



EAGLE COUNTY
Regional Airport



EAGLE COUNTY REGIONAL AIRPORT MASTER PLAN

Appendix B





B TERMINAL AREA STUDY

The development of a Masterplan for the Eagle County Regional Airport (EGE) requires the collection and evaluation of data directly relating to the airport, as well as the surrounding area. The most necessary steps in the development of an airport Masterplan are outlined in the Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070- 6B. The information was obtained through on-site investigation, interviews conducted with airport management, as well as collection and analyses of previous field reports and studies. The findings associated with following will be summarized:

B.1 GUIDING DOCUMENTS

The following documents were referenced for this Master Plan:

- 2011 EGE Master Plan Report (Jviation, a Woolpert Company)
- 2016 EGE Advanced Terminal Area Plan (RS&H)
- 2019 Existing Drawings - EGE Concourse Expansion & Remodel Project (Gensler)

B.2 PRELIMINARY CODE ANALYSIS

A preliminary building code analysis, performed by the Consultant Team, was focused on identifying expansion constraints.

Applicable codes for The Town of Gypsum:

- 2015 International Building Codes (IBC)
- 2015 International Residential Code (IRC)
- 2015 International Mechanical Code (IMC)
- 2015 International Fuel Gas Code (IFGC)
- 2015 International Plumbing Code (IPC)
- 2015 International Fire Code (IFC)
- 2017 National Electric Code (NEC)
- ICC/ANSI Accessibility Standards 2009 Edition

Applicable Code for the FAA:

- 2022 NFPA 415 Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways
- Although NFPA is not enforced by The Town of Gypsum, depending on FAA funding NFPA 415 may be a requirement.

In addition to the applicable codes listed above, the analysis utilizes the Gensler Code Compliance Summary from the 2018 expansion and remodel project. For reference, the existing building square footage is below:



Level 1 - 89,420 SF
Level 2 - 36,800 SF
TOTAL - 126,220 SF

The following factors that may limit expansion will be reviewed in this report:

Factor 1 | The existing construction type classification from IBC Chapter 6 coupled with the proposed uses from IBC Chapter 3 which together will be used in IBC Chapter 5 to determine the maximum allowable building area and the height / number of stories.

Factor 2 | The physical site configuration in terms of the open area around the existing building for the expansion and the existing distances from the building and proposed expansion to the existing property lines or adjacent buildings.

B.2.1 **Factor 1**

Occupancy Use Groups

The existing airport is a mixed-use building composed of the following occupancy groups:

- A-3 (Gate hold-rooms / waiting areas, Main Terminal / Hall, and Concourse)
- A-2 (Tenant spaces)
- B (Office and Restrooms)
- S-2 (Loading storage, Bag handling)

The 2018 expansion proposed that the airport building be classified as mixed-use with non-separated occupancies per 508.3. We propose this classification remain with future expansions.

Construction Type

The building has a mix of construction types from various additions:

- Type II-B for the baggage handling area
- Type III-B for the 2018 expansion
- Type IV HT for the original terminal and flanking terminal expansions
- Type IV HT for the office area between the terminal and baggage handling area

The 2018 expansion project reclassified the entire building to match the addition as Type III-B. The basis being the definitions for Type II-B and Type IV HT are compatible with the fire-resistance rating requirements of Type III-B found in **Figure B-1** below.



Figure B-1– NFPA 415 Table 601

FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)									
BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame ^e (see Section 202)	3 ^a	2 ^a	1	0	1	0	HT	1	0
Bearing walls									
Exterior ^{a, f}	3	2	1	0	2	2	2	1	0
Interior	3 ^a	2 ^a	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions	See Table 602								
Exterior									
Nonbearing walls and partitions									
Interior ^g	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1 1/2 ^b	1 ^{h,c}	1 ^{h,c}	0 ^c	1 ^{h,c}	0	HT	1 ^{h,c}	0

Source: NFPA.

However, if NFPA 415 is applicable Type III-B construction is not an approved construction type for Airport Terminals. Per NFPA 415, 4.1.1 only Type I, Type II, or Type IV construction types are permitted. To accommodate the NFPA requirement we propose re-classifying the 2018 addition to be Type II-B while still acknowledging the original terminal to be Type IV heavy timber construction. The 2018 addition is composed of steel construction and non-combustible materials which meets the requirements of the Type II-B definition. The proposed result is a building with two construction types: Type II-B and Type IV.

From NFPA 415:

4.1.1 Airport terminal building shall be of Type I or II, or Type IV construction, as defined in NFPA 5000 or NFPA 220. (See Annex B.)

Buildings with multiple construction types can either separate the construction types with fire walls to create separate buildings or can follow the most restrictive construction type to establish the maximum allowable area for the building. The 2018 expansion proposed the building be classified as an unlimited area/covered mall building, which we propose be maintained. Both the Type II-B and Type IV construction types fit the requirements for the unlimited area definition and there is no need to separate the construction types with fire walls or reclassify Type IV.

507.13 Covered and open mall buildings and anchor buildings. The area covered and open mall buildings and anchor buildings not exceeding three stories in height that comply with Section 402 shall not be limited.

402.4.1.1 Covered and open mall buildings. The building area of any covered mall or open mall building shall not be limited provided the covered mall or open mall building does not exceed three floor levels at any point nor three stories above grade plane, and is of Type I, II, III or IV construction.

Factor 1 Conclusion: The airport will remain classified as an unlimited area building, so the future expansion area will not be limited by this factor. However, the airport is limited to three stories should a vertical expansion be explored.



B.2.2 Factor 2

The physical site configuration for the airport is very conducive to expansion. The 60' of open space required to maintain the Covered Mall Building definition and Unlimited Area Building status should be easily maintained. Currently there is the airfield to the north, the parking lot with Cooley Mesa Road to the south and then the adjacent buildings are the Eagle County Regional Airport Administration building to the west that is approximately 349 feet away and the Vail Valley Jet Center to the east that is approximately 222 feet away. Expansion potential for each direction is summarized below:

- North Expansion: Expansion to the north is only limited by airfield functionality.
- South Expansion: Expansion to the south is only limited by parking lot capacity requirements.

The more likely expansion zones to the east and west have some limits based on the adjacent buildings. In looking at the existing Civil plans it does not appear there are property lines separating the adjacent buildings from the terminal. If an imaginary property line is centered between the adjacent buildings, the following would be the result for potential expansions:

- West Expansion: 114' expansion potential (174' minus the requisite 60' space to the imaginary property line)
- East Expansion: 51' expansion potential (111' minus the requisite 60' to the imaginary property line)

Note: if more expansion is needed there is the potential to shift the imaginary property line towards the adjacent buildings.

Factor 2 Conclusion: The constraints for horizontal expansion to the West is 114' and to the East is 51'. Expansion to the North is only limited by airfield functionality and expansion to the South is only limited by parking lot capacity and functionality.

