**UNIFIED FACILITIES GUIDE SPECIFICATIONS**

**References are in agreement with UMRL dated January 2021**
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UPHOLSTERED AUDIENCE SEATING

**08/20**

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|---|---|
| **USACE / NAVFAC / AFCEC / NASA** | **UFGS-12 61 13 (August 2020)** |
| | **----------** |
| **Preparing Activity: USACE** | **Superseding** |
| | **UFGS-12 61 13 (August 2017)** |

**UNIFIED FACILITIES GUIDE SPECIFICATIONS**

**References are in agreement with UMRL dated January 2021**
**********

SECTION 12 61 13

UPHOLSTERED AUDIENCE SEATING
**08/20**

**********
**NOTE: This guide specification covers the requirements for upholstered fixed seating.**

**Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.**

**Remove information and requirements not required in respective project, whether or not brackets are present.**

**Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).**
**********

PART 1 GENERAL

**********
**NOTE: On the drawings, show: (1) Seating layout, including row length and locations for wheelchair seating and ADA armrests as required by Architectural & Transportation Barriers Compliance Board, "ADA Title III, Americans with Disabilities Act - Buildings and Facilities"; and (2) Row and seat number identification.**

**Design must comply with all applicable fire and electrical codes, to include NFPA Life Safety Codes.**

**Coordinate aisle lighting, communication and electrical requirements with Electrical Engineer. Add requirements as appropriate for the project.**
**********

## 1.1 REFERENCES

**********

**NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.**

**Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.**

**References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.**

**********

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 FOREST FOUNDATION (AFF)

| | |
|---|---|
| ATFS STANDARDS | (2015) American Tree Farm System Standards of Sustainability 2015-2020 |

ASTM INTERNATIONAL (ASTM)

| | |
|---|---|
| ASTM A48/A48M | (2003; R 2016) Standard Specification for Gray Iron Castings |
| ASTM A513/A513M | (2020a) Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing |
| ASTM A1011/A1011M | (2018a) Standard Specification for Steel Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength |
| ASTM D4157 | (2013; R 2017) Standard Test Method for Abrasion Resistance of Textile Fabrics (Oscillatory Cylinder Method) |
| ASTM F851 | (1987; R 2020) Standard Test Method for Self-Rising Seat Mechanisms |

CALIFORNIA AIR RESOURCES BOARD (CARB)

| | |
|---|---|
| CARB Regulation | Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products |

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH (CDPH)

| | |
|---|---|
| CDPH SECTION 01350 | (2010; Version 1.1) Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers |

CSA GROUP (CSA)

| | |
|---|---|
| CSA Z809-08 | (R2013) Sustainable Forest Management |

FOREST STEWARDSHIP COUNCIL (FSC)

| | |
|---|---|
| FSC STD 01 001 | (2015) Principles and Criteria for Forest Stewardship |

HARDWOOD PLYWOOD AND VENEER ASSOCIATION (HPVA)

| | |
|---|---|
| HPVA HP-1 | (2016) American National Standard for Hardwood and Decorative Plywood |

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

| | |
|---|---|
| ANSI/NEMA LD 3 | (2005) Standard for High-Pressure Decorative Laminates |

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

| | |
|---|---|
| NFPA 101 | (2021) Life Safety Code |

PROGRAMME FOR ENDORSEMENT OF FOREST CERTIFICATION (PEFC)

| | |
|---|---|
| PEFC ST 2002:2013 | (2015) PEFC International Standard Chain of Custody of Forest Based Products Requirements |

STATE OF CALIFORNIA, DEPARTMENT OF CONSUMER AFFAIRS, BUREAU OF HOME FURNISHINGS AND THERMAL INSULATION (CTB)

| | |
|---|---|
| CTB 117-2000 | Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture |
| CTB 117-2013 | Requirements, Test Procedure and Apparatus for Smolder Resistance of Materials Used in Upholstered Furniture |

