Industrial Aluminium Towers

DOUBLE WIDTH LADDERSPAN & VERTICAL LADDER ASSEMBLY GUIDE

TO BS-EN 1004-2004

Using the 3T (Through the Trap) Assembly method

Using 2 rung frames (Recommended)

HORIZONTAL BRACE
1.8m (2040)
2.7m (2041)

TOE BOARD
1.8m (2066)
2.7m (2068)

4 RUNG LADDER FRAME (2213)

LADDERSPAN TRAP PLATFORM
1.8m (2201)
2.7m (2202)

2 RUNG LADDER FRAME (2215)

5 RUNG LADDER FRAME (2212)

STABILISERS (2065) or (2057)

ADJUSTABLE CASTORS (2230)

Using guardrail frames

HORIZONTAL BRACE
1.8m (2040)
2.7m (2041)

TOE BOARD
1.8m (2066)
2.7m (2068)

4 RUNG MAIN FRAME (2002)

MAIN PLATFORM
1.8m (2043)
2.7m (2044)

DIAGONAL BRACE
2.7m (2041)
3.3m (2042)

TOE BOARD
1.8m (2066)
2.7m (2068)

4 RUNG LADDER FRAME (2213)

DIAGONAL BRACE
2.7m (2041)
3.3m (2042)

MAIN PLATFORM
1.8m (2043)
2.7m (2044)

4 RUNG MAIN FRAME (2002)

MAIN PLATFORM
1.8m (2043)
2.7m (2044)

4 RUNG LADDER FRAME (2213)

5 RUNG LADDER FRAME (2212)

STABILISERS (2056) or (2057)

ADJUSTABLE CASTORS (2230)

COMPONENTS:-

DOUBLE WIDTH LADDERSPAN
(1.8m & 2.7m LONG) WITH 5 RUNG OR 4 RUNG STARTER FRAMES

Distributed by:-

Alto Tower Systems Ltd
Unit 6 Nash Road
Redditch
Worcestershire
B98 7AS
08451 77 66 44
www.alto-towers.co.uk
1. These towers should be built by at least 2 competent persons. Check you have the correct equipment & it is in working order. Apply brakes & fit adjustable castors into both 5 rung frames ensuring that spring loaded pin is engaged in hole provided (see detail 1A).

2. Make sure pegs on frame head fitting always point towards middle of tower (2B). Fit two short horizontal braces to vertical tubes of 5 rung ladder frame, ensuring spring loaded pin faces outwards (2A). Repeat process with 5 rung frame at the other end.

3. Fit two long braces diagonally in opposite directions as close to the vertical tube as possible. Fit a temporary platform on the 3rd rung down from the top of the frame, working through the trap fit short braces as temporary guardrails horizontally onto top & 2nd rung of frames between pegs provided. Level the tower by adjusting collar on castors (see construction notes).

4. Fit appropriate stabilisers (see schedule on back page) to each corner of the tower to increase the effective base dimensions A & B. They must be fitted so that when viewed from above the largest square is formed. Ensure the wing nuts are tight so that it is not possible to move stabilisers without slackening the wing nuts.

5. Working from platform add a 4 rung ladder frame to the 5 rung ladder frame by locating onto head fitting with peg engaging into hole provided. Repeat the process at the other end using a 4 rung main frame.

6. Work from a temporary platform add a 2 rung ladder frame to the 5 rung ladder frame by locating onto head fitting with peg engaging into hole provided. Add a trap platform on the 3rd rung down and working through the trap fit short braces horizontally on top rung of frames between pegs provided & 2 on first rung down over outside pegs.

7. Working from the guarded platform locate a trap platform with the trap opening adjacent to the ladder on the 3rd rung down from the top of the tower. Working through trap, fit short braces horizontally as guardrails, continue building the tower repeating the bracing pattern until the required platform height is reached. Continue onto box 12, 13 or 14 (whichever is applicable).

