

# ANNEX ( ) DESIGNS AND DRAWINGS.

PREPARED BY:



UNITED NATIONS OFFICE FOR PROJECT SERVICES

FUNDED BY:



WORLD BANK GROUP.

PROJECT.

SUPPLY AND INSTALL OF OFF GRID SOLAR SYSTEM FOR  
CHILDREN'S CENTER FOR AUTISM ADEN CITY - YEMEN.

PROJECT REFERENCE NO.

IUS-OPS-ESC-ADN-049.1

OCT. 2019



## SECTION 01: GENERAL PLANS..

- E01- MAIN NOTE
- E02- GOOGLE EARTH IMAGE
- E03- GENEAL LAYOUT
- E04- PV MODULE DISTRIBUTION ROOFTOP PLAN DETAILS
- E05- STRING & COMBINER BOX EARTHING
- E06- BATTERY ROOM AIR CONDITIONING AND FIRE ALARM SYSTEMS
- E07- CONTROL ROOM BATTREY, INVERTER, CC.,AC COPLING DB
- E08- ELECTRICAL SLD
- E09- MDB (MAIN DISTRIBUTION BOARD)
- E10- ACADEMIC BUILDING HEAVY LOADS DB
- E11- CENTER MAIN BUILDING HEAVY LOADS DB
- E12- EARTHING SYSTEM
- E13- SOLAR SYSTEM SCHEMATIC DIAGRAM



REMARKS: -

1. THE LAYOUT DRAWINGS DO NOT SHOW ALL THE SYSTEMSTEMS, OR ACCESSORIES COVERED UNDER THE SCOPE OF ELECTRICAL WORKS TO BE EXECUTED THE LAYOUTDRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT OR SPECIALIST DRAWINGS AND SPECIFICATIONS .
2. 2.DO NOT SCALE FROM THE LAYOUT DRAWINGS WORK ACCORDING TO ARCHITECTURAL OR ELECTRICAL DETAILSunLESS OTHERWISE AUTHORIZED .
3. ALL EQUIPMENT LAYOUTS ARE PROVISIONAL . FINAL LAYOUT SHALL BE DETERMINED BY THE CONTRACTOR FROM THE CONSTRUCTION /SHOP DRAWINGS AND AFTER COORDINATION WITH OTHER TRADES .
4. THE SIZE OF CONDUITS AND /OR CABLE TRAYS IS IN GENERAL NOT SHOWN ON DRAWINGS . THE SIZE OF ALL CONDUITS AND/OR CABLE TRAYS SHALL BE SELECTED BY THE CONTRACTOR IN ACCORDANCE WITH BOQ ,REGULATIONS AND /OR STANDARDS AND WILL BE FUNCTION OF THE NUMBER AND SIZE OF THE RESPECTIVE CONDUCTORS.
5. PERFORATED CABLE TRAY SHALL BE FIXED AND COVER PROPERLY AND SHALL NOT FIXED DIRECT TO ROOF SLAB .
6. EARTH CONTINUITY CONDUCTORS ARE NOT INDICATED ON THE DRAWINGS , BUT SHALL BE RUN WITH ALL CIRCUITS IN ACCORDANCE WITH SPECIFICATIONS , REGULATIONS AND/OR STANDARDS.
7. THE COLOR CODE FOR A FOUR WIRE CIRCUIT IS - ONE BLACK, - ONE RED , ONE BLUE AND ONE YELLOW ANY CONDUCTOR INTENDED FOR GROUNDING PURPOSE SHALL BE GREEN WITH YELLOW STRIPE .
8. CONTRACTOR RESPONSIBLE TO DISCONNECT ALL WIRING IN EXISTING DISTRIBUTION BOARD AND RECONNECTED IN NEW DISTRIBUTION BOARD AS PER SINGLE LINE DIAGRAM .
9. THE CONTROL AND /OR SWITCHBOARDS FOR THE DIFFERENT SYSTEMS SUCH AS THE AIR ONDITIONING EQUIPMENT MACHINES , ....E TC . WILL BE IN THE SCOPE OF SUPPLY OF THE SYSTEM SUPPLIER . THE ELECTRICAL CONTRACTOR WILL BE RESPONSIBLE FOR FURNISHING AND INSTALLING THE CABLE FEEDERS TO THESE BOARDS, HOOKING UP OF

- EQUIPMENT WILL BE THE SYSTEM SUPPLIER RESPONSIBILITY.
10. CONDUCTORS FOR SINGLE PHASE SOCKETS OUTLETS CIRCUITS SHALL BE 4MM COPPER CONDUCTORS AND PROTECTED BY 16A CIRCUIT BREAKERS UNLESS OTHERWISE INDICATED.
11. IN THE ABSENCE OF ANY INDICATION ON THE DRAWINGS OR THE SPECIFICATIONS, THE INSTALLATIONS SHALL BE DONE TO THE SATISFACTION OF THE ENGINEER.
12. THE CONTRACTOR SHALL PROVIDE ALL IRON ANGLES, AND FIXING ACCESSORIES REQUIRED FOR COMPLETE INSTALLATION OF LIGHTING FIXTURES, OUTLETS & ROUTES.
13. FOR EXACT QUANTITY, TYPE & LOCATION OF ELECTRICAL OUTLETS REFER TO INTERIOR DESIGN DOCUMENT.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MODIFYING THE NO. OF CIRCUIT BREAKERS, RATING, AND WIRING ACCORDING TO MANUFACTURER DATA WITHOUT ANY EXTRA COST.
15. ALL DISCONNECT SWITCHES FOR A/C SHALL BE ADJACENT TO THE UNIT..
16. UNLESS OTHERWISE INDICATED MINIMUM SIZE CONDUIT;
  - FOR EXTERIOR INSTALLATION IS 25MM DIAMETER OR AS SHOWN IN PANEL SCHEDULE.
  - FOR INTERIOR INSTALLATION IS 25MM DIAMETER OR AS SHOWN IN PANEL SCHEDULE.
17. CONTRACTOR SHALL PROVIDE MATCHING PLUG IN FOR ALL SPECIAL OUTLETS.
18. CONTRACTOR RESPONSIBLE FOR CHANGE ALL EXISTING FLORESCENT TUBE (T) 8LIGHT BY LED TUBE (T) 8INCLUDE ALL OPERATION ACCESSORIES FOR ALL LIGHTING FIXTURES AS PER BOQ.
19. LED LAMPS SHALL BE FURNISHED AND INSTALLED IN ALL LIGHTING FIXTURES.
20. ALL OUTDOOR WIRING ACCESSORIES SHALL BE WEATHER PROOF TYPE.
21. FOR GROUND-FAULT CIRCUIT INTERRUPT (GFCI) REFER TO PLANS AND PANEL SCHEDULES.
22. THE MINIMUM SEPARATE DISTANCE BETWEEN LOW CURRENT SYSTEMS & LOW VOLTAGE POWER CABLES IS 300MM.
23. THE MAXIMUM FILLING RATIO FOR POWER & COMMUNICATION CONDUITS IN SITE WORK ARE:
  - MIN50. MMD FOR POWER CABLE WITH MAX 40%. OF CONDUIT CAPACITY.
  - MIN50. MMD FOR LOW CURRENT SYSTEMS WITH MAX

