SECTION 01 84 00 — FACILITY INTERIOR PERFORMANCE REQUIREMENTS

[A16]**1.01 SUMMARY**:

A. Provide finished interiors for all buildings and facilities required, as indicated in the program, equipped with interior fixtures as required to function properly for specific occupancies and in accordance with the space-programming description in Section 01 81 36.13 (*O&M Building and Facilities — Space Programming*).

B. **Interiors Comprise the Following Assemblies**:

1. **Interior Construction**: All elements necessary to subdivide and finish space enclosed within the shell, including applied interior surfaces of the exterior enclosure. The following interior elements comprise the interior construction:

   a. **Partitions**: Space dividers, including demountable and operable partitions.

   b. **Interior Doors**: Interior doors, including hardware and frames, except for elevator doors. Interior doors controlled by the access control system described in Section 28 13 00 (*Access Control Systems*) shall have hold-closed magnets and electric door strikes.

   c. **Interior Windows**: All interior fixed and operable windows, including frames and casings.

   d. **Other Interior Openings**: Interior utility openings (including sills, jambs, heads, and operating hardware); hatches and access panels; louvers; and vents.

   e. **Stairs and Ramps**: Interior and exterior stair and ramp elements not a part of superstructure or exterior enclosure.

   f. **Interior Finishes**: Functional and decorative applied interior finishes, including secondary support structures.

2. **Interior Fixtures**: All elements attached to interior construction that add functionality to enclosed spaces, except for elements classified as equipment or services fixtures.

C. Provide physical separation between spaces, constructed to achieve fire ratings required by NFPA 101; appropriate security between adjacent spaces; and visual, acoustical, olfactory, and atmospheric isolation as necessary to maintain desirable conditions in each space.

D. Provide finishes for interior surfaces that are appropriate for the functions of each space. Interior finishes comprise the following elements:

1. Wall finishes, including those applied to the interior face of exterior walls and to the vertical faces of superstructure elements.

2. Floor finishes, except for access floors.

3. Suspended ceilings, soffits, and applied ceiling finishes.

4. Stair finishes, except for integral stair surfaces.

E. Provide interior fixtures that are necessary for the proper functioning of each space as required by the program.

1. Identifying devices, fixed to interior construction, that are necessary for direction to and identification of functions and spaces.

2. Storage fixtures, attached to interior construction, that are necessary for proper functioning of spaces.

3. Window treatment.

4. Accessory fixtures, as required to accomplish the design

5. Fixed seating for occupants, of the type and in the quantity required.

F. In addition to requirements specified in this section, comply with all applicable requirements of Section 01 81 36 (*O&M Building and Facilities — Program*) and Section 01 81 36.13 (*O&M Building and Facilities — Space Programming*).

1.02 REFERENCES:

A. **American Concrete Institute (ACI) Publications**:

301-05	Structural Concrete for Buildings
315-00	Detailing Manual
318/318R-02	Building Code Requirements for Reinforced Concrete and Commentary
530-05	Building Code Requirements for Masonry Structures
530.1-05	Masonry Structures

B. **American Architectural Manufacturers Association (AAMA) Publication**:

2605-05	Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels

C. **American National Standards Institute (ANSI) Standards**:

A108/A 118/A136.1-99	Installation of Ceramic Tile
A117.1-03	Accessible and Useable Buildings and Facilities
A137.1-88	Ceramic Tile

D. **American Society of Civil Engineers (ASCE) Code**:

7-05	Minimum Design Loads for Buildings and Other Structures

E. **American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (ASHRAE) Publication**:

ASHRAE Handbook - 07	HVAC Applications Handbook

F. **American Society for Testing and Materials (ASTM) International Standards**:

A 167-99	Stainless Steel and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip
A 176-99	Stainless Steel and Heat-resisting Chromium Steel Plate, Sheet and Strip
A 653/A 653 M-06(A)	Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
B 209/M-06	Aluminum and Aluminum-Alloy Sheet and Plate
B 221-06	Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes
C 36/C 36 M-04	Gypsum Wallboard
C 129-06	Nonload Bearing Concrete Masonry Units
C 373-88	Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity and Apparent Specific Gravity of Fired Whiteware Products
C 635-04	Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
C 645-07	Nonstructural Steel Framing Members
C 648-04	Standard Test Method for Breaking Strength of Ceramic Tile
C 665-06	Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
C 840-07	Application and Finishing of Gypsum Board

C 1028-06	Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method
D 2047-04	Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine
D 2244-07	Standard Practice for Calculation of Color Tolerance and Color Differences from Instrumentally Measured Color Coordinates
E 72-05	Standard Test Methods of Conducting Strength Tests of Panels for Building Construction
E 84-07	Standard Test Method for Surface Burning Characteristics of Building Materials
E 90-04	Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
E 96/E 96M-05	Standard Test Methods for Water Vapor Transmission of Materials
E 336-05	Measurement of Airborne Sound Attenuation between Rooms in Buildings
E 413-04	Classification for Rating Sound Insulation
E 1130-02	Standard Test Method for Objective Measurement of Speech Privacy in Open Offices using Articulation Index
E 1352-02	Standard Test Method for Cigarette Ignition Resistance of Mock-up Upholstered Furniture Assemblies
E 1477-98(08)	Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating Sphere Reflectometers
E 1537-02(A)	Standard Test Method for Fire Testing of Upholstered Furniture
F 476-84(02)	Standard Test Method for Security of Swinging Doors Assembly
F 588-07	Standard Test Method for Measuring the Forced Entry Resistance of Windows Assemblies, Excluding Glazing Impact

F 1233-04	Standard Test Method for Security Glazing Materials and Systems

G. **Autoridad del Canal de Panamá (ACP) Publication**:

	Manual para la Utilización e Implementación del Logotipo, 2000

H. **Builders Hardware Manufacturer's Association (BHMA) Standards**:

A 156.1-06	Butts and Hinges
A 156.2-03	Bored and Preassembled Locks and Latches
A 156.3-01	Exit Devices
A 156.5-01	Auxiliary Locks and Associated Products
A 156.12-05	Interconnected Locks
A 156.13-05	Mortised Locks and Latches

I. **Code of Federal Regulations (CFR)**:

29 CFR 1926	Occupational Safety and Health Administration (OSHA), Department of Labor — Safety and Health Regulations for Construction

J. **Comite Européen de Estandardisation (CEN) Standard**:

EN 101-91	Mohs Hardness

K. **Gypsum Association (GA) Publication**:

GA 216-04	Application and Finishing of Gypsum Panel Products

L. **International Organization for Standardization (ISO) Publication**:

10545-7 - 96	Ceramic Tiles — Part 7: Determination of Resistance to Surface Abrasion for Glazed Tiles

M. **Illuminating Engineering Society of North America (IESNA) Publication**:

RP-5 - 99	Daylighting

N. **International Code Council (ICC) Code**:

IBC 06	International Building Code

O. **Junta Técnica de Ingeniería y Arquitectura (JTIA) Norm**:

REP 2004	Reglamento Estructural de la República de Panamá

P. **National Fire Protection Association (NFPA) Publications**:

101-06	Life Safety Code
261-04	Standard Method of Test for Determining Resistance of Mock-up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes
266-98	Method of Test for Fire Characteristics of Upholstered Furniture Exposed to Flaming Ignition Source

Q. **Panama Law and Regulations**:

Ley 42	"Por la cual se establece la equiparación de oportunidades para las personas con discapacidad" 27 de agosto de 1999 y Decreto Ejecutivo No. 88 del 11 de diciembre de 2002 por medio del cual se reglamenta la Ley 42 de 27 de agosto de 1999.