8. Working from a temporary platform add a 2 rung ladder frame to the 5 rung ladder frame by locating onto head fitting with peg engaging into hole provided. Repeat the process at the other end using a 4 rung main frame. Add a diagonal brace to the top rung of the 2 rung on one side of the tower.

9. Fit short braces on the top 2 sets of rungs to form guardrails as before. Remove the current temporary platform & relocate onto 5th rung of the base frame.

10. Working from platform add a 4 rung ladder frame to 2 rung ladder frame by locating onto head fitting with peg engaging into hole provided. Repeat the process at the other end using a 4 rung main frame. Fit two braces diagonally in opposite directions as close to the frame vertical tubes as possible.

11. Fit a trap platform on third rung down from top of frame and working through trap fit short braces horizontally on top rungs of frame between pegs provided. Still using a platform & braces to aid safe erection, continue building the tower repeating the bracing pattern until the required platform height is reached.

12. TOWERS FINISHING WITH 4 RUNG FRAMES.
Erect as shown up to (7 or 11), then:- Still using a platform & braces to aid safe erection fit platform on the 3rd rung down in the same way as shown in (11). Working through the trap, fit 2 short braces horizontally on to top rung of frames between pegs provided & 2 on first rung down over outside pegs.
CONSTRUCTION NOTES

1. Follow the erection manual to ensure that the correct erection procedure is used.

2. Ensure that sufficient equipment is available to construct the tower and is in working order.

3. Do not extend castor jacks more than is necessary to level the tower. Adjustable swivel base jacks are available for use on stepped, steeply sloped or soft ground conditions.

4. Use a Spirit level to check that the tower is upright.

5. The peg on the head fitting must always point inwards.

6. Fit the first two horizontal braces to the vertical frame tube. This prevents the frame from falling over during erection and dismantling.

7. All diagonal braces are fitted as close as possible to the upright.

8. Observe all height limits (fig.5) and fit stabilisers to increase the safe working height to the tower. Towers may also be tied to a suitable rigid structure using standard scaffolding tubes and fittings (see tying in).

9. Fit toeboards to all working platforms and ensure that all platforms are adequately guarded.

10. The dismantling sequence is the reverse order of the erection process.

11. For special or unusual applications contact your supplier for further technical data sheets and expert advice.

12. During erection and dismantling any temporary platform used for building the tower, should be treated as a working platform with guard rails at 0.5m and 1.0m above platform.

TYING IN

NOTE: Arrangement shown in fig. D is considered to be a friction device and should not exceed 1/2 the total number of scaffold ties in any area.

When friction devices are used the connection to the scaffold must be made onto both vertical uprights. Ties should be at no more than 4m intervals.

Beware of high winds: If high winds are forecast do not erect the tower or leave up overnight.

<table>
<thead>
<tr>
<th>Wind Description</th>
<th>Beaufort-Scale</th>
<th>Beaufort-No.</th>
<th>Speed in mph</th>
<th>Speed in m/sec</th>
<th>Safe to work on the tower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium Breeze</td>
<td>Raises dust and loose paper small branches away.</td>
<td>4</td>
<td>13 - 18</td>
<td>5.5 - 8</td>
<td>Safe to work on the tower.</td>
</tr>
<tr>
<td>Strong Breeze</td>
<td>Large branches in motion, telegraph wires whistle.</td>
<td>6</td>
<td>25 - 31</td>
<td>11 - 14</td>
<td>Tie the tower onto a solid Structure. Do not work on tower.</td>
</tr>
<tr>
<td>Gale Force</td>
<td>Twigs snap off, walking is difficult.</td>
<td>8</td>
<td>39 - 46</td>
<td>17 - 21</td>
<td>Towers should on no account be erected in these conditions.</td>
</tr>
</tbody>
</table>

Beware of open ended building which can cause a funnelling effect.
Span towers with clip in vertical ladders are built in exactly the same way as ladder span towers with 5 rung starter frames (page 2). Where a ladder frame is shown on page 2, use a plain frame and then clip a 2m vertical ladder onto the horizontals of the frame on the inside of the tower, ensuring that the spring loaded pins on the ladder locate under the rungs.

