



## **PROJECT TITLE**

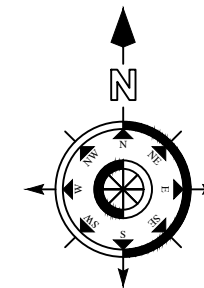
# **SUPPLY AND INSTALL OF HYBRID SOLAR SYSTEM FOR AL-MUWAIJAH WATER WELLS FIELDS**

**AL- SHAER - Hadhramout**

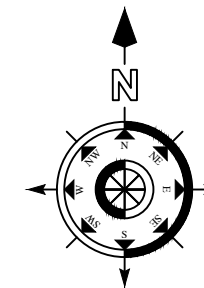
**Funded by: Word Bank through UN0PS**

**Bid No.: IUS-AF-UWS-SSHA-001**

**AUGUST , 2022**

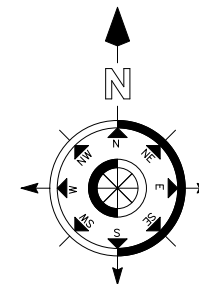
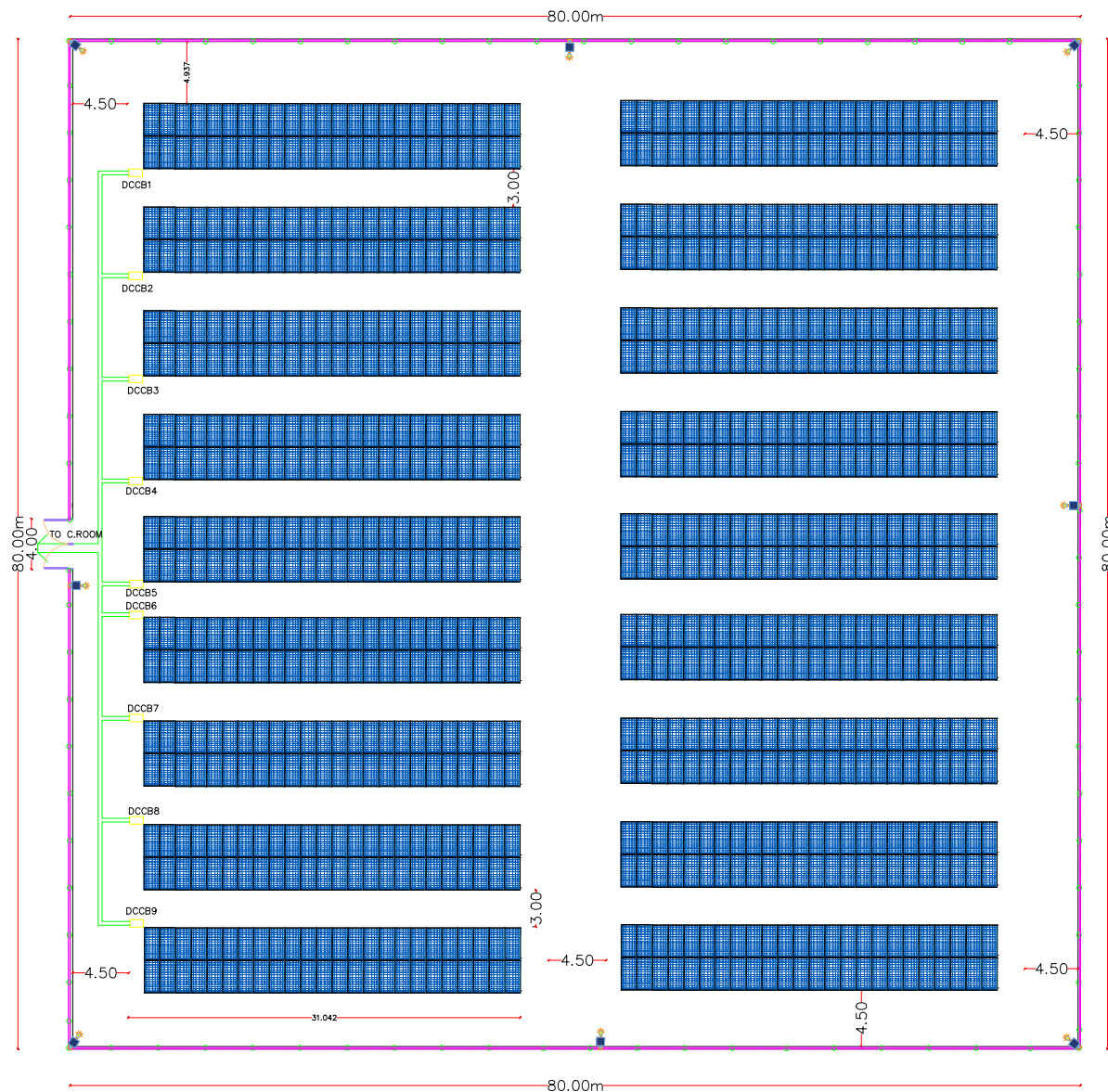


FIELD ID	Al-Muwaijah	
LOCATION	14° 52' 27.05"	N
	49° 31' 27.17"	E
CONTROL ROOM		
R.M.U		
GENERATOR ROOM		
PV MODULES LOCATION		
STEP UP TRANSFORMER		
STEP DOWN TRANSFORMER		
CABLE TRENCH		

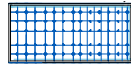


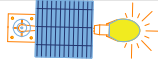


FIELD ID	Al-Muwaijah	
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GENERATOR ROOM		
PV MODULES LOCATION		
STEP UP TRANSFORMER		
STEP DOWN TRANSFORMER		
CABLE TRENCH		





## FIELD ID

FIELD ID	Al-Muwaijah	
LOCATION	14° 52' 27.05"	N
	49° 31' 27.17"	E
SINGLE PANEL	625W	
NO OF PANEL	864	
NO OF STRINGS	54	
NO OF PANEL/STRING	16	
SOLAR PANEL		
COM. BOX		
CABLE TRENCH		
SOLAR STREET LIGHT		

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## GENERAL PV LAYOUT

### Legend :

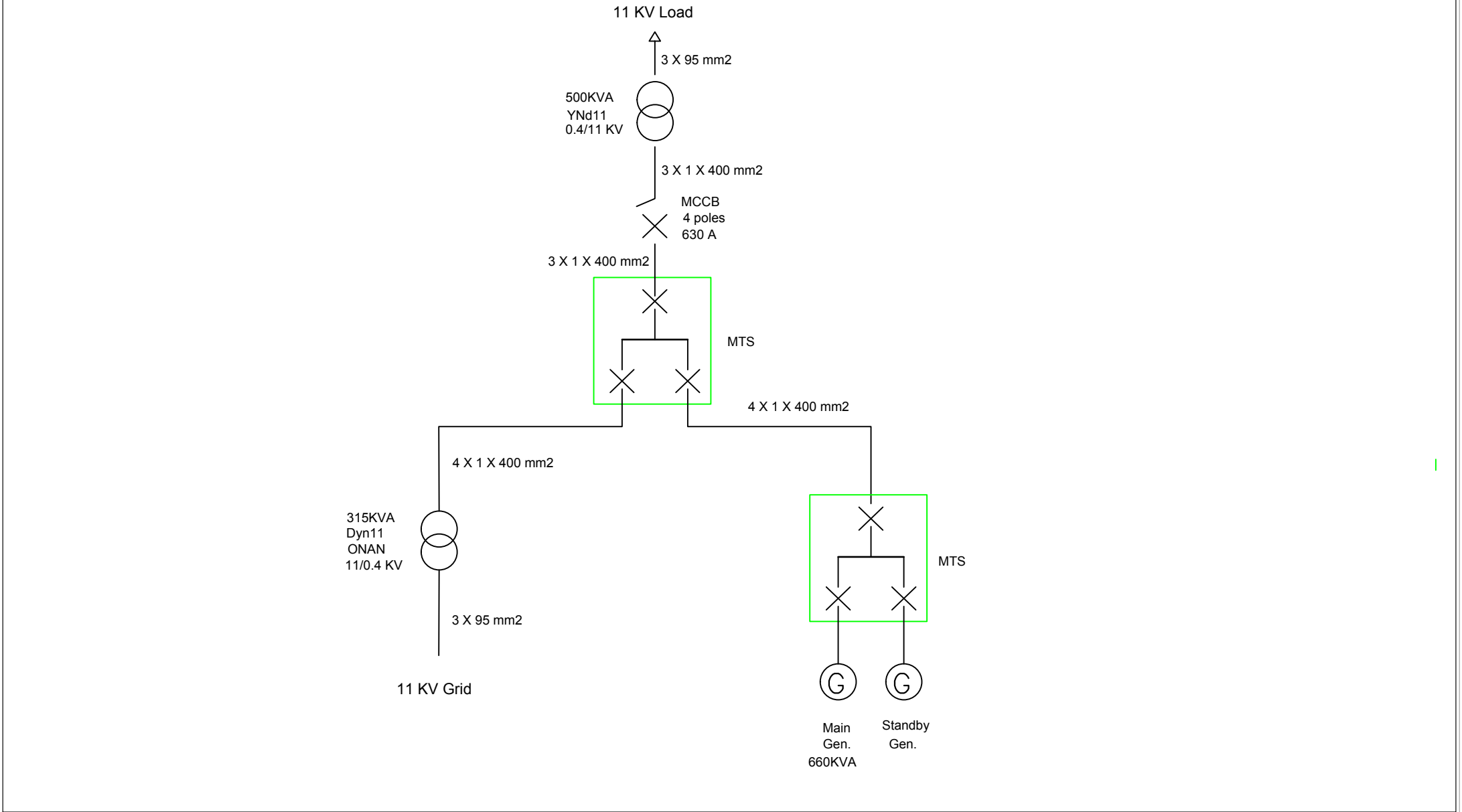
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Approved	ENG / AHMED BAFADHEL	Rev	date
		Rev 01	1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD		
Checked			

PROJECT

Supply, Installation  
and Operation of Solar  
PV Energy Units  
Al-Muwaijah Field

AL- SHAER CITY-YEMEN





PROJECT NO.

IUS-AF-UWS-SHA-001

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M-4

EXISTING GENERAL SINGLE LINE DIAGRAM

Legend :

Designed	ENG / AWADH BIN DAHMAN	Scale	A3
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Drawing	HAMMAM BA-MASSOOD		
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PROJECT

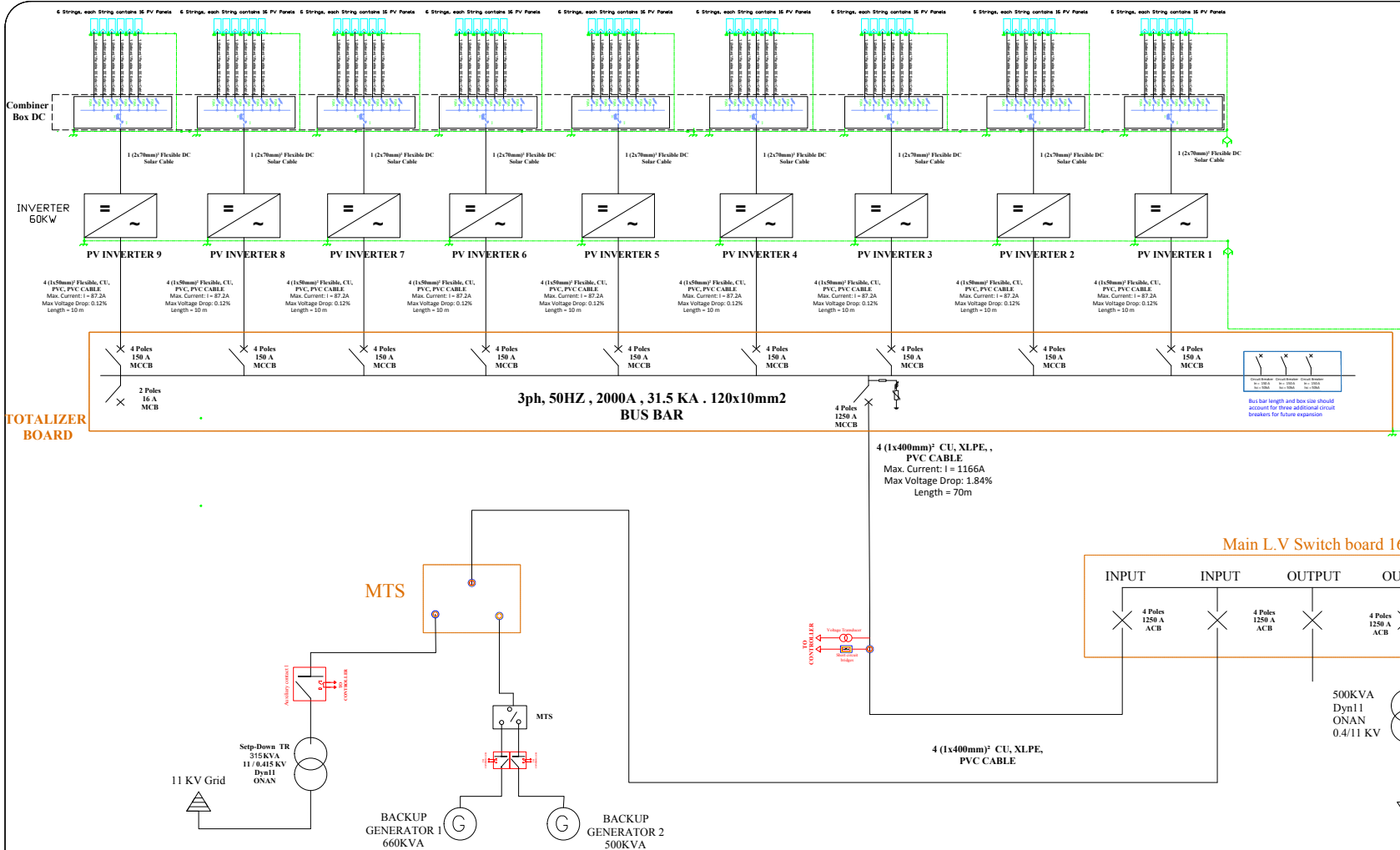
Supply, Installation  
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PV Energy Units  
Al-Muwaijah Field

AL- SHAER CITY-YEMEN

The diagram illustrates a 11KV busbar system with the following components and connections:

- Busbar 1600 A:** The central distribution busbar.
- Inputs:**
  - Two **ACB 1250 A** (Air Circuit Breakers) are connected to the busbar from the left.
  - One **ACB 1250 A** is connected to the busbar from the right.
- Output:**
  - One **MCCB 200 A** (Molded Case Circuit Breaker) is connected to the busbar from the right.
- Connections to Existing Infrastructure:**
  - 11 KV Grid:** Connected to the busbar via a **Dyn11 11/0.4 KV 315KVA** transformer. The connection is labeled **3x95 mm2 11 kv**.
  - Service:** Connected to the busbar via a **500KVA 0.4/11 KV yNd11** transformer. The connection is labeled **3x95 mm2 11 kv**.
  - To load:** Connected to the busbar via a **500KVA 0.4/11 KV yNd11** transformer. The connection is labeled **3x95 mm2 11 kv**.
- MTS (Main Transformer Station):** Two MTS units are shown, each containing a circuit breaker and two ACB units. They are connected to the busbar via **4( 1x400mm2) CU ,XLPE , ARMED ,PVC CABLE**.
- Generators:**
  - Main Gen. 660KVA** and **Standby Gen. 500KVA** are connected to the MTS units.
- PV Station:** A **PV STATION** (Photovoltaic Station) is connected to the busbar via **4( 1x400mm2) CU ,XLPE , ARMED ,PVC CABLE**.

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#### Notes :

- 1- The bidder has to foresee all required additional components based on selected equipment.
- 2- This is a conceptual drawing Contractor shall modify it based on actual equipment and system.
- 3- All hardware and software shall be the latest version available from manufacture during provide construction.
- 4-Control and Monitoring System (SCADA) should be provided . And manage whole system include PV inverters, weather station and switchgear.

#### Symbols :

	PV Panel (Solar Panel)
	Earthing Connection
	Earthing Copper Rod

#### Abbreviations

PV	Photovoltaic (Solar)	CU	Copper	PVC	Polyvinyl chloride colloquial
DC	Direct Current	UPS	Uninterrupted Power Supply	XLPE	Cross-linked polyethylene
MCCB	Molded Case Circuit Breaker	MTS	Manually Transfer Switch	VT	Voltage Transformer
MCB	Miniature Circuit Breaker	TR	Electrical Transformer	CT	Current Transformer

#### Legend :

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#### PROJECT

**Supply, Installation and Operation of Solar PV Energy Units**  
**Al-Muwaijah Field**

AL- SHAER CITY-YEMEN

PROJECT NO.

