

90m³ CIRCULAR WATER TANK (FERROCEMENT)

D-320

16th September, 2023



DRAWING INDEX

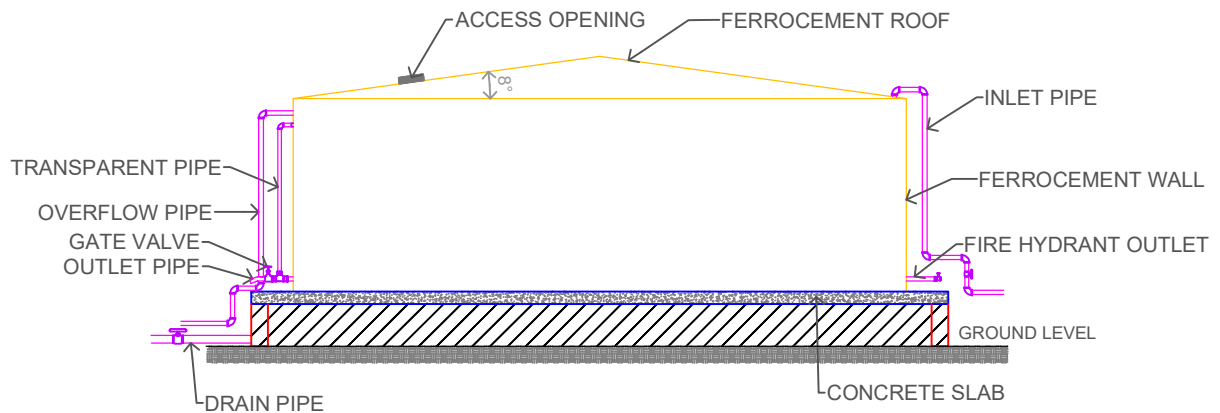
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Reference is made to;
Large Ferro-Cement Water Tank:
Design Parameters and Construction Details

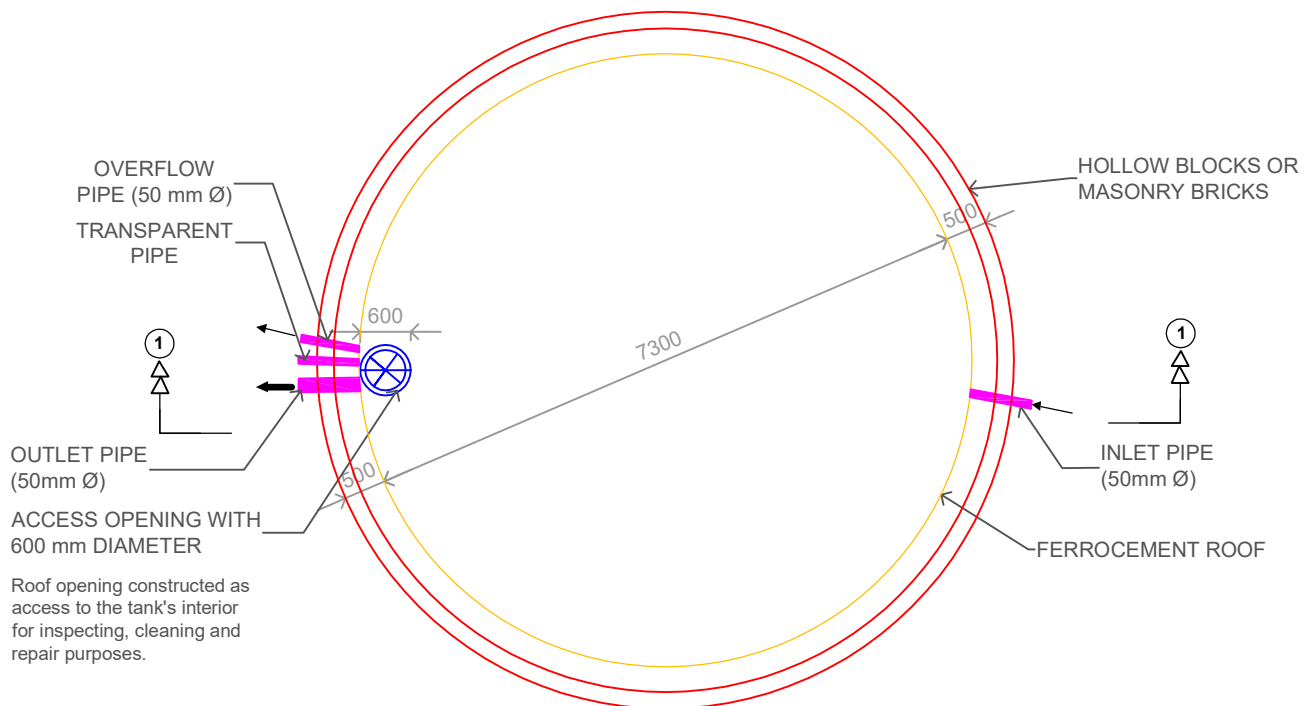
KEY SPECIFICATIONS

1. All dimensions indicated are in mm unless stated otherwise.
2. Concrete shall be of the grade specified in the drawings with a maximum aggregate size of 20 mm.
3. G.I = Galvanized Iron
4. Footing design is dependent on soil types and flooding risk.