Note. You cannot use 3 rung frames with clip in vertical ladders. Note also Illustration 14 on page 3.

### COMPONENT SCHEDULE

**DOUBLE WIDTH SPAN TOWERS WITH CLIP-IN VERTICAL LADDERS TO EN 1004-3-8/12 5 RUNG STARTER**

Using the 3T (Through the Trap) Assembly method

#### COMPONENT SCHEDULE

<table>
<thead>
<tr>
<th>Internal &amp; External Use</th>
<th>Platform Height Metric</th>
<th>Platform Height Imperial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8m x 1.4m SPAN</td>
<td>2,4 2,7*</td>
<td>7/10 11/12</td>
</tr>
<tr>
<td>2.6m x 1.2m/Tooboard</td>
<td>3,4 3.7</td>
<td>11/12 14/15</td>
</tr>
<tr>
<td>3.35m Brace</td>
<td>4,4 4.7</td>
<td>14/15 17/19</td>
</tr>
<tr>
<td>2.69m Brace</td>
<td>5,4 5.7</td>
<td>17/19 21/23</td>
</tr>
<tr>
<td>1.8m Main Platform</td>
<td>6,4 6.7</td>
<td>21/23 24/25</td>
</tr>
<tr>
<td>1.8m Trap Platform</td>
<td>7,4 7.7</td>
<td>24/25 27/29</td>
</tr>
<tr>
<td>Small Stabiliser</td>
<td>8,4 8.7</td>
<td>27/29 31/33</td>
</tr>
<tr>
<td>Large Stabiliser</td>
<td>9,4 9.7</td>
<td>31/33 35/37</td>
</tr>
<tr>
<td>Vertical Ladder</td>
<td>10,4 10.7</td>
<td>35/37 39/41</td>
</tr>
</tbody>
</table>

#### MAX. NO. OF WORKING LEVELS

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
</table>

#### TOTAL SELF WEIGHT OF TOWER (KGS)

| 157 205 233 284 328 366 |

#### Notes:

The above schedule includes for:-

1. i) 1 working level with double toeboards and handrails at 1m and 0.5m.
2. To convert a rest platform to a working level add:
   1. on a 1.8m long tower 1x1.8m Main Platform (2043) 1x1.8m Double Tooboard (2066)
   2. on a 2.7m long tower add 1x2.7m Main Platform (2044) 1x2.7m Double Tooboard (2068)
3. A working level on a Double Width Tower is 2 platforms side by side with toeboards and Guard Rails at 1m and 0.5m.

**SAFETY NOTES**

1. Before erecting check ground is level unobstructed and is suitable for the purpose. Also ensure area is clear of overhead obstructions, particularly power cables.
2. Check that brakes are applied and the tower is stable before use.
3. Do not ride on the tower or attempt to move a loaded tower.
4. Always climb the tower from the inside.
5. Do not overload the tower. Maximum platformloads 200 kg/m² (2kN/m²). Maximum tower load 2500kg mobile. Maximum horizontal force at platform 30kg.
6. When moving a tower, reduce the height to a maximum of 4m. Check that there are no power lines or other obstructions overhead.
7. Mobile towers must be moved by pushing at the base only. Beware of soft or uneven ground, drains or pot-holes and overhead obstructions, especially power cables. Stabilisers may be raised to a maximum of 25mm above the ground. Immediately after moving, apply the brakes and check that the tower is upright and stable and stabilisers returned to ground level.
8. Never remove components from a tower whilst it is erected. Dismantling must always be performed from the top. Failure to observe this rule will seriously reduce the strength and safety of the tower.
9. Do not use damaged components. Check all components before use and periodically lubricate all moving parts and wipe off surplus oil.
10. Beware of high winds. Secure the tower when in exposed positions and when left unattended.
11. Do not lean ladders against towers or use ladders on top of platforms.
12. At heights where components cannot be passed up or down by hand, a rope should be used for securing to components to aid safe raising and lowering.
13. Never work from, or build or dismantle the tower from an unguarded platform.
14. Legislation now calls for inspection and recording of assembled towers. See HSE guidance note 10 (revision 4) for further details.
NOTES: A WORKING LEVEL ON A DOUBLE WIDTH TOWER IS TWO PLATFORMS SIDE BY SIDE WITH TOEBOARDS & DOUBLE GUARDRAILS. THE MAXIMUM LOAD ON A 600 mm WIDE PLATFORM IS 2kN/m² WHICH IS:–