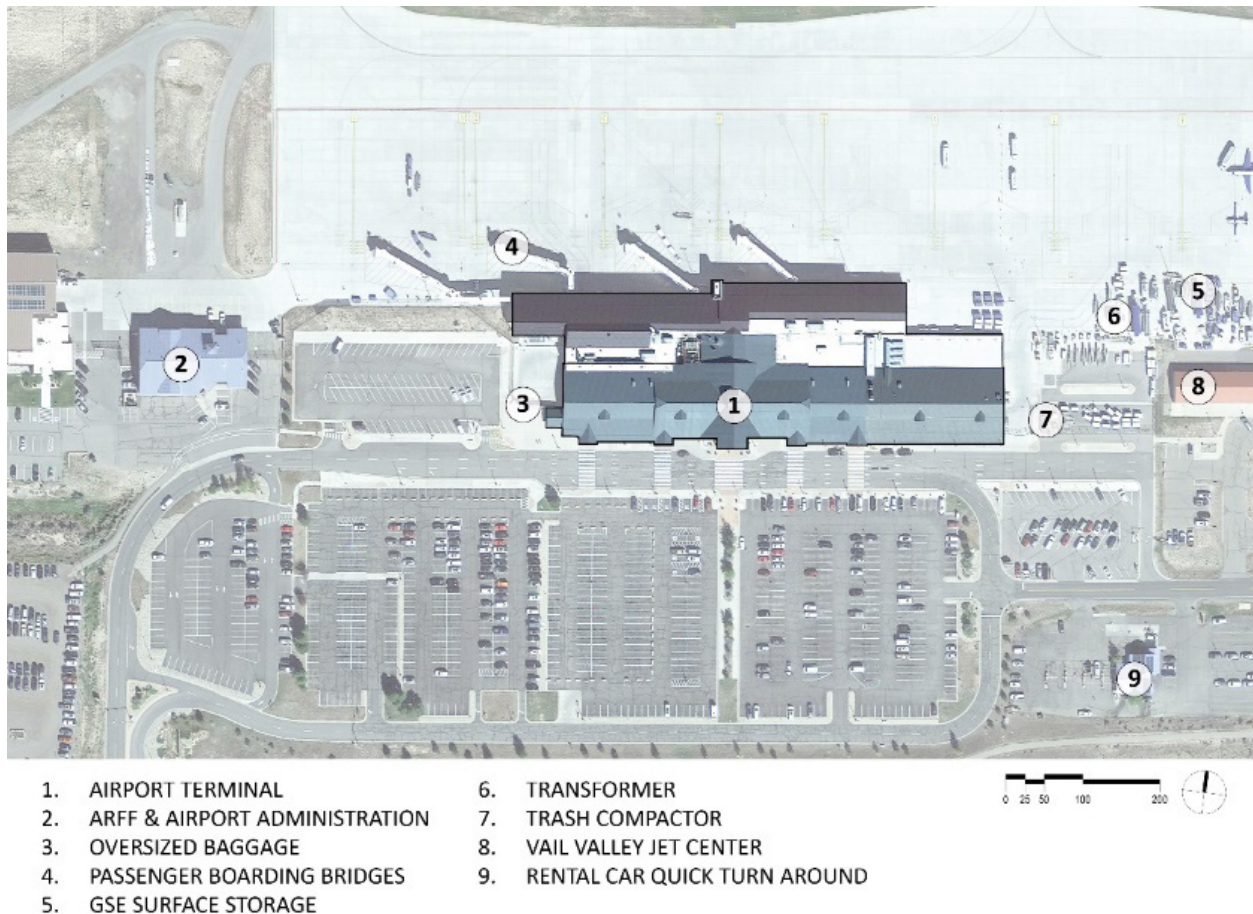
This analysis is strictly focused on any code constraints for a future expansion of the airport. The two factors above are the drivers. Although not constraints to an expansion, there are other aspects of the airport that will need to be considered to support an expansion and we have outlined a few of those below:

- Restrooms: restroom counts will need to be evaluated and new restrooms provided as required to accommodate the increased population of an expansion.
- Parking: The parking lot capacity will need to be evaluated and may also need to be enhanced by the introduction of a structured parking garage should additional parking be required.
- Exits: Depending on the expansion configuration, additional exits and exit stairs may be required to accommodate the increased population of an expansion.

- MEP: The HVAC systems, electrical systems, and plumbing systems will also need to be evaluated with an expansion. This will include not only the new systems found within the expansion areas but also confirming that the existing utility services to the building have capacity.

B.3 SITE EVALUATION AND EXPANSION CONSTRAINTS

Figure B-2 – Aerial Photo



Source: Gensler.

The aerial photo (**Figure B-2**) identifies the critical operational facilities needing to be considered with any future development of the site. The structural system constructed during the recent concourse renovation project provided the future flexibility to expand the concourses east, as well as vertically above the existing footprint, where parking of four additional planes is possible if the capacity need arises. Although parking additional aircraft is not possible any further on the west end of the concourse, due to the constraint of the ARFF Facility, there is a large area of footprint available to expand the interior space being captured for the concourse. Provided there are modifications made to the location of the Trash Compactor, it could be possible to expand the main terminal to the east. Surface parking lots and roadway paving could be reconfigured to expand the main terminal both to the west



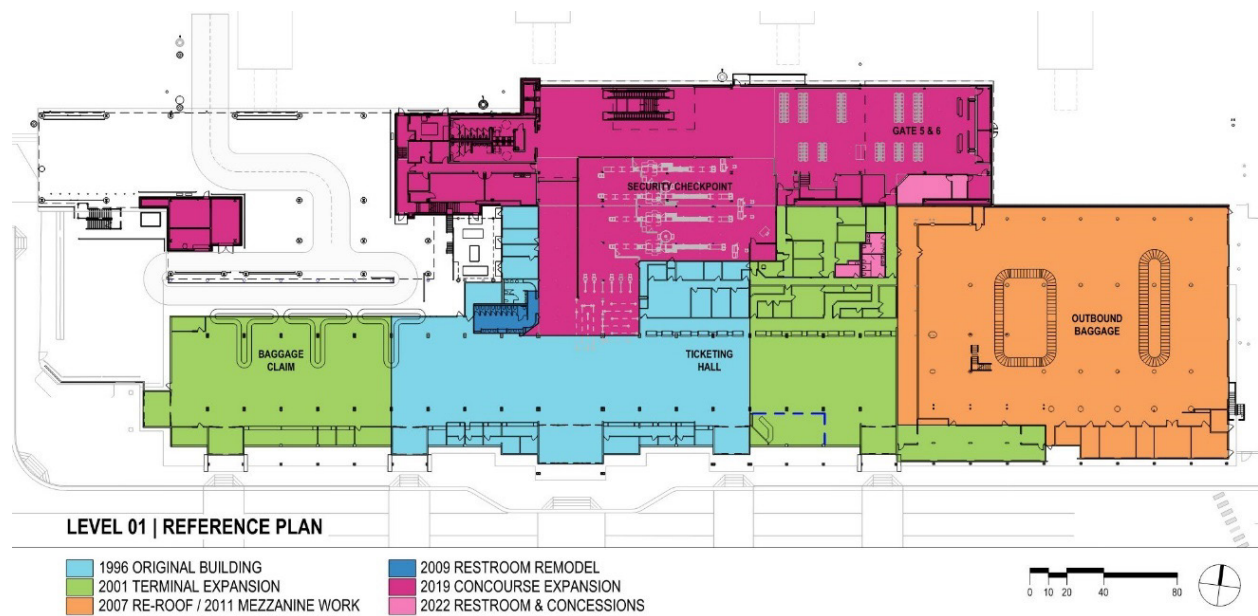
and south. The ARFF facility, to the west, is the limit to potential expansion, due to likely impacting critical operations, utilities and infrastructure.

