AUS Design Standards Manual

City of Austin

Department of Aviation

Austin-Bergstrom International Airport

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Austin-Bergstrom
International Airport

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Revision Location	Revision Description
Multiple Locations	Edited “technical standards section” to “AUS Information Technology Design Standards Manual”
Design Standards Governance - Design Standards Adherence	Added description of Design Review Committee (DRC) process
Project Process - Project Milestones	Added requirement for DRC involvement and Project Validation Report
Project Process - Project Milestone Review	Added requirement for AUS Utility Management Program
Project Process - Project Milestone Review	Added requirement for selection of concept from design options in 30% milestone
Project Process - Permitting	Updated Permitting flow chart graphics
General Site Design Requirements - Utilities	Added requirement for coordination with AUS Utility Management Program
Design Standards - Vertical Conveyance	Added requirement for service elevators
Technical Design Standards - Division 09 - Finishes	Added requirement for interior finish paint
Supplemental Appendices - Design Standards Adherence	Added description of and link to AUS Utility Management Program

Approved by:

Jennifer Williams
Officer of Planning & Development

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ADMINISTRATIVE

I. EXECUTIVE SUMMARY

The AUS Design Standards Manual (DSM) is a set of standards, guidelines, and design criteria for development, design, construction, and renovations at Austin-Bergstrom International Airport. It sets policies and standards that will assist the City of Austin Department of Aviation (AUS) in reaching its vision to provide a gateway to the world for all – the AUS way every day.

The DSM is intended to promote consistent communication and to establish a minimum set of design parameters including aesthetic, functional, regulatory, and technical development standards for site and facility design projects at AUS. It also includes procedural standards and processes established by the AUS Department of Aviation relative to design development and implementation. Airport tenants, project design teams, contractors and the project management team must comply with the DSM and incorporate these standards when developing project work designs at AUS. Project and approval delays may result when this DSM is not followed.

The DSM is a living document that cannot cover every situation. AUS understands that latest ideas, technologies, and lessons learned will arise during the development and execution of a project. Therefore, designers are encouraged to maintain open communication with the AUS project management team to suggest technologies, techniques, materials, and products that are not included in the DSM but that may further the AUS vision and mission. These design standards do not preclude other design approaches if a particular standard does not apply or if it presents functional or aesthetic difficulties. After careful consideration and discussions with the AUS PM, a variance from this DSM may be requested by submitting a written request for consideration.

Development shall follow the applicable sequences and processes established in the Design Standards Manual – including all appendices. Project-specific information, especially which relate to variations in development requirements due to site or program constraints, should be coordinated with the AUS Project Manager.

Design Professionals must comply with all airport design standards and other information contained within the DSM. The Design Standards Manual is organized into five main sections: Administrative, Design Principles, Design Standards, Technical Design, and Supplementary Appendices.

- Administrative: This section provides background information related to AUS and project procedural information.
- Design Principles: This section provides high-level and general design content relevant to all design projects at AUS.
- Design Standards: This section identifies key elements for exterior and interior improvements
- Technical Design: This section provides general technical design standards as well as key specification requirements critical to user group operations
- Supplemental Appendices: This section provides information and links to key documents referenced within the DSM.

II. AUS VISION AND MISSION STATEMENT

VISION

GATEWAY
TO THE WORLD
FOR ALL -
THE AUS WAY
EVERY DAY.

MISSION

PROVIDE SAFE
JOURNEYS TO THE WORLD,
ECONOMIC OPPORTUNITY
TO OUR COMMUNITY,
AND BE THE EMPLOYER
OF CHOICE.

Austin-Bergstrom International Airport

III. ABBREVIATIONS AND ACRONYMS

Acronym	Description
5K PAL	5000 Passenger Activity Level
A(AMP)	Ampere
A/C	Air Conditioning
A/D Hall	Arrivals And Departures Hall
AACE	The Association For The Advancement Of Cost Engineering International
ABV	Above
AC	Air Conditioning
ACI	American Concrete Institute
ACM	Asbestos Containing Material
ACR	Air Conditioning And Refrigeration
ACT	Acoustical Ceiling Tile
ACWP	Actual Cost Of Work Performed
ADPM	Average Day Of The Peak Month
A/E	Architect / Engineer
AE	Austin Energy
AEDP	Austin Expansion And Development Program
AEGB	Austin Energy Green Building
AFCI, AFI	Arc-Fault (Circuit) Interrupter
AFF	Above Finished Floor
AFG	Above Finished Grade
AHJ	Authority Having Jurisdiction
AHU	Air Handling Unit
AIPP	Art in Public Places
AL	Aluminum
AL	Alarm Line

Acronym	Description
ALP	Airport Layout Plan
ANSI	American National Standards Institute
AOA	Aircraft Operations Area
APIS	Advance Passenger Information System
APM	Automated People Mover
APPROX.	Approximate(ly)
AQM	Alternate Queuing Method
ARCH	Architect(ural)
ASHRAE	American Society of Heating, Refrigeration and Air-Conditioning Engineers
ASI	Architect's Supplemental Instruction
ASP	Advanced Surveillance Program
ATO	Airline Ticket Office
ATR	Automatic Tag Reader
AUS	Austin-Bergstrom International Airport
AV	Audio/Visual
BAC	Budget at Completion
BAM	Bag Allocation Methodology
BAS	Building Automation System
BCWP	Budgeted Cost of Work Performed
BCWS	Budgeted Cost of Work Scheduled
BHS	Baggage Handling System
BHSC	Baggage Handling System Contractor
BIC	Ball In Court
BICSI	Building Industry Consulting Services International
BIDS	Baggage Information Display System
BIM	Building Information Modeling

Acronym	Description
BIS	Baggage Inspection Station
BJT	Barbara Jordan Terminal
BKR	Breaker
BLDG	Building
BLW	Below
BMA	Baggage Measurement Array
BMS	Building Management System
BOD	Basis of Design
BOE	Basis of Estimate
BPH	Bags per Hour
BPT	Baggage Process Timer
BRL	Baggage Reinsertion Line
BRP	Baggage Removal Position
BSD	Bag Status Display
BSIS	Baggage Screening Investment Study
BTT	Bag Travel Time
CBIS	Checked Baggage Inspection System
CBP	Customs and Border Protection
CBRA	Checked Baggage Resolution Area
CCI	Construction Cost Index
CCO	City Contracting Organization responsible for Procurement
CCR	CBIS Change Request
CCTV	Closed Circuit Television
CD	Construction Documents
CFCI	Contractor Furnished, Contractor Installed
CFOI	Contractor Furnished, Owner Installed

III. ABBREVIATIONS AND ACRONYMS

Acronym	Description
CHW	Chilled Water System
CI	Control Interface
CIP	Capital Improvement Program
CKT	Circuit
CL	Centerline
CLG	Ceiling
CM	Construction Manager
CMR / CMAR	Construction Manager at Risk Delivery
CMU	Concrete Masonry Unit
COA	City Of Austin
COND	Condensate Drain
CPI	Cost Performance Index
CPIS	Concept Proposal Information Sheet Form
CRAC	Computer Room Air Conditioning
CSI	Construction Specifications Institute
CSV	Comma-Separated Values
CT	Current Transformer
CTR	Counter
CU	Copper
CUP	Central Utility Plant
CUPPS	Common Use Passenger Processing System
CUSS	Common Use Self Service
CWE	Current Working Estimate
DAS	Distributed Antenna System
D-B	Design Build Delivery
DBU	Date of Beneficial Use
DCM	Design Criteria Manual

Acronym	Description
DD	Design Development
DDFS	Design Day Flight Schedule
DEMO	Demolish(ition)
DEPT	Department
DET	Detail
DHS	Department of Homeland Security
DISC	Disconnect
DIV	Division
DO	Delivery Order
DOA	City of Austin Department of Aviation
DRC	Design Review Commitee
DSM	Design Standards Manual
DWG(S)	Drawing(S)
EA	Each
EAC	Estimate at Completion
ECAD	Energy Conservations and Audit Disclosure
EBSP	Electronic Baggage Screening Program
EC	Electrical Contractor
ECAD	Energy Conservations and Audit Disclosure
EDS	Explosives Detection System
EDS-CP	EDS Competitive Procurement
EF	Exhaust Fan
ELE	Electric(Al)
ELEV	Elevator
EM/EMER	Emergency
EMT	Electrical Metallic Tubing

Acronym	Description
ENGR	Engineer
EOC	Emergency Operations Center
EQPT	Equipment
ER	Existing Relocated
ERF	Exemption Request Form
ESC	Escalator
ESG	Environment, Social and Governance
ESM	Enhanced Staffing Model
ETC.	Etcetera
ETD	Explosives Trace Detection
ETR	Existing To Remain
EVM	Earned Value Management
EWC	Electric Water Cooler
EXIST/(E)	Existing
F/A	Fire Alarm
F/S	Fire / Smoke Damper
FA	False Alarm
FAA	Federal Aviation Administration
FAAP	Fire Alarm Annunciator Panel
FACP	Fire Alarm Control Panel
FBO	Fixed Based Operations
FC	Footcandles
FDRS	Field Data Reporting System
FIDS	Flight Information Display System
FIFO	First In First Out
FIS	Federal Inspection Services

III. ABBREVIATIONS AND ACRONYMS

Acronym	Description
FRM	Field Regional Manager
FSD	Federal Security Director
FT	Foot/Feet
GALV	Galvanized
GBR	Geotechnical Baseline Report
GC	General Contractor
GDM	Geotechnical Design Memorandum
GEC	Grounding Elec. Conductor
GFCI/GFI	Ground Fault (Circuit) Interrupter
GFI	Government Furnished Information
GIDS	Gate Information Display System
GMP	Guaranteed Maximum Price
GND/G	Ground
HMI	Human Machine Interface
HSD	High Speed Diverter
HVAC	Heating, Ventilation, And Air Conditioning
HWG	Hot Water Generators
IATA	International Air Transport Association
ICS	Individual Carrier System
ICS-CERT	Industrial Control Systems Cyber Emergency Response Team
ID	Identification (Or Identifier)
IDF	Intermediate Distribution Frame
IECC	International Energy Conservation Code
IEEE	Institute Of Electrical And Electronics Engineers
IESNA	Illuminating Engineering Society Of North America

Acronym	Description
IFC	Issued For Construction
IG	Isolated Ground
ILDT	Integrated Local Design Team
IMAC	Installation, Move, Add And Change
INFO	Information
INT	Interior
IPS	Integrated Program Schedule
IQ	Image Quality
IQT	Image Quality Test
IRD	Interface Requirements Document
ISAT	Integrated Site Acceptance Test
ISO	International Organization For Standardization
IT	Information Technology
IWG	Industry Working Group
JB/(J-BOX)	Junction Box
JIB	Jetbridge Interface Box
JOC	Job Order Continuedracting Construction Services
KAIC	Kiloampere Interrupting Capacity
KPI	Key Performance Indicators
kVA	Kilovolt-Amps
LBP	Lead-Based
LC	Lighting Contactor
LCC	Life-Cycle Cost
LCCA	Life-Cycle Cost Analysis
LCP	Lighting Control Panel

Acronym	Description
LEO	Law Enforcement Officer
LEED	Leadership in Energy and Environmental Design (rating system; US Green Building Council)
LOS	Loss of Service
LTHW	Low Temperature Hot Water Boiler System
MAP	Million Annual Passengers
MAX	Maximum
MCA	Minimum Current Ampacity
MCB	Main Circuit Breaker
MCP	Motor Control Panel
MCS	Master Control Station
MDF	Main Distribution Frame
MECH	Mechanical
MFR	Manufacture(R)
MIN	Minimum
MISC	Miscellaneous
MLO	Main Lug Only
MOCP	Maximum Overcurrent Protection
MSI	Master Systems Intergrator
MTCBF	Mean Time Between Critical Failures
MVW	Moving Walkway
N/A	Not Applicable
N1/N3R/N	Rating (As Noted)
NC	Non-Condensing
NEC	National Electrical Code
NEDS	Networked Explosive Detection Systems

III. ABBREVIATIONS AND ACRONYMS

Acronym	Description
NEMA	Nema 1, Nema 3r,
NFPA	National Fire Protection Association
NIC	Not In Contract
NL	Night Light
NO/#	Number
NOM	Nominal
NTP	Notice To Proceed
NTS	Not To Scale
O&D	Origin And Destination
O&M	Operating And Maintenance
OAPM	Office Of Acquisition Program Management
OEM	Original Equipment Manufacturer
OFCI	Owner Furnished, Contractor Installed
OFOI	Owner Furnished, Owner Installed
OH	Over Height
OIT	Office Of Information Technology
OL	Over Length
OOG	Out-Of-Gauge
OPR	Owner Project Requirements
ORAT	Operational Readiness, Activation and Transition
ORCA	Office Of Requirements And Capabilities Analysis
OS	Oversize
OSARP	On-Screen Alarm Resolution Protocol
OSHA	Occupational Safety And Health Administration
OSP	Outside Plant
OSR	On-Screen Resolution

Acronym	Description
OSRA	On-Screen Resolution Area
OTA	Other Transaction Agreement
OTK	Operational Test Kit
OVT	OSR Viewing Time
OW	Over Width
P	Pole
P+D	Planning And Development
PAL	Planning Activty Level
PART	Partial
PC	Photocell
PCS	Passenger Conveyance
PDB	Progressive Design Build
PDD	Program Definition Document
PDF	Portable Document Format
PDPM	Peak Day Peak Month
PE	Photo Eye
PEC	Photoelectric Cell
PER	Project Engineering Report
PGDS	Planning Guidelines And Design Standards
PH	Phase
PLC	Plug Load Controller
PLC	Programmable Logic Controller
PM	Project Manager
PMIS	Performance Management Information System
PMO	Program Management Office
PNL	Panel

Acronym	Description
PNR	Passenger Name Record
POC	Point Of Contact
PP	Power Pole
PVC	Polyvinyl Chloride
PVS	Primary Viewing Station
QTY	Quantity
RBS	Risk Based Security
RECEPT	Receptacle
RCP	Reflected Ceiling Plan
REF	Refer To / Reference
REQ	Require(D)
RFI	Request For Information
RFID	Radio Frequency Identification
RFP	Request For Proposal
RFQ	Request For Qualifications
RFV	Request For Variance
RGS	Rigid Galvanized Steel
RL	Re-Insert Line
RM	Room
RMC	Rigid Metallic Conduit
ROFA	Runway Object-Free Area
ROM	Rough Order Of Magnitude
RON	Record Of Negotiation
RON	Remain Overnight
ROW	Right Of Way

III. ABBREVIATIONS AND ACRONYMS

Acronym	Description
SAT	Site Acceptance Test
ScTP	Screened Twisted Pair
SD	Schematic Design
SDE	Service Distribution Enclosure
SEOR	Structural Engineer of Record
SF	Square Feet
SIDA	Security Identification Display Area
SMBR	Small And Minority Business Resources
SMC	Structured Media Center
SOP	Standard Operating Procedures
SOS	System Optimization Support
SOW	Scope Of Work
SPD	Surge Protective Device
SPEC	Specification(S)
SQ	Square
SS	Security Shunt
SSCP	Security Screening Checkpoint
SSI	Sensitive Security Information
SSTP	Site Specific Test Plan
STIP	Security Technology Integrated Program
STZ	Security Tracking Zone
SUPPS	Shared Use Passenger Processing System
SV	Schedule Variance
SVS	Secondary Viewing Station
SW	Switch
TAF	Terminal Area Forecast

Acronym	Description
TAS	Texas Accessibility Standard
TC	Timeclock
TCU	Threat Containment Unit
TDMM	Telecommunications Distribution Methods Manual
TES	Thermal Energy Storage Tanks For Both Chilled And Hot Water Systems
TGB	Telecommunications Grounding Busbar
TIA	Telecommunications Industry Association
TMGB	Telecommunications Main Grounding Busbar
TOFA	Taxiway Object Free Area
TRC	Technical Review Committee
TRR	Test Readiness Review
TSA	Transportation Security Administration
TSM	Transportation Security Manager
TSO	Transportation Security Officer
TV	Television
TX	Texas
TYP	Typical
UG	Underground
UL	Underwriters Laboratories, Inc.
UNO	Unless Noted Otherwise
UPS	Uninterruptible Power Supply
UTIL	Utility
UTP	Unshielded Twisted Pair
V	Voltage / Volts
VA	Volt-Amps

Acronym	Description
VAC	Variance At Completion
VFD	Variable Frequency Drive
VSU	Vertical Sortation Unit
WAP	Wireless Access Point
WBS	Work Breakdown Structure
WP	Weatherproof
WR	Weather Resistant
XFMR	Transformer

IV. DEFINITIONS

Term	Definition
Airside	All areas beyond TSA screening including SIDA, sterile, secure and restricted areas and including buildings and aircraft operations areas.
Concourse	The post-security portion of the airport that provides space for arriving and departing passengers and includes waiting areas for departing passengers, travel spaces, concessions and other passenger amenities and services
Contractor	The prime contractor employed by AUS or an AUS tenant to construct new facilities or revise existing facilities
Developer / Design Professional	Tenant representative or consultant (typically a licensed architect or engineer) responsible for project design, permitting and ensuring compliance with all applicable codes and regulations
Landside	All areas before TSA screening including the SIDA, Sterile, Secure, and Restricted Areas beyond TSA security
Owner	City of Austin, Texas, a municipal corporation, home rule city and political subdivision organized and existing under the laws of the State of Texas, acting through the City Manager or his/her designee, officers, agents or employees to administer design and construction of the Project
Owner’s Representative	The designated representative of the OWNER. The Owner’s Representative will be identified at the pre-construction conference.
PROCORE	A project management information system for managing and collaborating on all capital improvement projects at the airport
Record Drawings	Revised drawing set submitted by contractor, reflecting changes to specifications and drawings during construction, and sowing exact dimensions and locations of elements completed
Runway Protection Zone	A trapezoidal area off the end of the runway end that serves to enhance the protection of people and property on the ground in event an aircraft lands or crashes beyond the runway end
Runway Safety Area	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway
South Terminal	Small AUS terminal located at 10000 Logistics Lane
Sub / Subcontractor	Contractors (frequently trade-specific) employed by the prime contractor to construct certain portions of a construction project
Tenant	Lease holder representative for space or property at AUS
Terminal	The pre-security portion of the airport that includes ticketing, baggage claim,and all related services for processing arriving and departing passengers.

V. PURPOSE

A. Scope

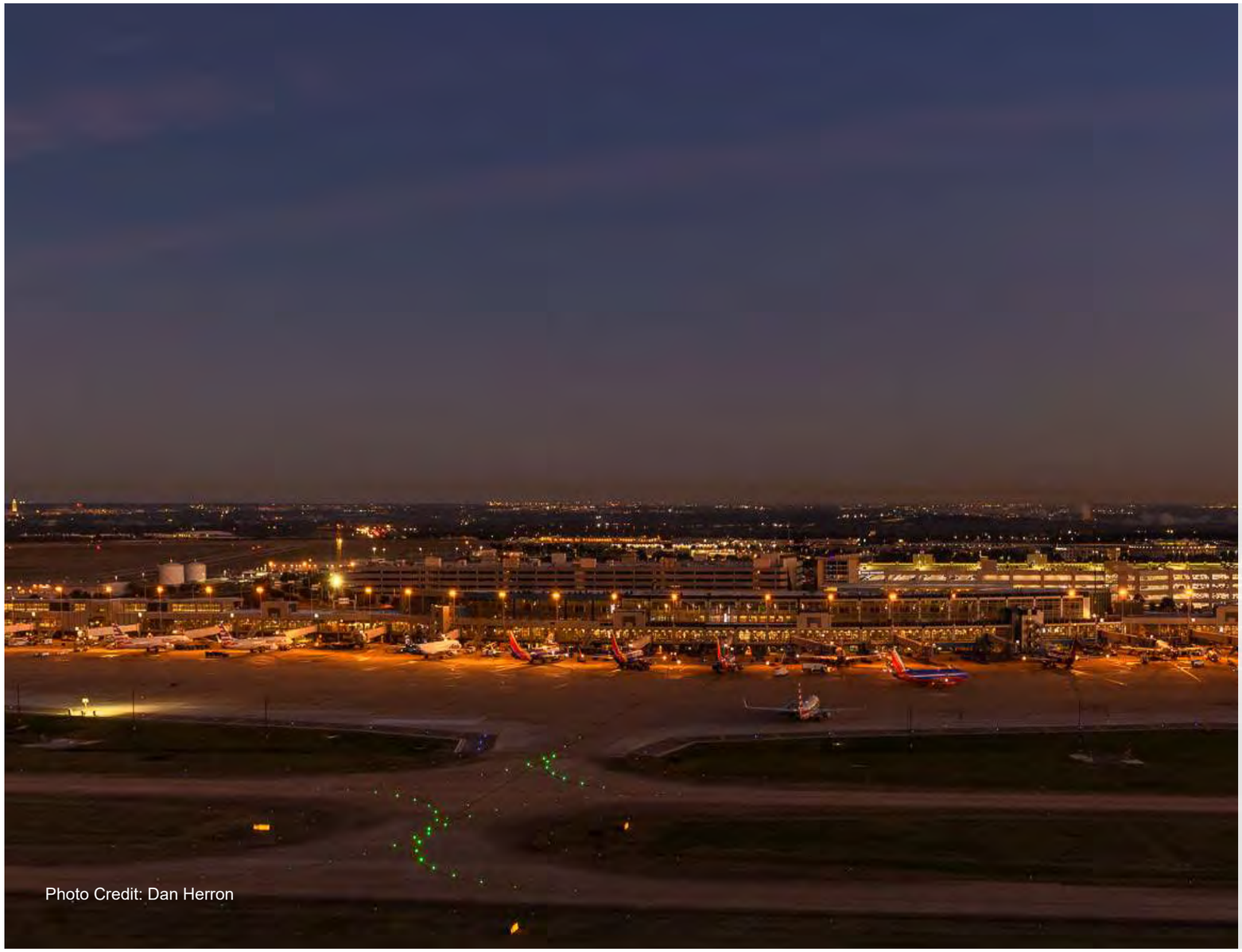


Photo Credit: Dan Herron

This Design Standards Manual (DSM) is intended to be followed by all Airport Tenants, Designers, Contractors, and any other stakeholder performing building and/or site improvements at the Austin-Bergstrom International Airport (AUS) including, but not limited to work at terminal, concourse, ancillary buildings, landside , apron, and airfield. It is intended to provide general standards for look and feel of projects at AUS and to provide general information regarding the process of completing a project at AUS.

This Design Standards Manual is intended to be a living document. It will be periodically revised and updated to address standards for all areas of design at Austin-Bergstrom International Airport. It is the responsibility of all members of the design and construction team to be familiar with the most recent version of this manual.

V. PURPOSE

B. Audience

The list below identifies the typical audience of the Design Standards Manual and their responsibilities to review and coordinate with AUS PM on specific scope of work and conform to guidelines outlined in this document.

Airport Tenants

Any airport tenant initiating a project to modify the occupied space must review the project intent with AUS and must ensure that the Designer is aware of the requirements in this design standards manual.

Project Design Team

The Project Design Team must be familiar with all aspects of this Design Standards Manual and is responsible to ensure that the design aligns with it.

Contractor

The Contractor must be familiar with the Design Standards Manual and follow all guidelines related to the construction phase.

Owner

Owner must be fully familiar with all aspects of the Design Standards Manual and should make recommendations for updates to the manual based on project management team feedback.

C. Organization

This section provides an overview of the AUS Design Standards Manual organization and provides a short narrative of each section's content.

Administrative

The Administrative section is meant to be an overview of important procedural information regarding the Department of Aviation and vision for AUS. This section also contains information that forms the basis of all design and construction projects within AUS. The contract between the designer and Department of Aviation and/or City of Austin will provide more thorough information.

Technical Design Standards

The Technical Design section provides General Standards for all systems at AUS as well as general CSI Specification standards where applicable. These standards are intended to be used by designers to provide systems, products, and materials important to AUS but does not specify every system, product or material.

Design Principles

The Design Principles section provides information pertaining to all designs at AUS. This section is intended to provide designers with a basis of design to ensure that AUS and City of Austin's vision and purpose is conveyed throughout AUS. This section will also ensure that the airport maintains a consistent look and feel.

Design Standards

The Design Standards section provides general information for AUS facilities and property. This section is separated into Exterior Improvements (Landside / Airside) and Interior Improvements (Public / Non-Public).

Supplemental Appendices

The Supplemental Appendices section provides links to key documents outside the Design Standards Manual.

VI. DESIGN STANDARDS GOVERNANCE

A. Design Standards Adherence

This Design Standards Manual provides Tenants and Design Professionals with information regarding design of new construction, building renovations, modifications, additions and other design and construction work at AUS.

Design standards indicated in this document apply to all construction work at AUS. The information contained herein should be shared with all members of each design team – all Designers are required to comply with these standards including appendices.

All projects, regardless of size, undertaken at AUS, which temporarily or permanently alter the terminal, concourse, landside, airside, airfield, or any other structures or site improvements in any manner, will comply with all standards set forth and will be reviewed by the Owner for adherence to these standards prior to approval of any work to construct or otherwise implement the projects.

All Tenant improvements or modifications, as required to meet operational or program requirements, are controlled by the Owner. The design of all individually occupied facilities should be compatible with the architectural design characteristics of the existing facilities and the airport guiding principles.

Initial development of Tenant spaces and the maintenance of those spaces throughout the life of the tenancy should promote – rather than detract from – the efficient, service-oriented, functional aspects of the airport by encouraging wayfinding, ease of circulation, and enhancing the passengers' and visitors' traveling experiences.

Design Professionals are encouraged to review any individual design concerns arising from use of the Design Standards Manual (DSM) with the Owner or Project Manager prior to, and throughout, the design process to ensure that the final design meets with the approval of Owner.

If, in the process of this review, changes to the DSM are needed, all impacted AUS divisions must review and approve the necessary changes.

Design Review Committee

The Design Review Committee (DRC) is composed of standing members and additional optional members (depending on the complexity and scope of the project and design process). The committee will review each project to ensure project designs are compatible with and enhance the aesthetic intent and design precedent and quality of AUS Facilities and tenant improvements based on the AEDP Guiding Principles.

The DRC reviews and provides recommendations at the design milestones. The Committee also provides formal approval of project design adherence to this Design Standards Manual at 60% Design Development as well as Design Changes during construction that have a significant impact on design elements of the project.

The committee convenes twice monthly to review ongoing AUS projects.

VI. DESIGN STANDARDS GOVERNANCE

B. Variance

Variance Submittal Process

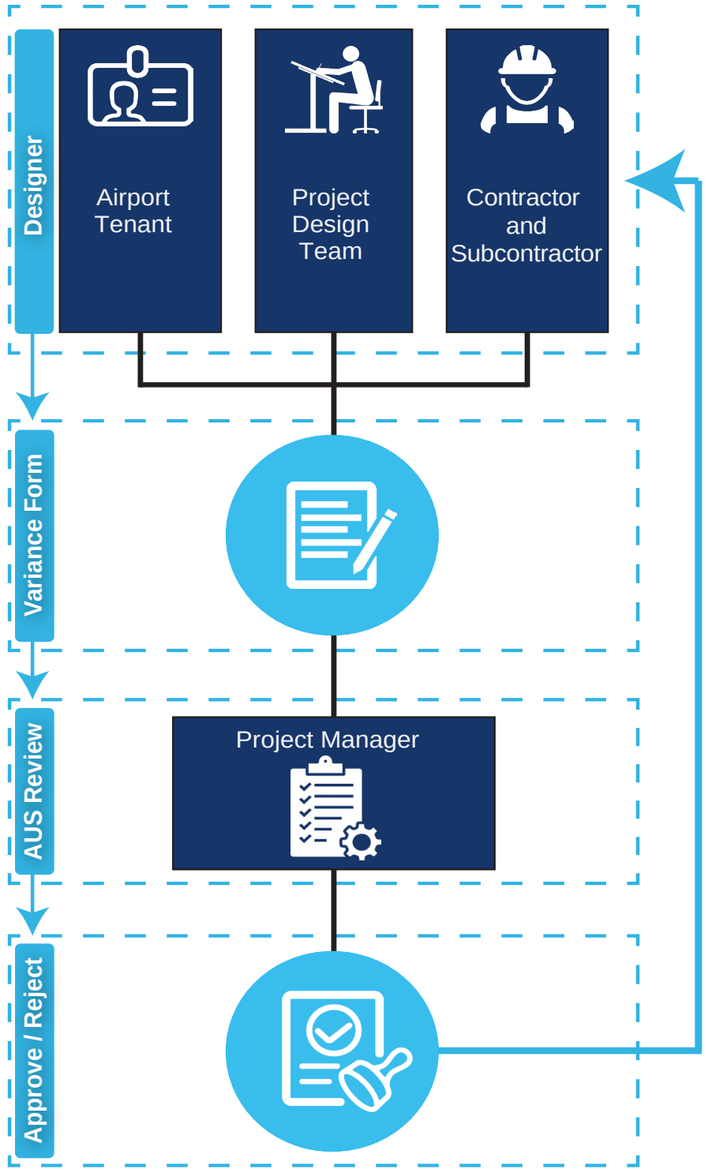
Designers are encouraged to be creative in the use of innovative materials, products, and technologies. This manual is not intended to limit such creativity. Rather, creativity and innovation support the AUS vision.

Formal documentation of exemptions and changes to the design standards assists AUS to maintain compliance with and to continuously improve this manual. Tenants and designers are encouraged to engage the AUS Project Manager to request exceptions or to propose amendments to these standards by completing and submitting the Variance Request Form which can be found here:

https://www.austintexas.gov/sites/default/files/files/AUS%20Variance%20Request%20Form.pdf

Variance Approval Process

The following diagram describes the variance process from Designer to PM approval.The designer provides the completed Variance Form to the AUS PM. The AUS PM will review the completed Variance Form and will share it with the appropriate stakeholders. After this review process, the variance will be approved or rejected. The Variance Request Form will be completed by the AUS PM and returned to the Designer. Approved variances will be allowed into the design.



Austin-Bergstrom International Airport

VII. PROJECT PROCESS

A. Project Management Life Cycle Overview

The Following Diagram Describes The Typical Life Cycle Of A Project At AUS. This Is A Guide For Designers And Contractors To Better Understand The Project Process.

Project Management Life Cycle Overview

V.d1

CIP - Long Range Plan → ENVISION → DESIGN → BUILD → ACTIVATE

Intake Approval	Feasibility Initiate Approval	Analysis Approval	Solution Approval	Design	Construction & Commissioning	Activate

Intake Form Received (Request)
CIP Manager:
meet with Champion to verify:
• **intake form - Problem Statement and proposed schedule**
• **Benefits and metrics – Success Factors**
• **highest level Justification (eCaprie)**
• **Score prioritize requests – present list to CSC**
CSC:
Intake lists (Requests) are on the CSC Agenda Quarterly
• **Level 5 cost and Level 1 schedule estimates**
• **Approve new requests to be included on CIP**
CIP Manager: coordinate set up of sub project in eCapris – status anticipated
Transfer CIP anticipated to active
CIP Manager:
• **Meet with Champion verify request**
• **Thursday Finance meeting 2x a month present**
PMO:
• **Verify PMO Resources**
Finance and P+D Leaders:
• **Verify Problem Statement and proposed schedule**
• **Benefits and metrics – Success Factor**
• **Level 5 cost and Level 1 schedule estimates**
CIP Manager:
• **Update highest level Justification (eCaprie)**
PMO: Assign PM
	PMO:
	• **Defines complexity & governance rigor**
	• **Assigns Project Controls support team, Cost, Estimating, Scheduling resources**
	• **Sets up project in Procore/SharePoint**
	PM:
	• Develop justification
	• Begin updating eCapris
	• Engage Champion – define Project Steering Committee
	• Engage Project Steering Committee (PSC)
	• Identify working team, SMEs and Stakeholders
	• Identify / analysis alternatives
	• Level 5/4 Cost Estimates and Level 1 Schedules and PM spend plan (Cash Flow)
	• Identify initial funding needs (studies, staff Aug.)
	• High level Benefits and defined Metrics
	• Identify potential constraints, impacts, and risks and issues
	• Receive all approvals from PSC and Champion
	PMO:
	• **PMO Governance and Controls Review**
	• **Score & Recommend Delivery Method**
	Complete Initiate Tollgate Is the project ready to move forward
	CSC:
	• **Review for a sound justification with defined Problem Statement, Issues, and Metrics that define success, linked directly to the strategic priorities of the airport**
	• **Determine if project moves forward**
	CIP Manager:
	Add to Council Notification List if Alt. Delivery Method
		PM:
		• Kickoff & Site Visit
		• Develop Communication Plan/ PIO/ORAT
		• Maintain Continuous Updates / Meetings / Communications*
		• Develop alternatives and define solution, benefits and success factors
		• Refine Schedule and Cost Estimates
		• Update Spending Plan Develop, Risk Matrix, Action Item Log,
		• Meet with enabling groups (IS)
		• Develop, commission, & council schedule based on proposed delivery method
		• Finalize Procurement Plan
		• Develop Resource Plan
		• Community Benefits Update
		  • Environmental Team
		  • SMBR
		  • Workforce Development
		  • Sustainability Matrix
		  • Art Program
		• Meet with Planning compare programming vs original plan
		• Complete Justification
		• Receive approval from PSC and Champion
		PMO:
		• **PMO Governance and Controls Review**
		CSC:
		• **Approve recommended solution**
		• **Review completed justification with defined Problem Statement, thought out alternatives. Issues, and Metrics that define scope and success, linked directly to the strategic priorities of the airport**
		• **Approve project to move forward**
		• **Approve funding if required**
			PM:
			• Maintain Continuous Updates / Meetings / Communications*
			• **Develop <u>Project Management Plan And Project Charter</u>**
			• Conduct functional design meeting with Stakeholders to create scope documents
			• Receive approval from PSC and Champion
			PMO:
			• **PMO Governance and Controls Review**
			• **Verify delivery method**
			Complete Envision Tollgate determine if the project is ready to advance to Design
			CSC:
			• **Approves recommended solution Approve that project moves forward**
			• **Determine if project moves forward**
			• **Approve I funding**
			• **PMO Baseline Scope, Budget and Schedule**
				PM:
				• Procure and Execute Design contracts
				• If using Alternate Delivery, procure Contractor
				• Manage Design work
				• Review 30/60/90 Drawings
				• Finalize Design with Sponsor
				• Refine Level Schedule and Cost Estimates
				• Engage ORAT team
				• Maintain Continuous Updates / Meetings / Communications
				• Community Benefits Update
				• **<u>Finalize Project Management Plan</u>**
				• Conduct Design Lessons Learned
				PMO Governance and Controls Review
				Complete Tollgate at PER/DDD 30,60 and 90% design reviews and/or if there is a change to contract or scope – Concept Approval
				Complete Design Tollgate for Funding and advance to Build
				CSC:
				• **Review final design**
				• **Determine if project moves forward**
				• **Approve funding if required**
				PMO Re-Baseline schedules as required
					PM:
					• Maintain Continuous Updates / Meetings / Communications
					• Procure and Execute Construction Contracts
					• Review and Implement Site Specific Safety Plans
					• Start Construction
					• ORAT Coordination
					• Coordinate change approvals through Change Review Board
					• Achieve Substantial Completion
					• Achieve Space Turnover and Owner Occupancy
					• Start Punch list
					• Begin reviews of Operations and Maintenance Manuals
					• Begin end user training
					• Activate and commission Systems
					• Conduct Build Lessons Learned
					PMO Governance and Controls Review
					Complete Checkpoints / Tollgate minimum every 3 months or at significant change in scope, schedule or cost
					Complete Build Tollgate to advance to Activate
						PM:
						• Complete Punch list
						• Collect and Archive Record Documents, Drawings and other Contractual Items, etc.
						• Advise Fixed Assets of project completion
						• Send out Project Survey to sponsor and Stakeholders
						• Close out Final Budgets
						• Review actual vs budget
						• Closeout PMP
						• Close out Contracts and Task Orders
						• Deliver O&M manuals, initiate warranty start dates
						• Warranty follow-ups 10 months out
						• Conduct Lessons Learned
						PMO Governance and Controls Review
						Conduct Closing Activate Tollgate
						PMO:
						• **Closeout Procore / SharePoint**
						• **Ensure Document Archive**

VII. PROJECT PROCESS

B. Project Initiation

After a Notice to Proceed (NTP) has been issued, each design project at AUS will start with a kickoff meeting scheduled by the AUS Project Manager. The kickoff meeting will be attended by the AUS project manager, AUS Contract Administrator, other key AUS representatives determined by the AUS Project Manager, and key members of the design team including but not limited to the Project Manager, Architect of Record, and Engineers of Record. Kickoff meeting discussions will include project goals, program for design, environmental impacts, sustainability goals, project budget, and project schedule. Stakeholder issues and operational considerations impacting the design, the project phasing, and special requirements to maintain service during construction may also be discussed as determined necessary by the AUS Project Manager. The kickoff meeting will also establish lines of communication between the AUS project team and the design team. The following table is a sample checklist that will be completed by the project team (Including Designers, Contractors, and AUS Project Management) during the project initiation.

Project Initiation Checklist

Item	Description	Check	Exceptions
1	*Identify all project team members and AUS stakeholder groups*		
2	*Determine project communication lines*		
3	*Identify major existing project elements*		
4	*Identify key environmental impacts of the project*		
5	*Identify all necessary project site elements such as contractor staging and haul routes*		
6	*Confirm if the Federal Aviation Administration (FAA) review for the project National Environmental Policy Act (NEPA) is underway, or if it is not required based on scope*		

VII. PROJECT PROCESS

C. Project Submittals

The Designer must provide all project submittals in accordance with the professional services contract.

Project Reports

Project Reports, such as design narratives, will provide project definition not conveyed in any other document.

Design Calculations

If required by the AHJ Design Calculations must be prepared by a professional engineer licensed in the state of Texas and shall be submitted for AUS review at each milestone as required. Signed and sealed design calculations must also be provided to the AHJ as required for permitting.

Specifications

Specifications shall be prepared by a professional Architect or Engineer licensed in the state of Texas and shall be submitted for AUS review at each milestone as required for permitting. Signed and sealed specifications shall be provided to the AHJ as required for permitting. Specifications shall be prescriptive in nature. Unless noted elsewhere in this Standard, sole source products and materials shall not be specified. Where sole source products and materials are specified, AUS shall be required to approve any “Or Equal” products and materials.

Project Drawings

Project Drawings shall be prepared by or under the supervision of a professional Architect or Engineer licensed in the state of Texas and must be submitted for AUS at each milestone as required. Signed and sealed drawings must also be provided to the AHJ as required for permitting and to the Contractor for construction. Unless otherwise noted, all submissions will be provided electronically in PDF format.

Construction Phasing

When needed to ensure safety or to maintain proper airport operations during construction, the Designer shall develop a construction phasing plan. This plan will include information regarding construction staging, sequencing, demolition and preparation, and new work at each phase. The construction phasing plan must be well coordinated and developed into the entire project documentation.

D. Project Milestones

After a project is defined through a Project Definition Document (PDD) or a Preliminary Engineering Report (PER), a Project Validation Report will be established. This deliverable will serve as a guide to the rest of the project. The following design reviews represent a typical project flow. However, the Professional Services Agreement will dictate the exact submittal process.

Design Review Submittals

Design review submittals are required at Schematic Design (30%), Design Development (60%), Construction Documents (90%), and IFC / Permit Documents (100%) levels of completion. This Design Standard provides specific information on the requirements and level of detail required for each of these submittals.

Schematic Design (30%)

Schematic design documents shall be prepared to sufficient detail to illustrate design intent and system concepts. The documents shall identify all project features such as life safety plans, site plans, aircraft parking plans, architectural floor plans, building elevations, building sections, interior elevations, sections, structural, mechanical, electrical, plumbing, communications security design concepts. The documents shall be sufficiently developed (including quantities and material selection and equipment sizing and scheduling) to produce a rough order of magnitude cost estimate.

As a part of the Schematic Design phase, a Project Validation Report will be developed to confirm the assumptions of the early PDDs or PERs.

The Design Review Committee will review and provide comments on the 30% submittal.

Design Development (60%)

Design development documents will further develop the approved schematic design documents and shall be prepared to sufficient detail to define the proposed character, materials, and scope of the project. These documents shall include overall dimensions, code requirements, spot elevations and dimensions of existing and proposed elements. The documents should include sufficient detail (including quantities and material selection and equipment sizing and scheduling) from all disciplines including civil, environmental, architecture, structural, life safety, fire protection, plumbing, mechanical, electrical, fire alarm, communications, security equipment, and any other disciplines necessary for the project to develop and refine a valid cost estimate.

When a GMP is negotiated, the Designer must include material and equipment selection, schedules, and sizing in the applicable submittal.

The Design Review Committee will review and provide written approval on the 60% submittal.

Construction Documents (90%)

Construction documents will continue the development of the approved design development documents and shall be prepared to sufficient detail to properly execute and complete the construction work and initiate any applicable project permitting These documents will provide a final review opportunity prior to solicitation of construction bids. The documents should include complete detail from all disciplines involved including civil, environmental, architecture, structural, life safety, fire protection, plumbing, mechanical, electrical, fire alarm, communications, security equipment, and any other disciplines necessary for the project to develop and refine a final cost estimate.

IFC / Permit Documents

Issued for Construction (IFC) or Permit documents will finalize the design process and will incorporate all review comments made previously. These documents will be used by AUS to solicit construction bids and to properly execute and complete the construction work. The documents should include complete detail from all disciplines involved including civil, architecture, structural, life safety, fire protection, plumbing, mechanical, electrical, fire alarm, communications, security equipment, and any other disciplines necessary for the bidding, permitting, and construction. All documents shall be signed and sealed by a professional according to AHJ requirements.

VII. PROJECT PROCESS

E. Coordination of Design

The prime Design Professional must coordinate the services and work provided by the project design team and has primary responsibility of the program and processes utilized to eliminate any conflicts and inconsistencies within the final design packages prepared by the design team. The following checklists should be used to ensure each deliverable has been reviewed and coordinated. The AUS Project Manager must be kept informed throughout the entire design process.

Photo Credit: Loren Litner

VII. PROJECT PROCESS

F. Project Milestone Review

Design submittals are typically required at the Schematic Design (30%), Design Development (60%), and Construction Documents (90%) milestones. The scope and schedule vary between projects and will be reviewed by the Designer and AUS Project Manager at the beginning of each project. Some submittals may be omitted, altered, or accelerated due to early delivery packages. The Designer will formally present documents to the AUS Project Manager for Department of Aviation review at each milestone and as determined by the scope of work. IFC / Permit Documents (100%) will be issued to the AUS Project Manager for backchecking prior to submission to the City of Austin for plan review.The following tables provide the minimum requirements for each milestone review.

Schematic Design - 30%

Submittal Requirements	%*	N/A	Y	N
General, Codes, Zoning, Life Safety Plans				
Initial development of checklist for sustainability goals and strategies to achieve them.Note: AEGB checklist will be separate process that also needs to be initiated. Determine Sustainability Goals and applicable verification method. Envision, LEED; AEGB, WELL, etc. Then choose the appropriate verification tool and specific goals for project.	40%			
Area Tabulation	80%			
Code Analysis (Small Scale Plans)	60%			
Construction classification, building area/height limitations, occupancy use and load (including multiple and special uses) and egress capacity.				
Site accessibility, property line restrictions, structural seismic requirements and importance factor to be used, means of egress, energy code requirements, local code issues, travel distance restrictions, horizontal exits, smoke control/evacuation requirements, plumbing fixture count review.				
Zoning Analysis (Land Use Restrictions), local site requirements	100%			
Site Demolition, Civil, Landscape				
Site Plans - Fencing and Impacts to SIDA Boundary	15%			
Show location of all buildings, roads, parking, landscape elements, property lines	35%			
Accessible routes through the site and to the building	15%			
Clear delineation of easements, project limit lines, road, or lane closures	25%			
Preliminary spot elevations	35%			
Existing and proposed utilities noted	25%			

Submittal Requirements	%*	N/A	Y	N
Existing and to be removed trees, protected trees, new vegetation, sod or seeding	25%			
Site drainage, storm water removal and/or detention and retention areas noted	10%			
Location of all utilities (storm, water, electrical, communications, etc) which are proposed to be demolished and/or abandoned in place - including method of abandonment	60%			
Identify any utilities installed before 1989 which may have have asbestos-containing material (ACM) wrap, coating, or otherwise be integral to the utility (i.e. transite pipe)	60%			
Identify and show the required number of parking spaces per local code & zoning requirements	80%			
Provisions for trash disposal and removal by truck dock, compactor, etc.	10%			
Conformance to zoning restrictions for easements and setbacks, etc.	25%			
Show site related sustainable design strategies and features	20%			
Show retaining walls if required and note type proposed				
Show general site demolition and areas requiring protection.	50%			
Site Survey (including utilities, industrial hygiene surveys and all use limitations)	100%			
Site Geotechnical Information (soil and boring survey results)	100%			
Environmental Impact Surveys or other regulatory reviews as required.	100%			
Construction Stormwater Pollution Prevention Plan (SWPPP) / Erosion Settlement Control (ESC) Plan	15%			
Utility Management Program				

** If differs from Milestone Level*

VII. PROJECT PROCESS

F. Project Milestone Review

Schematic Design - 30%

Submittal Requirements	%*	N/A	Y	N
Building Demolition, Architectural, Interior Design				
Building and Selective Demolition Plans	50%			
General and selective building demolition with areas requiring protection should be shown. Indicate above and below grade demolition. Note the type of construction to be demolished i.e., “brick veneer on metal studs” or “wood framed building with concrete basement walls and slab” major demolition on a separate plan(s)				
Architectural Floor Plans	25%			
Show structural grid, vertical circulation elements, core elements, vertical shafts, interior partitions, door and window locations, floor elevations, room names, overall and key dimensions, bay sizes, accessible routes through the building				
Show sustainable design features, such as, recycling room(s), staff showers, etc., as appropriate	25%			
Selection of concept from design options, if applicable				
Architectural Roof Plans	25%			
Show structural grid, roof material, equipment, preliminary slope and drain locations, expansion joints	10%			
Show sustainable and special design features such as area(s) of vegetated roof, solar arrays, etc., as appropriate	15%			
Principal Building Elevations & Sections	25%			
Material indications, extent of glazing and mullion spacing, shading devices, floor, roof and top of parapet lines, with dimensions	25%			
Below grade structure shown dashed in. Finished grades clearly shown.	10%			
Building Sections (longitudinal and transverse)	25%			
Wall Sections (typical sections)	15%			
Wayfinding, Signage, and Public Address Design				

** If differs from Milestone Level*

Submittal Requirements	%*	N/A	Y	N
Schedules & Analysis	25%			
Preliminary Finish Schedule (typical areas, lobbies, etc.)	15%			
Equipment Schedules and Brochures	10%			
Statement of Probable Cost based on SF and special design areas	15%			
Major Materials (selection and description in CSI format) including materials and high recycled content materials	15%			
Analysis of Compatibility with Site Analysis / Selection	100%			
Analysis of Life Cycle Costs 0v(methodology and assumptions to be indicated)	10%			
Massing Study Model, 3D Computer Model (complying with Digital Governance LOD)	80%			
Image Statement, Renderings, and Presentation Media (if contracted)	15%			
Structural (See the HNTB Struct. Dept. Design Milestone List)	10%			
Structural				
Systems Narrative of Typical Structural System	100%			
Include verification that loads of sustainable design features are accommodated, as well as MEP equipment loads or assumptions, architectural load assumptions, live and dead load criteria to be used in different areas of the facility	100%			
Written confirmation from the Owner that the building importance factor, vibration and disproportionate collapse and/or blast design requirements are correct, based on actual use of the building and the building code.	100%			
Demolition narrative of structural items to be removed	50%			

VII. PROJECT PROCESS

F. Project Milestone Review

Schematic Design - 30%

Submittal Requirements	%*	N/A	Y	N
Floor and Roof Framing Plan (single line drawings with typical bay and member sizes noted)	100%			
Preliminary lateral load analysis and design description	100%			
Description of Foundation System and estimated depths based on soils report	100%			
Alternate framing to be considered	100%			
Typical Frame Structural System Depth with deflection and lateral loads considered	50%			
Typical Bay Sizes / Column Grid				
Floor to Floor Heights				
Statement of Probable Cost	15%			
Mechanical/Plumbing				
Mechanical and Plumbing Systems Narrative	100% SD			
Demolition narrative of HVAC and plumbing systems to be removed	50%			
Mechanical and Plumbing Design Criteria and Assumptions	100% SD			
HVAC narrative including U factors, temperature ranges, air changes, chillers' humidity control, natural ventilation, building management system, water supply/sanitary systems, etc., security at louvers				
Energy Source(s) Identified, proposed envelope review	100%			
Mechanical rooms sized and located on architectural drawings	100%			
Vertical shafts and risers sized and located on architectural drawings				
Special Features Noted – i.e. elevator machine rooms, UPS room, geothermal and gray water systems, raised floor air distribution systems, economizers, etc.	100%			

** If differs from Milestone Level*

Submittal Requirements	%*	N/A	Y	N
Plumbing Fixture Counts (complying with code and program) including drinking fountains, lavatories, toilets and urinals				
Review of plumbing chase widths on arch drawings	100%			
Cooling Tower Location or alternate locations (shown on elevations, roof or site plans)	100%			
Review of mech space access and equipment removal/replacement	100%			
Fire Protection Codes and Standards	100%			
Fire Alarm and Suppression System Description	100%			
HVAC System Space Requirements / Plenum Zones Dimensions (Heights – coordinated with other disciplines)				
Describe rooms with special 24/7 cooling, such as elevator machine rooms, data rooms, etc.	35%			
Review and adjustment of LEED strategies	35%			
Statement of Probable Cost for plumbing, HVAC and controls	15%			
Preliminary equipment weights given to structure engineer	30%			
Electrical (See BMS and Energy Deliverables Below)				
Electrical Design Criteria and Assumptions including preliminary loads, average watts per SF, lighting levels to be attained, preliminary transformer, generator and system on emergency power, grounding system	100%			
Power Systems Narrative grounding, lightning protection, metering concepts, basic electrical work, underground or overhead feeders. Availability of electricity, availably of green power, local power redundancy and reliability of local power form the local utility, UPS if applicable, switchgear and transformer types proposed, potential for solar power, Primary distribution concepts	75%			
Lighting and Lighting Control Systems Narrative of lighting design concepts, light levels to be attained, control types, lamp types, temperature/color and life, lighting at food venues, general light level requirements, lighting design aesthetic concepts, fixture types, watts/SF, controls, daylighting control, maintenance	75%			

VII. PROJECT PROCESS

F. Project Milestone Review

Schematic Design - 30%

Submittal Requirements	%*	N/A	Y	N
One-Line Plans or Other Documentation (as appropriate)	100 SD			
General initial list of items to be controlled on the BMS system.				
Energy Report / Model				
Life Costing Methodology Description	25%			
Description of Major Energy Conservation Assumptions	25%			
• LEED/Energy Code/ and ASHRAE requirements				
• Building envelope assumptions				
• Air Barrier and insulation types				
• Below slab and foundation insulation assumptions				
• Thermal Bridging Issues, if any				
• Types of fenestration and percent of gross wall area				
• Type of air handling / distribution systems, reheat system, economizers, etc				
• Automatic BMS control features and Daylighting Control Systems, if any				
• Lighting and lighting control system integration/capabilities for energy savings				
• Operational considerations for energy savings				
Life Cycle Cost Analysis and Energy Conservation Measure Recommendations	50%			
(furnish an energy report consisting of calculations including any computer program analysis, and a written summary of the results clearly stating assumptions made, alternatives, fuel price escalation and impacts on other disciplines). With the architect, describe how the predicted results will be attained.				
• Total monthly and annual energy consumption (BTUs)				

Submittal Requirements	%*	N/A	Y	N
Space Requirements for Substations Transformers, Switchgear and Generators (sized and located on architectural plans). Locate service entrance and required entrance conduit protection	75%			
Demolition narrative of electrical systems to be removed	50%			
Telecom (TR) and Electrical Rooms (sized and located on architectural plans). Give approximate cooling loads of these rooms. Describe voltage(s) to be used for each anticipated system, number and whether feeders are overhead or underground. Specific description of items to be served by emergency power and describe any requirements for special areas	80%			
Review and adjustment of LEED strategies options and recommendations including on-site power generation and renewable energy	35%			
Description of Unusual System Requirements / Recommendations	50%			
Preliminary equipment weights given to structure engineer	30%			
Statement of Probable Cost for electrical design systems	30%			
Building Management System				
BMS Criteria and Recommendations Narrative	100% SD			
Address compatibility with existing BMS system if applicable				
• Energy consumption per month by energy type. Including maximum demand per month				
• Annual energy consumption (BTU/GSF/Year) per building system, i.e. lighting, power, HVAC, domestic hot water, equipment efficiency vs. first and live cycle costs, etc.				
• Alternative recommendations				
• Energy budget determination; energy saving strategies, first cost differential and cost benefits				
• Annual energy consumption per gross SF of building				
Statements of Probable Cost	**15%**			

** If differs from Milestone Level*

VII. PROJECT PROCESS

F. Project Milestone Review

Design Development - 60%

Submittal Requirements	%*	N/A	Y	N
Estimate of Probable Costs (verify inclusion of elements by cross-checking against outline specification table of contents for omissions and compare with budget) List components that are below or under the initial budget assumptions	15%			
List square footage of the project in conjunction with the architect	100%			
List a breakdown of site cost components, listing assumptions and risks	15%			
List recent comparable similar projects and adjust for location cost variations	100%			
Identify Escalation Factors to Mid-Point of Construction	100%			
Identify Contingency Allowance for both Design and Construction. List other assumptions	100%			
Estimate Construction Period (identify any phased work and any lead time for special items)	50%			
Determine and list what equipment and other items will be provided by the Owner and who will install these and reflect these issues in the cost statement	50%			
List assumptions for general conditions and special conditions, including contract overhead and profit, (A/E fees and land acquisition if appropriate), profit, insurance, bonds, permitting, and other soft costs	25%			
Identify Sole Source Providers (and justify their use)	15%			
Provide Life Cycle Cost Analysis of Proposed Roofing System if required	25%			
Area Tabulation – Gross to Net SF, other ratios as required	50%			
Provide cost information for alternates, if any, construction and costs/risks associated with them, recommending a construction contingency based on unknowns and project complexity.	15%			
Sustainable Design				

Submittal Requirements	%*	N/A	Y	N
Verify documentation of sustainable strategies:Coordinated review by building commissioning agent Verification of Sustainability Goals. Checklist showing progress toward goals. Verification of applicable ROIs/Studies as required by established sustainability goals prior to incorporating in 90% design.				
Sheet Index				
General				
Area Tabulation	100%			
Code Analysis	100%			
Zoning Analysis	100%			
Phasing and Sequencing Plans	90%			
Civil, Landscape				
Site Plans	90%			
Civil Plans	90%			
Civil Details / Sections	30%			
Soil Erosion and Sedimentation Control Plans	60%			
Landscaping Plans	90%			
Landscaping Details	20%			
Planting Schedule	100%			
Site Details	25%			

** If differs from Milestone Level*

VII. PROJECT PROCESS

F. Project Milestone Review

Design Development - 60%

Submittal Requirements	%*	N/A	Y	N
Site Survey, (with Disclaimer) and all use limitations	100%			
Site Geotechnical Information (with Disclaimer)	100%			
Utility Management Program				
Life Safety				
Code Analysis, Variances/Code Modification Requests, Occupant Loads, Const. Type, Exterior Exit Capacities, System Ratings, PA/VE, etc.	90%			
Architectural, Interior Design				
General Notes, Arch. Symbols and Legends, Partition Types, etc.	80%			
Demolition Plans Industrial Hygiene surveys (ACM, Lead-Based Paint (LBP), Mold, Universal, Hazardous, Special, and/or hard to handle wastes)	70%			
Existing to Remain Plans (LEED projects only)	70%			
Demolition Details	25%			
Architectural Floor Plans	90%			
Roof Plan	90%			
Reflected Ceiling Plans	90%			
Building Elevations	95%			
Building Sections	95%			
Wall Sections	80%			

Submittal Requirements	%*	N/A	Y	N
Large Scale Views	50%			
Exterior Details	25%			
Interior Details	25%			
Interior Elevations	80%			
Details/Door and Window Schedules	50%			
Door and Window Details	25%			
Finish Schedule, color boards	95%			
Equipment Schedules and Brochures				
Statement of Probable Cost				
Specifications / Project Manual	70%			
Incorporate Commissioning Requirements	70%			
Wayfinding, Signage, and Public Address Design				
Structural				
General Notes / Information / Design Loads	80%			
Foundation Plans				
Framing Plans				

** If differs from Milestone Level*

VII. PROJECT PROCESS

F. Project Milestone Review

Design Development - 60%

Submittal Requirements	%*	N/A	Y	N
Location and size of all openings				
Elevations of critical frames / members	80%			
Structural Sections/Details				
Schedules				
Specifications	80%			
Plumbing				
General Notes / Information	75%			
Site Utilities Plan (if not by Civil Engineer)				
Floor Plans – Plumbing	75%			
Flow Riser Diagram Piping Schematics	50%			
Piping Schematics	50%			
Special Systems	50%			
Schedules	75%			
Details	75%			
Specifications	75%			
Calculations	75%			
Incorporate Commissioning Requirements	50%			
Mechanical				

Submittal Requirements	%*	N/A	Y	N
General Notes / Information	75%			
Site Utilities Plan (if not by Civil Engineer)				
Floor Plans	75%			
Ceiling Plans	50%			
Enlarged Plans and Elevations	75%			
Control System	50%			
Riser Diagrams	50%			
Schedules	65%			
Details	75%			
Specifications	75%			
Calculations	65%			
Incorporate Commissioning Requirements	50%			
Hydronics				
Electrical				
General Notes / Information	75%			
Site Utilities Plan	75%			
Power Plans	65%			
Lighting Plans	65%			

** If differs from Milestone Level*

VII. PROJECT PROCESS

F. Project Milestone Review

Design Development - 60%

Submittal Requirements	%*	N/A	Y	N
Lighting Controls Schedule				
Special Systems Plans	50%			
Phone, data, fire alarm, smoke detection, security, CCTV, wireless, etc.				
Enlarged Plans and Elevations	65%			
One-line Diagrams	65%			
Schedules				
Details				
Specifications				
Calculations				
Incorporate Commissioning Requirements				
Telecommunications				
Diagrams / General Information				
Data Plan				
Telephone Plans				
Terminal Room Plan and Elevations				
Schedule / Details				
Security				
Diagrams / General Information				
Data Plan				
Audio Visual / Vertical Transportation / Food Service (TBD)				
List Those Deliverables As Contracted				

** If differs from Milestone Level*

Construction Documents - 90% / 100%

Submittal Requirements	%*	N/A	Y	N
Sustainable Design				
Verify Documentation Of Sustainable Strategies: Coordinated review by building commissioning agent.Verification of Sustainability Goals. Checklist showing progress toward goals.Verification of applicable ROIs/Studies as required by established sustainability goals prior to incorporating in 90% design.	90%			
Verify Compliance With Commissioning Plan				
Permit applications and supporting documents				
Sheet Index				
General				
Area Tabulation				
Code Analysis				
Zoning Analysis				
Phasing and Sequencing Plans				
Soil Erosion and Sedimentation Control Civil, Landscape				
Environmental Survey Reports (Industrial Hygiene, Soil Evaluations, etc)				
Site Plans				
Civil Plans				
Civil Details / Sections				
Landscaping Plans				
Landscaping Details				
Planting Schedule				
Site Details				
Site Survey, (with Disclaimer)				

VII. PROJECT PROCESS

F. Project Milestone Review

Construction Documents - 90% / 100%

Submittal Requirements	%*	N/A	Y	N
Site Geotechnical Information (with Disclaimer)				
Utility Management Program				
Life Safety				
Code Analysis, Variances/Code Modification Requests, Occupant Loads, Const. Type, Exterior Exit Capacities, System Ratings, PA/VE,etc.				
Architectural, Interior Design				
General Notes, Arch. Symbols and Legends, Partition Types, Etc.				
Demolition Plans				
Existing to Remain Plans (LEED projects only)				
Demolition Details				
Architectural Floor Plans				
Roof Plan				
Reflected Ceiling Plans				
Building Elevations				
Building Sections				
Wall Sections				
Large Scale Views				
Exterior Details				
Interior Details				

Submittal Requirements	%*	N/A	Y	N
Interior Elevations				
Details/Door and Window Schedules				
Door and Window Details				
Finish Schedule, Material Sample Boards				
Equipment Schedules and Brochures				
Statement of Probable Cost				
Specifications /Project Manual				
Incorporate Commissioning Requirements				
Structural				
General Notes / Information / Design Loads				
Foundation Plans				
Framing Plans				
Location and size of all openings				
Elevations of critical frames / members				
Structural Sections/Details				
Schedules				
Specifications				
Calculations				
Special Inspection Requirements	100%			

** If differs from Milestone Level*

VII. PROJECT PROCESS

F. Project Milestone Review

Construction Documents - 90% / 100%

Submittal Requirements	%*	N/A	Y	N
Plumbing				
General Notes / Information				
Site Utilities Plan (if not by Civil Engineer)				
Floor Plans – Plumbing				
Flow Riser Diagram Piping Schematics				
Piping Schematics				
Special Systems				
Schedules				
Details				
Specifications				
Calculations				
Incorporate Commissioning Requirements				
Mechanical				
General Notes / Information				
Site Utilities Plan				
Floor Plans				
Ceiling Plans				
Enlarged Plans and Elevations				
Control System				
Riser Diagrams				

Submittal Requirements	%*	N/A	Y	N
Schedules				
Details				
Specifications				
Calculations				
Incorporate Commissioning Requirements				
General Notes / Information				
Special Systems Plans				
Telecommunications				
Diagrams / General Information				
Data Plan				
Telephone Plans				
IDF/MDF Plan and Elevations				
Schedule / Details				
Security				
Diagrams / General Information				
Data Plan				
Telephone Plans				
Terminal Room Plan and Elevations				
Schedule / Details				

** If differs from Milestone Level*

VII. PROJECT PROCESS

F. Project Milestone Review

AUS Design Review Policy and Procedures

All new construction and modifications at AUS must comply with the AUS Design Standards Manual requirements.

The City of Austin passed Ordinance No. 20230914-101 on September 14, 2023 approving a Master Development Plan for AUS. The Ordinance applies to projects constructed directly by AUS, or by third parties. According to this Ordinance, all projects associated with the Airport Expansion and Development Program shall be prioritized and permitted without delay. The appropriate site plan mechanism shall be determined by the Development Services Department.

Changes in the Scope of Work

Changes in the work during construction through RFI, ASI, etc. must be carefully documented by the Designer and reviewed with the AUS Project Manager prior to proceeding with those changes. The AUS Project Manager will review the proposed changes and furnish comments to the Designer. Work related to the change of scope may not commence without AUS project Manager approval.

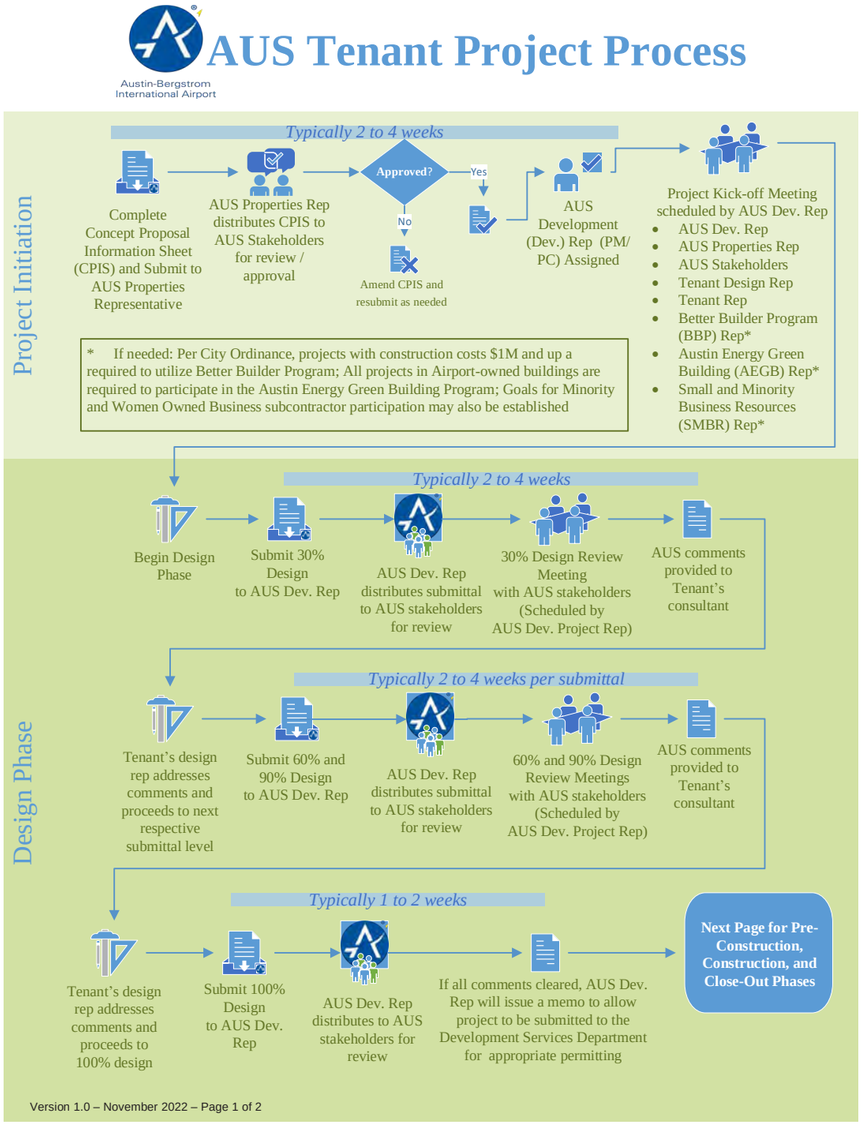
Changes include all modifications, additions, deletions, substitutions, or variations between the contract documents and the work. Changes incorporated into the Work must be accurately reflected in the job site drawings and in the record drawings.

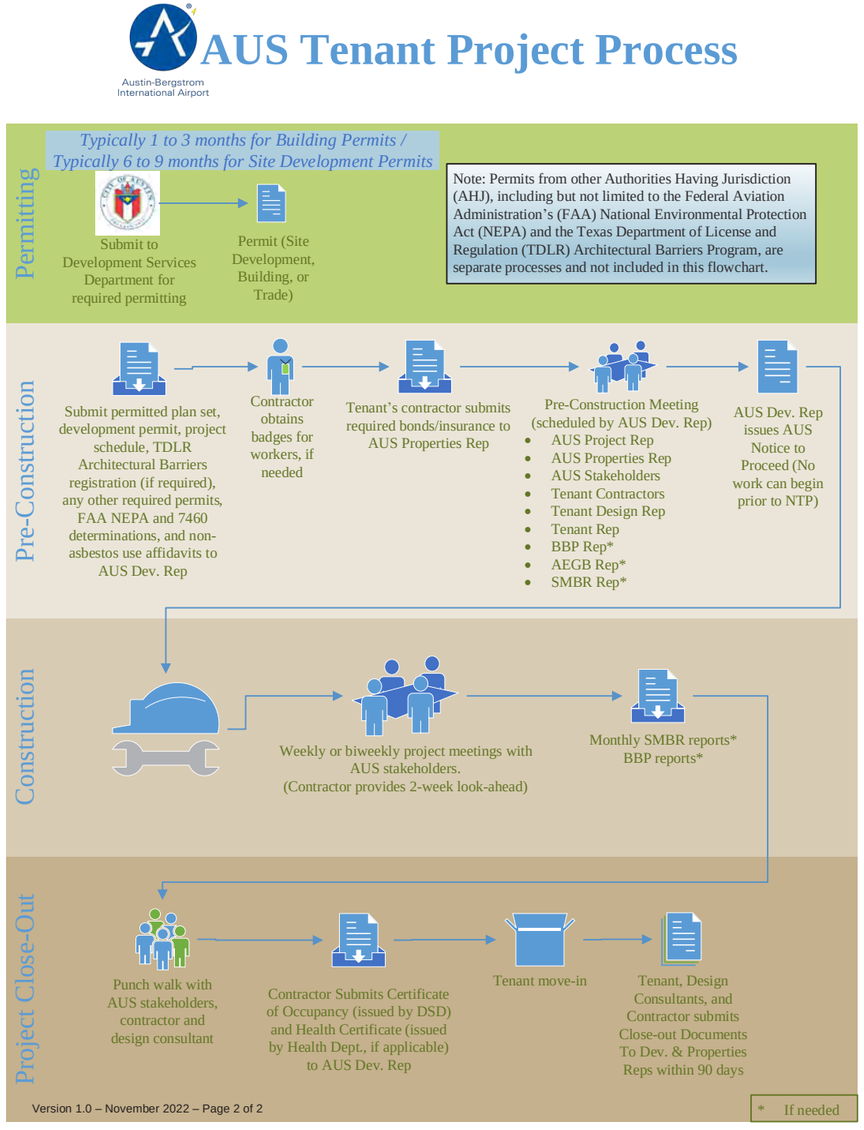
All changes must conform to the AUS Design Standards Manual requirements.

VII. PROJECT PROCESS

G. Concept Proposal Information

Prior to the start of any tenant construction project, a Concept Proposal Information Sheet (CPIS) must be completed and the concept must be approved by the AUS Project Manager. Construction may not begin prior to approval of the CPIS. The Concept Proposal Information Sheet is available from the AUS Project Manager. The diagrams below provide additional information regarding the tenant project process.





VII. PROJECT PROCESS

H. Permitting

Construction Permits

All requirements for City of Austin construction activities are applicable at AUS, including City of Austin site development permits, building permits, trade permits and environmental permits.

In addition to City of Austin guidelines, policies, and standards, all development is subject to the provisions of the City of Austin Land Development Code (LDC) and building codes including adopted amendments and related publications.

Designers, should apply to the Public Projects Review Process to consult with the City of Austin Development Services Department staff early in the design process in order to minimize potential difficulties during project work, design or construction.

https://www.austintexas.gov/page/public-project-review

The flow charts on the following pages outline this process.

Building Permit Submittals

The City of Austin Commercial Building Plan Review Division

https://www.austintexas.gov/page/commercial-plan-review

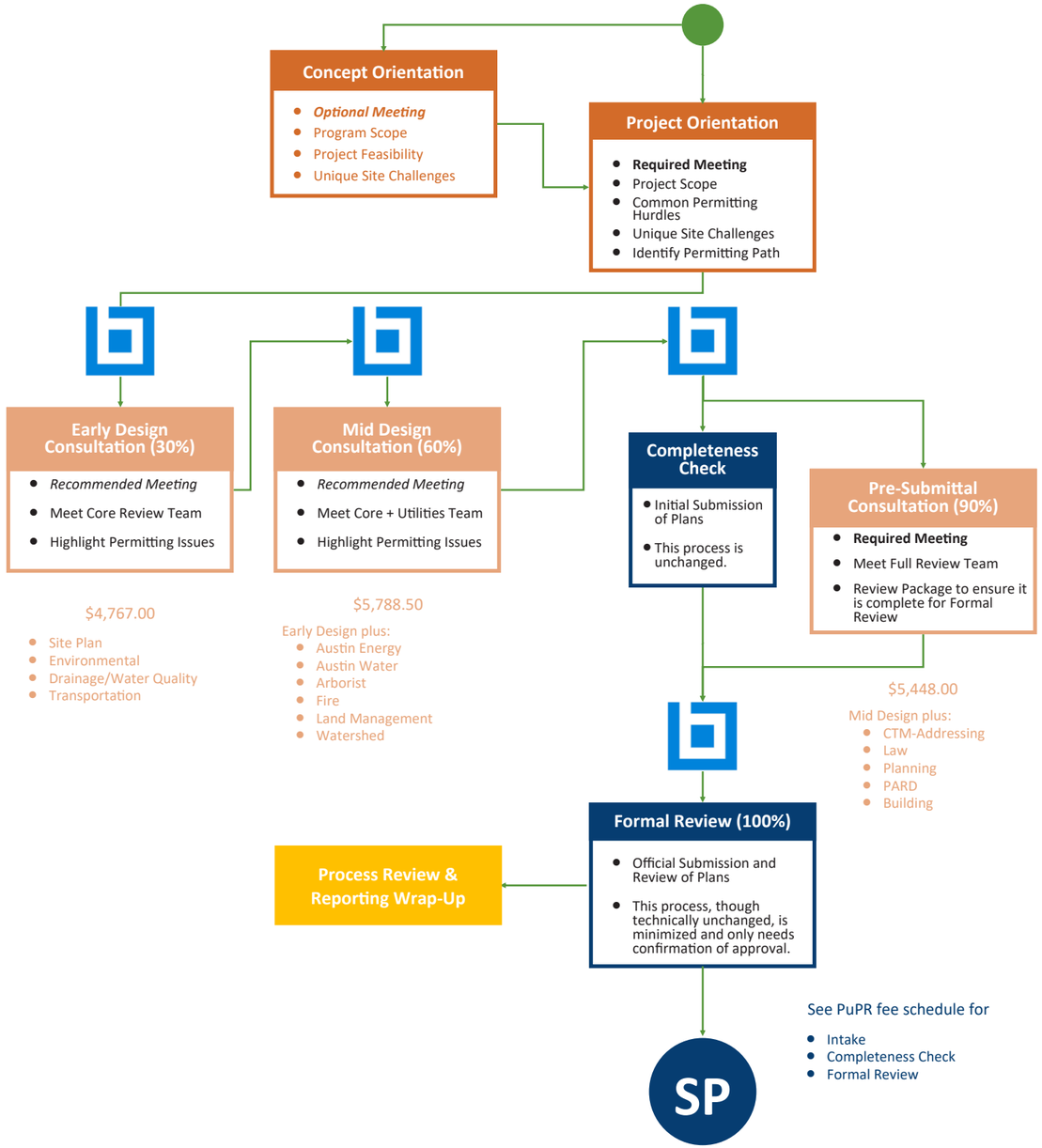
reviews and approves plans for new construction, remodels, revisions to approved permits, changes of use, and certificates of occupancy/compliance. Commercial construction projects are reviewed for compliance with the adopted International Building Code (IBC) and Building Technical Codes (Local Amendments).

VII. PROJECT PROCESS

H. Permitting

Consultation: Site Development

The overall process flow of this new program is intended to abbreviate the time required for the Formal Review process by facilitating collaborative communications between a project's Design Team and the Public Projects Review Team. The objective is to offer insights and observations from permit experts to benefit the design team's work as early as possible in the process. When this collaboration is performed well, challenges to "permittability" will be identified and mitigated without requiring re-work of a finalized design. Initially driven by a project's sponsor department, this process will allow the Public Projects Review Team to offer their expertise at various stages to help funnel a project from concept to construction as smoothly as possible.



VII. PROJECT PROCESS

H. Permitting

Consultation: Building Projects

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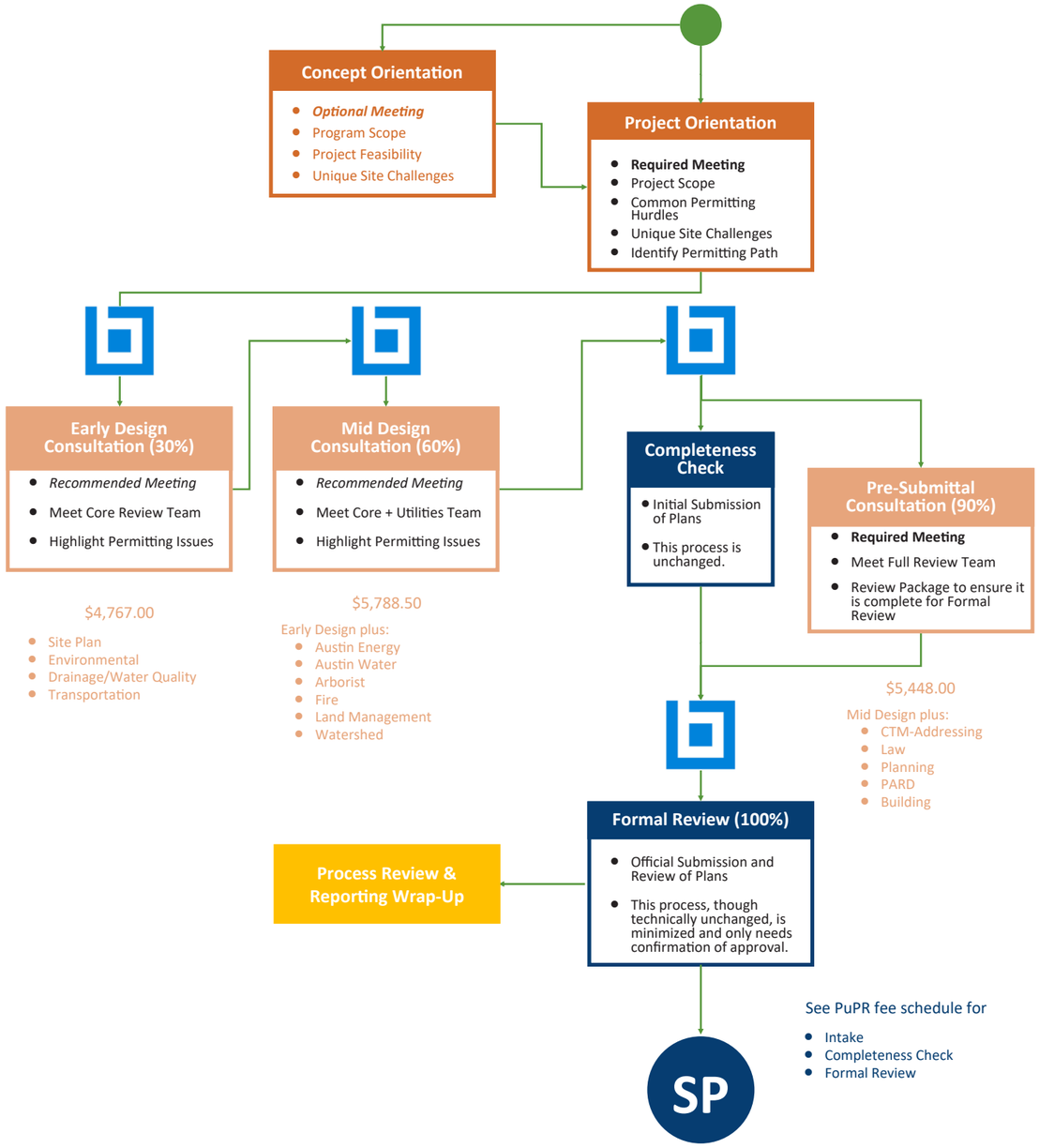


VII. PROJECT PROCESS

I. City Review and Approval Process

City of Austin Commercial Plan Review

The Commercial Building Plan Review Division reviews projects at AUS with the following services. Designers can review here:

https://www.austintexas.gov/page/commercial-plan-review

The City of Austin passed Ordinance No. 20230914-101 on September 14, 2023 approving a Master Development Plan for AUS. The Ordinance applies to projects constructed directly by AUS, or by third parties. According to this Ordinance, all projects associated with the Airport Expansion and Development Program shall be prioritized and permitted without delay. The appropriate site plan mechanism shall be determined by the Development Services Department.

Concept / Building Orientation Meeting

A Preliminary Plan Review allows the Designer or AUS Project Manager to meet with plan reviewers to discuss preliminary design or code issues to identify items that need to be addressed or modified before construction plans are submitted to the City for permit review.

Quick Turn-Around Review

Quick Turn-Around reviews and approvals apply to small commercial finish-outs, interior remodels, and minor structures and are generally reviewed within one business day.

7 Business Day Review

7 Business Day reviews and approvals allow small commercial remodels of certain occupancy types and small projects to be processed within a 7-business day period.

New Construction / Addition / Remodel

Projects that exceed the limitations of a Quick Turnaround or 7 Business Day Review will be reviewed based on the size and scope of the project per the Commercial Review Times which can be found here:

https://library.municode.comtx austin/codes/building_criteriamanual?nodeId=S15SIPLSUAPTAPLAP_15.7RET

Typically, the process of obtaining a building permit will follow this flow. Consult the Commercial Plan Review site:

https://www.austintexas.gov/page/commercial-plan-review for further information.

1 Concept / Building Orientation Meeting

If an owner and/or the owner's agents wish to meet with staff to discuss preliminary design and/or construction issues, request a Preliminary Plan Review Meeting (PPR) at any time before submitting a permit application to Commercial Plan Review. These meetings, conducted by the Expedited Building Plan Review team, are designated to assist the owner and/or design team in identifying items that need to be addressed or modified before construction plans are submitted to the City for permit review. The PPR does not guarantee approval of plans. The Preliminary Plan Review meeting is required for any general pre-application consultation that needs more than 20 minutes and/or requires two or more major code disciplines.

The Commercial Plan Review Preliminary Plan Review Meeting Request Form is available here:

Commercial Plan Review Preliminary Plan Review Meeting Request Form (PDF)

2 Prepare

Download a Commercial Building Application (PDF) and review submittal requirements to determine what documentation you will need to gather for your permit application. If your project is eligible for a Quick Turnaround (QT), 7-day Small Commercial Remodel review or QT Electric Vehicle Charger installation, include the appropriate QT/7-day qualifying checklists:

Quick Turnaround (QT) and 7-Day Permit Process (PDF)

Electric Vehicle Quick Turnaround (EVQT) SubmittalRequirements (PDF

3 Site Plan

A Site Plan, Site Plan Correction, or Site Plan Exemption is required in advance of submitting an application for a building permit. A Site Plan can be reviewed concurrently when the building permit application is accompanied by an approved Concurrent Review Request form:

Concurrent Reviews Request Form (PDF)

4 Apply

Please create an account at

AB+C.

Then submit your

Commercial Plan Review Application

with the Commercial Building Permit Web Form. Please include your AB+C account email address. Once your project is accepted for review, you will receive an invoice and link to upload all the required documents and drawings outlined within the Commercial Plan Review Application. The invoice can be paid on the AB+C portal. Once the invoice is paid, your project will be distributed for review, and your review time will start.

5 Plan Review

Review staff reviews plans in the order they are received and based on the mandated review times. Once a review is complete, you will receive an approval notification or a Master Comment Report via email from an Intake Coordinator, which must be addressed by the owner or owner's agent before permit application approval.

VII. PROJECT PROCESS

I. City Review and Approval Process

City of Austin Construction Permit

6 Corrections

Make corrections to the required documentation as outlined in the Master Comment Report. If you have questions about comments, reach out to the assigned reviewer for clarification, and they will respond to your email or call within one business day. If you need more than 20 minutes or need to meet with more than 1 review discipline, please schedule a Plan Review Consultation using the Plan Review Consultation Form:

Commercial Plan Review Consultation (PDF)

Once all corrections have been made, submit an update with the

Commercial Building Permit Web Form.

Once your update is accepted for review, you will receive an invoice (if applicable) and a link to upload the updated documents and drawings. Please note that when submitting an update, the full plan set must be submitted, not just the updated sheets. The invoice can be paid on the AB+C Portal. You may have to repeat this step if deficiencies remain.

7 Permit Issuance

Once the final reviewer approves your application, the plans go back to our Intake Coordinators, who finalize the process. This step can take one to two days. Once the required permits have been created, you will receive an email indicating that the permit(s) are pending activation. To activate permits, visit the

Service Center page.

8 Inspections

Once your permits have been activated, you may schedule a pre-construction meeting and then start construction and the inspection process. Visit the

Building Inspections webpage to learn more.

9 Revisions

We understand changes can arise in the field for various reasons. Or you may have deferred submittals for certain items as allowed by code. Submit revisions to the approved permit application using the same steps as above using the Plan Review Revision Form:

Commercial Plan Review Revision (PDF)

AUS / City of Austin Site Plan Ordinance

Site plans must depict the location of buildings, landscaping, parking lots, driveways, detention ponds, utility improvements, etc. and are reviewed for compliance with Austin's Land Development Code Chapter 25-5 Site Plan (LDC) and Ordinance 20230914-101. Review requirements include zoning, design standards, drainage and floodplain, water quality, transportation, environmental review, erosion control, and mitigation and/or protection of heritage trees.

Reviews are coordinated with other city departments including, but not limited to Austin Energy, Austin Water, Fire Department, Public Works, Watershed Protection, and Transportation.

Site Plans are approved administratively, except those with conditional uses and/or on a Hill Country Roadway, which are approved by the Land Use Commission. A Site Plan is required for any site work on a non-residential site or a change of zoning use unless it meets the requirements for a Site Plan Exemption.

Additional information can be found on the Site Plans, Exemptions, and Corrections website here:

https://www.austintexas.gov/siteplans

Environmental Guidelines and Regulations

The City of Austin Environmental Criteria Manual

https://library.municode.com/tx/austin/codes/environmental_criteria_manual

address the issues of water quality management, landscaping, preservation of trees and natural areas, and the underground storage of hazardous materials. The rules contained in this manual apply to tracts of land within the corporate limits of the City of Austin and its extraterritorial jurisdictional areas as defined in the Austin City Code. These rules are designed, intended and are to be administered in a manner to not contradict the provisions of the Austin City Code and to promote uniformity, clarity and stability in the application of development regulations.

In addition to City of Austin Environmental Criteria, projects are also expected to be subject to additional Federal and State environmental permitting requirements, with should be identified during design in accordance with the Permitting Services Flow Charts.

VII. PROJECT PROCESS

I. City Review and Approval Process

Asbestos / Hazardous Materials

Prior to any building demolition work, an environmental inspection must be completed to test the presence or absence of asbestos-containing material (ACM) prior to site demolition. Any project that disturbs, removes, encapsulates, or encloses any amount of asbestos within a public building for any purpose, including repair, renovation, dismantling, demolition, installation, or maintenance operations, or any other activity that may involve the disturbance, encapsulation, enclosure, or removal of any amount of asbestos-containing material (ACM), whether intentional or unintentional must adhere to Chapter 296 of the Texas Administrative Code:

https://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=4&ti=25&pt=1&ch=296

and must complete the Required Asbestos Compliance Notice Form

https://www.austintexas.gov/sites/default/files/files/Development_Services/COM_RequiredAsbestosComplianceNoticeForm.pdf

The environmental report, or "Hazardous Materials Inventory Report" must also identify any lead-based paint, mold, and hard to handle waste (hazardous, universal, special, etc).

Accessibility Standards

All projects at AUS must accommodate persons with disabilities, as outlined in the latest edition of the Texas Accessibility Standards (TAS) published by the Texas Department of Licensing and Regulation (TDLR). Additional information can be found here: https://www.tdlr.texas.gov/ab/abtas.htm

Agencies with Jurisdiction

Numerous agencies have stakeholders and hold jurisdiction at AUS. A subset of these agencies is listed below. The Designer is responsible to incorporate stakeholder agency requirements in the design documents.

Federal Aviation Administration (FAA)

Design and construction shall be in accordance with all applicable FAA design standards criteria, as set forth in FAA Advisory Circulars (ACs) and Federal Aviation Regulations (FARs). Add: Coordination with the FAA should be initiated early in design to support the development of 7460 Determination Requests for both temporary and permanent points, as well as to support development of the Construction Safety Phasing Plan.

The latest edition ACs may be obtained from the Federal Aviation Administration, U.S. Department of Transportation at:

www.faa.gov/regulations_policies/advisory_circulars

Transportation Security Administration (TSA)

TSA Spaces, including security checkpoints for passengers and secondary screening, electronic baggage screening, office and ancillary spaces, must comply with all TSA Guidelines. The Designer must coordinate with the TSA to determine proper layout of all TSA spaces.

Checkpoint Requirements and Planning Guide (CRPG):

https://sam.gov/opp/44099b735e494ef48cd27a9589c3c8ba/view

Electronic Baggage Screening Program:

https://www.tsa.gov/for-industry/electronic-baggage-screening

U.S. Customs and Border Protection (CBP)

The Department of Homeland Security - CBP is authorized to control the entrance and clearance of aircraft arriving in and departing from the United States and to inspect the crews, passengers, baggage, stores, and cargo carried thereon.

CBP enforces a large array of different laws for other agencies in protecting the borders of the United States. Any development of an international facility shall meet all U.S. Customs rules and regulations.

Public Health Agencies

The design and construction of projects that affect a food or beverage handling service at AUS will be reviewed by local, state, and federal regulatory health agencies as appropriate.

Federal Communications Commission (FCC)

All projects at AUS shall comply with any applicable FCC rules and regulations. All types of proposed wired and wireless communication systems shall be coordinated with the AUS Project Manager.

AUS Department of Aviation

The AUS Project Manager will facilitate coordination with additional Department of Aviation departments as required.

General Airport Development Considerations

The use of AUS property shall remain consistent with the aesthetic and functional standards of the Airport. These standards derive from the Airport Layout Plan (ALP) of AUS (latest version) and the Airport Master Plan (latest version). Federal, state, and local statutes and regulations also apply and may restrict development.

Professional Licensing Requirements

All Design Professionals signing and sealing drawings and project manuals (specifications) on behalf of the Developer shall be currently licensed for their respective disciplines in the State of Texas.

Leased Property Restrictions

Improvements to leased spaces within City owned facilities which are privately managed or operated must comply with the City of Austin's Green Building Policy described in Resolution No. 20210902-042, as amended. Construction of improvements of more than $1 million in project value in these spaces must comply with the standards and principles of the Better Builder® Program or a program with comparable worker protections for all construction workers performing work, as described in Resolution No. 20190619-091, as amended. The City's Better Builder Program includes OSHA training, Workers' Compensation insurance coverage, hiring goals, and independent on-site monitoring.

As requested by the Owner's Representative, the Design Professional may be required to submit documents which may indicate lease lines, building setback lines, building frontage lines, and/or surveys conducted by a Registered Professional Land Surveyor for a particular area. Landscape features, paving, and other pertinent features affecting development or operations will be included whenever possible.

All improvements shall be limited to within the boundaries of the leasehold, with the exception of the required utility extensions and access roadways. Any proposed improvements which significantly impact areas outside of the project sponsor's leasehold – especially those which may affect other leaseholders – must be approved the AUS's Tenant Management Division prior to commencement of the project design.

VII. PROJECT PROCESS

I. City Review and Approval Process

General Airport Development Considerations (Continued)

Public Access

The primary mission of the Airport is the efficient movement of passengers and their property to and from aircraft and flight operations. All facilities in which public activity occurs shall meet all requirements for public accessibility and safety.

Height Restrictions

Per FAR Part 77, structures and objects within designated areas are height-restricted to prevent interference with air navigation, flight and navigation surfaces, radar shadowing, and the requirement that air traffic controllers be able to see all aircraft operating pavement under the control of Air Traffic Control personnel.

The Design Professional shall submit FAA Form 7460-1, Notice of Proposed Construction or Alteration, to the Owner's Representative at least 60 calendar days prior to the scheduled start of construction activities. FAA approval of the 7460 is required prior to issuance of the NTP. The Designer will discuss with AUS on a project-by-project basis if initiating this FAA review at an earlier design stage, prior to the project being submitted for Bid, is recommended, as there may be stipulations for the submitted points in the FAA Determination Letter for which Contractors may need to be aware of in advance of construction (i.e. hours of operation, equipment height restrictions).

Any changes to or additions to above grade infrastructure developments must also be reviewed with the FAA for a permanent points analysis.

Noise

Local, state and federal regulations control the development and use of land at AUS and the latest AUS Master Plan has information relevant to proposed land developments at AUS.

The Developer shall fully coordinate noise impacts of any proposed changes at AUS with the Owner's Representative and all local, state, and federal authorities, including but not limited to the FAA and City of Austin.

Facilities within the Airport may be subjected to average noise exposure from airport operations in excess of 65 decibel Activities sensitive to excessive noise are discouraged within these areas, and structures accommodating noise-sensitive uses must be sound-insulated in accordance with applicable codes and/or standards.

The FAR Part 150 Noise Study (latest version) contains noise contours and a table indicating the compatibility of different activities and land uses with the different levels of noise exposure. It also prescribes the noise attenuation that should be achieved in each zone.

Security

All Developers shall be aware of the specific airport security requirements. TSA and federal security regulations require that access to the Air Operations Area (AOA) be strictly controlled, and the design and operation of all airport facilities shall not permit access to the AOA by unauthorized persons.

Improvements and operations within 10 feet of an AOA fence are severely limited. Written approval of the Owner's Representative is a prerequisite to improvements and/or operations in this area.

All persons performing work at the Airport shall be familiar with security measures and be aware that substantial fines may be assessed for violations of the security provisions of the Airport. Not only may the Director of Aviation assess citations, but also Airport police and TSA Security Staff have jurisdiction on Airport property.

Airport Security reserves the right to install, or to have installed, security devices including, but not limited to, security fencing, gate controls, video cameras, magnetic card readers and associated electronics and power sources within the project limits of any development on the Airport.

The AUS Security Plan is maintained by the Airport Security Manager, and questions about plan provisions may be submitted to AUS for review and response, as required.

Confined Spaces

Design Professionals shall identify permanent permitted or non-permitted confined spaces as defined in OSHA 29 CRF 1910 on construction drawings for use by the Airport.

VII. PROJECT PROCESS

J. Applicable Codes and Standards

Airport facilities are subject to all federal, state, local, and Airport requirements depending on the location and nature of the development. The Project Manager will advise the Design Professional of information required to be incorporated into the project documents.

Federal agencies, including the FAA, TSA, FCC, CBP, US Public Health Service, OSHA, EPA, and USDA,, all have specific requirements for design, construction, and operations at a certified airport.

Accessibility standards required by Texas Accessibility Standards (TAS) are enforced by the U.S. Department of Justice and the Texas Department of Licensing and Regulations (TDLR), respectively. Other State of Texas agencies which may have jurisdiction include the Texas Commission on Environmental Quality (TCEQ) and Texas Parks and Wildlife Department (TPWD).

All construction projects at AUS are subject to ordinances, codes, policies, standards, and design criteria required by the City of Austin and Travis County. Additionally, regulations of the Austin / Travis County Health Department:

https://www.austintexas.gov/department/health

https://www.traviscountytx.gov/health-human-services

may also apply.

Design and construction must comply with the latest adopted editions of the referenced codes, publications, and manuals, and standard specifications, including all revisions effective at the time the project is submitted for permitting, unless specifically indicated otherwise.

This Design Standards Manual is the primary guideline for development of all AUS facilities. The City of Austin, Travis County, State of Texas, and federal regulatory agencies' requirements will take precedence whenever they are more stringent and/or in conflict with this Manual.

The following list of regulatory agencies is not to be considered complete; the design professional is responsible for identifying and complying with all permitting and code requirements.

- National Fire Protection Association (NFPA)
- International Building Code
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- United States Green Building Council (USGBC)
- Austin Energy Green Building (AEGB)
- Building Owners and Managers Association (BOMA)
- Building Industry Consulting Services International (BICSI)
- Institute of Electrical and Electronic Engineers (IEEE)
- American National Standards Institute (ANSI) - TIA/EIA
- Underwriter's Laboratories (UL)
- FM Global
- American Society for Testing and Materials (ASTM)
- National Electric Manufacturers Association (NEMA)
- American Society of Mechanical Engineers (ASME)
- Texas Accessibility Standard (TAS)
- Federal Aviation Administration (FAA)
- American Association of State Highway Transportation Officials (AASHTO)
- Texas Department of Transportation Bridge Standards and Manual (Current)

VII. PROJECT PROCESS

K. Construction

Overview

The AUS Vision and Mission must be emphasized along with the passenger experience, comfort, and safety during construction.

Quality

Focus on quality should be a continuous process through the design and construction process. Construction quality requires the Contractor to preserve the passenger experience and provide the necessary attention to detail that minimizes accidents and other risks to construction personnel and stakeholders. At the request of the AUS Project Manager, contractors may be required to submit a Quality Control Plan review and approval.

AUS may provide supplementary jobsite observations and inspections to ensure that work is completed in compliance with the contract documents and in compliance with the requirements of this Design Standards Manual. The Contractor is responsible for providing reasonable jobsite access while maintaining jobsite safety.

Construction Coordination and Safety

The AUS Project Manager will serve as a single point of contact and will assist with coordination between the Contractor, the Designer, and all stakeholders.

Inspections

All construction and/or renovation projects are subject to inspection by AUS and/or City of Austin staff for compliance with the Drawings, Specifications, Contract Documents, and this Design Standards Manual.

Cleanliness

Contractors working at AUS must maintain a clean work area at all times with no exceptions. Contractors shall not cause dirt or debris to collect in areas outside of the work area, including footprints and other tracks, including sediment track-out from construction vehicles. Foreign Object Debris (FOD) must be controlled and not allowed to collect in any Aircraft Operating Area (AOA).

Confined Spaces

All spaces that meet the City requirements for confined spaces must have proper, City approved/required signage.

Temporary Construction Walls

To maintain airport operations, temporary construction walls should be used where permanent walls are not available to completely surround any construction area to reduce noise, dust, and disturbance to operations and the passengers.

Temporary construction walls should extent full height from floor to ceiling where possible. Where the existing ceiling height is too great for a full height wall, the temporary construction wall must be of sufficient height to shield passengers and occupants from construction activities. However, temporary construction walls must not be less that 10-feet high.

Construction walls should be shown on the construction drawings provided by the Designer and should complement the adjacent finishes. Temporary construction walls should also include wayfinding signage and graphics as requested by the AUS Project Manager. The AUS Project Manager will coordinate with AUS departments such as PIO and Properties to ensure proper temporary wall placement and graphics.

Doors on temporary construction walls must remain locked at all times and must allow AUS Project Manager access. If any door is observed unlocked by Airport personnel, the Contractor may be penalized at the discretion of the AUS Project Manager. This penalization may include project delays, including stopping of ongoing work, until a meeting is held to discuss the issues.

A Knox Box must be provided for access into all temporary construction spaces. Access and Knox Box location must be coordinated with the Fire Department.

Temporary construction walls must remain in place until final approval is issued by the AUS Project Manager.

Temporary Construction Fencing and Barricades

Where construction requires a secure exterior perimeter, temporary construction fencing may be used. All construction fencing must follow the ASP requirements stated in the Airport Security Fencing specification.

VII. PROJECT PROCESS

L. Commissioning

The Commissioning Process verifies the Contractors' installation of Mechanical, Electrical, Plumbing, Fire Protection, Building enclosure ACS or CCTV systems, and other building systems adheres to AUS requirements and the design intent. This is done through the execution of an approved Project Commissioning Plan (PCP) which is developed by the Commissioning Agent (CxA) with input from the Designer and the Contractor. The PCP must be submitted to the AUS Project Manager for review and approval prior to the 60% Design Submittal.

For projects with a large thermal and moisture protection scope, a building envelope consultant, building commissioning agent, and/or waterproofing consultant is required to peer review the Designer's details and monitor the construction of critical waterproofing installation and details. For these projects, Building Envelope Commissioning (BECx) is required.

The Project Commissioning Plan (PCP) is intended to establish a formal process for verification that the design and construction of new facilities or renovations meet local, state, and federal sustainability requirements, AUS project requirements, and compliance with contract documents. It defines project-specific requirements and responsibilities for the commissioning process and includes, but is not limited to, the following.

- Time and resources schedules
- Installation sequences
- Manufacturer's factory test certificates
- Equipment and material checklists
- Observations of functional and performance testing
- AHJ Documentation

Project quality control is the responsibility of the Contractor who must coordinate with the AUS Project Manager, the CxA, the Designer, and the City of Austin for quality assurance activities. The Contractor is responsible to assemble, organize, and submit content required by the PCP and to submit the required information and forms to the CxA for review and approval.

Commissioning activities are to be performed by the contractor or at the contractor's expense pursuant to Division 01 specification requirements and witnessed by the CxA or other representative approved by the AUS Project Manager. The Contractor must maintain current records of all documentation to be included in the Operation and Maintenance (O&M) Manuals to be submitted to the AUS Project Manager at project close-out.

M. Project Closeout

Certificate of Occupancy

A certificate of occupancy indicating completion of the work for which a permit was issued must be obtained prior to the occupancy of any project at AUS. The certificate shall be issued after completion of the final inspection and when the project complies with the City of Austin Development Services Department requirements. The building official will issue a certificate of occupancy provided the project meets all of the requirements for a certificate.

Upon request of the permit holder, a temporary certificate of occupancy may be issued before the completion of the work covered by a permit, provided that such portion or portions of a project may be occupied safely prior to full completion of the project without endangering life or public safety.

Record Documents

The contractor must maintain a set of marked-up digital copies of the Contract Documents and Shop Drawings. New and revised drawings as well as field revisions should be incorporated into these copies. The contractor will provide these marked-up documents to the AUS Project Manager at project close-out.

