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USACE / NAVFAC / AFCEC / NASA UFGS-12 61 13 (August 2017)  
Change 1 - 08/18  
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Preparing Activity: USACE Superseding  
UFGS-12 61 13 (August 2008)

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated October 2019

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#### SECTION 12 61 13

##### UPHOLSTERED AUDIENCE SEATING 08/17

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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).

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#### PART 1 GENERAL

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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.

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## 1.1 REFERENCES

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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.

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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 2012) Standard Specification for Gray Iron Castings

ASTM A513/A513M (2019) 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 2013) 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

PROGRAMME FOR ENDORSEMENT OF FOREST CERTIFICATION (PEFC)

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

SUSTAINABLE FOREST INITIATIVE (SFI)

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

1.2 SUBMITTALS

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NOTE: Review submittal description (SD) definitions  
in Section 01 33 00 SUBMITTAL PROCEDURES and edit  
the following list to reflect only the submittals  
required for the project.

The Guide Specification technical editors have  
designated 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 submittals requiring Government approval on Army  
projects, a code of up to three characters within  
the submittal tags may be used following the "G"

designation 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" following a submittal item indicates that the submittal is required for the Sustainability eNotebook to fulfill federally mandated sustainable requirements in accordance with Section 01 33 29 SUSTAINABILITY REPORTING. Locate the "S" submittal under the SD number that best describes the submittal item.

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

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.][information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submittals with an "S" are for inclusion in the Sustainability eNotebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. 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, Wood Structural Panel and Agrifiber Products; S]

Installation; G[, [\_\_\_\_\_]]

#### SD-04 Samples

Seating System; G[, [\_\_\_\_\_]]

#### SD-06 Test Reports

Fire Safety; G[, [\_\_\_\_\_]]

Tests; G[, [\_\_\_\_\_]]

#### SD-07 Certificates

## Seating System

- [ Installer's Certification]
- [ 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, wood structural panel and agrifiber products; S]

## SD-10 Operation and Maintenance Data

- Assembly Manuals; G[, [\_\_\_\_\_]]
- Maintenance Manuals; G[, [\_\_\_\_\_]]

### 1.3 CERTIFICATIONS

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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.

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#### [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. Provide current product certification documentation from certification body. Submit copies of invoices bearing certification numbers.

#### ]1.3.2 Indoor Air Quality Certifications

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**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 1.3.2.1 if out-sourcing is not identified as a problem. Choose paragraphs 1.3.2.2 and 1.3.2.3 in lieu of paragraph 1.3.2.1 if outsourcing is identified as an issue.

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##### 1.3.2.1 Upholstered Audience Seating 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, Wood Structural Panel and 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 Certification](#)

When recommended by the manufacturer, seating must be delivered and installed by an authorized dealer with a certified installation crew. All hardwiring must be completed by a licensed electrician; the certified installers must be onsite when questions arise.



#### 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. Seating must not be stored 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

Warrant the fixed seating for a period of 5 years with the following exceptions: one year for fabric and two years for tablet arms. Provide manufacturer's standard performance guarantees or warranties that extend beyond the periods listed.

### PART 2 PRODUCTS

#### 2.1 MATERIALS

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**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.

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

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

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

### 2.1.1 Upholstery Fabric

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

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

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

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Provide fabric which is a [plain] [decorative] [\_\_\_\_\_] weave, fiber content of [100 percent polypropylene] [ 100 percent polyester] [100 percent nylon] [\_\_\_\_\_] treated to resist staining and soiling. Fabric upholstery for seating must comply with a minimum of [55,000] [75,000] [\_\_\_\_\_] double rubs when submitted to the tests required by ASTM D4157. Submit complete set of test reports for the fire safety and other testing.

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

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[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.]

