FORT LAUDERDALE-HOLLYWOOD INTERNATIONAL AIRPORT

BROWARD COUNTY, FLORIDA

Broward County Aviation Department

TERMINAL
DESIGN GUIDELINES MANUAL

August 2022 - Revision 2

BROWARD COUNTY AVIATION DEPARTMENT
TERMINAL DESIGN GUIDELINES MANUAL

TABLE OF CONTENTS

Revisions to the Terminal Design Guidelines Manual

The Terminal Design Guidelines Manual (DGM) was originally developed in April 2012 with the assistance of Leigh | Fisher & ACAI Associates Inc. As the airport to continues to expand and renovations or construction projects are completed, BCAD may be periodically update the Terminal DGM. The Consultant, Designer, and Contractor leading any FLL terminal-related project shall verify with the BCAD Contract Administrator and/or designee 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**	**Prepared By**
Terminal DGM	April 2012	BCAD Leigh|Fisher ACAI Associates, Inc.
Terminal DGM, Revision 1	July 2017	BCAD
Terminal DGM, Revision 2	August 2022	BCAD

Broward County Aviation Department Contacts

BCAD Department Name	Contact Information	BCAD Position
Project Manager (PM) (Various) Contact Office Manager to get PM contact information.	***Jalaine Chambers*** *Phone: 954-359-2581* *Email: JChambers@broward.org*	BCAD Office Manager - Airport Development

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 boldface font followed by its corresponding meaning or definition.

A/E of Record	Architect / Engineer responsible for the signing and sealing of the design documents
ACRP	Airport Cooperative Research Program
AHJ	Authority Having Jurisdiction
AEP	Airport Expansion Program
BAS	Building Automation System
BCAD	Broward County Aviation Department
BIM	Building Information Model
BIP	Building Improvement Project
CADD	Computer Aided Design and Drafting
CIP	Capital Improvement Projects
Construction GM	Construction Guidelines Manual
Consultant	The individual or entity contracted by BCAD to complete a predetermined scope of work at FLL
Contractor	The individual or entity contracted by BCAD responsible for performing and overseeing construction activities for a given Project on BCAD/FLL property
Curbside	The area next to but outside the terminals where passengers are dropped off and picked up by a private automobile or commercial vehicle
Designer	A Florida Licensed Professional or authorized representative thereof within the fields of Architecture, Engineering, and/or Interior Design; “Designer” may also refer to A/E of Record for the purposes of this Terminal DGM
FBC	Florida Building Code
FIDS	Flight Information Display System

FLL	Fort Lauderdale-Hollywood International Airport
GIS	Geographic Information System
HPB	High Performance Building
LOD	Level of Detail required when preparing a Building Information Model (BIM)
NTP	Notice to Proceed
PM	Project Manager
PO	Purchase Order
PRC	Project Review Committee
Project	Refers to the subject project being planned, designed, and/or constructed
T1	Terminal One
T2	Terminal Two
T3	Terminal Three
T4	Terminal Four
Tenant DGM	Tenant Design Guidelines Manual
Terminal	The physical building space of the airport where passengers transfer between ground transportation and the facilities that allow them board and deplane from aircraft.
Terminal DGM	Terminal Design Guidelines Manual

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 conducted in the day-to-day functions of the Terminal.

Figure 1: Norman Y. Mineta San Jose International Airport

The Fort Lauderdale-Hollywood International Airport (FLL) consists of four Terminals containing seven concourses (*see figure 3*). Each terminal has two floors for public use. The first floor is for arrivals and the second floor is for departures. All four terminals serve domestic arrivals and departures, while Terminal 1 and Terminal 4 also contain U.S. Customs facilities for processing international arrivals.

Figure 2: FLL Terminal 2 Modernization

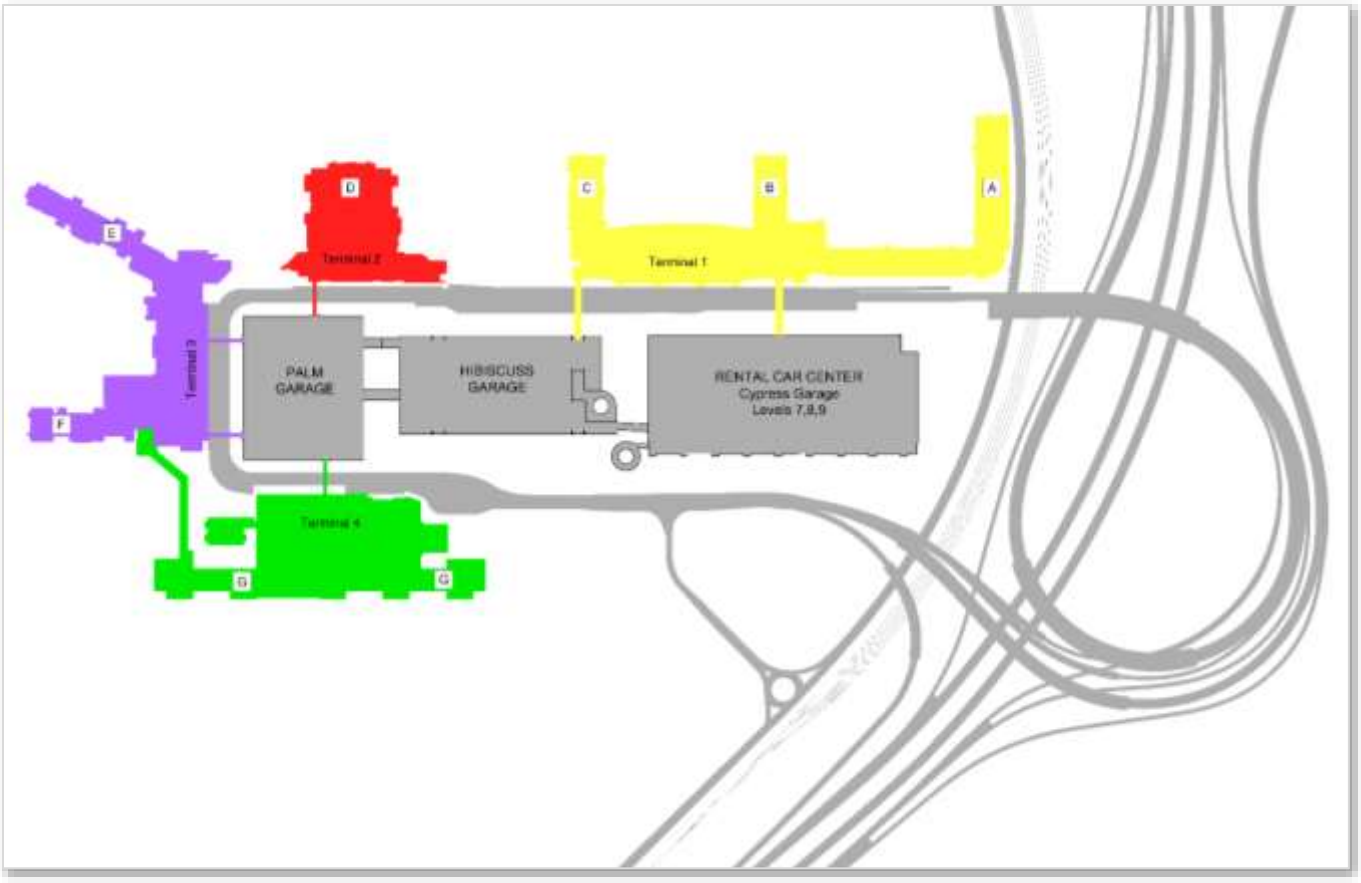


Figure 3: Terminals and Concourses - Key Plan of FLL

To help ensure a consistent design approach for integrating each terminal project into FLL, 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. 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: International Terminal Example – FLL T4 Concourse G

The Terminal DGM are one in a series of guidelines that any project within the FLL Terminals must comply with. Each document is a volume, part of a larger, comprehensive framework for the development of projects at the airport. Each document is coordinated and works in tandem with the others. There are two volumes of Design Guidelines: Terminal and Tenant. Depending on the project, one or both will govern the design decisions for a project. In addition to the Terminal and Tenant Design Guidelines, the following documents should be considered during planning, design, and implementation of projects at FLL:

- Tenant Design Guidelines Manual
  - Link: https://www.broward.org/Airport/Business/Pages/DesignGuidelines.aspx
- Terminal Design Guidelines Manual
  - Link: https://www.broward.org/Airport/Business/Pages/DesignGuidelines.aspx
- Standards for New and Upgrade Communications Infrastructure (also known as Broward County Aviation Department Inside Plant Infrastructure Specifications)
  - Link: https://www.broward.org/Airport/Business/Pages/DesignGuidelines.aspx
- Building Information Modeling (BIM) Standards
  - Link: https://www.broward.org/Airport/Business/Pages/BIMStandard.aspx
- BCAD Electronic Media Submittal Requirements
  - Link: https://www.broward.org/Airport/Business/Pages/BIMStandard.aspx
- BCAD Computer Aided Design (CAD) Standards Manual
  - Link: https://www.broward.org/Airport/Business/Pages/BIMStandard.aspx*
- Geographic Information System Data Standards
  - Link: https://www.broward.org/Airport/Business/Pages/BIMStandard.aspx*
- Maintenance Standards
  - *Available upon request.*
- Signage and Wayfinding Master Plan / Signage Standards
  - *Available upon request.*
- Utility Work Program (and Application)
  - Link: https://www.broward.org/Airport/Business/Pages/Permits.aspx
- Security Standard for Access Control Systems
  - *Document contains Sensitive Security Information (SSI) and may be available upon request.*
- Security Standards for CCTV Systems
  - *Document contains Sensitive Security Information (SSI) and may be available upon request.*
- Security Standards for Terminal Building Infrastructure
  - *Document contains Sensitive Security Information (SSI) and may be available upon request.*
- Security Standards for Terminal Security Signage
  - *Document contains Sensitive Security Information (SSI) and may be available upon request.*
- Operational Guidelines for Ground Transportation Services at FLL
  - Link: https://www.broward.org/Airport/business/Pages/Default.aspx
- Public Art Master Plan – 2010 Update
  - *Available upon request.*
- FLL Airport Master Plan Update (MPU)
  - *Available upon request.*
- FLL Airport Layout Plan (ALP)
  - *Available upon request.*

All terminal projects/work at FLL shall be governed by the Terminal DGM and other BCAD documents, as necessary (*see Figure 5*). A Compliance Review for the Terminal DGM will be conducted by a BCAD Project Review Committee (PRC). Refer to section 3.6 of this document for additional information.

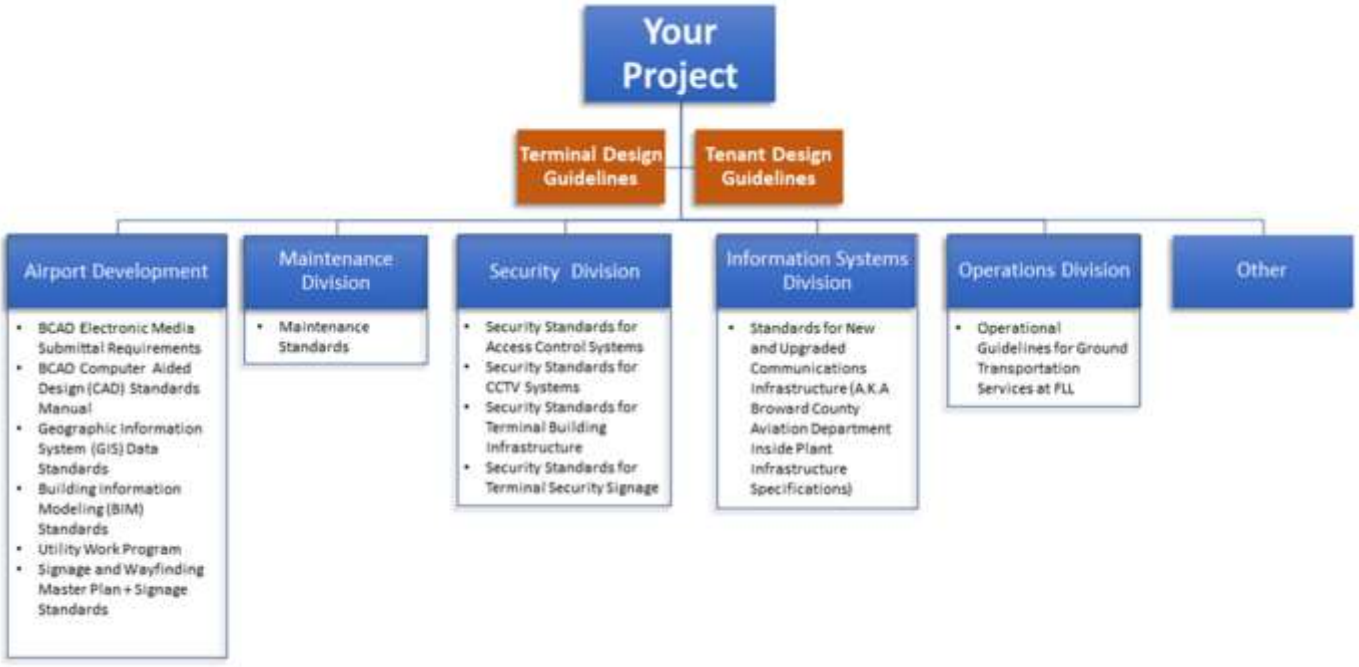


Figure 5: Applicable BCAD Standards/Guidelines for Terminal Projects

1.2 General Conditions

The Terminal DGM applies to all projects associated with the terminals, including curbside roadways, at FLL. Regarding pedestrian bridges and at-grade crosswalks between the terminals and parking garages – these pedestrian facilities are not directly addressed in the Terminal DGM, however, projects for these (or similar) facilities should still consider the Terminal DGM as terminal systems may be affected. 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 any time. 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 and/or obtain the latest guidelines and associated documents.

