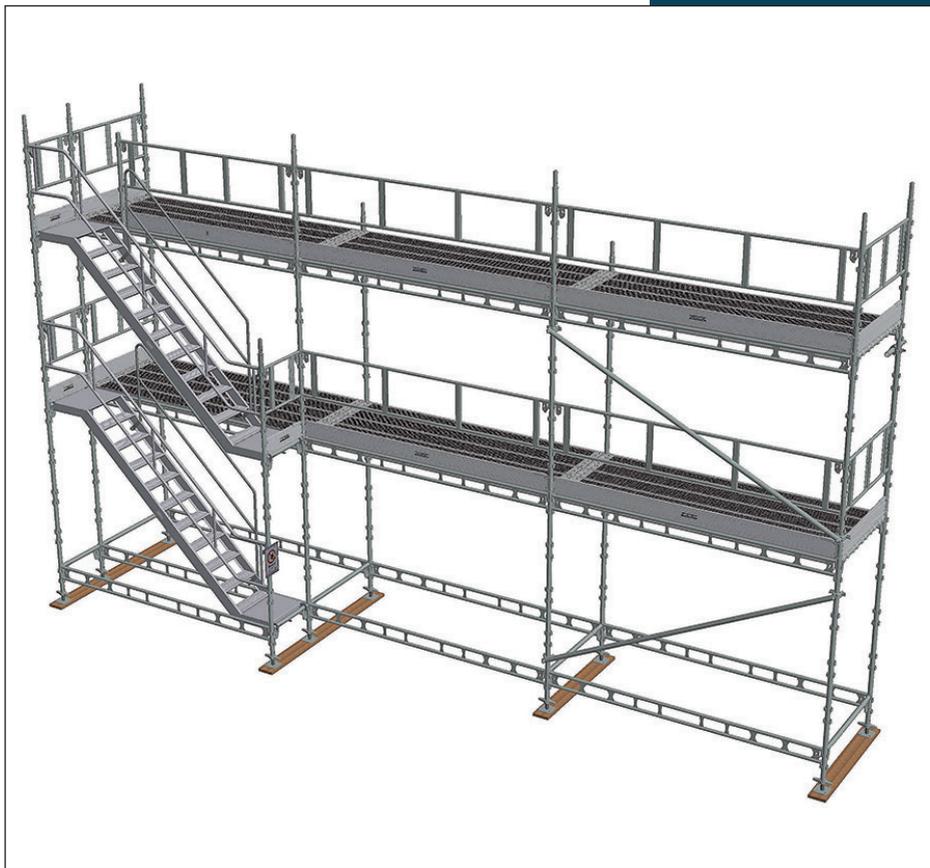


USER'S MANUAL

HAKI UNIVERSAL



Translation of the Swedish HAKI Universal manual, adapted for the Nordic markets.

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Important information

HAKI's product liability and user's manuals apply only to scaffolds that are entirely composed of components that have been made and supplied by HAKI.

HAKI's type examination certificate applies only to scaffolds whose materials, dimensions and design accord with those specified in the documentation upon which this certificate is based.

HAKI's scaffold systems must not be erected using components of makes other than HAKI or be connected to scaffolds of makes other than HAKI. In such cases, a special study of load-bearing capacity must be carried out. However, HAKI has no objection to the customary addition of scaffold tubes and approved couplers to the scaffold.

Adding components from different suppliers may invalidate the insurance cover.

HAKI reserves the right to make technical modifications on a continual basis.

This user's manual is to be used in conjunction with HAKI training courses.

The latest versions of HAKI user's manuals can be downloaded from our website, www.HAKI.com.

For scaffold structures that are not covered by this user's manual, please contact HAKI's technical department.

HAKI colour code

Horizontals and diagonals are marked with their nominal sizes (bay sizes) and a colour code. The marking is a useful means of identification when erecting and handling the scaffold material.

564		1050		1964		3050	
700		1250		2050			
770		1550		2500			
1010		1655		2550			

Forces and dimensions

1000 N = 1 kN ~ 100 kg

10 N ~ 1 kg

All measurements in mm

HAKI Universal

HAKI Universal has been type examined by RISE Research Institutes of Sweden in accordance with SS-EN 12810-1 – Certifikat nr 14 55 01.



General

HAKI Universal has a bay widths of 700, 770, 1050, 1250 or 1655 mm and a bay length of 3050 mm with a lift height of 2000, 2500 or 3000 mm.

ERB and LBL beams can be used both as ledgers and transoms.

Clear height between work plane must normally correspond to height class H2, which means a clear height of at least 1.90 m between work plane and ledger beam, alternatively between work plane and transoms when widening the scaffolding with brackets. The free height between the work plane and any horizontal diagonal must be at least 1.90 m regardless of height class.

When a bracket is used, the space between the main plane and the bracket plane must be covered, normally with a ledger beam, or in some other way.

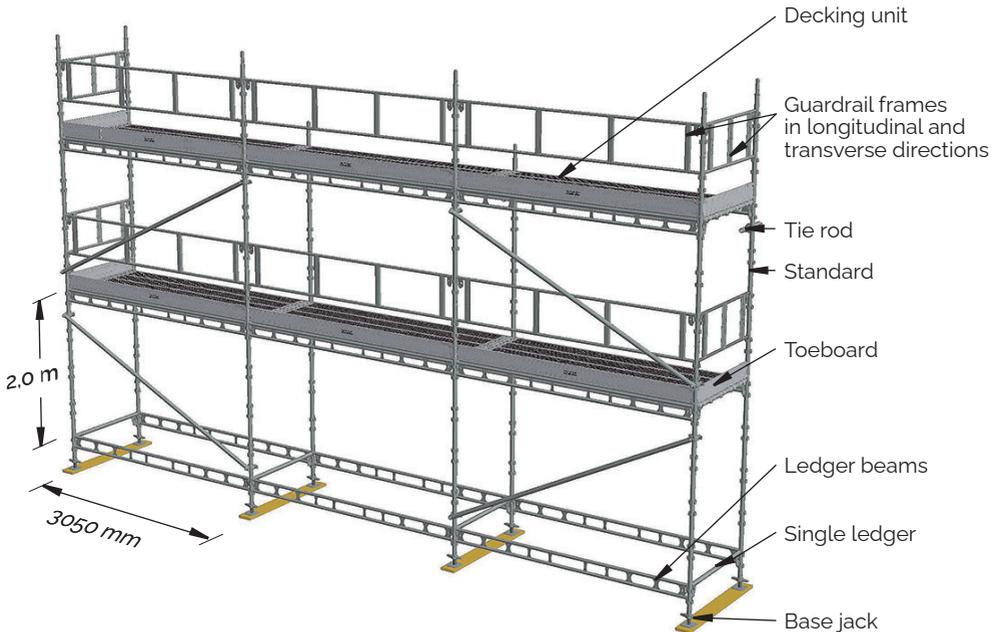
Platforms used must be type examined and designed so that they can be safely placed on the scaffold's transoms or ledger beams and secured against accidental lifting at both ends.

Lattice beams and couplers used must be type examined.

Components for the HAKI Universal system are hot-dip galvanized.

Older components that are covered by earlier certificate

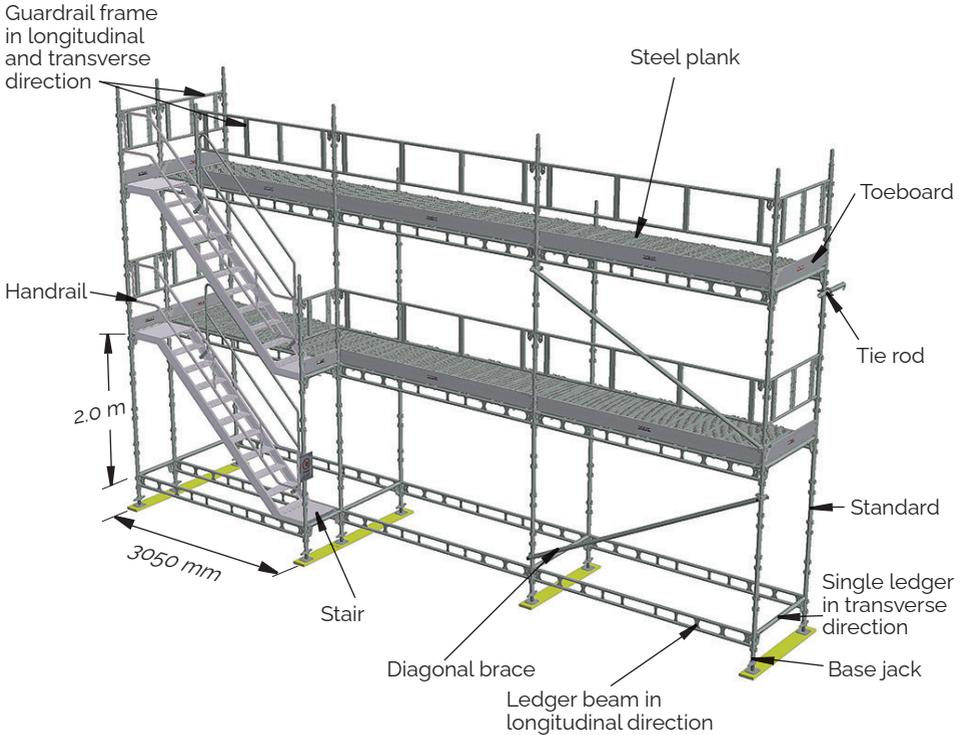
Ledger beam LB, Standard FSSH, Guardrail frame SKRD and SKRH.



