

**PROJECT TABLE OF CONTENTS****DIVISION 01 - GENERAL REQUIREMENTS**

01 11 00	SUMMARY OF WORK
01 14 00	WORK RESTRICTIONS
01 20 00.00 20	PRICE AND PAYMENT PROCEDURES
01 30 00	ADMINISTRATIVE REQUIREMENTS
01 30 01.00 22	DESIGN, PROCUREMENT, AND INSTALLATION OF FURNITURE, FIXTURES, AND EQUIPMENT
01 32 17.00 20	NETWORK ANALYSIS SCHEDULES (NAS)
01 33 00	SUBMITTAL PROCEDURES
01 33 29.00 20	SUSTAINABLE REQUIREMENTS
01 35 26	GOVERNMENTAL SAFETY REQUIREMENTS
01 35 40.00 20	ENVIRONMENTAL MANAGEMENT
01 42 00	SOURCES FOR REFERENCE PUBLICATIONS
01 45 00.00 20	QUALITY CONTROL
01 50 00	TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
01 57 13.00 22	EROSION AND SEDIMENT CONTROL
01 58 00	PROJECT IDENTIFICATION
01 78 23	OPERATION AND MAINTENANCE DATA
01 78 24.00 20	FACILITY ELECTRONIC OPERATION AND MAINTENANCE SUPPORT INFORMATION (eOMSI)

**DIVISION 02 - EXISTING CONDITIONS**

02 41 00	DEMOLITION
02 82 16.00 20	ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS
02 83 13.00 20	LEAD IN CONSTRUCTION

**DIVISION 03 - CONCRETE**

03 30 00	CAST-IN-PLACE CONCRETE
----------	------------------------

**DIVISION 04 - MASONRY**

04 20 00	MASONRY
----------	---------

**DIVISION 05 - METALS**

05 12 00	STRUCTURAL STEEL
05 40 00	COLD-FORMED METAL FRAMING

**DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES**

06 10 00	ROUGH CARPENTRY
06 20 00	FINISH CARPENTRY
06 41 16.00 10	LAMINATE CLAD ARCHITECTURAL CASEWORK
06 61 16	SOLID POLYMER (SOLID SURFACING) FABRICATIONS

**DIVISION 07 - THERMAL AND MOISTURE PROTECTION**

07 05 23	PRESSURE TESTING AN AIR BARRIER SYSTEM FOR AIR TIGHTNESS
07 11 13	BITUMINOUS DAMPPROOFING
07 21 13	BOARD AND BLOCK INSULATION
07 21 16	MINERAL FIBER BLANKET INSULATION
07 22 00	ROOF AND DECK INSULATION
07 24 00	EXTERIOR INSULATION AND FINISH SYSTEMS
07 27 10.00 10	BUILDING AIR BARRIER SYSTEM

07 60 00 FLASHING AND SHEET METAL  
07 61 14.00 20 STEEL STANDING SEAM ROOFING  
07 84 00 FIRESTOPPING  
07 92 00 JOINT SEALANTS

**DIVISION 08 - OPENINGS**

08 11 13 STEEL DOORS AND FRAMES  
08 11 16 ALUMINUM DOORS AND FRAMES  
08 14 00 WOOD DOORS  
08 51 13 ALUMINUM WINDOWS  
08 71 00 DOOR HARDWARE  
08 81 00 GLAZING  
08 91 00 METAL WALL AND DOOR LOUVERS

**DIVISION 09 - FINISHES**

09 22 00 SUPPORTS FOR PLASTER AND GYPSUM BOARD  
09 29 00 GYPSUM BOARD  
09 30 13 CERAMIC TILING  
09 51 00 ACOUSTICAL CEILINGS  
09 65 00 RESILIENT FLOORING  
09 67 23.13 STANDARD RESINOUS FLOORING  
09 68 00 CARPETING  
09 69 13 RIGID GRID ACCESS FLOORING  
09 72 00 WALLCOVERINGS  
09 90 00 PAINTS AND COATINGS  
09 96 00 HIGH-PERFORMANCE COATINGS

**DIVISION 10 - SPECIALTIES**

10 10 00 VISUAL COMMUNICATIONS SPECIALTIES  
10 14 00.20 INTERIOR SIGNAGE  
10 21 13 TOILET COMPARTMENTS  
10 22 26.13 ACCORDION FOLDING PARTITIONS  
10 26 13 WALL AND CORNER GUARDS  
10 28 13 TOILET ACCESSORIES  
10 51 16 PLASTIC LOCKERS

**DIVISION 12 - FURNISHINGS**

12 24 13 ROLLER WINDOW SHADES  
12 48 13.13 ENTRANCE FLOOR MATS  
12 93 00 SITE FURNISHINGS

**DIVISION 21 - FIRE SUPPRESSION**

21 13 13.00 20 WET PIPE SPRINKLER SYSTEM, FIRE PROTECTION

**DIVISION 22 - PLUMBING**

22 00 00 PLUMBING, GENERAL PURPOSE

**DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING**

23 00 00 AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEMS  
23 03 00.00 20 BASIC MECHANICAL MATERIALS AND METHODS  
23 05 48.00 40 VIBRATION AND SEISMIC CONTROLS FOR HVAC PIPING AND EQUIPMENT

23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC  
 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS  
 23 09 23.13 20 BACnet DIRECT DIGITAL CONTROL SYSTEMS FOR HVAC  
 23 11 25 FACILITY GAS PIPING  
 23 81 00.00 20 UNITARY AIR CONDITIONING EQUIPMENT  
 23 81 28.10 22 VARIABLE REFRIGERANT FLOW (VRF) MULTI-SPLIT AIR  
 CONDITIONING AND HEAT PUMP EQUIPMENT  
 23 83 00.00 20 ELECTRIC SPACE HEATING EQUIPMENT

**DIVISION 26 - ELECTRICAL**

26 00 00.00 20 BASIC ELECTRICAL MATERIALS AND METHODS  
 26 08 00 APPARATUS INSPECTION AND TESTING  
 26 12 19.10 THREE-PHASE PAD-MOUNTED TRANSFORMERS  
 26 20 00 INTERIOR DISTRIBUTION SYSTEM  
 26 27 14.00 20 ELECTRICITY METERING  
 26 29 23 VARIABLE FREQUENCY DRIVE SYSTEMS UNDER 600 VOLTS  
 26 41 00 LIGHTNING PROTECTION SYSTEM  
 26 51 00 INTERIOR LIGHTING  
 26 56 00 EXTERIOR LIGHTING

**DIVISION 27 - COMMUNICATIONS**

27 10 00 BUILDING TELECOMMUNICATIONS CABLING SYSTEM  
 27 51 16 RADIO AND PUBLIC ADDRESS SYSTEMS  
 27 54 00.00 20 COMMUNITY ANTENNA TELEVISION (CATV) SYSTEMS

**DIVISION 28 - ELECTRONIC SAFETY AND SECURITY**

28 20 00.00 20 ELECTRONIC SECURITY SYSTEMS (ESS), COMMERCIAL  
 28 31 76 INTERIOR FIRE ALARM AND MASS NOTIFICATION SYSTEM

**DIVISION 31 - EARTHWORK**

31 11 00 CLEARING AND GRUBBING  
 31 23 00.00 20 EXCAVATION AND FILL

**DIVISION 32 - EXTERIOR IMPROVEMENTS**

32 05 33 LANDSCAPE ESTABLISHMENT  
 32 10 00 BITUMINOUS CONCRETE PAVEMENT  
 32 11 23 AGGREGATE BASE COURSE  
 32 14 13 REINFORCED TURF SYSTEM  
 32 92 23 SODDING  
 32 93 00 EXTERIOR PLANTS

**DIVISION 33 - UTILITIES**

33 11 00 WATER DISTRIBUTION  
 33 30 00 SANITARY SEWERS  
 33 40 00 STORM DRAINAGE UTILITIES  
 33 40 01.00 22 STORM DRAINAGE  
 33 71 01 OVERHEAD TRANSMISSION AND DISTRIBUTION  
 33 71 02 UNDERGROUND ELECTRICAL DISTRIBUTION  
 33 82 00 TELECOMMUNICATIONS OUTSIDE PLANT (OSP)

-- End of Project Table of Contents --



## SECTION 08 14 00

WOOD DOORS  
08/11

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

## ARCHITECTURAL WOODWORK INSTITUTE (AWI)

AWI AWS (2009) Architectural Woodwork Standards

## ASTM INTERNATIONAL (ASTM)

ASTM E2226 (2012) Standard Practice for Application of Hose Stream

## NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 252 (2012) Standard Methods of Fire Tests of Door Assemblies

NFPA 80 (2013) Standard for Fire Doors and Other Opening Protectives

## SCIENTIFIC CERTIFICATION SYSTEMS (SCS)

SCS Scientific Certification Systems  
(SCS) Indoor Advantage

## U.S. GREEN BUILDING COUNCIL (USGBC)

LEED GBDC (2009) LEED Reference Guide for Green Building Design and Construction

LEED NC (2009) Leadership in Energy and Environmental Design (tm) New Construction Rating System

## UL ENVIRONMENT (ULE)

ULE Greenguard UL Greenguard Certification Program

## UNDERWRITERS LABORATORIES (UL)

UL 10B (2008; Reprint Apr 2009) Fire Tests of Door Assemblies

## WINDOW AND DOOR MANUFACTURERS ASSOCIATION (WDMA)

ANSI/WDMA I.S.1A (2013) Interior Architectural Wood Flush Doors

- WDMA I.S.4 (2013) Preservative Treatment for Millwork
- WDMA TM-7 (2008) Cycle Slam Test Method
- WDMA TM-8 (2008) Hinge Loading Test Method

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

SD-02 Shop Drawings

Doors; G

Submit drawings or catalog data showing each type of door unit . Drawings and data shall indicate door type and construction, sizes, thickness, and glazing, .