SUSTAINABLE FOREST INITIATIVE (SFI)

| | |
|---|---|
| SFI 2015-2019 | (2015) Standards, Rules for Label Use, Procedures and Guidance |

U.S. DEPARTMENT OF COMMERCE (DOC)

| | |
|---|---|
| DOC CS 191 | Commercial Standard for the Flammability of Clothing Textiles |

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

| | |
|---|---|
| 16 CFR 1610 | Standard for the Flammability of Clothing Textiles |

1.2 SUBMITTALS

**********
**NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a “G” to an item, if the submittal is sufficiently important or complex in context of the project.**

**For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.**

**The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.**

**Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.**
**********

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Detailed Drawings; G[, [_____]]

SD-03 Product Data

Seating System; G[, [_____]]

[ Recycled Content for upholstered audience seating; S

][ No added Urea-formaldehyde for Composite Wood or Agrifiber Products; S

] SD-04 Samples

Seating System; G[, [_____]]

SD-06 Test Reports

Fire Test Response Characteristics; G[, [_____]]

Double Rub Tests; G[, [_____]]

SD-07 Certificates

[ Installer's Qualifications

][ Certified Sustainably Harvested plywood; S

][ Certified Sustainably Harvested solid hardwood and wood veneer; S

] Indoor Air Quality for upholstered audience seating; S

[ Indoor Air Quality for fabrics; S

][ Indoor Air Quality for composite wood and agrifiber products; S

] SD-10 Operation and Maintenance Data

Assembly Manuals, Data Package 1; G[, [_____]]

SD-11 Closeout Submittals

Seating System, Data Package 1; G[, [_____]]

Submit Data Package 1 for upholstered audience seating in accordance with Section 01 78 23 OPERATIONS AND MAINTENANCE DATA.

1.3 CERTIFICATIONS

**********

**NOTE: Use certified sustainably harvested wood where suitable for application and cost effective. Sustainably Harvested Wood is a product which comes from a third-party Forestry Certification Program and thus carries certain characteristics: 1) Protection of biodiversity, species at risk and wildlife habitat, sustainable harvest levels, protection of water quality, and prompt regeneration (e.g., replanting and reforestation); 2) Third-party certification audits performed by accredited certification bodies; 3) Publicly available certification audit summaries; 4) Multi-stakeholder involvement in a standards development process; 5) Complaints and appeals process.**

**Verify suitability, availability within the region, cost effectiveness and adequate competition before**

**specifying these sustainably harvested wood certifications - if these conditions are verified for the project locale, include the following section. For projects pursuing LEED, delete certifications other than FSC; for all other projects allow the entire list of third party certifications.**
**********

[1.3.1 Certified Sustainably Harvested Wood

Provide wood certified as sustainably harvested by FSC STD 01 001[, ATFS STANDARDS, CSA Z809-08, SFI 2015-2019, or other third party program certified by PEFC ST 2002:2013]. Provide a letter of Certification of Sustainably Harvested Wood signed by the wood supplier. Identify certifying organization and their third party program name and indicate compliance with chain-of-custody program requirements. Submit sustainable wood certification data; identify each certified product on a line item basis. Submit copies of invoices bearing certification numbers.

]1.3.2 Indoor Air Quality Certifications
**********
**NOTE: The Government's preference is for use of products that have been certified for indoor air quality by third-party organizations such as Greenguard or SCS Global Services. However, verify there is a certified product available that is both cost effective and appropriate for the project.**

**Research has shown that manufacturer's that out-source their fabric because of customer's demands cannot obtain a third-party certification for the assembly. When out-sourcing is deemed necessary, consider requiring Indoor Air Quality for fabrics and composite wood separately. Choose paragraph entitled "Seating System Products" if out-sourcing is not identified as a problem. Choose paragraphs entitled "Fabrics" and "Low-Emitting Composite Wood or Agrifiber Products" in lieu of paragraph entitled "Seating System Products" if outsourcing is identified as an issue.**
**********

[1.3.2.1 Seating System Products

Provide products certified to meet indoor air quality requirements by UL 2818 (Greenguard) Gold, SCS Global Services Indoor Advantage Gold or provide certification or validation by other third-party program that products meet the requirements of this Section. Provide current product certification documentation from certification body.

