TECH DATA REF: PROPPING

PRODUCT: TILT PROPS

REFERENCE: TDP05-PAGE 1

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TECHNICAL DATA

STEEL TILT PROPS

Introduction

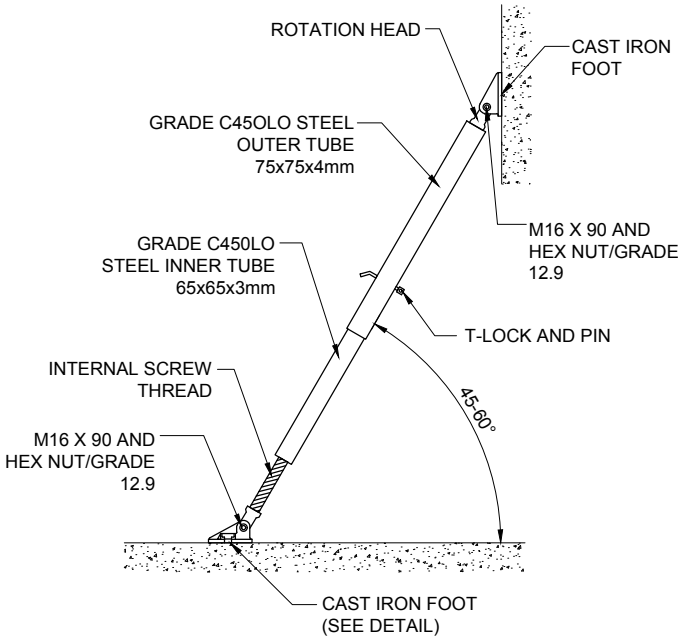
The Shore Hire range of steel push pull braces has been developed to meet the current demands and advances of tilt-up slab and precast wall construction. With a series of tilt brace props covering a length range of 1.0m to 10.1m, the steel tilt brace suits the majority of load applications in tilt-up panel construction. The following is the range of characteristics associated with our steel tilt braces:

1. Safe and economical system for temporary support of concrete panels and concrete elements until secured into the permanent structure.
2. Compliance plate with manufacturer, WLL test number and WLL at each extension displayed.
3. Versatile and easy to install. Quick connections saves time and labour expense.
4. Tilt props are designed, tested and rated in accordance with the following Australian Standard: AS 3850: 2003 - TIlt-up concrete construction

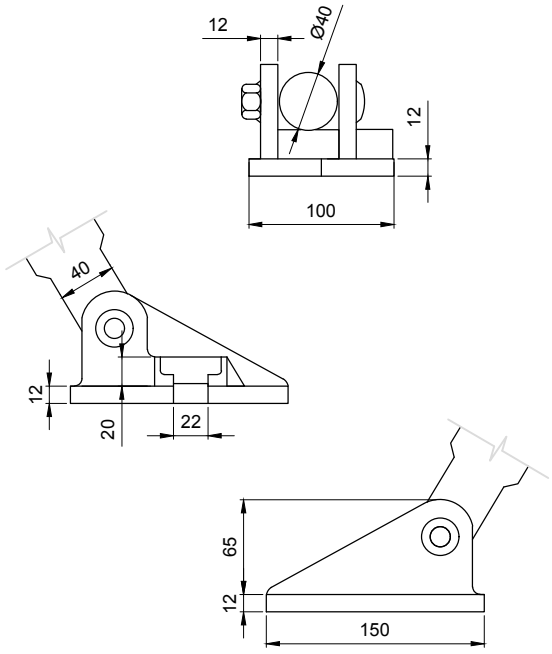
Technical Specifications

The following is the list of components and associated specifications:

1. Both the inner and outer SHS tubes of the telescopic brace are type C450LO Grade steel in accordance with AS 1163.
2. Both the inner and outer tubes are duragal surface finished in accordance with coating class ILG100 of AS 4792: hot dip galvanised coatings on ferrous hollow sections.
3. The foot is a casting ductile iron FCD45 to JIS Grade SC-450 and ISO Grade 450W.
4. The locking pin is manufactured from grade 4140 bar.