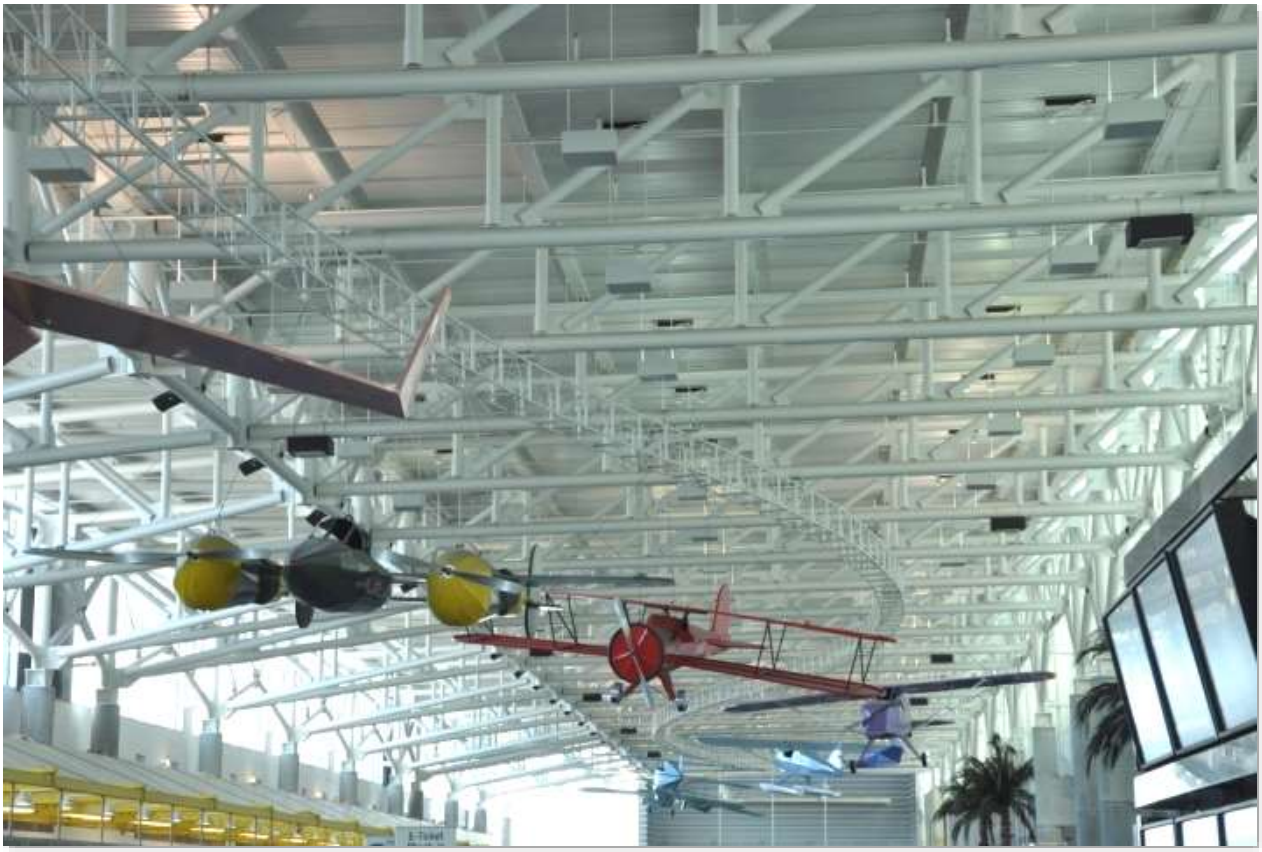


Figure 6: FLL, Terminal 1, Ticketing Level

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 Purchase Order, Work Authorization, and Notice to Proceed prior to the commencement of any work.
- Download, obtain and review all associated BCAD Design Guidelines, Plans, and all other pertinent documents. (e.g., Terminal DGM, and Signage and Wayfinding Master Plan / Signage Standards, etc.)
- Obtain and review the latest FLL MPU and ALP.
- Review Airport Cooperative Research Program (ACRP) Reports, FAA's Airport Design and Engineering Standards, Airport Construction Standards, Advisory Circulars, and any other pertinent FAA rules and regulations.

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

- Obtain and review the latest FAA, TSA, and/or sponsored by TSA document regarding the: "Recommended Security Guidelines for Airport Planning, Design and Construction" prepared by National Safe Skies Alliance, Inc. https://www.sskies.org/images/uploads/subpage/PARAS_0004.Recommended_Security_Guidelines.FinalReport.v2.pdf (*see Figure 7*).

- If available, obtain as-builts, verify 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.

- Obtain the latest BCAD Signage and Wayfinding Master Plan / Signage Standards Manual and advise the BCAD Project Manager if any signage is impacted by the proposed project.

Figure 7: Temporary construction walls "McCain Walls"

- Projects shall include and specify temporary construction walls where possible to limit dust, noise, and unauthorized access during Terminal improvements.

- Temporary construction walls shall be interlocking, modular metal panels that are full height systems from floor to ceiling with smooth white finish, free from tool marks and sharp edges. The basis of design shall be McCain Walls (or similar as approved by BCAD) *(See figure 7).* Temporary walls/partitions are not to be made of drywall material.

Figure 8: Temporary Project Rendering (Wall-mounted Banner)
Terminal 3 Modernization project

- Projects shall include the installation of temporary project renderings on temporary construction walls and/or in the vicinity of the project. Refer to Chapter 2.5 Signage, Wayfinding, and Advertisements for additional requirements *(See figure 8).*

- Temporary construction walls must have accessible doors which shall remain in the locked position at all times and be supplied with a numeric lock combination (to be provided by the contractor). The combination code shall be shared with BCAD personnel, as necessary.

- Do not reference the Terminal DGM in any construction documents or project specifications.

- Become familiar with BCAD's Project Review Committee (PRC) processes and procedures (*see appendix section 3.6*).

BCAD 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.

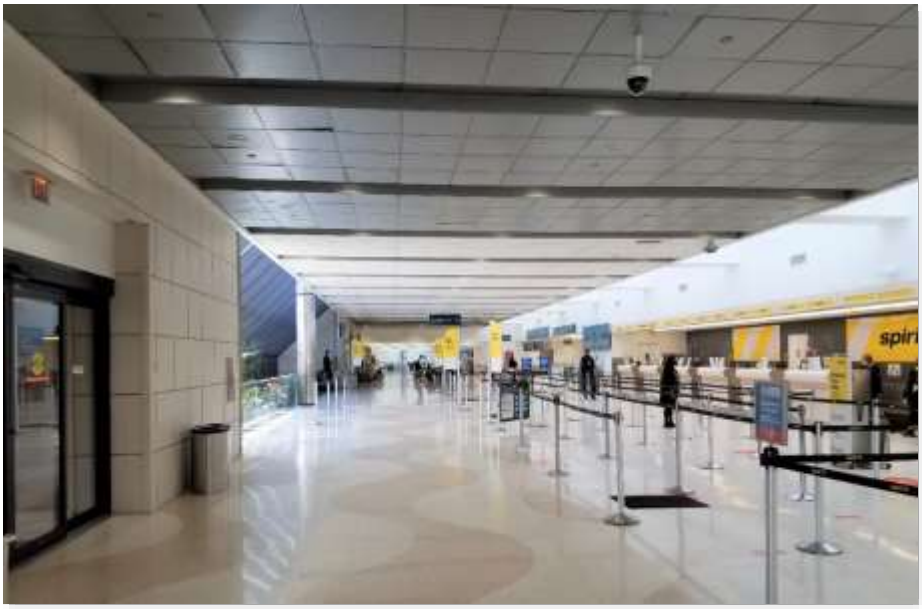


Figure 9: FLL, Terminal 4, Ticketing Level

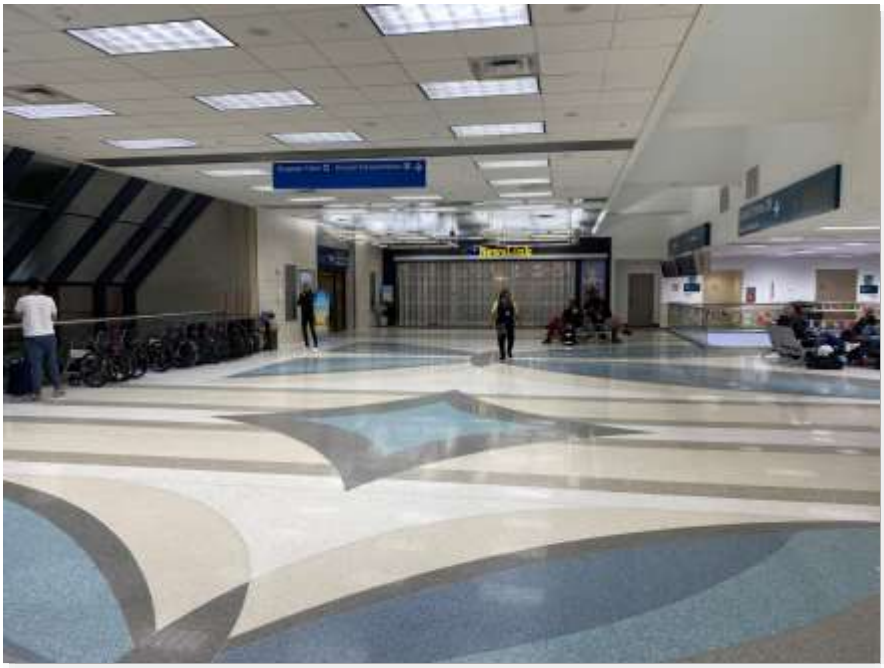


Figure 10: FLL, Terminal 2, west end of Ticketing Level

Conditions and aesthetic design choices at FLL vary by terminal. The overall aesthetics of the terminals are in the process of being modernized while other spaces still need enhancements and design improvements. Natural and artificial light levels are lacking in many areas still. There are a few concourse ceilings that are still low in height with outdated ceiling systems and light fixtures as well as corridors that 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

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 on required and/or accepted functions, color palettes, patterns, lighting levels, and quality of workmanship. The appearance of all terminal projects shall support the airport's design intent.

Figure 11: Consider Aesthetics & Design Excellence

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 optimizing life cycle cost 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 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.

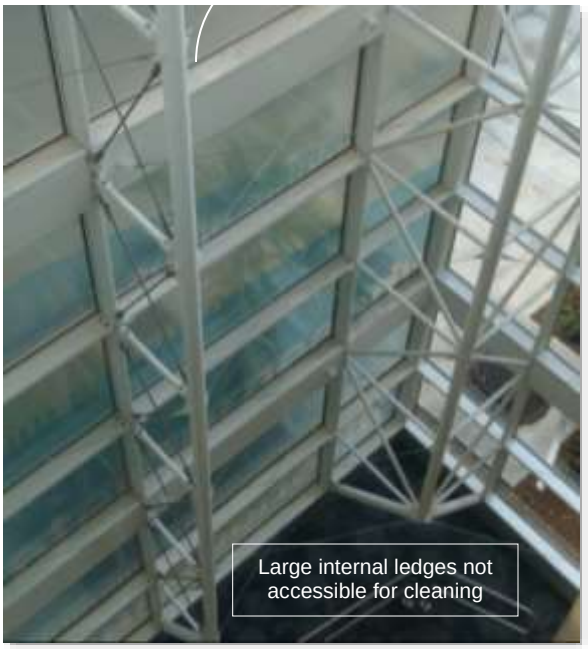


Figure 12: Provide Unobstructed Floor Area for Maintenance and Cleaning of Curtain Wall Framing.

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 13: Consider Sustainable Design Features

1.3 Design Intent Integration

A successful, modern airport terminal reflects the local and regional culture of its geographic location. 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's 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:

- Bright blue skies, variety of exotic palms, and invigorating sunlight
- Lush green vegetation with other vibrant colors
- Beaches, riverwalks, and long boardwalks
- A boating, 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 urban 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.

This shall drive the development of creative, innovative, and optimized design projects for terminals, concourses, and projects within. With the design professional's development of efficient passenger processing and a unique spatial experience through lighting, materials, textures, colors, and systems integration, all should 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 FLL. 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 14: FLL Terminal 1 Concourse A

"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)

To transform an existing airport terminal into a 21st century facility that enhances operational efficiency and improves the passenger experience, design professionals must be innovative. Every aspect of how one person, or hundreds of people, are processed through the terminal needs to be considered. This innovation by the Designer begins at curbside and continues along a 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 FLL 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 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 (ARCP) "ARCP 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 designers ideas for new, innovative 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 meeter-greeter area
- Arrivals lounges

Figure 15: Example of Terminal Passenger Processing with Self Check-in Kiosks at FLL, Terminal 4 Ticketing Level

In September of 2019, *Portland International Airport* was ranked the best large hub in passenger satisfaction. *Indianapolis International Airport* was also ranked first as best medium hub airport.

J.D. Power 2019 North America Airport Satisfaction Study has given these two airports its highest marks in passenger satisfaction in a survey of 62 major airports. Now in its 14th year, the study measures overall traveler satisfaction with large-hub and medium-hub North American airports by examining six factors: terminal facilities; airport accessibility; security check; baggage claim; check-in/baggage check; food, beverage, and retail. This is an example of the type of innovative design that BCAD encourages at FLL.

Figure 16: Example of Terminal Passenger Processing with Self Check-in Kiosks at FLL, Terminal 2 Ticketing Level

Figure 17: Indianapolis International Airport
(Image by HOK architects)

2.2 Building Envelope Facades and Roof

Walls, Curtain Walls, and Storefronts

Figure 18: Airport Curtain Wall System at T1 Curbside

The curbside exterior facades of the airport terminals are one of the most important visual elements of the terminal buildings. An inviting appearance sets the stage for the curb appeal and announces the start of the passengers' travel experience. The existing Chattahoochee precast panels, bronze-anodized curtain walls, and storefront systems are being phased out on future modernization projects. All exterior walls shall be designed for hurricane velocity winds per the Florida Building Code. Criteria for curtain walls and storefront design shall include:

- 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.
- Exterior wall cladding material should be brushed stainless steel or aluminum with a durable metallic finish (e.g., Kynar®, Alucobond®).
- All fasteners shall be stainless steel. Dissimilar metals shall be separated by a manufacturer's 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, horizontal, 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.
- Floors shall be structurally capable of supporting scissor lifts and boom arms to allow access to glass for cleaning and maintenance.
- 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 19: Existing bronze-anodized Curtain Wall Systems at FLL are being phased out and have an undesirable slope for maintenance.

- New exterior walls and/ or storefront systems abutting adjacent existing walls shall consider matching existing reveal joint patterns, spacing, orientation, and exterior wall base design.
- Exterior wall paint color and finish shall be reviewed with BCAD during the design phase.

Glazing

Daylighting, views, and open space generally offer comfort to passengers and enable a less stressful travel experience. Designers should maximize the amount of glazing and natural light for terminal projects involving the building envelope 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 shall obtain BCAD approval during Design Development. Slot-type glazing within an exterior concrete wall system, similar to recent Terminal 4 improvements, shall be considered by the Designer for glass curtain walls facing south, east, or west (direct sun exposure) *(see figure 20).*

Figure 20: Slot Glazing at FLL, T4 Concoure G

Figure 21: Curtain Wall Glass System at FLL T1 B/C Connector

Figure 22: Detroit International Airport Concourse Glazing

Terminal Entrances

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

Figure 23: JFK International Airport Entry

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
- No air curtains at terminal entrances
- Walk-off carpet tiles inside entrance vestibules, through the central area of the vestibule (*see figure 33*).
- No carpeting outside entrance vestibules
- Minimize grooved or textured surfaces that may cause noise from rolling luggage

Terminal entrance signage shall be coordinated with BCAD's Signage and Wayfinding Master Plan / Signage Standards.

Figure 24: Air Curtain Incorporated into Curtain Wall at Barcelona International Airport Entry

Terminal Roofing

Figure 25: Aerial Image of FLL (Source: Nearmap, November 2021)

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 and/or a portion is modified in any which way to accept new construction to existing conditions (e.g., terminals that were recently re-roofed).
- Innovative but proven roofing designs will be considered
- New roofing systems shall carry at least a 20-year warranty
- All roof assemblies and products must have a valid Miami Dade Notice of Acceptance (NOA)
- 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 white, highly reflective surface is preferred by BCAD
- Exposed metal roofs for terminal-to-terminal connectors and walkways may be considered by BCAD
- All roofed areas of the Airport Terminal shall 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 shall be provided at all roof locations
- Roof equipment shall be placed such that they are generally not in view from public areas
- Antenna farms and mounting shall be coordinated with the BCAD IS, Maintenance, and the FAA.
- Refer to the BCAD Maintenance Standards for additional information.
- All roof sections that have mechanical equipment shall be provided with elevator access for service, maintenance, and repairs needed to roof mechanical equipment.

Figure 26: Bilco Type S Ladder Access Enhanced Performance Roof Hatch (or as approved equal)

2.3 Materials and Finishes

Aesthetics, durability, maintainability, and sustainability will be the key drivers for all materials and finishes used in all FLL terminal modernization projects and new terminal design and construction projects. Architects, engineers, and interior designers must incorporate materials and finishes that will be durable and resistant to abuse. All materials and finishes must be able to maintain their aesthetic appeal when exposed to high occupancy and use, South Florida climate, and impacts from luggage. The Designer shall submit samples of all materials and finishes for review and approval by BCAD. Lighter-colored materials and finishes that highlight the natural colors of South Florida are preferred.

