Battery Energy Storage System (BESS)
BASE LOAD POWER HUB

Statron ref. 331497

Project Code: K559-2254
Purchase Order Number: CW-I-WP4-2022-01

Document number:
23A2007_240712_FREQCON_Container_Installation_Manual_v3.0

Document description: Installation Manual

Revision	Date	Name	Description
001	20.06.2024	CPA	First Version

Installation Manual
PCS & BESS Containers

for Base Load Power Hub (BLPH) Project

Classification: confidential

Document no.	PCS & BESS Containers
Document name	Installation Manual
Component / System	BESS
Project code	K559-2254

Version	Date	Name	Description
1.0	2024-06-28	C. Palenzuela	First version
2.0	2024-07-04	C. Palenzuela	Updated several sections
3.0	2024-07-12	C. Palenzuela	Updated several sections

Table 1: Version overview

	Date	Name
Editor	2024-06-28	C. Palenzuela
Checked by	2024-06-29	M.v. Dreuten
Approved by	2024-06-29	C. Palenzuela

Table 2: Approval overview

Imprint

Hardware Development and Production Centre
Freqcon GmbH
Bürgerwiesenweg 5
D-27336 Rethem, Germany

Phone: +49 (0) 5165 – 291 760 – 0

Email:
info@freqcon.de
hardware@freqcon.de
Phone: +49 (0) 571 – 388 478 – 10

Email:
info@freqcon.de
Software@freqcon.de

Contact details

For further information please contact us by phone or send us a mail to **info@freqcon.de**.
You can also visit us on our website **http://www.freqcon.com** to find more information about our products and solutions.

Content

1 Introduction 7
1.1 About this Document 7
1.2 Display Elements 7
1.3 Other Applicable Documents 7
1.4 Generic Terms and Abbreviations Used 7
2 Weights 8
3 Container Dimensions 9
4 Environmental Conditions 14
5 Transport, Storage and Commissioning 14
5.1 Unpacking 14
5.2 Transport 15
5.2.1 Container Lifting 16
5.2.2 Sling Angles and Centre of Gravity 20
6 Installation 23
6.1 Required Tools 23
6.2 Installation location 24
6.3 General Arrangement 25
6.4 Distances between Containers 27
6.5 Container Feet and T-Beams 28
6.5.1 PCS Container Feet 28
6.5.2 BESS Container Feet 29
6.5.3 BESS T-Beams 30
6.6 Mechanical Installation of Containers 31
6.6.1 PCS 31
6.6.2 BESS 1 34
6.6.3 BESS 2 42
7 Appendix 51

Identification

Product Version / Document Version

Product version
Prototype

Document release date
July 2024

Doc Code
23A2007_240712_FREQCON_Container_Installation_Manual_v3.0

Name and Address of Manufacturer

Manufacturer of the product
FREQCON GmbH
Bürgerwiesenweg 5
D-27336 Rethem, Germany

Legal Information

This work is protected by copyright. Any rights derived from the copyright shall be reserved for FREQCON GmbH. Reproduction of this document or parts of this document is only permissible within the limits of the legal determination of Copyright Law. Any modification, expurgation or translation of this document is prohibited without the express written permission of FREQCON GmbH.
The trademarks stated in this document are the property of their respective owner.
© FREQCON GmbH. All rights reserved.

Original document

This document is an original document of FREQCON GmbH.

1 Introduction

1.1 About this Document

This document is part of project phase “Detailed Design Engineering” for the Base Load Power Hub (BLPH) Project (K559-2254). In case of any contradiction resulting by the information or specification given in this document, phase 2 or later documents supersede the information provided in this document.

1.2 Display Elements

Symbol	Meaning
➜	Action with one or several steps for which the sequence is irrelevant.
Step 1 : **Step 2 :**	Action with several steps for which the sequence is relevant.
•	First level of list.
-	Second level of list.

Table 1: Display Elements

1.3 Other Applicable Documents

The following documents are applicable:

Document type	Document Name
PCS drawing	53396 PCS Container
BESS 1 drawing	53406 BESS Container 1
BESS 2 drawing	53412 BESS Container 2
General Arrangement	23A2007 BLPH BESS complete system
PCS container feet drawing	STA010947 RevC
BESS container feet drawing	STA010599 RevC

Table 2: Other applicable documents

1.4 Generic Terms and Abbreviations Used

This following list should help you understand some of the abbreviations used in this document.

Generic Term and Abbreviation	Description
BESS	Battery Energy Storage System
BLPH	Base Load Power Hub
PCS	Power Conversion System

Table 3: Generic terms and abbreviations used

2 Weights

PCS	
Serial No.	FRQ-53396000001
Manufacturer	FREQCON GmbH
Container weight	Approx. 13.7 t

Table 4: PCS weight

BESS 1	
Serial No.	FRQ-53406000001
Manufacturer	FREQCON GmbH
Container weight (without batteries)	Approx. 15 t
Container weight (with batteries)	Approx. 35 t

Table 5: BESS 1 weight

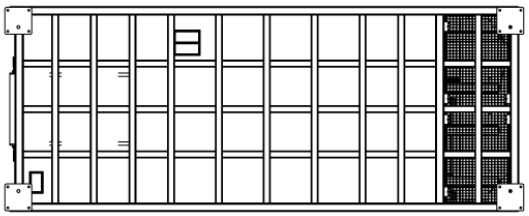
BESS 2	
Serial No.	FRQ-53412000001
Manufacturer	FREQCON GmbH
Container weight (without batteries)	Approx. 15 t
Container weight (with batteries)	Approx. 35 t

Table 6: BESS 2 weight

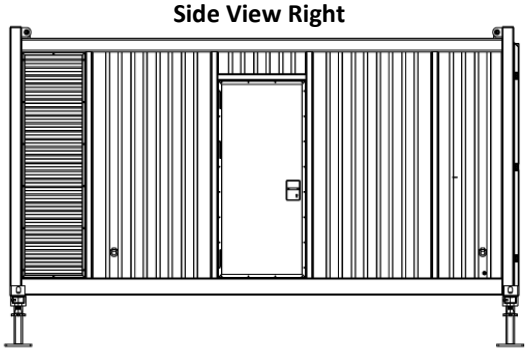
3 Container Dimensions

PCS

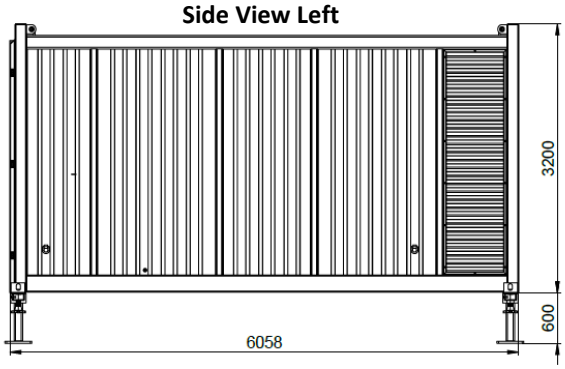
Botton View



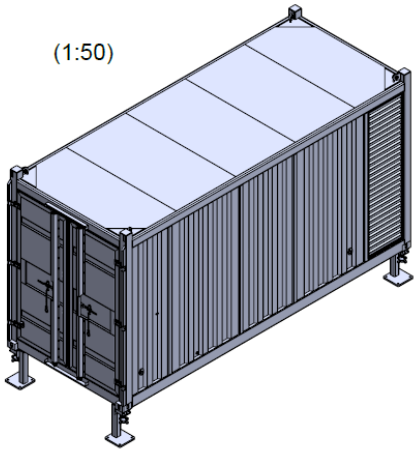
Side View Right



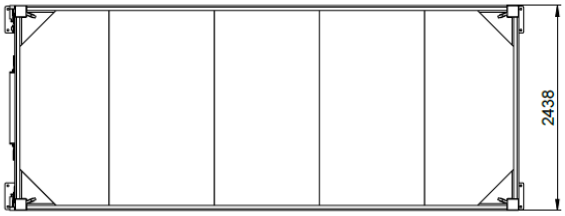
Side View Left



(1:50)

