EXPERIENCE EXCEPTIONAL

RAPID CITY REGIONAL AIRPORT

TERMINAL RENOVATION AND EXPANSION PROJECT

CONCEPT DESIGN REPORT

JULY 28, 2022 (FINAL VERSION AUGUST 19, 2022)

Mead & Hunt

RAPID CITY REGIONAL AIRPORT

DIRECTION

MANAGING THE BOTTOM LINE

Managing the triple bottom line of Social, Environmental, and Financial alongside Operations is the first step in engaging a successful, balanced project.

AIRPORT MISSION

OUR MISSION IS TO PROVIDE A SAFE, ENVIRONMENTALLY RESPONSIBLE AND FISCALLY SELF-SUSTAINABLE OPERATION ENSURING HIGH QUALITY SERVICES AND FACILITIES.

AIRPORT VISION

OUR VISION IS TO PROVIDE WORLD CLASS TRANSPORTATION SERVICE ENHANCING ECONOMIC GROWTH.

CONTENTS

LETTER FROM THE DIRECTOR

PATRICK DAME

RAPID CITY REGIONAL
AIRPORT

To Our Stakeholders and Community:

The Rapid City Regional Airport has retained the services of Mead and Hunt to lead the charge on analyzing existing conditions of our airport, reviewing past planning documentation, and coming up with revised proposals during this Concept Design phase of this study. This Report is a summary of the information collected by their team and shared with the Airport.

The design process and anticipated construction projects address every corner of our airport, maximizing positive passenger experience and minimizing disturbances to our operations. The fiscal responsibility of our projects is of primary importance, and we are seeking public backing and support for multi-phased construction projects that will improve the airport and bring positive impacts to the greater Rapid City Community.

Many of the concepts presented here are very preliminary, but represent the overall direction in this early step in our design process. Our next steps are Schematic Design, Design Documentation, Construction Documents, Bidding, and then Construction.

The Rapid City Regional Airport is the gateway to the beautiful Black Hills, Rapid City and the Ellsworth Airforce Base. This project development is the right thing to do. We believe strongly that our proposed improvements will encourage increased enplanements and interest in the region.

Thank you for being a part of our process and we look forward to continued success.

Patrick B. Dame, C.M.
Executive Director

PROJECT INTRODUCTION

PROJECT EXECUTIVE SUMMARY

The Rapid City Regional Airport has retained Mead & Hunt to provide planning and design services for the airport terminal expansion and renovation project. Mead & Hunt is a full service architectural and engineering firm with airport facility design being a key market that Mead & Hunt serves. Mead & Hunt has built a long-standing reputation for designing cost-effective, visually pleasing and energy-efficient airport facilities. In addition, an earnest consideration of maintenance and operations is a hallmark of our work. A comfortable, well-designed environment is the key to the passenger experience where daily functions including ticketing, baggage sorting and claims, concourse layout, concessions and administrative areas are carefully planned by our diverse group of professionals.

Mead & Hunt has served the Rapid City Regional Airport on several airside projects and is pleased to continue our relationship with the airport management team.

The airport is projecting a significant increase in enplanements over the next ten years and is working to ensure that the facility meets the projected demands and provide visitors to the region with a pleasant experience upon arrival.

From an analysis of the projected enplanements and peak load, it is evident that all areas of the facility are impacted. The renovation and expansion of the facility will include the following modifications to address the projected demands.

- The concourse will be expanded to include additional gates, provide the appropriate hold room area and amenities such as dining areas to serve the passengers.
- A new TSA checkpoint will be constructed with five lanes to minimize wait times during peak travel periods.
- Ticketing will be reconfigured to provide flexibility for the airlines and ease of use for the passengers.
- The checked baggage area will be upgraded to meet TSA requirements.
- The baggage claim area/rental car area will be expanded to reduce the congestion for passengers retrieving luggage and obtaining rental cars.

The project team's goal is to design a facility that addresses these modifications while building upon the architectural aesthetic that has been established and is valued by the Rapid City Regional Airport.

PROJECT VISION

The Rapid City Regional Airport's vision for the project is to design and construct a renovated and expanded facility that addresses the projected enplanements. In expanding and renovating the facility, the goal is to provide spaces and amenities that establish a level of service that enhances the travel experience. At the same time, the design of the facility needs to enhance and build upon the design aesthetic that celebrates the Black Hills, Badlands, and other cultural resources of South Dakota.

CONCEPT REPORT OVERVIEW

The report that follows documents the project team's efforts for the renovation and expansion of the Rapid City Terminal project. Over the course of the Months of April, May, and June 2022, the design team and airport staff met to discuss the goals and objectives for the project, future enplanement projections, limitations of the existing facility, and vision for a future terminal. The design team used this information to provide an assessment of the facility and develop concepts that address these goals and objectives.

To provide flexibility to the Airport, the project is envisioned to consist of four primary areas for construction. These areas include the concourse renovation and expansion, the TSA checkpoint, ticketing and checked baggage, and the baggage claim/rental area. By considering each area as a separate construction project, the Airport can determine which portions of the project to move forward with based on the availability of funding.

The Concept Report will be a living document through the early design phases of the project. As additional information becomes available, the intent is to update the document to ensure that all participants understand the overall direction for the project and are aware of those factors and decisions that may result in changes to the approach. The report is organized in the following manner.

- **Project Overview** in which information is project team, schedule, existing terminal, proposed terminal, phasing, and visioning is presented.
- **Studies** of each area of the facility including ticketing, checked baggage, concourse, TSA checkpoint, checked baggage, baggage claim/rental car.
- **Narratives** for each building system including architectural, interiors, structural, site/civil, mechanical, electrical, plumbing, technology, and sustainability. In these narratives, an assessment of existing systems is made with commentary
- **Cost Estimate** for the proposed project.
- **Appendix** in which the cost estimate is provided.

