

ISCHEBECK[®]

TITAN

Titan support system

Method statement

Method statement Titan support system

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Introduction

Ischebeck Titan is renowned as one of the leading manufacturers and suppliers of equipment to the construction and civil engineering industries.

Our commitment to safety and site efficiency is evident in the design performance and quality of our products, which offer safe access and secure working platforms for an enormous variety of applications.

The enclosed method statement underlines our devotion to site safety by providing recommendations, based on tried and trusted methods, for the proper use and application of Ischebeck Titan support and formwork systems.

Please take time to read and understand the information presented before using the products covered. If you need further advice or assistance consult a suitably qualified person within your own company or contact Ischebeck Titan.

Disclaimer

The methods presented in this document are solely for the use of Ischebeck Titan equipment and are intended for guidance only. When familiarity has been gained with the equipment preferred methods may be adopted, provided they do not contravene health and safety regulations or accepted safe working practices. The information is correct at time of publication, but Ischebeck Titan reserves the right to change, without prior notice, the specifications and methods mentioned. No responsibility whatsoever can be accepted for any errors or omissions in, or misrepresentation of, the contents. For specific information refer to Ischebeck Titan Limited.

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Site safety is your responsibility

The importance of site safety cannot be over emphasized. You have a responsibility to yourself, your colleagues, site visitors, family, friends and others to ensure you do not injure yourself or take actions, which put the lives and health of other people at risk.

Site safety rules will form part of every site's health and safety plan. You should familiarise yourself with these rules and make sure that you and fellow workers do not contravene their requirements. A prominent notice will identify personnel with overall responsibility for site safety.

You will have contractual and legal obligation to follow these rules and adhere to relevant legislation, such as the Health and Safety at Work Act, which place specific responsibilities on you and your employer to prevent accidents.

Site safety is the responsibility of everyone on site. If you have a reason to believe that safety is being compromised, you should report it to the appropriate personnel.

Your responsibilities

Following are a few suggestions to help you work safely and contribute to safety on your site:

- Make sure you fully understand the safe and proper way to do any job.
- If in doubt, ask your supervisor – do not guess.
- Always conduct yourself in a responsible and safe manner.
- Do not expose others to danger through your actions.
- Always use the correct tools and equipment for the job.
- Always use the appropriate safety equipment and protective clothing.
- Report ALL defects in plant and equipment.
- Observe and comply with warning and hazard notices.
- Advise newcomers of safe working practices.
- Make sure you know where to go for first aid treatment.
- Report any injury and ensure it is entered in the accident book.
- Never indulge in horseplay or practical jokes at work.
- Never attempt to work whilst under the influence of alcohol or drugs.
- Make sure you have read and understood the sites health and safety requirements.
- Report any situation which might compromise site safety to the sites safety officer.

Safe working practice

- Consider health and safety first. If you are not sure of procedures ask.
- Do not take shortcuts – use the access provided.
- Do not remove handrails or ladders from scaffolds unless instructed to do so and replace them as soon as possible.
- Play your part in keeping the site tidy and safe.
- Look out for hazard warning notices and obey them.
- Never attempt to operate machinery unless you have been trained and authorized to do so.
- Attempting to lift heavy objects or materials can cause injury – obtain assistance where necessary.
- Study you company's policy.
- Remember you have a legal duty to take reasonable care of your own health and safety and to avoid placing other people at risk. Such as those who work with you and members of the public.
- If in doubt about your job, ask your immediate supervisor for guidance.
- Your co-operation in discouraging children from entering the site will help to reduce the risk of accidents to them and others.
- Remember that entering an unsafe area could render you liable to prosecution. If it looks or feels unsafe, report it. If you are unsure, ask site supervision for advice.

Personal protective equipment

For your protection, always use the safety helmets, ear protectors, face masks, goggles, gloves, safety harnesses and other items of personal protective equipment appropriate to the tasks you are undertaking.

When protective clothing and/or equipment is issued to you:-

- Wear or use the equipment when required and when there is any possibility of personal injury in the course of your work.
- Look after the equipment.
- If the equipment is on personal issue, store it carefully and ensure that it is available for use when needed.
- Make sure that equipment is properly maintained.
- Replace defective equipment immediately.
- If you have any doubts about the correct use, adjustment or maintenance of the equipment, ask your supervisor.

Brief description

The Titan support system is recognised as the leading product in its field by many professionals in the construction and civil engineering industries.

Comprising two main components; legs and frames, together with a comprehensive range of accessories, the Titan support system offers one of the quickest, most effective and versatile means of providing rapid support and access solutions in an enormous variety of situations.

The system can be used in both 'flying table' and erect and dismantle applications and is ideal for multi-storey structures, water reservoirs and soffit situations where mobility and ease of handling are required.

With the majority of components being manufactured from high grade aluminium to patented designs, the Titan support system possesses an exceptionally high strength to weight ratio which facilitates rapid erection, whilst its excellent corrosion resistance and robust build quality assure long term durability.

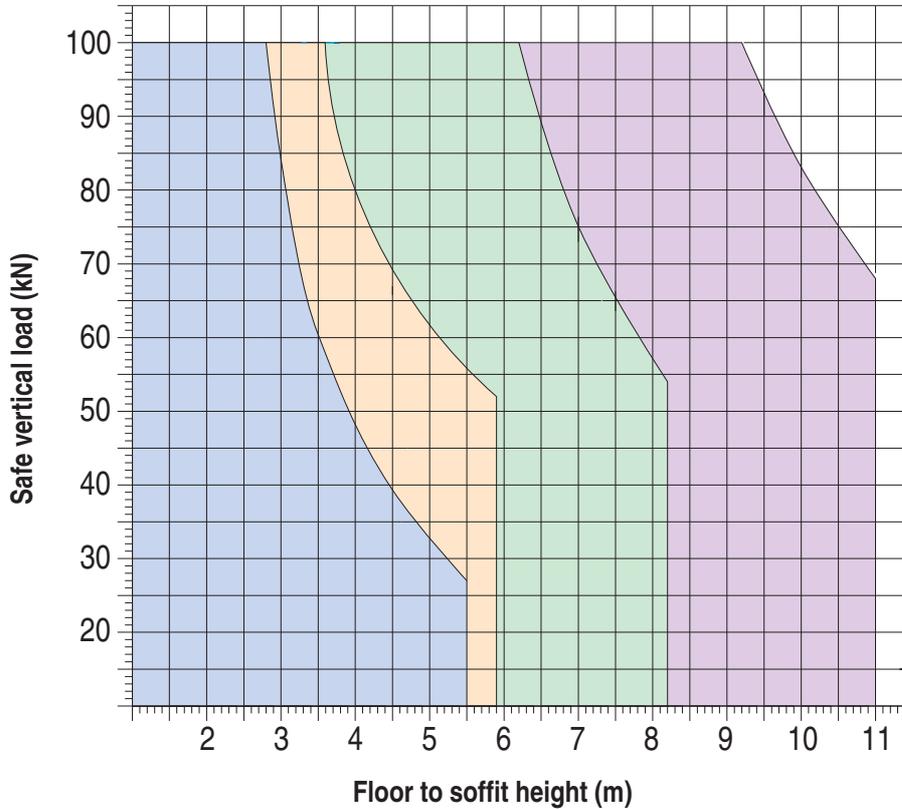
The Titan support system is designed to reduce labour costs, increase site efficiency, improve safety and meet the demands of today's construction and civil engineering techniques.

Technical specification

- Lightweight components can be easily handled by one man
- Titan can be loaded up to 100kN per leg
- 2.4m of jack adjustment with jacks top and bottom
- Two components for fast, efficient erection and dismantling
- No loose fittings
- Rigid connection between Titan legs and frames self-aligns the system
- Continuous vertical slots on the Titan legs allow ledger frames to be positioned at convenient working heights
- One system suitable for erect and dismantle falsework and large, rigid flying tables for versatility and economy
- Modular components easily adapt to height and width variations
- Accessories include rocking headplates, guard post brackets, access platforms, cantilever frames and a full range of safety components.

Titan loading graphs

Titan leg graph



- Single leg
- 1 level of ledger frames in height
- 2 levels of ledger frames in height
- 3 levels of ledger frames in height

The allowable leg load is determined by the floor to soffit height, the number of ledger frames in height or jack extension

Notes:

It is assumed the formwork is restrained from horizontal movement at the formwork level.

Ledger frames to be fixed in the optimum position.

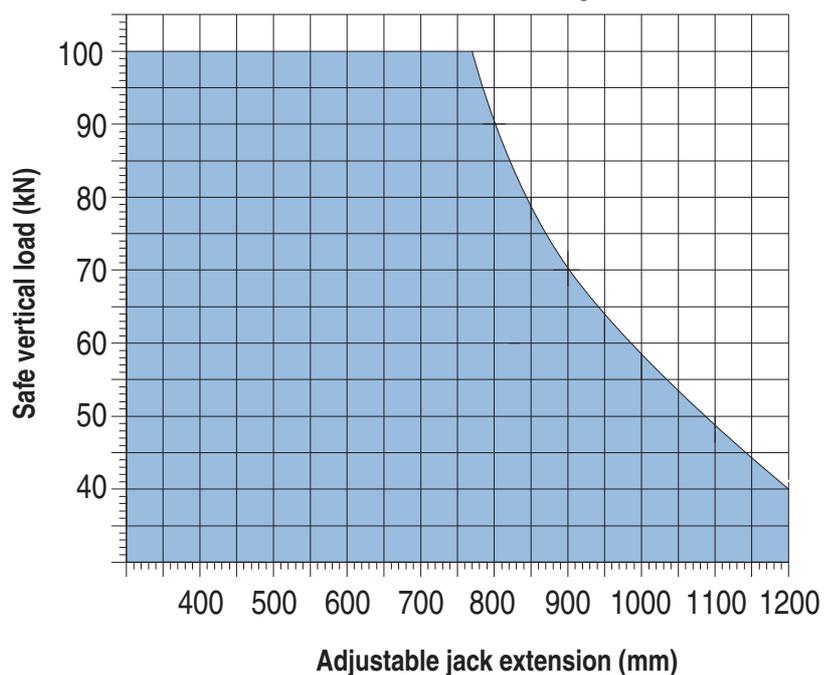
Maximum distance between ledger frames not to exceed 2.0m between top and bottom chords of ledger frames. This rule also applies on floor to soffit heights greater than 11.0m.

On propping heights over 11.0m refer to Ischebeck Titan Design Services for advice.

