

1.0 Introduction

This guidance note is for the erection, use and dismantling of Alshor Plus aluminium falsework and soffit formwork.

This document shall not be used as a working method statement. It is the customer's responsibility to assimilate this information into a document specific to the site conditions.

This document shall be read in conjunction with the RMD Kwikform (RMDK) drawings.

It is assumed that work with RMDK equipment is undertaken or supervised by personnel familiar with the products. Where necessary, product familiarisation can be provided by RMDK.

2.0 References

Please refer to RMDK Alshor Plus brochure, Technical Data Sheets and the attendant RMDK Risk Assessment. Reference should also be made to the contract method statement and construction drawings provided by the contractor for specific details and sequence.

3.0 Health & Safety

This document is for general guidance only and does not remove the responsibility for safe erection, use and dismantling from the customer.

Only trained, competent operatives shall erect, dismantle or adapt Alshor Plus equipment. Plan all lifts and execute in accordance with applicable Manual Handling Regulations.

Provide safe access and a safe working platform at all times. Safe systems of work shall reflect industry best practice and comply with applicable local legislation. RMD Kwikform recommend that the principles for working practices for scaffolders working at heights contained in document SG4, produced by the National Access and Scaffolding Confederation (NASC) are applied to all scaffolding and falsework activities.

4.0 Design Parameters

The Alshor Plus is designed to support soffit formwork, reinforced concrete, other dead loads and live loads. All of the design parameters used are clearly shown on the RMDK drawing. If any of this information is incorrect the relevant RMDK office must be contacted prior to erection.



5.0 Foundations

The falsework area shall be clear of obstacles, relatively flat and of a suitable material that will adequately withstand the indicated leg loads without undue settlement. Where appropriate provide spreaders and/or back props to guard against punching shear.

The allowable working loads for Alshor Plus legs are based on a condition of fixity in both position and rotation at the base. Ensure that spreaders/foundations cannot roll over under the applied loads.

In order to promote the conditions described above, found the falsework directly on a previously cast concrete slab or, when bearing on the ground provide substantial sole boards, sleepers or sheet piles suitably bedded and haunched to spread the load, prevent accidental movement and eliminate foundation washout during inclement weather. If the ground is sloping the foundation will need to accommodate the resulting horizontal forces.

6.0 Erection of Falsework

Four methods of erection are described in this document each requiring a minimum of two operatives. The method selected will depend on personal preference and site criteria.

This text makes reference to Alshor Plus Platforms for use to provide access within the falsework structure. Standard scaffold boards may be substituted if required provided they are supported at the required centres by the use of Alshor Plus Board Bearers and/or Alshor Plus Ledgers.

6.1. Base Jacks

Alshor Plus Base Jacks are equipped with a rapid load strike mechanism to facilitate later unloading of the falsework.

Before assembling jacks into the structure ensure that the load release mechanism is set in the raised position with the vertical locking plunger installed into the striking plate (upper picture).

Insert the jacks fully into the legs and engage the horizontal locking plunger into a hole near the end of the leg. If additional security is required during repeat table flying operations then a cable tie can be applied to the latch as an anti-tamper strap (lower picture).

Adjust the jack extensions to those shown on the RMDK drawing by reference to the tape integral with each jack stem. The tape gives the correct distance when read underneath the jack collar. Over-extend by 15-25mm to allow for final levelling.

The Jack base plate houses ball and cup bearing surfaces that are pinned when no load is applied and fixed in rotation during load application. **Never allow lubricant to come into contact with these bearing surfaces**



6.2. Erection of the Base Lift and Single Frame High Towers

Single frame high structures can be assembled without the need for Alshor Plus access accessories within the structure. Access for the lowest height structures may be afforded from ground level. RMD Kwikform supply lightweight Adjustable Podium Steps having a working height of up to 1.25m that are suitable for use in applications where the floor to soffit heights is up to 3.3m. Use mobile access towers for taller structures.