- 40%. OF CONDUIT CAPACITY.
24. ALL C.BS WITH FRAME RATING LARGER THAN 100A SHOULD HAVE ADJUSTABLE THERMAL OVERLOAD SETTING.
25. CONTRACTOR SHALL PROVIDE CONTROL CONDUIT & WIRING AS PER OPERATIONAL REQUIREMENTS SHOWN ON HVAC AND PLUMBING DRAWING.
26. EXACT METHOD OF JOINING CABLE TRAYS,AND CABLE TRUNKING SHALL BE IN ACCORDANCE WITH THE RESPECTIVE MANUFACTURERS RECOMMENDATION USING PROPER COMPONENT.
27. GROUNDING TO LOW CURRENT SYSTEMS SHALL BE SEPARATE GROUNDING PIT AND CONNECTED TO BUILDING GROUNDING NETWORK.
28. THE DISTANCE BETWEEN EARTH PIT SHALL BE DOUBLE OR MORE THAN LENGTH OF EARTHING ROD.
29. THE CONTRACTOR SHOULD PROVIDE COMPLETE CENTRAL INTERFACE BETWEEN THE SOLAR GENERATION SYSTEM & GENERATOR SET.
30. THE DIMENSION OF ELECTRICAL PANELS AND EQUIPMENT'S SHALL BE AS PER APPROVED FABRICATOR / SUPPLIER SHOP DRAWING.
31. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALL SUITABLE VENTILATION SYSTEM IN BATTERY ROOM TO ASSURING REFRESHING AIR FLOW INSIDE ROOM . CONTRACTOR RESPONSIBLE TO DISTRIBUTE ALL DISTANCE BETWEEN ALL SYSTEM COMPONENTS INSIDE BATTERY ROOM AS PER MANUFACTURE INSTALLATION INSTRUCTION.

PREPARED BY:

UNOPS

OPERATIONAL EXCELLENCE  
FOR RESULTS THAT MATTER.

SANAA - YEMEN.

FUNED BY:

 WORLD BANK GROUP

WORLD BANK GROUP.

PROJECT TITLE:

CHILDREN CENTER FOR AUTISM

PROJECT LOCATION:

ADEN - YEMEN

DRAWING TITLE:

MAIN NOTES

DRAWING TYPE:

ELECTRICAL PLAN

DESIGN-BY:

CHECKED-BY:

APPROVED-BY:

STATUS:

STATUS

PROJECT NO:

IUS-OPS-ESC-ADN-049.1

DATE:

OCT.,30TH,2019

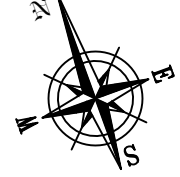
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A3

SCALE:

SCALE

NORTH:



DRAWING NO:

E-01



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OPERATIONAL EXCELLENCE  
FOR RESULTS THAT MATTER.  
SANA'A - YEMEN.

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PROJECT TITLE:  
CHILDREN CENTER FOR AUTISM

PROJECT LOCATION:  
ADEN - YEMEN

DRAWING TITLE:  
GOOGLE EARTH IMAGE

DRAWING TYPE:  
ELECTRICAL PLAN

DESIGN-BY:

CHECKED-BY:

APPROVED-BY:

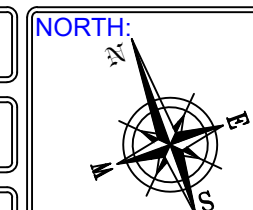
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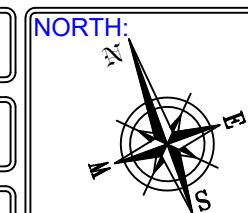
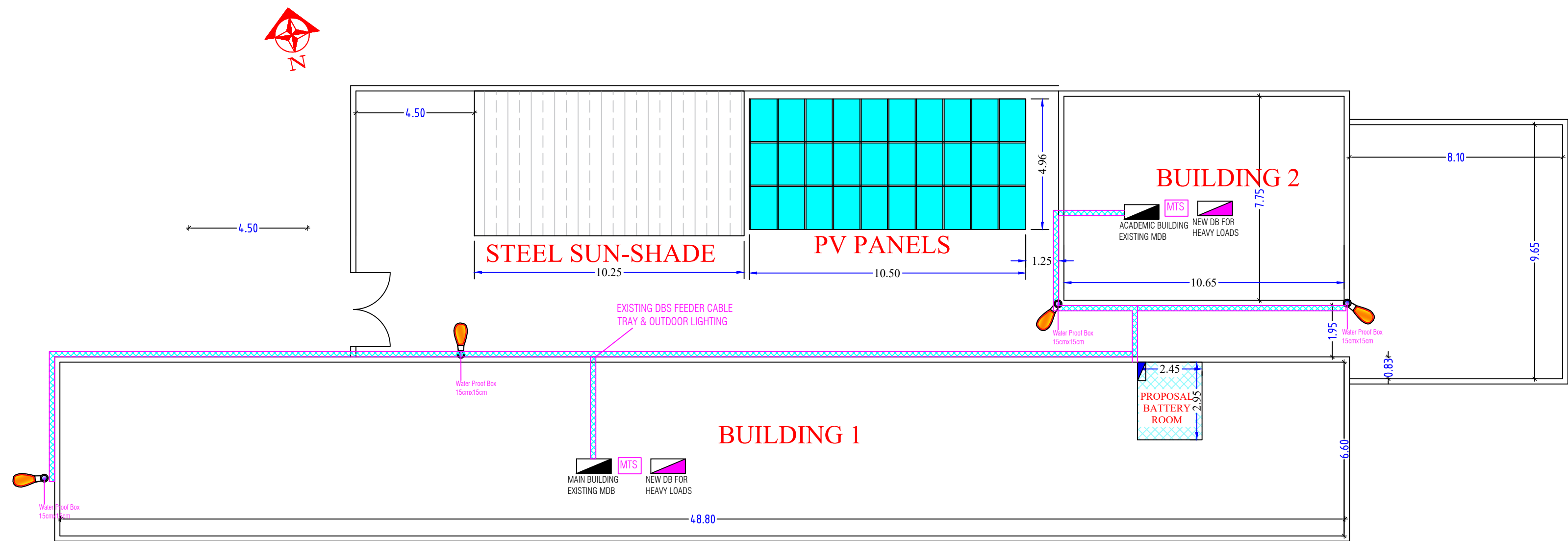
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OCT.,30TH,2019