Transverse decking

HAKI Universal scaffolding with transverse decking in steel or aluminium is built with the widths of 1250 or 1655 mm and bay lengths of 1050, 1550, 2050, 2550 or 3050 mm and with lift heights of 2000 mm.

ERB and LBL beams can be used as transoms, but only LBL beams can be used as ledgers for spans greater than 2050 mm and load classes greater than 3.



Marking

All components, with the exception of locking catches, pins etc, come permanently marked with the HAKI logo or HAKI text, the first letter of the country of manufacture and the last two figures of the year of manufacture (HAKI S25).

All loadbearing components are marked for full traceability. For further information, please refer to the HAKI Safety Guide.

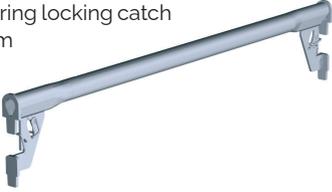
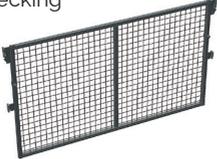


! IMPORTANT!

ENGAGE LOCKING CATCHES AS EACH COMPONENT IS FIXED



Name		Code	Item No.	Weight
Base jack Adjustable BS=55-570 mm		BS	2071000	5.0
Standard S Standard joint with spigot Ø 48 mm		500	7016050	2.9
		1000	7016100	5.3
		1500	7016150	7.7
		2000	7016200	10.1
		3000	7016300	15.2
Open end Standard SC Standard joint without spigot Ø 48 mm		853	7011104	4.8
		1353	7011154	7.3
		1853	7011204	9.8
Tripod With pockets on one standard Ø 48 mm		500	7203340	10.0
		1000	7203341	17.3
		2000	7203342	31.8
		3000	7203343	45.8
Ledger beam LBL With spring locking catch Ø 34 mm		1050	7021102	4.8
		1250	7021122	6.5
		1550	7021152	6.6
		1655	7021162	6.7
		1964	7021192	8.0
		2050	7021202	8.5
		2500	7021252	10.9
		2550	7021257	11.2
		3050	7021302	12.3

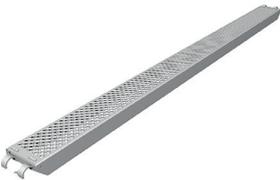
Name	Code	Item No.	Weight	
Single ledger ERB With spring locking catch Ø 48 mm 	450	7022045	2.9	
	564	7022050	3.6	
	700	7022066	3.3	
	770	7022073	3.6	
	1050	7022101	4.4	
	1250	7022121	5.1	
	1550	7022153	6.2	
	1655	7022161	6.3	
	1964	7022191	7.3	
	2050	7022201	7.6	
	2500	7022246	9.9	
	2550	7022253	9.7	
	3050	7022301	11.3	
Guardrail frame GFL With spring locking catch Octagon 28 mm 	700	7052070	3.8	
	770	7052077	4.0	
	1050	7052106	4.9	
	1250	7052124	5.7	
	1550	7052154	6.6	
	1655	7052164	7.4	
	1964	7052194	8.1	
	2050	7052204	8.2	
	2500	7052254	9.2	
	2550	7052255	9.3	
	3050	7052304	10.5	
	Guardrail frame GFLH With spring locking catch Octagon 28 mm 26 mm higher compared with GFL Fitted when using wooden gratings 	700	7052071	3.9
		770	7052076	4.1
1050		7052108	5.0	
1250		7052125	5.8	
1550		7052155	6.7	
1655		7052165	7.5	
1964		7052195	8.2	
2050		7052205	8.3	
2357		7052234	9.0	
2500		7052250	9.3	
2550		7052256	9.4	
3050		7052305	11.5	
Safety Gate with mesh SGF Adjustable 118 mm in height to fit different types of decking Jaw width 22 mm 		1050	7055101	13.3
	1250	7055121	14.6	
	1550	7055151	14.9	
	1655	7055161	17.0	
	1964	7055191	19.4	
	2500	7055250	23.2	
	2550	7055251	24.0	
	3050	7055300	26.8	

Name	Code	Item No.	Weight
Diagonal brace DS	700/770	7122074	8.5
With wedge couplers	1010/1050	7122104	8.6
Ø 48 mm	1250	7122124	9.0
700/770 L=1657	1655	7122164	10.1
1010/1050 L=1810	1964	7122194	10.7
1250 L=1954	2500	7121254	12.3
1655 L=2235	3050	7121304	14.2
1964 L=2473			
2500 L=2917			
3050 L=3400			
			
Diagonal brace DS-UB	3050	7121301	15.2
For wooden grating			
With wedge couplers			
Ø 48 mm			
DS-UB 3050 L=3440			
			
Plan brace HDS	3050x1655	7141000	13.8
With wedge couplers	3050x1250	7141001	13.2
Ø 48 mm			
3050x1655 L=3472			
3050x1250 L=3298			
			
Tie rod tube SVF	450x48 AL	4832045	1.2
Permissible load 5.4 kN			
Hook Ø 12 mm			
			
Tie rod tube SVF 16	300	8832031	1.4
Permissible load 9 kN	450	8832046	2.2
Hook Ø 16 mm	600	8832061	2.6
	900	8832091	3.7
	1200	8832121	4.8
			

Name	Code	Item No.	Weight
Tie rod tube SVFA16 Permissible load 5.2 kN Adjustable 709-1109 mm 		8832110	4.9
Wall tie VST With flexible plate Ø 48 mm Fitted using right-angle coupler RA 48x48 	1000 2000 3000 4000 5000 6000	7111100 7111200 7111300 7111400 7111500 7111600	5.3 9.1 13.7 16.7 21.9 24.5
Pocket coupler Assembling see page 34 		2048017	1.4

Longitudinal decking

Name	Code	Item No.	Weight
Decking Unit B=600 mm Load class 3 (2.0 kN/m ²) 	700x600	4071078	5,7
	1050x600	4071118	7,4
	1250x600	4071128	9,1
	1550x600	4071158	10,5
	1655x600	4071168	11,1
	1964x600	4071198	12,5
	2050x600	4071208	12,9
	2500x600	4071268	15,8
	2550x600	4071278	16,1
	3050x600	4071308	18,5
Decking Unit B=400 mm Load class 3 (2.0 kN/m ²) 	1050x400	4073108	6,2
	1250x400	4073124	7,5
	1550x400	4073154	8,7
	1655x400	4073164	9,1
	1964x400	4073194	10,3
	2050x400	4073204	10,7
	2500x400	4073254	12,9
	2550x400	4073258	13,1
Decking Unit Hatch B=600 mm Load class 3 (2.0 kN/m ²) 	1655x600	4071169	13,2
	1964x600	4071199	14,5
	2500x600	4071269	17,0
	3050x600	4071309	19,6
Decking Unit Hatch and ladder Load class 3 (2.0 kN/m ²) with lock in each end 	3050x600	4071310	24,5
Ladder ST 	2100	2091210	3,4

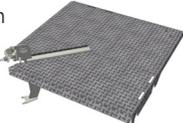
Name	Code	Item No.	Weight
HAKI Steel Plank W=230 mm L=700-3050 - Load class 6 (6.0 kN/m ²) L=2050-3050 delivered with handles	564x230	21520564	4.2
	700x230	21520700	5.1
	770x230	21520770	5.3
	1010x230	21521010	6.6
	1050x230	21521050	6.9
	1250x230	21521250	7.9
	1550x230	21521550	9.9
	1655x230	21521655	10.1
	1964x230	21521964	11.8
	2050x230	21522050	12.2
	2500x230	21522500	14.6
	2550x230	21522550	15.2
	3050x230	21523050	18.1
			
HAKI Steel Plank W=200 mm L=564-3050 - Load class 6 (6.0 kN/m ²)	564x200	21510564	4.2
	700x200	21510700	4.6
	770x200	21510770	5.0
	1010x200	21521010	6.5
	1050x200	21511050	6.4
	1250x200	21511250	7.4
	1550x200	21511550	8.9
	1655x200	21511655	9.5
	1964x200	21511964	11.1
	2050x200	21512050	11.5
	2500x200	21512500	13.8
	2550x200	21512550	14.3
	3050x200	21513050	17.0
			
AL plank W=230 mm L=770-1964 - Load class 6 (6.0 kN/m ²) L=2500 - Load class 5 (4.5 kN/m ²) L=3050 - Load class 4 (3.0 kN/m ²)	770x230	2158077	4.1
	1050x230	2158105	4.9
	1250x230	2158120	5.6
	1655x230	2158160	6.9
	1964x230	2158190	7.8
	2500x230	2158250	9.5
	3050x230	2158300	11.2
			
AL plank W=200 mm L=700-2500 - Load class 6 (6.0 kN/m ²) L=3050 - Load class 5 (4.5 kN/m ²)	770x200	2153079	3.6
	1050x200	2153105	4.5
	1250x200	2153125	5.0
	1655x200	2153165	6.2
	1964x200	2153195	7.1
	2500x200	2153255	8.7
	3050x200	2153305	10.3
			

Name	Code	Item No.	Weight
Toeboard AL 	700	4161071	1.3
	770	4161077	1.4
	1050	4161105	1.9
	1250	4161121	2.2
	1550	4161151	2.8
	1655	4161161	2.9
	2050	4161201	3.6
	2210	4161221	4.0
	2357	4161231	4.2
	2550	4161255	4.6
	3050	4161301	5.5
Toeboard wood hak FL FL 3300x150x32 for toeboard clip 7161006 	3300x150x32	2025331	5.6
Toeboard clip 	LF 70	7161006	1.0

