





# Industrial Aluminium Towers SINGLE WIDTH LADDERSPAN & VERTICAL LADDER ASSEMBLY GUIDE

TO BS-EN 1004-2004

Using the 3T (Through the Trap) Assembly method

Using 2 rung frames (Recommended)

**Using Guardrail frames** 





1. These towers should be erected by at least 2 competent persons. Contact your supplier for details of appropriate training. Check you have the correct equipment and it is in working order. Apply brakes and 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 (see detail 2B). Fit two short horizontal braces to vertical tubes of one of the frames ensuring spring loaded pin faces outwards (see detail 2A). Repeat with a 5 rung frame at the opposite end.



3. 1) Fit two long braces diagonally in opposite directions as close to the frame vertical tube as possible. 2) Fit a temporary platform on the 3rd rung down from the top &, working through the trap, fit short braces as temporary handrails onto frame uprights above top rungs of frames. At this stage level the tower by adjusting collar on castors (see notes).





#### 13. **TOWERS FINISHING WITH 3 RUNG FRAMES:** Still using a temporary

platform & braces, build tower as shown up to (11). Repeat (11) but use 3 rung frame & either blue braces or black braces provided. Fit trap platform on the 3rd rung down in the same way as shown in (9). Working through the trap, fit two short braces horizontally onto top rung of frames between pegs provided and two on first rung down over outside pegs.

#### 14. TOWERS FINISHING WITH GUARDRAIL FRAMES:

Guardrail frames can be used at the top of the tower instead of 2 rung frames lower down, but they will need the intermediate

platforms to be rearranged before forming the top platform. Using a temporary platform & braces to aid safe erection fit two G.R. frames (2 rung) by locating onto head fitting with peg engaging into hole provided. Fit two short braces horizontally onto top rungs of frames between pegs provided and two on first rung down over outside pegs. Fit one long brace diagonally from top rung of frame as close to the frame vertical tubes as possible. Relocate the top platform into its final position.

## **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.
- 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 <u>diagonal</u> braces are fitted as close as possible to the upright.
- 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 <u>working</u> 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.
- 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.





1. These towers should be erected by at least 2 competent persons. Apply brakes and fit adjustable castors into one 4 rung ladder frames and one 4 rung main frame, ensuring that spring loaded pin is engaged in hole provided (see detail 1A).



3. Fit opposite ends of short braces to other 4 rung frame ensuring pegs on frame head fitting point towards middle of tower.



2. Make sure pegs on frame head fitting always point towards middle of tower (see detail 2B). Fit two short horizontal braces to vertical tubes of one of the frames ensuring spring loaded pin faces outwards (see detail 2A).



4.) Fit two blue (1.8m tower) or black braces (2.7m tower) diagonally in opposite directions as close to the frame vertical tube as possible. 2

vertical tube as possible. 2) Fit a temporary platform on the third rung down from the top of the frame and working through the trap fit four short braces horizontally onto top rungs and second rungs of frames between pegs provided. At this stage level the tower by adjusting collar on castors (see construction notes). Continue as (4-14) on opposite page.



NOTE: Arrangement shown in fig. D is considered to be a friction device and should not exceed  $\frac{1}{2}$  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.

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

Beware of open ended building which can cause a funnelling effect.

## ALL TOWERS **REST PLATFORMS** ALL TOWERS Rest platforms must be fitted every 2m and consist Fit toeboard unit around the platforms. Remember to of a trap platform and guardrails at 0.5m and 1m as WARNING: never work from or build, or dismantle always close trapdoor immediately after climbing shown. Remember to always close trapdoor the tower from an unquarded platform. immediately after climbing through. through.

### SPAN TOWER WITH CLIP IN VERTICAL LADDERS ASSEMBLY GUIDE

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 on the inside of the frame, ensuring that the spring loaded pins on the ladder locate under the runa

Note. You cannot use 3 rung frames with clip in vertical ladders. See also illustration 14.

