



SolBank3.0 Decommissioning Manual

V1.0

1 Preface

1.1 Document Purpose and Scope

The purpose of this document is to provide an overview of the processes and procedures required to decommission a SolBank 3.0 Energy Storage System (ESS). The scope of this manual is limited to only those tasks applicable to decommissioning of this product. Topics covered include pre-decommissioning inspections and checks, equipment disassembly, and removal.

This manual should be made available to all field personnel participating in the design and decommissioning of the SolBank3.0 energy storage system.

This manual is to be considered supplemental to project specific design and safety documentation. Please read and understand all aspects of this document prior to initiating SolBank3.0 decommissioning.

For any questions that arise, please contact your e-STORAGE service representative.

1.2 Applicable Models

This manual covers the following models only:

- CSI-SolBank-S-5016-2h-NA
- CSI-SolBank -S-5016-4h-NA
- CSI-SolBank -S-5016-2h-EU
- CSI-SolBank -S-5016-4h-EU
- CSI-SolBank -S-5016-2h-AUS
- CSI-SolBank -S-5016-4h-AUS

1.3 Reference Documents

The SolBank3.0 Decommissioning Manual exists as part of the library of product specific documents. Please consult the following documents to ensure a comprehensive understanding of SolBank3.0 attributes.

- *SolBank3.0 Installation Manual*
- *SolBank3.0 User Manual*
- *SolBank3.0 Safety Manual*
- *SolBank3.0 Maintenance Manual*
- *SolBank3.0 Commissioning Manual*
- *SolBank3.0 Decommissioning Manual*
- *SolBank3.0 Transportation Instruction Document*

1.4 Version Control

As part of e-STORAGE's continuous improvement process, e-STORAGE reserves the right to make technology and document changes. Please contact e-STORAGE to verify this manual reflects the most recent release or to report omissions or inaccuracies.

Version	Description	Date of Issuance
SolBank3.0 Decommissioning Manual_V1.0	Initial publication date	2024.7.16

1.5 Document Safety Notices

Throughout this manual the below indicated labels are used to convey hazards associated with specific tasks and procedures. These safety notices do not represent all hazards present when performing a given task. Installers and operators of the SolBank3.0 should adhere to industry safety best practices; site specific Environmental, Health and Safety plans, and local safety requirements and regulations. Only properly trained, authorized, and qualified personnel are permitted to complete the decommissioning procedures identified in this manual.

Labels	Explanation
	UKCA mark of conformity.
	CE mark of conformity.
	Indicates a hazardous situation which, if not avoided, could result in death or serious injury. Indicators are not used for property damage hazards unless personal injury risk appropriate to this level is also involved.
	Label the product as inflammable and explosive, and do not involve open flame.
	Electrical hazard sign, non-professional personnel do not approach. Professional personnel are required to perform maintenance and operation.
	Do not discard randomly
	Recycling equipment

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3 Acronyms and Abbreviations

AC – Alternating Current

AHJ – Authority Having Jurisdiction
BMS – Battery Management System
BOL – Beginning of Life
DMC – Distribution Management Cabinet
DC – Direct Current
EMS – Energy Management System
EOR – Engineer of Record
ESS – Energy Storage System
COG – Center of Gravity
HVAC – Heating Ventilation Air Conditioning
IFC - Issued for Construction
LFP – Lithium Iron Phosphate
LOTO – Lock-Out-Tag-Out
NFPA – National Fire Protection Association
PCS – Power Conversion System
PPE – Personnel Protective Equipment
SPD – Surge Protection Device
UPS – Uninterruptible Power Supply

4 Introduction

4.1 System Overview

The SolBank3.0 system integrates all power electronics, controls, and safety features required to support a battery energy storage system. An overview of the SolBank 3.0 layout and key features is shown in Figure 1 and further described in Table 2.

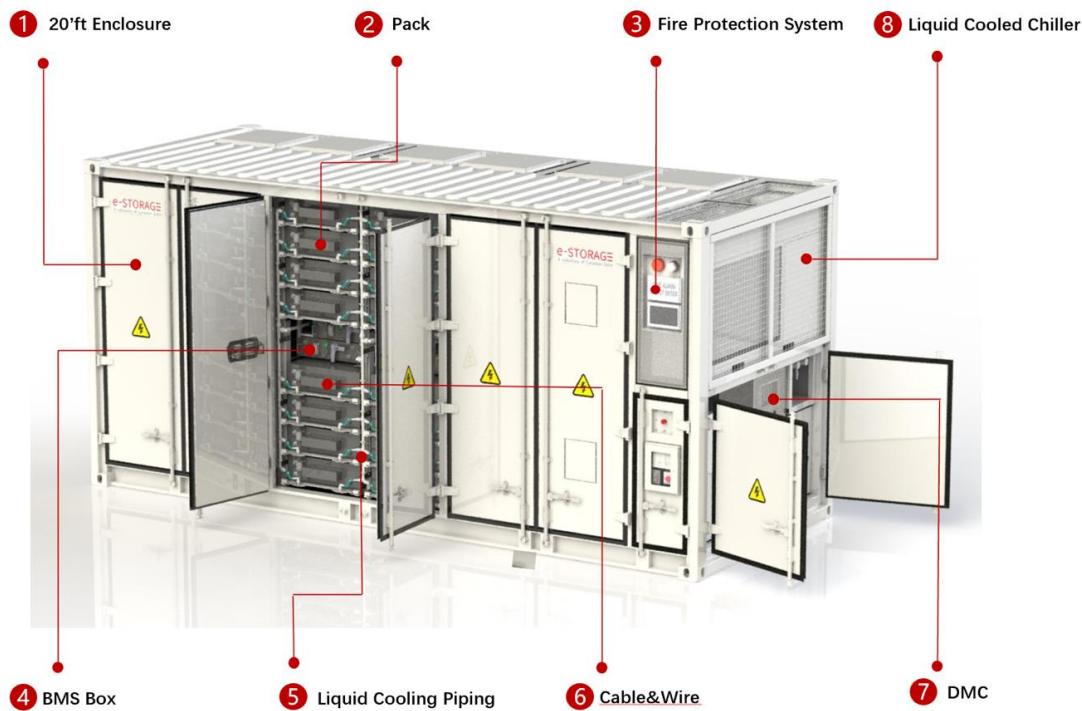


Figure 1: Layout and features of the

Solbank3.0

Table 2: Key System Features

NO.	Name	Remarks
1	Standard Enclosure and Rack	All models of the SolBank3.0 utilize a standard IP55 rated 20'ft HC container and battery rack design allowing for enhanced system modularity.
2	Pack	The SolBank3.0 contains 48 Lithium Iron Phosphate (LFP) battery packs, each consisting of 104 series wired battery cells.