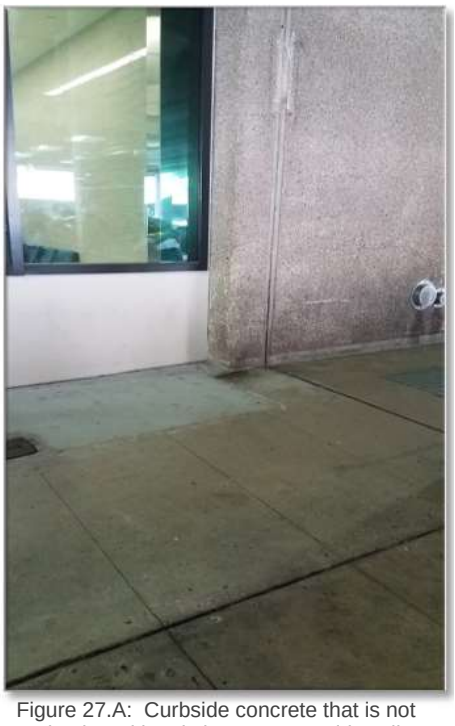


Figure 27.A: Curbside concrete that is not cohesive with existing concrete sidewalk

Figure 27: Curbside Concrete Sidewalks at Indianapolis International Airport by HOK

Curbside Walkways

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'. New concrete sidewalk additions abutting existing sidewalks shall have a cohesive and aesthetic appearance. New sidewalks shall match existing concrete finish, control joint pattern width, depth and design, and new pours shall extend to the nearest control joint to eliminate differences between existing and new. Figure 27.A depicts undesirable architectural design and finish elements. The minimum thickness for all poured concrete sidewalks shall be 5 inches or more if deemed necessary by a licensed engineer. At entrances and along the terminal's exterior wall, the Designer should consider a thickened edge slab to help prevent cracking and support lifts (i.e., scissor lifts and boom lifts).

Figure 28: Typical Scissor Lift at FLL Stored on Curbside

The Designer shall give special attention to control and expansion joints. All joints shall be coordinated with handrail modules. A 1/2-inch 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 29*). Dissimiliar metal fasteners are prohibited to avoid galvanic reactions. The Designer shall ensure that railing post modules align with concrete joints.

Figure 29: Existing Handrails at FLL

Curbside Stanchions

Stanchions (utility posts) located on curbside shall consist of a black aluminum post, black removable rubber base, and a black belt (*see figure 30*).

Figure 30: Standard BCAD Curbside Stanchion

Curbside Bollards

Bollards shall be stainless steel with a sloped top. Existing protective/security bollards at FLL are part of an engineered plan. The Designer shall request specific information regarding their design and performance criteria from BCAD (*see figure 31*). Refer to the BCAD Security Standards for Terminal Building Infrastructure for additional requirements.

Curbside Concrete Columns

The bottom 8 feet of all exposed concrete columns shall be coated with a protective finish to prevent soiling and staining of the concrete. An exterior grade textured stainless steel column enclosure or other Class 5, BCAD-approved finish shall be considered by the Designer and must be approved by the BCAD PRC.

Curbside Soffits

Open soffits or exposed structure are not allowed as they attract bird perching and nesting. Exterior terminal soffits shall be clad with a metal panel system that one person can remove and repair (*see figure 32*). The panels shall be corrosion resistant due to humidity and salt air conditions.

LED light fixtures shall be considered for exterior areas and within curbside soffits. Other light fixtures along FLL's curbside canopies should be installed on the canopy's columns to accent the design of the canopies.

Figure 31: Existing entrance bollards at FLL

Curbside Signage

There are a variety of signage requirements along FLL's terminal curbsides. The signage required includes, but is not limited to, terminal location, airline designation, services, restriction signage, direction signage, etc. The Designer shall refer to FLL's Signage and Wayfinding Master Plan – Master Plan / Signage Standard Manual for additional information. At-grade pedestrian crossing (crosswalk) signage shall be provided in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).

Figure 32: Existing Metal Soffits at FLL Terminal 1

Terminal Entry Flooring

Tiled entries will not be allowed in any FLL terminal project (*see figure 33*). The entrance path portion of the vestibules shall be provided with walk-off carpet tiles installed in a quarter turn pattern. The typical entrance carpet tile used in FLL is either the Quadrus Liftoff-Boundary, or more recently the Milliken OBEX Tile CutX; these or similar shall be referenced as basis of design. The Designer shall coordinate with the BCAD Maintenance Division to obtain further information regarding carpet requirements. Figure 33 shows existing walk-off carpeting in terminal vestibules. Figures 34-35 are potential alternatives that may be discussed further between the Designer and BCAD. In addition, epoxy terrazzo flooring shall be provided along the sides of the carpet entrance path. The epoxy terrazzo design and colors shall correspond to the terminal terrazzo flooring and shall be discussed with the BCAD project manager. Samples of all proposed vestibule entrance flooring shall be provided to BCAD during Design Development for review and approval.

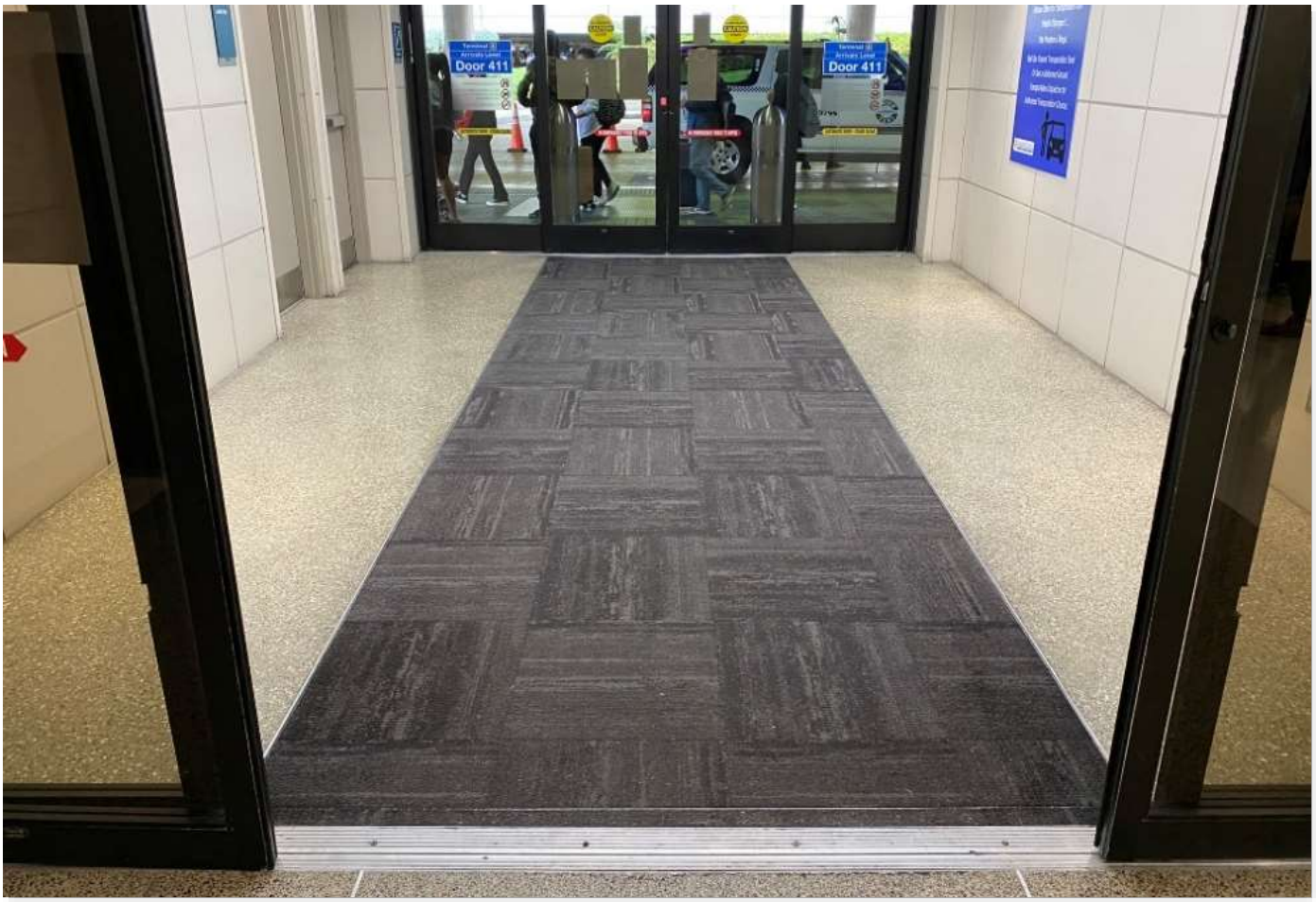


Figure 33: Existing FLL Terminal Vestibule Entrance Flooring

Terminal Flooring

Poured in place epoxy terrazzo flooring will be used in the primary circulation paths of the terminals and concourses including public stairways and baggage claim level circulation areas. Proposed terrazzo flooring around baggage claim devices shall be discussed with BCAD PM during Design Development. Primary divider strips shall be 1/4” wide aluminum. Secondary divider joints shall be 1/8” or 1/16” wide aluminum. Areas of continuous terrazzo flooring shall not be larger than 10’ x 10’. Smaller areas are encouraged to help minimize cracking or as needed to allow phasing of terrazzo installation while maintaining areas open for pedestrian circulation. Designers shall provide a crack-suppression membrane and a moisture mitigation membrane below the terrazzo to control potential cracking and moisture problems. The terrazzo floors shall be sealed with 3M Scotchgard Stone Floor Protection (or similar to be approved by BCAD). The base color terrazzo specified by BCAD (*see figures 34*) is as follows:

Figure 34: BCAD Terrazzo Resin Systems

AKA (FLL Airport White):

- Epoxy Terrazzo
    - Chips:
        - 40% Crystal Glass #,1
        - 20% Blanco Mexicano #0
        - 20% Blanco Mexicano #1
        - 10% Classic MOP #2
        - 10% Classic MOP #3

Prior to terrazzo installation, the Contractor shall provide terrazzo samples of the above mix and/or a terrazzo sample that matches existing conditions to be approved by the BCAD PM. Provisions shall be provided for the floor substrate in order to ensure a flush and level floor between terrazzo and other floor applications (e.g., carpet tile, etc.). The Designer shall give special consideration to floor materials in restrooms that resist staining (*see Terminal Restroom Floors section for additional guidance*). 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 Figures 35-38 which shows cropped sections of artistic terrazzo flooring recently installed at FLL.

Figure 35: Terrazzo Floor Examples at FLL

Modular carpet tile 1 meter x 1 meter with PVC-free cushion backing will be the preferred material at all concourse holding areas and around baggage carousel areas. Floor materials that will not be allowed in public areas include:

- Rolled carpeting
- Engineered wood
- Vinyl tile
- Vinyl sheet
- Exposed polished concrete

Floor base materials within the terminal concourses shall be from 8” up to 12” in height (depending on existing terminal finishes). Depending on the location or in the overall design of the space, Designers shall either recommend a terrazzo base where terrazzo flooring meets a wall or a stainless steel baseboard. Other hard and abuse-resistant base materials may be allowed, provided a color sample of the material and a material product sheet is submitted for review during the Design Development phase. Prohibited floor base materials include rubber, vinyl, and wood.

Figure 37: Terrazzo Flooring at FLL Terminal 2

Figure 38: Terrazzo Flooring at FLL Terminal 4

Terminal Walls

Due to the South Florida climate and its humidity, there are certain materials and finishes that work better than others at FLL. The Designer shall recommend wall materials that can withstand the South Florida climate and the high traffic activity of an airport. Product material shall be submitted for review and approval during the Design Development phase.

All airport terminal walls shall be of noncombustible materials, such as metal studs, channels, caps, and bracing. All gypsum board shall have a minimum thickness of 5/8". Fire resistant ratings shall be designed per Florida Building Code requirements.

Primarily, terminal wall finishes include tiled walls, non-perforated demountable wall systems with or without a powder coat finish, laminated or solid material, painted drywall partitions, and exposed chattahoochee walls. Tiled walls are either installed as wainscot or extend the full height of walls. Regarding interior architectural wall cladding, certain modular wall panel system compositions and its anchoring systems have presented irregularities in its installation and aesthetic characteristics. Depending on the substrate (existing or new), location, type, and fastening method, the use of modular wall panel systems may not be suitable or recommended.

BCAD's preferred finish on gypsum drywall partitions is an eggshell finish. The colors for all painted wall surfaces shall be reviewed and approved by the BCAD PRC. All wall corners shall receive stainless steel corner guards (2" x 2") min., 14-gauge, type 304 countersunk screwed-on guards. Wood framing will not be allowed for use in any wall types. Exposed CMU walls are not permitted either.

Lastly, there are certain locations in the terminals that still have chattahoochee wall finishes and imitation coral wainscot. As terminals are modernized, the chattahoochee walls and imitation coral wainscot finishes are being phased out and replaced with modern finishes.

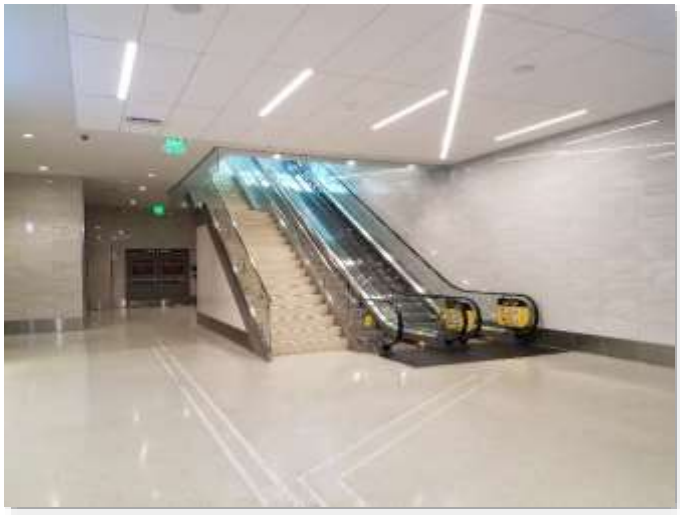


Figure 39: Tiled walls at FLL T1 Concourse B Corridor

Figure 40: Demounted wall system at FLL T1 Concourse G Exit Corridor

Terminal Ceilings

Painted gypsum board ceilings will be allowed throughout the terminals. Access panels shall be provided as necessary to allow access to service equipment within the ceiling space. Suspended ceiling grids with 2’ x 2’ and 2’ x 4’ acoustical lay-in tiles may also be used. In specific areas, the use of extra micro perforated metal panels may be applicable for architectural design aesthetics. Designers should also provide differentiated ceiling heights as well as material and color variation to enhance the passengers traveling experience through the FLL terminals. Linear metal ceilings with a wood-effect finish and other well designed ceiling elements may 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 41: Indianapolis International Airport by HOK
Ceiling at Security Screening Area

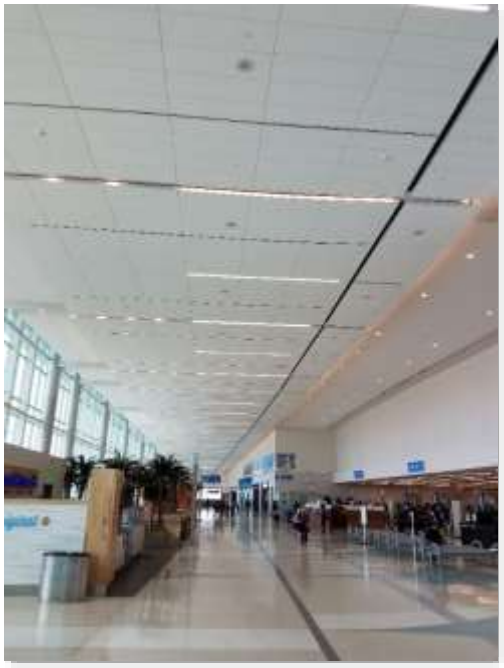


Figure 42: FLL T1 Concourse B/C Connector Ceiling

Figure 43: FLL Terminal 4 Concourse G Ceiling

Terminal Restrooms

In addition to the information provided in this section, the Designer shall coordinate the terminal restroom requirements with the BCAD Maintenance Standards. 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. Entrance doors will not be allowed. The openings shall be screened from public view such that no line of sight to fixtures, toilet accessories, and mirrors is possible. BCAD's preference for the front wall is blue glass panels, similar to those installed in the T1 B/C Connector (*see figure 44*), except with a higher kick plate base than that installed in the T1 B/C Connector. Restrooms shall have (preferred) a split design to allow the cleaning of one half of each restroom while keeping the other half fully open (for both 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 (minimum) lockable service door shall be provided at each chase. Floor drains and hose bibs are required in all chase areas.