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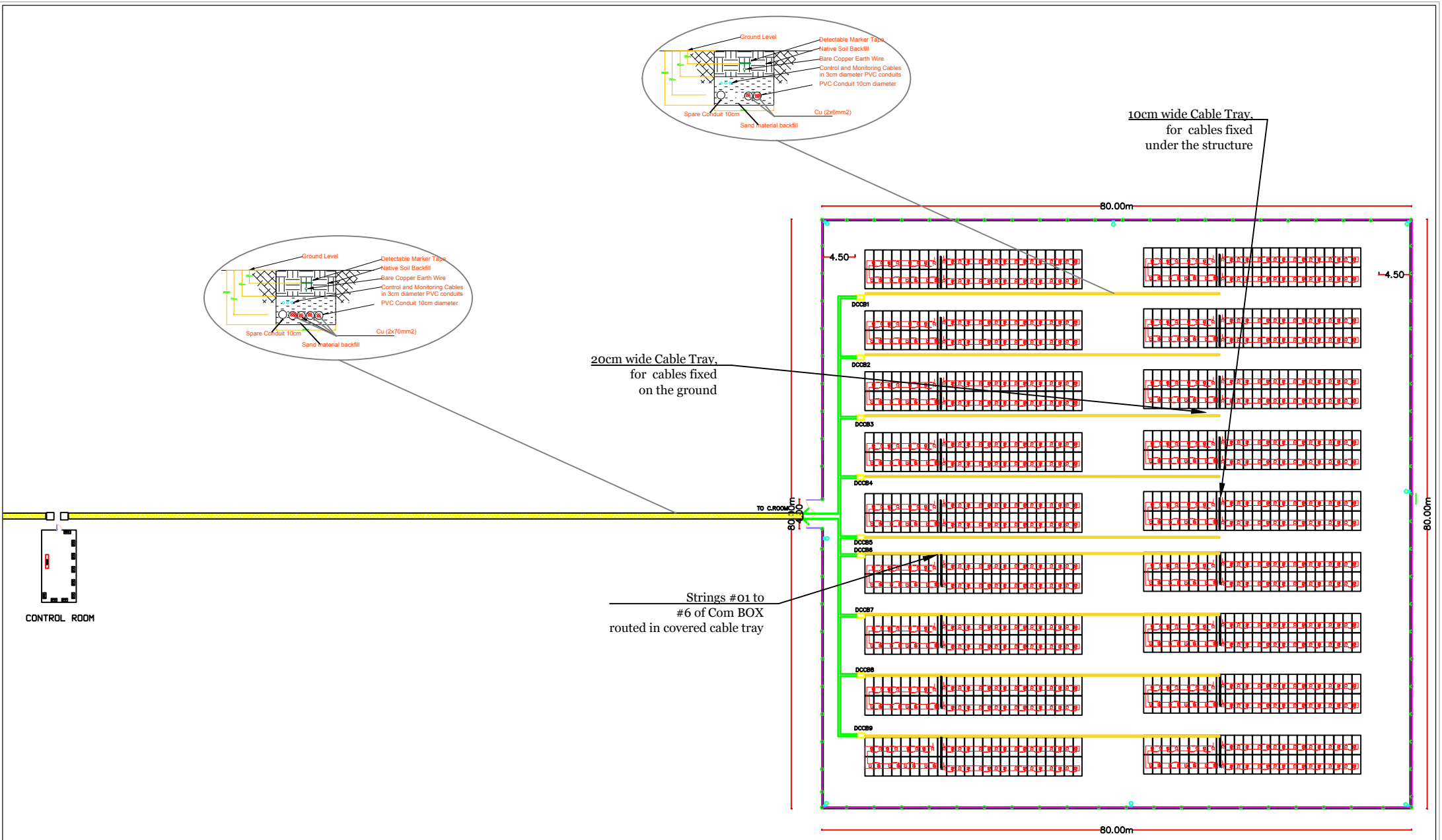
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M-6

PROPOSED SINGLE LINE DIAGRAM





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M-7

DC CABLE LAYOUT

Legend :









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Drawing	HAMMAM BA-MASSOOD	Drawing No.	
Checked			

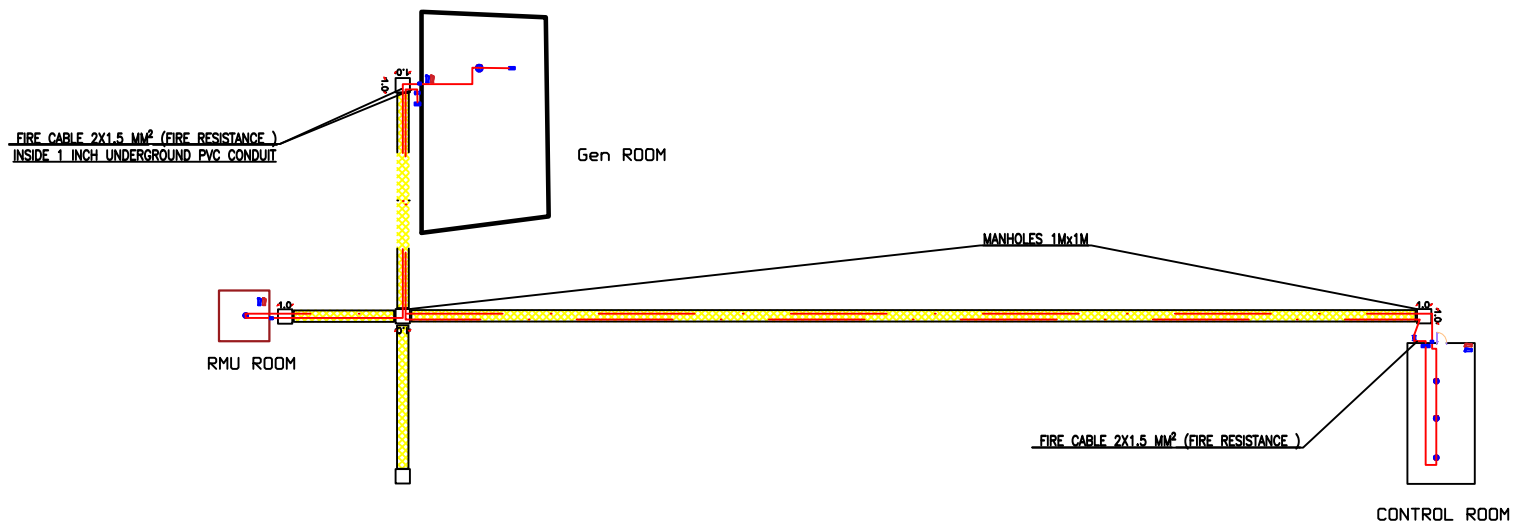
PROJECT

Supply, Installation and Operation of Solar PV Energy Units  
Al-Muwaijah Field

AL- SHAER CITY-YEMEN

## LEGEND

	6kg DRY-POWDER EXTINGUISHER
	5kg CO2 EXTINGUISHER
	SMOKE AND HEAT DETECTOR
	UV/IR FLAME DETECTOR
	FIRE ALARM CONTROL PANEL
	END OF LINE RESISTOR
	OUTDOOR SOUNDER
	MANUAL CALL POINTS



## M-8 FIRE ALARM SYSTEM LAYOUT

### Legend :

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**PROJECT**  
Supply, Installation  
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PV Energy Units  
Al-Muwaijah Field

AL- SHAER CITY-YEMEN

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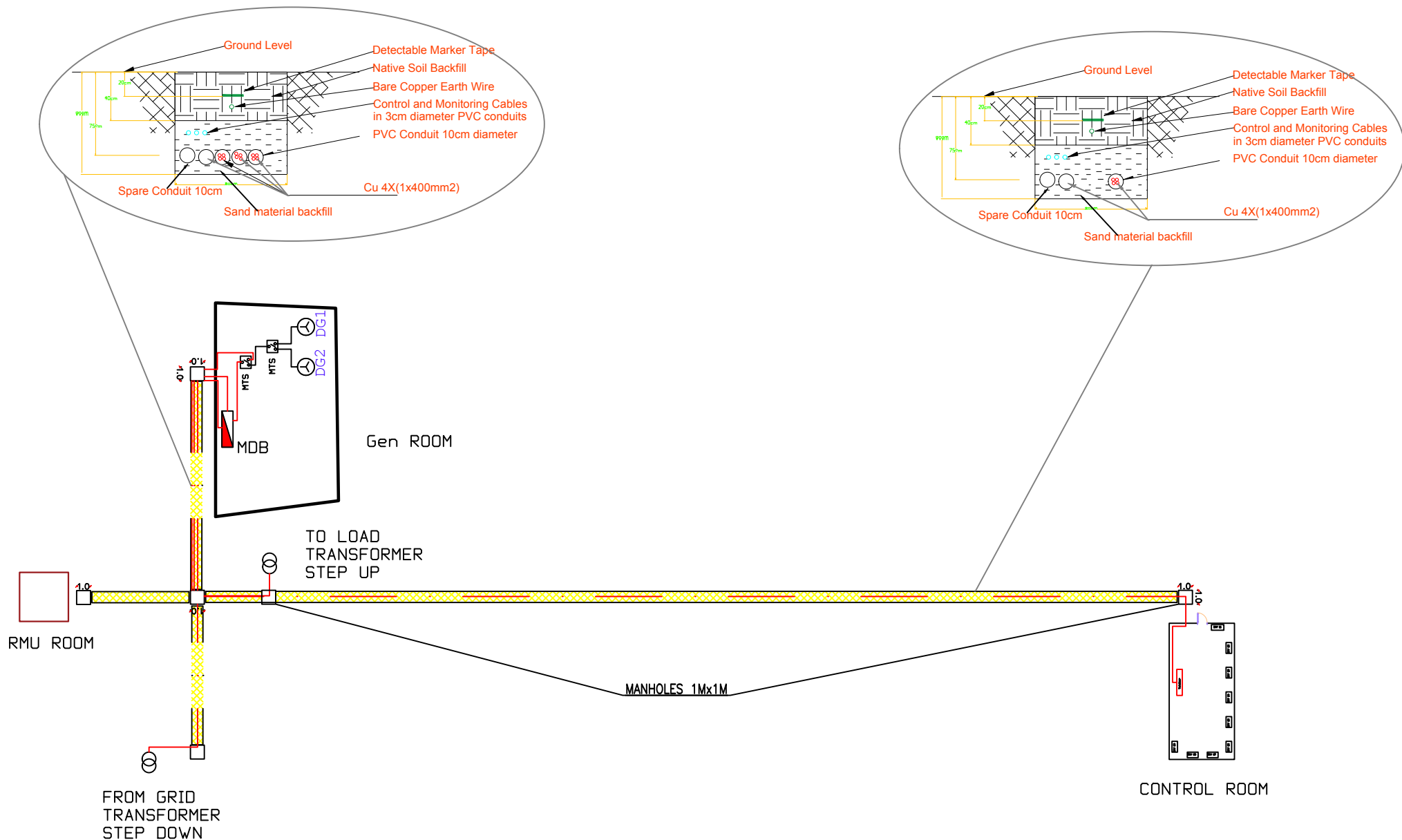


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**M-9**

**AC CABLE LAYOUR**

**Legend :**

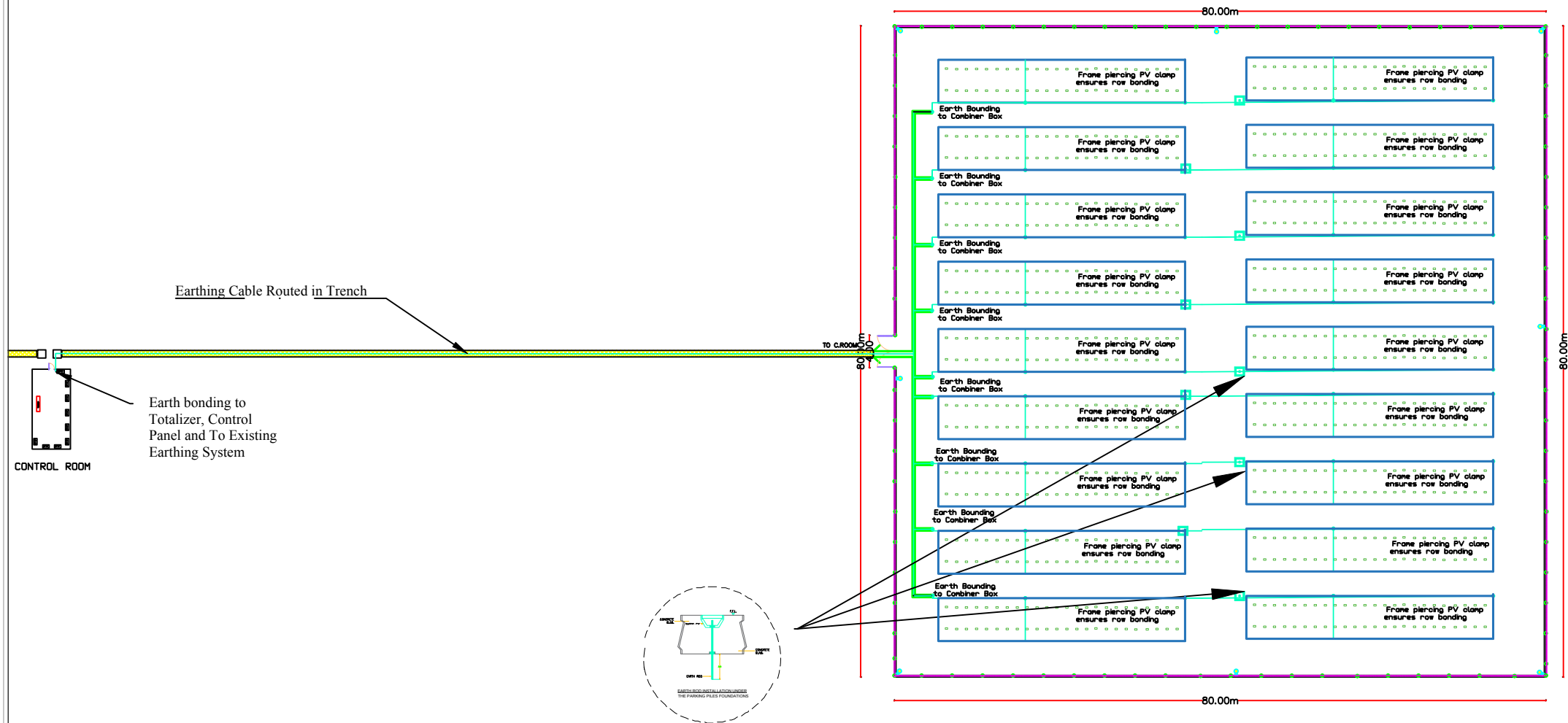
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Approved	ENG / AHMED BAFADHEL	Rev	date
		Rev 01	1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD		
Checked			

**PROJECT**

**Supply, Installation and Operation of Solar PV Energy Units  
Al-Muwaijah Field**

AL- SHAER CITY-YEMEN





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## M-10 EARTHING LAYOUT

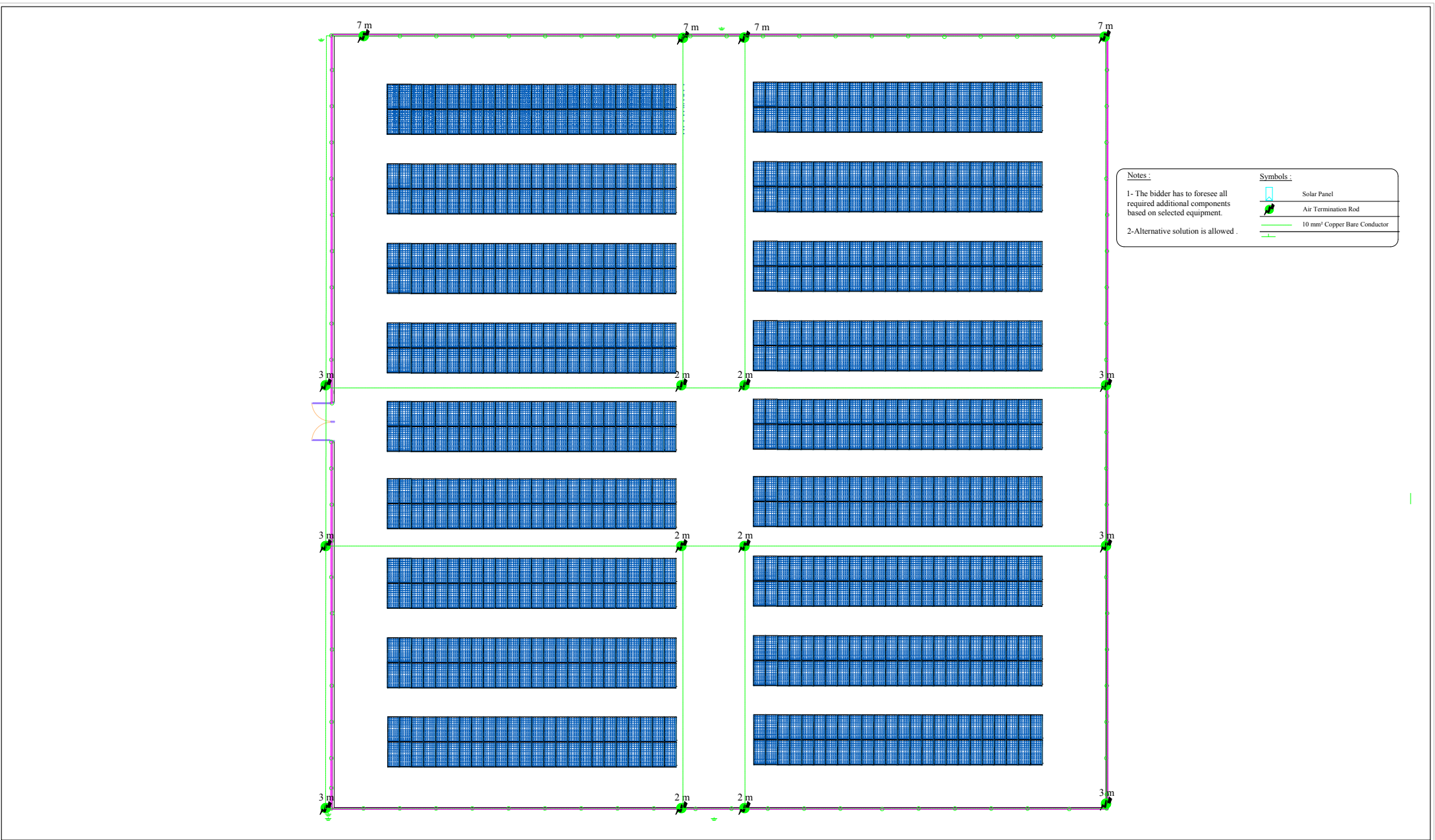
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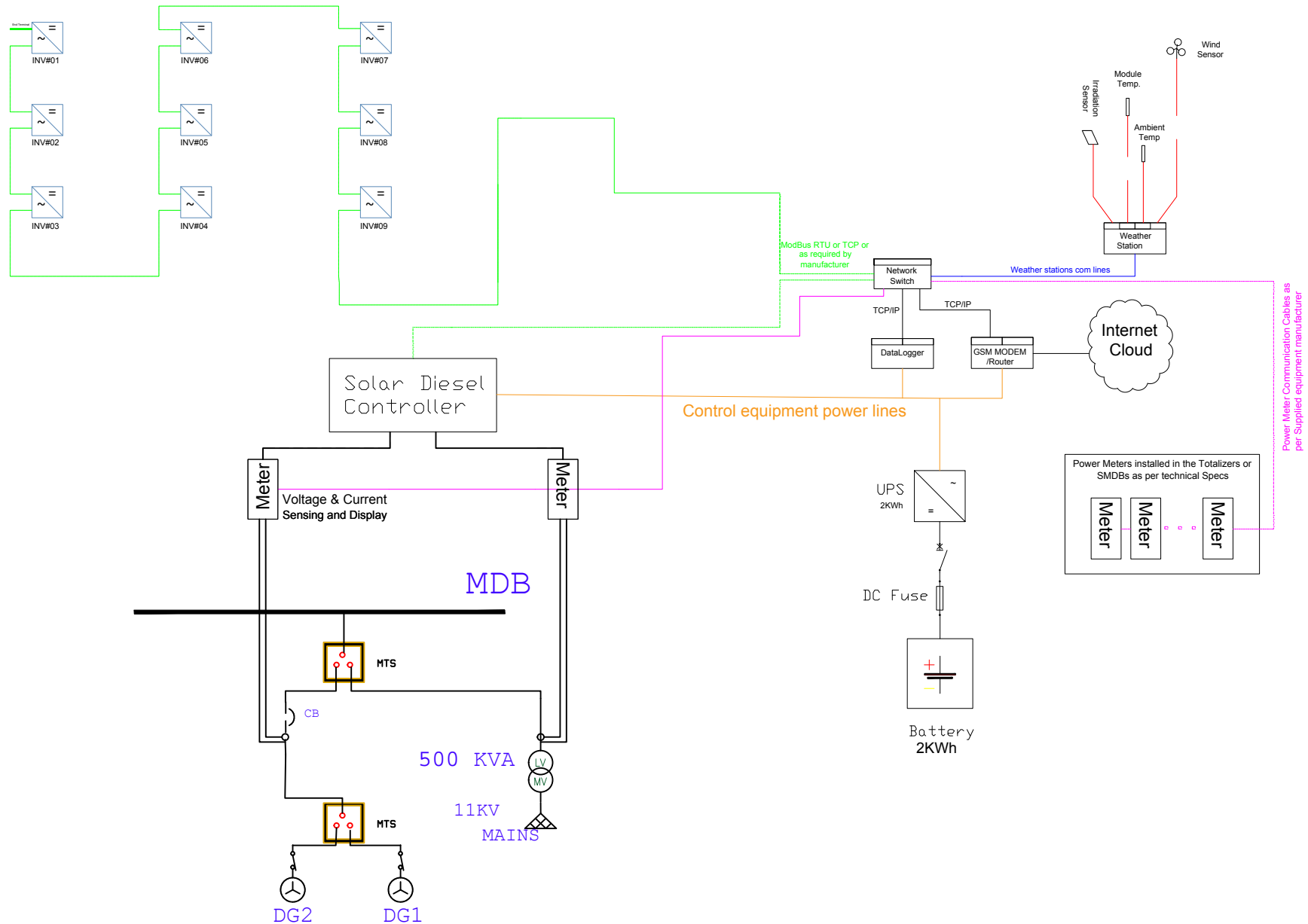
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Approved	ENG / AHMED BAFADHEL	Rev	date
		Rev 01	1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD		
Checked			

