

SECTION 3.10 LAWA ART PROGRAM REQUIREMENTS

Please note that the requirements detailed in this document are for standard / typical / usual conditions expected by the LAX Art Program for all new construction/renovation. If any project is defined as outside the bounds of standard / typical / usual conditions, the principles described herein shall serve as the basis of design for the project.

PART 1 - EXHIBITION WALL AND DISPLAY CASE DESIGN & CONSTRUCTION

1.1 EXHIBIT TYPE AND MEDIA

- A. The LAWA Art Program exhibits paintings, photographs, drawings, site-specific installations, sculptures, mixed-media art/installations, kinetic art, video, digital projection, sound, multi-media and interactive art - by individual artists, or groups of artists.

1.2 EXHIBIT WALL AND DISPLAY CASE REQUIREMENTS

- A. All LAWA owned/leased Terminal Development Programs shall incorporate the design, fabrication and installation of museum-quality display walls, display cases, and dedicated infrastructure such as lighting, power and data. Designs require Art Program approval prior to 60% and 90% / 100% architectural design submittal.
- B. Displays shall be simple and clean to make the exhibition wall or case a blank canvas for exhibitions. Displays shall be designed to be as versatile as possible. Adding embellishments or making the case an irregular shape will make it difficult to select art to place inside.
- C. Materials used for display construction shall be chosen carefully because component materials can easily become a significant source of pollutants or harmful fumes for displayed objects. Outgassing from materials used in the construction of the exhibition case and/or coatings used for lining or finishing the case interiors can be destructive.
 - 1. Displays must be constructed of safe, durable, and cleanable materials such as metal, glass, Plexiglas, or sealed woods.
 - 2. Separating certain materials from the display section of an exhibition by lining relevant surfaces with a barrier (drywall) or impermeable film will help protect items from damage. Any fabrics that line or decorate the case (e.g. polyester blend fabric), and any adhesives used in the process, must also be reviewed to determine any risk. If the display is to be painted, acrylic or latex paint in white eggshell/satin finish is preferable.
 - 3. Storage shall be incorporated into display cases and be placed out of sight, in the base or behind the backboard of a case.
 - 4. Whenever possible, the exhibition area shall be within view of security cameras.

1.3 ART DISPLAY CASES

- A. Overall
 - 1. The overall aesthetics of the displays cases shall be simple, clean, and visually integrated with the Terminal design and interior finishes. The design should not draw attention away from the exhibition with mullion-free glazing systems for an unfettered view of the case contents. The materials selection and quality of fabrication and

installation shall be safe, robust, and durable enough to resist frequent exhibition changes as well as normal wear and tear in an airport passenger terminal environment.

B. Accessibility, Maintenance, and Security

1. Display cases shall allow for attachment of suspended, wall- and floor-mounted, 2- and 3-dimensional work in all media.
2. Minimum uniform clear depth of interior display area shall be 18 inches. Minimum clear height of interior display area shall be 48 inches.
3. Case access shall permit adequate room for loading and safe installation of a single object as close as possible in size to the display area.
4. Floor within case shall be with removable panels for access, maintenance and change-out of floor finish material.
5. Display case glass shall be low iron (ultra-clear), UV protected safety glass. Any adjacent or nearby glass windows/skylights shall be UV protected safety glass.
6. Removable/movable and lockable (keyed) glass system to access and protect art works.

C. Finishes and Interior Filtration/Climate Control

1. Walls and floors should be reinforced with (wood) sub-panels for mounting artworks and finished to appear seamless. Finished interior surfaces shall be paintable.
2. Interior finishes and furniture should be made of low-formaldehyde or sealed products.
3. The base shall be stainless steel satin finish up to 6" above floor and solid surface panels for all other exposed surfaces not requiring glass.
4. Filtered ventilation (i.e. filtered vents) shall be incorporated, avoiding a completely sealed environment; allowing air exchange with use of HEPA filters, etc.
5. Provide options for procuring a stable climate-controlled environment, desiccants, or passive and active climate stabilization systems. Humidity shall remain within 50 – 72%.

D. Technical Information and Materials

1. Art Program shall review and approve single point load capacity and uniformly distributed load capacity for interior display case walls and floors.
2. Loads acting as a result of art hung on the wall of the case shall be assumed to reach a maximum of 30 pounds per square foot (psf) over the full height of the case.
3. Loads acting as a result of art fixed to the floor of the case shall be assumed to reach a maximum of 500 pounds point load over a one foot square area.
4. Loads acting as a result of art hung from the ceiling of the case shall be determined during the design phase wherever it is appropriate to support vertical loads.
5. Electrical and data service shall be provided by Architect to the location of the case for distributing power/data as required by IMT and POC respectively, to form a complete systematic install.
6. Task lighting (LED) shall be incorporated for working within the display case.
7. If freestanding, cases shall contain an internal structural steel frame anchored to the base building in a method that allows for discrete attachment and detachment and engineered as required by applicable codes and regulations.

