20 FOOT CONTAINER ROLL OUT WAREHOUSING SYSTEM (CROWS) USER MANUAL

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SAFETY WARNINGS

Operators involved in moving, stacking, loading or unloading CROWS should be suitably qualified and experienced, and wear appropriate approved Personnel Protective Equipment (PPE).

It is recommended that the following items should be worn:

- Appropriate long sleeved shirts, and long pants,
- Steel capped boots,
- Suitable gloves,
- Safety glasses, and
- Hard hat.

Failure to follow the warning may result in serious injury to personnel.

Suitable **Material Handling Equipment (MHE)** must be used to move, load, unload and stack CROWS. Key safety requirements include:

- The MHE has to be rated and capable of lifting the Maximum Gross Weight (MGW) of CROWS, including secured load;
- The MHE needs to have appropriate lifting tines to suit the CROWS tine pockets;
- All moving, loading and unloading activities need to be carried out on suitable level, even and compacted surfaces; and
- Particular attention is needed when moving, loading and unloading stacked CROWS assemblies to ensure MHE is capable of handling total gross weight of stack.

Failure to comply may result in severe injury or death to personnel and damage to equipment.

When **loading and unloading CROWS** ensure all personnel stand clear of the CROWS and the Container, in particular operators/spotters must ensure that they:

- Do not stand between the CROWS and the shipping container during loading, and
- Do not extend any part of the body under a suspended CROWS platform.

Failure to comply may result in severe injury or death to personnel and damage

The CROWS must only be **loaded** up to the maximum permissible payload, depending on stacking arrangement as specified in this manual.

Loads must be evenly distributed across the CROWS deck surface.

Loads must be secured using suitable rated and certified load restraint equipment, and only secured to the CROWS using the certified tie-down points as marked on the CROWS platform.

Tie-down rails are provided along both sides of the CROWS and are capable of restraining up to 3.8 tonnes, per load restraint bay. Ensure only one restraint is applied to each tie rail bay.

Failure to comply may result in severe injury to personnel or damage to equipment.

Before **moving or loading CROWS** as a nested configuration, the operator is to confirm that all interfacing twist-locks are positively engaged.

Always lift a stacked or nested CROWS via the base CROWS, either by overhead MHE or forklift.

Payload restrictions apply to double stacked CROWS when being transported using the CROWS Claws, detailed in Table 19.

Failure to comply may result in severe injury or death to personnel and damage to equipment.

Stacked CROWS for transportation or warehousing shall have heavier loads on the lower levels.

Failure to comply may result in severe injury or death to personnel and damage to equipment.

The 20 foot CROWS are compatible with the 40 foot CROWS.

The 40 foot CROWS user manual must be used when operating the 20 foot CROWS with the 40 foot CROWS.

Failure to comply may result in severe injury or death to personnel and damage to equipment.

The **CROWS end forklift pockets are not to be used for lifting the CROWS**. The tine pockets provided at the end of the CROWS is for Roll in/Roll out loading and unloading into a 20 foot shipping containers.

Failure to comply may result in severe injury or death to personnel and damage to equipment.

If at any time the CROWS legs cannot be fully tightened i.e. the leg is loose after fully tightening the securing bolt, the legs have been damaged and must not be used the leg will need to be repaired or replaced.

Failure to comply may result in severe injury or death to personnel and damage to equipment.

FOREWORD

Authority

Sea Box Inc. (SBI) is the Design Authority for the Container Roll Out Warehousing System (CROWS). For safety purposes, this manual is a 'controlled item' and as such is not to be modified or altered in any way. Any suggested improvements relating to design, functionality or operating procedures are actively encouraged. Any such suggestions or notifications are to be sent to: info@seaboxintl.com.au or phone (02) 6162 2826.

Manual Currency and Version Control

Updated versions of this manual will be available on requests sent to info@seaboxintl.com.au. SBI will make best endeavours to ensure that SBI – CROWS customers are updated with subsequent versions of this document.

Manual Layout and Applicability

This manual is divided into two sections:

Chapter 1: Description and Tabulated Data. This section provides familiarity with the equipment and provides specification data intended to assist users conduct operational planning.

Chapter 2: Operating Instructions. This section provides instruction on:

1. Preparation for Use,
2. Assembly,
3. Loading,
4. Unloading,
5. Warehousing, and
6. Servicing.

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CHAPTER 1 DESCRIPTION AND TABULATED DATA

Introduction

7. The Container Roll Out Warehousing System (CROWS) is an ISO shipping container derivative that provides a Roll in/Roll out capability to load problematic cargo into ISO shipping containers, in particular for logistics operations into environmentally controlled areas. It also provides an expedient warehousing system such that loads can be removed from containers and efficiently stored, and ready for subsequent redeployment.

8. Throughout this Manual the word CROWS refers to a 20 foot CROWS unless otherwise specified.

CROWS Description and Layout

9. The layout of a static CROWS platform, including its major components is shown in Figure 1 and Figure 2 below.

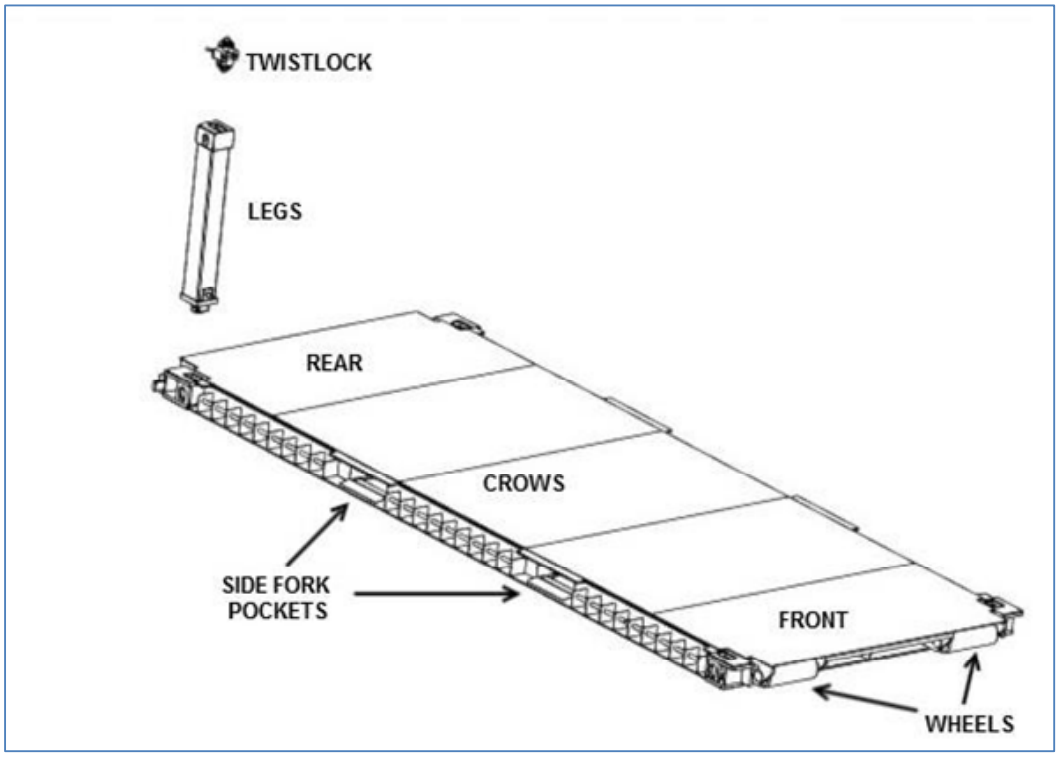


Figure 1: Front View

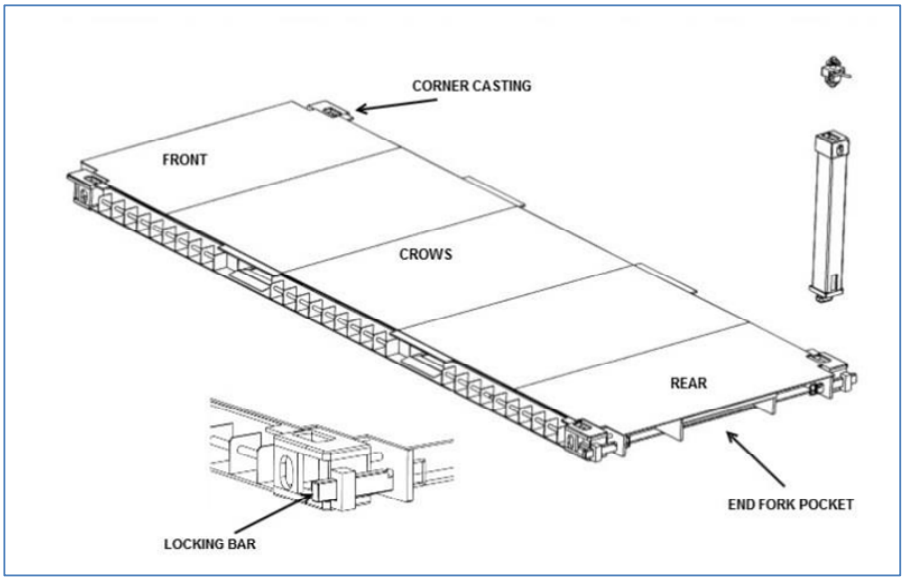


Figure 2: Rear View

Deployment Configurations

10. The CROWS is designed to deploy in the following configurations:

    a. **Single unit loaded into the container.** This configuration provides for the transport 'large bulky' items that encompass a significant percentage of the containers storage capacity;

    b. **Double Stacked unit loaded into the container.** This configuration is designed to accommodate smaller loads, and provide a mechanism to optimise load space available in the container and as such reduces logistics overheads;

    c. **Nested units loaded into the container.** This configuration provides the ability to nest several CROWS platforms and effectively deploy the modules into an operational environment; and

    d. **Warehousing configuration.** This capability provides an expedient storage system. It is intended to minimise the environmental footprint required to establish lay-down areas and storage yards. It is also intended to be a mechanism in which project stores can be effectively located and redeployed. It should also be noted that this warehousing dynamic includes storage and stacking in containers (for items that require protection from the elements). In this case the CROWS platform provides rapid deployment out of the warehoused containers.