SD-03 Product Data

Doors; G

Accessories

Water-resistant sealer

Sample warranty

Fire resistance rating; G

Certification

Local/Regional Materials; (LEED NC)

LEED documentation relative to local/regional materials credit in accordance with LEED GBDC. Include in LEED Documentation Notebook.

SD-04 Samples

Door finish colors; G

Submit a minimum of three color selection samples , minimum 3 by 5 inches in size representing wood stain.

SD-06 Test Reports

Cycle-slam

Hinge loading resistance

Submit cycle-slam test report for doors tested in accordance with WDMA TM-7, and hinge loading resistance test report for doors tested in accordance with WDMA TM-8.

### 1.3 SUSTAINABLE DESIGN CERTIFICATION/DOCUMENTATION

Product shall be third party certified in accordance with ULE Greenguard Gold, SCS Scientific Certification Systems Indoor Advantage Gold or equal. Certification shall be performed annually and shall be current.

### 1.4 LOCAL/REGIONAL MATERIALS

Use products extracted, harvested, or recovered, as well as manufactured, within a 500 mile radius from the project site, if available from a minimum of three sources. Refer to Section 01 33 29 SUSTAINABLE DOCUMENTATION for cumulative total local material requirements. Wood doors may be locally available.

### 1.5 DELIVERY, STORAGE, AND HANDLING

Deliver doors to the site in an undamaged condition and protect against damage and dampness. Stack doors flat under cover. Support on blocking, a minimum of 4 inch thick, located at each end and at the midpoint of the door. Store doors in a well-ventilated building so that they will not be exposed to excessive moisture, heat, dryness, direct sunlight, or extreme changes of temperature and humidity. Do not store in a building under construction until concrete, masonry work, and plaster are dry. Replace defective or damaged doors with new ones.

### 1.6 WARRANTY

Warrant doors free of defects as set forth in the door manufacturer's standard door warranty.

## PART 2 PRODUCTS

### 2.1 DOORS

Provide doors of the types, sizes, and designs [indicated] [specified] free of urea-formaldehyde resins.

#### 2.1.1 Flush Doors

Conform to ANSI/WDMA I.S.1A for flush doors. Provide hollow core doors with lock blocks and 1 inch minimum thickness hinge stile. Hardwood stile edge bands of doors receives a natural finish, compatible with face veneer. Provide mill option for stile edge of doors scheduled to be painted. No visible finger joints will be accepted in stile edge bands. When used, locate finger-joints under hardware.

##### 2.1.1.1 Interior Flush Doors

Provide staved lumber, particleboard or agrifiber core, Type II flush doors conforming to ANSI/WDMA I.S.1A with faces of premium grade natural birch. Hardwood veneers shall be book matched.

#### 2.1.2 Composite-Type Fire Doors

Provide doors specified or indicated to have a fire resistance rating

conforming to the requirements of [UL 10B](#), [ASTM E2226](#), or [NFPA 252](#) for the class of door indicated. Affix a permanent metal label with raised or incised markings indicating testing agency's name and approved hourly fire rating to hinge edge of each door.

## 2.2 ACCESSORIES

### 2.2.1 Door Light Openings

Provide glazed openings with the manufacturer's standard wood moldings. Provide moldings for doors to receive natural finish of the same wood species and color as the wood face veneers. Provide moldings on the exterior doors with sloped surfaces. Lip type moldings for flush doors.

### 2.2.2 Additional Hardware Reinforcement

Provide the minimum lock blocks to secure the specified hardware. The measurement of top, bottom, and intermediate rail blocks are a minimum 125 mm 5 inch by full core width. Comply with the manufacturer's labeling requirements for reinforcement blocking, but not mineral material similar to the core.

## 2.3 FABRICATION

### 2.3.1 Marking

Stamp each door with a brand, stamp, or other identifying mark indicating quality and construction of the door.

### 2.3.2 Quality and Construction

Identify the standard on which the construction of the door was based , identify the standard under which preservative treatment was made, and identify doors having a Type I glue bond.

### 2.3.3 Preservative Treatment

Treat doors scheduled for restrooms, janitor closets and other possible wet locations including exterior doors with a water-repellent preservative treatment and so marketed at the manufacturer's plant in accordance with [WDMA I.S.4](#).

### 2.3.4 Adhesives and Bonds

[ANSI/WDMA I.S.1A](#). Use Type I bond for exterior doors and Type II bond for interior doors. Provide a nonstaining adhesive on doors with a natural finish.

### 2.3.5 Finishes

#### 2.3.5.1 Factory Finish

Provide doors finished at the factory by the door manufacturer as follows: [AWI AWS](#) Section 1500, specification for System No. 4 Conversion varnish alkyd urea or System No. 5 Vinyl catalyzed. The coating is [AWI AWS](#) premium, medium rubbed sheen, open grain effect. Use stain when required to produce the finish specified for color. Seal edges, cutouts, trim, and wood accessories, and apply two coats of finish compatible with the door face finish. Touch-up finishes that are scratched or marred, or where

exposed fastener holes are filled, in accordance with the door manufacturer's instructions. Match color and sheen of factory finish using materials compatible for field application.

#### 2.3.5.2 Color

Provide door finish colors as indicated on the Interiors drawing Finish Schedule.

#### 2.3.6 Water-Resistant Sealer

Provide manufacturer's standard water-resistant sealer compatible with the specified finishes.

### 2.4 SOURCE QUALITY CONTROL

Meet or exceed the following minimum performance criteria of stiles of "B" and "C" label fire doors utilizing standard mortise leaf hinges:

- a. Cycle-slam: 200,000 cycles with no loose hinge screws or other visible signs of failure when tested in accordance with the requirements of WDMA TM-7.
- b. Hinge loading resistance: Averages of ten test samples not less than 700 pounds load when tested for direct screw withdrawal in accordance with WDMA TM-8 using a No. 12, 1-1/4 inch long, steel, fully threaded wood screw. Drill 5/32 inch pilot hole, use 1-1/2 inch opening around screw for bearing surface, and engage screw full, except for last 1/8 inch. Do not use a steel plate to reinforce screw area.

## PART 3 EXECUTION

### 3.1 INSTALLATION

Before installation, seal top and bottom edges of doors with the approved water-resistant sealer. Seal cuts made on the job immediately after cutting using approved water-resistant sealer. Fit, trim, and hang doors with a 1/16 inch minimum, 1/8 inch maximum clearance at sides and top, and a 3/16 inch minimum, 1/4 inch maximum clearance over thresholds. Provide 3/8 inch minimum, 7/16 inch maximum clearance at bottom where no threshold occurs. Bevel edges of doors at the rate of 1/8 inch in 2 inch. Door warp shall not exceed 1/4 inch when measured in accordance with ANSI/WDMA I.S.1A.

#### 3.1.1 Fire Doors

Install fire doors in accordance with NFPA 80. Do not paint over labels.

#### 3.1.2 Prehung Doors

Install doors in accordance with the manufacturer's instructions and details. Provide fasteners for frames within 3 inch of each end and spaced 11 inch on center maximum. Provide side and head jambs joined together with a dado or notch of 3/16 inch minimum depth.

-- End of Section --



## SECTION 09 22 00

## SUPPORTS FOR PLASTER AND GYPSUM BOARD

02/10

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

## ASTM INTERNATIONAL (ASTM)

ASTM A463/A463M	(2010) Standard Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process
ASTM A653/A653M	(2013) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM C645	(2013) Nonstructural Steel Framing Members
ASTM C754	(2011) Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products
ASTM C841	(2003; R 2013) Installation of Interior Lathing and Furring
ASTM C847	(2012) Standard Specification for Metal Lath

## NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)

NAAMM EMLA 920	(2009) Guide Specifications for Metal Lathing and Furring
----------------	---

## UNDERWRITERS LABORATORIES (UL)

UL Fire Resistance	(2012) Fire Resistance Directory
--------------------	----------------------------------

## 1.2 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the job site and store in ventilated dry locations. Storage area shall permit easy access for inspection and handling. If materials are stored outdoors, stack materials off the ground, supported on a level platform, and fully protected from the weather. Handle materials carefully to prevent damage. Remove damaged items and provide new items.

## PART 2 PRODUCTS

## 2.1 MATERIALS

Provide steel materials for metal support systems with galvanized coating

ASTM A653/A653M, G-60; aluminum coating ASTM A463/A463M, T1-25; or a 55-percent aluminum-zinc coating.

#### 2.1.1 Materials for Attachment of Lath

##### 2.1.1.1 Suspended and Furred Ceiling Systems and Wall Furring

ASTM C841, and ASTM C847.

