Project

Community Resilience Enhancement Project (Additional Financing) THABAT AF

Component 1 (Community Led Delivery of Basic Services)

Organization

MERCY CORPS

Mercy Corps Europe,
Sudan

Donor

STARS

Sudan Transition and Recovery Support

Solar Panel Module Typical Design

Solar System for water points

CONSULTANT :

Abbas Abdalwahab Abdulraheem

General Notes for Solar System Installation:

Site Assessment
- Evaluate solar exposure, shading, and roof orientation.
- Confirm structural integrity for mounting panels.
- Ensure access for maintenance and cleaning.

2. System Components
- Solar Panels: Select based on wattage, efficiency, and available space.
- Inverter: Match capacity to panel output; choose grid-tied or off-grid type.
- Battery Bank (if applicable): Size based on daily load and autonomy requirements.
- Charge Controller: Prevents battery overcharging and regulates input.
- Mounting Structure: Use corrosion-resistant, wind-rated materials.
- Cabling & Protection: Use UV-resistant cables, proper fuses, and grounding.

3. Installation Standards
- Follow IEC and local electrical codes.
- Maintain safe clearances between components.
- Use weatherproof enclosures for outdoor electronics.
- Label all components for identification and troubleshooting.

4.**Safety Protocols**
- Disconnect power before handling components.
- Use insulated tools and personal protective equipment.
- Avoid installation during wet or windy conditions.
- Ensure proper grounding and surge protection.

5. **Commissioning & Testing**
- Verify voltage, current, and inverter output.
- Test battery charge/discharge cycles.
- Monitor system performance for 48-72 hours before handover.

Capacity (Wattage)	Typical Dimensions (cm)	Cell Type	Weight (kg)	Use Case
540W	227 × 113 × 3.5	144 half-cut cells	~28	Commercial/Utility
600W	233 × 113 × 3.5	210mm cells	~30	Utility-scale
660W	238 × 130 × 3.5	210mm cells	~32	Utility-scale
700W	245 × 130 × 3.5	210mm cells	~34	Utility-scale

NOTES:

KEY PLAN

Drawn | Chkd.

No.	Description:	Date
4		
3		
2		
1		
0		

Revisions

PROJECT TITLE:

Community Resilience Enhancement Project (Additional Financing) THABAT AF Component 1 (Community Led Delivery of Basic Services)

Solar System for water points

Organization

MERCY CORPS
Mercy Corps Europe, Sudan

Donor

STARS
Sudan Transition and Recovery Support

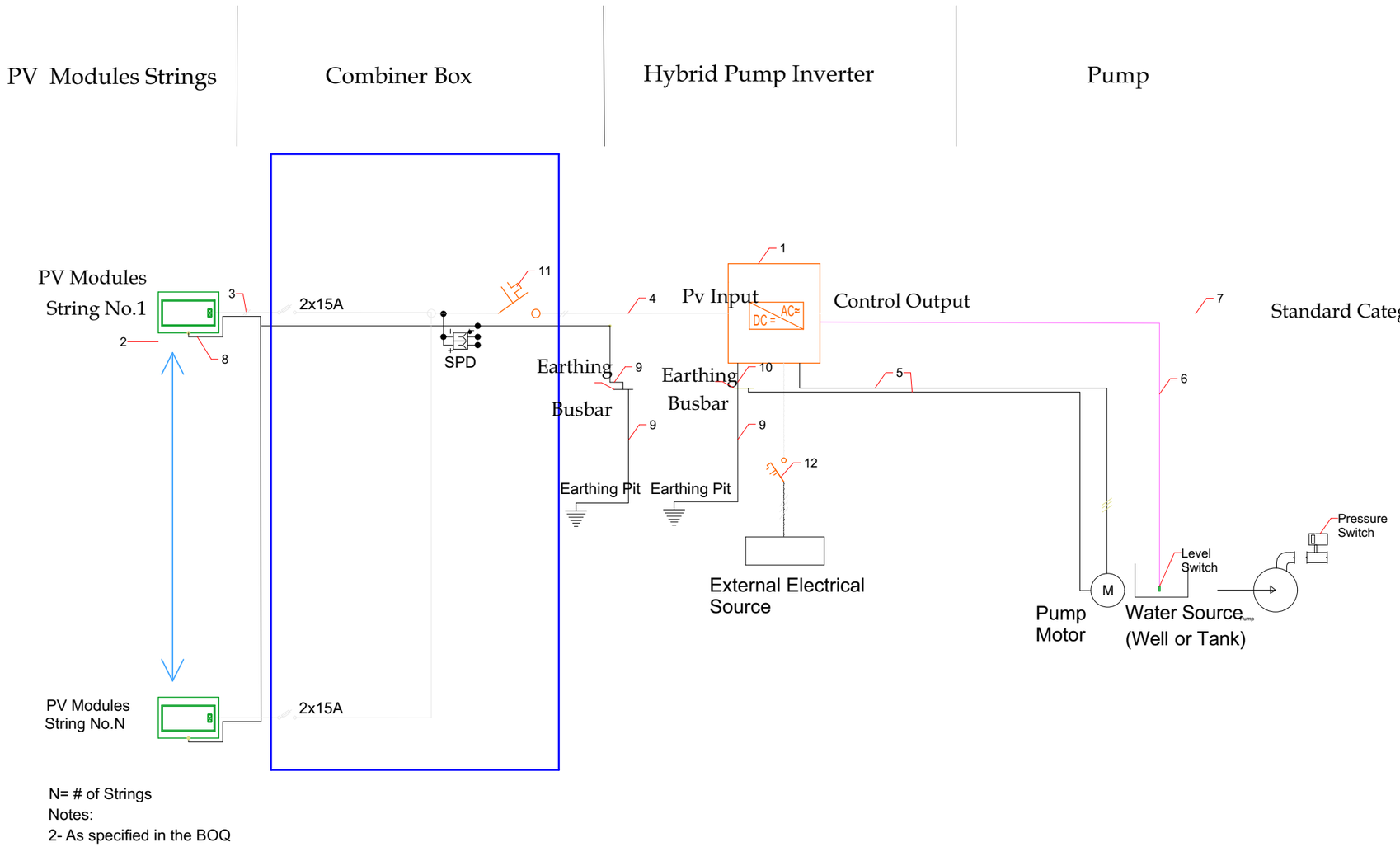
CONSULTANT :