11. Figure 3 through to Figure 6 provide an illustrated representation of CROWS configurations.

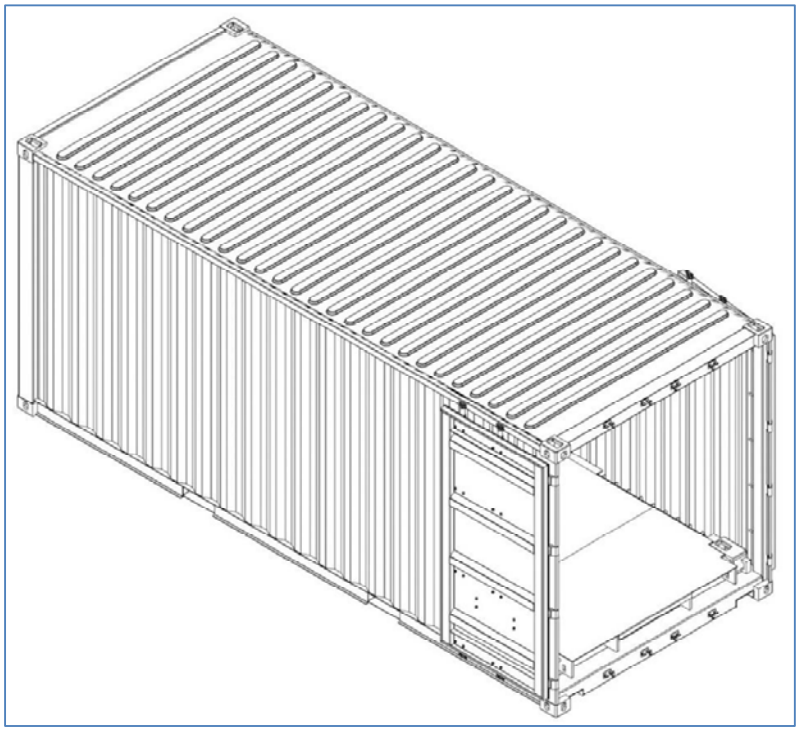


Figure 3: Single Loaded CROWS

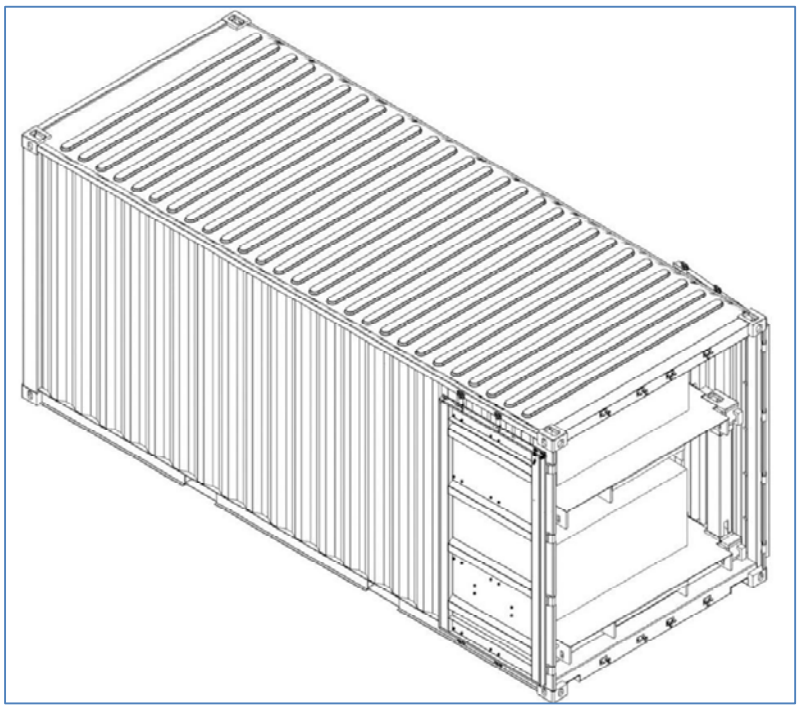


Figure 4: Double Stacked Laden CROWS

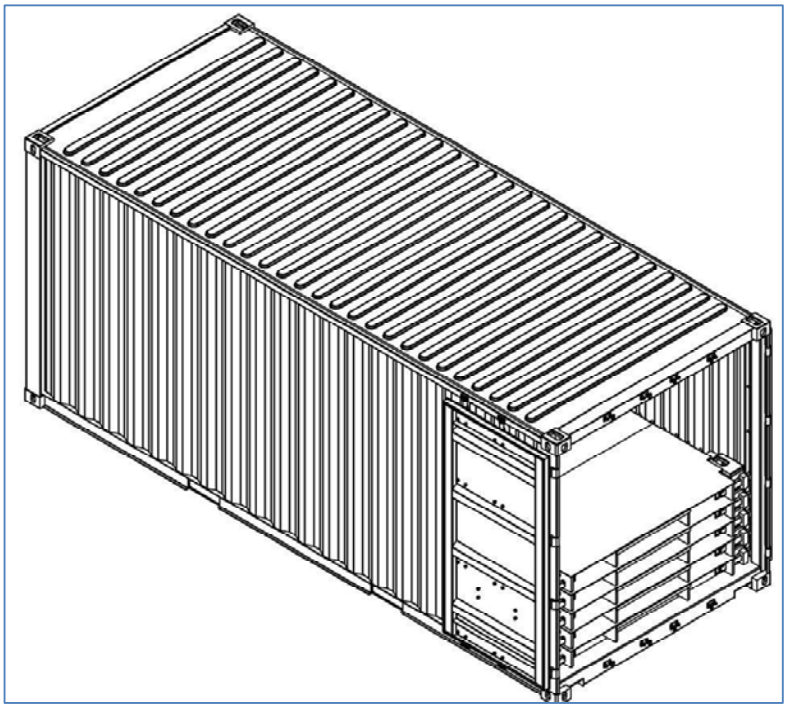


Figure 5: Nested Loaded CROWS

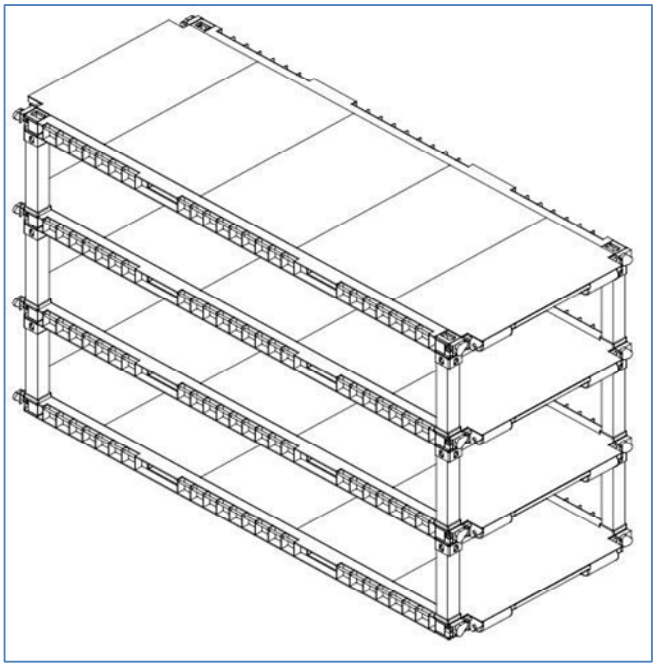


Figure 6: Stacked Warehousing Configuration

Characteristics and Tabulated Data

12. The purpose of this section is to outline the specific dimension, weights and capabilities of the CROWS. Additionally it defines key capabilities and restrictions relating to the use CROWS in specified configurations. Table 1 below details the specification of a single CROWS.

Table 1: CROWS Specifications

Single CROWS Specifications	
Characteristics	Dimension (mm)
Width	2296
Length	5853
Height	181
Characteristics	Weight (kg)
Tare Weight	2200
Maximum Payload (including tie-down equipment)	9800
Maximum Gross Weight (MGW)	12,000

13. Table 2 below shows the specifications of the CROWS when double stacked CROWS are being used for moving and transportation using 1, 2 and 3 foot legs.

Table 2: Double Stacked CROWS Specifications for Moving and Transportation

Configurations	Tare Weight (kg)	Maximum Payload (kg)	Maximum Gross Weight (kg)	Height (mm)
Double Stacked (1 foot legs)	4536	7464	12,000	687
Double Stacked (2 foot legs)	4568	7432	12,000	987
Double Stacked (3 foot legs)	4600	7400	12,000	1287
Double Stacked (4 foot Legs)	4632	7368	12,000	1587

14. Table 3 below shows the specifications for triple stacked CROWS for moving and transportation using 1 and 2 foot legs.

Table 3: Triple Stacked CROWS Specification for Moving and Transportation

Configurations	Tare Weight (kg)	Maximum Payload (kg)	Maximum Gross Weight (kg)	Height (mm)
Triple Stacked (1 foot legs)	6872	5128	12,000	1193
Triple Stacked (2 foot legs)	6936	5064	12,000	1793

Note 1: For moving and transportation, triple stacking using 3 foot legs is not permitted.

Note 2: Weights of the double ended twist-locks are not included in the tare weight.

15. Table 4 below shows the allowed weight that can be supported during warehousing in a static environment.

Four high stacking with 4 foot legs is not allowed, maximum warehousing when using 4 foot legs at any level is 3 high with the same payloads as Table 4.

Failure to comply may result in severe injury or death to personnel and damage to equipment.

Table 4: Warehousing Specifications

Configuration	Maximum Payload (kg)	Maximum Gross Weight (kg)
Base level CROWS	9800	12,000
2nd level CROWS in stack	9800	12,000
3nd level CROWS in stack	9800	12,000
4th level CROWS in stack	9800	12,000

Note: When the CROWS are being moved or transported in a container the payload limits of Table 2 and Table 3 apply. When the CROWS are warehoused

in a static environment they must be stacked in accordance with the operational procedures outlined in Chapter 2: CROWS Stacking Installation and Warehousing Installation.

16. Table 5 below outlines the different heights and weights of the CROWS legs.

Table 5: CROWS Leg Specifications

Length of CROWS Leg mm (ft)	Weight (kg)
300 (1)	34
600 (2)	42
900 (3)	50
1200(4)	58

CHAPTER 2 OPERATING INSTRUCTIONS

Introduction

17. The purpose of this chapter is to provide instruction on safe and efficient operating procedures required for the use of CROWS in all configurations. This consists of:

    a. Preparation for Use,

    b. Assembly,

    c. Loading,

    d. Unloading,

    e. Warehousing, and

    f. Servicing.

Preparation for Use

18. Operators are required to inspect the CROWS before the operation occurs in any configuration. The operator is to conduct a walk around and perform the following checks prior to operation:

Walk Around Inspection

19. The operator is to walk around the CROWS in a path shown below in Figure 7. During the walk around the operator will perform the checks outlined below.

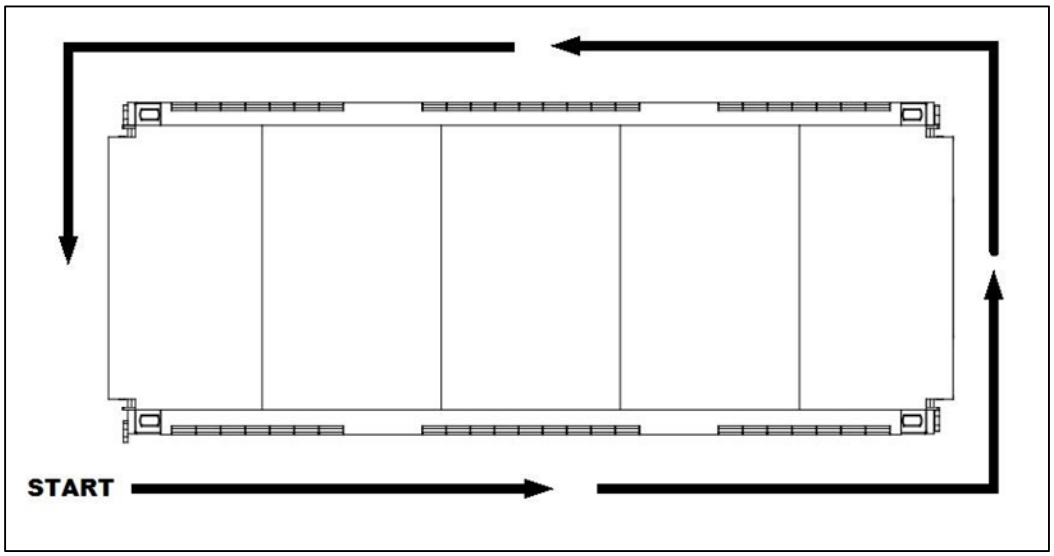


Figure 7: Walk-Around Inspection Path

Tie-Down Rail Check

20. Check the tie-down rails down each side of the CROWS to ensure they are serviceable as per Table 6.

Table 6: CROWS Tie-Down Rail Inspection

Item No.	Interval	Item to Check/Service	Procedure	Not Fully Functional If:
1	Before operation	Tie-down rails at each side of CROWS and two individual tie-down points at front and rear of CROWS	Visibly inspect CROWS, and check condition of tie- down rails to ensure no impact or loading damage is evident, that rails and supports are not excessively bent, and no evidence of damaged welds, or sharp edges.	Tie-down rails are bent by more than 5mm, or if not fully secured to supports.

CROWS Mounting and Lifting Points Check

21. Check the CROWS mounting and lifting points to ensure they are serviceable as per Table 7.

Table 7: CROWS Mounting Lifting Points Inspection

Item No.	Interval	Item to Check/Service	Procedure	Not Fully Functional If:
2	Before operation	Twist-lock mounts	Visibly inspect each of the four twist-lock mounting plates, at each corner of the platform, to ensure the mounting plate opening is free of debris, and is not deformed or bent. If only debris, clean as required.	Twist-lock mounting openings are bent or obstructed with debris.
3	Before operation	Corner castings	Visibly inspect each of the four corners casting at each lower corner of the platform, to ensure the castings are not bent or damaged and that the opening is free of debris or any obstacles. If only debris, clean as required.	Corner castings are bent or obstructed with debris.

Item No.	Interval	Item to Check/Service	Procedure	Not Fully Functional If:
4	Before operation	Fork pockets	Visibly inspect each of the three fork pockets to ensure they are free of damage, including: • split or torn metal sections, and • damaged or split welds.	Fork pockets have any damage more than superficial denting of plate surfaces.

CROWS Rollers Check

22. Check the CROWS Rollers as detailed in Table 8.

Table 8: CROWS Rollers Inspection

Item No.	Interval	Item to Check/Service	Procedure	Not Fully Functional If:
5	Before operation	Rollers	Ensure each roller will rotate. (Can only be inspected with CROWS elevated) Visibly inspect each roller to ensure it is not defaced or so out-of-round that it will not roll properly.	Either roller is excessively worn, split, or defaced that proper loading into 20 foot ISO container is not possible.

CROWS Deck and Underside Plating Check

23. Check the CROWS deck as detailed in Table 9.

Table 9: CROWS Deck and Underside Plating Inspection

Item No.	Interval	Item to Check/Service	Procedure	Not Fully Functional If:
6	Before operation	Load deck and lower CROWS plating	Visibly inspect load deck and to ensure that the metal plating is not deformed, ripped or torn and that all welds are intact and not split.	Load deck is ripped or torn so that material or water can enter the frame of the CROWS.

7	Before operation	Load deck and lower CROWS plating	Visibly inspect the metal plating protecting the underneath of the CROWS frame to ensure it is not deformed, ripped or torn and that all welds are intact and not split.	Lower metal plating is ripped or torn so that foreign material or water can enter the frame of the CROWS.
8	Before operation	Load deck and lower CROWS plating	Ensure that all joint sealant is intact and not worn away or impact damaged.	Joint sealant compound on lower frame plating joints is worn away or not visible to the point that protection from foreign material or liquids is compromised.

CROWS Legs Check (if posts are used)

24. Check the CROWS Legs as detailed in Table 10, the CROWS Legs come in 3 different sizes being 1, 2 and 3 foot. The instructions below apply equally to all 3 sizes.

If at any time the CROWS legs cannot be fully tightened i.e. the leg is loose after fully tightening the securing bolt, the legs have been damaged and must not be used the leg will need to be repaired or replaced.

Failure to comply may result in severe injury or death to personnel and damage to equipment.

Table 10: CROWS Legs Inspection

Item No.	Interval	Item to Check/Service	Procedure	Not Fully Functional If:
9	Before operation	CROWS Legs	Inspect the overall condition of each CROWS Legs to ensure they are undamaged, not bent and that the connecting fixtures at each end are fitted and complete.	If the Leg mechanism is bent or damaged.
10	Before operation	CROWS Legs	Ensure that the attaching mechanism at the base of each leg as shown at (2) in Table 13 is undamaged, is complete, and that the screw and nut assembly turns freely.	If the mechanism will not lock or unlock freely.
11	Before operation	CROWS Legs	A standard twist-lock is supplied and fitted to the top of each Leg. Ensure the twist-lock operates freely through both the latch and unlatch positions using the attached lever.	If the mechanism will not lock or unlock freely.

