



KTN Ketchikan International Airport Terminal Concept and Budget Report



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INTRODUCTION

The Ketchikan International Airport (KTN) services Southeastern Alaska. It is located on Gravina Island across the Tongass Narrows from the City of Ketchikan. Its' unique island location is only accessible by ferry from the city. Ketchikan itself has no regional connection of roadways or rail lines so any access to the city is by waterway or the airport. Because of this the airport is a vital operation for the region.

The airport has commercial passenger service and is a through point for cargo to the Borough and the entire state of Alaska. A unique aspect of the airport is the air taxi service that it supports. The airport is a hub for ground aircraft as well as float planes that create a connection to the outer, remote communities and the hunting and fishing resorts.

The airport is an important link for the tourism industry of the region. The commercial flights link a vibrant cruise ship port to the borough that is vital for the economic development of Ketchikan. The airport also provides a valuable connection point to the equally important sport fishing and hunting industry of the region. Because of the vastness of Alaska, its airports are the veritable highways interconnecting the major Alaskan cities.

The importance of the air taxi service cannot be underestimated. The outer communities rely on this service for connection of goods and services. For example, while most of these communities have local medical clinics any major medical service is located in Ketchikan.

A major component of the terminal renovation is to facilitate the taxi service. Currently, there is no hold room space for these passengers. Passengers must wait in the landside portion of the terminal which creates significant congestion. The renovation will provide separate hold room space for these passengers.

The second main impact of the renovation will be the relocation of the TSA checkpoint. It is currently located on the second floor of the terminal in a very restrictive space with a very constricted queuing area, which at times forces passengers to stand on the stairway in the queue. The relocation of the checkpoint to the first floor will provide for a checkpoint that meets current TSA standards and will improve passenger throughput.

Third point of this expansion is to add another holdroom and a second passenger boarding bridge to an aircraft. Currently when a second or third aircraft is boarding, passengers must be escorted out of the secure side of the terminal to ground board their plane.

Upon completion the renovation will provide a more efficient space for airport operations and a comfortable and convenient passenger experience.

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I. CHAPTER 1: EXISTING CONDITIONS SURVEY

1.1 Airport Location and Overview

The Ketchikan International Airport (KTN or Airport) is in southeastern Alaska on Gravina Island, approximately a quarter of a mile west of Ketchikan, Alaska. The Airport provides a safe operating environment for all classes of aircraft, including small general aviation aircraft, floatplanes, corporate business jets, and commercial service passenger aircraft and is an important asset for the region and the Ketchikan Borough.

1.2 Annual and Peak Hour Forecasts

Peak period forecasts are prepared to estimate when certain airport facilities such as the passenger terminal, will be at their busiest. They are utilized to evaluate the Level-of-Service (LOS) provided by both airside and landside facilities (e.g., runway/taxiway systems and passenger terminal buildings) and to assist in the rightsizing of future development projects. As with most development, airport improvements are not typically designed for the busiest hour of the busiest day of the year because such a design would lead to over-building. Instead, peak period forecasts will often identify a busy period throughout the year (e.g., the average day of the peak month) from which to further analyze. Forecasters use historical records to project future peaking; therefore, it is essential that peak forecasts be reevaluated if a change in user or aircraft type occurs.

Table 1 (*see next page*) presents a breakdown of the peak period passenger and aircraft operations forecasts generated for this study.

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TABLE 1: Peak Period Forecasts

Category	Period	Factor	2018	2023	2028	2033	2038
Enplanements and Deplanements	Annual	100%	227,112	254,809	289,029	318,385	345,896
	Peak Month	13.0%	29,321	32,700	37,100	40,900	44,400
	Peak Day	3%	980	1,090	1,240	1,360	1,480
	Peak Hour-Enplanements ¹	23%	230	250	290	310	340
	Peak Hour-Deplanements ¹	23%	230	260	290	320	350
Total Passengers	Annual	100%	457,502	513,295	582,230	641,366	696,784
	Peak Month	12.9%	58,926	66,100	75,000	82,600	89,700
	Peak Day	3%	1,960	2,200	2,500	2,750	2,990
	Peak Hour ¹	15%	280	320	360	400	430
Aircraft Operations	Annual	100%	15,812	16,463	17,791	18,013	19,259
	Peak Month	12%	1,800	1,880	2,030	2,050	2,200
	Peak Day	3%	60	60	70	70	70
	Peak Hour	18%	11 ²	11 ²	133	133	133

¹ Peak hour forecasts adjusted to reflect average load factor, depicted in **Table 1**

² Total includes four Alaska Airline passenger operations (two flights), one Island Air Express passenger operation (one departure or arrival), and one Alaska Airline cargo operation (one departure).

³ Total includes four Alaska Airline passenger operations (two flights), one Island Air Express passenger operation (one departure or arrival), two Delta Air Line passenger operations (one flight), and one Alaska Airline cargo operation (one departure).

Peak Enplanements/Deplanements/Passengers: Month: FAA T-100 Database. Day and Hour: Airline Schedules.

Peak Aircraft Operations: Peak Month and Day: USDOT BTS T-100 Data. Day and Hour: Airline Schedules.

Peak enplanement and deplanement passenger forecasts are driven by growth in total passenger numbers, resulting from a combination of airlines transitioning from smaller to larger aircraft (e.g., aircraft up-gauging) and/or the provision of additional flights (e.g., adding summer season flights). T-100 data and airline schedules show that KTN experiences peak passenger numbers during the summer months of June through August. This coincides with Alaska's peak summer tourist season, during which time both Alaska Airlines and Delta Air Lines add seasonal flights from Seattle. Daily peaks for both enplaned and deplaned passengers occur in the afternoon (between 4:40 p.m. and 5:35 p.m.) and coincide with the daily peak in commercial passenger operations occurring currently.

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Future peaking analysis assumes that peak percentages, shown in Table 1, will remain the same into the future; however, the total number of peak passengers will steadily increase due to projected increases in aircraft seating capacities.

1.3 Terminal Building Overview and History of Improvements

The passenger terminal building at Ketchikan International Airport was opened in 1973. The structure consists of two primary levels with additional levels in a tower structure on floors three through five. These tower floors consist of airport administration offices, FAA offices and the FAA flight services station, which provides services to pilots and controls traffic in a manner like an Airport Traffic Control Tower. The first floor (ground) contains passenger check-in and baggage claim, airline operations and checked baggage make-up, rental car counters and a small waiting area for ground boarding for air taxi passengers. The second floor includes non-secure passenger waiting areas and concessions, the Security Screening Checkpoint (SSCP), holdrooms/departure lounges for two gates, concessions, and TSA offices. Vertical circulation between the first and second floors is provided via an elevator and a stairway. The gross square footage area of the terminal is approximately 30,600 square feet however, over 4,000 of that square footage is in the tower floors 3 through 5. On the two levels accessible to the public, floors 1 and 2, there is approximately 26,600 square feet of space.

In 2003, the terminal underwent a major renovation. This included upgrading baggage claim by replacing the baggage carousel, the addition of two new ticket counters, expanding concessions on the second floor, the reconfiguration of the terminal entries, renovation, and expansion of the restrooms, adding an elevator, the addition of rental car counters and offices, and upgrading interior finishes. In 2009, interior modifications were undertaken on the fourth and fifth floor of the tower. In 2012, the TSA screening area was added to the second floor and in 2015, some minor interior upgrades that impacted the north airline ticketing counter area were completed. Finally, in 2019, the Airport completed a roof renovation and interior terminal building remodel.

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1.4 Terminal Building Survey

1.4.1 Architecture

During the on-site survey conducted on July 20, 2022 by the design team, several areas of concern were evident as we conducted the terminal survey. Meetings with airport staff, airport facilities manager, Delta and Alaska airlines, TSA and concessioner were held as part of this visit to discuss existing conditions and needs.

Wayfinding can be difficult for the users. The queuing areas on the first floor for airlines baggage claim and rental cars overlap into circulation causing congestion. Reviewing the terminal signage it was noted that there is a non-uniformity to the size and color of signs. Some signs carry more visual weight than others and tend to overwhelm the eye, making certain signs less recognizable.

The security screening checkpoint (SSCP) is located on the second floor immediately south of the elevator and at the top of the stairwell. The SSCP is only one lane with precheck allowed with a hand card. The SSCP queueing area is inadequate, and the queue often backs up in front of the elevator and down the stairs. The layout of the checkpoint and the number of turns passengers must make, significantly reduces the efficiency and the processing rates of the SSCP. Passengers leaving flights must pass through the security queue if it is of any length to access the only public stairway connecting the first and second floors.

There are two primary gates on the second floor, Gates B1 and C1. Gate B1 is a walkout gate located at the southwest corner of the terminal adjacent to a stairwell. This means that passengers with carry-on luggage carry their luggage up a stairwell to get to the second floor and again down a stairwell to the first floor to board a flight. Gate C1 includes a walkway that is owned by the Airport connecting to the only passenger boarding bridge at KTN.

There are two main concession locations in the terminal. A gift shop located at the south end of the second floor and the restaurant/lounge area located at the north end of the second-floor space. The restaurant also operates a pass-through window to the nonsecure side of the second-floor space where employees and non-secure passengers can order food by use of a phone.

The baggage claim area is located between the outbound baggage screening area and the Delta counter and includes one flat plate T-shaped device. This size is adequate for one aircraft deplanement, but when there are delays or overlapping flights during the peak periods, delays occur, and congestion develops. The input (exterior) side of the claim area also has functional issues. A limited portion of the claim unit has weather protection and ramp congestion in front of the claim unit is an issue. When multiple flight arrivals occur, only one flight can unload its' baggage carts at a time delaying baggage claim operations. The equipment for inbound baggage is also nearing its end of service life.

The location of the rental car counters, on the northeast side of the building, is visible to passengers when first entering the terminal building but the queuing space for the RAC counters often extends into the path of circulation and passengers waiting at baggage claim.

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Inspection of terminal building (Exterior) revealed that the exterior walls are under insulated concrete panels and CMU.

The airport terminal tower, floors 4th and 5th, is enclosed by a curtain wall on all sides. The curtain wall system combines double pane windows and uninsulated metal siding. The curtain wall is at the end of its service life. It leaks, especially on the southeast side where prevalent winds are.

Weathering of concrete panels in the front canopy soffit. This is potential hazard of falling small concrete chunks from the panels onto public and airport personal.

Concrete wall panels are missing anchorage at connection points to the steel framing and properly welded slip connections.

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1.4.2 Site Civil Characteristics

In reviewing the site to determine the location for the expansion of the current terminal, the site presents various conditions and structures that are constraints to the expansion of the terminal.

On the plan north side of the building the Tongass Narrows is the major constraint to expansion in that direction. The terminal's ferry dock and roadways abut the edge of the waterway.

On the eastern side of the building a biomass heating facility, an underground oil tank, a trash compactor, parking for airport service vehicles and hangar #1 users and the fire lane access to the perimeter of the terminal create constraint issues.

The south side constraints consist of aircraft hard stands, a trench drain, inbound and outbound baggage systems, and air cargo operations.

On the western side of the building, there is a narrow strip of land next to the terminal before an elevation drop that limits the expansion without extensive landfill operations. This side has a gated driveway to accommodate access connecting the front of the terminal to the back of the building. This area also contains storage tanks for deicing fluid, a maintenance building, diesel storage tanks, equipment storage and ground service equipment parking.

It was determined that expansion of the terminal to the east and south offers the greatest amount of site for the extension of the terminal.

To accommodate this the following actions are needed:

- The removal of the biomass facility
- The removal of the below ground oil tank
- The relocation of the waste compactor and parking

The trench drain to the south will remain in place but limits the building expansion to the south to within fifty feet of the drain, relocating the air cargo loading site and a shifting of a current aircraft hardstand will needed to accommodate the new expansion.

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Existing site (Figure 1.1 in the Appendix)

1.4.3 Electrical Site Survey

The existing electrical service is provided by Ketchikan Public Utilities (KPU) via a submersible medium-voltage cable routed between a utility-owned medium voltage switch adjacent to the KPU Power House on Revilla and a utility-owned medium voltage switch south east of the airport on Gravina. This submersible cable is in the process of being upgraded to a #2 Copper conductor good for 125A - 145A to account for future load growth on Gravina. The total ampacity on the current submersible medium-voltage cable is 12A at 12.47kV.

The medium voltage cable is then routed north on Gravina to the utility-owned medium voltage switch located at the airport. A medium voltage cable is routed between the medium voltage switch and a utility-owned 12.47kV:208Y/120V, 500kVA transformer. This utility-owned transformer feeds five (5) meters.

- Meter #14039 -Airport Terminal Service
- Meter #12885 - FAA Service Disconnect
- Meter #15193 -Alaska Airlines GPU/ Boarding Bridge
- Meter #15037 -Alaska Airlines Cargo
- Meter #10773 - Alaska Airline Maintenance

An 800A service entrance feeder is routed between the utility-owned transformer and the existing 800A, 208Y/120V main distribution panel (MDP) via a service-entrance rated 800A Cummins/ Onan Automatic Transfer Switch. This service feeder is metered by KPU #14039. The existing main distribution panel is manufactured by Square D (I-Line) and was installed in 2004. Most of the branch circuit panel boards were manufactured by Square D and installed in 2004, however there are a handful of older panelboards scattered throughout the airport.

The existing 250kW, 208Y/120V generator was installed in 2004 and is manufacturer by Cummins/ Onan. The generator is in a walk-in enclosure on the other side of the drop off/ pick up lanes across from the airport. In addition to providing back-up power to existing Panel MDP, the generator also provides a 100A feed to a 100A Cummins/ Onan automatic transfer switch which serves a dedicated FAA panelboard on the 4th floor. This service feeder is metered by KPU #12885.

The third metered service (KPU #15193) meters the power associated with the Alaskan Airlines GPU and boarding bridge. A feeder conductor is routed between the utility-owned service transformer and a Panelboard on the far west side of the airport located in a storage room beneath the boarding bridge.

The FAA tower has lighting protection installed, but the cables were cut off on the terminal roof. The rest of the terminal is not protected with a lightning protection system.

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Most of the lighting and lighting controls on Floors 1, 2, and 4 were replaced with LED light fixtures in 2019. The remaining light fixtures in the buildings (predominantly on Floors 3 and 5) are fluorescent. The existing apron light is a three-headed HID fixture and controlled via a photocell. The existing exterior lighting is also controlled via a photocell.

The existing fire alarm system is a horn/strobe-based systems and devices are manufactured by EST. The fire alarm control panel was recently upgraded in 2021.

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1.4.4 HVAC Site Survey

The existing HVAC system for the Airport Terminal Building have been renovated in 2002 and 2018 projects. These renovation projects including new HVAC equipment, piping, ductwork, and controls serving 1st and 2nd floors. The existing 4th and 5th perimeter radiation equipment were existing to remain with new piping and controls. The HVAC instrumentation and Controls were upgraded with the new DDC controls with electric actuation in both projects.

Air Distribution Systems

The HVAC airside equipment is comprised of three air handling units serving the Airport Terminal Building. The indoor custom air handler unit (AHU-1) serves the Main Terminal. This indoor unit is located on the 2nd floor mechanical space. This unit is Constant Air Volume (CAV), multizone unit which provides heating and cooling for space comfort. The unit's capacity is 20,200 CFM or 35 Ton. This system comprises of prefilter, final filtration, preheat coil, heating coil, DX cooling, and dual supply/return fan system. There are nine space zones for serving the Airport Main Terminal 1st and 2nd floors. The supply and return fans have variable frequency drives (VFDs) for resetting of the supply and return fan speed during unoccupied times to reduce system airflows.

The second air handler unit (AHU-2) is located on the roof which serves the 2nd floor concessions and lounge area. This is custom outdoor unit with maintenance service vestibule. This unit is Variable Air Volume (VAV) unit which provides heating and cooling for space comfort. The unit's capacity is 2,500 CFM or 5 Ton. This system comprises of pre-filters, final filtration, preheat coil, heating coil, DX cooling, and fan system.

The third air handler unit (AHU-3) is located on the third floor which serves the 4th floor administrative offices, support spaces and FAA equipment space. This indoor unit is CAV system which provides heating and ventilation only. The previous outdoor air-conditioning split system serving the air handler unit has been removed. The unit's capacity is 1,085 CFM or equivalent 2 Ton. This system comprises of a pre-filters, preheat coil, and fan system.

All airside systems are capable for economizing for "free cooling" when ambient conditions are present.

Cooling Equipment - Rooftop

There are two air-cooled split air-conditioning systems that serves the two air handlers, AHU-1 and 2. Both units were installed in 2018 with the refrigerant R-410. Refrigeration lines are piped to each associated air handlers' units. The larger unit is 4-stage circuit with 2 compressors at 35 Ton capacity. This unit is currently be serviced with compressor failure which is on-going at time of this visit. The other unit is a single-stage circuit with single stage compressor at 5 Ton capacity.

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Heating Distribution System

The second-floor mechanical room has the two secondary hydronic distribution pumps with VFDs. These pumps are lead/lag control, and each are sized for 100% capacity for redundancy purposes. The secondary pumps serve all the heating terminals equipment such as perimeter radiation, convectors, unit heaters, booster coils and preheat coils. This heating distribution system as provide hot water to the two domestic indirect storage vessels. The hydronic system consists of air separator, flow meter and end of main bypass valve. All hydronic coils are served by 2-way control valves with electric actuation. The hydronic piping and insulation to all the hydronic equipment were replaced in the 2018 renovation project.

Heating Terminal Equipment

The Airport Terminal building is hybrid of various types of heating terminal equipment serving the perimeter spaces on 1st and 2nd floors. The perimeter hydronic radiate baseboard is prevalent at the occupant spaces for OPS, ATO, administration areas and FAA flight tower on 4th to 5th floors. There is hydronic ceiling mounted radiant heaters in the ticket counter and restrooms areas. The storage and janitorial services spaces have hydronic wall-mounted convectors. The stairwells and Terminal's entry/egress points have hydronic cabinet unit heaters for space tempering for unwanted outdoor air infiltration. All heating terminal equipment, controls, thermostats, and equipment were replaced in 2018 renovation project.

Exhaust Systems

The exhaust systems were also upgraded in 2002 and 2018 renovation projects. These dedicated exhaust fans (EF-5, 6 and 7) serve the stacked toilet rooms, elevator machine room and the concession area. Exhaust fan EF-2 serves the third air handler as ducted return fan system which return air from the 4th floor - Administrative area.

Window AC units Systems

There are two existing window AC units serving the 4th floor FAA equipment room. Approximately 8,000 btu/hour cooling capacity for the FAA's electronic equipment. These units are standalone with packaged controls.

Controls and Instrumentation

The existing Building Automation System (BAS) for the Airport Terminal building have been upgraded in 2002 and 2018 renovation projects. This system upgrades including new DDC controllers, control valves, field devices, sensors, and new thermostats. The BAS control platform is Siemens Apogee system. The main node in the new boiler room with CPU desktop located in the 2nd floor mechanical room. Ethernet cabling system is extended from ethernet switch located in the 1st floor IT closet. The BACnet MS/TP communication serves to boilers, VFDs, main outdoor air-cooled condensing unit and air handling units. The communications network is shielded 24 AWG twisted strand pair to the field devices. All dampers and control valves are electric actuators as a part renovation projects.



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Boiler Plant

The new boiler plant was completed in 2016-17 which is a separate structure from the Airport Terminal. This single-story boiler plant is approximately 1,400 GSF. The boiler plant consists of primary pumps, expansion tank, 700-gallon buffer tank, 500-gallon AST oil storage tank, pellet fired, oil-fired boiler, and pellet silo. Both boilers are manifolded together to operate in unison based on system demand to serve the Main Terminal's heating distribution system. There four primary pumps with motor starters to serve the boilers. The primary pumps are lead/lag control, and each are sized for 100% capacity for redundancy purposes to serve each boiler. The hydronic piping and insulation are new to the boilers and pumps.

The Viessman Pyrot's biomass pellet wood boiler is 512 MBH capacity heating system or 85% efficiency. This biomass boiler is triple pass heat exchanger with modulating output control. A rotary combustion chamber design to feed an auger continuously by moving the dry wood fuel onto a rotating grate. The wood fuel is supplied from the adjacent outdoor pellet silo. Biomass boiler is the primary baseline heating source year-round and frequently supplemented by the oil-fired boiler to meet the building demands. The system has pneumatic cleaning system served nearby air-compressor and tank. The dry wood fuel products can be pellets, sawdust, woodchips, or mixed woods. Currently, the wood fuel source purchased by the Airport is quality hard wood pellets for biomass boiler. This is clean and premium grade pellets product which has a higher BTU content. The biomass boiler's heating capacity is limited in which the Airport Terminal can only reach to 50 deg. F space temperature during the winter months which requires the oil-fired boiler to operate to meet space temperature's setpoint, secondary boiler is supplemented during sub freezing temperatures.

The McLain Series 80 oil-fired boiler is 1,110 MBH capacity heating system or 82% efficiency. The oil-fired is fed 500-gallon AST oil storage tank outside the boiler plant. The oil-fired boiler supplements the biomass boiler based on the call for building heating or domestic heating demands or when required as the backup operation when biomass boiler is disabled.

The Boiler Plant's DOC control system including controllers, control valves, field devices, and sensors. All control valves are electric actuation. The BAS control platform is Siemens Apogee system with is also integrated with the Viessmann's biomass boiler controller. The BACnet MS/TP communication serves to boilers and pumps which interfaces to the BAS control platform in the Airport Terminal.

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1.4.5 Plumbing Site Survey

Domestic Water Service

The airport terminal is served by a 3" domestic water service. It enters the building on the south side at the electrical room. The pipe rises vertically up through the electrical room into the mechanical room on the 2nd floor where the PRV and bypass are located. The back-to-back 1st and 2nd floor restrooms are served by a 2" cold water. The kitchen is served by a 1" cold water. The domestic hot water is generated by two indirect water heaters that are served by the HVAC heating supply piping system. This system is located in the mechanical room on the 2nd floor. There are two master mixing valves, one serving the kitchen @ 140 degrees, and one serving the remainder of the terminal @ 120 degrees. Both of these systems are recirculated with inline circulating pumps.

Sanitary Service

The airport terminal is served by a 6" sanitary service. It enters the building on the northeast side at the back-to-back restrooms and distributes out to the facility. The kitchen is served by a 3" sanitary with a point of use grease interceptor at the scullery sink.

Storm System

The airport terminal roof is served by internal primary and secondary (overflow) roof drains. This system is piped down through the building and out. The upper roof has primary roof drains, but the secondary (overflow) is through scuppers to the lower roof. The lower roof has primary and secondary (overflow) roof drains.

Fire Sprinkler Service

The airport terminal is served by a 6" fire sprinkler service with a double check valve assembly. It enters the building on the northeast side at the fire riser room. Sprinkler heads are distributed throughout the facility.

Boiler Plant

The boiler plant is served by three floor drains that terminate to a catch basin that is located on the north side. The domestic water is fed from the airport terminal building. The fire sprinkler service enters the southeast side of the building with sprinkler heads distributed throughout.

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1.4.6 Technology Site Survey

Incoming Service

The existing internet service to the airport and its tenants are currently provided by two utility providers, Ketchikan Public Utilities (KPU) and GCI Communications. Within the last 2 years, GCI has brought in a new fiber optic service feed that is currently terminated in existing Phone Room 125 and is serving Alaskan Airlines. KPU's incoming service is currently terminated in existing Phone Room 124 and is serving KTN airport, FAA, Delta, Rental Car agencies, local airlines and the Ketchikan Visitors Bureau. KPU is currently in the process of installing a new submersible fiber optic cable to serve the airport's needs.

Technology Spaces

The airport and its tenants have technology spaces located throughout the facility. The airport's main demarcation point is housed in existing Phone Room 124 which also serves as its Main Equipment Room (MER) for the building. Horizontal cables are distributed from a wall mount communications rack to the equipment outlets located throughout the airport. This room is shared with equipment from Delta, Island Air Express, SeaWind Express and the rental car agencies.

Alaska Airlines has a dedicated Communication Room (Comm 140) located within their space. The room is equipped with two floor mounted two post racks that house network equipment and horizontal cabling for the Alaska Airlines device locations. Comm 140 is fed via a 12 strand SM fiber installed from the GCI demarcation point in Room 125.

The FAA has a dedicated space on the 4th floor mechanical space located in existing Room 404 that houses the majority of their network and radio equipment. Multiple coaxial cables are fed from Room 404 to the roof for radio and weather antenna equipment.

Systems

Many of the systems within the facility are serviced and provided by the individual tenants.

Each tenant has their own phone service into the building and distributes their phone service via individual phone systems composed of the following:

- Alaska Airlines - NEC phone system
- KTN Airport - Cisco IP Phone system
- Delta - Strat DK424
- Rental Car and local airlines - Two Line Phones

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The FIDS (Flight Information Display System) are owned and operated with content provided by each individual airport tenant. Monitors are located outside of the ticket counters and gates with flight information and airline related announcements being displayed.

Informational displays throughout the airport are owned and have content provided by the Ketchikan Visitors Bureau.

The building is serviced by a Valcom Paging system that has its head end located in the MER Room 124. Speakers are located throughout the facility with paging stations provided at the ticket and gate counter locations.

Security

The buildings Video Surveillance System is an IC Realtime analog system. The systems Digital Video Recorder (DVR) and monitors are located within the Police Office Room 257. Analog cameras are located throughout the facility and on the exterior of the building and utilize coaxial cable terminated at the DVR in Room 257.

The State of Alaska is currently in the process of installing a new Tyco Video Surveillance System with Axis cameras as part of an Upland Project. The Video Management System and head end for this new system will be housed at the airport and the system will be expanded upon to provide video surveillance coverage for the airport.

Both Alaska Airlines and Island Air Express have their own video surveillance system located behind their ticket area to monitor their individual airline areas.

The building currently has two access control systems. The terminal building is secured utilizing a DSX Access Control System. The system panels are in the Airport Security Director's office Room 143. The airport has 4 Electronic Gates that are secured via a Software House C-Cure access control system. The C-Cure system server is in a floor mounted cabinet located in the Airport Security Director's office Room 143.

The airport currently has an Advance Communications Alarm system installed throughout the facility.

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1.4.7 Structural Building Survey

The existing terminal is a two-story steel framed structure with a five-story air traffic control tower. It was constructed in 1972 and renovated in 2004. The renovation included a seismic retrofit. The floor and roof framing consist steel beams and open web steel joists. The floor is a composite deck and the roof is a steel roof deck. Exterior walls are precast concrete wall panels supported by the steel framing. Columns are steel wide flange columns. The main lateral force resisting system consists of steel brace frames. At the tower, there are steel moment frames on three sides and a brace frame on the other side. The foundation is a conventional shallow reinforced concrete foundation with spread footings and grade beams. The structure appears to be in generally good condition with no clear signs of significant deterioration or distress. The terminal is a non-essential facility and the tower is an advisory control center, not an aviation control tower or air traffic control center. Facility is not a designated emergency preparedness, communications and operations center or facility required for emergency response. City of Ketchikan Building Official to verify these assumptions.

1.4.8 Baggage Handling System Survey

Ketchikan International Airport conducts all BHS operations on the first floor of the terminal building. The outbound BHS of KTN is set up in two different areas, the regular ticketing line, and the air taxi ticketing line. The regular ticketing line consists of a single ticket counter conveyor line that leads into the TSA Baggage Screening Area. The Baggage screening room then consists of a single EDS machine. Once the bags are screened, they are then placed on a runout line to be picked up by the ground handlers. The second outbound area is for air taxis. Since security screening is not required for local air taxis, this area consists of a ticket counter line that turns into a runout line where bags are picked up by the ground handlers. The inbound area consists of a single flat plate claim device. Ground handlers drive up and unload inbound bags straight onto the flat plate claim to be picked up on the inside of the terminal by the passengers.

2 CHAPTER 2: HISTORICAL/ CULTURAL RESOURCES

2.1 Summary

Mead & Hunt surveyed the area for cultural resources and met with Airport staff on July 11, 2022. The team collaborated on the completion of one determination of eligibility for the Airport terminal building (Alaska Heritage Resources Survey No. KET-1473), which is included in this report. Team members meet the Secretary of the Interior's Standards for Professional Qualifications (48 CFR 44738-44739) for architectural history and history.

The KTN terminal building was evaluated for the National Register of Historic Places (National Register) under Criteria A, B, C, and D. The building does not possess significance under any of the criteria, as detailed in this report. Due to lack of significance, this resource is not eligible for inclusion in the National Register and historic integrity was not assessed. Mead & Hunt recommends the KTN terminal building is not eligible for the National Register, with the resulting Section 106 of the Historic Preservation Act of 1966 (Section 106) determination of *no historic property affected*.

2.2 Introduction and Project Deliverables

This document evaluates the eligibility of the Ketchikan International Airport (KTN or Airport) terminal building in Ketchikan, Alaska, for eligibility for listing in the National Register of Historic Places (National Register) in support of the Section 106 process under the National Historic Preservation Act of 1966, as amended. Ketchikan is on the Inside Passage along Alaska's southeastern coast. The airport is situated on the east side of Gravina Island, defined by steep northeastern-facing slopes, which is located approximately one-quarter mile west of Ketchikan, Alaska, across the Tongass Narrows (see Figure 1). KTN is located on 997 acres of flat land approximately 92 feet above sea level, on a coastal plain with scrub forest vegetation. Gravina Island is largely uninhabited, except for the Clam Cove neighborhood approximately 1.7 miles south of KTN, a sawmill approximately 1.3 miles to the north, and a few residences farther to the north. Other areas of the island that have road access are used for timber harvesting.

The proposed undertaking is a terminal building reconfiguration and expansion program focused on modifications of and expansion to the terminal building. The proposed project involves approximately 4,030 square feet of interior renovation and approximately 21,350 square feet of building expansion.

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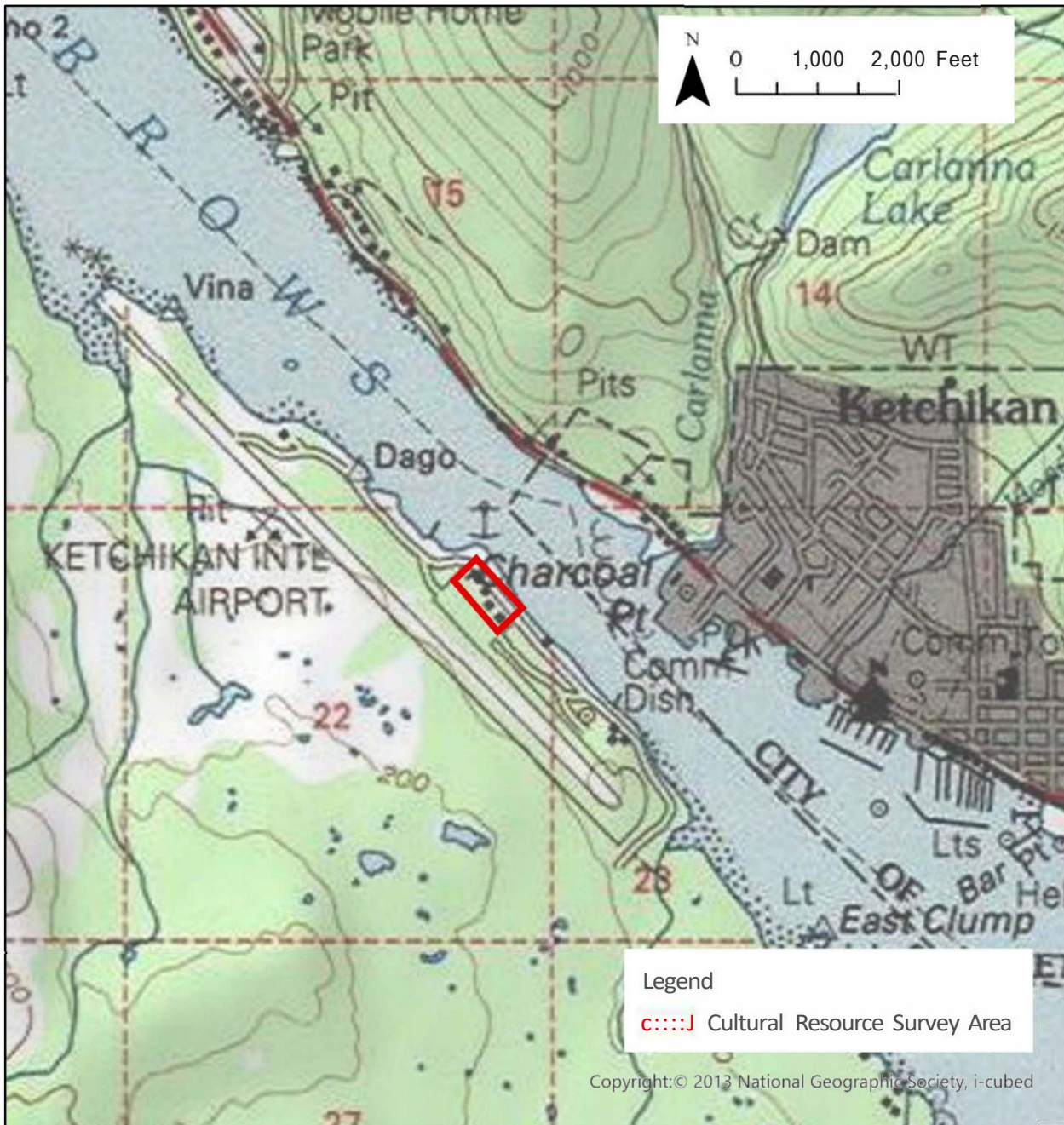


Figure 1 KTN location map, with the Phase I Cultural Resource Survey Area denoted in red.

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2.3 Area of Potential Effects




The Area of Potential Effects (APE) is the geographic area within which an undertaking may directly or indirectly cause alterations in the character or use of cultural resources if any such properties exist. The APE was defined to include areas of the Airport that may be directly or indirectly impacted by project activities. Project activities include the reconfiguration and expansion of the terminal building that are focused on the terminal building, biomass boiler building, and maintenance building. The terminal building was built in 1973 and therefore will be over 50 years of age by the time of project construction in 2024 (defined as being constructed in 1974 or earlier, following the National Park Service's 50-year suggested threshold). The biomass boiler building was built in 2016 and will not be age eligible. The maintenance building was constructed c.1979 and will not be age eligible. Eligibility determinations for the historic-age resources in the APE will potentially influence the design, as avoidance of historic properties is an important consideration for the City of Ketchikan, the Airport, the Federal Aviation Administration (FAA), and the project design team.

Figure 2 is the APE map with the location for the property surveyed for this project. The APE includes a 50-foot buffer around the existing building and proposed undertaking. The buffer provides staging areas for the terminal reconfiguration and expansion program. The built environment located outside of the APE includes buildings associated with the Airport. The Airport was established in 1973 as one of several post-World War I (postwar) airports located on the Inside Passage along Alaska's southeastern coast. While one of the airport hangars dates from this period, the majority of the Airport's operations currently take place in buildings and structures, and along runway configurations from the mid-1980s through the 2010s.

CONCEPT BUDGET REPORT

Terminal Area Plan

LEGEND

-  AREA OF POTENTIAL EFFECT (APE)
-  EXISTING BUILDINGS
-  BUILDING EXPANSION

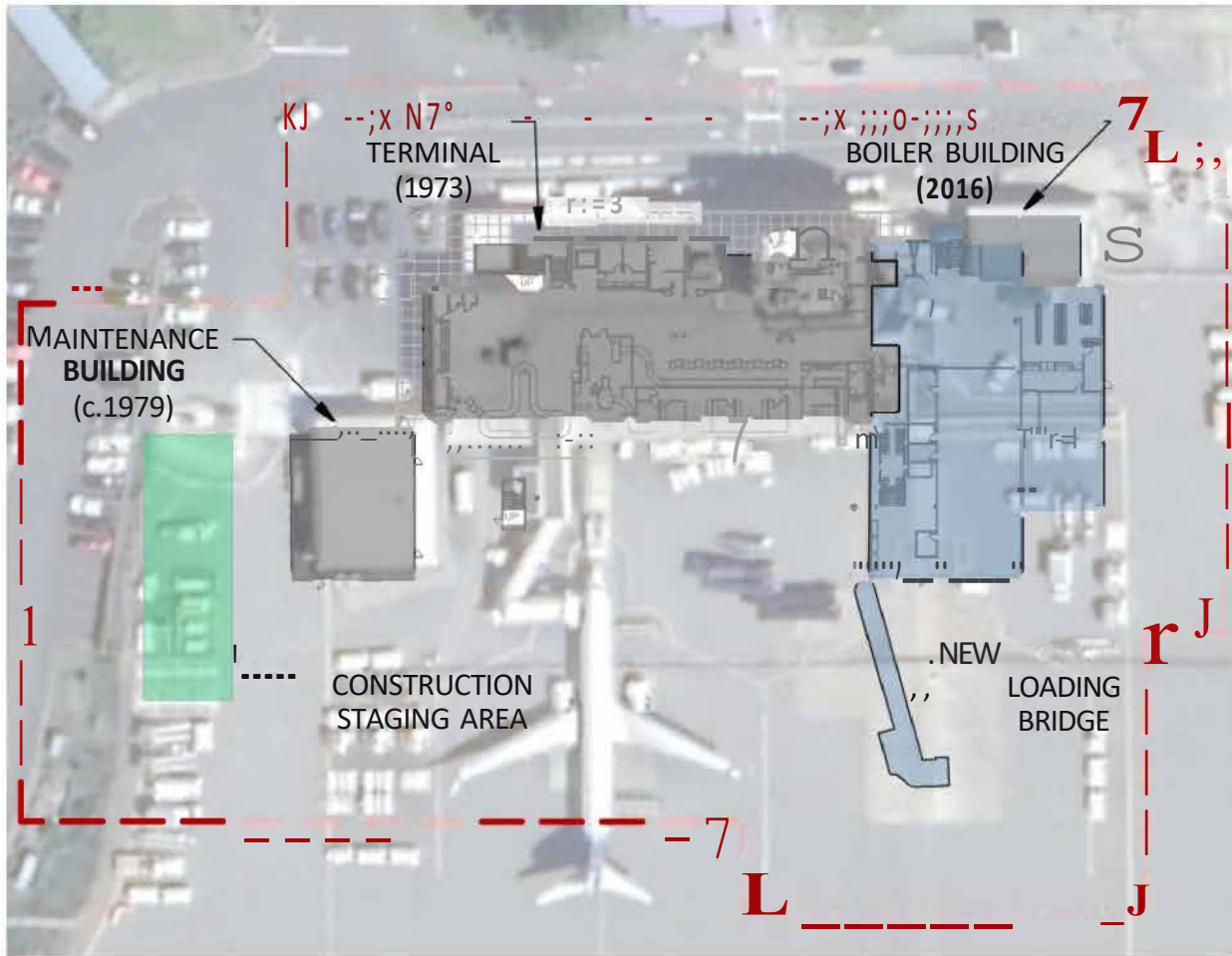
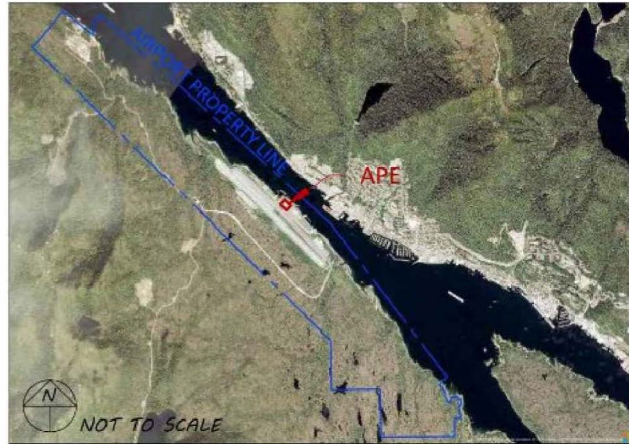
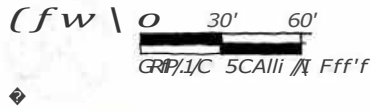


Figure 2 KTN Terminal Expansion proposed undertaking and APE. The existing KTN terminal building is recommended not eligible for the National Register.

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2.4 Research Design and Methodology

The objective of the historic resource investigations for the Airport terminal improvement project was to identify and assess historic properties within the identified project area that possess significance and integrity to be eligible for listing in the National Register. This documentation and significance assessment is intended to facilitate determination of the proposed project's effects on historic properties (properties listed in or eligible for inclusion in the National Register). The historic resource investigation included a search of previously recorded properties in the Alaska Department of Natural Resources Office of History and Archaeology (OHA) Alaska Heritage Resources Survey - Integrated Business Suite (AHRs-IBS) Portal, intensive-level survey of the one historic-age building within the APE, archival research, preparation of this determination of eligibility, and one inventory form. The study was carried out in accordance with the guidelines of the Alaska Department of Natural Resources Office of History and Archaeology, as published in the Historic Preservation Series No. 7: Determinations of Eligibility.¹ The methods employed in the investigation are detailed below.

Previously recorded historical information about the project area and about specific historical resources was collected from the OHA, including existing site forms and survey reports. Further research was conducted at the Ketchikan Public Library and the Ketchikan Museums: Tongass Historical Museum. Resources consulted at these repositories included local community histories, historic maps, archived newspaper articles, and archived scrapbooks. Research was also conducted at the Ketchikan International Airport. Resources consulted at the Airport included as-built plans and oral histories from Airport personnel. The team also reached out directly to MRV Architects (formally Linn A. Forrest Architects AIA, which designed the KTN terminal building). While MRV Architects has records of the design, the company was unable to locate the records in its off-site storage facility. Research was also conducted in person at the Alaska State Library and the Alaska State Archives in Juneau, as well as in person at the OHA office in Anchorage. Web-based resources were also consulted including the Alaska Digital Archives and digitized historic and current newspapers available from Genealogy Bank and Newspapers.com. The locally owned, online news and information website focused on Ketchikan, known as SitNews - Stories in the News, was utilized. Historic aerial photos were accessed from the U.S. Geological Survey (USGS) Earth Explorer online database and historic maps were accessed from the USGS Topo View database. In addition, historic contexts and other secondary resources related to the history of Ketchikan, Ketchikan Gateway Borough, and Alaska were consulted. The historic context provides a framework for evaluating the integrity and significance of any identified cultural resources. The information collected through the archival and field investigations was used to create this determination of eligibility and the relevant Alaska OHA Building Inventory Form for the KTN terminal building (see Appendix A).

¹ *Determinations of Eligibility*, Historic Preservation Series (Anchorage, AK: Alaska Department of Natural Resources Office of History and Archaeology, n.d.), <http://dnr.alaska.gov/1parksloha/hpseries/hp07.pdf>.

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2.4.1 Previously cultural Resource Investigation

The AHRS-IBS was researched in June 2022 to determine if known historic or cultural properties occur within the APE. No known historic or cultural properties are located within the direct vicinity of the project or within the APE.

2.5 Architectural Description

The KTN terminal building is located on an irregular lot on Gravina Island. The KTN airport apron and runways are to the west and the Tongass Narrows is to the east of the building. The Borough of Ketchikan is across the Tongass Narrows on Revillagigedo Island. The subject building is a 1972-1973, two-story, irregular plan, utilitarian terminal building with a multi-story, square, glass and metal, air traffic control tower. The KTN terminal building is clad in rough exposed concrete panels and has a flat roof with metal coping. The foundation is not visible. The primary facade (landside) faces east with a recessed entry located near the southeast corner of the building. The entry has replacement metal sliding doors with fixed windows. A secondary entrance has been infilled on the northeast corner of the building and converted into a vestibule. A cantilevered awning with a repeating Tsimshian totem design extends along the facade, as well as on the rear (airside) facade of the building. Typical fenestration consists of metal fixed curtain windows on the second story. A second story addition was built above the north portion of the building between 1982 and 1992. The simple utilitarian building displays architectural features consistent with Brutalism and New Formalism styles, such as the rough exposed concrete panels and the abstract use of glass and metal. A c. 1979 maintenance building is to the north of the building and a biomass boiler building built in 2016 is to the south of the building. The ferry terminal is to the east of the building. The KTN terminal building appears to be in good condition.

2.6 Property History

2.6.1 Ketchikan

Ketchikan is a borough in Southeast Alaska located on Revillagigedo Island. The town is named after Ketchikan Creek, which flows through the community into the Tongass Narrows. The word "Ketchikan" comes from the Tlingit name for the creek, Kich, fan, said to mean "thundering wings" or "spread wings" of an eagle. The Tlingit people have lived in what is now Southeast Alaska since time immemorial and operated seasonal fish camps along the creek and near the mouth of the creek before the abundant fishing in the region attracted white settlers.²

In 1885 Michael Martin, an Irish immigrant who immigrated to Oregon before moving to the Territory of Alaska, purchased 160 acres of land around Ketchikan Creek from Tlingit Chief Kyan. The homestead included land that would become known as Ketchikan. The first cannery opened in 1886, and by 1936 Ketchikan had seven canneries, including the New England Fish Company from Boston (see Figure 3)³. In 1890 the community had 40 individuals, including 26 "native," nine white, and five "mixed," with 21 men and 19 women.⁴

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- ²"Our History," Central Council: Tlingit & Haida Indian Tribes of Alaska, n.d., <http://www.ccthita.org/about/history/index.html>.
- "Ketchikan - Kich1Saan," Alaska Natives Without Land, 2022, <https://www.withoutland.org/ketchikan>
- Richard Arlin Walker, "The Land of Many Welcomes: Ketchikan Alaska Is Tlingit Country," Indian Country Today, September 13, 2018, <https://indiancountrytoday.com/archive/ketchikan-alaska-is-tingit-country-land-many-welcomes>
- "Ketchikan - Kich1Saan," Visit Southeast Alaska: Remote Rugged Beautiful, 2022, https://visitsoutheastalaska.com/cities_villages/ketchikan-kich1saan/
- Dave Kiffer, "Ketchikan Took Shape 120 Years Ago," Sit News - Stories In The News, April 7, 2007, http://www.sitnews.us/Kiffer/TongassPacking/040707_tongass_packing.html
- Census of Ketchikan Residents and Voters (Ketchikan, AK: United States Census Office, 1906), <https://vilda.alaska.edu/digital/collection/cdmg41/id/720/rec/18>.
- Patricia Rappel, Land of Mists: Revillagigedo & Gravina Islands Misty Fjords National Monument, 2nd ed. (Ketchikan, AK: Parnassus Books, 2011), 5.
- ³Kiffer, "Ketchikan Took Shape 120 Years Ago"; "Ketchikan - Kich1Saan," 2022; "Ketchikan - Kich1Saan," 2022.
- ⁴Kiffer, "Ketchikan Took Shape 120 Years Ago."



Figure 3. View from a boat of the New England Fish Company cannery in Ketchikan, Alaska.