### COMPONENT SCHEDULE SINGLE WIDTH SPAN TOWERS WITH CLIP-IN VERTICAL LADDERS TO EN 1004-3-8/12

Using the 3T (Through the Trap) Assembly method

		INTE	RNA	L & E	XTEF	RNAL	USE	INTE	RNAL	USE
PLATFORM HEIGHT	METRIC	2.4	3.4	4.4	5.4	6.4	7.4	8.4	9.4	10.4
DESCRIPTION	IMPERIAL	7'10"	11'2"	14'5"	17'9"	21'0"	24'3"	27'7"	30'10"	34'1"
1.8 m x 0.8 m SPAN	CODE									
150mm Adjustable Castors	2230	4	4	4	4	4	4	4	4	4
1.8m x 0.6mToeboard	2065	1	1	1	1	1	1	1	1	1
Single Base Frame	2015	2	2	2	2	2	2	2	2	2
Single Main Frame	2016	-	2	2	4	4	6	6	8	8
Single G.R. Frame	2017	2	-	2	-	2	-	2	-	2
1.8m Brace	2040	6	10	10	14	14	18	18	22	22
2.69m Brace	2041	3	3	4	4	5	5	6	6	7
1.8m Trap Platform	2050	1	2	2	3	3	4	4	5	5
Small Stabiliser	2056	4	4	4	4	4	4	-	-	-
Large Stabiliser	2057	-	-	-	-	-	-	4	4	4
Vertical Ladder	2060	1	2	2	3	3	4	4	5	5
TOTAL SELF WEIGHT OF TOWER (KO	GS)	132	175	188	229	240	283	302	344	355
MAX. No. OF WORKING LEVELS		1	2	2	3	3	4	4	5	5

		INTE	RNA	L & E	XTEF	RNAL	USE		INTE	RNAL	L USE
PLATFORM HEIGHT	METRIC	2.4	3.4	4.4	5.4	6.4	7.4		8.4	9.4	10.4
DESCRIPTION	IMPERIAL	7'10"	11'2"	14'5"	17'9"	21'0"	24'3"		27'7"	30'10"	34'1"
2.69 m x 0.8 m SPAN	CODE										
150mm Adjustable Castors	2230	4	4	4	4	4	4		4	4	4
2.6m x 0.6mToeboard	2067	1	1	1	1	1	1		1	1	1
Single Base Frame	2015	2	2	2	2	2	2		2	2	2
Single Main Frame	2016	-	2	2	4	4	6		6	8	8
Single G.R. Frame	2017	2	-	2	-	2	-		2	-	2
2.69m Brace	2041	6	10	10	14	14	18		18	22	22
3.35m Brace	2042	3	3	4	4	5	5		6	6	7
2.69m Trap Platform	2051	1	2	2	3	3	4		4	5	5
Small Stabiliser	2056	4	4	4	4	4	4		-	-	-
Large Stabiliser	2057	-	-	-	-	-	-		4	4	4
Vertical Ladder	2060	1	2	2	3	3	4		4	5	5
TOTAL SELF WEIGHT OF TOWER (KI	GS)	149	202	214	265	277	330		349	401	413
MAX. No. OF WORKING LEVELS		1	2	2	3	3	4	]	4	5	5

Notes. The above schedule includes for:-

- 1. i) 1 working level with span trap platform, toeboards and handrails at 1m and 0.5m.
  - ii) A span trap platform and handrails at 0.5m and 1m as rest platform every 2m. To convert a rest platform to a working platform add a single toeboard.
- 2. Maximum working load on a 0.61m wide x 1.8m long platform is 2kN/m<sup>2</sup> which is 212kgs.
- 3. Maximum working load on a 0.61m wide x 2.7m long platform is 2kN/m<sup>2</sup> which is 324kgs.
- 4. Maximum load on a tower (including the self weight of the tower) should not exceed 2500kgs.

- 5. Maximum horizontal force when using hand tools, etc, should not exceed 30kgs.
- 6. Stabilisers must be fitted.

- 7. WGT KGS = Total self weight of tower.
- 8. MAX PLATS = Maximum No. of working platforms.

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 platform loads 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 maximun 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 potholes & overhead obstructions, especially power cables. Stabilisers may be raised to a maximum of 25mm above the ground. Immediately after moving, apply the brakes & check that the tower is upright & stable & stabilisers returned to around level.

8. Never remove components from a tower whilst it is erected. Dismantling must always be performed from the top. Failure to observe this 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. Never 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 & 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.

