1. Cutting the cement block where the columns.
2. Demolition for Roof and walls of the Staircase.
3. Demolition for the existing floor tiles with screed plain concrete.
4. Relocate the water tank to be on the roof to supply the building while working then install it again on the roof of the staircase.
5. Dismantling the existing staircase solid door with its frame then install it again on the new roof.
6. Dismantling for the existing Solar water heater then reinstall it again on the new roof.
7. Demolition for the wall to be as an emergency door.
8. Dismantling the exiting Aluminum windows.
9. Dismantling the Ac then reinstall it again.
10. Demolition for the staircase walls.
Detail for the Handrails

Architecture

2" x 4 mm

1.5" x 3 mm

1" x 2 mm

2" x 4 mm

1" x 2 mm

2" x 4 mm

2" x 4 mm

100

100

165

16

38

16

5

18

21

21
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 7.

4. Supply and installation of Polycarbonate frame catcher as shown in detail 6.

5. Arnoord Door as shown in detail 5.
1. Blast-Resistant External Frame size 10 cm X 50 cm X 6 mm X 2.
2. Blast-Resistant Internal Frame size 50 cm X 100 cm X 3 mm.
3. Steel door full metal plate 8 mm two sides (16 mm thickness).
4. 45 mm * 150 mm * 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 horizontally and vertically.
7. Hex Bolt on Concrete Anchor size D 20 mm * 20 cm * 6 in all horizontal and vertical.
8. A TUBE size 50 cm * 50 cm * 3 mm to distribute it each 40 cm horizontally and vertically.
9. Door closer.
10. Four side sealing strip smoke protection.
11. Manual lock inside 7 cm, 400 mm, 7 cm, 2 in both sides with electrical lock.
12. Handles with steel pipe 1 in dia.

Detail 5: Steel Door

Detail 6: Window Plexiglass Upgrade.

6.1 Plexiglass Hardening

Cutting the Plexiglass (polycarbonate) with 15 cm width to facilitate opening the windows.

6.2 Existing Exterior Window.

10 mm plexiglass replacement for existing window.

16 mm mechanical anchor into concrete slab with minimum 100 mm embedment length typical.
**Detail 7: Frame Catcher**

16mm mechanical anchor into concrete ceiling with minimum 150mm embedment length, typical spacing 200mm.

100mm x 10mm anchor plate with welded close hooks spaced at 200mm to connect cables.

10mm diameter clip (no less than 3 per cable end).

Installation and spacing as recommended by manufacturer.

Aircraft Wire Rope spaced 200mm thimble end and no less than 3 clips installed as per manufacturer requirements to develop the breaking strength of the cable.

U10x6 with 8mm steel plate welded.

16mm through bolt (estimated 450mm length) with typical spacing 400mm.

80 mm 20 mm 40 mm 20 mm 6 mm Ø20 cm 200 mm 100 mm 25 mm 100 mm 100 mm 200 mm 100 mm 25 mm.
4.0 INCH WASTEWATER SCHEDULE 80 PVC PIPING LINE.

3.0 INCH WASTEWATER SCHEDULE 80 PVC PIPING LINE.

UNDERGROUND 8.0 INCH WASTEWATER SCHEDULE 80 PVC PIPING LINE.

UNDERGROUND 6.0 INCH WASTEWATER SCHEDULE 80 PVC PIPING LINE.

−−→ INSIDE EXTERIOR WALLS 4.0 INCH WASTEWATER SCHEDULE 80 PVC PIPING LINE.

QUANTITY AND DIRECTION OF THE BUILDING FLOORING TILE

UNDERGROUND 4.0 INCH RAIN DRAINAGE SCHEDULE 80 PVC PIPING LINE.

Location: Sana'a - Yemen
Project: UNDP Engineering Unit
Drawing Title: Design By:
Drawing Type: Plumbing Work
Status:
Drawing No. 21 September 2022

LEGEND:
SYMBOL:
4.0 INCH WASTEWATER SCHEDULE 80 PVC PIPING LINE.
3.0 INCH WASTEWATER SCHEDULE 80 PVC PIPING LINE.
UNDERGROUND 8.0 INCH WASTEWATER SCHEDULE 80 PVC PIPING LINE.
UNDERGROUND 6.0 INCH WASTEWATER SCHEDULE 80 PVC PIPING LINE.
INSIDE EXTERIOR WALLS 4.0 INCH WASTEWATER SCHEDULE 80 PVC PIPING LINE.