Abbas Abdalwahab Abdulraheem

Drawing Title:

Solar Panel Typical Module Design Notes

Org.Sheet Size:	Date: October 2025	
A3	Scale:	
Project No. PO# 40452947	Sheet No. A.01.01	Rev. No. 0



Standard Categories (BoQ 3 Reference)

Sn	Item	Size / Capacity / Notes
1	Inverter Power, KW	7.5 - Refer to **BoQ 1, Item 1.2**
2	# of PV Strings	2 (Assuming 7 panels per string) - **BoQ 1, Item 1.1**
3	DC Cable Between Arrays, mm²	1 × 6 mm² - **BoQ 1, Item 1.4**
4	DC Cable Between Inverter	Included in **BoQ 1, Item 1.4**
5	Pump AC Cable, mm²	Included in **BoQ 1, Item 1.4**

Additional Components (BoQ 3 Reference)

Sn	Item	Size / Capacity / Notes
6	Level Sensor Cable, mm²	Included in **BoQ 1, Item 1.3**
7	Pressure Switch Cable, mm²	Included in **BoQ 1, Item 1.3**
8	Earthing Cable Between PV Modules, mm²	Included in **BoQ 1, Item 1.5**
9	Earthing Cable from Bus Bar to Earthing Pit, mm²	Included in **BoQ 1, Item 1.5**
10	Earthing Cable from Inverter to Bus Bar, mm²	Included in **BoQ 1, Item 1.5**
11	Combiner DC Circuit Breaker Size “10KA”, A	Included in **BoQ 1, Item 1.3**
12	Input AC Circuit Breaker, A	Included in **BoQ 1, Item 1.3**

NOTES:

KEY PLAN

No.	Description:	Date
4		
3		
2		
1		
0		

Drawn | Chkd.

Revisions

PROJECT TITLE:

Community Resilience Enhancement Project (Additional Financing) THABAT AF Component 1 (Community Led Delivery of Basic Services)