3	Fire Protection System	The SolBank3.0 combines heat, smoke and gas detection with an explosion-proof ventilation system.
4	BMS Box	The SolBank3.0 contains 12 BMS boxes. These are easily accessed for installation and maintenance within the middle line of the container. The BMS ensures optimal battery functionality and safety.
5	Liquid Cooling piping	The liquid-cooled piping connects the chiller to the packs.
6	Cable & Wire	High-voltage connection and low-voltage communication power cable.
7	DMC	The Distribution and Control Cabinet houses all aux power distribution equipment including 2-hour backup UPS; system communication, control, and monitoring hardware including network switch, and Local EMS, and all required customer communication, signal, and aux power interfaces.
	Junction Box	The SolBank3.0's DC Junction box contains all primary DC busbar, fusing, Surge Protection Devices (SPD), and power monitoring required to safely exchanged power between the SolBank3.0 and PCS.
8	Chiller	The SolBank3.0's liquid cooling/heating system facilitates improved battery temperature management efficiency relative to traditional forced air systems. Each battery pack is liquid cooled, allowing for greater heat dissipation and uniform cell temperature management. During charge and discharge, cell temperature is maintained between 20°C - 35°C.

4.2 System Specifications

The SolBank3.0 system has two models, as shown in Table 3 below. Each model has varying C-rate, power, and energy characteristics. Battery string size, nominal voltages, form factor, and physical dimensions remain consistent across all models.

Table 3: SolBank3.0 (DC 1324.8V) Specifications.

Item	Parameters	
Discharge Duration	2-hour	4-hour

Charge/Discharge C-rate	0.5P	0.25P
BOL Cell Energy (kWh)	5016	5016
Usable Energy (kWh)	4700	4800
Voltage Range (VDC)	1164.8 V ~ 1497.6 V	1164.8 V ~ 1497.6 V
Recommended Discharge Power (kW)	2350	1200
# of LFP Battery Packs	48	48
# of HV BMS	12	12
Operating temperature	-30°C to 55°C (External environment ambient temperature) 5°C to 45°C (Battery compartment Interior temperature)	

4.2.1 System Dimensions and Weight

SolBank3.0 dimensions and weights are shown below. System weights may vary with product characteristics. Verify the design weight and center of gravity (COG) shown in Figure 2 used for the lifting plan. The shipping weight should also be verified prior to completing the lifting plan and initiating the SolBank3.0 offloading process. See Section 6 for details.

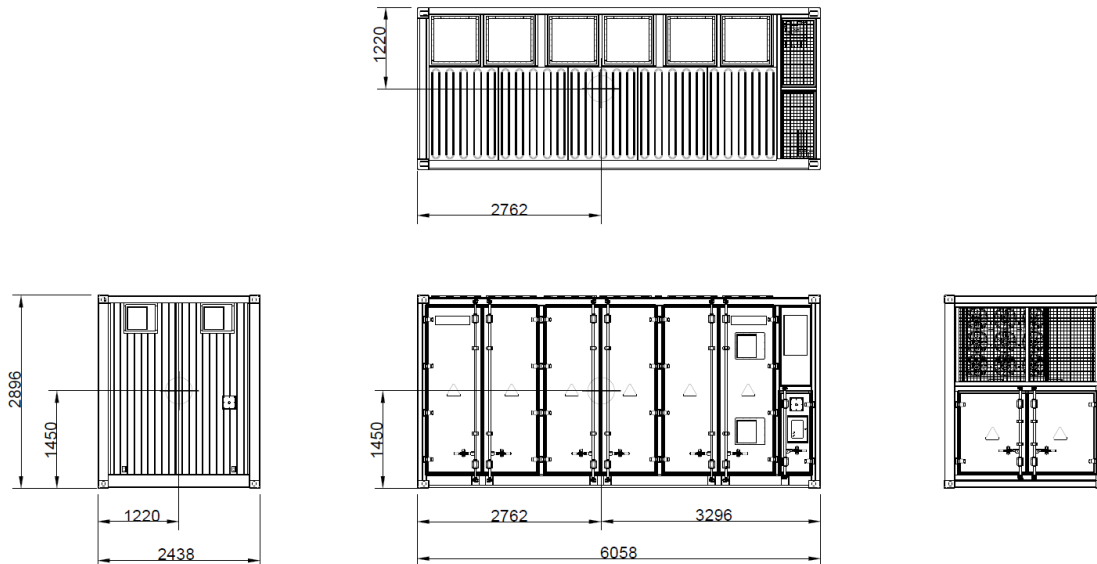


Figure 2 SolBank3.0 Center of Gravity



Figure 3 SolBank3.0 Dimensions

Product Version	Length (mm)	Depth (mm)	Height (mm)	Approximate Standard Weight (kg)
SolBank3.0	6058	2438	2896	43,000

5 Pre-Decommissioning Procedures

5.1 SolBank3.0 Inspection

This section details inspection processes that must be completed prior to initiation of decommissioning procedures.

5.1.1 Precautions



Batteries cannot be de-energized. Although the battery packs will not be electrically interconnected, risk of electrocution exists. Exercise extreme caution.



High DC voltage present. Properly rated insulated gloves, insulated footwear, insulated tools, arc flash clothing, and face shields are recommended when working around batteries and energized circuits.



Ensure DC Disconnects are open and battery strings are isolated from PCS when working on system.



Always employ proper lock-out-tag-out (LOTO) procedures when on circuits or equipment that can be energized.



All tasks described in this Section must be performed by appropriately qualified personnel.



PPE is required during all stages of this process. Refer to EH&S plan for task-specific requirements.



The SolBank3.0's thermal management system contains both Ethylene Glycol solution and refrigerant. Both can be hazardous to personnel and the environment. Consult MSDS within Annexes for precautions and PPE advisement.



