RAISED FLOORING

1. GENERAL
   * + 1. RELATED DOCUMENTS
          1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
       2. SUMMARY
          1. Section Includes:

Raised-Hollow flooring panels.

Understructure.

Floor panel coverings.

* + - * 1. Related Requirements:

Section 233600 "Air Terminal Units" for variable-air-volume diffusers.

Section 260526 "Grounding and Bonding for Electrical Systems" for connection to ground of access-flooring understructure.

* + - 1. COORDINATION
         1. Coordinate location of mechanical and electrical work in under floor cavity to prevent interference with raised-flooring pedestals.
         2. Mark pedestal locations on subfloor using a grid to enable mechanical and electrical work to proceed without interfering with raised-flooring pedestals.
      2. PREINSTALLATION MEETINGS (Delete this clause if not required)
         1. Pre installation Conference: Conduct conference at [**Project site**] <**Insert location**>.

Review connection with mechanical and electrical systems.

Review requirements related to sealing the plenum.

Review procedures for keeping under floor space clean.

* + - 1. ACTION SUBMITTALS
         1. Product Data: For each type of product.
         2. The system to be Cradle-2-Cradle© Silver certified.
         3. LEED Submittals: Categories positively affected by the indoor raised hollow flooring

Product Data for Credit MR 3.1: For material reuse at 5%.

Product Data for Credit MR 3.2: For material reuse 10%.

Product Data for Credit MR 4.1: For recycled content 10% (Post-consumer + ½ Pre-consumer).

Product Data for Credit MR 4.2: For recycled content 20% (Post-consumer + ½ Pre-consumer).

Product Data for Credit IEQ 3.1: For construction IAQ management plan, during construction.

Product Data for Credit IEQ 3.2: For construction IAQ management plan, before occupancy.

Product Data for Credit IEQ 4.1: For pedestal-installation adhesives, documentation including printed statement of VOC content.

Product Data for Credit IEQ 4.3: For pedestal-installation adhesives, documentation including printed statement of VOC content.

Laboratory Test Reports for Credit IEQ **5**: For complete system provide documentation indicating that products comply with the requirements of the California Specification Section 01350 (CA/DHS/EHLB/R-174) – Version of July 15, 2004.

Product Data for Credit IEQ 7.1: For Thermal comfort, design.

Product Data for Credit IEQ 7.2: For Thermal comfort, verification.

* + - * 1. Shop Drawings: Include layout of raised-flooring system and relationship to adjoining Work based on field-verified dimensions.

Details and sections with descriptive notes indicating materials, finishes, fasteners, typical and special edge conditions, accessories, and understructures.

* + - * 1. Samples:

Floor Covering: Full-size units for each color and texture specified.

Exposed Metal Accessories: Approximately 10 inches (250 mm) in length.

Minimum 12 inches x 12 inches (300 mm x 300 mm) floor panel, pedestal and understructure unit for each type of raised-flooring system required.

* + - 1. INFORMATIONAL SUBMITTALS
         1. Qualification Data: For Installer and manufacturer.
         2. Product Certificates: For each type of raised-flooring system.
         3. Product Test Reports: For each type of flooring material and exposed finish, for tests performed by a qualified testing agency.
         4. Seismic Design Calculations: If applicable for seismic design of raised-flooring systems including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
         5. Preconstruction Test Reports: For preconstruction adhesive field test. (Delete this sub clause if not required)
      2. MAINTENANCE MATERIAL SUBMITTALS
         1. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Flooring Panels: <**Insert number**>.

Pedestals: <**Insert number**>.

* + - 1. QUALITY ASSURANCE
         1. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer and a minimum 5 years of installing similar product on similar projects.
         2. Manufacturer Qualifications: minimum 5 years of manufacturing raised flooring systems.
         3. Mockups: Build mockups to verify selections made under Sample submittals to demonstrate aesthetic effects and to set quality standards for materials and execution.