1. Lay out sufficient materials for the first tower. Insert the base jacks into the leg sections and engage the locking plungers to captivate

2. Attach brace frames between opposite pairs of legs. Orientate the frame so that the spring latches are on the top chord. The blades at the ends of the frame locate into the leg pockets. Locate the longer lower blades first to their step position followed by the upper blades. Push the lower blade off the step position to fully engage the frame. Check that the spring latches locate securely beneath the pockets (pictured bottom)

3. Attach the side frames to one of the leg assemblies.

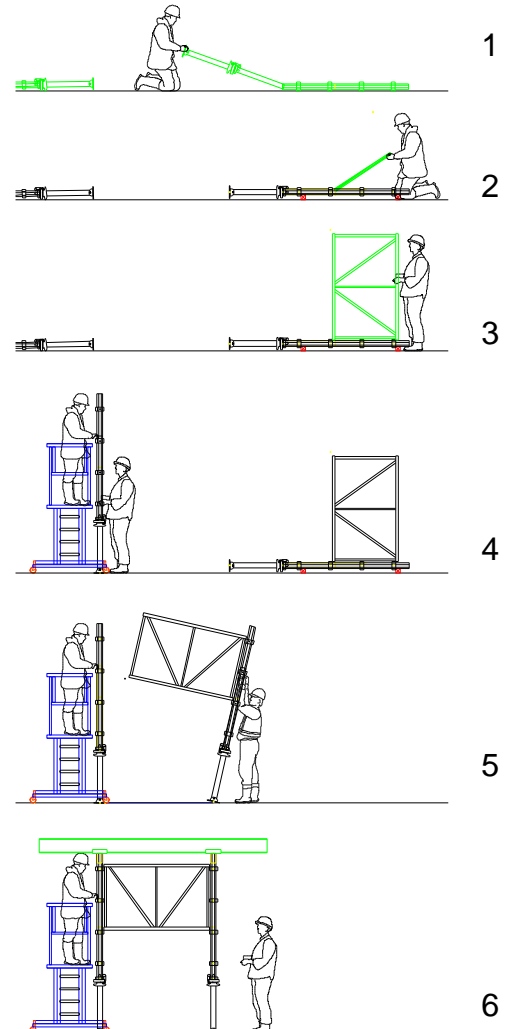
4. Upend the leg assembly without the side frames and secure in the upright position

5. Raise the assembly having the side frames attached and offer up to the other assembly. Engage the side frames to join the two assemblies together. Check correct frame blade and spring latch engagement

6. Install the head units (U-Heads, Adjustable Heads, inverted Adjustable Base Jacks or Flat Bases).

The Podium Steps may be used to assemble the soffit formwork. This operation is described further in section 7.

If additional bays of leg assemblies are required add side frames and assemblies in sequence to complete.



6.3. Erection in the Vertical Mode

Individual towers should not be erected with height to base ratios greater than 3.5. Taller towers should be either linked together with frames with the progress of erection or be restrained to prevent them falling over.

1. Assemble the legs with the base jacks and erect the structure with the first frame in accordance with 6.2.

2. Place the Alshor Plus Platforms on the top chord of the frame with the trapdoor platform in the centre (If the top chord height exceeds 2m then supplementary access will be required to enable this operation otherwise the platforms can be placed on the bottom chord of the frame and subsequent operations can be adjusted accordingly). Add an Alshor Plus Bottom Ladder and Starter Ladder to the frame. Place Alshor Plus Advance Guardrails to the full perimeter of the platform before climbing the ladder

3. Place Alshor Plus Ledgers to suit the position of any temporary platform that may be required. The maximum lift between platforms is 2 metres. Place the platforms.

