ROYAL NORWEGIAN EMBASSY

SOS SAHEL SUDAN

Promoting conflict affected community livelihood project in South Kordofan

STUDY AND DESIGN FOR REHABILITATION OF ALHEJAIRAT HAFIR IN SOUTH KORDOFAN STATE ABU JOBAIHA LOCALITY

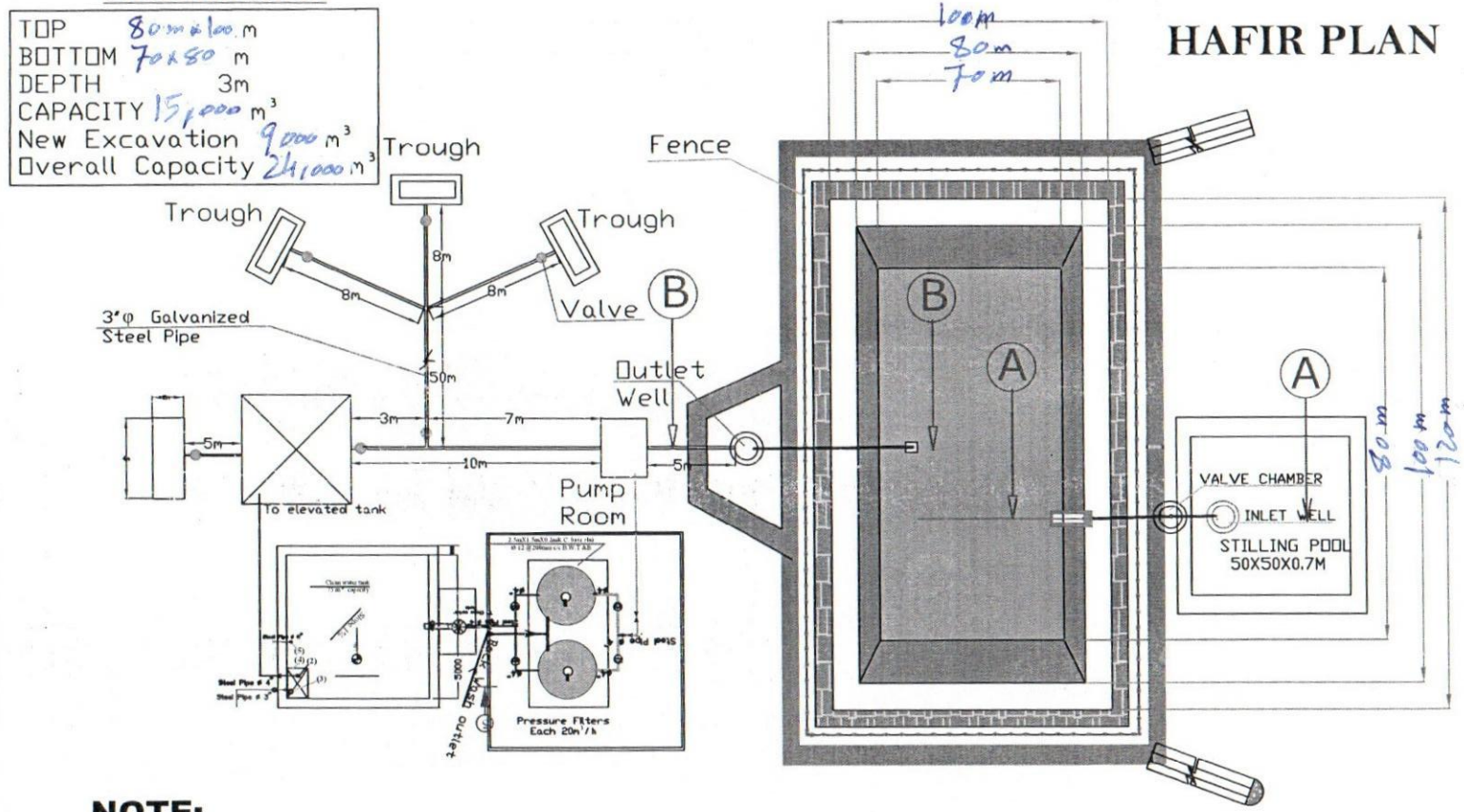
DRAWINGS ALBUM

ALHEJAIRAT HAFIR

February 2026

HAFIR DIMENSION

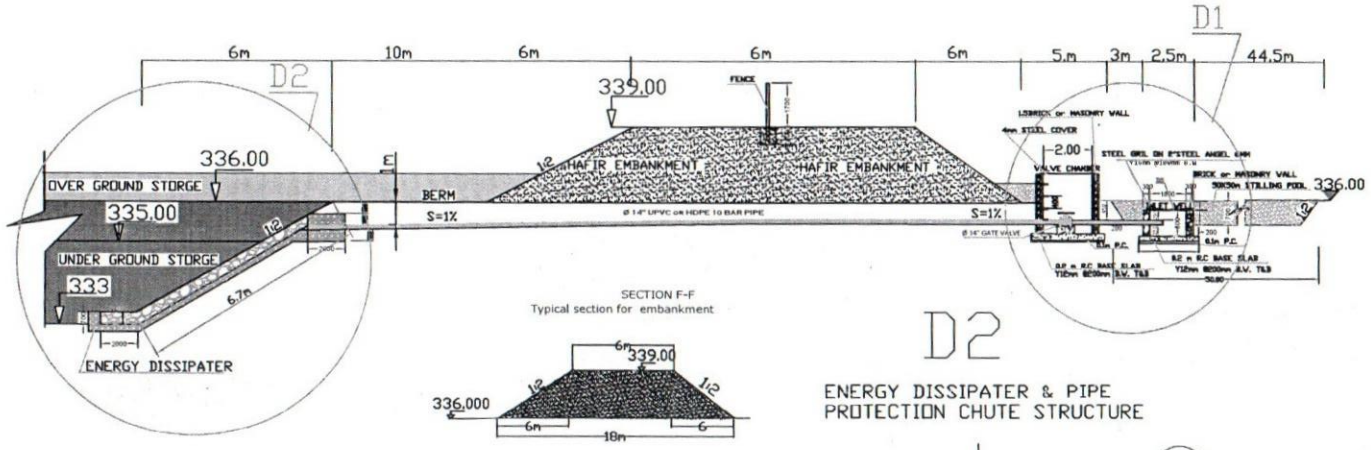
TOP	80 m x 100 m
BOTTOM	70 x 80 m
DEPTH	3m
CAPACITY	15,000 m^3
New Excavation	9000 m^3
Overall Capacity	24,000 m^3

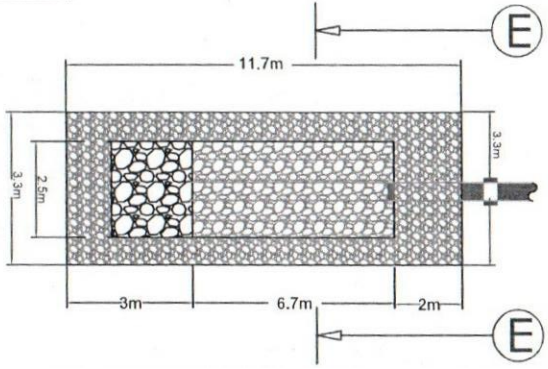


NOTE:

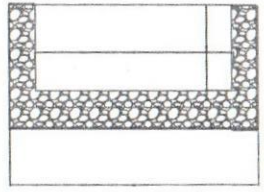
1. All Dimensions are in milimeters unless otherwise noted.
2. NOT TO SCALE

