
USACE / NAVFAC / AFCEC / NASA UFGS-10 11 00 (February 2009)

Preparing Activity: USACE Nontechnical Title Revision
(August 2015)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated April 2017

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SECTION 10 11 00

VISUAL DISPLAY UNITS 02/09

NOTE: This guide specification covers the requirements for visual communications specialties.

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

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 Reference Identifier (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 NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z97.1 (2015) Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test

ASTM INTERNATIONAL (ASTM)

ASTM B221 (2014) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

ASTM B221M (2013) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)

ASTM C1048 (2012; E 2012) Standard Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass

ASTM E84 (2016) Standard Test Method for Surface Burning Characteristics of Building Materials

ASTM F148 (2013) Binder Durability of Cork Composition Gasket Materials

ASTM F152 (1995; R 2009) Tension Testing of Nonmetallic Gasket Materials

ASTM F793/F793M (2010a) Wallcovering by Durability Characteristics

1.2 SUMMARY

NOTE: The designer has the option to require that visual display boards for a project be provided by one manufacturer when appropriate. It is the designer's responsibility to determine if all products being specified for a project are available from a minimum of three manufacturers. Not all manufacturers produce the variety of visual display boards offered in this specification.

Alternate frame methods such as: self-edge for fabric or vinyl covered tackboards, vinyl edge on tackboards, and markerboards are options but are not available from all manufacturers. Designer must

research available sources.

The term visual display board when used herein includes presentation boards, marker boards, tackboards, board cases, display track system and horizontal sliding units; submit manufacturer's descriptive data and catalog cuts plus manufacturer's installation instructions, and cleaning and maintenance instructions. Visual display boards shall be from manufacturer's standard product line. Submit certificate of compliance signed by Contractor attesting that visual display boards conform to the requirements specified.

1.3 SUSTAINABILITY REPORTING

NOTE: The bracketed items are representative of LEED material documentation and requirements that may apply to this project. These items should be edited to reflect the project requirements.

Materials in this technical specification may contribute towards contract compliance with sustainability requirements. See Section 01 33 29 SUSTAINABILITY REPORTING for project certification [local/regional materials,] [low-emitting materials,] [recycled content,] [USDA biobased,] [certified wood] [_____ ,] [rapidly renewable materials] and LEED documentation requirements.

1.4 SUBMITTALS

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.

Use the "S" classification only in SD-11 Closeout

Submittals. 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.

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" 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-03 Product Data

Visual Display Board; G[, [_____]]

SD-04 Samples

Aluminum; G[, [_____]]
Porcelain Enamel; G[, [_____]]
Materials; G[, [_____]]

SD-07 Certificates

Visual Display Board

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the building site in the manufacturer's original unopened containers and store them in a clean dry area with temperature maintained above 10 degrees C 50 degrees F. Stack materials according to manufacturer's recommendations. Visual display boards shall be allowed to acclimate to the building temperature for 24 hours prior to installation.

1.6 WARRANTY

Provide manufacturer's standard performance guarantees or warranties that extend beyond a one year period.

PART 2 PRODUCTS

2.1 MATERIALS

Submit section of core material showing the lamination of colored cork, natural cork, woven fabric, non-woven fabric, and vinyl wall covering. Submit sample of hardwood and plastic laminate finish, and glass type. Samples shall be minimum 100 by 100 mm 4 by 4 inches and show range of color.

2.1.1.1 Porcelain Enamel

Provide marker board writing surface composed of porcelain enamel fused to a nominal 0.378 mm 28 gauge thick steel, laminated to a minimum 6 mm 1/4 inch thick core material with a steel or foil backing sheet. Writing surface shall be capable of supporting paper by means of magnets. Marker board surface for display track system may be a powder paint dry erase surface adhered to a nominal 1.214 mm 18 gauge thick steel. Submit section showing porcelain enamel coating, steel, core material and backing.

2.1.1.2 Cork

Cork shall be a continuous resilient sheet made from soft, clean, granulated cork relatively free from hardback and dust and bonded with a binder suitable for the purpose intended. The wearing surface shall be free from streaks, spots, cracks or other imperfections that would impair its usefulness or appearance. The material shall be seasoned, and a clean cut made not less than 13 mm 1/2 inch from the edge shall show no evidence of soft sticky binder.