The SolBank3.0's battery pack contains electrolyte. Electrolyte can be hazardous to personnel and the environment. Consult MSDS within Annexes for precautions and PPE advisement.



Always consult CSI before performing work on the SolBank3.0's thermal management system. Equipment damage may result from improper operation and maintenance.

5.1.2 Inspections

- **SOC:** Ensure that the battery SOC range complies with local transportation safety regulations.
- **Battery:** Battery should be checked for leakage or swelling. If there is battery leakage or swelling, it needs to be packaged in accordance with local transportation safety regulations.
- **Coolant:** Coolant can remain in the system for shipping from project site to recycle. The cabinet floor should be inspected for standing liquid or other signs of leaks. Additionally, transport lines should be visibly inspected for the presence of accumulated droplets, or other damage. If damage is found, document clearly and contact CSI for advisement.

5.2 Pre-Decommissioning Checklist

Prior to initiating SolBank3.0 decommissioning, please ensure the following items are reviewed, inspected, or completed. Note, the below pre-decommissioning checklist may not represent a complete list of all items requiring inspection or completion prior to decommissioning the SolBank3.0 and will need to be developed by a 3rd party. The following is provided for general advisement only.

5.2.1 Safety

- All personnel have proper PPE as dictated by the project specific EH&S plan and safety codes and

regulations

- A safety briefing is held for the specific decommissioning procedures being undertaken
- All personnel are properly qualified and licensed to perform the decommissioning procedures being undertaken
- The site is clean, orderly and all hazards have been mitigated to the extent possible and required by law
- All lock-out-tag-out (LOTO) is complete if required
- Working areas have been properly isolated using marking tape, fencing, and signage as appropriate

5.2.2 Other

- Weather is appropriate for decommissioning procedures
- All required permits and approvals have been obtained

5.3 Tools and Equipment Preparation

The following section provides an overview of key equipment that may be required for disassembly of the SolBank3.0 at the project site. The items indicated in Table 4 must be procured or obtained separately.

Note, Table 4 is provided for planning purposes only and does not reflect all tools, equipment, and construction commodities necessary for a complete disassembly. Always refer to industry best practices and project specific design documentation for specific details regarding disassembly of the SolBank3.0 and the project specific EH&S plan regarding required PPE.

Table 4: Recommended minimum disassembly PPE, tools, equipment

Item	Remarks
Basic PPE	
Hard hat	Protection from impacts from falling objects and other hazards
Safety gloves	Protection from cuts, abrasion, and other hazards
Safety glasses	To protect eyes from contact with foreign objects and airborne debris
Safety toe boots	To protect feet from heavy objects and equipment
Hearing protection	Protection from loud noises generated by machinery and other tools
High visibility vest	To ensure all personnel are seen by equipment operators
Specialty PPE	Arc flash PPE, fall prevention harnesses, and other hazard specific PPE as required by the site conditions and the site EH&S manager or local laws and regulations
First-aid Kit	Basic first-aid kit. To include eye wash station.
Equipment and Tools	

Crane	Crane (and support personnel) meeting capacity and reach requirements as identified in the project specific lifting plan
Forklift	Forklift (and support personnel) appropriately sized for the movement of equipment and materials
Miscellaneous tools	Basic power tools and hand tools required for safe and code compliant mechanical and electrical installation procedures.
Ladder or Man-lift	Used to access the roof of the SolBank3.0. Minimum reach should be 5M (16.4ft). Ladder shall meet OSHA and EH&S plan requirements
Pallet jack	Used for equipment receiving

6 Disassembly

The following sections outline the procedures required to fully disassemble SolBank3.0. Figure4 below provides an overview of the SolBank3.0 disassembly process. These steps must be followed sequentially and be performed by qualified personnel.

During each step of the disassembly, safety is of paramount importance. Please note all safety hazards described in this section and adhere to the project specific EH&S plan.