Build mockup of typical raised-flooring assembly as shown on Drawings. Size to be an area no fewer than [**five**] <**Insert number**> floor panels in length by [**five**] <**Insert number**> floor panels in width.

Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

* + - 1. PRECONSTRUCTION TESTING (Delete this clause if not required)
         1. Preconstruction Testing Service: [**Owner will engage**] [**Engage**] a qualified testing agency to perform preconstruction testing on field mockups.

<**Insert sizes and configurations of assemblies**>.

Use personnel, materials, and methods of construction that will be used at Project site.

Notify Architect [**seven**] <**Insert number**> days in advance of the dates and times when laboratory mockups will be tested.

* + - 1. FIELD CONDITIONS
         1. Environmental Limitations: Do not install access flooring until spaces are enclosed,[**subfloor has been sealed,**] ambient temperature is between 59 and 77 deg F (15 and 25 deg C), and relative humidity is not less than 40 and not more than 65 percent.
         2. Flooring Contractor to ensure the quality of the existing concrete subfloor is suitable for use of pedestal base adhesive as per manufacturer testing recommendation. The structural subfloor shall be examined for unevenness, irregularities and dampness that would affect the quality and execution of the work. Do not proceed with the installation until structural floor surfaces are level, clean, and dry as completed by others.  
            Subfloor sealers, if used, shall be identified and proven to be compatible with the pedestal adhesive. A subfloor sealant as per floor manufacturer’s recommendation shall be used. Verify that adhesive achieves to set before commencing work

1. PRODUCTS
   * + 1. PERFORMANCE REQUIREMENTS
          1. Seismic Performance: Raised flooring shall withstand the effects of earthquake motions determined according to International Building Code.
          2. Structural Performance: Provide raised-flooring systems capable of complying with the following performance requirements according to International Standard:

Concentrated Loads: [**1125 lbf (5000 N)**] class 5 acc. to EN 13213, with the following deflection and permanent set:

Top-Surface Deflection: [**0.078 inch (2.00 mm)**].

Permanent Set: [**0.010 inch (0.25 mm)**]

Safety factor of 2.

Ultimate Loads: [**2250 lbf (10000 N)**] Installed mass of system (maximum)- 53 kg/m2

Pedestal Axial Load Test: [**6740 lbf (20000N)**] >.

Drop Impact Load Test: **160 lbf (700N)**.

* + - * 1. Fire Performance:

Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

Flame-Spread Index: 0. Class A Interior Wall & Ceiling Finish.

Smoke-Developed Index: 0 Class A Interior Wall & Ceiling Finish.

Panels shall meet REI 30-fire resistance (30 minutes fire resistance). Tests shall be performed in accordance with EN 13501 Part 2, European Fire Safety Standard and have to be certified. If panels shall meet F 30-fire resistance (30 minutes fire resistance), tests shall be performed in accordance with DIN 4102 Part 2 (German Fire Safety Standard) and have to be certified. Any metal connection between bottom and top side of the panel is not acceptable.

Panels shall meet class A1 fully non-combustible. Tests shall be performed in accordance with the EN 13501 Part 1 (European Fire Safety Standard) and have to be certified. If panels shall meet class A2 fully non-combustible, tests shall be performed in accordance with DIN 4102 Part 1 (German Fire Safety Standard) and have to be certified. System shall meet Class A Flame spread requirements for flame spread and smoke development.

Combustion Characteristics: ASTM E 136 Class A

* + - * 1. Low-Emitting Materials: Flooring system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
        2. Air Leakage: If the cavity underneath the floor system will be used as an air plenum or if some under floor air conditioning systems are used, the floor system shall have no air leakage without using special assemblies or coverings (laboratory test at 25 Pa). Significant certificate shall be provided.
      1. MANUFACTURERS
         1. Source Limitations: Obtain raised-flooring system from single source from single manufacturer.
      2. FLOOR PANELS

Floor Panels, Size: Nominal [**23.622 by 23.622 inches (600 by 600 mm)**]

Attachment to Understructure: With adhesive.