QUANTITY AND DIRECTION OF THE BUILDING FLOOR TILE
UNDERGROUND 4.0 INCH RAIN DRAINAGE SCHEDULE 80 PVC PIPING LINE.

Location: Sana'a- Yemen
Project: UNDP Engineering Unit
Design By: Fourth Floor on UNDP Operation Building
Status: Drawing No.
Date: 21 September 2022

LEGEND:

DESCRIPTION:
Concrete Mixture Specifications

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

<table>
<thead>
<tr>
<th>Concrete Cover (mm)</th>
<th>Reinforcement Member</th>
<th>Concrete Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>No. 36 bar</td>
<td>Contact with ground</td>
</tr>
<tr>
<td>50</td>
<td>No. 43 and No. 57</td>
<td>Exposed to weather or in contact with ground</td>
</tr>
<tr>
<td>75</td>
<td>No. 16 bar</td>
<td>Permanently in contact with ground</td>
</tr>
</tbody>
</table>

Concrete shall be conveyed from mixer to place of final deposit by methods that will prevent separation or loss of materials. Concrete shall be conveyed to place of deposit by methods that will prevent separation or loss of materials. Concrete shall be conveyed to place of deposit by methods that will prevent separation or loss of materials. Concrete shall be conveyed to place of deposit by methods that will prevent separation or loss of materials.

Concreting shall be carried out at such a rate that concrete is at all times uniform in composition and quality. Concreting shall be carried out at such a rate that concrete is at all times uniform in composition and quality. Concreting shall be carried out at such a rate that concrete is at all times uniform in composition and quality.

Concrete shall be deposited as near as practical in its final position to avoid segregation due to rehandling or flowing. Concrete shall be deposited as near as practical in its final position to avoid segregation due to rehandling or flowing. Concrete shall be deposited as near as practical in its final position to avoid segregation due to rehandling or flowing.

Concrete shall be thoroughly consolidated by suitable means during concreting. Concrete shall be thoroughly consolidated by suitable means during concreting. Concrete shall be thoroughly consolidated by suitable means during concreting.

Concrete that has been remixed after initial set shall not be used unless approved by the engineer. Concrete that has been remixed after initial set shall not be used unless approved by the engineer. Concrete that has been remixed after initial set shall not be used unless approved by the engineer.

Concrete that has partially hardened or been contaminated by foreign material shall not be used unless approved by the engineer. Concrete that has partially hardened or been contaminated by foreign material shall not be used unless approved by the engineer. Concrete that has partially hardened or been contaminated by foreign material shall not be used unless approved by the engineer.

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The minimum clear spacing between parallel bars in a layer shall be 25 mm, but not less than 25 mm.

Where parallel reinforcement is placed in two or more layers, bars in the upper layers shall be placed directly above bars in the bottom layer with clear distance between layers not less than 25 mm.

In spirally reinforced or tied reinforced compression members, clear distance between longitudinal bars shall be not less than 1.5 times 25 mm nor less than 40 mm. Clear distance limitations also apply to the clear distance between lap-spliced bars and adjacent bars of lap splices.

In walls and slabs other than concrete joist construction, primary flexural reinforcement shall not be spaced farther apart than three times the wall or slab thickness, nor farther apart than 450 mm.

Development length:
- For development length and tension lap splice use 50 25 mm.
- For compression lap splice use 40 25 mm.

Bar spacing requirements:
- The minimum clear distance between longitudinal bars shall not be less than the larger of 1.5 times the longitudinal bar diameter, or 40 mm, or 1.5 times the maximum size of the coarse aggregate. These clear-distance limitations also apply to the clear distance between lap-spliced bars and adjacent bars of lap splices.

Offset bent longitudinal reinforcement:
- Slope of inclined portion of an offset bar with axis of column shall not exceed 1 in 6.
- Portions of bar above and below an offset shall be parallel to axis of column.
- Offset bars shall be bent before placement in the forms.
- Where a column face is offset 75 mm or greater, longitudinal bars shall not be offset bent. Separate dowels, lap spliced with the longitudinal bars adjacent to the offset column faces, shall be provided.

