

## إعادة تأهيل بئر مرفد

### Rehabilitation of Marfad Borehole

Essential health, nutrition and WASH assistant to vulnerable  
and conflict-affected population in Yemen –YEM110

April 2021.

المساعدة الأساسية في الصحة والتغذية والمياه والصرف الصحي للسكان  
المعرضين للخطر والمتضررين من النزاع في اليمن

إبريل 2021 م

- Village: Marfad
- District: Al-Hussein
- Governorate: Al-Dhale`e
- Drawings No: 26

- القرية: مرفد
- المديرية: الحصين
- المحافظة: الضالع
- عدد الرسومات: 26

WASH Team – AL-Dhale`e Office

# CONSTRUCTION TANK & SOLAR PUMPING SYSTEM DRAWINGS FOR MARFEAD BOREHOLE YEM-110

**MEDAIR**

*each life matters*

PROJECT NAME:

Rehabilitation of Marfad Borehole YEM – 110

DRAWING TITLE:

TITLE

DESIGN BY:

DRAWING NO.:

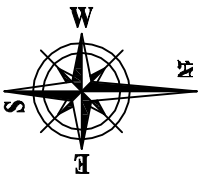
SCALE:

(     )

CHECKED BY:

DATE:

(May 2021)



**MEDAIR**

*each life matters*

PROJECT NAME:

Rehabilitation of Marfad Borehole YEM – 110

DRAWING TITLE:

General Site Google Map

DESIGN BY:

CHECKED BY:

DRAWING NO: (01–26)

SCALE:

( )

DATE:

(May 2021)

Protection wall Fence

Solar Panels Location

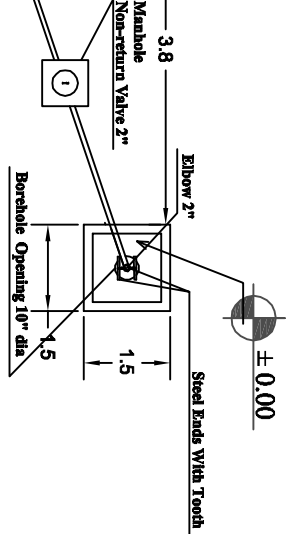
+0.50

17.40

30

30.00

1.0



GI 2" diameter, length of 112.00 m

96

Vent Pipe Ø3  
inch Dia

1.0

Manhole of Stop Valve 2"

Iron Inlet Pipe

Stone Pavement Around Tank

0.3

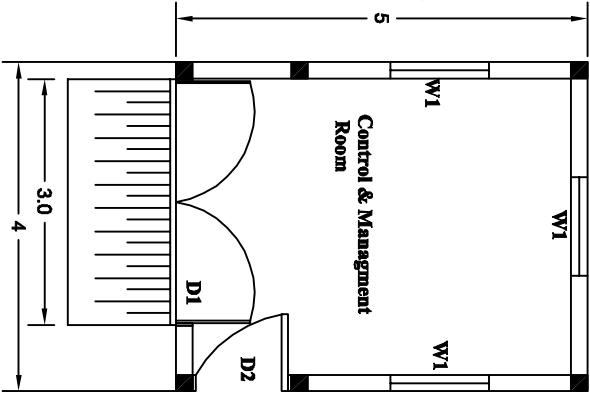
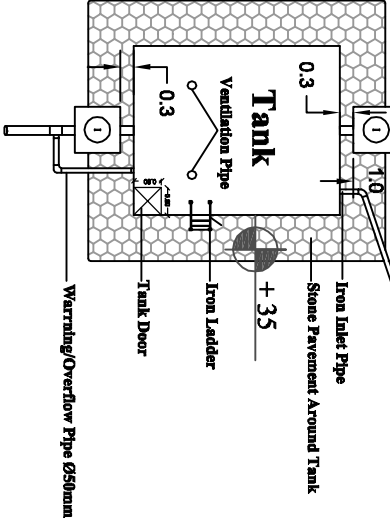
Ventilation Pipe

Iron Ladder

Tank Door

Warring/Overflow Pipe Ø50mm

+ 35



MEDAIR

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PROJECT NAME:

Rehabilitation of Marfad Borehole YEM – 110

DRAWING TITLE:

Master Site Plan

DESIGN BY:

A.-Dhole & WASH Team

CHECKED BY:

DRAWING NO:

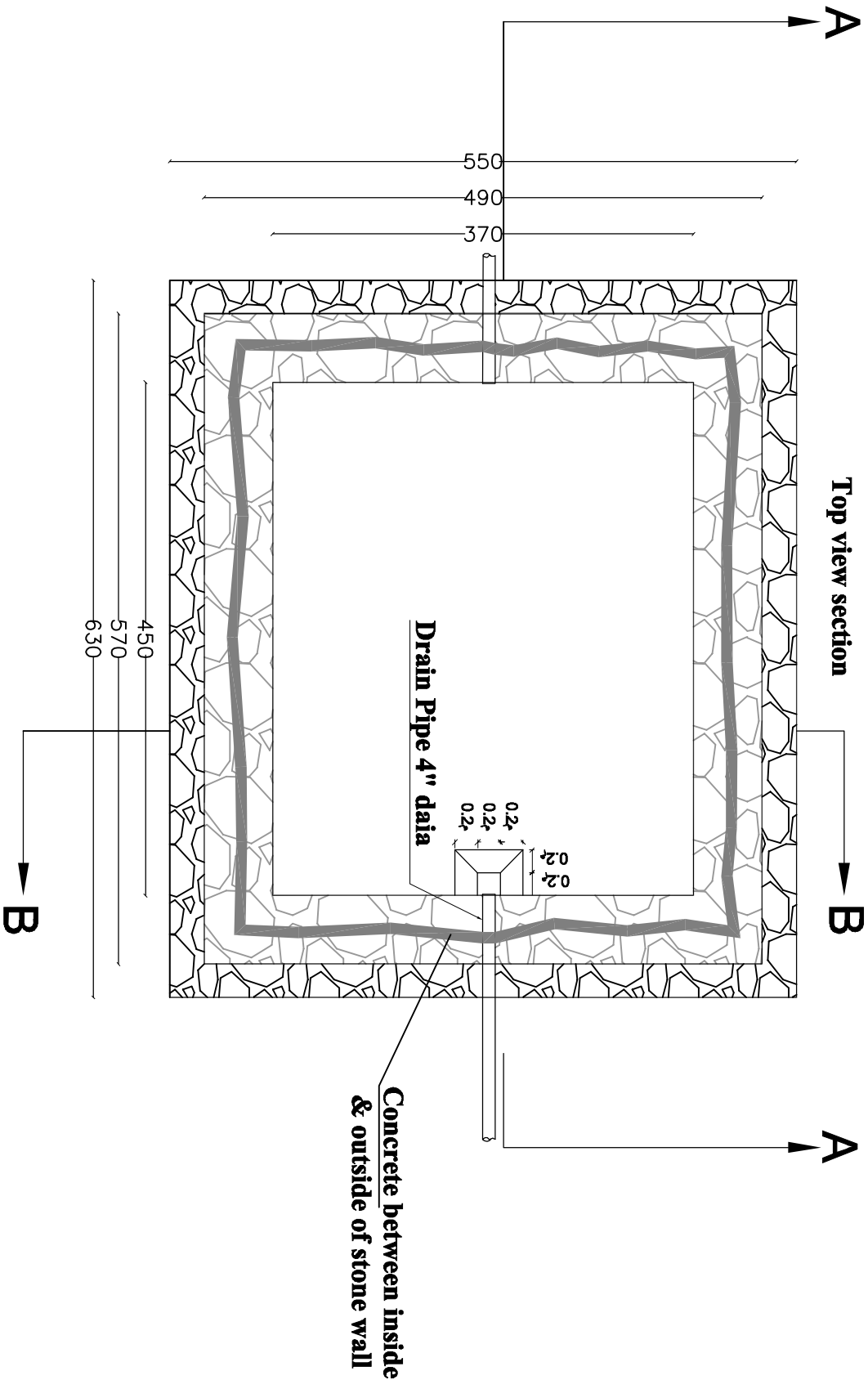
(02-26)

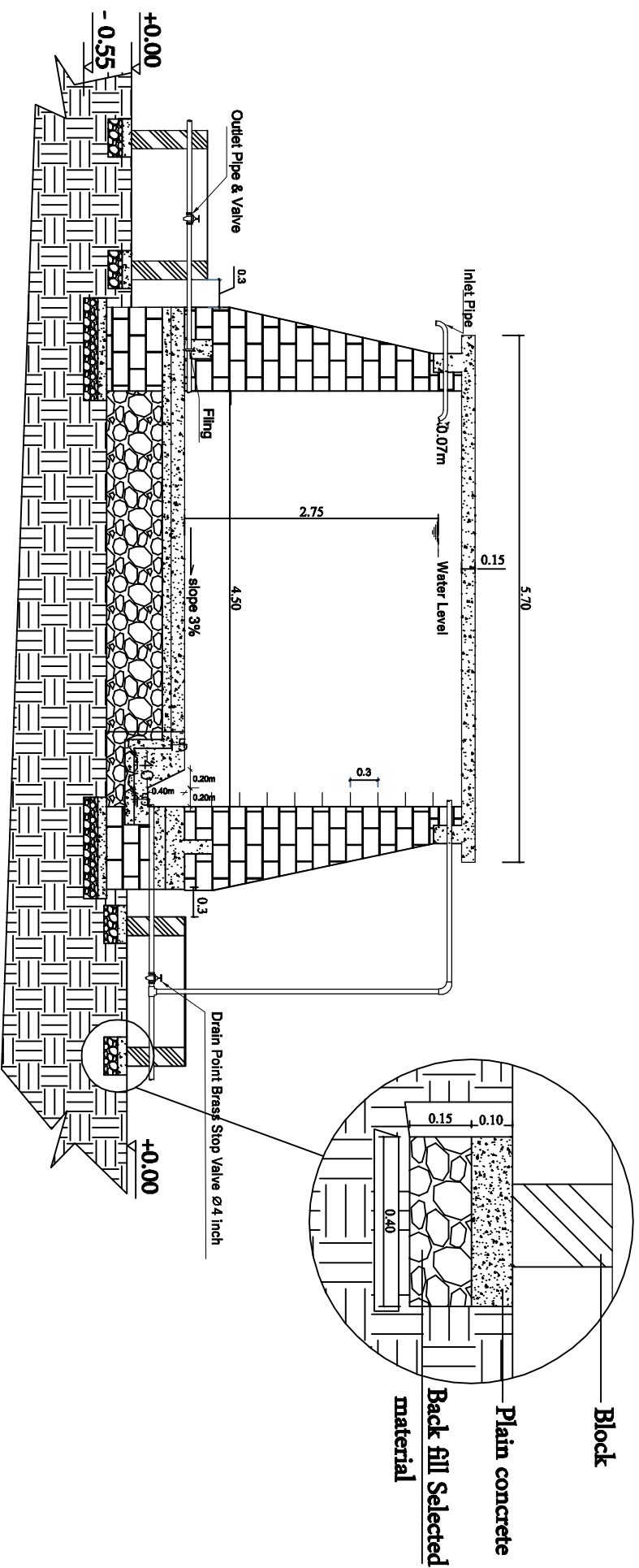
SCALE:

( )

DATE:

(May 2021)





## SECTION A-A

**MEDAIR**

*each life matters*

**PROJECT NAME:**

Rehabilitation of Marfad Borehole YEM – 110

**DRAWING TITLE:**

General DETAILS OF FIXED STAIR IN  
WALL & STEEL REINFORCEMENT OF  
GROUND SLAB AND BEAM

**DESIGN BY:**

A.-Dhole & WASH Team

**CHECKED BY:**

**DRAWING NO:**

(04-26)

**SCALE:**

( )