4. Place the next ladder unit. Raise the advance guardrails prior to climbing to the next platform

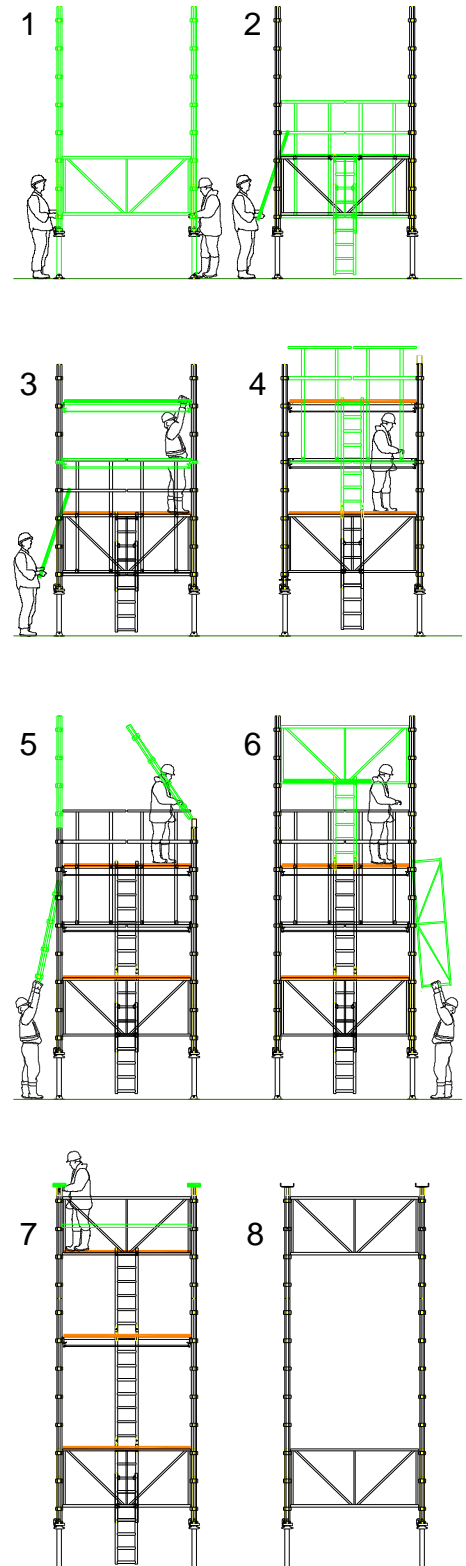
5. Add spigots to the top of the first lift of standards. Upend and add the next lift of standards

6. Place the next lift of frames, platforms and ladder

7. Place the intermediate guardrail for the top platform if needed and the Alshor Plus U-Heads or head jacks

8. Depending on final arrangement of the falsework it may be appropriate to remove all of the safe erection accessories at this time working from the top downwards in the reverse sequence to erection. Otherwise they can be left in situ in whatever combination necessary with the addition of toe boards to provide access for erection of the soffit formwork. - see section 7.

If the Alshor Plus system ladders are to remain in the tower to provide access to the completed falsework system the maximum height permitted from the ground to the first platform is 4.4m. The maximum lift height permitted between successive platforms is 4.0m



6.4. Assembly in the Horizontal Mode

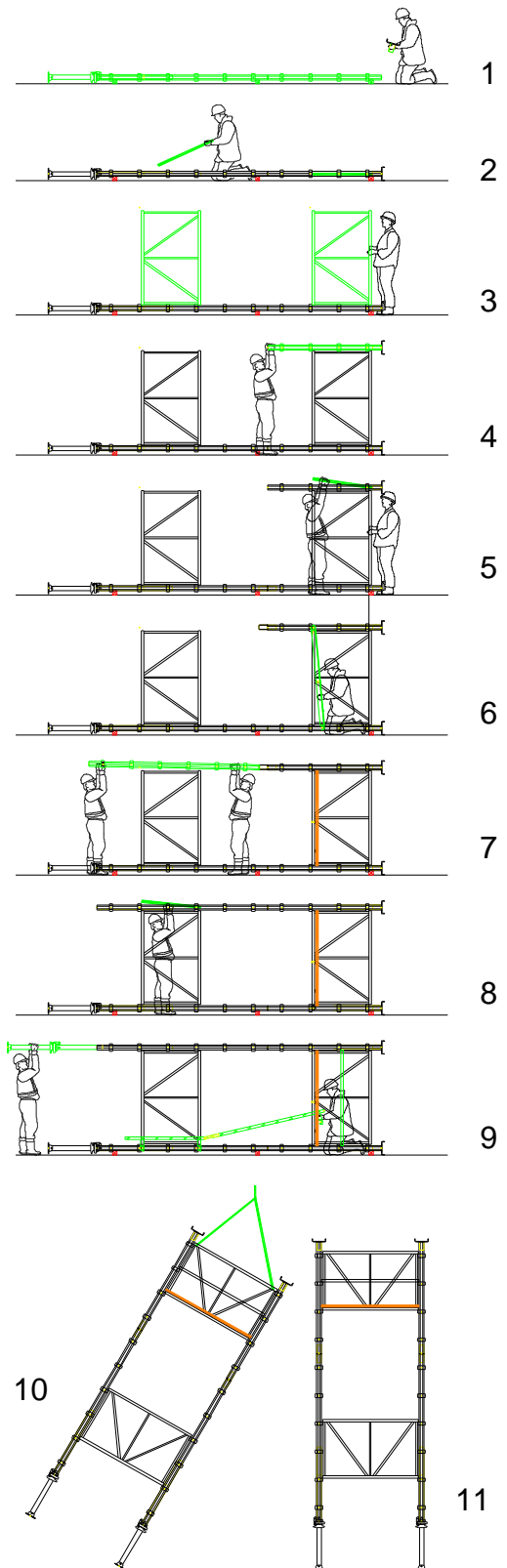
With its fixed position lug extrusions Alshor Plus lends itself well to erection of towers in the horizontal mode. Positive location of the bracing frames in the pockets leads to straight and true towers every time. This method is the quickest of all listed in this document but a crane may be needed to upend the completed towers.

