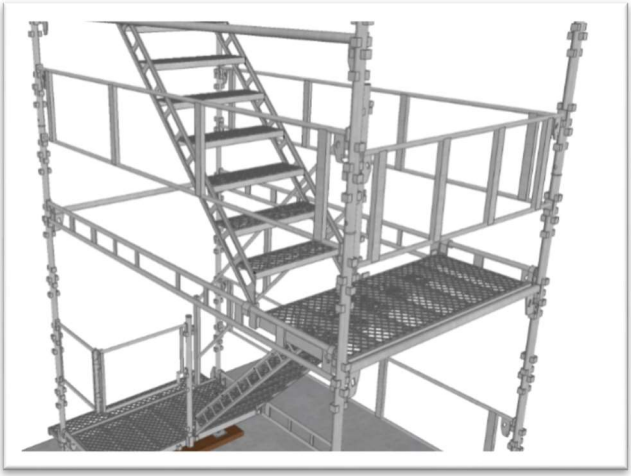
ACCESS SOLUTIONS LTD.

Universal Stair Tower

VR Access Solutions Universal Stair Tower

Introduction

The VR Access Solutions Universal Stair Tower is specifically designed to provide Code compliant safe access to a working scaffold, whilst simultaneously being quick to erect and dismantle. All components are purposely designed to work as a system, and this allows for flexibility of layouts with respect to lifts and access/egress points.



Standards, landings, ledger beams, flights and guard rails are all specific to the Universal Stair Tower, and all components are fabricated from galvanised steel for long term durability.

This guide describes the use of the components as a standard access stair and describes the basic configurations for erecting a stair on site. Further information on additional configurations can be obtained from VR Access Solutions Ltd or a competent scaffold designer.

Accreditations

The Universal Stair Tower has undergone both rigorous physical testing and assessment by calculation by independent testing organisations. The results are the safe working heights and loads as described in this guide, which have been derived in accordance with the following Codes of Practice:

BS EN 12810-1:2003 – Façade scaffolds made of prefabricated components. Product specifications.

BS EN 12810-2:2003 - Façade scaffolds made of prefabricated components. Particular methods of structural design.

BS EN 12811:1 2003 – Temporary works equipment. Scaffolds – Performance requirements and general design

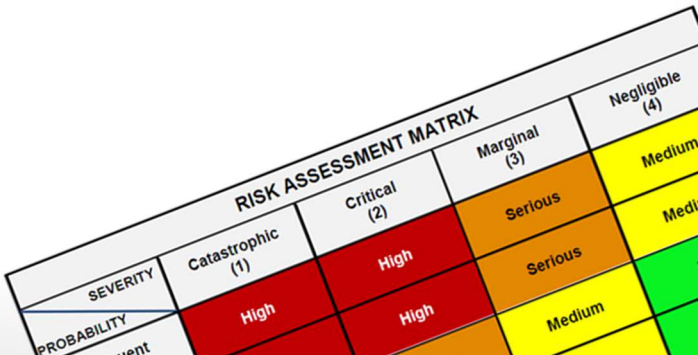
BS EN 12811:2 2004 – Temporary works equipment. Information on materials.

BS EN 12811:3 2002 – Temporary works equipment. Load testing.

Safety Considerations

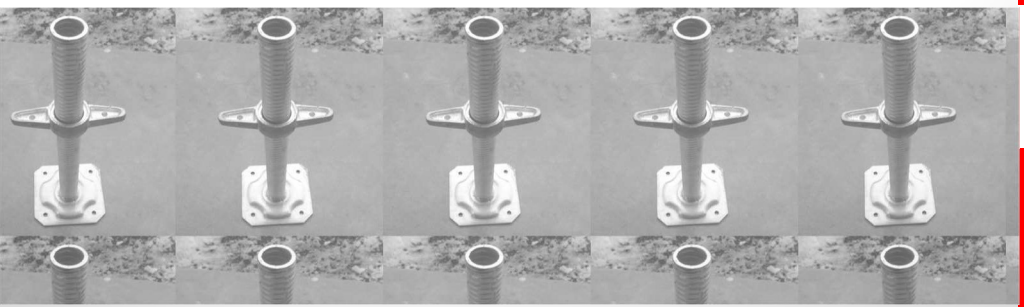
General Safety Notes

- Only individuals with appropriate training and experience should erect the Universal Stair Tower
- The guidance issued in the latest versions of Health and Safety legislation should be adhered to at all times. This includes, but is not limited to, the Health and Safety at Work Act, Work at Height Regulations, and the Construction Regulations Safe Place of Work act
- Always work to the guidance of NASC SG04:15
- Harnesses should be worn and secured to a suitable location at all times when erecting the Universal Stair Tower
- Always work in accordance with the requirements of any site specific risk assessments