- a) 212 kgs EVENLY DISTRIBUTED ON A 1.8m (6’0”) LONG PLATFORM.
- b) 324 kgs EVENLY DISTRIBUTED ON A 2.7m (8’10”) LONG PLATFORM.

THE MAXIMUM LOAD ON A TOWER (INCLUDING THE SELF WEIGHT OF THE TOWER) SHOULD NOT EXCEED 2500kgs (2.5 TONNE) ON TOWERS NOT USING 2 RUNG FRAMES. ON TOWERS USING 2 RUNG FRAMES, MAXIMUM LOAD ON TOWER IS 1500kg (1.5 TONNE) UNLESS ADDITIONAL SHORT BRACES HAVE BEEN ADDED. (REFER TO SUPPLIER FOR MORE INFORMATION). THE MAXIMUM HORIZONTAL FORCE WHEN USING HAND TOOLS ETC. SHOULD NOT EXCEED 30 kgs & STABILISERS MUST BE FITTED.

THE ABOVE SCHEDULE INCLUDES FOR:

1. 1 WORKING LEVEL WITH DOUBLE TOEBOARDS & DOUBLE HANDRAILS AT 0.5m And 1m
2. A SINGLE TRAP PLATFORM & HANDRAILS EVERY 2 m.

TO CONVERT A REST PLATFORM TO A WORKING LEVEL:

- ON A 1.8m LONG DOUBLE WIDTH TOWER ADD 1 - 1.8m MAIN PLATFORM (2043) & 1 - 1.8m DOUBLE TOEBOARD SET (2066)
- ON A 2.7m LONG DOUBLE WIDTH TOWER ADD 1 - 2.7m MAIN PLATFORM (2044) & 1 - 2.7m DOUBLE TOEBOARD SET (2068)
NOTES:

A WORKING LEVEL ON A DOUBLE WIDTH TOWER IS TWO PLATFORMS SIDE BY SIDE WITH TOEBOARDS & DOUBLE GUARDRAILS. THE MAXIMUM LOAD ON A 600 mm WIDE PLATFORM IS 2kN/m² WHICH IS:

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THE ABOVE SCHEDULE INCLUDES FOR:
(i) 1 WORKING LEVEL WITH DOUBLE TOEBOARDS & DOUBLE HANDRAILS AT 0.5m & 1m
(ii) A SINGLE TRAP PLATFORM & HANDRAILS EVERY 2 m.

TO CONVERT A REST PLATFORM TO A WORKING LEVEL:
ON A 1.8m LONG DOUBLE WIDTH TOWER ADD 1 - 1.8m MAIN PLATFORM (2043) & 1 - 1.8m DOUBLE TOEBOARD SET (2066).
ON A 2.7m LONG DOUBLE WIDTH TOWER ADD 1 - 2.7m MAIN PLATFORM (2044) & 1 - 2.7m DOUBLE TOEBOARD SET (2068).