##### 2.1.1.2 Non-loadbearing Wall Framing

NAAMM EMLA 920.

#### 2.1.2 Materials for Attachment of Gypsum Wallboard

##### 2.1.2.1 Suspended and Furred Ceiling Systems

ASTM C645.

##### 2.1.2.2 Nonload-Bearing Wall Framing and Furring

ASTM C645, but not thinner than 0.0179 inch thickness, with 0.0329 inch minimum thickness supporting wall hung items such as cabinetwork, equipment and fixtures.

##### 2.1.2.3 Furring Structural Steel Columns

ASTM C645. Steel (furring) clips and support angles listed in UL Fire Resistance may be provided in lieu of steel studs for erection of gypsum wallboard around structural steel columns.

##### 2.1.2.4 Z-Furring Channels with Wall Insulation

Not lighter than 26 gage galvanized steel, Z-shaped, with 1-1/4 inch and 3/4 inch flanges and 2 inch furring depth or as indicated.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

##### 3.1.1 Systems for Attachment of Lath

##### 3.1.1.1 Suspended and Furred Ceiling Systems and Wall Furring

ASTM C841, except as indicated otherwise.

##### 3.1.1.2 Non-loadbearing Wall Framing

NAAMM EMLA 920, except provide framing members 16 inches o.c. unless indicated otherwise.

##### 3.1.2 Systems for Attachment of Gypsum Wallboard

##### 3.1.2.1 Suspended and Furred Ceiling Systems

ASTM C754, except provide framing members 16 inches o.c. unless indicated otherwise.

### 3.1.2.2 Non-loadbearing Wall Framing and Furring

ASTM C754, except as indicated otherwise.

### 3.1.2.3 Furring Structural Steel Columns

Install studs or galvanized steel clips and support angles for erection of gypsum wallboard around structural steel columns in accordance with the UL Fire Resistance.

### 3.1.2.4 Z-Furring Channels with Wall Insulation

Install Z-furring channels vertically spaced not more than 24 inches o.c. Locate Z-furring channels at interior and exterior corners in accordance with manufacturer's printed erection instructions. Fasten furring channels to masonry walls with powder-driven fasteners or hardened concrete steel nails through narrow flange of channel. Space fasteners not more than 24 inches o.c.

## 3.2 ERECTION TOLERANCES

Provide framing members which will be covered by finish materials such as wallboard, plaster, or ceramic tile set in a mortar setting bed, within the following limits:

- a. Layout of walls and partitions: 1/4 inch from intended position;
- b. Plates and runners: 1/4 inch in 8 feet from a straight line;
- c. Studs: 1/4 inch in 8 feet out of plumb, not cumulative; and
- d. Face of framing members: 1/4 inch in 8 feet from a true plane.

Provide framing members which will be covered by ceramic tile set in dry-set mortar, latex-portland cement mortar, or organic adhesive within the following limits:

- a. Layout of walls and partitions: 1/4 inch from intended position;
- b. Plates and runners: 1/8 inch in 8 feet from a straight line;
- c. Studs: 1/8 inch in 8 feet out of plumb, not cumulative; and
- d. Face of framing members: 1/8 inch in 8 feet from a true plane.

-- End of Section --



## SECTION 09 29 00

## GYPSUM BOARD

05/11

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

## AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A108.11 (1992; Reaffirmed 2005) Specifications for Interior Installation of Cementitious Backer Units

## ASTM INTERNATIONAL (ASTM)

ASTM C1002 (2007; R 2013) Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs

ASTM C1047 (2010a) Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base

ASTM C1177/C1177M (2013) Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing

ASTM C1178/C1178M (2013) Standard Specification for Glass Mat Water-Resistant Gypsum Backing Panel

ASTM C1396/C1396M (2013) Standard Specification for Gypsum Board

ASTM C475/C475M (2012) Joint Compound and Joint Tape for Finishing Gypsum Board

ASTM C840 (2013) Application and Finishing of Gypsum Board

ASTM C954 (2011) Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness

ASTM D1149 (2007; R 2012) Standard Test Method for Rubber Deterioration - Surface Ozone Cracking in a Chamber

ASTM D226/D226M (2009) Standard Specification for Asphalt-Saturated Organic Felt Used in

## Roofing and Waterproofing

**ASTM D412** (2006a; R 2013) Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension

**ASTM D624** (2000; R 2012) Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

## GYPSUM ASSOCIATION (GA)

**GA 214** (2010) Recommended Levels of Gypsum Board Finish

**GA 216** (2010) Application and Finishing of Gypsum Panel Products

**GA 253** (2012) Application of Gypsum Sheathing

## U.S. GREEN BUILDING COUNCIL (USGBC)

**LEED NC** (2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System

## UNDERWRITERS LABORATORIES (UL)

**UL Fire Resistance** (2012) Fire Resistance Directory

## 1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

**SD-03 Product Data**

Cementitious backer units "G"

Glass Mat Water-Resistant Gypsum Tile Backing Board "G"

Water-Resistant Gypsum Backing Board "G"

Glass Mat Covered or Reinforced Gypsum Sheathing "G"

Glass Mat Covered or Reinforced Gypsum Sheathing Sealant "G"

**Accessories**

Submit for each type of gypsum board and for cementitious backer units.

Gypsum Board; (**LEED NC**)

Submit documentation indicating percentage of post-industrial and post-consumer recycled content per unit of product. Indicate relative dollar value of recycled content products to total dollar

value of products included in project.

Adhesives; (LEED NC)  
Joint Treatment Materials

Submit manufacturer's product data, indicating VOC content.

Local/Regional Materials; (LEED NC)

Documentation indicating distance between manufacturing facility and the project site. Indicate distance of raw material origin from the project site. Indicate relative dollar value of local/regional materials to total dollar value of products included in project.

Environmental Data

#### SD-07 Certificates

Asbestos Free Materials; G

Certify that gypsum board types, gypsum backing board types, cementitious backer units, and joint treating materials do not contain asbestos.

#### SD-08 Manufacturer's Instructions

Material Safety Data Sheets

#### SD-10 Operation and Maintenance Data

Manufacturer maintenance instructions

Waste Management

#### SD-11 Closeout Submittals

Local/Regional Materials; (LEED)

LEED documentation relative to local/regional materials credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

Gypsum Board; (LEED)

LEED documentation relative to recycled content credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

Adhesives; (LEED)

LEED documentation relative to low emitting materials credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

### 1.3 DELIVERY, STORAGE, AND HANDLING

#### 1.3.1 Delivery

Deliver materials in the original packages, containers, or bundles with each bearing the brand name, applicable standard designation, and name of manufacturer, or supplier.

#### 1.3.2 Storage

Keep materials dry by storing inside a sheltered building. Where necessary to store gypsum board and cementitious backer units outside, store off the ground, properly supported on a level platform, and protected from direct exposure to rain, snow, sunlight, and other extreme weather conditions. Provide adequate ventilation to prevent condensation. Store per manufacturer's recommendations for allowable temperature and humidity range. Gypsum wallboard shall not be stored with materials which have high emissions of volatile organic compounds (VOCs) or other contaminants. Do not store panels near materials that may offgas or emit harmful fumes, such as kerosene heaters, fresh paint, or adhesives.

#### 1.3.3 Handling

Neatly stack gypsum board and cementitious backer units flat to prevent sagging or damage to the edges, ends, and surfaces.

### 1.4 ENVIRONMENTAL CONDITIONS

#### 1.4.1 Temperature

Maintain a uniform temperature of not less than 50 degrees F in the structure for at least 48 hours prior to, during, and following the application of gypsum board, cementitious backer units, and joint treatment materials, or the bonding of adhesives.

#### 1.4.2 Exposure to Weather

Protect gypsum board and cementitious backer unit products from direct exposure to rain, snow, sunlight, and other extreme weather conditions.

#### 1.4.3 Temporary Ventilation

Provide temporary ventilation for work of this section.

### 1.5 SUSTAINABLE DESIGN REQUIREMENTS

#### 1.5.1 Local/Regional Materials

Use materials or products extracted, harvested, or recovered, as well as manufactured, within a 500 mile radius from the project site, if available from a minimum of three sources. See Section 01 33 29 SUSTAINABLE REQUIREMENTS for cumulative total local material requirements. Gypsum board materials may be locally available.

### 1.6 QUALIFICATIONS

Furnish type of gypsum board work specialized by the installer with a minimum of 3 years of documented successful experience.

## 1.7 SCHEDULING

The gypsum wallboard shall be taped, spackled and primed before the installation of the highly-emitting materials.

## PART 2 PRODUCTS

### 2.1 MATERIALS

Conform to specifications, standards and requirements specified. Provide gypsum board types, gypsum backing board types, cementitious backing units, and joint treating materials manufactured from [asbestos free materials](#) only.

[Submit Material Safety Data Sheets and manufacturer maintenance instructions for gypsum materials including adhesives.](#)

#### 2.1.1 Gypsum Board

[ASTM C1396/C1396M](#). Gypsum board shall contain a minimum of 10 percent post-consumer recycled content, or a minimum of 40 percent post-industrial recycled content. Paper facings shall contain 100 percent post-consumer recycled paper content. Gypsum cores shall contain a minimum of 95 percent post-industrial recycled gypsum content. See Section [01 33 29 SUSTAINABLE REQUIREMENTS](#) for cumulative total recycled content requirements. Gypsum board may contain post-consumer or post-industrial recycled content.