Solar System for water points

Organization

MERCY CORPS
Mercy Corps Europe, Sudan

Donor

STARS
Sudan Transition and Recovery Support

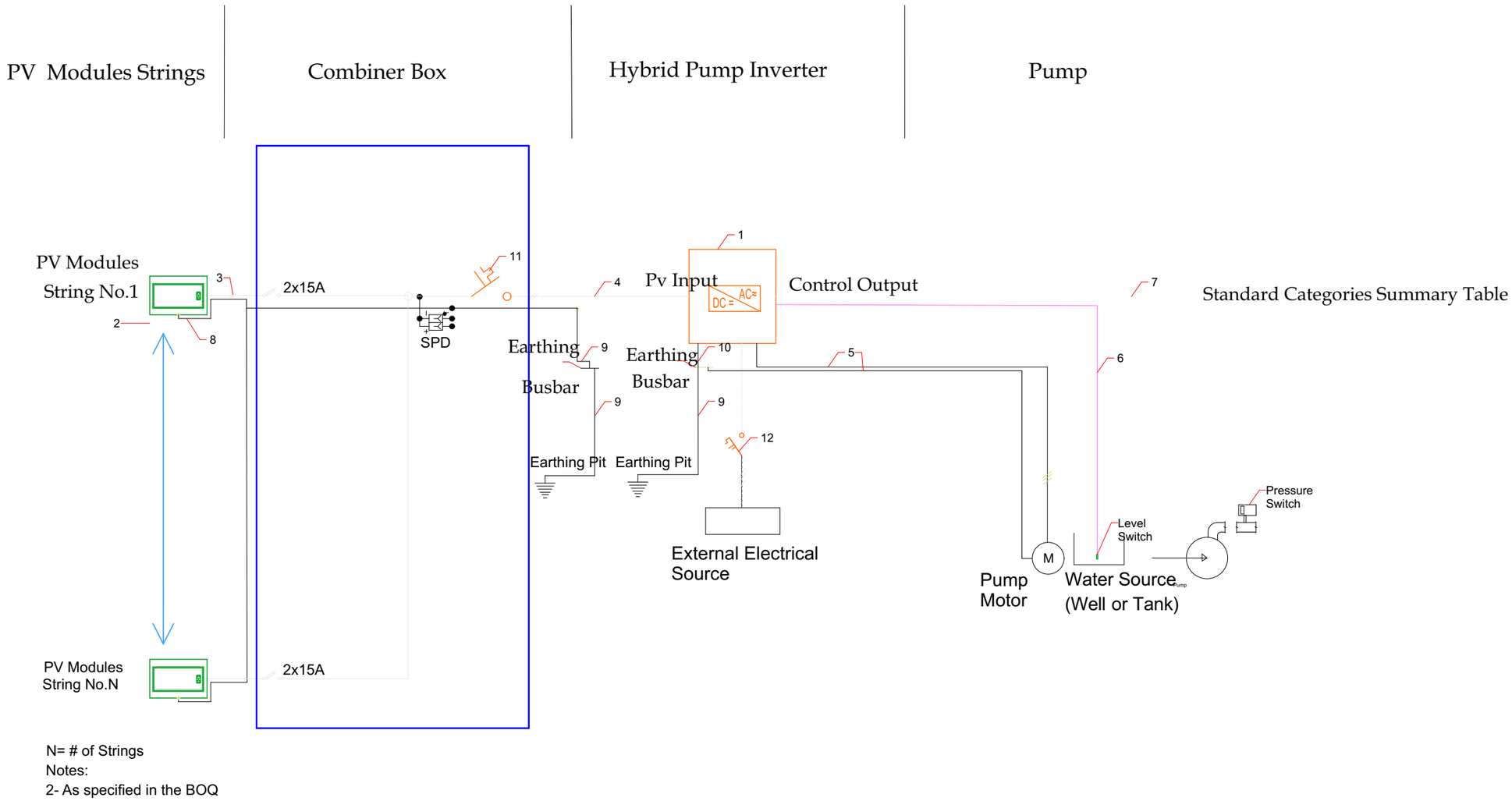
CONSULTANT :

Abbas Abdalwahab Abdulraheem

Drawing Title:

6 KW System Diagram

Org.Sheet Size:	Date:	
A3	October 2025 Scale:	
Project No.	Sheet No.	Rev. No.
PO# 40452947	A.01.02	0



N= # of Strings

Notes:

2- As specified in the BOQ

Standard Categories (BoQ 3 Reference)

Sn	Item	Size / Capacity / Notes
1	Inverter Power, KW	Sized for 12.1 kWp - Refer to **BoQ 3, Item 1.2**
2	# of PV Strings	2-3 strings (22 panels @ 550 W) - **BoQ 3, Item 1.1**
3	DC Cable Between Arrays, mm²	≥ 6 mm² - **BoQ 3, Item 1.4**
4	DC Cable Between Inverter	Included in **BoQ 3, Item 1.4**
5	Pump AC Cable, mm²	Included in **BoQ 3, Item 1.4**

Additional Components (BoQ 3 Reference)

Sn	Item	Size / Capacity / Notes
6	Level Sensor Cable, mm²	Included in **BoQ 3, Item 1.5**
7	Pressure Switch Cable, mm²	Included in **BoQ 3, Item 1.5**
8	Earthing Cable Between PV Modules, mm²	Included in **BoQ 3, Item 1.3**
9	Earthing Cable from Bus Bar to Earthing Pit, mm²	Included in **BoQ 3, Item 1.3**
10	Earthing Cable from Inverter to Bus Bar, mm²	Included in **BoQ 3, Item 1.3**
11	Combiner DC Circuit Breaker Size “10KA”, A	Included in **BoQ 3, Item 1.3**
12	Input AC Circuit Breaker, A	Included in **BoQ 3, Item 1.3**

NOTES:

KEY PLAN

No.	Description:	Date
4		
3		
2		
1		
0		

Drawn | Chkd.

Revisions

PROJECT TITLE:

Community Resilience Enhancement Project (Additional Financing) THABAT AF Component 1 (Community Led Delivery of Basic Services)

