UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2021
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SECTION 10 11 00

VISUAL DISPLAY UNITS

08/20

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USACE / NAVFAC / AFCEC / NASA	**UFGS-10 11 00 (August 2020)**

Preparing Activity: USACE	**Superseding**
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UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2021
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SECTION 10 11 00

VISUAL DISPLAY UNITS
08/20

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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 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	(2018) Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass
ASTM E84	(2020) 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	(2020) Standard Classification of Wall Coverings by Use Characteristics

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

SCIENTIFIC CERTIFICATION SYSTEMS (SCS)

SCS	SCS Global Services (SCS) Indoor Advantage

UNDERWRITERS LABORATORIES (UL)

UL 2818	(2013) GREENGUARD Certification Program For Chemical Emissions For Building Materials, Finishes And Furnishings

1.2 DEFINITIONS

****

NOTE: The designer has the option to require that visual display units 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 units 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 unit when used herein includes presentation boards, markerboards, tackboards, board cases, display track systems, horizontal sliding units, copyboards, interactive whiteboards, and projection screens; submit manufacturer's descriptive data and catalog cuts plus manufacturer's installation instructions, and cleaning and maintenance instructions. Provide visual display units from manufacturer's standard product line. Submit certificate of compliance signed by Contractor attesting that visual display units conform to the requirements specified.

1.3 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

Placement Schedule; G[, [_____]]

SD-03 Product Data

Visual Display Unit; G[, [_____]]

Projection Screen; G[, [_____]]

SD-04 Samples

Aluminum; G[, [_____]]

Hardwood; G[, [_____]]

Porcelain Enamel; G[, [_____]]

Cork; G[, [_____]]

Fabric; G[, [_____]]

Vinyl Wall Covering; G[, [_____]]

Glass; G[, [_____]]

SD-07 Certificates

[Indoor air quality for markerboards; S

][Indoor air quality for tackboards; S

][Indoor air quality for projection screen; S

] Certificate of Compliance

SD-08 Manufacturer's Instructions

Manufacturer's Cleaning Instructions

Manufacturer's Printed Installation Instructions

SD-10 Operation and Maintenance Data

Visual Display Units, Data Package 1; G[, [_____]]

1.4 CERTIFICATIONS

1.4.1 Indoor Air Quality

1.4.1.1 Indoor Air Quality for Visual Display Products

****

NOTE: The Government's preference is for use of products that have been certified for indoor air quality by a third-party organization such as Greenguard or SCS Global Services. However, it must be verified there is a certified product available that is both cost effective and appropriate for the project. The requirements of this paragraph are invoked when the designer of record confirms local/regional availability of Greenguard or SCS products and includes the bracketed requirements for indoor air quality certified products in Part 2 of this Section.

****

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. When product does not have certification, provide validation that product meets the indoor air quality product requirements cited herein.

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. Allow visual display units to acclimate to the building temperature for 24 hours prior to installation.

1.6 WARRANTY

Provide manufacturer's warranty to repair or replace defective materials and workmanship for period of [one year][_____][years] from date of final acceptance of the work.

PART 2 PRODUCTS

2.1 MATERIALS

For each type, submit a section of core material and backing showing the lamination of porcelain enamel coating on steel, colored cork, natural cork, woven fabric, non-woven fabric, or vinyl wall covering, as applicable. Submit a sample of hardwood, plastic laminate finish, or glass type, as applicable. Provide minimum 102 by 102 mm 4 by 4 inch samples, or larger, showing range of color.

Submit manufacturers' descriptive product data for [each type of] visual

display unit indicated. Include manufacturers' literature, finishes, profiles and thicknesses of materials.

Submit manufacturers' operations and maintenance data for [each type of] visual display unit in accordance with Section 01 78 23 OPERATIONS AND MAINTENANCE DATA.

2.1.1 Porcelain Enamel

Provide markerboard 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 must be capable of supporting paper by means of magnets. Markerboard surface for display track system may be a powder paint dry erase surface adhered to a nominal 1.214 mm 18 gauge thick steel.