When assembling towers with 2.4 or 3m brace frames, a low level access platform will be required. This access can either be local and mobile or static strips located either side of the assembly area

1. Assemble the ground based legs with spigots and straight pins. Add the base jacks and heads.
2. Add the brace frames between the legs.
3. Add the vertical brace frames
4. Add the topmost leg sections and head units
5. Place the brace frame between the upper legs
6. Add any platform units on the upper frames
7. Place the spigots and pins to connect the other sections of leg in sequence engaging with the vertical brace frames with the progress of the work.
8. Complete placing the upper brace frames
9. Add the base jacks together with any ladders that are to be used within the tower and any intermediate guardrail required to the top working platform
10. Attach the crane to the node points of the top frames as shown with soft nylon slings and up-end the tower

11. If the tower has a height to base ratio of more than 3.5 connect it to its neighbours with brace frames or provide alternative restraint to prevent the tower from falling over. Disconnect the crane

If the Alshor Plus system ladders are to remain in the tower to provide access to the completed falsework system the maximum height permitted from the ground to the first platform is 4.4m. The maximum lift height permitted between successive platforms is 4.0m



6.5. Erection within a U-Shaped Access Scaffold

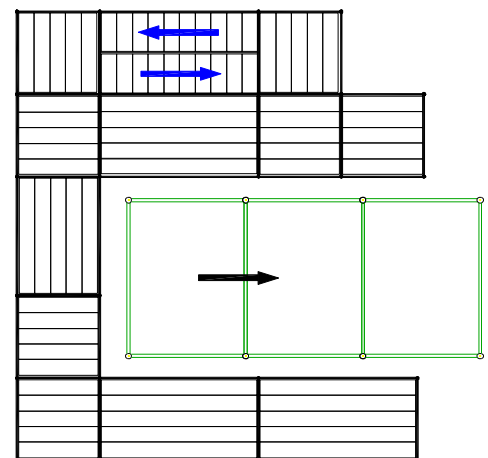
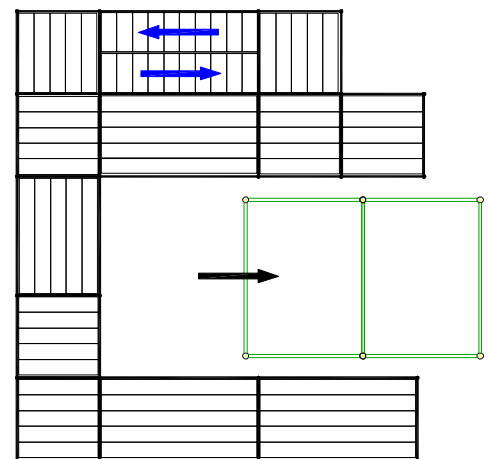
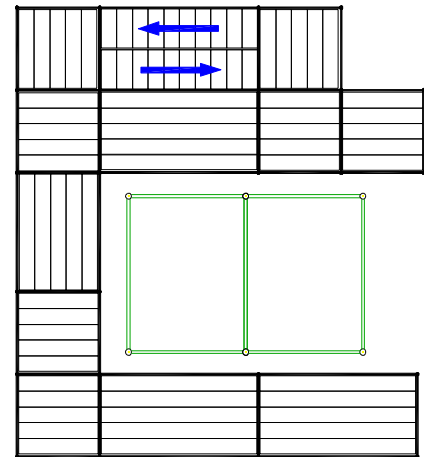
This method is useful for erecting long falsework tables or very tall tables. The U-shaped access may itself be a considerable structure, which will need to be correctly designed and safely erected. Using this method with Alshor Plus jacks at the base only it is possible to do away completely with ancillary access components that may otherwise need to be incorporated into the table construction