Figure 44: Restroom Entry at FLL Terminal 1 B/C Connector

Terminal Restroom Janitor's Closet

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 shall be designed to hang on adjacent walls.

Terminal Restroom Floors

Restroom floors shall be made of large-format epoxy terrazzo flooring with minimum thickness joints. The flooring shall have adequate friction characteristics for slip resistance (particularly when wet) to minimize risk of slips/falls (also check that any code requirements for friction are met). The flooring shall have a robust sealer that has proven to prevent staining from urine. Other floor finishes may be considered by BCAD, such as recycled glass tiles, porcelain tiles, or other materials if proposed by the Designer. Flooring (tile or otherwise) must achieve the code required cross slope and slope to the each required floor drain. At least one floor drain per 150 square feet shall be provided. Joint grout (if applicable) must be non-staining. A 6" high flush with floor cove base shall be provided. Colors of flooring should be light and natural. Colors and patterns require BCAD PRC approval. Drains shall also be slip resistant and designed to not allow spike heels to catch in them.

Terminal Restroom Walls

The structure of the walls shall 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 match the color of the tile. The tile shall run horizontally from the top of the floor base to the bottom

edge of the ceiling. Colors of wall tile shall be light and natural. Patterns may be allowed but will require review and approval by the BCAD PRC.

Figure 45: Example of Existing Tiled Walls in Restroom at FLL Terminal 1 B/C Connector

Terminal Restroom Ceilings

Ceilings shall be a smooth and hard surface. Acoustical tile and metal ceiling tiles are not allowed. Variations in height are allowed, but a minimum height of 8'-0" shall be provided. 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 standard 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. For structural rigidity, the toilet partitions shall be supported by a full-length channel (floor to ceiling), secured to the red iron above the ceiling, with pilasters inserted in the channel and secured accordingly. The shoe should be a high-grade stainless steel. The partitions shall have an embossed diamond textured stainless steel finish. Panels, ceiling pilasters, and doors shall be one inch thick and fabricated from stainless steel. All hardware shall be stainless steel. Locking mechanisms shall be surface-mounted sliding latches. Wall, pilaster brackets, and door hinges shall be continuous. Gaps between doors and panels will not be accepted. The Designer should consider taller partitions to further enhance privacy from above and below. The Designer shall provide ADA accessible compartments and stalls as required.

Figure 46: Example of Existing Toilet Partitions in Restroom at FLL Terminal 1 B/C Connector

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)

Figure 47: Dyson Airblade Hand Dryers in FLL Restroom

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 dryer selection shall be coordinated with the BCAD PM. Soap dispensers 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.

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 at least 1,000 lbs. of pull-out force. Paper towel dispensers shall be provided 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 at least 25 lbs. shall also be provided. Water Closets will be wall hung vitreous china with water saver siphon jet elongated bowl, both standard and handicapped (Sloan or approved similar). 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 wash-down function or siphon jet (integral trap) (0.125 gallons per flush or less). Flush valve shall be sensor-operated water saver with solenoid and GFI. Chair carrier shall be floor mounted with floor bolts.

Figure 48: Example of a Continuous Sink at FLL Terminal 1 B/C Connector

Terminal Column Covers

All concrete columns and exposed steel 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*).

Terminal Stairways

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. The Designer 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.

Figure 49: Example of Stainless Steel Column Cover at Terminal 2 Ticketing Level

Figure 50: Example of Terrazzo Stairs at Terminal 2 Ticketing Level

Figure 51: Example of Terrazzo Stairs at Terminal 2 Ticketing Level

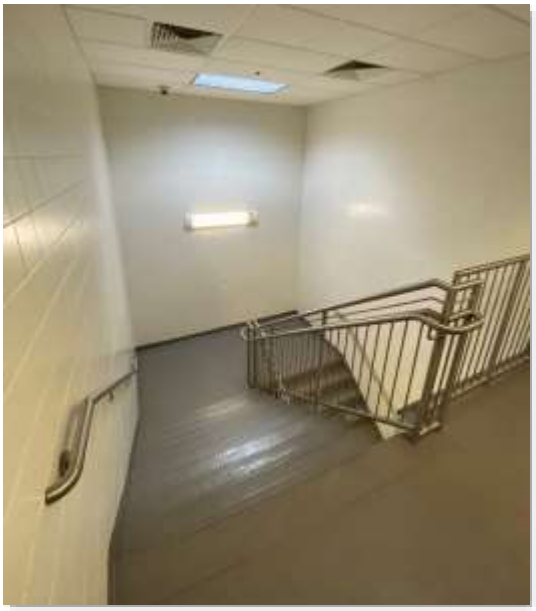


Figure 52: Example of Emergency Stairs in Terminal 3

Terminal Handrails

The Designer 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 53-54*).

Figure 53: Clear Glass inserts at an Airport Terminal

Figure 54: Frosted Glass Inserts on a Stairway Rail

Terminal Water Fountains

Water fountains shall be provided frequently throughout FLL terminals. The Designer shall confirm the make and model number with BCAD. BCAD's preferred locations are between restrooms and near concessions. Water fountains that include water bottle fillers are encouraged (e.g., those recently installed in the new Concourse A). All water fountains shall be ADA compliant.

Figure 55: Existing Drinking Fountain at FLL Terminal 3

Figure 56: Existing Drinking Fountain at FLL Terminal 2

Pet Relief Areas

Pet relief areas shall be provided throughout FLL terminals in accordance with ADA requirements. The Designer shall coordinate with BCAD Operations and BCAD Security to determine whether to provide no door, or to enclose it with a door and provide CCTVs to discourage unintended activities.

Other requirements

Additional passenger service areas shall be incorporated into the terminals: family restrooms and breast -feeding rooms.

Figures 57: Pet Relief Area at FLL, Terminal 4

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 (Phillips HeartStart FRx, with carrying case #989803139251) or approved equal. At least one pre-security and one, post security shall be provided on each floor in the following areas:

- Concourses
- Ticketing lobby
- Baggage claim area

Figure 58: Example of a wall mounted recessed Defibrillator cabinet

Interior Courtesy Vehicle Parking

Space should be allocated for battery-powered vehicles that operate within public areas of terminal interiors, such as courtesy vehicles and other vehicles for maintenance or security staff. An appropriate power receptacle should be provided near their parking area(s) for charging. The Designer shall coordinate with the BCAD PM for vehicle parking requirements, if applicable.

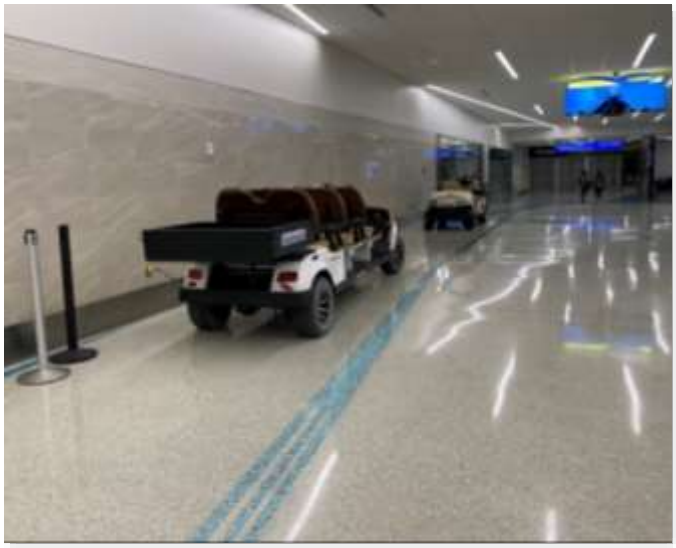


Figure 59: Battery-powered Interior Vehicle (BSO Owned) Parking in T1 Concourse A

Figure 60: Battery-powered Interior Vehicle (Spirit Owned) Parking in T4 Concourse G

ADA Accessibility Codes

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

2.4 Furnishings, Fixtures, and Equipment

Curbside

BCAD's priority is to create and maintain an attractive and functional curbside appeal along landside public areas. Inconsistent furnishing, fixtures, equipment, and lack of equipment screening, as well as inconsistent furnishing layouts, shall be avoided. The Designer shall consult with BCAD for any current criteria, standards, preferences, and available vendors regarding furnishings along the curbside. The Designer will need to consider and provide the following curbside design elements when improvement projects are executed during terminal modernization projects. All items below, and any other items related to curbside furnishings, fixtures, and equipment, shall be presented and reviewed with BCAD during design phase:

Figure 61: Existing Terminal 4
Upper Level Curbside

- Seating design opportunities regarding arrangement, type, location, quantity, material, color, etc. shall be discussed with BCAD during the design phase. Currently, there are several different bench styles, materials, and finishes along the terminal curbsides that shall be phased out to meet the new criteria. (*see figure 62 for one type*).
- Standard trash cans shall be explosion resistant stainless steel with a brushed with abraded finish.
- Consider screened storage areas designed for wheelchairs and luggage cart storage (*see figure 63*).
- 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). The Designer shall consider placement of outdoor kiosks under shade and rain screen devices.

Figure 62: Existing BCAD Standard Curbside Bench

Figure 63: Existing wheelchairs with no screened storage

Figure 64: Example of existing curbside Ticket Counters and Baggage Check-in

Figure 65: Additional Curbside Benches at FLL for reference

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 the Designer should pursue for FLL Terminal improvement projects.

Figure 66: Indianapolis International Airport by HOK
Vehicular Curbside

Figure 67: 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. Bollards shall be provided separating the roadway from the terminal building. The Designer shall reference BCAD Security Standards and coordinate with the BCAD Security Division to ensure bollard specification compliance. Bollards also provide a wide aisle on the terminal side for passengers to find their way to their desired curbside baggage check-in, wheelchair storage, ticketing kiosks, and entry into the terminal. This separation also enables space for innovative design of curbside check-in kiosks (*see figure 68*).

Figure 68: Example of Curbside Check-in at an Airport Terminal

Figure 69: Example of stainless steel outdoor smoking post

Smoking Posts

New curbside smoking posts shall be provided for all terminals. Smoking is not 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 secondhand smoke enters the terminal (*see figure 69*).

Terminal Side

The furniture, fixtures, and equipment within FLL will require upgrades when terminal improvement projects are performed. Beginning with the passenger processing, all self service check-in kiosks will be standardized by BCAD. The Designer shall comply with the following requirements:

Figure 70: Example of existing FLL E-ticketing Kiosks connected in series to a bank.

- Coordinate with BCAD on the selected manufacturer make and model for airline e-ticketing kiosks
- Standardized spacing of all kiosks
- Design an effective arrangment of kiosks for easy passenger processing
- Center align all kiosk groupings in FLL Terminals on the adjacent wall
- E-Ticketing kiosks shall be connected in series to a bank, minimizing floor penetrations and permanent damage of terrazzo floors. (*see figure 70*)

Figure 71: Example of E-ticketing Kiosk Configuration at FLL

Terminal Ticket Counters

The existing FLL ticket counters (BCAD common-use counters) within the terminals are outdated *(see figure 72*) and are being replaced as the terminals are modernized *(see figure 73)*. There are other ticket counters throughout the terminals that are airline specific and designed to their own design standards.

New ticket counter design ideas and solutions shall be provided during terminal modernization projects by the Designer. All new ticket counters shall be ADA accessible. A diagrammatic concept for a new FLL service counter has been provided for reference (*see figures 75-76*). Variations of this concept will be allowed by BCAD. All proposed designs must be submitted for review by the BCAD PRC.

Ticket counters shall accommodate two airline personnel each. Their minimal work area shall be 30” wide (2’-6”). The ADA accessible area shall be in the middle or in front of the casework structure. The base of the ticket counter shall have a toe kick front and back with a 6-inch 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 74*) that BCAD may allow include, but shall not be limited to, the following:

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

Figure 72:
Example of existing Ticket Counter at FLL Terminal 4

Figure 73:
Example of existing Ticket Counter at FLL Terminal 1

Figure 74: Typical Abraded Stainless Steel Finishes

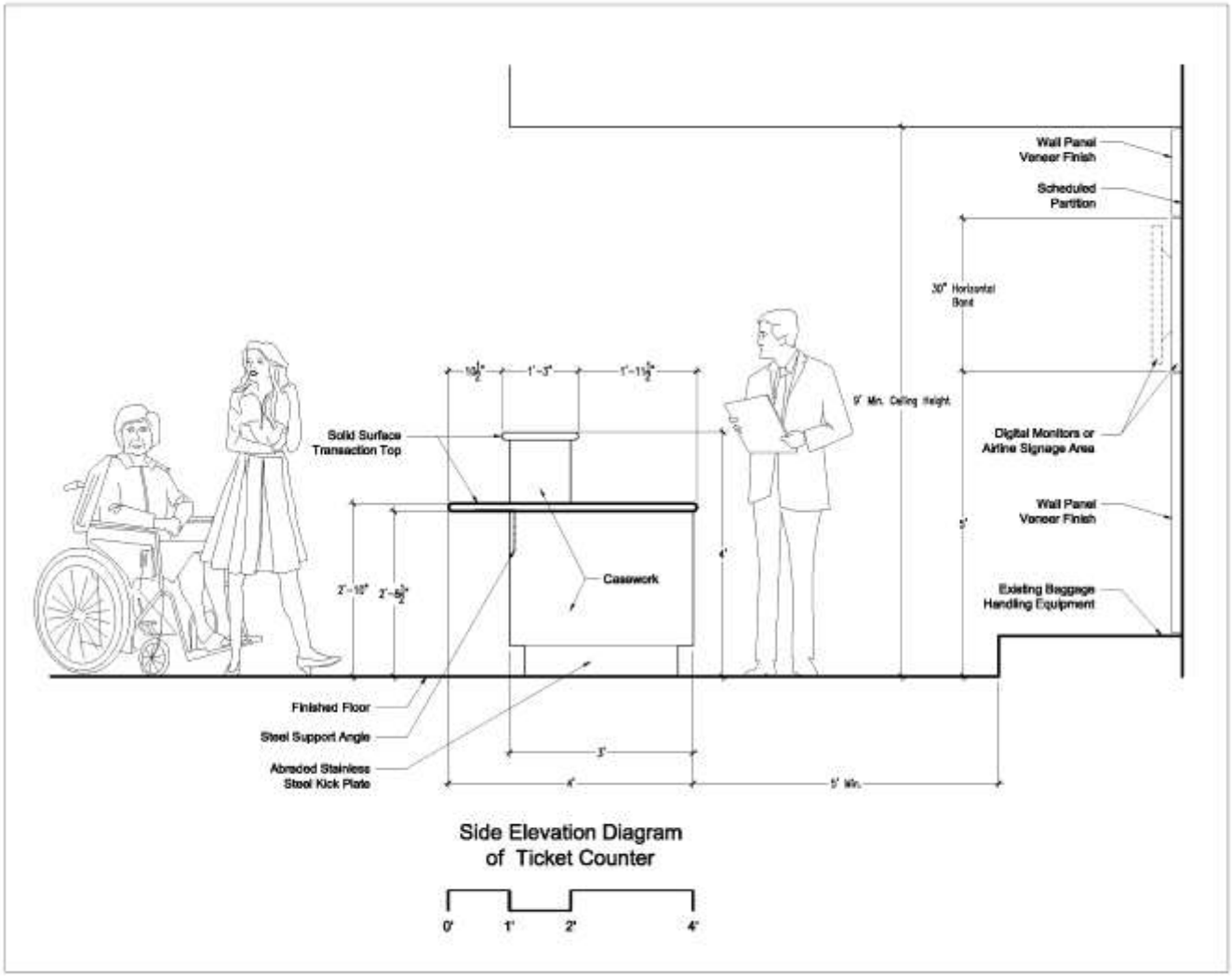


Figure 75: Side Elevation of New Concept for FLL Terminal Ticket Counter

Self-service or attended baggage check-in counters are new features offered by airline tenants. Design and layout has to be approved by PRC (*see figure 76*).