OVERVIEW

TEAM

CONSULTANT DESIGN MEMBERS

MEAD & HUNT

Justin Anderson, Senior Terminal Planner

Brent Ballweg, Structural Engineer

Cassidy Compton, Interior Designer

Nate DeMaster, BIM/CAD Technician

Devika DeMarion, CAD / BIM Technician

Matt Dubbe, National Design / Market Leader

Luis Sanchez Guevara, Architectural Designer

Evan Hall, Project Architect

Travis Hirschey, Civil Engineer

John Hudock, Electrical Engineer

Sarah Lawley, Architect

Dave Lepine, Senior Engineering Technician

Roger Porter, Mechanical Engineer

Dave Provencher, Project Manager

Joe Rutledge, Plumbing Engineer

Tom Schauer, Senior Aviation Advisor

Rod Senn, Project Manager, Aviation

Mary Shaffer, Principal in Charge

Jeremy Vorheis, Technology Engineer

Tonya Wood, Senior Interior Designer

AMBIENT, A MEAD & HUNT COMPANY

Victoria Horrero, Sustainability and Carbon Leader

Linda Morrison, Sustainability Team Leader

Loretta Pokorny, Sustainability Consultant

Eric Rader, Building Performance Engineer

AERO SYSTEMS

Dennis Ruff, Vice President

SIGNAGE CONSULTANT

Roland Eidahl, Environmental Graphic Designer

SURVEYOR CONSULTANT - FMG ENGINEERING

Alex Fisher, Professional Engineer / Geotech Engineer

COST ESTIMATING - CONCORD GROUP

John Tilleman, Director / Cost Management

LOG PLAN

Rick Kelly, Senior Project Manager

Kevin Walker, Senior Project Manager

CONCESSIONS CONSULTANT - ICF

Stephen Freibrun, Principal

Tod Yankee, Aviation Consultant

AIRPORT DIRECTOR

Patrick Dame, Executive Director

AIRPORT STAFF

Toni Broom, Deputy Director for Finance & Administration

Chris Deitz, Director of Operations & Maintenance

Megan Johnson, Airport Marketing and Air Service Development

Wade Kreun, Airport Facilities and Maintenance Manager

Tod Love, Airport Operations Manager

AIRPORT BOARD OF DIRECTORS

Dustin Dale, Vice President

Darren Haar, Member

Dr. Robert Hall, Secretary

Rod Pettigrew, President

Michael Rath, Member

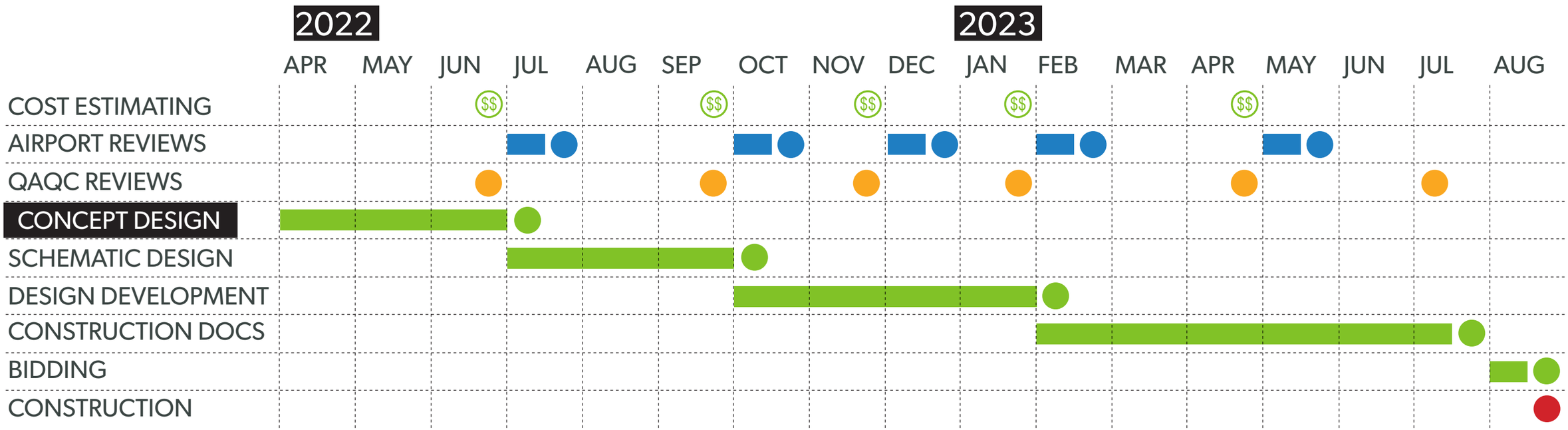
Michelle Thomson, Member

OTHER STAKEHOLDERS

City of Rapid City Council

SCHEDULE

OVERALL PROJECT

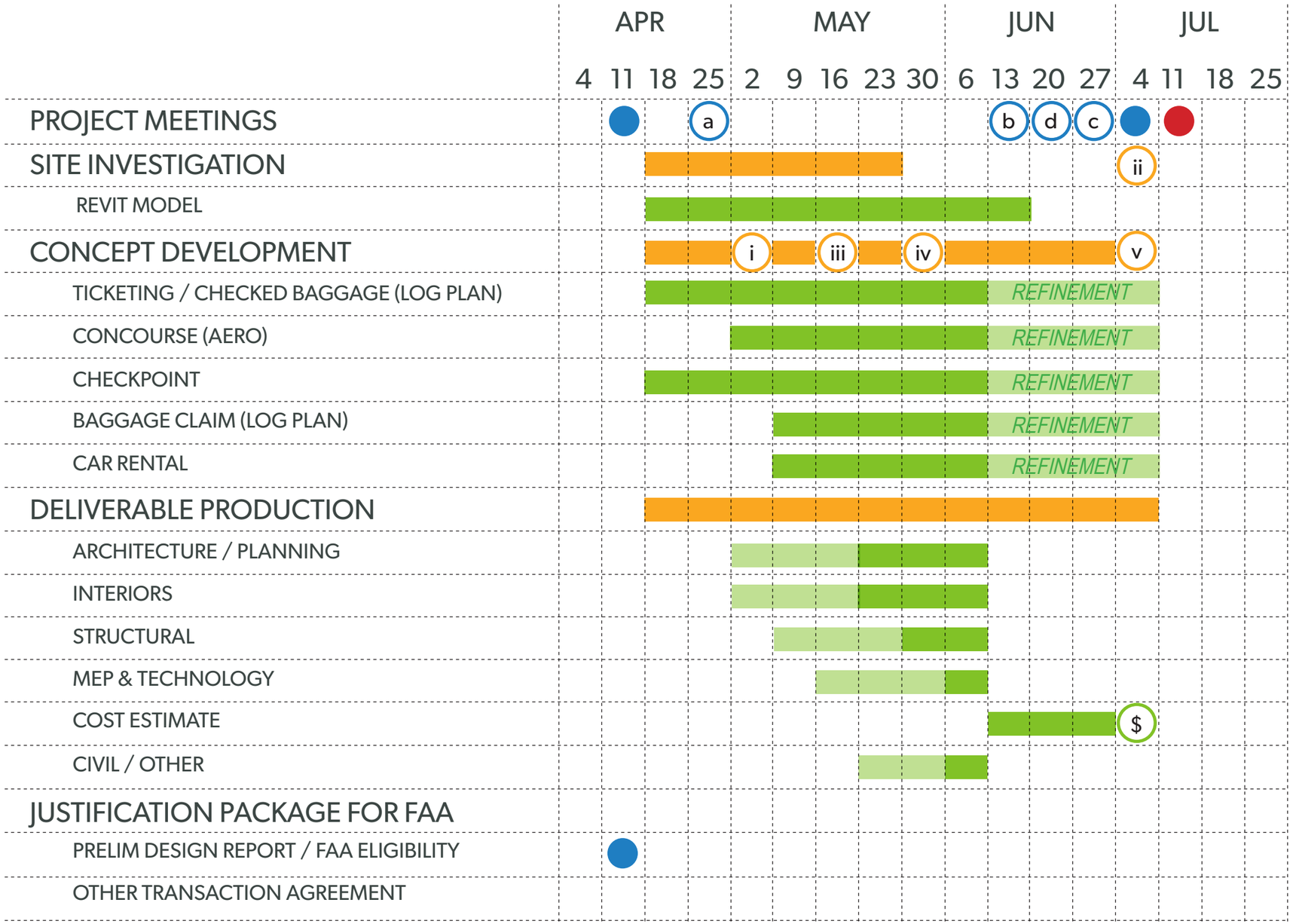


COLOR KEY

- INTERNAL QAQC REVIEW
- AIRPORT REVIEW
- DESIGN TEAM PRODUCTION
- $$ COST ESTIMATING

SCHEDULE

CONCEPT DESIGN



AIRPORT

- a VERIFY PREVIOUS REPORT
- b TSA MEETING (VIRTUAL)
- c MEETING WITH AIRLINES
- d ECONOMIC DEVELOPMENT MEETING

DESIGN TEAM

- $ COST ESTIMATE

TASK

KEY DATES

- i CONFIRMATION OF ENPLANEMENTS
- ii BUILDING SCANS
- iii DESIGN WORKSHOP 1 - VISIONING
- iv DESIGN WORKSHOP 2 - OPTIONS / LEED
- v DESIGN WORKSHOP 3 - REFINEMENT

DELIVERABLE

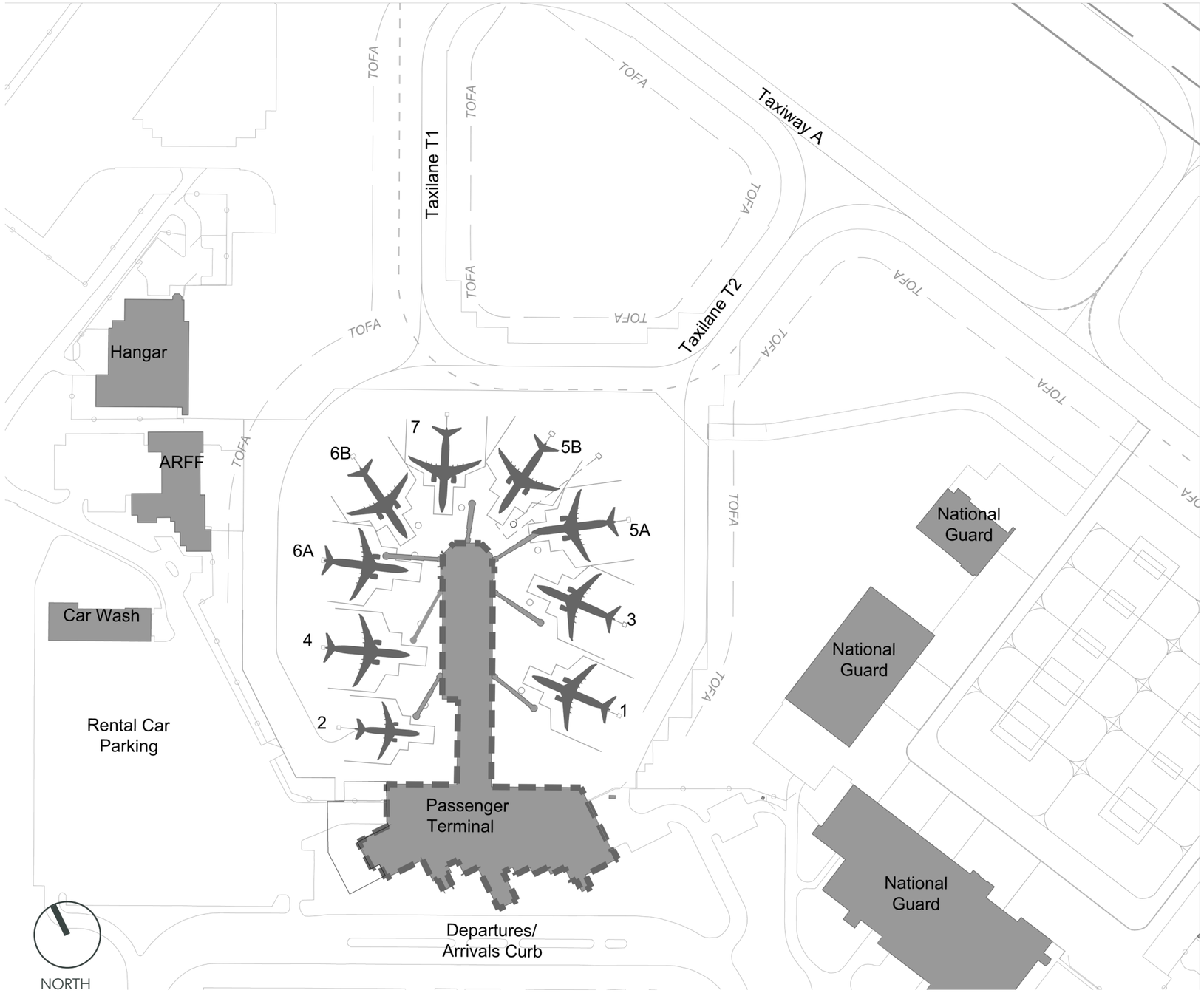
- Passenger, Baggage projections
- Owner's Goals / Objectives
- Operations Narrative
- Design Concepts
- System Description (SMEPT)
- Cost Estimate

EXISTING TERMINAL

CURRENT GATE AND PARKING POSITIONS

SUMMARY

The existing concourse consists of 7 jet bridges with 2 gates providing swing access to 2 additional parking positions making the total parking positions around the concourse 9. All gates, except Gate 2, can accommodate mainline aircraft such as the B737/A320 with Gate 2 being restricted to a large regional jet. The concourse apron is surrounded by rental car parking to the west, Airport Rescue Firefighting station to the northwest, and the national guard to the east. Providing access to the airfield from the terminal area is an ADG III taxilane. Airline growth has warranted the need for additional jet bridges and more flexibility with the types of aircrafts these gates can accommodate.



PROPOSED TERMINAL

FULL BUILD OUT OPTION SHOWN

SUMMARY

The full-build concourse is expected to extend ±344' from the existing concourse at an angle perpendicular to the Runway 14-32 centerline. The concourse is expected to accommodate 12 jet bridges with 2 gates providing swing access to 2 additional parking positions making the total parking positions around the concourse 14. Similar to the existing concourse, all gates, except gate 2 can accommodate a B737/A320 with Gate 2 being restricted to a large regional jet.

The gate at the most north corner will have the capability to accommodate an ADG V aircraft in the event of a diversion or special event.

The full-build concourse will be surrounded by a vehicle service road providing a designated road for ground service equipment to travel to and from gates and baggage make-up areas.

The concourse will be surrounded by a fully compliant ADG III taxilane which will provide access for aircraft to and from the airfield. The taxilane does downgrade to an E175-specific object free area from Gate 4 to Gate 2.

