



## **PROJECT TITLE**

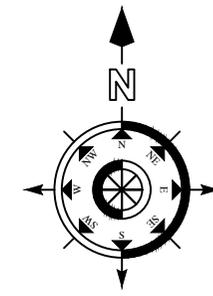
# **SUPPLY AND INSTALL OF HYBRID SOLAR SYSTEM FOR AL-MUWAIJAH WATER WELLS FIELDS**

**AL- SHAER - Hadhramout**

**Funded by: World Bank through UNOPS**

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

**AUGUST , 2022**



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

**PROJECT NO.**  
IUS-AF-UWS-SHA-001

**PREPARED BY**  
UNOPS  
UNITED NATIONS OFFICE FOR PROJECT SERVICES

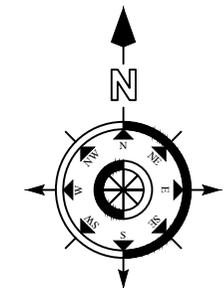
**FUNDED BY**  
WORLD BANK GROUP  
WORLD BANK GROUP

**M-1 GENERAL PV LAYOUT**

**Legend :**

Designed	ENG / AWADH BIN DAHMAN	Scale	A3
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



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	

PROJECT NO. IUS-AF-UWS-SHA-001

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**M-2** GENERAL PV LAYOUT

UNOPS UNITED NATIONS OFFICE FOR PROJECT SERVICES

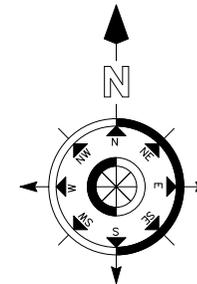
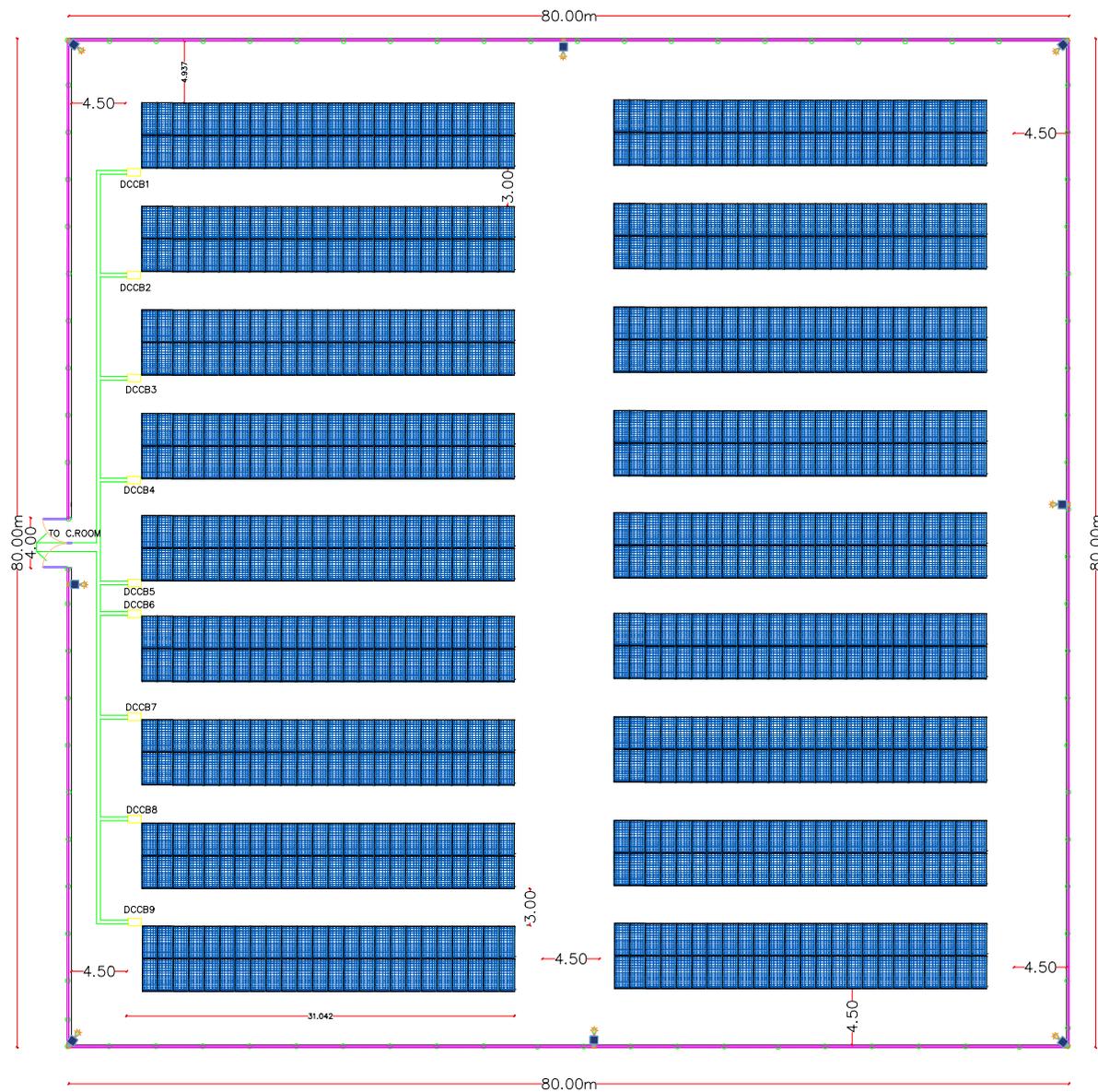
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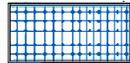
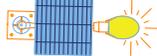
Designed	ENG / AWADH BIN DAHMAN	Scale	A3
Approved	ENG / AHMED BAFADHEL	Rev	date
		Rev 01	1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD		
Checked			

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

AL- SHAER CITY-YEMEN



**FIELD ID**

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

PROJECT NO.

IUS-AF-UWS-SHA-001

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**GENERAL PV LAYOUT**

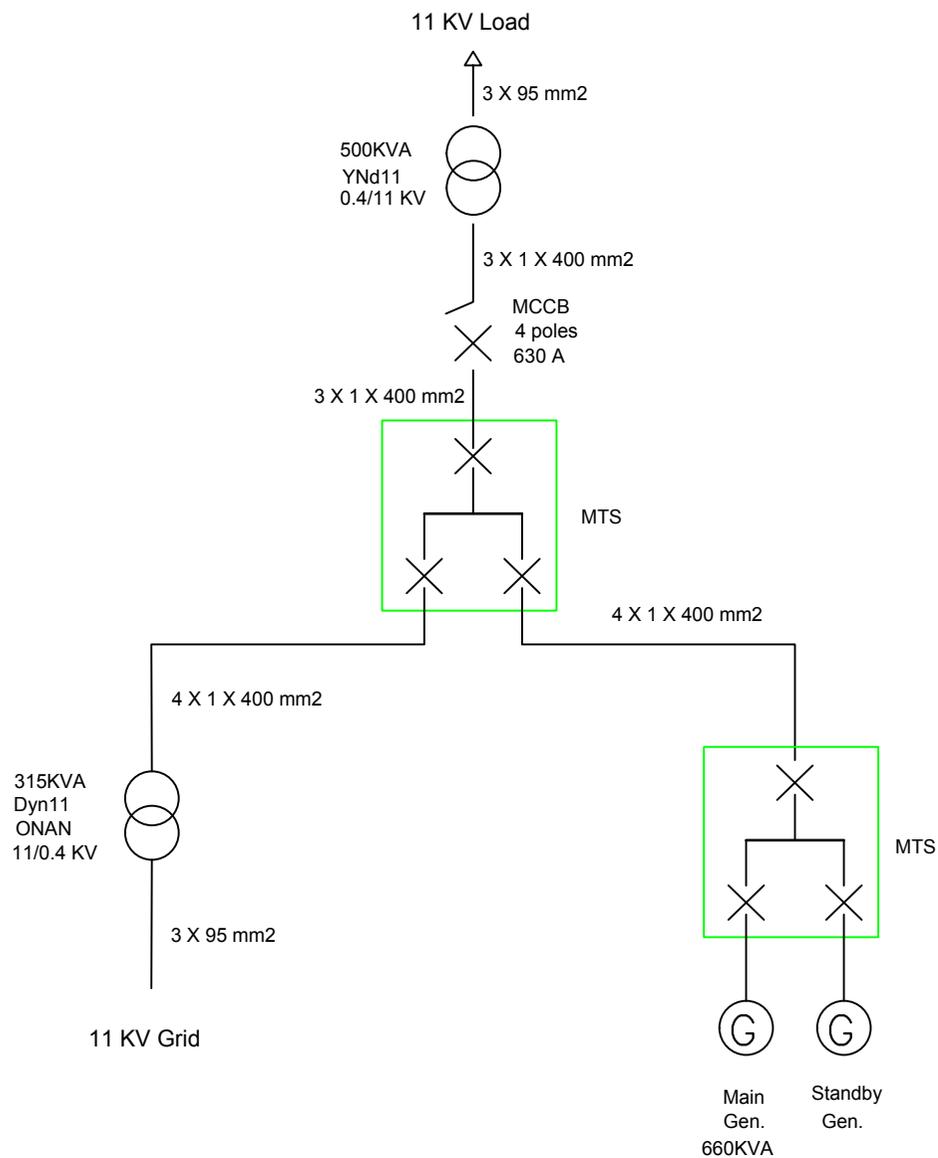
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Approved	ENG / AHMED BAFADHEL	Rev	date
		Rev 01	1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD		
Checked			

**PROJECT**

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

AL- SHAER CITY-YEMEN



**M-4 EXISTING GENERAL SINGLE LINE DIAGRAM**

PROJECT NO.

IUS-AF-UWS-SHA-001

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**Legend :**

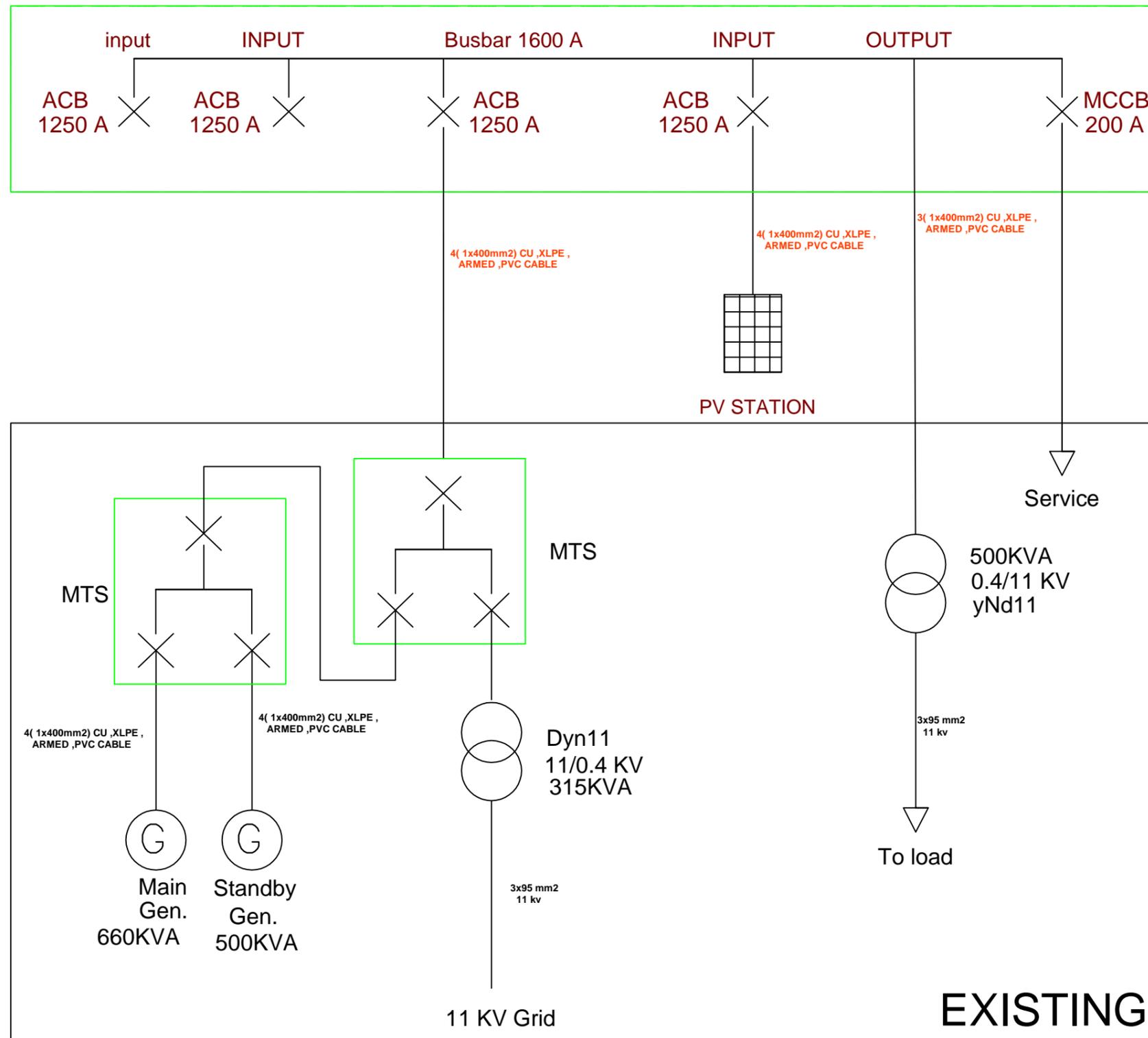
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Approved	ENG / AHMED BAFADHEL	Rev	date
		Rev 01	1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD		
Checked			

**PROJECT**

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

AL- SHAER CITY-YEMEN

# Main L.V Switch board 1600 A busbar



PROJECT NO.

IUS-AF-UWS-SHA-001

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**M-5**

## PROPOSED GENERAL SINGLE LINE DIAGRAM



Legend :

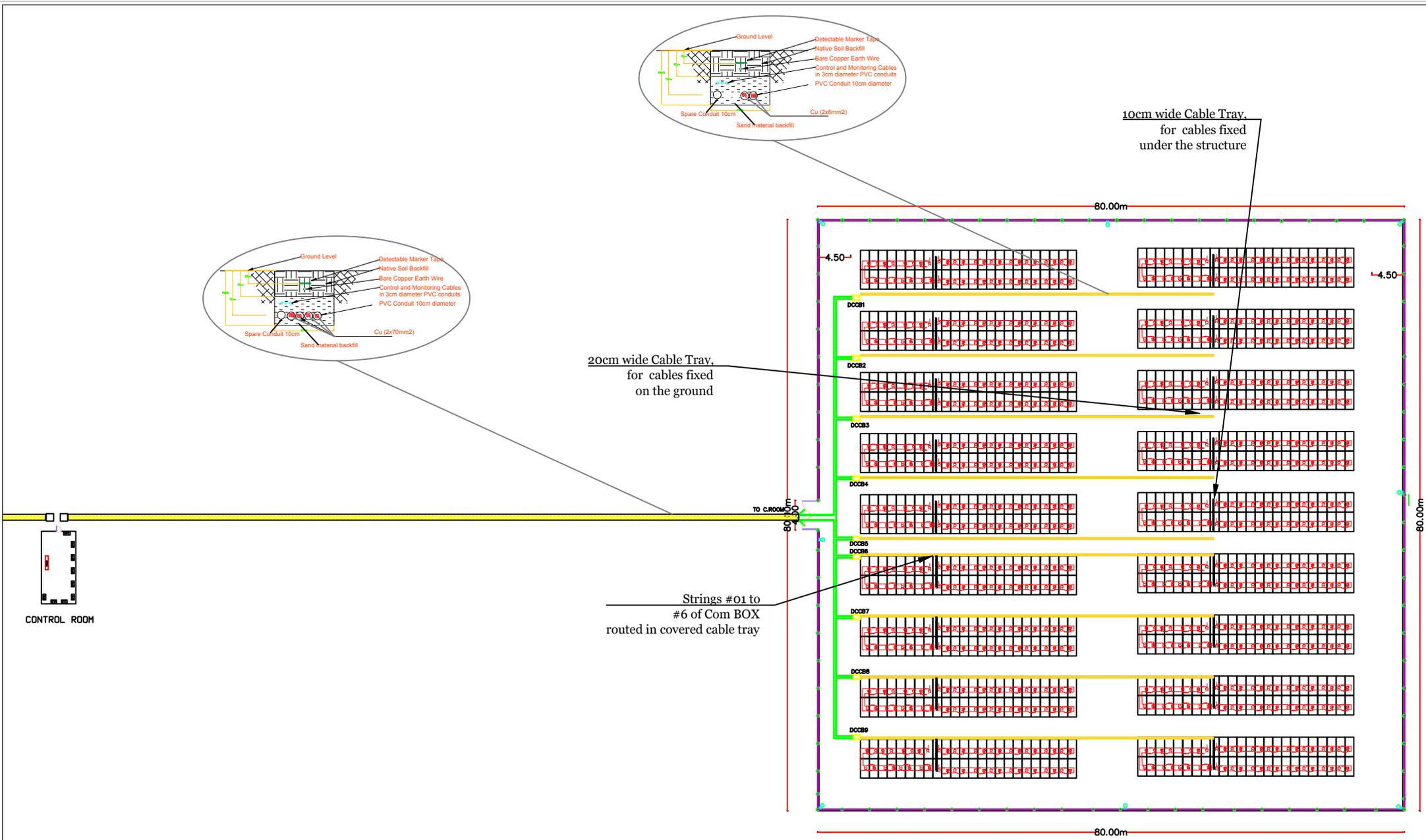
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Approved	ENG / AHMED BAFADHEL	Rev	date
		Rev 01	1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD		
Checked			