Solar System for water points

Organization

MERCY CORPS
Mercy Corps Europe, Sudan

Donor

STARS
Sudan Transition and Recovery Support

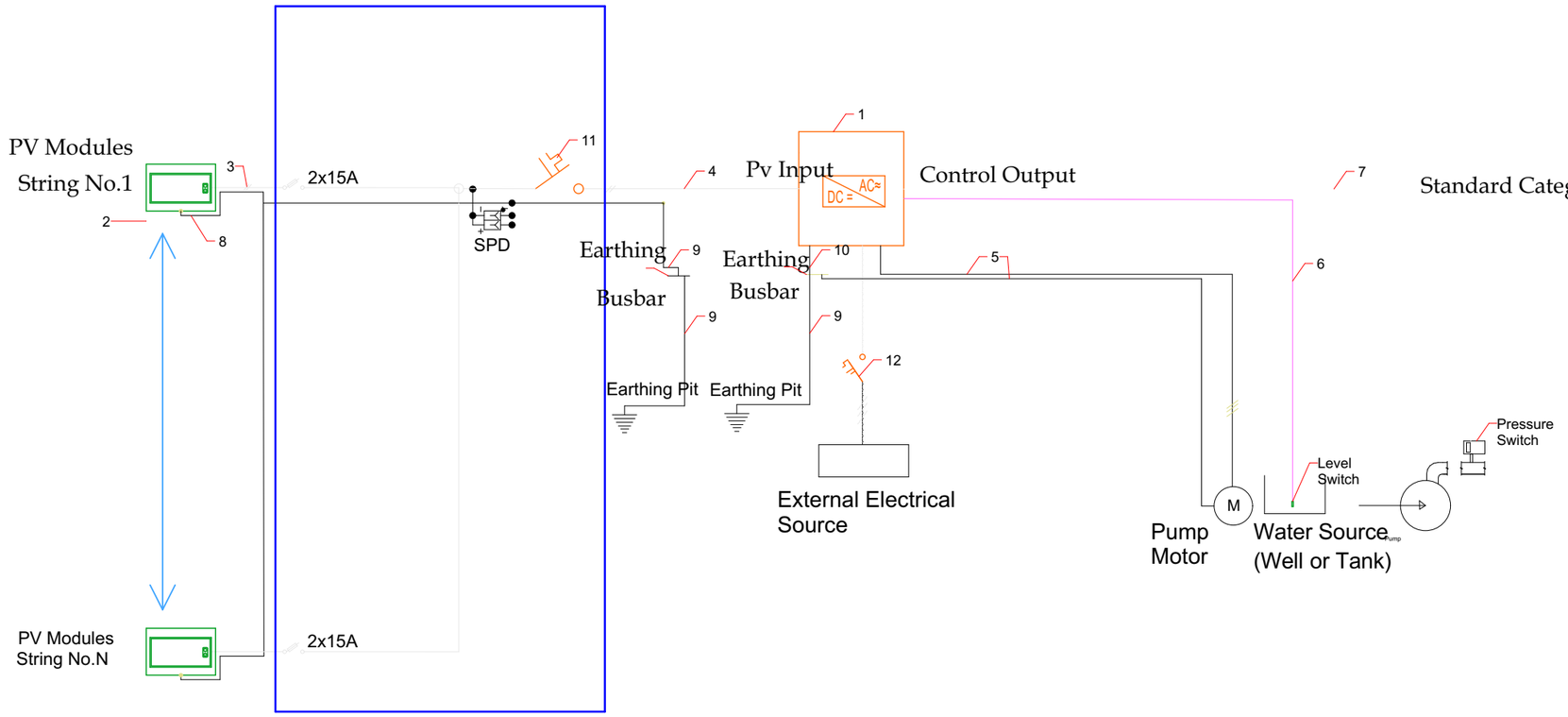
CONSULTANT :

Abbas Abdalwahab Abdulraheem

Drawing Title:

12 KW System Diagram

Org.Sheet Size:	Date: October 2025	
A3	Scale:	
Project No. PO# 40452947	Sheet No. A.01.03	Rev. No. 0



N= # of Strings
Notes:
2- As specified in the BOQ

Standard Categories (BoQ 3 Reference)

Sn	Item	Size / Capacity / Notes
1	Inverter Power, KW	18 - Refer to **BoQ 2, Item 3**
2	# of PV Strings	3 (Assuming 3 strings of ~8-9 panels) - **BoQ 2, Item 1**
3	DC Cable Between Arrays, mm²	2-core, ≥ 6 mm² - **BoQ 2, Item 4**
4	DC Cable Between Inverter	2-core, ≥ 10 mm² - **BoQ 2, Item 4**
5	Pump AC Cable, mm²	Included in AC wiring - **BoQ 2, Item 4**

Sn	Item	Size / Capacity / Notes
6	Level Sensor Cable, mm²	Included in inverter protection - **BoQ 2, Item 3**
7	Pressure Switch Cable, mm²	Included in inverter protection - **BoQ 2, Item 3**
8	Earthing Cable Between PV Modules, mm²	Included in inverter protection - **BoQ 2, Item 6**
9	Earthing Cable from Bus Bar to Earthing Pit, mm²	Included in inverter protection - **BoQ 2, Item 6**
10	Earthing Cable from Inverter to Bus Bar, mm²	Included in inverter protection - **BoQ 2, Item 6**
11	Combiner DC Circuit Breaker Size “10KA”, A	≥1000 V DC breakers - **BoQ 2, Item 3**
12	Input AC Circuit Breaker, A	100 A / 4 Pole changeover - **BoQ 2, Item 5**

NOTES:

KEY PLAN

No.	Description:	Date
4		
3		
2		
1		
0		

Drawn | Chkd.