B.4 AIRPORT PHASING

Figure B-3A and **Figure B-3B** are a graphic representation of the chronological building history at Eagle County Regional Airport (EGE) included the following projects:

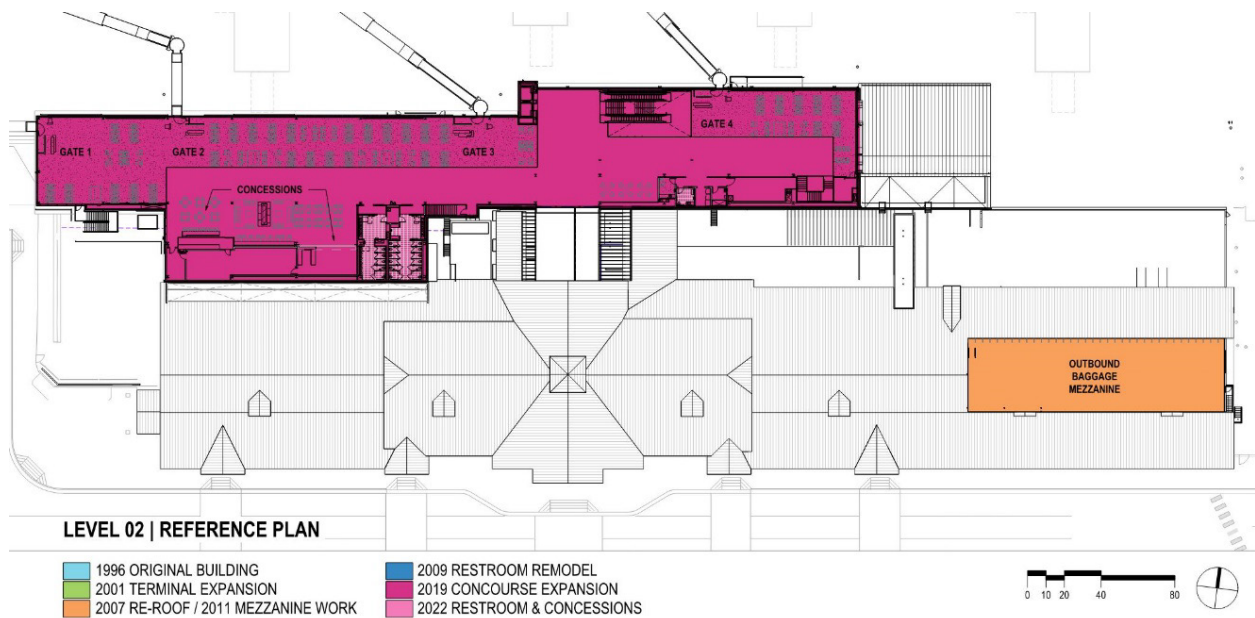
- 1996 Original Building
- 2001 Terminal Expansion
- 2007 Re-Roof / 2011 Mezzanine Work
- 2009 Restroom Remodel
- 2012 Checkpoint Reconfiguration **additional reconfiguration with 2019 Concourse Expansion*
- 2019 Concourse Expansion
- 2022 Restroom and Concessions

Figure B-3A – Airport Construction Phases | Level 01



Source: Gensler.

Figure B-3B – Airport Construction Phases | Level 02



Source: Gensler.

B.5 TERMINAL FACILITIES OVERVIEW

Figure B-4 - Eagle County Regional Airport



Source: Gensler, photo by David Lauer.

Eagle County Regional Airport (EGE) is located south of Interstate 70 just off Highway 6 between the Towns of Eagle and Gypsum, Colorado. While EGE first experienced commercial passenger service in the 1960s, it began in earnest in 1989 with seasonal commercial service from Phoenix and Los Angeles. While service levels and frequencies have fluctuated, the Airport's current commercial service program to includes three major airlines with non-stops to 13 airports, in 12 major cities. EGE's commercial traffic is currently driven largely by tourism specifically to access local area resorts of Vail, Beaver Creek, and Aspen. Seventy-five percent (75%) of EGE's

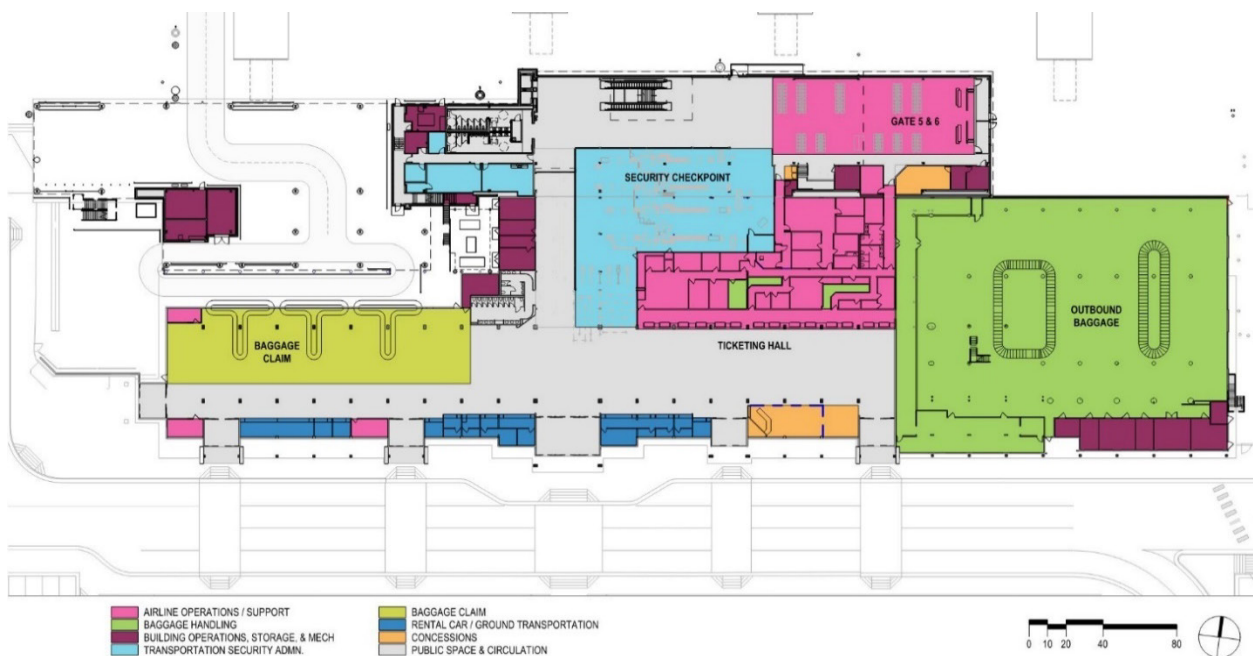
passenger traffic occurs between the months of December and March, and there were over 200,000 passenger enplanements in 2021. Eagle County Regional County Airport also supported over 57,000 aircraft operations in 2021. That type of demand influences decisions related to the future of the Airport.

Figure B-5A – Program Plan | Level 1



Source: Gensler.

Figure B-5B – Program Plan | Level 2



Source: Gensler.



B.6 CURBSIDE APPROACH

Figure B-6— Main Entry and Oversize Baggage Area



Source: Gensler, photo by David Lauer.

The curbside approach is located directly in front of the terminal on the south side of the building on Eldon Wilson Road. This local road loops around the primary long- and short-term parking lots, as well as having a rental car pickup area. In front of each entrance there are dedicated areas to temporarily park, in order to drop off and pick up passengers. Curbside check-in and oversize baggage drop-off are both available prior to entering the terminal, but lack of curbside capacity has been expressed as a concern to the efficiency of traffic and passenger flows.

B.7 MATERIALITY, BUILDING ENVELOPE AND STRUCTURE

Figure B-7 – Concourse Exterior



Source: Gensler, photo by David Lauer.



Currently the two main massing elements for the terminal are the original terminal, built in 1996, and the recently completed Concourse Renovation project in 2019. For the purposes of this inventory, they will be discussed separately.

The new concourse included significant improvements to the building envelope and the performance of the overall building from an energy code standpoint. The new steel structure had a building envelope assembly attached which included continuous insulation, air and water barriers, bonderized metal cladding, standing seam metal panel roof & large portions of high-performance curtainwall glazing. On the interior the primary elements included wood plank dropped ceiling and poured concrete slab flooring system with carpet in select areas.

The original terminal is a heavy timber structure, including exposed glulam beams, columns and wood decking. The insulation was mostly captured between studs, rather than run continuously, which has led to thermal inadequacies. Stucco cladding with a standing seam metal panel roof covers a majority of the building envelope. The glazing throughout is punched openings with a storefront glazing system. Flooring throughout is carpet with ceramic tile in select areas.