On the higher propping heights an additional level of frames may be required for ease of erection and stability.

Minimum height to base ratio =3:1.

Titan jack graph



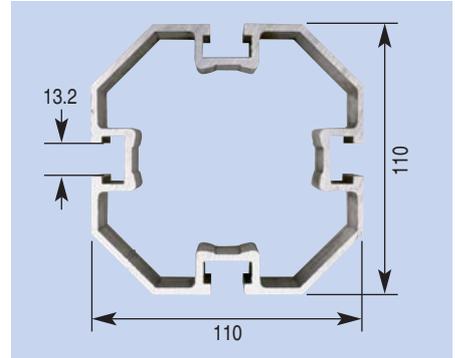
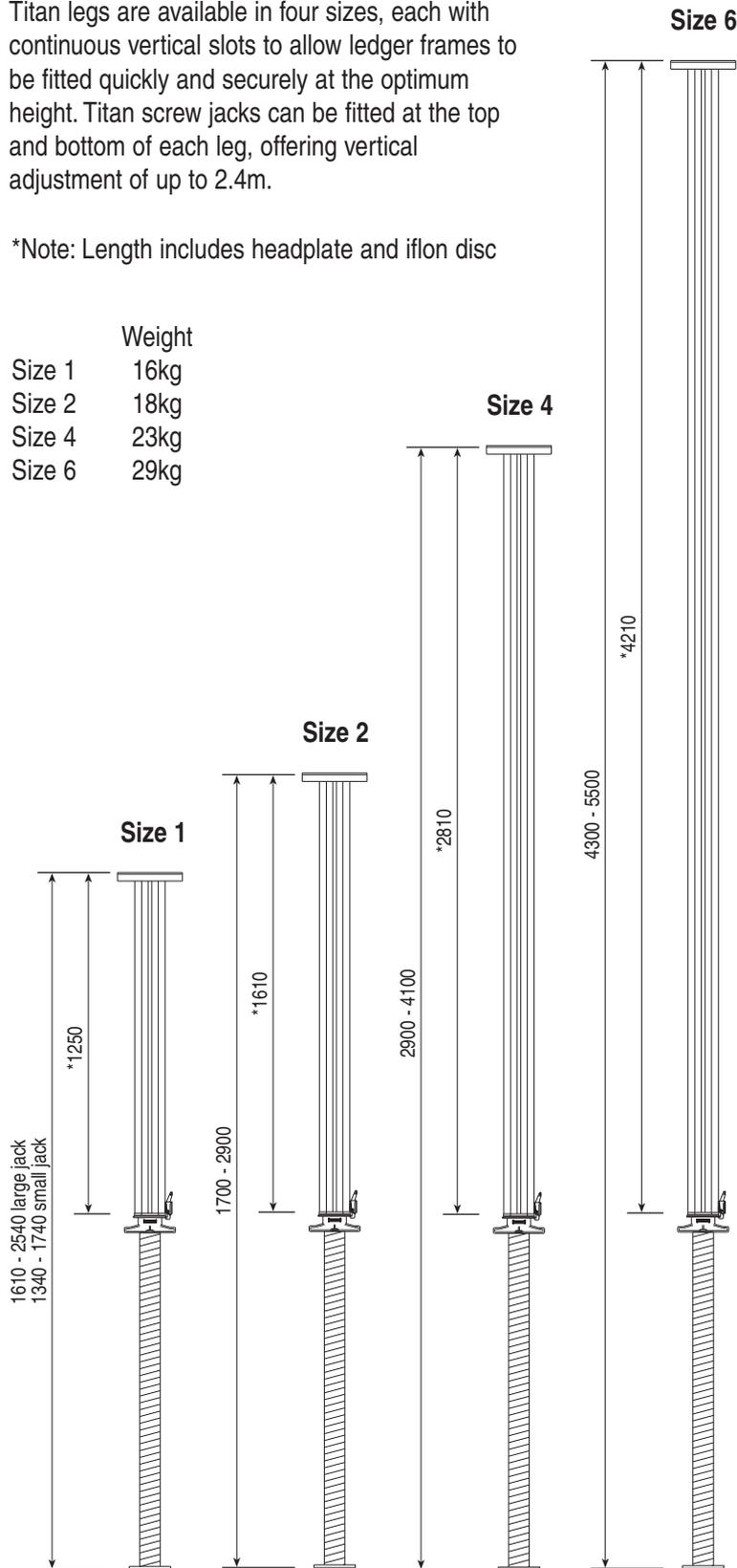
Components

Titan legs

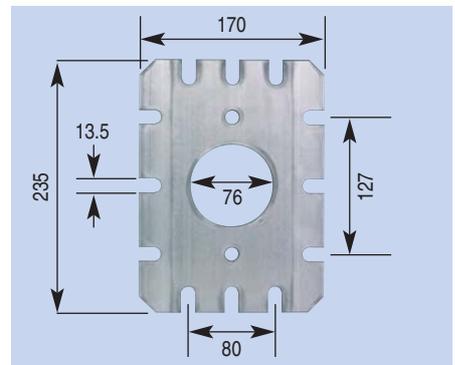
Titan legs are available in four sizes, each with continuous vertical slots to allow ledger frames to be fitted quickly and securely at the optimum height. Titan screw jacks can be fitted at the top and bottom of each leg, offering vertical adjustment of up to 2.4m.

*Note: Length includes headplate and iflon disc

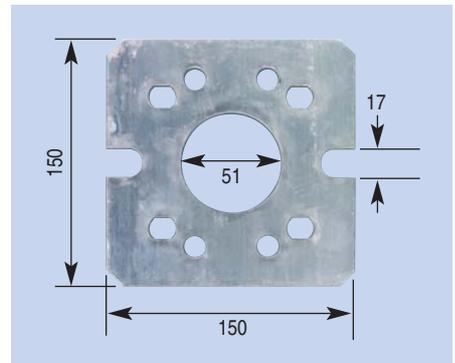
	Weight
Size 1	16kg
Size 2	18kg
Size 4	23kg
Size 6	29kg



Profile



Headplate



Baseplate



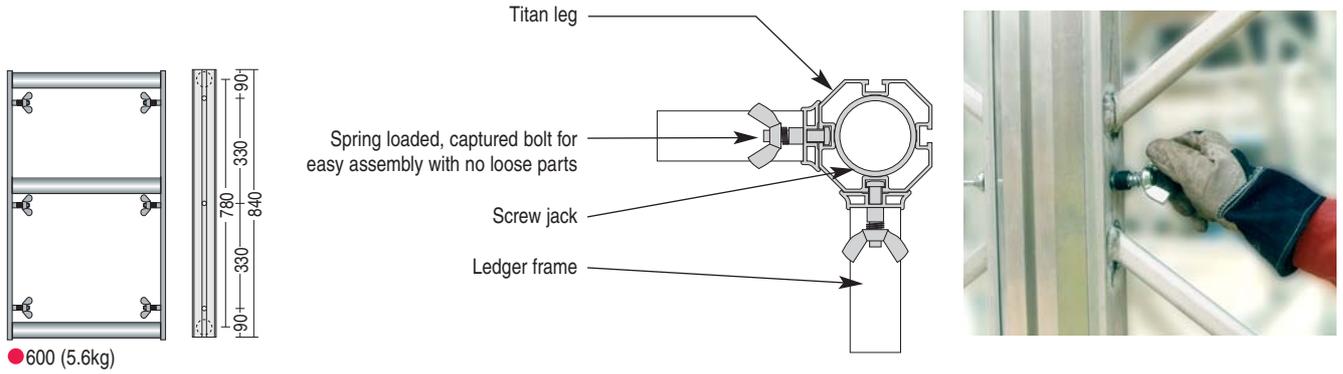
Retainer clips

Components

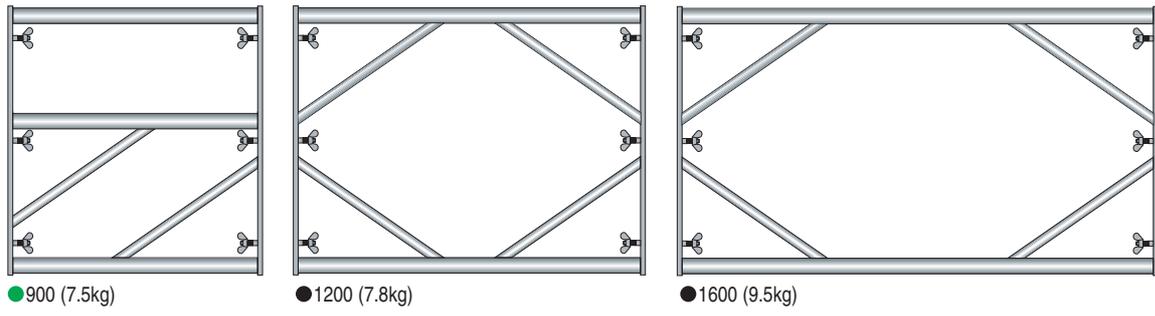
Titan ledger frames

A range of seven Titan ledger frames is available. All frames are shown colour coded in Ischebeck design drawings.

Note: Frame lengths shown are in millimetres and centre-to-centre of Titan legs.