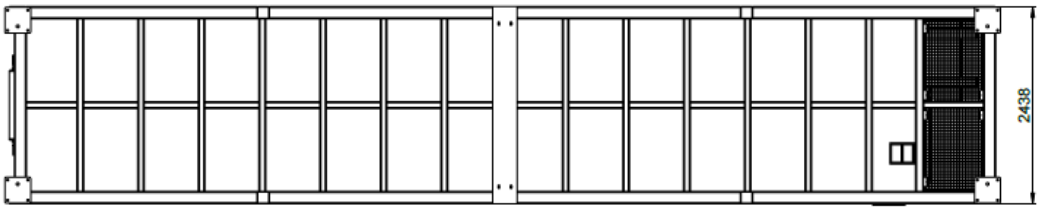


Top View

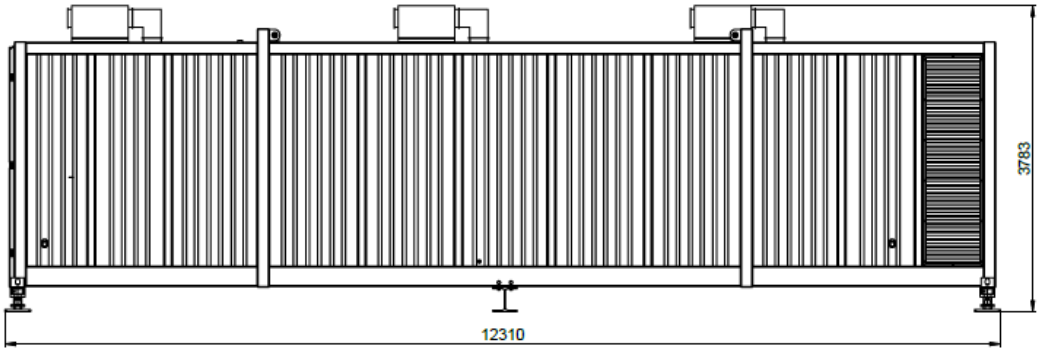


BESS 1

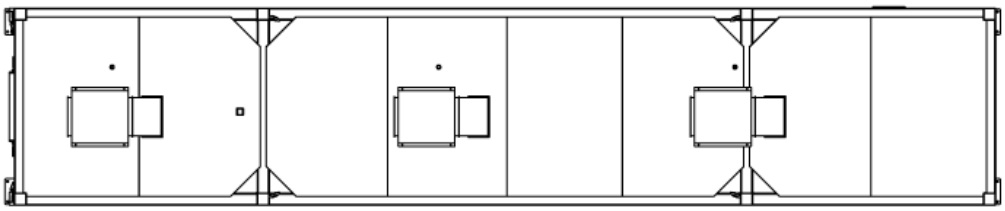
Botton View



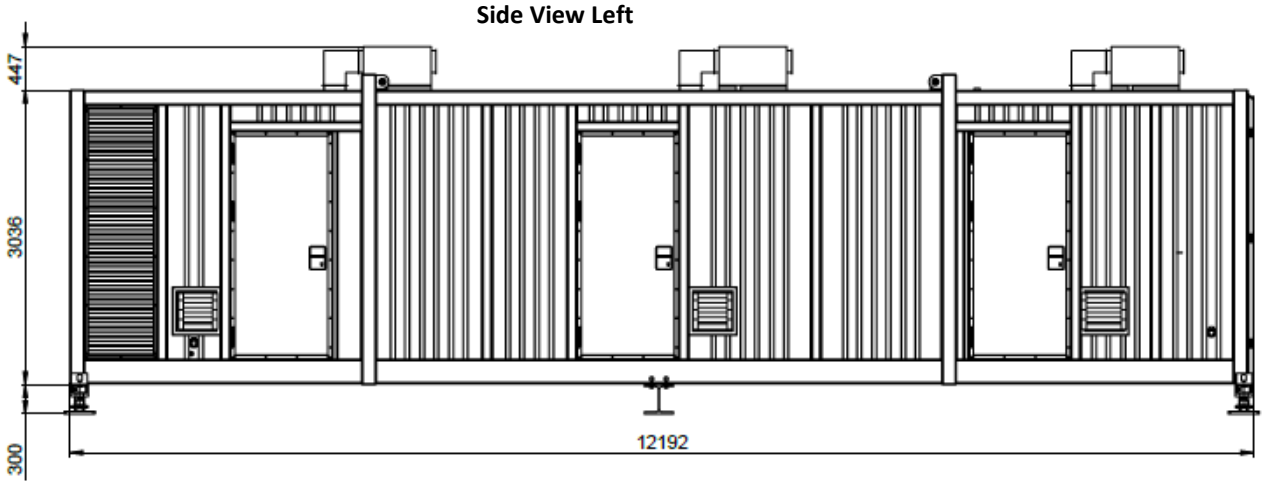
Side View Right

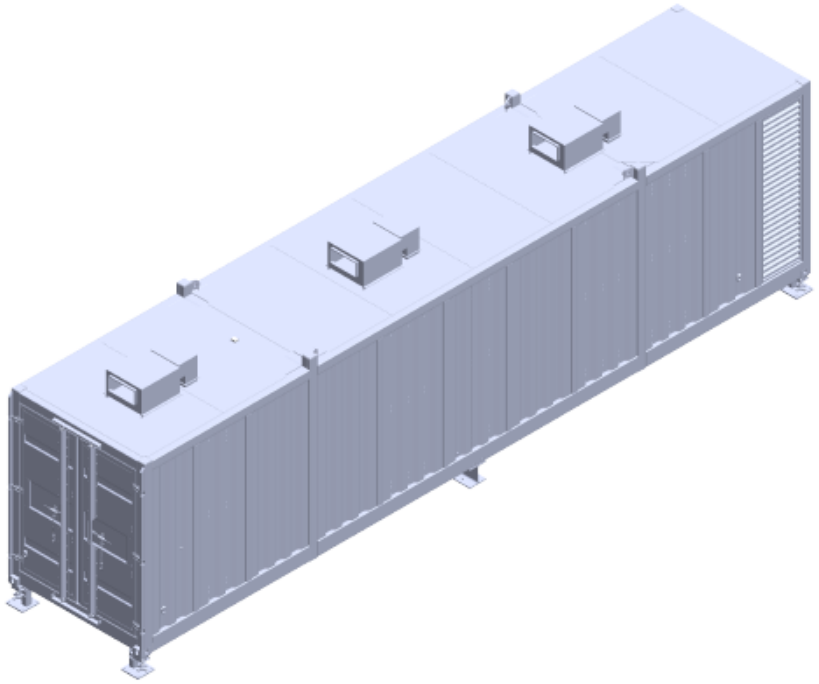


Top View



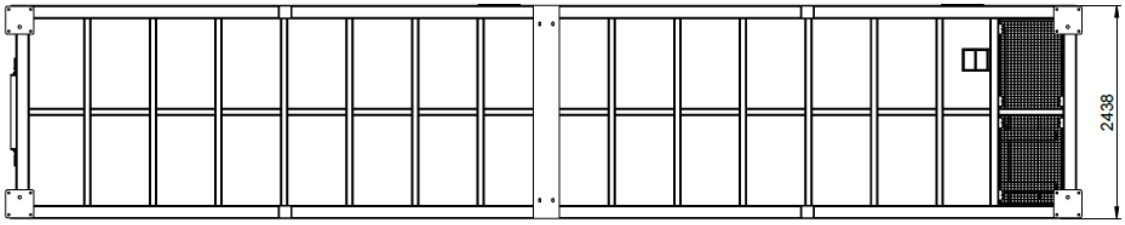
Side View Left



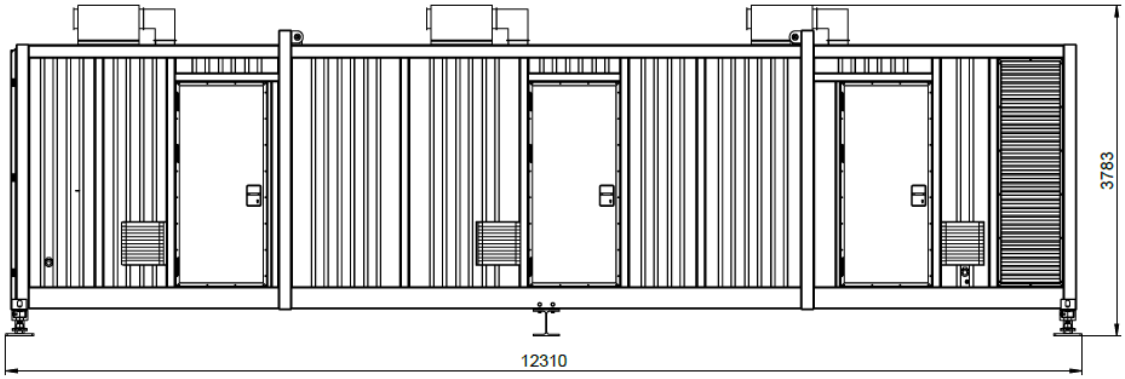


BESS 2

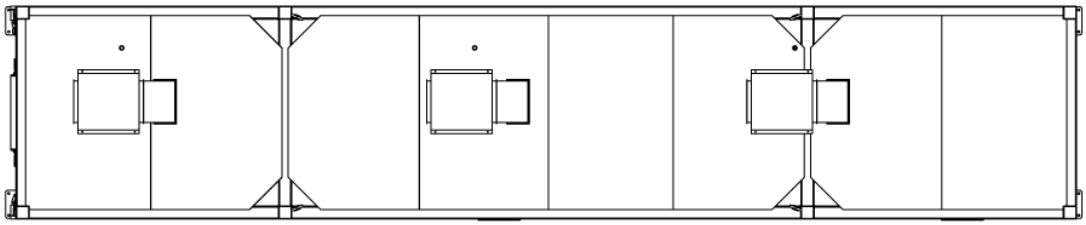
Botton View

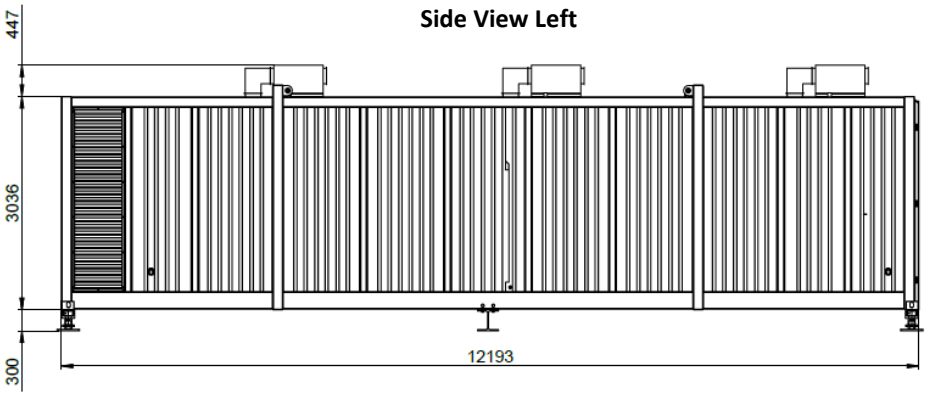


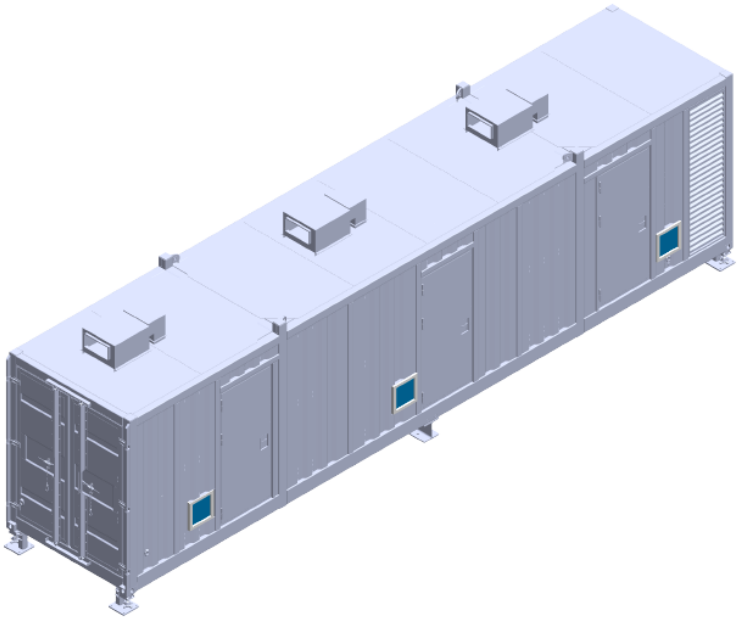
Side View Right



Top View




Side View Left
447
3036
300
12193



4 Environmental Conditions

	Stationary Operation	Storage packaging with protected layers	Transportation packaging with protected layers
Relative Humidity	Max. 95% No condensation; Relative Humidity <60% under corrosive atmosphere	Max. 95%	Max. 95%
Pollution level IEC60721-3-3 IEC60721-3-2 IEC60721-3-1	No conductive dust		
	3S2 coated PCB: Chemical Air: 3C2 Solid Particulate: 3S2	1S3 coated PCB: Chemical Air: 1C2 Solid Particulate: 1S3	2S2 coated PCB: Chemical Air: 2C2 Solid Particulate: 2S2
Atmospheric pressure	70 … 106 kPa	70 … 106 kPa	70 … 106 kPa
Vibration amplitude	Max 1 mm (5 … 13.2 Hz)	Max 1 mm (5 … 13.2 Hz)	Max. 3.5 mm (5 … 13.2 Hz)
IEC60068-2	Max. 7 m/s^2 (13.2 … 100 Hz) sinusoidal	Max. 7m/s^2 (13.2 … 100 Hz) sinusoidal	Max. 15 m/s^2 (9 … 200 Hz) sinusoidal
Impact IEC60068-2-29	Impermissible	Max. 100 m/s^2, 11 ms	Max. 100 m/s2, 11 ms
Free-fall	Impermissible	Impermissible	Impermissible

Table 7: Environmental conditions

5 Transport, Storage and Commissioning

Please observe the instructions for transport in section 5.2.

5.1 Unpacking

⚠ CAUTION

Hazard by sharp edges on packaging

Improper handling during unpacking can cause injuries.

➜ Use appropriate safety gloves to protect your hands from possible cuts.

The packaging of the system consists of cardboard, plastic and corrugated board. After usage the packaging must be disposed according to the local regulations for the disposal of paper products (e.g. recycling). After delivery, the delivered units and components must be checked for completeness and damage. If any damage on the delivered units and components have been found, contact the delivery service or FREQCON GmbH immediately.

5.2 Transport

NOTICE

Inadequate transportation of the device and all of its components may cause damage to the installed components.

- ➜ Vibrations and jolts must be avoided during transportation.
- ➜ The container must be transported in a horizontal position (lying down).
- ➜ Make sure to observe the specific national safety precautions for transport by truck, train or ship´.

NOTICE

Do not transport the containers with installed batteries

- ➜ Lifting or moving of BESS containers is not allowed if battery modules are inside the container
- ➜ Remove every battery module from the container before lifting or mowing the container

The containers must be transported to the installation site by instructed personnel.

Make sure that the components can be placed on a level surface.

For information regarding the dimensions and center of gravity of the containers, see section 5.2.2. The container weights are specified in section 2.

Vibrations and jolts must be avoided during transportation. If the system was damaged during transport, you must immediately inform the responsible transport company.

The containers must be transported in a horizontal position (lying down). It is not permitted to tip over the container during transportation or in any other scenario.



5.2.1 Container Lifting

⚠ DANGER	
	**Heavy load** **Improper lifting can result in death, serious injury or property damage.** Never lift the container above people. Use only lifting and personal protective equipment approved by OSHA or other national institutions.

NOTICE
Only use an appropriate crane to lift the container, capable to withstand the loads specified as follows: Weight of containers *see section 2*

NOTICE
Observe the container´s center of gravity during lifting: Observe the container´s center of gravity during lifting with crane, shown in section 5.2.2.

To lift the container with a crane, use the four transport lugs on the top corners of the container (*see following illustration*).

⚠ DANGER	
	**Heavy load** **Improper lifting can result in death, serious injury or property damage.** Never lift the container above people. Use only lifting and personal protective equipment approved by OSHA or other national institutions.

NOTICE
Only use an appropriate crane to lift the container, capable to withstand the loads specified as follows: Weight of containers *see section 2*

NOTICE
Observe the container´s center of gravity during lifting: Observe the container´s center of gravity during lifting with crane, shown in section 5.2.2.

To lift the containers with a crane, use the four transport lugs on the top corners of the container (*see following illustration*).

