date: 13 April 2021

Drawing No: 31
Electrical

NEW BUILDING REPLACING UNDSS OLD BUILDING

Location: SANAA - Yemen

Design By: UNDP Engineering Unit

Date: 13 April 2021

KVA

MCC

LOCATION: BASEMENT

1x35 SQ.MM CU.COND

Total Demand Load: 81.8 KVA

Diversity Factor: 0.8

Total Load After Diversity: 65.8 KVA

In = 452800 x 1.25 x 1.3 Future Extension

CB : 200A-4P-MCCB

TO MDB

4CX70 SQ.MM-XLPE/PVC/CU.COND

250A TP+PE CU.BUSBAR

400V, 25KA, 50Hz
1 x 50mm² EARTH COPPER CONDUCTOR
6 WAYS
EP-1
EP-2
EP-3
DRAUGHT-1
DRAUGHT-2
DRAUGHT-3
1 x 50mm² EARTH COPPER CONDUCTOR
1 x 50mm² EARTH COPPER CONDUCTOR

EARTHING SYSTEM
EARTHING SYSTEM DETAILS

TYPICAL DETAILS FOR EARTHING PIT

NOTE (FOR POWER & LOW CURRENT NETWORKS):

TYPICAL DETAILS FOR EARTHING PIT

NOTE (FOR LIGHTNING PROTECTION SYSTEM):
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BASEMENT FLOOR HVAC SYSTEM</td>
</tr>
<tr>
<td>2</td>
<td>GROUND FLOOR HVAC SYSTEM</td>
</tr>
<tr>
<td>3</td>
<td>FIRST FLOOR HVAC SYSTEM</td>
</tr>
<tr>
<td>4</td>
<td>SECOND FLOOR HVAC SYSTEM</td>
</tr>
</tbody>
</table>
1. ALLOW SUFFICIENT SPACE FOR WIRING, REFRIGERANT PIPING AND SERVICING UNIT

CONDENSING UNIT

VIBRATION ISOLATOR

SUCTION LINE WITH INSULATION

LIQUID LINE

PITCH

PITCH

DRAIN PAN

DRAIN PIPE

TRAP

OIL TRAP

WITH INSULATION

NOTES:

AIR FLOW

BELT DRIVE MOTOR

BELT

FAN

FAN HOUSING

END VIEW

FOR BASE DETAIL REFER TO "EQUIPMENT ISOLATION BASE DETAIL"

FAN LEG

ROOF CONCRETE SLAB

STRUCTURAL/ARCHITECTURAL DETAIL

ROOF FINISH TO BE AS PER

ROOF MOUNTED INSTALLATION

CENTRIFUGAL IN-LINE FAN

(ALT.-2)

ANGLE HANGERS/TRAPEZE

RECOMMENDED HANGER SIZES FOR RECTANGULAR DUCT

MAXIMUM SPACING

DIMENSION

1080 THRU 1520mm.

40mm X 16 Ga.

50mm X 50mm X 3mm

8mm

3.00 M.

8mm

6mm

10mm BOLT (MINIMUM)

8mm

6mm

6mm

MAXIMUM SPACING

3.00 M.

2.40 M.

THREADED HANGER

10Ø MM INSULATION

RECTANGULAR DUCT HANGER DETAIL & SCHEDULE

Duct

Throat

Angle Bar

Push Nut

Fixture Clips

Threaded Hanger

10Ø MM

3.00 M.

6mm

8mm

8mm

2.40 M.

2.40 M.
### FANS SCHEDULE

<table>
<thead>
<tr>
<th>FAN NO.</th>
<th>AREA SERVED</th>
<th>LOCATION</th>
<th>TYPE</th>
<th>QTY</th>
<th>CAPACITY (LPS)</th>
<th>ESP</th>
<th>MOTOR KW</th>
<th>ELECTRICAL DATA</th>
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</thead>
<tbody>
<tr>
<td>F.A.F-01</td>
<td>SEE DRAWINGS</td>
<td>ROOF</td>
<td>AXIAL</td>
<td>1</td>
<td>800</td>
<td>250</td>
<td>2</td>
<td>220</td>
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<tr>
<td>E.A.F-01</td>
<td>SEE DRAWINGS</td>
<td>ROOF</td>
<td>AXIAL</td>
<td>1</td>
<td>640</td>
<td>200</td>
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<td>E.A.F-02</td>
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### SPLIT UNITS SCHEDULE

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<thead>
<tr>
<th>REF. NO.</th>
<th>NOMINAL COOLING CAPACITY (TR)</th>
<th>AIR (L/S)</th>
<th>IN DOOR UNIT TYPE</th>
<th>ESP (PA)</th>
<th>POWER (KW)</th>
<th>VOLT</th>
<th>PHASE</th>
<th>QTY</th>
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<tbody>
<tr>
<td>UVW-1.5 TR</td>
<td>1.5</td>
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<td>HIGH WALL</td>
<td>-</td>
<td>2.4</td>
<td>220</td>
<td>1</td>
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</tbody>
</table>

**NOTES:**
- Nominal capacity is based on:
  1. Entering air temp: 23°C (Cooling)
  2. Outside temp: 35°C (Summer)