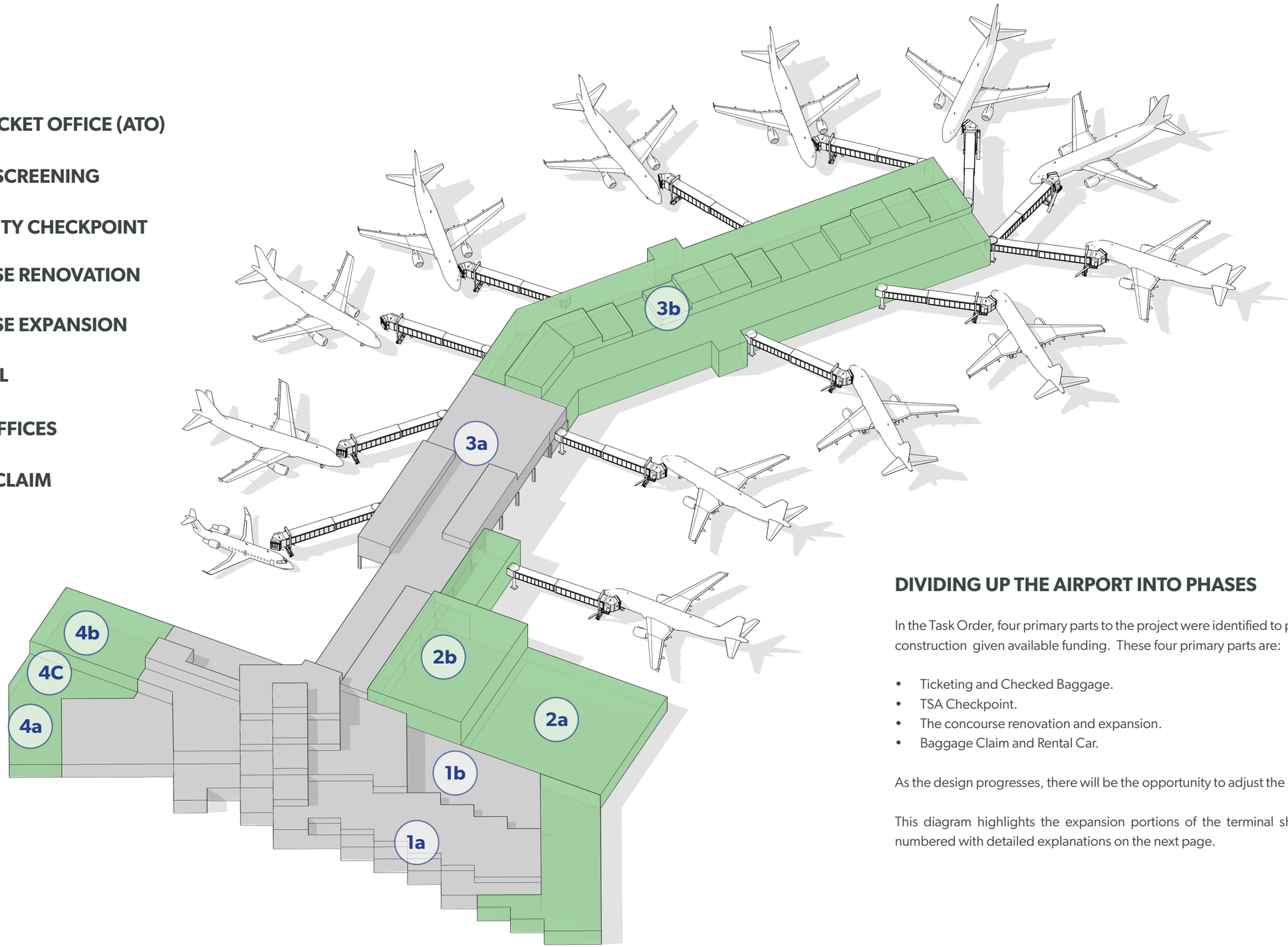
The terminal program also includes an expanded baggage screening / outbound baggage area and security screening checkpoint that has the capability to accommodate five lanes. The ticketing area of the terminal will be expanded to the southeast to provide additional space for passenger circulation, more full-service positions, kiosks, and a two-step bag drop area when that technology comes to Rapid City.

For deplaning passengers, the terminal will be expanded to the west to accommodate an additional baggage carousel and baggage offloading space. Additionally, rental car counters will be reconfigured to mitigate congestion in the arrivals hall area.

PROJECT AREAS

MASSINGS

- 1a TICKETING
- 1b AIRPORT TICKET OFFICE (ATO)
- 2a BAGGAGE SCREENING
- 2b TSA SECURITY CHECKPOINT
- 3a CONCOURSE RENOVATION
- 3b CONCOURSE EXPANSION
- 4a CAR RENTAL
- 4b AIRPORT OFFICES
- 4c BAGGAGE CLAIM



DIVIDING UP THE AIRPORT INTO PHASES

In the Task Order, four primary parts to the project were identified to provide flexibility for construction given available funding. These four primary parts are:

- Ticketing and Checked Baggage.
- TSA Checkpoint.
- The concourse renovation and expansion.
- Baggage Claim and Rental Car.

As the design progresses, there will be the opportunity to adjust the construction scope.

This diagram highlights the expansion portions of the terminal shown in green and numbered with detailed explanations on the next page.

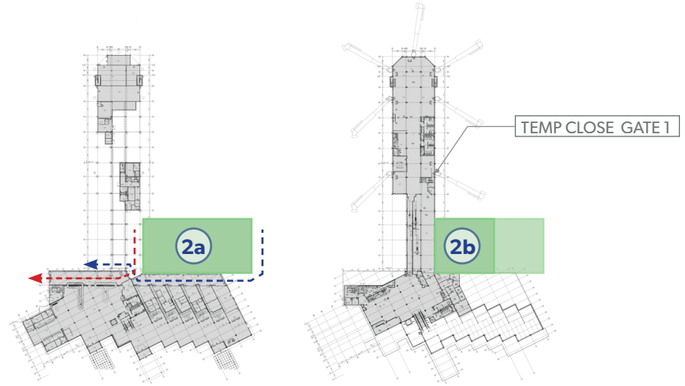
CONSTRUCTION SEQUENCING

ORDER OF CONSTRUCTION

SUMMARY

The owner has identified Ticketing/Checked Baggage/TSA checkpoint as the first construction package. The following construction sequence is based on this preference and then assumes that the concourse proceeds next followed by baggage claim/rental car. This information is conceptual in nature and will be refined as the project detail develops

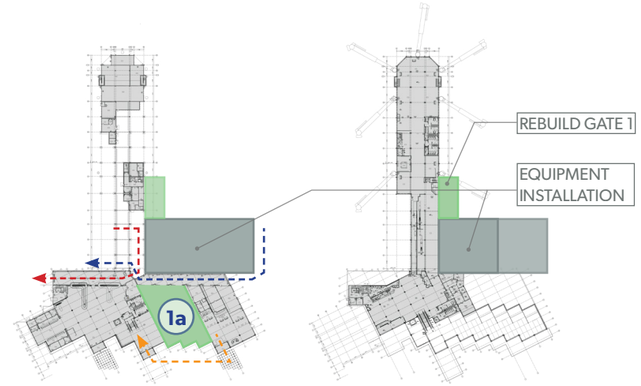
- ## — CORRESPONDS WITH CONSTRUCTION ZONE LABELS
- EXISTING STRUCTURE
- NEW CONSTRUCTION
- FINISHED NEW CONSTRUCTION
- INBOUND BAGGAGE TUG PATH
- OUTBOUND BAGGAGE TUG PATH
- TEMPORARY PASSENGER PATH



MAIN LEVEL CONCOURSE LEVEL

CONSTRUCTION SEQUENCE 1

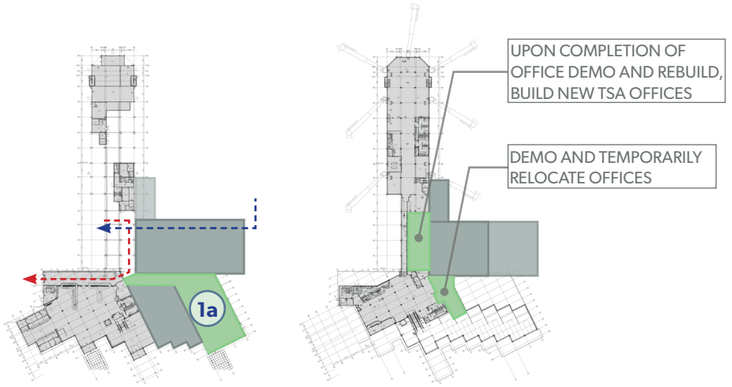
This sequence creates a new checked baggage (2a) and security checkpoint (2b) while allowing existing operations to continue due to construction occurring outside of the existing footprint.



MAIN LEVEL CONCOURSE LEVEL

CONSTRUCTION SEQUENCE 2

Sequence two renovates half of the ticketing area (1a) as well as adds a bump out of new construction for Gate 1.



MAIN LEVEL CONCOURSE LEVEL

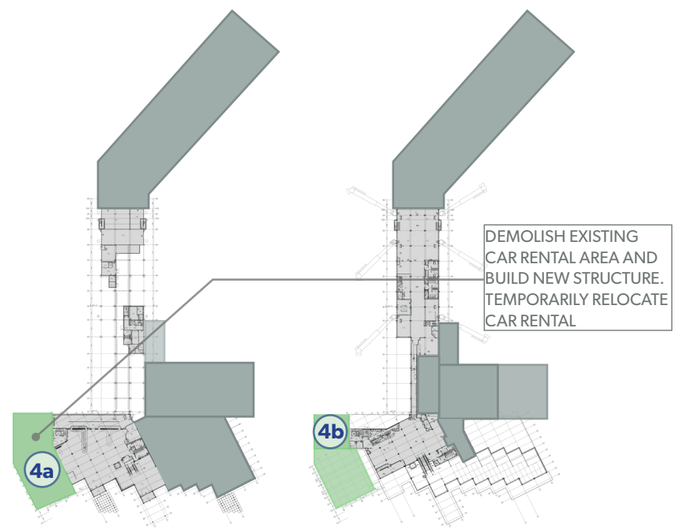
CONSTRUCTION SEQUENCE 3

Sequence three renovates the rest of the ticketing area (1a) as well as an expansion and new ATO offices. The bridge on the concourse level is converted to TSA offices, and the Airport Administration offices are relocated.

MAIN LEVEL CONCOURSE LEVEL

CONSTRUCTION SEQUENCE 4

Sequence four builds the concourse (3b) expansion as well as selective demolition of the end of the existing concourse. This is potentially the most disruptive phase, and must be planned closely.



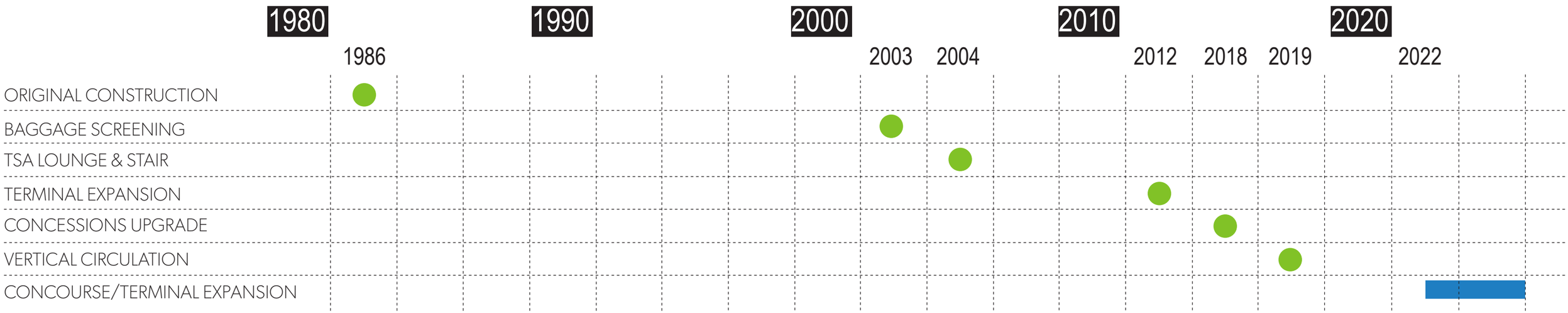
MAIN LEVEL CONCOURSE LEVEL

CONSTRUCTION SEQUENCE 5

The final sequence is the expanded baggage claim (4a) along with the airport offices (4b) above. Temporary rental offices and airport offices will be accommodated elsewhere in the terminal.