Revisions

PROJECT TITLE:

Community Resilience Enhancement Project (Additional Financing) THABAT AF Component 1 (Community Led Delivery of Basic Services)

Solar System for water points

Organization

MERCY CORPS
Mercy Corps Europe, Sudan

Donor

STARS
Sudan Transition and Recovery Support

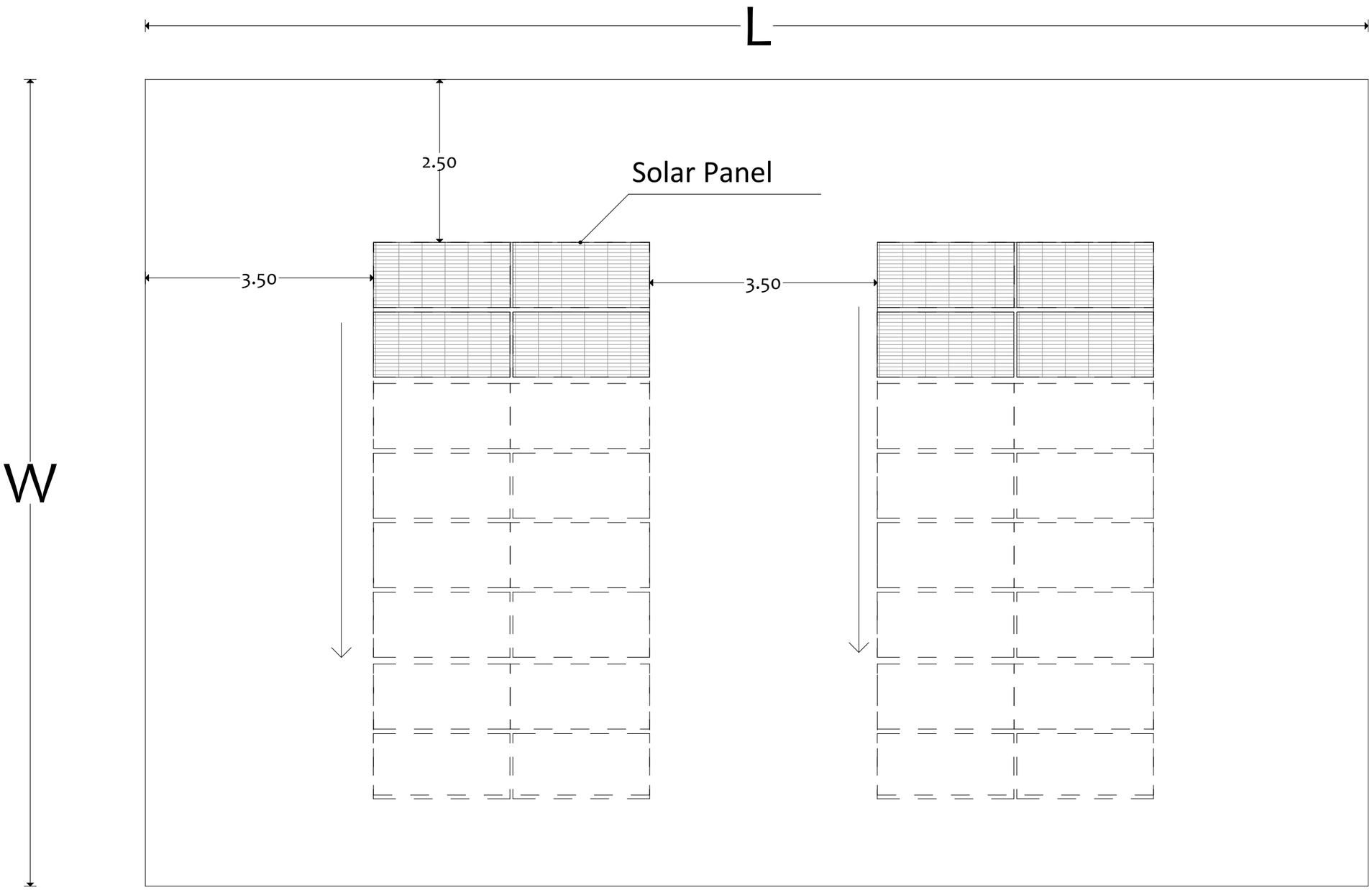
CONSULTANT :

Abbas Abdalwahab Abdulraheem

Drawing Title:

18 KW System Diagram

Org.Sheet Size:	Date: October 2025	
A3	Scale:	
Project No. PO# 40452947	Sheet No. A.01.04	Rev. No. 0



Top View

Scale 1:50

NOTES:

KEY PLAN

Drawn | Chkd.

No.	Description:	Date
4		
3		
2		
1		
0		

Revisions

PROJECT TITLE:

Community Resilience Enhancement Project (Additional Financing) THABAT AF Component 1 (Community Led Delivery of Basic Services)