All tops of service counters shall be a solid surface material. The color and material selection for all may vary by terminal but must be approved by the BCAD PRC. Behind the service counters, the Designer shall provide a 30-inch 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 inches. 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. Screens will not be allowed to exceed the 30” zone (*see figure 75)*. Background wall coverings may be accepted with PRC approval.

Figure 76: Terminal 3 Ticketing and Baggage Check-in Counters at FLL

Terminal Concourse Service Counters and Gate Podiums

Some of the existing FLL concourse gates have old gate podiums that have been renovated (*see figure 77*) while others are being replaced as the concourses are modernized (*see figures 78, 79, 80, and 81*). 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 figure 79*). Variations of this concept may be allowed by BCAD (*see figures 78, 80, and 81*). All proposed designs must be submitted for review by the BCAD PRC.

Behind the gate podium and set 6 inches from the back wall there shall be a monitor support structure (*see figures 78 and 81*). 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" wide. 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, made of 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 PRC. The back of the counter shall be open to receive a casement insert, with open shelves and ventilated locked compartments for computers. Access panels to power and data connections are recommended (*see figure 81*).

Figure 77: Example of older, renovated existing gate podiums in T4 Concourse G

Figure 78: Approved FLL concept for new gate podiums in T2 Concourse D

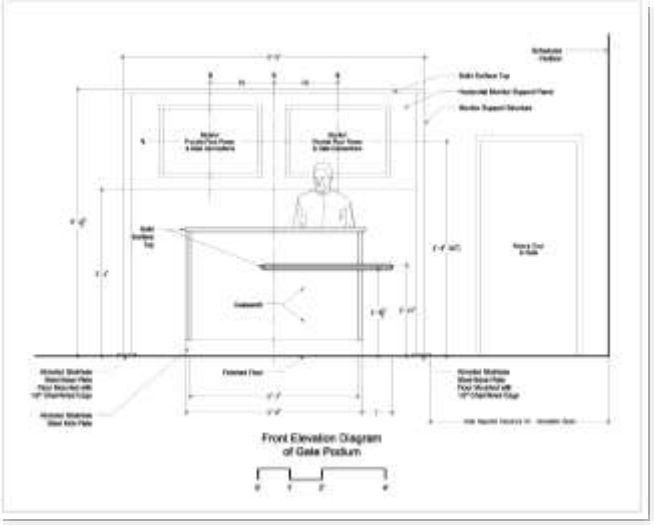


Figure 79: Ticketing and baggage check in counters

Figure 80: Approved FLL concept for new service counters at T1 Concourse A, B, and C gates

Figure 81: Approved FLL concept for new gate podiums in T4 Concourse G

Terminal Ticket Counter Stanchions & Queuing Signage

The design and layout of stanchions shall be considered by the Designer for all pedestrian queue areas throughout the terminal. Stanchions shall be made of brushed aluminum (satin) finish and be of the retractable belt type. They shall be Single Line Visiontron (part # 300-SS) or a comparable vendor to be approved by BCAD. The color of the retractable belts shall be navy (Visiontron Custom Dark Blue Belt or similar) or BCAD-approved airlines' customized belt with airline branding. All stanchion posts must be uniform. Hard panel stanchions shall also be brushed aluminum with frosted ¼" thick acrylic material. Both stanchions and panels shall be compatible systems. Ticket counter queuing signage shall be 14" x 11" engraved plastic in a frame that attaches to the stanchion posts, consistent with the style of the stanchions (*see figure 82*).

Figure 82: Stanchions, Hard Panels and Signage

Terminal Concourses Seating

Figure 83: Rocking Chair Seating, T4 Concourse G

Gate seating shall be Arconas bernu aero (or similar to be approved by BCAD). In-seating power/charging receptacles (e.g., inPower Flex System) is strongly recommended and shall be confirmed with BCAD Operations during Design Development. Seating must be configured back-to-back in groupings that are easy for BCAD Maintenance personnel to move. They shall be arranged perpendicular to the concourse's primary circulation route. The seat color material shall be black (*see figure 84*). Where space permits, consider additional seating that offers comfort/relaxation and aircraft observation (*see figure 83*).

Figure 84: Arconas bernu aero Seating – Terminal 1 Concourse A

Terminal Waste and Recycling Receptacles

Waste receptacles shall be a brushed or other BCAD PRC approved stainless steel finish (*see figure 85*). Recycling receptacles shall also be of the same finish and clearly marked with standard symbols for recycled waste *(see figures 85-86)*. No polished stainless steel receptacles shall be permitted due to unpleasant aesthetics after from prolonged use. Automatic compacting waste receptacles should also be considered by the BCAD PM and coordinated with the Designer (*see figure 87*). The Designer shall confirm the make and model number of BCAD's preferred waste and recycling can manufacturer. General waste trash cans openings must be large enough to allow for disposal of pizza boxes.

Figure 85: Preferred Trash Receptacle for Waste and Recycling

Figure 86: Alternate Trash Receptacle for Waste and Recycling

Figure 87: Automatic Compacting Trash Receptacles at FLL Terminal 2

Terminal Baggage Claim

Terminal projects shall include baggage claims with sloped carousels in lieu of the existing flat carousels (*see figure 88*). Adequate passenger circulation space shall be provided to accommodate peak passenger loads. Existing or new baggage cart rental units will be relocated to not interfere with passengers retrieving luggage. All carousel surface areas shall be stainless steel. An abraded finish is preferred for the base of the equipment.

Figure 88: Example of Preferred Sloped Baggage Carousel

The Designer shall consider the use of natural daylight and provide views to the outside where possible *(see figure 89*). 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 baggage claim carousel.

Figure 89: Indianapolis International Airport by HOK - Example of Sloped Baggage Carousel and Baggage Claim Area

Mobile Device Charging Stations

Mobile device charging stations (or recharging stations) in the terminals are strongly recommended. Charging stations shall be provided in the concourses (post-security) and in the ticketing lobby and baggage claim areas (pre-security) where possible. Where space permits, device charging stations are intergrated within seating units or in between seating (*see figure 84 and 91*). In other concourses, a linear countertop parallel to the concourse seating may be provided (*see figures 92 and 93*). In Terminal 1 Concourse A, an innovative solution recently installed are countertops with seating that have both flush/integrated inductive charging stations and outlets underneath the countertops. Another innovative concept that also exists in the concourses includes the use of charging station kiosks (*see figure 90*). Charging station kiosks are a convenient way for passengers to recharge their mobile phones and other devices. Such kiosks should be placed at the ends of gate seating and power shall be provided to the unit from the floor. The Designer shall also reference the Tenant Design Guidelines for guidance on charging kisoks.

Counters shall be ADA accessible. Other creative design solutions are also welcomed. Countertop colors and surface materials shall be coordinated with the BCAD PM. A minumum 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. Any device charging stations should include grounded AC power outlets as well as DC power outlets via USB Type A or Type C ports. All mobile device charging station designs/implementations proposed by the Designer shall be coordinated with BCAD Operations during Design Development.

Figure 90: Existing Post Charging Station in FLL T4 Concourse G

Figure 91: Existing FLL Pedestal Recharging Station in FLL T2 Concourse D

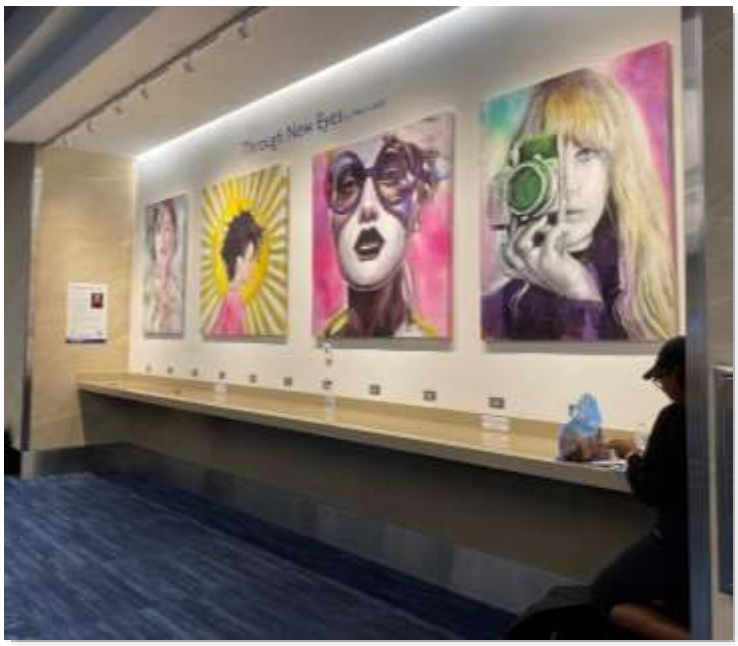


Figure 92: Counter with Recharging Receptacles in FLL T2 Concourse D

Figure 93: Innovative Recharging Station

Flight Information Display System (FIDS)

FIDS monitors shall be provided in all airport terminals. They shall be easily accessible and not obstruct passenger circulation. A vertical (portrait) orientation is preferred by BCAD. In concourses, an array of three FIDS monitors shall be provided. Two shall display departure information and one shall display arrival information. In baggage claim areas, an array of four FIDS monitors shall be provided. Two shall display departure information and two shall display arrival information. The Designer shall coordinate with the BCAD PM to confirm FIDS monitor configurations.

The FIDS monitor 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 94*) or incorporate other terminal elements such as location maps (*see figure 95*). 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 94).*

Figure 94: Example of a Standalone FIDS Monitor Array with Clear Overhead Signage

Figure 95: Example of FIDS Monitors at Indianapolis International Airport

Terminal Courtesy and Emergency Phones

Figure 96: Courtesy Phones

Courtesy phones shall be provided throughout the airport complex (*see figures 96-97*). Locations will be designated by BCAD. These phones allow for only local calls. Courtesy phones shall be connected to the airport's VoIP system. Additional requirements and possible design alternatives shall be presented and discussed by the Designer with the BCAD PM. Design criteria may include but are not limited to the following:

- Wall mounted
- Signage
- TDD capabilities
- Stainless steel
- Writing surface
- No sharp edges
- Incorporate the same design within every terminal and/or throughout the airport complex.

Figure 97: Courtesy Phones

Emergency phones shall be provided in each terminal for the use of an emergency. They shall be wall mounted and be provided with supporting signage and signal light (*see figures 99-100*). Emergency phones shall be located in the baggage and ticketing levels and in both pre- and post-security areas. Emergency phones shall also connect to the Airport Operations Control Center (AOCC).

All phones must conform to all applicable codes, regulations and accessibility guidelines including signage. During Design Development, the Designer shall coordinate with the BCAD PM and other BCAD divisions for additional requirements.

Figure 98: Example of Airport Service Alcove BCAD's preferred location for Public Phones and other Customer Service Items

Figure 99: Emergency Phone

Figure 100: Emergency Phone

Terminal Elevators

Passenger elevators shall have a stainless steel interior finish. Cargo elevator flooring shall be stainless steel plate with a diamond pattern. Elevator floor finishes shall be resislient tile flooring, consistent with those installed in Terminal 1 Concourse A. New passenger elevators should be designed as pass-thru type, with doors on front and back side (where practical). This will allow passengers with baggage to not have to turn around with their bags to exit the elevator, which has demonstrated more efficient passenger processing and improved travel experience. Glass passenger cabs are encouraged with views to the terminal and exterior (*see figure 101*). Terminal elevator signage (interior and exterior) shall be coordinated with BCAD's Signage and Wayfinding Master Plan / Signage Standards Manual.

Figure 101: Glass Passenger 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 102*). Their sides may be glass or stainless steel (*see figure 103*). Wher 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 102: Stainless Steel Underside of

Figure 103: Escalators in FLL Terminal 2

2.5 Signage, Wayfinding, and Advertisements

Signage

The Designer shall coordinate with the BCAD PM for all terminal project designs that may impact the airport's wayfinding signage. Architects and interior designers are encouraged to obtain a copy of the latest BCAD's Signage and Wayfinding Master Plan / Signage Standards Manual. Other valid resources are the Aviation Industry Wayfinding and Signage Guidelines developed for ACRP.

Figure 104: Example of Curbside Airline Signage at FLL

Terminal Side Advertisements

Advertisement signage will conform to all applicable codes and regulations and shall be reviewed by BCAD's Communications team to approve graphic design and content. It should adhere to the South Florida region, which includes sun, sea, beaches, everglades environment, yachting, cruises, aviation, and the arts. Advertising sites are determined by BCAD's contract with the current advertising concessionaire vendor. No advertisements can be installed in areas designated for public art, unless expressly approved in advance by BCAD upper management.


Figure 105: Example of Preferred Advertising Signage

Figure 106: Example of Airport Signage at Las Vegas Airport

Advertisements and all other signage shall be sited as not to interfere, obstruct, or negatively impact public art viewing or aesthetics. All airport signage for advertisements shall be:

- Securely fastened
- Wall mounted with a vertical center at average level of 60-66" above the finished 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-though shatter-resistant panels

Kinetic and digital imagery through flat screen signage should not compete for attention or create extreme brightness. Shadows from digital signage backlights are not permitted due to possible distraction or other impacts to wayfinding and directional signs.

Temporary Project Signage

Temporary project signage and graphics shall be provided on all projects under construction. To minimize the appearance of construction in the terminals and enhance the public awareness of upcoming renovations, temporary graphics such as project renderings and/or advertisement signage must be installed on either temporary construction walls or in the vicinity of the project. Renderings shall represent the final design of the space being renovated and provide details of the project. Renderings shall also include both the “Broward County” logo *(see figure 107)* and the “FLL” logo *(see figure 108)*. The Designer shall coordinate the specifics of the graphics with the BCAD PM and receive pre-approval from upper management of such graphics and wording prior to placing any project renderings and/or advertisement signage on site.

Other temporary signage such as informational, directional, wayfinding signage, safety signage, re-routing signage, signage required by AHJ, and any other may be required and/or proposed. Signage may be either wall-mounted or ceiling-hung, laminated on construction walls, installed on pedestal stands, or otherwise as approved by BCAD.