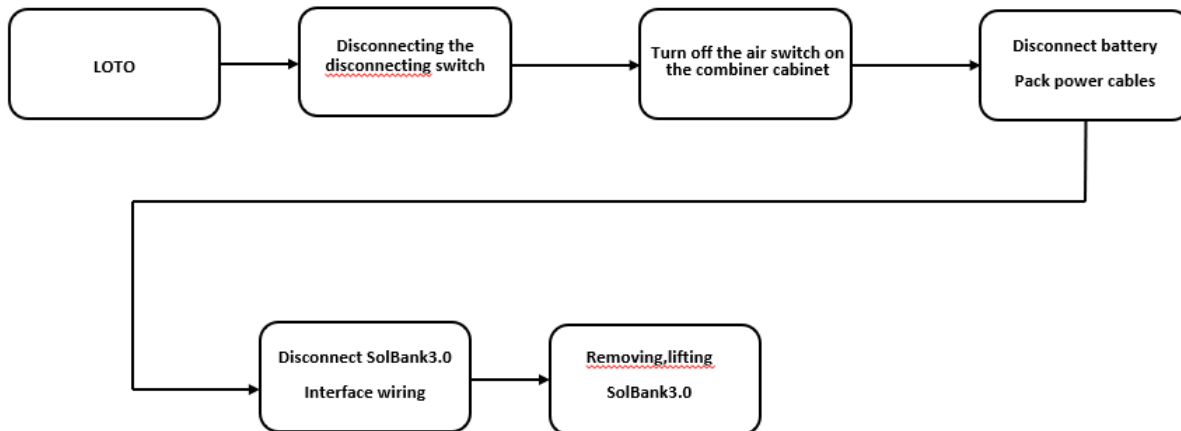


Figure 4. SolBank3.0 Installation disassembly Process Overview

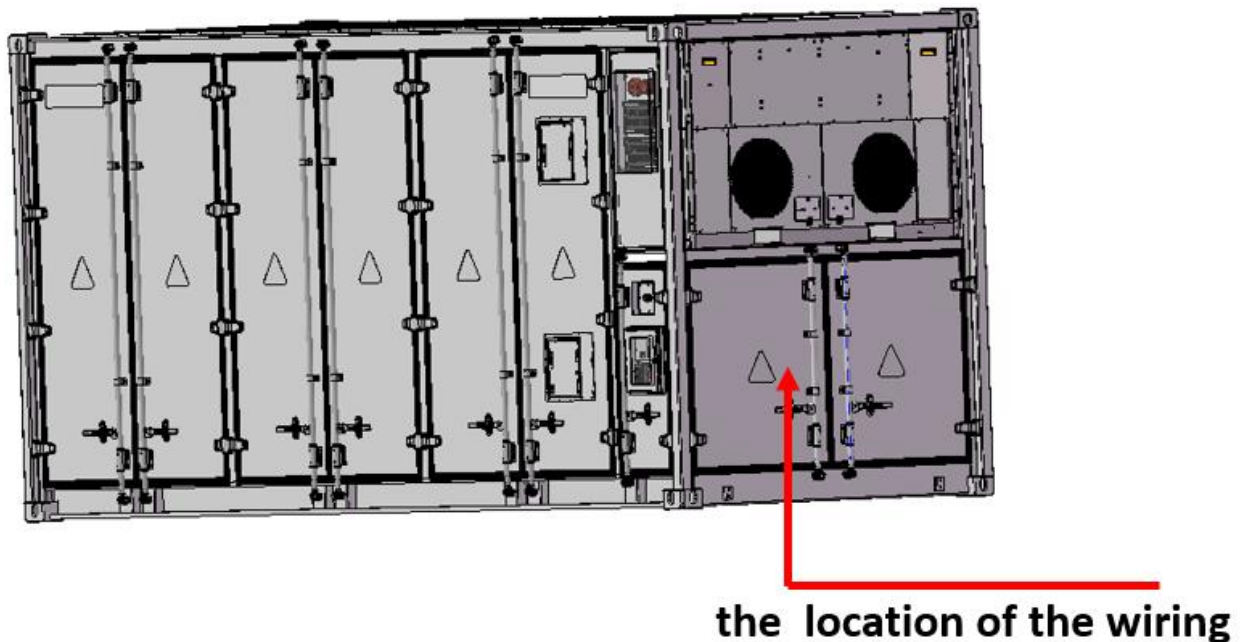


Figure 5. Location of SolBank3.0 field wiring interfaces

6.1 Disconnecting the disconnecting switch

This section details the procedures for disconnecting (opening) the 12 rotary disconnect switches located on the front panel of the BMS (Battery Management System) boxes.

6.1.1 Precautions



High DC voltage present. Properly rated insulated gloves, insulated footwear, insulated tools, arc flash clothing, and face shields are recommended when working around batteries and energized circuits



Ensure DC disconnects are open and battery strings are isolated from PCS when working on system



Always employ proper lock-out-tag-out (LOTO) procedures when on circuits or equipment that can be energized



All tasks described in this Section must be performed by appropriately qualified personnel

6.1.2 Required Tools and Equipment

Table 5: Required Materials

Tool Name	Remarks
PPE	Basic PPE and specialized electrical PPE suitable for high DC voltages per site specific EH&S plan

6.1.3 Disconnecting the disconnecting switch

One SolBank3.0 contains 12 rotary disconnect switches in the BMS Box.

- ✓ **Step 1:** Turn the rotary disconnect switch located on the front panel of the BMS Box from ON to the OFF position. Refer to Figure 6 below.
- ✓ **Step 2:** Continue Steps 1-2 for all 12 rotary disconnect switches in SolBank3.0.

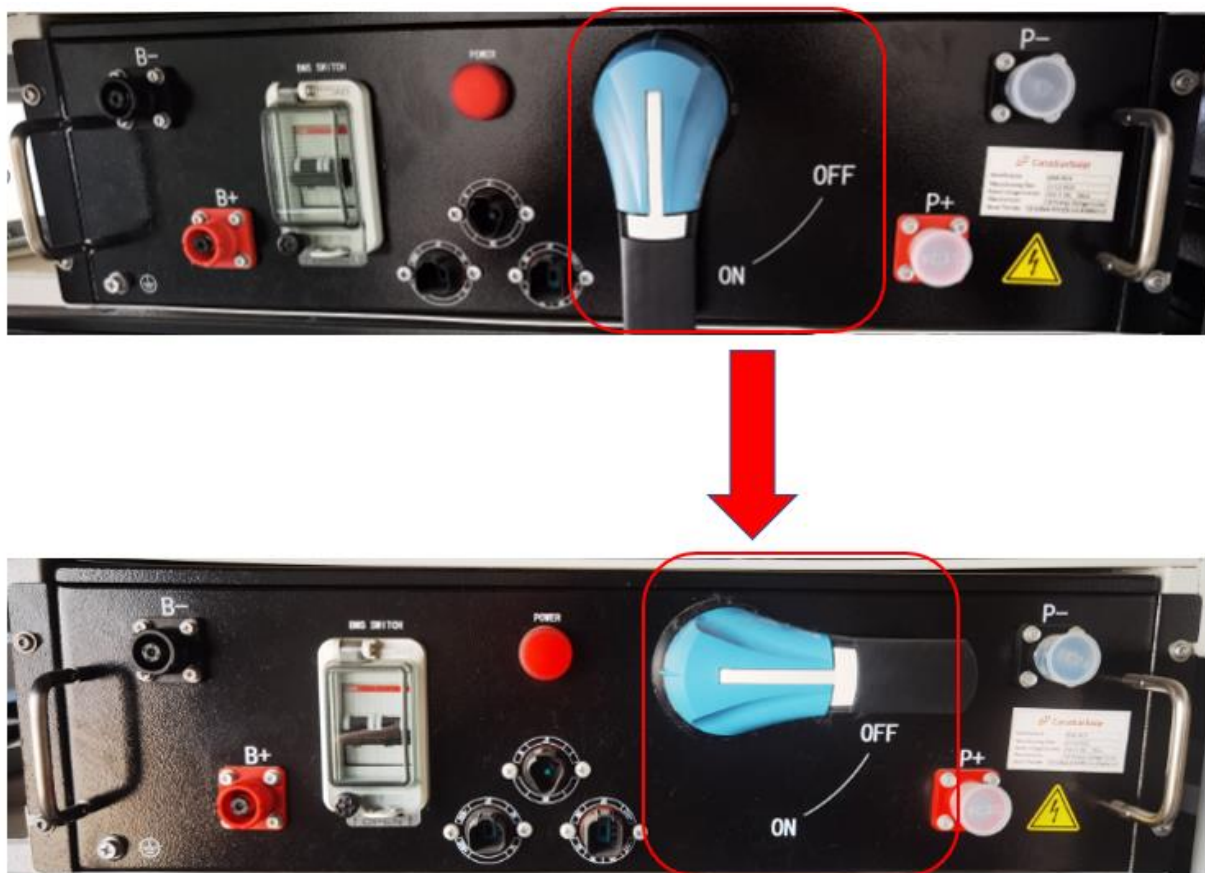


Figure 6. BMS Box

6.2 Turn off the air switch

Disconnect all air switches on the combiner cabinet. Refer to Figure 7 below.