PCS

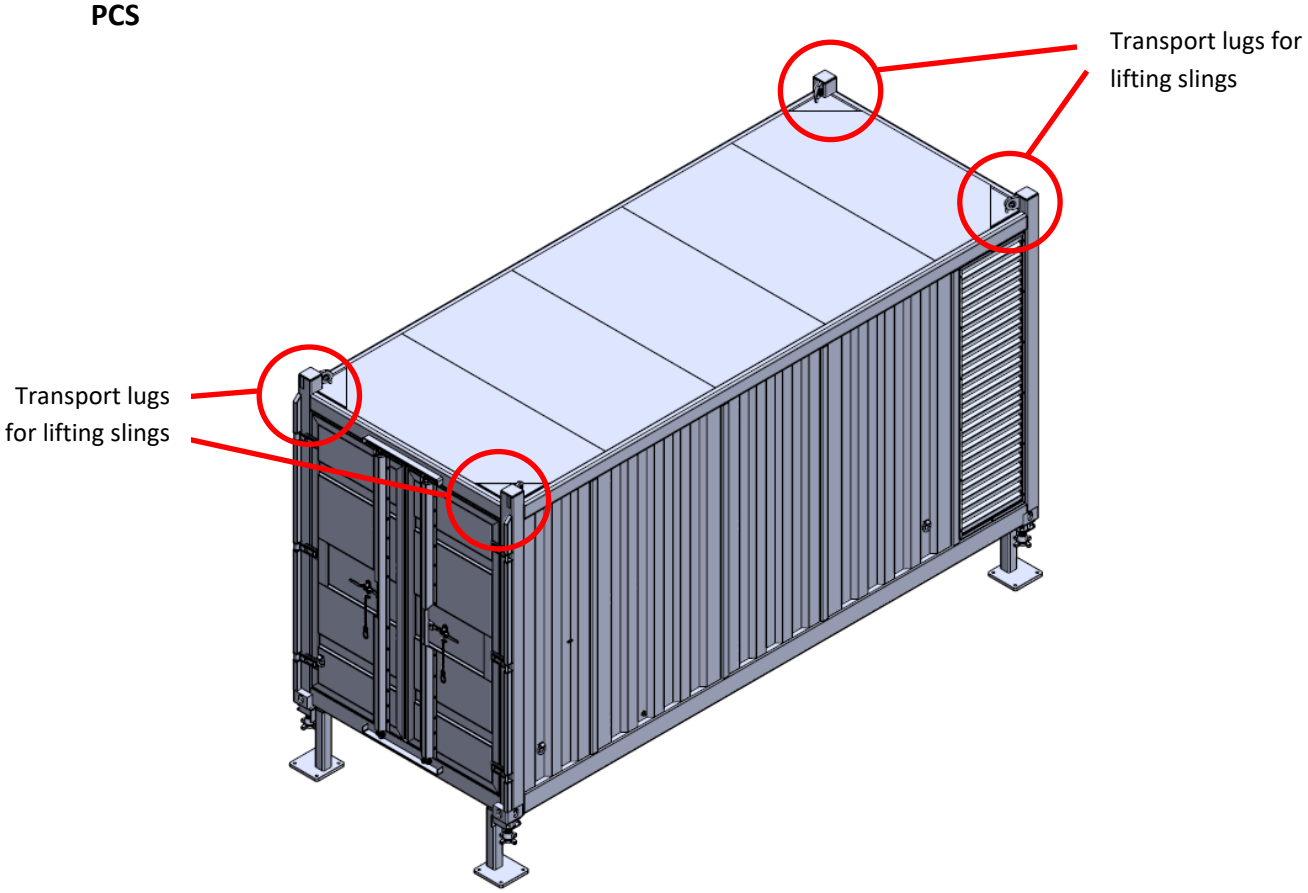


Figure 1: PCS container transport lugs

BESS 1

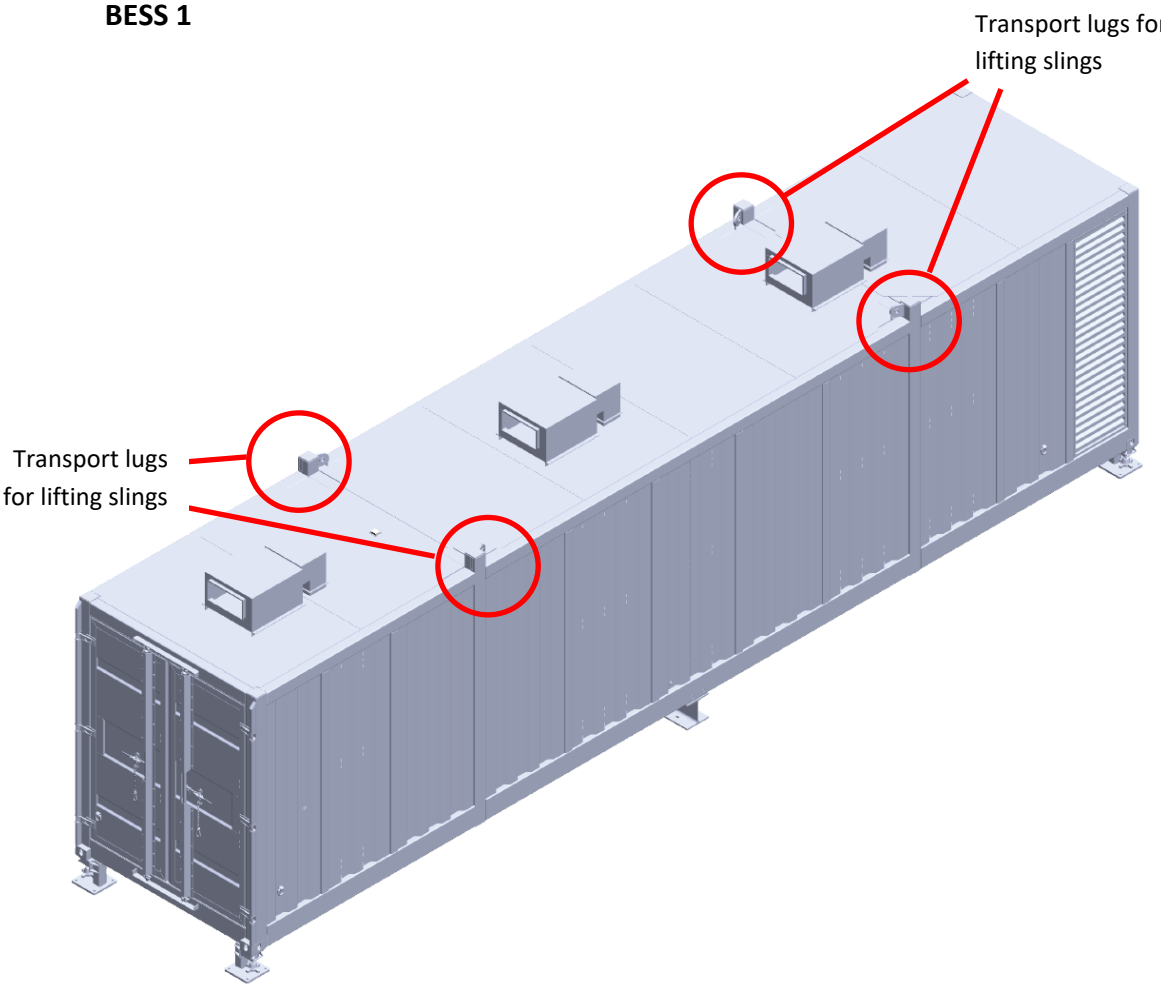


Figure 2: BESS 1 container transport lugs

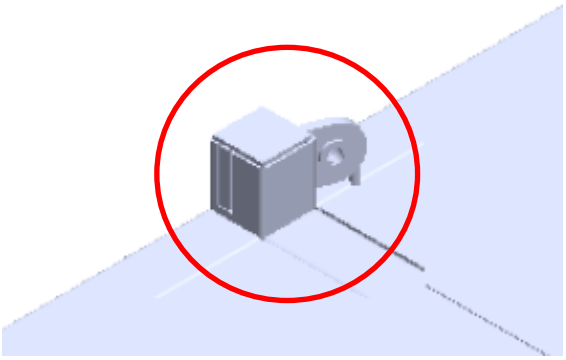


Figure 3: Transport lug

BESS 2

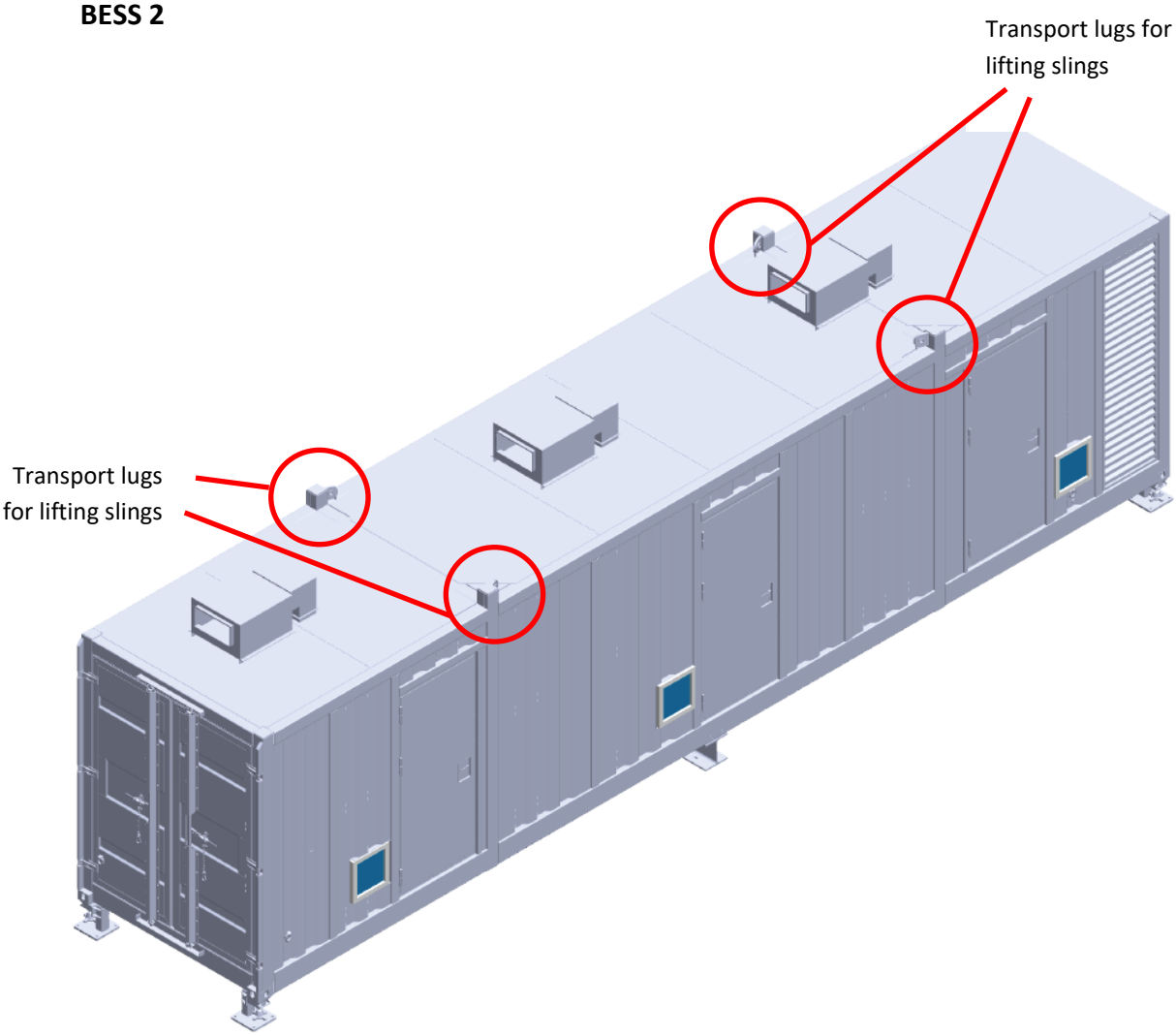


Figure 4: BESS 2 container transport lugs

5.2.2 Sling Angles and Centre of Gravity

PCS

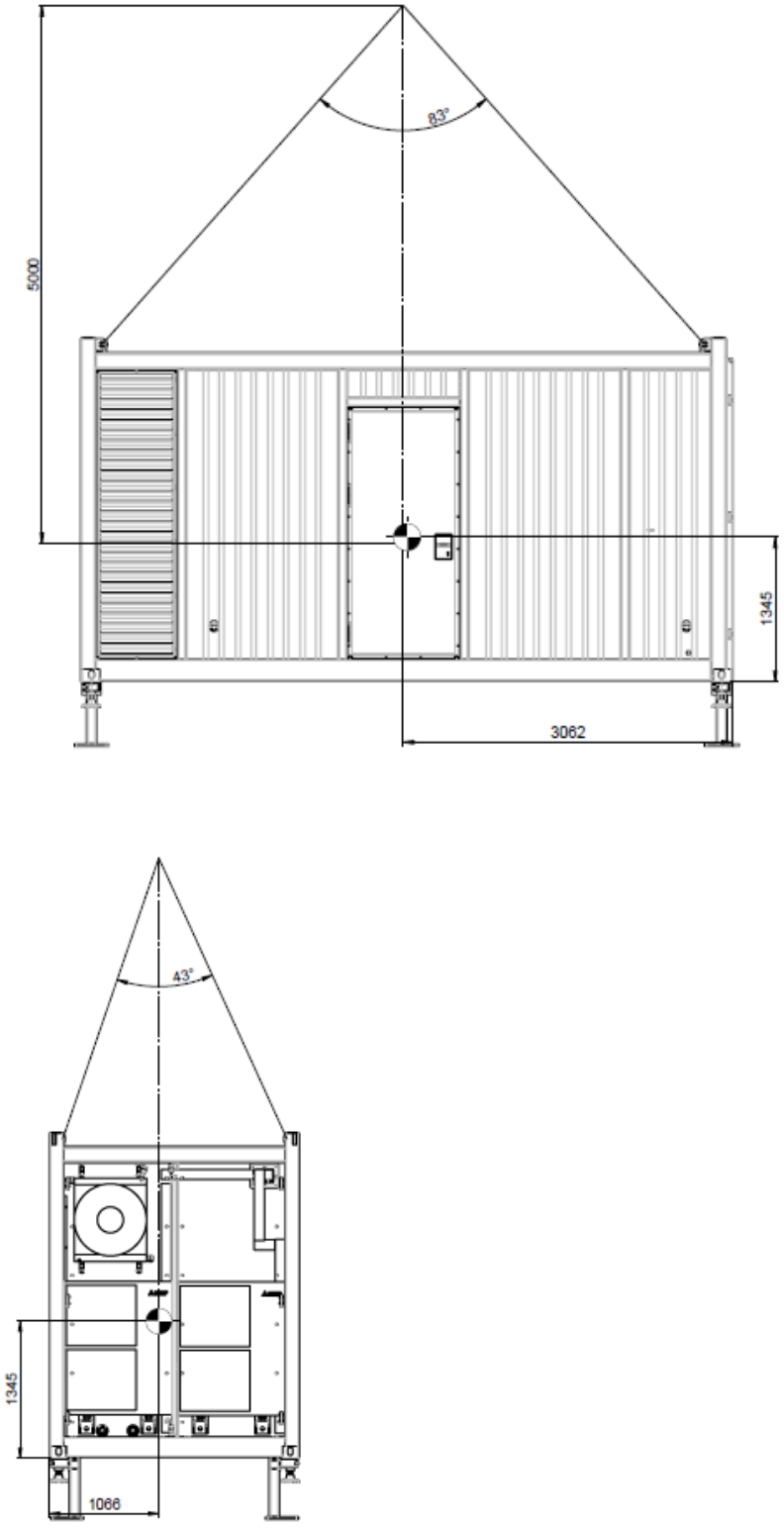
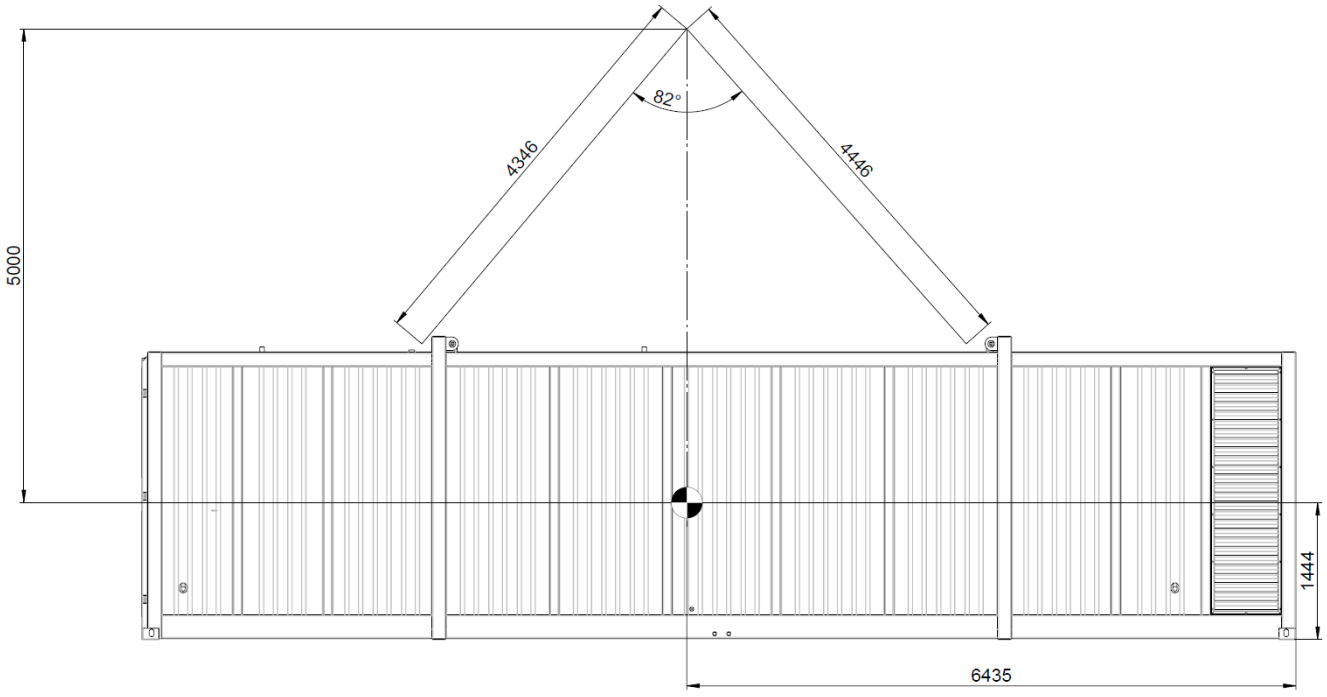


Figure 5: PCS - Sling angles and CoG

BESS 1



NOTE:
Empty container, no batteries installed

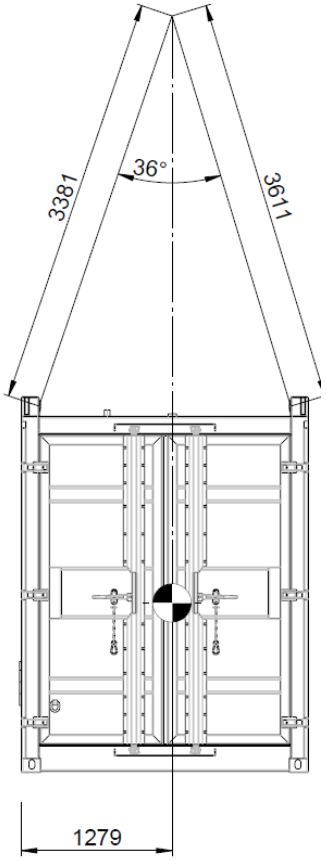
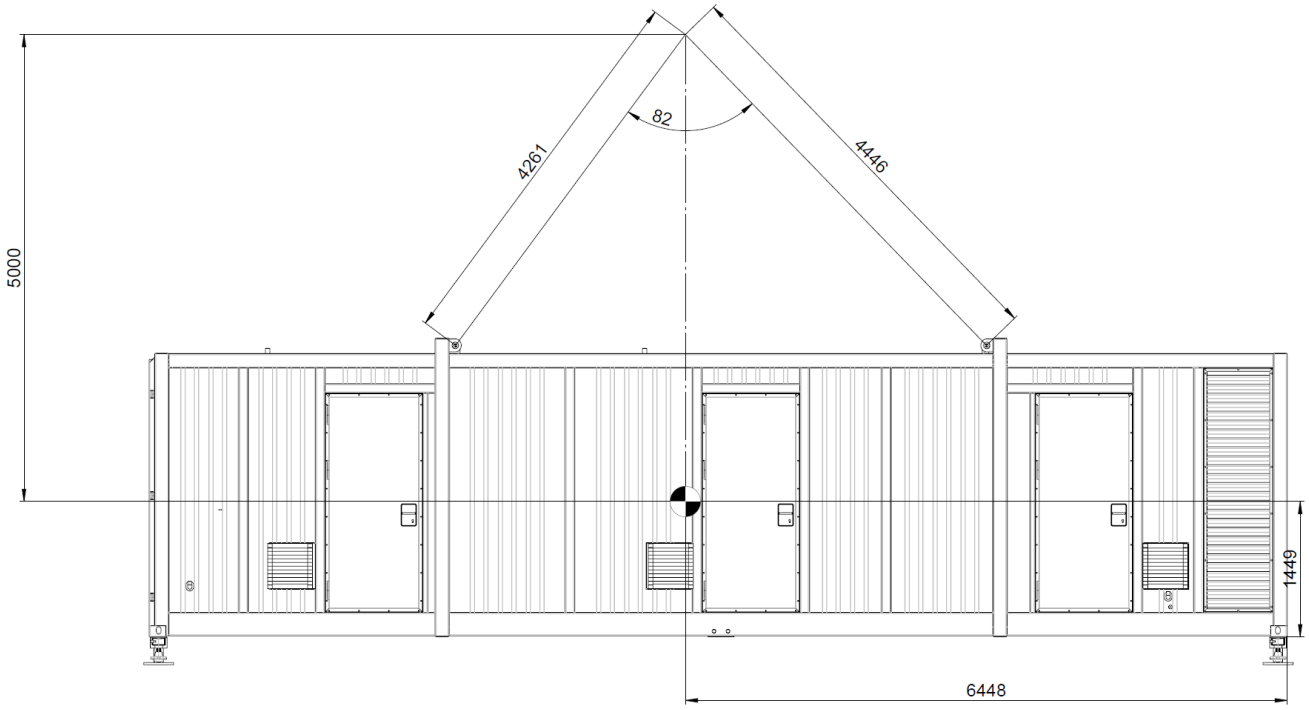


Figure 6: BESS 1 - Sling angles and CoG

BESS 2



NOTE:
Empty container, no batteries installed

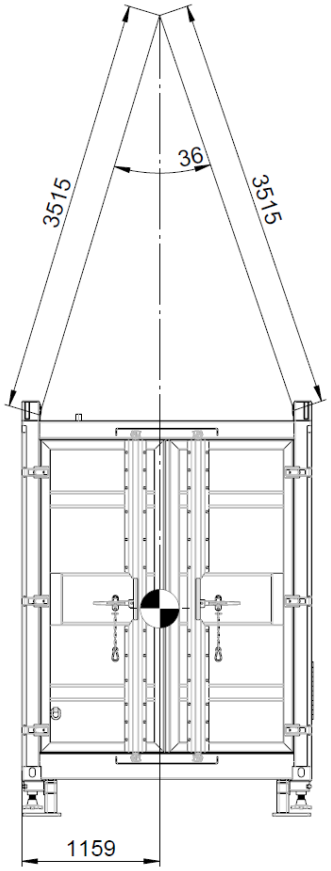


Figure 7: BESS 2 - Dimensions, sling angles and CoG

6 Installation

6.1 Required Tools

Installation personnel must at least have the following tools in reach before starting the installation:

Pos.	Installation Tools	Amount
	Basic Tools	
1.	Flash light	1
2.	Pliers set	1
3.	Ratchet set	1
4.	Torque wrench (1 - 100 Nm)	1
5.	Socket wrench set (with sockets 7 – 19 mm)	1
6.	Wrench set	1
7.	Cross-section screw drivers set	1
8.	Flat-section screw drivers set	1
9.	Allen key / Hex socket key set	1
10.	Cutter	1
11.	First-aid kit	1

Table 8: Installation tools

⚠ DANGER	
	**Electric shock due to low voltage and arcing on loose wires.** Severe irreparable damage to the nervous system, burns and death. ➜ Access to control cabinets and string cabinets only by FREQCON service personnel or by FREQCON instructed and authorized maintenance personnel. ➜ Plant control units may also be opened by instructed persons with the qualification of a qualified electrician. ➜ Work on electrical and electronic components as well as cables of the battery system may only be carried out by FREQCON service personnel or by FREQCON instructed and authorized maintenance personnel.

⚠ DANGER
Make sure that the energy source is locked and tagged and ensure that the isolation is effective before conducting work on the system. After switching-off the voltage supply, some components might still carry a charge. Check all poles using a suitable device.