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-7 DC CABLE LAYOUT**

**Legend :**

Designed	ENG / AWADH BIN DAHMAN	Scale	A3
Approved	ENG / AHMED BAFADHEL	Rev	date
		Rev 01	1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD	Drawing No.	
Checked			

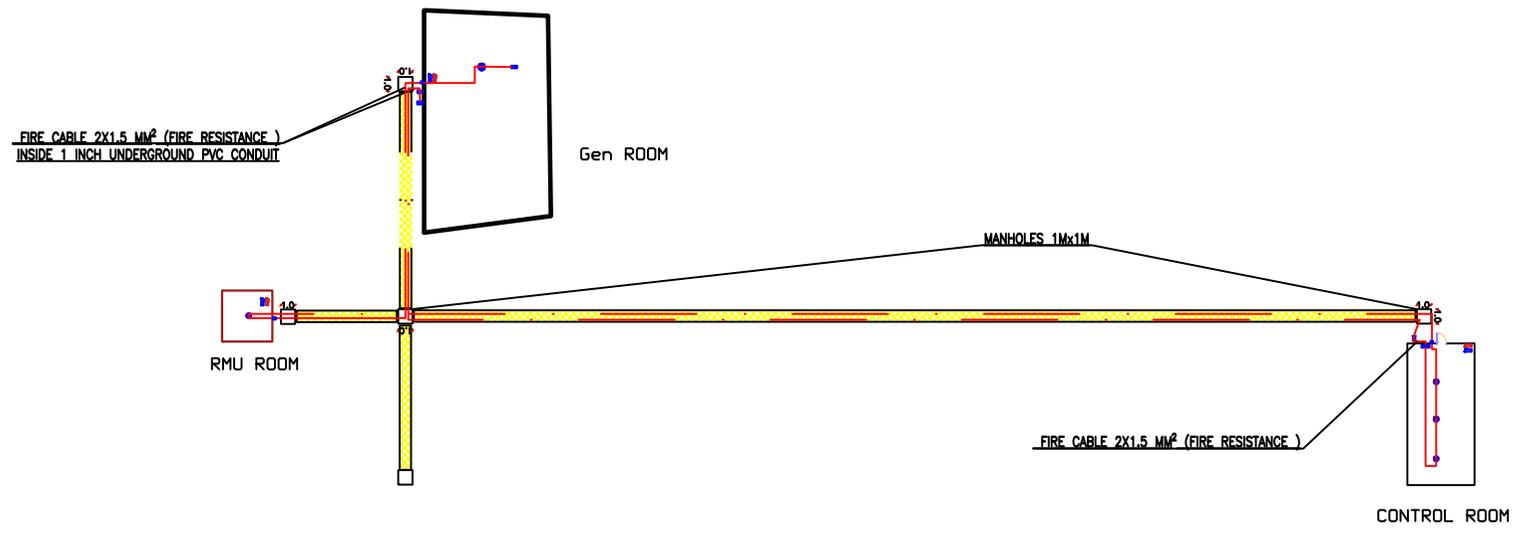
**PROJECT**

**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



PROJECT NO.

IUS-AF-UWS-SHA-001

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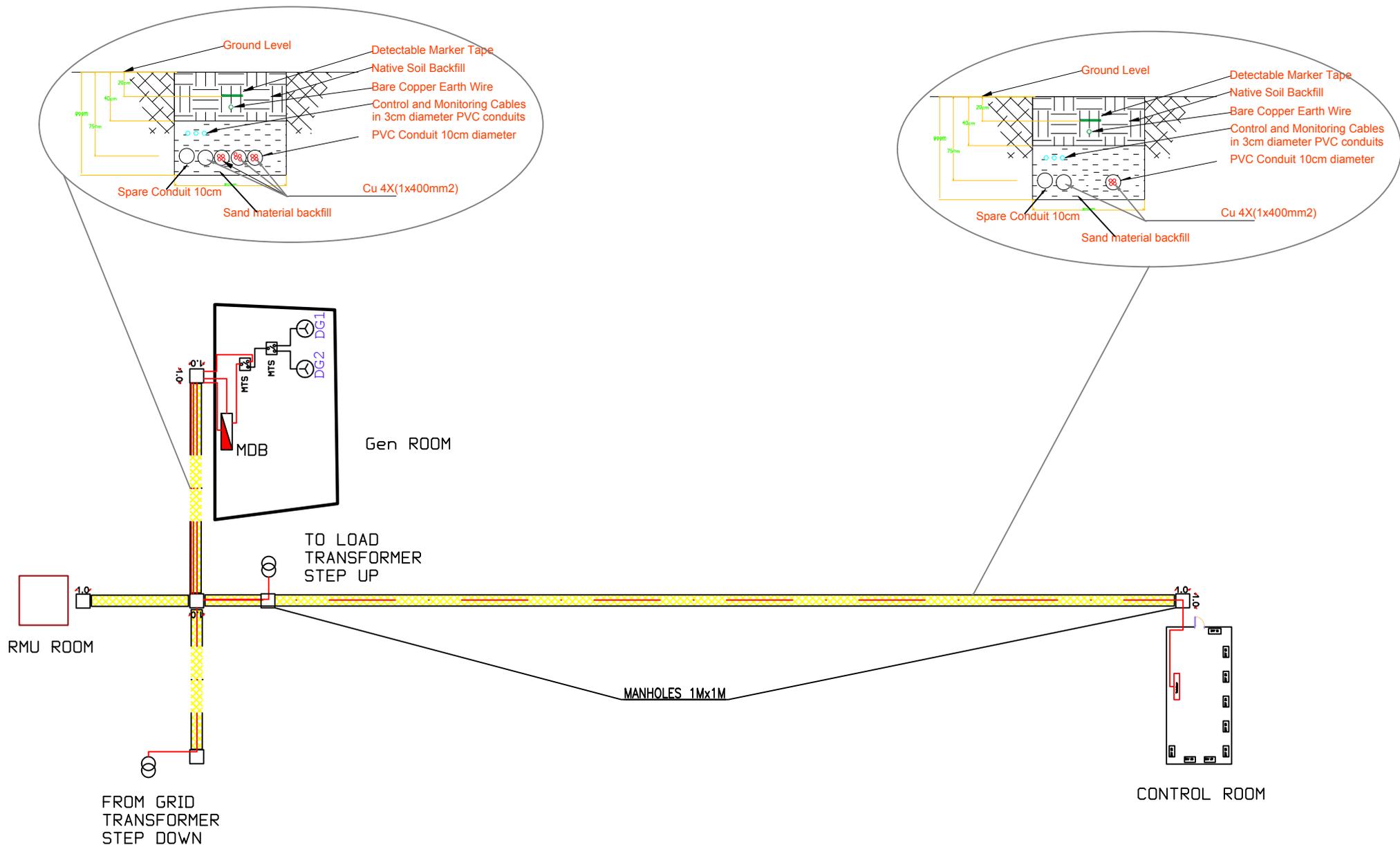
## M-8 FIRE ALARM SYSTEM LAYOUT

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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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IUS-AF-UWS-SHA-001

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**M-9**

**AC CABLE LAYOUR**

**Legend :**

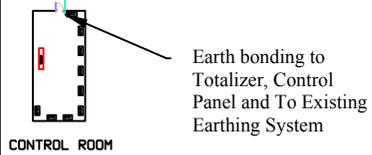
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		Rev 01	1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD		
Checked			

**PROJECT**

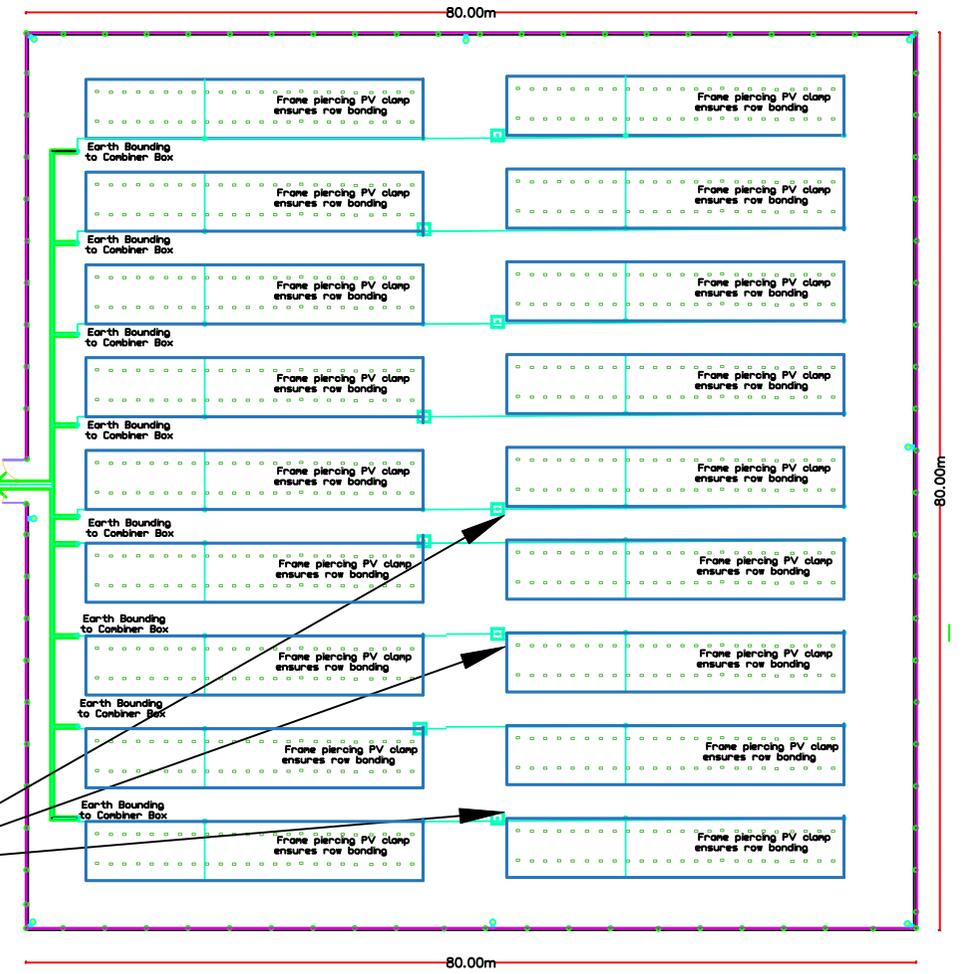
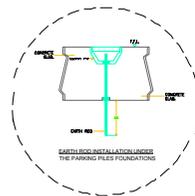
**Supply, Installation and Operation of Solar PV Energy Units Al-Muwaijah Field**

AL- SHAER CITY-YEMEN

Earthing Cable Routed in Trench



TO C ROOM



**M-10 EARTHING LAYOUT**

PROJECT NO.  
IUS-AF-UWS-SHA-001

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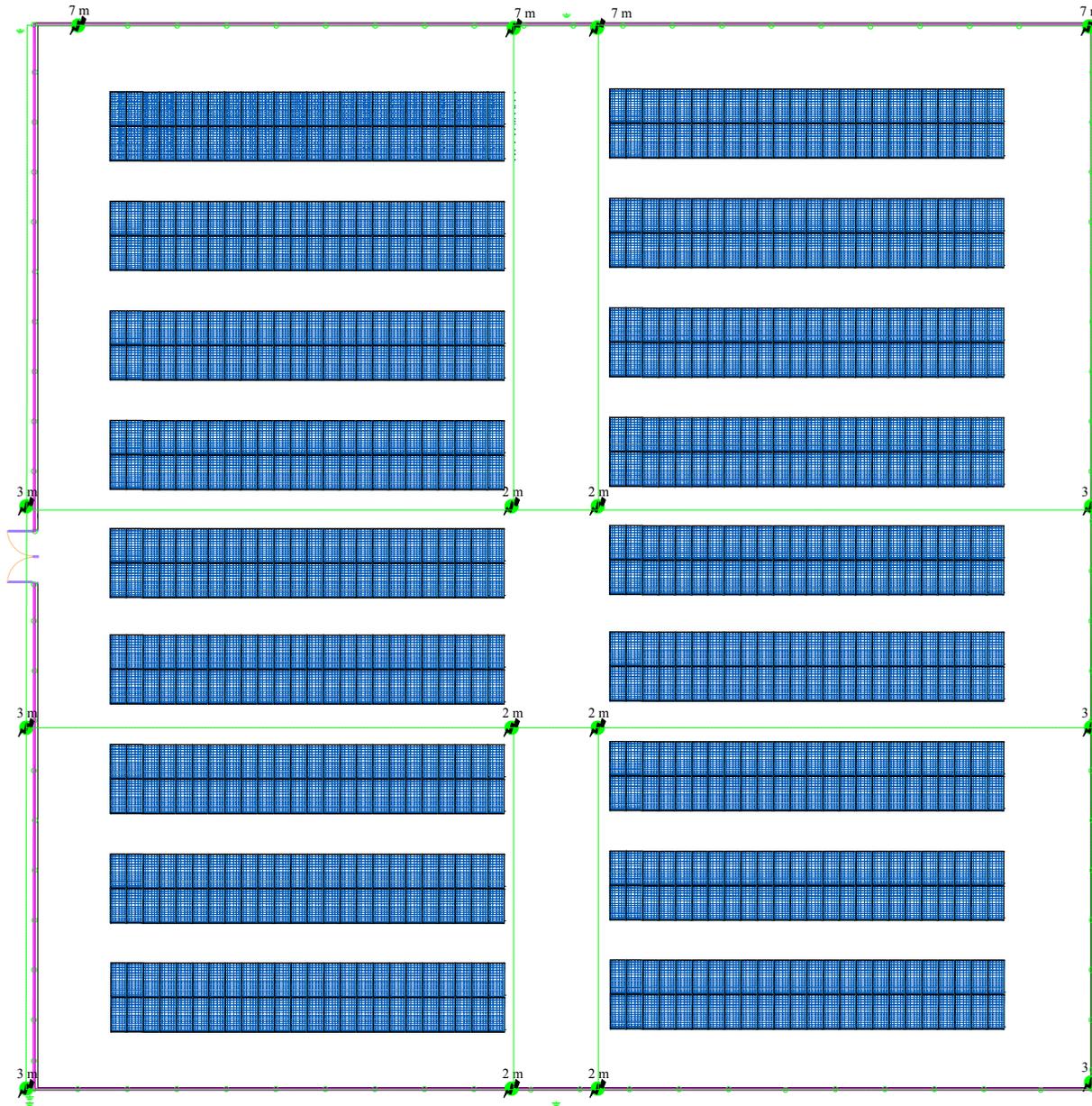
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**Legend :**

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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



**Notes :**

- 1- The bidder has to foresee all required additional components based on selected equipment.
- 2-Alternative solution is allowed .