Figure 7.the position of the air switch

6.3 SolBank3.0 Internal Wiring Disconnection

The following sections detail the tasks required to electrically disconnect the SolBank3.0's 48 battery packs.

6.3.1 Required Tools and Equipment

Table 6: Required Materials

Tool Name	Remarks
Basic electrical tools	Scissors

PPE	Basic PPE and specialized electrical PPE suitable for high DC voltages per site specific EH&S plan
-----	--

6.3.2 Precautions



Batteries cannot be de-energized. The risk of electrocution exists. Exercise extreme caution.



High DC voltage present. Properly rated insulated gloves, insulated footwear, insulated tools, arc flash clothing, and face shields are recommended when working around batteries and energized circuits.



Ensure DC Disconnects are open and battery strings are isolated from PCS when working on system



Always employ proper lock-out-tag-out (LOTO) procedures when on circuits or equipment that can be energized.



All tasks described in this Section must be performed by appropriately qualified personnel.



PPE is required during all stages of this process. Refer to EH&S plan for task-specific requirements.

6.3.3 SolBank3.0 Battery Cable disconnection Procedure

The SolBank3.0 contains 48 battery packs and 12 BMS boxes. A typical battery string consists of 4 1P104S battery packs wired in series and connected to a single BMS as shown in Figure 7. 12 such strings exist within each SolBank3.0. The below process describes the field disconnection process. See Figure 8 through Figure 9 for reference.

As noted in the precautions section above, these batteries are charged and therefore personnel will be handling energized cables. **Extreme caution and proper PPE are required.**

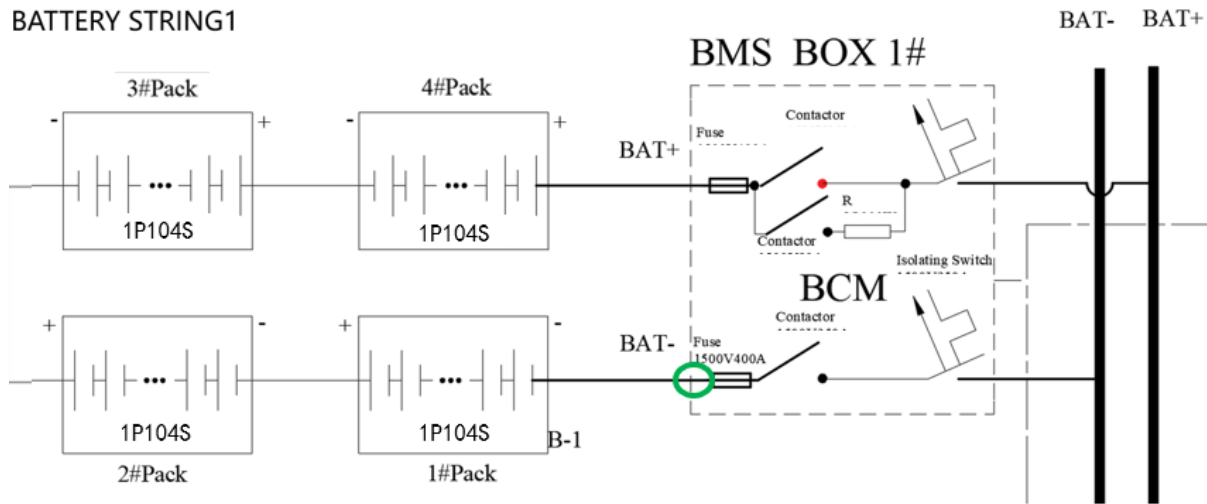
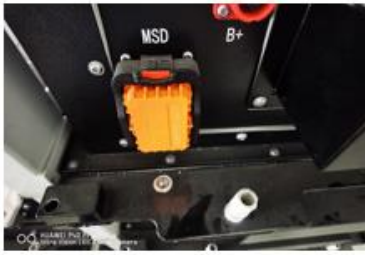


Figure 8. SolBank3.0 battery string configuration (1 of 12). The green circle indicates a battery power cable which must be removed for safe transport.

- ✓ **Step 1:** Ensure a safe working environment via consultation with site safety manager.
- ✓ **Step 2:** Remove the MSD from each battery pack. The steps to disassemble the MSD in detail are shown in Figure 9.
- ✓ **Step 3:** Remove the power cable from Pack 1's B- terminal by releasing the quick connector.
- ✓ **Step 4:** Remove the other end of the same power cable from BMS Box #1 B- terminal by releasing the quick connector.
- ✓ **Step 5:** Remove the power cable. See Figure 8 through Figure 12.
- ✓ **Step 4:** Repeat steps 2-5 for the remaining 11 strings.