PROJECT

Supply, Installation  
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PV Energy Units  
Al-Muwaijah Field

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## M-12 PV SYSTEM CONTROL

### Legend :

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### PROJECT

**Supply, Installation  
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Al-Muwaijah Field**

AL- SHAER CITY-YEMEN



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**M-13 SDB CONTROL ROOM**

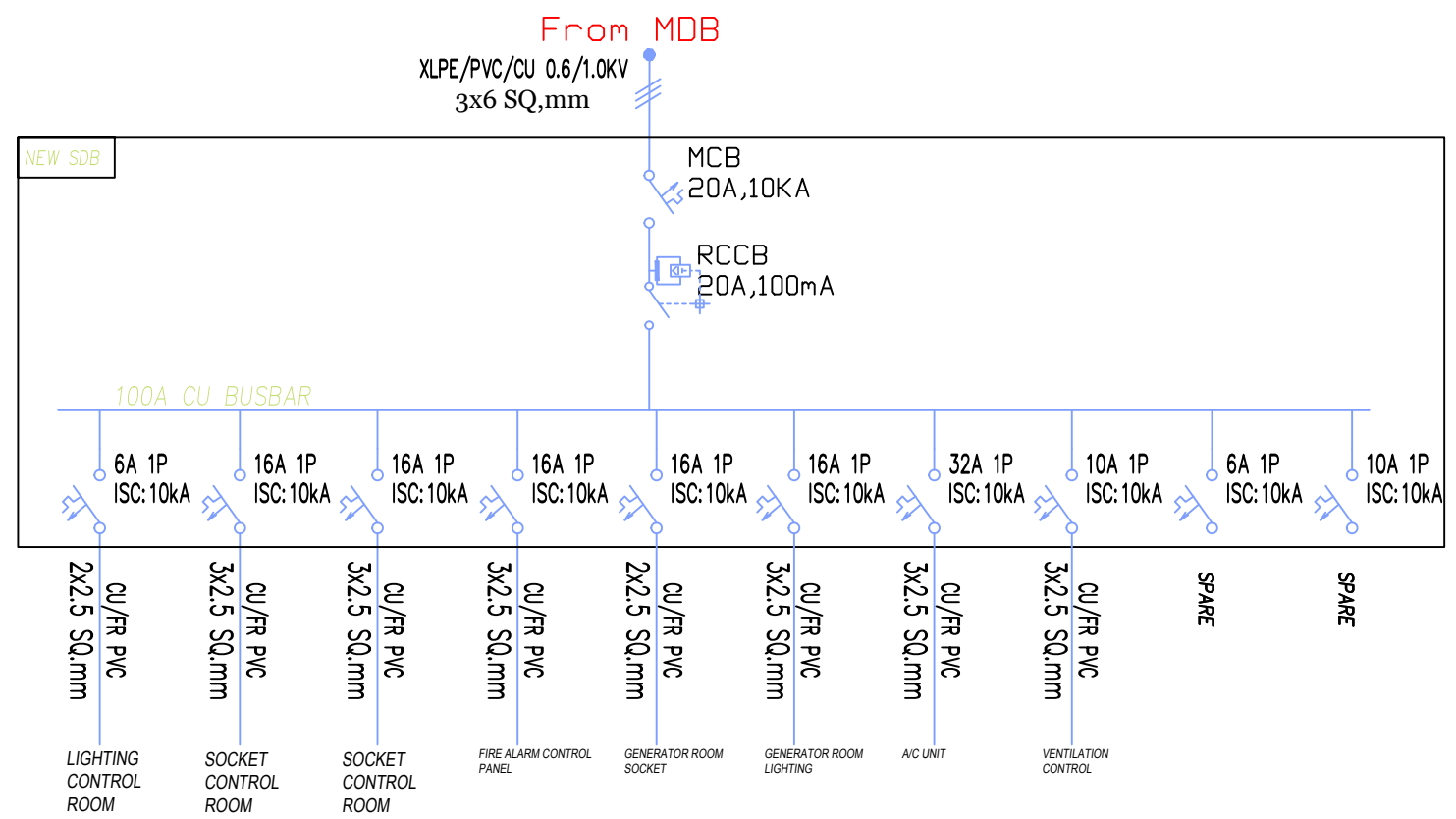
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Approved	ENG / AHMED BAFADHEL	Rev Rev 01	date 1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD		
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PROJECT

Supply, Installation  
and Operation of Solar  
PV Energy Units  
Al-Muwaijah Field

AL- SHAER CITY-YEMEN



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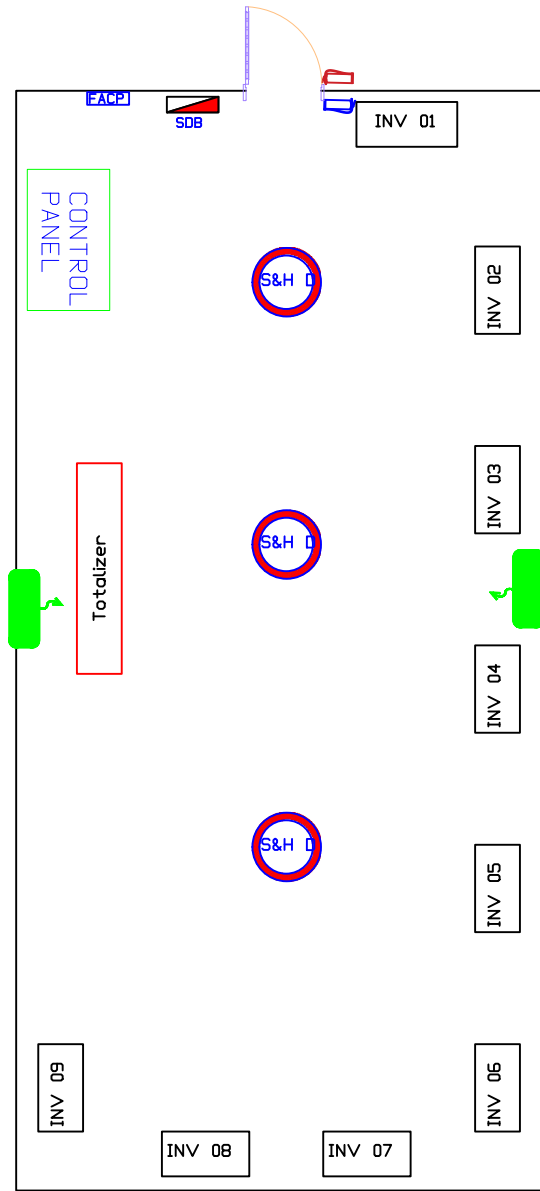
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**M-14 CONTROL ROOM**



LEGEND	
	Fire Extinguisher
	Air conditioner
	Smoke and Heat alarm
	INVERTER

Legend :

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PROJECT

Supply, Installation and Operation of Solar PV Energy Units  
Al-Muwaijah Field

AL- SHAER CITY-YEMEN

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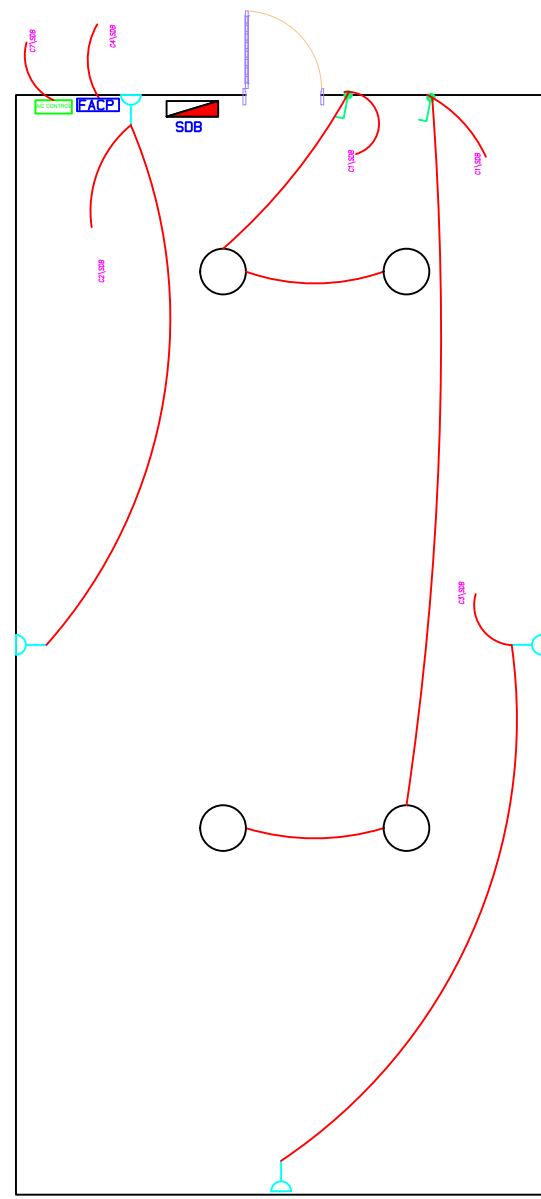


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**M-15 SLD NEW CONTROL ROOM**



LEGEND	
	LED LAMP
	13A SOCKET
	ONE GANG ONE POLE SWITCH
	DISTRIBUTION BOARD

Legend :

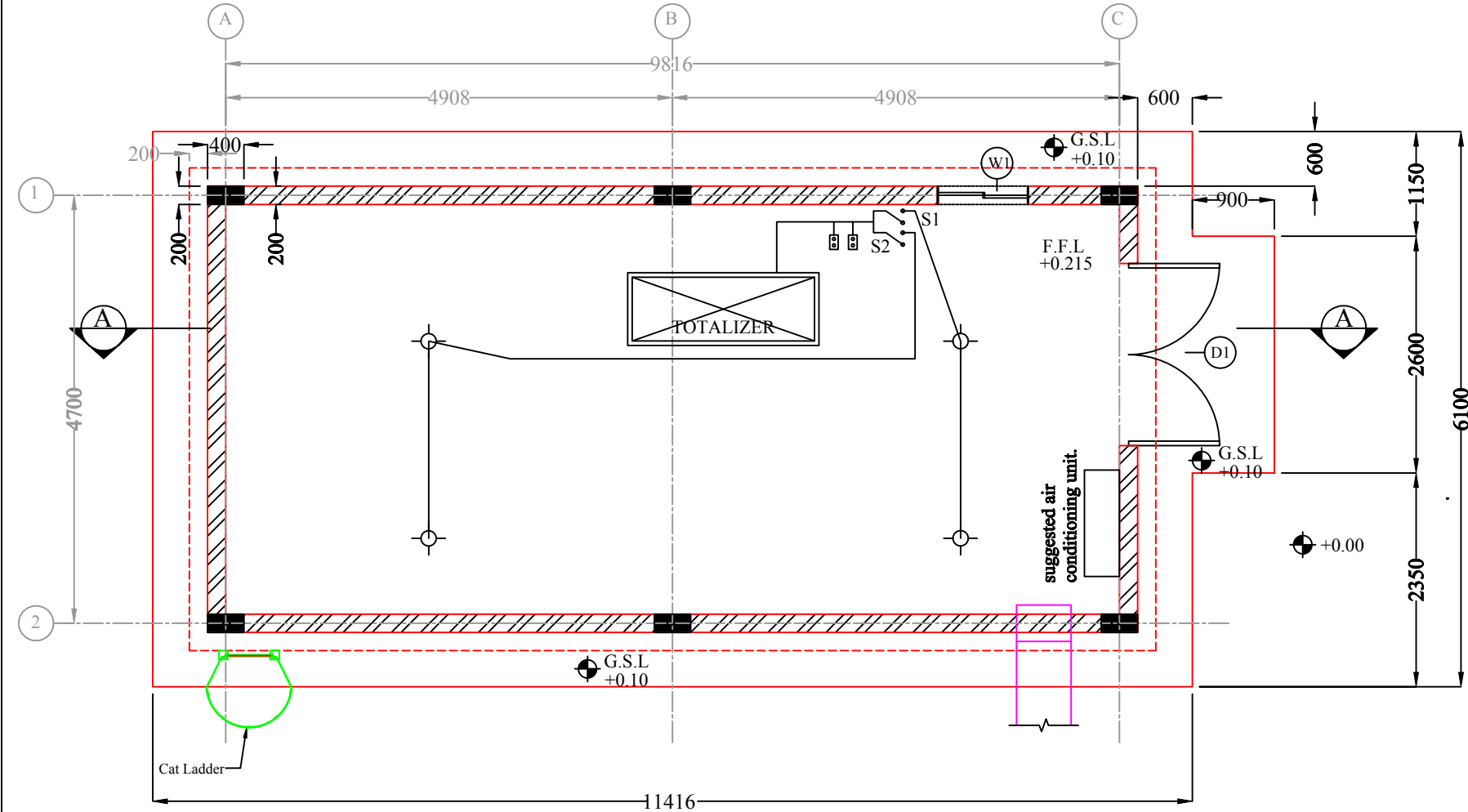
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Approved	ENG / AHMED BAFADHEL	Rev Rev 01	date 1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD		
Checked			

PROJECT

Supply, Installation  
and Operation of Solar  
PV Energy Units  
Al-Muwaijah Field

AL- SHAER CITY-YEMEN





- General Notes
- All dimensions are in (mm).
  - Levels are in (m).
  - Specific cubic compressive strength at 28-days should be 30 MPa.
  - Concrete Cover = 25 mm.
  - All main reinforcement should have minimum yield strength of 420 MPa.
  - All Stirrups should have minimum yield strength of 270 MPa.

Abbreviations

G.S.L	Ground Slab Level.
F.F.L	Finished Floor Level.
R.C	Reinforced Concrete.
Inv. #	Inverter Number.
H.C	Hybrid Controller.
M.D.B	Main Distributing Board.
S1	Electrical Switch.

Symbols

	Light
	Switch
	Plug

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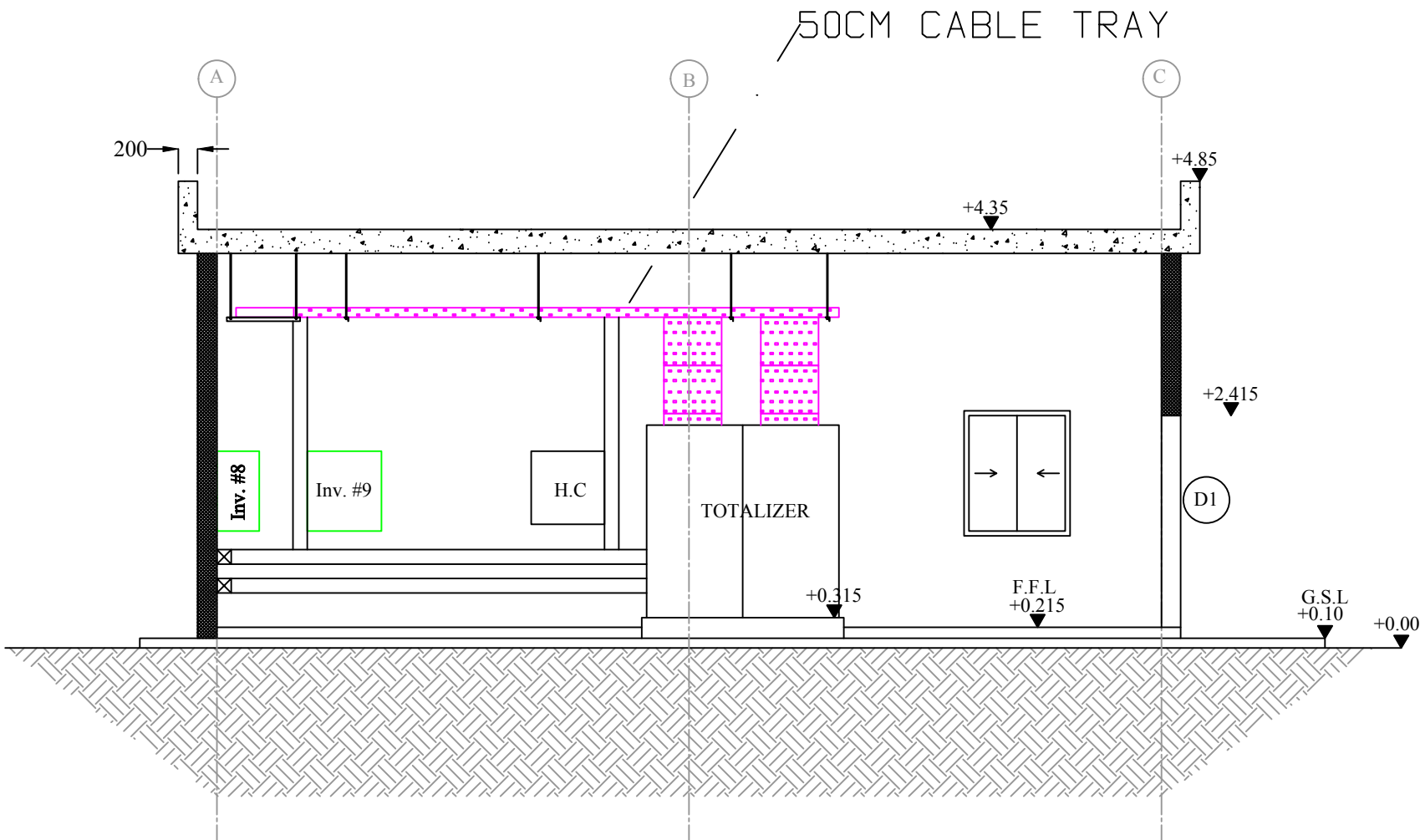
**M-16** CONTROL ROOM (Electrical Layout)

**Legend :**

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Approved	ENG / AHMED BAFADHEL	Rev	date
		Rev 01	1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD		
Checked			

PROJECT  
**Supply, Installation and Operation of Solar PV Energy Units**  
**Al-Muwaijah Field**

AL- SHAER CITY-YEMEN



#### General Notes

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R.C	Reinforced Concrete.
Inv. #	Inverter Number.
H.C	Hybrid Controller.
M.D.B	Main Distributing Board.
S1	Electrical Switch.

#### Symbols

	Light
	Switch
	Plug

#### Section B-B

### M-17 CONTROL ROOM(Inverters, Cable tray, and M.D.B Layout)

#### Legend :

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Approved	ENG / AHMED BAFADHEL	Rev	date
		Rev 01	1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD		
Checked			

**PROJECT**  
Supply, Installation  
and Operation of Solar  
PV Energy Units  
Al-Muwaijah Field

AL- SHAER CITY-YEMEN

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**Structural Drawings For**  
**Supply, Installation and Operation of Solar PV**  
**Energy Units at Al-Muwaijah Field**  
**Ground Mounting Structure Drawings**

**Funded by: Word Bank through UN0PS**  
**Bid No.: IUS-AF-UWS-SHA-001**

**December , 2022**

PREPARED BY:  
**UNOPS**  
OPERATIONAL EXCELLENCE  
FOR RESULTS THAT MATTER.  
SANA'A - YEMEN.

FUNED BY:  
**THE WORLD BANK**  
IBRD - IDA | WORLD BANK GROUP  
WORLD BANK GROUP.