**Symbols :**

	Solar Panel
	Air Termination Rod
	10 mm² Copper Bare Conductor
	10 mm² Copper Bare Conductor

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**M-11 PROPOSED LIGHTNING PROTECTION SYSTEM**

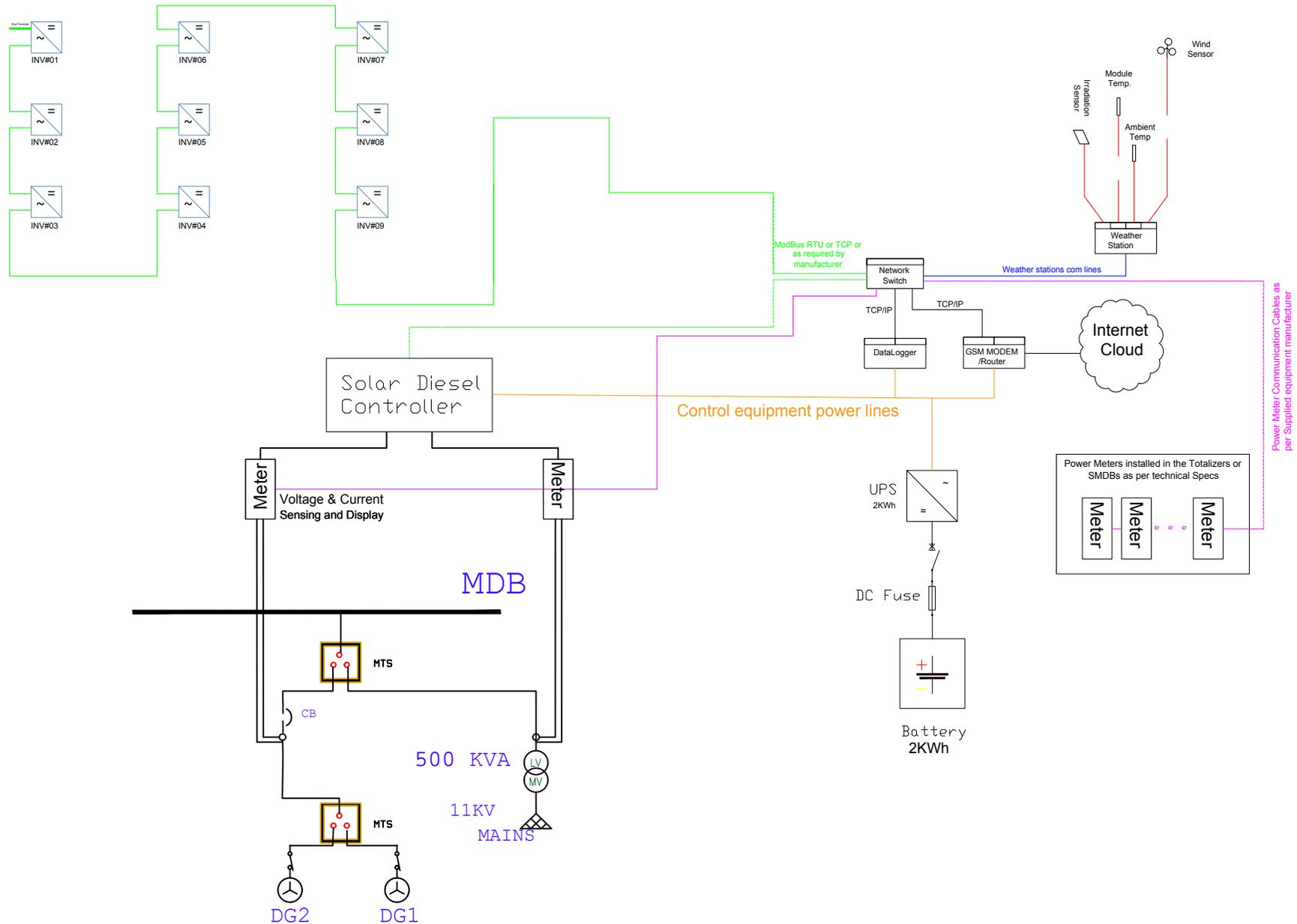
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Approved	ENG / AHMED BAFADHEL	Rev	date
		Rev 01	1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD		
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**PROJECT**

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

AL- SHAER CITY-YEMEN



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**M-12 PV SYSTEM CONTROL**

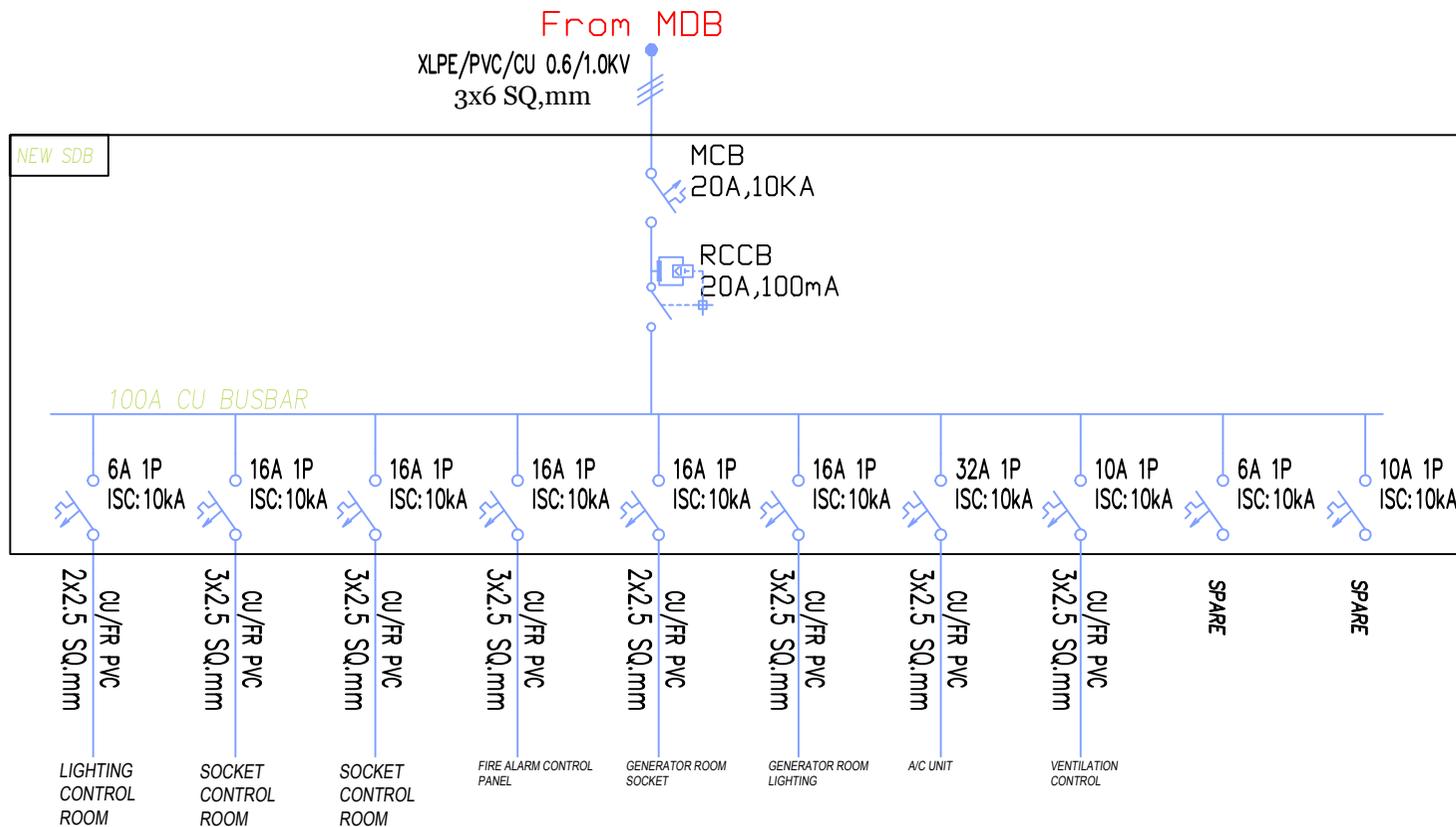
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Drawing	HAMMAM BA-MASSOOD		
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**PROJECT**

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

AL- SHAER CITY-YEMEN



**M-13 SDB CONTROL ROOM**

PROJECT NO.  
IUS-AF-UWS-SHA-001



**Legend :**

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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

PROJECT NO.

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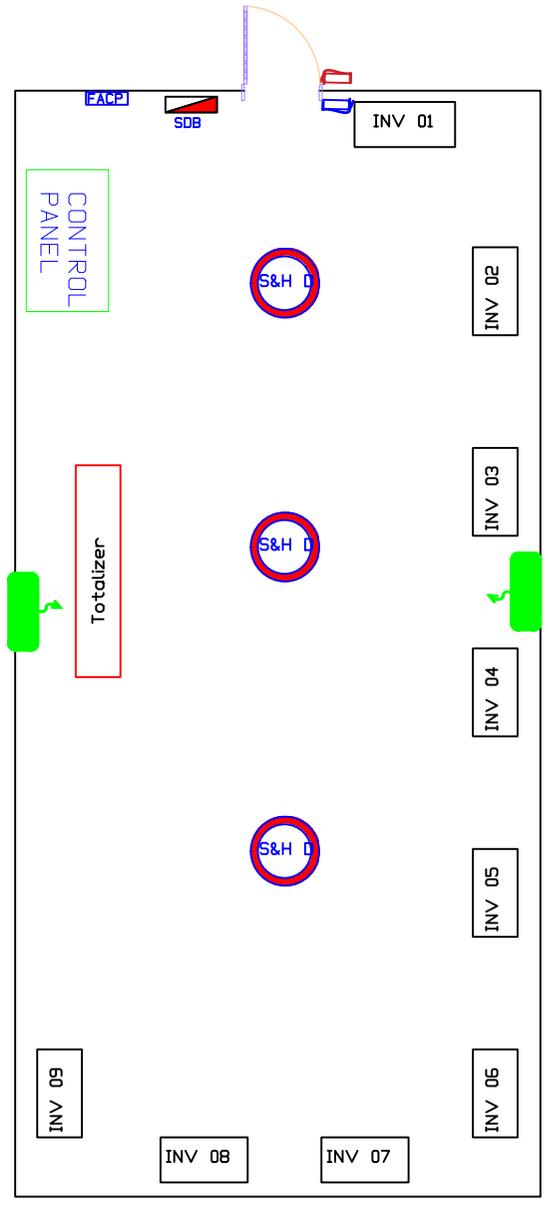


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M-14

# CONTROL ROOM



LEGEND	
	Fire Extinguisher
	Air conditioner
	Smoke and Heat alarm
	INVERTER

Legend :

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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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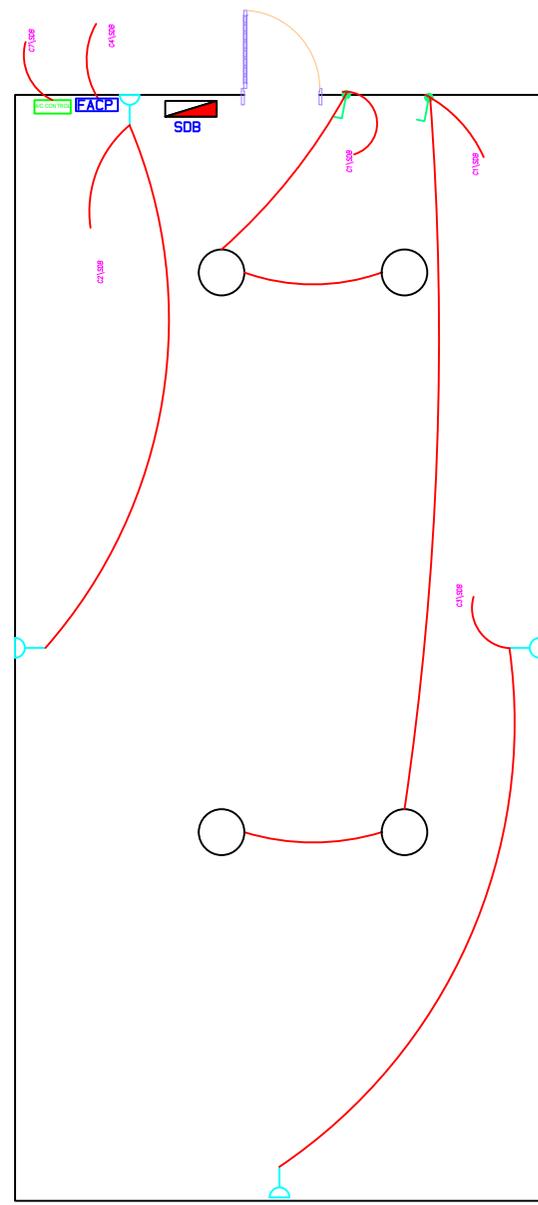


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**M-15 SLD NEW CONTROL ROOM**



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

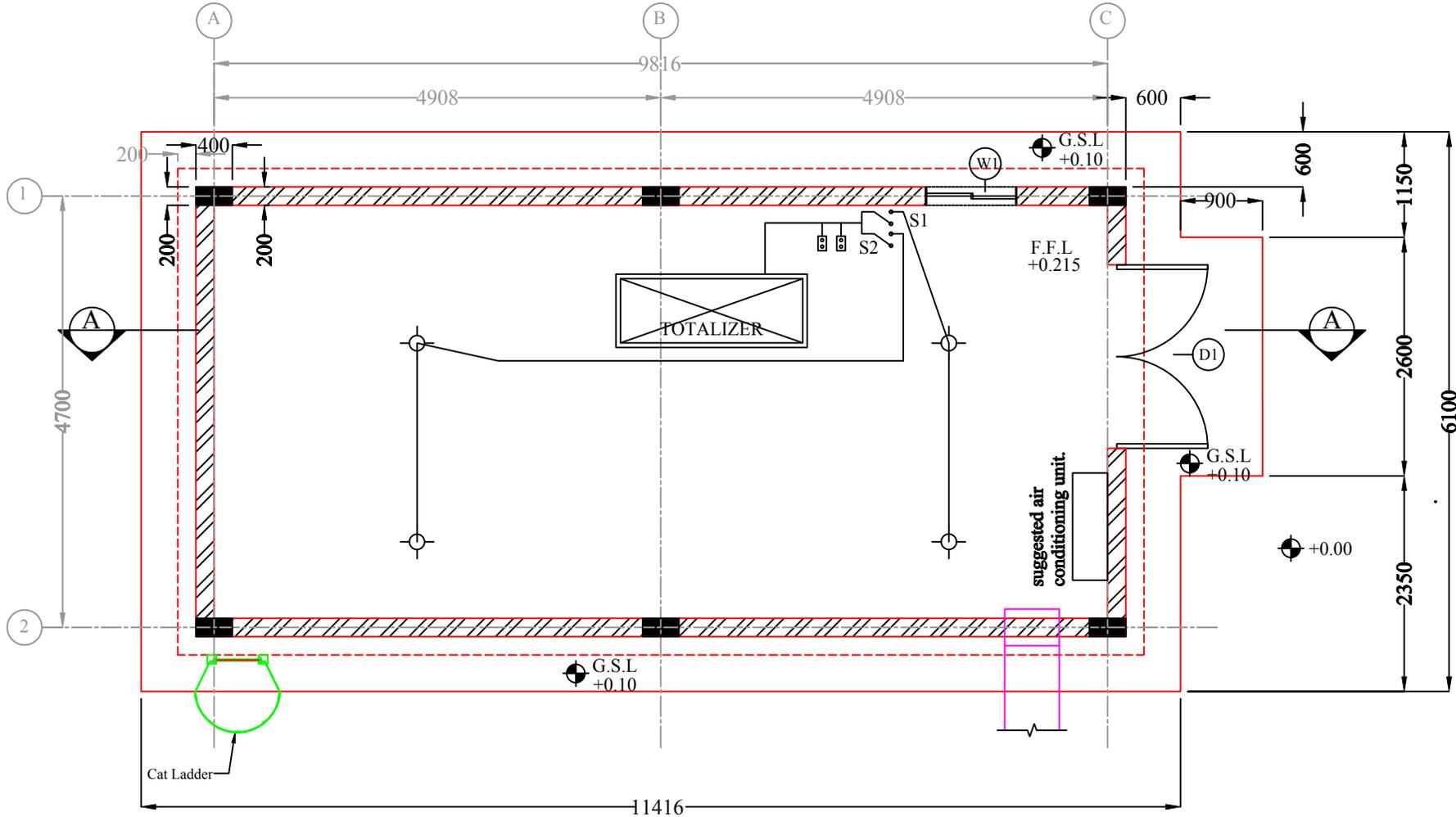
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Approved	ENG / AHMED BAFADHEL	Rev	date
		Rev 01	1 / 11 / 2022
Drawing	HAMMAM BA-MASSOOD		
Checked			

**PROJECT**

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

AL- SHAER CITY-YEMEN



**General Notes**

- 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

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

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IUS-AF-UWS-SHA-001

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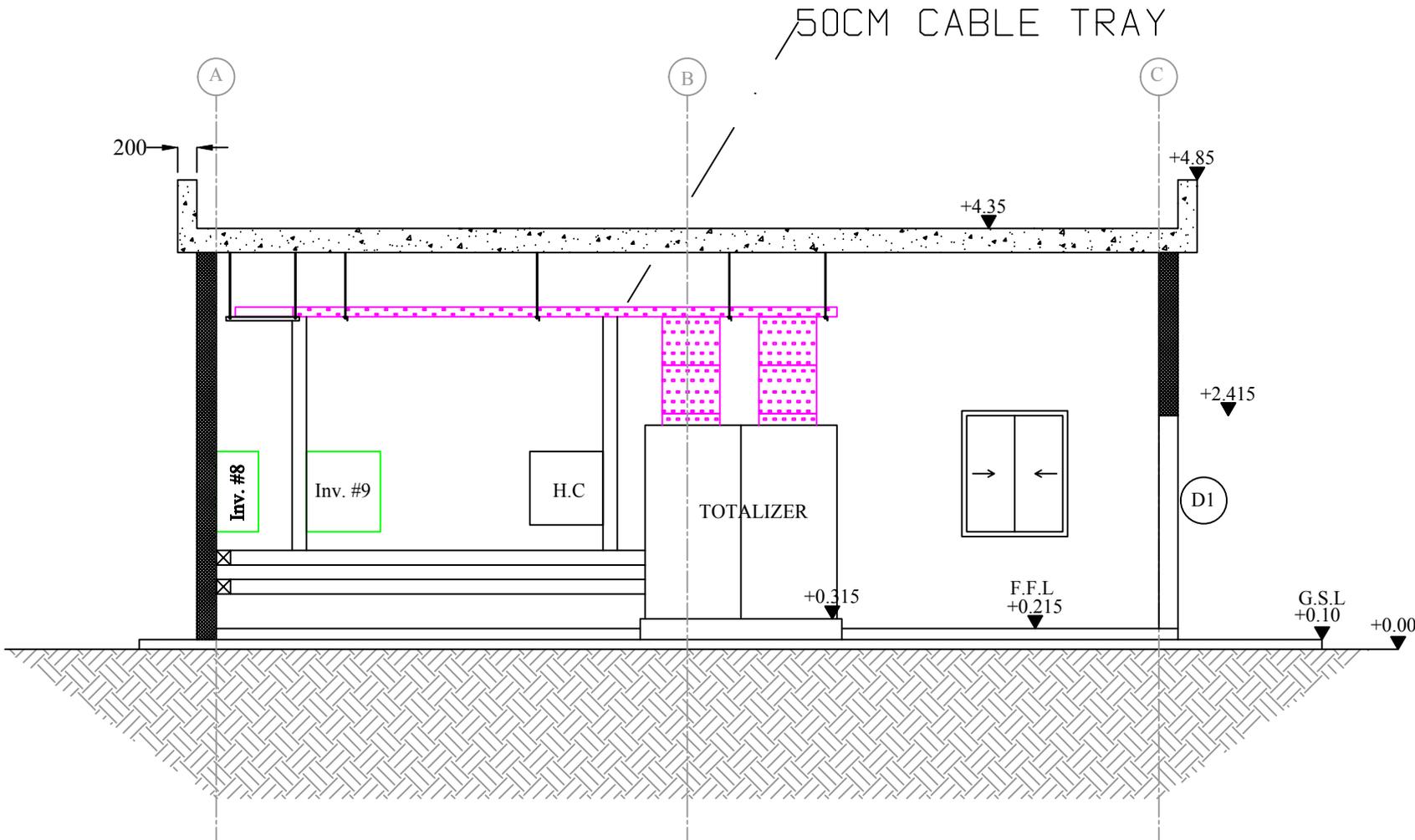
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**Legend :**

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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
- All dimensions are in (mm).
  - Levels are in (m).
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  - All Stirrups should have minimum yield strength of 270 MPa.