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In addition to canneries and commercial fishing, mining and mineral extraction in Southeast Alaska boosted the Ketchikan economy and brought more white immigrants to the area. The mining era in southern Southeast Alaska took off after the discovery of gold at Helm Bay on Revillagigedo Island and Dolomi on Prince of Wales Island, and copper on Kasaan Peninsula around the turn of the century. The community emerged as the support and supply center for mining exploration and development activities in southern Southeast Alaska, as Ketchikan itself did not have any large commercial grade ore deposits. Between the mining activity and fishing industry, more and more ships traveled through the Tongass Narrows. Ketchikan continued to support these industries and by 1900 Ketchikan officially incorporated (see Figure 4).⁶

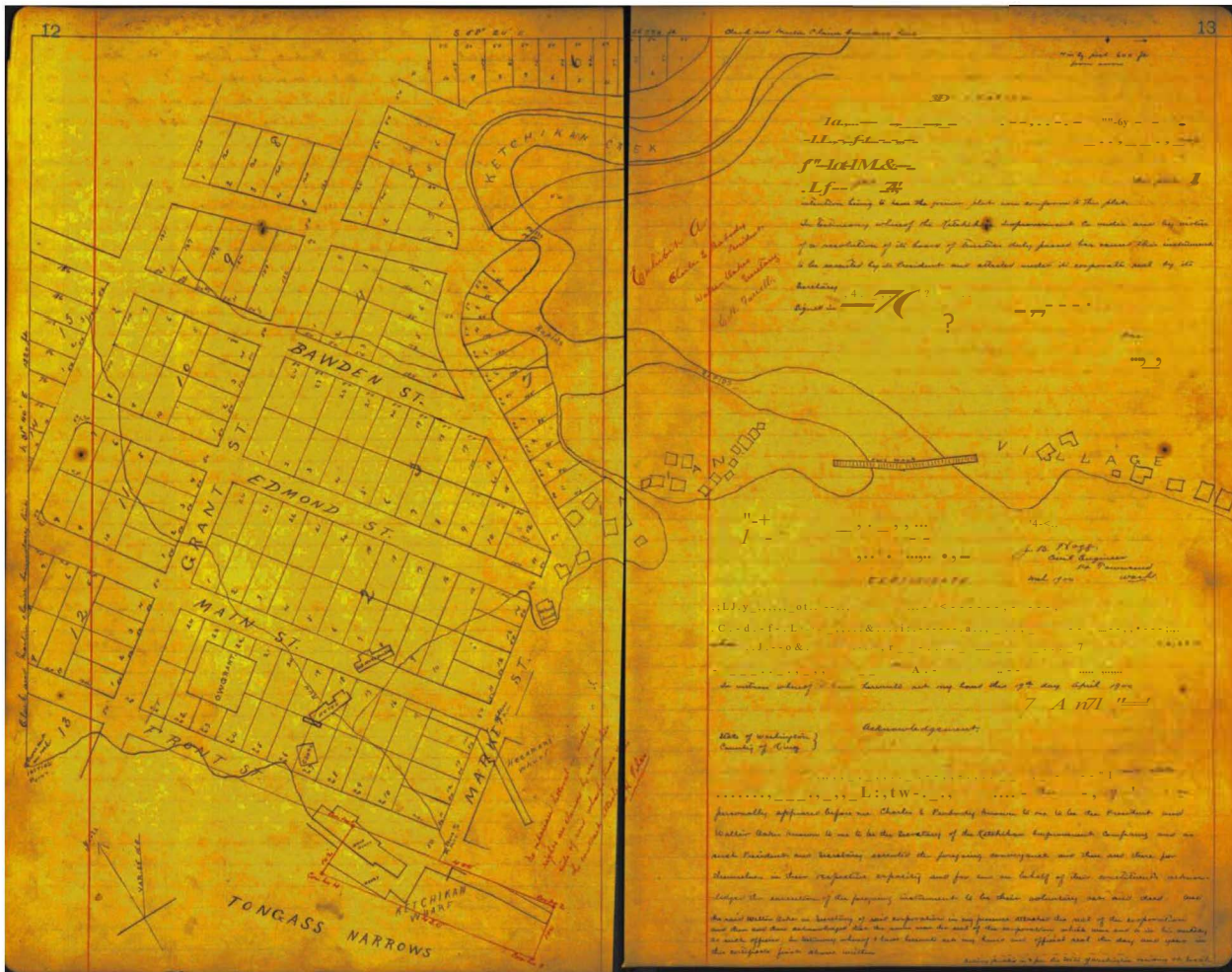


Figure 4. Property and survey map of Ketchikan, 1900.⁷

As the mining industry began to decline around 1910, the timber and pulp industry took its place and fishing continued strong. As early as 1902, three sawmills operated in the vicinity of Ketchikan. A small-scale sawmill

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operated at George Inlet supplying lumber for the cannery buildings, wooden "shooks"-boxes to hold the canned salmon and shakes for local housing construction. Ketchikan has a rich pulp and timber history, including large-scale industrialized operations such as the Ketchikan Power Company which provided lumber and power. It operated under various names in downtown between 1904 and 1987, or the Ketchikan Pulp Company's plant that operated between 1954 and 1997.⁸

2.6.2 Across the Tongass Narrows: Gravina Island

Gravina Island has been utilized by Alaska Native peoples for subsistence and other traditional activities for generations prior to white settlers homesteading on the island. The Tlingit were known to inhabit the territory of the Tongass (Tan-ta kwan), which included Gravina Island.⁹ On what is now the north side of the Airport, Tsmishians from Metlakatla on Annette Island started a community in 1892 focused on hunting, fishing, and gathering. The community was known as Port Gravina (KET-00027, nonextant). The settlement boasted a sawmill, school, church, general store, and one street along the waterfront facing Ketchikan. In 1904, a fire burned and destroyed the sawmill and half of the buildings on Port Gravina. Residents of Port Gravina moved across the Tongass Narrows to Ketchikan or 20 miles south to Metlakatla, abandoning the site.¹⁰

Since the 1880s, activities on Gravina Island have included timber harvesting, mining exploration, homesteading, administrative sites for the U.S. Coast Guard and U.S. Geodetic Survey (U.S.G.S.), commercial fishing, and community development. The first homestead on Gravina Island was filed with the federal Land Office in 1913 by Felix H. Fiedler, a German immigrant, under U.S. Survey No. 1081.¹¹ The Fiedler homestead was located at the southernmost portion of the current KTN property boundary (see Figure 5). Fiedler developed a ranch with several cabins and planted orchards of fruit trees and vegetables, selling his produce in Ketchikan at the local farmer's market. Fiedler's ranch also included a series of streams, drainage ditches, and a tramway that led to the beach to transport produce. Beginning in 1917, Fiedler began selling portions of his property.¹² Carl Dudler purchased 20 acres from Fiedler in 1932, along with the what became known as the Dudler house, a one-and-a-half story residence clad in cedar shingles (see Figure 6).¹³ All homestead dwellings associated with Fiedler and Dudler are nonextant.

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Figure 5. Fiedler's Ranch on Gravina Island. Source: Ketchikan Museums ¹⁴



Figure 6. Dud/er House. Source: Marlene Steiner Folder, Tongass Historical Museum, c. 1943-1944. ¹⁵

¹⁴ Helen Snow and Forest J. Hunt, *Fiedler's Ranch on Gravina Island*, 1914, Snapshots for Christmas, Tongass Historical Museum.

¹⁵ Marlene Steiner, *Dud/er House*, n.d., TC #599, Tongass Historical Museum.

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2.6.3 Transportation: From steamship to aviation

Ketchikan is a waterfront city in Southeast Alaska, lining the steep shore of Revillagigedo Island facing Tongass Narrows and Gravina Island (see Figure 7 through Figure 9). Southeast Alaska stretches for almost 300 miles along the Alaska-Canada border. Overland travel throughout Southeast Alaska is difficult due to steep, heavily forested lands, and narrow beaches along the coasts interrupted by rocky headlands. Ketchikan itself was built on pilings over the tidal flats and ocean beach. The early streets in downtown Ketchikan were wooden planks for foot and horse traffic. Beaches, footpaths, and horse trails served to connect the town to nearby businesses and residences.



Figure 7. 1929 aerial of Ketchikan and Tongass Narrows looking northwest over Pennock (left) and Gravina Islands (background).¹⁷

¹⁶ Janet M. Matheson, *Ketchikan: A City Historic Properties Survey* (Ketchikan, AK: Ketchikan Gateway Borough Historical Commission, 1980); Janet M. Matheson, *Ketchikan: A City Historic Properties Survey* (Ketchikan, AK: Ketchikan Gateway Borough Historical Commission, 1984); "Sanborn Fire Insurance Map from Ketchikan, Ketchikan Census Division, Alaska" (New York: Sanborn Map Company, 1914), Sheets 1-5, https://www.loc.gov/item/sanborn00120_001/.

¹⁷ Elliot L. Fisher, *Ketchikan Aerial - Tongass Narrows Looking Northwest over Pennock & Gravina Islands*, Photograph, black & white, 1929, Ketchikan Museums: Tongass Historical Society Collection, <https://ketchikan.pastperfectonline.com/photo/5648455F-8738-4C9A-B13B-951866852429>.

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Figure 8 1948 aerial view of the rugged terrain surrounding Ketchikan. Pennock Island is to the right of Ketchikan and Gravina Island is across the Tongass Narrows from Ketchikan on the left.¹⁸



Figure 9. 1948 aerial photograph showing the approximate current airport property boundaries.¹⁹

¹⁸ *Ketchikan Aerial*, Photograph, black & white, 1948, Steve Mccutcheon Collection, Anchorage Museum at Rasmuson Center, <https://vilda.alaska.edu/digital/collection/cdmg2/id/8035/rec/3>.

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¹⁹ U.S. Geological Survey, *Aerial Image, Ketchikan, Alaska*, Photograph, black & white, July 24, 1948, USGS Earth Explorer, earthexplorer.usgs.gov.

Many communities in Southeast Alaska are isolated and travel between communities can be challenging. ²⁰ In the late 1880s and early 1900s the main way to travel throughout the region was by boat (see Figure 10). In the 1920s it took about 20 hours to travel from Ketchikan to Wrangell (shown as Fort Wrangell in Figure 10), a distance of 90 miles. ²¹ Boats and steamships were the preferred method of travel and trade throughout Southeast Alaska until local aviation arrived in the 1920s. Even then, people often preferred to travel shorter distances by boat. ²² Today there are still no roads that connect larger Southeast Alaska communities like Sitka, Juneau, and Ketchikan.



Figure 10. Cropped portion of the "Map of Alaska and portions of the Northwest Territory" showing routes to the goldfields of Alaska in 1897. Red dashed lines indicate overland trails and steamship routes; black dashes and dotted lines indicate Canada-Alaska boundary. Ketchikan is located near the bottom right side of the figure. ²³

²⁰ Tara Neilson, *Raised In Ruins* (Berkeley, Calif.: West Margin Press, 2020), 159.

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²¹ Dave Kiffer, *Ketchikan Mini-Histories: Aviation*, Ketchikan Mini-Histories (Ketchikan, AK: Pioneer Printing Co., 2022), 4.

²² Neilson, *Raised In Ruins*, 218, 232-36; Kiffer, *Ketchikan Mini-Histories: Aviation*, 11.

²³ Poole Brothers, "Map of Alaska and Portions of the Northwest Territory" (Chicago: Poole Bros., 1897), Rare Maps Collection, Elmer E Rasmuson Library, University of Alaska Fairbanks, <https://archives.lib.uaf.edu/islandora/object/eerl-rare-97>.

Following the end of World War I (WWI), men who had learned to fly returned to their homes with a new skill and taste for adventure. ²⁴ The first plane to reach Ketchikan was the Northbird, a Curtiss flying boat flown by Roy Jones, on July 17, 1922. Jones was a resident of Ketchikan who served in the US Army Signal Corp in WWI. After successfully flying from Seattle to Ketchikan, Jones opened the first commercial flying service in Alaska under the name "Northbird in Southeast." Jones offered flights to residents around the Tongass Narrows, as well as transported people between Ketchikan, Wrangell, Petersburg, and Juneau. Jones also participated in the first aerial survey of Southeast Alaska. Unfortunately, his business only lasted one year. Jones crashed his plane in 1923 ending the Northbird in Southeast commercial service. ²⁵

After Jones' successful commercial service, several small airlines operated in the Ketchikan area. ²⁶ The airlines were mostly charter flights connecting the region to Canada and Seattle, as well as bringing the smaller communities of the region together. Where a boat took 20 hours to travel 90 miles, aircraft could travel the distance in two hours. ²⁷

As the terrain remained rocky and steep, there were no landing fields. Planes were flying boats or float planes with the ability to land in water (see Figure 11 through Figure 13). It was not until the late 1930s with the growing tension in the Pacific that the United States military took notice of the potential for an aviation presence in Alaska. The federal government began building new landing airfields that could support large numbers of military aircraft to protect the Pacific in the event of a war. ²⁸

²⁴ Kiffer, *Ketchikan Mini-Histories: Aviation*, 2-3.

²⁵ Kiffer, *Ketchikan Mini-Histories: Aviation*, 3; June Allen, "Celebrating Ketchikan History," *Ketchikan Daily News*, September 18, 1993, Tongass Historical Museum; Emery Tobin, "51 Yrs. Ago Jones Brought Aviation to Ketchikan," *Ketchikan Daily News*, August 3, 1973, Tongass Historical Museum.

²⁶ According to *Ketchikan Mini-Histories: Aviation* by Dave Kiffer, the largest of these small airlines was the Ellis Air Transport, founded in 1936 by Bob Ellis. Ellis grew up in Vermont and learned to fly while serving in the Naval Reserve in the Pacific Northwest before moving to Ketchikan. He grew his airline into a fleet of more than two dozen planes. He also opened a flight school, helping increase the number of pilots and planes that served the Ketchikan area. In the early 1960s, Ellis merged his airline with a similar airline based out of Juneau, Alaska Coastal. The newly formed company was known as Alaska Coastal-Ellis. In 1968 Alaska Coastal-Ellis merged with Alaska Airlines.

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²⁷ Kiffer, *Ketchikan Mini-Histories: Aviation*, 4-5; "Bob Ellis," *Alaska Airlines, Inc.*, 2022, <https://www.alaskaair.com/content/about-us/history/bob-ellis>; Archie Satterfield, *The Alaska Airlines Story* (Alaska Northwest Publishing Company, 1981), 54-55.

²⁸ Kiffer, *Ketchikan Mini-Histories: Aviation*, 6-8; Dave Kiffer, "A South Tongass Airport? Not Really, but a Local Pilot Did Land There Once," *Sit News - Stories In The News*, June 22, 2020, http://www.sitnews.us/Kiffer/MountainPointAirport/062220_MtPoint_Airport.htm1; Roppel, *Land of Mists: Revillagigedo & Gravina Islands Misty Fjords National Monument*, 99.



Figure 11. Seaplane ramp near the current south junction of North Tongass Highway and Shoreline drive. ²⁹

²⁹ Elliot L. Fisher, *The First Ketchikan Airport, Photograph, black & white, 1929*, Ketchikan Museums: Tongass Historical Society Collection, <https://ketchikan.pastperfectonline.com/photo/49BF5862-9A18-4264-9F76-431767189712>.

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Figure 12. One of Bob Ellis' Ellis Air Transport planes landing in the Tongass Narrows, 1937.³⁰

³⁰ Bradford Washburn, *Bob Ellis' Plane Just North of Ketchikan*, Photograph, black & white, 1937, Alaska and Polar Regions Collections, Elmer E Rasmuson Library, University of Alaska Fairbanks, <https://vilda.alaska.edu/digital/collection/cdmgll/id/50343/rec/1>.

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Alaska State Library - Historical Collections

Figure 13. A c.1939-1959 image of a single-engine seaplane parked at landing float built by the Bureau of Public Roads near Chichagof, Alaska. 31

Ketchikan did not have enough flat land to build an airfield, so the military looked about 20 miles to the south at Annette Island (see Figure 14). At the same time, the Civil Air Administration (CCA) (now the Federal Aviation Administration [FAA]) built a wood frame storage building in 1941 that was southeast of the existing KTN terminal area (KET-811, nonextant). After the United States formally entered World War I (WWII) in 1941, Annette Island Airfield began operations as a refueling and reservicing station for military planes between Seattle and Anchorage. The airfield supported the United States military efforts, as well as the Royal Canadian Air Force during WWII.

³¹ *An Alaskan "Streetcar" Carries a Passenger to a Gold Camp*, Photograph, black & white, 1959 1939, Paul M. Sorensen Photograph Collection, Alaska State Library- Historical Collections, <https://vilda.alaska.edu/digital/collection/cdmg21/id/10201/rec/36>.

³² Paul W. Chattey, "Determination of Eligibility for Air Navigation Facilities Built by the Civil Aviation Administration in Alaska, 1940-1958," July 1999.

³³ Kiffer, *Ketchikan Mini-Histories: Aviation*, 6-8; Allen, "Celebrating Ketchikan History"; *The Story of Ketchikan, Gateway to Alaska*, 28.

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Figure 14. Cropped portion of the 1952 USGS Ketchikan {B-6} Quadrangle. The red arrow indicates Ketchikan, and the blue arrow indicates Annette Island Airfield.³⁴

³⁴ "Ketchikan, Alaska Quadrangle" (Washington, D.C.: U.S. Geological Survey, 1952), <https://livingatlas.arcgis.com/topoexplorer/index.html>.

Following WWII, commercial airlines began utilizing the network of airfields in the Territory of Alaska. By the 1950s, several airlines such as Pacific Northern and Pan American World Airways brought tourists to the territory. Tourism in Southeast Alaska, however, did not take off as quickly as other regions such as

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Southcentral or Interior Alaska. It continued to rely on commercial fishing. Post-war infrastructure improvements mostly focused on harbors and docks to support the fishing industry rather than for tourists and travelers. Small ships slowly started to bring tourists along the Alaska Marine Highway System and communities in Southeast Alaska began to realize the potential for the tourism economy. In 1964 11,000 visitors came to Southeast Alaska by cruise ship and a little over 13,000 arrived by air. By the 1970s, large cruise lines like Princess brought over 30,000 people a year to the region.³⁵ The cruise industry continues to bring more people to the area than the commercial aviation industry through KTN. 36

In the 1950s Annette Island Airfield began passenger service and Pan American World Airways (Pan Am) became the first airline to fly between Seattle and Annette Island Airfield with options to fly to nearby communities (see Figure 15). At this time, Annette had some of the largest runways on the Pacific Coast, and quickly became “Ketchikan’s airport” with flights between Annette’s concrete airstrip and the Tongass Narrows.³⁷ Flights lasted about 10 minutes, a significant improvement from the previous hours-long boat ride. The Grumman Goose, a military plane first used to fight the Japanese on the Aleutian Islands in WWII, became the preferred plane to fly between Ketchikan and Annette as it could carry up to 10 passengers plus cargo.

³⁵ Amy Ramirez et al., *Mid-Twentieth Century Architecture in Alaska Historic Context (1945-1968)* (Anchorage, AK: National Park Service, Alaska Regional Office, 2016), 82–83, 147, 150, Alaska Department of Natural Resources Office of History and Archaeology, <http://dnr.alaska.gov/parks/oha/publications/MID20thCArchitectureinAK3.12.2018.pdf>; *The Story of Ketchikan, Gateway to Alaska*, 10; Dave Kiffer, “History of Alaska Tourism, Part 3: A Steady ‘Boom’ In Tourism Post World War II,” *Sit News - Stories In The News*, December 29, 2010, http://www.sitnews.us/Kiffer/Tourism3/122910_tourism_pt3.html.

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³⁶ “Visitor Statistics,” *Welcome to Ketchikan, 2022*, <https://www.visit-ketchikan.com/en/Membership/Visitor-Statistics>; “Ketchikan Cruise Ship 2021 Statistics” (Ketchikan Visitors Bureau, 2022), <https://www.visit-ketchikan.com/>.

³⁷ Allen, “Celebrating Ketchikan History”; Dave Kiffer, “Pan Am: Once Ketchikan’s Link to the Outside World,” *Sit News - Stories In The News*, December 29, 2006, http://www.sitnews.us/Kiffer/PanAm/122906_Pan_Am_Airways.html.

³⁸ Allen, “Celebrating Ketchikan History”; Kiffer, *Ketchikan Mini-Histories: Aviation*, 9–10.



Figure 15. A Pan Am airliner sits on the apron at the Annette Island Airfield and Airport. In the background, along with an Ellis Air Lines Grumman Goose, are a number of US Air Force, US Coast Guard, and Royal Canadian Air Force planes.³⁹

By the 1960s all of Southeast Alaska became dependent on the efficiency of air travel for residents and tourists as well as transporting goods and mail. Aviation also brought the region together and created close-knit ties

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between previously isolated communities. The people of Ketchikan started imagining what life could be like with their own airport and soon members of the community took it upon themselves to see what it would take to make it happen.⁴⁰ Ketchikan would not be the only Southeast Alaska community to harbor this dream as other communities such as Sitka, Petersburg, and Klawock opened their own airfields in the late 1960s and early 1970s.

³⁹ *Annette Island Airport, August 1953*, Photograph, black & white, 1953, Ketchikan Museums: Paulu T. Saari Collection, <https://ketchikan.pastperfectonline.com/photo/BA7BD1AB-A29F-4E65-9894-934446179421>.

⁴⁰ Allen, "Celebrating Ketchikan History"; *The Story of Ketchikan, Gateway to Alaska*, 28; "Ketchikan International Airport Master Plan: Summary Report" (Ketchikan Daily News, June 1981), 2, Tongass Historical Museum.

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2.6.4 Ketchikan International Airport

Discussions of Ketchikan getting its own airport started as early as the mid-1950s. One of the first locations delegates from the Ketchikan Chamber of Commerce proposed to the Alaska Aeronautics and Communications Commission, the entity responsible for making recommendations for the establishment and operation of airports in the state, was Point Higgins, north of Ketchikan on Revillagigedo Island (see Figure 16).⁴¹ In a meeting held by the Alaska Department of Aviation (now the Alaska Department of Transportation and Public Facilities [DOT P&F], Division of Statewide Aviation [SWA]) on November 2, 1946, Herman Porter, the director of the department, vetoed the proposal determining the potential airport project would be “beyond the financial capabilities of the department.”⁴² ⁴³ At the same meeting, Sitka approached the commission requesting an engineering and economic survey for an airport. Delegates from Sitka told the commission two airlines have already approached the community indicating they would “service Sitka if an airport space was available.”⁴⁴ No decisions were made that day regarding Sitka’s request, but Sitka and Ketchikan would continue to advocate for their own airports into the late 1960s.

⁴¹ “Airport Site Here Gets ‘No Action,’” *Ketchikan Daily News*, November 3, 1956, Tongass Historical Museum; Allen, “Celebrating Ketchikan History”; “Alaska DOT&PF’s History,” *Alaska Department of Transportation and Public Facilities*, n.d., <https://dot.alaska.gov/jobs/>; “Welcome to the Division of Statewide Aviation,” *Alaska Department of Transportation and Public Facilities Statewide Aviation*, n.d., <https://dot.alaska.gov/stwdav/index.shtml>; Theresa L. Kraus, *Civil Aviation Policy in Alaska: 1913-2018* (U.S. Department of Transportation Federal Aviation Administration, 2020), 28, https://www.faa.gov/about/history/media/Civil_Aviation_Policy_in_Alaska.pdf.

⁴² “Airport Site Here Gets ‘No Action.’”

⁴³ According to the Alaska Department of Transportation and Public Facilities website, the Alaska DOT&PF was established on July 1, 1977, merging the former departments of Highways and Public Works.

⁴⁴ “Airport Site Here Gets ‘No Action.’”

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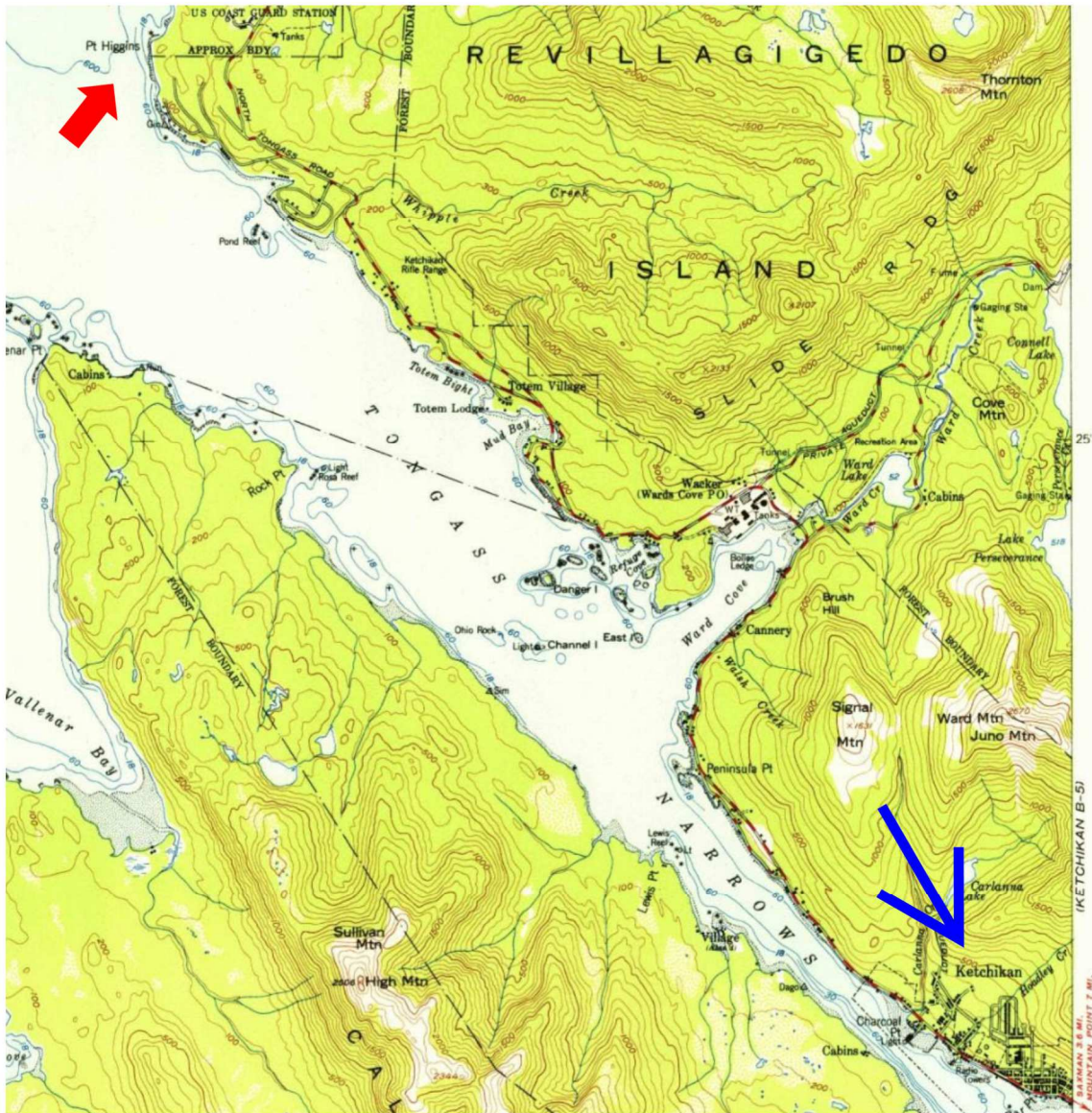


Figure 16. Cropped portion of the 1953 USGS Ketchikan (B-6) Quadrangle. The red arrow indicates Point Higgins, one of the locations proposed for the Ketchikan airport, and the blue arrow indicates Ketchikan.⁴⁵

During the next decade, members of the Ketchikan community continued to rely heavily on small charter flights and trips in Grumman Goose planes to and from Annette Island. While much more convenient than the steamships for goods and passenger service, reliably traveling the 20 miles between Annette and Ketchikan proved challenging.

⁴⁵“Ketchikan (B-6) Quadrangle” (Fairbanks, Alaska: U.S. Geological Survey, 1955), <https://livingatlas.arcgis.com/topoexplorer/index.html>.

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Locals in favor of a Ketchikan airport cited the frequent inclement weather as reasons for canceled or delayed flights between Annette and Ketchikan.

Residents who owned businesses, such as grocery stores, relied on consistent transport of goods from the lower 48 states of the United States (Lower 48). Often, large planes would successfully land at Annette and the smaller Grumman Goose and light aircraft that planned on transporting people and goods to Ketchikan would be grounded at Annette due to poor weather conditions. One woman shared with the Ketchikan Daily News that her brother-and-law's corpse made it to Annette from Washington but got delayed at Annette for three days on its way to Ketchikan for burial. Many businesses hoped an airport at Ketchikan would provide more consistent deliveries.

Approximately 180 miles north of Ketchikan, the smaller community of Sitka also continued to rely heavily on air transport for goods and passengers. Members of the Sitka community successfully petitioned the territorial government (now Alaska state government), the Federal Aviation Administration (FAA), and the United States federal government for funds to build an airport on Japonski Island (see Figure 17). In 1967 the airport opened with commercial service to Seattle and Anchorage.

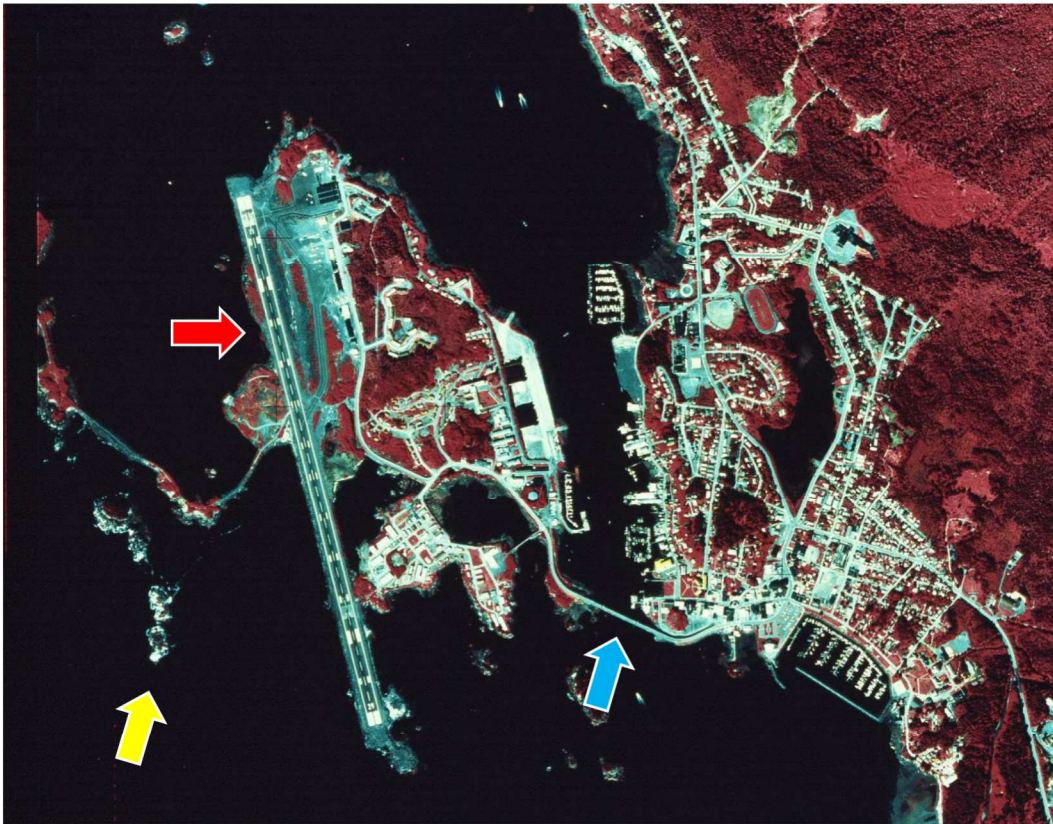


Figure 17. 1979 aerial photograph of the Sitka Rocky Gutierrez Airport on Japonski Island (red arrow) and the bridge connecting the community of Sitka to Japonski Island (blue arrow).

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Members of the Ketchikan community felt strongly that they too deserved an airport if their smaller neighbor to the north received the funding to build one, and continued to petition government officials for funding. Ketchikan received pushback, with officials claiming the airport and airfield on Annette Island was close enough and met the needs of the community. Airlines that service Alaska's interior persuaded government officials against funding construction of a Ketchikan airport, and instead to allocate that same federal funding for improvements to airports the airlines service further north. Sitka provided Ketchikan with testimonials of support and helped the community organize and make a stronger case to Congress and the FAA.

In April 1965 government officials hired Toner & Nordling of Juneau to study site possibilities for a Ketchikan airport, and in 1966 the government officials set aside \$60,000 for a comprehensive site study. When the airport site study plans were excluded from a general \$7.5 million general obligation bond issue in 1966, more than 50 Ketchikan community leaders flew to Juneau to meet with the governor and joint finance committee. The Ketchikan leaders were successful, and the Ketchikan airport project was put back into the bond issue and the legislature increased the bond issues to \$11.5 million.

2.6.5 Ketchikan International Airport site selection

Alaska aviation officials conducted a site study for the project in 1967 and identified several potential locations, including Point Higgins and Gravina Island. Many locals advocated for the site on Point Higgins on Revillagigedo Island, which was already connected to Ketchikan through the North Tongass Road (see Figure 7 above). The government officials and airport stakeholders preferred Gravina Island as it was much closer to Ketchikan, claiming the airport in Juneau, which is 10 miles north of the community, proved inconvenient. Gravina Island also aligned with prevailing winds. Ultimately the federal government selected Gravina Island, promising they would build a bridge across the Tongass Narrows as soon as they finished the bridge under construction between Sitka and its airport on Japonski Island. In the meantime, air travelers could travel back and forth across the Tongass Narrows on a ferry. After multiple attempts to design a bridge over the last 50 years, either straight across the Tongass Narrows from Ketchikan to Gravina Island, or from Ketchikan to Pennock Island to Gravina Island, no bridge exists connecting Ketchikan to the airport today. The ferry continues to run two round trips every hour between with the first trip departing the Ketchikan side at 6:15 am and last trip departing the airport at 9:30 pm (see Figure 19 and Figure 19).

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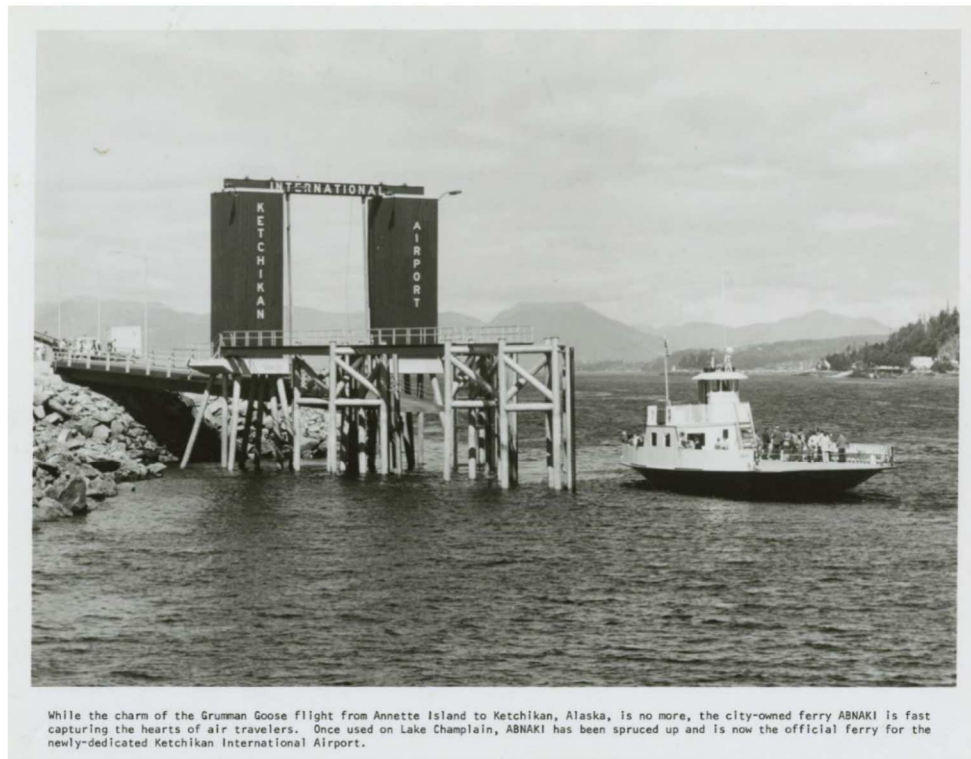


Figure 18. Original ferry slip on Gravina Island (nonextant, replaced in 2016).



Figure 19. Current ferry slip on Gravina Island taken from the ferry, view facing northwest. Mead & Hunt, Inc. July 11, 2022.

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Through a declaration of taking in 1969, the State of Alaska acquired the entire 289.33 acres of property on Gravina Island originally surveyed under U.S. Survey No. 1081 for development of the Ketchikan International Airport (KTN). The total amount of land acquired for the airport included 2,606 acres (11 tracts) at a cost of \$610,000. In the end, the entire project cost \$14.8 million; the state provided \$4.4 million, the federal government \$7.4 million, and the borough of Ketchikan \$3.0 million.

2.6.6 Ketchikan International Airport terminal construction history

Gravina Island was selected as the site for the airport in 1967 as it could provide for a 7,500-foot runway and had the potential to expand to a 10,000 foot runway in the future. The firm of Linn A. Forrest Architects, AIA (Linn A. Forrest Architects) was selected to design the KTN terminal building. The firm, at the time primarily managed by Linn A. Forrest's son, Steve Forrest, also designed the Alaska State Centennial Museum (JUN-1124, Listed) in Juneau, which was completed in 1967 as a major Alaska Centennial project and was a combination of New Formalism and Brutalism. Like the KTN terminal building, the design of the Alaska State Centennial Museum also incorporated the firm's interpretation of traditional Northwest Coast Native designs. During childhood, Steve developed an interest in the shapes and forms of Northwest Coast art as a result of Linn's work in the 1930s and 1940s as a supervisor for the U.S. Forest Service and the Civilian Conservation Corps. In particular, Steve took an interest in Linn's work on totem pole restoration projects in Southeast Alaska. Steve Forrest drew the plans for the KTN terminal building. Linn A. Forrest Architects hired Tsimshian master carver Stan Marsden to design the repeating Tsimshian totem panel on the cantilevered awning on the building (see Figure 20). The contractor for the construction of the terminal building was Saunders-Wick Construction of Seattle. Site clearing and preparatory work for airport construction began in 1969 and was completed 1972-1973, with the terminal building dedication occurring in July 1973. Construction of the terminal building is shown in Figure 21. The ferry landing (see Figure 18 above), seaplane base, and one hangar were also completed in 1973. An aerial image of the terminal area shortly after the completion of the terminal is shown in Figure 22.

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Figure 20. Photograph of the repeating Tsimshian totem design along the facade of the building, view facing south. Mead & Hunt, Inc. July 11, 2022.



Figure 21. KTN Terminal under construction, 1972-1973. Note the Tsimshian totem design has been applied to the cantilevered awning.

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Figure 22. Terminal area, c.1973. Note the hexagon seaplane base (nonextant) in the foreground.

A 1979 USGS aerial (see Figure 23 and Figure 24) shows the maintenance building on the west corner of the terminal building and three hangars on the south side of the terminal building, which were constructed sometime between 1973-1979. A second-story addition was built above the one-story portion of the terminal building on the north facade between 1982 and 1992 (see Figure 25).

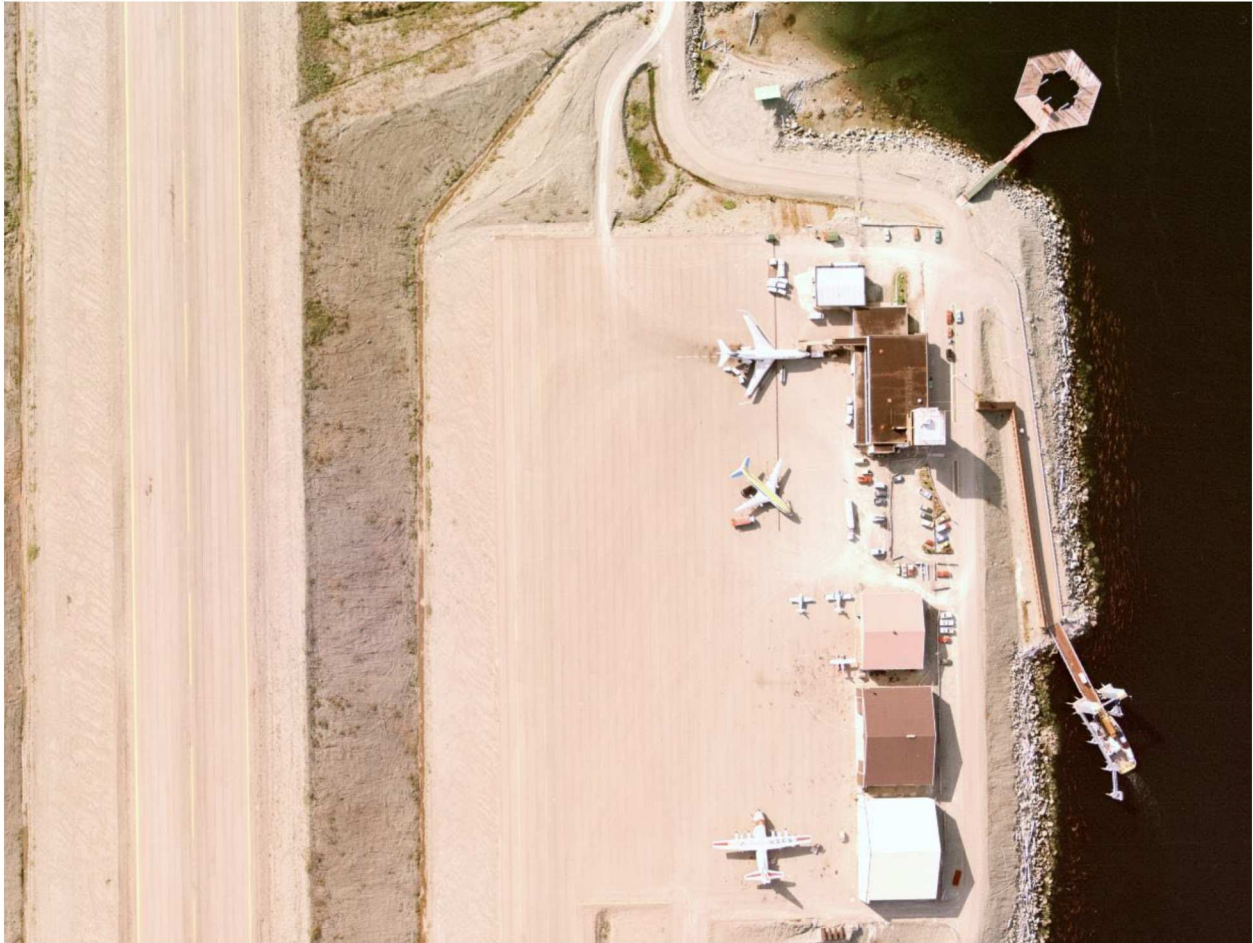


Figure 23. 1979 aerial of the terminal area.

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Figure 24. 1979 aerial of the terminal building. Note the original footprint of the terminal building before the second-story addition and extended awning on the north facade.

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Figure 25. The second-story addition on the north facade of the terminal building, view facing southwest. Mead & Hunt, Inc. July 11, 2022.

The Seattle based firm Edberg Christiansen Architects completed renovations on the terminal building in 1992. The renovations included interior alterations in the ticketing and baggage claim areas, modifications to the covered entrance on the northeast corner, and exterior alterations including the extension of the cantilevered awning on the northeast corner of the building and the addition of the glass covered air taxi entrance on the south corner of the building (see Figure 26 and Figure 27). In 2003 other interior renovations were completed and a revolving entrance door was added to the facade of the terminal building. The revolving door was removed and replaced with sliding doors sometime after 2011 (see Figure 28).

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Figure 26. The extended cantilevered awning located at the northeast corner of the terminal building (landside), view facing south. Mead & Hunt photograph, July 11, 2022.

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Figure 27. The glass covered air taxi entrance, view facing north. Mead & Hunt photograph, July 11, 2022.



Figure 28. The former northeast corner entrance (now enclosed, red arrow) and the new northeast entrance (blue arrow), view facing northwest. Mead & Hunt photograph July 11, 2022.

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Other major alterations to the Airport include runway and taxiway extension, construction of additional hangars, and construction of other airport support buildings, all of which are outside the APE.

2.6.7 Determination of Eligibility and Effect Determinations

2.6.7.1 Eligibility Evaluation and Recommendation

The KTN terminal building (Alaska Heritage Resources Survey No. KET-1473) was evaluated for the National Register under Criteria A, B, C, and D.

2.6.7.1.1 Criterion A

To be eligible under Criterion A: History, a property must be associated in an important way with a significant historic event or broad pattern in history, as well as demonstrate that the event was important to the development of Alaska, Ketchikan Gateway Borough, or the city of Ketchikan. Ketchikan is in southeast Alaska, which consists of many small, isolated communities. Boats and steamships and local aviation led to the establishment and continued accessibility of the community prior to the construction of the KTN terminal building and airport. In addition, approximately 30 years before the construction of KTN, Ketchikan's close proximity to the Annette Island Airfield provided the region with faster aviation-related transportation of goods and passengers between the small communities throughout southeast Alaska. The KTN terminal building therefore does not possess significance in opening up the Ketchikan region to settlement under Criterion A under the areas of Exploration/Settlement, Commerce, Tourism, Industry, Community Planning and Development, Recreation/Entertainment, or Transportation.

2.6.7.1.2 Criterion B

To be eligible under Criterion B: Significant Person, the property must be associated with a person who made a significant contribution to the development of Alaska, Ketchikan Gateway Borough, or the city of Ketchikan. No particular person of historical significance is known to be associated with the design, construction, or maintenance of KTN; therefore, the KTN terminal building does not possess significance under Criterion B: Significant Person.

2.6.7.1.3 Criterion C

To be eligible under Criterion C: Architecture, the property must represent the work of a master, possess high artistic value, and/or embody the distinctive characteristics of type, period, or method of construction. The original 1972-1973 terminal building was designed by the Juneau architectural firm Linn A. Forrest Architects. This was Linn A. Forrest Architects' only terminal building of the firm's career, and the firm is better known for its education buildings. In addition, the architectural firm and the individual architects did not earn any other accolades for the design of the KTN terminal building, and do not qualify as masters. Moreover, secondary sources consulted as a part of this project did not indicate that this building was a notable building for the firm. As such, the KTN terminal building does not represent the work of a master or possess high artistic value.

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The KTN terminal building is utilitarian in form and design. It does display some stylistic influences consistent with New Formalism and Brutalism styles, such as the rough exposed concrete panels and the abstract use of glass and metal, but overall the building is modest in design and is not a distinct example of either style. It also takes on limited regional characteristics through its band of Tsimshian totem-style artwork, but the panels are an applied element and not integral to the design or style of the building. In addition, the form and plan of terminal building has been altered with the extension of the cantilevered awning on the northwest corner of the building and the second-story addition of the north portion of the building. Therefore, the building does not embody the distinctive characteristics of type, period, or method of construction.

The KTN terminal building displays numerous characteristics of a mid-twentieth-century airport terminal building found in Alaska, including its location directly next to an airstrip; rows of windows for viewing flight arrivals and departures; contained internal functional areas for ticketing, baggage handling, and seating; and the multi-story, square, air traffic control tower incorporated into the terminal building. Although the KTN terminal building has many architectural traits of a mid-twentieth-century airport terminal, it does not possess significance under Criterion C under the area of Architecture.

2.6.7.1.4 Criterion D

The resource is not likely to contain information important to history or prehistory beyond what is already documented and does not possess significance under Criterion D.

Due to lack of significance, this resource is not eligible for inclusion in the National Register.

2.6.7.1.5 Integrity

Due to lack of significance, historic integrity was not assessed.

2.6.7.1.6 Determination of effect

The proposed undertaking includes a reconfiguration and expansion of the KTN terminal building and Biomass boiler building. The proposed project will include approximately 4,030 square feet of interior renovations and approximately 21,350 square feet of building expansion, with a building footprint expansion of approximately 13,530 square feet. Because the FAA has made a determination of not eligible for the National Register, the FAA has made a determination of no historic property affected.

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Appendices

Appendix A - Alaska Oha Building Inventory Form

Appendix B - Alaska Heritage Resources Survey Site Form

Appendix C - Terminal Area Plan Section G: Development Program And Financial Implementation Analysis

Appendix A - Alaska Oha Building Inventory Form

AHS # KET-1473

Historic Name: Ketchikan International Airport (KTN) Terminal Building

Associated District AHS # N/A

Date of Construction: 1973

Eligibility: Not Eligible

Associated District AHS Name: N/A

Period of Significance: 1972-1973



Building Photograph



Site Map

GENERAL PROPERTY INFORMATION

Location Description or Address:

1000 Airport Terminal Building, Ketchikan, AK 99901

Latitude: 55.356881

Longitude: -131.709646

Please use Degree, decimal e.g., 57.087172 -134.840399

USGS quad: KET 8-6

MTRS: T75SR90E

Format example for Meridian Township Range Section•• F7516W13

ARCHITECTURAL INFORMATION

Architectural Style: (Please reference Alaska Style Guide for styles found in Alaska)

Brutalism and New Formalism

Architectural Description: (Include setting, outbuildings, materials, etc...)