Based on the documents provided by the Contractor, the Designer will produce record documents to provide to the AUS Project Manager.

Owner Training

The contractor must provide Operations and Maintenance (O&M) documentation to the Owner at the conclusion of the project. Additionally, the contractor must provide training for all specialized systems installed in the project. This training must be recorded for future reference.

DESIGN PRINCIPLES

I. BACKGROUND

A. AUS Today

Owned and operated by the City of Austin, Austin-Bergstrom International Airport (AUS) is one of the fastest-growing airports in the United States. AUS is also an economic engine in Central Texas, supplying over 74,000 direct and indirect jobs in the Central Texas region.

The AUS main terminal, known as the Barbara Jordan Terminal, consists of airside and landside operations, including ticketing, security checkpoint, concourse, gates, international processing, and baggage claim. It has 34 gates, six of which can accommodate international arrivals. There are several food and retail concessions located in the terminal, most of which are located within the secure portion of the terminal.

The AUS secondary terminal is known as the South Terminal.

On-site parking consists of two parking garages and six surface parking lots, employee parking, TCN, and a cell phone lot for the Barbara Jordan Terminal and five surface parking lots for the South Terminal.

The rental car facility (ConRAC) is located in a parking garage attached to the Red Garage.

The Austin-Bergstrom Airport Expansion and Development Program

B. AUS Ongoing Projects

(AEDP) will modernize and improve AUS while serving as a catalyst for economic prosperity in Central Texas for business opportunities for professional services, construction, and concessions firms- large and small especially diverse and local companies.

Additional information regarding ongoing projects at AUS can be found here:

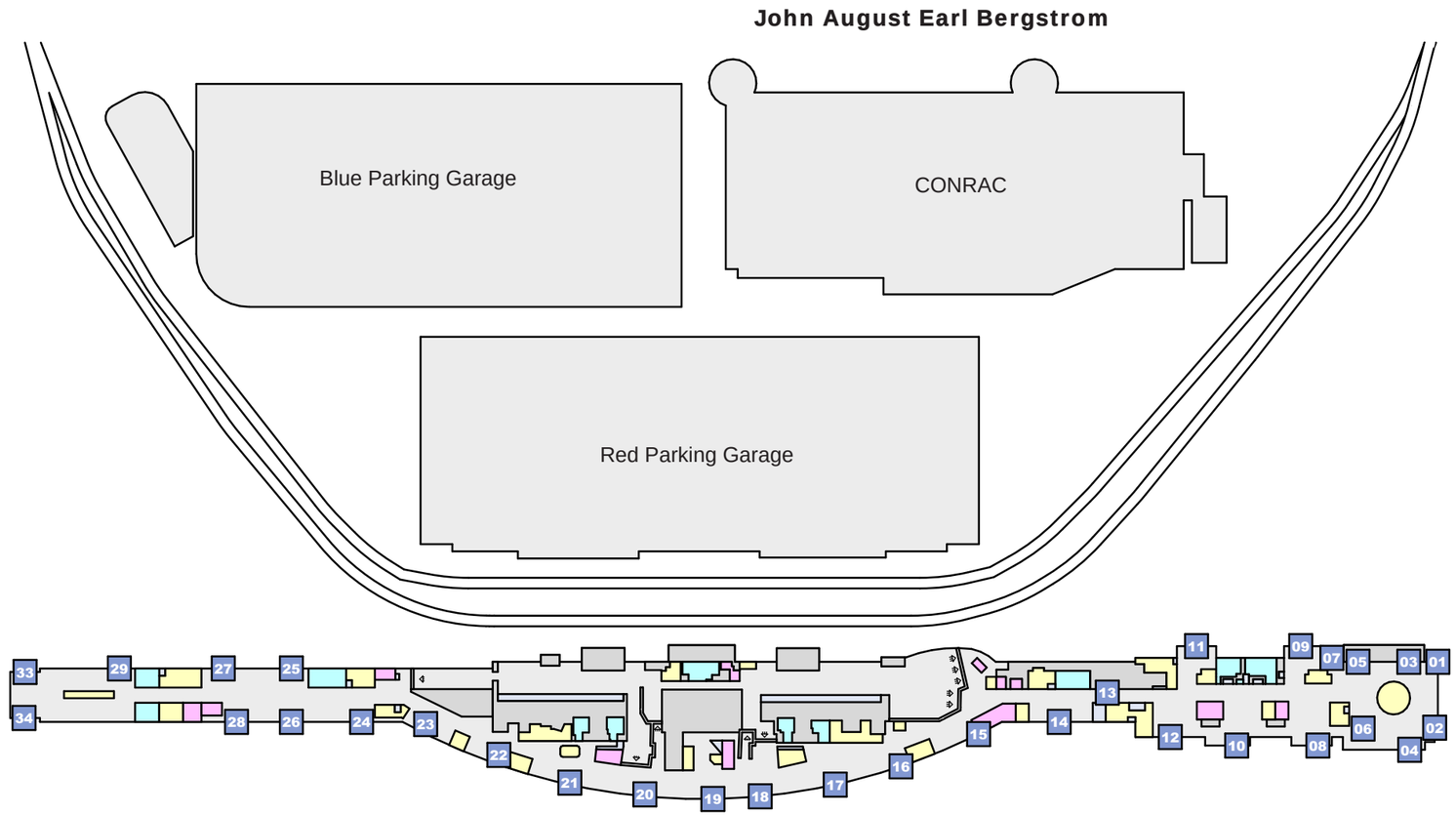
https://www.austintexas.gov/AEDP-Business

Additional information regarding JOURNEY WITH AUS can be found here:

https://www.austintexas.gov/AUSJourney

Information regarding ongoing projects not associated with the AEDP can be found here:

https://financeonline.austintexas.gov/afo/account_services/solicitation/solicitations.cfm



I. BACKGROUND

C. AUS History

On December 8, 1941, Captain John August Earl Bergstrom, 34, was serving as an administrative officer with the 19th Bombardment Group at Clark Field in the Philippines when he was killed. A graduate of Texas A&M University, Capt. Bergstrom was the first native Austinite to be killed in action during World War II. At the urging of his former employer, Austin National Bank, Lyndon B. Johnson, who at the time was a member of the U.S. House of Representatives from Texas's 10th District, prevailed upon the U.S. Army Air Force to rename a base recently opened in Austin after its fallen son.

On March 3, 1943, the Del Valle Airfield was officially renamed the Bergstrom Army Airfield. When the Air Force split from the Army to become its own military branch in 1948, the base was renamed Bergstrom Air Force base. It would have this name until it was decommissioned in the early 1990s, with all military aviation ceasing in 1995, after more than 50 years of faithful service.

AUS stands on the foundations of the base named after Captain Bergstrom. Opening in 1999, Austin-Bergstrom International Airport carries on the legacy of Bergstrom Air Force Base.

Bergstrom Air Force Base

Bergstrom Air Force Base, located in Southeast Austin, was home to the U.S. Air Force's aircraft reconnaissance fighter fleet. Following the end of the Cold War, the base was closed through the 1991 Base Realignment and Closure Commission. Leading up to its closure in 1993, City leaders were already eyeing it as a potential site for Austin's new and improved commercial airport. After receiving passing grades from the Federal Aviation Administration, and with the support of Austin residents and City Council, the City of Austin began to transform the military base into a commercial airport. Turning four thousand one hundred acres of land into public use.

John August Earl Bergstrom

Barbara Jordan

Barbara Jordan

Barbara Jordan (1936-1996) believed deeply in the Constitution and an America made up of diverse people bound by common beliefs. "E Pluribus Unum" — "in unity we are one," was one of her favorite sayings used frequently in her speeches.

As an elected official Barbara Jordan accomplished many firsts. She was the first African American to serve in the Texas Senate since Reconstruction (1966-72), and the first African American woman elected to the U.S. Congress from the South (1972-78), and the first woman to deliver the keynote address at a national party convention (Democratic Convention 1976, and again in 1992).

Her riveting Watergate testimony in 1974 inspired America's attention to the strength and foundation of the Constitution of the United States of America. Many Austinites remember her fondly as an educator at The University of Texas at Austin/LBJ School of Public Affairs (1979-96) and respectfully as Governor Ann Richards' counsel on ethics. Many also remember well the way she captivated listeners with her powerful voice, oratorical skills, and her ability to clarify complex moral issues of the day.

Throughout her life, Barbara Jordan instilled in Americans everywhere the hope for ethical leadership and racial equality and harmony.

Barbara Jordan Memorial Statue

The first life-sized statue of the late Barbara Jordan resides in the Austin-Bergstrom International Airport. Created by California artist Bruce Wolfe, the bronze sculpture depicts Jordan seated, in deep thought, with her fingertips pressed together; her glasses and a book placed in her lap.

The life-size sculpture is the first major, public piece in the country to honor Jordan and it is a landmark for all who visit the Barbara Jordan Terminal, named in her honor.

City of Austin Aviation Department officials unveiled the statue in November 2002.

I. BACKGROUND

C. AUS History

Austin's First Airport - Robert Mueller Municipal Airport

In the late 1920s, Austin City Council requested that the Army Corps at Kelly Field in San Antonio send a pilot over Austin to identify a suitable site for a municipal airport. Claire Chennault, who later became famous with the World War II "Flying Tigers," recommended Matthew's farm tract four miles NE of downtown Austin. This became Robert Mueller Municipal Airport, owned by the City of Austin and honoring a City Council Member who died while in service. Officially dedicated on October 14, 1930, the main terminal building was dedicated on May 27, 1961, then expanded in 1983. The east terminal was dedicated in April 1990.

Like many older airports, Mueller was on the outskirts of town in1930. Austin's population grew rapidly, becoming a high-tech hotspot and flights into the city increased substantially. Mueller sat landlocked on 711 acres in the middle of Austin, with urban growth on all sides.

Bergstrom Air Force Base becomes Austin-Bergstrom International Airport

Eight miles from the Capitol was Bergstrom Air Force Base, slated for closure in 1990 by order of Congress, still a fully operational military facility. When the Base Realignment and Closure Commission finally decided to decommission it, the land was returned to the City of Austin. In May 1999, Robert Mueller Municipal Airport was closed, and Austin-Bergstrom International Airport opened May 23, 1999. AUS was the first airport to be built under the Base Realignment and Closure Commission. What might have been an economic blow, not to mention the ongoing problem of caring for an abandoned military facility, had been averted. As Mayor Kirk Watson said at the time, "Austin turned lemons into lemonade."

City of Austin officials pledged that no tax dollars would be used to build Austin-Bergstrom International Airport. Even though the City of Austin owns the facility, the airport is not supported by the City's general fund. The people and businesses that use the airport pay the entire ongoing budget. Any revenue generated from the airport goes back into its operations, covering its operating expenses.

Runways Named for Distinguished Politicians

In 1999, the Austin City Council dedicated the West Runway (17R/35L) to the late President Lyndon Baines Johnson, a Texas native.

LBJ, a colorful character, frequently visited his Johnson City ranch by landing at Bergstrom. Before his visits, base personnel would paint all the dead grass green visible from the runway and Presidential Boulevard.

The East Runway (17L/35R) is dedicated to former Congressman J.J. "Jake" Pickle.

Throughout three decades in Washington, he never lost touch with the home folks, returning to Austin weekly, and during political campaigns - which he loved - two or three times a week. Because of the frequency with which Jake traveled, whichever airline he flew was dubbed "The Pickle Special".

II. AEDP GUIDING PRINCIPLES

A. Organizational + Project Design Principles

These principles represent the shared interests and objectives of AUS and the Signatory Airlines serving the Airport for development of the AEDP at AUS.

FINANCIAL STEWARDSHIP

Cost Efficient Development:

- Pursue cost efficient architectural design solutions that address operational deficiencies
- Develop and implement strategic phasing while maintaining critical revenue streams

Revenues:

- Preserve, maximize, and pursue opportunities for revenue generation in parking and concessions.

FUNCTION OVER FORM

Facility Design:

- Increase Airport domestic and international capacity
- Deliver design solutions based upon Central Texas demand assumptions and industry standards
- Design facilities for increasing airline operational efficiency while considering the impact to level of service standards for the traveling public

Protect Future Expansion:

- Develop necessary long-term resiliency in infrastructure and preserve future airport development right-of-ways
- Invest in improvements that result in efficient and effective long-term operations and maintenance
- Proactively pursue strategies to preserve rights for future airport expansion on adjacent and nearby properties

PARTNERSHIP

- Maintain an airline/ airport partnership, including processes for Facilities Programming and implementation of a new capital expansion and development program

OPERATIONAL EFFICIENCY & RESILIENCY

Maximize Utilization:

- Safe, secure, efficient, and reliable infrastructure and systems throughout the campus of the Airport
- Maintain appropriate level of shared use gates sufficient to accommodate future demand during the AEDP timeframe

Level of Service:

- Efficient and safe design of terminal and landside facilities, reasonably accessible for the users at all levels of ability
- Commit to operationally efficient design and facility components considering daily operational needs
- Prioritize repair and replacement of functionally deficient facilities and equipment for sustained, long-term viability of Airport operations

UNIQUE AUS EXPERIENCE

Vision:

- Develop a creative and economical approach to provide facility elements that are distinctive, and inherently recognizable as 'Austin' at key points in the passenger journey
- Provide convenient, equitable, comfortable, accessible airport facilities that provide a unique Austin and Central Texas experience

A SUSTAINABLE FUTURE

Approach:

- Maximize building performance, operational feasibility and flexibility of new facilities through new high efficiency systems and integration
- Maintain a strong focus on environmental compliance in development
- Incorporate resiliency into airport design

III. AUS EXPERIENTIAL STRATEGIC PLAN

A. Experiential Strategic Plan

The Experiential Strategic Plan seeks to define and create a versatile customer experience strategy to maintain a hospitable and authentically Austin experience for all travelers during periods of substantial growth and change at AUS. The recommendations within the Experiential Strategic Plan are based on passenger surveys and workshops with AUS staff and partners conducted between 2022 and 2023. The experiential recommendations are not intended to be design solutions for any single project. They are intended to capture experiential ideas that are a reflection of what a majority of AUS passengers, partners and staff desire out of their travel experience. The recommendations and visuals are intended to inspire passenger experience improvements on all future projects at AUS. The Experiential Strategic Plan is provided as an appendix to this Design Standards Manual. It strives to provide Designers with the tools necessary to provide an excellent passenger experience and meet the AUS Vision: GATEWAY TO THE WORLD FOR ALL - THE AUS WAY EVERY DAY.

The Foundation

Journey with AUS Vision

Meet the current and future needs of our growing region while staying true to our roots and elevating the passenger journey with an authentic Austin experience.

AUS Priorities

Journey with AUS Vision

Meet the current and future needs of our growing region while staying true to our roots and elevating the passenger journey with an authentic Austin experience.

Functional Ease & Efficiency

Provide equitable experiences for all abilities

Make efficiency a mandate in all process improvements

Design for sensory needs with a focus on safety and wellness

Revenue Generation & ROI

Generate revenue in a variety of ways to support continuous experiential improvements

Stay Authentically Austin

Stay authentically Austin (showcase independence, food, culture, music, old & new)

Continue to provide friendly service and personalized hospitality

Showcase local art / culture / design

Improve Sustainability & Resilience

Conserve resources and steward environmental prioritiesMake all future projects as adaptable and resilient as possible for an unknown future

Passenger Experience

Types of Travel

Departure ⟶

Arrival ⟵

Connecting ⟷

Passenger Types

Business

Leisure

Bleisure

Assisted

Family

TOP ENHANCEMENTS TO THE AUS TRAVELER JOURNEY

Areas of Improvement

Getting There

Landside Experience

Security

New Concourse B Connector

Airside Experience

Gate / Boarding

Arrivals

Transportation / Rideshare

Austin-Bergstrom International Airport

IV. LOOK AND FEEL

A. Campus-Wide Building Approach

Since its initial opening in 1999, Austin-Bergstrom International Airport (AUS) has quickly grown into a destination airport. In its capacity as one of the primary gateways into the vibrant, dynamic, and welcoming city of Austin, the airport reflects the character of the city and its people. Austin is a diverse community of people with widely varying interests, ideals, talents, backgrounds, and cultures.

Designers are encouraged to maintain the cohesive and intentional design plan for the airport campus, considering various aesthetic elements while maintaining a connection to the existing infrastructure through these key considerations:

1. Aesthetic Cohesion and Consistency: Maintain a consistent aesthetic throughout the campus to ensure visual harmony. Ensure new designs are in line with the existing architecture, creating a seamless flow between old and new elements.

2. Volume and Spatial Planning: Prioritize the strategic use of volume in areas that have the most significant impact on the overall experience of individuals and navigation through the airport facilities. Ensure a balance between varied volumes and considerate placement to enhance the passenger journey.

3. Material Selection: Utilize durable, locally sourced materials that reflect Austin and Central Texas place and culture.The application should withstand constant usage and maintenance and reflect a neutral base, allowing for subtle moments of visual interest along the journey.

4. Natural Light and Artificial Lighting: Maintain and expand the use of natural light while studying the balance with artificial lighting. Ensure that spaces are well-lit even on cloudy days or during evenings, creating a comfortable and inviting atmosphere. Explore advancements in glass technology for glazing. Glazing systems and artificial lighting systems should work together to provide maximum performance and facilitate passenger and airport functions.

5. Exposed Structure and Integrity: Emphasize the honesty and integrity of the structure through exposed elements where appropriate. Provide enclosure of structural elements as needed for aesthetic or functional purposes. Avoid darker tones on exposed surfaces and instead opt for reflective, lighter tones. Where needed, use minimalistic column wraps to preserve floor space and focus on durability for maintainability.

6. Financial Stewardship through Material Selection: Select materials that align with financial stewardship principles, considering both initial costs and long-term maintenance. Explore materials that serve multiple purposes. For instance, incorporating acoustic panels that double as artistic installations or seating with built-in charging points, blending functionality with aesthetics.

By integrating these considerations into the design process, a cohesive and meaningful campus design that respects the past, utilizes durable and locally relevant materials, and ensures a comfortable and visually appealing environment for all who interact with it is created.

Material Methodology | Essential Base Building

Designers are to use a balanced blend of muted and neutral tones as the primary building material methodology for the airport. Infuse the airport's ambiance with the warmth and friendliness characteristic to Austin.

1. Terrazzo Flooring: Incorporate a variety of warm and cool neutral tones in the terrazzo flooring. This could create a visually engaging yet neutral base for the airport's interior spaces.

2. Panel Cladding and Glazing Systems: Utilize muted and neutral tones in panel cladding and glazing systems to maintain a sense of cohesion throughout the airport's design. This can contribute to a modern and sleek aesthetic.

3. Metallic Accents: Introduce crisp modern moments with white and charcoal black elements to add contrast and visual interest. These accents can be applied strategically to highlight certain architectural features or create focal points.

4. Natural Stone: Infuse soft touches of natural limestone and granite into the design. These materials can add a sense of timelessness and depth to the overall aesthetic, complementing the neutral tones.

5. Natural Wood Tones: Incorporate natural wood tones in an enduring manner, ensuring they blend seamlessly with the overall design scheme. Wood can add warmth and a sense of comfort while maintaining a neutral palette.

By combining these materials and tones thoughtfully, the airport can achieve a sophisticated and inviting atmosphere that aligns with the city's character while also providing a modern and comfortable setting for travelers.

IV. LOOK AND FEEL

A. Campus-Wide Building Approach

Designers are to explore opportunities to introduce creative material selection to elevate the design of the airport, reflecting Austin's spirit while ensuring functionality and aesthetics. By pushing the boundaries of traditional material use and embracing innovative, locally inspired, and sustainable choices, the airport's design can truly resonate with the eclectic and vibrant spirit of Austin.

1. Subtle Moments: Infuse the airport with subtle, yet impactful, elements that capture the essence of Austin. These could be small details in design, artwork, or even landscaping that surprise and delight travelers, giving them a taste of the city's personality.

2. Creative Material Selection: Utilize materials in innovative ways that speak to Austin's identity. Terrazzo flooring, for instance, can be used not just for functionality but also as a canvas to express they city's character through unique patterns or designs. Consider using recycled materials or experimenting with custom designs that represent Austin.

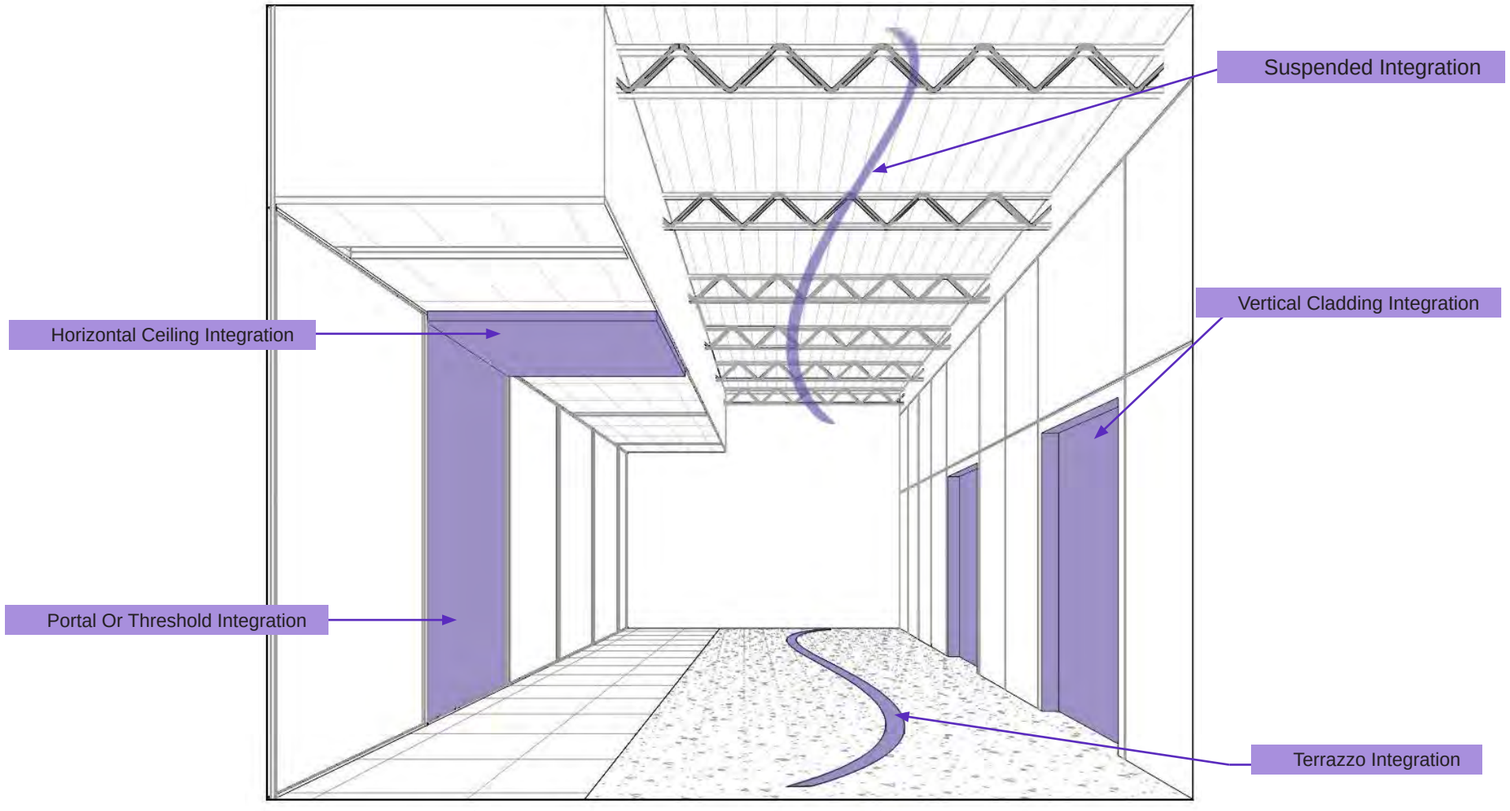
3. Expand Outdoor Spaces: Embrace Austin's appreciation for outdoor culture, expanding or integrating outdoor spaces within the airport can create a strong connection to the city's identity. These areas can provide relaxation spots, greenery, or even host events, aligning with Austin's vibe.

4. Cultural Representation: Collaborate with the City of Austin's public art program and other City of Austin Cultural divisions early in the design process to seamlessly integrate art and local culture into the airport's architecture. Art installations, sculptures, murals, and performance and presentation display areas can serve as focal points, reinforcing the sense of place and diversity within Austin.

5. Interactive Materials: Integrate materials that engage travelers. This could involve interactive surfaces, such as walls or displays using materials sensitive to touch, sound or light, providing an immerse and memorable experience.

6. Lighting and Technology Innovations: Experiment with materials that interact with light. This might involve translucent materials or surfaces that play with natural and artificial light, creating visually striking effects and enhancing the ambiance. Consider applications of technology using light and materials.

By focusing on these aspects, the airport can become more than just a transit hub - it can become an extension of Austin itself, offering a preview of the city's culture and atmosphere to travelers from around the world.



Diagrammatic example of building material integration to express sense of place along the passenger journey

Material Methodology Ratio Diagram

This material methodology should be top-of-mind when envisioning, designing, and constructing elements that serve to make up the terminal and other aspects of AUS. The airport is often the first and last impression of Austin for its visitors. Conveying the personality of Austin in the airport's facilities is essential.

The following sections outline look and feel mood boards aligning with AUS vision and representation of what makes AUS the Airport of Choice for Central Texas.

LOCAL AND AUTHENTIC

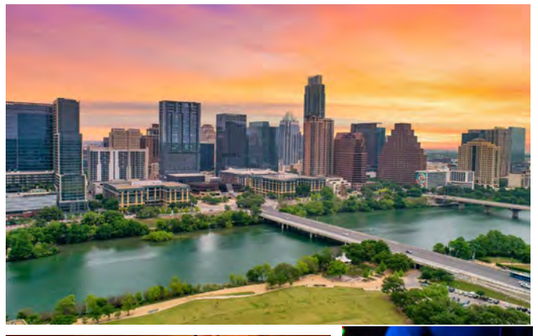
Embedded Creative | Iconic Texas | Local Flavor

"There's a freedom you begin to feel the closer you get to Austin, Texas

– Willie Nelson

In the dynamic cityscape of Austin, quintessential visuals emerge from a distinctive skyline, eclectic architecture, and lush green spaces that create a mosaic of cultural influences. The materiality approach is a harmonious blend of traditional and modern aesthetics, where bohemian enclaves and street art-adorned alleys provide a backdrop to a vibrant cultural experience unique to the Austin Vibe. Embedded within Austin is an expressive visual language, showcased through storytelling murals, diverse street performances, and symbolic motifs that weave cultural narratives into the city's very fabric.

The warm hospitable draw to the region emanates from an inclusive and welcoming ambiance, where unpretentious warmth and engaging cultural spaces bring locals and visitors together. Family-friendly cafes, with distinctive materiality, serve as casual meeting points, while the culinary scene, marked by gastronomic experimentation and culinary alchemy, adds to the city's open-minded and progressive atmosphere. This intersection of tradition and innovation creates an environment where the vibrant cultural experience becomes a shared love for creative expression, making Austin a living, breathing gallery of creativity.



LOCAL AND AUTHENTIC

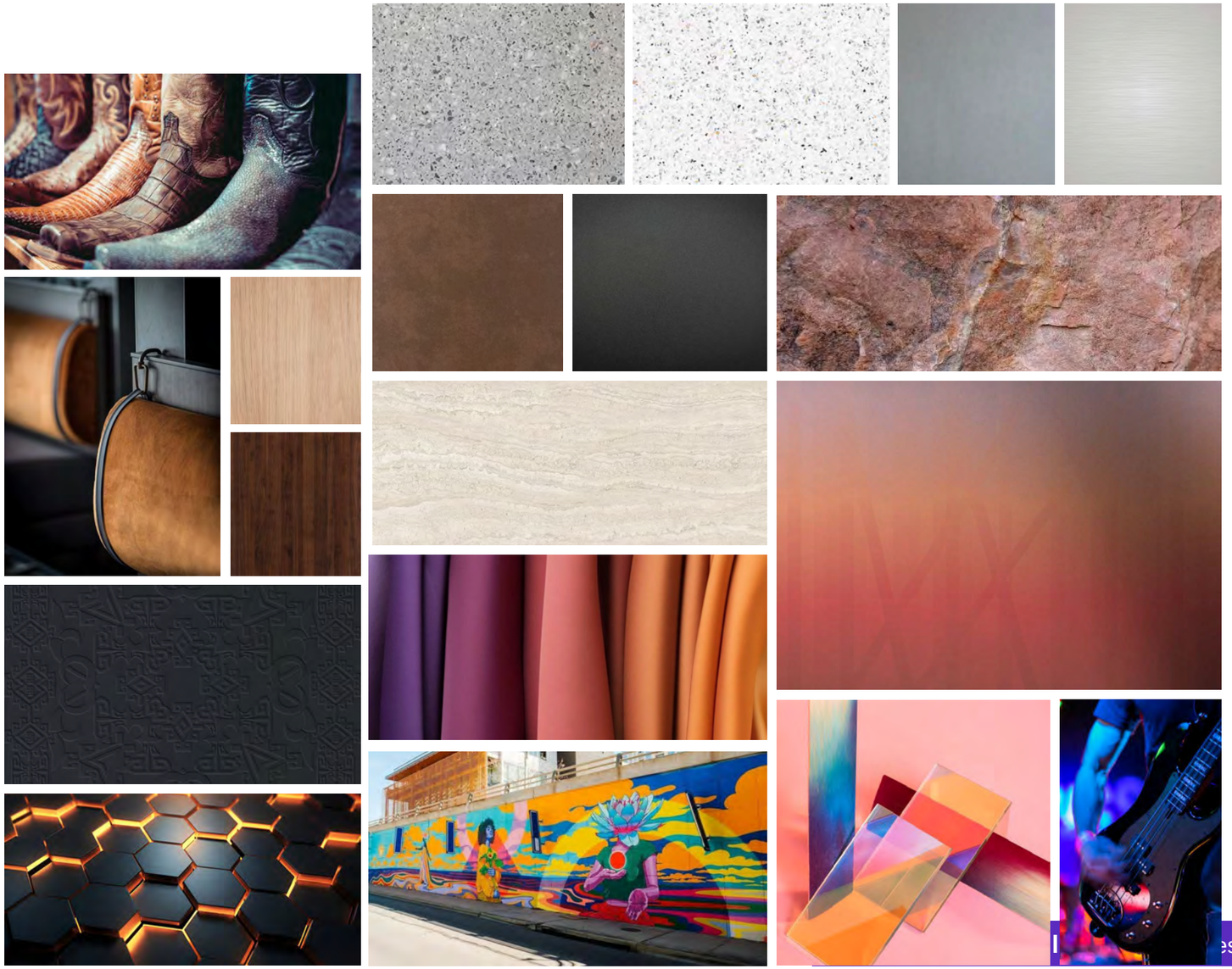
Embedded Creative | Iconic Texas | Local Flavor

“The unwritten motto of Austin has to be Keep Austin Weird. The landscape has changed, but I hope that doesn’t change. It’s a cool spot. Hopefully it stays that way.”

-Matthew McConaughey

In adopting the materiality aesthetic, this approach leans towards a neutral warm palette interspersed with moments of electric color. This involves incorporating warm wood and metal tones, regionally influenced stone, and expressive exposed structures, all of which serve as essential representations of Austin to establish a distinct sense of place.

Designers are prompted to delve into local iconography and texture, celebrating the harmonious collision of warm tones with a vibrant palette of saturated color and light that authentically captures the Austin vibe. This fusion not only pays homage to the city’s unique character but also creates a visual narrative that resonates with the cultural richness and ever-changing energy of the Austin experience.



LANDSCAPE TAPESTRY

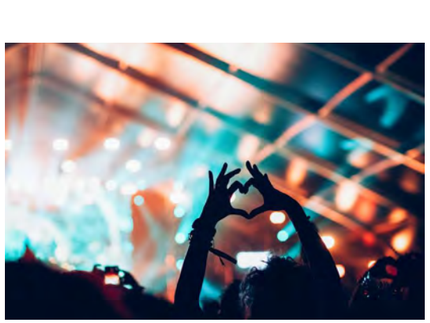
Colors of Texas | Sculpted Limestone | Enduring Oak

“When we tune in to an especially human way of viewing the landscape powerfully, it resonates with an audience.”

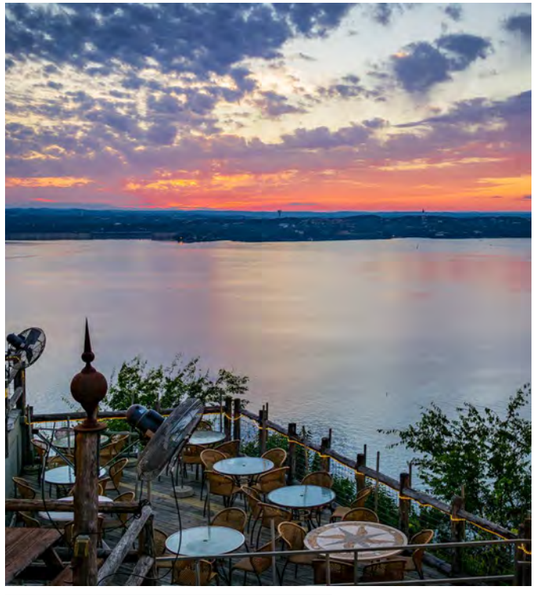
-Galen Rowell

The landscape of Austin and the Hill Country forms a unique tapestry, characterized by undulating hills, abundant lakes and rivers, and expansive flat lands saturated with clay soil. This materiality vernacular draws inspiration from the contrasting ecological regions present in the area, creating a visual language that mirrors the diversity of the terrain.

In the Austin region, there exists a profound human inclination to connect with nature, and the locale provides endless opportunities to immerse oneself in the natural surroundings. Whether reveling in a festival beneath the expansive Texas sky or savoring a casual meal on one of Austin’s many patios, bathed in the dappled light of a live oak tree, the natural environment consistently serves as a captivating backdrop to every Austin experience. The symbiotic relationship between the vibrant cultural scene and the picturesque landscape encapsulates the essence of Austin’s allure.






LANDSCAPE TAPESTRY

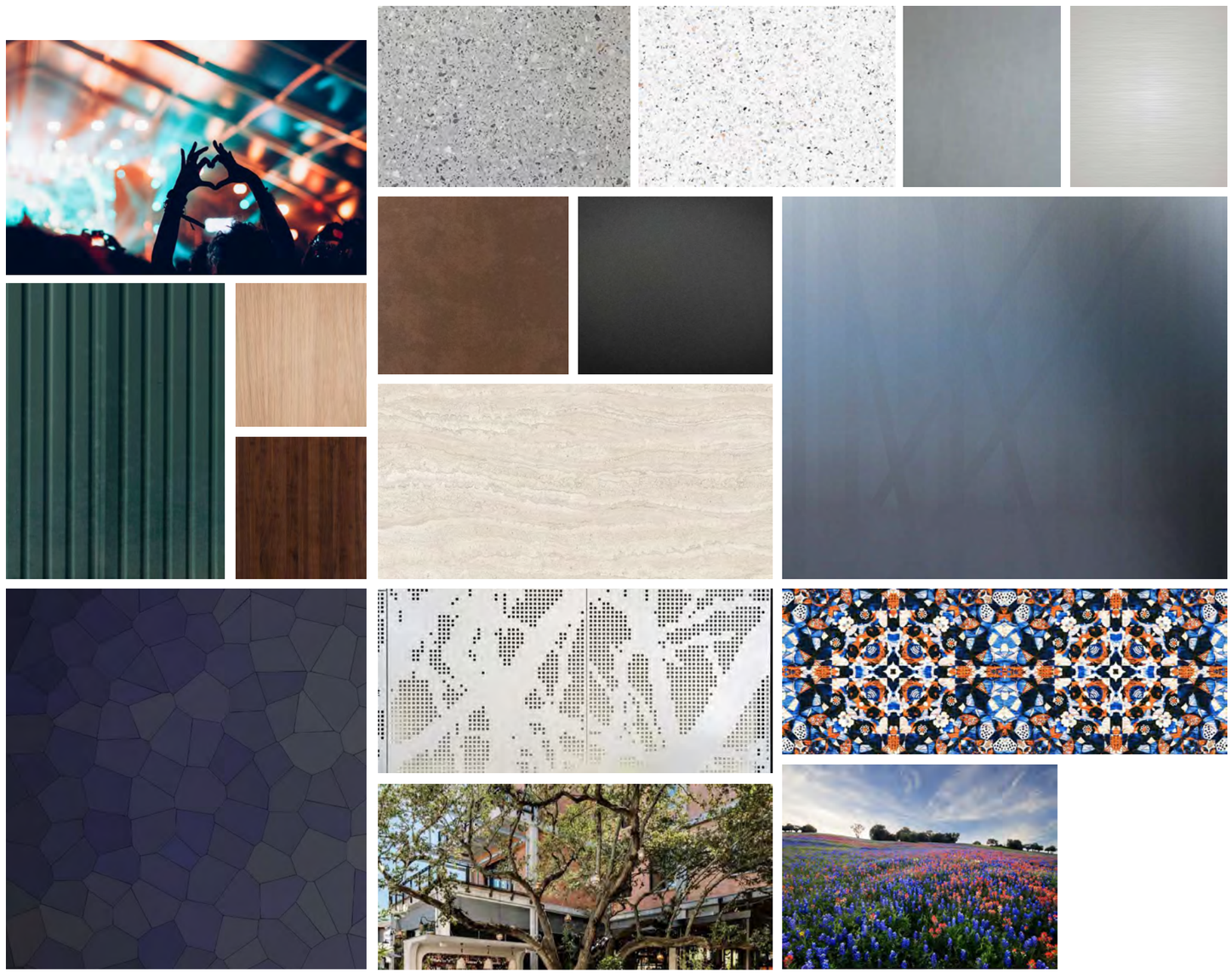
Colors of Texas | Sculpted Limestone | Enduring Oak

“Nature always wears the colors
of the spirit.”

-Ralph Waldo Emerson

This materiality aesthetic embraces a biophilic-inspired palette, seamlessly blending crisp cool pools of blue and gray with sandy soil tones. Key elements include expanses of glass to maximize natural daylight, neutral wood and metal tones, as well as natural-influenced tumbled stone and simplistic exposed structures, all of which serve as essential representations of the scenic beauty found in Austin.

Designers are not only urged to explore the Colors of Texas unique to the area - such as iconic bluebonnets, agave, sage, and wisteria - but are also encouraged to strategically incorporate these hues in impactful locations, especially during passenger orientation moments. Materials should reflect the ecological variety unique to the region, offering a balanced interpretation that captures the essence of the desert, tropical, and wetland climates respectively. This approach not only pays homage to the distinctive natural elements of Austin but also creates a design language that resonates with the rich ecological tapestry of the area.



HISTORIC MEETS FUTURE

Pioneering Spirit | Integrated Innovation | Digital Cowboy

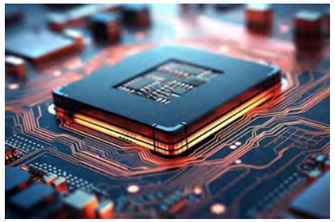
“If you don’t like the road you’re walking, start paving another one.”

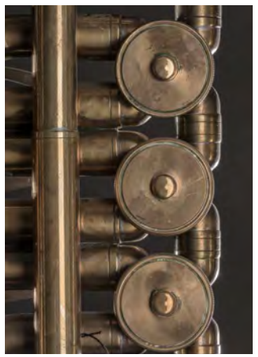
-Dolly Parton

The forward-thinking spirit ingrained in Austin natives has historically charted the course for a flourishing commerce, magnetizing innovative industries and continuously expanding the footprint of tourism in the region. This materiality language is conceived from a deep appreciation of the historic textures that define this remarkable capital city, converging with the aspirations of digital pioneers shaping the future.

The people of the Austin region epitomize a collective of welcoming, curious innovators and fearless explorers of the unknown. Whether embodied by celebrated craftsmen, experimental designers, or ambitious tech giants, the narrative seamlessly blends the stories of old and new, elegantly curated within the built environment of the Austin area. This synthesis of history and future-oriented ambition not only defines the city’s character but also underscores its capacity to embrace and evolve with the ever-changing tides of innovation.









HISTORIC MEETS FUTURE

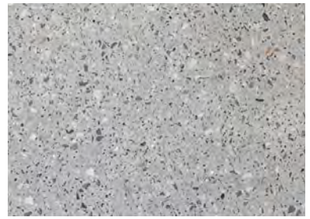
Pioneering Spirit | Integrated Innovation | Digital Cowboy

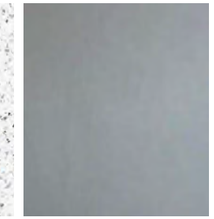
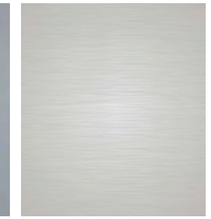
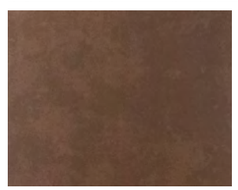
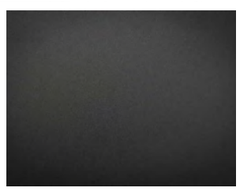
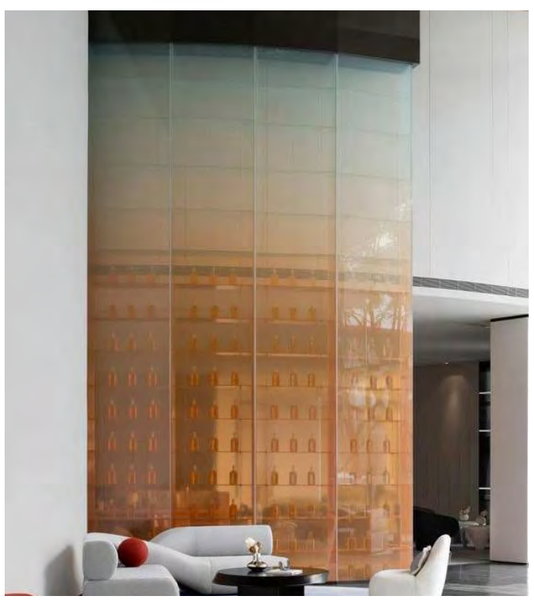
“The future belongs to those who believe in the beauty of their dreams.”

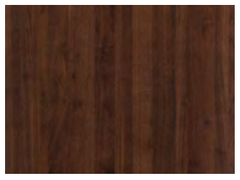
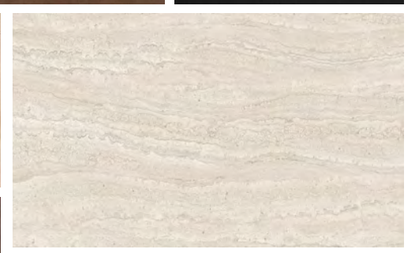
-Eleanor Roosevelt

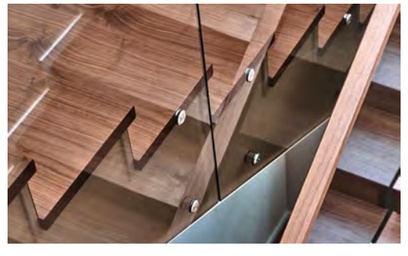
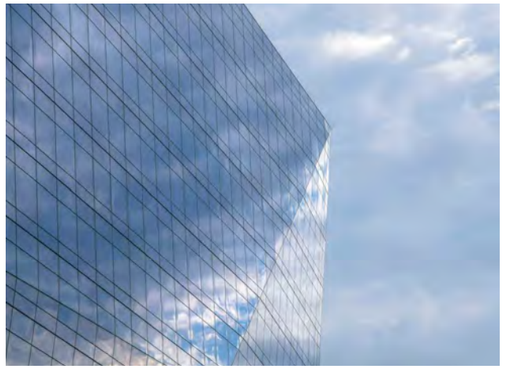
This materiality aesthetic adopts a timeless blend of warm and cool tones, creating a balanced interpretation where tonal blues and grays meet moments of warmth and richness.The palette is carefully curated, with expanses of glass strategically intersecting with historic industrial steel and stone. This approach acknowledges the soft tones of well-worn leather harmonizing with contemporary, high-performance metals, capturing the symmetry between two seemingly contrasting ideas.

Designers are not only urged but challenged to deconstruct the iconography of Historic Austin and Future Austin, seeking symmetry between these two competing yet complementary concepts. This involves discerning elements such as the substantial stone of the Capitol building, the airy glass facades of downtown structures, the formed ironwork representative of the industrial industry, and seamlessly integrated technology. The materials chosen should provide an equitable and fresh interpretation, serving as a visual bridge between the historic essence of Austin and the innovative aspirations of its future.

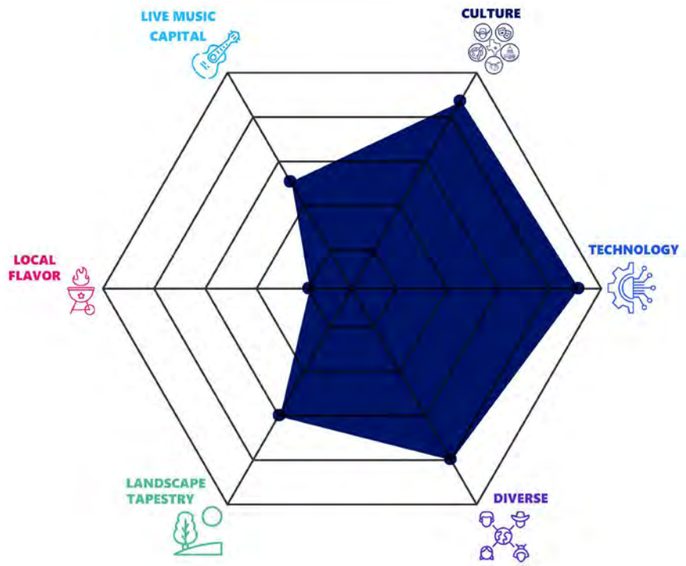







V. PASSENGER JOURNEY

A. Intersection of Sense of Place Along the Journey



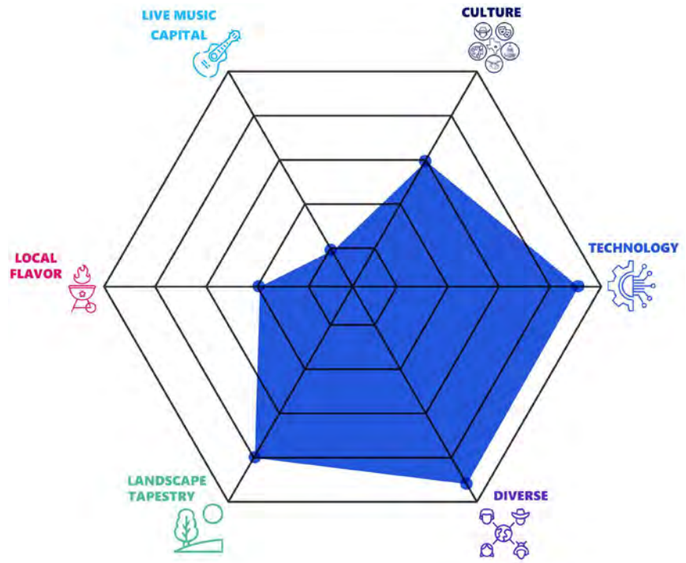
ARRIVALS AND DEPARTURES HALL

The departure hall should encapsulate the essence of Austin's cultural diversity while integrating advanced technology and reducing stress during the passenger journey.

Designers are encouraged to incorporate local artistic elements, colors, and materials that reflect Austin's cultural diversity. Art installations, murals, or digital displays should showcase the city's vibrancy. Integrate subtle nods to Austin's heritage, perhaps through architectural features or interactive displays that celebrate its musical roots and innovation in the high-tech industry. This could include information about local startups or tech breakthroughs. Incorporate smart technologies for efficient check-ins and baggage handling, showcasing the city's futuristic mindset.

Implement clear, multilingual signage with intuitive symbols for easy navigation, promoting a universally inclusive environment. Ensure the live music from the concessions area is audible enough to create ambiance within the arrivals hall without interfering with the check-in process. Consider directional speakers to control sound projection. Focus on maintaining a clean and fresh environment by minimizing the smells of the local flavor emanating from the concessions space.

Balancing these elements will require a cohesive design approach that considers both the practical aspects of airport operations and the experiential needs of diverse passengers.



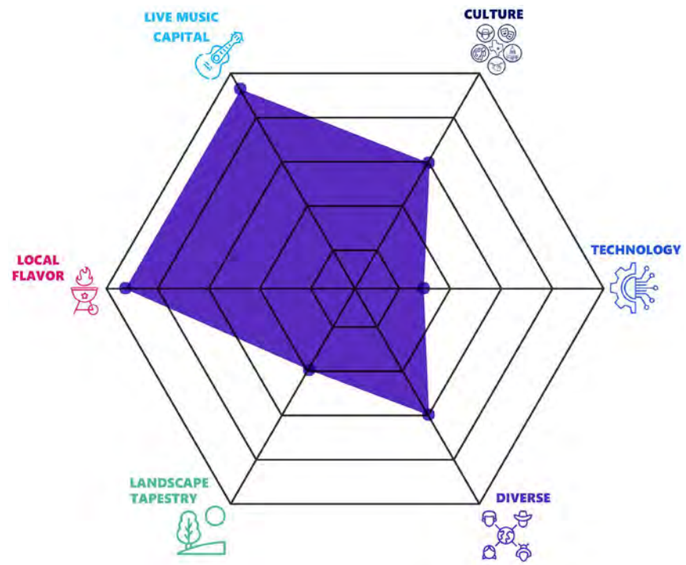
SECURITY CHECK POINT

At the height of a departing passenger's stress level, the security check point design should address a diverse passenger population while incorporating advanced technology and consideration for creating a calm atmosphere along the journey.

Designers should explore the use of elements influenced by the landscape tapestry of Austin and the adjacent Hill Country to create a serene atmosphere, perhaps through design features or greenery opportunities. Cool and neutral tones provide a clean backdrop to the security process. Leverage natural daylight or subdued lighting to maintain a clear and calm environment. Integrate advanced security screening technology to highlight Austin's position in the high-tech industry.

Install sound absorbing materials and manage noise levels to create a calming atmoshpere. Use ambient or gentle music to reduce stress without overwhelming passengers. Keep adjacent live music experiences subdued to maintain focus during the security screening process. Design a post-security recomposure area that gradually introduces sensory experiences like visuals tied to local flora and scents of culinary delights, leading passengers into the concessions and ameinities mall.

Creating a harmonious balance between security protocols, passenger experience, and commercial opportunities will be key.



CONCESSIONS + AMENITIES MALL

Create a warm and inviting ambiance at the concessions and amenities mall which embodies Austin's live music culture, culinary diversity, and authentic local experiences.

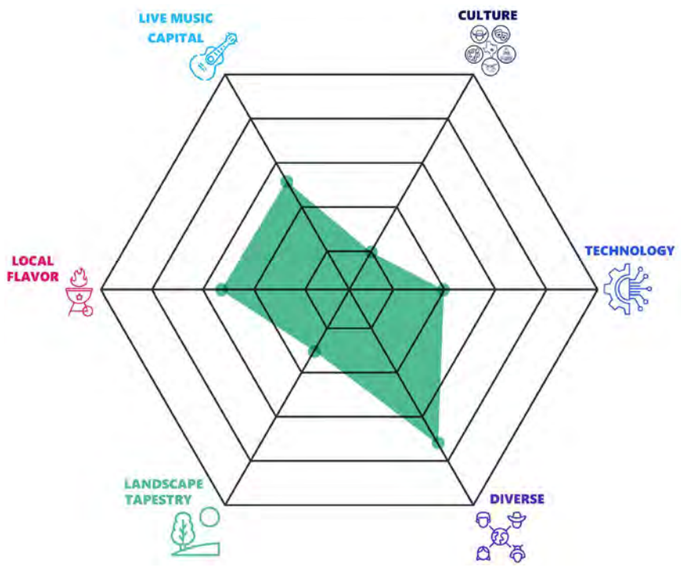
Designers are to craft an area offering an immersive experience, perhaps with interactive displays, art installations, or themed zones that highlight Austin's culture. Use warm lighting, comfortable seating and inviting layouts to make passengers feel welcomed and encouraged to linger and explore. Materials should feel authentic to the region, textures and design elements fostering a sense of approachable warmth. Incorporate elements inspired by Austin's landmarks, street art, or iconic spots into the design to evoke a genuine sense of place. Collaborate with local businesses and artisans to offer a mix of high-quality local influenced crafted spaces which embody Austin's spirit

Designate areas for live music performances, and craft these spaces to showcase local talents and the energetic atmosphere reflective of the Live Music Capital

A successful concessions and amenities mall will not only serve as a revenue-generating space but also as a destination within the airport that allows passengers to immerse themselves in the essence of Austin, prolonging their stay amongst the city's vibrant culture.

V. PASSENGER JOURNEY

A. Intersection of Sense of Place Along the Journey



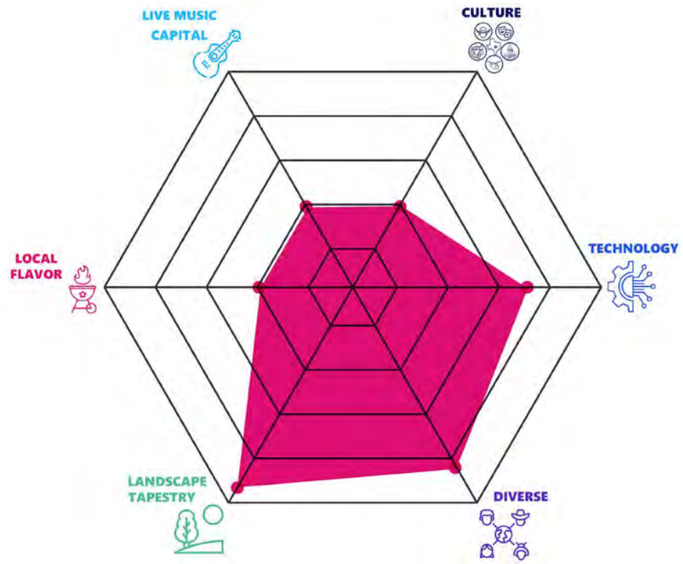
CONCOURSE CIRCULATION

Crafting an efficient concourse circulation path involves balancing navigation, passenger comfort, and infusing a sense of place.

Designers are to focus on creating a circulation path clear of excessive visual elements, directing attention to concessions areas where possible, and infusing unique moments of Austin along the concourse. Use neutral toned materials as a background to ensure signage and wayfinding elements stand out. While the primary materiality should be a balanced neutral palette, designers are to explore moments of saturated color at key passenger orientation moments.

Optimize the concourse design to maximize natural light along the circulation path, creating a pleasant atmosphere and aiding in passenger orientation. Ensure sufficient artificial lighting is provided for consistent visibility along the concourse in areas with limited natural light or during night hours. Blend functionality with Austin-inspired aesthetics in wayfinding elements integrated into the architecture, landmark art, or signage, creating a visually appealing and informative journey.

By carefully orchestrating elements of design, wayfinding, and sensory experiences, the concourse can seamlessly guide passengers while offering glimpses of Austin's cultural richness, encouraging exploration of concessions, and providing a memorable airport experience.



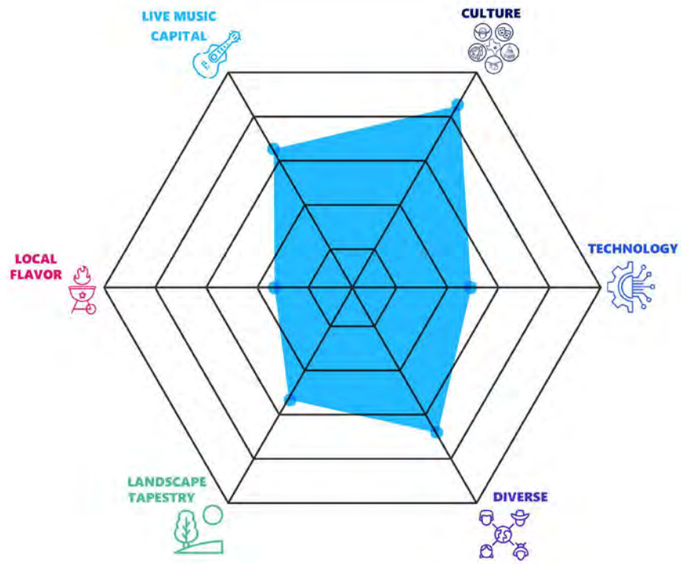
HOLDROOM

Creating a serene holdroom reflective of Austin and Central Texas tranquil outdoor spaces address opportunities for a diverse passenger typology and desired experience.

Designers should consider the use of materials and textures inspired by Austin's landscape-waterfront, live oak trees, and serene textures-to create a calming atmosphere. Design the space to evoke the dappled light of live oak trees, offering a cozy and tranquil environment in contrast to the energetic concourse and concessions spaces. Minimize noise and create a peaceful ambiance. Utilize appropriately scaled volumes and sound-absorbing materials to manage noise levels. Ensure concessions are visible, inviting passengers to dwell within the revenue generating offerings without disrupting the peaceful environment the holdroom lounge can offer.

Maximize natural daylight and visibility to the airfield, providing a soothing environment and preparing passengers for their departing experience. Integrate cutting edge technology into gate areas through seamless digital information screens and advanced boarding technologies reflective of Austin's technological prowess.

By carefully balancing natural aesthetics, tranquility, technological integration, and functional design, the holdroom can provide a serene respite for passengers while subtly reflecting the adventurous and casual essence of Austin



BAGGAGE CLAIM + MEETER GREETER

Establish an inspiring and efficient baggage claim and meeter greeter area which involves celebrating Austin's diversity, history and future aspirations while optimizing passenger flow and comfort.

Designers are to streamline the layout for efficient passenger flow from baggage claim to the meeter greeter zone while engaging passengers senses and crafting a uniquely Austin ambiance. Use textures and materials that blend historic elements reflective of Austin's rich history with modern elements to signify the city's evolution. Install landmark art pieces or interactive displays creating a sense of anticipation for arriving passengers about their upcoming journey through the region or a welcoming symbol to locals.

Incorporate ambient sounds and visual elements representative of Austin's diverse music and cultural scene, creating a welcoming and exciting atmosphere. Subtle cues of local iconography should be stitched throughout the design and architecture.

By harmonizing elements of cultural representation, operational efficiency, sensory engagement, and passenger comfort, the baggage claim and meeter greeter area can serve as a gateway that reflects Austin's past, present, and future, leaving a positive and lasting impression on arriving passengers and their greeters.

VI. ART

A. Existing Art Program

Since 1999, AUS has been “keeping it local” through highlighting the creativity of the region, as well as showcasing large-scale public art from internationally renowned artists. On the AUS Airport campus, you can find large-scale, permanent art installations inside and outside the terminal, as well as rotating galleries inside the terminal that house short-term exhibitions featuring local artists and organizations.The permanent art displayed throughout our airport’s campus is sourced through the City of Austin’s public art program, Art In Public Places (AIPP). Created in 1985 by action of the Austin City Council, AIPP commissions visual artists who work across all media to create site-specific installations and unique public art that reflects the history and values of our communities. The City ordinance establishes 2% of eligible capital improvement project budgets as a set-aside commitment to commission artists or purchase art for City-owned property and facilities. These cultural landmarks have become cornerstones of Austin’s identity.The Changing Exhibits Program proudly displays the works of local artists, collectives, and organizations from the greater Austin area throughout the airport. These exhibits give passengers the opportunity to experience Austin’s culture through visual art and artifacts while waiting to catch a flight or simply passing through.

Art Inventory

Eight Big Guitars

La Guitarra by Delfin Escalante
Piece of My Heart by Tracie Sutton,
Por Vida by Kathy Marcus,
Keep Austin Weird by Sara Hickman,
Rockabilly by Cindy Raschke & Craig Barnes,
Musician by Howard Weliver,
Austin Music Flows by Debra Samples
Music Capital by Sharon Finch

Originally part of the Austin GuitarTown in 2006, these ten foot tall fiberglass guitars were painted and decorated by various Austin artists and celebrities. After display they were bought by Milton Verrett at a charity auction and later donated to the City in 2009. The guitar display forms a veritable guitar garden for all to see and walk around.

Location: Atop bag claim carousel #3

Texas Rivers

Lawrence W. Speck Studio

Page Sutherland Page, 1999

As part of the local cultural expressions in the airport architecture, is a terrazzo floor inspired by the original plat map designed in 1839 by Edwin Waller for the new capital of Texas, Austin.

The terrazzo pattern of tans, blues & greens spans over 25 feet and contains spellings and labels of the river streets named in the plat and in use today. In the design only the rivers Waller chose to name on the plat are shown. Spellings of the river names on the map are as Waller wrote them over 177 years ago.

Location: Bag claim level floor by the Barbara Jordan statue

True Patriot: Barbara Jordan Memorial Statue
Bruce Wolfe, 2002.
Sculpture

The first life-sized statue of the late Barbara Jordan resides in the Austin-Bergstrom International Airport. Created by California artist Bruce Wolfe, the bronze sculpture depicts Jordan seated, in deep thought, with her finger tips pressed together; her glasses and a book placed in her lap.

The life-size sculpture is the first major, public piece in the country to honor Jordan and it is a landmark for all who visit the Barbara Jordan Terminal, named in her honor.

City of Austin Aviation Department officials unveiled the statue in November 2002.

Location: Baggage level

VI. ART

A. Existing Art Program

Art Inventory

Carved Granite Glyphs

Philippe Klinefelter, 1999

Twelve trees from the original Austin plat;

Pecan, Oak, Mesquite, Peach, Bois d'Arc, Hickory, Pine, Cedar, Mulberry, Bald Cypress, Walnut, Ash

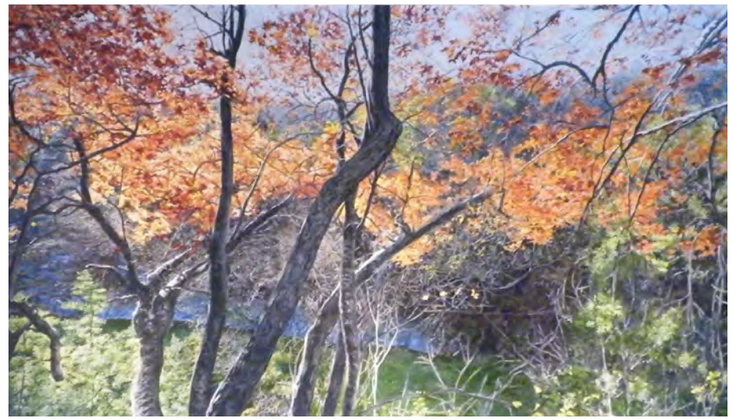
As part of the cultural expressions in airport architecture, Texas tree branches, leaves and seeds have been hand carved out of granite by Austin sculptor Philippe Klinefelter. The twelve trees carved correspond to the tree street names originally shown on the Austin plat map designed by Edwin Waller in 1839. The granite glyphs are low relief carvings embedded into a 170' wide wall high above the baggage carousels. Each of the twelve panels are 60" x 30" and over 5" thick

Location: bag claim level, behind bag carousels 1-5

Forged steel handrails.

Lars Stanley, 1999.

Locations: Public stairways and along glass balconies



Green Austin

Albert James Bonar Jr. aka Jimmy Jalapeeno 1991

Six oil paintings on canvas

Sunlight in Austin's wilderness areas is the subject of these paintings. From the urban greenbelt to Wild Basin Wilderness Preserve,

Jimmy Jalapeeno gives us a peaceful, deep look into the forest full of light, shadow, color & shape. The oil paintings are among the oldest artwork in the AIPP collection at the airport. Before coming to Austin-Bergstrom these paintings were on display at Mueller Airport until it closed in 1999.

Location: Ticket lobby concourse level adjacent to check point exits

VI. ART

A. Existing Art Program

Art Inventory

Hill of the Medicine Man

Thomas Evans, 1999

Oil on canvas panels

Just west of Austin is a Texas state park known as Enchanted Rock. There one can see and walk upon an ancient wonder of nature, a rounded hill of granite. This natural phenomenon was called by Native Americans, the Hill of the Medicine Man. Artist Thomas Evans celebrates the natural beauty and history of the Texas hill country with this nine panel landscape mural.

Location: East end ticket lobby level above the counters

Bergstrom Air Base History

Bergstrom-Austin Community Council Collection

Austin Scale Modelers Society

Items on display chronicle the service of those who lived and worked at the Bergstrom Air Force Base in Austin.

The Austin-Bergstrom International Airport stands on the foundations of the base named after Captain John Bergstrom some 70 years ago. The exhibit contains photos from the World War II era and highlights each decade up to the year of decommissioning in 1993. Scale model planes that once landed and took off from the base as well as artifacts from those who served are shown.

Location: Far west end of the ticket lobby - before check point 3

Reality Texas Mythology

Original drawings etched on mirrors, 1999

Jill Bedgood 1999, Art In Public Places (AIPP) Collection

The artist created a series of small works to be discovered throughout the Austin airport that explore Texas fact vs. Texas fiction. Images of big hair and cowboy hats are etched on mirrors in restrooms on the concourse level, so that travelers see themselves as stereotypical Texans.

Medallions installed over drinking fountains on the concourse level humorously dispel myths and inform viewers, in English and Spanish, of notable facts about Texas.

Location: Restrooms in bag claim & the ticket lobby

VI. ART

A. Existing Art Program

Art Inventory

To Parts Unknown

Sandra Fiedorek, 1999

Tarmac paint, reflective paint & oil on panels

Inspired by aviation iconography, airline jargon and airplane parts, the artist used aviation paint to create the mural of signs and symbols used with flying a plane.

Her caricatures of the parts and pieces of aviation take on a tongue-in-cheek double meaning approach with a fuel pump resembling a heart and a plane on a postage stamp.

The reflective paint is subtle to the naked eye. But if you take a flash picture of the mural, then a hidden layer of design comes forward for a pleasant surprise.

Location: Over the central ticket lobby balcony

The Visit

Fidencio Duran, 1999

Acrylic on canvas panels

Created in a traditional narrative form, The Visit, depicts a Sunday afternoon homecoming and family reunion with multiple generations of family members gathered under a cloud filled Texas sky. The fun and frolic of backyard play is mixed with everyday chores, a first dance lesson and family stories from the elders. Based on the artist's grandparents' rural homestead in central Texas, the painting reminds travelers of journeys to come and the simple things in life. Artist Fidencio Duran has the distinction of being the only artist to receive all three Dallas Museum of Art Awards to Artists.

Location: West end ticket lobby level above the counters

Voyages

Judy Jensen, 1999

three reversed glass paintings

The series titled Voyages consists of painted glass in the shape of luggage with dream like vignettes of the places and things that people might carry or pack with them. These three, life size, luminous reverse paintings on glass consist of a garment bag, overnight bag and guitar case. The dream-like tableaux on each piece is skillfully painted with layers of vibrant color and sparkles on the back of the glass, hence the term reverse glass painting.

Location: West ticket lobby wall by check point 3 entrance

VI. ART

A. Existing Art Program

[Art Inventory]

Austin Downtown Day Cruiser

Young-Min Kang, 2009

Digital images on Dibond panels

This photo-sculpture is a futuristic transformation of the city based on real images of downtown Austin in daylight combined with the dream of space travel. The sculpture consists of over 126 uniquely cut and shaped panels with photo-imagery applied. The sculpture spans over 18 feet and the top towers above the concourse floor over 32 feet high. A night version of the Cruiser can be seen on the east mezzanine wall across gates 6-7.

Location: West mezzanine wall across from Gate 13

Austin Downtown Night Cruiser

Young-Min Kang, 2009

Digital images on Dibond panels

This photo-sculpture is a futuristic transformation of the city based on real images of downtown Austin in daylight combined with the dream of space travel. The sculpture consists of over 126 uniquely cut and shaped panels with photo-imagery applied. The sculpture spans over 18 feet and the top towers above the concourse floor over 32 feet high. A daytime version of the Cruiser can be seen on the west mezzanine wall across gate 13.

Location: West mezzanine wall across from Gates 6-7.

Austin Icon Ceramic Tiles

Claudia Reese & Phil Martin, Cera-Mix Studio 1999

Location: Past Security Checkpoints, inside restrooms

VI. ART

A. Existing Art Program

[Art Inventory]

Austin's International Sister Cities Exhibit

A collection of "gifts of state" from Austin's Sister Cities

Includes a samurai warrior doll from Oita Japan, German ceramic-ware from Koblenz, Wood carvings from Old Orlu, Nigeria, silver from Mexico, needle point designs from Taichung, Taiwan and a leather kangaroo from Adelaide, Australia.

Nearby is a world map that identifies the location of Austin's Sister Cities to the traveler.

Location: Concourse level across from gate 7

Birds of Texas

Mila Sketch, 2019

Mural

Mural with cityscape scenery and large native birds

Location: Gate 12 Hold Room, Pet Relief Area

Jet Engine Turbine Blade

CFAN & Custom Creations, 2003

Sculpture

Marking the 100th anniversary of the Wright brothers historic first flight in 1903, modern air travel technology is artfully exhibited with a single fan blade from a jet engine. The sleek, slightly curved blade gives travelers a close up view and feel of this integral component of jet power.

Location: Across from Gate 7

VI. ART

A. Existing Art Program

[Art Inventory]

La Musica Sigue

Raul Valdez, 1999

Acrylic paint on wood panel

The ever growing richness and magic of the Austin music scene is depicted in Raul Valdez's mural with color, flowing transitions and a variety of music styles represented from Tejano to gospel to jazz and rock. The mural stretches over 48 feet long and is displayed in two sections above the west concourse corridor to the boarding gates.

"La Musica Sigue" is a tribute to the past, present and future continuation of music, lifestyle, culture and art that is part of the life blood of Austin and the surrounding area.

Location: Between Gates 19 - 21

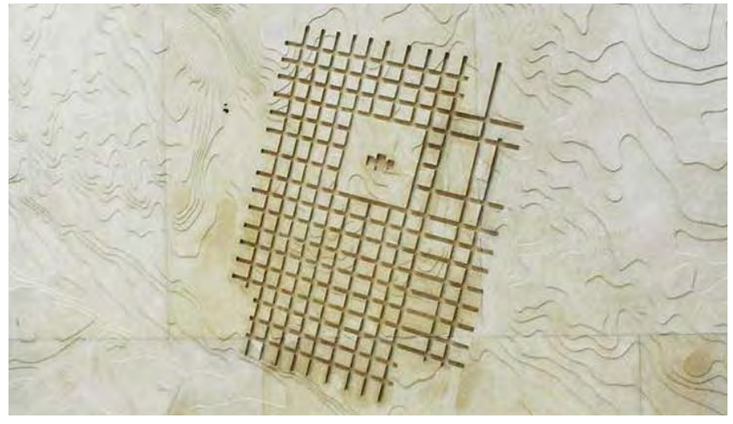
Lindbergh Lands in Paris

Rosemary Mahoney, 1975

Framed oil painting on stretched canvas,

Celebrating the historic milestone of American aviation history, this painting by Austin artist Rosemary Mahoney was created in 1975 for the United States Bi-centennial art-tour of 1976. A gift to the City of Austin by Dorothy and Terrell Blodgett in 2009.

Location: West concourse, mezzanine level, near entry to airline clubs and lounges



Carved Limestone Towers

PSP Architects & Escobedo Construction, 2015

CNC-carved limestone surfaces set in steel frame

As part of the cultural expressions in airport architecture, native Texas limestone has been carved with machine precision to reflect topographical elevations of the Austin area. Two towers over 14 feet tall are covered with limestone reliefs of the Colorado river basin watershed and the hill country it shaped. On the south tower downtown Austin is shown with the original city plat and the Capitol of Texas grounds shown in the middle.

Location: Check Point 1 Exit, near gate 6

VI. ART

A. Existing Art Program

[Art Inventory]

Texas Horizon Benches

Hawkeye Glenn, 2015

Porcelain-enameled steel, with wood and steel bases

A series of handcrafted benches, designed and made by Hawkeye Glenn. Each bench depicts a different view; a sunrise, a sunset, day and night sky, and a view of the Earth as seen from above. The benches provide a rest stop for travelers as they exit security screening lanes and provide an imaginative scene that suggests the vast expanses of Texas and the journey to come.

Location: Check Point 1 Exit - post security screening, near gate 6

Urban Nature Series

Mila Sketch, 2020

Mural

Locations: Men’s and Ladies’ Restrooms, Gate 10 area; TSA Security Checkpoint 2 East

Interimaginary Departures

Janet Zweig, 2021

Sculpture (visual work)

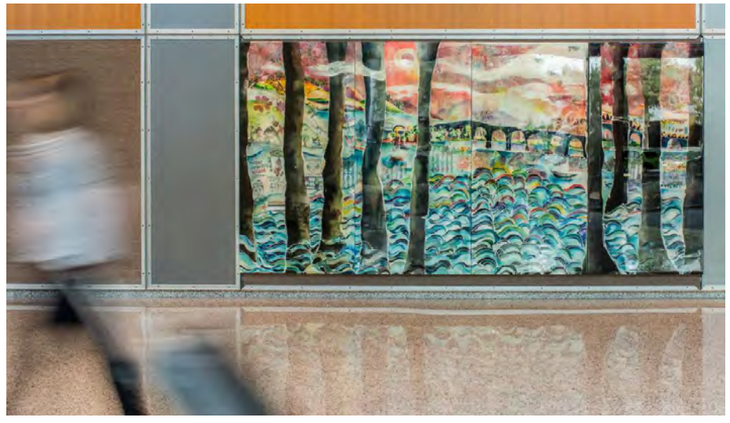
A boarding hold room intersects the existing airport furniture and walls at a seven degree angle. Flights board there for 120 fictional locations from literature, gaming, science fiction, film, animation, and comics. There is a Flight Information Display board, an upcoming flight board, a ticket machine, and flight announcements.

Location: Past Security Checkpoints, next to Gate 14

VI. ART

A. Existing Art Program

Art Inventory

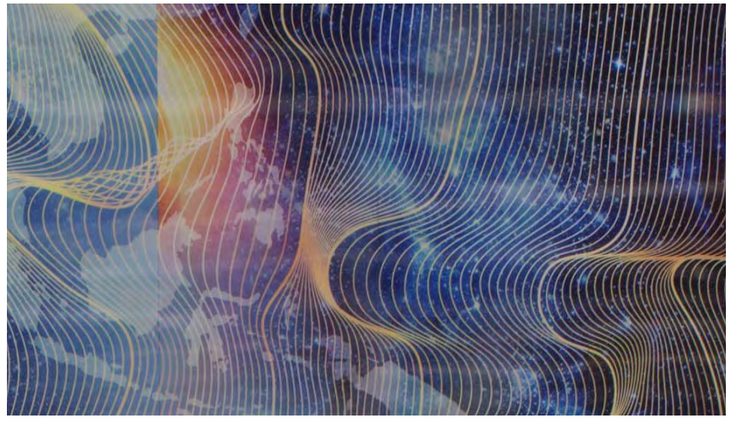


A Place To Call Home

Rakhee Jain Desai, 2018

Acrylic paint on wood panel

Location: International Arrivals Corridor



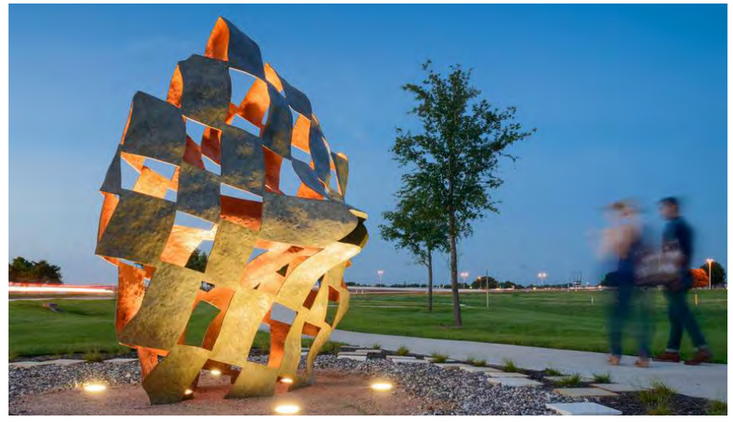
Time Lines

Mikyoung Kim, 2014

Digital prints on polycarbonate lenticular panels

Arriving international travelers are greeted by Time Lines, a mural that spans nearly 215 feet and is made of 70 lenticular panels mounted to appear as if they are floating in front of the architecture. Through holographic imagery, layers of geographical and temporal information appear and disappear as one passes by the artwork. One layer depicts a delicate web of lines that mimics the world's time zones, showing incremental transformations of the sky from night to day. While another layer illustrates the world's land masses and marks the traveler's geographical location in Austin.

Location: Sited on the secure side of the terminal within the newly expanded Customs & International Arrivals processing area



Checker Burst

Eric Eley, 2015

sculpture (visual work)

Inspired by the intersection of the physical world and technology inherent in air travel, this sculpture references the phenomenon of a vapor cone or "shock egg" the cloud formed around an object approaching supersonic speed. This bronze patchwork suggests the physically changing volume of air, and similarly changes shape as the viewer moves past.

Together with "Shock Egg" the two pieces explore the dynamics of aviation and our search for the leading edge of knowledge.

Location: Check Point 1 Exit, near gate 6

VI. ART

A. Existing Art Program

Art Inventory

Shock Egg

Eric Eley, 2015

Sculpture (visual work)

Inspired by the intersection of the physical world and technology inherent in air travel, this sculpture references the phenomenon of a vapor cone or “shock egg” the cloud formed around an object approaching supersonic speed. This stainless steel lattice twists to form an oculus at the tip of the cone that affords a unique, individual view of Austin’s airport environment. Together with “Checker Burst” the two pieces explore the dynamics of aviation and our search for the leading edge of knowledge.

Location: Spirit of Texas Drive, near Cell Phone Lot

Leaf, Pod, & Samara

John Christensen, 1999

Poured in place cast concrete sculptures

Situated outside of the terminal for all travelers to see, the artwork hearkens back to nature and those things that gently drift to earth. The Samara statue (over 25 feet tall) is inspired by the dried fruit that many plants and trees drop. Trees like the ash & elm produce the seeds that sometimes spin when dropped like helicopter blades in the sky. The pod & leaf are on pads that set them apart from the ground cover and foliage growing around them.

Location: Bag claim level, outside by the passenger pick-up lanes in front of the terminal - near column D

Transition

James E. Talbot, 2006

Ceramics, stone, colored mirror & glass

Along the sides of the foot bridge railings is a design that takes you through a visual transition from the earth to the sun and moon and back again. On the north side of the bridges is the earth mosaic assembled from native limestone and glass. Emanating from it a line of handmade ceramics and glass go through a transition from rough and jagged edges to smooth and straight line. On the south end of the bridge is either a mosaic solar-scape or lunar-scape that dazzles with iridescent radiance of the sun or coolness of moonlight.

Location: East & west pedestrian bridges from garage to terminal ticket lobby level

VI. ART

A. Existing Art Program

Art Inventory

Uplifted Ground

Michael Singer Studio, 2015

Cast concrete, steel cable, granite, stainless steel, copper, LED lighting,

Hundreds of earth-toned, suspended and grounded elements in this large-scale artwork were inspired by local geological formations, native materials and aerial photography. During the day, geometric patterns consisting of shadow and light reflect off the embedded metals, minerals and cast concrete shapes. At night, LED light emerges from within many of the hollow concrete elements to create a glowing pattern of light along the walkway.

Location: The Car Rental Facility customer service building plaza and the pedestrian walkway over the garage to the Barbara Jordan Terminal

Meander Wings

Marc Fornes, THEVERYMANY, 2021

Metalwork

Meander Wings is an experiential gateway and a strategic planning element for the Airport. Along the main concourse between parking and the airport terminals, the structure gives a dynamic presence to the circulation in and out of the airport. Following the twisting contours of live oaks and limestone grottos native to the Texan Landscape, its distinct structural network forms a dramatic canopy over the pedestrian pathway. Activating the ground plane with bold shadows.

Location: Pedestrian walkway between the CONRAC Car Rental Facility and the Blue Garage

Plume

Clay Odom & Kory Bieg, 2022

sculpture (visual work)

Inspired by the iridescent feathers of the grackle, Austin's unofficial mascot, and all the technologies and complexities of air travel, the piece is grounded in its specific site and the city of Austin. Just as grackle feathers shimmer in the Central Texas sun, PLUME reflects the blues of the sky and the colors in its surroundings, while at night, the structure disappears, and all that can be seen is the illuminated inner core. Designed to activate and anchor the pedestrian experience, the piece helps define a new section of the airport.

Location: Pedestrian walkway adjacent to Surface Lot C

VI. ART

B. Future Art Program

Art In Public Places Program

The Economic Development Department's Art in Public Places (AIPP) program is the City of Austin's public art program. The Art in Public Places program commissions visual artists who work across all media to create site-specific installations and unique public art that reflect the history and values of our communities. These cultural landmarks have become cornerstones of Austin's identity.

Created in 1985, by action of Austin City Council, the City ordinance establishes 2% of eligible capital improvement project budgets as a set-aside commitment to commission artists or purchase art for City-owned property and facilities.

Additional information can be found here:

https://www.austintexas.gov/department/art-public-places-processv/aipp

Designers should consider utilizing the AIPP program as a means of public wayfinding.

The Art in Public Places Process

The Art in Public Places process is implemented in six phases:

1. Project Discovery

AIPP staff collaborates with City Departments and other project stakeholders to determine artwork funding, project goals, and appropriate artwork location and siting.

2. Call for Artists

Based on preliminary engagement meetings, AIPP staff drafts the project scopes, determines eligibility requirements as the Calls to Artist which is usually a Request for Qualifications. The Call for Artist is presented to the AIPP Panel and Arts Commission for review and approval prior to publishing the posting.

3. Artist Selection

AIPP staff convenes a panel of arts professionals, community representatives, and project advisors to review artists' qualifications and to recommend artist(s) specific to each project. Recommended artists are reviewed and approved before contracting.

4. Community Engagement

Selected artists conduct independent research and meet as often as needed with City (Sponsor) Department(s), AIPP staff, and constituent neighborhoods/communities to understand construction time lines and community priorities and values.

5. Design and Fabrication

AIPP staff works with the artist to develop the specifics of the Artwork, including the following: scale models, materials, detailed budget, timelines, construction documents (shop/structural drawings), and fabrication and installation methods. Fabrication can occur on or off-site and may include painting, construction, forming, assembly, machining, or manufacturing of Artwork parts and/or the final Artwork.

6. Project Closeout

In an ongoing process, the artist, AIPP staff, and City Department(s) coordinate the delivery and installation of the Artwork at the specified site. The artist and staff inspect the installed Artwork and review the Artwork maintenance/conservation plan. City staff may undergo conservation training. Before the community celebration, AIPP Collection Management finalizes accessioning and receives the Artwork title.

Changing Exhibits Art Program

Changing art program gallery spaces should be located throughout the passenger terminal and concourse areas. Designers and Artists should coordinate with the AUS Project Manager to locate art spaces. The following characteristics must be considered when designing gallery spaces.

- Gallery spaces should be deep enough for personnel to work inside and install artwork.
- The back wall should be durable and able to be repaired when artwork is changed.
- Artwork may be a mix of digital screens and physical galleries
- Designers should consider lighting and ventilation suitable to all types of artwork. In order to accommodate the most flexibility, track lighting is preferred.
- Art Galleries should not be located near food courts.
- To create emphasis on the artwork, gallery space walls should be white (satin).

VII. MUSIC

A. Music Program

Known as the "Live Music Capital of the World," the airport live music program in Austin has become a model program for airports worldwide. Since 1999 this successful and iconic music program will continue the tradition of providing memorable and favorable experiences for travelers.

Performance venues should be located throughout the passenger terminal and concourse areas to create exciting and unique experiences for passengers visiting AUS. Designers should coordinate stage locations with the AUS Project Manager.

The following table describes the minimum requirements for stages at AUS:

Stage (Solo / Duo):

- 40 Square Feet.
- Cable management for stage.

Power:

- 110v quad outlet behind the stage.
- 110v quad outlet on the front of the stage.
- 10v quad outlet on the stage for audio equipment.
- 10v power for lighting.

Audio:

- (2) 12" Powered Main Speakers
- (1) 12" Powered Monitor Speakers
- 16 Channel Digital Mixer
- Dual Band Wireless Router
- (6) 10' XLR Microphone cables
- (6) 21' XLR Microphone cables
- (4) 50' XLR Microphone cables
- 16 channel audio snake
- (3) Microphones
- (2) Direct boxes
- (4) Microphone Boom Stands

Lighting:

- (4) LED Wash Lights
- Lighting Truss or mounting hardware.

Storage:

- Locking Storage cabinet/equipment rack.

Soundproofing:

- Soundproofing incorporated into design of stage/venue.
- Auralex Acoustic Treatments.
- Minimize reflective surfaces.

VIII. INCLUSIVE DESIGN

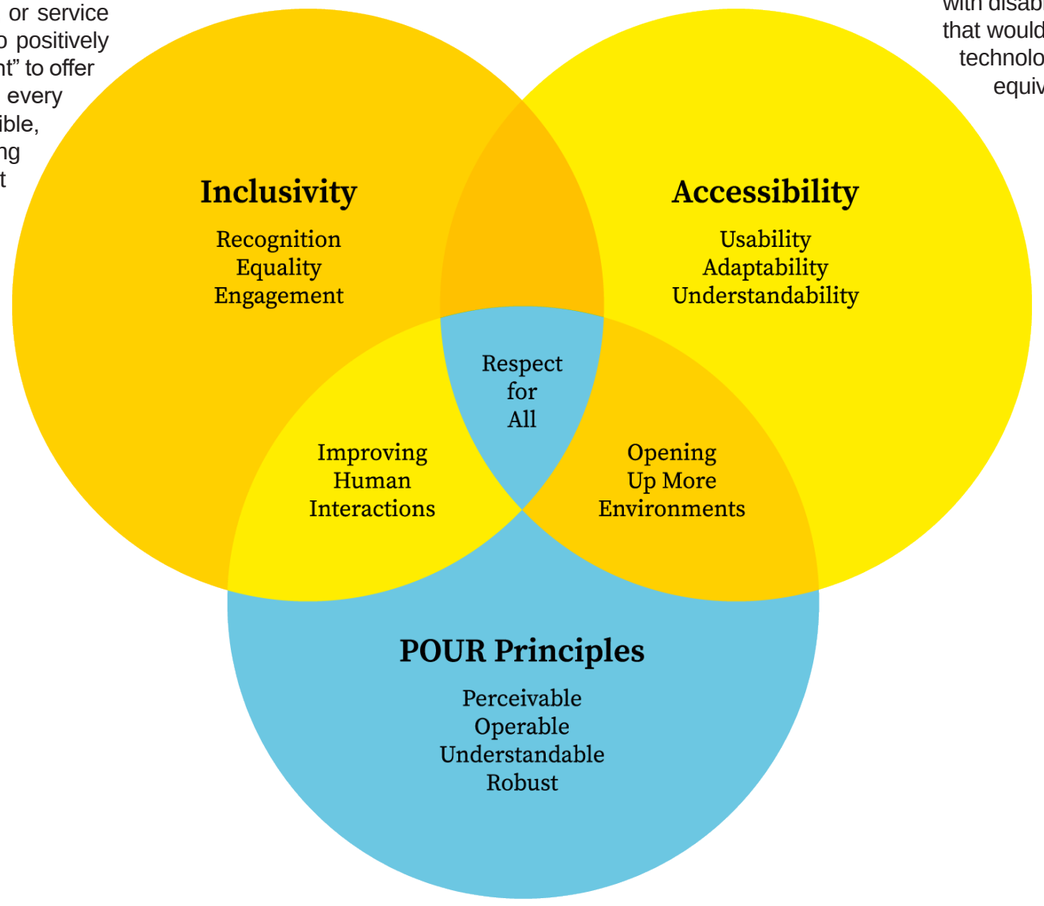
A. Inclusivity

Inclusive design is about providing a greater than equal means of access to opportunities, resources, and goods and services regardless of age, sex, ability, or disability. Inclusive design is a priority in which planning, product selection, building component selection, and configuration offer a greater "experience" for all people facing unique levels of sensory, intellectual, and physical abilities.

Inclusiveness is more than simply addressing common stereotypical disabilities or simply applying a minimum set of technical standards to the built physical environment. It is about developing solutions that meet the needs of all people and provide a fluid and seamless experience within the built environment.

Inclusive design encompasses a composition of the built environment that can be accessed, understood, and used to the greatest extent possible. The environment (including any building, product, or service within that environment) should be planned and designed to positively impact one's sensory needs. This is not a "special requirement" to offer a particular benefit of a certain population; but rather offer every person the benefits of a built environment that is accessible, convenient, and easy to navigate and use. By considering the diverse needs and abilities of all persons throughout the design process, inclusive design offers products, services, and environments that surpass peoples' needs. Simply put, inclusive design is driven by the goal to be equitable, inclusive of all people seeking services and experiences that are being provided.

The goal is to challenge each design discipline to go above and beyond to provide greater access rather than simply applying or complying with "minimum standards". As designers, we must approach the project from a different perspective and "think outside the box". Equitable design addresses a broader audience in increasing access to places, products, and services. Providing above and beyond bare minimum standards, if thoughtfully planned, lends itself to streamlined and efficient operations, cost savings and increased revenue. Improved operational efficiencies of airport processes such as queue management, passenger processing, airport security, and airport messaging are achieved. By adopting inclusive design practices, the airport forged a commitment to delivering a high-quality equitable and exceptional user experience across the entire property. The results offer improved passenger experiences for all.



The overall purpose to achieve "Inclusive Access for All" is obtained by applying design excellence with the goal of creating a fluid and seamless built environment that provides greater access to all users. Successful accessibility design begins with compliance with the Texas State Accessibility code - The Texas Accessibility Standards (TAS) – Effective March 15, 2012, per TDLR. This code is the bare minimum requirement. It does not, however, prevent the designer for achieving greater than minimum standards. The TAS requirements provide only the basic minimum framework that is to be applied during the design of planned new construction, additions and alterations of the site, facilities, buildings, and elements to the extent required by regulations issued by the Authorities Having Jurisdiction (AHJ's). While the TAS document contains minimum scoping and technical requirements to achieve accessibility for sites, facilities, buildings, and elements by individuals with disabilities, there is nothing in the standards and code requirements that would prevent the implementation and use of designs, products, or technologies as alternatives, provided that they result in substantially equivalent or greater accessibility and usability.

IX. WAYFINDING AND SIGNAGE

A. Scope and Purpose

Proposed wayfinding and signage must be coordinated with the AUS Project Manager and must be reviewed and approved by the Department of Aviation prior to installation. Proposed tenant signage must not intrude into the public way or interfere with wayfinding by being visually intrusive. The AUS Wayfinding and Signage Design Standards is a comprehensive signage program that communicates essential wayfinding and signage information to the traveling public using exterior and interior signs and graphics. All wayfinding and signage must comply with the AUS Wayfinding and Signage Design Standards which is provided as an appendix to this Design Standards Manual.

Purpose

The AUS Wayfinding Design Standards, which is a basis of design for developing future wayfinding projects, provides guidance and direction for developing wayfinding graphics throughout the following spaces at AUS:

- Roadways
- Parking Areas
- Terminal Frontages
- Terminal
- Concourses

Designers should not consider the Wayfinding Design Standard as a “clean sheet” approach to wayfinding at AUS. Some elements may adapt existing wayfinding approaches while others may have more significant changes. For example, phased projects will need to work in concert with existing adjacent wayfinding elements.

The Wayfinding Design Standard will guide Designers with sections including:

- Wayfinding Strategies
- Graphic Standards
- Hierarchies of Sign Types
- Programming Guidelines
- Specifications and Details

These will help meet the goal of clear and consistent holistic wayfinding throughout the AUS campus.

Goals and Objectives

Reinforce AUS’s reputation as an easy-to-navigate airport with simpl and clear wayfinding messages.

Reduce the stress levels of customers and employees with clear and understandable wayfinding working hand-in-hand with architecture.

Wayfinding should provide clear and understandable information to facilitate natural, intuitive navigation to all airport destinations.

Wayfinding should be simple and clear, with the information reduced down to only the primary destinations.

X. SUSTAINABILITY

A. Scope and Purpose

Sustainable practices mitigate negative environmental impacts by reducing the use of raw or material resources (materials, fossil fuels, energy consumption, etc.), reducing emissions, waste, and water pollution, mitigating increased flooding from stormwater runoff, and providing other environmental benefits.

Thoughtful and early planning to incorporate sustainable practices into every program, project and operation at AUS helps to reduce impacts and often results in financial and operational benefits. There are opportunities for applying principles of sustainability in all areas of airport operations - airside, landside, terminals, and hangars, just to name a few. New buildings, runways and taxiways, and maintenance facilities should be designed with sustainable principles in mind. Sustainability can also be applied as a component of retrofit and repair activities. The most beneficial opportunities for employing sustainable principles are during the initial planning and design phases of an airport development project, but there may be even more opportunities to consider in facility replacement and maintenance.

The AUS sustainable philosophy has been incorporated into the decision-making process at the airport. Projects are evaluated based on the four pillars of sustainability (shown at right). Being truly sustainable means that all projects must consider impacts across all four pillars, while minimizing the negative impacts. The AUS sustainable pillars are: environment, finance, operations, and community.

Sustainability goals at AUS are principally guided by the City of Austin's goals, plans, and programs. AUS supports and furthers the City's sustainability efforts and commitments. AUS staff works closely with the City to ensure that efforts at the Airport align with and support the sustainable policies and initiatives in place at the City level. AUS annually reports on key performance indicators (KPIs) to determine whether targets set for specific issues (carbon emissions, economic, operational, green building, energy, zero waste, etc.) are being met. AUS tracks and reports KPIs driven by City policies. The Airport also reports global reporting initiative (GRI) performance measures in its Environmental Social Governance (ESG) report.

In addition to the Airport's partnership with the City of Austin, AUS has worked closely with multiple stakeholders in support of furthering the Airport's sustainability initiatives. These partnerships have resulted in energy efficient retrofits, increased use of electric vehicles, transitioning to renewable natural gas, increased use of alternative fuels (e.g., sustainable aviation fuel), increased composting and recycling, and the purchase of renewable energy and carbon offsets from sustainable sources. AUS partners include those with airlines to support electric-powered ground service equipment (eGSE). Austin Energy Green Building (AEGB) provides support at AUS in many efforts, including accreditation of multiple buildings through their rating system. AUS is continuing to increase their their use of reclaimed water, resulting in millions of gallons of potable water saved.

This focus on sustainability and resiliency efforts to address climate change are central to design and operations. AUS is committed to incorporating sustainability into all facets of the airport which can be found in the sustainability goals in the appendix of this Design Standards Manual. Each project will track progress on sustainability goals and report from early design through project completion to the AUS Sustainability Committee and ultimately the Executive Teams for review. Variances from AUS sustainability goals must be requested in writing and submitted to the AUS Sustainability Committee for review.

DESIGN STANDARDS

I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

A. General Site Design Requirements

The goal of all AUS site design should be the safety and well being of all passengers, guests, employees and any other occupants of the airport. The following standards should be followed by the site designer. Designers must follow the most recent Texas Department of Transportation, City of Austin, FAA and all other relevant requirements. It is the sole responsibility of the designer to understand and comply with all requirements.

Environmental

The intent of the Environmental Design Standards is to establish a minimum set of environmental standards for AUS facility design and construction projects that coordinate and augment the City of Austin and governing agencies.

NEPA

The Designer is expected to assist the AUS Environmental Team with the preparation of project descriptions, including alignments, geometries, quantities, equipment, materials, etc. for either the preparation of supporting exhibits to prepare NEPA document(s) or to respond to comments from FAA or other reviewing agencies, as required.

Sustainability

For each project, the designer should (or must? Shall?) review any project-specific goals with the AUS Environmental Team, regardless if the project is civil or architectural in nature.

Contaminated Soils

If contaminated soil is suspected, it must be tested and characterized to determine proper disposal. If it contains constituents considered harmful to health, equipment, property, or the environment from a regulatory perspective, it must be handled as hazardous waste.

AUS was formerly part of the Bergstrom Airforce Base and currently in the Base Realignment and Closure (BRAC) program through the U.S. Department of Defense. At the start of project design, the Designers should (must? Shall?) review the project location(s) with the AUS Environmental Team to confirm proximity or overlap with an active site. There are several sites throughout AUS with either land use and/or institutional controls. For any active groundwater monitoring wells, coordinates of the well(s) should be included on the design drawings with a note for the monitoring well to be protected, unless otherwise directed by the AUS Environmental Team.

Spill Prevention Control and Countermeasures (SPC),

Facilities may be subject to Spill Prevention, Control and Countermeasure (SPCC) regulations at 40 CFR 112. The design of any new or renovated facility must include a submittal by the Designer with a formal determination whether an SPCC plan is required. If an SPCC plan is required, the Designer must incorporate the measures specified at 40 CFR 112 or any subsequent applicable federal or state regulation. It is the sole responsibility of the Designer to understand these requirements.

The Designer should supply the AUS Environmental Team with a schedule of all oil storage containers with volumes 55-gallons or greater. SPCC Plans are required for facilities with a cumulative of 1,320 gallons. Further, the Designer should review with the AUS Environmental Team their preferred approach on SPCC Plan development – for individual facilities throughout AUS, a single plan for AUS-operated facilities only, or a comprehensive plan which includes AUS-operated facilities plus tenant-operated facilities.

Construction Equipment Emissions Reduction

All construction projects will follow the AUS sustainability requirements. The Designer must be familiar with the sustainability requirements and properly convey those requirements in the design documents. The sustainability requirements are available as an appendix of this manual.

Construction and Demolition Waste Management

All construction projects will follow the AUS sustainability requirements. The Designer must be familiar with the sustainability requirements and properly convey those requirements in the design documents. The sustainability requirements are available as an appendix of this manual.

Excess earthwork materials should be managed on site to the extent possible to prevent off-site disposal of material. The excess earthwork volume generated from the project should be quantified and shared with the AUS Environmental Team to discuss potential disposal locations and any analytical parameters required for testing soil. The Designer must investigate, in coordination with AUS Environmental team if the excess soil qualifies as a Construction and Demolition (C&D) Debris.

Stormwater Pollution Prevention Plans (SWPPP)

The designer is responsible for the development of project SWPPP's and provide the necessary documentation to obtain a Texas Pollutant Discharge Elimination System (TPDES) Construction Permit.

Industrial Hygiene

The designer must review the utilities locations and potential age for the utilities infrastructure. Utilities installed prior to the year 1989 should be assumed to contain asbestos in the form of a wrap, coating, or integral to the pipe material.

Site Development Codes and Ordinances

As modifed by the airport development ordinance, the City of Austin codes that govern site development design and construction include:

1. **Current City of Austin Codes and Ordinances**
   a. Land Development Code
2. **Current City of Austin Technical Manuals**
   a. Drainage Criteria Manual
   b. Environmental Criteria Manual
   c. Land Development Code
   d. Standard Specifcations Manual
   e. Standards Manual
   f. Utilities Criteria Manual
   g. Fire Protection Criteria Manual

City Of Austin Standards

City of Austin Land Development Code -
https://library.municode.com/tx/austin/codes/land_development_code

City of Austin Standard Specifications -
https://library.municode.com/tx/austin/codes/standard_specifications_manual

City of Austin Environmental Criteria Manual -
https://library.municode.com/tx/austin/codes/environmental_criteria_manual

City of Austin Standard Specifications -
https://library.municode.com/tx/austin/codes/standard_specifications_manual

City of Austin Standards Manual -
https://library.municode.com/tx/austin/codes/standards_manual

City of Austin Utilities Criteria Manual -
https://library.municode.com/tx/austin/codes/utilities_criteria_manual

City of Austin Fire Protection Criteria Manual
https://library.municode.com/tx/austin/codes/fire_protection_criteria_manual

I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

A. General Site Design Requirements

Utilities

Utility Corridors

Where utilities are owned and operated by separate utility providers on AUS property, Utility Corridors are defined that allow the providers to access and maintain their infrastructure. Generally, no easements are granted on AUS property since the Utility Corridors serve the same. Utility Corridors are only provided for those utilities owned and operated by the utility providers, while private services connections downstream of meters and any airport owned utilities are not required to be located in Utility Corridors.

Utility Corridors should be planned efficiently by grouping utilities in parallel where practical to minimize the number and size of the corridors. At least seven feet of separation from the outer edge of a utility line to the boundary of a Utility Corridor shall be provided, with additional separation provided as needed for deep bury installations and other situations that require additional space for maintenance and repair of the utility lines and appurtenances.

