



FORT LAUDERDALE-HOLLYWOOD
INTERNATIONAL AIRPORT

BROWARD COUNTY, FLORIDA



your **portal** to
paradise

Broward County Aviation Department

**TERMINAL
DESIGN
GUIDELINES
MANUAL**

Leigh|Fisher

in conjunction with

ACA I
associates, inc

BROWARD COUNTY AVIATION DEPARTMENT TERMINAL DESIGN GUIDELINES MANUAL

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
Chapter 1	Introduction	
1.1	Introduction to Terminal Design Guidelines Manual	2-4
1.2	General Conditions	5-8
1.3	Design Intent Integration	9
Chapter 2	Design Guidelines	
2.1	Innovations for Airport Terminals	10-11
2.2	Building Envelope Facades & Roof	12-15
2.3	Materials and Finishes	16-26
2.4	Furnishings, Fixtures and Equipment	27-39
2.5	Signage, Wayfinding and Advertising	40-41
2.6	Lighting	42-45
2.7	Art in Public Spaces	46
2.8	Sustainability	47-48
Chapter 3	Appendices	
3.1	Guideline Revisions	49
3.2	Definitions and Abbreviations	49-50
3.3	Broward County Aviation Department Contacts	50
3.4	CADD and BIM Standards	50-51
3.5	Design Guidelines Interpretations	51
3.6	Review Process, Submittal Requirements and Approvals	51-53
3.7	Product Data Sheets and Outline Specifications	53
3.8	Terminal Plans	53

CHAPTER 1 Introduction

1.1 Introduction to Terminal Design Guidelines Manual

The 21st century airport terminal is a passenger service and technology hub that is in constant motion. Within the terminal various activities and convenience services are provided to travelers who have increasing needs for less stressful and more satisfying traveling experiences. Terminal spaces must be designed to function more efficiently and serve travelers more effectively. This requires the airport terminals to be optimized in their design and performance as well as integrated as seamlessly as possible with the processes that are carried out in the day to day functions of the Terminal.



Figure 1: Norman Y. Mineta San Jose International Airport



Figure 2: San Diego International Airport Terminal

The Fort Lauderdale Hollywood International Airport consists of four Terminals and six Concourses (see *figure 3*). Each Terminal has two floors. The first floor is for arrivals and the second floor is for departures. Terminals 1, 2 and 3 are for domestic and international arrivals and departures. Terminal 4 is for international arrivals and departures.

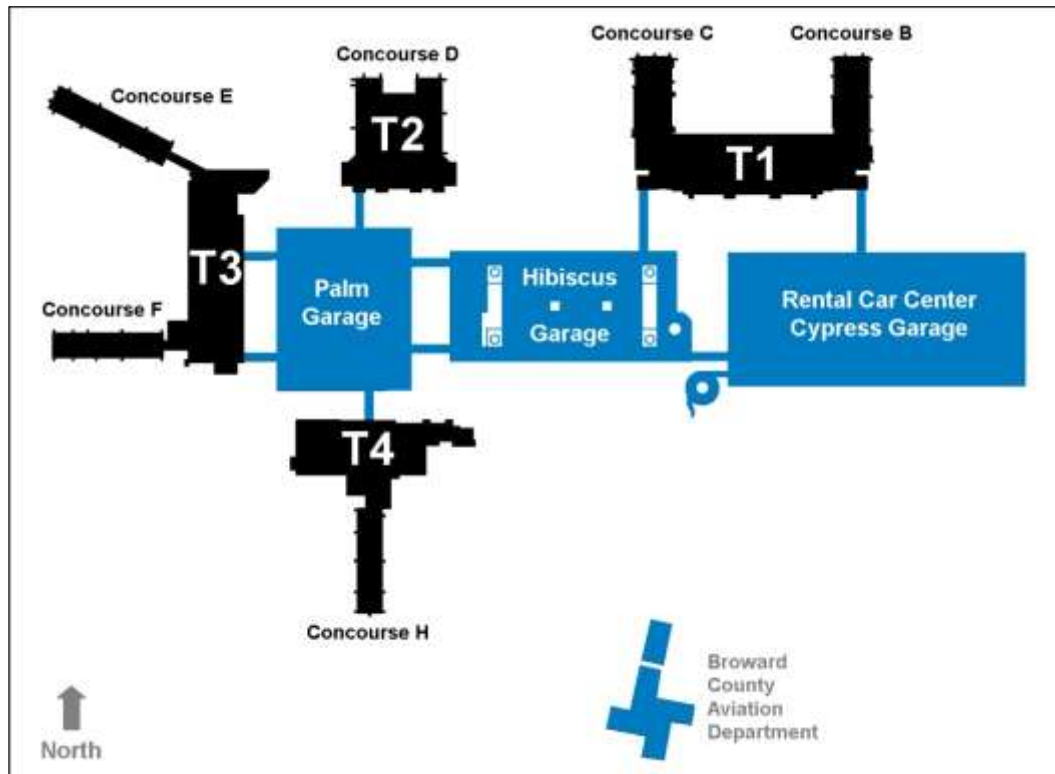


Figure 3: Terminals and Concourses Key Plan of Fort Lauderdale Hollywood International Airport

Diagrammatic floor plans for each Terminal and their associated Concourses are provided in the Appendix of this document. To help ensure a consistent design approach for the integration of each Terminal project into the Fort Lauderdale Hollywood International Airport this Terminal Design Guidelines Manual or "Terminal DGM" has been developed. The document's intent is to help bring each Design Professional's ideas into the fabric of the airport which in and of itself represents its own unique regional features and local culture through the adopted Conceptual Design Statement of "your Portal to Paradise" and other airport branding efforts. It is a resource that helps to clearly outline the Terminal design parameters. It serves as a unifying document for modernization projects within the airport Terminals and their design and performance optimization.



Figure 4: Example of an International Airport Terminal

The Design Guidelines are one in a series of guidelines that any project within the Fort Lauderdale Hollywood International Airport Terminals must comply. Each document is a volume, and part of a larger, comprehensive framework for the development of projects in the airport. Each document is coordinated and works in tandem with the others. (see figure 5). There are two volumes of Design Guidelines; Terminal and Tenant. Depending on the project, one or the other will govern the design decisions for a project. In addition to the Terminal and Tenant Design Guidelines there are the following:

- **Construction Guidelines** that provide a technical reference to the acceptable components and assemblies that defines a project.
- **Wayfinding Guidelines** that establish a uniform approach to signage, and passenger navigation through the Terminals
- **Sustainability Management Plan** which establishes best practices and minimum standards for environmentally sensitive design.

All Terminal work within the Fort Lauderdale Hollywood International Airport will be governed by the Terminal DGM and three other BCAD documents (see figure 5). A Compliance Review for the Terminal DGM will be conducted by a BCAD Design Review Committee (DRC). Refer to section 3.6 of this document for additional information.

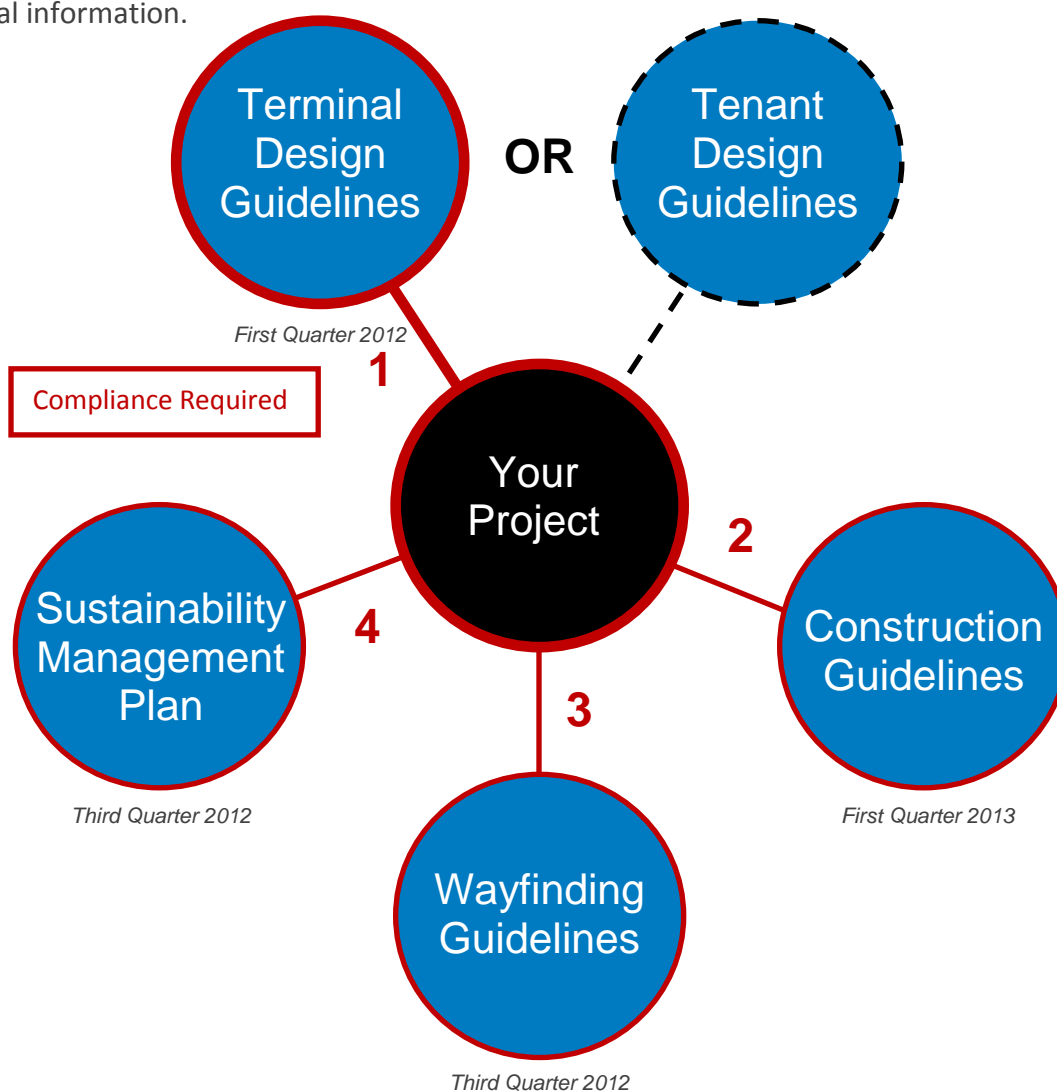


Figure 5: Applicable BCAD Standards for Terminal Projects

1.2 General Conditions

The Terminal DGM applies to all projects at the existing Fort Lauderdale Hollywood International Airport associated with the Terminals including curbside. All airport terminal expansion and improvement projects that will be performed must have written authorization by BCAD.

The Terminal DGM manual is not intended to be a static document. It is intended to be a "Living Document" that BCAD may amend at anytime. Adaptation to traveler's needs, maintenance requirements, cost reduction and changing cultural trends will require periodic updates to the Terminal DGM. Design Professionals should always check with their BCAD Project Manager, prior to the commencement of any work, to verify if the Design Guidelines Manual has been updated.



Figure 6: Existing Condition at Fort Lauderdale Hollywood International Airport Terminal One

The following list of General Conditions applies to all Licensed Design Professionals that intend to provide Architecture, Engineering and Interior design services for the airport terminals. Professionals shall:

- Obtain a copy of their executed Broward County Work Authorization and Notice to Proceed prior to the commencement of any work.

- Download and Review all associated BCAD Design Guidelines and Plans (e.g. Terminal, Construction, Wayfinding and Sustainability)
- Obtain and review the most updated FLL Master Plan available from BCAD.
- Review Transportation Airport Cooperative Research Program (ACRP) Reports, FAA design Guidelines and
- Obtain and review the TSA Document: “Recommended Security Guidelines for Airport Planning, Design and Construction” (http://www.tsa.gov/assets/pdf/airport_security_design_guidelines.pdf) (see figure 7).
- Verify the as-built location, conditions and physical dimensions of the terminal scope of work and the conformance of the final working drawings. Failure to do so shall be at the sole risk and expense of the Design Professional.
- Coordinate with BCAD’s signage consultant via BCAD’s Planning Director for all work that may impact the airports wayfinding signage design.
- Provide temporary construction barriers to prevent dust, noise, and unauthorized access during Terminal improvements.
- Provide a temporary construction wall with a door locked at all times that has a numeric lock combination provided by BCAD
- During Design Development, submit for a BCAD design review to assure compliance with the goals and parameters of the Terminal DGM.
- NOT reference the Terminal DGM in any construction documents or project specifications.
- Become familiar with BCAD’s Project Review Committee (PRC) and Design Review Committee (DRC) processes and procedures (see appendix section 3.6).



Figure 7: Recommended Security Guidelines for Airport Planning, Design and Construction

The Broward County Aviation Department reserves the right to reject any proposed design project associated with the Terminals that it considers to be in aesthetic conflict with the design goals and parameters of the airport.