Site Safety Notes

- Inspect all components prior to installation for damage and to ensure the correct items are available.
- Ensure that the ground is capable of supporting the loads imposed by the stair, and that a suitable foundation is provided.
- Do not undermine or weaken the tower foundation by excavating close to the base of the standards.
- Follow the guidance given in this guide with respect to the sequence of erection and the components to be used.
- Ties must be provided in strict compliance with the information given in this guide. Never remove ties without seeking advice from a competent scaffold designer.
- Never add netting or sheeting to a stair without further design being undertaken by a competent scaffold designer.
- Stair towers are designed for personnel access only. Do not load or store materials on the stair, and keep the flights and platforms free of obstructions at all times.



Rescue Plan

Employers are required to consider the need to assist employees who have fallen during erection procedures and are suspended on a fall arrest system. The Work at Height Regulations stipulate that a plan must be in place in advance of commencing work in order that procedures can be implemented swiftly in an emergency situation.

Users are directed towards the latest issue of the NASC publication SG19 ‘A Guide to Formulating a Rescue Plan’ for further information.

Components

The principal components of the VR Access Solutions Universal Stair Tower are detailed below, with weights, product codes, and safe working load data.

All components have been assessed for compliance with the imposed loading requirements of BS EN 12811-1:2003 for access routes onto scaffolds and found to be compliant.

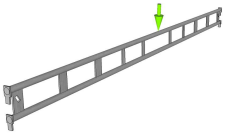
Where additional safe working load information is shown, this relates to the component in isolation; all supporting components should always be assessed if a bespoke design is being undertaken. Contact VR Access Solutions for safe working loads of additional components if required.

Standards

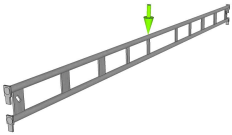
Item	*Weight (Kg)*	*Code*
3.0m Standard	16.7	VRHS03
2.0m Standard	11.3	VRHS02

Ledger Beam

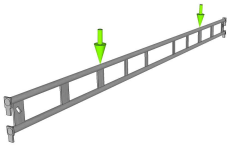
Item	*Weight (Kg)*	*Code*
3.0m Ledger Beam	17.0	VRHS09



Centre Point Load (A)



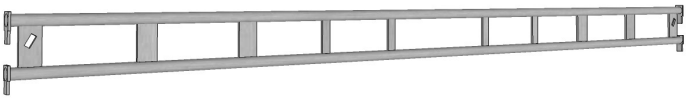
Centre Point Load (B)



Two Point Loads

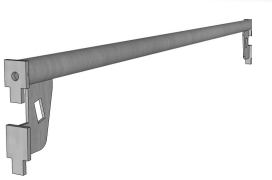
Configuration	*Max Permissible Load (kN)**
UDL	1.6 kN/m
Centre Point Load (A)	2.0
Centre Point Load (B) above Flat adjacent to Centre	1.9
Two point loads at third points (each)	2.5

* with top chord restraint at mid span



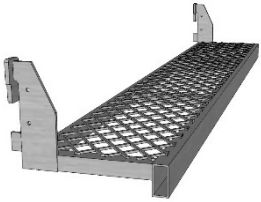
Single Tube Beam

Item	*Weight (Kg)*	*Code*
1.6m Single Tube Beam	6.3	VRHS08



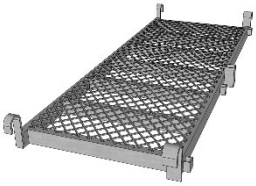
Entrance Step

Item	*Weight (Kg)*	*Code*
Entrance Step	15.1	VRHS26



Landing Platform

Item	*Weight (Kg)*	*Code*
Landing Platform	29.1	VRHS27



Stair Flights

Item	*Weight (Kg)*	*Code*
1.0m Flight	28.0	VRHS10
1.5m Flight	26.0	VRHS11
2.0m Flight	34.0	VRHS12

Stair Guardrail Frame

Item	*Weight (Kg)*	*Code*
1.0m Flight Rail	10.0	VRHS21
1.5m Flight Rail	12.0	VRHS22
2.0m Flight Rail	14.0	VRHS23