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

Figure 107: Logo - Broward County, Florida

Figure 108: Logo - Fort Lauderdale-Hollywood International Airport (FLL)

Figure 109: Example of rendering for Terminal 2 Modernization Project

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 practical while meeting code requirements for lighting levels and not compromising the design integrity. LED and other innovative lighting sources are encouraged. The Designer shall incorporate lamps with a CRI of at least 80 in applications where the color rendering of skin tones and merchandise is important (e.g., concourses). Strobe lights, flashing lights, and neon are prohibited. Lighting shall be designed to not create glare within the terminal common areas. Lighting shall:

- Be commercial-quality light fixtures approved by BCAD.
- Comply with applicable local and national codes and regulations.
- Be Energy Star rated or similar.

Figure 110: Example of existing FLL Linear Lighting at Terminal 3 Concourse F

Figure 111: Example of Various Types of Lighting at Indianapolis International Airport Terminal by HOK

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.
- 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 common areas.
- Accentuating architectural elements such as columns.
- Provide higher lighting levels along primary walk path/circulation routes.
- Visible linear fluorescents and sodium lamps will not be allowed.
- All display cases must integrate shielded lighting and be vented properly.

Lighting and Controls

To maximize energy efficiency, the Designer shall account for relevant criteria published in the latest versions of the Florida Building Code: Energy Conservation, the National Electric Code, the International Energy Conservation Code (IECC), and ASHRAE 90.1 standards. For example, the ASHRAE 90.1 standard provides watts-per-square-foot criteria for various terminal areas, such as baggage claim, concourses, and ticket counters, and shall be met where practical. For BCAD PRC review, the Designer shall include tabulations that summarize applicable IECC and ASHRAE 90.1 criteria and demonstrate the criteria is being met.

In addition, all lighting fixtures shall have the ability to respond to various inputs to provide the appropriate lighting level for the area or task required. Inputs will include, but are not limited to, occupancy sensors, photo sensors 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 and color balance of all light sources shall be consistent across any given contiguous space throughout the terminal and should be coordinated with the interior finishes. Color temperature of the lighting over the vanities with mirrors in all public bathrooms shall be between 2700˚K-3000˚K to promote a healthier appearance for passengers while visiting FLL.

Regardless of the 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 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 LEDs are at 70% of original output) shall not be less than 50,000 hours.

Where possible, high ceilings on high transit areas are encouraged. The Designer should work illumination of those spaces using indirect sources, leaving only sprinkler heads, smoke detectors, and CO_2 detectors attached to the ceiling structure. This type of configuration allows easier re-lamping and maintenance. Grouping lighting fixtures in fewer locations also improves accessibility from the floor and provides more flexibility for laying out concession spaces (*See figures 112-113).*

Figure 112: Example of Clearstory Lighting

Figure 113: Clearstory Lighting with Indirect Lighting

2.7 Public Art & Design

FLL participates in Broward County's Public Art & Design Program. The program allocates 2% of eligible construction costs to the design and installation of public art. Designers shall be aware of the program and whether the project will be required to have a public art component. In addition to coordinating with the BCAD PM, the Designer should reference then-current Broward County code pertaining to public art, which at the time of this Terminal DGM revision, is covered in Chapter 33, Part V of the Administrative Code and Chapter 1, Article V, Sec 1-88 of the Code of Ordinances. Architects, engineers, and interior design consultants will need to coordinate their terminal design efforts with the Public Art & Design Program to ensure that currently-installed artworks are not impacted. A list of artworks installed at FLL is available through the public art liaison.

In the event public art is part of a capital project, consultants shall coordinate with BCAD's PM and the public art project manager. Consultants shall cooperate and coordinate with the selected artist(s) during all the design phases and in construction, as necessary. Consultants shall include the necessary infrastructure for the artworks in their designs, including, but not limited to, lighting, foundations, structural supports, and electrical connections. Refer to figures 114 and 115 for samples of FLL artwork. Proposed areas for public art shall be cross-referenced with designated areas already established in the FLL Expansion Public Art Master Plan.

When designing a space or a new building, consideration shall be given to areas that are feasible for public art such as high-volume spaces, focus points, wide wall spaces, and other areas where artwork can be installed to enhance the overall look and feel of the space and provide passengers with a cultural amenity.

Careful consideration must be given when an artwork is installed or will be installed in close proximity to the space that is being designed. Design features that look like art, but are not titled and not created by an artist, shall not be implemented. If an artistic element is needed to complement or enhance a space, the Designer shall contact the public art liaison to communicate the need and discuss the proposed site. Design elements that strongly compete visually against artworks currently installed in the terminals shall not be implemented. Design themes and color schemes shall work harmoniously to enhance or complement such artworks. No signs, fixtures, or design elements shall be installed on or placed near an artwork where it may be obstructed or damaged. This also applies to artwork identification plaques. If an artwork is required to be temporarily removed or protected to facilitate a construction project, the Contractor must coordinate such activities with the public art project manager in advance. The cost of relocating the artwork shall be included in the Project's budget. No Contractor may handle the artwork. Only art handlers contracted by the public art project manager and BCAD Maintenance staff, if approved by the public art project manager, are allowed to remove, store, and reinstall the artwork.

Many terrazzo floors at the airport are public artworks. Any renovations to spaces where the floor design is affected must be carefully reviewed, in advance, in coordination with the public art liaison and public art project manager. Depending on the extent of the design changes (renovations), the artist may need to be involved in the design process to offer suggestions to protect the integrity of the artwork. The public art project manager and/or public art liaison will coordinate with the artist to review and approve such modifications.

Sculptures on the floor in terminal concourses should have a base of at least 8 inches high. Adequate clearance to allow BCAD's maintenance lift must be coordinated by the Designer if a floor sculpture or hanging piece of art is installed or will be installed within the Project area.

Artwork may include, but is 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 114: Existing T1 Concourse A-B Connector at FLL

Figure 115: Existing International Arrivals Corridor in T4 Concourse G at FLL

2.8 Sustainability

Sustainable planning, design, construction, and operation of FLL terminals, concourses, BCAD-owned facilities, and tenant spaces should account for and be consistent with ongoing planning efforts by BCAD. The FLL Master Plan Update Chapter 7, Sustainability Initiatives, identifies sustainability initiatives for future development of FLL. The identified initiatives were selected because they were determined to effectively address the current and future impacts of growth of FLL. Additionally, the initiatives reflect both the overall BCAD's "Sustainability Vision and Guiding Principles" as well as Broward County's ongoing planning efforts related to sustainability. Climate change has been a key focal area for Broward County since 2008. In 2008, Broward County passed a resolution which established a community-wide greenhouse gas (GHG) reduction target of 80 percent below 2007 emissions by 2050. Since then, Broward County has established numerous plans and policies addressing climate, energy, and sustainability. BCAD's and Broward County's planning efforts related to sustainability are as follows:

- **Climate Change Action Plan 2015 (PDF)** – Broward County's Climate Change Action Plan (CCAP) with nearly 100 actions to decrease greenhouse gas emissions and increase community resilience.
  Available here: https://www.broward.org/Climate/Toolbox/Pages/PlansPolicies.aspx
- **Climate Change Element (PDF), Supporting Documents (PDF)** – Broward County's Climate Change Element provides a framework for integrating the economic, environmental, and social factors of climate change. A county-wide strategy, based on local vulnerability and consistent with regional efforts, the Element aims to mitigate the causes, and address the local implications, of global climate change. In doing so, we move one step closer to building a sustainable, climate resilient community.
  Available here: https://www.broward.org/Climate/Toolbox/Pages/PlansPolicies.aspx
- **Community Energy Strategic Plan (PDF)** – Broward County Community Energy Strategic Plan (CESP) sets goals, establishes prioritized objectives, and recommends immediate and short-term actions for the Broward community to address climate change through energy.
  Available here: https://www.broward.org/Climate/Toolbox/Pages/PlansPolicies.aspx
- **Renewable Energy Action Plan (PDF)** – Broward County's Renewable Energy Action Plan (REAP) recommends strategic actions to support increasing the use of renewable energy in County facilities and operations.
  Available here: https://www.broward.org/Climate/Toolbox/Pages/PlansPolicies.aspx
- **Broward County Green Building Policy** – In October 2008, the Broward County Board of County Commissioners passed a resolution creating the County Green Building Policy. All new County-owned and operated buildings must achieve a minimum LEED* rating of "LEED Certified,". Broward County Administrative Code Chapter 25, Part XVIII, Green Building Policy, sets forth the details of this County's Green Building Policy. This policy is applicable to FLL terminals.
  Available here:
  https://library.municode.com/fl/broward_county/codes/administrative_code?nodeId=CH25OPPOPUWO_PTXVIIIGRBUPO
- **Broward County Aviation Department "Sustainability Vision and Guiding Principles" (2012)**
  Available here:
  https://www.broward.org/Airport/Business/Community/Documents/Sustainabilityvisionjune2012.pdf
  https://www.broward.org/Airport/Business/Community/Pages/Environment.aspx
- **FLL Master Plan Update, Chapter 7, Sustainability Initiatives** – Refer to Table 7.4-2, Prioritized Master Plan Update Sustainability Initiatives in the following pages for information. This table lists 24 initiatives that should be considered as part of the future development of FLL. Refer to following pages for the future development of FLL.

While this Terminal DGM generally reflects those plans in effect at this time, it is the expectation that as Broward County and/or BCAD adopt additional Sustainability Plans, those documents will be considered during Design Development of future FLL terminal projects.

BROWARD COUNTY FLORIDA | FORT LAUDERDALE-HOLLYWOOD INTERNATIONAL AIRPORT BROWARD COUNTY, FLORIDA

Table 7.4-2 (1 of 3): Prioritized Master Plan Update Sustainability Initiatives

	SELECTED MPU SUSTAINABILITY INITIATIVES	CATEGORIES SUPPORTED ▼ RESILIENT DESIGN	WASTE SUPPLY	ENERGY/GHG EMISSIONS	WATER CONSERVATION	COMMUNITY EDUCATION, OUTREACH, AND PARTNERING	AFFECTS ▼ BCAD DESIGN	BCAD OPERATIONS	TENANT[1/] DESIGN	TENANT[1/] OPERATIONS
Resilient Design										
1	Commit to LEED certification for new BCAD facilities construction. Start considering sustainable design opportunities in advanced planning efforts, which may include a cost comparison of obtaining the various LEED certification levels, prior to issuance of design bid documents.	■	■	■	■	■	■			
2	Require developers of new cargo, GA, and FBO facilities to make a sustainable design commitment. Consider establishing minimum sustainable design standards for tenant development on Airport property.	■	□	□	□	□			■	
3	Integrate daylight-harvesting[2/] into new buildings with proper sensor technology. Initiative should be supported by messaging to address potential concerns that "lights are not working."	■		■		■	■		□	
4	Ensure commissioning and operational readiness strategies are in place to transition emerging sustainability technologies from design/construction to operation. Maintenance staff should be fully trained in new O&M procedures and should have detailed O&M manuals to support ongoing operations.	■					■			
Waste Management										
5	Integrate flexibility to accommodate recycling/reuse collection, sortation, and circulation needs, and consider pre- and post-security issues for waste collection and processing in all new facilities.	■	■				■			
6	Require contractors to develop waste management plans for construction projects. Plans should identify project goals for waste reduction, recycling, and reuse, as well as methods to track and report performance to BCAD. Integrate the new requirement into design and construction bid documents.		■				■		■	
7	Implement a public art project themed to reinforce the Broward County recycling message.		■			■	■			
8	Evaluate and enhance MSW public and back-of-house signage and training of janitorial staff to promote proper waste sortation practices at points of disposal and at compactors/containers. If the development of a mini-MRF is pursued, then ensure public messaging recognizes the benefits of this BCAD sortation activity to instill the importance of recycling in Broward County to the traveling public (also supports Initiative #25).		■			■		■		
Energy and GHG Emissions										
9	Evaluate opportunities for canopy solar installations on the top level of parking garages, in surface parking lots, and on other BCAD-owned parcels, such as retention basins.	■		■			■		□	
10	New construction should maximize energy efficiency strategies, consistent with the LEED rating system.	■		■			■		□	

NOTE: ■ = Applicable □ = Potentially Applicable

BROWARD COUNTY FLORIDA | FORT LAUDERDALE-HOLLYWOOD INTERNATIONAL AIRPORT BROWARD COUNTY, FLORIDA

Table 7.4-2 (2 of 3): Prioritized Master Plan Update Sustainability Initiatives

	SELECTED MPU SUSTAINABILITY INITIATIVES	CATEGORIES SUPPORTED ▼ RESILIENT DESIGN	WASTE SUPPLY	ENERGY/GHG EMISSIONS	WATER CONSERVATION	COMMUNITY EDUCATIONAL, OUTREACH, AND PARTNERING	AFFECTS ▼ BCAD DESIGN	BCAD OPERATIONS	TENANT[1/] DESIGN	TENANT[1/] OPERATIONS
11	Prioritize multimodal connectivity through development of the Intermodal Center, an MPU recommended development project that provides opportunities to connect the Airport to Broward County busing/mass transit and that can support bicycle and pedestrian mode access to the Airport with amenities.			■		■	■			
12	Integrate flexibility in utility delivery systems to support future electric fleets on the airside and landside. Consider metering/tracking opportunities to support tenant use charges.	■		■			■			
13	To support reductions in operational GHG emissions, integrate the evaluation of energy demand changes and quantify associated GHG emissions changes associated with new development alternatives, where practical.			■			■		□	
14	Consolidate chillers and energy backup systems (generators) in a purpose-built facility (Central Plant) to promote long-term system efficiencies in energy use and maintenance, as well as to provide the ability to efficiently support incremental growth. In the consolidated facility, consider the use of alternative/low-emission fuels for generators.	■		■			■			
15	Seek opportunities to purchase renewable energy from utility providers. Consider participation in FPL's SolarTogether program, under which BCAD subscribes to the FPL program to develop off-site solar, and BCAD receives the renewable energy credit for electricity produced.			■				■		
16	Consider further opportunities to responsibly convert BCAD fleet to alternative fuel and/or zero-emission vehicles and equipment e.g. similar to those previously considered in the busing operation agreement recently awarded. As part of the decision-making process, investigate emerging technologies to understand maintenance requirements and equipment operational compatibility with Airport operational needs.			■				■		□
17	Consider opportunities to incentivize zero-emission vehicle fleets and alternative fuel vehicle fleets by ground transportation providers (e.g., taxis, shuttles, TNCs).			■				□		■
Water Conservation										
18	Develop a stormwater master plan to prepare for stormwater runoff storage needs associated with MPU proposed development projects. The stormwater master plan should consider storage needs given the current accepted planning standards and should evaluate the feasibility of rainwater harvesting opportunities.	■			■		■			
19	Strive for long-term resiliency to flooding and sea-level rise in future development, consistent with County planning guidance and within the constraints of the existing built environment (given operational dependencies among Airport facilities and aircraft operations). Evaluate risks if infrastructure cannot achieve minimum elevation standards.	■			■		■		□	

NOTE: ■ = Applicable □ = Potentially Applicable

BROWARD COUNTY FLORIDA | FORT LAUDERDALE-HOLLYWOOD INTERNATIONAL AIRPORT BROWARD COUNTY, FLORIDA

Table 7.4-2 (3 of 3): Prioritized Master Plan Update Sustainability Initiatives

SELECTED MPU SUSTAINABILITY INITIATIVES	CATEGORIES SUPPORTED ▼ RESILIENT DESIGN	WASTE SUPPLY	ENERGY/GHG EMISSIONS	WATER CONSERVATION	COMMUNITY EDUCATION, OUTREACH, AND PARTNERING	AFFECTS ▼ BCAD DESIGN	BCAD OPERATIONS	TENANT[1/] DESIGN	TENANT[1/] OPERATIONS
20 Adopt a xeriscaping policy for new development that minimizes the need for irrigation and is compatible with goals to minimize wildlife attractants at FLL. This new policy should be incorporated into minimum design standards and should apply to new tenant development as well.	■			■		■	□	■	□
21 Install submetering in new development to strategically manage water use more effectively and to allow for tenant-level water use analysis to engage high-water users in considering opportunities to reduce consumption.				■		■			
22 Continue conversion to low-flow fixtures in future renovations and continue to install low-flow technology in new construction that aligns with BCAD's customer level of service and maintenance objectives.	■			■		■			
Community Education, Outreach, and Partnering									
23 Provide passenger amenities at the proposed Intermodal Center that support alternative mode access to the Airport and may reduce vehicular trip generation by providing on-site services, such as a day care facility, commercial and retail facilities, and a wellness center.					■	■	□		
24 Identify opportunities to communicate FLL's sustainability successes through public art, signage, website, FLLash newsletters, etc. Prioritize sustainability messaging associated with the development of MPU proposed development projects.					■	■	■	□	□

NOTES:

■ = Applicable

□ = Potentially Applicable

BCAD = Broward County Aviation Department

FBO = Fixed-Base Operators

FLL = Fort Lauderdale–Hollywood International Airport

FPL = Florida Power & Light Company

GA = General Aviation

GHG = Greenhouse Gases

LEED = Leadership in Energy and Environmental Design

MPU = Master Plan Update

MRF = Materials Recovery Facility

MSW = Municipal Solid Waste

O&M = Operations and Maintenance

TNC = Transportation Network Company

1/ For purposes of this analysis, the term "tenant" is broadly applicable to non-BCAD entities developing facilities and/or conducting operations at FLL, including airlines, concessionaires, FBOs, government agencies, and ground transportation providers.