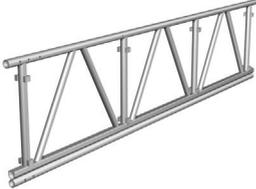
Transverse decking

Name	Code	Item No.	Weight
Steel decking unit Load class 6 (6.0 kN/m ²) 	1050x495	2152107	10.8
	1250x495	2152124	12.5
	1655x495	2152164	15.0
	1250x400	2152125	11.5
	1655x400	2152165	14.5

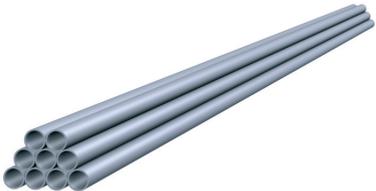
Other components

Name		Code	Art. nr	Weight
Bracket Without spigot SK With spring locking catch Ø 48 mm		230	7211025	1.6
		300	7211033	2.0
		334	7211035	2.0
		400	7211041	2.1
		460	7211045	2.3
		600	7211061	2.7
Bracket With spigot SK With spring locking catch Ø 48 mm		564	7211051	5.8
		700	7211067	5.9
		770	7211071	6.5
Bracket adjustable SK Adjustable 460-690 mm Load class 3 (2.0 kN/m ²)		460-490	7211069	4.1
Bracket foldable SK Foldable 200/400 mm Foldable 230/460 mm Load class 5 (4.5 kN/m ²)		200/400	7211022	3.1
		230/460	7211023	3.3
Corner bracket, adjustable Adjustable 400-600 mm Adjustable 460-690 mm Load class 3 (2.0 kN/m ²)		400-600	7211084	12.1
		460-690	7211080	14.0
<ul style="list-style-type: none"> • 400-600 compatible with Console SK 400 G/AL, 600 G/AL and 400-600 • 460-690 compatible with Console SK 460 G/AL, 600 G/AL and 460-690 				
Cantilever bracket SKD To be combined with single ledger 1250 or ledger beam 1250		1250	7212001	11.1

Name	Code	Item No.	Weight
Stair UTVAL With platform and locking catch Width 600 mm	2500x2000	4102247	22.9
	3050x2000	4102302	29.2
Stair handrail HLAL	2500x2000	4058245	9.2
	3050x2000	4058300	10.3
Handrail inner UTV For stair UTVAL	3050	7058253	11.4
Entrance step	700/770	7103065	7.8
	1250	7103120	11.1
	1655	7103160	14.7
Handrail Post STS	1000	7015102	4.2
Handrail post LSS-UTV For stairs UTV AL 4102302		7058300	1.5
Guardrail post For erection on single ledger ERB	23 mm	7015005	6.1
	22 mm	7015006	6.1
Guardrail post SRS For erection on ledger beam LBL	1000	7015001	7.3

Name	Code	Item No.	Weight
Intermediate transom ITL Can be locked with locking pin 12mm 	564	7204050	3.6
	700	7204070	4.1
	770	7204071	4.3
	1010	7204099	5.3
	1050	7204101	5.5
	1250	7204122	6.3
	1655	7204162	7.8
Lattice beam 	500/6100	7031602	59.1
Frame 750 AL With pockets 	750/1250	4032125	9.4
	750/2250	4032225	16.6
	750/3250	4032325	23.9
	750/6250	4032625	44.7
Lattice beam 450 AL FB With pockets 	2220	4032211	9.9
	4100	4032411	17.8
	6100	4032611	25.8
	8100	4032811	34.0
Lattice beam 450 AL FB 	4100	4032410	16.7
	6100	4032610	24.3
	8100	4032810	32.2

Other accessories (not included in the Certificate)

Name		Code	Art. nr	Weight
Right angle couple RA Jaw width 22 mm Certificate 145515		48x48 22 mm	2048010	1.2
Swivel coupler SW Jaw width 22 mm Certificate 145515		48x48 22 mm	2048011	1.4
Locking pin Steel Ø16 mm			2116000	0.2
For reinforcing standard joint in connection with tensile load, e.g. when scaffolding is suspended, when lifting or when scaffolding is used for temporary roof.			5141257	0.3
Scaffold tube SR		48-1000	7241100	4.1
		48-1500	7241150	6.1
		48-2000	7241200	8.0
		48-2500	7241250	10.3
		48-3000	7241300	12.4
		48-3500	7241350	14.1
		48-4000	7241400	16.7
		48-4500	7241450	18.0
	48-5000	7241500	20.1	
	48-6000	7241600	24.1	
Advance guardrail tool Erecting tool guard rail		AL	4052001	1.4
		AL	4052004	1.8
Scaffold safety sign Is hooked on the standard With pocket in A4 for "Facts about the scaffold"			2112000	1.1

For other accessories, see HAKI Component List.

Information on safety when erecting and dismantling

1. Before erecting or dismantling a scaffold, try to fence off the working area if possible.
2. The location for the scaffold must be checked in order to prevent risks when erecting, dismantling and moving the scaffold and to ensure that work can be carried out safely with regard to level and slope, obstacles and wind conditions.
3. Make sure that all lifting equipment to be used, e.g. chain hoists, lifting ropes, pulley blocks, etc., has been thoroughly tested and approved by an authorized person in accordance with local regulations.
4. Check that tools and protective equipment are available at the worksite.
5. Wear appropriate personal safety equipment at all times, e.g. safety harnesses, proper independent lifelines with suitable fixings, etc.
6. When erecting and dismantling a scaffold, robust temporary decking must be used as temporary platforms for the scaffolders.
7. Always make sure that the safety locking devices that prevent a platform lifting off have been activated once a platform has been installed.
8. Study all relevant instructions or safety directions from the manufacturers of the various scaffolds that are to be used.
9. Never climb up a scaffold from the outside. Always use the stairs, ladders or climbing frames that are designed to provide access to the upper decks from the inside of the scaffold.
10. If the scaffold is to be used outdoors, erection or dismantling work must be discontinued if the weather conditions are too bad. Make sure that all loose components are properly fixed before leaving the scaffold.
11. Scaffolding work must be done by "competent workmen" under the supervision of a "competent person".
12. Raising and lowering of parts, material and tools using ropes or slings must be carried out in a protected lifting area.
13. Lifting equipment must not be fitted to scaffolding unless ties or equivalent devices are secure.
14. Beware of any overhead power lines nearby.
15. Always observe and comply with the regulations issued by the local authorities concerned.

Before erecting the scaffold, check and flatten out the ground. The support surface must not be subject to uneven settlement. Its bearing capacity may be improved with the help of mud sills.



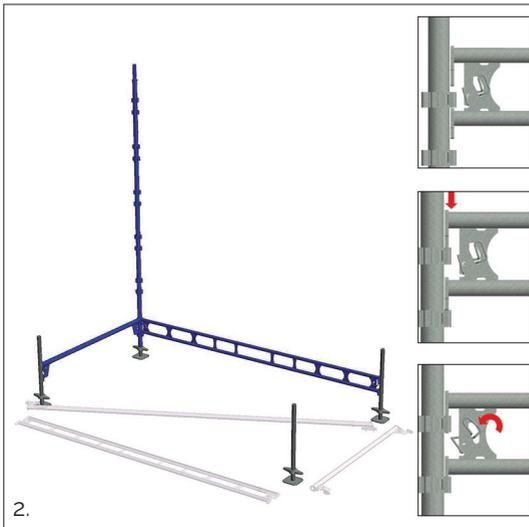
1.

1. Set out the material for the bottom of the scaffold along the facade.

Place the base jacks about 200 mm out from the facade and at the bay lengths that are to be used.

If inside brackets are to be used, increase the distance accordingly.

The greatest permissible distance between wall and work platform is 300 mm.



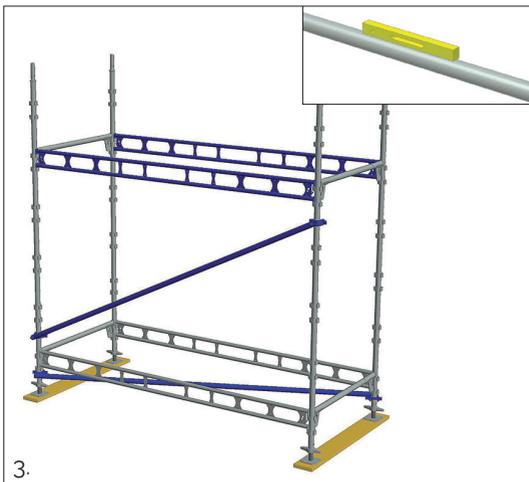
2.

2. Always start erection at the point that is situated highest.

Erect the first standard and fit a transom and ledger beam to it.

The beams are fitted to the lowest group of pockets on the standard. Lock the beams into position. Then fit standards and beams in order to complete the first lift.

If necessary, fit a plan brace in order to ensure that the scaffold is square.



3.

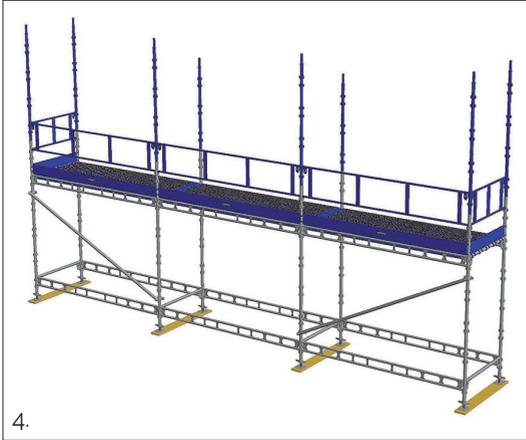
3. Fit the transom and ledger beams for the second lift 2.0 m above the beams that were fitted first.