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

Symbols

	Light
	Switch
	Plug

**PROJECT NO.** IUS-AF-UWS-SHA-001

**PREPARED BY** UNOPS UNITED NATIONS OFFICE FOR PROJECT SERVICES

**FUNDED BY** WORLD BANK GROUP

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

**Legend :**

Designed	ENG / AWADH BIN DAHMAN	Scale	A3
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



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

**Funded by: World Bank through UNOPS**  
**Bid No.: IUS-AF-UWS-SHA-001**

**December , 2022**

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

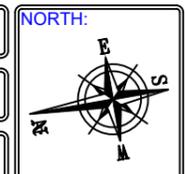
FUNED BY:  
**THE WORLD BANK**  
WORLD BANK GROUP.

PROJECT TITLE:  
**YEMEN INTEGRATED URBAN  
EMERGENCY SERVICES II AF**  
PROJECT LOCATION:  
**YEMEN**

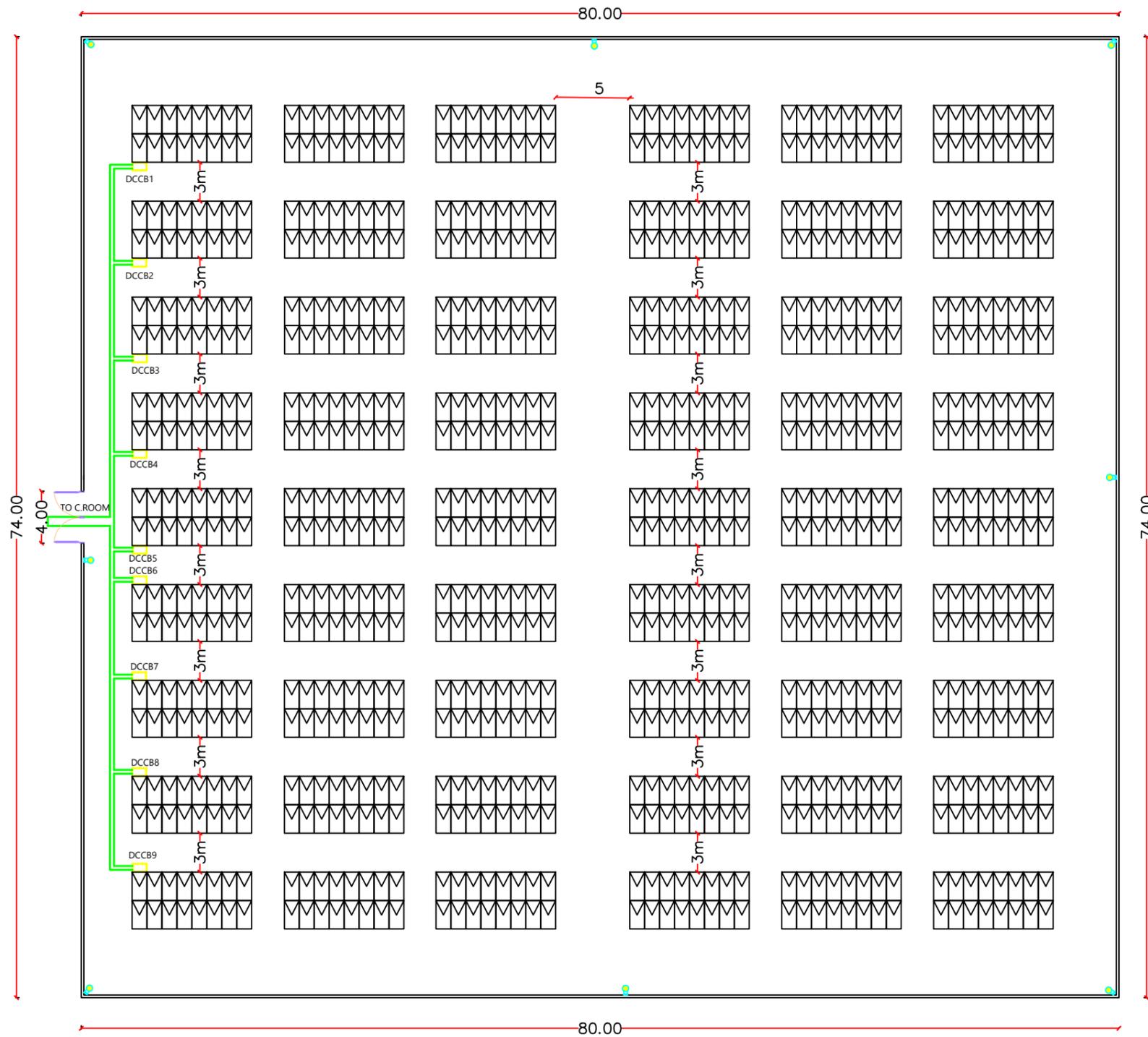
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**DRAWING TYPE:  
STRUCTURAL PLANS.**

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

STATUS:  
**TENDER DOCUMENTS.**  
PROJECT NO:  
DATE:  
FEB,12,2022  
PAPER SIZE:  
A3.  
SCALE:  
AS SHOWN.



DRAWING NO:  
**S-01**



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 WORLD BANK GROUP.

PROJECT TITLE:  
**YEMEN INTEGRATED URBAN  
 EMERGENCY SERVICES II AF**

PROJECT LOCATION:  
**YEMEN**

DRAWING TITLE:  
**GENERAL LAYOUT**

DRAWING TYPE:  
**STRUCTURAL PLANS.**

DESIGN BY:

CHECKED BY:

APPROVED BY:  
**UNOPS DESIGN REVIEW.**

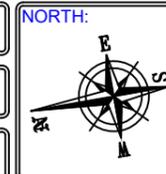
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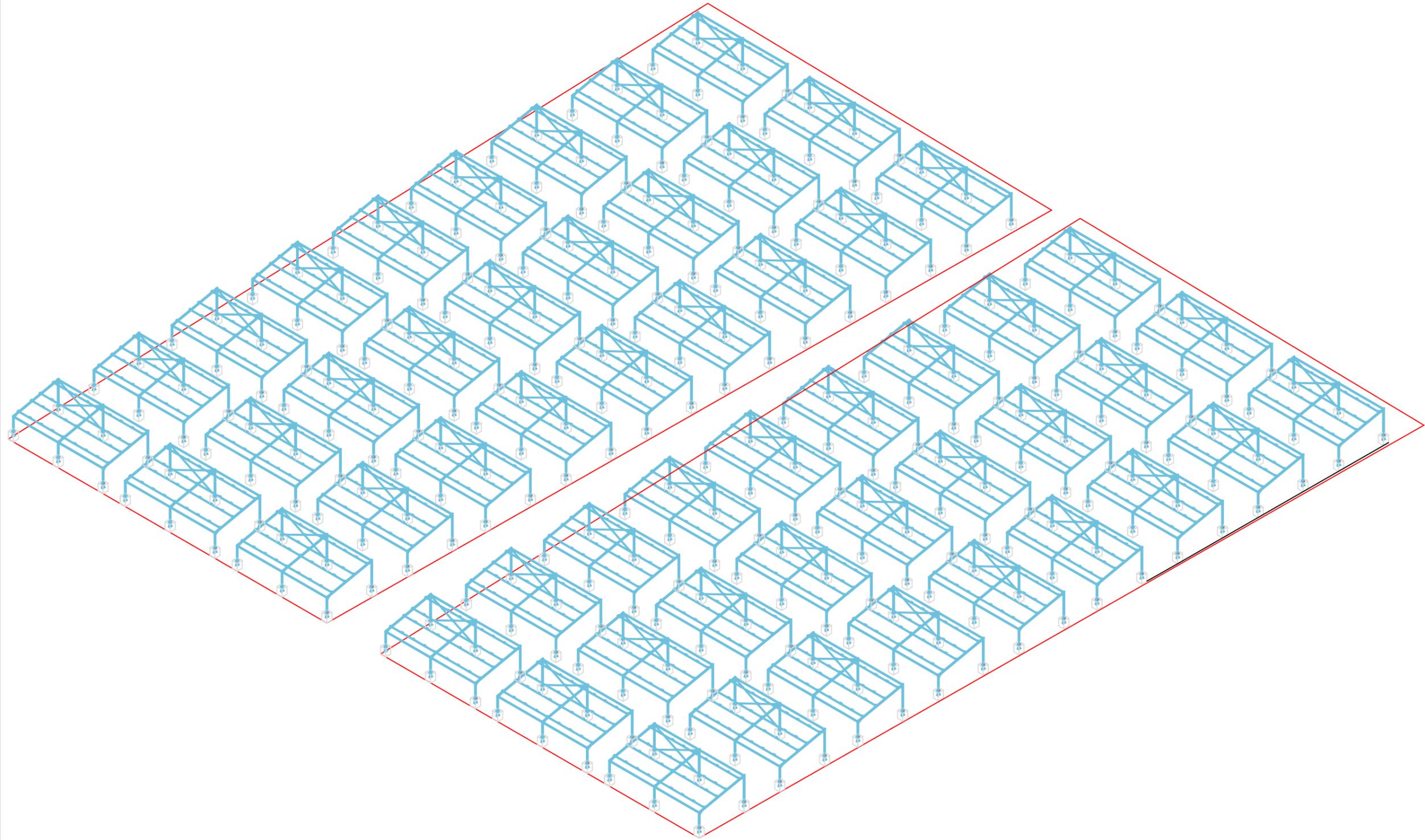
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 FEB, 12, 2022

PAPER SIZE:  
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SCALE:  
 AS SHOWN.



DRAWING NO:  
**S-01**



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PROJECT TITLE

Solar Energy Units at Al-Muwaijah

PROJECT LOCATION

Almuwajjah - 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

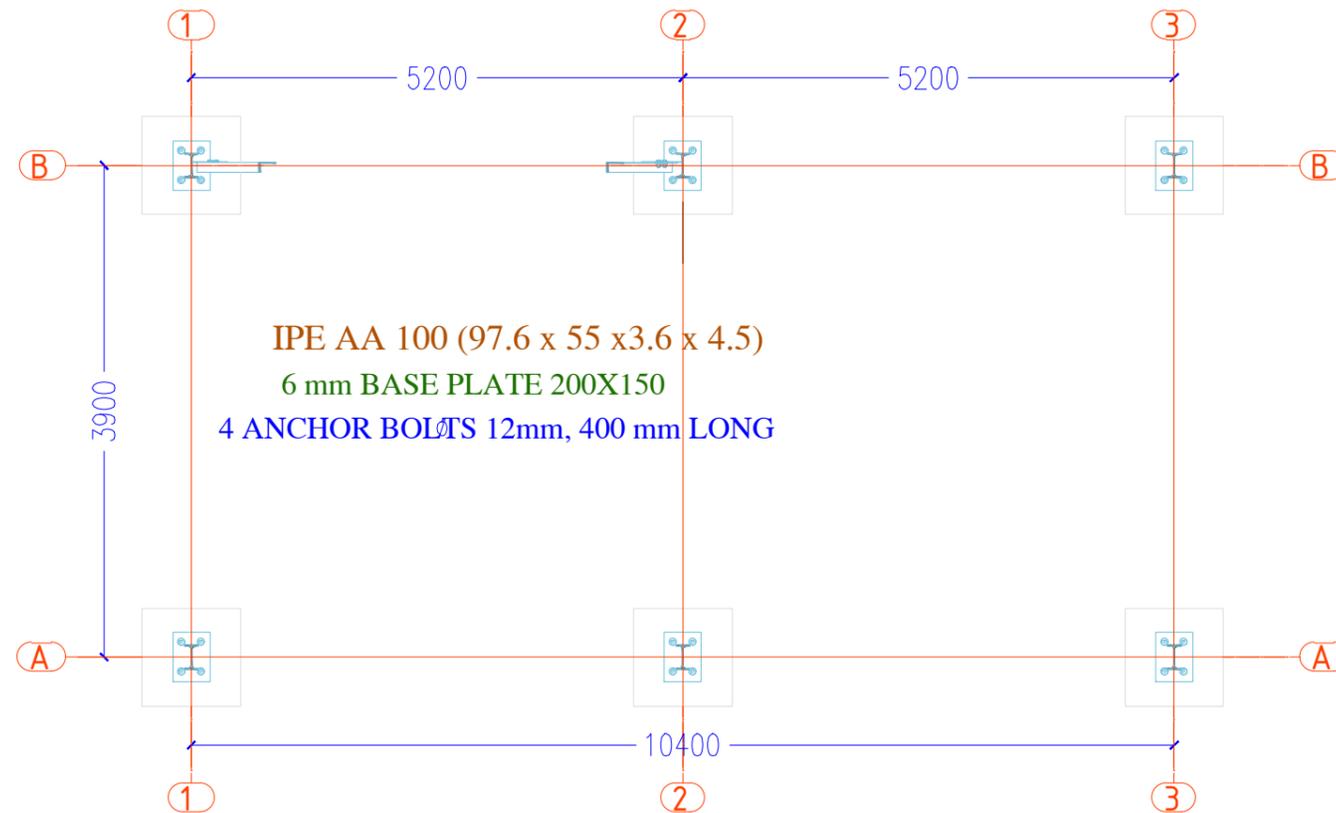
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NORTH