PAST PROJECTS

COMBINING INFORMATION

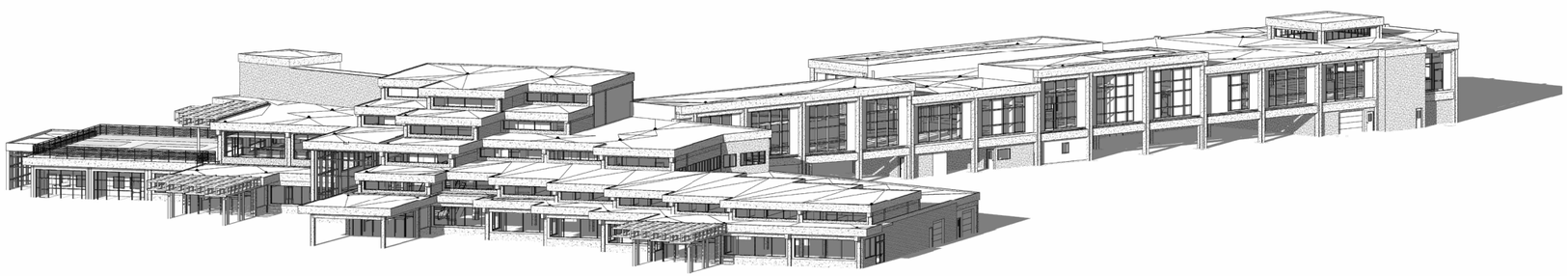


COLOR KEY

- STAMPED DRAWING
- DESIGN TEAM PRODUCTION

EXISTING CONDITIONS

Using the drawing sets from past projects, we were able to accurately model the structure as it exists today. The model will help though the next design phases to generate a complete vision of the proposed project.

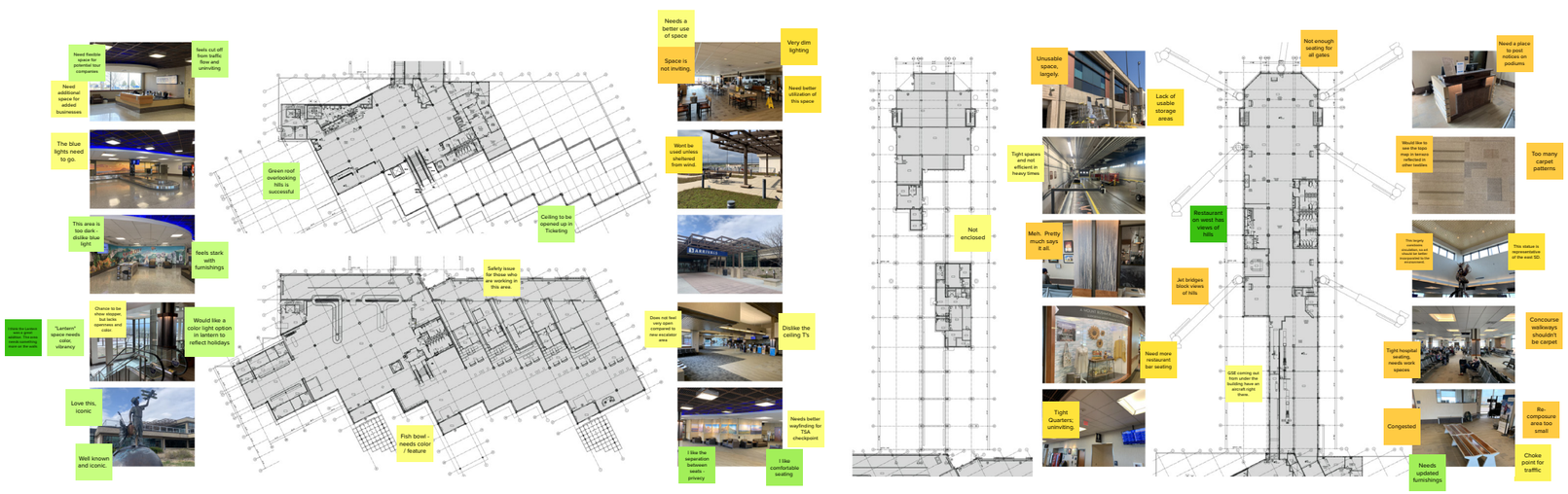


VISUAL CHOICE

During this interactive online activity, participants representing the airport placed green, red, and orange dots on different images they feel heavily align, heavily do not align, or are neutral when identifying with the future vision of the airport in a spatial form.

Images revolving around the Black Hills, the natural sky at different times of the day, and also the natural seasons in and around Rapid City were heavily favored. Neutral colors in warm tones were preferred over the colorful or more white tones.

This exercise was extremely helpful in identifying visual direction for the architectural team to help explore massings and a sense of place in the interior and the exterior of the proposed renovation and expansion projects.



SUMMARY COMMENTS

During this portion of the workshop, participants were encouraged to place post-it notes with concerns or opportunities surrounding the existing terminal.

Although opportunities have been numerous during workshops previous to this one, giving everyone the opportunity to express their thoughts visually allows for a broad number of participants to make their impact on the project.

Each post-it comment was reviewed and shared with the larger group during the meeting, and all ideas were identified and categorized for refining the design process.

FORECASTING

ENPLANEMENTS

SUMMARY

Enplanements and Peaking Characteristics drive the entire project design.

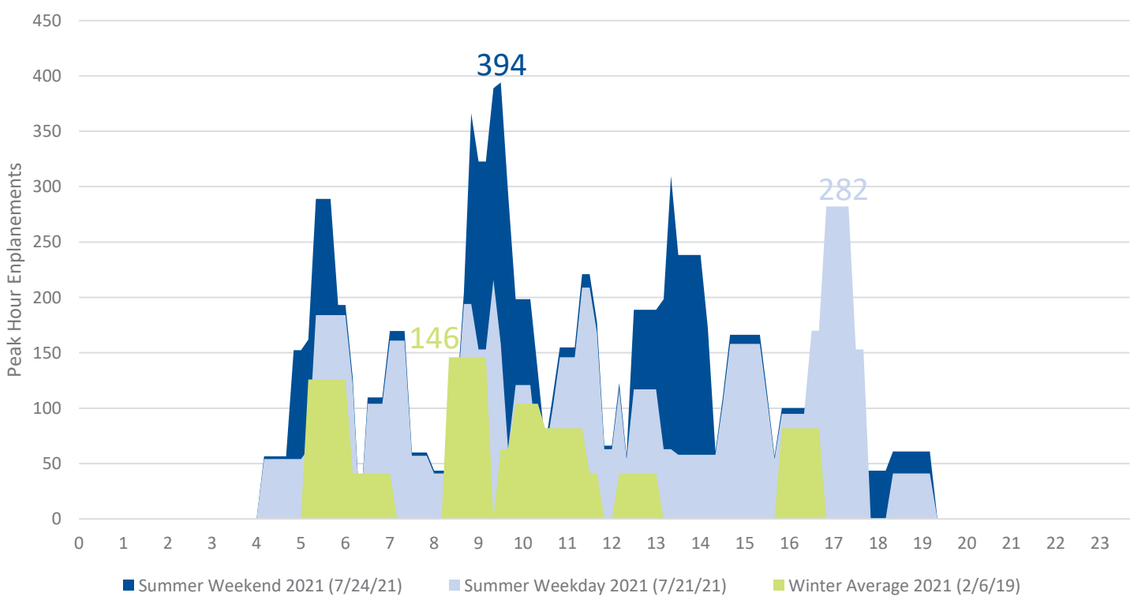
Peaking Characteristics impact the number of gates and hold room sizes, number of TSA checkpoint lanes, ticketing area space requirements, and checked baggage/baggage claim requirements.

TSA SECURITY CHECKPOINT PROJECTIONS

	Summer Weekend		Summer Weekday		Winter Average	
	2021	2031	2021	2031	2019	2031
Peak Hour Enplanements	394	752	282	728	146	262
Peak Hour Deplanements	394	752	282	728	146	262
Gates		10+2		10+2		5+1
Security Screening Checkpoint						
Peak 30 Minute Passengers	197	376	141	364	73	131
Surge Factor	30	56	21	55	11	20
# of Passengers Using PreCheck	89	169	63	164	33	59
# of Passengers Using Standard	138	263	99	255	51	92
Number of Standard Lanes (10 Minute Wait)	***2***	***3***	***1***	***3***	***1***	***1***
Number of PreCheck Lanes (5 Minute Wait)	***1***	***2***	***1***	***2***	***1***	***1***
Checkpoint	**3,600**	**6,000**	**2,400**	**6,000**	**2,400**	**2,400**
Checkpoint Queue	**900**	**1,500**	**600**	**1,500**	**600**	**600**

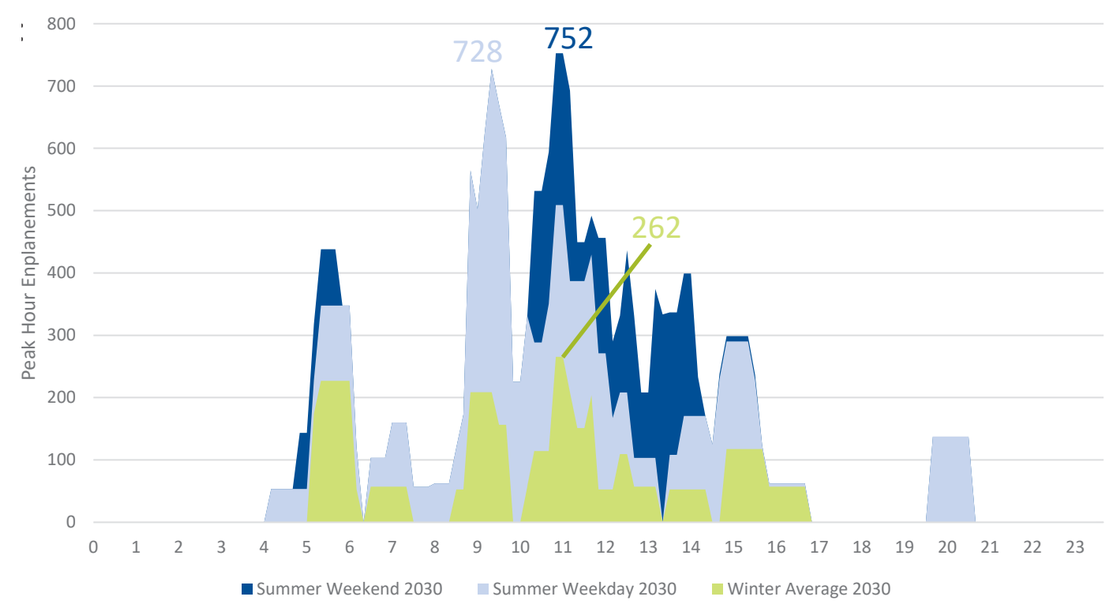
Peaking characteristics were evaluated from the following schedules:

Summer Weekend (07/24/2021)
Summer Weekday (07/21/2021)
Winter Average (02/06/2019)



Peaking characteristics forecasted for the same periods but with the following air service growth for each period:

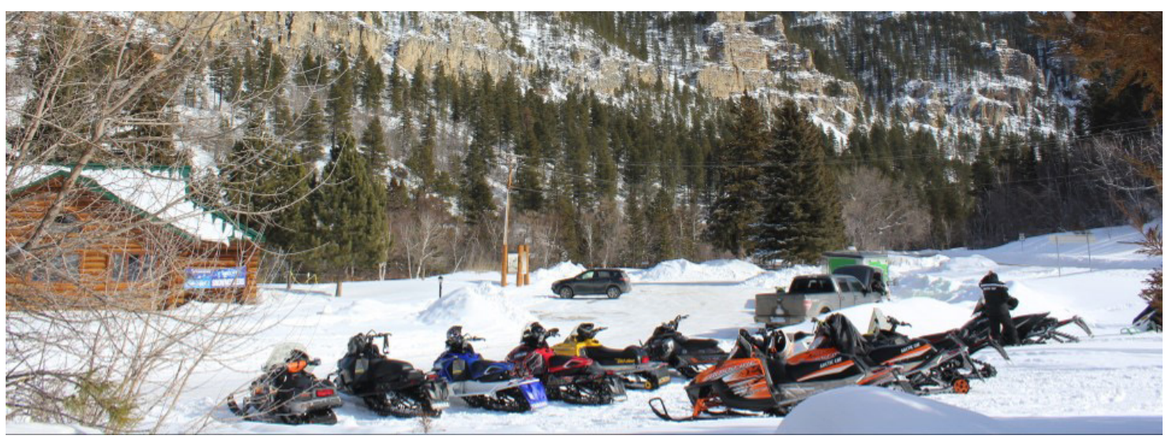
	Summer Wknd. 2021	Summer Wknd. 2030	Summer Wkd. 2021	Summer Wkd. 2030	Winter 2019 Avg.	Winter 2030 Avg.
Departures	31	40	26	31	11	14
Seats	2,482	4,515	2,183	3,503	755	1,406
Seats/Day	80	113	84	113	84	100



EXISTING LAYOUT - HOLDROOM ANALYSIS

Gate	Aircraft Served	Existing Holdroom Space (SF)	*Space Recommended (SF)	Deficit
1	B737	989	2,776	(1,787)
2	E175	973	1,360	(387)
3	B737	1,140	2,776	(1,636)
4	B737	2,025	2,776	(751)
5	B737	864	2,776	(1,912)
6	B737	867	2,776	(1,909)
7	B737	1,679	2,776	(1,097)
Total		8,537	18,016	(9,479)

* Based on largest aircraft serviced at gates.



Why go to full-build?

Additional terminal space is required to accommodate larger aircraft and additional gates with the refined schedule.

Flexibility

All gates in proposed layout can accommodate a B737 except Gate 2 providing a feasible common-use layout.

Revenue Generating

Some holdrooms remain undersized in proposed layout to allow passengers to leak into concessions space.

REDUCED BUILD LAYOUT - HOLDROOM ANALYSIS

The reduced build layout was explored in early Concept Design but not depicted in this document

Gate	Aircraft Served	Proposed Holdroom Space (SF)	*Space Recommended (SF)	Deficit
1	E175	1,011	1,360	(349)
2	CRJ7	1,575	1,279	296
3	B737	2,377	2,776	(399)
4	CRJ7	982	1,279	(297)
5	B737	1,759	2,776	(1,018)
6	CR7	982	1,279	(297)
7	B737	1,759	2,776	(1,017)
8	B737	982	2,776	(1,794)
9	B737	2,242	2,776	(534)
10	B737	2,242	2,776	(534)
Total		15,911	21,853	(5,943)

* Based on largest aircraft serviced at gates.

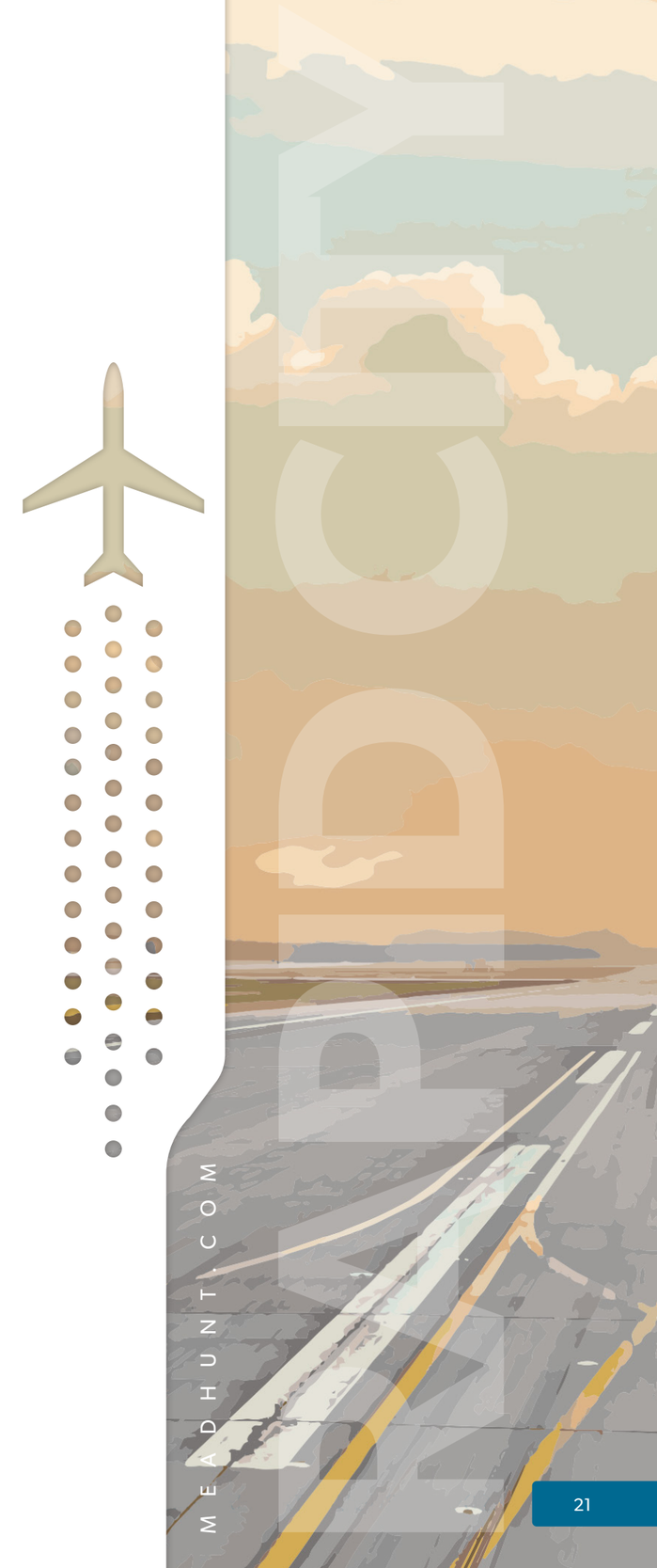
PROPOSED LAYOUT - HOLDROOM ANALYSIS

The proposed layout is what is depicted in this document

Gate	Max Aircraft Served	Proposed Holdroom Space (SF)	*Space Recommended (SF)	Deficit
1	E175	1,076	1,360	(284)
2	B737	2,776	2,776	0
3	B737	2,095	2,776	(681)
4	B737	1,826	2,776	(950)
5	B737	2,602	2,776	(174)
6	B737	3,238	2,776	462
7	B737	2,602	2,776	(174)
8	B737	3,238	2,776	462
9	B737	2,100	2,776	(676)
10	B737	2,242	2,776	(534)
11	B737	1,860	2,776	(916)
12	B737	2,790	2,776	14
Total		28,445	31,896	(3,451)

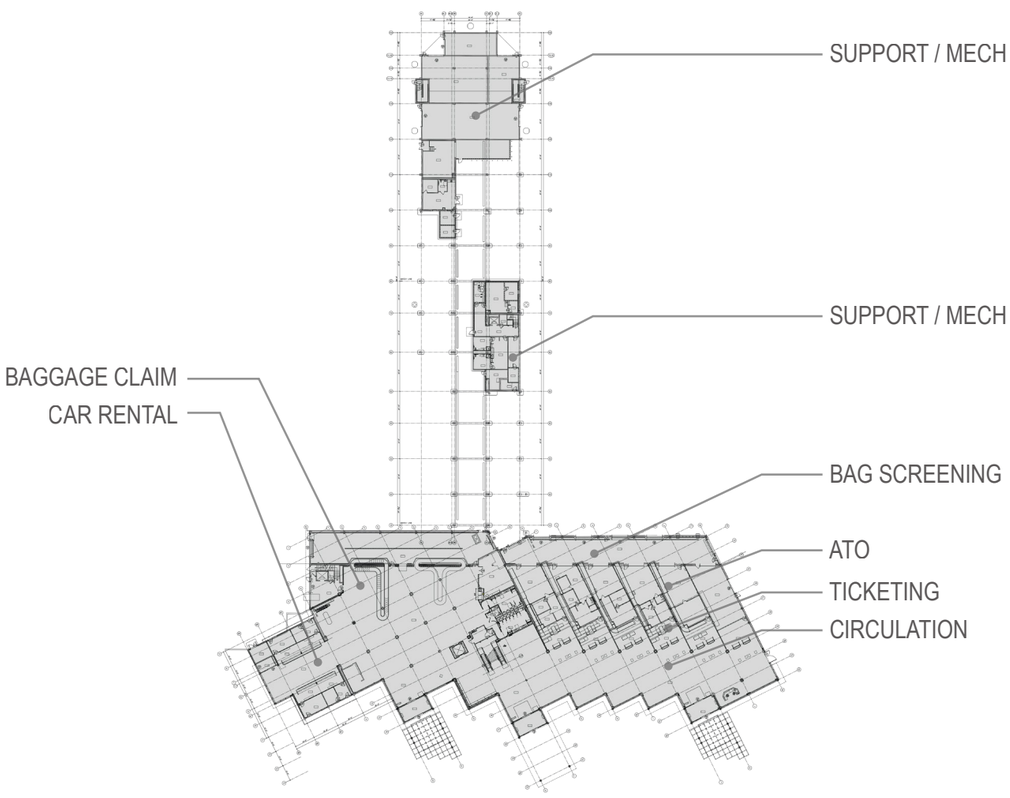
* Based on largest aircraft serviced at gates.