Then check the levels in both the transverse and longitudinal directions using a spirit level and adjust using the swivel base jacks.

Continue erecting the bottom of the scaffold bay by bay using base jacks, standards and beams. If there are major differences in levels, adjust each individual standard in relation to the support surface so as to make the beams level.

Fit the vertical diagonal braces and correct the vertical alignment of the standards. Alternatively, brace the scaffold vertically using GFL guardrail frames; see page 26.

For transverse decking, see page 21.



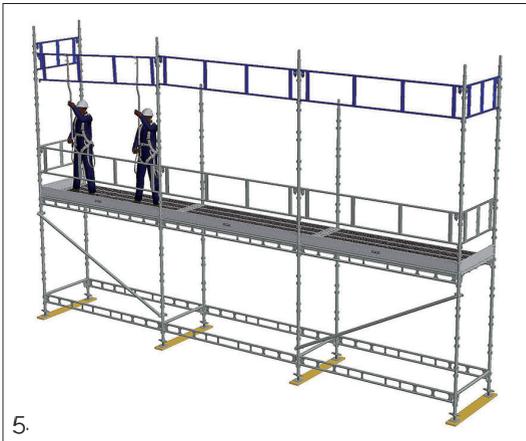
4.

4. Fit HAKI longitudinal decking units to the transom beams. Don't forget to lock the decking.

Fit the second set of standards.

Install GFL guardrail frames for the second lift and fit the toeboards.

Don't forget the end guardrails.



5.

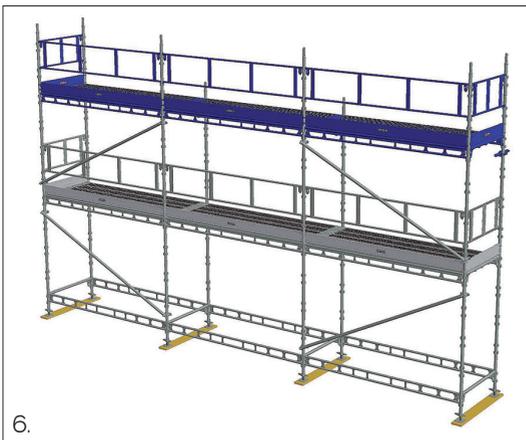
5. If HAKI's advanced guardrail tool is used, it is recommended to fit the GFL before beams.

6. Fit the transom and ledger beams for the third lift and then decking, guardrails and toeboards.

Don't forget to lock the beams and decking.

Anchor the scaffold at a height of approximately 4.8 m using tie rods and clamps. See page 26.

Check that the fixings in the facade can carry the forces involved.



6.

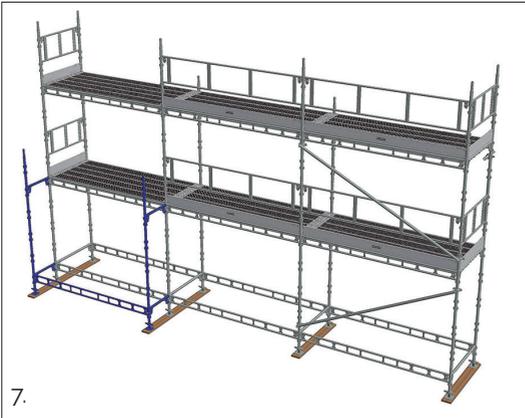
Continue erecting the subsequent lifts as described above. Use approved lifting aids for transport of the material.

Don't forget to lock the beams and decking.

Dismantling is done in the reverse order.

Scaffolding material must not be thrown down from the scaffold.

External stairway



7. The UTV stairway is fitted in an external bay using ERB 700 and LBL 3050 beams.

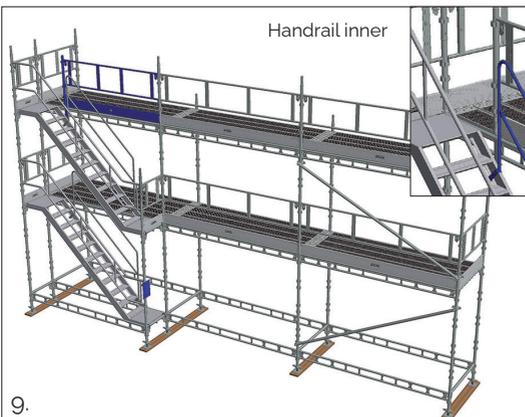
Set out the base jacks and erect the standards. Fit the 700 and 3050 beams into the lowest group of pockets. Fit the transom beams for the second lift too. At other levels, the handrails replace the ledger beams.



8. Fit the hooks of the UTV stairway over the tubes of the transom beams and lock the stairs using the locking device.

Fit the handrail at the 1.0 m level and provide the top end with GFL 700 guardrail frame and toeboard.

Fit the next set of standards, transom beams, stairs, handrail, guardrail frames and toeboards.



9. Continue erection up to the desired height as set out above. At the top level LBL 3050 fit a SRS 1000 so that a GFL 2500 guardrail frame can be put between the post and standard.

Alternatively combine a single ledger 3050 with a guardrail post SSKS.

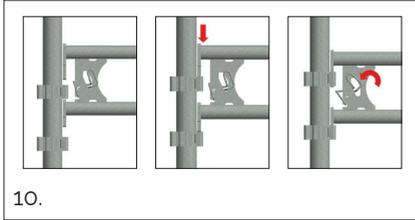
The guardrail frame provides fall protection at the top level of the scaffold.

At other levels, the next stairway provides sufficient protection.

However, an HLI UTV handrail can be fitted on the inside of the stairway. See detail.

Locking components

It is very important that all components in the HAKI System are continuously locked during the erection. It is made in the following way:



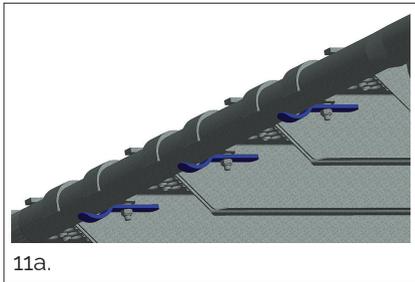
10.

10. The HAKI components are easily locked with a spring locking catch or hook.

In locked position, see illustration, the component is prevented from involuntarily coming out of position.

Spring locking catches that are defekted shall immediately be replaced. This is easily done with the help of the HAKI spring locking catch tool.

HAKI delivers the toll and original spring locking catches.



11a.

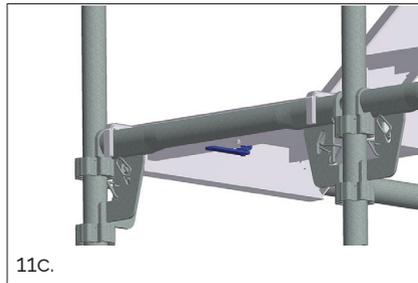
11. HAKI aluminium plank, steel plank and steel decking unit has the possibility to be locked in both ends.

The locking is a mechanical lock that is locked by hand and prevents the decking from involuntarily coming out of position.

In extreme environments the decking should also be locked using for example steel wire.



11b.

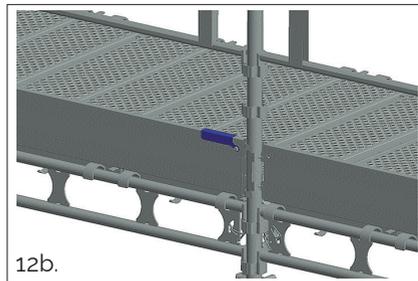


11c.

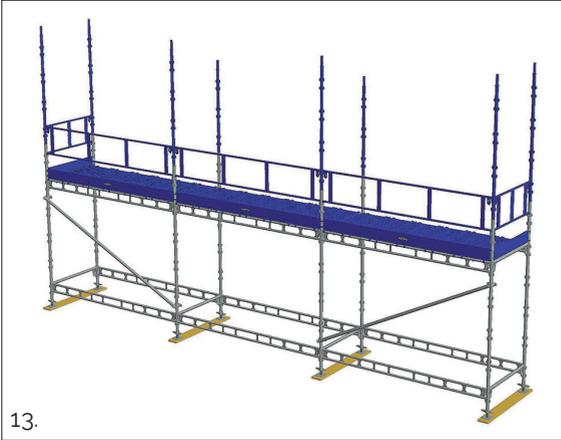
12. Toeboards are locked with a hook.



12a.

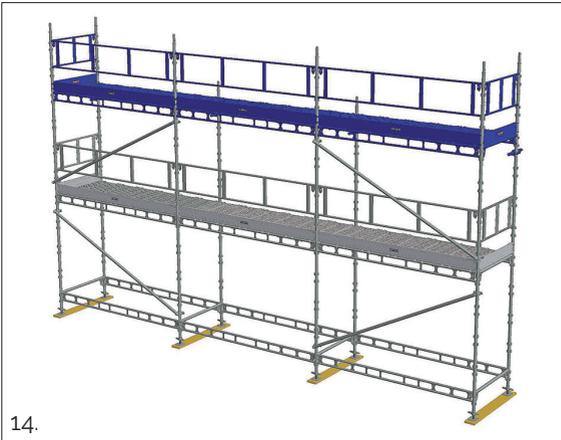


12b.



13.