COMPONENT SCHEDULE
DOUBLE WIDTH SPAN TOWERS WITH LADDER FRAMES TO BSEN 1004-2004 5 RUNG STARTER
Using the 3T (Through the Trap) Assembly method

<table>
<thead>
<tr>
<th>PLATFORM HEIGHT</th>
<th>METRIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESCRIPTION</td>
<td>IMPERIAL</td>
</tr>
<tr>
<td>1.8 m x 1.4 m</td>
<td>710'</td>
</tr>
<tr>
<td>SPAN</td>
<td>10'</td>
</tr>
<tr>
<td>150mm Castors</td>
<td>1.3</td>
</tr>
<tr>
<td>1.8m Double Toeboard</td>
<td>1.3</td>
</tr>
<tr>
<td>1.4m Rung Base Frame</td>
<td>1.3</td>
</tr>
<tr>
<td>1.4m Rung Ladder Frame</td>
<td>1.3</td>
</tr>
<tr>
<td>1.4m Rung Main Frame</td>
<td>1.3</td>
</tr>
<tr>
<td>1.4m Rung Ladder Frame</td>
<td>1.3</td>
</tr>
<tr>
<td>1.4m Rung Frame</td>
<td>1.3</td>
</tr>
<tr>
<td>1.8m Rung Frame</td>
<td>1.3</td>
</tr>
<tr>
<td>1.8m Ladder Span Trap Platform</td>
<td>1.3</td>
</tr>
<tr>
<td>Small Stabiliser (up to 8.9m)</td>
<td>1.3</td>
</tr>
<tr>
<td>Large Stabiliser (9.4 - 12.4m)</td>
<td>1.3</td>
</tr>
<tr>
<td>TOTAL SELF WEIGHT OF TOWER (KGS)</td>
<td>1.3</td>
</tr>
<tr>
<td>MAX. No. OF WORKING LEVELS</td>
<td>1.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.7m x 1.4m SPAN</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>150mm Adjustable Castors</td>
<td>2230</td>
</tr>
<tr>
<td>1.8m Double Toeboard</td>
<td>2066</td>
</tr>
<tr>
<td>1.4m Rung Base Frame</td>
<td>2041</td>
</tr>
<tr>
<td>1.4m Rung Ladder Frame</td>
<td>2042</td>
</tr>
<tr>
<td>1.4m Rung Main Frame</td>
<td>2043</td>
</tr>
<tr>
<td>1.4m Rung Ladder Frame</td>
<td>2044</td>
</tr>
<tr>
<td>1.4m Rung Frame</td>
<td>2045</td>
</tr>
<tr>
<td>1.8m Rung Frame</td>
<td>2046</td>
</tr>
<tr>
<td>1.8m Ladder Span Trap Platform</td>
<td>2047</td>
</tr>
<tr>
<td>Small Stabiliser (up to 8.9m)</td>
<td>2048</td>
</tr>
<tr>
<td>Large Stabiliser (9.4 - 12.4m)</td>
<td>2049</td>
</tr>
<tr>
<td>TOTAL SELF WEIGHT OF TOWER (KGS)</td>
<td>2050</td>
</tr>
<tr>
<td>MAX. No. OF WORKING LEVELS</td>
<td>2051</td>
</tr>
</tbody>
</table>

* or 2 Guardrail frames Code: 2003 (see illustration 14, page 3)

NOTES:
A WORKING LEVEL ON A DOUBLE WIDTH TOWER IS TWO PLATFORMS SIDE BY SIDE WITH TOEBOARDS & DOUBLE GUARDRAILS. THE MAXIMUM LOAD ON A 600 mm WIDE PLATFORM IS 2kN/m² WHICH IS:

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THE ABOVE SCHEDULE INCLUDES FOR:
(i) 1 WORKING LEVEL WITH DOUBLE TOEBOARDS & DOUBLE HANDRAILS AT 0.5m & 1m
(ii) A SINGLE TRAP PLATFORM & HANDRAILS EVERY 2 m.

TO CONVERT A REST PLATFORM TO A WORKING LEVEL:
ON A 1.8m LONG DOUBLE WIDTH TOWER ADD 1 - 1.8m MAIN PLATFORM (2043) & 1 - 1.8m DOUBLE TOEBOARD SET (2066).
ON A 2.7m LONG DOUBLE WIDTH TOWER ADD 1 - 2.7m MAIN PLATFORM (2044) & 1 - 2.7m DOUBLE TOEBOARD SET (2068).