Designers should reference the AUS Utility Management Program for utility design. Contact the AUS Project manager for more information.

Potable Water

Potable water is supplied by Austin Water to AUS via distribution facilities typically owned, maintained, and operated by Austin Water upstream of all meters. Austin Water infrastructure on AUS property shall be located within defined Utility Corridors.

All design and construction of potable water infrastructure shall conform to the latest edition of the Austin Water Utilities Criteria Manual, https://library.municode.com/tx/austin/codes/utilities_criteria_manual the City of Austin Standard Specifications, https://library.municode.com/tx/austin/codes/standard_specifications_manual the City of Austin Standard Details, https://library.municode.com/tx/austin/codes/standards_manual and the Austin Water Standard Products Lists. https://www.austintexas.gov/page/current-standard-products-lists For installations of new mains, the design must be approved through Austin Water's Service Extension Request process, and Austin Water development review and approval is required for the potable water designs. Sizing of potable water infrastructure shall typically be sized for future growth at AUS as guided by the Utility Area Plan on preliminary planning for sizing.

Fire hydrants and fire protection service are provided via the potable water system at AUS. Fire hydrant locations and spacing shall be per current Austin Water standards and approved through the site development review process for the City of Austin.

Wastewater

Wastewater service is provided by Austin Water to AUS via wastewater facilities typically owned, maintained, and operated by Austin Water downstream of service connections. Austin Water wastewater infrastructure on AUS property shall be located within defined Utility Corridors.

All design and construction of wastewater infrastructure shall conform to the latest edition of the Austin Water Utilities Criteria Manual, https://library.municode.com/tx/austin/codes/utilities_criteria_manual the City of Austin Standard Specifications, (https://library.municode.com/tx/austin/codes/standard_specifications_manual) the City of Austin Standard Details, https://library.municode.com/tx/austin/codes/standards_manual and the Austin Water Standard Products Lists. https://www.austintexas.gov/page/current-standard-products-lists For installation of new facilities, the design must be approved through Austin Water's Service Extension Request process, and Austin Water development review and approval is required for the wastewater designs. Sizing of wastewater infrastructure shall typically be sized for future growth at AUS as guided by the Utility Area Plan on preliminary planning for sizing.

Reclaimed Water

Reclaimed water is supplied by Austin Water to AUS via distribution facilities typically owned, maintained, and operated by Austin Water upstream of all meters. Per current City of Austin Ordinances, reclaimed water is anticipated to be provided to serve irrigation and toilet flushing at new buildings. Austin Water reclaimed water infrastructure on AUS property shall be located within defined Utility Corridors.

All design and construction of reclaimed water infrastructure shall conform to the latest edition of the Austin Water Utilities Criteria Manual, https://library.municode.com/tx/austin/codes/utilities_criteria_manual the City of Austin Standard Specifications, https://library.municode.com/tx/austin/codes/standard_specifications_manual the City of Austin Standard Details,https://library.municode.com/tx/austin/codes/standards_manual and the Austin Water Standard Products Lists. https://www.austintexas.gov/page/current-standard-products-lists For installations of new mains, the design must be approved through Austin Water's Service Extension Request process, and Austin Water development review and approval is required for the reclaimed water designs. Sizing of reclaimed water infrastructure shall typically be sized for future growth at AUS as practical, refer to the Utility Area Plan for additional information on preliminary planning for sizing.

Electrical

Electrical power is provided by Austin Energy (AE) to the majority of AUS facilities via the AE Bergstrom Substation and the AE Stony Ridge Substation. The Bergstrom Substation provides the majority of this power to the existing BJT, CUP, and surrounding facilities via 12kV circuits BE-1 and BE-4. Many of the facilities south of Taxiways H and G, such as the general aviation facilities, receive power from the AE Stony Ridge Substation. The remaining facilities in and around AUS receive power from local AE 12kV circuits from Stony Ridge or other AE substations, depending on location.

The 12kV circuits, ductbank, manholes, and switchgear are owned operate and maintained by AE. AUS takes ownership of electrical power on the secondary of the AE 12kV-480V step-down transformers, located at each facility.

All design and construction of AE electrical infrastructure shall conform to the most recent edition of the Austin Energy Design Criteria. All AE infrastructure is assumed to be sized, routed, and otherwise designed by and in accordance with Austin Energy, whether installed by the utility company or a third-party contractor hired by AUS.

AUS is currently coordinating with AE to adjust the distribution strategy at the airport such that AUS takes ownership of the 12kV infrastructure downstream of the AE Substations, excluding the duct bank that will provide power to the AUS owned substation. 'As it stands, both parties have agreed to proceed with the transfer from AE primary distribution to AUS owned primary distribution.

In the event the 12kV infrastructure, also referred to as primary distribution, is agreed upon by both parties to become AUS owned, then the airport will need to develop system standards, specifications, and design manuals to describe how the 12kV infrastructure should be designed and constructed. As a baseline, it should follow the AE system standards. Modifications should made with respect to airport specific areas, such as the airfield, and as recommended by industry standard practice for a non-utility entity.

I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

A. General Site Design Requirements

Utilities (Continued)

Electrical (Continued)

The following general guidelines for medium-voltage should be followed for 12kV infrastructure that AUS may own in the future:

- Ductbank should be concrete, rebar reinforced, with a 4/0 bare SD copper ground conductor between manholes. Ductbank shall have no less than 2' of backfill above the top of the ductbank unless beneath a roads, taxiways, or runways, in which case a minimum of 3' backfill shall be required.
- Minimum 6" Conduits shall be used, type Schedule 40 PVC Conduit when in ductbank and RGS when traveling along an exposed cable racks. Schedule 80 PVC shall be used in ductbanks beneath roads, taxiways, runways, or at other locations where a higher degree of physical disturbances may occur. Maximum conduit fill should be no greater than 40% per the NEC.
- Medium Voltage Cables shall be type MV 105 EPR, Copper, Compact-round concentric-lay Class B, with EPR Insulation that has a voltage rating of no less than 15kV, is 133% insulated, is shielded by a 5-mil uncoated copper tape that goes over a semi-conducting insulation shield and having a Chlorinate Polyethylene Cable Jacket. Cables shall comply with UL 1072, AEIC CS8, ICEA S-93-639 or NEMA WC 74, and ICEA S-97-682. Certain parameter may be adjusted as standards are developed by AUS.
- Cable Pulling Manholes shall be of size 11'x9'x9' at minimum and Cable Splicing Manholes shall be of size 13'x11'x9' at minimum, including 6" manhole walls. Large vaults beneath sectionalizing switchgear should be sized based on the type of equipment that will be installed atop the vault but can be up to 25'x9'x9'. Manholes should have all conducting components grounded to a grounding electrode at the bottom of the manhole. Provisions for Sump Pump drainage should also be provided. A compacted base should be provided beneath each manhole using adequate backfill material, such as crushed gravel. Manhole foldouts shall be produced at the design stage and following construction.
- Redundant feeder pairs shall be provided to each new facility fed by AUS from either sides of a single AUS substation switchgear or from separate substation switchgear, depending on facility location and the space available on all AUS substation at the time of construction.
- Interior medium-voltage transformers shall be pad-mounted and liquid-filled 12,47kV Delta – 480Y/277 Volt. The insulating liquid shall be silicone-based or a hydrocarbon mineral oil dielectric that is UL listed. Self-Cooled with an insulation temperature rise of 65 deg C and a BIL of 95kV. Taps at 2.5% above and below shall be provided and the impedance shall be no greater than 5.75%. Provisions for Forced-Air and Ambient Air shall be provided. Sound level rating shall be no greater than 3 dB in noise-sensitive areas.

All 480V infrastructure shall be installed with respect to all AUS airport design standards, City of Austin Series 16000 Electrical Standards for Wiring, the City of Austin Building Criteria Manual Section 5 for Electrical and Section 7 for AE Green requirements, section of the AE Design Criteria Manual that govern 480V electrical infrastructure, and the NEC.

IT Outside Plant

IT Outside Plant (OSP) duct pathways consist of both AUS and FAA pathways. OSP pathway sizing, routes, and design shall be coordinated with AUS. Additionally, FAA pathways shall be coordinated with FAA. General requirements for OSP pathway should follow the following guidelines:

- The OSP communication connection to a site facility should be to the nearest existing manhole that provides sufficient capacity.
- Physically diverse pathway should be used to route fiber and copper back to AUS IS core network switches and IT headend equipment.
- A minimum of (4) 4-inch ducts should be installed from the existing pathway to a new facility's entrance facility. Within a facilities local campus, a minimum of 1.5-inch conduit may be used for connection of IT enclosures and field devices.
- Cut trenches uniformly and slope uniformly (4 inches per 100 feet) away from building entrance; restore surface of areas disturbed by excavation and establish original grades.
- Separate the OSP ducts by minimum of 3 inches from exterior wall and minimum of 2 inches between ducts. Provide separators a minimum of every 5 feet and secure separators to earth and ducts.
- Backbone OSP duct conduits should be encased in concrete with minimum of 3 inches of concrete over ducts; provide a minimum of 30 inches from top of duct to finished grade; bury warning tape 12 inches above concrete over centerline with additional tape every 12 inches off centerline as required.
- Direct buried pathway may be utilized for runs serving a maximum of (1) hardened field switch or for induvial device horizontal pathway.
- Maintenance holes (handholes and manholes) should be installed at distance no greater than 500 feet apart, with not more than 90 degrees of total bend between; all intersections of ducts and 90 degree bends shall include a maintenance hole.
- Building entrance maintenance holes should be provided within 30 feet of buildings with a minimum size of 12 feet by 10 feet by 8 feet.
- Handholes should be a minimum of 40 inches by 60 inches by 30 inches.
- Provide maintenance hole ancillary elements (e.g., grounding, ladders).
- Develop maintenance hole design based on load ratings/traffic ratings.
- Label maintenance holes as "Communications."
- OSP backbone fiber optic cabling should be armored indoor/outdoor single mode.
- OSP backbone fiber optic cabling should have a minimum 20-foot service loop at both ends of each cable; a 20 foot service loop at each maintenance hole.
- Terminations should be fusion spliced to factory provided "pig-tail" SC-terminated cables.
- OSP backbone copper cabling should be Category 5 flooded UTP (unshielded twisted pair).

IT Outside Plant (Continued)

- OSP backbone copper cabling should have a 20-foot service loop at both ends of each cable, a 20-foot service loop in each maintenance hole, and should terminate in entrance facility with lightning protection and then in rack mounted RJ-45 patch panel.
- Provide telecommunications grounding and bonding.

Natural Gas

All demolition, abandonment, and addition of new natural gas piping on airport property should be coordinated with Texas Gas.

Natural gas systems should be tested, inspected, and purged according to the International Fuel Gas Code and authorities having jurisdiction.

Piping exterior to the building should conform to ASTM 53, be standard weight, grade B, be electric resistance welded or seamless, black steel.

Natural gas piping should enter the building above grade and cannot be routed under the foundation.

Diaphragm gas meters should be provided exterior to the building where the service is distributed. The meters should be labeled with gas meter AUS identification numbers. Any gas meters for tenant spaces should also be labeled with the space ID and tenant name.

Jet Fuel

Jet fuel is stored on airport in aboveground tanks. It is supplied to the airport via tanker trucks. Jet fuel is delivered to aircraft via refueler trucks. The fuel system is maintained and operated by the AUS Fuel Consortium. Jet fuel distribution mains are located within defined Utility Corridors on AUS property.

For any work requiring modifications to the Jet Fuel storage and distribution system, the proposed volume of storage of above ground tanks and below grade distribution should be provided to AUS to determine applicability of EPA Airport Hydrant UST System regulations.

I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

A. General Site Design Requirements

Stormwater Drainage and Water Quality

Background

The stormwater collection system on the airport encompasses a network of numerous channels, culverts, inlets, and detention, and water quality ponds facilities. The site drains to three watershed boundaries (Colorado River watershed, Carson Creek watershed, and the Onion Creek watershed).The vast majority of the airport site is within the Onion Creek watershed, with Onion Creek running along the eastern and southern boundaries of the site. The northwestern portion of the property drains into Carson Creek to the north/northwest. The northeastern portion of the property drains to the east and north to the Colorado River.

The City of Austin Watershed Protection Department shall be consulted from scoping through design development for all projects impacting drainage or water quality on AUS.

The stormwater and water quality infrastructure on AUS property is generally owned and maintained by AUS. This infrastructure is not required to be located within defined Utility Corridors, although it may be if crossing or running parallel to other utilities located in Utility Corridors.

Airport Development Ordinance

AUS has a specific “Ordinance for the Master Development Plan for Austin-Bergstrom International Airport” that guides development on the airport property that is approved by the City of Austin City Council. The most recent and approved version of this airport development ordinance supersedes portions of current City of Austin development ordinances and design standards, and should be followed as the primary guidance document for the design and construction of stormwater and water quality requirements for projects at AUS. It outlines certain criteria related to stormwater, detention, and water quality for construction at AUS. For elements not addressed by the airport development ordinance, the current City of Austin codes, ordinances, and design manuals shall be followed.

As modified by the airport development ordinance, the local City of Austin codes and standards that govern drainage and water quality design and construction include:

1. Current City of Austin Codes and Ordinances
    a. Land Development Code
2. Current City of Austin Technical Manuals
    a. Drainage Criteria Manual
    b. Environmental Criteria Manual
    c. Standard Specifications Manual
    d. Standards Manual
    e. Utilities Criteria Manual

The design of stormwater collection and water quality standards shall generally meet the above standards where not dictated by FAA requirements or modified by the Airport Master Development Ordinance. Although, as the stormwater drainage and water quality system on AUS property is owned and maintained by the airport, certain requirements in these documents can be modified with the approval of AUS staff. This would generally be related to items in these standards that are intended for use in public streets and right-of-way that aren’t directly applicable to airport uses, or that are related to maintenance preferences, etc. Any proposed deviation from the City standards listed above requires approval from AUS.

Onion Creek RSMP

A key element of the existing stormwater system at AUS is its participation in the City of Austin’s Regional Stormwater Management Program (RSMP) for the Onion Creek watershed. AUS acquired 300 acres of net impervious cover detention capacity as part of the RSMP, meaning onsite detention for those 300 acres of future impervious cover is not required, although 2 year detention may be required to mitigate stream erosion potential. Based on participation in the RSMP, within the Onion Creek watershed, the airport is not required to provide 25 and 100-year detention for added impervious cover for those 300 acres. The airport maintains a spreadsheet tracking the constructed impervious cover within this watershed that counts against that allotment.

FAA Design Standards

For drainage improvements on the airfield, design and construction shall meet the minimum requirements of the FAA standards, primarily the most current version of Advisory Circular 150/5320-5D – Airport Drainage Design.

Stormwater Model

AUS has an existing SWMM model of the entire airport property that is generally updated with new projects. Any new developments should reference and utilize the SWMM model (or current stormwater model) for developing flows and sizing of infrastructure.

Airport Drainage Master Plan & Studies

For the design and construction of stormwater facilities at AUS, reference shall be made to the most recent Airport Drainage Master Plan, and subsequent studies that have been performed in the areas of a project. Coordination with AUS staff on obtaining the most recent models and studies is required.

Drainage Conveyance

The design of drainage conveyance infrastructure shall meet the requirements of the current airport development ordinance; and where not addressed by the airport development ordinance the current City of Austin codes, ordinances, design criteria manuals, standard specifications, and standard details, shall be met. In all cases for work on the airfield, design of drainage infrastructure shall meet the current FAA standards.

As described in the following, runoff from certain areas of the airfield are permitted to be treated via vegetative filter strips (runways and taxiways) or not treated (taxilanes) per the Airport Master Development Ordinance. Runoff from buildings (BJT and future concourses) and from the gate areas around the BJT and future concourses, where deicing occurs, are required to be conveyed to structural water quality controls. Therefore, the airfield has dual collection and conveyance systems based on if the runoff being collected is routed to water quality/de-icing ponds or if it bypasses the water quality/de-icing ponds.

Coordination with AUS on the future locations of other utilities, buildings, tunnels, and other facilities shall be considered when finalizing the proposed alignments of drainage infrastructure.

I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

A. General Site Design Requirements

Storm Drainage and Water Quality (Continued)

Stormwater Detention

As described above, stormwater detention in the Onion Creek watershed is addressed by the airport's participation in the Onion Creek RSMP, including the evaluation of stream erosion potential. For areas outside the Onion Creek watershed, detention requirements are dictated by the Airport Master Development Ordinance and the City codes and ordinances. The design and locations of detention/retention ponds shall also take into account the recommendations and requirements of FAA Advisory Circular 150/5200-33C – Hazardous Wildlife Attractants on or Near Airports.

Stormwater Quality & De-Icing Ponds

Water quality design is primarily based on the City of Austin Drainage Criteria Manual for water quality capture, with exceptions, variances, and special conditions provided by the current Airport Master Development Ordinance (20230914-101). Specific items related to stormwater quality that are affected by the Airport Master Development Ordinance include:

- Runways and Taxiways - Treatment of taxiways and runways is accomplished via vegetative filter strips designed using the criteria spelled out in the Ordinance.
- Aircraft Taxilanes – Exempts existing and proposed taxilanes from the requirements to provide water quality controls. Exemption of proposed taxilanes requires the equivalent amount of existing un-treated impervious cover is removed, decompacted, and restored.
- Water Quality Capture – Within the "Constrained Development Area," as defined by the Ordinance, the water quality capture volume is limited to the first half inch of runoff. Areas outside the "Constrained Development Area" shall meet the water quality standards as defined in the current City of Austin Drainage Criteria Manual.

For areas requiring conventional structural water quality treatment, the design and locations of ponds shall also take into account the recommendations and requirements of FAA Advisory Circular 150/5200-33C – Hazardous Wildlife Attractants on or Near Airports.

The vision for the airfield capture of drainage areas that require water quality treatment and/or capture of areas where de-icing operations take place shall be comingled into a single collection system and directed to a water quality pond system. Primary design considerations for expanded or new water quality and de-icing ponds include:

- Pond system and controls to be easily operated and maintained and designed for reliability and simplicity.
- Pond layouts shall account for future expansion(s) based on the ultimate buildout of the drainage basin it serves.
- Designer shall coordinate with AUS on vertical concrete walled ponds vs. earthen ponds with side slopes. Ultimate decisions will be based on available space, future land uses, and cost.
- Ponds that receive de-icing runoff shall have a volume provided to receive three separate 0.5-inch runoff events. If the it has a direct connection (pumps and force main) to the remote de-icing facility, smaller capture volumes could be considered.
- The water quality pond configuration shall give preference to providing shallow sand filters as shallow basins. Pumping between the sedimentation and filtration basins may be required.

Storm Water Pollution Prevention Plan

Follow the requirements of the most current AUS Stormwater Pollution Prevention Plan.

Grades, Lines, and Level

Grades, lines, and levels shall be in accordance with the current City of Austin Standard Specification 01050 – Grades Lines & Levels.

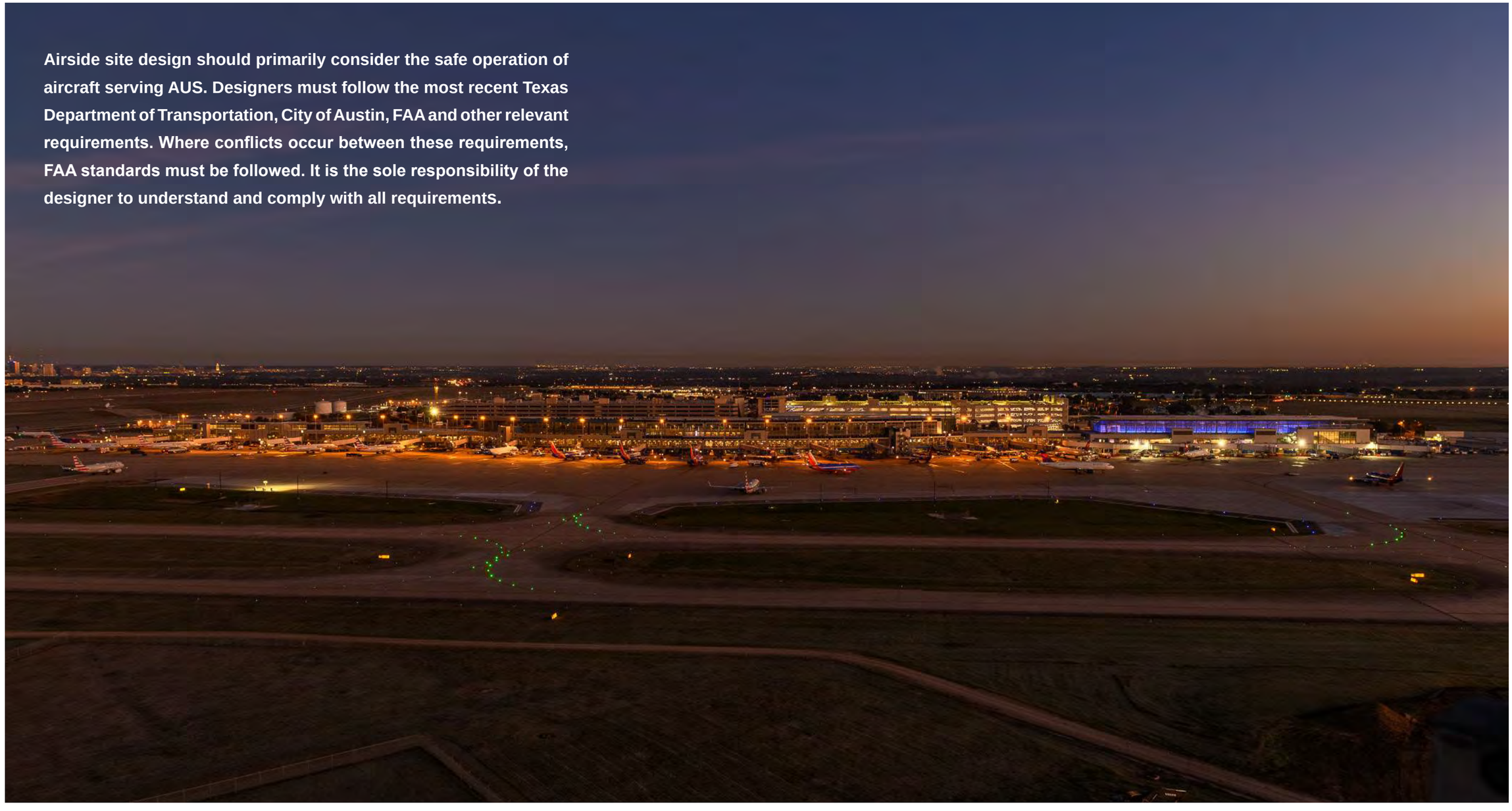
Safety and Security during Construction

Airport security requirements shall be in accordance with the current City of Austin Standard Specification 01555 – Airport Security Requirements.

I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

B. Airside

Airside site design should primarily consider the safe operation of aircraft serving AUS. Designers must follow the most recent Texas Department of Transportation, City of Austin, FAA and other relevant requirements. Where conflicts occur between these requirements, FAA standards must be followed. It is the sole responsibility of the designer to understand and comply with all requirements.



I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

B. Airside

Airplane Design Groups

For planning and design purposes, aircraft are divided into airplane design groups (ADG), as defined in FAA Advisory Circular 150/5300-13 – Airport Design (current edition). ADG is a classification based on wingspan and tail height. Aircraft are additionally subdivided into aircraft approach categories (AAC), based on the normal approach speed of a particular aircraft. Currently, the predominant airplane design groups at AUS are Group III (Boeing B 737-700, Airbus A-320, Embraer ERJ 190-100) and Group V (Boeing B777 series, Boeing B787 series, Airbus A-330 family). These aircraft fall into aircraft approach categories A and D. As AUS air traffic changes over time, reevaluation of the fleet mix (and predominant aircraft types utilizing the airport) shall be necessary.

Airfield Geometrics

The airside portion of the airport site is a secure area primarily consisting of the Air Operations Area (AOA). The continuous and efficient movement of aircraft, service equipment, and passenger vehicles throughout the AOA is integral to the operation of the airport. Airfield geometric design criteria shall be based on FAA Criteria and supplemented with national and local codes, standards, and recommendations as applicable.

Runways

Aircraft activity areas contain a series of runways and taxiways within the Airport Layout Plan (ALP) to facilitate aircraft landing and departure activities. The Airport has two operational runways and three operational helipads. The runways consist of Runway 18R-36L and Runway 18L-36R. These two existing runways at AUS are classified as and shall be designed in accordance with Runway Design Code (RDC) of D-V. Future runway needs not currently accounted for may be discussed with AUS for evaluation.

The preliminary geometric control for all runways is defined in the ALP, along with length, width, ADG, and AAC of the runways. Any projects associated with the existing runway system are required to maintain the existing runway geometry documented in the latest approved ALP. Any alteration of runway geometry shall be coordinated with and approved by FAA and AUS.

New runway and taxiway systems at AUS should comply with the requirements for ADG III (Boeing B 737-700, Airbus A-320, Embraer ERJ 190-100) and ADG V (Boeing B777 series, Boeing B787 series, Airbus A-330 family) and AAC's A and D. The geometric dimensional criteria of a specific runway shall be further determined by the largest aircraft that is anticipated to use this runway with a significant frequency of annual operations. Such criteria may include, but is not limited to runway length, width, longitudinal and transverse grades, and shoulders. For these standards, the Design Consultant should use the FAA Runway Design Standards Matrix Tool and shall reference standards and criteria in AC 150/5325-4 – Runway Length Requirements for Airport Design (current edition) for runway length requirements and AC 150/5300-13 – Airport Design (current edition) for runway shoulder and longitudinal and transverse grade requirements.

Runway capacity is dependent upon the ability to provide multiple arrival and departure streams on the parallel runways at AUS. Operational and design requirements shall be accommodated for parallel runways per AC 150/5300-13 – Airport Design (current edition).

Runways require certain critical areas and zones in their design. These critical areas shall be designed in accordance with the Airport's ADG for the specific project area and AC 150/5300-13 – Airport Design (current edition). The FAA defines these areas as the following:

Runway Safety Area (RSA) - The RSA enhances the safety of aircraft that undershoot, overrun, or veer off the runway, and provides greater accessibility for ARFF equipment during such incidents.

Obstacle Free Zone (OFZ) – The OFZ is a design and an operational surface kept clear during aircraft operations. This clearing standard does not allow aircraft and other object penetrations, except for locating frangible NAVAIDs in the OFZ because of their function. The FAA will not consider modification of the OFZ surface. The OFZ, when applicable, is composed of four components: Runway OFZ, Precision OFZ, Inner-Transitional OFZ, and the Inner-Approach OFZ.

Runway Object Free Area (ROFA) – The ROFA is a clear area limited to equipment necessary for air and ground navigation, and provides wingtip protection in the event of an aircraft excursion from the runway.

Runway Protection Zone (RPZ) – The RPZ is a protection zone that serves to enhance the protection of people and property on the ground. Airport owner control and implementation of compatible land use principles for each runway RPZ is the optimum method of ensuring the public's safety in these areas. Acquisition of appropriate property interest (e.g., fee title,easement, etc.) offers a high degree of control. Zoning ordinances offer a lesser degree of control. The primary goals are to clear the RPZ areas of incompatible objects and activities, and to ensure this area remains clear of such objects and activities. The approach RPZ dimensions for a runway end are a function of the aircraft approach category and approach visibility minimum associated with the approach runway end. The departure RPZ is a function of the aircraft approach category and departure procedures associated with the runway. For a particular runway end, the more stringent RPZ (usually the approach) will govern the property interests and clearing for the airport owner.

Taxiways

FAA design criteria detailed in AC 150/5300-13 – Airport Design (current edition) provides the basis for defining the taxiway system requirements. Taxiway design principles, as stated in the Advisory Circular, include taxiway and taxilane dimensions, configuration, and separation standards, taxiway turns and intersection design, and surface gradients. The FAA organizes design requirements for taxiways based on the Taxiway Design Group (TDG) which are a function of the Main Gear Width and Cockpit to Main Gear Distance of the design aircraft for a particular taxiway. The Design Consultant shall coordinate with AUS to determine the appropriate TDG for any given taxiway or taxilane design.

Aprons

The Design Consultants shall coordinate with AUS and meet the requirements set forth by AC 150/5300-13 – Airport Design (current edition) for the apron areas. Elements of apron design shall include the pavement section and grading, aircraft stand positions, aircraft safety envelope, passenger boarding bridge operation area, ground service equipment maneuvering and staging areas, and utilities. The FAA recommended surface gradients have been developed to ease aircraft towing and taxiing while promoting positive drainage. Refer to AC 150/5300-13 – Airport Design (current edition) for these design standards.

Airfield Geometrics (Continued)

Aprons

The Design Consultants shall coordinate with AUS and meet the requirements set forth by AC 150/5300-13 – Airport Design (current edition) for the apron areas. Elements of apron design shall include the pavement section and grading, aircraft stand positions, aircraft safety envelope, passenger boarding bridge operation area, ground service equipment maneuvering and staging areas, and utilities. The FAA recommended surface gradients have been developed to ease aircraft towing and taxiing while promoting positive drainage. Refer to AC 150/5300-13 – Airport Design (current edition) for these design standards.

Airfield Pavement Design

The Design Consultant shall provide a pavement section design prepared by a qualified engineer using the appropriate FAA design criteria and standards and submitted to AUS and FAA for approval. Airfield pavements shall be designed in accordance with the criteria described in this section and the current adopted FAA standards using currently available design programs and mechanistic methods. These standards include, but are not limited to:

1. AC 150/5320-6 – Airport Pavement Design and Evaluation (current edition)

2. AC 150/5370-10 – Standards for Specifying Construction of Airports (current edition)

3. AC 150/5320-12 – Measurement, Construction, and Maintenance of Skid-Resistant Airport Pavement Surfaces (current edition) The pavement section design should also consider the performance of existing pavements at AUS when specifying the pavement sections to be used. The Design Consultant shall consider frost protection for the nominal design frost depth at AUS of 12 inches.

The pavement section design should also consider the performance of existing pavements at AUS when specifying the pavement sections to be used. The Design Consultant shall consider frost protection for the nominal design frost depth at AUS of 12 inches.

All aircraft pavement designs shall be based on AC 150/5320-6 – Airport Pavement Design and Evaluation (current edition). Concrete pavements shall be designed with a minimum flexural strength, thickness, and maximum slab size conforming to the FAA design criteria. FAARFIELD software introduced in the current adopted AC 150/5320-6 – Airport Pavement Design and Evaluation (current edition) shall be the primary design method for aircraft pavements. Alternate design methods can be used as a design check only. Any difference between the FAARFIELD and other design procedures shall be fully explained and reconciled by the Design Consultant. For rigid pavement, the recommended panel size shall be developed as part of the Design Consultant's pavement design. Where load transfer using smooth dowels is provided, dowels and tie bars must conform to the requirements of ASTM A615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement (current edition). Where load transfer devices are not utilized, thickened edges shall be employed. Joint sealants must conform to the requirements of FAA standard specifications (current edition) for compression seals or other joint filler and sealant materials. The type of joint to be utilized on each project must be determined in cooperation with AUS, based on the past performance and maintenance record at the Airport. In areas subject to fuel spillage, fuel resistant sealant is required. All airfield pavements shall be designed to provide surface friction and drainage qualities that will promote good traction in all weather conditions. Airfield concrete pavement shall have a finish as approved by AUS. The friction qualities of asphalt surface texture come mainly from the abrasive resistance and hardness of the aggregates. Any additional surface texturing methods, if required, shall be at the discretion of AUS. Saw-cut grooves are required for runways and high-speed exit taxiways, and saw-cut grooves shall be considered for all other airfield pavements in coordination with AUS.

Airfield Lighting and Signage

The Design Consultant shall provide an airfield lighting and signage design prepared by a qualified engineer using the appropriate FAA design criteria and standards and submitted to AUS and FAA for approval. Airfield lighting shall be designed in accordance with the criteria described in this section and the current adopted FAA standards using currently available design programs and methods. These standards include, but are not limited to the current edition of the following:

1. AC 150/5340-30 – Design and Installation Details for Airport Visual Aids (current edition)

2. AC 120-57, Surface Movement Guidance and Control System.

3. AC 150/5000-13. Announcement of Availability--RTCA Inc., Document RTCA-221.

4. AC 150/5300-13, Airport Design.

5. AC 150/5340-26, Maintenance of Airport Visual Aid Facilities.

6. AC 150/5345-3, Specification for L-821 Panels for Control of Airport Lighting.

7. AC 150/5345-5, Circuit Selector Switch.

8. AC 150/5345-7, Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits.

9. AC 150/5345-10, Specification for Constant Current Regulators and Regulator Monitors.

10. AC 150/5345-26, FAA Specification For L-823 Plug and Receptacle, Cable Connectors.

11. AC 150/5345-27, Specification for Wind Cone Assemblies.

12. AC 150/5345-39, FAA Specification L-853, Runway and Taxiway Retroreflective Markers.

13. AC 150/5345-42, Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories.

14. AC 150/5345-44, Specification for Runway and Taxiway Signs.

15. AC 150/5345-46, Specification for Runway and Taxiway Light Fixtures.

I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

B. Airside

Airfield Lighting and Signage (Continued)

16. AC 150/5345-47, Specification for Series to Series Isolation Transformers for Airport Lighting Systems.

17. AC 150/5345-50, Specification for Portable Runway and Taxiway Lights.

18. AC 150/5345-51, Specification for Discharge-Type Flasher Equipment.

19. AC 150/5345-54, Specification for L-884 Power and Control Unit for Land and Hold Short Lighting Systems.

20. AC 150/5345-56, Specification for L-890 Airport Lighting Control and Monitoring Systems (ALCMS).

21. AC 150/5370-2, Operational Safety on Airports During Construction.

22. AC 150/5370-10, Standards for Specifying Construction of Airports.

23. EB #64, Runway Status Lights System.

24. EB #67, Light Sources Other than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures.

25. EB #83, In Pavement Light Fixture Bolts.

26. EB #92, Light Spacing Guidance for New Taxiway Fillet Geometry.

27. IES - RP-37, Recommended Practice: Lighting Airport Outdoor Environments.

28. FAA Order 7110.118, Land and Hold Short Operations (LAHSO).

29. FAA Order 6030.20, Electrical Power Policy.

30. FAA JO 6850.2, Visual Guidance Lighting Systems.

31. FAA-C-1391, Installation and Splicing of Underground Cable.

32. FAA-E-2083, Bypass Switch, Engine Generator.

33. FAA-E-2204, Diesel Engine Generator Sets, 10kW to 750kW.

34. FAA-STD-019e, Lightning and Surge Protection, Grounding, Bonding and Shielding Requirements for Facilities and Electronic Equipment.

35. Federal Specification J-C-145, Cable, Power, Electrical and Wire, Electrical (Weather-Resistant).

36. NFPA 70, National Electrical Code (NEC).

37. NFPA 70E, Standard for Electrical Safety in the Workplace.

38. NFPA 780, Standard for the Installation of Lightning Protection Systems.

Advisory circular (AC) 150/5340-30 provides installation details for all airport visual aids in one document. Performance specifications and configuration details for the various visual aids can be found in the referenced ACs. In general, adherence to 150/5340-30 is not mandatory; however, AC 150/5340-30 does become mandatory for all projects funded with federal grant monies through the Airport Improvement Program (AIP) or with revenue from the Passenger Facility Charges (PFC) Program. Drawings in Appendix E of 150/5340-30 depict typical installation methods for various types of airport lighting equipment and serve as useful guidance, along with applicable Owner provided design standards and specifications. Variations between the drawings in Appendix E of 150/5340-30 Owner provided details and standards, and between any Design Consultant developed details need to be coordinated with Owner early in the design process. All airfield lighting and signage materials procured for a project need to be certified by the FAA and listed in the latest addendum to AC 150/5345-53. All airfield lighting fixtures procured for a project must be from the same manufacturer. Likewise, all transformers, signage, and connector kits must be provided by one manufacturer for that type of product.

Beyond adherence to guidance provided by the AC, the designer will also need to coordinate with maintenance personal on preferences. For example, the type and color of connector kits to be used as well as color and tagging requirements for airfield lighting cables. Spacing and offset requirement for cable pulling structures (i.e. manholes) should be coordinated with maintenance personnel early in design to avoid rework. Similarly, all work within airfield lighting vault should be coordinated with maintenance personnel, in person when possible, to understand preferences beyond code compliance.

The designer must also be aware of any design issues which may or may not impact airfield lighting design in specific areas. For example, the airfield lighting designer must be aware of the existing SMCGS route, any potential changes to the route, and what are the potential implications to the airfield lighting and signage design. Another design issue that impacts airfield lighting is if the area is an apron or a remain overnight area. In which case the designer must consider both safe movement of aircraft in/out of the area, as well as maintenance activities around parked aircraft. Providing area lighting without causing glare to pilots and air traffic controllers entails the installation of luminaires at high levels on poles (which are significant obstructions) or on buildings (which requires coordination with structural designers and facility maintenance). Area lighting design requires completion of photometric calculations.

I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

B. Airside

Airport Navigation Aids

The Design Consultant shall provide an airfield Navigation Aids design prepared by a qualified engineer using the appropriate FAA design criteria and standards and submitted to AUS and FAA for approval. Airfield Navigation Aids shall be designed in accordance with the criteria described in this section and the current adopted FAA standards using currently available design programs and methods. These standards include, but are not limited to the current edition of the following:

1. AC 70/7460-1, Obstruction Marking and Lighting.
2. AC 120-29, Criteria for Approval of Category I and Category II Landing Minima for Approach.
3. AC 150/5300-13, Airport Design.
4. AC 150/5340-26, Maintenance of Airport Visual Aid Facilities.
5. AC 150/5345-7, Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits.
6. AC 150/5345-10, Specification for Constant Current Regulators and Regulator Monitors.
7. AC 150/5345-26, FAA Specification For L-823 Plug and Receptacle, Cable Connectors.
8. AC 150/5345-28, Precision Approach Path Indicator (PAPI) Systems.
9. AC 150/5345-42, Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories.
10. AC 150/5345-43, Specification for Obstruction Lighting Equipment.
11. AC 150/5345-45, Low-Impact Resistant (LIR) Structures.
12. AC 150/5345-46, Specification for Runway and Taxiway Light Fixtures.
13. AC 150/5345-47, Specification for Series to Series Isolation Transformers for Airport Lighting Systems.
14. AC 150/5345-51, Specification for Discharge-Type Flasher Equipment.
15. AC 150/5370-2, Operational Safety on Airports During Construction.
16. EB #67, Light Sources Other than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures.
17. EB #83, In Pavement Light Fixture Bolts.
18. EB #95, Additional Siting and Survey considerations for Precision Approach Path Indicator (PAPI) and Other Visual Glide Slope Indicators (VGSI).
19. FAA Order 7110.118, Land and Hold Short Operations (LAHSO).
20. FAA Order 6030.20, Electrical Power Policy.
21. FAA JO 6850.2, Visual Guidance Lighting Systems.
22. FAA Order 6950.11, Reduced Electrical Power Interruptions at FAA Facilities
23. FAA Order 6950.27, Power System Analyses: Load Flow Calculations, Short Circuit Analysis, Protective Device Coordination Studies, and ARC Flash Hazard Analysis.
24. FAA-C-1391, Installation and Splicing of Underground Cable.
25. FAA-E-2083, Bypass Switch, Engine Generator.
26. FAA-E-2204, Diesel Engine Generator Sets, 10kW to 750kW.
27. FAA-E-2325, Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights.
28. FAA-STD-019e, Lightning and Surge Protection, Grounding, Bonding and Shielding Requirements for Facilities and Electronic Equipment.
29. Federal Specification J-C-145, Cable, Power, Electrical and Wire, Electrical (Weather-Resistant).
30. NFPA 70, National Electrical Code (NEC).
31. NFPA 70E, Standard for Electrical Safety in the Workplace.
32. NFPA 780, Standard for the Installation of Lightning Protection Systems.Design and installation of airport navigational aids requires extensive coordination with Owner and the FAA.

B. Airside

Non-Licensed Vehicle Roads

Non-licensed vehicular roads connect the terminal support areas to air carrier operation facilities and throughout the airfield. These roads also support delivery vehicles and periodic construction activities, and these additional vehicles must be considered in the design. The facilities covered by this subsection refer only to roadways within the Airport security fence.

Airside roads not designed for aircraft at AUS shall be classified as to their traffic services:

1. Airside Service Roads are roads that will be subject to heavy loads from fuel trucks and Aircraft Rescue and Fire Fighting (ARFF) equipment, which are the heaviest vehicles anticipated to utilize the roadways. Design Consultants shall check vehicles for design requirements for pavement section and geometry including lane width and turning radius.

2. Airside Perimeter Roads are used by AUS and the Austin Police Department for security surveillance purposes only. Perimeter roads shall be constructed interior to the airport security fence. The roadway centerline shall be reasonably parallel to the security fence except at angles where a 35 mph design speed horizontal curve should be placed on the road centerline, but the edge of the road shall be no closer than 10 feet to the perimeter security fence. Perimeter roads shall have an asphalt surface unless specified otherwise by AUS.

3. FAA Facilities Access Roads are designed for service and security vehicles only. They are typically gravel roads with bituminous surface in the Runway and Taxiway Safety Areas and shall be designed in accordance with FAA regulatory criteria.

Ensuring the safety of these road facilities shall be the foremost responsibility of the Design Consultant. Minimum criteria for stopping, passing, and decision sight distance and design speed shall be met under all conditions. All geometric elements of the road shall be designed in accordance with the applicable sections of AASHTO – A Policy on Geometric Design of Highways and Streets (current edition) and the City of Austin Transportation Criteria Manual (current edition). Cross slopes, side slopes, clear zone criteria, and super elevation shall also comply with the AASHTO and City of Austin design standards. Horizontal and vertical control shall be based on a minimum of 35 mph design speed. Actual posted speeds shall be lower than design speeds. The design speed and posted speed shall be appropriately specified by the Design Consultant, and the design speed for each roadway will be dependent on geometric, operational restrictions, and consultation with AUS.

Service roads on the airfield must not be located inside the Runway, Taxiway, or Taxilane Object Free Areas (OFA). In instances where placement of a temporary service road within the OFA is unavoidable, prior approval must be obtained from the FAA. Such requests must be made via FAA Form 7460 Notice of Proposed Construction or Alteration (current edition) by the sponsor of the project.

Airside roads shall also maintain clearance between parked aircraft. Vehicle service roadways are designated roadways for service vehicles to maneuver safely on and around the apron area. These can be located behind the aircraft's tail, in front of the aircraft nose, between wingtips, or routed beneath the concourse. The limits of vehicle service roadways shall be clearly marked to ensure lateral and vertical clearance are maintained between parked aircraft and vehicles traversing the service roads. Minimum clearance above service roads is typically 17 feet; however, the Design Consultant shall coordinate with AUS to determine the minimum clearance required above the driving surface based on the type of vehicles expected to use the road and other potential structure limitations.

The type of pavement for airside vehicular roads, either rigid or flexible, shall be selected based on technical and economic considerations. The pavement type and sections shall be specified by the Design Consultant based on project-specific criteria and consultation with AUS. The type and composition of the various mixtures are also subject to the approval of AUS.

All roadway pavement designs shall be based the design procedures outlined in the City of Austin Transportation Criteria Manual, Appendix B – Pavement Design Guidelines (current edition), taking into account representative subgrade soils and support conditions, proper 18-kip ESALs, and appropriate material properties. Consideration must be given to the anticipated use of ARFF (81,000 pounds minimum) and aircraft fuel delivery (minimum 15,000 gallon capacity, 170,000 pounds) equipment. Where the roadways are expected to be used by ground service equipment (GSE), such as pushback tractors and baggage tugs with up to four carts in tow, the roadways shall be appropriately designed to accommodate the special width and length of the GSE, specifically along curves of the roadways. City of Austin and TxDOT specifications for materials and construction standards may be used for all non-aircraft traffic areas. However, this is not required when it may be more economical to have all airfield pavement meet the same standards.

B. Airside

Public Facing SIDA / AOA Fence

All fencing at AUS shall meet the minimum standards found in FAA AC 150/5370-10 – Standard Specifications for Construction of Airports (current edition). Additional requirements for fencing at AUS must align with the details and descriptions provided below.

Description

Dimensions must be field verified for each installation. Gaps at gates and terminations must not be greater than 5-inches. All fencing in secure areas must be no less than ten feet tall. All fencing must be grounded every 250-feet, at all utility crossings, and at all gate posts.The Designer must coordinate with the AUS project manager for additional requirements including hardware and signage mounted to the fence.

Fence Materials

Panels: Galvanized and powder coated mesh panels with ½" x 3" openings reinforced with four 2-inch deep horizontal "V" formations, two 70-degree flanges along the panel sides, and a 90-degree flange along the panel top and toe.

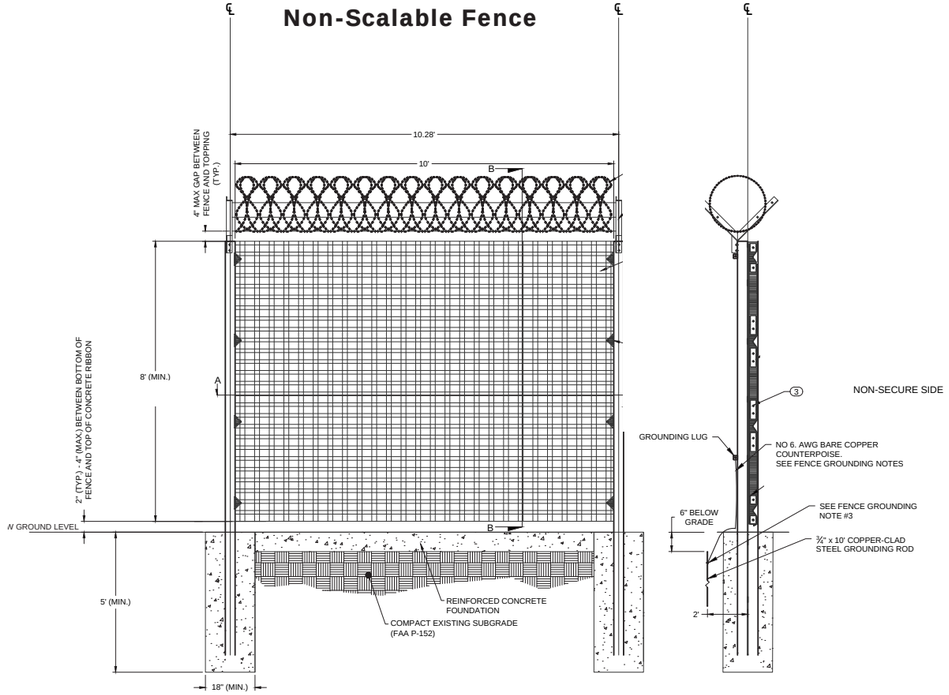
Posts: Galvanized and powder coated double taper locking posts with a UV stable polymer cap

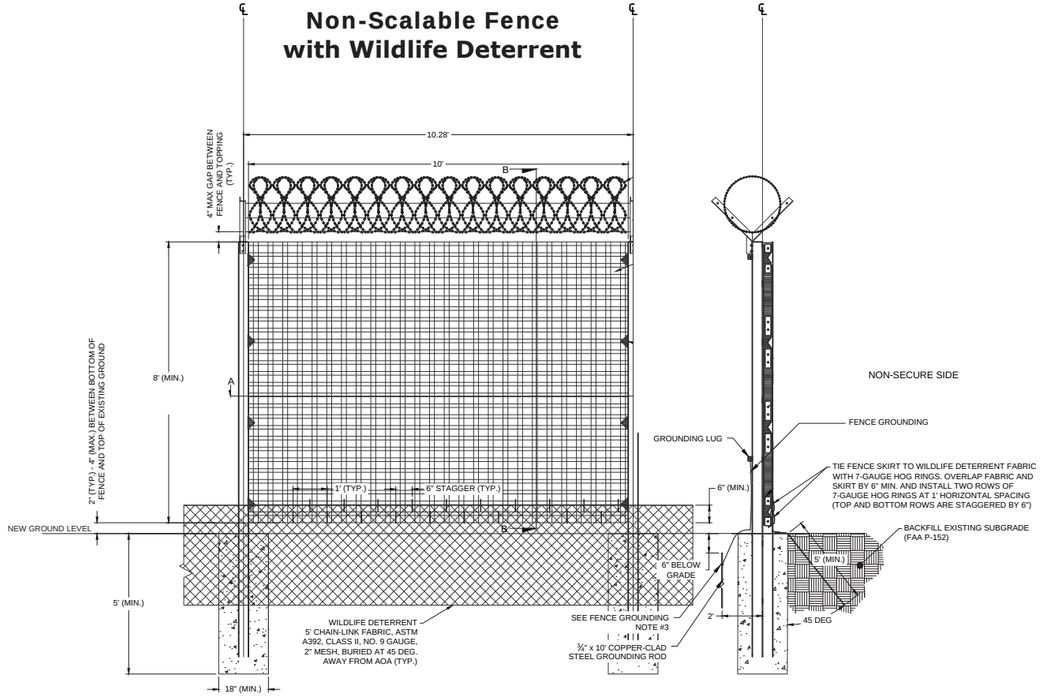
Clamps: Galvanized and powder coated comb type.

Anti-Scale Bracket: Galvanized and powder coated brackets at each "V" formation.

Topping: Galvanized 450mm diameter Ripper Coil (NATO 5660-99-371-1515)

Extension Bracket: Y-bracket extension for topping.





I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

B. Airside

De-Icing

Deicing operations are performed at the airline gates and at certain remain-over-night positions. It is anticipated that deicing operations will continue to take place at gate locations in a similar manner as new concourses are constructed. A trench drain collection system that receives all runoff from the gate areas is required around all current and future concourse gates. The runoff collected in these trench drains will be directed to existing or proposed de-icing/water quality ponds.

Fueling

All design and construction of jet fuel infrastructure shall conform to the latest edition of all federal, state, and local laws and regulations and industry standards. For any work requiring modifications to the Jet Fuel storage and distribution system, the proposed volume of storage of above ground tanks and below grade distribution should be provided to AUS to determine applicability of EPA Airport Hydrant UST System regulations, or change in regulatory status. Location siting, new designs or upgrades to existing, shall consider FAA clearances, site access, available utilities, security requirements, site topography and surface water drainage, subsurface conditions, environmental requirements including SPCC and NPDES requirements, and shall be coordinated with the AUS and authorities having jurisdiction. Review 40 CFR part 112 for general SPCC regulations/requirements.In addition to trucking fuel to gates, if the hydrant distribution is desired,it shall conform with B31.3, NFPA 407, NFPA 415 and be coordinated with aircraft parking plans to ensure necessary fueling operations are possible at each aircraft gate. System flow capacity shall be based upon a thorough analysis of current and future estimated enplanements, daily fuel consumption, and daily peak demand. Provisions for future expansion shall be included in the design. Positive isolation valves (API 6D DBB plug valves) shall be installed in valve vaults throughout the hydrant fueling system for maintenance, emergency operations, and leak detection. The number of high point vents (HPVs) and low point drains (LPDs) shall be minimized while meeting the pipe slope criteria (1% slope minimum desired), however, they shall be provided in sufficient number as to allow for proper draining and filling of the system as well as to allow periodic purging of air in HPVs and drainage of accumulated water, sediment, and debris in LPDs. Where possible, HPVs and LPDs shall be located within isolation valve pits (IVPs). When HPVs and LPDs cannot be installed in IVPs, provide individual or combination HPV/LPD pits. Hydrant Pits shall be complete with shutoff valve, hydrant pit valve, strainer, and piping accessories to be installed in a concrete pavement apron, suitable for interfacing the fixed fuel system components with the hydrant fueling vehicle. Pits shall be side entry. Body shall be one-piece molded fiberglass, with built-in concrete anchors.High point Vent and Low Point Drain Pits shall be molded prefabricated fiberglass construction complete with hinged aluminum access cover valves and piping.

Hydraulic and surge analysis of the aviation fueling system shall be performed using software specifically designed for modeling hydraulic steady state friction losses and transient surge pressures. The analyses shall simulate worst case scenarios to determine if emergency fuel shutoff (EFSO) or hydrant fueling valve closures can produce pressures exceeding allowable code and determine if surge suppression is required.Thermal expansion can cause excessive pressure buildup in the hydrant fueling system. Design shall consider the use of thermal relief valves for limiting the pressure of the piping in accordance with code requirements.The EFSO system shall be complete, functional, and shall also meet the requirements of the local Authority Having Jurisdiction. EFSO to include a Programmable Logic Controller (PLC) based monitoring and control system, utilizing addressable modules at the push button stations, to uniquely identify each station over common wiring. The jet fuel system to be monitored and controlled from, the “master” PLC at the west fuel storage facility. Local EFSO push buttons at the west fuel storage facility can shut down all the pumps, and thereby stop fuel delivery to the entire system. The EFSO system is intended to be reset, after it has been activated, from the master PLC at the fuel storage facility, after the cause of the initial activation has been investigated and cleared for restoration of fuel flow.Centrifugal pumps shall be API 610 latest edition construction. Impeller and shaft shall be 12% chrome steel overhung type, and all other materials of construction shall be per API-610 S-6 material classification. Mechanical seals shall conform to API Std. 682. Positive Displacement pumps shall be API 676 latest edition construction. All pumps shall be self-priming and be manufactured specifically for handling jet fuel or the medium being pumped. Pumps shall be complete with pump gear reduction, drive motor, coupling, mounting base, accessories, and all other parts and materials necessary for a complete installation. Pump casings shall be ductile iron with ASME Class 150 flanged side suction and top discharge piping connections.

Fueling (Continued)

The fuel piping shall meet the following requirements:

1. The system piping shall be ASME Class 150 pressure rating unless otherwise required for higher system working pressures

2. Changes in direction shall be accomplished with fittings

3. Pipe Diametera.Pipe 2 inches and smaller shall be seam-less Schedule 80b.Pipe 2-1/2 inches through 10 inches shall be Schedule 40 (Standard Weight)c.Pipe 12 inches or larger shall be 3/8-inch (0.375-inch) wall thickness (Standard Weight)

4. Shall be designed in accordance with ASME B31.3 Process Piping Code

5. Piping in contact with fuel shall be internally coated carbon steel as specified below or uncoated stainless-steel

6. Copper, zinc, cadmium, lead, and their alloys shall not be used in the system

7. Galvanized piping and fittings shall not be used in the system

8. System pipe shall be ASTM 53 Grade B, ASTM A106 Grade B, or API 5L Grade B

9. All piping shall be stamped with the specification and grade. If factory coated specification and grade shall be stenciled·Carbon steel piping 2-1/2 inches and larger shall be internally coated·Flang-es shall be forged weld neck type

To protect fuel quality and system integrity, fuel system corrosion shall be addressed with internal and external system coatings as well as cathodic protection where necessary. Specifications provided cannot cover all anticipated environmental conditions. The Design Professional shall be knowledgeable in the design and application of coating and cathodic protection systems in accordance with all applicable industry codes, standards, and best practices as applicable to the existing conditions.Testing of the underground fuel piping shall be accomplished with an automatic fixed or portable leak detection system. The leak detection system shall programmatically determine, through pressure sensing equipment, if a reduction of pressure is occurring in the isolated section of piping over a given period. The system shall have the ability to discriminate between changes in pressure due to thermal expansion and contraction or due to a leak over the given period. Both systems test piping by isolating piping sections with double block and bleed valves. The valves can be actuated by either motor operated or manually operated isolation valvesJet fuel system inspection, testing and flushing shall conform to ATA 103 and B31.3.

Revegetation

Landscaping elements on the AUS airfield should address erosion control, be low maintenance, ecologically sustainable and avoid the creation of habitat for birds or other wildlife. The landscaping criteria at AUS is intended to minimize wildlife hazards with particular emphasis on large birds, small mammals, and small birds that congregate into large flocks. In general, landscapes that provide food or shelter to these types of birds and small mammals is to be avoided. Design Consultants shall reference the latest AC 150/5200-33 – Hazardous Wildlife Attractants on or Near Airports (current edition) for additional design criteria and requirements. Add: and the AUS-specific Wildlife Hazard Management Plan Approved Plant List. Any proposed landscaping plan which relies on a species not specifically listed in the AUS-specific Wildlife Hazard Management Plan must be reviewed with AUS for consultation with the AUS Wildlife Coordinator.

In concert with wildlife management, Airport landscaping must be low-maintenance and environmentally sound. Specific guidelines for plant selection and location includes:

1. No trees of any kind are to be used anywhere within the AOA.

2. Plants native to the Southwest region of the United States are preferred.

3. Plants that minimize or eliminate fertilization, mowing, pest control, and irrigation are to be used whenever possible.

4. No evergreen shrubs are allowed. These species provide shelter, roosting and nesting sites for birds.

5. Shrubs and plants that produce wildlife edible fruit and seeds or provide palatable forage for grazing animals are not allowed. Non-fruiting or male plants of a given species may be allowed in some cases, subject to approval by the AUS.

6. Mass plantings of shrubs or hedge rows are not allowed.

7. All Airport safety and security protocols related to the placement of landscape features must be adhered to in all cases including the preservation of sight lines for the security perimeter or other security-sensitive areas and the line-of-sight for the air traffic control towers and runway approaches.

8. Separation of landscape elements from fence-lines or other physical barriers should be considered to not reduce the minimum effective height of the perimeter fence.

9. All landscape plans are to be submitted to and approved by AUS.

Low maintenance, drought-resistant turf grasses are to be used in place of traditional lawn/turf grass whenever possible at AUS. The list of acceptable turf grasses presented below is based on the criteria in the City of Austin Environmental Criteria Manual Appendix N Preferred Plant List (current edition):

1. Low or Slow Growing – Turf grass species are to grow at a rate that does not require excessive mowing.

2. Drought Tolerant – Turf grass species are to require no additional irrigation except during establishment. The species must be suitable to Austin's climate (USDA Zone 9) and precipitation ranges.

3. Non-Wildlife Attracting – Turf grass species are to be unattractive to wildlife either due to low palatability of the vegetation or through low seed production although the latter can be mitigated through mowing. Clover (Trifolium sp.) varieties are not acceptable.

Areas of the airfield that are within 600 feet of any runway or taxiway are to be planted only with acceptable turf grasses. Ornamental grasses are strictly prohibited. Mowing heights and frequencies are to be strictly enforced within these areas. All turf grass areas must be maintained at a height of 5 to 8 inches per FAA Wildlife Hazard Management at Airports (current edition). This recommended mowing height reduces the attraction of small birds while not promoting excessive cover for small mammals that may attract large birds.

I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

B. Airside

Revegetation (Continued)

Acceptable Turf Grasses

Botanical Name	Common Name	Features
Cynodon Dactylon	Bermuda	seed or hybrid sod
Bouteloua Gracilis	Blue Grama	native, seed, fine-leaf tufted grass, good meadow grass, not for mowed lawns
Buchloe Dactyloides	Buffalograss	native, many seed varieties, sod available in '609' and Prairie hybrids
Schizahyrium Scoparium	Little Bluestem	native, seed, blue-green, fine texture, not for mowed lawns
BouteloуaCurtipendula	Side Oats Gramma	native, seed, not for mowed lawns

Seed Mixes Readily available agency-specified seed mixtures are to be used whenever possible. It is recommended that seed mixtures consist of a variety of acceptable turf grass species that promote diversity and thereby minimize susceptibility to disease and promote a longer growing season by utilizing complimentary cool-season and warm-season grass species where possible. An annual nurse crop may be added to the seed mix to aid establishment of the turf. Seed mixes that will be allowed for use at AUS include those provided by the City of Austin Standard Specifications Manual – Environmental Enhancement (current edition).

Botanical Name	Common Name	Recommended Application Rate • lbs / ac (kg/ha)
Buchloe Dactyloides	Buffalograss	24.0 (27.0)
Bouteloua Gracilis	Blue Grama	10.0 (11.2)
Leptochioa Dubia	Green Sprangletop	2.0 (2.2)
Sporoboius Cryptandrus	Sand Dropseed	1.0 (1.1)
Pleuraphis Jamesii	Galleta	10.0 (11.2)
Elymus Canadensis	Canada Wild Rye	10.0 (11.2)
Aristida Pururea	Purple Threeawn	4.0 (4.5)
Bouteloua Curtipendula	Side Oats Gramma	7.0 (7.8)

I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

C. Landside

Landside civil elements must follow the requirements of these standards. Designs should align with the most recent Texas Department of Transportation, City of Austin, FAA, and other applicable codes and design guidelines as directed.

Austin-Bergstrom International Airport

I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

C. Landside

Primary Public Roadways

This section relates to all non-airfield projects. Roadways on airport property are owned and maintained by AUS (unless specifically defined otherwise). Right-of-way or easements are not required for airport owned roads.

Design Criteria

The latest edition of the Texas Department of Transportation (TxDOT) Highway Design Section Operations and Procedures Manual shall be used for basic design criteria and geometry for roadways. Any deviation must be approved by the Department of Aviation. Where conditions require features that are not covered by this standard, the design shall be based on the use of good engineering practice utilizing similar designs to other City of Austin installations.

Design Speed

The proposed design speeds for a roadway shall be based on the safe speed that can be maintained over a section of roadway based on terrain, site distance, geometry, etc. Selected design speeds will be presented to AUS for review and approval prior to final design. Design criteria shall be based on the approved design speeds.

Design Vehicles

The physical and operating characteristics of the proposed design vehicles shall establish roadway design controls to accommodate the vehicle of that type. New projects shall be designed to meet the minimum requirements set forth for WB-50 design vehicles, unless otherwise approved by AUS. Fire fighting and emergency vehicles shall be accounted for in the design.

Lane Width

The minimum standard lane width shall be 12 feet unless approved otherwise by AUS.

Materials & Construction Specifications

Construction specifications for roadways shall be taken from the City of Austin's current standard specifications. Based on the specific needs of the project, the Engineer may amend the standard specifications or use of TxDOT standard specifications with approval of AUS.

Roadway Signs and Markings

The design of signage and markings for roadways shall be in accordance with the latest version of the Texas Manual for Uniform Traffic Control Devices. The signage details and requirements will conform to TxDOT standards. Wayfinding signage on the AUS campus shall conform to current standards and guidance provided by AUS.

Pavement Section

The design of roadway pavement sections outside of the airfield shall be based on the latest edition of TxDOT standards. Geotechnical investigations are required for the specific roadway location to determine the proposed pavement section. The Engineer shall submit the planned geotechnical boring locations/spacing for a project to AUS for approval prior to commencing the investigation.

Non-Revenue Parking Lots

All design work should align with accepted professional practices and comply with applicable codes, standards, and regulations.

Design Criteria

For parking areas at non-revenue generating parking lots (at support buildings, etc.) to be used by airport employees and non-traveling public, the parking requirements, including electric vehicle charging requirements, shall meet the current requirements of the City of Austin codes and ordinances. The overall number of spaces, the required number of Texas Accessibility Standard (TAS) accessible parking spaces, and the geometry/layout of the parking area shall meet the current City of Austin codes, ordinances, and standard details. However, AUS standard 9' by 18' parking spaces should be designed to allow access for passengers and baggage. Pedestrian traffic flow shall be considered to provide access to buildings, avoid conflicts with traffic, and other hazardous conditions.

Materials & Construction Specifications

Construction specifications for parking lots shall be taken from the City of Austin's current standard specifications. Based on the specific needs of the project, the Engineer may amend the standard specifications or use of TxDOT standard specifications with approval of AUS.

Signs and Markings

The design of signage and markings for parking lots shall be in accordance with the latest version of the Texas Manual for Uniform Traffic Control Devices. The signage details and requirements will conform to TxDOT standards. Wayfinding signage on the AUS campus shall conform to current standards and guidance provided by AUS. Parking lot signage color and text should align.

Pavement Section

The design of parking lot pavement sections outside of the airfield shall be based on the latest edition of TxDOT standards. Geotechnical investigations are required for the specific location to determine the proposed pavement section. The Engineer shall submit the planned geotechnical boring locations/spacing for a project to AUS for approval prior to commencing the investigation.

Security

The current AUS standards for fencing, access terminals, gate arms, etc. shall be used for all access-controlled parking garages and lots. AUS operated parking garages and lots must have adequate lighting to provide pedestrian safety and to discourage unlawful activities. The majority of available parking areas, vehicle access/exit routes, and areas where people congregate (such as shuttle bus stops) should be monitored by CCTV. Parking garage and lot entrances should provide space for posting airport operator required signage (such as federal face mask mandates, etc.). Additional safety requirements can be found here:

https://www.austintexas.gov/sites/default/files/images/Airport/business/Construction_Design_Resources/Airport_Security_Construction_Requirements_01555.pdf

Revenue Generating Parking Lots

The goal of passenger parking facilities shall be to provide safe and efficient facilities that meet passenger demands. Passenger parking lots shall be implemented with effective layouts that optimize the efficiencies of the limited space and overall operation of the on-site parking at AUS. Considerations shall be made for the flow of traffic in/out of the facility, efficient routes for shuttle bus stops, and provision of pedestrian routes for passengers.

Parking Layout

Below are the standard criteria for parking lot layouts. Designer shall verify that these standards are appropriate for the safe and efficient movement of the design passenger vehicles and shuttle busses (if applicable) for the proposed facility. Drive aisles shall be two-way unless approved otherwise by AUS. Deviations from the standards shall be approved by AUS.

- Stall Angle: 90-degree
- Stall Width: 9 feet
- Stall Depth: 18 feet
- Aisle Width: 25 feet
- Aisle Length: 25 spaces maximum
- End and Landscape Islands:
  Determined on a project by project basis

Entry / Exit Lanes

Entry and exit lanes shall be a minimum of 10-feet clear between curbed islands with all parking revenue control equipment mounted on 6-inch high curbed islands. All entry lanes and equipment shall be protected by appropriate barriers or embedded bollards. The width of the curbed islands shall be 5 feet minimum, but shall be determined based on current revenue control equipment dimensions and operation.

Automatic drop-arm gates shall be installed at all entry and exit stations. Provide appropriate cueing depths at the entry and exit lanes.

Circulation

Separately located entry and exit plazas are preferred with the design considering overall circulation in an efficient manner that limits conflicting traffic movements. The exit of passenger parking facilities should allow for recirculation to the terminal curb for passenger pickup.

Pedestrian Access

Pedestrians will generally utilize the parking aisles to access the nearest shuttle bus stop or sidewalk. If shuttle service is not provided or pedestrian access is meant to be provided to terminal or other facilities, sidewalks and striped walkways shall be installed. These walkways shall be a minimum of 8-feet wide. Striped walkways on parking lot pavement shall be striped and clearly marked. Where pedestrian paths intersect with vehicular traffic at an uncontrolled intersection, markings and signage shall indicate that pedestrians have the right-of-way at all times. Walkways, sidewalks, curb cuts, and pedestrian ramps shall meet the accessibility requirements of the Texas Accessibility Standards.

Pavement Section

The design of parking lot pavement sections outside of the airfield shall be based on the latest edition of TxDOT standards. Geotechnical investigations are required for the specific location to determine the proposed pavement section. The Engineer shall submit the planned geotechnical boring locations/spacing for a project to AUS for approval prior to commencing the investigation.

Signs and Markings

The design of signage and markings for parking lots shall be in accordance with the latest version of the Texas Manual for Uniform Traffic Control Devices. The signage details and requirements will conform to TxDOT standards. Wayfinding signage on the AUS campus shall conform to current wayfinding standards and guidance provided by AUS. Parking lot signage color and text should align.

Height Clearance

For parking lots in which vehicles encounter height limitations at the entrance, exit, or within the facility (canopies, etc.), the appropriate height clearance shall be posted at the entrance lanes to limit over-height vehicles from entering. On a project by project basis, height limiting overhead bars shall be included at the entrance lanes.

Security

The current AUS standards for fencing, access terminals, gate arms, etc. shall be used for all access-controlled parking garages and lots. AUS operated parking garages and lots must have adequate lighting to provide pedestrian safety and to discourage unlawful activities. The majority of available parking areas, vehicle access/exit routes, and areas where people congregate (such as shuttle bus stops) should be monitored by CCTV. Parking garage and lot entrances should provide space for posting airport operator required signage (such as federal face mask mandates, etc.). Additional safety requirements can be found here:

https://www.austintexas.gov/sites/default/files/images/Airport/business/Construction_Design_Resources/Airport_Security_Construction_Requirements_01555.pdf

Sidewalks and Trails

Sidewalks

Pedestrian concrete walks shall be constructed between buildings and other essential locations, and in locations directed by AUS for pedestrian connectivity on the campus. The minimum width for sidewalk pavement shall be 5-feet, although the width will be based on the location, use, and the interconnectivity with other pedestrian facilities. Standard details and specifications shall be per current City of Austin standards. Sidewalks, curb cuts, and pedestrian ramps shall meet the accessibility requirements of the Texas Accessibility Standards.

Trails

Where directed by AUS, trails on the airport campus shall be provided. Trails shall generally be constructed of a crushed granite surface with a crushed limestone base material. The section will be determined based on the geotechnical recommendations for the project. The width of the trail shall be as directed by AUS.

I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

C. Landside

Irrigation and Landscaping

Careful consideration should be given to provide aesthetically pleasing landscaping while keeping aviation safety in mind. The primary goal of airport landscape management should be to reduce attracting wildlife species that interfere with safe aviation activities and eliminate the vertical intrusion of vegetation into aircraft operating airspace. To reduce potential wildlife issues with safe aircraft operations, the FAA has issued several Advisory Circulars. All FAA Part 139 certificated airports or airports that receive federal funding must adhere to these Advisory Circulars.

FAA AC 150/5200-33 provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public-use airports. Section 2-8 of this AC states: “There may be circumstances where two (or more) different land uses that would not, by themselves, be considered hazardous wildlife attractants…are in such an alignment with the airport as to create a wildlife corridor directly through the airport and/or surrounding airspace…therefore, airport operators and the wildlife damage management biologist must consider the entire surrounding landscape and community.”

Additionally, the 2005 Wildlife Hazard Management at Airports Manual, written jointly by the FAA and USDA states: “Do not use trees and other landscaping plants for the street side of airports that produce fruits or seeds attractive to birds. Avoid plants that produce fruits and seeds desired by birds. Also avoid the creation of areas of dense cover for roosting, especially by European starlings and blackbirds. Thinning the canopy of trees, or selectively removing trees to increase their spacing, can help eliminate bird roosts that form in trees on airports.”

Vegetation should be utilized for both aesthetics while also creating thermally controlled areas for passengers in waiting areas and circulation areas.

Landscaping should be incorporated into any design adjacent to Presidential Boulevard or any other public area or road, and a landscape study will be required. Landscaping and trees shall be incorporated within any workspace whenever conditions permit so. Shrubs may be planted adjacent to each other in groups of up to five. If there is more than one group of shrubs, there must be at least 10 feet between each group. If shrubs are not planted in groups, there must be at least 10 feet between each shrub. However, to address security concerns as well as vertical structure and wildlife hazards, no shrubs will be allowed within 10 feet from any airfield perimeter fence. Each design must provide an approved list of trees, shrubs, and ground cover for vegetation.

Trees can also be used in conjunction with canopies at open parking areas to provide additional shaded areas.

Preservation of heritage trees on the AUS campus must be prioritized. Proposals to remove any tree resources must be requested through the AUS Project Manager and justification for the removal must be presented.

Existing heritage trees are protected by the Environmental Criteria Manual. Prior to site development, a Tree Inventory Report, which identifies the various Critical Root Zones (CRZ) must be completed. The following construction activities impact the CRZ and must be reported in the Tree Inventory Report:

- Digging, trenching, or excavating
- Soil compaction
- Grade changes
- Chemical exposure or spills

Construction activities in the CRZ are limited as follows:

- Quarter CRZ: No cut or fill is allowed
- Half CRZ: Cut or fill must be limited to 4 inches
- Full CRZ: No less than 50% of the area must be preserved at natural grade with natural ground cover

Revegetation

Refer to Revegetation in Airside Civil

I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

D. Buildings

Building improvements and new construction designs should consider the following criteria. Passenger and guest comfort and safety should be prioritized throughout the design of all projects at AUS.

Additionally, the AUS vision and mission should be emphasized in all buildings on the AUS campus. Designers should consider the balance between fiscal responsibility and longevity of building materials.

I. EXTERIOR IMPROVEMENT AND DEVELOPMENT

D. Buildings

Holistic Campus Approach

The AUS experience begins long before arriving to the terminal: It begins at Presidential Boulevard upon exiting Bastrop Highway. Therefore, it is important to provide a holistic approach to the AUS experience and user perception by studying the impact and carefully planning of the location of any building or construction.

Landscaping and airport approach concepts must connect the airport to Austin's lifestyle. The following is not intended to be an exhaustive list of design principles and may not apply to every project at AUS. However, Designers should consider these and other concepts while developing new projects.

- Renovate and improve existing pathways and create new pathways that form a functional network connecting the airport terminal with parking garages, hotels, and other campus amenities.
- Art in Public Places (AIPP) should be considered in this holistic design by improving the integration of the existing art program and proposing new programs that will contribute to the whole AUS passenger experience.
- Lighting along Presidential Boulevard should create a holistic, on campus feature.
- Create a welcoming art and/or landscaping feature along Presidential Boulevard.

Noise Intrusion

Exterior Envelope

The exterior envelope of all buildings at AUS should be designed to provide occupant comfort and safety. The building envelop should serve to reduce harsh airport noises, particularly from aircraft.

Building Envelope

The building envelope, which includes floors, roofs, and walls, has a significant impact on the overall building, energy consumption, and occupant health, safety, and welfare. Because the building envelope is difficult to repair, special care must be taken to ensure it is designed and constructed properly. The central function of the building envelope is to provide a barrier between the exterior space and the interior, conditioned space by providing energy conservation, water/vapor control, air control, sound control, pest control, fire safety, and security. Because of this important function, it is critical the ensure continuity of the building envelope. During building repairs and modifications, the building envelope must remain continuous during construction and must be repaired to a continuous state when construction is complete.

Passenger Facing Buildings

Passenger facing and public buildings on the AUS campus must adhere to the standards and principles identified in this Design Standards Manual.Non-Passenger Facing Buildings

Non-Passenger Facing Buildings

All non-passenger facing buildings should function well, should serve employees needs and safety and provide a pleasant work environment, and should maintain consistency throughout the AUS campus To achieve this goal, the building envelope should:

- Provide shaded spaces inside and outside for comfort and climate control.
- Provide a façade that reduces glare for airfield operation.
- Provide a durable and easy to maintain façade.
- Provide a façade that inspires quality and beauty upon passengers and airport users.
- Provide sustainable envelope solutions such as solar panels and rainwater collection which must comply with all codes and ordinances including FAA Circulars.

All building facades should be consistent and complementary to the established campus-wide look and feel.

Building Envelope Composition

Transparent Portions

Transparent walls should be as clear as possible and should avoid heavily tinted or mirrored glass panels. Curtain wall mullions should be neutral colored anodized aluminum.Translucent panel glass (Low-iron channel glass) is also permitted. Solar glare study should be considered at all equipment.

Shading Devices

Solar protective devices may be mounted on the exterior of transparent walls to provide the most effective reduction of energy input through translucent layers. Louvers oriented in accordance with the façade orientation (Horizontal to the south, vertical on east and west) are preferred.

Opaque Portions

The following aspects should be considered for opaque portions of the building envelope. This list is not in order of importance:

- Variations of design while maintaining a campus-wide approach
- Insulation
- Easy replacement and maintenance of elements
- Light and color fast
- Graffiti resistance
- Reduce package waste during construction
- Easily recyclable materials
- Self-cleaning treatments
- Air purifying material treatments
- Long life span material
- Fire safety
- Lightning protection
- Noise control

D. Buildings

Building Envelope Composition (Continued)

Opaque Portions (Continued)

Public facing building envelopes should consist of one or more of the following preferred materials:

- Rear-ventilated ceramic façade solutions for thermal optimization and for better maintenance.
- Rear-ventilated stone façade solutions.
- Rear-ventilated aluminum panels.
- Engineered stone.
- Opaque glass panel solutions.
- Natural or colored, glass fiber reinforced concrete panels.
- Standard Precast concrete panels.
- Glazing

These materials are also acceptable while less preferred:

- Metal panel solutions
- Composite metal panel systems.

These materials should not be used as part of the public facing portion of the building envelope:

- Load-Bearing Concrete Walls.
- CMU Walls
- Ventilated Or Semi Opaque Wall Materials

Combination and Proportions

Opaque portions of the façade should combine matte and earthy finishes with polished or glazed contrast colors.Ratios of materials and finishes should be coordinated between the Designer and the AUS Project Manager.

Matte Earthy Or Natural Finishes

- Stone
- Solid Surfaces

Polished Or Glazed Finishes

- Ceramic
- Metal

Restrictions

- Metal panels must not contact the grade, surrounding landscaping, or paving.

Exterior Lighting

Exterior lighting requirements for buildings at AUS are based on the following standards:

- City of Austin – Code of Ordinances: Title 25.2 – Zoning, Chapter E, Article 2, Section 2.5: Exterior Lighting
- The IES Lighting Handbook, 10th Edition
- IES RP-8 (Parking Lots Only)
- IES RP-37-22: Lighting Airport Outdoor Environments
- IES RP-43-22: Lighting Exterior Applications

Fully shielded or full cut-off luminaires are required for parking lots, yard lighting, building exterior lighting, and building façade lighting. LED luminaires shall be used. Lighting calculations on all exterior areas should be conducted using AGI32, the industry standard software for lighting system design. Acceptable lighting manufacturers must have been in the business of manufacturing exterior lighting and lighting control products for a minimum of ten years. Fixtures must be wet location approved.

Lighting levels, uniformity ratios, and veiling luminance levels must meet the recommendations provided in the IES Lighting Handbook, 10th Edition and IES RP-43-22. Reduction in light pollution, glare, and spillover must meet the practices described in IES RP-37-22. Luminaires must be oriented away from the taxiways wherever possible.

Area Classifications	Pertinent Standard	Average Illuminance (fc)	Max/Min Ratio	Avg./Min. Ratio
Building Entries (Canopied, Secured/ Normally Locked)	IES Lighting Handbook, 10th Edition, Section 26	2	4:1	2:1
Building Entries (Uncovered, Secured/ Normally Locked)	IES Lighting Handbook, 10th Edition, Section 26	1	4:1	2:1
Building Façade Lighting (Dark Walls)	IES Lighting Handbook, 10th Edition, Section 26	10	NA	NA
Building Façade Lighting (Light Walls)	IES Lighting Handbook, 10th Edition, Section 26	20	NA	NA
Exterior Lighting (Areas with Electrical Switching Equipment)	IES RP-37-20, Table A-1 for Outdoor Electrical	2	NA	4:1
Parking Lot Lighting (Parking Area & Drive Aisles)	RP-8-21, Table 17-2	0.2	0.2	NA
Parking Lot Lighting (Transition Areas)	RP-8-21, Table 17-2	1	1	NA

An in-depth analysis of the exterior area should be conducted as design progresses to determine the various exterior areas. Based on this analysis, the most applicable area classifications will be used to determine recommended light levels and uniformity. The light levels shown in Table 26.4 of the IES Lighting Handbook, 10th Edition can be used to determine the required lighting levels in and around each AUS building. For example, a building with the exterior classified as a LZ4 area will be lighted as shown in the following table.

II. INTERIOR IMPROVEMENTS - PUBLIC

The AUS GUIDING PRINCIPLES, MISSION, STRATEGIC OBJECTIVES, and VISION should be considered in the design of all spaces, finishes, furniture, equipment, and systems. The following design requirements are intended to be a minimum standard related to all interior public spaces at AUS. These standards should be considered along with the standards described in the "DESIGN PRINCIPLES" and "TECHNICAL DESIGN STANDARDS" sections of this design standards manual. Designers should strive to follow these minimum standards to provide interior spaces that provide safe, comfortable, and functional spaces for AUS travelers, employees, and tenants. Materials used in interior public spaces should be durable, easily maintained, and cleanable. All materials and products must be approved by the AUS Project Manager.

II. INTERIOR IMPROVEMENTS - PUBLIC

A. Entry Vestibules

Entry Vestibules are the first space passengers and visitors will experience. Designers should consider the heavy traffic, weather, and extreme temperature exposure when selecting materials to be used in Entry Vestibules. Entry Vestibules are a key factor in an excellent passenger experience. Materials used in the Entry Vestibules should align with the Passenger Terminal Areas. Additional considerations are listed below.

Flooring

Walk-Off Mats

- Recessed Aluminum Grille Type

Doors

Vestibule doors should be automatic glass sliding type with emergency breakaway features. The designer should calculate the door width to accommodate the anticipated occupant loads and egress calculations. Vestibules should be sized to place doors far enough apart to minimize building air changes.

Mechanical

Each entry/exit vestibule should be provided with air curtains with heating coils and independent controls and should be activated while the doors are open. All visible mechanical equipment must be coordinated with architectural features and aesthetics.

Plumbing

Piping and Accessories

- Floor drains should be located under recessed walk-off mats.
- Access panels should be provided in non-accessible ceilings and walls for valve access (Refer to “Access Panels” above)

Electrical

Each vestibule should have one duplex general purpose outlet.

Lighting

The lighting in entry vestibules must be powered by the life safety branch of the emergency power system of AUS. The lighting fixtures should align and coordinate with the ceiling type that the architectural interior team chooses and should be exterior grade fixtures. If a lay in ceiling is provided, it is recommended that an architectural indirect LED troffer type fixture or a direct linear slot fixture be selected. The fixtures that are chosen should be coordinated in length and width dimensions for the ceiling grid. If the entry vestibule is open to structure space, the lighting designer may choose to implement pendant lighting mounted from the structure or wall-mounted lighting. Wall-mounted lighting fixtures should be placed out of reach of pedestrians. The lighting designer should also design the placement of the fixtures so that the fixtures are easily accessible to be maintained. Fixtures should be installed in locations and spotted to ensure that the safety of the public and the AUS staff is considered during the time that the fixtures will need to be serviced and the possibility of an emergency egress. Entry vestibules of the terminal should accommodate illumination levels for automated intelligence security screening and monitoring and shall not be less than 20 footcandles on the horizontal plane and 10 footcandles on the vertical plane. The lighting fixtures in the vestibule should be connected to the Facility Building Management System, be UL 924 compliant, and respond to both occupancy and daylight.

Life Safety

Life safety systems within entry vestibules should be provided and must comply with the applicable edition of the International Building Code (IBC) and the International Fire Code (IFC), with City of Austin amendments, and all referenced codes and standards. Life safety systems are expected to include, but are not limited to, means of egress systems (I.e., quantity and capacity of exits), passive fire protection (I.e., fire barriers and opening protection), fire protection systems (I.e., automatic sprinkler, standpipe, and fire pump), fire alarm systems and portable fire extinguishers. Each life safety system must comply with the requirements of the applicable code or standard.

IT and Security

AUS systems must follow the AUS Information Technology Design Standards Manual and the Division 27 and 28 specifications. Coordinate IT systems and telecom requirements with AUS. The following space specific system standards shall be adhered to by the designer:

Wireless And Radio System

- Wi-Fi: This space should have both Admin and Public Wi-Fi coverage ensuring proper bandwidth.
- DAS Radio: Public Safety DAS should be made available in all areas of the building as per NFPA 1221 code and must comply with the local AHJ (Authority Having Jurisdiction) guidelines for coverage requirements.
- DAS Cell: Carrier's cellular coverage should be made available throughout the public areas in the airport.

VMS (CCTV)

- Entry vestibule area must be provided with ‘identification’ type video coverage of people entering the vestibule.

Operational Airport Systems

- Electronic Visual Information Display (EVIDS): EVIDS displays must be provided along the path of travel from Entry Vestibules for displaying flight information and other information as per Airport operations requirements. Size, exact location and placement of displays must ensure best visibility to travelers and mounting enclosures and arrangements of displays shall be in coordination with Architects and AUS IS.
- Dynamic Signage: All static signage at entry vestibules should be reviewed for potential replacement with dynamic signage. Coordinate with Architect and AUS IS.
- Overhead Paging system: Paging system consisting of speakers suitable for space to be provisioned.
- Visual Paging: Visual paging shall be provided in all areas where both EVIDS and Overhead Paging are provided.

II. INTERIOR IMPROVEMENTS - PUBLIC

B. Passenger Terminal and Concourse Areas

As one of a passenger's first impressions of AUS, the Passenger Terminal Areas must set the tone for a positive experience and should embrace the AUS vision and sense of place. Passenger Terminal Areas include departing passenger check-in / processing and arriving passenger meeting areas as well as the associated circulation space.

Passenger Concourse Areas provide circulation space between Security Screening Areas, Holdrooms, and post-security concessions and passenger amenities. This space also provides connecting passenger movement from gate-to-gate. Careful consideration should be given to ensure these spaces induce a positive and stress reducing passenger experience by providing sufficient space, maximizing natural light and views to the outside, clear signage and wayfinding, and pleasing finishes.

Highly durable, abuse-resistant, low maintenance materials should be considered in all public Passenger Terminal and Concourse Areas.

Flooring

Note: All flooring selections must consider passenger roller bag and cart ease of use and noise.

- Terrazzo
- Terrazzo Tile
- Large-Format or Panel, Rectified Porcelain Tile, Thru-Body Color
- Stone
- Carpet Tile (avoid in circulation areas)

The following materials are prohibited:

- Wood
- Ceramic Tile
- Exposed Concrete (including polished)
- Vinyl Composite Tile (VCT)

Walls

Wall materials below 8' AFF should be highly durable, easily cleanable, and impact resistant

- Wall Panel Systems
  - Flush Wood
  - Cork
  - Formed Metal
  - Stone
  - Resin/Plastic
- Thru-Body Tile
- Fiber Cement Panels
- Ultracompact Surface Material
- Vinyl Wall Covering
- Gypsum Board, Painted, MPI Gloss Level 4 (at non-contact areas greater than 8 feet above finished floor only)
- Aluminum framed interior storefront system
- All-glass interior storefront system

Column Treatment

- Pre-formed Metal Column Covers
- Decorative Steel

Wall Base

Dark colored materials should be prioritized for maintenance consideration

- 12" minimum base height, flush with face of wall or recessed
- Integral terrazzo wall base with aluminum cap
- Stainless Steel, 16 ga. Minimum, with backing board
- Ultracompact Surface Material
- Solid Surface Material

The following materials are prohibited:

- Rubber
- Vinyl
- Wood
- MDF

Corner Guards

- Full Wall Height or align with wall lines but not less than 8' AFF.
- Stainless Steel
- Aluminum

The following materials are prohibited:

- Rubber
- Vinyl
- Wood
- MDF

Ceilings

- Gypsum Board, Painted, MPI Gloss Level 1
- Acoustic Metal Ceiling Panels
- Textile Ceilings
- Linear metal ceilings
- Linear wooden ceilings
- Open to Structure (with the appropriate services coordination)

II. INTERIOR IMPROVEMENTS - PUBLIC

B. Passenger Terminal and Concourse Areas

Access Panels

- Flush type with drywall bead;
  painted to match adjacent surfaces

Expansion Control

- Expansion joint covers that minimally affect the look of the space
- Maintain assembly separation requirements

Floor

Floor expansion joint covers must be flush with surrounding finish

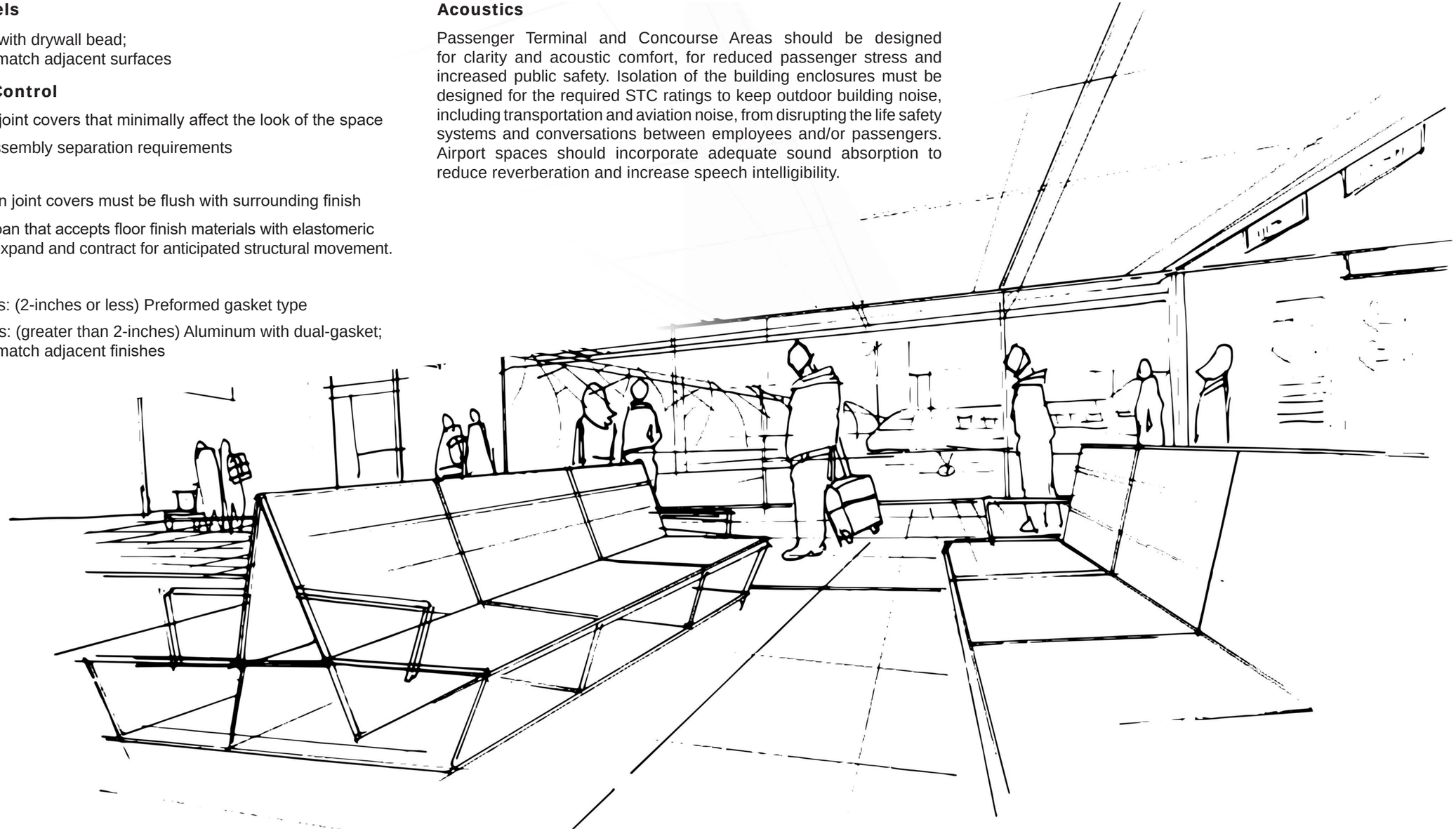
- Recessed pan that accepts floor finish materials with elastomeric joints that expand and contract for anticipated structural movement.

Wall/Ceiling

- Small Joints: (2-inches or less) Preformed gasket type
- Large Joints: (greater than 2-inches) Aluminum with dual-gasket; painted to match adjacent finishes

Acoustics

Passenger Terminal and Concourse Areas should be designed for clarity and acoustic comfort, for reduced passenger stress and increased public safety. Isolation of the building enclosures must be designed for the required STC ratings to keep outdoor building noise, including transportation and aviation noise, from disrupting the life safety systems and conversations between employees and/or passengers. Airport spaces should incorporate adequate sound absorption to reduce reverberation and increase speech intelligibility.



II. INTERIOR IMPROVEMENTS - PUBLIC

B. Passenger Terminal and Concourse Areas

Mechanical

In order to maximize the AUS way and passenger experience, air distribution systems must comply with ASHRAE acoustical requirements for Passenger Terminal and Concourse areas and spaces should have independent temperature controls. Air devices should distribute conditioned air accordingly throughout the space and should address thermal comfort factors according to ASHRAE 55. All visible mechanical equipment must be coordinated with architectural features and aesthetics. Ventilation air, according to the latest version of ASHRAE 62.1 and City of Austin (COA) Amendments requirements, must be provided from the roof or land side of the building. Ventilation air must not be provided from the air side of the building. Access panels should be provided for mechanical equipment located above inaccessible ceilings and walls.

Plumbing

Electric Water Coolers should include vandal-resistant bubblers, filters, and bottle filling stations. Include a cane skirt for TAS compliance on bi-level coolers if not recessed in an alcove.

Access panels should be provided in non-accessible ceilings and walls for valve access (Refer to “Access Panels” above).

Electrical

General purpose duplex receptacles should be located throughout spaces not more than 40 feet on center.

Lighting

The lighting systems in the passenger terminal and concourse areas should be designed to maximize the passenger experience, security, and safety. Lighting fixtures in the passenger terminal and concourse should be powered by the normal and emergency branches of the electrical power distribution system.Light fixtures should be coordinated to use lamp types consistent with AUS Maintenance recommendations Consideration should be given to vandal resistant fixtures or fixtures mounted out of reach of occupants to maintain security and emergency egress functions at all times. In addition, the passenger experience can be greatly enhanced by the lighting system. The designer should consider using this opportunity to incorporate creative selections of lighting fixtures. Permanent exposed structural features throughout the concourse and terminal, such as beams, should be highlighted with lighting fixtures. Architectural wall features, wall art murals, accent tile, stone or rock may be wall washed or glazed with light to enhance the feature and bring the colors, textures, and patterns to life. If any interior landscaping, water features, or trees are incorporated into the design, the lighting designer should locate fixtures to highlight the area, while also considering safety and serviceability.

Lighting controls throughout the concourse should be both daylighting and occupancy responsive in order to achieve the AUS sustainability goals. The lighting control system selected for the spaces should have a plug load control and be UL 924 compliant for egress purposes. The lighting control system shall be connected to the selected Building Management System and have the capability to be controlled remotely. The Designer should coordinate lighting controls with the AUS Project manager in order to select the AUS preferred system.

Illumination levels in the passenger terminal and concourse vary throughout according to the various space types in the facility and are minimally recommended as follows:

- In general, the recommended illumination levels for the concourse of an aviation terminal are 5 footcandles measured at the floor surface and 2 footcandles measured at 60” AFF on vertical surfaces.
- Escalators and moving walkways located in the concourse are also recommended at 5 footcandles measured at the floor and 2 footcandles measured vertically at 60” AFF.
- Elevators also have the same recommended target of 5 footcandles on the floor, however, the vertical target measured at both 36” AFF and 60” AFF is increased to 3 footcandles.
- At Flight Information Screens, the lighting designer will need to consider the sources of light around the area and target 30 footcandles on the horizontal plane and 15 on the vertical plane.
- In the gate areas, at the agent counter check-in it is recommended to achieve 30 footcandles at 36” AFF horizontally and 10 footcandles at 60” AFF.
- At the ticketing counter the recommended illumination levels are 30 footcandles at 36” AFF horizontally and 15 at 60” AFF at the counter
- At a service kiosk or queue the designer could achieve 20 footcandles at 36” AFF and 10 footcandles at 48” AFF.

Life Safety

Life safety systems within passenger terminal and concourse areas must be provided and must comply with the applicable edition of the International Building Code (IBC) and the International Fire Code (IFC), with City of Austin amendments, and all referenced codes and standards. Life safety systems are expected to include, but are not limited to, means of egress systems (I.e., quantity and capacity of exits), passive fire protection (I.e., fire barriers and opening protection), fire protection systems (I.e., automatic sprinkler, standpipe, and fire pump), fire alarm systems, and portable fire extinguishers. Each life safety system shall comply with the requirements of the applicable code or standard.

IT and Security

AUS systems shall follow the AUS Information Technology Design Standards Manual and the Division 27 and 28 specifications. Coordinate IT systems and telecom requirements with AUS. The following space specific system standards shall be adhered to by the designer for this space.

IT Network

Passenger Terminal areas must have data for kiosks, EVIDS, ticket counters, dynamic signage, Wi-Fi, carts, ATMs, security and safety systems, airline customer service areas, airline BSOs, and airline ticket offices (ATOs).

- Curbside check-in areas must include data for the following systems: Airline workstations and associated peripheral equipment.
- Ticket counter area and Airline Customer Service areas are high density cable areas and therefore special consideration of IDF room sizing and cable management features should be considered. Additionally, the ticketing IDF rooms placements should be planned in such a way to meet the horizontal cabling distance requirements while allowing interweaving of alternating ticket counter positions to physically separate IDFs.
- Passenger Terminal areas should include AUS networks as required to support devices.

II. INTERIOR IMPROVEMENTS - PUBLIC

B. Passenger Terminal and Concourse Areas

Wireless and Radio System

- Wi-Fi: This space should have both Admin and Public Wi-Fi coverage and must ensure proper bandwidth.
- DAS Radio: Public Safety DAS must be made available in all areas of the building as per NFPA 1221 code and must comply with the local AHJ guidelines for coverage requirements.
- Airline Radio: Ground staff must be able to communicate with the Airline Operations using available VHF Frequency radios. Provision radio rooms, pathway, and antenna mount locations as required.
- DAS Cell: Carrier's 4G/5G coverage must be made available throughout the public areas in the airport.

Security

- VMS (CCTV): All passenger terminal areas must provide a minimum of 'observation' level coverage. Additionally, SIDA boundaries and other critical security junctures must provide 'identification' level coverage. Additional areas must be reviewed with AUS Security to determine passenger areas requiring 'recognition' level coverage.
- Access Control system: ACS, intrusion detection, and intercom must be provided in passenger terminal areas per security guidelines and in coordination with AUS Security.
- Gunshot detection system are not in use at AUS and have not been identified as active shooter mitigation technology of preference. Should coordinate with AUS Operations, Security, and Information Systems to determine technology(ies) of choice.

Operational Airport Systems

- AODB:
  - The AODB must be the master interface between the following system sources: flight, baggage, and gate information within the terminal areas. In the future, in case of multiple AODB's operating at AUS a data hierarchy must be established. Database translators will need to be established between AODB's such that the is normalized to each source native scheme.
  - The AODB and/or RMS must be updated to support any new or alternated operational elements related to the ticket counter area, gate counters and loading doors, stands and RON parking, curbside baggage drop/check-in area, airline customer service and BSOs, baggage claim carousels, baggage make-up conveyors, changes in airline operations, and addition of EVIDS displays.
- RMS: Ticket counter, gate counter, loading bridge, and other airline common use counter workstations, common use counter associated displays, baggage claim carousels and displays, and baggage makeup conveyors and displays should be assigned by the RMS platform.
- CUPPS:
  - Coordination with the AUS and Airlines shall be conducted to determine if passenger ticketing, check-in, loading, BSO, and/or customer service counter will be common use or airline proprietary. The AUS CUPPS (SUPPS) platform will be utilized for common use counters.
  - Exact Ticket Counter CUPPS hardware and configuration should be coordinated with the AUS and airlines, but would typically include the following: a workstation per position with intelligent keyboard and credit card reader, passport reader and document reader, phone, boarding pass printer, bag tag printer, a document printer, paging microphone, and additional elements as requested by AUS and airlines.
  - Exact Gate Counter CUPPS hardware and configuration should be coordinated with the AUS and airlines, but would typically include the following: a workstation per position with intelligent keyboard and credit card reader, at least one phone, boarding pass printers, at least one bag tag printer, passport reader and document reader, a document printer, and additional elements as requested by AUS and airlines.
  - Exact Loading Bridge Counter CUPPS hardware and configuration should be coordinated with the AUS and airlines, but would typically include the following: at least one workstation with an intelligent keyboard, boarding pass printer, and at least one paging microphone. International gates shall require additional coordination and development. Coordination regarding self-boarding gates shall be conducted with AUS.
  - CUSS: Check-in areas should be reviewed for CUSS kiosk implementation for passenger check in without bags.
- EVIDS: EVIDS banks and displays should be provided at specific areas throughout passenger terminal to provide ease of locating displays, ease of viewing of information and to avoid passenger flow congestion. Ticket counter, back wall, and gate counter displays shall be provided. Size, exact location and placement of displays shall ensure best visibility to travelers and mounting enclosures and arrangements of displays shall be in coordination with Architects and AUS IS.
- Overhead Paging System: Paging system consisting of speakers suitable for space to be provisioned. Microphone Paging Stations should be provided at required customer service and airline positions.

Additional Airport Systems

- Parking and Revenue Control System: A parking validator or fare machines may be made available in certain Curb side areas.
- IPTV: IPTV provision for passenger terminal areas shall be made available for the public in wait areas.