Solar System for water points

Organization

Mercy Corps Europe, Sudan

Donor

Sudan Transition and Recovery Support

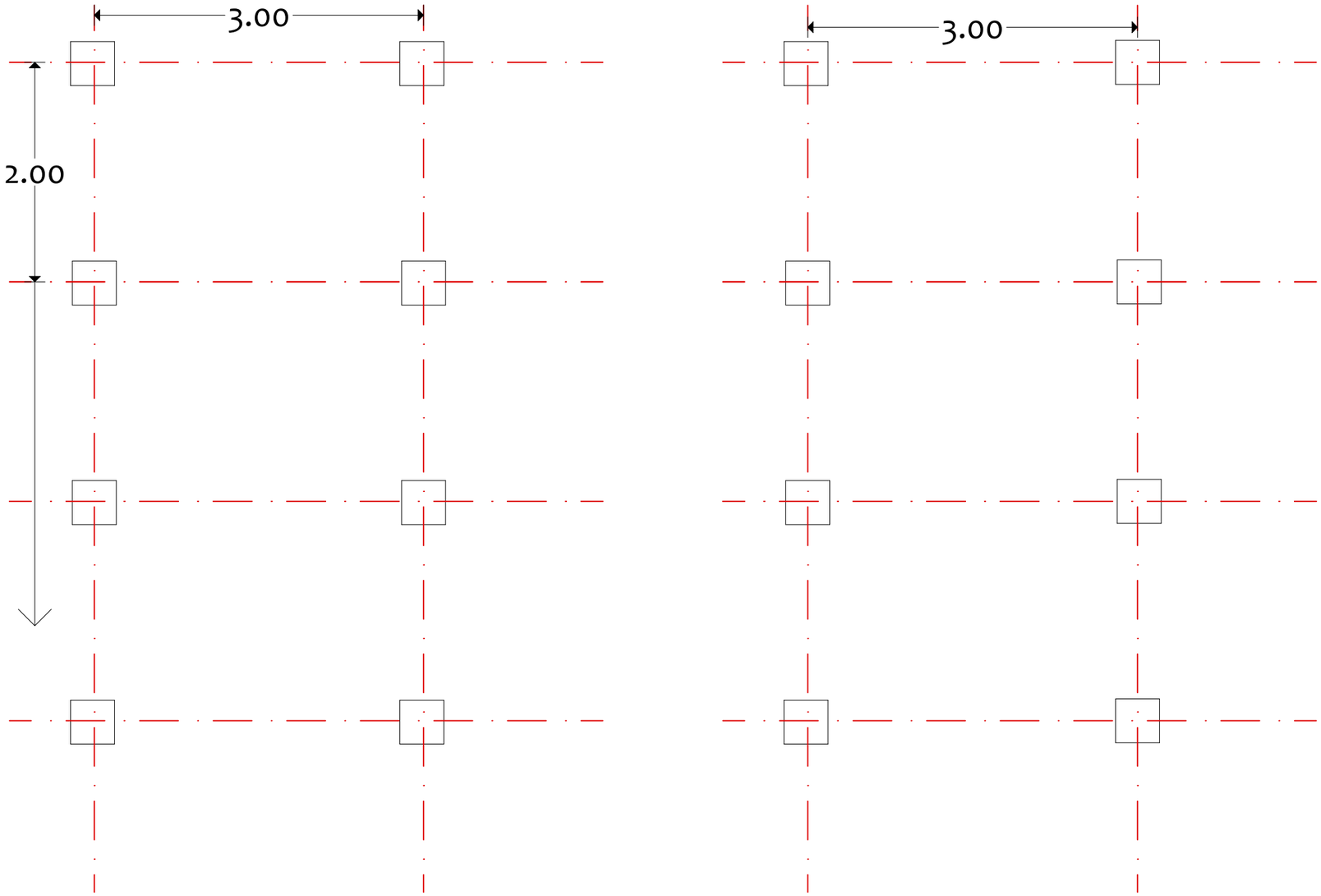
CONSULTANT :

Abbas Abdalwahab Abdulraheem

Drawing Title:

Solar Panel Typical Module Design
Top View

Org.Sheet Size:	Date: October 2025	
A3	Scale:	
Project No. PO# 40452947	Sheet No. A.01.05	Rev. No. 0



Foundation plan

Scale 1:50

NOTES:

KEY PLAN

Drawn | Chkd.

No.	Description:	Date
4		
3		
2		
1		
0		

Revisions

PROJECT TITLE:

Community Resilience Enhancement Project (Additional Financing) THABAT AF Component 1 (Community Led Delivery of Basic Services)