The width between the sides of the U is governed by the width of the table under construction and the level of the top access lift is set a metre below the finished table soffit level. In this way the access can be used to place the soffit formwork as well as to construct the table skeleton. Intermediate access lifts are placed such that operatives can reach all areas required to complete the construction of the table skeleton. Assembly is generally as indicated in 6.2 except working from the access scaffold.

In the construction of very tall tables, the table skeleton can be split into several horizontal slices or sub-tables which can be constructed in the horizontal mode (see 6.4) and craned into position above the U. Successive sub-tables can be assembled and craned into position on top of the others and the connections made from the U-access.

Further time and safety advantages can be gained by pre-assembling the soffit formwork complete with plywood and where appropriate perimeter fall protection on a dummy table at low level. This sub-assembly can be craned up onto the top of the completed table skeleton.

Long tables can be constructed by mounting completed table bays on Alshor Plus Castor Units and rolling them out of the U. Additional bays can subsequently be added until the table is completed. As with all tables that are required to be rolled, plan bracing will be required at the base of the table. Very tall tables may need additional levels of plan bracing part way up the structure. Ensure that the height to base ratio is controlled at all times such that erected tables can not fall over



7.0 Assembly of the Soffit

The soffit can be assembled in situ or preassembled at low level on a dummy tower or table followed by lifting into position by crane. Access to complete the assembly process can be from Alshor Plus Platforms placed within or between the towers, from mobile access towers, podium steps or from a mobile elevated working platform (MEWP).

If full access is required to the underside of the soffit area, for instance where the soffit slopes and access is needed to adjust head jacks, it is usual to provide a fully boarded platform between the towers using standard scaffold boards with Alshor Plus ledgers spanning between towers and Alshor board bearers to provide intermediate support to the boards. In this way the Alshor Bracing frames can continue to high level to gain maximum load capacity from the system (pictured).

Full perimeter edge protection should be provided before allowing unrestricted access to the soffit. Those accessing the soffit before this time will need to wear suitably anchored personal fall arrest equipment.