**Step1:**

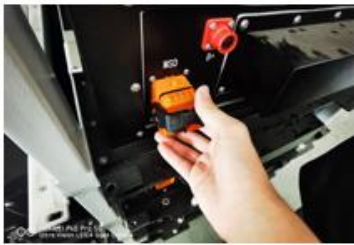
Locate the MSD on the battery pack

**Step2:**

Push the red button inside until you hear a sound

**Step3:**

Hold the black plastic pieces on both sides

**Step4:**

Flip the black plastic piece parallel to the horizontal plane

**Step5:**

Pull out the MSD cover and observe the fuse inside the cover

Figure 9. the steps to disassemble the MSD

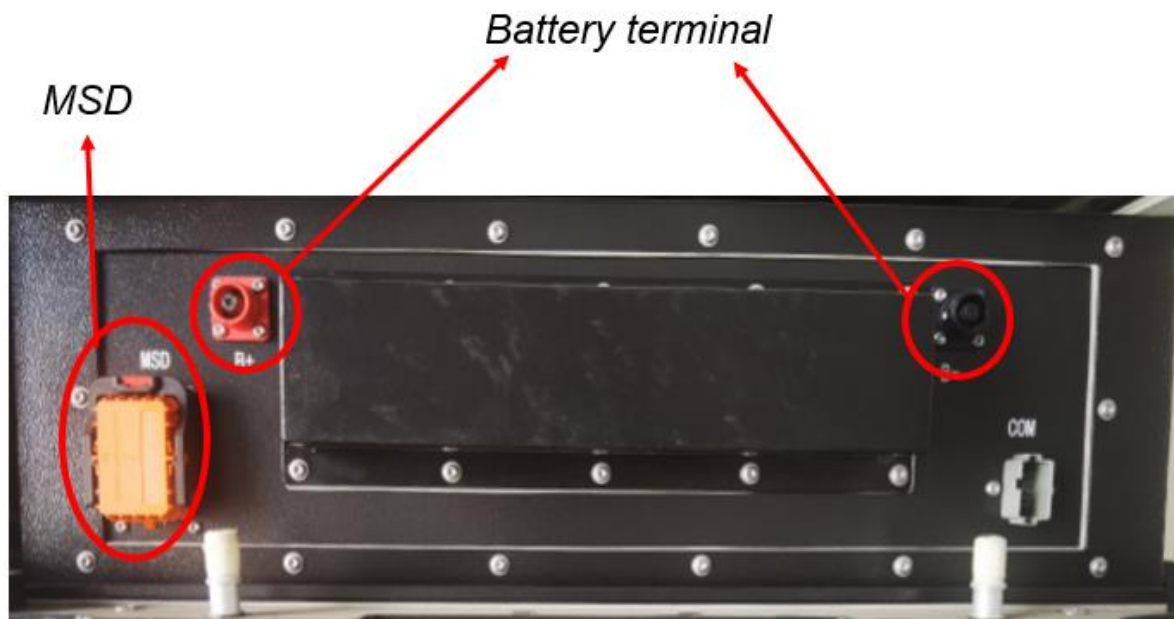


Figure 10. SolBank3.0 Battery Pack. Battery terminal and MSD indicated by red circle.



Figure 11. BMS Box plug receptacles and termination locations. Battery string positive (below) and negative (above) indicated by red circle.



Figure 12. Battery cable quick connect.

6.4 SolBank3.0 External Interface Wiring Disconnection

The following section details the field wiring disconnection procedures required to remove the SolBank3.0.

6.4.1 Workflow

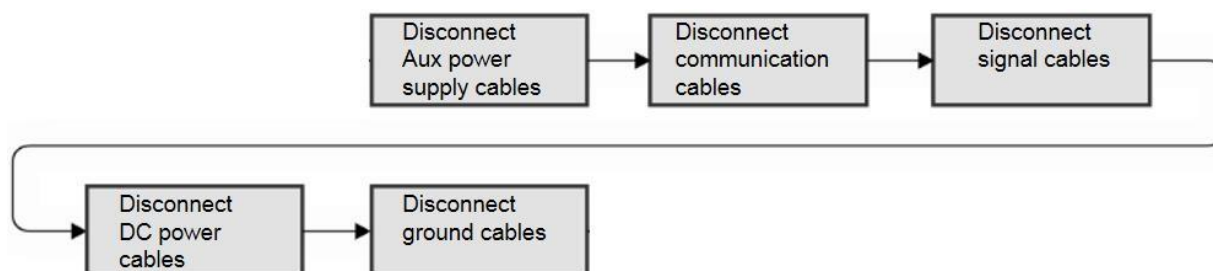


Figure 13. SolBank3.0 External Interface Wiring disconnection

6.4.2 Required Tools and Equipment

Table 7: Required tools and equipment

Tool Name	Quantity	Remarks
Basic electrical tools	--	Used to disconnect cables
PPE	--	Basic PPE and specialized electrical PPE per site specific EH&S plan

6.4.3 Precautions



Batteries cannot be de-energized. Although the battery packs will not be electrically interconnected, risk of electrocution exists. Exercise extreme caution.



High DC voltage present. Properly rated insulated gloves, insulated footwear, insulated tools, arc flash clothing, and face shields are recommended when working around batteries and energized circuits.



Ensure DC Disconnects are open and battery strings are isolated from PCS when working on system.



Always employ proper lock-out-tag-out (LOTO) procedures when on circuits or equipment that have the ability to be energized.



All tasks described in this Section must be performed by appropriately qualified personnel.



PPE is required during all stages of this process. Refer to EH&S plan for task-specific requirements.

6.4.4 Auxiliary Power Cable, Signal Wires and Communication Cable Disconnection

Procedures

- ✓ **Step 1:** Ensure a safe working environment via consultation with site safety manager. Ensure the main DC Disconnect and auxiliary power input are locked-out and tagged-out.
- ✓ **Step 2:** Disconnect all SolBank3.0 auxiliary power supply cables, as shown in Figure 14.
- ✓ **Step 3:** Disconnect SolBank3.0 communication cables, as shown in Figure 14.
- ✓ **Step 4:** Disconnect all other SolBank3.0 signal cables, as shown in Figure 14.
- ✓ **Step 5:** Remove all cables disconnected above by pulling cables through the SolBank3.0 bottom cable entry point.



Auxiliary power input
cable(L1/L2/L3/N)5AWG*4



Network communication wires



F-STOP signal input:
X3:27,X3:37

Figure 14. Description of busbar layout and dry contact

6.4.5 SolBank3.0 DC Cable Disconnection Procedure

- ✓ **Step 1:** Ensure a safe working environment via consultation with site safety manager. Ensure the main DC Disconnect and auxiliary power input are locked-out and tagged-out.

- ✓ **Step 2:** Disconnect all DC power cables and remove them by pulling cables through the SolBank3.0 bottom cable entry point, as shown in Figure 15.