Reference is made to;
Large Ferro-Cement Water Tank:
Design Parameters and Construction Details



ELEVATION



ROOF PLAN

DRAWING NO.

D320

DRAWING TITLE

**CIRCULAR WATER TANK
90 m3 (FERROCEMENT)
ELEVATION AND ROOF PLAN**

DRAWN BY

Sheilla C. A

CHECKED BY

SCALE

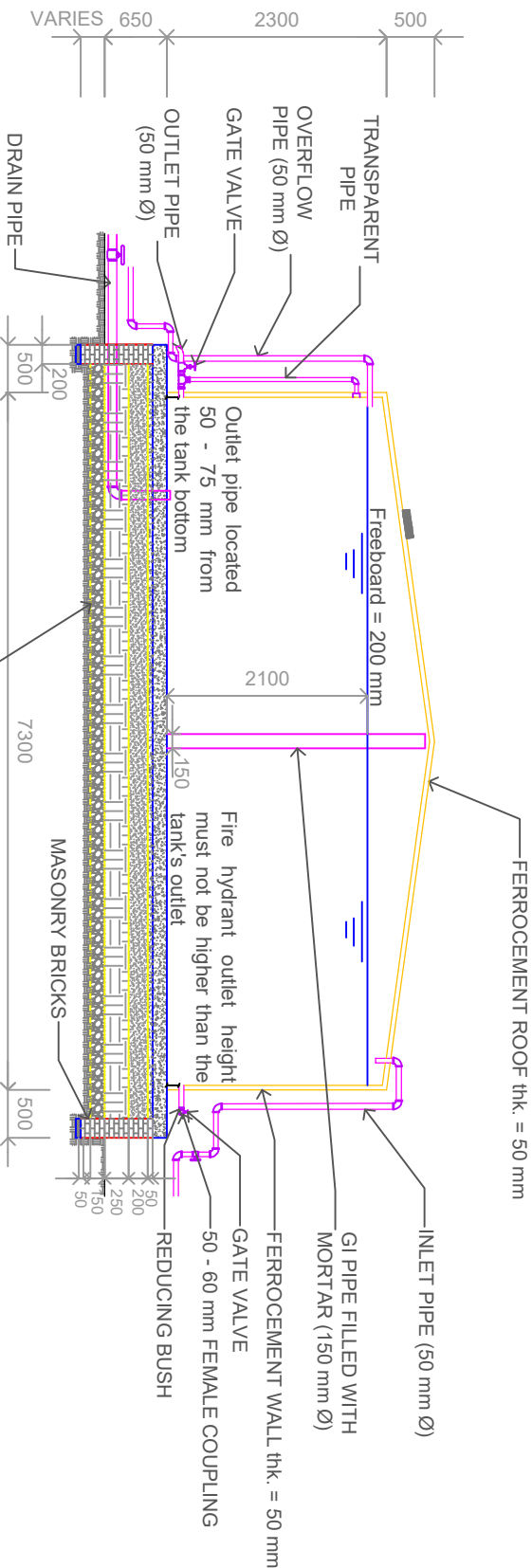
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16/09/23




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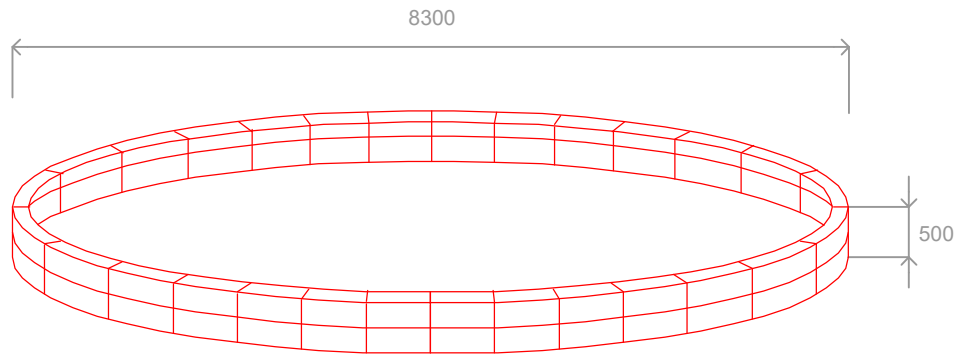


