

## **SECTION 09 6900 - Access Flooring**

### **SECTION 10270 – RAISED ACCESS FLOORING**

#### PART 1 - 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

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

##### 1.3 UNIT PRICES

- A. 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

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

##### 1.5 SYSTEM DESCRIPTION

- A. Raised Access Flooring System: Assemblies composed of modular and self-supporting floor sub-structure bolted together, having gravity placed floor panels

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on top not connected to the pedestal supports. Lateral strength of floor system shall be independent from all floor panels being in place or fully removed.

### 1.6 PERFORMANCE REQUIREMENTS

A. 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 23.6 x 23.6 inch (600x600 mm) floor panels, including those with cutouts, capable of withstanding a concentrated design load of 1100 lbf (5000 N), with a top-surface deflection under load and a permanent set not to exceed, respectively, 0.13 and 0.008 inch (3.3 mm and 0.2 mm). If custom size floor panels are provided with a span of less or equal to 31.5" (800 mm) between secondary support beams, they need to comply with the above deflection and permanent set values as well, except if located under installed equipment cabinets or racks.
2. Rolling Loads: Provide 23.6 x 23.6 inch (600x600 mm) floor panels, capable of withstanding a rolling load of 1400 lbf (6350 N), with a top-surface deflection under load and a permanent set not to exceed, respectively, 0.13 and 0.008 inch (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 204 lbs/sf (10 kN/m<sup>2</sup>) 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 stands under Server racks or cabinets.
4. Ultimate\* Loads: Provide access flooring sub-structure system capable of withstanding a minimum ultimate concentrated load of 2500 lbf (9070 N) and a minimum ultimate distributed load of 1500 lbf/ft<sup>2</sup> (39 kN/m<sup>2</sup>) without failing,

\* = max deflection of L/360 of span between beam sections

5. Pedestal Axial Load Test: Provide structure and pedestal assemblies, without panels in place, capable of withstanding a 7000 lbf (31 136 N) axial load per pedestal.

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6. Recycled Content: Understructure system and Floor panel shall be required to have a minimum recycled content of 50%.

B. 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:

a. Electrical Resistance: Test per ESD STM 7.1.

1) Average greater than 50,000 ohms and less than 1,000 megohm when test specimens and installed floor coverings are tested surface to ground resistivity.

b. Static Generation: Less than 100 V when tested per AATCC-134 at 40 percent relative humidity with conductive footwear.

### 1.7 SUBMITTALS

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

B. Shop Drawings: Include Auto-CAD layout 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, fasteners, finishes, 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.

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

D. 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.

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

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- F. Qualification Data; For Installer: Certified by manufacturer.
- G. 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

- A. Installer Qualifications: Lead Installer has to be trained and certified by manufacturer in order for the warranty to be valid.
- B. Source Limitations: Obtain access flooring system through one source from a single manufacturer.
- C. Regulatory Requirements: Fabricate and install access flooring to comply with NFPA 75 requirements for raised flooring.
- D. Provide floor panels that are clearly and permanently marked on their underside with panel type, batch number/date and rolling-load rating.
- E. 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.

### 1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install access flooring until spaces are enclosed, sub floor sealed, ambient temperature is between 40 and 90 deg F (4 and 32 deg C), and relative humidity is not more than 70 percent.

### 1.10 COORDINATION

- A. Coordinate location of mechanical and electrical work in under floor cavity to prevent interference with access flooring pedestals.

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- B. Mark pedestal locations on sub floor by use of a grid, to enable mechanical and electrical work to proceed without interfering with access flooring pedestals.
- C. 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 under the floor, 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

- A. Furnish extra materials described in subparagraphs 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 size if applicable)
  - 2. Pedestals including head bracket: 5 (of each height if applicable)
  - 3. 94.5 inch (2400 mm) long 80x40 mm tube steel sections: 5
  - 4. Stepless cable ladder brackets of each width (if applicable)

## PART 2 - PRODUCTS

### 2.1 FLOOR PANELS AND UNDERSTRUCTURE

- A. Basis-of-Design Product: Subject to compliance with requirements, provide a Dynamic raised access floor system or similar by the following:
  - 1. Bergvik Flooring North America, Inc., 2040 Shipley Drive, Building C-3, Salisbury, Maryland 21801. Phone: (410) 548-1449. Fax: (410) 548-2630  
Email: [marketing@bergvik.com](mailto:marketing@bergvik.com)
  - 2. Alternative floor system shall meet or exceed all requirements as indicated herein and must receive prior written approval by the architect or designer.
  - 3. Product: "Iso Floor", a modular and self supporting 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 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.

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B. 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: 23.6 x 23.6 inch (600x600 mm). Custom size panels to be specified if shown on engineering drawings.

2. Fabrication Tolerances: Fabricate panels to the following tolerances with square ness tolerances expressed as the difference between diagonal measurements from corner to corner:

a. Size and Squareness: Plus or minus 0.015 inch (0.38 mm) of required size, with a squareness tolerance of plus or minus 0.015 inch (0.38 mm), unless tolerances are otherwise indicated for a specific panel type.

b. Flatness: Plus or minus 0.020 inch (0.50 mm), measured on a diagonal on top of panel.

3. Panel Attachment to Understructure: By gravity.

C. Wood-Core Panels with metal backside: Fabricate from 1.5 inch (38 mm) thick, V313 moist resistant and E1 type particleboard core, made with less than 10 ppm urea formaldehyde and be fully recyclable. Manufacturer of particleboard shall operate it's own bio power plant to make sure that the amount of thermal energy derived from biofuel is atleast 91 percent and shall make sure that the forests harvested are re-planted with atleast one million seedlings annually. Manufacturer shall also use the ISO 14001 Environmental Management System as a tool to continually improve environmental issues.