1.03 REQUIREMENTS:

A. **Partitions**:

1. Provide partitions with sufficient strength and rigidity to withstand anticipated horizontal loading conditions without excessive deflection or structural damage. Partitions comprise the following elements:

   a. **Fixed Partitions**: Solid, stationary space dividers that are opaque and extend full height.

   b. **Partial Height Partitions**: Fixed, solid, opaque visual barriers, including bathroom compartments such as:

      1) **Shower Partitions**: Provide partitions resistant to corrosion between shower units.

      2) **Toilet and Urinal Partitions**: Provide partitions resistant to corrosion between urinals and other toilet units.

      3) **Changing Compartments**: Provide for men and for women with bench and two (2) corrosion- resistant clothing hooks per compartment.

   c. **Demountable Partitions**: Fixed, solid, modular space dividers designed to be relocatable without significant damage to partitions or substrates.

   d. **Fixed, Open Protection and Control Devices**: Barriers include interior railings.

   e. Do not provide operable partitions that are moveable barriers.

2. **Structural Criteria**:

a. **Lintels**: Constructed to span openings in partitions and support imposed loads with maximum deflection vertically and horizontally of 1/360 of span.

b. **Vertical Loads**: Provide partitions with sufficient strength to withstand anticipated vertical loads for wall-mounted handrails, equipment, and furnishings without excessive deflection or structural damage.

1) **Partial Height Partitions**: Withstand point load of 890 N applied every 610 mm to top of partition, in any direction.

2) **Demountable Partitions**: Capable of supporting hanging components weighing up to 100 N/m.

c. **Horizontal Loads**: Provide partitions with sufficient strength and rigidity to withstand anticipated horizontal loading conditions without excessive deflection or structural damage.

1) **Fixed Partitions**: Withstand loading of 240 Pa with maximum deflection of L/120, per ASTM E 72.

2) **Partial Height Partitions**: Withstand concentrated load of 890 N applied over not more than 6,400 sq mm anywhere on partition surface.

3) **Demountable Partitions**: Withstand loading of 240 Pa with maximum deflection of L/120, per ASTM E 72.

d. **Railings**: Provide railings with sufficient strength and rigidity to withstand loads in accordance with 29 CFR 1926.

e. **Railing Configuration**:

1) For all railings, if used as fall protection in SP1 and SP2 spaces, provide a configuration that prevents the passage of a 10 mm sphere below the top rail.

2) For all other spaces where public access is restricted, railing configuration shall be as required by 29 CFR 1926.

B. **Doors**:

1. In partitions that function to allow passage of people, vehicles, and goods, equip all openings so they can be closed and secured when not in use, using components as specified.

2. The elements comprising interior doors include doors of all sizes and uses, gates, and elements that form or complete the openings, unless an integral part of another element.

3. Protect door openings in fire-rated walls and partitions in accordance with the code.

4. Where doors must be latched or locked, comply with the code and the following for emergency egress.

   a. Panic hardware and a posted sign stating that "this door must remain unlocked during business hours".

   b. Locking devices requiring a key for egress are not allowed.

   c. Exit doors having an occupant load of 50 or more shall use an exit hardware that releases the locking/latching mechanism upon the application of a force in the direction of egress travel.

5. **Physical Security**:

   a. **Locks**: Secure each room door using a keyed lockset that allows exit from inside using only one motion.

      1) **Exceptions**: The following must not have any locking feature at all:

         a) Doors into stairwells.

         b) Doors across corridors (i.e. interrupting the length of corridors for fire, smoke, or privacy reasons).

         c) Doors to shower rooms and kitchenettes.

      2) The following may have privacy lock function (without key): doors to bathrooms, water-closet compartments, or single-person restrooms.

      3) **Lock Function**: As described in BHMA A156.2 (F36-F48, F75-F94, F107, F109); A156.3 ("X" prefix); A156.5 ("E" prefix); A156.12 (F95-F106); and A156.13 (F01-F25); type of lock required may also be governed by other criteria.

         a) **(Reserved)**

         b) **SP2 (Occupant Work Spaces)**: Office (F82 GRADE 1).

         c) **SP3 (Equipment Utilization Spaces):** Always locked (F86).

         d) **SP6 (Meeting and Instruction Spaces) for More Than One Occupant**: Office (F82 GRADE 1).

         e) **SR (Occupant Services Spaces)**: One occupant, privacy (F76 GRADE 1); more than one occupant, no locking.

         f) **SS (Storage Space)**: Always locked (F86).

         g) **CS (Circulation Space) Interior Doors**: No locking,

         h) **SU1 (Building Services Spaces)**: Entry deadbolt (F20).

         i) **SU2 (Utility Equipment Spaces)**: Always locked (F86), except for water-heater room [PB].

b. **Keys**:

1) **Keying**: Master keying system.

2) **Key Changing**: All locks changeable without disassembly of lock cylinders; acceptable methods include use of standard mortise cylinders and interchangeable removable core cylinders.

3) **Key-Making Restrictions**: Key blanks and key-making restricted to Employer.

6. **Convenience**:

a. **Dimensions**: Provide interior doors that are sized appropriately for people, vehicles, equipment, and materials likely to move between adjacent spaces.

1) **Height**: Not less than 2,030 mm in height.

2) **Width**: Not less than 915 mm in width, except for individual toilet doors and shallow closets.

3) **Closing Devices**: Required for occupant work spaces (SP2), smooth closing motion, with slower latching speed than closing speed (no slamming). Meeting and instruction spaces (SP6), smooth closing motion, with slower latching speed than closing speed (no slamming).

4) Provide hinges conforming to BHMA A156.1.

C. **Windows**:

1. Provide interior windows between adjacent spaces where required by the program or where proper functioning of adjacent spaces requires limited visual or physical connection between them. Interior windows comprise the following elements:

a. **Operable Windows**. Provide operable interior windows that are sized appropriately for objects, materials, and services likely to be transferred between adjacent spaces.

1) **Dimensions**: Provide operable interior windows sized not less than 915 mm square.

2) **Forced Entry Resistance**: At interior windows adjacent to public circulation spaces, provide minimum Class I in accordance with ASTM F 1233 and Grade 10 in accordance with ASTM F 588.