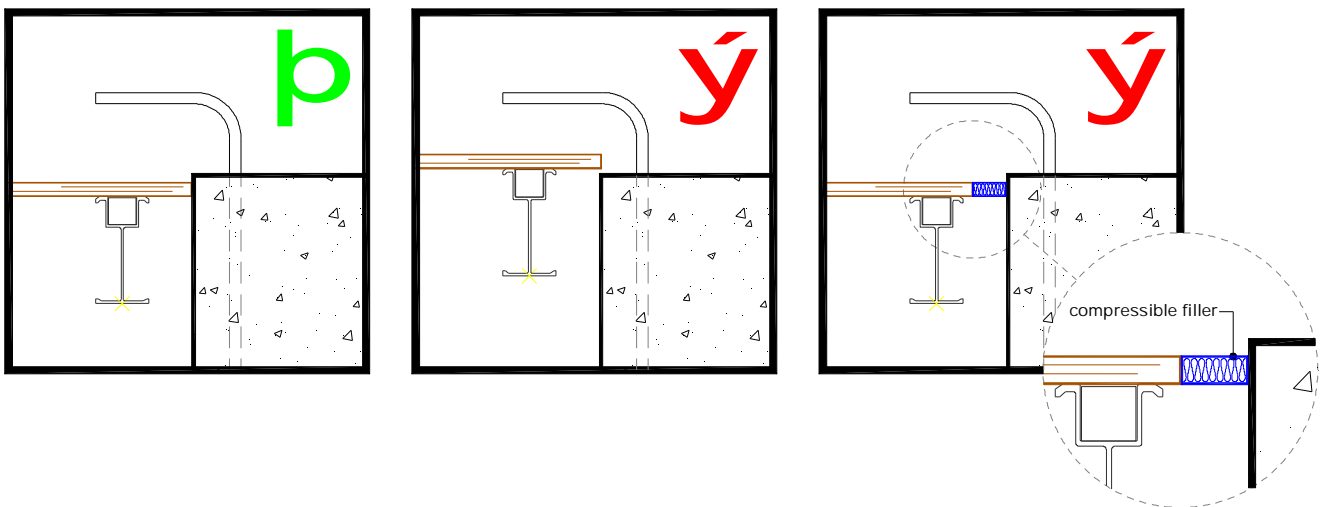
Provide barriers and warning notices to prevent access to incomplete falsework. Ensure that safe access and egress routes are provided to all working areas, and that such routes, including ladders and stairways, are clear.



- When installing the primary beams in the Alshor Plus heads ensure that they are placed centrally within 5mm and secured with the progress of the work by clamping to the central head slots as shown. Add lock nuts to clamps if the table is to be crane handled. Pack timber primary beams to centralise them and secure the packs.
- Lapping of primary beams may create additional load eccentricity and is not permitted unless described on the drawing.
- Carry out any levelling adjustments using the jacks. A Jack Adjuster Handle is available to assist with collar rotation. Driving the jack collar lugs hard with a hammer to extend the jacks is not recommended. It is easier to lower the structure than raise it on the jacks. Do not exceed the maximum extensions shown.
- Install the secondary members and clamp at the appropriate centres. Install the perimeter edge protection system.
- Check the level of the ply soffit and carry out any fine adjustment using the jacks. Ensure that all heads correctly support the primary beams and that all base jacks correctly support the legs.

7.1. Soffit Infill Construction

Place and fix the ply sheets to the infills around the columns, walls and lift shafts ensuring that the edges are adequately supported. The system relies for stability on fixity at the head created by the edge of the plywood bearing against elements of the permanent works. Cut the plywood tight at the interface and seal with mastic to prevent grout loss. Ensure that such interfaces and the permanent works are capable of resisting all actual and notional horizontal loads. Good and poor practice is indicated below.



8.0 Use of the Alshor Plus System

8.1. Steelfixing and Formwork Operations

Set out and mark the perimeter of the structure. Fix the reinforcement and any inserts/embedments.

Place the edge formwork together with any grout check, fillet and screed rails. Check the correct concrete cover to the reinforcement. Blow out the pour to remove debris.

8.2. Checks and Loading

Prior to placement of concrete check the Alshor Plus system to ensure that the ends of all frames are correctly engaged in the leg pockets with the spring latches engaged. Check the vertical frame position and spacing is correct and the jack extensions do not exceed the maximum shown. Check that primary beams are concentric in the heads and that lapping primary beams are only used where indicated on the scheme drawings. Check the heads adequately support the primary beams and the base sits correctly on the foundation. Adjust as necessary.

Consult the drawing and ensure that all aspects of the structure are constructed as shown. Ensure that any specific requirements indicated for placement of concrete and any restrictions to loading are communicated to the site team.

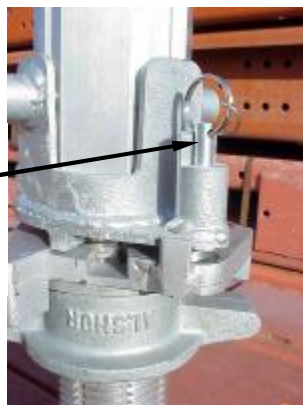
Issue Permit to Load document to site operatives. Place the concrete and allow curing

9.0 Striking

Rapid unloading of the falsework is afforded by the load release mechanism integral with the base jack. Retract the locking plunger and rotate by 90 degrees to secure. Strike the hitting lugs on the Drop Plate so as to cause rotation and immediate lowering by 12mm in a single operation. Further lower the jacks to give adequate clearance to the cast soffit.