II. INTERIOR IMPROVEMENTS - PUBLIC

C. Security Screening Checkpoint

Because all departing passengers pass through the Security Checkpoints, these spaces are critical to the overall passenger experience and impression of AUS. Designers should consider the high occupancy load, high-level durability, and passenger comfort (physical and mental) when selecting materials for the Security Checkpoints. Most importantly, Security Checkpoints must meet all the most current requirements of the Transportation Security Administration (TSA). The Designer must coordinate closely with the TSA (through the AUS Project Manager) to determine clear responsibilities between the TSA and AUS. Materials used in the Security Checkpoints should align with the Passenger Terminal and Concourse Areas. Additional considerations are listed below.

Mechanical

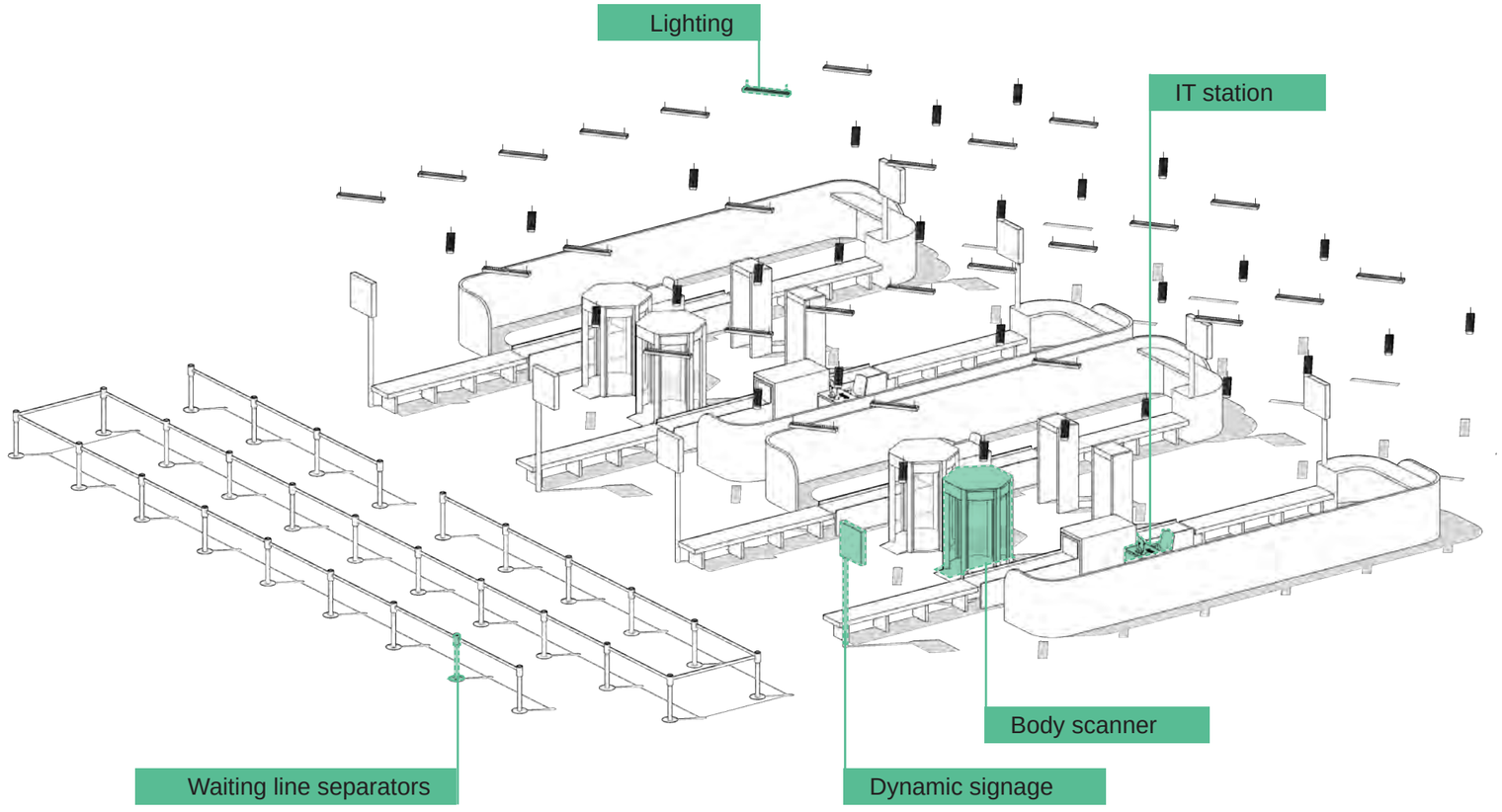
In order to maximize the AUS way and passenger experience, air distribution systems must comply with ASHRAE acoustical requirements for Security screening areas and spaces should have independent temperature controls. Air devices should distribute conditioned air accordingly throughout the space and should address thermal comfort factors according to ASHRAE 55. All visible mechanical equipment must be coordinated with architectural features and aesthetics. Ventilation air, according to the latest version of ASHRAE 62.1 and City of Austin (COA) Amendments requirements, must be provided from the roof or land side of the building. Ventilation air must not be provided from the air side of the building. Access panels should be provided for mechanical equipment located above inaccessible ceilings and walls.

Electrical

Provide power as required for screening/scanning equipment. Power should be fed from an uninterruptible power supply system.

Lighting

Lighting at the Security Screening Checkpoint is critical to the effective operation of the airport. The Designer must work closely with the TSA to ensure that proper lighting is supplied at each function at the Security Checkpoint. Circuits from more than one emergency lighting panelboard shall be extended to the lighting fixtures in the area and shall comply with the requirements set forth by TSA. Light fixtures must be carefully coordinated to minimize potential security risks caused by glare. The lighting fixtures shall respond to both occupancy sensors and daylight. The lighting control system shall report to the Facility Building Management System and be controlled remotely by AUS. The controls shall have plug-load control, meet UL 924 requirements and sense occupancy.



II. INTERIOR IMPROVEMENTS - PUBLIC

C. Security Screening Checkpoint

IT and Security

Security screen checkpoint technology shall include both AUS operational elements and TSA elements. TSA systems and telecom infrastructure at checkpoints shall follow TSA Planning Guidelines and Design Standards (PGDS). AUS systems shall follow the AUS Information Technology Design Standards Manual and the Division 27 and 28 specifications. Coordinate security screen checkpoint systems and telecomm requirements with AUS IT and Security and TSA. The following space specific system standards must be adhered to by the designer.

IT Network

- Passive Infrastructure: Data at TDC stations, AVS stations, X-Ray machines, CPSS stations. Refer to TSA's latest Security Guidelines for Airport Planning Design and Construction for additional area details including for CBRA and CBIS areas. Additionally, passive infrastructure shall be provided for AUS systems listed below.
- Active network: Security screen check points shall include both AUS networks and TSA networks (by TSA). TSA devices shall be routed to TSA IDFs while AUS devices shall be routed to AUS IDFs and LAN switches.

Wireless And Radio System

- Wi-Fi: This area may include public Wi-Fi and will include admin Wi-Fi coverage ensuring proper bandwidth.
- DAS Radio: Public Safety DAS shall be made available in all areas of the building as per NFPA 1221 code and must comply with the local AHJ (Authority Having Jurisdiction) guidelines for coverage requirements.
- DAS Cell: Carrier's 4G/5G coverage should be made available throughout the public areas in the airport.

Security

- VMS (CCTV): The area shall have CCTV coverage at ‘recognition’ level with ‘identification’ level at TDC stations.
- ACS: The area will be provided with access control for the roll-up doors in and out of the security checkpoints and any doors leading to non-public areas as required. Duress alarms will be provided as directed by TSA. Checkpoint exit will be provided with flow control and access control.
- Coordinate additional security requirements with TSA and AUS Security and IT.

Operational Airport Systems

- AODB: AODB shall be updated to support any new operational elements related to the checkpoint area as required.
- EVIDS: Displays shall be provided at easily accessible points upon exiting the security checkpoint. The displays shall be placed so as to not create congestion or bottleneck to passenger flow. Flight displays will be placed were easily visible to travelers exiting the security check point into the secure areas. Additionally, baggage information displays should be considered at a convenient location for passengers as they leave the security checkpoint and move toward the baggage claim area.
- Dynamic Signage: Dynamic display needs and requirements shall be coordinated with TSA and AUS to service the security queue area and exit. Displays providing informational content, directional information, and other notices shall be placed to ensure ease of management of passenger screening process and flow at the security checkpoint. All static signage should be reviewed for potential replacement with dynamic signage. Coordinate with Architect and AUS IS.
- Overhead Paging System: Paging system consisting of speakers suitable for space to be provisioned. Microphone Paging Stations should be provided as required by TSA.

Additional Airport Systems

- Checkpoint Queue Wait Time: Passenger wait-time and security queue monitoring shall be provided at the security checkpoint. Sensors for monitoring the queue, processor, and overall queue monitoring integration shall be provided.
- Jurisdiction (AHJ), to ensure the design is compliant with all requirements and guidelines and with the PGDS.

II. INTERIOR IMPROVEMENTS - PUBLIC

D. Passenger Amenities

AUS may provide the following passenger amenities within the terminal and concourses. These amenities should be planned according to anticipated demands in the airport. Designers should coordinate with the AUS PM and the local Authority Having Jurisdiction (AHJ), to ensure the design is compliant with all requirements and guidelines. Passenger Amenities should foster relaxation and restoration by incorporating nature, accessible design, lighting, varied, adaptable seating arrangements, calming finishes, visual privacy, etc. These passenger amenities may include the elements included in this section. The designer may suggest other elements, but all elements must be approved by the AUS PM.

Interfaith Chapel

The interfaith chapel should be a welcoming space open to anyone who needs to take advantage of the quite space. The space should provide higher noise reduction to block aircraft, passenger, and other ambient noises.

This space should also include storage space for elements such as stacking chairs, prayer rugs, books, and other essential equipment.

Meditation Room

The meditation room should be a stress-free place of peace and tranquility. It should include minimal finishes and furnishings while remaining comfortable and safe. Finishes should be warm whites, grays, and earth-tones. Warm wood tones may also help induce a sense of serenity to the occupants.

Mother's Room

Mother's Rooms should provide a safe, comfortable space for nursing mothers to provide milk for newborns. These rooms should be provided throughout the airport not only near restrooms. Mother's rooms should minimally have the following:

- Lockable door
- Clear signage
- Electrical outlets
- A sink
- Easy-to-sanitizer finishes and surfaces
- Ergonomic, comfortable chair with a built-in table or side table

Business Center

A business center should be provided to allow business travelers an opportunity to conduct meetings or have a quiet place to work away from the business and commotion of the airport terminal and concourse. Tis space should include higher levels of noise reduction to block aircraft, passenger, and other ambient noises. This space may include multiple rooms including a conference room, quiet office spaces, and common work areas. The spaces should include the following:

- Comfortable furniture - Desks, task seating, conference tables
- Ample electrical outlets for laptop computers, etc.
- Laser jet printer

Post Office/Post Box

A postal drop box with a stamp vending machine allows passengers to mail postcards purchased at the concessions and/or take care of other mailing needs without leaving the airport campus.

The postal drop box should be located on the pre-security side of the terminal.

Children's Play Areas

Children's play areas offer a controlled space for families to allow children to engage in physical activity in an enjoyable atmosphere, while limiting disruption in public holdrooms or concessions spaces.

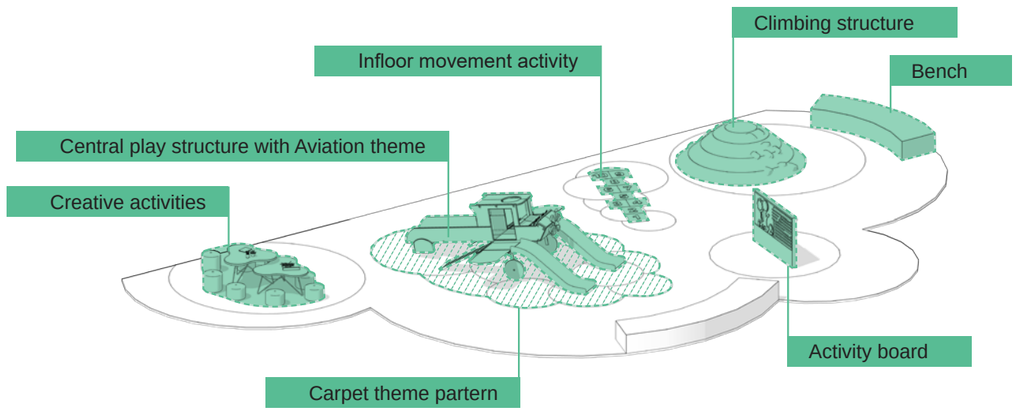
Children's play areas should strive to be inclusive to all children. An adjacent enclosed sensory room should be considered.

Play equipment and finishes should be highly durable and cleanable. Flooring should provide safe, cushioned landing for falling and jumping. In areas where children's eating may occur, hard flooring surface must be provided.

Children's play areas should be located near concessions, family restrooms, and bottle filler stations.

Children's play areas should include the following:

- Perimeter control
- Climbing or play features
- Soft floors
- Bright, inviting colors
- Seating for parents or caregivers with clear visibility to entire play area
- Hand sanitizer dispensers



II. INTERIOR IMPROVEMENTS - PUBLIC

D. Passenger Amenities

United Service Organization (USO)

The United Service Organization offers a variety of services to active military personnel and their dependents, including free refreshments, information, and referrals at AUS. The center provides service members and family members with a place to relax, enjoy a meal, check e-mail, and call family and friends before being deployed or traveling for any reason.

USO facilities can be located either pre- or post-security to support the different aspects of their services. Coordinate solutions with the USO and the AUS PM.

While features should be designed in consultation with local representatives, the USO typically provides the following features:

- Wi-Fi
- Computers with internet access
- Quiet rooms
- Children's room
- TV lounge area
- Flight information
- Emergency assistance
- Travel and lodging information
- Referrals
- Full Kitchen

Smoking Facilities

AUS prohibits the use of smoking or electronic cigarette products within public buildings or within 25 feet of the building entrance. Non-secure outdoor smoking areas are provided for passengers at the curbside. Outdoor smoking facilities may be provided for employees in the secure area to SIDA when approved in writing by the AUS PM. Provide an ashtray or combination waste and ashtray in each smoking area. Provide permanent and durable signage identifying any approved smoking area. Refer to The Code of the City of Austin, TX (section 13-1.38) for further information:

https://library.municode.com/tx/austin/codes/code_of_ordinances?nodeId=TIT13TRSE_CH13-1AVSE

Automated Teller Machines (ATMs)

Bank ATMs may be located throughout the terminal facilities to support passenger needs.

ATMs should be in an alcove off of a public circulation area, but within clear view of the public for safety reasons. Coordinate the power and data requirements to each ATM location with the AUS PM.

Lighting at the ATM shall be selected so that the security of the ATM machine and the people near and around the machine are considered. The lighting levels at the ATM are recommended to measure 20 footcandles at horizontal surfaces at 36" AFF and 10 footcandles on vertical surfaces at 60" AFF.

Vending

Vending areas may be located throughout the terminal facilities to support passenger needs.

Space must be provided to service and restock each vending machine.

Vending machines should be placed in an alcove off of public circulation areas and should be located to avoid queuing conflicts with other circulation. Coordinate the power requirements to each vending area location with the AUS PM.

II. INTERIOR IMPROVEMENTS - PUBLIC

E. Common Seating Areas

Common seating areas can be a significant contributor to the passenger experience. These common seating areas, not associated with a departure gate, should provide a stress reducing atmosphere by reducing ambient noise, providing natural light, and providing views to the outside while not impairing other airport functions. Designers should carefully balance seating and floor space to provide convenient circulation through the seating area. Amenities such as phone charging and workspaces should also be included in common seating areas.

Flooring

- Carpet Tile
- Terrazzo
- Terrazzo Tile
- Large-Format or Panel, Rectified Porcelain Tile, Thru-Body Color
- Stone
- Wood

The following materials are prohibited:

- Ceramic Tile
- Exposed Concrete (including polished)
- Vinyl Composite Tile (VCT)

Walls

Wall materials below 8' AFF should be highly durable and impact resistant

- Gypsum Board, Painted, MPI Gloss Level 4
  (at non-contact areas greater than 8 feet above finished floor only)
- Vinyl Wall Covering
- Wall Panel Systems
  - Flush Wood
  - Cork
  - Formed Metal
  - Stone
  - Resin/Plastic
- Thru-Body Tile
- Fiber Cement Panels
- Aluminum framed interior storefront system
- All-glass interior storefront system

Column Treatment

- Pre-formed Metal Column Covers
- Decorative Steel
- Stone
- Solid Surface
- Terrazzo

Wall Base

- 12” minimum base height, flush with face of wall or recessed
- Integral terrazzo wall base with aluminum cap
- Stainless Steel, 16 ga. Minimum, with backing board
- Ultracompact Surface Material
- Solid Surface Material

The following materials are prohibited:

- Rubber
- Vinyl
- Wood
- MDF

Corner Guards

- Full Wall Height or align with wall lines but not less than 8' AFF.
- Stainless Steel
- Aluminum

The following materials are prohibited:

- Rubber
- Vinyl
- Wood
- MDF

Ceilings

- Gypsum Board, Painted, MPI Gloss Level 1
- Acoustic Metal Ceiling Panels
- Access Panels: Flush type with drywall bead; painted to match ceiling
- Textile Ceilings
- Linear metal ceilings
- Linear wooden ceilings
- Open to Structure (with the appropriate services coordination)

Access Panels

- Flush type with drywall bead, painted to match adjacent surfaces.

Furniture

Seating and accessory furniture should be comfortable, durable, and easily cleanable and should be located to avoid wall damage. All seating types should include 120v and USB power for phone, etc. charging.

Trash, compost, and recycling receptacles should be provided – coordinate with the AUS project manager.

Acoustics

Common Seating Areas should be designed for clarity and acoustic comfort, for reduced passenger stress and increased public safety. Isolation of the building enclosures must be designed for the required STC ratings to keep outdoor building noise, including transportation and aviation noise, from disrupting the life safety systems and conversations between employees and/or passengers. Airport public spaces tend to be larger volumes, so airport spaces should incorporate adequate sound absorption to reduce reverberation and increase speech intelligibility.

II. INTERIOR IMPROVEMENTS - PUBLIC

E. Common Seating Areas

Mechanical

In order to maximize the AUS way and passenger experience, air distribution systems must comply with ASHRAE acoustical requirements for Common Seating Areas and spaces should have independent temperature controls. Air devices should distribute conditioned air accordingly throughout the space and should address thermal comfort factors according to ASHRAE 55. All visible mechanical equipment must be coordinated with architectural features and aesthetics. Ventilation air, according to the latest version of ASHRAE 62.1 and City of Austin (COA) Amendments requirements, must be provided from the roof or land side of the building. Ventilation air must not be provided from the air side of the building. Access panels should be provided for mechanical equipment located above inaccessible ceilings and walls. Refer to “Access Panels” above.

Electrical

Provide general purpose duplex receptacles throughout space not more than 40 feet on center.

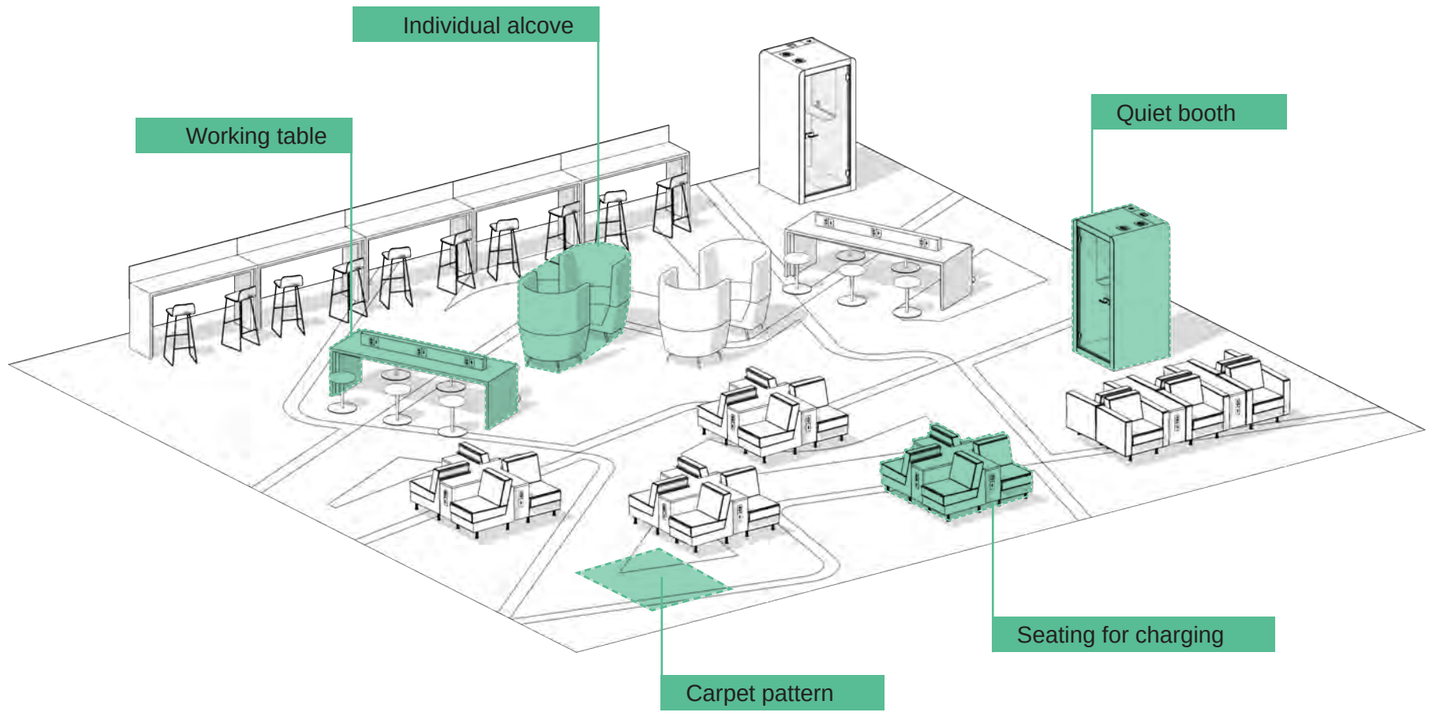
Provide duplex outlets in floor boxes/poke-thrus as required for powered passenger seating.

Lighting

Lighting fixture selection in the seating areas of the Concourse should be energy efficient, controlled by occupancy sensors, and offer passenger comfort. The lighting designer may consider using sources of direct overhead lighting for ambient purposes and offer the flexibility for the user to dim the lighting levels or use another source of lighting, such as nearby accent lighting, and task lighting sources to reduce lighting levels. Utilizing different sources gives the AUS team functionality to create comfortable spaces for passengers of varying desired experiences. A passenger who may need a place of respite may also be in the same seating area as one who might need a place to plug-in and work before their departing flight. In this scenario, these passengers may experience a lower lighting level through task lighting, with direct lighting off. Designers should target 15 footcandles at 30” AFF on horizontal targets in seating areas.

Life Safety

Life safety systems within common seating areas shall be provided and shall comply with the applicable edition of the International Building Code (IBC) and the International Fire Code (IFC), with City of Austin amendments, and all referenced codes and standards. Life safety systems are expected to include, but are not limited to, means of egress systems (I.e., quantity and capacity of exits), passive fire protection (I.e., fire barriers and opening protection), fire protection systems (I.e., automatic sprinkler, standpipe, and fire pump), fire alarm systems, and portable fire extinguishers. Each life safety system must comply with the requirements of the applicable code or standard.



II. INTERIOR IMPROVEMENTS - PUBLIC

E. Common Seating Areas

IT and Security

AUS systems shall follow the AUS Information Technology Design Standards Manual and the Division 27 and 28 specifications. Coordinate IT systems and telecom requirements with AUS. The following space specific system standards shall be adhered to by the designer for this space:

IT Network

Data infrastructure shall be provided for Wi-Fi locations, IPTV locations, and other systems listed below. Data cable shall run to the applicable network IDF.

Wireless and Radio System

- Wi-Fi: These spaces shall have both Admin and Public Wi-Fi coverage ensuring proper bandwidth.
- DAS Radio: Public Safety DAS shall be made available in all areas of the building as per NFPA 1221 code and must comply with the local AHJ (Authority Having Jurisdiction) guidelines for coverage requirements.
- DAS Cell: Carrier's 4G/5G coverage shall be made available throughout the public areas in the airport.

Security

- VMS (CCTV): Common seating areas shall provide a minimum of 'observation' level coverage. Additional coverage requirements shall be reviewed with AUS Security to determine seating areas requiring higher levels of coverage.

Operational Airport Systems

- CUSS: Common seating areas shall be reviewed for CUSS kiosk implementation for passenger check-in without bags.
- EVIDS: EVIDS banks and displays shall be provided at specific areas to provide ease of locating displays, ease of viewing of information and to avoid passenger flow congestion.
- Dynamic Signage: Digital signage for seating areas may be made available for displaying advertisements, messages, way finding and other airport information. All static signage should be reviewed for replacement with dynamic signage. Coordinate with, TSA, and AUS IS.
- Overhead Paging System: Paging system consisting of speakers suitable for space to be provisioned.

Additional Airport Systems

- IPTV: IPTV provision for seating areas shall be made available for the public in wait areas.

II. INTERIOR IMPROVEMENTS - PUBLIC

F. Holdrooms

Holdrooms should offer passengers a comfortable and stress reducing wait for departing flights. Natural daylight and views to the outside are important as part of the overall character of these spaces, however, daylight must be controlled to reduce glare. Along with sufficient seating to accommodate the anticipated passenger load in the holdroom, passenger amenities such as ample cell phone charging stations and workspaces should be considered. Consideration should be given to provide a consistent look and feel to holdrooms throughout the airport.

Flooring

- Carpet Tile
- Terrazzo
- Terrazzo Tile
- Large-Format or Panel, Rectifed Porcelain Tile, Thru-Body Color
- Stone

The following materials are prohibited:

- Wood
- Ceramic Tile
- Exposed Concrete (including polished)
- Vinyl Composite Tile (VCT)

Walls

Wall materials below 8' AFF should be highly durable and impact resistant

- Gypsum Board, Painted, MPI Gloss Level 4
  (at non-contact areas greater than 8 feet above finished floor only)
- Vinyl Wall Covering
- Wall Panel Systems
  - Flush Wood
  - Cork
  - Formed Metal
  - Stone
  - Resin/Plastic
- Thru-Body Tile
- Fiber Cement Panels
- Aluminum framed interior storefront system
- All-glass interior storefront system

Column Treatment

- Pre-formed Metal Column Covers
- Decorative Steel

Wall Base

Wall base should be impact resistant to provide protection from cleaning equipment.

- 12” minimum base height, flush with face of wall or recessed
- Integral terrazzo wall base with aluminum cap
- Stainless Steel, 16 ga. Minimum, with backing board
- Ultracompact Surface Material
- Solid Surface Material

The following materials are prohibited:

- Rubber
- Vinyl
- Wood
- MDF

Corner Guards

- Full Wall Height or align with wall lines but not less than 8' AFF.
- Stainless Steel
- Aluminum

The following materials are prohibited:

- Rubber
- Vinyl
- Wood
- MDF

Ceilings

- Gypsum Board, Painted, MPI Gloss Level 1
- Acoustic Ceiling Panel, Standard Grid Size, 2x2 or 2x4 Panels
- Acoustic Metal Ceiling Panels
- Access Panels Flush type with drywall bead;
  painted to match ceiling
- Linear metal ceilings
- Linear wooden ceilings
- Open to Structure (with the appropriate services coordination)

Access Panels

- Flush type with drywall bead; painted to match adjacent sufaces

Expansion Control

- Expansion joint covers that minimally affect the look of the space
- Maintain assembly separation requirements

Floor

- Recessed pan that accepts floor finish materials with elastomeric joints that expand and contract for minor thermal movement.

Wall/Ceiling

- Small Joints: (2-inches or less) Gasket type
- Large Joints: (greater than 2-inches) Aluminum with dual-gasket; painted to match adjacent finishes

II. INTERIOR IMPROVEMENTS - PUBLIC

F. Holdrooms

Furniture / Equipment

Seating and accessory furniture should be comfortable, durable, and easily cleanable and should be located to avoid wall damage. All seating types should include 120v and USB power for phone, etc. charging. Accessible seating must be provided according to the TAS.

Trash, compost, and recycling receptacles should be provided – coordinate with the AUS project manager. 55” television display, pole-mounted from above. Designer should coordinate the display locations, sizes, and infrastructure requirements with AUS’s IS Division.

Airline proprietary equipment and/or fixtures must be approved by AUS prior to installation in the holdroom.

Acoustics

Holdrooms should be designed for clarity and acoustic comfort, for reduced passenger stress and increased public safety. Isolation of the building enclosures must be designed for the required STC ratings to keep outdoor building noise, including transportation and aviation noise, from disrupting the life safety systems and conversations between employees and/or passengers. Airport public spaces tend to be larger volumes, so airport spaces should incorporate adequate sound absorption to reduce reverberation and increase speech intelligibility.

Mechanical

In order to maximize the AUS way and passenger experience, air distribution systems must comply with ASHRAE acoustical requirements for Holdrooms and spaces should have independent temperature controls. Air devices should distribute conditioned air accordingly throughout the space and should address thermal comfort factors according to ASHRAE 55. All visible mechanical equipment must be coordinated with architectural features and aesthetics. Ventilation air, according to the latest version of ASHRAE 62.1 and City of Austin (COA) Amendments requirements, must be provided from the roof or land side of the building. Ventilation air must not be provided from the air side of the building. Access panels should be provided for mechanical equipment located above inaccessible ceilings and walls. Refer to “Access Panels” above. Add: Concourse spaces will be served from equipment above located within a mechanical penthouse.

Electrical

General purpose duplex receptacles should be provided throughout space not more than 40 feet on center. .

Provide duplex outlets in heavy duty floor boxes/poke-thrus as required for powered passenger seating.

Lighting

Lighting fixture selection in the seating areas of the Concourse should be energy efficient, controlled by occupancy sensors, and offer passenger comfort. The lighting designer may consider using sources of direct overhead lighting for ambient purposes and offer the flexibility for the user to dim the lighting levels or use another source of lighting, such as nearby accent lighting, and task lighting sources to reduce lighting levels. Utilizing different sources gives the AUS team functionality to create comfortable spaces for passengers of varying desired experiences. A passenger who may need a place of respite may also be in the same seating area as one who might need a place to plug-in and work before their departing flight. In this scenario, these passengers may experience a lower lighting level through task lighting, with direct lighting off. Designers should target 15 footcandles at 30” AFF on horizontal targets in seating areas.

IT and Security

AUS systems shall follow the AUS Information Technology Design Standards Manual and the Division 27 and 28 specifications. Coordinate IT systems and telecom requirements with AUS. The following space specific system standards shall be adhered to by the designer for this space:

IT Network

Data infrastructure shall be provided for Wi-Fi locations, IPTV locations, and other systems listed below. Gate counters may require redundant network connectivity from disparate IDF locations to ensure resiliency. Data cable shall run to the applicable network IDFs.

Wireless and Radio System

- Wi-Fi: These spaces shall have both Admin and Public Wi-Fi coverage ensuring proper bandwidth.
- DAS Radio: Public Safety DAS shall be made available in all areas of the building as per NFPA 1221 code and must comply with the local AHJ (Authority Having Jurisdiction) guidelines for coverage requirements.
- DAS Cell: Carrier's 4G/5G coverage shall be made available throughout the public areas in the airport.

Security

- VMS (CCTV): Holdroom areas shall provide a minimum of ‘observation’ level coverage. Boarding areas shall require a minimum of ‘identification‘ level coverage. Additional coverage requirements shall be reviewed with AUS Security to determine specific areas requiring coverage.

Operational Airport Systems

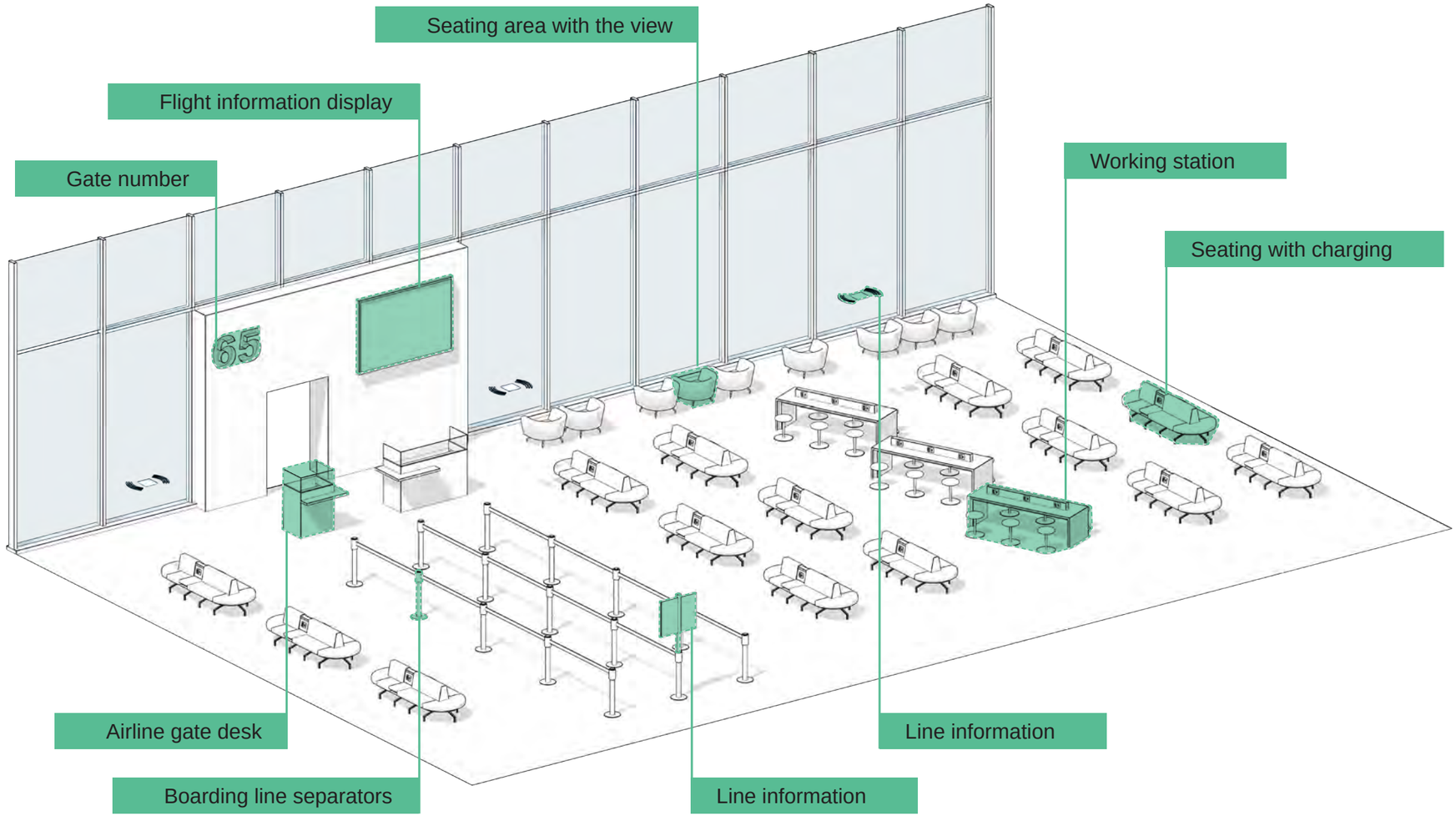
- EVIDS: EVIDS banks and displays shall be provided at specific areas to provide ease of locating displays, ease of viewing of information and to avoid passenger flow congestion.
- Overhead Paging System: Paging system consisting of speakers suitable for space to be provisioned. Microphone stations shall be provided at gate counters and passenger boarding bridge doors, as required.

Additional Airport Systems

- IPTV: IPTV provision for holdrooms shall be made available for the public in holdroom areas.

II. INTERIOR IMPROVEMENTS - PUBLIC

F. Holdrooms



Austin-Bergstrom International Airport

II. INTERIOR IMPROVEMENTS - PUBLIC

G. Passenger Boarding Bridges

Passenger Boarding Bridges provide the first impression to passengers arriving at AUS and the last impression to passengers departing AUS. The Passenger Boarding Bridge Designer's primary goal should be the safe, efficient, and expeditious movement of passengers between the Holdroom and Aircraft. Additionally, Passenger Boarding Bridges must be designed to provide an environment that is protected from hazards and inclement weather conditions – both when sealed against an aircraft and when parked with the weather doors closed. Designers should consider apron-drive type Passenger Boarding Bridges with regional jet capability. All point of use equipment must be attached to the underside of the passenger boarding bridge unless allowed by the AUS Project Manager. All Passenger Boarding Bridges must comply with the latest version of FAA Circular AC 150/5220 and all local codes and ordinances.

Flooring

- Sheet Carpet
- Rubber Flooring

Transition Ramps

- Non-Slip Rubber

Ceilings / Walls

- Passenger Boarding Bridge manufacturer's standard, durable finishes

Handrails

- Stainless Steel

Mechanical

To create an improved passenger experience, passenger boarding bridges should be equipped with a rooftop heating and cooling system specifically designed to control the climate conditions within the passenger boarding bridge. OSHA compliant fall protection must be included with all rooftop mounted equipment.

Lighting

The light fixtures should be located between 6' and 8' on center, be recessed, and blend with the ceiling design.

Aircraft Accessories

Passenger Boarding bridges should be equipped with preconditioned air (PCA) units and 400 Hz ground power units (GPU). This equipment should be under-mounted on the passenger boarding bridge.

Electrical

Passenger Boarding Bridges should be powered from single connection point with other GSE requirements at each gate.

IT and Security

AUS systems shall follow the AUS Information Technology Design Standards Manual and the Division 27 and 28 specifications. Coordinate IT systems and telecom requirements with AUS. The following space specific system standards shall be adhered to by the designer for this space:

IT Network

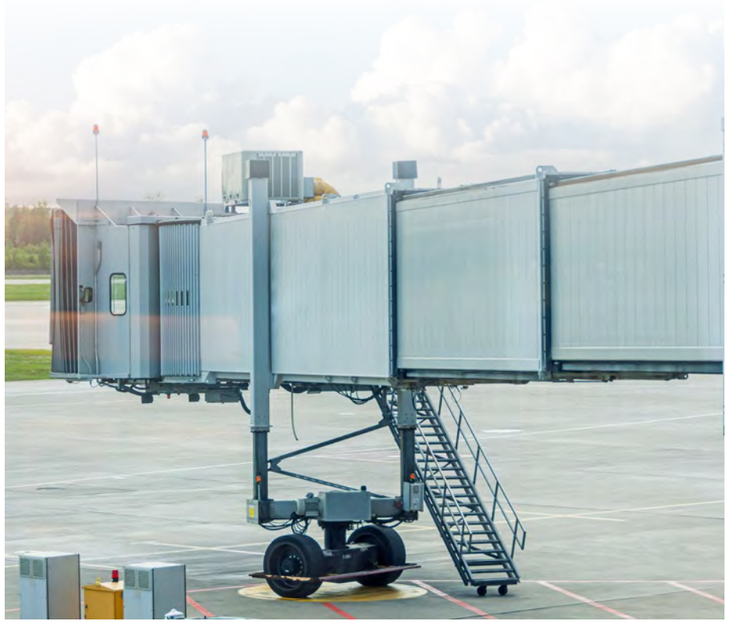
- Passive Infrastructure: PBB shall provide data cabling for security, wireless, and PBB ethernet devices. PBBs may also require fiber infrastructure extended for connection of PBB field switch. Refer to division 27 specifications for additional requirements.
- Active network: Hardened field switches may be utilized as required to extend data coverage at the PBB which exceed 295 cabled-feet distance limitations to the nearest IDF patch panel. Hardened field switches shall be provided with UPS.

Wireless and Radio System

- Public Wi-Fi shall be coordinated for within PBBs. Admin shall be reviewed for outside of PBBs. Coordinate with AUS IS.
- DAS Radio: Public Safety DAS shall be made available in all areas of the building as per NFPA 1221 code and must comply with the local AHJ (Authority Having Jurisdiction) guidelines for coverage requirements.
- Airline Radio: Ground staff shall be able to communicate with the Airline Operations using available VHF Frequency radios. Provision radio rooms, pathway, and antenna mount locations as required.
- DAS Cell: Carrier's 4G/5G coverage shall be made available throughout the public areas in the airport.

Security

- VMS (CCTV): PBB shall be provided with a minimum of 'observation' level video coverage. Provide 'identification' level coverage for entrance and exit from PBB.
- Access Control system: ACS, intrusion detection, and intercom shall be provided for Passenger Boarding Bridges per security guidelines and in coordination with AUS Security.



II. INTERIOR IMPROVEMENTS - PUBLIC

H. Customs and Border Protection

As one of an international passenger's first impressions of AUS and the United States, the Customs and Border Protection area must set the tone for a positive experience and should embrace the AUS vision and sense of place. Careful consideration should be given to ensure this space induces a positive and stress reducing experience by providing sufficient space, maximizing natural light (where allowed), clear signage and wayfinding, and welcoming and inviting finishes. The Customs and Border Protection space must comply with the most recent edition of the Customs and Border Protection (CBP) Regulations and be designed in accordance with CBP Facilities Design Standards Guidelines which will supersede all other requirements. This space should accommodate a large, fluctuating number of arriving passengers at all times. Highly durable, abuse-resistant, low maintenance materials should be considered in all public Passenger Terminal and Concourse Areas.

Flooring

- Terrazzo
- Large-Format or Panel, Rectified Porcelain Tile, Thru-Body Color
- Stone
- Carpet Tile (avoid in circulation areas)

The following materials are prohibited:

- Wood
- Ceramic Tile
- Exposed Concrete (including polished)
- Vinyl Composite Tile (VCT)

Walls

- Wall Panel Systems
  - Flush Wood
  - Formed Metal
  - Stone
  - Resin/Plastic
- Thru-Body Tile
- Fiber Cement Panels
- Ultracompact Surface Material
- Vinyl Wall Covering
- Gypsum Board, Painted, MPI Gloss Level 4 (at non-contact areas greater than 8 feet above finished floor only)
- Aluminum framed interior storefront system
- All-glass interior storefront system

Column Treatment

- Pre-formed Metal Column Covers
- Decorative Steel

Wall Base

- 12" minimum base height, flush with face of wall or recessed
- Integral terrazzo wall base with aluminum cap
- Stainless Steel, 16 ga. Minimum, with backing board
- Ultracompact Surface Material
- Solid Surface Material

The following materials are prohibited:

- Rubber
- Vinyl
- Wood
- MDF

Corner Guards

- Full Wall Height or align with wall lines
- Stainless Steel
- Aluminum

The following materials are prohibited:

- Rubber
- Vinyl
- Wood
- MDF

Ceilings

- Gypsum Board, Painted, MPI Gloss Level 1
- Acoustic Metal Ceiling Panels
- Textile Ceilings
- Linear metal ceilings
- Linear wooden ceilings
- Open to Structure (with the appropriate services coordination)
- Access Panels: Flush type with drywall bead; painted to match ceiling

II. INTERIOR IMPROVEMENTS - PUBLIC

H. Customs and Border Protection

Access Panels

- Secure, Lockable, Flush type with drywall bead; painted to match adjacent surfaces

Expansion Control

- Expansion joint covers that minimally affect the look of the space
- Maintain assembly separation requirements

Floor

- Recessed pan that accepts floor finish materials with elastomeric joints that expand and contract for minor thermal movement.

Wall/Ceiling

- Small Joints: Gasket type
- Large Joints: Aluminum with dual-gasket; painted to match adjacent finishes

Acoustics

Customs and Border Protection areas should be designed for clarity and acoustic comfort, for reduced passenger stress and increased public safety. Isolation of the building enclosures must be designed for the required STC ratings to keep outdoor building noise, including transportation and aviation noise, from disrupting the life safety systems and conversations between employees and/or passengers. Airport public spaces tend to be larger volumes, so airport spaces should incorporate adequate sound absorption to reduce reverberation and increase speech intelligibility.

Mechanical

In order to maximize the AUS way and passenger experience, air distribution systems must comply with ASHRAE acoustical requirements. The Customs and Border Protection area must have temperature controls independent from other parts of the building. Air devices should distribute conditioned air accordingly throughout the space and should address thermal comfort factors according to ASHRAE 55. All visible mechanical equipment must be coordinated with architectural features and aesthetics. Ventilation air, according to the latest version of ASHRAE 62.1 and City of Austin (COA) Amendments requirements, must be provided from the roof or land side of the building. Ventilation air must not be provided from the air side of the building. Secure access panels should be provided for mechanical equipment located above inaccessible ceilings and walls. Refer to “Access Panels” on this page.

Plumbing

Fixtures

- Where electric water coolers are indicated, include vandal-resistant bubblers, filters, and bottle filling stations. Include a cane skirt for TAS compliance on bi-level coolers if not recessed in an alcove.
- Refer to the AUS Restroom Design Standards for additional information and requirements.

Piping and Accessories

- Lockable access panels should be provided in non-accessible ceilings and walls for valve access (Refer to “Access Panels” above)

Electrical

General Purpose Power

- Provide general purpose duplex receptacles throughout not more than 40 feet on center. The upper outlet on each duplex should be controlled by the occupancy sensor serving the area.

Special Purpose Power

- Provide power as required for screening/scanning equipment. Power should be fed from an uninterruptible power supply system.

Lighting

In customs and border protection, the lighting fixtures shall be coordinated with the space and should be connected to the emergency branch power system. The fixtures should be selected to achieve target illumination levels on varying horizontal and vertical planes depending on the space in customs and border protection. Illumination levels must be coordinated with the Customs and Border Protection guidelines.

Life Safety

Life safety systems within the customs and boarder protection spaces shall be provided and shall comply with the applicable edition of the International Building Code (IBC) and the International Fire Code (IFC), with City of Austin amendments, and all referenced codes and standards. Life safety systems are expected to include, but are not limited to, means of egress systems (I.e., quantity and capacity of exits), passive fire protection (I.e., fire barriers and opening protection), fire protection systems (I.e., automatic sprinkler, standpipe, and fire pump), fire alarm systems, and portable fire extinguishers. Each life safety system must comply with the requirements of the applicable code or standard.

II. INTERIOR IMPROVEMENTS - PUBLIC

H. Customs and Border Protection

IT and Security

All Technology systems and Provisions within Custom Border and Protection shall include both AUS operational elements and CBP elements. CBP systems and telecom provisions shall follow CBP Airport Technical Design Standard latest version. AUS systems shall follow the AUS Information Technology Design Standards Manual and Division 27 and 28 specifications in Coordination with AUS and CBP.

IT Network

- Passive Infrastructure: Refer to CBP's latest and coordinate with CBP for infrastructure requirements. Additionally, passive infrastructure shall be provided for AUS systems listed below.
- Active network: CBP areas will include both AUS networks and CBP networks (by CBP). CBP devices shall be routed to CBP IDFs, LAN, and SLAN rooms as required, while AUS devices shall be routed to AUS IDFs and LAN switches. Refer to applicable network technical standards.

Wireless and Radio System

- Wi-Fi: CBP space Admin and Public Wi-Fi coverage shall be coordinated with CBP and AUS IS. Public Wi-Fi Coverage in this area may be limited for use and restricted.
- DAS Radio: Public Safety DAS shall be made available in all areas of the building as per NFPA 1221 code and must comply with the local AHJ guidelines for coverage requirements.
- DAS Cell: Carrier's 4G/5G coverage shall be made available throughout the public areas in the airport.

Security

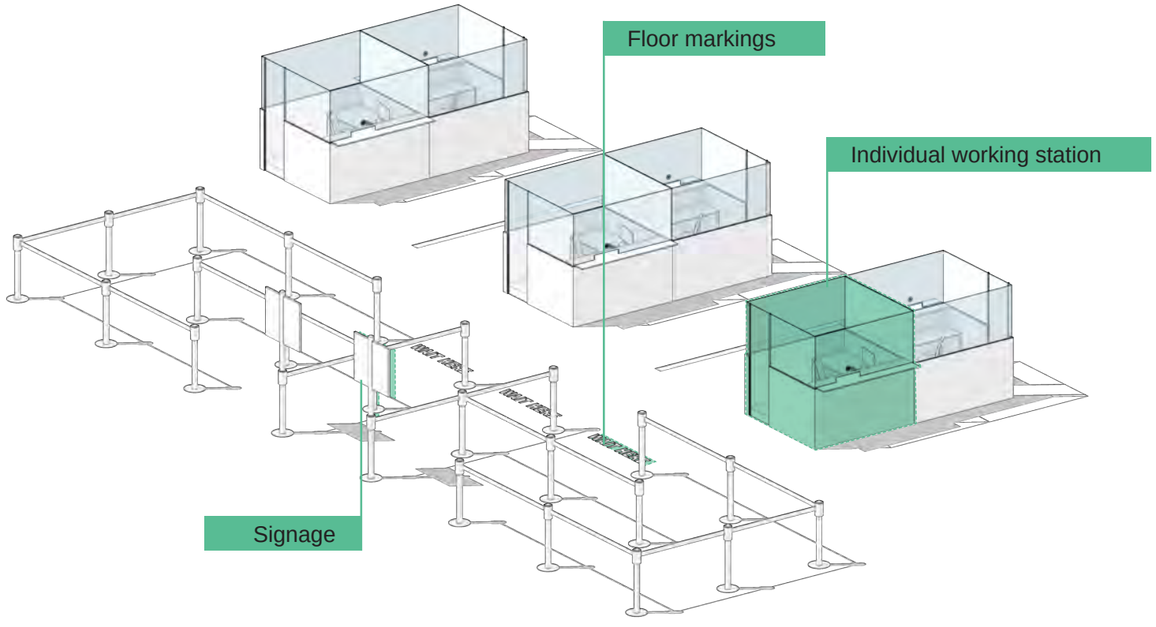
- VMS (CCTV): CBP spaces must be provided with minimum 'observation' level of video coverage. Refer to system CBP requirements and division 28 specifications for additional security requirements. AUS coverage requirements will be coordinated with AUS Security and will include for example International Baggage Claim area, which will require 'recognition' level coverage. Some areas will require 'identification' level coverage as well as microphone listening.
- ACS: The area will be provided with access control for throughout CBP areas as well as duress alarms will be provided as directed by CBP.
- Coordinate additional security requirements with CBP and AUS Security and IT.

Operational Airport Systems

- AODB: AODB shall be updated to support any new operational elements related to the areas as required.
- EVIDS: EVIDS displays, e.g., at international bag claim, should be provided only as coordinated with CBP. The displays shall be placed so as to not create congestion or bottleneck to passenger flow. Displays will be placed were easily visible to travelers.
- Dynamic Signage: Dynamic display needs and requirements shall be coordinated with CBP and AUS to service the CBP process. Displays providing informational content, directional information, queue notices and other notices shall be placed to ensure ease of management of passenger processing and flow. All static signage should be reviewed for potential replacement with dynamic signage. Coordinate with Architect, CBP, and AUS IS.
- Overhead Paging System: Paging system consisting of speakers suitable for space to be provisioned. Microphone Paging Stations should be provided as required by CBP.

Additional Airport Systems

- Queue Wait Time: Passenger wait-time may be provided at the passenger processing; coordinate with CBP and AUS IS.



II. INTERIOR IMPROVEMENTS - PUBLIC

I. Baggage Claim Area

Baggage Claim Areas are high-use public spaces that provide a final impression of AUS. Passenger orientation in the Baggage Claim Areas is critical to any design or renovation. Designers should provide clear passenger circulation, decision-making points, and entries and exits through the use of signage and wayfinding as well as architectural elements.

Materials and systems within the Baggage Claim Areas should align with the Passenger Terminal and Concourse Areas. Additional considerations are listed below.

Flooring

Note: All flooring selections must consider passenger roller bag and cart ease of use and noise.

- Terrazzo
- Terrazzo Tile
- Large-Format or Panel, Rectified Porcelain Tile, Thru-Body Color
- Stone

The following materials are prohibited

- Wood
- Ceramic Tile
- Exposed Concrete (including polished)
- Vinyl Composite Tile (VCT)

Walls

Wall materials below 8' AFF should be highly durable and impact resistant

- Gypsum Board, Painted, MPI Gloss Level 4
  (at non-contact areas greater than 8 feet above finished floor only)
- Vinyl Wall Covering
- Wall Panel Systems
  - Flush Wood
  - Cork
  - Formed Metal
  - Stone
  - Resin/Plastic
- Thru-Body Tile
- Fiber Cement Panels
- Aluminum framed interior storefront system
- All-glass interior storefront system

Column Treatment

- Pre-formed Metal Column Covers
- Decorative Steel

Wall Base

- 12” minimum base height, flush with face of wall or recessed
- Integral terrazzo wall base with aluminum cap
- Stainless Steel, 16 ga. Minimum, with backing board
- Ultracompact Surface Material
- Solid Surface Material

The following materials are prohibited:

- Rubber
- Vinyl
- Wood
- MDF

Corner Guards

Full Wall Height or align with wall lines

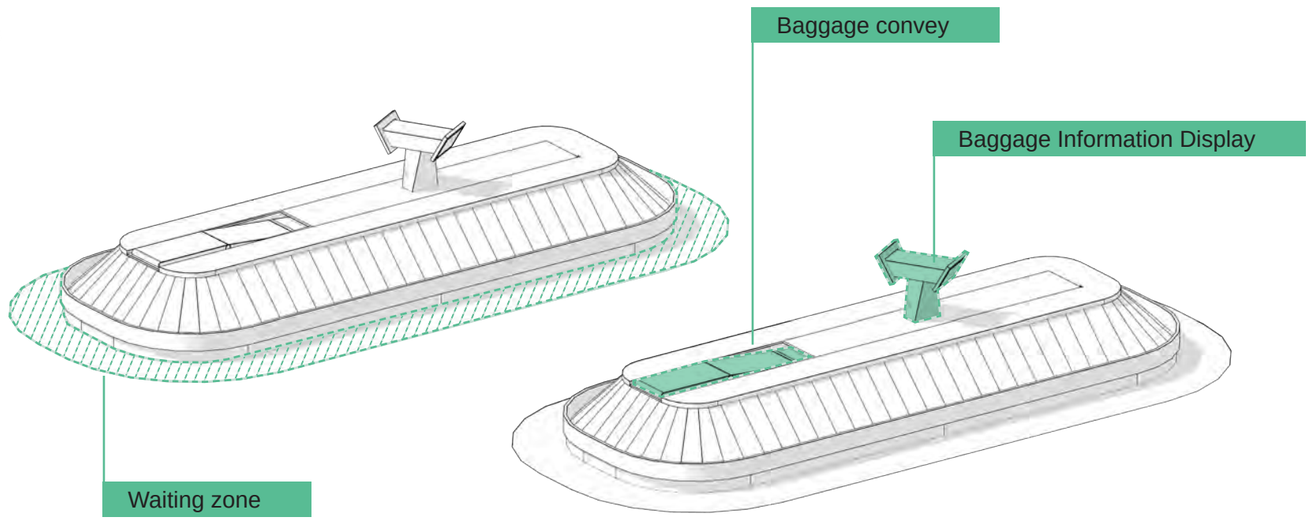
Stainless Steel

Aluminum

The following materials are prohibited

- Rubber
- Vinyl
- Wood
- MDF

Ceilings



II. INTERIOR IMPROVEMENTS - PUBLIC

I. Baggage Claim Area

- Gypsum Board, Painted, MPI Gloss Level 1
- Acoustic Metal Ceiling Panels
- Access Panels: Flush type with drywall bead; painted to match ceiling
- Textile Ceilings
- Linear metal ceilings
- Linear wooden ceilings
- Open to Structure (with the appropriate services coordination)

Access Panels

- Secure, Lockable, Flush type with drywall bead; painted to match adjacent surfaces

Expansion Control

- Expansion joint covers that minimally affect the look of the space
- Maintain assembly separation requirements

Floor

- Recessed pan that accepts floor finish materials with elastomeric joints that expand and contract for minor thermal movement.

Wall/Ceiling

- Small Joints: Gasket type
- Large Joints: Aluminum with dual-gasket; painted to match adjacent finishes

Acoustics

Baggage Claim Areas should be designed for clarity and acoustic comfort, for reduced passenger stress and increased public safety. Isolation of the building enclosures must be designed for the required STC ratings to keep outdoor building noise, including transportation and aviation noise, from disrupting the life safety systems and conversations between employees and/or passengers. Airport public spaces tend to be larger volumes, so it should incorporate adequate sound absorption to reduce reverberation and increase speech intelligibility.

Mechanical

In order to maximize the AUS way and passenger experience, air distribution systems must comply with ASHRAE acoustical requirements for baggage claim areas should have independent temperature controls. Air devices should distribute conditioned air accordingly throughout the space and should address thermal comfort factors according to ASHRAE 55. All visible mechanical equipment must be coordinated with architectural features and aesthetics. Ventilation air, according to the latest version of ASHRAE 62.1 and City of Austin (COA) Amendments requirements, must be provided from the roof or land side of the building. Ventilation air must not be provided from the air side of the building. Access panels should be provided for mechanical equipment located above inaccessible ceilings and walls.

Electrical

General purpose duplex receptacles should be locatede throughout spaces not more than 40 feet on center.

Lighting

The lighting systems in the passenger terminal and concourse areas should be designed to maximize the passenger experience, security, and safety is paramount. Lighting fxtures in the passenger terminal and concourse should be powered by the normal and emergency branches of the electrical power distribution system. Consideration should be given to vandal resistant fxtures or fxtures mounted out of reach of occupants to maintain security and emergency egress functions at all times. In addition, the passenger experience can be greatly enhanced by the lighting system. The designer should consider using this opportunity to incorporate creative selections of lighting fxtures. Permanent structural features throughout the concourse and terminal, such as beams, should be highlighted with lighting fxtures. Architectural wall features, wall art murals, accent tile, stone or rock may be wall washed or glazed with light to enhance the feature and bring the colors, textures, and patterns to life. If any interior landscaping, water features, or trees are incorporated into the design, the lighting designer should locate fixtures to highlight the area, while also considering safety and serviceability.

It is recommended that the wayfnding and signage selections be the illuminated type and be powered from emergency power.Lighting controls throughout the concourse should be both daylighting and occupancy responsive. The lighting control system selected for the spaces should have a plug load control and be UL 924 compliant for egress purposes. The lighting control system shall be connected to the selected Building Management System and have the capability to be controlled remotely.

IT and Security

II. INTERIOR IMPROVEMENTS - PUBLIC

I. Baggage Claim Area

AUS systems must follow the AUS Information Technology Design Standards Manual and the Division 27 and 28 specifications. Coordinate IT systems and telecomm requirements with AUS. The following space specific system standards shall be adhered to by the designer for this space:

IT Network

- Passive Infrastructure: The Structured Cabling System (SCS) shall include the minimum following requirements: Courtesy phone, BIDS, Wi-Fi and other systems listed below. Data cable shall run to the applicable network IDF/MDF.
- Active network: Baggage claim areas shall include AUS networks as required to support devices. Refer to applicable AUS network technical standards.

Wireless and Radio System

- Wi-Fi: This space should have both Admin and Public Wi-Fi coverage and shall ensure proper bandwidth.
- DAS Radio: Public Safety DAS should be made available in all areas of the building as per NFPA 1221 code and must comply with the local AHJ guidelines for coverage requirements.
- DAS Cell: Carrier's 4G/5G coverage should be made available throughout the public areas in the airport.

Security

- VMS (CCTV): The baggage claim areas must have minimum ‘observation’ level video coverage with ‘recognition’ level near the conveyors to observe passengers.
- Access Control system: ACS must be provided per security guidelines and in coordination with AUS Security.

Operational Airport Systems

- AODB: AODB should be updated to support any new operational elements related to the baggage claim area.
- RMS: Changes in quantities and locations of BSO workstations within the baggage claim area as well as carousel configurations shall be updated within the RMS.
- EVIDS: EVIDS displays should be provided for baggage information at baggage claims as well as a display bank providing baggage summary information at a convenient location within the principal entry point of each baggage claim. Size, exact location and placement of displays shall ensure best visibility to travelers and mounting enclosures and arrangements of displays shall be in coordination with Architects and AUS IS.
- Dynamic Signage: Digital signage for baggage claim should be made available for displaying advertisements, welcome messages, way finding and other airport information. All static signage should be reviewed for potential replacement with dynamic signage. Coordinate with Architect and AUS IS.
- Overhead Paging System: Paging system consisting of speakers suitable for space should be provisioned. Paging microphones should be review for BSOs and help/welcome desks.

Additional Airport Systems

- Parking and Revenue Control System: A parking validator or fare machines may be made available in the baggage claim areas.
- IPTV: IPTV provision for passenger terminal areas should be made available for the public in wait areas.

II. INTERIOR IMPROVEMENTS - PUBLIC

J. Passenger Conveyance System (PCS) Stations

The Passenger Conveyance System stations are an important piece of passenger circulation between the terminal areas and concourses and can have a significant impact on the overall passenger experience at AUS. The PCS Stations must produce a positive passenger experience while facilitating passenger movement throughout the airport. Designers should consider quick orientation in the space, simple access through the PCS Station (especially between the PCS vehicle and vertical circulation), the ability to focus on critical information, and passenger safety while boarding and exiting the PCS vehicle. Materials used in the PCS Stations should align with the Passenger Terminal and Concourse Areas. Additional considerations are listed below.

Life Safety

Life safety systems within PCS spaces shall be provided and shall comply with the applicable edition of the International Building Code (IBC) and the International Fire Code (IFC), NFPA 130, with City of Austin amendments and all referenced codes and standards. Life safety systems are expected to include, but are not limited to, means of egress systems (I.e., quantity and capacity of exits), passive fire protection (I.e., fire barriers and opening protection), fire protection systems (I.e., automatic sprinkler, standpipe, and fire pump), fire alarm systems, and portable fire extinguishers. Each life safety system must comply with the requirements of the applicable code or standard.

IT and Security

AUS systems shall follow the AUS Information Technology Design Standards Manual and the Division 27 and 28 specifications. Coordinate IT systems and telecom requirements with AUS. The following space specific system standards shall be adhered to by the designer for this space:

IT Network

- Passive Infrastructure: The SCS shall include the minimum following requirements: EVIDS, dynamic displays, Wi-Fi, safety and security systems, and PCS ethernet systems. Data cable shall run to the applicable network IDF/MDF.
- IDFs or field cabinets shall be provided such that cabled distances do not exceed 295-ft.
- Active network: Refer to system technical standards and division 27 specifications for requirements.

Wireless and Radio System

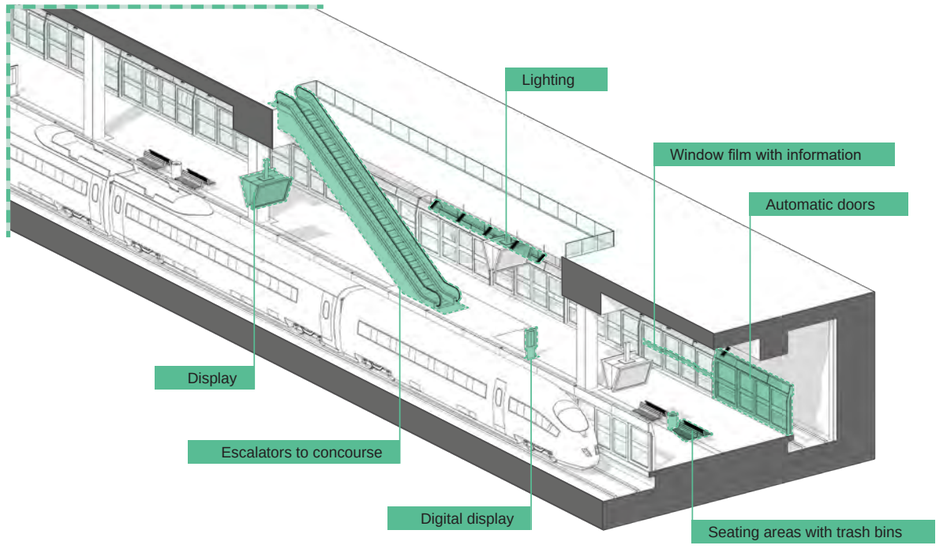
- Wi-Fi: This space shall have both Admin and Public Wi-Fi coverage ensuring proper bandwidth.
- DAS Radio: Public Safety DAS shall be made available in all areas of the building as per NFPA 1221 code and must comply with the local AHJ (Authority Having Jurisdiction) guidelines for coverage requirements.
- DAS Cell: Carrier's 4G/5G coverage shall be made available throughout the public areas in the airport.

Security

- VMS (CCTV): The PCS shall be provided with minimum ‘observation’ level video coverage of people at PCS stations and boarding areas. Higher levels of surveillance should be reviewed with operator and AUS Security for entrance / exit points and within passenger vehicle.
- Appropriate ACS control will be provided on any secure doors and shall be interlocked and integrated with the PCS system.

Operational Airport Systems

- Wayfinding digital displays, visual paging displays, vehicle to be provided by PCS supplier.
- Dynamic signage shall be furnished by the PCS supplier and integrated with the system. It may also require integration with AUS IS and the architect..
- PCS announcements and paging shall be supplied and integrated by the PCS supplier. Interface with outside AUS IS systems may be required.
- PCS vehicle system shall be provided by the PCS supplier. Interface with AUS IS may be required.



II. INTERIOR IMPROVEMENTS - PUBLIC

K. Horizontal And Vertical Conveyance

Passenger Elevators

Designers should determine the recommended suitable capacity of each elevator for passenger and personal baggage transport. System should provide transportation for all passengers and their personal baggage between all publicly accessible floors or levels in the area in which it is installed. The elevator unit must have suitable capacity based upon a ridership study of the areas being served, including gurney carrying capacity as ridership studies determine to be required. Elevators should be provided with elevator control rooms to contain controllers for all elevators of the same type in a common location. Service for the passenger elevators should comply with all applicable codes and ordinances.

Passenger elevators should be located to conveniently serve all required floors including basements, interstitial spaces, and overhead mechanical spaces. Access control may be included to limit passenger access to secured areas as necessary.

Passenger elevators should include 2-way emergency communication and CCTV security cameras.

Passenger elevators should comply with all applicable codes and ordinances including, but not limited to, ASME, NFPA, IBC,TAS, and City of Austin ordinances.

Flooring

Flooring must provide slip protection at all exterior and wet locations.

- Terrazzo
- Large-Format or Panel, Rectifed Porcelain Tile, Thru-Body Color
- Carpet Tile (coordinate location with AUS PM)

Walls

- Stainless Steel
- Decorative Metal / Steel
- Flush Wood Panel System
- Resin/Plastic

Ceilings

- Stainless Steel
- Decorative Metal

Lighting

- LED Light Fixtures (Manufacturer's Standard)

Doors

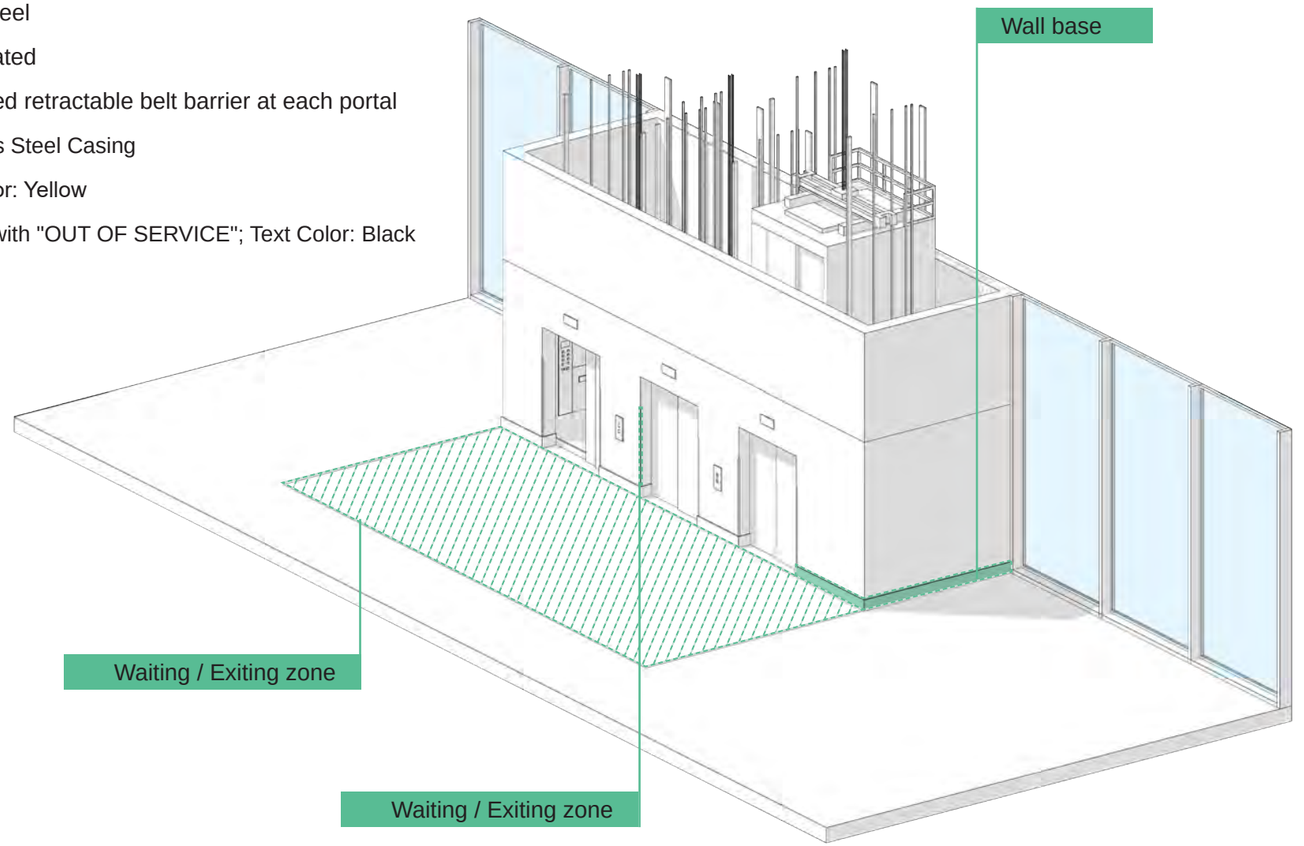
- Sliding Doors
- Stainless Steel
- Powder Coated

Entry Portal

- Stainless Steel
- Powder Coated
- Wall mounted retractable belt barrier at each portal
  - Stainless Steel Casing
  - Belt Color: Yellow
  - Printed with "OUT OF SERVICE"; Text Color: Black

IT and Security

Technology systems within elevators must support the equipment and applicable requirements of the Current Accepted International Building Code (IBC). These systems may include network infrastructure, wireless “Wi-Fi” network, cellular and radio distributed antenna systems, public address, digital displays, video surveillance, electronic access control, and audio-video intercom.



II. INTERIOR IMPROVEMENTS - PUBLIC

K. Horizontal And Vertical Conveyance

Escalators

Designers should determine the recommended suitable capacity for each escalator suitable for passenger conveyance. System should provide transportation for all passengers between all floors or levels in the area it is installed. Provide heavy duty escalators of suitable capacity based upon a ridership study of the areas being served for installation. Escalators should include integrated pits and control spaces that will contain all machinery and controllers in a common location. Service for the escalators should comply with all applicable codes and ordinances. Escalators should be located to conveniently serve as rapid transportation between two selected floors. Escalator steps should be a minimum of 40 inches wide to allow walking passengers to pass standing passengers.Escalator rated speed should be less than 100 feet/minute.Escalators must comply with all applicable codes and ordinances including, but not limited to, ASME, NFPA, IBC, TAS, and City of Austin ordinances.

Step Tread

- Tread depth: 15-3/4 inches (minimum)Riser height: 8-1/2 inches (maximum)
- Die-cast aluminum with rounded nosing - grooved

Panel Skirt

- Stainless Steel
- Anodized Aluminum
- Powder-Coated Steel

Balustrade

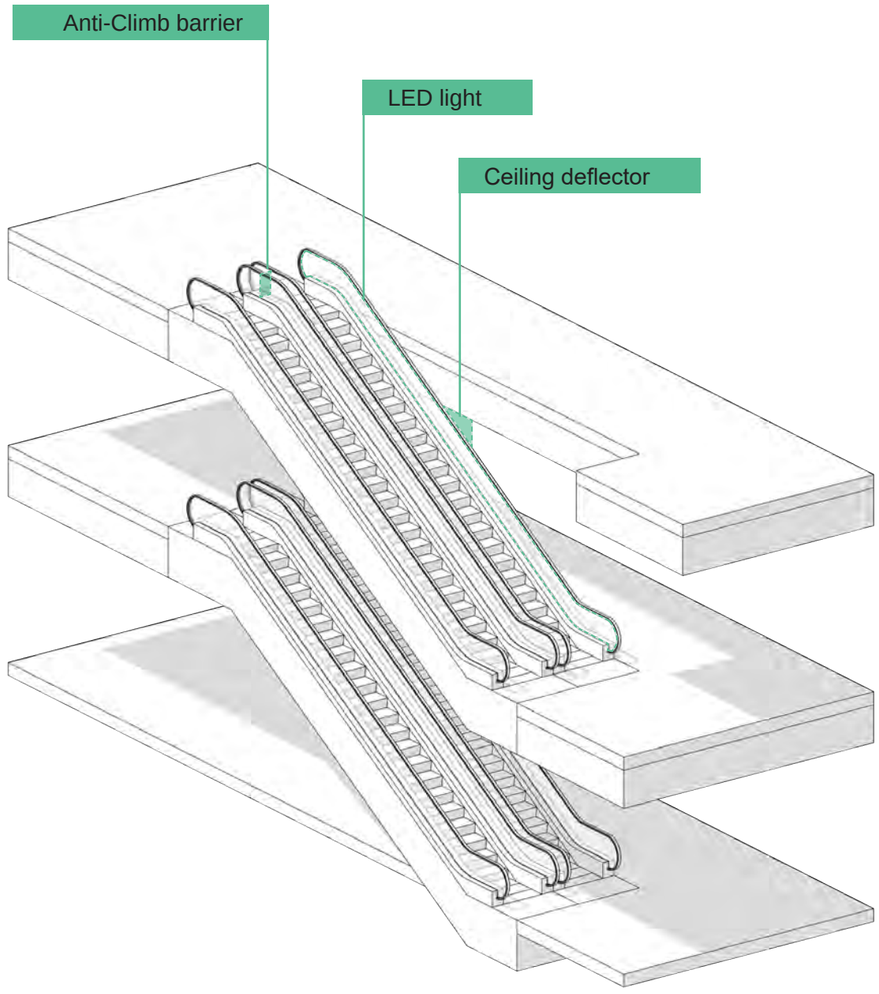
- Safety glass - Clear

Handrail

- Black Rubber
- UV-C disinfection

Lighting

Lighting may be considered to aid in directional orientation and wayfinding. LED lighting may be included in the skirt panel, balustrade (under the handrail), and at potential danger zones.



II. INTERIOR IMPROVEMENTS - PUBLIC

K. Horizontal And Vertical Conveyance

Moving Walkways

Designers should determine the recommended suitable capacity for each moving walkway suitable for passenger and personal baggage transport. System will provide transportation for all passengers between areas as determined by circulation studies. Moving walkways should be heavy duty units of suitable capacity based upon a ridership study of the area(s) being served. Moving walkways should be provided with integrated pit and control spaces that will contain all machinery and controllers in a common location. Service for moving walkways should comply with all applicable codes and ordinances.

Moving walkways must comply with all applicable codes and ordinances including, but not limited to, ASME, NFPA, IBC, TAS, and City of Austin ordinances.

Designers should use the following speeds when determining travel distance:

- Unassisted Walking: 264 feet/minute
- Walking on Moving Walkway: 322 feet/minute
- Standing on Moving Walkway: 123 feet/minute

Travel time and unassisted walking distance should be limited limited to provide the best passenger experience. Moving Walkways should be considered where extended walking distances are unavoidable.

For passenger safety, moving walkway speed must not exceed 100 feet/minute.

Moving walkway pallets should be a minimum of 48 inches wide to allow a walking passenger to pass a standing passenger while pulling rolling luggage.

Moving walkway lengths should be determined by passenger travel needs but should typically not exceed 250 feet.Pallet Tread

- Die-cast aluminum with rounded nosing - grooved

Panel Skirt

- Stainless Steel

Balustrade

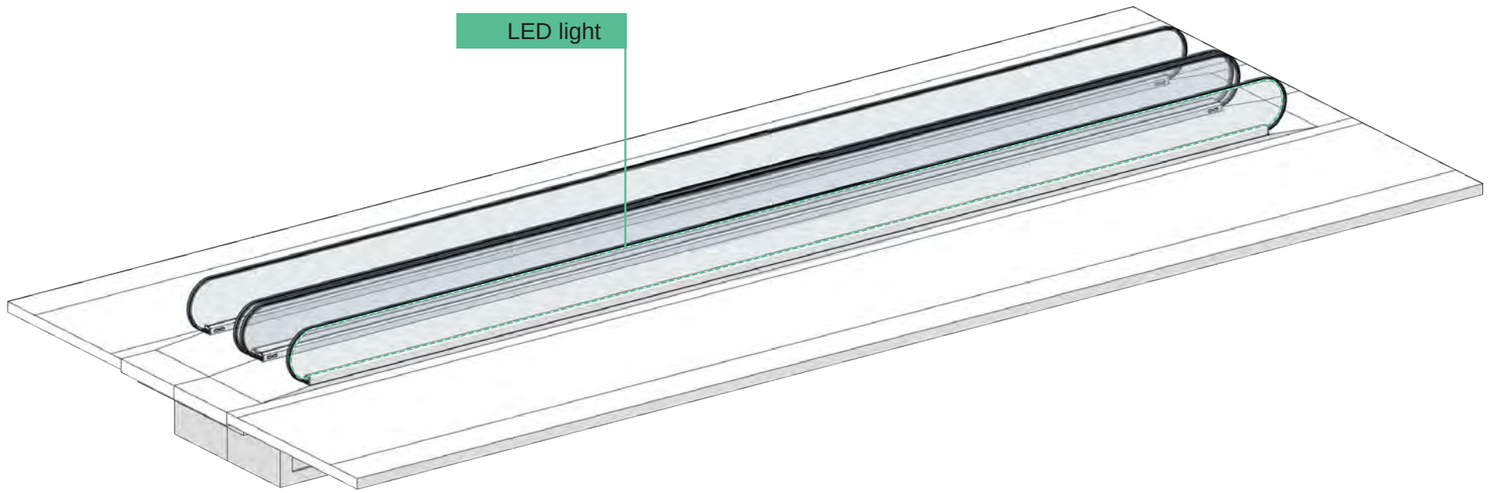
- Safety glass - Clear
- Stainless Steel (when adjacent to a wall)

Handrail

- Black Rubber
- UV-C disinfection

Lighting

Lighting may be considered to aid in directional orientation and wayfinding. LED lighting may be included in the skirt panel, balustrade (under the handrail), and at potential danger zones.



II. INTERIOR IMPROVEMENTS - PUBLIC

K. Horizontal And Vertical Conveyance

Interior Stairs Open

Careful consideration should be given to stair design to contribute to occupant safety in day-to-day use as well as emergency situations. All stairs at AUS must be of permanently fixed construction and must meet all building code requirements, OSHA requirements and accessibility requirements. Stair widths must accommodate the required occupant load, but consideration should be given to providing additional width for ease of use and comfort. Materials should be considered in stairs to provide safe conveyance between floors. Public stairs should complement the look and feel of the surrounding spaces and, where allowed, be open type.

Guard Rail / Balustrade Panel

- Safety Glass
- Metal Pane
- Stainless Steel Cable
- Stainless Steel

Panel Skirt

- Stainless Steel

Handrail

- Stainless Steel
- Wood

Tread / Landing

- Tread and landing materials should be consistent with adjacent spaces.
- Tread materials may extend to the risers or risers may include the following

Riser

The lowest and highest riser at each stair must be identifiable by using alternate color.

- Stainless Steel
- Wood

Lighting

Lighting may be considered to aid in directional orientation and wayfinding. LED lighting may be included in the skirt panel, balustrade (under the handrail), and at potential danger zones.

Interior Stairs - Enclosed

Careful consideration should be given to stair design to contribute to occupant safety in day-to-day use as well as emergency situations. All stairs at AUS must be of permanently fixed construction and must meet all building code requirements, OSHA requirements and accessibility requirements. Stair widths must accommodate the required occupant load, but consideration should be given to providing additional width for ease of use and comfort. Materials should be considered in stairs to provide safe conveyance between floors. Enclosed public stairs should have no exposed utilities. To ensure the safety of all passengers and building occupants, all enclosed stairs must include CCTV cameras to monitor the entire stair.

Guard Rail

- Metal Pane
- Stainless Steel
- Stainless Steel Cable

Handrail

- Stainless Steel
- Wood

Tread

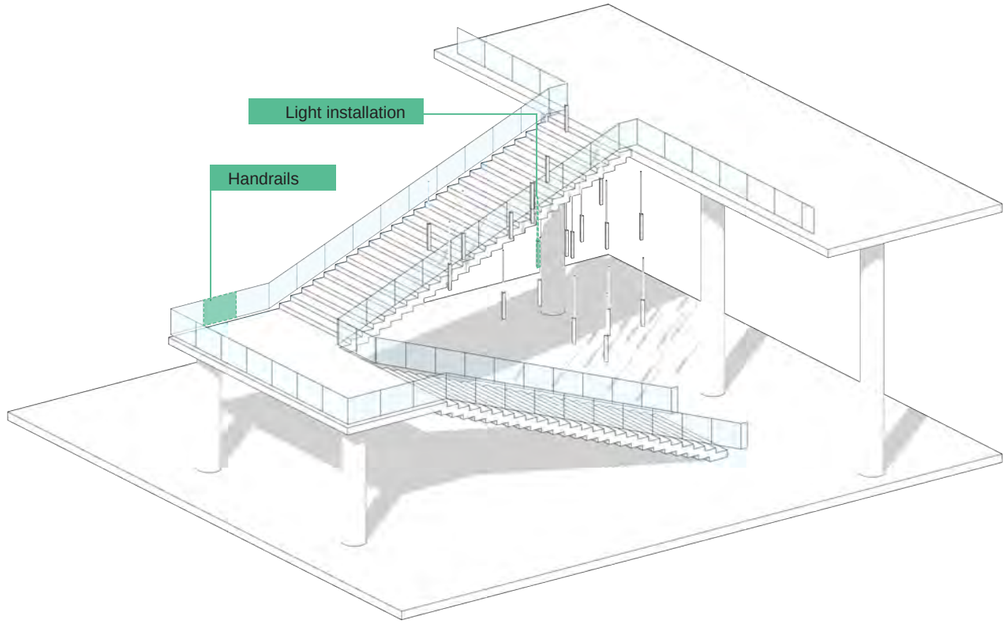
- Terrazzo - Precast or Tile
- Large-Format or Panel, Rectifed Porcelain Tile, Thru-Body Color
- Stone

Riser

- Stainless Steel
- Decorative Steel

Walls

- Wall Panel Systems
- Flush Wood
- Cork
- Formed Metal
- Stone
- Resin/Plastic
- Thru-Body Tile
- Fiber Cement Panels
- Ultracompact Surface Material
- Vinyl Wall Covering
- Aluminum framed interior storefront system
- All-glass interior storefront system



II. INTERIOR IMPROVEMENTS - PUBLIC

L. Restrooms - Public

Studies show that passengers' experiences with terminal restrooms have a large effect on their overall experience and impression of the airport terminal. The re-envisioned restrooms at Austin-Bergstrom International Airport send a clear message of support for all individuals,regardless of age, gender, or ability. Additional amenities in these spaces add value and demonstrate empathy and understanding of the end-user's needs. This accessible and inviting atmosphere creates a space that is truly inclusive for all people. The standards outlined in thisdocument should be a starting point for future projects, providing a frame of reference that can be adapted to meet the challenges of the time. Specifically, this document will be adaptable to any changing industry standards required for the betterment of the public due to the recent impact of COVID-19.

Goals And Objectives

Our objectives are to provide a positive experience and respond to different travelers' needs with the following:

- Clearly visible, welcoming entrance
- Ease of maintenance, fast and efficient
- Ease of use, accessible
- Durable and sustainable
- Passenger comfort and privacy
- Efficient storage
- Ease of maintenance and cleaning
- Easy to access, with short walking distances from all public areas
- Design and element integration for light and calm/ order feel
- Restrooms to accommodate diverse passenger needs
- Facilities to accommodate nursing mothers and families
- Powered toilet accessories should include batter backup

Functionality

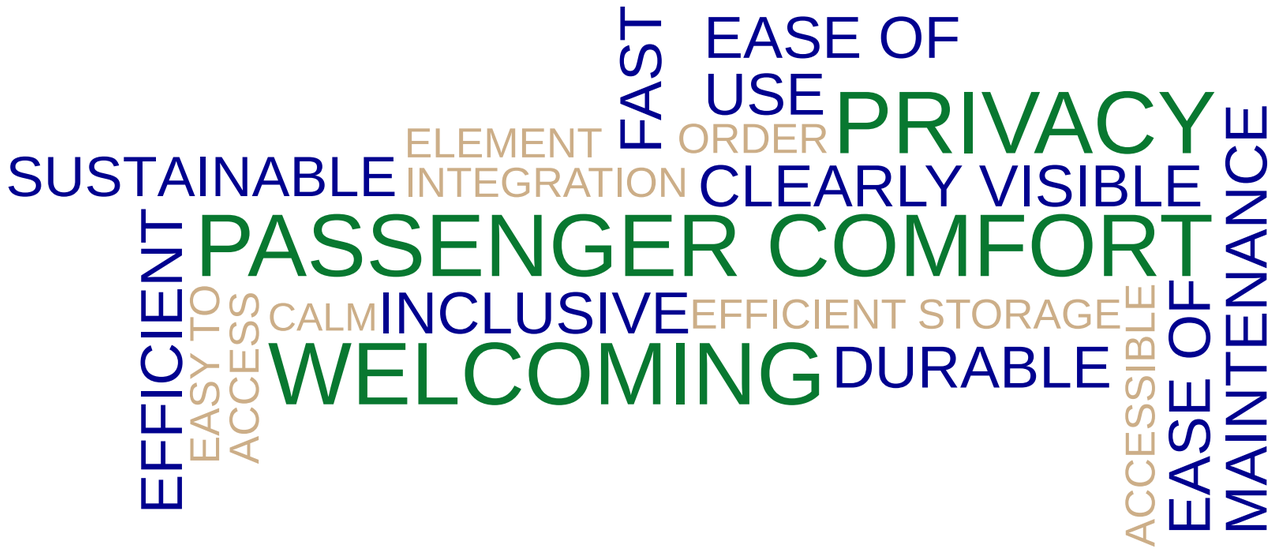
Functionality is an important part of the restroom. It is evidenced mainly in the importance given to maintenance, offering strategies to avoid restroom shutdowns.

- Intuitive wayfinding
- Chase access for maintenance
- Ability to close portions of restrooms for cleaning and maintenance.
- Centralized soap reservoirs
- Clearly visible storage locations for visitors

Passenger Experience

The design is attentive to the individual experience, using separate fixtures and ensuring privacy to cater to each passenger distinctly. Another focus of the design is the decision to maintain groups and families together, which is accomplished by locating all amenities in the restroom cluster.

- Differentiate between types of passenger needs.
- LED "open/occupied" lighting on toilet stall doors
- Near full height stall doors with 0" gap for privacy



II. INTERIOR IMPROVEMENTS - PUBLIC

L. Restrooms - Public

Planning

When space planning restrooms, there are many considerations to be balanced. There is often limited space available e and many features to be incorporated. It is important restrooms are planned with the passenger experience as the most important design criteria. With this goal in mind, restrooms should prioritize meeting the required fixture counts within the footprint first, then move on to providing other elements and features.

Space Planning

When space planning, all restroom related activities and services should be centralized including men and women´s restrooms, family rooms and nursing rooms. When all elements are placed together it allows for intuitive wayfinding. The Restroom Zone as indicated in Figure 2, can implement “intuitive wayfinding” to direct passengers’ attention to a specific programmatic area (through the use of color, lighting, signage, etc.) instead of having an erratic placement of program throughout the concourse. Passengers will navigate intuitively to the restroom zone and discover a variety of amenities.

The redundant restroom layout (two spaces for men and two for women) is a product of the maintenance strategy. The central wall (and a built-in maintenance closure accessory) allow a portion on each restroom to be closed for cleaning and/or maintenance without needing to stop restroom operation, a common disruption for the passenger experience at airports.

Circulation space should be planned to allow enough space for travelers to maneuver past each other with roller bags, carts, strollers, etc. Aisles provided within group restrooms should be generous, with a minimum dimension of 6’-6”. This minimum should be exceeded when space allows, with a goal of providing 8’-0” in two-way traffic areas.

Opportunities to provide natural light should be maximized in the designed layout. This can be achieved with clerestory windows or full-height glazing. When renovating, designers should help the airport weight the cost and implications of changes to the building envelope. In all cases, designers should provide a translucent film to ensure privacy from views into the restroom.

An airport striving for Level of Service A (excellent) or B (high) as defined in the IATA standards should provide restrooms that are adequately spaced, generously dimensioned and comprise all the different services and amenities an international airport requires.

Airport restroom number and size are typically calculated based on the relative area of the Concourse they serve, whether pre-screening (calculation based on throughput) or post-screening (calculation based on airplane size/ frequency). It should also be considered landside and airside restrooms serve a different mix of users, since landside locations are also frequented by meeters and greeters.

Passenger Experience

A further consideration regarding restroom sizing is passenger behavior. Arriving passengers will presumably wait to use the Concourse restrooms instead of the airplane one (especially in shorter domestic flights). Conversely, travelers will also wait until they have passed security to use the restroom, so the probability of running into issues that may impact their flight is diminished. The Designer should address the specific needs of the restroom depending on the area where it is located.

An important percentage of the Terminal´s restrooms will be in the Concourse area. In order to assist the Designer with preliminary dimensioning of walking distances, a useful rule of thumb has been published in the ACRP Report 25: Airport Passenger Terminal Planning and Design, Volume 1 Guidelines. The Guidebook recommends providing one restroom module (one restroom for men and one for women) for every eight EQA.

US FAA equivalent aircraft (EQA) factor to convert an existing gate size to an EQA:

- 1 EQA ≈ 145 Seats (typical narrow-body aircraft)

RESTROOM MODULE

II. INTERIOR IMPROVEMENTS - PUBLIC

L. Restrooms - Public

Passenger Experience (Continued)

Depending on the fleet mix, this translates to one module centered on a reasonable number of gates (approximately four narrow-body gates on each side of a double-loaded concourse) where the farthest passenger's walk equates to approximately 450 feet. Arriving passengers are typically the principal factor in restroom demand, especially when airplane turnaround sequencing allows for simultaneous flights to arrive at nearby gates. Taking surges into account, the peak 20-minute arrival period of the peak arrival hour is a good indicator for calculating peak passenger capacity. In today´s restrooms, it is typical to provide an equal split for women´s and men´s fixtures, However, it is recommended to provide 25 to 50 percent more fixtures for women than for men due to numerous factors: accompanied children, longer utilization factors, unavailability of urinals, etc. It is not the intent of these guidelines to provide a detailed procedure on how to appropriately size the terminal's restrooms, but rather to assist with the necessary tools to assist designer on preliminary rough dimensioning. Local building codes and airport authorities should be the primary point of consideration when approaching the sizing of airport areas, including restrooms. Furthermore, codes usually provide minimum requirements for health and safety standards, and considerations should be given to provide an adequate response to the needs of these spaces in an international airport environment.

Key Considerations

The first consideration regarding restroom ambiance is related to wayfinding. Contrasting color and materials to the adjacent finishes will create an approach and identifier for the restroom entry to achieve intuitive wayfinding. The designer should consider an accent material, garden wall or art at the entry for interest. The material inside of the restroom will consist of durable non-porous material with thoughtful use of high shine materials to avoid reflections and views into the restroom. The ceiling is an interlocking ceiling system to provide multiple points of access for maintenance. Gypsum board ceiling with white paint is acceptable at entries, fur downs, and cove lighting area, but should be minimal in size. Recesses for drinking fountains are provided. Once inside the restroom, the ambiance is communicated by materials and colors. The use of color is reasonable, allowing for some color accent but avoiding any overwhelming sensation. The use of color should also contribute to the ambience of cleanliness in the restroom camouflaging signs of heavy use. The use of lighting is to be carefully designed, as a poorly lit environment will lower the overall ambience. Identify opportunities for integrating indirect lighting, letting the light bounce off the ceiling to shed some warm light throughout the restroom and provide opportunities for natural light. The vanity area should be carefully designed to incorporate all the elements into a seamless design, each vanity island is thought to provide an individual, personalized environment. Mirrors and fixtures are to be kept individual, providing a hospitable experience. All elements need to reference the passenger´s functional use of the restroom: all touch-less fixtures, occupied/ vacant sign at stalls, centralized use wash areas, carry-on space inside stalls, etc. Material selection has also taken the current cleaning procedures into account for durability to daily power washing.

II. INTERIOR IMPROVEMENTS - PUBLIC

L. Restrooms - Public

Structural Requirements

Support Of Lavatories And Partitions

- Use of miscellaneous steel or cold-formed steel framing may be required o Lavatories and sinks may require miscellaneous steel supports embedded within CFSF backup in walls for support.
- Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated, with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction as appropriate for the substrate.
- Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction,based on ICC-ES AC70.
- Refer to Figure 5 for potential detailing for overhead structural detail to attachments to existing deck.

Support Of Adult Changing Table

- Provide miscellaneous steel vertical elements where adult changing table mounts and anchor require attachment. Miscellaneous steel vertical elements shall be from floor to ceiling and anchored at base with post-installed anchors and laterally braced but vertically slipped at top.

Support Of Overhead Hoist System In Changing Place

- Where existing conditions allow, provide new miscellaneous steel supported by existing structural steel above. Design of new, horizontal miscellaneous steel elements and their attachment to the existing structural steel should be based upon the loading requirements for the Overhead Hoist System selected.
- Where existing conditions do not allow for the installation of new, horizontal miscellaneous steel (i.e., at the Departures Level where the existing structural steel above is much higher than would be practical to use), additional consideration will be required. Where possible, consider the use of new structural steel frames with new, horizontal miscellaneous steel supported off new, vertical steel posts buried in the cold-formed steelframed walls.

Framing Of New Vertical Penetrations Through Existing Framed Floors

- Any new penetrations through existing steel framed floors should be provided such that the existing steel is not impacted.
- For new penetrations larger than 10”x10” or 10” diameter, supplemental steel angles can be installed per detail in Figure 4. Maximum size of penetration for this detail is 2’-0”x2’-0” or 2’-0” diameter. Larger openings will have to be evaluated separately and may require more significant miscellaneous steel framing.

II. INTERIOR IMPROVEMENTS - PUBLIC

L. Restrooms - Public

Program & Accessories

After minimum fixture count and adjacencies have been determined, designers should consult the following lists to understand the fixtures and features needed in each part of the restroom. The specific performance requirements and detailing of fixtures is outlined at the end of this chapter.

Each Restroom Cluster should provide the following as outlined in the subsequent sections

- Men's and Women's Restrooms with fixture counts based on estimated 15-year demand
- Gender Neutral Restroom (at least one)
- Family Restroom (at least one)
- Ambulatory Restroom (at least one)
- Nursing Room (at least one)
- Ancillary Features

Men's / Women's Restroom

Entry / Exit

- Signage must comply with the AUS Wayfnding and Signage Design Standards
- Dual Flow Layout that prevents all sight lines into the group restrooms
- Customer Feedback Interface to record impressions and provide a cleaning/maintenance alert function

Toilet Stall Area

- Accessible stall most convenient to entry – with lavatory in stall
- Touch-less stall opener if possible
- If proposed fixture count is exceeded, one toilet should be provided at a lower height to accommodate persons of shorter stature and children
- Typical stalls will be at least 7'-0" deep and 3'-0" wide, with outward swinging doors (other than code required exceptions)
- Stalls should provide a 1"-3" gap at the floor with minimal floor connections for ease of cleaning and maintenance
- When feasible, stall partitions should be ceiling hung with all panels extending to the ceiling for privacy (extra consideration should be given to fire code requirements and ceiling device layouts)
- Stalls should be detailed to prevent any gaps allowing sight lines into the stall
- Stall partition material should be resistant to vandalism
- Stalls should be equipped with clearly visible occupancy lights
- Stall door locks should include a visible, color occupancy indicator and should be lockable from the exterior side for maintenance of out-of-service stalls
- Toilets should be located on walls adjacent to the maintenance chase with touch-less flushometers (reference later section for performance requirements)
- Each toilet should be discretely numbered for ease of maintenance
- Toilet seat cover dispensers in each stall
- Toilet paper dispensers that hold a minimum of 2 rolls and dispense across the stall, not front to back. Provide coreless toilet paper rolls.
- Toilet paper dispensers should feature a supply sensor if possible
- Small waste compartment in each stall (both men's and women's)
- Each stall should provide a single hook on the stall door, as well as a dual hook on the stall side walls for heavy bags
- Each stall should provide a recessed shelf for personal items, ensuring the shelf is not obscured by other equipment that could cause passengers to leave behind items
- Feminine hygiene dispensers (provided on each side of the restroom or a central location for access while cleaning is occurring).