CROWS Transport Locking Bars Check

25. Check the CROWS transport locking bars as shown in Figure 8 and detailed in Table 11.

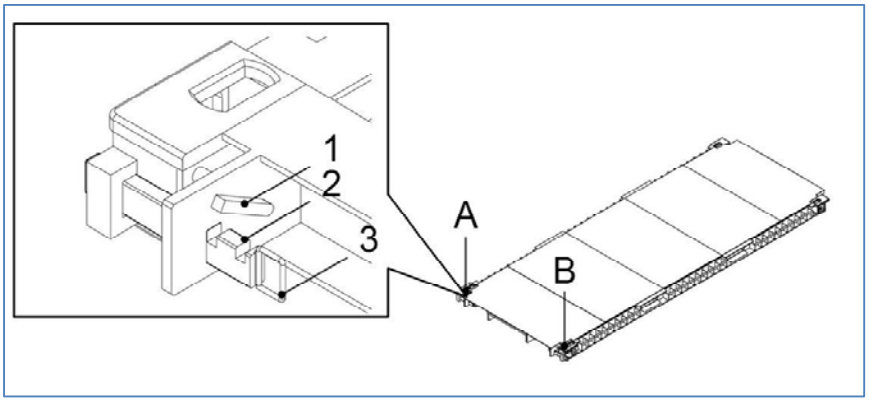


Figure 8: CROWS Transport Locking Bar

Item Number	Description
1	Pivot Locking Bar
2	Locking Bar
3	Locking Bar Handle

Table 11: CROWS Locking Bars Inspection

Item No.	Interval	Item to Check/Service	Procedure	Not Fully Functional If:
12	Before operation	Transport Locking Bars	Locate the two locking bar assemblies located at A & B on Figure 8. Inspect the two locking bar mechanism situated at 2 in Figure 8. Ensure mechanism including slide bolt and retaining bracket is not bent and slide bolt moves freely in both the locked and unlocked positions Ensure the mechanism is not bent or distorted.	If the mechanism will not lock or unlock freely. If the mechanism is bent or distorted.

Assembly

26. This Assembly section details the following configurations of the CROWS:

    a. The procedure to nest empty CROWS using double ended twist-locks for transportation or warehousing;

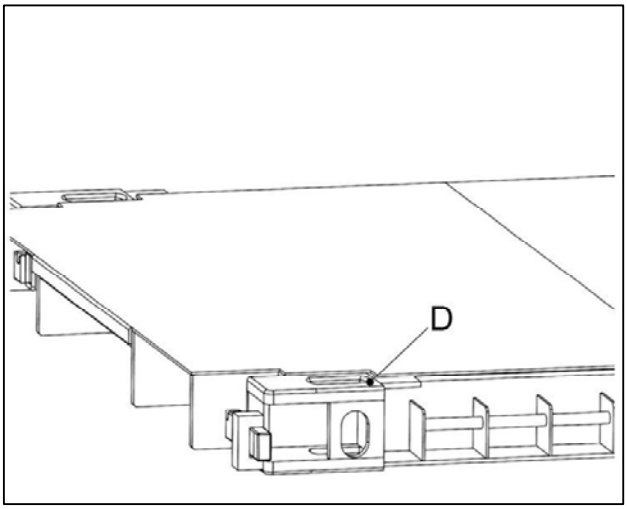
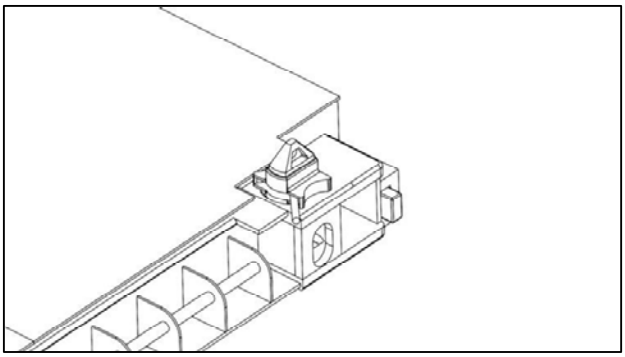
    b. The procedure of the CROWS legs installation if they are required for stacking loads during transportation or stacking in a warehousing situation; and

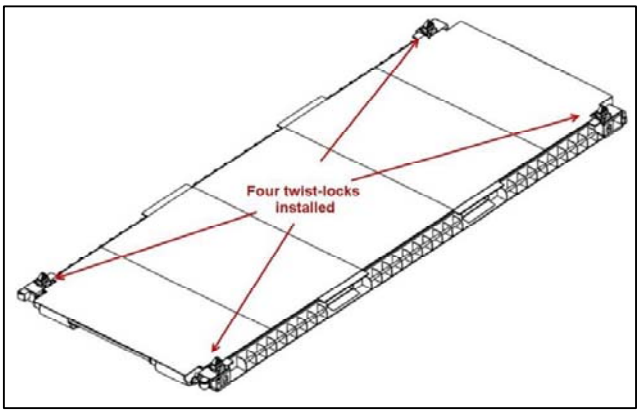
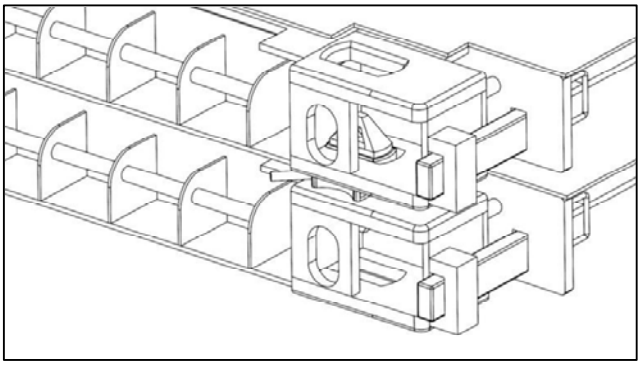
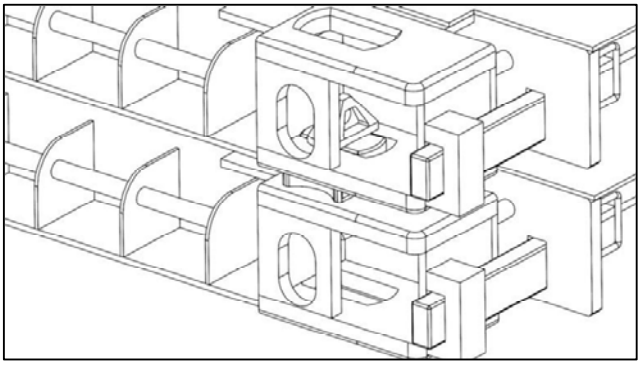
    c. The assembly of the CROWS Claws if required for transportation on a flatbed truck or MAFI trailer.

CROWS Nesting Installation

27. Table 12 below details the procedure for nesting empty CROWS as shown in Figure 5.

Table 12: CROWS Nesting Procedure

1	Position CROWS platform on a hard level surface and locate mounting point (D) on deck.	
2	Install a double ended twist-lock in the mounting point.	

3	Install double ended twist-locks at all four corner mounting points.	
4	Position the next CROWS such that all four mounting point align with the four double ended twist-locks.	
5	Lock all four twist-locks in the locked position.	

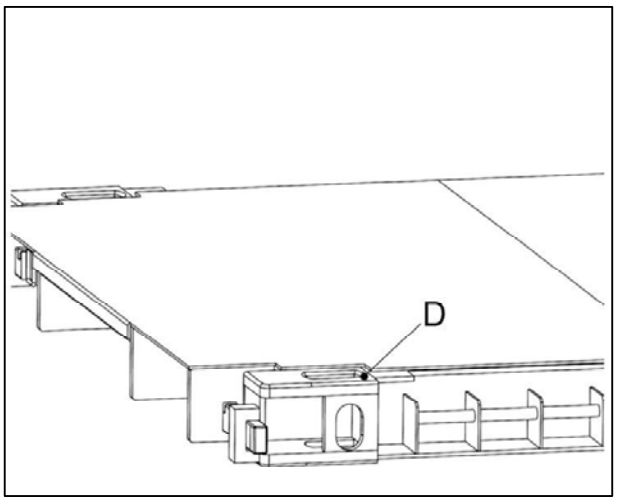
CROWS Legs Installation

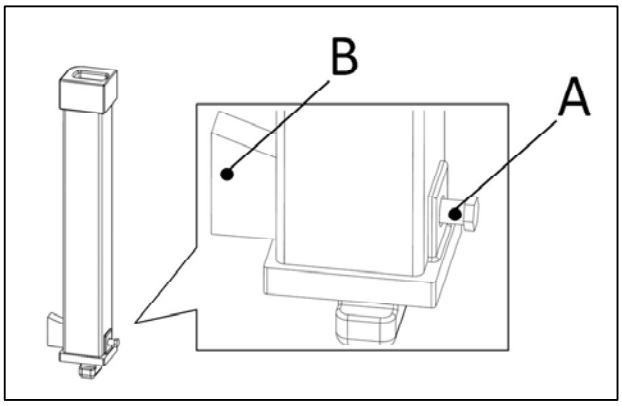
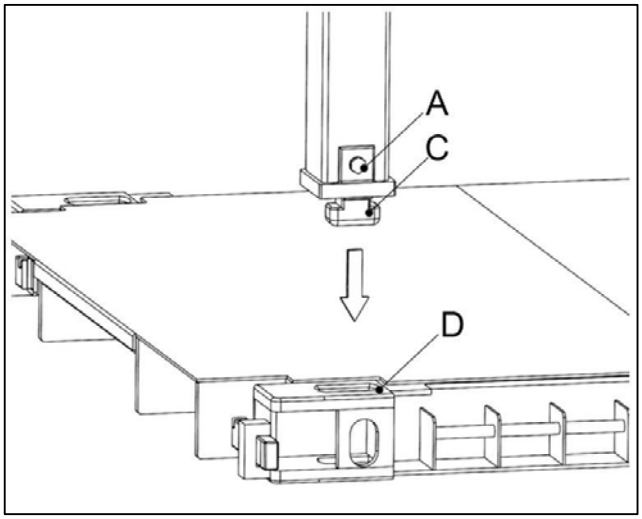
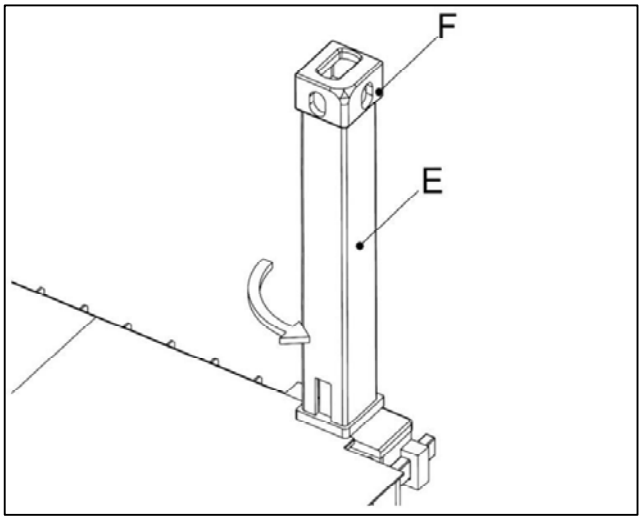
28. The following procedure should be used to fit four CROWS Legs to a CROWS platform. An instruction panel is affixed to each CROWS leg for operator guidance.

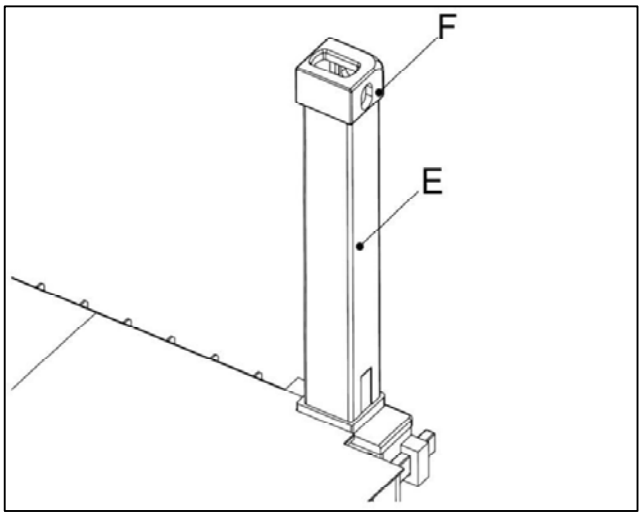
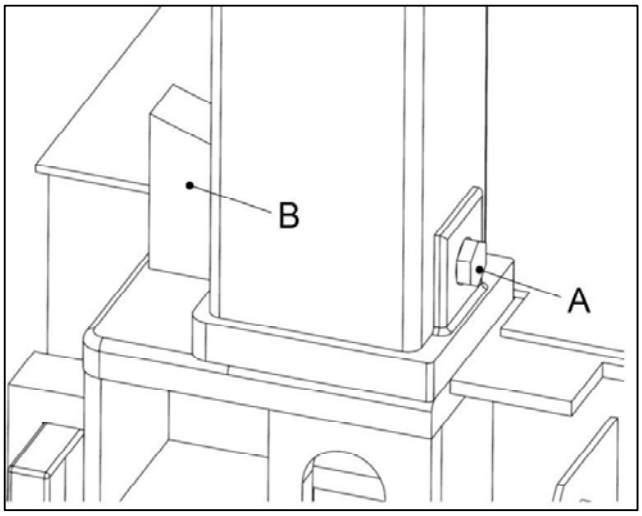
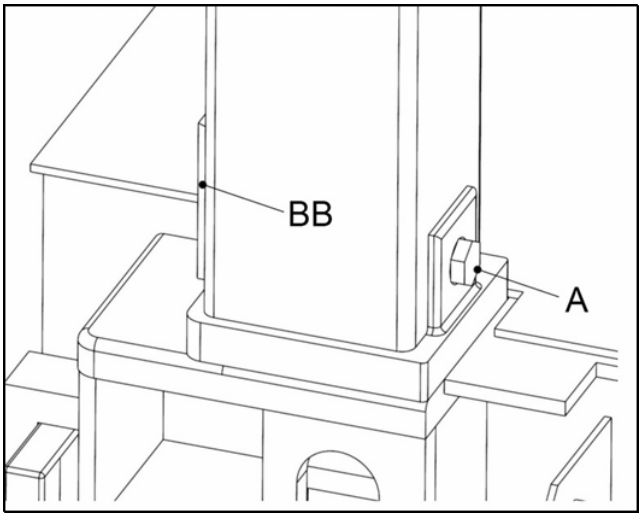
Figure 9: CROWS Legs Information Label

29. The following parts and tools are required to complete the task:
    a. 1x CROWS platform;
    b. 4x CROWS legs, of equal length, 2x Left Hand and 2x Right Hand (legs are marked LH or RH and are further identified by each having a top corner casting right hand or left hand); and
    c. 1x 3/4in drive x 500mm ratchet and 30mm socket (for tightening the lower twist-lock securing nut).

