

# PhotonAssay1408X Transport Information

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## REVISION TABLE

Rev	Description	Revision Date	Revised by	Approved by
1	Initial release	21/07/2021	JQ	AC
2	Overall document revision	08/05/2023	SK	JQ

# 1 PURPOSE AND SCOPE

This procedure provides guidance for the safe shipment, transport, and movement of PhotonAssay™ 1408X systems from point of dispatch to installation at the client facility. It outlines the requirements for packaging, handling, site access, and the use of lifting and moving equipment to ensure the cabins and associated equipment are delivered and positioned without damage or delay.

The scope of this procedure covers:

- Shipment of PhotonAssay™ systems, including containerized equipment and flat-rack cabin transport.
- Transport and handling requirements, including weight considerations, lifting points, and rigging practices.
- Site access planning and coordination with trucking and lifting companies.
- Methods for moving cabins into client facilities, including the use of frannas, cranes, trolleys, and forklifts.
- Floor suitability checks and preparation for safe cabin movement.
- Positioning of cabins onto timber blocks at their final installation locations.
- Delivery and unloading of loose shipments, including weather protection and forklift operations.

This procedure applies to Chrysos Project Managers, logistics coordinators, and installation teams, as well as third-party transport and lifting contractors engaged in the shipment and installation of PhotonAssay™ systems. It ensures consistent planning, safe handling, and reliable delivery outcomes across all projects.

# 2 SHIPMENT OF A PHOTONASSAY™ SYSTEM

The shipment consists of approximately 3 x 40-foot HC containers and 2 x 40-foot flat racks.

The ~3 x 40-foot HC containers contain the following:

- Equipment/ parts that will be used to assemble the final PA1408X system.
- Gear that will be used to unload and move the PA1408X system into the facility.
- Tools that will be used during the installation.

Figure 1 below shows the containers (only 3 in this image) as well as the type of equipment/ parts that are in the containers.



a) 3 x40-foot containers



b) Images of typical gear in containers

Figure 1 Shows (a) the 40-foot containers and (b) typical contents.

The 2 x 40-foot flat racks carry the 3 cabins that make up the PA system. Figure 2 below shows the 2 flat racks. The one flat rack carries the heavy cabin (LINAC cabin) and the other carries the automation and modulator cabins:



a) Flat rack with 2 lighter cabins



b) Flat rack with heavy LINAC cabin

Figure 2 Shows (a) Flat rack with 2 cabins (b) Flat rack with heavy cabin.

### 3 TRANSPORT AND HANDLING

The mass of the cabins varies significantly with the approximate weights as follows:

- Automation cabin ~13 tonnes
- LINAC cabin ~30 tonnes
- Modulator cabin ~10 tonnes

**⚠️ WARNING:** The LINAC cabin CoG is not centred and must be considered for the lift to ensure the cabin remains evenly balanced.

- Details regarding the lifting eyes and centre of gravity can be found in 'C101-33-000 - Cabin Lifting Points & CoG'
- The rigger must adjust the chain lengths to suit the COG as per the drawing.
- If the cabin is not lifted evenly/balanced the contents may shift and result in damage to the system.