Figure 8: Existing Fort Lauderdale Hollywood International Airport Terminal 4 Ticketing

Conditions at the Fort Lauderdale International Airport vary by Terminal. The overall aesthetic is dated and requires well designed improvements. Natural and artificial light levels are lacking in many areas. Concourse ceilings are low and corridors are dull and boring. Elegant and sophisticated solutions are needed by design professionals to achieve BCAD's goals for a modern 21st century airport. Important considerations include:

- Appearance
- Cost
- Maintenance
- Sustainability

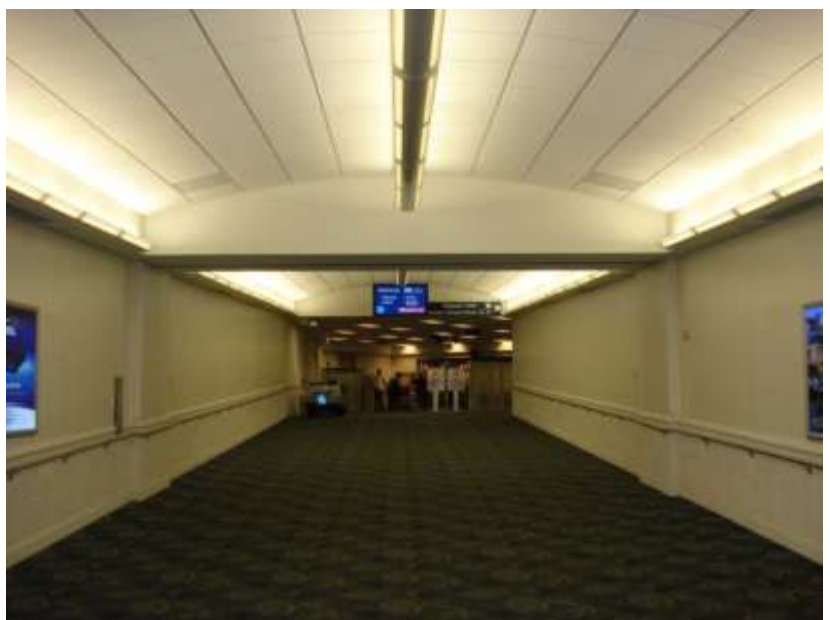


Figure 9: Existing Fort Lauderdale Hollywood International Airport Concourse

The intended definitions of these terms are as follows:

Appearance

Appearance, also referred to as aesthetics, shall mean the integration of the project elements and systems into a coherent design theme based upon required and/or accepted functions, color palettes, patterns, lighting levels and quality of workmanship. The appearance of all Terminal Projects shall support the airports design intent.

Cost

Cost shall mean the economy of the materials and/or elements that may be specified by design professionals. It shall also mean the life cycle cost associated with the Operations and Maintenance of the project elements and systems. Design solutions for all Terminal Projects should focus on Life Cycle Cost Optimization while maintaining the intended appearance and high performance standards.

Maintenance

Maintenance shall mean the upkeep, care, repair and replacement of the project elements and systems in order to provide a sustainable operations plan that optimizes life cycle costs. This includes incorporating best practices for Facilities Management and Asset Sustainability. All areas, elements, and systems must be accessible for maintenance and include clearance for BCAD's mechanical lift to ensure cleaning and repairs can be performed.

Sustainability

Sustainability shall mean the adoption of design practices and materials that minimize negative environmental and human health impacts during their life cycle. It includes energy conservation, low emitting materials, recycled content, renewable and regional materials, recycling of construction debris and the recycling of other material assets that have reached their maximum life cycle (e.g. carpeting, metal airport furniture, abandoned conduits and old ductwork).



Figure 10: Consider Aesthetics & Design Excellence



Figure 11: Provide Unobstructed Floor Area for Maintenance and Cleaning of Curtain Wall Framing.



Figure 12: Consider Sustainable Design Features

1.3 Design Intent Integration

A successful modern Airport Terminal reflects the local and regional culture of its geographic location. The Broward County Aviation Department has adopted a unifying theme for the Fort Lauderdale Hollywood International Airport Terminal projects. FLL is a major arrival point in the South Florida region. It is a convenient airport for travelers because it is accessible, user friendly, and economical. The airport Terminals are the portals to Broward County and its diverse communities. It is a region that is recognized nationally and internationally due to its unique features that include:



Figure 13



Figure 14



Figure 15



Figure 16



Figure 17



Figure 18



Figure 19

- Bright blue skies, variety of exotic palms, and invigorating sunlight
- Lush green vegetation with other vibrant colors
- Beaches, riverwalks, and long boardwalks
- A boating and yachting and cruise ship capital
- Active arts and entertainment venues
- Natural wonders (FL Everglades)
- International business travelers
- International vacationers
- Bustling beachfront cafes, restaurants, cocktail lounges and nightlife
- Elegant downtown cafes, upscale restaurants and shopping opportunities
- Growing young, high-tech professional population in the high rise district
- Diverse demographics of the local population including snowbirds as well as people with Caribbean and Latin ancestry.

Architects, Engineers & Interior Designers shall adopt the Concept Statement of:

your **portal to paradise**

This shall drive the development of creative, innovative and optimized design projects for Terminals One, Two, Three and Four. This theme coupled with the design professional's development of efficient passenger processing and a unique spatial experience through lighting, materials, textures, colors, and systems integration should all contribute to an elegant and sophisticated Terminal space. The goal is to create a memorable and iconic traveling experience for passengers arriving and departing from the Fort Lauderdale Hollywood International airport. All Terminal projects should capture the vitality and beauty that Fort Lauderdale, Broward County and South Florida have to offer visitors.

CHAPTER 2 Design Guidelines

2.1 Innovations for Airport Terminals



Figure 20: Indianapolis International Airport by HOK

“Airport terminal and landside projects are projected to account for well over one-half of the planned development costs at large- and medium-hub airports in the United States over the next 5 years. With construction costs increasing faster than inflation, the need for innovative solutions to address the common terminal and landside issues facing many U.S. airports is more crucial than ever.” (Source: ACRP Report 10 Innovations for Airport Terminal Facilities, 2008)

In order to transform an existing airport terminal into a 21st facility that enhances operational efficiency and improves the passenger’s levels of service design professionals must be innovative. Every aspect of how one person or several hundreds of people are processed through the Terminal needs to be considered. This innovation by the Designer begins at curbside and continues along the passenger’s route of travel through the Terminal and to their gate.

BCAD’s objectives are to have all Designers contracted to do work at Fort Lauderdale Hollywood International Airport consider cost effective design and operational solutions. They also want professionals to focus on how a passenger can be quickly processed to ensure a unique, pleasant, and convenient traveling experience. The designer must recognize all of the applicable components of the existing facilities, while creating a new, clean and inviting image that enhances operational efficiency while improving the level of passenger service. Architects, Engineers and Interiors Designers are strongly encouraged to familiarize themselves with the Airport Cooperative Research Program (ACRP) “ACRP Report 10 Innovations for Airport Terminals”, sponsored by the Federal Aviation Administration.

http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_010.pdf

The innovations listed below are items that were identified in the ARCP Report 10 and offer innovative Designers new opportunities to address common issues that passengers face on the terminal landside:

- Process-based departures hall
- Passenger-processing facilities
- Self-service baggage check
- Bag-check plaza
- Supplemental curbsides
- Passenger-assistance parking area
- Low-profile passenger baggage devices
- High-capacity flow-through elevators
- Consolidated meeters-and-greeters area
- Arrivals lounges

In February of 2010 the Indianapolis International Airport, designed by HOK, was ranked the best in passenger satisfaction.



Figure 21: Example of Terminal Passenger Processing with Self Check-in Kiosks Adjacent to Curbside

“J.D. Power and Associates has given the HOK-designed Col. H. Weir Cook Terminal at Indianapolis International Airport its highest marks in passenger satisfaction in a survey of 64 major airports. The \$1.2 billion terminal earned 777 points, the most of any airport surveyed in airport accessibility, baggage claim, check-in and baggage check-in process, terminal facilities, ease of security checks, and food and retail services.” This is an example of the type of innovative design that BCAD encourages at the FLL airport.

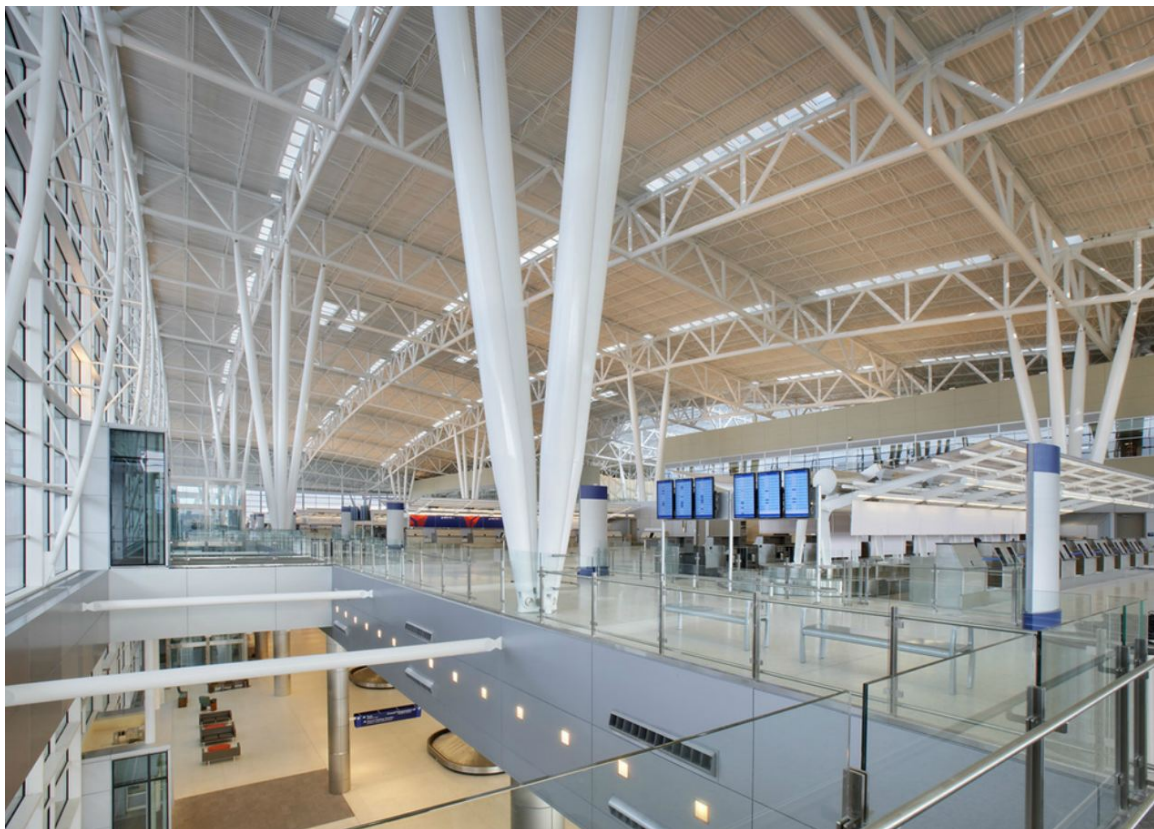


Figure 22: Indianapolis International Airport by HOK

2.2 Building Envelope Facades & Roof

Walls, Curtain Walls & Storefronts

The curbside exterior facades of the airport terminals are one of the most important visual elements of the facility. An inviting appearance sets the stage for the curb appeal and announces the start of the passengers traveling experience. The existing curtain wall and storefront systems at the Fort Lauderdale Hollywood International Airport require modernization. All exterior walls shall be designed for hurricane velocity winds per the Florida Building Code. Criteria for curtain walls and storefront design shall include:

- Compliance with facility insurer's requirements (e.g. FM Global) obtained from BCAD.
- Curtain Wall or Storefront System must have a valid Miami Dade County Notice of Acceptance (NOA) for large missile impact.
- Base shall be a minimum of 12" in height.
- Material should be brushed stainless steel or aluminum with a durable metallic finish (e.g. kynar).
- All fasteners shall be stainless steel. Dissimilar metals will be separated by a manufacturers approved washer (e.g. neoprene or other approved non reactive material). Refer to the Specialty Steel Industry of North America's "Guideline for Selection of Fasteners Based on Galvanic Action."
- Orientation shall be vertical or an outward slant of no more than 15 degrees away from the Terminal. No curtain walls or storefronts that have a slope towards the Terminal will be allowed.
- Incorporation of solar control devices on all east, west and south facing facades.
- All glass wall systems will not be allowed on the exterior of the terminal.
- Samples of all curtain wall and storefront systems with their intended finish must be provided to BCAD during Design Development for review and approval.