Table 13: CROWS Legs Installation

1	Position CROWS platform on a hard level surface and locate mounting point (D) on deck.	

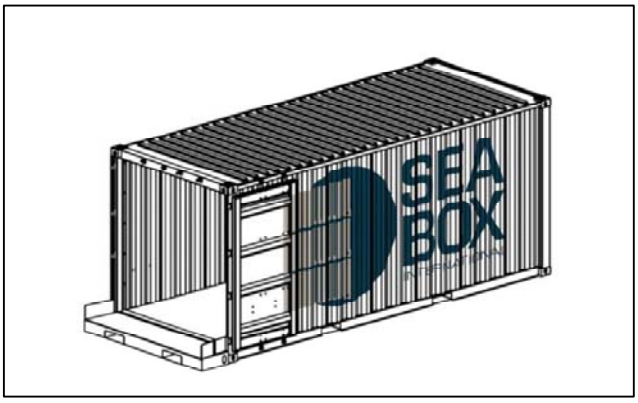
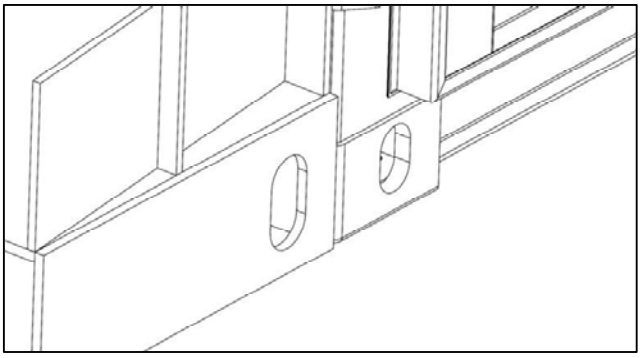
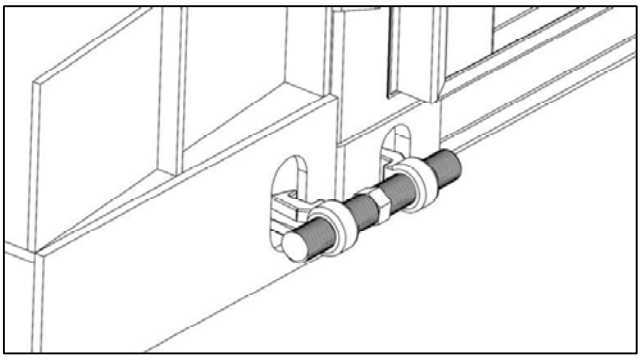
2	Select a LH CROWS leg, undo nut (A) and slacken off the wedge (B).	
3	Using suitable lifting equipment, position the LH leg vertically over the LH mounting plate on the CROWS platform. Ensure the weight of the Leg, being around 40kg, is adequately supported during this stage of the process. Insert the twist-lock (C) into the top corner casting (D) of the CROWS deck LH to LH.	
4	Rotate the whole leg (E) through 90 degrees so that the twist-lock is locked inside the mounting plate and the leg top casting (F) is orientated with the end and side facing outwards from the container as ISO specifies.	

5	Leg in the correct final position. **Note:** Ensure the bevelled edge of upper corner casting (F) is facing outwards.	
6	Using drive ratchet and 30mm socket tighten the securing bolt (A) looking inside through the apertures to make sure that wedge (B) is drawing smoothly into the clamped position (BB).	
7	The bolt (A) needs to be tightened to a firm fit using full arm strength only. Do not over tighten by standing on the socket wrench, using your feet to push against the socket wrench, or using other leverage gaining means such as a "cheater bar" or pipe.	

CROWS Ramp Installation

30. This section details the procedure for installation of the CROWS Ramps. The ramps are used at the door of the container to support the front end of the CROWS during installation. The Ramps installation procedure is detailed below in Table 14.

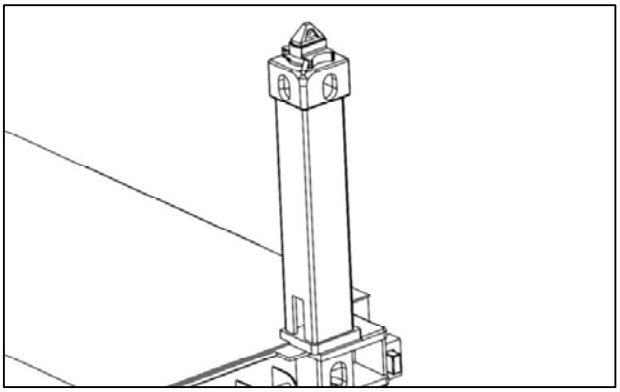
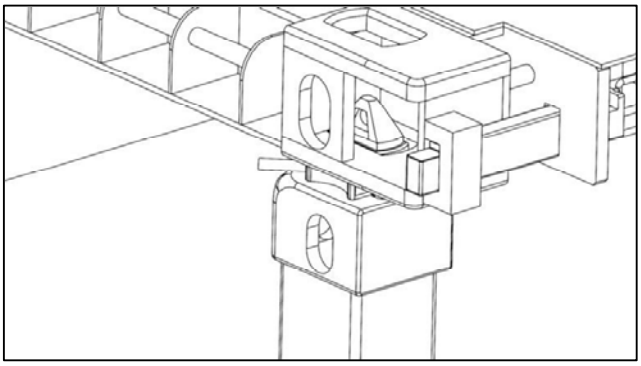
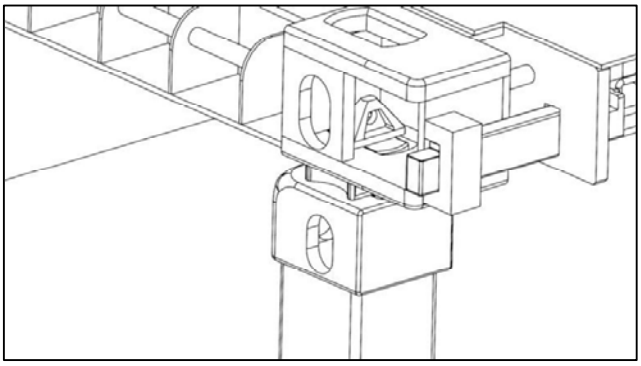
Table 14: CROWS 179mm Ramp Installation Procedure

1	Position the Ramp at the open door end of the container.	
2	Move the ramp so that it is hard against the container door frame.	
3	Install and tighten bridge fitting to secure the ramp to the container.	
Note: Where 100mm Gluts are used to support the shipping container, the 279mm ramps must be used. The installation process is the same as for the 179mm ramp.		

CROWS Stacking Installation

31. Once four legs are installed as outlined in Table 13, a second CROWS can be secured to the top corner fitting of the legs, using a double ended twist-lock. This process is outlined below in Table 15.

Table 15: CROWS Stacking Procedure

1	Install a double ended twist-lock in the top corner fitting of all four legs.	
2	A second CROWS must then be aligned such that all corners fitting of the CROWS are fitted to the double ended twist-lock on the leg.	
3	All four double ended twist-locks must be locked in the locked position, locking the top CROWS to the legs.	

CROWS Claws Installation

The CROWS Claws are only suitable for use with flatbed trucks and trailers; they are not to be used on skeleton trucks or skeleton trailers.

All twist-locks on the truck and the Claws must be in the locked position before transporting CROWS.

If at any time the CROWS legs cannot be fully tightened i.e. the leg is loose after fully tightening the securing bolt, the legs have been damaged and must not be used the leg will need to be repaired or replaced.

Payload restrictions apply to double stacked CROWS when being transported using the CROWS Claws, detailed in Table 19.

Failure to comply may result in severe injury or death to personnel and damage to equipment.

32. The CROWS Claws are an adapter that allows the CROWS to be secured onto a flatbed truck or trailer with Standard 20 foot GP container footprint attachments.

33. The Claws consists of two 25mm plates with standard twist-locks attached at a location of the CROWS corner fittings relative to the ISO footprint. The CLAWS are shown below in Figure 10.

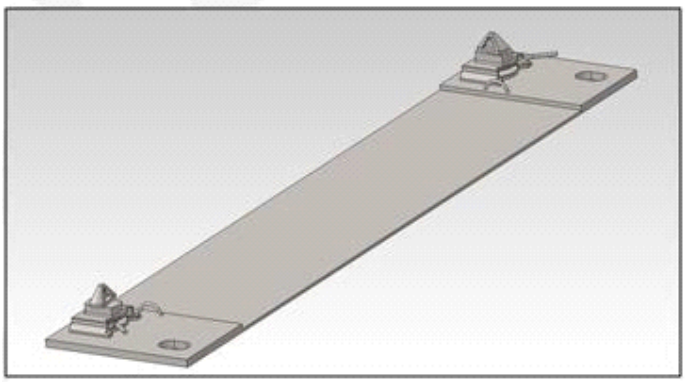
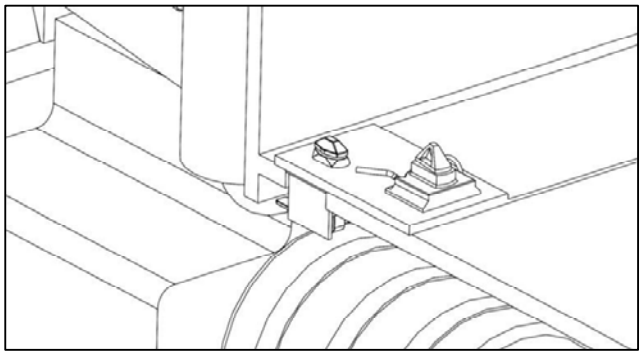
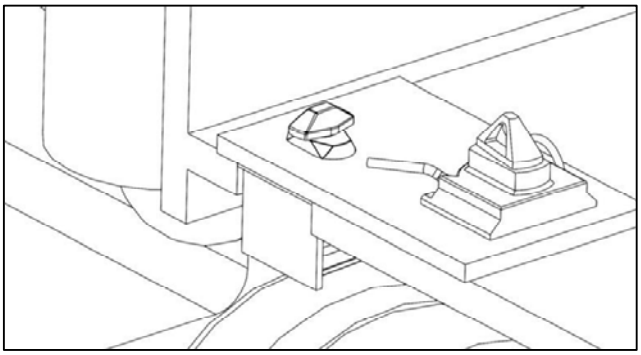
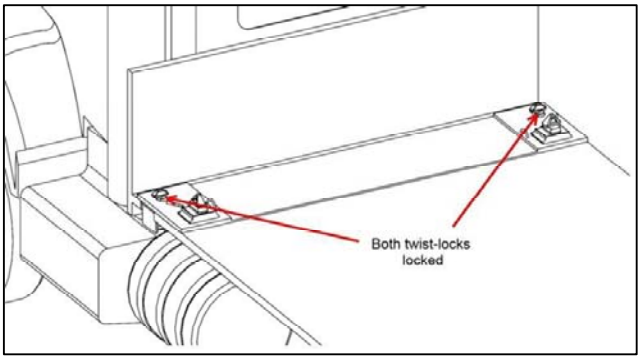
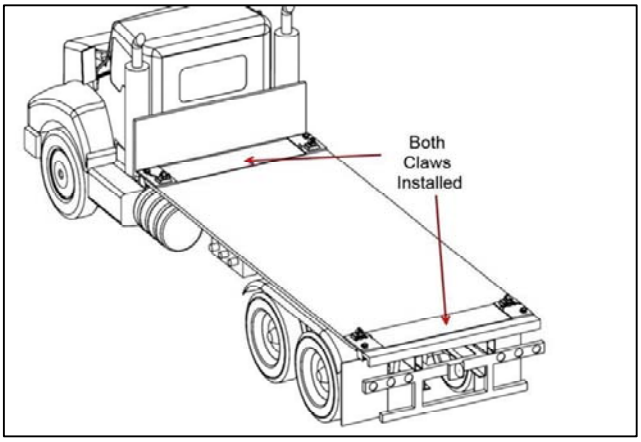
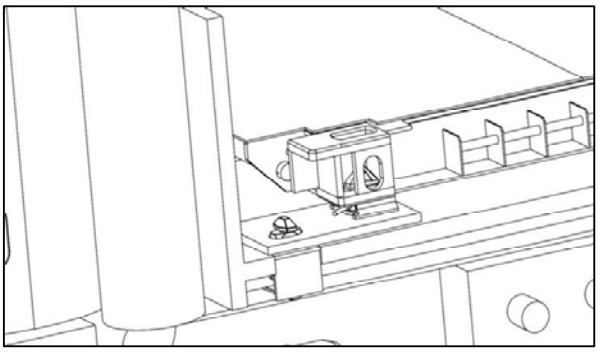
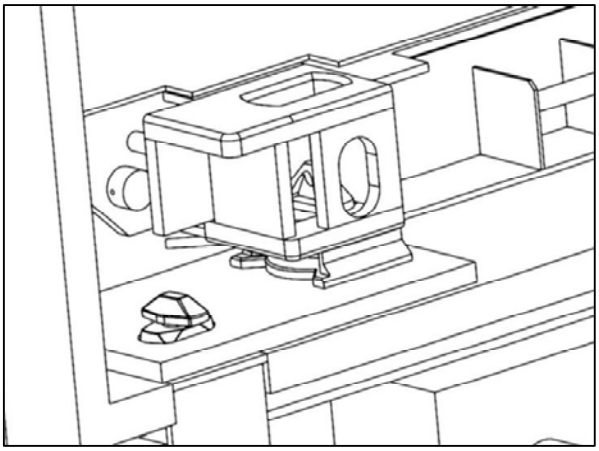
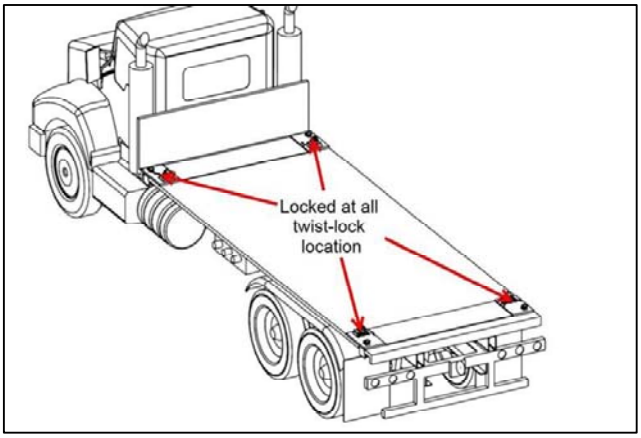


Figure 10: CROWS Claws V2 (Flatbed Truck and Trailer only)

34. The CROWS Claws are only to be used on flatbed trucks or trailers; they are not to be used on skeleton trucks or skeleton trailers. The method for operating the CROWS Claws is detailed in Table 16.