13. Fit the steel decking unit on the single ledger. Lock the decking. Erect the second set of standards. Install guardrail frames for the second lift and fit the toeboards. Don't forget the end guardrails.



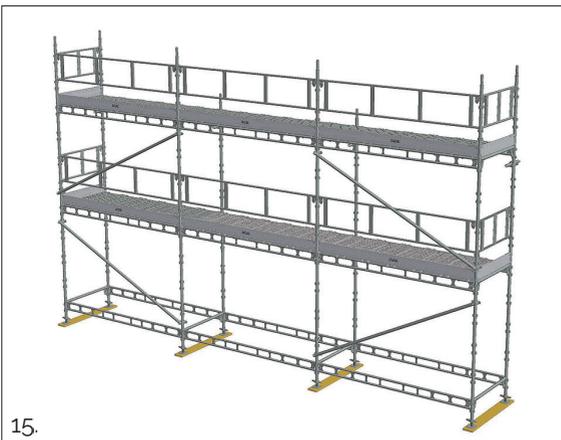
14.

14. Fit the transom and ledger beams for the third lift and then the decking, guardrails and toeboards.

Do not forget to lock the beams and decking.

Anchor the scaffold at a height of approximately 4.8 m using tie rods and clamps, see page 26.

Check that the fixings in the facade can carry the forces involved.



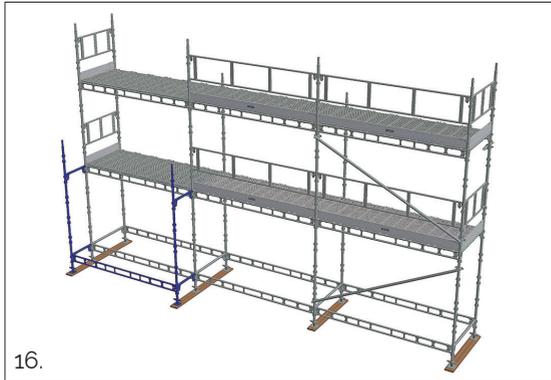
15.

15. Continue erecting the following lifts as described above.

Use approved lifting equipment for transporting materials.

Dismantling is done in the reverse order.

Scaffolding material must not be thrown down from the scaffold.

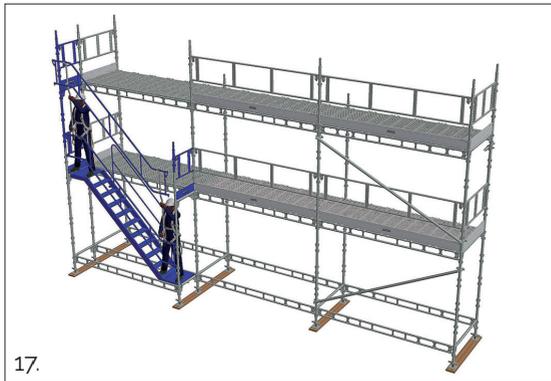


16.

External stairway

16. The UTV stairway is fitted in an external bay using ERB 700 and LBL 3050 beams.

Set out the base jacks and erect the standards. Fit the ERB 700 and LBL 3050 beams into the lowest group of pockets on the standards. Fit the transom beams for the second lift too. At other levels, the handrails replace the ledger beams.

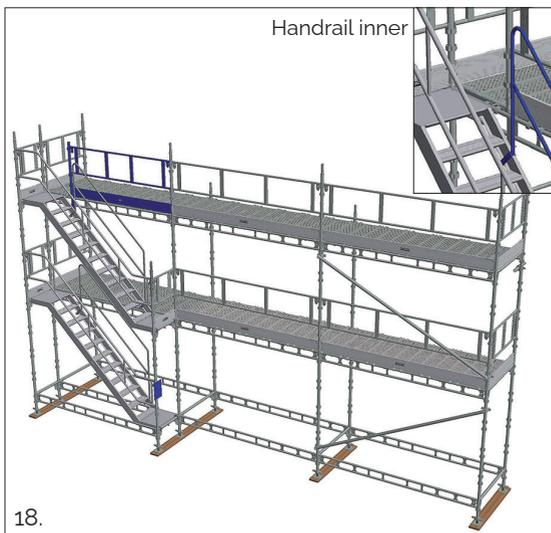


17.

17. Fit the hooks of the UTV stairway over the tubes of the transom beams and lock the stairs using the locking device.

Fit the handrail at the 1.0 m level and provide the top end with 700 guardrail frame and toeboard.

Fit the next set of standards, transom beams, stairs, handrail, guardrail frames and toeboards.



18.

18. Continue erection up to the desired height as set out above.

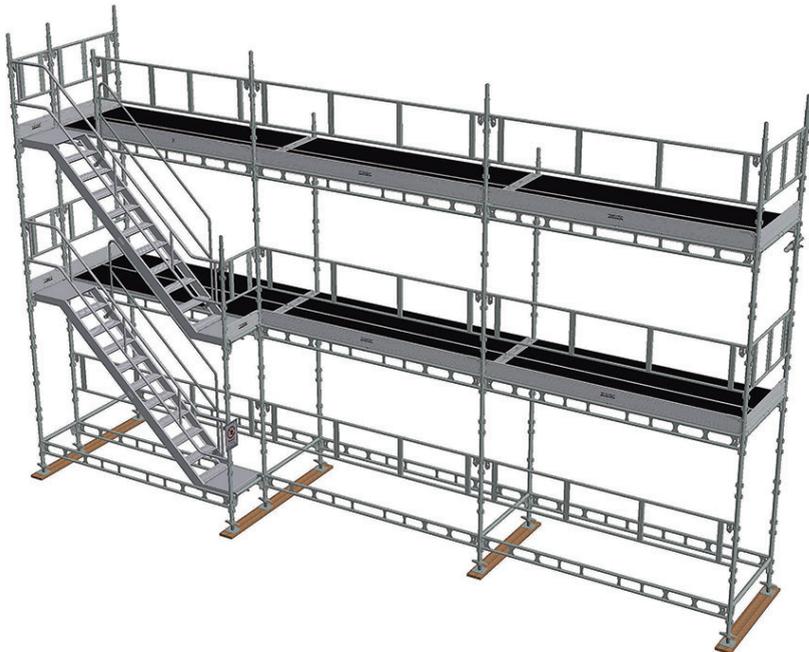
At the top level, an LBL 3050 beam is fitted externally in the scaffold, fit guardrail post 1000 so guardrail frame 2357 can be fitted between the post and standard.

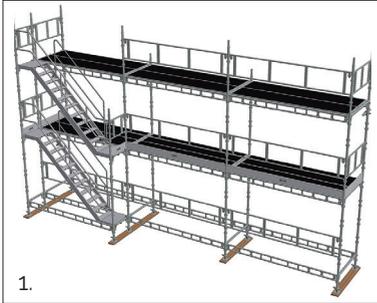
The guardrail frame provides fall protection at the top level of the scaffold.

At other levels, the next stairway provides sufficient protection. However, an HLI UTV handrail can be fitted on the inside of the stairway; see detail.

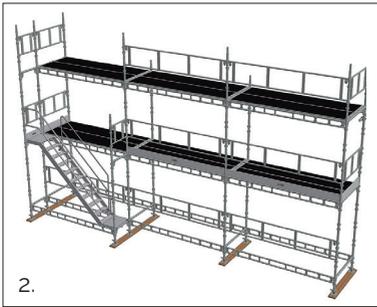
Instructions for dismantling

1. Dismantle the scaffold from the topmost lift.
2. Start by taking down the toe boards, mid-rails and hand rails.
3. Take down the topmost decking, then the stairs.
4. Take down the horizontals and diagonals of the topmost lift.
5. Finally, take down the standards of the topmost lift.
6. Repeat steps 3 to 5 to take down the second topmost lift and continue the whole process until the tower is completely dismantled.
7. Do not throw or dump the material onto the ground. This may damage the material or cause personal injury. The material must be lowered down to the ground by means of ropes or slings or carried down by hand.
8. Ties must not be removed before the dismantling process has reached the level in question.
9. If the scaffolding is to be used outdoors, the dismantling work must be interrupted if the weather is too bad. Check that all loose components are properly anchored before leaving the scaffold.

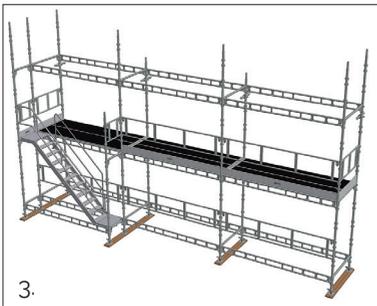




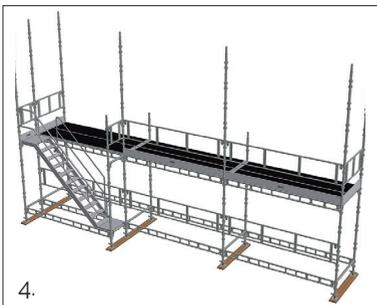
- 1.** Remove toeboard on the top level.
Remove safety gate, guardrail post and guardrail frame from the upper level.



- 2.** Remove handrail, handrail post and stair flight.



- 3.** Remove decking.
Remove all the guardrail frames using AGR tools.



- 4.** Remove beams and tie rods on the top level.
Finish by removing the standards.
Repeat same dismantling procedure until dismantling is complete.
Scaffolding material must not be thrown down from the scaffold.

Base jacks

The scaffolding is mounted on BS base jacks which are adjustable in height between 55 and 570 mm.