Figure 23: Airport Curtain Wall System at Terminal One Curbside

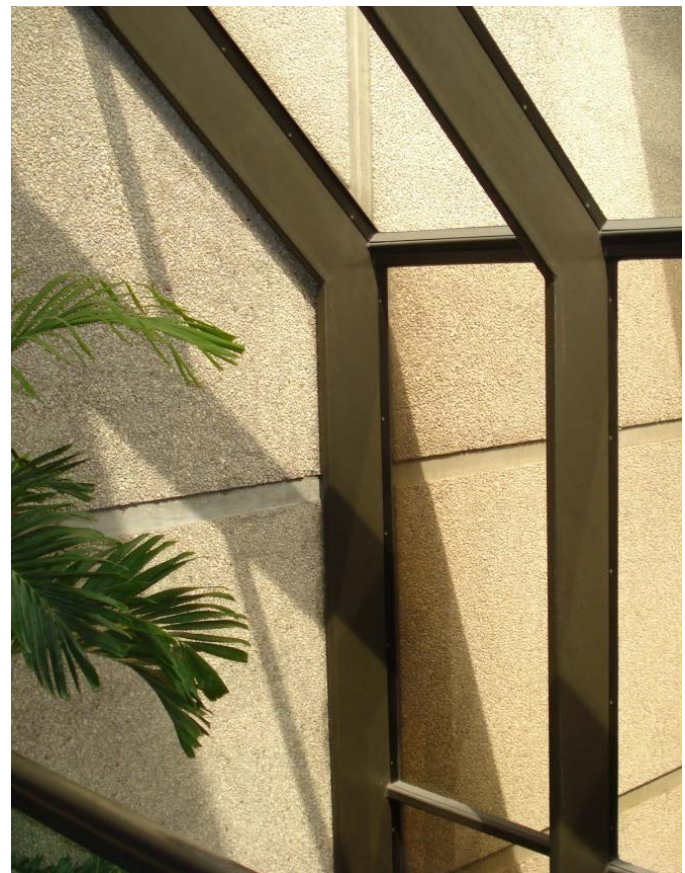


Figure 24: Existing Curtain Wall System at FLL
Undesirable Slope for Maintenance

Glazing

Daylighting, views and open space all offer comfort and provide for a less stressful travel experience. Designers shall provide the maximum amount of glazing and natural light for terminal projects involving the building envelop that is allowable by budget. Building performance (e.g. heat gain, glare reduction, orientation, etc.) must also be considered when selecting glazing for a project.

BCAD prefers a green or blue colored glass. All glass selections will be reviewed and approved by BCAD. Slot type glazing within an exterior concrete wall system similar to Terminal 4 improvements shall be considered by Design Professional for Terminals 1, 2 and 3.



Figure 25 Indiana International Airport



Figure 26: Detroit International Airport Concourse Glazing

Terminal Entrances

Design Professionals shall comply with the following requirements for all publicly accessible Airport Terminal Entrances:

- “Florida Americans With Disabilities Accessibility Implementation Act.” per Florida State Statutes 553.501 – 553.14

http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0500-0599/0553/0553PARTIIContentsIndex.html

Design Features that Architects and Engineers should consider at the Airport Terminal Entrances include the following:

- Automatic double sliding doors at exterior vestibule entrances
- Flush mounted thresholds
- Air Curtains either recessed into the ceiling or designed into the entry for enhanced energy performance at all exterior vestibule entrances
- No Carpet Tile at entrances
- Minimize grooved or textured surfaces that may cause noise from rolling luggage
- Coordinate the Integration of Airport Signage with BCAD’s Signage Consultant

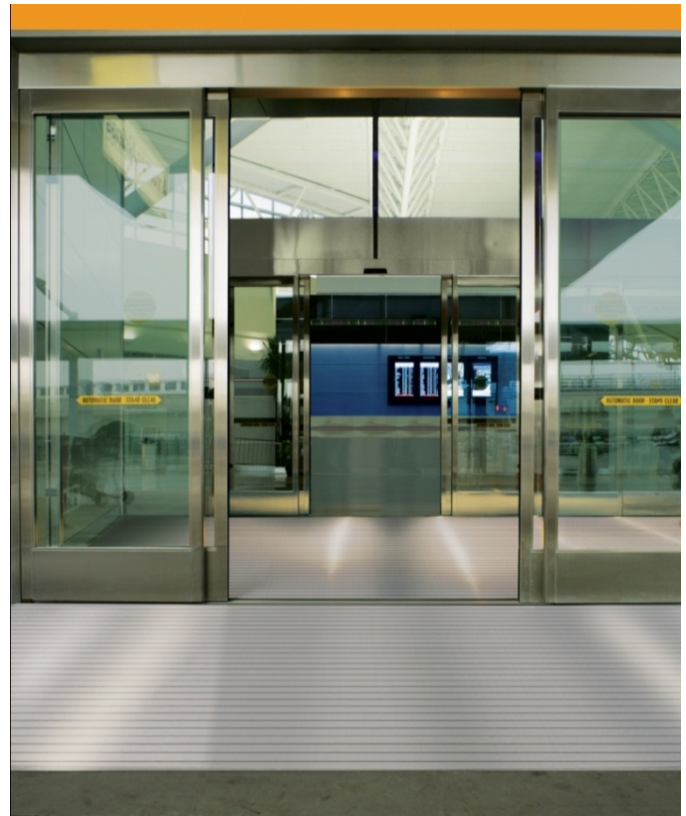


Figure 27: JFK International Airport Entry



Figure 28: Air Curtain Incorporated into Curtain Wall at Barcelona International Airport Entry

Terminal Roofing



Figure 29: Fort Lauderdale Hollywood International Airport

All proposed modifications to the existing roofing systems at the airport terminals must be approved by and coordinated with BCAD. The following criteria must be incorporated for all roofing designs:

- Any existing warranty of the roofing system must be maintained if the roof is not replaced (e.g. Terminals that were recently reroofed).
- Innovative but proven roofing designs will be considered
- New roofing systems will carry a 20 year warranty
- All roof assemblies and products must have a valid Miami Dade Notice of Acceptance (NOA)
- All Roofing systems must be FM Global approved
- A minimum R-value of at least 19.0 shall be provided uniformly across the entire roof area
- A single ply system (90 mil thick) with a highly reflective surface is preferred by BCAD
- Exposed metal roofs may be considered by BCAD at terminal to terminal connectors and walkways
- All roofed areas of the Airport Terminal will be accessible by aluminum roof hatches (with current Miami-Dade NOA) and external wall mounted transfer ladders that are galvanized or aluminum
- Lighting protection systems will be provided at all roof locations
- Roof equipment shall be screened from view
- Antenna farms shall be coordinated with the BCAD Telecommunications Department.



Figure 30: Bilco Type S Ladder Access Enhanced Performance Roof Hatch

2.3 Materials and Finishes

Aesthetics, durability, maintainability and sustainability will be the key drivers for all materials and finishes used in all Fort Lauderdale Hollywood International Airport Terminal modernization projects. Architects, Engineers and Interior Designers must incorporate materials and finishes that will be very durable and abuse resistant. All materials and finishes must be able to maintain their aesthetic appeal when exposed to high occupant use and potential impact by traveler's luggage. Design Professionals shall submit samples of all materials and finishes for review and approval by the BCAD. Lighter color materials and finishes that highlight the natural colors of South Florida are preferred.

Curbside Walkways



Figure 31: Curbside Concrete Sidewalks at Indianapolis International Airport by HOK

All exterior flooring and sidewalks shall be concrete with a broom finish. No patterned surface finishes will be allowed. No poured area of concrete shall be larger than 10' x 10'. The minimum thickness for all poured concrete sidewalks shall be 5". At entrances and along the Terminal's exterior wall Designer's should consider a thickened edge slab to help prevent cracking and support BCAD's maintenance lift.

Special attention by Design Professionals shall be given to control and expansion joints. All joints shall be coordinate with the handrail modules. A 1/2" wide joint must be provided around every column.

Curbside Handrails

Exterior handrails shall be stainless steel with heavy galvanized metal posts and pickets to match the existing handrail system (*see figure 32*). Dissimilar metal fasteners will not be allowed in order to avoid galvanic reactions. Design Professionals shall ensure that the module of the railing posts align with concrete joints.

Curbside Stanchions

The use of curbside stanchions is strongly discouraged. If utilized in a design all exterior stanchions must have an aluminum base and post to avoid rust stains on the concrete walkways at the terminals (*see figure 33*).

Curbside Bollards

Bollards shall be stainless steel with a sloped top. The protective bollards at Fort Lauderdale Hollywood International Airport are part of an engineered plan. Specific information regarding their design and performance criteria shall be obtained by design professionals from BCAD (*see figure 34*).

Curbside Concrete Columns

At the bottom 8'-0" of all exposed concrete columns design professionals shall provide a protective finish to prevent soiling and staining of the concrete due to passenger use. An exterior grade textured stainless steel column enclosure or other class 5 BCAD approved finish shall be considered by Architects and must be approved the BCAD Design Review Committee (DRC).

Curbside Soffits

Open soffits or exposed structure will not be allowed due to bird perching and nesting problems. Exterior Terminal soffits shall be clad with a metal panel system that one person can remove and repair (*see figure 35*). The panels shall be corrosion resistant due to humidity and salt air conditions.



Figure 32: Existing Handrails at Fort Lauderdale Hollywood International Airport



Figure 33: Standard BCAD Stanchion



Figure 34: Curbside Bollards at Fort Lauderdale Hollywood International Airport



Figure 35: Existing Metal Soffits at Fort Lauderdale Hollywood International Airport

Terminal Entry Flooring

Tiled entries will not be allowed in any Fort Lauderdale Hollywood International Airport terminal project (see figure 36). Flooring at all entries will be a recessed stainless steel grate that can be removed for maintenance and cleaning. (e.g. Floorometry, see figures 37-39).



Figure 36: Existing FLL Airport Terminal Entry

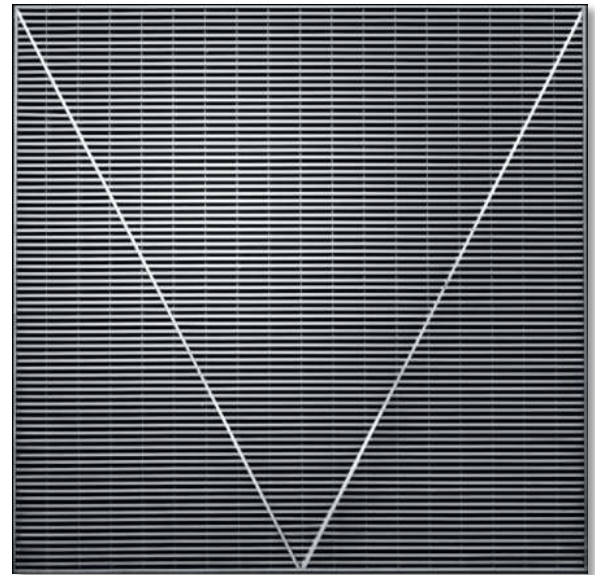


Figure 37: Proposed FLL Terminal Vestibule Entrance Flooring

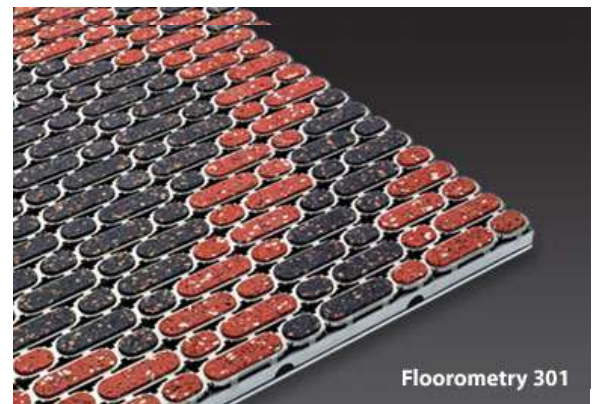


Figure 38: Proposed Alternate FLL Terminal Vestibule Entrance Floor



Figure 39: Proposed FLL Terminal Vestibule Entrance Flooring

Samples of all proposed vestibule entrance flooring shall be provided to BCAD during Design Development for review and approval.

Terminal Flooring

Poured in place terrazzo flooring will be used in the primary circulation paths of the terminals including public stairways and baggage claim areas. Primary divider strips will be 1/4" wide aluminum. Secondary divider joints will be 1/8" or 1/16" wide aluminum. Areas of continuous terrazzo flooring will not be larger than 10' x 10'. Smaller areas are encouraged to help minimize cracking. Designers shall provide antifracture and waterproofing membranes below the terrazzo to control potential cracking and moisture problems. The terrazzo specified by BCAD (*see figures 40 & 41*) is as follows:

- Terroxy Resin Systems: TM#10 – 2048
- Natural Finish 800 Grit with Terra Shine
- #3 Epoxy: 2001 White
- Chips:
 - 50% Crystal Glass #0,1
 - 40% Blanco Mexicano #0,1
 - 10% Classic MOP #2,3



Figure 40: BCAD Terrazzo Resin Systems
TM#10-2048

Provisions shall be provided for the floor substrate in order to assure a flush and level floor between terrazzo and other floor applications (e.g. carpet tile, etc.). Terrazzo flooring will not be allowed in restrooms due to ongoing problems with staining of the floors. Per BCAD, no pure surface coating or wax sealer shall be allowed. BCAD also reserves the right to request an artistic design for terrazzo flooring in the terminals. See figure 41a which is a cropped section of terrazzo floor art from Thomas Sayre's Mangrove Islands.