B.8 TICKETING

Figure B-8 – Original Terminal Ticketing Area



Source: Gensler, photo by David Lauer.



There are currently three airlines serving Eagle County Regional Airport including: American Airlines (AA), Delta Airlines (DL), United Airlines (UA) which provides nonstop service. The ticket counters are located just as you enter the main entrance of the building. There are additional curbside ticket counters located toward the southeast end of the building. Ticketing Positions by airline carrier are as follows:

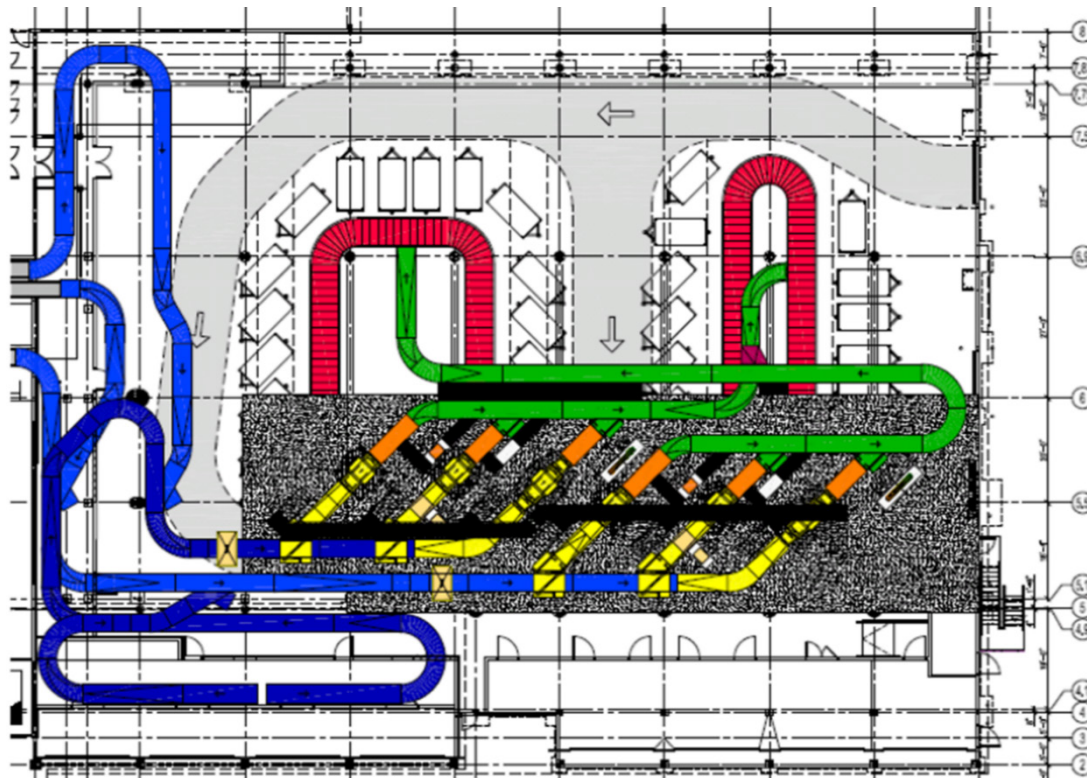
- AA – 6 positions (plus self-service kiosks)
- UA – 6 positions
- DL – 2 positions

B.9 SCREENING

The main attraction that Eagle County Regional Airport provides is the ease of transport to the slopes, therefore they experience an influx of skis, snowboards and snow gear during ski season. Oversize, or odd sized baggage will be processed via the check in counters, they are only accepted at the curbside area. Large radius (5') power turns are used so skis can be routed directly to the CT80DRXL machines.

The specified Baggage Handling System (BHS) is directly associated with the operation of the Explosive Detection System (EDS) machines for the security screening of all originating passengers. The proposed System Type 3 Mini In line CBIS consists of three ticket counter conveyors, and two curbside inputs.

Figure B-9A – Plan of Baggage Handling System



Source: Gensler



B.9.1 EDS Subsystem Description

Level 1 | Refers to an EDS device operating in a fully automated mode. All bags will be routed to a Level-1 subsystem for screening. The EDS will scan the bag(s) before exiting the device. The EDS will pass the bag back to the BHS with the appropriate bag status. (e.g., clear, suspect, decision pending, etc.) and the corresponding bag identifier. The BHS will maintain PLC tracking of the bag at both input and output interfaces with the EDS. 8.1.2.3 If the bag is successfully cleared at Level-1, prior to the decision point, then it will be sorted to its final sortation destination. If a “suspect” or “fault” bag decision is received from the Level-1 EDS, the BHS shall advance the bag and the bag image will be sent to the remotely located manned workstation/Level-2 where the operator will review the bag image.

Level 2 | Known as a “manually” operator workstation where the TSA agent will decide after reviewing the image. They will then determine as to whether the bag is a threat or not. If the bag is successfully cleared, then it will be sorted to its final sortation destination. If the bag reaches to the decision point and a decision has not been made, then the bag will stop at the appropriate Bag Removal Point (BRP) for ETD screening.

Level 3 | The ETD area refers to a location where failed Level-2 bags, are routed by the BHS in order to be cleared as per airport/airline/TSA protocols. Once the bag has been cleared at the ETD area it will be placed on the re-insertion queue conveyor and transported to the make-up device. Bags that have been cleared by the CBIS system (automatically or manually) bags will be transported onto a dedicated clear line. There is no automated sortation subsystem, in its initial configuration; each EDS pod has a dedicated clear bag line feeding a single slope pallet make-up device. The capacity for the EDS pod system is 30BPM. In the event of a Make-up device failure manual Sortation is accomplished utilizing fixed diverters positioned on the clear line transport conveyors.

B.9.2 Previous Work

BNP Associates, Inc. was retained by the Eagle County Air Terminal Corporation (ECAT) to design an outbound inline checked baggage inspection systems (CBIS) capable of screening skis. The baggage system’s design consists of two EDS screening pods, each of which contains three EDS machines. The pods are fed by three ticket counters and two curbside lines. The EDS pods divert ski bags to either a CT80DRXL line or to the out-of-gauge line for screening and standard passenger bags to CT80DR machines. In case of an EDS machine failure, the system has a purge functionality. Out-of-gauge bags are diverted around the EDS devices onto an OG line for transport to ETD screening. BNP’s designs incorporate the latest TSA Planning Guidelines & Design Standards making the EGE baggage handling system design fully compliant to TSA’s current protocol for 100% inline certified EDS checked baggage screening.

Figure B-9B – Screening

Source: Gensler

B.9.3 Operational Faults

BNP Associates has identified existing issues with the system that need to be improved in order to meet performance benchmarks. Regarding the CS1-07, there is a significant number of Variable Frequency Drive (VFD) Faults for Over Current Fault (OCF). These faults shut down the CS1-07 conveyor in this area, and during the peak departure period bags will start to cascade stop until the fault is cleared and reset. The resetting of this fault requires the cycling of the Emergency Stop controls and start-up sequencing of the conveyors upstream of this location. Based on information received from Five Star Airport Alliance the original equipment manufacturer (OEM) and installer of the BHS, these faults have been occurring for a significant period. Several facets have been implemented to resolve this issue such as replacement of several components, VFD, and gearbox. Also, conveyor belt adjustment tension was made but the fault persists. Just recently the maintenance staff at EGE has received a VFD cable for installation on CS1-07.