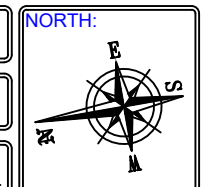
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PROJECT LOCATION:  
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DRAWING TITLE:  
**STRUCTURAL PLANS.**

DESIGN BY:  
CHECKED BY:  
APPROVED BY:  
**UNOPS DESIGN REVIEW.**

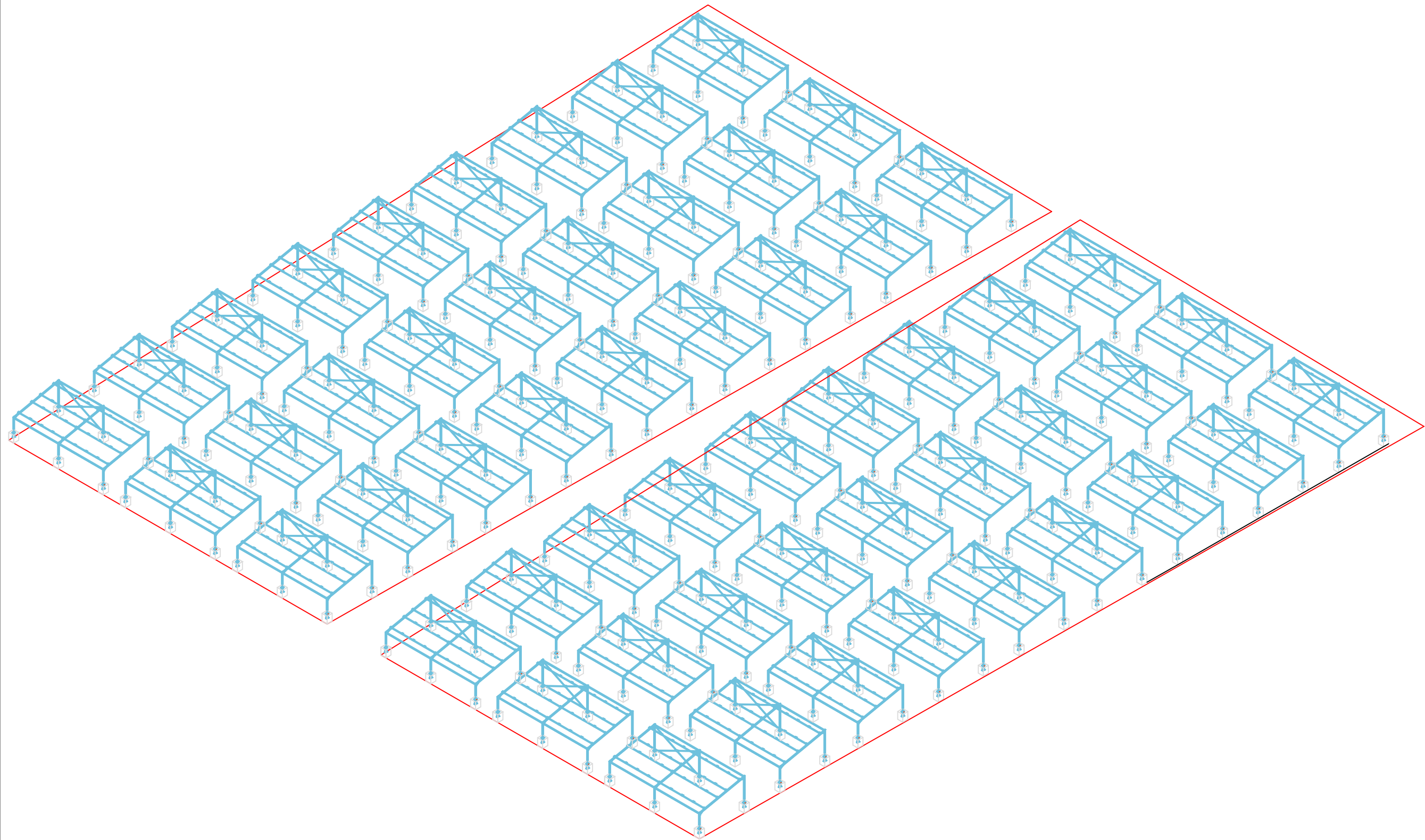
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PROJECT NO:  
DATE:  
**FEB,12.2022**

PAPER SIZE:  
**A3.**  
SCALE:  
**AS SHOWN.**



DRAWING NO:  
**S-01**





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PROJECT TITLE

Solar Energy Units at Al-Muwaijah

PROJECT LOCATION

Almuwaijah - Alshaer

DRAWING TITLE

PV Mounting Structures - 3D View

CODE

IUS-AF-UWS-SHA-001

DESIGNED BY

TFE

CHECKED BY

APPROVED BY

STATUS

PROJECT NO

DATE

2022 / 12 / 04

PAPER SIZE

A3

SCALE

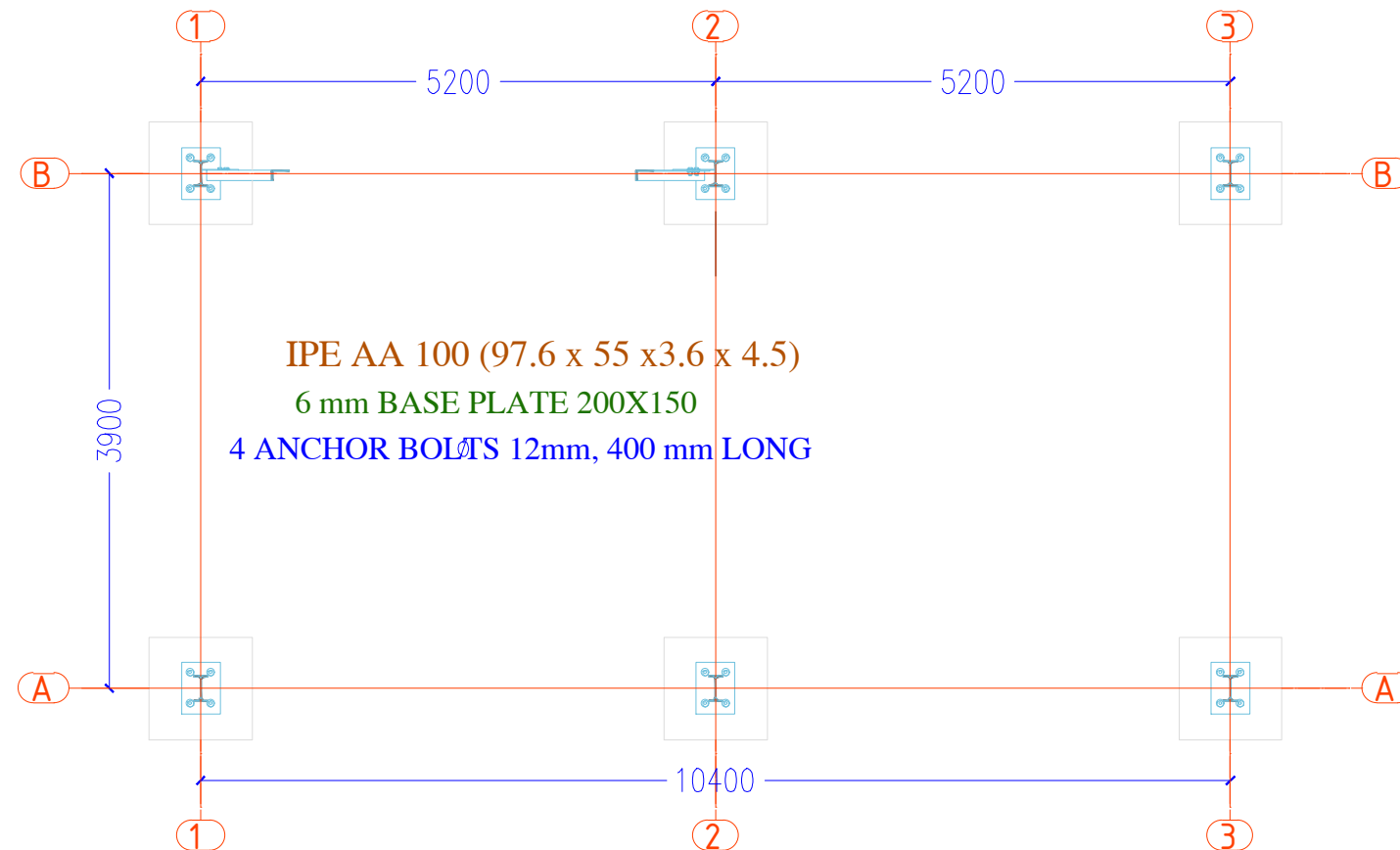
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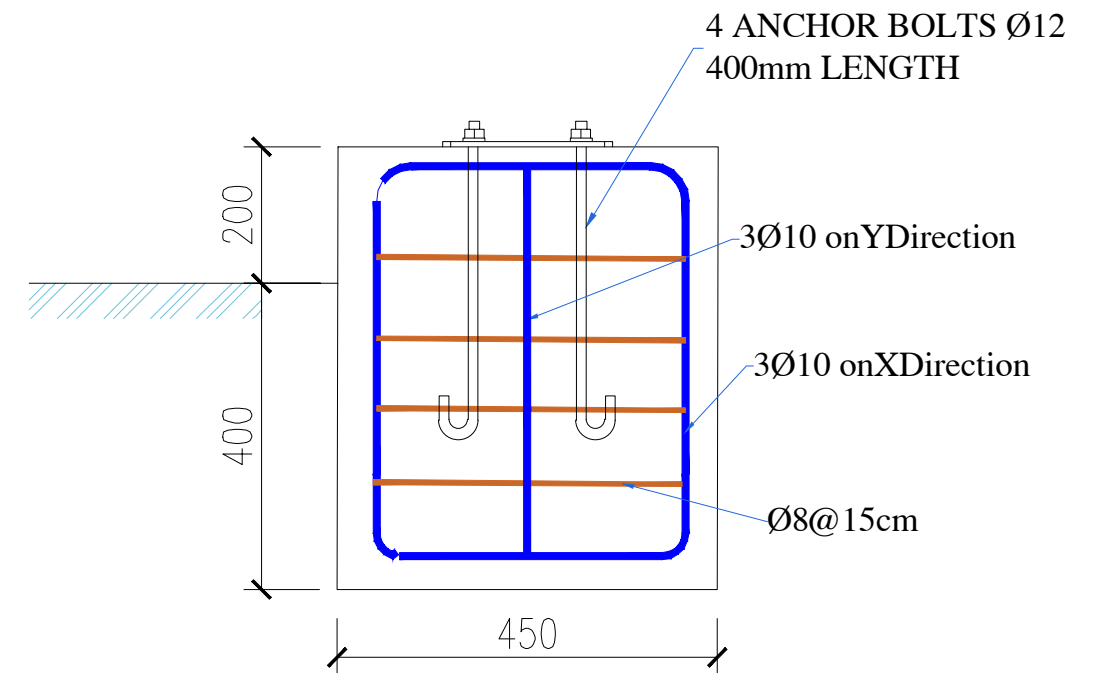


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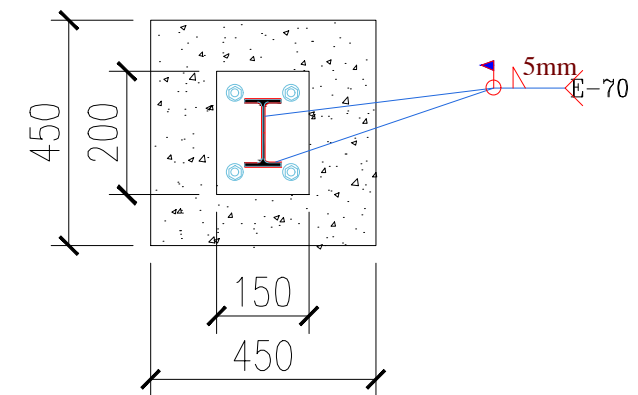
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1 ANCHOR BOLTS PLAN  
STRUCTURE DETAILS