NOTES

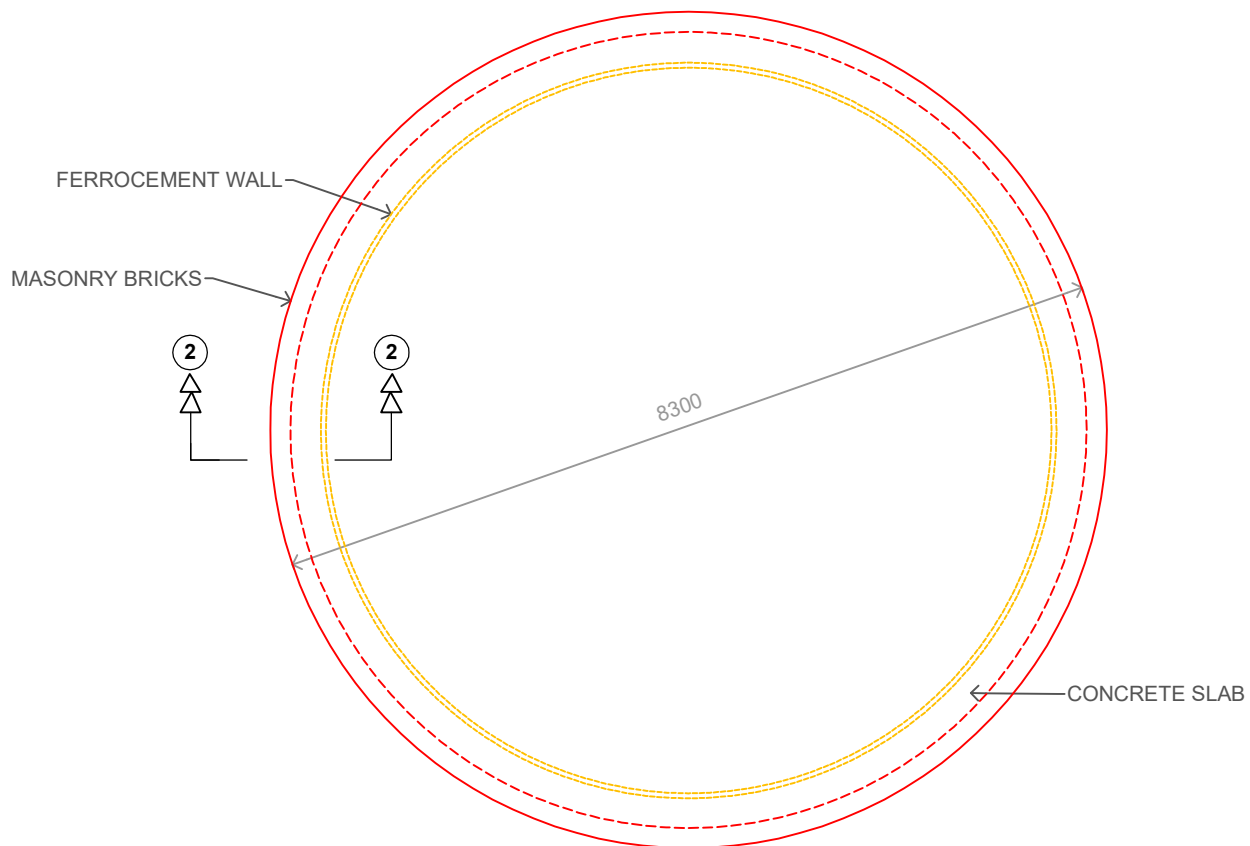
1. Ferrocement Mortar for wall and roof = 1:2:0.4 (Cement: Sand: Aggregate by weight).
2. Slab Concrete = 1:2:4 (Cement: Sand: Water by weight).
3. GI = Galvanized Iron

SECTION 1-1

DRAWING NO.	DRAWING TITLE		DRAWN BY	SCALE	 The UN Refugee Agency
D320	CIRCULAR WATER TANK 90 m3 (FERROCEMENT)		Sheilla C. A	1 : 75	
SECTION			CHECKED BY	DATE	
				16/09/23	



MASONRY BRICK LAYOUT



FOUNDATION PLAN

NOTES

1. Select a suitable site for the foundation, taking into consideration the source of water supply, areas in which water is to be distributed, possibility of flooding and practical aspects of construction. The final decision on the footing design should be taken by a qualified engineer and will be determined by the nature of the soils in the area. Additional footing below the ground should be added for more stability in areas with poor soils.
2. The site must be cleared and loose material properly compacted.
3. Depending on the nature of the terrain for instance after introducing terraces at the site, protection retaining walls may be required in order to improve soil stability around the structure

DRAWING NO.