Floor panels shall consist of a monolithic fibre reinforced calcium sulphate material with perimeter tongue and groove feature. Panels shall consist of approx. 99% recycled materials, i.e. FDG-gypsum (no natural gypsum) and kraft paper.

Basis of Design: Subject to compliance with requirements, provide **Floor and more® G40.**

or comparable product by one of the following:

* LINDNER AG. [www.lindner-group.com](http://www.lindner-group.com) [Middleeast@Lindner-Group.com](mailto:Middleeast@Lindner-Group.com)
* ROWA-MOSER Handelsges.m.b.H [www.rowa-moser.at](http://www.rowa-moser.at)
* AGB [www.agb-bautechnik.ch](http://www.agb-bautechnik.ch)
  + - * 1. Biological Safety: Panels shall be approved as “Recommended by the IBR”. An examination is to be carried out for lindane, pentachlorphenol, formaldehyde, heavy metals and more. Tests shall be performed in accordance to the regulations of IBR (Institute für Baubiologie Rosenheim GmbH, Germany) and panels shall meet the Product Emission Test tested in accordance to ASTM 5116 (no cancer-causing emissions) and has to be certified. The waste material shall be fully recyclable.
        2. The panel shall be capable to meet the mechanical requirements when tested under the following testing conditions: 40 °C +/- 2 °C and 95 % r. h. +/- 2% r. h. for 7 and 14 days. Significant test certificate shall be provided.
        3. The panel shall meet the following acoustic values when tested in accordance to ISO 140. The compliance has to be certified.
        4. Sound absorption value according to ISO 140:

|  |  |  |
| --- | --- | --- |
|  | without covering | with covering  (29 dB improvement) |
| Rated degree of longitudinal sound reduction Dnfw | 50 dB  (55 dB with joint cut and mineral fibre barrier) | 53 dB |
| Sound insulation index Rw | 64 dB | - |
| Degree of improvement in footfall sound ∆ Lw | 14 dB | 23 dB (29 dB with sound dampening gaskets) |
| Rated footfall sound level Lnfw | 70 dB | 52 dB |

* + - 1. UNDERSTRUCTURE
* Pedestals: Assemblies shall be all steel welded construction galvanized and blue passivated, and shall provide means of levelling and locking at selected height, which prevents vibration displacement and excludes the possibility to tamper with height settings.

Provide pedestals designed for use in seismic applications.

Base: Square base with not less than [**2.5 sq. in. (16 sq. cm)**] of bearing area.

Column: Of height required to bring finished floor to elevations indicated. Provide vibration-proof leveling mechanism for making and holding fine adjustments in height over a range of not less than [**2.1 inches (54 mm) adjustment range could differ in low height pedestals**] and for locking at a selected height, so deliberate action is required to change height setting and prevent vibratory displacement.

Head: Designed to support the panel system indicated.

* + - 1. FABRICATION
         1. Fabrication Tolerances:

Size: Plus or minus 0.007 inch (0.20 mm) of required size.

Squareness: Plus or minus 0.011 inch (0.30 mm) between diagonal measurements across top of panel.

Flatness: Plus or minus 0.011 inch (0.30 mm), measured on a diagonal on top of panel.

* + - * 1. Panel Markings: Floor panels shall be permanently marked with manufacturer’s name, product identification and country-of-origin. Removable Product ID stickers are not acceptable.
        2. Cutouts: Fabricate cutouts in floor panels for cable penetrations and service outlets. Provide reinforcement or additional support, if needed, to make panels with cutouts comply with structural performance requirements.

Number, Size, Shape, and Location: [**As indicated.**]

Provide foam-rubber pads for sealing annular space formed in cutouts by cables.

* + - 1. ACCESSORIES
         1. Adhesives: Manufacturer's standard adhesives for bonding pedestal bases to subfloor and locking pedestal head in position.