8. Free-standing cases shall be able to hold up to 50 pounds per square foot plus 200 pounds point load over 4" x 4".

1.4 ART DISPLAY WALLS

- A. Designated art walls shall be finished with 5/8" drywall over 5/8" fire rated/retardant plywood sheathing.
- B. Art walls are to remain blank, clean and seamless for Art Program. Keep art wall locations clear of ATMs, vending machines, thermostats, SmarteCartes, chairs, BIDS/FIDS/GIDS, mechanical or light switches, fire strobes, fire extinguishers cabinets, AED cabinets, wayfinding or signage, wall-mounted security cameras, and any furniture or fixture as allowed by Code.
- C. Art Program shall review and approve single point load capacity and uniformly distributed load capacity for art display walls.
- D. Loads acting as a result of art hung on the wall (up to 8 inch depth) shall be assumed to reach a maximum of 30 pounds per square foot (psf) over the full height of the wall.

PART 2 - LIGHTING

2.1 GOALS

- A. The goal of this section is to provide standards for all art lighting at Los Angeles World Airports (LAWA). Additional discipline-specific guidance related to electrical work can be found throughout the Design & Construction Handbook (DCH) including, but not limited to electrical and sustainability guide specifications. These standards provide information for the art lighting component at LAX and provide the project design team the ability to have a unique lighting experience while keeping with LAWA guidelines. As LAX is a transitory space, the lighting requirements should be considered as a transition space where long-term viewing of art at close distances is not the predominate experience.

2.2 GENERAL

- A. Art lighting fixtures and design shall provide the lighting levels, visual comfort, color rendering and aesthetics to complement the artwork and the area in which it is installed. Lighting of artwork is especially important to LAWA and all art lighting design, **including photometric calculations**, shall be approved by LAWA prior to submitting 90% construction documents for plan check. All lighting shall be installed in areas that are accessible by ladder or lift for ease of maintenance. Artwork types anticipated include wall-mounted, floor-mounted, suspended, free-standing cases and built-in casework.

2.3 STANDARDS

- A. The art lighting design shall follow the following industry standard guideline:
 1. IES Lighting Handbook, 10th Edition.
- B. The art lighting design shall reference the following industry standard guideline:
 1. ANSI/IES RP-30-17 Recommended Practice for Museum Lighting.

2.4 LUMINAIRE REQUIREMENTS

- A. All lighting design shall be high efficacy, energy efficient and shall comply with the latest Title 24 requirements. Dimmable LED's shall be required utilizing 3000K - 3500K color

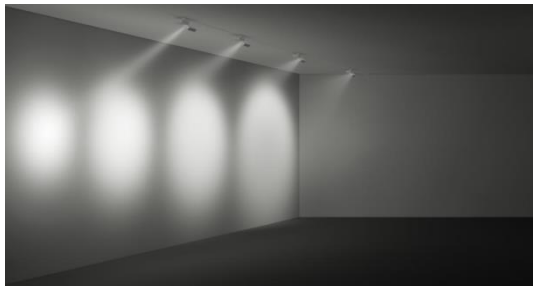
temperature (LAWA requirement); provide consistent color temperature (tight binning), high CRI (85+), and rated life >50,000 hours.

1. General
 - a. Luminaire manufacturer shall have a minimum of five (5) years' experience in the manufacture and design of LED products and systems and no less than one hundred (100) North American installations.
 - b. Unless otherwise specified, all LED luminaires and power/data supplies shall be provided by a single manufacturer to ensure compatibility and consistency.
 - c. All LED sources used in the LED luminaire shall be of proven quality from established and reputable LED manufacturers and shall have been fabricated after two (2) years from current date.
2. Replacement and Spares
 - a. Manufacturer shall provide written guarantee of the following:
 - (1) Manufacturer will keep record of original bin for each LED module and have replacement modules from the same bin available for five (5) years after date of installation.
 - (2) Manufacturer will keep an inventory of replacement parts (source assembly, power and control components).
 - (3) Manufacturer's LED system will not become obsolete for ten (10) years: Manufacturer will provide exact replacement parts, or provide upgraded parts that are designed to fit into the original luminaire and provide equivalent distribution and lumen output to the original, without any negative consequences.
 - b. All parts of system shall replaceable in field. Manufacturer shall provide written guarantee of the following:
 - (1) Manufacturer has in place a written recycling and re-use program, and will accept returned product and/or components for recycling or re-use.
 - (2) Manufacturer will properly dispose of non-recyclable components that are deemed harmful to the environment.
 - c. System shall carry a full warranty for five (5) years. Additional warranty may be purchased by the project or Owner.
3. Products and Components – Performance
 - a. LED luminaires and components shall be UL listed or UL classified (or equivalent approved agency such as ETL).
 - b. LED luminaires and components shall be CE certified.
 - c. LEDs shall comply with ANSI/NEMA/ANSI C78.377-2008 – Specifications for the Chromaticity of Solid State Lighting Products. Color shall remain stable throughout the life of the lamp. Color shall match approved sample.
 - d. LEDs shall comply with IESNA LM-80 – Standards for Lumen Maintenance of LED Lighting Products.
4. LED sources shall have no measurable (UV) or infrared (IR) emission in the light beam.
5. Luminaire shall meet a minimum flicker threshold of 120Hz. (IES recommendation)
6. Luminaires shall have at least 50 lumens per Watt out of the aperture (efficiency).
7. Preferred manufacturers include:
 - a. Lighting Services Inc.