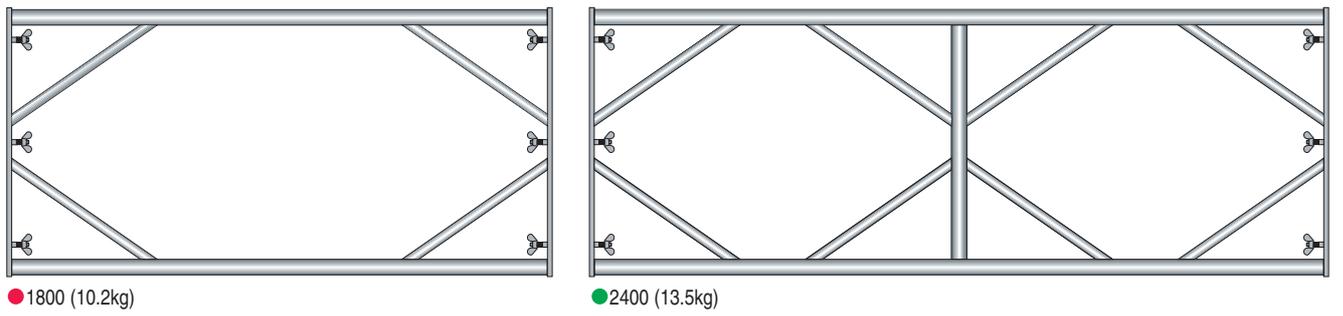
● 600 (5.6kg)



● 900 (7.5kg)

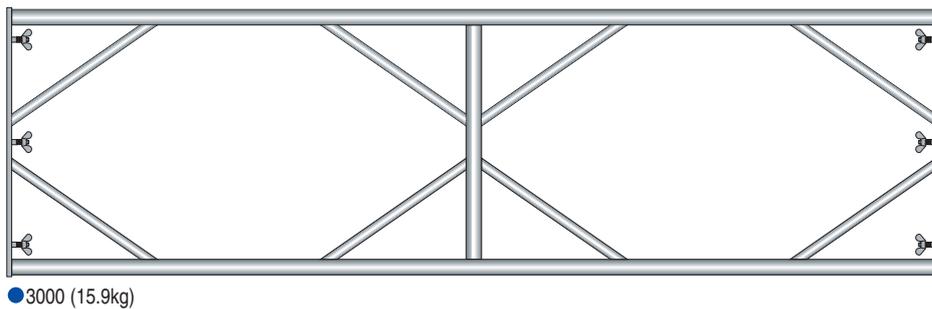
● 1200 (7.8kg)

● 1600 (9.5kg)



● 1800 (10.2kg)

● 2400 (13.5kg)

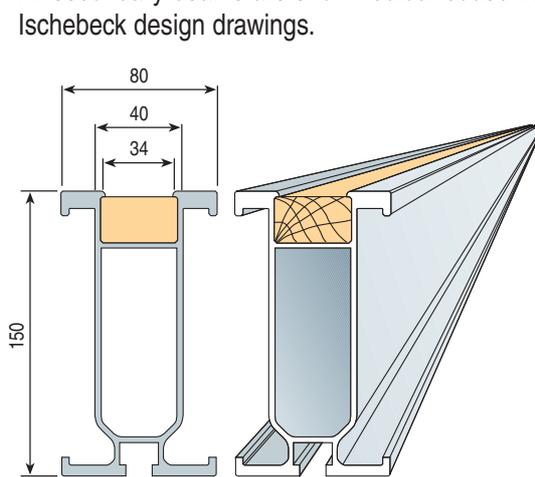


● 3000 (15.9kg)

Components

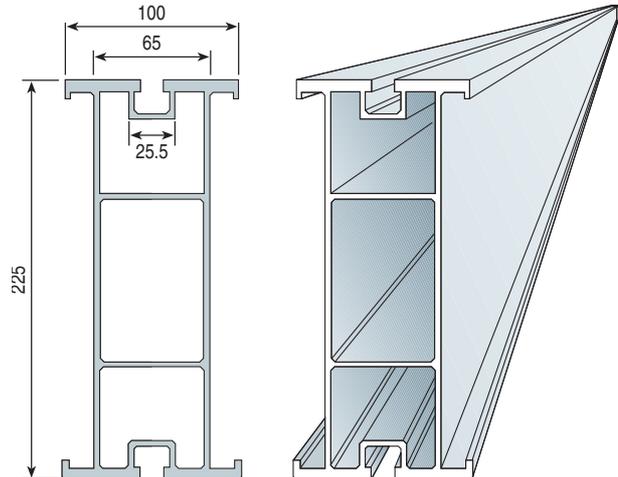
Titan beams

Manufactured from extruded aluminium section, Titan beams offer a lightweight, easy to handle solution for decking/soffit applications. All secondary beams are shown colour coded in Ischebeck design drawings.



Titan 150 beam

	Area	18.6 cm ²
I _{xx}	Moment of inertia	596.9 cm ⁴
Z _{xx}	Section modulus	77.31 cm ³
E	Modulus of elasticity	68900N/mm ²
E.I.	Bending stiffness	411 kNm ²
W	Weight	5.63 kg/m
M	Resistance moment	11.9 kNm
S	Allowable shear force	30 kN



Titan 225 beam

	Area	32.63 cm ²
I _{xx}	Moment of inertia	2241 cm ⁴
Z _{xx}	Section modulus	199.2 cm ³
E	Modulus of elasticity	68900N/mm ²
E.I.	Bending stiffness	1544 kNm ²
W	Weight	8.87 kg/m
M	Resistance moment	28.5 kNm
S	Allowable shear force	71.3 kN

- length (m)
- 1.2
- 1.8
- 2.4
- 2.7
- 3.0
- 3.6
- 4.2
- 4.8
- 5.4
- 6.0
- 6.4
- 7.2

- length (m)
- 1.2
- 1.8
- 2.4
- 3.0
- 3.6
- 4.2
- 4.8
- 5.4
- 6.0
- 6.4
- 7.2

- length (m)
- 8.0
- 9.0
- 10.0
- 11.0



Beam to beam fixing



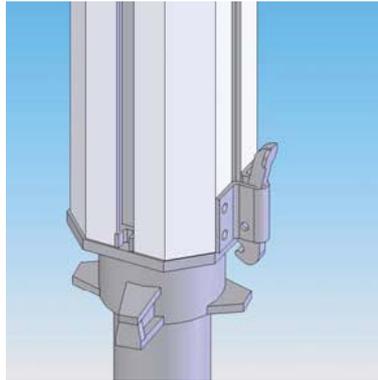
Titan Clamp



Headplate to beam fixing

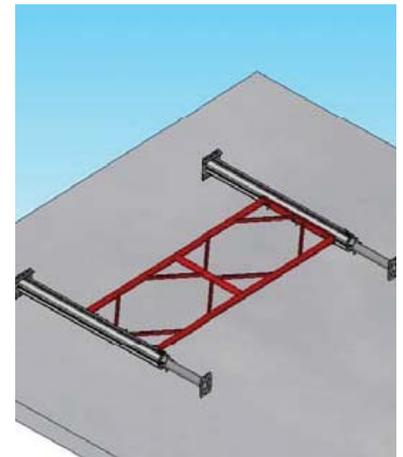
Standard erection procedure

1. Set the jack nuts in the approximate position to give the correct jack extension. Then insert the jack into the ends of the legs so that the nut engages with the retaining clip

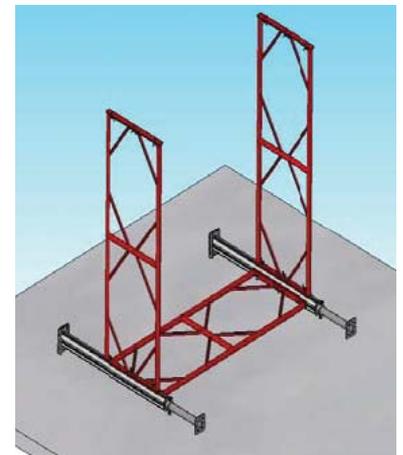
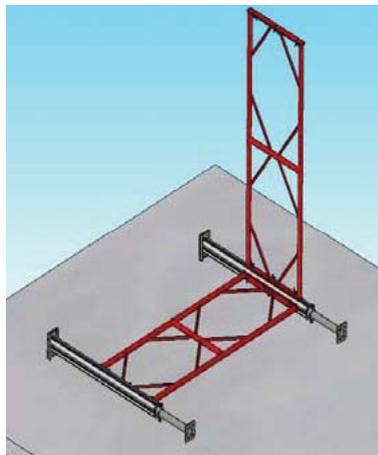


2. Place the legs, complete with jacks, at approximately the required leg centres on the ground, introduce a ledger frame of the correct length between them and secure this in position. It will be found that the operation of tightening the 'T' bolts will be facilitated if the middle 'T' bolt is left until last.

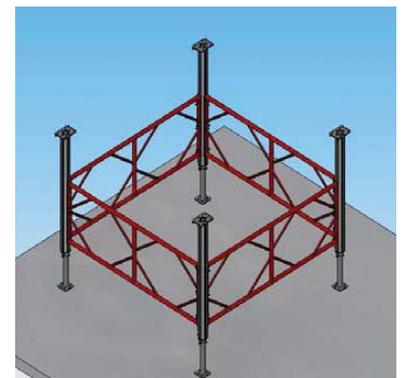
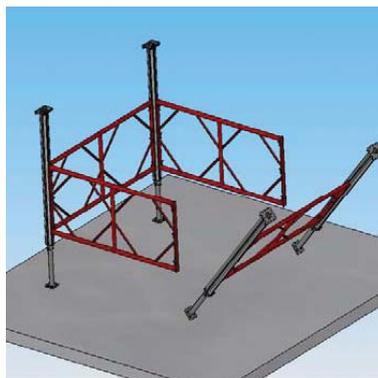
It may be found necessary to completely unscrew wing nuts before attempting to locate. When the line on the end of the stem is in line with the slot in the outer leg, the 'T' bolt has been positioned correctly.



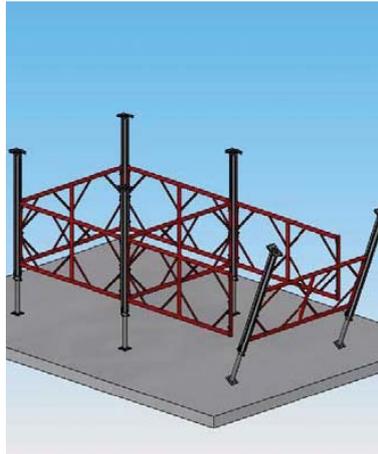
3. Vertical ledger frames are now fixed to the legs in a similar manner to paragraph 2.



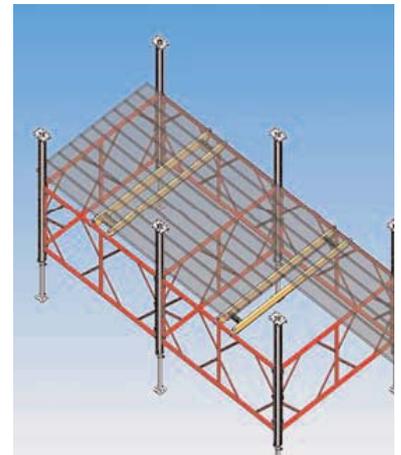
4. A further two legs are assembled in a similar manner to paragraph 2. The two assemblies may now be raised until the legs are vertical and the exposed ends of the ledger frames connected to the legs to form a four leg tower.