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SCALE:  
SCALE



DRAWING NO:  
**E-02**








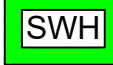


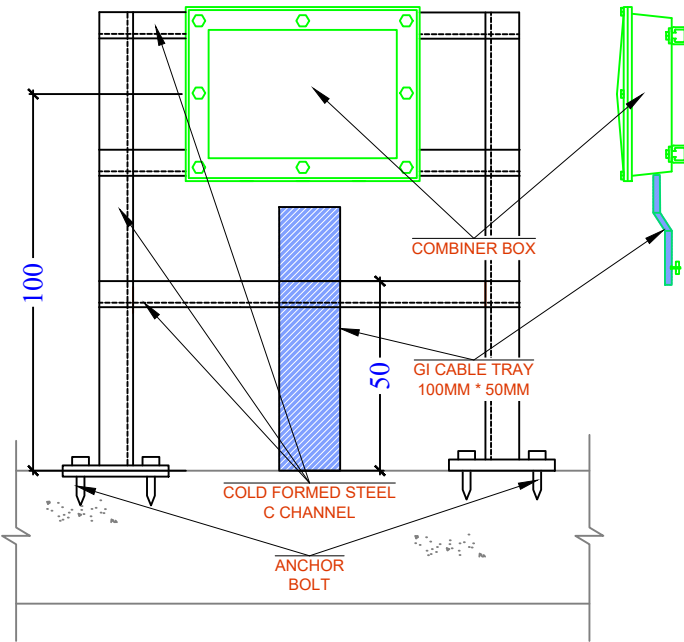


REMARKS:

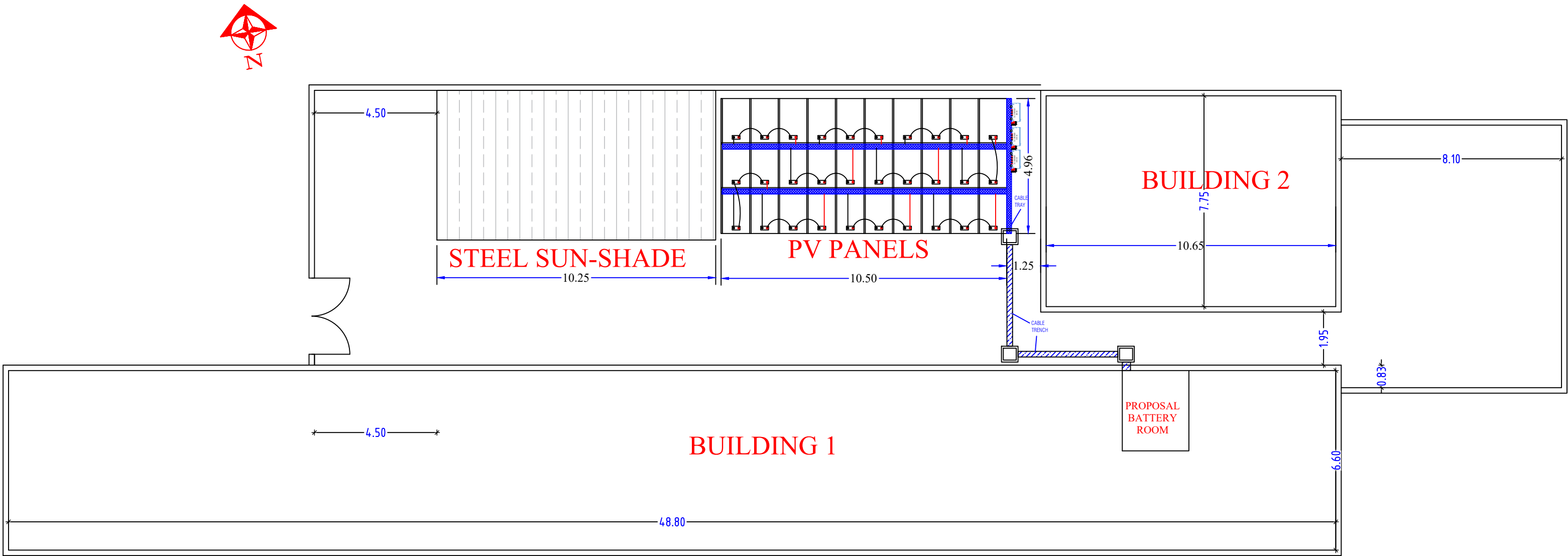
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- 2. ALL DIMENSIONS TO BE CHECKED AND CONFIRMED ON SITE BEFORE COMMENCEMENT OF ANY WORK.
- 3. ANY DISCREPANCY TO BE REPORTED TO THE UNOPS SITE ENGINEER/ PROJECT MANAGER PROMPTLY BEFORE PROCEEDING.
- 4. ALL OUTDOOR OUTLETS, SOCKET OR WIRING ACCESSORIES SHALL BE WEATHER PROOF TYPE.
- 5. ALL DISTANCE BETWEEN SYSTEM COMPONENTS INSIDE BATTERY ROOM TO BE DISTRIBUTE AS PER MANUFACTURE INSTALLATION INSTRUCTION.

LEGEND:

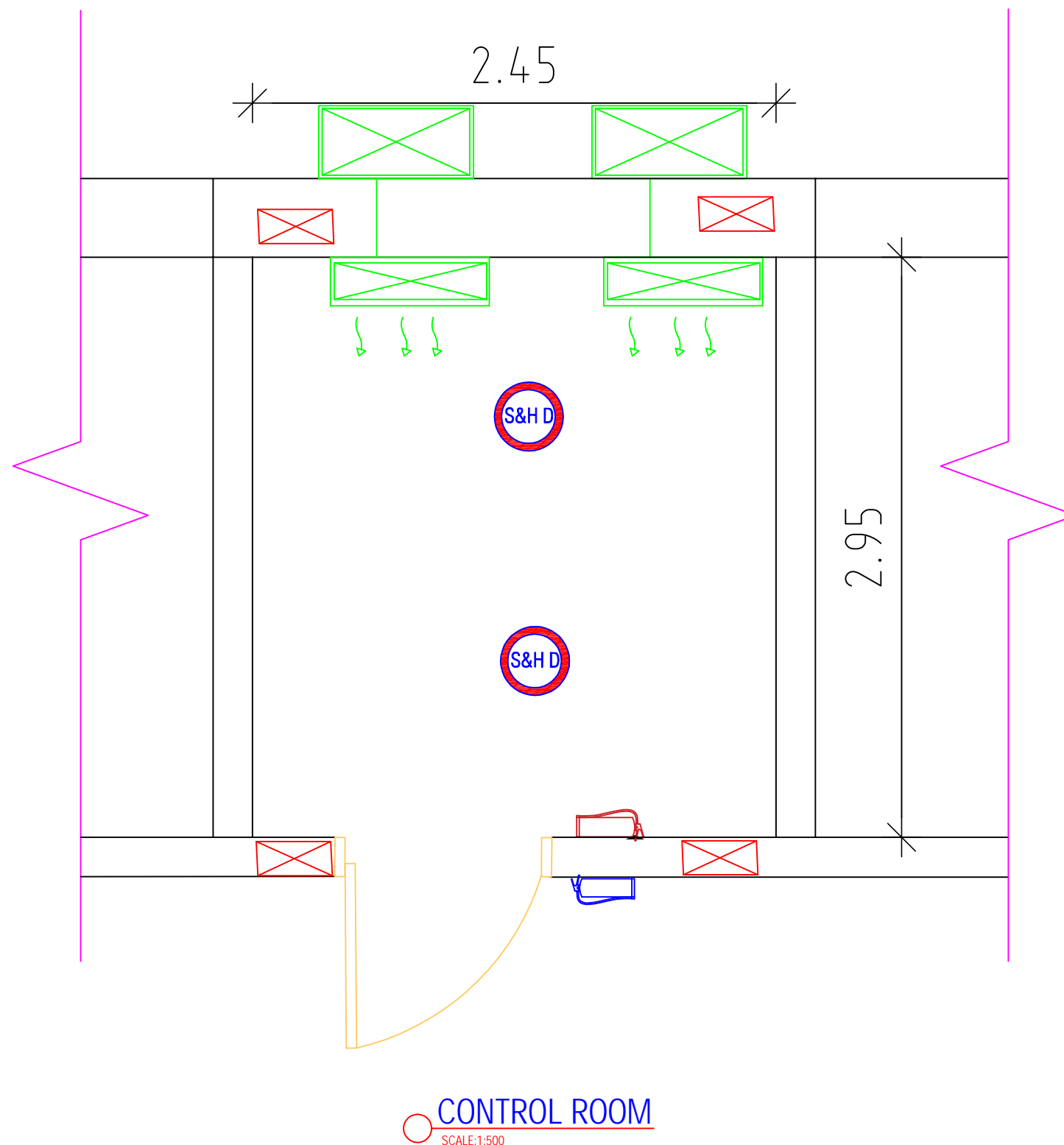
	PHOTOVOLTAIC MODULE
	COMBINER BOX
	SOLAR SINGLE CORE CABLE 1C X 6 SQ.MM (RED COLOR)
	SOLAR SINGLE CORE CABLE 1C X 6 SQ.MM (BLACK COLOR)
	SOLAR SINGLE CORE CABLE 1C X 35SQ.MM (RED COLOR)
	SOLAR SINGLE CORE CABLE 1C X 35SQ.MM (BLACK COLOR)
	GALVANIZED CABLE TRAY
	SOLAR WATER HEATER



COMBINER BOX DETAILS  
NOT TO SCALE.





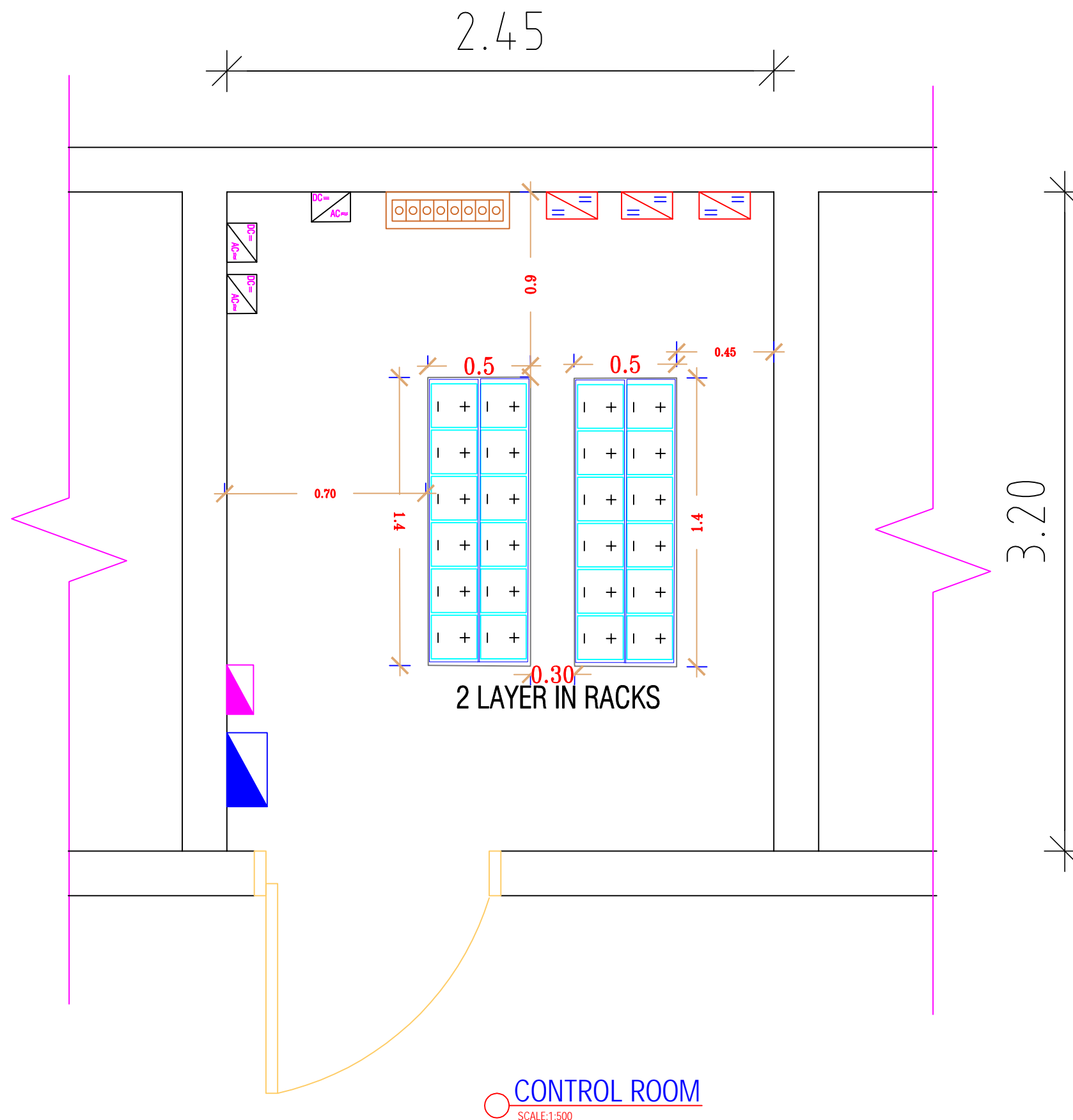


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4. EARTHING PIT SHALL BE CARRY OUT AS BE SITE ENGINEER INSTRUCTION.