- b. Edison Price Lighting
 - c. Erco Lighting
 - d. Intense Lighting
 - e. Philips Lightolier
 - f. Endo Lighting Corp
 - g. Solais Lighting
 - h. Luxam Lighting
 - i. Cree Lighting
 - j. Nordlux
 - k. Opto Light
8. All fixtures shall be approved by LAWA prior to specification, provide sample for review.

2.5 LUMINAIRE APPLICATION

- A. Track-mounted lighting shall be utilized for most art lighting to allow for lighting of many different types of artwork and easy adjustment of lighting when artwork changes.
1. Track shall be continuous for the full length of the art locations, or contain breaks no larger than 12 inches. (LAWA requirement)
 2. Luminaires shall allow for full adjustment of pan and tilt angles to allow aiming at artwork. Pan and tilt angle indicators are desired “for tilt and rotation precision. This is especially important where multiple accents are used in close proximity and where each is to produce an identical lighting effect. Also desired is locking capability to lock tilt and aim once set in the field. This minimizes, if not eliminates, misalignment that can occur during relamping or cleaning.” (IES Lighting Handbook 10th Edition 15.1.2.1)
 3. Luminaires shall allow for field changing of optics (reflectors) and integration of multiple field-changeable optical accessories (louvers, lenses etc.) and glare reduction accessories (snoots, visors). This is important to allow for shaping of the light on the wall from general wash to specific highlighting of various size artworks, as well as reducing luminaire brightness and glare.



Erco Lighting

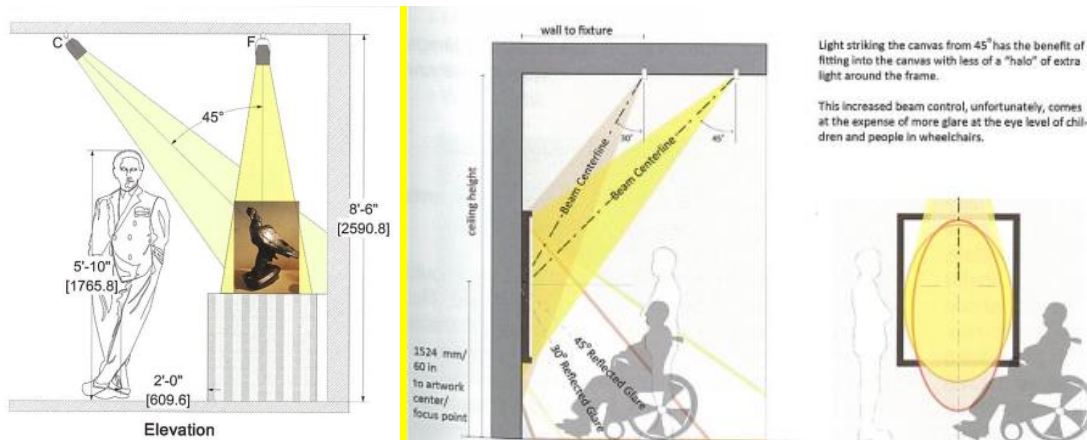
- B. Built-in and free-standing cases shall have integral casework lighting of artwork – external lighting may create veiling reflections in the glass. Coordinate with casework designer. Luminaire types may include linear, recessed or surface-mounted adjustable.
1. Luminaires shall be hidden from view wherever possible.
 2. Linear luminaires shall be lensed to prevent view or reflection of individual LED diodes.
 3. Remote power supplies and dimmer controls shall be located in a secure, concealed, accessible and well-ventilated location away from artwork.

4. Casework glass shall be non-reflective glass to prevent veiling reflections over views of the artwork.

C. Motorized luminaires may be considered for special applications.

2.6 LOCATIONS AND ANGLES

- A. Industry standard is a 30-35° aiming angle to the artwork to prevent glare and veiling reflections on glass. The airport environment is largely transitional so there is less concern of glare and veiling reflection and more focus on uniform light levels created by higher aiming angles. Locate track to provide a nominal 45° angle to the artwork. Lower angles than 45° (closer to the wall) will provide less uniform light levels, higher angles than 45° (further from the wall) create more risk for direct and reflected glare and shadowing of art by visitors.