SECTION A-A
INLET SYSTEM DETAILS





SECTION E-E

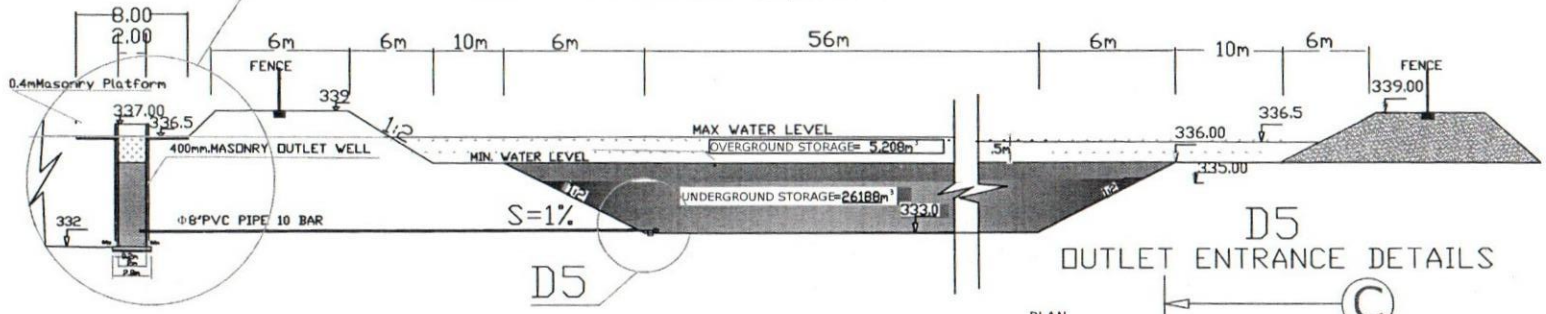


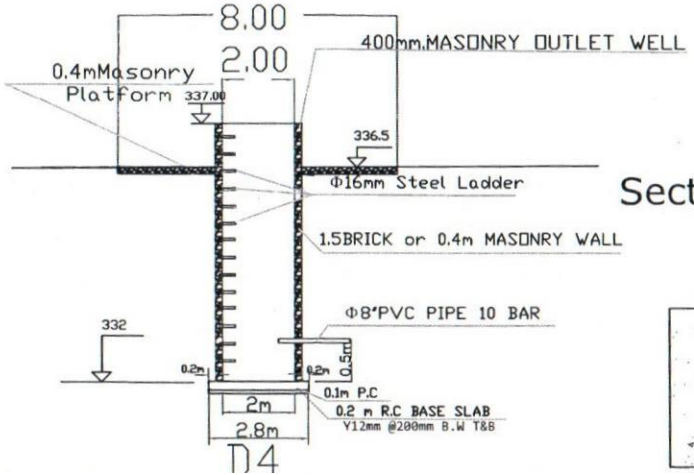
NOTE:

1. All Dimensions are in millimeters unless otherwise noted.
2. Mix ratio of Concrete should be 1:2:4.
3. Mix ratio of Plain Concrete should be 1:3:6.
4. Steel shall satisfy the requirement as per Grade 40 (40,000 psi)
5. Guide post spacing along the irish bridge 2 meters c/c.
6. Clear Cover for main reinforcement of Bottom Slab should be 50 mm.
7. Clear Cover for main reinforcement of Vert. Wall should be 50 mm.
8. Clear Cover for main reinforcement of Top Slab should be 40 mm.
9. During casting of Reinforced concrete use concrete vibrator.
10. Reinforced Concrete Grade 25, (cement 350kg/cu.m minimum)
11 Mix ratio of morter for pitching should be not less than 1:6

SECTION B-B
OUTLET SYSTEM DETAILS

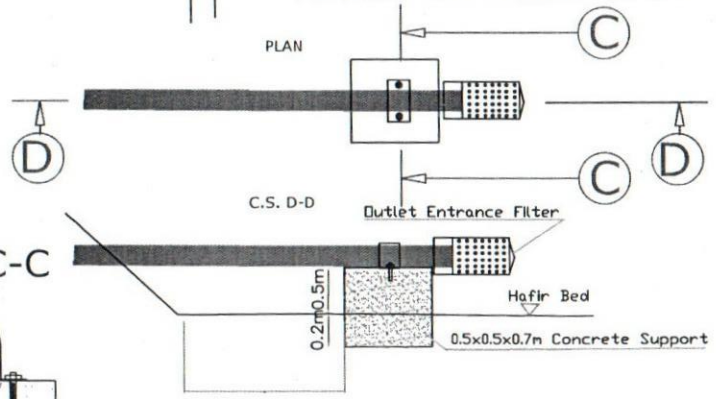
OVER ALL STORAGE =31,396m3

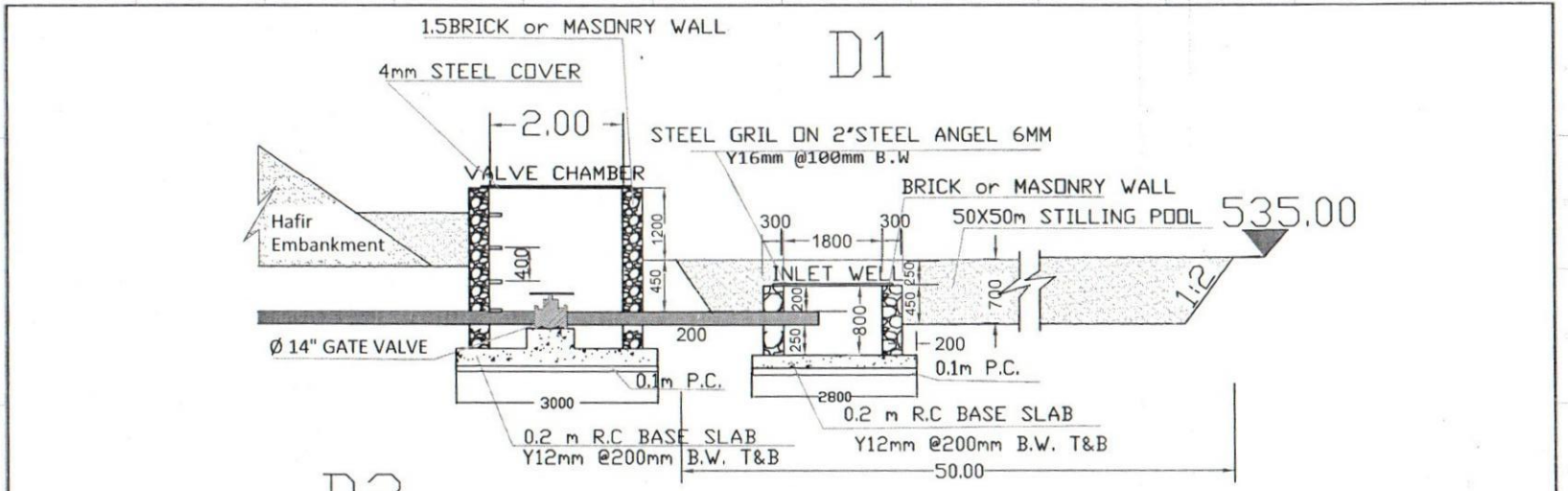


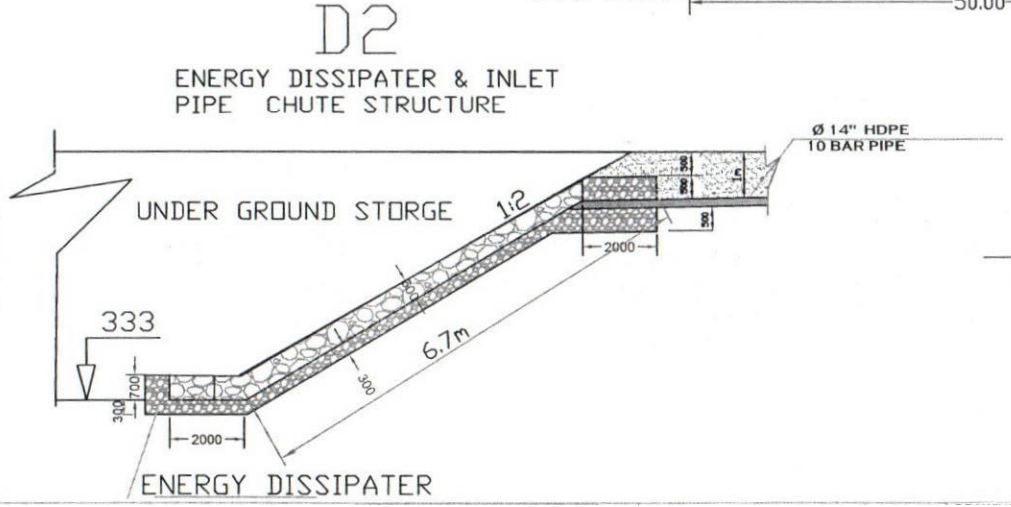


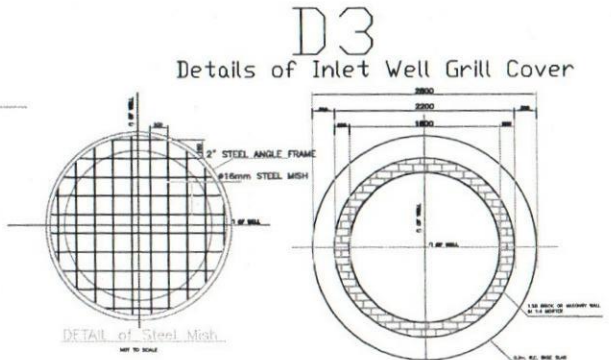
Section C-C

D5
OUTLET ENTRANCE DETAILS




1.5BRICK or MASONRY WALL
4mm STEEL COVER
D1
2.00
STEEL GRIL ON 2"STEEL ANGEL 6MM
Y16mm @100mm B.W
VALVE CHAMBER
BRICK or MASONRY WALL
50X50m STILLING POOL
535.00
Hafir
Embankment
300
1800
300
1200
400
450
INLET WELL
200
250
800
450
250
700
1:2
Ø 14" GATE VALVE
200
200
0.1m P.C.
0.1m P.C.
3000
2800
0.2 m R.C BASE SLAB
Y12mm @200mm B.W. T&B
0.2 m R.C BASE SLAB
Y12mm @200mm B.W. T&B
50.00