2.1.2.1 Colored Cork

Provide colored cork composed of pure cork and natural color pigments that are combined under heat and pressure with linseed oil. Colored cork shall be colored throughout and shall be washable. The burlap backing shall be deeply imbedded and keyed to the work sheet being partially concealed in it and meeting the requirements of ASTM F148.

2.1.2.2 Natural Cork

Material shall be a single layer of pure grain natural cork without backing or facing. The color shall be light tan. The cork sheet shall have a tensile strength of not less than 275 kPa 40 psi when tested in accordance with ASTM F152.

2.1.3 Woven Fabric

NOTE: A multi-colored, patterned, textured fabric will aid in hiding pin and tack holes.

Fabric other than manufacturer's standard may be used; however there may be an upcharge cost and minimum quantity requirements. Provide minimum generic specifications to obtain fabric required.

Provide plain weave fabric. Fiber content shall be [100 percent polyester] [_____]. Minimum total weight shall be [496 grams plus or minus 14 grams per linear meter 16 oz. plus or minus 0.5 oz. per lineal yard] [_____]. Fabric shall have a Class A flame spread rating of 0-50 and smoke development rating of 0-450 in accordance with ASTM E84.

2.1.4 Non-Woven Fabric

Fabric shall be non-woven and hooktape compatible. Fiber content shall be [100 percent polyester, 100 percent polyolefin or 100 percent nylon] [_____, [backed]]. Minimum total weight shall be [340 grams plus or minus 14 grams per linear meter 11 oz. plus or minus 0.5 oz. per lineal yard for

1524 mm 60 inch wide fabric] [_____]. Fabric shall have a Class A flame spread rating of 0-50 and smoke development rating of 0-450 in accordance with ASTM E84.

2.1.5 Vinyl Wall Covering

NOTE: A multi-colored, textured, vinyl wall covering will aid in hiding pin and tack holes.

Vinyl wall covering other than manufacturer's standard may be used; however there may be an upcharge cost and minimum quantity requirements. Provide minimum generic specifications to obtain fabric required.

Provide vinyl wall covering conforming to ASTM F793/F793M, Category V. Vinyl wall covering shall have a Class A flame spread rating of 0-50 and smoke development rating of 0-450 in accordance with ASTM E84.

2.1.6 Aluminum

Aluminum frame extrusions shall be alloy 6063-T5 or 6063-T6, conform to ASTM B221M ASTM B221, and be a minimum 1.5 mm 0.06 inches thick. Exposed aluminum shall have an anodized, satin finish. Straight, single lengths shall be used wherever possible. Joints shall be kept to a minimum. Corners shall be mitered and shall have a hairline closure. Submit sections of frame, map rail, and chalktray, and [two] [_____] map hooks.

2.1.7 Hardwood

Exposed hardwood for frames, cabinets, and cases shall be oak, walnut or mahogany. Provide hardwood with a durable factory-applied stain and lacquer finish of a type standard with the manufacturer.

2.1.8 Glass

Glass shall be comprised of tempered glass in accordance with ANSI Z97.1 and shall conform to ASTM C1048, Kind FT (fully tempered), Condition A (uncoated), Type I, Class I (clear), thickness as specified.

2.2 PRESENTATION BOARD

NOTE: A presentation board with an integral pull down projection screen is recommended if projection surface is required. Some units are not available with projection screens. Hot spots may occur if writing surface is used as a projection surface.

The type of doors, double or single, is dependent on the size of the presentation board.

The presentation board shall be a wall hung cabinet with lockable [double doors] [single door] and [shall] [shall not] have a projection screen that pulls down over the marker board writing surface in the cabinet interior. The doors shall be attached to cabinet with piano hinges and have a catch

or closure to keep doors closed when not in use. The interior of the cabinet shall contain a porcelain enamel markerboard writing surface with chalktray, a flip chart that can be hung on an interior door panel, and fabric covered tacksurface on the interior door panels. The cabinet shall be [oak hardwood] [walnut hardwood] [mahogany hardwood] [plastic laminate] [_____]. The edge detailing shall be [rectilinear] [bullnose or radius] [traditional] [_____]. Dry erase markings shall be removable with a felt eraser or dry cloth without ghosting. Each unit shall come complete with an eraser and four different color compatible dry erase markers. Two keys shall be provided for each unit. The size shall be as shown in [paragraph PLACEMENT SCHEDULE] [the drawings] [_____].