][1.3.2.2 Fabrics

Provide products certified to meet indoor air quality requirements by UL 2818 (Greenguard) Gold, SCS Global Services Indoor Advantage Gold or provide certification or validation by other third-party program that products meet the requirements of this Section. Provide current product

certification documentation from certification body.

][1.3.2.3 Composite Wood or Agrifiber Products

For purposes of this specification, composite wood and agrifiber products include particleboard, medium density fiberboard (MDF), wheatboard, strawboard, panel substrates, and door cores. Provide current product certification documentation from certification body.

][1.3.3 Installer's Qualifications

When recommended by the manufacturer, deliver and install seating by an authorized dealer with a certified installation crew. Complete all hardwiring by a licensed electrician.

]1.4 DELIVERY, STORAGE, AND HANDLING

Deliver components to the site in unopened containers clearly labeled with the manufacturer's name and container contents. Store materials in a safe, dry, and clean, well ventilated area (100 percent outside air supply, minimum of 1.5 air changes per hour, and no recirculation), protected from damage, soiling, and moisture, and strong contaminant sources and residues, maintained at a temperature above 16 degrees C 60 degrees F for 2 days prior to installation. Do not s with materials which have high emissions of volatile organic compounds (VOC's) or other contaminants, including [_____]. Do not store seating near materials that may offgas or emit harmful fumes, such as kerosene heaters, fresh paint, or adhesives. Handle the items in a manner that will protect the materials from damage.

1.5 WARRANTY

Provide manufacturer's warranty to repair or replace defective materials and workmanship for specified warranty periods from date of final acceptance of the work as follows:

1.5.1 Warranty Periods

a. Structural: [5 years][10 years][_____]

b. Plastic, Wood and Paint Components: [3 years][_____]

[ c. Electrical Components: [5 years][_____]

][d. Operating Mechanism: [5 years][_____]

] e. Fabric: [1 year][3 years][_____]

PART 2 PRODUCTS

2.1 MATERIALS

**********

**NOTE: Use materials with recycled content where appropriate for use. Verify suitability, availability within the region, cost effectiveness and adequate competition before specifying product recycled content requirements. A resource that can be used to identify products with recycled content is the "Comprehensive Procurement Guidelines (CPG)"**

**page within the EPA's website at http://www.epa.gov. Other products with recycled content are also acceptable when meeting all requirements of this specification.**

**Research shows the product is available among US national manufacturers above the minimum recycled content shown.**

**********

[Provide Upholstered Audience Seating with a minimum of 20 percent recycled content. Provide data identifying percentage of recycled content for upholstered audience seating.]

**********

**NOTE: For manufacturers outsourcing fabrics, delete the bracketed sentence below.**

**********

[Provide certification of indoor air quality for Upholstered Audience Seating.]

## 2.2 PERFORMANCE REQUIREMENTS

### 2.2.1 Fire Test Response Characteristics

**********

**NOTE: Specify "Fabric and Padding" paragraph where required by authorities having jurisdiction.**

**********

#### 2.2.1.1 Fabric and Padding

Provide fabric that is flame and smolder ignition resistant, and self-extinguishing, Class 1 fabric according to DOC CS 191 or 16 CFR 1610, as applicable per authorities having jurisdiction, tested according to California Technical Bulletin CTB 117-2000. Provide padding that complies with California Technical Bulletin CTB 117-2000. Provide fabric and padding that comply with NFPA 101.

**********

**NOTE: Specify "Upholstery Assembly" paragraph where required by authorities having jurisdiction. This test is required in California.**

**********

[2.2.1.2 Upholstery Assembly

Comply with component-testing requirements of California Technical Bulletin CTB 117-2013.