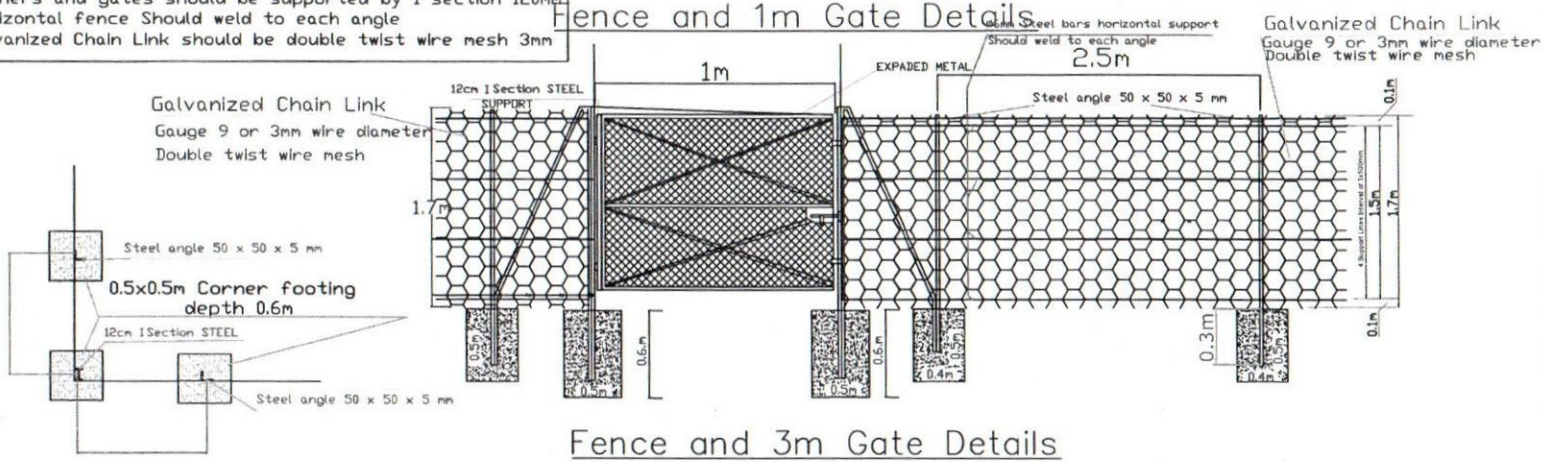

D2
ENERGY DISSIPATER & INLET
PIPE CHUTE STRUCTURE
Ø 14" HDPE
10 BAR PIPE
UNDER GROUND STORGE
1:2
2000
333
6.7m
300
700
300
2000
ENERGY DISSIPATER


D3
Details of Inlet Well Grill Cover
2" STEEL ANGLE FRAME
Ø16mm STEEL MISH
DETAIL of Steel Mesh
Plan of Inlet Well

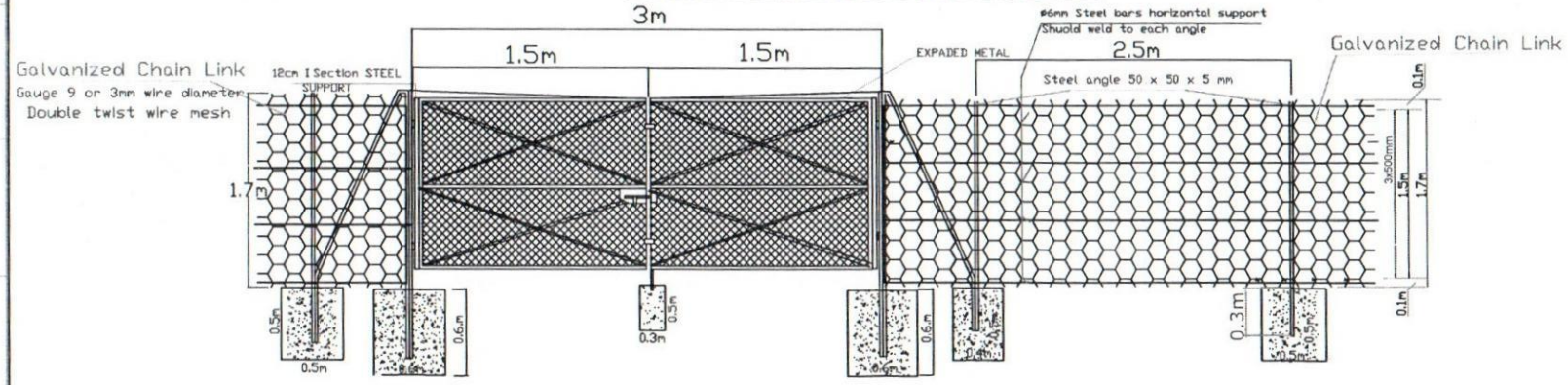
NOTE:

1. All Dimensions are in millimeters unless otherwise noted.
2. Corners and gates should be supported by I section 120mm
3. Horizontal fence Should weld to each angle
4. Galvanized Chain Link should be double twist wire mesh 3mm

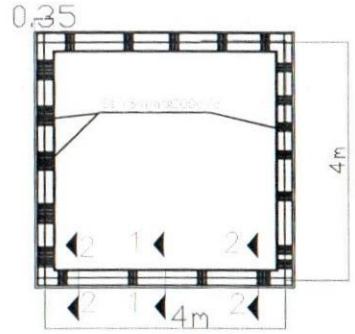
Fence and 1m Gate Details



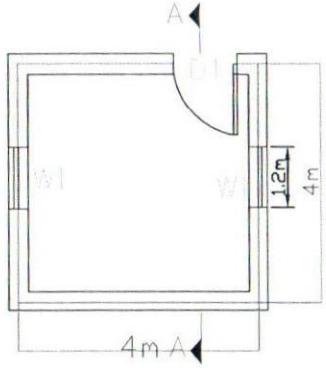
Fence and 3m Gate Details



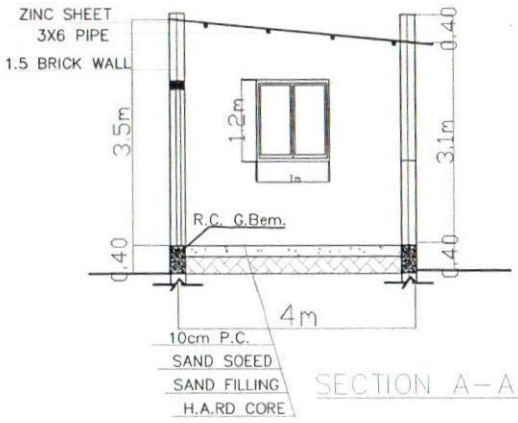
GUARD ROOM



G. Bem Reinforcement Plan

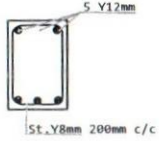


PLAN

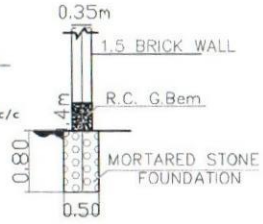


SECTION A–A

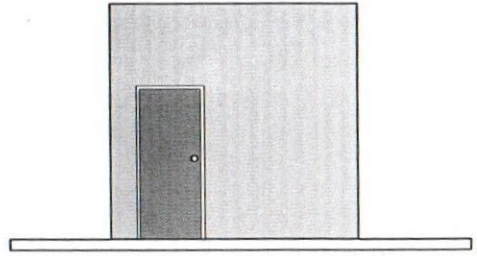
SECTION 1-1



SECTION 2-2



FOUNDATION DETAIL



MAIN ELEVATION

NOTE:

1. All Dimensions are in millimeters unless otherwise noted.
2. Mix ratio of Concrete should be 1:2:4.
3. Mix ratio of Plain Concrete should be 1:3:6.
4. Steel shall satisfy the requirement as per Grade 40 (40,000 psi)
5. Guide post spacing along the Irish bridge 2 meters c/c.
6. Clear Cover for main reinforcement of Bottom Slab should be 50 mm.
7. Clear Cover for main reinforcement of Vert. Wall should be 50 mm.
8. Clear Cover for main reinforcement of Top Slab should be 40 mm.