If more adjustments are needed, screw the base jacks down and assemble the beams to the next group of pockets. This means that the standards can always be adjusted to ensure that the beams are horizontal.

Permissible load when the base jack is fully extended is 50 kN.

Standards

Standards of length 3000 or 2000 mm are normally used in the scaffold. Standards shorter than 2000 mm may only be used as top standards.

However, 1.5 m standards may be used at the bottom of the scaffold in accordance with the alternative method of erection described on page 36.

Beams

The scaffolding is erected using ERB or LBL beams as ledgers and transoms with a height of 2000 mm between the lifts.

Each lift must be fitted with beams on both the inside and the outside. The lowermost lift must always be placed at the lowest possible level.

Guardrails

Decked lifts must be provided with guardrail frames or double guardrails and toeboards if the drop is 2.0 m or more.

The guardrail height must be at least 950 mm.

Use the GFLH higher guardrail frame or the SGF safety gate with net when decking using wooden gratings.

Bracing and tying-in

Vertical diagonal bracing between the outside standards must be installed in every 5th bay and always in the end bays. GFL/GFLH guardrail frames can replace vertical diagonal braces, but must then be fitted in each bay and at every lift level, including the bottom level. Applies only to scaffolding with a maximum lift distance of 2m.

Plan braces must be fitted in every 5th bay and always in the end bays at every 12th metre in height. **If horizontal braces are on the same level from where work is to be done, the horizontal brace needs to be moved to the level below.**

Each inside standard must be tied to the facade or equivalent at every 4th metre in height adjacent to the node between standard and beam. The lowest tie must be fitted no more than 4.8 m above ground level. There must be ties that can carry horizontal forces on at least every 5th pair of standards along the scaffold and at every level of ties.

In addition, we recommend that the scaffold always be anchored as high up as possible.

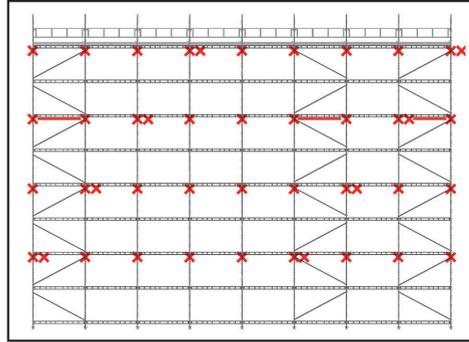
Scaffold with lattice beams must be anchored at the fixing points of the beams.

The following estimated maximum loads apply to scaffolding of this type of 24 m in height in accordance with EN 12811.

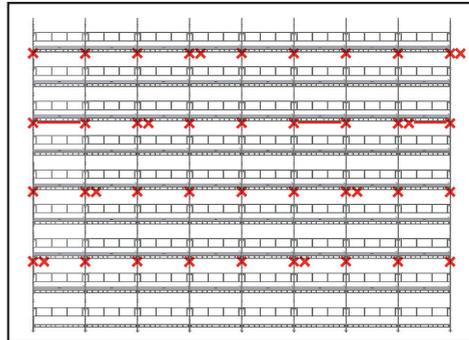
Ties that can withstand horizontal forces should be dimensioned for a load of 5,5 kN parallel with the façade and 6,5 kN (8,5 kN') perpendicular to the façade. Other ties should be dimensioned for a load of 4,6 kN perpendicular to the façade.

*8,5 kN applies to lattice beams (see page 35).

Where a scaffold is covered in sheeting, the number of ties must be increased to take account of wind load. Separate calculations are therefore required.

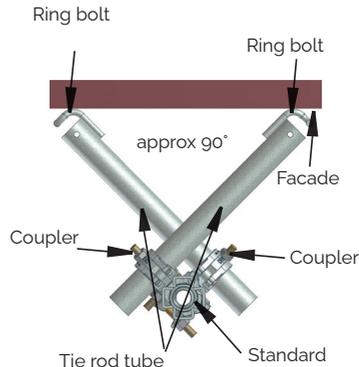


Bracing with vertical diagonal braces and tying-in



Bracing with GFL/GFLH guardrail frames and tying-in

Permissible load = dimensionerande last / 1,5



Examples of ties that can carry horizontal forces
(PLEASE NOTE! use only type examined couplers)

Longitudinal decking

HAKI steel-or aluminium planks are used for decking. These units are available in all bay sizes with widths of 230 and 200 mm and 320 and 295 mm for aluminium.

Alternatively HAKI Decking unit light may be used. These are available in all bay sizes with widths of 600 and 400 mm.

Load classes for longitudinal decking

Decking	Width [mm]	Length [mm]	Load class
Decking unit light	400, 600	1050-3050	3
HAKI Steel plank	200, 230	1050-2500 3050	6 6
AL plank	200	1050-2500 3050	6 5
AL plank	230	1050-1964 2500 3050	6 5 4

Transverse decking

Steel decking, aluminium or wooden gratings are used for transverse decking. These are designed for scaffolds of width 1050, 1250 alt. 1655 mm.

Load classes for transverse decking

Decking	Width [mm]	Length [mm]	Span	Load class
Steel decking	400;495	1114	1050	6
		1314	1250	6
		1719	1655	6
Grating AL	495	1332	1250	6
		1737	1655	6
Wooden grating with plastic spacers	490	1400	1250	5
		1950	1655	4
Wooden grating	485	1400	1250	5
		1950	1655	5

Permissible loads on standards

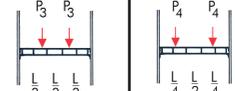
When calculating permissible construction heights for the scaffold, the following permissible loads on standards can be applied for different combinations of lift height and vertical distances between ties. When using 1.5 m standards at the bottom of the scaffold as described in the alternative method of erection on page 36, the table values for the S 2000 standard should be applied.

Lift height [m]	Vertical distance between ties [m]	Permissible standard load [kN]		
		S 3000 Base jack max	S 3000 Base jack max 250 mm	S 2000
1.5	1.5	36.8	40.5	30.5
	3	21.7	23.9	18.0
2	2	29.9	33.0	24.8
	4	16.9	18.6	14.0
2.5	2.5	21.5	23.7	17.8
	5	12.3	13.5	10.2
3	3	19.6	21.5	16.2
	6	9.0	9.9	7.5

The supporting ground must be able to withstand a design force per standard of **34.0** kN at lift height 2 m and vertical distance between ties 4 m. When scaffolding is suspended, standard joints must be locked using 16 mm pins. The permissible tensile load on a standard in a suspended scaffold is **20.0** kN.

Permissible loads on beams

Permissible loads on beams erected on HAKI standards.

Type of beam						
	Permissible load q [kN/m]	Uniformly distributed load Q [kN]	Centre point load P [kN]	Permissible point loads		
				P ₃ [kN]	P ₄ [kN]	
LBL 1050	32.4	34.0	11.0	11.0	12.4	
LBL 1250	21.4	26.7	9.5	8.5	10.0	
LBL 1655	15.1	25.0	9.2	7.7	10.1	
LBL 1964	11.3	22.2	6.9	6.7	10.0	
LBL 2500	7.9	19.8	7.0	7.1	8.0	
LBL 3050	5.2	15.7	5.8	5.7	7.2	
LB 3650	2.4	8.6	4.3	3.2	4.3	
LB 4050	2.4	9.6	4.8	3.6	4.8	
ERB 700	39.3	26.0	13.0	9.8	13.0	
ERB 770	38.5	26.0	13.0	9.8	13.0	
ERB 1050	25.4	26.0	13.0	9.8	13.0	
ERB 1250	21.7	26.0	13.0	9.8	13.0	
ERB 1655	12.4	19.9	10.0	7.5	10.0	
ERB 1964	7.7	14.8	7.7	5.8	7.7	
ERB 2050	7.1	14.2	7.4	5.5	7.4	
ERB 2500	3.8	9.3	4.7	3.5	4.7	
ERB 3050	3.0	9.0	4.5	3.4	4.5	

Permissible construction heights

The table applies to HAKI Universal with bay lengths 3,05 m, lift heights 2.0 m and a vertical distance between ties of 4.0 m.

Work must not be carried out on more than one lift at a time.

In the case of other standard loads, bay lengths, bay widths and decking options, the permitted building height is affected..