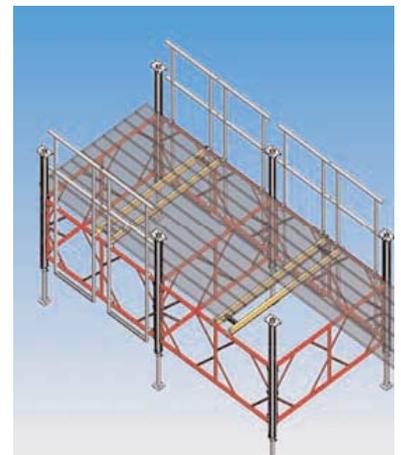
5. Ledger frames can be hung off any face of this tower and the erection continued until the desired falsework area has been achieved.



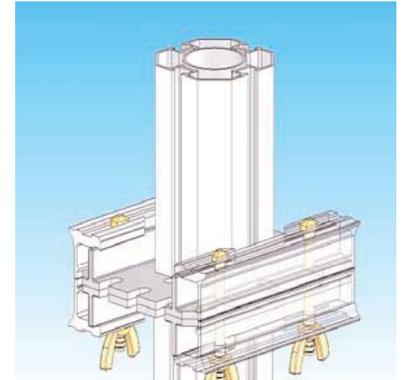
6. Propriety decking or standard scaffold boards can be used to form a suitable work deck for fixing aluminium formwork beams. If boards are used intermediate transoms will be required and these should be positioned at 1.5m maximum centres to suit the permissible board span.



7. Titan quick release handrail frames should also be used for edge protection around the work area. Scaffold tube handrails and posts can also be fixed to the system if required.



8. If the falsework requires more than one lift of legs and ledger frames then this will be erected off the work deck as described previously. The next lift of legs are inverted and fixed to the first lift by means of 2 No. Titan fast connector brackets or 4 No. M12 x 35 bolts and nuts. Ledger frames to be fixed to the legs as previously described.

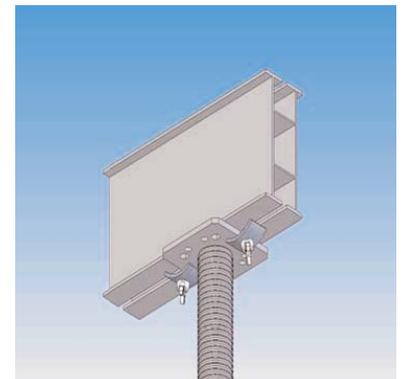
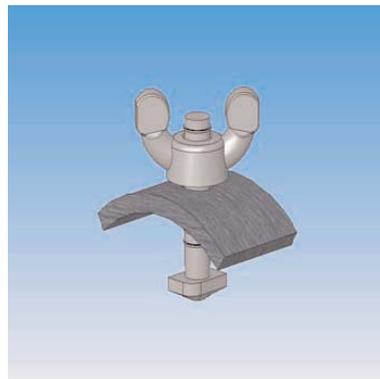


A work deck will be required at the higher ledger frame level to provide access for the fixing of formwork beams.

An alternative to the above is to assemble a tower as described in paragraphs 1-4 and then crane handle this tower into position and bolt headplates together as shown.

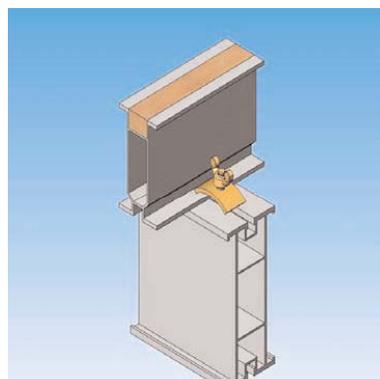
Any lacing or bracing that may be required should be fixed before the working load is applied.

9. Only recognised Titan clamps are to be used for the fixing of Titan beams.



10. Primary beams should be placed centrally on the headplate of the leg or jack and fixed by means of 2 No. Speedthread Titan clamps or Titan 'T' bolts and nuts.

11. Secondary beams are then placed on top of the primary beams at predetermined centres and fixed by the Titan clamp at each intersection with the primary beam.



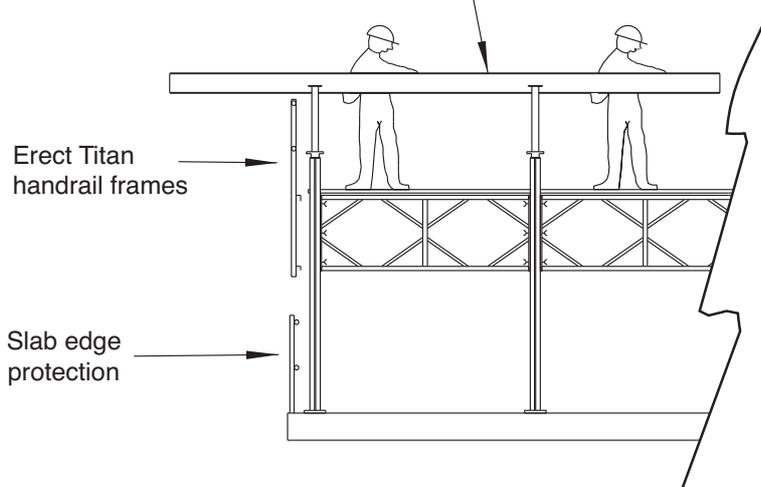
Plywood is then fixed to the secondary beam by means of suitable nails/screws at the required centres.

Titan falsework

Erection guide

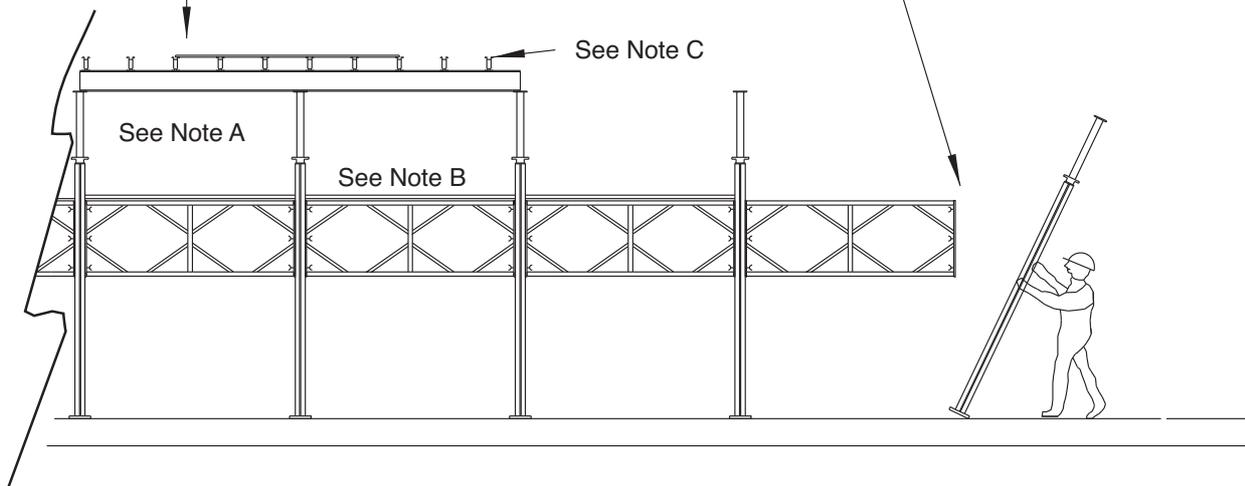
Stage 1

Cantilevered primary beams must have a minimum of 2 bays of support.



Initial decking area laid prior to work commencing towards outer faces.

Titan leg located and secured into position by ledger frame wing nuts



Note A: Min. dimension from work platform to underside of primary beam must be 1100mm

Note B: Fully boarded platform moved in direction of falsework.

Note C: Initial secondaries taken from ground/.slab and manhandled onto primaries. Once sufficient ply deck is laid then secondary bundles can be landed on the ply decking.