The KTN terminal building is located on an irregular lot on Gravina Island. The KTN apron and runways are to the west and the Tongass Narrows is to the east of the building. The city of Ketchikan is across the Tongass Narrows on Revillagigedo Island. The subject building is a 1972-1973, two-story, irregular-plan, utilitarian terminal building with a multi-story, square, glass and metal, air traffic control tower. The KTN terminal building is clad in rough exposed concrete panels and has a flat roof with metal coping. The foundation is not visible. The primary facade (landside) faces east with a recessed entry located near the southeast corner of the building. The entry has replacement metal sliding doors with fixed windows. A secondary entrance has been infilled on the northeast corner of the building and converted into a vestibule. A cantilevered awning with a repeating Tsimshian totem design extends along the facade, as well as on the rear (airside) facade of the building. Typical

AHRS #: KET-1473

Historic Name: Ketchikan International Airport (KIN) Terminal Building

fenestration consists of metal fixed curtain windows on the second story. A second-story addition was built above the north portion of the building in 1992. The simple utilitarian building displays architectural features consistent with Brutalism and New Formalism styles, such as the rough exposed concrete panels and the abstract use of glass and metal. A c.1979 maintenance building is to the north of the building and a biomass boiler building built in 2016 is to the south of the building. The KIN terminal building appears to be in good condition. **a**

BUILDING EVALUATION FOR THE NATIONAL REGISTER

Historic Context: (Relate people, events, and themes with time and place)

Ketchikan is in southeast Alaska, which consists of many small, isolated communities. Boats and steamships and local aviation led to the establishment and continued accessibility of the community prior to the construction of the KIN terminal building and airport. In addition, approximately 30 years before the construction of KIN, Ketchikan's close proximity to the Annette Island Airfield provided the region with faster aviation-related transportation of goods and passengers between the small communities throughout Southeast Alaska. **la**

Statement of Significance:

The KIN terminal building was evaluated for the National Register of Historic Places (National Register) under Criteria A, B, C, and D. The KIN building does not possess significance in opening up the Ketchikan region to settlement under Criterion A under the areas of Exploration/Settlement, Commerce, Tourism, Industry, Community Planning and Development, Recreation/Entertainment, or Transportation. No particular person of historical significance is known to be associated with the design, construction, or maintenance of KIN; therefore, the KIN terminal building does not possess significance under Criterion B Significant Person. The KIN terminal building does not represent the work of a master or possess high artistic value and does not embody the distinctive characteristics of type, period, or method of construction. Although the building has many architectural traits of a mid-twentieth-century airport terminal, it does not possess significance under Criterion C under the area of Architecture. The resource is not likely to contain information important to history or prehistory beyond what is already documented and does not possess significance under Criterion D. Due to lack of significance, this resource is not eligible for inclusion in the National Register. **a**

Integrity Discussion:

Due to lack of significance, historic integrity was not assessed.

Eligible: YES NO If yes: A B C D

Criteria Consideration: A B C D E F G

Form Preparation Information

Prepared By: Katherine Oldberg, Mead & Hunt, Inc.

Professional Qualifications: Architectural Historian

Date Prepared: 2/23/2023

Appendix B - Alaska Heritage Resources Survey Site Form

Alaska Heritage Resources Survey Site Form

Date Received:

Alaska Department of Natural Resources, Office of History and Archaeology

550 W. 7th Ave., Suite 1310 Anchorage, AK 99501-3565

Phone: (907) 269-8718; Fax (907) 269-8908

<http://www.dnr.state.ak.us/parks/oha/index.htm>

1. **Type of Form**: New

2. **AHRS Number**: KET-1473

3. **Site Name**: Ketchikan International Airport (KTN) Terminal Building

4. **Description**: The KTN terminal building is located on an irregular lot on Gravina Island. The KTN apron and runways are to the west and the Tongass Narrows is to the east of the building. The city of Ketchikan is across the Tongass Narrows on Revillagigedo Island. The subject building is a 1972-1973, two-story, irregular-plan, utilitarian terminal building with a multi-story, square, glass and metal, air traffic control tower. The KTN terminal building is clad in rough exposed concrete panels and has a flat roof with metal coping. The foundation is not visible. The primary facade (landside) faces east with a recessed entry located near the southeast corner of the building. The entry has replacement metal sliding doors with fixed windows. A secondary entrance has been infilled on the northeast corner of the building and converted into a vestibule. A cantilevered awning with a repeating Tsimshian totem design extends along the facade, as well as on the rear (airside) facade of the building. Typical fenestration consists of metal fixed curtain windows on the second story. A second-story addition was built above the north portion of the building in 1992. The simple utilitarian building displays architectural features consistent with Brutalism and New Formalism styles, such as the rough exposed concrete panels and the abstract use of glass and metal. A c.1979 maintenance building is to the north of the building and a biomass boiler building built in 2016 is to the south of the building. The KTN terminal building appears to be in good condition.

5. **Cultural Significance**: Ketchikan is in southeast Alaska, which consists of many small, isolated communities. Boats and steamships and local aviation led to the establishment and continued accessibility of the community prior to the construction of the KTN terminal building and airport. In addition, approximately 30 years before the construction of KTN, Ketchikan's close proximity to the Annette Island Airfield provided the region with faster aviation-related transportation of goods and passengers between the small communities throughout Southeast Alaska. The terminal building was evaluated for the National Register of Historic Places (National Register) under Criteria A, B, C, and D. The KTN terminal building does not possess significance in opening up the Ketchikan region to settlement under Criterion A under the areas of Exploration/Settlement, Commerce, Tourism, Industry, Community Planning and Development, Recreation/Entertainment, or Transportation. No particular person of historical significance is known to be associated with the design, construction, or maintenance of KTN; therefore, the KTN terminal building does not possess significance under Criterion B: Significant Person. The terminal building does not represent the work of a master or possess high artistic value and does not embody the distinctive characteristics of type, period, or method of construction. Although the building has many architectural traits of a mid-twentieth-century airport terminal, it does not possess significance under Criterion C in the area of Architecture. The resource is not likely to contain information important to history or prehistory beyond what is already documented and does not possess significance under Criterion D. Due to lack of significance, this resource is not eligible for inclusion in the National Register.

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<http://www.dnr.state.ak.us/parks/oha/index.htm>

6. **Associations**: Airport

7. **Location Information**: The KTN terminal building is located at 1000 Airport Terminal, Ketchikan, AK 99901 on Gravina Island. The building is located on the east side of the airport property. The airport apron and runways are located to the west of the terminal building. The airport is located across the Tongass Narrows from the community of Ketchikan, which is on Revillagigedo Island. The KTN terminal building is accessible from Ketchikan by ferry or by seaplane and the seaplane base located northwest of the KTN Terminal Building.

8. **Location Reliability**: Location Exact and Site Existence Verified (1)

9. **AHRS Resource Nature**: Building

10. **Resource Nature Subtype**: Default Building

11. **Resource Keywords**: airport; airport terminal building; two-story utilitarian building; Linn A. Forrest

12. **Site Area (Acres)**: 3.5

13. **Period Codes**: Modern Choose an item. Choose an item.

14. **Associated Dates**: 1972-1973; 1992

15. **Cultures**: Modern American

16. **Prehistoric/Historic Function**: Airport

17. **Current Function**: Transportation: Air-related

18. **Condition Code**: Investigated and planned reconstruction (CD6)

19. **Destruct Codes**: Construction Rehabilitation Choose an item.

20. **Destruct Year**: 1992

21. **Owner Info**: Ketchikan Gateway Borough

22. **Source Reliability**: Professional Reports, Records, and Field Studies (A)

23. **Form Author**: Katherine Oldberg

24. **Date Completed**: 2/23/2023

25. **Record Status**: Complete

26. **Other Number(s)**: N/A

27. **Artifact Repository**: N/A

28. **Attachments** (File Name): 230223_Ketchikan Cultural Resources Report.pdf

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<http://www.dnr.state.ak.us/parks/oha/index.htm>

29. Location Information (Decimal Degrees, NAD 83 Datum):

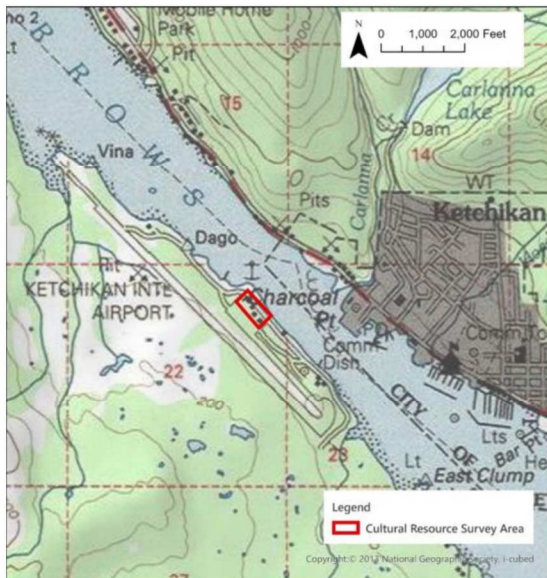
Latitude: 55.356881

Longitude: -131.709646

30. Attach a portion of appropriate Aerial Photograph and U.S.G.S Quad Map or detailed sketch map showing the location of the site relative to surrounding natural landforms, water bodies and/or city or town landmarks. (Either include it in the space provided or attach in a separate file).



Caption: Aerial Photograph



Caption: USGS Site Map

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<http://www.dnr.state.ak.us/parks/oha/index.htm>

31. **Summary Artifact Tables** (Insert table that notes artifact type, material, count, and any notes, including associated date ranges, if appropriate). Replace representative table if appropriate.

Artifact Type	Artifact Material	Number of Artifacts	Notes

32. **Representative Site Photos** (Caption photos, note direction taken, add as many as necessary)



Caption: Overview of the KTN terminal building from the landside, view facing south.

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<http://www.dnr.state.ak.us/parks/oha/index.htm>



Caption: Overview of the KTN terminal building and apron from the airside, view facing northeast.



Caption: View of the side (south) elevation and the rear (airside) elevation of the 2016 biomass boiler building from the airside, view facing north.

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<http://www.dnr.state.ak.us/parks/oha/index.htm>



Caption: View of the side (south) elevation and primary facade (landside) of the KTN terminal building and the biomass boiler building from the landside, view facing northwest.



Caption: View of the side (north) elevation and primary facade (landside) of the KTN terminal building and the c.1979 maintenance building from the landside, view facing south.

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Appendix C - Terminal Area Plan Section G: Development Program And Financial Implementation Analysis

3 CHAPTER 3: ENVIRONMENTAL



3.1 Introduction

The purpose of this chapter is to present an overview and screening of the environmental considerations of the Terminal Area Conceptual Development Plan for Ketchikan International Airport (KTN or Airport). The following narrative provides information concerning environmental resources to define and identify critical resources that would need to be addressed in the preparation of environmental documentation for the proposed Airport development identified in the development program.

3.2 Existing Conditions

The Ketchikan Gateway Borough is located in Southeast Alaska in a maritime climate zone. Much of Southeast Alaska is covered by the Tongass National Forest and surrounded by the Inside Passage, an area known for its scenic, rugged coastline with steep terrain and forested islands. The Airport is located on Gravina Island, across the Tongass Narrows from Ketchikan. The Tongass Narrows waterway is part of the Alaska Marine Highway and is used by recreational vessels, passenger vessels (including large cruise ships), commercial fishing vessels, commercial freight barges, commercial tank barges, kayaks, floatplanes, charter vessels, and passenger ferries.

The climate of the Ketchikan Gateway Borough is characterized as a mild maritime or oceanic climate, that frequently has heavy cloud cover, high humidity and abundant rainfall averaging 153 inches per year, while the average snowfall is about 40 inches per year. The average annual maximum temperature is 52° F, and the average annual minimum temperature is 39° F.

CONCEPT BUDGET REPORT

The Borough has authority over the zoning and development codes that help guide development on Gravina Island. Much of Gravina Island is undeveloped and owned by the United States Forest Service (USFS). The area immediately south and west of the Airport has an Airport Reserve designation that is intended for future airport uses. There is an Airport Development zone beyond the Airport Reserve zone, which is intended for other airport facilities such as parking facilities and airport related businesses. The area north of the Airport Development zone was formerly a timber processing plant is designated as heavy industrial. There are also two residential zones, one on the northern side of the island and one on Clam Cove south of the Airport.

There are limited surface transportation facilities on the island. Vehicle access to the Airport is provided by the Airport ferry. Passenger terminal access is provided by the Airport Access Road from the ferry dock. The Airport Access Road also connects to Lewis Reef Road and the Gravina Island Highway.

3.3 Future Conditions

The following future conditions discussion assumes that the project is implemented. An analysis of the potential environmental impacts of implementing this project allows for the identification of any potentially significant environmental concerns and also allows for the identification of the level of documentation required to receive environmental clearance. The terminal area projects can be environmentally cleared under a Categorical Exclusion Form.

3.4 Air Quality

The proposed development outlined in this CBR is not expected to have a significant impact on the long-term quality of the air in the vicinity of the Airport. According to the U.S. Environmental Protection Agency (EPA), Ketchikan Gateway Borough is in attainment area with federal health-based air quality standards known as the National Ambient Air Quality Standards (NAAQS). A non-attainment area is defined as a locality where air pollution levels persistently exceed the NAAQS. The EPA normally makes this designation only after air quality standards have been exceeded for several consecutive years. Furthermore, a conformity analysis conducted to ensure actions included in a non-attainment or maintenance area “conforms” to any relevant State Implementation Plan (SIP) will not be required because Ketchikan Gateway Borough is not considered a non-attainment or maintenance area.

Short-term air quality impacts may be expected during construction of the proposed projects from heavy equipment pollutant emissions, fugitive dusts resulting from cut and fill activities, and the operation of portable concrete batch plants. Compliance with all applicable local, state, and federal air quality regulations and permitting requirements will be the responsibility of construction contractors.

3.5 Biological Resources

The Endangered Species Act, as Amended, requires each federal agency to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered

CONCEPT BUDGET REPORT

or threatened species or result in the destruction or adverse modification of habitat of such species. According to the U.S. Department of the Interior Fish and Wildlife Service (USFWS), Information for Planning and Consultation (IPaC) website, there no known occurrences of federal threatened, endangered, and candidate species or migratory birds of conservation concern located within the Ketchikan Gateway Borough.²

Section 305 of the Magnuson-Stevens Act requires federal agencies to identify and conserve essential fish habitat (EFH) for federally managed fish species. EFH is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” According to the National Marine Fisheries Service (NMFS), the Tongass Narrows is identified as EFH for five pacific salmon species and various ground fish.³ Projects that involve fill into the Narrows could result in direct habitat loss as well as indirect effects to physical processes that shape aquatic habitats and the species that live there. An EFH assessment could be required for the North Airport Service Road Relocation and the Vehicle Parking Expansion development projects.

Marine mammals are protected under the Marine Mammal Protection Act. The 2017 environmental documentation related to the Gravina Access Project notes that eight species of marine animals have been documented in the Tongass Narrows east of the Airport: harbor seals, Steller sea lions, humpback whales, killer whales, Dall’s porpoises, Pacific white-sided dolphins, minke whales, and harbor porpoises.⁴

Coordination with the USFWS, NMFS, and Alaska Department of Fish and Game (ADF&G) was necessary to determine whether any major development project actions are likely jeopardizing the continued existence of ESA-listed species and marine mammals or would result in the destruction or adverse modification of federally designated critical habitat. Best Management Practices (BMPs) will be incorporated into development projects to mitigate temporary construction impacts, protect water quality, and minimize effects related to runoff.

3.6 Coastal Zone Management and Wild and Scenic Rivers

In 2011, Alaska chose to discontinue the Coastal Management Program, which was developed under the Coastal Zone Management Act of 1972. However, under the Ketchikan Coastal Management Plan (1978), the Borough of Ketchikan established enforceable coastal development (CD) policies that provide guidelines and requirements for developing along the waterfront.

According to a listing of Wild and Scenic Rivers compiled and managed by the USACE, the Bureau of Land Management (BLM), the National Park Service (NPS), the U.S. Forest Service (USFS), and the U.S. Fish and

² U.S. Fish & Wildlife Service, 2020. Information for Planning and Consultation. Accessed June 20, 2020. Available at: <https://ecos.fws.gov/ipac/location/index>.

³ National Marine Fisheries Service, 2019. Alaska Essential Fish Habitat Mapper. Accessed June 20, 2020. Available at: <https://alaskafisheries.noaa.gov/portal/apps/webappviewer/index.html?id=bf2254ed51f444a8a16c564add54250>

⁴ Federal Highway Administration (FHWA) and the Department of Transportation & Public Facilities (DOT&PF), 2017. Gravina Access Project Final SEIS, Chapter 4 Environmental Consequences, p 4-57. Accessed June 20, 2020. Available at: http://dot.alaska.gov/sereg/projects/gravina_access/assets/FSEIS_6-2017/12-Chap4_EnvConseq_red.pdf

CONCEPT BUDGET REPORT

Wildlife Service (USFWS), there are no wild and scenic rivers located within the vicinity of KTN. Therefore, there will not be any impacts to a nationally significant river resource as a result of the proposed development within the Airport's terminal area.

3.7 Noise and Noise Compatible Land Use

The proposed terminal area projects are not anticipated to have an impact on the number or type of aircraft operations occurring at KTN over the 20-year planning period. An aircraft noise analysis will likely not be required prior to implementation of any of these projects. The KTN noise contours also do not encompass any noise sensitive land use such as residential, schools, hospitals, nursing home and churches.

3.8 Natural Resources and Energy Supply

The proposed development outlined in this Terminal Area Plan is not expected to have a significant impact on natural resources and energy supply in the vicinity of the Airport.

3.9 Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

Socioeconomics. The potential effects of proposed airport projects can extend to nearby residents and communities to cause direct or indirect socioeconomic impacts. The principal social impacts that should be considered during project analyses include those associated with relocation or other community disruption, transportation, planned development, and employment. In some cases, the effects of proposed projects can extend beyond current Airport boundaries to cause the relocation of residents or businesses, disrupt an established community, affect transportation patterns, or conflict with off-site development plans or land uses. Project implementation may also affect employment by creating temporary or permanent jobs associated with Airport development or by relocating jobs to another location.

All proposed development projects will occur within the Airport boundary. As such, none of the proposed development projects will result in the relocation of residents or businesses or conflict with off-site development land and land uses.

Environmental Justice. Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies. None of the proposed development projects are likely to disproportionately affect minority or low-income populations in the Borough.

Children's Environmental Health and Safety Risks. Under NEPA, sponsors and federal agencies must consider environmental health risks and safety risks that may disproportionately affect children and ensure that policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. Children's Health and Safety Risks are generally risks that would be

CONCEPT BUDGET REPORT

attributable to products or substances children are likely to encounter or ingest through air, food, drinking water, recreational waters, soil, or other projects that children might use or to which they might be exposed.

Given the isolated location of the Airport on Gravina Island, there are no residential structures, schools, churches, hospitals, or assisted living facilities present within 1-mile of the Airport. No impacts to Children's Environmental Health and Safety Risks are anticipated with any of the proposed development projects.

3.10 Water Resources

Under Section 10 of the Rivers and Harbors Act of 1899, approval by the United States Army Corps of Engineers (USACE) is required prior to any work in, over or under navigable waters of the United States, or which affects the course, location, condition, or capacity of such waters. Since the Tongass Narrows is a navigable waterway, this would be required for Airport improvement projects that involve construction of any piers, ramps, floats, and cable or pipeline crossings; dredging or disposal of dredged material; and excavation, fill or other modifications to into the Narrows. National Pollutant Discharge Elimination System (NPDES) construction permits will be needed for projects that include new ground disturbance or changes in impervious surface.

Prior to completing any projects at the Airport where there is potential for wetlands impacts, coordination with the USACE is recommended to confirm whether wetland features are present in project areas and to classify any such wetland features. If wetlands will be disturbed as a result of a project, the requisite permits would need to be obtained. The National Wetlands Inventory (NWI) classifies most of the developed area of the Airport as uplands, which is a non-wetland area. The shoreline along the Tongass Narrows and the Narrows itself are classified as an estuarine and marine wetlands, which consist of deepwater tidal habitats and adjacent tidal wetlands.

The Airport is located within the Tongass Narrows-Frontal Clarence Strait watershed, which has been designated as a priority watershed by the Alaska Department of Environmental Conservation (ADEC).

3.11 Farmland

There are no prime or unique farmlands in Alaska because the soil temperatures in the state do not meet the criteria established by congress. Furthermore, no farmlands of statewide importance have been designated in Alaska and there are no farmlands of local importance in the Ketchikan area.

3.12 Visual Effects (Light Emissions/Visual Resources)

Airfield lighting and rotating beacons are the main sources of light emissions emanating from an airport. Lighting required for construction activities could result in temporary light emissions, however no significant lighting impacts are expected from any of the proposed development projects.

Visual effects refer to the extent to which a project would emit light that creates annoyance or interferes with other activities, contrasts with, or detracts from visual resources, or affects the visual character of the existing

CONCEPT BUDGET REPORT

environment. Per NEPA regulations, proposed Terminal Area Plan projects will require evaluation of potential impacts on visual resources associated with new structures, roadways, and/or aviation facilities. Proposed development in the Terminal Area Plan is not anticipated to significantly change the lighting or visual environmental at the Ketchikan International Airport.

3.13 Summary

The environmental documentation included a Categorical Exclusion. The purpose of this Environmental Review chapter is to document and potentially uncover any significant environmental concerns that might greatly influence the ability to implement one or more of the recommended improvement projects and determine the level of environmental documentation required.

Appendices:

Appendix A – FAA Signed KTN Terminal CATEX

Appendix B- NWI Map

Appendix C – KTN Terminal Asbestos Results

Appendix D – Project Diagram

Appendix A – FAA Signed KTN Terminal CATEX

APPENDIX A. DOCUMENTED CATEX

Airport sponsors may use this form for projects eligible for a categorical exclusion (CATEX) that have greater potential for extraordinary circumstances or that otherwise require additional documentation, as described in the Environmental Orders (FAA Order 1050.1F and FAA Order 5050.4B).

To request a CATEX determination from the FAA, the sponsor should review potentially affected environmental resources, review the requirements of the applicable special purpose laws, and **consult with the Airports District Office or Regional Airports Division Office staff** about the type of information needed. The form and supporting documentation should be completed in accordance with the provisions of FAA Order 5050.4B, paragraph 302b, and submitted to the appropriate FAA Airports District/Division Office. The CATEX cannot be approved until all information/documentation is received and all requirements have been fulfilled.

Name of Airport, LOC ID, and location:

Ketchikan International Airport (KTN), Ketchikan, Alaska

Project Title:

KTN Terminal Expansion Project

Give a brief, but complete description of the proposed project, including all project components, justification, estimated start date, and duration of the project. Include connected actions necessary to implement the proposed project (including but not limited to moving NAVAIDs, change in flight procedures, haul routes, new material or expanded material sources, staging or disposal areas). Attach a sketch or plan of the proposed project. Photos can also be helpful.

The Ketchikan International Airport (KTN) completed a Terminal Area Plan in 2021 that identified the need to expand the terminal building and terminal area facilities to meet current and future demand. The proposed project involves approximately 4,030 square feet of interior renovation and approximately 21,350 square feet of building expansion. The proposed project includes the following elements:

- Building expansion for a first floor air taxi holdroom, a second floor mechanical room, an additional second floor holdroom, and a new passenger boarding bridge
- Relocation of the security screening checkpoint from the second floor to the first floor.
- Demolition or relocation of the biomass boiler building

The completion of each of these components is contingent upon funding; however, if each element is constructed, the overall terminal building footprint would be increased by approximately 13,530 square feet. As described in the Terminal Area Plan, the current terminal building is undersized to meet current and future demand during the busy summer months. The proposed terminal improvements would minimize congestion issues and overcrowding in terminal areas, as well as improve building efficiency. Construction is expected to begin in 2024 and last 18-24 months. The proposed terminal expansion project is illustrated in Appendix A.

Give a brief, but complete, description of the proposed project area. Include any unique or natural features within or surrounding airport property.

The proposed project will take place on airport owned property that has been previously disturbed by original development of the airport and is currently paved/developed. There are no unique or natural features within or surrounding the proposed project area.

Identify the appropriate CATEX paragraph(s) from Order 1050.1F (paragraph 5-6.1 through 5-6.6) or 5050.4B (Tables 6-1 and 6-2) that apply to the project. Describe if the project differs in any way from the specific language of the CATEX or examples given as described in the Order.

Order 1050.1F, Paragraph 5-6.3i. Approval of an Airport Layout Plan (ALP), Federal financial assistance for, or FAA projects for: the installation of solar or wind-powered energy equipment, provided the installation does not involve more than three total acres of land (including the land needed for easements and rights-of-way associated with building and installing the equipment, and any trenching and cabling that would connect the installed solar or wind equipment to other parts of the airport or an existing electrical grid) and would not have the potential to cause significant impacts on bird or bat populations. Construction contracts or leases for this equipment must include requirements to control dust, sedimentation, storm water, and accidental spills.

Order 1050.1F, Paragraph 5-6.4f. Federal financial assistance, licensing, Airport Layout Plan (ALP) approval, or FAA construction or limited expansion of accessory on-site structures, including storage buildings, garages, hangars, t-hangars, small parking areas, signs, fences, and other essentially similar minor development items.

Order 1050.1F, Paragraph 5-6.4h. Federal financial assistance, licensing, or Airport Layout Plan (ALP) approval for construction or expansion of facilities

Order 1050.1F, Paragraph 5-6.4i. Demolition and removal of FAA buildings and structures, or financial assistance for or approval of an Airport Layout Plan (ALP) for the demolition or removal of non-FAA owned, on-airport buildings and structures, provided no hazardous substances or contaminated equipment are present on the site of the existing facility

Order 1050.1F, Paragraph 5-6.4n. Minor expansion of facilities, including the addition of equipment such as telecommunications equipment, on an existing facility where no additional land is required, or when expansion is due to remodeling of space in current quarters or existing buildings.

Order 1050.1F, Paragraph 5-6.4 ee. Environmental investigation of hazardous waste or hazardous substance contamination on previously developed airport or FAA-owned, leased, or operated sites including temporary activities such as minor excavation, soil test borings, and installation of groundwater testing and monitoring wells, piezometers and other groundwater well monitoring devices impacting approximately one acre in aggregate surface area.

Order 1050.1F, Paragraph 5-6.4 ff. Remediation of hazardous wastes or hazardous substances impacting approximately one acre or less in aggregate surface area, including siting, site preparation, construction, equipment repair or replacement, operation and maintenance, remote or on-site monitoring, and removal of remediation-related equipment and facilities, on previously developed FAA-owned, leased, or operated sites.

The circumstances one must consider when documenting a CATEX are listed below along with each of the impact categories related to the circumstance. Use FAA Environmental Orders 1050.1F, 5050.4B, and the Desk Reference for Airports Actions, as well as other guidance documents to assist you in determining what information needs to be provided about these resource topics to address potential impacts. Keep in mind that both construction and operational impacts must be included. Indicate whether or not there would be any effects under the particular resource topic and, **if needed**, cite available references to support these conclusions. Additional analyses and inventories can be attached or cited as needed.

5-2.b(1) National Historic Preservation Act (NHPA) resources

	YES	NO
<p>Are there historic/cultural resources listed (or eligible for listing) on the National Register of Historic Places located in the Area of Potential Effect? If yes, provide a record of the historic and/or cultural resources located therein and check with your local Airports Division/District Office to determine if a Section 106 finding is required.</p> <p>There are no National Register of Historic Places (NRHP) listed (or potentially eligible) resources located in the proposed project area. The KTN terminal building was constructed in 1972-1973. Mead & Hunt surveyed the terminal building (Site KET-1473) on July 11, 2022 and prepared a cultural resources report, evaluating the terminal building for the NRHP. As a result of this effort, the KTN terminal building was recommended as not eligible. FAA issued a finding of no historic properties affected on April 3, 2023. The Alaska Office of History & Archaeology concurred with the finding of no historic properties affected for the proposed expansion of the terminal building on April 13, 2023. The cultural resources report and Section 106 correspondence are included in Appendix B.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Does the project have the potential to cause effects? If yes, describe the nature and extent of the effects.</p> <p>The proposed project would have no effects to cultural or historic resources.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Is the project area undisturbed? If not, provide information on the prior disturbance (including type and depth of disturbance, if available)</p> <p>The proposed project area would take place in a developed area of the terminal area that is paved and has been previously disturbed during grading for construction of the airport facilities and ongoing, regular maintenance activities.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	YES	NO
<p>Will the project impact tribal land or land of interest to tribes? If yes, describe the nature and extent of the effects and provide information on the tribe affected. Consultation with their THPO or a tribal representative along with the SHPO may be required.</p> <p>The proposed project is taking place entirely on airport property. The Metlakatla Indian Community and the Ketchikan Indian Community were both invited to consult on the proposed project. No responses were received. No known tribal land or land of interest would be impacted by the proposed project.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5-2.b(2) Department of Transportation Act Section 4(f) and 6(f) resources

	YES	NO
<p>Are there any properties protected under Section 4(f) (as defined by FAA Order 1050.1F) in or near the project area? This includes publicly owned parks, recreation areas, and wildlife or waterfowl refuges of national, state or local significance or land from a historic site of national, state or local significance.</p> <p>There are no properties protected under Section 4(f) within or near the proposed project area. The closest 4(f) properties are located over 3 miles east of KTN, across the Tongass Narrows.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Will project construction or operation physically or constructively “use” any Section 4(f) resource? If yes, describe the nature and extent of the use and/or impacts, and why there are no prudent and feasible alternatives. See 5050.4B Desk Reference Chapter 7.</p> <p>The proposed project would not result in changes that could directly or indirectly affect or constructively use Section 4(f) resources.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Will the project affect any recreational or park land purchased with Section 6(f) Land and Water Conservation Funds? If so, please explain, if there will be impacts to those properties.</p> <p>The proposed project would occur entirely on airport property. No Section 6(f) resources are present and there would be no direct or indirect impacts to any 6(f) resources.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5-2.b(3) Threatened or Endangered Species

	YES	NO
<p>Are there any federal or state listed endangered, threatened, or candidate species or designated critical habitat in or near the project area? This includes species protected by individual statute, such as the Bald Eagle.</p> <p>The US Fish and Wildlife Services (USFWS) Information, Planning and Consultation (IPaC) report (Appendix C) does not show any endangered or threatened species or critical habitats in the proposed project area. According to the NOAA Alaska Endangered Species and Critical Habitat Mapper, there are several species of endangered marine mammals with critical habitats in the Tongass Narrows, which is outside the proposed project area (Appendix D). There are no federal or state listed species expected to occur at the proposed project location.</p> <p>There are five total state listed endangered species (Short-tailed Albatross, Eskimo Curlew, Blue Whale, Humpback Whale, and Right Whale) in the entire state of Alaska. The proposed project area does not provide suitable habitat for any of these species. As of 2011, the Alaska Department of Fish and Game (ADFG) does not provide a Species of Special Concern list, but instead authored the 2015 Alaska Wildlife Action Plan which does not mention critical habitats in the Ketchikan area.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Does the project affect or have the potential to affect, directly or indirectly, any federal or state-listed, threatened, endangered or candidate species, or designated habitat under the Endangered Species Act? If yes, Section 7 consultation between the FAA and the US Fish & Wildlife Service, National Marine Fisheries Service, and/or the appropriate state agency will be necessary. Provide a description of the impacts and how impacts will be avoided, minimized, or mitigated. Provide the Biological Assessment and Biological Opinion, if required.</p> <p>No endangered, threatened, or candidate species are present in or near the proposed project area and therefore, the proposed project would not directly or indirectly affect any federal or state-listed species or designated habitat under the Endangered Species Act.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Does the project have the potential to take birds protected by the Migratory Bird Treaty Act? Describe steps to avoid, minimize, or mitigate impacts (such as timing windows determined in consultation with the US Fish & Wildlife Service).</p> <p>No birds protected by the Migratory Bird Treaty Act exist in the proposed project area. Given that the proposed project is located in a paved area near an existing active aircraft apron, it is unlikely that migratory birds exist in the proposed project area or would be impacted as a result of the proposed project.</p> <p>The proposed project site would be checked for nesting birds prior to construction. If any nests are identified, the area would be avoided until the birds leave the nest.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5-2.b (4) Other Resources

Items to consider include:

a. Fish and Wildlife Coordination Act	YES	NO
<p>Does the project area contain resources protected by the Fish and Wildlife Coordination Act? If yes, describe any impacts and steps taken to avoid, minimize, or mitigate impacts.</p> <p>The proposed project area does not contain essential fish habitat, and it is not aquatically connected to any essential fish habitat.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Wetlands and Other Waters of the U.S.	YES	NO
<p>Are there any wetlands or other waters of the U.S. in or near the project area?</p> <p>The NWI wetlands mapper (Appendix E) inaccurately depicts wetlands that appear to occur in the proposed project area. Mead & Hunt field verified that the bodies of water that the NWI mapper shows in the proposed project area do not exist. The proposed project would occur on land that is currently developed and paved; as such, no wetlands are present.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Has wetland delineation been completed within the proposed project area? If yes, please provide U.S. Army Corps of Engineers (USACE) correspondence and jurisdictional determination. If delineation was not completed, was a field check done to confirm the presence/absence of wetlands or other waters of the U.S.? If no to both, please explain what methods were used to determine the presence/absence of wetlands.</p> <p>The proposed project would occur on land that is currently developed and paved with no wetlands present.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>If wetlands are present, will the project result in impacts, directly or indirectly (including tree clearing)? Describe any steps taken to avoid, minimize or mitigate the impact.</p> <p>No wetlands are present in the proposed project area and therefore, no mitigation steps would be required.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Is a USACE Clean Water Act Section 404 permit required? If yes, does the project fall within the parameters of a general permit? If so, which general permit?</p> <p>No wetlands are being impacted by the proposed project and therefore no Clean Water Act Section 404 permit is required.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

c. Floodplains	YES	NO
<p>Will the project be located in, encroach upon or otherwise impact a floodplain? If yes, describe impacts and any agency coordination or public review completed including coordination with the local floodplain administrator. Attach the FEMA map if applicable and any documentation.</p> <p>The airport property and the proposed project area is located above sea level and outside any mapped floodplains according to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs). The proposed project would be taking place near the airport’s current footprint and all drainage would be managed by the existing and/or improved drainage infrastructure. There would be no change in the impervious area and no natural channels would be impacted by the expansion. As with the existing facility, any flooding that could potentially occur would only impact airport property and would not have adverse impacts to any adjacent landowners.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Coastal Resources	YES	NO
<p>Will the project occur in or impact a coastal zone as defined by the State’s Coastal Zone Management Plan? If yes, discuss the project’s consistency with the State’s CZMP. Attach the consistency determination if applicable.</p> <p>The proposed project would not occur in or impact a coastal zone.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Will the project occur in or impact the Coastal Barrier Resource System as defined by the US Fish and Wildlife Service?</p> <p>The proposed project would not occur in or impact a Coastal Barrier Resource System.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. National Marine Sanctuaries	YES	NO
<p>Is a National Marine Sanctuary located in the project area? If yes, discuss the potential for the project to impact that resource.</p> <p>No, there is no National Marine Sanctuary located within the proposed project area or within the state of Alaska.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Wilderness Areas	YES	NO
<p>Is a Wilderness Area located in the project area? If yes, discuss the potential for the project to impact that resource.</p> <p>There is no Wilderness Area located within or near the proposed project area.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Farmland	YES	NO
<p>Is there prime, unique, state, or locally important farmland in/near the project area? Describe any significant impacts from the project.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<p>There are no unique farmlands or farmlands of statewide or local importance located within the proposed project area. The proposed project would occur on airport property on land that is currently developed and paved with no farmlands present.</p>		
<p>Does the project include the acquisition and conversion of farmland? If farmland will be converted, describe coordination with the US Natural Resources Conservation and attach the completed Form AD-1006.</p> <p>The proposed project does not include the acquisition or conversion of farmland. All construction would take place on airport property that has already been designated for aviation interest.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>h. Energy Supply and Natural Resources</p>	<p>YES</p>	<p>NO</p>
<p>Will the project change energy requirements or use consumable natural resources either during construction or during operations?</p> <p>During the implementation of the proposed project, the use of natural resources would principally include construction materials, fuel, and water; however, consumption would be temporary and short-term. Therefore, it would not result in resource shortages in the area and impacts to these resources would be minimal.</p> <p>Once operational, the expanded terminal could consume more energy than that of the original terminal as the overall size will be larger; however, the additions and renovated areas will operate more efficiently than the older parts of the terminal, making any potential increase minimal. No known natural gas, geothermal, or other energy resources are anticipated to be impacted by the proposed project.</p> <p>Additionally, the proposed project would lead to a minor increase in fuel consumption through the construction of the proposed project; however, these increases in energy use are expected to be minimal. Upon completion, the proposed project would require minimal resources (electricity, gas, and water).</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Will the project change aircraft/vehicle traffic patterns that could alter fuel usage either during construction or operations?</p> <p>While the proposed project would generate vehicular traffic related to construction activities, this increase would not significantly increase fuel usage because vehicles traveling to or from the proposed project area would likely originate from the Ketchikan area.</p> <p>The location of the aircraft gates would remain the same.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

i. Wild and Scenic Rivers	YES	NO
<p>Is there a river on the Nationwide Rivers Inventory, a designated river in the National System, or river under State jurisdiction (including study or eligible segments) near the project?</p> <p>The proposed project area is entirely on airport property. There are no Wild and Scenic Rivers and no eligible segments or rivers under state jurisdiction in the proposed project area.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Will the project directly or indirectly affect the river or an area within ¼ mile of its ordinary high water mark?</p> <p>No Wild and Scenic Rivers are located in or near the proposed project area.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j. Solid Waste Management	YES	NO
<p>Does the project (either the construction activity or the completed, operational facility) have the potential to generate significant levels of solid waste? If so, discuss how these will be managed.</p> <p>The renovation and expansion of the terminal building would produce waste that would be transported off-airport by the contractor. It is not anticipated that the amount of solid waste would be significant and can likely be accommodated by the local landfill.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5-2.b(5) Disruption of an Established Community

	YES	NO
<p>Will the project disrupt a community, planned development or be inconsistent with plans or goals of the community?</p> <p>The proposed project would result in minimal, temporary increases in vehicle traffic during construction. The proposed project is not expected to result in impacts to the community or planned development in the area.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Are residents or businesses being relocated as part of the project?</p> <p>The construction would take place entirely on airport property. No residences or businesses would be relocated as a result of this proposed project.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5-2.b(6) Environmental Justice

	YES	NO
<p>Are there minority and/or low-income populations in/near the project area?</p> <p>The proposed project area is fully contained within the airport’s property boundary. It is not anticipated that the proposed project would result in socioeconomic impacts.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Will the project cause any disproportionately high and adverse impacts to minority and/or low-income populations? Attach census data if warranted.</p> <p>Since the proposed project would occur on airport property, there would be no disproportionately high or adverse impacts to minority and/or low-income populations.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5-2.b(7) Surface Transportation

	YES	NO
<p>Will the project cause a significant increase in surface traffic congestion or cause a degradation of level of service provided?</p> <p>The proposed project would occur on airport property and would not result in long-term negative impacts to aircraft operations or surface transportation patterns. The proposed project would result in a slight increase in vehicular traffic in the area during construction, but all roads and the ferry have available capacity to accommodate anticipated vehicle trips.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Will the project require a permanent road relocation or closure? If yes, describe the nature and extent of the relocation or closure and indicate if coordination with the agency responsible for the road and emergency services has occurred.</p> <p>No roads would be relocated or closed as part of the proposed project.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5-2.b(8) Noise

	YES	NO
<p>Will the project result in an increase in aircraft operations, nighttime operations, or change aircraft fleet mix?</p> <p>The terminal expansion and renovations are proposed to meet existing demand and relieve current constraints at KTN. However, the proposed terminal expansion could accommodate additional airline service and passengers in the future. Any increase in service would be a result from passenger demand and not as a result of the proposed terminal expansion and renovations.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	YES	NO
<p>Will the project cause a change in airfield configuration, runway use, or flight patterns either during construction or after the project is implemented?</p> <p>The proposed project would not have any impact on airfield configuration, aircraft operations, or flight patterns during construction or once construction is complete.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Does the forecast exceed 90,000 annual propeller operations, 700 annual jet operations or 10 daily helicopter operations or a combination of the above? If yes, a noise analysis may be required if the project would result in a change in operations.</p> <p>There are over 700 annual jet operations at KTN annually. The proposed project is not expected to result in an operational increase, as it is needed to meet existing demand.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Has a noise analysis been conducted, including but not limited to generated noise contours, a specific point analysis, area equivalent method analysis, or other screening method. If yes, provide that documentation.</p> <p>No noise analysis was conducted, as the proposed project is not expected to result in changes to operations or the fleet operating at the airport.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Could the project have a significant impact (DNL 1.5 dB or greater increase) on noise levels over noise sensitive areas within the 65+ DNL noise contour?</p> <p>The proposed project would not significantly change operations or fleet and therefore, would not increase noise levels.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5-2.b(9) Air Quality

	YES	NO
<p>Is the project located in a Clean Air Act non-attainment or maintenance area?</p> <p>The Ketchikan Gateway Borough is in attainment for all criteria pollutants.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>If yes, is it listed as exempt, presumed to conform or will emissions (including construction emissions) from the project be below <i>de minimis</i> levels (provide the paragraph citation for the exemption or presumed to conform list below, if applicable) Is the project accounted for in the State Implementation Plan or specifically exempted? Attach documentation.</p> <p>As noted above, KTN is located in an area that is in attainment for all criteria pollutants.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	YES	NO
<p>Does the project have the potential to increase landside or airside capacity, including an increase of surface vehicles?</p> <p>The proposed project would be constructed to meet current demand and would not increase capacity.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Could the project impact air quality or violate local, State, Tribal or Federal air quality standards under the Clean Air Act Amendments of 1990 either during construction or operations?</p> <p>There could be a short-term, temporary increase in emissions at the airport from construction equipment during construction. Based on emissions analysis for similar projects, construction emissions would be below de minimis thresholds and therefore would not exceed air quality standards under the Clean Air Act. No permanent negative air quality impacts related to the proposed project are anticipated.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5-2.b (10) Water Quality

	YES	NO
<p>Are there water resources within or near the project area? These include groundwater, surface water (lakes, rivers, etc.), sole source aquifers, and public water supply. If yes, provide a description of the resource, including the location (distance from project site, etc.).</p> <p>The Tongass Narrows is located immediately to the east of the airport, but it is outside the proposed project area.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Will the project impact any of the identified water resources either during construction or operations? Describe any steps that will be taken to protect water resources during and after construction.</p> <p>The proposed project would not impact water resources during construction or operations.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Will the project increase the amount or rate of stormwater runoff either during construction or during operations? Describe any steps that will be taken to ensure it will not impact water quality.</p> <p>The proposed project area is currently paved; therefore, the proposed project would not increase the amount or rate of stormwater runoff.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Does the project have the potential to violate federal, state, tribal or local water quality standards established under the Clean Water and Safe Drinking Water Acts?</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	YES	NO
The proposed project would not violate Clean Water and Safe Drinking Water Act water quality standards.		
Are any water quality related permits required? If yes, list the appropriate permits. No water quality permits would be required.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5-2.b(11) Highly Controversial on Environmental Grounds

	YES	NO
<p>Is the project highly controversial? The term “highly controversial” means a substantial dispute exists as to the size, nature, or effect of a proposed federal action. The effects of an action are considered highly controversial when reasonable disagreement exists over the project’s risks of causing environmental harm. Mere opposition to a project is not sufficient to be considered highly controversial on environmental grounds. Opposition on environmental grounds by a federal, state, or local government agency or by a tribe or a substantial number of the persons affected by the action should be considered in determining whether or not reasonable disagreement exists regarding the effects of a proposed action.</p> <p>There are no significant environmental impacts that would result from the construction of the proposed project. The construction would occur entirely within airport property on pre-disturbed ground. No known controversy exists and there is low likelihood that the proposed project would be controversial on environmental grounds.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5-2.b(12) Inconsistent with Federal, State, Tribal or Local Law

	YES	NO
<p>Will the project be inconsistent with plans, goals, policy, zoning, or local controls that have been adopted for the area in which the airport is located? The proposed project is wholly contained within existing airport property and consistent with the operation of KTN.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Is the project incompatible with surrounding land uses? The site of the proposed project is already a functioning, developed part of the airport facility and would not cause conflict or concern based on previously approved land uses and operations.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5-2 .b (13) Light Emissions, Visual Effects, and Hazardous Materials

a. Light Emissions and Visual Effects	YES	NO
<p>Will the proposed project produce light emission impacts?</p> <p>The lighting would be consistent with that which is present on the current terminal building. The lighting would not significantly affect visual resources; nor would it create an annoyance for people in the area, interfere with normal activities, or alter the characteristics of the protected properties. Lighting associated with construction activities would be kept to the minimum level needed for safety and security. Therefore, there would be no substantial changes to lighting as a result of the proposed project.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Will there be visual or aesthetic impacts as a result of the proposed project and/or have there been concerns expressed about visual/aesthetic impacts?</p> <p>It is not anticipated that the proposed project would have a long-term effect on the nature or the visual character of the area given the existing airport infrastructure. No residences are located adjacent to the terminal area or in proximity that their view would be impacted by the expansion. The proposed project would not result in a contrast to the existing visual character of the area.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Hazardous Materials	YES	NO
<p>Does the project involve or affect hazardous materials?</p> <p>On February 6, 2018, an asbestos survey was performed at KTN by Dahlberg Design (Appendix F). Several areas in the terminal have materials containing an asbestos content greater than 1% and need to be regulated as asbestos-containing materials.</p> <p>According to the survey, two samples of gypsum wallboard with taping mud (GWB/mud) were collected from the main shop . Two of the samples contained asbestos. Prior to construction, this material would be treated as nonfriable asbestos-containing material (ACM) and would only be disturbed by an abatement crew.</p> <p>In addition, one sample of caulking was collected from ducting enclosed above the soffit over the check-in counter. This material is used throughout the soffit are area to seal wallboard and ducting penetrations. The sample contained 2% chrysotile asbestos. Prior to construction, this material would be treated as nonfriable ACM and would only be disturbed by an abatement crew.</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<p>Will construction take place in an area that contains or previously contained hazardous materials?</p> <p>Construction would be taking place in areas identified as containing asbestos. Any controlled materials identified in the asbestos study would be removed prior to construction in compliance with the City of Ketchikan requirements for demolition and remodeling work.</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>If the project involves land acquisition, is there a potential for this land to contain hazardous materials or contaminants?</p> <p>The proposed project does not include the acquisition of any land.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>Will the proposed project produce hazardous and/or solid waste either during construction or after? If yes, how will the additional waste be handled?</p> <p>It is not anticipated that the proposed project would produce a significant amount of solid waste. Any waste produced will be disposed of by the contractor off airport property.</p> <p>In addition, all hazardous materials will be handled according to FAA Order 1050.1F, Paragraph 5-6.4 ee. and ff. Remediation of asbestos in the terminal would occur prior to project initiation. Materials would be treated as nonfriable ACM and disturbed by an abatement crew.</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

5-2 .b (14) Public Involvement

	YES	NO
<p>Was there any public notification or involvement? If yes, provide documentation.</p> <p>The proposed project would occur entirely on airport property. No public notification or involvement was undertaken as part of this proposed project.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5-2 .b (15) Indirect/Secondary/Induced Impacts

	YES	NO
<p>Will the project result in indirect/secondary/induced impacts?</p> <p>No indirect, secondary, or induced impacts are expected and no increase in activity is anticipated from this proposed project.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	YES	NO
When considered with other past, present, and reasonably foreseeable future projects, on or off airport property and regardless of funding source, would the proposed project result in a significant cumulative impact? There are no components of the proposed project that would lead to significant cumulative impacts. There are no reasonably foreseeable impacts as the proposed project is consistent with planned airport improvements.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Permits

List any permits required for the proposed project that have not been previously discussed. Provide details on the status of permits.

