



Titan Support System

Technical Data Sheet

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List of amendments / additions to previous issue

Issue A - Preliminary issue.

1.0 Titan aluminium megashore system

1.1 Introduction

The Titan aluminium megashore system is primarily utilised as a vertical falsework system. The system is arranged in towers, assembled from adjustable aluminium legs, aluminium extension legs and aluminium ledger frames.

In the vertical falsework application the system is considered to be partially restrained. Lateral restraint is required at deck level (via the permanent works) in order to achieve high axial leg loads (in line with and as required by the literature in the codes listed below).

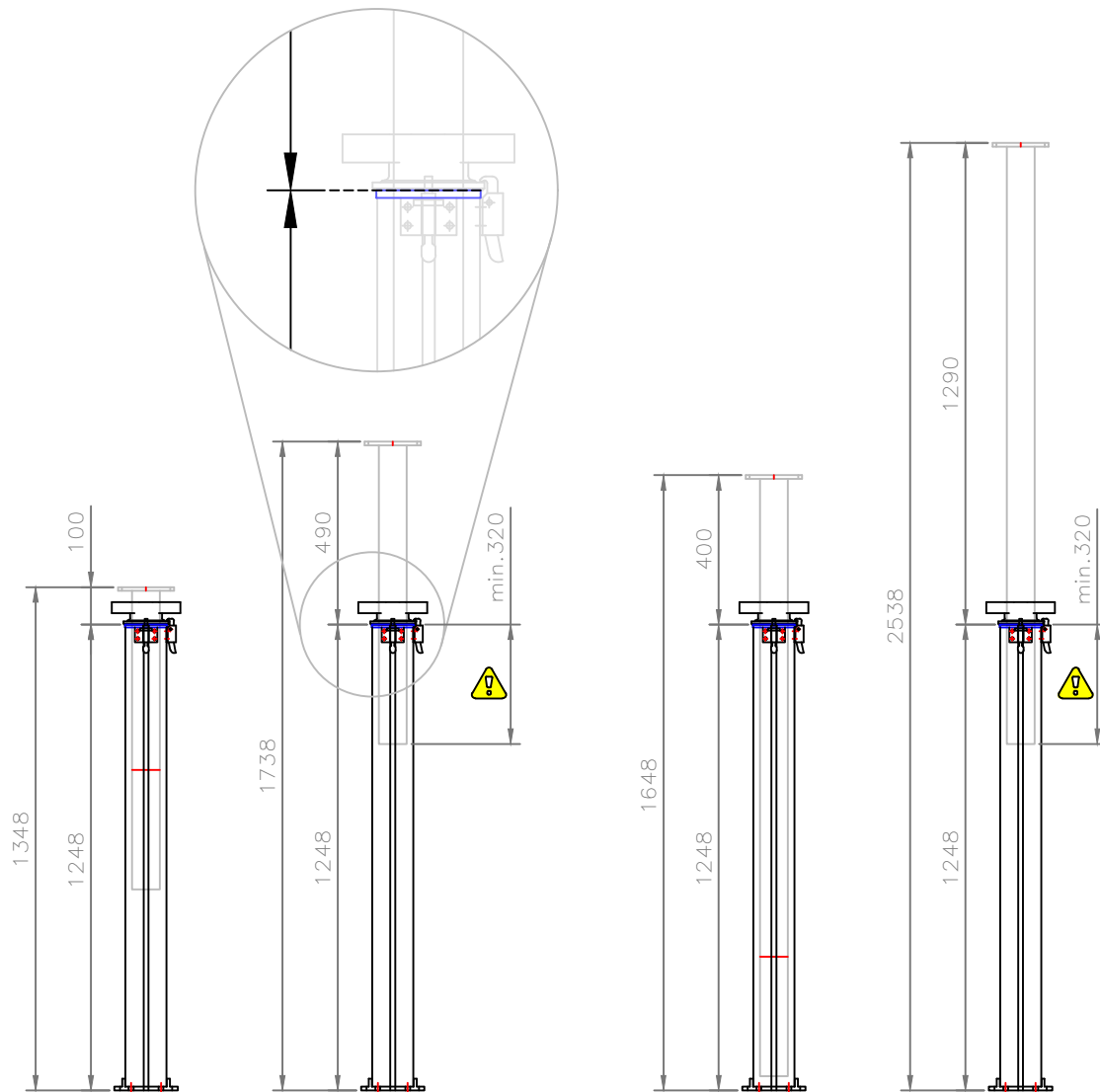
The system can be used in other applications such as, free standing falsework (without deck restraint), horizontal / inclined struts, back propping and shoring in various building and civil engineering applications.

Titan support system and components have been designed to comply with all relevant parts of the following codes:

- BS EN 12811-1:2003, *Temporary works equipment. Scaffolds. Performance requirements and general design*
- BS EN 12812:2008, *Falsework — Performance requirements and general design*
- BS EN 1991-1-4:2005+A1:2010, *UK National Annex to Eurocode 1 – Actions on structures Part 1-4: General actions – Wind actions*
- BS 5975:2019, *Code of practice for temporary works procedures and the permissible stress design of falsework*
- BS EN 16031:2012, *Adjustable telescopic aluminium props - Product specifications, design and assessment by calculation and tests*

The following pages in section 1.0 will detail each individual component and sub-component of the Titan support system. Section 2.0 introduces SmartTITAN analysis and presents current SWL data in table and chart format.

1.2 Titan adjustable aluminium legs



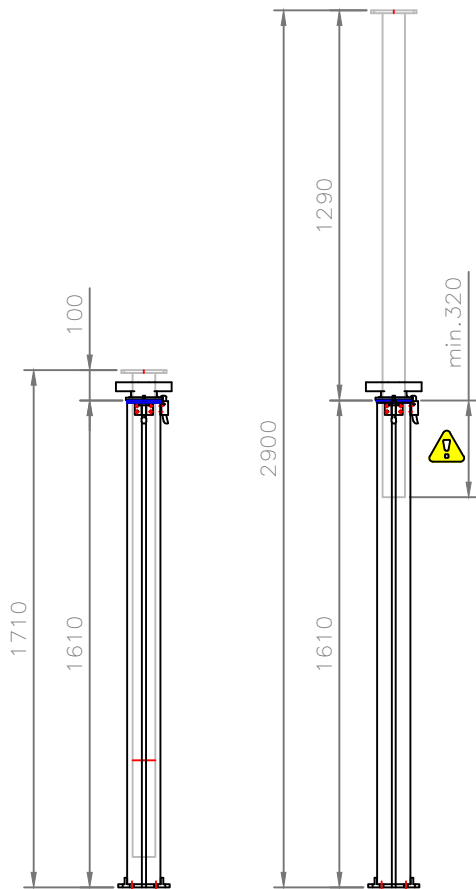
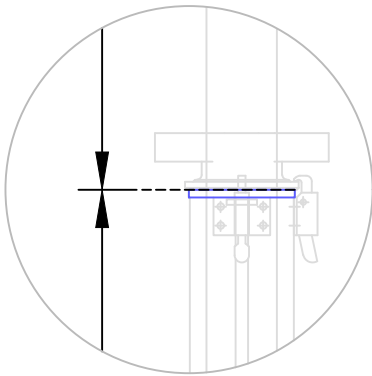
Description: Titan adjustable size 1 leg short jack (810 mm)
Height range: 1.348 m - 1.738 m

Description: Titan adjustable size 1 leg long jack (1610 mm)
Height range: 1.648 m - 2.538 m

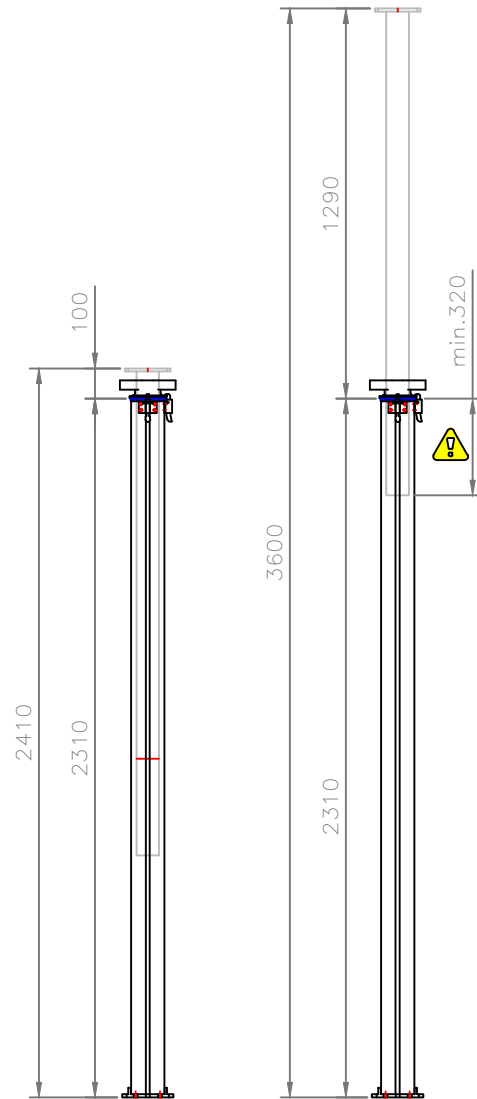
Safe working loads (SWL's)

See section 2.0 SmartTITAN load charts

Description	Code	Material	Finish	Weight
Titan adjustable size 1 leg short jack (810 mm)	100100	Aluminium	-	12.3 kg
Titan adjustable size 1 leg long jack (1610 mm)	n/a	Aluminium	-	16.6 kg



Description: Titan adjustable size 2 leg
Height range: 1.710 m - 2.900 m



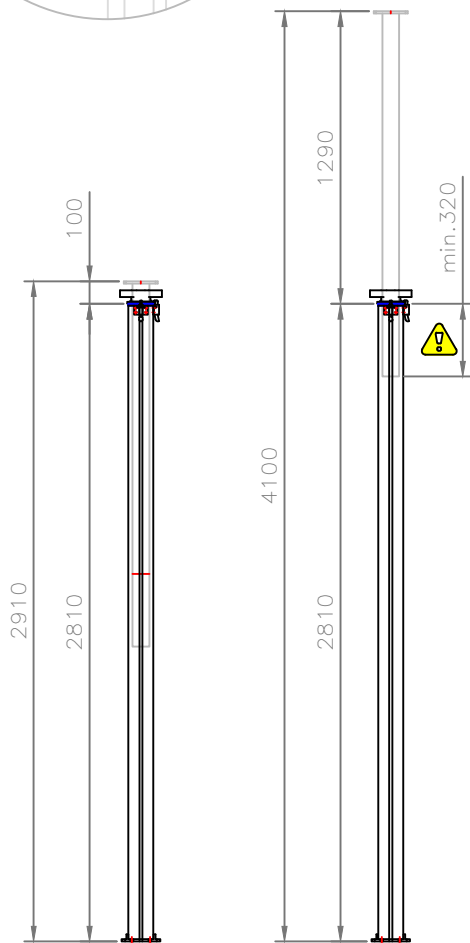
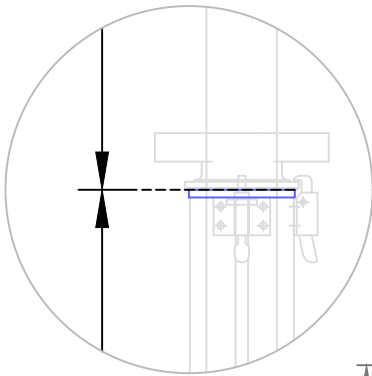
Description: Titan adjustable size 3 leg
Height range: 2.410 m - 3.600 m

Non-UK Item

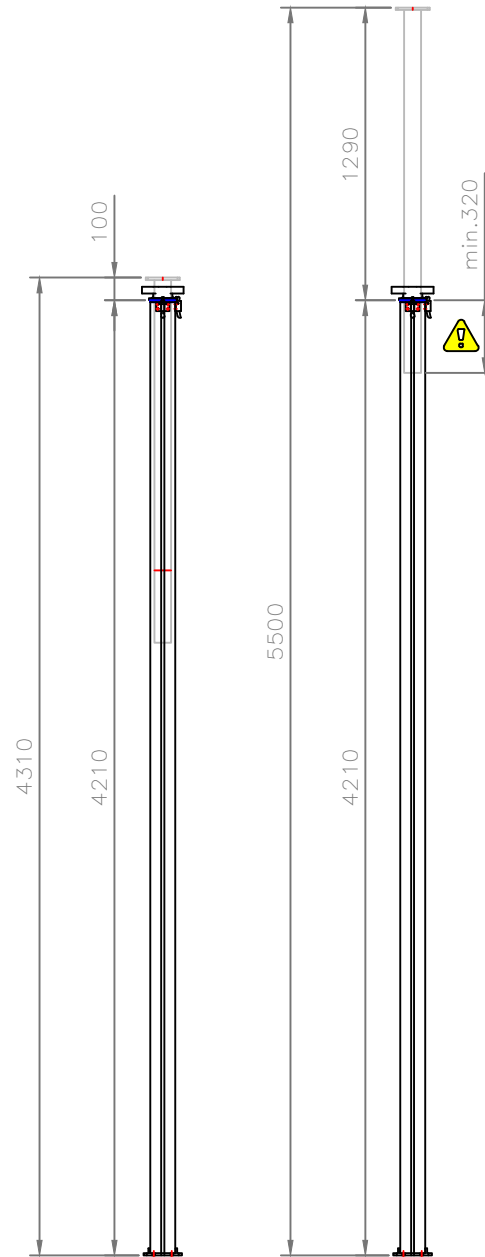
Safe working loads (SWL's)
See section 2.0 <i>SmartTITAN</i> load charts

Description	Code	Material	Finish	Weight
Titan adjustable size 2 leg	110200	Aluminium	-	20.0 kg
Titan adjustable size 3 (Non-UK item)	-	Aluminium	-	21.0 kg

Considerations / Guidance:
All dimensions in this document are in (mm) unless stated otherwise.



Description: Titan adjustable size 4 leg
Height range: 2.910 m - 4.100 m



Description: Titan adjustable size 6 leg
Height range: 4.310 m - 5.500 m

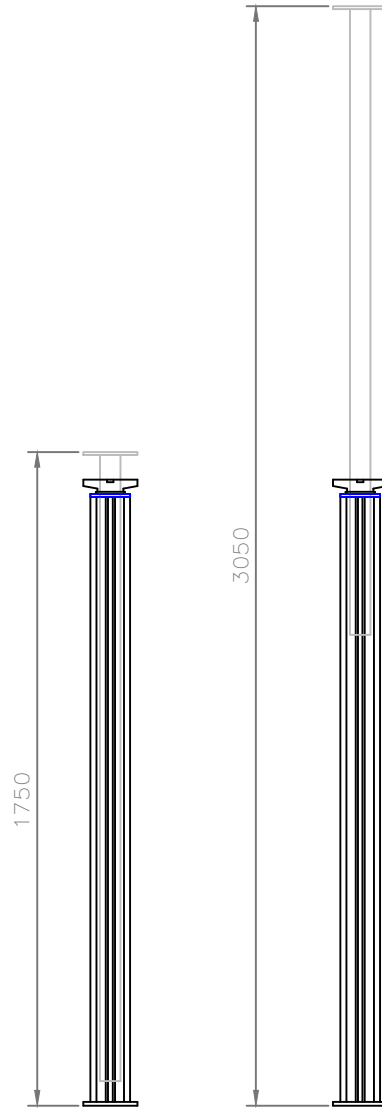
Safe working loads (SWL's)

See section 2.0 *SmartTITAN load charts*

Description	Code	Material	Finish	Weight
Titan adjustable size 4 leg	110400	Aluminium	-	22.4 kg
Titan adjustable size 6 leg	110600	Aluminium	-	29.4 kg

Considerations / Guidance:
All dimensions in this document are in (mm) unless stated otherwise.

Issue: Page:



Description: Titan adjustable HV leg

Height range: 1.750 m - 3.050 m

Non-UK Item

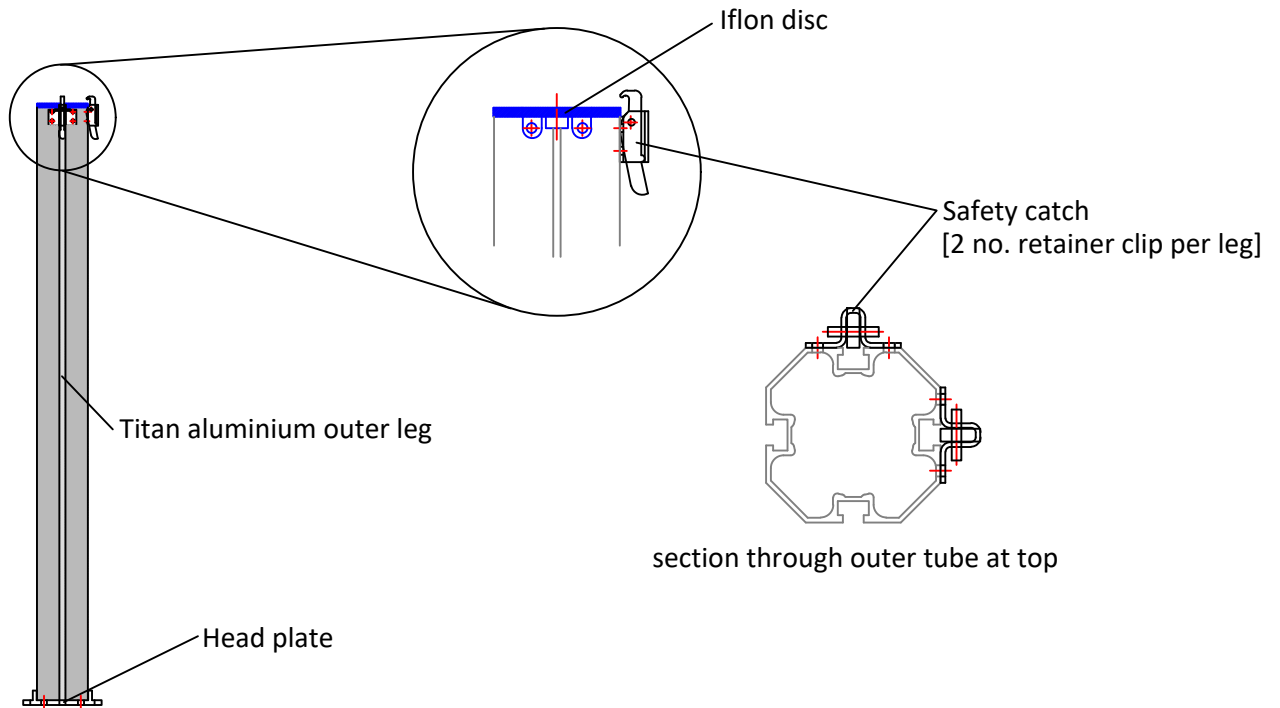
Safe working loads (SWL's)	
Axial load	40.0 kN

*The maximum load is limited to 40 kN when using legs with an iflon disc.

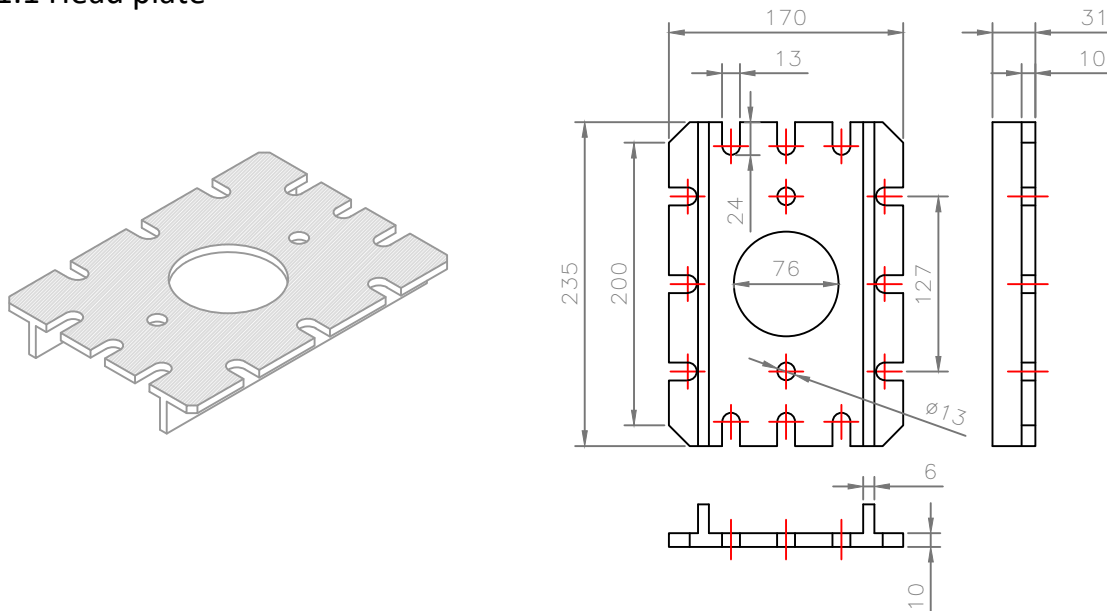
Description	Code	Material	Finish	Weight
Titan adjustable HV leg (Non-UK item)	-	Aluminium	-	16.4 kg

Considerations / Guidance:
All dimensions in this document are in (mm) unless stated otherwise.