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 0.02-inch (0.45 mm) glued perimeter ABS edge trim. Edge trim shall be applied so it covers the tapered panel edges, including surface finish. Provide custom panel sizes under equipment unless "open bottom access" is specified using a 1.5 square (38 mm) 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 or cooling aisles are fully removable.

C. D. Perforated Airflow Panels: Perforated Triad steel airflow panels designed for static loads of 1500 lbs. shall be interchangeable with standard field panels and shall have 25% to 56% open surface area with the following air distribution capability:

At 56%, Panel without damper: 2845 cfm at 0.1-inch of H<sub>2</sub>O (static pressure).

At 56%, Panel with OPD damper at 50% open position: 1400 cfm at 0.1-inch of H<sub>2</sub>O (static pressure).

At 56%, Panel with OPD damper at 100% open position: 2805 cfm at 0.1-inch of H<sub>2</sub>O (static pressure).

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E. Floor understructure: Assembly shall consist of 3 x 1.5 inch (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/360 of span. Certified structural engineer shall furnish a distributed and concentrated static load calculation report for approval. All primary sections shall have a tension screw plate mounted to one side for tension against the perimeter wall. Provide "open bottom access" under the equipment racks using a 1.5 square (38 mm) steel tube under front and back of the equipment aisle if shown on engineering drawings. **Recycled scrap metal content shall be minimum 50% and steel manufacturer shall use the ISO 14001 Environmental Management System as a tool to continually improve environmental issues.**

F. Pedestals: Assembly consisting of base, 3 x 1.5 inch (80x40 mm) tube column and head cap including head bracket with provisions for height adjustment, made of steel.

1. Base: Rectangular base with not less than 11.6 sq. in. (75 sq. cm.) of bearing area.
2. Column: Of height required to bring finished floor to elevations indicated, less 8.25 inch (210 mm). Pressed securely into base plate and head cap.
3. Provide vibration-proof leveling mechanism for making and holding fine adjustments in height over a range of not less than +/- 1 inches (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: Designed to support head bracket indicated which is attached to primary stringer.

G. Rust corrosion, metal components: All parts of the Floor understructure including Pedestal components shall be hot-dipped galvanized to ensure that no zinc particles will erode into the atmosphere.

### 2.2 FLOOR PANEL COVERINGS

A. General: Provide factory-applied direct Laminate by raised access flooring manufacturer to top surface of floor panels.

B. Standard Direct Laminate:

1. Manufactured from phenolic and melamine resin impregnated papers, using a high-wear type melamine glass overlay.
  - a. Wear resistant to >6000 cycles according to EN 438-2:6 1991.
2. Fabricate to cover each panel face prior to applying edge trim.

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3. Colors and Décor(s): M335 Granite // H817 Alder // A287 Oak as shown on engineering drawings..

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

1. Coveright

### 2.3 ACCESSORIES

A. Nail plugs: Manufacturer's standard nail plugs for securing pedestals to sub floor if nothing else is shown on the engineering drawings.

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

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

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

C. 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 engineering drawings.

D. 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 engineering drawings. .

E. Panel Lifting Device: Manufacturer's standard portable lifting device of double type required for specified panels. Provide one lifting devices per room including wall mounted panel lifting bracket for each lifting device.

F. 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 engineering drawings.

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## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. 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 sub floor has been sealed.
  - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. 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 8 inches (200 mm).
- B. Complete any necessary sub floor preparation, and vacuum clean sub floor to remove construction debris before beginning installation.

### 3.3 INSTALLATION

- A. Install access flooring system and accessories under supervision of access flooring manufacturers 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**

- B. 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.
- C. Set pedestals with nail plugs as recommended by access flooring manufacturer to provide full bearing of pedestal base on sub floor.
- D. Level sub-structure pedestals to permit panels on top to be level and to proper height as set out in engineering drawings. Secure the leveling by tightening the locking nuts on all pedestals.
- E. 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.

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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**

- F. Install floor panels securely in place on top of secondary beam sections, properly seated with panel edges flush. Do not force panels into place. Verify if custom size panels are to be located in rows where equipment racks or cabinets of different depths are to be installed, to allow for service aisle panels to be fully removable.
- G. Scribe perimeter panels to provide a close fit with adjoining construction using foam tape between perimeter panel and wall, with no voids greater than 1/4 inch (6 mm) where panels abut vertical surfaces.
- H. 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.
- I. Ground flooring system as recommended by manufacturer and as needed to comply with performance requirements for electrical resistance of floor system and coverings.
- J. Clean dust, dirt, and construction debris caused by floor installation, and vacuum sub floor area, as installation of floor panels proceeds.
- K. Install access flooring without change in elevation between adjacent panels and within the following tolerances:
  - 1. Plus or minus 1/16 inch (1.5 mm) in any 10-foot (3 meter) distance.
  - 2. Plus or minus 1/8 inch (3 mm) from a level plane over entire flooring area.

### 3.4 ADJUSTING, CLEANING, AND PROTECTION

- A. Prohibit traffic on access flooring structure unless floor panels have been installed, or floor structure is covered by secure means to prevent accidents.
- B. 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.
- C. Replace access floor panels that are stained, scratched, or otherwise damaged or that do not comply with specified requirements.

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- D. 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.
- E. After receipt of signed “completed inspection form”, manufacturer shall provide customer with a detailed warranty document dated and signed by an authorized officer of the manufacturer.

END OF SECTION 10270