3) **Hardware at Operable Interior Windows**: Highly scratch-resistant and of finish that will minimize appearance changes due to wear; satin or brushed finish and no plated or coated finishes.

b. **Fixed Windows**: Fixed interior windows and operable interior windows, when closed, function as partition elements and cannot degrade performance of partitions below the levels specified.

2. **Fire Resistance**. Provide window rating as required to maintain fire resistance rating of partitions in which they occur.

3. **Emergency Escape**: Provide minimum opening size not less than 0.185 m^2 as required for secondary means of egress.

4. **Light**: Provide interior windows or fixed partitions that are transparent or translucent where required to meet natural lighting objectives.

5. **Visual Privacy**: Provide interior windows equipped with translucent or obscure glazing where required for security or protection of visual privacy.

6. **Convenience**:

   a. **Dimensions**: Provide operable windows sized for services to be provided between adjacent spaces, but not less than 914 mm square.

   b. **Features**: Provide operable interior windows with sill wide enough to serve as counter and track only at head

D. **Other Interior Openings**:

1. Provide interior openings between adjacent spaces when required for air movement, louvered where required for visual privacy, baffled where required as acoustical isolator. Equip with automatic fire dampers where separations are fire-rated.

2. Provide interior openings where required for maintenance access to mechanical services and other concealed systems, designed to be as unobtrusive as possible.

3. Provide covers for interior expansion joints to protect joints from debris and provide safe and durable support for anticipated traffic.

4. Provide properly sized and located interior openings where required for natural ventilation.

5. Provide properly sized and located interior openings to accommodate air return where air conditioning systems are employed.

6. Other interior openings comprise the following elements:

   a. Louvers and vents.
   b. Access doors and panels.
   c. Hatches.
   d. Expansion joint covers.
   e. Elements forming or completing interior openings, including sills, jambs, heads, and operating hardware.

7. **Fire Resistance of Elements Closing Openings**: Not less than fire resistance of construction in which the assembly is installed.

8. **Appearance**:

   a. **Compatibility**: Provide access panels, hatches, and louvers that are compatible in appearance with the finished surfaces in which they are installed, employing similar colors, and textures.

b. **Contrast**: Provide expansion joint covers that contrast sharply in material, color, and texture with the finished surfaces in which they are installed.

c. **Frames**: Design frames to give a flush appearance.

9. **Convenience**:

a. **Dimensions**: Provide access panels and hatches sized as follows.

1) **At Walls**: Not less than 0.184 m^2.

2) **At Floors and Ceilings**: Not less than 0.368 m^2.

10. **Features**: Provide access panels and hatches with concealed hinges, recessed latches, keyed cylinders, and hold-open devices.

E. **Interior Stairs and Ramps**:

1. Provide interior stairs, ramps, and fire escapes as necessary for access to and egress from all occupied spaces required by the program, in compliance with code.

2. Provide not less than one stair to all unoccupied roofs as required and to mechanical spaces and equipment rooms as necessary.

3. Stairs comprise the following elements.
   a. Structure supporting stairs.
   b. Tread and riser construction.
   c. Railings for interior stairs.
   d. Integral stair finishes.

4. Design and construct enclosed stairs to prevent chimney effect when stairs are in normal (non-emergency) use.

5. **Structural**:

a. Provide stairways, ramps, platforms, and landings capable of supporting loads required by 29 CFR 1926.

b. **Handrails and Guardrails**. Provide handrail and guardrail assemblies capable of resisting forces required by 29 CFR 1926.

F. **Interior Finishes**

1. Provide appropriately finished interiors for all spaces required by the program.

2. Interior finishes comprise the following elements.

a. **Wall Finishes**: Provide integral or applied wall surfaces that are appropriate for anticipated usage and traffic, offer durability, and are classified in accordance with ASTM F 793.

1) **Interior Wall Finishes at Exterior Walls**: Provide surfaces

that will not be damaged by incidental condensation from windows.

2) **Wall Protection**: In corridors, provide impact-resistant wall bumpers, and corner guards or wall surfaces that are inherently resistant to impact damage due to rolling carts and hand trucks.

3) **Opening Protection**: At partition openings intended to accommodate pedestrian or vehicular traffic, provide protection of opening edges in the form of door frames (cased openings) or corner guards.

b. **Floor Finishes, Except for Access Floors**:

1) **Structure**: For floor loading, provide floor finishes that meet static load requirements of 29 CFR 1926, REP 2004 and ASCE 7 without deformation.

2) For spaces subject to floor wetting, including entry lobbies, provide floor finishes with inherent slip resistance under wet conditions.

3) At building entries, provide means for reducing or minimizing moisture and debris on shoe soles.

4) Minimum static friction coefficient in dry or wet floor conditions shall be 0.60 in accordance with ASTM C 1028 or ASTM D 2047.

5) At ramps and sloped floor surfaces, provide floor finishes with minimum static coefficient of friction of 0.60, measured in accordance with ASTM D 2047.

6) (Reserved)

7) **Static Generation**: At computer installations and rooms with electronic equipment, provide floor finishes that generate less than 2.0 kV at 20 percent relative humidity, when tested in accordance with AATCC 134 using step and scuff tests with Neolite and leather soles. Do not use carpeted surfaces.

8) **Ceramic Tile Floors**: Shall be unglazed, slip resistant, with minimum thickness of 6 mm and 150 mm on side, conforming to ANSI A137.1 for types, compositions, and grades of tiles indicated. Minimum hardness rating shall be 7 mohs conforming to CEN EN 101.

9) For quarry tile floors, tiles shall have minimum thickness of 13 mm. Mortar and tile setting for quarry tiles shall be furan or epoxy conforming to ANSI A108/A118.

10) Provide floor finishes that are appropriate for anticipated usage and traffic in each area, based on a 30 year replacement cycle.

c. **Suspended Ceilings and Soffits**:

1) **Suspended Ceilings**: Metal suspension system shall conform to ASTM C 635; mineral fiber acoustical panels not less than 18 mm thick. Exposed metal surfaces shall be standard baked enamel finish.

2) Gypsum ceilings shall conform to ASTM C 36.

d. **Applied Ceiling Finishes**: Provide interior finishes that will minimize specular reflections.

e. **Stair Finishes, Except for Integral Stair Surfaces**: Provide slip resistance at stairs and corridors; floor finishes with minimum static coefficient of friction of 0.60, measured in accordance with ASTM D 2047.

f. **Interior Ceiling Finishes at Roof Level**: Provide vapor permeability of 57 ng/s·m^2·Pa (1 perm) maximum when tested in accordance with ASTM E 96.