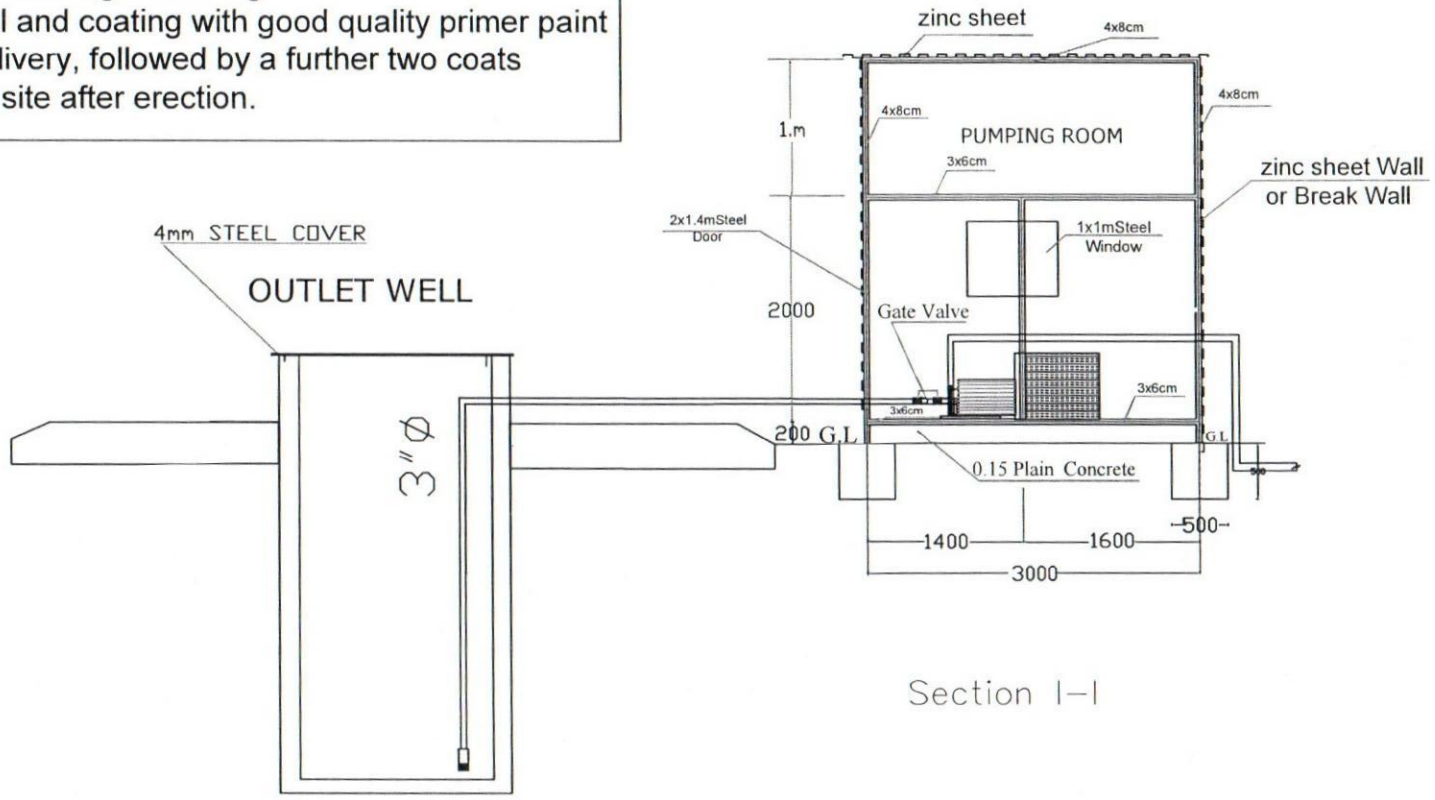
NOTE

W1 STEEL WINDOW 1.2mX1.2m+GRILL

D1 STEEL DOOR 1X2.2m

Note : -

The minimum acceptable finish
should consist of grit blasting
all material and coating with good quality primer paint
before delivery, followed by a further two coats
of paint at site after erection.