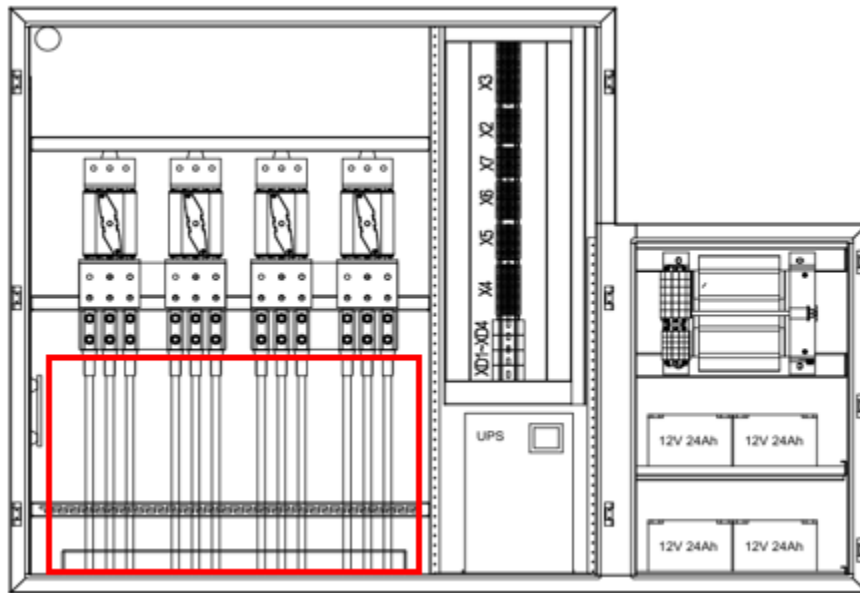


Figure 15. Power cable termination location

6.4.6 SolBank3.0 Grounding Disconnection Procedure

- ✓ **Step 1:** Ensure a safe working environment via consultation with site safety manager. Ensure the main DC Disconnect and auxiliary power input are locked-out and tagged-out.
- ✓ **Step 2:** Disconnect all grounding cables and remove them.

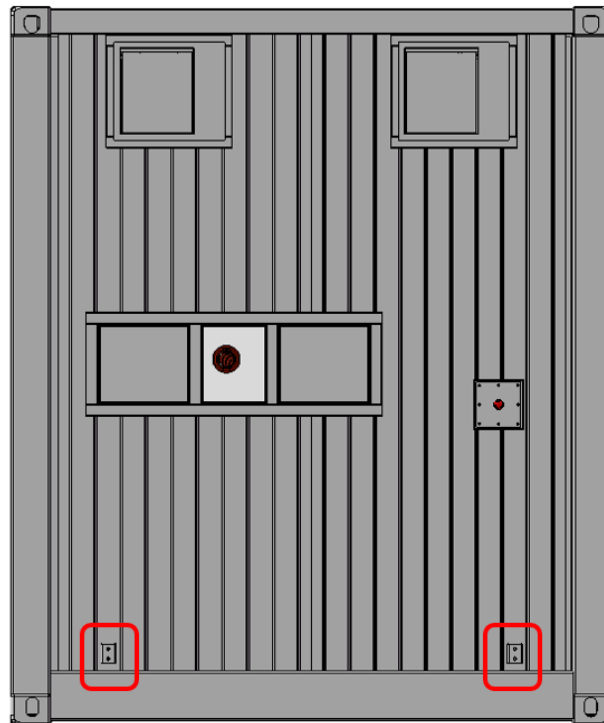


Figure 16: SolBank3.0 Ground Bus

6.5 Removing, Lifting the SolBank3.0

This section details the procedures and tasks required to remove SolBank3.0.

6.5.1 Required Tools and Equipment

Table 8: Required tools and equipment

Name	Purpose	Remark
High Capacity Crane	Used for lifting the SolBank3.0 system from foundations to delivery truck	Size to be determined by lifting plan. Dependent on required reach of arm and other site specifics.
Torque Wrench	For removing expansion bolts and bridge ware	--
Ladder	For SolBank3.0 roof access	--
PPE	Basic PPE and proper fall protection	--

6.5.2 Precautions



Batteries cannot be de-energized. Although the battery packs will not be electrically interconnected, risk of electrocution exists. Exercise extreme caution.



All tasks described in this Section must be performed by appropriately qualified personnel.



A task-specific lifting plan must be developed by qualified personnel and reviewed with all participating individuals prior to removing SolBank3.0 from foundations and setting on the flatbed or similar trailer. Shipping weight should be used to verify design weight and crane selection.



PPE is required during all stages of this process. Refer to EH&S plan for task-specific requirements.



Forklifts and other heavy equipment should only be operated by qualified personnel with support from spotters and other required support personnel.



When working at elevated locations personnel should be equipped with appropriate fall protection.

6.5.3 Anchor bolts removal Procedure

- ✓ **Step 1:** Remove all anchor expansion bolts, locations are shown in Figure 15.
- ✓ **Step 2:** If back-to-back installation was used, remove two bridge lock clamps at the locations shown in Figure 16.