D320

DRAWING TITLE

**CIRCULAR WATER TANK
90 m3 (FERROCEMENT)
FOUNDATION LAYOUT & PLAN**

DRAWN BY

Sheilla C. A

CHECKED BY

SCALE

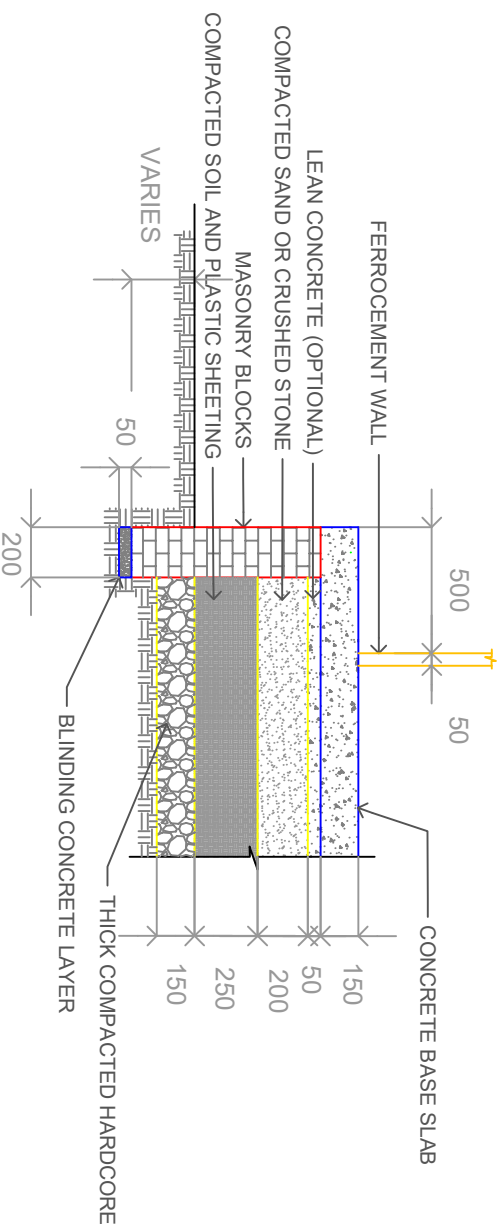
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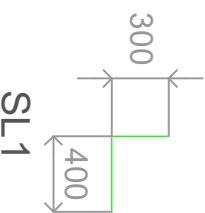
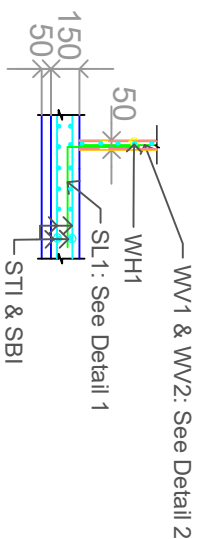
SECTION 2-2

NOTES

1. Footing design dependent on soil types and flooding risk; consult local engineer.
2. Lean concrete can be added to provide a level base and water-tightening layer for the concrete slab to be cast upon. Lean concrete mix proportion = 1:4:8 (Cement: Sand: Aggregate by weight).
3. Ferrocement Mortar for wall = 1:2:0.4 (Cement: Sand: Aggregate by weight).
4. Slab Concrete = 1:2:4 (Cement: Sand: Water by weight). The slab surface should be levelled with a trowel or smooth planks.
5. Use Ordinary Portland Cement Type I or Type II for tropical countries and Type II for cold climates.

DRAWING NO.	DRAWING TITLE	DRAWN BY	SCALE	 UNHCR The UN Refugee Agency
D320	CIRCULAR WATER TANK 90 m3 (FERROCEMENT) SECTION	Shella C. A CHECKED BY	1 : 30 DATE	
			16/09/23	

