



RAISED ACCESS FLOOR SYSTEM

TECHNICAL SPECIFICATION



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SYSTEM DESCRIPTION

This specification covers the supply and installation of a raised access floor of a Type 1, 2 or 3 capable of meeting the requirements detailed in the Load Performance Table below and all other requirements of this specification and finishing at a height above the sub-floor all as called for in the Provisional Bill of Quantities.

The raised access floor installation shall consist of 600 mm x 600 mm modular and interchangeable steel panels, supported by a steel understructure, in accordance with this specification.

The finished raised access floor surface shall be free of exposed metal edges and shall be sturdy, rigid, firm and free of vibration, rocking panels, rattles, squeaks, echoing sounds and other noises to render a quiet and aesthetically pleasing floor.

The raised access floor shall be finished in accordance with the finishes detailed herein and in the Provisional Bill of Quantities.

The raised access floor shall comply with the requirements of SABS 1549 : 1992 except where otherwise called for in this specification or EN 12825:2001

The raised access floor is to be manufactured under the integrated quality assurance requirements of ISO 2001 - 2008.

COMPONENT SPECIFICATION

Access floor panels

The access floor panels shall be structurally rigid isotropic or linear assemblies fabricated entirely from non-combustible components and shall consist of a dead flat full-hard steel top sheet, resistance-welded to a steel bottom section of irregular or regular domed formation. The exterior and interior surfaces of the access floor panel shall be protected from corrosion by a process of cleaning and dip phosphating. The core interior of the panel shall be filled with a non-combustible cementitious compound which will support no less than 90% of the top surface of the panel. The exterior surface of the panel shall be coated with an expoxy coated finish.

For a freestanding system the access floor panels shall provide for positive engagement with the pedestal at all four corners.

For a system in which the panels are screwed down at their corners the access floor panel shall be provided with four corrosion resistant captured fasteners. The fasteners shall bolt through the panel and clamp the panel to the pedestal heads. The panels shall be able to be removed by releasing the four fasteners.

Understructure

The understructure system shall consist of a steel or aluminium factory assembled pedestal head and base which shall be surface treated and have a corrosion-resistant finish. This assembly shall be capable of supporting a minimum axial load of 22,5 kN.

The maximum depth of the access floor panel and the pedestal assembly shall not exceed 40 mm.

A corrosion resistant nut shall be provided which shall allow for adjustment of the pedestal assembly over a range of 50mm (25mm up and 25mm down) without rotation of the pedestal head. The nut shall have an anti-rotation and vibration-proof feature.

For a freestanding system the pedestal head shall have locating studs on which the access floor panels positively locate as well as locating tabs and ridges which positively position and self-align the pedestal head with the access floor panel.

For a system in which the panels are screwed down at their corners the pedestal head shall have four threaded holes to accept the panel fasteners as well as locating tabs and ridges which positively position and self-align the pedestal head with the access floor panel.

For both the freestanding and the screw-down systems the access floor shall rest on a conductive plastic gasket.

For a stringer system the pedestal head shall be designed so as to receive snap-on or Bolt-on stringers.

Stringers shall be manufactured from a minimum 20 gauge steel channel section with a snap-on attachment to the pedestal. Each stringer shall be surface treated and have a corrosion-resistant finish and be provided with a factory-applied and conductive bonded gasket on the top surface.

The design of all understructure systems and their interfaces to the panels shall be such that the floor shall remain sturdy and firm no matter how many panels are removed for work to be carried out under the access floor.

Finishes

If required, the raised access floor shall be finished with one of the following finishes and as specified in the Provisional Bill of Quantities:

Carpeting adhered to the full surface of the access floor panel for use in a snap-on stringer or freestanding system.

High pressure laminate of 1,5 mm thickness adhered to the full surface of the access floor panel for use in a snap-on stringer or freestanding system. The laminate shall have an integral trim edge or be bevelled along its edge and shall not crack or split or come away from the edge of the panel.

Static control vinyl of 2,0 mm thickness fully flexible antistatic or static conductive 600 mm x 600 mm vinyl tiles adhered to the full surface of the access floor panel for use in a snap-on stringer or freestanding system. The vinyl shall be bevelled along its edge.