Guardrail Tube

Item	*Weight (Kg)*	*Code*
2.16M Guardrail Tube	7.9	VRHS13
3.0m Guardrail Tube	11.0	VRHS18

Horizontal Guardrail Frames

Item	*Weight (Kg)*	*Code*
1.6m Guardrail Frame	10.9	VRHS16
3.0m Guardrail Frame	15.4	VRHS17

1m Handrail Post

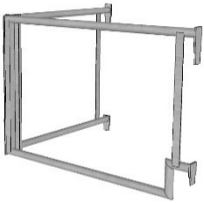
Item	*Weight (Kg)*	*Code*
Handrail Post	5.1	VRHS24

Clip on Post

Item	*Weight (Kg)*	*Code*
Clip on Post	6.6	VRHS25

Guardrail Frame

Item	*Weight (Kg)*	*Code*
Guardrail Frame	7.3	VRHS14



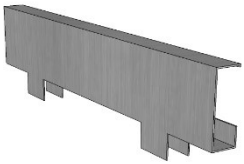
Folding Guardrail Frame

Item	*Weight (Kg)*	*Code*
Folding Guardrail Frame	9.0	VRHS15

Base Jacks

Item	*Weight (Kg)*	*Code*
Adjustable Jack	4.5	VRS66

Toe Boards



Item	*Weight (Kg)*	*Code*
End Toe Board	7.0	VRHS31
Side Toe Board	3.1	VRHS32
Top Toe Board	3.1	VRHS33

Erection Platform

Item	*Weight (Kg)*	*Code*
Erection Platform	15.0	VRHS01

Advance Guardrail Tool

Item	*Weight (Kg)*	*Code*
Advance Guardrail Tool	1.5	VRHG01

Bracing and Tying

In order to achieve the safe working heights and capacities stated in this guide, the Universal Stair Tower must be tied back to a supporting structure on every lift.

When the tower is constructed with the long face parallel to the supporting structure, ties should be formed using EN39 ties connected to both the inner and outer face standards, and connected into the supporting structure using an appropriate tying system.

When the tower is constructed with the short face parallel to the supporting structure, the inner standards must be tied to the supporting structure at every lift. The outer standards should be braced at every lift using EN39 raking tubes at a 45° horizontal angle.

For connections to the supporting structure, masonry anchors, box ties, through ties and girder couplers are all acceptable variants of tie. The tie and the supporting structure should always be approved by a qualified individual prior to erecting the tower.

Safe Heights and Capacities

Quoted safe heights and capacities within this guide are calculated when loaded in accordance with the requirements of BS EN 12811-1:2003, which requires an imposed load of 1kN/m^2 to be applied over a 10m loaded height of the tower. Users should ensure that the accumulation of construction dust and debris, or environmental loads such as ice or snow do not cause this loading to be exceeded.

Maximum Leg Loads

The following maximum permissible leg loads are applicable when the Universal Stair Tower is erected and ties in accordance with the information given in this guide.

Arrangement	Bracing and Tying	Safe Axial Load in Standards (kN)
Long Face Parallel	Tied through both inner and outer standard at every lift	32.8 kN
Short Face Parallel	Inner standard tied every lift. Outer standard braced with raking tubes at every lift.	32.7 kN

Safe Working Heights

Safe working heights are quoted up to a maximum of 30m for cases where either the short face or the long face is parallel to the supporting structure, and a further option of 'town' or 'country' sites is provided.

Heights are quoted relative to a site wind speed 'S', and the resulting wind load on the tower is calculated in accordance with the guidance given in TG20:13. The user must derive the site specific 'S' value, taking account into local effects such as funneling, cliffs, escarpments etc., which can cause significant changes to the basic site wind speeds. All heights relate to a stair tower without either cladding or debris netting.

The values given within this guide are specific only to the VR Access Solutions Universal Stair Tower.