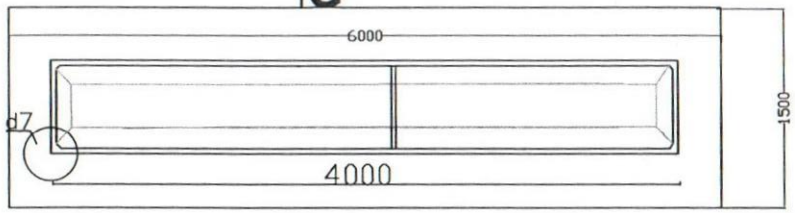
Section I–I

TYPICAL DOMESTIC LIVESTOCK WATER YARD PUMPING UNIT

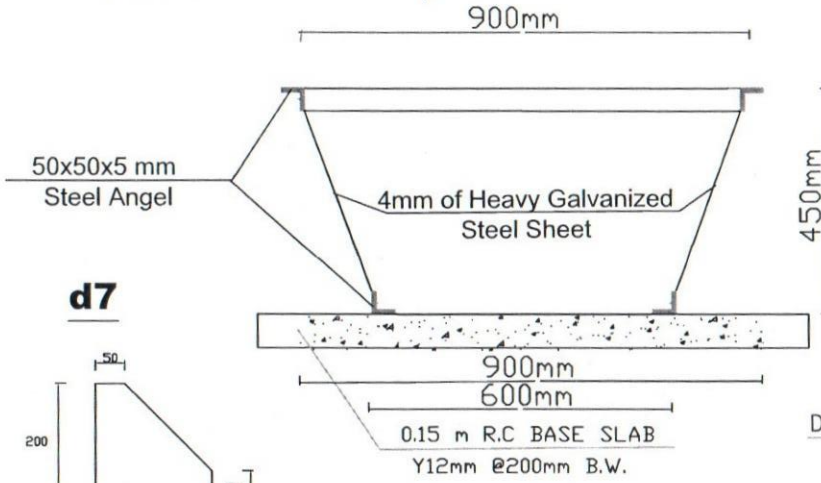
FOR

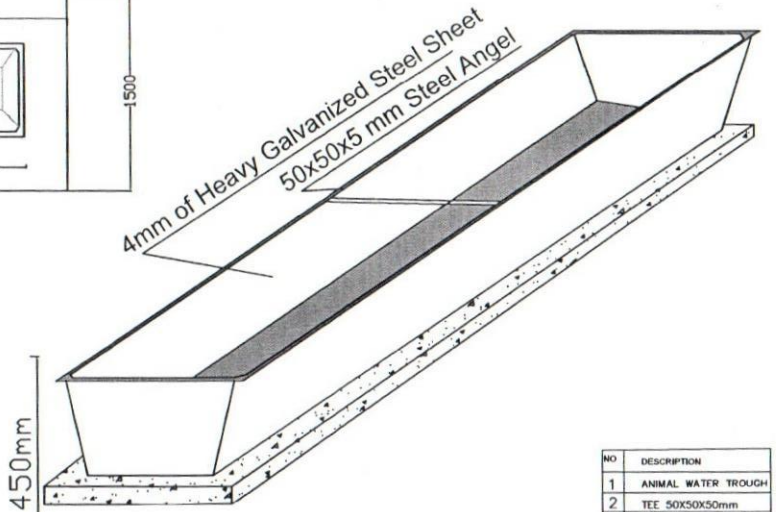
DOMESTIC LIVESTOCK WATER YARD

Plan



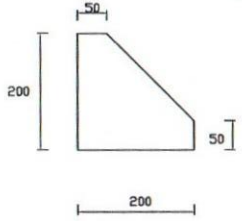
Section G-G

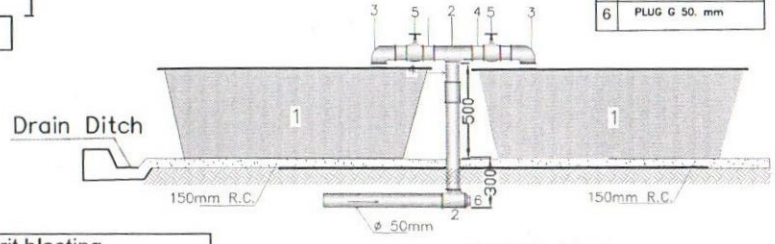




NO	DESCRIPTION
1	ANIMAL WATER TROUGH
2	TEE 50X50X50mm
3	BEND 50 mm
4	NIPPLE 50mm
5	VALVE 50 mm
6	PLUG G 50. mm

d7



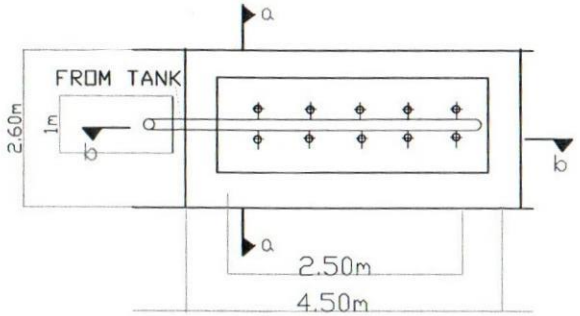


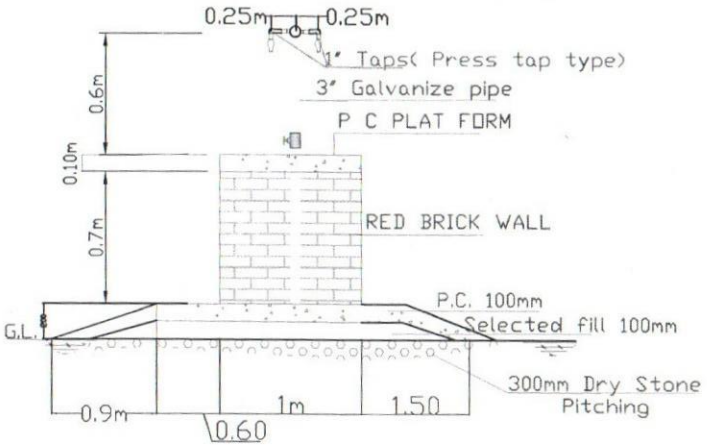
Note : -

The minimum acceptable finish should consist of grit blasting all material and coating with good quality primer paint before delivery, followed by a further two coats of paint at site after erection.

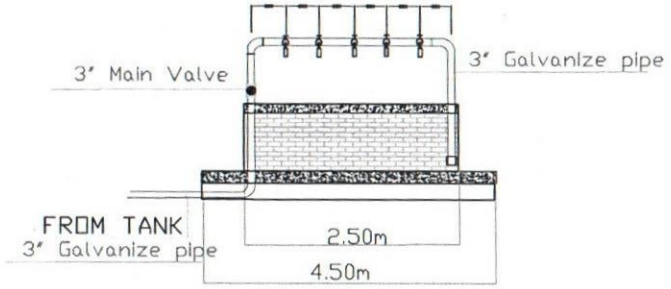
1. All Dimensions are in millimeters unless otherwise noted.

PLAN



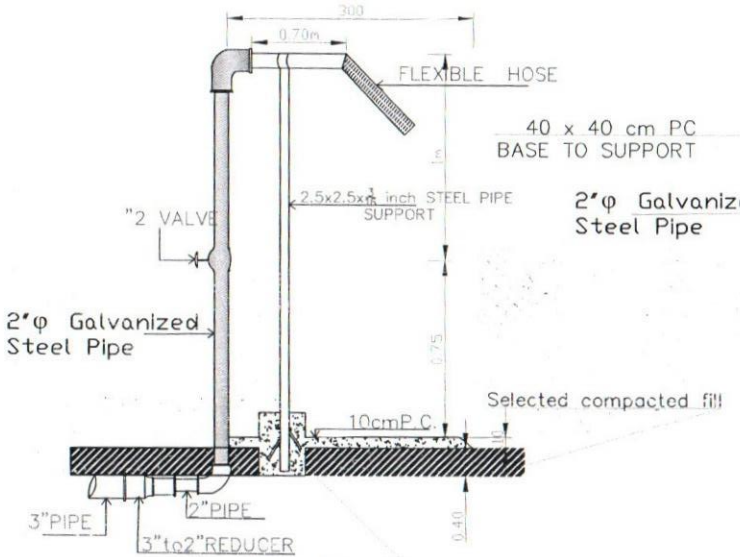


SECTION a-a

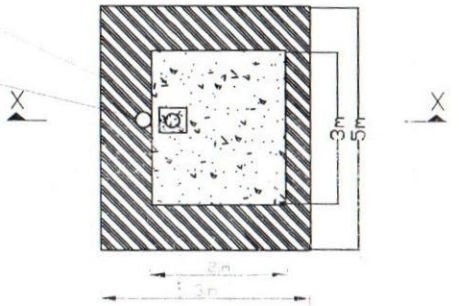


SECTION b-b

TANKER AND CART LOADING AREA



SECTION X–X

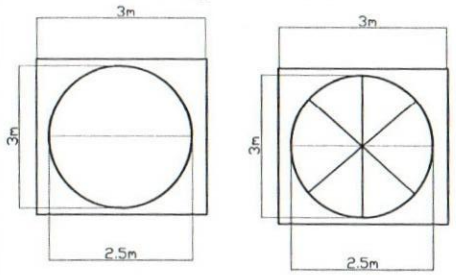


PLAN

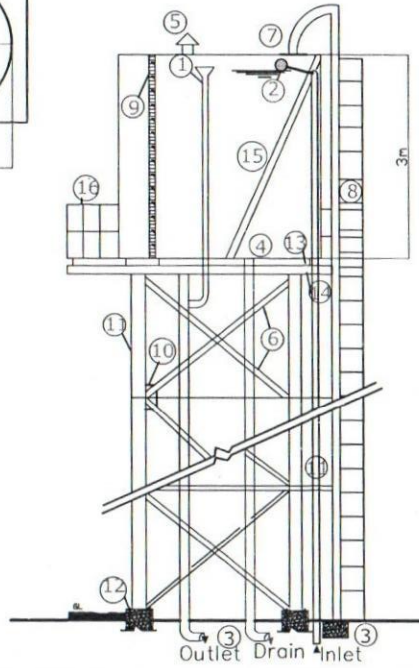
1. All Dimensions are in millimeters unless otherwise noted.

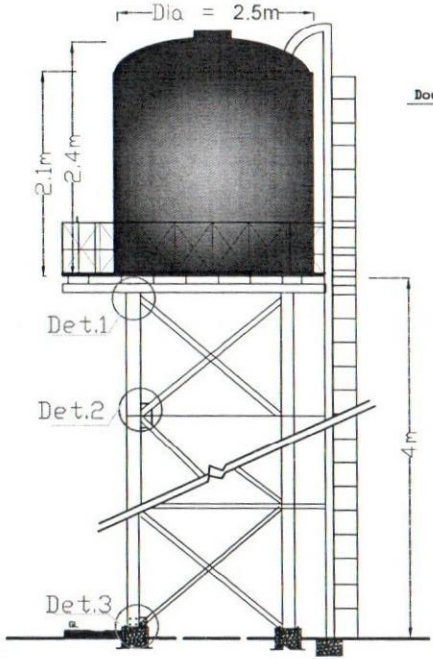
Plan on Horizontal inner Diagonal Cross Bracing

12 m^3 GRP ELEVATED TANK

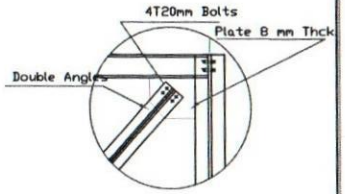


No.	
1	OVERFLOW PIPE
2	FLOAT LEVEL VALVE
3	OUTLET INLET PIPE
4	WASH PIPE
5	VENT PIPE
6	DIAGONAL BRACER 50X50X6mm
7	MANHOLE COVER 50X50cm
8	EXTERNAL LADDER
9	WATER LEVEL INDICATOR
10	GUSSET PLATES 8mmTHICK
11	I 12cm
12	HD BOLT 80X 25mm
13	I 10cm
14	I 12cm
15	INTERNAL LADDER
16	BALCONY