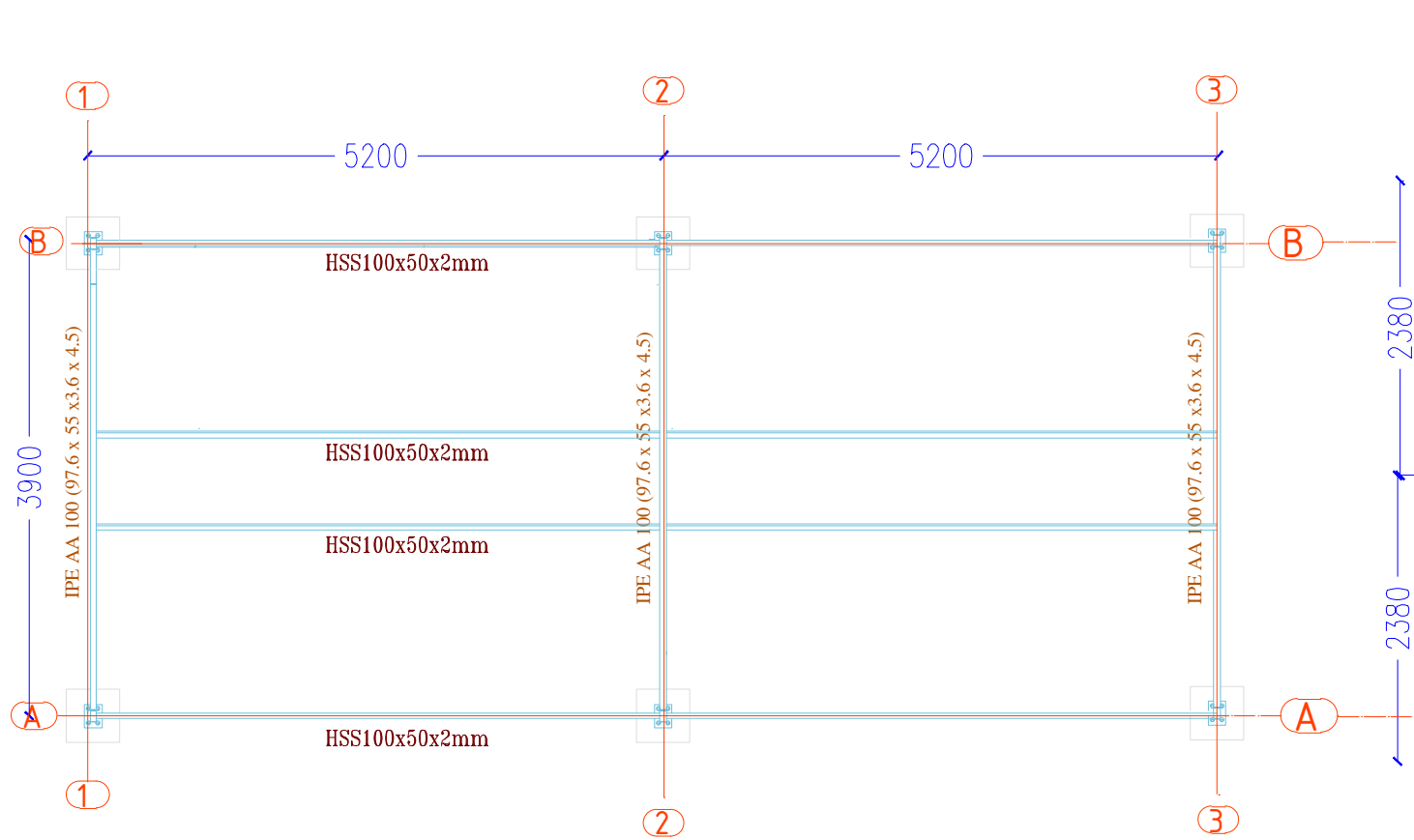


2 CONCRETE FOOTING - DETAIL A  
STRUCTURE DETAILS

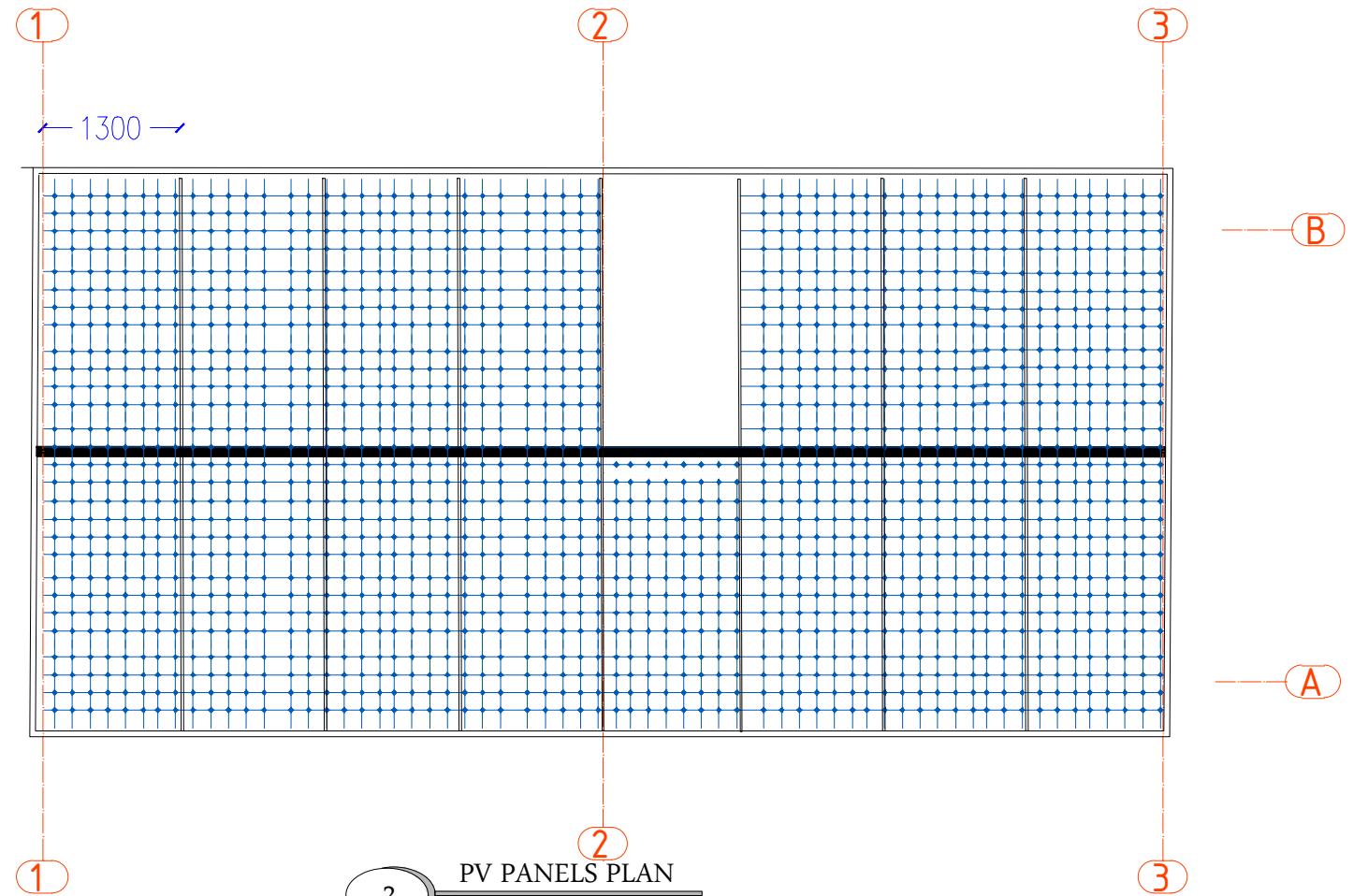


3 BASE PLATE - DETAIL A  
STRUCTURE DETAILS

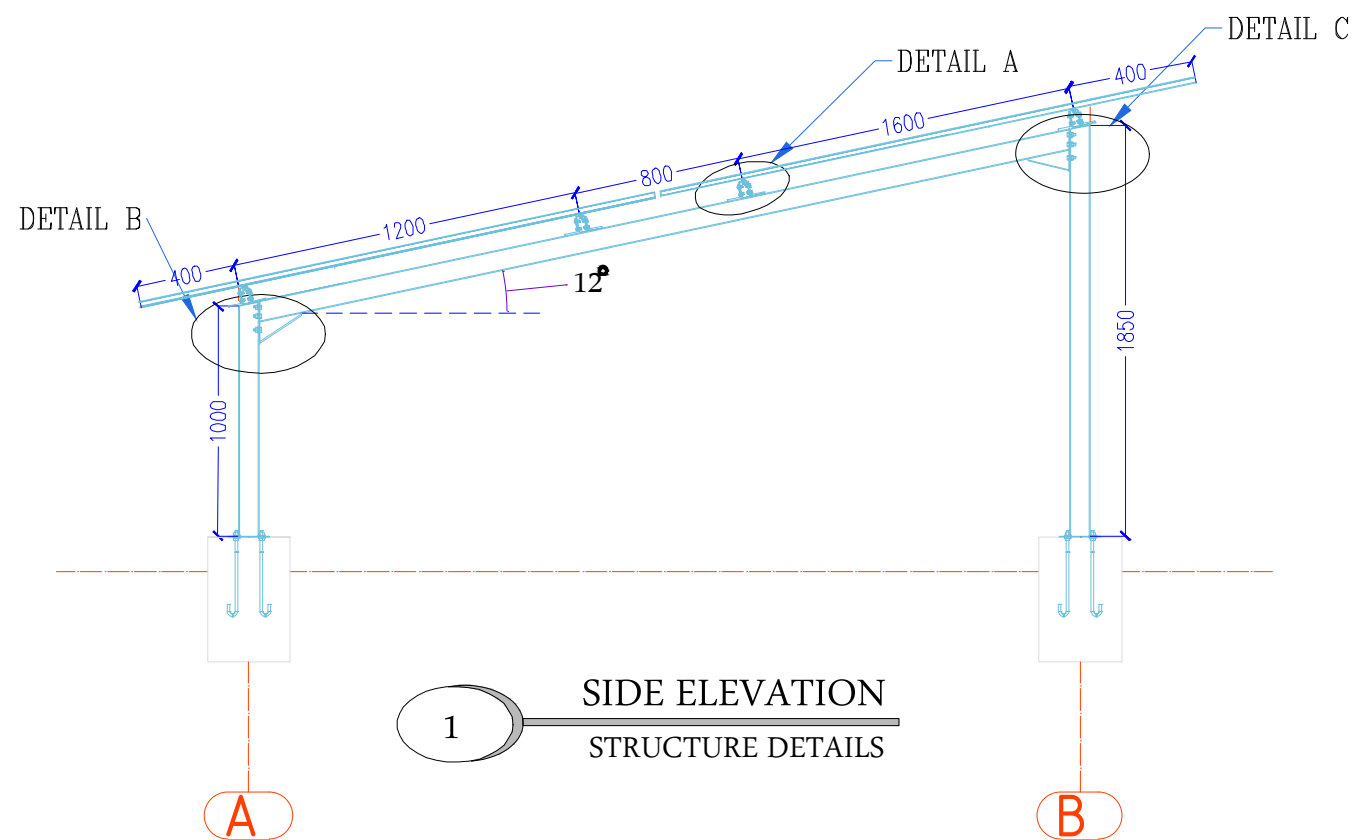




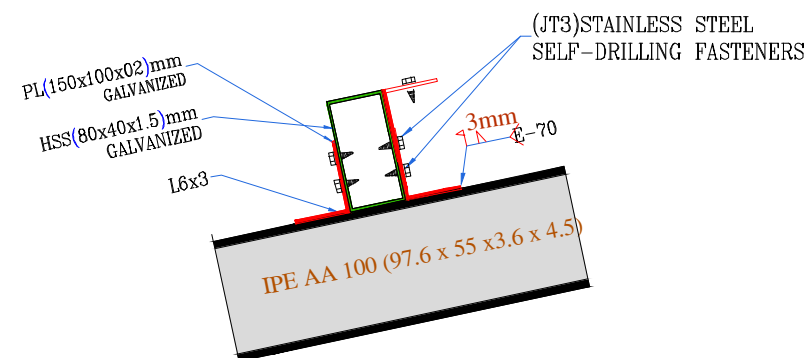
1 FULL FRAMING PLAN  
STRUCTURE DETAILS



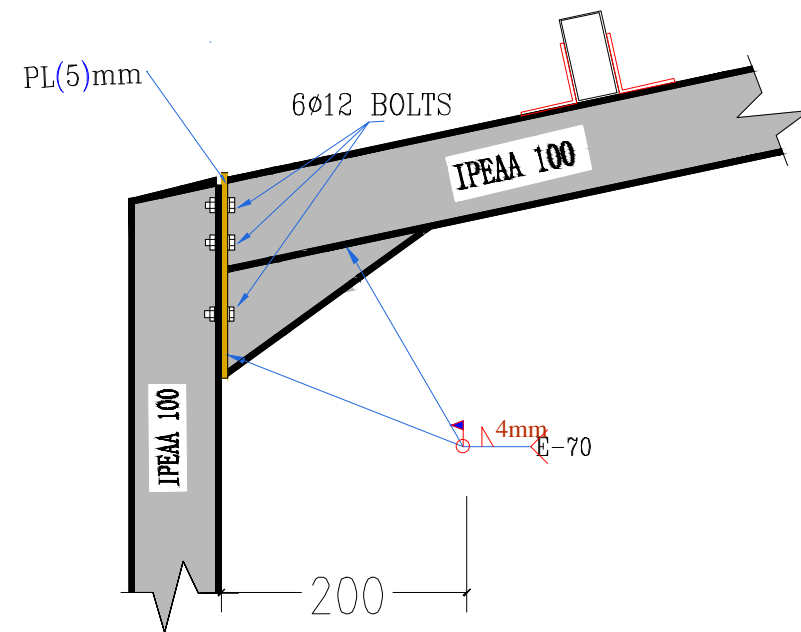
2 PV PANELS PLAN  
STRUCTURE DETAILS



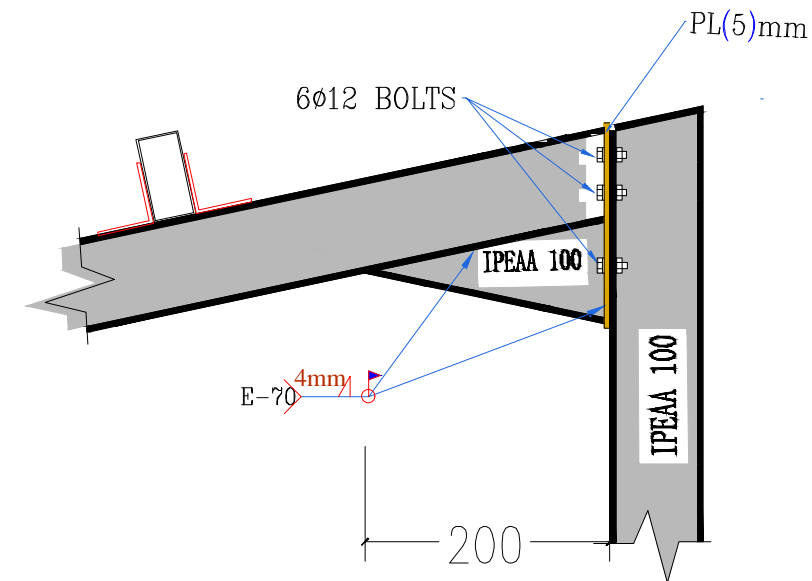
1 SIDE ELEVATION  
STRUCTURE DETAILS



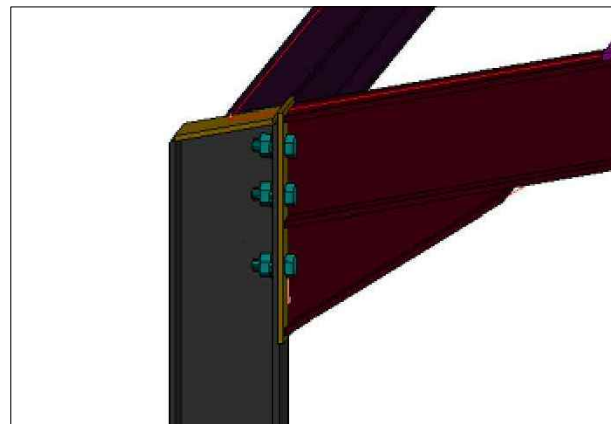
2 JOINT - DETAIL A  
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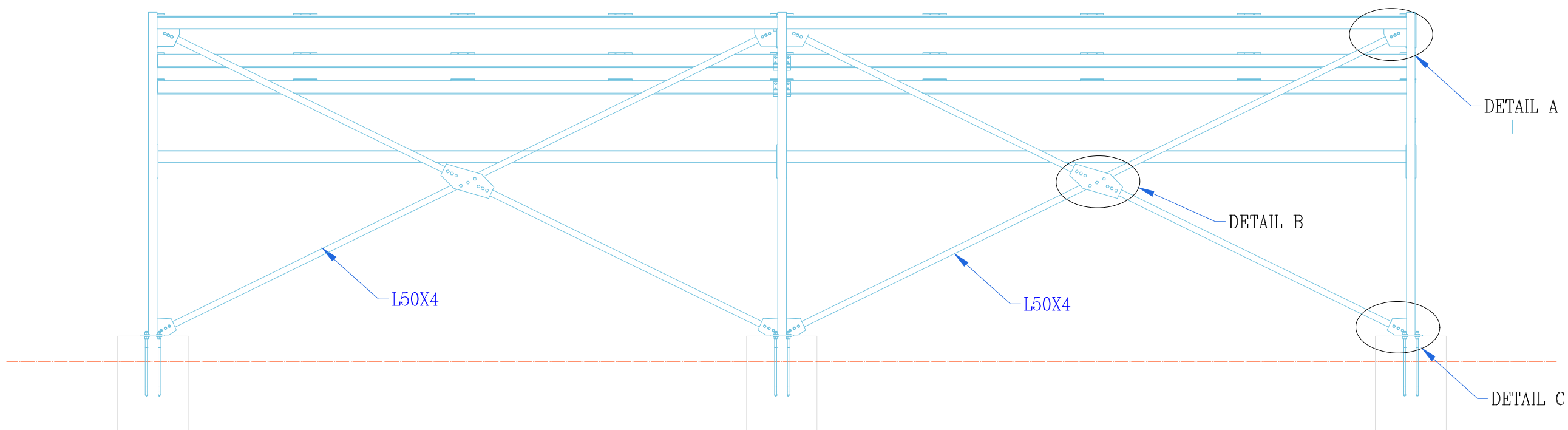
1 JOINT - DETAIL B  
STRUCTURE DETAILS



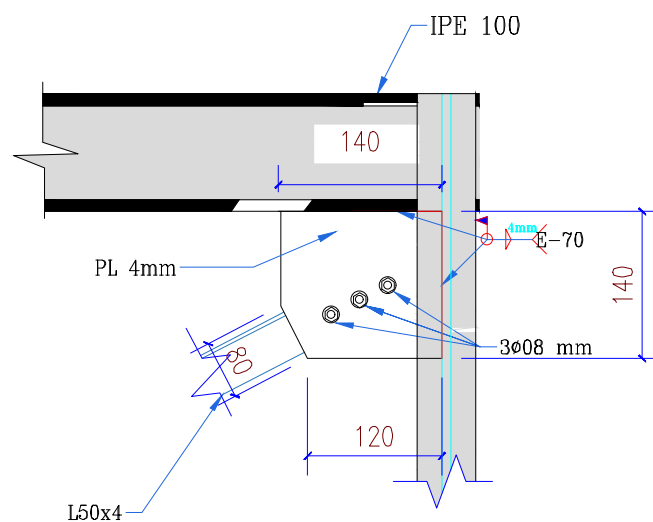
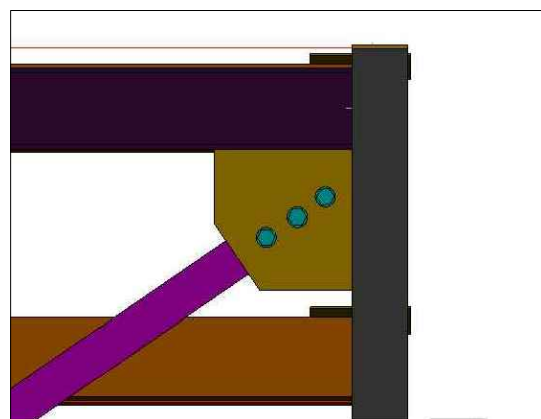
2 JOINT - DETAIL C  
STRUCTURE DETAILS



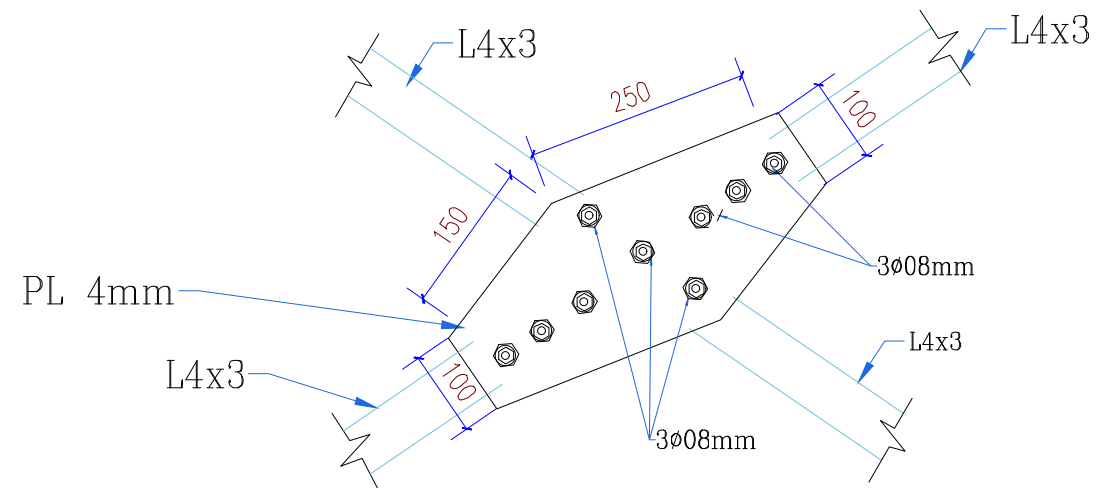
1-A JOINT - DETAIL B (3D) VIEW  
STRUCTURE DETAILS



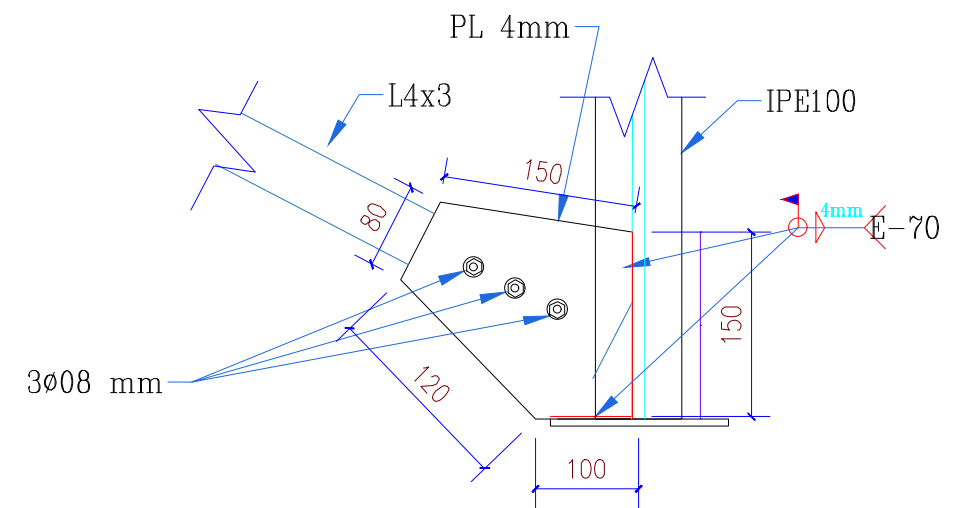
1 BACK ELEVATION  
STRUCTURE DETAILS



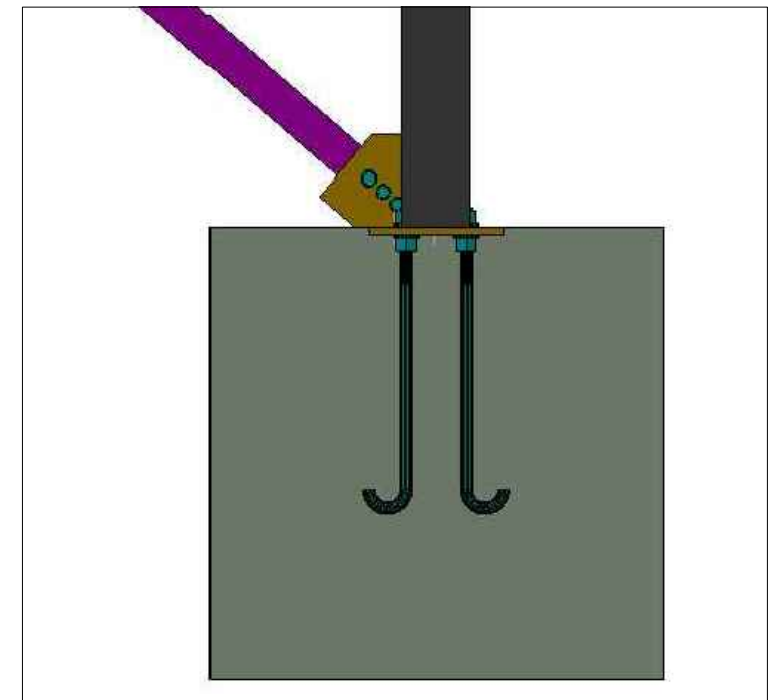
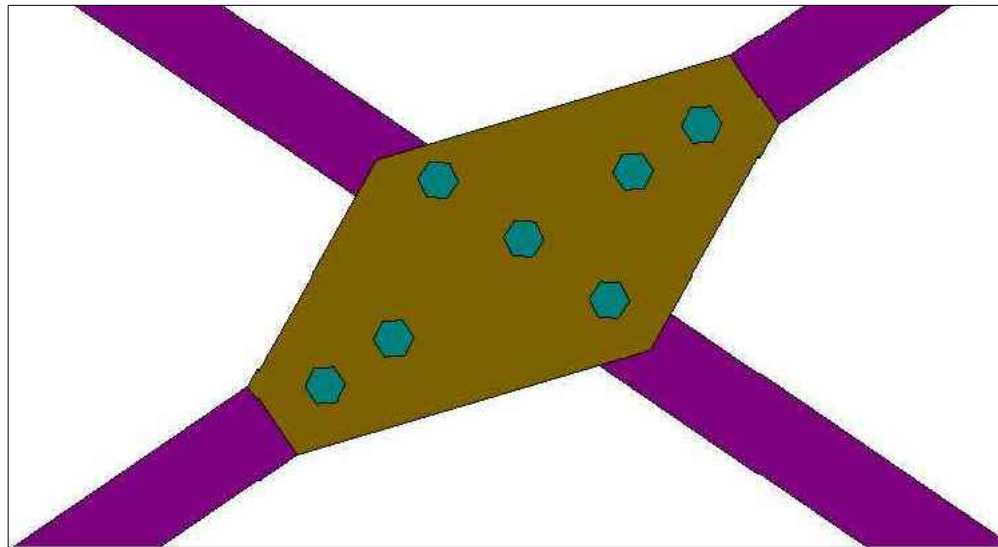
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STRUCTURE DETAILS