Figure 41a:
Section of Terrazzo
Floor Art from Thomas Sayre's
Mangrove Islands

Figure 41: Newly Installed Terrazzo Floor Standard at Fort Lauderdale Hollywood International Airport Terminal 4



Figure 42: Indianapolis International Airport by HOK – Terrazzo Flooring at New Terminal

Carpet tile 3' x 3' will be the preferred material at all concourse holding areas. Floor materials that will not be allowed in public areas include:

- Rolled carpeting
- Engineered wood
- Vinyl tile
- Vinyl sheet

Floor base materials within the Terminal Concourses will be 8" in height. Designers will provide a terrazzo base where terrazzo flooring meets a wall. Other hard and abuse resistant base materials will be allowed provided a color sample of the material and a material product sheet is submitted for review during the Design Development phase. Floor base materials that will not be allowed include rubber, vinyl and wood.

Terminal Walls

All airport terminal walls shall be of noncombustible materials, such as metal studs, channels, caps, and bracing. All gypsum board will have a minimum thickness of 5/8". Fire resistance ratings shall be designed per Florida Building Code requirements. Modular demountable wall systems with a non-perforated powder coating finish are preferred by BCAD. They may be incorporated into the first 10'-0" of wall height. Wood framing will not be allowed for use in any walls types. Colors for all painted wall surfaces will be reviewed and approved by the BCAD DRC. Exposed CMU walls will not be permitted. BCAD's preferred terminal wall painted finish is egg shell. Stainless steel corners guards (3.5" x 3.5" min., 14 gauge, type 304 screw-on), shall be provided at all wall corners.

Terminal Ceilings

Painted gypsum board ceilings will be allowed throughout the Terminals. Suspended ceiling grids with 2' x 2' and 2' x 4' acoustical lay-in tiles may also be used. The use of extra micro perforated metal panels (6" x 16"), on high ceilings is encouraged. Designers should also provide differentiated ceiling heights as well as material and color variation in order to enhance the passengers traveling experience through the FLL terminals. Linear metal ceilings with a wood-effect finish and other well designed ceiling elements will also be allowed. Use of suspended ceiling systems with individual pieces (e.g. flanges) that require balance or manual configuration will not be allowed. BCAD will review all proposed ceiling materials and provide written approval for their use.



Figure 43: Indianapolis International Airport by HOK
Ceiling at Security Screening Area



Figure 44: Indianapolis International Airport by HOK
Ceiling at Baggage Claim Area

Terminal Restrooms

BCAD will require that the design of all Terminal restrooms be two times (2x) the Florida Building Code occupant load requirements. A double circulation entrance is preferred. Entrances to restrooms shall be designed to accommodate side by side passengers with wheeled baggage. Doors will not be allowed. The openings shall be screened from public view so that no line of sight to fixtures, toilet accessories, and mirrors is possible. Restrooms shall have a split design to allow the cleaning of one half of each restroom (women's and men's). Service chases shall be provided behind all fixture walls and be a minimum of 2'-6" clear from the inside face of the metal framing. A 2'-0" wide lockable service door shall be provided at each chase. Floor drains and hose bibs are required in all chase areas.



Figure 45: Example of a Restroom Entry at Detroit Metropolitan International Airport

Terminal Restroom Floors

Floors shall be large format (min. 12" x 12") porcelain, epoxy terrazzo tiles, or recycled glass tiles with rectified edges and minimum thickness joints. Tile must achieve the code required cross slope and slope to the each required floor drain. Floor drains shall be provided at one per 150 square feet. Joint grout must be non-staining. An 6" high flush with floor cove base shall be provided. Colors of flooring will be light and natural. Patterns are acceptable with approval of the BCAD DRC. Floors shall be designed to be slip resistant when wet. Drains shall also be slip resistant and not allow spike heels to catch in them.

Terminal Restroom Walls

The structure of the walls will be sufficient to withstand impact and abuse by passengers with wheeled baggage carts. Walls shall be cement board taped and sealed at all joints with a glazed ceramic tile (minimum size of 6" x 6") finish. The epoxy grout joints shall be no larger than 1/8" and matches the color of the tile. The tile will run vertically from the top of the floor base to the bottom edge of the ceiling.

Colors of wall tile will be light and natural. Patterns may be allowed but will require review and approval by the BCAD Design Review Committee.

Terminal Restroom Ceilings

Ceilings will be a smooth and hard surface. Acoustical tile and metal ceiling tiles are not allowed. Variations in height are allowed with a minimum of 8'-0". Provide 18" x 18" (minimum) lockable door panels for access to services above the ceiling. All lighting within the ceiling shall be fully recessed and flush with the face of the ceiling.

Terminal Toilet Partitions

BCAD's toilet stall size is 3'-6"W x 6'-0"D. No stall sizes shall be less than 3'-0"W x 5'-6"D. Toilet partitions shall be ceiling hung. They shall have an embossed diamond textured stainless steel finish. Panels, ceiling pilasters, and doors shall be one inch thick and also fabricated from stainless steel. All hardware will be stainless steel. Wall, pilaster brackets and door hinges will be continuous. Design Professionals shall provide ADA accessible compartments and stalls as required.



Figure 46: Example of Existing Ceiling Mounted Stainless Steel Partitions in Restroom at FLL Terminal 1 Concourse "B"

Terminal Toilet Accessories

All toilet accessories shall be stainless steel and comply with ADA and FBC Code requirements. They may include but not be limited to the following:

- Grab Bars
- Toilet tissue dispensers
- Toilet seat covers dispensers
- Coat hooks
- Waste receptors
- Sanitary napkin disposal units
- Feminine hygiene vending machine
- Utility shelf units (24" L x 4" D in each toilet stall)

No wood blocking for the mounting of any device will be allowed. All wall reinforcement for the attachment of toilet room accessories shall be galvanized metal. Mirrors shall be provided over lavatories. Baby change units must be provided in all restrooms. Hand dryers shall be Dyson airblade. Soap dispenser shall be non-touch foam type powered by low voltage. They shall be integrated into the trough sink's countertop area along with a trash chute opening for paper towel disposal. The paper towel dispenser shall be installed over the trough sink area and aligned with the trash chute opening.

A janitor service closet will be provided at for each group of restrooms. The mop receptor shall be 24" x 24" x 12". A rough plated faucet with a hose end, pail hook, vacuum breaker and stops shall also be provided. Mop and broom holders will be designed to hang on adjacent walls.

Terminal Restroom Fixtures

Lavatories shall be a double trough type with a continuous shelf above. Material shall be corian or other approved solid surface material (*see figure 48*). Color shall be integral and coordinated with wall and floor tile finishes. Lavatories shall be mounted with a wall support system sufficient to resist a 1000 pounds pull out force. Paper towel dispensers shall be provide between trough lavatories. They shall be hardwired with a sensor for hands-free operation. Faucets shall only provide cold water for hand washing. They shall be hands-free and powered by low voltage. Stainless steel mechanically fastened handbag hooks capable of supporting 25 lbs. (min.) shall also be provided.



Figure 47: Dyson Airblade Hand Dryer



Figure 48: Example of a Continuous Corian Washplane

Water Closets will be wall hung vitreous china with water saver siphon jet elongated bowl, both standard and handicapped. Flush valve will be sensor operated with water saver solenoid and GFI. Provide open front seat without cover. Provide chair carrier floor mounted with floor bolts. Urinals will be wall hung vitreous china with blowout function. Flush valve shall be sensor operated water saver with solenoid and GFI. Chair carrier shall be floor mounted with floor bolts.

Terminal Column Covers

All concrete columns shall be covered with a textured stainless steel column cover a minimum of 8'- 0" high AFF. The textured finish shall be approved by BCAD and be consistent throughout each terminal. In two story spaces BCAD prefers that the stainless steel column cover extend to the ceiling (*see figure 49*).

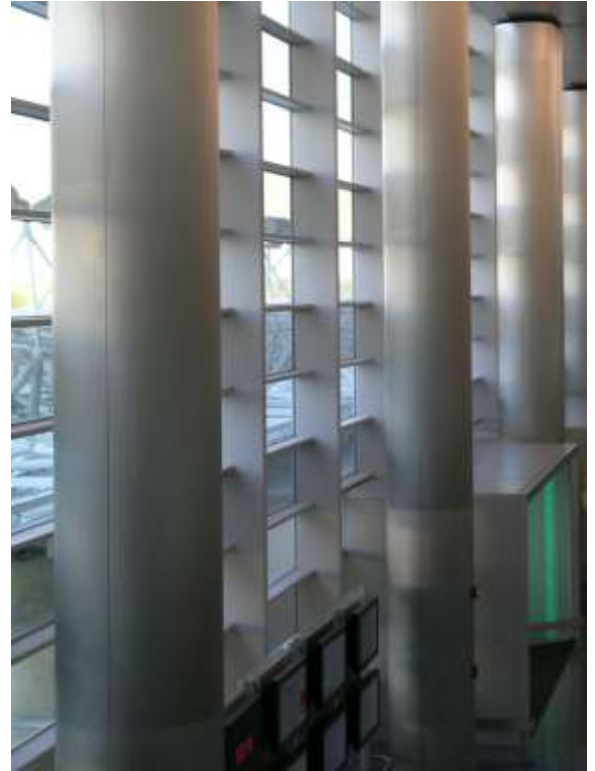


Figure 49: Example of Stainless Steel Column Cover

Primary terminal stairways shall have terrazzo flooring. Refer to the terminal flooring requirements at the beginning of this section. BCAD requires that all emergency stairs be designed with a rubber floor finish. Design Professionals shall ensure that all stairways meet the slip coefficients required by applicable codes. Flame spread of all materials used in emergency stairs shall comply with all applicable codes and standards.

Terminal Handrails

Design Professionals shall provide stainless steel handrails throughout the FLL terminals. Glass inserts for stainless steel balcony railings are preferred. Glass inserts used in floor areas shall be clear and may be frosted on the outside face of stairways that is away from passenger circulation. (*see figures 50 & 51*).



Figure 50: Clear Glass inserts at an Airport Terminal



Figure 51: Frosted Glass Inserts on a Stairway Rail

Terminal Water Fountains

Water fountains shall be provided frequently throughout the Fort Lauderdale Hollywood International Airport terminals. They shall be the same manufacturer make and model number in each terminal. BCAD's standard terminal drinking fountain also incorporates a fire extinguisher cabinet (see *figure 52*). Design Professionals shall confirm the make and model number with BCAD. BCAD's preferred location is between restrooms and near food courts. All water fountains shall be ADA compliant.

Terminal Defibrillators

Recessed wall mounted defibrillator cabinets shall be provided throughout the airport terminals with any signage that may be required by code. The manufacturer's make and model number shall be the same for all terminals and approved by BCAD (see *figure 52a*). At least one, pre-security, and one, post security shall be required on each floor in the following areas:

- Concourses
- Ticketing lobby
- Baggage claim area

ADA Accessibility Codes

The current edition of the Florida Building Code (FBC) shall be utilized for all ADA code compliance requirements. Design Professionals shall be responsible for compliance with all ADA code requirements.

Florida Building Code:

http://www2.iccsafe.org/states/florida_codes/



Figure 52: Existing Drinking Fountain at Fort Lauderdale Hollywood International Airport



Figure 52a: Example of a wall mounted recessed Defibrillator cabinet

2.4 Furnishings, Fixtures and Equipment

Curbside

The curbside appeal for passengers traveling through Fort Lauderdale Hollywood International Airport is lacking. Furnishing, fixtures and equipment are inconsistent, cluttered and not visually appealing. Design Professionals will need to consider and provide the following curbside design elements when improvement projects are executed during terminal modernization projects:

- Standard outdoor seating at each terminal shall be a black mesh bench. Design professionals shall obtain the manufacturer make and model from BCAD (see figure 22).
- Standard trash cans shall be explosion resistant stainless steel with a brushed with abraded finish.
- Screened storage areas designed for wheel chairs and luggage cart storage (see figure 23).
- Outdoor kiosks shall be made of durable materials that can withstand Florida's harsh outdoor conditions (e.g. rain, wind, humidity, salt air and UV light). Design Professionals shall consider placement of outdoor kiosks under shade and rain screen devices.