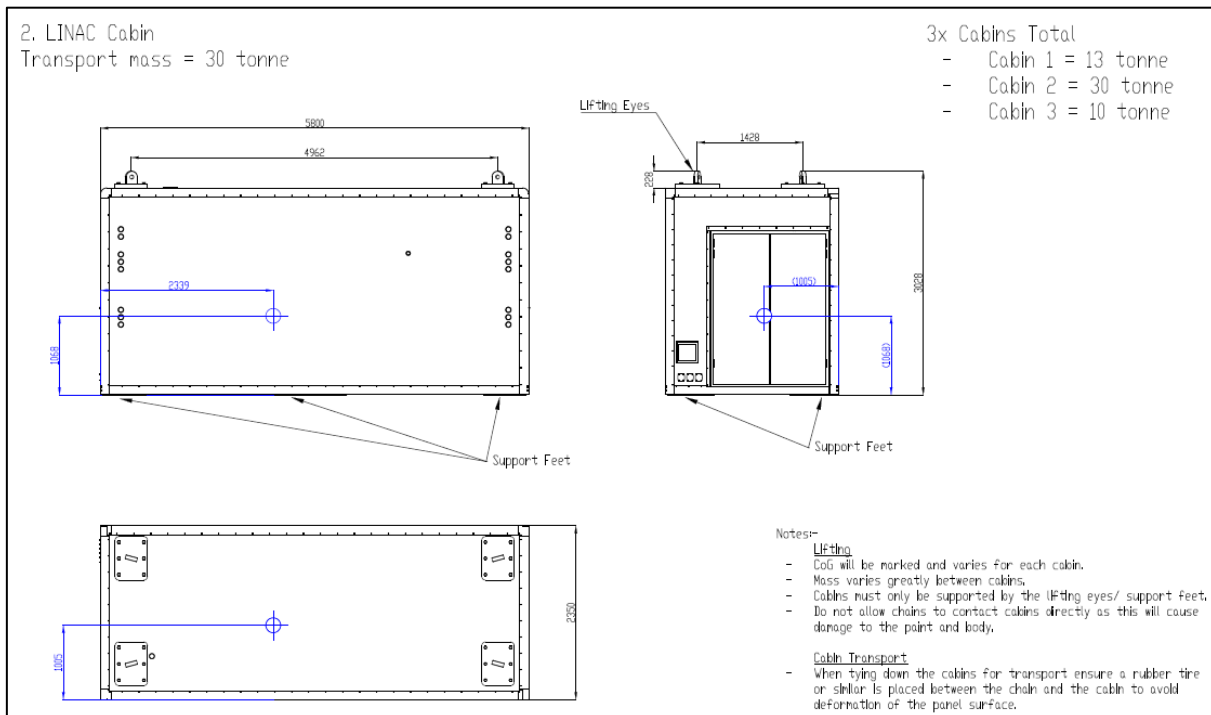


Figure 3 - Shows details on the LINAC Cabin - C101-33-000 - Cabin Lifting Points & CoG

Due to the lack of a connection point at the base of the cabins they cannot be loaded/unloaded using a traditional 'side loader' truck unlike the flat racks themselves.



Figure 4 shows a 'side loader' unloading a flat rack container - this is not possible with the cabins.

The cabins need to be lifted from the lifting eyes at the top of each cabin using a crane or similar. See Figure 5 below.



Figure 5 Image of crane lifting a cabin off the back of a truck.

When the cabins are loaded onto the back of a truck for transport to site it is important that they are tied down correctly to avoid damaging them. It's recommended that rubber mats or tyres are used to separate the chains from the cabin surface to prevent deformation as shown in Figure below. The capacity of the crane will be site specific and depend on the required reach.



Figure 6 shows the how the cabin is protected from the chains using a rubber mat.



Figure 7 shows damage that will occur to the cabins if not protected from the chains.

## 4 FACILITY ACCESS

The facility must have adequate access for the trucks to enter and manoeuvre and should be clear off any obstacles on the day of delivery. Depending on the specific site, space must be considered for the positioning of the trucks, cranes and frannas.



Figure 8 shows an example of a clear access way for the trucks.



Figure 9 shows an example of the crane positioning for unloading the cabins.



Figure 10 shows an example of the space required for the trucks to enter.

Each site will have specific conditions that will need to be considered. Chrysos recommends a professional representative from the trucking and lifting company visits the site to analyse the any site-specific details. Ideally a Chrysos representative would also be present during the visit.

Considerations should be made for the following:

- Access route
- Equipment available locally for hire
- Positioning of cranes, trucks and frannas
- Overall plan for unloading.
- Orientation and sequence of cabins
- Access door dimensions
- The clearance height available into and inside the facility
- Obstructions for the lifting of the franna (articulated mobile crane) / crane boom.

Based on the orientation of the PA unit inside the facility, the sequence of cabin movement into the facility could vary, the Chrysos PM will send through details on the order the cabins should arrive at the site.

## 5 MOVING CABINS INTO THE CLIENT FACILITY

Depending on the size of the facility, entrance door dimensions, available cranes/frannas onsite, the cabins can be moved into the facility in the below two ways.

### 5.1 Unloading and positioning the Cabins inside the Facility using frannas (mobile articulated crane)

If the facility has adequate space, the cabins can be directly moved into the facility via the truck and then unloaded onto their final positions using a franna (mobile articulated crane).



Figure 11 shows a franna unloading a Modulator Cabin from the truck inside the facility



Figure 12 shows 2x frannas waiting in position for a truck to reverse.

All the above analysis is made based on the type of Equipment (Franna/Crane) and the size of the truck that the local transport company have.