Summary Points:

- Large number of E-stops in front of the machines to cross over instead of using stop/start crossover controls.
- Jams are occurring primarily upstream of the EDS machines possibly due to the frequent use of E- stops.
- Seemingly continuous issues with EDS machines powering off/offline or faulting for a few seconds to a minute throughout the day

- Total bag counts between Input and output do not match, brings into question the accuracy of the reports. Data off by approximately 300 bags e.g., December 23rd
- Faults on (Baggage Measuring Array) cause undue demand on OOG screening lanes.
- TC1 Security door sensors, and controls are not operating properly
- CS1-07 VFD shows multiple faults and drive should be replaced or repaired.

B.10 BAGGAGE MAKEUP AND CLAIM

Figure B-10A – Baggage Makeup



Source: Gensler

In fall of 2009 the terminal lobby equipment was removed and upgraded to include four (4) Reveal CT80-DR's machines and two (2) Reveal CT80-XL machine.

Many elements were carefully considered while constructing the in-line operations mezzanine, including locating the mezzanine in the best possible area for bag movement and conveyor installation, use of existing conveyor systems, and structural reinforcement to carry the loads of the heavy in-line equipment and screening operations. It was envisioned that the conveyors currently delivering bags for all airlines will all be routed to the in-line bag screening area on the mezzanine and sorted to the appropriate airline belt once screened. The local TSA collected baggage and passenger information which has been used in the assumptions for the inline screening analysis to determine screening demands for an in-line system to meet current demand needs and DBU + 5 years.

B.10.1 Design Criteria

For any changes being proposed will be designed with the specific characteristics below:

The BHS top of belt clearance for all the conveyor lines will be designed with a clearance of 30" from top of belt to the bottom of the lowest obstruction (e.g., beam, conduit, etc.) for all outbound baggage and 30" clearance for all new curbside

conveyor lines. BHS controls will be specified with a particular programming to ensure that all baggage processed through the EDS units does not exceed the EDS supplier maximum height restriction - to comply with the EDS supplier's documentation.

The size for standard conveyors is 120 lbs. maximum and 1lb minimum per bag. The maximum length by width by height is: 54" by 33" by 34" and the minimum dimensions are as follows: 12" by 12" by 12".

Figure B-10B – Baggage Claim and Rental Car Facilities



Source: Gensler

B.11 RENTAL CAR FACILITIES

Currently operating at EGE are seven different rental car companies within the terminal: Avis, Budget, Dollar, Enterprise, Hertz, National and Sixt. Off airport, there are also two additional rental car companies which serve EGE: Thrifty and Go Rentals. There are also two ground transportation shuttles located in the terminal: Epic Mountain Express and High Mountain Taxi. Rental car and ground transportation providers have expressed interest in additional space, but operations appear adequate at this time. However, the queuing from these counters often extends north into the circulation path, causing congestion in the east-west flow of passengers.



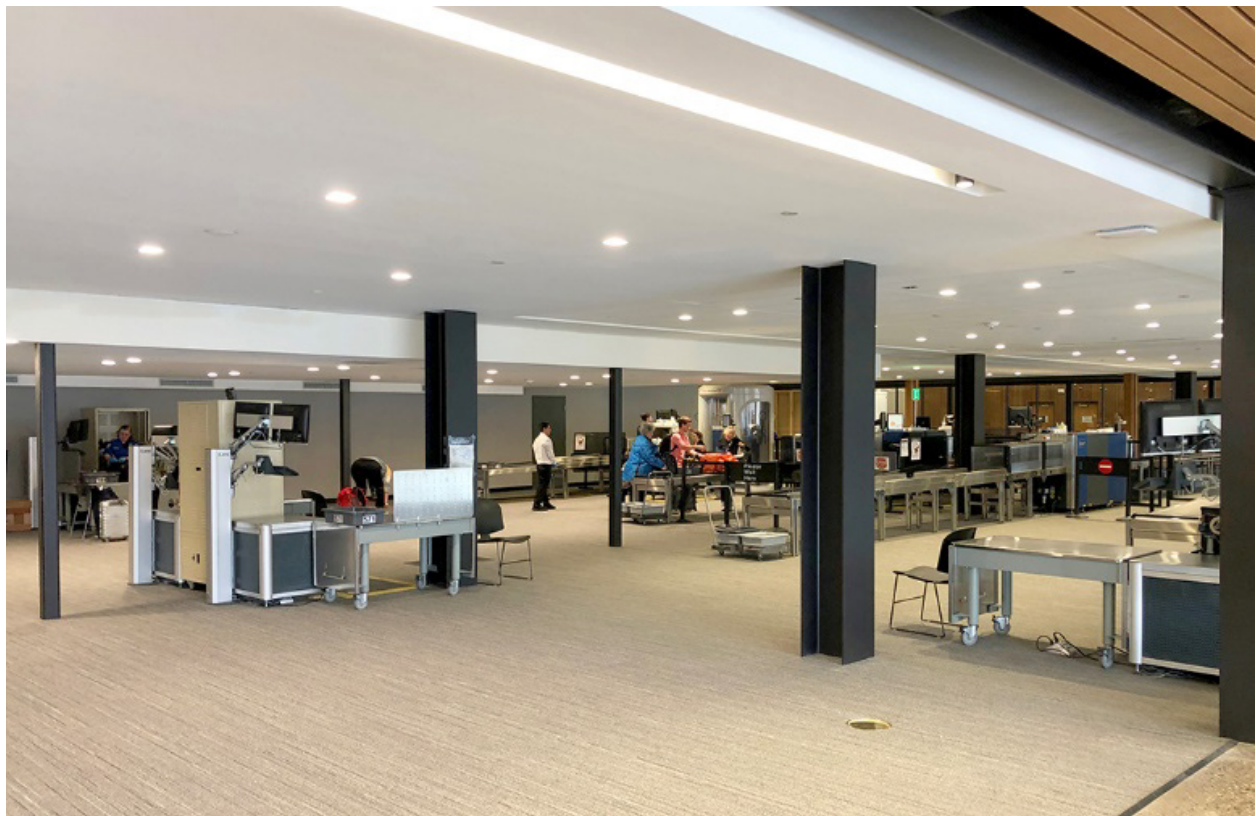
B.12 AIRLINE TICKET OFFICES

Airline Ticket Offices (ATO) primarily serving the airline back of house functions, are located in various locations throughout the terminal:

- East end of the commercial terminal at curbside check-in.
- Inside the commercial terminal at the northeast end of the building.
- West end of the terminal in the vicinity of the baggage claim carousels.

B.13 TSA SECURITY CHECKPOINT AND FACILITIES

Figure B-11 – Reconfigured SSCP



Source: Gensler

The Security Screening Checkpoint (SSCP), and other facilities associated with the operations of the TSA, operate on Level 01 in the middle of the terminal between Ticketing and the Concourse areas.

The 2019 concourse expansion and remodel involved a rearranging of the security checkpoint in order to obtain a more efficient layout and increase the area of passenger queuing. The security checkpoint has (4) lanes, with (2) ATD scanners, a private screening room with glass partitions, a couple recomposure benches, and additional recomposure space north of the security checkpoint exit. In fall of 2022 EGE upgraded the scanning equipment to the Computed Tomography (CT) x-ray systems, which will improve both security screening and passenger experience by



allowing for greater passenger throughput. Additionally, the 2019 concourse expansion relocated the TSA offices, breakroom, and storage to level 1 of the new concourse, west of the security checkpoint.

Currently, the security screening check point is approximately 6,380 square feet with approximately 1,200 square feet of queuing space south of the document checkers. The additional TSA support spaces, including the breakroom, multi-purpose room, office, storage, and IT room total approximately 1,150 square feet.

B.14 HOLDROOMS AND GATES

Figure B-12 – Level 02 Holdrooms



Source: Gensler, photo by David Lauer.