Figure 21: Existing Terminal Curbside



Figure 22: BCAD Standard Curbside Bench



Figure 23: Existing wheel chairs with no screened storage



Figure 24: Example of a Self Service Kiosk for Luggage Check-in

The curbside design and organization of furnishings fixtures and equipment for the “in- passenger service and convenience award winning” Indianapolis International Airport is a good example of “Design Excellence” that Professionals should pursue for the Fort Lauderdale by increasing the overhang Hollywood International Airport Terminal improvement projects.



Figure 25: Indianapolis International Airport by HOK
Vehicular Curbside



Figure 26: Indianapolis International Airport by HOK
Pedestrian Curbside

Designers should consider increasing the overhang area of each terminal. An increased covered/sheltered area for passenger drop-off is desired. A row of bollards could be installed to allow a covered area for vehicles to unload passengers without them having to dodge other passengers and baggage by those attempting to enter the terminal. Being on the terminal side of the bollard row would provide a wide aisle for them to find their way to the right curbside baggage check-in, wheelchair storage, ticketing kiosks and entry into the terminal. This would allow space for innovative design of curbside check-in kiosks (see figure 27).



Figure 27: Example of Curbside Check-in at an Airport Terminal

Smoking Posts

New Smoking post shall be provided curbside for all terminals. No smoking is allowed within the FLL terminals. Smoking posts shall either be stainless steel or aluminum to prevent rust stains on the outdoor sidewalks. They must be located away from the terminal entries to avoid interference with passenger circulation and so that no second hand smoke enters the terminal (see figure 28).



Figure 28:
Example of
stainless steel
outdoor smoking
post

Terminal Side

The furniture, fixtures and equipment within the Fort Lauderdale Hollywood International Airport will require upgrades when terminal improvement projects are performed. Beginning with the passenger processing, all self service check-in kiosk will be standardized by BCAD. Design Professionals will comply to the following requirements:

- Coordinate with BCAD the selected manufacturer make and model for airline e-ticketing kiosks
- Standardized spacing of all kiosks
- Design an effective arrangement of kiosks for easy passenger processing
- Center align all kiosk groupings in FLL Terminals on the adjacent wall



Figure 29: Example of Existing FLL E-ticketing Kiosk Configuration that is not centered on the adjacent wall.



Figure 30: Example of Existing FLL E-ticketing Kiosk Configuration that is not centered on the adjacent wall.

Terminal Ticket Counters

The existing FLL ticket counters within the terminals are out dated (*see figure 31*). New design ideas and solutions shall be provided during terminal modernization projects by Design Professionals. All new ticket counters shall be ADA accessible. A diagrammatic concept for a new FLL service counter has been provided for reference (*see figures 32 & 34*). Variations of this concept will be allowed by BCAD. All proposed designs must be submitted for review by the BCAD DRC.



Figure 31: Example of existing Terminal ticket counters

Ticket counters shall accommodate two personnel from the airlines. Their minimal work area shall be 30" wide (2'-6"). The ADA accessible area shall be in the middle of the casework structure. The base of the ticket counter shall have a toe kick front

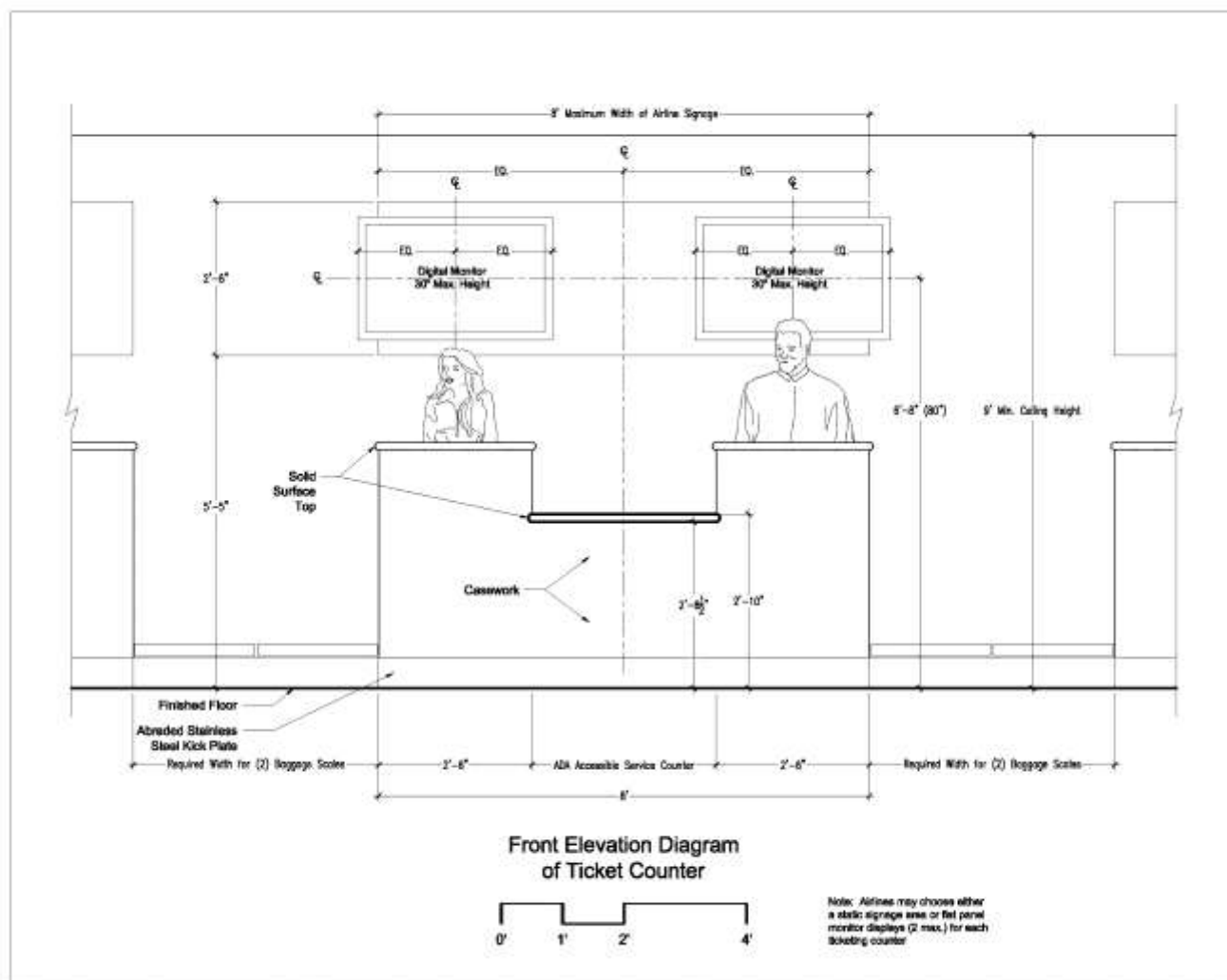


Figure 32: Front Elevation of New Concept for FLL Terminal Ticket Counter

and back with a 6" high abraded stainless steel kick plate on all sides. The kick plate shall be mechanically attached with stainless steel fasteners that are flush with the face of the kick plate. Standard abraded stainless steel finishes (see figure 33) that BCAD may allow include but shall not be limited to the following:

- Non-directional
- Random swirl
- Angel hair
- Bead blasted

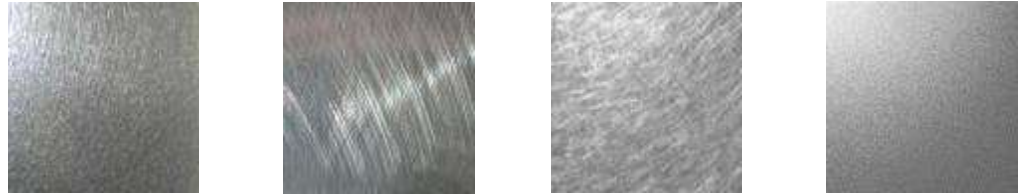


Figure 33: Typical Abraded Stainless Steel Finishes

All tops of the service counters shall be a solid surface material. The color and material selection for all may vary by terminal and must be approved by the BCAD DRC. Behind the service counter Designers shall provide a 30" high horizontal band where airlines will be able to locate their logos or flat screen monitors. The centerline height of this band shall be 80". Above and below this band a veneer-finished modular wall system shall be provided to reinforce the concept of a standardized band. Tenant logos and graphics shall be metal or opaque acrylic. Uppercase letters shall not be higher than 14" and lowercase letters shall not exceed 10" in height. Logos or screens will not be allowed to exceed the 30" zone (see figure 34).

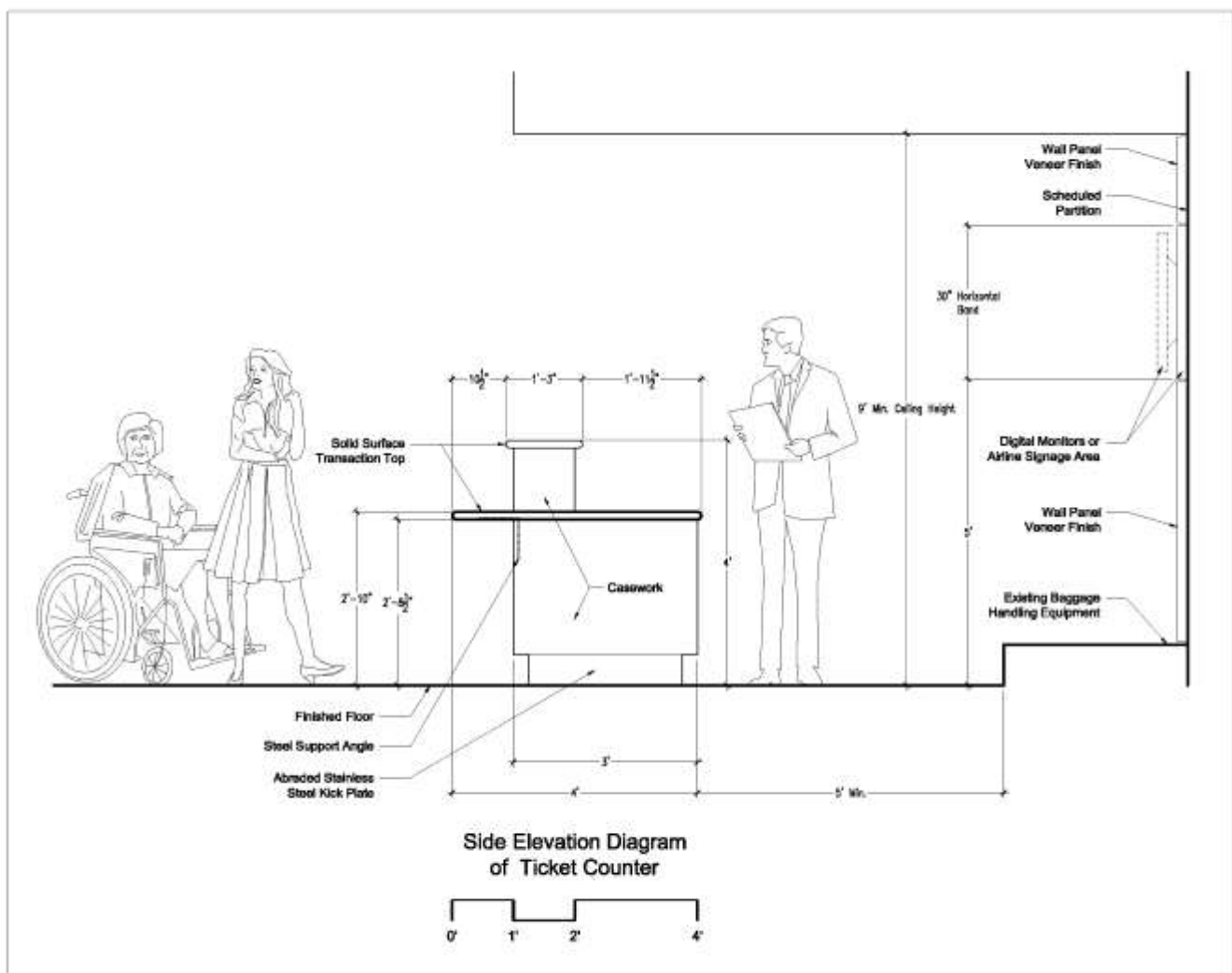


Figure 34: Side Elevation of New Concept for FLL Terminal Ticket Counter

Terminal Concourse Gate Podium

The existing FLL concourse gates have old gate podiums (*see figure 35*). New ADA accessible gate podiums shall be provided in all terminal modernization projects. A concept diagram for a new FLL gate podium has been provided for reference (*see figures 36 & 37*). Variations of this concept may be allowed by BCAD. All proposed designs must be submitted for review by the BCAD DRC.