Table of Finishes:

Finish Product	**Use**	**Location**
Unglazed Ceramic Tiles	Showers and locker room floors	[PB]
	Walls	Lunch area at [MB] and [PBR]
Quarry Tiles	Floors	Kitchenettes, lunch areas, janitor rooms, water-heater room [PB]
Tinted Concrete Pavement	Floors	Maintenance building [MB]
Concrete Pavement	Floors	Machinery rooms:[MR-G], [MR-WSB], and [MR-V], as well as [PBR], [ELR], [SS], and [FE]
Terrazo Tiles	Floors	Offices [PB], [MB], [CB]
Glazed Ceramic Tiles	Showers, changing compartments, locker rooms, janitor rooms, and kitchenette walls	[PB]
Acoustical Tiles	Ceilings	[CB]
Gypsum Board	Ceiling	Control room display area [CB]
Ceiling Tile or Board	Ceilings	[PB], office space at [MB]

G. **Interior Fixtures**: Functional items that are permanently attached to interior walls, ceilings, and floors, except for equipment and items that are integral components of service systems and comprise the following elements:

1. **Identifying Devices Comprise**:

a. Room or function labels applied to doors or walls immediately adjacent to doorways. Provide room label signs for all spaces.

b. Signs that provide guidance to, or information about, building functions or spaces, including directional signs, locator maps, and logotypes. Provide directional signs at SP1 and [PB].

c. **Emergency Signs**: In addition to exit signs required by NFPA 101, provide the following types of signs.

1) Self-illuminating signs at electrical closets, equipment rooms, fire hose cabinets where required by code, and fire extinguishers.

2) Self-illuminating exit signs at stairways, mounted not more than 150 mm above the floor and immediately adjacent to stairway doors.

3) Emergency signs shall include, but not be limited to, alarm loudspeakers, alarm lights, emergency equipment and signs, such as: "Salida de Emergencia/Emergency Exit"

d. **Safety Signs**: In addition to signs required by NFPA 101, provide danger signs with bright background color at the following locations:

1) **Ramps**: Wall- or floor-mounted warning signs immediately adjacent to tops and bottoms of ramps.

2) **Steps at Changes of Floor Level**: Wall- or floor-mounted warning signs immediately adjacent to tops and bottoms of unenclosed flights of steps.

3) **Crosswalks**: Wall- or floor-mounted hazard signs at pedestrian crosswalks, for both pedestrians and vehicles.

e. **Required Signage**: Bilingual signs (Spanish and English) are required at each location. Signs shall include identification of each room, building, space, door, and equipment component. The numbering system for buildings and equipment rooms shall be coordinated with the Employer's Representative during the design phase. The following list of required signs does not exclude those required by NFPA 101:

1) **General Signs**: In addition to the universally recognized symbol to indicate accommodation for the disabled, signs shall be provided with the following Spanish and English phrases:

Bienvenidos/Welcome

Damas/Women

Caballeros/Men

Teléfono/Telephone

Aseo/Cleaning room

Sólo personal de la ACP/ACP personnel only

Entrada/Entrance

Salida/Exit

2) **Safety Signs**: Shall include, but not be limited to:

Alto voltaje/High voltage

Peligro/Danger

Área restringida/Restricted area

f. **Regulatory Signage**: Shall include, but not be limited to:

Prohibido fumar/Smoking prohibited

g. **Other Text/Content**: Some content will be provided by the Employer's Representative; remainder to be provided by Contractor for the Employer's Representative's approval.

h. (Reserved)

i. **Visibility**:

1) **Illumination Levels**: Provide ambient lighting or equivalent backlighting of identifying devices adequate to provide clear visibility for normally sighted persons at typical viewing distances.

a) **Wall-Mounted Corridor Signs or Signs Intended for Viewing at Less Than 1.5 m**: Minimum of 108 lx.

b) **Signs Mounted Above Head Height or Intended for Viewing at More Than 3.0 m**: Minimum of 320 lx.

c) **Written and Graphic Information on Interior Fixtures**: Clearly legible from typical viewing distances by occupants with normal eyesight.

2) **Character Size**: Provide signs with characters of adequate size to be seen comfortably by normally sighted persons at typical viewing distances.

a) **Wall-Mounted Corridor Signs or Signs Intended for Viewing at Less than 1.5 m**: Minimum character height of 16 mm and maximum of 50 mm.

b) **Signs Mounted Above Head Height or Intended for Viewing at More Than 3.0 m**: Minimum character height of 75 mm.

c) **Building Directories**: Minimum name strip height of 9.5 mm.

3) **Fonts**: Provide one font throughout the Works in accordance with ACP "Manual para la Utilización e Implementación del Logotipo" (Señalizaciones).

4) **Reflectivity**: Provide signs with matte surface measuring 11-19 degree gloss on 60 degree glossimeter.

a) **Surfaces Containing Written or Graphic Information**: Matte finished reducing the incidence of veiling reflections.

b) **Transilluminated Surfaces**: Luminance that is not more than 10 times brighter than surrounding surfaces under ambient lighting conditions for the space.

5) **Contrast**: Provide signs with contrast between characters and background of not less than 70 percent. Characters shall be dark on light backgrounds throughout the Works.

6) **Convenience**:

a) **Room Label Signs**: Provide signs with feature allowing Employer to change information.

b) **Directories**: Provide directories with feature allowing Employer to prepare new listings directly, without involvement of sign company or other agency.

7) **Appearance**:

a) Provide signage for entire Works that is consistent in design with other interior features and coordinated with overall color scheme.

b) **Room Label Signs**: Framed panel signs.

c) **Directional Signs**: Backlighted box signs.

d) **Directories**: Backlighted units that are wall mounted, with glazed cover and concealed hinges.

2. **Storage Fixtures**: Non-furniture items intended primarily for storing or securing objects, materials, and supplies, including cabinets, casework, closet fixtures, lockers, and shelving. Storage fixtures comprise the following elements.

a. **Closed Material and Utensils Storage**: Provide modular storage cabinets with capacity adequate to accommodate required functions in spaces as follows:

1) **SP3 (Equipment Utilization Space)**: Workshop, administrative area.

2) **SR (Occupant Services Space)**: Kitchenette.

3) SU1 (Building Services Space): Janitors Room.

4) [PB], [GH], [CB], [PBR], and [MB].

b. **Lockable, Heated, and Ventilated Clothing Storage in [PB]**: Provide individual full size, metal, heated and ventilated clothing lockers as indicated in Section 01 81 36 (*O & M Buildings and Facilities — Program*) for SR (occupant-services spaces) in locker rooms.

c. **Lockable Clothes Storage**: Provide space for regular full size metal clothing lockers as indicated in Section 01 81 36 (*O & M Buildings and Facilities — Program*) for SRs at [CB] and [GH].

d. **Miscellaneous Storage Fixtures**: Provide shelves, hooks, and clothing hanger rods, with capacity adequate for anticipated occupancy in spaces as follows:

1) **SU1 (Building Services Space):** Janitor's closet — provide shelf, hooks, and clothing hanger rods).

2) **SS**: Shelves).

e. **Temporary Lockable Storage**: Provide lockable transient storage units adequate for anticipated occupancy in spaces as follows.

1) SS rooms in [GH] for firearms and ammunition.