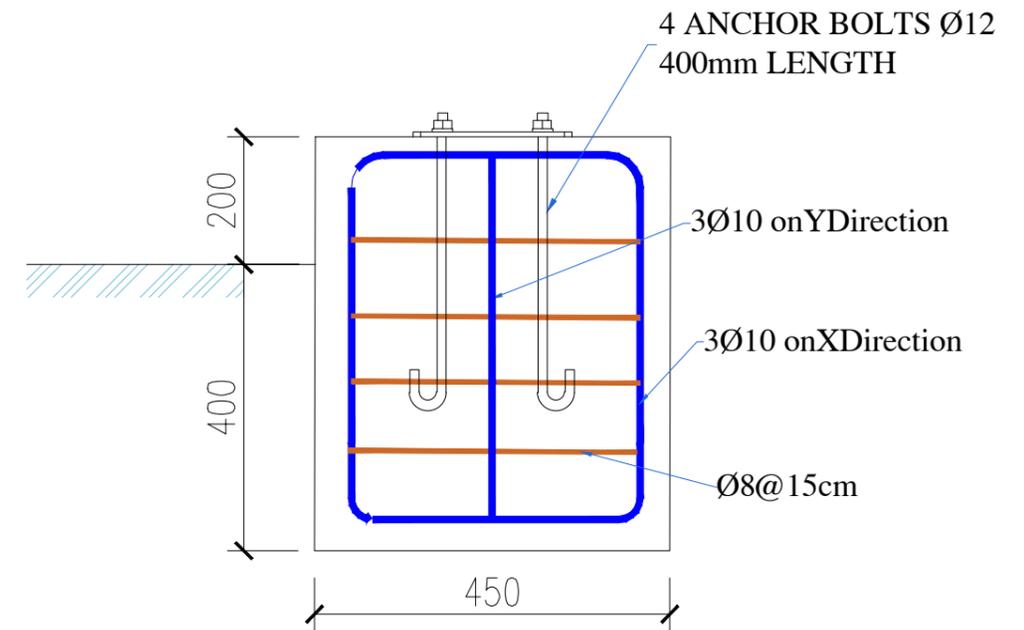


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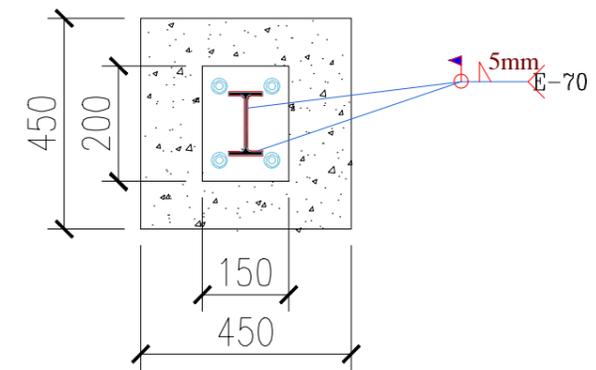
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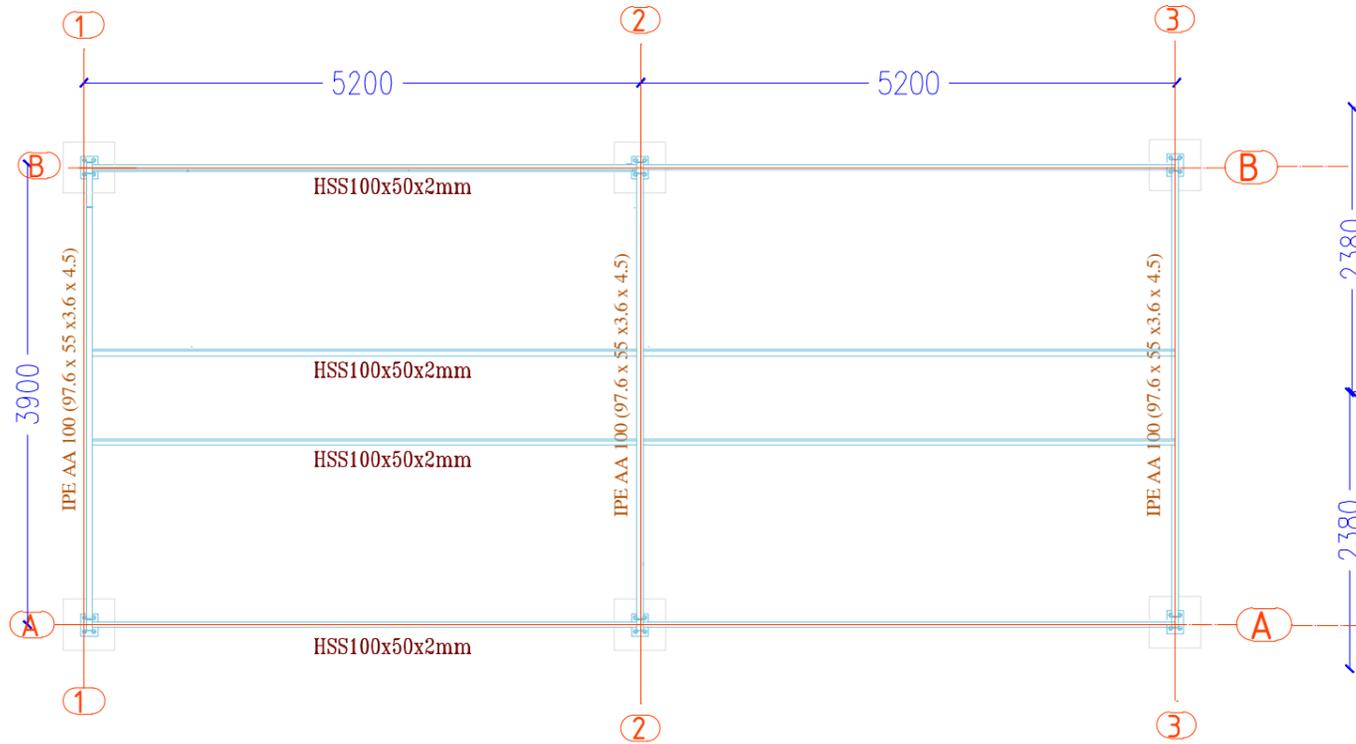
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STRUCTURE DETAILS



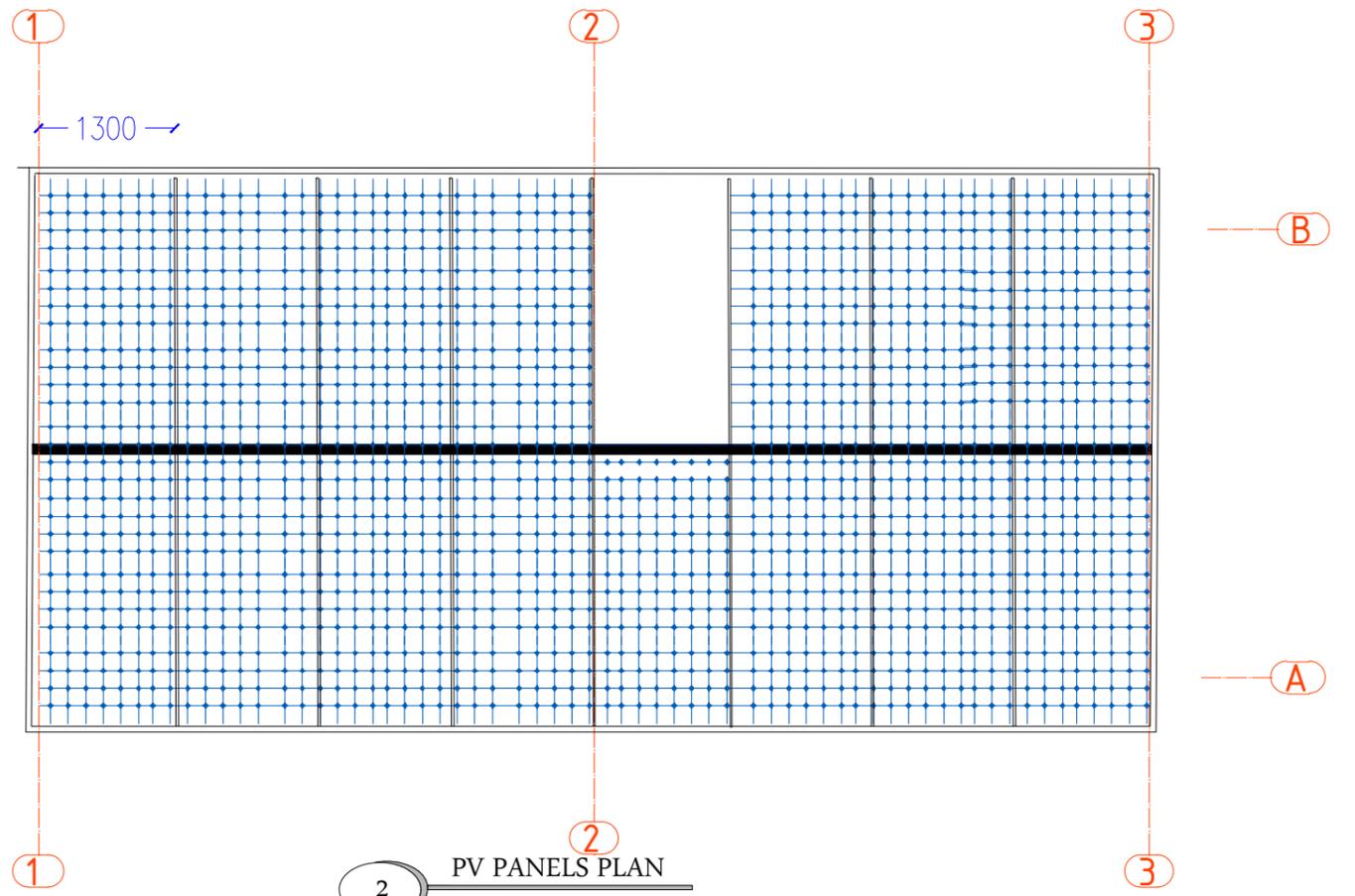
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STRUCTURE DETAILS



3 BASE PLATE - DETAIL A  
STRUCTURE DETAILS



1 FULL FRAMING PLAN  
STRUCTURE DETAILS



2 PV PANELS PLAN  
STRUCTURE DETAILS

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SANA'A - YEMEN.

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PROJECT TITLE:  
YEMEN INTEGRATED URBAN  
EMERGENCY SERVICES II AF

PROJECT LOCATION:  
YEMEN

DRAWING TITLE:  
PANELS

DRAWING TYPE:  
STRUCTURAL PLANS.

DESIGN BY:

CHECKED BY:

APPROVED BY:  
UNOPS DESIGN REVIEW.

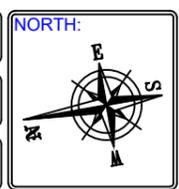
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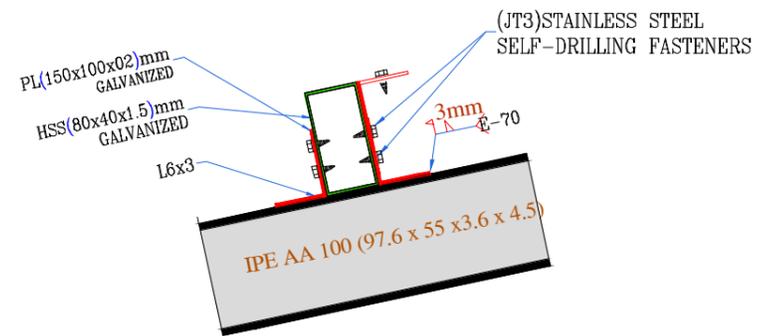
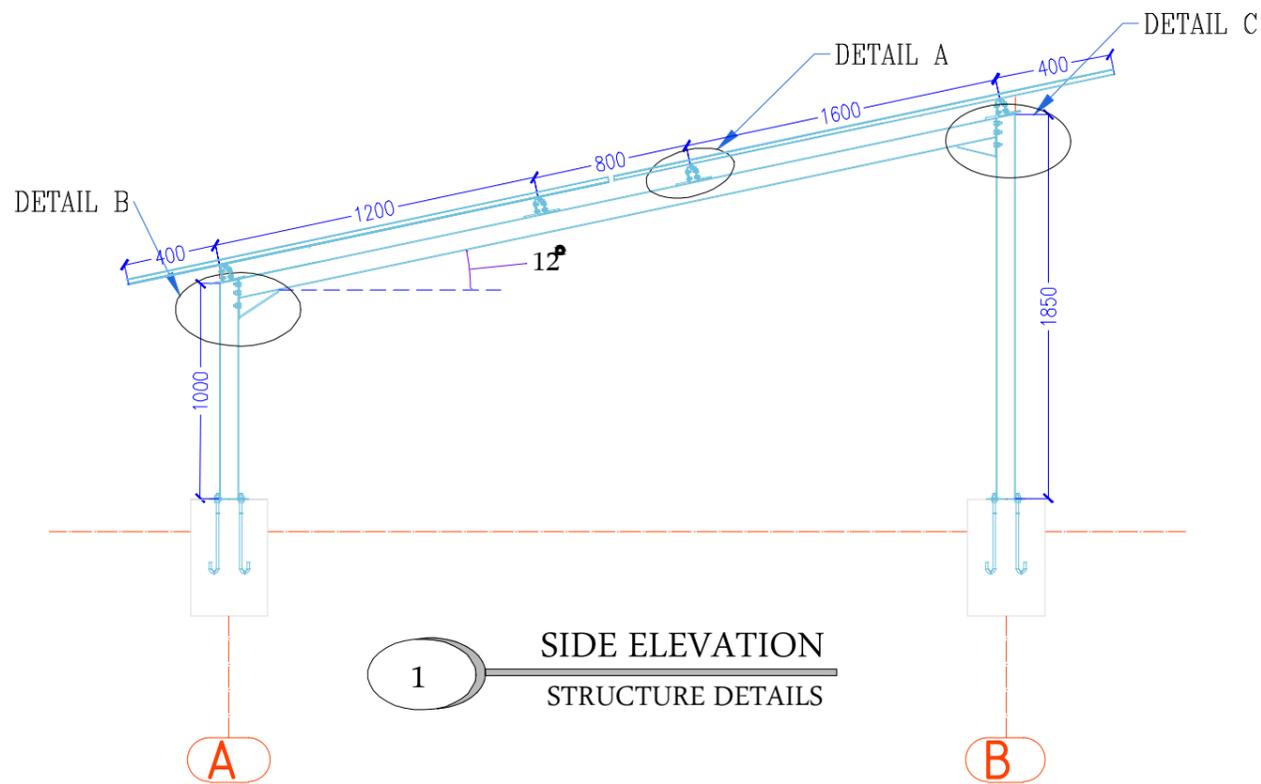
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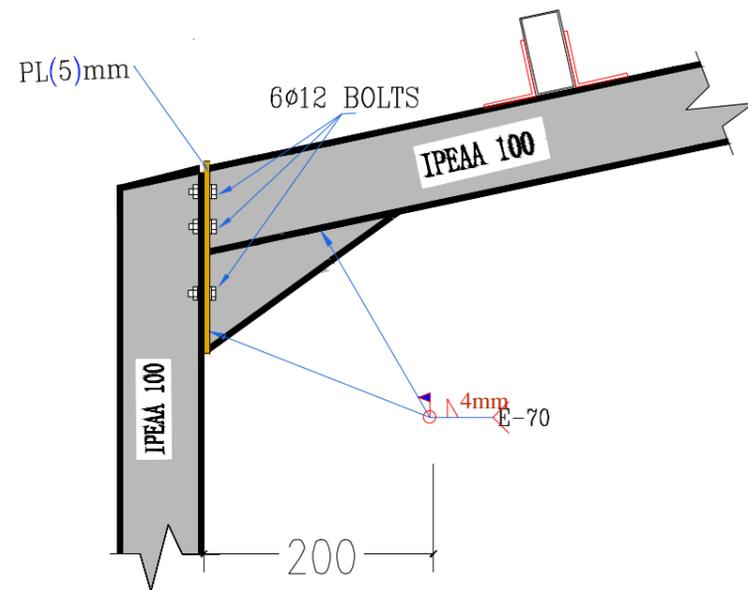
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SCALE:  
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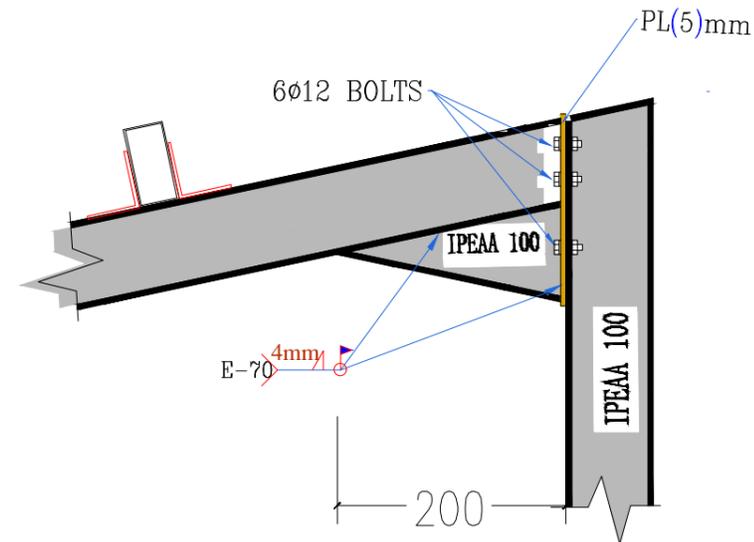


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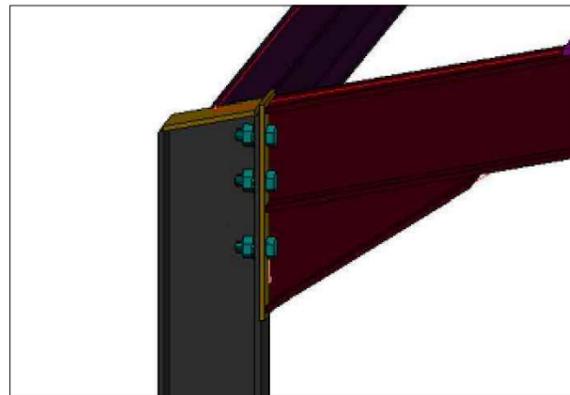