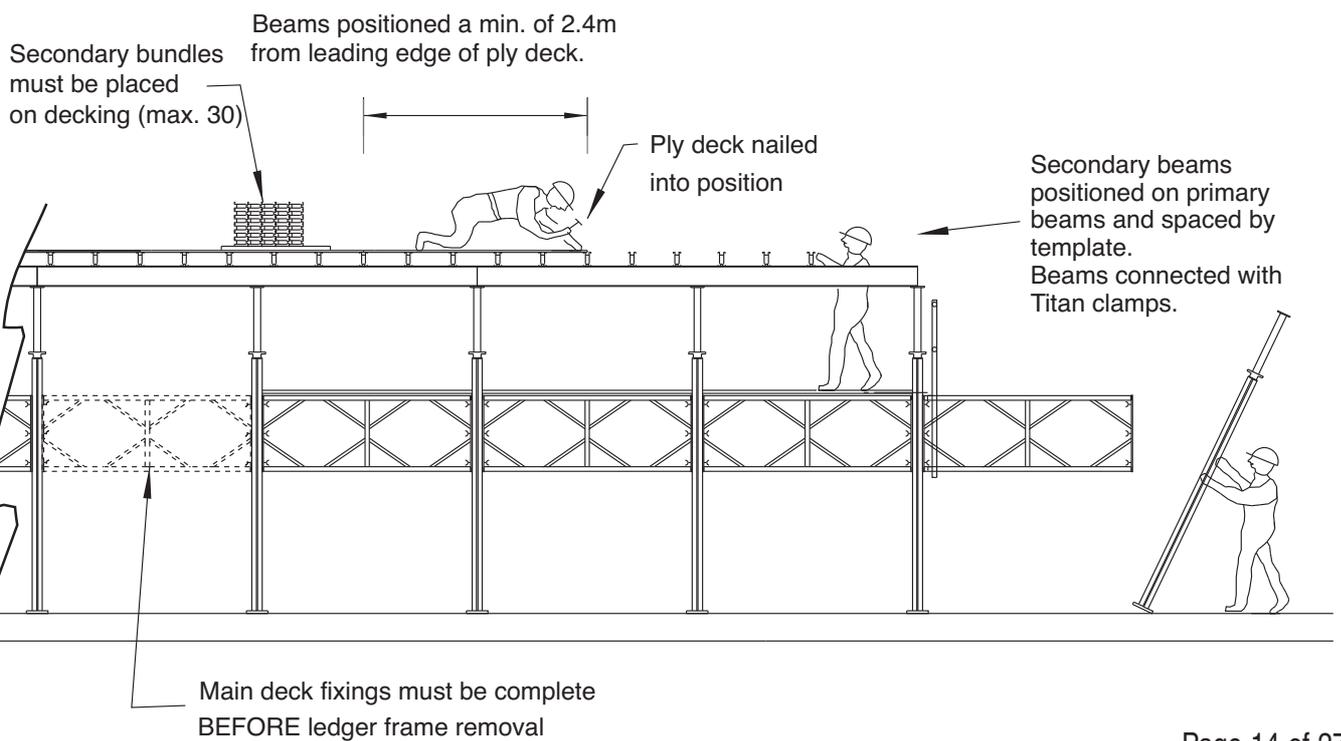
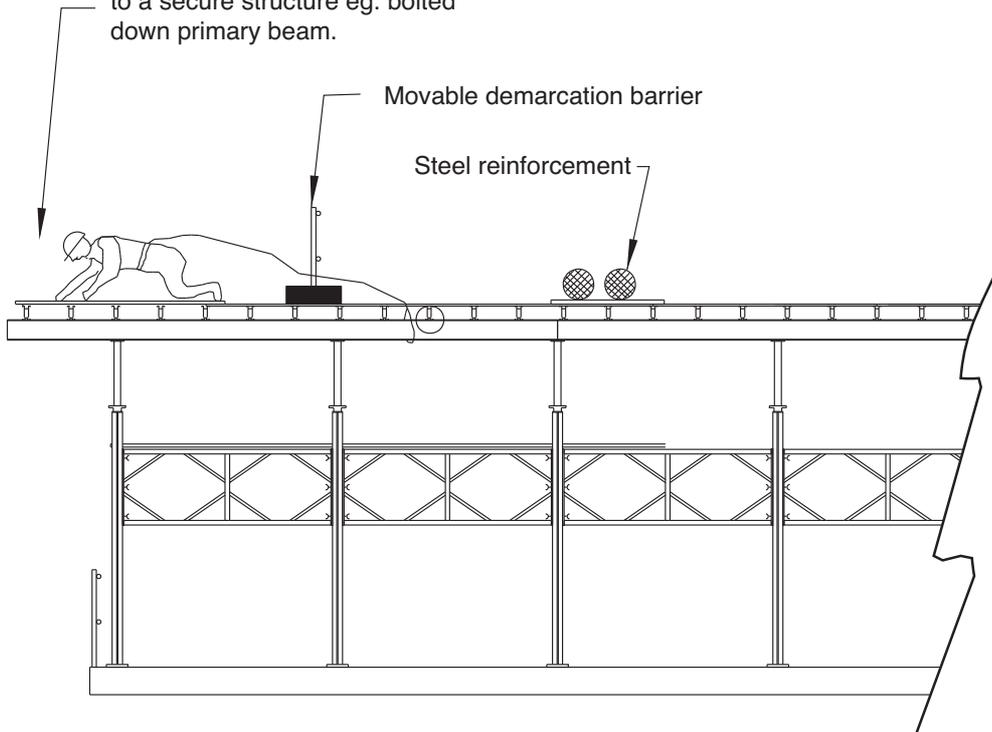
Titan falsework

IMPORTANT NOTE:

All Titan erection to be carried out from intermediate work/crash platform

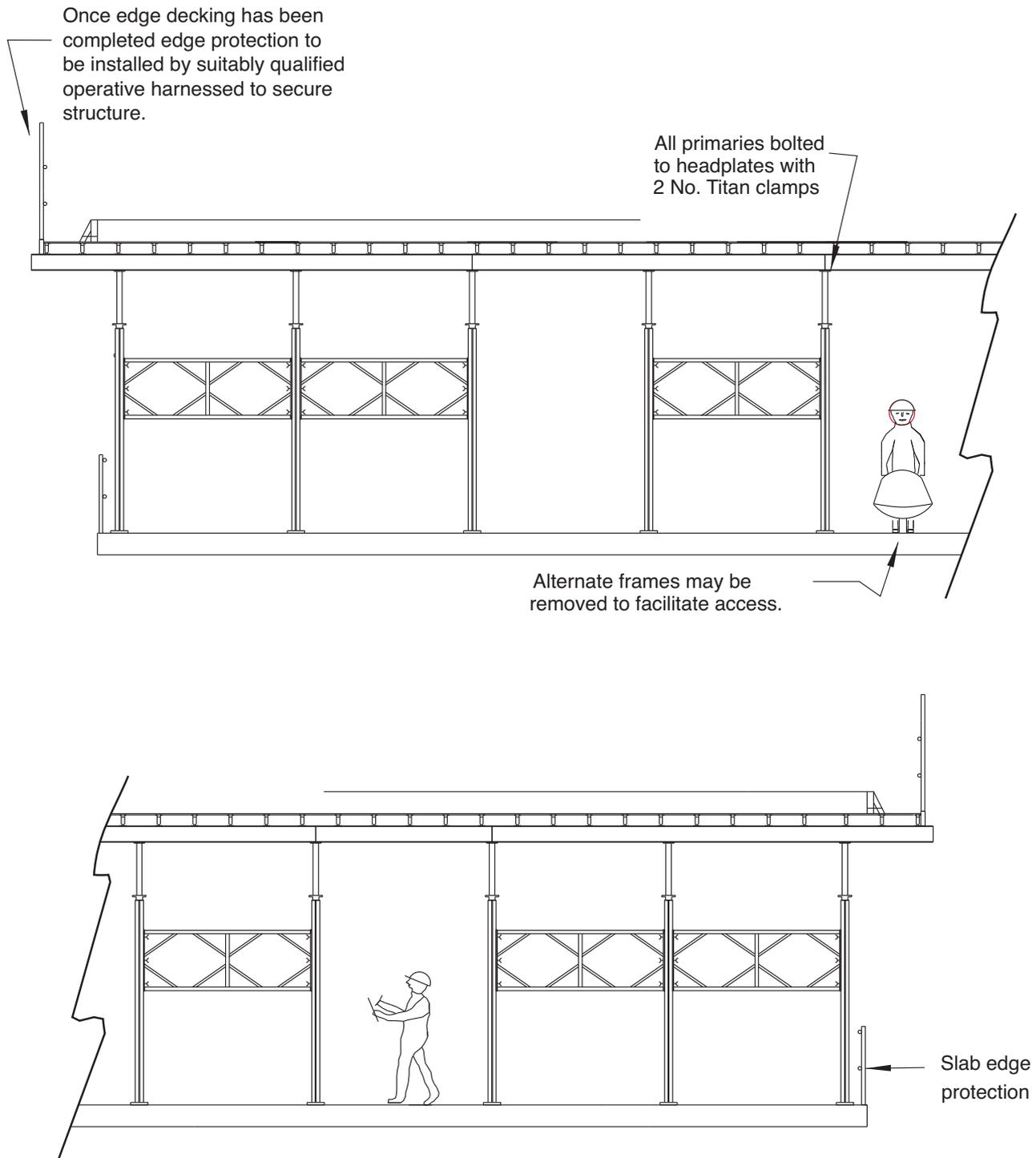
Stage 2

Secondary beams placed and spaced using a template. Operatives must be harnessed to a secure structure eg. bolted down primary beam.



Titan falsework

Stage 3



Titan falsework

Method of Dismantling

1. Begin dismantling operation by lowering the jacks. Titan spanners to be used.
2. Release secondary members by undoing the Speedthread clamp and passing each beam to the ground from an intermediate working platform.
3. Repeat process 2 for primary decking members.
4. Stripping of Titan falsework should begin by releasing one end of one ledger frame at all three locations and repeat this procedure for the adjacent Titan ledger frame which runs off at right angles.
5. The above procedure will then release a leg, leaving two ledger frames 'hanging' from other legs.
6. The ledger frames should now be removed by following process 4.
7. Continue repeating processes 4 and 5 until all falsework is removed.
8. On falsework structures greater than one leg in height, all works as previously described should be carried out from safe, temporary working platforms as previously recommended.

Safety checklist

The following checklist should be adhered to prior to the placement of concrete:-

1. Ensure plumbness of legs.
2. Ensure that all spring loaded wing nuts are tight on ledger frames (over-exposed thread on 'T' bolt indicates otherwise).
3. Ensure that base jack extensions are within design parameters.
4. Ensure that jack nut is properly located in leg (Retainer clip securely fixed).
5. Ensure that the jack base plate/headplate maintains positive friction against floor slab.
6. Ensure that the size, number and location of ledger frames are as per design drawings.
7. If bolting legs together vertically and/or using extension pieces, ensure that a positive, rigid connection is maintained by means of 4 No. M12 x 35 nuts & bolts or 2 No. Titan connector brackets.
8. If using jacks at the top of the falsework, ensure items 3 and 4 above are followed and that 2 No. Titan clamps/'T' bolts are used to locate jacks securely to underside of primary beams.
9. Ensure that primary beam spans are no greater than those shown in design drawings.
10. Ensure spacing and span of secondary beams are no greater than those shown in design drawings.
11. Ensure all/any damaged parts are removed and replaced immediately.
12. Ensure the proper safety procedures are adopted to facilitate the above items in compliance with construction and health and safety working regulations.

Titan tableforms (tables)

Introduction

The following identifies the components required and their proper use with a step by step procedure for stripping, flying and landing a Titan tableform (table).

Instructions are provided for standard tables.

General

It is essential that these procedures are fully understood before the equipment is used. It is, therefore, recommended that all personnel using the equipment on the first occasion should be supervised by a competent person.

There may be occasions when it is necessary for operatives to work adjacent to unguarded slab edges. In all such cases operatives should wear suitable anchored safety harnesses. In addition, other personnel should be made aware of such short duration hazards.

Particular attention should be paid by site management to ensure that crane signalling systems comply with ruling regulations and that laid down procedures are fully understood and complied with.

Loose materials or equipment must not be transported on tables during moving and flying operations.

At no time during the operations is it necessary or desirable to exert undue force, either manually or through the equipment.