**DATE:**

(May 2021)

each life matters

Rehabilitation of Marfad Borehole YEM – 110

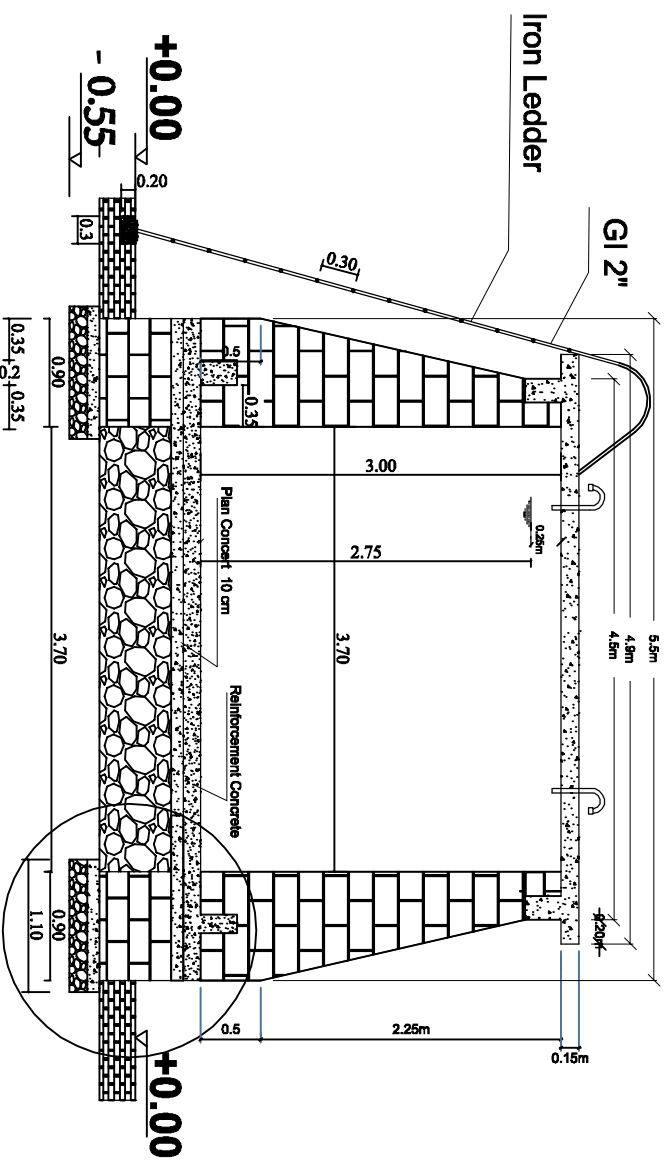
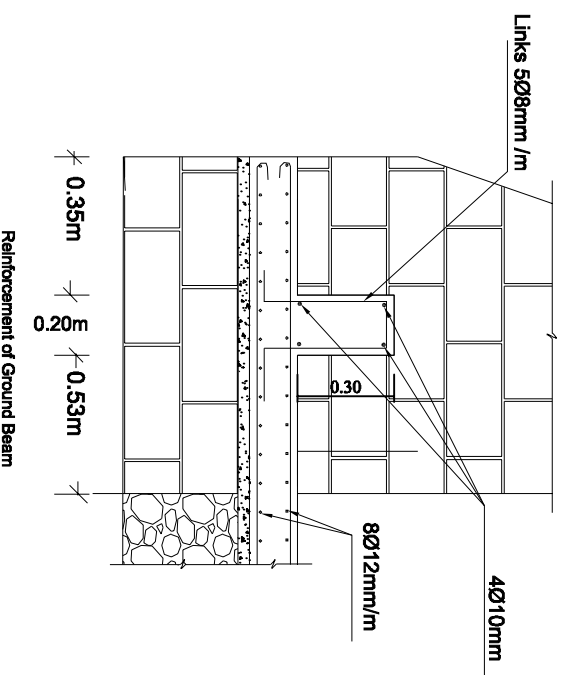
**DRAWING TITLE**  
General DETAILS OF FIXED STAIR IN  
WALL & STEEL REINFORCEMENT OF  
GROUND SLAB AND BEAM

**AL-Dhale'a WASH Team**

DRAWING NO:  
(05-26)

SCALE: ( )

DATE: (May.2021)

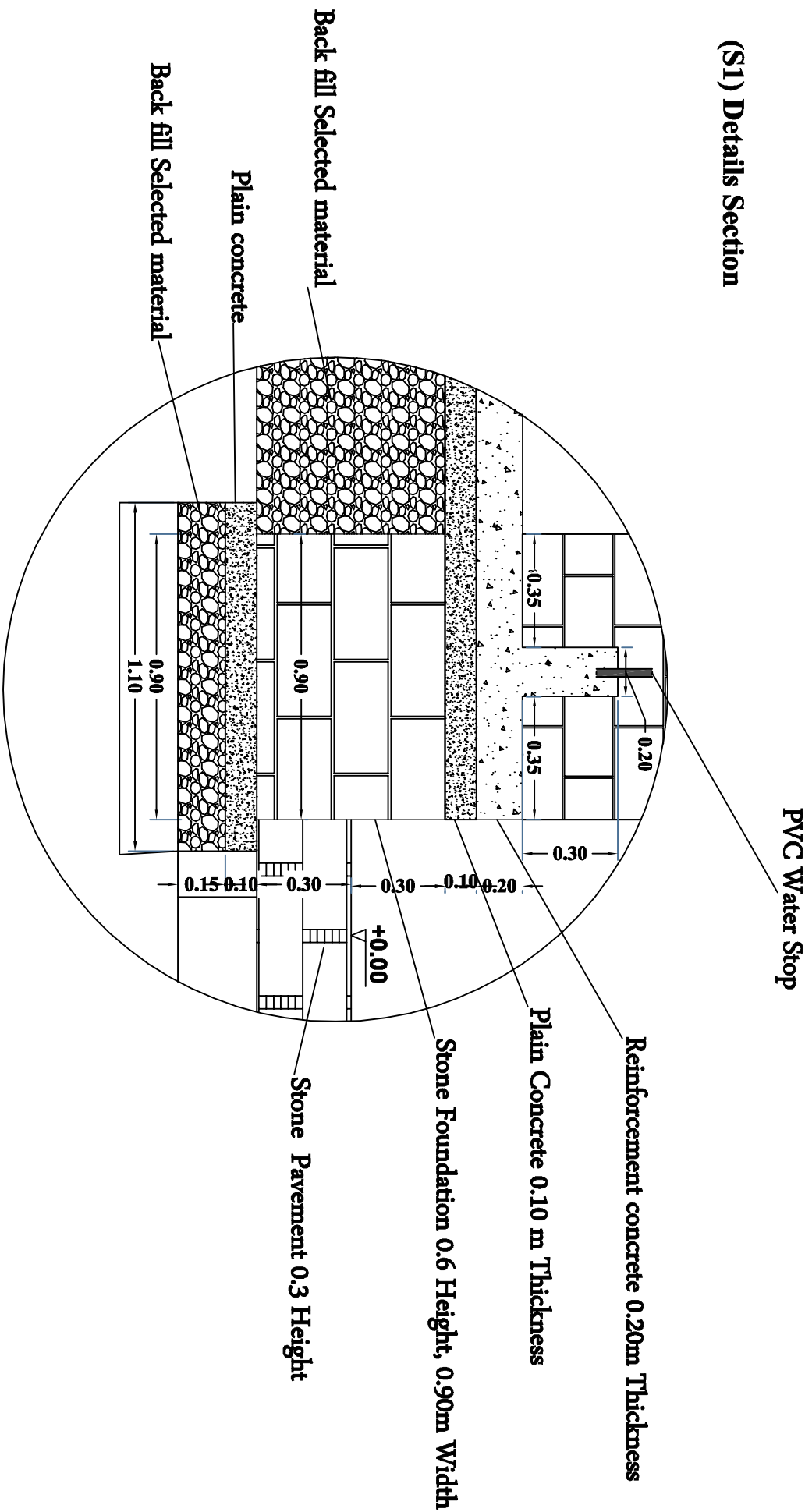


**Please see the details in (SI) Section**

# SECTION B-B



(S1) Details Section



**MEDAIR**

*each life matters*

**PROJECT NAME:**

Rehabilitation of Marfad Borehole YEM – 110

**DRAWING TITLE:**

General DETAILS OF FIXED STAIR IN  
WALL & STEEL REINFORCEMENT OF  
GROUND SLAB AND BEAM

**DESIGN BY:**

Al-Dhale'a WASH Team

**CHECKED BY:**

**DRAWING NO:**

(06-26)

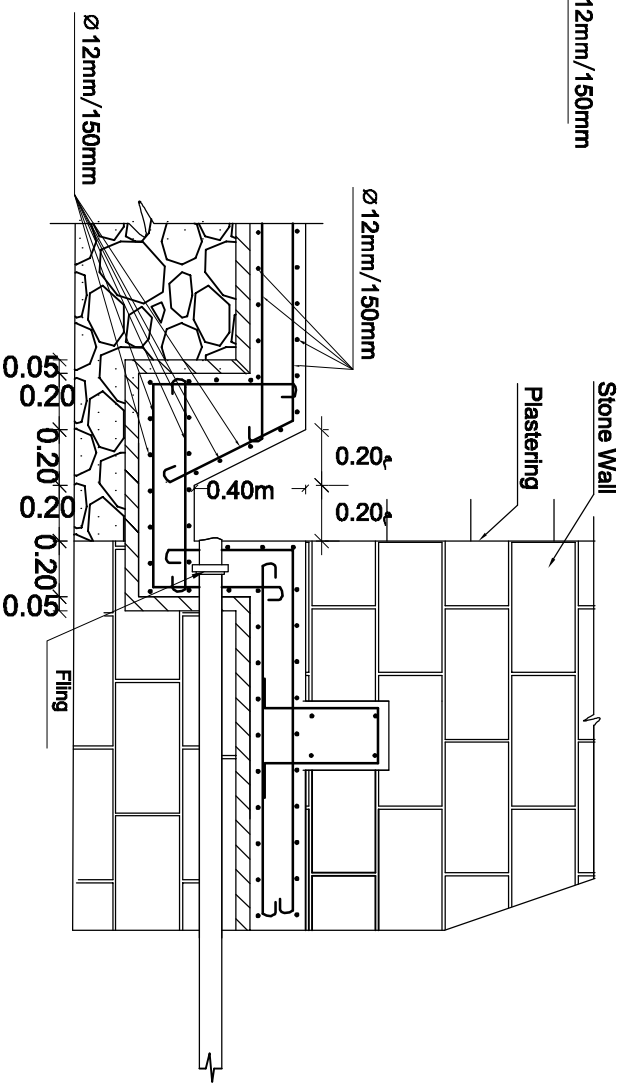
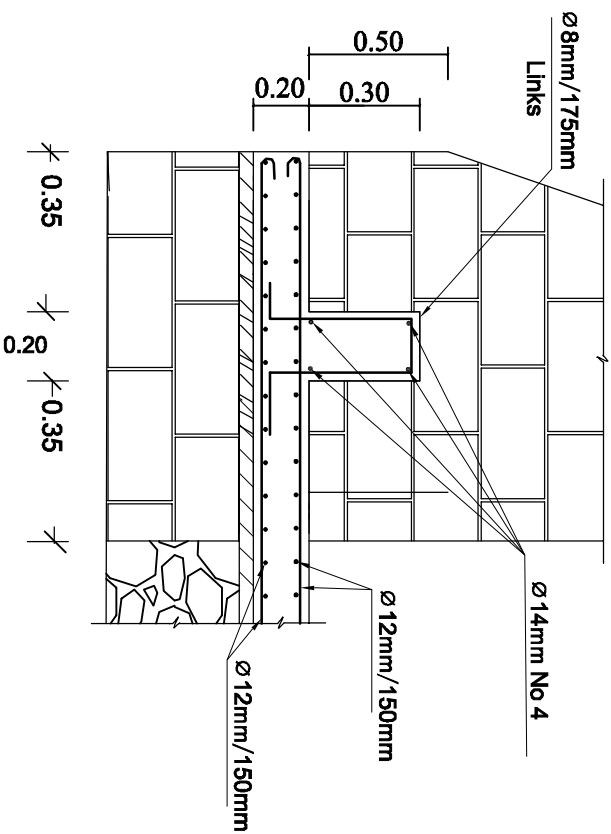
**SCALE:**

( )

**DATE:**

(May 2021)