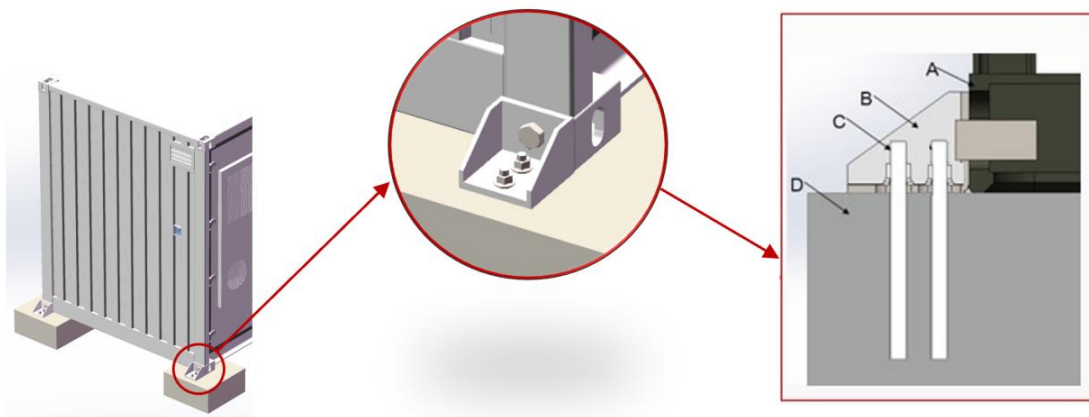


Figure 15. Remove all anchor expansion bolts

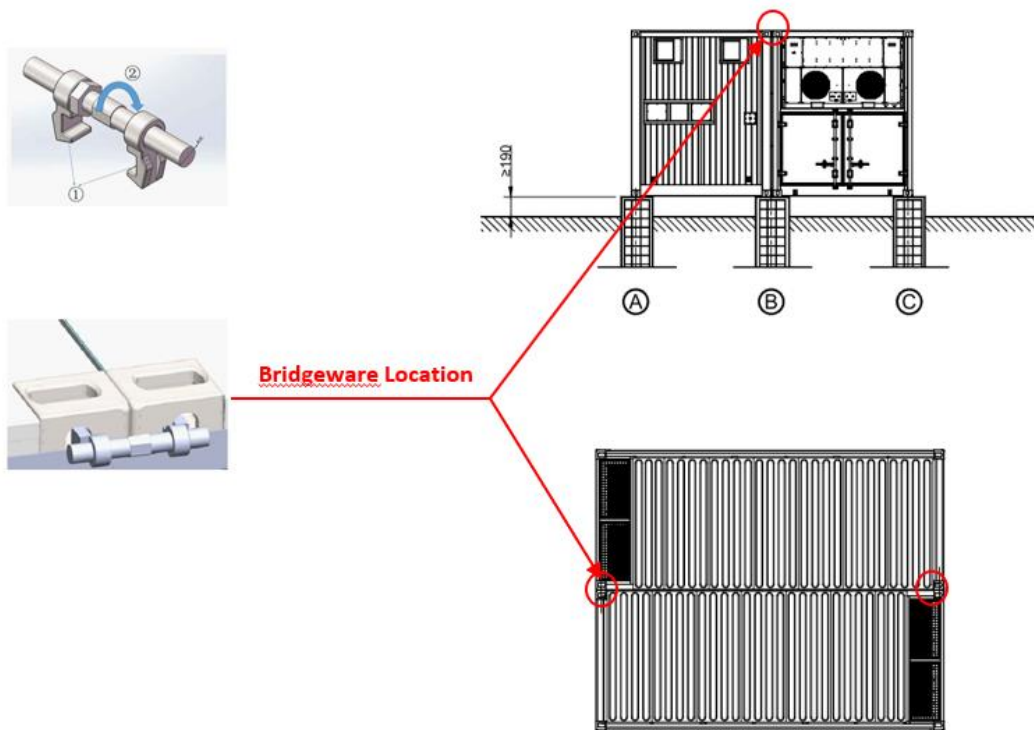


Figure 16. Remove two bridge lock clamps

6.5.4 Parts Packaging

Pack all the parts that were removed from the SolBank3.0 during the disassembly process and put them in a carton to be shipped with the Solbank3.0.

6.5.5 Lifting and Setting Procedure

- ✓ **Step 1:** Attach lifting harness and equipment to the 4 lifting points identified in Figure 17 per the task-specific lifting plan. This lifting plan is to be developed by qualified personnel in collaboration with site safety personnel and crane operators.
- ✓ **Step 2:** Remove the SolBank 3.0 from its foundation and move and set on trailer.

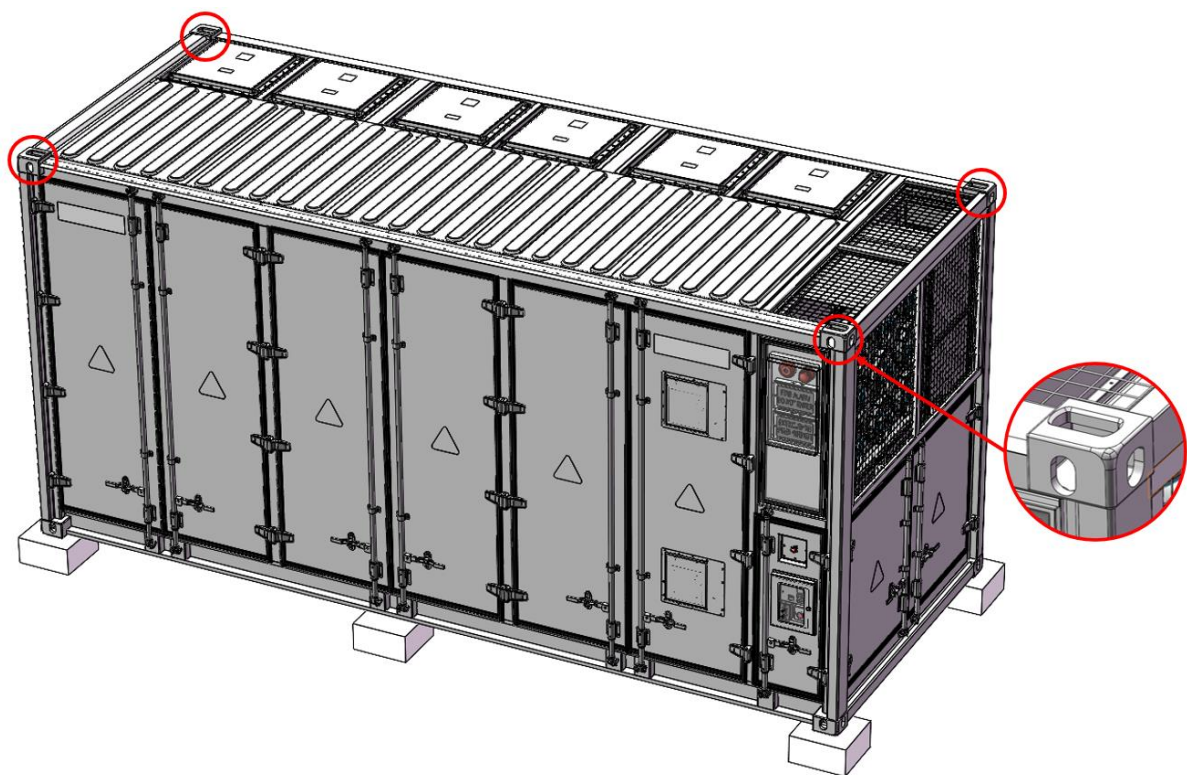


Figure 17. Location of SolBank3.0 lifting points