2) SS rooms in [MB], [SS], [PBR] for tools and parts.

3) SS in [MB] for flammable and combustible liquid storage).

f. **Open Material Storage**: Provide storage racks or utility shelves for material storage adequate for anticipated needs in spaces as follows.

1) SP3 (equipment–utilization space) in [MB] for spare parts.

2) SS.

3) SU2 for utility equipment.

g. **Convenience**:

1) **Open Clothing Storage**: Provide raincoat and hard hat racks and hooks at [MB] and [PBR] that are designed with rounded ends and edges to avoid damage to items.

2) **Secured Clothing Storage**: Provide individual full size lockable storage units with corrosion-resistant finish for transient usage at the [PB], [GH], and [CB], equipping them with hard hat shelf, clothing hanger rod, boot storage shelf, and wall hooks. Minimum size shall be 450 mm by 450 mm by 1,830 mm.

3) **Closed Material and Utensil Storage**: Provide floor-mounted and wall-mounted cabinets equipped with full-extension drawers, shelves, and doors that open a full 180 degrees at the [PR], [GH], [CB], [PBR], and [MB].

4) **Door Hardware**: Provide heavy-duty corrosion-resistant hardware.

h. **Stored Item Security**:

1) **Locks**: Provide locking capability at storage fixtures as follows.

a) **Lockers**: Keyed at [GH] and [PB].

b) **Cabinets**: Keyed locks, except for kitchenette cabinets.

c) (Reserved)

2) **Door Assembly Strength**: Provide metal door assemblies configured and tested for applicable criteria in accordance with ASTM F 476 for minimum X5 classification as follows:

a) **Lockers**: Grade 30.

b) **Cabinets**: Grade 20.

c) **Casework**: Grade 20.

i. **Ventilation**: For lockers, provide door louvers for air circulation through fixtures, except for heated lockers in [PB] where lockers require heating and mechanical ventilation. For flammable and combustible liquid storage area in [MB] provide mechanical air extraction. For ventilation systems, see Section 01 86 13 (*Plant — Mechanical Systems and Equipment*).

j. **Appearance**:

1) **Cabinetry**: For closed storage fixtures, provide elements that are designed to complement interior finishes, with concealed hinges and door and drawer pulls integrated into cabinet fronts.

2) **Countertops**: Provide light-colored or metallic surfaces that are seamless or tightly jointed.

3) **Racks**: Provide appropriate heavy duty-metal racks for flammable and combustible liquids.

4) **Lockers**: Provide transient storage lockers designed and finished with concealed hinges and color coded to floor or area.

3. **Window Treatment**: Provide accessories at interior and exterior windows for adjustments to control lighting, increase privacy, and enhance view.

a. **Light and Glare**: Provide interior fixtures that are not a source of direct or reflected glare.

1) Provide window treatment throughout the Works that will allow control of light transmitted through window assembly. May be horizontal blinds with 25 mm wide aluminum slats and ladder type support. Finish for all exposed metal shall be the manufacturer's standard baked enamel finish in a color to match the slats.

a) **Fully Open Position**: Maximum reduction of light level of 10 percent.

b) **Fully Closed Position**: Minimum reduction of light level of 50 percent.

2) **Light and Glare Control with View**: Provide window treatment throughout the Works that will allow control of light, glare in closed position while retaining some level of view to exterior of room.

a) **Fully Open Position**: Maximum reduction of or interference with view of 10 percent.

b) **Fully Closed Position**: Maximum reduction of or interference with view of 30 percent.

3) **Privacy**: Provide window treatment throughout the Works that will allow complete visual privacy for room interior from observers at any angle to window when window treatment is in fully closed position.

b. **Convenience**: Provide interior fixtures with fittings and controls that are manageable without special instruction or the need for excessive force.

1) Provide window treatment throughout Works with controls that are conveniently located and easily operated.

a) **Vertical Movement by Manual Controls**: Maximum weight of window treatment of 9 kg.

b) **Horizontal Movement by Manual Controls**: Maximum weight of window treatment of 27.2 kg.

c) Provide motorized controls, with manual backup for weights in excess of limits above.

2) At Main Control Room [CB], provide window treatment that will control degree of protection against glare and provide energy savings in response to changing exterior light conditions.

c. **Appearance**: Provide interior fixtures that are coordinated in design with other elements of interior construction, using compatible materials, colors, textures, and design features.

1) Provide window treatment throughout the Works that is coordinated with window modules and does not conflict with expression of architectural elements of interior construction.

a) **Concealment**: Provide window treatment that is concealed from normal viewing angles when completely open.

b) **Uniformity**: Provide window treatment system that maintains uniform appearance by limiting open positions to a predetermined number of possibilities.

d. **Texture**: Provide durable, low maintenance exposed surfaces for interior fixtures that are within reach of occupants engaged in activities normal for the particular space in which they are installed.

4. **Accessory Fixtures**: Provide specialty items intended to provide service or amenity to building interiors.

   a. **Mirrors**: One for each lavatory, with corrosion resistant shelf unless otherwise indicated.

   b. **Toilet Fixtures**: Include flush-type toilet fixture, toilet paper dispenser, lavatory, mirror with shelf, and floor drain. Lavatories shall have water-saving faucet, soap dish, and dispenser.

   c. **Shower Curtain Rod**: One per changing room (dressing compartment).

   d. **Electric Hand Dryers**: One for every 3 lavatories or less in a group.

   e. **Holders**:

      1) Towel hooks, one in each changing room (dressing compartment).

      2) Bar soap dish in each shower area.

      3) Hooks for temporary storage of occupants' property; one in each toilet compartment.

      4) Holders and dispensers for cleaning supplies, utensils, and tools. Mops and brooms — provide space for 4 items to be hung up in each janitor's closet, plus shelf for supplies.

   f. Install the following accessories for supplies to be furnished by the Employer:

      1) **Toilet Paper Dispenser**: Roll, consumer-size; one tamper proof dispenser per toilet.

      2) Towel hooks, one for each shower head.

   g. **Visual Display Fixtures**: Configuration and surface area as indicated in the program.

      1) Projection surfaces, which are identified in the program as projection screens.

         a) **Meeting and Instruction Room in [PB] and Main Control Room in [CB]**:

            i. Contrast and resolution sufficient to provide accurate viewing at all normal seating locations in the room or space.

            ii. **Projection Surfaces**: Not less than 915 mm above floor; not more than 2,134 mm above floor.

            iii. Ambient light rejection as required to provide minimum gain specified under design lighting conditions.

iv. Minimum gain of 1 at all locations within 30 degrees of viewing axis; minimum gain of 2 at all locations within 10 degrees of viewing axis.

2) Projection equipment will be furnished by the Employer.

3) Coordinate the surfaces and equipment provided with the room/space design, lighting, and sound reinforcement equipment for optimum viewing at all normal seating locations, without hot spots, loss of resolution, excessive dimming of image, or difficulty in hearing.