**MEDAIR**

*each life matters*

**PROJECT NAME:**

Rehabilitation of Marfad Borehole YEM – 110

**DRAWING TITLE:**

STEEL REINFORCEMENT OF BEAM

**DESIGN BY:**

A.-Dhole & WASH Team

**CHECKED BY:**

**DRAWING NO:**

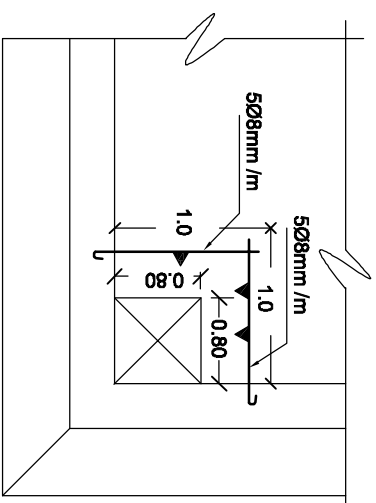
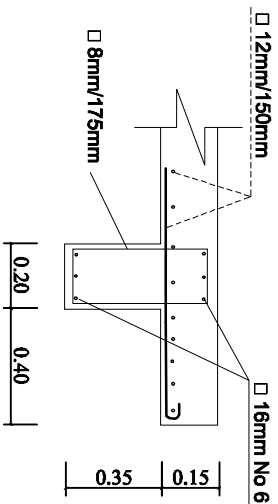
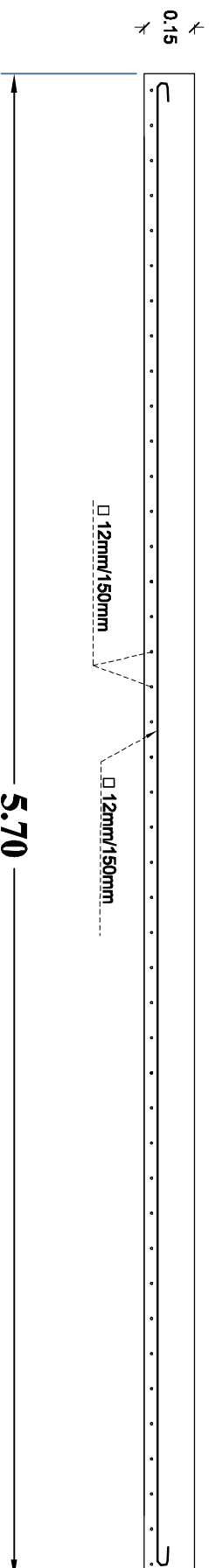
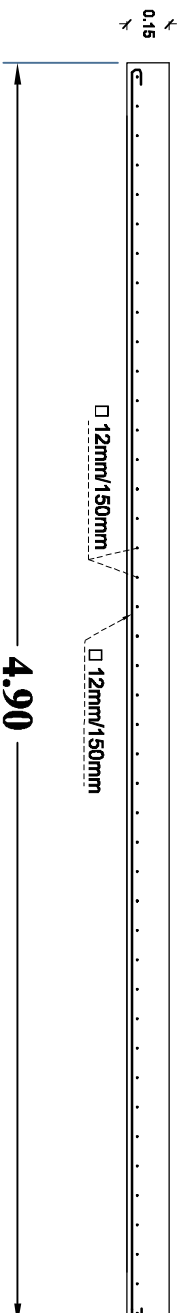
(07-26)

**SCALE:**

( )

**DATE:**

(May 2021)



## Details of Ring Beam to Roof of Tank

## Details of door tank

**MEDAIR**

*each life matters*

**PROJECT NAME:**

Rehabilitation of Marfad Borehole YEM – 110

**DRAWING TITLE:**

SECTION OF ROOF & STEEL  
REINFORCEMENT OF ROOF

**DESIGN BY:**

A.-Dhole & WASH Team

**DRAWING NO:**

(08-26)

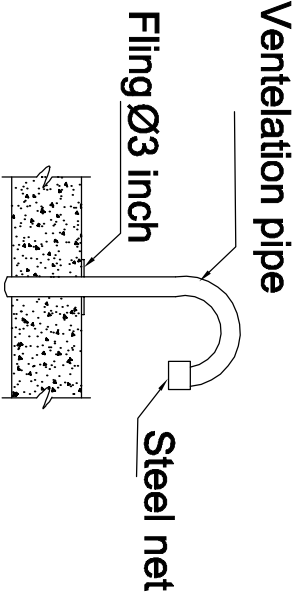
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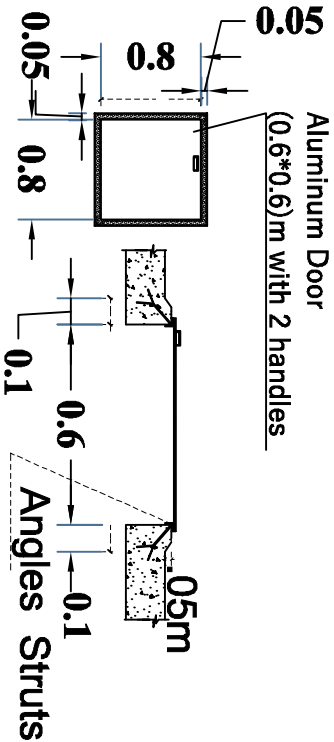
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**DATE:**

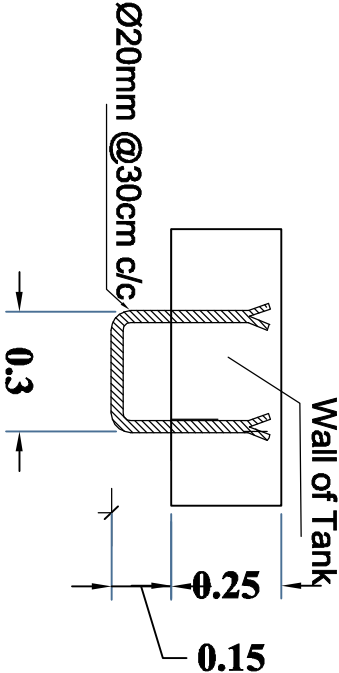
(May 2021)



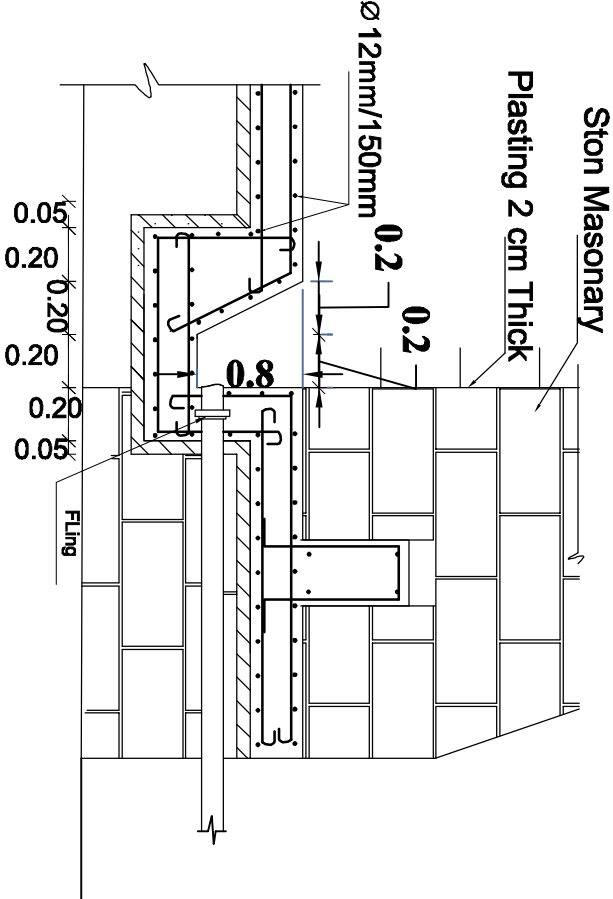
Details of Vent Pipe



Details of open Roof



Details of Fixed Stair in Wall



Steel Reinforcement of ground beam

**MEDAIR**

*each life matters*

**PROJECT NAME:**

Rehabilitation of Marfad Borehole YEM – 110

**DRAWING TITLE:**

General DETAILS OF FIXED STAIR IN WALL & STEEL REINFORCEMENT OF GROUND SLAB AND BEAM

**DESIGN BY:**

Al-Dhole & WASH Team

**DRAWING NO:**

(09-26)

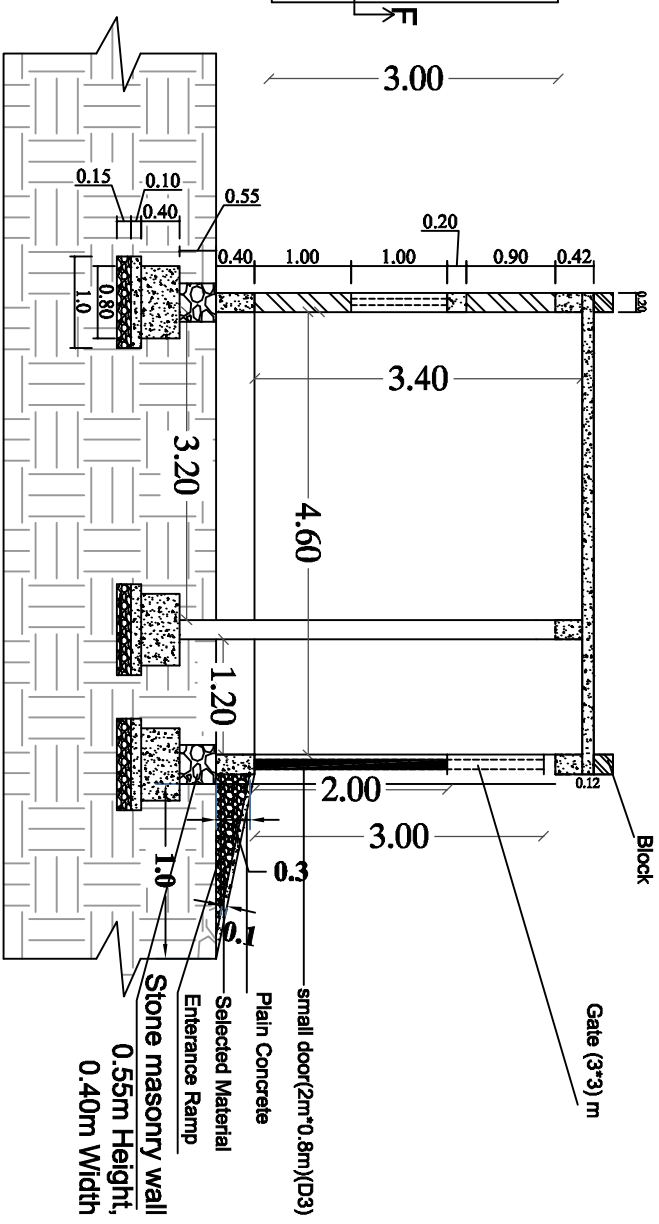
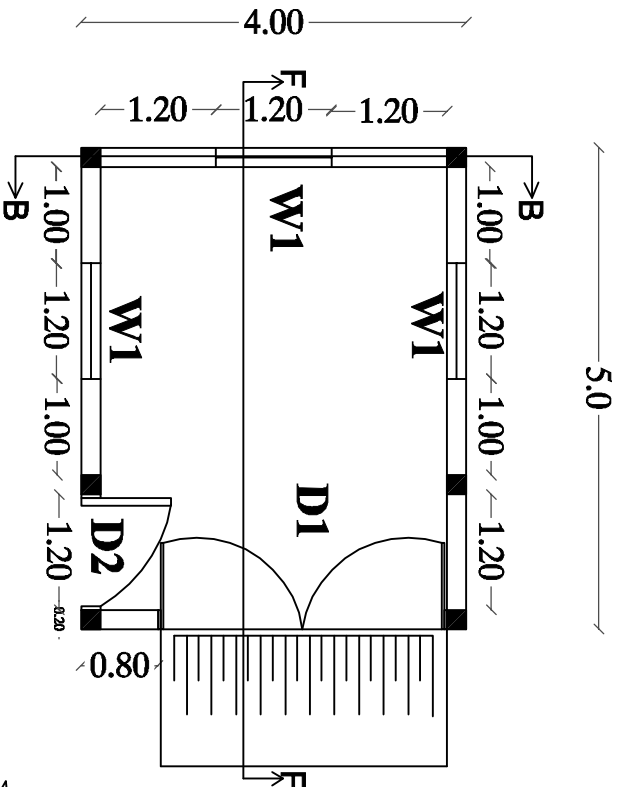
**SCALE:**

( )

**CHECKED BY:**

**DATE:**

(May 2021)



SECTION F-F

Symbol	Width	Height
D1	3.0	3.0
D2	1.2	2.0
D3	0.8	2.0
W1	1.2	1.0

MEDAIR
each life matters

PROJECT NAME:
Rehabilitation of Marfad Borehole YEM – 110

DRAWING TITLE:
Plan & SECTION OF CONTROL & MANAGEMENT ROOM

DESIGN BY:
A.-Dine & WASH Team

CHECKED BY:

DRAWING NO:
(10-26)

SCALE:
( )

DATE:
(May 2021)