1.2.1 Titan aluminium leg overview

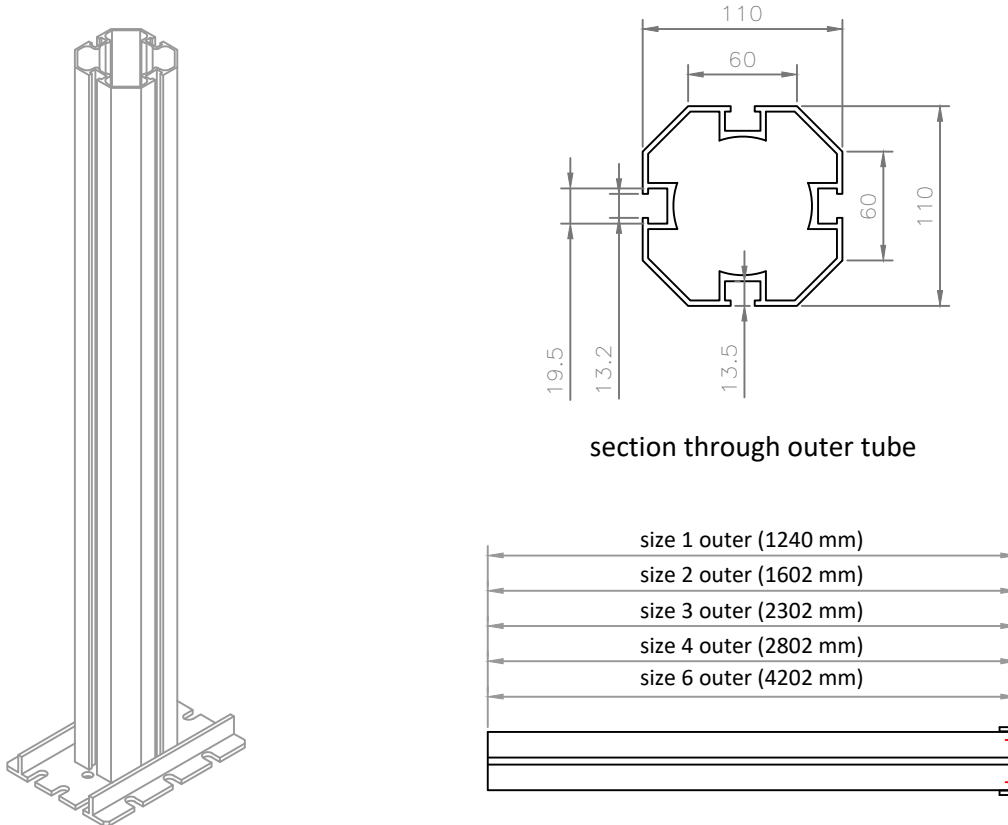


1.2.1.1 Head plate



Description	Code	Material	Finish	Weight
Head plate	171200	Aluminium	-	1.02 kg

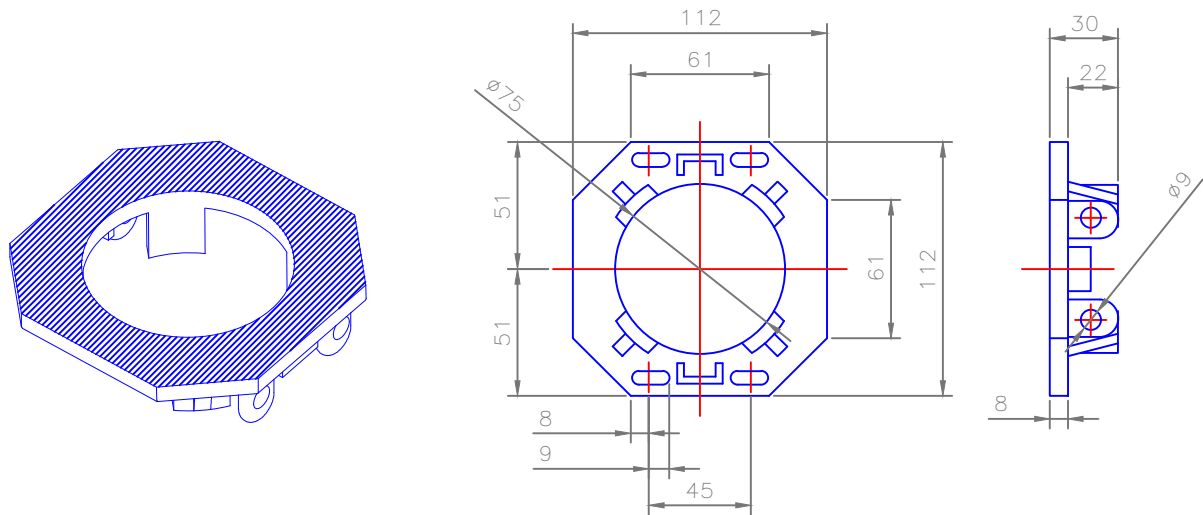
1.2.1.2 Titan aluminium outer leg



Titan aluminium outer leg properties	
Outer Profile	Extruded aluminium profile
Area	16.7 cm ²
Moment of inertia about the x-axis [I _{xx}]	230 cm ⁴
Section modulus [Z _{xx}]	41.7 cm ³
Elastic modulus [E]	63.636 kN/mm ²

Description	Code	Material	Finish	Weight
Titan size 1 outer leg	110001	Aluminium	-	6.2 kg
Titan size 2 outer leg	110201	Aluminium	-	8.0 kg
Titan size 3 outer leg (Non-UK item)	-	Aluminium	-	10.6 kg
Titan size 4 outer leg	110401	Aluminium	-	12.0 kg
Titan size 6 outer leg	110601	Aluminium	-	19.0 kg

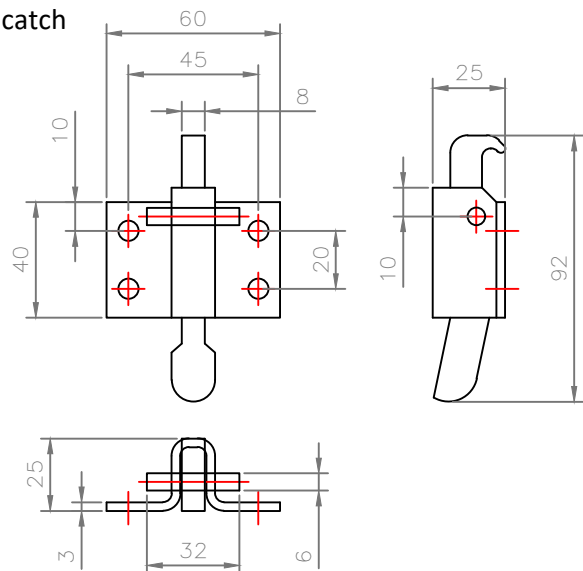
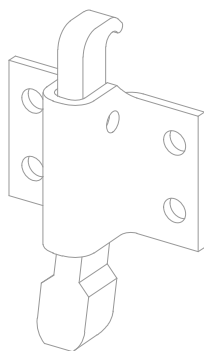
1.2.1.3 Iflon disc



Description	Code	Material	Finish	Weight
Iflon disc	170900	Iflon	-	0.11 kg

1.2.1.4 Safety catch [retainer clip]

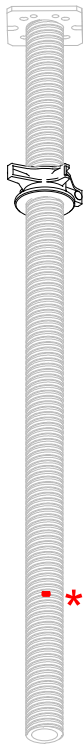
The outer to jack connection requires minimum 2 no. safety catch per Titan aluminum leg. 1 no. safety catch is for redundancy.



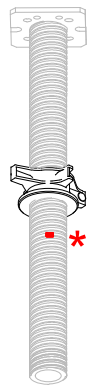
Safe working loads (SWL's)	
per 1 No. safety catch	3.0 kN

Description	Code	Material	Finish	Weight
Safety catch [retainer clip]	171000	-	-	0.16 kg

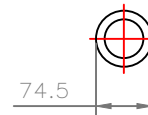
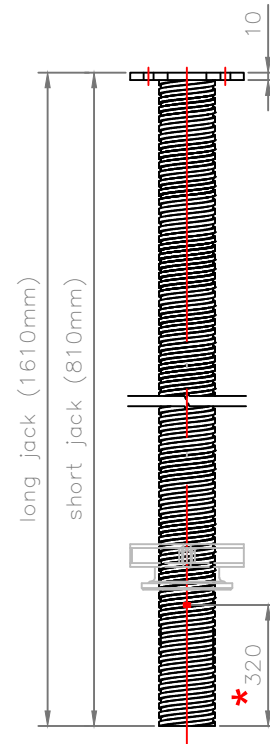
1.2.2 Titan aluminium screw jacks



Description: Titan long jack
Length: 1610 mm



Description: Titan short jack
Length: 810 mm



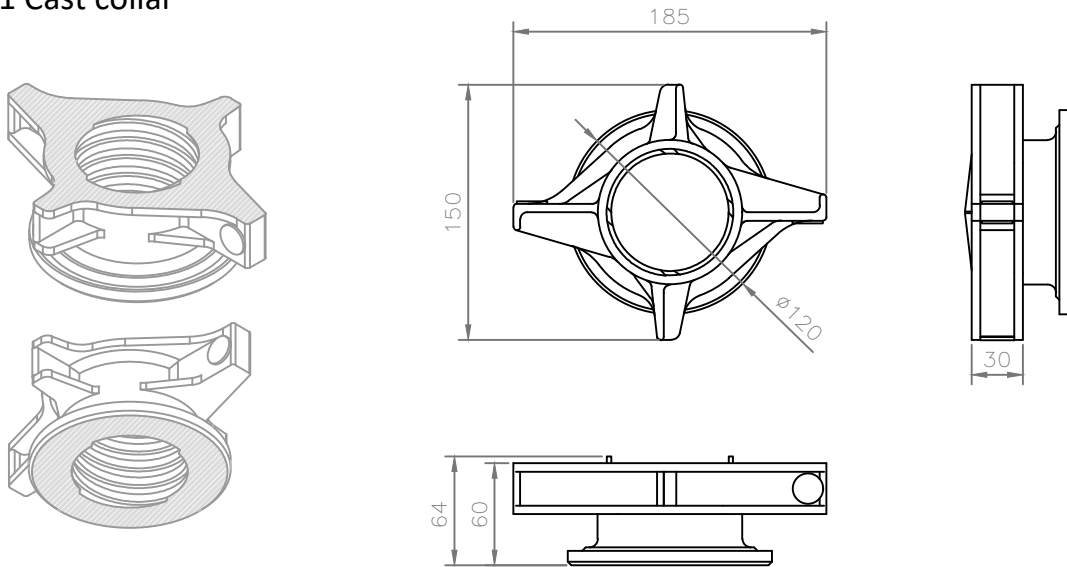
section through jack

* Thread damaged to prevent over extension of screw jack from outer leg. A minimum screw jack length of 320 mm must remain in the outer leg.

Titan aluminum screw jack properties	
Outer Profile	Aluminium tube with rolled thread
Outside diameter	74.5 mm
Area	16.3 cm ²
Bending moment [BM]	3.9 kNm

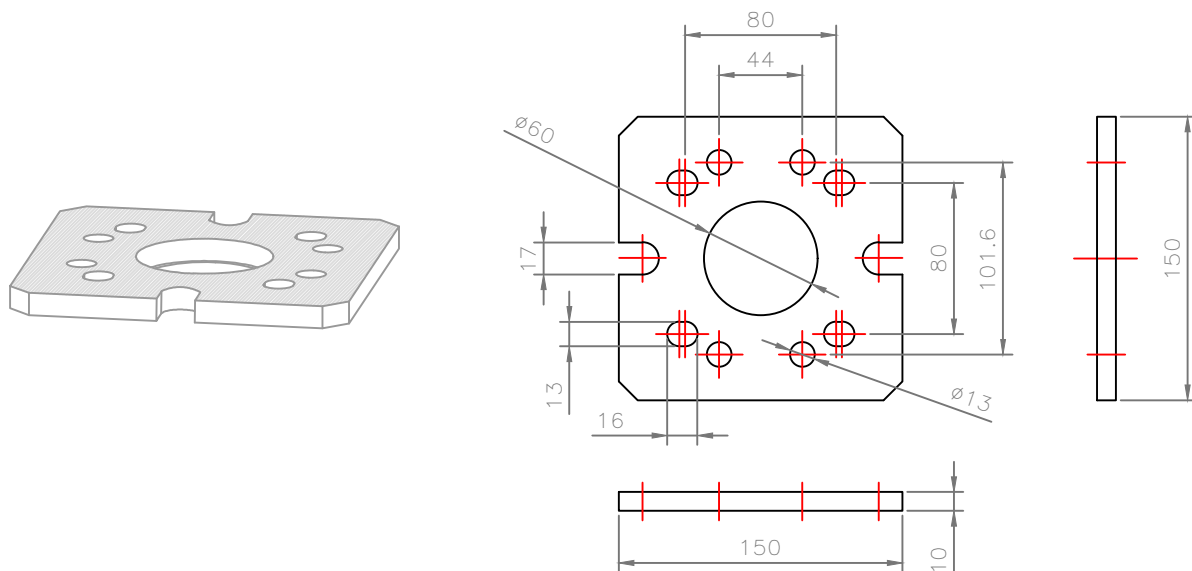
Description	Code	Material	Finish	Weight
Titan long jack	132000	Aluminium	-	10.4 kg
Titan short jack	132700	Aluminium	-	6.1 kg

1.2.2.1 Cast collar



Description	Code	Material	Finish	Weight
Cast collar	171400	Cast Iron	Galvanized	1.6 kg

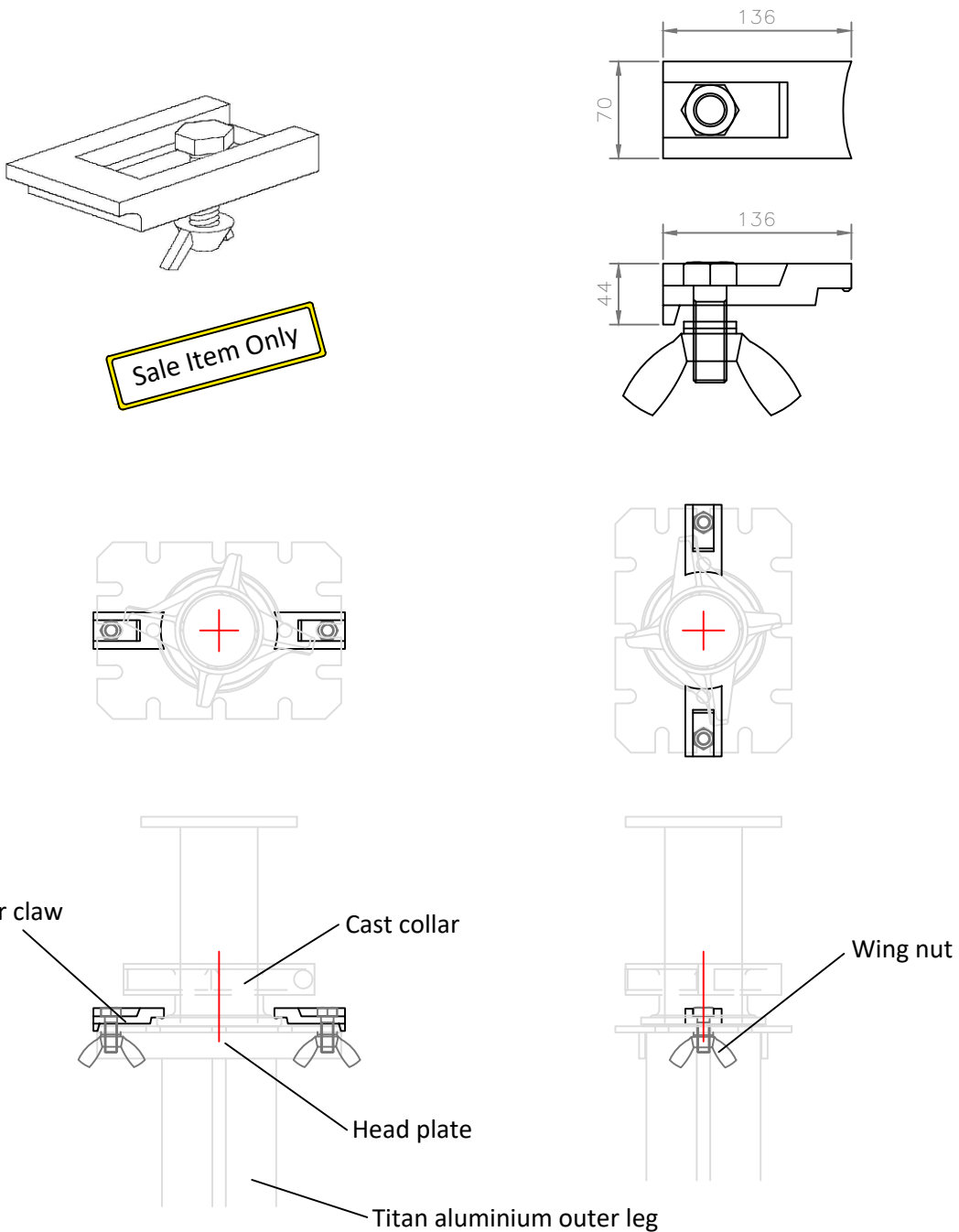
1.2.2.2 Base plate



Description	Code	Material	Finish	Weight
Base plate	171100	Aluminium	-	0.46 kg

1.2.2.3 Jack retainer claw

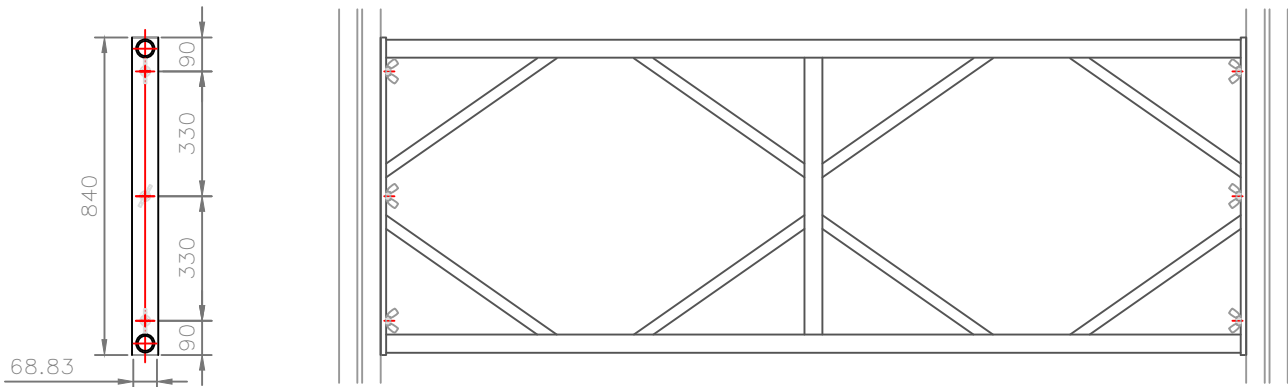
The jack retainer claw is utilised to secure a Titan aluminium screw jack to the head plate of a Titan aluminium leg. Two claws are required per screw jack.



Description	Code	Material	Finish	Weight
Jack retaining claw	137300	-	-	0.25 kg

1.3 Titan aluminium ledger frames

The ledger frame forms around Titan leg preventing any misalignment and ensures legs are erected plumb. The T-bolt notch should be positioned parallel with T-slot of leg profile when assembled. The wing nuts require tightening to a torque of 50 Nm (a tolerance of $\pm 10\%$ is permissible).



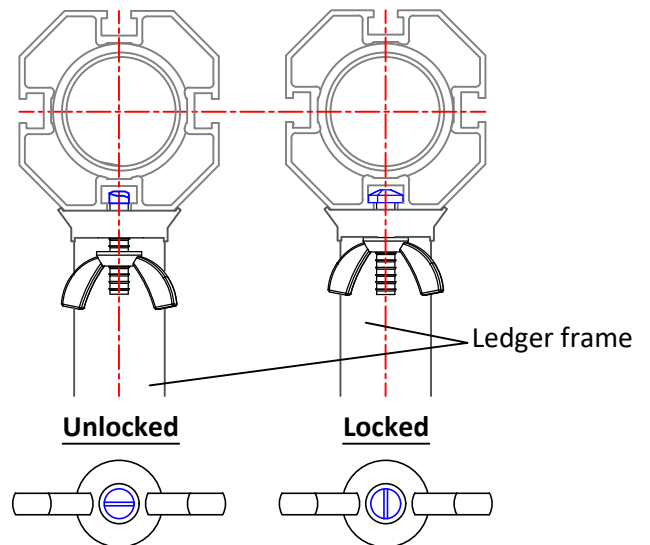
Each frame is connected to the Titan leg profile by means of 6 no. T-bolt connections (3 no. each side).

Unlocked

T-bolt with positioning notch parallel with T-slot of leg outer.

Locked

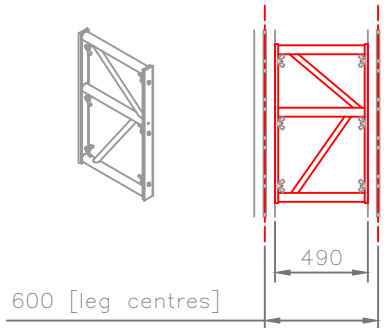
T-bolt with positioning notch perpendicular with T-slot of leg outer.



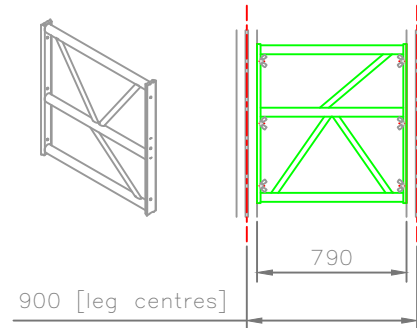
Titan aluminum ledger frame properties

Vertical side members	Extruded aluminium profile that wraps around the leg profile for added stiffness. Material: Aluminium
Horizontal chords	48.3mm Diameter x 4.05mm thick alloy tube. Material: Aluminium
Diagonal bracing struts	Oval tubes 30 x 20 x 3mm. Material: Aluminium

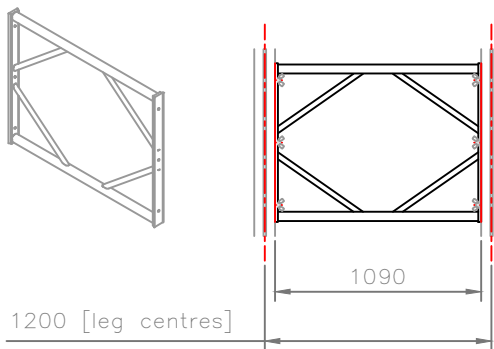
Description: 600 ledger frame



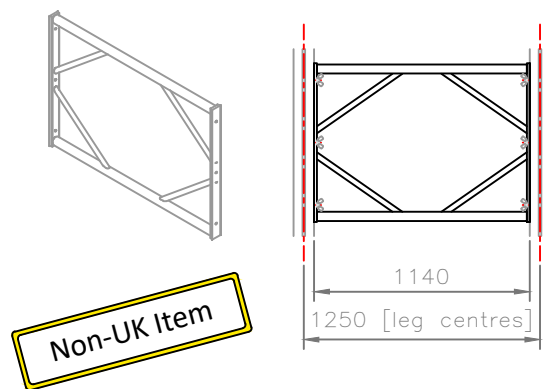
Description: 900 ledger frame



Description: 1200 ledger frame



Description: 1250 ledger frame



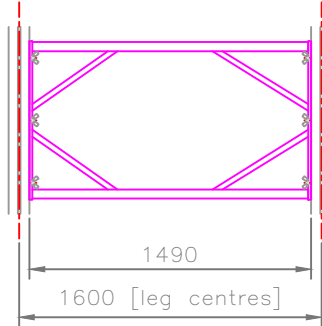
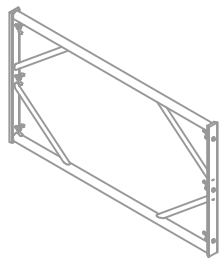
Frame size is measured from centre to centre of Titan adjustable aluminium leg.

Safe working loads (SWL's)	
Maximum permissible slip load per T-bolt	2.5 kN
Maximum permissible pull out load per T-bolt	5.3 kN

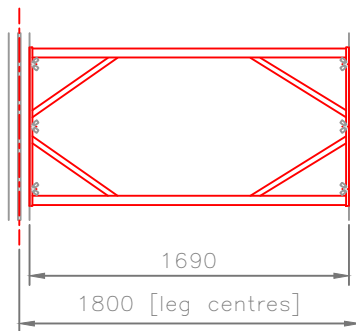
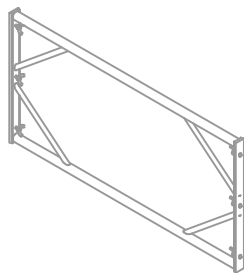
Description	Code	Material	Finish	Weight
600 ledger frame	120600	Aluminium	-	5.6 kg
900 ledger frame	120900	Aluminium	-	7.5 kg
1200 ledger frame	121200	Aluminium	-	7.8 kg
1250 ledger frame (Non-UK item)	-	Aluminium	-	7.8 kg

Considerations / Guidance:
All dimensions in this document are in (mm) unless stated otherwise.

Description: 1600 ledger frame



Description: 1800 ledger frame



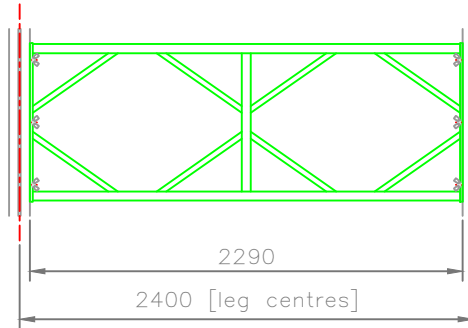
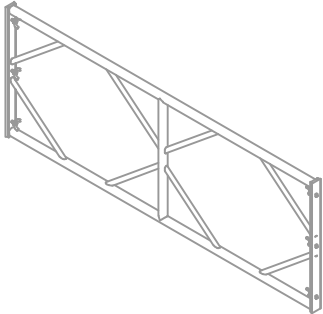
Frame size is measured from centre to centre of Titan adjustable aluminium leg.

Safe working loads (SWL's)	
Maximum permissible slip load per T-bolt	2.5 kN
Maximum permissible pull out load per T-bolt	5.3 kN

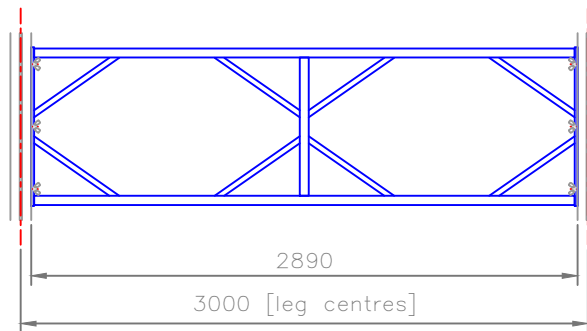
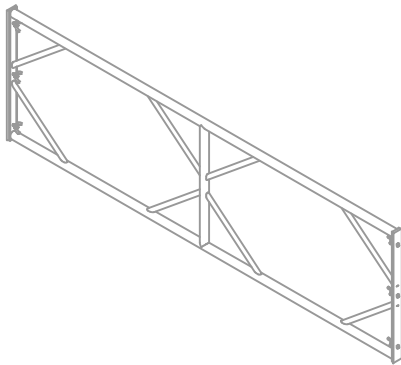
Description	Code	Material	Finish	Weight
1600 ledger frame	121600	Aluminium	-	8.8 kg
1800 ledger frame	121800	Aluminium	-	9.7 kg

Considerations / Guidance:
All dimensions in this document are in (mm) unless stated otherwise.