STUDIES

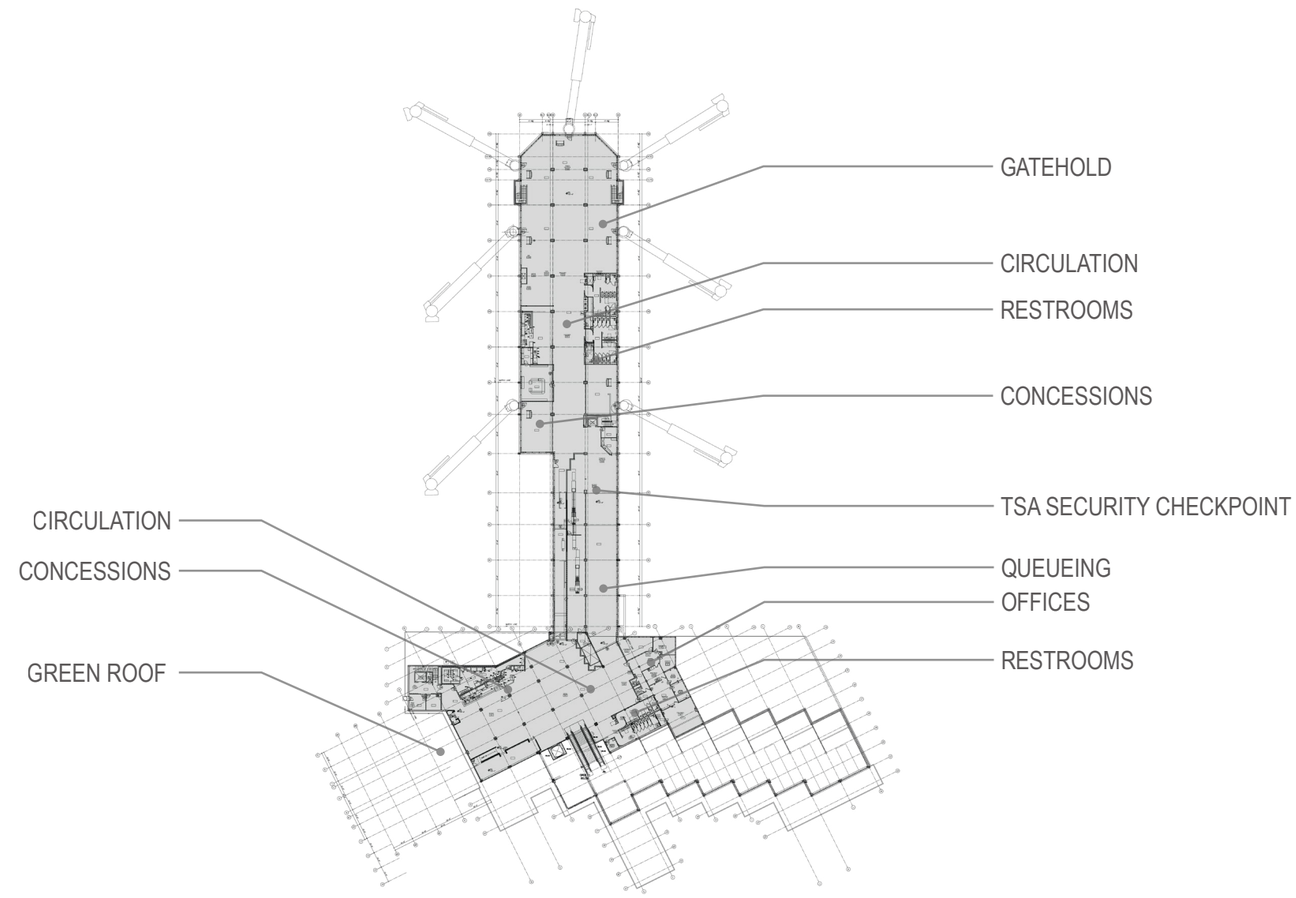


OVERALL EXISTING

PLAN DIAGRAMS



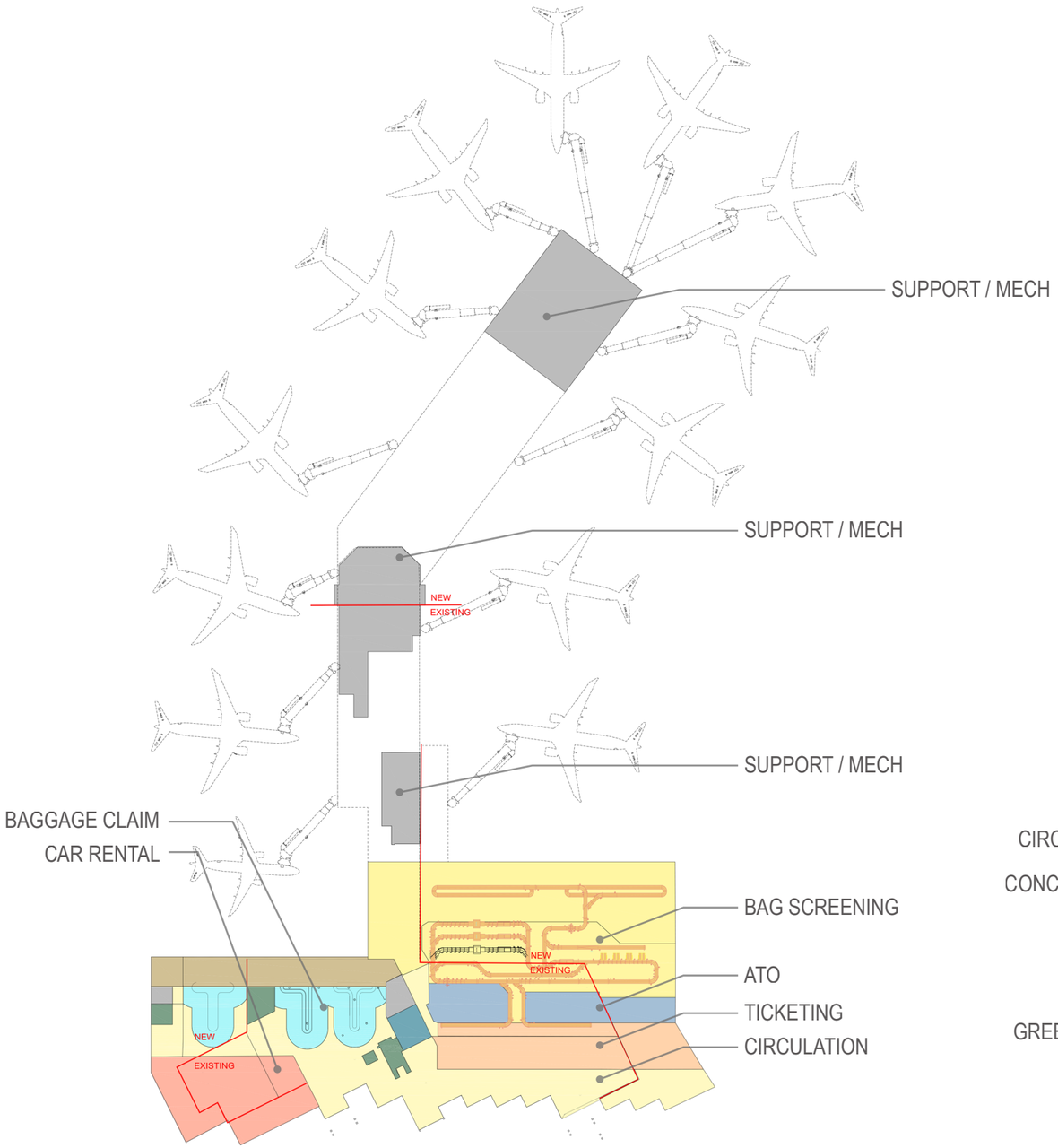
MAIN LEVEL PLAN - EXISTING CONDITIONS



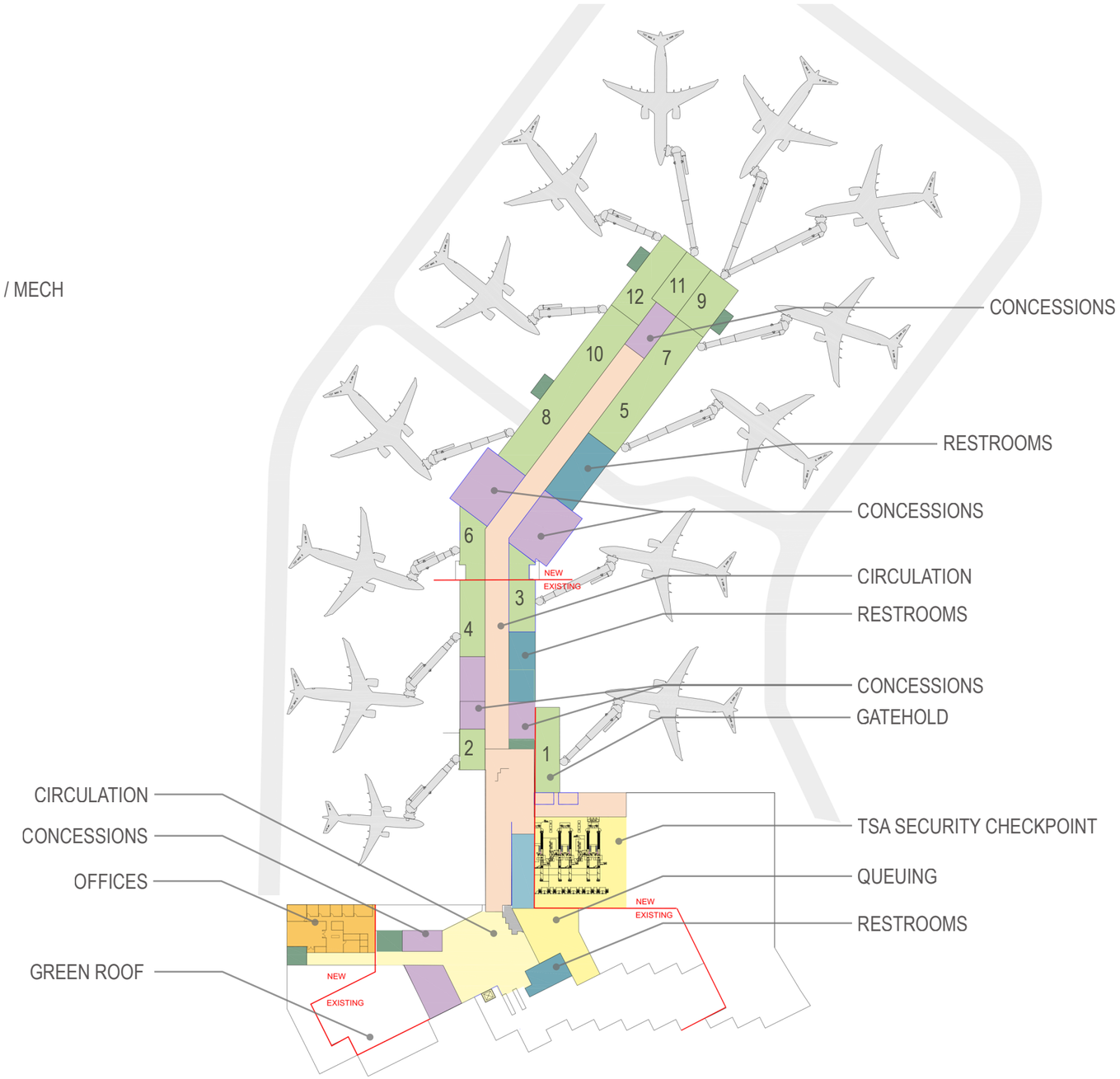
CONCOURSE LEVEL PLAN - EXISTING CONDITIONS