Rehabilitation of Marfad Borehole YEM – 110

SECTION OF CONTROL  
& MANAGEMENT ROOM

AL-Dhale'a WASH Team

(11-26)



DATE: (May.2021)

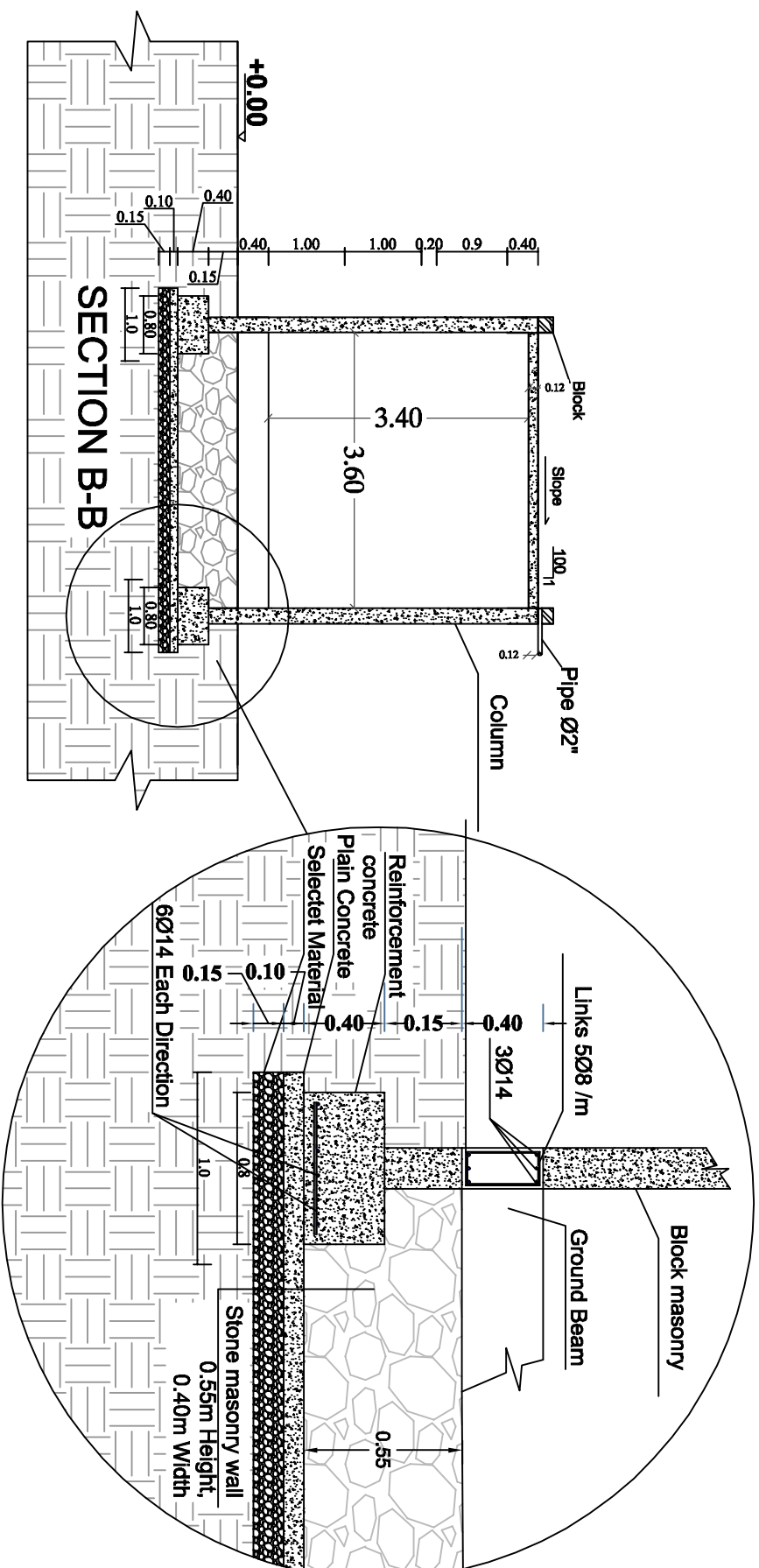


TABLE OF COLUMNNE

NO.OF COL.	DIMENSIONS CM/XCM	RFT	STIRRUPS	NOT
C	20X20	4Ø14	7Ø8/M	<div></div>

TABLE OF GROUND BEAM

NO,	B(Cm)	H(Cm)	RFT		STIRRUPS
			BOTTOM	RFT	UPPER RFT
M	20	40	Straight	Bent up	
			3Ø14	—	3Ø14
					5Ø8/M

TABLE OF FOOT

NO.OF FOOT	DIMENSIONS(P.C)	DIMENSIONS(R.C)	RFT
			EACH DIRECTION
F	1.0X1.0X0.10	0.80X0.80X0.40	Ø14- @15cm c/c

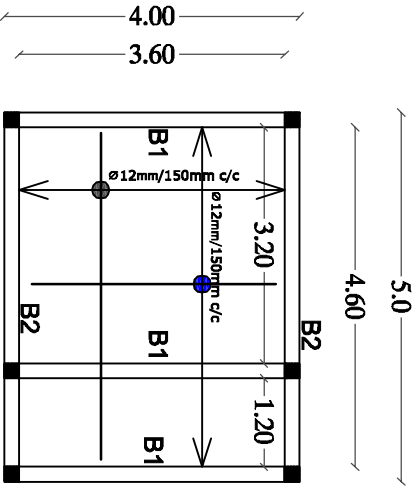
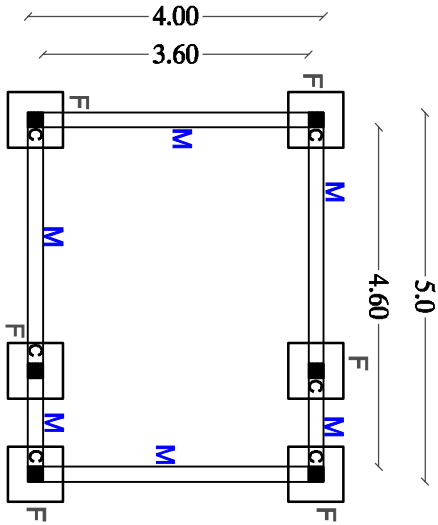


TABLE OF BEAMS

NO,	B(Cm)	H(Cm)	RFT		STIRRUPS
			BOTTOM	RFT	UPPER RFT
B1	20	40	Straight	Bent up	
			2Ø16	—	2Ø16
					6Ø8/M
B2	20	40	2Ø16	—	2Ø16
					6Ø8/M

MEDAIR

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PROJECT NAME:

Rehabilitation of Marfad Borehole YEM – 110

DRAWING TITLE:

STEEL REINFORCEMENT OF ROOF,  
COLUMNS, BEAMS

DESIGN BY:

Al-Dhale'a WASH Team

DRAWING NO:

(12-26)

SCALE:

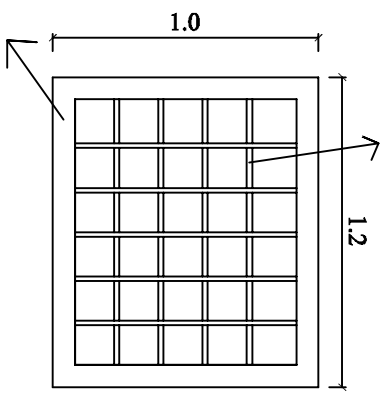
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CHECKED BY:

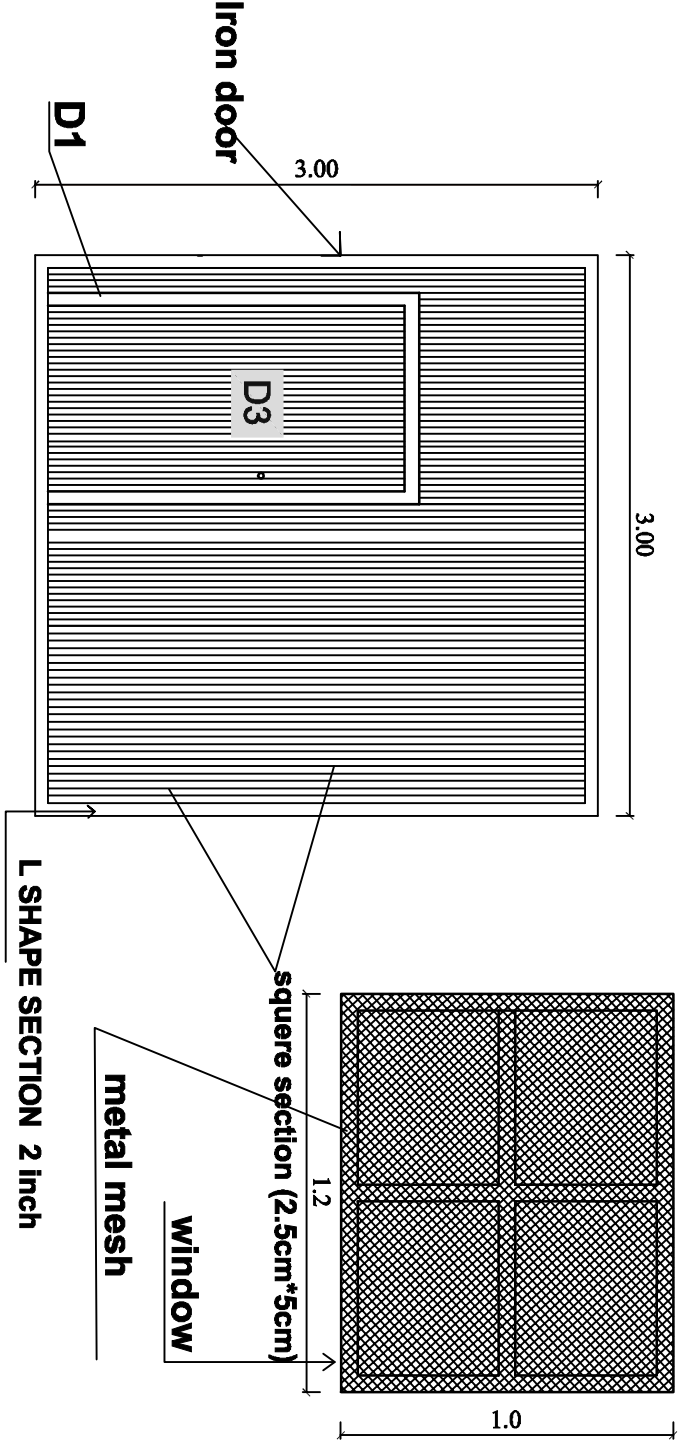
DATE:

(May 2021)

**square section bars 10 mm thickness**



**L SHAPE SECTION BARS 2 inch**



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**PROJECT NAME:**

Rehabilitation of Marfad Borehole YEM – 110

**DRAWING TITLE:**

DETAILS OF DOOR FOR CONTROL  
& MANAGEMENT ROOM

**DESIGN BY:**

Al-Dhale'a WASH Team

**CHECKED BY:**

**DRAWING NO:**

(13-26)