2.1.2 Cork

Provide 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; wearing surface to be free from streaks, spots, cracks or other imperfections that would impair its usefulness or appearance. Provide seasoned material and a clean cut made not less than 13 mm 1/2 inch from the edge and must 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 must be colored throughout and be washable. The burlap backing must 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

Provide a light tan natural cork composed of a single layer of pure grain natural cork without backing or facing. Cork sheets must 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 with [100 percent polyester] [_____] fiber content and[496 grams plus or minus 16 grams per linear meter 16 oz. plus or minus 0.5 oz. per lineal yard] for 1524 mm 60 inch wide fabric [_____] minimum total weight. Fabric must 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

Provide a non-woven, hooktape compatible fabric with a [backed] [100 percent polyester][,][100 percent polyolefin][or][100 percent nylon] [_____] fiber content and[341 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] [_____] minimum total weight. Fabric must 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 with 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

Provide a minimum 1.5 mm 0.06 inch thick, 6063-T5 or 6063-T6 aluminum alloy frame extrusion conforming to ASTM B221M ASTM B221. Exposed aluminum must have [anodized, satin finish][_____]. Use straight, single lengths wherever possible and keep joints to a minimum. Provide mitered corners with a hairline closure. Submit sections of frame, map rail, and marker rail, and [two] [_____] map hooks.

2.1.7 Hardwood

Provide exposed oak, walnut or mahogany hardwood with manufacturer's standard durable factory-applied stain and lacquer finish for frames, cabinets, and cases.

2.1.8 Glass

Provide tempered glass in accordance with ANSI Z97.1 and ASTM C1048, Kind FT (fully tempered), Condition A (uncoated), Type I, Class I (clear), thickness as specified.

2.1.8.1 Glass with Interlayer Color Coating

Provide glass markerboard writing surface composed of tempered, low-iron, extra clear, safety writing glass with polished edges. Provide glass with an interlayer color coating with a durable paint/glass bond that is fade resistant, water resistant, and heat resistant.

2.1.8.2 Magnetic Glass

Provide magnetic glass markerboard writing surface composed of tempered,

low-iron, extra clear, safety writing glass with polished edges and steel backing permanently adhered to the back of the glass.

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.

****

Provide wall hung cabinet presentation board with lockable [double doors] [single door] [with] [without] a projection screen [that pulls down over the markerboard writing surface in the cabinet interior]. Attach doors to cabinet with piano hinges and include a catch or closure to keep doors closed when not in use. Provide a porcelain enamel markerboard writing surface on the interior of the cabinet with marker rail, a flip chart that can be hung on an interior door panel, and fabric covered tack surface on the interior door panels. Provide cabinet of [oak hardwood] [walnut hardwood] [mahogany hardwood] [plastic laminate] [_____], with [rectilinear] [bullnose or radius] [traditional] [_____] edge detailing. Dry erase markings must be removable with a felt eraser or dry cloth without ghosting. Provide each unit with an eraser and four different color compatible dry erase markers, and two keys.

2.3 MARKERBOARD

****

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

Not all marker rails 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 marker rail is needed to meet user requirements. A full length marker rail is not available from all manufacturers. This requirement may increase the cost and add lead time. Generally the full length marker rail 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 markerboards 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.
****

****
NOTE: Retain the last bracketed sentence requiring products with indoor air quality certification when the designer of record confirms local/regional availability of Greenguard or SCS products that does not impact cost effectiveness.
****

2.3.1 Porcelain Markerboard

Provide a factory assembled markerboard with a porcelain enamel[, magnetic] writing surface. Unit to be comprised of one piece, without joints whenever possible. When markerboard dimensions require delivery in separate sections, components must be prefit at the factory, disassembled for delivery and jointed at the site. Provide [hardwood oak][hardwood walnut][hardwood mahogany][aluminum][_____] frame with marker rail [constructed of the same material as the frame] [and] [[extending the full length of the markerboard] [_____] inches long]. The markerboard [does not include a map rail.] [includes a map rail with a tackable insert extending the full length of the markerboard, map hooks and clips for holding sheets of paper. Provide two map hooks for each 1219 mm 4 feet of map rail.] Dry erase markings must be removable with a felt eraser or dry cloth without ghosting. Supply each unit with an eraser and four different color compatible dry erase markers. [Provide magnetic glass markerboard with [10] [_____] rare each magnets.] [Provide markerboards that meet the 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 markerboards.] [Provide surface applied [direct print][_____] graphics where required. Graphic type is [semivisible writing guidelines][penmanship lines][grid][horizontal lines] [_____][as indicated].]