]2.3 MATERIALS

### 2.3.1 Upholstery Fabric

**********

**NOTE: Consider the following when selecting upholstery fabric:**

**- frequency of use**
**- length of use**
**- double rub or performance testing**
**- pilling**
**- are food and drink to be allowed**

**Add information on recycled material or natural fibers as applicable for the project.**
**********

Provide fabric meeting specified fire test response characteristics which is a [plain][decorative][_____] weave, fiber content of [100 percent polypropylene][100 percent polyester][100 percent nylon][_____] treated to resist staining and soiling. Provide fabric upholstery for seating with [minimum [55,000][75,000][_____] double rub tests according to ASTM D4157.]

**********
**NOTE: Retain the bracketed sentences below when the manufacturer outsources their fabrics due to customer demands.**
**********

[Provide fabrics meeting emissions requirements of CDPH SECTION 01350 (limit requirements for either office or classroom spaces regardless of space type). Provide certification of indoor air quality for fabrics.]

2.3.2 Polyurethane Foam Padding

Provide polyurethane foam padding meeting specified fire test response characteristics which is nonhardening, non-oxidizing and has a high resistance to alkalies, oils, grease, soaps, abrasions, moisture, mildew, and tearing.

2.3.3 Sub Title

Provide plywood conforming to HPVA HP-1, made of hardwood and of crossbanded construction. Provide face veneers for exposed surfaces of Grade A hardwood, vertical grain, [maple][oak][cherry][_____] with manufacturer's standard finish. Provide unexposed veneers of sound grade hardwood or Grade A fir.

**********
**NOTE: Use certified sustainably harvested wood where suitable for application and cost effective. Verify suitability, availability with the region, cost effectiveness, and adequate competition before specifying these certifications.**
**********

[Provide certified sustainably harvested plywood.]

2.3.4 Solid Hardwood and Wood Veneer

Provide solid hardwood and wood veneer of first grade [maple][oak][cherry][_____]. Finish exposed wood with manufacturers standard finish.

**********
**NOTE: Use certified sustainably harvested wood**

**where suitable for application and cost effective. Verify suitability, availability with the region, cost effectiveness, and adequate competition before specifying these certifications.**
**********

[Provide certified sustainably harvested solid hardwood and wood veneer.]

2.3.5 Composite Wood or Agrifiber Products

For purposes of this specification, composite wood and agrifiber products include particleboard, medium density fiberboard (MDF), wheatboard, strawboard, panel substrates, and door cores.

Provide products containing no added urea-formaldehyde resins. Provide current product literature showing no added urea-formaldehyde for composite wood or agrifiber products.

[Provide products certified to meet emissions requirements of either CARB Regulation or CDPH SECTION 01350 (limit requirements for either office or classroom spaces regardless of space type). Provide certification of indoor air quality for Composite wood and agrifiber products.]

2.3.6 Plastic Laminate

Plastic laminate conforms to ANSI/NEMA LD 3, Horizontal General Purpose Standard (HGS) Grade, 1.22 mm (plus or minus 0.127 mm) 0.048 inches (plus or minus 0.005 inches) in thickness.

2.3.7 Plastic

Plastic has built-in inhibitors to retard fading and anti-static compounds to retard dirt attraction. Pigment quality eliminates need to paint plastic parts. Component surfaces have a textured finish. Color is integral to the plastic.

2.3.8 Cast Iron

Cast iron complies with ASTM A48/A48M. Finish is [powder coat][_____].

2.3.9 Steel

Steel complies with ASTM A513/A513M or ASTM A1011/A1011M. Finish is [powder coat][_____].