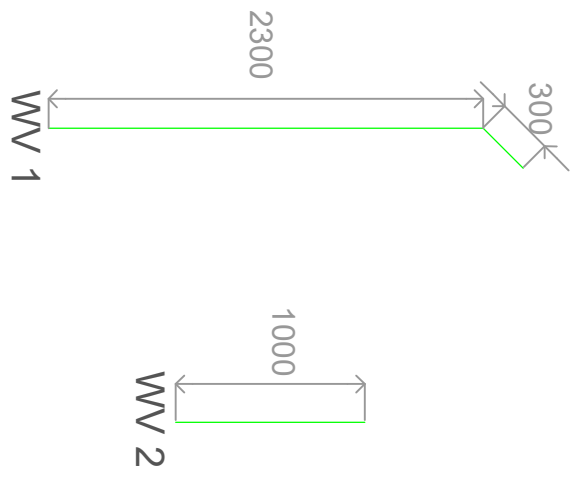





SECTION 3-3: SLAB DETAIL

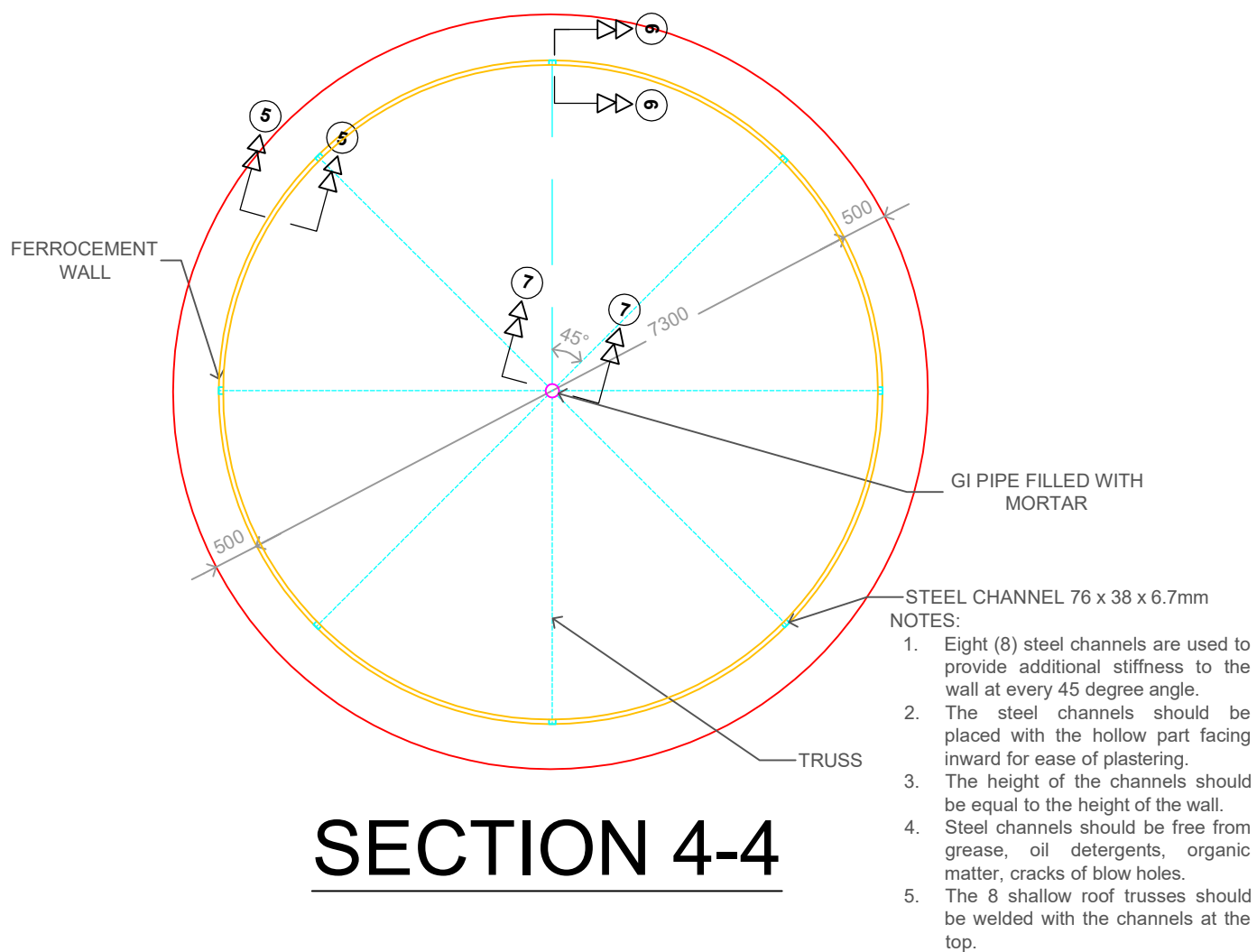
NOTES

1. Vertical bars (WV1 and WV2) are T8 @ 125 mm spacing.
2. Horizontal bars (WH1) are T6 @ 125 mm spacing.
3. L-shaped bars (SL1) are T8 @ 125 mm spacing.
4. L-shaped bars improve strength and constructability and should be tied into the base slab reinforcement.
5. One or two tie wires are required for each L-shaped bar.
6. Tie wires should consist of soft galvanized wires of 24 or 26 gauge. Cut pieces of wire from meshes could also be used for tying.