OVERALL CONCEPT

PLAN DIAGRAMS



MAIN LEVEL PLAN - PROPOSED CONDITIONS



CONCOURSE LEVEL PLAN - PROPOSED CONDITIONS

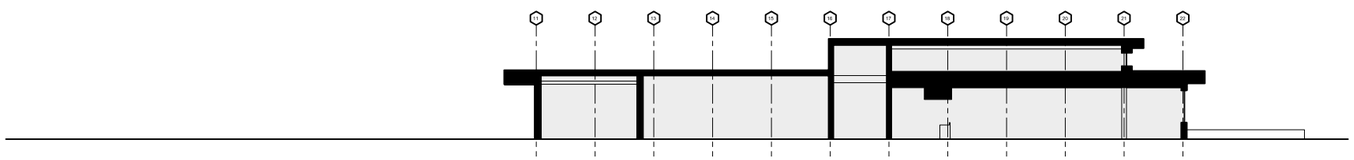
TICKETING & CHECKED BAGGAGE

RENDERING

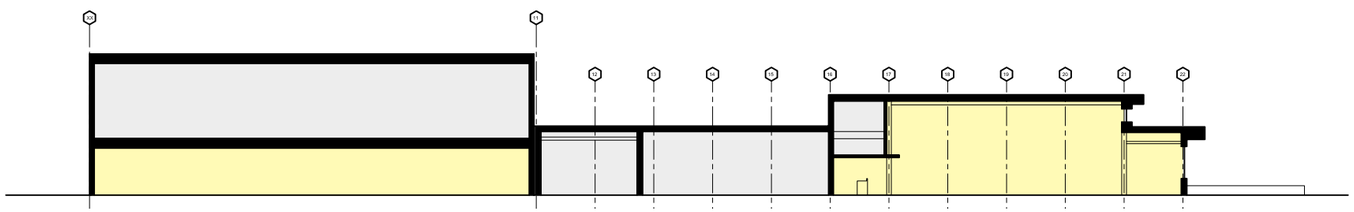
Ticketing and checked bag area: Passengers are welcomed to the airport with a large open space that feels like it could have been carved out of the Black Hills themselves. The ticketing hall's dedication to natural materials can be seen across the space, from the new terrazzo flooring to the natural stone that frames the new, larger passenger check in point.

TICKETING & CHECKED BAGGAGE

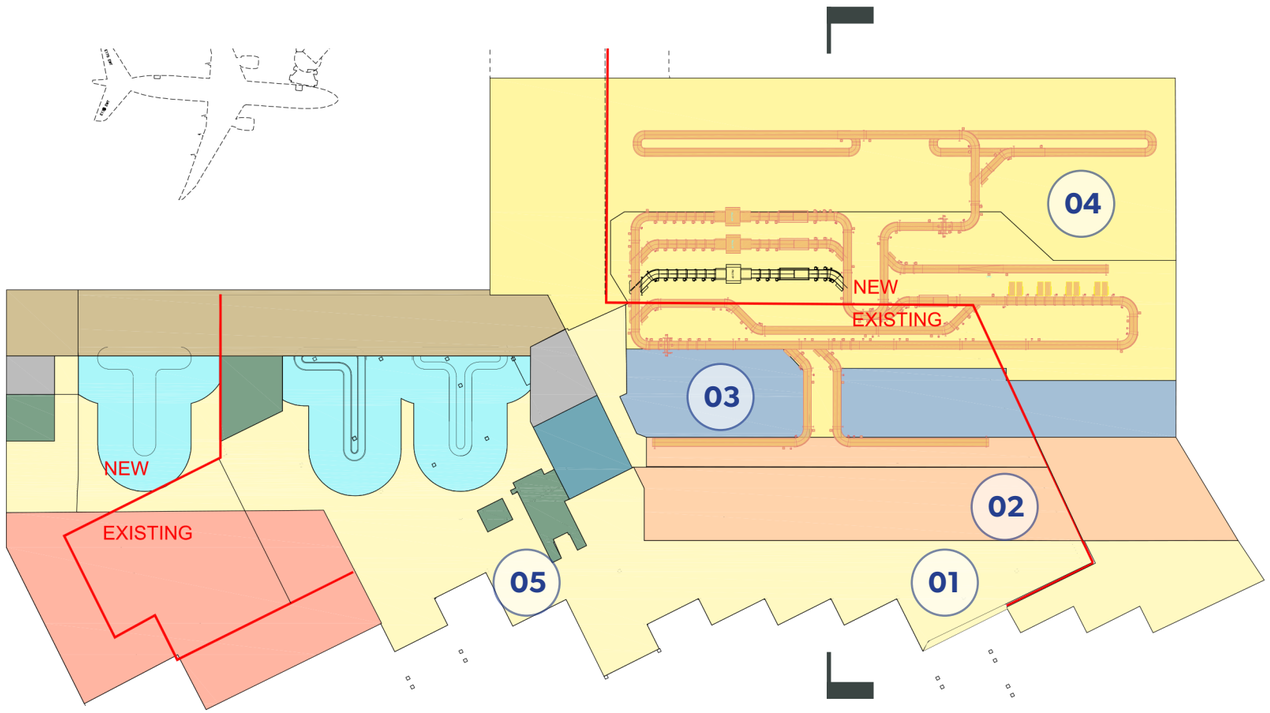
PLAN DIAGRAM / NARRATIVE



SECTION DIAGRAM - EXISTING CONDITIONS



SECTION DIAGRAM - PROPOSED CONDITIONS



MAIN LEVEL PLAN - PROPOSED CONDITIONS

PROPOSED IMPROVEMENTS

The Ticketing area will be revitalized to become more open, utilizing existing clerestories facing the curbside that are currently blocked by oversized soffits housing ductwork and lighting. By raising the ductwork and the lighting to the top of the existing structural ceilings, we are able to open up the space and provide a more rewarding passenger experience.

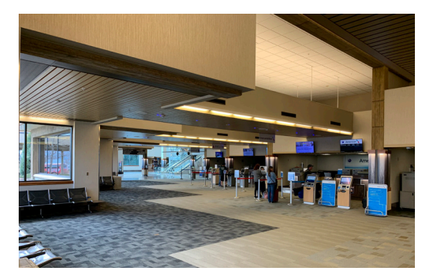
01 Currently the ticketing counters zigzag in and out and face the incorrect direction. This concept design proposes to straighten out the ticketing counters to increase efficiency and create more intuitive wayfinding. By straightening out the ticketing counters, additional stations can be added as the space is used more efficiently. The realigned ticket counters and ticketing area expansion can provide space for up to 40 check in counters depending airline counter layout.

02 Queueing area is increased drastically by pushing the straightened ticketing counters away from the circulation space. This allows for additional soft seating areas along the glass, allowing passengers to lounge on the main level of the headhouse, an amenity that currently does not exist. The straightened counters allow for staight sight lines of ticketing, which improves queueing and wayfinding.

03 New Airport Ticket Offices (ATO) space is provided in between the checked baggage and the ticketing counters. This space is flexible and allows for proper support for the airlines.

04 The current checked baggage screening devices shown are a 2+1 system that represents the full build out for the system, a system that is supported by the TSA funding sources. Although the full build is the largest and most efficient system available, it also carries increased maintenance costs.

05 The vertical circulation of the headhouse was recently completed with a glass elevator, escalators, stair, and new terrazzo flooring. This area, often referred to as the lantern, is filled with natural light and may require a revamped lighting source or feature for activating the space.



Existing Conditions

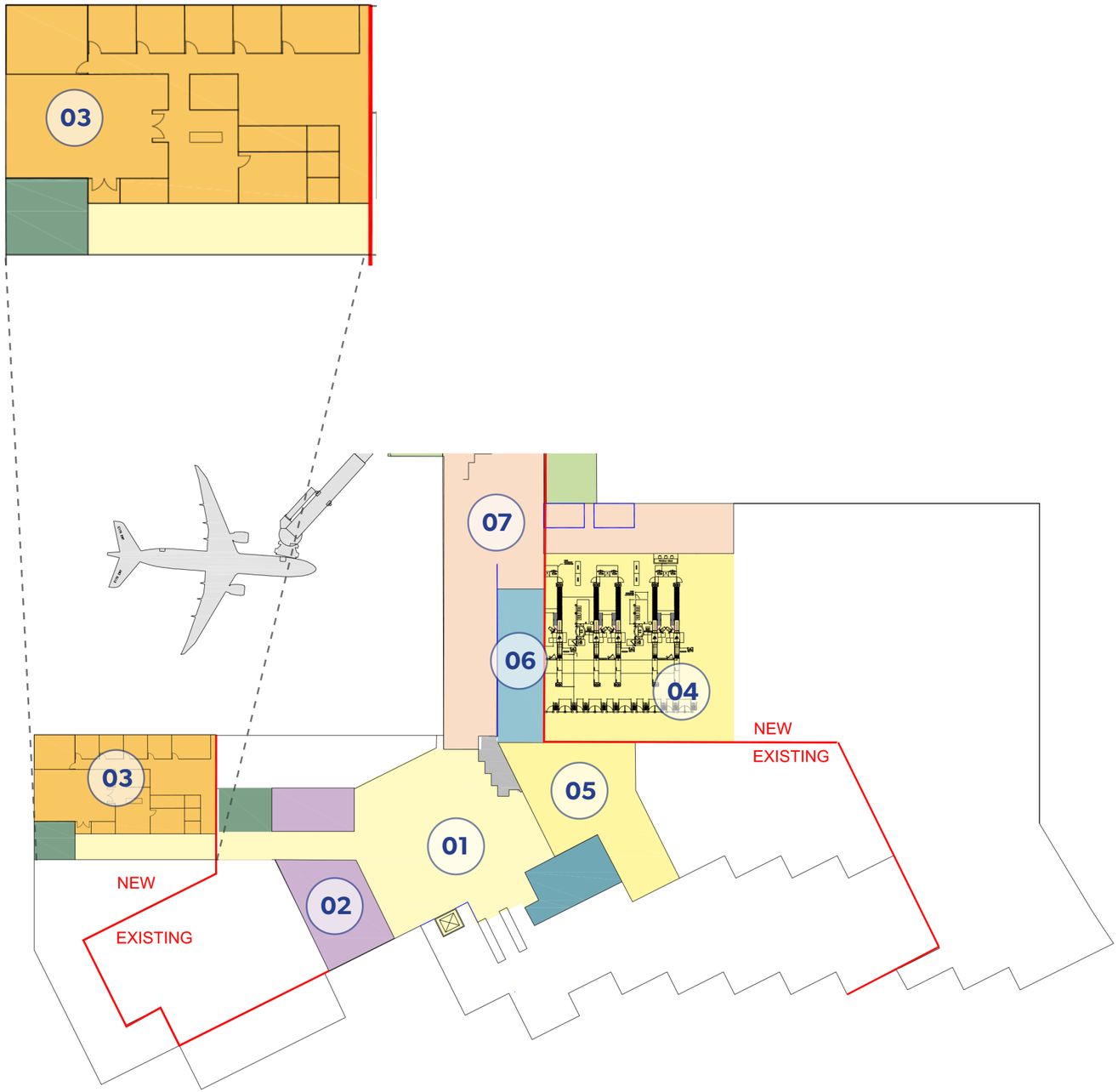
SECURITY SCREENING CHECKPOINT (SSCP)

RENDERING

TSA security checkpoint: The new expanded security checkpoint carves out amazing views of the surrounding landscape while offering the same natural material from ticketing to help pull you through the security screening checkpoint into the concourse.