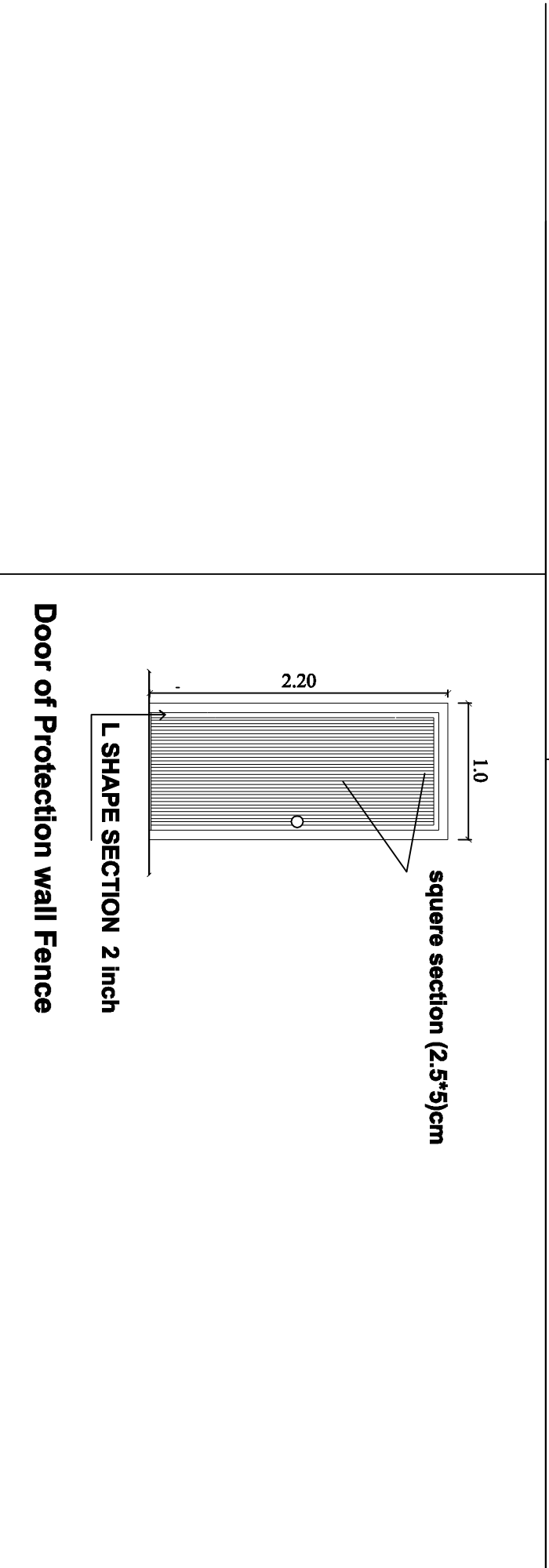
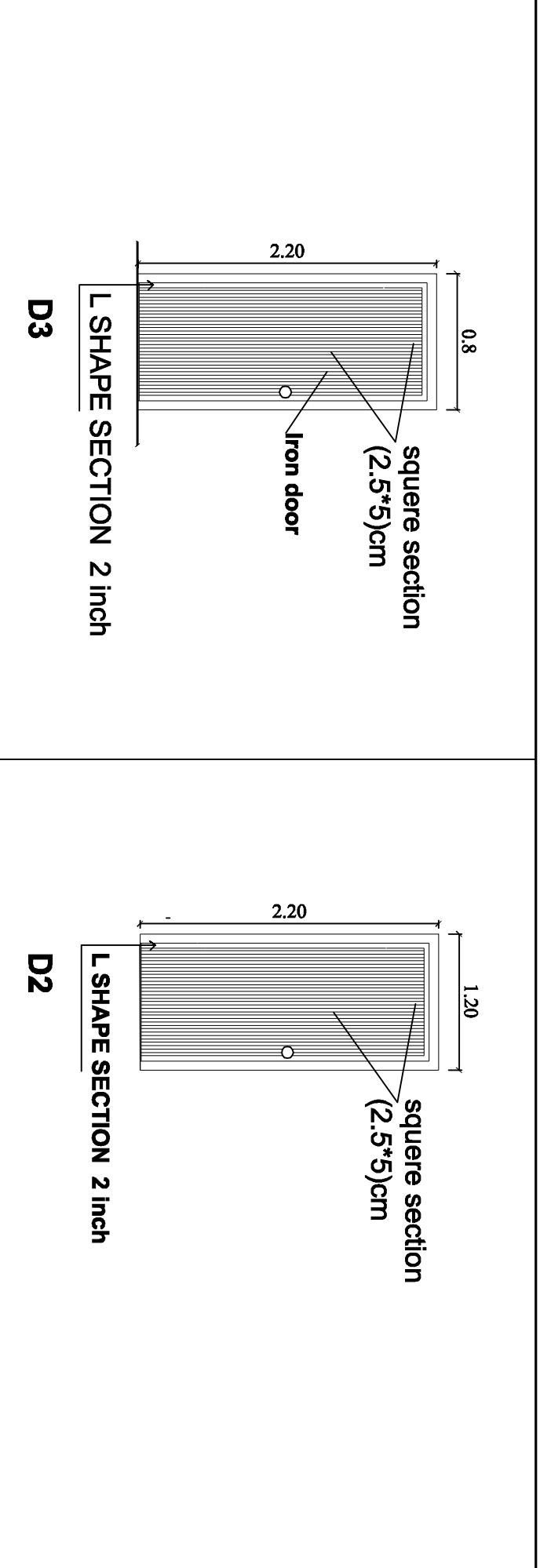
**SCALE:**

( )

**DATE:**

(May 2021)





MEDAIR

each life matters

PROJECT NAME:

Rehabilitation of Marfad Borehole YEM – 110

DRAWING TITLE:

DETAILS OF DOOR FOR CONTROL & MANAGEMENT ROOM

DESIGN BY:

Al-Dhale'a WASH Team

CHECKED BY:

DRAWING NO:

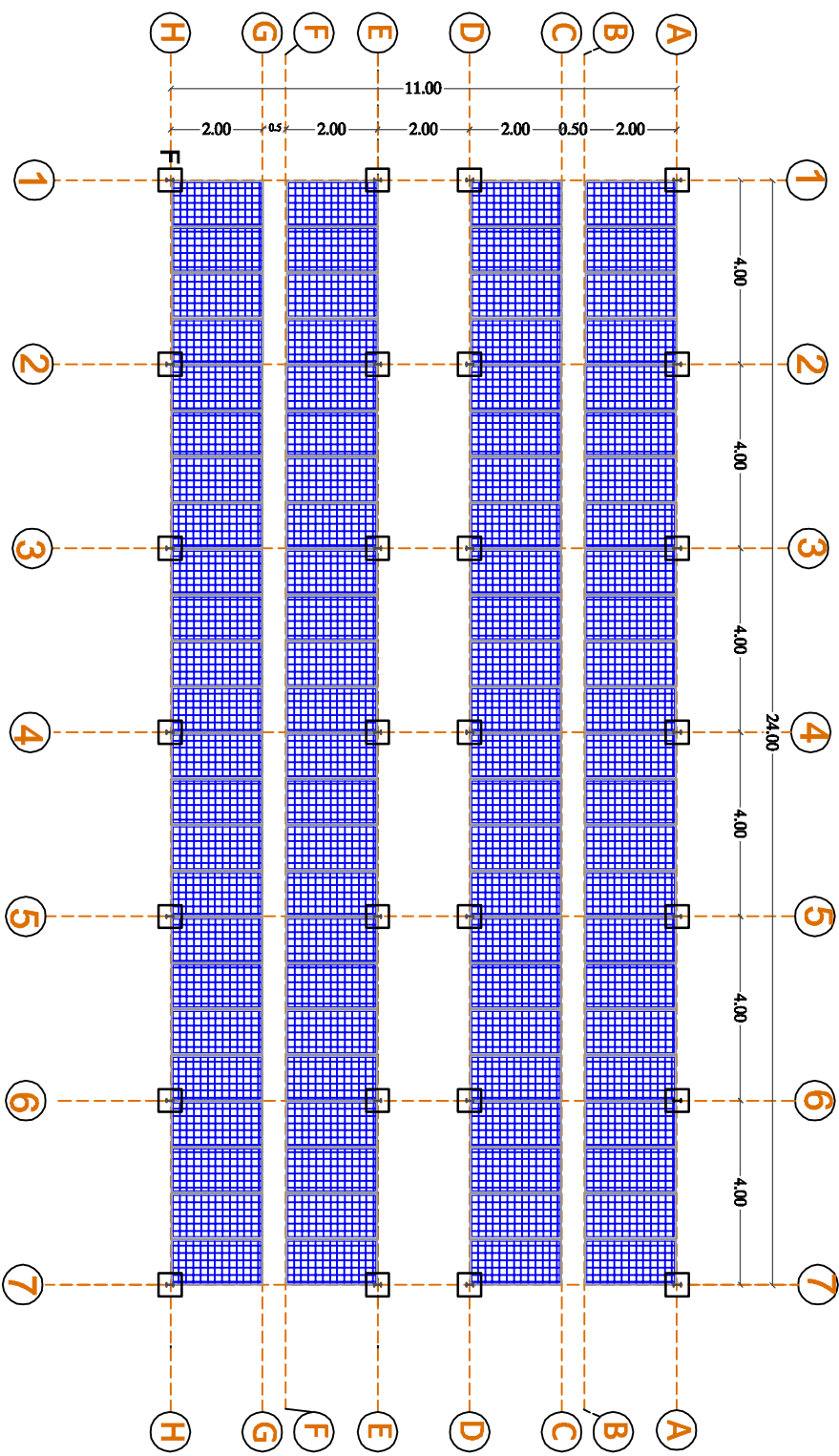
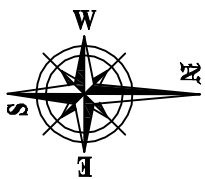
(14-26)

SCALE:

( )

DATE:

(May 2021)



**MEDAIR**

*each life matters*

PROJECT NAME:

Rehabilitation of Marfud Borehole YEM – 110

DRAWING TITLE:

General PV Site Plan

DESIGN BY:  
Al-Dhale'a WASH Team

CHECKED BY:

DRAWING NO: (15-26)

SCALE: ( )

DATE: (May 2021)

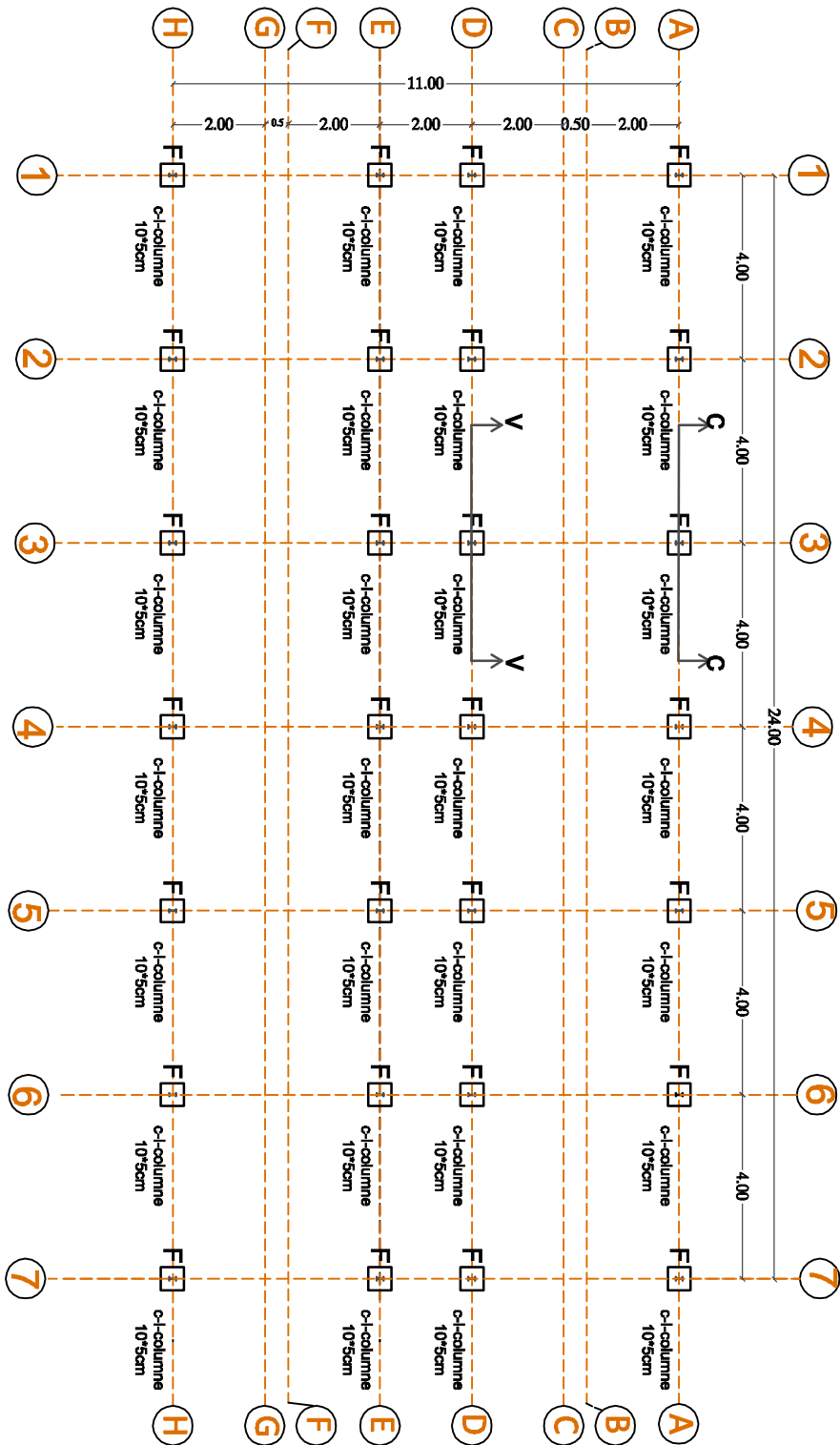
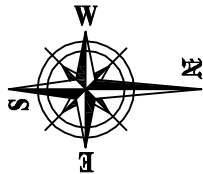