II. INTERIOR IMPROVEMENTS - PUBLIC

L. Restrooms - Public

Program & Accessories (Continued)

Urinal Stall Area

- Provide floor drain at urinal stall area
- Floor material under urinals should be non-porous, suitable to withstand urine, and should have minimal joints
- At least one urinal installed at a lower height to accommodate wheelchair users, persons of shorter stature and children
- At least one urinal with wall mounted grab bars
- Urinal partitions shall provide 3’-0” of clear width and at least 2’-0” of depth for privacy
- Urinal partitions should begin 1”-3” from the floor and extend to 60” from the floor
- Urinal partitions should be wall mounted with minimal floor connections for ease of cleaning

Handwash Area

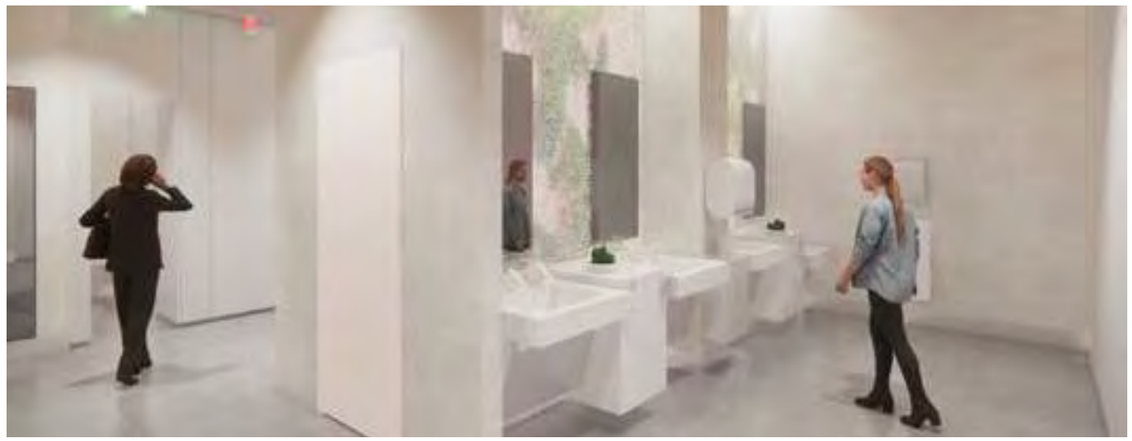
- Individual wash stations with touch-less plumbing and soap fixtures
- Lavatories should be located with a chase wall
- One lower wash station on each side of the restroom for persons of lower stature and children
- A step stool may be provided at the lower wash station to accommodate users of even less height
- Provide a 1:1 hand dryer to sink ratio
- Paper towel dispenser with coreless paper towels, one for every 4 wash stations
- Stainless steel recessed trashcan, at least
- 12- gallon capacity for every 4 wash stations
- Bag hooks should be provided convenient to wash stations
- An elevated surface or shelf should be provided convenient to each wash station for personal items to be placed in a dry area
- Signage should be provided in at least one location in each restroom to remind employees to wash hands
- Integrated and dynamic signage solutions should be considered ease of cleaning and flexibility

Nursing Room

- At least one per restroom module
- Chair or sofa that has a cleanable space between the seat and back, upholstery should be bleach cleanable
- Movable table near chair for pumping devices
- Dual hook near chair for bags
- Wall mounted toddler seat with lap buckle
- Lavatory with integrated soap dispenser
- Step stool at lavatory
- Full height mirror
- Paper towel dispenser and recessed trash can convenient to sink (trash can be integrated into millwork)
- Recessed or built in millwork baby changing station with adjacent surface/shelf and convenient hook for bags
- Art or interesting accent surface viewable from chair or sofa

II. INTERIOR IMPROVEMENTS - PUBLIC

L. Restrooms - Public



Program & Accessories (Continued)

Family Room

- Privacy locks with color occupancy indicator should be coordinated with the AUS Project Manager to ensure compliance with AUS standards
- At least one per restroom module
- One typical height toilet
- One lower height toilet to accommodate persons of shorter stature or children
- Toilets should be located on walls adjacent to the maintenance chase with touch-less flushometers
- Toilet seat cover dispenser
- Toilet paper dispensers that hold a minimum of 2 rolls and dispense across the stall, not front to back
- Toilet paper dispensers should feature a supply sensor if possible
- Small wall mounted waste compartment near toilets
- Feminine hygiene dispenser
- Recessed shelf for personal items near toilets, ensuring the shelf is not obscured by other equipment that could cause passengers to leave behind items
- Wall mounted toddler seat with lap buckle
- Divider between toilet and lavatory area
- Lavatory with integrated soap dispenser
- Step stool at lavatory
- Paper towel dispenser and recessed trash can convenient to sink
- Wall hook for baggage
- Full height mirror
- Recessed baby changing station with adjacent surface/shelf and convenient hook for bags

All Gender Room

- Privacy locks with color occupancy indicator should be coordinated with the AUS Project Manager to ensure compliance with AUS standards
- At least one per restroom module
- One typical height toilet
- Toilets should be located on walls adjacent to the maintenance chase with touch-less flushometers
- Toilet seat cover dispenser
- Toilet paper dispensers that hold a minimum of 2 rolls and dispense across the stall, not front to back
- Toilet paper dispensers should feature a supply sensor if possible
- Small wall mounted waste compartment near toilets
- Feminine hygiene dispenser
- Recessed shelf for personal items near toilets, ensuring the shelf is not obscured by other equipment that could cause passengers to leave behind items
- Lavatory with integrated soap dispenser
- Step stool at lavatory
- Paper towel dispenser and recessed trash can convenient to sink
- Wall hook for baggage
- Full height mirror
- Recessed baby changing station with adjacent surface/shelf and convenient hook for bags

II. INTERIOR IMPROVEMENTS - PUBLIC

L. Restrooms - Public

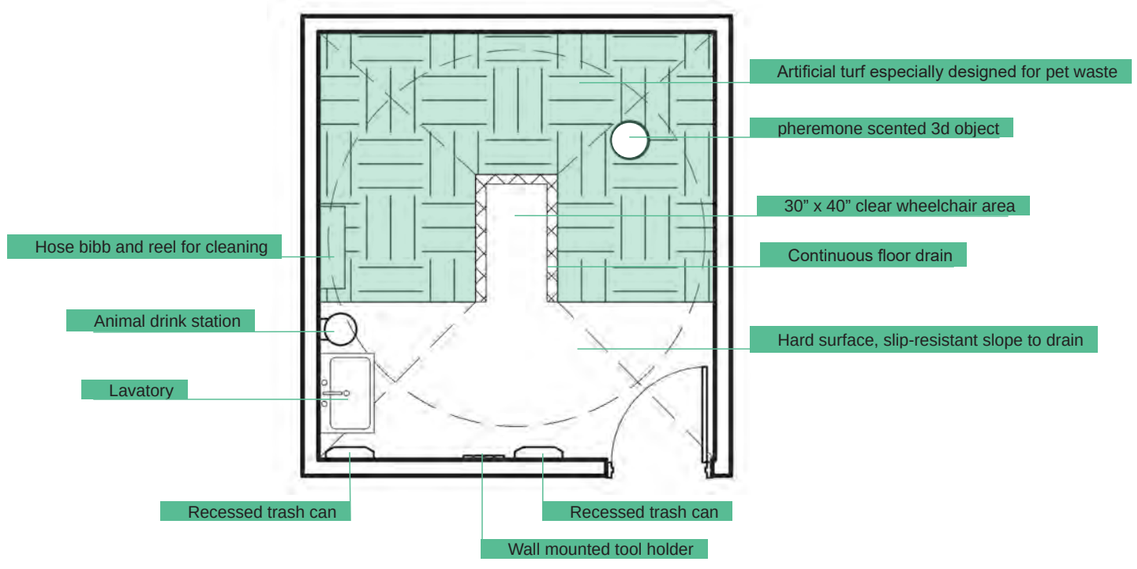
Program & Accessories (Continued)

Ambulatory Room

- Privacy locks with color occupancy indicator should be coordinated with the AUS Project Manager to ensure compliance with AUS standardsAt least one per restroom module
- 10’-0” x 13’-0” or equivalent floor space for 130 Sq. Ft
- Height adjustable, adult sized changing bench (min 1800mm long)
- Paper roll dispenser adjacent to bench
- Tracking hoist system
- Wall-mounted toilet with flush/leak detectors (with chase 3’-0” clear required) – centrally place with space on either side
- Screen/Curtain system
- Soap dispenser
- Hand dryer
- Paper towel dispenser
- Large wall mounted waste bin
- Accessible wash basin 720-740 mm from floor (preferably height adjustable)
- Shower/ floor drain
- Emergency button or pull cord

Pet Relief Area (Airside)

- Signage/ Guidance/ Wayfinding in layout maps
- Hose with built in flushing system and reel needed for rinsing artificial turf
- Adequate drainage
- Continuous ventilation to building exterior
- Accessible entrance – hard surface with delineation from relief area
- Accommodate 48” x 30” clear space for wheelchair with 6’-0” leash
- Artificial turf designed for pet relief and treated to inhibit the spread of disease
- Three-dimensional device (rock or fake fire hydrant, preferably pheromone-scented)
- Features should be accessible by wheelchair user
- Lavatory for hand washing
- Soap dispenser
- Paper towel dispenser
- Trash receptacle near sink
- Pooper scooper with long handle
- Pick up bag dispenser (just inside entrance, accessible height). Bags to be readily available
- Trash receptacle (just inside entrance, accessible height)
- Drinking station for animal
- Signage for usage and responsible behavior –and instructions to contact maintenance
- Automatic rinse button



II. INTERIOR IMPROVEMENTS - PUBLIC

L. Restrooms - Public

Ancillary Features

Janitorial Supply Room

- Mop sink
- Mop broom holder
- Chemical mixing units over mop sink
- Central soap drums for refilling
- Provide shelving for dry storage
- Provide adequate space for cleaning carts, up to 2 carts if possible
- Continuous ventilation to building exterior
- Walls must be full-height (to underside of structure above)

Maintenance Chases

- 3’-0” interior width for lavatory chases
- Provide power for hard-wired accessories/fixtures. Connected to emergency power. On the flush valve wall, do not place insulation. The wall between the chase and adjacent spaces will need insulation for sound proofing.
- Chases with toilets on one wall should be 4’-3” to provide 3”-0” clear with 15” allowed for plumbing
- Chases with toilets on two walls should be 5’-6” wide to provide 3’-0” clear with 15” allowed for plumbing on each side
- Minimum clear space for limited runs in 28” to accommodate sewer machine

Drinking Fountain

- Drinking fountain quantity should meet all building code requirements
- Hi/Lo drinking fountains with integral bottle fillers should be used at all locations
- Additional stand-alone bottle fillers should be provided for additional passenger convenience
- Priority should be given to fully recessed drinking fountains and bottle fillers with remote chillers

Performance Requirements And Detailing

Toilets

- Must contain a WaterSense Label
- Wall-mounted
- Flush/Leak detectors
- Siphon jet
- Recessed Flush-ometer with sensor
- Touch-free activation with manual override option

Urinals

- In order to prevent splashing at urinal, provide a splash guard placed at the basin of the urinal and a “bullseye” emblem etched at the anti-backsplash wall of the urinal. AUS to approve emblem design.
- Vitreous china fixtures should be provided to protect against staining and discoloration.
- Must contain a WaterSense Label

Lavatory

- Faucet must contain a WaterSense Label
- Touch-free activation at soap and water
- Soap system should be refillable

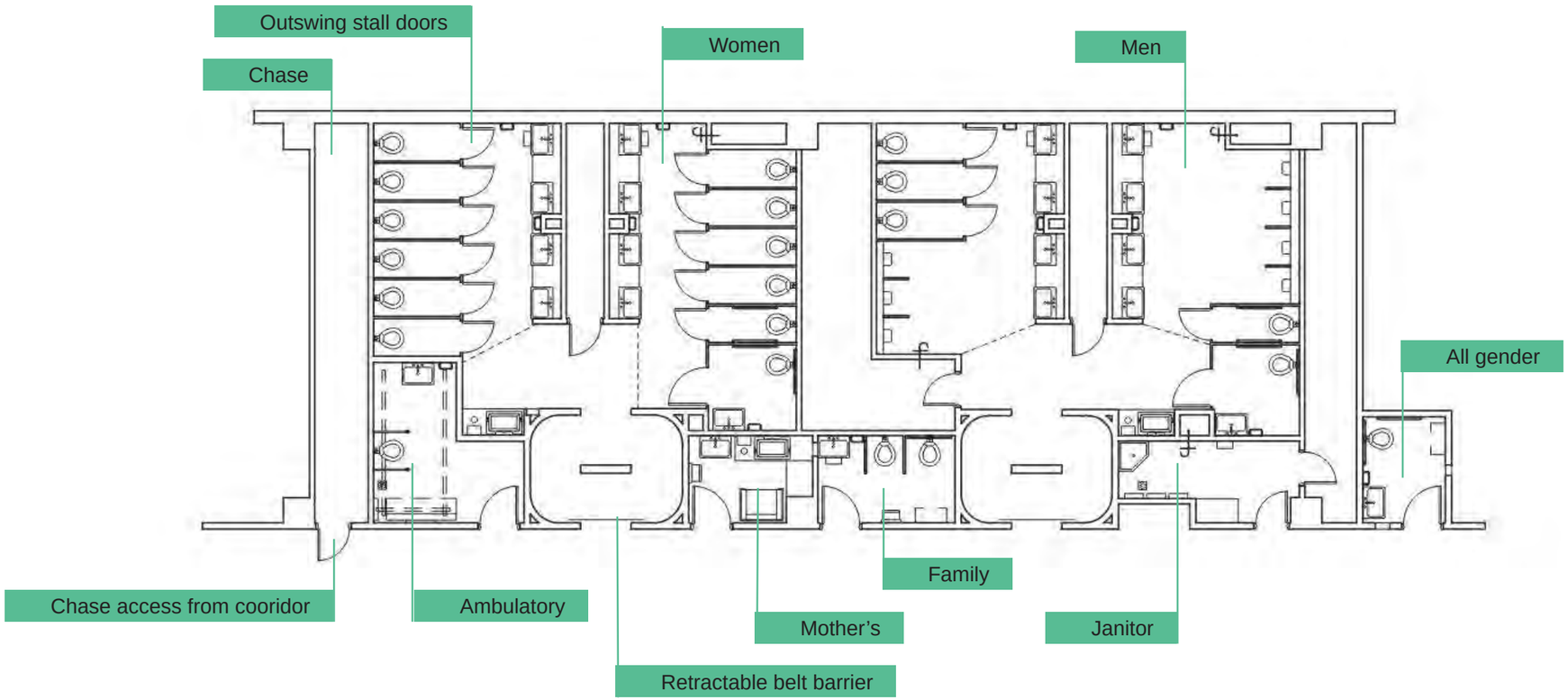
II. INTERIOR IMPROVEMENTS - PUBLIC

L. Restrooms - Public

Prototypical Plans

Renovation Prototype

The design team created a prototypical plan based on the existing footprint of the terminal, seen in Figure 14. This plan can be utilized for future renovation projects and will complement the new construction proposed prototype. Due to the varied existing conditions, the plan will likely require some adaptations to existing locations, including the possibility of double loaded restrooms with entrances on each side.



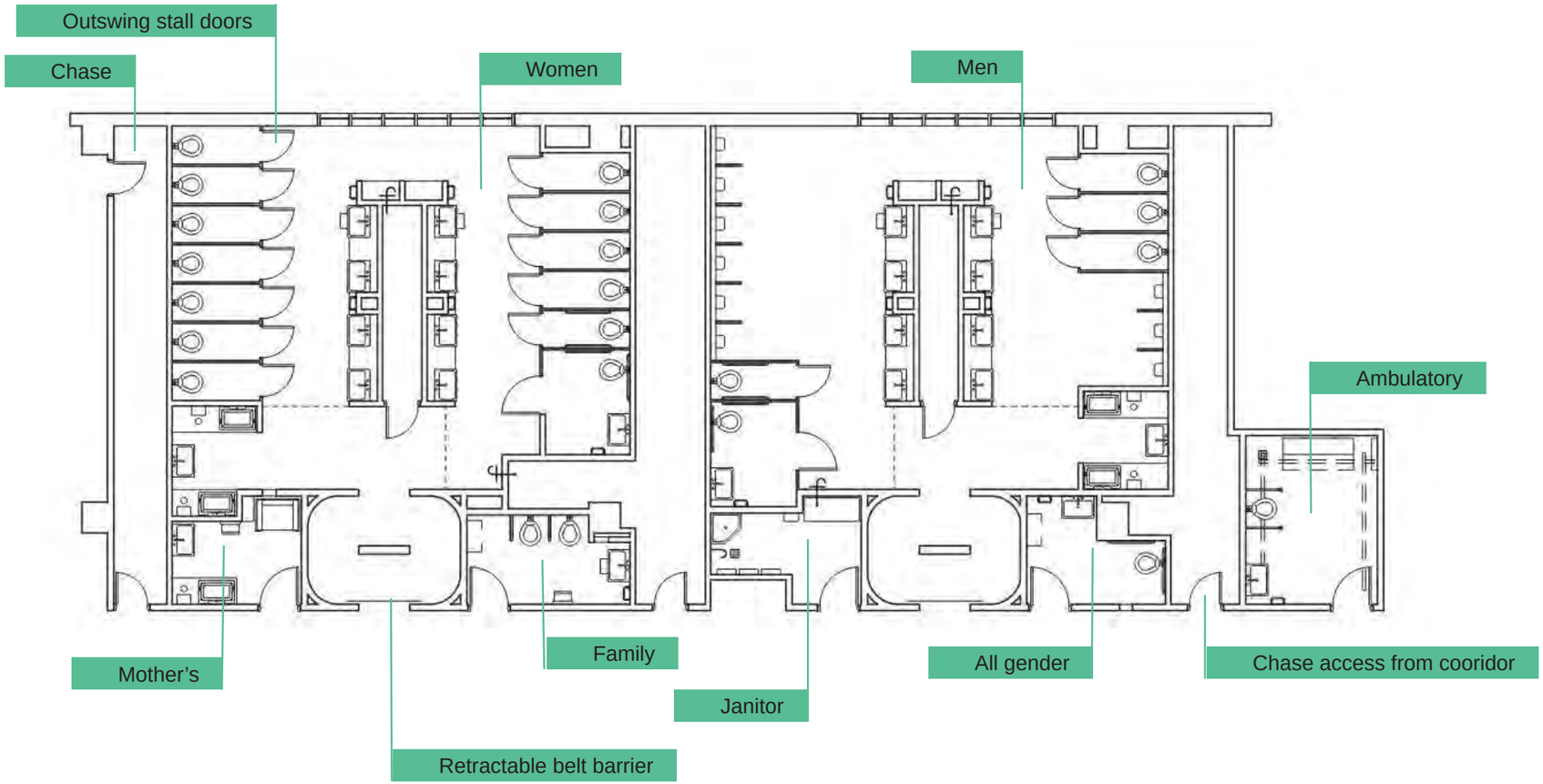
II. INTERIOR IMPROVEMENTS - PUBLIC

L. Restrooms - Public

New Construction with Natural Light

New Construction Prototype

The new construction prototypical plan is an extended version of the renovation restroom. Figure 15 shows how this configuration allows for a similar layout of amenities with more fixtures and allows for natural daylight to be introduced into the restrooms.



II. INTERIOR IMPROVEMENTS - PUBLIC

L. Restrooms - Public

Operations & Maintenance

Materials

Special consideration should be given to the materials and finish systems provided in the restroom environment. Materials should be assessed for durability, maintenance requirements and their compatibility with the Airport's current cleaning methods. In general materials that are non-porous, abrasion resistant, chemical resistant and graffiti-proof are good options for this high traffic and often cleaned environment. Materials should aid in the Restroom's clean and bright appearance to enhance passenger impressions and experience. The following list of materials has been provided as suggested starting point, any materials not on this list should be reviewed with and approved by the airport.

Walls

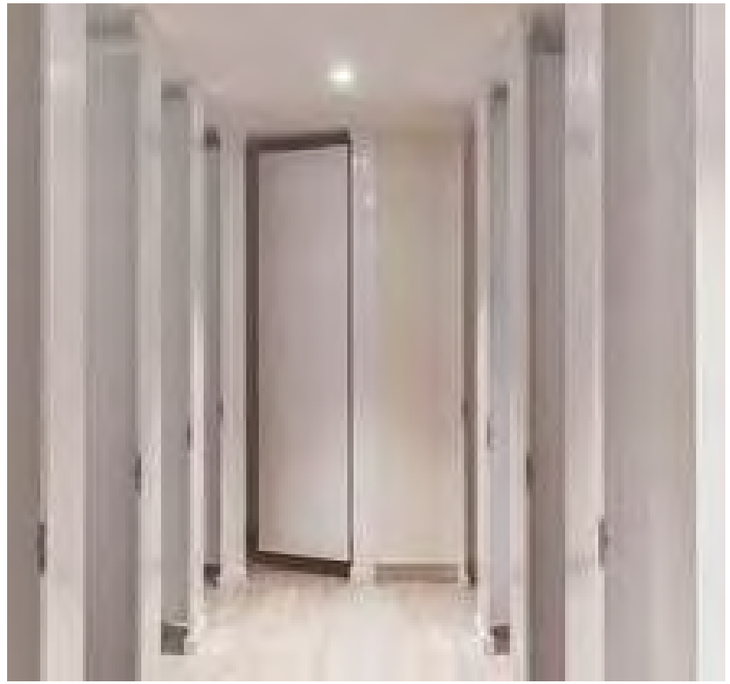
- Porcelain Tile
  - Primary choice for field walls
  - Color should be thru-body
  - Tile sizes should be large with minimal grout for ease of cleaning
  - Minimum field tile size: 12" x 24"
- Wall Panel System
  - Primary Option for Accent Walls
  - Should be accessible where needed
  - Example system is aluminum framed with hinged access panels
  - Panel finishes can be back-painted glass, metal or phenolic
  - Large panels are preferred for ease of cleaning and maintenance
- Ceramic Tile
  - Secondary Option for limited accent applications
  - Should be detailed to protect tiles from impacts or abrasions from baggage
- Glass Tile
  - Secondary Option for limited accent applications
  - Should be detailed to protect tiles from impacts or abrasions from baggage
- Advanced Protection Wall Coverings
  - Primary option for curved entry walls
  - This material applies like wallpaper
  - Specified options should offer protection from abrasion, impact and chemicals
  - Stainless steel corner guards

Flooring

- Terrazzo
- Porcelain Tile
  - Primary choice floors
  - Color should be thru-body
  - Large tiles preferable to minimize hard to clean grout lines
  - Recommended sizes up to 48" x 48" tiles. Min. of 12" x 24"
  - Recommended thickness for renovated areas is typical 3/8" tile thickness rather than thin-gauge panels.
  - Special consideration should be given to Color, pattern and finish with the goal of minimizing the visibility of dirt and grime
  - Coordinating grout should be a mid or dark tone and
  - Grout should be chosen for its performance and clean-ability – being able to resist regular pressure washing
  - Special attention should be given to minimizing the size and number of grout lines near urinals to prevent staining
- Metal Base
  - Primary option for wall to floor transitions
  - Tile should not be extended to the floor with metal trims less than 4" tall
  - Metal base should be detailed to provide wall materials adequate protection from the impact of carts and baggage
  - Base should ideally be provided for the first 6" of the wall from the floor

II. INTERIOR IMPROVEMENTS - PUBLIC

L. Restrooms - Public



Operations & Maintenance (Continued)

Materials (Continued)

Toilet And Urinal Partitions

- Solid Surface
  - Primary option for partitions
  - Finish should allow resurfacing as needed for maintenance
- Phenolic
  - Secondary option for minimal budgets
  - Must be color through to allow resurfacing as needed

Millwork

- Quartz
  - Preferred option for countertops, sink basins and horizontal applications
  - Should be detailed as impervious to moisture and provide easy clean-ability
- Solid Surface
  - Secondary option for countertops and sink basins
  - Should be detailed as impervious to moisture and provide easy clean-ability
- Stainless Steel
  - Preferred option for vertical surfaces
  - Should be detailed resist moisture and provide easy clean-ability
- Plastic Laminate
  - Secondary option for vertical surfaces in lower traffic areas
  - Should be detailed with sealed seams to resist moisture and provide easy clean-ability
- Resinous Materials
  - Option for limited accent applications
  - Should be detailed with sealed seams to resist moisture and provide easy clean-ability

Ceilings

- Metal Panel
  - Panel system should provide easy access to panels without having to remove adjacent panels
  - Designers should consider acoustics when choosing a finish or perforation pattern
- Acoustic Ceiling Tile
  - All tiles that can be accessible should be accessible
  - Tiles specified should be appropriate for humid and wet environments
- Gypsum Board
  - Option for soffits and limited trim areas
  - The use of non-accessible ceilings should be minimized as much as possible
  - Usages of gypsum as more than 20% of the ceiling should be reviewed with the airport
- Mirrors
  - Flat Glass, Fully-Tempered type with beveled polished edges
  - Framed mirrors are not allowed

II. INTERIOR IMPROVEMENTS - PUBLIC

L. Restrooms - Public

Operations & Maintenance (Continued)

Ease Of Maintenance

While smart technology and data utilization are helping with identifying the maintenance needs, there are other fixture features required to ensure more accessible and more efficient service:

Coating to the standard ceramic surfaces of toilet and urinal to increase the efficiency of flushing and leaves a cleaner surface

- Selected stainless steel or chrome-plated finishes of fixture hardware ensure its superior durability and clean-ability.
- Install rectified large-format porcelain tiles with equal or less than 1/8” grout on public restroom wall and floor surfaces to reduce build-up and create durable surfaces of heavy usage.
- Phenolic Panels or Solid Surface are selected for toilet stalls and urinal partition for its versatility, heavy-duty application, as well as its vandal and waterproof properties.

MEP Requirements

HVAC

Supply

- Ideally a linear diffuser would run along the entire length of the wall underneath sinks or counter or a 2’-0” x 2’-0” supply close to the sink - duct work to be coordinated with plumbing in chase.
- If under counter diffusers aren’t an option, supply should be provided above the sinks.
- Supply air should also be provided in single fixture rooms like family rooms and gender neutral.

Exhaust – Each restroom should have a dedicated exhaust located directly above all stalls.

- Ventilation – Provide an occupied and unoccupied setting by using the space’s occupancy sensor and modulation of the fan.
  - Unoccupied = Code Min.
  - Occupied = 1.5 x Code Min. (but not less than 10 ACH)
  - Need to be tied to an occupancy sensor and/or building automation system.
- If using a restroom management system, exhausts should also have a cleaning setting to remove fumes (1.5 x Occupied mode)
- Provide access panels on both sides of exhaust fan to allow for duct cleaning.
- Verify building’s existing HVAC calculations won’t go negative.
  - Oversize both the fan for exhaust and pathway to the exterior. Might be limited on above the ceiling height requirement.
  - Thermostat should be in an inconspicuous location – preferably with no display or on the ceiling.

Plumbing

During construction, any existing underfloor plumbing/piping will need to be tested and inspected prior to commencement of work.

Hard Wired Soap

- Include recommendations for where to route piping from drum to reservoir at each unit.
- Position drum in an easy to access location.
- Drum should be 3’-0” x 4’-0” radius
- May need to provide access through slab if Janitor closet (preferred) or chase access (alternate) not feasible

Water fountains – should be bi-level and provide a bottle filler at an accessible height (both should have filters)

- Compressor located behind lavatory, make sure doesn’t clash with service sink

Hose (with atmospheric volume breaker) – in each restroom for hose down

- Concealed under the sink
- Concealed behind an access panel with a cover – Preferred
- Locate in chase behind door at sink
- Locate a hose bibb on both sides of the restroom to enable maintenance closures during cleaning
- Each restroom should have its own shut off valves to the isolate the block
- Waste piping to slope towards door with clean out placed above the spill line for easy access

MEP Requirements (Continued)

Plumbing (Continued)

Lavatories / Sinks

- Lavatories should have removable shroud
- Trap and tailpiece of 17-gauge piping should be provided at sinks
- Sink strainers should be made of stainless steel to prevent staining/ discoloration
- If sinks are on a chase, a cleanout should be provided above the spill line for cleaning without causing an overflow
- If sinks are not on a chase, a cleanout should be provided under the sink
- Passengers expect warm water right away at the sink, they system should have the hot water main as close to the sinks as possible; Tempered water system in new terminals is 105 Degrees Fahrenheit.
- Braided supply lines should be avoided, chrome plated brass supply tubes should be used for easy cleaning.
- Shutoff under sinks: quarter turn ball valves (if no shroud, provide loose key quarter turn ball valves)

Toilets / Urinals

- Provide cleanouts on the waste piping above toilet spill line for easy maintenance
- Provide accessible cleanouts in the maintenance chase for each urinal
- Provide readily accessible isolation valves and serviceable wye strainers for the water closet and urinal branches. Each side of the restroom should have the capability to be separately isolated
- Provide water hammer arrestors for each restroom and make them available
- All toilet seats should have all stainless-steel bolts and springs (no plastic or zinc parts)
- When possible install sinks or toilets upstream of low flow urinal waste lines, this will keep water flowing due to potential of uric acid corrosion 1 Max. 0.5 GPF urinal

Flush Valves

- When chases are used, a concealed flush valve should be used to access for maintenance from the chase
- When chases are not used, models that are concealed with access panels should be considered

Service Sinks

- Should be made of impact – resistant composite poly with an integrally molded drain along with a factory gasket and a removable stainless-steel strainer
- Faucet should have hot and cold-water supply with check valves, a support arm, atmospheric volume breaker, integral shut offs, pail hook, chrome finish and lever handles

Lighting

- Entry lighting should transition users well from the adjacent area, providing accent lighting at signage or art
- Sink area should be well lit with a good combination of vertical and horizontal light
- Vertical lighting at sink should be the emphasis with even lighting on either side
- Stalls can be lit from the back wall to provide a clean crisp appearance, but a small downlight should be provided in stalls to allow users to maneuver when they are standing and casting a shadow from the back light
- Occupancy sensors should be dual technology (DT) to provide max energy savings and minimum false offs
- Emergency backup lighting must be provided at all restrooms to ensure occupant safety

Power

- Electrical outlet should support cleaning equipment ratings to satisfy current AUS cleaning procedures with incorporated child protection
- Should be provided in chase for power tools and hardwired valves
- Should be provided at lavatories or grooming stations
- Should be provided at the nursing room seating area
- Should be provided for cleaning
- Consider GFCI circuit breaker rather than CFCI receptacle
- All wires (including low-voltage) in chase should be run inside conduit

Sustainability

Designers and Contractors will need to follow the ACity of Austin Green Building Policy.

Energy Saving Features

Touch-less fixtures are used at all areas of the restrooms. At the sink area, faucet, soap dispenser and hand dryer and operated by IR sensors with automatic shut off after being used for more than certain periods of time depending on the function and program setup.

Water Efficient Fixtures

Water-efficient toilets and urinals shall be installed at future restroom projects, including new construction and renovation. Some of the critical fixture water usage limits to abide by are:

- Max. 1.28 GPF for the water closet
- Max. 0.5 GPF for the urinal
- Max. 0.5 GPM flow rate for the sink faucet

USA Made Products

Local and USA made products are preferred due to project availability and other economic and environmental benefits. American manufacturers are required by law to minimize their ecological imparts, from limiting carbon emissions to properly disposing of toxic waste.

III. INTERIOR IMPROVEMENTS - NON-PUBLIC

The following design requirements are intended to be a minimum standard related to interior, non-public spaces at AUS. Designers should strive to follow these minimum standards to provide interior spaces that provide safe, comfortable, and functional spaces for AUS employees, tenants, and other users working in any facility or building on the AUS campus.

III. INTERIOR IMPROVEMENTS - NON PUBLIC

A. Lobbies

Lobbies should welcome and direct tenants and visitors, control access, and provide exit ways from buildings or individual spaces within buildings. Lobbies should also provide inclusive accessibility and user comfort. The lobby space may or may not include elevator lobbies, however, they should be adjacent or connected physically or aesthetically. Lobbies serve as the “public face” of buildings and individual spaces and should be inviting while also providing security to the rest of the building or space.

Flooring

- Terrazzo
- Polished Concrete
- Resilient Tile (LVT / LVP)
- Resinous Flooring
- Walk-Off mats
    - Inset Carpet Type
    - Recessed Aluminum Grille Type

Following materials are prohibited
unless approved by the AUS Project Manager

- Sealed or Topically stained Concrete
- Vinyl Composite Tile (VCT)

Walls

- Gypsum Board, Painted, MPI Gloss Level 3
- Vinyl Wall Covering
- Flush Wood Paneling
- Cork Paneling

Column Treatment

- Gypsum Board, Painted, MPI Gloss Level 3
- Flush Wood Paneling
- Metal Column Covers

Wall Base

- Integral terrazzo or resinous wall base with aluminum cap, 6”
- Stainless Steel, #4 Finish, Straight, 6”

Corner Guards

- Full Wall Height
- Stainless Steel
- Clip-on Vinyl

Following materials are prohibited

- Clear Plastic
- Wood

Ceilings

- Gypsum Board, Painted, MPI Gloss Level 1
- Acoustic Ceiling Panel, Standard Grid Size, 2x2 or 2x4 Panels
- Acoustic Metal Ceiling Panels
- Access Panels: Flush type with drywall bead; painted to match ceiling
- Textile Ceilings
- Linear metal ceilings
- Linear wooden ceilings
- Open to Structure (with the appropriate services coordination)

Acoustics

To meet STC ratings, walls must extend full height to structure, and penetrations through the wall must be sealed air-tight with acoustic sealant.

- Between Lobby and adjacent, occupied spaces: STC 50
- Between Lobby and circulation spaces (if separated): STC 45

Mechanical

Air devices should distribute conditioned air accordingly throughout the space and should address thermal comfort factors according to ASHRAE 55. All visible mechanical equipment should be coordinated with architectural features and aesthetics.

Access panels for mechanical equipment above inaccessible ceilings shall be provided.

Ventilation shall be provided per minimum ventilation requirement according to the latest version of ASHRAE 62.1 and City of Austin (COA) Amendments.

Air distribution systems shall comply with acoustical requirements for this space.

Lobbies shall have their own independent temperature controls.

Plumbing

Fixtures

- Where electric water coolers are indicated, include vandal-resistant bubblers, filters, and bottle filling stations. Include a cane skirt for TAS compliance on bi-level coolers if not recessed in an alcove.
- Refer to the AUS Restroom Design Standards for additional information and requirements.

Piping and Accessories

- Provide access panels in non-accessible ceilings and walls for valve access, as applicable.

III. INTERIOR IMPROVEMENTS - NON PUBLIC

A. Lobbies

Electrical

Provide general purpose duplex receptacles throughout the lobby spaces.

Lighting

Lobbies are considered a transition space where generally people are waiting for short periods of time or passing through, and may or may not have a reception desk. In the waiting area of the lobby, a light level of 10fc should be measured at the floor and if a reception desk is in the space, then the lighting level at the desk should accommodate productivity levels with a target illuminance value of 30fc measured on the desktop. Lobbies should have emergency lighting and exit marking when in the path of egress.

Life Safety

Life safety systems within lobbies shall be provided and shall comply with the applicable requirements of the International Building Code (IBC) and International Fire Code (IBC), with City of Austin amendments, and all referenced codes and standards. Life safety systems are expected to include, but are not limited to, means of egress systems (i.e., quantity and capacity of exits), passive fire protection (i.e., fire barriers and opening protection), fire protection systems (i.e., automatic sprinkler, standpipe, and fire pump), fire alarm systems, and portable fire extinguishers. Each life safety system shall comply with the requirements of the applicable code or standard.

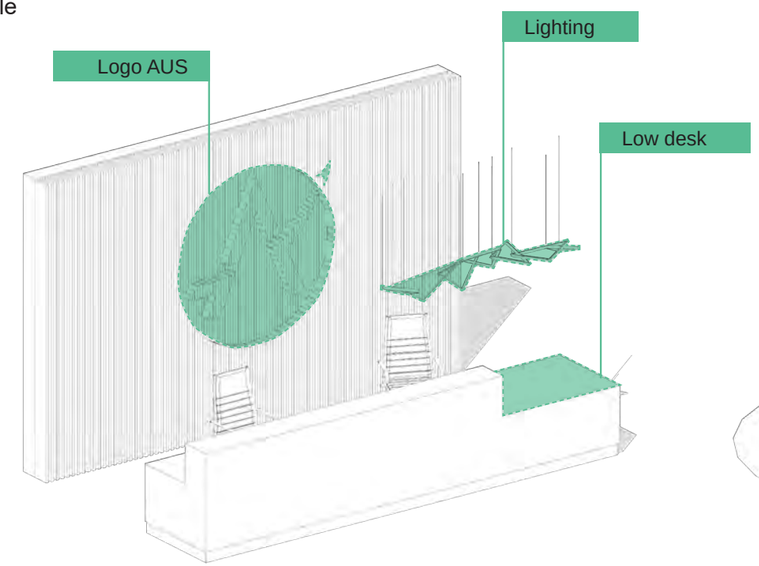
IT and Security

Technology systems within Lobbies spaces shall be as per operational needs of the space. These systems may include network infrastructure, wireless “Wi-Fi” network, cellular and radio distributed antenna systems, public address, digital displays, video surveillance, electronic access control, and intercom. These systems shall follow the AUS Information Technology Design Standards Manual and the Division 27 and 28 specifications.

IT Network

Passive Infrastructure: Structured Cabling System (SCS) include the following minimum requirements: Work Area Outlets (WAO) for each workstation or reception desk, data outlet and (1) Internet Protocol Television (IPTV) interface and TV (coordinate location with tenant and AUS Project Manager).

Active network: Refer to division 27 specifications for requirements.



Wireless & Radio System

Wi-Fi: This space shall have Admin Wi-Fi coverage ensuring proper bandwidth. Wi-Fi concentration shall be in at reception/visitor desks and waiting areas.

DAS Radio: Public Safety DAS shall be made available in all areas of the buiding as per NFPA 1221 code and must comply with the local AHJ (Authority Having Jurisdiction) guidelines for coverage requirements.

DAS Cell: Carrier's 4G/5G coverage shall be made available throughout the public areas in the airport.

Security:

VMS (CCTV): Lobby areas may be provided with minimum ‘observation’ level video coverage of public traffic entering and exiting the lobby. Reception/Visitor desk may be provided with ‘recognition’ level of video coverage.

Determination of ACS and CCTV placments in lobbies will be made by AUS Security on a case-by-case basis. (ACS placements will typically not be made in tenant lobbies)

Access Control System: Lobby area may have a card reader on the exterior side of the entrance door with remote opening and duress at reception desk.

Operational Airport Systems

Overhead Paging System: Coordinate with AUS IT to determine specific space requirement.

III. INTERIOR IMPROVEMENTS - NON PUBLIC

B. Offices

The goal of office space is to provide the occupant with a space where productivity can be maximized. Offices shall be sufficiently sized to allow inclusive accessibility and comfort. While designing office space, architectural finishes, acoustic qualities, light levels, and thermal comfort must be carefully considered to achieve these goals. Natural light must be prioritized in all office, and at a minimum, may be indirectly provided.

Flooring

- Carpet Tile (avoid in circulation areas)
- Resilient Tile (LVT / LVP)
- Continuous Linoleum
- Cork

Following materials are prohibited unless approved by the AUS Project Manager

- Sealed or topically stained Concrete
- Vinyl Composite Tile (VCT)

Walls

- Gypsum Board, Painted, MPI Gloss Level 3
- CMU, Painted, MPI Gloss Level 3
- Aluminum framed interior storefront system
- All-glass interior storefront system
- Wood paneling
- Cork

Following materials are prohibited:

- Vinyl Wall Covering

Column Treatment

- Gypsum Board, Painted, MPI Gloss Level 3

Following materials are prohibited:

- Wood

Wall Base

- Thermoplastic-Rubber Base, Straight, 4” (carpet flooring)
- Thermoplastic-Rubber Base, Cove, 4” (resilient flooring

Corner Guards

Full Wall Height

- Stainless Steel
- Clip-on Vinyl

Following materials are prohibited:

- Clear Plastic
- Wood

Ceilings

- Gypsum Board, Painted, MPI Gloss Level 1
- Acoustic Ceiling Panel, Standard Grid Size, 2x2 or 2x4 Panels
- Textile Ceilings
- Linear metal ceilings
- Linear wooden ceilings
- Open Ceilings (with appropriate services coordination)

Acoustics

To meet STC ratings, walls must extend full height to structure, and penetrations through the wall must be sealed air-tight with acoustic sealant.

- Between private office and adjacent, occupied spaces: STC 50
- Between private office and circulation spaces: STC 45

Mechanical

Air devices should distribute conditioned air accordingly throughout the space and should address thermal comfort factors according to ASHRAE 55. All visible mechanical equipment should be coordinated with architectural features and aesthetics.

Access panels for mechanical equipment above inaccessible ceilings shall be provided.

Ventilation shall be provided per minimum ventilation requirement according to the latest version of ASHRAE 62.1 and City of Austin (COA) Amendments.

Air distribution systems shall comply with acoustical requirements for this space.

Plumbing

Piping and Accessories

Provide access panels in non-accessible ceilings for valve access, as applicable.

Electrical

Provide a duplex outlet on each wall spaced not more than 12’ apart. The upper outlet on each duplex should be controlled by the occupancy sensor serving the area.

Lighting

Lighting systems in offices shall provide efficient, uniform, comfortable ambient and productive task lighting levels for the occupants. If daylighting is available, it shall be considered as a lighting contribution to the space and controlled in accordance with IECC requirements. In general, the lighting fixtures, layout, and controls should be designed with multiple illuminance levels so that the occupants have the ability to adjust the lighting level accordingly to meet their needs. For example, a localized task might require brighter illumination, or in contrast, a low illumination level may be desired for user comfort at the end of the day. Illumination targets shall be designed to the latest IESNA recommendations for offices; 30fc measured at the work plane or desk.

- Luminaires shall be LED with 0-10V dimming drivers. Indirect lighting is preferred for glare control.
- Stand-alone room controls with dual-technology vacancy sensors, dimming capability, and daylighting responsive.

III. INTERIOR IMPROVEMENTS - NON PUBLIC

B. Offices

Life Safety

Life safety systems within offices shall be provided and shall comply with the applicable requirements of the International Building Code (IBC) and International Fire Code (IBC), with City of Austin amendments, and all referenced codes and standards. Life safety systems are expected to include, but are not limited to, means of egress systems i.e., quantity and capacity of exits), passive fire protection (i.e., fire barriers and opening protection), fire protection systems i.e., automatic sprinkler, standpipe, and fire pump), fire alarm systems, and portable fire extinguishers. Each life safety system must comply with the requirements of the applicable code or standard.

IT and Security

Technology systems within Offices spaces shall be as per operational needs of the space. These systems may include network infrastructure, wireless “Wi-Fi” network, cellular and radio distributed antenna systems, public-address, Audio-Visual systems, video surveillance, electronic access control, and intercom. These systems shall follow the AUS Information Technology Design Standards Manual and the Division 27 and 28 specifications.

IT Network

Each office will have a minimum of one (1) 2-data work area outlet. Refer to system technical standards and division 27 specifications for additional requirements.

Active network requirements will be coordinated with AUS IS depending on systems to be implemented in an office.

Wireless & Radio System

Wi-Fi: This space shall have Admin Wi-Fi coverage ensuring proper bandwidth. Wi-Fi AP should be in the corridor adjacent to the office.

DAS Radio: Public Safety DAS shall be made available in all areas of the building as per NFPA 1221 code and must comply with the local AHJ guidelines for coverage requirements.

DAS Cell: Carrier's 4G/5G coverage should be reviewed on a case-by-case basis.

Security

VMS (CCTV): Camera and card reader placement at individual offices will be determined by airport security.

Operational Airport Systems

Overhead Paging system: Paging system speakers within offices will be determined on a case-by-case basis.

III. INTERIOR IMPROVEMENTS - NON PUBLIC

C. Break Rooms

Break rooms should provide employees with a comfortable, functional, and practical space to take required breaks from daily duties and should be sized to allow inclusive accessibility and comfort. Finishes, materials, and layout must allow for durability and easy cleaning. While designing break rooms, architectural finishes, acoustic qualities, light levels, and thermal comfort must be carefully considered to achieve these goals. At a minimum, the following equipment should be included in the break room: Dishwasher, Coffee Maker, Full-Height Refrigerator, Stand Alone Ice Maker, In-Sink Garbage Disposer, Range, Microwave (may be range hood type).

Flooring

- Resilient Tile (LVT / LVP)
- Resinous Flooring
- Continuous Linoleum

Following materials are prohibited:

- Sealed or topically stained Concrete
- Vinyl Composite Tile (VCT)

Walls

Walls should be constructed of impact resistant material to 4 feet AFFGypsum Board, High-Build Epoxy Coating, MPI Gloss Level 5

- CMU, High-Build Epoxy Coating, MPI Gloss Level 5

Column Treatment

- Gypsum Board, High-Build Epoxy Coating, MPI Gloss Level 5

Following materials are prohibited:

- Wood

Wall Base

- Integral wall base with aluminum cap, 6” (resinous flooring)
- Thermoplastic-Rubber Base, Cove, 4” (resilient flooring)

Corner Guards

- Full Wall Height
- Stainless Steel
- Clip-on Vinyl

Following materials are prohibited:

- Clear Plastic
- Wood

Ceilings

- Gypsum Board, Painted, MPI Gloss Level 1
- Acoustic Ceiling Panel, Standard Grid Size, 2x2 or 2x4 Panels
- Textile Ceilings
- Linear Metal Ceilings
- Linear Wooden Ceilings
- Open To Structure (with appropriate services coordination)

Casework

- Plastic-Laminate-Faced Architectural Cabinets
- Phenolic Panel

Countertops

- Solid Surface Material
- Quartz
- Granite

Following materials are prohibited

- Plastic Laminate

Acoustics

To meet STC ratings, walls must extend full height to structure, and penetrations through the wall must be sealed air-tight with acoustic sealant.

- Between private office and adjacent, occupied spaces: STC 50
- Between private office and circulation spaces: STC 45

Mechanical

Air devices should distribute conditioned air accordingly throughout the space and should address thermal comfort factors according to ASHRAE 55. All visible mechanical equipment should be coordinated with architectural features and aesthetics.

Access panels for mechanical equipment above inaccessible ceilings shall be provided.

Ventilation shall be provided per minimum ventilation requirement according to the latest version of ASHRAE 62.1 and City of Austin (COA) Amendments.

Where included, range hoods shall be ducted to the exterior of the building.

Break Rooms shall have their own independent temperature controls.

Air distribution systems shall comply with acoustical requirements for this space.

Plumbing

Fixtures

- Provide adequately sized 2-basin sinks. Waste disposals are not allowed.
- Provide ice-maker wall-boxes with shock arrestors behind refrigerators.
- Where stand-alone ice-makers are indicated, provide a dedicated Reduced-Pressure-Zone (RPZ) type back flow preventer in the water supply. Include a floor sink beneath the ice maker or sink and route the ice maker drain and RPZ relief-port drain to the floor sink. RPZ must be easily accessible for maintenance.
- Where plumbed coffee, espresso, or tea makers are indicated, provide a Double Check Valve Assembly (DCVA) in the water supply. A single DCVA may serve multiple coffee, espresso, or tea makers.

Piping and Accessories

- Provide access panels in non-accessible ceilings for valve access, as applicable.

III. INTERIOR IMPROVEMENTS - NON PUBLIC

C. Break Rooms

Electrical

Provide dedicated duplex outlets for appliances, i.e., microwave,coffee maker, refrigerator, dishwasher, vending, etc. Provide quadplex outlets 6” above counter space not more than 36” apart for general use. Provide duplex outlets on each wall spaced not more than 12’ apart for general use. General use outlets should have the upper outlet on each duplex controlled by the occupancy sensor serving the area. Outlets that are within 6’ of a water source should be GFCI protected.

Lighting

Break rooms are considered a common application space type according to the IESNA with a target illumination of 10fc measured on the floor. Task lighting at the counter area is recommended where hand-washing, dishwashing and food preparation occurs. This can be easily accommodated with the installation of low-profile undercabinet LED lighting with local control. If the programming does not allow for undercabinet task lighting, then the minimum illumination level of the break room should be increased to 30fc measured on the counter.

- Luminaires shall be LED with 0-10V dimming drivers.
- Dual-Technology Vacancy controls.
- In spaces where daylight is available, the control device shall be both vacancy and daylighting responsive.

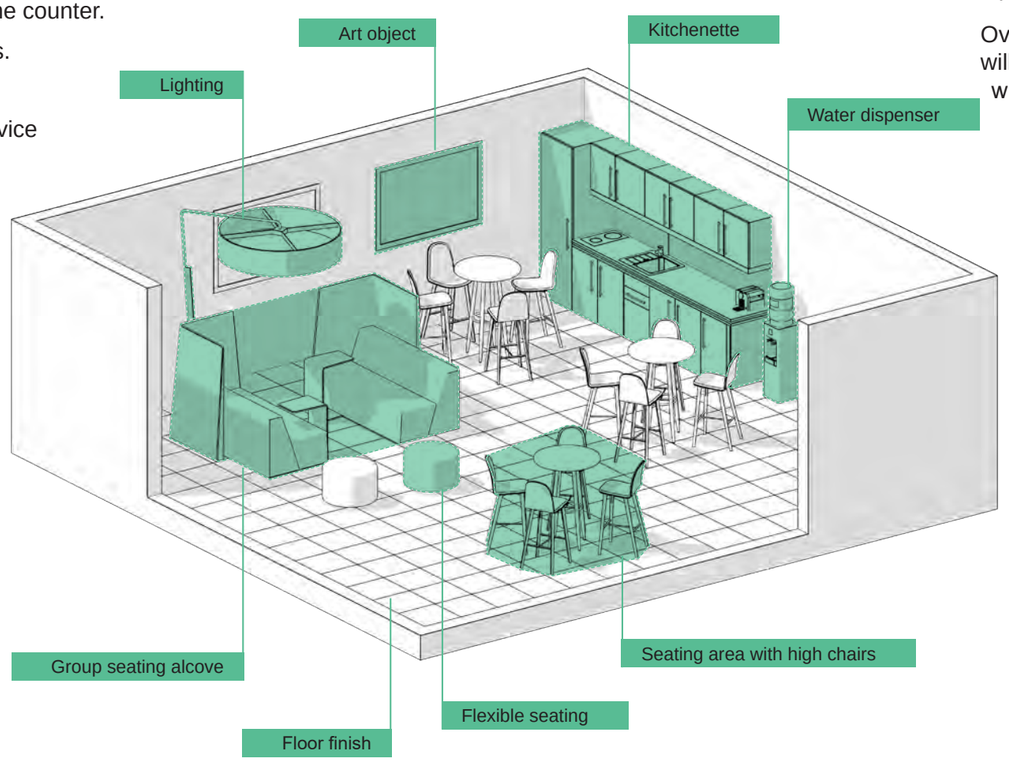
IT and Security

Technology systems within Break rooms shall be as per operational needs of the space. These systems may include network infrastructure, wireless “Wi-Fi” network, cellular and radio distributed antenna systems, public address, IPTV system, video surveillance and intercom. These systems shall follow the AUS Information Technology Design Standards Manual and the Division 27 and 28 specifications.

IT Network

Passive Infrastructure: Refer to AUS Information Technology Design Standards Manual and Division 27 specifications for requirements.

Active network requirements will be coordinated with AUS IS depending on systems to be implemented in an office.



Wireless & Radio System

Wi-Fi: This space may have Admin Wi-Fi coverage. Wi-Fi AP should be in the corridor adjacent to the break room.

DAS Radio: Public Safety DAS shall be made available in all areas of the building as per NFPA 1221 code and must comply with the local AHJ guidelines for coverage requirements.

DAS Cell: Carrier's 4G/5G coverage should be reviewed on a case-by-case basis.

Security:

VMS (CCTV): Camera and card reader requirements for break rooms will be determined by airport security and tenant.

Operational Airport systems

Overhead Paging system: Paging system speakers within breakrooms will be determined on a case-by-case basis. All breakrooms located within terminals shall have PA speakers for emergency notifications

Additional Airport Systems

IPTV: IPTV provision with suitable size display shall be facilitated for the break rooms for broadcasting entertainment content.

Break rooms shall be reviewed for Time Clock and wall phone.

III. INTERIOR IMPROVEMENTS - NON PUBLIC

D. Conference / Training Rooms

Conference and training rooms should provide occupants with productive space for meeting, training, and teleconferencing and shall be sufficiently sized to allow inclusive accessibility and comfort. While designing conference and training rooms, architectural finishes, acoustic qualities, light levels, and thermal comfort must be carefully considered to produce a productive space.

Flooring

- Carpet Tile
- Sheet Carpet

Following materials are prohibited

- Sealed or topically stained Concrete

Walls

Walls should be constructed of impact resistant material to 4 feet AFF

- Gypsum Board, Painted, MPI Gloss Level 3
- Vinyl Wall Covering
- Flush Wood Paneling

Column Treatment

- Gypsum Board, Painted, MPI Gloss Level 3
- Flush Wood Paneling

Wall Base

- Thermoplastic-Rubber Base, Straight, 4”

Corner Guards

- Stainless Steel
- Clip-on Vinyl

Following materials are prohibited

- Clear Plastic
- Wood

Ceilings

- Gypsum Board, Painted, MPI Gloss Level 1
- Acoustic Ceiling Panel, Standard Grid Size, 2x2 or 2x4 Panels
- Acoustic Metal Panels
- Wood Baffle Systems

Acoustics

To meet STC ratings, walls must extend full height to structure, and penetrations through the wall must be sealed air-tight with acoustic sealant.

- Between Conference/Training Room and adjacent, occupied spaces: STC 55
- Between Conference/Training Room and circulation spaces: STC 50

Mechanical

Air devices should distribute conditioned air accordingly throughout the space and should address thermal comfort factors according to ASHRAE 55. All visible mechanical equipment should be coordinated with architectural features and aesthetics.

Access panels for mechanical equipment above inaccessible ceilings shall be provided.

Ventilation shall be provided per minimum ventilation requirement according to the latest version of ASHRAE 62.1 and City of Austin (COA) Amendments.

Air distribution systems shall comply with acoustical requirements for this space.

Conference and Training Rooms shall have their own independent temperature controls.

Plumbing

Fixtures

- Provide sinks if indicated.
- Where stand-alone ice-makers are indicated, provide a dedicated Reduced-Pressure-Zone (RPZ) type back flow preventer in the water supply. Include a floor sink beneath the ice maker or sink and route the ice maker drain and RPZ relief-port drain to the floor sink.
- Where plumbed coffee, espresso, or tea makers are indicated, provide a Double Check Valve Assembly (DCVA) in the water supply. A single DCVA may serve multiple coffee, espresso, or tea makers.

Piping and Accessories

- Provide access panels in non-accessible ceilings for valve access, as applicable.

Electrical

Provide duplex outlets on each wall spaced not more than 12’ apart for general use. General use outlets should have the upper outlet on each duplex controlled by the occupancy sensor serving the area. Provide floor box/or poke-thru under the conference room table with a quadplex outlet and 2 gang opening for AV/IT connectivity.

Lighting

Conference rooms and training rooms may accommodate many people and often use a flexible furniture arrangement. The lighting in the space shall accommodate different functions and offer flexibility and control to the occupants. For this purpose, the IESNA recommends target illuminance levels for an educational space with audio/visual at 50fc measured on the table. The layout of the fixtures should accommodate flexibility in the space and provide both uniform ambient levels and dimming capabilities. Multiple zones of lighting should be considered by the lighting professional to optimize the comfort of the occupants.

- Luminaires shall be LED with 0-10V dimming drivers.
- Controls with dual-technology vacancy sensors, dimming capability, and daylighting responsive.
- Multiple zones of lighting with dimming capabilities.
- Ability to interface with audio-visual systems.

III. INTERIOR IMPROVEMENTS - NON-PUBLIC

D. Conference / Training Rooms

Life Safety

Life safety systems within conference rooms and training rooms shall be provided and shall comply with the applicable requirements of the 2021 International Building Code (IBC) and 2021 International Fire Code (IBC), with City of Austin amendments, and all referenced codes and standards. Life safety systems are expected to include, but are not limited to, means of egress systems (i.e., quantity and capacity of exits), passive fire protection (i.e., fire barriers and opening protection), fire protection systems (i.e., automatic sprinkler, standpipe, and fire pump), fire alarm systems, and portable fire extinguishers. Each life safety system shall comply with the requirements of the applicable code or standard.

IT and Security

Technology systems within Conference / Training rooms spaces shall be as per operational needs of the space. These systems may include network infrastructure, wireless “Wi-Fi” network, cellular and radio distributed antenna systems, public-address, Audio-Visual systems, video surveillance, electronic access control, and intercom. These systems shall follow the AUS Information Technology Design Standards Manual and the Division 27 and 28 specifications.

Training standards are in development by AUS IS. Conference and training room technology requirements shall be closely coordinated with and approved by AUS IS during design.

IT Network

Passive Infrastructure: Structured Cabling System (SCS) include the following minimum requirements: Work Area Outlets (WAO) for each workstation or reception desk, data outlet and (1) Internet Protocol Television (IPTV) interface and TV (coordinate location with tenant and AUS Project Manager).

Active network: Refer to AUS Information Technology Design Standards Manual and Division 27 specifications for requirements.

Wireless & Radio System

Wi-Fi: This space shall have both Admin and potentially Public Wi-Fi coverage and shall ensure proper bandwidth.

DAS Radio: Public Safety DAS shall be made available in all areas of the building as per NFPA 1221 code and must comply with the local AHJ guidelines for coverage requirements.

DAS Cell: Carrier's 4G/5G coverage should be reviewed on a case-by-case basis.

Operational Airport Systems

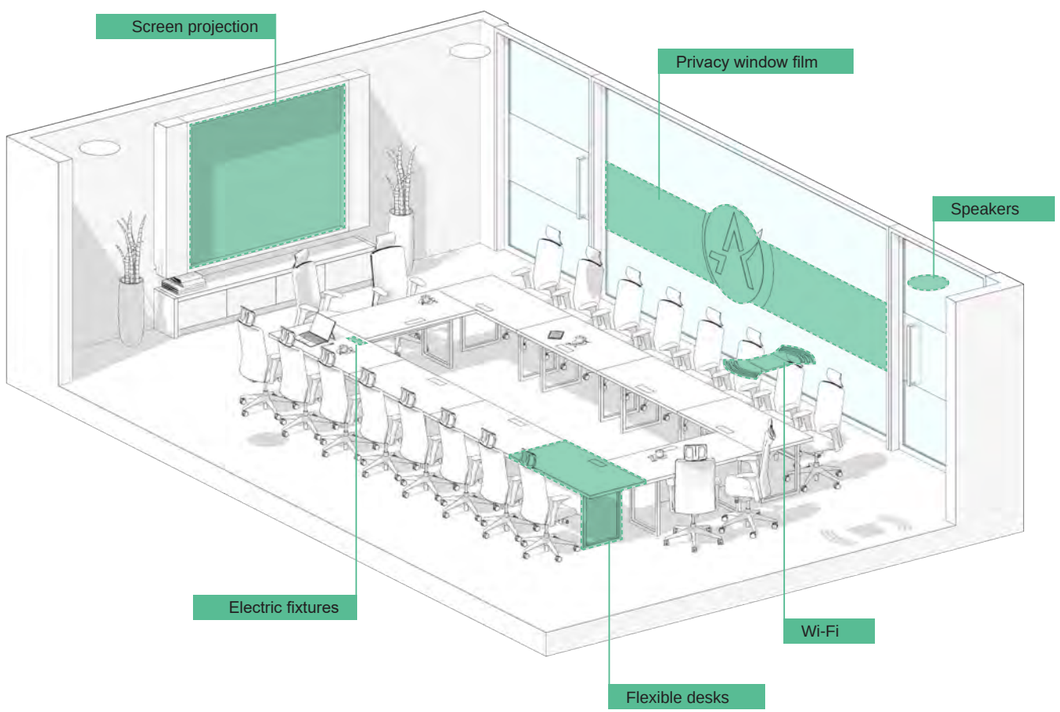
Overhead Paging System: Overhead Paging system: Paging system consisting of speakers suitable for space to be provisioned.

Additional Airport Systems

Audio / Visual Systems

Small Conference Rooms: Audio / Visual equipment to support space purpose such as projector & Screen, conference displays of suitable size, Wireless Presentation system, Overhead speakers, Ceiling microphone tiles, conference microphone, Amplifiers & DSPs, conference phone, Video Conferencing camera with required licenses, Tabletop popup boxes, Cabling like HDMI, Audio and ethernet etc.,

Large Conference Rooms: Audio / Visual equipment to support space purpose such as projector & Screen, conference displays on front walls of suitable size & Additional Side wall displays as required for back seating coverage, Wireless Presentation system, Overhead speakers, Ceiling microphone tiles, conference microphone, Amplifiers & DSPs, conference phone, Video Conferencing camera with required licenses, Tabletop popup boxes, Cabling like HDMI, Audio and ethernet etc.



III. INTERIOR IMPROVEMENTS - NON PUBLIC

E. Service Corridors

Service corridors are high-traffic areas and are prone to daily wear and tear. Consideration shall be given to the anticipated primary and occasional usages of these spaces, particularly to the number of people traveling through at any given time. Finishes shall be robust, easily cleaned and easily maintained.

Flooring

- Resilient Tile (LVT / LVP)
- Resinous Flooring
- Latex Water-Based Floor Enamel
- Sealed Concrete using Penetrating Water Repellent

Following materials are prohibited

- Topically stained Concrete

Walls

Walls should be constructed of impact resistant material to 4 feet AFF

- Gypsum Board, High-Build Epoxy Coating, MPI Gloss Level 5
- CMU, High-Build Epoxy Coating, MPI Gloss Level

Column Treatment

- Gypsum Board, High-Build Epoxy Coating, MPI Gloss Level 5

Following materials are prohibited

- Wood

Corner Guards

- Stainless Steel; 14 ga., 5-inch wing (minimum)

Following materials are prohibited

- Clear Plastic

Wall Base

- Stainless Steel, Flat, 8” (omit if using stainless steel wall protection)

Wall Protection

Wall protection should extend 48” AFF (min)

- Diamond Plate Stainless Steel
- Rigid Vinyl
- FRP

Door Protection

Doors should be extra heavy duty construction

- 34-inch Stainless Steel Armor plate
- Vision Slot where possible

Ceilings

- Acoustic Ceiling Panel, Standard Grid Size, 2x2 or 2x4 Panels
- Gypsum Board, Painted, MPI Gloss Level 1
- Open to Structure

Mechanical

Air devices should distribute conditioned air accordingly throughout the space and should address thermal comfort factors according to ASHRAE 55. All visible mechanical equipment should be coordinated with architectural features and aesthetics.

Access panels for mechanical equipment above inaccessible ceilings shall be provided.

Ventilation shall be provided per minimum ventilation requirement according to the latest version of ASHRAE 62.1 and City of Austin (COA) Amendments.

Air distribution systems shall comply with acoustical requirements for this space.

Plumbing

Piping and Accessories

- Provide access panels in non-accessible ceilings for valve access, as applicable.
- Heavy duty floor drain/cleanout covers required due to damage from carts

Electrical

Provide duplex outlets at a maximum distance of 40’ apart. Alternate on opposite sides of the corridor.

Lighting

Lighting fixtures and controls in service corridors shall provide uniform lighting levels with a target illuminance level of 10-15fc measured at the floor.

Lighting in service corridors shall be connected and controlled to the BMS system. Emergency lighting and exit marking shall be provided to meet minimum code requirements.

Life Safety

Life safety systems within service corridors shall be provided and shall comply with the applicable requirements of the 2021 International Building Code (IBC) and 2021 International Fire Code (IBC), with City of Austin amendments, and all referenced codes and standards. Life safety systems are expected to include, but are not limited to, means of egress systems (i.e., quantity and capacity of exits), passive fire protection (i.e., fire barriers and opening protection), fire protection systems (i.e., automatic sprinkler, standpipe, and fire pump), fire alarm systems, and portable fire extinguishers. Each life safety system shall comply with the requirements of the applicable code or standard.

IT and Security

Technology systems within Service Corridors shall be as per operational needs of the space. These systems may include network infrastructure, wireless “Wi-Fi” network, cellular and radio distributed antenna systems, public address, video surveillance, electronic access control, and intercom. These systems shall follow the AUS Information Technology Design Standards Manual and the Division 27 and 28 specifications.

Wireless & Radio System

Wi-Fi: This space shall have both Admin and potentially Public Wi-Fi coverage and shall ensure proper bandwidth.

DAS Radio: Public Safety DAS shall be made available in all areas of the building as per NFPA 1221 code and must comply with the local AHJ guidelines for coverage requirements.

DAS Cell: Carrier's 4G/5G coverage should be reviewed on a case-by-case basis.

Security

VMS (CCTV): Service corridors shall be provided with a minimum of ‘recognition’ level video coverage of people entering service corridors. Refer to system technical standards and division 28 specifications for requirements.

Access Control System: Provision of Access Control to be made as per Airport operational requirements.

Operational Airport Systems

Overhead Paging System: Area to be reviewed for speaker requirements.

III. INTERIOR IMPROVEMENTS - NON PUBLIC

F. IT Support Spaces / Electrical Rooms

IT Support spaces house data processing systems including floor- and counter-mounted units. Because of the computer and electronic equipment housed in these spaces require regulated temperature and humidity, reliable power and HVAC is critical 24 hours per day.

Flooring

- Static-Control Resilient Flooring
- Static Dissipative Concrete Sealer

Walls

- Gypsum Board, Painted, MPI Gloss Level 4
- CMU, Painted, MPI Gloss Level 4
- Fire Retardant Treated Plywood Panel, Painted, MPI Gloss Level 4

The following materials are prohibited

- Vinyl Wall Covering

Column Treatment

- Gypsum Board, Painted, MPI Gloss Level 3

The following materials are prohibited

- Wood

Wall Base

- Thermoplastic-Rubber Base, Cove, 4”

Corner Guards

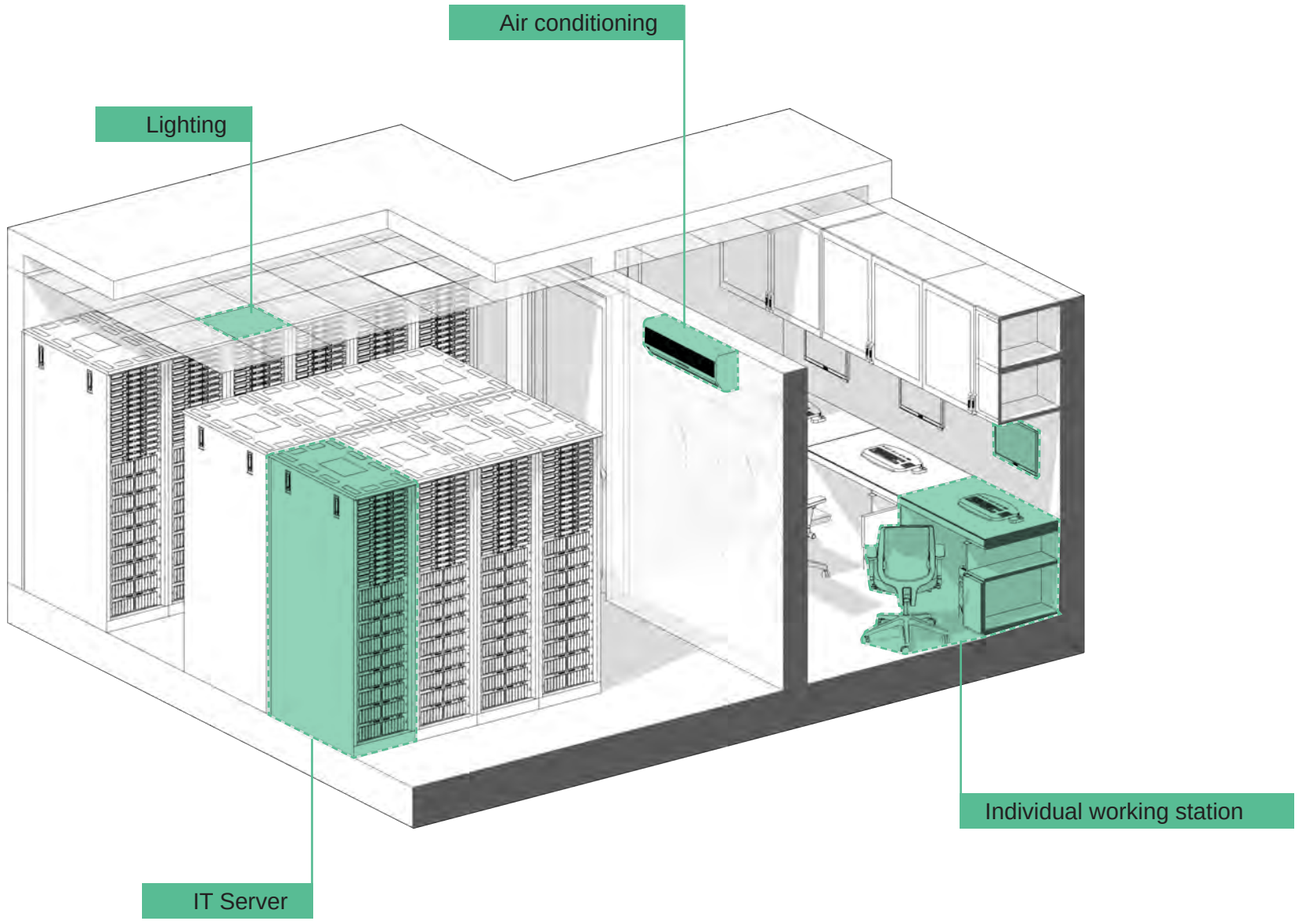
- Stainless Steel
- Clip-on Vinyl

The following materials are prohibited.

- Clear Plastic
- Wood

Ceilings

- Acoustic Ceiling Panel, Standard Grid Size, 2x2 or 2x4 Panels
- Exposed to Structure



Austin-Bergstrom International Airport

III. INTERIOR IMPROVEMENTS - NON PUBLIC

F. IT Support Spaces / Electrical Rooms

Acoustics

To meet STC ratings, walls must extend full height to structure, and penetrations through the wall must be sealed air-tight with acoustic sealant.

- Between IT Support / Electrical Room and adjacent, occupied spaces: STC 50-60
- Between IT Support / Electrical Room and circulation spaces (if separated): STC 45-55

Mechanical

Primary equipment providing air conditioning for this space shall be located outside of the space.

Air devices shall not be installed directly over IT equipment and shall be located and directed to provide adequate ventilation of IT equipment.

Access panels for mechanical equipment above inaccessible ceilings shall be provided.

Ventilation shall be provided per minimum ventilation requirement according to the latest version of ASHRAE 62.1 and City of Austin (COA) Amendments.

Air distribution systems shall comply with acoustical requirements for this space.

A backup, non-ducted, split system on emergency power shall be provided and shall activate upon failure of the primary system.

IT Rooms shall have their own independent temperature controls.

Hydronic and condensate piping shall not run directly over or through IT rooms.

Electrical

Provide dedicated branch circuits to each IT rack. Provide duplex outlets on each wall for general purpose use. Provide dedicated duplex outlets for security devices. Provide emergency power to room cooling equipment.

Lighting

The same lighting found in equipment rooms, personnel office spaces, and storage closets can also be used in IT support spaces. The fixtures in equipment rooms shall consider the IT cable tray, bus duct, and/or IT hardware infrastructure. Horizontal illuminance and vertical illuminance levels should be considered. The IESNA recommends a horizontal illuminance of 50fc measured at 36” AFF and a vertical illuminance of 20 fc measured on the equipment racks in equipment rooms. The offices for personnel, storage closets for media, etc., should follow the recommendations for common space type applications with 30fc measured at the work plane for offices and 10fc measured at the floor for storage spaces. The main equipment rooms shall be provided with emergency lighting.

Life Safety

Life safety systems within IT support spaces shall be provided and shall comply with the applicable requirements of the 2021 International Building Code (IBC) and 2021 International Fire Code (IBC), with City of Austin amendments, and all referenced codes and standards. Life safety systems are expected to include, but are not limited to, means of egress systems (i.e., quantity and capacity of exits), passive fire protection (i.e., fire barriers and opening protection), fire protection systems (i.e., automatic sprinkler, standpipe, and fire pump), fire alarm systems, and portable fire extinguishers. Each life safety system shall comply with the requirements of the applicable code or standard.

Wet pipe sprinkler systems should not be located in IT support spaces and electrical rooms. IT support spaces and electrical rooms should be protected by either a dry or preaction sprinkler system.

IT and Security

Technology systems within IT support spaces must support the equipment and operational needs of the facility. These systems may include network infrastructure, wireless “Wi-Fi” network, cellular and radio distributed antenna systems, public address, digital displays, audio-video conferencing, video surveillance, electronic access control, and intercom.

ACS control panels shall be wired to emergency circuits - those supported by generators in event of power failures.

Security

Provide Cameras and card readers as required in coordination with AUS Security.

III. INTERIOR IMPROVEMENTS - NON PUBLIC

G. Shops / Utility Rooms / Mechanical Rooms

Shops and Utility Rooms are used for the assembly, disassembly, and repairing various types of materials and equipment. Shops and Utility Rooms must be designed to accommodate a structured working environment with a heavy reliance on machinery and technology. Well laid out circulation spaces are critical to the safety and well-being of building occupants and increased productivity. These spaces need to accommodate changes in workflow caused by new technology and new equipment.

Flooring

- Latex Water-Based Floor Enamel
- Sealed Concrete using Penetrating Water Repellent

The following materials are prohibited:

- Topically stained Concrete

Walls

- Gypsum Board, High-Build Epoxy Coating, MPI Gloss Level 5
- CMU, High-Build Epoxy Coating, MPI Gloss Level

Column Treatment

- Gypsum Board, High-Build Epoxy Coating, MPI Gloss Level 5

Corner Guards

- Stainless Steel

Wall Protection

Wall protection should extend 48” AFF (min)

- Stainless Steel

Wall Base

- Stainless Steel, Flat, 8” (omit if using stainless steel wall protection)

Ceilings

- Acoustic Ceiling Panel, Standard Grid Size, 2x2 or 2x4 Panels
- Exposed to Structure

Waterproofing

Where the risk of spills/leaks occurs, rooms should be designed to adequately contain liquids until clean-up can occur. The Designer should carefully consider containment protocols such as curbs and waterproofing.

Acoustics

To meet STC ratings, walls must extend full height to structure, and penetrations through the wall must be sealed air-tight with acoustic sealant.

- Between Shop / Utility Room / Mechanical Room and adjacent, occupied spaces: STC 55-65
- Between Shop / Utility Room / Mechanical Room and circulation spaces: STC 50-60

Mechanical

Access panels for mechanical equipment above inaccessible ceilings shall be provided.

Ventilation shall be provided per minimum ventilation requirement according to the latest version of ASHRAE 62.1 and City of Austin (COA) Amendments.

The Shops and Utility Rooms shall have their own independent temperature controls.

Plumbing

Fixtures

- Provide hose bibbs and floor drains where area washdown is required for cleaning or maintenance.
- Provide sinks with hot and cold water where indicated.
- Where miscellaneous equipment requires a domestic water supply, include back flow prevention device per City of Austin’s Back flow Prevention Hazard List, as applicable.

Piping and Accessories

- Where compressed air is required for tool or equipment operation, consider portable air compressors. If inadequate, provide a central compressed air system within the shop.

Electrical

Provide duplex outlets on each wall for general use. Provide dedicated duplex outlets/ service disconnect as required for specialty equipment. Provide GCFI outlets as required by the NEC.

Lighting

The lighting in shops or utility spaces should provide ambient lighting and additional task lighting for the functions of the space. Ambient lighting levels should target 20fc measured at the floor, and task illumination should be provided at workshop counters, or near powered machinery or equipment if applicable. Task illumination should be controlled locally, and ambient lighting shall be controlled by a dual-technology vacancy sensor.

Life Safety

Life safety systems within shops and utility rooms shall be provided and shall comply with the applicable requirements of the International Building Code (IBC) and International Fire Code (IBC), with City of Austin amendments, and all referenced codes and standards. Life safety systems are expected to include, but are not limited to, means of egress systems (i.e., quantity and capacity of exits), passive fire protection (i.e., fire barriers and opening protection), fire protection systems (i.e., automatic sprinkler, standpipe, and fire pump), fire alarm systems, and portable fire extinguishers. Each life safety system shall comply with the requirements of the applicable code or standard.

IT Network

Passive Infrastructure: Refer to system technical standards and division 27 specifications for requirements.

Active network: Refer to system technical standards and division 27 specifications for requirements.

Wireless & Radio System

Wi-Fi: This space may have Admin Wi-Fi coverage. Ensure proper bandwidth.

DAS Radio: Public Safety DAS shall be made available in all areas of the buiding as per NFPA 1221 code and must comply with the local AHJ guidelines for coverage requirements.

DAS Cell: Carrier's 4G/5G coverage should be reviewed on a case-by-case basis.

Security

Provide Cameras and card reader as required in coordination with AUS Security.

III. INTERIOR IMPROVEMENTS - NON PUBLIC

H. Vertical Conveyance

Service Elevators

Provide the recommendation of the required capacity of the Elevator that is suitable for material transport. System will provide transportation for all equipment, materials, and passengers between all floors or levels in the area it is installed. Provide unit of suitable capacity based upon a ridership study of the areas being served, including any heavy weight equipment for installation. Elevators are to be traction units and provided with elevator machine rooms that will contain all machinery and controllers in a common locations. All elevators should be "heavy duty", commonly used models with easily sourced parts, and service for the elevators should comply with all applicable codes and ordinances.

Service elevators should be located to conveniently serve all required floors including basements, interstitial spaces, and overhead mechanical spaces and should be sized for the anticipated functional requirements and equipment usage. Freight elevators should be used where elevators serve concessionaires or mechanical spaces.

Service elevators should comply with all applicable codes and ordinances including, but not limited to, ASME, NFPA, IBC, TAS, and Austin ordinances.

Elevator enclosures should be front entrance or front/rear entrance type and should include the following finishes and requirements.

Flooring

- Zinc coated steel diamond plate
- Rubber Floor

Walls

- Protective Padding (hooks)
- Zinc coated steel diamond plate

Ceilings

- Stainless Steel

Lighting

- LED Light Fixtures

Doors

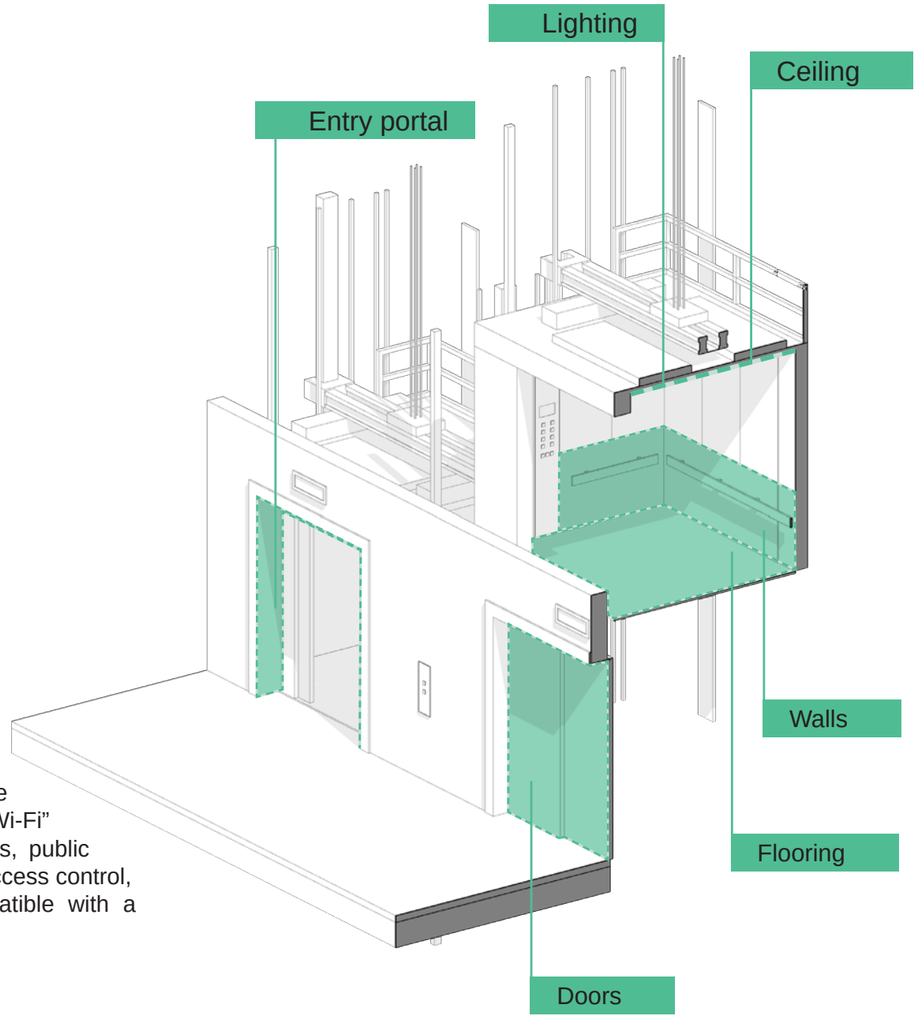
- Sliding Doors

Entry Portal

- Stainless Steel

IT and Security

Technology systems within elevators must support the equipment and applicable requirements of the Current Accepted International Building Code (IBC). These systems may include network infrastructure, wireless “Wi-Fi” network, cellular and radio distributed antenna systems, public address, digital displays, video surveillance, electronic access control, and audio-video intercom. Elevators should be compatible with a building automation or monitoring system.



III. INTERIOR IMPROVEMENTS - NON PUBLIC

H. Vertical Conveyance

Non-Passenger Facing / Back-of-House Stairs

Careful consideration should be given to stair design to contribute to occupant safety in day-to-day use as well as emergency situations.

All stairs at AUS must be of permanently fixed construction and must meet all building code requirements, OSHA requirements and accessibility requirements. Stair widths must accommodate the required occupant load, but consideration should be given to providing additional width for ease of use and comfort. Materials should be considered in stairs to provide safe conveyance between floors.

BOH stairs used to fulfill passenger egress requirements shall include a delayed egress device at portals opening onto terminal aprons (agreement is in place w/AFD to allow such placements to mitigate risk of passengers fleeing into path of jet engines)

Guard Rail / Handrail

- Stainless Steel
- Steel, Powder Coated
- Steel, High-Performance Coated

Tread / Riser

- Steel, High-Performance Coated Riser
- Sealed Concrete
- Resilient tread / nosing
- Metal Grating (Exterior/Utility Space Only)

Walls

- Gypsum Board, Painted, MPI Gloss Level 4
- CMU, Painted, MPI Gloss Level 4

Ceiling

- Open to Structure
- Acoustic Ceiling Panel, Standard Grid Size, 2x2 or 2x4 Panels

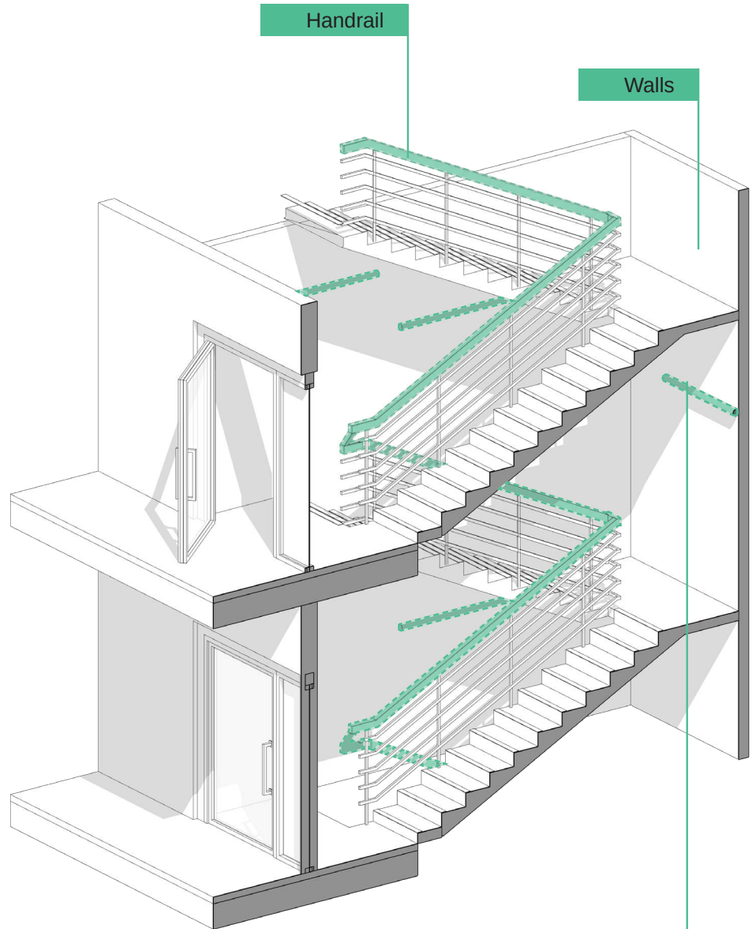
Lighting

Lighting in stairways should be designed to keep pedestrians safe and to provide guidance in emergencies. The horizontal illuminance targets for the floor or steps should be achieved to meet the requirements for wayfinding and emergency signage. The mounting locations for fixtures and signage should be carefully coordinated with the architectural interior team regarding mounting surfaces and heights. The IESNA recommendations for horizontal illuminance at the floor level in a typical stair is 5fc in a high activity stair 10fc, and in a live surveillance stair area 10fc. Considering the surveillance recommendation and future technology requirements, lighting in AUS stairs should be 10fc for the high activity and live surveillance categories.

In addition to general purpose fixtures used at stair locations, additional lighting fixtures may be used where localized lighting may be needed for safety, such as at a transition in floor level other than the expected stair riser, or at a ramp. The power for the lighting fixtures, the emergency exit signage, and AUS wayfinding signage should be coordinated with the electrical engineer to be energized by the appropriate branch of the electrical system per NFPA 110, Standard for Emergency and Standby Power Systems and National Electric Code, Article 700, Emergency Systems.

IT/Communication

Technology systems within stairwells must support the equipment and applicable requirements of the 2021 International Building Code (IBC). These systems may include network infrastructure, wireless “Wi-Fi” network, cellular and radio distributed antenna systems, public address, video surveillance, electronic access control, and audio-video intercom.



III. INTERIOR IMPROVEMENTS - NON PUBLIC

I. Ramp Level

While planning Ramp Level Spaces including baggage make-up, vehicular circulation spaces, pedestrian areas, etc., top priority must be placed on employee safety. Because employees in this space spend long hours on their feet moving baggage from conveyors to carts and baggage containers for transport to the aircraft, special consideration should be taken to provide ergonomic operations. Materials should be utilitarian in nature and must resist severe abuse. TSA areas within the Baggage Make-up Area must comply with all TSA requirements. Because the climate in Austin can be hot and humid, substantial natural air flow must be prioritized in these spaces.

Flooring

- Exposed Concrete, Light Broom Finish, Penetrating Water Repellent

Walls

- CMU, High-Performance Coated, MPI Gloss Level 3

Column Treatment

- Concrete Encased with Steel Angle Corner Protection, High-Performance Coated, MPI Gloss Level 3

Ceilings

- Exposed to Structure

Overhead Doors

- High Speed Overhead Fabric Doors
- Steel Coiling Overhead Doors

Equipment Protection

- Concrete-Filled Steel Pipe Bollards, High Performance Coated, Safety Yellow
- Bolted Base Plates Not Allowed
- Steel Pipe Guard Rails, High Performance Coated, Safety Yellow

Acoustics

To meet STC ratings, walls must extend full height to structure, and penetrations through the wall must be sealed air-tight with acoustic sealant.

- Between Baggage Makeup Room and adjacent, occupied spaces: STC 55-65
- Between Baggage Makeup Room and circulation spaces: STC 50-60

Mechanical

- Electric Unit Heaters
- Circulation Fans

Plumbing

Fixtures

- Provide hose bibbs and floor drains where area washdown is required for cleaning or maintenance.
- Provide sinks with hot and cold water where indicated.
- Where miscellaneous equipment requires a domestic water supply, include backflow prevention device per City of Austin's Backflow Prevention Hazard List, as applicable.

Electrical

Duplex outlets should be located on each wall for general use. Coordinate with equipment manufacturer for service disconnects as required for baggage handling and other equipment.

Lighting

The lighting in Baggage Makeup Rooms should provide ambient lighting and additional task lighting for the functions of the space. Ambient lighting levels should target 20fc measured at the floor, and task illumination should be provided at work counters and at baggage equipment. Task illumination should be controlled locally, and ambient lighting shall be controlled by a dual-technology vacancy sensor.

Life Safety

Life safety systems within baggage makeup rooms mush be provided and must comply with the applicable edition of the International Building Code (IBC) and the International Fire Code (IFC), with City of Austin amendments, and all referenced codes and standards. Life safety systems are expected to include, but are not limited to, means of egress systems (I.e., quantity and capacity of exits), passive fire protection (I.e., fire barriers and opening protection), fire protection systems (I.e., automatic sprinkler, standpipe, and fire pump), fire alarm systems, and portable fire extinguishers. Each life safety system shall comply with the requirements of the applicable code or standard.

IT and Security

IT Network

- Passive Infrastructure: Refer to system technical standards and division 27 specifications for requirements.
- Active network: Refer to system technical standards and division 27 specifications for requirements.

Wireless & Radio System

- Wi-Fi: This space may have Admin Wi-Fi coverage. Ensure proper bandwidth.
- DAS Radio: Public Safety DAS shall be made available in all areas of the buiding as per NFPA 1221 code and must comply with the local AHJ guidelines for coverage requirements. Additionally airline radio coverage will be extended throughout the ramp level based on each airline's required operational area.
- DAS Cell: Carrier's 4G/5G coverage should be reviewed on a case-by-case basis.
- Airline Radio:Ground staff must be able to communicate with the Airline Operations using available VHF Frequency radios.
- Provision radio rooms, pathway, and antenna mount locations as required.

Security

- Provide Cameras and card reader as required in coordination with AUS Security.

III. INTERIOR IMPROVEMENTS - NON PUBLIC

J. Restrooms

Non-public or "back-of-house" restrooms should provide privacy, comfort, and functionality for all AUS staff, tenants, and visitors. As a first priority, non-public restrooms should be functional, inclusively accessible, durable, clean, and bright. The inclusive design approach includes improved usability characteristics to ensure they are usable to the greatest extent possible by people of all ages, genders and abilities.

Flooring & Walls

- Large Format Porcelain Tile
- Terrazzo
- Additional Flooring and wall materials may be selected with AUS Project Manager approval

Millwork

- Stainless Steel
- Plastic Laminate
- Phenolic

Countertops

- Solid Surface

Ceiling

- Acoustic Ceiling Tiles
- Gypsum Board

Toilet Partitions

- When feasible, stall partitions should be ceiling hung
- Stalls should be detailed to prevent any gaps allowing sight lines into the stall
- Materials
  - Phenolic
  - Stainless Steel
- Stainless Steel Hardware

Toilet Accessories - Stainless Steel

- Grab Bar
- Toilet Tissue Dispenser
- Sanitary Napkin Disposal
- Toilet Seat Cover Dispenser
- Soap Dispenser
- Mirror
- Paper Towel Dispenser / Receptacle

Mechanical

Air devices should distribute conditioned air accordingly throughout the space and should address thermal comfort factors according to ASHRAE 55. All visible mechanical equipment should be coordinated with architectural features and aesthetics and per AUS Restroom Design Standards.

Access panels for mechanical equipment above inaccessible ceilings shall be provided.

Exhaust and ventilation shall be provided per AUS Restroom Design Standards.

Air distribution systems shall comply with acoustical requirements for this space.

Plumbing

Fixtures

- Provide plumbing fixtures per the AUS Restroom Design Standards and architectural drawings.
- Where electric water coolers are indicated, include vandal-resistant bubblers, filters, and bottle filling stations. Include a cane skirt for TAS compliance on bi-level coolers if not recessed in an alcove.

- For water closet and urinal flush valves, include a true mechanical override on the user side, as well as an electronic push-button actuator with the button located in the chase behind the fixture for maintenance.
- Where mop sinks include a chemical mixing unit, include a faucet bleeder t-device for back flow prevention between the hard-connected hose and the mop sink faucet.
- Refer to the AUS Restroom Design Standards for additional information and requirements.

III. INTERIOR IMPROVEMENTS - NON PUBLIC

J. Restrooms (Continued)

Plumbing

Piping and Accessories

- Provide cleanouts in the vertical vent takeoffs of all water closets and urinals. The cleanouts shall face the accessible plumbing chase located behind the fixtures.
- Provide cleanouts at the upstream end of all horizontal sanitary waste piping serving multiple fixtures, with the cleanout located above the flood-level rim of the fixtures served.
- Include shock arrestors in water lines connected to fixtures or equipment with quick-closing valves. Size and installation of shock arrestors shall be per PDI-WH201.
- Provide isolation and balancing valves within the accessible chase spaces, wherever they are provided. Where chase spaces are not provided, provide access panels in non-accessible ceilings and walls for valve access, as applicable.

Electrical

Provide duplex GFCI protected outlet 6” above the counter at each end of the sink area. Provide dedicated branch circuit to each hand dryer. Provide GFCI outlets as required for automatic sensor for lavatories and sinks.

Lighting

Restrooms for employees should have lighting controlled automatically via dual technology occupancy sensors or controlled by the BAS Schedule. Restrooms shall be adequately lit to provide a sense of cleanliness and safety. Multiple lighting levels shall be considered at different zones of a restroom. In multiple stall restrooms, multiple lighting sources may be utilized to achieve lighting levels at appropriate zones. In restrooms with showers, an independent lighting source should be provided in the shower. At the hand-washing station, illumination should be provided to achieve a higher level of 15-20fc measured at the lavatory. In locker room areas, it is recommended that illumination levels target of 5-10fc measured at the floor and 20fc measured at the lavatory or countertop.

Life Safety

Life safety systems within restrooms shall be provided and shall comply with the applicable requirements of the 2021 International Building Code (IBC) and 2021 International Fire Code (IBC), with City of Austin amendments, and all referenced codes and standards. Life safety systems are expected to include, but are not limited to, means of egress systems (I.e., quantity and capacity of exits), passive fire protection (I.e., fire barriers and opening protection), fire protection systems (I.e., automatic sprinkler, standpipe, and fire pump), fire alarm systems, and portable fire extinguishers. Each life safety system shall comply with the requirements of the applicable code or standard.

IT and Security

Technology systems within restrooms may support the smart restroom equipment and applicable requirements of the International Building Code (IBC). These systems may include network infrastructure, wireless “Wi-Fi” network, cellular and radio distributed antenna systems, public address, and digital displays.

Equipment

Toilets

- Must Contain A Watersense Label
- Wall-Mounted
- Flush/Leak Detectors
- Siphon Jet
- Recessed Flush-Ometer With Sensor.
- Touch-Free Activation With Manual Override Option

Urinals

- In order to prevent splashing at urinal, provide a splash guard placed at the basin of the urinal and an AUS approved “bullseye” emblem etched at the anti-backsplash wall of the urinal.
- Must contain a Water Sense Label

Lavatory

- Faucet must contain a WaterSense Label
- Touch-free activation at soap and water

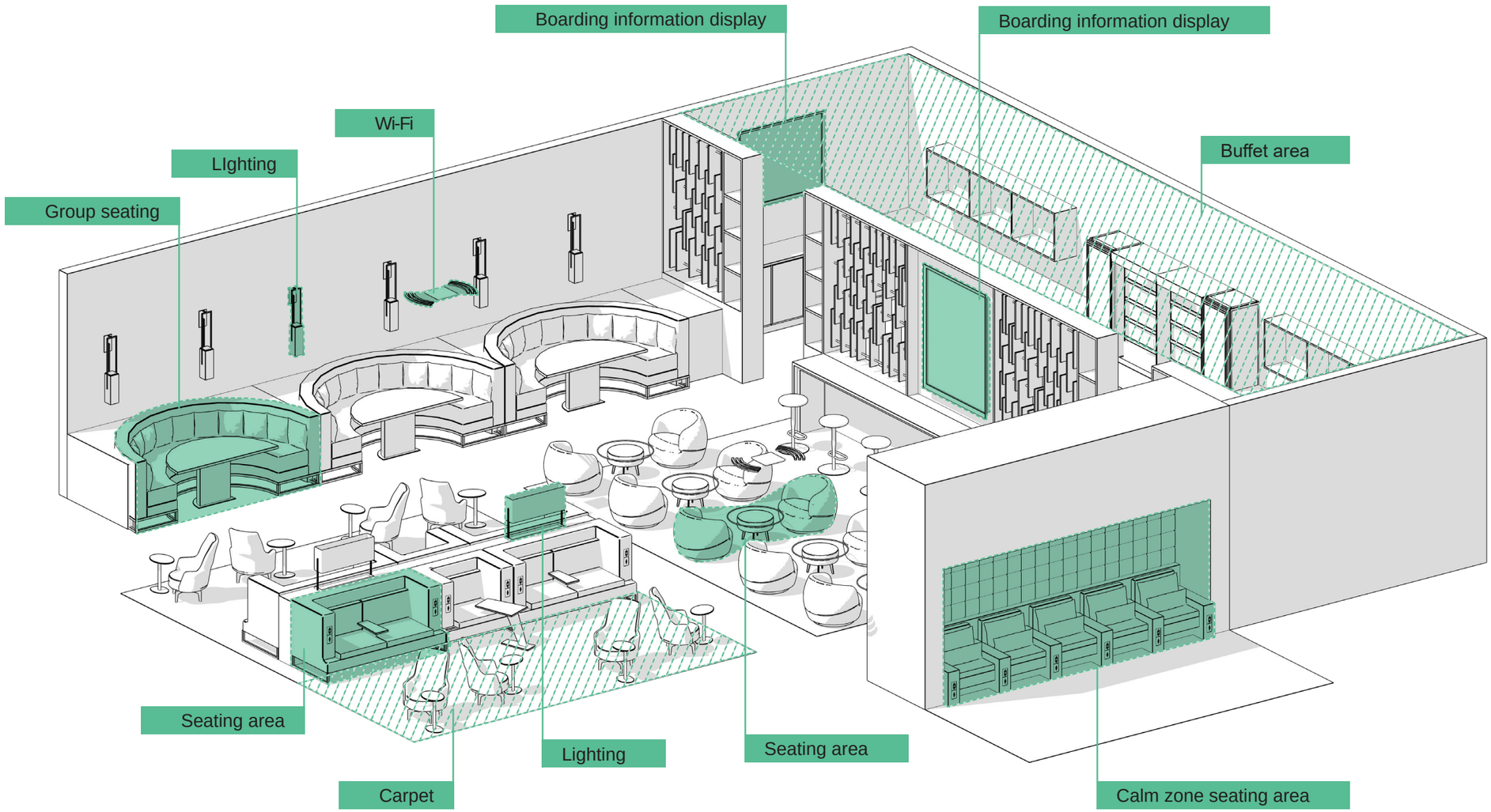
Drinking Fountain

- Code approved drinking fountain with bottle filler (placed at TAS height)
- Water fountains should be recessed off the main circulation space

IV. INTERIOR IMPROVEMENTS - TENANT SPACES

A. Clubs

Club spaces should provide a comfortable space for traveling passengers to relax while waiting for flights. The space must adapt inclusive design and the operator must confirm proper accommodations are met. Designers should consider the identity of the airline or other tenant while also incorporating an AUS sense of place. The space should provide ample natural light and views to the outside, sufficient seating, dining space, and workspace. The public facing club entrance must complement the design of the surrounding spaces.



IV. INTERIOR IMPROVEMENTS - TENANT SPACES

B. Concessions

Concession spaces are intended to contribute to the AUS GUIDING PRINCIPLES, MISSION, STRATEGIC OBJECTIVES, and VISION and overall passenger experience. These spaces are important to the AUS sense of place and should be comfortable, enjoyable, and informal. Concession design should captivate passengers and visitors and draw them into shops and restaurants. Retail design elements must follow the AUS Design Principles included in the Concessions Program Vision and Strategy. Materials used in Concessions spaces should align with the Passenger Terminal and Concourse Areas. Additional considerations are listed below.

Concession Spaces

Upon arrival to concession areas, passengers will discover a large volume where the dining and retail environment is modern, authentic and clean. This space should be celebrated through the use of textures, materials and design language establish by AUS. In Concessions Program and Vision Strategy, tenants will find all necessary information regarding zones (food & beverages, retail, common dining area), typologies, technical parameters to respect. While encouraging each tenant to express individual brand and identity, the following criteria and elements should be considered for further discussions and agreements between the tenant and AUS. Concession spaces should provide sufficient internal queuing space to avoid patrons queuing and congregating in public spaces.

Flooring:

Designers should explore a variety of durable materials and experiment with layering patterns to customize the space (marble, granite, limestone, terrazzo, stained concrete, ceramic, porcelain tile, resistant timber).

Materials To Avoid:

- Carpet
- Quarry Tile
- Laminate
- Low Durability Materials

Ceiling

Where possible, provide open ceilings with an acoustic solution. For enclosed restaurant space, attention should be paid to the technical installation in cooking zones. Encourage materials with texture, dimension and height variation.

Materials To Avoid:

- Acoustical Ceiling Tiles
- Continuous Ceiling Throughout The Entire Space
- Large Expanses Of Painted Gypsum Board

Walls

All interior type wall should be full height – partial height walls are discouraged. Walls should be treated with materials, textures, graphics, high durability materials, lights.

Materials To Avoid:

- Painted Gypsum Board

Lighting

Lighting is an important element and tool in the design space creation. LED strip lighting a diffuser to avoid direct light should be considered. Lighting should be warm (3000K) white with a high Color Rendering Index (CRI). Lighting should emphasize key zones of the concession such as product displays and cashiers.

Lighting To Avoid:

- Exposed Neon
- Inconsistent light temperature ranges in customer areas
- Visible hot pots either directly or in reflections

Furniture

Furniture is a great "tool" to create variety and interest in a design. This can be accomplished through furniture size, textures, and uses. Furniture can also build a strong and interesting brand image.

For high passage zones and common areas high resistant materials with easy maintenance should be prioritized.

Signage

When designing concession signage, Designers should consider location proportion, three-dimensionality, finishes and illumination.

Handcrafted and artisanal quality signage is preferred.

The AUS Project Manager must approve all signage prior to installation.

Materials To Avoid:

- Fluorescent or reflective materials such as polished mirror
- Simulated Materials
- Cardboard

Mechanical

Fan coil units, makeup air units and exhaust for kitchen equipment should be provided by tenants and will be dedicated to the tenant space

IT and Security

AUS systems shall follow the AUS Information Technology Design Standards Manual and the Division 27 and 28 specifications. Coordinate IT systems and telecom requirements with AUS. The following space specific system standards shall be adhered to by the designer for this space:

IT Network

- Passive Infrastructure: Concession areas shall typically be built out by concessionaires. 2-in conduit and junction box should be provided to service their technology needs. Refer to division 27 specifications for requirements.
- Active network: Refer to division 27 specifications for requirements.

Wireless and Radio System

- Wi-Fi: This space will have adjacent Public Wi-Fi coverage, however, further coordination with AUS and tenant is required for coverage within the space.
- DAS Radio: Public Safety DAS shall be made available in all areas of the building as per NFPA 1221 code and must comply with the local AHJ (Authority Having Jurisdiction) guidelines for coverage requirements.
- DAS Cell: This space will have adjacent 4G/5G coverage, however, further coordination with AUS and tenant is required for coverage within the space.