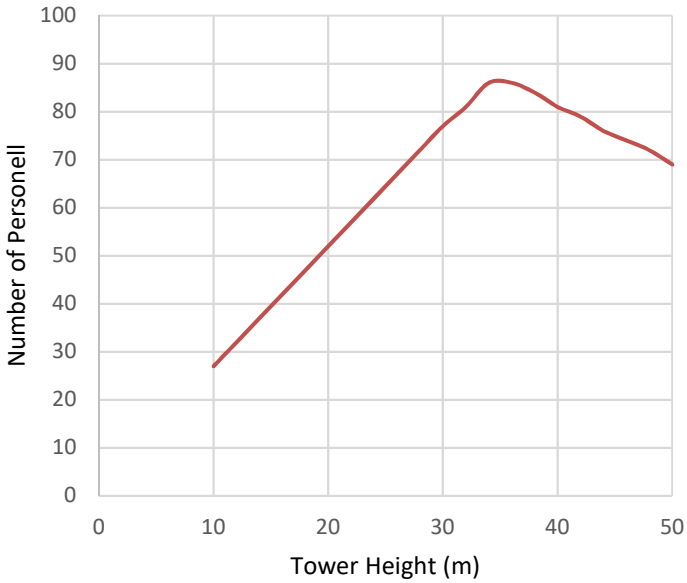
Long Face Parallel to Supporting Structure		
	Maximum Height	
S	***Country***	***Town***
20	30	30
24	30	30
8	30	30
32	14	16
38	6	10
40	4	6

Short Face Parallel to Supporting Structure		
	Maximum Height	
S	***Country***	***Town***
20	30	30
24	30	30
8	30	30
32	30	30
38	30	30
40	30	30

Personnel Capacities

The following tables indicate the allowable number of personnel on the Universal Stair Tower for each given height.

The chart below applies to both long and short face parallel to the supporting structure, and allows for gravity loads only. Lateral forces (for example wind loads) must be consider in further design by a competent temporary works engineer. It is assumed for the purposes of the table that 1 person = 1kN



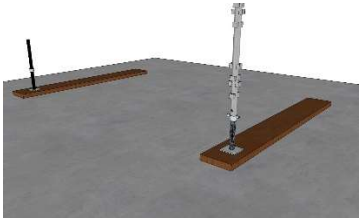
Erection Sequence

This section describes the standard erection sequence for the Universal Stair Tower, using Advance Guardrail methods for compliance with the NASC SG04:15 guidance. This allows guardrails to be erected in advance of the working platform, provided enhanced safety for the erection operatives.

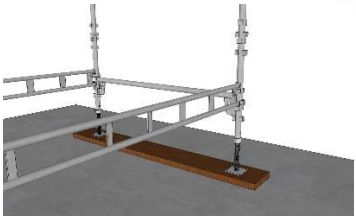
Operatives should wear an appropriate safety harness at all times, and this should be secured by 800mm twin tail lanyards to the highest horizontal member of the tower.

It is recommended the Universal Stair Tower is erected by a minimum of two operatives. Site specific method statements should be followed at all times where applicable, and tying points to the supporting structure must be finalised prior to erection in all cases.

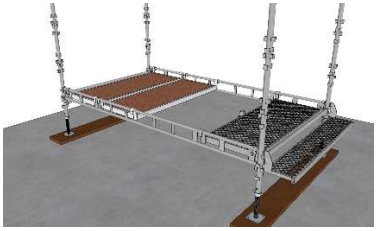
Set out sole pads/foundations and base jacks. Add standards to the base jacks. Whilst holding the standard connect a 3.05m ledger and a 1.65m single tube beam.



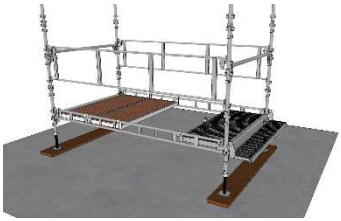
Connect 3.05m ledger to higher pockets and 1.65m tube ledger to lower pockets. Engage all locking pins, and adjust the base jacks to the level the first lift.



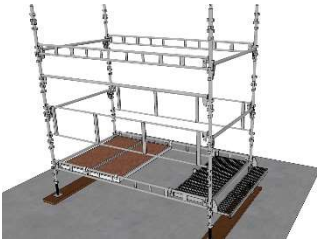
Install the entrance step, first landing platform and two erection platforms.



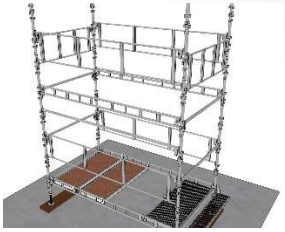
Working from the landing and the erection platforms, install two 3.05m guardrail frames and two 1.65m guardrail tubes.



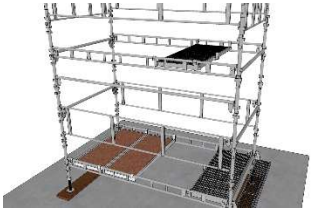
Install a 3.05m guardrail tube at +1.5m above the landing. At the next lift level install two 3.05m ledger beams and two 1.65m ledger tubes.