LOADING PERFORMANCE SPECIFICATIONS

The type of access floor specified shall comply with the requirements of the following table:

LOAD PERFORMANCE TABLE			
(These requirements are for the access floor components only and do not include panel surface coverings)			
Type of load	Panel grade		
	Type 1	Type 2	Type 3
Concentrated load on a 25 mm x 25 mm area	2,7 kN	4,5 kN	5,5 kN
Maximum deflection on top surface (not to increase when load is applied continuously for 24 hours)	2,00 mm	2,00 mm	2,00 mm
Maximum permanent set on top surface	0,25 mm	0,25 mm	0,25 mm
Safety factor = design load (failure shall be ductile and not sudden)	x 3	x 3	x 3
Uniformly distributed load per m ²	9,0 kN	13,5 kN	16,5 kN
Maximum deflection on underside	1,00 mm	1,00 mm	1,00 mm
Maximum permanent set on underside	0,25 mm	0,25 mm	0,25 mm
Rolling loads			
Under rolling load test conditions edge to edge deflection between loaded and unloaded panels shall not exceed 2,00 mm and maximum permanent set shall not exceed 0,50 mm (both on top surface) for all rolling load tests			
75 mm \varnothing x 25 mm wide hard plastic wheel Number of passes	3,5 kN 10	4,9 kN 10	6,0 kN 10
150 mm \varnothing x 50 mm wide hard plastic wheel Number of passes	2,7 kN 20 000	3,5 kN 20 000	4,5 kN 20 000
200 mm \varnothing x 75 mm wide hard plastic wheel Number of passes	2,25 kN 40 000	2,25 kN 250 000	2,25 kN 500 000
Impact load			
Load dropped onto an area of 25 mm x 25 mm Maximum permanent set	0,43 kN 1,50 mm	0,43 kN 1,50 mm	0,43 kN 1,50 mm
Pedestal assembly			
Axial load	22,5 kN	22,5 kN	22,5 kN
Horizontal force applied at a height of 300 mm from the sub-floor after the adhesive has cured - minimum resistance	10 kg	10 kg	10 kg

Test methods

In order to determine compliance of the access floor system with the Load Performance Table the following test methods and procedures shall be followed:

Concentrated load test:

The panel, without surface covering, is to be supported by the specified pedestal heads (and stringers, if applicable). Pedestal heads are to be mounted on rigid blocks to eliminate distortion of results, which may occur from the isolated use of pedestal base assemblies in the test fixture. The blocks are to rest on a solid test bed.

Loads are to be applied to the top surface of the panel by a hydraulic cylinder and measured by a calibrated Force Ring. The loads are to be transmitted to the panel surface by a 25 mm x 25 mm steel contact area indenter. The panel is to be loaded at the centre; then at the mid-span of the edge; then at the thinnest section of a quarter quadrant.

The resultant permanent sets are to be measured from the top surface of the panel by a dial indicator positioned on the top of the indenter, which is located directly below the Force Ring.

The panel is to be first loaded to the design load to settle the system. After unloading, a pre-load of 0,25 kN is to be applied and both the Force Ring and the dial indicator are to be set at zero. The panel is then to be loaded in 0,50 kN increments to the design load and the deflection readings are to be taken incrementally. The load is then to be removed from the panel and the 0,25 kN pre-load is to be reapplied to measure the set on the dial indicator. Deflection shall be recorded at the start and during the last hour of load application. Permanent set shall be measured as set out above.

Uniform load test:

The panel, without surface covering, is to be supported by the specified pedestal heads (and stringers, if applicable). Pedestal heads are to be mounted on rigid blocks to eliminate distortion of results which may occur from the isolated use of pedestal base assemblies in the test fixture. The blocks are to rest on a solid test bed.

The load is to be applied to the panel by a hydraulic cylinder and spread uniformly over the top of the panel. The surface pressure is to be measured by a water manometer calibrated in 2,5 kN/m² increments.

Dial indicators are to be positioned on the underside of the panel to measure deflections under load at the centre; at the mid-span of the edge; and at the weakest point of a quarter quadrant.

The panel is to be first loaded to the design load to settle the system. After removing the load, a pre-load of 0,25 kN is to be applied and the dial indicators are then to be set at zero. The panel is then to be loaded in 0,25 kN increments to design load and the deflection readings are to be taken incrementally. The load is then to be removed from the panel and the 0,25 kN pre-load is then to be reapplied to measure the permanent set on the dial indicator.