##### 2.1.1.1 Regular

[48 inch wide, 5/8 inch thick, tapered edges.](#) Provide tapered and featured edge gypsum board in Room [ISMT 101 west wall of the Applied Instruction Bldg.](#) .

##### 2.1.1.2 Type X (Special Fire-Resistant)

[48 inch wide, 5/8 inch thick, tapered edges.](#)

#### 2.1.2 Gypsum Backing Board

[ASTM C1396/C1396M](#), gypsum backing board shall be used as a base in a multilayer system.

##### 2.1.2.1 Regular

[48 inch wide, 5/8 inch thick, square edges.](#)

##### 2.1.2.2 Type X (Special Fire-Resistant)

[48 inch wide, 5/8 inch thick, square edges.](#)

#### 2.1.3 Regular [Water-Resistant Gypsum Backing Board](#)

[ASTM C1396/C1396M](#)

##### 2.1.3.1 Regular

[48 inch wide, 5/8 inch thick, tapered edges.](#)

#### 2.1.3.2 Type X (Special Fire-Resistant)

48 inch wide, 5/8 inch thick, tapered edges.

#### 2.1.4 Glass Mat Water-Resistant Gypsum Tile Backing Board

ASTM C1178/C1178M

##### 2.1.4.1 Regular

48 inch wide, 5/8 inch thick, square edges.

##### 2.1.4.2 Type X (Special Fire-Resistant)

48 inch wide, 5/8 inch thick, square edges.

#### 2.1.5 Glass Mat Covered or Reinforced Gypsum Sheathing

Exceeds physical properties of ASTM C1396/C1396M and ASTM C1177/C1177M. Provide 1/2 inch, gypsum sheathing. Provide gypsum board of with a noncombustible water-resistant core, with glass mat surfaces embedded to the gypsum core or reinforcing embedded throughout the gypsum core. Warrant gypsum sheathing board for at least twelve months against delamination due to direct weather exposure. Provide continuous, asphalt impregnated, building felt to cover exterior face of sheathing. Seal all joints, seams, and penetrations with compatible sealant.

##### 2.1.5.1 Glass Mat Covered or Reinforced Gypsum Sheathing Sealant

Provide sealant compatible with gypsum sheathing, rubber washers for masonry veneer anchors, and other associated cavity wall components such as anchors and through wall flashing. Provide sealants for gypsum sheathing board edge seams and veneer anchor penetrations recommended by the gypsum sheathing manufacturer and have the following performance requirements:

- a. ASTM D412: Tensile Strength, 80 psi
- b. ASTM D412: Ultimate Tensile Strength (maximum elongation), 170 psi
- c. ASTM D624: Tear Strength, dieB, 27 ppi
- d. ASTM D1149: Joint Movement Capability after 14 Days cure, plus or minus 50 percent.

##### 2.1.6 Cementitious Backer Units

In accordance with the Tile Council of America (TCA) Handbook.

##### 2.1.7 Joint Treatment Materials

ASTM C475/C475M. Use all purpose joint and texturing compound containing inert fillers and natural binders, including lime compound. Pre-mixed compounds shall be free of antifreeze, vinyl adhesives, preservatives, biocides and other slow releasing compounds.

##### 2.1.7.1 Embedding Compound

Specifically formulated and manufactured for use in embedding tape at gypsum board joints and compatible with tape, substrate and fasteners.

#### 2.1.7.2 Finishing or Topping Compound

Specifically formulated and manufactured for use as a finishing compound.

#### 2.1.7.3 All-Purpose Compound

Specifically formulated and manufactured to serve as both a taping and a finishing compound and compatible with tape, substrate and fasteners.

#### 2.1.7.4 Setting or Hardening Type Compound

Specifically formulated and manufactured for use with fiber glass mesh tape.

#### 2.1.7.5 Joint Tape

Use cross-laminated, tapered edge, reinforced paper, or fiber glass mesh tape recommended by the manufacturer.

#### 2.1.8 Fasteners

##### 2.1.8.1 Screws

ASTM C1002, Type "G", Type "S" or Type "W" steel drill screws for fastening gypsum board to gypsum board, wood framing members and steel framing members less than 0.033 inch thick. ASTM C954 steel drill screws for fastening gypsum board to steel framing members 0.033 to 0.112 inch thick. Provide cementitious backer unit screws with a polymer coating.

##### 2.1.9 Adhesives

Do not use adhesive containing benzene, carbon tetrachloride, or trichloroethylene. Adhesive shall contain a maximum VOC content of 50 grams per liter. Adhesive must meet the requirements of LEED low emitting materials credit.

##### 2.1.10 Accessories

ASTM C1047. Fabricate from corrosion protected steel or plastic designed for intended use. Accessories manufactured with paper flanges are not acceptable. Flanges shall be free of dirt, grease, and other materials that may adversely affect bond of joint treatment. Provide prefinished or job decorated materials.

##### 2.1.11 Asphalt Impregnated Building Felt

Provide a 15 lb asphalt moisture barrier over gypsum sheathing. Conforming to ASTM D226/D226M Type 1 (No. 15) for asphalt impregnated building felt.

##### 2.1.12 Water

Provide clean, fresh, and potable water.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

##### 3.1.1 Framing and Furring

Verify that framing and furring are securely attached and of sizes and

spacing to provide a suitable substrate to receive gypsum board and cementitious backer units. Verify that all blocking, headers and supports are in place to support plumbing fixtures and to receive soap dishes, grab bars, towel racks, and similar items. Do not proceed with work until framing and furring are acceptable for application of gypsum board and cementitious backer units.

### 3.1.2 Gypsum Board and Framing

Verify that surfaces of gypsum board and framing to be bonded with an adhesive are free of dust, dirt, grease, and any other foreign matter. Do not proceed with work until surfaces are acceptable for application of gypsum board with adhesive.

### 3.1.3 Masonry and Concrete Walls

Verify that surfaces of masonry and concrete walls to receive gypsum board applied with adhesive are dry, free of dust, oil, form release agents, protrusions and voids, and any other foreign matter. Do not proceed with work until surfaces are acceptable for application of gypsum board with adhesive.

## 3.2 APPLICATION OF GYPSUM BOARD

Apply gypsum board to framing and furring members in accordance with [ASTM C840](#) or [GA 216](#) and the requirements specified. Apply gypsum board with separate panels in moderate contact; do not force in place. Stagger end joints of adjoining panels. Neatly fit abutting end and edge joints. Use gypsum board of maximum practical length; select panel sizes to minimize waste. Cut out gypsum board to make neat, close, and tight joints around openings. In vertical application of gypsum board, provide panels in lengths required to reach full height of vertical surfaces in one continuous piece. Lay out panels to minimize waste; reuse cutoffs whenever feasible. Surfaces of gypsum board and substrate members may not be bonded together with an adhesive, except where prohibited by fire rating(s). Treat edges of cutouts for plumbing pipes, screwheads, and joints with water-resistant compound as recommended by the gypsum board manufacturer. [Minimize framing by floating corners with single studs and drywall clips.](#) [Install 1/2 inch ceiling board over framing at 24 inches on center.](#) Provide type of gypsum board for use in each system specified herein as indicated.

### 3.2.1 Adhesive Application to Interior Masonry or Concrete Walls

Apply in accordance with [ASTM C840](#), System VI or [GA 216](#).

### 3.2.2 Application of Gypsum Board to Steel Framing and Furring

Apply in accordance with [ASTM C840](#), System VIII or [GA 216](#).

### 3.2.3 Arches and Bending Radii

Apply gypsum board in accordance with [ASTM C840](#), System IX or [GA 216](#).

### 3.2.4 Gypsum Board for Wall Tile or Tile Base Applied with Adhesive

In dry areas (areas other than tubs, shower enclosures, saunas, steam rooms, gang shower rooms), apply glass mat water-resistant gypsum tile backing board [or water-resistant gypsum backing board] in accordance with

ASTM C840, System X or GA 216.

### 3.2.5 Exterior Application

Apply exterior gypsum board (such as at soffits) in accordance with ASTM C840, System XI or GA 216.

### 3.2.6 Glass Mat Covered or Fiber Reinforced Gypsum Sheathing

Apply gypsum sheathing in accordance to gypsum association publications GA 253. Follow gypsum sheathing manufacturer's requirements of design details for joints and fasteners and be properly installed to protect the substrate from moisture intrusion. Do not leave exposed surfaces of the gypsum sheathing beyond the manufacturer's recommendation without a weather barrier cladding. Provide continuous asphalt impregnated building felt over sheathing surface in shingle fashion with edges and ends lapped a minimum of 6 inch. Property flash the openings. Seal all joints, seams, and penetrations with a compatible silicone sealant.

### 3.2.7 Floating Interior Angles

Minimize framing by floating corners with single studs and drywall clips. Locate the attachment fasteners adjacent to ceiling and wall intersections in accordance with ASTM C840, System XII or GA 216, for single-ply applications of gypsum board to wood framing.

### 3.2.8 Control Joints

Install expansion and contraction joints in ceilings and walls in accordance with ASTM C840, System XIII or GA 216. Fill control joints between studs in fire-rated construction with firesafing insulation to match the fire-rating of construction.