STEEL TILT PROP



FOOT DETAILS

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TECHNICAL DATA

ALUMINIUM TILT PROPS

Introduction

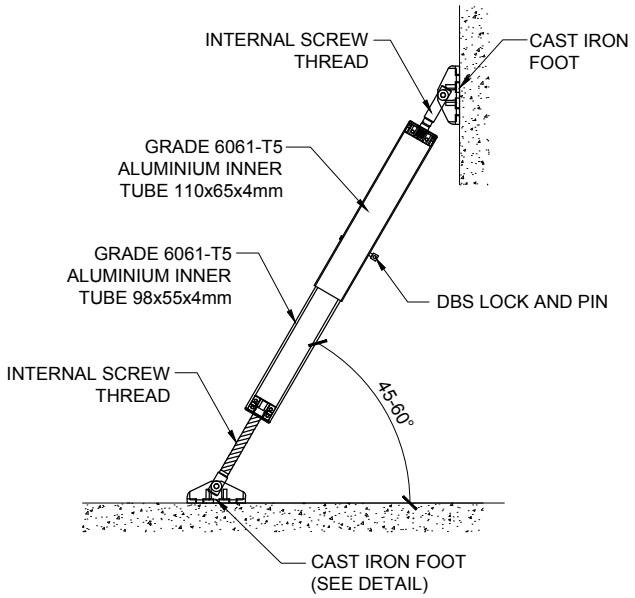
Shorehire have created a lightweight, safe and simple alternative to the traditional precast panel brace. Designed and manufactured in Australia, Our braces are specifically designed to meet the Australian standards and safety. Our braces are 33% lighter that the traditional steel panel brace, manufactured using anodised aluminium, they are colour coded for safety and easy identification and their lengths range from 1.2m to 10.4m. the following is the range of characteristics associated with our aluminium tilt brace:

1. Safe and economical system for temporary support of concrete panels and concrete elements until secured into the permanent structure.
2. Compliance plate with manufacturer, WLL test number and WLL at each extension displayed.
3. Versatile, lightweight and easy to install. Quick connections saves time and labour expense.

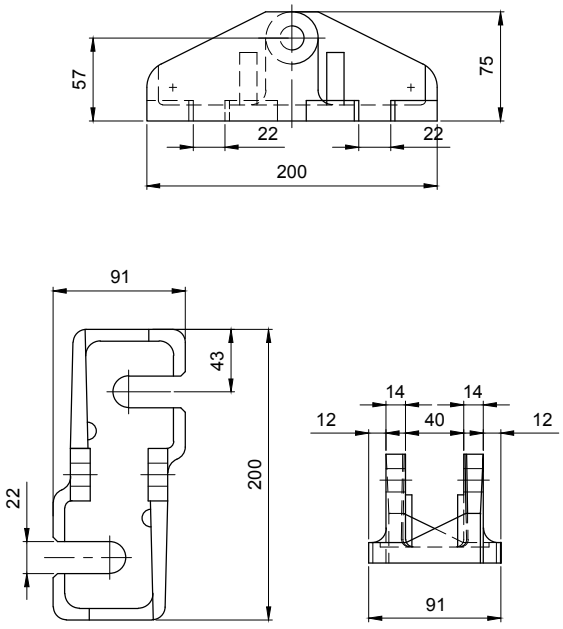
Technical Specifications

The following is the list of components and associated specifications:

1. Both the inner and outer extrusions of the telescopic brace are type 6061-T5 Grade aluminium in accordance with AS 1664.
2. TIlt props are designed, tested and rated in accordance with the following Australian standard: AS 3850: 2003 - tilt-up concrete construction.
3. The foot is a casting ductile iron FCD45 to JIS grade SC-450 and ISO grade 450w.
4. The DBS locking pin is manufactured from grade 4140 bar.



ALUMINIUM TILT PROP



FOOT DETAILS

TECH DATA REF: PROPPING

PRODUCT: TILT PROPS

REFERENCE: TDP05-PAGE 3

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TECHNICAL DATA

Design Stage

An appropriately qualified professional engineer should assess each design specifically in accounting for the following:

1. The size of brace for each concrete element according to the loads, type and size of concrete element and wind rating of the site.

2. The type of connection for the brace to the concrete element and the brace to the dead-man, slab or footing at the base.