Solar System for water points

Organization

MERCY CORPS
Mercy Corps Europe, Sudan

Donor

STARS
Sudan Transition and Recovery Support

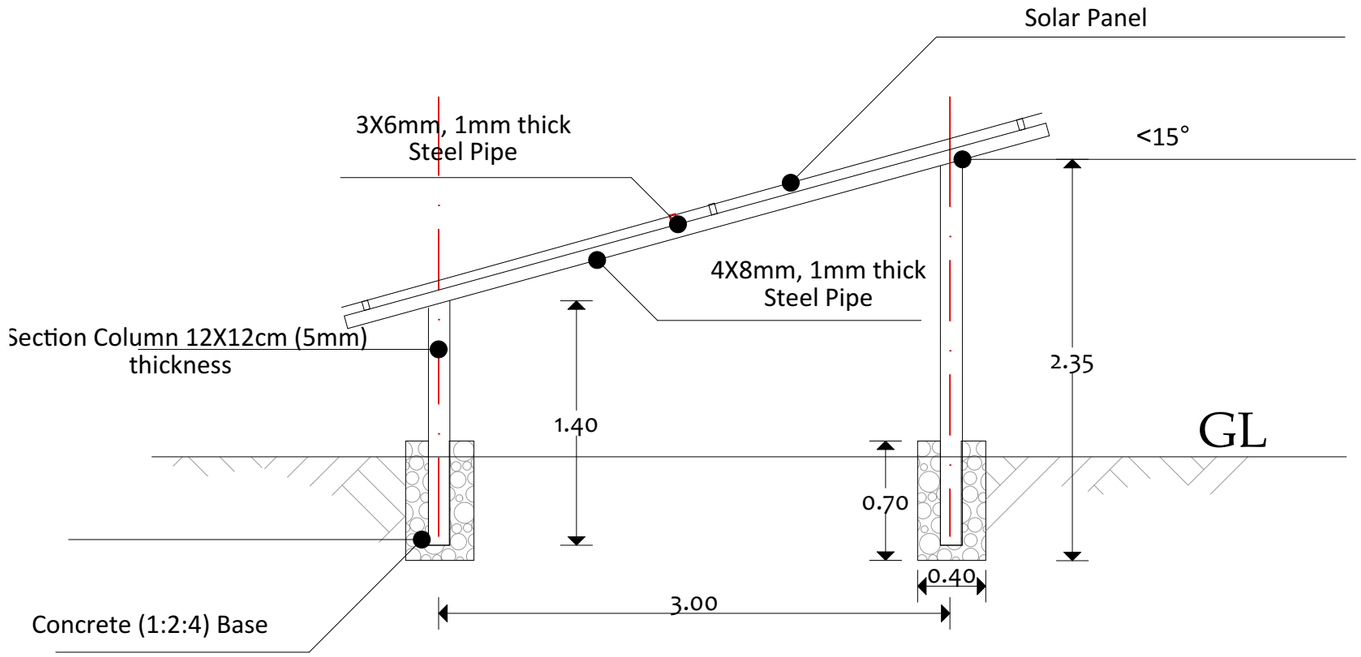
CONSULTANT :

Abbas Abdalwahab Abdulraheem

Drawing Title:

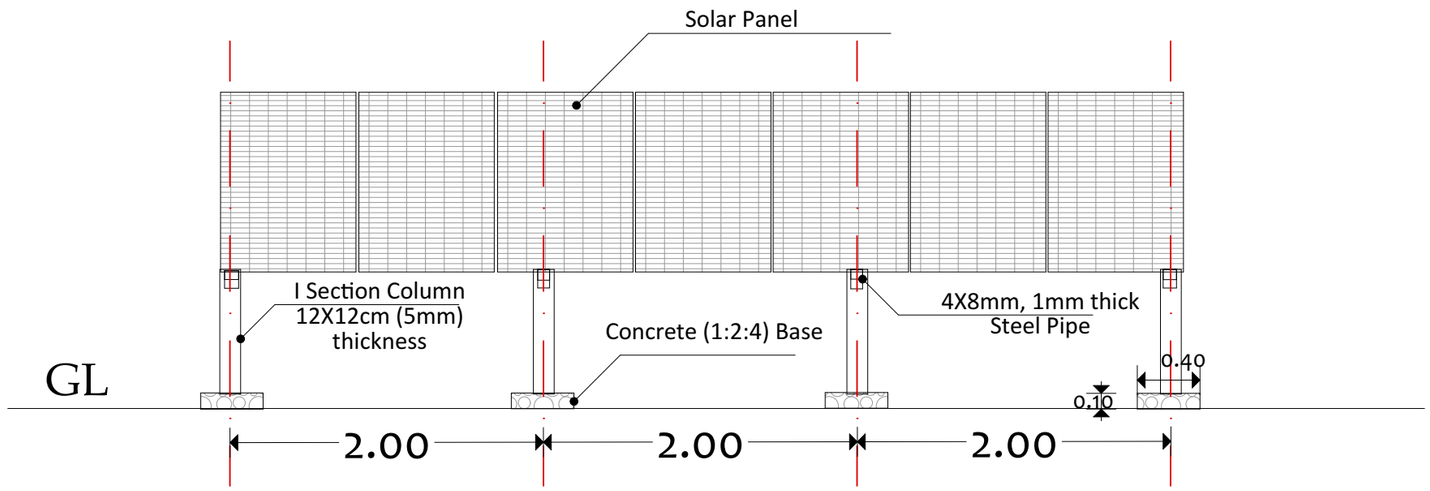
Solar Panel Typical Module Design Foundation Plan

Org.Sheet Size:	Date: October 2025	
A3	Scale:	
Project No.	Sheet No.	Rev. No.
PO# 40452947	A.01.06	0



Side View

Scale 1:40



Fornt View

Scale 1:40

NOTES:

KEY PLAN

Drawn | Chkd.

No.	Description:	Date
4		
3		
2		
1		
0		

Revisions

PROJECT TITLE:

Community Resilience Enhancement Project (Additional Financing) THABAT AF Component 1 (Community Led Delivery of Basic Services)