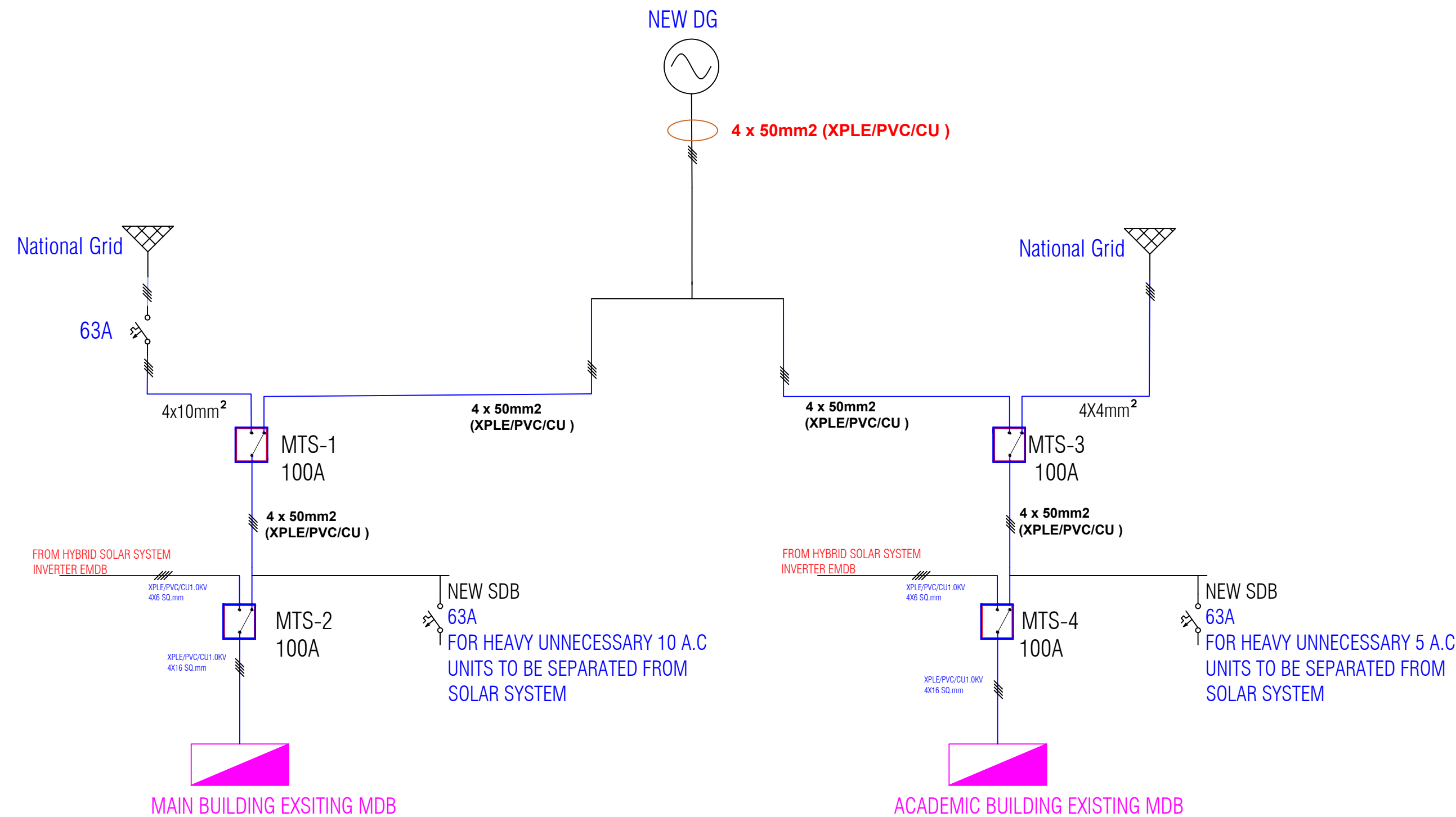
SYMBOL	DESCRIPTION
	Air Condition outdoor unit
	Air Condition indoor unit
	Battery Smoke&Heat Detector
	Powder Fire Extinguisher
	CO <sub>2</sub> Fire Extinguisher
	Exhaust fan





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SYMBOL	DESCRIPTION
	INVERTER
	MPPT BATTERY CHARGE CONTROLLER
	Busbar
	AC COUPLING PANEL
	BATTERY RACK
	EMDB