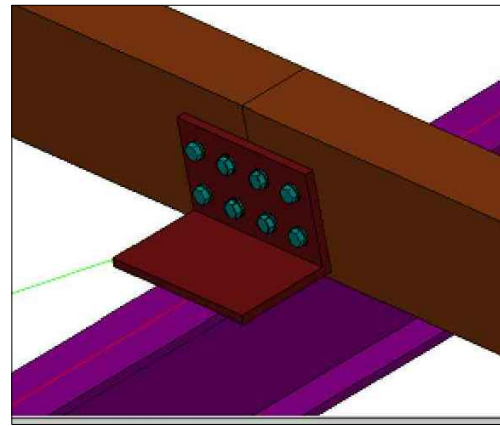


1 JOINT - DETAIL B  
STRUCTURE DETAILS

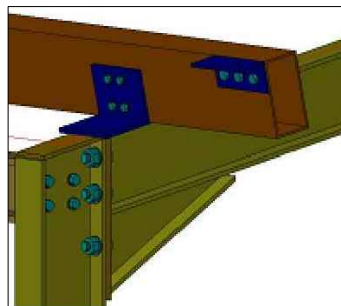
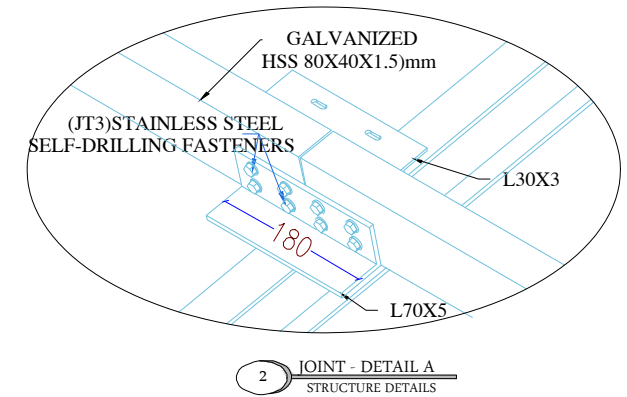