Security

- VMS (CCTV): Exterior of concession areas shall be provided with minimum ‘observation’ level video coverage.
- Overhead Paging System: Paging system consisting of speakers suitable for space to be provisioned adjacent to concessions areas.

IV. INTERIOR IMPROVEMENTS - TENANT SPACES

B. Concessions

Common Dining Areas

Flooring

- Terrazzo
- Terrazzo Tile
- Large-Format or Panel, Rectified Porcelain Tile, Thru-Body Color

Materials To Avoid:

- Carpet
- Ceramic Tile
- Exposed Concrete (including polished)
- Vinyl Composite Tile (VCT)

Walls

Wall materials below 8' AFF should be highly durable and impact resistant

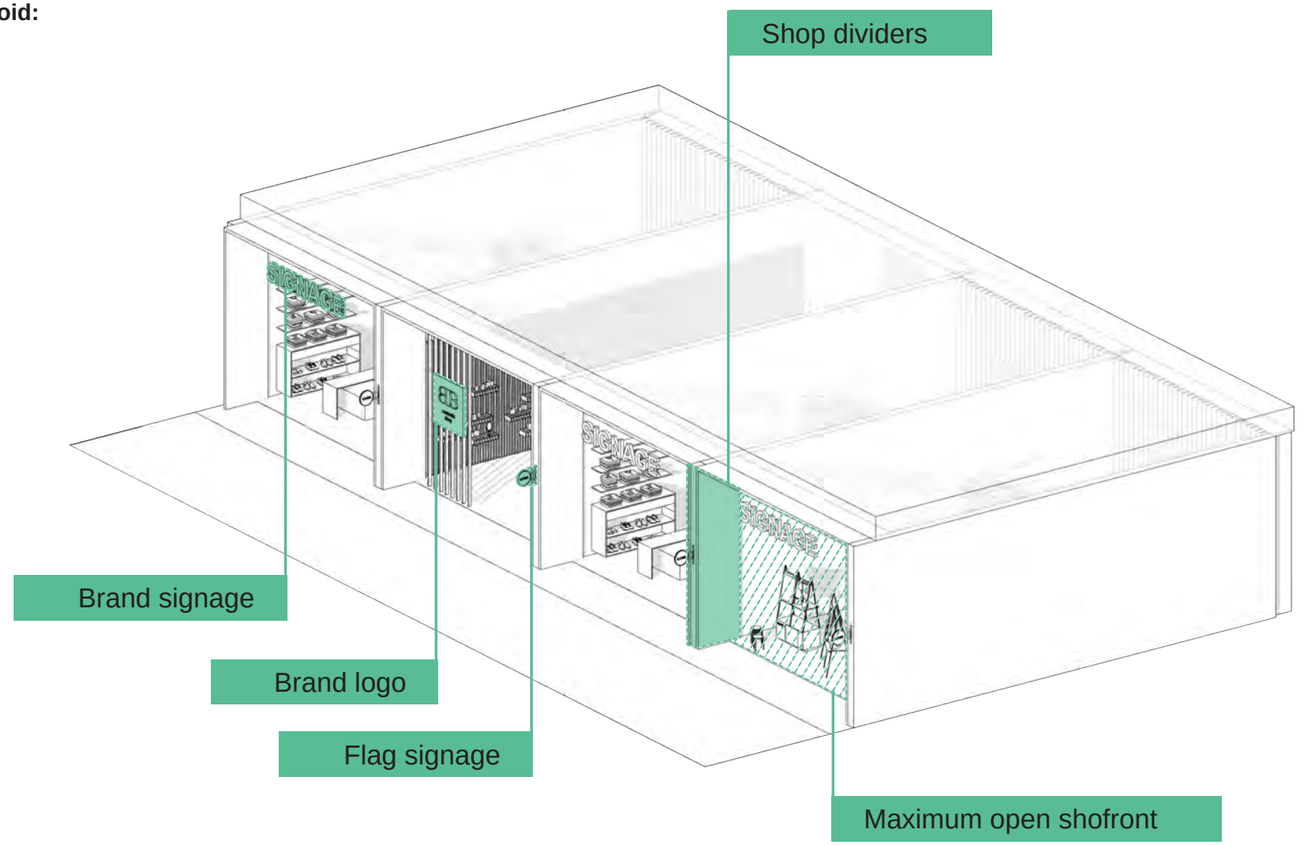
- Gypsum Board, Painted, MPI Gloss Level 4
  (at non-contact areas greater than 8 feet above finished floor only)
- Vinyl Wall Covering
- Wall Panel Systems
  - Flush Wood
  - Cork
  - Formed Metal
  - Stone
  - Resin/Plastic
- Thru-Body Tile
- Fiber Cement Panels
- Aluminum framed interior storefront system
- All-glass interior storefront system

Wall Base

- 12” minimum base height, flush with face of wall or recessed
- Integral terrazzo wall base with aluminum cap
- Stainless Steel, 16 ga. Minimum, with backing board
- Ultracompact Surface Material
- Solid Surface Material

Materials To Avoid:

- Rubber
- Vinyl
- Wood
- MDF



IV. INTERIOR IMPROVEMENTS - TENANT SPACES

B. Concessions

Common Dining Areas (Continued)

Ceilings

- Gypsum Board, Painted, MPI Gloss Level 1
- Acoustic Metal Ceiling Panels
- Access Panels: Flush type with drywall bead; painted to match ceiling
- Textile Ceilings
- Linear Metal Ceilings
- Linear Wooden Ceilings
- Open to Structure
  (with the appropriate services coordination)

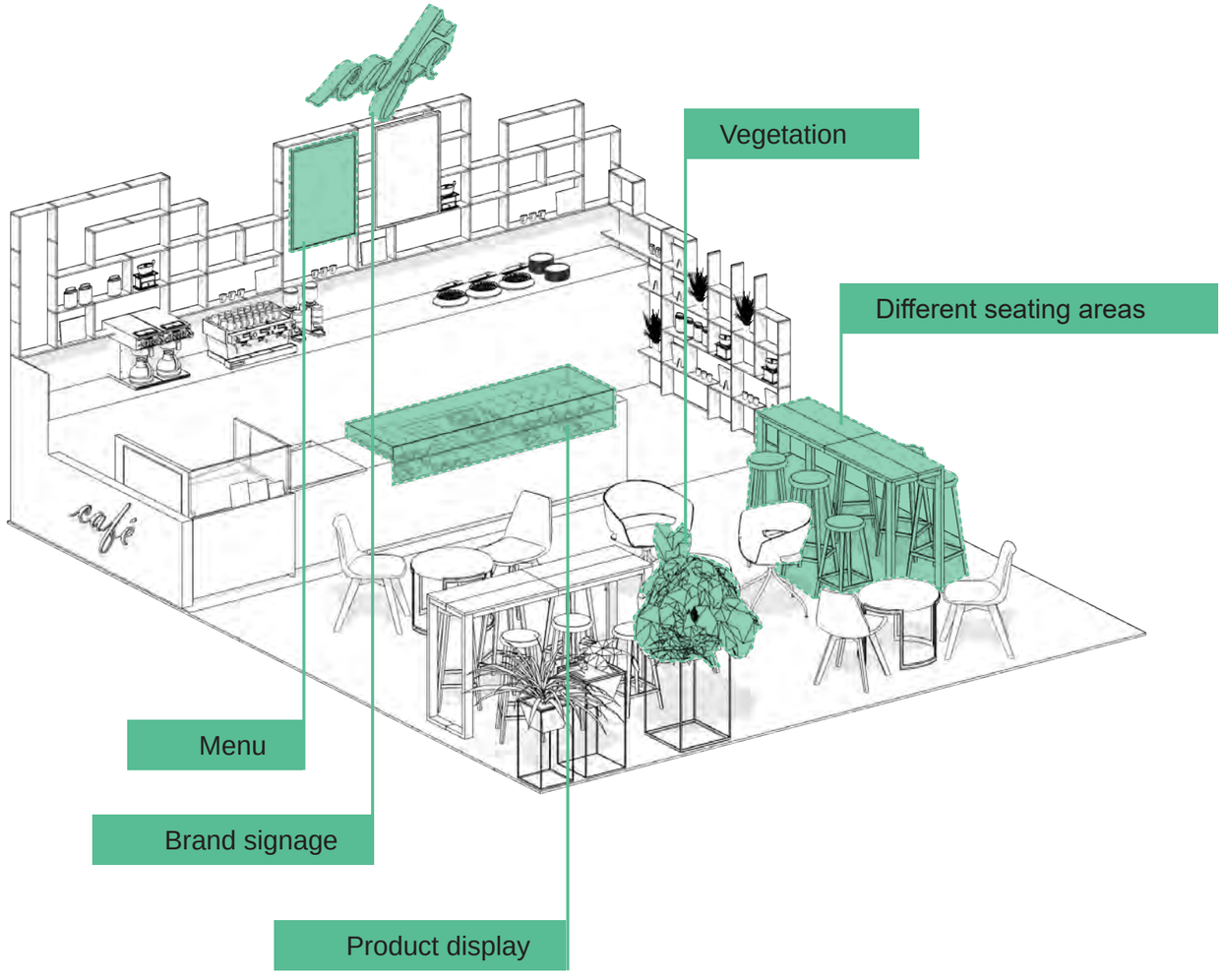
Furniture

Tables and seating should be comfortable, durable, and easily cleanable and should be located to avoid wall damage. Tables should provide a variety of height options such as table height, bar height, and standing height.

Trash, compost, and recycling receptacles should be provided – coordinate with the AUS project manager.

Acoustics

Common dining areas should be designed for clarity and acoustic comfort, for reduced passenger stress and increased public safety and should incorporate adequate sound absorption to reduce reverberation and increase speech intelligibility.



IV. INTERIOR IMPROVEMENTS - TENANT SPACES

C. General Airline Services Design Requirements

General Airline And Tenant Space Requirements

Walls

Tenant improvements or modifications, as required to meet operational or program requirements, will be strictly controlled by AUS. The design of all individually occupied facilities must be compatible with the architectural design characteristics and aesthetics described in this Design Standards Manual.

Signage

Stainless steel, pin-mounted signage will be installed above each airline's ticketing area and at the bag claim offices. The Tenant may not modify, move, or remove any signage unless approved by AUS.

Federal regulatory signage is required at mandated locations. Temporary signs, handwritten signs, promotional signs, literature, and advertising materials are prohibited unless specifically approved by AUS.

Equipment

Tenants may install baggage scales at their individual baggage wells, as required and approved by AUS. Modifications to the bag well base are the responsibility of the Tenant. Modifications to the bag well base should match the existing base. The Tenant must receive approval from the AUS prior to the installation of scales.

Queue Control Devices

Queue control devices may be provided, as approved by AUS. Tenant are responsible for maintaining queue control devices. Designers are responsible for specifying devices that do not interfere with general circulation. Location, extent, and type of queue control devices must be approved by AUS.

Casework

Casework must match existing, as approved by AUS. Casework should be coordinated with the AUS Project Manager and developed consistent with other facility casework. Casework design and fabrication documents should be reviewed and accepted by AUS prior to procurement.

Individual airlines may have specific requirements for special custom casework to support individual operations regarding "ticketless" travel or other similar programs, but existing casework must not be replaced without approval from AUS.

Modifications requiring AUS approval include changes to finish materials or colors; modifications to casework or millwork; addition or removal of signage; and addition of freestanding casework including, but not limited to, interactive video units, vending, automatic teller and/or ticket machines.

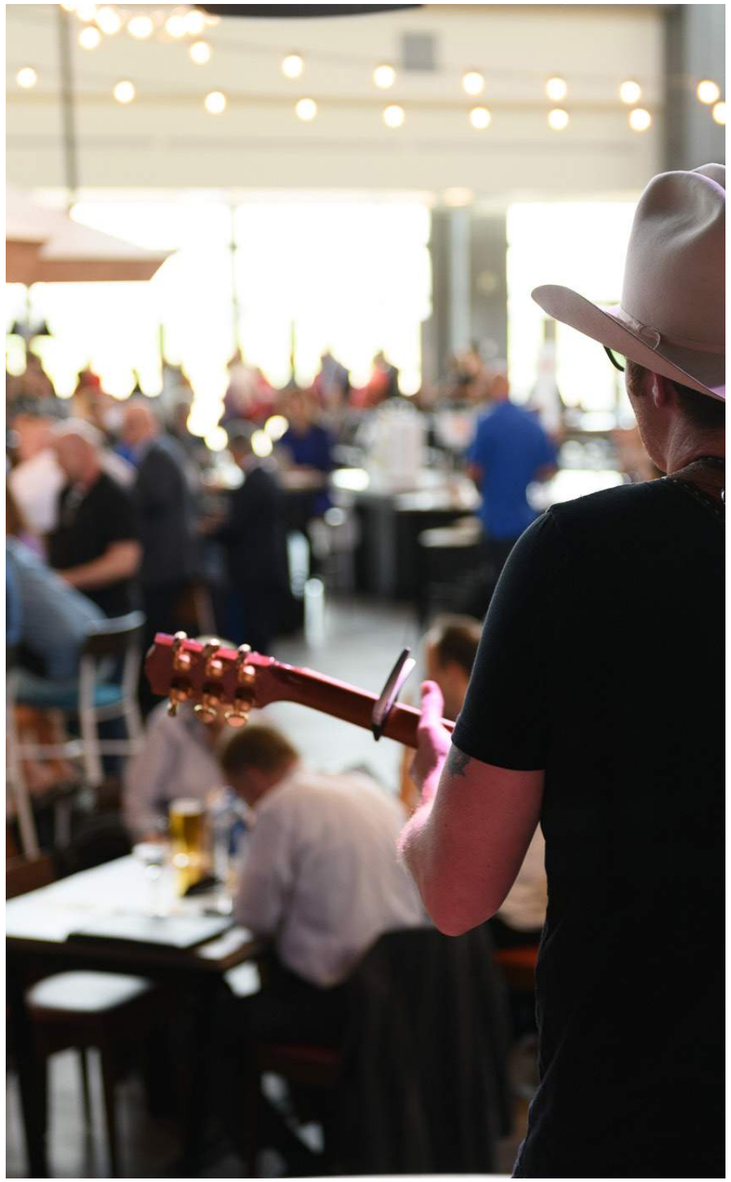
Casework/millwork on public side of house should be evaluated for inclusion of ballistic/active shooter mitigation measures

Advertising

Airlines may display airline promotional materials within the common use hold room areas only. All promotional materials must be reviewed and approved by AUS in advance.

Music

Music is permitted in Tenant areas on either a temporary or regular basis, However, it may not be audible in adjacent public, or Tenant areas and it may not interfere with, or make inaudible, the Terminal's public announcement system.



IV. INTERIOR IMPROVEMENTS - TENANT SPACES

C. General Airline Services Design Requirements

Electrical and Lighting

Emergency standby power capacity for minimum airline Tenant operations during an extended normal power outage will be installed as coordinated with the AUS Project Manager. Equipment connected to emergency standby power may include the following, as approved by AUS: FIDS, BIDS, computers, ticket counters, reduced-level task lighting, gate counters, security check-in, apron lighting, holdrooms, security and communications systems.

Telecommunications and Special Systems

Revisions and/or modifications to airline space telecom and special systems must be approved by AUS.

Designers are responsible to design/specify cabling of contiguous lease spaces. Designers may not route conduit or cable outside of the Tenants' lease spaces without AUS approval. Tenant cabling within AUS conduit is not permitted without AUS approval.

Any proposed changes to existing Multi-User Flight Information Displays (MUFIDS) must be reviewed and approved by AUS. Interaction with existing MUFID computers must be coordinated with AUS.

Proposed need for Flight Information Displays (FIDS) at the gates, loading bridges or elsewhere, must be coordinated and approved by AUS. Monitors at the gate counter back screen must display flight status and the airline logo.

Monitors at the loading bridge door may display destination information and serve as an TAS monitor to provide boarding information to the hearing impaired.

A keypad, or functionally equivalent solution, must be installed at each gate counter to input or modify information on the monitors located in the gate counter back screen and the loading bridge door. Actual location of the keypad relative to the Tenant inserts must be field- coordinated and approved by AUS.

Baggage Information Display Systems (BIDS) will be provided by AUS at baggage claim devices. BIDS monitors will display baggage information and the respective airline logo.

Monitors should be installed on the operations side of baggage claim to direct operational personnel to the correct baggage claim input device. A keypad should also be installed at each input device for use by operational personnel.

Miscellaneous:

Unless otherwise noted it is the Designer's responsibility to provide any equipment required for individual tenant operations, including inserts at ticket counters, curbside check-in, computers, portable phones, radios, etc.

Loose equipment used by any air carrier, or contract employee thereof, within public areas in and around the terminal must be reviewed and approved by AUS. Such mobile equipment includes, but is not limited to, handcarts, tubs, and wheelchairs.

Mobile equipment must have factory or manufacturer-installed bumpers on all exposed edges and semi-inflatable tires to prevent damage to interior and exterior wall and floor finishes.

Ticket Counter Areas

Tenants must provide all ticket counter inserts, including equipment, wiring, and agent-side counter tops. The agent-side countertops should be constructed to match existing conditions, and must be accepted by AUS.

Signing and Graphics

Tenants may display airline identification and/or corporate logos on the back wall behind the ticket counter. Signage must be accepted by AUS.

Airline identification and/or corporate logos may be displayed within the full width of the Tenant lease frontage. However, signage is not permitted on the doors leading into the airline ticket offices or at the baggage belt enclosures.

No additional signing, graphics and/or display of corporate logos is permitted on the ticket counter casework, baggage wells or baggage belt decline enclosures in the ticketing lobby.

Curbside Check-In

Podium locations must be approved by AUS. Tenants are responsible for providing inserts, equipment and agent-side countertops required for operations.

Tenant-provided countertops must be installed to ensure that the unfinished interior surfaces of the casework at the sides and back are enclosed from view.

Proposed revisions to the curbside check-in podiums must match existing conditions and be submitted for review and approval by AUS.

IV. INTERIOR IMPROVEMENTS - TENANT SPACES

C. General Airline Services Design Requirements

Self-Service Kiosks

Self-service kiosks may be installed at locations approved by AUS.

Airline Clubs

Airline clubs may be located per lease requirements. Proposed modifications to existing airline clubs should be as submitted and approved by AUS.

Baggage Service Offices

Proposed changes to existing offices, or addition of new offices, must be submitted and approved by AUS.

Holdrooms

Proposed changes to existing holdrooms or the addition of holdrooms must be submitted the AUS Project Manager for review. AUS approval is required prior to scheduling any work.

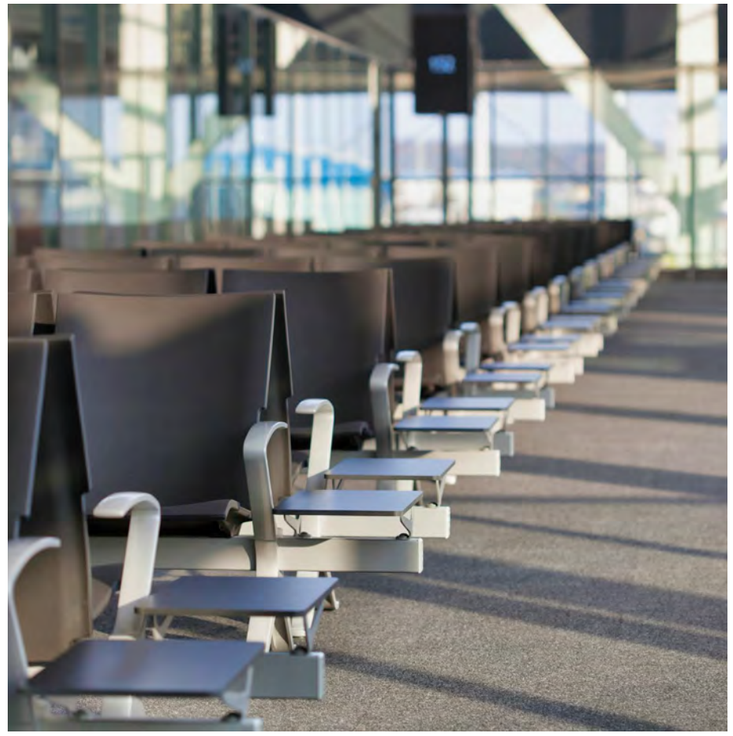
Baggage Claim Lobby Area

Except for airline identification at the baggage service office, no other logo, signage, or other graphics may be applied to any surfaces, equipment, or appurtenances within the baggage claim area, including baggage claim devices, BIDS racks or monitors, or positive claim railing systems.

Passenger Boarding Bridges

Airlines may not attach or install any temporary or permanent decals, graphics, signage, advertising posters, or other fixtures within the passenger boarding bridge, on either side of the door to the passenger boarding bridge, the door itself, on the exterior of the passenger boarding bridge, support or attached equipment unless approved by AUS.

Interior finishes must follow this Design Standards Manual and must be provided by AUS. Tenants may not alter any base building elements, or any materials or fixtures that fall within them unless reviewed and accepted by AUS.



Austin-Bergstrom International Airport

IV. INTERIOR IMPROVEMENTS - TENANT SPACES

D. Shell Spaces

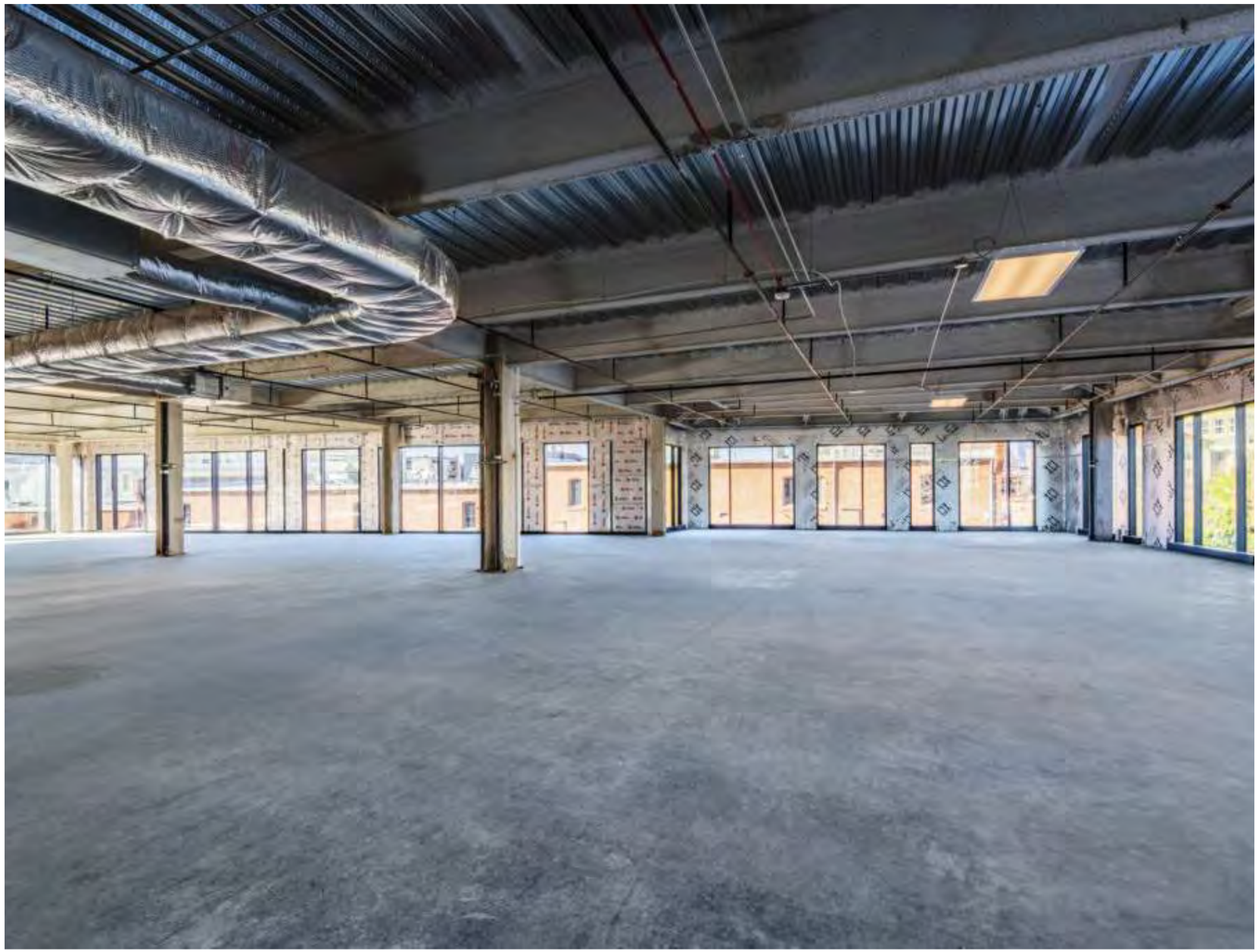
Many spaces within the Passenger Terminal and Concourse are provided to tenants as shell space. These spaces are defined as "White Box" and "Gray Box". White Box Space minimizes the work required by the future tenant while Gray Box Space maximizes future tenant flexibility.

White Box

White Box space is partially complete with basic finishes. Typically, this means that floors are unfinished trowel finish concrete. Walls are unpainted gypsum board with a Level 2 finish. Ceilings are standard acoustic ceiling panels with lighting to achieve efficient, uniform, comfortable ambient and productive lighting levels for the occupants (30fc measured at work plane or desk height).Mechanical is provided through air devices located and directed to provide occupant comfort per latest version of ASHRAE 55. Ventilation is provided per minimum ventilation requirement according to the latest version of ASHRAE 62.1 and City of Austin (COA) Amendments. Air distribution systems should comply with acoustical requirements for office spaces. Each White Box space should have independent controls. Provide a duplex outlet on each wall spaced not more than 12’ apart. Access control should be coordinated with the AUS Project Manager.

IV. INTERIOR IMPROVEMENTS - TENANT SPACES

D. Shell Spaces



Gray Box

Gray Box space is completely unfinished (also referred to as "Cold Shell Space"). This space is provided with trowel finish concrete floors. The interior side of walls are exposed to structure. Insulation should be provided only as required for a continuous building envelope. Ceilings should not be included. Temporary lighting should be provided as needed for life safety. Electrical power should be provided to a distribution panel only. Mechanical should be provided as supply and return stubs to provide minimal heating to prevent freezing. Plumbing supply and sanitary should be provided as a single point stub. Fire Sprinklers should be provided to ensure life safety. Access control should be coordinated with the AUS Project Manager.

For spaces identified as future concessions, exhaust hood rights-of-way and grease trap connectivity should be provided. A study to identify the grease trap capacity should be included.

TECHNICAL DESIGN STANDARDS

I. GENERAL TECHNICAL DESIGN STANDARDS

A. Structural Design Standards

Guiding Principles

FINANCIAL STEWARDSHIP

Structures should be responsibly designed and detailed to minimize cost in support of the project budge. Consideration should be given to allow flexibility for future renovations to existing structures.

FUNCTION OVER FORM

Freedom of space through the implementation of long span structures improves the functionality and flexibility of the airport's operation/passenger experience.

OPERATIONAL EFFICIENCY & RESILIENCY

Design, erection, and performance of the structure should not impair or disrupt ongoing airport operations or the passenger experience. Where operational conflicts cannot be avoided, the Designer should work with the AUS Project Manager to limit the impact of the conflict.

UNIQUE AUS EXPERIENCE

Exposed structures showcased in a meaningful way can be an expression of the creativity and uniqueness of Austin.

A SUSTAINABLE FUTURE

The Designer should advocate for the use of sustainable building materials according to the project Austin Energy Green Building (AEGB) goals and requirements. Furthermore, the Designer should responsibly design structures to minimize carbon content and quantity of construction materials.

I. GENERAL TECHNICAL DESIGN STANDARDS

A. Structural Design Standards

General Structural Requirements

Codes

The Structural design and documentation shall be in accordance with the following codes:

- International Building Code (Current Adopted Code per City of Austin) with City of Austin Amendments
- International Existing Building Code as referenced by the IBC
- Other applicable codes and standards as referenced by the above
- American Association of State Highway and Transportation Officials (AASHTO)
- Texas Department of Transportation Bridge Design Manual – LRFD, Current Standard
- Texas Department of Transportation Bridge Standards, Current Standards
- In addition to the codes and respective requirements above, the structural engineer should review and verify the project documentation complies with the Structural Review Submittal Checklist from the City of Austin for Commercial Plan Review. Link to list below:

  https://www.austintexas.gov/sites/default/files/files/Development_Services/COM_StructuralReviewSubmittalChecklist.pdf

Load Combinations

Buildings and other structures shall be designed using load combinations from ASCE 7. Reference the City of Austin currently adopted IBC for the correct version of the ASCE 7.

Roadway bridges shall be designed using load combinations from the current AASHTO code.

I. GENERAL TECHNICAL DESIGN STANDARDS

A. Structural Design Standards

General Structural Requirements

Loads

Dead Loads

The structure shall be designed to carry dead loads including, but not limited to, the following:

- Self-weight of any permanent building component
- Weight of the building structure
- Architectural envelope and finishes
- Primary MEP and baggage handling systems (BHS)
- Fixed furniture and fixtures
- Solar panel systems

Live Loads

In addition to dead loads, the structure shall support superimposed live loads, which meet or exceed the minimum code occupancy Live Loads:

LIVE LOAD OCCUPANCY	EXPECTED LIVE LOAD VALUES UNIFORM – POUNDS PER SQUARE FOOT (PSF), CONCENTRATED – POUNDS (LBS)
Airside apron area below concourse	250 psf
Art in Public Places preliminary allowance	Engineering judgment based on expected location
Floor-mounted baggage handling system Includes conveyor and baggage adjacent walkway	50 psf
Baggage Level	150 psf
Concourse Level *	150 psf; 2,000 lbs
Check-in and Security	150 psf, concentrated loads as required for equipment
Garages And Vehicle Floor	40 psf; 3,000 lbs
Occupiable Roof Terraces Or Balconies	100 psf, plus additional allowance for landscaping, as applicable
Maintenance Platforms Or Catwalks	40 psf, 300 lbs
Mechanical Rrooms	150 psf
Mezzanine	100 psf
Offices	100 psf; 2,000 lbs
Partitions, where live load does not exceed 100 psf	15 psf additional
Public Corridors	100 psf; 2,000 lbs
Restrooms	100 psf
Roof, exterior	20 psf, 300 lbs
Roof exterior rain, snow, and ice loads	As calculated by the engineer of record; 5 psf minimum ground snow load in Austin, Texas
Stairs and exit ways	100 psf, 300 lbs
Storage	150 psf

* 150 psf includes 100 psf for assembly occupancy and a superimposed or hanging load of 50 psf. Engineer should review and confirm combined hanging and superimposed loads do not exceed 50 psf.

Additional Notes for Table:

- Design live load plans should be included in the contract drawings.
- Structural framing should be designed for other live loads, including, but not limited to, elevators, escalators, mechanical equipment, or other specialty equipment including baggage screening and security equipment. Specific loads should be coordinated with the design professional and documented in the calculations or on the drawings as appropriate.
- Handrails and guardrails shall be designed for loads specified in IBC.
- Live loads for floor framing shall not be reduced. A reduction for live loads for members supporting two or more floors is permitted by up to 20 percent per IBC.

Wind and Tornado Loads

Building structures and foundations shall be designed to withstand minimum wind lateral and uplift pressures in accordance with IBC and ASCE 7.

Seismic Loads

Building structures and foundations shall be designed to withstand minimum wind lateral pressures in accordance with IBC and ASCE 7.

In general, seismic loading will not govern the lateral design or detailing of the structure.

Jet Blast Loading

The required design forces, if any, for airplane jet exhaust blast for the design of terminal building should be coordinated with the design professional. The design pressures from jet blasts shall be determined based on the FAA AC 150/5300-13A Appendix 3 or latest version.

Snow Loads

Generally, snow loads do not control the design of structures in Austin. Minimum ground snow load to design for is 5 psf.

Blast Loading

Blast load criteria, if required, shall be established by the SEOR in consultation with the AHJ and applicable authorities.

I. GENERAL TECHNICAL DESIGN STANDARDS

A. Structural Design Standards

General Structural Requirements

Serviceability Considerations

Buildings

Floor/Roof Deflection Criteria

- Floor and roof structure shall be designed to limit vertical deflection in accordance with the IBC. Additionally, spandrel beams shall be designed for a maximum vertical superimposed dead load plus live load deflections of 3/8 inch.
- Structure supporting or bracing masonry veneer, masonry partition, or walls w/ other brittle finishes, shall be designed for a deflection limit of span length (L) over 600 or 3/8 inch maximum for combined superimposed dead load plus live load. This deflection shall be the long-term deflection of the structure after construction of masonry or other brittle finishes.

Floor Vibration Criteria

- Floor vibrations to conform to the recommended criteria in AISC Design Guide 11, “Floor Vibrations Due to Human Activity”.
  - Design Criteria for Concourse Floors:

DESIGN PARAMETERS	ACCEPTED VALUES
DAMPING RATIO	2%
ACCELERATION LIMIT	1% g
MINIMUM BAY FREQUENCY	3 Hz

  - The maximum peak criterion shall be discussed and determined with AUS official’s input.

Floor Flatness and Levelness Criteria

- Floors Exposed to public or slabs specified to receive thin-set flooring shall meet the requirements of a “flat” floor surface classification (FF 35, FL 25) as per ACI 117. Floors not exposed to public or specified to receive carpet shall meet the requirements of a “moderately flat” floor surface classification (FF 25, FL 20) per ACI 117. Floor Flatness value, FF, and Floor Levelness value, FL, shall be measured per ASTM E1155, “Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness values”.

Expansion Joints

- Building expansion joints sizes and locations shall be determined by the design professional to accommodate thermal expansions as well as differential lateral movements between structures separated by the expansion joints. Minimum expansion joint size shall be 2 inches. Expansion joint covers shall be chosen and detailed for durability against impact from hard rolling luggage and impact from maintenance vehicles such as scissor lifts and boom lifts.
- Differential deflections should be considered in the design of the framing adjacent to the expansion joint. The engineer should limit vertical differential movements at these joints to ¼”, but not more than allowed by requirements of the Texas Accessibility Standard (TAS). When evaluating the differential vertical movement, consider the following:
  - 25% of superimposed live load applied on one side with 100% applied on opposite side of joint
  - 100% of floor lift load of the joint on one side with no superimposed live loading on the opposite side of the joint.

I. GENERAL TECHNICAL DESIGN STANDARDS

A. Structural Design Standards

Geotechnical

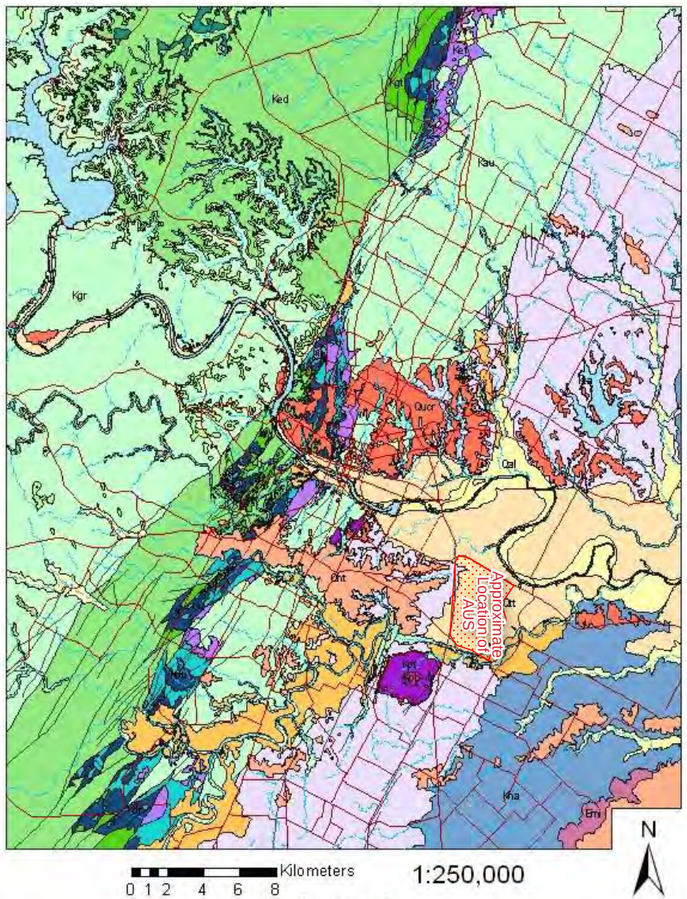
Description

Since the design of the existing terminal in the early 1990's, there have been many geotechnical investigations and reports produced for specific projects ranging from Terminal expansions to parking garages, to taxiway construction and miscellaneous site structures. New construction will require a new geotechnical investigation to be performed. Any exception to this requirement will require approval from the City of Austin Project Manager.

Local Geology

The site lies within an area characterized by Lower Colorado River terrace deposits of Pleistocene age underlain by montmorillonite and calcareous clays and marls of the Taylor Group of Upper Cretaceous age. The Lower Colorado River terrace deposits are typically clay to silty soils near the ground surface, generally grading into sandier to gravelly soils with depth. These soils are commonly overlain by a variable thickness of moderate to highly plastic clayey soils. The Taylor Formation consists of primarily of greenish gray to gray highly plastic shale.

Although several faults are known to exist within the Taylor Group south of Bergstrom (south of Onion Creek), it is not known whether these faults extend north across Onion Creek. No surface indications of faulting are evident due to the presence of the terrace deposits over the Taylor Group. The Austin area is located in seismic zone zero and, therefore, possesses minimal potential for seismic activity. No movement has been detected in the Balcones fault zone, the primary local structural feature, during modern times.



Report Requirements

Geotechnical investigations shall be conducted in accordance with the current adopted IBC and applicable local amendments. Each request for investigation shall note the minimum requirements as noted in the IBC plus any additional requirements as needed by the design professional. Where geotechnical investigations are required, a written report of the investigations shall be prepared by a licensed geotechnical engineer in the State of Texas and shall provide, but not limited to, the following:

- Project information as noted in the geotechnical investigation request letter.
- Site Geology
- Groundwater conditions
- Compacted fill material properties and testing
- Soil bearing capacities and associated settlement values (differential and total)
- Foundation recommendations
- Lateral earth pressures and distribution
- Soil site classification for seismic design
- Special details for construction required by the existence of expansive clay
- Excavation slope requirements
- Boring logs and testing data

Where existing geotechnical reportfis were provided adjacent to the new or existing construction site, these should be provided to the design professional and geotechnical engineer for review and applicability.

I. GENERAL TECHNICAL DESIGN STANDARDS

A. Structural Design Standards

Geotechnical

Foundation Settlement

Where a geotechnical report has been provided for a project, the structural engineer should coordinate with the geotechnical engineer, architect, contractor (when applicable) and owner for acceptable foundation settlement values based on project specifics (e.g. permissible foundation cracking, floor finishes, facade material and ability to move, etc.).

At high-risk buildings such as terminal structures, Central Utility Plants, IT and administration buildings, where the damage from settling could impact ongoing airport operations or induce large costs to the owner for remediation, settlement values should be minimized by supporting large, concentrated loads (e.g. columns, shear walls, wind braces, etc.) on deep foundations embedded into the shale bearing stratum.

Some low risk structures may be located on shallow foundation or spread footings as appropriate. Confirm foundation type with AUS management.

- Slab on Grade
  - Typical solutions for slab on grade construction include subgrade preparation as recommended by the geotechnical engineer.
- Deep Foundations
  - Based on previous geotechnical investigations, all large, concentrated loads should be supported by drilled straight shaft concrete piers bearing in the Taylor Shale. The allowable foundation capacities shall be determined from a project specific geotechnical investigation, unless otherwise approved by the AHJ.
- Permanent Earth Retaining Structures
  - The design of permanent earth retaining structures shall be based on fully hydrostatic pressures using pressures listed in the project geotechnical report.
  - A minimum surcharge pressure of 100 psf should be applied for the design of the structure. Where structure is located adjacent to vehicular traffic, the minimum surcharge should be 250 psf. Where structure would be subject to airplane gear loading directly or indirectly by means of soil redistribution, apply applicable surcharge loading for worst case airplane gear loading.
  - Design considerations must be given to the following loads and surcharges, but not limited to:
    - Vertical, lateral, and surcharge loads
    - Lateral soil pressure
    - Hydrostatic pressure
    - Uplift pressure
    - Friction
    - Overturning Forces
  - Minimum factors of safety to design to for permanent earth retaining structures:
    - Overturning – 2.0
    - Sliding – 1.5
    - Bearing – 1.0

I. GENERAL TECHNICAL DESIGN STANDARDS

A. Structural Design Standards

Structural Concrete

General

The design, and detailing of structural concrete should conform to the following standards:

- Building Code Requirements for Structural Concrete – ACI 318

Sustainable Practices

- When designing and specifying concrete materials, the SEOR should be efficient in their design and make good engineering judgements to minimize the quantity of concrete and reinforcing steel.
- Blended hydraulic cements should be considered during the design for implementation in the specifications to minimize cement and associated embodied carbon.
- Supplementary cementitious materials and blended hydraulic cements should be considered for implementation in the specifications to minimize the embodied carbon.
- Specifying a 56-day strength, and a 28-day strength for the same concrete application where the 56-day strength is what you need for final design should be considered to lower the quantity of cement in the mix, and embodied carbon.

Exterior Concrete

Where exterior concrete is exposed to weather, engineer should apply good engineering practice to extend the useful life of the structure, which may include, but is not limited to:

- Sloping concrete to drain for horizontal concrete construction
- Providing adequate reinforcement for temperature and shrinkage
- Applying sealers to concrete surfaces to prevent intrusion of damaging chemicals.
- Specifying concrete meeting the durability requirements with adequate clear cover per ACI.
- Prohibit the use of river rock as coarse aggregate in exterior concrete applications to avoid the risk of concrete staining due to the presence of iron pyrite clay balls

Cast in Place Concrete

Materials

Normal-weight concrete shall be made of normal-weight aggregates and conform to ASTM C33, using Portland Cement Type I/II conforming to ASTM C150. Concrete shall have a minimum compressive strength of 3,600 psi at 28-days.

Normal-weight concrete should be used where exposed to the weather and at wet conditions, or for structural components. Examples would include, but are not limited to:

- Slabs on grade
- Structural slabs
- Beams
- Joists
- Transfer Girders
- Columns
- Foundations

Light-weight concrete shall have a maximum dry density of 120 pcf. and shall be made of light-weight aggregates conforming to ASTM C-330, using Portland Cement Type I/II conforming to ASTM C150. Concrete shall have a minimum compressive strength of 4,000 psi at 28-days.

Lightweight concrete shall not be used on roof structures due to the porous aggregate to retain moisture and damage the adhesion of the waterproofing to the concrete.

Where possible and in accordance with good engineering judgement, the SEOR should specify City of Austin concrete types listed under the Standard Specifications Manual, Series 400 – Concrete Structures and Miscellaneous Concrete.

Durability Requirements

Concrete specified should meet durability requirements for project specific conditions in accordance with ACI 318.

Good engineering judgement should be used to extend the useful life of structures, which may include, but are not limited to:

- Applying sealers to concrete surfaces to prevent intrusion of chloride ions.
- Providing adequate crack control joints and reinforcing in horizontal concrete construction in accordance with ACI 224.

Reinforcing

Reinforcing to conform to ASTM 615, Grade 60 deformed bars, minimum.

Construction/Tolerances

Tolerances for concrete construction shall be in accordance with the current ACI 117, “Specifications for Tolerances for Concrete Construction and Materials and Commentary”.

Formed surface “Class” shall be indicated on the contract drawings or in the specifications but shall not be less than Class C as defined in latest version of ACI 347 “Guide to Formwork for Concrete”.

Use industry best practices when specifying concrete construction such as required for hot-weather or cold-weather concrete placement, finishing tolerances, and proper curing procedures.

I. GENERAL TECHNICAL DESIGN STANDARDS

A. Structural Design Standards

Structural Concrete

Prestressed / Precast Concrete

General

Observe applicable provisions for cast-in-place conventional concrete construction noted above.

Prestressed, post-tensioned, precast concrete structural elements shall be designed using the best engineering practices by a Structural Engineer licensed in the State of Texas.

Pre-stressed and post tensioned concrete members shall be produced by experienced manufacturers in plants certified by Precast/Prestressed Concrete Institute.

Materials

Concrete compressive strength shall be a minimum of 5,000 psi. Unless otherwise shown by the SEOR to be prudent, the noted strengths are to be considered.

Pre-stressed and precast concrete shall use material conforming to the requirements of ACI, PCI, PTI and ASTM.

Bearing Pads for prestressed or post-tensioned concrete shall be provided as appropriate for the design application.

Post Tensioned Concrete

Materials

Concrete compressive strength shall be a minimum of 5,000 psi. Unless otherwise shown by the SEOR to be prudent, the noted strengths are to be considered.

Post-tensioned concrete shall use material conforming to the requirements of ACI, PTI and ASTM.

Systems and Parameters

Post tensioned concrete shall be detailed with appropriate slip connections to prevent restraint cracking.

Post-tensioned concrete shall be detailed with appropriate clear cover to meet the required fire rating for each design member.

Bonded post-tensioned construction to be used at high-demand structural areas where additional structural resiliency is required such as transfer girders or transfer slabs.

Architectural Concrete

Materials

No fly ash additive is permitted in the use of architectural concrete, unless demonstrated that an acceptable finish can be accomplished through a mockup.

To minimize color variations, the same type and brand of cement from the same mill should be used for all the architectural concrete on a given structure.

Well graded aggregate conforming to ASTM C33 shall be provided. Aggregates should come from the same source to provide consistent quality and color similar to an approved sample or mockup.

Reference cast in place concrete section for other requirements.

Construction/Tolerances

Tolerances for architectural concrete should generally be ½ of the specified values noted in ACI 117. This should be coordinated with the design professional specifying the architectural concrete.

Formwork shall be specified by the design professional to limit formwork deflection to L/400, maximum.

Design

It is recommended where Architectural concrete is specified in the design, an Architectural concrete specialist be consulted to assist with mix designs, formwork, and finishes.

Design of architectural concrete should be done in accordance with ACI 303R ‘Guide to Cast-in-Place Architectural Concrete Practice’.

I. GENERAL TECHNICAL DESIGN STANDARDS

A. Structural Design Standards

Structural Concrete Masonry

Material Strengths

Masonry Unit Strength

- Net area compressive strength (f'm) shall be a minimum of 2,000 psi at 28 days.

Concrete Masonry Unit

- Concrete masonry units shall be Lightweight (density of 105 pcf) hollow load bearing type N-1 per ASTM C90 with a minimum compressive strength of 2,800 psi.

Mortar and Grout

- Mortar shall conform to ASTM C270, Type S, by proportion.
- Coarse grout shall conform to ASTM C476, by proportion, with a maximum aggregate size of ½".

Construction / Tolerances

Design and Construction of concrete masonry shall be in accordance with TMS 402/602 'Building Code Requirements and Specifications for Masonry Structures'.

Structural Steel

General

The design, and detailing of structural steel should conform to the following standards:

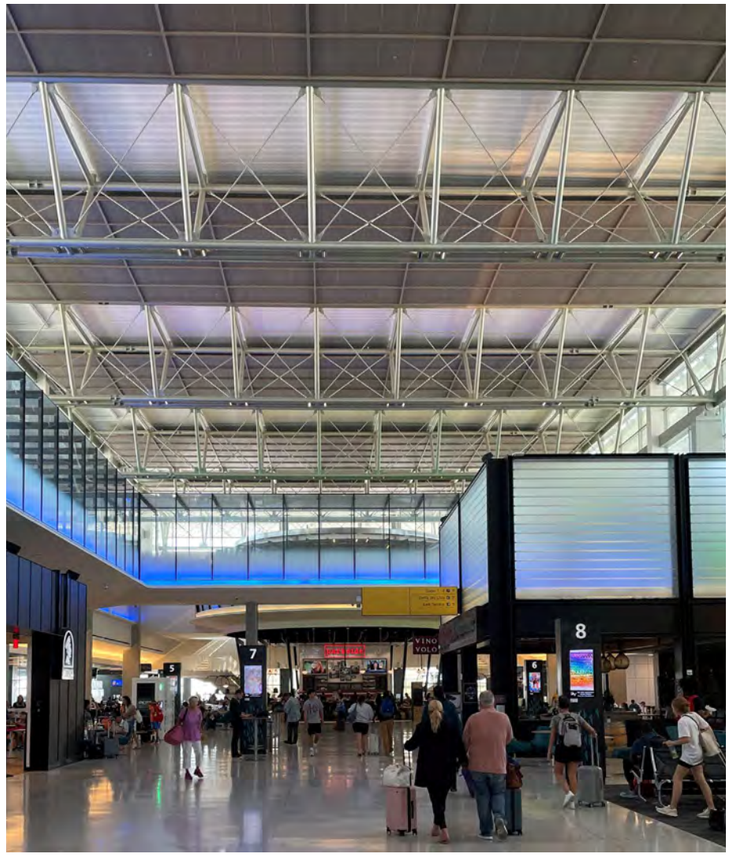
- American Institute of Steel Construction (AISC) – Code of Standard Practice
- American Institute of Steel Construction – AISC 360 – Specification of Structural Steel Buildings
- American Welding Society (AWS) – AWS D1.1 Structural Welding Code -Steel.

Materials

Structural steel shapes should conform to the following specifications:

- W, WT: ASTM A992, Grade 50
- Channels, Angles and Plates: ASTM A36, Grade 36
- Pipes: ASTM A53 Gr. B, Grade 35
- HSS: ASTM A500 Gr. C, Grade 46 round, Grade 50 rectangular/square
- High Strength Bolts: ASTM A325 or ASTM A490
- Anchor Bolts and Rods: ASTM A36, or F1554, Grade 36
- Alternative specifications of steel: Where AISC indicates availability of higher strength material, the design professional should use their best judgement to determine appropriate use of the material.

Architectural Exposed Structural Steel (AESS)



The use of architecturally exposed structural (AESS) steel in an open concourse should be considered by the design professional(s) in the design of passenger-facing spaces where structural steel is exposed. Close coordination between the structural engineer, architect and owner will be required for efficiency of the design and desired aesthetics.

If AESS is considered for a project, the design professional(s) shall determine the levels of finishes and clearly document which levels of finishes are required for each component.

I. GENERAL TECHNICAL DESIGN STANDARDS

A. Structural Design Standards

Cold-Formed Steel

General

The design, and detailing of cold formed steel should conform to the following standards:

- American Iron and Steel Institute (AISI) North American Standard for Cold-Formed Steel Framing
- AISI S100, North American Specification for the Design of Cold-Formed Steel Structural Members
- Steel Deck Institute – Current Standard for Steel Deck
- American Welding Society (AWS) – AWS D1.3 Structural Welding Code – Sheet Steel

Materials

Cold-formed steel framing and decking shall have a minimum yield strength of 33 ksi.

Delegated Design

Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, SEOR and/or Architect to indicate products and systems along with the specific performance and design criteria indicated.

Delegated design of specialty products shall be performed by a Structural Engineer licensed in the State of Texas.

Accepted nomenclature for these required services in contract documents shall be noted as “Delegated Design”.

Modifications To Existing Building

Modifications to the existing building shall be done in accordance with the City of Austin adopted version International Existing Building Code.

Where modifications to the existing structure are required, the design professional shall make their best efforts to design it in such a way that eliminates or minimizes disruption to ongoing airport operations.

IBC Testing and Special Inspections

An independent 3rd party testing agency shall be selected and hired to perform special inspections and material testing per Chapter 17 of the International Building Code.

The Design professional in charge (engineer of record) shall submit a statement of special inspections form per the City of Austin. Additionally, the design professional in charge shall provide structural observations and shall submit to the building official a written statement that the site visits have been made and identify any reported deficiencies which, to the best of the structural observer’s knowledge, have not been resolved.

Link to Statement of Special Inspections:

https://www.austintexas.gov/sites/default/files/files/Development_Services/INSP_StatementOfSpecialInspections.pdf

I. GENERAL TECHNICAL DESIGN STANDARDS

B. Plumbing Design Standards

Guiding Principles

FINANCIAL STEWARDSHIP

The cost of specified plumbing systems must be considered, however long-term reliability, resiliency, maintainability, and manufacturer support shall take precedence, so long as they can be reasonably achieved within each project budget.

FUNCTION OVER FORM

For products requiring maintenance, only those with a history of reliable local support should be considered.

OPERATIONAL EFFICIENCY & RESILIENCY

Plumbing systems will be designed with a high value of efficiency and resiliency. Refer to the section on Interior Improvements for operational requirements of plumbing systems as they apply to each interior space at AUS.

UNIQUE AUS EXPERIENCE

Where applicable and reasonably achievable, plumbing systems shall be designed to accommodate architectural design features unique to AUS.

A SUSTAINABLE FUTURE

Water-efficient plumbing fixtures shall be used to save water and associated energy consumption. Power for water heaters should be electric, and heat-pump type water heaters should be considered where appropriate. As AUS continues to pursue carbon neutrality, natural gas should only be used where electric power is shown to be impractical. Domestic hot water circulation pumps shall include aquastat controls to reduce unnecessary power consumption.

General Plumbing Requirements

Plumbing standards for AUS facilities are based on best practices and local experience. These standards are intended to support the implementation of an efficient design of plumbing systems to maximize building system efficiencies, while minimizing unplanned maintenance shutdowns. All plumbing designs shall comply with the local City of Austin Plumbing Code. Where no additional guidance is provided, the designer shall use their judgement and experience to comply with the greater AUS goals described herein.

Backflow Prevention

Fixtures and equipment shall be protected against backflow in accordance with the City of Austin's online Water Protection Hazard List, available at:

https://www.austintexas.gov/department/cross-connection-control-water-protection-program

together with the UPC and local amendments.

Provide a dedicated Reduced Pressure Zone (RPZ) type backflow preventer in the water supply to HVAC equipment, commercial ice makers (not ice-makers integral with a refrigerator water dispenser), carbonated beverage dispensers, aircraft potable water cabinets, and other equipment marked as high hazard on the City of Austin's online Water Protection Hazard List. Each high-hazard piece of equipment shall have its own RPZ. Pipe each RPZ relief-port through an air gap fitting to a floor drain, floor sink, or approved outdoor area. Provide a Double Check Valve Assembly (DCVA) type backflow preventer in water supplies to coffee, espresso, and tea makers; and to similar low-hazard equipment. A single DCVA may serve multiple coffee, espresso, or tea makers. At mop sink faucets, provide a Bleeder T Device to protect the faucet's vacuum breaker from being left under continuous pressure when connected to a janitorial chemical dispenser.

Provide a vacuum breaker and dual check-valve hose connection fitting at each hose bibb and hydrant.

Demolition

When modifying or connecting to existing systems, remove all fixtures and equipment and their associated above-ground piping back to active piping to remain and cap. No above-ground piping no longer needed shall be abandoned in place. Buried sanitary waste and vent piping may be removed to below the floor level and capped, rather than demolishing sections of slabs on grade in order to remove such piping.

I. GENERAL TECHNICAL DESIGN STANDARDS

C. Mechanical Design Standards

Guiding Principles

FINANCIAL STEWARDSHIP

Upfront cost of mechanical systems shall be considered, however long-term energy savings, reliability, resiliency, maintainability, and manufacturer support shall take precedence, so long as they can be reasonably achieved within each project budget.

FUNCTION OVER FORM

Equipment shall be selected from commercial grade manufacturers with reliable local representation and easily available replacement parts.

OPERATIONAL EFFICIENCY & RESILIENCY

Mechanical systems will be of commercial grade quality and designed to meet high efficiency standards. Equipment monitoring and control systems will ensure equipment is operating successfully. Exceptional design along with quality and functionality of systems shall provide maximum passenger comfort and experience.

UNIQUE AUS EXPERIENCE

Where applicable and reasonably achievable, mechanical systems shall be designed to accommodate architectural design features unique to AUS.

A SUSTAINABLE FUTURE

High-efficient mechanical equipment shall be used to reduce energy consumption. Unit coils shall be designed to maximize the water temperature difference and minimize the total GPM required to accommodate building cooling and heating loads. High delta T and low flow are critical to the new central plant chilled water thermal storage system operation and the added infrastructure at the units is justified to accommodate the overall system performance.

Existing Mechanical Systems Overview

The existing terminal building is served by equipment with chilled-water cooling coils and hot water heating coils. Chilled water and hot water are supplied to the terminal building from a central utility plant owned by the city. The chilled water and heating water systems throughout are configured in a variable volume two-way system with an end of line bypass to maintain continuous flow.

General Design Requirements

The mechanical systems will be designed in accordance with the latest editions of the International Building Code, Uniform Mechanical Code, International Fire Code, the International Energy Conservation Code, ASHRAE 90.1- Energy Standard for Buildings Except Low-Rise Residential Buildings, ASHRAE Standard 55- Standard for Thermal Environmental Conditions for Human Occupancy, ASHRAE Standard 62. Ventilation for Acceptable Indoor Air Quality, NFPA Standards 1, 30, 54, 70, 72, 90A, and 101, local City of Austin code amendments and the AUS Restroom Design Standards. When applicable the project shall also meet LEED and Austin Energy Green Building (AEGB) requirements.

Temperature and Humidity Design Conditions

Summer Outside Design Conditions: 100.3 degrees F dry-bulb / 74.3 degrees F wet-bulb temperature

- Basis of data: Latest ASHRAE Handbook of Fundamentals, Austin/Mueller Texas 0.4% dry bulb and 0.4% wet bulb data.

Winter Outside Design Conditions: 26.6 degrees F

- Basis of data: Latest ASHRAE Handbook of Fundamentals, Austin/Mueller Texas 99.6% dry bulb.

General Office, Common and Public space Design Conditions

- Summer: 75 degrees F and 50 percent RH
- Winter: 72 degrees F

I. GENERAL TECHNICAL DESIGN STANDARDS

C. Mechanical Design Standards

General Design Requirements (Continued)

Temperature and Humidity Design Conditions

Computer Rooms and Critical Space Design Conditions

- Summer: 72 degrees F and 50 percent RH
- Winter: 72 degrees F and 35 percent RH

Vestibules, Loading Docks, Equipment, and utility spaces Design Conditions

- Cooling: 80 degrees F
- Heating: 70 degrees F

Outside Air Ventilation: Per ASHRAE 62 Standards

- Non-public Restrooms: 75 CFM per Water Closet, 50 CFM per Urinal, or 1.5 CFM per SF, whichever is greater.
- Public Restrooms: Per AUS Restroom Design Standards.

HVAC Distribution

Supply air, return air, outside air, and exhaust air ductwork will be fabricated of galvanized sheet metal in rectangular and round shapes according to SMACNA Duct Construction Standards for 2-inch and 4-inch Pressure Classification, and for Class A duct sealing. Insulated flexible ducts will be used for connections from supply air ducts to air outlets above ceilings. 4-inch pressure class ductwork will be used for all supply ducts upstream of terminal units in variable air volume systems. 2-inch pressure class ductwork will be used for supply ducts downstream of air terminal units and any constant volume systems. Return ductwork will be 4-inch pressure class throughout. Exhaust ductwork will be 2- or 4-inch pressure class as appropriate for each system.

Supply and return ducts in mechanical rooms, shafts, and above ceilings will be insulated with external fiberglass duct insulation with a foil-scrim-kraft vapor barrier and all service jacket covering. Insulation thickness will be as required to prevent condensation, and to prevent thermal losses on hot piping. Thickness will be as prescribed by ASHRAE 90.1

Building pressurization will be controlled by a centrally located pressure sensor and a motorized relief air damper. Building pressure sensor to be DDC monitored and controlled. Building pressure control may also be accomplished through integral relief on the central station units where this concept lends itself as a good solution architecturally.

Each central station air handling unit serving terminal boxes will be controlled to deliver 55 deg F discharge air and hot water reheat in each box will control zone temperature. Individual unit sequences may include a discharge temperature reset sequence, static pressure reset and or a humidity override sequence based on spaces being served.

Central-Station Air Handling unit cooling coils shall be designed to maximize the water temperature difference and minimize the total GPM required to accommodate building cooling loads. Ideally the temperature difference target should be 24 degrees on each air-handling unit (AHU). This can be accomplished by adding cooling coil rows, increasing number of fins per inch (not to exceed 12 fins/inch and reducing air velocities across the coils and consider two series chilled water coils. Final AHU configuration will require approval by AUS maintenance. High delta T and low flow are critical to the new central plant chilled water thermal storage system operation and the added infrastructure at the units is justified to accommodate the overall system performance.

Central-Station Air Handling unit heating coils shall be designed to maximize the water temperature difference and minimize the total GPM required to accommodate building heating loads. Ideally the temperature difference target should be 30 degrees on each air-handling unit (AHU). 150 deg F entering and 120 Deg F leaving. High delta T and low flow are critical to the new central plant heating water thermal storage system operation and the added infrastructure at the units is justified to accommodate the overall system performance. Heating water is intended to be produced by heat recover chillers which have a maximum water delivery temperature of 150 Deg F.

The building exhaust system, where applicable, shall connect to the dedicated outdoor air unit and used for heat recovery. For other spaces, the exhaust will consist of centralized roof mounted centrifugal exhaust fans and a ductwork distribution system that connects to each space having an exhaust requirement. Exhaust fans will be up blast or down blast powered roof ventilators. Exhaust fans will be located strategically to eliminate re-entrainment of exhaust air.

A demand-controlled ventilation system, utilizing CO2 monitoring in densely occupied spaces, will be employed to optimize ventilation rates to occupied zones and save energy associated with conditioning outside air. CO2 monitors will be located within each densely occupied space according to latest IECC, ASHRAE 90.1 and LEED requirements. CO2 setpoint shall have a maximum allowable concentration of 1100 PPM.

Direct Digital Controls

The Direct Digital Control System / Facility Building Management System (DDC/FMS) controlling the HVAC Systems shall be manufactured by Alerton and offered as the Alerton Compass2 Building Automation System.

The DDC/FMS shall communicate with the present AUS Alerton Compass2 system over the AUS Airport ABIA1 backbone.

The DDC/FMS shall communicate using existing Alerton Compass2 workstation Human Machine Interface (HMI) client computers.

The DDC/FMS Direct Digital Controllers shall be BACnet-Internet Protocol (BACnet- IP) based, and BACnet-Master/Slave Protocol (BACnet-MS/TP) based.

Space/zone temperature control shall not be provided to the end-user unless approved by AUS.

Sustainability

The following should be considered when selecting mechanical equipment to reduce energy consumption and provide maximum occupant comfort:

- High efficiency HVAC systems
- CO2 in high volume occupancy spaces
- MERV 13 filters
- Zone thermal comfort controls
- Commissioning
- Low global warming and ozone depletion potential refrigerants.

I. GENERAL TECHNICAL DESIGN STANDARDS

D. Electrical Design Standards

Guiding Principles

FINANCIAL STEWARDSHIP

Electrical systems should be designed with efficiencies to maximize dependability and avoid unnecessary service interruptions.

OPERATIONAL EFFICIENCY & RESILIENCY

Electrical infrastructure supports a wide range of building systems and operations across the airport terminals which contribute to the safety and comfort for passengers, employees, and visitors.

UNIQUE AUS EXPERIENCE

A flexible electrical system shall allow the airport infrastructure to adapt, or change uses over time.

A SUSTAINABLE FUTURE

High performance energy efficient electrical systems shall be structured with a renewable energy generation solution.

General Design Requirements

Selective Demolition

Selective demolition within an airport without impacting operations requires extensive site investigation, planning, care, and coordination. Conduits, cables, and infrastructure which pass through an area of selective demolition must be identified, traced, and documented by the contractor. There must never be an equipment disconnection or cable removal without the appropriate approvals and coordination

Electric Services

Service shall be fed by the new 12.5kV substations with redundant circuits.

New Service Equipment

New electrical service equipment shall be UL-listed and labeled with identification.The following requirements must be followed for new electrical service equipment:

- Ensure that adequate ventilation is provided for all equipment.
- All electrical equipment shall be installed in dedicated, separate rooms, and have all code- required clearances. Standby power automatic transfer switches shall be installed in a separate room from the main service entrance equipment.
- New service equipment shall be in a single line with front and rear sections lining up to form an assembly of all required sections. Rear access shall be provided. Bottom plates shall be provided to comply with code requirements.
- Overcurrent protective devices shall be draw-out type air circuit breakers for low voltage instances with remote breaker operations via a remote Human Machine Interface (HMI) panel for arc - flash mitigation, vacuum circuit breakers for medium voltage solutions with remote racking. A main-tie-main configuration shall be utilized. Ratings shall be adequate to protect the equipment and all components from the available fault current.

General Design Requirements (Continued)

General Electrical System Strategies

The electrical system infrastructure shall be designed and configured to support the following systems:

- Mechanical systems
- Plumbing systems
- Fire alarm systems
- Fire protection systems
- UPS systems
    - City communications and IT systems
    - Airline communication and IT systems
    - Security systems
    - PA systems
- BHS equipment
- Ground service equipment
- Passenger boarding bridges
- Aircraft support systems
- PCA
- Ground power
- Vendor/concession equipment, including kitchen and other food preparation equipment
- Vertical transportation equipment
- Building automation and controls systems
- Renewable systems (PV)
- Rainwater treatment and pumping systems
- Waste handling equipment

General Electrical System Strategies

Normal and/or emergency/standby power shall be provided as needed for the proper operation of the equipment associated with each of these systems.

Code-required back-up power, and optional standby power for City or airline loads shall be connected to the emergency and standby power system.

When program functions are updated in building facilities and using existing electrical systems, Design Consultants shall verify the updated load demand with the existing system capacities.

Systems must be integrated with existing electrical distribution systems, electrical power monitoring systems, and BAS systems.

Electrical devices utilized in these systems should be best-in-class energy performance rated to help with the reduction of the overall energy usage of the terminals. In addition, metering of user and load type monitoring and tracking the energy usage of the various systems shall be provided and integrated into the BMS system and existing SMS network.

Sustainable Considerations

Solar Energy can be employed wherever it is beneficial to a project and long-term operations at the airport.

The system shall be efficient in integration with the implementation of solar energy. “Solar-ready” design shall be considered, such as installing conduits in the concrete structures.

The following technologies can be considered for any applicable projects or the infrastructure for the future implementation as part of the project’s sustainability strategy:

- Solar-thermal water or air heating
- Solar Panels
    - When solar panels are provided, include associated power conversion devices and coordinate with the utility power sources.
    - Roof-mounted or building-integrated photovoltaic panels (BIPV)
    - When the solar panels are planned to be installed on roofs of buildings the Designer should analyze and coordinate with the FAA and AUS to avoid any glare and glint from solar panels that could interfere in the operation of aircraft and the air traffic control tower (ATCT).

Power Distribution

This criterion guides Design Consultants, Contractors, Tenants and other project stakeholders in the procedures necessary to obtain electrical services for new facilities.

System Type

Power distribution shall be provided to all new terminal and concourse facilities through unit substations located within the new facilities. Design Consultants shall verify site conditions and coordinate with AUS.

Main Electrical Rooms

The main electrical rooms shall be located at four service points. Coordinate with medium-voltage vaults. Do not route unprotected service conductors through the building.

Piping, storm water, plumbing, ductwork and all other items unrelated to the function of the main electrical room are not permitted inside the room. The use of protection methods against condensation, leaks or breaks in piping is not permitted to justify unrelated piping in main electrical rooms. The main electrical room shall be dedicated solely to electrical equipment except for required HVAC and fire protection serving the specific room.

Distribution equipment shall be located in dedicated electrical rooms.

Concrete curbs with waterstops shall be constructed surrounding the entirety of the room, including doorways. Ramps to address curbs at doors shall be installed.

Electrical rooms require at least a pair of 36”x 96” doors.

Doors shall swing outward and be provided with panic hardware.

Ceilings shall be a minimum of 10 feet height to provide clearance.

Electrical Panels

Electrical panels rated Arc Flash Category 4 and higher shall not be operated manually. Include provisions for operating breakers from a remote location outside the Arc Flash Boundary via (Human Machine Interfaces) HMI and electronically operated breakers.

I. GENERAL TECHNICAL DESIGN STANDARDS

D. Electrical Design Standards

General Design Requirements (Continued)

HVAC and Fire Protection

Proper heating and cooling systems are required to vent all equipment rooms including electrical distribution equipment (switchboards, switchgears, and transformers). Do not install HVAC ducts or piping above electrical panels.

Utilization Voltage

The building distribution system shall be a radial type. Where possible the utilization equipment shall be served at 480/277V including lighting, mechanical equipment and any other equipment specified by AUS. 208/120V transformers and distribution gear shall be provided for other devices and equipment.

Equipment

Power feeders that are buried shall be encased in red concrete indicating a hazard. Based on engineering industry best practices for electrical equipment common for this type of installation, the following are guidelines for electrical equipment spaces:

- Substations, switchgear, transformers, and panel boards shall be installed in dedicated electrical rooms or closets, located strategically to limit feeder runs to less than 200 feet or branch circuit runs to less than 125 feet and shall be sized in accordance with code to provide clear space around the equipment and safe egress. In cases where longer runs are required, wiring is to be up-sized for voltage drop.
- Rooms shall be ventilated to maintain temperatures no greater than 86 degrees F.
- Space shall be provided for future conduits and equipment.
- Empty conduit shall be capped for protection and future use.
- Outdoor equipment shall be rated NEMA 4x2 Stainless steel, and shall be protected against physical damage.
- Power panelboards and Motor Control Center (MCC)'s serving mechanical equipment shall be in mechanical equipment rooms.
- Power panelboards and transformers serving the various concession spaces shall be located within each concession space.

Main Switchgear

Main switchgear shall be a metal-enclosed switchgear meeting UL 1558 requirements and utilizing insulated case draw-out type circuit breakers for long-term maintenance and reliability. The main service switchgear shall be rated NOT less than 100 kAIC.

- Provide sufficient switchgear sections to allow enough conduit entry space to accommodate all feeders including feeders for future sections.
- Include Infrared windows on all service gears.

Distribution Switchboards/ Panelboards

Panels rated greater than 800A shall be UL 891 switchboards. Panels 800A or less shall be distribution panel boards.

All boards shall utilize full-length copper bussing with full size neutrals, and shall be fully rated for 125% of the available short circuit fault current. Circuit breakers may be group-mounted molded case circuit breakers. Circuit breakers in switchboards shall be electronic trip type breakers. Fused switch assemblies are not allowed. 20% spare fully bussed space shall be provided in all boards.

All devices must be fully rated. Series-rating of breakers is not allowed. Sufficient sections shall be provided to allow enough conduit entry space to accommodate all feeders, including feeders for future sections. All panelboards shall have loads balanced across the phases to ±10 percent. The design consultant shall adjust the individual circuit load to accomplish this requirement.

Equipment Pads

Concrete equipment pads are standard for all floor-mounted electrical equipment. Exceptions shall be made for equipment with an integral metal stand that serves the intended purpose.

- Concrete equipment pads shall extend six inches beyond the face of equipment or face of mounting support.
- Pads for transformers shall be sized, configured, and installed to match the specifications of the transformer.
- 4,000 psi concrete shall be used for equipment pads.

Identification

AUS standard for asset naming and numbering must be applied to all new equipment owned by AUS. Tenants are encouraged to follow the same naming convention for equipment within their lease area. Design Consultants shall coordinate the implementation of the naming and numbering standard with AUS prior to producing labels for equipment associated with each project.

Install labels or nameplates only when temperature and humidity conditions for the proposed adhesives are within the manufacturer's recommended range.

Panelboard Identification

Panelboards shall be listed in a schedule to clearly and completely identify the requirements for each. The information shall include the following for each:

- Identification label/tag/name
- Voltage, phase, wire, ground
- Ampere rating
- Mounting requirements (surface and flush)
- Main bus rating
- Main device rating, if included
- Branch circuit devices:
  - Quantities
  - Ratings of each
  - Spare circuits with sizes
  - Spaces
- Total connected load (KVA and amperes)
- Location
- Loop feed and through feed lugs, if included
- Split bussing, if included

General Design Requirements (Continued)

Equipment

Transformers Identification

Transformers shall be listed in a schedule to identify each one. The information shall include the following for each transformer:

- Identification tag
- Primary voltage
- Secondary voltage
- KVA rating
- Mounting (wall and floor)
  - Provide concrete pads for floor mounted units.
  - Ensure adequacy of walls for weight of wall- mounted units.

Raceway Identification

Electrical raceway shall be labeled with the source panel.

- Labels shall be provided at 50 foot intervals but shall be within 10 feet of wall or floor penetrations.

Pull boxes and junction boxes shall be labeled with the source panel.

Markings may be permanent adhesive tags with letters on a contrasting background or stenciled letters.

Conduit Identification

Electrical Identification conduit and junction box covers shall be color coded to indicate the wiring system contained within the conduit. Junction boxes must also be labeled with voltage and system type. Color coding shall be as follows (AUS standard):

- Yellow- high voltage 277/480
- Orange- low voltage 120/208
- Red/Yellow-emergency high voltage 277/480
- Red/Orange-emergency low voltage 120/208
- Blue- Data
- White- AV/Paging
- Green- Security/Access Control
- Red- Fire Alarm
- Purple- BAS and Lighting control

Metering

Metering and monitoring all switchgear mains and feeder circuit breakers with digital meters shall be compliant with IECC 2021. The Design Consultant shall design the categorization of the energy-use metered by digital metering, including, but not limited to, the following:

- Interior lighting
- Exterior lighting
- Vertical transportation loads
- Receptacle loads
- HVAC loads
- Process loads
- Building operations and other miscellaneous loads

Loads shall be grouped and segregated in the distribution arrangement to facilitate highly detailed metering of these load groups by user.

- This metering data shall be integrated to the existing AUS power monitoring system.
- Metering shall also provide the information needed to adjust the operation of various building systems to further reduce the energy use of the buildings.

Protection

Protect all electrical equipment from impact from vehicles or service carts. Where equipment is located adjacent to vehicle traffic lanes, provide impact protection using concrete filled bollards and/or steel railing.

Raceway Systems

Raceway systems protect wires and cables from heat, humidity, corrosion, water intrusion, and general physical threats. The types of raceway shall be selected by reviewing the location, and environmental conditions in compliance with these standards, industry standards, and code requirements.

General Requirements

All wiring is to be installed in approved raceways. Raceways include conduits (all types), wire ways, wire troughs, surface metal raceways, under floor duct, cable trays and all related components and fittings. All items shall be UL listed or approved by another approved listing agency with prior approval from CDA and the authorities having jurisdiction.

Conduit Types and Use

Conduit Type	Location/Use
RGS (Rigid Galvanized Steel)	1. Exposed interior dry locations. 2. Concealed in concrete floor slabs. 3. In tunnels, ducts, plenums, and other enclosed spaces. ◦ NFPA 5023 Standards for Road Tunnels Section 11.3.3 disallows use of PVC raceways and PVC-coated metal conduits (materials that produce toxic by-products during electric circuit failure or external fire) at the above-mentioned locations. 4. Vertical risers from underground duct banks.
PVC - coated RGS	1. Where exposed to corrosive atmospheric conditions where exposed on the exterior of the building. 2. Where hazardous conditions warrant additional conduit protection. 3. Where encased in concrete under aircraft runway and taxiway pavements. spaces.
IM (Intermediate Metal)	• In sizes two inches and larger for exposed surface-mounted interior dry locations • Not less than eight (8) feet above the floor • Not subject to mechanical damage
EMT (Electric Metal Tubing)	• Concealed in walls • Concealed above ceilings
LTFM (Liquid-Tight Flexible Metal)	• Final connections to motors or transformers in lengths not more than 6'-0" and not less than 3/4 inch. Include a ground conductor. ◦ Note that LTFM conduit is not permitted in return air plenum ceilings.
PMC cable	• Connections to recessed lighting fixtures in return air plenum ceilings in lengths not exceeding 6'-0"
RA (Rigid Aluminum)	For use with 400 Hertz wiring only
PVC	• For use in concrete encasement underground outside of building walls.

I. GENERAL TECHNICAL DESIGN STANDARDS

D. Electrical Design Standards

General Design Requirements (Continued)

General Requirements

Electrical raceway must be coordinated with other systems to ensure efficient routing. While design procurement documents may provide diagrammatic routing; the contractor's coordination drawings, also referred to as shop drawings, must be drawn in 3D where sized 2 1/2 inches or larger, and compared with other systems to identify and resolve any clashes prior to construction.

All raceways shall be sized based on the type of insulation on the wire used and percentage of fill permitted by code. Note that code requirements for conduit fill varies, depending on the type of insulation for conductors of the same size.

All raceways should not be exposed in any area visible to the public.

Conduit Fittings and Components - Interior Work

Conduit fittings and components shall be specified to be of the same materialand finish as the conduits for which they shall be used such as PVC (coated fittings for PVC-coated RGS conduit), and LTFM fittings for LTFM conduit. All connections shall be hub connections, use of locknuts shall not be permitted. Fittings include the following:

- Couplings
- Box connectors
- Pull and splice boxes, including covers
- Outlet and junction boxes, including covers
- Conduit fittings ("condulets-LB, RB" , "unilets", T-types, unions, etc.), including covers
- Expansion fittings
- Hangers, struts, supports, etc.

Material

- All hardware is to be specified as steel compression type.

Expansion Fittings

- Expansion fittings shall be specified for all conduits and raceways crossing expansion joints, and for straight runs greater than 200 feet. Indicate the amount of expansion required.

Sleeves

- Sleeves shall be specified for all conduits passing through floors and walls, indicating size and material requirements based on locations.

Pull and Splice Boxes

- Pull and splice boxes shall be sized per the NEC.
- The material and gauge (thickness) shall be specified. Allow space in the box for splices.

Conduit Systems - Underground Work

The proper type and size of each conduit shall be specified for each underground run. Spare conduits with pull cords shall be included for future use. Indicate if conduits are to be laid in place or "pushed".

Specify and detail manholes and handholes. Indicate each location on plans, defining each location by dimensions and/or stations as applicable. Include them on profiles.

Specify excavating and backfilling for underground electrical work.

Detail underground single conduit runs and "duct" banks for each configuration. Indicate elevations and include on profiles. Encase all runs in three inches of concrete using fabricated spacers of proper types. Locate spacers a maximum of 8'-0" on center. Ensure that the location of each conduit in any duct bank can be "peeled off" without difficulty. Study cross-over locations carefully to eliminate any conflicts.

Conductors - Wire and Cable

Wire and cables are subject to safety standards for design and installation. Allowable wire and cable types and sizes are specified according to the circuit operating voltage and electric current capability, with further restrictions on the environmental conditions.

General Design Requirements

The type of insulation and the size of the conductor being used, as well as the quantity of conductors required, shall be the major factors to be used to determine the minimum conduit size required per the NEC.

- Conductors are to be derated per code when more than three current carrying conductors are installed in any one conduit.
- Circuits over 800 amperes are to have conductors sized for a minimum of the full circuit rating, and shall be increased if required to compensate for voltage drop.
- Do not permit the use of "butt splices."
- Splicing for convenience is not permitted, as it is only acceptable when absolutely necessary.
- Double lugging is not permitted unless the terminal or lug is specifically designed for and UL-approved for terminating more than one wire.
- The use of direct burial cable is strictly prohibited.

I. GENERAL TECHNICAL DESIGN STANDARDS

D. Electrical Design Standards

Conductors - Wire and Cable

Conductors Connected in Parallel

Where parallel sets of conductors are required, each set of conductors shall be installed in a separate conduit. Combining more than one set of conductors in a single conduit is not permitted. Paralleling of conductors in sizes smaller than Number 1/0 is NOT permitted. Ground conductors shall be sized per upstream Overcurrent Protection Device (OCPD) and ground conductors should be sized proportionally when upsized for voltage drop.

Materials

All conductors shall be copper. The use of aluminum conductors shall not be permitted.

Voltage Drop

Voltage drop shall be a major factor in sizing conductors and shall be calculated per the IECC 2021.The sizes of conductors (or number of sets of conductors) shall be increased to provide acceptable limitations.

Neutral Conductor

Provide dedicated neutral for all circuits.

Insulation

All conductors used for any system of 600 volts and less shall have 600 volt insulation. The type of insulation shall vary according to various applications as follows:

- Service entrance: Type USE-2, single conductor in raceway
- Exposed exterior feeders: Type XHHW-2, single conductors in raceway
- Feeders concealed in ceilings, walls, partitions, and crawl spaces: Type THHN.THWN-2, single conductors in raceway
- Feeders concealed in concrete, below slabs on grade, and underground: Type XHHW-2, single conductors in raceway
- Feeders installed below raised flooring: Type THHN/THWN-2, single conductors raceway, or armored cable, Type AC
- Feeders in cable Tray, allowed for temporary conditions only: Type portable power cables, multi-conductors larger than No. 1/0 AWG, rated for portable and extra-hard usage
- Branch circuits concealed in ceilings, walls, and partitions: Type THHN/THWN-2, single conductors in raceway
- Branch circuits concealed in concrete, below slabs-on-grade, and underground: Type XHHW- 2, single conductors in raceway
- Branch circuits installed below raised flooring: Type THHN/THWN-2, single conductors in raceway
- Branch circuits in cable tray: Type THHN/THWN- 2, single conductors in raceway, or Type XHHW- 2, single conductors larger than No. 1/0 AWG.
- Cord drops and portable appliance connections: Type SO, hard service cord with stainless-steel, wire-mesh, and strain relief device at terminations to suit application.
- VFC output circuits: Type TC-ER cable with braided shield.

Emergency Systems

As an independent source of electrical power, an emergency power system supports important electrical systems on loss of normal power supply. To protect life and property from the consequences of loss of primary electric power supply, emergency power systems shall be carefully selected in compliance with these standards, industry standards, and code requirements. Such systems may consist of electric power generators, battery storage systems, Uninterruptible Power Supply (UPS), and similar apparatus.

System Design Requirements

The suitable types of emergency systems are dependent on the types of building facilities and occupancy classifications. Design Consultants shall coordinate with AUS any specific requirements on emergency systems within the airport properties. Projects would require one set emergency system or a combination of several sets of emergency systems. Acceptable emergency system types may include, but are not limited to the following:

- A generator utilizing automatic transfer schemes
- Uninterruptible power supply (UPS)
- Unit battery lights/exit signs with phosphorescent faces
- Inverter systems

The design consultant is to indicate the “emergency” system as being an independent system with no interconnections to the “normal” system except where permitted by code in certain lighting fixtures and in transfer switches.

Transportation Security Administration (TSA) and Customs and Border Protection (CBP) may have specific requirements on emergency systems for their facilities. Design Consultants shall reference the following documents and verify with TSA and CBP project coordinators for specific requirements.

TSA Planning Guidelines and Design Standards (PGDS) for Checked Baggage Inspection Systems (CBIS)

TSA Checkpoint Requirements and Planning Guide (CRPG)

CBP Airport Technical Design Standard (ATDS)

I. GENERAL TECHNICAL DESIGN STANDARDS

D. Electrical Design Standards

Conductors - Wire and Cable

Exit and Emergency Lighting Circuits

A fully coordinated circuit breaker system shall be provided for exit and emergency lighting circuits.

The neutral conductor for exit/directional sign circuits shall not be used for emergency lighting circuits. Exits shall be placed on dedicated emergency circuits.

Generator

Emergency power generation systems should be designed, arranged, and installed in accordance with applicable NFPA codes.

Natural Gas Generator

Natural gas generators shall comply with 40 CFR part 60 subpart JJJJ for EPA emission standards that owners and operators must meet, EPA certification requirements, testing requirements, and compliance requirements. Further redundant fuel sources can be provided for certain natural gas generators that also have the capability to run on liquid propane.

- Natural gas generators do not require fuel tanks and are fed directly from natural gas utilities.
- If redundant liquid propane tanks are provided in addition to the natural gas feed, tanks must be sized to, at minimum, operate for four hours.

Outdoor Installation

Generators intended for outdoor installation are to be specified as such and include all associated appurtenances.

- Generator enclosures shall be weather-resistant.
- Anti-freeze shall be included.
- Heaters shall be included (engine oil and block heaters).
- Locations shall be selected so as not to be in critical areas or other locations where noise would be objectionable.

Indoor Installation

Generators intended for indoor installation are to be specified to include the following:

- Integral or remote radiator. If remote radiator is to be used, include duct connection from generator set to radiator. If louvers are used on the radiator discharge, be sure they are of “fail-safe” design, and shall instantly open upon generator start.
- Intake (combustion) air louvers: “fail-safe” design.
- Be sure adequate ventilation is provided.
- Freeze protection
    - For any water-based items in this space.
    - For any plumbing that occurs on floors above, and is routed within this room.
    - For spaces that are located above, review and design for acoustics and thermal separation.

Automatic Starting System

Generators in general shall be specified to include:

- Starting batteries
- Battery racks
- Battery chargers
- Indicating lights and alarm devices (integral and/ or remote) as required.
- Connected to BAS

Automatic Transfer Switches

Automatic transfer switches shall be of the bypass-isolation type with sufficient bracing to withstand the available short circuit stresses. Transfer switches shall include load side monitoring tied to the existing system.

Uninterruptible Power Supply

The design consultant is to determine if a UPS system (or systems) is required for the facility. This may be a requirement for certain applications determined by the AUS or may be code-required. The type of system(s) to be incorporated in the facility shall be reviewed in detail by the design consultant with AUS. The capacity of each system shall meet the needs of the initial design requirements, plus include a minimum of 20% spare capacity.

I. GENERAL TECHNICAL DESIGN STANDARDS

E. Fire Protection and Fire Alarm Design Standards

Guiding Principles

FINANCIAL STEWARDSHIP

The installation of technically excellent fire protection systems designed and provided in accordance with the applicable edition of the International Building Code (IBC) and the International Fire Code (IFC), with City of Austin amendments, and all referenced codes and standards, will protect long-term assets of AUS.

FUNCTION OVER FORM

Prioritization of fire protection systems over appearances will protect the long-term assets of AUS, AUS employees, and the general public. Investing in technically excellent fire protection systems will allow AUS to function smoothly.

OPERATIONAL EFFICIENCY & RESILIENCY

Providing technically excellent fire protection systems will allow AUS to withstand disruption and to continue to operate efficiently.

UNIQUE AUS EXPERIENCE

Specifications shall be provided to create a safe environment at AUS with without disrupting visual attractiveness.

A SUSTAINABLE FUTURE

Fire protection systems have the potential to save both lives and property. Despite threatening emergencies, destruction can be limited when time and money are invested in developing these lifesaving systems.

Fire Protection / Fire Alarm Design Requirements

Fire protection and fire alarm systems shall be installed as required by Authorities Having Jurisdiction (AHJ) and the applicable building and fire codes. Design Professionals shall be responsible for adding new or modifying existing fire protection systems to conform to needs in renovated areas.

Fire Protection System

Fire protection systems (automatic sprinkler systems, fire pump, standpipe system, etc.) shall be provided and shall comply with the applicable edition of the International Building Code (IBC) and the International Fire Code (IFC), with City of Austin amendments, and all referenced codes and standards. Sprinkler systems are expected to include, but are not limited to, wet pipe, dry pipe, and pre-action systems. Wet pipe sprinkler systems shall not be permitted to protect electrical or IT rooms. Approval from applicable AHJ and the Owner are required.

Fire Alarm System

Emergency voice/alarm systems shall be provided and shall comply with the applicable edition of the International Building Code (IBC) and the International Fire Code (IFC), with City of Austin amendments, and all referenced codes and standards. The emergency voice/alarm systems are expected to include, but are not limited to, audible and visual notification, smoke detection, heat detection, carbon monoxide detection, emergency communication systems, and supervising station alarm systems.

New and renovated areas shall be provided with an emergency voice/ alarm communication system and shall be integrated with the existing fire alarm system.. Installation of additional fire alarm devices shall be the Tenant's responsibility. New fire alarm systems shall maintain the existing positive alarm sequence currently in place throughout the airport terminals, as permitted by NFPA 72 Section 23.8.1.2.

I. GENERAL TECHNICAL DESIGN STANDARDS

F. IT / Telecommunications / Security Design Standards

Guiding Principles

FINANCIAL STEWARDSHIP

Telecommunication systems and infrastructure are to be responsibly designed and detailed to minimize cost in support of the project budget. Consideration should be given to allow flexibility for future operational needs and changes to the systems.

OPERATIONAL EFFICIENCY & RESILIENCY

The design, construction, and maintenance of the telecommunications systems shall not impair or disrupt ongoing airport operations or the passenger experience. Where operational conflicts cannot be avoided, the Designer should work with the Owner, Design and Construction teams to limit impact of the conflict.

UNIQUE AUS EXPERIENCE

Telecommunications and technology systems should be leveraged to showcase the creativity and uniqueness of Austin in a meaningful way.

A SUSTAINABLE FUTURE

The Designer should advocate for the use of new technologies and materials which may minimize carbon content and quantity of construction materials.

IT / Telecommunications / Security Design Requirements

Overview

This design guide is intended to establish a minimum baseline standard for telecommunications system design and construction. Designers are responsible to perform a comprehensive examination of their specific project requirements and coordinate with the appropriate stakeholders, including AUS's Information Systems (IS), early in the project design phase.

Designers must also be familiar with the AUS standard Division 27 specifications and the AUS Master System Integrator (MSI) which are separate documents that may be obtained through the AUS Project Manager.

Where conflicts may exist between this document and any code or standard, the more stringent shall prevail.

Selective Demolition

As a critical international transportation hub to the region, AUS operations are active 24 hours per day, 365 days per year. Outages to network infrastructure carry risk of significant impacts to airport and airline operations, therefore any demolition work occurring near active facilities requires extra care. Selective demolition within an airport without impacting operations requires extensive site investigation, planning, coordination, and communications.

Designers shall make every reasonable effort to understand existing system infrastructure conditions within or adjacent to project scope areas. Designers shall identify clear systems demolition scope of work boundaries, including identification of known infrastructure that must remain in service, and provide instructions within design documents regarding selective demolition requirements. Conduits, cables, and infrastructure which pass through an area of selective demolition must be identified, traced, and documented by the Contractor. There must never be an equipment disconnection or cable removal without the appropriate approval and coordination prior to the start of work. Selective demolition work specified by Designers shall include requirement for the Contractor to work closely with the Owner/Stakeholders to develop a clear communication plan including work time frames and contact numbers in event of reported outage.

I. GENERAL TECHNICAL DESIGN STANDARDS

F. IT / Telecommunications / Security Design Standards

IT / Telecommunications / Security Design Requirements (Continued)

Codes & Industry Standards

Designs shall comply with the adopted version of the following codes and standards:

- NFPA 70 National Electric Code
- NFPA 72 National Fire Alarm and Signaling Code
- International Fire Code
- BICSI Telecommunications Distribution Methods Manual – 14th Edition
- ANSI/TIA-568 Commercial Building Telecommunications Cabling Standards
- ANSI/TIA-569 Telecommunications Pathways and Spaces
- ANSI/TIA-607 - Generic Telecommunications Bonding and Grounding for Customer Premises

Telecommunications

Telecomm Spaces (MDF and IDF)

AUS facilities require dedicated Main Distribution Frame rooms (MDFs) and Intermediate Distribution Frame rooms (IDFs), sized to accommodate network, security, and special systems equipment. These rooms shall be spaced as often as required to ensure all ethernet cable lengths are less than the maximum 295-feet including service slack. As an early design metric, BICSI's TDMM recommends that when the usable floor space served by an MDF or IDF exceeds 10,000 square feet, then the Designer shall consider additional IDFs. An MDF or IDF must only serve data outlets on the same level as the room, as well as the level above and below.

Refer to the following requirements, as well as AUS's Division 27 standard specification for further requirements.

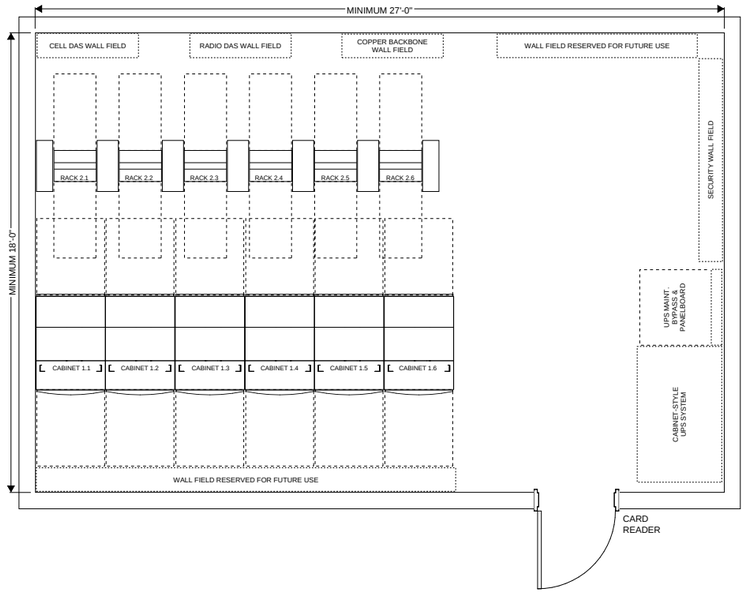
MDF/IDF Configuration:

AUS MDFs and IDFs should be rectangular rooms without columns or vertical shafts, and should avoid locations that are restricted by building components that limit flexibility, such as elevators, exterior walls, or other fixed building walls. The location must allow accessibility for the delivery of large equipment. The location must be away from sources of electromagnetic interference (electrical transformers, motors, generators, etc.) and must also be away from sources of water (breakrooms, restrooms, concession spaces, mop sinks, etc.).

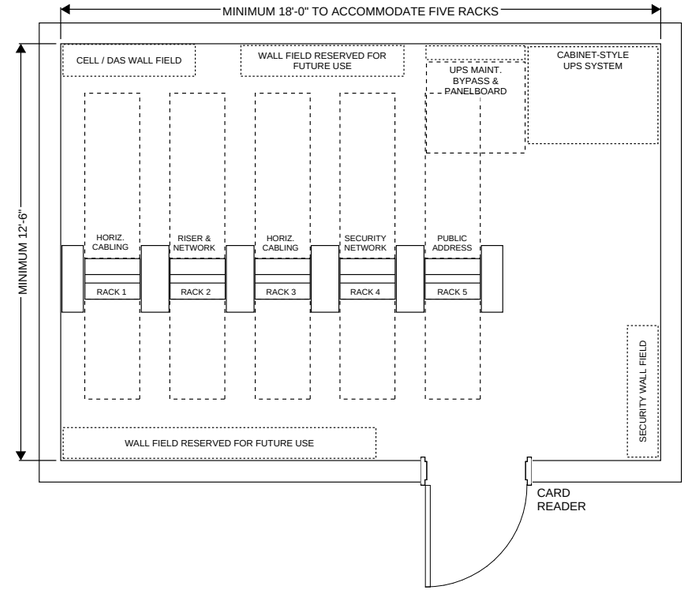
MDFs and IDFs shall be located in an accessible area, and shall not be accessed through a tenant or restroom space.

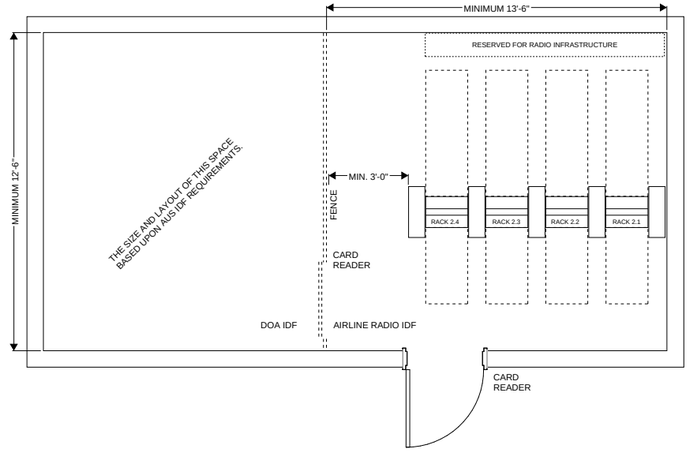
MDFs and IDFs must be sized to accommodate the quantity of equipment racks and wall mounting space required to service all building systems devices served within the room's service boundary. A typical IDF supporting the terminal will require no less than five (5) 2-post equipment racks to support up to a total of (672) patch panel ports (or fourteen 48-port patch panels). If the quantity of cables is close to that limit then a larger room with an additional 2-post rack shall be required. Coordinate exact rooms sizes with AUS's IS Division early during the design process.

Vertical cable managers shall be sized to accommodate no more than 20% maximum calculated cable fill in order to accommodate the looped patch cable slack within the vertical manager.



IDFs may also house and support tenant or 3rd party radio equipment. These rooms shall be sized to accommodate a divisible partition within the room to maintain secure separation between the airport's infrastructure and 3rd party infrastructure.





I. GENERAL TECHNICAL DESIGN STANDARDS

F. IT / Telecommunications / Security Design Standards

Telecommunications

Telecomm Spaces (MDF and IDF)

MDF/IDF Construction:

Walls, floors, and ceilings within MDFs and IDFs shall be treated to minimize dust. Finishes shall be light in color to enhance room lighting. Flooring shall have anti-static properties. False (suspended) ceilings must be avoided. Mechanical, electrical, plumbing, fire protection, and other utilities shall not pass through an MDF or IDF unless they serve equipment in the room. Plumbing and fire suppression which serves equipment within the room must be routed away from rack and electronics. Baggage handling conveyers must avoid passing through an MDF or IDF, as this introduces dust and debris which is detrimental to the active electronics.

The entrance shall be minimum 36” wide and 80” high doorway, with no doorsill, and hinged to open outward (code permitting). If the door must open inward, the size of the room should be increased accordingly. These rooms must not have exterior windows.

MDF/IDF Electrical Requirements:

Electrical service shall be configured with both normal grid (non-emergency) circuit and UPS circuits, sized to accommodate MDF and IDF system requirements. UPS shall be a cabinet style UPS system within the room, served by an emergency circuit.

MDF/IDF Grounding & Bonding:

A dedicated telecommunications grounding busbar (TGB) must be provided in each MDF and IDF (per TIA/BICSI standards). These grounding busbars must be bonded to the nearest electrical service panel ground, as well as the nearest building structural metal if the structural metal is electrically continuous to earth ground. Concrete reinforcing steel must not be considered as a structural metal. IDFs which support radio systems must also comply with the grounding requirements in Motorola Standard R56.

MDF/IDF Pathways:

MDFs and IDFs shall have overhead telco-style ladder rack for routing of cabling within the room. The layout of the telco-style ladder rack must not impede or inhibit access to the overhead infrastructure.

MDF/IDF Lighting:

Lighting must be provided in the MDFs and IDFs to support 50 foot-candles, measured 3-feet above the finished floor in the front and back of equipment racks. Emergency lighting must be included as required by code. Lighting fixtures must not be powered from the same electrical distribution panel as the telecommunications equipment receptacles.

MDF/IDF Mechanical:

MDFs and IDFs shall have independent controls for temperature and humidity with sensors located in the room. Main equipment dedicated to serving MDF and IDF rooms shall be located outside of the room and shall be ducted into the room. A separate DX split system on emergency power shall be required for backup

MDF/IDF Fire Suppression:

MDFs shall have double-interlocked pre-action fire suppression system in each room. Pre-action valve equipment must be located outside of the room.

IDFs shall have a fire suppression system in each room.

MDF/IDF Security:

MDFs and IDFs shall have electronic access control on the entry door, with video surveillance inside the room monitoring the door.

Horizontal Cabling

In general, each horizontal cable data outlet shall consist of the required quantity of connections plus a minimum of one (1) spare cable per three (3) required cables.

Horizontal cabling products must comply with AUS’s campus-wide standard and maintain the manufacturer’s extended warranty. The installing contractor and their personnel shall be certified by the manufacturer to purchase, install, and warrant the horizontal cable products. Refer to AUS’s Division 27 standard specification for products and further requirements.

Horizontal copper data cabling for AUS work areas shall be unshielded category 6A (augmented) with a Limited Power (LP) rating which complies with NEC section 725.144(B). Shielded cabling may be required where electromagnetic interference is a concern due to environment (such as near electrical transformers) or signal type (such as HDMI-over-twisted pair extenders).

Horizontal data cabling lengths which exceed the 100-meter distance limitation may be accommodated for select applications, such as jet bridge devices. These select applications may be accommodated with an extended distance twisted pair cable (e.g. Anixter UTG20 compliant products) or with horizontal optical fiber infrastructure (e.g. Composite Fiber/Copper cabling).

All horizontal cabling shall be routed in cable tray or conduit pathways. Non-continuous cable supports (such as “j-hooks”) are not allowable. Refer to the Telecom Pathways section below for additional requirements.

AUS horizontal cabling must be installed per TIA-568, TIA-569, and BICSI standards.