2.3 MARKERBOARD

NOTE: Hot spots may occur if this product is used as a projection screen. A visual display board unit with pull down projection screen should be specified if a projection surface is required.

Not all chalktrays are available in the same material as the frame, determine if this is a requirement to acquire desired design aesthetics.

Indicate if a full length chalktray is needed to meet user requirements. A full length chalktray is not available from all manufacturers. This requirement may increase the cost and add lead time. Generally the full length chalktray is the same length material as the frame.

Specify the map rail if there is a requirement to display maps, drawings, or large sheets of paper. Not all marker boards are available with map rail and map rail accessories.

If necessary add requirements for graphics. Graphics can include such items as a grid, ruled lines or logo.

Full wall application of markerboard writing surface is an option. Designer must modify the following paragraph to meet specific requirements and must verify that application is in compliance with National Fire Protection Association (NFPA) Life Safety Code 101.

Markerboard shall have a porcelain enamel writing surface and a chalktray. Markerboard shall be a factory assembled unit complete in one piece, without joints whenever possible. When markerboard dimensions require delivery in separate sections, components shall be prefabricated at the factory, disassembled for delivery and jointed at the site. Frame shall be [oak] [walnut] [mahogany] [aluminum] [_____]. Chalktray shall [be the same material as the frame] [and] [extend the full length of the liquid markerboard]. The markerboard [shall not include a map rail] [shall have a map rail]. The map rail with a tackable insert shall extend the full length of the liquid chalkboard, and shall have map hooks with clips for holding sheets of paper. Two map hooks shall be provided for each 1220 mm 4 foot

of map rail.] Dry erase markings shall be removable with a felt eraser or dry cloth without ghosting. Each unit shall come complete with an eraser and four different color compatible dry erase markers. The size shall be as shown in [paragraph PLACEMENT SCHEDULE] [the drawings] [_____].

2.4 TACKBOARDS

2.4.1 Cork

NOTE: Tackboards with 6 mm 1/4 inch thick cork are more durable and higher in cost than tackboards with 3 mm 1/8 inch thick cork. Tackboards constructed with insulation board or fiberboard are generally less durable and less expensive than tackboards constructed of a hardboard. Cost of natural cork tackboards is generally less than colored cork tackboards.

Tackboard shall consist of a minimum [3 mm 1/8 inch thick colored cork with burlap backing laminated to a minimum 10 mm 3/8 inch thick insulation board or fiber board] [6 mm 1/4 inch thick colored cork with burlap backing laminated to a minimum 6 mm 1/4 inch thick hardboard] [3 mm 1/8 inch thick natural cork laminated to a minimum 10 mm 3/8 inch thick insulation board or fiber board] [6 mm 1/4 inch thick natural cork laminated to a minimum 6 mm 1/4 inch thick hardboard], and shall have an [oak] [aluminum] [_____] frame. The size shall be as shown in [paragraph PLACEMENT SCHEDULE] [the drawings] [_____].

2.4.2 Vinyl Covered

Tackboard shall have a vinyl wall covering laminated to a minimum [3 mm 1/8 inch thick cork laminated to a minimum 10 mm 3/8 inch thick insulation board or fiberboard] [6 mm 1/4 inch thick cork laminated to a minimum 6 mm 1/4 inch thick hardboard or particleboard] [13 mm 1/2 inch thick insulation board or fiberboard], and shall have an [oak] [aluminum] [_____] frame. The size shall be as shown in [paragraph PLACEMENT SCHEDULE] [the drawings] [_____].

2.4.3 Fabric Covered

Tackboard shall have a [woven] [non-woven] fabric covering laminated to a minimum [3 mm 1/8 inch thick cork laminated to a minimum 10 mm 3/8 inch thick insulation board or fiberboard] [6 mm 1/4 inch thick cork laminated to a minimum 6 mm 1/4 inch thick hardboard or particleboard] [13 mm 1/2 inch thick insulation board or fiberboard], and shall have an [oak] [aluminum] [_____] frame. The size shall be as shown on [the Placement Schedule] [the drawings] [_____].