TABLE OF FOOT

NO.OF FOOT	DIMENSIONS(R.C)	RFT	
		EACH DIRECTION	
F	0.80X0.80X0.40	Ø14- @15cm c/c	

MEDAIR

each life matters

PROJECT NAME:

Rehabilitation of Marfad Borehole YEM – 110

DRAWING TITLE:

PV Steel structure Foundation Plan

DESIGN BY:

A.-Dhole & WASH Team

DRAWING NO:

(16-26)

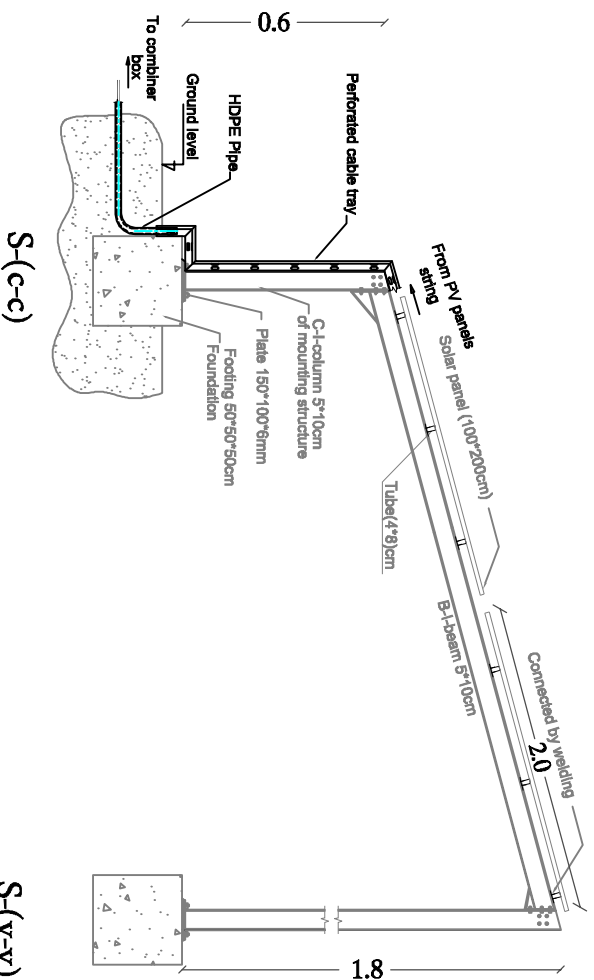
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CHECKED BY:

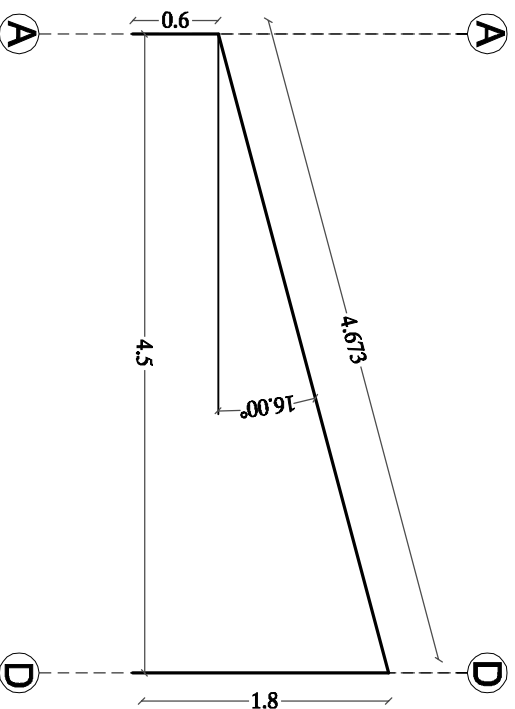
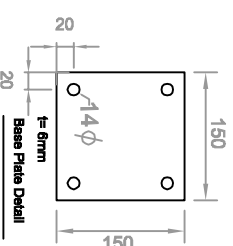
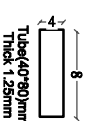
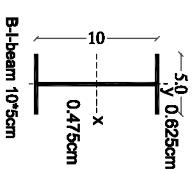
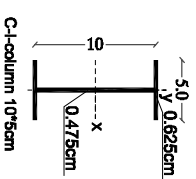
DATE:

(May 2021)



S-(c-c)

S-(v-v)

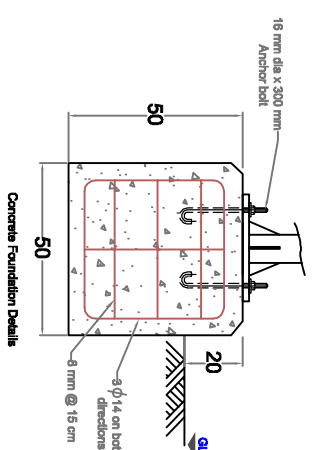


A

A

D

D



MEDAIR

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PROJECT NAME:

Rehabilitation of Marfad Borehole YEM – 110

DRAWING TITLE:

PV Steel Structure Detail Plan

DESIGN BY:

A.-Dhole & WASH Team

DRAWING NO:

(17-26)

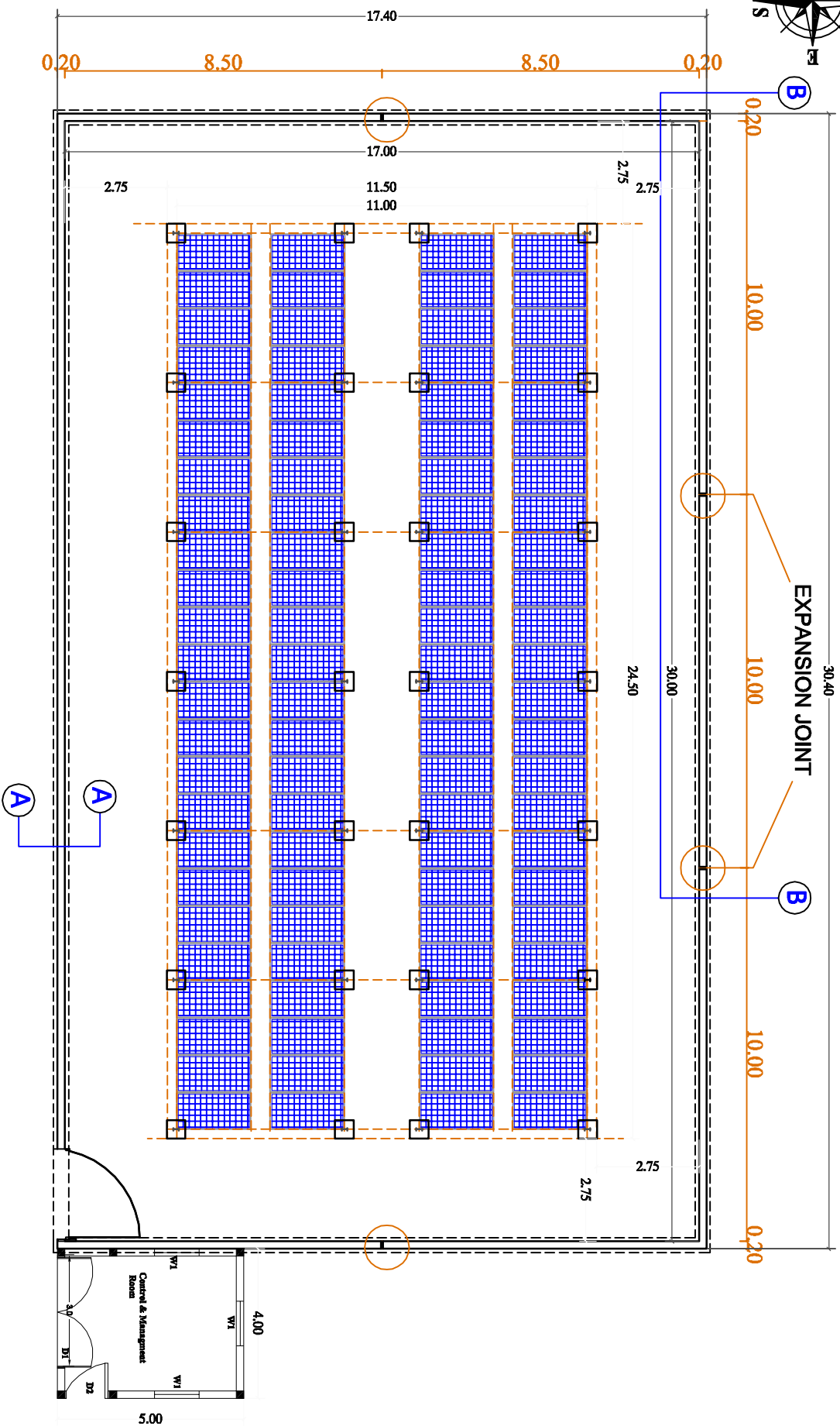
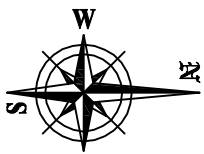
SCALE:

( )

CHECKED BY:

DATE:

(May 2021)



**MEDAIR**

*each life matters*

PROJECT NAME:

Rehabilitation of Marfad Borehole YEM – 110

DRAWING TITLE:

PV Protection Wall  
Detail Plan

DESIGN BY:

Al-Dhale a WASH Team

CHECKED BY:

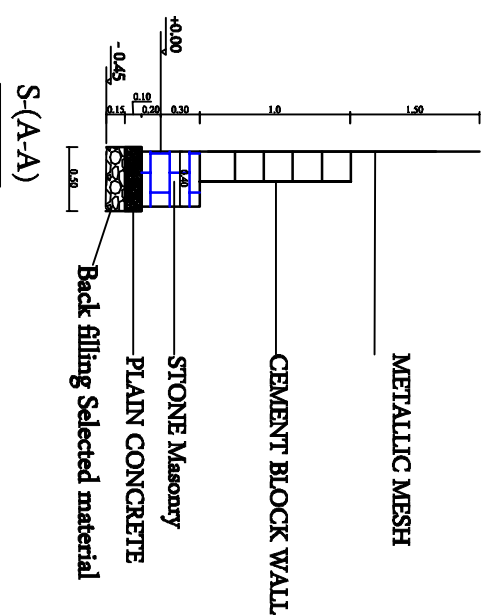
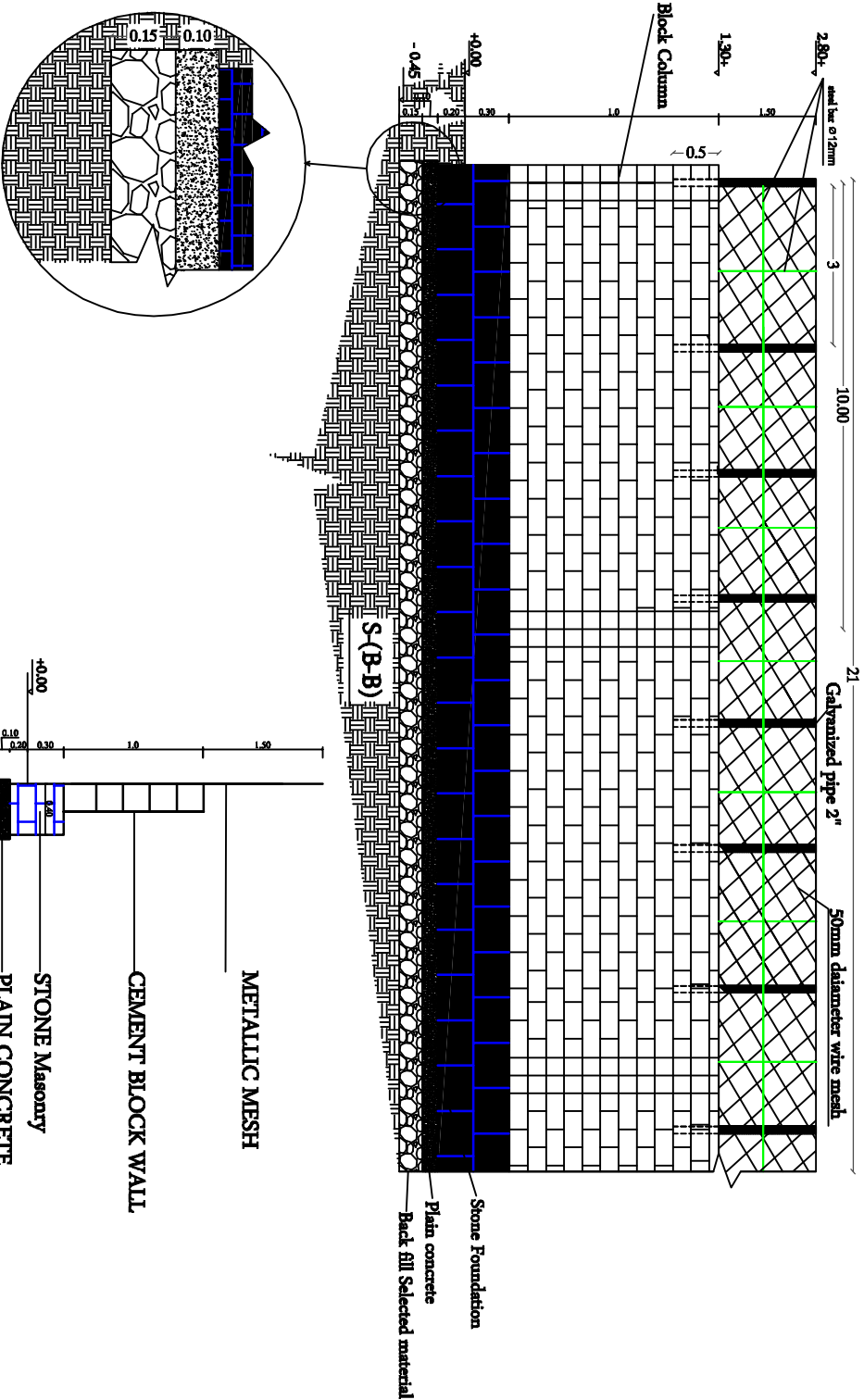
DRAWING NO: (18-26)