2 JOINT - DETAIL C  
STRUCTURE DETAILS

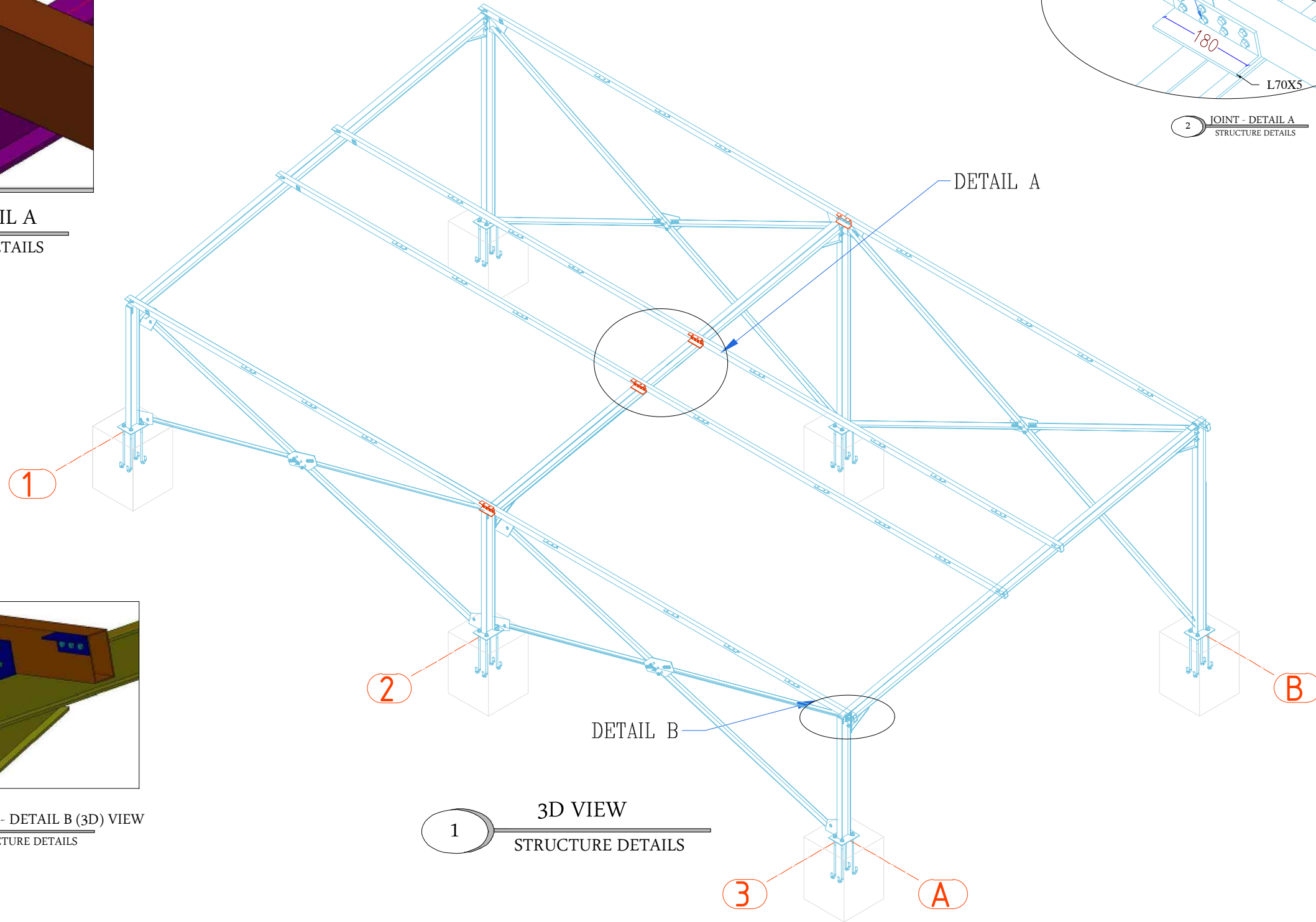




2-A JOINT - DETAIL A  
STRUCTURE DETAILS



1-A JOINT - DETAIL B (3D) VIEW  
STRUCTURE DETAILS



1 3D VIEW  
STRUCTURE DETAILS



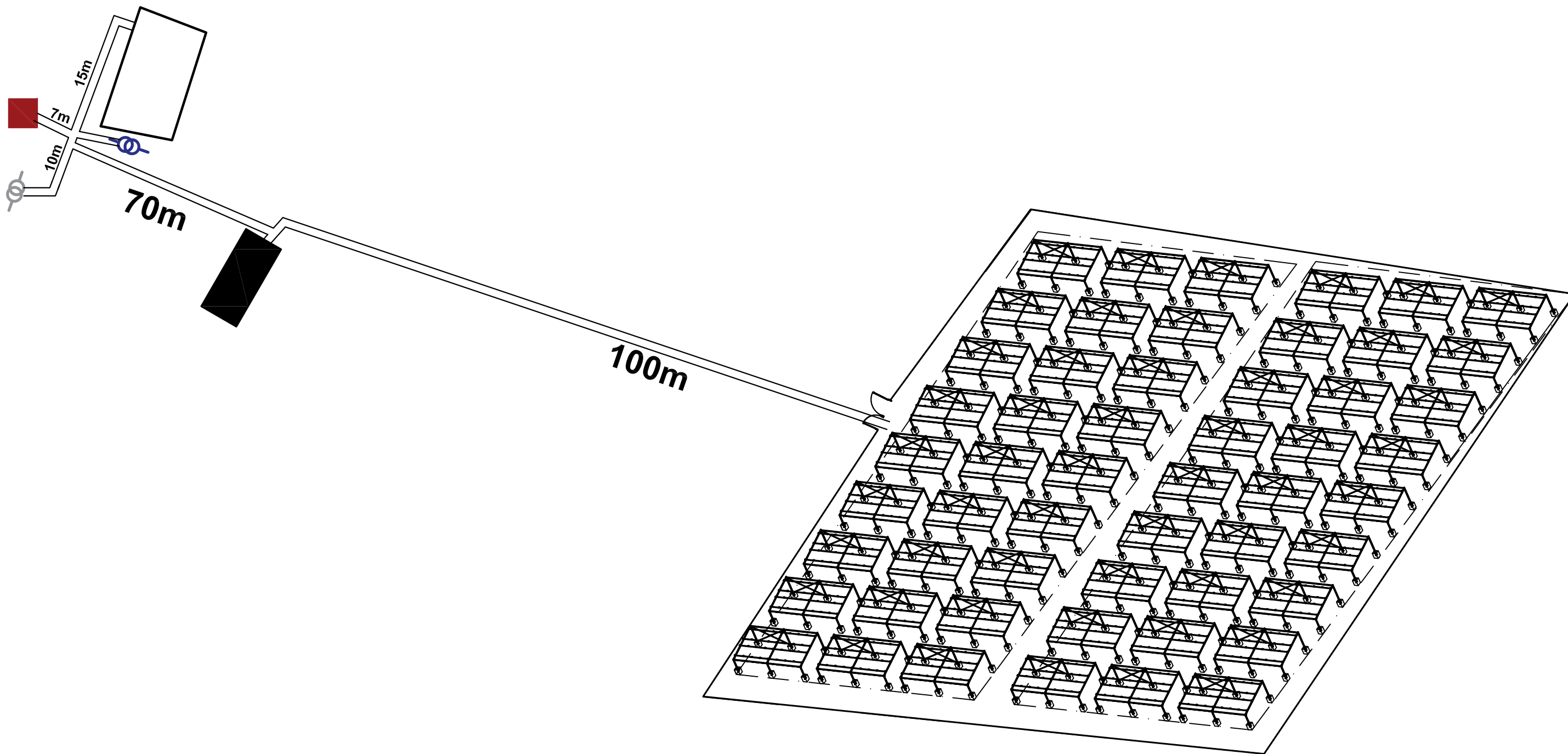


**Structural Drawings For**  
**Supply, Installation and Operation of Solar PV**  
**Energy Units at Al-Muwaijah Field**

**Control Room Structure Drawings**

**Funded by: Word Bank through UN0PS**  
**Bid No.: IUS-AF-UWS-SHA-001**

**December , 2022**



FUNED BY



PREPARED BY



PROJECT TITLE

Solar Energy Units at Al-Muwaijah

DRAWING TITLE

Control Room - Structural Plans

DESIGNED BY

TFE

CHECKED BY

APPROVED BY

STATUS

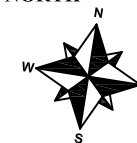
PROJECT NO

DATE  
2022 / 12 / 04

PAPER SIZE  
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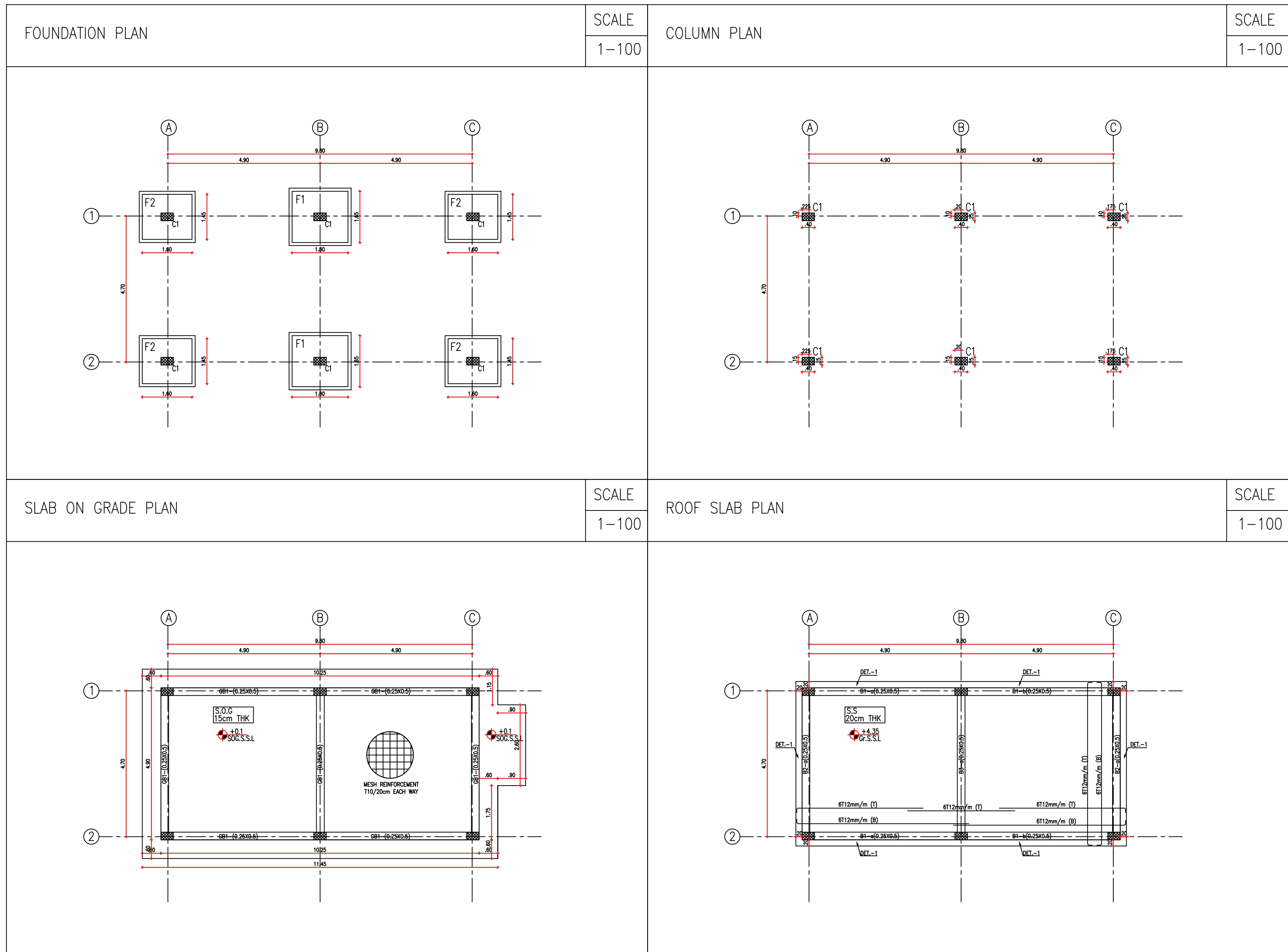
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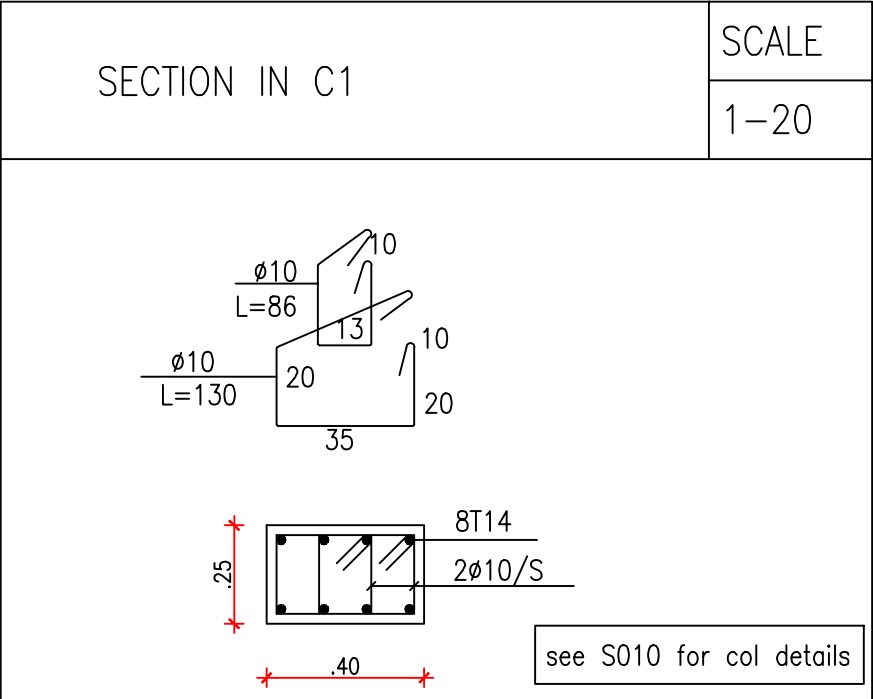
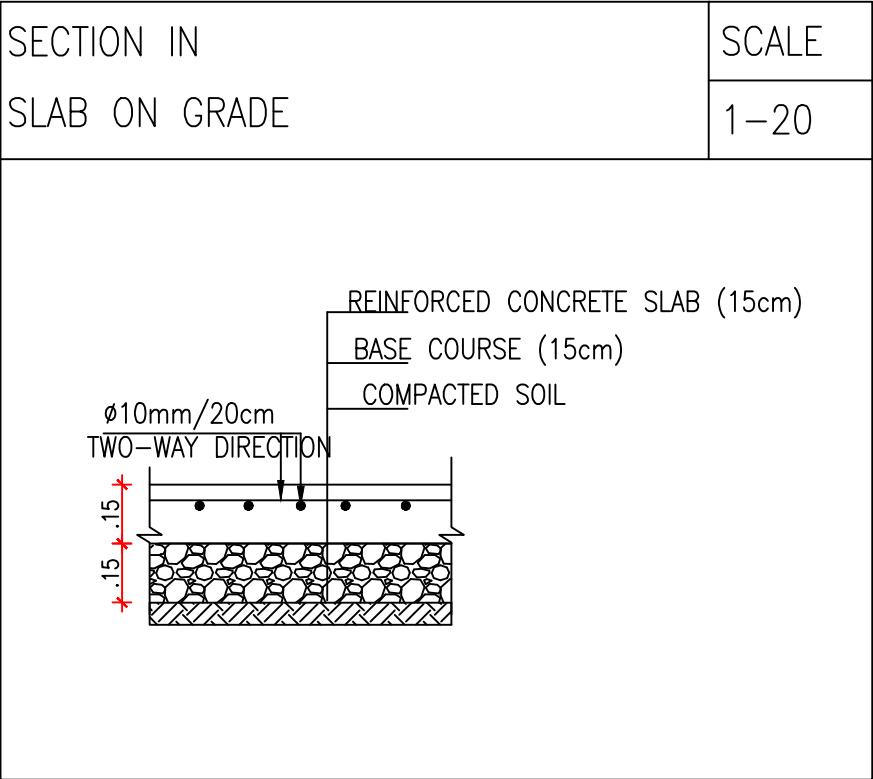
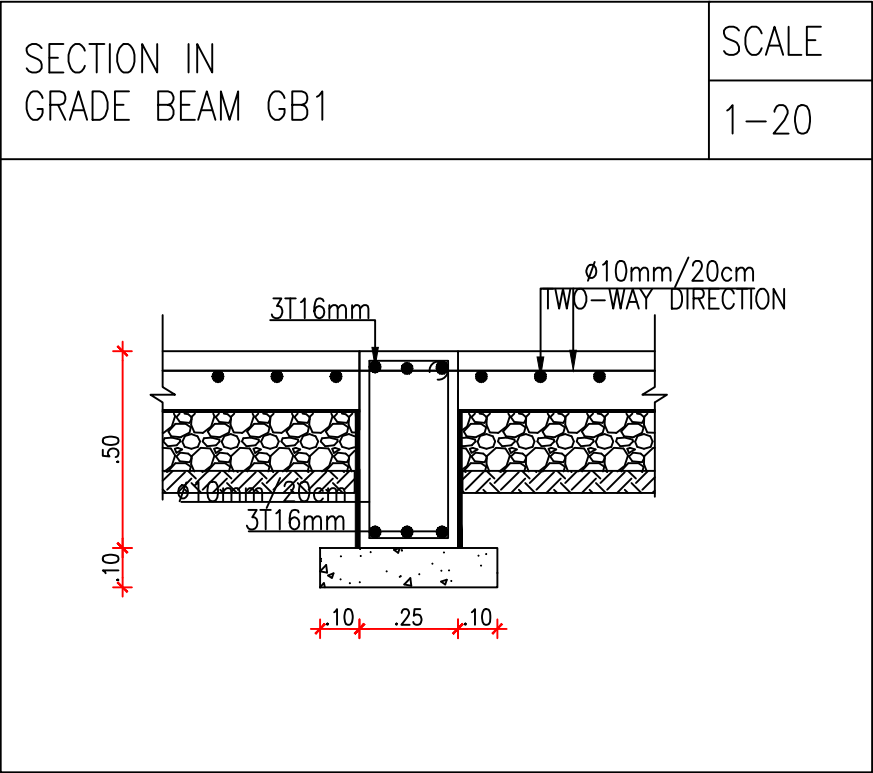
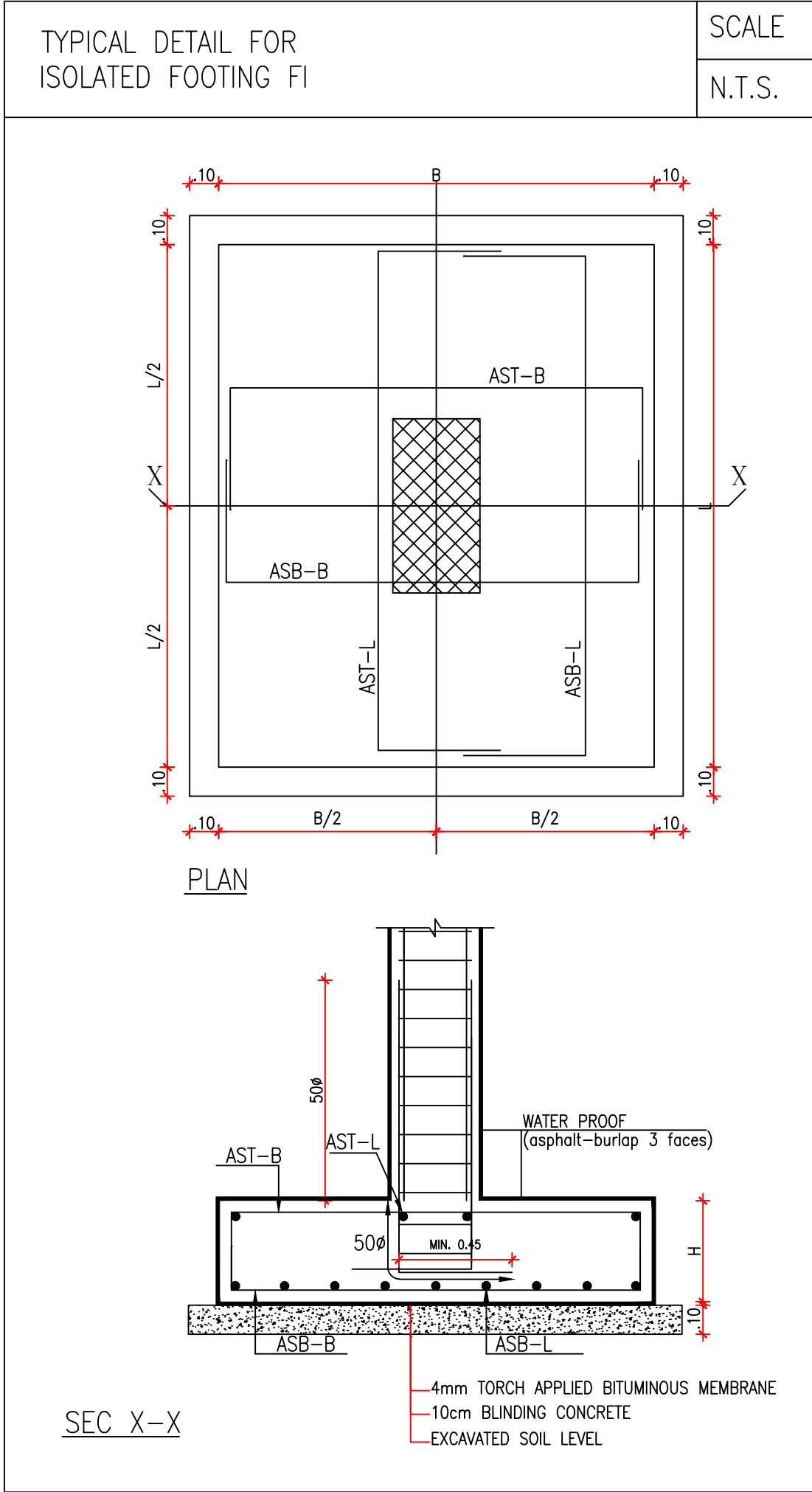
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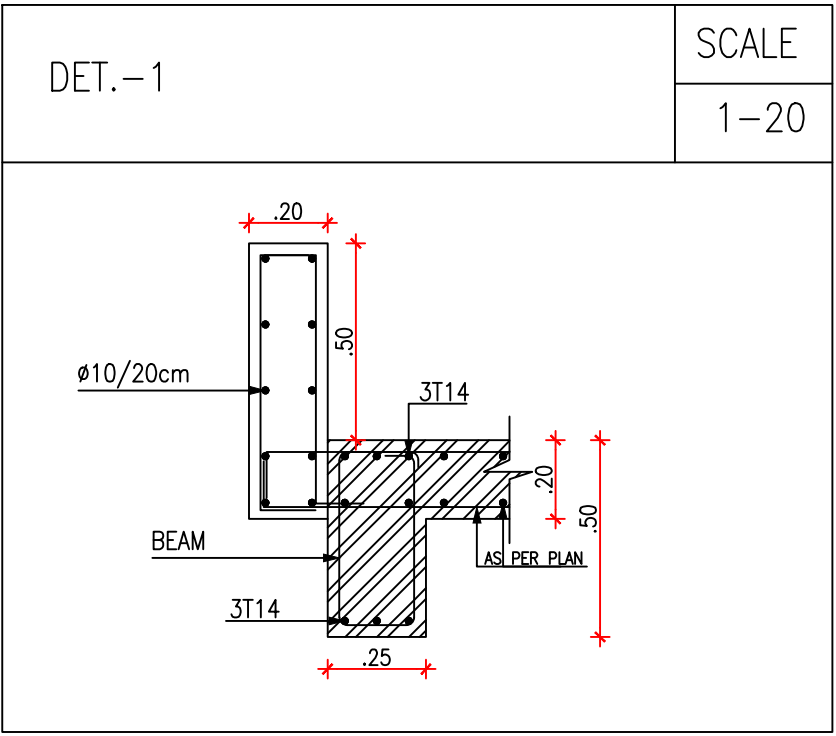
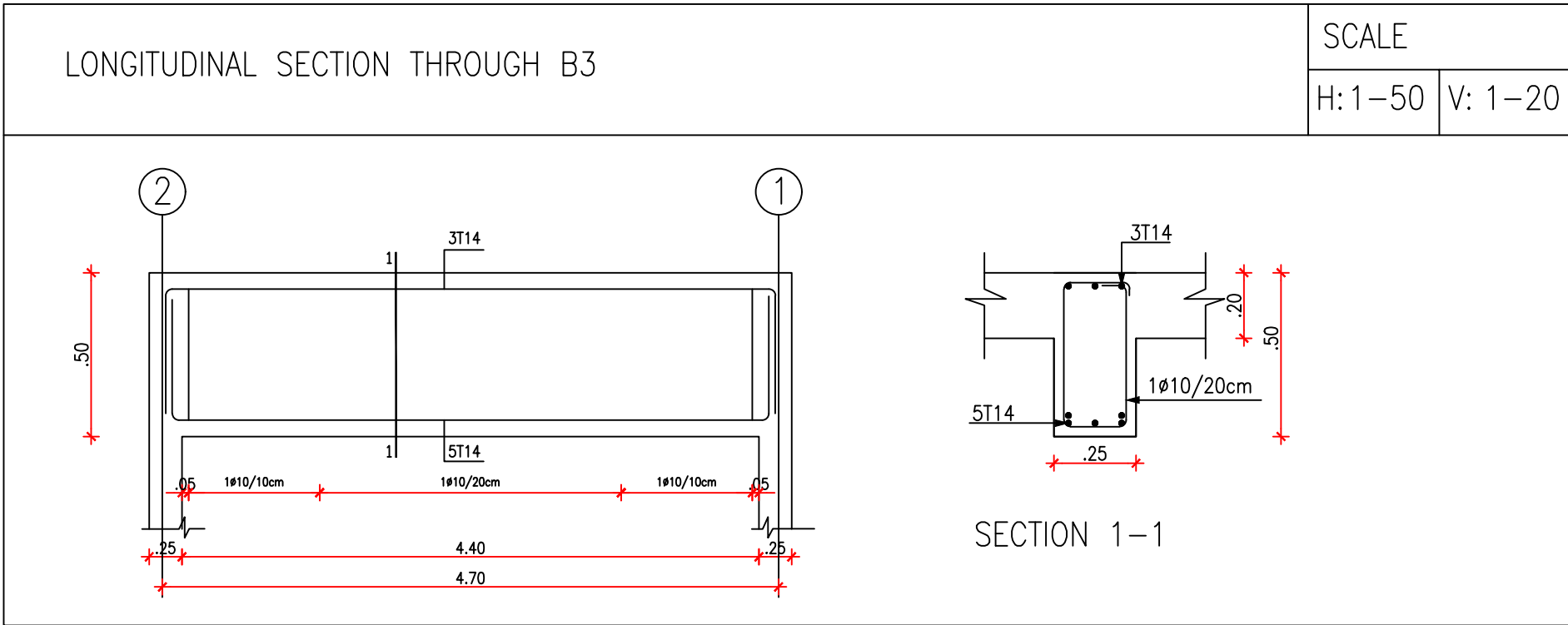
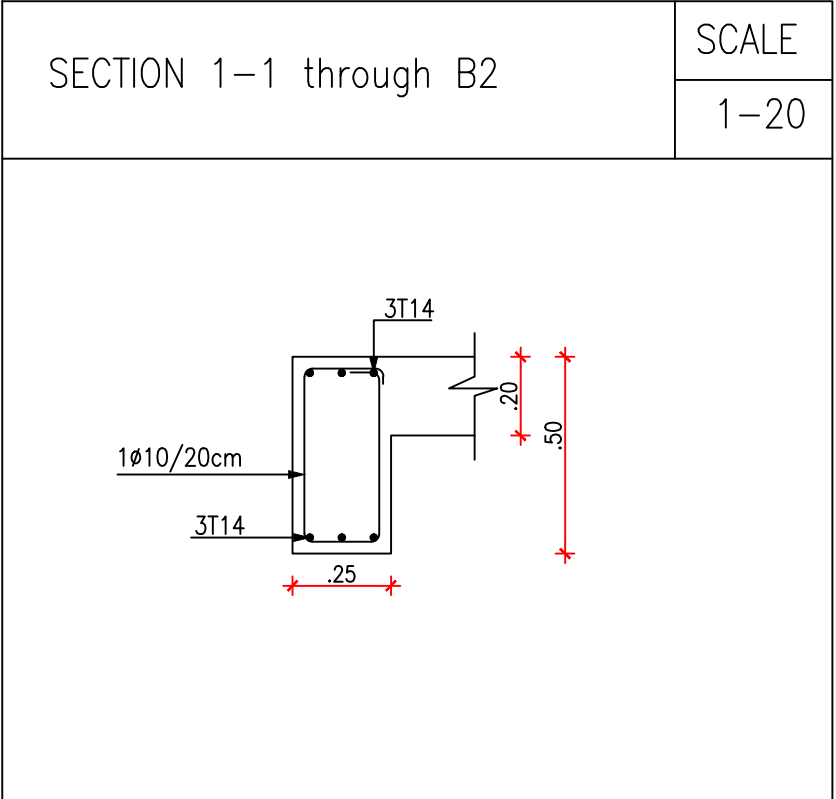
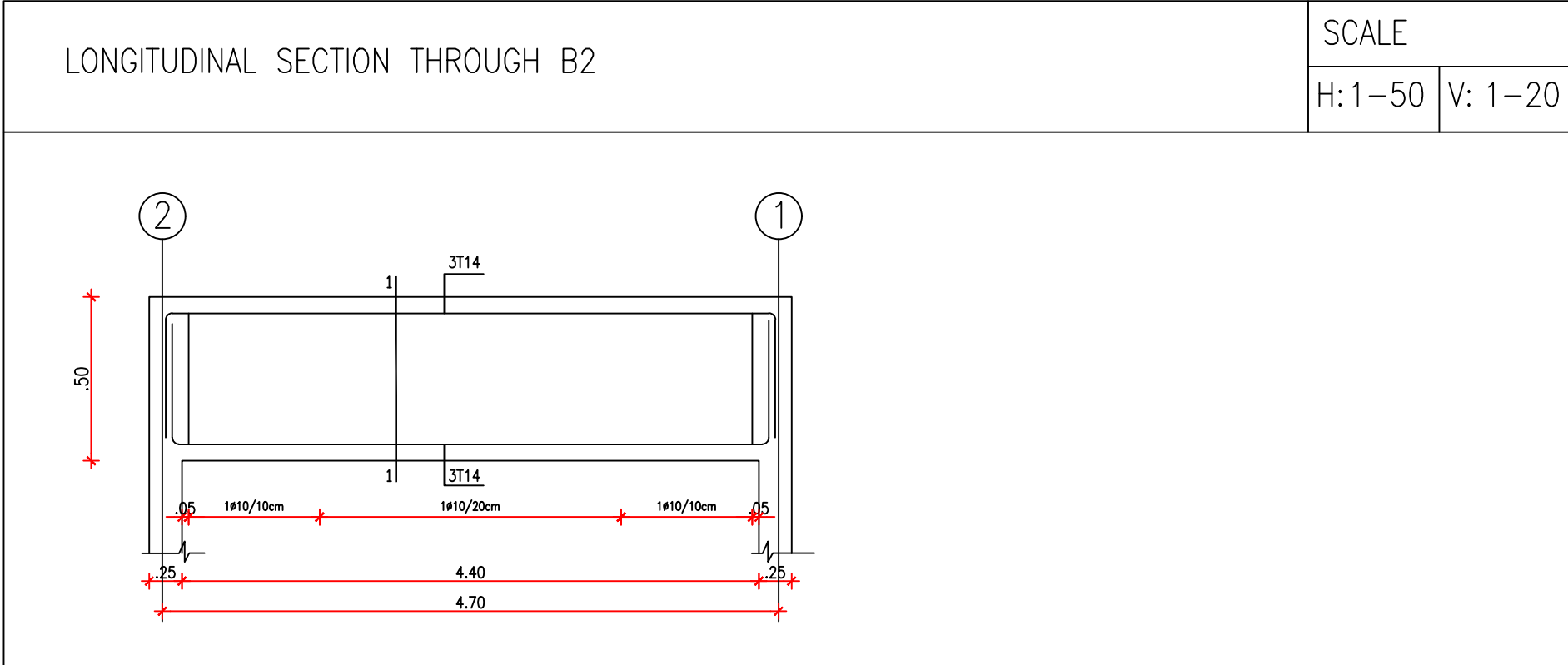
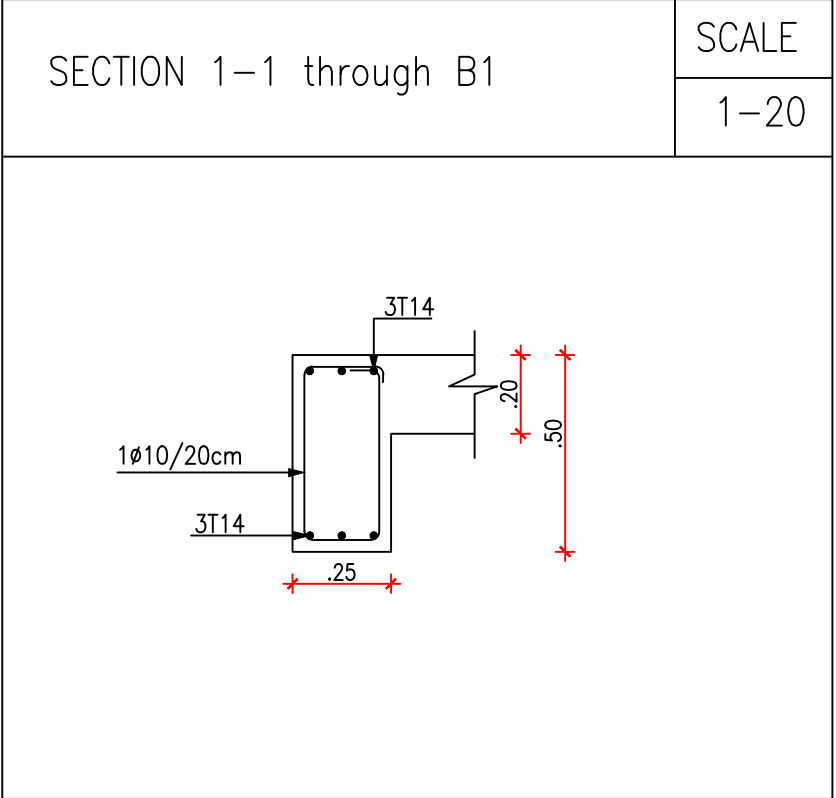
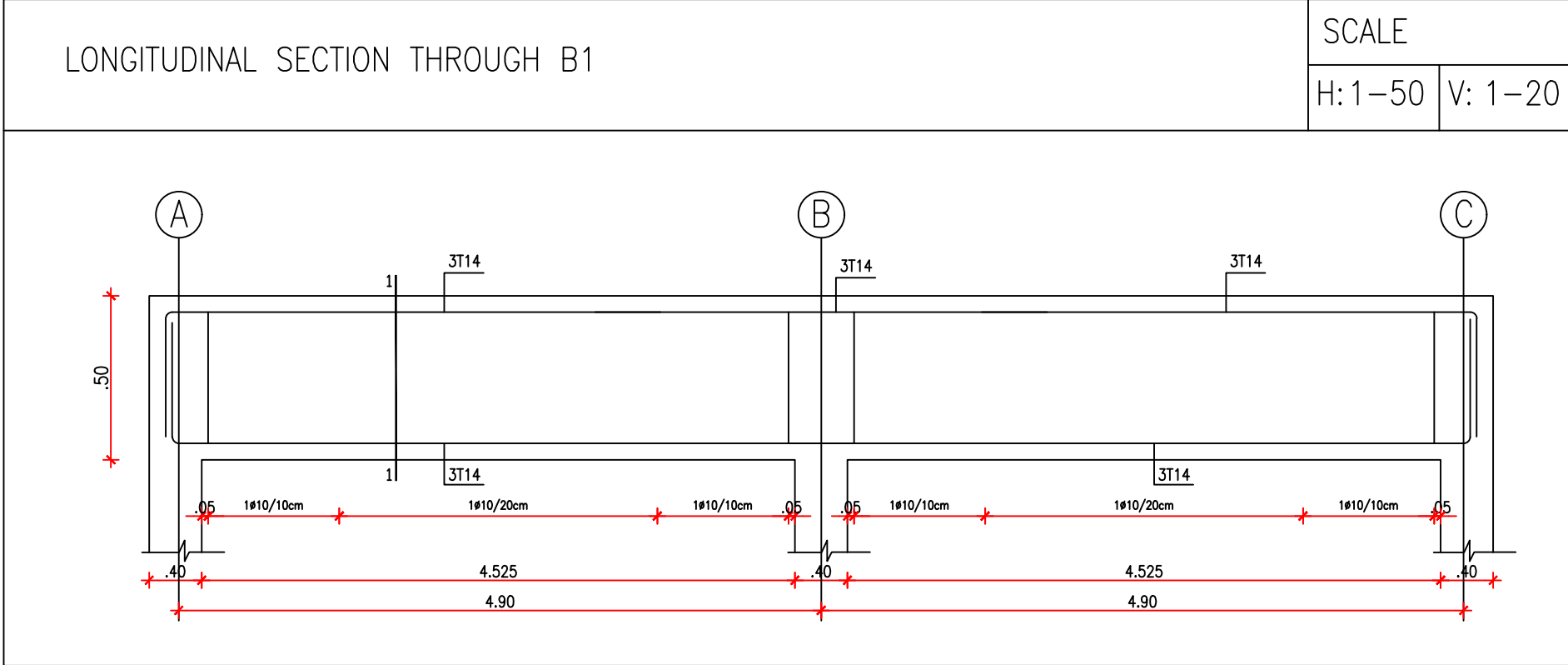
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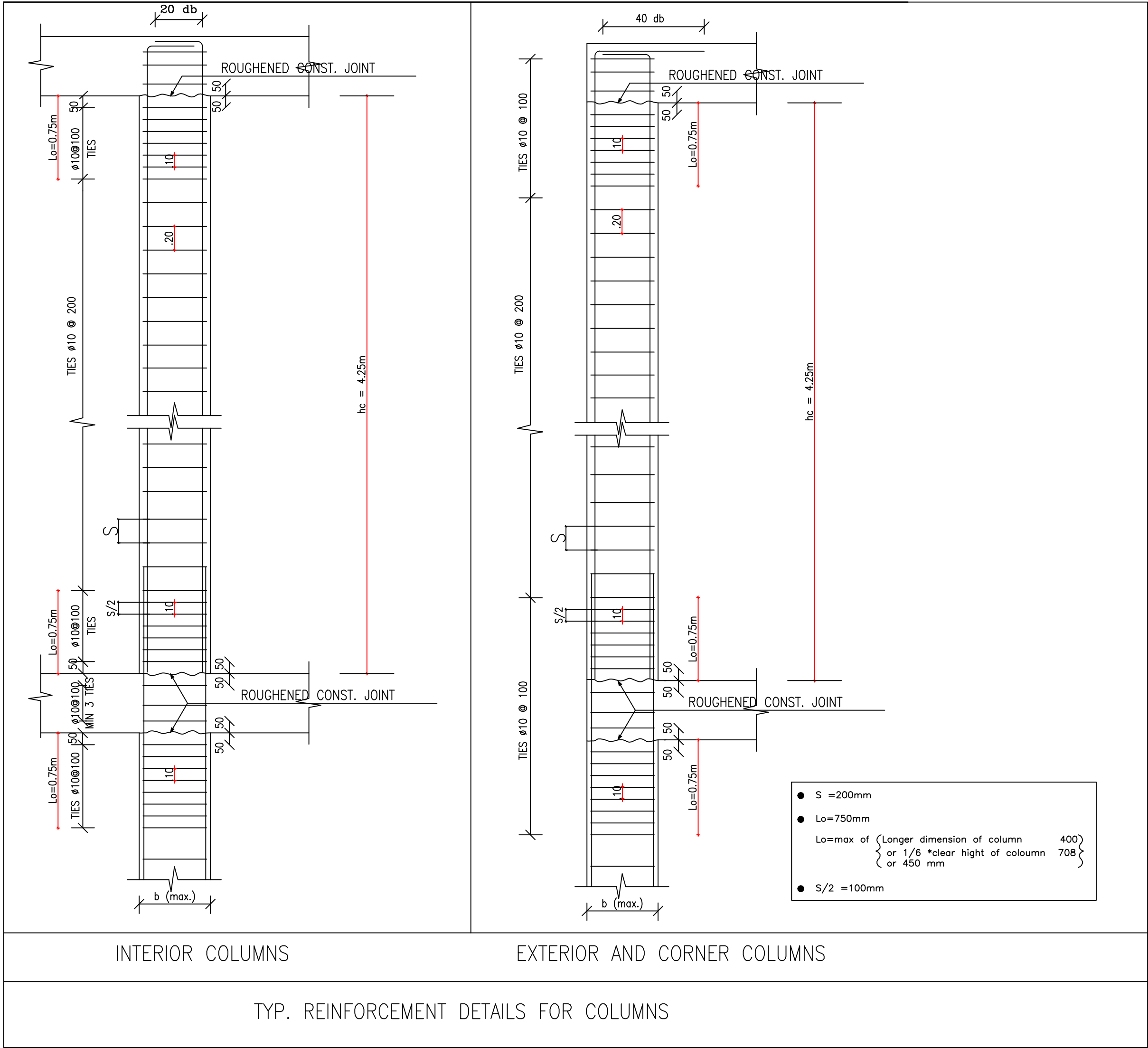




