

SECTION 09 69 00 – RAISED ACCESS FLOORING

1.01 SUMMARY:

- A. **Scope:** ^{A17}This Section covers the performance, design, supply, installation, and commissioning requirements for complete raised access flooring, as required, for telecommunications equipment and process control system rooms in the main control buildings (MCB) of the Works. ^{A17} ^{A16}This Section of the Employer's Requirements shall be read in conjunction with the Sections listed in Table 09 69 00-1. ^{A16}

B. **Related Sections:**

TABLE 09 69 00-1: Related Sections			
1.	Section 01 81 26	-	Communications, Control, Safety, and Security Systems.
2.	Section 01 81 36	-	Operations and Maintenance Buildings and Facilities - Program
3.	Section 01 86 13	-	Plant – Mechanical Systems and Equipment (ref. Air Conditioning Systems).
4.	Section 12 59 83	-	Custom System Furniture (ref. Consoles).
5.	Section 26 05 13	-	Medium Voltage Cables.
6.	Section 26 20 00	-	Electrical Low Voltage Distribution Work.
7.	Section 26 33 00	-	Direct Current Equipment.
8.	Section 27 05 28	-	Communications Pathways for Inside Plant.
9.	Section 28 31 00	-	Fire Alarm Systems for Buildings.
10.	Section 40 95 13	-	Process Control Hardware.

1.02 REFERENCE:

- A. **Applicable Publications:** Refer to Section 01 81 26 (*Communications, Control, Safety, and Security Systems*), Paragraph 1.02.

1.03 REQUIREMENTS:

A. **General Requirements:**

- The Contractor shall meet all applicable requirements of Section 01 81 26 (*Communications, Control, Safety, and Security Systems*), Paragraph 1.03.
- Raised access floors shall have fifteen (15) year or longer duration, provide acoustic and thermal insulation, and be corrosion resistant and adequate for data centers.
- Floors shall be anti-static when kept clean and free of residuals. ^{A10}Finish and laminates shall meet the requirements of NEMA LD 3. ^{A10}

4. Raised floors shall be fire retardant or non-combustible, with class “A” flame spread rating when tested in accordance with ASTM E84.
5. Floors shall be anti-reflective to avoid possible light reflection problems to operators as well as on computer monitors and video walls.
6. Minimum height from building finished floor to raised access floor tile upper surface shall be 610 mm (24”).
7. Floors shall allow for air conditioning through the lower plenum for equipment to be installed in racks and cabinets.
8. Floors shall be easily modifiable to include air diffuser grilles, embedded power and communications outlets, ramps, and stairs.
9. Raised floors shall be asbestos free.

B. Equipment and Materials:

1. **Air Seals:** Shall be manufacturer’s standard item adequate for sealing underfloor plenums.
2. **Lifting Devices:** Two lifting devices with a pair of suction cups shall be provided for each room with raised access floor to facilitate temporary removal of tiles.
3. **Pedestals:** Shall be made of steel providing excellent impact load conditions and means for leveling.
4. **Pedestal Bases:** Shall be capable of resisting 90 N-m (800 in-lb).
5. **Pedestal Heads:**
 - a. Units shall be universal type, capable of receiving combination bolted and snapped-on stringers.
 - b. Heads shall be one piece, galvanized steel tubes with size matching pedestal studs.
6. **Perforated Tiles:** Shall meet the requirements for solid tiles except for holes and adjustable slide dampers suitable for air conditioning.
7. **Solid Tiles:**
 - a. Tiles shall be interchangeable, gravity held modular squares, with side of approximately 610 mm (24"). Size tolerance shall be ± 0.25 mm (± 0.01 ") or better.

- b. Tile lower surface shall have high electrical conductivity. Electrical resistance shall not exceed 2×10^{10} Ohms at 500 volts when tested at 50% RH and 22°C (72°F) in accordance with NFPA 99 or similar method.
 - c. Tile upper surface shall be High Pressure Laminate (HPL) or better, electrically insulated, and resistant to abrasion, humidity, and pedestrian traffic.
 - d. Tiles shall be resistant to scratches from sliding equipment with small rollers, and have excellent rolling load performance.
 - e. Edge trim shall be rigid, mechanically attached, and bonded to the panel surface flush with panel finish.
 - f. Acoustic insulation to a 500 Hz step noise shall be 21 dB \pm 3dB, or better.
8. **Stairs:** Steps shall not exceed 178 mm (7 in).
9. **Stringers:**
- a. Stringers shall be galvanized steel and as required to form grid pattern.
 - b. Fasteners shall be flat head machine screws or better.

C. **Installation:**

1. **General:**
- a. Raised access floors shall be provided for the entire area in communications equipment and control rooms of locks main control buildings.
 - b. Raised floors shall be sealed to avoid leaks of under-floor plenum air conditioning supply through openings other than those under equipment cabinets and racks.
 - c. Damaged flooring shall be replaced at no cost to the Employer.
2. **Air Seals:** Shall be installed where under-floor space is used as an air plenum.
3. **Cleaning:**
- a. The Contractor shall vacuum under and above newly installed access floor to remove all debris and dirt.
 - b. Upon completion of the installation, the Contractor shall remove all scuff marks from newly installed access floors using floor manufacturer's recommended cleaning solutions.