SCALE:

( )

DATE:

(May 2021)



MEDAIR

each life matters

PROJECT NAME:

Rehabilitation of Marfad Borehole YEM – 110

DRAWING TITLE:

PV Protection Wall  
SEC.A–A,B–B Detail Plan

DESIGN BY:

Al-Dhale o WASH Team

CHECKED BY:

E.Nabil Alsorany

DRAWING NO:

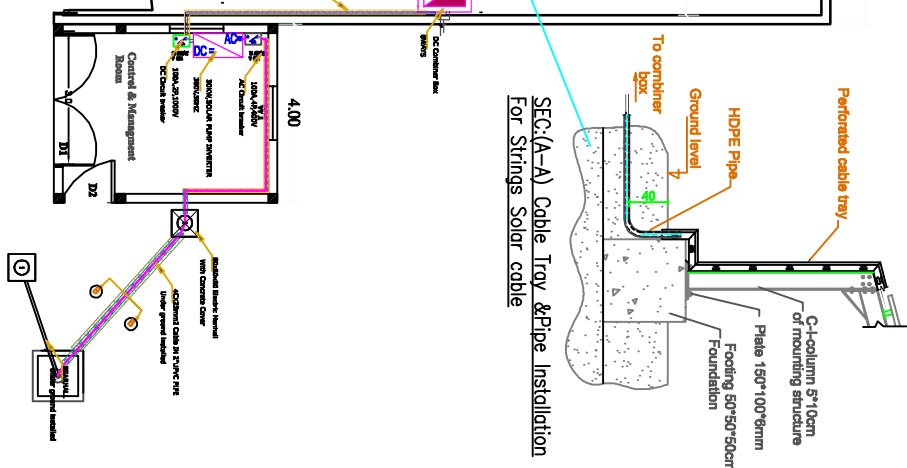
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SCALE:

( )

DATE:

(May 2021)



each life matters

Rehabilitation of Marfad Borehole YEM – 110

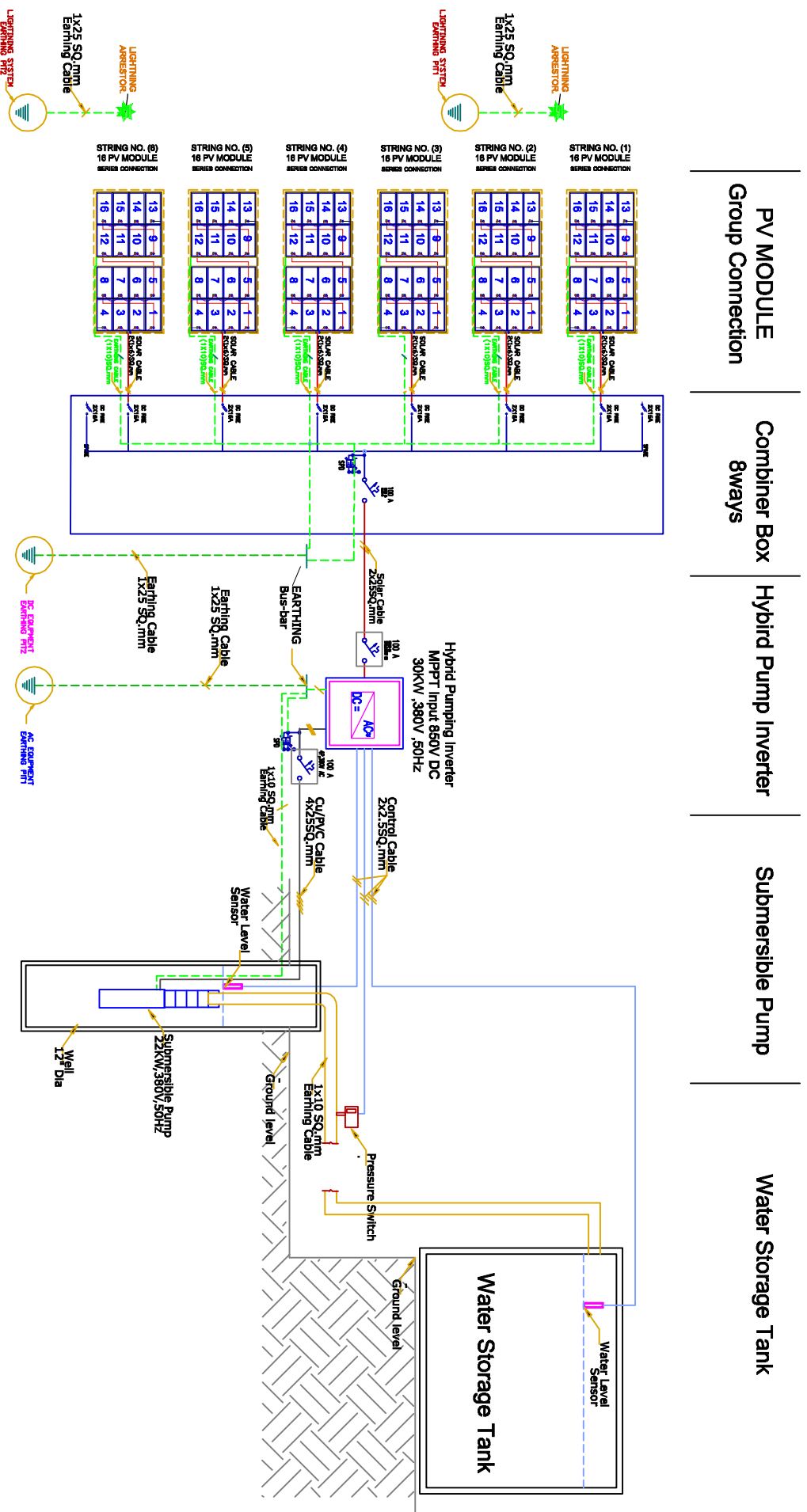
## Solar Cable Connections & Roots Detail Plan

CHECKED BY:

SCALE: ( )

DATE: (May.2021)





## PV MODULE Group Connection

## Combiner Box 8ways

## Hybird Pump Inverter

## Submersible Pump

## Water Storage Tank

MEDAIR

each life matters

PROJECT NAME:

Rehabilitation of Marfad Borehole YEM – 110

DRAWING TITLE:

## PV Steel Structure Detail Plan

DESIGN BY:

DRAWING NO: (21-26)

CHECKED BY:

SCALE: ( )

DATE: (May. 2021)

# SOLAR WATER PUMPING SYSTEM SINGLE LINE DIAGRAM (S.L.D)

SCALE



### SIDE VIEW SEC A-A LIGHTNING ARRESTER DETAIL

each life matters

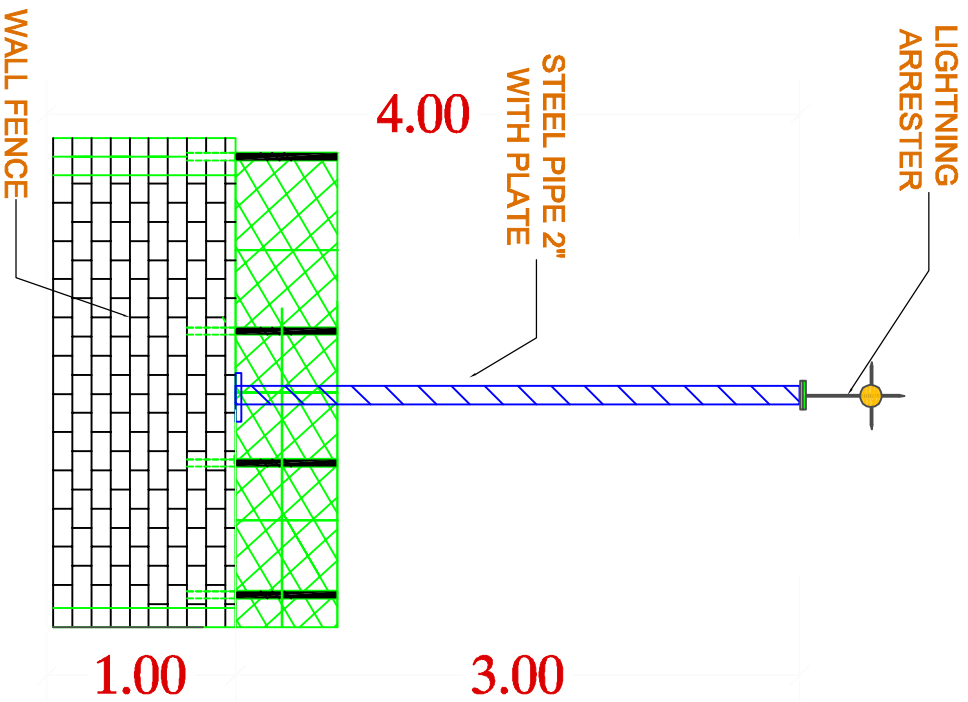
Rehabilitation of Marfad Borehole YEM – 110

## Solar Cable Connections & Roots Detail Plan

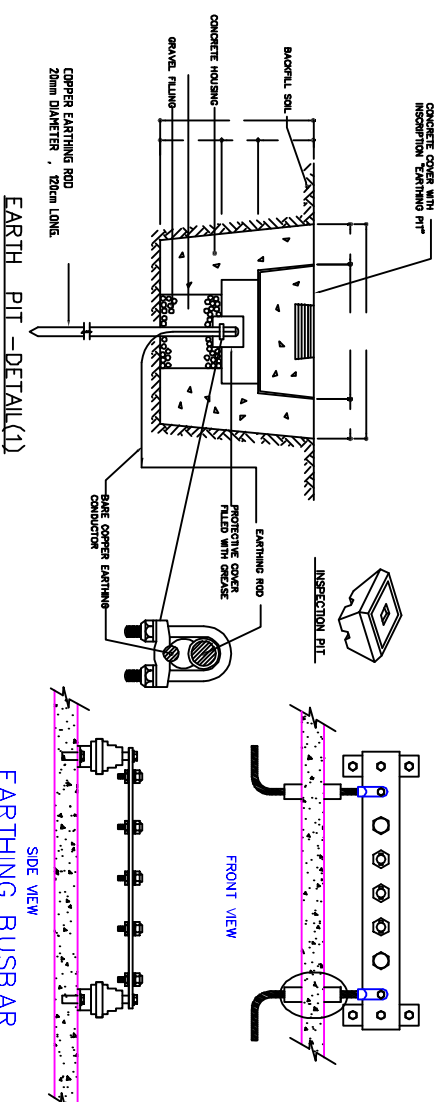
DRAWING NO.: (22-26)

SCALE: ( )

DATE: (May.2021)