⚠ WARNING
The electrical connection must be carried out in accordance with the local regulations of the utility company and /or VDE (in Germany).

Do not operate!	Lock and tag power switches and controller devices
	Observe national laws regarding Occupational Safety and Health, as well as Industrial Standards. ➢ DIN VDE 0105-100; VDE 0105-100:2009-10 Operation of electrical installations - General requirements.

6.2 Installation location

⚠ GEFAHR	
	**Danger from and for unauthorized persons** Unauthorized persons are not aware of the dangers in the work area and may endanger themselves and third parties danger. ➜ Keep unauthorized persons away from the work area. ➜ If in doubt, speak to persons and direct them away from the work area. ➜ Interrupt the work as long as unauthorized persons are in the work area. ➜ Always keep the entrance door(s) locked when not performing work on the system to prevent unauthorized persons from entering the container.

⚠ CAUTION	
	**Danger to life due to unsuitable lifting material** While lifting the container and/or battery modules use only suitable lifting equipment and lifting tackle ➜ Make sure that all the material and equipment is designed for the weight and all required inspections have been done. ➜ Make sure that no person is under the container or battery module during lifting.

NOTICE
Equipment damage due to intruding animals Prevent animals from entering the interior of the container from below through the cable glands or recesses. ➜ Secure the container from the outside with suitable protection against the entry of animals.

The PCS & BESS Containers are designed for outdoor installation, on a flat and ground level surface. Make sure that the environmental conditions meet the values of section 4 “Environmental Conditions”.

The entrances to the containers must be accessible from every side to allow for visual inspections or maintenance and repair work, if necessary.

Air inlets and outlets of the container, as well as on the cabinets inside the container, must always be kept free and cleaned of dirt in order to ensure the required air flow of the installed fans.

6.3 General Arrangement

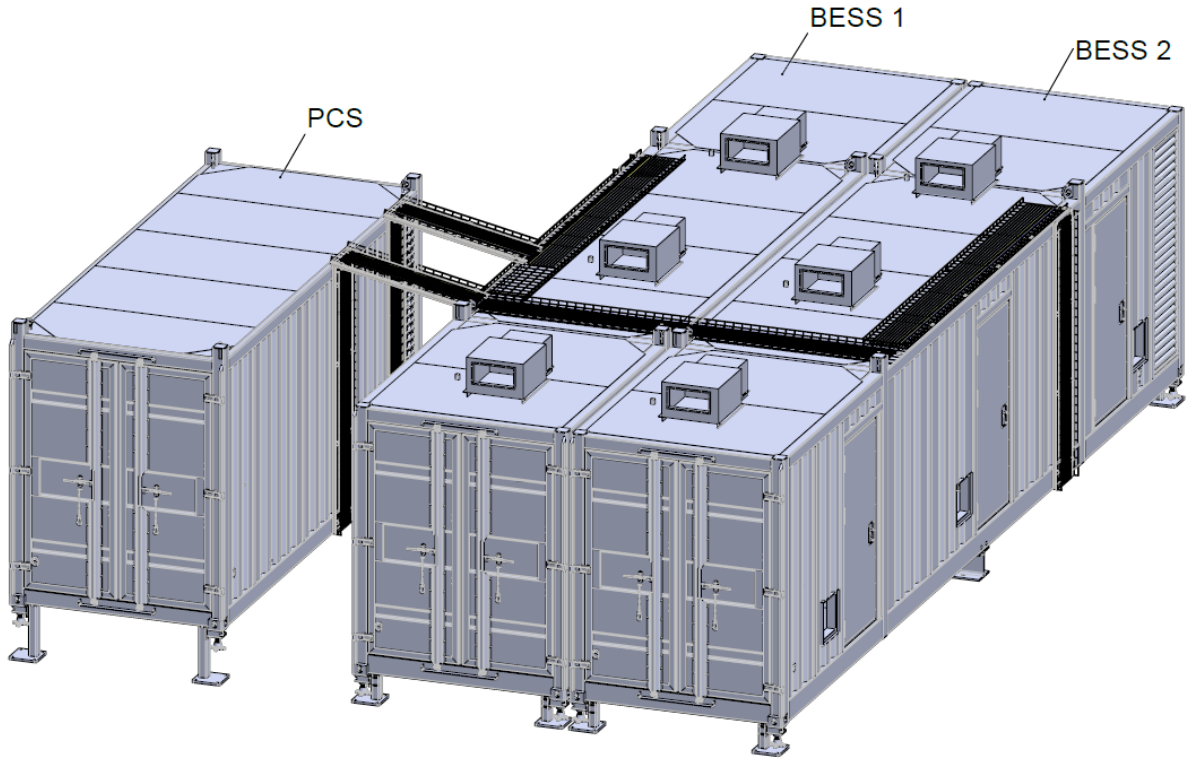
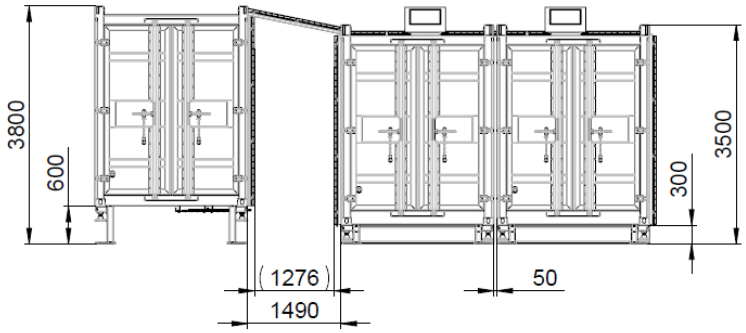
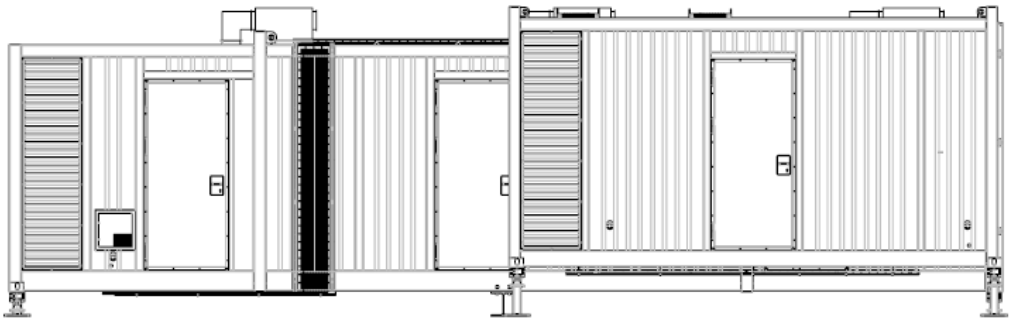


Figure 8: General arrangement

Front view



Side view



Top view

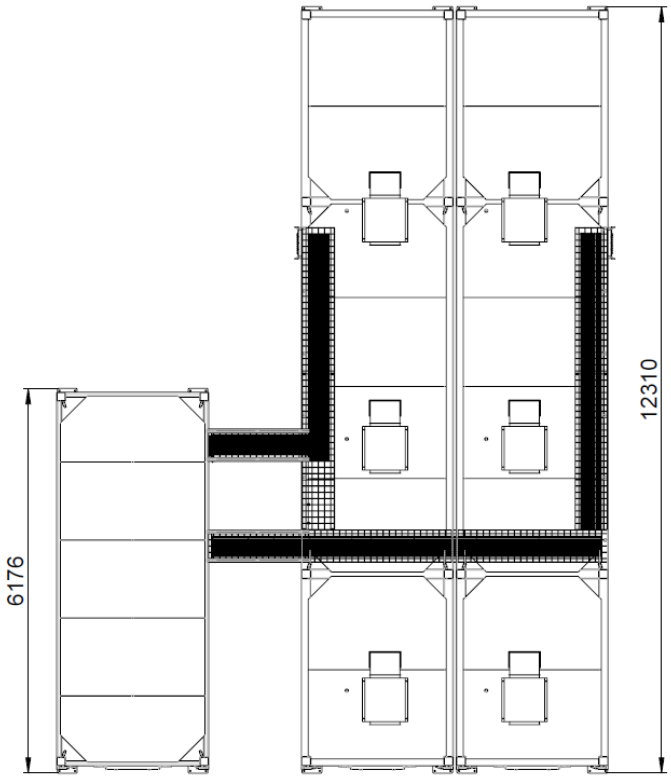


Figure 9: General arrangement with dimensions

6.4 Distances between Containers

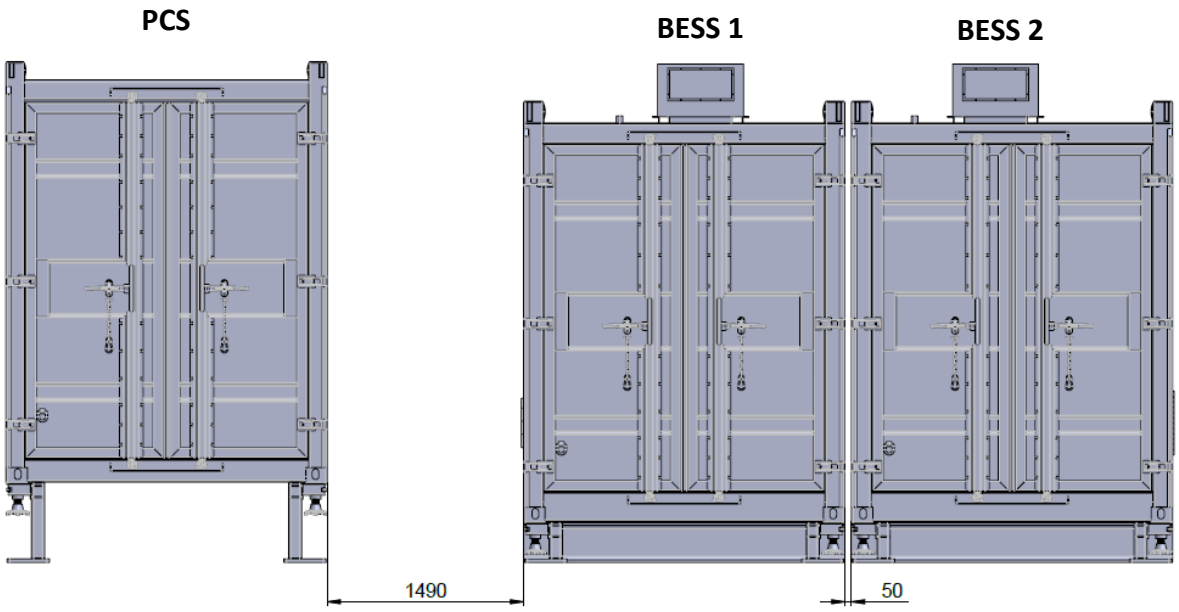
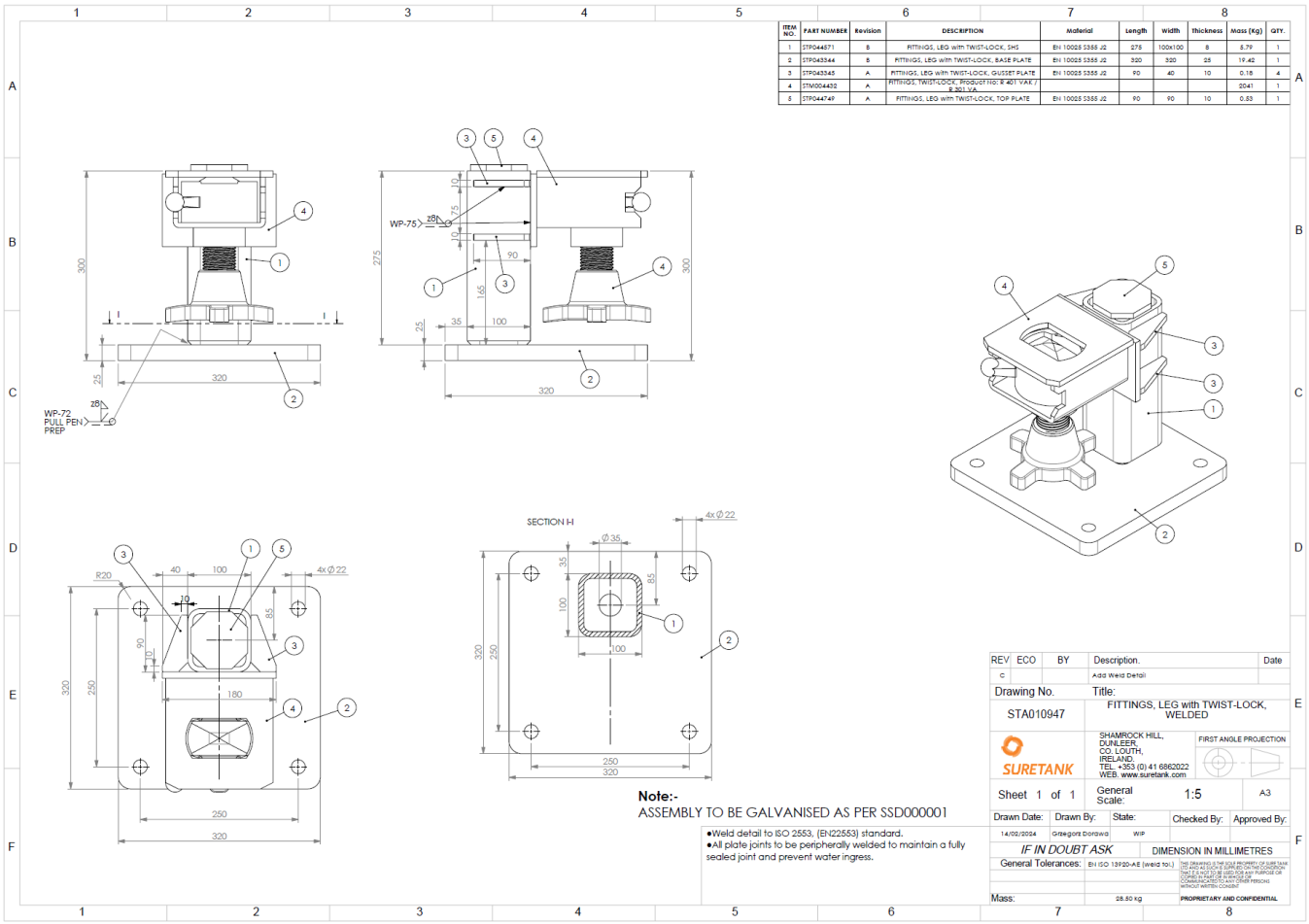


Figure 10: Distances between containers

6.5 Container Feet and T-Beams

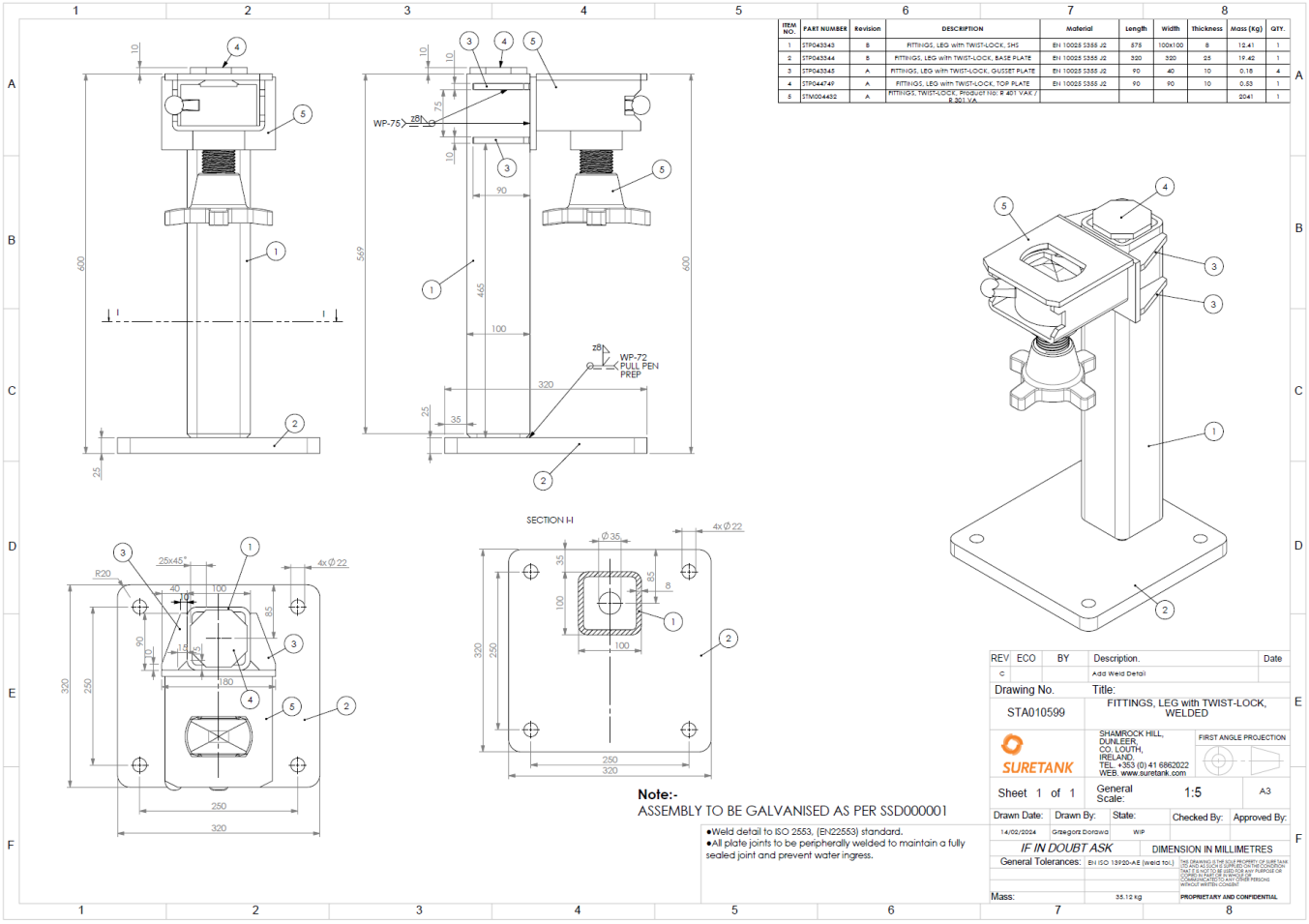
6.5.1 PCS Container Feet

4 container feet must be installed to the bottom corners of the 20FT PCS containers, before placing the container to the final installation location (*see drawing below and 1.3 "Other Applicable Documents"*.