2.4 SEATING SYSTEM

**********
**NOTE: Determine on project by project basis if sample chair is required.**
**********

Construct components and assembly free from objectionable projections or irregularities. Make corners and edges smooth and rounded. Unless otherwise noted, bolts, nuts, and other fastenings are concealed where possible. Steel is well-formed to shape and size required. Connections of members are by welding, riveting, or interlocking. Casting is fine textured, sound, and free of pits, blow holes, and fins. Lines are true,

accurate, and true-to-pattern with excess metal or imperfections removed. Submit Assembly Manuals, manufacturer's descriptive data, catalog cuts, installation instructions and the following:

a. Minimum 152 by 150 mm 6 by 6 inches samples of upholstery, exposed plywood, plastic laminate, wood, identification plate, paint, armrest and plastic finish materials. Furnish fabric samples of sufficient size to show color range, pattern, and finish.

b. Two complete sets of certificates attesting that the proposed seating system meets specified requirements. Date the certificate after the award of contract, include name of the project and a list of specific requirements being certified. Three sets of assembly manuals describing assembly procedures.

c. One complete chair that meets requirements specified. Chair sample may be incorporated into the installation, provided the sample is approved and its location is noted.

2.4.1 Backs

**********

**NOTE: The option of an upholstered steel, plywood or polypropylene inner panel should remain since manufacturers use such a variety of materials for the inner panel.**

**Specification of hard surface backs is recommended for durability and maintenance reasons. Although, fully upholstered backs are available and may be substituted as appropriate to meet project requirements.**

**To achieve a certain aesthetic, it may be determined that hardware be visible. Edit to meet desired appearance. Example: It may be desired or acceptable that screws and bolts be visible on units composed of seat backs with exposed plywood.**

**Rocker type mechanism is an option but not available from all manufacturers. If required, research availability.**

**********

Provide back assembly of the fixed type and consisting of [a hard injection molded surface rear panel with an upholstered inner panel] [an exposed plywood front and rear panel]. Attach back assembly to standards with 14 gauge steel wings/back brackets; wings/back brackets have back pitch adjustability option, back assembly length is between [508] [_____] and [724] [_____] mm [20] [_____] and [28-1/2] [_____] inches for a total height of [762] [_____] to [914] [_____] mm [30] [_____] to [36] [_____] inches above the floor measured parallel to the back. Rear panel extends below the seat unit to completely conceal and protect the seat assembly.

2.4.1.1 Plastic Rear Panels

Panels are one-piece injection molded high impact resistant polypropylene or polyethylene with textured outer surface. Panel is formed to enclose and protect the edges of the inner upholstery panel at the top and sides.

2.4.1.2 [Plastic Laminate Finish][Wood] Rear Panels

Panels are fabricated from minimum [5 ply, 8 mm 5/16 inch] [7 ply, 16 mm 5/8 inch] thick plywood. [Exposed back surface is plastic laminate.] Rear panel is formed on the same radius as the upholstered inner panel. Sand smooth exposed wood edges.[ Exposed bolts, fasteners or other hardware are not acceptable.]

2.4.1.3 Upholstered Inner Panels

Fabricate upholstered inner panels from 5 ply, 11 mm 7/16 inch minimum thick plywood, compound steel or compound curved 20 percent glass filled polypropylene with deep web reinforcing. Cushion consists of [51 mm 2 inch ] [_____] thick polyurethane foam padding and have an upholstery cover. Padding is cemented to plywood inner panel. Upholstery cover is securely stapled to the inner plywood panel or held in place with draw strings for ease of re-upholstering. Upholstery cover cannot be attached with the use of nails, tacks, or screws.

2.4.1.4 Exposed Plywood Front & Rear Panel [Plastic Laminate Finish]

Back is fabricated from minimum [5-ply, 11 mm 7/16 inch] [7-ply, 19 mm 3/4 inch] thick contour molded plywood. [Exposed back and front surfaces are finished with plastic laminate.] Smoothly sand and finish all exposed edges.