2/ The practice of designing a facility to use daylight to reduce artificial lighting (and electricity) use.

SOURCE: Broward County Aviation Department, Sustainability Initiatives Workshop, March 18, 2019.

PREPARED BY: Ricondo & Associates, Inc., March 2019.

CHAPTER 3 Appendices

3.1 CADD and BIM Standards

The Designer shall refer to BCAD's Electronic Media Submittal Requirements for all graphic deliverables as per their executed contractual requirements. Agencies and their contracted project architects and engineers shall obtain a copy of the latest BCAD's CAD, BIM, and GIS Standards. The Designer shall provide all construction documents for terminal improvement projects per their contractual requirements.

A BIM may be developed from which 3D and 2D deliverables can be produced. If a BIM is used, it shall include all architectural, structural, mechanical, electrical, plumbing, and fire protection elements. A BIM is strongly encouraged for all new projects due to its usefulness for the future life cycle management of airport facilities and systems.

BCAD Electronic Media Submittal Requirements:
https://www.broward.org/Airport/Business/pages/bimstandard.aspx

BCAD Computer Aided Design (CAD) Standards Manual:
https://www.broward.org/Airport/Business/pages/bimstandard.aspx

BCAD Building Information Modeling (BIM) Standards:
https://www.broward.org/Airport/Business/pages/bimstandard.aspx

BCAD Geographic Information System Data Standards:
https://www.broward.org/Airport/Business/pages/bimstandard.aspx

3.2 Design Guidelines Interpretations

The A/E of Record, Designer, or Contractor may have questions regarding the intent of the Terminal DGM during the development and implementation of their creative designs. All questions related to interpretation and intent of the Terminal DGM shall be provided in writing to the BCAD PM by the A/E of Record.

3.3 Review Process, Submittal Requirements, and Approvals

Review Process

The key goals of the BCAD review process, conducted by a determined PRC, include but are not limited to evaluating technical conditions, checking for airport operational conflicts, ensuring safety compliance, and verifying maintenance agreements. This will apply to all projects on BCAD/FLL property. The intent is to ensure that the proposed scope and design follows aesthetics planned for the airport terminals and as described in the Terminal DGM. Another significant purpose of the review will be to focus on the spatial relationships and aesthetic decisions for all BCAD projects that will be visible to the public. This includes:

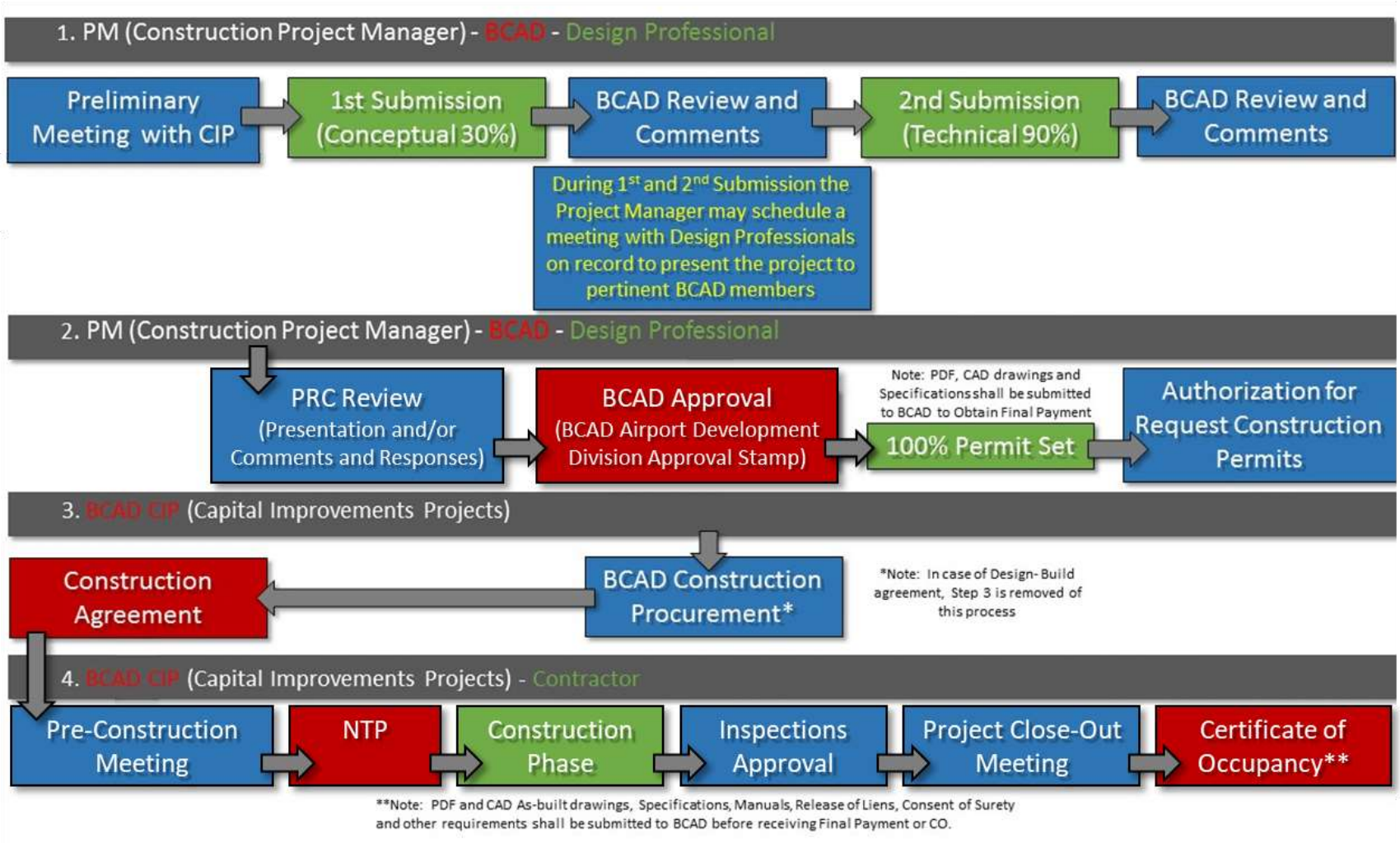
- New construction
- Renovation and remodeling of existing terminal spaces
- All interior and exterior wayfinding signage

An Airport Development representative (PRC meeting coordinator) will work with the assigned PM to upload an application to start the BCAD review process. The A/E of Record shall contact their assigned BCAD PM who will fill out a SharePoint BIP Application to start the review process. Pertinent BCAD members will review projects and provide comments electronically. Depending on the complexity of the project, the PM may schedule meetings with the A/E of Record and Designer to discuss the project with BCAD representatives prior to initiating work on the Project. A diagram illustrating the BCAD approval process is shown on the next page.

Broward County Aviation Department

Design Review Procedure and

Project Review Committee (PRC) / BCAD Improvement Projects (BIP) Process



Submittal Requirements

The A/E of Record and/or Designer shall, at minimum, submit the following, unless otherwise specified in their contractual agreement with BCAD:

A. **1st Submittal: Design Development**
Submittal shall include:
1. *Site location/area map indicating project limits and surrounding facilities*
2. *Sketches/preliminary plans that illustrate the design intent for the scope of work with supporting representations of proposed aesthetics*

B. **2nd Submittal: Conceptual (Set of 30% Design Drawings)**
Submittal shall include:
1. *Location Plans:*
   - *Site plan of airport terminal indicating scope of work location.*
   - *Enlarged plan of terminal location and adjacent areas.*
2. *Full color 3-D rendering that represents the design intent for the scope of work*
3. *Preliminary material board that conveys proposed furniture, fixtures, and equipment with proposed finishes, color swatches, and schemes (if applicable)*

C. **3rd Submittal**: **Technical (Set of 60% Design Drawings)**
Submittal shall include:
1. *Draft Specifications*
2. *Refined material board that conveys proposed furniture, fixtures, and equipment with proposed finishes, color swatches, and schemes (if applicable)*

D. **4th Submittal**: **Technical (Set of 90% Design Drawings)**
Submittal shall include:
1. *Specifications*
2. *Final material board that conveys proposed furniture, fixtures, and equipment with proposed finishes, color swatches, and schemes (if applicable)*

E. **Permit Record Drawings Submittal**: **Set of 100% Design Drawings, also known as "Construction Documents"**
Submittal shall include*:*
1. *PDF and CAD electronic files and specifications*

F. **As-Built Record Drawings Submittal**: **100% Set of As-Built Drawings**
Submittal shall include:
1. *PDF and CAD electronic as-built drawings*
2. *Specifications*
3. *Shop drawings*
4. *Manuals*

Note: All drawings must have a clear title description (Elevations, Reflected Ceiling, Civil Site Plan, etc.) to guide the reviewer.

3.4 Terminal Plans

The Designer shall contact BCAD Airport Development to obtain the latest FLL terminal plans and visit the following website link for other useful information:
https://www.ifly.com/fort-lauderdale-hollywood-international-airport/terminal-map

3.5 Outline Specifications and Airport Systems Information

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 DGM. Prior to the commencement of any design work, design professionals (or "Designer") shall review the following list to ensure they have the latest Outline Specifications and Airport Systems Information.

A. **BCAD Project Review Committee:** Designers shall obtain Project Review Committee (PRC) approval with the BCAD Airport Development Division Approval Stamp prior to obtaining any Building Code Services (BCS) permits and prior to commencement of any construction work.

B. **Building Code Permit:** Designer and Contractor must obtain a building permit from the Authority Having Jurisdiction (AHJ) prior to the commencement of any construction work. Designers are encouraged to meet with Building Code Services, the Fire Marshal, and/or the AHJ to review the project throughout the design phase.

C. **Notice to Proceed:** Designer and Contractor must have a written "Notice to Proceed" issued by BCAD prior to the commencement of any work.

D. **Building Code Compliance:** Designer and Contractor are responsible for bringing the building space associated with the Project into compliance with the Florida Building Code regardless of unforeseen conditions. There may be instances where the Project may impact other spaces, systems, or other areas of the terminal, in which the terminal and systems may have to be brought up to current code. The Designer shall research and discuss with BCAD and Building Code Services at the onset of the Project.

E. **Terminal Operational Building Systems**:
   - Designer and Contractor must protect the integrity and functionality of the terminal's Operational Building Systems.
   - Any intent or action to add or modify systems must be coordinated with and approved by the BCAD Facility Maintenance Division.
   - All new systems shall be installed as per the applicable codes and standards and have a minimum one-year warranty.
   - Designer and Contractor are responsible for all costs related to work that will be performed on these systems.
   - Designer and Contractor are responsible for maintaining all Operational Building Systems and shall design all required elements up to BCAD's tie-in points.
   - The physical tie-in to the Operational Building Systems shall be coordinated by the Designer and Contractor but performed by an authorized on-call Contractor managed

by the BCAD Facility Maintenance Division and/or by any other BCAD division's on-call contractor responsible for that particular system. The Contractor is responsible for payment to any other contractors that will perform the physical tie-in during the Project's execution.

- Testing procedures related to the modification or addition to the existing terminals Operational Building Systems shall be paid by the Contractor (e.g., fire sprinklers, A/C valve pressure, etc.)

F. Tie-in Points and Shut-Downs: The Designer must clearly identify on the construction documents all tie-in points for:

- Mechanical Systems
- Electrical Panels
- Plumbing Systems
- Fire Sprinkler Systems
- Fire Alarm Systems
- Communication Systems and Telephone rooms

All coordination for tie-ins, shut-downs, and/or additions to any or all existing systems will require a minimum 10-day advance notice in writing to the BCAD Facility Maintenance Division. An applicable phasing plan shall be provided by the Contractor and included in the written notice to the BCAD Facility Maintenance Division. Refer to applicable contact information at the end of this section.

1. Fire Watch: All fire watch services and inspections shall be the responsibility of the Contractor. The Contractor shall coordinate, acquire, and pay for the personnel and agencies required to perform the fire watch services and inspections throughout the duration of the Project's phasing and construction.

During Design Development, the Designer shall coordinate with the BCAD PM, BCAD Maintenance, and BCAD Operations to develop an itemized list of the expected fire watch required for the Project and identify who will be responsible for performing the services and for payment.

2. Hot Work Permit: The Contractor is responsible to submit a Hot Work Permit as necessary and obtain approval prior to commencing any hot work. The Contractor shall provide notification to all necessary parties, including BCAD Maintenance, BCAD Operations, Fire Marshal Bureaus Office, etc. Any necessary payment will be the responsibility of the Contractor.

G. Utility Calculations: The Designer shall provide all calculations related to utility needs to obtain approval of their design from BCAD. During Design Development, the Designer shall perform site investigation to verify the existing and current electrical service, panels, breakers, etc. in additional to obtaining electrical as-builts and record drawings as available and provided by BCAD.

H. Utility Work: All utility work shall be approved by the "Broward County Environmental Services Environmental Engineering" and/or other pertinent agencies and shall be designed per each divisions' applicable standards and per applicable code.

Before any underground work is started, all contractors must comply with Sunshine One-Call requirements and contact 1-800-432-4770 or 811 for guidelines and coordination.

1. **Utility Work Program** (for work on BCAD property):
   Any Contractor(s) desiring to perform utility work at Fort Lauderdale-Hollywood International Airport (FLL) or North Perry Airport (HWO) must first register the work by completing the Utility Registration Application. The BCAD, Airport Development, Capital Improvement Projects Division issues these utility registrations. BCAD property includes FLL and HWO – refer to BCAD's Exhibit A Property Maps for current property ownership boundaries.

   The Utility Work Registration Application is required when placing, extending, or repairing any pipes, ducts, structures, vaults, manholes, cables, wire, roadway structure, or appurtenances, or for any other purposes, such as surveying, layout or subsurface utility exploration (SUE), or utility testing impacting airport property.