Behind the gate podium and set 6" from the back wall there shall be a monitor support structure (*see figures 36 & 37*). The main gate podium casework shall be located on the centerline of the monitor support structure. The shell of the casework shall be 5'-6" in width. It shall be located adjacent to the secure door for the gate which may be to the right or left of the service counter. The base of the counter shall have a toe kick front and back



Figure 35: Example of Existing Concourse Gate Podiums

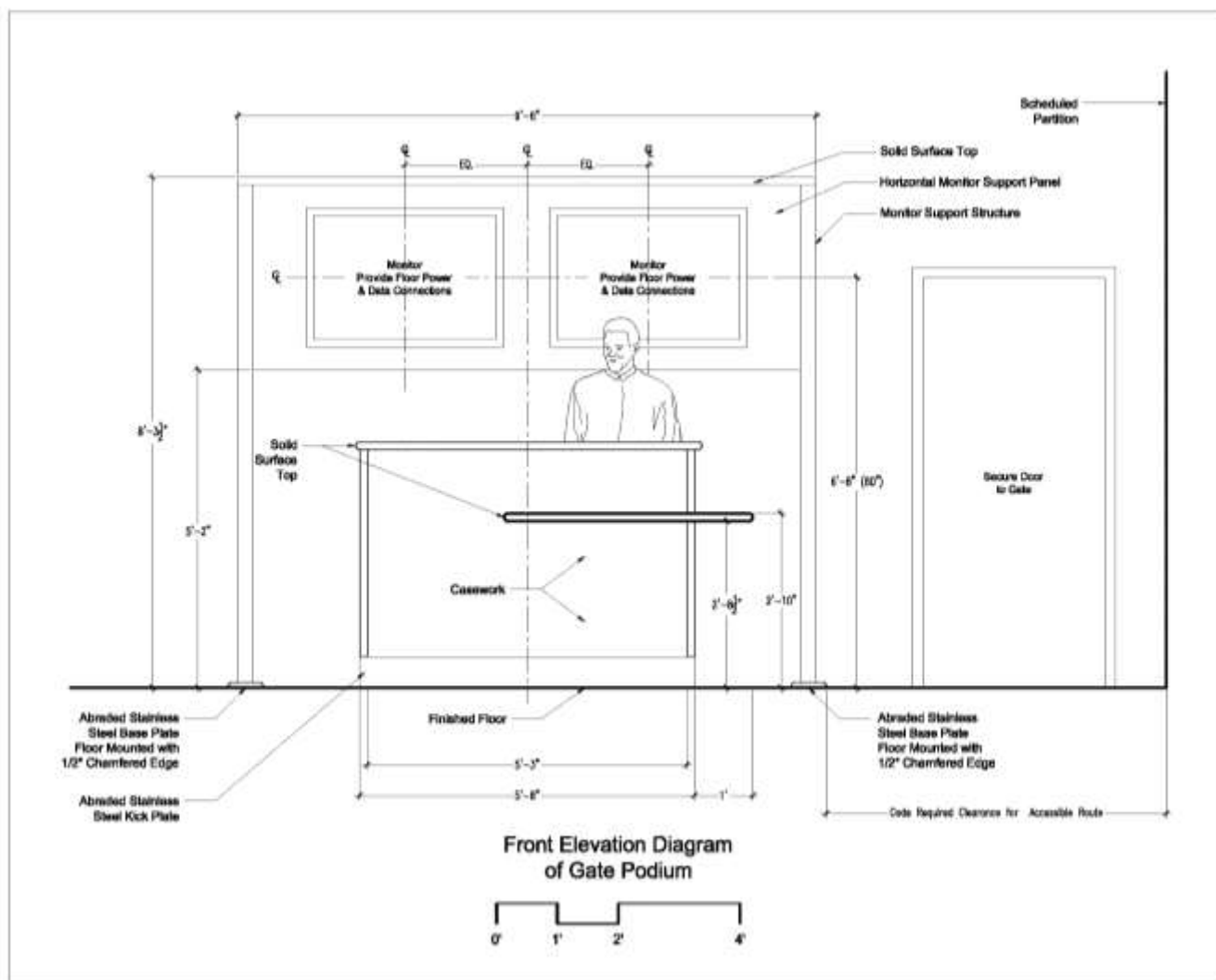


Figure 36: Front Elevation of a new FLL concept for service counter at gates

with a 6" high, brushed stainless steel kick plate on all sides. The kick plate shall be mechanically attached with stainless steel fasteners that are flush with the face of the kick plate. All tops of the service counters shall be a solid surface material. The color and material selection for all gate counter finishes and casework may vary by terminal and must be submitted for approval by the BCAD DRC.

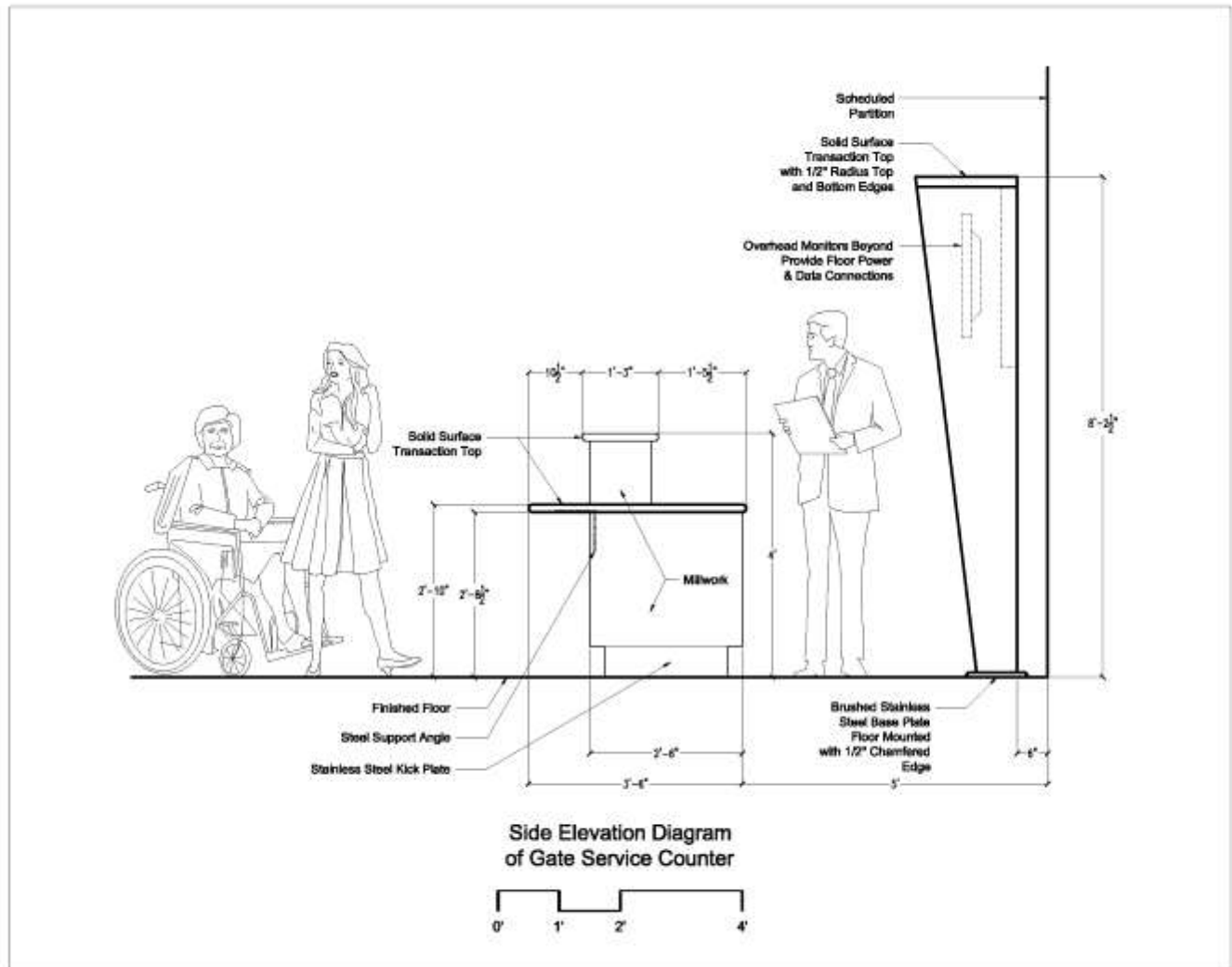


Figure 37: Side Elevation of a new FLL concept for service counter at gates

Terminal Ticket Counter Stanchions & Queuing Signage

The design layout of stanchions shall be considered by Design Professionals for all terminal ticket counters. Stanchions shall be made of brushed aluminum (satin) or black matte finish and be of the retractable belt type (*see figure 38*). They shall be Visiontron (part # 300SC) or a comparable vendor. The color of the retractable belts shall be "Navy" (Visiontron Custom Dark Blue Belt or equivalent) or BCAD approved airlines customized belt with logo. All stanchions posts must be uniform. If brushed aluminum is used, then that style should be used throughout the entire area. Ticket Counter queuing signage shall be 14" x 11" engraved plastic in a frame that attaches to the stanchion posts, consistent with the color/style of the stanchions.



Figure 38: Standard BCAD Stanchion

Terminal Concourses Seating



Figure 39: Eames Tandem Sling Seating

Gate seating shall be Herman Miller's Eames Tandem Sling Seating configured back to back in groupings that are easy to move for BCAD maintenance personnel. They shall be arranged perpendicular to the concourse's primary circulation route. The seat color material shall be black (*see figure 39*).

Terminal Waste and Recycling Receptacles

Waste receptacles shall be a brushed or other BCAD DRC approved stainless steel finish (*see figure 40*). Recycling receptacles shall also be of the same finish and clearly marked with standard symbols for recycled waste including text for glass, plastic and paper. No polished stainless steel receptacles shall be permitted due to unpleasant aesthetics after from prolonged use (*see figure 41*). Design Professionals shall confirm the make and model number of BCAD's preferred waste and recycling can manufacturer.



Figure 40: Preferred Garbage Cans for Waste and Recycling



Figure 41: Existing Polished Stainless Steel (Scratched) Garbage Can at FLL

Terminal Baggage Claim

Improvements to the baggage claim areas shall include sloped carousels in lieu of the existing flat carousels (see *figure 42*). Adequate passenger circulation space shall be provided to accommodate peak passenger loads. Existing or new baggage cart rental units will be relocated so as to not interfere with the passengers retrieving luggage. All carousel surface areas shall be stainless steel. An abraded finish is preferred for the base area of the equipment.



Figure 42: Example of Preferred Sloped Baggage Carousel

Designers shall consider the use of natural daylight and provide views to the outside where possible (see *figure 43*). Lighting levels shall comply with the baggage area space requirements provided in Section 2.6., Lighting. Seating shall be provided along the wall furthest from the luggage carousel.



Figure 43: Indianapolis International Airport by HOK - Example of Sloped Baggage Carousel and Baggage Claim Area

Terminal Concourse Recharging Stations

Recharging stations within the FLL Terminal Concourses will vary due to spatial limitations and concourse configurations. In terminal concourses where space permits (e.g. Terminal One, Concourse B) charging stations shall be designed around the existing concourse's concrete columns (*see figure 44*). In other concourses the a linear countertop parallel to the concourse seating may be provided (*see figure 46*). One end of the counter shall be ADA accessible. Other creative design solutions are also welcomed. BCAD prefers that all countertops be a black solid surface material. A minimum of six seats shall be provided for each type of charging station. Electrical service shall be integrated into the design and concealed by the counter.

An innovative concept that may be considered by BCAD includes the use of charging station kiosks (*see figure 45*). Charging station kiosks are a convenient way for passenger to recharge their mobile phones and other devices. They shall be placed at the end of the gate seating configuration and power shall be provided to the unit from the floor. Coordination with the Tenant Design Guidelines for all kiosk requirements shall be required.



Figure 44: Existing FLL recharging Station at Terminal One, Concourse B



Figure 45: Example of Kiosk Charging Station



Figure 46: Existing FLL recharging Station at Terminal One, Concourse B

Terminal Flight Information Displays (FIDS)

FIDs shall be provided in all airport terminals. They shall be easily accessible and not obstruct passenger circulation. A vertical or portrait orientation is preferred by BCAD. In concourses an array of three FID screens shall be provided. Two shall display departure information and one shall display arrival information. In baggage claim areas an array of four FID screens shall be provided. Two shall display departure information and two shall display arrival information.

The FIDs support structure shall be stainless steel and either free standing or suspended from the ceiling (BCAD's preferred option). They may be independent (*see figure 47*) or incorporate other terminal elements such as location maps (*see figure 48*). The structure must have a protective bar barrier around its base. A clearly visible sign that does not compete with the Terminal wayfinding signage shall also be incorporated for easy identification. (*see figure 47*).