Flying and Stripping Equipment

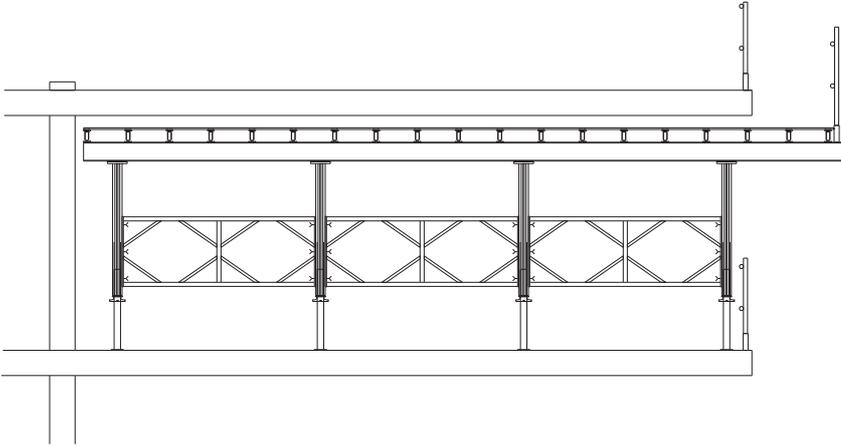
Trolleys/castors are used in the stripping and flying procedure of a Titan table.

A minimum of 4 No. trolleys/castors are used for the movement of the table. 2 No. trolleys/castors are used adjacent to the second row of legs in from the front of the table. These positions may vary depending on size and weight of table.

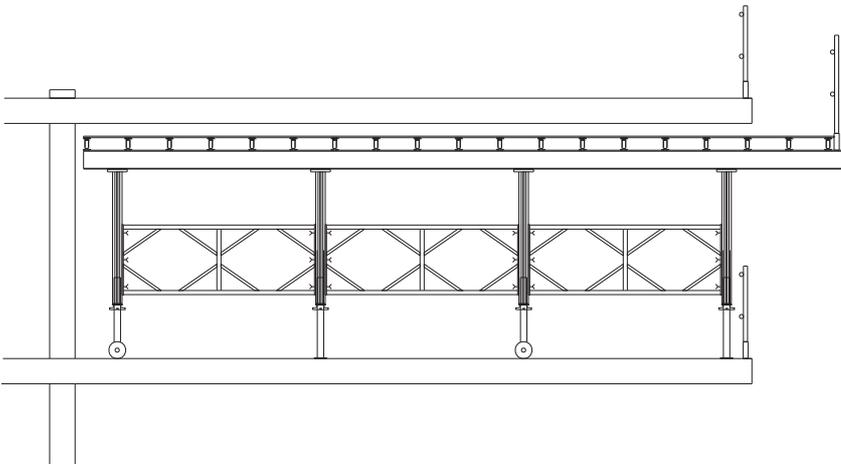
Titan tableforms (tables)

Stripping and flying procedure

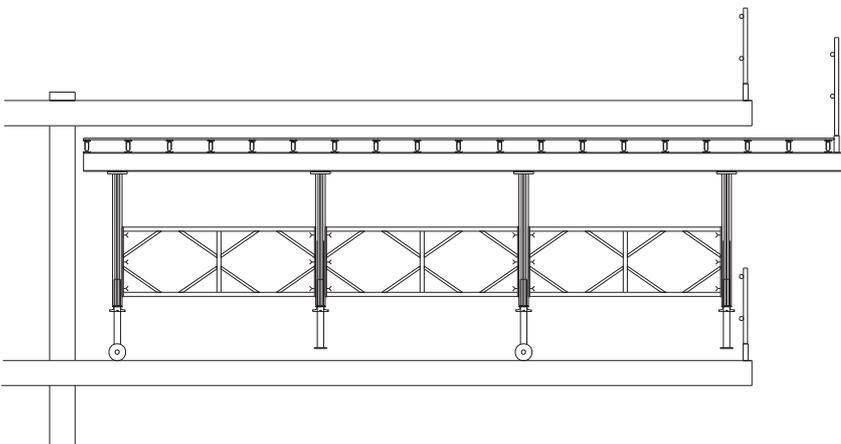
Before any stripping takes place, all obstructions to the safe movement of the table must be removed.



1. Break bond between slab and decking by turning collars on jacks thus creating first stripping action.



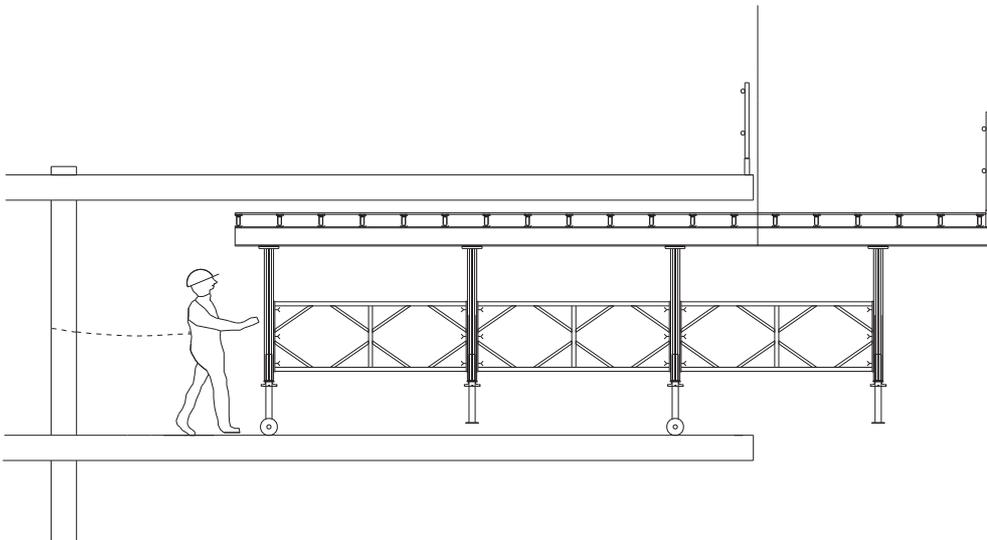
2. Having wound about 100mm off each jack, locate trolleys or castors as previously instructed.



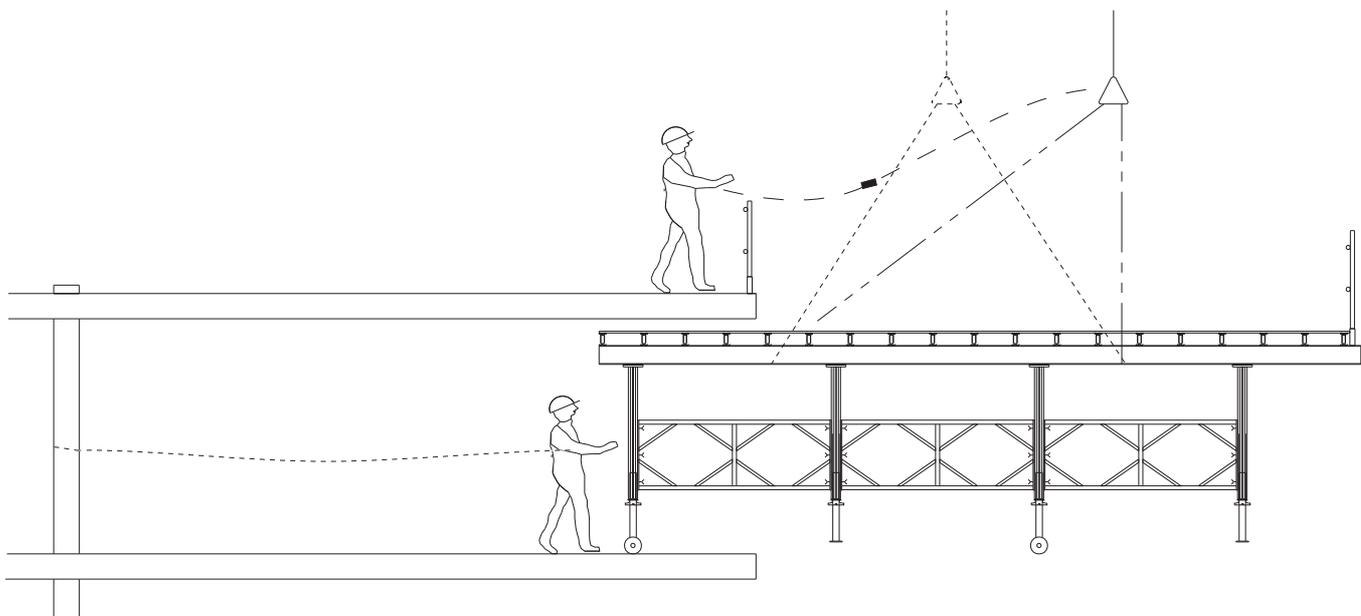
3. With weight of table now being carried by the trolleys or castors, retract remaining jacks to provide sufficient clearance.
The table is now in the lowered position.

Moving

To enable tables to be removed horizontally it is recommended that electric chain hoists are used to allow automatic compensation of lifting chains.

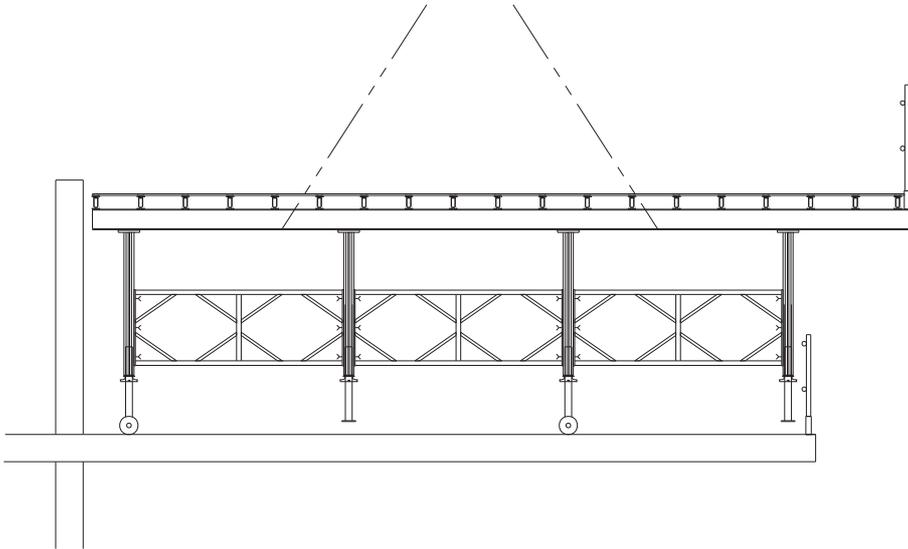


4. After removing slab edge protection, the table should be pushed until the first two legs are clear of the slab, allowing fixing of chains at predetermined lifting points that suit the balance of the table. If trolleys are used the front pair are removed once chains are connected.