### 2.1.2 Polyurethane Foam

Polyurethane foam must be fire retardant, nonhardening and non-oxidizing and must have a high resistance to alkalies, oils, grease, soaps, abrasions, moisture, mildew, and tearing. Handling of this foam must conform to the requirements of fire safety as specified in the Submittals paragraph.

### 2.1.3 Plywood

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

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**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.**

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[Provide certified sustainably harvested plywood.]

#### 2.1.4 Solid Hardwood and Wood Veneer

Solid hardwood and wood veneer must be first grade [maple] [oak] [cherry] [\_\_\_\_\_]. Finish exposed wood with manufacturers standard finish.

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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.

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

#### 2.1.5 Composite Wood, Wood Structural Panel and Agrifiber Products

Provide products containing no added urea-formaldehyde resins. Provide current product literature showing [no added Urea-formaldehyde for Composite Wood, Wood Structural Panel and 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 or validation of [indoor air quality for Composite wood, wood structural panel and agrifiber products.](#)

#### 2.1.6 Plastic Laminate

Plastic laminate must conform 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.

#### 2.1.7 Plastic

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

#### 2.1.8 Cast Iron

Cast iron must comply with [ASTM A48/A48M](#). Finish must be [powder coat] [\_\_\_\_\_].

#### 2.1.9 Steel

Steel must comply with [ASTM A513/A513M](#) or [ASTM A1011/A1011M](#). Finish must be [powder coat] [\_\_\_\_\_].

### 2.2 SEATING SYSTEM

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

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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 must be concealed where possible. Steel must be well-formed to shape and size required. Jointing of members must be welded, riveted, or interlocked. Casting must be fine textured, sound, and free of pits, blow holes, and fins. Lines must be 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 150 by 150mm 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.

#### 2.2.1 Backs

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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.

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Provide back assembly of the fixed type and consisting of [a hard 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 must have back pitch adjustability option, back assembly length must be between [500] [\_\_\_\_\_] and [725] [\_\_\_\_\_] mm [20] [\_\_\_\_\_] and [28-1/2] [\_\_\_\_\_] inches for a total height of [760] [\_\_\_\_\_] to [910] [\_\_\_\_\_] mm [30] [\_\_\_\_\_] to [36] [\_\_\_\_\_] inches above the floor measured parallel to the back. Rear panel must extend below the seat unit to completely conceal and protect the seat assembly.

#### 2.2.1.1 Plastic Rear Panels

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

#### 2.2.1.2 [Plastic Laminate Finish][Wood] Rear Panels

Panels must be fabricated from minimum [5 ply, 11 mm 5/16 inch] [7-ply, 11 mm 5/8 inch] thick plywood. [Exposed back surface must be plastic laminate.] Rear panel must be formed on the same radius as the upholstered inner panel. Sand smooth exposed wood edges.[ There must be no exposed bolts or other hardware.]

#### 2.2.1.3 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 must consist of [50 mm 2 inch] [\_\_\_\_\_] thick polyurethane foam padding and have an upholstery cover. Padding must be cemented to plywood inner panel. Upholstery cover must be securely stapled to the inner plywood panel or held in place with draw strings for ease of re-upholstering. Upholstery cover must not be attached with the use of nails, tacks, or screws.

#### 2.2.1.4 Exposed Plywood Front & Rear Panel [Plastic Laminate Finish]

Back must be 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 must be finished with plastic laminate.] Smoothly sand and finish all exposed edges.

#### 2.2.2 Seats

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**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.**

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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 must have an identification plate. The area to receive the plate must be recessed to prevent wear and abrasion. Method of attachment must be tamper-resistant.] The seat unit must be removable without disturbing the standards, the upholstered seat cover must be easily removable without removing the seat unit; and the fabric covering must be fastened to the frame in a manner that will permit easy reupholstering.