2.5 CASE FOR BOARD UNIT

The case for the board unit shall be [surface] [recess] mounted and have [hinged minimum 5 mm 3/16 inch thick] [sliding minimum 6 mm 1/4 inch thick] tempered glass doors that are lockable. Case shall be [aluminum] [oak] [_____]. Mitered corners shall be reinforced for rigidity. Doors shall be [equipped with continuous piano hinges. Door glass shall be framed with the case material, and be reinforced at all corners. Door framing shall not depend upon the glass for rigidity. Multiple door cases shall have an

elbow catch] [sliding and have aluminum "H" molding at top and bottom of case]. The interior side of the back panel shall be tackable and shall be composed of [a minimum 6 mm 1/4 inch colored cork] [a minimum 6 mm 1/4 inch natural cork] [a vinyl wall covering laminated to a minimum 6 mm 1/4 inch cork] [[_____] laminated to a minimum 6 mm 1/4 inch fiberboard] [_____] . Two keys shall be provided for each unit. The size shall be as shown on [the Placement Schedule] [the drawings] [_____] .

2.6 DISPLAY TRACK SYSTEM

NOTE: Track systems with more than one level have increased component capacity. Not all components can be located on all levels, coordinate locations with manufacturer recommendations.

This method of display shall be a flexible and interchangeable system that consists of lightweight presentation components suspended from a wall mounted, linear, horizontal track. Track shall have [one] [two] [_____] levels to attach components. Track shall allow attached components to slide horizontally. Presentation components shall be capable of being lifted from the track and being relocated to allow for reconfiguration. Components shall be capable of being installed on the track without the use of tools for installation, removal, and reconfiguration. The presentation components shall consist of a [retractable projection screen,] [tilted projection screen (top tilts forward),] [reversible panel with dry erase markerboard on both sides,] [reversible panel with markerboard on one side and woven fabric covered tacksurface on the other,] [[1] [_____] [removable shelf],] [panel with adjustable flipchart,] [_____] and [display rail for setting presentation materials or a holder for displaying maps, presentation boards, drawings and other paper display materials up to a [3] [6] mm [1/8] [1/4] inch thickness]. Components shall be installed and located on track in accordance with manufacturer recommendations. Marker boards shall be provided with a marker tray. Marker board surface shall accept magnets. Dry erase markings on the marker board shall be removable with a felt eraser or dry cloth without ghosting. Each unit shall come complete with an eraser and four different color compatible dry erase markers. The sizes shall be as shown in [paragraph PLACEMENT SCHEDULE] [the drawings] [_____] . Track and trim materials shall be [standard products of the manufacturer] [_____] .

2.7 HORIZONTAL SLIDING UNITS

NOTE: Specify the number and types of panels. Identify which panels shall be installed in which track.

The horizontal sliding unit shall be composed of a fixed back panel, sliding panels, an aluminum track assembly, and shall have a map rail and chalktray. The unit shall have [2] [3] [4] [_____] tracks. The fixed back panel shall be [markerboard] [tackboard]. The unit shall have [_____] marker board sliding panel and [_____] tackboard sliding panel. The track assembly and exposed members, including panel edging and chalktray, shall be extruded aluminum. Frame assembly shall be reinforced at corners. Sliding panels shall be suspended from the top and shall slide over the aluminum track using molded nylon ball bearing rollers at the top of the

track and nylon guide rollers at the bottom of the track to eliminate vibration and to provide quiet and smooth operation of the panels. Sliding panels shall have finger pulls at each end. The map rail shall have a tackable insert and extend the length of the horizontal sliding unit. The map rail shall have map hooks with clips for holding sheets of paper. Two map hooks shall be provided for each 1220 mm 4 foot of map rail. Chalktray shall extend the full length of the horizontal sliding unit. Dry erase markings on the marker board shall be removable with a felt eraser or dry cloth without ghosting. Each unit shall come complete with an eraser and four different color compatible dry erase markers. The size shall be as shown in [paragraph PLACEMENT SCHEDULE] [the drawings] [_____].

2.8 COPYBOARD

NOTE: Models are available that have copy feature only and do not operate with a PC.

Specify PC ready or PC interface if required.

Coordinate PC requirements for PC ready and PC interface units with user to assure the government furnished and government installed PC and printer will be compatible with copyboard PC requirements.

Some models that have PC interface do not have a built-in printer since printer capability is obtained through interfacing with the PC and printer.

Coordinate copyboard requirements and locations with electrical engineer to assure that electrical outlets or hardwiring at the appropriate locations are included in the design.