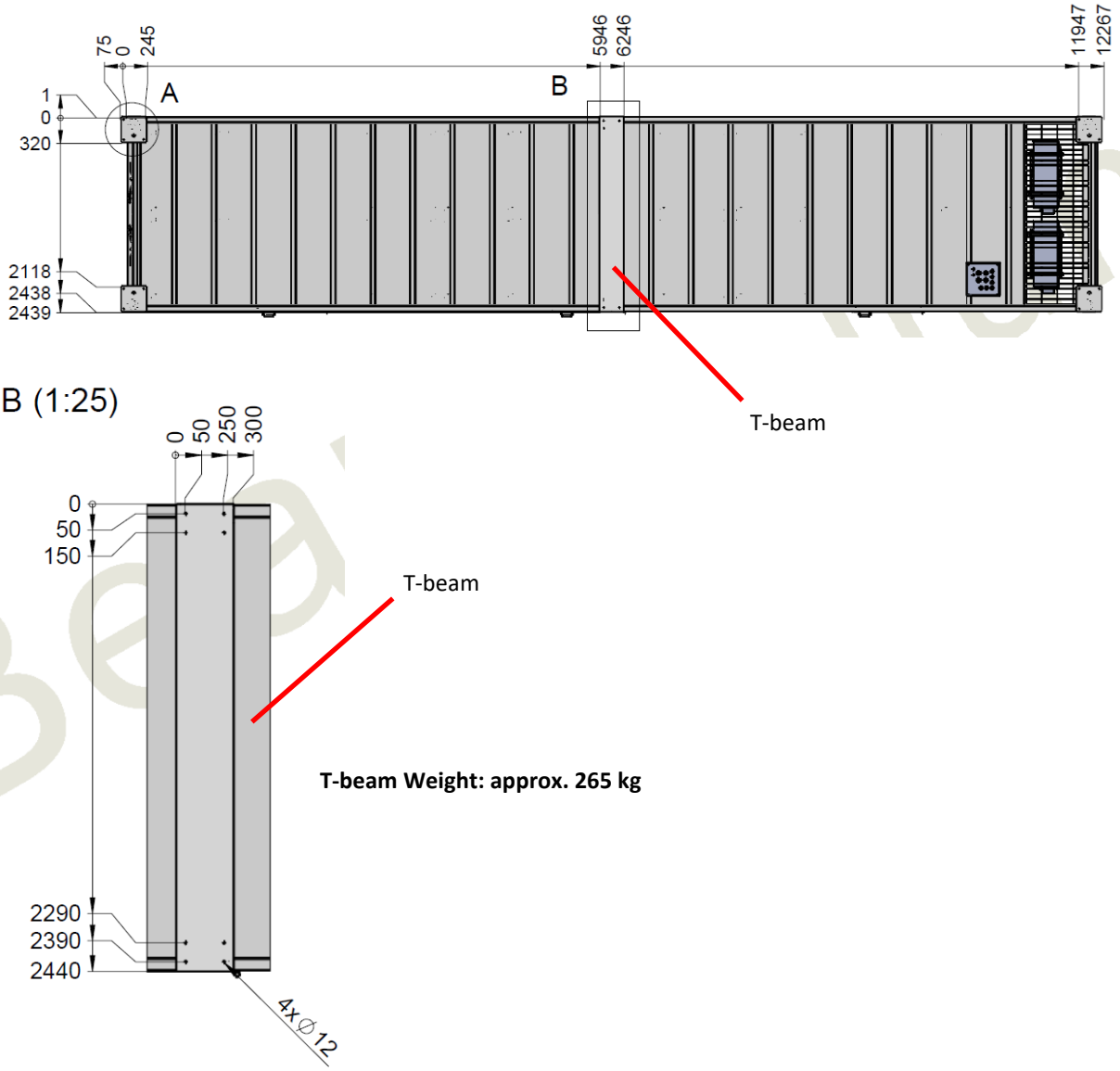
Weight: approx. 28.5 kg

6.5.2 BESS Container Feet



Weight: approx. 35 kg

6.5.3 BESS T-Beams



T-beam Weight: approx. 265 kg

6.6 Mechanical Installation of Containers

6.6.1 PCS

Task 1 **Lift PCS container and place on pedestal.**

Step 1 : Lift the container (*see section 5.2.1*).

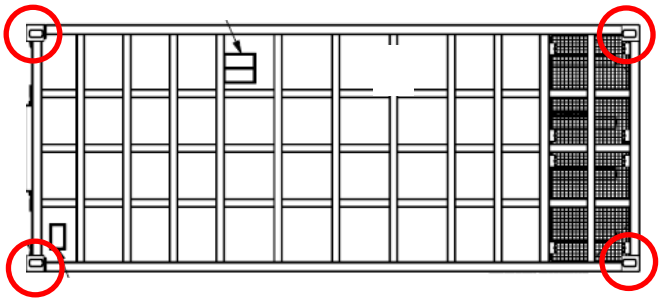
Step 2 : Place the container to several stools suitable to withstand the container load indicated in section 2. Please refer to Figure 13: Suggested stool positions for information on the stool positions.

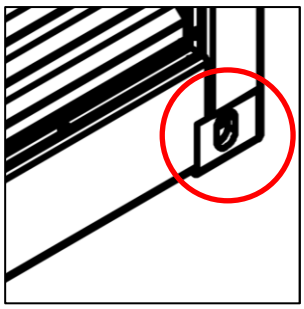
Task 2 **Install the 4 container feet to PCS container.**

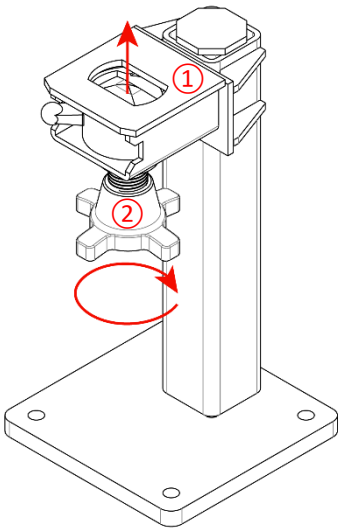
Attach first of the 4 container feet (*see section 6.5.1*).to one of the 4 bottom corner of the container.

Step 1 : Place the top plate (①) from the bottom to the corner of the container.

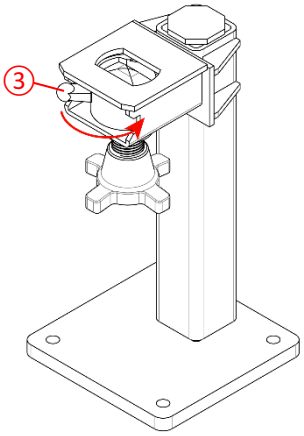
Step 2 : Screw the twist lock head mechanism of the foot (②) by twisting it as indicated in the illustration below. Screw until it has completely penetrated the bottom recess of the foot.

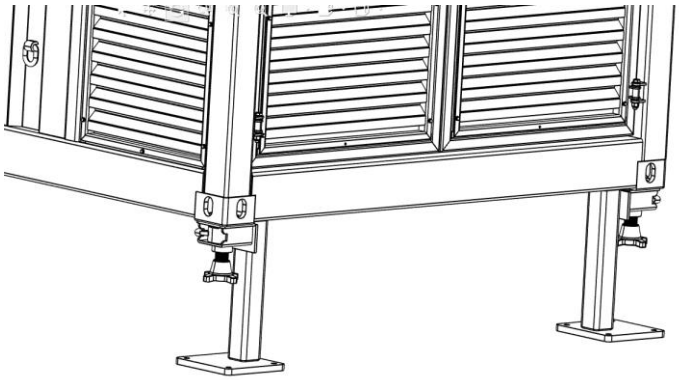






Step 3 : Secure the feet by twisting the twist lock locking mechanism (③) to the position like indicated in the illustration below.





Step 4 : Repeat the steps for the other 3 container feet.

✓ **The container feet have been successfully installed to the PCS container.**

Task 3 **Install cable trays on container bottom**

Step 1 : While the container is still lifted on the stools, drill the bore holes for cable tray installation according to the attached drawing " Mounting cable tray".

Step 2 : Insert blind rivet nuts to the prepared bore holes according to the drawing " Mounting cable Tray".

Step 3 : Fix the cable trays (① - ④) according to drawing " Mounting cable Tray".

Step 4 : Apply a torque to the connections according to drawing " Mounting cable Tray"

Cable trays:

GKX 520x60x2507

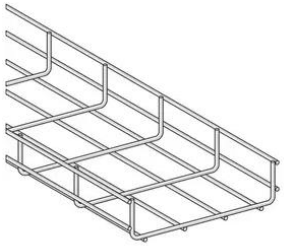


Figure 11: Cable tray V2A_ Gitterrinne GKX

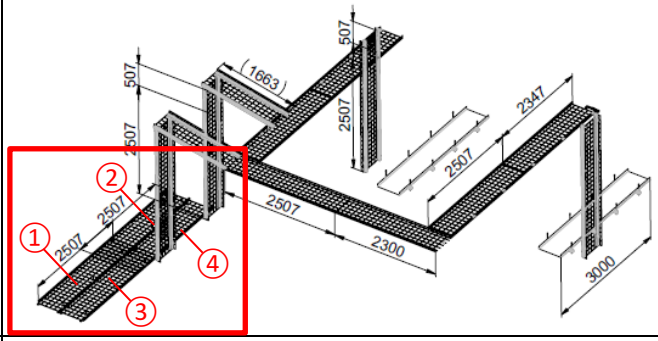


Figure 12: Cable trays for PCS container installation

Specification per cable tray:

Original part no.	Cable tray V2A_ Gitterrinne GKX 520x60x2507
Type	GKX 520x60x2507
Length	2507 mm
Width	520 mm
Height	60 mm

Task 4 **Lift container to installation location and fix to installation location.**

Step 1 : Lift the container (*see section 5.2.1*) and place it to the desired installation location.

Step 2 : Fix the 4 feet to the ground using suitable connection material (welding or bolting).

✓ **The PCS container has been successfully fixed to the installation location.**

6.6.2 BESS 1

Task 1 **Lift BESS container and place on pedestal.**

Step 1 : Lift the container (*see section 5.2.1*).

Step 2 : Place the container to stools suitable to withstand the container load indicated in section 2.

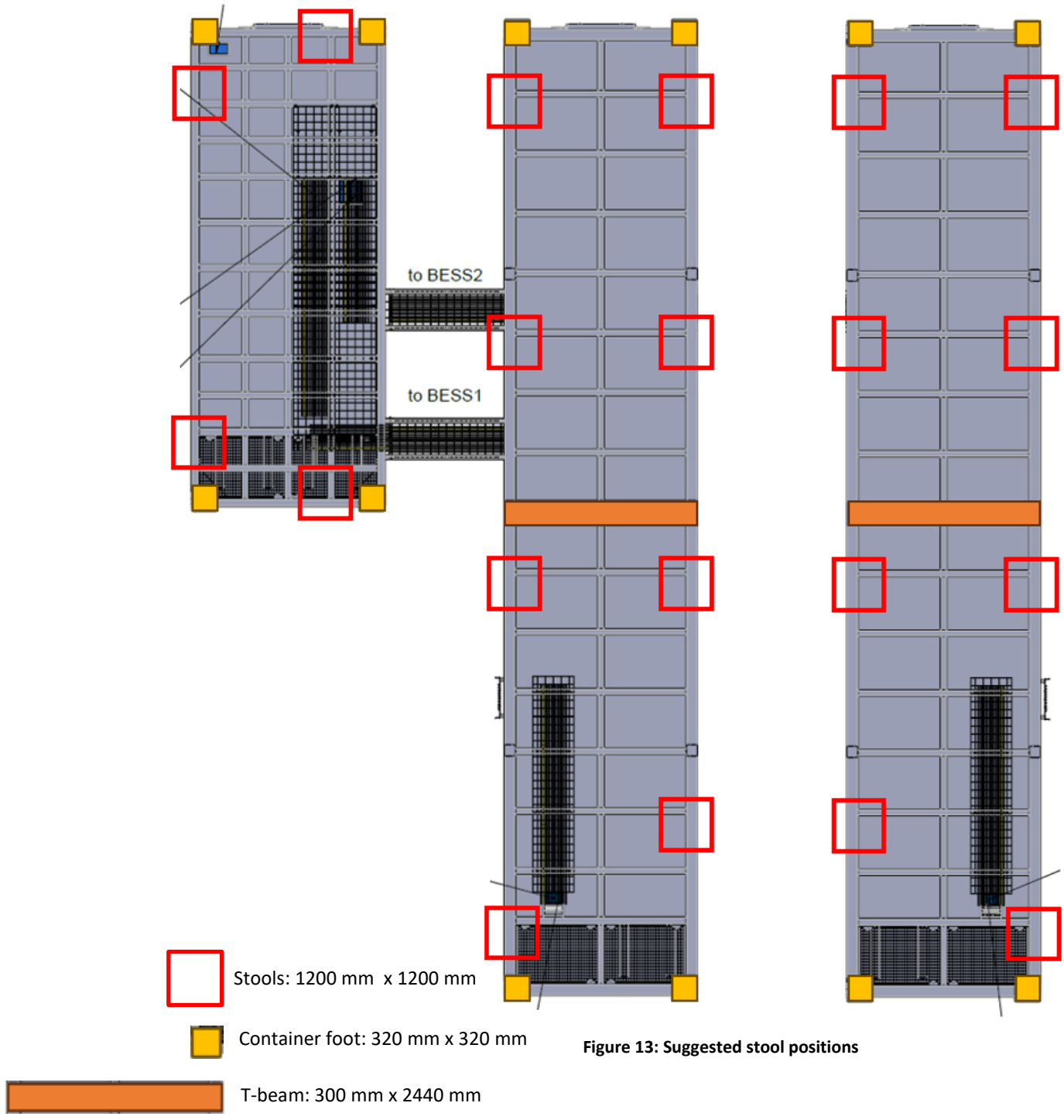


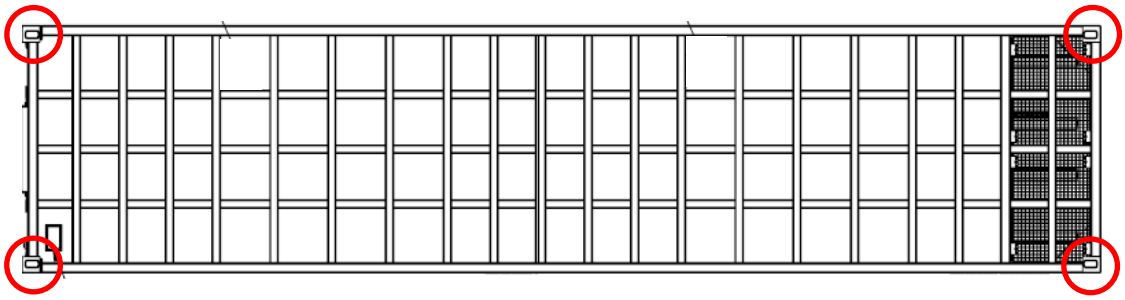
Figure 13: Suggested stool positions

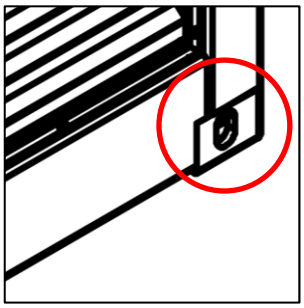
Task 2 **Install the 4 container feet to BESS container.**

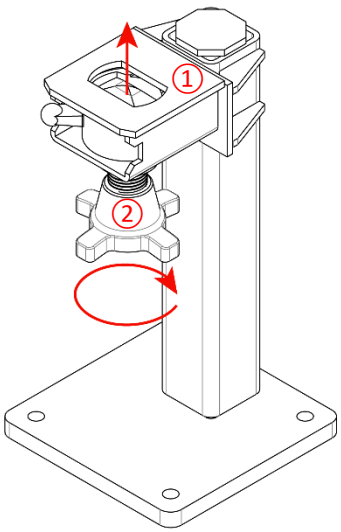
Attach container foot (*see section 6.5.1*) to one of the 4 bottom corner of the container.