Description: 2400 ledger frame



Description: 3000 ledger frame



Frame size is measured from centre to centre of Titan adjustable aluminium leg.

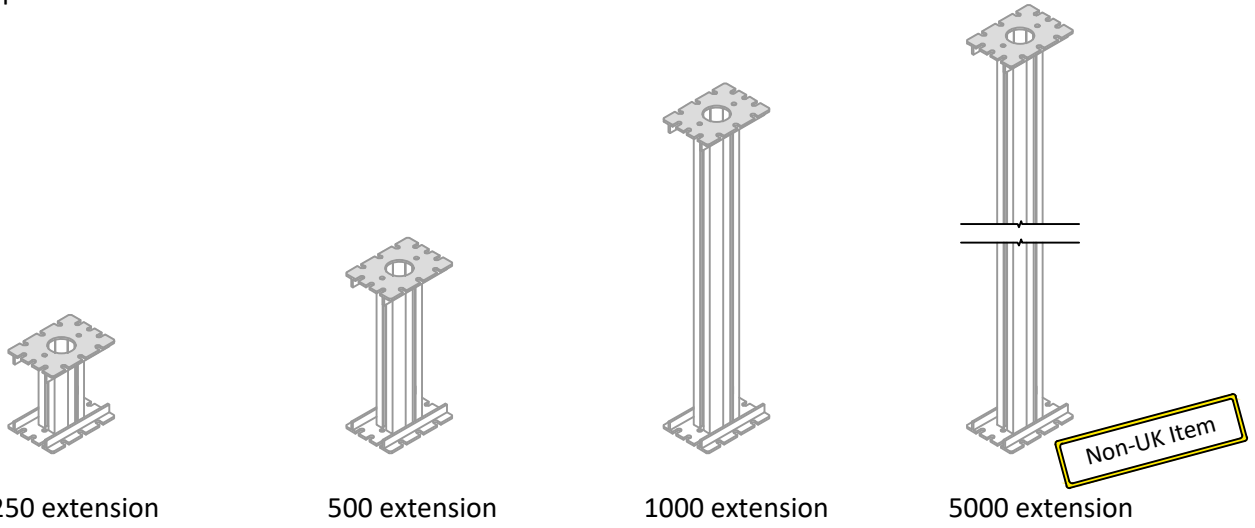
Safe working loads (SWL's)	
Maximum permissible slip load per T-bolt	2.5 kN
Maximum permissible pull out load per T-bolt	5.3 kN

Description	Code	Material	Finish	Weight
2400 ledger frame	122400	Aluminium	-	13.5 kg
3000 ledger frame	123000	Aluminium	-	15.4 kg

Considerations / Guidance:
All dimensions in this document are in (mm) unless stated otherwise.

1.4 Titan leg extension pieces

Titan leg extension pieces are available to make-up non-standard tower heights and reduce jack extension, when required.

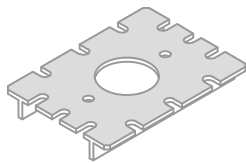


250 extension

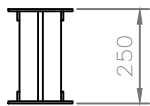
500 extension

1000 extension

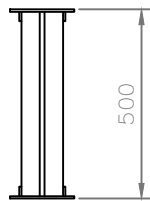
5000 extension



see 1.2.1.1 Head plate for dimensions.



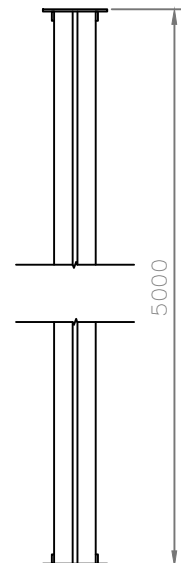
250 extension



500 extension



1000 extension



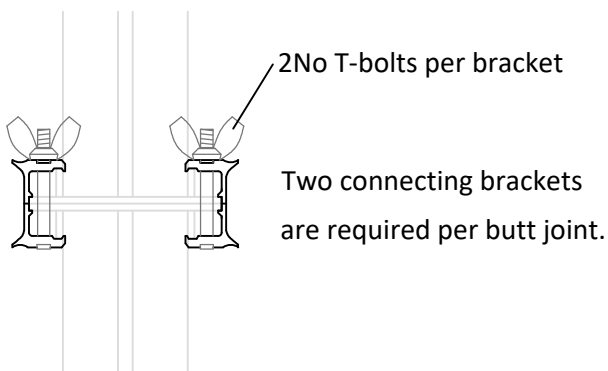
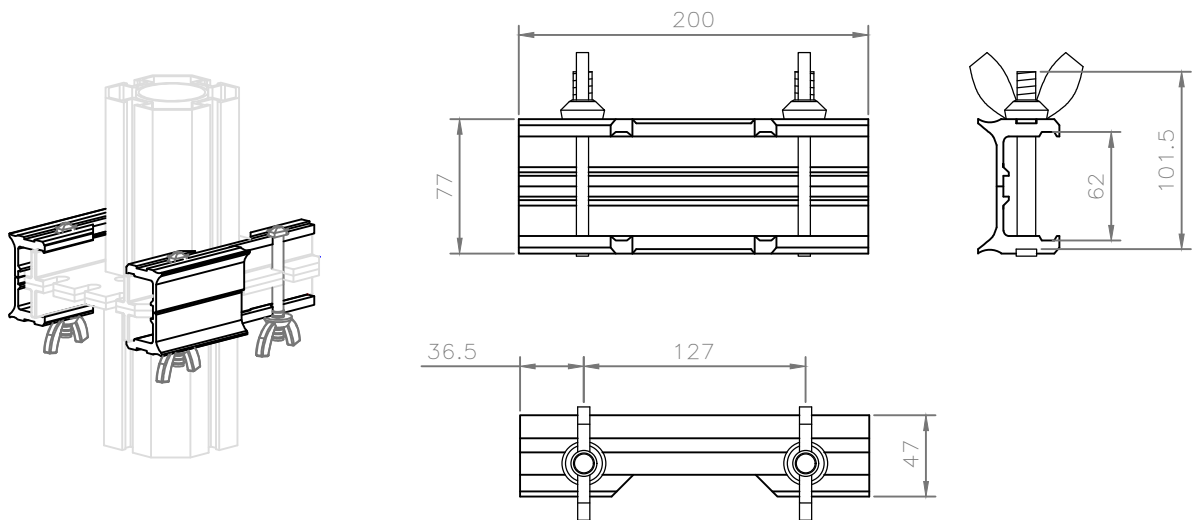
5000 extension

Description	Code	Material	Finish	Weight
250 extension	130200	Aluminium	-	3.25 kg
500 extension	130500	Aluminium	-	4.3 kg
1000 extension	131000	Aluminium	-	5.7 kg
5000 extension (Non-UK item)	-	Aluminium	-	24.0 kg

1.5 Falsework ancillaries

1.5.1 Leg connecting bracket

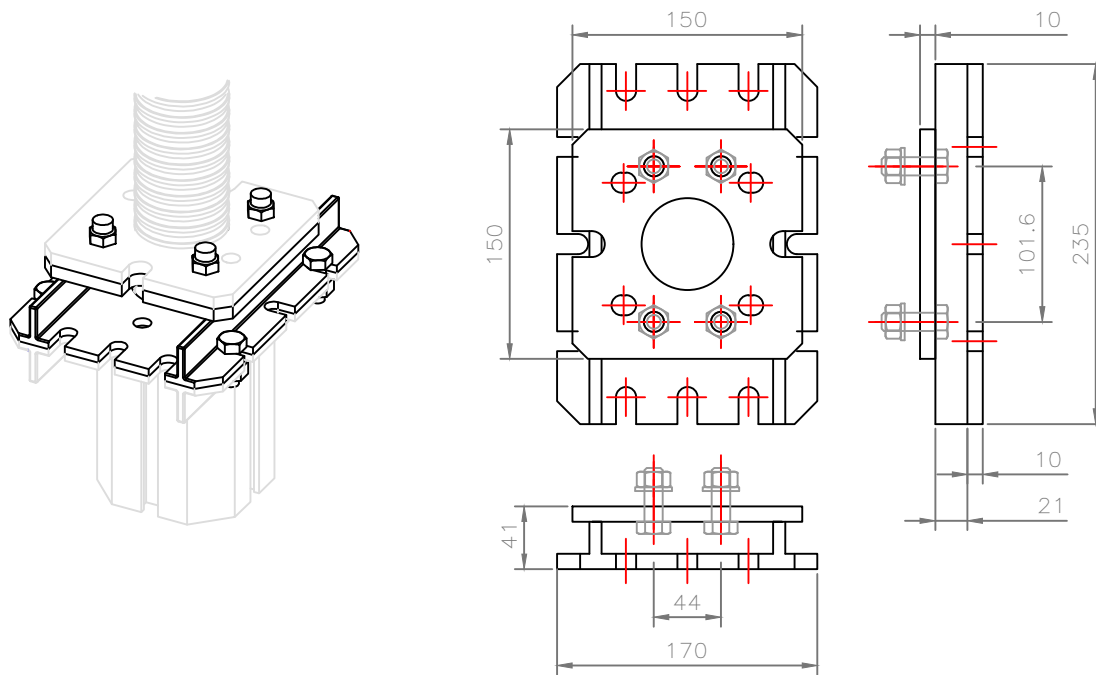
The connecting bracket is for connecting Titan adjustable aluminium legs back to back, or connecting adjustable aluminium legs with aluminium extension pieces.



Description	Code	Material	Finish	Weight
Leg connecting bracket	137000	-	-	0.8 kg

1.5.2 Leg adaptor

The leg adaptor is for connecting Titan adjustable aluminium leg / aluminum extension piece head plate to a Titan aluminium screw jack base plate.

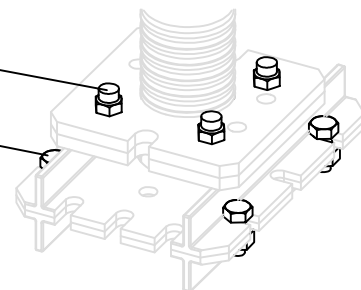


See 1.2.1.1 Head plate / 1.2.3.2 Base plate for dimensions of head plate and base plate.



M12 x 35 bolts and nyloc nuts (see 1.5.3 M12 x 35 bolts and nyloc nuts for dimensions).

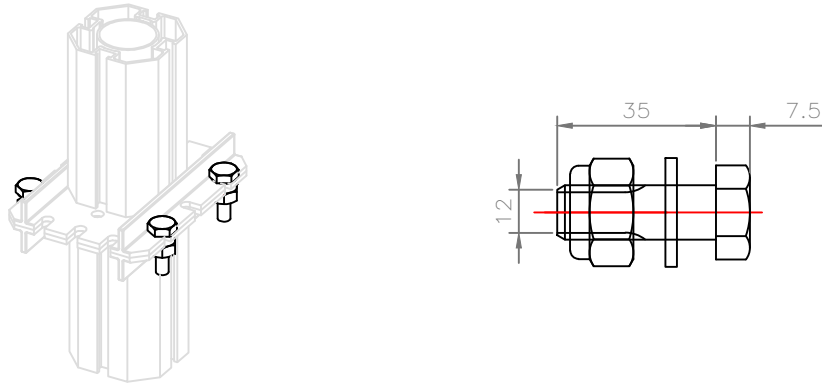
- 4 no. come complete with leg adaptor plate.
- Additional 4 no. required on order.



Description	Code	Material	Finish	Weight
Leg adaptor	133200	Aluminium	-	1.43 kg
M12 x 35 bolt and nut	133100	Grade 8.8 Steel	-	0.1 kg

1.5.3 M12 x 35 bolt and nut

The alternative to the connecting bracket is 4 no. M12 x 35 bolts, washers and nyloc nuts.

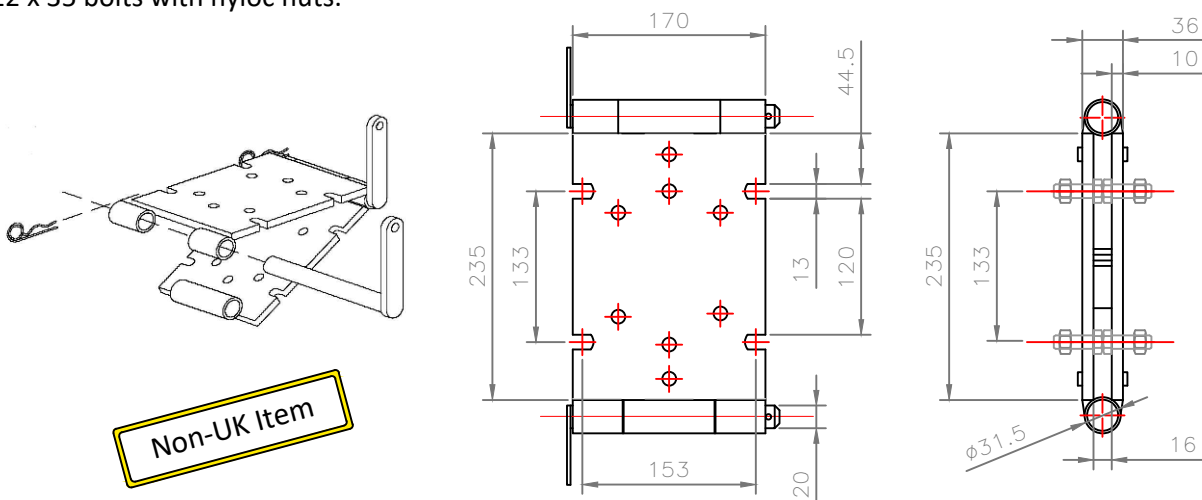


Description: 4 No. M12 x 35 set bolts, washers and nyloc nuts on head plate to head plate connection.
Base plate to base plate connection similar.

Description	Code	Material	Finish	Weight
M12 x 35 bolt and nut	133100	Grade 8.8 Steel	-	0.1 kg

1.5.4 Titan hinge unit

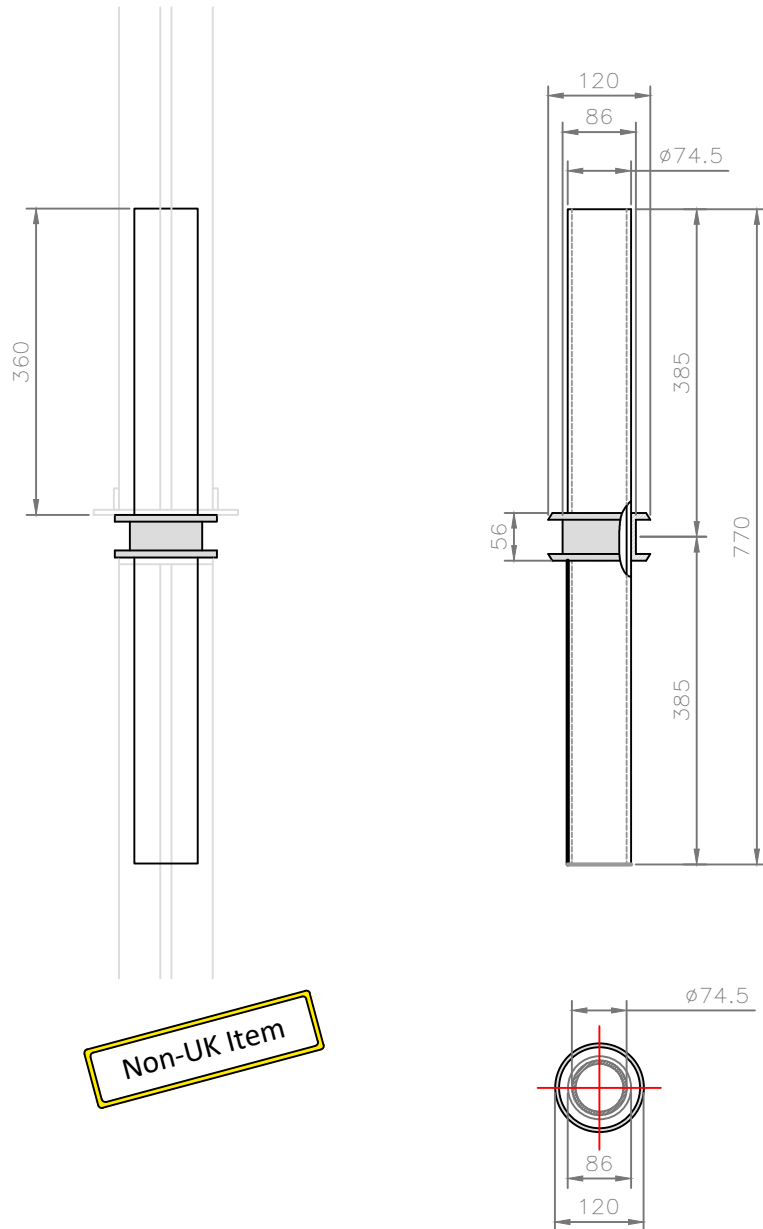
The Titan hinge unit is used for folding assembled Titan adjustable aluminium legs to clear narrow vertical openings. The hinge unit enables folding through any angle of up to 180°. Titan hinge unit requires 8 no. M12 x 35 bolts with nyloc nuts.



Description	Code	Material	Finish	Weight
Titan hinge unit (Non-UK item)	-	Steel	-	9.3 kg

1.5.5 Titan spigot

The Titan spigot is used for connecting Titan adjustable aluminium legs back to back, or connecting adjustable aluminium legs with aluminium extension pieces. The Titan spigot is retained in outer legs with jack retainer claw as per detailed in 1.2.3.3 Jack retainer claw.

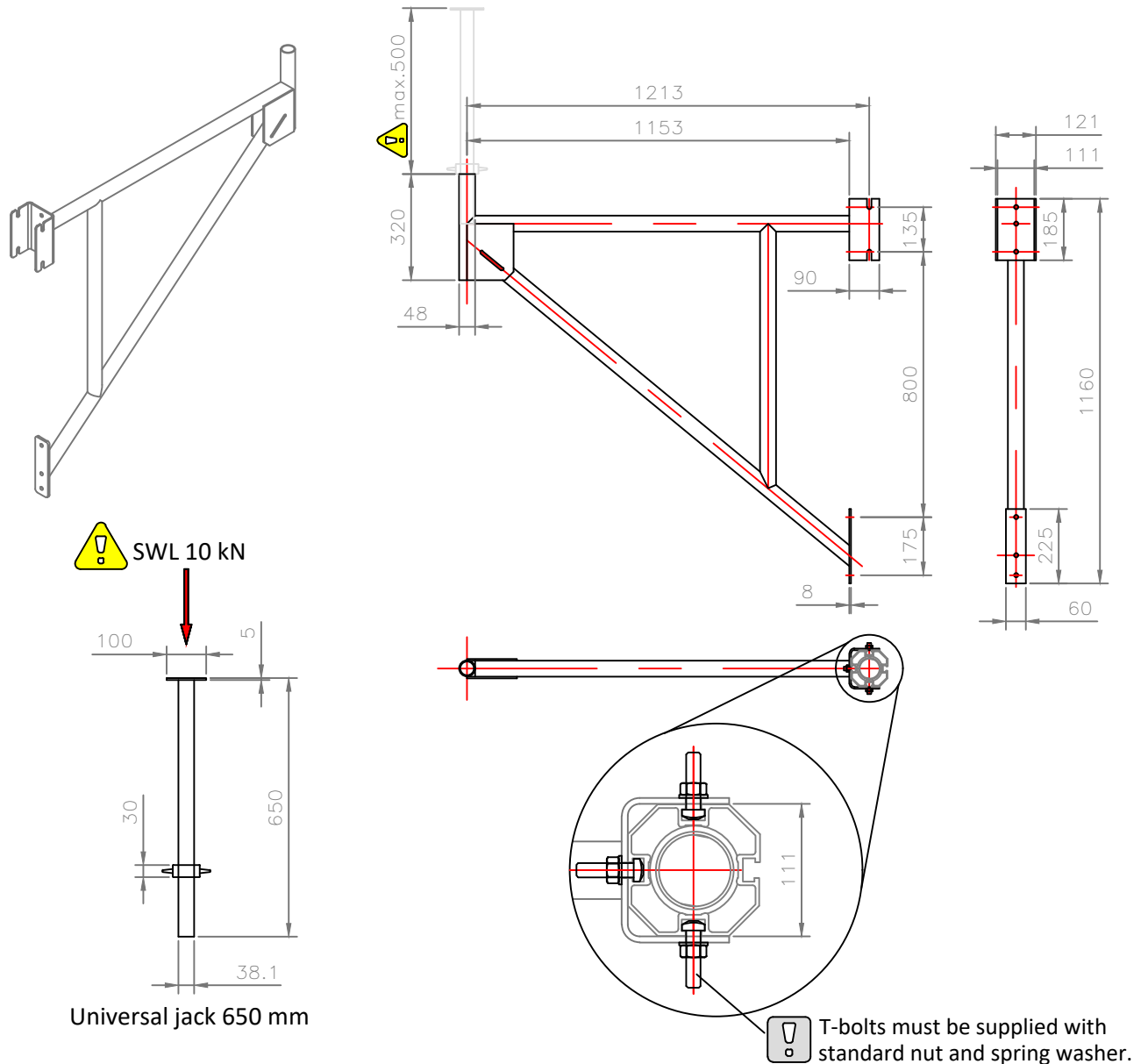


Non-UK Item

Description	Code	Material	Finish	Weight
Titan spigot (Non-UK item)	-	-	-	5.2 kg

1.5.6 Cantilever frame

The cantilever frame provides external access and support. Each bracket is connected to the Titan adjustable aluminium leg / aluminium extension piece with 8 no. T-bolts.



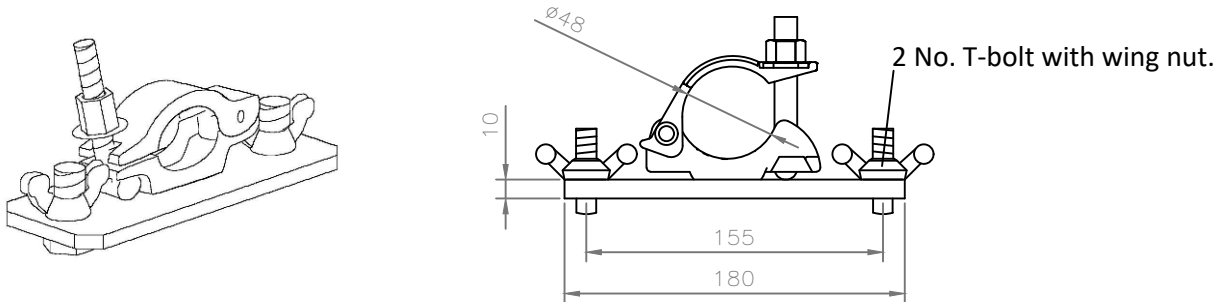
Safe working loads (SWL's)	
Axial load	10.0 kN

Description	Code	Material	Finish	Weight
Cantilever bracket	133300	S275/S235 Steel	Hot Dip Galv	17.2 kg
Universal jack 650 mm	133400	S275/S355 Steel	Zinc plated	4.3 kg

Considerations / Guidance:
All dimensions in this document are in (mm) unless stated otherwise.

1.5.6 Titan half coupler

The Titan half coupler is used for connecting $\varnothing 48$ mm scaffold tubes to the Titan adjustable aluminium outer leg. Swivel coupler for any angle.