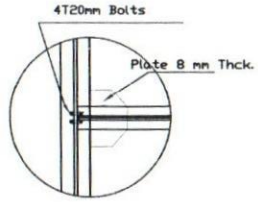




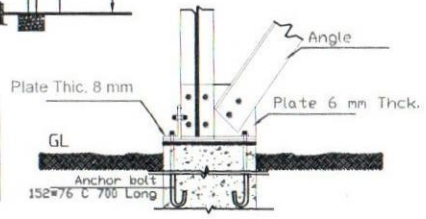
Det.1



Det.2

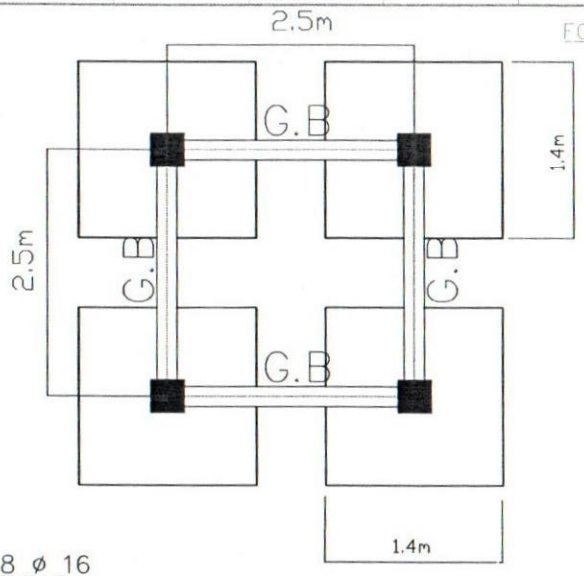


Det.3

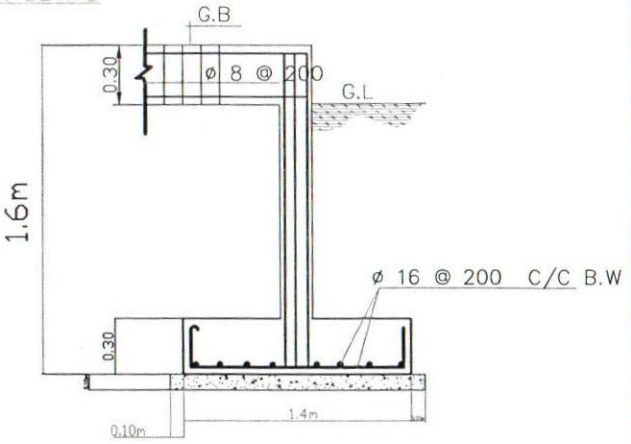


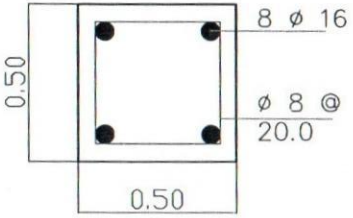
Note : -

The minimum acceptable finish should consist of grit blasting all material and coating with good quality primer paint before delivery, followed by a further two coats of paint at site after erection.

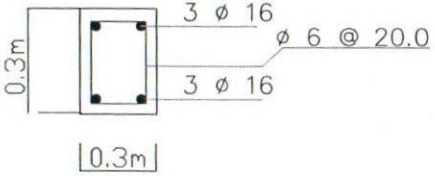


FOUNDATION DETAIL



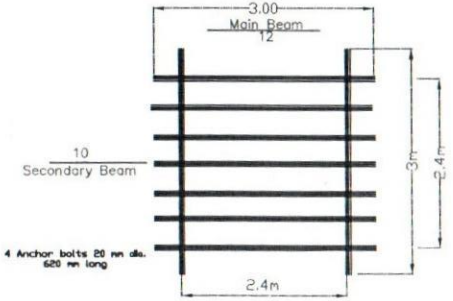


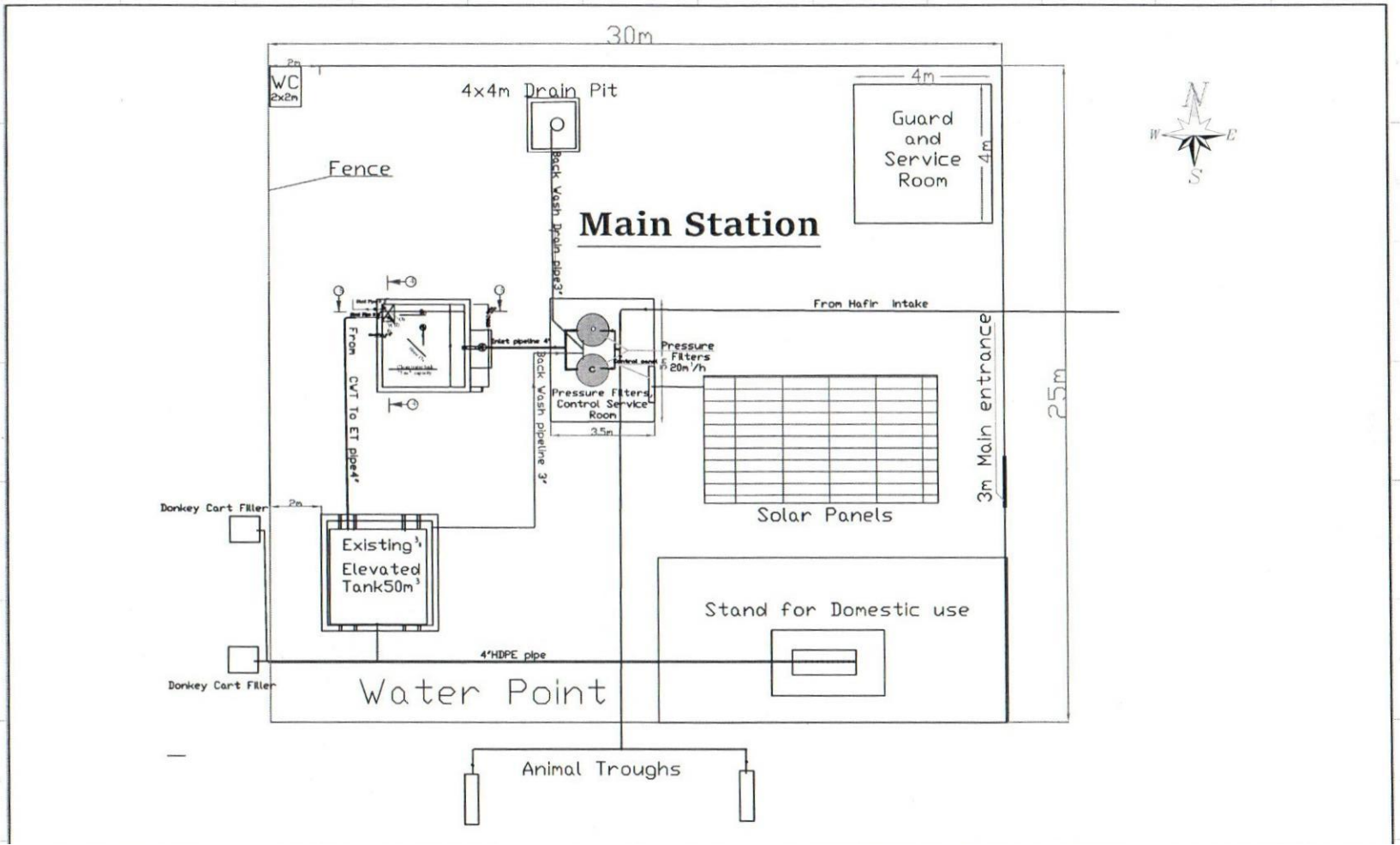
SHORT COLUMN

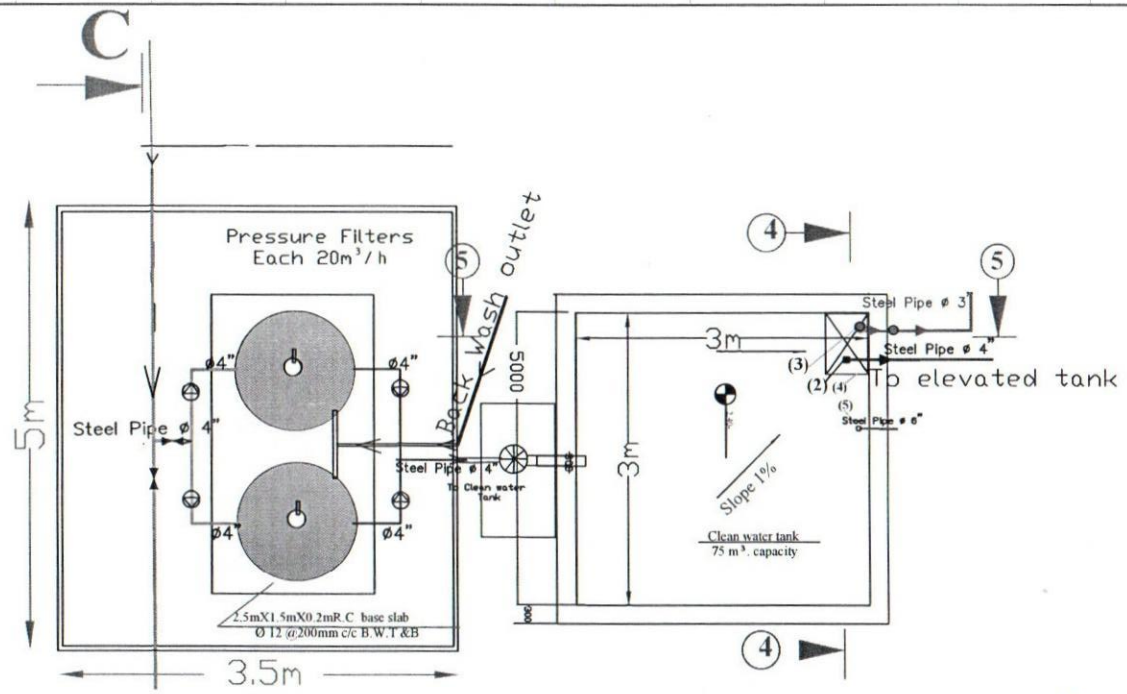


G.B SECTION

Frame Top View




30m
WC
2x2m
4x4m Drain Pit
4m
Guard and Service Room
4m
Fence
Main Station
Back Wash Drain pipe3"
From Hafir Intake
From CVT To ET pipe4"
Pressure Filters 20m³/h
Pressure Filters Control Service Room
3.5m
Back Wash pipeline 3"
3m Main entrance
25m
Donkey Cart Filler
2m
Existing Elevated Tank50m³
Solar Panels
Stand for Domestic use
4"HDPE pipe
Donkey Cart Filler
Water Point
Animal Troughs
N
W
E
S