4) **Projection Surface Access**: Easily assembled or lowered without the use of tools.

a) **Surfaces Concealed When Not in Use**: Access by up/down controls conveniently located near space entrance(s) and to session presenter location, if any, but minimizing likelihood of tampering by audience or unauthorized personnel.

1.04 DESIGN CRITERIA/SYSTEM DESCRIPTION:

A. **Fire Resistance**: Design and select materials to provide fire resistance in accordance with NFPA 101, except for the following, which are in excess of those required by NFPA 101:

1. **Fire Area Separation Walls**: 2 hours.

2. **Stairway Enclosures**: 2 hours.

3. **Corridor Walls at Building Exit Levels**: 3 hours.

4. For all elements required to have a fire resistive rating and which are not made of materials and systems specified as acceptable by NFPA 101, use proven-by-mock-up construction.

5. For proven-by-mock-up construction, acceptable testing agencies are Underwriters Laboratories Inc.

6. Ceilings and walls in primary spaces and ceilings and walls in exits and corridors shall be provided with the following ratings: not greater than 25 flame spread and 450 smoke developed in accordance with ASTM E 84.

7. Provide storage fixtures throughout the Works that are made of totally incombustible or treated fire-retardant materials.

8. At locations intended for the storage of flammable or highly combustible materials, provide storage fixtures made of totally incombustible materials and doors that are lockable and airtight.

B. **Flammability**: At all locations throughout the Works, provide interior fixtures made of materials with flame spread index of 25 or less and smoke developed index of 450 or less when tested in accordance with ASTM E 84.

1. **Projection Surfaces**: Free-hanging and tensioned flame-retardant fabric screens in accordance with NFPA 266.

2. Provide window treatments throughout the Works that are made of totally incombustible or treated fire-retardant materials.

3. **Exception**: Materials such as metals that are obviously non-combustible.

C. **Structural Performance**: In addition to loads defined by IBC 2006 and/or REP 2004 code, provide interior construction and fixtures to support, without damage, all loads required by code.

1. **Live Loads**: Provide suspended interior fixtures or portions of fixtures designed for storage or support of persons or objects that have been engineered and installed to withstand 1.5 times the anticipated live loads without excessive deflection or permanent distortion.

2. **Special Loads**: In addition to loads defined by code, provide for adequate support of wall-mounted or ceiling-mounted furnishings and equipment in spaces where such equipment is required by the program or is likely to be installed after construction because of intended function.

3. Adequate support is defined as the ability to sustain 150 percent of design loads without damage to building or equipment.

D. **Safety**: Design and provide interior construction to protect building occupants in accordance with code and the following.

1. **Heights**: Protect building occupants from falling from elevated interior observation decks.

2. **Tripping**: Protect building occupants from tripping hazards such as uneven floor surfaces or abrupt changes in floor elevation of more than 3.2 mm.

3. **Stairs**:

a. **Stair Steepness**: Provide risers of not more than 16.5 cm and treads sized so that twice the riser height plus the tread depth totals 61 to 63.5 cm.

a. **Landings**. Provide stairs with maximum rise of not more than 3 m. between landings.

b. **Slip Resistance**: Design and construct exterior stairs so that treads have a minimum static coefficient of friction of 0.60, measured in accordance with ASTM D 2047.

c. **Risers**: Design and construct stairs with closed risers.

4. **Ramp Comfort:**

a. **Pedestrian Ramps**. Provide slope in accordance with ANSI A117.1.

b. **Landings**. Provide ramps with landings in accordance with ANSI A117.1.

5. **Egress**: Provide egress from all interior spaces in accordance with code.

6. **Slip Resistance — Fixtures Expected to Support or Assist in the Support of Persons**: Touchable surfaces shall have minimum slip resistance of 0.50, measured in accordance with ASTM D 2047, using wet conditions.

E. **Sanitation**: At spaces used for food manipulation, provide smooth, impervious, and water-resistant partition surfaces and integral coved base that will allow chemical cleaning and sterilization without damage.

F. **Natural Ventilation**: Design and construct interiors to permit air movement between exterior openings positioned to enhance warm weather thermal comfort of occupants in all major spaces. SR1 (sanitary facilities), SV (automotive), SC (circulation), and SU (utility/building services) spaces are exempt from natural ventilation requirements.

G. **Thermal Performance**:

1. Where adjacent spaces have differential required temperatures in excess of 5.6 degrees C, provide windows with minimum U-value of 6.42 SI.

2. Provide window treatment throughout the Works that enhances interior thermal comfort.

a. **Rainy Conditions**: With window treatment in closed position, improved rainy season thermal resistance (R) of not less than 0.088 SI.

b. **Dry Conditions**: With window treatment in open position, improved dry season shading coefficient of not less than 50 percent.

c. Provide window treatment throughout the Works that is water-resistant and made of non-corrosive materials that will not be damaged by contact with condensation on window surface.

3. Provide, at interior wall finishes at exterior walls, vapor permeability of 57 $ng/s \cdot m^2 \cdot Pa$ (1 perm) maximum when tested in accordance with ASTM E 96.

H. **Access**: Circulation space (CS) shall be used to provide access to all primary interior spaces. (No primary interior spaces shall be used to provide exclusive access to any another primary interior space.)

I. **View**: Provide views to the building exterior or interior atria from most locations within primary interior spaces.

1. **View Spaces Include the Following Types**:

a. (Reserved)

b. (Reserved)

c. Control display area — SP2 in [CB].

d. SP1 in guardhouse [GH].

e. SP1 in guard booth [GB].

f. Supervisor's office (SP2) in [MB].

g. SR in personnel break room [PBR].

2. **Exterior View**: At primary interior spaces without access to exterior windows, provide transparent fixed partitions or transparent interior windows that permit occupants to borrow light from and see into adjoining occupant work spaces.

3. **Interior View**: At interior office and kitchenette spaces in [MB], provide view out to the shops.

4. **Visual Privacy**: Provide fixed, full-height partitions that afford visual privacy between adjacent stalls in occupant service spaces (toilet rooms and dressing compartments in changing rooms).

J. **Natural Light**:

1. **Daylighting**: Provide ambient natural lighting in primary spaces that is of intensity adequate for essential tasks when measured at mid-afternoon on a typical overcast day.

a. **Spaces for Daylighting Include the Following Types**:

1) Occupant work spaces (SP2).

2) Equipment-utilization spaces (SP3).

3) Meeting and instruction spaces (SP6).

4) Occupant services spaces (SR).

b. **Light Levels**: Provide minimum light levels not less than those required in Section 26 50 00 (*Lighting Systems*) for the types of tasks to be anticipated in each category of space.

2. Ambient natural light is not required in the following types of primary spaces:

a. Meeting and Instruction Rooms (SP6 Spaces).

3. Ambient natural light is not required in the following types of secondary spaces:

a. Storage (SS Spaces).

b. Circulation (SC Spaces).

c. Building Services (SU1 Spaces).

d. Utility Equipment (SU2 Spaces).