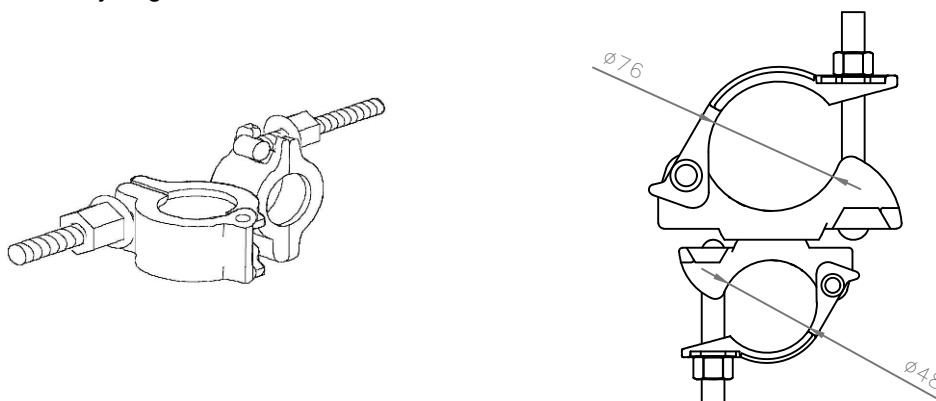


Safe working loads (SWL's)	
Maximum slipping force per T-bolt	2.5 kN
Maximum slipping force for 2 No. T-bolts	5.0 kN
Swivel coupler slipping force	6.1 kN

Description	Code	Material	Finish	Weight
Titan half coupler	132400	-	-	1.56 kg

1.5.7 Scaffold coupler 76/48

The scaffold coupler 76/48 is used for bracing Titan jack aluminium screw jack with $\varnothing 48$ mm scaffold tubes. Swivel coupler for any angle.

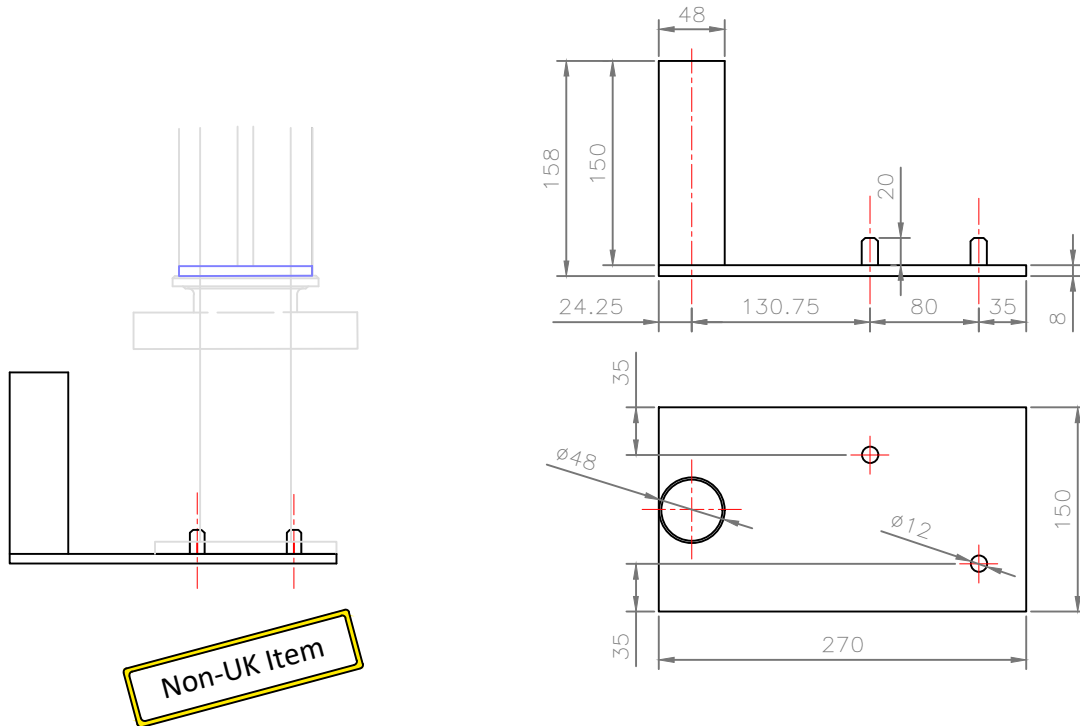


Safe working loads (SWL's)	
Swivel coupler slipping force	6.1 kN

Description	Code	Material	Finish	Weight
Scaffold coupler 76/48	138700	-	-	1.70 kg

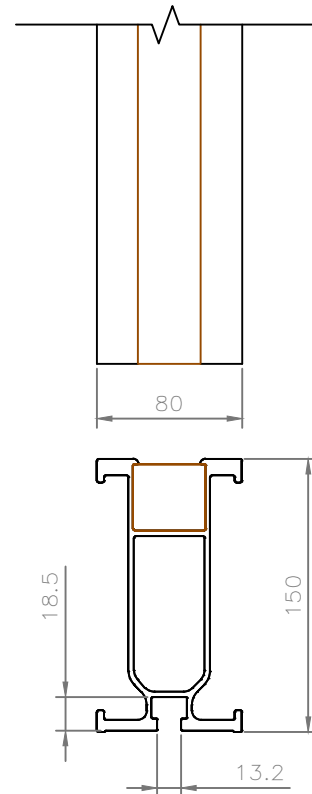
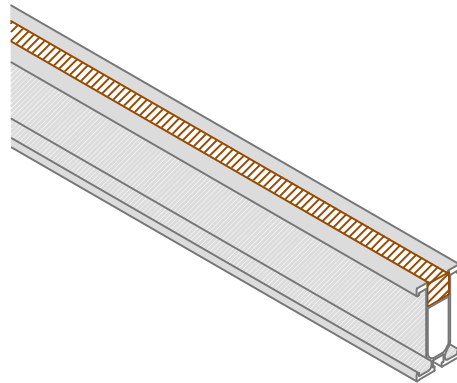
1.5.8 Jack bracing plate

The alternative solution to bracing Titan aluminium screw jack with a scaffold coupler 76/48 and $\varnothing 48$ mm scaffold tube, is to utilise a jack bracing plate. The jack bracing plate is positioned under the screw jack or alternatively, positioned between the screw jack base plate and formwork deck depending on orientation of Titan adjustable leg.



Description	Code	Material	Finish	Weight
Jack bracing plate (Non-UK item)	-	-	-	4.26 kg

1.6 Titan twin web 150 beam (secondary)

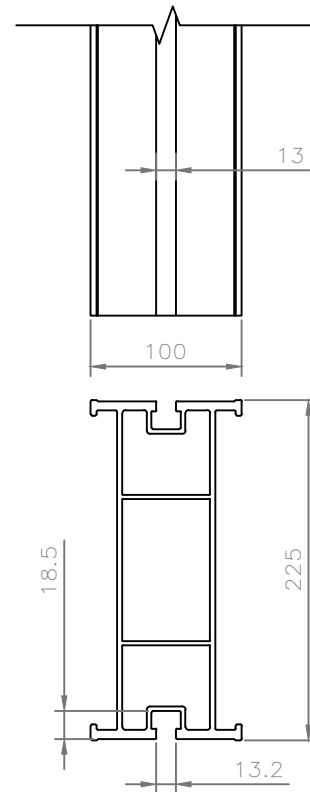
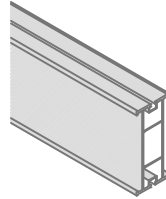


Titan twin web 150 beam properties	
Area	18.6 cm ²
Moment of inertia about the x-axis [I _{xx}]	596.9 cm ⁴
Section modulus [Z _{xx}]	77.31 cm ³
Elastic modulus [E]	68.9 kN/mm ²
Bending stiffness [EI]	411 kNm ²
Weight per metre	5.63 kg/m
Moment capacity [M _c]	11.9 kNm
Shear capacity [V _c]	30 kN
Centre bearing (80mm bearing)	34 kN *
End bearing (40mm bearing)	22 kN

* min cantilever for a centre reaction = 600 mm

Description	Code	Material	Finish	Weight
1.2m T150 beam	211200	Aluminium	-	6.77 kg
1.8m T150 beam	211800	Aluminium	-	10.13 kg
2.4m T150 beam	212400	Aluminium	-	13.51 kg
2.7m T150 beam	212700	Aluminium	-	15.20 kg
3.0m T150 beam	213000	Aluminium	-	16.88 kg
3.6m T150 beam	213600	Aluminium	-	20.27 kg
4.2m T150 beam	214200	Aluminium	-	23.65 kg
4.8m T150 beam	214800	Aluminium	-	27.02 kg
5.4m T150 beam	215400	Aluminium	-	30.40 kg
6.0m T150 beam	216000	Aluminium	-	33.78 kg
6.4m T150 beam	216400	Aluminium	-	36.03 kg
7.2m T150 beam	217200	Aluminium	-	40.54 kg

1.7 Titan twin web 225 beam (primary)



Titan twin web 225 beam properties	
Area	32.63 cm ²
Moment of inertia about the x-axis [I _{xx}]	2241 cm ⁴
Section modulus [Z _{xx}]	199.2 cm ³
Elastic modulus [E]	68.9 kN/mm ²
Bending stiffness [EI]	1544 kNm ²
Weight per metre	8.87 kg/m
Moment capacity [Mc]	28.5 kNm
Shear capacity [Vc]	71.3 kN
Centre bearing (head plate either direction)	100 kN *
End bearing (½ head plate 117.5 mm bearing)	40 kN
End bearing (½ head plate 85 mm bearing)	40 kN
End bearing (50mm bearing)	34 kN

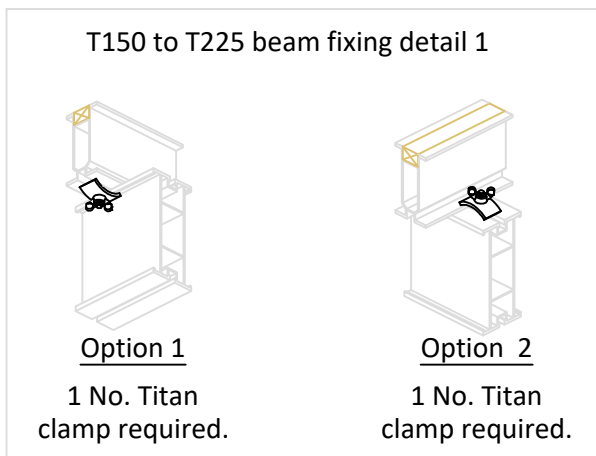
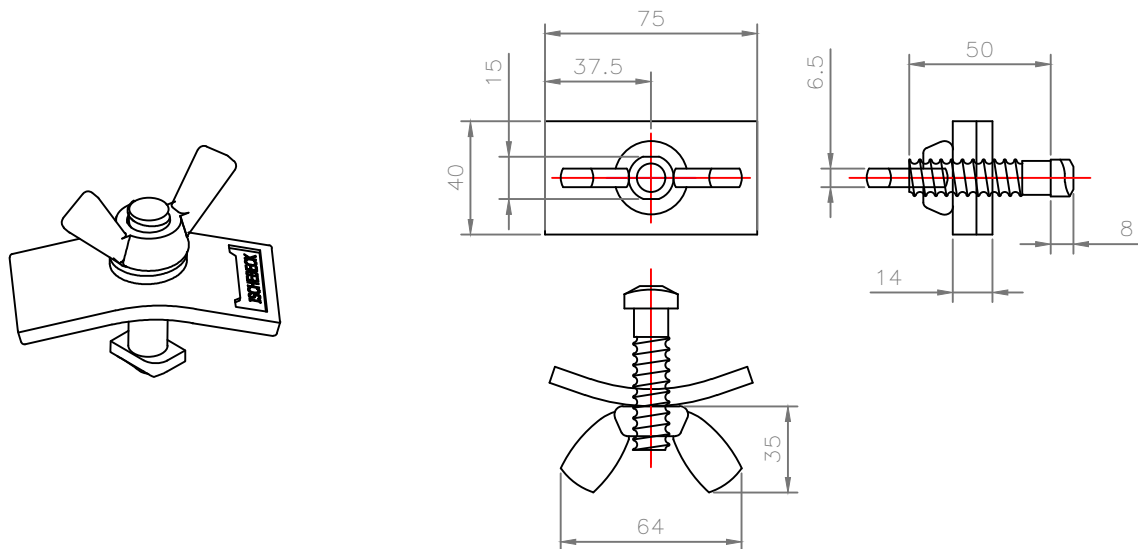
* min cantilever for a centre reaction = 600 mm

Description	Code	Material	Finish	Weight
1.2m T225 beam	221200	Aluminium	-	10.64 kg
1.8m T225 beam	221800	Aluminium	-	15.97 kg
2.4m T225 beam	222400	Aluminium	-	21.29 kg
2.7m T225 beam	222700	Aluminium	-	23.95 kg
3.0m T225 beam	223000	Aluminium	-	26.61 kg
3.6m T225 beam	223600	Aluminium	-	31.93 kg
4.2m T225 beam	224200	Aluminium	-	37.25 kg
4.8m T225 beam	224800	Aluminium	-	42.58 kg
5.4m T225 beam	225400	Aluminium	-	47.90 kg
6.0m T225 beam	226000	Aluminium	-	53.22 kg
6.4m T225 beam	226400	Aluminium	-	56.77 kg
7.2m T225 beam	227200	Aluminium	-	63.89 kg
8.4m T225 beam (Non-UK item)	-	Aluminium	-	74.51 kg
9.0m T225 beam (Non-UK item)	-	Aluminium	-	79.83 kg
10.2m T225 beam (Non-UK item)	-	Aluminium	-	88.70 kg

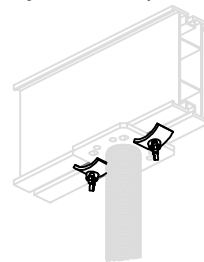
1.8 Formwork ancillaries

1.8.1 Titan clamp

The Titan clamp is used for connecting Titan beams to Titan beams (fixing detail 1) and Titan adjustable aluminium legs to Titan beams (fixing detail 2 & 3). To be used with Ischebeck Titan components only.



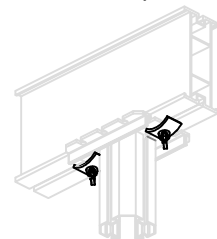
T150/T225 beam to jack base plate



Fixing detail 2

2 No. Titan clamp required.

T150/T225 beam to head plate



Fixing detail 3

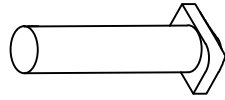
2 No. Titan clamp required.


Safe working loads (SWL's)

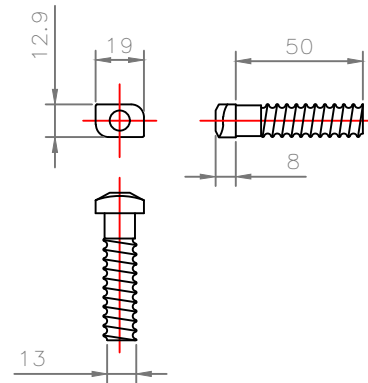
Maximum slipping force per Titan clamp	2.5 kN
Maximum pull out force per Titan clamp	6.5 kN

Description	Code	Material	Finish	Weight
Titan clamp	132600	Grade 8.8 Steel	-	0.2 kg

1.8.2 Titan T-bolt



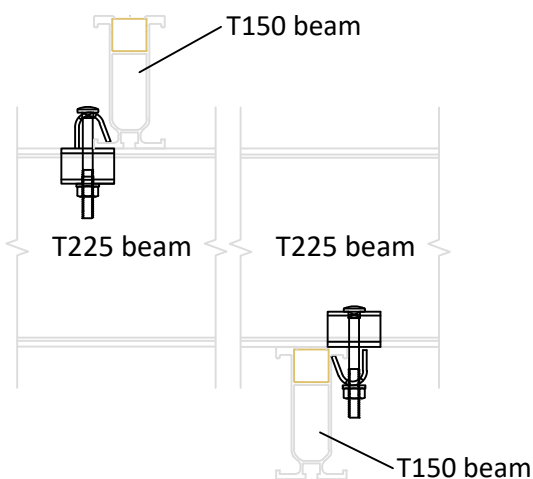
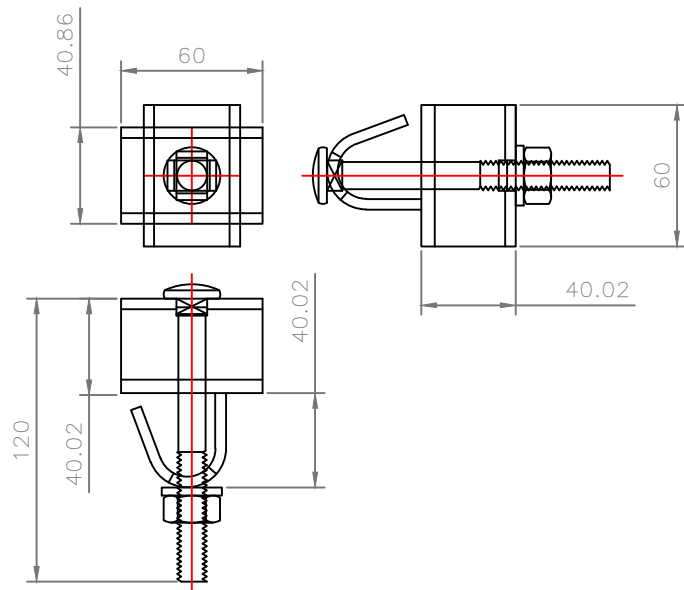
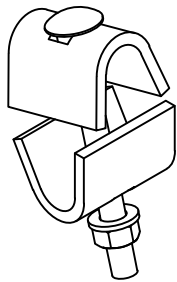
 T-Bolts must be supplied with standard nut and spring washer.



Description	Code	Material	Finish	Weight
Titan T-bolt	132300	Grade 8.8 Steel	-	0.1 kg

1.8.3 Universal clamp

The universal clamp is an alternative solution to connecting Titan beams to Titan beams.

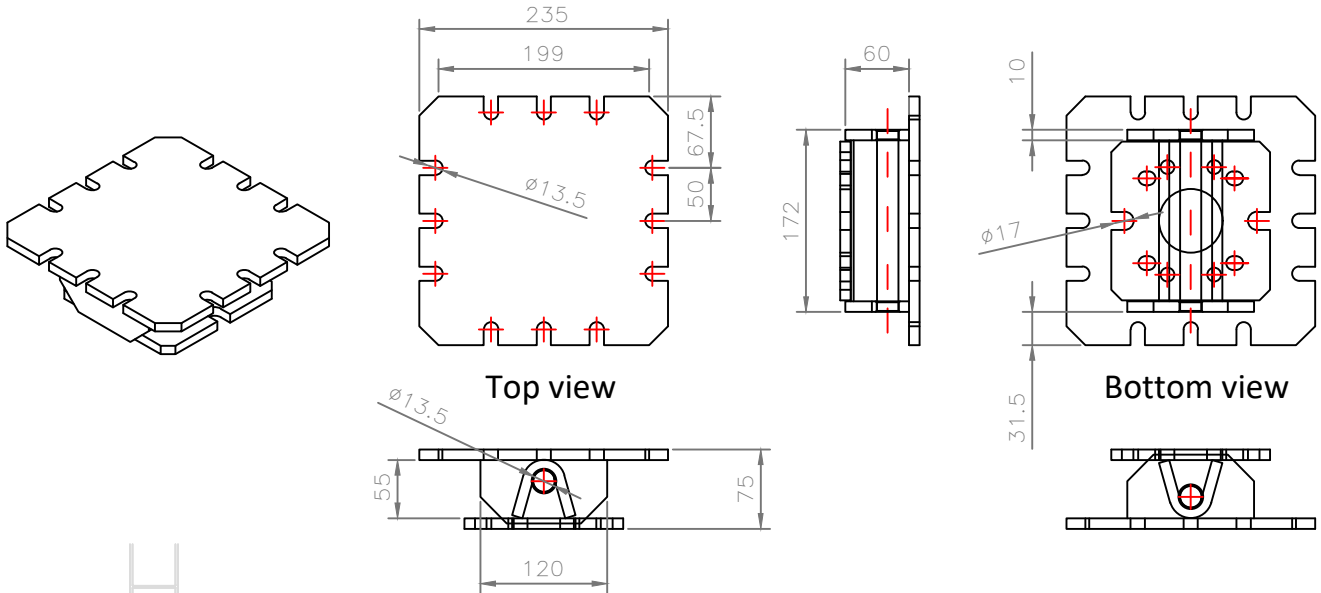


Safe working loads (SWL's)	
Maximum slipping force per universal clamp	0.5 kN
Maximum tension per universal clamp	3.0 kN

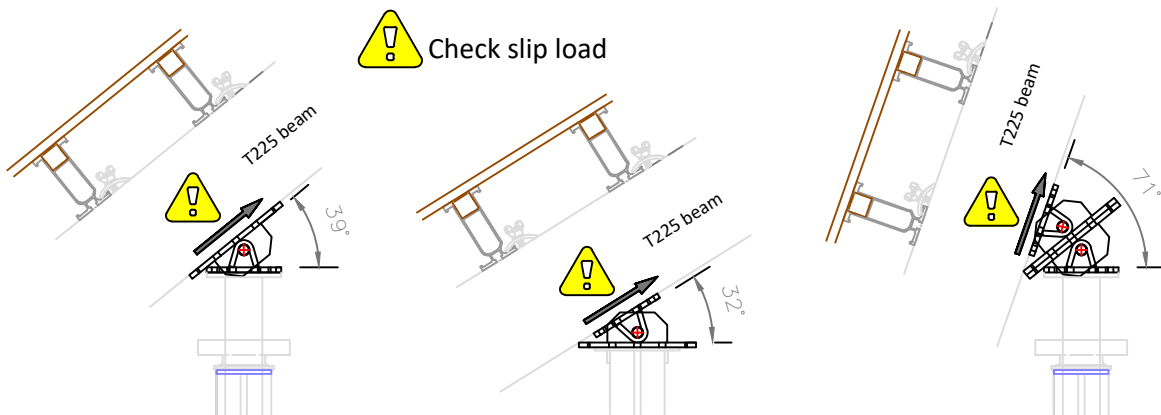
Description	Code	Material	Finish	Weight
Universal clamp	161300	S275 Steel	Hot Dip Galv	0.6 kg

1.8.4 Rocking head plate

The rocking head plate allows for formwork beams to be angled up to 39°. The plate can be positioned in any direction by simply turning the Titan screw jack.



Rocking head plate fixed to Titan base plate using 4 no. M12 x 35 bolts and nyloc nuts (see 1.5.3 M12 x 35 bolts and nyloc nuts for dimensions).
Requires 4 no. M12 x 35 bolts and nyloc nuts on order - *code 133100*.

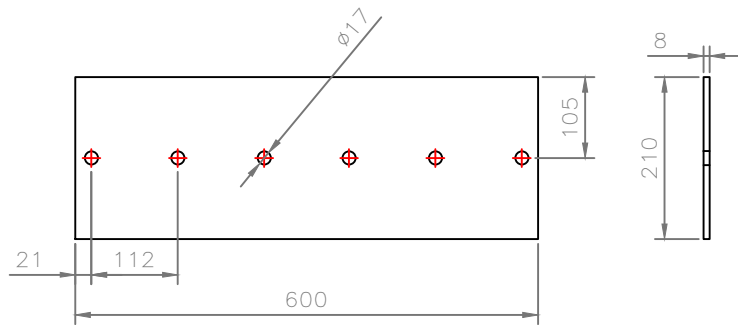
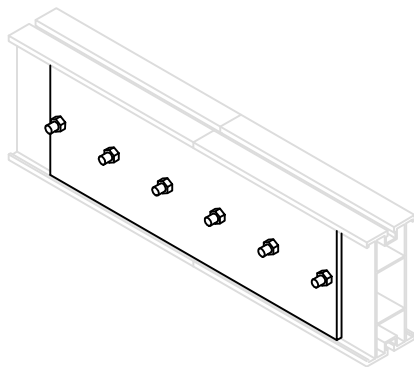


These angles represent the physical angles possible. However, additional checks on lateral stability are required and Titan should be designed to accommodate for horizontal load induced in legs.

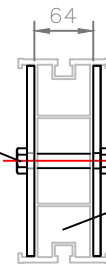
Description	Code	Material	Finish	Weight
Rocking head plate	133800	-	-	2.8 kg

1.8.5 Titan splice plate

The Titan splice plate is used to join two splice T225 beams. Titan splice plates are used in pairs - one plate either side of the T225 beams to be joined. In order to connect both plates, both T225 beams require 3 no. holes drilling (dimension of holes required as detailed below). Connect both plates with 6 no. M16 x 100 bolts, washers and nyloc nuts.