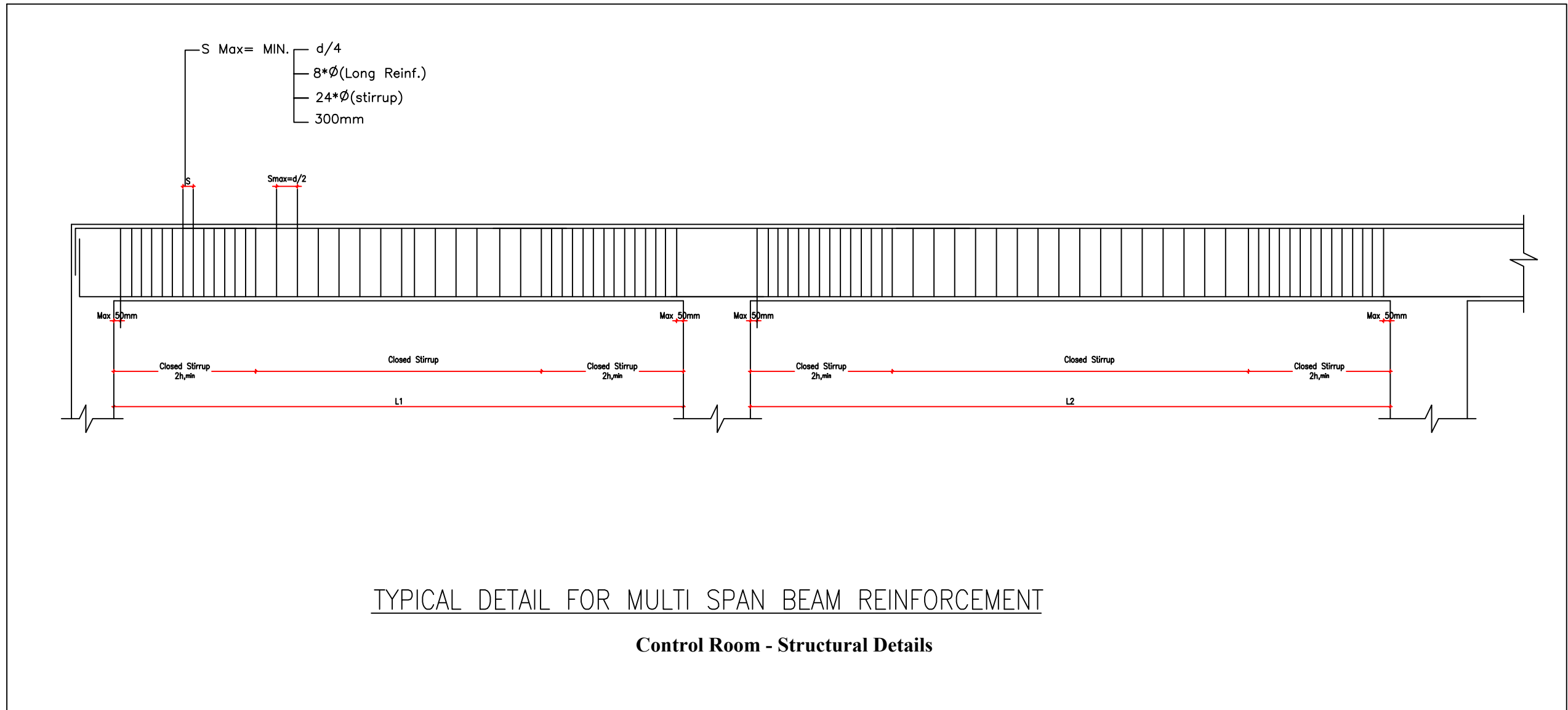
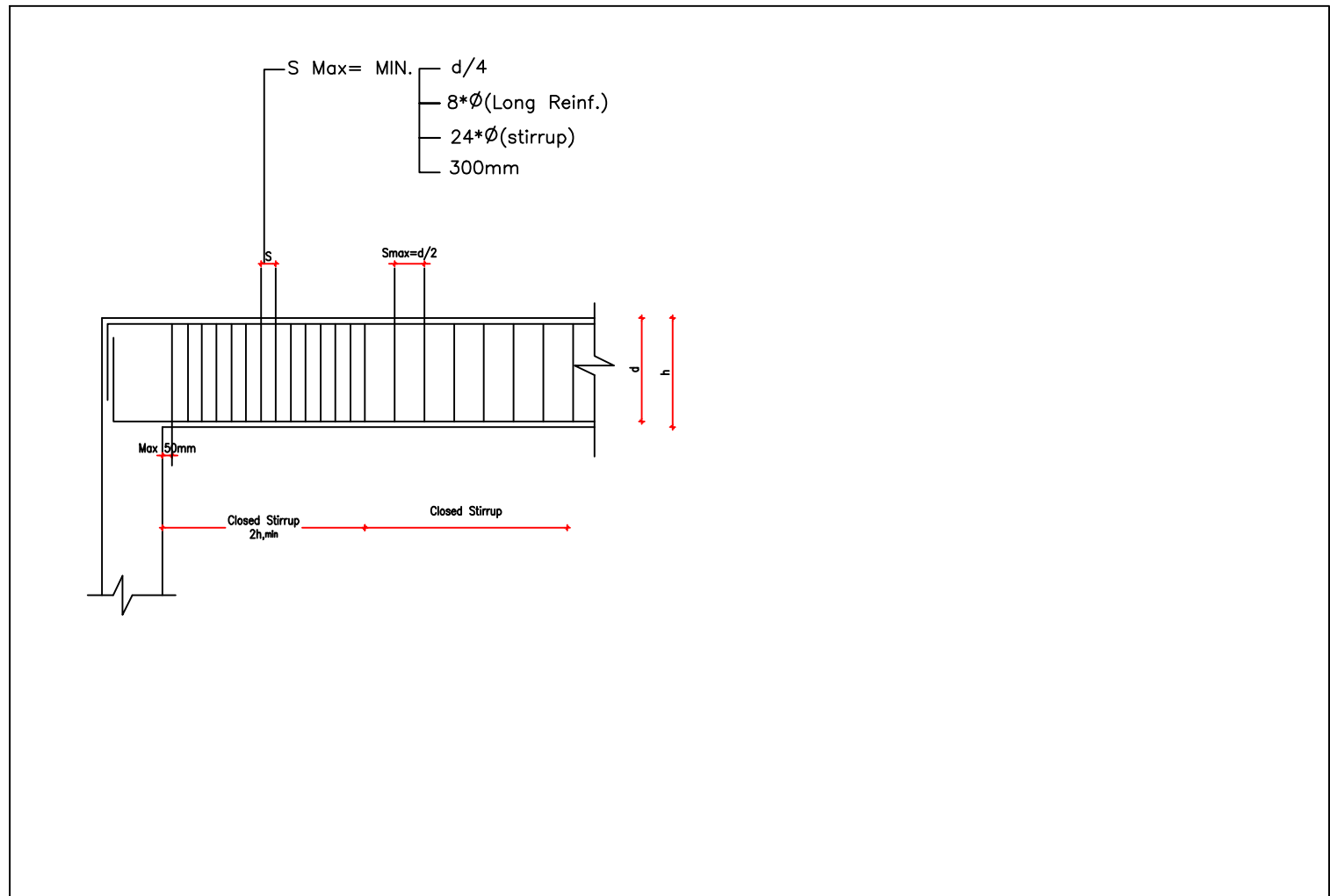
SCHEDULE FOR FOUNDATION REINFORCEMENT									
FOOTING NO.	SECTION SIZE (cm)			COLUMN SIZE		BOT REINF.		TOP REINF.	
	L	B	H	l	b	AS-L	AS-B	AS-L	AS-B
F1-C1	180	165	35	40	25	5T14/m	5T14/m	4T14	4T14
F2-C1	160	145	35	40	25	5T14/m	5T14/m	4T14	4T14

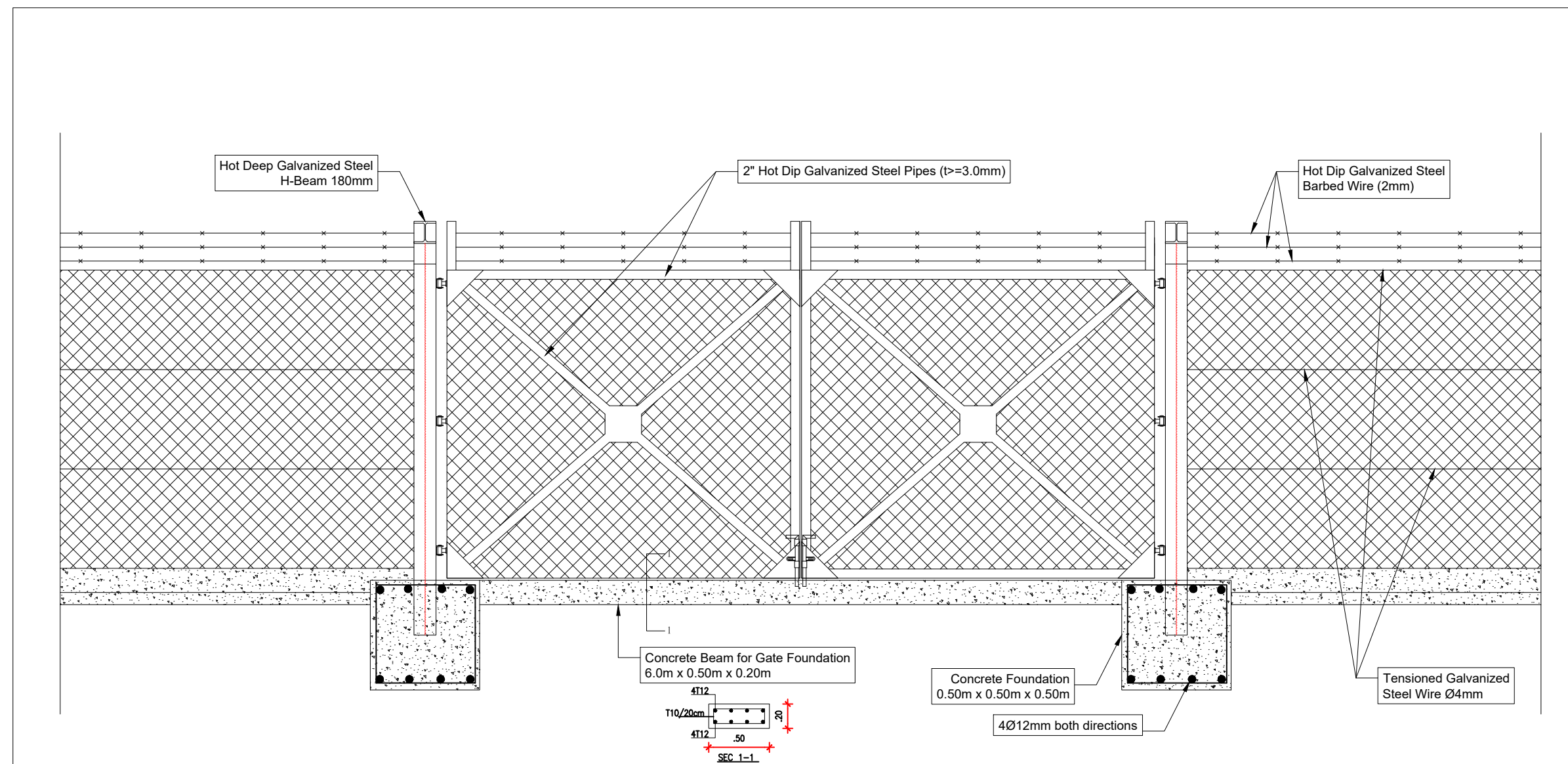




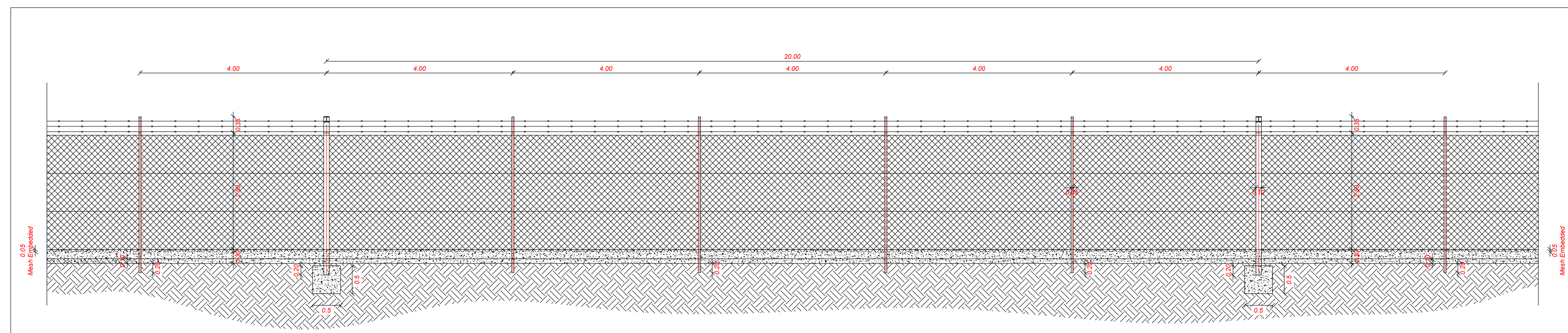








## GATE PLANE



## FENCE DETAILS

**FUNED BY**



**PREPARED BY**



UNITED NATIONS OFFICE FOR PROJECT SERVICE

## PROJECT TITLE

### Solar Energy Units at Al-Muwaijah

**PROJECT LOCATION**  
Almuwaijah - A

**LOCATION**  
Almuwaijah - Alshaer

**DRAWING TITLE**

### Fence Details

CODE

**IUS-AF-UWS-SHA-001**

DESIGNED BY

TFE

**CHECKED BY**

**APPROVED BY**

## STATUS

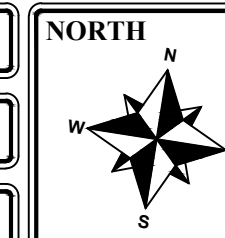
PROJECT NO

**DATE**  
2022 / 12 / 04

DATE  
2022 / 12 / 04

**PAPER SIZE**  
A3

**SCALE**  
**N.T.S**

SCALE  
N.T.S

**DRAWING NO**

**S012**