2.3.2 Glass Markerboards with Interlayer Color Coating

Provide markerboard with a smooth finish[, magnetic glass] writing surface units to be comprised of one piece, without joints whenever possible. When markerboard dimensions require delivery in separate sections, components must be prefit at the factory, disassembled for delivery and jointed at the site. [Extend marker rail the full length of the markerboard.] [Marker rail is [____] inches long]. The markerboard [does not include a map rail.] [includes a map rail with a tackable insert extending the full length of the markerboard, map hooks and clips for holding sheets of paper. Provide two map hooks for each 1219 mm 4 feet of map rail.] Dry erase markings must be removable with a felt eraser or dry erase cloth without ghosting. Supply each unit with an eraser and four different color compatible dry erase markers. [Provide magnetic glass markerboard with [10][_____] rare earth magnets.] [Provide markerboards that meet the 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 markerboards.] [Provide high resolution graphics[reverse surface applied][printed on paper for insert behind glass][surface applied, direct print][_____] where

required. Graphic type is [semivisible writing guidelines][penmanship lines][grid][horizontal lines][_____][as indicated].]

2.4 TACKBOARDS

****

NOTE: Retain the last sentence below requiring products with indoor air quality certification when the designer of record confirms local/regional availability of Greenguard or SCS products that does not impact cost effectiveness.

****

[Provide tackboards that meet the emissions requirements of CDPH SECTION 01350 (limit requirements for either office or classroom spaces regardless of space type).][Provide certification or validation of indoor air quality for 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.

****

Provide tackboard consisting 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 [a] [hardwood oak] [hardwood walnut] [hardwood mahogany] [an] [aluminum] [_____] frame.

2.4.2 Vinyl Covered

Provide tackboard consisting of 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 [a][hardwood oak] [hardwood walnut] [hardwood mahogany] [an] [aluminum] [_____] frame.

2.4.3 Fabric Covered

Provide tackboard consisting of 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 [a][an] [hardwood oak] [hardwood walnut] [hardwood mahogany] [an] [aluminum] [_____] frame.

2.5 BOARD CASE

Provide [surface] [recess] mounted board case with [hinged minimum 5 mm 3/16 inch thick] [sliding minimum 6 mm 1/4 inch thick] tempered glass doors that are lockable. Provide [a][an] [aluminum][hardwood oak][hardwood walnut][hardwood mahogany][_____] case with mitered corners reinforced for rigidity. Provide doors [equipped with continuous piano hinges. Door glass framed with the case material, and reinforced at all corners. Door framing does not depend upon the glass for rigidity. Multiple door cases with an elbow catch] [sliding aluminum "H" molding at top and bottom of case]. The interior side of the back panel is tackable and 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] [_____]. Provide two keys for each unit.

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.

****

Method of display is a flexible and interchangeable system that consists of lightweight presentation components suspended from a wall mounted, linear, horizontal track. Track has [one] [two] [_____] levels to attach components. Track allows attached components to slide horizontally. Presentation components are capable of being lifted from the track and being relocated to allow for reconfiguration. Components must be capable of being installed on the track without the use of tools for installation, removal, and reconfiguration. The presentation components 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 tack surface on the other,] [[1] [_____] [removable shelf],] [panel with adjustable flip chart,] [_____] 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]. Install and locate components on track in accordance with manufacturer's written recommendations. Provide markerboards with a marker rail Markerboard surface accepts magnets. Dry erase markings are removable with a felt eraser or dry cloth without ghosting. Provide each unit with an eraser and four different color compatible dry erase markers.

2.7 HORIZONTAL SLIDING UNITS

****

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

****

Provide horizontal sliding unit composed of a fixed back panel, sliding panels, an aluminum track assembly, map rail and marker rail. Provide unit with [2] [3] [4] [_____] tracks. The fixed back panel is [markerboard] [tackboard]. Provide unit with [_____] markerboard sliding panel and [_____] tackboard sliding panel. The track assembly and exposed

members, including panel edging and marker rail, are made of extruded aluminum. Reinforce frame assembly at corners. Sliding panels are suspended from the top and 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 have finger pulls at each end. Provide a map rail with a tackable insert extending the length of the horizontal sliding unit. The map rail has map hooks with clips for holding sheets of paper. Provide two map hooks for each 1220 mm 4 feet of map rail. Marker rail extends the full length of the horizontal sliding unit. Dry erase markings are removable with a felt eraser or dry cloth without ghosting. Provide each unit with an eraser and four different color compatible dry erase markers.