## SAFETY NOTES

## **COMPONENT SCHEDULE**

## SINGLE WIDTH SPAN TOWERS WITH LADDER FRAMES TO BSEN 1004-2004 5 RUNG STARTER FRAMES

Using the 3T (Through the Trap) Assembly method

	INTERNA	L & E	ЕХТЕ	RNA	L US	Е									INT	ERNA	۱L US	SI
PLATFORM HEIGHT	METRIC	2.4	2.9	3.4	3.9	4.4	4.9	5.4	5.9	6.4	6.9	7.4	7.9	]	8.4	8.9	9.4	1
DESCRIPTION	IMPERIAL	7'10"	9'6"	11'2"	12'10"	14'5"	16'0"	17'9"	19'4"	21'0"	22'8"	24'3"	25'11"	-	27'7"	29'2"	30'10'	"
1.8 m x 0.8 m SPAN	CODE	4	4				4					4		-				┝
150mm Adjustable Castor	2230	4	4	4	4	4	4	4	4	4	4	4	4	-	4	4	4	╞
1.8m SingleToeboard	2065	1	1	1	1	1	1	1	1	1	1	1	1	-	1	1	1	╞
0.8m 5 Rung Base Frame	2015	1	1	1	1	1	1	1	1	1	1	1	1	-	1	1	1	╞
0.8m 5 Rung Ladder Frame	2222	1	1	1	1	1	1	1	1	1	1	1	1	-	1	1	1	╞
0.8m 4 Rung Main Frame	2016	-	-	1	-	1	1	2	1	2	2	3	2	-	3	3	4	╞
0.8m 4 Rung Ladder Frame	2223	-	-	1	-	1	1	2	1	2	2	3	2	-	3	3	4	Ļ
0.8m 3 Rung Frame	2018	-	1	-	1	-	1	-	1	-	1	-	1		-	1	-	╞
0.8m 3 Rung Ladder Frame	2224	-	1	-	1	-	1	-	1	-	1	-	1		-	1	-	╞
0.8m 2 Rung Frame	2019	1	-	-	1	1	-	-	1	1	-	-	1		1	-	-	L
0.8m 2 Rung Ladder Frame	2225	1	-	-	1	1	-	-	1	1	-	-	1		1	-	-	
1.8m Brace*	2040	6	10	10	10	10	14	14	14	14	18	18	18		18	22	22	
2.7m Brace	2041	3	2	3	2	4	3	4	3	5	4	5	4		6	5	6	
1.8m 3 Rung Blue Brace	2080	-	1	-	2	-	1	-	2	-	1	-	2		-	1	-	
1.8m Ladder Span Trap Platform	2201	1	2	2	2	2	3	3	3	3	4	4	4		4	5	5	
Small Stabiliser (up to 7.4m)	2056	4	4	4	4	4	4	4	4	4	4	4	-		-	-	-	
Large Stabiliser (7.9 - 10.4m)	2057	-	-	-	-	-	-	-	-	-	-	-	4		4	4	4	
TOTAL SELF WEIGHT OF TOWER (K	GS)	126	159	164	169	174	207	212	219	224	255	260	273		283	317	322	
MAX. No. OF WORKING PLATFORM	S	1	1	1	2	2	2	2	3	3	3	3	3		4	4	4	Γ
2.7 m x 0.8 m SPAN	CODE													1				Г
150mm Adjustable Castor	2230	4	4	4	4	4	4	4	4	4	4	4	4	1	4	4	4	t
2.7m SingleToeboard	2067	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	t
0.8m 5 Rung Base Frame	2015	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	t
0.8m 5 Rung Ladder Frame	2222	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	t
0.8m 4 Rung Main Frame	2016	-	-	1	-	1	1	2	1	2	2	3	2	1	3	3	4	t
0.8m 4 Rung Ladder Frame	2223	-	-	1	-	1	1	2	1	2	2	3	2	1	3	3	4	t
0.8m 3 Rung Frame	2018	-	1	-	1	-	1	-	1	-	1	-	1	1	-	1	-	t
0.8m 3 Rung Ladder Frame	2224	-	1	-	1	-	1	-	1	-	1	-	1	1	-	1	-	t
0.8m 2 Rung Frame	2019	1	-	-	1	1	-	-	1	1	-	-	1	1	1	-	-	t
0.8m 2 Rung Ladder Frame	2225	1	-	-	1	1	-	-	1	1	-	-	1	1	1	-	-	t
2.7m Brace	2041	6	10	10	10	10	14	14	14	14	19	19	19	1	19	22	22	t
3.3m Brace	2042	3	2	3	2	4	3	4	3	5	4	5	4	1	6	5	6	t
2.7m 3 Rung Black Brace	2083	_	1	_	2	-	1	-	2	-	1	_	2	1	-	1	-	t
2.7m Ladder Span Trap Platform	2202	1	2	2	2	2	3	3	3	3	4	4	4	1	4	5	5	t
Small Stabiliser (up to 7.4m)	2056	4	4	4	4	4	4	4	4	4	4	4	-	1	<u> </u>	-	-	t
Large Stabiliser (7.9 - 10.4m)	2057	-	-	-	-	-	-	-	-	-	-	-	4	1	4	4	4	t
TOTAL SELF WEIGHT OF TOWER (K		142	181	187	195	200	240	245	254	259	299	304	320	1	326	366	371	t
TOTAL SELF WEIGHT OF TOWER (K	00)	172	101	107	100	200	270	273	204	200	200	004	020	1	020	000	- 57 1	╀