Step 1 : Place the top plate (①) from the bottom to the corner of the container.

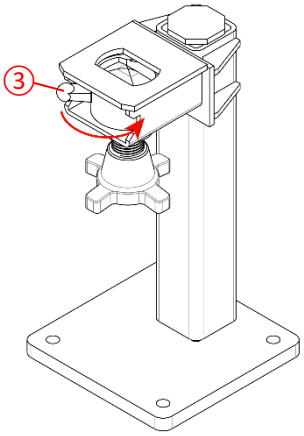
Step 2 : Screw the twist lock head mechanism of the foot (②) by twisting it as indicated in the illustration below. Screw until it has completely penetrated the bottom recess of the foot.

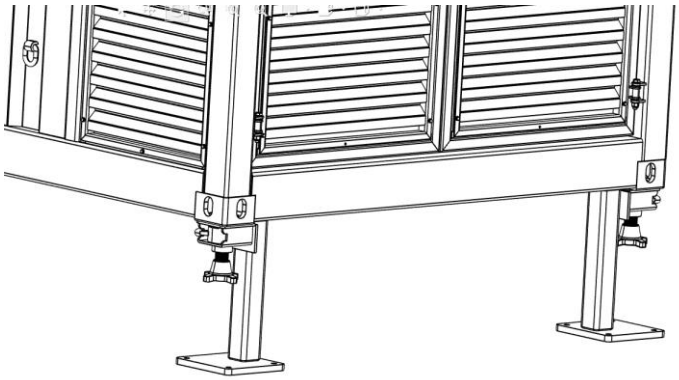






Step 3 : Secure the foot by twisting the twist lock locking mechanism (③) to the position like indicated in the illustration below.





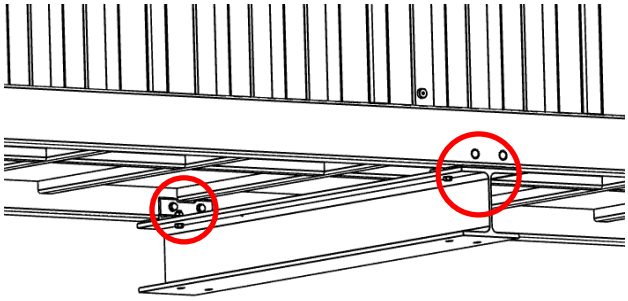
Step 4 : Repeat all the steps of task 2 for the 3 remaining container feet.

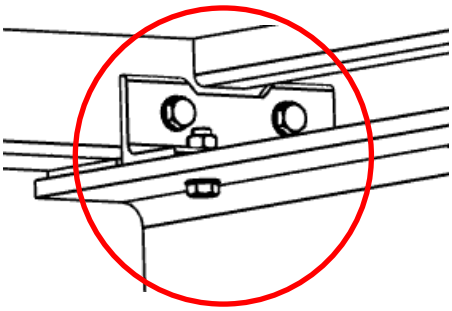
✓ **The container feet have been successfully installed to the BESS container.**

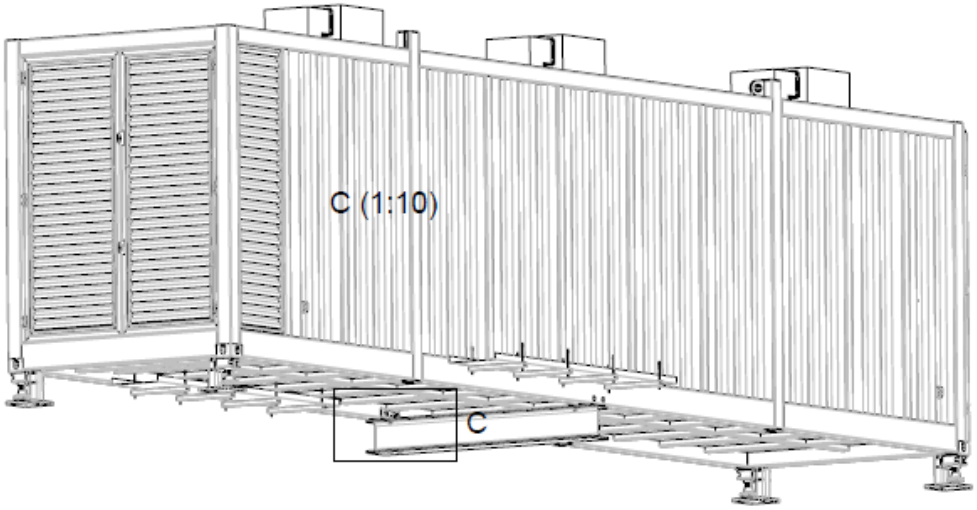
Task 3 **Install the t-beam to BESS container.**

Step 1 : While the container is still lifted on the stools, lift the provided t-beam (④) using a suitable lifting device under the container.
Beam weight approx. 260 kg.
Refer to below drawing for exact positioning of the beam.

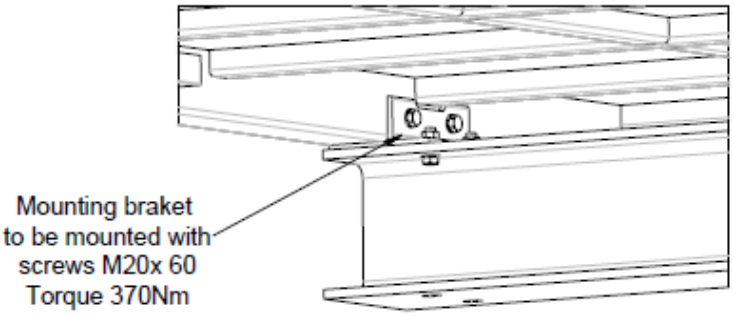
Step 2 : Fix the t-beam to the container using the bore holes underneath the container and provided mounting brackets, nuts and bolts. Apply a torque of 370 Nm to the connections.

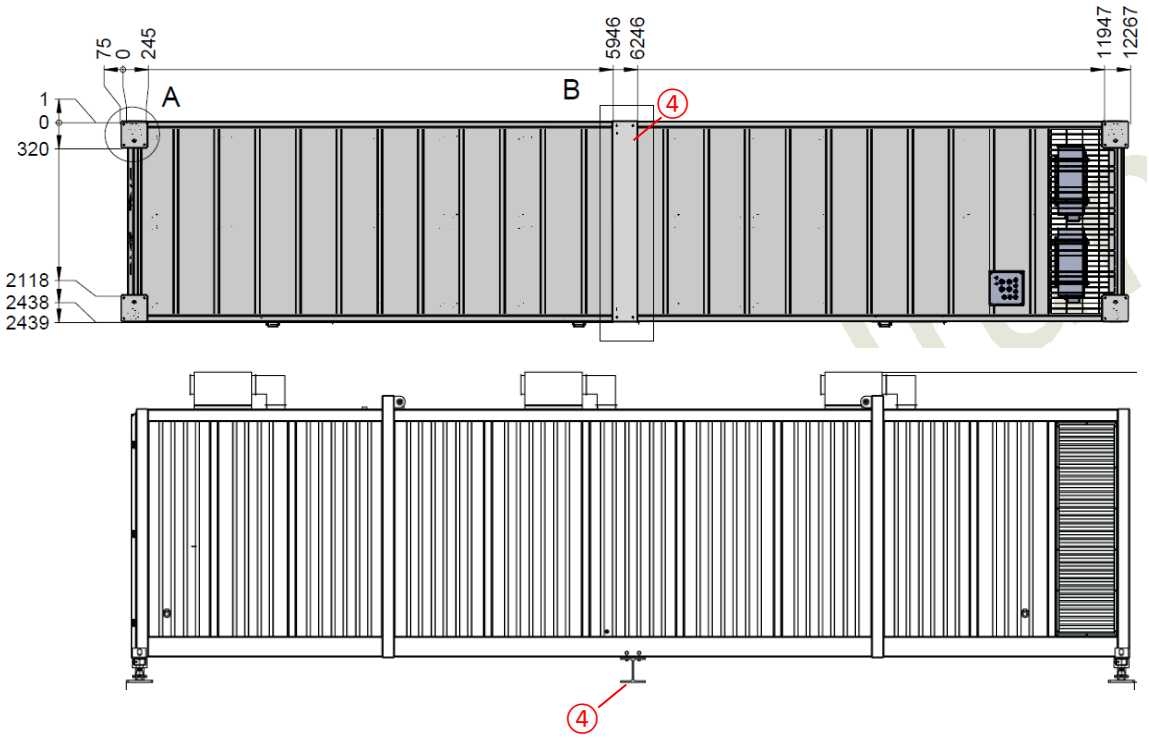


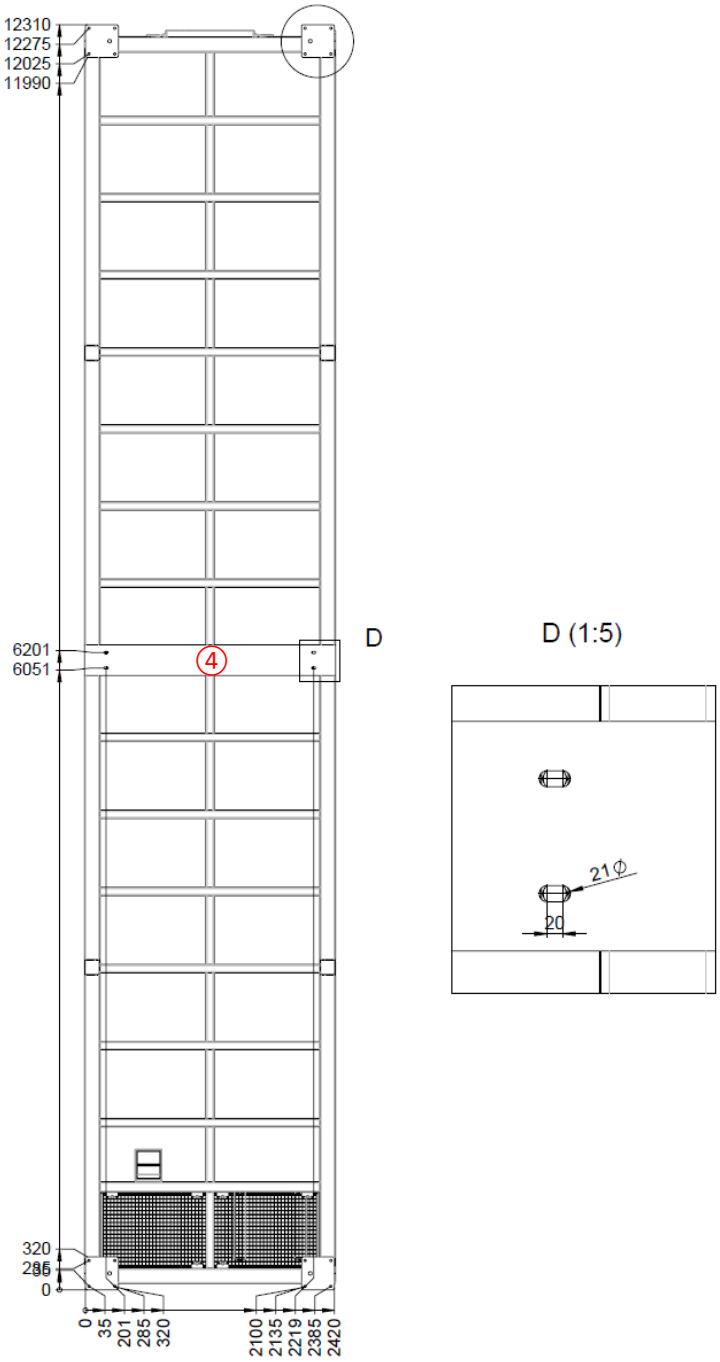



C (1:10)
C

C


Mounting braket
to be mounted with
screws M20x 60
Torque 370Nm


75
0
245
5946
6246
11947
12267
A
B
1
0
320
2118
2438
2439
4
4


12310
12275
12025
11990
6201
6051
4
D
320
285
0
0
35
201
285
320
2100
2135
2219
2385
2420

D (1:5)
21Φ
20

Task 4 **Install cable trays on container bottom**

Step 1 : While the container is still lifted on the stools, drill the bore holes for cable tray installation according to the attached drawing " Mounting cable tray".

Step 2 : Insert blind rivet nuts to the prepared bore holes according to the drawing "Mounting cable Tray".

Step 3 : Fix the cable tray (①) according to drawing "Mounting cable Tray".

Step 4 : Apply a torque to the connections according to drawing "Mounting cable Tray".

Cable trays:

RKS-Magic® 60 A4



Figure 14: Cable tray RKS-Magic® 60 A4

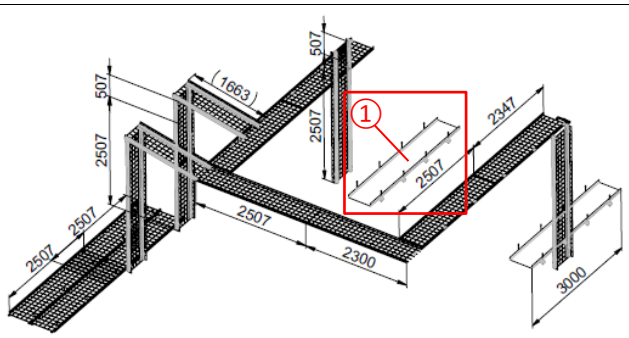


Figure 15: Cable tray for BESS 1 container installation

Specification per cable tray:

Description / name	Cable tray RKS-Magic® 60 A4
Original manufacturer part no.	6047422
Type	RKS-Magic® 60 A4
Length	3000 mm
Width	500 mm
Height	60 mm

Task 5 **Lift container to installation location and fix to installation location.**

Step 1 : Lift the container (*see section 5.2.1*) and place it to the desired installation location.

Step 2 : Fix the 4 feet to the ground using suitable connection material (welding or bolting).

✓ **The PCS container has been successfully fixed to the installation location.**

Task 6 **Lift BESS container with installed feet and T-beam to installation location.**

Step 1 : Lift the container (*see section 5.2.1*) and place it to the desired installation location. If bolting of the container feet is foreseen, make sure the boreholes of the installed container feet and t-beam are aligned with the connection provisions at the ground of the installation site.

Step 2 : Fix the T-beam to the ground using suitable connection material (welding or bolting).

Step 3 : Fix the container feet to the ground using suitable connection material (welding or bolting).

Step 4 : Check connections for tightness.