Prior to construction, FAA 7460 form would be submitted and all other necessary local permits would be obtained, including building permits from Ketchikan Gateway Borough for the terminal development. Best Management Practices would also be used throughout construction.

Environmental Commitments

List all measures and commitments made to avoid, minimize, mitigate, and compensate for impacts on the environment, which are needed for this project to qualify for a CATEX.

No environmental impacts have been identified as a result of the proposed project.

Preparer Information

Point of Contact: Lauren Rasmussen		
Address: 999 18th St Suite 2300 S		
City: Denver	State: CO	Zip Code: 80202
Phone: 303-729-3768	Email Address: lauren.rasmussen@meadhunt.com	

Signature: _____

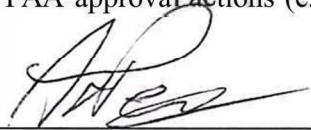
Date: 06/09/2023

Airport Sponsor Information and Certification (may not be delegated to consultant)

Provide contact information for the designated sponsor point of contact and any other individuals requiring notification of the FAA decision.

Point of Contact: Alex Peura	
Address: 1000 Terminal Way	
City: Ketchikan	State: AK Zip Code: 99901
Phone Number: 907-228-6688	Email Address: alexp@kgbak.us
Additional Name(s):	Additional Email Address(es):

I certify that the information I have provided above is, to the best of my knowledge, correct. I also recognize and agree that no construction activity, including but not limited to site preparation, demolition, or land disturbance, shall proceed for the above proposed project(s) until FAA issues a final environmental decision for the proposed project(s) and until compliance with all other applicable FAA approval actions (e.g., ALP approval, airspace approval, grant approval) has occurred.

Signature:  _____

Date: 6/12/2023

FAA Decision

Having reviewed the above information, it is the FAA’s decision that the proposed project (s) or development warrants environmental processing as indicated below.

Name of Airport, LOC ID, and location: **Ketchikan International Airport (KTN), Ketchikan, Alaska**

Project Title: **KTN Terminal Expansion Project**

- No further NEPA review required. Project is categorically excluded
FAA Order 1050.1F, Paragraph 5-6.4.h.
- ..An Environmental Assessment (EA) is required.
- ..An Environmental Impact Statement (EIS) is required.
- ..The following additional documentation is necessary for FAA to perform a complete environmental evaluation of the proposed project.

Name: **Jack L Gilbertsen, REM**
Responsible FAA Official

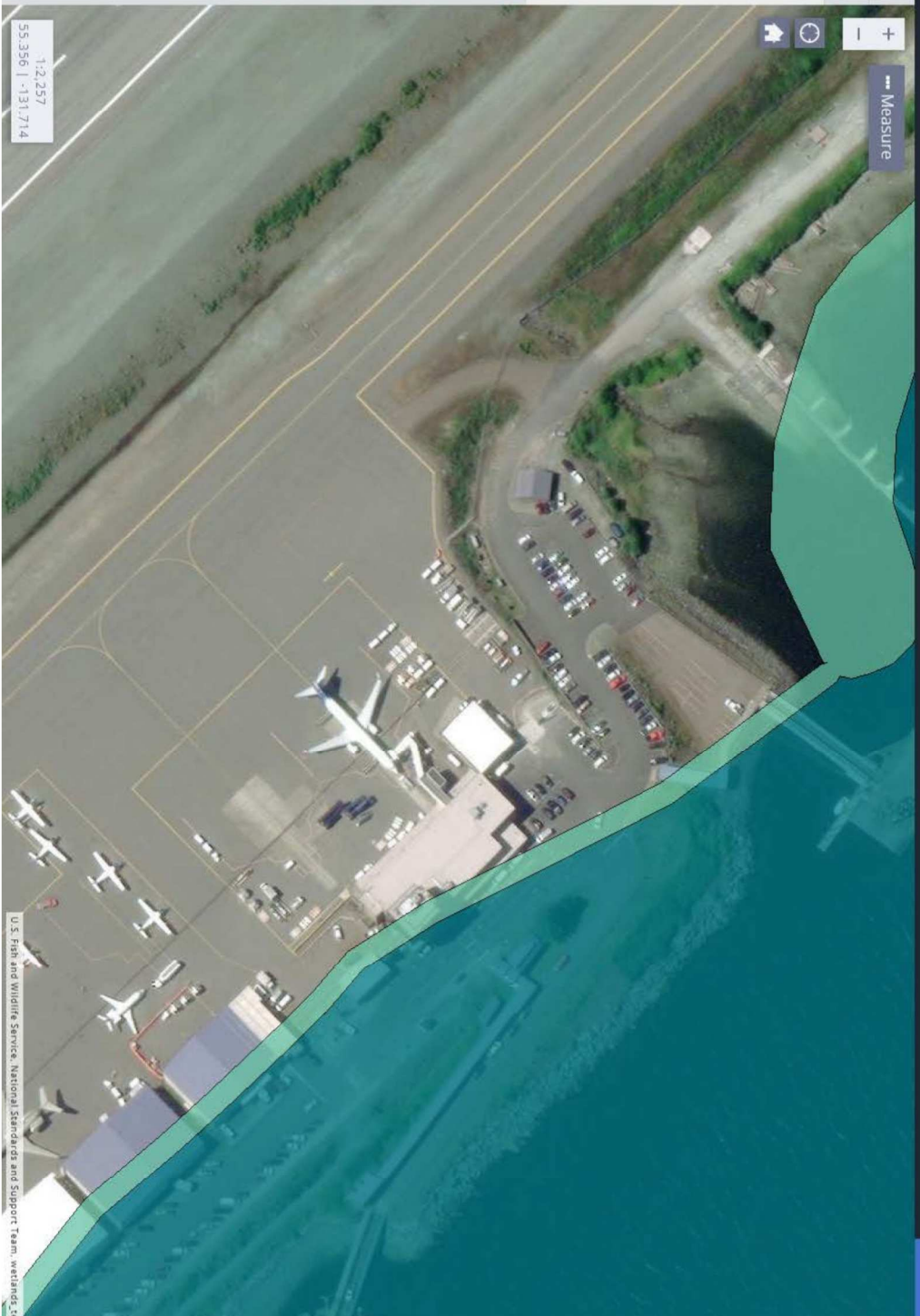
Title: **FAA EPS, South Coast, AAL-611**

Signature: _____

Date: **6/20/2023**

Appendix B- NWI Map

- BASEMAPS >
- MAP LAYERS >
- Wetlands
 - Riparian
 - Riparian Mapping Areas
 - Data Source
 - Source Type
 - Image Scale
 - Image Year
 - Areas of Interest
 - FWS Managed Lands
 - Historic Wetland Data



1:2,257
55,356 | -131,714

U.S. Fish and Wildlife Service, National Standards and Support Team, wetlands_team@fws.gov | ERI, HERF, Garmin, NRCAN

LEGEND

Wetlands

- Estuarine and Marine
- Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Riparian

- Forested/Shrub
- Herbaceous

Riparian Mapping Areas

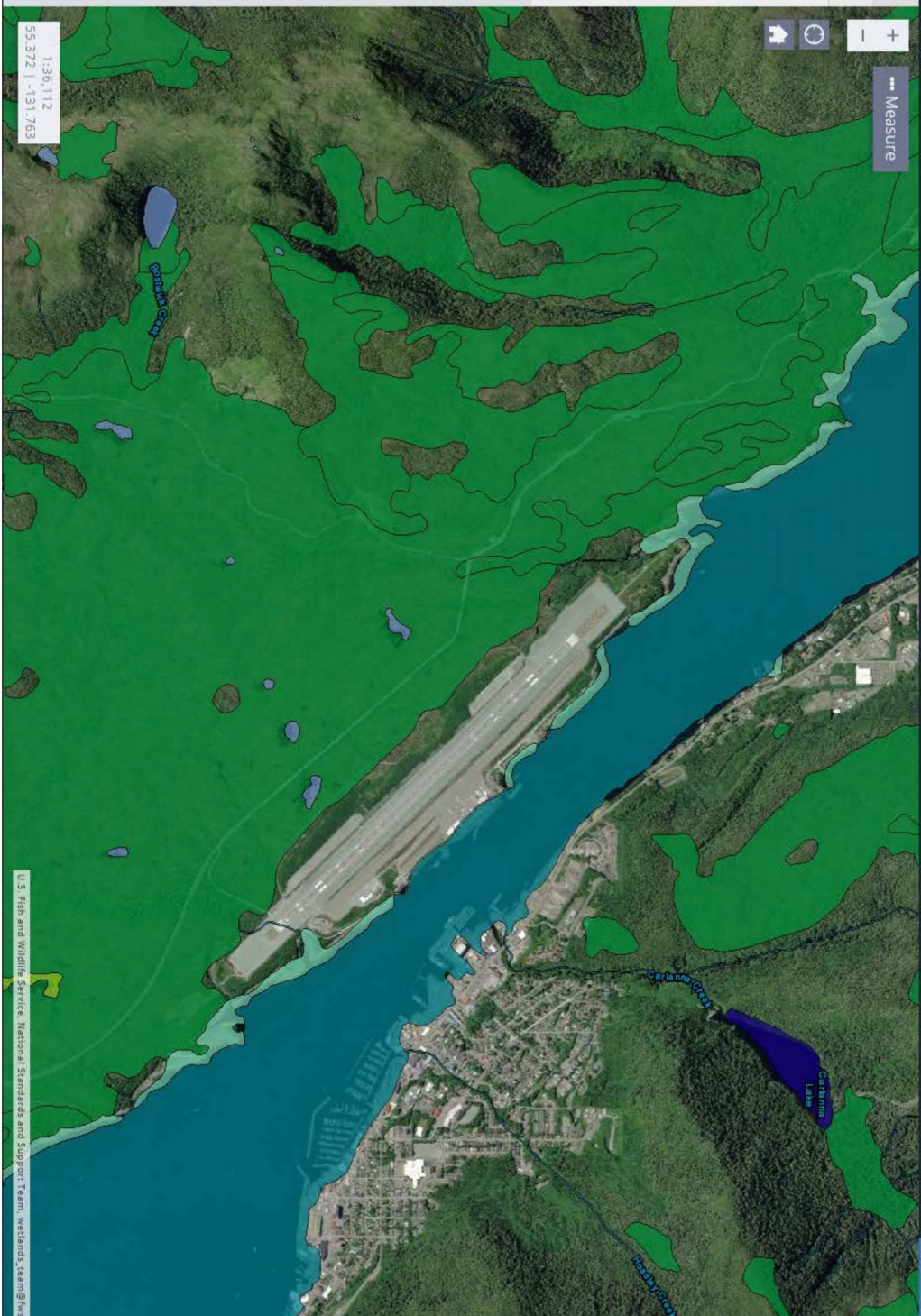
- Riparian Mapping Areas

Areas of Interest

- Other
- Ramsar site

FWS Managed Lands

- BASEMAPS >
- MAP LAYERS >
- Wetlands
 - Riparian
 - Riparian Mapping Areas
 - Data Source
 - Source Type
 - Image Scale
 - Image Year
 - Areas of Interest
 - FWS Managed Lands
 - Historic Wetland Data



LEGEND

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Riparian

- Forested/Shrub
- Herbaceous

Riparian Mapping Areas

- Riparian Mapping Areas

Areas of Interest

- Other
- Ramsar site

FWS Managed Lands

Appendix C – KTN Terminal Asbestos Results



February 20, 2018

Corey Wall
Jensen Yorba Lott Architects
522 W 10th Street
Juneau, AK. 99801
Re: Sampling results from the KTN Terminal

Dear Corey,

On February 6, 2018, I performed an asbestos survey at the Ketchikan International Airport Terminal (KTN) in Ketchikan, Alaska. Samples were collected for analysis for asbestos content by polarized light microscopy and were submitted to Med-Tox Northwest, a NVLAP-certified laboratory located in Auburn, WA. Materials containing an asbestos content greater than 1% are regulated as asbestos-containing materials.

SAMPLE TYPES AND RESULTS

Two samples of gypsum wallboard with taping mud (GWB/mud) were collected from the main shop. Two of the samples contained asbestos. This material should be treated as nonfriable ACM and should only be disturbed by an abatement crew.

Seven samples of thermal system insulation (TSI) were collected from fittings on piping systems throughout the building. No asbestos was found in these samples.

Three samples of ceiling tile (including mastic where used) were collected from the building. No asbestos was found in any of the samples.

Two samples of residual flooring mastic were collected. Neither sample contained asbestos.

One sample of caulking was collected from ducting enclosed above the soffit over the check-in counter. This material is used throughout the soffit area to seal wallboard and ducting penetrations. The sample contained 2% chrysotile asbestos. This material should be treated as nonfriable ACM and should only be disturbed by an abatement crew.

A single sample of leveling compound was collected from the small carrier office area. No asbestos was detected in the sample.

Sample results are attached in an annotated laboratory report. Please let me know if you have any questions.

Regards,

Sigrid Dahlberg, P.E.
Principal Engineer
AHERA Project Designer No. 163759
AHERA Building Inspector No. 163732
EPA Lead Renovator R-I-42872-16-10239

SEATTLE ASBESTOS TEST

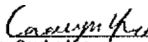
Bellevue Laboratory: 12727 Northup Way, Suite 1, Bellevue, WA 98005, Tel: 425.861.1111, Fax: 425.861.1118, NVLAP Lab Code: 200876-0

Disclaimer: This report must not be used by the client to claim product certification, approval, or endorsement by Seattle Asbestos Test, LLC, NVLAP, NIST, or any agency of the Federal government.

ANALYTICAL LABORATORY REPORT

PLM by Method EPA/600/R-93/116

Attn: Ms. Teresa Choate Client: Med-Tox, Northwest Address: PO Box 1446, Auburn, WA 98071-1448
 Job#: L8551(34) Batch#: 201809557 Date Received: 2/13/2018
 Samples Rec'd: 19 Date Analyzed: 2/13/2018 Samples Analyzed: 19
 Project Loc.: Ketchikan Int'l Airport Remodel
 Roof Renovation

Analyzed by: 
Carolyn Yeo

Reviewed by: Steve (Fanyao) Zhang, President

Lab ID	Client Sample ID	Layer	Description	%	Asbestos Fibers	Non-fibrous Components	%	Non-asbestos Fibers
1	GWB/mud KTN-01 Boiler Rm	1	White powdery material with paint and paper	2	Chrysotile	Filler, Binder, Paint	28	Cellulose
		2	White chalky material with paper		None detected	Binder/filler, Gypsum/binder	23	Cellulose, Glass fibers
		3	White powdery material with paint and paper	2	Chrysotile	Filler, Binder, Paint	29	Cellulose
2	TSI KTN-02	1	Off-white woven fibrous material with paint		None detected	Filler, Paint	84	Synthetic fibers
		2	Trace yellow fibrous material		None detected	Filler	90	Glass fibers
		3	Gray powdery material with fibrous material		None detected	Filler, Fine particles	18	Cellulose, Glass fibers
3	TSI KTN-03	1	Off-white woven fibrous material with paint		None detected	Filler, Paint	87	Synthetic fibers
		2	Gray powdery material with fibrous material		None detected	Filler, Fine particles	24	Cellulose, Glass fibers
4	TSI KTN-04	1	Off-white woven fibrous material with paint		None detected	Filler, Paint	84	Synthetic fibers
		2	Gray powdery material with fibrous material		None detected	Filler, Fine particles	20	Cellulose, Glass fibers
		3	Yellow fibrous material		None detected	Filler	92	Glass fibers
5	TSI KTN-05	1	Off-white woven fibrous material with paint		None detected	Filler, Paint	86	Synthetic fibers
		2	Gray powdery material with fibrous material		None detected	Filler, Fine particles	21	Cellulose, Glass fibers
6	TSI KTN-06	1	Off-white woven fibrous material with paint		None detected	Filler, Paint	90	Synthetic fibers
		2	Gray powdery material with fibrous material		None detected	Filler, Fine particles	25	Cellulose, Glass fibers
		3	Trace yellow fibrous material		None detected	Filler	81	Glass fibers
7	Ceiling tile KTN-07 12x12	1	Gray fibrous material with paint		None detected	Paint, Filler, Perlite	67	Cellulose
		2	Yellow mastic		None detected	Mastic/binder	2	Cellulose

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Belleuve Laboratory: 12727 Northup Way, Suite 1, Bellevue, WA 98005, Tel: 425.861.1111, Fax: 425.861.1118, NVLAP Lab Code: 200876-0

Disclaimer: This report must not be used by the client to claim product certification, approval, or endorsement by Seattle Asbestos Test, LLC, NVLAP, NIST, or any agency of the Federal government.

ANALYTICAL LABORATORY REPORT PLM by Method EPA/600/R-93/116

Attn: Ms. Teresa Choate Client: Med-Tox, Northwest Address: PO Box 1446, Auburn, WA 98071-1446
 Job#: L8551(34) Batch#: 201809557 Date Received: 2/13/2018
 Samples Rec'd: 19 Date Analyzed: 2/13/2018 Samples Analyzed: 19
 Project Loc.: Kelchikan Int'l Airport Remodel
 Roof Renovation

Analyzed by: Carolyn Yeo

Reviewed by: Steve (Fanyao) Zhang, President

KTN-11
 Caulking on
 ducts in
 soffit above
 counter

 KTN-12
 GWB/mud,
 1st floor by
 elevator

Lab ID	Client Sample ID	Layer	Description	%	Asbestos Fibers	Non-fibrous Components	%	Non-asbestos Fibers
7	KTN-07	3	Brown mastic		None detected	Mastic/binder	3	Cellulose, Talc
8	KTN-08 Carpet mastic	1	Gray foamy material		None detected	Synthetic foam		None detected
		2	Green mastic		None detected	Mastic/binder	2	Cellulose
9	KTN-09 Ceiling tile	1	Gray fibrous material with paint		None detected	Paint, Filler, Perlite	64	Cellulose
10	KTN-10 Ceiling tile	1	Gray fibrous material with paint		None detected	Paint, Filler, Perlite	68	Cellulose
11	KTN-11	1	Black soft material	2	Chrysotile	Filler, Binder	3	Cellulose
12	KTN-12	1	White powdery material with paper	2	Chrysotile	Filler, Binder	30	Cellulose
		2	White chalky material with paper		None detected	Binder/filler, Gypsum/binder	25	Cellulose, Glass fibers
13	KTN-13 TSI	1	Gray powdery material with fibrous material		None detected	Filler, Fine particles	19	Cellulose, Glass fibers
14	KTN-14 TSI	1	Gray powdery material with fibrous material		None detected	Filler, Fine particles	23	Cellulose, Glass fibers
15	KTN-15 Ceiling tile	1	Gray fibrous material with paint		None detected	Paint, Filler, Perlite	69	Cellulose
16	KTN-16 TSI	1	Gray powdery material with fibrous material		None detected	Filler, Fine particles	27	Cellulose, Glass fibers
17	KTN-17 Lev. cpd	1	Yellow mastic		None detected	Mastic/binder	4	Cellulose, Synthetic fibers
		2	White brittle material		None detected	Filler, Binder	2	Cellulose
		3	Trace green mastic		None detected	Mastic/binder	3	Cellulose
18	KTN-18 GWB/mud	1	Trace white powdery material with paint and paper		None detected	Filler, Binder, Paint	3	Cellulose
		2	White chalky material with paper		None detected	Binder/filler, Gypsum/binder	26	Cellulose, Glass fibers
19	KTN-19 VCT mastic	1	Clear mastic with debris		None detected	Mastic/binder, Debris	3	Cellulose

SEATTLE ASBESTOS TEST, LLC
 19711 Scriber Lake Rd. Suite D, Lynnwood, WA 98036
 Tel: (425) 673-9850, Fax: (425) 673-9810

Website: seattleasbestostest.com

BATCH # 201809557

CHAIN OF CUSTODY

Analysis Type: Bulk Analysis X Point Count 400 ___ Point Count 1000 ___ Point Count Gravimetric ___

Turn Around Time 1 Day Number of Samples 19 Client Job # L8551(34)

Client Name Med-Tox Northwest

Address Post Office Box 1446 City Auburn State WA Zip 98071-1446

Phone 253-351-0677 Fax 253-351-0688 Email choatet@medtoxnw.com & lewisc@medtoxnw.com

Project Location: Ketchikan Int'l Airport Remodel Roof Renovation Project Manager: Teri Choate

Sample Condition: Good ___ Damaged ___ Severe Damage (Spillage) ___

SEQ#	SAMPLE ID	SAMPLE DESCRIPTION	Lab ID	Comment	A/R
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

See attached data sheet

	Print	Signature	Company Name	Date	Time
Sampled by	Dahlberg Design				
Relinquished by	Chelsea Lewis	<i>[Signature]</i>	Med-Tox Northwest	02/12/18	1351
Delivered by					
Received by	<i>Katie Black</i>	<i>[Signature]</i>	SAT	2/13/18	9:11
Analyzed by	<i>Carolyn Lee</i>	<i>[Signature]</i>	SAT	2/13/18	12:13
Result reported by					

Seattle Asbestos Test warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted, and disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. Seattle Asbestos Test accepts no legal responsibility for the purpose for which the client uses test results. By signing on this form, the clients agree to relieve Seattle Asbestos Test of any liability that may arise from the test results. Late payment may be charged of interest, invoices goes to collection causes 17-25% of collection fee. NSF is \$50.

Result Reporting method: Phone ____, Fax ____, Email XX, Pick Up Report ____

1701 West Valley Hwy N, Suite F
Auburn, Washington 98001
Telephone (253) 351-0677, Fax (253) 351-0688

Company: Dahlberg Design LLC
Report to: Ms. Sigrid Dahlberg
Street: 222 Seward Street, STE 205
City: Juneau State/Zip: AK 99801
Phone: (907) 586-4447 Fax:
Cell: 907-723-8896
Email: sigrid@dahlberg.design
Project Name:
 Ketchikan Int'l Airport Remodel Roof Renovation
 Project No. / PO Number: 16024

Chain of Custody

Lab Batch Number

Archive Box No.

Number of Samples: 19

Page 1 of 2

MTNW Proj. No.

L8551(34)

Sample ID	Turn-Around Times	Lab ID	Comments	Special Instructions
1	X 1 work day □ 2 work days □ 3 work days □ 4 work days	KTN-01	TSL, smaller diameter piping	OCD
2		KTN-02	TSL, lg diameter piping	
3		KTN-03	Cloth wrap and plaster over fiberglass duct insulation, Fan 2nd floor Rm	
4		KTN-04	TSL	
5		KTN-05	TSL, smaller diameter piping, 2nd floor Women's Toilet Rm	
6		KTN-06	Glue-on ceiling tile 12x12w brown mastic, SE stairwell	
7		KTN-07	Black mastic residue under green carpet tile mastic	
8		KTN-08	Ceiling tile, drop-in, 2nd floor security zone	
9		KTN-09	Ceiling tile, matte, 1st floor by baggage claim	
10		KTN-10	Call on duct and GWB firewall, soffit above AK Air counter	
11		KTN-11	GWB/rnud, 1st floor by elevator	
12		KTN-12	TSL, lg diameter piping, 1st floor by elevator	
13		KTN-13	TSL, smaller diameter piping, 1st floor by elevator	
14		KTN-14	Ceiling tile, main 1st floor style	
15		KTN-15	TSL, smaller diameter piping, 1st floor by Gate A-1	

Organic Compound	Fungal Non-viable	Metal	(Select metals from list)	Other (Please specify)
<input type="checkbox"/> 8240 GCMS volatile	<input type="checkbox"/> Airborne	<input type="checkbox"/> Air	<input type="checkbox"/> Lead (Pb)	<input type="checkbox"/> Barium (Ba)
<input type="checkbox"/> 8270 GCMS semi-vol	<input type="checkbox"/> Airborne	<input type="checkbox"/> SEM	<input type="checkbox"/> Wipe	<input type="checkbox"/> Beryllium (Be)
		<input type="checkbox"/> TEM	<input type="checkbox"/> Chip	<input type="checkbox"/> Cadmium (Cd)
		<input type="checkbox"/> Airborne Asbestos	<input type="checkbox"/> TCLP	<input type="checkbox"/> Priority pollutant (13)
		<input type="checkbox"/> PCM		<input type="checkbox"/> TAL (23)
		<input type="checkbox"/> TEM - AHERA	<input type="checkbox"/> Fuel	<input type="checkbox"/> Antimony (Sb)
		<input type="checkbox"/> TEM - Modified EPA	<input type="checkbox"/> AK-GRO	<input type="checkbox"/> Arsenic (As)
		<input type="checkbox"/> TEM - NIOSH 7402	<input type="checkbox"/> AK-DRO	<input type="checkbox"/> TPH-HCD (WAVOR)
		<input type="checkbox"/> Yamate II		<input type="checkbox"/> BETX (by 8020)
				<input type="checkbox"/> TPH-D (WAVOR)
				<input type="checkbox"/> 8015 Modified
				<input type="checkbox"/> 418.1 (WAVOR)
				<input type="checkbox"/> 413.2
				<input type="checkbox"/> 8010 Halogenated/VOC
				<input type="checkbox"/> 8040 phenol
				<input type="checkbox"/> 8310 HPLC PAH

Relinquished by	Received by	Analyzed by
Signature: <i>[Signature]</i> Print Name: SIGRID DAHLBERG	Signature: <i>[Signature]</i> Print Name: GALESSA WOODS	Signature: <i>[Signature]</i> Print Name:
Date: 8/8/2018	Date: 8/12/18	Date:
Time: 4:00 PM	Time: 1:50	Time:

@ \$



1701 West Valley Hwy N, Suite 1
 Auburn, Washington 98001
 Telephone (253) 351-0677, Fax (253) 351-0688

Company: Dahlberg Design LLC

Report to: Ms. Sigrid Dahlberg

Street: 222 Seward Street, STE 205

City: Juneau State/Zip: AK 99801

Phone: (907) 586-4447 Fax: (907) 586-5917

Cell: 907-723-8896

Email: sigrid@dahlbergdesign.com

Project Name: Ketchikan Int'l Airport Remodel Roof Renovation

Project No. / PO Number:

Turn-Around Times

1 work day 5 work days

2 work days

3 work days

4 work days

Sample ID

Lab ID

Comments

Organic Compound

Fungal Non-viable

Metals

Bulk Asbestos

Airborne Asbestos

PCB

Pesticide

Herbicide

Other (Please specify)

Special Instructions

Received by

Analyzed by

Date

Time

Signature

Print Name

Date

Time

Signature

Print Name

Date

Time

Signature

Print Name

Date

Time

Chain of Custody

Lab Batch Number

Archive Box No.

MTNW Proj. No.

L8551()

Number of Samples: 19

Sample ID	Lab ID	Comments	Organic Compound	Fungal Non-viable	Metals	Bulk Asbestos	Airborne Asbestos	PCB	Pesticide	Herbicide	Other (Please specify)	Special Instructions	Received by	Analyzed by	Date	Time	Signature	Print Name	Date	Time		
16	KTN-16	TSI, smaller diameter piping, 1st floor by Gate A-1																				
17	KTN-17	Leveling Compound, under carpet in Island Air office																				
18	KTN-18	GWB/mud, NE stairwell																				
19	KTN-19	Mastic under carpet squares, 4th floor manager's office																				
20	00																					
21	00																					
22	00																					
23	00																					
24	00																					
25	00																					
26	00																					
27	00																					
28	00																					
29	00																					
30	00																					

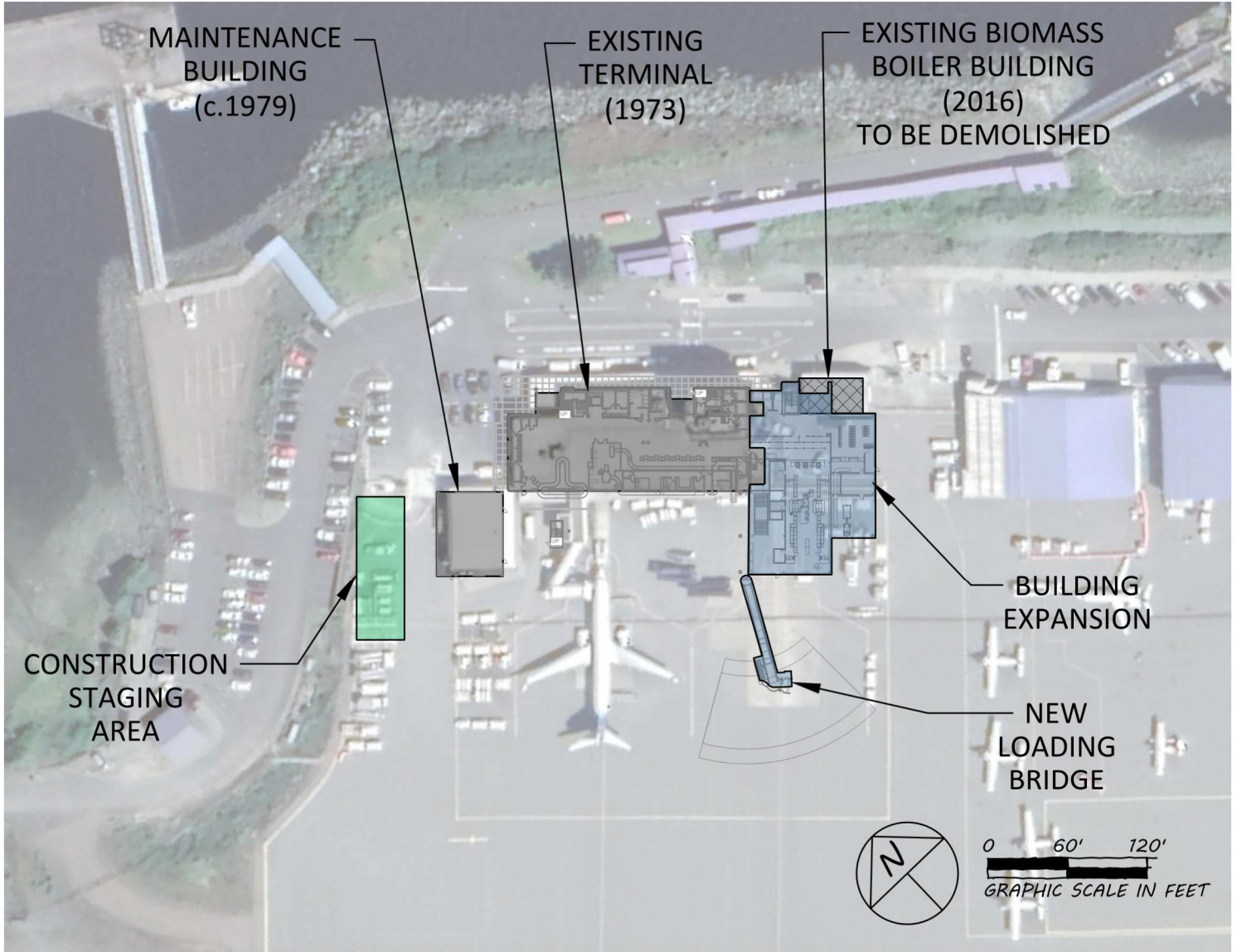
Relinquished by *[Signature]*
 Signature: SIGRID DAHLBERG
 Print Name: SIGRID DAHLBERG
 Date: 1/28/09
 Time: 4:00 PM

Received by *[Signature]*
 Signature: MELISSA COVENS
 Print Name: MELISSA COVENS
 Date: 2/12/09
 Time: 13:50

Analyzed by *[Signature]*
 Signature: _____
 Print Name: _____
 Date: _____
 Time: _____

@ \$

Appendix D – Project Diagram



CONCEPT BUDGET REPORT

4 CHAPTER 4 – SUSTAINABLE DESIGN WORKSHOP

4.1 Project Summary

Ketchikan International Airport (the Airport or (KTN)) completed a Terminal Area Plan (TAP) in 2021 that proposed the expansion and reconfiguration of the existing passenger terminal. The TAP identified 3 phases of work to deliver needed terminal improvements per available funding. Due to potential additional funding sources that may be available, and to examine if the baggage handling systems identified in Phase 2 can be incorporated into Phase 1, the Airport is now progressing with a Concept and Budget Report (CBR).

4.2 Project Objectives

The objectives of the Terminal Expansion project are:

1. Evaluate the existing terminal facility.
2. Reassess the program for spatial requirements.
3. Perform engineering investigations.
4. Reevaluate phasing.
5. Establish sustainability goals that will aid in additional BIL funding.

4.2.1 Ketchikan International Airport Terminal – Sustainability Narrative for Concept and Budget Report

Aviation is invaluable for our planet’s socioeconomic development, and airports are in a unique position to support sustainable development. According to the Federal Aviation Administration (FAA), Airport Sustainability involves taking the necessary action to reduce environmental impacts, help maintain economic growth, and achieve social progress that meets the needs and values of the local community. Airports have large carbon footprints and high energy needs, leading to a significant environmental impact. It is important that Ketchikan International Airport (KTN) take the necessary steps to reduce this high impact and establish sustainability goals that are significant to the airport, its ecoregion, and surrounding communities.

4.2.2 LEED v4 BD+C New Construction and Major Renovation

LEED is the most widely used green building rating system in the nation. It is a globally recognized symbol of sustainability achievement and leadership. A few of the many advantages to pursuing LEED certification include saving money, improving energy efficiency, reducing carbon emissions, and creating healthier spaces for people to thrive.

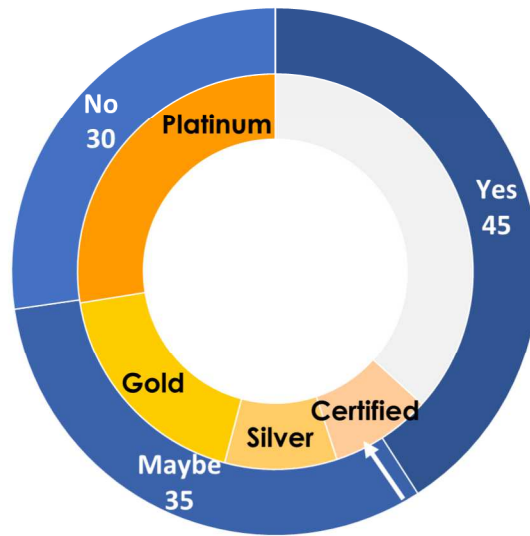
Additionally, Bipartisan Infrastructure Law (BIL) funding may be awarded to airports that improve energy efficiency, upgrade environmental systems, and achieve LEED certification.

The KTN Terminal project will aim to achieve a LEED-NC Certified level at a minimum with a preference to achieve LEED Silver. LEED Certified requires at least 40 points and LEED Silver requires at least 50 points. Based on a sustainability charrette conducted with the Airport and design team, the current estimate is 45 points as

CONCEPT BUDGET REPORT

a “Yes”, 35 as “Maybe”, and 30 “No”, putting the project in the LEED Certified level. As the design progresses, the credits will be further refined. A LEED scorecard can be found in Appendix A.

LEED-NC v4 Point Summary for KTN Airport



4.2.3 AIA Framework for Design Excellence

The Framework for Design Excellence represents the defining principles of good design in the 21st century. Comprised of 10 principles and accompanied by searching questions, the Framework seeks to inform progress toward a low carbon, equitable, resilient, and healthy built environment. With feedback from the Airport and design team during the sustainability charrette, these principles will be thoughtfully considered and incorporated into the work as appropriate to the project scope.

Following are the 10 Principles that make the Framework for Design Excellence and listed under each principle are goals and strategies that the project will be exploring in the next stage of design.

CONCEPT BUDGET REPORT

<i>Design for Integration</i>	<ul style="list-style-type: none"> • Improve and integrate with existing system building systems
<i>Design for Equitable Communities</i>	<ul style="list-style-type: none"> • Incorporate local native art and reuse existing artwork • Involve the diverse community of Ketchikan throughout design • Design to meet universal design strategies including wayfinding, ADA requirements, and signage best practices
<i>Design for Ecosystems</i>	<ul style="list-style-type: none"> • Design to incorporate surrounding forest and wildlife in regard to views, artwork, and potentially local forest resources • Design for bird collision deterrence
<i>Design for Water</i>	<ul style="list-style-type: none"> • Install low-flow plumbing fixtures to align with LEED goals • Provision for faucets and flushes with sensors to provide enhanced passenger experience • Access to water bottle filling stations for passenger health and comfort
<i>Design for Economy</i>	<ul style="list-style-type: none"> • Design building to withstand abundance of rainfall and saline conditions with a durable long-lasting 50-year minimum building (design to eliminate corrosion and water leakage) • Consider first cost and life-cycle cost of mechanical and architectural systems
<i>Design for Energy</i>	<ul style="list-style-type: none"> • Meet and exceed energy load reduction and energy efficiency standards <ul style="list-style-type: none"> ○ Current terminal is at an Energy Use Index (EUI) of 167 kBtu/sf/yr ○ Benchmark EUI based on an ACRP study is 150 kBtu/sf/yr ○ Recommended EUI goal for project is 90 kBtu/sf/yr • Use energy modeling to evaluate different systems during design. Energy Efficiency Measures (EEMs) to evaluate in later stages of design may include the following: <ul style="list-style-type: none"> ○ High levels of insulation ○ High performance glazing ○ Infiltration reduction ○ Limited window to wall ratio ○ Air source heat pumps ○ Dedicated outdoor air systems with heat recovery ○ LED lighting with networked controls ○ Backup diesel generator
<i>Design for Well-being</i>	<ul style="list-style-type: none"> • Analyze daylight to increase natural lighting and reduce glare during design • Prioritize good indoor air quality measures using carbon dioxide (CO2) sensors and MERV 13+ filters. • Use low Volatile Organic Compound (VOC) materials

CONCEPT BUDGET REPORT

<i>Design for Resources</i>	<ul style="list-style-type: none"> • Consider the abundant and locally available wood for construction • Preference given to materials with transparency labels and low embodied carbon. • Preference given to red-list free and healthy building materials. • Plan for provision of recycling receptacles in the airport.
<i>Design for Change</i>	<ul style="list-style-type: none"> • Design with region’s biggest climate risks in mind including heavy rain, earthquakes, and flooding. • Prioritize local seismic zone design requirements with the design by the local structural engineers .
<i>Design for Discovery</i>	<ul style="list-style-type: none"> • Ensure high quality design through commissioning of building envelope and MEP systems. • Integrate Owners Project Requirements (OPR) throughout design.

4.2.4 Owner’s Project Requirements

The Owner’s Project Requirements (OPR) provide an explanation of the ideas, concepts, performance metrics and criteria to create a high-performance building design that are especially important to the Owner which are desired to be tracked throughout design and construction. When practical and known, the OPR documents the criteria that the project will be measured to achieve success. The OPR is developed by the owner and provides direction for the design team in their development of the Basis of Design and subsequent drawing and specification packages. This document should be completed in the earliest design phases of a project, distributed, and referenced throughout the project at key milestones and updated as the Owner’s goals and criteria are refined. The OPR is also a requirement for the commissioning prerequisite of LEED and is to be completed at the earliest stages of design.

The OPR for the terminal expansion was drafted by the design team and reviewed with the Airport during the sustainability charrette. The OPR is included in Appendix B.

Appendices:

Appendix A - LEED for New Construction and Renovation BD+C v4 Scorecard

Appendix B - Owner’s Project Requirements

CONCEPT BUDGET REPORT

Appendix A – LEED for New Construction and Renovation BD+C v4 Scorecard



LEED 2009 for New Construction and Major Renovations

Project Checklist

Project Name _____
Date _____

Sustainable Sites Possible Points: 26

Y	?	N	
Prereq 1			Construction Activity Pollution Prevention
Credit 1			Site Selection
Credit 2			Development Density and Community Connectivity
Credit 3			Brownfield Redevelopment
Credit 4.1			Alternative Transportation—Public Transportation Access
Credit 4.2			Alternative Transportation—Bicycle Storage and Changing Rooms
Credit 4.3			Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles
Credit 4.4			Alternative Transportation—Parking Capacity
Credit 5.1			Site Development—Protect or Restore Habitat
Credit 5.2			Site Development—Maximize Open Space
Credit 6.1			Stormwater Design—Quantity Control
Credit 6.2			Stormwater Design—Quality Control
Credit 7.1			Heat Island Effect—Non-roof
Credit 7.2			Heat Island Effect—Roof
Credit 8			Light Pollution Reduction

Water Efficiency Possible Points: 10

Prereq 1			Water Use Reduction—20% Reduction
Credit 1			Water Efficient Landscaping
Credit 2			Innovative Wastewater Technologies
Credit 3			Water Use Reduction

Energy and Atmosphere Possible Points: 35

Prereq 1			Fundamental Commissioning of Building Energy Systems
Prereq 2			Minimum Energy Performance
Prereq 3			Fundamental Refrigerant Management
Credit 1			Optimize Energy Performance
Credit 2			On-Site Renewable Energy
Credit 3			Enhanced Commissioning
Credit 4			Enhanced Refrigerant Management
Credit 5			Measurement and Verification
Credit 6			Green Power

Materials and Resources Possible Points: 14

Prereq 1			Storage and Collection of Recyclables
Credit 1.1			Building Reuse—Maintain Existing Walls, Floors, and Roof
Credit 1.2			Building Reuse—Maintain 50% of Interior Non-Structural Elements
Credit 2			Construction Waste Management
Credit 3			Materials Reuse

Materials and Resources, Continued

Y	?	N	
Credit 4			Recycled Content
Credit 5			Regional Materials
Credit 6			Rapidly Renewable Materials
Credit 7			Certified Wood

Indoor Environmental Quality Possible Points: 15

Y	?	N	
Prereq 1			Minimum Indoor Air Quality Performance
Prereq 2			Environmental Tobacco Smoke (ETS) Control
Credit 1			Outdoor Air Delivery Monitoring
Credit 2			Increased Ventilation
Credit 3.1			Construction IAQ Management Plan—During Construction
Credit 3.2			Construction IAQ Management Plan—Before Occupancy
Credit 4.1			Low-Emitting Materials—Adhesives and Sealants
Credit 4.2			Low-Emitting Materials—Paints and Coatings
Credit 4.3			Low-Emitting Materials—Flooring Systems
Credit 4.4			Low-Emitting Materials—Composite Wood and Agrifiber Products
Credit 5			Indoor Chemical and Pollutant Source Control
Credit 6.1			Controllability of Systems—Lighting
Credit 6.2			Controllability of Systems—Thermal Comfort
Credit 7.1			Thermal Comfort—Design
Credit 7.2			Thermal Comfort—Verification
Credit 8.1			Daylight and Views—Daylight
Credit 8.2			Daylight and Views—Views

Innovation and Design Process Possible Points: 6

Credit 1.1			Innovation in Design: Specific Title
Credit 1.2			Innovation in Design: Specific Title
Credit 1.3			Innovation in Design: Specific Title
Credit 1.4			Innovation in Design: Specific Title
Credit 1.5			Innovation in Design: Specific Title
Credit 2			LEED Accredited Professional

Regional Priority Credits Possible Points: 4

Credit 1.1			Regional Priority: Specific Credit
Credit 1.2			Regional Priority: Specific Credit
Credit 1.3			Regional Priority: Specific Credit
Credit 1.4			Regional Priority: Specific Credit

Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

Appendix B - Owner's Project Requirements



KETCHIKAN INTERNATIONAL AIRPORT

KETCHIKAN, ALASKA

TERMINAL EXPANSION AND MODERNIZATION, PHASE 1

OWNER'S PROJECT REQUIREMENTS

Facilitated by Mead & Hunt

**Developed by Ketchikan Gateway Borough (KGB)
(operator) and Alaska Department of Transportation and
Public Facilities (ADOT&PF) (owner)**

July 26, 2023

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OWNER'S PROJECT REQUIREMENTS

Definition and Scope

The Owner's Project Requirements (OPR) provide an explanation of the ideas, concepts, performance metrics and **criteria to create a high-performance building design** that are very important to the Owner which are desired to be tracked throughout design and construction.

The OPR does not list items that are already required by code. When practical and known, the OPR documents **the criteria that the project will be measured to achieve success**. The OPR is **developed by the owner and provides direction for the design team in their development of the Basis of Design** and subsequent drawing and specification packages. This document should be completed in the earliest design phases of a project, distributed, and referenced throughout the project at key milestones and updated as the Owner's goals and criteria are refined.

This document includes requirements for the systems that are more likely to be included under the formal commissioning umbrella or be impacted by their interactions. This document does not include all project requirements and directives to the design team which could include many other disciplines. **This document focuses on the mechanical, electrical, plumbing, energy, and comfort related systems and on the sustainability requirements of the project.** The design categories described in this document are as follows:

- Sustainability
- Building envelope
- Heating, ventilation & air conditioning (HVAC)
- Plumbing
- Electrical and Lighting
- Commissioning

The OPR will be followed by the Basis of Design written by the design team and included with the concept design package submission. The basis of design documents the primary thought processes and assumptions behind the design decisions and describes the design elements being incorporated to meet the OPR.

PROJECT OVERVIEW

Description

Ketchikan International Airport (the Airport or (KTN)) completed a Terminal Area Plan (TAP) in 2021 that proposed the expansion and reconfiguration of the existing passenger terminal. The TAP identified 3 phases of work to deliver needed terminal improvements per available funding. Due to potential additional funding sources that may be available, and to examine if the baggage handling systems identified in Phase 2 can be incorporated into Phase 1, the Airport is now progressing with a Concept and Budget Report (CBR).

Objectives

The objectives of the Terminal Expansion project are:

- Evaluate the existing terminal facility
- Reassess the program for spatial requirements
- Perform engineering investigations
- Reevaluate phasing

Construction Process

Table 1. Construction Process

CRITERIA	COMMENTS
Construction Delivery Type	Construction Manager at Risk (CMAR)
Construction Management	General Contractor

Project Schedule

The KGB intends to occupy the terminal expansion (phase 1) by 2025:

- Design is anticipated to be 16-18 months (estimated)
- Construction is anticipated to be 12-15 months (estimated)

Lessons Learned from Previous Projects

List below the lessons learned from previous projects that the project team should keep in mind.

List items/practices that were successful as well as those that were not successful.

- Lack of design details in state run project leads to project inefficiencies
- Design-bid-build process inefficient

Table 2. General Project Information and Requirements in Phase 1

CRITERIA	COMMENTS
Existing site conditions/ unique features	KTN terminal is located on Gravina Island. It is required for the passengers to take a ferry to get across the narrows to Ketchikan. Gravina Island hosts most airport operations except for the main parking area, which is located across the narrows. The terminal expansion is constrained by the narrows to the north, fire lane and biomass facility to the east, grade drop off to the west and Alaska GSE building to the south
Building description:	Airport terminal building.
Activities/functions that will occur in this facility:	Ticketing and airline spaces, security, three commercial gates and departure lounges, air taxi operations and waiting, float plane operations, concessions, restrooms, baggage claim, baggage makeup, rental cars, airport administration, air traffic control center, building and airport support spaces
Building size:	<p>Concept 4.1A: 32,500 / 24,000 sf existing / new - Phase 1A 56,500 / 5,800 sf existing / new – Phase 1B</p> <p>Concept 4.1B: 32,500 / 28,200 sf existing / new - Phase 1A 60,700 / 5,800 sf existing / new – Phase 1B</p> <p>Concept 4.2: 32,500 / 29,500 sf existing / new - Phase 1A 62,000 / 5,800 sf existing / new – Phase 1B</p>
Green building rating system version and goals:	LEED for New Construction and Major Renovations v 4.0/4.1
Fuel Sources provided by:	Electricity, wood pellets, oil (existing) Electricity, oil (proposed)

Building Occupancy and Schedule

Table 3. Proposed Phase 1 Complete Terminal Building Space Types, Occupant Load

PARAMETER	COMMENTS
Estimated Number of Staff	See table below
Estimated Number of Passengers	Future enplanements: <ul style="list-style-type: none"> ○ 2023 – 143,022 ○ 2028 – 154,863 ○ 2033 – 168,934 ○ 2038 – 184,981 (Terminal Area Plan dated July 2021)
Major Space Types	<p>First Floor</p> <ul style="list-style-type: none"> ○ TSA passenger screening ○ Outbound baggage screening ○ Air Taxi operations, ticketing, and seating area ○ Restrooms ○ Commercial Ticketing ○ Ticketing Offices ○ Baggage claim ○ Airport and Building support spaces <p>Second Floor</p> <ul style="list-style-type: none"> ○ Three Commercial Gates and departure lounge ○ Concessions ○ New passenger boarding bridges ○ Restrooms ○ Airport and building support areas <p>Third Floor (NIC)</p> <p>Fourth Floor (NIC)</p> <p>Fifth Floor (NIC)</p>
Typical Schedule of Operation (note if different for different space types)	<ul style="list-style-type: none"> ○ Terminal 05:45-21:45 ○ Concessions 06:30 – 20:30 ○ Rental Cars 07:00 – 21:00 ○ Airlines Alaska 06:30 – 21:00 ○ Island Air 07:00-18:00 ○ Offices 07:00 – 16:00

Table 4. Proposed Tenant Occupant Load

Terminal Tenant Occupancy	Winter	Summer
TSA	10	10
Snack bar	3	5
Giftshop	1	2
Island Air	9	13
AK CSA	12	12
AK Ramp	12	15
Delta	0	6
AK rental	1	1
Budget	1	1
Waterfall	0	2
Flight Serv	3	3
KGB Staff	6	6

Occupant Comfort Parameters

Table 5. Occupant Comfort Parameters

Space Type	Space Temp (°F)	Lighting Levels (fc)
First Floor:		
TSA passenger screening	68F/70F	50-75
Bag makeup (covered area)	Not conditioned	
Baggage screening	65F	50-75
Air tax ticketing, office, and departure lounge	68F/75F	25-30
Commercial ticketing	68F/75F	25-30
Baggage claim	68F/75F	15-20
Second Floor:		
Departure lounge	68F/75F	25-30
Concessions	68F/75F	40-50
New passenger boarding bridge	Not conditioned	10-15

DESIGN / CONSTRUCTION REQUIREMENTS

The following section details code and standards and energy goals for the project.