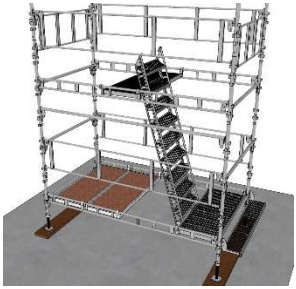
Using the advance guardrail tool, install two 3.05m and two 1.65m guardrail frames, securing all locking pins



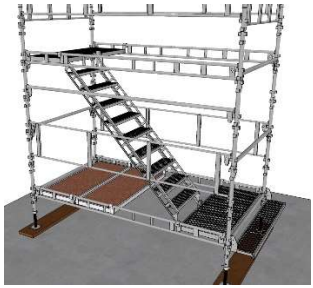
Install the landing platform to prepare for the installation of the stair flight



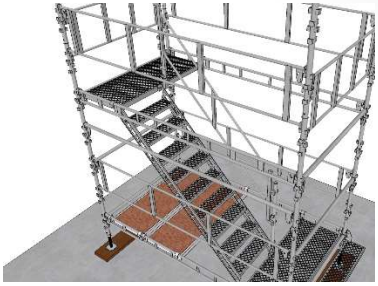
Locate the lower end of the stair flight into the support pockets on the left of the lower landing platform. The stair should ascend in a clockwise direction.



Slowly lower the stair flight, pushing the upper landing platform into place. Ensure the upper end of the stair flight connects into the support pockets on the upper landing platform.

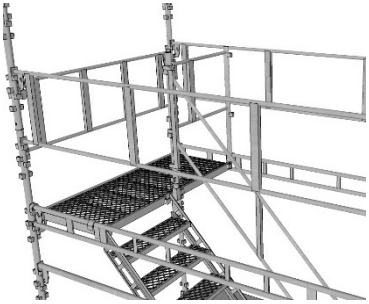


Install upper and lower handrail posts and fix stair guardrail frame into place.

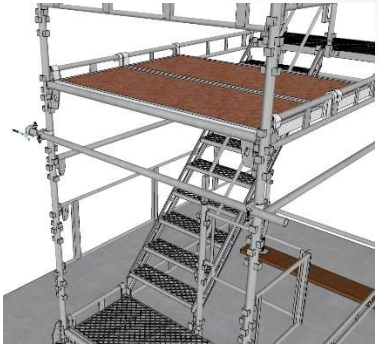


Remove rear 3.05m guardrail frame, one side 1.65m single guard rail, and install folding guardrail frame at lower landing.

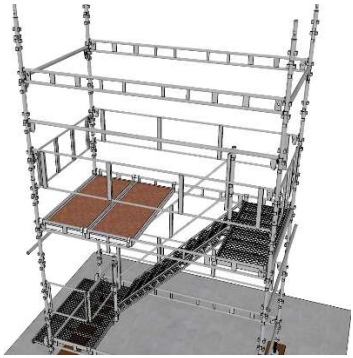
Fit temporary guardrail frame at top landing.



Fit tie tubes across inner and outer standards and anchor into supporting structure. Move erection platforms up to second lift.

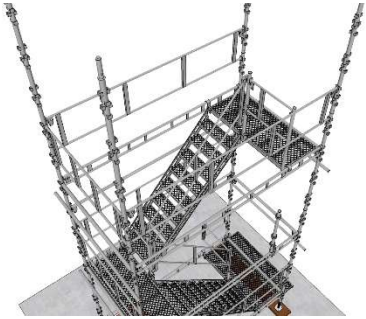


Working from the landing and erection platforms, install the next lift of 3.05m ledger beams and 1.65m single tube beams. Install further standards as required, making sure pockets are in correct orientation.

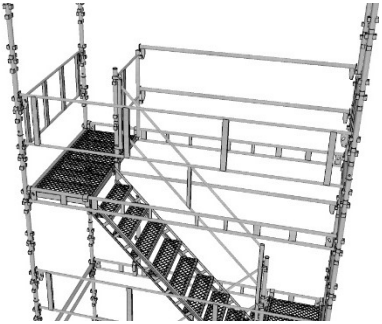


Repeat the sequence to erect the stair to the required height.

For top access on the 1.65m end, remove the 1.65m guardrail frame and install the top end guardrail frame to protect the landing edge.