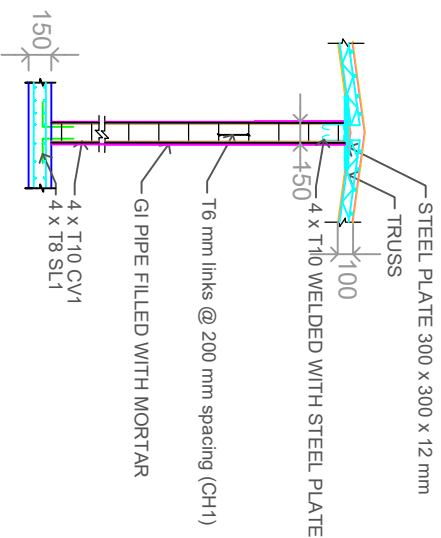
DETAIL 2

DRAWING NO.	DRAWING TITLE	DRAWN BY	SCALE	 UNHCR The UN Refugee Agency
D320	CIRCULAR WATER TANK 90 m3 (FERROCEMENT) BASE SLAB DETAILS (2)	Sheilla C. A CHECKED BY	1 : 40 DATE 16/09/23	



SECTION 4-4

DRAWING NO. D320	DRAWING TITLE CIRCULAR WATER TANK 90 m3 (FERROCEMENT) WALL AND CENTRAL COLUMN DETAILS (1)	DRAWN BY Sheilla C. A	SCALE 1: 75	 UNHCR The UN Refugee Agency
		CHECKED BY	DATE 16/09/23	



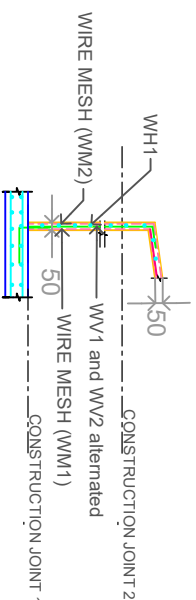
SECTION 7-7:

CENTRAL COLUMN

DETAIL

NOTES:

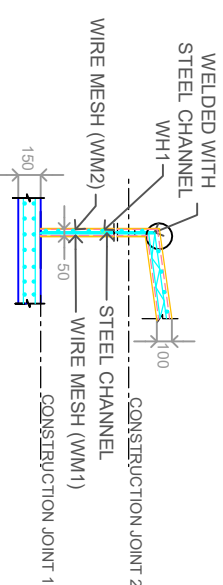
1. 4 - 8 vertical dowel bars (SL1) should be placed at the location where the central column is to be erected. The dowel bars should be encased at the bottom end of the pipe.
2. The plate at the top of the column may be fixed before or after erection. It is generally welded with the column rebar at the top.
3. Temporary support may be required to hold the erected column in place.



SECTION 5-5

NOTES:


1. The two layers of wire mesh should be wrapped around the wall reinforcement and fixed with the wire at a few locations. It is convenient to start from the bottom and move upward and leave about 10cm of overlapping at discontinuous ends.
2. Woven square or hexagonal (chicken mesh) can be used; having openings of 13mm x 13mm, 19mm x 19mm or 25mm x 25mm. For square meshes, wire gauges can range from 18 to 22 gauge, whereas gauges 20 to 26 can be used for chicken mesh.
3. Plastering should commence after completion of wall reinforcement and central column erection.
4. The mortar should have a workable consistency (sand and cement only, ratio 1:2). Water should be limited in the range of 0.35 to 0.45 by weight.