2.4.2 Seats

**********

**NOTE: To achieve a certain aesthetic it may be determined that hardware be visible. Edit to meet desired appearance. Example: It may be desired or acceptable that screws and bolts be visible on units composed of seats with exposed plywood.**

**An acoustical or perforated seat bottom is available from some manufacturers. If needed to meet project requirements, research availability and add requirement to specification.**

**********

Provide foundation for upholstered seats free from visible screws, bolts, open holes, and projections on the bottom, front, and sides. [The front center edge of each seat has an identification plate. The area to receive the plate is recessed to prevent wear and abrasion. Method of attachment is tamper-resistant.] The seat unit is removable without disturbing the standards, and the upholstered seat cover is easily removable without removing the seat unit. The fabric covering is fastened to the frame in a manner that will permit easy reupholstering.

2.4.2.1 Polypropylene Seat Unit

Provide foundation consisting of a one-piece, injection molded polypropylene foundation fabricated with a minimum 25 percent glass-filled polypropylene or an inner structural panel constructed of 20 percent glass-filled polypropylene with deep web reinforcing and a wraparound polypropylene shell outer panel. Polypropylene foundation seat is serpentine spring or ergonomic seat cushion. Serpentine spring cushion

contains at least five serpentine design springs spanning an injection molded plastic frame with molded polyurethane foam padding fitting firmly on springs. Frame and spring assembly are covered with a chafing barrier to protect foam padding from abrasion. Ergonomic seat cushion consists of a 5 mm 3/16 inch thick contoured polypropylene substrate supporting a polyurethane foam pad. Seat unit consisting of an inner structural panel has padding that is a molded polyurethane foam pad and has a minimum thickness of 76 mm 3 inches at the center, 38 mm 1-1/2 inches at the front with an overall thickness of 51 mm 2 inches. Upholstery cover fits the cushion size, is fastened with drawstring closure or staples for ease of re-upholstering, and does not have welts. Upholstery cover cannot be attached with the use of nails, tacks, or screws.

2.4.3 Hinges

**********

**NOTE: Three quarter fold is recommended for safety reasons; it is easier to open when hands are full and opens to 100 percent when additional pressure is applied to seat.**

**********

Hinges are a counterweight mechanism using gravity to return to the upright position, compensating type or spring lift mechanism, completely enclosed in the seat assembly, totally independent, free and easy in operation, and capable of compensating for circular installation, variation in installation conditions, and unevenness of floors. Each hinge has a noiseless, self-rising seat device, rises automatically to a uniform safety position of 3/4 fold at all times, and folds 100 percent when additional pressure is applied, to provide additional clearance. Seat hinge mechanism complies with ASTM F851 and requires no adjustment after installation. The compensating type and spring lift mechanism hinge is self-lubricating requiring no maintenance. Cushion both the up and down stops on the seat to reduce noise.

2.4.4 Standards

Provide standards which are minimum 1.9 mm 14 gauge tubular or sheet steel or one integral piece of cast iron. Steel standards are welded. Standards with ADA hinged armrests are provided with a label displaying the handicapped symbol and located and installed as shown on drawings.

2.4.4.1 Floor Standards

**********

**NOTE: Not all manufacturers produce both steel and cast iron standards; it is recommended that both options be left in the specification.**

**********

Form floor standards to fit the floor incline so that the standards will be vertical and the hinge point will be at a height that will maintain proper relation of seat to floor. Form the feet to eliminate tripping hazards, with a minimum of two holes for bolt attachment to the floor.

2.4.4.2 Riser Standards

Form riser standards to approach the riser face at an angle to allow maximum clearance, formed to fit the riser so that the standards will be

vertical and the hinge point will be at a height that will maintain proper relation of seat to floor. Projection of the standard is not permitted in order to avoid a stumbling hazard or interfere with sweeping and cleaning. Provide riser attachment through a 6 mm 1/4 inch steel plate welded to the standard or on an integrally cast foundation. Provide securely attached standard to the riser without the use of shims or filler strips and attach at a minimum of 2 points.