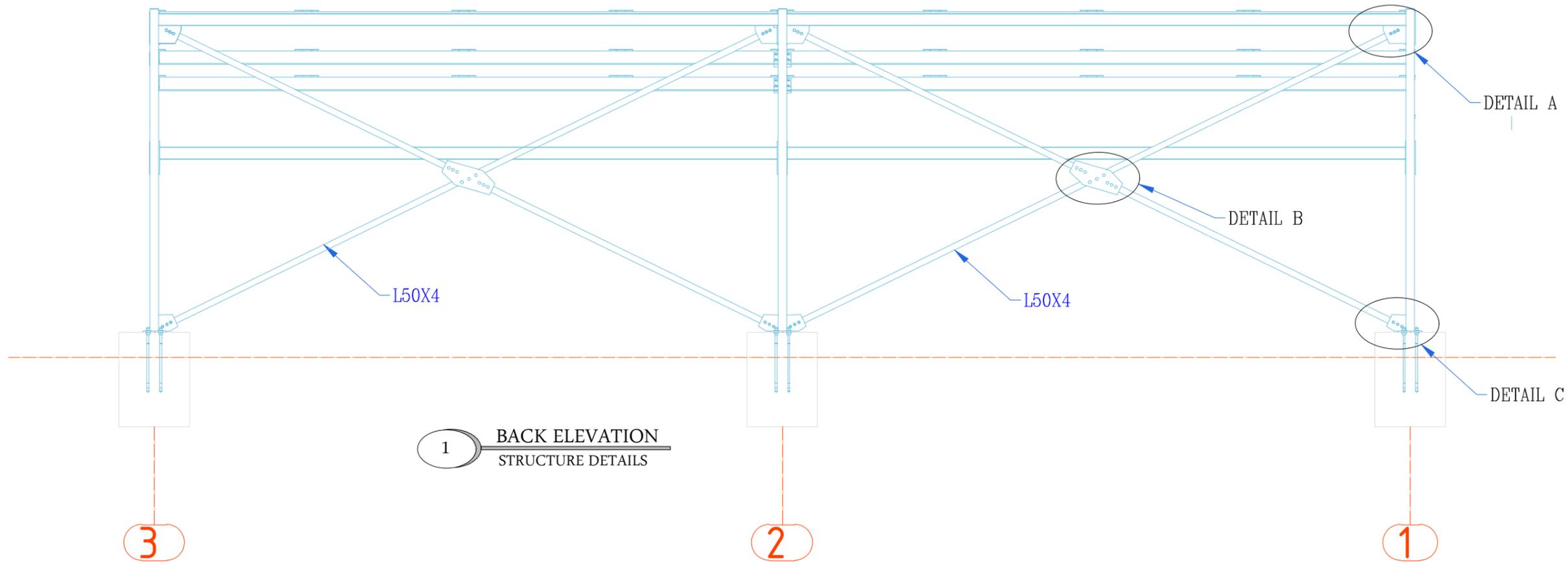
1 JOINT - DETAIL B  
STRUCTURE DETAILS



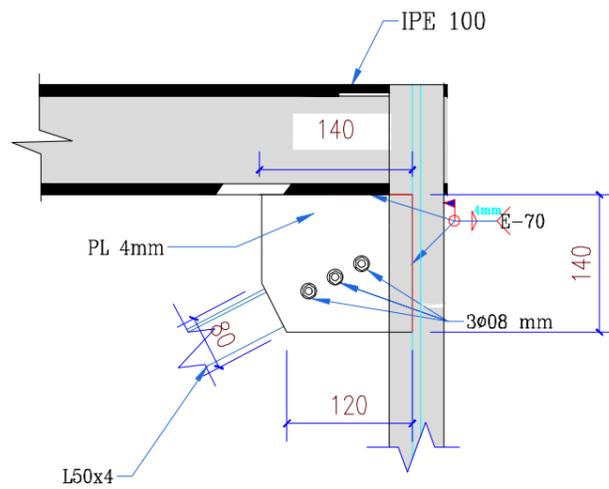
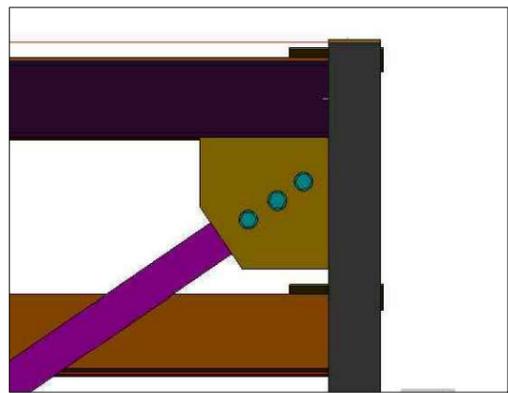
2 JOINT - DETAIL C  
STRUCTURE DETAILS



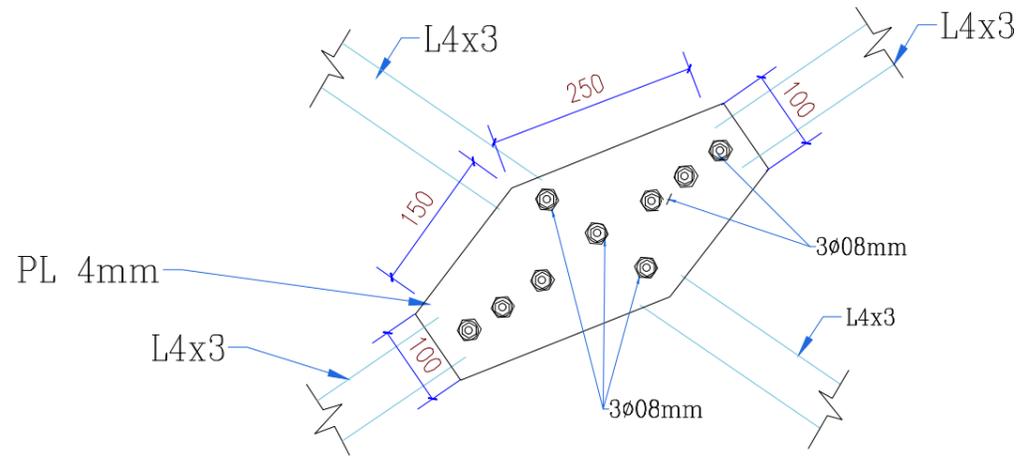
1-A JOINT - DETAIL B (3D) VIEW  
STRUCTURE DETAILS



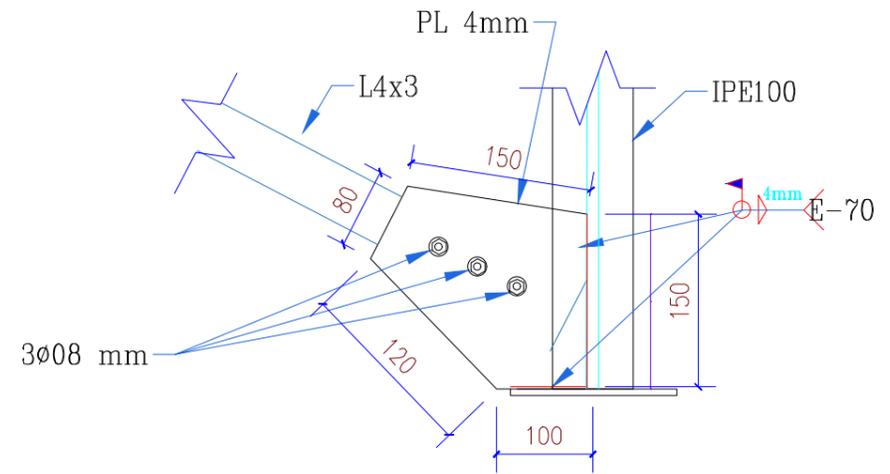
1 BACK ELEVATION  
STRUCTURE DETAILS



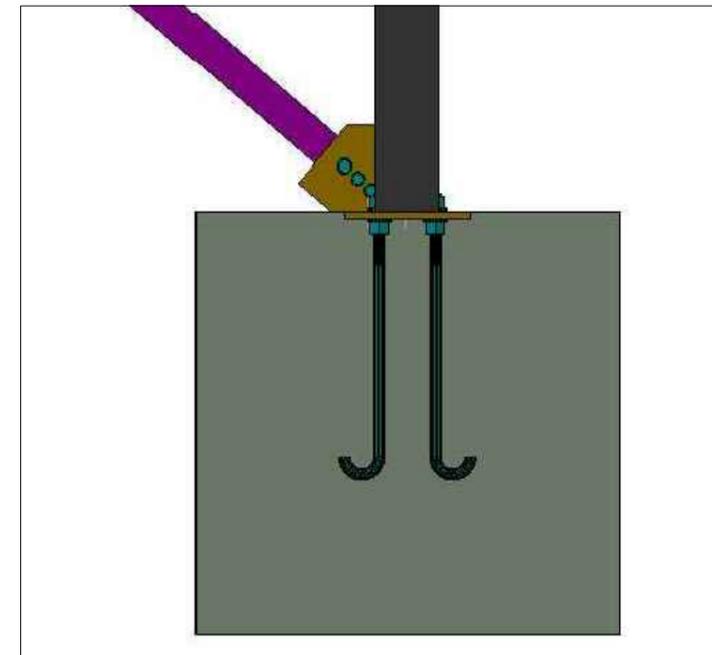
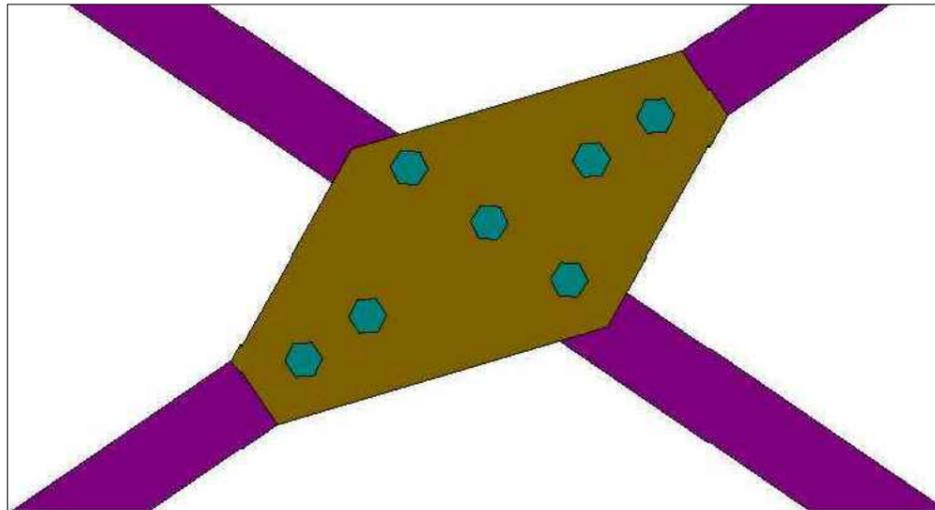
2 JOINT - DETAIL A  
STRUCTURE DETAILS

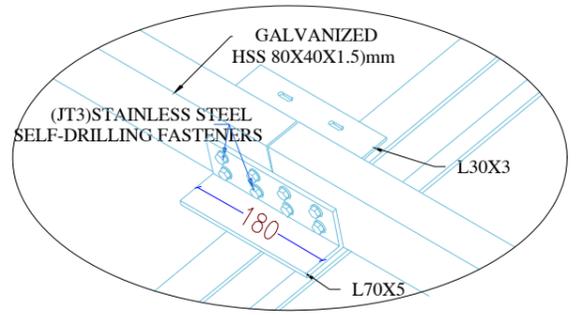
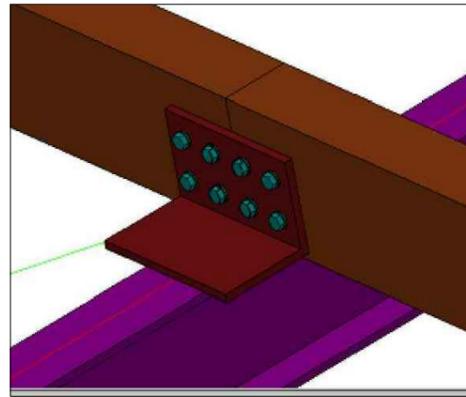


1 JOINT - DETAIL B  
STRUCTURE DETAILS



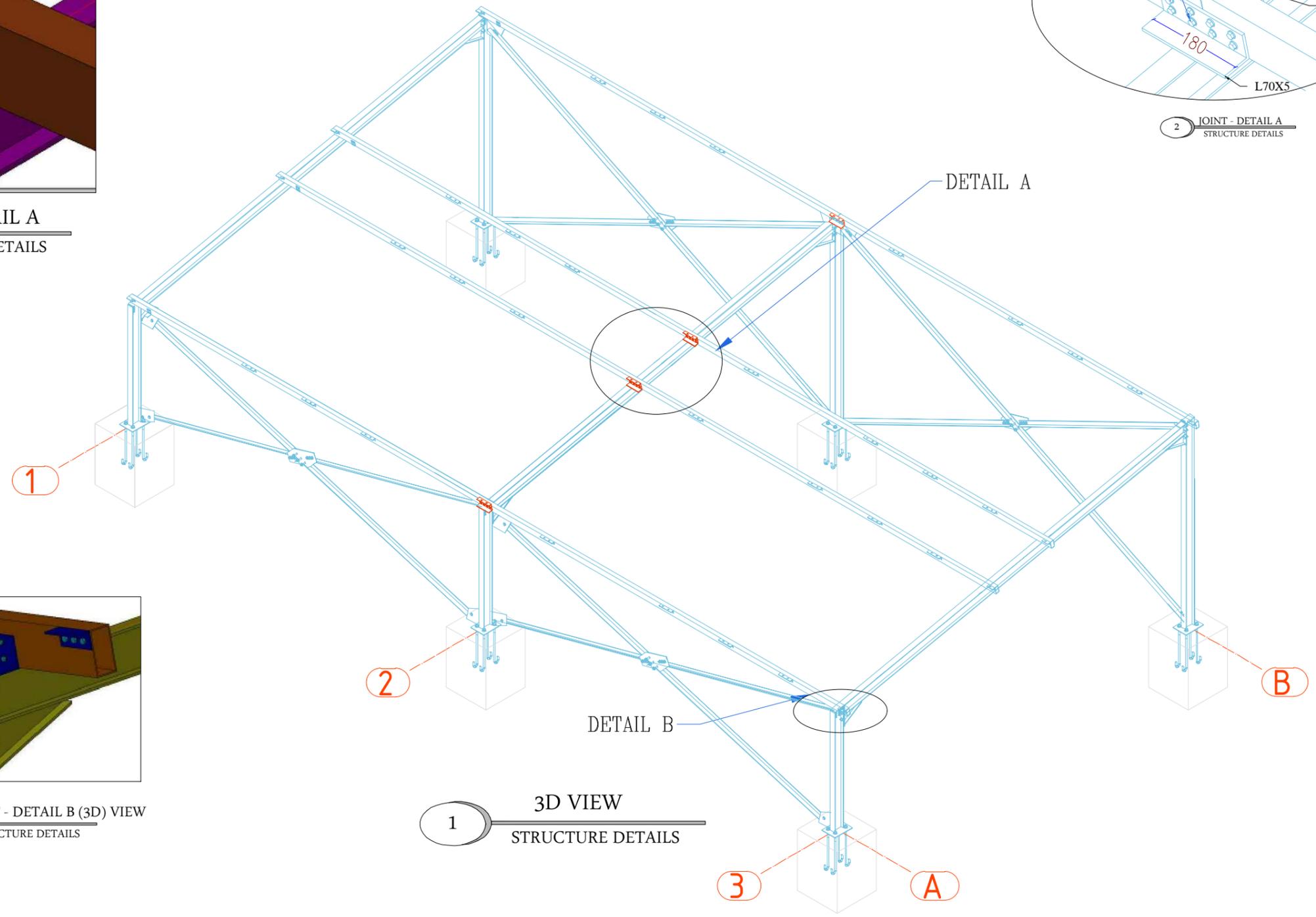
2 JOINT - DETAIL C  
STRUCTURE DETAILS



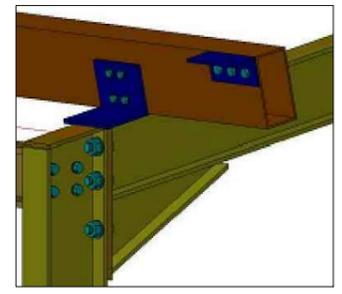


2 JOINT - DETAIL A  
STRUCTURE DETAILS

2-A JOINT - DETAIL A  
STRUCTURE DETAILS



1 3D VIEW  
STRUCTURE DETAILS



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

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**UNOPS**  
OPERATIONAL EXCELLENCE  
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SANA'A - YEMEN.

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IBRD · IDA | WORLD BANK GROUP  
WORLD BANK GROUP.

PROJECT TITLE:  
**YEMEN INTEGRATED URBAN  
EMERGENCY SERVICES II AF**

PROJECT LOCATION:  
**YEMEN**

DRAWING TITLE:  
**3D MODEL VIEW**

DRAWING TYPE:  
**STRUCTURAL PLANS.**

DESIGN BY:

CHECKED BY:

APPROVED BY:  
**UNOPS DESIGN REVIEW.**

STATUS:  
**TENDER DOCUMENTS.**

PROJECT NO:

DATE:  
FEB.12.2022

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A3.

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AS SHOWN.