4. **Visual Comfort**: Provide ambient natural light in primary spaces that is free of excessive direct or reflected glare, as defined in IESNA RP-5.

5. **Daylight Control**: Provide local devices to enable occupants to control brightness and glare from direct daylighting.

6. Provide transparent or translucent fixed partitions or interior windows where required to meet natural lighting objectives

K. **Reflectivity**:

1. **Glare**: Provide interior finishes that will not result in discomfort glare due to excessive contrast with light sources.
   a. **Ceiling Surfaces**: Not less than 80 percent reflectivity, when measured in accordance with ASTM E 1477.
   b. **Wall Surfaces**: Not less than 50 percent reflectivity.
   c. **Floor Surfaces**: Not less than 30 percent reflectivity.
   d. **Exceptions**: SR (occupant-services), SS (storage), CS (circulation), and SU (utility) spaces.
2. **Specular Reflections**: Provide interior finishes that will minimize specular reflections.
3. **Glare**: Provide interior fixtures that are not a source of direct or reflected glare.

L. **Acoustical Performance**:

1. **Background Noise**: Provide interiors that maintain ambient sound levels in primary spaces within the following Noise Criteria (NC) ranges, as defined in ASHRAE HVAC Applications Handbook, and comply with ASTM E 1130, ASTM E 336, and ASTM E 413 when adjacent spaces are occupied and are being used normally:
   a. **Lockmaster's Office [PB]**: 20-30.
   b. **Meeting and Instruction Room [PB]**: 25-30.
   c. **Conference Rooms [CB]**: 25-30.
   d. (Reserved)
   e. (Reserved)
   f. **Maintenance Building [MB]**: 50-60.
   g. **Open Work Areas**: 50-60.
2. **Impact Insulation**: Provide floor-ceiling construction, including floor structure, floor finish, and ceiling finish, to insulate primary spaces from undesirable impact noise when adjacent spaces are occupied and are being used normally.
3. **Reverberation**: Provide reverberation times in primary spaces for frequencies of 500-1000 Hz.
4. **Sound Transmission Class (STC)**: Provide doors with minimum 31 STC, as measured in accordance with ASTM E 90 and classified in accordance with ASTM E 413.
   a. Wooden doors (treated wood).
   b. Aluminum doors conforming to ASTM B 209 and ASTM B 221.

c. Steel doors conforming to ASTM A 653.

5. **Isolation for Fixed Partitions**: Provide in-place Field Sound Transmission Class (FSTC) values not less than 3 greater than Noise Isolation Class (NIC) values required for interior construction, when tested in accordance with ASTM E 336 and classified in accordance with ASTM E 413.

6. **Sound Absorption**: Provide acoustical absorption within interior spaces to achieve reverberation times within the limits specified.

M. **Odor Control**: Prevent unpleasant odors generated within a space from affecting occupants of adjacent spaces, by providing physical isolation of the spaces, separate ventilation, or a combination of isolation and ventilation.

1. **Control Odors from Spaces of the Following Types**:

a. Kitchenettes [PB], [PBR], [MB], [CB], and [GH].

b. Janitor's lunchroom [PB].

c. Toilet rooms [PB], [PBR], [MB], [CB], and [GH].

d. Locker and changing rooms [PB].

e. Trash collection.

f. Trash removal.

N. **Appearance**:

1. Provide interiors that are pleasing in appearance and do not detract from the primary functions performed in each space.

2. Provide partitions that are smooth in texture at all circulation routes (CS).

3. Provide demountable partitions of same type and manufacturer to allow future relocation.

4. Provide interior windows that are compatible in appearance with exterior windows in the same space, employing similar materials, colors, and textures.

5. **Appearance of Stairs**:

a. **Enclosed Stairs**. Provide finished appearance.

b. **Exterior Stairs**. Provide finished appearance.

6. **Colorfastness**: Provide window treatment throughout the Works that is resistant to degradation from exposure to ultraviolet light. For painted aluminum, provide maximum of 5 Delta E units (Hunter) color change as calculated in accordance with ASTM D 2244 after 5 years of exposure in accordance with AAMA 2605.

7. **Texture**: Provide interior elements and surfaces that are textured appropriately for primary functions to be accommodated within each space.

a. For surfaces that are within normal reach of occupants, provide textures that are safe for occupants and require minimum maintenance.

b. For surfaces that are not within normal reach of occupants, design may provide textures that are generally of a coarser scale than those permitted within normal reach.

O. **Cleanliness**:

1. For kitchenette, provide wall, ceiling, and floor surfaces that are resistant to moisture and that can be cleaned by caustic agents and detergents without damage.

2. For spaces such as toilet rooms, provide wall, ceiling, and floor surfaces that are inherently resistant to moisture and that can be cleaned by caustic agents and detergents without damage.

P. **Operation and Maintenance**:

1. **Cleaning**: Provide interior construction and fixtures that will not be damaged by ordinary cleaning and maintenance operations.

2. **Ease of Use**:

a. **Language of Identifying Devices**: All text in Spanish and English.

b. **Interior Fixtures with Movable Components**: Easy to use without special instruction and designed to prevent misuse.

c. **Hinges and Latches**: Heavy-duty hardware, easily adjustable, providing minimum anticipated service life of 20 years.

d. **Mechanical Controls**: Movable cranks, rotors, pulleys, and levers designed for trouble-free operation over a minimum anticipated service life of 20 years.

3. **Ease of Repair**: Provide interior fixtures at all locations that are designed to permit repair or replacement of individual components without removal of fixture. For mirrors, provide glazing replaceable without disassembly of frame.

4. **Ease of Replacement or Relocation**: Provide, at all locations, interior fixtures that are modular in form, detachable from substrate without damage to fixtures, and relocatable. For building directories, provide system with message strips that are easily replaceable by Employer's Personnel.

5. **Theft Resistance**: Provide interior fixtures at all locations that are attached to substrates with concealed, tamper-resistant, or tamperproof fasteners to minimize theft and vandalism. In restrooms, secure toilet accessories to substrates using tamperproof or concealed fasteners.

6. **Vandalism Resistance**: For signs in public areas that are within reach, provide signs that are positively attached to substrate by concealed mechanical devices and not by double-sided tape, sealant, or adhesive. In spaces accessible to the public and not subject to continuous surveillance, provide interior construction and fixtures that are inherently vandal-resistant or designed to be difficult to access or damage.

7. **Access to Lighting**: For illuminated signage, provide signage with system of quick access to lamps for Employer's maintenance personnel that will also prevent unauthorized tampering with lighting.

8. **Doors**: Provide doors that will be easy to use by occupants and easy to repair or service, with easy-to-replace operating components.