Solar System for water points

Organization

MERCY CORPS
Mercy Corps Europe, Sudan

Donor

STARS
Sudan Transition and Recovery Support

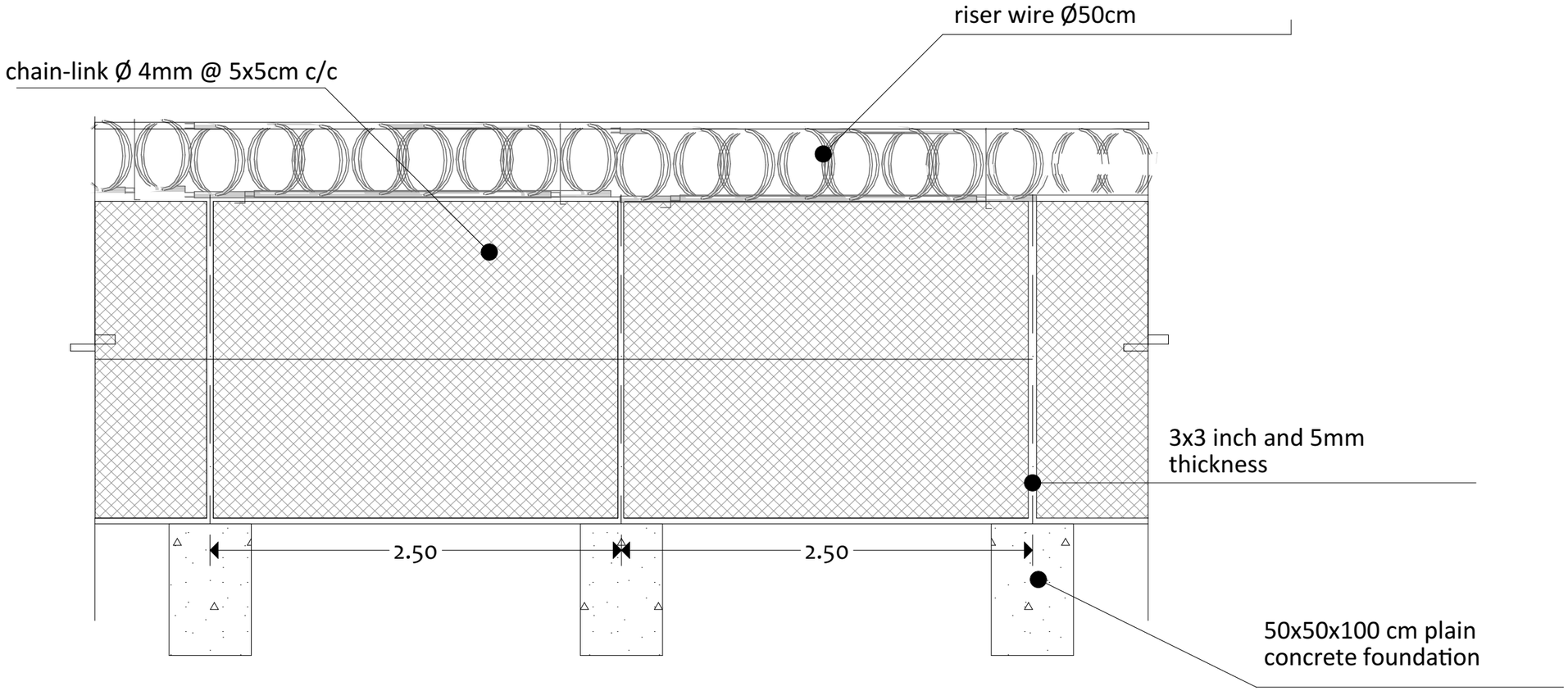
CONSULTANT :

Abbas Abdalwahab Abdulraheem

Drawing Title:

Solar Panel Typical Module Design Side and Front View

Org.Sheet Size:	Date: October 2025	
A3	Scale:	
Project No. PO# 40452947	Sheet No. A.01.07	Rev. No. 0



Fence Design

Scale 1:40

NOTES:

KEY PLAN

Drawn | Chkd.

No.	Description:	Date
4		
3		
2		
1		
0		

Revisions

PROJECT TITLE:

Community Resilience Enhancement Project (Additional Financing) THABAT AF Component 1 (Community Led Delivery of Basic Services)

Solar System for water points

Organization

MERCY CORPS
Mercy Corps Europe, Sudan

Donor

STARS
Sudan Transition and Recovery Support

CONSULTANT :

Abbas Abdalwahab Abdulraheem

Drawing Title:

Solar Panel Typical Module Design
Fence Design

Org.Sheet Size:	Date: October 2025	
A3	Scale:	
Project No. PO# 40452947	Sheet No. A.01.08	Rev. No. 0

Approvals
Report • Printed on January 19, 2026

Approved

Approval Request: SoW_QCP.&.Drawings_Solarization_C1,WASH,THABAT AF1

Dear Approvers, I want to request your approval for the attached SoW package of Solarization under WASH sub-component as per AWP
Activity 1.2.1: Repair and maintenance of water supply systems and solarization.

Project Lead Approval
ESS Approval
CoP Approval
Best regards, Noman

Attachments

10.11.2025_ANNEX_Solarization_Drawin
https://mercycorpsorg-my.sharepoint.com/:b:/

10.11.2025_FINAL_ Solarization_SOW_Bc
https://mercycorpsorg-my.sharepoint.com/:b:/

Final status: Approved

JM **Step 3: Approved by**
Jaafarsadiq Mohamed 1/19/2026 12:55:00 PM

FM **Step 2: Approved by**
Farai Mushayavanhu 1/19/2026 12:54:40 PM

A **Step 1: Approved by**
Asaad Mohamed Taha Ahmed 1/19/2026 12:31:53 PM

M **Requested by**
Mohammed Noman Musa Suluman 1/19/2026 7:58:32 AM