M16 x 100 bolt,
washer and nyloc nut
code 413045



T225 beam

section through T225 beam

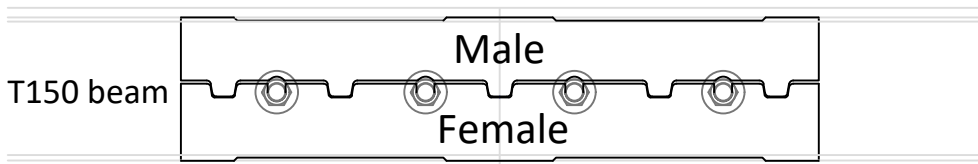
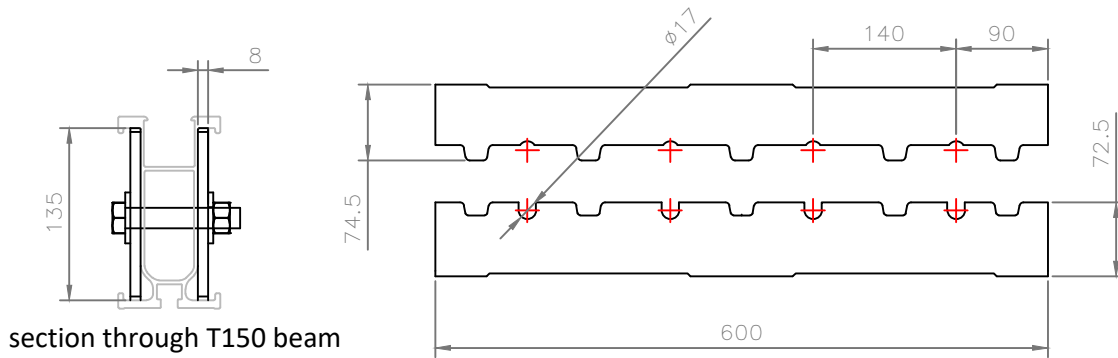
Properties	
Moment capacity [Mc]	23.0 kNm

Description	Code	Material	Finish	Weight
Titan splice plate	136900	S275 Steel	Hot Dip Galv	7.8 kg

1.8.6 Alligator splice plate

The alligator splice plate is used to join two splice T150 beams. Titan splice plates are used in pairs - two plates either side (male and female) of the T150 beams to be joined. In order to connect both plates, both T150 beams require 2 no. holes drilling (dimension of holes required as detailed below).

Connect both plates with 4 no. M16 x 90 bolts and nyloc nuts, and 8 no. M16 washers (2 no. per bolt).



Sale Item Only

Properties	
Moment capacity [M _c]	11.9 kNm

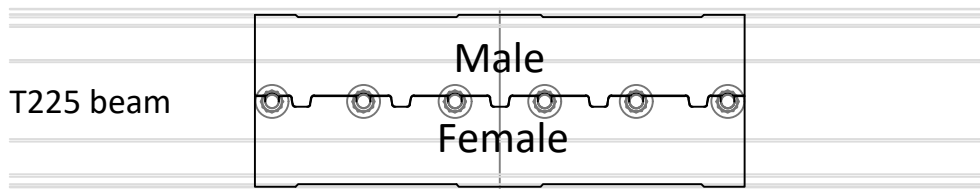
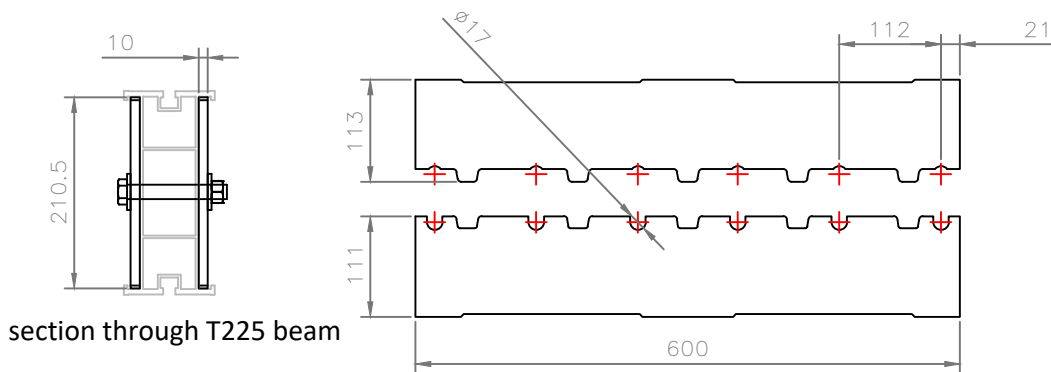
Description	Code	Material	Finish	Weight
T150 alligator splice plate	-	-	-	- kg

Considerations / Guidance:
All dimensions in this document are in (mm) unless stated otherwise.

1.8.7 T225 alligator splice plate

The alligator splice plate is used to join two splice T225 beams. Titan splice plates are used in pairs - two plates either side (male and female) of the T225 beams to be joined. In order to connect both plates, both T225 beams require 3 no. holes drilling (dimension of holes required as detailed below).

Connect both plates with 6 no. M16 x 110 bolts and nyloc nuts, and 12 no. M16 washers (2 no. per bolt).



Sale Item Only

Properties	
Moment capacity [Mc]	28.5 kNm
Total weight of all 4 plates (2 no. pair of male and female plates)	19.0 kg

Description	Code	Material	Finish	Weight
T225 alligator splice plate	-	S355 Steel	Galvanised	19.0 kg

Considerations / Guidance:
All dimensions in this document are in (mm) unless stated otherwise.

1.8.8 Friction clamp

The friction clamp is for shear-resistant connections between two or three Titan T25 beams. The application for friction clamp includes assembly of bridging beams and trussed beams. For further information on friction clamps, contact Friedr. Ischebeck GMBH.

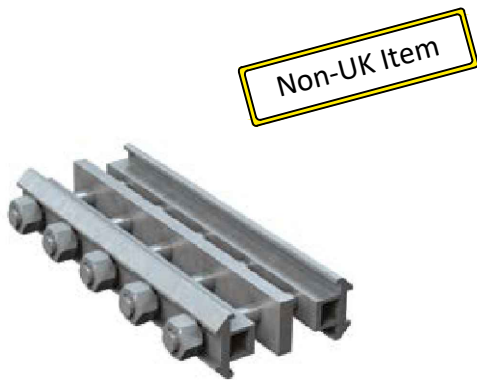


Figure 01 - Friction clamp

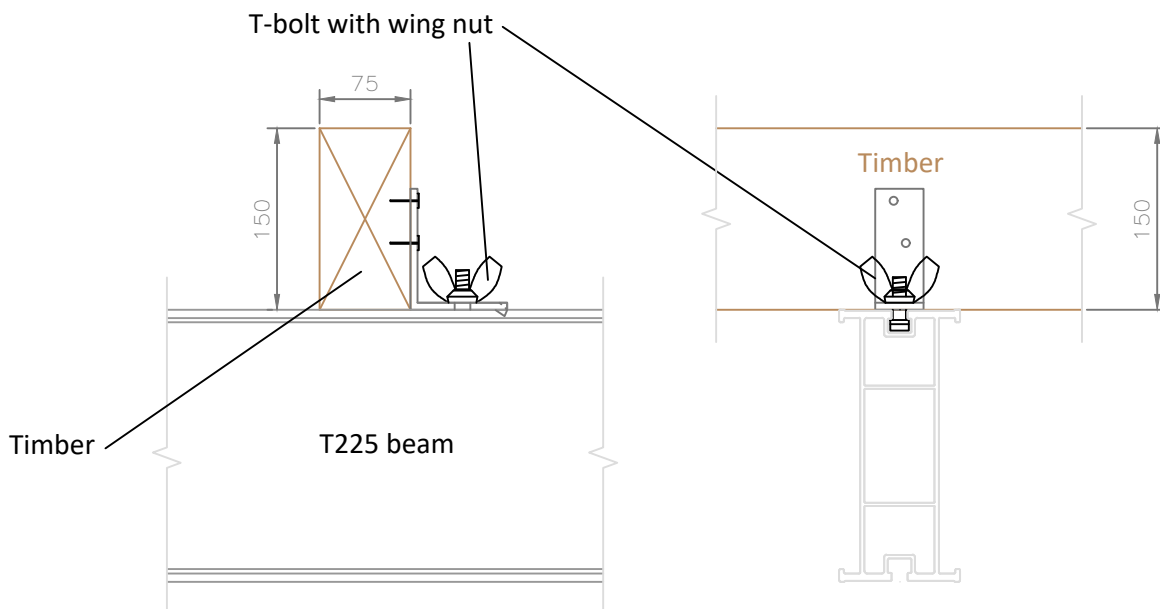
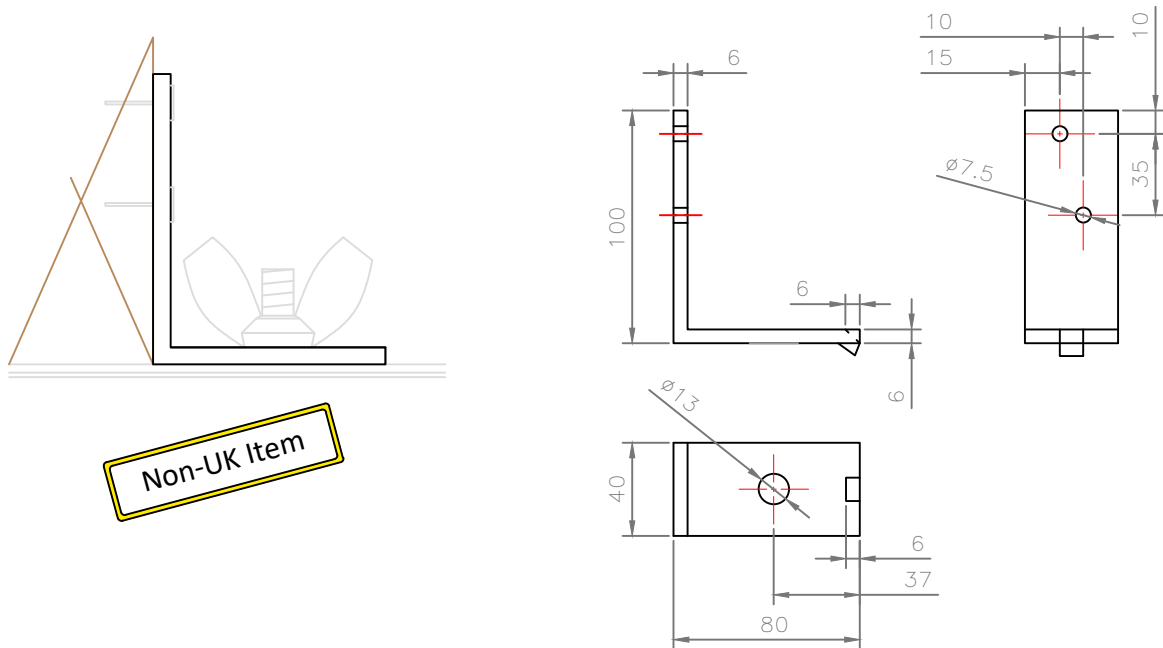


Figure 02 - Bridging beam

Description	Code	Material	Finish	Weight
Friction clamp	-	-	-	- kg

1.8.9 Timber fixing angle

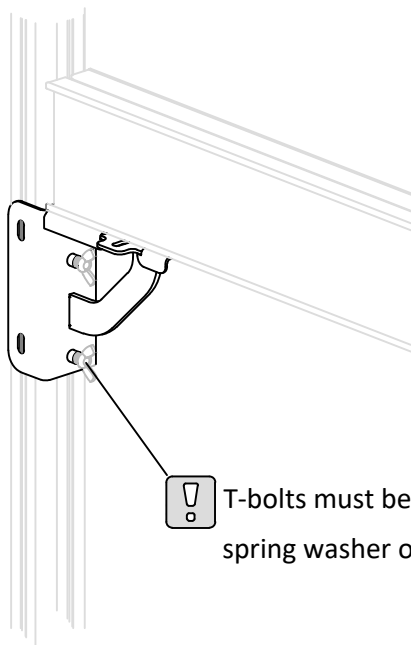
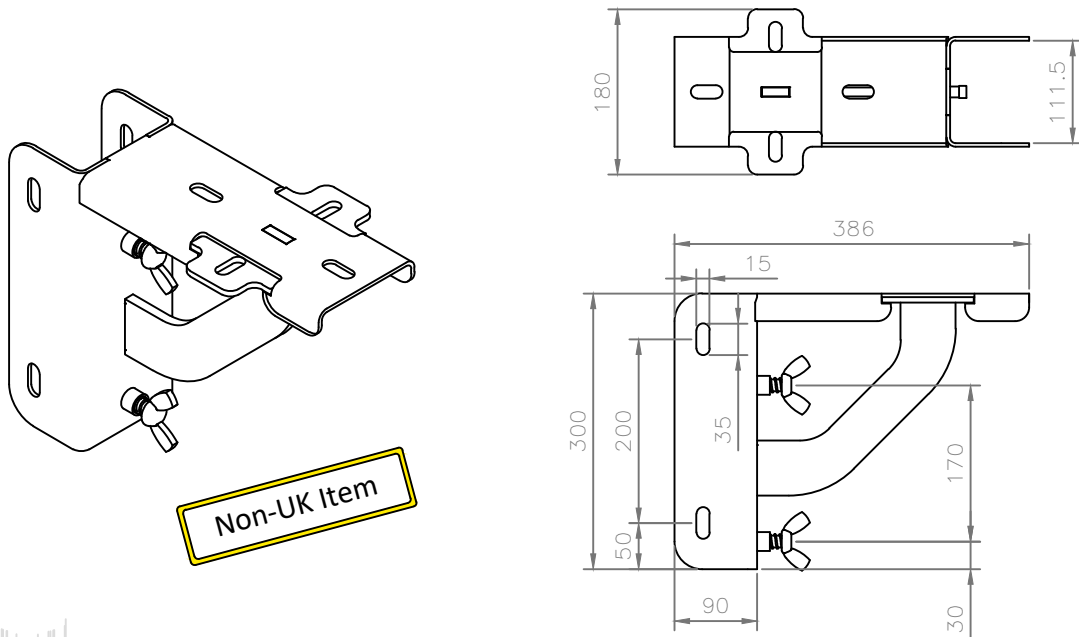
The timber fixing angle is used for fixing a timber secondary beam to a Titan T225 primary beam.



Description	Code	Material	Finish	Weight
Timber fixing angle (Non-UK item)	-	-	-	0.43 kg

1.8.10 Edge beam support

The cantilever bracket is used to provide support to lower level primary / secondary beams which can support drop beams, thus removes the need for any additional Titan system layout to independently support the drop beam.



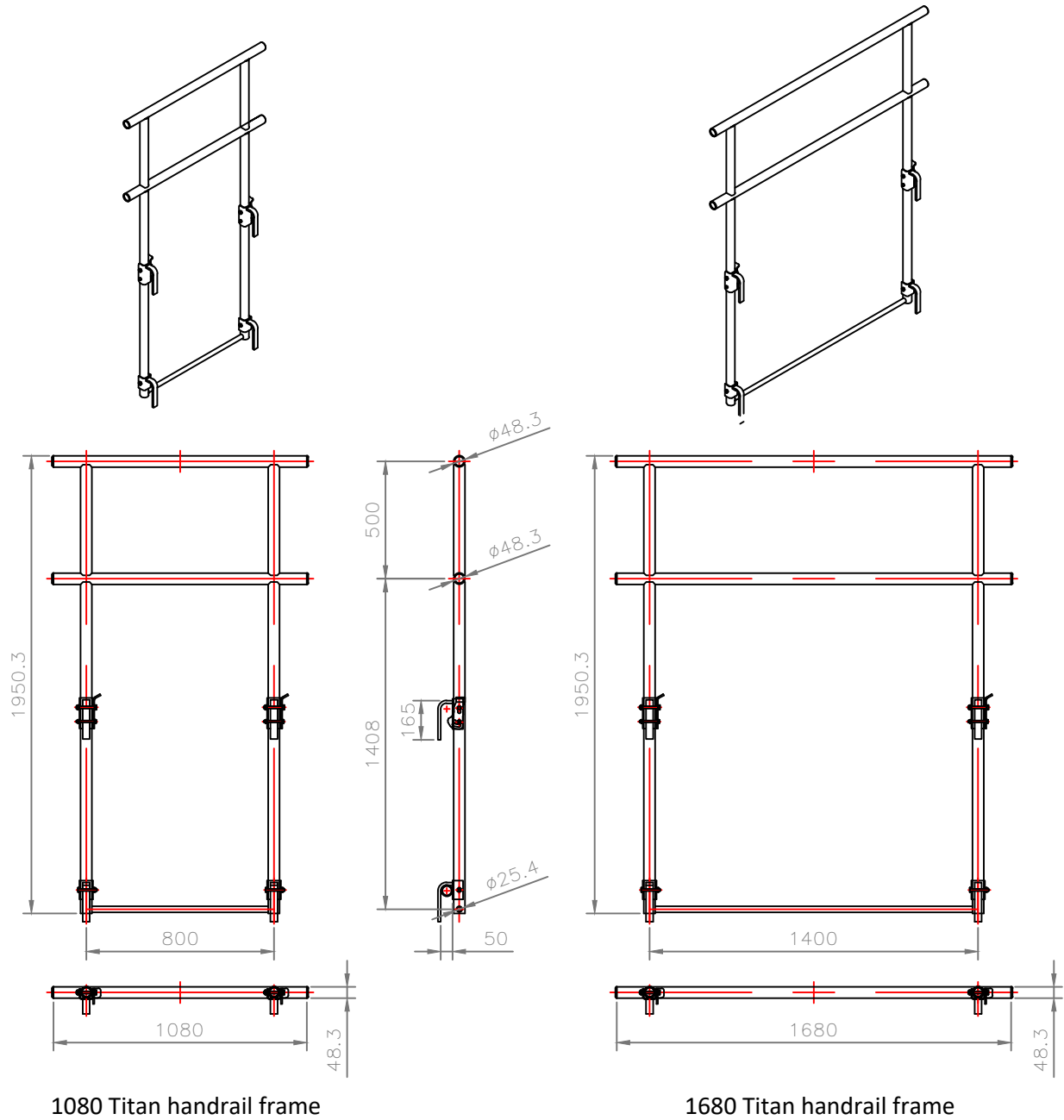
! T-bolts must be supplied with standard nut and spring washer or T-bolt with wing nut.

The cantilever bracket fixes to Titan aluminum adjustable leg with 2 no.T-bolts (as shown in figure to the left).The cantilever bracket supports the primary beam and is fixed in place with 2 no. Titan clamps.

Description	Code	Material	Finish	Weight
Edge beam support bracket	-	S275 Steel	Painted Silver	6.113 kg

1.8.11 Titan handrail frame

The Titan handrail frame connects to ledger frames and provides edge protection when using the access platforms for erecting/ dismantling Titan system.

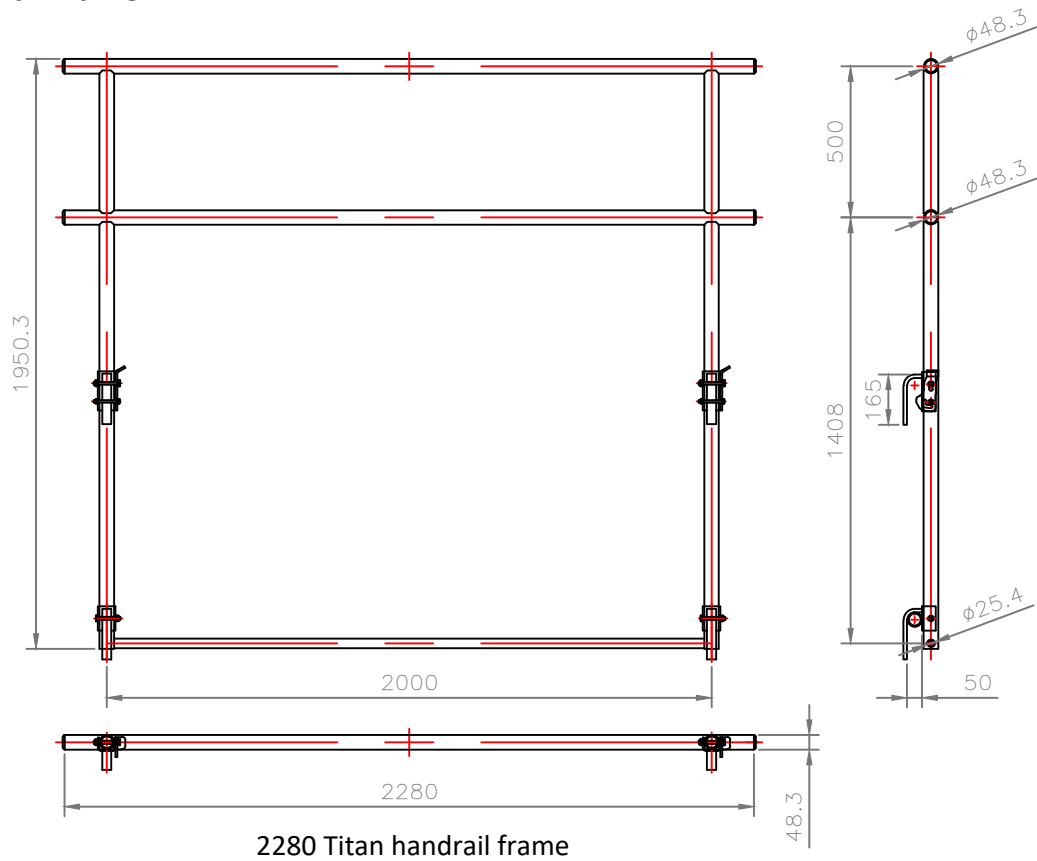


1080 Titan handrail frame

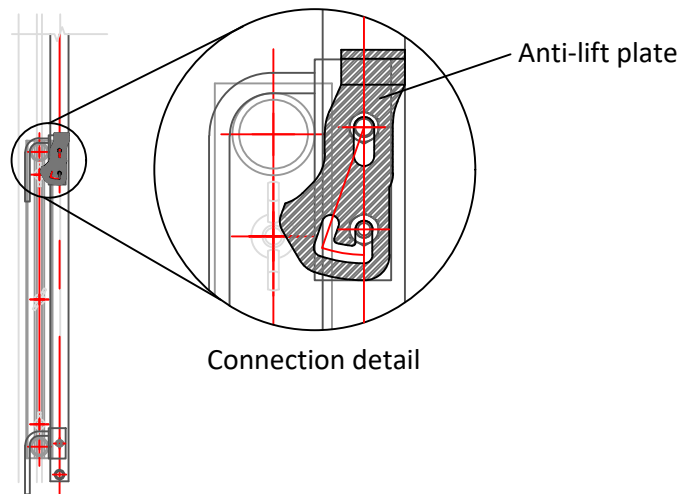
1680 Titan handrail frame

Description	Code	Material	Finish	Weight
1200 Titan handrail frame	138212	-	-	17.2 kg
1800 Titan handrail frame	138218	-	-	19.4 kg

Titan handrail frame



2280 Titan handrail frame



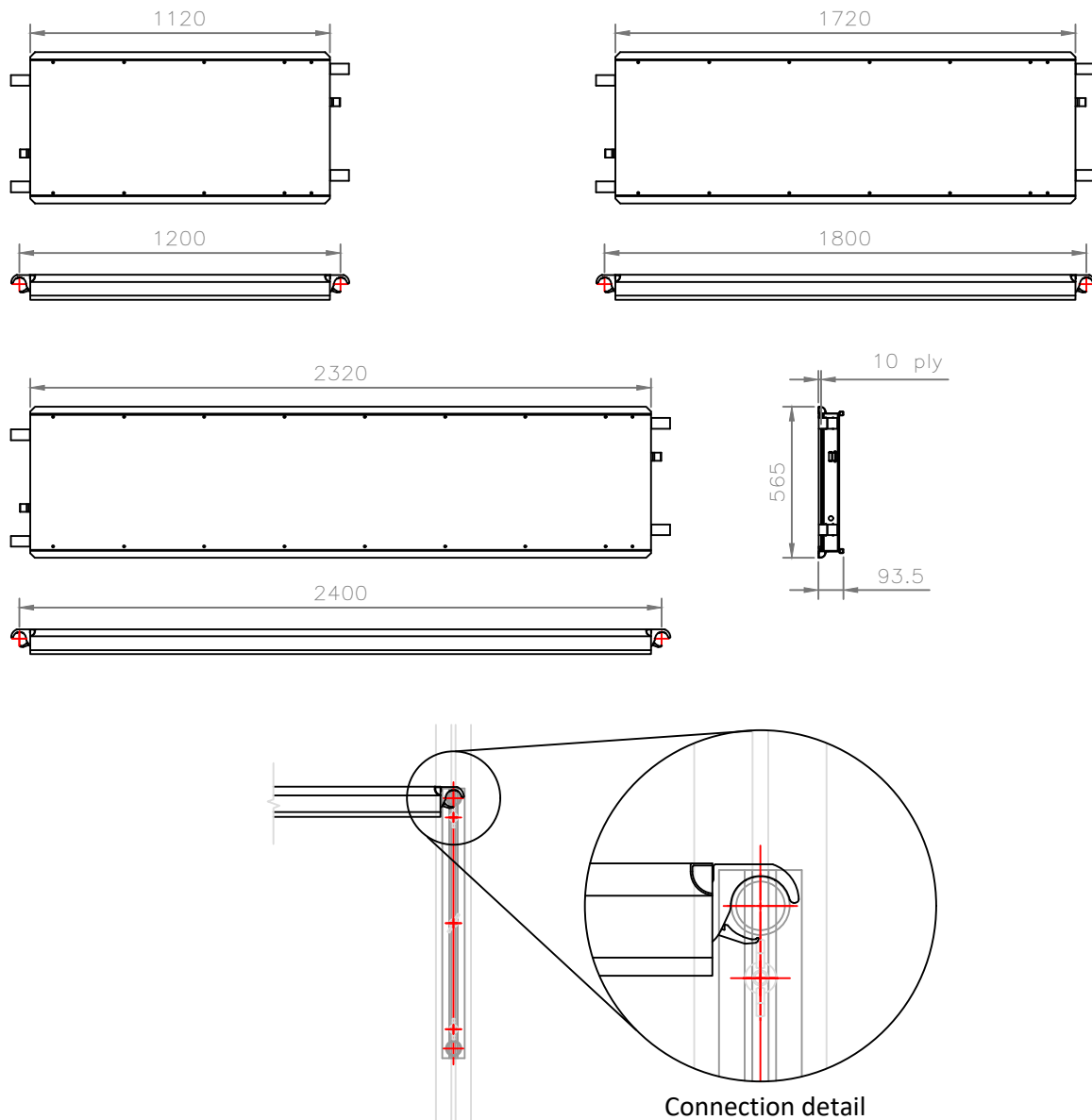
Description	Code	Material	Finish	Weight
2400 Titan handrail frame	-	-	-	21.9 kg

Considerations / Guidance:
 All dimensions in this document are in (mm) unless stated otherwise.