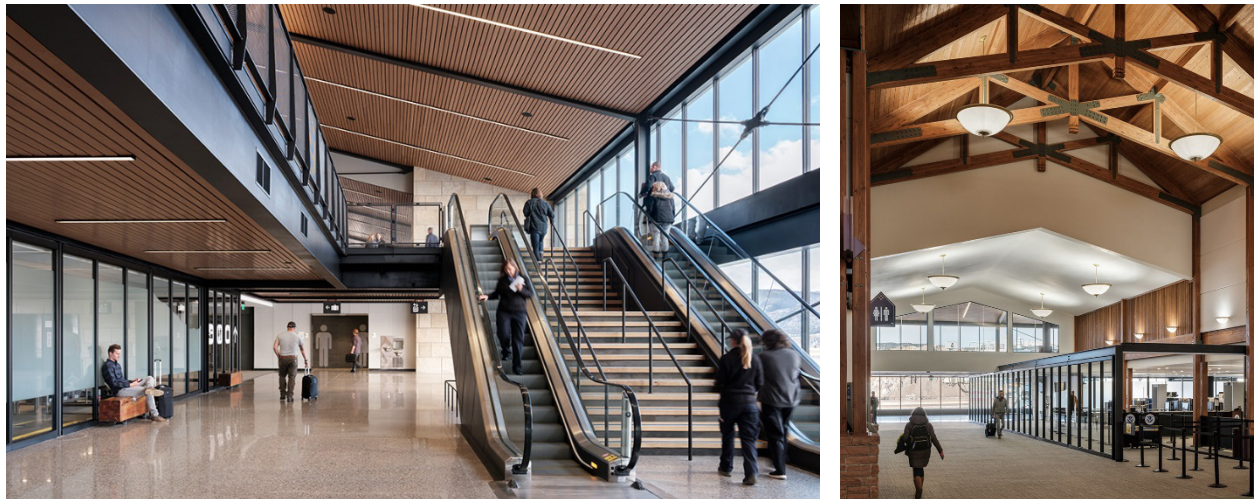
The terminal has 16,000 square feet of holdroom area reserved for scheduled outgoing passengers waiting to access their aircraft through one of the 6 available gates. The concourse has 6 gates total, four on level 2 with passenger boarding bridges (PBB) and two ground loaded gates on level 1. The holdrooms have a mix of tandem seating, lounge seating, and tables to meet the varied needs of the passengers. The majority of the holdroom layouts exist within a 27-foot depth and adjacent to a 20-foot concourse circulation path and there is increased density of holdrooms on both the east and west ends of the concourse. The compression of the roof form at the gate lounges creates a more intimate environment and strong connection with the airfield and landscape beyond. Holdroom 1, on the west end of level 2, has a 78' boarding bridge extender to the west. Holdrooms 5 and 6 are the ground loading gates on level 1, and passengers egress out the east vestibule to the apron.



B.15 CIRCULATION

The commercial terminal at EGE incorporates a great hall concept in the main terminal area, which allows for passenger circulation in the east-west direction of the ticketing hall and baggage claim with generous spatial volume. Typically, main passenger flow occurs in the middle of the terminal, however, queuing for the ticket counters, around the baggage claim carousels, and at the ground transportation counters can all extend into this circulation space during peak times and cause congestion.

Figure B-13A – Vertical Circulation (left); Figure B-13B – Security Circulation (right)



Source: Gensler, photo by David Lauer.

The 2019 concourse addition expanded and reconfigured the security checkpoint for improved circulation and upon exiting security offers a generous re-composure area. The custom-crafted wood stair, escalators and elevators offer intuitive wayfinding to the second level, which is organized by a 20-foot-wide concourse circulation spine. This amount of circulation space allows for the movement of passengers coming and going, as well as an overflow space when flights get delayed or canceled and the holdrooms exceed their seating capacity.

B.16 CONCESSIONS

The landside concessions area is a 1,020 square foot space on the south side of the ticketing hall, which offers coffee, news, gifts and some grab-and-go products. There are a few high-top tables and counter spaces, but none of these seating options offer an ADA compliant seating choice. There are also landside vending machines located in the main entry vestibule and the west baggage claim vestibule.

The secure side concessions are located on the west side of the level 2 concourse and include a point-of-sale counter with grab-and-go products, coffee bar, and a restaurant menu run by the Tailwind Concessions. The concessions area is supported by a 900 square foot back-of-house kitchen. The seating options outside the point-of-sale area include 2-top tables, a long banquette with tables, lounge seating around a fireplace, and high-top tables and bar seating. The total area of this concessions zone,



including the point-of sale, kitchen, trash room, bar, seating, and fireplace area is approximate 4,040 square feet. The queuing at the point-of-sale counter can become quite long at peak times, stretching through the seating area and occasionally into the concourse circulation. The central location and layout of the level 2 concessions area allows it to function as an alternate passenger waiting area, supplementing the holdroom capacity, because of the proximity and direct sightlines to gates 1, 2, and 3.

EGE is currently building out an additional secure concessions space on level 1, inside holdrooms 5 and 6, which will also be run by a contracted operator. It will provide 400 square feet of concessions space and a 100 square foot storage room. Currently there are also secure vending machines located on level 1 in a niche south of holdroom 5 and 6 and on level 2 in a niche south of Gate 4.

Figure B-14 – Airside Concession



Source: Gensler, photo by David Lauer.

B.17 RESTROOMS, NURSING ROOM, AND PET RELIEF

The landside public restrooms are a single bank of men's and women's restrooms, centrally located across from the main entry and adjacent to the security queuing. There are 5 fixtures and 3 lavatories in the men's restroom, which is part of the original 1996 building, and there are 9 fixtures and 6 lavatories in the women's restroom which was remodeled in 2009. Once arriving passengers leave the secure



concourse, these are the only restrooms available and often become overcrowded with long lines during peak times.

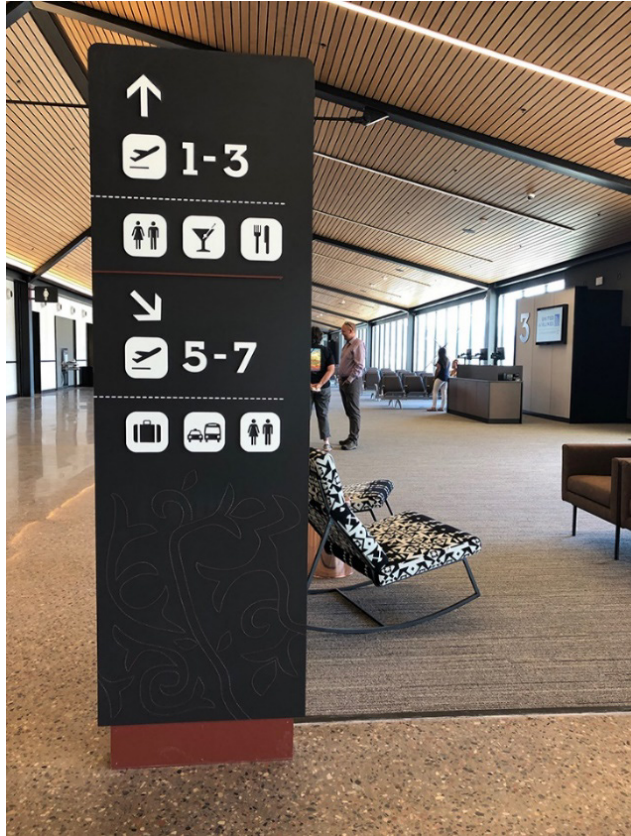
EGE is currently undergoing a restroom remodel in the ATO space, which will replace 2 single use restrooms with a men's and women's restrooms with 3 fixtures and 2 lavatories each. These are the only back-of-house restrooms in the airport.