4. **Floor Cutouts:** Shall be trimmed as required to install communications, electrical, and mechanical items associated with this project.
5. **Fire Alarm Detectors:** Shall be in the underfloor plenum, in accordance with Section 28 31 00 (*Fire Alarm Systems for Buildings*).
6. **Grounding:** Metal structures shall be electrically grounded in accordance with NFPA 70.
7. **Pedestal Bases:** Shall be anchored to the building floor with a minimum of four screws.
8. **Protection:** Temporary floor covering shall be installed to protect newly installed access floor until project completion. This shall be taped down cardboard, plastic, or a better combination of both.
9. **Ramps:** Shall be as required to facilitate access to a handicapped person with wheelchair to the upper operator console location in main control buildings.
10. **Stairs:** Shall be as required to have console No. 2 higher and behind console No. 1, so that view to video wall is unobstructed.
11. **Stringers:** Shall be snapped, bolted, or a combination, as recommended by the manufacturer.
12. **Tiles:**
 - a. Finished floor surface shall be flush with adjacent area floors.
 - b. Tiles shall be supported with pedestals on its four corners and lateral supporting structure.
 - c. Tiles shall be mechanically coupled and sealed on its borders so that humidity does not cross up or down.
 - d. The access floor system shall be level within 2.5 mm (0.1 in) over the entire floor.
 - e. The Contractor shall provide a minimum of 5% extra tiles for storage at job site.
13. **Adjusting:**
 - a. Finished floors shall be level and locked at a selected height.
 - b. Any dampness, irregularity or unevenness shall be corrected.

1.04 DESIGN CRITERIA/SYSTEM PERFORMANCE:

A. General:

1. **Problem to be Solved:** Raised flooring systems shall solve the following business needs:
 - a. Provide a heavy duty, aesthetically pleasant, durable walking surface and an underfloor plenum for cabling and artificial ventilation.
2. **Restrictions to be Considered:**
 - a. Raceways for communications, special systems signaling, and control wiring under raised floors shall be in accordance with Section 27 05 28 (*Communications Pathways for Inside Plant*).
 - b. Raceways for power wiring under raised floors shall be in accordance with Sections 26 20 00 (*Electrical Low Voltage Distribution Work*) and 26 33 00 (*Direct Current Equipment*).
 - c. Air cooling and filtering under raised floors shall be in accordance with Section 01 86 13 (*Plant - Mechanical Systems and Equipment*).

- B. **Design Criteria:** The Contractor shall use the best design practices for raised access floors in data centers and similar locations.

C. System Performance:

1. Raised flooring shall have the following or better loading capacities, or as required for the actual loads, whichever is the greatest:
 - a. **Concentrated Load Capacity:** 575 kg (1,250 lb) placed on a 645 mm² (1 in²) area at any location on a panel.
 - b. **Ultimate Load Capacity:** 1,700 kg (3,750 lb) at weakest point with stringer.
 - c. **Uniform Load Capacity:** 1,746 kg/m² (358 lb/ft²).

1.05 SUBMITTALS: The following shall be submitted for substantiation purposes:

A. ^{A17}Within 77 Days after the Commencement Date: ^{A17}

1. CPM diagram, with monthly updates.
2. Descriptive literature.
3. MSDS for floor finish and floor panels.
4. Any other data required for review.

- B. **Design:** The following shall be in accordance with Section 01 81 26 (*Communications, Control, Safety, and Security Systems*), ^{A10}Subparagraph 1.05 D.: ^{A10}
1. Calculations.
 2. Drawings.
 3. Protection methods for corrosion, ESD, fungus/humidity, thermal, and vibration.
 4. Specifications.
 5. Tile sample(s).
- C. **Re-submittals Just Prior to Purchasing Materials:** All items in A. and B. above that have changed from original submittal shall be resubmitted in a Design Conference in accordance with Section 01 81 26 (*Communications, Control, Safety, and Security Systems*), Paragraph 1.05.
- D. **Upon Receipt of Shipped Items in Panama:**
1. Instruction manuals for installation and maintenance.
 2. Packing lists.
- E. **Prior to Issuance of Taking Over Certificate:**
1. As-built drawings.
 2. List of recommended spare parts.

1.06 QUALITY ASSURANCE: Shall include the following in accordance with Section 01 81 26 (*Communications, Control, Safety, and Security Systems*), Paragraph 1.06:

- A. Factory Quality Control Tests (FQCT).
- B. Certifications of compliance with the required standards for the model numbers offered.
- C. Field demonstrations, including humidity and scratch tests, as well as distributed (uniform) and uniform and concentrated load tests. Load tests shall be in accordance with CISCA RTPAF.
- D. Test reports from independent laboratory verifying compliance for the model numbers offered.
- E. ^{A17}Manufacturer's warranty. ^{A17}

END OF SECTION