1.8.12 Titan access platform

Titan access platform is used for access and available in the following sizes: 1.2 m x 0.565 m, 1.8 m x 0.565 m and 2.4 m x 0.565 m. Titan access platform is for access only to EN12810 - Class 3 - 2.0 kN/m².

These platforms are NOT designed for impact loads.

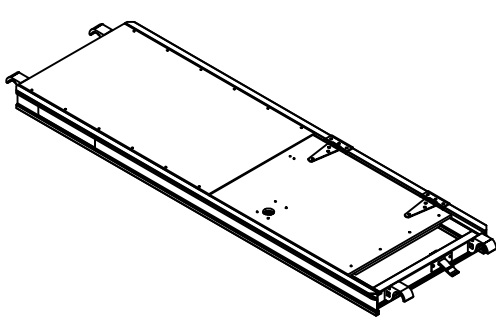


Description	Code	Material	Finish	Weight
1200 access platform	139212	Aluminium	-	8.2 kg
1800 access platform	139218	Aluminium	-	11.2 kg
2400 access platform	139224	Aluminium	-	14.6 kg

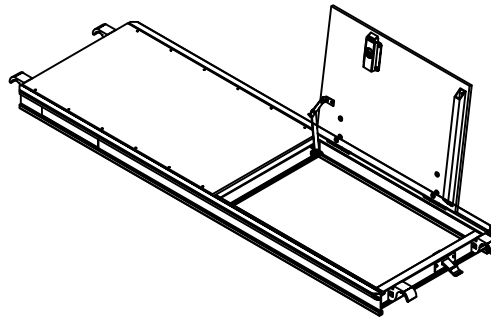
1.8.13 Titan access platform with trapdoor

Titan access platform with trapdoor is used for access and available in the following sizes: 1.8 m x 0.565 m and 2.4 m x 0.565 m. The 100 mm opening adjacent to trapdoor allows for assembly of a fixed ladder. Titan access platform is for access only to EN12810 - Class 3 - 2.0 kN/m².

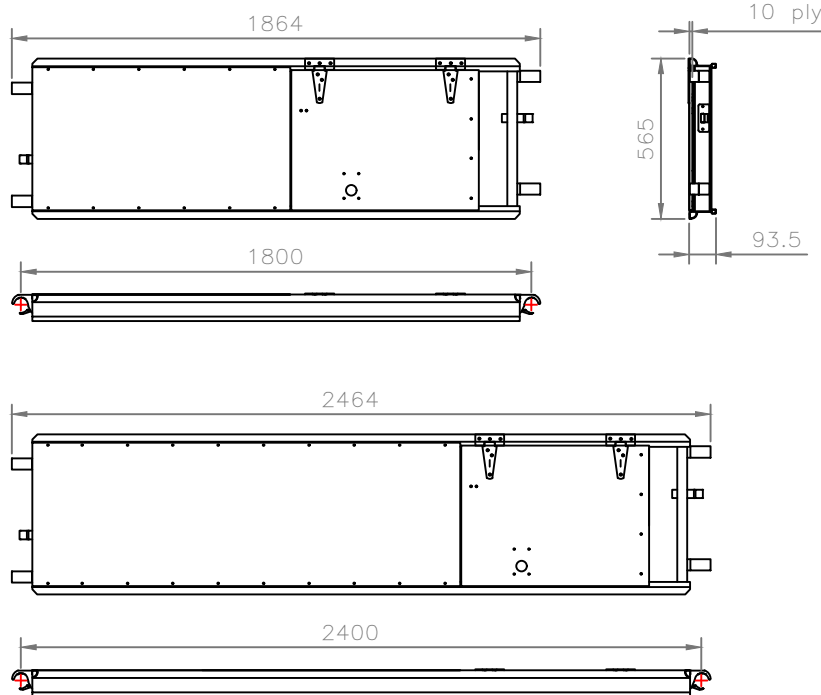
These platforms are NOT designed for impact loads.



Titan access platform with trapdoor closed.



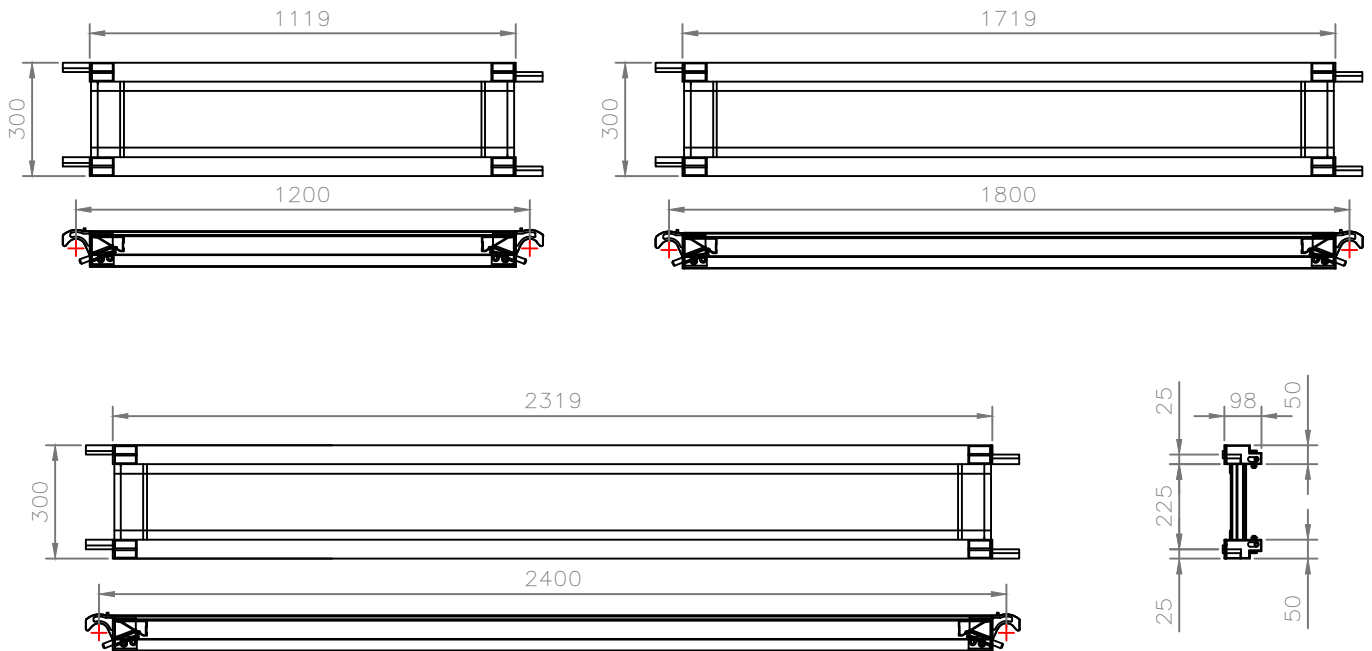
Titan access platform with trapdoor open.



Description	Code	Material	Finish	Weight
1800 access platform with trapdoor	139318	-	-	12.1 kg
2400 access platform with trapdoor	139324	-	-	15.5 kg

1.8.14 Intermediate transom board

The intermediate transom boards are used for spanning between ledger frames to support scaffold boards. These components are available in the following sizes: 1.2 m x 0.3 m, 1.8 m x 0.3 m and 2.4 m x 0.3 m.



Properties	
Allowable access loading	2.0 kN/m ²
Bending stiffness [EI] (pair)	89.7 kNm ²
Moment capacity [Mc] (pair)	3.8 kNm

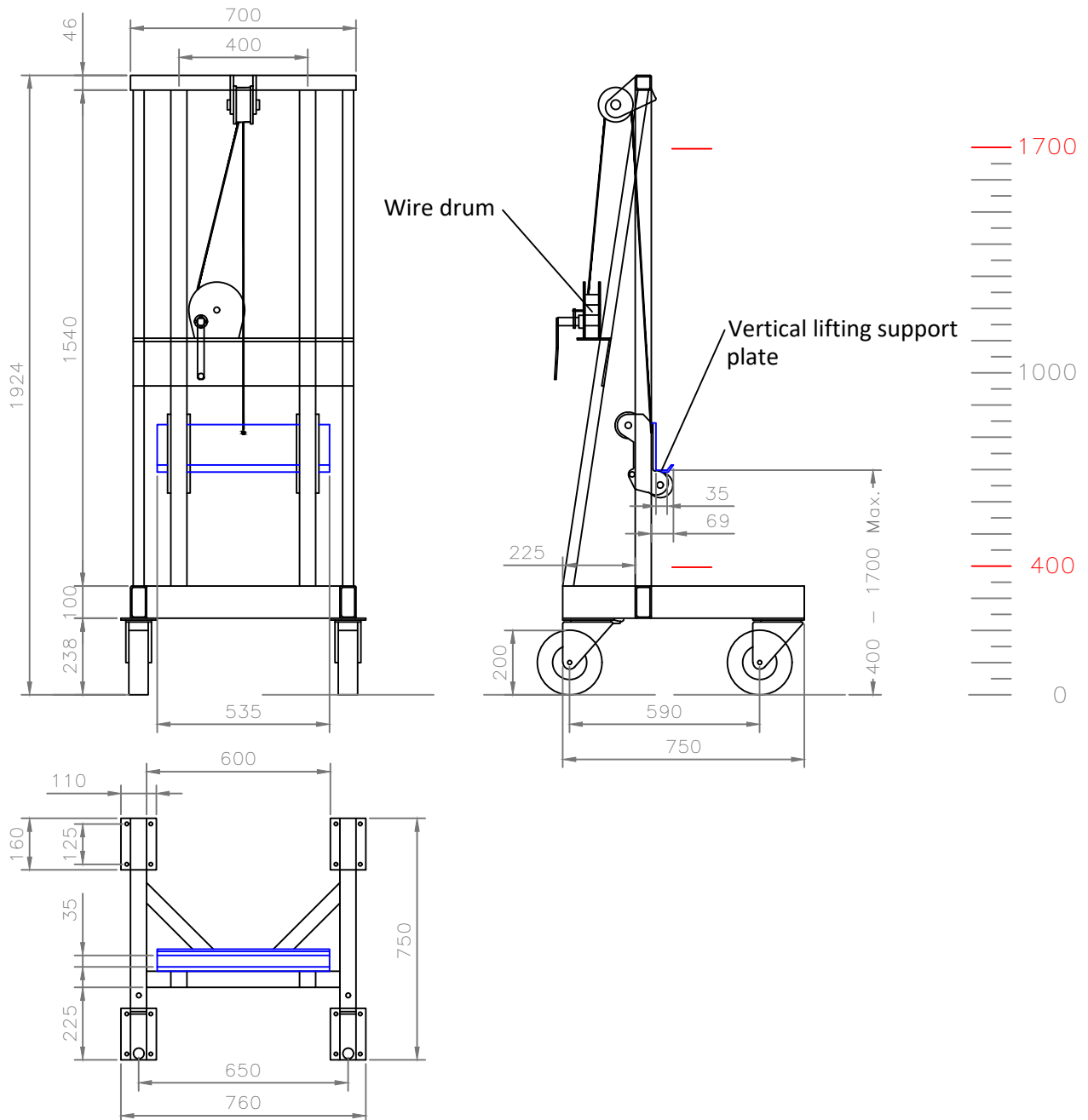
Safe working loads (SWL's)	
Ledger frame slip	15.0 kN [UDL]

Description	Code	Material	Finish	Weight
1200 intermediate transom board	138112	Aluminium	-	6.0 kg
1800 intermediate transom board	138118	Aluminium	-	8.0 kg
2400 intermediate transom board	138124	Aluminium	-	9.0 kg

Considerations / Guidance:
All dimensions in this document are in (mm) unless stated otherwise.

1.8.15 Titan trolley

The Titan trolley is used for moving Titan tables. A minimum of 2 no. Titan trolleys required per table.



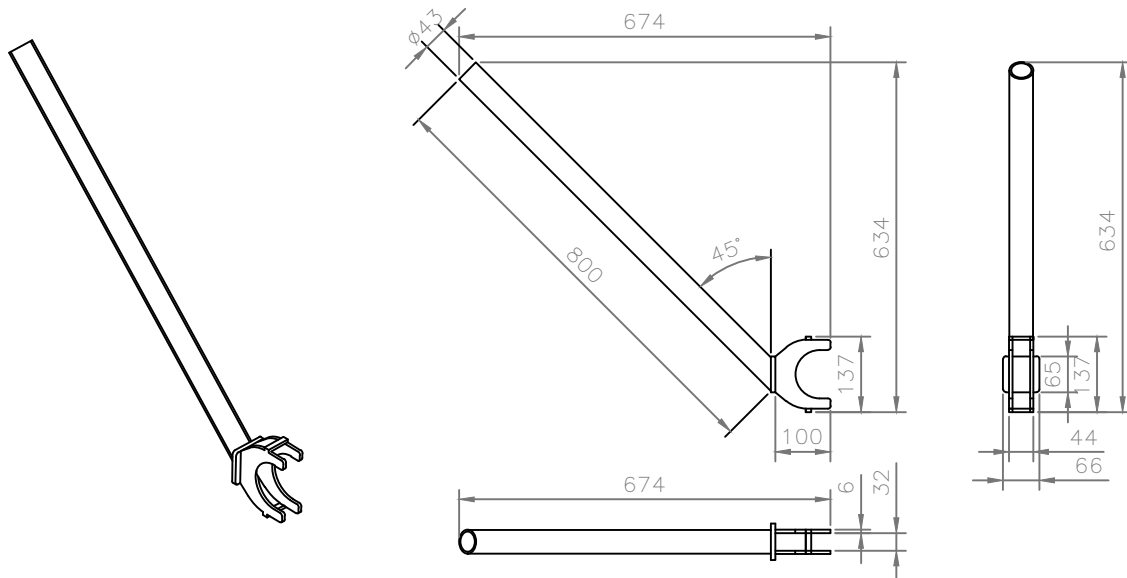
Safe working loads (SWL's)	
Axial load	10.0 kN

Description	Code	Material	Finish	Weight
Titan trolley	132100	Steel	-	124.0 kg

Considerations / Guidance:
All dimensions in this document are in (mm) unless stated otherwise.

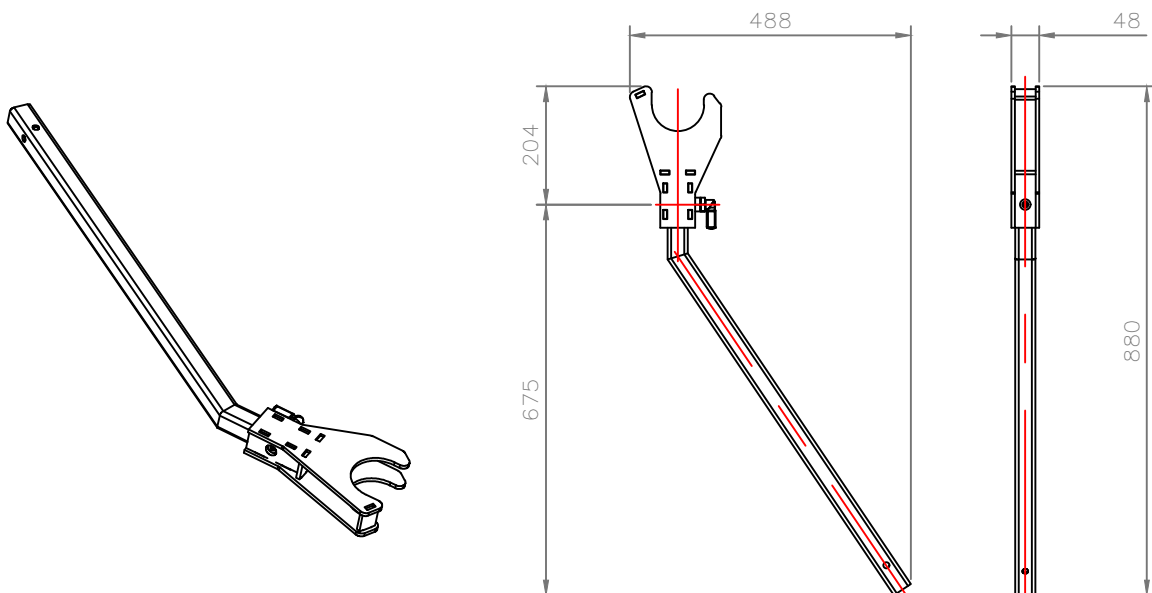
1.8.16 Titan spanner

The Titan spanner is used to release Titan screw jack when under load.



1.8.17 Next generation Titan spanner

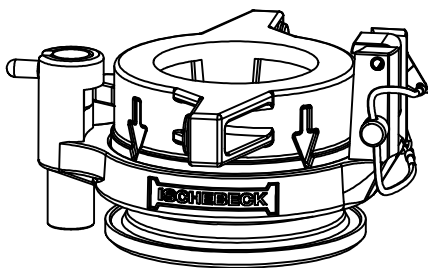
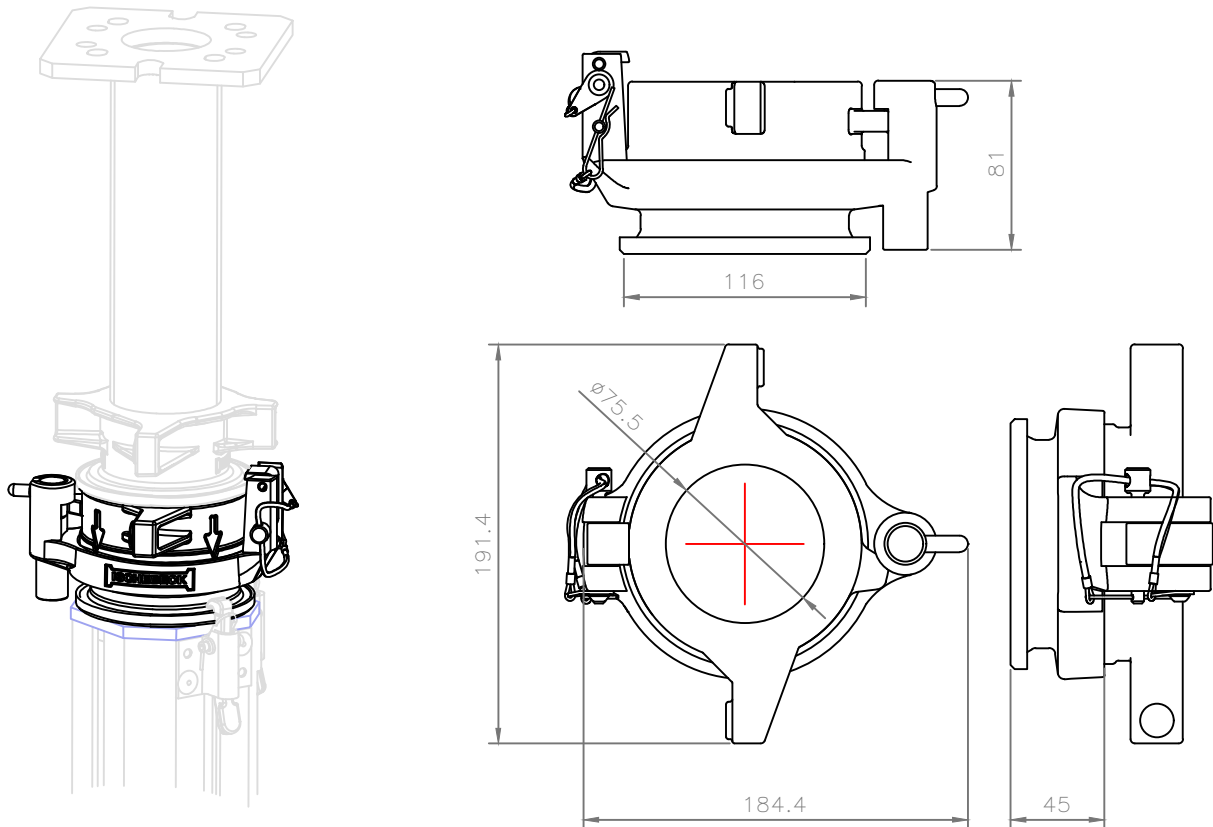
The next generation Titan spanner is used to release Titan screw jack when under load.



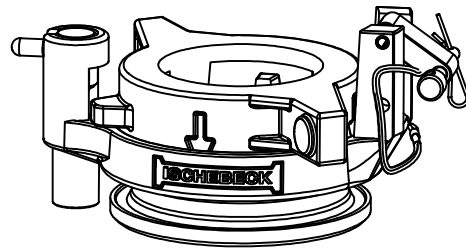
Description	Code	Material	Finish	Weight
Titan spanner	132200	Steel	-	4.35 kg
Next generation Titan spanner	-	-	-	4.7 kg

1.8.18 Titan quick strike

The Titan quick strike is used to easily release Titan screw jack when under high load and avoid striking cast collar when stripping Titan adjustable leg. Strike depth achievable is 11 mm.