2.4.4.3 [Aisle] [and] [End] Standards

[Aisle] [and] [end] standard complies with standard specifications and have a [molded plastic] [plastic laminate] [upholstered] [solid hardwood or wood veneer] [_____] decorator panel. [Shape of decorator panel is [open] [tapered] [rectangular] [radius on lower edge] [_____].] Decorator panels are not required for standards that have the ADA armrest. Install all decorator panels with concealed hardware.

2.4.5 Armrests

**********
**NOTE: Specification of hard surface armrests are recommended for durability and maintenance reasons.**
**********

Armrests are [solid hardwood with [rounded corners] [_____] and manufacturer's standard finish] [with cup holder] [wood with laminated plastic] [plastic] [plastic with cup holder] [_____]. Provide ADA armrest in locations as shown on drawings. ADA armrest is hinged at rear to allow easy access for limited mobility occupants.

2.4.6 Tablet Arm

**********
**NOTE: There are varying sizes of tablet arms, but not all manufacturers offer all sizes. Some only have one size. If size other than standard is required, add requirements to paragraph. Note some manufacturer have a size that accommodates a laptop computer.**
**********

Equip each chair with a fold-away tablet arm assembly. Tablet arm will automatically return to the stored position when raised manually to a vertical position in one motion and fall to the stored position by force of gravity, fold smoothly and quietly, store completely out of the way and be easily accessible when needed by the occupant without bending or reaching. Tablet arm is fabricated using balanced construction and is composed of manufacturer's standard core material faced with plastic laminate on the writing surface and supported by a minimum 3 mm 11 gauge steel bracket. All edges are rounded. When in a writing position, the arm locks firmly in place so that it cannot be accidentally disengaged. [Tablet arm[ is capable of supporting a laptop computer][ and is a minimum of[ 53548 square mm 83 square inches][ 64516 square mm 100 square inches][ 77419 square mm 120 square inches][ 84516 square mm 131 square inches][ 97419 square mm 151 square inches.]]] Provide both left and right handed tablet arms as show.

[2.4.7 Sub Title

**********

**NOTE: Some manufacturers offer power, data or USB connection. If this option is selected, coordinate electrical requirements. When power and data modules are included as an option, end panels are required on aisle ends.**

**********

Provide power [and data] to each seat in a location that is convenient to the occupant. Include a 120 Volt wiring with duplex receptacle [and a telecommunications and data port] per seat. Provide power [and data] from the building power source and insure that all power [and data] components are UL listed and conform to Article No. 604 of the National Electric Code.

Connect all chairs in a row with a formed aluminum raceway with [molded] [or] [extruded] polymer covers to conceal power [and data] wiring [in the arm rest] [on raceway beneath the seating] [in fully enclosed wireways]. Provide 120 Volt, A.C. electrical power throughout the row [by means of a [two circuit, 4 wire system to power up to 16 chairs] [three circuit, 5 wire system to power up to 24 chairs][with a doubled sized neutral]]. [Use a separate molded polymer module to accommodate owner supplied ethernet, USB, phone and HDMI wiring.]

]2.4.8 Identification Plates

**********

**NOTE: Identify row and seat numbering system on drawings.**

**Address placement of identification plates when seat unit is fully upholstered.**

**Delete paragraph if not required.**

**********

Provide seating with number and letter plates for seat and row designations. Plates are constructed of manufacturer's standard [brass or bronze][clear anodized aluminum] [_____] finish and have black letters and numbers. Provide [tamper resistant] hardware with finish compatible with plates. Provide text font and seat numbering system [per manufacturer's standard.][as indicated.]