I. **Regular / Normal Power:** All electrical work shall comply with the National Electric Code, NFPA70, and the Florida Building Code. All electrical work by the Contractor will require load calculations and panel identification. No additional load shall be added to BCAD emergency panels, except as required for security and life safety, unless otherwise approved by BCAD. All electrical equipment must be approved by BCAD. All emergency generators shall be diesel driven with a 72-hour runtime day tank system.

   If additional power is required to the Project site, it shall be the responsibility of, and provided by, the Contractor, and approved by BCAD. All electrical conduit buried underground shall provide the minimum number of required conduits, plus at least one spare with pull string. All duct banks shall be encased in concrete. Location medallions shall be placed every 50 feet as well as before and after turns.

   All electrical conduits outside the Contractor's Project limits in an unconditioned air space on the ramp level must be Galvanized Rigid Conduit (GRC) with all steel compression fittings. All such conduits leaving the space must be labeled with 1-1/2" label tape every 10 feet and include origin, destination, room numbers, space names, circuit numbers, and system names. Labels shall be created using a labeling tool; no Sharpie or other markers allowed).

   All junction boxes shall be color coded as follows:
   1. Communication shall be Green
   2. Power (120V/208V) shall be Blue
   3. Power (277V/480V) shall be Yellow
   4. Emergency Power shall be Orange
   5. Lighting shall be White
   6. Fire Alarm shall be Red conduit; no painted conduit.
   7. HVAC Controls (e.g., Johnson Controls) shall be Purple
   8. Matrix card readers shall be Black

   (Refer to the latest BCAD Maintenance Standards for additional information on requirements and labeling examples.)

Typed circuit identifications shall be placed on all faceplates. Panel and circuit numbers shall be permanently identified on junction box cover.

J. Standby Power: Contractor shall provide power for all life safety devices and all required interconnecting conduits. Similar as described previously, all conduits shall be labeled per the BCAD Maintenance Standards.

K. Power Energy Savings: BCAD promotes the use of inductive reactors (PowerGUARD by POM Energy Concepts or approved equal) on large equipment like chillers, in-line baggage systems, and others. Inductive reactors reduce power demand (i.e., kilowatts, or KW, of load), improve power quality, protect against spikes and surges (including lightening), and extend equipment life.

L. Lightning Protection: All buildings shall be designed with a lightning protection system and tied into an existing system were possible. All lightning and surge protection work shall be done by a certified/qualified professional lightning protection installer.

M. Air Conditioning & Heating: The Designer and Contractor shall connect to the nearest trunk line for heating and air conditioning service. The Designer and Contractor are responsible for the configuration of the spaces' supply and return grilles. The Designer and Contractor shall confirm capacity with the BCAD PM and is responsible for all costs associated with meeting capacity requirements per BCAD. METASYS Building Automation System: Contact Johnson Controls (JCI), Inc. at (954) 233-3000. All existing VAV boxes, FTB boxes, fan coils, and any other associated HVAC system controls (i.e., sensors, chilled water valves, etc.) must be wired in electrically and must communicate back to the head end. BCAD must receive a commissioning report from JCI through the Contractor. All air handlers must have electronic filtration systems. Domestic water shall not be used in the booster pump system in chiller plants. All roof mounted systems shall use stainless steel hardware. All new mechanical systems shall be BACnet compatible. The Test and Balance to be performed by the contractor shall include the entire system affected. Any refrigeration condensing lines shall not be tapped into the building's chilled water system.

Exterior roof-top air handlers shall be constructed of stainless steel. Chilled water piping shall be welded; Victaulic-style fittings, with a manufacturer's 10 year-warranty, are acceptable. Valves must be accessible by BCAD Maintenance staff. Armaflex-style insulation is not acceptable on chilled water systems.

N. Domestic Water: Wet stacks provide a minimum 1-inch, non-metered, cold water line with a ready tap for Contractor connection. Connection, piping, hot water generation, storage, and metering are the Contractor's responsibility. Any new water and drain lines outside air-conditioned spaces will need to be insulated to avoid condensation to areas above or below.

O. Sanitary Waste: The Designer is responsible for the design and connection into the airport's sanitary waste system. Under no conditions shall a Studor Vent be connected or installed into the sanitary waste vent line.

P. Grease Waste: In selected locations, a 4-inch or 6-inch riser with stub-outs under the floor deck are provided for connection into grease interceptors at the ramp level. Only the food and beverage Designer and Contractors are required to connect to the grease interception system. All drains in food and beverage locations are to be connected to the grease interception system. The Contractor is responsible for all costs for connections to grease waste risers.

Q. Fire Protection: The Designer and Contractor shall provide all required sprinkler heads per the Florida Building Code and/or AHJ. The Designer and Contractor are responsible for the design and modification of fire protection system in their premises, including special fire protection systems required at hood conditions for food preparation areas. Kiosks and merchandise units are encouraged to have a grid type ceiling, open to above, to benefit the main sprinkler system. Provider Contact: Sprinklermatic. Contact Tim O'Brien @ tim@sprinklermatic.net. Any flow device shall connect to the building's fire alarm system. All main shut-off valves shall be updated in the as-builts/record drawings to reflect current conditions. All shut-off valves shall be clearly identified and marked at the beginning of construction. The airport has two deluge systems. One in Terminal 1 and the other in Terminal 3 Concourse F. The designer shall make every possible effort to avoid any deluge installation at the airport.

R. Fire Extinguishers: Portable fire extinguishers (2-A type minimum) shall be provided throughout the airport terminal buildings. Maximum spacing between them shall be the lesser of 75 feet or as required per applicable codes. Portable fire extinguishers shall be recessed in a cabinet when located along a walk path or within public areas. Fire extinguisher cabinets and fire hose/valves cabinets shall follow the height and wall projections guidelines per the American with Disabilities Act (ADA).

S. Smoke Detectors: The Designer and Contractor shall provide all required detectors per the Florida Building Code and/or AHJ. The Designer and Contractor are responsible for the design and modification of smoke detector locations and connecting additional units into existing terminal systems.

T. Video Management System (VMS): FLL's current sole source VMS vendor and provider is Micro Security Systems Integration (MSSI). Contact Stephen DeMolina at SDeMolina@microsecurity.com. During the early stages of Design Development, the requirements of VMS shall be further discussed with the BCAD PM, the Security Division, and coordinated with the VMS vendor. The Designer shall identify the responsibilities and scope of work of the Contractor and the VMS vendor regarding the entire VMS system including, but not limited to, CCTV cameras, servers, storage, analytics, capacity, licensing, etc. Any implementation of new and/or removal of existing CCTV or associated video equipment shall be reviewed and approved by BCAD Security and coordinated with the VMS vendor prior to performing any work. Projects shall take into consideration existing conditions that may be affected by new construction, such as space in existing communication rooms, server rack space, heating and cooling in communication rooms, power availability, etc. which may/or may not have to be replaced for the new VMS equipment to function properly**.** The airport's security systems shall integrate with the VMS and ACS systems as required.

U. Fire Alarm Interface: Fire alarm system interface connection point(s) shall be provided in the general vicinity of each of the Contractor's project limits/areas. The Contractor shall install all fire alarm components, wiring, annunciation components, and interfacing necessary (beyond existing components in the terminal). All devices shall be UL listed and tested for use with FLL's fire alarm system. It is the responsibility of each Designer and Contractor to provide and assure compatibility with the existing fire alarm system in the FLL terminal where the project is located. Provider Contact: WSA/SCIENS Building Solutions. Contact WSA/SCIENS Building Solutions at (954) 570-8155.

All fire and sprinkler system work on an existing system must be done between the hours of 22:30 and 5:00 (no exceptions). The systems must be returned to service (normal operation) by 5:00. WSA shall be present any time the fire alarm system/panel is switched in and out of manual operation. Sprinkler system work is the responsibility of the Contractor, which includes, but is not limited to, draining the system down, locating shut-off valves, and any other associated work with their Project. All new systems shall be compatible with existing systems, including emergency power notifications tied to the fire alarm system. Any obsolete fire alarm systems or devices in the vicinity of the Project shall be modified to meet current standards.

V. Access Control System (ACS): FLL's current sole source ACS vendor and provider is Matrix. Contact: Jeff Stout, Sales Vice-President at (716) 563-5010. During the early stages of Design Development, the requirements of ACS shall be further discussed with the BCAD PM, the Security Division, and coordinated with the ACS vendor. The Designer shall identify the responsibilities and scope of work of the Contractor and the ACS vendor regarding the entire ACS system including, but not limited to, access control devices, readers, cabling, parts, equipment, software, control panels, hardware, etc. Any implementation of new and/or removal of existing ACS devices or associated equipment shall be reviewed and approved by BCAD Security and coordinated with the ACS vendor prior to performing any work. All access controls work must be done by the ACS vendor with certified reports to verify all hardware and software are operating at the time of project completion. Only authorized vendor technicians are approved to work on this system and must document all activities within the system. The airport's security systems shall integrate with the VMS and ACS systems as required. Access controls shall be provided to all portals including, but not limited to, man doors, roll up gates, cargo doors, baggage belts openings, vehicular and pedestrian gates, KABA access points, etc. All alarms generated from the system must report to the airport's AOCC.

V. Toilet Exhaust: The Designer and Contractor shall locate existing ventilation chases or ventilation stacks within the airport terminals. The Contractor is responsible for the installation of all ductwork and fans from their space to the nearest ventilation chase and ventilation stack.

W. Smoke Evacuation: Where required by the Fire Rescue Department, the airport shall extend smoke removal ductwork to concession spaces. Connection to the smoke removal system shall be provided by the Contractor.

X. **Cooking Exhaust:** The Designer shall confirm with BCAD whether cooking exhaust is available in the vicinity of their Project. Fire-rated chases and mechanical services dedicated for ventilation of concessions spaces may have predetermined locations throughout the airport. The Designer and Contractor are responsible for installing grease-rated exhaust ductwork from their Project area, sloped horizontally above the ceilings to the nearest chase or designated connection to minimize the spread of grease waste particles. The total grease exhaust system shall comply with the current edition of NFPA-96. Chase penetrations and ductwork shall be enclosed with a two-hour fire-rated enclosure or an alternative UL-listed high-temperature insulation wrap that complies with all applicable codes. Ductwork inside the chase shall be vertical and connect to the exhaust fan penthouse. The Contractor shall be responsible for costs for ductwork, conduit and wiring for fan control, hoods with fire suppression system, and exhaust fans. A separate makeup system of at least 90% outside air is needed for the hood exhaust to avoid drawing conditioned air from adjacent airport spaces. Alternate methods of achieving required duct ratings may be used with prior approval by BCAD and the Building Department. The airport will provide the right-of-way path for the grease duct exhaust system.

Y. **Telephone and Data:** Empty conduit(s) shall be provided by the Contractor from the closest overhead cable tray to the Contractor's demising walls. The Designer and Contractor are responsible for the wiring and connection to local phone service and for providing the drop conduit runs from the closest overhead cable tray down to the final location(s) of the outlet(s).
Refer to BCAD "Standards for New or Upgraded Communications Infrastructure Specifications" for guidelines.
http://www.broward.org/Airport/Business/Documents/Insideplantinfrastructurespecs2016.pdf

Z. **Public Address System:** All terminals and concourses shall be provided with a Public Address (PA) System. BCAD phones are required at each ticketing and gate counter position. The BCAD Information Systems (IS) Division provides some equipment, such as BCAD phones and switches for the ticketing and gate counters. However, BCAD IS does not install terminations or do infrastructure work. It is the Contractor's responsibility to provide and install speakers and it is their responsibility to build the technology infrastructure. Furthermore, the Contractor shall provide and install all cabling which includes terminations in communication rooms as well as end points.

New PA speakers shall be IP-based and not analog in order to connect to the existing VoIP System. New equipment must be compatible with the existing system. Any local system shall be equipped with an override feature to accept signals from the main system and provide priority annunciation.

Ramp-side Emergency Speakers: To provide announcements to the ramp areas during emergency situations, emergency speakers shall be provided to the exterior walls of terminals and concourses facing the ramp areas. During Design Development, the Designer shall coordinate with the BCAD IS Division and the BCAD Security Division for location, quantity, and other specific requirements and equipment that may be necessary for the system to fully function *(see below figure)*.

Terminal 3 Concourse F – Exterior Ramp Side Emergency Speaker

AA. Gas: Any Contractor requiring natural gas service shall coordinate with BCAD, so that BCAD can coordinate directly with their approved gas provider to arrange installing a natural gas meter in the central meter room closest to the Project area. The Designer and Contractor is responsible for piping natural gas from the aforementioned meter room to their Project area.

BB. Doors: All regular exterior doors shall be stainless steel. All interior doors shall be solid wood type with metal framing. All doors shall be fire rated and approved by BCAD before installation. All automatic entrance doors shall be “Besam Entrance door systems” or BCAD-approved equivalent. Lock sets shall be “KeyMark series by Medeco” with construction cores to be changed at final inspection. No “Best” cylinder cores are allowed.

CC. Escalators: Escalators and moving walkways shall be "Schindler Products” or BCAD-approved equivalent.

DD. In-Line Baggage Systems: All baggage systems shall be designed similarly/equally as the in-line baggage system in Terminal 1 and note “per BCAD Terminal 1 In-line baggage system design”. Refer to the BCAD Maintenance Standards for additional information.

EE. Paint: All painted surfaces shall be primed with two coats of finished paint. All exterior paint shall be Sherwin-Williams A-100 Exterior Latex Paint. All interior paint shall be Promar 200.

FF. Roadways: All roadway work shall be per then-current editions of the FDOT Design Standards and the FDOT Standard Specifications for Road and Bridge Construction.

GG. **Roof Work:** All roof work must be coordinated with the BCAD Facility Maintenance Division and approved in writing prior to commencement. The Contractor is responsible for maintaining the integrity of all roof systems and components. All roofing modifications shall comply with BCAD, FBC, NRCA, and SMACNA roofing standards. All roof modifications associated with the Project are at Contractor's expense. The Contractor must use a BCAD-approved bonded and insured roofer.

Any roof penetrations to an existing roof must be certified through the appropriate warranty representative, in writing, and approved by BCAD. BCAD will provide existing roof warranty information from the roof manufacturer. BCAD reserves the right to review all roof penetration details prior to fabrication.

New roofs shall be built-up type with Single-Ply Thermo-Plastic Membrane Roofing systems (mechanically attached). The warranty of the airport's existing roof must be maintained. BCAD's current roof warranty is with FiberTite.

HH. **Antenna Mounting:** All antenna mounting needs to be approved by the BCAD Facility Maintenance Division and the BCAD IS Division. There are approved areas that are designated for these antennas. There are also conduits that are designated from the communication rooms to the roof for services required by concession vendors that need their own services. New antennas located on BCAD property must be reviewed to determine if FAA Part 77, Florida Statutes Chapter 333, and/or the Broward County Airport Zoning Ordinance apply. Based on the location of a proposed antenna, the FAA may need to review to determine whether the project is a potential hazard to airspace or navigation aids. To initiate the FAA review process, visit the following website:

https://oeaaa.faa.gov/oeaaa/external/portal.jsp

II. **Record Drawings:** Specifications, instruction manuals, warranties, and as-built drawings shall be delivered to BCAD before the final closeout of the Project (refer to Graphic Standards in Section 3.4). During construction, the Contractor must maintain an up-to-date set of drawings on site, which shall be reviewed by the Designer at least once per month.

BCAD Department Name	Contact Information	BCAD Position
*BCAD Facility Maintenance Division	Ashram (Ash) Morgan Cell Phone: (954) 465-7296 E-mail: AMORGAN@broward.org Lawrence (Larry) Cole Phone: (954) 498-6514 E-mail: LCOLE@broward.org	Facilities Maintenance Superintendent BCAD Aviation - Maintenance Division