3. The type of structure that the bottom foot of the brace is attached to. This could be a dead-man, slab or footing.

4. The position of the top and bottom brace connections and the strength of the concrete of the substrate at both locations.

Design Considerations for Bracing A Concrete Element

The designer must analyse all limit states, strength considerations and failure mechanisms.

1. Brace strength:

A number of components contribute towards a braces' capacity.

- Connection to the propped element.
- Connection to the deadman / slab or footing.
- Brace pin.
- Welds on the brace.
- Brace foot bolt.

2. Concrete strength:

If the concrete ruptures it will cause the bottom or top connection to fail.

The concrete strength must have the capacity to withstand the brace load.

- Concrete compressive strength mPA 15 20 25 30
- Multiplying factor 0.68 0.79 0.88 0.97

3. Design for brace strength:

Select the appropriate brace to match the total proportional load imposed from the propped the element. When a knee brace is installed with a brace, consideration must be given to the working load limit (wll) of both brace & knee brace.

4. Design for concrete strength:

Correctly installed braces transfer the applied load to the concrete element. Should the applied load exceed the brace capacity and concrete strength, the connection will fail and the concrete element will fail. Extra reinforcement or increased concrete strength may be required to prevent connection failure. A Design Engineer must account for propping loads in the temporary state when specifying reinforcement details.

5. Connection limit state:

The WLL of the specified connections between the concrete element and the brace must be sufficient to withstand the factored load. This connection could be a cast in ferrule and high tensile bolt or a mechanical expansion anchor. When a mechanical expansion anchor is used the ultimate load limit must be 1.5 times the brace design. Factoring is not required when the working load limit of the anchor is used in calculations.

6. Brace anchoring limit state:

The WLL of the specified base support for the brace must be sufficient to withstand the factored load on the brace. This could be a deadman specifically poured for the job or existing slab or footing. A Design Engineer must specify the brace anchoring system.

ALUMINIUM TILT PROPS

ITEM	WEIGHT	CLOSED	EXTENDED	RATING CLOSED (WLL)	RATING EXTENDED (WLL)
F1	15kg	1.2m	2.0m	35kN	25kN
F2	20kg	2.0m	3.4m	35kN	25kN
F3	24kg	2.4m	4.0m	35kN	25kN
F5	29kg	3.4m	5.1m	35kN	25kN
F6	36kg	4.4m	6.9m	25kN	18kN
F7	42kg	5.1m	8.4m	25.3kN	13.1kN
F8	52kg	6.4m	10.4m	21.6kN	12.9kN

STEEL TILT PROPS

ITEM	WEIGHT	CLOSED	EXTENDED	RATING CLOSED (WLL)	RATING EXTENDED (WLL)
TR MINI A	20kg	1.0m	1.6m	35kN	30kN
TR MINI B	22kg	1.2m	1.8m	35kN	30kN
MINI	38kg	2.6m	4.4m	35kN	30kN
STANDARD	53kg	4.4m	6.7m	35kN	14kN
JUMBO	76kg	6.4m	10.1m	25kN	6kN

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TECHNICAL DATA

Installation Process

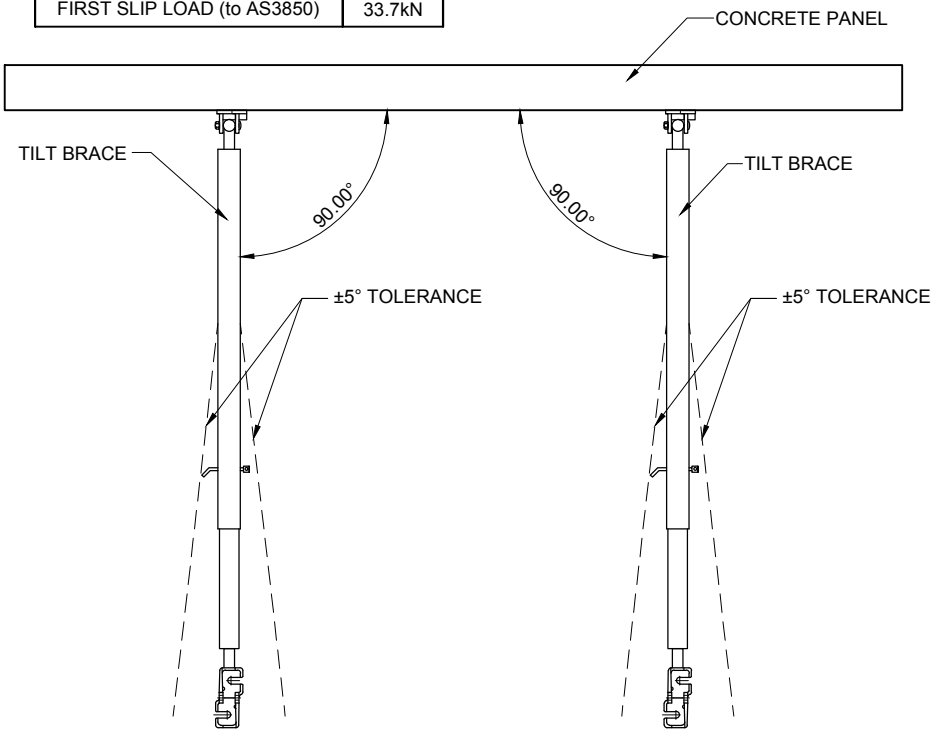
A typical installation procedure is as follows:

1. Attach the top foot of the brace to the concrete element before it is lifted into place.
2. Pull the inner and outer sleeve apart to the specified length.
3. Insert the pin through the position holes in the inner and outer sleeves of the brace and lock the pin so that it cannot be removed.
4. Attach a guide rope and or place the brace foot on a prop dolly to control the brace throughout the placement.
5. When the concrete element is placed into position the bottom foot of the brace is attached to the brace support structure. (dead-man, slab or footing).
6. Ensure that the foot is in line with the body of the brace to prevent rotation.
7. Wind the bottom thread to adjust the length of the brace so that the concrete element is plumb.
8. Ensure the line of all braces are placed 90˚ (+/- 5˚) to the supported panel and at an angle between 45˚ and 60˚ to the horizontal.
9. Shore Hire supply an approved M20 brace bolt mechanical anchor developed to comply with the requirements of AS 3850 and developed specifically for tilt up concrete applications. Set out table below are the technical specification details.

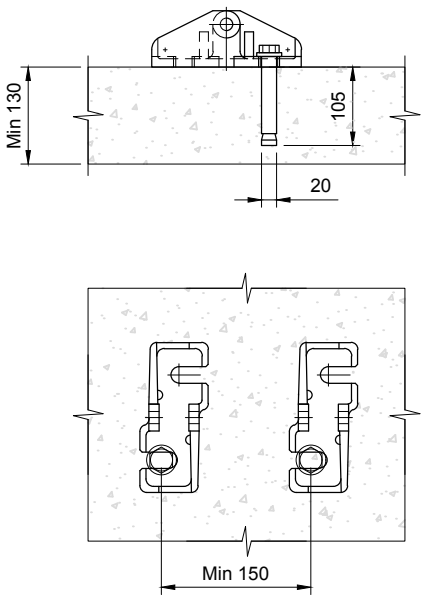
M20 BRACE BOLTS	
BOLT	M14 G8.8
INSTALLATION TORQUE	150Nm
HOLE Ø REQUIRED	20mm
HOLE DEPTH	105mm
EFFECTIVE DEPTH	90mm
MIN CONCRETE THICKNESS	130mm
SHEAR WLL	30kN
TENSILE WLL (to AS3850)	22kN
FIRST SLIP LOAD (to AS3850)	33.7kN

M20 BRACE BOLTS	EDGE DISTANCE OR ANCHOR SPACING (mm)				
	>300	250	200	150	<150
TENSILE EDGE DISTANCE FACTOR	1.0	0.98	0.83	0.70	NOT RECOMMENDED
SHEAR EDGE DISTANCE FACTOR	1.0	0.86	0.71	0.64	NOT RECOMMENDED
TENSILE AND SHEAR SPACING FACTOR*	1.0	0.99 / **0.98**	0.89 / **0.78**	0.79 / **0.59**	NOT RECOMMENDED

***VALUES IN BOLD WHERE ADJACENT ANCHORS ON 2 SIDES**



PLAN VIEW OF THE TILT BRACE SET-UP



M20 BRACE BOLT CONNECTION REQUIREMENTS