I. GENERAL TECHNICAL DESIGN STANDARDS

F. IT / Telecommunications / Security Design Standards

Telecommunications

Backbone Cabling

Each AUS MDF is required to include primary and secondary backbone connections to the nearest network core. Backbone connections between MDF and core network locations shall be routed via physically separate and diverse pathways. Coordinate the exact requirements with AUS's IS Division early in the design process.

Each AUS IDF is required to include a primary backbone connection in dedicated conduit to the nearest (primary) MDF. Additionally, a secondary backbone connection must be provided in cable tray or separate dedicated conduit to a redundant (secondary) MDF. Primary and secondary backbone connections shall be routed via physically diverse routes. Coordinate the exact requirements with AUS's IS Division early in the design process.

AUS backbone infrastructure must be installed per TIA-568, TIA-569, TIA-758, and BICSI standards.

Refer to the Telecom Pathways section below for additional requirements.

Telecom Pathways

Horizontal and backbone cable pathways shall consist of cable tray and conduit systems. Non-continuous cable supports (such as "j-hooks") are not allowable.

Cable trays infrastructure shall consist of aluminum ladder or wire basket construction, depending upon the environment and installation condition. New cable tray systems must be sized to accommodate all horizontal cabling, plus additional capacity to support 100% growth. Cable trays shall not be deeper than 6-inches.

Cable tray must be routed above accessible ceilings, ideally at a reasonable height above the accessible ceiling to ease future maintenance. The tray shall be provided with minimum 4" clearance to accessible ceiling below, to allow opening of acoustical ceiling tiles below tray. Open ceiling environments may require conduit or cable tray liners & covers in lieu of typical cable tray.

Conduit infrastructure within buildings shall consist of Electrical Metallic Tubing (EMT) or Rigid Metallic Conduit (RMC), depending upon the environment and installation condition. Conduits for telecommunications and technology applications shall be sized to accommodate the required quantity of cables and must not exceed a 40% calculated fill ratio following BICSI and TIA standards. All backbone cable conduits shall be designed to accommodate the required backbone cabling, plus minimum 100% spare conduit capacity for future growth.

Telecommunications and technology conduits shall not be smaller than 1-inch. In all cases, these conduits shall have no more than two (2) bends or 100-feet between pullboxes. Outdoor, underground conduits shall have no more than two (2) bends or 600-feet between pullboxes.

Refer to the Division 26 (Electrical) section for additional conduit requirements, including conduit color code labeling requirements. Where conflicts may exist between sections, the more stringent shall prevail.

Designers are responsible to provide telecommunications firestop requirements based on the architectural partition ratings as part of a complete design. UL-listed mechanical firestop devices are required where horizontal cables penetrate fire-rated partitions.

Data Networks and Telephone Services

Due to the fast-changing nature of network hardware technology, which then impacts the associated rack space and power requirements, the design team shall engage AUS's IS Division stakeholders early in the design process for review of these requirements.

Wireless Systems

The Airport IT Systems described in the subsequent sections shall be deployed throughout the Terminal, A/D Hall, and Concourses as well as the ancillary buildings as applicable. The systems shall follow flexible integration architecture to allow for common communication and centralized management.

Public Wi-Fi

Public Wi-Fi coverage shall be provided in all public Terminal areas beginning from Curbside out through the Concourse(s) including any people movers. Review of parking garages and other non-Terminal public areas shall be coordinated with AUS IS to determine coverage requirements.

The design of the public Wi-Fi system at AUS Airport shall be coordinated with AUS third-party Wi-Fi designer and provider. The third-party service provider is responsible for providing Wi-Fi service at the Airport for public use Wi-Fi, but not administrative Wi-Fi.

Admin Wi-Fi

The design process of the Admin Wi-Fi is to identify locations where an Access Point (AP) is required. If the location is a new area of coverage or a new building, a predictive Heat Map modeling will be required to confirm coverage expectations. When providing an access point in an existing building, a signal strength analysis will be required at site to determine the required signal strength in reference to an existing access point positioned in the area.

I. GENERAL TECHNICAL DESIGN STANDARDS

F. IT / Telecommunications / Security Design Standards

Wireless Systems

Admin Wi-Fi

The following guidelines shall be followed when providing an Admin Wi-Fi AP:

- The standard shall be the newest standard when available which is currently 802.11be or Wi-Fi 7
- The existing standard IEEE 802.11ax shall be supported
- The minimum bandwidth is 100Mbps download and upload
- The design and placement of the APs shall be at a minimum diamond or triangle pattern in accordance with Cisco best practice guidelines
- Heatmaps should be provided to define the coverage in each area
- The infrastructure layout shall follow the Telecom pathways' requirements with (2) CAT6A cables (one is spare) for every AP.

Cellular DAS

Cellular Distributed Antenna System (DAS) coverage shall be provided in all public and non-public facilities, Terminal areas, Concourse(s) areas and other areas where tower cell phone coverage is limited. Review of each facility shall be coordinated with AUS IS to determine Cellular DAS coverage requirements. Additional non-DAS 5G coverage shall also be reviewed.

The delivery of Cellular DAS and non-DAS 5G must be coordinated with the AUS third-party Cellular DAS designer and provider. The third-party service provider is responsible for providing Cellular 4G and 5G DAS and non-DAS 5G service for both public use and operational staff use.

In general, Cellular system performance requirements include:

- A minimum Received Signal Strength Indication (RSSI) of -65 dBm and -95 dBm RSRP per channel for all frequency bands shall be available across 95% of the facility for all carriers/frequency/channels).
- DAS shall deliver usable signal over the coverage areas defined diagrammatically by the Contract Drawings =.

Public Safety Radio

The radio systems reference is based on the Emergency Radio Responder Communication system. It is crucial that a Public Safety Radio DAS is provided for any new building installation and likewise provide coverage and extend the signal in new areas identified as new construction. The DAS shall deliver coverage throughout 95 percent of the building, and 100 percent of areas designated as critical. The areas requiring coverage include stairwells corridors, hallways, fire pump room, fire command center and other areas designated as critical by the 2018 NFPA 72, Section 24, NFPA 1221, IFC 510 and other information necessary to deploy a complete and fully operational system at this location.

The designer of any new facility at AUS must coordinate with the AUS 3rd party Public Safety DAS provider and work with them regarding new coverage areas. For each project area signal levels need to be checked and reviewed. If coverage is insufficient, designer shall add additional DAS coverage as required.

I. GENERAL TECHNICAL DESIGN STANDARDS

F. IT / Telecommunications / Security Design Standards

IT Facility Systems

The Airport IT Systems described in the subsequent sections shall be deployed throughout the Terminal, A/D Hall, and Concourses as well as the ancillary buildings as applicable. The systems shall follow flexible integration architecture to allow for common communication and centralized management.

Public Address Systems

AUS provides terminal-wide voice announcements throughout all public terminal and concourse areas, as well as select back of house areas. The public address system collects, manages, and distributes audible information throughout the facility – either to select zones or to the entire building. Voice announcement coverage throughout public spaces include, but are not limited to, the following areas:

- Terminal and Concourse passenger circulation areas
- Curbside areas
- Ticketing and Security Screening
- Boarding Gates
- Bag Claim
- US Customs Federal Inspection Station (FIS)
- Restrooms
- Airport/Airline/Tenant Clubs

System Platform

The PA system is a network distributed system with controllers, amplifiers, and ancillary system components located in airport Telecommunication Rooms. Where public address system additions or modifications occur, the Designer shall leverage the existing enterprise system to provide public address capability

Performance

The PA system design should allow all intended occupants to hear audio announcements at roughly equal sound pressure levels regardless of the listener's location within a given coverage area. Audio loudspeakers shall be positioned to prevent audio interference from other loudspeakers in adjacent paging zones, where applicable. PA system audio performance shall be designed to provide a speech transmission index (STI/STIPA) testing value of .5, or greater throughout the respective PA coverage area.

UPS backup power shall be provided for all public address system components, in event of power outage. Designers must coordinate with AUS IS and Facilities departments to determine run time requirements for the UPS backup solution, based upon the facility use and generator backup power availability.

Television

AUS utilizes an IPTV system for distribution of television channels and video content over the data network to airport back-of-house displays. Currently the television service for the airport tenants is a separate analog service provided over coaxial cable infrastructure, however the intent is that tenant television services will eventually be migrated to the AUS IPTV system.

Presentation & Video Conferencing Systems

Due to the fast-changing nature of audio-video technology and conferencing solutions, the design team shall engage AUS's IS Division early in the design process for review of these requirements.

Airport IT Operational Systems

I. GENERAL TECHNICAL DESIGN STANDARDS

F. IT / Telecommunications / Security Design Standards

The Airport IT Systems described in the subsequent sections shall be deployed throughout the Terminal, A/D Hall, and Concourses as well as the ancillary buildings as applicable. The systems shall follow flexible integration architecture to allow for common communication and centralized management.

EVIDS

The existing AUS Electronic Visual Information Display System (EVIDS) receives, holds, processes, manages, and displays visual information throughout the terminal buildings. The following sub systems are described separately below:

- Flight Information Display System (FIDS): FIDS monitors are located in public areas and are typically portrait-oriented 55” LCDs configured to present arrivals and departures information.
- Baggage Information Display System (BIDS): BIDS monitors are typically located above baggage belts and display from which flight baggage will arrive.
- Gate Information Display System (GIDS): GIDS monitors are typically 55” LCDs, displaying gate and flight information. Two (2) GIDS are typically placed side by side in landscape orientation at the gate counter backwall behind the gate counter, and a single GIDS display is typically located in landscape orientation above the jetway door.

Designers shall coordinate these display technologies, locations, and sizes with the AUS IS Division early in the design process.

Lightning Notification System

The existing AUS Lightning Notification System (LNS) is a network-based system and web service which identifies the presence of lightning within 3-miles, 5-miles, and 8-miles (or beyond). The system is comprised of controllers, touchpanel interfaces, relays, horns, speakers, and beacons of multiple colors. Any modifications or expansions of this existing system shall be coordinated with the AUS IS Division.

FAA “Crash Line” System

This system is deployed in select areas of terminal buildings. Any changes or expansions to the system shall be coordinated with the AUS IS Division.

Apron Management

Designers must coordinate with the AUS IS Division to confirm the Apron Management requirements of each specific project.

Common Use Systems

Passengers shall have various check-in options based on their individual needs. Curbside check-in shall be available upon arrival for those passengers with bags to check. Within the Ticket Lobby, a passenger may choose to use self-service kiosk and bag drop or check their bags with the assistance of an agent. Check-in workstations and kiosks shall be a common-use resource (unless directed otherwise by AUS).

Gate and boarding systems shall generally follow the common-use model unless airline proprietary solutions are approved by AUS. Gate counter workstations, loading bridge workstations, ticket printers, ticket scanners/readers, and other peripherals and signage shall be able to serve any airline assigned to a given gate.

The common use system shall be compliant with all IATA/ACI standards and recommended practices, including, but not limited to RP1797, RP1800, and RP753.

Common Use Self-Service (CUSS)

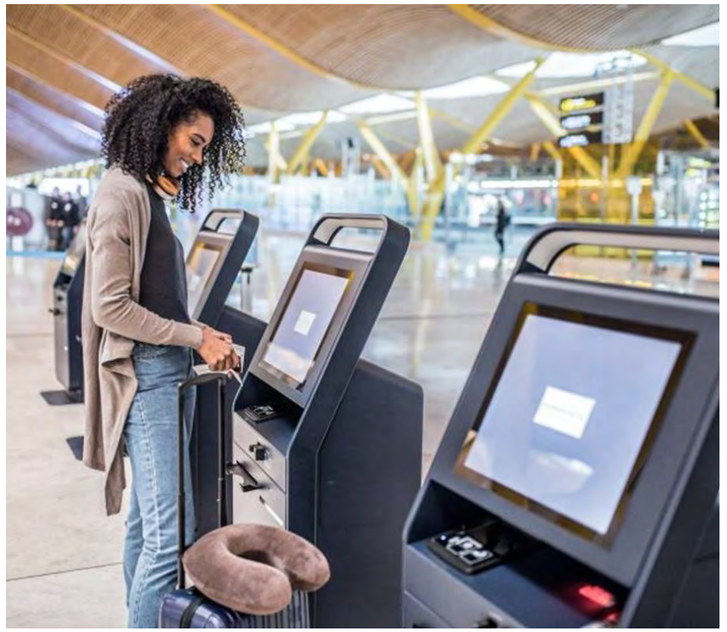
Overview

The system consists of kiosks shared by airlines and used by passengers to check-in without the support of airport staff.

The CUSS kiosks shall support all airlines present (and future) operating at AUS unless an explicit exception is made by the AUS or requested by an airline.

The CUSS kiosks shall be configured to check-in for both Domestic and International passengers and print boarding passes and bag tags.

Support full check-in process for Machine Readable Travel Documents.



Airport IT Operational Systems

Common Use Systems (Continued)

Common Use Self-Service (CUSS) (Continued)

Components:

The system shall consist of all required physical and logical components for a fully functional system. Coordinate with AUS to determine final equipment configurations.

Topology:

The CUSS platform shall support all software required to provide service for each airline

CUSS Kiosks shall conform to TAS requirements.

All kiosks shall be compatible/interfaced with the Airport Operational Database (AODB) for tracking maintenance and statistical data.

All kiosks shall be managed within the Resource Management System for assignment of preferential airline use, general airline use, and to manage the EVIDS display above any a kiosk (where provided).

Deployment:

General CUSS kiosks shall be self-contained, floor-standing enclosures.

CUSS kiosks located at dual-purpose ticket counter positions shall feature a countertop form factor, as opposed to a freestanding floor enclosure.

Each kiosk shall contain a dedicated computer with hard-wired network connections provided by a data outlet.

CUSS kiosks location deployment shall be reviewed with AUS; areas to be reviewed include garages, passenger bridges, ticket lobby, airline customer service areas; refer to Design Standards for additional direction.

Common Use Passenger Processing System (CUPPS)

Overview:

CUPPS clients are common-use computers that can be used by any airline that is configured to use the system. Software that runs on each CUPPS workstation ensures the peripheral devices are handled in a consistent manner regardless of the Airlines software.

The system shall enable multiple airlines and users to share physical check-in or gate podium positions.

Workshops and coordination shall be completed with both AUS during design.

Thesystem shall be designed to achieve product and service consistency across the terminal and to maximize the use of check in and boarding areas.

Components:

The system shall consist of all required physical and logical components for a fully functional system. Coordinate with AUS to determine DCS interface configuration and final agent position configurations including ticket counters, Baggage Service Office (BSO) counters, Airline customer service positions, gate counter positions, and loading bridge positions.

Topology:

The system shall interface with each Airline's Departure Control System (DCS).

Local DCS shall be provided for charter airlines and other smaller operations without an airline DCS.

The system shall support passenger and baggage reconciliation by ensuring information regarding passengers who have checked-in but not boarded is made available in real time

Though not currently in use, Gate counters shouldl be able to accommodate the Automated Flight Announcement System (AFAS) to allow airline agents to trigger announcements via the AFAS.

All CUPPS workstations shall be compatible/interfaced with the Airport Operational Database (AODB) for tracking maintenance and statistical data.

All CUPPS workstations shall be managed within the RMS for assignment of airline use and to manage the EVIDS displays above ticket counters, behind ticket counter, behind gate counters, above loading bridge door.

All the peripherals are required to comply with the relevant safety and TAS regulations

Deployment:

Conventional airport counters in the Terminal shall be provisioned with CUPPS equipment and workstations along with other supporting hardware to provide standardized check-in services.

Check-in counters shall feature nonproprietary common use hardware including workstations, ticket printers, bag tag machines bag scale and other similar passenger and baggage processing devices. Provide equipment at each workstation in quantity to serve the calculated demand based on utilization during peak hour check-in operations.

Boarding gate readers shall be arranged in such a way so as to allow passenger self-boarding or agent-assisted boarding.

The system shall utilize the Terminal IT infrastructure which shall provide data cabling that is in line with the manufacturer's requirements and the ICT structured cabling specifications, network services and IT spaces.

Agent positions shall be interweaved to alternate network switch stacks (preferably in alternate IDFs) to ensure operational resiliency.

I. GENERAL TECHNICAL DESIGN STANDARDS

F. IT / Telecommunications / Security Design Standards

Airport IT Operational Systems

Common Use Systems (Continued)

Self-Service Baggage Drop Systems

Overview:

Baggage self-drop shall be reviewed with AUS, airlines, and TSA. Baggage self-drop shall help improve efficiencies in the ticket lobby. The designer shall also coordinate with Baggage Handling System (BHS).

Components:

The system shall consist of all required physical and logical components for a fully functional system. Coordinate with AUS to determine final equipment configurations.

Self-Boarding Systems

Overview

Self-boarding gates expedite supervised boarding of the aircraft and validate both paper and smart device boarding passes. These self-boarding systems shall be reviewed for deployment to increase operational efficiencies and passenger service. The system shall seamlessly interface with airline and airport systems to accurately collect data and ensure immediate user acceptance for improved throughput rates. The system shall have the provision of Audible signal in case of unauthorized access. And the system shall be of modular type and shall allow for multiple lanes at a gate area in future. The number of lanes requirement at each gate shall be coordinated with AUS.

Components:

The system shall consist of all required physical and logical components for a fully functional system. Coordinate with AUS to determine final equipment configurations.

AODB and RMS

The Airport Operations Database (AODB) is a central information repository and data exchange, which provides the airport operator with the ability to manage, exchange, and store airline and airport operational data, flight and aircraft data, and support common use and proprietary processes as well as management and reporting functions. This data is fundamental to the shared operations such as check-in, baggage handling, security controls, passenger tracking and service information, concessions, displayed information (flight, gates, bag claims, ticketing), arrivals, etc. It also captures historical data in support of usage billing, operational analysis, and planning for the airport.

The Resource Management System (RMS) shall be designed to provide scheduling of resources based on flight schedules, resource availability and status, and operational and business rules. Schedule functions shall support both day-of-operations and longer term (seasonal) development and planning. The RMS shall also be a key tool for operational modeling for future schedule and capacity planning.

The RMS shall establish and maintain the schedule of use for all common use and shared resources and shall have the capability of monitoring utilization of exclusive use resources.

I. GENERAL TECHNICAL DESIGN STANDARDS

F. IT / Telecommunications / Security Design Standards

Airport IT Operational Systems

Automated Flight Announcement System

Overview:

Designer should review the requirement of Automated Flight Announcement System (AFAS) at AUS and shall follow these minimum design guidelines if required:

- Provide clear, recorded flight status announcements, including but not limited to flight delays, gate changes, baggage delays and flight boarding messages.
- Be a scalable system
- Provide voice support in multiple languages.
- Allow for both centralized and remote operation of all voice messages.
- Include announcements that are automatized in real-time for accuracy and clarity.
- Include a text-to-speech phonetic system and feature remote access capabilities
- Provide messages including, but not limited to, template messages, adhoc messages, courtesy calls, automated gate and flight calls, boarding calls, baggage calls, timed messages and delayed announcements.

Components:

The system shall consist of all the required physical and logical components for a fully functional system. Coordinate with AUS to determine final equipment configurations.

Aviation Integration Platform

Any future project shall use an Aviation Integration Platform (AIP) for all cross platform communication. Coordinate with AUS IS Division.

Airport IT Operational Systems

Queue Management System

Overview:

The Queue Management System (QMS) shall monitor passenger flow in real time at security checkpoints. The system shall use Artificial Intelligence (AI) and analytics to count passengers, monitor queues, visualize passenger flow, communicate wait times at checkpoints, support terminal operations while simultaneously improving passenger experience. The designer must coordinate with applicable airport personnel (i.e., AUS IS, AUS Security, TSA) to obtain the Concept of Operations (CONOPS), issues and concerns in order to determine which queue management system technology to utilize to meet the requirements.

The system shall have the ability to predict future wait times for a specific queue, lane, or checkpoint area. This capability shall include the tools for helping plan and schedule resources based on the current status of passenger queuing. Users shall be able to generate “canned” and “ad-hoc” reports for real-time data or using historical performance data. The QMS users shall be able to visually display historical queuing playback by showing the passengers tracked and measured in an anonymized manner. Users must be able to immediately replay the flow of passengers and the associated key performance indicators. The playback feature must allow users to adjust the speed of the playback with speeds ranging from 1x (real time) to 10x (ten times as fast). The System shall provide the ability to replay the density map and flow of passengers from within the past 30 days.

Queue management shall also be reviewed for tenant areas, airline queues, concessionaire queues, CBP queues, and other passenger queue areas. Queue management in these areas may additionally include queue management lights and dynamic signs to indicate turn.

Components:

The system shall consist of all the required physical and logical components for a fully functional system. Coordinate with AUS to determine final equipment configurations:

Topology:

Coordinate with AUS IS for QMS topology requirements for system expansion.

Deployment:

All queues in the airport shall be reviewed for queue management requirements with AUS and applicable tenant. Potential QMS locations include, but are not limited to:

- Security check points
- Concession spaces for management of ordering and pick-up of merchandise
- Airline lounge for people counting
- Tenant spaces (i.e., TSA pre check interview office) to provide virtual appointments
- CBP primary processing

Security Systems

Closed Circuit Television (CCTV) System

Overview:

The Closed-Circuit Television System (CCTV) shall be designed as an extension of the existing AUS CCTV system. The designer shall coordinate with AUS IS, AUS Security, and applicable stakeholders (e.g., TSA, CBP, Tenant) to determine specific system requirements for a given project. The CCTV cameras shall be IP and include both fixed, multi-sensor and pan-tilt-zoom (PTZ) cameras depending on capture intent and location. Camera resolution shall be determined by need and shall use the “pixel on target” criteria for determination of resolution and scene size. All cameras shall have the ability to be viewed in real time (30-fps). Minimum video recording capacity shall be 90-days unless specifically stated by AUS security or AUS operations to be otherwise and shall be based on the number of cameras, assumed recording time, assumed resolution, and assumed video compression. All cameras and recording equipment shall be capable of utilizing HEVC (H.265) video compression. The CCTV system shall be configured to support efficient transmission of video streams and shall be capable of supporting advanced video analytics such as facial recognition and passenger tracking to increase the effectiveness of the system.

The following coverage level definitions are provided and shall be applied as noted in the Design Standards by location and purpose:

- Identification: Security Operator can positively identify a person beyond reasonable doubt – approximately 76 PPF.
- Recognition: Security Operator shall be able to recognize a person known to them – approximately 38 PPF. Also in this area, it is possible to recognize license plates manually, but the camera resolution may not be sufficient for Automatic number plate recognition (ANPR) systems.
- Observation: Security Operator can observe some characteristic details of the individual, such as distinctive clothing - approximately 19 PPF
- Detection: Security Operator shall be able to detect a human presence- approximately 8 PPF

Current COA Counsel Resolution bans the use of Facial recognition with the Airport having permission to only utilize as required by Federal law. Any other possible biometric analytical features shall be utilized if required in coordination with AUS Security.

Components:

The system shall consist of all the required physical and logical components for a fully functional system. Coordinate with AUS Security to determine final equipment configurations. Equipment may include but not limited to:

- Fixed, Multi-sensor 180, Multi-sensor 360, and Pan-Tilt-Zoom (PTZ) cameras and licenses
- CCTV Workstations and licenses
- Video Walls as needed
- Video Storage, Servers – designer will expand existing system as needed to support addition of new cameras

Topology:

The CCTV system shall include redundant video surveillance servers and video storage arrays located in physically separate rooms with video processing servers for cameras. The redundancy architecture, and any system expansion, shall be coordinated with AUS Security. The CCTV System shall be integrated with the ACS such that ACS alarms can trigger camera call-ups on related video of the associated area. Except for specialty CCTV cameras, all cameras shall be powered by Power over Ethernet (PoE+) via minimum CAT 6A to the nearest IDF.

The designer shall work with AUS Security or AUS Operations to determine video processing server requirements, cameras per server, and redundancy architecture for individual cameras (if any).

Deployment:

Refer to the Design Standards for physical locations requiring video surveillance. The typical areas for video surveillance shall include, but are not limited to:

Main circulation areas

- Curbside
- Ticket Lobby
- Baggage Claim
- Security Checkpoints
- Hold rooms
- Passenger Boarding Bridges
- Apron
- Retail Areas
- Terminal Entrance and Exits
- SIDAs
- Baggage Handling System
- TSA Areas
- CBP Areas
- Terminal approach/exit roadways
- Vehicle Checkpoints
- Service Corridors
- ACS Portals
- License Plate Recognition

I. GENERAL TECHNICAL DESIGN STANDARDS

F. IT / Telecommunications / Security Design Standards

Security Systems

Closed Circuit Television (CCTV) System (Continued)

The table below further details locations and video capture intent to be followed in design development. There shall be only one Single CCTV system throughout the AUS Airport including TSA & CBP areas. However, any specific requirements for these Agencies must be coordinated with AUS Security and the respective agency.

Surveillance Location	Capture Intent
Terminal Site Perimeter	Entire site perimeter (Integrated PIDS cameras) and additional site situational awareness cameras
Terminal Building Perimeter	Building mounted cameras with views of entry and exit points.
Stairwells	View of each flight of stairs to track movement. Recommended location at landing with view both up and down stairs.
SSCP Passenger Queue	Entrance to queue. Overview of queue areas for awareness of queue length/wait times. Separate from TSA cameras. Possible integration of queue views with Queue Management System (if used).
Curbside	Full curb coverage for observation and investigation of accidents and entering passengers. In addition, cameras that are part of the system may be used for analytics such as license plate recognition, vehicle dwell time, etc.
Ramp Control	Dedicated cameras for observing ramp movements for the purpose of remote ramp control. Cameras to be placed in a consolidated location with views that can be effectively stitched together to provide comprehensive situational awareness as though the controller is located in a traditional tower cab. Cameras must be high resolution with the ability to operate in all weather conditions and low light conditions. All views to support a fully virtual ramp control tower.
Entrance Vestibules	Straight-on camera view with resolution for facial recognition to positively identify individuals as they enter the terminal building.
General Circulation / Areas	Ability to monitor crowd flows and to track the movement of individuals as they move through the Terminal (e.g. no major blind spots). Specific areas may include Children's play areas and surrounding spaces and all pinch points prone to congestion.
Hold Rooms	View of transactions at the gate desk and transactions at the boarding podium (or e-gates). Overview of queue area. (Note "transactions" to mean the ability to see the interaction between a passenger and airline employee for the purpose of investigation of incidents or fraud not necessarily forensic level view of names on documents, what was typed, etc.).
Vertical / Horizontal Circulation	View of the interior of all elevator cabs and the entry/exit points of all escalators and moving walkways.
Ticketing Lobby	Transactions at ticket counters and bag drop belt. Overview of queue areas for ticket counters.

Surveillance Location	Capture Intent
Baggage Handling System	View of induction points, sort pier/carousels, inbound belts, manual encode stations, locations susceptible to jams (turns, merges, etc.), any other locations recommended by BHS system designer.
Loading Dock	View of vehicle movements, activity at the dock, and waste areas.
Goods Screening	Full coverage to monitor movement of goods throughout the process for audit and investigative purposes. High resolution view of search area(s).
Back-of-House Corridors	General overview of movement in back-of-house corridors.
Baggage Claim	Full view of carousels for awareness of capacity and investigation of theft.
IT Rooms	Camera on interior of IDF rooms viewing all persons entering room. MDF rooms shall include camera views of persons entering the room plus camera view of each row of racks within the room.
Triturate / Aircraft Septage Room	View of room and equipment for investigating spills
Passenger Exits from Sterile Area	High resolution views placed to easily identify (on both sides) backflowing persons in the event of a breach.
Airline Ramp	Cameras on Airport operator network with views provided to airlines for view of ramp operations; specifically below wing views
SIDAs	Coordinate with AUS Security and Airlines
CBP areas	Coordinate with CBP
TSA areas	Coordinate with TSA
Passenger Crosswalks	View of passenger movements and activities at crosswalks.
Miscellaneous	Feature to view of Unattended bags and items; leverage analytics when feasible
Ramp Drivers	Monitor interaction between AUS Security staff and drivers

Security Systems

Active Shooter Mitigation Technology

Designer shall coordinate with AUS Operations, Security, and Information Systems to determine any technology implementations for active shooter mitigation. Gunshot detection systems are not in use at AUS and have not been identified as active shooter mitigation technology of preference. Designer Should coordinate with AUS Operations, Security, and Information Systems to determine any such technology(ies) of choice.

Access Control System

Overview

The Access Control Security (ACS) shall be extension to the Airport existing ACS. New doors and ACS devices shall be populated and managed within the existing ACS platform. ACS shall provide access control between areas of different security categories, from emergency egress stairs, elevators leading to restricted areas, and to restrict passenger access to back-of -house areas. All ACS doors shall be configured as specified by AUS Security - if not otherwise stated, doors shall be configured for badge-in/badge-out capability, with an independent audible/visible alarm device, and dedicated CCTV placement.

ACS requirements for the access control panels power and FA integration shall be coordinated with electrical and fire alarm designers. Power requirements for the door hardware required to be monitored or controlled by the security access system shall be coordinated with door hardware specifier. ACS controllers shall have electrical characteristics that match the signal and power requirements of door hardware specified.

Intercoms at ACS placements are required at AUS Security specified locations - generally this is limited to main vehicle access gates and as otherwise dictated by AUS Security Intrusion detection system shall be an integrated feature of ACS & CCTV system. The Duress/IDS shall be provided to monitor and detect unauthorized access to a building or secure space as determined by AUS. Upon a security breach this feature of system shall send an alarm notification to Airport Operations Center (AOC). Coordinate with AUS security personnel to identify alarm reporting codes.

Refer to AUS 01555 - Airport Security Construction Requirements for additional information and requirements.

Components

The system shall consist of all the required physical and logical components for a fully functional system. Coordinate with AUS Security to determine final equipment configurations. In coordination with AUS Security, specific requirements of other agencies like TSA, CBP, and Tenants shall be coordinated as required.

Equipment may include but not limited to:

- Card readers with keypad
- Biometric readers
- Door position switch
- Request to exit device
- Alarm horn/strobe
- Local door controller
- Door hardware
- Access control panel
- ACS servers
- ACS workstations

Line modules shall be primarily distributed to the access control door mounted above the door on the secure side. Unobstructed access to the line modules is particularly important and they should not be placed in congested ceiling spaces. The security junction box shall be accessible with a ladder. Placement of alarm horn/strobe devices shall be coordinated with AUS Security case by case basis.

All ACS doors shall be configured fail secure and have Best 1C7 key override (with key override causing breach alarm). Contractor shall coordinate with AUS Security to place lock core order with Best authorized dealer. This key override provision should be verified and to be agreed by Fire AHJ.

Topology

Any changes to the ACS redundant server pair shall be coordinated with AUS IS and Security. ACS cables shall run in continuous conduit from the ACS field panel located in the IDF to the local door controller and to the end devices (card reader, door contact, horn/strobe). All security and devices shall be labeled with specific device identification tags.

At a minimum, the ACS shall be integrated with the following other systems:

- Closed Circuit Television (CCTV) System.
- Fire Life Safety System (FLS).
- Building Management System (BMS).

Access Control Systems shall be installed by an AUS approved installer and integration shall be performed through utilization of the AUS designated integrator.

Security Systems

Access Control System (Continued)

Deployment

ACS placements shall be as dictated by AUS Security. See table below for typical door types and the types of hardware that may be provided at each door. However, the exact ACS Hardware and configuration requirements of individual portals / Doors (ACS placements may be made on gates, baggage belts, windows, etc) will be determined by AUS Security.

Door Type	Description
Type SS (Double secure)	The door is normally secure from both sides and requires a positive card read to pass in both directions. Will alarm in the event of breach or hold-open initiated from either side. Typical application: SIDA boundary door (if free exit not permitted), boundary between sterile and secure/AOA. Typical devices could include door contact, electric lock, horn-strobe, card reader, intercom, and camera views.
Type EO (Exit Only)	Door exists for emergency egress only from an area and is not defined as an access path in either direction. Will alarm when opened. Typical application: Emergency exit stair, where the stair is not defined for staff movement. Also Such doors used to fulfill egress requirements shall include a delayed egress device at portals opening onto terminal aprons (agreement is in place w/AFD to allow such placements to mitigate risk of passengers fleeing into path of jet engines) Typical devices could include door contact, horn-strobe, intercom, and camera views.
Type SD (Secure Door)	Door secures a room or area to ensure authorized entry only. Both sides of the door are in the same security zone. Positive card read required to enter but free exit is permitted. Typical application: Securing telecom rooms, mechanical rooms, office areas, etc. Typical devices could include door contact, electric lock, card reader, request-to-exit device (REX) and camera views.REX devices must require physical contact, motion/ infrared/etc REX devices are not permitted.
Type ES (Exit Stair)	Door exists for emergency egress only from an area and is not defined as an access path in either direction. Will alarm when opened. Door will unlock from the inside of stair during a fire alarm if this is required by code. Typical application: Emergency exit stair where code requires re-entry during an emergency, where the stair is not defined for staff movement. Such doors used to fulfill egress requirements shall include a delayed egress device at portals opening onto terminal aprons (agreement is in place w/AFD to allow such placements to mitigate risk of passengers fleeing into path of jet engines) Typical devices could include door contact, electric lock, crash bar, horn-strobe, card reader, intercom, and camera views.
Type MD (Motorized Door)	Typically, double door with motorized opener when automatic opening is required (e.g. smoke control) or desired (e.g. high traffic route for large bins such as a main waste route where manual operation is likely to damage the door). Design shall consider sliding door as swing door produces significant torque forces that can cause frequent failure. Door shall be configured for badge-in/badge-out and as otherwise dictated by AUS Security, Typical application: Waste route or loading dock. Typical devices could include door contact, card reader, hold-open device, motorized operator, and camera views.
Type GD (Gate Door)	Door shall be configured for badge-in/badge-out and as otherwise dictated by AUS Security, Hold-open feature shall be integrated with ACS Typical application: Passenger boarding bridge door. Typical devices could include door contact, electric lock, crash bar, horn-strobe, card reader, request-to-exit device (REX) door hold-open and camera views.
Type KD (Keyed Door)	Door secured only by key, no electronic monitoring of door status for alarms. Typical application: Non-critical mechanical rooms, office spaces, storage rooms. Typical devices could include a crash bar and camera views.
Type RH (Roof Hatch)	In case of hatch is intended for personnel access, it shall include ACS and CCTV placements and the Hardware configuration shall be as specified by AUS Security
Type RA (Roof Access)	All ACS doors shall be configured as specified by AUS Security - if not otherwise stated, doors shall be configured for badge-in/badge-out capability, with an independent audible/visible alarm device, and dedicated CCTV placement.

Additionally, for typical duress and intrusion detection via the ACS, locations may include, but not be limited to:

- Building entrances
- Public access desks/receptions/counters
- Access control doors
- Secure areas
- ATM machine
- Cashier locations
- Ticket counter
- Information desks
- Defibrillator enclosures

I. GENERAL TECHNICAL DESIGN STANDARDS

G. Vertical / Horizontal Transportation Design Standards

Guiding Principles

FINANCIAL STEWARDSHIP

An airport that excels in performance and cost-effectiveness, with seamless operations, is realized by embracing time-tested, heavy-duty application vertical transportation solutions. While implementing consistent installation standards and equipment specifications. This commitment to established practices ensures not only the efficient functioning of the airport but also the longevity and reliability of maintenance procedures.

FUNCTION OVER FORM

Vertical and horizontal conveyance systems serve as integral components supporting both the traveling public and airport personnel, emphasizing practical efficiency. These systems facilitate a unified circulation path for all passengers while specifically addressing the unique challenges faced by individuals requiring assistance with extended distances or stairs, highlighting the paramount importance of operational effectiveness.

OPERATIONAL EFFICIENCY & RESILIENCY

Ensure a robust design framework where the efficiency of vertical and horizontal transportation systems are finely tuned to the dynamic operational needs of the airport, ensuring a resilient infrastructure capable of withstanding the demands of a busy and ever-evolving travel environment. Thoughtful coordination of these transportation elements ensures a seamless and expedient flow of passengers and personnel throughout the airport.

UNIQUE AUS EXPERIENCE

Harmonize vertical and horizontal transportation through the integration of digital signage and wayfinding at Austin airport, aiming to greet passengers while optimizing traffic circulation within the facility.

A SUSTAINABLE FUTURE

Prioritize sustainable initiatives, including regenerative drives, LED lighting, energy management systems, solar panels, and efficient design, significantly enhancing energy efficiency. By incorporating these green innovations, AUS can lower operating costs and contribute to a more sustainable future, providing a comfortable user experience in vertical and horizontal transportation.

I. GENERAL TECHNICAL DESIGN STANDARDS

G. Vertical / Horizontal Transportation Design Standards

General Vertical / Horizontal Transportation Requirements

Design Consultants must align the design with at least three OEM manufacturers approved by AUS for competitive bidding. Once a manufacturer is chosen, verification of specific application dimensions relative to space constraints may be necessary.

Accessibility

Design consultants will incorporate TAS building requirements to ensure smooth access to vertical and horizontal transportation for all passengers.

Maintenance and Support

All VHT (Vertical and Horizontal Transportation) equipment, inclusive of a one-year warranty maintenance and a monthly service agreement starting at beneficial occupancy, should mandate a 24-hour call-back service. Scheduled maintenance and cleaning must occur during off-peak hours, coordinated with AUS.

Procurement of conveyance equipment typically includes a five-year term triggered after the warranty maintenance period.

Moving Walks

When integrating moving walks, Design Consultants should enhance passenger mobility, minimize travel time, and consider the following:

Travel Distances

- Apply the following speed data for travel time calculations:
- Unassisted walking: 264 FPM
- Passenger walking on moving walk: 322 FPM
- Passengers standing on moving walk: 100 FPM
- Escalator: 145 FPM

Limit unassisted walking distance to industry standards for a positive passenger experience.

IATA suggests a maximum unassisted walking distance of 985 feet and 2,133 feet with assistance.

Use moving walks where long walking distances are unavoidable.

Coordinate clearances for electric carts provided by airlines, including charging and storage stations.

Planning

Provide one moving walk for unassisted passenger walk distances exceeding 1,000 feet where space allows.

Limit the length of a moving walk to 250 feet. For distances beyond 250 feet, design a series of moving walks.

Ingress/Egress

Design clear passenger circulation areas at each end for safe boarding and disembarking.

Follow ASME A17.1 requirements for entry and exit clearances, ensuring a minimum of 15 feet at each end.

Maintain flush landing surfaces with no abrupt elevation change.

Physical Operational Requirements

Width

- Moving walk pallets must be a minimum of 48” wide for overtaking stationary passengers with rolling luggage.

Length

- Recommend a maximum length of 250 feet for reliability and traffic flow.
- Consider proximity to gates, concessions, and passenger amenities in determining length and location.

Comb Plates

- Provide removable die-cast aluminum comb plates at entrances and exits, coated in safety yellow.

Inclinators

- Consider inclinators for grade changes after AUS, AHJ, and manufacturer review.

Moving Walks (Continued)

Configuration

Full Depth Pit – Heavy Duty Application

- Design for a heavy-duty application with full-sized pits for motorized equipment.
- Modernization may be considered, but machine space and machinery must remain below floor level.

Reduced Pit

- Propose reduced pit configurations for AUS consideration where building system limitations exist.

Rated Speed

- Maintain a maximum speed of 100 fpm with adjustable operational speeds coordinated with AUS facilities.

Sustainability and Energy Saving Technologies

- Utilize sleep mode, usage-based energy-efficient controllers, and LED lighting.
- Equipment Requirements

Pallet Treads

- Use one-piece, heavy-duty die-cast aluminum pallet treads, grooved for traction.
- Outer edges of pallets should be safety yellow for high visibility.

Balustrade

- Install glass balustrades on both sides, with stainless balustrades along walls for maintenance.

Handrail

- Provide moving rubber handrails on each balustrade with UV-C disinfection modules.

Lighting

- Integrate LED lighting along skirt panels and handrails, coordinating with AUS for aesthetics.

Safety Considerations

Signage

- Place caution signs at entry and exit, with voice announcements and lighting for direction clarification.

Control and Monitoring

- Provide walkway controllers with data transmission and non-proprietary monitoring system compatibility.

Emergency Stop

- Install emergency stops at both drive and return ends of each moving walk.

Additional Walkway Requirements

- Include skirt brushes along the entire length.
- For pre-security areas, provide bollards to restrict luggage carts.
- Install fire alarm modules in each pit per code.

Escalators

Design escalators at AUS adhering to applicable codes, accessibility standards, and specified criteria.

All escalators must be connected to emergency building power.

Spatial Requirements

Provide a spacious passenger circulation area at each landing, considering peak periods and baggage sizes.

Follow ASME A17.1 for clearance areas, maintaining a minimum of 15 feet at entry and exit.

Maintain separation between consecutive escalators to prevent congestion.

Operational Requirements:

Wellway & Pit:

- Ensure a minimum 40-inch width for escalator steps, with cladding and finishes for exposed surfaces.
- Consider boarding rate over speed for capacity determination.

Rated Speed:

- Keep escalator speed below 100 fpm. Specify venting to prevent smoke accumulation, coordinating with AUS.

Headroom:

- Maintain a minimum of 96 inches of headroom to avoid minimum code ceiling heights.

Angle of Inclination:

- Adhere to ASME code provisions, limiting the angle of inclination to 30 degrees.

Step Treads:

- Use die-cast aluminum for step construction, with grooved metal for traction and rounded step noses. c. Guarantee Visibility:
- Mark outer edges and rear of pallet treads with 1.5 inches safety yellow.

Escalators (Continued)

Operational Requirements:

Comb Plate:

- Install die-cast aluminum comb plates at escalator entrances and exits.
- Emphasize transition with removable, safety yellow powder-coated comb plates.

Skirt Panel:

- Use stainless steel interior skirt guards and brushes to prevent entrapment.
- Propose alternative materials for exterior cladding skirt panels for AUS review.

Protective Barriers:

- Install tempered glass balustrades with robust barriers at upper and lower ends.
- Implement solid guards for escalators with floor openings; coordinate with AUS for standby speed.

Emergency Shutdown:

- Position visible emergency stop buttons on the right side at top and bottom levels, or in readily accessible location within the circulation zone for parallel installed units.
- Distribute buttons for escalators with multiple floor openings following ASME A17.1.

Variable Speed Drive:

- Use variable speed drives for reduced-speed operation during inactivity.
- Explore photocells or radar detection for automatic activation from standby mode.

Escalator Monitoring:

- Include monitoring system with safety feature disengaging power if speed exceeds 120%.
- Enable manual-reset and remote control from AUS Operations Center.

Custom Depth Tread Escalator:

- Consider custom depth tread escalators with minimum three flat steps at top and bottom.
- Ensure step tread dimensions fall within 22 to 40 inches width, 16 inches depth, and 9 inches rise.

Sustainability:

- Reference Moving Walk section and explore regenerative escalator drives.

Visual Design Requirements:

Balustrade:

- Use clear tempered glass for low deck balustrades; stainless steel for high deck exterior.

Handrail System:

- Install dynamic rubber handrails with UV-C disinfection on guide rails.
- Ensure handrails comply with accessibility and building code requirements.

Deck Covering:

- Implement uniform cladding for escalator decking.

Illumination:

- Incorporate directional lighting for wayfinding; coordinate safety lights with AUS.
- Explore handrail LED lighting at specific locations.

Wayfinding:

- Implement strategic signage for passenger guidance.

Additional Considerations:

Ensure independent operation of each escalator during maintenance.

Install bollards for pre-security escalators and LED lighting.

I. GENERAL TECHNICAL DESIGN STANDARDS

G. Vertical / Horizontal Transportation Design Standards

Elevators

Design elevators for AUS, adhering to codes and maximizing efficiency.

All elevators must be connected to emergency building power.

Spatial/Placement Requirements

Strategically locate passenger elevators, group in banks for efficient wayfinding.

Prioritize non-conflicting flows; minimize obstacles in lobby for easy identification.

Operating Performance

Ensure adequate elevators with dwell time; maintain average interval below 45 seconds.

Maintain average waiting time below 30 seconds.

Lobbies/Landings

Provide a minimum 15-feet depth or 1.5 times elevator depth for queue areas.

Adjust queue area for pre- and post-security passenger needs.

Elevator Landing Aesthetics

Choose materials for tranquility, directional emphasis, and non-reflectivity.

Call Stations in Hallways

Install two-button hall call stations at each elevator queue area.

Adhere to accessibility codes for call station placement.

Hydraulic Elevators

Use hydraulic elevators for freight with waterproof pits and sump pumps.

Electrical Traction Elevators

Prefer electrical traction elevators, explore Machine Room Less (MRL) options.

Machine Room Less (MRL)

Design hoistway with flush surface; explore MRL for space efficiency.

Elevator Shaft Design

Establish shaft size based on elevator grouping, type, and configuration.

- Maintain a flush surface on the hoistway side, with variation not exceeding construction tolerances or one inch (whichever is less) throughout the hoistway height.
    - Confirm necessary criteria for elevator rails; consider intermediate bracing between floors.
    - Install wall blockouts and fire-rated closures for control and signal fixture boxes penetrating walls.
    - Grout the floor up to the hoistway sill and around entrances for a secure, fire-resistant environment.
    - Size and install hoisting beams overhead for car installation, maintenance, and repair.

MRL Elevator Maintenance Access:

Provide top clearance and access for MRL elevator motor maintenance.

Control Room and Machinery Spaces:

Allocate conditioned machine room space for hydraulic elevators on the ground floor or basement, close to elevators, avoiding public corridors. Skip separate control room for hydraulic elevators.

For MRL elevators, provide conditioned control room; minimize distance from elevator machinery. Paint wall and ceiling, size rooms for equipment, ensuring maintenance access and pressurization.

Elevator Cab:

Cab Size:

- Size elevators based on ACRP recommendations for specific use, capacity, occupancy, and service levels during peak 15 minutes.

Provide larger cab size for pre-security elevators, considering area requirements per standing passenger.

Cabin Enhancements:

Include hooks for protective mats in all elevators (excluding glass) for finish safeguarding during heavy use.

Pre-finish exposed elevator components in the factory, with post-installation touch-ups.

Handrails:

Size handrails for secure grip, preferably 1¾” diameter cylindrical profiles. Propose alternative profiles for AUS approval.

Use brushed stainless steel handrails anchored to walls; strategically position crash rails for impact protection.

Ensure layout complies with accessibility and building codes.

Bumpers:

Size bumpers for protection of wall surfaces against damage from baggage, carts and equipment. Preferably 4” of flat profile with return ends.

Use brushed stainless steel handrails anchored securely.

Ensure layout complies with accessibility and building codes

I. GENERAL TECHNICAL DESIGN STANDARDS

G. Vertical / Horizontal Transportation Design Standards

Elevators (Continued)

Illumination:

Integrate LED lighting uniformly in elevator cabs and transparent walls, meeting code requirements.

Encourage modular ceilings with down lighting for easy replacement; coordinate with AUS for decorative elements.

Systems for Control and Monitoring:

Safety Measures:

- Install access control on cab control panels for secure area elevators; program system for floor access.
- Implement CCTV inside each elevator; monitor from AOC
- Provide CCTV cameras for security-controlled stops, monitored in AOC.

Emergency Communication and Monitoring:

Equip elevators with two-way emergency communication and systems monitoring. Update with IBC and ASME required Audible and Visible emergency communications devices

Integrate copper feeds in traveling cable for VOIP or Single line phone in each elevator.

Remote Management:

Enable remote control from Operations Control Center for emergency and routine operations.

Sustainable Approaches & Technologies:

Recommend high-efficiency, gearless AC machines, regenerative drives, LED lighting, mandatory sleep mode, and phasing out hydraulic elevators in locations where MRL are an appropriate alternative.

Additional Considerations:

Capacity and Speed:

Evaluate elevators based on stops, travel distance, speed, and quality.

Select minimal rate load considering use and location.

Noise:

Ensure elevators operate quietly, maintaining max 65 dBA with closed doors during an up run.

Reliability Requirements:

Specify reliability based on operating time, load capacities, and 30-year service design life.

Freight Elevator:

Coordinate freight elevator locations with facilities, install more than one for redundancy.

Signage:

Include clear wayfinding signage for elevators; maintain consistent floor terminology.

- Install mandated accessibility signage using durable materials, considering brushed aluminum or stainless steel for specific components.
- Ensure uniform floor identification

I. GENERAL TECHNICAL DESIGN STANDARDS

H. Baggage Handling / Checked Baggage Inspection System Design Standards

Design Parameters

This section describes design requirements and parameters to be considered prior to starting data collection.

Right of Way

All projects/installations shall maintain the BHS right of way and provide a minimum vertical clearance of 30 inches from the bed of the conveyor to ensure baggage has the vertical clearance required.

Planning Horizon and Baggage Demand Forecast

Checked Baggage Inspection Systems (CBIS) planning typically takes place on a 5-to-8-year horizon as a matter of construction time and TSA funding cycles. CBIS are sized to accommodate baggage volume five years after the system is initially turned on with space reserved for sufficient equipment to handle the bag volume ten years after that. Details are described in the Planning Guidelines and Design Standards (PGDS) published by TSA.

General steps for the screening baggage demand forecast are:

- Determine the methodology for estimating baggage demand
  - Field Data Reporting System (FDRS) analysis methodology
  - Flight Schedule analysis methodology
    - Identify Average Day of Peak Month (ADPM)
    - Select flight schedule
    - Collect assumptions/design parameters
    - Identify peak demand
- Project future baggage demand

After the baggage demand is forecasted, the number of screening equipment will be calculated based on the formula defined in the PGDS. It is also common that some airports may have planning horizons of up to 25 years in the future in order to align with the master plan study.

It is particularly critical for planning the airport's growth expectations, and anticipated changes in airline operations. For example, will the airport be designated a hub for an airline, or will an airline be adding new or substantially expanded international operations?

Information such as aircraft size, load factor, O&D ratios, number of bags per passenger, and connecting flight data all factor into demand forecasts.

Types of Baggage Handling System to Design

Inbound System consists of claim units for domestic or/and international. In addition to the future flight schedules and forecasted baggage demand, design assumptions/planning parameters need to be determined based on the existing operations, inputs from airlines/airport stakeholders, and best practices. The major planning parameters are:

- Airport policy on how equipment is to be shared (or not) between airlines
- Airport preference for class of equipment (e.g. slope-plate vs. flat-plate devices)
- Level of Services (LOS) to determine adequate queuing space and reasonable waiting times during peak activity periods. This impacts the size of claim units or space between claim units.
- Equipment longevity and airport planning cycle expectations of the airport

Outbound System consists of makeup units for marshalling passenger baggage for delivery to the departing aircraft. Similar to the operation of Inbound systems, future flight schedules and forecasted demand as well as a description of how the airlines and other stakeholders intend to operate are critical for sizing and placement of makeup devices. The major planning parameters are:

- Airport and airline expectations on the use and sharing of carousel devices and space
- Airline preferences for staffing and staging
- Equipment longevity and airport planning cycle expectations of the airport

Site Analysis - Understanding Existing Conditions

This section describes common process and flow of data collection to understand the existing system.

Introduction to General Conditions and Challenges

The general conditions of an airport present many challenges throughout the design phase as existing and operating systems such as plumbing, HVAC, and IT cabling are often difficult to move and require extensive phase planning to move in order to maintain daily airport operations. Heavily congested areas are recommended to be avoided to save cost, but sometimes no other option is available. There are several tools and documents that can be utilized to help assess existing conditions which are described in the following sections.

Perform Site Survey

A site survey of an existing facility is performed to inspect and assess a specific area to identify existing conditions, equipment, and to determine the suitability for system installation and development of the area for a specific purpose. The survey includes a search to identify areas of Right of Way (ROW) to locations of interests for the movement of items from place to place to support the airport's future requirements. It involves measuring and analyzing the spaces available, existing infrastructure, activities in the area, traffic patterns as applicable and access to utilities while noting the environmental conditions in the areas of interest for future work.

Review 3D Scan

3D scans are a useful tool that allows design teams to analyze the existing conditions of the site without needing to be physically onsite. Measurements can be made virtually, and higher quality 3D scans allow for the 3D design model to be integrated inside the 3D scan to allow virtual walkthroughs of the proposed design. 3D scans of the existing system are recommended to save future design time and allow for review of collisions between the new design and the existing conditions. Multiple 3D scans of the existing system have already been made, but much of the airport remains unscanned.

Review As-built Documents

As-built drawings of the existing conditions for the BHS are available for review to help understand ROW's, elevations, and the overall process flow of the existing BHS. As-built drawings contain the most up to date layouts of the BHS but should be verified with a site survey or 3D scan to ensure there were no undocumented changes to the BHS after the as-built documents were created. Information that is difficult to obtain by site surveys or 3D scans such as belt speeds, motor horsepower, full load amperages, conveyor construction details, and component cutsheets are available in the as-built documents. It is also useful to review the spare part lists and Operation and Maintenance (O&M) Manuals for the existing system.

BHS Technologies

This section describes common methods to introduce BHS technologies into the design. The Designer should coordinate closely with the AUS Project Manager to select and develop the best system for AUS.

Technology Options

As of the year 2024, majority of the BHS in U.S. airports are belt conveyor systems. While other BHS technologies are more common internationally, they have seen limited use at airports in the United States. But with advantages these other technologies bring like increased energy efficiency and system availability these technologies are now making advances in the U.S., and the following options are currently available.

Belt Conveyor

As noted earlier, belt conveyor has been the primary base for BHS and has a well-established supply base. Belt conveyor is based on transporting bags on a wide belt surface. The components are mainly based on industry standards. Therefore, belt widths are the same or similar from the OEMs, making much of the equipment interchangeable within a system. While there have been new technologies beneficial to belt conveyor like PMM motors and Controls, the use of a wide belt makes belt conveyor inherently less energy efficient, requires more maintenance requirements, and operational issues like bag jams or longer-term failures.

Figure 1: Example of Belt Conveyor

Individual Carrier System (ICS)

ICS is a technology similar to belt conveyor providing much of the same equipment types such as sortation, queuing, transporting; however, the surface for transporting the bag is greatly reduced to two parallel strip belts. Since there is no longer a wide belt being pulled across the surface, energy requirements are greatly reduced. The bags are also individually transported in tub-like carriers. This improves bag-related issues like jams. The carrier also includes an RFID tag providing this technology 100% bag tracking throughout the system. ICS is very modular both for components and installation. This gives the benefit of reduced spare part types and installation needs. ICS equipment and

Figure 2: Example of ICS

BHS Technologies (Continued)

Cross-Belt Sorter

A cross-belt sorter is a sortation system that uses a transport system made-up of trains and carts with onboard cross-belt cells that move perpendicularly in the direction of the cart and assist with the baggage loading and unloading. The carts ride on a steel structural support system with aluminum rail sections with induction bars to support linear motor technology used by the train therefore having no electric motors or batteries to maintain. The system is a continual loop to transport and sort items with the inherit characteristic to recirculate items to ensure delivery to the items destination. Tracking is 100% on the sorter loop. The sorter uses system encoders and advanced Wi-Fi technology that is certified to international standards to transfer data between the loading and unloading points. The system is dynamic in its speed control to support the demand placed on the system, operating faster in high demand.

Figure 3: Example of Cross-belt

Destinated Coded Vehicle (DCV)

A DCV system is based on rails with powered carts that transport individual bags. This type of technology has similarities with ICS and cross-belt systems. Like both other systems it is looped providing paths for the vehicles to move around the system. It is more similar to ICS where the layout of rails can be made up of multiple interconnected loops, whereas a cross-belt is one closed loop. The vehicles have a short belt section perpendicular to the vehicle flow direction. This is for loading and unloading the bags.

Engagement with OEM

With a belt conveyor based system, the BHS contractor may or may not be the equipment OEM or provide the controls. With the other technologies, the BHS contractor and OEM are usually the same. Therefore, with the newer technologies, it is critical to understand the selection of the system should include the consideration that the vendor needs to provide quality materials but also be able to execute the installation well.

Evaluation Criteria of Technologies

With all technologies, the capital cost of the system needs to be considered. While the newer technology components are usually more expensive than belt conveyor components, how the system is designed can make the newer technologies cost competitive. Other criteria for evaluation:

- Bag time-in-system needs
- Energy efficiency
- Operational availability of the system
- Maintenance requirements
- Operation and maintenance staffing requirements

Considerations of the Preferred Technology

When an end-user is evaluating a technology to satisfy their business needs, an understanding of the integration of modern technologies are to be considered into the current system and the ultimate objectives of the organization with a full understanding of the environment for the application.

Consideration includes service expectations of the customer, reliability and availability of the technology, environmental conditions, operations and maintenance costs and budget.

Expectations of the customer is having as a service that does not preclude the traveler from experiencing a seamless and positive travel experience. Such as experiences as having longer cutoff times to check baggage or excessive waits to collect checked baggage resulting in wait times taking away from other priorities. These expectations identify the system's objectives towards meeting specific performance requirements.

When selecting a technology, the environment of the space the system to be installed should not be overlooked. Some of today's newer technologies, although they may have many features and characteristics of interest, will not be able to perform the environment to be installed. Computers, networks, and other electrical devices cannot sustain exposure to heat, cold, and humidity, resulting in additional costs for service or environmental protection.

Reliability, availability, operations, and maintenance contribute to cost at some period, either in continual cash out flow or initial upfront costs. Some may fall into a sunk cost fallacy, choosing a solution and making irrational decisions that lead to suboptimal outcomes because of monies already spent. New action, evaluation and commitment is necessary to objectively review the future costs of persons to use and maintain the technology with the performance that is expected and/or being experienced by others.

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Option Development

This section describes steps to develop the design options and key elements to determine the preferred option to move forward with detailed design. Design options are driven by various considerations such as facility constraints, operational constraints, construction cost, future considerations, and preferred technology.

Evaluation Criteria of Design Options

Evaluation criteria of design options consider a holistic approach to accommodate the airport needs. Qualitative criteria that are commonly used for the assessment are:

- System capacity and BHS performance such as screening capacity (for the screening system), equipment utilization, reliability and availability of the system, and contingency operations
- Design and construction feasibility such as constructability/ phasing, impacts on existing BHS, and impacts on existing facilities
- Effect on Operation and maintenance such as ease of maintenance (maintainability), impacts on airline operations, impacts on passenger experience (customer level of service)
- Economic considerations such as BHS cost, facility cost, and total cost of ownership
- Ergonomic considerations such as the accessibility of the system (e.g., stairs, ladders, egress path, etc.)

It is important to involve various stakeholders for the evaluation process. The evaluation process can be done through design engagement charrette or/and questionnaire/survey method. As necessary, weighted evaluation may be used to identify significant criteria.

Qualitative Analysis

Qualitative analysis is a tool to evaluate design options based on general criteria in order to assist key stakeholders' decision-making process for the selection of the viable option. It is a common practice especially for the design of screening system since the qualitative analysis is required by TSA during the pre-design phase.

Using the evaluation criteria, the BHS designer develops the assessment matrix, which typically compares rating of each evaluation criteria for all options. An example of assessment matrix is shown in Figure 1 (referred to Planning Guidelines and Design Standards for Checked Baggage Inspection Systems v8.0 published by TSA on 12/30/2022, C-42, Appendix C).

Table C.18: Qualitative Assessment Matrix

Criterion	Alternative 1	Alternative 2A	Alternative 2B	Alternative 3
Screening capacity	Adequate	Adequate	Adequate	Adequate
Customer level of service	[illegible]	Same	Same	Same
Operations	-	-	-	-
Utilization of EDS equipment	Moderate	Moderate	Moderate	Moderate
Reliability and availability	[illegible]	Moderate	Moderate	Moderate
Contingency operations	Adequate	Moderate	Moderate	Moderate
Maintainability	Adequate	Adequate	Adequate	Adequate
Impact to airline operations	Moderate	Moderate	Moderate	[illegible]
Design	-	-	-	-
Impact on existing facilities	[illegible]	Lower	Lower	Moderate
Expandability	[illegible]	Feasible	Feasible	Feasible
Constructability and phasing	[illegible]	Moderate	Moderate	[illegible]

Figure 4: Example of Assessment Matix (PGDSv8.0)

Selection of the Preferred Design Option

Based on the qualitative analysis results, the preferred design option is selected. BHS design will then advance to detailed design phases with the preferred option.

General Design Guidelines

This section describes steps to develop the design options and key elements to determine the preferred option to move forward with detailed design.

Mechanical

Areas to be covered for mechanical design of a BHS are based on providing a safe, reliable, and both energy and operational efficiencies.

- System layout and flow: the system is to be developed as a whole while considering the impact of the subsystems – Input, screening, sortation, and output. The focus is mainly on the BHS layout design to minimize congestion and maximize throughput.
- Baggage size and weight variability: Design the system to accommodate baggage of various sizes and weights, including oversized or irregular items, including addressing the need for flexibility and adaptability in the design.
- Maintenance and reliability: Develop strategies for ensuring the reliability and availability of the BHS, considering maintenance schedules, redundancy and availability measures, and fault detection systems.
- Integration with airport infrastructure: Consider how the baggage handling system integrates with other airport infrastructure and existing BHS.
- Security and screening: The design incorporates security measures, including explosive detection systems, and physical inspections. Develop ways to optimize security while maintaining operational efficiency.
- Regulatory compliance: Consider the regulations and standards that govern BHS, such as safety regulations, data protection requirements, or environmental guidelines and. how the design aligns with these TSA and other federal, state, and local

General Design Guidelines

Mechanical

regulations.

- Safety
  - System: System design includes ensuring that the system and related components satisfy all legal safety requirements required by all governing codes.
  - Life safety: Develop egress routes with coordination with the Owner and the responsible authorities. The design must supply all necessary crossovers, catwalks, etc. to satisfy all life safety requirements.
  - Personnel: System design includes safety measures to protect the working staff of the BHS and those that can access the BHS from injuries. These safety measures must be in accordance with and follow federal as well as local OSHA and other safety regulations.
- System Requirements
  - Bag hygiene and clearances: Develop baggage right-of-ways that provide adequate clearances for bags, including at elevation changes. Also, the system design must include load points and bag transitions that maximize bag hygiene and bag stability to transport the baggage smoothly and effectively through the system. This is done through:
    - Measures to protect bag and system damage from bag straps, handles, wheels, etc.
    - Keeping incline and decline angles minimized; especially when bags are tracked.
    - Eliminate abrupt speed changes or direction changes.
  - The system design must include clearances for equipment to provide maintenance access.
  - The system design must consider means to limit noise below OSHA requirements.
  - The system design must consider means to eliminate vibrations from the BHS from transmitting to the building and structures.

Electrical

This document provides a comprehensive set of guidelines for designing the electrical system in the Baggage Handling System (BHS). Covering key areas such as project assessment, power distribution, Power Panel installation, conduits, transformers, and more, these guidelines aim to enhance the reliability and efficiency of the BHS electrical infrastructure.

Guidelines for Electrical Load Planning

Planning the electrical load for a Baggage Handling System (BHS) is a critical step to ensure the safe and efficient operation of the system. Consider the following guidelines when undertaking electrical load planning.

- Equipment Inventory: Develop a comprehensive inventory of all electrical equipment within the BHS, including conveyor systems, motors, sensors, PLCs, servers, workstations, and other devices. Consider both present and future equipment requirements.
- Power Requirements: Determine the power requirements for each electrical device based on their specifications and operational needs. Account for both peak and average power consumption to dimension the electrical infrastructure accordingly.
- Voltage and Current Ratings: Verify the voltage and current ratings of each device to ensure compatibility with the electrical supply. Plan for appropriate transformers or power distribution units to manage different voltage requirements within the system.
- Diversity Factor: Consider the diversity factor, which reflects the likelihood that not all devices will operate at maximum load simultaneously. This factor helps in sizing the electrical system more accurately and prevents over-dimensioning.
- Start-Up Currents: Account for start-up currents, which can be significantly higher than the steady-state currents. Ensure that the electrical infrastructure can handle the inrush currents during device start-up without causing voltage drops.
- Future Expansion: Plan for future expansions and additional equipment. Design the electrical load capacity to accommodate potential growth in the BHS, preventing the need for major upgrades or modifications when expanding the system.
- Load Balancing: Distribute the electrical load evenly across phases to balance the electrical system. This prevents phase imbalances, reduces losses, and ensures optimal performance of equipment.
- Harmonics and Power Quality: Assess the potential for harmonics generated by nonlinear loads such as variable frequency drives (VFDs) and implement measures to mitigate their impact. Ensure good power quality to prevent disturbances in the BHS.
- Emergency and Redundancy: Plan for emergency situations and incorporate redundancy where critical. Ensure that essential systems, such as security scanners or emergency lighting, have dedicated power sources to guarantee continuous operation.
- Monitoring and Control: Implement monitoring and control systems to track electrical loads in real-time. This enables proactive management, early detection of issues, and optimization of the electrical infrastructure.
- Environmental Considerations: Consider the environmental conditions, such as temperature and humidity, as they can impact the efficiency and lifespan of electrical equipment. Implement measures to mitigate adverse environmental effects.
- Regulatory Compliance: Ensure compliance with relevant electrical codes and standards. Adhering to regulatory requirements is crucial for the safety and legality of the electrical installation.

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Guidelines for Electrical Power Panels and Motor Control Center (MCC) Installation

Consider the following guidelines in the installation of electrical power panels and Motor Control Centers (MCCs).

- Location and Environment: Choose a suitable location for electrical power panels and MCCs, considering accessibility, ventilation, and environmental conditions. Protect equipment from exposure to extreme temperatures, humidity, and potential physical damage.
- Compliance with Standards: Ensure that the installation adheres to relevant electrical codes and standards. Complying with industry regulations promotes safety and reliability.
- Space Planning: Plan for adequate space around electrical panels and MCCs for maintenance activities. Follow manufacturer recommendations for clearance to ensure proper ventilation and easy access.
- Cable Routing: Implement organized cable routing to and from electrical panels and MCCs. Use conduits, trays, and supports to manage cables, preventing interference with other equipment and facilitating future maintenance.
- Equipment Grounding: Properly ground electrical panels and MCCs to ensure safety and protect against electrical faults. Grounding practices should comply with industry standards and local regulations.
- Labeling and Documentation: Clearly label all components and circuits within electrical panels and MCCs for easy identification. Maintain detailed documentation outlining the layout, connections, and specifications.
- Accessibility and Safety: Design the installation to ensure easy accessibility for maintenance personnel. Install safety features such as disconnect switches, emergency stops, and proper signage for quick and safe interventions.
- Redundancy and Backup Systems: Consider redundancy in critical components to minimize downtime in case of failures. Implement backup systems where necessary, especially for components that are vital to the continuous operation of the BHS.
- Electromagnetic Interference (EMI): Mitigate EMI by using shielded cables and isolating sensitive equipment within the panels. This is crucial, especially in areas with sensitive electronic devices.
- Cooling and Ventilation: Ensure proper cooling and ventilation for electrical panels and MCCs to prevent overheating. Use fans or ventilation systems if necessary and monitor temperatures to avoid equipment damage.
- Fire Protection: Implement fire protection measures, such as fire-resistant enclosures or suppression systems, to safeguard against potential fire hazards.

Guidelines for Electrical Installation of Conductors and Wires

- Wire Sizing: Size conductors based on current carrying capacity, accounting for factors like load, ambient temperature, and installation conditions to ensure optimal performance.
- Insulation Material: Select insulation materials considering environmental conditions, ensuring compatibility with temperature, moisture, and other factors crucial for longevity and safety.
- Color Coding: Implement a standardized color-coding system for conductors to facilitate easy identification and compliance with industry standards, promoting clarity in the wiring system.
- Stranding and Flexibility: Choose stranded conductors for enhanced flexibility, particularly in areas with vibrations or movements, to prevent damage and ensure longevity.
- Voltage Rating: Select conductors with a voltage rating that exceeds the system's operating voltage, ensuring safety and compliance with electrical standards.
- Installation Practices: Adhere to proper installation practices, including secure cable bundling and robust support structures, to prevent sagging or damage during operation.
- Grounding Conductors: Install grounding conductors in accordance with safety regulations and standards, promoting electrical safety and system reliability.
- Shielded Cables: Use shielded cables for sensitive electronic equipment to minimize the impact of external electromagnetic interference, ensuring the integrity of signals.
- Separation of Power and Control Wiring: Separate power and control wiring in distinct raceways to prevent interference, maintain signal integrity, and comply with safety standards.
- Cable Management: Implement effective cable management practices such as cable trays or conduits to organize and secure conductors, facilitating maintenance and troubleshooting.
- Temperature Considerations: Consider temperature ratings of conductors, especially in areas with varying temperatures, to ensure the insulation's reliability under diverse environmental conditions.

Guidelines for Electrical Installation of Conduits and Raceway

- Conduit Selection: Choose conduits made from suitable materials based on environmental conditions and specific applications.
- Sizing and Fill Ratio: Size conduits appropriately to accommodate the number and size of conductors. Ensure compliance with fill ratio guidelines to prevent overheating and facilitate future modifications.
- Routing Planning: Plan conduit routes to minimize bends and turns, optimizing the efficiency of the system. Avoid sharp bends that could damage conductors or impede the pulling of cables.
- Support and Fastening: Provide proper support and fastening for conduits to prevent sagging and ensure stability. Use hangers, clamps, or brackets according to manufacturer recommendations.
- Environmental Protection: Protect conduits from environmental elements such as moisture, chemicals, and physical damage. Utilize appropriate seals, fittings, and covers to maintain the integrity of the conduit system.

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Guidelines for Electrical Installation of Conduits and Raceway

- Accessibility for Maintenance: Ensure that conduits are easily accessible for maintenance purposes. Design access points or removable covers at strategic locations for convenient inspection and troubleshooting.
- Separation from Other Systems: Keep conduits separated from other building systems and avoid sharing conduits with incompatible services to prevent interference and maintain signal integrity.
- Grounding: Implement proper grounding techniques for metallic conduits to ensure electrical safety. Connect grounding conductors according to industry standards and local electrical codes.
- Expansion Considerations: Plan for future expansions by leaving spare conduits or raceway pathways. This foresight facilitates the addition of new cables or conductors without major disruptions to the existing conduit system.
- Conduit Marking and Labeling: Clearly mark and label conduits to indicate the type of cables they contain, termination points, and any specific instructions for maintenance or modifications.
- Bushing and Grommets: Install bushings or grommets at entry and exit points of conduits to protect cables from abrasion and ensure a smooth transition. This prevents damage to cable insulation during installation.
- Fire Ratings and Compliance: Choose conduits with appropriate fire ratings and ensure compliance with local building codes. Use fire-rated conduits in areas where fire resistance is a critical factor.

Guidelines for Electrical Transformers

- Voltage Regulation: Ensure transformers deliver stable and regulated power to accommodate the specific voltage requirements of sensitive equipment like server racks, Programmable Logic Controllers (PLCs), and control panels within the BHS.
- Isolation and Protection: Select transformers that provide effective isolation between primary and secondary circuits, safeguarding electronics from voltage spikes, fluctuations, and electrical noise to enhance overall system safety and reliability.
- Power Distribution: Select transformers that facilitate efficient power distribution at various voltage levels, aligning with the diverse requirements of equipment in the BHS for compatibility and optimal performance.
- Efficiency and Energy Management: Prioritize high-efficiency transformers to minimize energy losses, promoting energy efficiency in the BHS and reducing operational costs.
- Space Optimization: Choose compact transformer designs to optimize space utilization within BHS facilities, especially where real estate is limited, ensuring efficient placement of electrical components.
- Compliance with Standards: Verify that selected transformers comply with relevant electrical standards, codes, and regulations to ensure adherence to industry best practices, promoting safety, reliability, and performance in the BHS.

Controls

Baggage Handling System (BHS) control systems are integral components in modern airports, orchestrating the intricate process of moving baggage seamlessly from check-in to final destination. These systems leverage a combination of hardware and software elements to ensure the efficient, accurate, and secure handling of luggage, contributing to the overall functionality and reliability of airport operations. Key Components are described in the following section.

Network Architecture

In designing the network architecture for Baggage Handling Systems (BHS), designers should prioritize redundancy, scalability, and cybersecurity. This involves implementing failover mechanisms, accommodating future growth, and ensuring robust protection against unauthorized access. Key considerations also include seamless integration with external systems, effective network segmentation, real-time monitoring, and comprehensive documentation to enhance manageability and overall system performance.

- Redundancy and Failover
  - Redundant Network Paths: Implement redundant network paths to minimize disruptions in case of failures.
  - Failover Mechanisms: Incorporate health monitoring tools to assess system conditions and trigger failover as needed.
  - Data Synchronization: Ensure real-time data synchronization between primary and backup systems to prevent data inconsistencies.
  - Failback Capabilities: Include failback procedures to smoothly return operations to the primary system after recovery.
- Scalability and Flexibility
  - Scalable Infrastructure: Design a network architecture that is scalable to accommodate growing data demands and additional equipment.
  - Modular Design: Adopt a modular approach for flexibility, allowing easy integration of new technologies and components.

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- Traffic Prioritization
  - Quality of Service (QoS): Prioritize network traffic, especially for critical BHS operations like Sort Allocation Controller (SAC) and messaging to Programmable Logic Controllers (PLC).
  - Bandwidth Allocation: Allocate bandwidth judiciously, considering the volume of data generated by various applications and ensuring optimal performance.
- Security Measures
  - Robust Cybersecurity: Employ robust cybersecurity measures, including firewalls, intrusion detection systems, and encryption protocols, to protect against unauthorized access and data breaches.
  - Access Controls: Implement stringent access controls to secure data center resources and prevent unauthorized entry.
- Integration with External Systems
  - Secure Connections: Establish secure connections with external systems, such as airline servers, for seamless integration of critical data like Baggage Source Message (BSM) and Baggage Process Message (BPM).
  - Data Exchange Standards: Ensure compatibility with industry data exchange standards for consistent and secure communication.
- In-line with "Data Exchange Standards":
  - Cybersecurity: Ensure that the BHS is coordinated with AUS Information Systems to provide all necessary TSA cybersecurity measures.
- Network Segmentation and Isolation
  - Segmentation: Segment the network to isolate different components within the data center, preventing interference and enhancing overall system reliability.
  - Virtual LANs (VLANs): Utilize Virtual LANs to logically separate traffic, facilitating efficient network management.
- Monitoring and Analytics
  - Real-time Monitoring: Implement real-time network monitoring tools within the data center to assess network health, identify potential issues, and enable prompt interventions.
  - Analytics Utilization: Utilize analytics tools to gain insights into network performance, enabling data-driven optimization strategies.
- Documentation and Compliance
  - Comprehensive Documentation: Maintain detailed documentation of the network architecture, configurations, and protocols within the data center.
  - Regulatory Compliance: Ensure that the network design adheres to relevant industry standards and regulations governing data center operations.
- Backup and Recovery
  - Data Backups: Regularly back up network configurations and settings within the data center to expedite recovery in case of network failures or changes.
  - Disaster Recovery Plan: Develop a comprehensive disaster recovery plan outlining procedures for network restoration and data recovery.
- Training and Support
  - Staff Training: Provide training for IT personnel responsible for managing and maintaining the network within the data center to ensure optimal performance.
  - Vendor Support: Establish relationships with network equipment vendors to ensure ongoing support, updates, and maintenance.

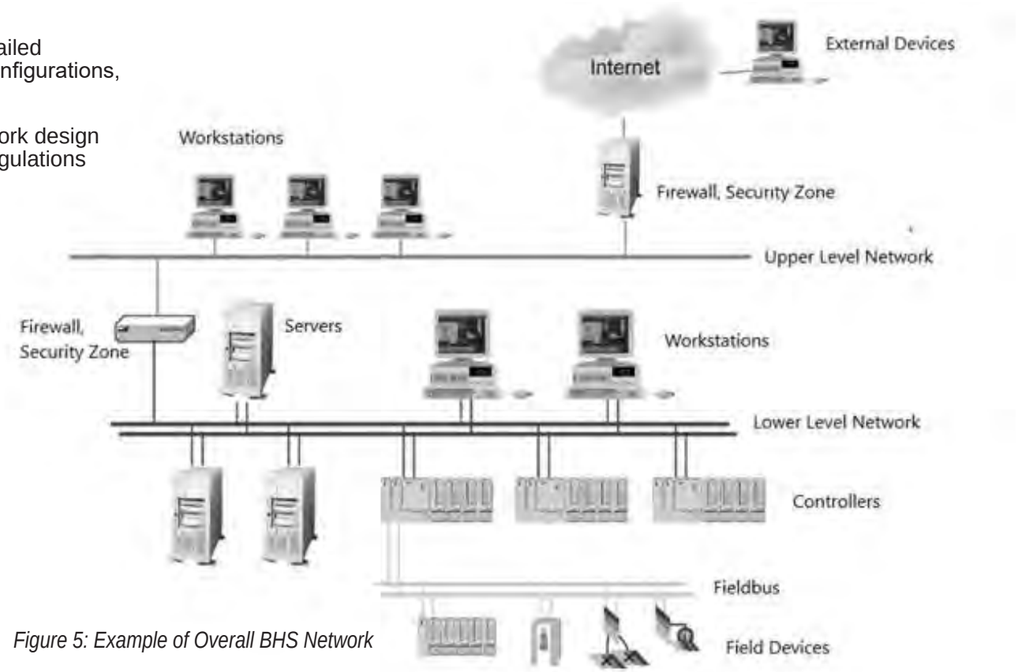

Figure 5: Example of Overall BHS Network

General Design Guidelines

Controls (Continued)

Upper-Level Control Systems

The upper-level control systems in a Baggage Handling System (BHS) serves as the technological backbone, encompassing server computers, virtualization technologies, network architecture, and cybersecurity measures.

This design guideline aims to provide a comprehensive framework for developing an upper-level control system that optimizes sorting processes, facilitates real-time decision-making, integrates seamlessly with security protocols, and offers operators a complete view of the BHS layout and health status for enhanced operational visibility. The following are key considerations in the design of upper-level control system.

- Server Configuration
  - Redundancy: Implement redundant host servers to ensure continuous BHS operation in the event of server failures.
  - Virtualization: Leverage virtualization technologies such as VMware or Hyper-V for server consolidation, flexibility, and efficient resource utilization.
- Network Architecture
  - Redundant Switches: Design a network architecture with redundant network switches to ensure reliable and uninterrupted communication between BHS components.
  - Scalability: Plan for scalable network infrastructure to accommodate future expansions or modifications in the BHS.
- Data Exchange with Airlines
  - API Integration: Establish secure Application Programming Interface (API) integrations with airline servers for seamless data exchange.
  - Message Handling: Implement efficient handling of Baggage Source Messages (BSM) and Baggage Process Messages (BPM) to support accurate baggage tracking and routing.
- Cybersecurity Measures
  - Access Controls: Define and implement access controls to restrict unauthorized access to BHS data and control systems.
  - Encryption: Employ encryption protocols for secure data transmission between upper-level components and external servers.
- Server Room Environment
  - Temperature and Humidity Control: Maintain optimal temperature and humidity levels within the server room to ensure server performance and longevity.
  - Power Redundancy: Implement redundant power systems, including Uninterruptible Power Supply (UPS), to prevent data loss or system downtime during power fluctuations.
- Monitoring and Reporting
  - Real-time Monitoring: Deploy monitoring tools to provide real-time visibility into server performance, network traffic, and overall BHS health.
  - Alerting System: Establish an alerting system to notify operators of critical issues or potential failures for timely intervention.
- Documentation and Compliance
  - Comprehensive Documentation: Maintain detailed documentation of the upper-level control system design, including configurations, network diagrams, and integration details.
  - Regulatory Compliance: Ensure the design complies with relevant industry standards and regulations governing airport IT systems.
- Disaster Recovery and Backup
  - Backup Systems: Implement regular data backups and establish backup systems to recover critical information in case of system failures.
  - Disaster Recovery Plan: Develop a comprehensive disaster recovery plan outlining procedures for system restoration and data recovery.
- Scalability and Future Expansion
  - Modular Design: Design the upper-level control system with a modular approach to facilitate easy scalability and accommodate future expansions or technological upgrades.
  - Compatibility: Ensure compatibility with emerging technologies and industry trends to support the BHS's long-term viability.

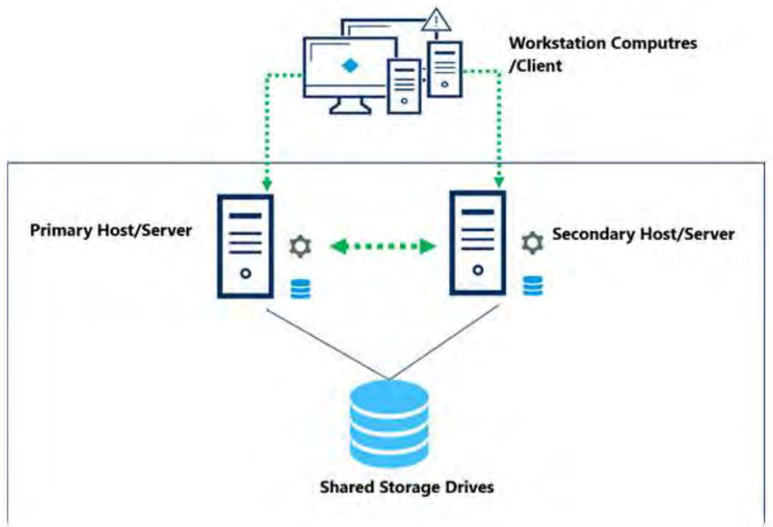

Figure 6: Example of Upper-Level Network

I. GENERAL TECHNICAL DESIGN STANDARDS

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Controls (Continued)

Design Guidelines for Sort Allocation Controller

- Real-Time Sorting Logic: Develop algorithms that enable real-time decision-making for efficient and accurate sortation of baggage based on destination, flight, or other relevant criteria.
- Adaptability to Changing Conditions: Design the application to adapt to dynamic conditions, accommodating variations in flight schedules, and system statuses.
- Redundancy and Failover: Implement redundancy and failover mechanisms to prevent disruptions in case of system failures, ensuring continuous sortation operations.
- User-Friendly Interface: Create an intuitive and user-friendly interface for operators to configure sortation rules, monitor system status, and troubleshoot issues efficiently.
- Priority Handling: Incorporate prioritization features to handle urgent or high-priority baggage effectively, ensuring critical items are processed promptly.
- Data Exchange Standards: Adhere to industry-standard data exchange formats to facilitate communication with other BHS components and external systems, including airline servers.
- Error Handling and Reporting: Implement robust error handling mechanisms and reporting features to promptly identify and address issues in the sortation process.
- Security Measures: Incorporate security measures to protect the application from unauthorized access, ensuring the integrity and confidentiality of sortation rules and data.

Design Guidelines for Supervisory Control and Data Acquisition (SCADA) /HMI

- User-Centric Design: Prioritize a user-friendly interface with intuitive controls to enhance operator efficiency. Ensure clear and concise presentation of critical information, minimizing cognitive load for operators.
  - Prioritize
  - Ensure clear
- Customization Options: Allow operators to customize the HMI layout and preferences based on individual needs.
- Alerts and Notifications: Implement a robust alert system for timely notifications of system status, faults, or abnormal conditions.
- Real-Time Monitoring: Provide real-time monitoring capabilities, enabling operators to track baggage and system performance continuously.
- Interactive Elements: Incorporate interactive elements such as touchscreens, buttons, and sliders for an engaging and responsive user experience.
- Intuitive Navigation: Design an easily navigable interface, allowing operators to access different functions swiftly.
- Error Handling and Diagnostics: Include features for effective error handling, diagnostics, and troubleshooting assistance.
- Compatibility with Devices: Ensure compatibility with various devices, including desktops, tablets, or mobile devices, for flexibility in operator access.
- Security Measures: Implement security features to control access levels and protect sensitive information within the HMI.

Guidelines for Programmable Logic Controllers (PLC)

When selecting Programmable Logic Controllers (PLCs), designers must ensure optimal performance, reliability, and efficiency. The following key considerations should be followed:

- Redundancy and Reliability
  - Implement redundancy in PLC configurations to eliminate single points of failure.
  - Utilize hot backup solutions for critical areas, ensuring continuous operation in the event of hardware failures.
- Scalability: Design the PLC system to be scalable, accommodating future expansions or increased baggage handling capacity.
- Scan Time and Memory Utilization
  - Group PLCs based on industry best practices to maintain efficient scan times and memory utilization.
  - Optimize program logic to minimize scan times and ensure timely execution of control functions.
- Integration with Field Devices: Implement communication protocols that facilitate seamless integration with various field-mounted devices, including variable frequency drives, motors, photocells, encoders, beacons, and tower lights.
- Security Measures
  - Implement security features on PLCs to protect against unauthorized access and cyber threats.
  - Use secure communication protocols and consider physical security measures for PLC cabinets.
- Backup and Restore Procedures: Establish robust backup and restore procedures for PLC programs to facilitate quick recovery in case of failures.
- Network Connectivity
  - Provide reliable network connectivity for PLCs to enable communication with other components of the BHS, such as servers, workstations, and field devices.
  - Implement redundant network paths to minimize the impact of network failures.
- Environmental Considerations
  - Ensure that PLC cabinets are located in environments with controlled temperature, humidity, and adequate ventilation.
  - Protect PLCs from environmental factors that may impact their performance.

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Design Guidelines for Sensor Devices

The following key considerations should be followed when selecting sensor devices for BHS applications.

- Type of Sensors: Select sensor devices tailored to the specific needs of the BHS, encompassing photocells, encoders, proximity sensors, and other types suitable for baggage tracking and sorting.
- Accuracy and Precision: Choose sensors with high accuracy and precision for reliable detection and tracking of baggage, with adjustable sensitivity to accommodate varying sizes and materials.
- Environmental Considerations: Ensure sensors are suitable for environmental conditions, considering factors like temperature, humidity, and exposure to dust or debris, with appropriate IP ratings for protection.
- Durability and Reliability: Select durable sensors capable of withstanding high-traffic and fast-paced baggage handling environments, with long mean time between failures (MTBF) to minimize maintenance.
- Integration with PLCs and Control Systems: Select sensors that seamlessly integrate with Programmable Logic Controllers (PLCs) and control systems, ensuring compatibility with communication protocols like Ethernet/IP, ProfiNet, or others.
- Communication Speed and Latency: Evaluate communication speed for real-time data acquisition and minimal latency, considering sensors with fast response times for quick decision-making.
- Communication Redundancy: Implement redundant communication paths for critical sensor data to eliminate single points of failure, ensuring resilience to network or system failures.
- Power Requirements: Consider power requirements, ensuring the BHS infrastructure provides sufficient and reliable power, and explore low-power or energy-efficient sensor options to minimize operational costs.
- Maintenance and Calibration: Choose sensors easy to maintain and calibrate, implementing a regular schedule for periodic checks and calibrations to ensure continued accuracy.
- Positioning and Mounting: Determine optimal sensor positioning and mounting locations, considering adjustable mounting options for flexibility in adapting to changing operational requirements.

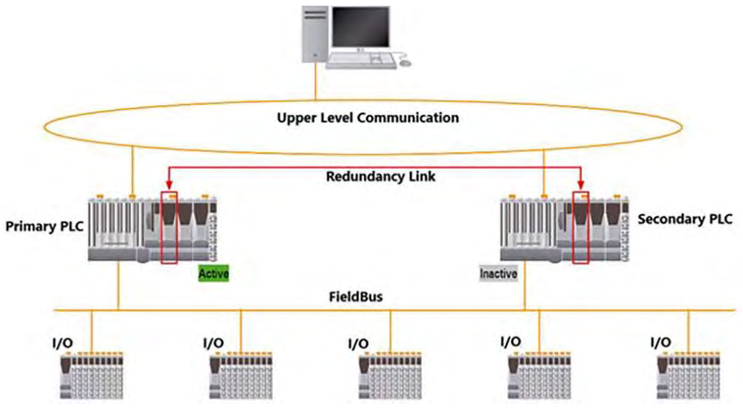
Transportation Security Administration (TSA) Requirements for Screening System

AUS is required to screen all originating checked and rechecked/ transfer bags that have not been screened for concealed explosives to the TSA Standard Operating Procedures (SOP) as required by United States regulations. To achieve this mission, TSA relies on the close coordination with aviation operating entities by using their installed baggage conveying systems and infrastructure to support aviation security policies using TSA certified Explosive Detection Systems (EDS) or any other TSA approved/certified technology and procedure.

TSA assists planners and designers in developing cost-effective solutions for Checked Baggage Inspection Systems (CBIS) with the development of the TSA Planning Guidelines and Design Standards (PGDS). The PGDS outlines requirements and guidelines to identify compliant CBIS by using an Individual Carrier System (ICS) or by standard belt conveyor, other technologies may be considered in cooperation with TSA. The PGDS incorporates insights, design principles, methods, and experiences from industry stakeholders, including airport and airline representatives, planners, architects, baggage handling system designers and equipment manufacturers.

The PGDS outlines the design process including detailed deliverables to obtain the EDS and associated ancillaries to support baggage screening.

Detailed system configuration and test requirements are established for system acceptance by TSA to facilitate baggage screening to support aviation operations.



II. SPECIFICATIONS

A. General Requirements Subgroup

Airport facilities are subject to all federal, state, local, and Airport requirements depending on the location and nature of the development. The AUS Project Manager will advise the Designer of information required to be incorporated into the Project Manual. Civil specifications must conform to the City of Austin standard specifications (pre-95 formatting). FAA specifications must comply with FAA submittal requirements and formatting. All other specifications must comply with and be formatted according to CSI standards.

Division 01 - General Requirements

Permits, Codes, and Regulations

Federal agencies, including the FAA, TSA, FCC, CBP, US Public Health Service, OSHA, and EPA, all have specific requirements for design, construction, and operations at a certified airport.

Accessibility standards required by the Texas Accessibility Standards (TAS) are enforced by the U.S. Department of Justice and the Texas Department of Licensing and Regulations (TDLR), respectively. Other State of Texas agencies which may have jurisdiction include the Texas Commission on Environmental Quality (TCEQ) and Texas Parks and Wildlife Department (TPWD).

Given AUS's location within the incorporated City of Austin in Travis County, any project located on AUS property is also subject to ordinances, codes, policies, standards, and design criteria required by the City and County. Regulations of the Austin / Travis County Health Department may also apply.

Design and construction shall be compliant with the latest adopted editions of the referenced codes, publications, and manuals, including all revisions effective at the time the project is submitted for permitting, unless specifically indicated otherwise.

Manuals adopted by the City establish drainage, environmental, transportation, and utilities criteria and standards. Standard specification manuals have also been adopted.

The listing of regulatory agencies in the DSM is not to be considered complete; the Developer is responsible for identifying and complying with all permitting and code requirements.

The DSM is the primary guideline for development of all facilities at AUS. City of Austin, Travis County, State of Texas, and federal regulatory agencies' requirements shall take precedence whenever they are more stringent and/or in conflict with this Manual.

AUS Design Review Policy and Procedures

Proposed changes at AUS by lease holders or proposed lease holders shall be compliant with this AUS Design Standards Manual requirements. The process for submitting proposed changes shall be as directed by the AUS Project Manager.

City of Austin Capital Improvement Program (CIP) projects are excluded from application for changes procedures because design documents are reviewed through a different process.

Maintenance work or repairs which are done under the General Development Permit are also excluded unless they will significantly alter the appearance or function of a facility or affect airport operations. However, maintenance work is not excluded from compliance with applicable permitting regulations.

AUS Construction Inspections

The AUS authorized representatives may inspect construction sites for the purpose of determining compliance with the terms and requirements of the DSM, AUS policies, and/or regulatory requirements. Construction work may be inspected or re-inspected any time.

Changes in the Scope of Work

Changes in the work during construction (via RFIs or ASIs) shall be carefully documented by the Designer and brought to the attention of the AUS Project Manager prior to proceeding with those changes. The AUS Project Manager will review the proposed changes and furnish comments to the Designer within one week of receipt of the change proposal. Work related to the change of scope shall not commence until the AUS Project Manager has given explicit approval to do so.

Changes shall include all modifications, additions, deletions, substitutions, or variations between the contract documents and the work. Changes incorporated into the work shall be accurately reflected in the job site drawings and as- built drawings

Changes shall conform to the terms and provisions of the DSM.

City of Austin Construction Permits

All requirements for City of Austin construction activities are applicable at AUS, including City of Austin site development permits, building permits, and trade permits.

In addition to City of Austin guidelines, policies, and standards, a development is subject to the provisions of the City of Austin Land Development Code (LDC), and building codes, including adopted amendments and related publications.

Designers are encouraged to consult with the City of Austin DSD staff early in the design process to minimize potential difficulties during project work, design, or construction.

Inspections, reviews, fees, testing, and permits required for design and construction in the City of Austin, County of Travis, and State of Texas, are the responsibility of the Designer.

AUS/City of Austin Site Plan Ordinance

City of Austin Ordinance 2012 0628-014 (AUS Development Ordinance / Development Permitting Guidance Document – December 2012) allows variances to the Land Development Code for on-Airport development. This ordinance is based on a set of master plans for water quality, erosion and sedimentation control, spoil storage, drainage and grading, land use, and demolition. These documents are available through the AUS Project Manager.

In preparing the Airport master plans, assumptions were made regarding configuration of developments, including those which would not be constructed prior to the first commercial passenger flights. The estimated impervious cover of those developments was included in the master plan calculations.

As required, the Designer must coordinate through the AUS Project Manager to determine how accurately the master plan assumptions anticipated the facilities under design. Variances from these assumptions are to be highlighted for City of Austin plan reviewers in the municipal permits process, and mitigation measures may be necessary to compensate for these variations.

II. SPECIFICATIONS

A. General Requirements Subgroup

Division 01 - General Requirements (Continued)

Environmental Guidelines and Regulations

The City of Austin is committed to environmentally responsible development. Facility development at AUS must meet appropriate community standards of environmental sensitivity. The site's history as a United States Air Force base means that additional efforts may be required to verify individual project site acceptability for development, and a selected project site may require remediation in order to complete the project.

AUS maintains records of site environmental conditions, including the status of remediation of all known contamination sites. Information may be requested through the AUS Project Manager.

All construction at AUS shall align with the City of Austin's commitment to sustainability and environmental responsibility. Designers shall incorporate sustainable principles and provisions into each construction project.

Erosion and Sedimentation Controls

Any construction projects which involve excavation, backfill, or disturbance of the existing ground will require erosion and sedimentation control measures.

The Designer shall provide temporary and permanent erosion and sedimentation control plans, narrative, and details in the construction documents in accordance with local, state, and federal requirements.

Storm Water Pollution During Construction

When applicable, any development disturbing an AUS land surface shall submit a Notice of Intent (NOI) under the National Pollutant Discharge Elimination System (NPDES) rules regarding storm water discharges from construction activities.

AUS has interpreted these requirements to mean that both the landowner – who does not retain day to day control of the site storm water discharge – and the Tenant – who does – shall submit NOIs.

The Designer and the AUS Project Manager shall coordinate the required submittals.

Storm Water Pollution from Industrial Activities

AUS is to be included in the NPDES Multi-Sector General Permit.

In AUS developments where storm water runoff is subject to industrial permit requirements, the Designer and/or Tenant may obtain permit by submitting an NOI referencing the AUS permit number or may obtain separate coverage and develop a project-specific Storm Water Pollution Prevention Plan (SWPPP).

The SWPPP for AUS as an operating airport does not include developments which are separately permitted and covered.

Wetlands and Floodplain Areas

Federal regulations control the development and use of land that is designated as either floodplain areas or wetlands to avoid environmental hazards and/or to protect environmentally sensitive areas from encroachment by development.

Floodplain areas and wetlands on the Airport are shown in the most current City of Austin Site Development Permit Master Plans.

Asbestos / Hazardous Materials

Asbestos containing materials (ACM) may be found on AUS properties either in buildings or underground as asbestos cement piping. Incorporation of any asbestos-containing materials (ACMs) in design or construction at AUS is prohibited. Forms documenting the non-use of ACM's before and after project design (Design Consultant's responsibility) and before and after construction (Contractor's responsibility) shall be submitted for the Owner's project files, as required by the AUS Project Manager.

The use of chlorofluorocarbons (CFC's) is limited to refrigerant use in accordance with local, state, and federal guidelines. Lead components shall not be included in the assemblies of domestic water systems.

Removal

If the Developer detects the potential for use or disturbance of ACM's or other hazardous materials during a project, immediate notification of the AUS Project Manager is required.

ACM abatement and disposal shall only be accomplished by personnel specifically qualified in asbestos handling and shall be performed in accordance with all local, state, and federal requirements.

The removal of other potentially hazardous materials, including but not limited to, lead paint, Polychlorinated Biphenyls (PCB's), CFC's, pesticides, etc., may be necessary prior to or during facility construction.

The proper identification, handling, removal, and disposal of hazardous materials are the sole responsibility of the Developer and shall only be performed by qualified personnel in accordance with all local, state, and federal requirements.

Hydrocarbons and Other Hazardous Materials

All storage and distribution systems for hydrocarbons and other hazardous materials at AUS, except for natural gas, shall be constructed above ground to reduce the potential for environmental contamination. In addition, containment may be required.

Such installations shall comply with all applicable codes and industry standards and shall be installed in accordance with all local, state, and federal requirements.

II. SPECIFICATIONS

A. General Requirements Subgroup

Division 01 - General Requirements (Continued)

Asbestos / Hazardous Materials

Minimizing Deleterious Effects on the Environment

Local, state, and federal regulatory agencies have established air and water quality standards which are in effect at AUS. Hazardous materials, whether a primary product such as fuel, fertilizer or motor oil, or a secondary product such as residue on paved vehicle parking areas, shall be handled responsibly.

Filtration, containment, or treatment may be required before materials are released into the environment. The Developer is responsible for providing all necessary equipment and/or systems for compliance with all authorities having jurisdiction.

Wash Facilities

The conservation of water resources is of great importance at AUS. Any Developer's proposed wash facility shall provide water treatment systems required by local, state, and federal regulations.

Waste and Sustainability

Any proposed Developer's facilities shall include provisions for participation in the refuse recycling and sustainability programs, as coordinated with, and approved by, the AUS Project Manager.

Accessibility Standards

All projects at AUS shall accommodate persons with disabilities, as provided for in the latest edition of the Texas Accessibility Standards (TAS) published by the Texas Department of Licensing and Regulation (TDLR).

Agencies with Jurisdiction

Numerous agencies have stakeholders and hold jurisdiction at the Airport. A subset of these agencies are below. The Designer is responsible to incorporate stakeholder agency requirements in the design documents.

Federal Aviation Administration (FAA)

Design and construction shall be in accordance with all applicable FAA design standards criteria, as set forth in FAA Advisory Circulars (ACs) and Federal Aviation Regulations (FARs).

The latest edition ACs may be obtained from the Federal Aviation Administration, U.S. Department of Transportation at: www.faa.gov/regulations_policies/advisory_circulars

See General Airport Development Considerations for information regarding height restrictions.

U.S. Customs and Border Protection (CBP)

The Department of Homeland Security - CBP is authorized to control the entrance and clearance of aircraft arriving in and departing from the United States and to inspect the crews, passengers, baggage, stores, and cargo carried thereon.

CBP enforces a large array of different laws for other agencies in protecting the borders of the United States. Any development of an international facility shall meet all U.S. Customs rules and regulations.

Public Health Agencies

The design and construction of projects that affect a food or beverage handling service at AUS will be reviewed by local, state, and federal regulatory health agencies as appropriate.

Federal Communications Commission (FCC)

All projects at AUS shall comply with any applicable FCC rules and regulations. All types of proposed wired and wireless communication systems shall be coordinated with the AUS Project Manager.

Transportation Safety Administration (TSA)

Designs must comply with all applicable TSA standards including those for security screening and checked baggage screening

AUS Airport Security Program

All designs must comply with US CFR Part 1542.101 and COA 13-1-81.

II. SPECIFICATIONS

A. General Requirements Subgroup

Division 01 - General Requirements (Continued)

General Airport Development Considerations

The use of AUS property shall remain consistent with the aesthetic and functional standards of the Airport. These standards derive from the Airport Layout Plan (ALP) of AUS (latest version) and the Airport Master Plan (latest version). Federal, state, and local statutes and regulations also apply and may restrict development.

Professional Licensing Requirements

All Designers signing and sealing drawings and project manuals (specifications) on behalf of the Developer shall be currently licensed for their respective disciplines in the State of Texas.

Leased Property Restrictions

Where the AUS development includes work to be owned, operated, and maintained by the City of Austin, transfer of responsibility shall be by means of a document setting forth the facilities and conditions of acceptance.

As requested by the AUS Project Manager, the Designer may be required to submit documents which may indicate lease lines, building setback lines, building frontage lines, and/or surveys conducted by a Registered Professional Land Surveyor for a particular area.