2.4.9 Aisle Lighting

**********

**NOTE: Determine if aisle lighting is required to meet project requirements. Delete paragraph if not required.**

**Coordinate design requirements with electrical engineer.**

**********

Provide [aisle] [and] [end] standard panels with [concealed] [surface mounted] [_____] LED aisle lights. Aisle lights are low voltage, 12 Volt, D.C., system with manufacture's voltage reduction device housed in safety enclosure equipped with fuses, terminal blocks, and safety disconnect.

Aisle lighting is prewired, UL approved and wiring is routed through concealed casing into floor. Provide low heat generating lighting fixture components that are easily accessible for replacement. Aisle light wiring is hardwired to the building electric distribution system. The installation, proper safe mounting, and connection of the voltage reduction device, is the responsibility of a certified electrician.

[2.4.10 Electrical [and Telecommunications] Work

Provide electrical materials conforming to the requirements of Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM[ and telecommunications materials conforming to the requirements of Section 27 10 00 BUILDING TELECOMMUNICATIONS SYSTEM]..

]2.5 COLOR

**********

**NOTE: Editing of color reference sentence(s) must be coordinated with the Government. Generally Section 09 06 00 SCHEDULES FOR FINISHES or drawing is used when the project is designed by an Architect or Interior designer. Color must be selected from manufacturers standard colors or identified as a manufacturers color in this specification only when the project is very simple and has minimal finishes.**

**When the Government directs that color be located in the drawings, a note must be added that states: "Where color is shown as being specific to one manufacturer, an equivalent color by another manufacturer may be submitted for approval. Manufacturers and materials specified are not intended to limit the selection of equal colors from other manufacturers. The word "color" as used herein includes surface color and pattern."**

**Prior to specifying a custom color finish, research to determine if additional cost and lead time is feasible. Note there is often a minimum order requirement; this requirement will also affect future orders.**

**When a manufacturer's name, stock number, pattern, and color is used, be certain that the product conforms to this specification, as edited.**

**********

Provide colors [as specified in Section 09 06 00 SCHEDULES FOR FINISHES.][as indicated; colors listed are not intended to limit the selection of equal colors from other manufacturers.]

PART 3 EXECUTION

3.1 EXAMINATION

Examine floor, riser, and other adjacent work and conditions prior to layout and installation. Verify compliance with requirements and other conditions affecting performance of the work. [Verify that electrical connections are properly located.][Verify HVAC air-distribution locations

are correct.] Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PLACEMENT OF STANDARDS

**********

**NOTE: Generally, the width of seat units should be 533 or 559 mm with 508 mm 21 or 22 inches with 20 inch wide units restricted to the exit seat location if needed to meet specific dimension requirements.**

**********

The system permits the standards to be installed on radial lines from a common center for which concentric circles are determined with each row of units utilizing common middle standards. Standards in each row are placed laterally so the aisle-end standards will be in alignment as indicated on seating layout drawing. The angle of inclination of backs adjusted for variations in sightlines. Mechanical attachment of components is of sufficient flexibility so that when permanently assembled they will compensate for the changing dimensions laterally between standards caused by convergence toward the center. Seat and back attachments absorb inaccuracies in lateral spacing of standards at point of attachment caused by unevenness of floor. Varying lateral dimensions of backs and seats are in accordance with approved seating layout. Minimum width of seating unit is 508 mm 20 inches and may be used only to complete a specific row dimension.

## 3.3 INSTALLATION

Do not install building construction materials that show visual evidence of biological growth.

Installation of the seating system is in accordance with the approved detailed drawings and manufacturer's recommended installation instructions. Submit seating plans dimensioned and showing row spacing, row lengths, the varying lateral spacing at backs and seats, back pitch, and seat widths for the various section lengths, placement of standards, floor pitch, and riser height, where applicable. Submit drawings indicating metal thickness, fastenings, details of hinge mechanism, seat and back dimensions, and proposed finish.

## 3.4 CLEANING

Clean and polish all products and leave the area in a clean and neat condition upon completion of installation. Repair any defects in material and installation and replace damaged products that cannot be satisfactorily repaired.

-- End of Section --