Table 16: CROWS Claws Operation on Flatbed Truck and Trailer

1	Position CROWS CLAWS on the truck such that the plate apertures correspond with the twist-lock location on the truck or trailer.	
2	Lock the truck twist-lock.	
3	Lock the Claws at both twist-lock locations.	
4	Install Claws at both ends of the truck/trailer.	

5	Lower CROWS platform onto CROWS Claws twist-locks.	
6	Lock the Claws twist-locks.	
7	Twist-locks must be locked at all locations on the truck and on the Claws before transportation.	

35. The Claws used for the MAFI trailers are the CROWS Claws V3, the key difference is the 25 mm plate mounted to the base, as shown below in Figure 11 and detailed in Table 17. The plate allows for a double ended twist-lock to be secured to the trailer and the CLAWS without the Claws sitting on an angle.

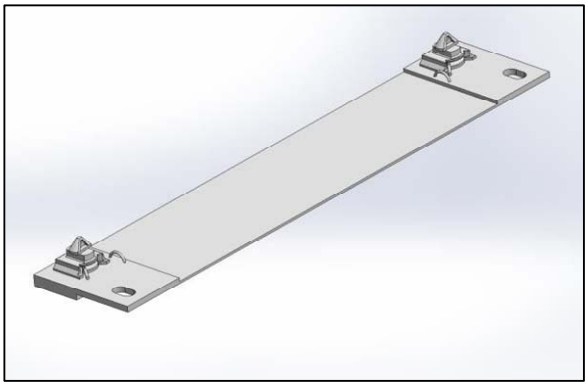
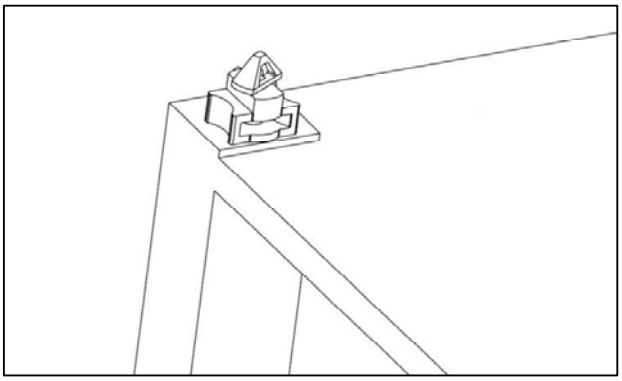
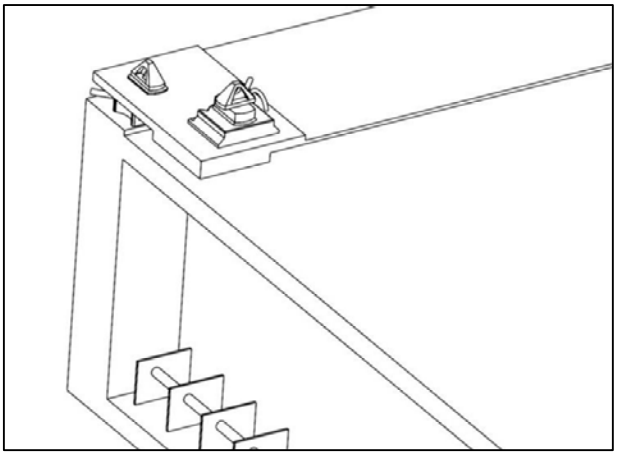
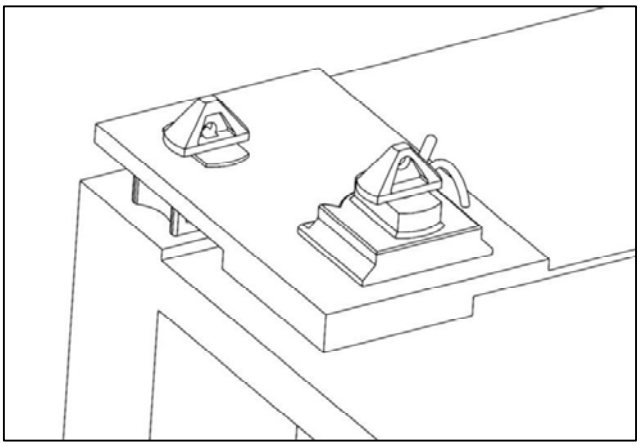
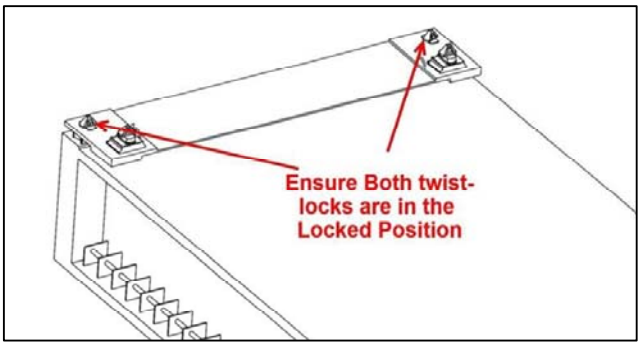
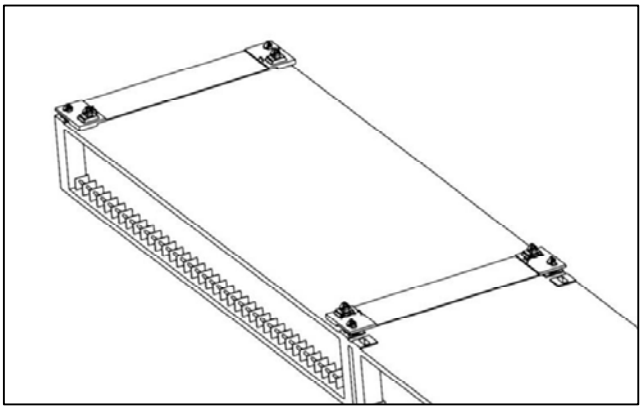
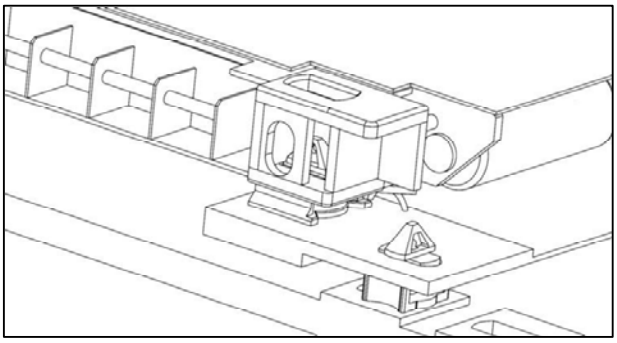
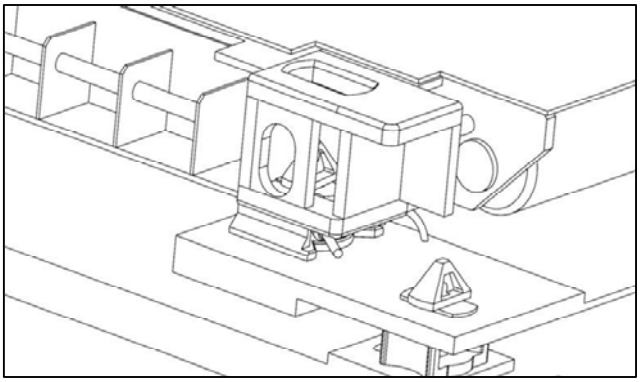
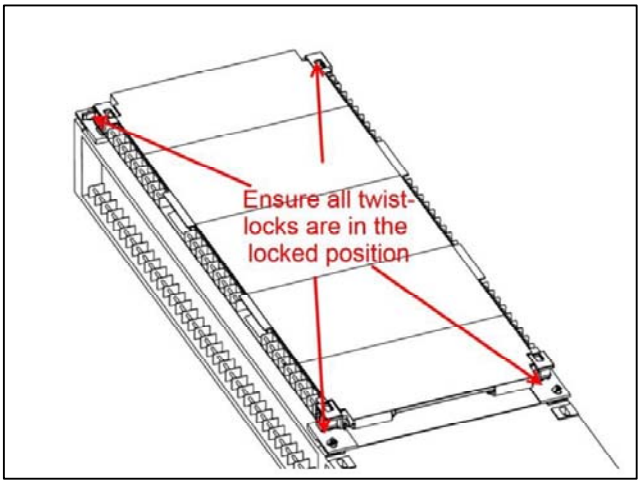


Figure 11: CROWS Claws V3 (MAFI Trailer only)

Table 17: MAFI CROWS Claws Installation

1	Install double ended twist-locks at the appropriate locations on the MAFI trailers.	
2	Position MAFI trailer CROWS Claws V3 on the trailer such that the plate apertures correspond with the double ended twist-lock fitted to the trailer.	

3	Lock the double ended twist-lock.	
4	Lock the Claws at both twist-lock locations.	
5	Install Claws at both 20 foot ISO twist-lock locations on the MAFI trailer.	
6	Lower CROWS platform onto CROWS Claws twist-locks.	

7	Lock the Claws twist-locks.	
8	Twist-locks must be locked at all locations on the MAFI trailer and on the Claws before transportation.	

Note: This operation is consistent with the maximum speed limit of the MAFI trailer to 6km/h

Loading

Suitable **Material Handling Equipment (MHE)** must be used to move, load, unload and stack CROWS. Key safety requirements include:

- The MHE has to be rated and capable of lifting the Maximum Gross Weight (MGW) of CROWS, including secured load.
- The MHE needs to have appropriate lifting tines to suit the CROWS tine pockets.
- All moving, loading and unloading activities need to be carried out on suitable level, even and compacted surfaces.
- Particular attention is needed when moving, loading and unloading stacked CROWS assemblies to ensure MHE is capable of handling total gross weight of stack.

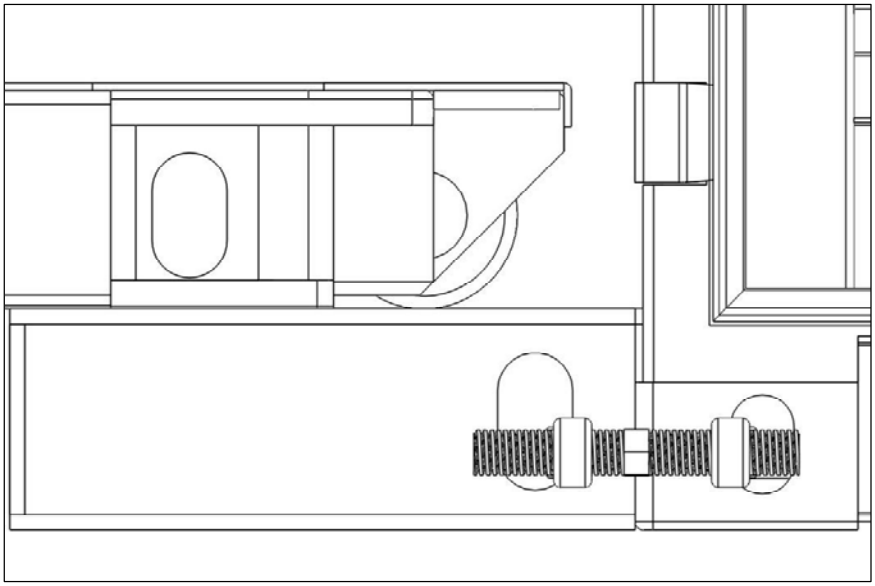
Failure to comply may result in severe injury or death to personnel and damage to equipment.

Single CROWS Loading Procedure

36. The procedure for loading a single CROWS into a 20 foot ISO shipping container is detailed in Table 18, as follows:

Table 18: Single CROWS Loading Procedure

1	The 20 foot ISO Container that is being used to transport the nested CROWS can be either General Purpose or High Cube configuration. The container needs to be positioned on level, hard compacted surface such as concrete or compacted gravel. The container loading doors both need to be fully opened and restrained.
2	Install CROWS Ramp in accordance with the CROWS Ramp installation section of this manual.