Landscape features, paving, and other pertinent features affecting development or operations will be included whenever possible.

All improvements shall be limited to within the boundaries of the leasehold, except for the required utility extensions and access roadways. Any proposed improvements which significantly impact areas outside of the project sponsor's leasehold – especially those which may affect other leaseholders – must be approved the AUS's Tenant Management Division prior to commencement of the project design.

Public Access

The primary mission of the Airport is the efficient movement of passengers and their property to and from aircraft and flight operations. All facilities in which public activity occurs shall meet all requirements for public accessibility and safety.

Height Restrictions

Per FAR Part 77, structures and objects within designated areas are height- restricted to prevent interference with air navigation, flight and navigation surfaces, radar shadowing, and the requirement that air traffic controllers be able to see all aircraft operating pavement under the control of Air Traffic Control personnel.

The Designer shall submit FAA Form 7460-1, Notice of Proposed Construction or Alteration, to the AUS Project Manager at least 60 calendar days prior to the scheduled start of construction activities. FAA approval of the 7460 is required prior to issuance of the NTP.

Noise

Local, state, and federal regulations control the development and use of land at AUS and the latest AUS Master Plan has information relevant to proposed land developments at AUS.

The Developer shall fully coordinate noise impacts of any proposed changes at AUS with the AUS Project Manager and all local, state, and federal authorities, including but not limited to the FAA and City of Austin.

Facilities within the Airport may be subjected to average noise exposure from airport operations more than 65 decibels. Activities sensitive to excessive noise are discouraged within these areas, and structures accommodating noise-sensitive uses must be sound-insulated in accordance with applicable codes and/or standards.

The FAR Part 150 Noise Study (latest version) contains noise contours and a table indicating the compatibility of different activities and land uses with the different levels of noise exposure. It also prescribes the noise attenuation that should be achieved in each zone.

Security

All Developers shall be aware of all airport security requirements pertaining to project scope. All security and law enforcement requirements, measures, and actions at the Austin-Bergstrom International Airport are governed by the AUS Airport Security Program (ASP). AUS Security maintains and enforces the AUS ASP, and questions about plan requirements/provisions must be directed to AUS Security. Entry and movement of persons and vehicles with Security Identification Display Area (SIDA) portions of the Airport are strictly controlled with such access being limited to the operational minimums.

Improvements and operations within 10 feet of an AOA fence are severely limited. Written approval of the AUS Project Manager is a prerequisite to improvements and/or operations in this area.

All persons performing work at the Airport shall be familiar with security measures and be aware that substantial fines may be assessed for violations of the security provisions of the Airport. Not only may the Director of Aviation assess citations, but also Airport police and TSA Security Staff have jurisdiction on Airport property.

Airport Security reserves the right to install, or to have installed, security devices including, but not limited to, security fencing, gate controls, video cameras, magnetic card readers and associated electronics and power sources within the project limits of any development on the Airport.

The AUS Security Plan is maintained by the Airport Security Manager, and questions about plan provisions may be submitted to AUS for review and response, as required.

Confined Spaces

Designers shall identify permanent permitted or non-permitted confined spaces as defined in OSHA 29 CRF 1910 on construction drawings for use by the Airport.

II. SPECIFICATIONS

A. General Requirements Subgroup

Division 02 - Existing Conditions

The Designer is responsible for confirming all existing conditions prior to design and construction. The Owner and Airport shall not be held responsible for existing conditions that were reasonably discoverable by the Designer or Contractor's due diligence. Designers and Contractors shall request historical drawings from the AUS Project Manager prior to work.

Geotechnical Conditions

General Subsurface Conditions

In general, the subsurface soils at AUS generally consist of dense, high-plasticity, expansive soils with a high corrosion potential. The Austin area has minimal potential for seismic activity; most structures are designed with a Seismic Design Category of A in accordance with ASCE 7 as referenced in local building codes. No movement has been detected in the Balcones fault zone, the primary local structural feature, during modern times.

Geotechnical reports and pavement design analyses for various locations on campus are available upon request from the Planning & Engineering Division through the AUS Project Manager. The Designer may be provided courtesy copies of the reports, which are considered useful only for general knowledge of the subsurface conditions of the general area.

No warranty for the site conditions or the recommendations is expressed or implied. The Designer shall have qualified professionals review this material.

Subsurface Investigations

The Designer's geotechnical engineer shall follow all federal, state, and local guidelines during all field operations.

Any indications of soil/groundwater contamination shall be made known to the AUS Project Manager immediately. Work shall cease in the affected area until the site condition has been investigated and resolved.

Proposed drilling locations shall be submitted to the AUS Project Manager prior to commencement of drilling activities for review.

Design Criteria

The foundation criteria will typically be that found in the City of Austin Building Code, as well as recommendations provided by the geotechnical engineer. The Designer shall identify on the drawings the design loads and deflection criteria of the slabs, column, and piers (including bearing/friction loads) for the assumed differential movement to be withstood by the building foundation and system.

- Foundation Design Criteria - The Designer shall employ a qualified structural engineer licensed in the State of Texas to provide a foundation design for the intended structure. This engineer shall have available the results of the Designer's geotechnical engineer's investigation.

  The Designer shall investigate the alternative foundation types provided by the geotechnical engineer suitable for the soil conditions and the proposed building type.

- Structural Systems - The Designer shall ensure the building structure is appropriate for the foundation type selected, including the stresses and differential movement likely to be experienced due to the soils at this location.

Groundwater Control Criteria

The Designer shall investigate and confirm the existing groundwater conditions at the building site and provide a plan for both temporary control of the water during construction and permanent control of the water to prevent deterioration of the building, the adjacent pavements and the surrounding facilities.

Protection of Adjacent Structures and Facilities

The Designer shall prepare plans for locations where proposed construction will endanger other facilities. These may consist of other foundations, roads, buried or overhead utilities, Navigational Aids (NAVAIDS), drainage system components or conveyances, airfield pavements, and temporary installations (such as other construction).

The Designer shall require the Contractor to install and maintain proper protection in any situation where other facilities are identified as likely to be endangered during construction, or when this is discovered in the field.

No blasting will be allowed. No unusual vibration or noise shall be allowed to unduly disturb adjacent operations or occupied spaces due to construction activities or use of the new facility or related activities.

Hazardous Materials

Lead or asbestos-containing materials (ACM's) shall not to be specified, requested, approved, or installed. Drawings must be submitted to the Asbestos Program Manager for review prior to the start of the project for assessment. This will help determine if an abatement consultant and contractor will be needed.

The Designer shall submit signed copies of the following:

- Statement of Non-Inclusion of Asbestos Containing Material (Designer, Prior to Design) stating that Designer shall not specify, request, or approve any ACM in this Project without prior written approval of Owner.
- Statement of Non-Inclusion of Asbestos Containing Material (Designer, After Design) stating that Designer has not specified, requested, or approved any ACM in this Project without the prior written approval of the Owner, and that any ACM allowed in this Project is identified in the Statements.

II. SPECIFICATIONS

A. General Requirements Subgroup

Division 03 - Concrete

Cast-in-Place Concrete

At a minimum, all cast-in-place concrete work, including forming, placement, and finishing, must be performed according to the American Concrete Institute (ACI) requirements and applicable standards. Quality control, including field testing of mechanical properties, should be performed by an Owner engaged inspector.

Floor slabs must be level within a tolerance of 1/8-inch in 10-feet. Pitch to drains in planes must have the same tolerance.

Precast Concrete

At a minimum, all precast architectural concrete must be designed and constructed according to the American Concrete Institute (ACI) and Precast Concrete Institute (PCI) requirements of all applicable standards.

Precast concrete sample panels should be required for all precast concrete work in a development and should illustrate the quality, color, and texture of the final surface finish. Sample panels must be approved by the AUS Project Manager prior to being manufactured and installed.

Division 04 - Masonry

Masonry products should be installed according to all applicable codes and standards, including but not limited to IBC, TMS, and ACI. Quality control, including field testing of mechanical properties, should be performed by an Owner engaged testing agency.

Acceptable masonry products include brick, concrete masonry units, and cast and natural stone. The finish and color must be approved by the AUS Project Manager. ASTM standards for mortars and grouts are acceptable but mix proportions must be carefully measured. Proportion by shovel or similar means is unacceptable.

Sample panels no less than 4-foot by 4-foot should be constructed to show materials and workmanship and must be approved by the AUS project manager prior to construction. The sample panel must remain for the duration of the project. At the AUS Project Manager's discretion, in-place mock-ups may be allowable in leu of sample panels.

Division 05 - Metals

Structural Steel:

Structural steel must conform to all applicable codes and standards, including but not limited to those published by IBC and AISC.

Light-Gauge Metal Framing:

The gauge and spacing of metal framing members must align with the recommendations of the wall or ceiling sheathing materials manufacturer for stability and flexure.

Handrails and Guardrails:

Handrails and guardrails must comply with all requirements of the building codes and accessibility standards. Welding must comply with American Welding Society (AWS) standards. Returns with closed ends at wall-mounted handrails must be provided.

Division 06 - Wood, Plastics, and Composites

Wood blocking in contact with concrete or masonry shall be pressure treated. All other wood blocking shall be fire retardant treated.

Cabinet hardware should be heavy duty grade selected for durability and aesthetic.

II. SPECIFICATIONS

A. General Requirements Subgroup

Division 07 - Thermal and Moisture Protection

Peer Review and Monitoring

Building projects with a large thermal and moisture protection scope require a building envelope, building commissioning, and/or waterproofing consultant to peer review details and monitor the construction of critical waterproofing installation and details.

Mockups and Testing

Building projects should prioritize the construction of standalone preconstruction performance mockups, to be inspected for quality, constructability, and aesthetics, and tested for performance characteristics determined by the Design Professional with input from the Owner's Representative.

Third-party design peer review, construction monitoring, and compliance testing of exterior building envelope, including, but not limited to, exterior walls, windows, roofs (see other sections regarding roofs), water-resistive barriers, waterproofing membranes, air and vapor barriers, flashings, and cladding, by subconsultants and/or testing agencies is encouraged. Such subconsultants should be retained by the Owner, Contractor, and/or Design Professional dependent on the task in a manner to maintain independence and minimize conflicts of interest.

Iterative inspection and testing of mockups is preferred to ensure subsequent trades do not impact the performance of the wall assembly. At minimum, inspection and testing should be performed both before and after installation of the cladding.

In addition, in-situ mockups shall be inspected and/or tested as specified by the Deisgn Professional at all critical components and transitions, including, but not limited to, water-resistive barriers, fenestrations, and other critical components. Mockup construction shall be collaborative, with input from the Design Professional, Contractor, Owner's Representative, Subconsultants, and Subcontractors considered. Standalone mockups should remain in place for the duration of the project to establish the baseline project quality and aesthetics.

Water Testing

Water testing of fenestrations shall be performed in general accordance with the applicable ASTM and American Architectural Manufacturers Association (AAMA) standards, with the following exception: collection of any water onto horizontal surfaces (such as mullions) during testing is unacceptable. The Design Professional shall define testing compliance to conform to this requirement.

Manufactured Metal Wall Panels

Manufactured metal panel systems and profiles are subject to approval by the Owner's Representative, with appropriate concealed water-resistive barrier resistant to high-temperatures.

Wall panels shall be no less than 22 gauge.

Roofing

A Class A, Factory Mutual approved roof system with a minimum of 20 year, no-dollar-limit manufacturer's warranty is required. Roofs should be designed, and materials selected to be durable and low-maintenance. In addition, a "Cool Roof" system (as defined by the U.S. Energy Department) should be incorporated where possible. For re-roofing projects, the Design Professional should ensure integration of the roof membrane and exterior wall water-resistive barrier.

Acceptable systems may include modified bitumen or standing seam interlocking metal. Exposed materials shall be light-colored for solar reflectance, but must not produce significant glare, which could adversely affect aircraft operations.

Roof-mounted equipment and roof penetrations should be avoided unless necessary. Where roof-mounted equipment is necessary, the equipment shall be screened for visual compatibility in such a way as to allow for proper maintenance of equipment, and roof protection pads shall be provided where foot traffic is anticipated.

Manufactured metal roofing and soffit panel systems and profiles must be approved by the AUS Project Manager and must be installed by a contractor certified by the roofing manufacturer.

Division 08 - Openings

Doors

Aluminum Entrances and Storefront

Aluminum storefront entrances should be equipped with extra-heavy-duty hardware. Storefront entrance assembly should be heavy-duty construction, medium-stile type.

Metal Doors and Frames

Exterior openings should be constructed of hollow metal doors and frames. All interior hollow metal doors and frames should be heavy duty at a minimum. All exterior hollow metal doors and frames should be extra heavy duty at a minimum. Standard duty doors and frames are not allowed. Doors and frames subject to wet conditions and all exterior conditions should be galvanized.

Flush Wood Doors

Interior wood doors should be solid core wood construction. Exterior wood doors are not allowed.

Overhead Doors

Motorized overhead doors and grilles, sectional, rolling, or coiling, must be equipped with a safety stop and a manual override. Exterior sectional doors and grilles should be galvanized metal or aluminum.

Door Hardware

Keying must be compatible with the AUS keying system and existing hardware products and must be coordinated through the AUS Project Manager. All key systems are part of the Airport security system and are subject to review by AUS security personnel. Door hardware must be coordinated with the access control system.

Vision Panels

Vision panels should be provided in all hollow metal and wood doors unless otherwise prohibited by security or operational requirements.

II. SPECIFICATIONS

A. General Requirements Subgroup

Division 08 - Openings (Continued)

Windows

Individual windows in opaque walls may be high quality aluminum framed storefront or curtainwall construction and should meet all aesthetic, energy, and functional standards.

Sloped or horizontal systems are not permitted.

Glazing

All glazing must meet the AUS aesthetic, energy, and functional standards.

Aluminum Framed Storefront and Curtainwall

Aluminum Framed Storefront systems must meet the AUS standards for sustainability and performance and may be designed under a delegated design.

Division 09 - Finishes

Aesthetics

The nature and character described in the Design Principles section of this Design Standards Manual must be expressed throughout the campus. Building materials should be selected for durability, ease of maintenance, and for their relationship to the structure and its intended use. Building materials should be locally-sourced whenever possible.

AUS has functional requirements for all projects. Public access and convenience, federally-mandated security, and airline and tenant operations are primary. Each development is to incorporate the functional requirements of that specific program, as well as those of the Airport.

All building systems should be highly efficient over the intended life cycle. Energy should be conserved, and operational and maintenance requirements minimized. Systems must be based upon aesthetic, climatic, and environmental conditions of the Central Texas and Austin areas.

Glare

Airport operations require maximum visibility for communications and safety. Building designs shall control solar glare within and without. Glazed surfaces should not have reflective coatings. Maximum reflectivity of exterior surfaces may not exceed 20%. Interior glare should not disturb airport operations or passenger comfort and convenience.

Architectural Finishes, Exterior

The Designer must submit a complete exterior material color and finishes board (in physical form – digital material boards are not allowed) to the AUS Project Manager for Owner review. All materials and finishes must be shown on a location plan provided with the finish board.

Walls and Windows

All wall surfaces subject to damage from materials handling, equipment, or vehicles shall be of durable, low-maintenance, impact-resistant materials. Examples of acceptable cladding materials include stone, masonry, and flat metal panel systems. Cladding materials, including insulated panels, should be fire-resistance to prevent vertical propagation of flames at exterior cladding.

Ribbed profile metal panel systems may be permitted for limited use with the written approval of the Owner’s Representative.

Architectural Finishes, Interior

All finishes must be durable, low-maintenance, and fire-resistant. A complete interior material color and finishes board (in physical form – digital material boards are not allowed) to the AUS Project Manager for Owner review. All materials and finishes must be shown on a location plan provided with the finish board.

- Tile / Resilient Flooring - The acceptable grade is commercial or industrial.
- Carpet - Adhesive-backed, non-padded, minimum 26 oz., tiled carpet is preferred.
- Acoustic Panel Ceilings - White, acoustic panels, two feet by four feet, set in an exposed grid are preferred. Concealed spline ceilings are prohibited.
- Paint - Only low-VOC paint is acceptable. No lead content will be allowed. Apply products in accordance with manufacturer's instructions and as specified or recommended by MPI Manual, using the preparation, products, sheens, textures, and colors as indicated.

II. SPECIFICATIONS

A. General Requirements Subgroup

Division 10 - Specialties

Signage and Graphics

Any publicly displayed signage (including logos, and promotional or advertising signage) must be included in the design documents and must be reviewed and approved by the AUS Project Manager prior to installation. All signage, graphics, and wayfinding must be compatible with the AUS signage standards and the surrounding aesthetics.

Signage must not create glare or block views. Illuminated signs must meet the lighting requirements of this Design Standards Manual and the Signage Standards.

Signage and graphics at AUS must be designed and constructed according to the following requirements.

- All building exterior and interior signage required by municipal, state, and federal regulations and accessibility standards must be specified by the Designer. Street addresses are assigned by the City of Austin.
- All site signage within the lease or project limits is to be specified by the Designer based on AUS standards and approved by the AUS Project Manager.
- Where operation or business identification is outside the lease area or at, or near, the access-way or roadway is necessary and approved by AUS, prototypical signage must be provided by the Developer.
- No corporate logo signage is permitted outside the lease area. The proposed signage location, utilities, and associated work must be approved in writing by the AUS Project Manager prior to fabrication or installation. The Developer is responsible for maintenance of all signage.
- When identifying a building or building complex, private or corporate signage is generally limited to one location within the leased space and must be surface mounted on the exterior wall and adjacent to the main building entrance. Maximum signage area, interior or exterior, is 40 square feet. Maximum height above finished grade for exterior signage is 16 feet. Lighting fixtures must be internal to the sign body.
- All public building signage must conform to AUS signage and graphics standards.
- Signage or graphic identification of concession or lease spaces within buildings is strictly controlled. Location, size, color, materials, and type of any signage proposed by a developer or operator of such space shall be clearly represented in design submittals.

Lockers

Personal storage lockers (for non-public spaces) should be of all welded construction.

Fire Extinguishers and Accessories

Designers should specify recessed or semi-recessed fire extinguisher cabinets, except in warehouse or storage facilities. In exterior locations, warehouse or storage facilities, surface-mounted cabinets or mounting brackets are allowed.

Fire Extinguisher cabinets must conform to all required fire separation requirements.v

Division 11 - Equipment

All exterior equipment shall be screened from view of the general public or otherwise made discreet and must be approved through the Owner's Representative. Roof-mounted equipment shall be avoided for ease-of-maintenance and security purposes.

Division 12 - Furnishings

All furnishings installed at AUS should be highly durable, easily maintainable and must be compatible with the surrounding finishes.

Division 13 - Special Construction

All Special construction must adhere to the AUS guidelines described in this Design Standards Manual.

Division 14 - Conveying Equipment

Refer to Vertical / Horizontal Transportation Design Standards section for requirements.

II. SPECIFICATIONS

B. Facilities Services Subgroup

Division 21 - Fire Suppression

General Fire Protection Specifications

Fire protection systems shall be installed as required by Authorities Having Jurisdiction (AHJ). Design Professionals shall be responsible for adding new or revising existing fire protection systems to conform to needs in renovated areas. Fire protection systems shall comply with the applicable edition of the International Building Code (IBC) and the International Fire Code (IFC), with City of Austin amendments, and all referenced codes and standards.

Project specifications shall be developed to reflect code compliance, industry standards, and AUS guiding principles.

Division 22 - Plumbing

Sleeves and Sleeve Seals for Plumbing Piping

Sleeves with water-proof caulking shall be provided at pipe penetrations through floors of wet areas located above spaces where a water leak could cause damage.

Escutcheons for Plumbing Piping

Chrome-plated metal escutcheons shall be provided at all pipe penetrations through walls or ceilings in regularly occupied areas.

Meters and Gauges for Plumbing Piping

Install thermometers at the outlet of each domestic water heater or hot water storage tank, the outlet of each master mixing valve, upstream of domestic hot water circulation pumps, and downstream of each balancing valve in domestic hot water return systems.

Install pressure gauges at the building entry for domestic water piping, at the inlet and outlet of each pressure reducing valve, and at the suction and discharge of each domestic water or reclaimed water booster pump system.

Hanger and Supports for Plumbing Systems

Steel used in hangers, rods, and supports for plumbing systems shall be stainless or galvanized.

Heat Tracing for Plumbing Piping

Heat trace beneath insulation for freeze-protection shall be provided wherever domestic cold water, uncirculated domestic hot water, or auxiliary water piping is exposed to unconditioned, outdoor air and temperatures that may drop below 40 degrees F.

Refer to AUS grease waste requirements for heat trace requirements for grease waste piping which may be provided by the AUS Project Manager.

P-traps in the sanitary waste system that are exposed to unconditioned, outdoor air at the Apron Level may require heat trace. These shall be evaluated on a case-by-case basis with AUS. If determined to be necessary, provide heat-trace beneath insulation at sanitary p-traps as well.

Identification for Plumbing Systems

Valve tags shall be included with all isolation valves.

Equipment labels shall be included with water heaters, water softeners, circulation pumps, primary thermostatic mixing valves, and other major equipment requiring maintenance.

Pipe labels shall be included with all above-ground piping systems and shall be the pre-coiled, semi-rigid plastic snap-around type. Label contents shall include the system name and flow-direction arrows.

Plumbing Piping Insulation

Indoor domestic and reclaimed water piping shall be provided with fiberglass insulation with all service jacketing. The minimum insulation thickness for each water system type and pipe size shall be in compliance with the latest City of Austin Energy Conservation Code.

Outdoor water piping to exterior potable water stations, emergency rinse stations, or other equipment shall be provided with elastomeric or cellular glass insulation and aluminum or stainless-steel jacketing.

Roof drain bodies and horizontal stormwater drainage piping shall be provided with minimum 1-inch-thick fiberglass insulation with all service jacketing.

Natural Gas Systems

Natural gas piping shall be distributed within the building at a pressure no greater than 5 PSIG, with secondary pressure-regulators at equipment as required. Pressure-regulators within distribution piping shall include an upstream isolation valve and strainer, and a downstream pressure gauge.

Above-ground natural gas piping shall be standard-weight (Schedule 40) black steel with threaded joints and malleable-iron threaded fittings. Provide plug valves in distribution piping and ball valves at the point of use equipment. Valves used for natural gas shall be listed for gas use by the manufacturer.

Domestic Water Piping

Domestic cold water, hot water, and hot water return piping shall be type “K” and “L” copper water tube. Below grade, type “K” annealed temper shall be used without joints, and shall include a polyethylene sleeve around the piping. Type “L” drawn temper shall be used above grade. Fittings and joints shall be either wrought copper solder joint fittings with soldered joints, copper pressure-seal-joint fittings and pressure-sealed joints, or grooved fittings with roll-grooved pipe ends and joints. For larger diameter piping, stainless steel piping with grooved couplings and roll-grooved pipe ends and joints may be used in place of copper.

General-Duty Valves for Plumbing Piping

Domestic water piping shall be provided with shutoff valves for isolation of piping sections and groups of plumbing fixtures for maintenance and repair. For restrooms, each shall have its own set of shut-off valves. In addition, in multi-occupant restrooms, each group of fixtures sharing a chase should have its own shut-off valves, to provide staff the ability to perform maintenance on one section of the restroom, while the other sections remain open for passenger use.

Valves Nominal Pipe Size (NPS) 2 and smaller shall be two-piece, full-port, brass-body ball valves with stainless steel trim. Valves NPS 2-1/2 and larger shall be cast-iron-body butterfly gate valves.

Locate valves to be accessible. Where an accessible chase is provided behind the fixtures, the preferred location for valves serving the group of fixtures is within the chase. Provide valves behind access panels in non-accessible ceilings and walls, if unable to locate them exposed in a chase, at the ceiling of a space without a ceiling, or above an accessible ceiling.

Division 22 - Plumbing (Continued)

Domestic Water Piping Specialties

A Pressure Reducing Valve (PRV) shall be provided at building service entrances and as required to keep the maximum pressure at 65 PSI or less, in accordance with the City of Austin Plumbing Code. Include inlet and outlet shutoff valves at each PRV. Where larger than a 3/4" PRV is required, include a low-flow 3/4" PRV with an outlet pressure set to 65 PSI, and one or more high-flow PRVs piped in parallel, sized for the peak flow, and with an outlet pressure setting of 55 PSI.

Automatic thermostatic balancing valves (CircuitSolver by ThermOmegaTech, or approved equal) shall be provided in domestic water return branch piping. At each balancing valve, include an upstream ball valve and strainer, and a downstream thermometer and ball valve. Ensure that the assembly is installed in an accessible location. Where an accessible chase is provided behind the fixtures, the preferred location is within the chase, next to the isolation valves serving the same group of fixtures.

At the end of each domestic hot water return main, include a manual balancing valve, sized to ensure that the velocity through the return main does not exceed 5 feet per second.

Provide an ASSE 1017 thermostatic mixing valve in the hot water piping exiting each domestic water heater. The outlet temperature shall be no greater than 120 degrees F. Provide point of use ASSE 1070 thermostatic mixing valves at each lavatory not equipped with a faucet that contains an integral ASSE 1070 mixing valve. The faucet delivery temperature shall be no greater than 110 degrees F.

Shock arrestors shall be included in the water lines serving fixtures or equipment that utilize quick-closing valves. Sizing and locating of shock arrestors shall comply with PDI-WH 201.

Ice maker boxes serving refrigerators shall include an integral shock arrestor.

Hose bibbs in public areas shall include a lockable wall box.

Next to each Potable Water Cabinet (PWC), provide a non-freeze wall hydrant, or a hose bibb connected to the heat-traced water supply to the PWC.

Floor drains shall include trap primers. The preferred source is the flush-tube from a water-closer flush-valve, followed by the tailpiece of a lavatory or drinking fountain. If neither is available within 20-ft of the floor drain, provide an electronically actuated type trap primer.

For the hub drains located beneath each outdoor Potable Water Cabinet (PWC), include a pressure-drop activated type trap-primer behind the PWC and route the discharge to the hub drain.

Domestic Water Circulation Pumps

Where fixtures requiring hot water are located further than 20-ft from the water heater, provide a circulated hot water loop to ensure that maximum distances between the source of hot water and the fixtures requiring hot water are within the limits of the CoA International Energy Conservation Code. Domestic water circulation pumps shall be provided with digital timer and aquastat controls.

Domestic Water Packaged Booster Pumps

Pressure booster pump systems shall be pre-packaged by the manufacturer and include multi-plex, variable speed, skid-mounted pumps and Variable Frequency Drive (VFD) controls. The pump run status and alarms shall be integrated with the Building Management System (BMS).

Mount booster pump skids on concrete housekeeping pads with vibration isolation devices.

Piping to booster pump systems shall include isolation valves and braided flexible connector fittings on the inlet and outlet, along with a normally-closed valved bypass with check valve.

Reclaimed Water Systems

Water closet and urinal flush fixtures not connected to the BJT shall be provided with reclaimed water for flushing. Piping shall be polypropylene with heat-fusion joints (Aquatherm Lilac, or approved equal) and shall be colored purple.

After entering the building, the City of Austin Reclaimed Water line shall enter a storage tank through an air gap. A domestic water fill line shall also be provided through an air gap, and shall open at a tank water-level as required to maintain a minimum level within the tank, in the event that the flow through the reclaimed water line is less than the building demand. The domestic water fill shall turn off at a level that is higher than the minimum, but much lower than the top of the tank. The reclaimed water fill line shall be open whenever the water level in the tank is less than full.

The reclaimed water storage tank shall be sized to accommodate the difference between the peak building demand and the fill-rate from the reclaimed water provider. If the resultant tank volume would be impractical, it shall be as large as can be accommodated by the architecture, with the difference being made up by the domestic water backup line rather than storage. The system shall then include treatment against unpleasant smells and bacteria growth (to be determined by the designer and water utility provider), before exiting the tank to be routed through a booster pump system.

Flush valves used with reclaimed water shall be listed by the manufacturer for such use (Sloan Royal Reclaimed, or approved equal).

For operation of the reclaimed water system, include training session of Owner personnel by individuals certified by the equipment manufacturer. Include digital file of the training session for Owner records.

Valve, shock arrestor, pressure, and label requirements shall then be the same as for domestic water systems.

Sanitary Waste and Vent Piping

Piping for sanitary waste and vent systems shall be cast iron. Buried systems shall be service-weight hub-and-spigot cast iron pipe with hubbed and gasketed fittings. Above ground systems shall be hubless cast-iron soil pipe and fittings with heavy-duty hubless-piping couplings and coupled joints.

Division 22 - Plumbing (Continued)

Sanitary Waste Piping Specialties

Floor drains shall include cast iron bodies and either nickel-bronze or stainless-steel strainers.

Provide a hub drain beneath each outdoor Potable Water Cabinet (PWC). Route the drain from each PWC to the hub drain and terminate it with an air gap.

Unless no walls are available within the distances listed in the UPC between cleanouts, provide wall cleanouts rather than floor cleanouts.

Provide a cleanout in the vertical vent takeoff of each water closet and urinal. Provide a cleanout at the upstream end of each run of horizontal sanitary waste piping serving multiple fixtures, with the cleanout located above the flood-level rim of the fixtures served. Where an accessible chase is provided behind the fixtures, the cleanout plugs shall face the chase for access. Where no accessible chase is provided, provide wall cleanouts instead.

Sanitary Sewerage Pumps

Where sanitary waste systems are required to be lifted, provide an automatic duplex sewage ejection system. Pumps shall include cutters/grinders for the handling of sewage and flushed solids, and guide rails for maintenance and removal. Controls shall include integration with the Building Management System (BMS) for pump run status and high-water alarm.

Grease Waste

Piping and fittings for grease waste systems shall be epoxy coated cast iron (by NewAge Casting, DuRa Pipe by Tyler, Edge HP Iron by Charlotte, or approved equal). Buried systems shall be service-weight hub-and-spigot pipe with hubbed and gasketed fittings. Above ground systems shall be hubless soil pipe and fittings with heavy-duty hubless-piping couplings and coupled joints.

Grease traps shall be approved by the City of Austin Industrial Waste Department. Grease trap sizes shall be limited to 5,000 gallons or less. Locate grease traps outside of aircraft lanes so that the grease traps do not need to be located within an aircraft traffic-rated vault.

For additional grease waste design requirements, refer to the AUS Grease Waste Management Program Manual.

Facility Storm Drainage Systems

Piping for primary and overflow storm drainage systems shall be cast iron. Buried systems shall be service-weight hub-and-spigot cast iron pipe with hubbed and gasketed fittings. Above ground systems shall be hubless cast-iron soil pipe and fittings with heavy-duty hubless-piping couplings and coupled joints. Unless no walls are available within the distances listed in the UPC between cleanouts, provide wall cleanouts rather than floor cleanouts.

Provide cast iron dome strainers on storm drains.

Area drains connected to the storm drainage system shall be provided at the tug tunnels and baggage handling areas exposed to the outdoors at the Apron Level. Backwater valves with access covers shall be provided between the drainage from these Apron Level area drains and drains from the roof or other higher levels.

Drains in vehicle traffic areas shall include cast iron bodies and ductile iron tractor grates.

Elevator Sump Pump Discharge

Elevator sump pumps shall be sized at 50 GPM per cab in accordance with ASME A17.1. A high-water alarm shall be provided with each sump. Where hydraulic elevators are used, the sump pit shall include a deeper, secondary sump with oil detection and alarm as well, in accordance with City of Austin requirements. The alarms shall then be integrated with the Building Management System (BMS).

Route elevator sump pump discharge piping above grade to a point near the exterior wall. Route it through a sample port in compliance with the City of Austin Plumbing Code, prior to connecting it to the site stormwater drainage system.

Elevator sump pump discharge piping shall be Type “L” drawn temper copper tubing with Drainage, Waste, and Vent (DWV) type copper fittings and soldered joints.

Include a check valve and downstream isolation gate valve in the discharge piping. Locate the valves to be accessible with the elevator pit.

Domestic Water Softeners

Provide domestic water softeners to soften domestic-water prior to it entering a water heater. Include a valved bypass around water softeners to facilitate maintenance and replacement. Domestic and auxiliary cold water does not need to be softened.

Domestic Water Heaters

The tanks and heat-exchangers within storage-type domestic-water heaters shall include a minimum 15-year manufacturer’s warranty (AquaPLEX by PVI, or approved equal). Natural gas fired water heaters shall be low NOx, high-efficiency, condensing type, and include an acid neutralizer for condensate drainage from the exhaust flue.

Gas fired water heaters shall be vented with CPVC, PP, or B-Vent material; PVC shall not be used for this function.

A check valve shall be included in the cold water piping between the water softener and the water heater. A thermal expansion tank shall be provided and connected to the piping between this check valve and the water heater to accommodate thermal expansion.

Water heaters shall not be located above a hung ceiling.

Domestic water heaters shall be set to a storage temperature of 140 degrees F.

II. SPECIFICATIONS

B. Facilities Services Subgroup

Division 22 - Plumbing (Continued)

Plumbing Fixtures

Refer to the AUS Restroom Design Standards for plumbing fixture guidelines. Areas covered by this standard include group and family restrooms, ambulatory restrooms, gender neutral restrooms, nursing rooms, pet relief rooms, and janitor service rooms. Fixtures covered include drinking fountains and bottle fillers, water closets, urinals, flush valves, general purpose sinks, service sinks, lavatories, faucets, hose bibbs, and floor drains.

Water closet and urinal flush valves shall be concealed and electronically activated, with a true mechanical override button on the user side. In addition, for water closet and urinal flush valves in the public areas, include an electronic push-button actuator with the button located in the chase behind the fixture for maintenance.

Electric water coolers shall include vandal-resistant bubblers, filters, and bottle filling stations. Include a cane skirt for TAS compliance on bi-level coolers if not recessed in an alcove. Where located in public areas, for additional chilled water capacity, provide in each water supply an additional remote 8 GPH chiller located above the nearest accessible ceiling.

Emergency Plumbing Fixtures

Emergency rinse stations provided outdoors near the aircraft gates shall be electrically heat traced and listed as freeze-proof by the manufacturer.

Division 23 - Heating, Ventilating, and Air Conditioning (HVAC)

Mechanical systems for building construction and renovations at AUS shall be designed to be constructed, installed and operated safely and in compliance with the requirements of the Authorities Having Jurisdiction.

These systems shall fully address the comfort and use needs of the building Owner and occupants in an energy-efficient and sustainable manner that minimizes impact on the environment.

Designer should provide specifications to meet all AUS requirements necessary for the project and ensure compliance. Specifications for each specific project should be reviewed with the AUS Project Manager during the design phase.

Common Work Results for HVAC

Contractor is responsible for all costs associated with providing mechanical equipment other than the equipment listed as the bases of design.

Construct concrete bases of 4” high or height recommended by the manufacturer, not less than 6 inches larger in both directions than supported unit.

Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials in accordance with NFPA.

All adhesives, sealants, paints and coatings used on the interior of the building shall comply with the Volatile Organic Compounds (VOC) requirements of this Design Standards Manual.

Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

Install HVAC equipment to allow maximum possible head room and to facilitate service, maintenance, and repair or replacement of components.

Verify final equipment locations for roughing-in.

Air doors shall be provided at building openings. At openings with operable doors the air door shall be interlocked to with the door. Large entry doors shall be provided with air curtains with heating water coils.

Equipment shall be selected from commercial grade manufacturers with local representation and easily available replacement parts.

Training shall be provided on all new equipment and software.

Common Motor Requirements for HVAC Equipment

Motors shall be manufacturer’s premium efficiency design for constant speed motors and manufacturer’s high efficiency design for variable speed motors.

Sleeves, Flashings, Supports and Anchors

Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

All supports shall be of type and arrangement to prevent excessive deflection, to avoid excessive bending stresses between supports, and to eliminate transmission of vibration.

Extend sleeves through floors (except in stairwells) two inches above finished floor level.

Sleeves through floors shall be sealed watertight to floors and pipe.

Where piping, ductwork or conduit penetrates floor, ceiling, or wall, close space between pipe or duct and adjacent work with fire stopping insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers, as appropriate, at both sides of penetration.

Meters and Gages for HVAC Piping

Scale temperature ranges for chilled water shall be 0-100 deg F and 30-240 deg F for hot water, with 2-degree scale divisions.

Install meters and gages on pipe at most accessible and readable position.

Division 23 - Heating, Ventilating, and Air Conditioning (HVAC) (Continued)

General Duty Valves for HVAC Piping

Provide valves with extended stem or handles to allow operation of valves without disturbing insulation.

Valve shall be installed in position to allow full stem movement.

Chilled Water Valve Schedule:

- Pipe NPS 2 and Smaller:
  - Ball Valves: Two piece, full port, brass or bronze with stainless-steel V-ball and trim.
  - Bronze Swing Check Valves: Class 150, bronze disc.
- Pipe NPS 2-1/2 and Larger:
  - Iron Ball Valves, NPS 2-1/2 to NPS 10: Class 150.
  - Iron, Single-Flange Butterfly Valves, NPS 2-1/2 to NPS 12: 200 CWP, EPDM seat, aluminized bronze disc nosing and stem.
  - Iron, Single-Flange Butterfly Valves, NPS 14 to NPS 24: 150 CWP, EPDM seat, aluminized bronze disc.
  - Iron Swing Check Valves: Class 250, metal seats.
  - Lubricated Plug Valves: Class 250, threaded

Heating Water Valve Schedule:

- Pipe NPS 2 and Smaller:
  - Ball Valves: Two piece, full port, brass or bronze with stainless-steel V-ball and trim.
  - Bronze Swing Check Valves: Class 150, bronze disc.
- Pipe NPS 2-1/2 and Larger:
  - Iron Ball Valves, NPS 2-1/2 to NPS 10: Class 150.
  - Iron, Single-Flange Butterfly Valves, NPS 2-1/2 to NPS 12: 200 CWP, EPDM seat, stainless-steel disc nosing and stem.
  - Iron, Single-Flange Butterfly Valves, NPS 14 to NPS 24: 150 CWP, EPDM seat, stainless-steel disc.

Condenser Water Valve Schedule:

- Pipe NPS 2-1/2 and Larger:
  - Iron, Single-Flange Butterfly Valves: 200 CWP, EPDM seat, stainless-steel stem and aluminized bronze disc.

Hangers and Supports for HVAC Piping and Equipment

Provide pipe shields and thermal hanger shields for all insulated piping to prevent damage to the piping or piping insulation.

Testing, Adjusting and Balancing for HVAC

The balancing, testing, and adjusting of the heating, ventilating and air conditioning systems shall be performed by a 3rd party certified technical test and balance firm agency not involved in the design. All tests shall comply with certification agencies standards and practices.

HVAC system airflow and water flow rates shall be set within plus or minus 10 percent tolerances.

Duct Insulation

Products shall not contain asbestos, lead, mercury, mercury compounds or formaldehyde.

Maximum length of flexible duct shall not exceed 5 feet.

Ductwork shall be externally insulated in accordance with associated temperatures and most current codes. Ductwork insulation materials shall be selected for the function involved, considering sound requirements, velocities, temperatures and locations.

HVAC Piping Insulation

Products shall not contain asbestos, lead, mercury, mercury compounds or formaldehyde.

HVAC piping shall be externally insulated in accordance with associated temperatures and most current codes. Pipe insulation materials shall be selected for the function involved, considering sound requirements, velocities, temperatures, locations, etc.

Indoor Piping Insulation Schedule:

- Condensate and Equipment Drain:
  - All Pipe Sizes: Insulation shall be the following:
    - Insulation Material: Flexible elastomeric.
    - Insulation Thickness: 1-1/2 inch.
    - Jacket: None
    - Vapor Retarder Required: No.
- Chilled Water Supply and Return:
  - All Pipe Sizes: Insulation shall be the following:
    - Insulation Material: Cellular Glass
    - Insulation Thickness: 2 inches
    - Minimum K value @ 75 Deg F: 0.23
    - Jacket: Aluminum for piping exposed in mechanical rooms or baggage handling areas and ASJ in all other locations.
    - Finish: Painted for ASJ only
    - Vapor barrier required: Yes

II. SPECIFICATIONS

B. Facilities Services Subgroup

Division 23 - Heating, Ventilating, and Air Conditioning (HVAC) (Continued)

HVAC Piping Insulation

- Heating-Hot-Water Supply and Return:
  - All Pipe Sizes: Insulation shall be the following:
    - Insulation Material: Mineral-Fiber, Preformed Pipe, Type I
    - Insulation Thickness: 2 inches
    - Minimum K value @ 75 Deg F: 0.012
    - Jacket: Aluminum for piping exposed in mechanical rooms or baggage handling areas and ASJ in all other locations.
    - Finish: Painted for ASJ only
    - Vapor barrier required: No

Outdoor Piping Insulation Schedule

- Chilled Water Supply and Return:
  - All Pipe Sizes: Insulation shall be the following:
    - Insulation Material: Cellular Glass
    - Insulation Thickness: 2 inches
    - Minimum K value @ 75 Deg F: 0.23
    - Jacket: Aluminum.
    - Vapor barrier required: Yes
- Heating-Hot-Water Supply and Return:
  - All Pipe Sizes: Insulation shall be the following
    - Insulation Material: Cellular Glass
    - Insulation Thickness: 2 inches
    - Minimum K value @ 75 Deg F: 0.23
    - Jacket: Aluminum

Hydronic Piping

Hydronic piping will be designed according to pressure drop and velocity data available in the ASHRAE Handbooks and shall minimize pressure drop, noise, corrosion, and scaling. Connection methods will be threaded or welded as appropriate for each system. Victaulic and pressure fitting systems are not allowed unless approved by AUS.

Isolation valves shall be included near the takeoff of any main/large branches. Any valves that would be placed over hard ceiling should have an access door provided and a label attached to the door to note its usage.

Identification tags should be attached to all valves. Wrap-around or sticker identifiers should be added to pipes after any transitions through walls.

Provide heat tracing with jacketed insulation on all exterior hydronic piping.

Piping Schedule:

- Hot-water heating piping, aboveground, NPS 2 and smaller, shall be any of the following:
  - Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered or brazed joints.
  - Schedule 40 steel pipe; Class 150, malleable-iron fittings; cast-iron flanges and flange fittings; and threaded joints.
- Hot-water heating piping, aboveground, NPS 2-1/2 and larger, shall be the following:
  - Schedule 40 steel pipe, wrought-steel fittings and wrought-cast or forged-steel flanges and flange fittings, and welded and flanged joints.
- Chilled-water piping, aboveground, NPS 2 and smaller, shall be any of the following:
  - Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered or brazed joints.
  - Schedule 40 steel pipe; Class 150, malleable-iron fittings; cast-iron flanges and flange fittings; and threaded joints.
- Chilled-water piping, aboveground, NPS 2-1/2 and larger, shall be the following:
  - Schedule 40 steel pipe, wrought-steel fittings and wrought-cast or forged-steel flanges and flange fittings, and welded and flanged joints.
- Makeup-water piping installed aboveground shall be the following:
  - Type L, drawn-temper copper tubing, wrought-copper fittings, and soldered or brazed joints.
- Makeup-Water Piping Installed Belowground and within Slabs: Type K, annealed-temper copper tubing, wrought-copper fittings, and soldered joints. Use the fewest possible joints.
- Condensate-Drain Piping: Type DWV, drawn-temper copper tubing, wrought-copper fittings, and soldered joints.
- Blowdown-Drain Piping: Same materials and joining methods as for piping specified for the service in which blowdown drain is installed.
- Air-Vent Piping:
  - Inlet: Same as service where installed with metal-to-plastic transition fittings for plastic piping systems according to piping manufacturer's written instructions.
  - Outlet: Type K, annealed-temper copper tubing with soldered or flared joints.
- Safety-Valve-Inlet and -Outlet Piping for Hot-Water Piping: Same materials and joining methods as for piping specified for the service in which safety valve is installed with metal-to-plastic transition fittings for plastic piping systems according to piping

Division 23 - Heating, Ventilating, and Air Conditioning (HVAC) (Continued)

manufacturer's written instructions.

Hydronic Pumps

Pumps shall be provided with premium efficiency inverter motors and shaft grounding rings.

Pump shall be provided with N+1 redundancy.

Variable volume pumping systems with variable frequency drives are preferred.

Metal Ducts

Install and construct ducts according to SMACNA's "HVAC Duct Construction Standards

Metal and Flexible" and per the latest edition of ASHRAE unless otherwise indicated.

Internally lined ductwork is not allowed for any duct system.

Grease ducts shall be installed according to latest codes and the grease duct manufacturer's instructions and recommendations. Access panels shall be provided on side of duct at changes in direction for cleaning, inspection and maintenance.

Air Terminal Units

Provide unit with installation for factory installed components of the building management system.

Fan powered terminal units are not allowed unless approved by AUS.

VAV boxes shall be double wall construction.

Modular Indoor Central-Station Air-Handling Units

Provide unit with high efficiency fan motors and shaft grounding rings.

Provide each unit with a blank off plate per fan array to isolate one non-operational fan per array.

Unit shall be provided with intake and discharge connections and access doors. Access doors shall open against pressure.

Provide with stainless steel drain pan. Unit shall drain to the coil connection side.

Provide separate power connections for lights, receptacles, and DDC subsystem panels.

Provide unit with ultra-low leakage, modulating, opposed blade OA and return air dampers.

Size damper opening for a maximum velocity of 1,200 fpm at max OA & supply cfm respectively. Provide with 24V actuator with position feedback, mounted inside the airstream, fail closed.

Unit shall have minimum 2-inch-thick cabinet with full thermal breaks and R-13 closed cell foam insulation.

Variable Frequency Motor Controllers

VFD's shall be complete with Bacnet/MSTP cards.

Ductless Split System Air Conditioning Units

Units shall meet or exceed SEER/EER as required to meet code requirements and building certifications.

Use of DX systems shall be limited to emergency backup systems for electrical and IDF Rooms.

Fan Coil Units

Provide unit with high efficiency fan motors and shaft grounding rings.

Provide with stainless steel drain pan.

Unit shall be double wall construction.

Direct Digital Controls

Direct Digital Control (DDC) System/Building Management System (BMS)

The Direct Digital Control System / Facility Building Management System (DDC/FMS) controlling the HVAC Systems shall be manufactured by Alerton and offered as the Alerton Compass2 Building Automation System.

The DDC/FMS shall communicate with the present AUS Alerton Compass2 system over the AUS Airport ABIA1 backbone.

The DDC/FMS shall communicate using existing Alerton Compass2 workstation Human Machine Interface (HMI) client computers.

The DDC/FMS Direct Digital Controllers shall be BACnet-Internet Protocol (BACnet- IP) based, and BACnet-Master/Slave Protocol (BACnet-MS/TP) based.

II. SPECIFICATIONS

B. Facilities Services Subgroup

Division 26 - Electrical

Medium Voltage Cables

Cables

- Type: MV105.
- Conductor: Copper.
- Conductor Stranding: Compact round, concentric lay.
- Strand Filling: Conductor interstices are filled with impermeable compound.
- Conductor Insulation: Ethylene-propylene rubber
- Voltage Rating: 15 kV.
- Insulation Thickness: 133 percent.
- Shielding: Copper tape.
- Shielding and Jacket: Corrugated copper drain wires embedded in extruded, chlorinated, polyethylene jacket.
- Cable Jacket: Chlorosulfonated polyethylene.

Modular system, complying with IEEE 386, with disconnecting, single-pole, cable terminators and with matching, stationary, plug-in, dead-front terminals designed for cable voltage and for sealing against moisture.

Terminations at Distribution Points: Modular type, consisting of terminators installed on cables and modular, dead-front, terminal junctions for interconnecting cables.

Load-Break Cable Terminators: Elbow-type units with 200-A-load make/break and continuous-current rating; coordinated with insulation diameter, conductor size, and material of cable being terminated. Include test point on terminator body that is capacitance coupled.

Dead-Break Cable Terminators: Elbow-type unit with 600-A continuous-current rating; designed for de-energized disconnecting and connecting; coordinated with insulation diameter, conductor size, and material of cable being terminated. Include test point on terminator body that is capacitance coupled.

Dead-Front Terminal Junctions: Modular bracket-mounted groups of dead-front stationary terminals that mate and match with above cable terminators. Two-, three-, or four-terminal units as indicated, with fully rated, insulated, watertight conductor connection between terminals and complete with grounding lug, manufacturer's standard accessory stands, stainless-steel mounting brackets, and attaching hardware.

- Protective Cap: Insulating, electrostatic-shielding, water-sealing cap with drain wire.
  - Portable Feed-Through Accessory: Two-terminal, dead-front junction arranged for removable mounting on accessory stand of stationary terminal junction.
- Grounding Kit: Jumpered elbows, portable feed-through accessory units, protective caps, test rods suitable for concurrently grounding three phases of feeders and carrying case.
- Standoff Insulator: Portable, single dead-front terminal for removable mounting on accessory stand of stationary terminal junction. Insulators suitable for fully insulated isolation of energized cable-elbow terminator.

Test-Point Fault Indicators: Applicable current-trip ratings and arranged for installation in test points of load-break separable connectors, and complete with self-resetting indicators capable of being installed with shotgun hot stick and tested with test tool.

Tool Set: Shotgun hot stick with energized terminal indicator, fault-indicator test tool, and carrying case.

Low Voltage Electrical Power Conductors and Cables

Materials

- Copper Conductors
- Conductor Insulation: Type THHN/THWN-2.

Conductor Material Applications

- Feeders: Copper stranded
- Branch Circuits: Copper stranded

Conductor Insulation Applications and Wiring Methods

- Service Entrance: Type THHN/THWN-2, single conductors in raceway.
- Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.
  - Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN/THWN-2, single conductors in raceway.
- Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.

Grounding and Bonding for Electrical Systems

Insulated Conductors: Copper wire or cable.

Bare Copper Conductors

- Solid conductors.
- Stranded conductors.
- Tinned conductors.
- Stranded bonding conductors.
- Copper tape braided bonding jumpers.
- Tinned-copper braided bonding jumpers

Grounding Bus: Predrilled rectangular copper bars with stand-off insulators.

Connectors: Bolted and exothermic-welded type.

Grounding Electrodes:

Ground Rods: Copper-clad steel.

Division 26 - Electrical (Continued)

Hangers and Supports for Electrical Systems

Products Performance Requirements:

- Delegated Design: Engage a qualified structural professional engineer.
- Support, Anchorage, and Attachment Components:
- Galvanized-steel Steel Stainless steel slotted support systems with metallic nonmetallic painted coatings.
- Raceways and cable supports.
- Steel conduits and cable hangers, clamps, and associated accessories.
- Support for nonarmored conductors and cables in vertical conduit risers.
- Structural steel for fabricated supports and restraints.
- Mounting, Anchoring, and Attachment Components:
  - Powder-actuated fasteners.
  - Mechanical-expansion anchors.
  - Concrete inserts.
  - Clamps for attachment to steel structural elements.
  - Steel springhead toggle bolts.
  - Threaded hanger rods.
- Fabricated Metal Equipment Support Assemblies: Welded or bolted steel shapes.

Selection

- Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and ERMC as required by NFPA 70. Minimum rod size must be 1/4 inch (6 mm) in diameter.

Raceways and Boxes for Electrical Systems

Metal Conduits, Tubing, and Fittings:

- GRC.
- EMT.
- FMC: Aluminum.
- LFMC.
- Fittings:
  - Conduit fittings for hazardous (classified) locations.
  - EMT: Steel, compression type.
  - Expansion fittings.
  - PVC coated.

Surface Metal Raceways

- Metal, galvanized steel, with snap-on covers.

Boxes, Enclosures, and Cabinets:

- Metal Outlet and Device Boxes: Ferrous alloy.
- Small sheet metal pull and junction boxes.
- Cast-metal access, pull, and junction boxes.
- Gangable boxes are prohibited.
- Hinged-Cover Enclosures: Metal.
- Cabinets: Galvanized steel.

Raceway Application

- Indoors:
  - Exposed, Not Subject to Physical Damage: EMT.
  - Exposed, Not Subject to Severe Physical Damage: EMT.
  - Exposed and Subject to Severe Damage: GRC.
  - Concealed: EMT.
  - Connection to Vibrating Equipment: FMC, except LFMC in damp or wet locations.
  - Damp or Wet Locations: GRC.
  - Boxes and Enclosures: Type 1, except Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

Minimum Raceway Size

- 3/4-inch (21-mm) trade size.

Raceway Fittings

- Compatible with raceways and suitable for use and location.
  - Rigid and Intermediate Steel Conduit: Threaded rigid steel conduit fittings.
  - EMT: compression, steel fittings.
  - Flexible Conduit: Fittings listed for use with flexible conduit.

Labels

- Vinyl labels for raceways carrying circuits at 600 V or less.
- Snap-around labels for raceways and cables carrying 600 V or less.
- Preprinted, vinyl flexible labels with pressure-sensitive adhesive.
- Vinyl, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels.

II. SPECIFICATIONS

B. Facilities Services Subgroup

Division 26 - Electrical (Continued)

Raceways and Boxes for Electrical Systems (continued)

Bands and Tubes

- Snap-around color-coding bands for raceways and cables.
- Heat-shrink preprinted tubes.

Tapes

- Marker tapes.
- Self-adhesive vinyl tape.
- Tape and stencil for raceways carrying circuits at 600 V or less.
- Floor marking tape with yellow and black stripes and clear vinyl overlay.
- Underground-line warning tape

Tags

- Brass or aluminum metal tags
- Polyethylene preprinted tags.
- Polyester write-on tags.

Signs

- Preprinted aluminum baked-enamel signs.
- Metal-backed butyrate signs.
- Laminated acrylic or melamine plastic signs.

Cable Ties

- UV-stabilized cable ties.
- Plenum-rated cable ties.

Underground Ducts and Raceways for Electrical Systems

General Requirements for Ducts and Raceways

- Quality Standard: ANSI C2.
- Concrete encased duct banks

Sustainability Requirements

- VOC limits for adhesives and sealants.

Components

- Metal conduits and fittings.
- Rigid nonmetallic duct.
- Flexible nonmetallic duct.
- Duct accessories.
- Precast concrete handholes and boxes.
- Handholes and Boxes Other than Precast Concrete:
  - Polymer concrete handholes and boxes with polymer concrete cover.
- Precast concrete manholes.
- Utility Structure Accessories:
  - Iron frames and covers.
  - Chimney components.
  - Sump frame and grate.
  - Pulling eyes.
  - Pulling-in and lifting irons.
  - Bolting inserts for concrete utility structure cable racks and other attachments.
  - Ground rod sleeve.
  - Expansion anchors.
  - Cable rack assemblies.
  - Fixed ladders.

Division 26 - Electrical (Continued)

Overcurrent Protective Device Coordination Study

Summary

- Computer-based, overcurrent protective device coordination studies. Series-rated devices will not be used.

Software Capability

- Comply with IEEE 242 and IEEE 399.
- Computer software program for plotting and diagramming time-current-characteristic curves and for reporting settings and ratings of all overcurrent protective devices.
- Optional Computer Program Features:
  - Arcing faults.
  - Simultaneous faults.
  - Explicit negative sequence.
  - Mutual coupling in zero sequence.

Execution

- Begin analysis at the service, extending down to the system overcurrent protective devices as follows:
  - To normal system low-voltage load buses where fault current is 10 kA or less.
  - Exclude equipment rated 240-V ac or less when supplied by a single transformer rated less than 125 kVA.

Studies

- Study electrical distribution system from normal and alternate power sources.
- Coordination study includes the following:
  - Transformer primary overcurrent protective devices.
  - Motors served by voltages more than 600 V.
  - Conductor protection.
  - Generator protection.
  - Protective device evaluation.
- Load-flow and voltage-drop study.
- Motor-starting study.

Field Adjusting

- Adjust relay and protective device settings to the settings provided by the coordination study.

Overcurrent Protective Device Arc-Flash Study

Summary

- Computer-based, arc-flash study to determine the arc-flash hazard distance and the incident energy to which personnel could be exposed during work on or near electrical equipment.

Software Capability

- Comply with IEEE 1584 and NFPA 70E.
- Produce 3.5-by-5-inch ((76-by-127-mm)) labels for each work location included in the analysis.

Execution

- Calculate the arc-flash protection boundary and incident energy at locations in the electrical distribution system where personnel could perform work on energized parts.
- Include medium- and low-voltage equipment locations.
- Specify safe working distances based on the calculated arc-flash boundary at incident energy of 1.2 cal/sq.cm.
- Base arc-flash calculations on actual overcurrent protective device clearing time. Cap maximum clearing time at two seconds based on IEEE 1584, Section B.1.2.

Division 26 - Electrical (Continued)

Electrical Power Monitoring

System Description

- Microprocessor-based monitoring of electrical power distribution system(s) that includes the following:
- Electrical meters that monitor and connect to the existing data transmission network.
- Listed and labeled in accordance with UL 61010-1.

Performance Requirements

- Surge protection.
- Addressable devices.
- Interface: Connect to the existing Power Monitoring System
- Backup power.
- Comply with IECC 2021 with COA amendments.
- Comply with current Version of LEED.

Multifunction Energy Meters

- Separately mounted, modular, permanently installed, solid-state, digital I/O instrument for power and energy metering and monitoring, complying with UL 61010-1.
- Overvoltage: Comply with UL 61010-1.
- Accuracy: Comply with ANSI C12.20, Class 0.5.
- Data link.
- Backlit LCD capable of displaying three user selected values at one time.
- Sampling Rate: No less than 64 samples per cycle.
- Meters:
  - Instantaneous.
  - Energy.
  - Demand.
  - Power quality.

Installation

- Wiring Method: In raceways except in accessible indoor ceiling spaces and attics.

Secondary Unit Substations with Switchgear Secondary

Manufactured Units

- Indoor Unit Arrangement: Single assembly.
- Connections:
- Between Primary Device and Transformer: Bus.
- Between Transformer and Secondary: Flexible bus braid.
- Indoor Enclosure: Steel.
- Unit Substation Enclosures Finish: Manufacturer’s standard color.

Medium-Voltage Terminal Compartment Section

- Primary incoming section.
- Ratings: Three-phase, 60 Hz, solidly grounded-neutral system.
- System Voltage: 12.5 kV nominal; 15 kV maximum.
- Surge Arresters: Distribution class.

Medium-Voltage Metal-Clad Switchgear Section

- Metal-clad,circuit-breaker switchgear.
- Ratings:
  - System Voltage: 12.5 kV nominal; 15 kV maximum.
  - Nominal Interrupting-Capacity Class: as required.
  - Main-Bus Rating: as required continuous.
- Electrically Operated, Drawout Mounting Circuit Breakers:
  - Interrupt fault current within three cycles.
  - Contact-wear indicator.
  - Minimum of six Type A and six Type B spare contacts.
  - Interchangeable with vacuum circuit breakers.
  - Operating Mechanism: Electrically charged, mechanically and electrically trip-free, stored-energy operation.
- Relay and meter test plugs.
- Circuit-breaker test cabinet.
- Remote-tripping device.
- Surge arresters.
- Maintenance tools.

Medium-Voltage Instruments Section

- Instrument Transformers:
  - Potential transformers.
  - Current transformers.
- Multifunction digital-metering monitor.
- Analog instruments.
- Overcurrent and ground-fault protective relays.
- Control Power Supply:
  - Control power transformer supplies 120 V control circuits through secondary disconnect devices.
  - DC battery system.

Liquid-Filled Transformer

- Insulating Liquid: Less-flammable, edible-seed-oil based.
- Insulating Temperature Rise: 65/55 deg C.
- Basic Impulse Level: 95 kV.
- Full-Capacity Voltage Taps: Four nominal 2.5 percent taps, 2 above and 2 below rated primary voltage.
- Cooling System: Class ONAN/ONAF, liquid cooled, and with forced-air rating.
- Accessories:
  - Liquid-level gage.
  - Pressure-vacuum gage.
  - Liquid temperature indicator.
  - Drain and filter valves.
  - Pressure relief device.

Division 26 - Electrical (Continued)

Secondary Unit Substations with Switchgear Secondary

Secondary Distribution Section Switchgear

- Drawout, low-voltage switchgear.
- Secondary Distribution Section: Low-voltage switchgear.
  - Neutral Bus: 100 percent of phase-bus ampacity.
  - Phase- and Neutral-Bus Material:
    - Hard-drawn copper.
    - Silver- or tin-plated, high-strength, electrical-grade aluminum alloy, with copper or tin-plated aluminum circuit-breaker line connections.
- Circuit-Breaker Compartment:
  - Racking mechanism drawout features.
  - Stationary primary disconnect.
  - Secondary Disconnect: Floating terminals mounted on stationary part of compartment.

Low-Voltage Instrument Section

- Instrument Transformers:
  - Potential transformers.
  - Current transformers.
- Microprocessor-based, multifunction digital-metering monitor.
- Analog instruments.
- Relays: Comply with IEEE C37.90, types and settings as indicated; with test blocks and plugs.
- Surge Suppression:
  - Factory installed as an integral part of low-voltage switchgear, complying with UL 1449 SPD Type 1, with the following features and accessories:
    - Integral disconnect switch.
      - Internal thermal protection that disconnects SPD before damaging internal suppressor components.
  - Indicator light display for protection status.
  - Form-C contacts rated at 5 A 250 V(ac), one N.O. and one N.C., for remote monitoring of protection status. Contacts must reverse on failure of any surge diversion module or on opening of any current-limiting device. Coordinate with building power monitoring and control system.
  - Surge counter.
- Control Power Supply: Control power transformer supplying 120 V control circuits through secondary disconnect devices.
- Maintenance tools.
- Identification Devices
  - Compartment Nameplates: Engraved, laminated-plastic or metal nameplate.

Low-Voltage Distribution Transformers

Comply with NFPA 70.

Cores: Electrical grade, non-aging silicon steel with high permeability and low hysteresis losses.

- Core volume must allow efficient transformer operation at 10 percent above nominal tap voltage.

Coils: Continuous windings except for taps.

- Coil Material: Copper.
- Terminal Connections: Bolted.

Enclosure: Ventilated.

- Core and coil must be encapsulated within resin compound to seal out moisture and air.

Taps for Transformers 25 kVA and Larger: Two 2.5 percent taps above and four 2.5 percent taps below normal full capacity.

Insulation Class, 30 kVA and Larger: 220 deg C, UL-component-recognized insulation system with maximum of 80 deg C rise above 40 deg C ambient temperature.

K-Factor Rating: Transformers indicated to be K-factor rated must comply with UL 1561 requirements for nonsinusoidal load current-handling capability to degree defined by designated K-factor.

Electrostatic Shielding: Windings must have independent, single, full-width copper electrostatic shield arranged to minimize interwinding capacitance.

Neutral: Rated 200 percent of full load current for K-factor-rated transformers.

Division 26 - Electrical (Continued)

Panelboards

Manufacturer Qualifications: ISO 9001 or 9002 certified.

Products

- General Requirements for Panelboards:
  - Constructed to withstand seismic forces.
  - Enclosures: Surface mounted.
    - Front: Hinged cover.
    - Directory card.
- Phase, Neutral, and Ground Buses: Copper.
  - Optional Buses: extra-capacity neutral.
- Conductor Connectors:
  - Material: Hard-drawn copper.
  - Main and Neutral Lugs: Mechanical type.
  - Ground Lugs and Bus-Configured Terminators: Mechanical type.
  - Feed-Through Lugs: Mechanical type.
  - Extra-Capacity Neutral Lugs: Rated 200 percent of phase lugs.
  - Percentage of Future Space Capacity: 20 percent.
- Service equipment label for panelboards incorporating one or more main service disconnecting and overcurrent protective devices.

Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals.

- Branch Overcurrent Protective Devices for Circuit-Breaker Bolt-on circuit breakers.

Lighting and Appliance Branch-Circuit Panelboards:

- Branch Overcurrent Protective Devices: Bolt-on circuit-breaker type.
- Doors: Door in door construction with concealed hinges.

Identification:

- Panelboard labels.
- Breaker labels.
- Circuit Directory: Computer generated.

Diesel Emergency Engine Generators

Materials and Workmanship Warranty: Five years.

Full-Maintenance Service: 12 months.

Performance Requirements

- Comply with NFPA 37.
- Comply with NFPA 70.
- Comply with NFPA 99.
- Comply with NFPA 110 requirements for Level 1 EPSS.

UL Compliance: Comply with UL 2200.

Environmental Conditions:

- Ambient Temperature: 5 to 40 deg C.
- Relative Humidity: Zero to 95 percent.
- Altitude: Sea level to 1000 feet (300 m).

Assembly Description

- EPSS Class: Engine generator shall be classified as Class 48 according to NFPA 110.
- Service Load: as required.
- Power Factor: 0.8, lagging.
- Frequency: 60 Hz.
- Voltage: 480-V ac.
- Phase: Three-phase, three four-wire wye.
- Induction Method: Naturally aspirated.
- Performance: Suitable for loads involving sensitive electronic equipment, adjustable frequency drives, or UPS systems.

II. SPECIFICATIONS

B. Facilities Services Subgroup

Division 26 - Electrical (Continued)

Natural Gas Emergency Generator

Engine

- Fuel: Natural Gas from Utility Connection
- Backup Fuel (Optional): Liquid Propane
- Muffler/Silencer: Semi critical type.
- Air-Intake Filter: Standard duty.
- Starting System: 24 V electric, with negative ground.
  - Cranking Cycle: 60 seconds.
  - Battery: Nickel cadmium; cranking cycle three times without recharging.
  - Battery Charger: Current-limiting, automatic-equalizing and float-charging type.

Natural Gas Utility Connection

- Must be approved my AHJ.
  Alternative backup fuel source may also be required.

Liquid Propane Backup

- Storage
  - Day Tank
  - Base mounted liquid propane tank.

Control and Monitoring

- Sequence of Operations: Automatic starting; with control devices grouped on panel mounted on engine generator.
  - Minimum run time control set for 15 minutes with emergency-stop switch.
  - Configuration: Operating and safety indications, protective devices, basic system controls, and engine gages grouped in a common control and monitoring panel mounted on engine generator and wall-mounted control and monitoring panel.

Generator Overcurrent and Fault Protection

- Generator Circuit Breaker: Molded-case, electronic-trip type.
- Generator disconnect switch.
- Microprocessor-based generator protector.
- Ground-fault indication.
- Generator: Directly connected to engine shaft, with dripproof enclosure and solid-state voltage regulator.

Generator, Exciter, and Voltage Regulator

- Drive: Shaft directly connected to engine shaft.
- Electrical Insulation: Class H or Class F.
- Stator-Winding Leads: Six-lead alternator.
- Range: Limited.
  - Enclosure: weather proof
  - Instrument Transformers: Mounted within generator enclosure.
  - Voltage Regulator: Solid state.
    - Adjusting Rheostat on Control and Monitoring Panel: Plus or minus 5 percent adjustment of output-voltage operating band.
    - Maintain voltage within 15 percent on one step, full load.
    - Provide anti-hunt provision to stabilize voltage.
    - Maintain frequency within 10percent and stabilize at rated frequency within five seconds.

Strip Heater

Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.

Outdoor Engine Generator Enclosure

- Vandal-resistant, sound attenuating, weatherproof steel housing.

II. SPECIFICATIONS

B. Facilities Services Subgroup

Division 26 - Electrical (Continued)

Transfer Switches

Summary

- Transfer switches rated 600 V and less.

Quality Assurance

- Quality Standards: NEMA ICS 1, NFPA 70, NFPA 110, and UL 1008.

Products

- Solid-state controls.
- Resistant to damage by voltage transients.
- Solenoid or electric-motor operated.
- Designed for continuous-duty, repetitive transfer of full-rated current.
- Neutral terminals for single-phase, three-wire or three-phase, four-wire systems without neutral switching.
- Oversize neutrals.
- Battery charger for generator starting batteries.
- Annunciation, control, and programming interface components.
- Enclosures: NEMA 250, Type 3R.

Automatic Transfer Switches: NFPA 110, Level 1.

- Type: Double throw. By-pass isolation.
- Manual Switch Operation: Under load.
- Signal-before-transfer contacts.
- Digital communication interface.
- Control Features: In-phase monitor.
- Features:
  - Undervoltage sensing for each phase of normal source.
  - Time delay for override of normal-source sensing.
  - Voltage/frequency lockout relay.
  - Time delay for retransfer to normal source.
  - Test switch.
  - Switch-position pilot lights.
  - Source-available indicating lights.
  - Unassigned auxiliary contacts.
  - Transfer override switch.
  - Engine starting contacts.
  - Engine Shutdown Contacts: Time delay adjustable.
  - Engine-generator exerciser with programmable-time switch.

Either source of power directly to load, isolating transfer switch from load and from both power sources; factory-installed copper bus bars interconnected with automatic transfer switches.

Remote annunciator and control system.

Lightning Protection for Structures

Quality Assurance

- Installer: UL-listed installer, category OWAY or LPI Master Installer.

Performance Requirements

- Lightning Protection Standard: NFPA 780 for Class I buildings.
- Components: UL 96.

Components

- Roof-Mounting Air Terminals: Aluminum.
- Ground Rods: Solid copper.
- Main Conductors: Class I.

Installation

- Conductors to Be Concealed:

System Conductors

- Down conductors.
- Interior conductors.
- Conductors within normal view of exterior locations at grade.
- Ground loop.

Ground Ring

Lightning protection components bonded with intermediate-level interconnection loop conductors at 60-foot (18-m) intervals.

II. SPECIFICATIONS

B. Facilities Services Subgroup

Division 27 - Communications

Overview:

The following Division 27 information is not meant to supersede the AUS Division 27 template specifications. The Designer should utilize the AUS template Division 27 specifications (which are a separate document available from the AUS Project Manager) as the governing specification requirements and should utilize the following information to supplement the AUS Division 27 template specifications. In the event of overlapping or conflicting requirements, the Designer must default to the AUS Division 27 template requirements.

Communications systems and IT systems specifications may include the following. The Designer and AUS project manager should coordinate the project requirements.

- Common Work Results for Communications
- Grounding and Bonding for Communications Systems
- Outside Plant Pathway for Communications Systems
- Inside Plant Pathway for Communications Systems
- Communications Equipment Rooms
- Communications Backbone Cabling
- Communications Horizontal Cabling
- Data Communications Network
- Voice Communications
- Data Communications Wireless
- Cellular DAS
- Public Safety Radio DAS
- Electronic Visual Information Display System (EVIDS)
- Content Management System (CMS) and Dynamic Signage
- IPTV System
- Common Use Systems
- Airport Operational Database
- Resource Management System
- Integration Platform (ESB and BI)
- Parking and Revenue Control System and AVI
- Overhead Paging Announcement System
- Queue Management Systems

Some of the above specifications exist as AUS standard (boilerplate) specifications. The Designer shall request and utilize the AUS template specifications when available. Additional communication specifications and requirements shall be developed as required for a given project.

Software Specification Minimum Requirements

Introduction:

For projects requiring a software system procurement, the Designer shall develop the appropriate software specifications. Software specifications shall meet the below minimum requirements as a baseline. The Designer shall develop additional specification requirements as appropriate for the specific software system and project to deliver a solution that fully meets AUS needs and requirements. Coordinate with AUS IS regarding all software systems specification and requirements.

Submittals Minimum Standards:

All project submittals are subject to Representative approval. Contractors shall submit for review and evaluation by AUS IS or their designated representative (Representative), copies of each major product and item. Contractors shall not purchase or install an item prior to receipt of written approval from AUS IS or their Representative. Submitted items, found unsuitable, rejected or returned for revision, shall be reworked and resubmitted until approved.

Contractors and the Representative shall negotiate and agree to the final list of items required for submittal. The delivery dates of submittals will be negotiated. Contractors shall supply any submittal within twenty (20) working days if requested by the Representative.

Minimum Submittals From Contractors Shall Include:

Systems Design Document: Provide a complete system design document for a system including:

- System Overview Diagram: Contractors shall submit a block diagram that depicts general system overview, including databases, application servers, communication and distribution methods, and external interfaces.
- System Architecture Details: Design detail of core system configuration including servers, services, applications, connectivity, and network, firewall, and IP scheme. Coordinate with Representative for IP and other network settings.
- Database Structure: Contractors shall develop and submit a system's Database Structure including:
  - Database modeling concept and methodology
  - Define database schema including field type, field length, table dependencies, etc.
  - Define applications and other database interfaces to a system's database
  - Database backup and archiving methods.
- Software submittals: shall include manufacturer's / developer's documentation for each type of software used in by a system including:
  - Complete description of software features and functionality.
  - Software version & revision identification
  - Software manufacturer's contact information for technical support, including address, telephone numbers, and e-mail /Web URL's.

II. SPECIFICATIONS

B. Facilities Services Subgroup

Division 27 - Communications (Continued)

Software Specification Minimum Requirements

Minimum Submittals From Contractors Shall Include:

- Hardware submittals: shall include for a system:
  - Manufacturer's documentation for hardware used by a system.
  - Complete description of hardware features, proposed options and functionality. Specific features to be included / excluded shall be indicated on cut sheets.
  - Manufacturer's contact information for technical support, including address, telephone numbers, and e-mail /Web.
- Implementation Documents: shall include for a system:
  - Test Plan
  - Training Plan and Materials
  - Canned Reports
  - SLA: Contractors shall submit an SLA meeting or exceeding the requirements of these standards and of the project. Contractors shall include an SLA that addresses hardware maintenance, on-site repairs and service, replacement parts, and anticipated future technology upgrades for the duration of a contract.
- User Documentation: shall include for a system:
  - Shall explain how a system operates from an Owner and Operator end user perspectives.
  - Shall be in accordance with and contain at least as much information as that included within the online help system.
- System Administration Documentation: shall include for a system:
  - Supply System Administrator documentation that details the operation of each of the provided systems and integration pieces.
  - This documentation shall provide complete information on the operation, maintenance, and troubleshooting of a system.
  - The information included in this documentation shall be covered during systems administrator training provided by Contractors.
- As Built: shall include for a system:
  - As-builts shall include finalized equipment locations, room routing notes, and installation details. The As-builts shall not be redlined copies but be finalized drawings. The As-builts shall build on the initial design details and further develop these based on specific installation details.
  - Provide the Owner with as-built documentation defining a system, modules, database structure, interfaces, configurations and related information. Compiled and updated versions of previously approved submittals may be included to meet this requirement.
  - The level of detail defined in these As-built documents shall be suitable to allow any third party to support system maintenance as well as support future integration and expansion of a system at the Airport.
  - Acceptance of as-built documentation shall be part of the final system acceptance process.
- Software Documentation and Utilities: shall include for a system:
  - All software shall be delivered with full documentation. Documentation shall include software error messages, description, and troubleshooting guide.
  - The documentation shall include textual explanations and instructions and be supported by appropriate graphs, flowcharts and/or block diagrams.
  - Backup copies of all the configured system software shall be provided. This should include server software and end user software. System restore images shall be provided as applicable.
  - All original distribution software shall be delivered with an installable backup.
  - Provide a backup copy of all system drivers.
- Maintenance Manuals: shall include for a system:
  - Manuals including maintenance instructions and other descriptive material as received from the manufacturers shall be provided that will enable designated personnel to maintain and test equipment.
  - As applicable, this documentation shall include descriptions, specifications, theory of operation, layout drawings (showing component types and positions), and back-panel and assembly wiring diagrams.
  - Instructions shall be provided for preventive maintenance procedures that include examinations, tests, adjustments, and periodic cleaning.
  - The manuals shall provide guidelines for isolating the causes of hardware malfunctions and for localizing faults.
  - The manuals shall provide instructions on the use of any specialized test equipment needed for hardware maintenance.
- Parts Lists: shall include for a system:
  - Complete parts lists and breakdowns that identify each hardware component (to the lowest repairable unit) shall be provided.
  - Ordering information for the parts identified in the complete parts list shall be provided.
  - Recommended spare parts lists shall be included.
  - Spare parts list shall include a complete list of manufacturers, including address, telephone number and contact. It shall also include the manufacturer's catalogue literature and specifications for all purchased parts.

II. SPECIFICATIONS

B. Facilities Services Subgroup

Division 27 - Communications (Continued)

Software Specification Minimum Requirements

Minimum Submittals From Contractors Shall Include:

Warranty Minimum Standards

Contractors shall warrant systems conform to their description and any applicable specifications and shall be of good quality for the known purpose for which it is intended. Contractors shall provide a joint written warranty of the manufacturer(s) and the installer(s), on a single document. System warranties shall warrant complete installation of the equipment, system, and software to be free from defects in materials and workmanship. Warranties shall list the City of Austin as the owner. The starting point for warranties shall be from a system's final system acceptance.

All hardware supplied and all hardware integrated shall have a minimum of five (5) years warranty from final system acceptance. Warranties shall allow for the replacement or repair of failed items at the discretion of the Representative. Alternate Hardware manufacturers shall only be used for replacement warranty parts during the warranty period at the discretion of the Representative. Changes in hardware manufacturer designation by the Representative during the warranty period shall be indicated in writing. Warranty hardware replacement for items not included in spare parts shall be delivered to the Airport within required service response times. Warranty hardware replacement for items included in spare stores shall be delivered to the Airport within ten (10) working days. Warranty hardware replacement shall be delivered fully configured.

All software supplied as a part of a system shall have a minimum of a five (5) year warranty from final system acceptance. The warranty shall allow for replacement or repair at the discretion of the Representative. System software upgrades shall be provided and installed at no additional cost during the warranty period.

Warranty response times for system failures during the warranty period shall be governed by systems SLA. Contractors shall provide, at the outset of the onsite testing a store of consumables and spare parts as required. Those consumables and spare parts shall be available for use during equipment demonstration testing, warranty periods, and extended support periods in order to maintain system response time criteria. Contractors shall replenish the store as it is used, so that at the end of the test and warranty periods, a systems store shall be equal to that initially provided.

Service Level Agreement Minimum Standards

Contractors shall provide service to the Airport throughout phasing and implementation for systems. Contractors shall maintain any and all software systems furnished and activated by a Contractor, unless directed otherwise. A base Service Level Agreement (SLA) shall be provided as described below for a minimum of five (5) years beginning at final system acceptance. Refer to individual system standards and project requirements for additional SLA requirements. During any operational period prior to Final System Acceptance, Contractors shall provide SLA maintenance services equal to the maintenance period. During the Warranty period, onsite response technicians are required to obtain and maintain an Airport badge of the appropriate type so that maintenance services can be conducted without Owner escort. Any maintenance performed on systems shall be accomplished during the Airport's designated maintenance period. This has been designated from after the completion of the last departure to one hour prior to ticket counter scheduled opening in the mornin unless directed otherwise. All upgrade service releases and hot fixes shall be included during the SLA period. Written notification of any modifications to systems shall be provided no less than 10 working days prior to any anticipated actions.

SLA shall include hardware and software support as a minimum as follows:

- 24/7/365 help desk phone support for Owner
- Level 3 support and maintenance services
- Installation/configuration of all software updates and patches
- 6-hour onsite response for critical failure, 24-hour total resolution period from Representative call.
- 2-hour onsite response for emergency failure, 8-hour total resolution period from Representative call.
- Representative coordination and follow up as required to resolve system failures.
- Provide a detailed list of recommended preventative maintenance services.

System Failure Definitions:

Inoperative: A device shall be considered inoperative when the device does not perform its intended function(s) within defined performance criteria. Response services shall include inspections and necessary tests to determine the causes of equipment or software malfunction or failure. The failure services shall include the furnishing and installation of components, parts or software changes required to replace malfunctioning system elements. Operational Failure – Defined as an end device that is inoperative. Critical Failure – Defined as 1) a redundant head end component that is inoperative; or 2) when a system failure results in (2) or more simultaneous operational failures, but less than forty percent (40%) of entire system; or 4) the fifth and subsequent recurrence of an operational failure with same unresolved root cause.

Emergency Failure – Defined as 1) a system failure that results in more than forty percent (40%) of a system's end devices being inoperative; or 2) the second and subsequent recurrence of a critical failure with same unresolved root cause. A formal report shall be submitted to the Owner on the cause and resolution of the problem. Resolution shall not be considered complete until written approval is provided by the Representative.

Other SLA Requirements:

Support Availability: Contractors shall commit to make available support for the for ten (10) years after final system acceptance.

Support Personnel: Contractors shall commit approved support personnel for the duration of the SLA. Technicians performing installation and maintenance on the proposed system shall meet the following requirements:

Manufacturer certified on all of a system's hardware/software applications with at least 2 years post-certification work experience.

Be approved by the Representative.

Shall attend a one (1) week manufacturer training class each year.

II. SPECIFICATIONS

B. Facilities Services Subgroup

Division 27 - Communications (Continued)

Software Specification Minimum Requirements (Continued)

Software Minimum Standards

Systems shall use industry standard components. Systems shall not contain any proprietary interfaces or components. System shall use industry standard application development software.

Commercial software packages shall have all registration and licensing documentation filed indicating the City of Austin as the owner of the software. Costs for commercial off-the-shelf software licenses shall be included.

Developed software shall be licensed to the Owner. This license shall include all executable, library, object, and source code required to maintain and modify the delivered product.

Software license shall be a site license, unless noted otherwise.

Provide original and copies of software licenses for each type of software installed at the Airport including but not limited to:

- Application software
- Operating system software
- Database and middleware software
- Device drivers' software

Database Minimum Standards:

Databases shall be Microsoft SQL based, or Owner approved equal, and capable of supporting real time data warehousing. The databases shall use a common relational database to store all data. The databases shall be based on accepted and recognized industry standards. Databased software shall be the latest vendor version as of time of a contract award.

Contractors shall submit all database schema(s) for review and approval. Contractors shall add needed fields as requested by the Owner. The database(s) shall be designed such that the addition of fields and/or tables is easily accommodated. The database schema shall be provided in a chart format showing all tables, key fields, and hierarchical relationships.

The database maintenance system shall be capable of maintaining configuration control (i.e., keep track of changes and compare versions of the database). Database maintenance software shall be provided to allow modification of designated database fields. Common system data fields shall have a simple user interface for data cleanup and management.

The database shall have user-friendly reporting capabilities. The reporting tool shall allow the user to create "ad hoc" reports from the database and print "canned" reports. The reporting tool shall be capable of building reports from any fields in the database and on any subset of records with permissions.Contractors shall provide a minimum of fifteen (15) canned reports. Each of the canned reports shall require Owner approval. Contractors shall add any fields, filters, or other features to meet Owner's approval. For any and all reports, including both canned reports and ad hoc reports generated via the reporting tool, only authorized users shall have access to the reporting features.

System Architecture Minimum Standards:

Network communications shall utilize TCP/IP network communications protocol. Servers and system administrator workstations shall be 10 gigabit Ethernet as a minimum. End devices shall be gigabit Ethernet at a minimum. End device IP addressing shall be coordinated with the Owner.

Sufficient resiliency/redundancy and logic shall be provided to assure that availability objectives can be met without manual intervention. All major system hardware components shall be designed so that there is not any single point of failure that can cause operations to be disrupted. Adjacent end devices that are connected to the network shall be interweaved to separate edge network switches when two more network switches are available within 295 routed feet.

All devices connected to the network shall have SNMP management capability. System failures, including ethernet field device failures, shall be viewable at a central administration point. A failure shall initiate an alarm and add a failure record to the failure database table. Additionally, systems administrator shall receive a warning message on systems administrator workstation, notifying him of the failure. Server failure shall include any hardware or software-based failure.

Network devices shall have remote administration and monitoring capabilities. This capability shall allow the specific machine to be remotely configured and to provide a status report to the management system. Data included in the reporting capabilities shall include data pertaining to the machine's memory, storage devices, network connections, and general health of the machine.

System Security Minimum Standards:

Authorized users shall log into systems using a unique username and password. Depending on assigned user access privileges, the user shall be either granted or denied access to individual applications. System administrator shall be granted the highest level of login access credentials for systems. Operating system command line shall not be accessible by a user unless that user is specifically authorized. User authorizations shall allow for specific authorizations per user for read, read/write, and no access privileges to each dataset and module. The System Administrator shall be able to add, delete, set, and change user privileges and access authorization via a GUI built into the general operations of the application. All system security parameters shall be configurable by the System Administrator.

Division 27 - Communications (Continued)

Software Specification Minimum Requirements (Continued)

Systems shall have an “inactivity timeout period” such that if any workstation is determined to be inactive by having no input/output performed at that workstation for the defined timeout period, that workstation shall be automatically logged out of the application. The System Administrator shall be able to configure, enable, and disable the timeout period. The occurrence of an inactivity timeout occurring as described above shall be recorded in the fault log, showing date, time, workstation identifier, and the username of the user who was logged in at the time when the inactivity timeout occurred. Systems shall have the ability to prevent a username from being logged in more than one time concurrently (i.e., Same user cannot login to multiple workstations). This capability shall be able to be disabled.

Systems shall be able to provide an audit trail of all transactions. The audit trail shall track on a per user basis and be initiated for all users, no users, and selected users. The audit trail file shall indicate any changes that occurred to applications configuration, data structure, and database fields/records, and shall contain the date and time of the change, the user identification of the user who made the change, and the contents of the changed record both before and after the change.

Systems shall be PCI-DSS compliant and have an Attestation of Compliance (AOC) as proof of this compliance. A system provider shall represent and warrant that a system and each of its’ components and modules are listed on the PCI Security Standards web site (www.pcisecuritystandards.org) and is in compliance with all applicable PA-DSS requirements as they existed on the date of certification posted on the web site. Contractors shall provide Attestation of Validation (AOV) and Contractor is responsible for maintaining this validation. Contractors shall maintain the certification current.

Contractors shall ensure that Personally Identifiable information (PII) such as cardholder data shall not be cached and must not be written to unencrypted persistent storage. Contractors shall ensure that cardholder data shall not be written to log files and shall be transmitted over encrypted channels. Contractors’ products shall support strong cryptography and security protocols to safeguard sensitive cardholder data during transmission. Contractors’ products shall support the usage of trusted keys and certificates that is appropriate for the encryption methodology in use. Contractors shall ensure that no cardholder data is used for testing or development. Contractors shall not share cardholder data with any 3rd parties.

Integration Minimum Standards:

Each system provided to AUS shall be capable of integrating with AUS data warehouse and AUS integration environment. The contractor shall list programming languages utilized. List protocols utilized such as SOAP or RESTful API. Systems shall be capable of event driven and real-time integration. Contractors shall provide coordinate with the Owner in support of dashboard development and KPIs related to the provided System’s data.

Headend Equipment Minimum Standards:

Contractors shall recommend the server configuration that best serves the overall design solution. Contractors shall coordinate to provide application and database server expansion within AUS IS enterprise environment as required to support the new system. Systems shall be fault tolerant via mirroring or other vendor technology. The design should allow a server session to be powered down and updated without disruption to the network, applications, or operations. Contractors shall submit system core configuration for review and approval. Core configuration details shall include:

- Specific hardware specifications and components
- COTS software loaded and configuration
- Applications and services loaded on each core device
- Diagram of core system configuration

Provided servers shall be 19-inch rack mountable. As required, provide one (1) 17-in rack mounted slide out monitor and keyboard with KVM switch. Servers shall be “dual-homed” to the LAN core switches via server grade 10 Gbps Ethernet NICs. Final requirements and configuration shall be coordinated with the Representative. Total usable disk capacity shall be at least 4 times the estimated storage requirements of the application. RAID shall be implemented as best suits the application. Operating system RAID shall be RAID 1, while data shall be RAID 5 unless justification for alternative configuration is provided. RAID shall not be implemented by a hardware controller. Hard drives shall be hot swappable.

Field Equipment Minimum Standards:

Systems shall include all configured hardware necessary for a fully functional system. Contractors shall supply all cabling, connectors, adapters, and termination equipment necessary to interconnect all system hardware. All hardware and materials shall be new. The hardware requirements given are the minimum requirements. Contractors’ products shall meet or exceed these requirements to meet the operational, functional, performance, and redundancy requirements. Coordinate final equipment selection with Representative for written approval. Contractors shall ensure all selected equipment fits within millwork restrictions.

Division 27 - Communications (Continued)

Software Specification Minimum Requirements (Continued)

Implementation Minimum Standards:

System installation and implementation methods shall conform to the requirements of the Owner. All installation activities shall be performed in a neat and professional manner in accordance with all applicable local and national codes. Additionally, Contractors and all subsequent Sub-Contractors employed to satisfy the requirements of these specifications shall obtain, or satisfy, the following prior to installation:

- All licenses and permits.
- All insurance and bonding as required.
- All other standards or requirements specified.

Contractors shall install and inspect all hardware required in this specification in accordance with the manufacturer's installation instructions. Contractors shall adhere to the following during installation of systems:

- Underwriter's Laboratories (UL) listing for restricted access installations in business and customer premises applications. This listing is required by the National Electric Code for customer premise installations.
- Fire resistance requirements specified by Underwriter's Laboratories in UL 1459, 2nd edition.
- Where undefined by codes and standards, Contractors shall apply a safety factor of at least 2 times the rated load to all fastenings and supports of system components.
- Contractors shall install all system components including Owner furnished equipment in accordance with the manufacturer's instructions, NFPA 70, NEC, ANSI-C2 and shall furnish all cables, connectors, terminators, interconnections, services, and adjustments required for a complete and operable system.
- Grounding shall be installed as necessary to preclude ground loops, noise, and surges from adversely affecting system operation.
- For equipment mounted in drawers or on slides, provide the interconnecting cables with a service loop of not less than two feet and ensure that the cable is long enough to allow full extension of drawer or slide.
- Contractors shall install all custom and packaged software in the development and production environments.

Contractors' Quality Assurance Inspector shall conduct a visual inspection of all installations to verify that the installations are in accordance with the Owner's and manufacturer's specifications. Records of the inspections signed and dated by the Quality Assurance Inspector shall be provided to the Representative. The Representative shall be notified by Contractors of any inspection(s) and the Representative may elect to participate in any inspection(s).

All products shall be new, undamaged and covered by the original manufacturer's warranty and licensed as applicable to meet project intent. Products shall be shipped, handled and stored as recommended by the manufacturer. Contractors shall furnish and install products in accordance with manufacturer's recommendations and as illustrated in the project drawings. Should discrepancies be noted regarding quantities in schedules, specifications and/or on Project drawings, Contractors shall provide the greater number of units. Contractors shall provide all tools and test equipment required to install, verify, and test the installation and to determine that it meets the specifications. Contractors shall furnish all necessary materials required to implement and to achieve the required work performance

Contractor shall coordinate product delivery and movement to installation locations with the Representative. AUS shall provide a secure storage area for spare parts and some equipment. Store products in accordance with manufacturer's instructions, within Contractor's staging area and with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions. Contractors shall be responsible for any and all loss or damage to the shipment and delivery of all material. Contractors shall place materials only in those locations that have been previously approved. Any other locations shall be approved, in writing, by the Owner. Contractors shall coordinate installation with the Owner, to minimize disruption of existing business functions at the airport. End user devices shall be labeled with IP address and device name.

Contractors shall not apply power to systems until after:

- System and components have been installed and inspected in accordance with the manufacturer's installation instructions.
- A visual inspection of systems components has been conducted to ensure that defective equipment items have not been installed and that there are no loose connections.
- All system grounding and transient protection systems have been verified as properly installed and connected, as indicated.
- Power supplies to be connected to systems and equipment have been verified as the correct voltage, phasing, and frequency as indicated.
- Satisfaction of the above requirements shall not relieve Contractors of responsibility for incorrect installations, defective equipment items, or collateral damage as a result of Contractor work/equipment.

Testing Minimum Standards

Systems testing shall include the following phases or equivalent:

Functionality (Factory) Testing

Performance Verification Testing

On-Site Endurance Testing (Burn-in Period)

The overall system project shall not be considered complete until Performance Verification and On-Site Endurance Testing are completed on the entire system. In general, these tests shall verify:

Proper function of all field equipment

Proper function of all headend equipment

Proper function of all infrastructure elements

Proper function of software and interfaces

System is performing within defined parameters.

Division 27 - Communications (Continued)

Software Specification Minimum Requirements (Continued)

Contractors shall provide test plan/procedures for each testing phase for the review and approval of the Representative. The test plan for each phase of testing shall detail the objectives of all tests. The tests shall clearly demonstrate that systems and its components fully comply with the requirements specified herein. The test plan shall be provided at least twenty (20) days prior to the scheduled start of each test. Test plans shall contain at a minimum:

Functional procedures including use of any test equipment

Test equipment is to be identified by manufacturer and model

Interconnection of test equipment and steps of operation shall be defined

Test records shall include test equipment serial number, calibration date and calibration certification of test equipment

Expected results required to comply with specifications

Traceability matrix referencing systems' requirements with specific test procedures

Record of test results with witness initials or signature and date performed

Pass or fail evaluation with comments.

Contractors' Quality Assurance organization shall review all formal test procedures prepared by Contractors and deliverable under the contract to assure the tests cover all requirements and that there is a conformity between the conducted test, the test results and Specification requirements. Documentation verification, both interconnects and operationally, shall be part of the test. Where documentation is not in accordance with the installed system interconnect and operating procedures, systems shall not be considered accepted until systems and documentation correlate. Contractors shall provide the representative the opportunity(s) to participate in all of the tests.

Contractors shall prepare, for each test, a test report document that shall certify successful completion of that test. The test report shall be submitted to the Representative for review and acceptance within seven (7) days following each test. The test report shall contain, at a minimum:

Commentary On Test Results;

A listing and discussion of all discrepancies between expected and actual results and of all failures encountered during the test and their resolution;

Complete copy of test procedures and test data sheets with annotations showing dates, times, initials, and any other annotations entered during execution of the test;

Signatures of persons who performed and witnessed the test.

Any discrepancies or problems discovered during these tests shall be corrected by Contractors at no cost to Owner. The problems identified in each phase shall be corrected and the system re-tested before any subsequent testing phase is performed.

Training Minimum Standards

Contractors shall prepare training materials and conduct all training for users and administrators. The owner shall provide a training classroom to conduct project training. Contractors shall supply the appropriate training for designated Owner personnel. The training shall provide personnel with a working knowledge of the design and layout and shall provide troubleshooting methods and techniques. In addition, the training shall cover testing, maintenance, and repair procedures for all equipment which is provided under this Specification. Contractors shall supply a detailed plan of user training and system administrator training. Contractors shall provide a course outline, course materials and syllabus to the Owner for approval twenty (20) days prior to the scheduled training date. Each course shall require Owner's approval prior to presentation. Course materials shall be delivered to the Owner for future presentation.

All training shall be completed a minimum of two weeks prior to systems becoming operational and utilized by tenants. Training schedule subject to Representative's approval. Training shall be conducted by experienced personnel and supported by training aids. An adequate amount of training material shall be provided by Contractors. The following is considered a minimum:

- Functional flow charts, overall block diagrams, and descriptive material for all software
- Schematic drawings for each of the hardware components
- All procedure manuals, specification manuals, and operating manuals
- As-built drawings.

Participants shall receive individual technical manuals and pertinent documentation 7 days in advance of the training course. The courses shall be scheduled such that Owner personnel can participate in all courses (no overlap). A final course schedule and syllabus shall be prepared by Contractors for each course to be conducted for Owner personnel.

User Training Minimum Requirements:

- User training shall be conducted on site at the Airport.
- Airport system users shall be instructed in all aspects of the operation of a systems. As a minimum, one (1) course with four (4) hours of user training shall be provided (if in person training, for a minimum of 6 attendees).

II. SPECIFICATIONS

B. Facilities Services Subgroup

Division 27 - Communications (Continued)

Software Specification Minimum Requirements (Continued)

Administrator Training Minimum Requirements:

- System Administrator Training shall include both classroom work and on-the-job training.
- Classroom Training: A minimum of eight (8) hours of system training (for up to 2 system administrators) shall be provided. Contractors shall structure the course to describe all systems, software and applications and support programs. This course shall include a functional overview of the complete software system. The course material shall be presented in depth with the instructor covering detailed system elements.
- On-the-Job Training: An additional minimum of three (3) working days of on-the-job training shall be provided. On-the-job training of the designated Owner personnel shall be scheduled with Owner. This training shall be conducted on site at the Airport. Contractors shall answer any and all questions regarding the operation, repair, and maintenance of systems, software, and equipment.

Final System Acceptance Minimum Standards:

After Endurance Testing is complete, documentation submitted and approved by the Representative, schedule final system acceptance review and inspection. Final system acceptance and review shall be conducted with the Representative. Any remaining open issues shall be documented and resolved. All training shall be completed. Service level agreement shall be finalized and given written approval.

Once all remaining open issues are closed, the Representative shall issue Final System Acceptance approval in writing. Upon Final System Acceptance approval, the warranty period and first year maintenance period shall begin.

Division 28 - Electronic Safety and Security

Overview

The following Division 28 information is not meant to supersede the AUS Division 28 template specifications. The Designer should utilize the AUS template Division 28 specifications (which are a separate document available from the AUS Project Manager) as the governing specification requirements and should utilize the following information to supplement the AUS Division 28 template specifications. In the event of overlapping or conflicting requirements, the Designer must default to the AUS Division 28 template requirements.

Communications

Communication Specifications May Include:

- Access Control System
- Duress and Intrusion Detection System
- Video Management System / CCTV
- Perimeter Intrusion Detection System
- Physical Security Information Management System
- Intercom System

Some of the above specifications exist as AUS template (boilerplate) specifications. The Designer shall request and utilize the AUS template specifications when available. Additional security specifications and requirements shall be developed as required for a given project.

For projects requiring software procurement, the Designer shall develop the appropriate software specification requirements. As a baseline, software-based systems shall meet the minimum requirements identified in Division 27 above. The Designer shall develop additional specification requirements as appropriate for the specific software system and project to deliver a solution that fully meets AUS needs and requirements.

Fire Alarm

Fire alarm systems shall be installed as required by Authorities Having Jurisdiction (AHJ). Design Professionals shall be responsible for adding new or revising existing fire protection systems to conform to needs in renovated areas. Fire alarm systems shall comply with the applicable edition of the International Building Code (IBC) and the International Fire Code (IFC), with City of Austin amendments, and all referenced codes and standards.

Project specifications shall be developed to reflect code compliance, industry standards, and AUS guiding principles.

C. Site and Infrastrucure Subgroup

Division 31 - Earthwork

Refer to Exterior Improvement and Development Design Standards sections for requirements.

Division 32 - Exterior Improvements

Refer to Exterior Improvement and Development Design Standards sections for requirements.

Division 33 - Utilities

Refer to Exterior Improvement and Development Design Standards sections for requirements.

Division 34 - Transportation

Refer to Exterior Improvement and Development Design Standards sections for requirements.

SUPPLEMENTAL APPENDICES

I. SUPPLEMENTAL APPENDICES

A. Digital Governance

AUS Digital Governance represents a collection of standards developed to produce, release, and receive design and construction data in a consistent format. Adherence to the following standards is required on all AUS projects in conjunction with a BIM Execution Plan, generated per project, identifying specific project Digital Governance requirements. Additional execution plans may be generated to meet the needs of a specific project.

https://www.austintexas.gov/page/construction-and-design-resources-airport

BIM Standards

Guide for developing Building Information Models with AUS approved design and construction software.

GIS Standards

Guide for structuring and inputting data into AUS Geographic Information Systems.

Asset Management Standards:

Guide for generating AUS assets with required attributes in alignment with the airport's Asset Management, BIM, and GIS platforms.

Autodesk Construction Cloud (ACC) Standards

Guide for utilizing Autodesk Construction Cloud a cloud-based collaboration platform for design and construction.

Digital Governance Appendices:

Appendices containing new documentation, external references, and supporting information identified throughout the Digital Governance.

B. AUS Utility Management Program

AUS has adopted policies and procedures intended to prevent the interruption of utility service due to construction and to minimize the length of planned service interruptions. The policies are also intended to allow for cost effective future expansion of the AUS facility with minimal disturbance to the existing infrastructure through the efficient use of available space and to minimize future utility relocations through proactive utility planning. Adherence to the following standards is requested on all AUS projects in conjunction with the AUS Utility Management Program.

https://www.austintexas.gov/sites/default/files/files/Airport/AUS%20Utility%20Management%20Plan_web.pdf

I. SUPPLEMENTAL APPENDICES

B. Tenant Design Manual

This section includes links and references to the AUS Tenant Design Manual

(AUS Tenant Design Manual Forthcoming)

C. Sustainability

This section includes links and references to AUS sustainability and working condition resources such as AUS Environmental Affairs web portal, the City of Austin's proposed strategy to align with the Better Builder Program, and Environmental Social Governance (ESG)

https://www.austintexas.gov/department/environmental-affairs

https://services.austintexas.gov/edims/document.cfm?id=366255

https://austinenergy.com/energy-efficiency/green-building

https://www.austintexas.gov/sites/default/files/files/Airport/AUS%20ESG%20FINAL.pdf

D. Wayfinding and Signage

This section includes links and references to the AUS Wayfnding and Signage Design Standards

(AUS Wayfinding and Signage Design Standards Forthcoming)