C

Legend

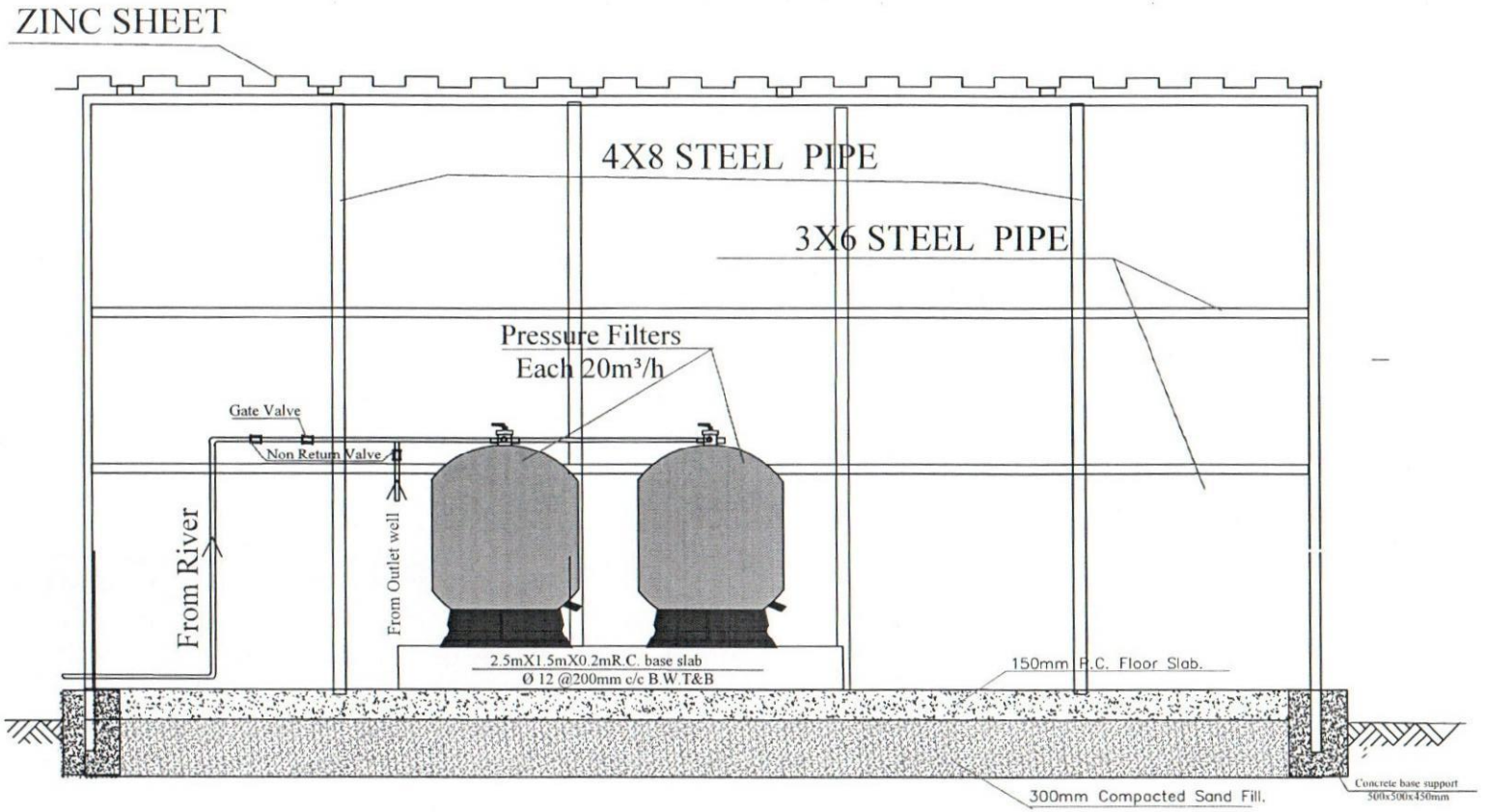
1. 4"Ø inlet pipe
2. 4" Ø Submersible Pump Q=30m³/h, H=25m
3. 3" Ø Submersible **Sludge** Pump Q=10m³/h, H20=m
4. Intake and Drain Pit
5. Bill-mouth 6" over flow

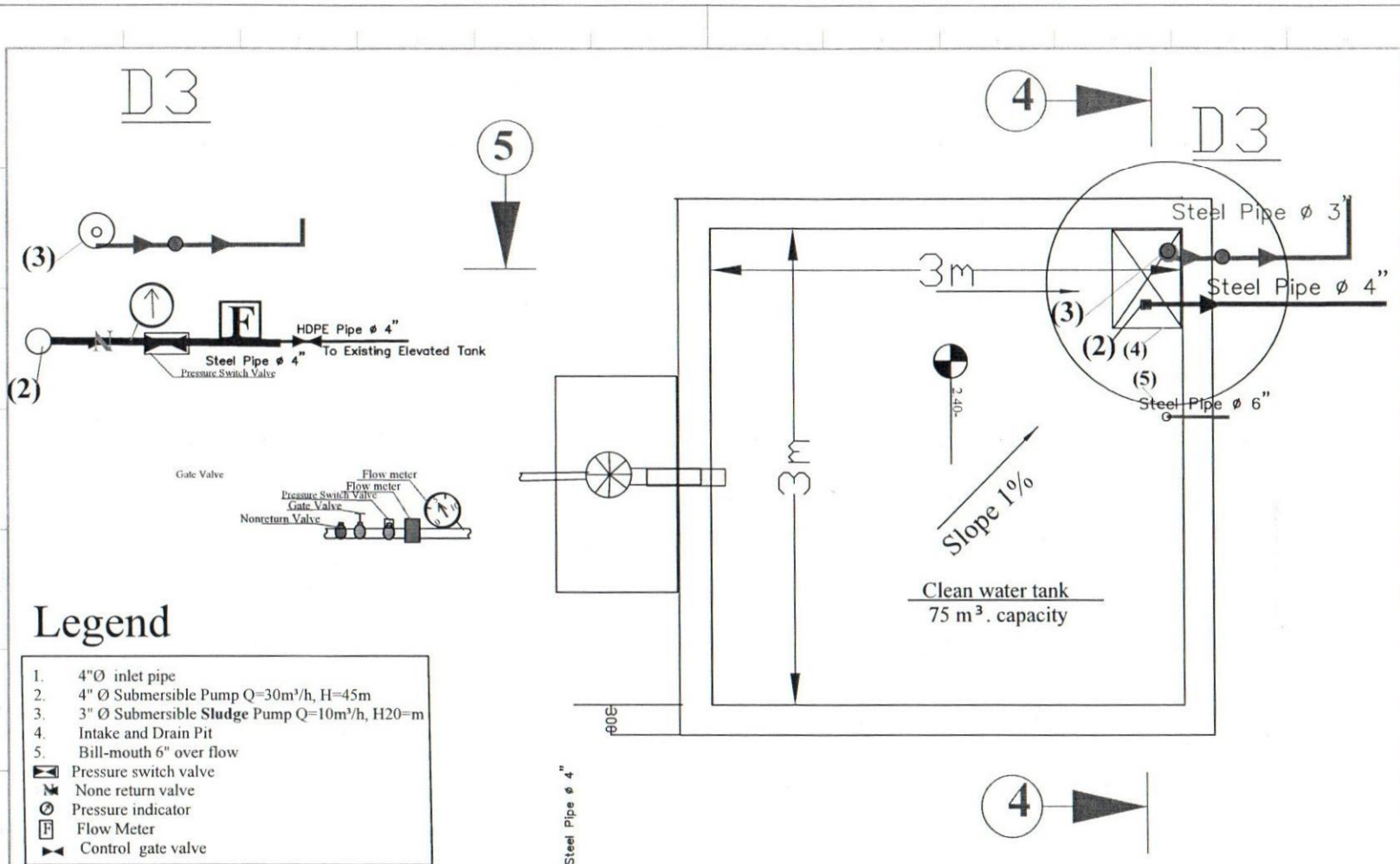
Pressure switch valve
None return valve
Pressure indicator
Flow Meter
Control gate valve