The height of the facility required to unload the cabins inside the facility is dependent on the equipment available to hire and should be confirmed with a local supplier. The minimum recommended door width and height can be found in the C101-35-001 - *Installation Drawing*.



Figure 13 shows a Franna positioning a cabin inside the facility.



Figure 10 shows two Frannas moving the LINAC Cabin to its final position inside the facility.

As shown in the above figure, to lift the heavier LINAC Cabin, two Frannas were used. As this particular facility could not accommodate the truck and the two Frannas, the LINAC cabin was unloaded outside the facility using the two Frannas and then slowly moved inside the facility as in the above figures.



Figure 11 shows 40T Franna positioning the Automation Cabin inside the facility.

In the above example the facility could only accommodate the truck and 1x franna, therefore the cabins were unloaded from the truck outside the facility and then moved and positioned inside the facility using the frannas.

**⚠️ WARNING:** The lifting capacity of the franna with the extended boom must be considered.



Figure 12 shows two Franna along with the truck unloading Cabin inside the facility.

As shown in the above figure, this type of unloading is possible if the facility is big enough to accommodate 2x frannas and the truck.

## 5.2 Utilising the Unloading Slab and moving the cabins inside using Tanks/Trolleys and Forklifts

If the facility is not large enough to accommodate unloading the cabins internally, the cabins must be placed onto the Unloading Slab and rolled into the facility.

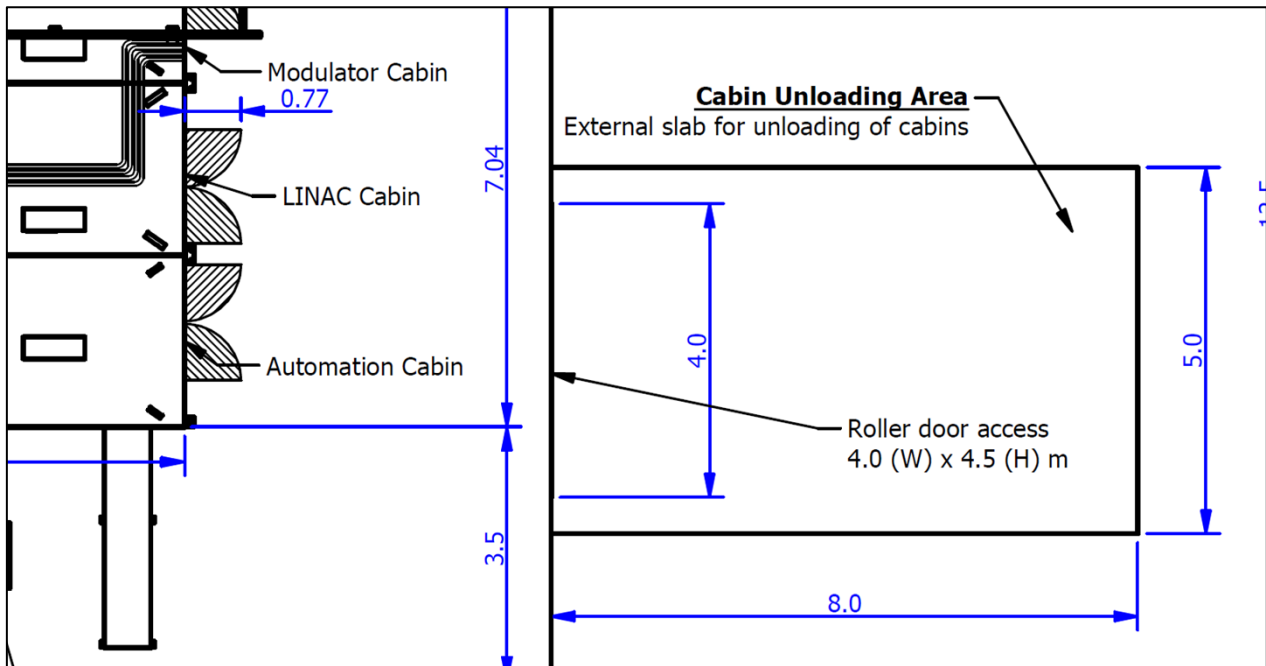


Figure 13 shows the recommended Cabin Unloading Slab dimensions (in meters).



Figure 14 shows the Trolleys/Tanks that the cabins are unloaded onto.