2.8 COPYBOARD

****

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

Copyboards are used to document and print information directly from the writing surface.

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.

****

Provide wall mounted copyboard, 120V, UL listed, with [2] [_____] sided rotating screens, 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 [has grid lines] [and] accepts dry erase markers. Dry erase markings are removable with a felt eraser or dry cloth without ghosting. [Copyboard [has PC interface] [or] [is PC ready].] [Provide PC interface kit for each PC ready unit.] Copyboards [are hardwired] [have an electrical cord that plugs into an electrical wall outlet]. Comply with electrical work requirements in Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM. Provide each copyboard with an eraser and three different color compatible dry erase markers.

2.9 INTERACTIVE WHITEBOARDS

****

NOTE: Models are intended to be a collaboration system using a touchscreen/interactive panel.

Coordinate connectivity to local area network (LAN) and verify with the Government the need to address cybersecurity and Risk Management Framework (RMF).

Include size, resolution, input/output requirements, aspect ratio, touch points, and other salient points.
****

Provide interactive whiteboards are composed of a wall mounted interactive touch screen/panel with infrared touch technology. System includes keyboard, conference camera, [short throw projector] [[connection to local area network (LAN)] and built-in wireless], remote control, pen, and audio. [Provide a system compatible with Government furnished and Government installed PC and printer][Provide a system that includes a printer and that is compatible with a Government furnished and Government installed PC]. Interactive whiteboards [are hardwired] [have an electrical cord that plugs into an electrical wall outlet]. Comply with electrical work requirements in Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM.

2.10 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 must 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.
****

****
NOTE: Retain the last bracketed sentence requiring products with indoor air quality certification when the designer of record confirms local/regional availability of Greenguard or SCS products that does not impact cost effectiveness.
****

Provide [wall mounted] [ceiling mounted] [recessed mounted] motorized projection screen with 120V motor that is lubricated for life, quick reversal type, has overload protector, integral gears, and preset

accessible limit switches. [Provide recessed mounted projection screens with an operable closure door and access panel.]Provide flame retardant, mildew resistant, [glass beaded] [white matte] [_____] screen [with [white] [black] masking borders] [that is tab tensioned. Tab tensioned screens have a vinyl surface that is stretchable]. Bottom of screen fabric is weighted with a metal rod. Provide roller of rigid metal at least [76] [127] [_____] mm [3] [5] [_____] inches in diameter mounted on sound absorbing supports. Motor is [end mounted] [or] [motor-in-roller] design. Provide screen with a 3 position control switch to stop or reverse screen at any point. Install the switch 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 is furnished and installed by the Contractor. [Provide ceiling recessed case of [extruded aluminum] [or] [wood with metal lined motor compartment]]. [Provide [wall] [ceiling] mounted case of [aluminum] [or] [steel] [or] [wood. Wood case is finished in [plastic laminate] [light oak] [medium oak] [walnut] [cherry] [mahogany] [_____]]]. Screen is UL listed. Comply with electrical work requirements in Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM. [Provide projection screens that meet the 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 projection screens.]

2.11 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 finish colors for required items [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 PLACEMENT SCHEDULE

****

NOTE: Identify location and mounting height of visual display units.

Identify size and type of visual display units only once in the contract documents.

Include additional information for the display track system. Specify the length of the wall track, and type and number of presentation components required per room.

****

[Location, size and mounting height of visual display units as shown on the drawings.] [Provide visual display units 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 visual display unit frame.

3.2 INSTALLATION

****

NOTE: Provide reinforcing at partitions to support visual display units.

****

Do not install items that show visual evidence of biological growth. Perform installation and assembly in accordance with manufacturer's printed installation instructions. Use concealed fasteners. Attach visual display units 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. Do not initiate installation until completion of room painting and finishing operations. Install visual display units in locations and at mounting heights indicated. Install visual display units level and plumb, and if applicable align doors and adjust hardware. Repair or replace damaged units as directed by the Contracting Officer.

3.3 CLEANING

Clean writing surfaces in accordance with manufacturer's cleaning instructions.

-- End of Section --