DRAWING NO:  
**S-08**



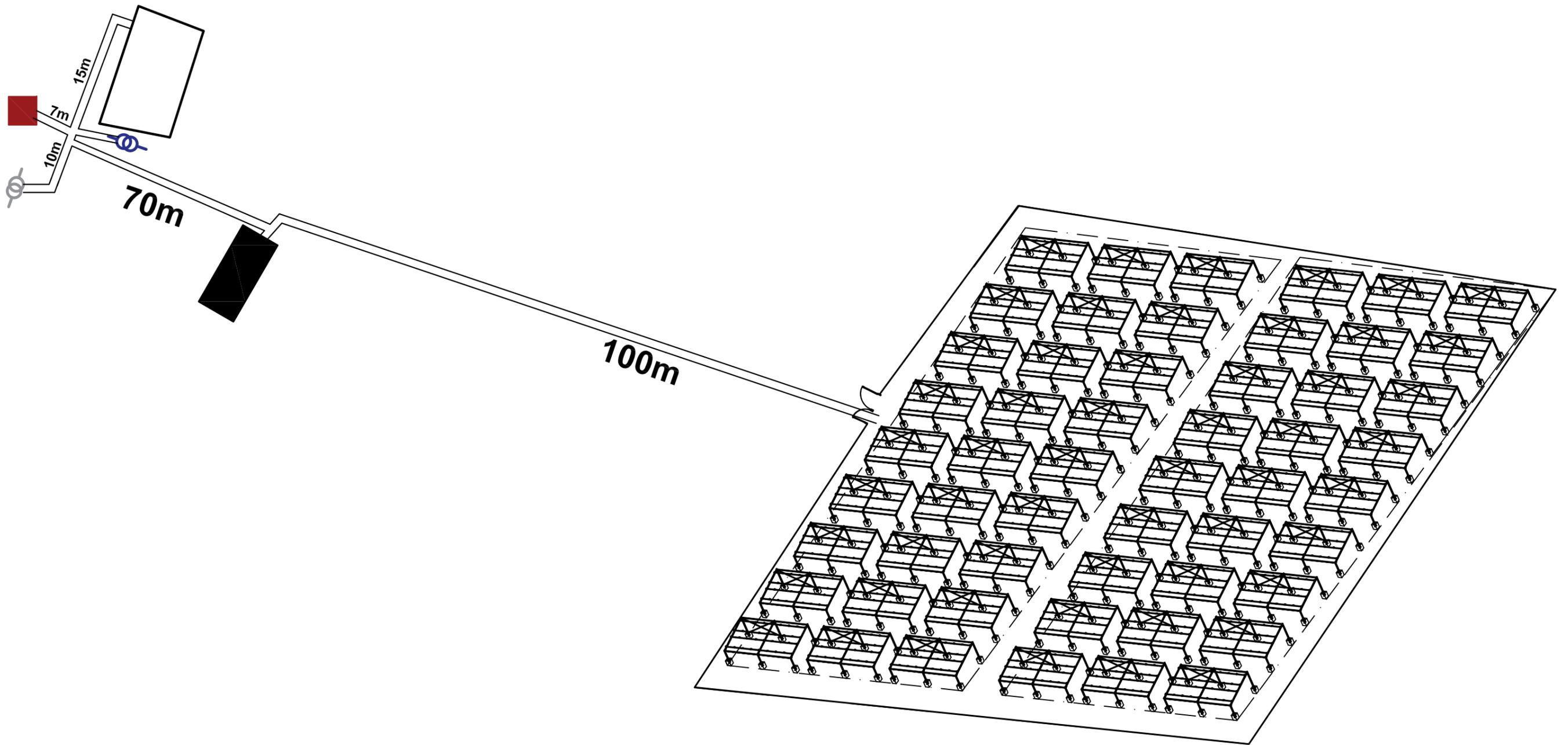
**Structural Drawings For**  
**Supply, Installation and Operation of Solar PV**  
**Energy Units at Al-Muwaijah Field**

**Control Room Structure Drawings**

**Funded by: World Bank through UNOPS**

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

**December , 2022**



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**THE WORLD BANK**

PREPARED BY  
  
UNITED NATIONS OFFICE FOR PROJECT SERVICES

PROJECT TITLE  
**Solar Energy Units at Al-Muwaijah**

PROJECT LOCATION  
 Almuwajjah - Alshaer

DRAWING TITLE  
**Control Room - Structural Plans**

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

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APPROVED BY

STATUS

PROJECT NO

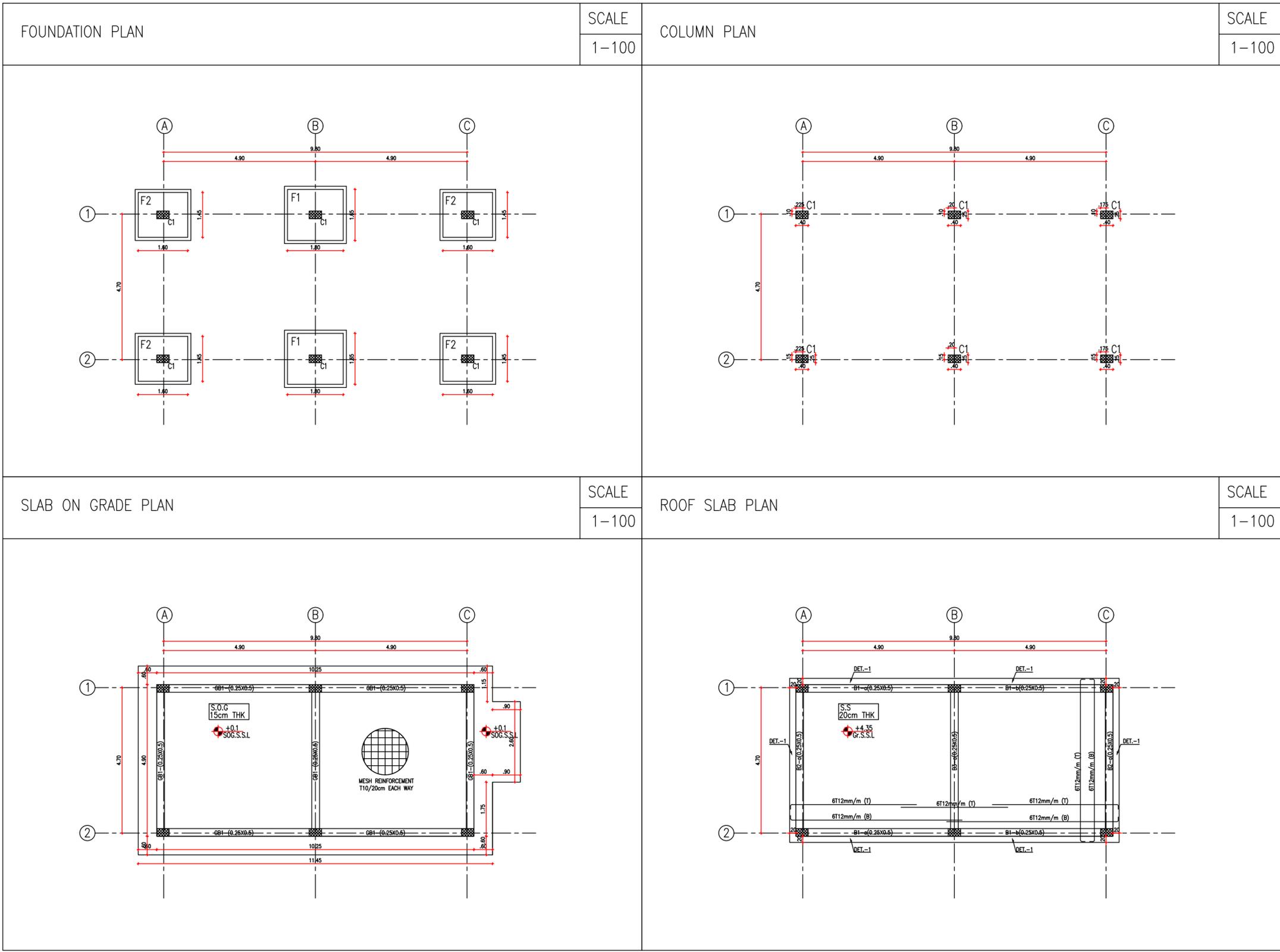
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 A3

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**S007**



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UNITED NATIONS OFFICE FOR PROJECT SERVICES

PROJECT TITLE

**Solar Energy Units at Al-Muwaijah**

PROJECT LOCATION

Almuwajjah - Alshaer

DRAWING TITLE

**Control Room - Structural Plans**

CODE

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

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DATE

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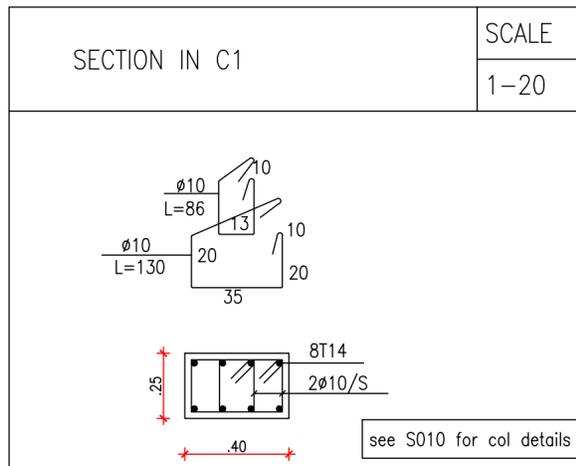
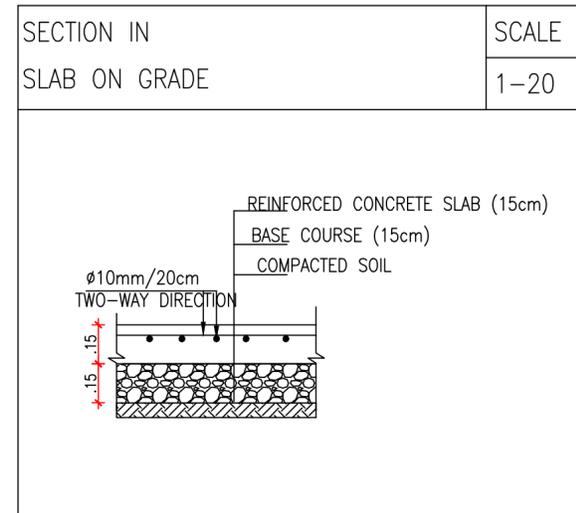
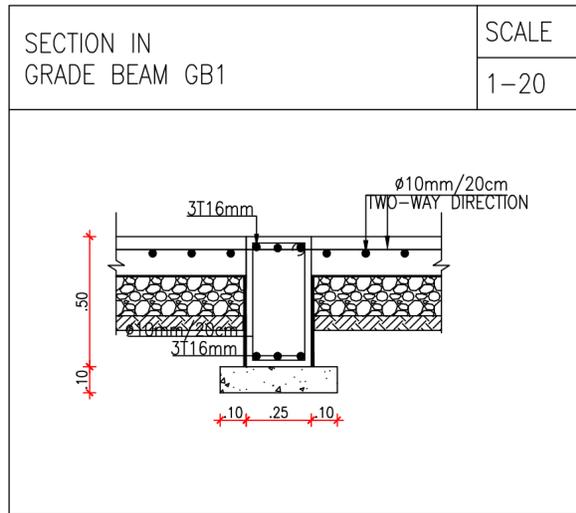
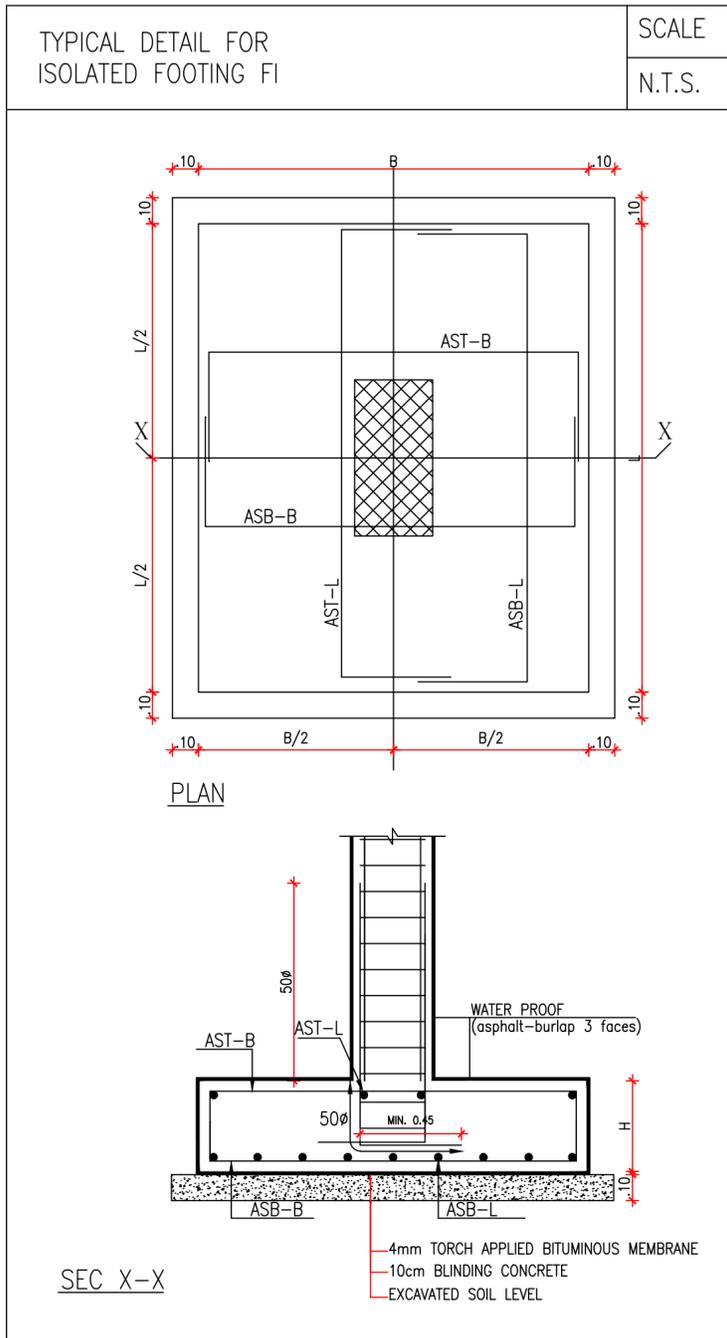
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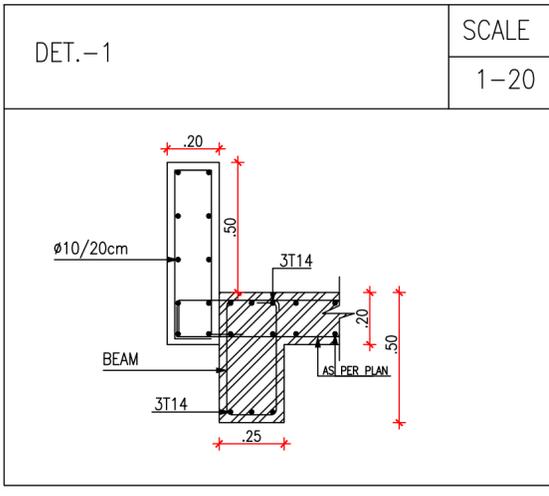
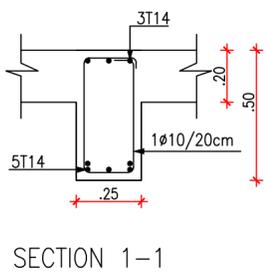
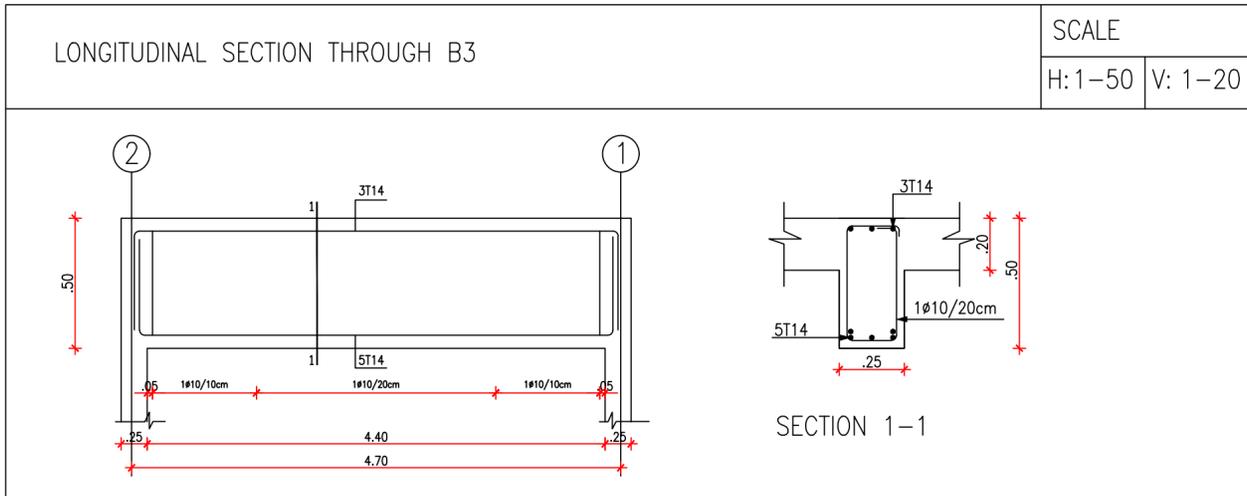
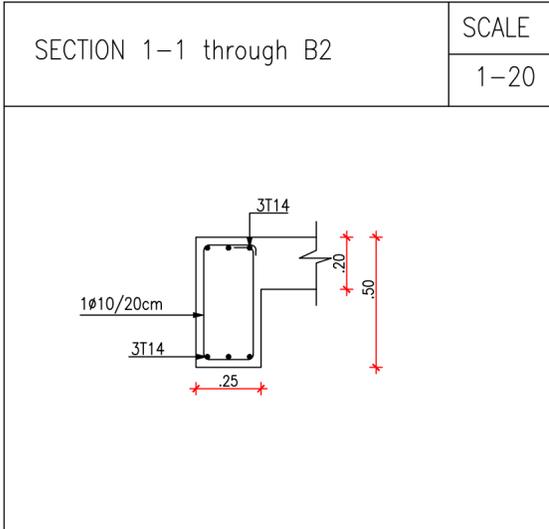
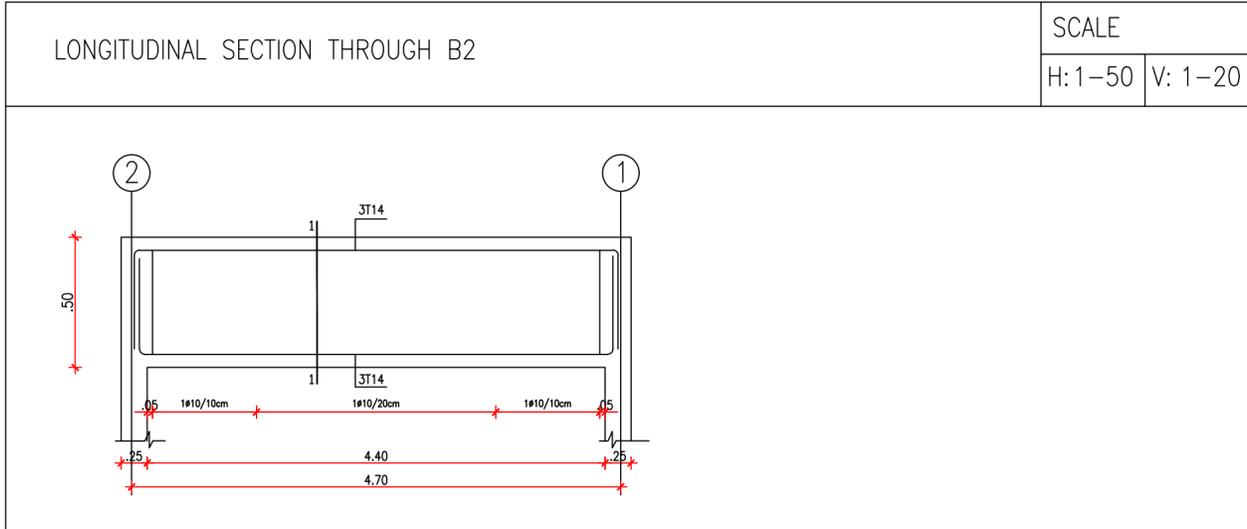
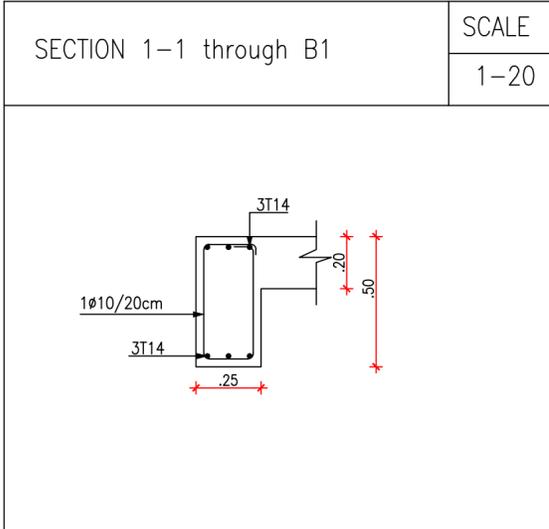
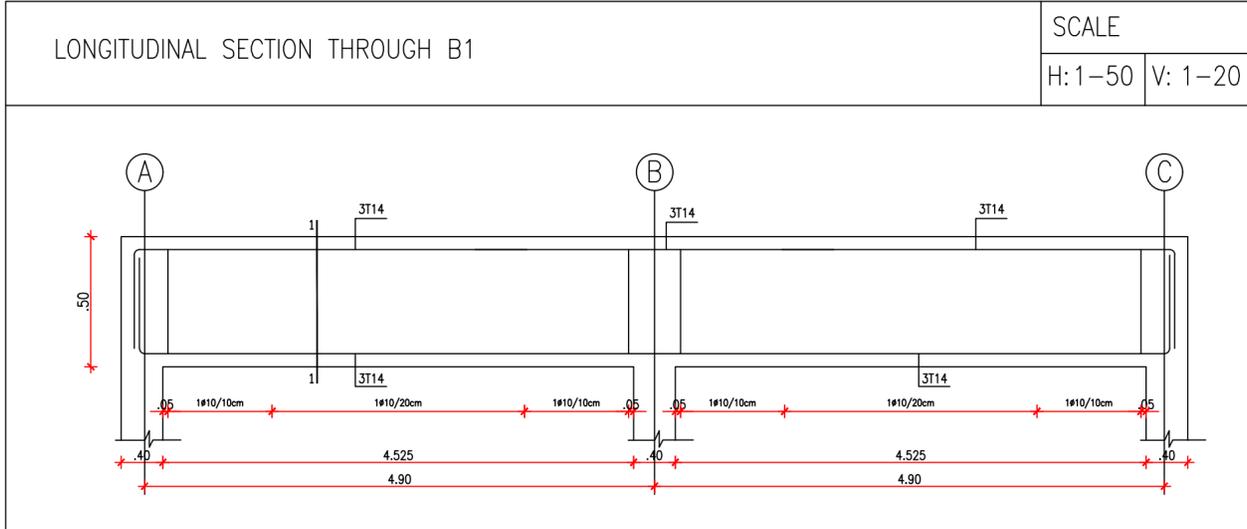
DRAWING NO