Rolling load tests:

Two abutted panels, without surface coverings, are to be supported by the specified pedestal heads (and stringers, if applicable). The pedestal heads are to be mounted on a rigid rolling load fixture to eliminate distortion of results which may occur through the isolated use of pedestal base assemblies in the test fixture.

The specified wheel or castor is to be mounted in the fixture and loaded to the specified weight, which is to be verified by the use of a calibrated Force Ring.

The wheel is then to be rolled over the panel surfaces from one panel to the other along the centre line of the panels; along a line which is 150 mm from the panel edges; and along a line which is 50 mm from the panel edges. For each of these three test locations, new sets of panels are to be used.

After completion of the rolling loads, the maximum permanent set in the surface is to be measured.

COMPONENT AND SYSTEM TOLERANCES AND LIMITS

The access floor components and installed access floor system shall conform to the requirements of the Tolerance and Limits Table below:

TOLERANCE AND LIMITS TABLE	
Description	Tolerance/ limit
Panel size	600 mm x 600 mm +0,00 mm –0,50 mm
Panel squareness	±0,50 mm
Panel flatness	±0,50 mm
Installed access floor level	1,50 mm in 3.00 m 2,50 mm over the entire floor
Variation in height between adjoining panels	0,50 mm
Maximum depth of panel and pedestal head assembly	±40 mm
Maximum panel mass	16,5 kg
Maximum system mass	55 kg per m ²

SABS 1549 :1992

All test methods, equipment for testing, other tests and test result requirements not specifically referred to in this specification shall be carried out in accordance with SABS 1549 : 1992 and comply therewith.

GENERAL PERFORMANCE SPECIFICATION

Electrical resistivity and conductivity

For computer rooms the resistance between the surface of the covering of the access floor panel and earth shall be between 5×10^5 and 2×10^{10} ohms measured at 22 degrees Celsius and 25% Relative Humidity (after the room has been stabilised at these levels for 48 hours).

For all raised access floors the entire system shall be electrically conductive to allow for grounding at a later date if required.

Fire resistance and tests

All components of the access floor system are to be non-combustible when tested in accordance with SABS 0177 Part V and the completed installation shall comply with the requirements of the National Building Regulations and Building Act of 1977 (as amended) where applicable.

The access floor system when tested in accordance with the SABS "Small Crib Fire Test" method shall not show any evidence of instability, deformation or failure for a period of 30 minutes after commencement of the test. In addition the system and any of its components shall not change in level or dimension in excess of 10 mm during or after the test.

Compliance with codes and laws

The construction of the raised access floor system and the materials and components used therein shall comply with all local codes and laws regarding safety and health.

Openings in panels

All openings in panels for the fitting of grilles, frames, collars and similar items shall be trimmed with a metallic tape.

Pedestal base adhesive

All pedestal bases shall be adhered to the sub-floor. The adhesive shall be non-toxic, waterproof and non-soluble when cured. The pedestal and the adhesive shall be capable of resisting a horizontal force of 10 kg applied at a height of 300 mm from the sub-floor when the adhesive has cured.

REQUIREMENTS FROM THE TENDERER

The tenderer must submit the following information and documentation with his tender:

Detailed qualifications of any deviation from the contents of this specification.

Evidence of the Tenderer's capability of undertaking this sub-contract and that he has successfully completed similar contracts of like size and scope.

REQUIREMENTS FROM THE SUB-CONTRACTOR

General

The sub-contractor must submit the following information and documentation when required to do so:

A guarantee of the installed access floor system for a period of 10 years from the date of issue of the Certificate of Practical Completion.

A copy of the Manufacturers updated ISO certificate confirming that the product is manufactured to the necessary standard.

A quality assurance document which includes control and management procedures.

A manual detailing installation care and maintenance procedures.

A set of shop drawings showing details of the installed access floor system including the method of dealing with perimeter edges, expansion joints and other items.

Grid layout

The setting out of the access floor installation shall be in accordance with the Architect's approved grid layout.

Mock-up

The sub-contractor shall supply and install a mock-up of a size as stated in the Provisional Bill of Quantities which shall consist of the grade and type of raised access floor specified, on the understructure specified, together with the finish specified. The mock-up shall contain expansion joints and other items of a similar nature and shall show perimeter details and finishes and all other interface items between the sub-contractor's work and the work of other sub-trades, and with furniture.