Tie reinforcement for compression members shall conform to the following:
- All non-prestressed bars shall be enclosed by lateral ties, at least No. 10 in size for longitudinal bars No. 32 or smaller, and at least No. 13 in size for No. 36, No. 43, No. 57, and bundled longitudinal deformed wire or welded wire reinforcement of equivalent area shall be permitted.
- Vertical spacing of ties shall not exceed 16 longitudinal bar diameters, 48 tie bar or wire diameters, or least dimension of the compression member.
- Ties shall be arranged such that every corner and alternate longitudinal bar shall have lateral support provided by the corner of a tie with an included angle of not more than 135° and no bar shall be farther than 150 mm clear on each side along the tie from such a laterally supported bar. Where longitudinal bars are located around the perimeter of a circle, a complete circular tie shall be permitted.
- Ties shall be located vertically not more than one-half a tie spacing above the top of footing or slab in any story, and shall be spaced as provided herein to not more than one-half a tie spacing below the lowest horizontal reinforcement in slab or drop panel.
- Circular ties shall be permitted where longitudinal bars are located around the perimeter of a circle.
- Anchorage of individual circular ties shall be in accordance with:
  - Ends shall overlap by at least 150 mm.
  - Ends shall terminate with standard hooks that engage a longitudinal bar.
  - Overlaps at ends of adjacent circular ties shall be staggered around the perimeter enclosing the longitudinal bars.

Bars not to exceed 150 mm clear spacing without support may be greater than 150 mm with intermediate tie required.
**Bar Spacing Requirements:**

The minimum clear distance between longitudinal bars shall not be less than the larger of 1.5 times the longitudinal bar diameter, or 40 mm or 13 times the maximum size of the coarse aggregate. These clear-distance limitations also apply to the clear distance between lap-spliced bars and adjacent bars of lap splices.

**Structural Integrity Reinforcement:**

- At least one-quarter of the maximum positive moment reinforcement, but not less than two bars, shall be continuous.
- At least one-sixth of the negative moment reinforcement at the support, but not less than two bars, shall be continuous.
- Longitudinal reinforcement shall be enclosed by closed stirrups or hoops along the clear span of the beam.
- Longitudinal structural integrity reinforcement at noncontinuous supports shall be anchored to develop fy at the face of the support.
  - Positive moment reinforcement shall be spliced at or near the support.
  - Negative moment reinforcement shall be spliced at or near midspan.
  - Splices shall be class tension lap splices.
- If the depth of a continuous beam changes at a support, the bottom reinforcement in the deeper member should be terminated into the support with a standard hook and the bottom reinforcement in the shall be extended into and fully developed in the deeper member.

**Beam Details:**

- Stirrup at ends
- DEVELOPMENT LENGTH
- STANDARD HOOK DEVELOPMENT LENGTH

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**Note:**

- References to the clear span of the beam are made.
- Tables and additional details may be necessary for a complete understanding of the reinforcement requirements.
Main Notes
Structure

Reinforcement

Concrete

General

Table:

<table>
<thead>
<tr>
<th>Material</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>100</td>
</tr>
<tr>
<td>Steel</td>
<td>50</td>
</tr>
<tr>
<td>Wood</td>
<td>20</td>
</tr>
</tbody>
</table>

Location:
Sana'a, Yemen

Project:
UNDP Engineering Unit

Design By:
Fourth Floor on UNDP Operation Building

Status:
Drawing No.

Date:
21 September 2022
LEGEND
DESCRIPTION
60x60 LED LIGHTING LUMINARE WITH FIXTURE (NON CRITICAL LOAD)
FINAL DISTRIBUTION BOARD
60x60 LED LIGHTING LUMINARE WITH FIXTURE (CRITICAL LOAD)
12W RECESSED CEILING DOWNLIGHT PANEL
SURFACE WALL MOUNTED MIRROR LIGHTING
2X18 LED TUBE LIGHTING FIXTURE
ONE, TWO, THREE GANG ONE WAY
WALL MOUNTED SELF CONTAIN EXIT LIGHTING FIXTURE WITH 3HOUR DURATION BATTERY
CEILING MOUNTED SELF CONTAIN EXIT LIGHTING FIXTURE WITH 3HOUR DURATION BATTERY