On the secure side, level 1 has a bank of men's and women's restrooms located west of the stairs and escalators, serving the level 1 holdrooms and arriving passengers along their route to baggage claim or ground transportation. The men's restroom has 7 fixtures and 3 lavatories and the women's restroom has 6 fixtures and 3 lavatories. Both restrooms have a single baby changing station inside the handicapped accessible stall. These restrooms were part of the 2019 concourse expansion, and all finishes are in good condition. These restrooms are separated by a janitor's closet that has an access door from the women's restroom. The level 2 secure restrooms are centrally located on the south side of the concourse spine, east of the concessions area. The men's restroom has 11 fixtures, 5 lavatories, and 1 baby changing station. The women's restroom has 12 fixtures, 5 lavatories, and 2 baby changing stations. They are separated by a janitor's closet, which has access doors into both restrooms. On the east side of level 2, south of Gate 4, there is a family restroom, a nursing room and a room for pet relief. These facilities appear to be adequately serving the current passenger loads at EGE.



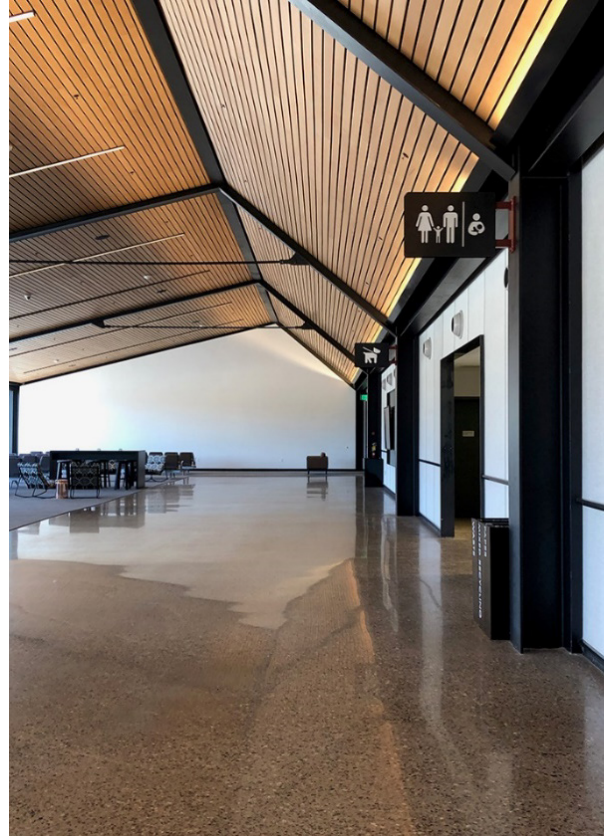
B.18 SIGNAGE AND WAYFINDING

Figure B-15A – Pylon Sign



Source: Gensler.

Figure B-15B – Flag Mounted Sign



The 2019 concourse expansion and renovation included comprehensive signage and wayfinding that was integrated into the building architecture. Due to the large number of international travelers, the signage was focused on clear icons that can be globally understood. The concourse signage was accomplished through stand-alone pylons, as seen in Figure 2.18A; flag mounted signs, as seen in Figure 2.18B, and occasionally ceiling hung signs. The signage in the non-secure terminal is not consistent with the 2019 signage and is primarily brown surface mounted signs and occasional flag mounted signs.



B.19 INTERIOR FURNITURE AND FINISHES

Figure B-16 – Concourse Living Room



Source: Gensler, photo by David Lauer.

The furniture throughout the concourse is brand new, compared to how the main terminal elements are either simply outdated, or had to be removed entirely due to inhibiting the passenger flow at highest traffic. The main terminal area finishes are generally considered to need outdated and in need of being refreshed (i.e., carpet, walls).

B.20 MECHANICAL

The following section includes a brief history of major projects impacting the mechanical, plumbing and fire protection systems as well as facility upgrade considerations.

B.20.1 Original Terminal

The mechanical systems serving the original terminal consisted of chilled water cooling and hot water heating systems with a mixture of large volume air handling units and four pipe fan coil units. The chilled water system was fed by an air cooled chiller with nominal 70 tons of cooling capacity. This chiller is still in service although it was not operational at the time of the 11/17/2022 site visit. The original main heating plant consisted of four natural gas fired boilers with primary and secondary



circulating pumps. This system also served the snowmelt systems for the terminal. The capacity of the system for the 1996 original terminal was approximately 1.8 million btu/h. This boiler system is still in service as of the 11/17/2022 site visit although it appears portions of the original load have been removed as evidenced by cut pipes within the boiler room.

The plumbing systems for the original terminal were fed by a 6" water main to feed both domestic water and fire protection supply systems from the west side of the building. Sanitary sewer for the 1996 terminal construction connected to a 6" gravity main on the west side of the building.

The original 1996 terminal building was provided with a fire sprinkler system throughout the building.

***B.20.2* 2001 Terminal Building Expansion**

The following section is reproduced from the EGE Airport Advanced Terminal Area Planning Program Criteria Document dated January 2016. This information is reproduced here to add & retain context to revisions that have occurred over time.

In 2001, the terminal added approximately 30,000 square feet by expanding the ticket lobby, baggage claim, and the concourse.

The chilled water plant for the building was not expanded in 2001, maintaining its original 70-ton nominal cooling capacity. The chilled water system was also noted in 2001 to have 30% propylene glycol solution in the chilled water loop. The approximate Square Foot/Ton ratio for the building after the 2001 expansion was 928 sf/ton, assuming the chiller was providing its full 70-ton nominal rating. The presence of propylene glycol in the system would de-rate the chiller capacity from its 70-ton nominal rating, so the ratio is even higher. A typical sf/ton ratio for cooling is approximately 350-400 sf/ton. Thus, the existing chiller system was undersized to provide proper cooling after the 2001 expansion.

The heating plant for the building was modified and provided with four new boilers rated to provide 1.6 Million Btu/h each, for a total heating capacity for the building, including snowmelt, of 6.4 million Btu/h. The heating capacity for the building after the 2001 expansion appears to be adequate.

The plumbing systems were expanded in the 2001 building expansion to serve new restrooms located in the expansion areas, but these were fed from sources internal to the existing building. Thus, the main system connections remained in the same location and size as the 1996 construction. There was some site utility construction to relocate the existing underground utilities to avoid the new building expansion, but the plumbing and fire protection system connections were not affected.

***B.20.3* 2007 Outbound Baggage Expansion**

The following section is reproduced from the EGE Airport Advanced Terminal Area Planning Program Criteria Document dated January 2016. This information is reproduced here to add & retain context to revisions that have occurred over time.



The 2007 expansion consisted of a 22,000 square foot addition east of the ticket lobby to serve as outbound baggage screening area.

The mechanical systems for this outbound baggage area consisted of roof mounted gas-fired make-up air units to provide ventilation air and heating to these areas. These new units were not connected to the existing chilled water cooling and hot water heating systems.

In the 2007 baggage expansion, the domestic water supply system and the fire protection supply systems were modified to provide a separate and independent fire sprinkler supply line to the building. This line was located at the east end of the new expansion and routed across the roof to connect to the existing fire protection system.

***B.20.4* 2009 Restroom Remodel**

The 2009 restroom remodel included an expansion of the existing Women's restroom and construction of a storage/janitor room. The toilet rooms were reconfigured in same location.

***B.20.5* 2011 Baggage Claim Remodel**

The 2011 bag claim remodel included addition of a mezzanine level above the bag claim area to house additional baggage screening equipment. This mezzanine area is provided with heating and cooling via two cooling-only Trane fan coils with split DX condensers and two Liebert Mini-Mate units with split DX condensers providing both heating and cooling.

Plumbing was limited to condensate drains from new fan coils which were taken to existing sanitary drains below.

Fire protection was extended from existing systems to serve the new mezzanine area.

***B.20.6* 2012 Checkpoint Reconfiguration**

The 2012 checkpoint reconfiguration did not appear to include any mechanical, plumbing, or fire protection updates.