Cleaning and protection.

During the progress of his work the sub-contractor shall clean the access floor and the plenum.

During the progress of the work, the sub-contractor shall protect his work and shall report to the contractor, in writing, any damage caused to his work by others. The sub-contractor shall also report to the contractor, in writing, any dirtying of the access floor and the plenum caused by others. Only the sub-contractor shall have access to the plenum and the sub-contractor will only have permission to uplift and replace panels for other sub-trades on the written instruction of the principle contractor.

WORK BY OTHERS.

The following work will be carried out by others :

Providing a smooth and clean sub-floor free of any contaminants and irregularities.

Providing datum points for setting out of the floor grid and for setting of the finished floor level.

Ensuring that the work of all sub-trades in the plenum is completed and tested to the satisfaction of the contractor before the raised access floor installation commences.

Providing work areas for installation of the raised access floor which are clean, sealed from the weather and moisture free and clear of all other trades (especially wet trades) for a period ending at least 48 hours from the time of completion of the raised access floor installation.



RAISED ACCESS FLOOR SYSTEM

PROVISIONAL BILL OF QUANTITIES

(This bill of quantities is for example purposes only and should be altered to meet the requirements of the particular project. It does not constitute an exhaustive list of all items to be specified for an access floor system installation).

PROVISIONAL BILL OF QUANTITIES

Item No	Unit	Quan- tity	Rate	Amount R	c
<u>PRELIMINARIES</u>					
<p>Allow for Preliminaries items which are not priced with the bills of quantities items. The cost of all Preliminaries items are to be priced in a detailed format. The detailed format should indicate whether the item is a fixed cost, time related cost or value related cost item. (This breakdown will be used for interim payment valuation, etc.)</p>					

Item No		Unit	Quantity	Rate	Amount R	c
<u>RAISED ACCESS FLOOR</u>						
<u>TYPE 1 (or 2 or 3) SYSTEM</u>						
1	Freestanding (or Snap-on stringer, or Screw-down) raised access floor to finishmm above the concrete slab in accordance with the specification	m ²				
<u>Extra over raised access floor for:</u>						
2	Straight cutting and fitting around perimeter walling etc., including all necessary additional supporting members, pedestals, etc.	m				
3	Raking, cutting and fitting around perimeter walling etc., including all necessary additional supporting members, pedestals etc.	m				
4	Straight and raking cutting and fitting around all sides of island column not exceeding sizemm xmm including all necessary additional supporting members, pedestals, etc.	No				
5	Circular cutting and fitting around perimeter walling etc., including all necessary additional supporting members, pedestals, etc.	m				
6	Circular cutting and fitting around circumference of island column not exceedingm diameter including all necessary additional supporting members, pedestals, etc.	No				
7	Circular cutting and fitting around pipe not exceeding.....mm diameter.	No				
8	Bracing of raised access floor where no vertical butting face exists, including supply and fixing of finishing angle	m				
9	Special panel complete with opening sizemm xmm to accommodate floor mounted service outlet (outlet supplied and fixed by others).	No				
<u>EXPANSION JOINTS</u>						
10	Forming expansion joint in flooring including cover plate, double row of pedestals and all additional bracing, etc.	m				
<u>SHOP DRAWINGS</u>						
11	Allow for the preparation of fully detailed shop drawings for the entire access floor installation		Item			

Item No		Unit	Quantity	Rate	Amount R	c
	<u>FLOORCOVERINGS</u>					
12	Supply and fix	m ²				
	<u>SUPPLY ONLY</u>					
13	Lifting tool for panels	No				
14	Type 1 (or 2 or 3) bare panel	No				
	<u>MOCK-UP</u>					
15	Allow for the supply and installation of a mock-up of sizem xm as described in the specification		Item			
	<u>TESTING</u>					
16	Allow for testing the access floor components and installation in accordance with the specification		Item			
	<u>CLEANING AND PROTECTION</u>					
17	Allow for cleaning the raised access floor and the plenum space during the course of the work		Item			
18	Allow for protecting the entire installation		Item			
	<u>GENERAL</u>					
19	Removal and re-installation of floor panels to accommodate installation of services by others in the floor plenum for second fix items.	No				