**SIDE VIEW SEC A-A  
LIGHTNING ARRESTER DETAIL**



**EARTHING PIT DETAIL**

**MEDAIR**

*each life matters*

**PROJECT NAME:**

Rehabilitation of Marfod Borehole YEM – 110

**DRAWING TITLE:**

LIGHTNING PROTECTION & EARTHIN  
PIT DETIL PLAN

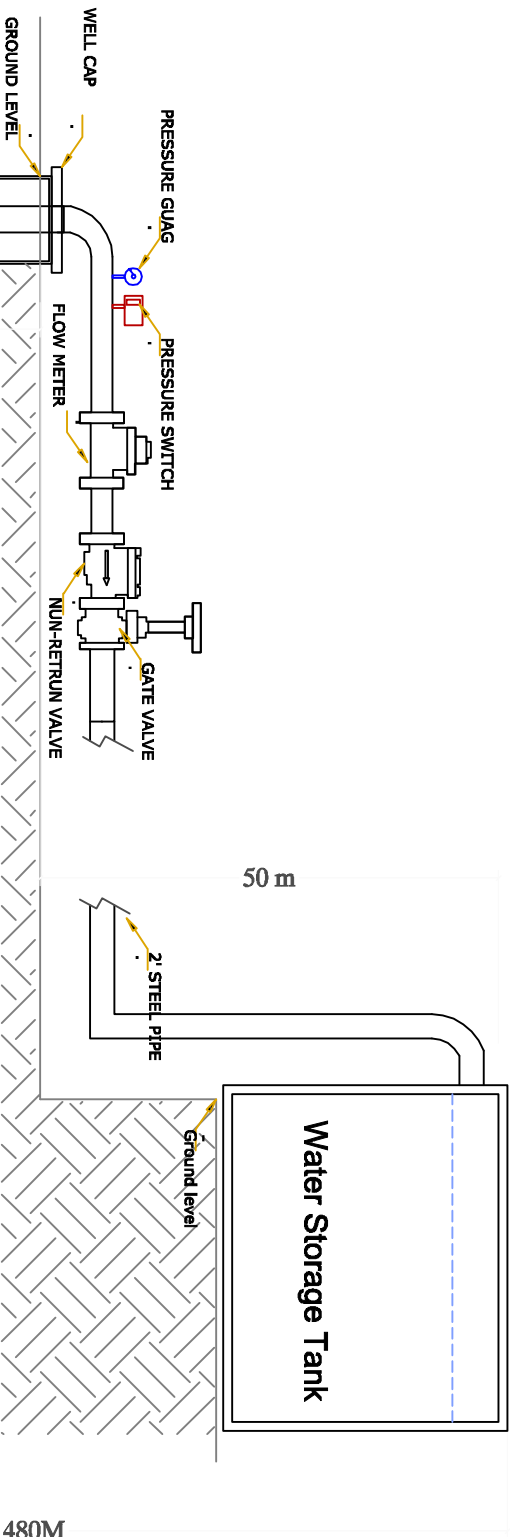
**DESIGN BY:**

**CHECKED BY:**

**DRAWING NO:** (23-26)

**SCALE:** ( )

**DATE:** (May 2021)



**MEDAIR**

*each life matters*

PROJECT NAME:

Rehabilitation of Marfad Borehole YEM – 110

DRAWING TITLE:

WATER HEAD AND PUMP ACCESSORIES  
DETAILPLAN

DESIGN BY:

CHECKED BY:

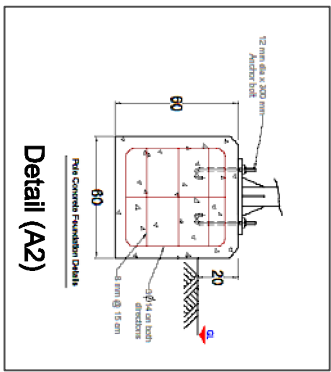
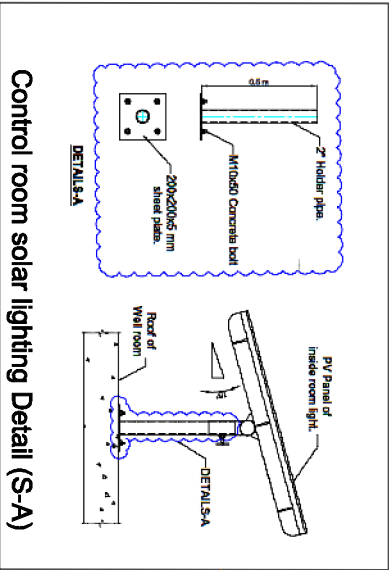
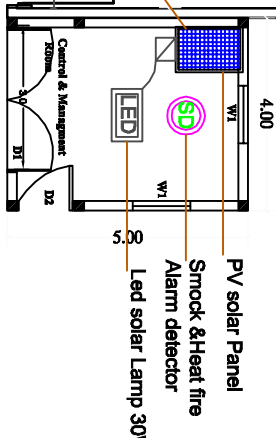
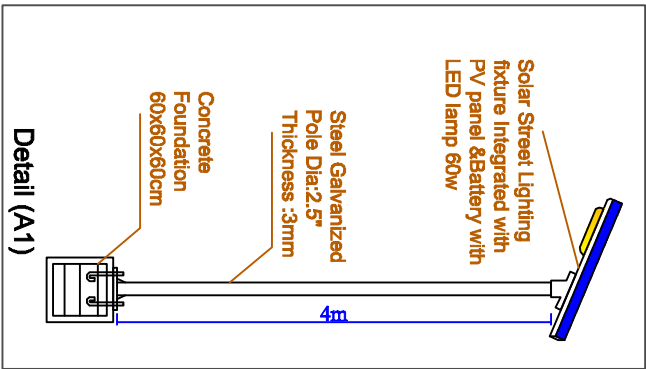
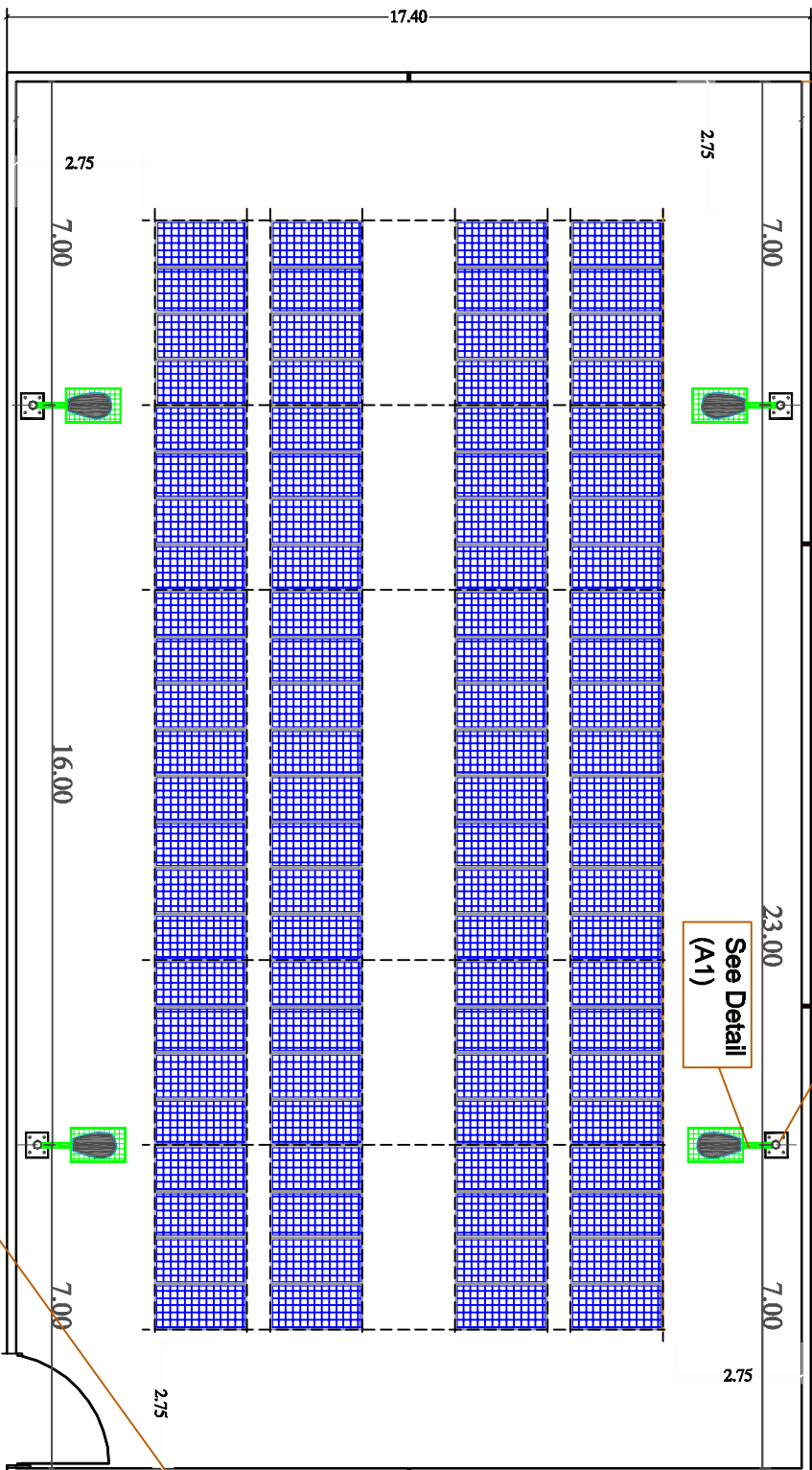
DRAWING NO: (24–26)

SCALE: ( )

DATE: (May 2021)

See Detail  
(A2)

See Detail  
(A1)



**MEDAIR**

*each life matters*

PROJECT NAME:

Rehabilitation of Marfad Borehole YEM – 110

DRAWING TITLE:

Outdoor Solar Lighting &  
Fire Alarm Plan

DESIGN BY:

AL-Dhale a WASH Team

DRAWING NO: (25-26)

SCALE:

( )

CHECKED BY:

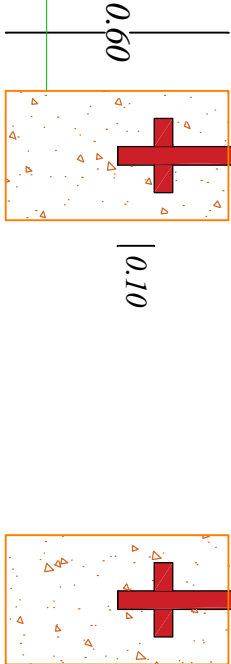
DATE: (May 2021)

2 inch galvanized pipe

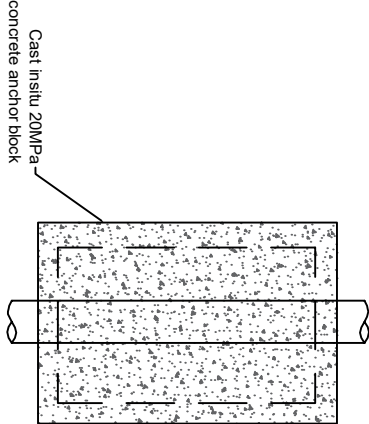
Thickness of Plate Board 3MM

1/2 in galvanized pipe

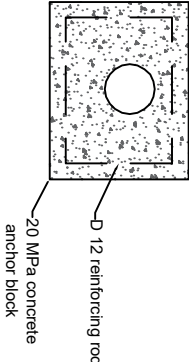
Plain Concrete 0.6\*0.35\*0.35



# Dimensions Details



Vertical bend anchor block detail



Inclined Pipeline Anchor Block

## MEDAIR

each life matters

مشروع تأهيل سبر منطقة مرفد مدينة الحسين محافظة النجف  
يوليو 2021م - تمهيدية: منطقة مرفد  
المساعدة الإنسانية في الصحة والتغذية والبيئة والصرف الصحي للسكان  
المعرضين للخطر والمعرضين من النزاع في اليمن

### MARFAD BOREHOLE

Rehabilitation of Marfad Borehole , Al-Hussein  
district Al Dhia e governorate  
June 2021 Implemented by Medair Organization  
"Essential health nutrition and WASH assistance to vulnerable and  
conflict-affected populations in Yemen"

MEDAIR

each life matters

#### PROJECT NAME:

Rehabilitation of Marfad Borehole YEM – 110

#### DRAWING TITLE:

SIGN METAL BOARD & CONCRETE  
SUPPORT FOR PIPES

#### DESIGN BY:

Al-Dhia e WASH Team

#### DRAWING NO:

(26-26)

#### SCALE:

( )

#### CHECKED BY:

#### DATE:

(May 2021)