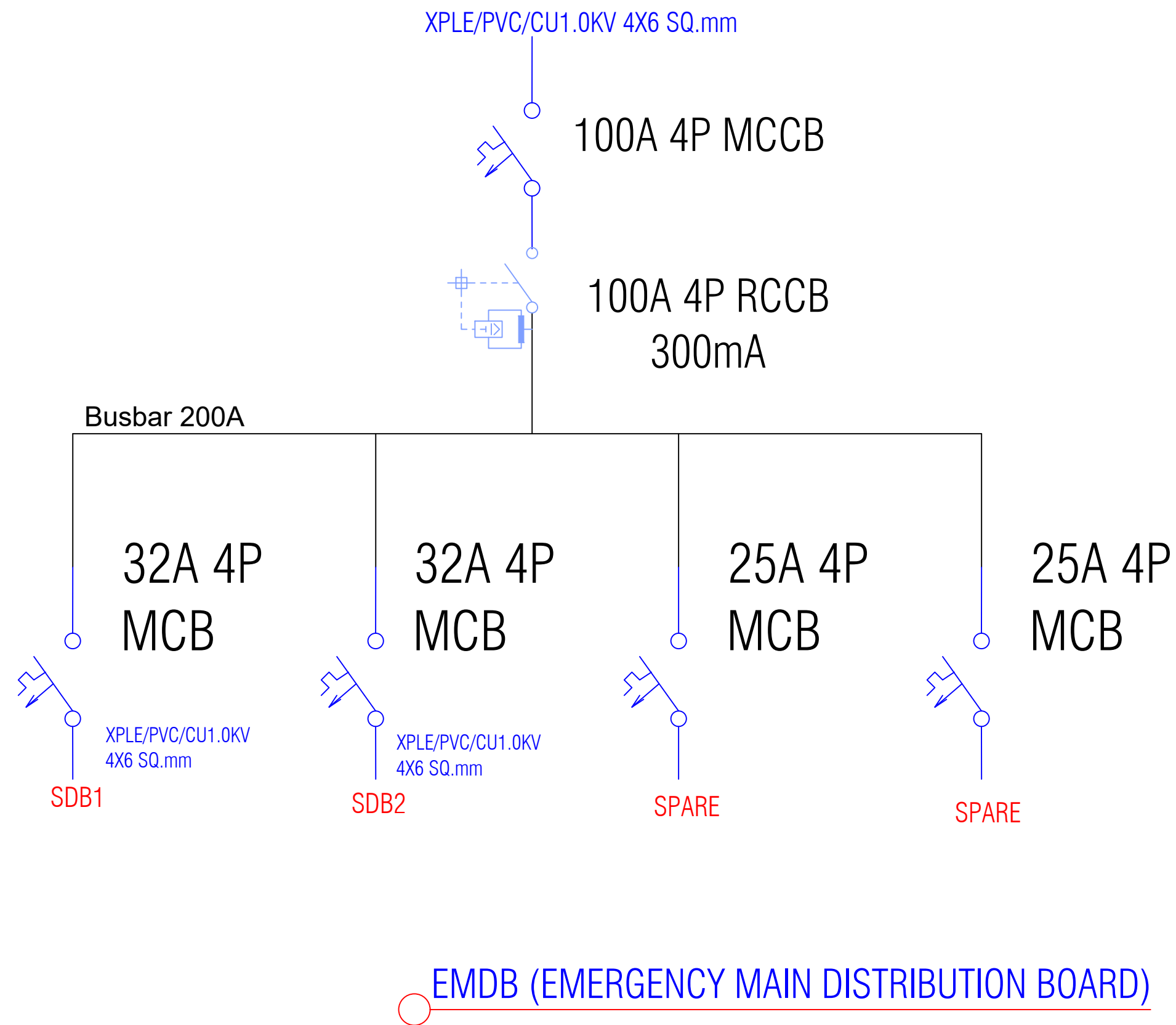


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SYMBOL	DESCRIPTION
	DG DIESEL GENERATOR
	PUBLIC GRID SYSTEM
	MANUAL TRANSFER SWITCH
	DISTRIBUTION BOARD
	MCCB

ELECTRICAL SLD  
SCALE:1:500



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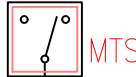

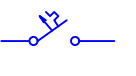

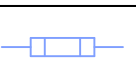
SYMBOL	DESCRIPTION
	MANUAL TRANSFER SWITCH
	SURGE ARRESTER
	CIRCUIT BREAKER (MCCB/MCB)
	CIRCUIT BREAKER (RCB)
	AC FUSE

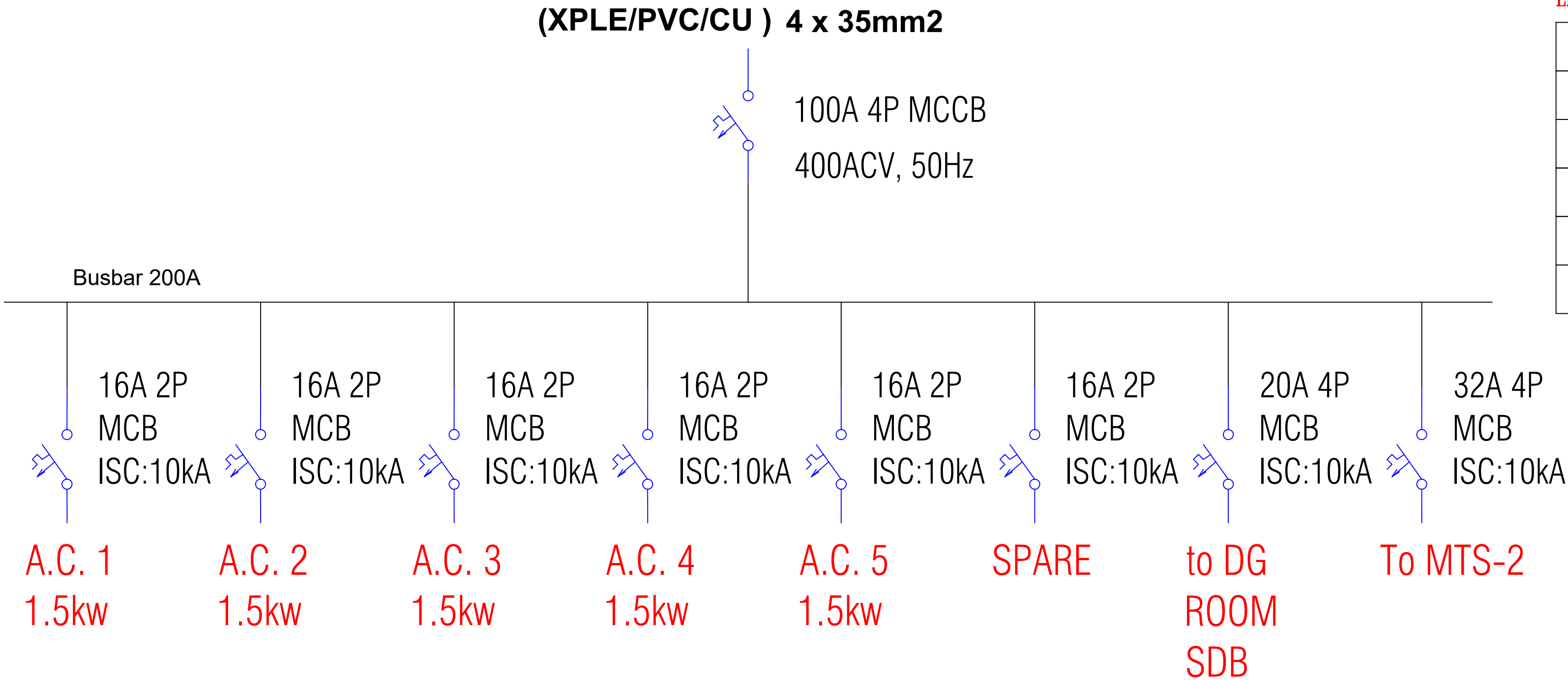


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LEGEND:

SYMBOL	DESCRIPTION
	MANUAL TRANSFER SWITCH
	SURGE ARRESTER
	CIRCUIT BREAKER (MCCB/MCB)
	CIRCUIT BREAKER (RCB)
	AC FUSE

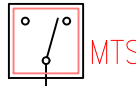

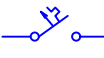




ACADEMIC BUILDING HEAVY LOADS NEW SDB

REMARKS:

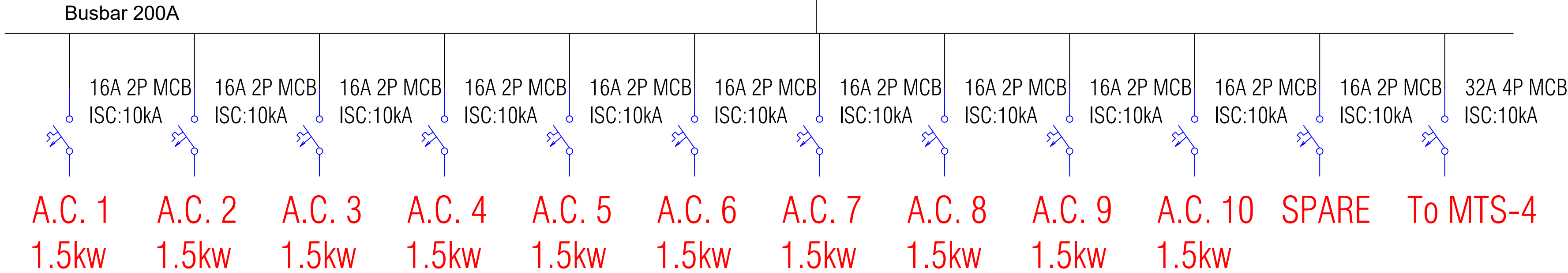
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LEGEND:

SYMBOL	DESCRIPTION
	MANUAL TRANSFER SWITCH
	SURGE ARRESTER
	CIRCUIT BREAKER (MCCB/ MCB)
	CIRCUIT BREAKER (RCB)
	AC FUSE


(XPLE/PVC/CU ) 4 x 35mm2

100A 4P MCCB  
400ACV, 50Hz



CENTER MAIN BUILDING HEAVY LOADS NEW SDB

PREPARED BY:



UNOPS  
OPERATIONAL EXCELLENCE  
FOR RESULTS THAT MATTER.  
SANA'A - YEMEN.