Pedestal adhesive:  
Adhesive shall be solvent-free, low emission, have a VOC (USA) content of < 0 g/L and comply to the requirements of the SCAQMD Rule 1168 VOC content < 70 g/L.

Pedestal locking adhesive:  
Adhesive shall be a solvent-free locking adhesive with a VOC (ASTM D 2369) content of < 1 g/L and comply to the requirements of the SCAQMD Rule 1168 VOC content < 30 g/L.

FLOOR and more® installation adhesive:  
Adhesive shall comply to the requirements of the SCAQMD Rule 1168 VOC content < 50 g/L.

* + - * 1. Service Outlets: As per Engineers choice and compatible with raised flooring system.
        2. Ramps: Manufacturer's standard ramp construction of width and slope indicated, but not steeper than 1:12, with raised-disc or textured rubber or vinyl-tile floor coverings, and of same materials, performance, and construction requirements as access flooring.
        3. Steps: Provide steps of size and arrangement indicated with floor coverings to match access flooring. Apply nonslip aluminum nosings to treads unless otherwise indicated.
        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.
        5. Panel Lifting Device: Panel manufacturer's standard portable lifting device for each type of panel required [**for each computer room**].
        6. Perimeter Support: Where indicated, provide manufacturer's standard method for supporting panel edge and forming transition between access flooring and adjoining floor coverings at same level as access flooring.

1. EXECUTION
   * + 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 the Work.

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 that might interfere with attachment of pedestals.

Verify that concrete floor sealer and finish have been applied and cured.

* + - * 1. Proceed with installation only after unsatisfactory conditions have been corrected.
      1. PREPARATION
         1. Lay out floor panel installation to avoid using panels cut to less than 6 inches (152 mm) at perimeter.
         2. Locate each pedestal, complete any necessary subfloor preparation, and vacuum subfloor to remove dust, dirt, and construction debris before beginning installation.
      2. INSTALLATION
         1. Install raised / hollow-flooring system and accessories under supervision of flooring manufacturer's authorized representative to produce a rigid, firm installation that complies with performance requirements and is free of instability, rocking, rattles, and squeaks.
         2. Adhesive Attachment of Pedestals: Set pedestals in adhesive, according to access-flooring manufacturer's written instructions, to provide full bearing of pedestal base on subfloor.
         3. Adjust pedestals to permit top of installed panels to be set flat, level, and to proper height.
         4. Install flooring panels securely in place, properly seated with panel edges flush. Do not force panels into place.
         5. Scribe perimeter panels to provide a close fit with adjoining construction with no voids greater than 0.2 inch (5 mm) where panels abut vertical surfaces.
         6. Cut and trim access flooring and perform other dirt-or-debris-producing activities at a remote location or as required to prevent contamination of subfloor under already-installed access flooring.
         7. Under floor Dividers: Scribe and install under floor-cavity dividers to closely fit against subfloor surfaces (Delete if not required).
         8. Closures: Scribe closures to closely fit against subfloor and adjacent finished-floor surfaces. Set in mastic and seal to maintain plenum effect within under floor cavity.
         9. Clean dust, dirt, and construction debris caused by floor installation and vacuum subfloor area as installation of floor panels proceeds.
         10. Install raised / hollow-flooring without change in elevation between adjacent panels and within the following tolerances:

Plus or minus [**1/16 inch (1.5 mm)**] in any 10-foot (3-m) distance.

Plus or minus [**1/8 inch (3 mm)**] from a level plane over entire access-flooring area.

* + - 1. PROTECTION
         1. Prohibit traffic on hollow-flooring for 48 hours and removal of floor panels for 72 hours after installation to allow pedestal adhesive to set. Removal of floor panels to be done by trained personnel only.
         2. After completing installation, vacuum access flooring and cover with protection sheets as recommended by floor manufacturer. Maintain protective covering until time of Substantial Completion.
         3. Replace access-flooring panels that are damaged or that do not comply with specified requirements.

END OF SECTION