ANSI/IES RP-30-17 Museum Lighting

- B. Per existing LAWA standards, a 6' setback from the wall is standard for single-story walls to provide uniform light levels across the wall for any size artwork, and to allow for artwork of varying depth off the wall including free-standing artwork against the wall. Multiple track locations may be required to provide appropriate lighting angles and uniform light levels for taller walls.
- C. Provide wide-optic "wallwash" or "flood" luminaires evenly spaced one to three feet on center to provide uniform light levels across the top of wall. Also allow for medium- or narrow- optic luminaires evenly interspersed to light the bottom of the wall to match light levels from the wallwash luminaires. These can also be used to spotlight/highlight the artwork against the rest of the wall/wallwash. These luminaires shall be equipped with accessory lenses such as linear spread lenses, softening lenses for more even illumination or to fine-tune the distribution.

2.7 CONTROLS

- A. All art lighting shall be dimmable. Provide dual-circuit-dimmable track with separate control every 14-16 feet (LAWA requirement) to allow for separate dimming of wide- and narrow-optic luminaires, and/or lighting of different artwork to different light levels. Alternatively provide on-board or wireless (Bluetooth) dimming of individual luminaires. Art lighting shall be switched separately from the rest of the architectural lighting to allow for turning off late at night or if art is not being displayed at that location. All controls and dimmers shall be in a secure, concealed and accessible location.

2.8 LIGHT LEVEL CRITERIA

- A. Provide light levels on artwork walls for five to ten times the average ambient light levels for “Feature” level emphasis on the artwork (IES Lighting Handbook 10th Edition Table 15.2). Provide light levels of 60-80 foot-candles average, 140 foot-candles maximum (LAWA requirement).
- B. Light level uniformity across the individual artworks should be 2-to-1 average-to-minimum and 4-to-1 maximum-to-minimum. Uniformity across entire walls should be 10-to-1 maximum-to-minimum (IES Lighting Handbook 10th Edition 15.1.2.3).
- C. Light levels should be provided with artwork light sensitivity taken into account to reduce risk of significant deterioration.

2.9 LIGHTING DESIGN SUBMITTALS

- A. Provide photometric calculation, based on actual architectural conditions, including appropriate reflectance values and light loss factors. Submit to LAWA Art Program for review and compliance.
 - 1. Calculations shall be done with software such as AGI 32 or Visual.
 - 2. Calculations shall be done in point-by-point format with elevation views and shall include mounting height, on-center spacing, luminaire type, distance to wall, lumen information, light loss factor information and all appropriate industry standard levels. Elevation views shall show calculation points at 2’ on center spacing in both directions, from floor to ceiling of the art location wall.
- B. Design shall indicate initial system luminaire quantities as well as system maximum capacity of luminaire quantity or power.

2.10 LIGHTING DESIGNER QUALIFICATIONS

- A. The lighting designer shall be a member of International Association of Lighting Designers or a Certified Lighting Designer.

2.11 EXTRA STOCK

- A. Furnish to the Owner and store at the site where directed, extra stock of each type of lighting fixture type and installed in the Project in quantities as required by Owner, packaged in manufacturer’s unopened cartons and identified as to contents by fixture type.
- B. Furnish items above with appropriate quantity of each optical accessory, reflectors, glare shielding or other components available for the luminaire.

2.12 INSTALLATION

- A. Provide labor and materials for final aiming of all adjustable fixtures under the Architect's supervision. Aiming shall take place immediately before building is turned over to Owner, after regular working hours where required.
- B. Provide setting of dimming levels under the direction of the commissioning agent or Architect/Lighting Designer.
- C. Provide training in system operation for Owner.

PART 3 - POWER AND DATA

3.1 INFRASTRUCTURE

- A. Provide infrastructure for electrical power and data for future art exhibitions and cultural performances as follows:
1. Art Exhibition Locations:
 - a. At least two dedicated power and data outlets at each art wall location. For art exhibition walls larger than 45' long, power/data must be evenly spaced and located at specified intervals, approx. every 15'.
 - b. Position power and data outlets at the top of the wall behind soffits recessed outside of the display area, or mounted in ceilings directly above display walls.
 - c. Power for art exhibition locations shall be provided as dual-outlet, 20amp dedicated circuit. Each wall shall have a minimum of one (1) dedicated and distinct 20amp circuit.
 - d. Data ports shall be duplex data (CAT6 Ethernet).
 2. Cultural Performance Locations:
 - a. Two dedicated distinct 30amp power outlets in walls or at base of columns.
 - b. Power for cultural performance locations shall be provided as 30amp dedicated circuit.

END OF LAWA ART PROGRAM REQUIREMENTS