FUNED BY:



WORLD BANK GROUP  
WORLD BANK GROUP.

PROJECT TITLE:

CHILDREN'S CENTER FOR AUTISM

PROJECT LOCATION:

ADEN - YEMEN

DRAWING TITLE:

CENTER TARGETED LOADS DB

DRAWING TYPE:

ELECTRICAL PLAN

DESIGN-BY:

CHECKED-BY:

APPROVED-BY:

STATUS:

STATUS

PROJECT NO:

IUS-OPS-ESC-ADN-049.1

DATE:

OCT.30TH,2019

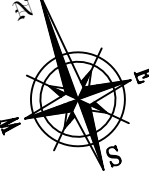
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SCALE:

SCALE

NORTH:

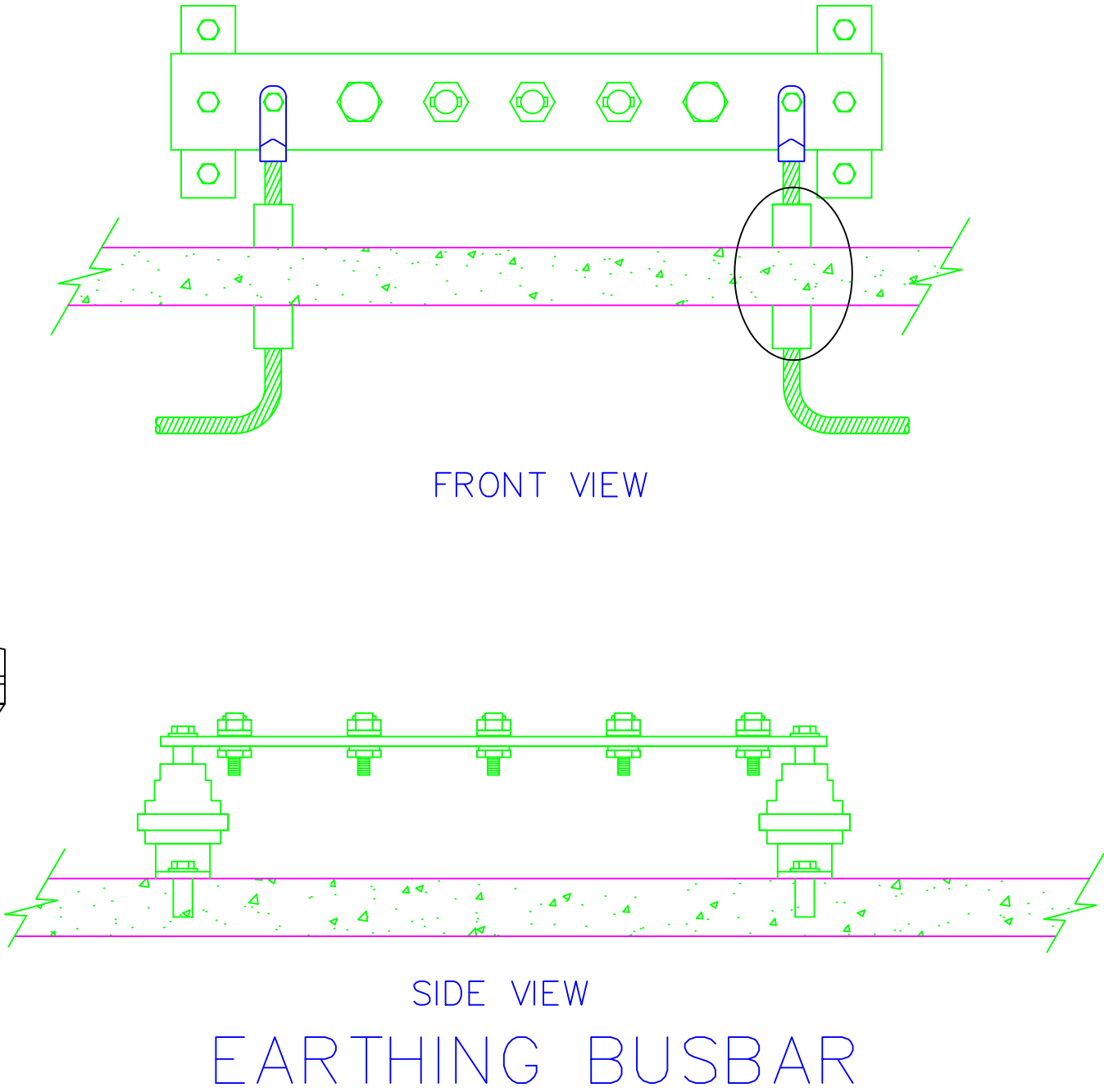
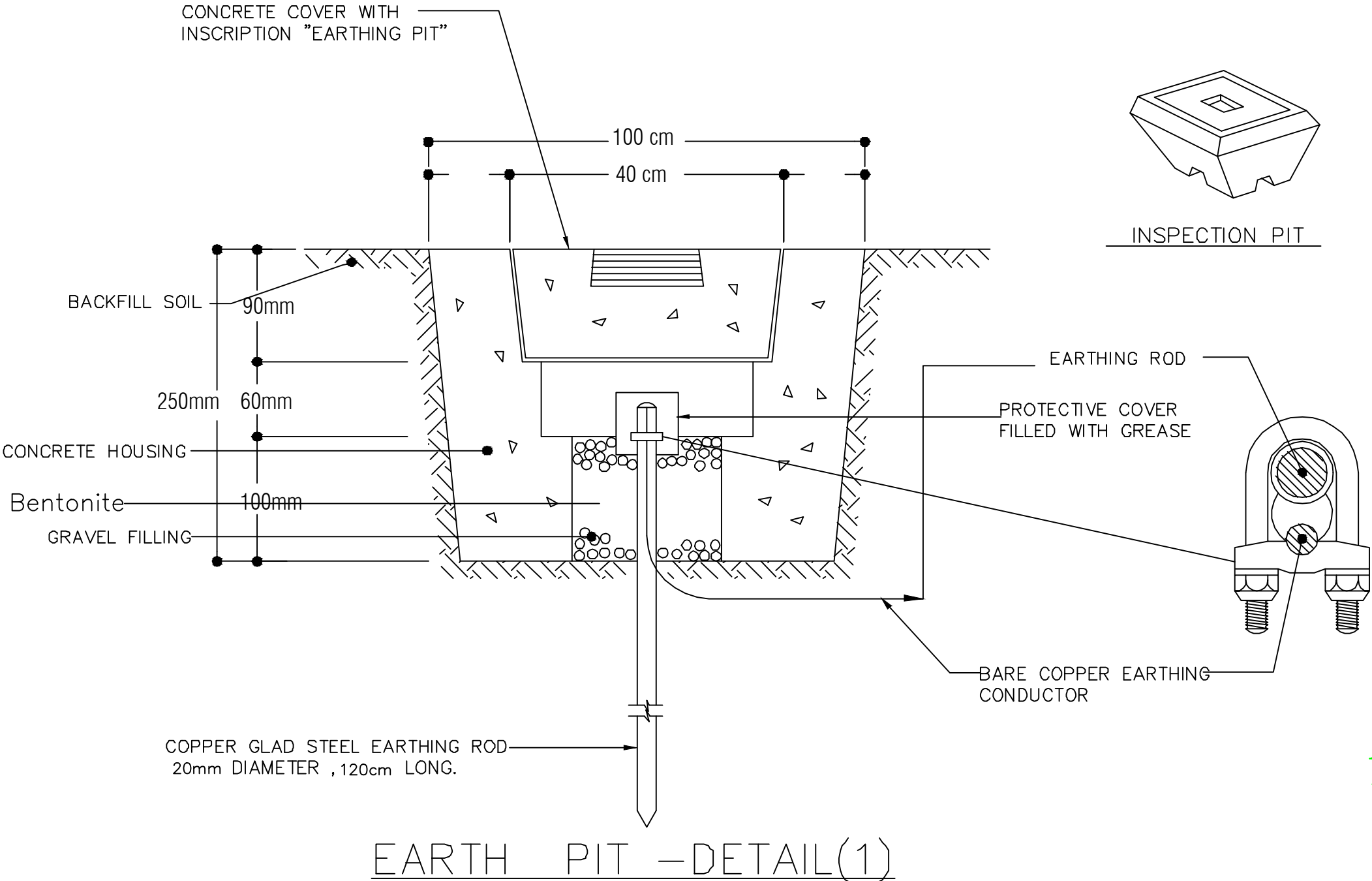


