

09 69 00 SPECIFICATION – RAISED ACCESS FLOORING

1.0 GENERAL

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 Summary

- .1 Concrete sealer shall be compatible with pedestal adhesive.
- .2 Electrical contractor shall provide necessary material and labor to electrically connect the access floor to the building.
- .3 Quantity Allowances: Provide the following as specified in Division 1 Section "Allowances":
 1. Floor panel sizes.
 2. Cut-outs in floor panels.

1.3 Unit Prices

.1 Unit Prices: The Contract Sum will be adjusted for changes in quantity from that indicated in allowances for specified panel sizes and cutouts in floor panels based on amounts stipulated in the Form of Agreement and complying with Division 1 Section "Unit Prices." Changes to quantities and to the contract sum will be made by change order.

1.4 Definition

.1 ESD: Electrostatic discharge. The transfer of electric charge between bodies at different potentials, from panel surface to ground.

1.5 System Description

.1 Raised Access Flooring System: Assemblies composed of modular and self-supporting floor sub-structure bolted together, having gravity placed floor panels on top not connected to the pedestal supports. Lateral strength of floor system shall be independent from floor panels being in place, or fully removed.

1.6 Performance Requirements

.1 Structural Performance: Provide access flooring system capable of withstanding the following loads and stresses within limits and under conditions indicated, as determined by testing manufacturer's current standard test procedures:

1. Concentrated Loads: Provide 600x600 mm floor panels, including those with cutouts, capable of withstanding a concentrated design load of 5 kN, with a top-surface deflection under load and a permanent set not to exceed, respectively, 3.3 mm and 0.2 mm. If custom size floor panels are provided with a span of less or equal to 600 mm between secondary support beams, they need to comply with the above deflection and permanent set values as well.
2. Rolling Loads: Provide 600x600 mm floor panels, capable of withstanding a rolling load 5 kN, with a top-surface deflection under load and a permanent set not to exceed, respectively, 3.3 mm and 0.2 mm.
3. Uniform Distributed Loads: Provide self-supporting floor structure, without panels in place, capable of withstanding a minimum 10 kN/m² uniform distributed load. For heavy equipment, which requires higher loading in accordance with the engineering drawing, the floor structure shall provide a uniform distributed loading capable of supporting the equipment for each individual case to avoid using separate equipment support stands under Server racks, CRAH's, or PDU's.
4. Ultimate* Loads: Provide access flooring sub-structure system capable of withstanding a minimum ultimate concentrated load of 9 kN and a minimum ultimate distributed load of 39 kN/m² without failing, * = max deflection of L/300 of span between beam sections
5. Pedestal Axial Load Test: Provide structure and pedestal assemblies, without panels in place, capable of withstanding a 40 kN axial load per pedestal.
6. Recycled content: Understructure system and floor panel shall be required to have a minimum recycled content of 85%.

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2. ESD-CONTROL PROPERTIES:

Provide floor coverings with ESD-control properties indicated as determined by testing identical products per test method indicated by an independent testing and inspecting agency.



1. Antistatic Floor Covering Properties:

.1 Electrical Resistance: Test per EN 14041, 2004.

.1 Greater than 50,000 ohms and an average value of less than 50.000 megohm when test specimens and installed floor coverings are tested surface to ground resistivity at a relative humidity of 50%.

.2 Static Generation: Max 200 V when tested at 50 percent relative humidity with conductive footwear.

1.7 Submittals

.1 Product Data: For each type of product indicated.

.2 Shop Drawings: Include Auto-CAD layout or Revit model of access flooring system including measurements between all support members and indicated panel sizes in relationship to adjoining work based on field-verified dimensions.

.1 Details and sections with descriptive notes indicating materials, bolted floor understructure, finishes, fasteners, typical and special edge conditions and accessories.

.2 For installed products indicated to comply with design loads, include structural data analysis report signed and sealed by a qualified professional engineer prior to starting installation.

.3 Samples for Initial Selection: For each type of flooring material and exposed finish indicated.

.4 Samples for Verification: For each type of flooring material and exposed finish indicated.

.1 One complete full-size floor panel and floor understructure unit for each type of access flooring system required.

.5 Product Certificates: For each type of access flooring system, signed by product manufacturer.

.6 Qualification Data; For Installer: Accredited and certified by manufacturer.

.7 Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, or performed by access flooring manufacturer and witnessed by a qualified testing agency, for each type of flooring material and exposed finish.

1.8 Quality Assurance

.1 Installer Qualifications: Lead Installer has to be trained and certified by manufacturer in order for the warranty to be valid.