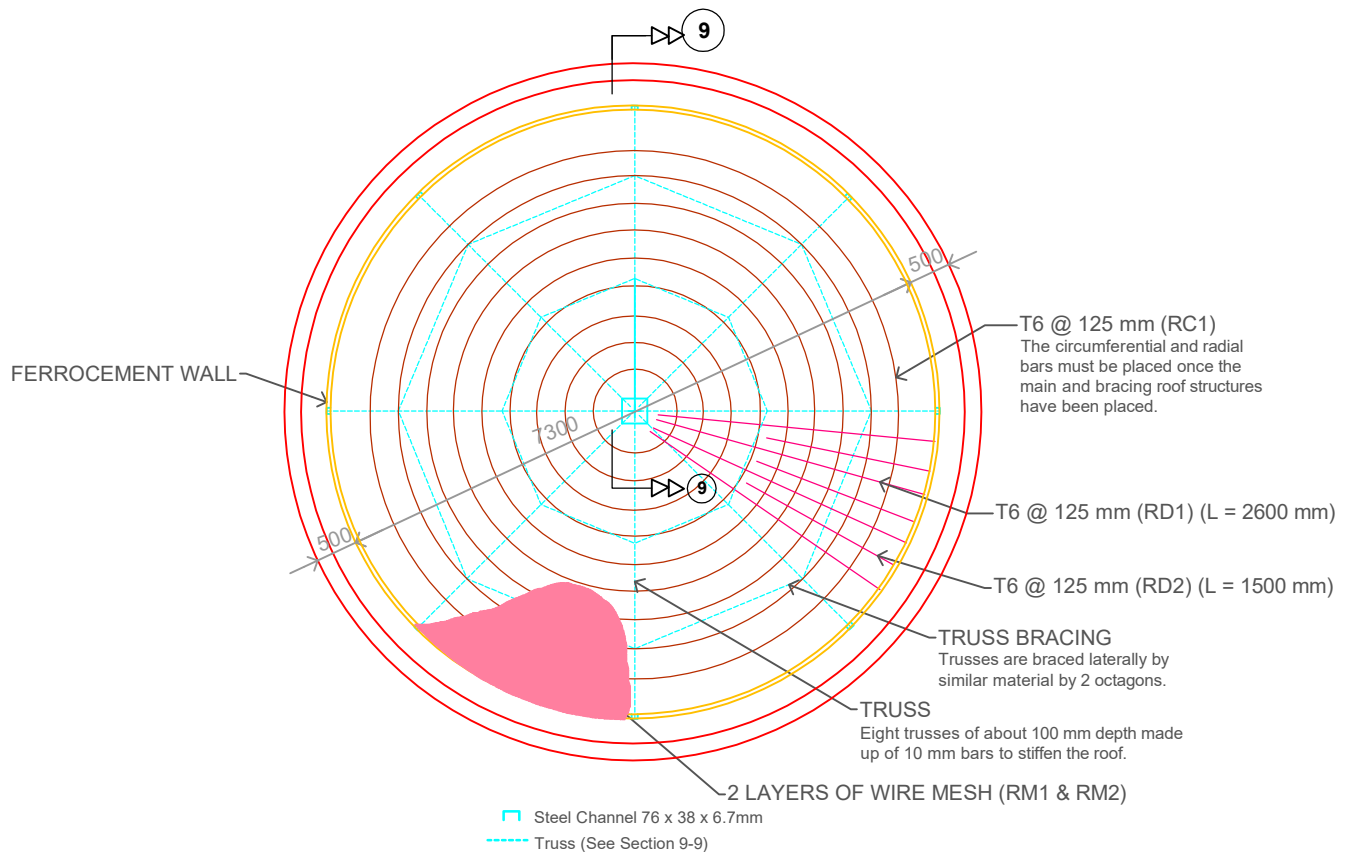
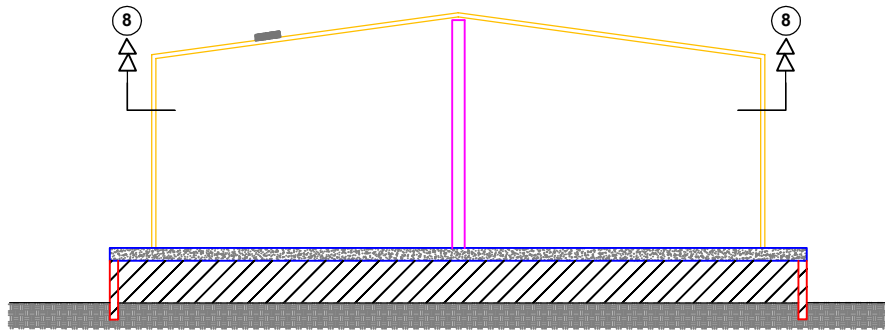


SECTION 6-6

NOTES:

1. Vertical bars (WV1 and WV2) are T8 @ 125 mm spacing.
2. Horizontal bars (WH1) are T6 @ 125 mm spacing.
3. Vertical bars of two different lengths (WV1 & WV2) should be used along the wall - the first type extending up to 1 meter from the base and the other type extending up to the top of the wall with some additional length to bend into the roof (2300 + 300 = 2600 mm). These bars should be fixed with the wire to the L-shaped base bars.

DRAWING NO.	D320	DRAWING TITLE	CIRCULAR WATER TANK 90 m3 (FERROCEMENT) WALL AND CENTRAL COLUMN DETAILS (2)	DRAWN BY	Sheilla C. A	SCALE	1 : 50	
		CHECKED BY		DATE	16/09/23			



SECTION 8-8: ROOF FRAMING PLAN

DRAWING NO.

D320

DRAWING TITLE

**CIRCULAR WATER TANK
90 m3 (FERROCEMENT)
ROOF DETAILS (1)**

DRAWN BY

Sheilla C. A

SCALE

1: 75

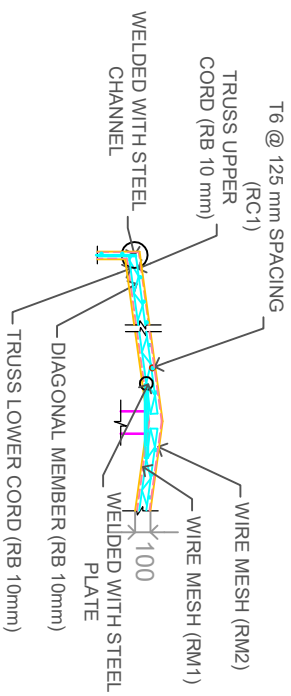
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SECTION 9-9:

TRUSS DETAIL

NOTES

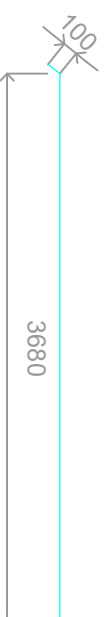
1. The roof stiffening trusses are welded with the top of C-channels at the lower end and with the column top base plate at the other end.
2. While cutting bars for the trusses, additional lengths are required to facilitate welding with the C-channels.
3. Plastering of trusses should be done before the rest of the roof structure using the same procedure as that of the wall.
4. Plastering of the roof should be carried out from the top against a sheet of plywood/wooden plank placed on the working area underside. Temporary form work (2-3 props) should be used to support the wooden plank.
5. RB = Round Bar

DIAGONAL MEMBER




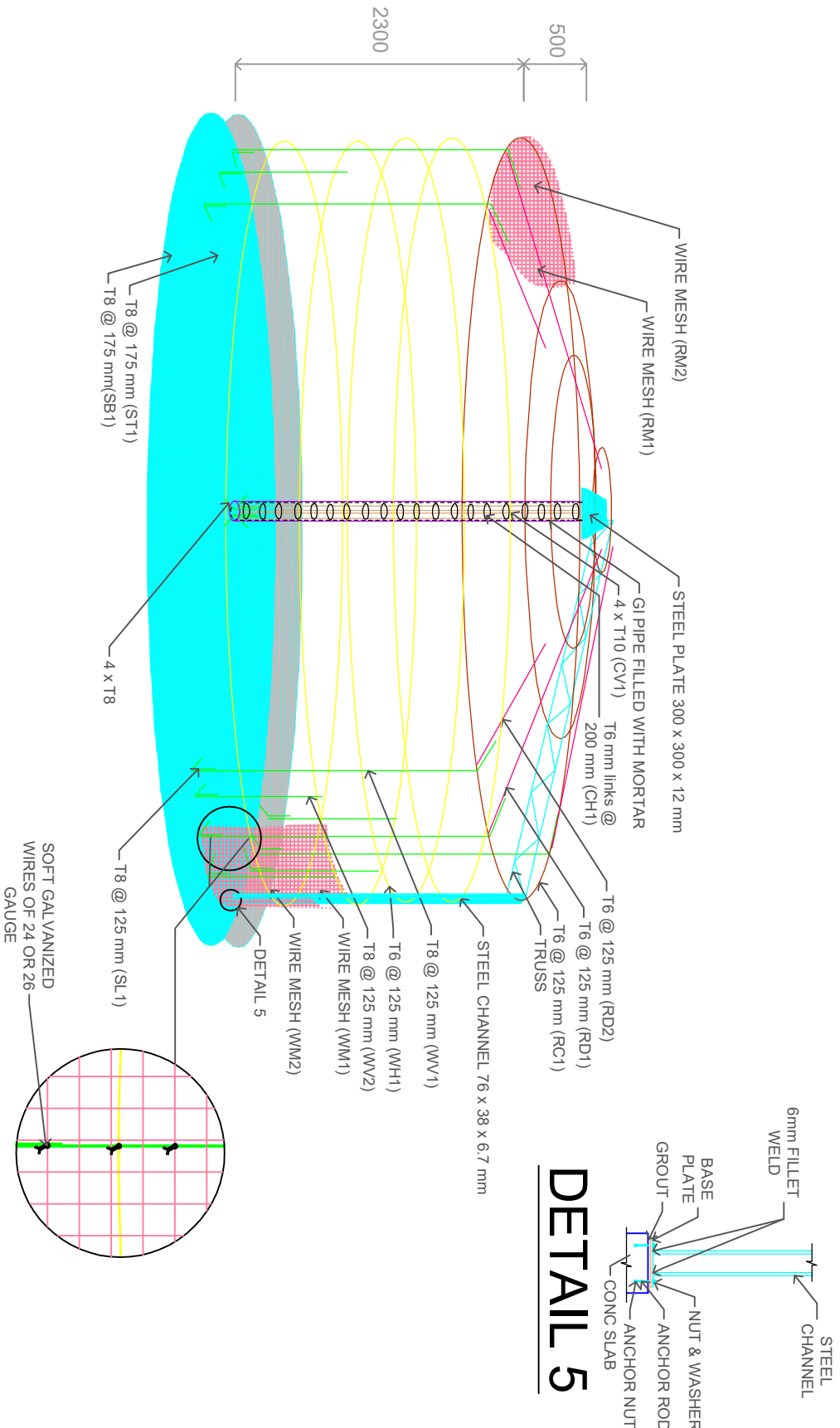
DETAIL 3

TRUSS UPPER AND LOWER CORD DETAIL




DETAIL 4

DRAWING NO.	DRAWING TITLE	DRAWN BY	SCALE	 UNHCR The UN Refugee Agency
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DETAIL 5

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REINFORCING STEEL SKELETON		CHECKED BY	DATE	
			16/09/23	