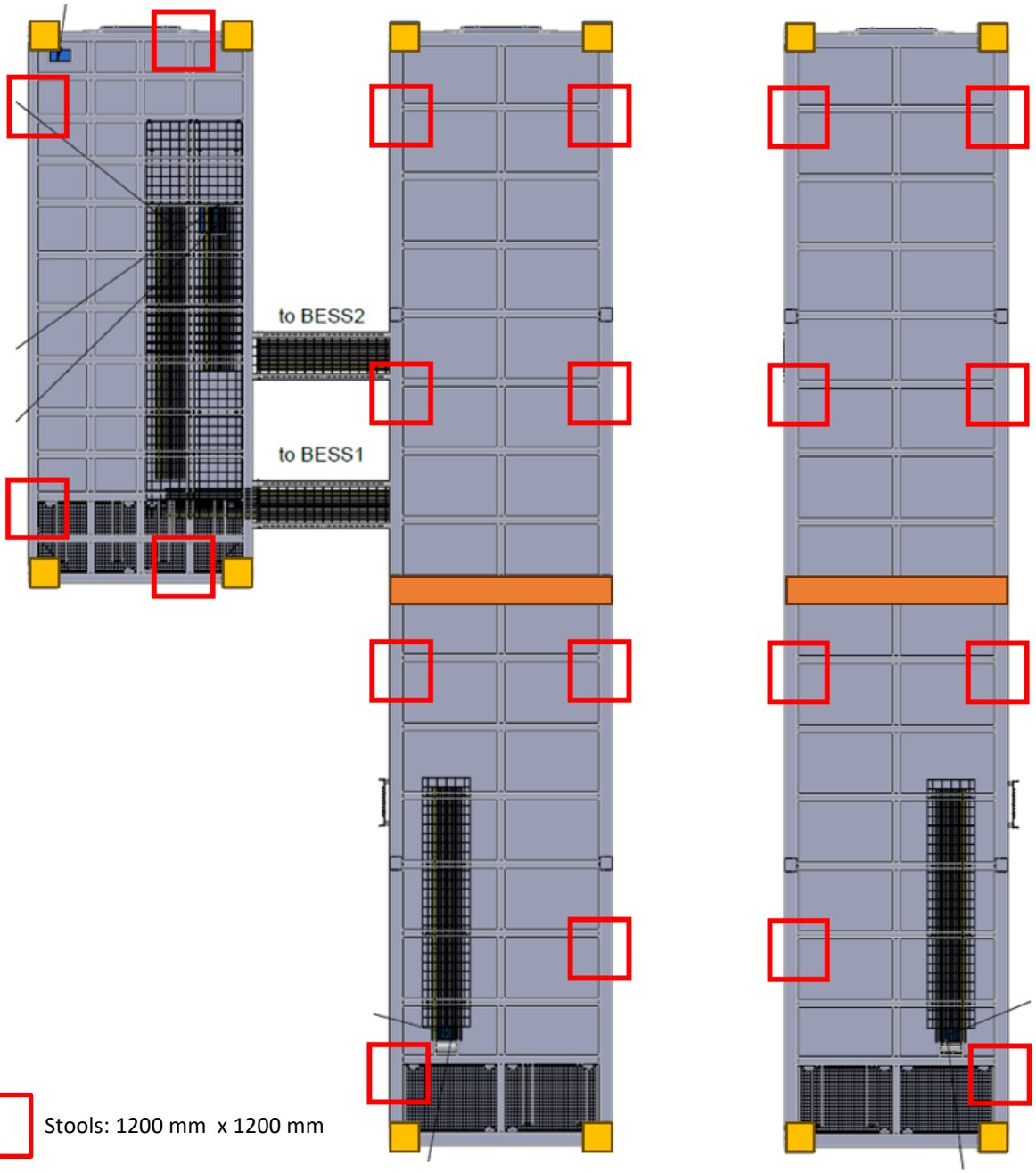
✓ **BESS container has been successfully fixed to the installation location.**

6.6.3 BESS 2

Task 1 **Lift BESS container and place on pedestal.**

Step 1 : Lift the container (*see section 5.2.1*).

Step 2 : Place the container to stools suitable to withstand the container load indicated in section 2. Please refer to below figure for information on the stool positions.



Stools: 1200 mm x 1200 mm

Container foot: 320 mm x 320 mm

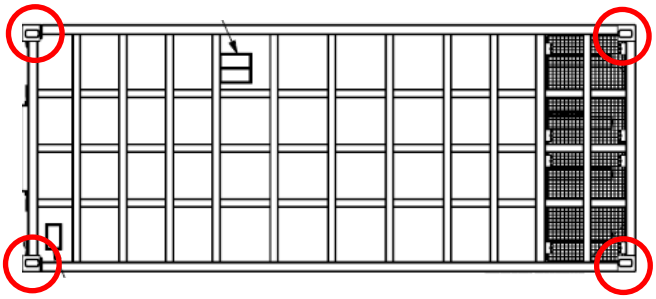
T-beam: 300 mm x 2440 mm

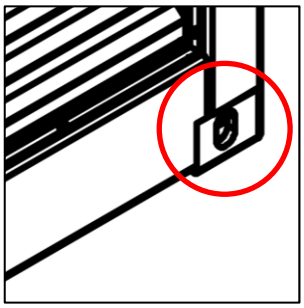
Task 2 **Install the 4 container feet to BESS 1 container.**

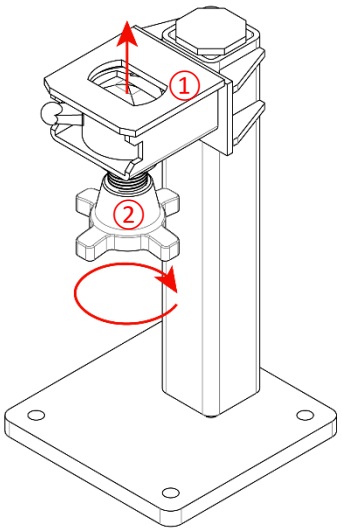
Attach container foot (*see section 6.5.1*) to one of the 4 bottom corner of the container.

Step 1 : Place the top plate (①) from the bottom to the corner of the container.

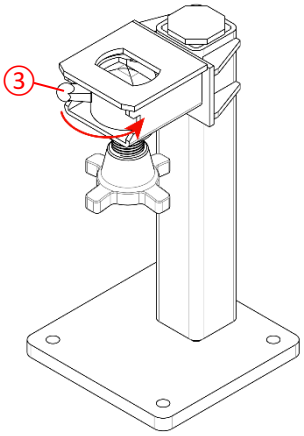
Step 2 : Screw the twist lock head mechanism of the foot (②) by twisting it as indicated in the illustration below. Screw until it has completely penetrated the bottom recess of the foot.

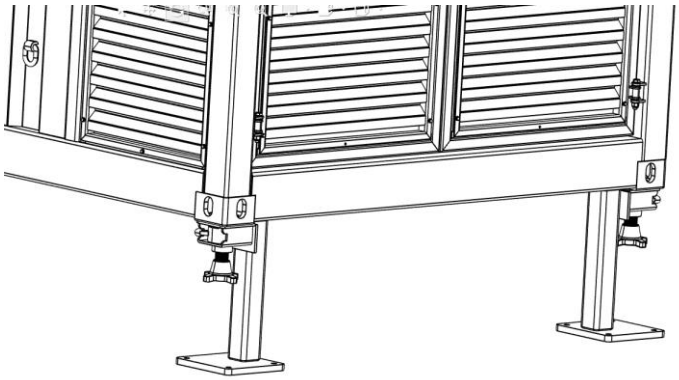






Step 3 : Secure the foot by twisting the twist lock locking mechanism (③) to the position like indicated in the illustration below.





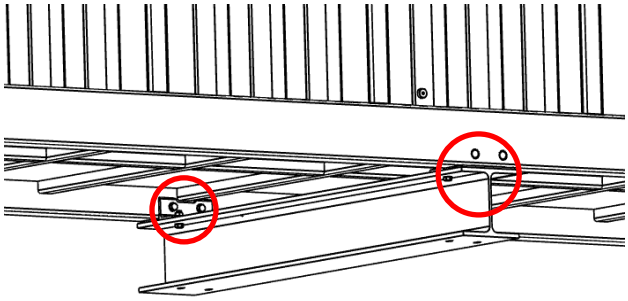
Step 4 : Repeat all the steps of task 2 for the 3 remaining container feet.

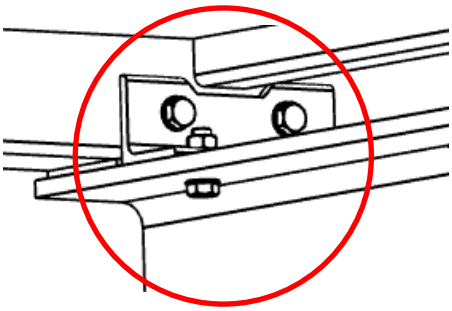
✓ **The container feet have been successfully installed to the BESS container.**

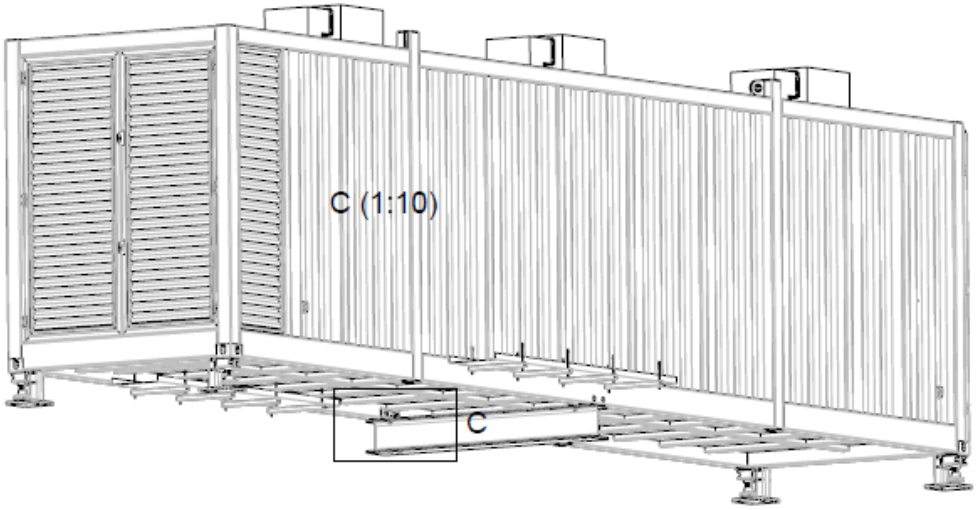
Task 3 **Install the t-beam to BESS container.**

Step 1 : While the container is still lifted on the stools, lift the provided t-beam (④) using a suitable lifting device under the container.
Beam weight approx. 260 kg.
Refer to below drawing for exact positioning of the beam.

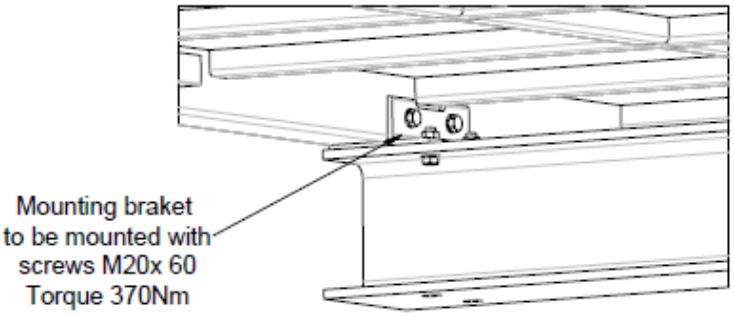
Step 2 : Fix the t-beam to the container using the bore holes underneath the container and provided mounting brackets, nuts and bolts. Apply a torque of 370 Nm to the connections.

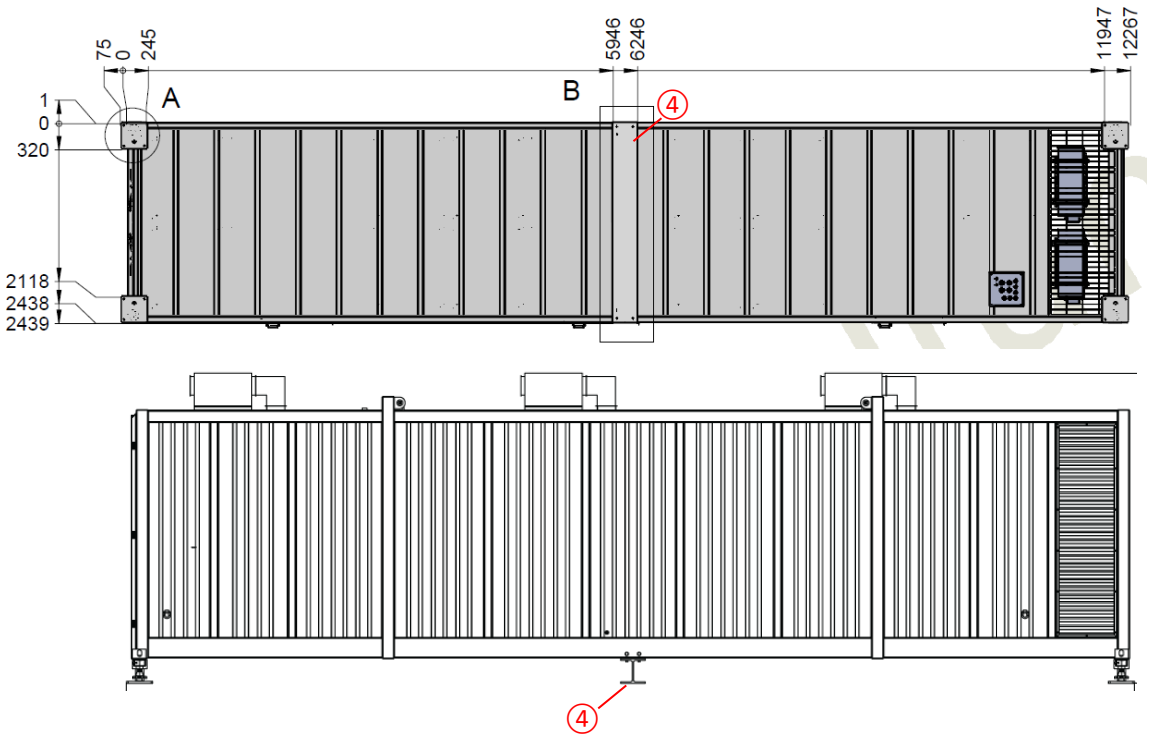


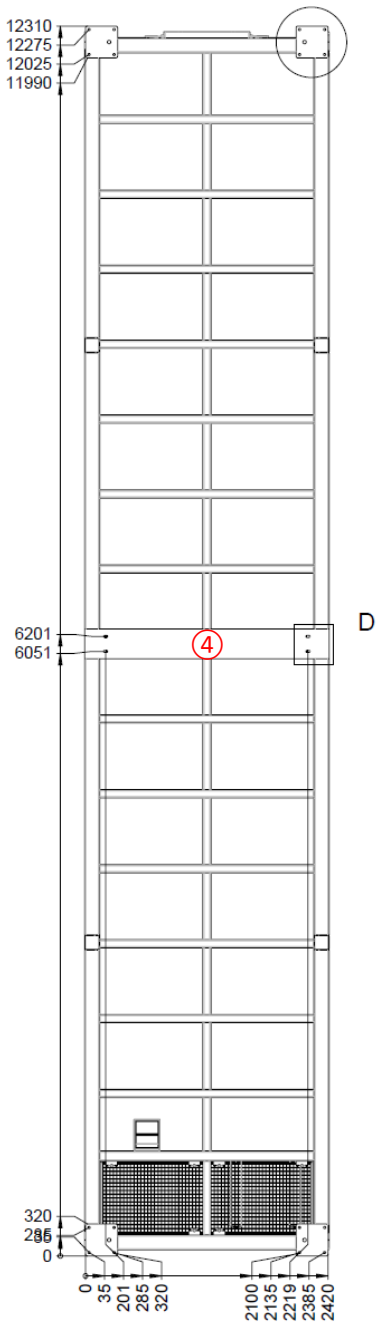


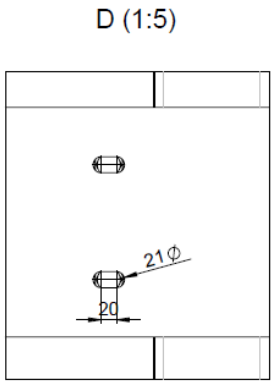

C (1:10)
C

C


Mounting braket
to be mounted with
screws M20x 60
Torque 370Nm


75
0
245
5946
6246
11947
12267
A
B
4
1
0
320
2118
2438
2439
4


12310
12275
12025
11990
6201
6051
4
D
320
285
0
0
35
201
285
320
2100
2135
2219
2385
2420


D (1:5)
21Φ
20

Task 4 **Install cable trays on container bottom**

Step 1 : While the container is still lifted on the stools, drill the bore holes for cable tray installation according to the attached drawing " Mounting cable tray".

Step 2 : Insert blind rivet nuts to the prepared bore holes according to the drawing "Mounting cable Tray".

Step 3 : Fix the cable tray (②) according to drawing "Mounting cable Tray".

Step 4 : Apply a torque to the connections according to drawing "Mounting cable Tray".