Unstruck position

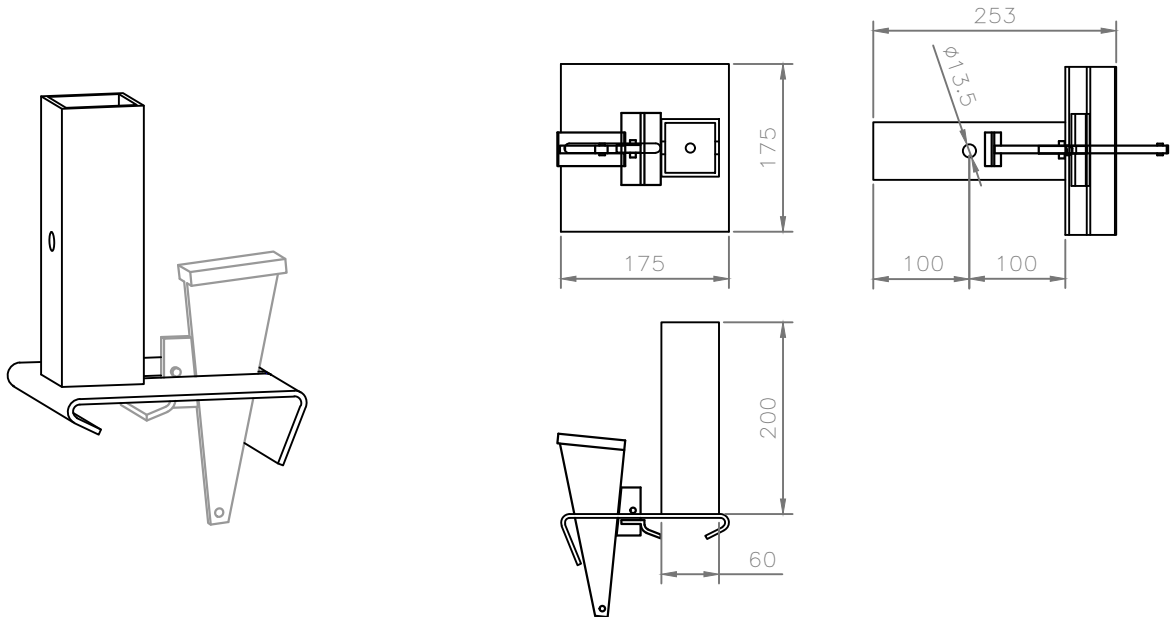


Struck position

Description	Code	Material	Finish	Weight
Titan quick strike	110901	-	-	3.8 kg

1.8.19 Titan adjustable aluminium beam bracket

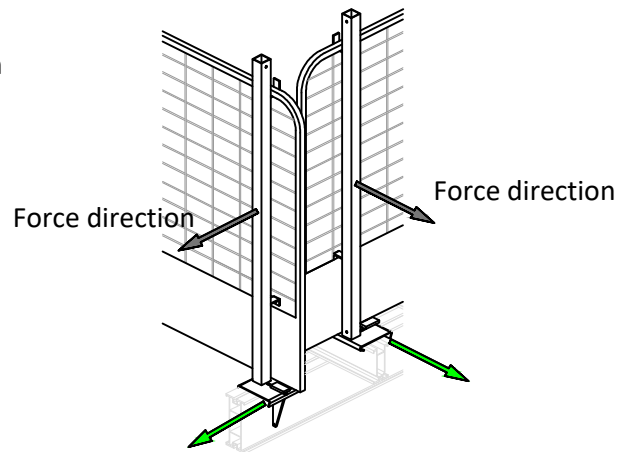
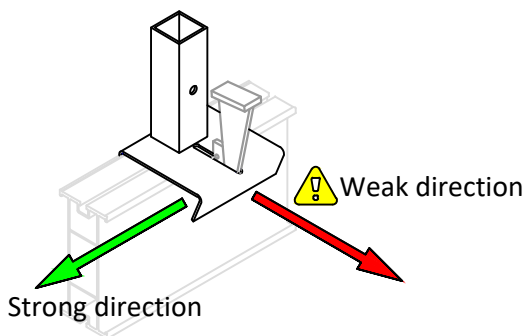
The Titan adjustable aluminium beam bracket fits onto either the T150 or T225 beams providing a fixing for the edge protection post onto the Titan beams. For more component information on Titan edge protection system (EPS), refer to Titan EPS Technical data sheet and method statement.



Loading Direction:

Do not position the beam bracket in the weak direction (beam running perpendicular to the direction of force).

The weak direction is indicated with the **red arrow**.



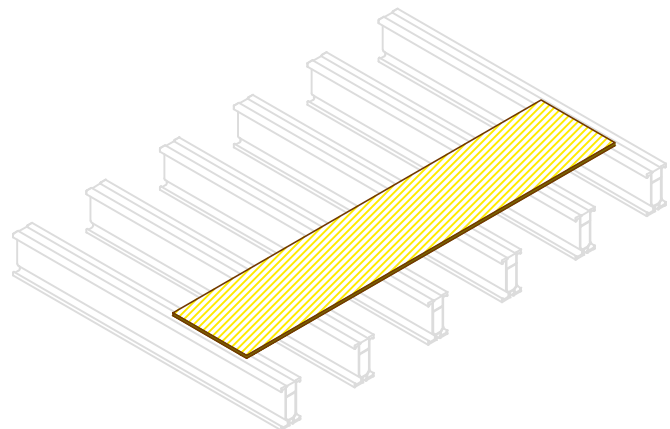
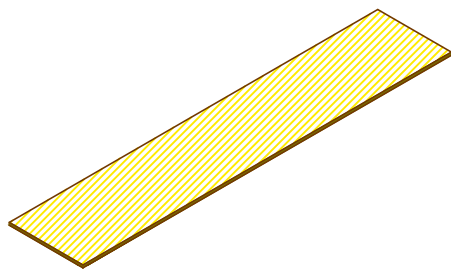
Beam bracket must be positioned so that any applied load on the EPS is parallel to the direction of the main beam. Do not bend beam in weak direction. This may mean fixing to primary and secondary beams as shown.




Description	Code	Material	Finish	Weight
Titan adjustable aluminium beam bracket	502201	-	-	2.5 kg

1.8.20 Titanply

The Titanply shuttering panels have a long life and high quality surface. With a slab thickness typically between 250 mm and 600 mm, there is a saving of approximately 20% of the total number of secondary beams required by using Titanply oppose to common plywood types currently available on UK sites.

For further technical data, refer to *Titanply Technical Data Sheet*.



-  Secondary (supporting) beams must always be parallel to the 500 mm board edge.
-  Cutting the board can allow water ingress which will affect board performance and optimum use.
-  Packing = 100 pcs/packet

Dimensions	
Panel thickness	21 mm
Panel length	2.5 & 3.0 m
Panel lengths (Non-UK item)	1.5 & 2.0 m

Properties	Soffit	Wall
Bending strength	17.28 N/mm ² *	18.52 N/mm ² *
Elastic modulus [E]	6920 N/mm ² *	7950 N/mm ² *
Bending stiffness [EI]	2.67 kNm ²	3.07 kNm ²
Moment capacity [M _c]	0.64 kNm	0.68 kNm
Shear capacity [qA]	5.3 kN	5.3 kN

* These are design figures derived from BS5268:2002 - Pt2

Description	Code	Material	Finish	Weight
2500 Titanply	-	-	-	9.45 kg/m ³
3000 Titanply	-	-	-	9.45 kg/m ³

2.0 SmartTITAN

2.1 Introduction

SmartTITAN is a 2D analysis programme in compliance with DIN EN 12812 & DIN EN 16031:201 (E). Ultimately, the programme determines the permissible safe working load (SWL) of a Titan aluminium Megashore leg for different Titan tower configurations at specific heights.

The new charts presented in this document and the SmartTITAN software supersedes any existing load charts in the UK, thus making all existing UK load charts obsolete.

2.1.1 Titan tower configuration

The Titan tower configurations are pre-determined leg make ups and ledger frame positions. Standard Titan tower configurations can be found on pages 49 - 51.

Titan tower configurations are listed with an array of safe working loads (SWL) relating to tower height. The engineer simply determines tower height (floor to soffit [m] - formwork deck [m]) required in their design and can select from a variety of Titan tower configurations for this specified height. For heights above 5.5m, freestanding unrestrained deck support, or for specific tower configurations not provided in this document, consult Ischebeck technical office for a SmartTITAN analysis to determine the SWL.

2.1.2 Improving permissible leg load

SmartTITAN has improved the capacity of the Titan support system by increasing the potential permissible safe working load of the Titan aluminium Megashore leg to 127 kN. In addition, SmartTITAN has increased the allowable jack extension under higher load which means in many cases extension pieces can be omitted.

The method of collecting permissible leg loads for different Titan tower configurations using the SmartTITAN software has been carried out with a standardised approach. Consequently, not every configuration in this document has been maximised to full capacity. Consult Ischebeck technical office for a SmartTITAN analysis to optimise schemes.

The collection of data from the SmartTITAN analysis for each Titan tower configuration can be improved upon by implementing / interpreting specific conditions. Consult Ischebeck technical office for a SmartTITAN analysis to improve SWL.

These specific conditions include:

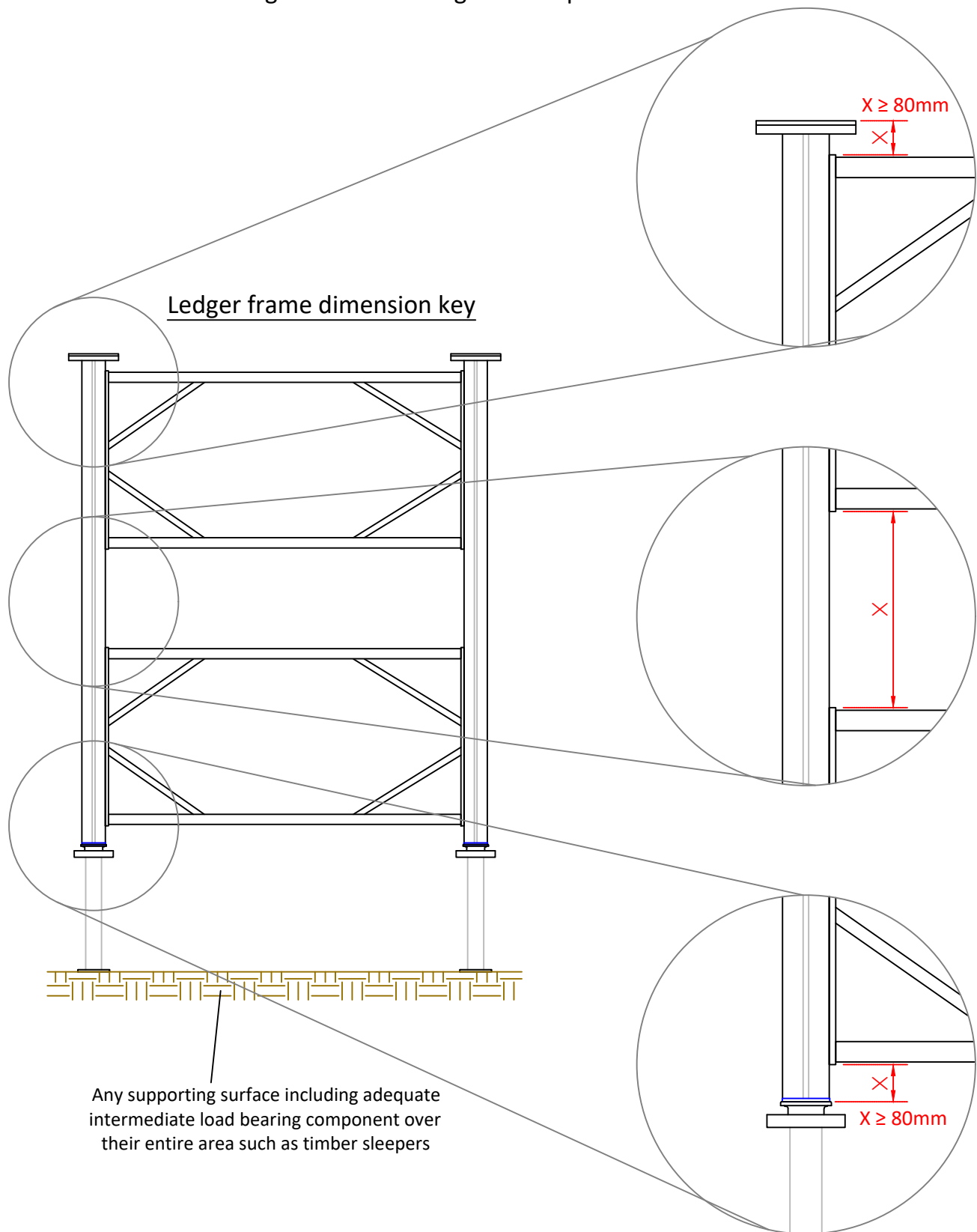
1. Changing the orientation of leg arrangement and positioning the jack at the top.
2. Changing the ledger frame size.
3. Creating a birdcage configuration instead of singular towers.
4. Laterally restraining singular towers at different height intervals.
5. Adjusting the ledger frame position by moving the ledger frames up/down.
6. Redistribution of loads.

Any changes to the Titan tower configuration such as altering the ledger frame position can have a positive or negative effect on the Titan tower capacity, thus increasing or decreasing the permissible leg load.

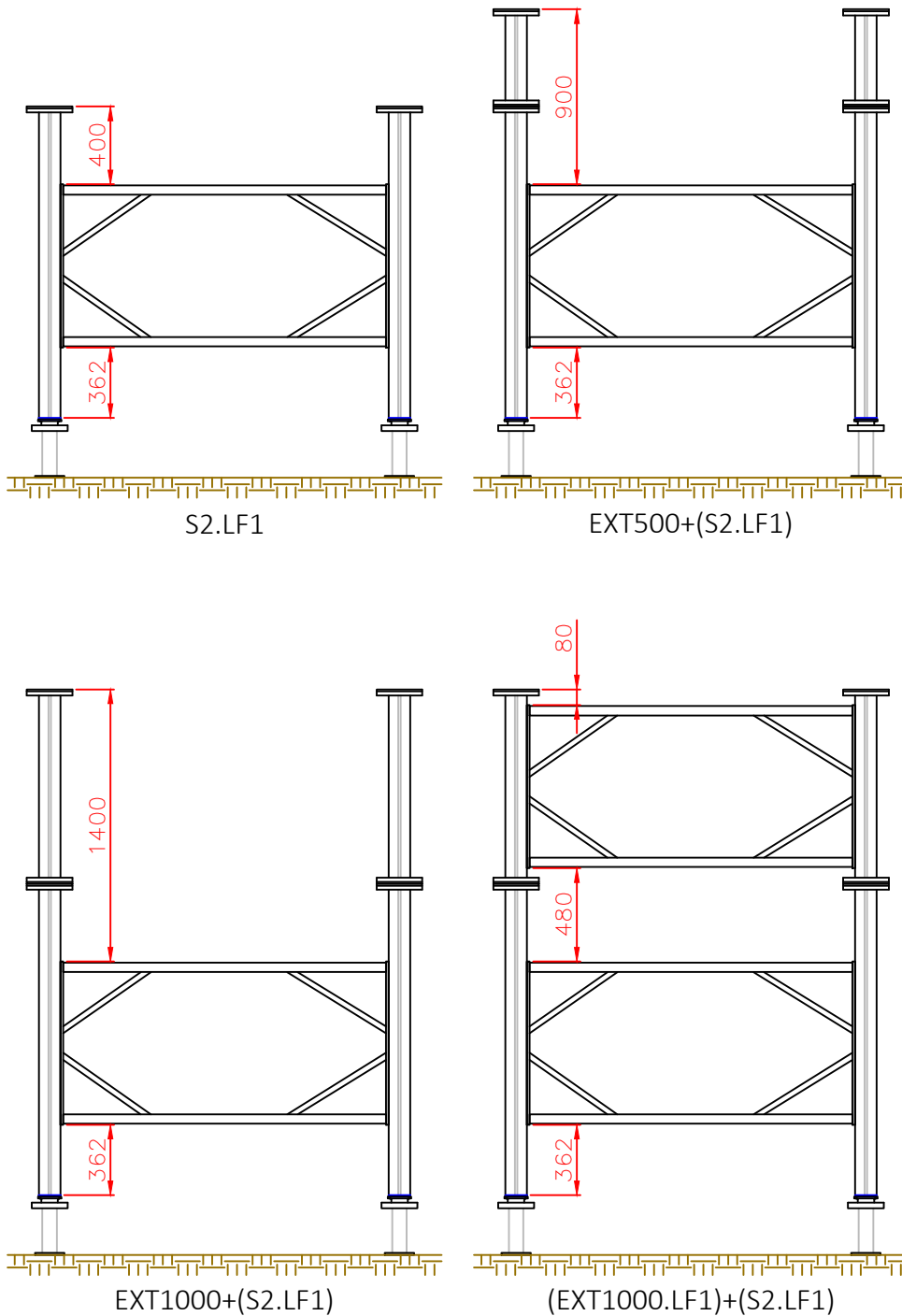
Therefore, any changes to the pre-determined singular towers found on pages 49 - 51 will void all the data presented in this document and will require separate SmartTITAN analysis to determine the permissible leg load.

The following data provided in this document was produced using the SmartTITAN software. For any additional information regarding SmartTITAN, refer to document - 'Certificate of Conformity'.

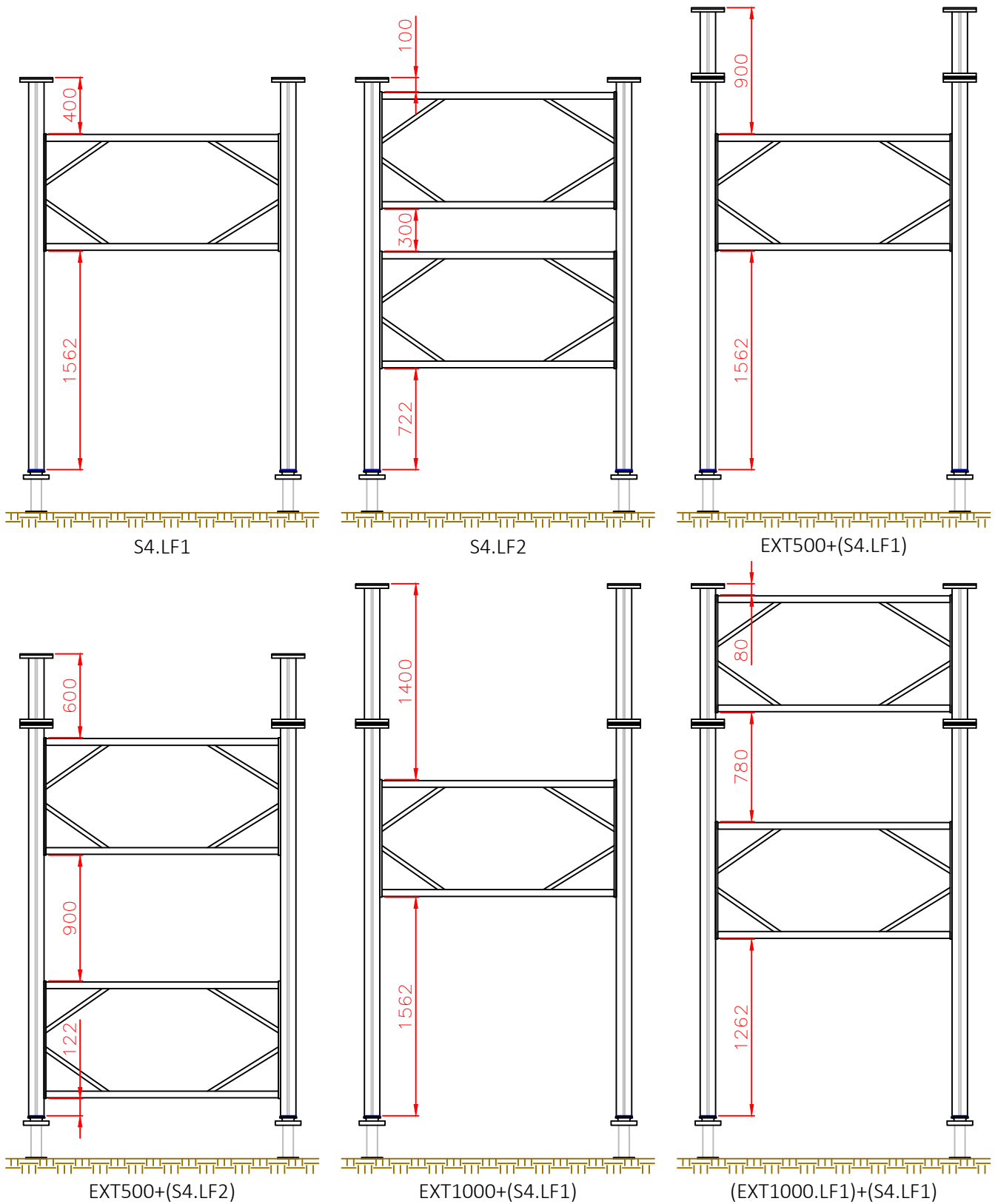
2.2 Titan tower configurations and ledger frame positions



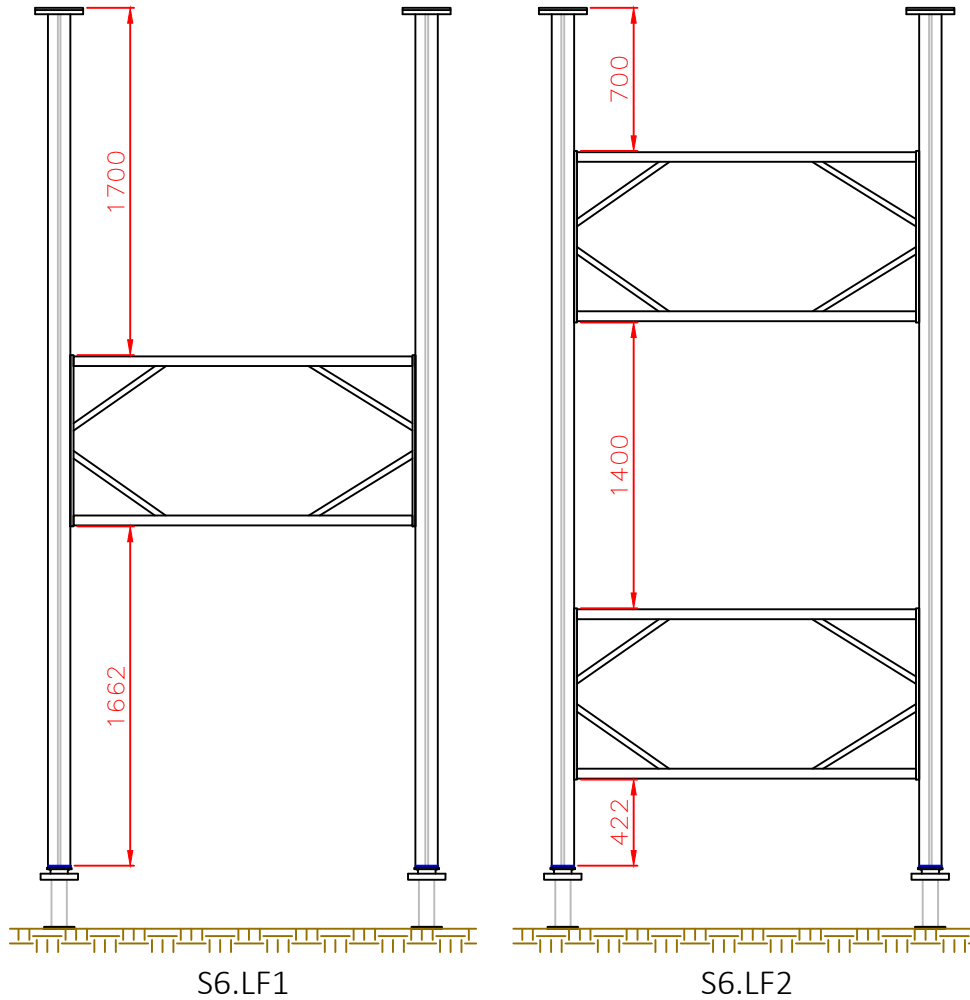
Size 2 Titan tower configurations



Size 4 Titan tower configurations



Size 6 Titan tower configurations



2.3 Titan load table guidelines

- SmartTITAN software has been utilised to calculate permissible leg loads at 300 mm jack extension intervals and values between have been interpolated.
- In the Titan load table, the tower height values are increments of 100mm jack extensions, thus are indicative of true dimension of tower configuration. For example: S2.LF1 with 1200 mm jack extension will have a tower height of 2810 mm and not 2800 mm as stipulated on Titan load table.
- Pre-determined ledger frame positions for each Titan tower configuration MUST be adhered to for these permissible loads to be achieved (see pg. 49 - 51 for pre-determined ledger frame positions). Altered tower configurations will require separate SmartTITAN analysis.
- First and last permissible safe working load (SWL) values for each tower configuration sequence will specify jack extension in the adjacent grey box. The SWL sequence increment equates to 0.1 m jack extension or 0.1 m tower height, however the last SWL value will indicate the maximum jack extension for that particular tower configuration.