#### 2.2.2.1 Steel Seat Units

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NOTE: If an exposed plywood underside is desired, it will be necessary to add a sentence to the steel and/or polypropylene seat unit paragraph that the seat unit must have a wood seat bottom attached with exposed fasteners. The seat bottom must be constructed of minimum 5-ply, 19 mm 5/16 inch thick, hardwood veneers and formed with the same radius as the front of the steel seat unit.(AS 35-216)

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Form steel foundation of not less than 1 mm (20 gauge) 20 gauge steel and roll it inward around entire perimeter for rigidity. Upholstered steel seat unit must be nonsag construction. Nonsag spring units must contain at least five serpentine design springs suspended under tension; cross bracing, if required by manufacturer, must be welded to frame so as not to interfere with spring action. Cushions must be polyurethane foam; must have a minimum thickness of 75 mm 3 inches at front edge, 44 mm 1-1/2 inches at rear edge, and 50 mm 2 inch throughout the other portions for nonsag spring units. Frame and spring assembly must be covered with a chafing barrier to protect foam padding from abrasion. [Upholstery cover must [be of panel side construction without welts, fastened to the frame without the use of nails, tacks, or screws, and must be easily reupholstered][enclose entire seat unit, seat pan and cushion assembly][ ,and have a zippered closure for easy re-upholstering]].

#### 2.2.2.2 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 must be serpentine spring or ergonomic seat cushion. Serpentine spring cushion must contain 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 must be covered with a chafing barrier to protect foam padding from abrasion. Ergonomic seat cushion must consist of a 4.5 mm 3/16 inch thick contoured polypropylene substrate supporting a polyurethane foam pad. Seat unit consisting of an inner structural panel must have padding that is a molded polyurethane foam pad and have a minimum thickness of 75 mm 3 inches at the center, 44 mm 1-1/2 inches at the front with an overall thickness of 50 mm 2 inches. Upholstery cover must fit the cushion size, be fastened with drawstring closure or staples for ease of re-upholstering and not have welts. Upholstery cover must not be attached with the use of nails, tacks, or screws.

#### 2.2.2.3 Exposed Plywood Seat Units

Seat unit must be fabricated from plywood, minimum [5-ply, 11 mm 7/16 inch thick] [7-ply, 19 mm 3/4 inch thick]. Seat unit must be supported by sturdy formed steel arms that are bolted to the seat. Bolts must have decorative heads. [Exposed back and front surfaces must be finished with plastic laminate.] Sand smooth all exposed edges. Seat hinges must be securely attached. Form seat to fit the contour of a seated person.

### 2.2.3 Hinges

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**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.**  
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Hinges must be 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 must have a noiseless, self-rising seat device, must rise automatically to a uniform safety position of 3/4 fold at all times, and must fold 100 percent when additional pressure is applied, to provide additional clearance. Seat hinge mechanism must comply with [ASTM F851](#) and require no adjustment after installation. The compensating type and spring lift mechanism hinge must be self-lubricating requiring no maintenance. Cushion both the up and down stops on the seat to reduce noise.

### 2.2.4 Standards

Provide standards which are minimum 14 gauge tubular or sheet steel or one integral piece of cast iron. Steel standards must be welded. Standards with ADA hinged armrests must be provided with a label displaying the handicapped symbol and must be located as shown on drawings.[ Install standards on a radius, see drawings for layout.]

#### 2.2.4.1 Floor Standards

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

#### 2.2.4.2 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. There must be no projection of the standard to create a stumbling hazard or interfere with sweeping and cleaning. Riser attachment must be made through a [6 mm 1/4 inch](#) steel plate welded to the standard or on an integrally cast foundation, standard must be securely attached to the riser without the use of shims or filler strips and must be attached at a minimum of 2 points.

#### 2.2.4.3 [Aisle] [and] [End] Standards

[Aisle] [and] [end] standard must comply with standard specifications and

have a [molded plastic] [plastic laminate] [upholstered] [solid hardwood or wood veneer] [\_\_\_\_\_] decorator panel. [Shape of decorator panel must be [tapered] [rectangular] [radius on lower edge] [\_\_\_\_\_.] Decorator panels are not required for standards that have the ADA armrest.