3	The CROWS platform is lifted and positioned directly in front of the opened container doors using a suitable MHE using the side fork pockets, or crane and slings using designated lifting points at each corner of the CROWS frame. The front end of the CROWS needs to be supported using either the CROWS Ramp (as shown in Figure 12) or similar support and timber gluts to ensure CROWS rollers are level with the container floor height.  **Figure 12: CROWS Front Supported Using Ramp** **Note:** the guide has been removed from Figure 12 for clarity. ⚠Suitable Manual Handling Equipment (MHE) must be used to move, load, unload and stack CROWS.
4	A suitable MHE with lifting forks is then positioned at the rear of the CROWS and both forks adjusted to fit the end fork pockets, ensuring the forks are extended fully to contact the outer sides of the pockets. The MHE then slowly inserts the forks into the end fork pockets of the CROWS until contact is made with the end of the pockets. The end of the CROWS can then be raised to a height that will allow the rollers at the front of the CROWS to contact the platform and the CROWS can be moved. ⚠Warning The CROWS should not be raised to a height exceeding 400mm, measured at the deck surface.

5	Warning A spotter is required to carry out this part of the loading operation. Using the MHE, slowly roll the CROWS forward into the container, ensuring that an equal gap between the side of the CROWS and the container wall on each side is maintained. A spotter, positioned at the side of the container door entrance will need to give the MHE operator positioning directions to ensure the CROWS is loaded without binding on container walls. The loading continues until the base CROWS frame contacts the rear wall of the shipping container. At this point the CROWS can be lowered gently onto the floor of the container, and the MHE forks withdrawn from the CROWS frame. Warning Operators involved in moving, stacking, loading or unloading CROWS should be suitably qualified and experienced, and wear appropriate approved Personnel Protective Equipment (PPE).
6	The CROWS can now be secured inside the shipping container by activating the two securing latches shown at A and B on Figure 8. The latches, at the rear of the CROWS frame, are slid to an outwards position to allow the locking pivot bar to engage in the slot in the top of the latch. This will allow the latches to fit behind the front corner posts of the shipping container and prevent the CROWS from moving when being transported.
7	Remove the CROWS ramp by reversing the Ramp Installation section (Table 14) of this manual.
8	The 20 foot shipping container doors can be closed and latched shut, and locked if required.

Stacked CROWS Loading Procedure

When Stacking CROWS for transportation the following restrictions apply:

- The payloads for two high stacked CROWS must be in accordance with Table 2
- The payloads for three high stacked CROWS must be in accordance with Table 3
- The CROWS legs must be installed in accordance with the CROWS Legs Installation section of this manual
- CROWS must be stacked in accordance with the CROWS Stacking section of this manual
- Stacking three high for transportation shall only occur using the 1 and 2 foot legs
- Stacking for transportation using 3 foot legs or greater shall only occur 2 high

Failure to comply may result in severe injury or death to personnel and damage to equipment.

37. The procedure for loading two stacked CROWS into a 20 foot ISO shipping container follows the process in Paragraph 36 for loading a single CROWS platform with the additional warning instructions:

    a. Attention must be paid to the loading of stacked CROWS that the load does not come in contact with the top of shipping container door opening or inside walls of the container. Failure to exercise extreme caution during insertion may result in damage to container, CROWS or load;

    b. Ensure the maximum load restrictions are adhered to; and

    c. Ensure all the CROWS locking bars are engaged before transportation.

38. The procedure for loading three stacked CROWS into a 20 foot ISO shipping container follows the process in paragraph 36 for loading a single CROWS platform with the additional warning instructions below:

    a. Stacking CROWS 3 high shall only occur with 1 and 2 foot Legs;

    b. Attention must be paid to the loading of stacked CROWS that the load does not come in contact with the top of shipping container door opening or inside walls of the container. Failure to exercise extreme caution during insertion may result in damage to container, CROWS or load;

    c. Ensure the maximum load restrictions are adhered to; and

    d. Ensure all the CROWS locking bars are engaged before transportation.

Unloading

Single and Stacked CROWS unloading procedure

39. The procedure for unloading CROWS from a 20 foot ISO shipping container are the reverse of the loading procedure in Paragraphs 36-37 above with the following additional warnings:

    a. When unlatching the 20 foot ISO shipping container main doors, be aware of possible load shift within the container which could result in cargo resting against the inside of the door/doors. Care should be taken to ensure that personnel stand behind the door being opened and not in the container opening until it has been confirmed that all cargo is adequately restrained; and

    b. Conduct an inspection to confirm that there are no obstructions between the side of each CROWS and the container walls. This includes ensuring that all load restraints are still secured and tight, and will not obstruct the removal of the CROWS from the container. All loose load restraints need to be tightened prior to attempting to unload CROWS from shipping container.

Stacked CROWS Truck and Trailer Transportation

When using the CROWS Claws to transport Nested or Stacked CROWS on a Truck or MAFI trailer the following restrictions apply:

- The CROWS Claws must be installed in accordance with the CROWS Claws Installation section of this manual;
- CROWS can stacked to a maximum of two high on a truck or MAFI trailer;
- Stacked CROWS using 4 foot legs are not permitted for transportation on a truck or trailer using the CROWS Claws.
- CROWS can be nested to a maximum of five high on a truck or MAFI trailer;
- The payload restrictions of the top CROWS in a double stack is detailed in Table 19;
- When stacked, the CROWS Legs must be installed in accordance with the CROWS legs installation;
- CROWS must be stacked in accordance with the CROWS Stacking section of this manual;
- Four double ended twist-locks must join the top CROWS to the top of the legs; and
- The CROWS must be nested in accordance with the CROWS nesting section of this manual.
- If at any time the CROWS legs cannot be fully tightened i.e. the leg is loose after fully tightening the securing bolt, the legs have been damaged and must not be used the leg will need to be repaired or replaced.

Failure to comply may result in severe injury or death to personnel and damage to equipment.

40. The CROWS can be stacked a maximum of two high on a truck or MAFI trailer using the CROWS Claws, as shown in Figure 13.

Figure 13: Truck Transportation of Stack CROWS

41. The limitation and restrictions when transported on a truck or MAFI trailer using CROWS Claws are as follows:
    a. The CROWS legs must be installed in accordance with the CROWS Legs Installation section of this manual,
    b. The CROWS Claws must be installed in accordance with the CROWS Claws Installation section of this manual, and
    c. The MGW of both CROWS cannot exceed 12,000kg.
    d. The CROWS only be stacked two high.
42. The payload of the top CROWS shall be less than or equal to the payload of the base CROWS. Table 19 below details the allowable payloads of stacked CROWS on a truck or MAFI trailer.
43. The payload of the base CROWS is the Maximum Payload minus the Top CROWS Maximum Payload; values as detailed below in Table 19.

Table 19: Stacked CROWS Truck and Trailer Transportation Maximum Payloads

Configurations	Tare Weight (kg)	Maximum Payload (kg)	Maximum Gross Weight (kg)	Top CROWS Maximum Payload (kg)
Double Stacked (1 foot legs)	4536	7464	12,000	3700
Double Stacked (2 foot legs)	4568	7432	12,000	3700

Double Stacked (3 foot legs)	4600	7400	12,000	3700

Note: Twist-lock weights are not included in the tare weight.

Note: 4 foot legs are not allowed for truck and trailer transportation.

Nested CROWS Truck and Trailer Transportation

44. The CROWS can be nested five high for transportation on a truck or MAFI trailer using the CROWS Claws, as shown below in Figure 14.

Figure 14: Truck Transportation of Nested CROWS

45. The CROWS must be nested in accordance with the CROWS Nesting section of this manual.
46. The CROWS Claws must be installed in accordance with the CROWS Claws Installation section of this manual.

CROWS Warehousing Installation Procedure

47. The CROWS are designed to be used as a storage and warehousing system. The CROWS can be stacked up to 4 platforms high using the CROWS legs. The CROWS legs are available in 3 different lengths, being 1, 2 and 3 foot.
48. The CROWS can be stored empty in a nested configuration up to 15 units high.

Ground Requirements

49. The CROWS, when being used as warehousing system needs to be supported on suitably prepared compacted level ground surfaces which are able to support the weight of the stacked CROWS. The surface needs to be the same standard that is currently being used to store shipping containers at all project locations.
50. The designated area must be clear of all obstacles including trees, power lines and other overhead obstructions. There must be adequate access for heavy machinery to safely load, unload and move CROWS.

Nested Warehousing Installation

51. The procedure for nesting CROWS in a warehousing environment is a repetition of the procedure outlined in Table 12.

52. Warehousing of nested CROWS can occur up to 15 units high, as shown below in Figure 15.

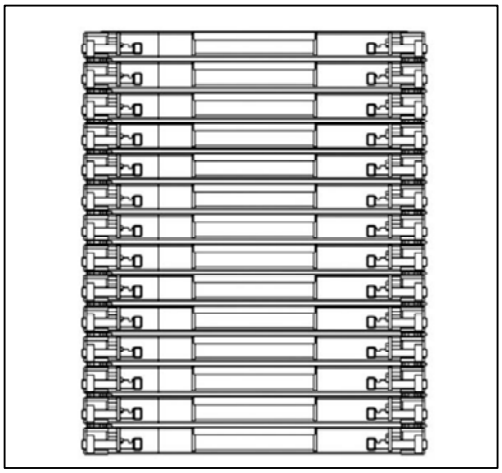


Figure 15: Warehouse Nested CROWS 15 High

Stacked Warehousing Configuration

53. Stacking of the CROWS in a warehousing environment can occur up to four levels, however four CROWS in a single stack are not permitted, and the stacking of CROWS when four high must be done in tandem. Figure 16 to Figure 19 below show the permissible combinations, and Figure 20 shows the non-permissible stand-alone stacking of four CROWS.

Figure 16: Stand Alone Double Stack

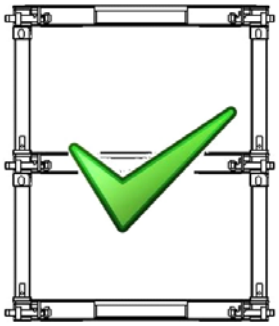


Figure 17: Stand Alone Triple Stacking

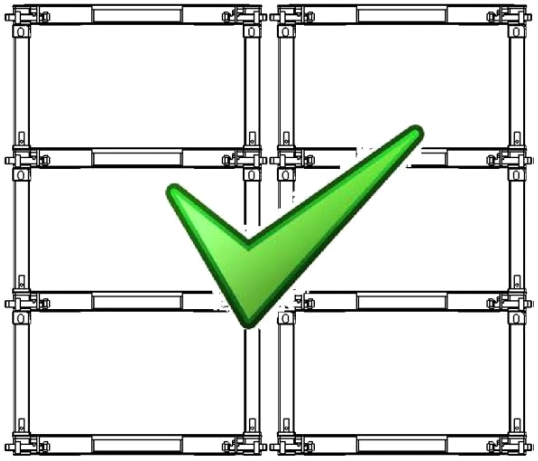


Figure 18: Double Four Stacking

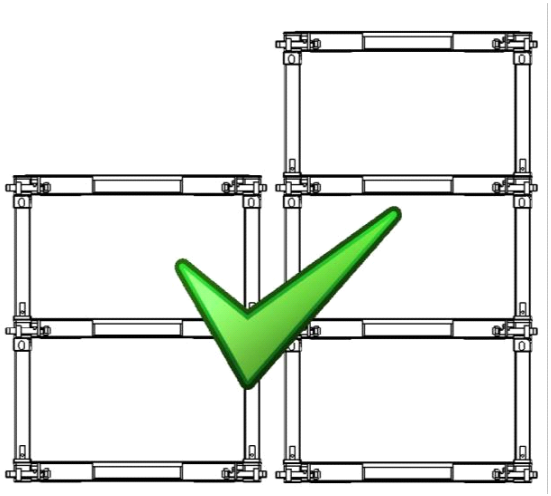


Figure 19: Pyramid Stacking

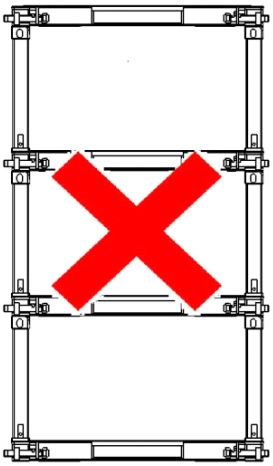
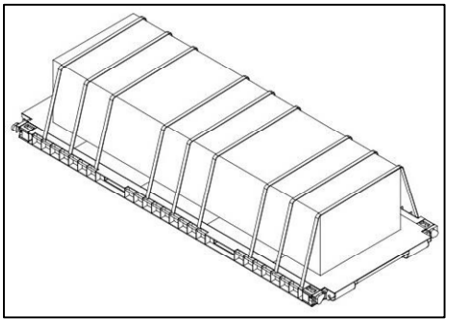
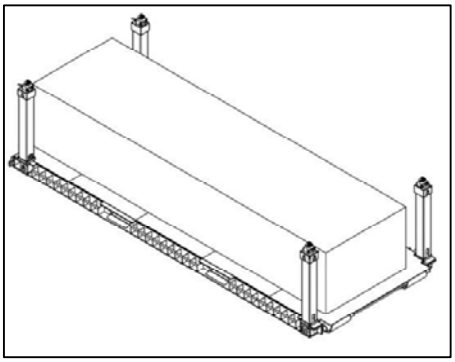


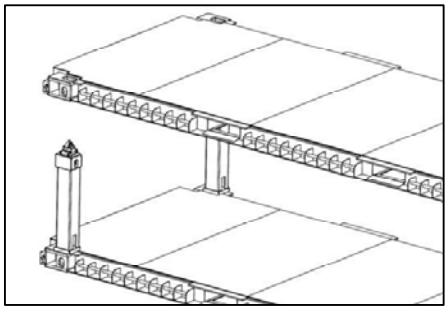
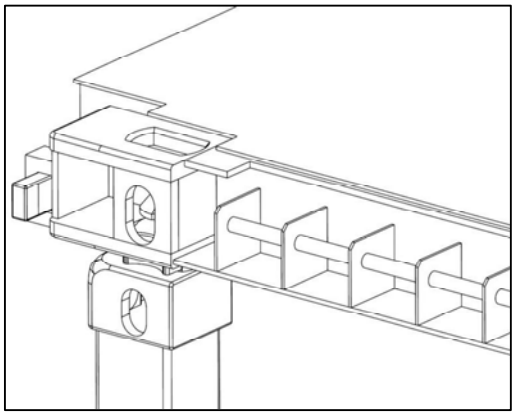
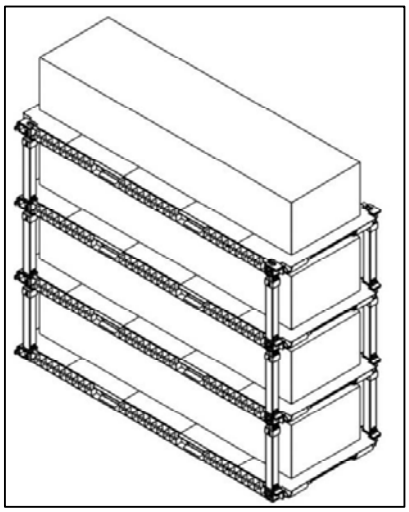
Figure 20: Stand Alone Four Stacking

Installation

54. The process of installing stacked CROWS for warehousing is detailed below.

Table 20: Stacked Warehousing Installation

1	With the CROWS platform at ground level, load each CROWS platform with the required cargo and suitable restraints, allowing enough clearance for CROWS Legs to be installed.	
2	Install four CROWS legs on to each platform as per the process installing CROWS Legs in Table 13.	