\* or 2 Guardrail frames Code: 2017 (but see illustration 14, page 3, before use)

MAX. No. OF WORKING PLATFORMS

#### THE ABOVE SCHEDULE INCLUDES FOR:

(i) 1 WORKING LEVEL WITH LADDERSPAN TRAP PLATFORM, TOEBOARDS AND DOUBLE HANDRAILS AT 0.5m AND 1m (ii) A LADDERSPAN TRAP PLATFORM & HANDRAILS. AS A REST PLATFORM EVERY 2m.

TO CONVERT A REST PLATFORM TO A WORKING PLATFORM ADD A SINGLE TOEBOARD

MAXIMUM WORKING LOAD ON A 0.61m WIDE x 1.8m LONG PLATFORM IS 2kN/m<sup>2</sup> WHICH IS 212kgs.

MAXIMUM WORKING LOAD ON A 0.61m WIDE x 2.7m LONG PLATFORM IS 2kN/m<sup>2</sup> WHICH IS 324kgs.

MAXIMUM LOAD ON THE TOWER (INCLUDING THE SELF WEIGHT OF THE TOWER) SHOULD NOT EXCEED 2500kgs 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)

MAXIMUM HORIZONTAL FORCE WHEN USING HAND TOOLS ETC. SHOULD NOT EXCEED 30kgs.

STABILISERS MUST BE FITTED.

#### **USE ONLY** 9.9 10.4

32'6"

34'9'

## **COMPONENT SCHEDULE**

### SINGLE WIDTH SPAN TOWERS WITH LADDER FRAMES TO BSEN 1004-2004 4 RUNG STARTER FRAMES

Using the 3T (Through the Trap) Assembly method

#### **INTERNAL & EXTERNAL USE**

#### PLATFORM HEIGHT METRIC 2.2 2.7 3.2 3.7 4.7 5.2 5.7 6.2 6.7 7.2 7.7 4.2 DESCRIPTION IMPERIAL 13'9" 17'1" 20'4" 25'3" 7'3" 8'10" 10'6" 12'2" 15'5" 18'8" 22'0" 23'7" CODE 1.8 m x 0.8 m SPAN 150mm Castor Adjustable Leg 1.8m SingleToeboard 0.8m 4 Rung Main Frame 0.8m 4 Rung Ladder Frame 0.8m 3 Rung Frame 0.8m 3 Rung Ladder Frame 0.8m 2 Rung Frame 0.8 2 Rung Ladder Frame 1.8m Brace 2.7m Brace 1.8m 3 Rung Blue Brace 1.8m Ladder Span Trap Platform \_ Small Stabiliser (up to 7.4m) Large Stabiliser (7.9 - 10.4m) TOTAL SELF WEIGHT OF TOWER (KGS) MAX. No. OF WORKING PLATFORMS