Codes and Standards

The codes and standards which shall be followed for this project are listed in the following table. Note additional amendments should be reviewed within each code per the Ketchikan Municipal Code found here: [Chapter 19.04 BUILDING CODE \(codepublishing.com\)](https://dps.alaska.gov/Fire/regulations), <https://dps.alaska.gov/Fire/regulations>

Table 6. Codes and Standards

Parameter	Comments
Building Code	2021 International Building Code
Energy	2021 International Energy Conservation Code
Mechanical	2021 International Mechanical Code
Ventilation	2016 ASHRAE Standard 62.1
Thermal Comfort	2019 ASHRAE Standard 55
Plumbing	2021 Uniform Plumbing Code
Electrical	2017 National Electrical Code
Lighting	2010 Illuminating Engineering Society of North America
Fire Protection	2021 International Fire Code
Other	

Energy Goals

Table 7. Energy Efficiency Goals

Goal Description	Performance Metric	Benchmark
% Savings Energy Usage	40-60%	ASHRAE 90.1-2019
% Savings Energy Cost	30-50%	ASHRAE 90.1-2019
Existing Energy Utilization Index (EUI)	167 kBtu/sf/yr	2020-2021 utility data
Target Goal EUI	90 kBtu/sf/yr (45% reduction from existing)	150 kBtu/sf/yr (TRB ACRP Study)
2030 Commitment (80% reduction)	33 kBtu/sf/yr	CB ECS 2003
% On-Site Renewable	0%	

LESSONS LEARNED BY SYSTEM TYPE

The intent of this section is to capture the Owner's requirements and guidance with respect to selection of building systems and equipment.

Building Envelope

- Describe the overall envelope design criteria and any special concerns or any special features desired or required (e.g. envelope air leakage, façade mockup requirements, water or air leakage testing, etc.).
 - Current conditions of KTN terminal building envelope: second floor roof has been recently updated. The exterior walls are under insulated concrete panels and CMU. The airport terminal tower, floors 4th and 5th, is enclosed by a curtain wall on all sides. The curtain wall system combines double pane windows and uninsulated metal siding. The curtain wall is at the end of its life. It leaks, especially on the south east side where prevalent winds are.
- What are the fenestration requirements (natural daylighting for perimeter or deeper spaces, elimination of daylight, access to views, solar orientation, entrance location requirements, functional needs, aesthetics, performance)?
 - Views best on the north side (channel) and south side (mountains)
- Are there any envelope (roofing, façade, fenestration) products or techniques that are not acceptable?
 - Durable materials that are corrosion resistant
 - Better air and thermal barrier; insulation

Heating, Ventilation and Air Conditioning

- List any specific HVAC energy efficiency features or equipment desired or required for this project.
 - Heat pumps with variable volume system
- What system types are not desired or are not acceptable? Why?
 - Wood pellet boiler. The system has limited sourcing for wood pellets, is very labor intensive to maintain and the current system is inadequately sized to meet the needs of the expanded terminal.
- What redundancies are desired for HVAC serving specific spaces and why?
- Are there specific ventilation requirements for air quality that should be considered?
 - Demand-Controlled Ventilation (DCV) will regulate the ventilation airflow rate using signals from air-pollutant sensors or occupancy sensors. Use of DOAS for ventilation system for both existing Multizone and proposed VAV units.
- What are the requirements for flexibility in the HVAC systems to accommodate changing floor layouts, additions and occupancy needs?

- Displacement ventilation

ASHRAE 36 – Advanced HVAC Control Sequences

- Are there owner requirements for standardized energy efficiency control strategies?
 - Prefers to stay with Siemens. Confirm if on Apegy platform. Potential to update to newer Siemens platform.
- If there are existing buildings what control methods are used? Trim/respond? Max zone control? DAT, SP reset?
 - 2018 - Siemens BAS installed for the CAV multizone unit. The CAV has no Trim/response, zone control or DAT, SP resets. The hydronic secondary pumps has VFD with the SP resets and possible trim/response. Will need to confirm with Siemens.
- Are there owner indoor air quality (IAQ) standards?
 - ASHRAE 62.1 standards, high MERV rating filters, CO2 sensors
- How will demand controlled ventilation (DCV) be handled? Zone level control first? Will there be O_{Amin}/O_{Amax} ventilation setpoints?
 - DCV will be handling with CO2 sensors and occupancy sensors in spaces where appropriate. These sensors will be implemented at local zone as over-ride and well resetting the outside air at the proposed DOAS.

Lighting Systems

- Are there any types of lamps or lighting fixtures that are to be included or not included in this project?
 - We will only be using LED lighting for this project.
 - Currently the airport has occupancy sensors and a standalone lighting control system.
- There are many different types of lighting control methods. What are the preferences or requirements by major space type for interior and exterior lighting? (occupancy sensors, lighting sweeps, time clocks, daylight dimming, etc).
 - We will be expanding their existing lighting system and meeting the intent of the current IECC code.
- Can lighting be tied to HVAC systems?
 - Potentially. Future discussion on tying lighting system to HVAC.
- Is there any desire to integrate lighting controls with the building automation system?
 - Potentially. Future discussion on tying lighting system to BAS system.

Plumbing Equipment

- Are there specific water heating systems that are preferred or are there some that are not to be considered (e.g., point of use heaters, electric heaters, solar thermal, gas water heaters, etc.)?
 - Planning on new tank electric water heaters replacing existing system.
 - Hot water demand consists of the concessions and the restroom and currently uses a lot of energy. Stand alone or heat pump hot water or other more efficient water system is preferred.
- Desire for additional water meters to various systems?
- What type of plumbing fixtures are desired?
 - Low flow sensor operated fixtures.
- Are there desires / ability for any water reuse systems?
 - No
- Is there irrigation on site? What kind of controller is preferred? (on/off, moisture sensor, timer)
 - No

Metering

- What level of submetering of electricity and natural gas is desired, if any? (e.g. plug loads, lighting, HVAC, renewable energy, etc.)
 - None
- Are there any process loads that should be submetered? (e.g. concourse gate loads, EV charging, tenant spaces, concessions, etc.)
 - Tenants have separate utility meters.
 - Determine if there is a desire to specific any additional tenant spaces.

Building Automation System (BAS) and Controls

- Are there special owner control system standards that need to be followed?
 - Siemens installed in 2018 for BAS. Siemens should be maintained.
- What level of control is desired for the occupants to have over the temperature and ventilation in their space?
 - None for passengers.
- Is a web accessible system desired?
 - Airport will need to determine if Cyber Security and if Web-Access IP is desired.
- Will the control system need to tie into another existing building automation control system from another building? Explain
 - The HVAC systems will tie-into the existing BAS.
- Will the BAS be tied to back up power? Generator
 - All DDC controllers and Temperature Control Panels will be on standby power and tied to the BAS.

- Is there a desire for long term monitoring of the BAS system for trend analysis and use for existing building commissioning?
 - Siemens' BAS system has ability for trend analysis.

Emergency Generator and UPS

- In general, what equipment is required to be on generator power?
 - Confirm if whole building or specific loads of building will be on backup generator power.
- How many hours of full load operation are desired in sizing the fuel tank?
 - TBD
- What equipment is desired to be on an uninterruptible power system (UPS)?
 - None

Distributed Generation

- Describe any renewable energy or distributed generation goals (% percent renewable or distributed, certain loads served by these systems).
 - 0%
- If a solar or wind system is installed, is a battery backup desired for part of the load so that when the utility is down there is still power? If so, for which loads and for how many days of storage?
 - Not applicable

COMMISSIONING SCOPE

This section details specific Owner requirements for Commissioning regarding building systems that should be considered for this project. Commissioning (Cx) is a systematic quality assurance process that begins during the early design phase and follows through occupancy. The intent of Commissioning is to observe and document building system construction and installation, test system calibration and performance, and document whether systems, sub-systems, and equipment performance conform to the Owner’s project requirements (OPR) and the design teams’ basis of design (BOD).

Table 8. Commissioned Systems

CX SCOPE (Code where required)	REQUIRED (R)/ DESIRED? (Y/N/NA)
Building Automation Systems (IECC 2015+)	Required
Domestic Hot Water (IECC 2015+)	Required
HVAC Systems (IECC 2015+)	Required
Lighting, Daylighting Controls (IECC 2015+)	Required
Audio Visual	
Central Utility Plant	
Conveyance Systems (elevators, moving walkways, escalators)	Yes
Demand Response Program (LEED related credit)	NA
Electrical (transfer switches, normal power, service switchgear, standby generator systems)	
Emergency Generator and UPS	
Envelope: Walls (design/observation/testing)	Yes
Envelope: Roof (design/observations/testing)	Yes
Fire (fire alarm and sprinklers)	Yes
Irrigation Systems (Title 24)	No
IT	Yes
Labs, Clean Rooms	NA
Low Voltage	Yes
Meters and submeters	
Plumbing fixtures and systems (non DHW)	
Renewable Energy Systems	NA
Security & Access	
Telecommunication	
Water Reuse Systems (Title 24)	NA
Other	

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5 CHAPTER 5 – BASIS OF DESIGN

5.1 Architectural Narrative

On the first floor the eighteen station ticketing counters for commercial and air taxi services are centralized, providing adequate room for queuing and cross-circulation at the counter. TSA Secure Checkpoint is located on the first floor south of ticketing. The check point screening is expanded to include two check points lanes and provides a recompose area that leads to the secured circulation. The departure lounge for Air Taxi ground boarding is located south of the SSCP and contains restrooms and a vending area.

From the secure exiting lane and stairway and elevator provides circulation from the main floor to the second floor. The circulation provides access to a new departure lounge, retail concessions and the existing holdrooms and restaurant and lounge. This departure lounge will be served by Passenger Boarding Bridge that connect to the aircraft. A quiet area “view room” facing the Borough will be located on the north side the second floor along with a retail concession area. Inbound passengers move through circulation to the secure exiting lanes and proceed to the existing vertical circulation that leads them to baggage claim on the first floor. An expansion of the current restroom is planned as an Alternate Bid Item.

5.2 Structural Narrative

Structural renovations to the existing terminal will be limited to new exterior cladding and upgrades of existing connections at existing exterior concrete wall panels. All other renovation work in the structure will be architectural and MEP.

The Prescriptive Compliance Method in Sections 503.3 and 503.4 of the 2021 International Building Code (IEBC) will be utilized for the renovation. These sections provide the threshold for existing gravity and lateral framing requiring upgrades to the 2021 IBC requirements. The threshold for upgrades for existing gravity and lateral members is a 5% and 10% increase, respectively, in the demand/capacity ratio. The current plan is to limit renovations to the building to meet these thresholds and therefore not require structural upgrades.

The exception to the above will be at the existing exterior concrete wall panels. Section 503.7 of the 2021 IEBC requires upgrading the connections of the existing wall panels to the structure. Per IEBC 2021, the connections will be retrofitted to withstand the reduced seismic forces in the 2021 IBC. Connections will also be retrofitted to horizontal slip connections to ensure the wall panels are not subject to lateral loads from the building.

The foundation will include conventional, cast-in-place, reinforced concrete footings and grade beams including spread footings and perimeter strip footings. Perimeter strip footings will support cast-in-place, reinforced concrete foundation walls.

The structure will be steel-framed consisting of wide flange columns, beams, and girders. Exterior walls will consist of light gage framed walls.

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The Level 1 floor will be a slab-on-grade, on imported well-graded sandy-gravel fill confined by the perimeter foundation walls and at an elevation that matches the existing terminal Level 1 floor.

The Level 2 floor will be a composite deck consisting of metal deck with concrete topping at an elevation that matches the existing terminal Level 2 floor. Roof will either be untopped metal roof deck or a composite deck consisting of metal deck with concrete topping. Screen walls at rooftop mechanical units will consist of galvanized steel columns, girts, and bracing.

Lateral load resisting system will consist of steel special moment frames. Moment frame types that will be considered include bolted end-plate moment connections, reduced beam section (RBS) moment connections, and Sideplate moment connections. Steel special brace frames will also be considered, but based on the current floor plans are not likely to be feasible.

The structure will be seismically isolated from the existing terminal with seismic joints.

5.3 Plumbing And Fire Protection Narrative

5.3.1 Plumbing

5.3.1.1 Overview

The project is the expansion and modernization of the terminal at the Ketchikan International Airport. The following narrative describes the technical scope and approach to the work of the Project.

5.3.1.2 Scope of Work

5.3.1.2.1 Project Understandings, Goals and Objectives

- a. This Basis of Design (BOD) and associated drawings describe and define the plumbing systems proposed for the terminal at the Ketchikan International Airport.
- b. The existing terminal is two-story and the expansion will also be two-story with construction phasing, demo of existing areas, remodeling/renovating, and expanding.
- c. The purpose of these documents is to describe the design basis and the design intent in sufficient detail to serve as basis for the contract documents, which will be prepared by Mead and Hunt, Inc.

5.3.1.3 Base Design Criteria

5.3.1.3.1 Applicable Codes

The following applicable Codes, Standards, and Guidelines are intended to be used to determine acceptable design criteria, standard of performance, workmanship, etc. Based on industry best practice and Owner's experience, system design criteria that exceed the minimum standards will be applied as appropriate.

- a. Applicable Codes
 - UPC Uniform Plumbing Code

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- b. Applicable Guides and Standards
ASPE PEDH Plumbing Engineering Design Handbook, Volumes 1-4 (Current Editions)

5.3.1.3.2 Design Conditions

- a. Water supply flow is based on the following values obtained from City of Ketchikan:

WATER SUPPLY FLOW	
DATE OF TEST:	00/00/00
LOCATION:	Ketchikan, AK
TEST HYDRANTS:	
HYD. OUTLET ELEV.:	20" OFF FINISHED GRADE
STATIC PRESSURE:	100 PSI
RESIDUAL PRESSURE:	PSI
FLOW GPM:	GPM

- b. Water quality is based on the following values obtained from TBD:

Water Quality Report	
Total Hardness, gpg	
Turbidity	

- c. Proposed manufacturers of major equipment will be as indicated:

MANUFACTURER(S)
AO Smith, HTP, Bock, Bradford White, Navien
Ingersoll-Rand, Quincy, Garner-Denver, Powerex, Atlas Copco
Green Turtle, Schier, Canplas
Thermaco, Rockford, JR Smith, Watts, Zurn
Watts, Zurn, JR Smith, Josam, Wade
American Standard, Kohler, Zurn, Mansfield
American Standard, Kohler, Chicago Faucets, Sloan, Moen, Zurn

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5.3.1.4 *Systems Descriptions*

5.3.1.4.1 Domestic Water Supply

a. System Description

- 1) Plumbing fixtures are attached to a cold and hot water distribution system containing potable water that is connected to water supply through a water meter and backflow prevention device.
- 2) Hot water is generated with one tank-type electric fired water heater. The new water heater will be located in the mechanical room replacing the existing dual heat exchanger water heaters.
- 3) Hot water is continuously circulated through the system and returned back to the hot water source.
- 4) Mechanical equipment is attached to a non-potable water distribution system that is connected to water supply through a backflow prevention device.

b. Design Criteria

- 1) The existing three-inch water service entrance will be dedicated to the potable water supply. The domestic water service will be designed at 6 feet per second maximum allowable velocity. Velocity limitation is to provide capacity for future expansion of the system.
- 2) The water distribution system will be designed by the segmented loss method. This method requires the following information: the load factor in water supply fixture units or gallons per minute flow rate, the minimum pressure available from the water source (water main or pressure tank), the pressure loss due to the difference in elevation between the water source and the controlling plumbing fixture, the pressure loss due to equipment (water softener, backflow prevention device, etc.), the minimum flow pressure required at the controlling fixture, and the pressure loss through piping, valves, fittings, and appurtenances. The maximum allowable velocity shall be 6 feet per second in cold water supply, 5 feet per second in hot water supply, and 4 feet per second in hot water recirculation. Velocity limitations are to reduce the potential for pipe wall erosion.
- 3) The water heater will be selected based on the average hourly demand method. This method requires the following information: the average hourly use for each plumbing fixture type, the simultaneous usage factor based on facility type, and the storage factor based on facility type.

c. Materials and Equipment

- 1) Domestic plumbing distribution pipe shall be type L Copper or schedule 10 stainless steel with solder joints, brazed pipe joints, welded joints, or press-fit joints. Pipe insulation shall be pre-formed fiberglass pipe insulation.

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- 2) Domestic plumbing valve intended for shut-off duty shall be two- piece, full port ball valves for pipe sizes 3” and smaller or butterfly valves for pipe sizes larger than 3”. Hot water recirculation system shall include thermostatic balancing valves at each system branch connecting. Swing check valves shall be included to ensure proper direction of flow.
- 3) The backflow prevention devices on the incoming water service shall be reduced pressure zone style backflow preventer. Hose thread style backflow preventers shall be provided for all loose hose connections, hose bibbs or wall hydrants, janitor’s sinks and any hose threaded spout outlets.
- 4) Circulation pumps shall be variable speed, electronically commutated motor (ECM) high efficiency pumps with integral thermal controls.
- 5) Water heater shall be electric fired, tank type high efficiency sealed combustion water heater. The thermal expansion tank shall utilize a permanent bladder system.

5.3.1.4.2 Plumbing Fixtures

a. Materials and Equipment

- 1) Lavatories shall be vitreous china, undermount bowl and sensor faucet rated for 0.5 gallons per minute flow rate.
- 2) Water closets shall be vitreous china, wall hung sensor flush valve style fixtures with 1.28 gallons per flush.
- 3) Urinals shall be vitreous china, wall hung sensor flush valve style fixtures with 1.28 gallons per flush.
- 4) Kitchen sink shall be two compartment stainless steel drop-in with two handle swing spout faucet rated for 2.2 gallons per minute flow rate. A commercial grade garbage disposal shall be provided for one sink compartment.
- 5) Drinking fountain shall be wall hug stainless steel in high-low configuration, with bottle filler.
- 6) Outlet boxes for icemakers, or dishwashers shall be powder coated steel.
- 7) Hose bibbs shall be cast brass with rough bronze finish and wheel handle operation. Wall hydrants shall be freezeproof with loose key operation.
- 8) Floor drains in finished areas shall be cast iron body with nickel bronze heel proof grate. Floor drains in mechanical rooms shall be cast iron body with heavy duty tractor grate.

5.3.1.4.3 Sanitary Drain and Vent

a. System Description

- 1) Plumbing fixtures are connected to a sanitary drain and vent collection system that is connected to a municipal sanitary sewer system.

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- 2) Grease producing fixtures in the kitchen are connected to a grease drain and vent system that is connected to a gravity grease interceptor. Grease separates from wastewater in the grease interceptor and is collected for future remediation. Grease free wastewater continues downstream from the grease interceptor and connects to the sanitary drain and vent collection system.
 - 3) Tug bay drains are connected to an oil waste and vent collection system that is connected to an oil interceptor. Flammable liquids separate from wastewater in the oil interceptor and is collected for future remediation. Oil free wastewater continues downstream from the oil interceptor and connects to the sanitary drain and vent collection system.
 - 4) Below grade and above grade drain waste and vent pipe shall be Sch 40 PVC DWV solid wall pipe and fittings.
 - 5) Above grade drain waste and vent pipe within a return air plenum shall be Cast Iron No Hub pipe and fittings
- b. Design Criteria
- 1) The existing 6" sanitary service will be dedicated to the sanitary system. Drain and vent systems shall be designed using the fixture unit method. This method requires the following information; the load factor in drainage fixture units or gallons per minute flow rate and the slope of the connected drainage pipe. The drain and vent systems shall be designed with a minimum of 2 feet per second velocity to ensure solids remain suspended in the wastewater.
 - 2) A hydromechanical grease interceptor shall be required for on-site pretreatment of the grease laden wastewater from the kitchen. The interceptor shall be designed to provide a minimum of a one hour holding period to ensure separation of grease, and a 90-day cleaning cycle.
 - 3) A gravity oil interceptor shall be required for on-site pretreatment of flammable liquids that may be present in wastewater from the tug bay. The interceptor shall be designed to accommodate the discharge from hose bibbs, to ensure separation of flammable liquids from wastewater.
- c. Equipment and Materials
- 1) Pipe – Schedule 40 DWV PVC
 - 2) Pipe – Cast Iron No Hub (within return air plenum)
 - 3) Trench Drains – Precast, with heavy duty cast iron grate
 - 4) Floor drains – Heavy duty cast iron in maintenance spaces, medium duty in public spaces
 - 5) Trap guard - waterless trap seal
 - 6) Interceptor – oil, sand/grit.
 - 7) Interceptor – grease.

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5.3.1.4.4 Storm Drain

a. System Description

- 1) Primary and secondary (overflow) roof drains will be collected via internal storm piping. Primary storm will be routed below grade and connect to the site storm system. Secondary storm will be routed to downspout nozzles.
- 2) Below grade and above grade storm pipe shall be Sch 40 PVC DWV solid wall pipe and fittings.
- 3) Above grade storm pipe within a return air plenum shall be Cast Iron No Hub pipe and fittings

b. Design Criteria

- 1) Storm systems are designed by calculating the projected square footage of roof area converted to GPM. This is a gravity system sloped at a minimum of 1/8"/FT.

c. Equipment and Materials

- 1) Pipe – Schedule 40 DWV PVC
- 2) Pipe – Cast Iron No Hub (within return air plenum)
- 3) Roof drains – Heavy duty cast iron with dome strainers and 2" internal water dam for overflow drains.

5.3.2 Fire Suppression Systems

5.3.2.1 Overview

The project is the expansion and modernization of the terminal at the Ketchikan International Airport. The following narrative describes the technical scope and approach to the work of the Project.

5.3.2.2 Scope of Work - Project Understandings, Goals and Objectives

- a. This Basis of Design (BOD) and associated drawings describe and define the fire protection systems proposed for the terminal at the Ketchikan International Airport.
- b. The existing terminal is two-story and the expansion will be two-story with construction phasing, demo of existing areas, remodeling/renovating, and expanding.
- c. The purpose of these documents is to describe the design basis and the design intent in enough detail to serve as basis for the contract documents, which will be prepared by Mead and Hunt.

5.3.2.3 Sprinkler System

The existing sprinkler system will be extended into the new two-story expansion. The existing sprinkler system will be modified in existing spacers as necessary for new remodels/renovations. There is an existing dry pipe system that serves exterior canopies that will be replaced with a new dry pipe system.

5.3.2.3.1 Design Conditions

1. Building hazard classifications are based on the following occupancies as found in NFPA 13:

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NFPA 13	
Light	Unless Otherwise Noted
Ordinary Hazard Group 1	Mechanical rooms, Janitors closet

2. Hose stream demand is based on the following values as found in NFPA 13

NFPA 13 Hose Stream Demand and Duration

HAZARD CLASSIFICATION	HOSE DEMAND, GPM (LPM)		DURATION, MIN
	CEILING HEIGHT 60 FT. OR LESS (18 m)		
LIGHT HAZARD	100		60
Hazard Category 1	250		60 - 90

3. Proposed manufacturers of major equipment will be as indicated:

EQUIPMENT	MANUFACTURER(s)
Double Check Valve Assembly	Apollo, FEBCO, Zurn
Specialty Devices	Elkhart, Guardian, Potter, Tyco, Viking
Sprinklers	Reliable, Tyco, Victaulic, Viking

5.3.2.3.2 Systems Descriptions

5.3.2.3.2.1 Wet Pipe Fire Sprinkler Systems

a. System Description

- 1) Automatic sprinklers are attached to piping containing water and that is connected to water supply through an alarm valve. Water discharges immediately from sprinklers when they are opened. Sprinklers open when heat melts fusible link or destroys frangible device. Hydraulic and electric sensors send alarms when water flows.
- 2) Wet pipe fire sprinkler system will serve all building spaces unless noted otherwise.

b. Design Criteria

- 1) There is an existing 6-inch fire service entrance that will be dedicated to the fire sprinkler system.
- 2) All fire suppression systems will be hydraulically calculated with a computer calculation system.

c. Equipment and Materials

- 1) Fire sprinkler pipe shall be black steel. Pipe 2-inch and smaller will be Schedule 40 with threaded joints. Pipe larger than 2-inch shall be Schedule 10 with welded or roll groove joints, or Schedule 40 with welded, threaded, or cut groove joints.

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- 2) Sprinkler heads shall be quick response standard spray. Semi-recessed sprinklers shall be installed in areas with ceilings. Upright or pendant sprinklers shall be installed in areas without ceilings. Sprinkler guards shall be used in mechanical and storage rooms.
- d. Distribution
 - 1) All fire sprinkler pipe will be routed overhead and square to building structure.
 - e. System Description

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5.3.3 Mechanical Narrative

5.3.3.1 Scope of Work

- 1 Project Understandings, Goals and Objectives
 - a This Basis of Design (BOD) and associated drawings describe and define the HVAC/Mechanical engineering systems proposed for the Ketchikan International Terminal Project.
 - b The purpose of these documents is to describe the design basis and the design intent in sufficient detail to serve as basis for the contract documents.
 - c The project involves three construction phases:
 - 1) Phase I A / IB: New TSA Checkpoint Addition/ Gate 1 (East Addition)
 - 2) Phase 2: New Baggage Claim Addition (West Addition) / renovation of interior spaces.

5.3.3.2 General Description

- 1 This an overall description for the proposed HVAC strategies for the Terminal Expansion and the demolition the existing heating utility plant for the project.
 - a The project will require construction sequencing for the decommissioning of the current utility plant. The existing 1,110 MBH oil boiler, hydronic pumps and associated SOD-gallon fuel tank will be salvaged for reuse as part of the renovation/expansion project. The existing 512 MBH Bio-Mass boiler, pumps and pellet silo system will be repurposed to a different off-site location and application.
 - b The new HVAC system will consist of centralized, air-cooled heat pump system that will provide heating/cooling for the Addition as well serve the existing multizone air handing system, AHU-1. The air-cooled heat pump system will be a centralized rooftop unit that consist of (4) 30 Ton modular compressors that can provide both heating and cooling simultaneously for the building's HVAC demands.
 - c The existing 20,800 CFM multizone air handling system will remain as-is and will continue to provide thermal comfort for the current Terminal. The existing air-cooled condensing unit on the roof serving AHU-1 will be removed and the DX air handler coils replaced with hydronic coils. The existing constant air volume, DX air handling unit serving the Concession area will also remain as-is. The new HVAC air distribution serving the Addition will be variable air volume (VAV) system with variable frequency drives.
 - d This new air handling unit (AHU-3) will be sized for approximately 30,000 CFM capacity. This new unit will consist of heating/cooling coils, filtration, fans, and zoned air terminals boxes with reheat coils. To provide outside air ventilation requirements for the Addition and the existing Terminal a dedicated outside air unit (DOAS-1) will

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provide the facility's ventilation needs for both AHU-1 and AHU-3. The proposed dedicated outside air unit will consist of an energy recover wheel, filters, coils, and fans. For heating terminals units, the Terminal will have a combination perimeter fin-tube radiation, unit heaters, and cabinet unit heaters for space comfort.

- e. For maximizing the system's efficiency, the air-cooled heat pump is highly effective when the outside air temperature is above 20 deg F. The air-cooled heat pump can provide supplemental heating down to 0 deg F outside air temperature, but the heat pump's defrost cycle will consume more energy at this ambient condition. The existing oil boiler in combination with a new oil boiler will operate to meet the building's heating demand. When the outside air temperature falls below 20 deg F, the existing and new oil boilers will provide heating for the HVAC air distribution systems as well the perimeter radiation for the entire facility.

5.3.3.3 Base Design Criteria

- 1. The following applicable Codes, Standards, Guidelines, and Criteria are intended to be used to determine acceptable design criteria, standard of performance, workmanship, etc. Based on industry best practice and owner's experience, system design criteria that exceed the minimum standards will be applied as appropriate.

- 2. Applicable Codes

IMC	International Mechanical Code – 2021
IECC	International Energy Conservation Code – 2021
IFGC	International Fuel Gas Code (IFGC) – 2021

- 3. Guidelines, Standards, and Criteria

- a. American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)

ASHRAE 55-2019	Thermal Environmental Conditions for Human Occupancy
ASHRAE 62.1-2016	Ventilation for Acceptable Indoor Air Quality

- b. National Fire Protection Association (NFPA)

NFPA 54	National Fuel Gas Code, 2015 Edition
NFPA 101	Life Safety Code

- c. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
- d. Occupational Safety and Health Administration (OSHA)

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4. Design Conditions

- a. Project Location: Ketchikan, AK
- b. Elevation: 0 feet above mean sea level
- c. Outdoor Design Conditions
 - 1) Summer: 75.1° F DB / 61.0° F WB (ASHRAE 2021 - 1%)
 - 2) Winter: 18.3° F DB (ASHRAE 2021 - 99.6%)
- d. Indoor Design Conditions
 - 1) Admin Areas: Offices, Support, Conference, Mothers' Room, Rental Car
 - Heating: 68°F ± 2°F 25% RH minimum
 - Cooling: 75°F ± 2°F 50% RH maximum
 - 2) Concessions and Retail Areas
 - Heating: 68°F ± 2°F
 - Cooling: 75°F ± 2°F 50% RH maximum
 - 3) Passenger Hold Rooms
 - Heating: 68°F ± 2°F
 - Cooling: 75°F ± 2°F 50% RH maximum
 - 4) TSA
 - Heating: 68°F ± 2°F
 - Cooling: 75°F ± 2°F 50% RH maximum
 - 5) General Circulation
 - Heating: 68°F ± 2°F
 - Cooling: 75°F ± 2°F 50% RH maximum
 - 6) Toilet/Shower/Locker Rooms
 - Heating: 70°F ± 2°F 25% RH minimum
 - Cooling: 75°F ± 2°F 50% RH maximum
 - 7) Vestibules
 - Heating: 65°F ± 2°F
 - Cooling: None
 - 8) Telecommunication Rooms
 - Heating: 60°F ± 2°F 25% RH minimum
 - Cooling: 75°F ± 2°F 50% RH maximum
 - 9) Mechanical and Electrical Rooms

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Heating: 60°F ± 2°F
Cooling: None; Ventilation Only

10) Unoccupied Spaces

Heating: 65°F ± 2°F
Cooling: None

e. Heating and Cooling Loads

1) Electrical

a) Admin Areas; Offices, Support, Mothers' Room, Rental Car

Lighting: 1.0 watts per sq ft
Equipment: 1.5 watts per sq ft

b) Training, Break, Conference Rooms

Lighting: 1.5 watts per sq ft
Equipment: 1.0 watts per sq ft

c) Corridors

Lighting: 1.0 watts per sq ft
Equipment: None

d) Restrooms

Lighting: 1.0 watts per sq ft
Equipment: None

e) Passenger Hold Rooms

Lighting: 0.75 watts per sq ft
Equipment: 0.25 watts per sq ft

f) TSA

Lighting: 1.5 watts per sq ft
Equipment: 5.0 watts per sq ft

g) General Circulation

Lighting: 0.7 watts per sq ft
Equipment: None

h) Retail Areas

Lighting: 1.5 watts per sq ft
Equipment: 4.0 watts per sq ft

i) Storage

Lighting: 0.5 watts per sq ft
Equipment: None

j) Mechanical/Electrical

Lighting: 0.5 watts per sq ft
Equipment: 8.0 watts per sq ft

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- k) Communications
 - Lighting: 1.0 watts per sq ft
 - Equipment: 12.0 watts per sq ft
- l) Retail Spaces
 - Lighting: 3.0 watts per sq ft
 - Equipment: 0.5 watts per sq ft

2) Occupancy

a) The number of occupants in each space will be based on the actual occupant density listed in the project program documents when available or will be based on occupancy densities as specified in the International Mechanical Code and ASHRAE 62.1. The typical occupancy heat rejection will be as follows:

- Office Environment
 - Sensible: 250 Btuh/person
 - Latent: 200 Btuh/person
- Break/Retail
 - Sensible: 275 Btuh/person
 - Latent: 275 Btuh/person
- Concessions
 - Sensible: 250 Btuh/person
 - Latent: 200 Btuh/person
- Passenger Hold Rooms
 - Sensible: 225 Btuh/person
 - Latent: 105 Btuh/person
- TSA
 - Sensible: 375 Btuh/person
 - Latent: 625 Btuh/person

b) Occupancy Schedule

- The mechanical system will be designed to operate per the building occupancy schedule.

c) Diversity

- A diversity factor, to be determined as the design progresses, of full building occupancy will be used in sizing the mechanical equipment.

3) Infiltration

a) The building heat loss calculations will include an infiltration load based on 1.5 cfm of infiltration air per lineal foot of exterior wall with

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windows, per floor level, and 1.0 cfm of infiltration air per lineal foot of exterior wall without windows, per floor level.

- b) Infiltration rates of 200 cfm per door will be used for exterior main entrance, high use service doors. Infiltration rates of 100 cfm will be used for secondary exterior entrances and exits. Infiltration rates of 5 cfm/sf will be used for exterior overhead doors.

4) Building Envelope

- a) Heat loss calculations will include an infiltration load as indicated above. Initial heat loss calculations will utilize the following envelope properties for areas of new construction. Performance criteria for building envelope construction materials will be revised as project design progresses to be in accordance with the data provided by the architect. The following initial envelope properties are based on ASHRAE Climate Zone 5C.

Wall (below ceiling)	U value = 0.09 Btuh/sf/°F
Wall (above ceiling)	U value = 0.09 Btuh/sf/°F
Wall (below grade)	U value = 0.14 Btuh/sf/°F
Partition Wall	U value = 0.11 Btuh/sf/°F
Roof	U value = 0.09 Btuh/sf/°F
Glass (Shading Coeff. = 0.45)	U value = 0.50 Btuh/sf/°F
Service Door	U value = 0.55 Btuh/sf/°F
Overhead Door	U value = 0.90 Btuh/sf/°F
Slab on Grade perimeter	F factor = 0.73

- b) Performance criteria for existing building envelope will be derived from documentation of existing conditions.

f. Pressure Relationships

Toilet, Locker, Janitor	Negative to adjacent
Break Room	Negative to adjacent
Offices, Conference Rooms, etc.	Neutral
Hold Rooms, Retail Space	Neutral
Concessions	Negative to adjacent
Building as a whole	Positive to exterior

g. Ventilation Rates

- 1) Outdoor

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- a) Building ventilation (outdoor air) will comply with ASHRAE standard 62.1 and the International Mechanical Code. Code minimum rates will be increased as necessary to account for building exhaust rates and maintain pressure relationships.
- 2) Exhaust
 - a) Individual room exhaust rates will comply with ASHRAE standard 62.1 and the International Mechanical Code.
- h. Diversity / Redundancy Requirements
 - 1) None.
- i. Seismic Criteria
 - 1) Seismic bracing will be provided for mechanical systems for this facility.
- j. Noise Criteria
 - 1) Sound attenuation equipment will be provided based on standard design practice. Results are not guaranteed due to many items not under control of the design team and actual building usage. Initial goals based on NC levels are as follows:

Hold rooms	NC 40
Concessions	NC 40
Offices, Conference Rooms, etc.	NC 30
Retail Spaces	NC 30
Telecom Rooms	NC 45
 - 2) Measured dBA values will be approximately 5 points higher than average NC level. An NC 40 space will have an average sound power level of 45 dBA.
 - 3) Requirements and criteria will be further evaluated as design progresses.
 - 4) Sound attenuation devices may be required for main air handling units, exhaust fans, and downstream of air terminal units for occupied spaces.

5.3.3.4 System Descriptions

- 1. Central Utility Plant Mechanical Demolition
 - a. Systems Description
 - 1) The existing utility plant will be removed. The existing oil boiler, hydronic pumps and fuel tank will be salvaged for reuse for the project. The existing Bio-Mass

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boiler, pumps and pellet silo system will be repurposed to a different off-site location and application. All hydronic pumps will be demolished.

2. Terminal Building Mechanical Demolition

a. Systems Description

- 1) Selective demolition of mechanical systems work will occur in a phased sequence to allow the building to remain operational during construction.
- 2) Existing air handling units AHU-1 and AHU-2 will be existing to remain. Associated ductwork, air terminals, and controls, will be existing to remain with minor building renovation work.

3. Cooling Chilled Water System

a. System Description

- 1) Chilled water system will consist of (4) modular 30-ton air cooled heat pump chillers, primary pumps, secondary pumps, distribution piping, and cooling coils in air handling units.
- 2) Air cooled compressor will have liquid injection for low-ambient conditions.
- 3) Cooling media will be water mixed with 20% propylene glycol.
- 4) Chilled water will be supplied to the air handling unit cooling coils at approximately 45°F.
- 5) The chilled water distribution system will be constant volume primary / variable volume secondary utilizing a modulating 2-way control valve at each cooling coil. Each secondary pump will be provided with a variable frequency drive (VFD). Primary pumps serving the chillers will be constant volume.
- 6) A differential pressure transmitter between the supply and return mains will be utilized to vary the speed of the pumps, via variable frequency drives, to maintain a constant pressure differential between the piping mains.

b. Design Criteria

1) General

- a) Chilled water piping will be sized as follows:
 - Maximum pressure drop of 4 ft. of water/100 ft.
 - Maximum velocity of 8 fps.
- b) Reserve Capacity and Redundancy:

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- Modular heat pump chillers will be sized for 100% of design cooling capacity.
 - Two new primary pumps, one for each chiller, will each be sized to provide 100% of the design water flow rate of each chiller.
 - Two new secondary pumps will each be sized to provide 100% of the design chilled water flow rate. One pump will operate with the second pump being a redundant unit.
 - c. Equipment and Materials
 - 1) Air-cooled heat pump water chillers will be air-cooled scroll type with R-410A as a refrigerant.
 - 2) Chiller (primary) pumps will be end suction centrifugal constant volume.
 - 3) System (secondary) pumps will be end suction centrifugal type with a variable frequency drive.
 - 4) The chilled water system will also include the following components:
 - a) Chemical pot feeder
 - b) Air separator
 - c) Bladder type expansion tank
 - d) Glycol fill tank and pump assembly
 - e) Cooling coils
 - f) Appropriate valving and piping specialties
 - d. Distribution
 - 1) Chilled water piping 2" and under will be Type L copper with soldered fittings or carbon steel with threaded fittings.
 - 2) Chilled water piping over 2" will be carbon steel with welded fittings.
 - 3) Chilled water piping system will be insulated with closed cell type insulation with appropriate insulation jacket.
- 4. Heating Hot Water System
 - a. System Description
 - 1) Heating hot water system will consist of the existing oil-fired boiler, new 500 MBH oil-fired boiler, primary pumps, secondary pumps, distribution piping, AHU heating coils, and terminal heating devices such as unit heaters, cabinet unit heaters, convectors, finned tube baseboard radiation, etc.
 - 2) Heating media will be water with water mixed with 20% propylene glycol.

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- 3) Heating hot water will be distributed at a supply water temperature of approximately 190°F. Outside air reset will allow the temperature to be reset down to 120°F.
 - 4) The heating hot water distribution system will be constant volume primary / variable volume secondary utilizing a modulating 2-way control valve at each heating device. Each secondary pump will be provided with a variable frequency drive (VFD). Primary pumps serving the boilers will be constant volume.
 - 5) A differential pressure transmitter between the supply and return mains will be utilized to vary the speed of the pumps, via variable frequency drives, to maintain a constant pressure differential between the piping mains.
- b. Design Criteria
- 1) General
 - a) Heating hot water piping will be sized as follows:
 - Maximum pressure drop of 4 ft. of water/100 ft.
 - Maximum velocity of 8 fps.
 - b) Reserve Capacity and Redundancy:
 - Existing oil boiler will provide design heating capacity.
 - Two new primary pumps will each be sized to provide 100% of the design hot water flow rate. One pump will operate with the second pump being a redundant unit.
 - Two new secondary pumps will each be sized to provide 100% of the design hot water flow rate. One pump will operate with the second pump being a redundant unit.
- c. Equipment and Materials
- 1) Existing oil-fired boiler will be salvage and reused for the project.
 - 2) Boiler (primary) pumps will be inline centrifugal constant volume.
 - 3) System (secondary) pumps will be end suction centrifugal type with a variable frequency drive.
 - 4) The heating hot water system will also include the following components:
 - a) 10% sidestream water filter
 - b) Chemical pot feeder
 - c) Air separator
 - d) Bladder type expansion tank
 - e) AHU heating coils

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- f) VAV reheat coils
 - g) Unit heaters
 - h) Cabinet unit heaters
 - i) Convectors
 - j) Finned-tube baseboard radiation
 - k) Glycol fill tank and pump assembly
 - l) Appropriate valving and piping specialties
- d. Distribution
- 1) Heating hot water piping 2" and under will be Type L copper with soldered fittings or carbon steel with threaded fittings.
 - 2) Heating hot water piping over 2" will be carbon steel with welded fittings.
 - 3) Unions will not be provided at terminal heating devices in copper piping.
 - 4) Heating hot water piping system will be insulated with rigid glass fiber type insulation with appropriate insulation jacket.
5. Air Handling System
- a. System Description
- 1) One air handling unit will serve the Addition.
 - 2) System will be single duct, variable air volume with hot water reheat.
 - 3) Air will be supplied to all appropriate spaces and a portion of this air will be returned to the air handling unit. The remain portion of air not returned to the air handling unit shall be utilized as make-up air for the exhaust systems and for building pressurization.
 - 4) Ducted return air system will be used instead of return air ceiling plenum to return air from the spaces back to the AHU.
 - 5) Air handling system will operate with occupied, unoccupied, and morning warm-up control cycles.
 - 6) Supply air ductwork will be lined for 5 ft. downstream of air terminal devices for sound attenuation.
 - 7) Sound attenuating flexible duct up to 5 ft in total length will be provided at the supply diffusers to control noise.
 - 8) An air-cooled heat pump condensing unit will be utilized with chilled cooling and heating coils in the air handling unit to provide mechanical cooling for the building.

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b. Design Criteria

1) Air Handling Unit Component Sizing

a) Maximum allowable nominal face velocities:

Air Intake Louvers:	400 fpm through the free area of louver
Filters:	400 fpm
Hot Water Heating Coils:	650 fpm
Cooling Coils:	400 fpm

2) Duct System Sizing

Air Handling Unit to Air Terminal (AT) Devices (a)

AT to Supply Diffuser: (b)

Return/Exhaust Duct to Fan: (b)

a) Maximum pressure drop of 0.15"/100 ft when $\leq 10,000$ cfm Maximum velocity of 2,000 fpm when $> 10,000$ cfm.

b) Maximum pressure drop of 0.1"/100 ft when $\leq 8,000$ cfm Maximum velocity of 1,600 fpm when $> 8,000$ cfm

c. Equipment and Materials

1) The air handling unit will be of galvanized steel double wall construction. The unit will consist of the following components:

- a) Outside Air Intake Damper
- b) Air Mixing Devices
- c) 30% (MERV 7) Pre-filters
- d) 90% (MERV 14) Final Filters
- e) Pumped Hot Water Preheat Coil
- f) Chilled Water-Cooling Coil
- g) Supply Fan with VFD
- h) Smoke Detector at Supply Air Discharge Ductwork

2) Supply fans will be double width double inlet or plenum centrifugal type with airfoil blades. Fan speed and air volume will be modulated through VFDs controlled by supply duct static pressure controller.

3) Return fans will be mixed flow type with air foil blades. Fan speed and air volume will be modulated through VFDs controlled by return fan discharge static pressure controller.

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- 4) The return fan will consist of the following components:
 - a) Smoke Detectors at Return Fan Inlet Ductwork
 - b) Return Fan with VFD
 - c) Return Air Damper
 - d) Relief Air Damper
 - 5) The supply air terminals will have an internal liner with aluminum foil protection. ATs will be provided with system pressure independent DDC controllers with 24-volt electric actuators.
- d. Distribution
- 1) Ductwork will be constructed in accordance with SMACNA Standards for the appropriate pressure class. Ductwork will be sealed to meet SMACNA Seal Class A as a minimum and to limit ductwork leakage not to exceed 1% of the design flow rate for high pressure ductwork and 2% for low pressure ductwork.
 - 2) High pressure (3" wc) galvanized steel ductwork will distribute supply air from the air handling unit to the supply air terminal devices.
 - 3) Low pressure (2" wc) galvanized steel ductwork will be utilized downstream of supply terminal devices to distribute supply air to the spaces and for return air ductwork.
 - 4) One air terminal device will be provided where individual space temperature control is required.
 - 5) Supply air ductwork will be externally insulated with fiberglass insulation.
6. Dedicated Outdoor Air System (DOAS)
- a. System Description
 - 1) System will be constant volume energy recovery unit for the dedicated outside air system (DOAS).
 - 2) Air will be supplied to AHU-1 and AHU-3 with a majority of this air returning to the DOAS unit. The remaining portion of air not returned to the unit shall be utilized as make-up air for the exhaust systems and for building pressurization.
 - 3) Ducted exhaust air system will be used.
 - 4) The DOAS system will operate with occupied and unoccupied control cycles.
 - 5) Supply air ductwork will not be lined.

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b. Design Criteria

1) DOAS Unit Component Sizing

a) Maximum allowable nominal face velocities:

Air Intake Louvers:	400 fpm through the free area of louver
Filters:	500 fpm
Hot Water Heating Coils:	650 fpm
Cooling Coils:	500 fpm
Wheel:	500 fpm

2) Supply Air Duct System Sizing

Supply Ductwork Sizing	Maximum pressure drop of 0.08"/100 ft when $\leq 10,000$ cfm
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3) Exhaust Air Duct System Sizing

Exhaust Ductwork Sizing	Maximum pressure drop of 0.08"/100 ft when $\leq 8,000$ cfm
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c. Distribution

1) Ductwork will be constructed in accordance with SMACNA Standards for the appropriate pressure class. Ductwork will be sealed to meet SMACNA Seal Class A as a minimum and to limit ductwork leakage not to exceed 1% of the design flow rate for high pressure ductwork and 2% for low pressure ductwork.

2) High pressure (3" wc) galvanized steel ductwork will distribute from the DOAS unit serving to all main supply and exhaust ducts.

3) Low pressure (2" wc) galvanized steel ductwork will be utilized in branch ductwork to the spaces for all supply and exhaust air ductwork.