## 3.3 APPLICATION OF CEMENTITIOUS BACKER UNITS

### 3.3.1 Application

In wet areas (tubs, shower enclosures, saunas, steam rooms, gang shower rooms), apply cementitious backer units in accordance with ANSI A108.11. Place a 15 lb asphalt impregnated, continuous felt paper membrane behind cementitious backer units, between backer units and studs or base layer of gypsum board. Place membrane with a minimum 6 inch overlap of sheets laid shingle style.

### 3.3.2 Joint Treatment

ANSI A108.11.

## 3.4 FINISHING OF GYPSUM BOARD

Tape and finish gypsum board in accordance with ASTM C840, GA 214 and GA 216. Finish plenum areas above ceilings to Level 1 in accordance with GA 214. Finish water resistant gypsum backing board, ASTM C1396/C1396M, to receive ceramic tile to Level 2 in accordance with GA 214. Finish walls and ceilings to receive a heavy-grade wall covering or heave textured finish before painting to Level 3 in accordance with GA 214. Finish walls and ceilings without critical lighting to receive flat paints, light textures, or wall coverings to Level 4 in accordance with GA 214. Unless otherwise specified, finish all gypsum board walls, partitions and ceilings to Level

5 in accordance with GA 214. Provide joint, fastener depression, and corner treatment. Tool joints as smoothly as possible to minimize sanding and dust. Do not use fiber glass mesh tape with conventional drying type joint compounds; use setting or hardening type compounds only. Provide treatment for water-resistant gypsum board as recommended by the gypsum board manufacturer. Protect workers, building occupants, and HVAC systems from gypsum dust.

#### 3.4.1 Uniform Surface

Wherever gypsum board is to receive eggshell, semigloss or gloss paint finish, or where severe, up or down lighting conditions occur, finish gypsum wall surface in accordance to GA 214 Level 5. In accordance with GA 214 Level 5, apply a thin skim coat of joint compound to the entire gypsum board surface, after the two-coat joint and fastener treatment is complete and dry.

#### 3.5 SEALING

Seal openings around pipes, fixtures, and other items projecting through gypsum board and cementitious backer units as specified in Section 07 92 00 JOINT SEALANTS Apply material with exposed surface flush with gypsum board or cementitious backer units.

##### 3.5.1 Sealing for Glass Mat or Reinforced Gypsum Board Sheathing

Apply silicone sealant in a 3/8 inch bead to all joints and trowel flat. Apply enough of the same sealant to all fasteners penetrating through the glass mat gypsum board surface to completely cover the penetration when troweled flat. Do not place construction and materials behind sheathing until a visual inspection of sealed joints during daylight hours has been completed by Contracting Officer.

#### 3.6 FIRE-RESISTANT ASSEMBLIES

Wherever fire-rated construction is indicated, provide materials and application methods, including types and spacing of fasteners, wall and ceiling framing in accordance with the specifications contained in UL Fire Resistance. Joints of fire-rated gypsum board enclosures shall be closed and sealed in accordance with UL test requirements or GA requirements. Seal penetrations through rated partitions and ceilings tight in accordance with tested systems.

#### 3.7 PATCHING

Patch surface defects in gypsum board to a smooth, uniform appearance, ready to receive finishes.

#### 3.8 WASTE MANAGEMENT

As specified in Waste Management Plan and as follows. Separate clean waste gypsum products from contaminants. Do not include wood, plastic, metal, asphalt-impregnated gypsum board, or any gypsum board coated with glass fiber, vinyl, decorative paper, or other finish. Place in designated area and protect from moisture and contamination. Coordinate with Section 32 05 33 LANDSCAPE ESTABLISHMENT to identify requirements for gypsum soil amendment and to prepare scrap gypsum board for use as soil amendment.

Identify manufacturer's policy for collection or return of remaining construction scrap, unused material, and packaging material. Institute demolition and construction recycling to take advantage of manufacturer's programs. When such a service is not available, seek local recyclers to reclaim the materials.]

-- End of Section --



## SECTION 09 69 13

RIGID GRID ACCESS FLOORING  
11/10

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

## AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

AATCC 134 (2011; E 2013) Electrostatic Propensity of Carpets

AATCC 16 (2004; E 2010) Colorfastness to Light

## APA - THE ENGINEERED WOOD ASSOCIATION (APA)

APA E30 (2011) Engineered Wood Construction Guide

APA L870 (2010) Voluntary Product Standard, PS 1-09, Structural Plywood

## ASTM INTERNATIONAL (ASTM)

ASTM A780/A780M (2009) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings

ASTM E648 (2010; E 2011) Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source

ASTM E84 (2013a) Standard Test Method for Surface Burning Characteristics of Building Materials

## CEILINGS &amp; INTERIOR SYSTEMS CONSTRUCTION ASSOCIATION (CISCA)

CISCA Access Floors (2007) Recommended Test Procedures for Access Floors

## COMPOSITE PANEL ASSOCIATION (CPA)

CPA A208.1 (2009) Particleboard

CPA A208.2 (2009) Medium Density Fiberboard (MDF) for Interior Applications

## ICC EVALUATION SERVICE, INC. (ICC-ES)

ICC-ES AC300 (2010) Acceptance Criteria for Access Floors

INTERNATIONAL CODE COUNCIL (ICC)

ICC IBC (2012) International Building Code

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 99 (2012; TIA 11-1; TIA 11-2; Errata 12-1; TIA 12-3; TIA 13-4; TIA 13-5) Health Care Facilities Code

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS TT-C-490 (Rev F; Am 1) Cleaning Methods for Ferrous Surfaces and Pretreatments for Organic Coatings

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC (2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System

## 1.2 SYSTEM DESCRIPTION

Install access flooring at the location and elevation and in the arrangement shown on the drawings. The floor system shall be of the rigid grid stringer type, complete with all supplemental items, and be the standard product of a manufacturer specializing in the manufacture of access flooring systems.

- a. Provide for self-alignment of floor panels, adjustable pedestals and readily removable floor panels covered as specified.
- b. Lateral stability of floor support system shall be independent of panels. Provide a finished assembly that is rigid and free of vibration, noises, and rocking panels. Provide bolted stringer system with equipotential plane grounding.
- c. Submit Certificates for the complete [Access Flooring System](#) including, but not limited to the following:
  - (1) [Compliance with ICC-ES AC300](#). Submit design data substantiating compliance with International Building Code Acceptance Criteria for Access Floors.
  - (2) Load-bearing capabilities of pedestals, floor panels, and pedestal adhesive resisting force.
  - (3) Supporting independent laboratory test reports. For panel loads, test results include concentrated loads at center of panel, panel edge midpoint, ultimate loads and uniform loads.
  - (4) Floor electrical characteristics.
  - (5) Material requirements
  - (6) An elevated floor system free of defects in materials, fabrication, finish, and installation, that will remain so for a

period of not less than five years after completion.

- d. Warrant that, upon notification by the Government, defective work will be immediately replaced with new work at no additional cost to the Government.
- e. Submit manufacturer's descriptive data, catalog cuts, and installation instructions. Include in the data information about any design and production techniques, total system including all accessories and finish coatings of under-floor components, procedures and policies used to conserve energy, reduce material, improve waste management or incorporate green building/recycled products into the manufacturer of their components or products. Include cleaning and maintenance instructions. Systems which contain zinc electroplated anti-corrosion coatings are prohibited.

#### 1.2.1 Allowable Tolerances

##### 1.2.1.1 Floor Panel Flatness

Plus or minus 0.02 inches on diagonal on top of panel or underneath edge

##### 1.2.1.2 Floor Panel Length

Plus or minus 0.015 inch

##### 1.2.1.3 Floor Panel Squareness

Plus or minus 0.02 inch in panel length

##### 1.2.1.4 Finish Floor

Level within plus or minus 0.062 inch in 10 feet, and plus or minus 0.10 inch for entire floor

#### 1.2.2 Floor Panels

Conduct floor panel testing in accordance with CISCA Access Floors. When tested as specified, make all deflection and deformation measurements at the point of load application on the top surface of the panel. Floor panels shall be capable of supporting the following loads:

- a. Concentrated load of 1250 pounds on one square inch, at any point on panel, without a top-surface deflection more than 0.10 inch, and a permanent set not to exceed 0.01 inch in any of the specified tests.
- b. Uniform live load of 300 psf, without a top-surface deflection more than 0.06 inch, and a permanent set not to exceed 0.01 inch in any of the specified tests.
- c. A rolling load of 1000 pounds applied through hard rubber surfaced wheel 6 inch diameter by 2 inch wide for 10,000 cycles over the same path. Permanent set at conclusion of test shall not exceed 0.040 inch.
- d. A rolling load of 1250 pounds applied through a 3 inch diameter by 1-13/16 inch wide caster for 10 cycles over the same path, without developing a local overall surface deformation greater than 0.04 inch. In accordance with CISCA Access Floors, the permanent deformation limit under rolling load shall be satisfied in all of the specified tests.

- e. An impact load of 150 pounds anywhere on the panel dropped from a height of 36 inches onto a 1 square inch area without failure of the system, according to CISCA Access Floors, Section 8 Drop Impact Load Test.
- f. Ultimate Concentrated Load. Panels shall provide a safety factor of 3 times the specified concentrated load indicated above, when tested in accordance with CISCA Access Floors, Section 2 Ultimate Loading.