3	The second level CROWS can be lowered onto the prepared base CROWS Legs.	
4	Once the corner castings of the upper CROWS platform have been fully engaged into the CROWS legs twist-locks, the twist-locks can be locked.	
5	This process is repeated if additional levels of CROWS are required, up to four levels in total.	

55. When gluts are required underneath the CROWS, the gluts must be suitable material to support the weight of the CROWS and they must be located under the corner fittings of the base CROWS, as shown below in Figure 21.

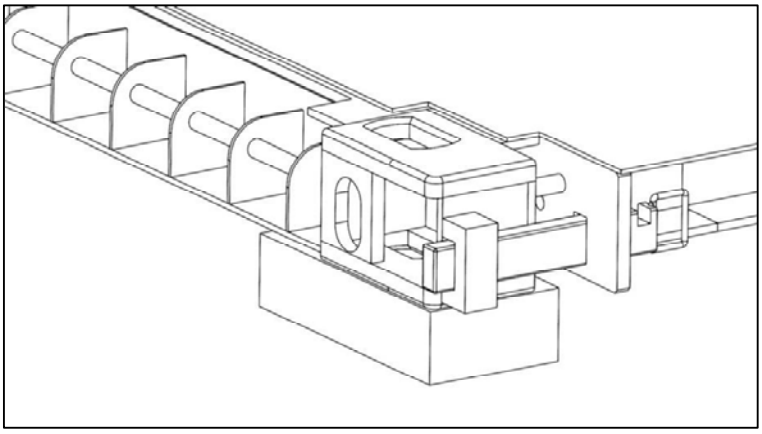


Figure 21: Glut Location under Corner Fitting

Note: When 100mm high gluts are used under a container, the taller 279mm high CROWS Ramp must be installed before loading CROWS.

Lifting and Moving

56. The CROWS are a versatile multifunctional piece of materials handling equipment. They can be deployed in a number of configurations depending on the required function. It is therefore the purpose of this section to outline the specifications and weight limits for the CROWS configurations. These configurations consist of:

    a. Single loaded CROWS,

    b. Double Stacked CROWS, and

    c. Nested CROWS.

Single Loaded CROWS Lifting

57. The single loaded CROWS follow the same weight requirements for lifting as listed in Table 1.

Table 21: Single CROWS Lifting Weight Limitations

Single CROWS Specifications	
Tare Weight (kg)	2200
Payload (kg)	9800
Maximum Gross Weight (MGW)	12,000

58. There are two lifting methods for the single fully laden CROWS:

    a. Lifting with a forklift, and

    b. Lifting with a crane (using Pigs Ears).

Lifting with a Forklift

59. Lifting with a forklift must only occur using the side fork pockets as shown in Figure 22; the end fork pocket is for the roll in/roll out procedure only.

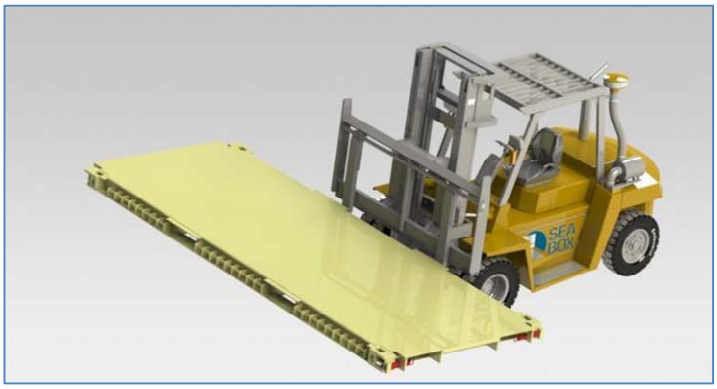


Figure 22: Lifting Single CROWS from Side Forklift Pockets

Lifting with a Crane (Using Pigs Ears)

60. When using Pigs Ears to lift from the corner castings, the Pigs Ears must be installed by appropriately trained personnel. Once the Pigs Ears are installed a spreader bar must be used as shown below in Figure 23.

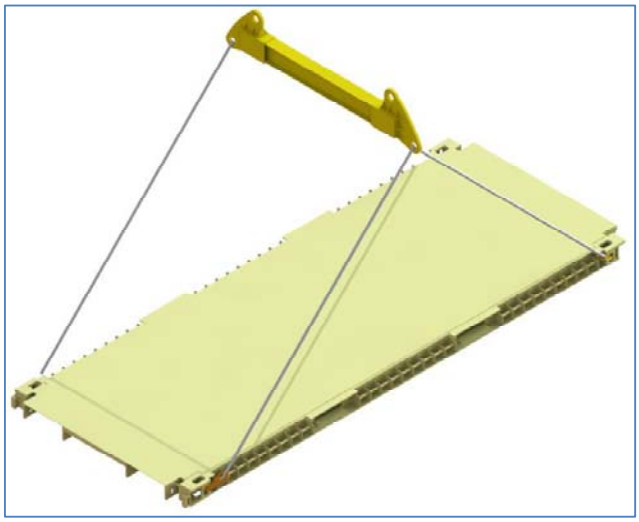


Figure 23: Lifting Single CROWS with Pigs Ears and Spreader Bar

61. The weight limits for lifting using a CRANE and Pigs Ears are specified in Table 21 above.

Double Stacked Lifting

62. When lifting double stacked CROWS it is important to understand that the base CROWS is supporting all the weight. The Maximum Gross Weight of any CROWS while moving or lifting is 12,000kg. Therefore the payload decreases as

a portion of the load is taken by the second CROWS and the legs. The weight limitations are the same as listed in Table 22.

Table 22: Lifting Double Stacked CROWS Weight Limitations

Configurations	Tare Weight (kg)	Maximum Payload (kg)	Maximum Gross Weight (kg)	Height (mm)	Maximum Payload of top CROWS (kgs)
Double Stacked (1 foot legs)	4536	7464	12,000	687	3700
Double Stacked (2 foot legs)	4568	7432	12,000	987	3700
Double Stacked (3 foot legs)	4600	7400	12,000	1287	3700
Double Stacked (4 foot legs)	4632	7368	12,000	1587	3700

63. There are two lifting methods for the double stacked, fully laden CROWS:
    a. Lifting with a forklift, and
    b. Lifting with a crane (using Pigs Ears).

Lifting with a Forklift

64. Lifting with a forklift must only occur using the side fork pockets as shown in Figure 24; the end fork pocket is for the roll in/roll out procedure only.

Figure 24: Lifting Stacked CROWS from Side Fork Lift Pocket

Lifting with a Crane (Using Pigs Ears)

65. When using Pigs Ears to lift from the corner castings, the Pigs Ears must be installed by appropriately trained personnel. The double stacked CROWS must be lifted from the base CROWS. Once the Pigs Ears are installed a spreader bar must be used as shown below in Figure 25.

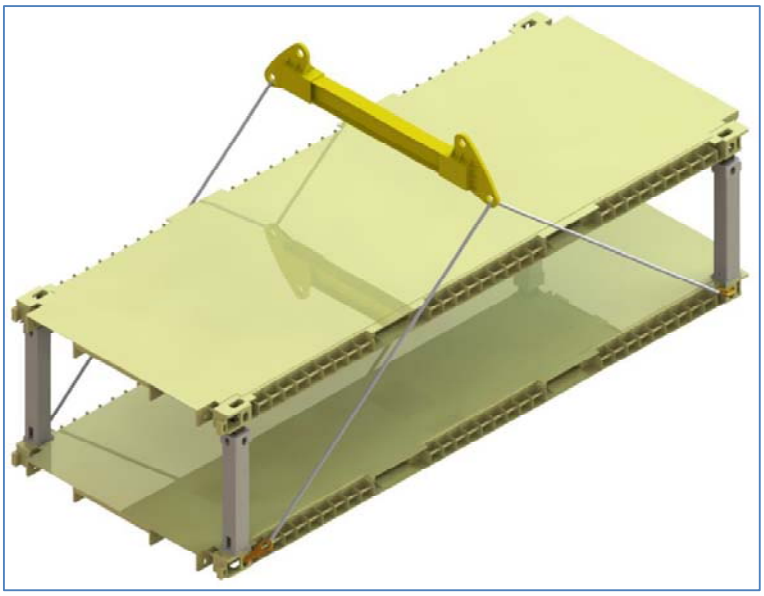


Figure 25: Lifting Stacked CROWS with Pigs Ears and Spreader Bar

66. The weight limits for lifting using a CRANE and Pigs Ears are specified in Table 22 above.

Lifting Nested Crows

67. Similar to lifting the double stacked CROWS, when nested the base CROWS is supporting the entire weight. The limit of the number of CROWS that can be lifted in the nested configuration is 5. This allows for the 4 CROWS with a total combined weight of 8800kg to be nested on the base CROWS. This is within the 9800kg payload limit of the base CROWS.

68. When lifting Nested CROWS there are two options:

    a. Lifting with a forklift, and

    b. Lifting with a crane (using Pigs Ears).

Lifting with a Forklift

69. Lifting with a forklift must only occur using the side fork pockets as shown in Figure 26; the end fork pocket is for the roll in/roll out procedure only.

Figure 26: Lifting Nested CROWS from Side Fork Lift Pockets

Lifting with a Crane (Using Pigs Ears)

70. When using the Pigs Ears to lift from the corner castings, the Pigs Ears must be installed by appropriately trained personnel. Once the Pigs Ears are installed a spreader bar must be used as shown below in Figure 27.

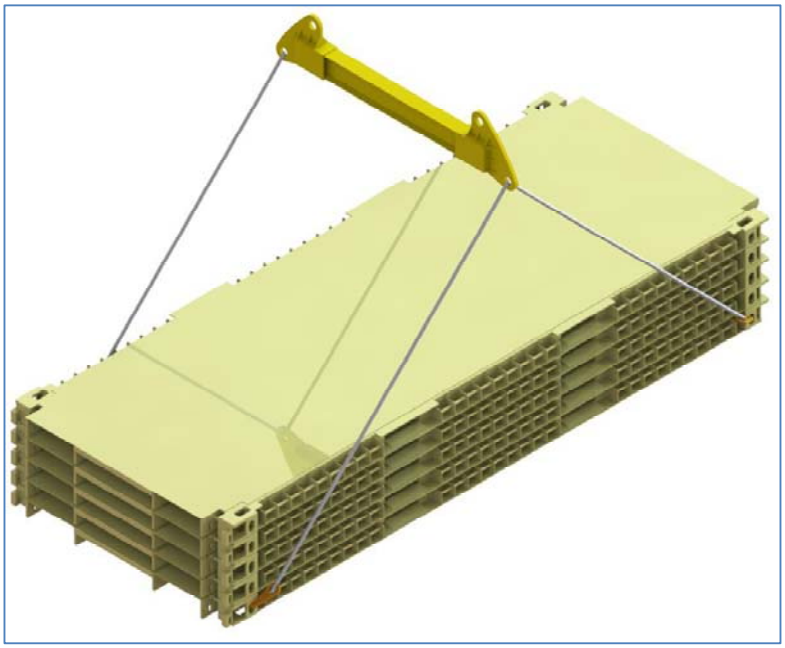


Figure 27: Lifting Nested CROWS with Pigs Ears and Spreader Bar

OPERATOR MAINTENANCE

Introduction

71. To ensure the CROWS remain in an operational condition, periodical maintenance must be undertaken in addition to the Preparation for Use checks. This section outlines the inspections and maintenance required.

72. Table 23 outlines the initial inspection requirements before maintenance is carried out.

73. Table 24 details the required action if maintenance is required. All maintenance must be carried out by appropriately trained and experienced personnel.

Responsibility

74. The operators are responsible for the scheduled Inspection and Maintenance of the CROWS. Failure to comply with the maintenance schedule will result in a potential void of the warranty conditions.

Maintenance Procedure

75. This section outlines the maintenance procedure for the CROWS; this procedure is designed to ensure the functionality of the CROWS over their lifetime. The maintenance procedure must be carried out once every 3 months. Figure 28 below shows the components of the CROWS identified in the Maintenance and Testing procedures.