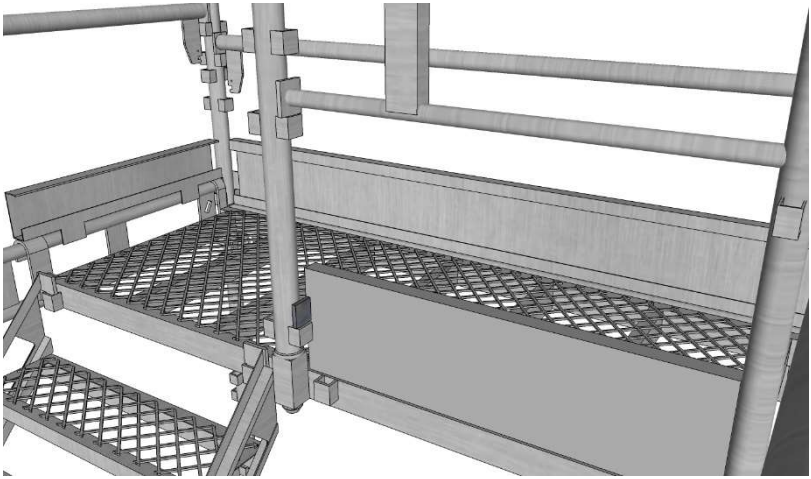


For top access on the 3.05m side, work from either the stair or temporary erection platforms (depending on access side) to remove the 3.05m guardrail frame. Install two 2.16m single tube guardrails to the clip on post.



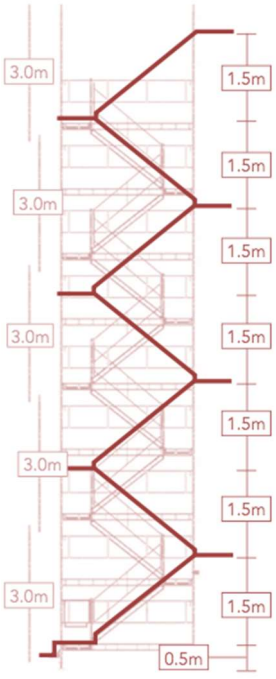
Toeboards

Industry guidance varies regarding the requirement for toe boards on a stair tower which is used only as an access to a working scaffold. It is recommended that a site specific risk assessment is undertaken to assess the need for toe boards, and these are available for the Universal Stair Tower if they are shown to be required.

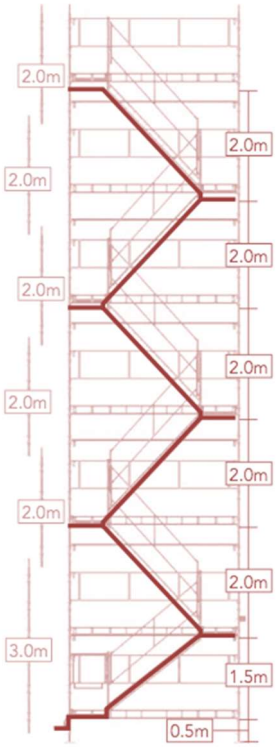


Standard Leg Arrangements

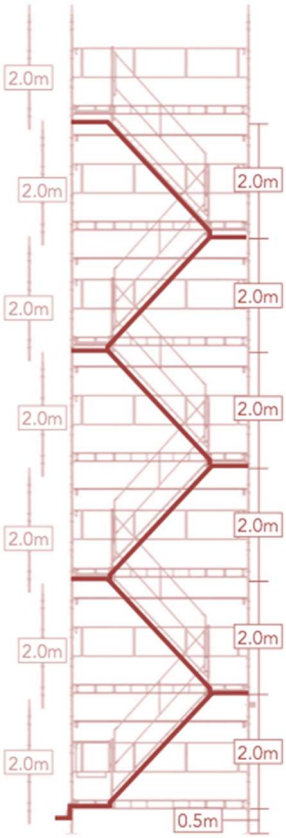
The following diagrams, show how three different configurations of lift heights can be constructed, with the corresponding standard lengths required. The height of the standards is shown on the left of the figure, with the lift height shown to the right.



Arrangement for 1.5m Lifts, made up using 3.0m length standards.



Arrangement for 1.5m base lift, with 2.0m lifts above.



Arrangement for 2.0m lifts using first lift of 2m + 2m standards to allow for use of advance guardrail tool.

Technical Support

For additional technical assistance, contact us for further assistance.

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VR ACCESS SOLUTIONS LTD.