**S007**



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



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UNOPS  
UNITED NATIONS OFFICE FOR PROJECT SERVICES

PROJECT TITLE  
Solar Energy Units at Al-Muwaijah

PROJECT LOCATION  
Almuwajjah - Alshaer

DRAWING TITLE  
Control Room - Structural Details

CODE  
IUS-AF-UWS-SHA-001

DESIGNED BY  
TFE

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APPROVED BY

STATUS

PROJECT NO

DATE  
2022 / 12 / 04

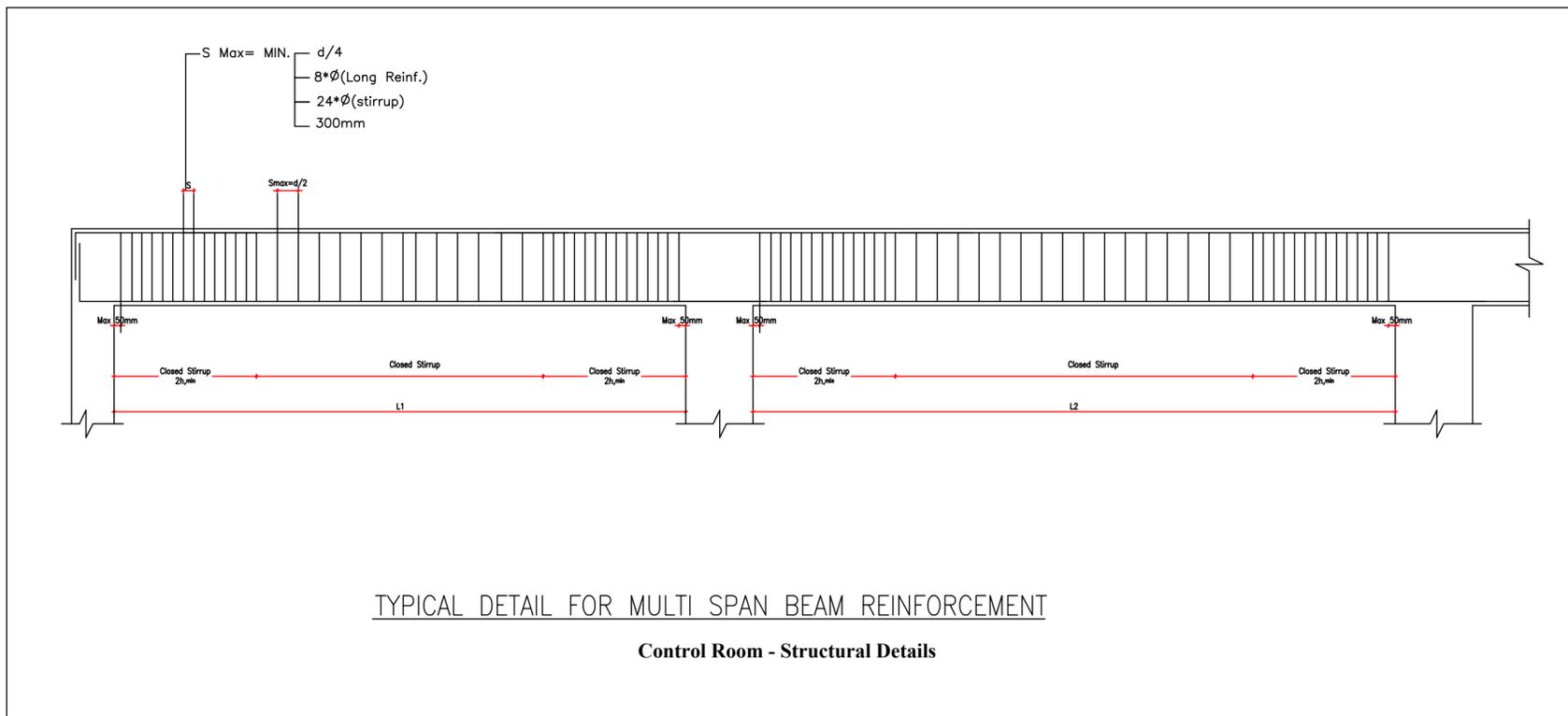
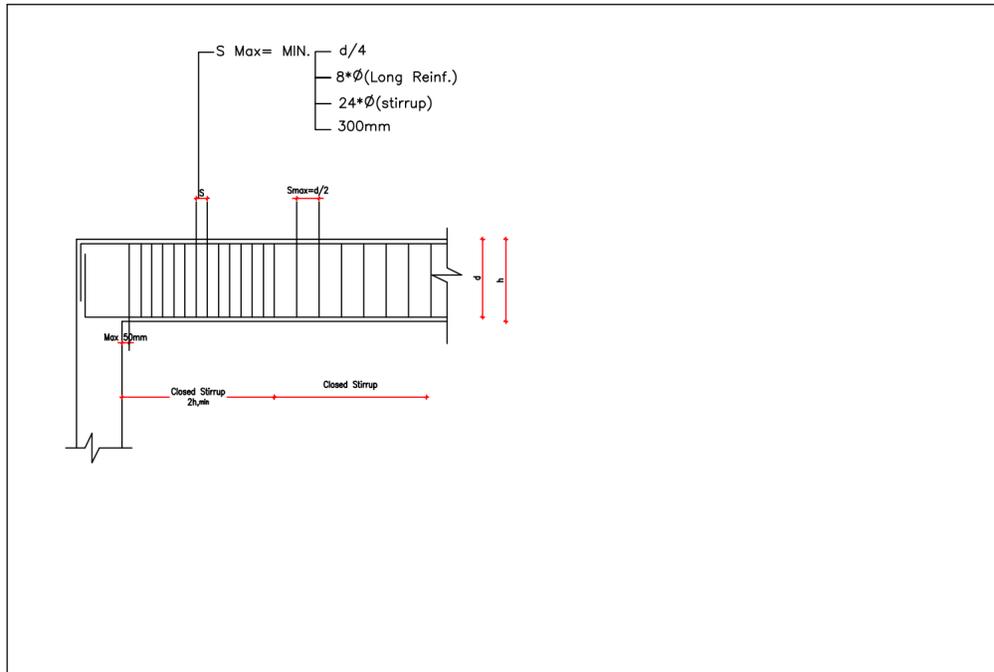
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SCALE  
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DRAWING NO  
S009





TYPICAL DETAIL FOR MULTI SPAN BEAM REINFORCEMENT  
Control Room - Structural Details

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PROJECT TITLE

Solar Energy Units at Al-Muwaijah

PROJECT LOCATION

Almuwajjah - Alshaer

DRAWING TITLE

Control Room - Structural Details

CODE

IUS-AF-UWS-SHA-001

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STATUS

PROJECT NO

DATE

2022 / 12 / 04

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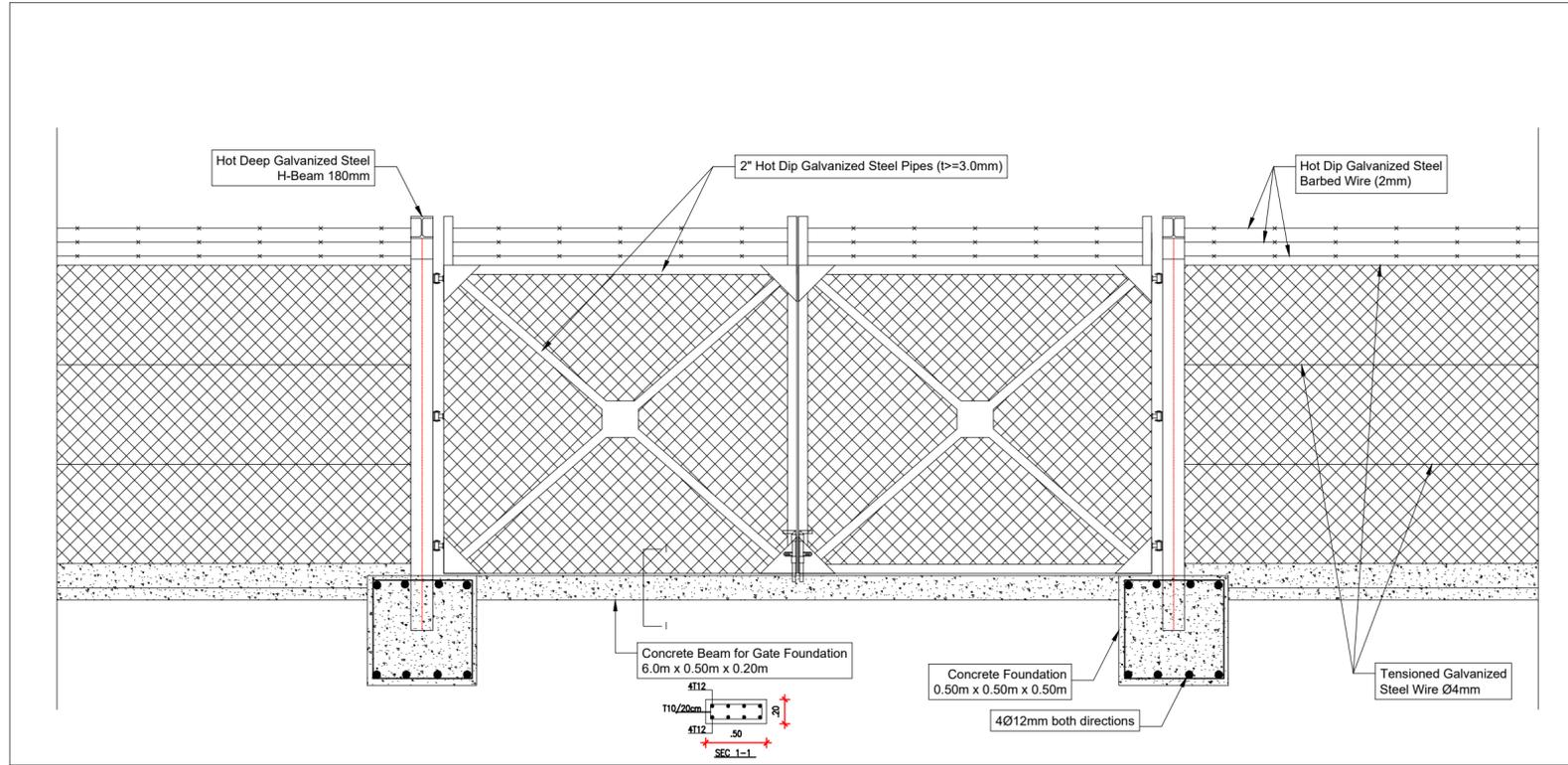
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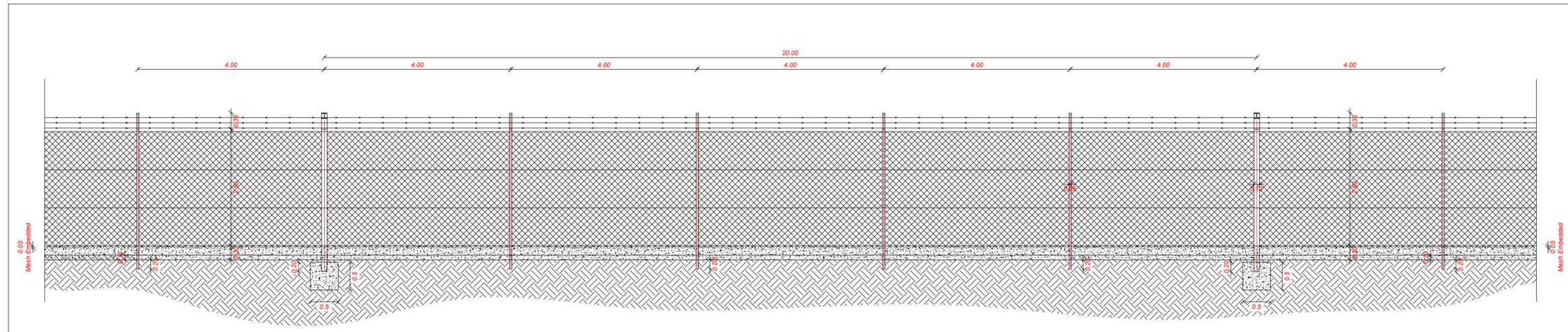


DRAWING NO

S011



**GATE PLANE**



**FENCE DETAILS**

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 UNITED NATIONS OFFICE FOR PROJECT SERVICES

PROJECT TITLE  
**Solar Energy Units at Al-Muwaijah**

PROJECT LOCATION  
 Almuwajjah - Alshaer

DRAWING TITLE  
**Fence Details**

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

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STATUS

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 2022 / 12 / 04

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SCALE  
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DRAWING NO  
**S012**