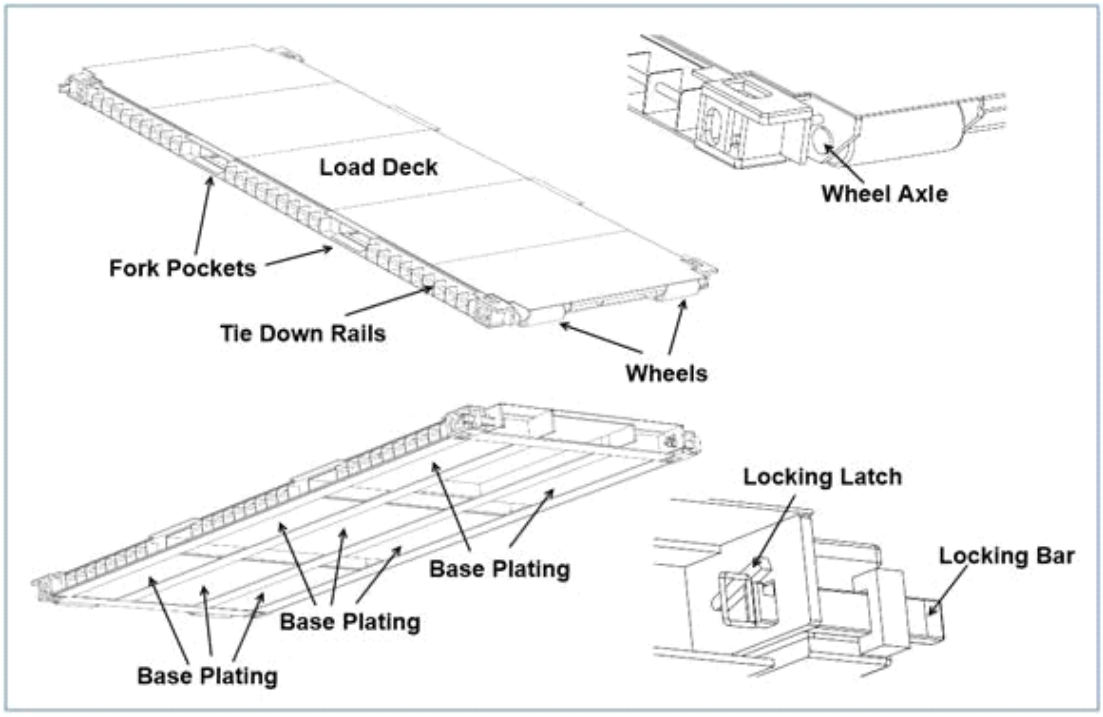


Figure 28: Maintenance Components

76. The maintenance procedure consists of three sections:
    a. Inspection,
    b. Maintenance and Repairs, and
    c. Verification.

77. The Inspection process will occur initially, followed by all Maintenance Procedures and Repairs where required. These procedures are outlined in Table 24 in the Maintenance and Repairs section. The final Verification section details the checking required to ensure the maintenance and repairs have returned the CROWS to operational functionality.

Inspection

If at any time the CROWS legs cannot be fully tightened i.e. the leg is loose after fully tightening the securing bolt, the legs have been damaged and must not be used the leg will need to be repaired or replaced.

Failure to comply may result in severe injury or death to personnel and damage to equipment.

78. This section outlines the initial inspection required during the maintenance process.

79. Table 23 below details the minimum inspections required to identify faults that could affect the CROWS functionality.

    Note: many of these inspections should occur during the Preparation for Use phase of operations, detailed in Chapter 2.

Table 23: CROWS Inspection Procedure

No.	Item	Inspection Task
1	Wheels	Inspect for deformation Inspect for cracks Inspect for lodged items such as rocks and gravel
2	Wheel Axles	Grease
3	Locking Bar	Inspect for corrosion and deformation
4	Locking Latch	Inspect for corrosion and deformation
5	Tie-Down Rails	Inspect for corrosion and deformation
6	Load Deck	Inspect for corrosion and deformation Clean
7	Fork Pockets	Inspect for corrosion and deformation Inspect sealant for cracks and degradation
8	Base Plating	Remove and inspect for corrosion and deformation Inspect sealant for cracks and degradation
9	CROWS Legs	Remove and inspect for corrosion and deformation Inspect for cracks and degradation
10	Legs base twist-lock mechanism	Inspect bolt for wear on the thread Inspect for cracks and degradation
11	Leg Stability	Inspect the leg for stability after securing

80. In the event that damage has occurred, repair or replacement will be required.

81. Table 24 in the following section, details the procedures required for maintenance and repairs.

Maintenance and Repairs

82. The maintenance of the CROWS ensures the continuity of functionality while in service.

83. Table 24 below details the maintenance required during all scheduled maintenance and additionally outlines the repairs required if defects are found in the inspection procedure.

Table 24: Maintenance Procedure

No.	Item	Maintenance Task	Repair
1	Wheels	The wheels are to be removed and grease is to be applied to the internal surface. Any stones or sharp object collected by the wheels are to be removed.	If the wheel requires repairs due to damage that is impeding its functionality, the wheel is to be replaced.
2	Wheel Axles	All corrosion is to be removed with an appropriate method.	If the pins are deformed such that they cannot function they must be replaced.
3	Locking Bar	Corrosion is to be removed with an appropriate method and anti-corrosion undercoat is to be applied and then repainted. Areas where paint has been removed an anti-corrosion undercoat is to be applied and then repainted.	If either bar is deformed or corroded such that they cannot function, they must be replaced.
4	Locking Latch	Corrosion is to be removed with an appropriate method and anti-corrosion undercoat is to be applied and then repainted. Areas where paint has been removed an anti-corrosion undercoat is to be applied and then repainted.	If either latch is deformed or corroded such that they cannot function, they must be replaced.

No.	Item	Maintenance Task	Repair
5	Tie-Down Rails	Corrosion must be removed with an appropriate method and an anti-corrosion undercoat is to be applied and then repainted. Areas where paint has been removed an anti-corrosion undercoat is to be applied and then repainted.	If either tie-down rails is deformed or corroded such that they cannot function, SBI must be notified and an inspection must occur must occur with SBI engineers.
6	Load Deck	Corrosion must be removed with an appropriate method and an anti-corrosion undercoat is to be applied and then repainted. Areas where paint has been removed an anti-corrosion undercoat is to be applied and then repainted.	If the deck has been penetrated or deformed such that it is no longer functional, SBI must be notified and an inspection must occur with SBI engineers.
7	Fork Pockets	Ensure there is no deformation in the fork pocket that inhibits its functionality. Corrosion must be removed with an appropriate method and an anti-corrosion undercoat is to be applied and then repainted. Areas where paint has been removed an anti-corrosion undercoat is to be applied and then repainted.	If the fork pockets are damaged or deformed such that they are no longer functional. SBI must be informed and an inspection must occur must occur with SBI engineers.
8	Base Plating	Ensure there is no deformation or holes in the base plating that inhibits its functionality. Corrosion must be removed with an appropriate method and an anti-corrosion undercoat is to be applied and then repainted. Areas where paint has been removed an anti-corrosion undercoat is to be applied and then repainted. Reapply any sealant that has degraded or damaged.	If the base plates are damaged or deformed such that they are no longer functional. SBI must be informed and an inspection must occur must occur with SBI engineers.

Legs Maintenance

Table 25: Legs Maintenance Procedure

No.	Item	Maintenance Task	Repair
1	Post	Inspect the Square Hollow Section (SHS) of the legs for deformation, corrosion and cracks.	If the SHS is substantially deformed or corroded such that they are no longer functional the leg must be replaced
2	Bolt and Wedge Assembly	Check that the bolt and wedge can operate freely and there is no cross-threading.	If the bolt cannot be tightened in the wedge, both the bolt and wedge must be replaced.
3	Twist-lock Stem	Inspect the twist-lock stem for deformation, corrosion and wear.	If the stem is substantially deformed, corroded or worn such that they are no longer functional the leg must be replaced

Verification

84. Table 26 outlines the steps required to ensure that the CROWS have been maintained and or repaired to a functional state. Each maintenance and repair task must be inspected by qualified personnel.

Table 26: Verification Procedure

No.	Item	Maintenance Verification	Repair Verification	Responsibility
1	Wheels	Ensure that the grease is adequately applied, such that the wheel can rotate without obstruction.	The replaced wheel must be a Sea Box International supplied product. Ensure that the wheel is greased and can rotate freely.	Operator
2	Wheel Axles	Inspect that all the corrosion has been removed and treated.	Ensure that the axle is of the correct size for the supports and the wheel.	Operator

No.	Item	Maintenance Verification	Repair Verification	Responsibility
3	Locking Bar	Inspect the Locking Bars to ensure the removal of all corrosion and the application of paint is even without runs. Ensure that the new paint will not cause the bar to jam in the gussets.	Test the function of the new bar to ensure that it fits with the gussets. Test that the new bar fits with the locking latch.	Operator
4	Locking Latch	Inspect the Latches to ensure the removal of all corrosion and the application of paint is even, without runs. Ensure that the new paint will not cause the latch to jam in the in the locking bar.	Test the function of the new latch to ensure that it fits with the locking bar. Test that the new latch fits with the locking bar.	Operator
5	Tie-Down Rails	Inspect the Tie-Downs to ensure the removal of all corrosion and the application of paint is even, without runs. Ensure no surface areas have exposed metal.	SBI engineering to inspect and test the repairs to ensure the load rating is maintained. Ensure the appropriate testing is performed to clarify the repairs meet the design requirements.	Operator (Maintenance) SBI Engineer (Repairs)
6	Load Deck	Inspect the Load Deck to ensure the removal of all corrosion and the application of paint is even, without runs. Ensure no surface areas have exposed metal.	The area of the deck repaired must be inspected by SBI to ensure the quality of the repair and a quarantine inspector to ensure quarantine compliance.	Operator (Maintenance) SBI Engineer (Repairs)

No.	Item	Maintenance Verification	Repair Verification	Responsibility
7	Fork Pockets	Inspect the Fork Pocket to ensure the removal of all corrosion and the application of paint is even, without runs. Ensure no surface areas have exposed metal.	The area of the fork pocket repaired must be inspected by SBI to ensure the quality of the repair and a quarantine inspector to ensure quarantine compliance.	Operator (Maintenance) SBI Engineer (Repairs)
8	Base Plating	Inspect the Base Plating to ensure the removal of all corrosion and the application of paint is even, without runs. Ensure no surface areas have exposed metal.	The area of the base plate repaired must be inspected by SBI to ensure the quality of the repair and a quarantine inspector to ensure quarantine compliance.	Operator (Maintenance) SBI Engineer (Repairs)
9	Post	Inspect that all the corrosion has been removed and treated.	Ensure the replacement post functions with the twist- lock assembly	Operator
10	Bolt and Wedge Assembly	The bolt can turn in the wedge with a full range of movement	Ensure that the wedge and bolt fit with the twist-lock assembly	Operator
11	Twist-lock Stem	Inspect that all the corrosion has been removed and treated.	Ensure that the twist-lock stem fit with the twist-lock assembly	Operator
12	Leg Stability	Check the legs for stability after installation.	After the leg is installed and fully secured, ensure that the leg does not have any remaining movement or ‘Wobble’	Operator

REVISION HISTORY

Date	Version	Summary of Changes	Revised by	Approved by
11/02/2014	A	Initial document creation	RB	SM
27/02/2014	B	Operations Maintenance section added	TE	SM
28/03/2014	C	Addition of CROWS Claws Operation section	TE	SM
28/04/2014	D	Addition of Claws for MAFI trailers and safety warning about Claws transporting stacked CROWS	TE	SM
08/07/2014	2-0	Addition of nested storage configuration, 3 high stacking, CROWS stacked on trucks and trailers and maximum payloads	TE	SM
21/07/2014	2-1	Warning about operations of 20 foot CROWS with 40 foot CROWS	TE	SM
23/09/14	2-1-a	Warning about damaged legs and 4 foot legs	TE	

SOURCE REFERENCES

85. Source references are as follows:

- N/A

RELATED DOCUMENTS

86. Related documents are as follows:

- N/A

ANNEXES

A. CROWS ATTACHMENT TECHNICAL DATA

ANNEX A CROWS ATTACHMENT TECHNICAL DATA

1. This annex outlines the rated strength of the following CROWS attachments:
   a. CROWS Ramps,
   b. CROWS Claws,
   c. Bridge Fittings, and
   d. Double Ended Twist-locks.
2. All specifications in this document are applicable when the components listed above are used in accordance with the operating procedures outlined in this manual.

CROWS Ramps 179mm high

3. The specifications of the CROWS ramps when operated in accordance with this manual are as follows:
   a. Payloads: 20,000kg
   b. Weight: 260kg

CROWS Ramps 279mm high

4. The specifications of the CROWS ramps when operated in accordance with this manual are as follows:
   a. Payloads: 20,000kg
   b. Weight: 260kg

CROWS Claws V2 (Flatbed Truck and Trailer)

5. The rating of the CROWS Claws are as follows:
   a. Transverse rating: 30,000kg
   b. Longitudinal rating: 40,000kg
   c. Lifting hook rating: 500kg
   d. Weight: 160kg

CROWS Claws V3 (MAFI Trailer)

6. The rating of the CROWS Claws are as follows:
   a. Transverse rating: 30,000kg
   b. Longitudinal rating: 40,000kg
   c. Lifting hook rating: 500kg
   d. Weight: 180kg

Bridge Fittings

7. The rating of the bridge fitting used for securing the ramp to the container during loading are:
    a. Tensile force: 10,000kg
    b. Weight: 3.8kg

Double Ended Twist-locks

8. The double ended twist-locks used for the CROWS have the following load ratings:
    a. Tension: 25,000kg
    b. Shear: 21,000kg
    c. Weight: 5kg