.2 Source Limitations: Obtain access flooring system through one source from a single manufacturer.

.3 Regulatory Requirements: Fabricate and install access flooring to comply with local requirements for raised flooring.

.4 Provide floor panels that are clearly and permanently marked on their underside with panel type, batch number/date and flame spread rating.

.5 Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." including verification of room dimension(s) and floor height(s).

.1 Review connection with mechanical and electrical systems.

.2 Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.



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1.9 Project Conditions

.1 Environmental Limitations: Do not install access flooring until spaces are enclosed, sub floor sealed, ambient temperature is between 4 and 32 deg C, and relative humidity is not more than 70 percent.

1.10 Coordination

.1 Coordinate location of mechanical and electrical work in under floor cavity to prevent interference with access flooring pedestals. System with fewer pedestals to avoid obstruction are favorable.

.2 Mark pedestal locations on sub floor by use of a grid if needed, to enable mechanical and electrical work to proceed without interfering with access flooring pedestals.

.3 Installation shall be performed in two (2) phases, floor sub-structure only in phase I to enable mechanical and electrical work to be done without removing floor panels. Once the mechanical and electrical work is completed in the under-floor plenum, phase II can commence installing the floor panels on top of the sub-structure. Proceed with installation only after completion of other construction within affected spaces receiving access flooring.

1.11 Extra Materials

.1 Furnish extra materials described in sub paragraphs below that match products installed and that are packaged with protective coverings for storage and identified with labels describing contents.

1. Flooring Panels: 5 (of each manufactured size if applicable).
2. Pedestals including head bracket: 5 (of each height if applicable).
3. 2400 mm long 80x40 mm tube steel sections: 5.
4. Stepless cable ladder brackets of each width (if applicable).



Cable ladder brackets.

2.0 PRODUCTS

2.1 Floor Panels And Understructure

.1 Basis-of-Design Product: Subject to compliance with requirements, provide a Dynamic raised access floor system or similar by the following:

1. Bergvik Flooring Pty Ltd, Building 3, Tre Mondri Office Park, Niblick Road, The triangle, Somerset West 7130, South Africa. Phone: (021) 851-1966. Fax: (021) 852-7662. Email: sales@bergvik.com
2. The Consultant will review the request and, at his sole discretion, accept or reject it. If the request for approval is accepted, the Consultant will issue an Addendum listing the alternate material or product as an "approved equal", not less than three (3) days prior to the date set for closing of Tenders.
3. Product: "Iso Floor", a modular and fully stable and bolted floor sub-structure, having gravity placed wood-core panel system with metal backside on top. Floor panels shall not be connected to the pedestal supports, allowing for lateral strength of floor system to be independent from all floor panels being in place or fully removed. The self-supporting and modular floor sub-structure is to be installed only during phase I, if shown on engineering drawings, in order to furnish all under floor installations prior to installing the phase II floor panels.

.2 Floor Panels, General: Provide modular panels complying with the following requirements that one person, using a portable lifting device, can interchange with other field panels without disturbing adjacent panels or understructure:

- .1 Nominal Panel Size: 600x600 mm. Custom size panels to be as specified based on engineering drawing.
- .2 Fabrication Tolerances: Fabricate panels to the following tolerances with squareness tolerances expressed as the difference between diagonal measurements from corner to corner:
 - .1 Size and Squareness: +/- 0.38 mm of required size, with a squareness tolerance of +/- 0.38 mm, unless tolerances are otherwise indicated for a specific panel type.
 - .2 Flatness: +/- 0.50 mm, measured on a diagonal on top of panel.
 - .3 Panel attachment to Understructure: By gravity.



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.3 Wood-Core Panels with metal backside: Fabricate from 38 mm thick, moist resistant and E1 type particleboard core, made with <10 ppm urea formaldehyde. Laminate bottom aluminum face sheet with a direct laminate process using heat and pressure, providing a flame-spread index of 25 or less per ASTM E84 or NFPA 266.

Provide tapered core edges including direct laminated surface finish of M335 Granite décor. All panel edges should be enclosed with a 0.45 mm glued perimeter ABS edge trim. Edge trim shall be applied so it covers the tapered panel edges, including surface finish to avoid de-lamination. Provide custom panel sizes under equipment unless "open bottom access" is specified using a 40x40 mm square steel tube under front and back of the equipment if shown on engineering drawings. Provide custom panels if shown on engineering drawings to assure all panels in service aisles or cooling aisles are fully removable.