#### 2.2.5 Armrests

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**NOTE: Specification of hard surface armrests are recommended for durability and maintenance reasons.**  
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Armrests must be [solid hardwood with [rounded corners] [\_\_\_\_\_] and manufacturer's standard finish] [with cup holder] [solid hardwood or plastic with foam padding and upholstered cover] [wood with laminated plastic] [plastic] [plastic with cup holder] [\_\_\_\_\_. ADA Armrest must be provided in locations as shown on drawings. ADA armrest must be hinged at rear to allow easy access for limited mobility occupants.

#### 2.2.6 Tablet Arm

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**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 must 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 must be fabricated using balanced construction and be composed of manufacturer's standard core material faced with plastic laminate on the writing surface. All edges must be rounded. When in a writing position, the arm must lock firmly in place so that it cannot be accidentally disengaged. Both left and right handed tablet arms must be provided as shown on drawings.

#### 2.2.7 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.**

\*\*\*\*\*

Seating must have number and letter plates for seat and row designations. Plates must be constructed of manufacturer's standard [brass or bronze finish or satin finished anodized aluminum] [\_\_\_\_\_] and have black letters and numbers. Attaching hardware must [be tamper resistant and ]have a finish compatible with plates.



### 2.2.8 Aisle Lighting

\*\*\*\*\*

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

Coordinate design requirements with electrical engineer.

\*\*\*\*\*

[Aisle] [and] [end] standard panels must have [concealed] [surface mounted] [\_\_\_\_\_] aisle lights. Aisle lighting must be prewired, UL approved and wiring must be routed through concealed casing into floor. Bulbs must be provided and must be easily accessible for replacement. Heat generated by bulb must not be sufficient to be uncomfortable if accidentally touched. Aisle light wiring must be hardwired to the building by a certified electrician.

### 2.2.9 Electrical Work

Provide electrical materials conforming to the requirements of Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM.

### 2.3 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 should be selected from manufacturer's standard colors or identified as a manufacturer's 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.

As directed above, Section 09 06 00 SCHEDULES FOR FINISHES or drawings must include color for all items with a finish: fabric upholstery, armrest, standards, decorator panels, trim and tablet arms if required, etc. When a manufacturer's name, stock number, pattern, and color is used, be certain that

the product conforms to this specification, as  
edited.

\*\*\*\*\*

Color must be [in accordance with Section 09 06 00 SCHEDULES FOR  
FINISHES.] [as indicated on the drawings.] [selected from manufacturers  
standard colors.] [[\_\_\_\_\_] Color listed is not intended to limit the  
selection of equal colors from other manufacturers.]

### PART 3 EXECUTION

#### 3.1 PLACEMENT OF STANDARDS

\*\*\*\*\*

NOTE: Generally, the width of seat units should be  
525 or 550 mm with 500 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 must permit 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 must be  
placed laterally so the aisle-end standards will be in alignment as  
indicated on seating layout drawing. The angle of inclination of backs  
must be adjusted for variations in sightlines. Mechanical attachment of  
components must be 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 must absorb inaccuracies in lateral spacing of standards at  
point of attachment caused by unevenness of floor. Varying lateral  
dimensions of backs and seats must be in accordance with approved seating  
layout. Minimum width of seating unit must be 500 mm 20 inch and may be  
used only to complete a specific row dimension.

#### 3.2 INSTALLATION

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

Installation of the seating system must be 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.

#### 3.3 CLEANING

Upon completion of installation, all products must be cleaned and polished  
and the area must be left in a clean and neat condition. Any defects in  
material and installation must be repaired, and damaged products that  
cannot be satisfactorily repaired must be replaced. Submit three sets of  
Maintenance Manuals describing routine maintenance and inspection, proper  
cleaning and minor repair procedures.

-- End of Section --