Cable trays:

RKS-Magic® 60 A4



Figure 16: Cable tray RKS-Magic® 60 A4

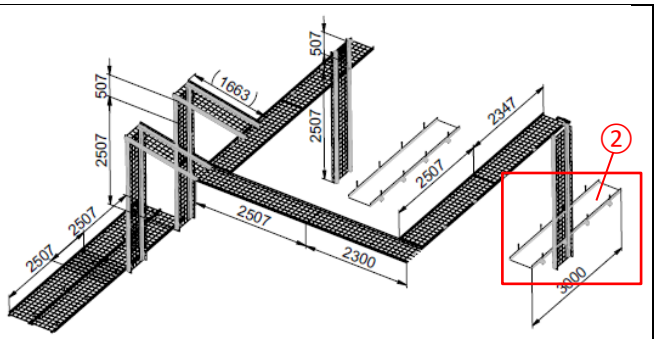


Figure 17: Cable tray for BESS 2 container installation

Specification per cable tray:

Description / name	Cable tray RKS-Magic® 60 A4
Original manufacturer part no.	6047422
Type	RKS-Magic® 60 A4
Length	3000 mm
Width	500 mm
Height	60 mm

Task 5 **Lift BESS container with installed feet to installation location.**

Step 1 : Lift the container (*see section 5.2.1*) and place it to the desired installation location. If bolting of the container feet and T-beam is foreseen, make sure the boreholes of the installed container feet and t-beam are aligned with the connection provisions at the ground of the installation site.

Step 2 : Fix the T-beam to the ground using suitable connection material (welding or bolting).

Step 3 : Fix the container feet to the ground using suitable connection material (welding or bolting).

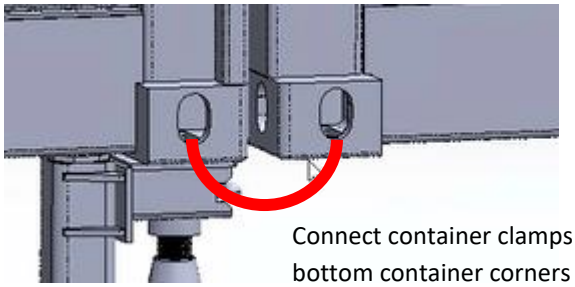
Step 4 : Check connections for tightness.

✓ **BESS container has been successfully fixed to the installation location.**

Task 6 **Fix BESS 1 and 2 containers with container clamps**

Step 1 : Attach container clamps for fixation of BESS 1 and BESS 2 containers like indicated below.

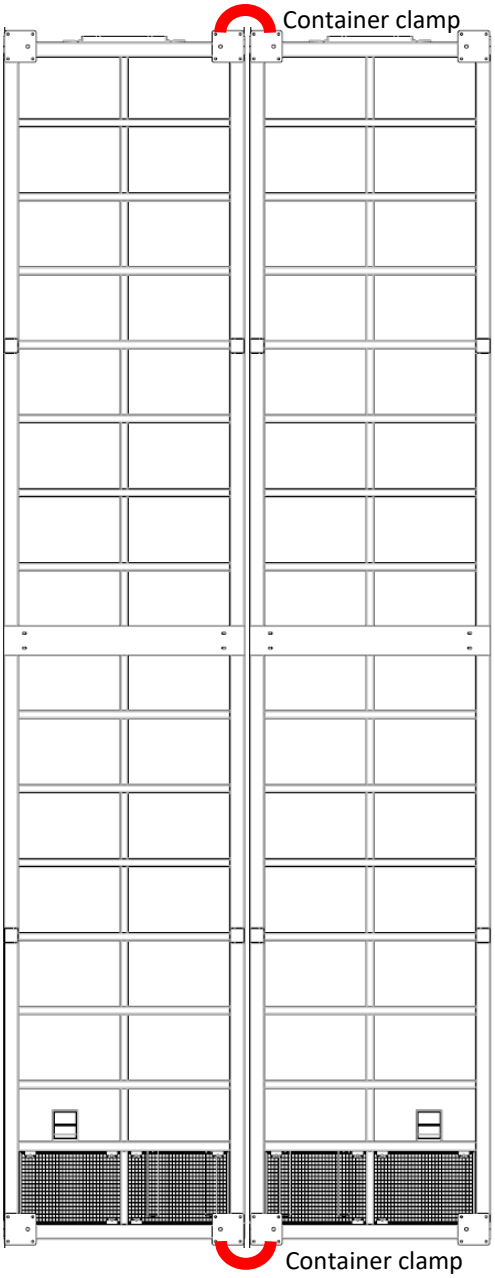
✓ **BESS container 1 and 2 has been successfully installed at the installation location.**



Connect container clamps to bottom container corners

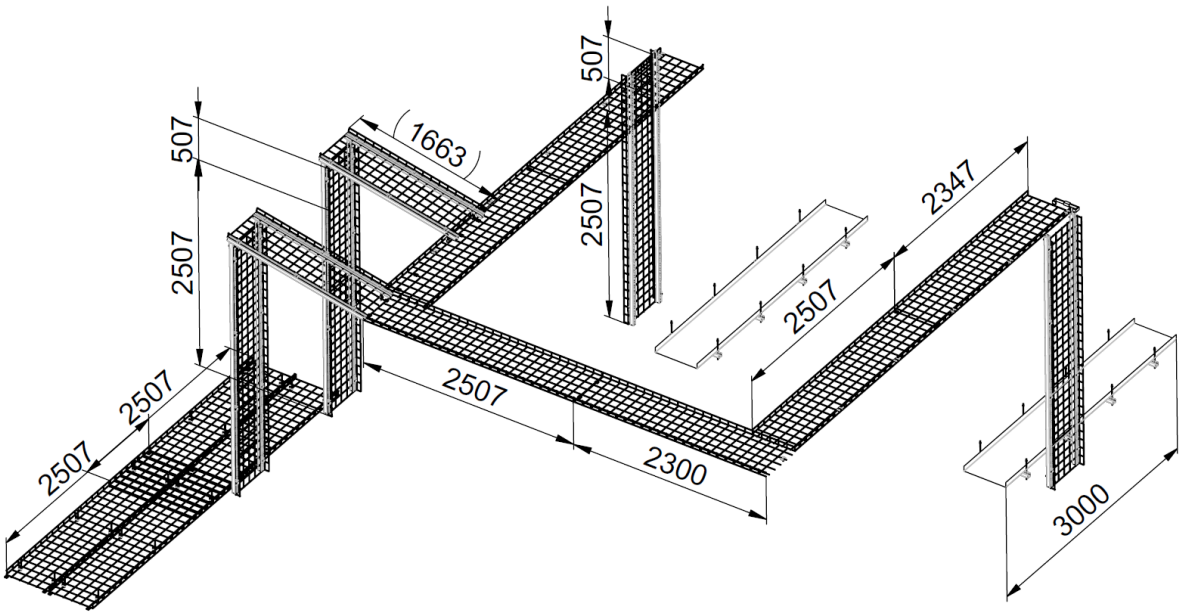


Container clamp

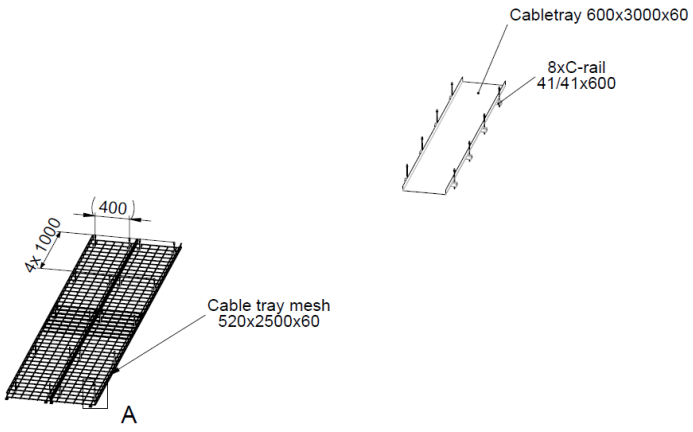


7 Appendix

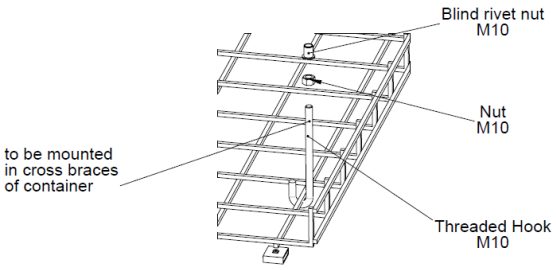
1. Drawing “Mounting cable tray”



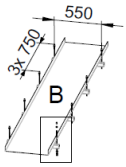
Pos. Nr.	Menge	Bezeichnung	Art.-Nr.	Lieferant	Lieferanten Nr.
1	25	V2A_ Gitterrinne GKX 520x60x2507	52520	Pflitsch	115496 GKX 520x60 V2A
6	6	MS 41-41 VA	54532	Sikla	195796
8	80	Blindnietmutter M10 Flachkopf (0,7-3,5)	505856	Böllhoff	23307100235
9	60	Sperrkantscheibe - Form M - M10	503802	--	--
10	60	Zylinderschraube mit ISK ISO 4762 - M10 x 20 - 8.8 - St.	500865	--	--
11	15	Gewindeplatte VA NT CC41 M10	54544	Sikla	199312
12	6	Befestigungswinkel	54546		
13	50	Sechskantmutter ISO 4032 - M10 - 8	503711	--	--
14	20	Gewindehaken GH	54547	Sikla	101602
15	4	Befestigungswinkel	54549		
16	50	Gewindeplatte CC41-M8	54550	Sikla	195305
17	55	V4A Gitterkanal Verbindungslasche X1	52531	Pflitsch	GK L X1 V4A
18	55	Sperrkantscheibe - Form M - M8	503801	--	--
19	55	Zylinderschraube mit ISK ISO 4762 - M8 x 30 - 8.8 - St.	503670	--	--
20	30	Gitterkanal VerbindungslascheX2	52505	Pflitsch	GK L X2
21	2	Bridge Fitting CL1/50	53388	Plomben.de	TS20003-001
22	16	threaded rod / Gewindestange	---		
23	8	MS 41-41 VA-600	54717	Sikla	195796
24	2	Kabelrinne RKS Magic 60A4	509409	Obo	6047422
25	16	Sperrkantscheibe - Form B - M8	505744	--	--
26	16	Blindnietmutter M8 KSGRSO (e=3,0-4,5)	505060	Böllhoff	34367080045



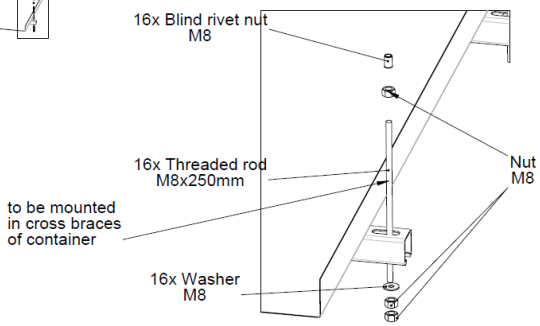
A (1:5)



Torque for all M10: 35Nm



B (1:5)



Torque for all M8: 20Nm

Rev.:	Änderung (changes):	Datum (Date):	Name:

Allgemeintoleranzen für Längenmaße DIN ISO 2768-mK
Abmaße in mm für Nennmaßbereiche

Genauigkeitsgrad	0,5 ... 3	> 3 ... 6	> 6 ... 30	> 30 ... 120	> 120 ... 400	> 400 ... 1000	> 1000 ... 2000
m (mittel)	± 0.1	± 0.1	± 0.2	± 0.3	± 0.5	± 0.8	± 1.2

Oberfläche (surface): -
Werkstoff (material): 176.97 kg

	Datum (Date):	Name:
Drawn:	03.07.2024	MvD
Checked:		

+0,5 -0,5
ISO 13715

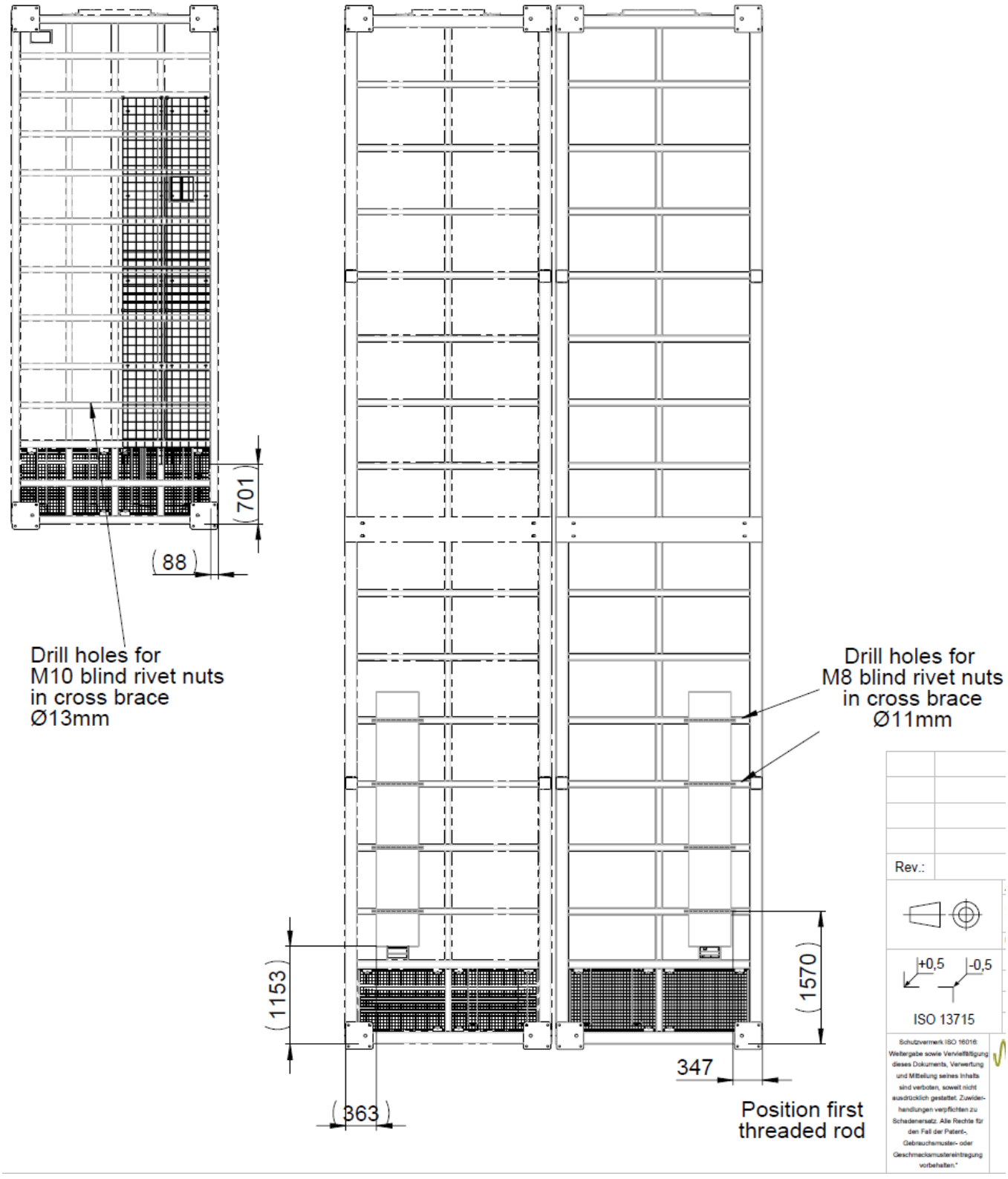
Bezeichnung (description): Cable trays

Scale: 1:40
Sheet: 2 (A3)
2 of: 4
Revision:

Artikel-Nr. (article number): 54543
Projekt-Nr. & Kunde (project number & customer): 23A2007 Statron

FREQCON
Freqcon GmbH
Bürgerwiesenweg 5
D-27336 Rethem
+49 (0) 5165 291760-0

Schutzvermerk ISO 16016: Weitergabe sowie Vervielfältigung dieses Dokuments, Verwertung und Mitteilung seines Inhalts sind verboten, soweit nicht ausdrücklich gestattet. Zuwiderhandlungen verpflichten zu Schadenersatz. Alle Rechte für den Fall der Patent-, Gebrauchsmuster- oder Geschmacksmustereintragung


701
88
Drill holes for
M10 blind rivet nuts
in cross brace
Ø13mm
Drill holes for
M8 blind rivet nuts
in cross brace
Ø11mm
1153
1570
363
347
Position first
threaded rod
Rev.:
+0,5
-0,5
ISO 13715

2. Drawing "Mounting T-Beam"