Permissible construction heights for HAKI Universal with standard S 3000, permissible load on standard 16.9 kN and longitudinal decking (see table page 27)

Decking	Width [mm]	Number of decked levels	Load class					
			1	2	3	4	5	6
Decking unit light Load class 3 11.9 kg/m ²	700	1	100	96	92	-	-	-
		5	92	84	78	-	-	-
		All	52	48	44	-	-	-
	1250	1	94	84	78	-	-	-
		5	80	66	56	-	-	-
		All	40	34	30	-	-	-
HAKI Steel plank 200 Load class 6 27.9 kg/m ²	770	1	100	94	92	84	74	64
		5	86	78	74	64	48	32
		All	42	38	36	30	24	18
	1250	1	92	82	76	64	46	-
		5	70	56	48	30	-	-
		All	28	24	20	14	6	-
HAKI Steel plank 230 Load class 6 26.2 kg/m ²	770	1	98	94	90	82	70	58
		5	84	76	70	60	42	24
		All	40	36	34	28	22	14
	1250	1	92	82	76	64	46	-
		5	72	58	50	30	4	-
		All	30	24	22	16	6	-
Al plank 200 Load class 5 / Al plank 230 Load class 4 16.5 kg/m ²	770	1	100	94	90	82	70	-
		5	88	80	74	62	46	-
		All	46	42	40	34	26	-
	1250	1	92	84	78	66	48	-
		5	78	64	54	36	10	-
		All	36	30	28	20	8	-

Permissible construction heights for HAKI Universal standard S 3000, permissible load on standard 16.g kN and transverse decking (see table page 27)

Platform	Bay width [mm]	Number of decked levels	Load class				
			1	2	3	4	5
Grating steel 1250 Load class 6 20.2 kg/m ²	1250	1	92	84	78	66	46
		5	74	60	52	34	-
		All	32	28	24	16	6
Grating steel 1655 Load class 6 18.3 kg/m ²	1655	1	88	76	68	52	28
		5	66	48	36	14	-
		All	28	22	18	10	-
Grating AL 1250 Load class 6 12.1 kg/m ²	1250	1	94	84	78	66	48
		5	78	66	56	38	10
		All	40	32	28	20	8
Grating AL 1655 Load class 6 11.9 kg/m ²	1655	1	88	76	68	52	30
		5	70	54	42	18	-
		All	34	26	22	12	-
Wooden grating with plastic spacers 1400 Load class 5 15.7 kg/m ²	1250	1	92	84	78	66	48
		5	76	62	52	34	-
		All	34	28	26	18	8
Wooden grating with plastic spacers 1950 Load class 4 16.9 kg/m ²	1655	1	86	76	68	52	-
		5	64	48	36	12	-
		All	26	20	16	8	-
Wooden grating 1400 Load class 5 22.0 kg/m ²	1250	1	92	82	76	64	46
		5	72	58	48	30	-
		All	28	24	22	14	6
Wooden grating 1950 Load class 5 22.6 kg/m ²	1655	1	86	74	66	50	26
		5	60	42	30	6	-
		All	22	16	14	6	-

Permissible loads on platforms and unilateral loading

 Weight decking max 20.7 kg/m² included.

	C-C between loaded beams (m) unilateral loading									
Loaded beam	0.564	0.700	0.770	1.050	1.250	1.550	1.650	2.050	2.550	3.050
LBL 1050	6	6	6	6	6	6	6	6	6	6
LBL 1250	6	6	6	6	6	6	6	6	6	6
LBL 1655	6	6	6	6	6	6	6	6	6	6
LBL 1964	6	6	6	6	6	6	6	6	6	5
LBL 2050	6	6	6	6	6	6	6	6	5	5
LBL 2500	6	6	6	6	6	6	6	5	5	4
LBL 2550	6	6	6	6	6	6	6	5	5	4
LBL 3050	6	6	6	6	5	5	5	4	4	3

	C-C between loaded beams (m) unilateral loading							
Loaded beam	0.700	0.770	1.050	1.250	1.650	1.964	2.500	3.050
ERB 450	6	6	6	6	6	6	6	6
ERB 564	6	6	6	6	6	6	6	6
ERB 700	6	6	6	6	6	6	6	6
ERB 770	6	6	6	6	6	6	6	6
ERB 1010	6	6	6	6	6	6	6	6
ERB 1020	6	6	6	6	6	6	6	6
ERB 1050	6	6	6	6	6	6	6	6
ERB 1250	6	6	6	6	6	6	6	6
ERB 1550	6	6	6	6	6	6	6	5
ERB 1655	6	6	6	6	6	6	6	6
ERB 1964	6	6	6	6	6	5	5	4
ERB 2050	6	6	6	6	6	5	4	4
ERB 2500	6	6	6	5	4	4	3	3
ERB 2550	6	6	6	5	4	4	3	3
ERB 3050	6	5	5	4	3	3	3	2

Permissible loads on platforms and bilateral loading

Weight decking max 20.7 kg/m² included.

	C-C between loaded beams (m) bilateral loading									
Loaded beam	0.564	0.700	0.770	1.050	1.250	1.550	1.650	2.050	2.550	3.050
LBL 1050	6	6	6	6	6	6	6	6	6	6
LBL 1250	6	6	6	6	6	6	6	6	5	5
LBL 1655	6	6	6	6	6	6	6	5	4	4
LBL 1964	6	6	6	6	6	5	5	4	4	3
LBL 2050	6	6	6	6	5	5	5	4	4	3
LBL 2500	6	6	6	5	5	4	4	3	3	3
LBL 2550	6	6	6	5	5	4	4	3	3	3
LBL 3050	6	5	5	4	4	3	3	3	2	2

	C-C between loaded beams (m) bilateral loading							
Loaded beam	0.700	0.770	1.050	1.250	1.650	1.964	2.500	3.050
ERB 450	6	6	6	6	6	6	6	6
ERB 564	6	6	6	6	6	6	6	6
ERB 700	6	6	6	6	6	6	6	6
ERB 770	6	6	6	6	6	6	6	6
ERB 1010	6	6	6	6	6	6	6	6
ERB 1020	6	6	6	6	6	6	6	6
ERB 1050	6	6	6	6	6	6	6	6
ERB 1250	6	6	6	6	6	6	5	5
ERB 1550	6	6	6	6	5	5	4	4
ERB 1655	6	6	6	6	5	4	4	3
ERB 1964	6	6	5	5	4	3	3	3
ERB 2050	6	6	5	4	4	3	3	3
ERB 2500	5	5	4	3	3	3	2	0
ERB 2550	5	5	4	3	3	3	2	0
ERB 3050	4	4	3	3	2	0	0	0

Brackets

Load classes for brackets apply provided that the brackets are fitted in a bay of length max. 3050 mm. In the specified load classes, no consideration has been paid to the bearing capacity of the decking. The permissible load class can never be greater than the load class for the decking.

Bracket	Load class
SK 230	6
SK 400	5
SK 460	4
SK 600	3
SK 600 förstärkt	4
SK 564 with spigot	3
SK 700 with spigot	3
SK 770 with spigot	3
SK 460-690	3
SKD 1250	3
SK 200/400	5
SK 230/460	5

Access ways

Access is usually provided by means of HAKI UTV stairways that are fitted to the outside of the scaffold using appropriate components.

Tillåten belastning på trapplöp och vilplan är 1,0 kN/m² för yta på max 10 m höjd.

Alternatively, a HAKI Stair Tower may be used; see the HAKI Stair Tower manual.

Load classers

Refers to EN 12811-1

Load-class	Uniformly distributed load [kN/m ²]	Concentrated load on area 0.5m x 0.5m [kN]	Load of one person on area 0.2m x 0.2m [kN]	Partial area load	
				Load [kN/m ²]	Partial [m ²]
1	0.75	1.5	1.0	-	-
2	1.5	1.5	1.0	-	-
3	2.0	1.5	1.0	-	-
4	3.0	3.0	1.0	5.0	0.4 A
5	4.5	3.0	1.0	7.5	0.4 A
6	6.0	3.0	1.0	10.0	0.5 A

A=the area between two pairs of standards

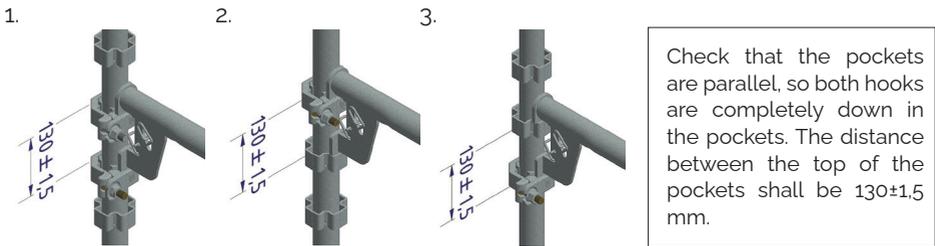
Pocket coupler 2048017

To be used for additional beams and brackets on HAKI standards.

Not for dimensioning of the entire scaffolding.

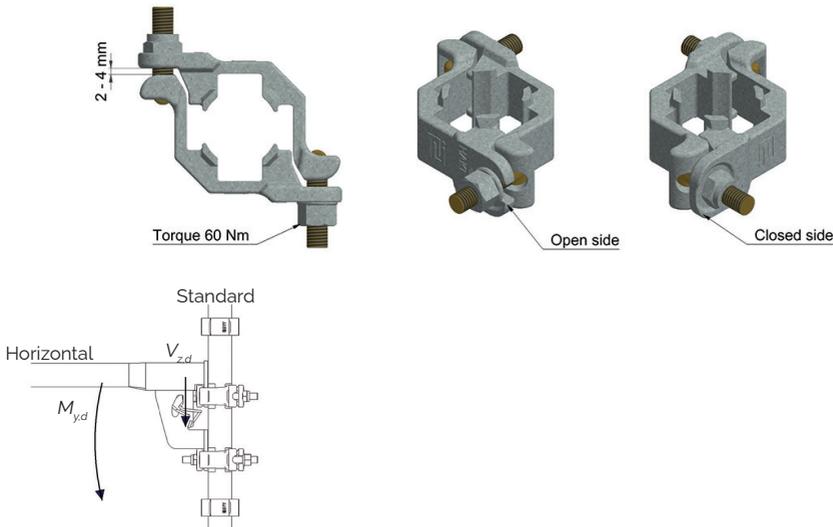
Assembly:

1. Two pocket couplers mounted on free height and angle between existing pockets.
2. One pocket coupler above existing pocket.
3. One pocket coupler below existing pocket.



Tightening torque: 60 Nm for nut on open side. (Threads lubricated)

Nut on closed side, adjusted if necessary, before assembly. Clearance 2-4 mm.