Ensure unloading of the falsework is carried out in sequence to avoid unacceptable load shedding to un-struck areas. This can usually be achieved by striking towers mid concrete span first and working back towards the columns.

Locking plunger retracted and rotated to secure



Rotate Drop Plate to cause 12mm drop



10.0 Relocation of Equipment

10.1. Crane Handling With Slings

Alshor Plus tables can be relocated between levels using just the crane and a suitable chain hoist to shift the centre of lift before the table exits the building. Access hatches are required in the plywood soffit. Refer to Equipment Guidance Note UIX10605 for details.

10.2. Crane Handling with a Single Prong C-Frame

Alshor Plus tables may be craned to the next level using the Alshor Plus C-Frame (top). Each C-Frame is rated for a maximum lift of 2500kg. Multiple units may be laced together to accommodate heavier tables. Lift the tables only from the points indicated and ensure that all table components are connected together as shown before carrying out the lift. Refer to Equipment Guidance Note UIX10602 for details.



10.3. Trolley Handling

Alshor Plus tables may be raised/lowered and moved on the same level using the Alshor Plus Trolley (middle). Each trolley is rated for a maximum lift of 500kg. Use multiple trollies to accommodate larger tables. Refer to Equipment Guidance Note UIX 10604 for details



10.4. Solid Wheel Castor Units

Tables may be moved using the Alshor Plus Castor Units (bottom) rated for a maximum load of 800kg when running on a smooth flat surface. For tables having more than one lift of legs in the height, add a tube and fitting plan brace at the base of the table to prevent lozenging.

Start with the table supported on all base jacks. Position the castors only at the leg locations indicated on the drawing. Ensure the table remains stable through all stages of castor placement and removal.

Raise the first jack by rotating the handle four turns. Reset the quick strike mechanism and engage the locking plunger. Slip the castor over the jack base and lower the jack so that the twin holes in the jack base plate locate over the nipples on the wheel unit. Tighten the jack to take the load. Engage the swing over latch to captivate the wheel unit and tighten the locking screws. Repeat in sequence for the other wheel units. Repeat for the remaining castor units.





Raise the non castor unit jacks to clear the running surface. Use the tow handles to roll the table to its destination steering as required. Trailing wheels may either be steered or locked by stowing the towing handle in a free leg pocket extrusion.

When more than 4 castor units are needed due to table weight, check all castors are loaded evenly by comparing the effort required to steer a static castor, adjust the base jacks to suit.

Once the table has reached the required location, lower the non castor jacks and take the load of the table. Raise the first castor jack and remove the castor. Lower the jack and take the load. Repeat to remove other castors.

10.5. Pneumatic Wheel Castor Units

Where tables are to be rolled over unmade ground or where they are very large and heavy, special order pneumatic camtor units provide advantages over the standard units.

On unmade ground select a low tyre inflation pressure. The tyre will deflect and spread the load over a larger area helping to prevent rutting of the running surface. The softer the running surface, the lower the tyre pressure that should be used.

Very large heavy tables will require many castor units to carry the load. In such cases, even when the running surface is smooth and flat, it is difficult to ensure that all castor units carry equal load. This can lead to overloading and tyre or axle failure. Use of pneumatic tyred castors with all tyres inflated to the same (high) pressure will ensure equal loading. In this case adjust castor base jacks so that all tyres appear roughly equally deflected. It is not possible to run large heavy tables over unmade ground.

11.0 Dismantling of Equipment

Dismantle the equipment by reversal of one of the sequences identified in this document. It may not be the same method as used for assembly and erection. Remove components with the progress of the work and stack them neatly in the appropriate containers or stillages. Clean as necessary prior to return to RMDK.

Bombing of equipment will result in damage and is illegal

IT IS THE CUSTOMER'S RESPONSIBILITY TO ENSURE THAT ALL EQUIPMENT IS CLEAN AND THAT STACKED EQUIPMENT IS SAFE TO HANDLE AND TRANSPORT.