DRAWING NO:

E-11

REMARKS:

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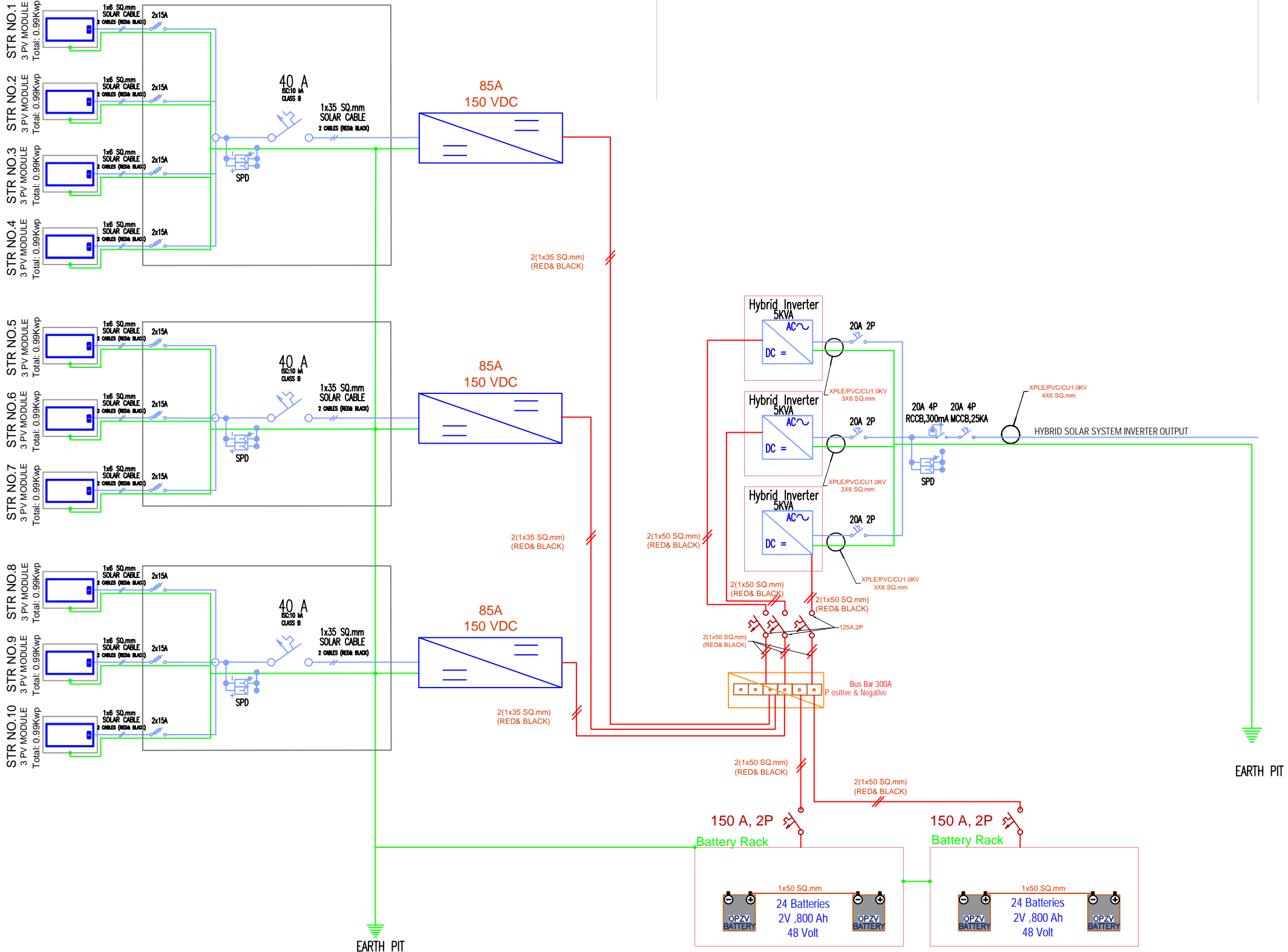


PV Module Connection

Combiner Box

Battery Charger

Hybrid INVERTER



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4. NEW DISTRIBUTION BOARD SHALL BE INSTALL IN THE SAME LOCATION OF EXISTING ONE.

LEGEND:

SYMBOL	DESCRIPTION
	PHOTOVOLTAIC MODULE
	HYBRID INVERTER
	MANUAL CHANGE OVER
	MPPT BATTERY CHARGER
	SURGE ARRESTER
	CIRCUIT BREAKER (MCB)
	CIRCUIT BREAKER (RCBO)
	DC FUSE
	POSITIVE & NEGATIVE CONNECTION BOX
	DC SWITCH ISOLATOR