For example: from extract below, first permissible SWL for J16.(S1.LF1) Fixed indicates a 0.4 m jack extension. Intermediate SWL values are increments of 0.1 m jack extension. The final SWL value indicates a jack extension of 1.29 m due to limitation of the jack extension.

Titan Leg Configuration	Tower Height [m]															
	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	
S2.LF1	0.1	127	127	127	127	126	126	126	126	126	121	117	112	107	1.29	
Jack extension (m)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.29			

2.3.1 Titan load table / graph assumptions

- In addition to using the charts, stability must be considered. Minimum height to base ratio of 3 : 1 for stability must be maintained and interpolated into Titan load table and graphs.
- Formwork must be restrained from horizontal movement at the formwork level. If this is not the case, horizontal restraint with tubular bracing to be designed accordingly and a separate SmartTITAN analysis will be required.
- Dynamic wind pressure of 0.2 kN/m² (working wind velocity pressure) has been utilised in SmartTITAN models to determine permissible leg load. If a higher dynamic wind pressure is required to simulate specific conditions on a project, a separate SmartTITAN analysis is required.

SmartTITAN software has calculated safe working loads of genuine ISCHEBECK TITAN components specified within this document. The use of non-genuine products will invalidate all specified safe working loads in all tables and graphs and could result in catastrophic failure. Please contact Ischebeck Titan if you would like help to check for genuine components.

2.4 Titan load table

Tower height ranging from 1.7m to 3.6m

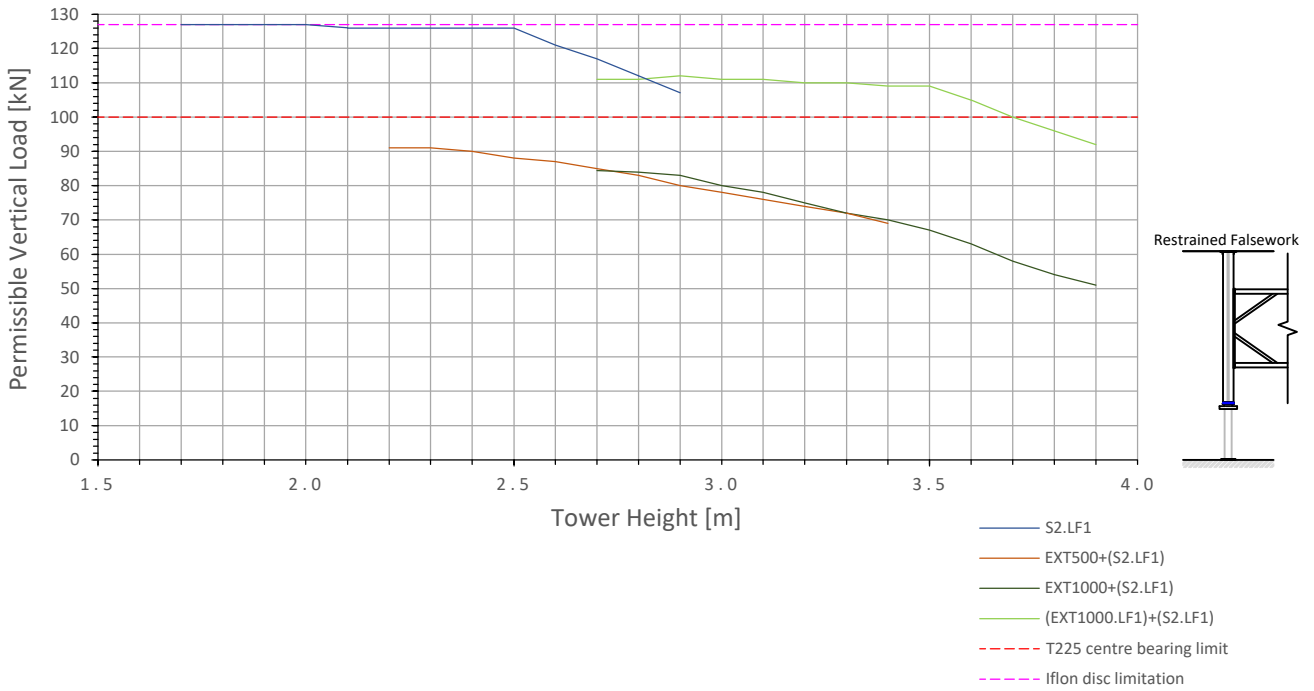
Titan Leg Configuration	Tower Height [m]																				
	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	
S2.LF1	0.1	127	127	127	127	126	126	126	126	126	121	117	112	107	1.29						
EXT500+S2.LF1						0.1	91	91	90	88	87	85	83	80	78	76	74	72	69	1.29	
EXT1000+S2.LF1											0.1	84	84	83	80	78	75	72	70	67	63
EXT1000.LF1+S2.LF1											0.1	111	111	112	111	111	110	110	109	109	105
S4.LF1													0.1	116	113	110	108	105	103	100	96
S4.LF2													0.1	125	125	125	122	118	115	111	106
EXT500+S4.LF1																		0.1	72	71	69
EXT500+S4.LF2																		0.1	82	81	80
EXT1000+S4.LF1																					
EXT1000.LF1+S4.LF1																					
S6.LF1																					
S6.LF2																					

Tower height ranging from 3.7m to 5.5m

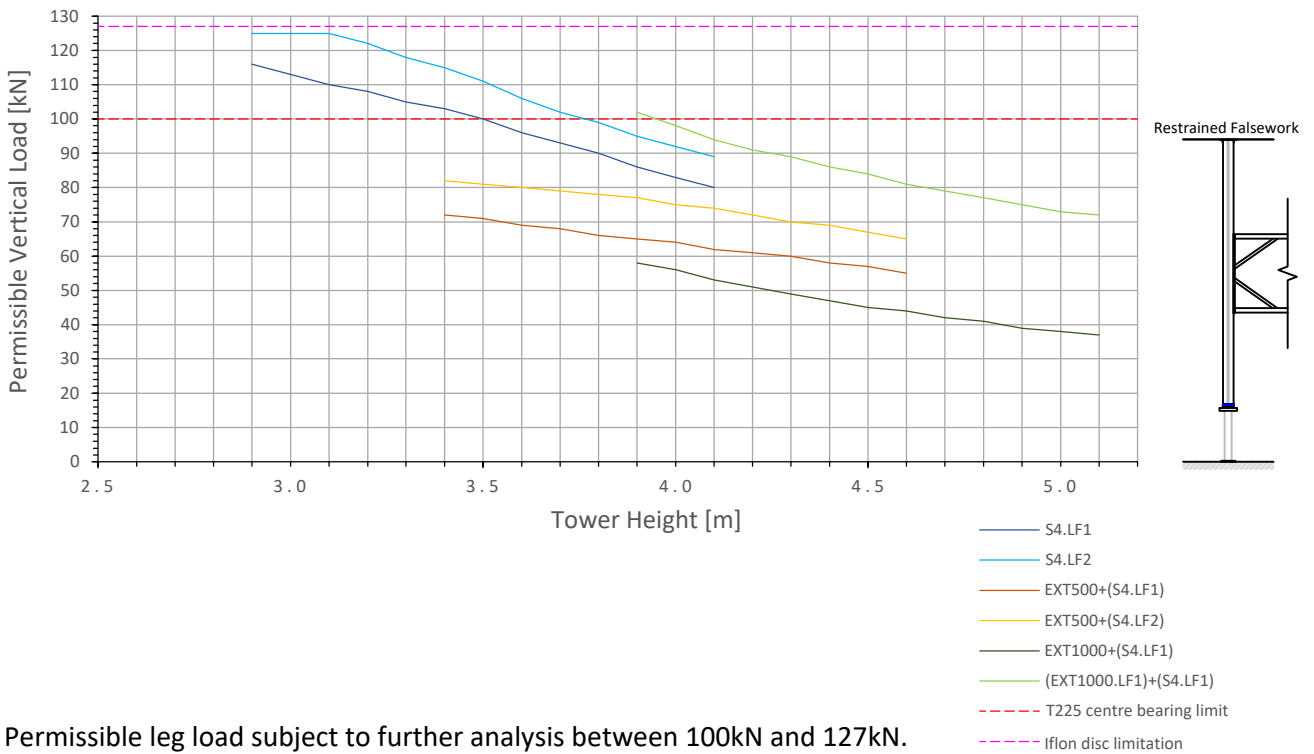
Titan Leg Configuration	Tower Height [m]																				
	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5		
S2.LF1																					
EXT500+S2.LF1																					
EXT1000+S2.LF1	58	54	51	1.29																	
EXT1000.LF1+S2.LF1	100	96	92	1.29																	
S4.LF1	93	90	86	83	80	1.29															
S4.LF2	102	99	95	92	89	1.29															
EXT500+S4.LF1	68	66	65	64	62	61	60	58	57	55	1.29										
EXT500+S4.LF2	79	78	77	75	74	72	70	69	67	65	1.29										
EXT1000+S4.LF1		0.1	58	56	53	51	49	47	45	44	42	41	39	38	37	1.29					
EXT1000.LF1+S4.LF1		0.1	102	98	94	91	89	86	84	81	79	77	75	73	72	1.29					
S6.LF1						0.1	54	53	51	49	47	45	43	42	40	39	37	36	35	1.29	
S6.LF2						0.1	86	85	83	81	79	77	74	72	69	66	62	59	56	1.29	

2.5 Titan load graphs

Size 2 configurations: Jack facing support



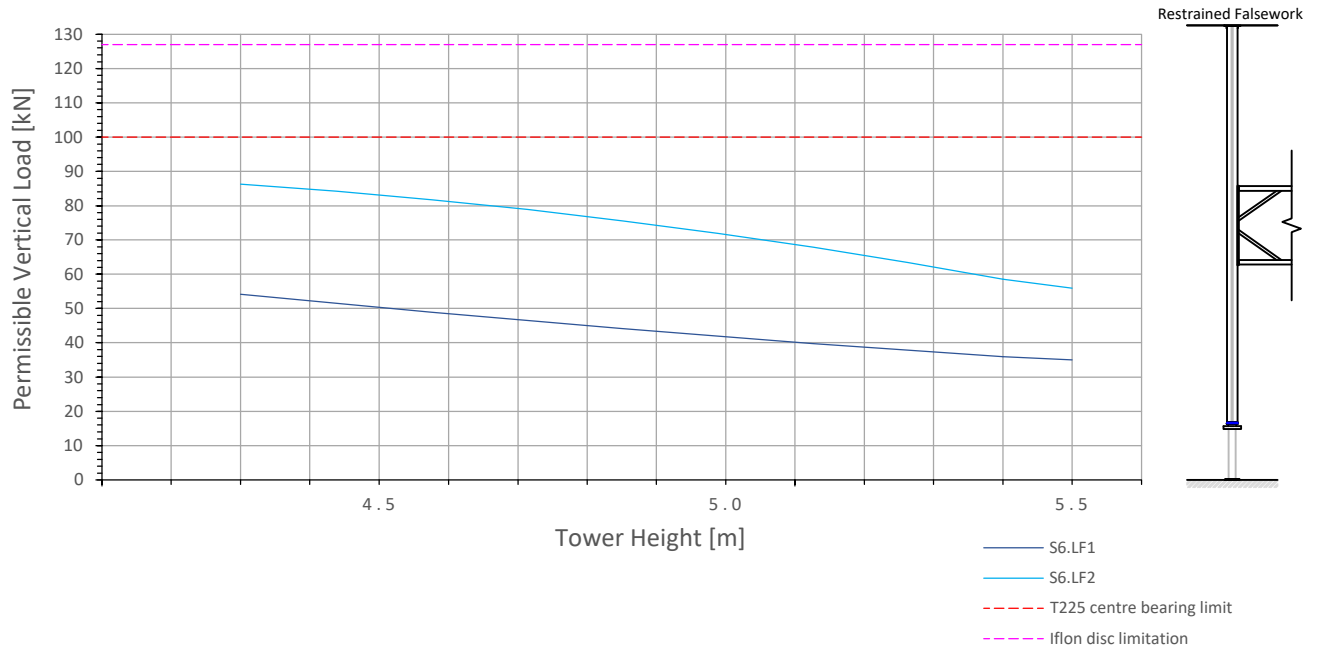
Size 4 configurations: Jack facing support



Permissible leg load subject to further analysis between 100kN and 127kN. Contact Technical department.

Titan load graphs

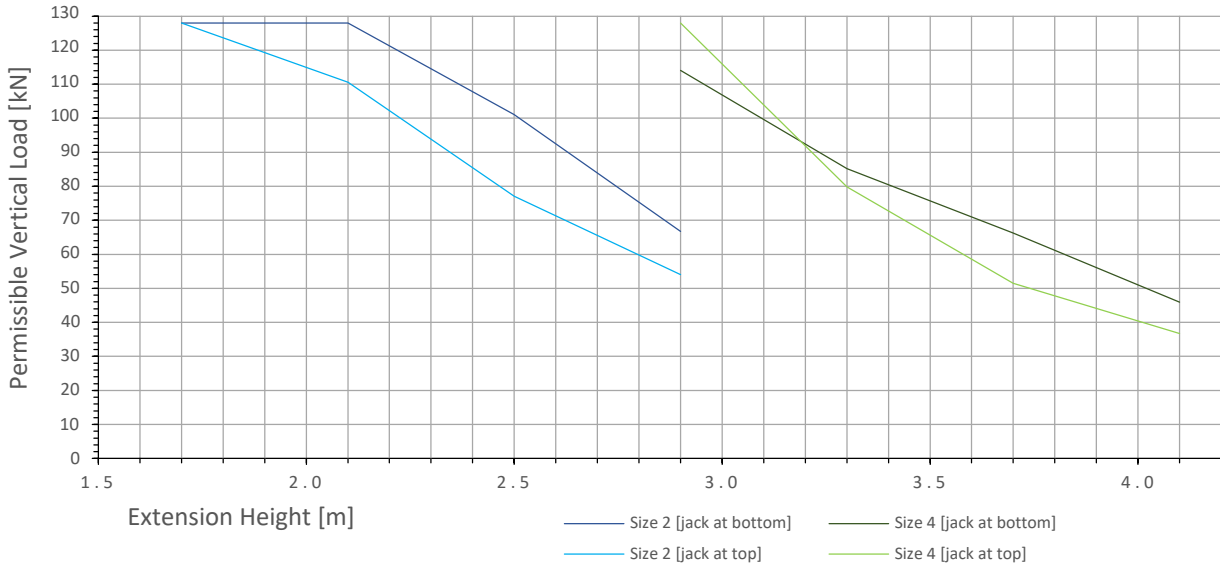
Size 6 configurations: Jack facing support



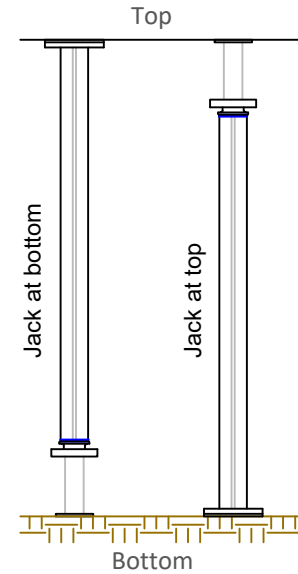
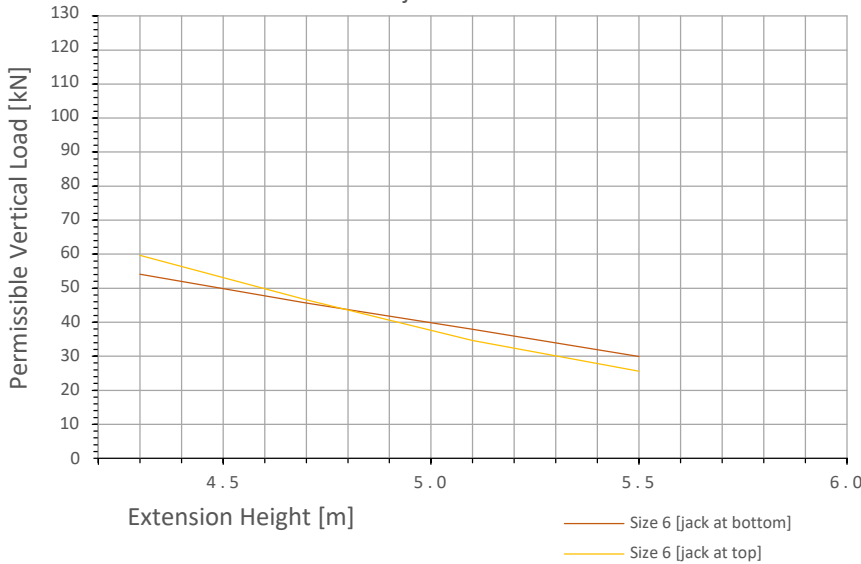
Permissible leg load subject to further analysis between 100kN and 127kN. Contact Technical department.

2.6 Titan load table / graphs for single Titan adjustable leg

Single Titan adjustable aluminium leg SWL depending on screw jack extension



Single Titan adjustable aluminium leg SWL depending on screw jack extension



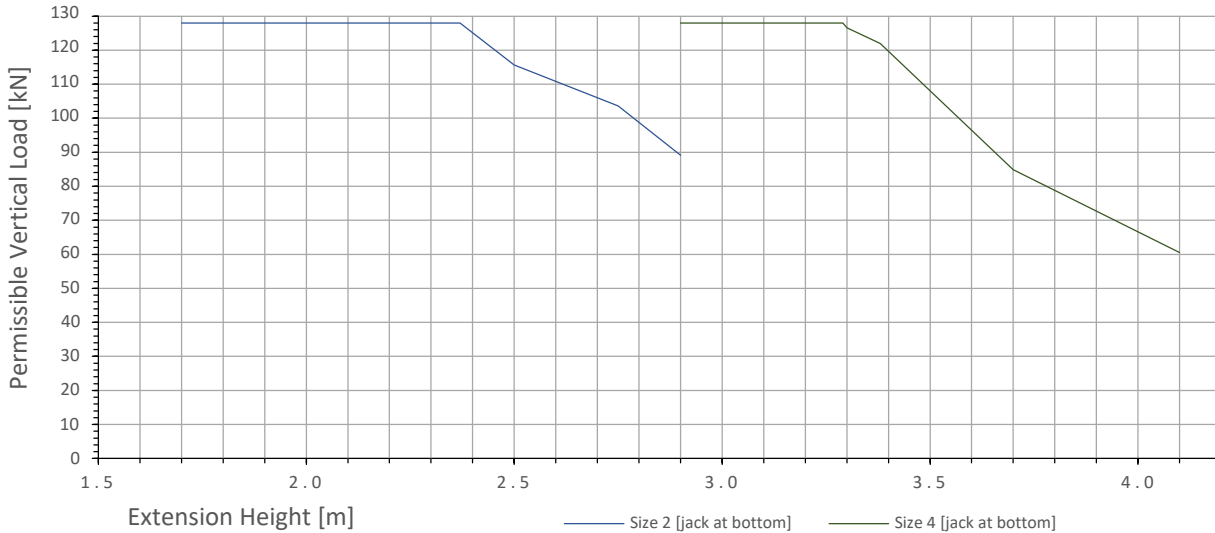
Head and base plate must be in direct contact with supporting surface or load bearing component over their entire area. Non-rigid intermediate layers such as timber boards are not permitted.

Refer to Friedr. Ischebeck GmbH 'TITAN aluminium Megashore leg Data sheets: single legs under defined application conditions' for further information.

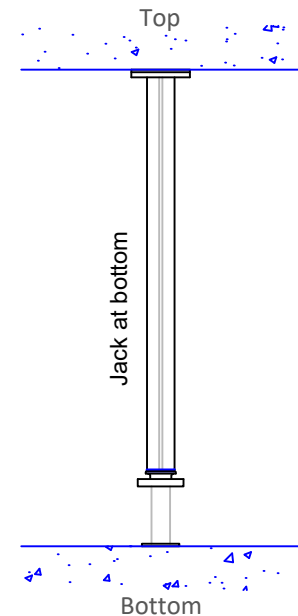
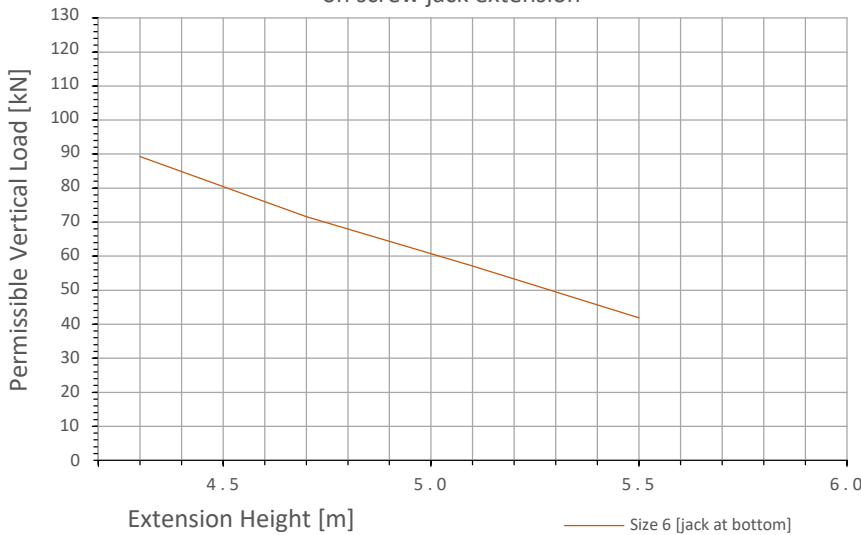
Titan Leg Configuration	Tower Height [m]										
	1.7	2.1	2.5	2.9	3.3	3.7	4.1	4.3	4.7	5.1	5.5
Size 2 [jack at bottom]	128.0	128.0	101.1	66.7							
Size 2 [jack at top]	128.0	110.6	77.1	54.0							
Size 4 [jack at bottom]				114.1	85.2	66.3	45.9				
Size 4 [jack at top]				128.0	79.8	51.5	36.7				
Size 6 [jack at bottom]								54.1	45.6	37.9	29.9
Size 6 [jack at top]								58.7	46.6	34.6	25.6

2.7 Titan load table / graphs for single Titan adjustable leg for back propping

Single Titan adjustable aluminium leg for direct support of adequately rigid superstructure (back propping), SWL depending on screw jack extension



Single Titan adjustable aluminium leg for direct support of adequately rigid superstructure (back propping), SWL depending on screw jack extension



Head and base plate must be in direct contact with supporting surface or load bearing component over their entire area. Non-rigid intermediate layers such as timber boards are not permitted.

Titan Leg Configuration	Tower Height [m]														
	1.7	2.1	2.37	2.5	2.75	2.9	3.29	3.3	3.38	3.7	4.1	4.3	4.7	5.1	5.5
Size 2 [jack at bottom]	128.0	128.0	128.0	115.7	103.6	89.1									
Size 4 [jack at bottom]						128.0	128.0	126.6	122.0	84.9	60.5				
Size 6 [jack at bottom]												89.3	71.6	57.1	41.9

Refer to Friedr. Ischebeck GmbH 'TITAN aluminium Megashore leg Data sheets: single legs under defined application conditions' for further information.

FRIEDR. ISCHEBECK GMBH

Founded in Germany over 130 years ago, Ischebeck is one of the world's principal manufacturers of formwork and falsework systems. Renowned internationally for its Titan Support system, the group has a long standing tradition of innovation and engineering excellence. Product quality is a hallmark of the group and the company's manufacturing facilities are amongst the most advanced of their type.

Ischebeck Titan Limited

Ischebeck Titan is a leading supplier of formwork, falsework, safety systems and ground engineering solutions. The company operates from headquarters centrally located in the heart of the U.K and has a team of product specialists ready to assist you with your concrete construction project.

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The company's Technical Services Division can provide a full drawing and structural analysis service using the latest computerised software.

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