The copyboard shall be wall mounted, 120V, UL listed, and have a [2] [_____] sided rotating screen, and [a built-in printer that prints letter size copies] [and] [capability to save and print to a government furnished and government installed PC and printer]. Copyboard surface shall have grid lines and accept dry erase markers. Dry erase markings shall be removable with a felt eraser or dry cloth without ghosting. [Copyboard shall [have PC interface] [or] [be PC ready].] [PC interface kit shall be provided for each PC ready unit.] Copyboards shall [be hardwired] [have an electrical cord that plugs into an electrical wall outlet]. Electrical work shall conform to requirements of Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM. Each copyboard shall come complete with an eraser and three different color compatible dry erase markers. The size shall be as shown in [paragraph PLACEMENT SCHEDULE] [the drawings] [_____].

2.9 PROJECTION SCREEN

NOTE: The designer must make appropriate selections based on the type of projection screen required. Not all options are available for all screens. Designer must research available sources and edit accordingly.

A selection needs to be made between a standard screen and tab tensioned screen. The tab tensioned screens have better picture quality since the viewing screen is flat, they are recommended when the primary use for the screen is for computer generated images.

If required, specify extra drop to lower picture area. Identify length of extra drop and if extra drop shall be white or black.

Seams may be required dependent on size of screen.

Coordinate projection screen requirements and locations with electrical engineer to assure that electrical outlets and hardwiring at the appropriate locations are included in the design.

[Wall mounted] [Ceiling mounted] [Recessed mount] motorized projection screen shall have 120V motor that is lubricated for life, quick reversal type, has overload protector, integral gears, and preset accessible limit switches. Recessed mount projection screens shall have an operable closure door and access panel. Screen shall be flame retardant, mildew resistant, and [glass beaded] [white matte] [_____] [with [white] [black] masking borders] [tab tensioned]. Tab tensioned screens shall have a vinyl surface that is stretchable]. Bottom of screen fabric shall be weighted with metal rod. Roller shall be a rigid metal at least [75] [125] [_____] mm [3] [5] [_____] inches in diameter mounted on sound absorbing supports. Motor will be [end mounted] [or] [motor-in-roller] design. Screen shall have a 3 position control switch to stop or reverse screen at any point. The switch shall be installed in a flush electrical box with cover plate, location(s) as shown on the electrical drawings. All conduit and wiring from the control switch to the projection screen shall be furnished and installed by the Contractor. [Ceiling recessed case shall be [extruded aluminum] [or] [wood with metal lined motor compartment]]. [[Wall] [Ceiling] mounted case shall be [aluminum] [or] [steel] [wood. Wood case shall be finished in [plastic laminate] [light oak] [medium oak] [walnut] [cherry] [mahogany] [_____]]]. Screen shall be UL listed. The size shall be as shown in [paragraph PLACEMENT SCHEDULE] [the drawings] [_____]].

2.10 COLOR

Finish colors for required items shall be as [specified in Section 09 06 00 SCHEDULES FOR FINISHES] [indicated].

PART 3 EXECUTION

3.1 PLACEMENT SCHEDULE

NOTE: Location and mounting height of visual display boards must be identified.

Size and type of visual display boards should be specified only once in the contract documents.

Additional information must be added for the display track system. Specify the length of the wall track,

and type and number of presentation components
required per room.

[Location and mounting height of visual display boards shall be as shown on the drawings.] [Visual display boards shall be provided as follows:

Room Name and Number	Board Type	Board Size	Wall Location	Mounting Height
[_____]	[_____]	[_____]	[_____]	[_____]

]

Mounting height is defined as distance from finished floor to top of the display board frame.

3.2 INSTALLATION

**NOTE: Provide reinforcing at partitions to support
visual display boards.**

Perform installation and assembly in accordance with manufacturer's printed instructions. Use concealed fasteners. Visual display boards shall be attached to the walls with suitable devices to anchor each unit. furnish and install trim items, accessories and miscellaneous items in total, including but not limited to hardware, grounds, clips, backing materials, adhesives, brackets, and anchorages incidental to or necessary for a sound, secure, complete and finished installation. Installation shall not be initiated until completion of room painting and finishing operations. Visual display boards shall be installed in locations and at mounting heights indicated. Visual display boards shall be installed level and plumb, and if applicable doors shall be aligned and hardware shall be adjusted. Damaged units shall be repaired or replaced as directed by the Contracting Officer.

3.3 CLEANING

Writing surfaces shall be cleaned in accordance with manufacturer's instructions.

-- End of Section --