.4 Perforated Airflow Panels: Perforated aluminium airgrille panel designed for static loads of 3 kN shall be interchangeable with standard field panels and shall have up to 39% open surface area. Airflow direction (static) available in 15 and 30 degrees, see separate louver data sheet. Air grille panel sizes: 600 mm x 150 mm, 600 x 600 mm and 600 x 900 mm. Special panel sizes upon request. Panel height is 28 mm. Panel weight: 11 kg for 600 x 600 mm. Available with or without damper. Damper can be adjusted from the top to restrict airflow by up to 100%. The panel is fully interchangeable with Bergvik Laminate Panels. As far as the air distribution capability, see the below table:

CORE VELOCITY		AIRFLOW		PRESSURE DROP	CORE VELOCITY		AIR VOLUME	STATIC PRESSURE
m/s	m ³ /s	m ³ /h	Pa		feet/second	CFM	In. H ₂ O	
1.0	0.098	353	1		3.28	208	0.004015	
1.2	0.118	423	2		3.94	250	0.008029	
1.4	0.137	494	2		4.59	290	0.008029	
1.6	0.157	564	3		5.25	333	0.012044	
1.8	0.176	635	4		5.91	373	0.016059	
2.0	0.196	706	4		6.56	415	0.020074	
2.2	0.216	776	5		7.22	458	0.020074	
2.4	0.235	847	5		7.87	498	0.024088	
2.6	0.255	917	6		8.53	540	0.028103	
2.8	0.274	988	7		9.19	581	0.032118	
3.0	0.294	1058	8		9.84	623	0.036133	
3.2	0.314	1129	9		10.5	665	0.040147	
3.4	0.333	1200	10		11.15	706	0.044162	
3.6	0.353	1270	11		11.81	748	0.048177	
3.8	0.372	1341	12		12.47	788	0.048177	
4.0	0.392	1411	14		13.12	831	0.056206	

.5 Floor understructure: Assembly shall consist of 80x40 mm primary and secondary layer tube steel beam sections bolted together 90 degrees perpendicular to each other with angle clips and self tapping screws. Tube steel sections shall provide a yield and a tensile strength to meet the max allowed temporary deflection of L/300 of span. A distributed and concentrated static load calculation report shall be furnished for approval by certified structural engineer. All primary sections shall have a tension screw plate mounted to one side for tension against the perimeter wall. Provide "open bottom access" design under the equipment racks using a 40x40 mm square steel tube under front and back of the equipment aisle if shown on engineering drawings.

.6 Pedestals: Assembly consisting of base plate, 80x40 mm tube column and head cap plate, including pedestal head bracket with provisions for height adjustment, made of steel.

1. Base: Rectangular base with not less than 75 cm² of bearing area.
2. Column: Of height required to bring finished floor to elevations indicated, less 200 mm. Pressed securely into base plate and head cap plate.

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3. Provide vibration-proof leveling mechanism for making and holding fine adjustments in height over a range of not less than +/- 25 mm and for locking at a selected height, so deliberate action is required to change height setting and vibratory displacement is prevented.

4. Head: Pedestal head bracket indicated, which is bolted to primary beam section.

.5 Rust corrosion, metal components: Floor sub-structure, including Pedestal base plate shall be hot-dipped galvanized.

2.2 Floor Panel Coverings

.1 General: Provide factory-applied direct laminate by raised access flooring manufacturer to top surfaces of floor panels to prevent de-lamination.

.2 Standard Direct Laminate:

1. Manufactured from phenolic and melamine resin impregnated papers, using a separate, high-wear type melamine glass overlay.

1 Wear resistant to >6000 cycles according to EN 438-2:6 1991.

2. Fabricate to cover each panel face prior to applying edge trim.

3. Colors and Decors: M335 Granite // H817 Alder // A0040 Oak as shown on engineering drawings.



.3 Basis-of-Design Product: Subject to compliance with requirements, provide the product, or a comparable product by one of the following:

1. Surfactor

2.3 Accessories

.1 Nail plugs: Manufacturer's standard nail plugs for securing pedestal bases to sub floor if nothing else is shown on the engineering drawings. Glue should not be used.

.2 Cutouts: Provide cut-outs in floor panels for cable grommets and service outlets. Provide reinforcement or additional support, if needed, to make custom size panels or cut-outs to comply with standard performance requirements.

1. Number, Size, Shape, and Location: Allow for a minimum of //...// circular penetrations for cut-outs of //...// mm (minimum) in diameter in the floor as shown on engineering drawings.