4) Supply air ductwork will be externally insulated with fiberglass insulation.

d. Equipment and Material

1) The DOAS unit will be of galvanized steel. The units will consist of the following components:

- a) Outside air intake damper
- b) 4" (MERV 13) Efficient Prefilters (as rated on ASHRAE Standard 52.1)
- c) Total enthalpy energy recovery wheel with VFD
- d) Supply and exhaust fan with VFDs
- e) Exhaust air intake damper
- f) Smoke detector at supply air discharge ductwork

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- 2) Supply fan will be direct drive, centrifugal plenum type with airfoil blades. Fan speed and air volume will be constant volume. Fan motor will have VFD for adjustment of airflow for Testing & Balancing.
 - 3) Exhaust fan will be direct drive, centrifugal plenum type with airfoil blades. Fan speed and air volume will be constant volume. Fan motor will have VFD motor for adjustment of airflow for Testing & Balancing.
 - 4) Wheel will be 4 angstrom rotary air-to-air enthalpy wheel with lightweight polymer or aluminum core and molecular sieve desiccant. The wheel will have bypass damper configuration to optimally condition the incoming outdoor and exhaust discharge air.
7. General Exhaust System
- a. System Description
 - 1) The system will service janitor's closets, storage, and toilet rooms.
 - 2) The exhaust will be ducted back to the DOAS energy recovery unit section where practical. Otherwise, there will be small in-line or ceiling mounted fan ducted to the exterior.
 - b. Distribution
 - 1) Ductwork will be constructed in accordance with SMACNA Standards for the appropriate pressure class. Ductwork will be sealed to meet SMACNA Seal Class A as a minimum and to limit ductwork leakage not to exceed 1% of the design flow rate for high pressure ductwork and 2% for low pressure ductwork.
 - 2) Low pressure (2" wc) galvanized steel ductwork will be utilized upstream of exhaust fan.
 - c. Equipment and Materials
 - 1) The exhaust system will consist of the following components:
 - a) Exhaust fan will be housed in the energy recovery air unit's section of the DOAS.
 - b) Ductwork will be galvanized steel for toilet and Janitor closets.
8. Concession Exhaust System
- a. System Description
 - 1) The system will service concession as exhaust system.
 - 2) The exhaust system will be constant volume.

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- 3) There will be roof mounted exhauster to the exterior.
 - b. Equipment and Materials
 - 1) The exhaust system will consist of the following components:
 - a) Ductwork will be galvanized steel for the Concession Area.
9. Mechanical Equipment Rooms
 - a. System Description
 - 1) The main mechanical room of boiler, pumps and air handling system will be ventilated with outdoor air and exhausted to outdoors.
10. Telecommunication Rooms
 - a. System Description
 - 1) Telecommunication rooms will be provided with split system, direct expansion cooling units to maintain specified equipment inlet temperatures.
 - 2) System will provide year-round cooling to the space.
 - b. Equipment and Components
 - 1) Split systems are packaged equipment including cabinet, controls, sensors, fans, cooling coils, and associated condensing unit outside.
11. Elevator Machine Rooms
 - a. System Description
 - 1) Elevator machine rooms will be provided with split system, direct expansion cooling units to maintain specified equipment inlet temperatures.
 - 2) System will provide year-round cooling to the space.
 - b. Equipment and Components
 - 1) Split systems will be packaged equipment including cabinet, controls, sensors, fans, cooling coil, and associated condensing units outside.

5.3.3.5 Testing, Adjusting, and Balancing:

1. The building will be tested, adjusted, and balanced by a Certified Subcontractor in accordance with AABC or NEBB and balancing standards. All minimum air and water flows for variable flow systems will be met and the temperature control vender will optimize energy usage. This work will be included under the HVAC Contractor's work scope.

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5.3.3.6 Building Controls

1. Mechanical systems will be controlled and monitored through a DDC based Building Automation System (BAS) with distributed processing at the local level. Electric actuation will be utilized for all control valves and dampers.
2. The control system will interface with BACnet open protocol to the existing Airport's BAS system. The intent is to provide a networked, distributed control system utilizing the ANSI/ASHRAE Standard 135, BACnet and integration to the Siemens's APOGEE Direct Digital Control System.
3. DDC controllers serving major equipment will have a minimum of 2 spare points of each type (DI, DO, AI and AO) at each panel. For universal points, the spares will be divided evenly between the analog and digital types of points.
4. Control panels and DDC controllers serving equipment fed by emergency/stand-by power shall also be served by emergency/standby power. All BAS and DDC system primary controllers, PC's and communications equipment that monitors life safety and critical points (fire alarm, elevator emergency, etc.) will be supported by emergency generators. Control panels and DDC controllers fed by emergency/standby power will be served by individual UPS for each controller/system with minimum of 5 minutes of backup time.

5.3.3.7 Miscellaneous Information

1. Stairwell Heating
 - a. Each stairwell having external glazing/exposure and access to the exterior for egress will be provided with cabinet unit heaters to provide heating to the space.
2. Vestibule Heating
 - a. Each vestibule having external glazing/exposure and access to the exterior for egress will be provided with electric door air curtain to provide heating to the vestibules.

5.3.3.8 Standby Power

- a. All mechanical equipment is to be on standby power.

5.3.3.9 Project Construction Phasing

- a. The building will be completed in multiple construction phases. Details of the phasing have yet to be fully determined with the demolition of the utility plant.

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5.4 Electrical Narrative

5.4.1.1 Scope of Work

1. Project Understandings, Goals and Objectives
 - a. This Basis of Design (BOD) and associated drawings describe and define the electrical engineering systems proposed for the Ketchikan International Terminal Project.
 - b. The purpose of these documents is to describe the design basis and the design intent in sufficient detail to serve as basis for the contract documents.
 - c. The project involves three construction phases:

Phase 1A / 1B: New TSA Checkpoint Addition / Gate 1 (East Addition)

Phase 2: New Baggage Claim Addition (West Addition) / renovation of interior spaces.

5.4.1.2 Codes and Standards

1. The following applicable Codes, Standards, and Guidelines are intended to be used to determine acceptable design criteria, standard of performance, workmanship, etc. Based on industry best practice and Owner's experience, system design criteria that exceed the minimum standards will be applied as appropriate.
2. Applicable Codes

NFPA 70	National Electrical Code – 2020
Energy Code	International Energy Code – 2021

5.4.1.3 Design Criteria

1. Overall normal building power is calculated based on the following load Density values. Where VA/sq. ft values are given, these values are taken over the entire building area or, in the case of exterior lighting, over the entire illuminated area.

Item	Load Density	Unit
General Purpose Receptacles	1.0	VA/sq. ft
Lighting	0.6	VA/sq. ft
Exterior Lighting	0.25	VA/sq. ft
Low Voltage Systems	As Scheduled	
Mechanical Equipment	As Scheduled	
Plumbing Equipment	As Scheduled	
Other Equipment	As Scheduled	

2. Branch Circuit Load Calculations

Lighting	Actual Installed VA
Receptacles	180 VA per outlet
Multi-Outlet Assemblies	180 VA Per 2'-0"
Special-Purpose Outlets	Actual installed VA of equipment served

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- | | | |
|--|--------|------------------|
| | Motors | 125% of Motor VA |
|--|--------|------------------|
3. Demand Factors

	Lighting	100% of connected VA
	Receptacles	100% of first 10 kVA plus 50% of balance
	Motors	180 VA Per 2'-0"
	Special-Purpose Outlets	Actual installed VA of equipment served
	Motors	125% of largest motor plus 100% of all
	Fixed Equipment	100% of connected VA

 4. Electrical Quality Level
 - a. Equipment selections will be from manufacturers whose products comply with current industry accepted design and testing standards.
 - b. Equipment selection, specification and installation practices will reflect a commitment to long- term longevity of system, ease of maintenance and energy efficiency.
 - c. The intended level of quality of all wiring devices will be specification grade.
 - d. The intended level of quality of all lighting fixtures will be specification grade.

 5. Proposed manufacturers of major equipment will be as indicated

	Equipment	Manufacturer(s)
	Power Distribution Equipment	Square D, Eaton, Siemens
	Generators	Cummins, Kohler, MTU
	Automatic Transfer Switches	Cummins, Kohler, MTU, ASCO
	Wiring Devices	Hubbell, Leviton, Legrand
	Fire Alarm Devices	EST (Existing System)
	Switchgear	Square D, Eaton, Siemens
	Panelboards	Square D, Eaton, Siemens
	Dry type transformers	Square D, Eaton, Siemens

 6. Energy conservation:
 - a. Electrical building systems shall be designed using sustainable energy efficiency goals.
 - b. Meet the requirements of IECC 2021.

5.4.1.4 Systems Descriptions

1. Electrical Demolition
 - a. System Description

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Phase 1A / 1B: The existing electrical service transformer and associated meters will be disconnected and relocated. The existing baggage claim carousel and bag screening will be removed and relocated.

Phase 2: Major renovation of the existing terminal.

b. Design Criteria

Owner release of structure.

Disconnection of electrical power to utilization equipment and circuits removed or affected by demolition work.

Electrical services rerouted or shut off outside area of demolition.

Survey and record condition of existing facilities to remain in place that may be affected by demolition operations. After demolition operations are completed, survey conditions again and restores existing facilities to their predemolition condition.

Notify utilities prior to razing operations to permit them to disconnect and remove or relocate equipment that served existing facilities.

Contractor shall notify Architect/Engineer of existing code violations observed while performing his work. If corrective action needs to be taken that changes the scope of the work, corrective action to proceed only after approved by Architect/Engineer.

Provide temporary wiring and connections to maintain existing systems in service during construction. Assume all equipment and systems must remain operational unless specifically noted otherwise on drawings.

Existing Electrical Service: Maintain existing system in service until new system is completed and ready for service. Disable system only to make switchovers and connections. Obtain permission no fewer than 14 days in advance of proposed interruption of electric service before partially or completely disabling system. Minimize outage duration. If required, make temporary connections to maintain service in areas adjacent to work area. Do not proceed with interruption of electric service without Owner's written permission.

Existing Fire Alarm System: Maintain existing system in service. Disable system only to make switchovers and connections. Obtain permission and no fewer than 14 days in advance of proposed interruption of Fire Alarm System before partially or completely disabling systems. Minimize outage duration. If required, make temporary connections to maintain service in areas adjacent to work area. Do not proceed with interruption without Owner's written permission.

2. Electrical Site Work

a. System Description

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Phase 1A / 1B: Major site work will include medium voltage cabling and conduit as required by electrical utility relocation. A temporary electrical service will be required to keep the airport operational. A new service transformer will be located across the street from the airport and new feeders for each meter (total of 5) will be routed under the road to associated services located around the airport property.

Phase 2: Minor site electrical work.

3. Electrical Service

a. System Description

Primary electric service at 208Y/120V voltage will be derived from Utility.

b. Design Criteria

The primary system service capacity will be designed to serve the calculated connected load of the facility plus an additional 20% for anticipated future loads.

4. Normal Power Services and Distribution

a. System Description

Secondary electric service at 208Y/120 volts 60 Hz will be provided by Utility.

b. Design Criteria

Service to the main switchboard shall be located within the main electrical room.

Utility metering shall be installed at service entrance and shall comply with local provider requirements as appropriate.

The requirements for the proper location of the meter enclosure shall be provided by the service provider. Metering of the normal service will be achieved by Utility-provided metering equipment comprised of a meter and CT cabinet located near the utility transformer.

The switchboard distributes power to panelboards located throughout the facility. Electrical panels are located throughout the facility to minimize circuit lengths and the consequent need to increase conductor size required to overcome voltage drop.

c. Equipment and Material

Low voltage secondary switchboard shall be dead front, freestanding, self-supporting, NEMA type PB. Switchboard shall have copper bussing with bolted connections. Main breaker shall be 100% rated, insulated case, solid state electronic type with adjustable trip settings. Feeder breakers 400 Amp and larger shall be solid state electronic trip, feeder breakers up to 400 Amp shall be molded case type. The use of solid-state electronics on lower ampacity feeder breakers will be reviewed for selective coordination purposes.

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5. Standby Power System

a. System Description

The generator distribution system provides backup power for the entire airport.

The emergency/standby power source will be derived from a single 500 KW/ 625 kVA, 208Y/120V diesel-powered engine- generator set located in a dedicated building across the road from the airport. The standby power will be distributed to 2 automatic transfer switches: one for FAA load and one for the terminal.

The main electrical room will contain the automatic transfer switches.

b. Design Criteria

The design criteria for the Emergency/Standby System will be like that for the normal power system.

The capacity of the generator will be enough to serve the facility, with approximately 50 KW future capacity.

c. Equipment and Material

The 500 KW/ 625 kVA, 208Y/120V generator will be diesel engine driven. A day tank installed in the generator room will have adequate capacity to operate the generator at full load for at least 12 hours.

The diesel engine cooling system will include a local radiator.

The engine-generator set will be mounted on a concrete-filled inertia base mounted on spring isolators.

Two (2) 208Y/120V, four-pole, Automatic Transfer Switches (ATS) will be used to couple the generator power to the distribution system. The transfer switches will be in the service entrance electrical room.

6. Switchboard

a. System Description

Basis of Design Product: Eaton Pow-R-Line C Switchboard

- a) Front-connected, front-accessible; rated for 3 phase, 4 wire.
- b) Main devices to be fixed, individually mounted. Branch devices to be panel mounted.
- c) Phase, neutral, and ground buses will be hard-drawn copper, tin-plated. All busses will be uniform capacity for entire length of switchboard and shall allow for future extensions from both ends. Neutral bus will be 100% of the ampacity of the phase buses.
- d) Circuit Breakers 250A and Over: Solid State Electronic Trip Type
- e) Circuit Breakers Under 250A: Thermal Magnetic Trip Type

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7. Low Voltage Distribution Transformers

a. System Description

Basis of Design Product: Eaton general purpose ventilated transformers

Transformers Rated 15 kVA and Larger: Comply with 10 CFR 431 (DOE 2016) efficiency levels

NEMA 2 enclosure

Transformers 75kVA and smaller: trapeze mounted

Transformers larger than 75kVA: pad-mounted

b. Equipment and Material

Size: varies

Primary Voltage: 480V

Secondary Voltage: 208Y/120V, 3PH, 4W

Windings: copper

Insulation: 220 degrees C

Rise: 150 degrees C

8. Distribution Panelboards

a. System Description

Basis of Design Product: Eaton Pow-R-Line C

Spare Capacity: 20%

b. Equipment and Material

Mounting: wall-mounted (flush or surface dependent on location)

Circuit Breaker: bolt-on type

Bussing: tin-plated copper bus

Connectors: compression type

Enclosures will be NEMA Type 1 for indoor dry locations, NEMA Type 3R for outdoor locations, NEMA Type 4X for other wet or damp indoor locations, NEMA Type 12 for indoor locations subject to dust, falling dirt, and dripping non-corrosive liquids.

9. Lighting and Appliance Panelboards

a. System Description

Basis of Design Product: Eaton Pow-R-Line C

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Spare Capacity: 20%

b. Equipment and Material

Mounting: wall-mounted (flush or surface dependent on location)

Circuit Breaker: bolt-on type

Bussing: tin-plated copper bus

Connectors: compression type lugs (MLO) or main circuit breaker (MCB).

Enclosures will be NEMA Type 1 for indoor dry locations, NEMA Type 3R for outdoor locations, NEMA Type 4X for other wet or damp indoor locations, NEMA Type 12 for indoor locations subject to dust, falling dirt, and dripping non-corrosive liquids.

10. Passenger Boarding Bridge Connections

a. System Description

Refer to Passenger Boarding Bridge drawings for electrical work associated with new / existing boarding bridges.

b. Design Criteria

All new boarding bridges have the following connections.

- a) PBB: 480V, 60A service to building face
- b) PCA: 480V, 150A service to building face
- c) 400Hz: 480V, 125A service to building face

11. Surge Protective Devices (SPDs)

a. System Description

Basis of Design Product: Liebert 510 Series

Comply with UL 1449.

The SPD shall have line to neutral (L-N), line to ground (L-G), line to line (L-L) and neutral to ground (N-G) protection modes for three-phase grounded wye configured systems.

b. Design Criteria

Comply with UL 1449, Type 2.

Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per phase shall not be less than 240kA for each mode.

SCCR: equal or exceed 100kA

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Surge suppression equipment shall be connected via a circuit breaker to allow for ease of maintenance.

12. Power Monitoring

a. System Description

A new central power monitoring system will be installed on all low-voltage switchgear, switchboards, power distribution panelboards, and tenant spaces.

Power monitoring system shall be interfaced with building automation system. Power monitoring system will allow for custom owner reports based on usage.

b. Design Criteria

Comply with UL 845 and NEMA ICS 2.

13. Lightning Protection System

a. System Description

No Lightning Protection system will be provided.

14. Grounding System

a. System Description

A new grounding system will be added to the airport.

15. Lighting System

a. System Description

The lighting system will be designed to provide average illuminance levels in compliance with IES Lighting Library® recommendations.

All lighting design and fixture selection shall be coordinated with Architect/User Agency.

The lighting system will be designed to enhance visual quality while minimizing connected lighting power density and lighting energy use.

Illumination quality will enhance the visual experience of visitors and staff by providing orientation cues and addressing visual comfort needs.

Vertical surfaces will be accented where to encourage the sense of brightness and openness.

Manual switching/dimming in conjunction with advanced lighting controls will be used to minimize electric lighting energy through the use of occupancy/vacancy sensors, daylight harvesting, and programmable dimming.

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Luminaires will use primarily high efficacy, long life, and high color rendering LEDs.

The vocabulary of lighting techniques will include ambient, task, and accent lighting using leading-edge technologies.

All luminaires will be high quality specification grade equipment by reputable manufacturers and CE/UL/IP- listed for the application, unless otherwise noted.

Only fixtures from reputable manufacturers will be specified, ensuring future support.

All LED lighting must adhere to the requirements and guidelines of the IESNA testing standards of LM-79 – IES Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products and LM-80 – Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and modules.

All LED luminaires shall meet or exceed 70% lumen output for a minimum of 50,000 hours. Overall lumen output shall not depreciate more than 20% after 10,000 hours of use.

All interior LED luminaires shall maintain color consistency utilizing a maximum 3-step MacAdam Ellipse binning process. Exterior fixtures shall maintain a maximum 5-step MacAdam Ellipse binning process.

- b. Lighting levels will be in accordance with recommendations of the Illuminating Engineering Society (IES) and as indicated below.

Area	Maintained Foot-candles
TSA Checkpoint	50-75
Circulation Areas	10-15
Recompose Area	15-20
Baggage Claim	15-20
Ticketing	25-30
TSA Baggage Screening	50-75
Stairs	10 (1FC min for emergency illumination)
Restrooms	15
Offices / General Office Area	35
Concessions – Food Prep	40-50
Concessions – Counter / Seating	20
Hold Rooms	25-30
MEP and Storage Rooms	20
Low Voltage System Rooms	50 (min of 5 C at the bottom of the rack)
Front Canopy	5

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c. Design Criteria

For the general lighting in the facility the following is the list of acceptable manufacturers and their brands subject to constructability, lumen packages and accessories comparability.

- a) Eaton/Cooper
- b) Acuity/Lithonia
- c) Philips Lighting
- d) Hubbell Lighting
- e) H.E. Williams

All lighting will be of the LED type.

The design will minimize the variety of fixture types to simplify long-term maintainability.

Lighting density will be based on IECC 2021 for lighting power allowances per space.

The target luminous efficacy shall be min of 100 Lumens/Watt for linear fixtures and 65 Lumen/Watt or greater for down-lighting.

All fixtures shall be provided with 0-10 Volt dimmable drivers, unless specifically required otherwise by the space application.

Dimming drivers shall be specified to dim to 10%, 5% or 1% light output or less and shall be fully compatible with dimming control equipment.

LED modules will have a minimum CRI of 80 and will generally be provide with a color temperature of 3500K.

d. Proposed Lighting

- Offices, Meeting rooms – with ceiling height 9’0” or below – Low glare LED troffer – Lithonia Envex or similar
- Open office space with ceiling height 10’0” and above – Low glare LED troffer – Lithonia Envex or similar
- Meeting/Conference rooms – Low glare LED troffer – Lithonia Envex or similar
- Lobby, Lounges and Main circulation spaces – Linear LED recessed lighting
- Restrooms – LED perimeter lighting at wet walls, Downlights for emergency/general lighting.
- Utilitarian spaces – LED flat panels or LED lensed strips if exposed to structure.
- Stairs – Low glare LED troffer – Lithonia Envex or similar

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e. Emergency Lighting:

UL 924 listed Emergency lighting inverters or individually mounted battery backup drivers will be utilized to provide power for the Code required emergency and egress lighting.

Emergency and exit/egress lighting will be provided in accordance with IBC 2021 and NFPA 101 and local codes. The required path of egress routes and location will be coordinated with Architect prior to issuance of Bidding documents. Emergency egress illumination will be extended to the nearest public way.

Exit lighting will be provided as required to mark the designated path of egress.

f. General Lighting Control:

All lighting will be controlled to meet or exceed the local energy code listed in the basis of design.

Total building lighting control shall be used. Low voltage control system may be distributed type or centralized or combination of both. All low voltage controls shall be by the same manufacturer and tied into a single head end.

The following is the list of acceptable manufacturers.

a) nLight by Acuity Controls – Expand existing nLight control in Concourse

Lighting control panels or distributed control systems will include a digital time clock with capabilities to control individual relays based on digital inputs from accessory devices.

Occupancy sensor will utilize passive infrared and/or ultrasonic or microphonic technologies. Dual technology occupancy sensors will be implemented in all public and staff restrooms. Ultrasonic sensors shall be utilized in stairwells and shall be equipped with fail-on technology.

Combination manual dimmer/vacancy sensors will be utilized in the private offices.

For emergency lighting controlled by a wall switch or lighting control panel, a UL924 ELCU will be provided to automatically turn emergency lighting on in the event of loss of normal power. Device model shall be compatible with power supply control type.

Occupancy and Vacancy sensors will be tied into the building low voltage lighting control

All low voltage lighting control will be tied into the building BAS for monitoring only.

g. Lighting Control Intent of Operation:

Interior Lighting Control

- a) Manual wall switches will be used in the following rooms (as permitted by NEC (locations where an unsafe condition would exist if the lights were turned off automatically)).

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- Mechanical Rooms
 - Electrical Rooms
 - Telecom Rooms
- b) Automatic only controls are allowed per IECC 2021 to be installed in the Public Restrooms – ceiling mounted occupancy sensors (min time delay pre-set at 20min).
- c) Occupancy/vacancy sensors will be used in conjunction with manual switches at the locations where occupancy is deemed intermittent. Occupancy and vacancy sensors will turn lights off at a predetermined amount of time. Occupancy sensors shall be used in areas where it is unsafe or difficult for occupants to turn on a switch upon entering a room such as storage rooms, janitorial closets, and individual restrooms. In workspaces, such as individual offices, small conference rooms, and collaboration areas, vacancy sensors will be used requiring the occupants to turn on the lighting to the desired level. Where occupancy or vacancy sensing switches are used, the occupant will be given the ability to turn the lights off upon exiting the room. Some occupancy and vacancy sensors shall also have the capacity for dimming control.

16. Apron Lighting

a. System Description

New LED, pole-mounted apron lighting will be installed for Gate 1 and Gate 2. The existing pole-mounted apron light will need to be removed. It is anticipated that two new poles will be required to provide adequate light levels at each aircraft position.

17. Fire Alarm System

a. System Description

The fire alarm system for the areas of the addition and renovation will consist of smoke detectors, heat detectors, duct smoke detectors, manual pull stations, water flow monitors, tamper switches, and visual/audible signaling devices.

The existing EST system will be expanded.

b. Design Criteria

The fire alarm system will comply with requirements of NFPA 72 and Life Safety Codes.

Audio/visual devices will be installed in all areas of the building in accordance with the NFPA and ADA guidelines. All areas of the building will be covered by audible device coverage as required by NFPA

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72 and the International Building Code as adopted in Alaska. Visual devices will be installed in those public and common areas as recognized by ADA such as corridors, bathrooms, hold rooms, break areas, and lobbies. Visual devices will also be provided in mechanical areas as a supplement to the audible devices.

Smoke detectors will be installed as required by the National Fire Protection Association and the International Building Code. Smoke detectors will be installed in, but not limited to, the following locations: air handling units, elevator shafts, elevator lobbies, elevator machine rooms, and electrical equipment rooms.

Heat detectors will be installed in areas that are not feasible for smoke detectors.

Manual pull stations will be installed adjacent to all exit doors, in each elevator lobby, and at nurses' stations.

c. Equipment and Material

The system will utilize individual, addressable, photoelectric smoke detectors; heat detectors; addressable manual pull stations; and addressable monitor and control modules. The system will monitor all sprinkler supervisory and water flow switches and will interface with elevators, HVAC smoke control, and smoke fire dampers.

d. Distribution

All initiating and signaling devices will operate at 24VDC and will be installed in accordance with manufacturer's specifications.

All wiring will be installed in conduit.

Fire alarm devices will be readily labeled with signal or input wiring loop number and device ID number.

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5.5 Technology Narrative

5.5.1 Scope of Work

5.5.1.1 *Project Understandings, Goals and Objectives*

1. This Basis of Design (BOD) and associated drawings describe and define the technology systems proposed for the Ketchikan International Airport Terminal Project.
2. The purpose of these documents is to describe the design basis and the design intent in sufficient detail to serve as basis for the contract documents.
3. The technology scope for this project includes the build-out of new technology spaces, pathways, and a Structured Cabling System (SCS). Additionally, existing technology systems will be expanded to support all the new areas and functions.
4. The project involves three construction phases:
 - a. Phase 1A / 1B: New TSA Checkpoint Addition / Gate 1 (East Addition)
 - b. Phase 2: New Baggage Claim Addition (West Addition) / renovation of interior spaces.

5.5.2 Codes And Standards

1. Applicable portions of the following codes, standards, regulations, and recommendations shall be observed in the design of the information technology infrastructure system, technologies and supporting facilities:
 - a. International Telecommunications Union – Telecommunications (IT-UTI)
 - b. International Organization for Standardization (ISO)
 - c. American National Standards Institute / Telecommunications Industry Association (ANSI/TIA)

ANSI/TIA-568.0.E	Generic Telecommunications Cabling for Customer Premise – 2020
ANSI/TIA-568.1.E	Commercial Building Telecommunications Cabling Standard – 2020
ANSI/TIA-568.2.D	Balanced Twisted-Pair Telecommunications Cabling and Component Standard – 2018
ANSI/TIA-568.3.D	Optical Fiber Cabling Components Standard – 2016
TIA-569	Commercial Building Standard for Telecommunications Pathways and Spaces – 2019
ANSI/TIA-606.C	Administration Standard for Commercial Telecommunications Infrastructure – 2017
ANSI/TIA-607.D	Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunication – 2019

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TIA-758.B Customer Owned Outside Plant
Telecommunications Infrastructure Standard – 2012

- 1) Institute of Electrical and Electronic Engineers (IEEE)
 - ANSI/IEEE 802.3 IEEE Standard for Ethernet – 2018
 - ANSI/IEEE 802.11 Wireless LAN Medium Access Control (MAC)
and Physical Layer (PHY) Specification - 2016

- 2) Building Industry Consulting Services International (BICSI) Manuals:
 - TDMM Telecommunications Distribution Methods Manual –
14th Edition
 - ITSIMM Information Technology Systems Installation Methods
Manual – 7th Edition
 - OSPRDM OSP Design Reference Manual – 6th Edition

5.5.3 Design Criteria

- 1. The following sections reflect and define the criteria and assumptions that will be used for the design, specifications, and documentation of the Ketchikan International Airport (KTN) information technology infrastructure. This infrastructure addresses the spaces, pathways, cabling, and technology systems which support both the building and user services. Three distinct areas will make up the complete information technology infrastructure solution for this Facility:
 - a. Technology Spaces (Building Entrance Facility (BEF), Main Technology Room (MTR), Technology Room(s) (TRs), etc.).
 - b. The Structured Cabling System (SCS) including the pathways that support the distribution of the SCS (cable tray, conduit, etc.).
 - c. Technology Systems: The systems that support the needs of the facility (networking, physical security systems, overhead paging (PA), Wi-Fi, etc.).

- 2. Technology Spaces:
 - a. Building Entrance Facility (BEF)
 - 1) The BEF is existing and resides on the first floor in the existing mechanical.
 - a) The BEF provides the point of demarcation for incoming telecommunications services from service providers and as the transition point between outside plant (OSP) cabling and the Structured Cabling System (SCS).
 - b) Additional riser cables are planned for connectivity between the BEF and the new TRs.

CONCEPT BUDGET REPORT

b. Main Technology Room (MTR)

- 1) A new MTR will be created in the first floor near the existing Building Entrance Facility claim area.
 - a) The MTR will house the base infrastructure for the facility including internet routers, firewalls, network distribution switches, and servers supporting the building services and applications.
 - b) Additional riser cables are planned for connectivity between the MTR and the new TRs.

c. Technology Rooms (TRs)

- 1) The TRs are defined as the interface between the backbone cabling system and the horizontal cabling system. The TRs accommodate necessary space and environmental considerations for all components necessary to provide final connectivity to end user devices through the horizontal cabling system.
- 2) Criteria established under TIA 568 set forth distance limitations on high performance cabling systems, which will be discussed in the Structured Cabling System (SCS) section below but has a direct effect on the placement of these distribution rooms. The TRs must be located so that installed and terminated horizontal cable lengths do not exceed 295 feet (90 meters).
- 3) Any entrance door should open outwards to increase the available usable space within the TRs.
- 4) The TRs will be arranged to accommodate the following systems and equipment:
 - a) Termination and patching facilities for horizontal cabling.
 - b) Termination and patching facilities for backbone cabling.
 - c) Hardware and racking for network switches and any other electronic components necessary to support the facility and users.
 - i. Power outlets for any electronic equipment located within the TR should be fed from an electrical panel dedicated to these loads, ideally located within each TR. Panels serving the TR should be on the building emergency power distribution system. Power accommodations should include both 120V and 208V to rack power distribution and UPS systems.
 - ii. Dedicated cooling, electrical and fire suppression provisions are recommended for the TRs to allow the network and associated electronics to operate efficiently and reliably over the life cycle of the building. The installation shall be in accordance with TIA 569.

CONCEPT BUDGET REPORT

5.5.4 The Structured Cabling System (SCS)

1. The SCS infrastructure is the cabling system that interconnects all technology spaces and devices in the KTN Airport Terminal from the BEF to the MTR, to the TR, and ultimately out to the technology outlets and subsequently to network-connected devices.
2. End devices will connect through the horizontal cabling terminated in the TR serving that area. Having a TR serving specific areas not only simplifies resource planning, but it is also designed to ensure that the proper distance limitations are maintained for the horizontal cabling.
3. To ensure the SCS is a reliable and flexible solution that can accommodate future growth and maintenance requires proper planning and design for the building pathway systems (cable trays, conduits, etc.) and the actual technology space buildout (racks, wire management, etc.).
4. The SCS, building pathway systems, and technology space buildout are outlined in detail in the subsections below.
5. SCS Design Considerations
 - a. In conformance with the ANSI/TIA-568.0.E standard, the information technology cabling system should be designed in a hierarchical star topology in the following manner:
 - 1) Horizontal cabling will be home run from each technology outlet to its respective TR.
 - 2) No intermediate termination or patching facilities will be allowed.
 - 3) Backbone optical fiber cabling shall be installed in a star topology from the fiber distribution panel in the MTR to each TR.
 - 4) Backbone copper cabling shall be installed in a star topology from the copper terminations field located in the MTR to each TR.
 - 5) All cable is to be of PVC, LSZH or Plenum construction depending on local codes, standards, and configuration of HVAC system installed.
 - b. Cable length limitations should be as follows:
 - 1) Horizontal Cabling – 295' feet (90 meters) from the technology outlet to the termination point located within the TRs.
 - c. Wherever possible, distribution of non-standard compliant cabling will be designed to conform to the above topological requirements.
 - d. The cabling system is designed to support any digital and analog voice grade services.
6. Fiber/Copper Backbone Cabling

CONCEPT BUDGET REPORT

- a. The primary backbone infrastructure will be single-mode optical fiber cable installed from the BEF and MTR to the TRs in this building. This will provide the capability to extend the network services and allow capacity for other systems or network topology changes. This will also support the implementation of 10Gbps Ethernet backbone and future 40Gbps technologies throughout the new facility.
 - b. A limited traditional copper backbone will be installed to accommodate any copper reliant analog or digital voice grade services that are required in the new facility.
 - 1) Internal copper backbone cables, consisting of a minimum of 25-pairs, shall be provided from the MTR to the TRs.
 - 2) The copper backbone cables should be terminated on rack mounted “resource” patch panels in the MTR and TRs. Termination in the BEF should be on 110 type blocks.
7. TV Cabling
- a. Television (TV) service will be distributed throughout the facility via coaxial cabling. End clients are used at displays where necessary, to convert signals for display on flat panels. Where technology permits, direct connection to displays may be an alternative for this project to obtain TV at selected displays.
 - b. A coaxial system consists of two basic elements:
 - 1) Distribution System—a network of distribution media (e.g., coaxial cables) and local area taps and splitters.
 - a) Typical distribution coaxial cable consists of RG111 or .500” cables.
 - b) Subscriber Drop - coaxial cables, faceplates and “F” connector outlets where the user connects the TV set.
 - c) Typical subscriber drop coaxial cable consists of RG-6 or RG11.
8. Horizontal Cabling
- a. The horizontal cables connecting the end user device to the network at a minimum should consist of Category 6 (Cat6) 4-pair unshielded twisted pair (UTP) cables for technology outlets and Category 6a (Cat6a) for wireless access points (WAPs).
 - b. Additional considerations for horizontal cabling:

CONCEPT BUDGET REPORT

- 1) All 4-pair UTP cables shall be terminated at the outlet utilizing Cat6 or Cat6a, 8-pin modular connectors with the 568B wiring configuration.
- 2) All 4-pair UTP cables shall be terminated within the TR on rack mounted 24 or 48 port patch panels utilizing the 568B wiring configuration. The termination method should be identical regardless of the intended application.
- 3) Any systems not capable of being supported on this media shall be addressed on a case-by-case basis. Where necessary, vendor specific cabling should be provided.

9. Building Pathway Systems

- a. Conduits, cable tray, non-linear cable supports and other fixed containment that support information technology cabling within the new facility are a key component in the information technology infrastructure. Proper sizing, placement, routing and integration with other routed services will ensure connectivity and flexibility, which becomes a benchmark in the determination of a truly successful infrastructure. Design parameters established herein follow standards established in the TIA 569 Installation Practices within Buildings documents. These standards have been established in reference to the dynamic, changing nature of information technology cabling systems and provide guidelines to enable maximum cabling flexibility to accommodate future changes.
- b. Backbone Cabling Pathways
 - 1) The copper and optical fiber backbone cabling pathways will be accommodated in appropriate conduit pathways from the BEF and MTR to the TRs in this facility.
 - a) Horizontal Cabling Pathways
 - i. The SCS horizontal cable distribution from the TR to each outlet position will require a flexible pathway of appropriate dimension to accommodate day one and future cabling installations to the SCS outlets. Also, ease of installation and cable maintenance are important in the selection of the appropriate pathway.
 - ii. The horizontal pathway will be provided within the ceiling area. The provision of a properly sized conduit and cable tray system will provide flexibility in installing, modifying, adding, or deleting any portion of the cable plant.
 - iii. All pathway routes shall be coordinated with other building services (electrical, mechanical, etc.) to assure proper clearance and access, as well as to avoid impact from heat, electro-magnetic interference or leakage from other building services.
 - iv. The pathway system shall be coordinated with the electrical distribution system in order to maintain a minimum 12" separation between parallel runs of information technology and electrical cabling. Where electrical and information technology cabling cross, it should be at right angles only.

CONCEPT BUDGET REPORT

10. Technology Space Hardware:

a. Cabinets

- 1) 7' high standard and colocation network cabinets supporting 19in rack mounting with standard EIA hole spacing.
- 2) Rack Units (RU):
 - a) Standard Network Cabinet: 44 RU
 - b) 2-Compartment Colocation Cabinet: 21 RU (36.812") x2
 - c) 3-Compartment Colocation Cabinet: 14RU (24.625") x3
- 3) Cabinets shall be secured to the floor and adjacent cabinets.
- 4) Vertical cable management shall be cabinet manufacturer specified to reside within the cabinet enclosure.
- 5) Horizontal cable management shall be provided for patch cable management.
- 6) Vertical power distribution strip a minimum of 60" mounted at the rear of the standard network cabinets (Zero-U).
- 7) All racks will be bonded to the telecommunications grounding bus bar with a horizontal rack-mounted ground bar.

b. Racks

- 1) 7' high, 19in mountable with standard EIA hole spacing.
- 2) 42U minimum usable spaces.
- 3) 2-post racks to support cabling.
- 4) 4-post racks to support network electronics.
- 5) Racks shall be bolted to the slab at front and rear flanges and tied to overhead ladder rack.
- 6) All racks are to be connected together in the TRs.
- 7) Vertical cable management shall be dual sided for patch cable management at the front and horizontal cable distribution management to the patch panels at the rear.
- 8) Vertical power distribution strip a minimum of 60" mounted to stand off brackets at the rear of the racks.
- 9) All racks will be bonded to the telecommunications grounding earth bar with a horizontal rack-mounted ground bar.

CONCEPT BUDGET REPORT

c. Telecommunications Grounding (Earthing) System

- 1) 7' high, 19in mountable with standard EIA hole spacing.

d.

- 2) The SCS cabling system must be provided with a reference signal grounding system, provided in accordance with the ANSI/TIA-607.D: Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunication – 2019, EN 50310 Bonding and Earthing standard, and local codes and standards documents. This system is an important component of the information technology infrastructure, maintaining ground continuity over the entire analog and digital transmission network throughout the building. The following guidelines are provided for the design of the system:

- a) A Telecommunications Grounding Busbar (TGB) shall be located in each TR.
- b) A copper grounding cable shall connect each grounding bus bar (TGB) to the electrical distribution board serving the respective TR.
- c) The grounding bus bars (TGB) shall be solid copper or electro-tin plated and insulated from their supports.

2. Pathways, space and media identification

- a) Due to the all-encompassing nature of the SCS, an identification system will be developed to uniquely identify each pathway segment, technology space, cabinet, rack, termination panel, grounding component and cable installed.
- b) All horizontal and backbone cables shall be assigned a unique alphanumeric designation for identification purposes and shall follow the ANSI/TIA-606.C Cable Labeling Standard.
- c) Labels having the appropriate cable designation shall be provided in the following locations for each cable:
 - 1) On each end of each cable
 - 2) On the outlet face plate in the work area.
 - 3) On the termination patch panels in the MTR and TRs.
- d) Cable designations will be designed for easy identification of point-of-origin and point-of-termination location.

CONCEPT BUDGET REPORT

5.5.5 Preliminary Space Program

1. Technology spaces
 - a. Telecommunication rooms (TRs)
 - 1) A combination of standard and colocation network cabinets to house backbone cabling, horizontal cabling, and electronics.
 - 2) Plywood lined wall(s) for wall-field terminations.
 - 3) Wall-fields or rack space for copper backbone cabling.
 - 4) Rack space as required for public address (PA) system expansion.
 - 5) Wall field or rack space for television systems equipment.
 - 6) Wall field for access control systems (ACS).
 - 7) Overhead tray support system
2. Comprehensive Facility Infrastructure
 - a. The SCS for the KTN Terminal Remodel will be a common use system. All horizontal cabling will be terminated in a common secured airport cabinet in each TR regardless of cable destination; the only exception is for cabling designated for TSA. Each tenant will be allocated a secured rack compartment for all their electronics and a patch panel that connects back to the airport cabinet mentioned above. This will facilitate a managed cabling solution allowing a conformed horizontal cable plant while giving flexibility for moves, adds, and changes.
 - b. Copper Horizontal Cabling
 - 1) Minimum performance standard stated for horizontal cabling is Category 6 (Cat6).
 - c. Technology Outlets
 - 1) Provide a minimum of two (2) Cat6 cables at each technology outlet.
 - 2) There will be two (2) such outlets on opposing or adjacent walls of each enclosed (office) work area.

CONCEPT BUDGET REPORT

- d. WI-FI
 - 1) Provide two (2) Cat6a cables at each wireless access point location.
- e. Video Surveillance
 - 1) Provide one (1) Cat6 cable at each IP camera location.
- f. Television (TV)
 - 1) Provide one (1) Cat6 and one (1) RG6 cable at each TV location.
- g. Copper Backbone Cabling
 - 1) Provide one (1) twenty-five (25) pair multi-pair Category 3 copper backbone cable from the MTR to the TRs in this facility.
- h. Optical Fiber Backbone Cabling
 - 1) Provide a minimum of one (1) twenty-four (24) strand of single-mode optical fiber backbone cable from the BEF and MTR to the TRs in this facility.
 - a) Optical fiber terminated in rack-mounted fiber enclosures with LC connectors.
- i. Horizontal Cabling Pathways
 - 1) Minimum of 1" conduits shall feed wall boxes to support technology outlets.
 - 2) Minimum size technology outlet back box shall be 4-11/16" X 4-11/16" X 2 -1/8" complete with a single-gang reducer ring.
 - 3) Main pathway routing should be accomplished using cable tray and conduit.
 - 4) If conduits are not installed from the work area outlet, non-linear cable supports (j-hooks) shall be used to extend the horizontal cabling from the tray to the conduit wall stub.

5.5.6 TECHNOLOGY SYSTEMS

- 1. Wi-Fi
 - a. Infrastructure for Wireless Access Points (WAPs) will be installed in a distributed design throughout the entire facility providing access in all areas for mobile devices.

CONCEPT BUDGET REPORT

Cat6a cabling will be used to take advantage of the latest wireless technologies and provide the most bandwidth and throughput.

- b. Considerations for both Wi-Fi 5 and Wi-Fi 6 will be accommodated in the design.

2. Public Address (PA)

- a. The existing PA system will be expanded to accommodate the new areas.
- b. Conduit pathways and loudspeaker placement will be driven by code since the PA system also provides service as the Mass Communications platform for emergency announcements.

3. Digital Display Systems

- a. The current Electronic Video Information Display Systems (EVIDS) and digital signage solutions are provided by the Ketchikan Visitors Bureau and will be expanded upon as required for new display layout.
- b. Flight Information Display System (FIDS) / Gate Information Display System (GIDS) / Bag Information Display System (BIDS)
 - 1) The current FIDS/GIDS/BIDS system are primarily provided by the individual airports and will be expanded to accommodate the facility's expansion and renovation. The EVIDS vendor will maintain control of the media hardware and content. Connectivity will be provided through the SCS and space will be allocated in the MTR and TRs for any current or additional head-end and connectivity hardware.
- c. Digital Signage
 - 1) The current digital signage platform will be expanded with new LED displays providing advertising content. The current digital signage vendor will maintain control of the media hardware and content. Connectivity will be provided through the SCS and space will be allocated in the MTR and TRs for any current or additional head-end and connectivity hardware.

4. Physical Security Systems

- a. Video Surveillance System (VSS)

CONCEPT BUDGET REPORT

- 1) A new Video Management System currently being installed by the State of Alaska will be expanded as necessary to accommodate the needs of the existing KTN Terminal and new addition areas.
 - a) Additional storage capacity for a minimum of 30 days retention of full resolution recording 24/7 at 15 frames per second (FPS) will be required as part of this project to accommodate the cameras in this facility.
- b. Cameras
 - 1) New IP cameras will be provided for coverage of all public, Sterile, SIDA and Secure areas. The new cameras will include a basic level of analytics with the ability to add more complex analytics as needed.
 - a) A combination of fixed, multisensor, and pan-tilt-zoom (PTZ) cameras will be used to provide appropriate coverage.
 - b) Enclosures will be required appropriate to the environment where the cameras will be installed to mitigate any potential physical damage and maintain operability in adverse weather conditions.
- c. Access Control System (ACS)
 - 1) The existing Software House C-Cure system that is currently serving the Electronic Gates will be expanded to accommodate all secured doors from Public to Sterile/SIDA and Sterile to Secure/SIDA. Building operation spaces will also be access controlled.
 - 2) Access control specifics for this project include:
 - a) Software House Control Panels (ACPs) and power supplies shall be remotely mounted in the TRs to serve Access Controlled doors within the area served by the room.
 - b) HID Credential readers will be smart card proximity reader in both configurations of either a reader only or a combined reader/keypad based off the access requirements of the secured area.
5. Security Screening Checkpoint (SSCP)
 - a. Requirements and guidelines outlined in the latest version of the Checkpoint Requirements and Planning Guide (CPRG) will be followed for all the general connectivity and security requirements.
 - 1) Additional cameras will be required to provide specific fields of view of all operational aspects of the checkpoint. These cameras will be part of the Airport's video surveillance system.

CONCEPT BUDGET REPORT

- 2) Access control will be required to secure the SSCP during non-operational hours; this will be part of the Airport's access control system.
 - 3) All SSCP hardware Cat6 cabling will terminate in the new TSA Technology Room.
6. Alarm System
- a. The airport currently has an Advance Communications Alarm system installed throughout the facility. The existing system will be expanded as required to service the remodeled and expansion areas.

CONCEPT BUDGET REPORT

5.6 Baggage Handling System Narrative

Ketchikan International Airport (KTN) completed a Terminal Area Plan in 2021 that proposed the expansion and reconfiguration of the existing passenger terminal. A study into the existing and future baggage handling system (BHS) was looked at during this time as well. Based off that study, the findings and path forward are as follows:

5.6.1 Proposed Baggage Handling System Upgrades

As part of this project, KTN is undergoing terminal improvements. As part of these improvements, the ticket counters are expanding, and the air taxi area is being relocated and improved. With these terminal improvements, the BHS will be complimenting the improvements. In the regular ticketing area, the ticket counter conveyors will be extended to allow for more ticket counters. This extension will feed into the existing ticket counter conveyor. The air taxi ticket area will be relocated, and with this a new ticket counter/runout line will be created. It will allow bags to be taken and dropped at the ticket counter then sent back on a runout line for ground handlers to pick up. As of right now, no adjustment will be made to the inbound system.

5.6.2 Passenger Boarding Bridge (PBB) Narrative

5.6.2.1 Project Description

Ketchikan International Airport (the Airport, or KTN) has recently completed an Airport Master Plan. The Airport is now progressing with the design for the renovation and expansion of the Airport Terminal. The first phase of this Design is the Concept Development. Included within this report Aero Systems Inc. has developed three conceptual layouts. The layouts have assumed a two phased approach to construction. Phase 1 is a partial upgrade to the terminal and provides passenger boarding service to the second parking position. Phase 2 is a future development assumed to be 20 years out.

The concept plans have been developed with the stated existing and assumed aircraft fleet mix. All gates are assumed to be fully ADG III capable as noted in the conceptual plans. The design should be updated for any missing aircraft if such a condition is found to exist.

5.6.2.2 Layout Detailed Description

AP1 Existing Airport Layout

This layout displays the existing conditions of the Airport. The fire lane has been emphasized to show impacts from concept to concept due to modifications with the aircraft parking. All gates are assumed to be fully ADG III capable as noted in the conceptual plans.

SK1 New Aircraft Parking Concept A, Phase 1

In this concept a new PBB, extended corridor and striping will be added at Gate 1. Gate 2 will stay as is. Gate 3 will be added as a cargo or RON position. New striping will be applied for this location. The fire lane has been emphasized to show it will be shifted to the south to fit in Gate 1. The new PBB and corridor being provided for Gate 1 is sized to accommodate the proposed aircraft layout in Phase 2. The PBB rotunda location is also intended to not require relocation in Phase 2.

CONCEPT BUDGET REPORT

SK2 New Aircraft Parking Concept A, Phase 2

This concept is sequential to the work shown in SK1. In this concept the final build out of the terminal has been completed. A new PBB and striping will be added at the new location of Gate 2 and Gate 3. Striping will be added or revised at Gates 2, 3, 4. The fire lane has been emphasized to show it will be impacted by these proposed changes. All gates are assumed to be fully ADG III capable as noted in the conceptual plans.

a) Layout Description Summary

AP1 Existing Airport Layout

- Layout displays existing conditions of the Airport.
- Fire lane emphasized to show impacts from concept to concept.
- Fleet mix has been assumed.