Q. **Products**:

1. Design and construct interiors using the following materials and systems.

   a. Cast-in-place concrete according to ACI 301, ACI 315, and ACI 318. Work shall conform to ACI 530 and ACI 530.1.

   b. Concrete masonry units for interior walls shall conform to ASTM C 129 for non-load bearing units.

   c. **Gypsum Walls for Office Partitions**: Gypsum board shall be of a 16 mm minimum thickness with 92 mm metal framing, spaced not more than 406 mm on center. Material shall be in accordance with ASTM C 36, type "X" with a flame spread rating of 25 or less when tested in accordance with ASTM E 84; application and finishing shall conform to ASTM C 840, except that framing and furring shall be metal in accordance with ASTM C 645. Finish shall conform to GA-216.

   d. **Batt Insulation**: Shall be thermal insulation, flame resistant foil faced vapor barrier on one face, conforming to ASTM C 665, Type III, Class A, with a flame spread rating of 25 or less when tested in accordance with ASTM E 84, and minimum R-value of 12.

   e. Manufactured stainless steel Type 304 or Type 316 conforming to ASTM A 167 and ASTM A 176.

   f. Metal framed demountable partitions, fire and water resistant panels, and laminated wood or glass shall be self-supported and modular, with factory-installed separate metal duct system for electrical and telecommunications wiring.

   g. Aluminum windows conforming to ASTM B 209 and ASTM B 221.

   h. Glazed ceramic walls for walls in wet areas shall conform to ANSI A137.1, be impact resistant with rupture resistance of 113 kg in accordance with ASTM C 648, and have maximum water absorption of 0.3 in accordance with ASTM C 373. Friction coefficient in dry or wet conditions shall be at least 0.60 in accordance with ASTM C 1028 or ASTM D 2047. Abrasion resistance shall be "Heavy Commercial" in accordance with ISO 10545-7.

   i. Unglazed ceramic tiles and quarry tiles in accordance with ANSI A137.1 and ANSI A108.1; tinted concrete pavement, terrazzo tiles, concrete tiles, and stone units for floors.

   j. Pipe and tube metal railings of stainless steel at occupant work spaces (SP2) in main control building [CB] shall be AISI Type 316, conforming to ASTM A 167 and ASTM A 176.

k. Exposed wood and wood framing for cabinetwork shall be constructed with treated wood resistant to termite attack.

2. For partitions, do not use:

a. Particleboard of any type.

b. Exposed plastic surfaces.

c. Medium Density Fiberboard (MDFB) panels.

d. Composite panels.

e. Gypsum board on wood framing and furring.

f. Wood paneling on wood framing and furring.

3. **For Identifying Devices:**

a. **Use**:

1) (Reserved)

2) Door-mounted room signs at all doors.

b. **Do Not Use**:

1) Dimensional characters.

2) Backlighted, ceiling-mounted signage.

3) Wall-mounted room signs.

4. For storage fixtures, use one or more of the following.

a. Built-in manufactured cabinetry or casework at kitchenettes.

b. Closet shelves and hanging rods in janitor's rooms.

c. Built-in clothing lockers in [CB] locker room.

d. Storage lockers at tool rooms.

e. Shelving at storage rooms.

5. For window treatments, use one of the following.

a. Horizontal aluminum window blinds for office space.

b. Window shades where required at occupied spaces.

c. (Reserved)

6. For reflective surfaces of mirrors, use glass.

7. For toilet and shower, use corrosion-resistant accessories.

8. For toilet compartments and shower and urinal partitions, use corrosion resistant materials.

9. For projection surfaces, use front projection screens or video walls.

10. (Reserved)

11. (Reserved)

12. For built-in cabinetry and casework, use the following.

    a. (Reserved)

    b. (Reserved)

    c. Manufactured plastic laminate-clad cabinets.

    d. Metal cabinets at storage spaces.

    e. Durable, integral countertops at kitchenettes.

15. For wardrobe units, use:

    a. All-metal raincoat and hard hat racks at [MB] and [PBR].

    b. Metal raincoat hooks at [MB] and [PBR].

16. For lockers, use metal frame and panel lockers, with baked enamel finish.

17. For utility storage shelving, use one of the following:

    a. Metal frame and panel shelving with baked enamel finish.

    b. Metal frame and expanded metal shelving with baked enamel finish.

    c. Modular metal pallet rack system.

    d. Heavy-duty metal rack system.

    e. Expanded metal shelving.

R. **Methods of Construction**:

1. Construct the interiors using the following methods and techniques.

    a. Shop-fabricated wall panels for field installation and finishing.

    b. Shop-fabricated fixtures and fittings.

    c. Site-built wall panels for full height (floor to ceiling) walls.

    d. Manufactured and pre-finished interior specialty items for field installation.

2. Do not use asbestos and asbestos-containing materials and finishes.

1.05 SUBMITTALS:

A. [A17]**Intermediate Design**: [A17]

1. Design criteria and preliminary analysis for interior performance, prepared by a licensed professional.
2. Product description and identification of location.
3. Certification of fire and water resistance for products.
4. Audiovisual space layouts, showing location of screen and projection equipment.
5. Certification of structural requirements.
6. Certification of sound attenuation, where required.
7. List and location of identifying devices showing color and size of sign and letters and/or numbers, technical data for materials, and typical sample for each type of proposed sign.
8. Name, qualifications, and license number of the following professional staff responsible for the design of the facilities:
   a. Architect.
   b. Structural engineer.
   c. Mechanical engineer for building ventilation systems.
   d. Mechanical engineer for building plumbing systems.
   e. Acoustical engineer.
   f. Electrical engineer.

B. **Before Taking Over**: [A17] The Contractor shall provide: [A17]

1. As-built drawings, manuals, reports, and documentation.
2. Warranty certificates from product manufacturers.
3. [A17]Service life analysis and life cycle cost analysis.
4. **Tests on Completion**: The Contractor shall perform and provide reports of:
   a. Field tests of natural air movement, verifying compliance with design requirements.
   b. Field tests of lighting levels verifying compliance with the Employer's Requirements.
   c. Field tests of acoustical conditions, verifying compliance with the Employer's performance requirements. [A17]

1.06 QUALITY ASSURANCE:

A. [A17]The Contractor shall demonstrate that the buildings meet the Employer's Requirements included in Paragraph 1.03 above.[A17] Materials, products and workmanship shall conform to minimum codes, regulations, and standards included in this section.

B. Safety, security, environmental, and functional space requirements shall be inspected in the presence of the Employer's Representative.

C. Verify material compliance and proper operation of locker system in [PB].

D. **Life Span**: [A17]The Contractor shall demonstrate[A17] that the design and the constructed and installed Materials and products will comply with following expected life span:

1. **Interior Doors and Other Operable Elements**: Minimum 25 years functional and aesthetic service life.
2. **Interior Ceiling Finishes**: Minimum 20 years functional and aesthetic service life; including suspended ceilings.
3. **Interior Wall and Floor Finishes**: Minimum 30 years functional and aesthetic service life.
4. **Other Interior Construction**: Minimum 20 years functional and aesthetic service life.[A16]

END OF SECTION