Figure 47: Example of a Standalone FIDS System with Clear Overhead Signage



Figure 48: Example of FIDs at Indianapolis International Airport

Terminal Pay Phones

Public telephones or pay phones shall be provide in each terminal for passenger convenience. They may free standing, wall hung or sit down (*see figure 49*). Phones shall be located within a customer service alcove near baggage claim areas and gate seating areas. They shall kept separate from any courtesy phones that may be incorporated with FIDs. They must conform to all applicable codes, regulations and accessibility guidelines including signage. Additional requirements include but are not limited to the following:

- Provide a TDD phone for the hearing impaired at each grouping
- Provide internet access phone for 1 phone that includes a laptop at each group of 3 or more phones
- Be stainless steel
- Provide a continuous writing surface when wall hung
- Designed with no sharp edges
- Incorporate the same design within every terminal



Figure 49: Wall mounted pay phone



Figure 50: Example of Airport Service Alcove
BCAD's preferred location for Public Phones and other Customer Service Items

Terminal Elevators

Passenger elevators shall have a stainless steel interior finish. Cargo elevator flooring shall be stainless steel plate with a diamond pattern. New passenger elevators should be designed as pass-thru type, with doors on front and back side. This will allow passengers with baggage not to have to enter the elevator and turn around with their bags to exit the elevator. This has been proven to speed up passenger processing and improve their traveling experience. Glass passenger cabs are encouraged with views to the terminal and exterior (see figure 51).



Figure 51: Airport Elevator Cab

Terminal Escalators

Escalators will have a railing at the center and edge access at terrazzo flooring. Their underside shall be clad with stainless steel (see figure 52). Their sides may be glass or stainless steel (see figure 53). Where ever possible the dead space under escalators shall be furnished with benches for passenger seating. A minimum head clearance of 7'-6" shall be provided where seating under escalators is provided. Space under escalators less than 7'-6" shall be fully exclosed and accessible by a locked service door.



Figure 52: Stainless Steel Underside of Escalator



Figure 53: Example of an Airport escalator with glass railings

2.5 Signage, Wayfinding and Advertisements

Signage

Design Professionals conducting airport terminal work will be required to coordinate with BCAD's Signage and Wayfinding Consultant for all designs that may impact the airports wayfinding signage. Architects and Interior Designers are encouraged to obtain a copy of the latest Aviation Industry Wayfinding and Signage Guidelines developed for the Airport Cooperative Research Program (ACRP). BCAD is currently developing their Wayfinding Guidelines that shall include a wayfinding masterplan (see section 1.1).



Figure 54: Example of Curbside Signage

Terminal Side Advertisements



Figure 55: Example of Preferred Advertising Signage



Figure 56: Example of Airport Signage at Tampa International

Advertisement Signage will conform to all applicable codes and regulations and have been reviewed by BCAD to approve graphic design and content. It should adhere to theme guidelines by displaying the

message in such a manner that conveys some aspect of the “your Portal to Paradise” theme which includes sun, sea, beaches, everglades environment, yachting, cruises, aviation and the arts.

All airport signage for advertisements shall be:

- Securely fastened
- Wall mounted with a vertical center at average level of 60-66” above finish floor
- Show no exposed hardware
- Repeat the same shape patterns and symmetry
- Have stainless steel or powder coated aluminum frames
- Have antiglare, matte finish screens or transparent view-through panels that shall be shatterproof

Kinetic and digital imagery through plasma or flat screen signage shouldn’t compete for attention or cause extreme brightness. Shadows on backlights are not permitted as well as distraction of passengers from way finding and directional signs.

Terminal way finding and life safety signage shall have precedence over all other airport terminal signage.

2.6 Lighting

All lighting will be subject to review and approval by BCAD. Lighting should be designed to illuminate Terminals creatively without detracting from its services and wayfinding signage. It should also be as energy efficient as possible without compromising the design integrity or code required lighting levels. LED and other innovative lighting sources are recommended. Design Professionals shall incorporate lamps



Figure 57: Example of Various Types of Lighting at Indianapolis International Airport Terminal by HOK

with a CRI of at least 80 in applications where the color rendering of skin tones and merchandise is very important (e.g. concourses). Strobe lights, flashing lights and neon are prohibited. Lighting will not create any glare within the Terminal. Lighting will:

- Be commercial-quality light fixtures approved by BCAD.
- All lighting will comply with applicable local and national codes and regulations.
- Energy Star rated lighting fixtures are preferred.

Lighting fixtures must not shine into the eyes of travelers or cause distraction. Other lighting considerations include:

- Creative use of cove lighting, indirect lighting, LED ropes, backlighting or recessed fixtures are encouraged.



Figure 58: Existing FLL Cove Lighting

- Storefronts, signage and displays shall be illuminated with higher intensity to draw attention to the retail zone
- Track lighting will not be allowed within Terminal areas.
- Accentuating architectural elements such as columns.
- Provide higher lighting levels along primary circulation routes
- Visible linear fluorescents and sodium lamps will not be permitted.
- All display cases must integrate shielded lighting and be vented properly.

Lighting and Controls

(Simultaneously, the U.S. Department of Energy is pursuing the adoption of the 2012 IECC with similar requirements¹).

A brief comparison of the two codes is as follows:

	CURRENT	ASHRAE 2010
<u>Space</u>	<u>Watts per square foot</u>	
Baggage Area	1.00	0.76
Airport Concourse	0.60	0.36
Audience Seating	N/A	0.54
Terminal-Ticket Counter	1.50	1.08
Daylighting	N/A	Required where primary side-lighted areas equals or exceeds 250 square feet

Based on recommendations by the International Energy Conservation Code (IECC) Code Development Committee, many proposed changes to the IECC are one step closer to translating into more energy efficient residential and commercial buildings. With only one round of public comment and the Final Action Hearings to go, the U.S. Department of Energy (DOE) is getting close to realizing its goal to achieve a 2012 IECC that is 30% more stringent than the 2006 IECC.

Although there is no timetable for adoption of ASHRAE 90.1-2010, designing to this standard will insure maximum energy-efficiency and preparedness for the inevitable requirements.

In addition, all lighting fixtures will have the ability to respond to various inputs to provide the appropriate lighting level for the task required. Inputs will include, but are not limited to, occupancy sensors, photosensors for daylighting control, timeclock control, dimming control and tuning control.

LED will be the preferred light source, provided that the combined energy and maintenance savings of fixtures selected for a given application will pay for any increase in cost over a traditional light source, in a period not to exceed five years.

Color temperature of all light sources to be consistent throughout the complex and to be coordinated with the interior finishes. Color temperature of the lighting over the vanities with mirrors in all public

bathrooms will between 2700°K-3000°K to insure that all passengers look their healthiest when visiting Fort Lauderdale.

Regardless of light source selected, the CRI (color-rendering index), will not be less than 80 for all interior spaces.

To minimize maintenance costs, lamp life for replacement four foot fluorescent lamps shall not be less than 46,000 hours, and for new fixtures shall not be less than 60,000 hours (which requires a lamp and ballast combination), unless special lighting requirements using shorter life lamps are necessary and no long life source is available. For fixtures with native LED sources, L70 (the industry standard of measurement of the number of hours of operation at which point the LED's are at 70% of original output) shall not be less than 50,000 hours.

Where it is possible, high ceilings on high transit areas are encouraged. Designers should work illumination of those spaces using indirect sources, leaving only sprinkler heads, smoke and CO₂ detectors attached to the ceiling structure. This type of configuration facilitates re-lamping and maintenance. Grouping lighting fixtures in few locations also improves accessibility from the floor and provides more flexibility to concession's layout. (*see figures 59 & 60*).



Figure 59: Example of Clearstory Lighting

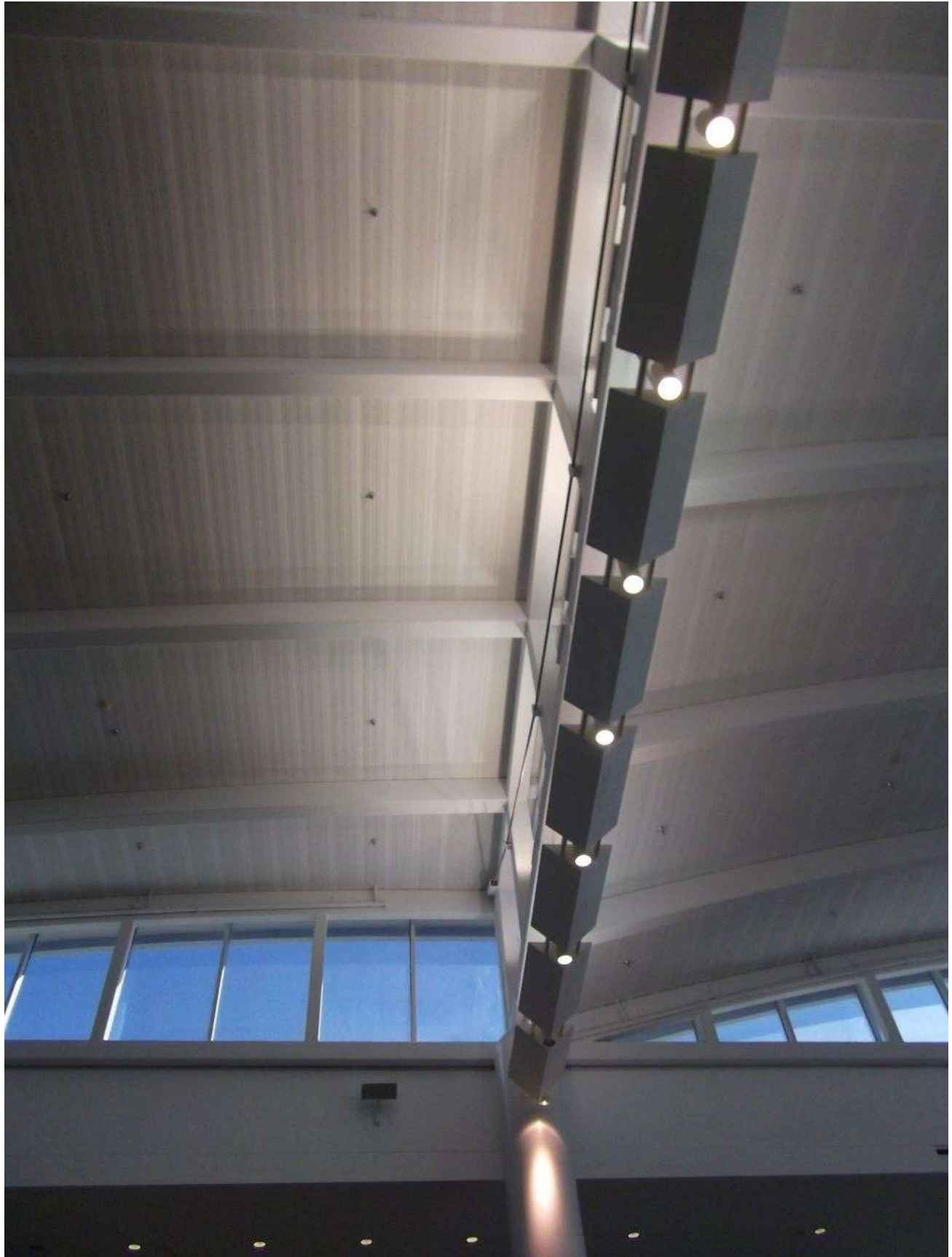


Figure 60: Existing of Clearstory Lighting with down lights

2.7 Public Art & Design

The Fort Lauderdale-Hollywood International Airport has a Public Art & Design Program. Designated areas for public art within all of the Terminals have been established in the Fort Lauderdale-Hollywood International Airport Expansion Public Art Master Plan. Architects, Engineers and Interior Design Consultants will need to coordinate their airport terminal design efforts with the Public Art & Design Program to ascertain that currently installed artworks are not impacted. In the event public art is part of a capital project, Consultants shall cooperate with the artist(s) and include the selected artist(s) as a design team member in the preliminary design and design phases of the Project. Consultants shall include in their designs the necessary infrastructure for the artworks, included, but not limited to lighting, foundations, structural supports, and electrical connections. Refer to figures 61 and 62 for samples of FLL artwork.

Sculptures that may be placed on the floor in Terminal concourses should have a base of at least 8" high. Adequate clearance to allow BCAD's maintenance lift must be coordinated by the design professionals if a floor sculpture or hanging piece of art is installed or will be installed within the Design scope of work boundary.