#### 1.2.3 Stringers

Provide stringers capable of supporting a 250 pound concentrated load at midspan without permanent deformation in excess of 0.010 inch.

#### 1.2.4 Pedestals

Pedestals shall be capable of supporting a 5000 pound axial load without permanent deformation.

#### 1.2.5 Bonding Strength of Pedestal Adhesive

Adhesive for anchoring pedestal bases shall have a bonding strength capable of resisting an overturning moment of 1,000 lbf-in when a force is applied to the top of the pedestal in any direction.

#### 1.2.6 Bond Strength of Factory Installed Covering

Bond strength of floor covering shall be sufficient to permit handling of the panels by use of the panel lifting device, and to withstand moving caster loads up to 1000 pounds, without separation of the covering from the panel.

#### 1.2.7 Seismic Calculations

##### 1.2.7.1 Navy Requirements

Submit seismic calculations for lateral bracing, sealed by a Professional Engineer. Document that access flooring system complies with seismic requirements of ICC IBC and ICC-ES AC300 in accordance with the seismic design criteria indicated on the structural drawings, sheet S001 B.

#### 1.2.8 Grounding

Ground the access flooring system for safety hazard and static suppression. Provide positive contact between components for safe, continuous electrical grounding of entire floor system. Total system resistance from wearing surface of floor to building grounding electrode shall be within range of 0.5 to 20,000 megohms.

##### 1.2.8.1 Metal Grilles

Exposed metal is not allowed at wearing surface of access floor system, except at metal grilles and registers. When grilles and metal registers are provided, insulate as required to provide same grounding resistance as wearing surface.

1.2.8.2 Joint Resistance

Electrical joint resistance between individual stringer and pedestal junctions shall be less than 0.1 milliohms. Electrical resistance between stringers and floor panels, as mounted in normal use, shall be less than 3 ohms.

1.3 SUSTAINABILITY REQUIREMENTS

Materials in this technical specification may contribute towards contract compliance with sustainability requirements.

1.3.1 LEED REQUIREMENTS

See Section 01 33 29 SUSTAINABLE DOCUMENTATION for project LEED NC local/regional materials, low-emitting materials, recycled content, and certified wood, requirements.

1.3.2 EPA Comprehensive Procurement Guidelines

See Section 01 62 35 RECYCLED/RECOVERED/BIOBASED MATERIALS for requirements associated with EPA designated products.

1.3.3 USDA Biobased

See Section 01 62 35 RECYCLED/RECOVERED/BIOBASED MATERIALS for requirements associated with USDA Biobased designated products.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Detailed Installation Drawings; G

SD-03 Product Data

Access Flooring System; G

SD-04 Samples

Finish Flooring

SD-05 Design Data

Compliance with ICC-ES AC308  
Seismic Calculations

SD-06 Test Reports

Factory Tests  
Electrical Resistance

## Field Tests

### SD-07 Certificates

### Access Flooring System

### SD-11 Closeout Submittals

### Sustainable Documentation

## 1.5 QUALITY ASSURANCE

Submit drawings showing location, details at floor perimeter, method of anchorage to structural subfloor, grounding, description of factory coating, installation height above structural floor, stairs, ramps, accessories and other details as specified. Take measurements from finished areas at site and submit [Detailed Installation Drawings](#) indicating:

- a. Location of panels
- b. Layout of supports, panels, and cutout locations
- c. Stair, handrail, and ramp framing
- d. Sizes and details of components
- e. Lateral bracing
- f. Typical cutout details
- g. Gasketing, return air grilles, supply air registers, and perforated panels. Include air transfer capacity of grilles, registers and panels
- h. Floor finishes
- i. Location of connection to building grounding electrode

## 1.6 DELIVERY, STORAGE, AND HANDLING

### 1.6.1 Delivery

Deliver materials to site in undamaged condition, in original containers or packages, complete with [accessories](#) and instructions. Label packages with manufacturer's name and brand designations. Package materials covered by specific references bearing specification number, type and class as applicable.

### 1.6.2 Storage

Store all materials in original protective packaging in a safe, dry, and clean location. Store panels at temperatures between **40 and 90 degrees F**, and between 20 and 70 percent humidity. Replace defective or damaged materials.

### 1.6.3 Handling

Materials shall be handled and protected in a manner to prevent damage during the entire construction period.

## 1.7 EXTRA MATERIALS

Provide six floor panels complete with specified floor covering for future use.

Submit four separate samples of the specified finish flooring.

## PART 2 PRODUCTS

## 2.1 FLOOR PANELS

## 2.1.1 Floor System Drawings And Planer Quality

- a. Submit Fabrication Drawings for elevated floor systems consisting of fabrication and assembly details to be performed in the factory.
- b. Indicate on Location Drawings exact location of pedestals, ventilation openings, cable cutouts, and the panel installation pattern.
- c. Provide Detail Drawings showing details of the pedestals, pedestal-floor interlocks, floor panels, panel edging, floor openings, floor opening edging, floor registers, floor grilles, cable cutout treatment, perimeter base, expansion joints, and peripheral support facilities.
- d. Design and workmanship of the floor, as installed, shall be completely planar within plus or minus 0.060 inch in 10 feet, 0.100 inch for the entire floor, and 0.030 inch across panel joints.
- e. Floor-panel joint-width tolerances shall be 0.017 inch as measured with a feeler gage at any point in any joint when the panels are in the pressure contact required in final installation and as long as the air leakage requirements above are met.

## 2.1.2 Panel Construction

- a. Base access floor system on a 24 by 24 inch square module providing minimum of 6 inch clearance between structural floor and bottom of finished floor. Fabricate so accurate job cutting and fitting may be done using standard sizes for perimeters and around columns.
- b. Do not expose metal on finished top surface of panels. Provide cutouts and cutout closures to accommodate utility systems and equipment intercabling. Reinforce cutouts to meet design load requirements. Provide extra support pedestals at each corner of cutout for cutout panels that do not meet specified design load requirements.
- c. Panel design shall provide for convenient panel removal for underfloor servicing and for openings for new equipment. Use panels of uniform dimensions within specified tolerances. Permanently mark panels to indicate load rating and model number.
- d. Machine square floor panels to within plus or minus 0.005 inch with edge straightness plus or minus 0.0025 inch. Tolerances apply to the panel before the plastic edging is applied.

## 2.1.2.1 Metal-Clad Wood Core

Provide wood core panels with cores of wood particleboard conforming to

CPA A208.1, Grade 1-M-3, or of plywood conforming to CPA A208.2, APA E30, and APA L870, EXT-DFPA-C-C. The core shall be not less than 1 inch thick, and be faced on both sides with structurally bonded zinc-coated steel sheets not lighter than 24 gauge. All edges and corners shall be sealed with zinc-coated steel or extruded aluminum. The completed panels shall have a flame spread rating of 25 or less when tested in accordance with ASTM E84. Provide zinc-coated steel, extruded aluminum, fire resistant vinyl, or other fire resistant edging to protect shop and field edge cuts and cutouts through the face of panels in a manner to meet specified flame spread requirements.

### 2.1.3 Floor Covering

Surface floor panels with materials firmly bonded in place with waterproof adhesive. The electrical resistance shall remain stable over the life expectancy of the floor covering. Any anti-static agent used in the manufacturing process shall be an integral part of the material, not surface applied. Bolt heads or similar attachments shall not rise above the traffic surface.

#### 2.1.3.1 Carpet

Carpet surfacing shall be field installed using one full carpet square per panel. Carpet shall be nylon filament, loop pile, minimum 24 ounce/square yard, minimum density 4000, and without cushion. Conform color fastness to AATCC 16. Carpet shall conform to ASTM E648 with a minimum average critical radiant flux of 0.25 watts per square centimeter. Static control shall be less than 2.0 kV at 20 percent relative humidity at 70 degrees F, when tested in accordance with AATCC 134. Provide vinyl edge trim to prevent unraveling.

#### 2.1.4 Edge Strip

Edge panels with extruded vinyl edge strips secured in place with mechanical interlock or adhesive bond, or use replaceable type. Top of strip shall be approximately 1/8 inch wide, and flush with the floor surfacing. Metal edge strips exposed at finish floor surface will be rejected.

#### 2.1.5 Accessories

Provide the manufacturer's standard registers, grilles, perforated panels, and plenum dividers type where indicated. Provide registers, grilles, and perforated panels designed to support the same static loads as floor panels without structural failure, and capable of delivering the air volumes indicated. Registers and perforated panels shall be 25 percent open area and equipped with adjustable dampers.

#### 2.1.6 Resilient Base

Base shall be rubbercovered style, 4 inches high and a minimum 1/8 inch thick. Furnish preformed offsite corners.

#### 2.1.7 Lifting Device

Provide each individual room with one floor panel lifting device standard with the floor manufacturer. Furnish a minimum of two devices.

## 2.2 PANEL SUPPORT SYSTEM

Design support system to allow for 360 degree clearance in laying out cable and cutouts for service to machines and so that panel and stringer together take up maximum of 2 inches.