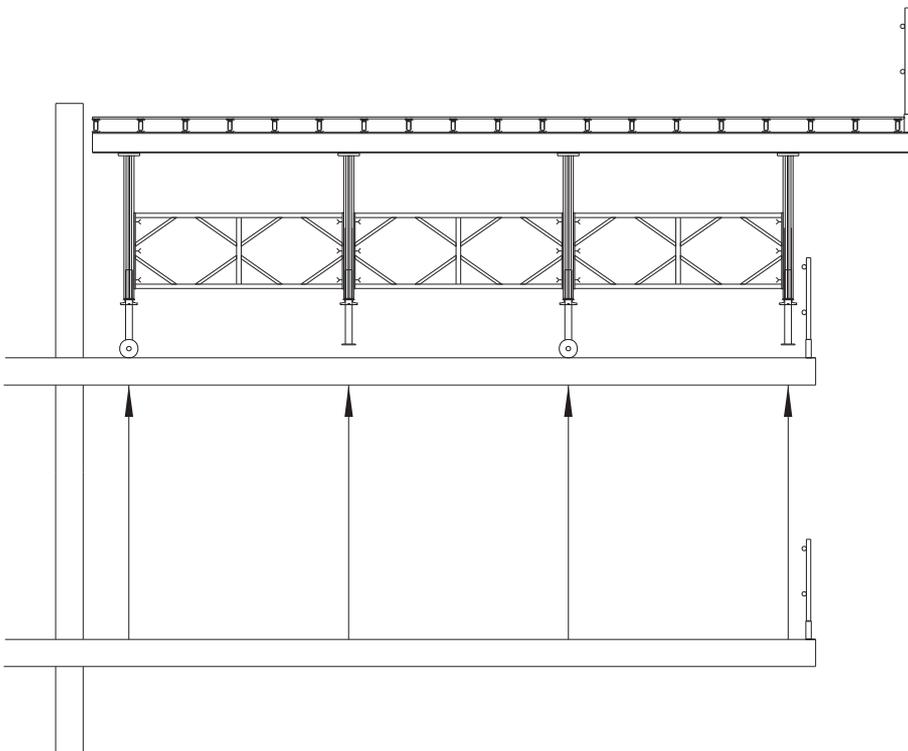


5. Continue pushing table (helped now by pulling action of crane) until the third line of legs are visible outside the line of the slab and repeat as above. If used, remove rear trolleys once chains are fixed.

Titan tableforms (tables)



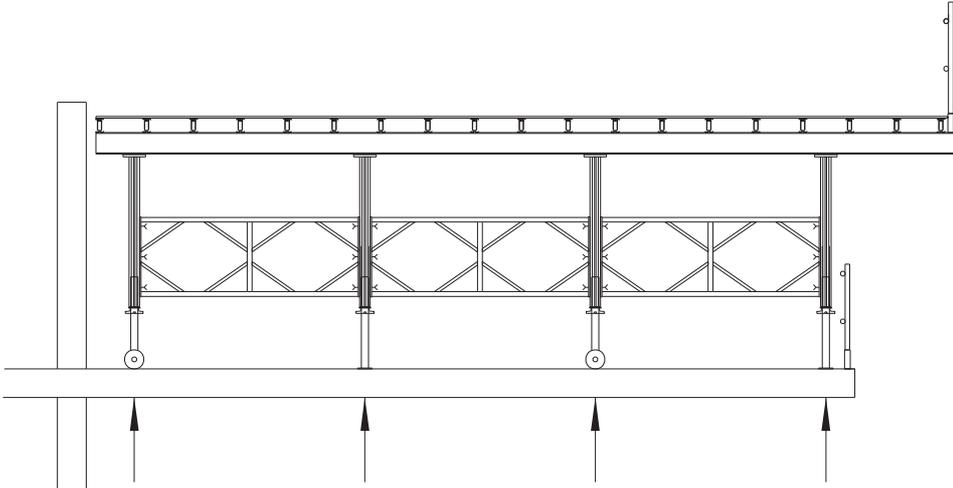
6. The table is now ready to be completely cleared from the slab and lifted to the next bay or floor above.



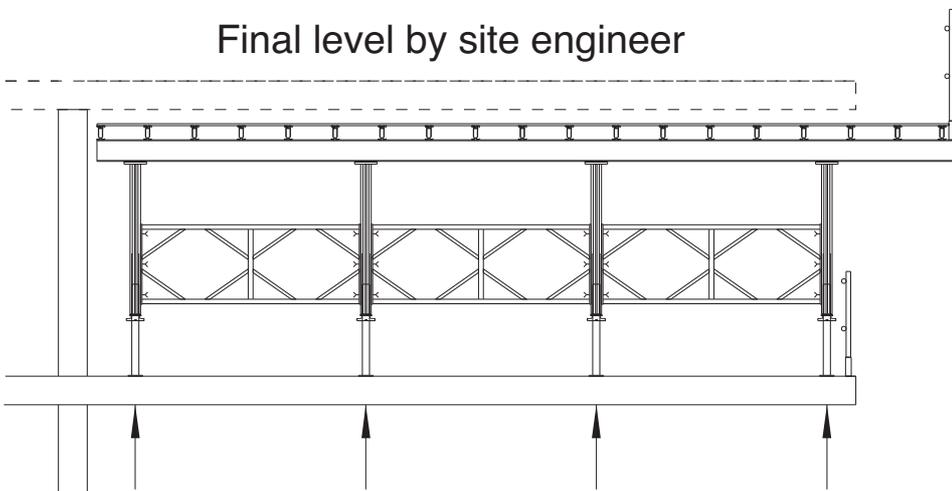
7. It is suggested at this stage that, if required, the contractor's props for re-propping are installed at the necessary positions.

Re-Fixing

Tables should be set down at approximately the position required when pouring concrete.



8. Jacks which are retracted should be wound down so as to take the weight of the table whilst the castors are removed from the other legs.



9. Once castors (if used) are removed, the table is free to be levelled into final pouring position by site engineers.

Process repeats

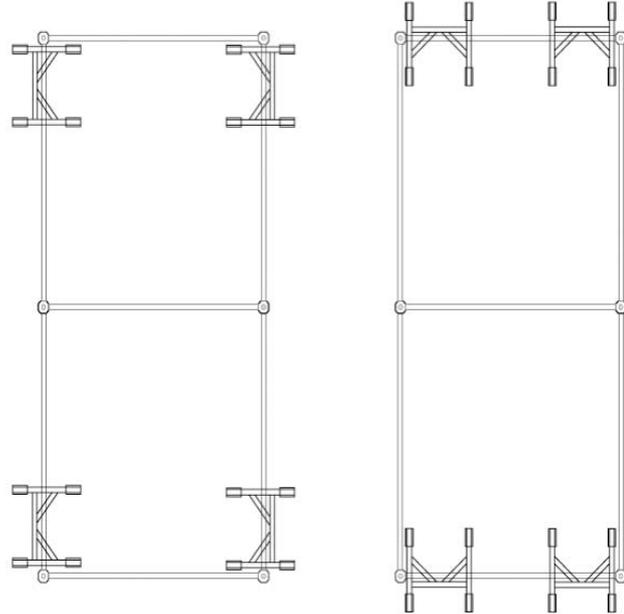
N.B.

All narrow width tables should be stabilised against overturning from either wind forces or horizontal loading due to construction loads.

Where operatives are required to lean over the edges of the slab, a suitable harness must be worn and appropriately fixed.

Titan table movement using Titan trolleys

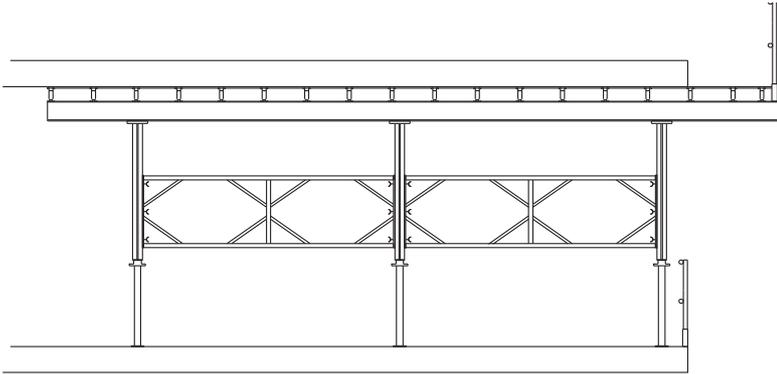
- Titan tables must be struck before positioning trolleys so that the table is no longer carrying concrete load.
- Trolley must be in proper working condition.
- Trolley must be used for its proper design purpose only.
- A minimum of 4 No. Titan trolleys to be used on Titan tables with 6 legs or more.
- Trolleys to be positioned as close to the Titan legs as possible.
- Safe Working Load of 1000kg. must not be exceeded.
- Trolleys must be raised or lowered in sequence to prevent overloading.
- Ensure floor slab is clear of debris.
- Table to be raised at least 50mm clear of floor slab.
- Care must be taken when working close to slab edge.
- Trolleys must be removed before flying tables.
- Trolleys must be inspected at least once a year by a suitably qualified person.
- If in doubt about trolley positions contact the Ischebeck Titan Design Office.
- Health and Safety requirements must be followed at all times.



'C' hook

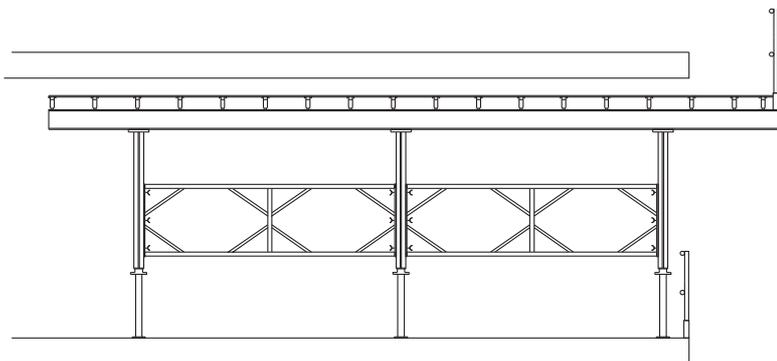
Note:
Self weight of table + self weight of 'C' hook must not exceed crane capacity.
Test for centre of gravity of tables at ground level and mark lifting plate positions of each table size on the top boom of the 'C' hook.