***B.20.7* 2019 Concourse Expansion and Remodel**

The 2019 concourse expansion and remodel included demolition of concourse mechanical and plumbing systems and installation of new air handling units and a new boiler room. Air handling units are air-cooled DX with indirect gas-fired furnace. Makeup air units are direct-fired natural gas type with evaporative cooling. The new boiler plant includes two (2) boilers with 1,055 MBH output at altitude each, 2,110 MBH output total. The plant is arranged with a constant primary/variable secondary pumping loop, and it includes 30% propylene glycol heat transfer fluid. The new boiler plant serves the new concourse expansion and select areas within the footprint of the original terminal building and 2001 terminal expansion. The boiler plant is not interconnected with the original building boiler plant.



During the 2019 scope of work, the existing boiler plant load appears to have been reduced. The piping system originating from the original boiler plant room was re-routed and connected to serve existing heating loads in the original terminal building, 2001 terminal expansion, and other non-concourse areas.

Plumbing systems in the new concourse areas were extended from existing services within the building including domestic water, sanitary, and storm piping systems. Domestic water serving the new concourse areas is connected to the original 2-1/2" water service entry in the original 1996 build-out.

Fire protection drawings were not available at the time of the site visit, although it is anticipated that the fire protection serving the new concourse areas is extended from the wet system originating in the original building terminal.

***B.20.8* Facilities Upgrade Considerations**

The air handling equipment and boilers installed under the 2011 and 2019 projects appear to be in working order and are anticipated to still have ample useful life.

The existing chiller system installed under the original 1996 build-out is beyond normal life expectancy. Consider replacement of the chiller system with a new chiller system sized for the remaining loads not already covered by other cooling systems. A capacity study will be needed to determine the required size of the new chiller and pumping system to serve remaining connected loads.

The existing boiler system is nearing end of life, and due to the arrangement of the equipment within the room, the system is very difficult to service. Access is very limited at the back of the boilers where the primary pumps and several other components are located. The normal life expectancy for these boilers is 25 to 30 years, which can be reduced where maintenance is difficult. Consider replacement of the boilers at the same time as replacement of the chiller system to reduce installation costs. When replacing the boiler system, a capacity study will be needed to determine the required size of the new boilers and pumping system to serve remaining connected loads.

The building was observed to have several air handling systems that were installed under the original 1996 build-out including fan coils and one rooftop mounted air handling unit. These units are beyond their useful life and should be considered for replacement.

Similarly, terminal heating equipment including unit heaters, cabinet heaters, etc. that were part of the original 1996 build-out and 2001 terminal expansion and are beyond their useful life. These units should be evaluated on a case-by-case basis to determine their age and remaining equipment life.

Plumbing and fire protection systems appear to be in working order. These systems should be maintained including periodic inspection and repair in order to extend useful life.



B.21 ELECTRICAL

The following section includes a brief history of major projects impacting the electrical systems as well as facility upgrade considerations.

B.21.1 Original Terminal

The Electrical systems serving the original terminal consisted of one 1600 amp 208/120v 3 phase service feeding a fused main Switchboard MDP which fed the chiller, conveyors, lighting and power distribution panels. The airfield lighting was tapped at the utility transformer and was provided with a separate service feeder from the main terminal. Lighting consisted of Metal Halide fixtures in the ticketing, baggage claim, and TSA Inspection area. The holding areas contained an assortment of incandescent and T8 parabolic fluorescent fixtures.

B.21.2 2001 Terminal Expansion

The following section is reproduced from the EGE Airport Advanced Terminal Area Planning Program Criteria Document dated January 2016. This information is reproduced here to add & retain context to revisions that have occurred over time.

In 2001, the terminal added approximately 30,000 square feet by expanding the ticket lobby, baggage claim and concourse. The electrical distribution was expanded in 2001 to a 1200-amp power panel SDP2 and an 800-amp power panel SDP1 were added. The same fixtures were used in the new holding areas, new ticketing, and the new baggage claim areas.

The outbound baggage area used a combination of wall and ceiling mounted 250-watt metal halide fixtures. The new curbside check-in uses incandescent down lights.

B.21.3 2007 Outbound Baggage Expansion

The following section is reproduced from the EGE Airport Advanced Terminal Area Planning Program Criteria Document dated January 2016. This information is reproduced here to add & retain context to revisions that have occurred over time.

The 2007 expansion consisted of a 22,000 square foot addition east of the ticket lobby to serve as outbound baggage screening area. The electrical distribution was only slightly modified for the conveyor system, screening, and new outbound baggage area. Additional lighting in the screening area consisted of more 250-watt metal halide fixtures.

B.21.4 2009 Bathroom and Storage Room Addition, Emergency Power Generators

The electrical work done in 2009 included the addition of a new 450kW generator installed to provide complete backup of all normal power fed the building's existing 208/120V service switchboard MDP. The generator work included a new outdoor diesel fuel tank. The diesel generator, diesel fuel tank, ATS switches and service switch are outdoor equipment located on the west side of the building.



In addition to the addition of the above referenced equipment, a 100kW, 208/120V natural generator (labeled EG-2 on 2009 drawings) was added on the east side of the building. This generator appears to have been removed in the 2011 electrical work.

B.21.5 2011 Baggage Claim Remodel

The 2011 bag claim remodel included the addition of a mezzanine level above the bag claim area to house additional baggage screening equipment. The 2011 baggage claim remodel electrical work included the addition of a 1600A, 480/277V service switchboard MDPB to support the new space. MDPB is fed from a utility transformer located east of the main building. An outdoor diesel generator, 750kVA-derated to 600kVA, 480/277V was also added and is located east of the main building near the utility transformer.

The 2011 electrical work included new panels and distribution boards required to power the baggage screening equipment including power to support areas, mechanical equipment power and power for new lighting. Light fixtures added included linear fluorescent lamps.

The 2011 work included demolition of the 100kW, 208/120V natural gas generator located just east of the building. The existing generator backed loads previously fed from the demolished generator were fed with the diesel generator installed in 2011.

B.21.6 2019 Concourse Expansion and Remodel

A concourse remodel and expansion project occurred in 2019. The associated electrical work included modifications to both the existing east and west services.

In the west, a new 208/120V, 800A distribution board SMDP3 was added to support mechanical rooftop equipment associated with the remodel/expansion work. SMDP3 appears to have been fed via a bus tap at the west outdoor main distribution panel MDPE.

In the east a new 480/277V, 1200A switchboard DPBM was added to support the remodel/expansion work. DPBM was fed from the existing service switchboard MDPB. Automatic transfer switch ATS-4 was added and has backup power connected to the east emergency generator distribution equipment.

LED Lighting with programmable lighting controls were included in the remodeled and expansion areas.

B.21.7 Facility Upgrade Considerations

There may be spare capacity on the existing east and west service entrance switchboards. Utility peak demand information and/or 30-day metering may be used to determine if capacity is available. The National Electrical code dictates associated calculation requirements. Depending on future project scope, expansion/remodel work in the terminal may require a new electrical service to support the project.

The original 208/120V distribution equipment on the west end of the building was installed circa 1996. This equipment may be considered as approaching the end of its



expected life-expectancy. Consideration should be given to a replacement program for the original distribution equipment. In addition, the originally installed electrical feeders can be megger tested to determine if there are any potential problems associated with the feeders.

Some of the original building areas utilize a fluorescent source. It is recommended consideration be given to replacement of non-LED light fixtures with LED source light fixtures. Analysis of the building lighting control systems should occur. Replacement of originally installed lighting control equipment with new energy code compliant systems should be considered. Lighting control system analysis could include consideration of including all building lighting controlled by a single lighting control system. Work associated with lighting and lighting control systems should comply with the latest energy code requirements