**NOTE:** Chrysos supplies and utilises two different types of trolley/tanks which are especially designed to carry the cabins, the steerable trolleys have a bearing at the centre which allows them to rotate in any direction and move forward and backward as required. Chrysos also provides connecting rods and slings required to move the cabins.

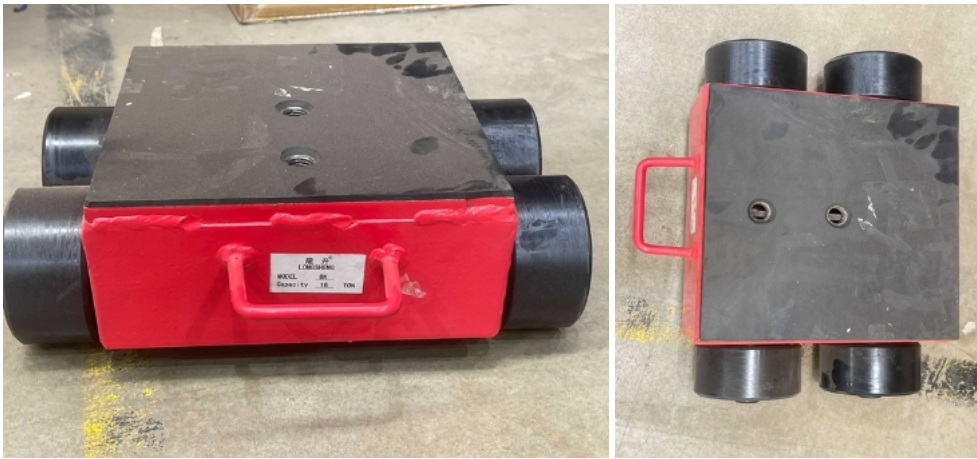


Figure 15 shows the non-steerable trolleys/tanks.



Figure 16 shows the steerable trolleys/tanks



Figure 17 shows the Trolley setup before unloading the cabin off the truck.



Figure 18 Unloading the cabin onto the trolleys - note the cabin is evenly balanced.

As shown in the above figure, the trolley positions are adjusted in such a way that they line up with the cabin rings that are attached to the corners of cabin base.



Figure 19 shows the Crane positioning the cabin onto the trolleys and the Forklift ready to move.



Figure 20 shows the trolleys attached to the forklift by the aid of connecting rod and slings.



Figure 21 shows the installation team guiding the Trolleys to move the cabin inside the facility.

**NOTE:** If available, frannas can be used to assist moving the cabins into the facility while utilising the trolleys/tanks. This should be discussed with the local lifting company as the technique used to bring the cabins into the facility is heavily dependent on the equipment available locally.



Figure 22 shows Franna lifting on end of the cabins and installation team guiding the cabin using trolleys.

### 5.3 Floor suitability for cabin movement

If the unloading plan involves moving the cabins inside the facility using trolleys/tanks as per the above, the client must ensure the access path is smooth to allow the trolleys to roll.



Fig 22 Acceptable floor surface



Fig 23 Unacceptable floor surface/ Stepped surface

For this reason, the floor should not have any uneven surfaces or 'steps' that would make it hard if not impossible to move the cabins without a franna.

**NOTE:** Generally, if a skateboard could roll smoothly across the floor the tanks/trolleys will not have any issues.

## 6 POSITIONING OF CABINS ONTO THE FLOOR

Each of the cabins are custom made using RHS and steel plate, they have been designed to be supported at specific locations only and therefore cannot be placed directly onto the floor but rather they must be placed on to timber blocks. These timber blocks should be placed at all the four corners next to the cabin rings for all three cabins. In addition to the four corner locations, timber blocks must be placed at the centre of LINAC Cabin as per the below image.

**NOTE:** During the installation, these timber blocks are supplied by Chrysos.



Figure 24 Cabins resting on timber blocks.

## 7 LOOSE SHIPMENT DELIVERY TO SITE

The loose shipment is delivered to the site as shown in the below figure, the cargo must then be unloaded using forklifts.

**⚠ CAUTION:** The loose shipment must be covered/protected properly from the weather (especially rain) on its way to the site.



Fig 25 shows the partial loose shipment delivery.

The cargo is then unwrapped and unloaded by forklift as shown below.



Fig 25 Unloading of Loose shipment off the truck using forklift.

**📝 NOTE:** Chrysos will typically have one licenced forklift operator onsite to unload the loose shipment which takes approximately 1-day. If a second forklift and operator are available, the unloading can be finished within a few hours.