SK1 New Aircraft Parking Concept C, Phase 1

- New PBB at Gate 1.
- New Extended Corridor at Gate 1.
- Gate 1 PBB sized and located to accommodate phase 2.
- New striping at Gate 1.
- New striping at Gate 4.
- Fire lane does not change in this phase.
- Fleet mix has been assumed.

SK2 New Aircraft Parking Concept C, Phase 2

- Existing Gate 1 PBB will be utilized in this phase.
- New striping at gate 1.
- New PBB at gate 2.
- New Striping at gate 2.
- New PBB at Gate 3.
- New Striping at Gate 3.
- New striping at Gate 4.
- Fire lane has been shifted.
- Fleet mix has been assumed.

Appendices:

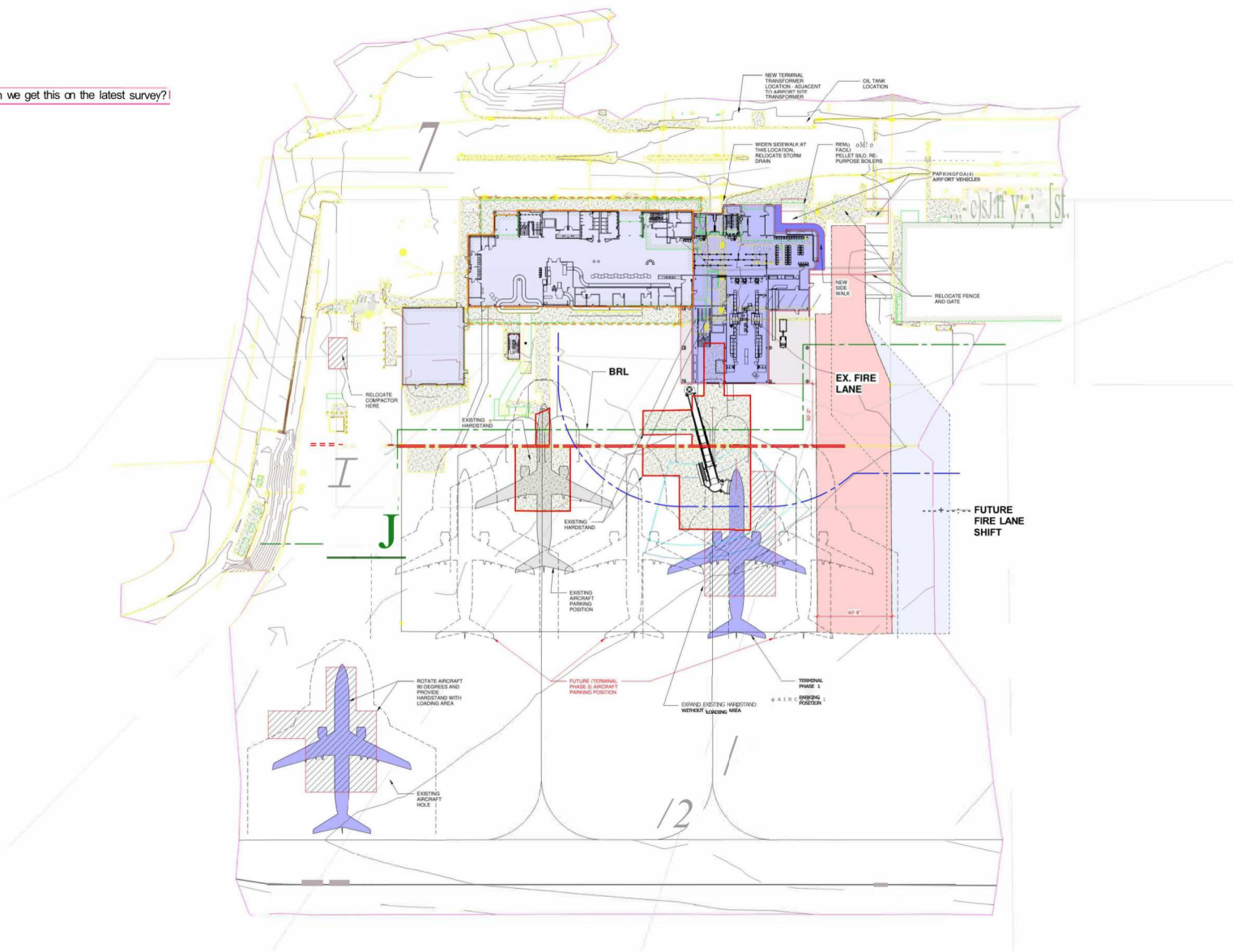
Appendix A – Site Plan

Appendix B- Building Plan

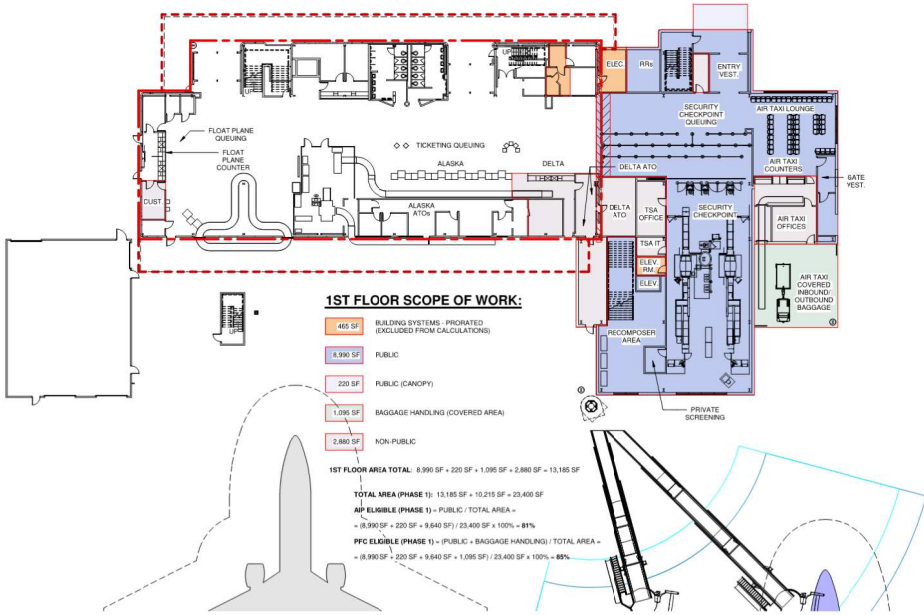
Appendix C – Elevations

Appendix D – 3-D Rendering

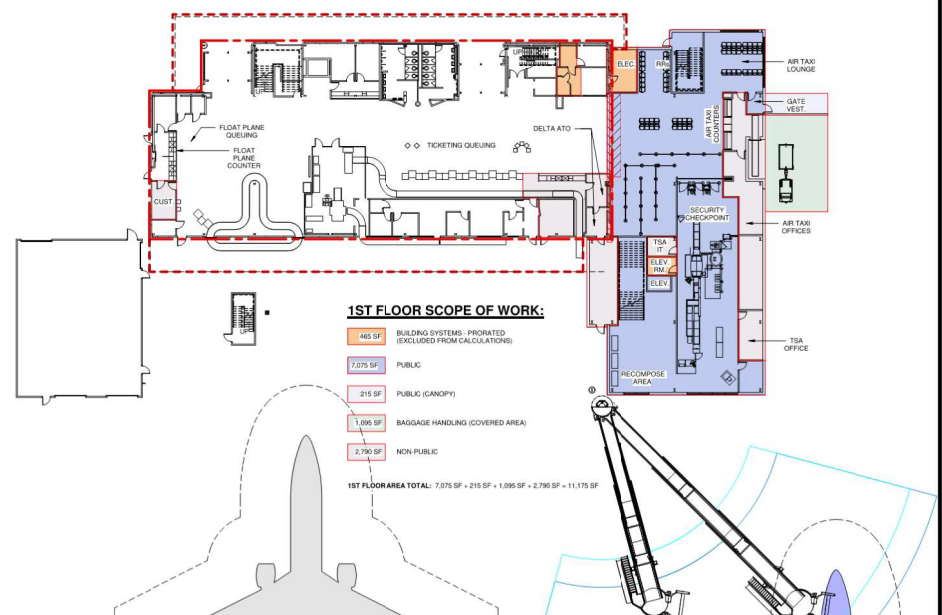
Can we get this on the latest survey?



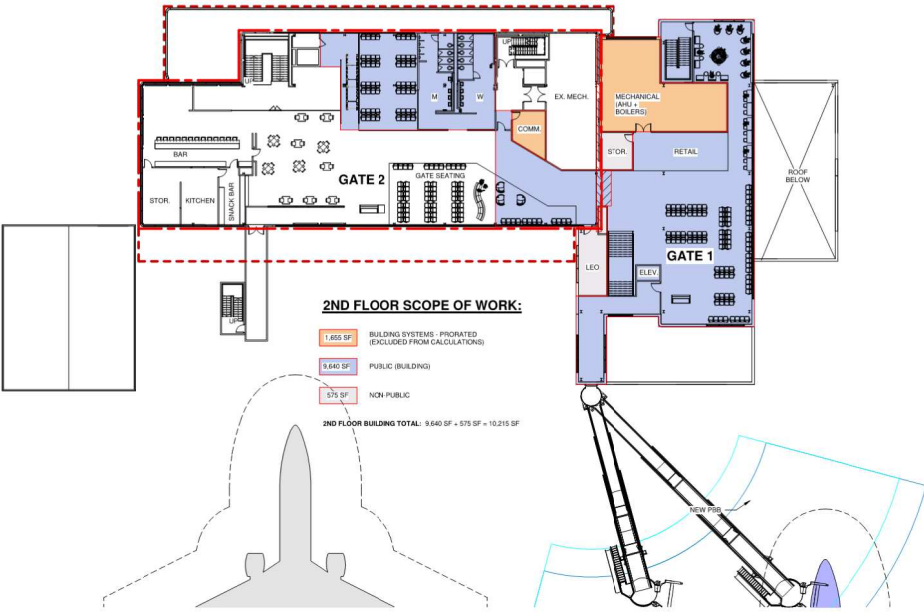
TRUE PLAN
N, CEPT 41 SITE PLAN - PHASE 1 COMPLETE



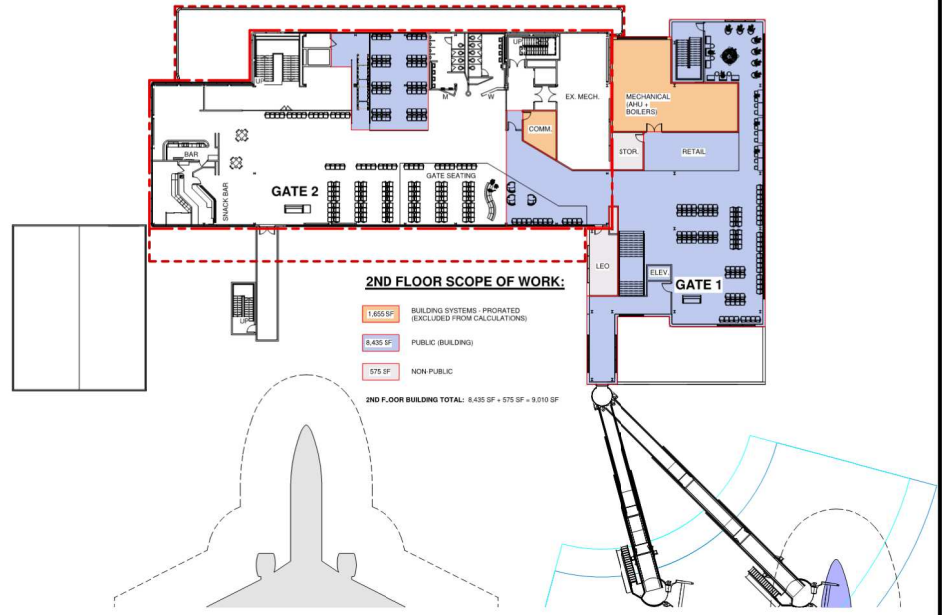
1 CONCEPT 4.1.1 FIRST FLOOR PLAN - PHASE 1
 1" = 20'-0"



3 CONCEPT 4.1.2 (REDUCED) FIRST FLOOR PLAN - PHASE 1
 1" = 20'-0"



2 CONCEPT 4.1.1 SECOND FLOOR - PHASE 1
 1" = 20'-0"

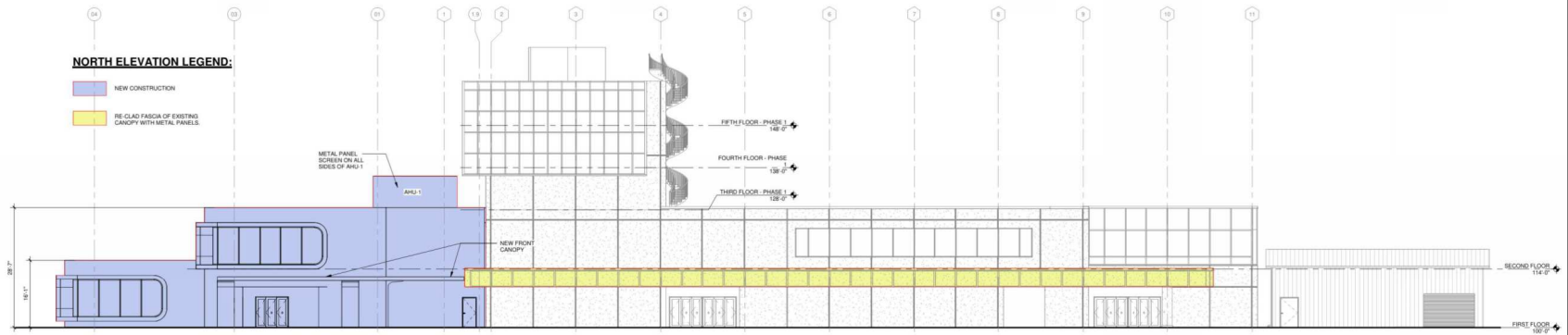


4 CONCEPT 4.1.2 (REDUCED) SECOND FLOOR - PHASE 1
 1" = 20'-0"

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NORTH ELEVATION LEGEND:

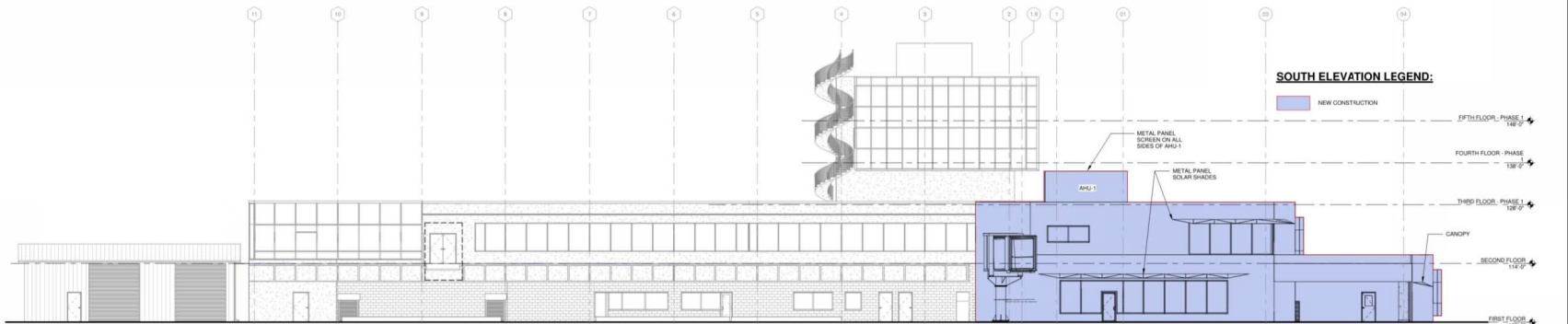
- NEW CONSTRUCTION
- RE-CLAD FASCIA OF EXISTING CANOPY WITH METAL PANELS



1 CONCEPT 4.1 NORTH EXTERIOR ELEVATION - PHASE 1
 1" = 10'-0"

SOUTH ELEVATION LEGEND:

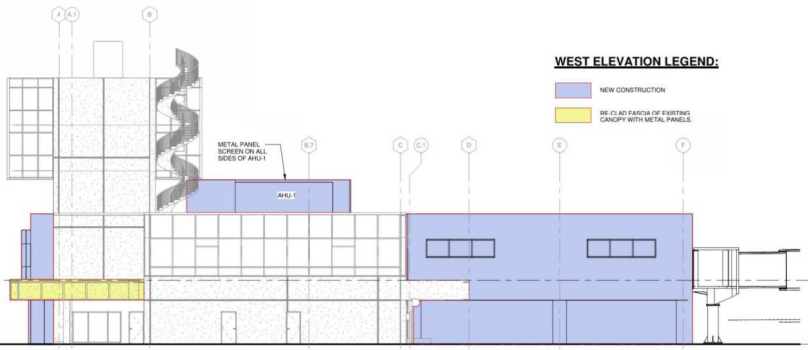
- NEW CONSTRUCTION



2 CONCEPT 4.1 SOUTH EXTERIOR ELEVATION - PHASE 1
 1" = 10'-0"

WEST ELEVATION LEGEND:

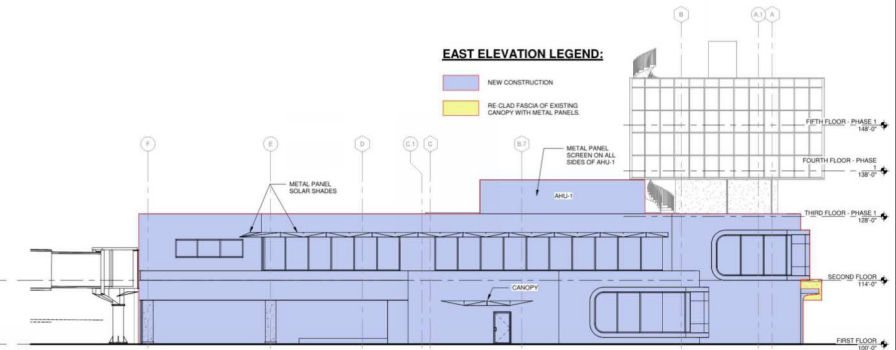
- NEW CONSTRUCTION
- RE-CLAD FASCIA OF EXISTING CANOPY WITH METAL PANELS



4 CONCEPT 4.1 WEST EXTERIOR ELEVATION - PHASE 1
 1" = 10'-0"

EAST ELEVATION LEGEND:

- NEW CONSTRUCTION
- RE-CLAD FASCIA OF EXISTING CANOPY WITH METAL PANELS



3 CONCEPT 4.1 EAST EXTERIOR ELEVATION - PHASE 1
 1" = 10'-0"

KETCHIKAN INTERNATIONAL AIRPORT, KTN
TERMINAL EXPANSION AND MODERNIZATION
 1000 AIRPORT TERMINAL BUILDING
 KETCHIKAN, AK 99901

DATE: 02/17/23 CONCEPT COST ESTIMATE

NOT FOR CONSTRUCTION

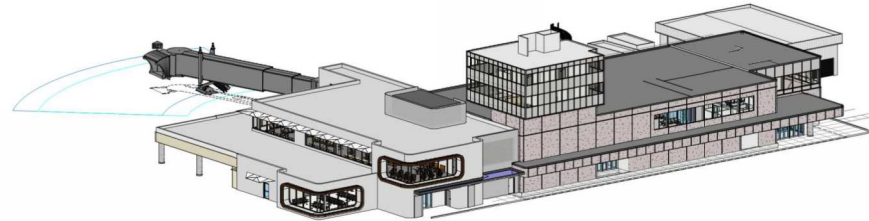
REV#0: 428340-100188.01
 DATE: February 9, 2023
 DRAWN BY: MMW
 CHECKED BY: PM, TIO

PROJECT: CONCEPT 4.1
 EXTERIOR ELEVATIONS PHASE 1

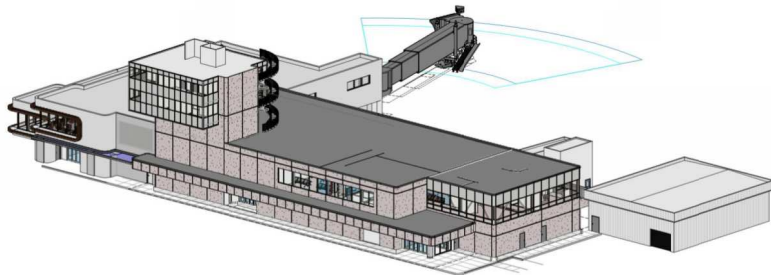
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A-201

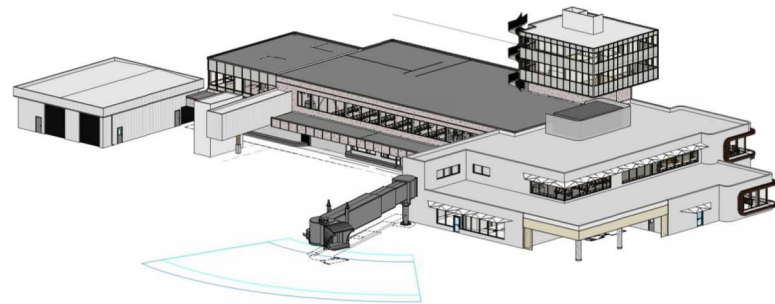
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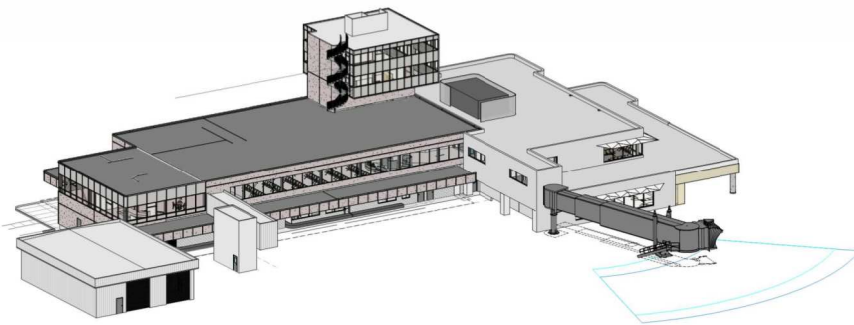
1 CONCEPT 4.1 3D VEIW NE CORNER - PHASE 1



3 CONCEPT 4.1 3D VEIW NW CORNER - PHASE 1



2 CONCEPT 4.1 3D VEIW SE CORNER - PHASE 1



4 CONCEPT 4.1 3D VEIW SW CORNER - PHASE 1

KETCHIKAN INTERNATIONAL AIRPORT, KTN
 TERMINAL EXPANSION AND MODERNIZATION
 1000 AIRPORT TERMINAL BUILDING
 KETCHIKAN, AK 99901

DATE: 02/17/23 CONCEPT COST ESTIMATE

NOT FOR CONSTRUCTION

REV: 01 4283400-100188-01
 DATE: February 9, 2023
 DRAWN BY: MMW
 CHECKED BY: PM, TFD
 SCALE: AS SHOWN

PROJECT: CONCEPT 4.1 3D VIEWS - PHASE 1 (FOR REFERENCE ONLY)

SHEET NO:

A-901

6 CHAPTER 6 – COST ESTIMATE

ROM DESIGN SUBMITTAL
CONSTRUCTION COST ESTIMATE

KETCHIKAN TERMINAL RENOVATIONS
PREFERRED ALTERNATIVE
KETCHIKAN, ALASKA

PREPARED FOR:

Mead & Hunt
9600 NE Cascades Parkway, Suite 100
Portland, Oregon 97220

March 20, 2023



NOTES REGARDING THE PREPARATION OF THIS ESTIMATE

DRAWINGS AND DOCUMENTS

Level of Documents: (6) concept design documents
Date: February 6, 2023
Provided By: Mead & Hunt and their subconsultants of Portland, Oregon

RATES

Pricing is based on current material, equipment and freight costs.

Labor Rates: A.S. Title 36 working 60 hours per week
Premium Time: 16.70% (included with unit rates)
Subcontractor's Mark-Up: 30.00%

BIDDING ASSUMPTIONS

Contract: Standard construction contract without restrictive bidding clauses
Bidding Situation: Competitive bid assumed
Bid Date: January 2024
Start of Construction: March 2024
Months to Complete: To be determined

EXCLUDED COSTS

1. A/E design fees
2. Administrative and management costs
3. Furniture, furnishings and equipment (except those specifically included)
4. Remediation of contaminated soils or abatement of any hazardous materials

GENERAL

When included in HMS Inc.'s scope of services, opinions or estimates of probable construction costs are prepared on the basis of HMS Inc.'s experience and qualifications and represent HMS Inc.'s judgment as a professional generally familiar with the industry. However, since HMS Inc. has no control over the cost of labor, materials, equipment or services furnished by others, over contractor's methods of determining prices, or over competitive bidding or market conditions, HMS Inc. cannot and does not guarantee that proposals, bids, or actual construction cost will not vary from HMS Inc.'s opinions or estimates of probable construction cost.

Due to the lingering effects of the COVID-19 pandemic on the global supply chain and labor market, as well as ongoing geopolitical impacts to energy prices, HMS Inc. has included an additional contingency titled 'Unique Market Risk'. This amount provided for in the estimate will be adjusted as the situation continues to change and the effect on construction pricing becomes better understood.

This estimate assumes escalation based on the most recent 3-month average of the U.S. Consumer Price Index. HMS Inc. will continue to monitor this, as well as other international, domestic and local events, and the resulting construction climate, and will adjust costs and contingencies as deemed appropriate.

HMS Project No.: 22120-A

GROSS FLOOR AREA

PHASE 1

New Construction First Floor	11,185 SF
New Construction Second Floor	8,055 SF
Covered Area	2,620 SF
Renovation First Floor	1,345 SF
Renovation Second Floor	<u>2,725 SF</u>
TOTAL PHASE 1 GROSS FLOOR AREA:	<u><u>25,930 SF</u></u>

HMS Project No.: 22120-A

ROM DESIGN COST SUMMARY

		<i>Total</i>
01 - SITE WORK		\$ 590,002
02 - SUBSTRUCTURE		284,429
03 - SUPERSTRUCTURE		2,443,563
04 - EXTERIOR CLOSURE		1,534,590
05 - ROOF SYSTEMS		648,278
06 - INTERIOR CONSTRUCTION		1,246,860
07 - CONVEYING SYSTEMS		172,250
08 - MECHANICAL		2,255,620
09 - ELECTRICAL		2,279,772
10 - EQUIPMENT		2,242,500
11 - SPECIAL CONSTRUCTION		499,210
<i>SUBTOTAL:</i>		<i>\$ 14,197,074</i>
12 - GENERAL REQUIREMENTS	40.00%	5,678,830
<i>SUBTOTAL:</i>		<i>\$ 19,875,904</i>
13 - CONTINGENCIES		
Estimator's Contingency	30.00%	5,962,771
Unique Market Risk	5.00%	1,291,934
Escalation to Bid Date of January 2024 at 6.67% per Annum (10 Months)	5.56%	1,508,462
TOTAL ESTIMATED CONSTRUCTION COST:		\$ 28,639,071
COST PER SQUARE FOOT:		\$ 1,104 /SF
GROSS FLOOR AREA:		25,930 SF
<i>Total Without 07 - Conveying and 10 - Equipment</i>		
TOTAL ESTIMATED CONSTRUCTION COST:		\$ 23,767,913
COST PER SQUARE FOOT:		\$ 917 /SF
GROSS FLOOR AREA:		25,930 SF

HMS Project No.: 22120-A

01 - SITE WORK	<i>QUANTITY</i>	<i>UNIT</i>	<i>UNIT RATE</i> \$	<i>TOTAL</i> \$
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SITE DEMOLITION

Remove biomass facility and silo, stage at designated area on site for salvage by others	1	LOT	300000.00	300,000
Relocate fuel oil tank as needed	1	LOT	2500.00	2,500
Relocate trash compactor as needed	1	LOT	7800.00	7,800
Demolish 20,000 gallon underground fuel tank, including drain, clean, inert, disposal, and backfill	1	EA	27500.00	27,500
Cut asphalt for demolition	385	LF	4.20	1,617
Remove asphalt and dispose	13,805	SF	1.20	16,566
Other demolition as needed	1	LOT	5000.00	5,000
Load, haul, and dispose of debris	5	LDS	1800.00	9,000

SELECTIVE BUILDING DEMOLITION

Demolish stairwell and covered entries, complete	115	CY	120.00	13,800
Demolish exterior concrete panels	210	SF	20.00	4,200
Demolish canopy for addition	180	SF	12.00	2,160
Demolish panels on canopy	1,100	SF	5.10	5,610
Demolish canopy edge flashing	220	LF	0.80	176
Demolish exterior or interior single door	17	EA	90.00	1,530
Demolish exterior or interior double door	1	EA	120.00	120
Demolish interior partition	4,004	SF	3.45	13,814
Demolish floor finishes as needed	4,680	SF	1.10	5,148
Demolish ceiling finishes as needed	4,680	SF	1.20	5,616
Demolish walls or ceilings as needed for structural retrofits	3,850	SF	6.00	23,100

HMS Project No.: 22120-A

01 - SITE WORK	<i>QUANTITY</i>	<i>UNIT</i>	<i>UNIT RATE</i> \$	<i>TOTAL</i> \$
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SELECTIVE BUILDING DEMOLITION (Continued)

Demolish walls or ceilings as needed for panel demolition	435	SF	6.00	2,610
Other demolition as needed	1	LOT	2500.00	2,500
Load, haul, and dispose of debris	17	LDS	1800.00	30,600

SITE PREPARATION

SWPPP plan and maintenance	12	MOS	2750.00	33,000
Site survey and staking	1	AC	7000.00	7,000
Temporary construction fencing	400	LF	12.90	5,160
Backfill with classified material at demolished foundations	500	CY	52.00	26,000

SITE IMPROVEMENTS

6" D1 base under hardscapes	75	CY	55.00	4,125
2" AC pavement repairs	2,950	SF	7.00	20,650
6" thick concrete sidewalks	500	SF	14.00	7,000
Site furnishings, signage, etc.	1	LOT	6100.00	6,100

TOTAL ESTIMATED COST:	\$ 590,002
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HMS Project No.: 22120-A

02 - SUBSTRUCTURE	<i>QUANTITY</i>	<i>UNIT</i>	<i>UNIT RATE</i> \$	<i>TOTAL</i> \$
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FOUNDATION

Excavate and backfill for foundation	378	CY	18.50	6,993
Formwork to foundation footings, pilasters, stem walls, and elevator pit	7,780	SF	10.50	81,690
Concrete pumped into place	134	CY	340.00	45,560
Dampproof foundation walls	2,165	SF	4.75	10,284
Rigid insulation to foundation walls	1,732	SF	2.05	3,551

SLAB ON GRADE

4" D1 base course	195	CY	55.00	10,725
4" thick slab on grade, finished	13,805	SF	9.10	125,626

TOTAL ESTIMATED COST:	\$ 284,429
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HMS Project No.: 22120-A

03 - SUPERSTRUCTURE	QUANTITY	UNIT	UNIT RATE \$	TOTAL \$
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FLOOR CONSTRUCTION

Steel structure for second floor (15# per SF)	120,825	LBS	3.95	477,259
1 1/2"x20 gauge steel decking	8,055	SF	10.30	82,967
4" thick overall concrete topping, finished	8,055	SF	9.10	73,301

ROOF CONSTRUCTION

Steel structure for roof (12# per SF)	165,660	LBS	3.95	654,357
1 1/2"x20 gauge steel decking	13,805	SF	10.30	142,192
New canopy	430	SF	60.00	25,800

STRUCTURAL UPGRADES

Upgrade concrete panel connections as needed	485	EA	520.00	252,200
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MISCELLANEOUS

Special inspections for structural work	1	LOT	5000.00	5,000
Crane and operator	2	MOS	29500.00	59,000
Temporary shoring and bracing	21,860	SF	0.50	10,930

STAIR CONSTRUCTION

48" wide concrete filled stairs	24	RSR	580.00	13,920
120" wide concrete filled stairs	24	RSR	1275.00	30,600
Landings	140	SF	115.00	16,100
Wall mounted handrail	55	LF	42.00	2,310
Floor mounted glass guardrail with grab rail	64	LF	452.00	28,928
Roof access ladder	2	EA	2400.00	4,800

SUBTOTAL:

\$ 1,879,664

HMS Project No.: 22120-A

03 - SUPERSTRUCTURE	QUANTITY	UNIT	UNIT RATE \$	TOTAL \$
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Subcontractor's Overhead and Profit on Material
and Labor

30.00%

563,899

TOTAL ESTIMATED COST:

\$ 2,443,563

HMS Project No.: 22120-A

04 - EXTERIOR CLOSURE	<i>QUANTITY</i>	<i>UNIT</i>	<i>UNIT RATE</i> \$	<i>TOTAL</i> \$
Exterior wall system with rain screen and siding, including gypboard inner face	11,225	SF	53.35	598,854
Seismic joint (fire rated as needed)	154	LF	110.00	16,940
Reclad canopy with metal panels	1,100	SF	25.00	27,500
Canopy edge flashing	220	LF	7.00	1,540
3'0"x7'0" insulated hollow metal exterior door with half lite, complete	7	EA	8185.00	57,295
6'0"x7'0" automatic sliding door and curtain wall at entry	1	EA	30000.00	30,000
8'0"x10'0" overhead door at air taxi	1	EA	10500.00	10,500
Heat transfer glass, triple glazed windows, or curtain wall	2,725	SF	157.00	427,825
Exterior signage allowance	1	LOT	10000.00	10,000
SUBTOTAL:				\$ 1,180,454
Subcontractor's Overhead and Profit on Material and Labor	30.00%			354,136

TOTAL ESTIMATED COST:	\$ 1,534,590
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HMS Project No.: 22120-A

05 - ROOF SYSTEMS	<i>QUANTITY</i>	<i>UNIT</i>	<i>UNIT RATE</i> \$	<i>TOTAL</i> \$
EPDM over insulation flat roofing system for addition	13,805	SF	35.00	483,175
Canopy roofing	430	SF	30.00	12,900
Temporary fall protection railings	400	LF	6.50	2,600
<i>SUBTOTAL:</i>				\$ 498,675
Subcontractor's Overhead and Profit on Material and Labor	30.00%			149,603

TOTAL ESTIMATED COST: **\$ 648,278**

HMS Project No.: 22120-A

06 - INTERIOR CONSTRUCTION	<i>QUANTITY</i>	<i>UNIT</i>	<i>UNIT RATE</i> \$	<i>TOTAL</i> \$
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PARTITIONS

4" metal stud partition walls	8,050	SF	5.50	44,275
6" metal stud partition walls	7,350	SF	6.55	48,143
5/8" Type X gypboard to partitions	30,800	SF	2.80	86,240
Temper glazed curtain wall	1,380	SF	110.00	151,800

DOORS

3'0"x7'0" interior door, complete	17	EA	2885.00	49,045
6'0"x7'0" interior door, complete	1	EA	5770.00	5,770
6'0"x7'0" automatic sliding door at entry	1	EA	15000.00	15,000
2-hour fire rated movable partition	2	EA	50000.00	100,000
32'0"x10'0" movable security grille	1	EA	32000.00	32,000

SUBTOTAL PARTITIONS AND DOORS:

\$ 532,273

FINISHES

Floor finishes in new and remodeled areas, including wall base	23,310	SF	10.35	241,259
Multi-color paint for gypboard on partitions and warm side of exteriors	42,025	SF	1.95	81,949
Acoustic tile suspended ceiling system, seismically braced	20,585	SF	6.40	131,744
Adjust existing suspended ceiling for new layout	2,725	SF	3.40	9,265
Paint/stain doors	1,540	SF	2.50	3,850

SPECIALTIES

Door sign	25	EA	95.00	2,375
Miscellaneous signage and graphics allowance	1	LOT	2500.00	2,500

HMS Project No.: 22120-A

06 - INTERIOR CONSTRUCTION	<i>QUANTITY</i>	<i>UNIT</i>	<i>UNIT RATE</i> \$	<i>TOTAL</i> \$
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SPECIALTIES (Continued)

Fire extinguisher	5	EA	350.00	1,750
Miscellaneous specialties allowance	1	LOT	2000.00	2,000
Casework allowance	1	LOT	10000.00	10,000

STRUCTURAL UPGRADE REPAIRS

Wall or ceiling repairs from structural upgrades	3,850	SF	14.70	56,595
Wall or ceiling repairs from structural demolition	435	SF	14.70	6,395

<i>SUBTOTAL:</i>				\$ 549,682
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Subcontractor's Overhead and Profit on Material and Labor	30.00%			164,905
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<i>SUBTOTAL FINISHES, SPECIALTIES, AND STRUCTURAL UPGRADES:</i>				\$ 714,587
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<i>TOTAL ESTIMATED COST:</i>				\$ 1,246,860
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HMS Project No.: 22120-A

07 - CONVEYING SYSTEMS	QUANTITY	UNIT	UNIT RATE \$	TOTAL \$
Two-stop elevator allowance	1	EA	130000.00	130,000
Permits and inspections	1	LOT	2500.00	2,500
<i>SUBTOTAL:</i>				<u>\$ 132,500</u>
Subcontractor's Overhead and Profit on Material and Labor	30.00%			39,750

TOTAL ESTIMATED COST: **\$ 172,250**

HMS Project No.: 22120-A

08 - MECHANICAL	QUANTITY	UNIT	UNIT RATE \$	TOTAL \$
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DEMOLITION

Demolish storm drain intake and basin structure	3	EA	2500.00	7,500
Demolish piping to biomass facility	150	LF	6.00	900
Demolish units on top of stairwell	1	LOT	3500.00	3,500
Demolish louver on east side	2	EA	650.00	1,300
Other site demolition as required	1	LOT	5000.00	5,000
Relocate fuel oil tank as needed, including piping	1	LOT	7500.00	7,500
HVAC demolition in areas to be renovated (minor)	4,070	SF	2.50	10,175
Load, haul, and dispose of debris	3	LDS	1075.00	3,225

SITE MECHANICAL

Adjust/upgrade water service to new addition for sprinkler service (allowance)	1	LOT	25000.00	25,000
Sewer service to building				No Work
Reconfigure affected storm drains in addition area (allowance)	1	LOT	20000.00	20,000
Upgrade fuel supply to building for new boilers, etc. (allowance)	1	LOT	75000.00	75,000

ADDITION/RENOVATION

Water closet with flush valve, ADA	3	EA	1220.00	3,660
Lavatory with faucet	3	EA	730.00	2,190
Prep sink	1	EA	675.00	675
Floor sink	1	EA	900.00	900
Rough-in for fixture	8	EA	2250.00	18,000
Floor drain in mechanical room	2	EA	400.00	800

HMS Project No.: 22120-A

08 - MECHANICAL	<i>QUANTITY</i>	<i>UNIT</i>	<i>UNIT RATE</i> \$	<i>TOTAL</i> \$
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ADDITION/RENOVATION (Continued)

Rough-in for floor drain	2	EA	1900.00	3,800
Roof drain and rain leader piping	22,290	SF	4.70	104,763
HVAC system to new areas	19,240	SF	62.00	1,192,880
Reconfigure/adjust HVAC in renovated areas	4,070	SF	8.50	34,595
Reconfigure/adjust sprinkler system in renovated areas	4,070	SF	3.50	14,245
Sprinkler system to addition	22,290	SF	8.00	178,320
Special mechanical systems as required	19,240	SF	1.10	21,164
SUBTOTAL:				\$ 1,735,092
Subcontractor's Overhead and Profit on Material and Labor	30.00%			520,528

TOTAL ESTIMATED COST:	\$ 2,255,620
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HMS Project No.: 22120-A

09 - ELECTRICAL	<i>QUANTITY</i>	<i>UNIT</i>	<i>UNIT RATE</i> \$	<i>TOTAL</i> \$
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DEMOLITION

Relocate or replace transformer, including conduit and conductors	1	EA	100000.00	100,000
Temporary service for other customers affected	1	EA	50000.00	50,000
Relocate utility box, including conduit and conductors	3	EA	8500.00	25,500
Demolish connections to biomass facility	150	LF	3.80	570
Demolish light pole	1	EA	1350.00	1,350
Other site electrical demolition as needed	1	LOT	5000.00	5,000
Demolish electrical fixtures, devices, conduit, and conductors in renovation areas as required	4,070	SF	4.00	16,280
Load, haul, and dispose of debris	3	LDS	1075.00	3,225

SITE ELECTRICAL

New light pole, including conduit and conductors	1	EA	12550.00	12,550
Telecom service to addition				From Existing
700 KVA site generator in walk-in enclosure	1	EA	610000.00	610,000

ADDITION/RENOVATION

Service and distribution in new addition	1,600	AMP	105.00	168,000
Lighting and power to new addition	22,290	SF	18.60	414,594
Adjust lighting and power in renovated areas	4,070	SF	5.50	22,385
Extend fire alarm system into new addition	22,290	SF	1.90	42,351
Special electrical systems to new addition	19,240	SF	14.65	281,866

SUBTOTAL:

\$ 1,753,671

HMS Project No.: 22120-A

09 - ELECTRICAL	QUANTITY	UNIT	UNIT RATE \$	TOTAL \$
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Subcontractor's Overhead and Profit on Material
and Labor

30.00%

526,101

TOTAL ESTIMATED COST:

\$ 2,279,772

HMS Project No.: 22120-A

10 - EQUIPMENT	<i>QUANTITY</i>	<i>UNIT</i>	<i>UNIT RATE</i> \$	<i>TOTAL</i> \$
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Chairs, benches, etc. With FF&E Budget

TSA security equipment By Others

Jet bridge for new gate, including PCA, electrical, bag slide, potable water cabinet, and striping	1	EA	1300000.00	1,300,000
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Shallow foundation for jet bridge	1	EA	50000.00	50,000
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Air taxi baggage handling system demolition	1	LOT	75000.00	75,000
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New conveyor for new air taxi location and new segment	1	LOT	300000.00	300,000
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<i>SUBTOTAL:</i>				\$ 1,725,000
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Subcontractor's Overhead and Profit on Material and Labor		30.00%		517,500
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TOTAL ESTIMATED COST:				\$ 2,242,500
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HMS Project No.: 22120-A

11 - SPECIAL CONSTRUCTION	QUANTITY	UNIT	UNIT RATE \$	TOTAL \$
Saw cut asphalt for new hardstand	700	LF	4.20	2,940
Remove asphalt and dispose	9,490	SF	1.20	11,388
Excavate 48" under new hardstand and dispose	1,405	CY	14.00	19,670
Backfill with 30" classified material	1,010	CY	52.00	52,520
6" D1 base course	203	CY	55.00	11,165
12" thick concrete hard stand	352	CY	340.00	119,680
Formwork to hardstand	700	LF	2.95	2,065
Galvanized reinforcing bar	42,240	LBS	3.00	126,720
Dowl into existing hardstand	68	EA	35.00	2,380
Cure and finish concrete	9,490	SF	2.00	18,980
Patch back asphalt around hardstand	1,400	SF	10.00	14,000
Striping, markings, etc.	1	LOT	1000.00	1,000
Other work as required	1	LOT	1500.00	1,500
SUBTOTAL:				\$ 384,008
Subcontractor's Overhead and Profit on Material and Labor	30.00%			115,202

TOTAL ESTIMATED COST: \$ 499,210

CONCEPT BUDGET REPORT

7 CHAPTER 7 – FUNDING

7.1 Background

In 2020, the Ketchikan Gateway Borough (Borough) undertook a Terminal Area Plan for the Ketchikan International Airport (KTN or Airport) to identify the needs related to the passenger terminal building in light of existing conditions, passenger traffic and anticipated future demand. The analysis included the selection of a preferred alternative, which was envisioned to require a three phased approach to the expansion of the terminal building. The study concluded with the preparation of a financial implementation analysis, the purpose of which was to evaluate the Airport's capability to fund the terminal building expansion and other projects in its overall Capital Improvement Program (CIP) while also financing operations. The results of the analysis are included in Chapter G of that Terminal Area Plan.

In 2021, an update to the financial implementation analysis was prepared in order to reflect funding programmed by the Alaska Department of Transportation and Public Facilities (DOT&PF) for the first phase of the project – this included updating the anticipated timing of the project and reflecting changes to assumptions related to anticipated debt financing.

With the passage of the Bipartisan Infrastructure Law (BIL) in November 2021, additional funding sources for the project became potentially available. The Borough elected to proceed with the next step of project design and development through preparation of this Concept and Budget Report (CBR). The CBR includes an update to the financial implementation analysis that was prepared as part of the Terminal Area Plan.

7.2 Approach

The approach to updating the financial implementation analysis included:

- Reviewing the previously completed financial implementation analysis and underlying assumptions
- Interviewing Airport officials to gain an understanding of any significant changes to the operating and financial environment at the Airport
- Updating the analysis based on actual passenger enplanements since completion of the Terminal Area Plan
- Updating the AIP/PFC project eligibility analysis based on the new cost estimates for the refined terminal expansion and renovation concept plan
- Updating the non-terminal related CIP
- Updating the funding plan based on the new cost estimates and the capital funding anticipated from DOT&PF, the Airport's debt capacity, and the availability of other funding to support the entire CIP
- Updating the analysis to reflect actual operating revenues and expenses for 2021 and 2022; estimates for 2023 and 2024; and projections for 2025 through the remainder of the planning period.

CONCEPT BUDGET REPORT

7.3 Estimated Terminal Expansion Costs and Capital Funding Sources

Cost estimates for the refined terminal expansion plan were prepared for the project, as described in Chapter 6. The cost estimate was broken down into a dollar estimate per square foot for the cost of new construction and the cost for light rehabilitation of existing areas. The estimate was also broken down to identify high-cost equipment items, including passenger loading bridges, elevators and baggage handling equipment. The total capital expenditure estimate, as reflected below in Table 7-1, includes construction costs (inclusive of a design contingency), 10% design costs and 20% soft costs to include pre-construction costs, construction administration, and construction contingencies. Estimates are based on 2023 dollars with no adjustment for future inflation.

TABLE 7-1: Estimated Terminal Expansion Development Costs (Base Year 2023)

Terminal Area Project Components	Construction Costs	Design and Soft Costs	Total Estimated Costs	Funding Eligibility	
				AIP/PFC	Ineligible
Airline Ticketing/Check-In	\$2,828,490	\$848,547	\$3,677,037	\$1,845,207	\$1,831,830
Pax and Baggage Screening/Security	6,325,935	1,897,781	8,223,716	7,641,134	582,582
Departure Areas	5,480,370	1,644,111	7,124,481	7,124,481	0
Concessions	1,256,640	376,992	1,633,632	1,132,131	501,501
Other Public Areas	7,182,315	2,154,695	9,337,010	9,337,010	0
Support Areas	2,049,600	614,880	2,664,480	1,837,956	826,524
Site Costs	1,874,799	562,440	2,437,239	2,437,239	0
Equipment	3,582,500	1,074,750	4,657,250	4,657,250	0
Total Estimated Cost	\$30,580,649	\$9,174,195	\$39,754,844	\$36,012,408	\$3,742,437
Estimated Eligibility Percentages				90.6%	9.4%

Source: Leibowitz & Horton, AMC, 2023.

Note: Addition errors are due to rounding of calculated amounts.

The estimated cost of the project was then adjusted by an assumed 3% rate of annual inflation, based on when the anticipated work is expected to be performed between 2023 and 2025. The total cost of the project adjusted for inflation is estimated to be \$40,864,004.

7.4 Capital Funding Sources

The anticipated sources of capital funding for the terminal expansion and renovation have not changed from the original financial implementation analysis provided in the Terminal Area Plan. The plan assumes three primary sources of funding for the project: Federal pass-through funding, debt proceeds to be repaid using Passenger Facility Charges, and Airport/Borough Cash.