Stage 1



Lower table approximately 200mm

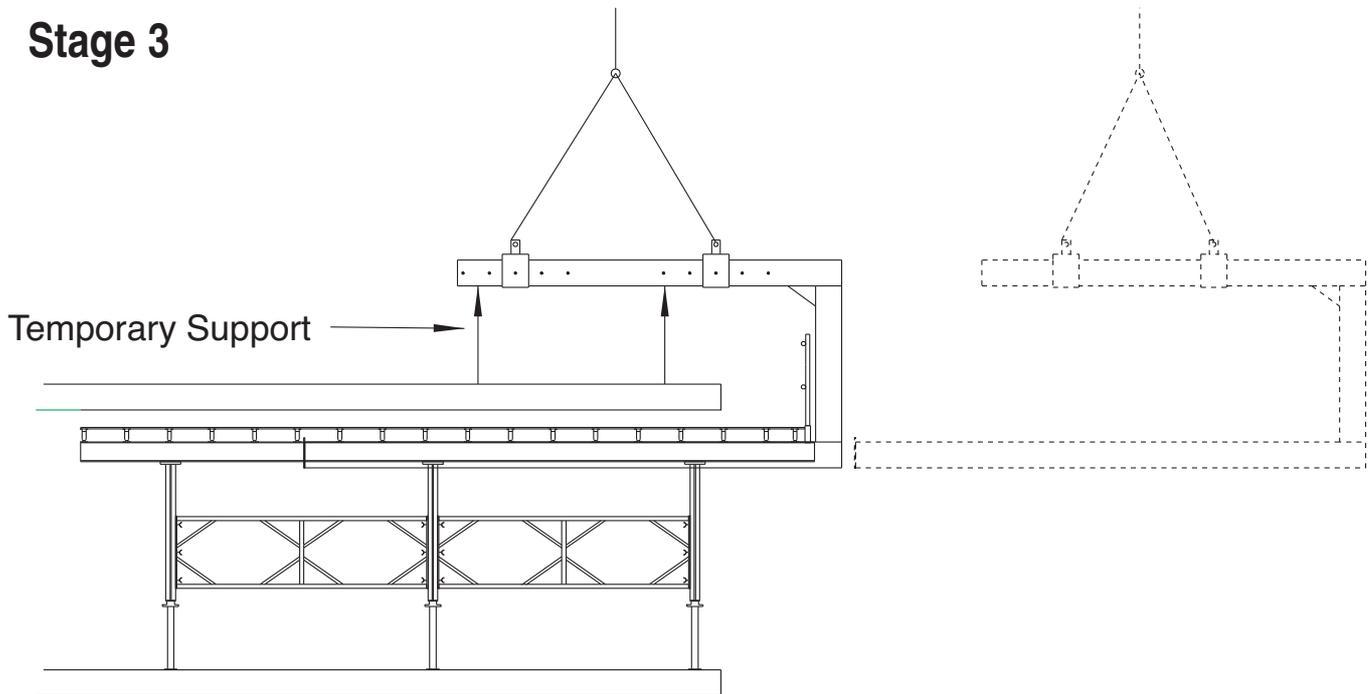
Stage 2



Remove slab edge protection.
If required, remove table handrails and posts.
Operatives to wear suitable safety harness.

'C' hook

Stage 3



Position 'C' hook under T.W.150 secondary beams.

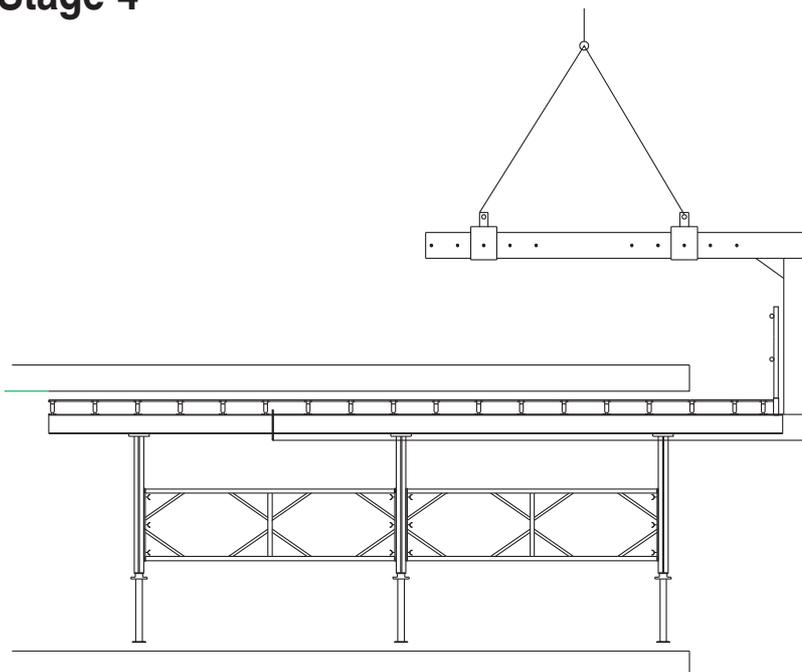
Support 'C' hook off slab and readjust lifting plates to suit centre of gravity of table.

Ensure M24 locking bolt locates in predrilled holes on top chord of 'c' hook.

Secure bottom boom to secondary beams with Titan clamps.

Do not rest 'C' hook on ledger frames.

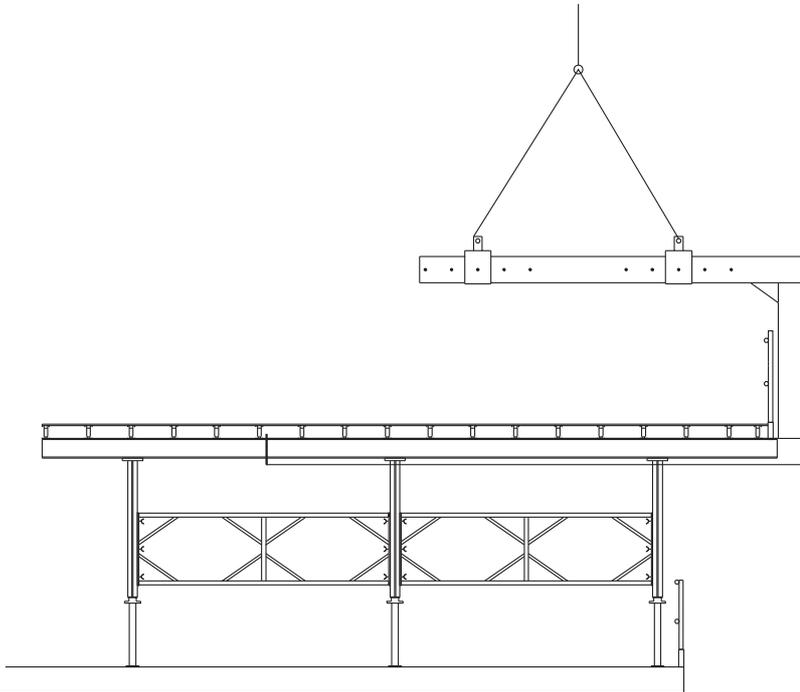
Stage 4



Raise table approximately 100mm and remove from building.

Operatives to wear suitable safety harness.

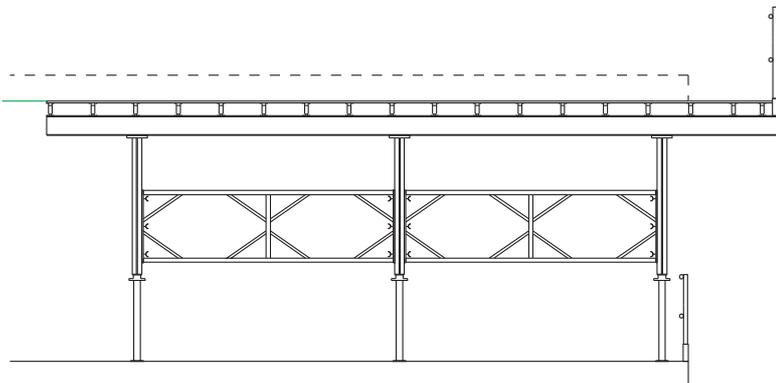
Stage 5



Refix slab edge protection.

Reposition table at next pour position.

Stage 6



Remove 'C' hook.

(Temporary support required whilst slings are adjusted).

Raise jacks 200mm for soffit level.

Typical infill methods

0.4m maximum wide infill areas between tables

Erection

- a. Cut plywood to suitable width.
- b. Place plywood in gap between tables (Plywood supported by existing secondary beams). If plywood positioned from above, operatives to wear a suitable safety harness.

Dismantling

- c. Lower tables.
- d. Remove plywood infill. If height is above 2.0m, a temporary access platform will be required.
- e. Reposition tables and then follow erection sequence above.

0.4m to 0.9m wide infill areas between tables

Erection

- a. Cut plywood to suitable width.
- b. Place plywood in gap between tables (Plywood supported by existing secondary beams). If plywood positioned from above, operatives to wear a suitable safety harness.
- c. Support plywood at mid span by means of temporary stringer beam and suitable props.

Dismantling

- d. Remove temporary props and stringer beams.

- e. Lower tables.
- f. Remove plywood infill. If height is above 2.0m, a temporary access platform will be required.
- g. Reposition tables and then follow erection sequence above.

0.9m to 1.5m wide infill areas between tables

Erection

- a. Undersling primary beams from existing table secondary beams (Beams fixed from below). If height is above 2.0m, a temporary access platform will be required.
- b. Place secondary beams in position. Beams fixed from above with operatives wearing a suitable safety harness.
- c. Cut, place, secure and fix plywood in infill area.
- d. Position support props to underslung primary beams before pouring concrete.

Dismantling

- e. Remove support props to infill area and then lower table.
- f. Remove secondary beams and plywood. If height is above 2.0m, a temporary access platform will be required.
- g. Remove underslung primary beams.
- h. Reposition tables and then follow erection sequence above.

ISCHEBECK

TITAN



Ischebeck Titan Group

Founded in Germany over 120 years ago Ischebeck is renowned internationally for its aluminium formwork and false work systems, trench support systems and ground engineering products.

Ischebeck Titan Ltd

The company operates from headquarters centrally located in the heart of the UK.



Product Availability

Substantial stocks of equipment are available ex-stock from the company's strategically located 4-acre distribution site, with most main product lines available nationwide on a 48-hour delivery. Products are available for both hire and outright purchase.

Technical Support

We will participate in concept stage development. Providing input on applications, production rates, budget design, programming and costings. Active for on site support and training. We can provide guidance on industry special European and national standards.



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