2. Fit cut-outs with manufacturer's standard grommets in sizes indicated or, if size of cut-outs exceeds maximum grommet size available, trim edge of cutouts with manufacturer's standard plastic molding or edgetrim. Furnish removable covers for grommets if specified.

.3 Ramps: Manufacturer's standard ramp construction of width and slope indicated, but not steeper than 1:12, with non-slip floor covering to match the same performance and construction requirements as of the access flooring, or as indicated on the engineering drawings.

.4 Railings: Standard extruded-aluminum railings, at ramps and open-sided perimeter of access flooring where indicated. Include handrail, intermediate rails, posts, brackets, end caps, wall returns, wall and floor flanges, plates, and anchorages where required, or as indicated on the engineering drawings.

.5 Panel Lifting Device: Manufacturer's standard portable lifting device of double type required for specified panels. Provide one lifting devices including wall mounted panel lifting bracket or a number as otherwise specified.

.6 Perimeter Support: Where indicated, provide manufacturer's standard method for supporting panel edges and forming transition between access flooring and adjoining floor coverings. Perimeter support covering shall match floor panel finish(es), or as indicated on the engineering drawings.

3.0 EXECUTION

3.1 Examination

.1 Examine substrates, with Installer and manufacturer's representative present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

1. Verify that substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, foreign deposits, and debris. Verify that concrete slab subfloor has been sealed.

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2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Preparation

.1 Lay out floor panel installation to keep the number of cut panels at floor perimeter to a minimum. Avoid using panels cut to less than 200 mm.

.2 Complete any necessary sub floor preparation, and vacuum clean sub floor to remove construction debris before beginning installation.

3.3 Installation

.1 Install access flooring system and accessories under supervision of access flooring manufacturer's authorized and certified representative to produce a rigid, firm installation that complies with performance requirements and is free of instability, rocking, rattles, and squeaks.

INSTALLATION, PHASE I

.1 Install primary beam sections supported by and mounted to pedestal assemblies so that no interference with feeder cables to and from equipment racks or cabinets occurs.

.2 Set pedestals with nail plugs as recommended by access flooring manufacturer to provide full bearing of pedestal base on sub floor.

.3 Level sub-structure pedestals supporting primary beam sections to permit panels be level and to proper height as set out in engineering drawings. Secure the leveling by tightening the locking nuts on all pedestals.

.4 Install secondary beam sections supported by primary beam sections using angle clips and self tapping screws, so that they line up center to center with all panels in accordance with the manufacturers floor layout drawings.

Before installation phase II starts, perform cable management, electrical and HVAC installations under the floor substructure to prevent floor panels to be removed and reinstalled by subcontractors. By following this procedure, project schedule can be shortened and damage of floor panels be avoided.

INSTALLATION, PHASE II

.5 Install floor panels securely in place, properly seated with panel edges flush. Do not force panels into place. Verify if custom size panels are to be located in rows where server racks or cabinets of different depths are to be installed, to allow for service aisle panels to be fully removable.

.6 Scribe perimeter panels to provide a close fit with adjoining construction using foam tape between perimeter panel and wall, with no voids greater than 6 mm where panels abut vertical surfaces.

.7 Cut and trim access flooring and perform other dirt-or-debris-producing activities at a remote location, or as required to prevent contamination of sub floor under access flooring already installed.

.8 Ground flooring system as recommended by manufacturer and as needed to comply with performance requirements for electrical resistance of floor system and coverings.

.9 Clean dust, dirt, and construction debris caused by floor installation, and vacuum sub floor area, as installation of floor panels proceeds.

.10 Install access flooring without change in elevation between adjacent panels and within the following tolerances:

1. Plus or minus 1.5 mm in any 3 meter distance.
2. Plus or minus 3 mm from a level plane over entire flooring area.

3.4 Adjusting, Cleaning, And Protection

.1 Prohibit traffic on access flooring sub-structure unless floor panels have been installed, or floor structure is covered by shutter boards, or other secure means to prevent accidents.

.2 After completing installation, vacuum clean access flooring and cover with continuous sheets of reinforced paper or plastic if required. Maintain protective covering until time of Substantial Completion.

.3 Replace access floor panels that are stained, scratched, or otherwise damaged or that do not comply with specified requirements.



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.4 After completed installation, inspect completed raised access floor installation together with customer using manufacturers standard "completed inspection form" and sign off for approval. Provide one copy to the customer and return one copy to manufacturer as a proof of completion and acceptance.

.5 After receipt of "completed inspection form", manufacturer shall provide customer with a detailed warranty document dated and signed by authorized officer of the manufacturer.

END OF SECTION