### 2.2.1 Pedestals

Provide pedestals made of steel or aluminum or a combination thereof. Ferrous materials shall have a factory-applied corrosion-resistant finish. Provide pedestal base plates with a minimum of 16 square inches of bearing surface and a minimum of 1/8 inch thickness. Pedestal shafts shall be threaded to permit height adjustment within a range of approximately 2 inches, to permit overall floor adjustment within plus or minus 0.10 inch of the required elevation, and to permit leveling of the finished floor surface within 0.062 inch in 10 feet in all directions. Provide locking devices to positively lock the final pedestal vertical adjustments in place. Pedestal caps shall interlock with stringers to preclude tilting or rocking of the panels.

### 2.2.2 Stringers

Provide stringers of rolled steel or extruded aluminum, to interlock with the pedestal heads to prevent lateral movement. Provide stringers that can be added or removed after floor is in place.

## 2.3 FASCIA

Provide aluminum or steel fascia plates at open ends of floor, at sides of ramps and steps, and elsewhere as required to enclose the free area under the raised floor. Steel plates shall have a factory applied baked enamel finish. Finish on aluminum plates shall be standard with the floor system manufacturer. Fascia plates shall be reinforced on the back, and supported using the manufacturer's standard lateral bracing at maximum 4 feet on center. Provide trim, angles, and fasteners as required.

## 2.4 STEPS

Securely fasten steps and ramps to the access flooring system and to the structural floor. Include in the construction standard floor system components and custom components as required, and all supports, fasteners, and trim necessary for a finished installation. Step nosings, threshold strips, and floor bevel strips shall be cast or extruded aluminum with non-slip traffic surfaces. Submit certificate of compliance attesting that the installed access floor system meets specification requirements, including all special equipment loads and specific electrical and or cable requirements.

### 2.4.1 Steps

Height of risers shall not exceed 7 inches. Design steps to support a uniform load of 150 psf. Surface treads with the manufacturer's standard non-slip floor finish.

## 2.5 RAILINGS

Provide hand railings of the single rail, fabricated of at least 1 inch round seamless aluminum tubing with a satin natural anodized finish. At steps and ramps, make the top rail a minimum of 36 inches high and parallel to the incline. Make the top rail 42 inches high at open ends of the

floor. Guardrails shall have intermediate rails or an ornamental pattern such that a sphere 4 inches in diameter cannot pass through. Provide railings complete with anchorages, floor plates, and end caps.

## 2.6 FACTORY TESTS

Factory test access flooring, using an independent laboratory, at the same position and maximum design elevation and in the same arrangement as shown on the drawings for installation so as to duplicate service conditions as much as possible.

### 2.6.1 Load Tests

Conduct floor panel, stringer, and pedestal testing in accordance with CISCA Access Floors.

### 2.6.2 Bond Strength of Covering

Support The test panel on pedestals and stringers as specified for the installed floor. Brace the supports as necessary to prevent sideways movement during the test. Impose a test load of 1000 pounds on the test assembly through a hard plastic caster 3 inches in diameter and 1 inch wide. Roll the caster completely across the center of the panel. The panel shall withstand 20 passes of the caster with no delamination or separation of the covering.

## 2.7 COLOR

Color shall be as indicated on the drawings. Color listed is not intended to limit the selection of equal colors from other manufacturers.

## 2.8 CUT OUTS

Provide cable cutouts finished with rigid polyvinylchloride or molded polypropylene edging to conform to the appearance level of the floor surface and to cover raw edges of the cutout panel. Extrusion shall be of a configuration to permit its effective and convenient use when new cable openings are required. Provide at least 24 feet of additional extrusion for future use.

- a. Provide non-metallic adapter for openings less than 4 inches wide. Secure adapter adhesively in cutout to preclude removal from panel. Provide at least two adapters per 1000 square feet for future use.
- b. Openings larger than 4 inches wide shall use rigid polyvinylchloride or molded polypropylene edging. Perform cutting of panels, including cutouts, outside of the building.
- c. When size of cutout reduces the performance requirement of panel, provide intermediate stringers adjacent to cutouts.

## ]2.9 EDGE CLOSURE

Provide 1/16 inch aluminum closure plate and extruded aluminum nosing at exposed edge of floor. Back up the closure plates with aluminum or steel framing braced diagonally, or anchor at bottom to continuous angle.

## PART 3 EXECUTION

### 3.1 INSTALLATION

Install the floor system in accordance with the manufacturer's instructions and with the approved detail drawings. Open ends of the floor, where the floor system does not abut wall or other construction, shall have positive anchorage and rigid support. Maintain areas to receive access flooring between [60] [40] and 90 degrees F, and between 20 and 70 percent humidity for 24 hours prior to and during installation.

#### 3.1.1 Preparation for Installation

Clear of all debris the area in which the floor system is to be installed. Thoroughly clean structural floor surfaces and remove all dust. Install floor coatings, required for dust or vapor control, prior to installation of pedestals, only if the pedestal adhesive will not damage the coating. If the coating and adhesive are not compatible, apply the coating after the pedestals have been installed and the adhesive has cured.

#### 3.1.2 Pedestals

Pedestals shall be accurately spaced, and set plumb and in true alignment. Set base plates in full and firm contact with the structural floor, and secured to the structural floor with [adhesive] [steel expansion anchors].

#### 3.1.3 Stringers

Interlock stringers with the pedestal caps to preclude lateral movement, spaced uniformly in parallel lines at the indicated elevation.

#### 3.1.4 Auxiliary Framing

Provide auxiliary framing or pedestals around columns and other permanent construction, at sides of ramps, at open ends of the floor, and beneath panels that are substantially cut to accommodate utility systems. Use special framing for additional lateral support as shown on the approved detail drawings. Provide additional pedestals and stringers designed to specific heights and lengths to meet structural irregularities and design loads. Connect auxiliary framing to main framing.

#### 3.1.5 Panels

Interlock panels with supports in a manner that will preclude lateral movement. Fasten perimeter panels, cutout panels, and panels adjoining columns, stairs, and ramps to the supporting components to form a rigid boundary for the interior panels. Floors shall be level within the specified tolerances. Cut edges of steel and wood-core panels shall be finished as recommended by the panel manufacturer. Secure extruded vinyl edging in place at all cut edges of all panel cut-outs to prevent abrasion of cables.

#### 3.1.6 Resilient Base

Provide base at vertical wall intersections. Cracks and voids in walls and other vertical surfaces to receive base shall be filled with an approved filler. Apply the base after the floor system has been completely installed with adhesive, in accordance with the base manufacturer's recommendations.

### 3.1.7 Fascia Plates

Cover exposed floor ends and exposed openings of stairs with aluminum or steel closures.

### 3.1.8 Repair of Zinc Coating

Repair zinc coating that has been damaged, and cut edges of zinc-coated components and accessories, by the application of a galvanizing repair paint conforming to ASTM A780/A780M. Areas to be repaired shall be thoroughly cleaned prior to application of the paint.

## 3.2 FIELD TESTS

Submit certified copies of test reports from an approved testing laboratory, attesting that the proposed floor system components meet the performance requirements specified.

### 3.2.1 Acceptance Tests

Conduct acceptance tests after installation of floor system. Make at least one test. Conduct tests in presence of Contracting Officer and representatives of manufacturer and installer.

### 3.2.2 Electrical Resistance

Conduct testing of electrical resistance, in the completed installation, in the presence of the Contracting Officer in accordance with NFPA 99, modified by placing one electrode on the center of the panel surface and connecting the other electrode to the metal flooring support. Take measurements at five or more locations. Each measurement shall be the average of five readings of 15 seconds duration at each location. During the tests, relative humidity shall be 45 to 55 percent and temperature set at 69 to 75 degrees F. Select panels used in the testing at random and include two panels most distant from the ground connection. Measure electrical resistance with instruments that are accurate within 2 percent and that have been calibrated within 60 days prior to the performance of the resistance tests. The metal-to-metal resistance from panel to supporting pedestal shall not exceed 10 ohms. The resistance between the wearing surface of the floor covering and the ground connection, as measured on the completed installation, shall be in accordance with paragraph FLOOR COVERING.

## 3.3 CLEANING AND PROTECTION

### 3.3.1 Cleaning

Free of all debris the space below the completed floor. Before any traffic or other work on the completed raised floor is started, clean the completed floor in accordance with the floor covering manufacturer's instructions. Do not permit seepage of cleaner between individual panels. Cleaning of ferrous surfaces shall conform to FS TT-C-490.

### 3.3.2 Protection

Protect traffic areas of raised floor systems with a covering of building paper, fiberboard, or other suitable material to prevent damage to the

surface. Cover cutouts with material of sufficient strength to support the loads to be encountered. Place plywood or similar material on the floor to serve as runways for installation of heavy equipment not in excess of design load capacity. Maintain protection until the raised floor system is accepted.

### 3.3.3 Surplus Material Removal

Clean surfaces of the work, and adjacent surfaces soiled as a result of the work. Remove all installation equipment, surplus materials, and rubbish from the work site.

### 3.4 OPERATION AND MAINTENANCE MANUALS

Submit maintenance instructions for proper care of the floor panel surface. When conductive flooring is specified, also submit maintenance instructions to identify special cleaning and maintenance requirements to maintain "conductivity" properties of the panel finish.