Notes :

1 - The Thickness Selected Fill Soil = 300mm
2 - The Thickness of floor Slab of Steel Rooms = 150mm
3 - The Thickness of the Slab = 250 mm
4 - Yeild Strength For Steel Fy = 410 N/mm .
5 - Compressive Crushing Strength For Concrete Fcu = 35 N/mm .
6 - Cover For Main Reinf = 30 mm.
7 - All The Spacings between bars in mms .
8 - Lap Length of Reinf. in Tension & Compression=55 x Diameter

Section C-C of Pressure Filters Room




D3
5
(3)
F
HDPE Pipe ø 4"
To Existing Elevated Tank
Steel Pipe ø 4"
Pressure Switch Valve
(2)
Gate Valve
Flow meter
Flow meter
Pressure Switch Valve
Gate Valve
Nonreturn Valve
4
D3
Steel Pipe ø 3"
3m
Steel Pipe ø 4"
(3)
(2)
(4)
(5)
Steel Pipe ø 6"
2.40
3m
Slope 1%
Clean water tank
75 m³. capacity
30ø
Steel Pipe ø 4"
4
Legend
1. 4"Ø inlet pipe
2. 4" Ø Submersible Pump Q=30m³/h, H=45m
3. 3" Ø Submersible Sludge Pump Q=10m³/h, H20=m
4. Intake and Drain Pit
5. Bill-mouth 6" over flow
Pressure switch valve
None return valve
Pressure indicator
Flow Meter
Control gate valve

Section 4-4 Mortajal Ground Clean Water Tank and Pumping Station and Reinforcement Details

Notes :

1 - The Thickness of the Base Plate = 400 mm

1 - The Thickness of the Slab & Walls = 300 mm

2 - Yeild Strength For Steel Fy = 410 N/mm .

3 - Compressive Crushing Strength For Concrete Fcu = 35 N/mm .

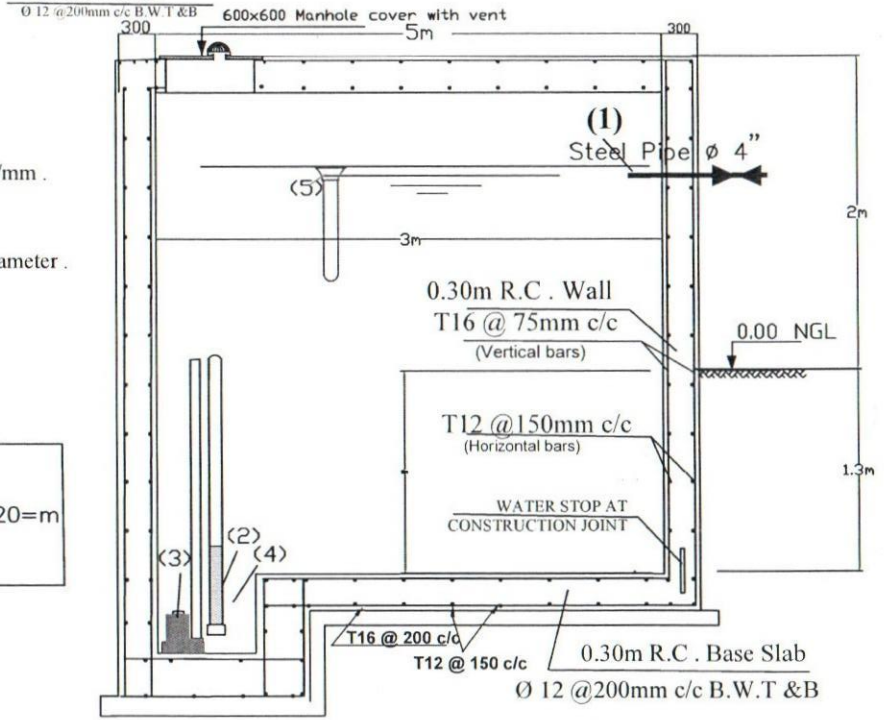
4 - Cover For Main Reinf = 50 mm.

5 - All The Spacings between bars in mms .

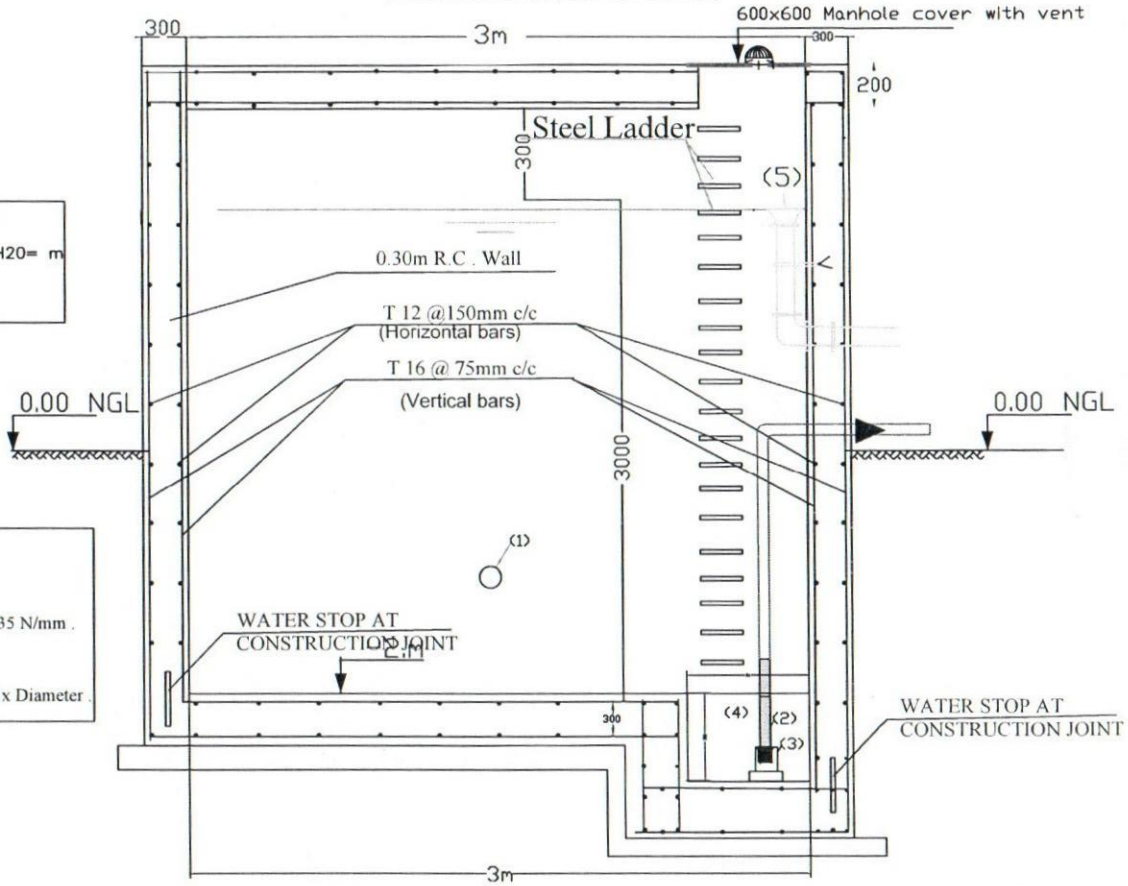
6 - Lap Length of Reinf. in Tension & Compression=55 x Diameter .

Legend

1. 4"ø inlet pipe
2. 4" ø Submersible Pump Q=30m³/h, H=25m
3. 3" ø Submersible **Sludge** Pump Q=10m³/h, H20=m
4. Intake and Drain Pit
5. Bill-mouth 6" over flow



Section 5-5 Ground Clean Water Tank and Pumping Station and Reinforcement Details



Legend

1. 6"ø inlet pipe
2. 4" ø Submersible Pump Q=50m³/h, H=45m³
3. 3" ø Submersible Sludge Pump Q=10m³/h, H20= m
4. Intake and Drain Pit
5. Bill-mouth 6" over flow

Notes :

1 - The Thickness of the Base Plate = 400 mm

1 - The Thickness of the Slab & Walls = 300 mm

2 - Yeild Strength For Steel Fy = 410 N/mm².

3 - Compressive Crushing Strength For Concrete Fcu = 35 N/mm .

4 - Cover For Main Reinf = 50 mm.

5 - All The Spacings between bars in mms .

6 - Lap Length of Reinf. in Tension & Compression=55 x Diameter .