Scaffold system and type of load	Design load capacity	Permissible load $\gamma F=1.5$
HAKI Universal steel My,d	2458 Nm	1639 Nm
HAKI Universal steel Vz,d	11860 N (23720 N) ¹⁾	7907 N (15813 N) ¹⁾

¹⁾ One coupler (two couplers)

Lattice beams

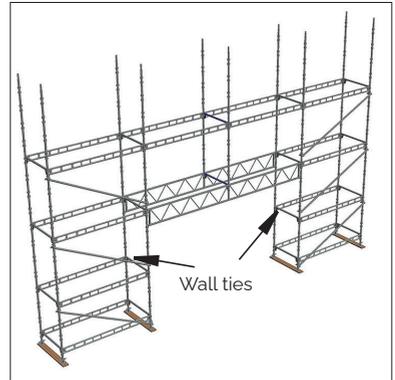
Steel lattice beams

Steel lattice beams 500/6100 are designed to allow the scaffold to continue to be erected across a span equivalent to two 3050 mm bays.

Steel lattice beams 500/6100 are fitted to the standards of the scaffold by hooking them over two pairs of pockets.

The lattice beams must be braced against lateral movement by fitting a beam to the pair of pockets in the middle of the beams.

Additional wall ties are placed at a height of 2.5 m to the side of the opening. Otherwise wall ties according to Bracing and tying-in page 26.



Steel lattice beam

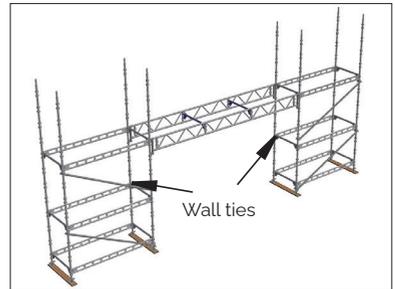
Aluminium lattice beams

If you are going to build further upwards with aluminium lattice beams, a special calculation must be made.

Aluminium lattice beams are fitted in pairs on the inside and outside of the scaffold. Both the top and bottom tubes must be fixed to the standards using SW 48x48 swivel couplers. The height is adjusted so that the decking is level when this is fitted.

The lattice beams must be braced against lateral movement at least every other metre with the aid of a diagonally rigid framework of standards and beams or tubes and couplers.

Additional wall ties are placed at a height of 2.5 m to the side of the opening. Otherwise wall ties according to Bracing and tying-in page 26.



Aluminium lattice beam

Permissible loads on lattice beams

				
Lattice beam	Permissible load q [kN/m]	Uniformly distributed load Q [kN]	Centre point load P [kN]	Point loads P_3 [kN]
Steel 500/6100	2.93	17.7	12.3	-
Aluminium FB 4100 AL	4.9	19.4	7.5	7.5
FB 6100 AL	3.0	18.3	7.5	6.9
FB 8100 AL	1.7	13.7	6.9	5.1

Alternative methods of erection when guardrail is fitted in advance

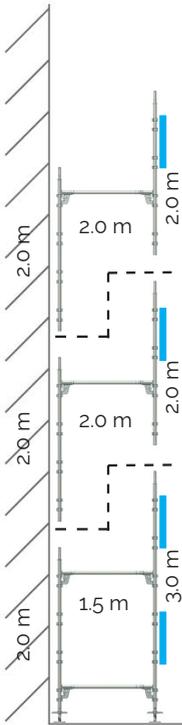


In order to be able to fit guardrails prior to decking, using HAKI's advance guardrail tool or with the aid of other guardrail fitting devices, the external standards must be one metre higher than the next lift. Some alternative methods of erection to achieve this are shown here.

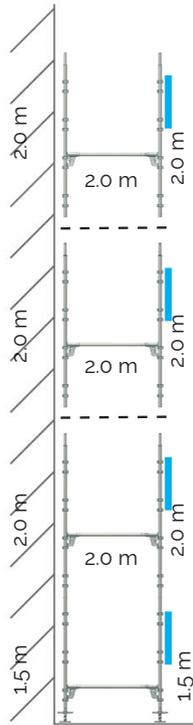
These methods of erection also facilitate the use of temporary guardrails.

For permissible loads on standards, see page 28.

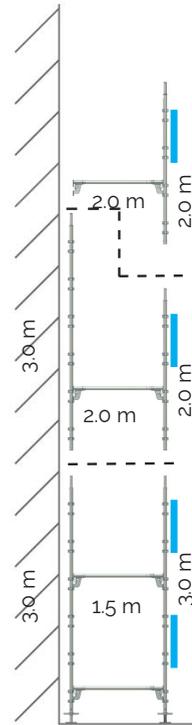
In other respects, see instructions for the fitting devices in question.



With a first lift height of 1.5 m, start with a 2.0 m standard internally and a 3.0 m standard externally. Continue with lift heights of 2.0 m, using 2.0 m standards both internally and externally.



With lift heights of 2.0 m, start with a 1.5 m standard both internally and externally. Continue with 2.0 m standards both internally and externally.



With a first lift height of 1.5 m, start with 3.0 m standards both internally and externally. Continue with lift heights of 2.0 m, using 3.0 m standards internally and 2.0 m standards externally.

Maintenance & storage

1. After use, all components must be thoroughly cleaned and inspected before storage.
2. Any damaged parts or components found must be replaced.
3. The manufacturer or supplier must be consulted before repairing scaffold material.
4. Components must be sorted and stacked properly. Take care not to pile the stacks too high, so that the material lower down in the stacks becomes overloaded and damaged. If the material must be stacked up high, suitable racking and shelves should be used.
5. Wooden and plastic components (e.g. platforms, toe boards, toe board holders, etc.) should be stored in a sheltered area so as to maximize their working life.

Wind, ice and snow

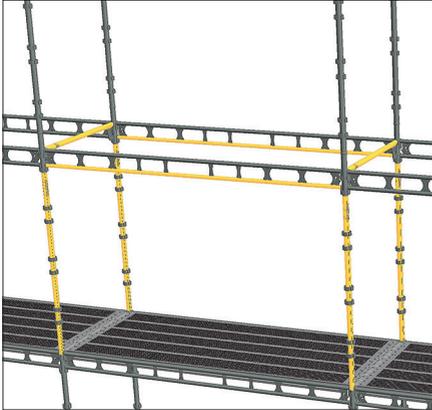
Since extreme weather conditions may occur during winter months, it is important to remove snow and ice immediately.

As regards wind loads, ties must be installed every fourth metre in height; see the section "Bracing and tying-in". As regards wind loads for clad scaffolding, calculations should be made in each individual case.

Attachment points for personal fall protection equipment

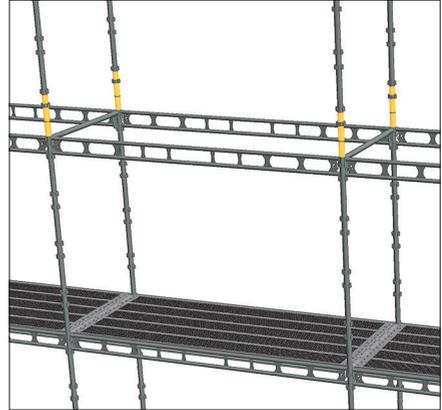
Permissible points of attachment for personal fall protection equipment are as described below.

PLEASE NOTE: Recommendations for points of attachment apply provided that the component in question is otherwise without load and that only one person is attached to the same component at any one time. Components that have been subjected to loading from fall protection equipment must be scrapped and replaced by new material.



Around a standard between two lifts or around the lower tube in a ledger beam fitted between two standards.

Alternatively, around a single-tube beam of maximum length ERB 2050, fitted between two standards.



Around a free standard, but only within 40 cm of the node.

PLEASE NOTE: Not next to a standard joint.

No other points of attachment can be recommended. Fall protection equipment **MUST NOT** be attached to guardrails, brackets and cantilevers, i.e. beams fixed at only one end. Fall protection equipment **MUST NOT** be attached to components that have not been locked into place.

PLEASE NOTE: Use only approved safety equipment.



SAFETY CHECKLIST

1. Supporting surface checked with regard to load-bearing capacity
2. Distance to wall or similar as short as possible
3. Scaffold aligned correctly horizontally and vertically
4. Components correctly fitted and locked
5. Bracing correctly fitted
6. Anchoring with right number and placing of ties
7. Decking correctly fitted
8. Guardrail with toeboard if drop is two metres or more
9. Suitable means of access to scaffold
10. Scaffold erected for correct class of load



Experience

With over 60 years experience to call on, HAKI has gained a leading reputation in its field. With its own R & D and manufacturing facilities, the company now operates throughout Europe and its equipment is in use worldwide. With all products designed and manufactured to ISO 9001:2015, and a comprehensive training and support infrastructure, you can rely on HAKI for support.



Training

The Company's dedicated Training Centre is equipped with the full range of HAKI products where a comprehensive choice of courses is offered. With the benefit of this training, all users of HAKI products can be assured that the equipment is being employed safely and effectively.



Support

From computerised estimating facilities to on site assessment and project back up, HAKI is with its customers every step of the way. Working with HAKI means far more than just proven equipment, it means working with people who understand the scaffolding industry. Whatever the project, the company is committed to ensuring every user enjoys the full benefits associated with the use of HAKI - maximising the savings, profitability, and above all, SAFETY.

Health and Safety at Work Act, 1974

HAKI equipment is designed to meet the requirements of the above Act, Section 6.

It is also the customer's responsibility to comply with the requirements of this Act, particularly to use the equipment in accordance with current codes of practice and in ensuring that components are in good working condition prior to each use.

We are able to provide assistance and advice on matters relating to safe and proper use of HAKI equipment.