Artwork may include, but are not limited to, the following:

- Sculpture: free-standing, wall supported or suspended; kinetic, electronic
- Murals or portable paintings
- Fiberworks, neon, glass, mosaics, photographs, prints, calligraphy, sound, literary elements, film, holographic images, and video systems
- Furnishings or fixtures, including but not limited to: gates, railings, lamps, signage, and seating, if created by artists as unique elements or limited editions
- Artistic or aesthetic elements of the overall architecture if created by a professional artist or a design team that includes a professional visual artist
- Flooring Design
- Temporary artworks or installations that serve the purpose of providing community and educational outreach purposes



Figure 61: Existing FLL Photography by Clyde Butcher Photo "Dunes"



Figure 62: Existing FLL Wall Mural by Guy Harvey – Sunken Treasure

2.8 Sustainability

Architects, Engineers and Interior Designers shall incorporate sustainable design practices and materials into the development of their airport terminal project. New public buildings in Broward County are required to pursue LEED certification. A transition to a High Performance Building (HPB) is one of BCAD's long term goals. Designers will check with BCAD, who is in the process of developing a Sustainable Design Guidelines Manual prior to the commencement of any design work. Additional resource guides for sustainable design include the following:

- United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design for Commercial Interiors (LEED-CI)
<http://www.usgbc.org/DisplayPage.aspx?CMSPageID=145>

"LEED for Commercial Interiors is the green benchmark for the tenant improvement market. It is the recognized system for certifying high-performance green interiors that are healthy, productive places to work; are less costly to operate and maintain; and have a reduced environmental footprint. LEED for Commercial Interiors gives the power to make sustainable choices to tenants and designers, who do not always have control over whole building operations." (Source: USGBC Commercial Interiors website)



- Florida Green Building Coalition (FGBC) Commercial Building Standard
<http://www.floridagreenbuilding.org/commercial>

"The intent of the FGBC Green Commercial Building Standard is to encourage building owners to adopt green and sustainable strategies during the design and construction of their project and to receive recognition for their efforts. The Florida Green Commercial Building Standard covers all commercial occupancies listed in the Florida Building Code."



Figure 63: Example of Green Space at Indianapolis International Airport by HOK

Sustainable design considerations should include:

- BCAD's Sustainable Design Guidelines Recommendations and other resource guides
- Selection of LED or other energy efficient lighting that is code complaint and within the parameters of BCAD's product criteria
- Keep all non-emergency lighting off during non-business hours.
- Install occupancy sensors in spaces that are not occupied regularly.
- Specify the use of low emitting materials such as: adhesives, sealants, paints, coatings and carpets

<http://www.greenguard.org/en/architectsDesigners.aspx>

- Specify the use of formaldehyde free materials
- Select materials with recycled content, renewable materials and certified wood
- Give preference to products fabricated or manufactured within Florida and the Southeast Region of the United States
- Zero use of CFC-based refrigerants in mechanical equipment
- Incorporate green space into the Terminal's curbside design (*see figure 63*)
- Consider the life cycle of all material used and Cradle to Cradle certified products

<http://c2c.mbdcc.com/c2c/list.php?order=type>



Figure 64: Solar Street Light

A visual connection from the interior to the exterior is very important for passenger comfort and well being. Architects and Designers should consider the utilization of green walls outside of the Terminal that are visible from the interior. Green walls will be considered by BCAD as a "Sustainable Design" feature provided they are well designed and do not use a non-indigenous species of plant (*see figures 65 & 66*).



Figure 65: Greenwall Example



Figure 66: Greenwall Detail

CHAPTER 3 Appendices

3.1 Guideline Revisions

The Terminal DGM may be periodically updated by BCAD. It is recommended that this action be performed once a year. The Consultant shall verify with the BCAD Contract Administrator their possession and use of the latest version of the Terminal DGM. The following table provides a history of the Terminal DGM updates and releases.

TERMINAL DESIGN GUIDELINES MANUAL VERSIONS	
Document Title	Date Released
Terminal Design Guidelines Manual	April 2012
Terminal Design Guidelines Manual Revision 1	
Terminal t Design Guidelines Manual Revision 2	
Terminal Design Guidelines Manual Revision 3	

3.2 Definitions and Abbreviations

The following Definitions and Abbreviations have been provided as an aid for understanding the Terminal Design Guidelines Manual. The Term or Acronym appears in bold case followed by its corresponding meaning or definition.

A/E of Record	The Architect / Engineer responsible for the signing and sealing of the design documents
AHJ	Authority Having Jurisdiction
BAS	Building Automation System
BCAD	Broward County Aviation Department
BIM	Building Information Model
BIP	BCAD Improvement Projects
CADD	Computer Aided Design and Drafting
Construction GM	Construction Guidelines Manual

Consultant	The individual or entity contracted by BCAD to complete a predetermined scope of work at FLL
Curbside	The area adjacent to but outside the terminals where passengers arrive and depart
Designer	A Florida Licensed Professional or authorized representative thereof within the fields of Architecture, Engineering and Interior Design
FIDS	Flight Information Displays
FLL	Fort Lauderdale Hollywood International Airport
HPB	High Performance Building
NTP	Notice to Proceed
Sustainable DGM	Sustainable Design Guidelines Manual
T1	Terminal One
T2	Terminal Two
T3	Terminal Three
T4	Terminal Four
Tenant	The occupant of the leased space and legal name of the operator renting space within the Terminal from the Landlord
Tenant DGM	Tenant Design Guidelines Manual
Terminal DGM	Terminal Design Guidelines Manual

3.3 Broward County Aviation Department Contact

BCAD Department Name	Contact Number	BCAD Position
Business Department	954-359-6974	Division Administrative Assistant
Design Review Committee	954-359-2302	Principal Planner
Project Review Committee	954-359-6124	Construction Management Administrator
Maintenance Department	954-359-1272	Division Administrative Assistant

3.4 CAD and BIM

Design Professionals shall provide all construction documents for terminal improvement projects per their contractual documents (including BCAD Electronic Media Submittal Requirements). A Building Information Model (BIM) is strongly encouraged for all new projects due to its usefulness for the future life cycle management of the airport. The BIM shall include all Structural, Mechanical, Electrical and Plumbing components developed to a detail level of 300. Design Professionals shall obtain a copy of the latest CAD and/or BIM standards from BCAD prior to the commencement of work. Useful resources for BIM are the AIA Document E202 and the buildingSMARTalliance website: <http://www.buildingsmartalliance.org/>

3.5 Design Guidelines Interpretations

Contracted design professionals may have questions regarding the intent of the Terminal DGM during the development of their creative designs. All questions regarding a Design Guidelines Interpretation shall be provided in writing to the BCAD DRC Coordinator by the A/E of Record.

3.6 Review Process, Submittal Requirements and Approvals

Review Process

BCAD will require that the A/E of record through a preliminary design review. The intent is to ensure that the proposed scope and design complies with aesthetics planned for the airport terminals and described in the Terminal Design Guideline Manual. The Design Review Committee will focus on the spatial relationship and aesthetic decisions for all BCAD projects that will be visible to the public. This includes:

- New construction
- Renovation and Remodeling of existing Terminal spaces
- All interior and exterior signage
- All advertising locations

The BCAD Design Review Committee consists of three BCAD professionals:

- BCAD Director of Planning or Representative
- BCAD Director of Maintenance or Representative
- BCAD Director of Business or Representative
- Technical Staff from BCAD Planning (Architect)
- Planning Consultant

Three votes minimum are needed for approval. Airport Development division will act as first contact. For all new projects the DRC is available to meet with all involved parties before the design process begins to save time and review the process. It is highly recommended that the A/E of record visit the physical space of the Terminal before creating any design or presentation. It is also recommended that they obtain as-

built drawings of the Terminal in which their team will be performing work. Any questions regarding DRC approval shall be directed to the DRC coordinator.

A Airport Development representative (DRC-BIP Coordinator) will sort projects that go to the DRC which will be projects that involve Airport Aesthetics or bypass them to the PRC which will review technical submittals that do not involve Airport Aesthetics. The A/E shall contact the DRC-BIP coordinator to schedule a review. Reviews will be scheduled on a first come first serve basis and will occur twice a month. The bi-weekly meetings will be held every other Monday. Below is a diagram of the how the entire BCAD approval process works. The Design Review Committee portion is highlighted with a dashed red line.

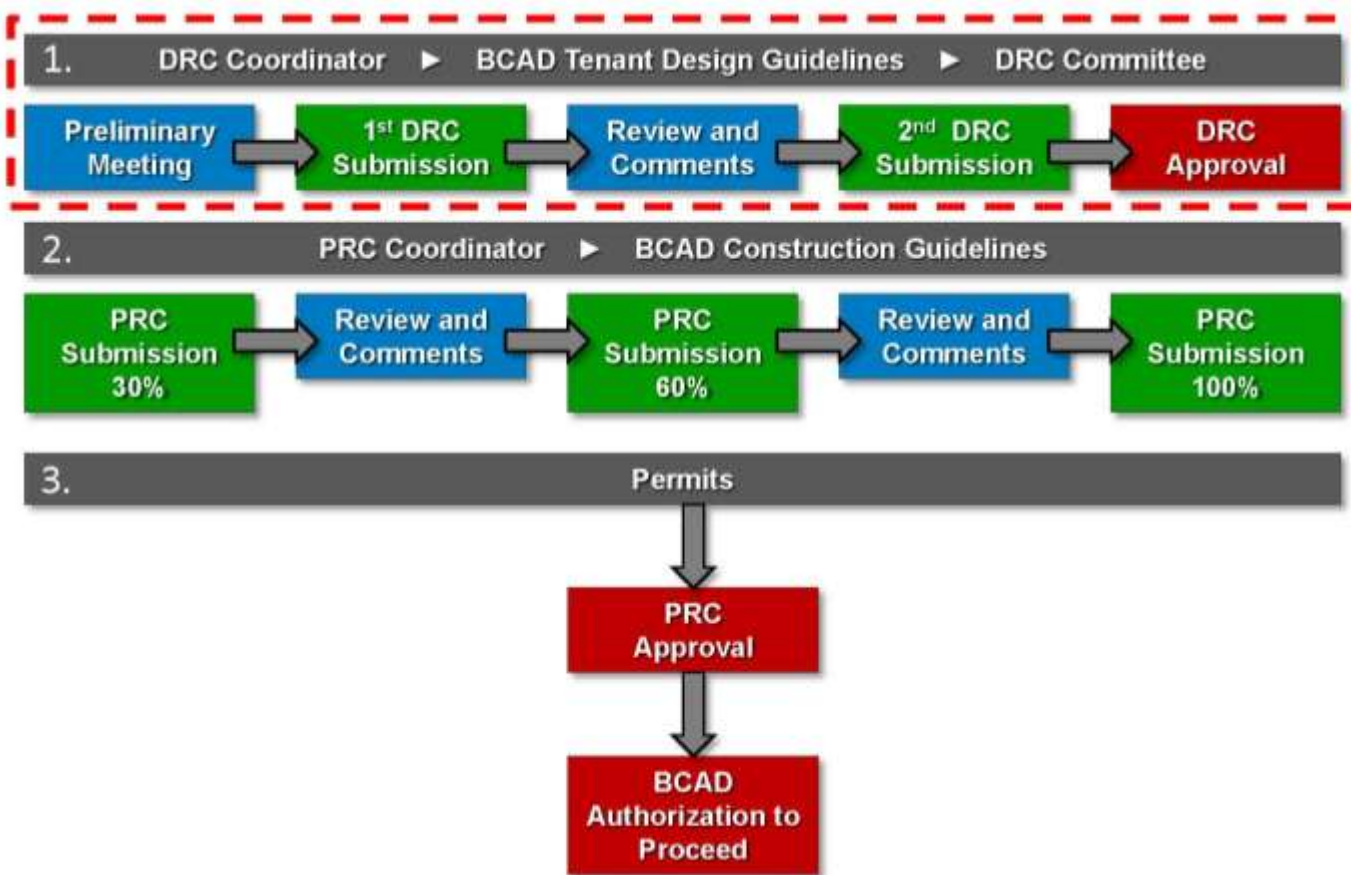


Figure : BCAD Design Review (DRC) and Project Review Committee (PRC) Process

Submittal Requirements

The Primary Design Consultant shall submit four identical copies for each design submittal that includes the following:

A. Conceptual

1. Location Plans:

- (1) 11"x17" Site plan of Airport Terminal indicating scope of work location.

- (1) 11"x17" enlarged plan of Terminal location and adjacent areas.
- 2. Photos of the area defined by the scope of work within the terminal.
- 3. Full color 3-D rendering that represents the design intent for the scope of work.
- 4. Preliminary floor plans (scale 1/8" = 1'-0") indicating Design Professionals proposed design concept.
- 5. Typical exterior elevations if applicable (scale 1/8" = 1'-0").
- 6. Conceptual interior elevations of the proposed design in relation to existing adjacent spaces.
- 7. Preliminary material board that conveys proposed furniture, fixtures and equipment with proposed finishes, color swatches and schemes.

B. All other submittal requirements for Schematic Design (SD), Design Development (DD) and Construction Documents (CDs) are outlined in the BCAD Project Review Committee's (PRC) manual. The A/E of Record shall obtain a copy of the PRC submittal guidelines from BCAD.

3.7 Product Data Sheets and Outline Specifications

BCAD may choose to provide specific product data sheets for sole sourced items as well as additional outline specifications to further define elements within the Terminal Design Guidelines. Prior to the commencement of any work Design Professionals shall check with BCAD to ensure they have the latest product information and outline specifications.

3.8 Terminal Plans

Design Professionals shall contact the BCAD Business Development to obtain the latest FLL Terminal plans and visit the following website link for other useful information: www.broward.org/AIRPORT/BUSINESS