CONCEPT BUDGET REPORT

FEDERAL PASS-THROUGH FUNDING (AIRPORT IMPROVEMENT PROGRAM GRANTS AND OTHER FEDERAL FUNDING). As owner and sponsor of the Airport, the State receives grants from the Federal Aviation Administration (FAA) to finance the eligible costs of certain capital improvements. Historically, these grants have included Airport Improvement Program (AIP) grants, both entitlement and discretionary. With the passage of the Bipartisan Infrastructure Law, the State will receive additional funding through the BIL Airport Infrastructure Grant (AIG) program. Based on discussions between the Borough and the State, the analysis assumes the State will provide approximately \$29.5 million of federal funding for this project. \$8.5 million was included in the most recent State budget, \$15 million is anticipated to be available in 2024, and \$6.5 million is expected to be available in 2025 to complete the project.

PASSENGER FACILITY CHARGES. The Aviation Safety and Capacity Expansion Act of 1990 established the authority for commercial service airports to apply to the FAA for imposing and using a Passenger Facility Charge (PFC) of up to \$3.00 per eligible enplaned passenger. With the passage of AIR-21 in June 2000, airports could apply for an increase in the PFC collection amount from \$3.00 per eligible enplaned passenger to \$4.50. Similar to the AIP, the FAA recognizes the State of Alaska as the KTN airport sponsor for purposes of the PFC Program. In February 2019, the Borough and the State entered into a Passenger Facility Charge Agreement which allows the Borough to continue to collect and use PFCs for projects approved under a PFC application developed by the Borough but agreed to and submitted by the State to the FAA. KTN currently collects PFC revenues in an approved open application at the \$4.50 collection level. It plans to submit a new application to secure authority to use PFCs to fund debt service on a \$5 million debt issue to fund the terminal project. The terms of the debt are assumed to be 30 years at a 6% rate of interest. The debt service payments required from PFC collections would be approximately \$395 thousand per year.

CASH RESERVES/AIRPORT NET OPERATING REVENUE. The Airport's cash reserves and future net operating revenues are an important source of funds for the implementation of the terminal expansion project. The implementation analysis assumes that Airport cash reserves/net operating cash flow will be used to fund approximately \$6.4 million in costs related to the terminal expansion. This includes funding for ineligible portions of the work as well as costs which would be AIP and/or PFC eligible but for which there is insufficient funding available from those sources.

Table 7-2 below provides a summary of the anticipated amounts and timing of the funding sources described above.

CONCEPT BUDGET REPORT

TABLE 7-2: Summary of Projected Capital Funding Sources – Terminal Building Expansion

Funding Sources	Funding Year			Totals
	2023 Design & Construct (25%)	2024 Construct 50%	2025 Construct 25%	
Total Capital Funding Uses	\$12,232,260	\$18,898,841	\$9,732,903	\$40,864,004
Pass Thru Federal Funding	\$8,514,933	\$15,000,000	\$6,500,000	\$29,514,933
PFC Debt Proceeds	0	2,648,841	2,351,159	5,000,000
Airport Cash Reserves	3,717,327	1,250,000	1,381,745	6,349,071
Total Capital Funding Sources	\$12,232,260	\$18,898,841	\$9,732,903	\$40,864,004

7.5 Financial Implementation Summary

The assumptions and results of the financial implementation analysis described in the Financial Implementation Summary provided at the end of Chapter G of the Terminal Area Plan remain unchanged with a financially feasible funding plan based on the updated information and analysis provided in this Concept and Budget Report. A complete set of the updated financial analysis schedules are provided at the end of this Chapter 7.

7.5.1 Assumptions

ASSUMPTIONS RELATED TO CAPITAL FUNDING SOURCES. Several key assumptions supporting the Financial Implementation Plan relate to the availability and timeliness of the funding sources that have been identified. Receiving awards for at least \$29.5 million in federal funding passed through by the State during the Short-Term will be essential to support implementation of the terminal expansion project without delay. Additional federal funds are also required to support non-terminal related projects identified for the Landing Field Parcel or other buildings associated with the Building Site Parcel.

ASSUMPTIONS RELATED TO AVIATION ACTIVITY FORECASTS. The Financial Implementation Analysis relies on achievement of the aviation activity and passenger enplanement forecasts. If the actual aviation activity varies temporarily from the projected levels of activity, the adverse impact on the capital program may not be significant. However, if decreased traffic levels occur and persist, implementation of all the proposed projects may not be financially feasible. It should also be noted, however, that if the forecast activity levels are not met, then a number of the planned capital improvements may be canceled, reduced in scope, or deferred as necessary.

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ASSUMPTIONS RELATED TO REQUIRED STATE APPROVALS. In order for the Borough to secure all of the required funding to undertake the terminal expansion project within the Short-Term time frame (2023 through 2025), coordination with, and approval by, Alaska DOT&PF are required on several items. First, DOT&PF must commit to the use of \$29.5 million in federal funds for the project. Second, per the lease agreement between the Borough and the State, the State must approve any debt issued over the amount of \$250,000 to finance construction of additional Airport improvements (including those in the Building Site Parcel). Therefore, the State must approve the issuance of \$5 million in Airport Revenue Bonds (presumably through the Alaska Municipal Bond Bank Authority). Third, given that repayment of the bonds would be made using PFC revenues and that the FAA considers the State the Airport sponsor for PFC purposes, the State would have to approve the submission of the PFC application, and the FAA must approve the application. Finally, the current agreement between the Borough and the State for the operation of the Airport is due to expire in May 2027. It is reasonable to assume that in anticipation of long-term debt which would mature in 2053, a new or extended lease agreement between the parties would need to be negotiated and executed prior to the issuance of such debt. Additionally, the analysis assumes continued financial support of KTN by the State for operating costs in the amount of \$502,000 annually.

7.5.2 Financial Implementation Analysis Schedules

The Financial Implementation Analysis Schedules updated in this Chapter 7 of the CBR are provided on the pages that follow as listed below.

Schedule 7-1 – Estimated Terminal Building Costs

Schedule 7-2 – Estimated Project Costs and Development Schedule

Schedule 7-3 – Projected Capital Funding Sources and Summary of Projected Capital Funding Sources

Schedule 7-4 – PFC Serviced Debt Issue

Schedule 7-5 – Actual, Estimated and Projected Operations & Maintenance Expenses

Schedule 7-6 – Actual, Estimated and Projected Operating Revenues

Schedule 7-7 – Financial Plan Summary

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Estimated Terminal Building Costs**

Terminal Building Components	Terminal Space (Sq Ft) (4)				Estimated Capital Costs			Funding Eligibility				
	Phase A		New	Rehab	Total	Design Costs (2)	Hard Costs (1)	Soft Costs (3)	Total Costs	AIP/PFC	PFC Only	Ineligible
	1st Floor	2nd Floor										
Airline Ticketing/Check-In												
Airline ATO - New	1,160		1,100	100	1,160	\$133,980	\$1,339,800	\$267,660	\$1,741,740			\$1,741,740
Airline ATO - Rehab	660		1,100	100	660	6,930	69,300	13,660	90,090			90,090
Ticketing Queuing	176		1,100	100	76	9,828	98,280	19,656	127,764	127,764		
Baggage Make-Up	2,097		600	100	2,097	132,111	1,321,110	264,222	1,717,443		1,717,443	
Total Airline Ticketing/Check-In	4,093		3,333	760	4,093	\$232,849	\$2,828,490	\$565,698	\$3,677,037	\$127,764	\$1,717,443	\$1,831,830
Passenger and Baggage Screening/Security												
Passenger Screening	3,177		1,100	100	3,177	\$366,944	\$3,669,435	\$733,887	\$4,770,266	\$4,770,266		
Passenger Screening Queuing	1,093		1,100	100	1,093	126,242	1,262,415	252,483	1,641,140	1,641,140		
Passenger Recomposure Area	819		1,100	100	819	94,595	945,945	189,189	1,229,729	1,229,729		
TSA Office/IT Areas	388		1,100	100	388	44,814	448,140	89,628	582,582		582,582	
Total Pax and Bag Screening/Security	5,477	0	4,629	547	5,477	\$632,594	\$6,325,935	\$1,265,187	\$8,223,716	\$7,641,134		\$582,582
Departure Areas												
Departure Lounge/Holdroom - New	1,028		1,100	100	1,028	\$534,650	\$5,346,495	\$1,069,299	\$6,950,444	\$6,950,444		
Departure Lounge/Holdroom - Rehab			1,100	100		13,388	133,875	26,775	174,038	174,038		
Total Departure Areas	1,028		2,200	200	1,028	\$548,037	\$5,480,370	\$1,096,074	\$7,124,481	\$7,124,481		\$0
Concessions												
Concessions - Public Areas	205		129	100	205	38,577	385,770	77,154	501,501			501,501
Total Concessions	205		883	100	205	\$7,087	\$70,870	\$14,174	\$132,131	\$132,131		\$0
Other Public Areas												
Vertical Circulation	961		807	100	1,768	\$204,204	\$2,042,040	\$408,408	\$2,654,652	\$2,654,652		\$0
Public Circulation	1,739		2,831	100	3,170	380,835	3,808,350	761,670	4,950,855	4,950,855		\$0
Public Restrooms	335		1,200	500	335	1,101,693	1,016,925	203,385	1,322,003	1,322,003		\$0
Public Canopy	500		600	100	500	31,500	315,000	63,000	409,500	409,500		\$0
Total Other Public Areas	3,535		4,838	700	3,535	\$718,232	\$7,182,315	\$1,436,463	\$9,337,010	\$9,337,010		\$0
Support Areas												
Mechanical & Electrical - New	397		959	100	1,356	\$156,618	\$1,566,180	\$313,236	\$2,036,034	\$1,588,107	\$203,603	\$244,324
Mechanical & Electrical - Rehab	200		1,100	100	200	4,043	40,425	8,085	52,553	40,991	5,255	6,306
Airport Support	160		369	100	369	44,300	442,995	88,599	575,894			575,894
Total Support Areas	757		1,513	200	757	\$204,960	\$2,049,600	\$409,920	\$2,664,480	\$1,629,097	\$208,859	\$826,524
Site Costs												
Exterior Cladding						\$149,079	\$1,490,791	\$298,158	\$1,938,028	\$1,938,028		\$0
Hardstand						38,401	384,008	76,802	499,210	499,210		\$0
Total Site Costs						\$187,480	\$1,874,799	\$374,960	\$2,437,239	\$2,437,239		\$0
Terminal Equipment												
Passenger Boarding Bridges						\$172,500	\$1,725,000	\$345,000	\$2,242,500	\$2,242,500		\$0
Baggage Handling Systems						172,500	1,725,000	345,000	2,242,500			\$2,242,500
Elevators						132,250	1,322,500	264,500	1,712,250			\$1,712,250
Total Terminal Equipment						\$358,250	\$3,582,500	\$716,500	\$4,657,250	\$2,414,750	\$2,242,500	\$0
Total Terminal Building Costs	15,095	12,110	22,025	5,180	27,205	\$3,058,065	\$30,580,649	\$6,116,130	\$39,754,844	\$31,843,605	\$4,168,802	\$3,742,437
						\$1,200.53						

Notes:
 (1) Hard Costs include construction costs plus a design contingency
 (2) Design Cost estimate is 10% of hard costs
 (3) Soft Costs include pre-construction costs, construction administration, and construction contingencies (20%)
 (4) Construction estimate is based on \$1,100 per square foot for new construction and \$100 per square foot for light rehabilitation.

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Estimated Project Costs and Development Schedule

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Capital Improvement Program	Funding Schedule										Total Escalated Costs									
	Short-Term					Mid-Term						Long-Term								
	2023	2024	2025	2026	2027	Total	2028-2032	2033-2042	Funding											
Funds Used for Capital Improvement Projects																				
Alaska DOT&PF - Pass Through Federal Funding:																				
AIP - Landing Field Parcel	\$0	\$0	\$2,188,106	\$0	\$0	\$0	\$0	\$2,188,106	\$5,424,477	\$4,531,043	\$12,143,627									
AIP - Building Site Parcel - Terminal Related	8,514,933	15,000,000	6,000,000	3,073,295	0	29,514,933	3,073,295	0	1,476,919	0	4,550,213									
AIP - Building Site Parcel - Other Facilities	0	0	0	8,195,453	0	8,195,453	8,546,213	1,671,924	2,679,866	6,166,234	10,520,206									
Alaska DOT&PF - Major Capital Contribution	0	0	350,760	481,848	338,058	1,169,666	536,841	(1,238,615)	(490,206)	(1,533,892)	(2,325,427)									
Passenger Facility Charges:	418,315	438,503	459,665	481,848	508,171	2,306,502	536,841	(1,238,615)	(490,206)	(1,533,892)	(2,325,427)									
PFC beginning year unliquidated balance	988,812	282,127	325,012	338,058	424,288	988,812	(536,841)	0	0	0	0									
PFC unspent current year + carryover	(282,127)	(325,012)	(338,058)	(424,288)	(536,841)	(2,306,502)	(536,841)	0	0	0	0									
PFC Debt Proceeds (30 yrs, 6.0%) Thru 2053	0	5,000,000	(68,851)	(77,395)	(82,039)	5,000,000	(301,329)	0	0	0	0									
Less PFC Funded Principal Payments	0	0	0	0	0	0	0	0	0	0	0									
Other Capital Contribution	0	0	0	0	0	0	0	0	0	0	0									
Private 3rd Party Funding	0	0	0	0	0	0	0	0	0	0	0									
Other Unidentified Funding	0	0	0	0	0	0	0	0	0	0	0									
Net Operating Cash Flow	1,476,763	(387,090)	217,570	336,706	513,244	2,157,193	3,090,106	3,399,432	3,090,106	3,399,432	12,655,414									
Funds Available Current Year	11,116,696	19,939,647	9,130,041	11,923,677	826,824	52,936,884	47,688,486	24,030,044	47,688,486	24,030,044	124,555,414									
Beginning Cash Balance/Funds Carried Over from Prior Year	9,057,530	6,816,966	7,481,035	3,744,183	3,876,003	9,057,530	4,389,247	7,479,353	4,389,247	7,479,353	9,057,530									
Funds Used Current Year	(13,357,260)	(19,275,578)	(12,866,892)	(11,791,857)	(313,580)	(57,605,167)	(44,598,380)	(20,630,613)	(44,598,380)	(20,630,613)	(122,834,159)									
Funds Carried Over to Next Year	\$6,816,966	\$7,481,035	\$3,744,183	\$3,876,003	\$4,389,247	\$4,389,247	\$7,479,353	\$10,878,785	\$7,479,353	\$10,878,785	\$10,878,785									
Average Debt Service Coverage >>>			1.71x	2.07x	2.88x	2.88x	2.92x	2.42x												
Estimated Project Costs and Development Schedule																				
Capital Project Description	2023 Base Year Costs	2023	2024	2025	2026	2027	Total	Mid-Term 2028-2032	Long-Term 2033-2042	Total										
Short-Term Projects (2023-2027)																				
Terminal Building Components	Design	Construct (25%)	Construct (50%)	Construct (25%)																
Airline Ticketing/Check-In	\$3,677,037	\$1,131,396	\$1,748,007	\$900,224			\$3,779,626			\$3,779,626										
Passenger and Baggage Security/Screening	\$8,223,716	2,530,374	3,909,428	2,013,355			8,453,157			8,453,157										
Departure Areas	7,124,481	2,192,148	3,386,869	1,744,237			7,323,254			7,323,254										
Concessions	1,633,632	502,656	776,604	399,951			1,679,210			1,679,210										
Other Public Areas	9,337,010	2,872,926	4,438,671	2,285,915			9,597,512			9,597,512										
Support Areas	2,664,480	819,840	1,266,653	652,326			2,738,819			2,738,819										
Site Costs	2,437,239	749,920	1,158,626	596,692			2,505,238			2,505,238										
Terminal Equipment	4,657,250	1,433,000	2,213,985	1,140,202			4,787,187			4,787,187										
Subtotal - Terminal Building Components	\$39,754,844	\$12,232,260	\$18,898,841	\$9,732,903	\$0	\$0	\$40,864,004	\$0	\$0	\$40,864,004										
Other Capital Projects																				
Covered Walkway to Seaplane Walkway	\$1,125,000	\$1,125,000					\$1,125,000			\$1,125,000										
Brush Cutting Excavator	450,000			477,405			477,405			477,405										
Relocate Seaplane Haul Out Ramp	2,200,000			2,333,980			2,333,980			2,333,980										
ARFF Truck Acquisition (Increase in Index)	1,000,000			1,092,727			1,092,727			1,092,727										
ARFF Building Expansion (Increase in Index) including new above ground fueling storage	2,000,000			2,185,454			2,185,454			2,185,454										
Murphy's Pulloft Replacement	7,500,000			8,195,453			8,195,453			8,195,453										
Total Short-Term Project Costs Before Financing	\$54,029,844	\$13,357,260	\$18,898,841	\$12,544,288	\$11,473,634	\$0	\$56,274,022	\$0	\$0	\$56,274,022										
Financing Costs for Debt Serviced with PFCs	-	0	376,737	322,604	318,223		313,580	1,331,144	0	0	1,331,144									
Total Short-Term Project Costs	\$54,029,844	\$13,357,260	\$19,275,578	\$12,866,892	\$11,791,857	\$313,580	\$57,605,167	\$0	\$0	\$57,605,167										
Mid-Term Projects (202-2032)																				
Air Cargo Apron Expansion	\$2,858,712						\$0	\$3,464,275		\$3,464,275										
Env. Assessment for Road Relocation/Vehicle Parking	300,000						0	363,549		363,549										

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Estimated Project Costs and Development Schedule

Capital Improvement Program	Funding Schedule										Total Funding	
	Short-Term					Total	Mid-Term 2028-2032	Long-Term 2033-2042	Total			
	2023	2024	2025	2026	2027							
Funds Used for Capital Improvement Projects												
Alaska DOT&PF - Pass Through Federal Funding:												
AIP - Landing Field Parcel	\$0	\$0	\$2,188,106	\$0	\$0	\$0	\$2,188,106	\$5,424,477	\$4,531,043	\$12,143,627		
AIP - Building Site Parcel - Terminal Related	8,514,933	15,000,000	6,000,000	0	0	0	29,514,933	0	0	29,514,933		
AIP - Building Site Parcel - Other Facilities	0	0	0	3,073,295	0	0	3,073,295	1,476,919	0	4,550,213		
Alaska DOT&PF - Major Capital Contribution	0	0	350,760	8,195,453	0	0	8,546,213	1,671,924	302,070	10,520,206		
Passenger Facility Charges:												
PFC beginning year unliquidated balance	418,315	438,503	459,665	481,848	508,171	529,288	2,306,502	2,679,866	6,166,234	11,152,601		
PFC unspent current year + carryover	988,812	282,127	325,012	338,058	424,288	424,288	988,812	536,841	1,238,615	988,812		
PFC Debt Proceeds (30 yrs, 6.0%) Thru 2053	(282,127)	(325,012)	(338,058)	(424,288)	(536,841)	(536,841)	(1,238,615)	(1,238,615)	(3,448,667)	(3,448,667)		
Less PFC Funded Principal Payments	0	0	(68,851)	(77,395)	(82,039)	(90,000)	(301,329)	(490,206)	(1,533,892)	(2,325,427)		
Other Capital Contribution	0	0	0	0	0	0	0	0	0	0		
Private 3rd Party Funding	0	0	0	0	0	0	0	4,241,408	1,278,138	5,519,546		
Other Unidentified Funding	0	0	0	0	0	0	0	30,295,768	0	30,295,768		
Net Operating Cash Flow	0	0	0	0	0	0	0	0	0	0		
Funds Available Current Year	1,476,763	(387,090)	217,570	336,706	513,244	2,157,193	3,090,106	3,399,432	3,399,432	12,655,414		
Beginning Cash Balance/Funds Carried Over from Prior Year	11,116,696	19,939,647	9,130,041	11,923,677	826,824	52,936,884	47,688,486	24,030,044	7,479,353	9,057,530		
Funds Used Current Year	9,057,530	6,816,966	7,481,035	3,744,183	3,876,003	9,057,530	4,389,247	(20,630,613)	(122,834,159)	(13,357,260)		
Funds Carried Over to Next Year	(13,357,260)	(19,275,578)	(12,866,892)	(11,791,857)	(313,580)	(57,605,167)	(44,598,380)	(20,630,613)	(122,834,159)	(6,816,966)		
	\$6,816,966	\$7,481,035	\$3,744,183	\$3,876,003	\$4,389,247	\$4,389,247	\$7,479,353	\$10,878,785	\$10,878,785	\$6,816,966		
	Average Debt Service Coverage >>>											
	1.71x					2.07x					2.58x	
	Estimated Project Costs and Development Schedule											
	2023		Short-Term		2027		2028-2032		2033-2042		Total	
	Costs		2023	2024	2025	2026	2027	Total	2028-2032	2033-2042	Escalated Costs	
Capital Project Description												
Alaska/Airline Equipment/Cargo/Fishbox Storage Facility			3,500,000					0	4,241,408		4,241,408	
Airport Ferry Replacement			25,000,000					0	30,295,768		30,295,768	
ARFF Building Re-roof			1,300,000					0	1,575,380		1,575,380	
Upper & Lower Drainage Improvements			1,000,000					0	1,211,831		1,211,831	
Convert Commercial Apron from Asphalt to Concrete (Ph			1,615,972					0	1,958,285		1,958,285	
Total Mid-Term Project Costs Before Financing			\$35,574,684					\$0	\$43,110,495		\$43,110,495	
Financing Costs for Debt Serviced with PFCs			-					0	1,487,885		1,487,885	
Total Mid-Term Project Costs			\$35,574,684					\$0	\$44,598,380		\$44,598,380	
Long-Term Projects (2033-2042)												
North Airport Service Road Relocation			\$445,186					0	\$673,384		\$673,384	
Vehicle Parking Expansion			4,604,003					0	6,963,968		6,963,968	
RAC Wash Facility Replacement			845,000					0	1,278,138		1,278,138	
Two Level Parking Deck			2,948,400					0	4,459,720		4,459,720	
Convert Commercial Apron from Asphalt to Concrete (Ph			3,195,257					0	4,833,113		4,833,113	
Total Long-Term Project Costs Before Financing			\$12,037,846					\$0	\$18,208,322		\$18,208,322	
Financing Costs for Debt Serviced with PFCs			-					0	2,422,290		2,422,290	
Total Long-Term Project Costs			\$12,037,846					\$0	\$20,630,613		\$20,630,613	
Total Project Costs			\$101,642,374					\$313,580	\$57,605,167		\$44,598,380	
			\$13,357,260					\$12,866,892	\$11,791,857		\$313,580	
			\$19,275,578					\$57,605,167	\$44,598,380		\$57,605,167	
			\$12,866,892					\$11,791,857	\$313,580		\$12,866,892	
			\$11,791,857					\$313,580	\$57,605,167		\$11,791,857	
			\$313,580					\$57,605,167	\$44,598,380		\$313,580	
			\$57,605,167					\$11,791,857	\$313,580		\$57,605,167	
			\$44,598,380					\$20,630,613	\$122,834,159		\$44,598,380	
			\$20,630,613					\$122,834,159	\$20,630,613		\$20,630,613	

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Projected Capital Funding Sources

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Capital Improvement Projects	Total Escalated Costs	AK DOT&PF - Pass Thru Federal Funding		Total Pass Thru Federal Funding	Alaska DOT&PF Grants	Passenger Facility Charges (Debt)	Passenger Facility Charges (PAYG)	Other Capital Contribution - Borough / Land Trust	Private 3rd Party Funding	Other Unidentified Funding	Cash Reserves/ Net Revs	Total Funding
		AIP - Landing Field Parcel	AIP - Building Site Parcel									
Short-Term Projects (2023-2027)												
Terminal Building Components												
Airline Ticketing/Check-In	\$3,779,626			\$0		\$1,700,000					\$2,079,626	\$3,779,626
Passenger and Baggage Security/Screening	8,453,157			7,362,335		490,822					600,000	8,453,157
Departure Areas	7,323,254			6,865,551		457,703					1,679,210	7,323,254
Concessions	1,679,210			0							1,679,210	1,679,210
Other Public Areas	9,597,512			6,679,631		1,777,647					1,140,235	9,597,512
Support Areas	2,738,819			1,770,768		118,051					850,000	2,738,819
Site Costs	2,505,238			2,348,660		156,577					0	2,505,238
Terminal Equipment	4,787,187			4,487,988		299,199					0	4,787,187
Subtotal - Terminal Building Components	\$40,864,004	\$0	\$29,514,933	\$29,514,933	\$0	\$5,000,000	\$0	\$0	\$0	\$0	\$6,349,071	\$40,864,004
Other Capital Projects												
Covered Walkway to Seaplane Walkway	\$1,125,000			\$0							\$0	\$1,125,000
Brush Cutting Excavator	477,405			0							477,405	477,405
Relocate Seaplane Haul Out Ramp	2,333,980	2,188,106		2,188,106		145,874					0	2,333,980
ARFF Truck Acquisition (Increase in Index)	1,092,727			1,024,432		68,295					0	1,092,727
ARFF Building Expansion (Increase in Index) including new Murphy's Pulout Replacement	2,185,454			2,048,863		136,591					0	2,185,454
	8,195,453			0		8,195,453					0	8,195,453
Total Short-Term Project Funding Before Financing	\$56,274,022	\$2,188,106	\$32,588,227	\$34,776,334	\$8,546,213	\$5,000,000	\$1,125,000	\$0	\$0	\$0	\$6,826,476	\$56,274,022
Financing Costs for Debt Serviced with PFCs	1,331,144					1,331,144						1,331,144
Total Short-Term Project Funding	\$57,605,167	\$2,188,106	\$32,588,227	\$34,776,334	\$8,546,213	\$6,331,144	\$1,125,000	\$0	\$0	\$0	\$6,826,476	\$57,605,167
Mid-Term Projects (2028-2032)												
Air Cargo Apron Expansion	\$3,464,275	\$3,247,758		\$3,247,758	\$216,517						\$0	\$3,464,275
Env. Assessment for Road Relocation/Vehicle Parking Expans	363,549	340,827		340,827	22,722				4,241,408		0	363,549
Alaska/Airline Equipment/Cargo/Fishbox Storage Facility	4,241,408			0							0	4,241,408
Airport Ferry Replacement	30,295,768			0						30,295,768	0	30,295,768
ARFF Building Re-roof	1,575,380			1,476,919	98,461						0	1,575,380
Upper & Lower Drainage Improvements	1,211,831			0	1,211,831						0	1,211,831
Convert Commercial Apron from Asphalt to Concrete (Ph II)	1,958,285	1,835,892		1,835,892	122,393						0	1,958,285
Total Mid-Term Project Funding Before Financing	\$43,110,495	\$5,424,477	\$1,476,919	\$6,901,396	\$1,671,924	\$0	\$0	\$0	\$4,241,408	\$30,295,768	\$0	\$43,110,495
Financing Costs for Debt Serviced with PFCs	1,487,885					1,487,885						1,487,885
Total Mid-Term Project Funding	\$44,598,380	\$5,424,477	\$1,476,919	\$6,901,396	\$1,671,924	\$1,487,885	\$0	\$0	\$4,241,408	\$30,295,768	\$0	\$44,598,380
Long-Term Projects (2033-2042)												
North Airport Services Road Relocation	\$673,384			\$0				\$673,384			\$0	\$673,384
Vehicle Parking Expansion	6,963,968			0				6,963,968			0	6,963,968
RAC Wash Facility Replacement	1,278,138			0					1,278,138		0	1,278,138
Two Level Parking Deck	4,459,720			0				4,459,720			0	4,459,720
Convert Commercial Apron from Asphalt to Concrete (Ph	4,833,113	4,531,043		4,531,043	302,070						0	4,833,113
Total Long-Term Project Funding Before Financing	\$18,208,322	\$4,531,043	\$0	\$4,531,043	\$302,070	\$0	\$0	\$12,097,071	\$1,278,138	\$0	\$0	\$18,208,322
Financing Costs for Debt Serviced with PFCs	2,422,290					2,422,290						2,422,290
Total Long-Term Project Funding	\$20,630,613	\$4,531,043	\$0	\$4,531,043	\$302,070	\$2,422,290	\$0	\$12,097,071	\$1,278,138	\$0	\$0	\$20,630,613
Total Project Funding	\$122,834,159	\$12,143,627	\$34,065,146	\$46,208,773	\$10,520,206	\$10,241,319	\$1,125,000	\$12,097,071	\$5,519,546	\$30,295,768	\$6,826,476	\$122,834,159

**KETCHIKAN INTERNATIONAL AIRPORT (KTN)
Ketchikan Gateway Borough**

KTN - CBR - 2023 - 1

Schedule 7-3b
14-Jul-23

**Concept and Budget Report - Financial Implementation Analysis
Summary of Projected Capital Funding Sources**

	2023 Design & Construct (25%)	2024 Construct (50%)	2025 Construct (25%)	Total
Total Terminal Building Cost	\$12,232,260	\$18,898,841	\$9,732,903	\$40,864,004
Capital Funding:				
Pass Thru Federal Funding	\$8,514,933	\$15,000,000	\$6,000,000	\$29,514,933
PFC Debt Proceeds	0	2,648,841	2,351,159	5,000,000
Airport Cash Reserves	3,717,327	1,250,000	1,381,745	6,349,071
Total Capital Funding	\$12,232,260	\$18,898,841	\$9,732,903	\$40,864,004

**KETCHIKAN INTERNATIONAL AIRPORT (KTN)
Ketchikan Gateway Borough**

KTN - CBR - 2023 - 1

Schedule 7-4

**Concept and Budget Report - Financial Implementation Analysis
PFC Serviced Debt Issue**

14-Jul-23

Debt Issue Structure						
				Issue Date:	01-Oct-23	
				Interest:	6.0%	
				Term:	30 Years	
				Project Funding Requirement:	\$5,000,000	
				Debt Service Reserve Fund Requirement (MADS):	395,618	
				Capitalized Debt Issue Costs (1.0%):	<u>50,000</u>	
				Total Debt Requirement:	<u><u>\$5,445,618</u></u>	
Notes:						
(1) Assumes no interest earnings on Construction Fund balance or Debt Service Reserve Fund deposit.						
(2) Assumes DSRF funded from the issue amount						
Debt Service Schedule						
Payment Number	Fiscal Year	Beginning Principal	Annual Debt Service	Interest Payment	Principal Payment	Ending Principal
1	2024	\$5,445,618	\$395,618	\$326,737	\$68,881	\$5,376,737
2	2025	5,376,737	395,618	322,604	73,014	5,303,723
3	2026	5,303,723	395,618	318,223	77,395	5,226,328
4	2027	5,226,328	395,618	313,580	82,039	5,144,289
5	2028	5,144,289	395,618	308,657	86,961	5,057,329
6	2029	5,057,329	395,618	303,440	92,179	4,965,150
7	2030	4,965,150	395,618	297,909	97,709	4,867,441
8	2031	4,867,441	395,618	292,046	103,572	4,763,869
9	2032	4,763,869	395,618	285,832	109,786	4,654,083
10	2033	4,654,083	395,618	279,245	116,373	4,537,710
11	2034	4,537,710	395,618	272,263	123,356	4,414,354
12	2035	4,414,354	395,618	264,861	130,757	4,283,597
13	2036	4,283,597	395,618	257,016	138,602	4,144,995
14	2037	4,144,995	395,618	248,700	146,919	3,998,076
15	2038	3,998,076	395,618	239,885	155,734	3,842,343
16	2039	3,842,343	395,618	230,541	165,078	3,677,265
17	2040	3,677,265	395,618	220,636	174,982	3,502,283
18	2041	3,502,283	395,618	210,137	185,481	3,316,801
19	2042	3,316,801	395,618	199,008	196,610	3,120,191
20	2043	3,120,191	395,618	187,211	208,407	2,911,785
21	2044	2,911,785	395,618	174,707	220,911	2,690,873
22	2045	2,690,873	395,618	161,452	234,166	2,456,708
23	2046	2,456,708	395,618	147,402	248,216	2,208,492
24	2047	2,208,492	395,618	132,510	263,109	1,945,383
25	2048	1,945,383	395,618	116,723	278,895	1,666,488
26	2049	1,666,488	395,618	99,989	295,629	1,370,859
27	2050	1,370,859	395,618	82,252	313,367	1,057,492
28	2051	1,057,492	395,618	63,450	332,169	725,324
29	2052	725,324	395,618	43,519	352,099	373,225
30	2053	373,225	395,618	22,393	373,225	0
Totals			<u>\$11,868,547</u>	<u>\$6,422,929</u>	<u>\$5,445,618</u>	

**KETCHIKAN INTERNATIONAL AIRPORT (KTN)
Ketchikan Gateway Borough
Concept and Budget Report - Financial Implementation Analysis
Actual, Estimated and Projected Operations & Maintenance Expenses**

14-Jul-23

Operations & Maintenance Expenses	Actual 2021	Actual 2022	Short-Term					Total	Mid-Term 2028-2032	Long-Term 2033-2042
			Estimate 2023	Estimate 2024	2025	Projected 2026	2027			
Personnel Costs	\$3,630,202	\$3,791,949	\$3,788,797	\$4,000,000	\$4,120,000	\$4,243,600	\$4,370,908	\$20,523,305	\$23,901,917	\$59,831,049
Travel & Training	18,535	18,909	26,700	30,500	31,415	32,357	33,328	154,301	182,252	456,212
Uniform Allowance	1,395	4,467	7,500	8,000	8,240	8,487	8,742	40,969	47,804	119,662
Supplies	3,034	1,934	9,500	9,900	10,197	10,503	10,818	50,918	59,157	148,082
Operating Supplies	148,564	134,100	213,000	198,000	203,940	210,058	216,360	1,041,358	1,183,145	2,961,637
Dues & Publications	993	1,134	1,000	1,300	1,339	1,379	1,421	6,439	7,768	19,445
Banking Fees	32,378	59,211	75,000	80,000	82,400	84,872	87,418	409,690	478,038	1,196,621
Security Screening Expense	925	2,475	2,000	2,000	2,060	2,122	2,185	10,367	11,951	29,916
Professional Services	0	0	783,000	0	0	0	0	783,000	0	0
Licenses/Fees/Permits	920	1,231	3,500	2,500	2,575	2,652	2,732	13,959	14,939	37,394
Contractual Services	193,208	122,869	109,000	471,240	485,377	499,939	514,937	2,080,492	2,815,885	7,048,666
Insurance	244,273	253,537	213,687	245,741	253,113	260,707	268,528	1,241,776	1,468,420	3,675,755
Medical Expense	142	0	2,250	2,000	2,060	2,122	2,185	10,617	11,951	29,916
Administrative Fees	280,072	264,356	367,038	399,859	411,855	424,210	436,937	2,039,899	2,389,349	5,980,996
Electricity	123,754	114,155	157,900	170,950	176,079	181,361	186,802	873,091	1,021,508	2,557,029
Water	39,375	38,091	34,500	47,000	48,410	49,862	51,358	231,130	280,848	703,015
Telephone/Long Distance	14,338	16,734	17,050	20,000	20,600	21,218	21,855	100,723	119,510	299,155
Sewer	36,008	33,777	24,500	43,000	44,290	45,619	46,987	204,396	256,946	643,184
Landfill Fees	6,294	11,277	13,866	17,000	17,510	18,035	18,576	84,988	101,583	254,282
Dock Maintenance	7,078	7,362	2,500	11,500	11,845	12,200	12,566	50,612	68,718	172,014
Field Maintenance	17,538	19,072	20,000	20,000	20,600	21,218	21,855	103,673	119,510	299,155
Building Maintenance	23,989	22,980	48,000	36,000	37,080	38,192	39,338	198,611	215,117	538,479
Heating Fuel	68,569	79,543	100,000	98,000	100,940	103,968	107,087	509,995	585,597	1,465,861
Equipment Maintenance	11,870	15,150	54,391	54,000	55,620	57,289	59,007	280,307	322,676	807,719
Vehicle Maintenance	27,686	13,584	18,200	20,600	21,218	21,855	22,510	104,383	123,095	308,130
Vehicle Fuel & Oil	180,363	309,658	417,500	467,500	481,525	495,971	510,850	2,373,346	2,793,536	6,992,754
Ferry Maintenance	194,815	243,987	300,000	85,000	87,550	90,177	92,882	655,608	507,916	1,271,410
Airport Parking Lot Maintenance	1,210	1,429	5,000	20,000	20,600	21,218	21,855	88,673	119,510	299,155
Equipment Purchases	10,875	18,988	81,500	113,500	75,000	77,250	79,568	426,818	435,108	1,089,157
Miscellaneous	590	4,958	979	800	824	849	874	4,326	4,780	11,966
Debt Service	0	0	0	0	0	0	0	0	0	0
Bad Debt Expense	11,538	0	0	0	0	0	0	0	0	0
Capital Improvements	0	0	24,308	0	0	0	0	24,308	0	0
Total Operations & Maintenance Expenses	\$5,330,531	\$5,606,916	\$6,922,166	\$6,675,890	\$6,834,262	\$7,039,290	\$7,250,468	\$34,722,075	\$39,648,532	\$99,247,827
	4.8%	5.2%	23.5%	-3.6%	2.4%	3.0%	3.0%	5.3%	3.0%	3.0%
Operating Expenses Per Enplaned Passenger:										
	\$45.28	\$43.18	\$50.85	\$46.78	\$45.69	\$44.89	\$44.11	\$46.32	\$45.41	\$49.46
	\$76.52	\$77.30	\$78.09	\$78.88	\$79.68	\$80.49	\$81.31	\$79.69	\$84.26	\$90.92

KETCHIKAN INTERNATIONAL AIRPORT (KTN)
Ketchikan Gateway Borough
Concept and Budget Report - Financial Implementation Analysis
Actual, Estimated and Projected Operating Revenues

14-Jul-23

Revenues	Actual 2021	Actual 2022	Short-Term					Total	Mid-Term 2028-2032	Long-Term 2033-2042
			Estimate 2023	Estimate 2024	2025	Projected 2026	2027			
AIRLINE REVENUES										
Terminal Building Rents - Airlines	\$361,048	\$347,299	\$363,000	\$363,000	\$373,890	\$385,107	\$396,660	\$1,881,657	\$2,169,099	\$5,429,668
Landing Fees - Airlines	771,128	974,096	975,100	975,100	1,114,353	1,257,784	1,405,517	5,727,854	7,685,944	19,239,381
Rental Income - Field - Airlines	119,087	119,087	119,087	119,087	122,660	126,339	130,130	617,303	711,602	1,781,275
Airline Security Revenue	137,002	239,124	250,000	250,000	262,065	274,712	287,970	1,324,747	1,560,637	3,347,292
Total Airline Revenues	\$1,388,264	\$1,679,606	\$1,707,187	\$1,707,187	\$1,872,968	\$2,043,942	\$2,220,276	\$9,551,559	\$12,127,281	\$29,997,615
Annual Growth Rate	-19.0%	21.0%	1.6%	0.0%	9.7%	9.1%	8.6%	5.7%	2.9%	2.8%
Airline Cost Per Explained Passenger:										
Ketchikan International Airport	\$11.79	\$12.93	\$12.54	\$11.96	\$12.52	\$13.04	\$13.51	\$12.74	\$13.89	\$14.95
Non-Hub Industry Average	\$13.32	\$13.45	\$13.59	\$13.73	\$13.87	\$14.01	\$14.15	\$13.87	\$14.66	\$15.82
NON-AIRLINE REVENUES										
Landing Fees - Non-Airline	\$15,737	\$19,880	\$19,900	\$19,900	\$20,497	\$21,112	\$21,745	\$103,154	\$118,912	\$297,659
Fuel Flowage Fees	96,787	166,504	185,000	185,000	290,550	299,267	308,244	1,268,061	1,685,607	4,219,396
State Fuel Tax Revenue	87,184	50,219	55,000	55,000	56,650	58,350	60,100	285,099	328,651	822,677
Rental Income - Field - Non-Airlines	43,623	39,400	30,913	106,913	175,120	180,374	185,785	679,106	1,015,950	2,543,116
Aircraft Parking Fees	13,980	22,217	15,000	15,000	15,450	15,914	16,391	77,754	89,632	224,366
The-Down Charges			1,000	1,000	1,030	1,061	1,093	5,184	4,958	89,632
Seaplane Dock Fees	4,070	4,089	6,000	7,210	7,210	7,426	7,649	35,285	41,828	104,704
Murphy's Landing Docking Fees	8,900	9,406	8,900	8,900	9,167	9,442	9,725	46,134	53,182	133,124
Terminal Building Rents - Non-Airline	185,994	178,912	187,000	187,000	192,610	198,388	204,340	969,338	1,117,415	2,797,102
Terminal Use Fees	22,905	38,667	46,000	46,000	47,380	48,801	50,265	238,447	274,872	688,057
Ambassador Fees	0	0	0	0	0	0	0	0	0	0
Background Check Fees	1,620	3,300	3,000	3,000	3,090	3,183	3,278	15,551	17,926	44,873
Terminal Vendor Concessions	5,538	4,014	4,500	4,400	4,751	5,129	5,538	24,318	32,858	93,762
TSA Law Enforcement Reimbursement	46,955	50,225	42,000	42,000	43,260	44,558	45,895	217,712	250,970	628,226
Vehicle Parking - Terminal	76,106	102,698	100,000	100,000	154,826	162,298	170,130	687,254	922,012	2,095,713
Vehicle Parking - Revilla	183,980	226,985	320,000	320,000	485,443	508,870	533,428	2,167,742	3,666,380	8,333,599
Parking Enforcement Fees	22,723	24,746	25,000	25,000	25,750	26,523	27,318	129,591	149,387	373,944
Ferry Fees	1,974,559	2,719,370	2,850,000	2,850,000	2,987,540	3,131,718	3,282,853	15,102,111	17,791,257	43,135,781
Medvac - Ambulance Ferry Fees	5,500	5,500	5,500	5,500	5,500	5,500	5,500	27,500	27,500	55,000
State MOA Revenue	502,000	502,000	502,000	502,000	502,000	502,000	502,000	2,510,000	2,510,000	5,020,000
Commercial Passenger Vessel Revenue:	34,698	0	0	0	69,525	71,611	71,611	280,247	358,054	716,108
Pers on Behalf Payments	162,565	155,157	58,000	58,000	0	0	0	58,000	0	0
Miscellaneous Revenues	40,340	45,396	28,500	500	515	530	546	30,592	2,988	7,479
Total Non-Airline Revenues	\$3,535,765	\$4,368,684	\$4,493,213	\$4,551,613	\$5,097,864	\$5,302,054	\$5,513,436	\$24,958,180	\$30,461,357	\$72,349,644
Annual Growth Rate	-9.2%	23.6%	2.9%	1.3%	12.0%	4.0%	4.0%	4.8%	2.7%	2.2%
NON-OPERATING REVENUES										
Interest Income	\$33,787	\$37,117	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$150,000	\$150,000	\$300,000
PFC Reimbursements	237,995	62,390	0	0	51,000	0	0	51,000	0	0
COVID Relief Funding	2,775,691	0	2,168,529	0	0	0	0	2,168,529	0	0
Total Non-Operating Revenues	\$3,047,473	\$99,507	\$2,198,529	\$30,000	\$81,000	\$30,000	\$30,000	\$2,369,529	\$150,000	\$300,000
Annual Growth Rate	81.4%	-96.7%	2109.4%	-98.6%	170.0%	-63.0%	0.0%	-21.3%	0.0%	0.0%
Total Revenues	\$7,971,502	\$6,147,797	\$8,398,929	\$6,288,800	\$7,051,832	\$7,375,996	\$7,763,713	\$36,879,269	\$42,738,638	\$102,647,259
Annual Growth Rate	9.4%	-22.9%	36.6%	-25.1%	12.1%	4.6%	5.3%	4.8%	2.8%	2.4%
Operating Revenues Per Explained Passenger:										
Ketchikan International Airport	\$41.83	\$46.58	\$45.55	\$43.86	\$46.60	\$46.85	\$47.05	\$46.04	\$48.78	\$51.01
Non-Hub Industry Average	\$74.71	\$75.47	\$76.24	\$77.02	\$77.80	\$78.59	\$79.39	\$77.81	\$82.26	\$88.77

KETCHIKAN INTERNATIONAL AIRPORT (KTN)
Ketchikan Gateway Borough
Concept and Budget Report - Financial Implementation Analysis
Financial Plan Summary
Estimated and Projected Net Revenues, Capital Funding and Capital Expenditures

14-Jul-23

	Short-Term										Total	Mid-Term 2028-2032	Long-Term 2033-2042	
	Estimate 2023	Estimate 2024	2025	Projected 2026	2027									
Operating/Capital Cash Flow														
Passenger Enplanements	136,126	142,695	149,582	156,801	164,368	749,571	873,067	2,006,584						
Annual Growth Rates	-	4.83%	4.83%	4.83%	4.83%	4.83%	4.83%	1.67%						
Operating Cash Flow														
Revenues:														
Airline Revenues	\$1,707,187	\$1,707,187	\$1,872,968	\$2,043,942	\$2,220,276	\$9,551,559	\$12,127,281	\$29,997,615						
Non-Airline Revenues	4,493,213	4,551,613	5,097,864	5,302,054	5,513,436	24,958,180	30,461,357	72,349,644						
Non-Operating Revenues	2,198,529	30,000	81,000	30,000	30,000	2,369,529	150,000	300,000						
Total Revenues	\$8,398,929	\$6,288,800	\$7,051,832	\$7,375,996	\$7,763,713	\$36,879,269	\$42,738,638	\$102,647,259						
Operations & Maintenance Expenses	(6,922,166)	(6,675,890)	(6,834,262)	(7,039,290)	(7,250,468)	(34,722,075)	(39,648,532)	(99,247,827)						
Total Net Operating Cash Flow Available	\$1,476,763	(\$387,090)	\$217,570	\$336,706	\$513,244	\$2,157,193	\$3,090,106	\$3,399,432						
For Capital Expenditures														
Capital Cash Flow														
Beginning Cash Balance	\$9,057,530	\$6,816,966	\$7,481,035	\$3,744,183	\$3,876,003	\$9,057,530	\$4,389,247	\$7,479,353						
Other Capital Funding Sources:														
Alaska DOT&PF - Pass Through Federal Funding:														
AIP - Landing Field Parcel	\$0	\$0	\$2,188,106	\$0	\$0	\$2,188,106	\$5,424,477	\$4,531,043						
AIP - Building Site Parcel - Terminal Related	8,514,933	15,000,000	6,000,000	0	0	29,514,933	0	0						
AIP - Building Site Parcel - Other Facilities	0	0	0	3,073,295	0	3,073,295	1,476,919	0						
Alaska DOT&PF - Major Capital Contribution	0	0	350,760	8,195,453	0	8,546,213	1,671,924	302,070						
Passenger Facility Charges:	418,315	438,503	459,665	481,848	508,171	2,306,502	2,679,866	6,166,234						
PFC beginning year unliquidated balance	988,812	282,127	325,012	338,058	424,288	988,812	536,841	1,238,615						
PFC unspent current year + carryover	(282,127)	(325,012)	(338,058)	(424,288)	(536,841)	(536,841)	(1,238,615)	(3,448,667)						
PFC Debt Proceeds (30 yrs, 6.0%) Thru 2053	0	5,000,000	0	0	0	5,000,000	0	0						
Less PFC Funded Principal Payments	0	(68,881)	(73,014)	(77,395)	(82,039)	(301,329)	(490,206)	(1,533,892)						
Other Capital Contribution	0	0	0	0	0	0	0	0						
Private 3rd Party Funding	0	0	0	0	0	0	0	4,241,408						
Other Unidentified Funding	0	0	0	0	0	0	0	30,295,768						
Total Other Capital Funding Sources	\$9,639,933	\$20,326,737	\$8,912,471	\$11,586,971	\$313,580	\$50,779,691	\$44,598,380	\$20,630,613						
Total Funds Available for Capital Expenditures	\$20,174,226	\$26,756,613	\$16,611,075	\$15,667,860	\$4,702,827	\$61,994,414	\$52,077,733	\$31,509,398						
Capital Improvement Program Expenditures	13,357,260	19,275,578	12,866,892	11,791,857	313,580	57,605,167	44,598,380	20,630,613						
Ending Cash Balance	\$6,816,966	\$7,481,035	\$3,744,183	\$3,876,003	\$4,389,247	\$4,389,247	\$7,479,353	\$10,878,785						

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