2.7 m x 0.8 m SPAN	CODE													]			Т
150mm Adjustable Castor	2230	4	4	4	4	4	4	4	4	4	4	4	4	1	4	4	t
2.7m SingleToeboard	2067	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Γ
0.8m 4 Rung Main Frame	2016	1	1	2	1	2	2	3	2	3	3	4	3	1	4	4	Γ
0.8m 4 Rung Ladder Frame	2223	1	1	2	1	2	2	3	2	3	3	4	3	1	4	4	Γ
0.8m 3 Rung Frame	2018	-	1	-	1	-	1	-	1	-	1	-	1	1	-	1	Γ
0.8m 3 Rung Ladder Frame	2224	-	1	-	1	-	1	-	1	-	1	-	1	1	-	1	Γ
0.8m 2 Rung Frame	2019	1	-	-	1	1	-	-	1	1	-	-	1	]	1	-	Γ
0.8 2 Rung Ladder Frame	2225	1	-	-	1	1	-	-	1	1	-	-	1	]	1	-	
2.7m Brace	2041	6	10	10	10	10	14	14	14	14	18	18	18		18	22	Γ
3.3m Brace	2042	-	-	1	-	2	1	2	1	3	2	3	2		4	3	
2.7m 3 Rung Black Brace	2083	3	3	2	4	2	3	2	4	2	3	2	4		2	3	
2.7m Ladder Span Trap Platform	2202	1	2	2	2	2	3	3	3	3	4	4	4		4	5	
Small Stabiliser (up to 7.4m)	2056	4	4	4	4	4	4	4	4	4	4	4	-		-	-	
Large Stabiliser (7.9 - 10.4m)	2057	-	-	-	-	-	-	-	-	-	-	-	4		4	4	
TOTAL SELF WEIGHT OF TOWER	(KGS)	137	178	183	192	197	237	242	251	256	296	301	317		322	362	
MAX. No. OF WORKING PLATFOR	MS	1	1	1	2	2	2	2	3	3	3	3	3		4	4	

\* or 2 Guardrail frames Code: 2017 (but see illustration 14, page 3, before use)

#### THE ABOVE SCHEDULE INCLUDES FOR:

(i) 1 WORKING LEVEL WITH LADDERSPAN TRAP PLATFORM, TOEBOARDS AND DOUBLE HANDRAILS AT 0.5m AND 1m (ii) A LADDERSPAN TRAP PLATFORM & HANDRAILS. AS A REST PLATFORM EVERY 2m.

TO CONVERT A REST PLATFORM TO A WORKING PLATFORM ADD A SINGLE TOEBOARD

MAXIMUM WORKING LOAD ON A 0.61m WIDE x 1.8m LONG PLATFORM IS 2kN/m<sup>2</sup> WHICH IS 212kgs.

MAXIMUM WORKING LOAD ON A 0.61m WIDE x 2.7m LONG PLATFORM IS 2kN/m<sup>2</sup> WHICH IS 324kgs.

MAXIMUM LOAD ON THE TOWER (INCLUDING THE SELF WEIGHT OF THE TOWER) SHOULD NOT EXCEED 2500kgs 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)

MAXIMUM HORIZONTAL FORCE WHEN USING HAND TOOLS ETC. SHOULD NOT EXCEED 30kgs.

STABILISERS MUST BE FITTED.

#### **INTERNAL USE ONLY**

9.7 10.2

8.7 9.2

8.2

26'11"	28'7"	30'2"	31'10"	33'6"	
4	4	4	4	4	
4	4	4	4	4	
1	1	1	1	1	
4	4	5	4	5	
4	4	5	4	5	
-	1	-	1	-	
-	1	-	1	-	
1	-	-	1	1	
1	-	-	1	1	
18	22	22	22	22	
4	3	4	3	5	
2	3	2	4	2	
4	5	5	5	5	
-	-	-	-	-	
4	4	4	4	4	
274	304	310	317	323	
4	4	4	4	5	
4	4	4	4	4	
1	1	1	1	1	
4	4	5	4	5	
4	4	5	4	5	
-	1	-	1	-	
-	1	-	1	-	
1	-	-	1	1	
1	-	-	1	1	
18	22	22	22	22	
4	3	4	3	5	
2	3	2	4	2	
4	5	5	5	5	
-	-	-	-	-	