-- End of Section --



## SECTION 10 22 26.13

## ACCORDION FOLDING PARTITIONS

08/10

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

## ASTM INTERNATIONAL (ASTM)

ASTM A653/A653M	(2013) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM B221	(2013) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM C423	(2009a) Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
ASTM D751	(2006; R 2011) Coated Fabrics
ASTM E413	(2010) Rating Sound Insulation
ASTM E557	(2012) Installation of Operable Partitions
ASTM E84	(2013a) Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM E90	(2009) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

## CHEMICAL FABRICS &amp; FILM ASSOCIATION (CFFA)

CFFA-W-101-D	(2002) Quality Standard for Vinyl Coated Fabric Wallcovering
--------------	--

## NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 101	(2012; Amendment 1 2012) Life Safety Code
NFPA 286	(2011) Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth

## UNDERWRITERS LABORATORIES (UL)

UL 10B

(2008; Reprint Apr 2009) Fire Tests of  
Door Assemblies

## 1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

## SD-01 Preconstruction Submittals

Manufacturer's Qualifications [; G] [; G, [\_\_\_\_]]

Manufacturer's Sample Warranty

Statement of Code Compliance [; G] [; G, [\_\_\_\_]]

Statement of Standards Conformity [; G] [; G, [\_\_\_\_]]

Verification of Field Measurements; G

## SD-02 Shop Drawings

Submit Fabrication Drawings for Accordion Folding Partitions consisting of fabrication and assembly details to be performed in the factory.

Submit Installation Drawings for the following items in accordance with paragraph entitled, "Installation," of this section.

Accordion Folding Partition Layouts; GSuspension System; GFinish Hardware; GJamb Panels; GAccessories; G

Submit drawings for the system that include dimensions and weight of stacked partition, layout of the work including stacking area, track and jamb fastening methods, seal details, and installation details.

## SD-03 Product Data

FrameworkSuspension systemFinish Hardware

Sound Seals and Sweepstrips

Covering

Ceiling Guard

Meeting Posts

Jamb Panels

Rolling Post

Pull-In Latch

SD-04 Samples

Covering; G

SD-06 Test Reports

Laboratory Acoustical Requirements

Acoustical test

SD-07 Certificates

Submit Certificates to the Contracting Officer for this installation clearly indicating:

Statement of Code Compliance; G

Statement of Standards Conformity; G

SD-10 Operation and Maintenance Data

Folding partitions, Data Package 1; ; G

Submit in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

SD-11 Closeout Submittals

Manufacturer's Guarantee

1.3 PRE-INSTALLATION REQUIREMENTS

1.3.1 Preconstruction Requirements

No less than 30 calendar days prior to the scheduled commencement of installation of Accordion Folding Partitions, submit the following to the Contracting Officer:

Manufacturer's Qualifications

Manufacturer's Sample Warranty

Statement of Code Compliance

Statement of Standards Conformity

Verification of Field Measurements and Existing Electrical Data

Fabrication Drawings and Installation Drawings

#### 1.3.2 Product Data

Submit the following information for review:

Finish Hardware

Jamb Panels and Accessories

Sound Seals and Sweepstrips

Ceiling Guard, Meeting Posts, Rolling Post

Pull-In Latch

#### 1.3.3 Manufacturer's Guarantee

Provide **Manufacturer's Guarantee** for partitions against defects in material and workmanship for a period of two years from date of installation. In addition, provide ten year guarantee for the pantographs, trolleys and tracks from date of acceptance for beneficial use.

#### 1.4 DELIVERY, HANDLING AND STORAGE

Deliver materials to project site in manufacturer's original, unopened, and undamaged packages with labels legible and intact. Labels must indicate the manufacturer, brand name, size, finish, and placement location. Store folding partitions and accessories in unopened packages in a manner that will prevent damage. Handle partition materials in accordance with manufacturer's instructions.

### PART 2 PRODUCTS

#### 2.1 FOLDING PARTITIONS

Provide full accordion type partitions, factory finished, supported from overhead track without floor guides, and complete with all hardware, track, and accessories necessary for operation. Provide partition framework with a mechanism that gives stability and maintains uniform spacing of partition folds in all partition positions. Provide completely concealed framework with a **recycled polyester fabric**. Provide partitions manually operated, one-way type as indicated. Provide patterns and colors of fabric **type as indicated for color selection by Government**. **Folding partition is to be equal to HUF COR 3500 Accordion Partitions.**

#### 2.2 MATERIALS

##### 2.2.1 Aluminum Extrusions

**ASTM B221**, Alloy 3003.

### 2.2.2 Steel Sheets

ASTM A653/A653M, G90 coating designation.

### 2.2.3 Fabric Covering

CFFA-W-101-D, Type III, 24 ounces/ face weight. Provide a recycled polyester staple fiber cover that does not absorb moisture and is pill resistant and solution dyed.

### 2.2.4 Seals and Sweepstrips

Provide perimeter seals of manufacturer's standard product, without crack or craze when subjected to severe usage.

### 2.2.5 Ceiling Guards

Furnish partitions with ceiling guards or integral track and ceiling guards as recommended by the manufacturer.

## 2.3 PERFORMANCE REQUIREMENTS

### 2.3.1 Fire Endurance

For partitions more than 60 square feet in area, provide fabric and lining with flame spread rating of 25 or less, fuel contribution rating of 15 or less, smoke generation of 50 or less when tested in accordance with ASTM E84. Complete assembly must also meet or surpass the requirements of NFPA 101 and UL 10B.

### 2.3.2 Laboratory Acoustical Requirements

Folding partition shall be minimum 35 STC rating. Provide certificates verifying folding partitions have been tested in accordance with ASTM C423 and ASTM E90 by a laboratory accredited by the U.S. Bureau of Standards and have attained a sound transmission class (STC) of not less than 40 in a fully extended position. Partition tested must be of the same construction, materials, and model number as the partition to be provided and be fully operable. Test specimen must be not less than 126 square feet in area. Panel weight must be 3 lbs per square ft.

## 2.4 FABRICATION

### 2.4.1 Framework

Fabricate framework, including posts, pantographs, hinges, hinge plates, and rods from either extruded aluminum or ferrous metal. Arrange frames requiring pantographs for horizontal pantograph action with pantographs located at top and bottom of the frame. Provide pantographs spaced not over 4 feet apart. Provide intermediate pantograph at center of doors less than 8 feet high unless the door has vertical metal reinforcing. The pantographs must operate smoothly with positive folding action and have a control device to prevent flattening of the folds when the panel is fully extended. Ferrous metal must be either cadmium plated or zinc coated. Posts, at the option of the door manufacturer, may have phosphate treatment and manufacturer's shop finish paint.

#### 2.4.2 Suspension System

Provide a suspension system consisting of steel or aluminum track and trolleys designed to support the weight of the partition. Provide steel track of 16 gage minimum, phosphate treated and finished, or zinc or cadmium coated. Provide extruded aluminum track with minimum thickness of 1/8 inch. Tracks may have an integral ceiling guard. Trolleys must have at least two ball bearing nylon or steel tired wheels spaced according to manufacturer's design criteria and four at an end post.

#### 2.4.3 Covering

Covering fabrics must conform to the requirements of ASTM D751 and NFPA 286.

Attach fabric to the framework with fasteners that permit easy removal of the cover but prevent sagging or separation. Position vertical seams in the bottoms of valleys and reinforce. Provide top and bottom edges of cover fabrics with 1/2 inch minimum turned hems.

#### 2.4.4 Sound Insulation

Provide sound insulation as necessary to achieve the specified sound transmission mission class, conforming to ASTM E413.

#### 2.4.5 Air Release

Provide an air release system which allows trapped air within the partition to be released during the stacking process.

#### 2.4.6 Seals

Provide perimeter seals as necessary to produce the sound transmission class specified.

#### 2.4.7 Hardware

Provide hardware of the heavy-duty type standard with the manufacturer. Provide pulls and latches for all partitions. Provide partitions with magnetic contact latches.

#### 2.4.8 Accessories

Provide ceiling guards and recessed tracks.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

##### 3.1.1 Existing Work

Check openings scheduled to receive accordion-folding partitions for correct dimensions.

Install partitions in accordance with the approved Accordion Folding Partition Layouts, manufacturer's directions, and ASTM E557. Provide structural support for the track support elements as indicated.

Submit to the Contracting Officer a certification of the following:

Statement of Code Compliance for the completed partition installation.

Statement of Standards Conformity

3.1.2 Adjustment

Adjust manually operated partitions to open and close from any position with a maximum horizontal force of 30 pounds applied to pendant pull, box or handle.

3.2 FIELD TESTS

3.2.1 Operational Test

Operate partition at least three times to demonstrate that partition is capable of being moved from the stored position to the fully extended position smoothly and quietly. Adjust partitions which do not operate properly and retest.

3.2.2 Visual Test

Conduct visual field tests for light leakage with all room lights turned on in the space on one side of the partition. Darken space on the other side of the partition. Light leakage from the lighted space to the darkened space is not acceptable. If light leakage does occur, adjust the partition to correct the problem and retest.

3.3 CLEANING

Clean any soiled parts of the partition according to manufacturer's instructions.

3.4 SUPPORT SERVICE

Equipment and component maintenance must be supported by a service organization which is reasonably convenient to the site of installation.

-- End of Section --