SECURITY SCREENING CHECKPOINT (SSCP)

PLAN DIAGRAM / NARRATIVE



UPPER LEVEL PLAN - PROPOSED CONDITIONS

PROPOSED IMPROVEMENTS

01 The public area on the second level is essential for catching views of the Black Hills and the vegetative roof out to the west and also wayfinding. This space remains open in the remodel.

02 The concessions space is reduced in size and focuses energy more so on the meeter and greeter space as well as creating wayfinding to the new TSA security checkpoint location.

03 Relocated airport offices are situated to the west of the main headhouse and on top of the new expanded baggage claim area. The offices contain a large board room, a conference room, private offices, restrooms, reception, and storage space. From the boardroom, there are magnificent views to the Black Hills. From the airport offices, views of the airfield and concourse prevail. An additional vertical stairway is added at the end of a public corridor for proper egress to the exterior.

04 The relocated Security Screening Checkpoint is sized for 5 lanes, with an additional ±2,000 SF of TSA Administrative and IT space. Three lanes will be operational on opening day.

05 The former location of the airport offices will become the queueing space for the new security checkpoint. The queueing area is housed mostly within the existing footprint of the headhouse. The new structure starts at the current edge of the existing, represented here with a red line. The security checkpoint, being entirely within a new structure, can have higher ceilings and provide an inspiring departure experience for passengers with indirect natural light with skylights and windows facing to the north.

06 Portions of the sloped bridge which currently houses the security checkpoint will be flattened out on pedestals. This will allow for a flat space for the new TSA offices immediately adjacent to the security checkpoint.

07 Finally, a recomposure area will be created after the security checkpoint and before ramping down to the concourse level, which is 2' below the headhouse and new security checkpoint level of 14'.

Existing Conditions

CONCOURSE

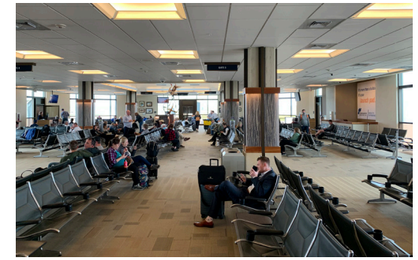
RENDERING

Concourse Holdroom: The concourse holdrooms focus on natural light and the connection to the surrounding environment. Holdrooms also feature a variety of natural materials and textures, as well as multiple seating options for passengers.

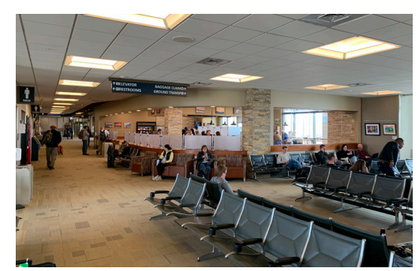
CONCOURSE

PLAN DIAGRAM / NARRATIVE

CONCOURSE LEVEL PLAN - PROPOSED CONDITIONS



Existing Conditions



Existing Conditions

PROPOSED IMPROVEMENTS

The concourse is a renovation and expansion project. The existing stem of the concourse will be added onto at a node. The new addition will be perpendicular to the existing runway and at an obtuse angle to the existing concourse stem. Select demolition of the end of the stem will need to be completed in order to maintain a proper expansion joint between the two structures.

01 The zone immediately following the recomposure area will have entering and existing traffic, and monumental wayfinding will be essential at this point to keep traffic flowing. Circulation zones will be delineated with terrazzo flooring, and the new concourse addition will feature increased ceiling heights and overall concourse widths for accommodating aircraft.

02 Gate 1 will be expanded out of the existing footprint to allow for additional gatehold seating that meets standards for the aircraft utilizing this gate.

03 Existing retail and food and beverage areas will remain in the renovated concourse to allow for simplified phasing of construction as well as cost savings. These spaces will be revitalized under the concessions contract and are separate to this project.

04 Existing restroom blocks are to remain in the same position, but will be refreshed under this project.

05 The new node at the end of the stem will be emphasized with ample retail, concessions, and food and beverage. This zone will focus views to the west, where the views to the Black Hills are prominent. A major feature of this node will be an outdoor seating location, that will further focus views to the west. Views of the concessions will be prominent from the head of the stem and attract passengers to explore the new concourse even if their departing flights are located in the renovated stem.

06 Amenities, such as restrooms, a Service Animal Relief Area (SARA), family restrooms, and nursing mothers area will be provided adjacent to the node in the new concourse expansion to meet the peak demand and provide a level of service that exceeds the minimum standards for concourses.

07 New Gate-holds will house updated podiums, wayfinding, bench and lounge seating, as well as spaces for art and other passenger amenities. Zones of furniture and millwork will be delineated in the space to create separate rooms that make the space feel welcoming.

08 At the end of the concourse circulation path, there will be an additional food and beverage location that will celebrate the area with activity and revenue making concession space. The higher ceilings draw the passenger to these spaces of activity while also providing zones of respite.

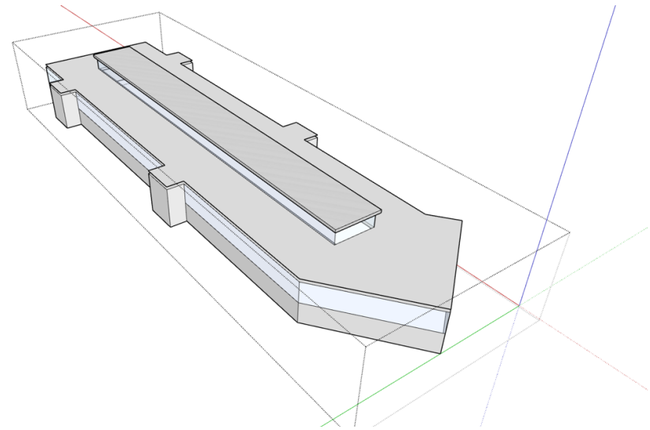
CONCOURSE

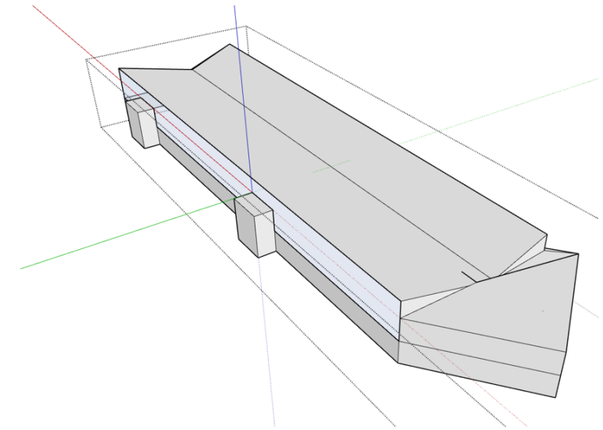
EXPLORING OPTIONS

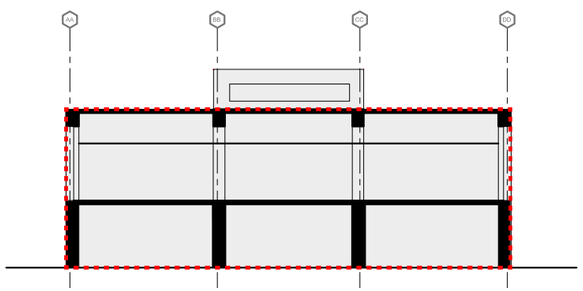
SUMMARY

Multiple massing options were explored with the airport for consideration for the new concourse expansion. Option 1 was selected as the most aesthetically appealing as well as the most practical structurally to move forward with.

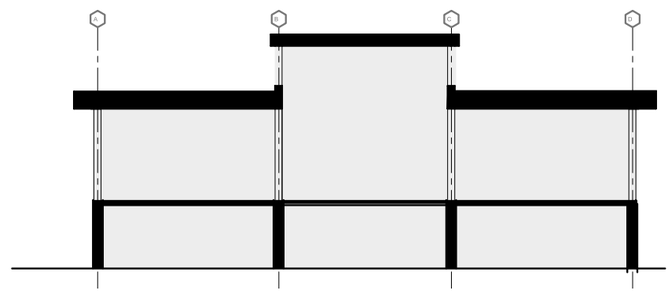
A section of the existing concourse is shown below for scale comparison purposes.



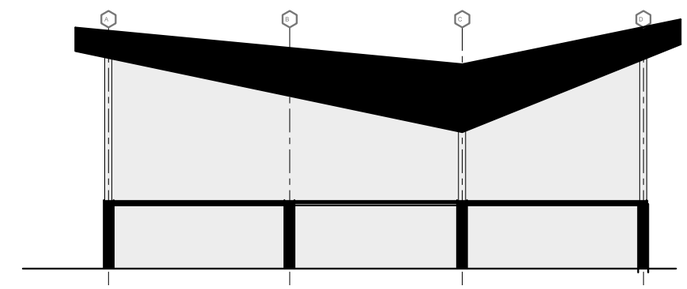




EXISTING CONDITIONS



OPTION 1



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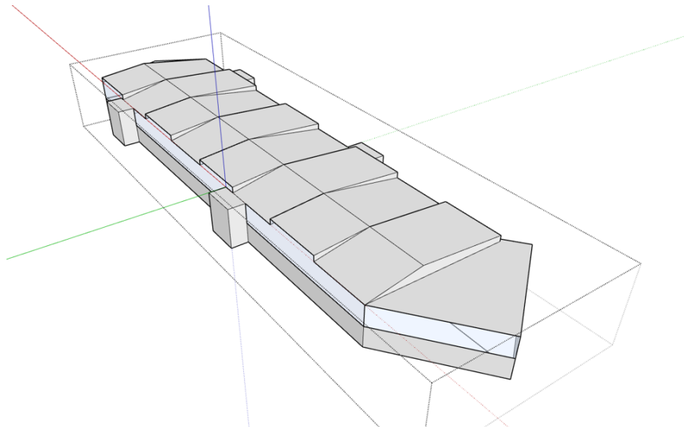
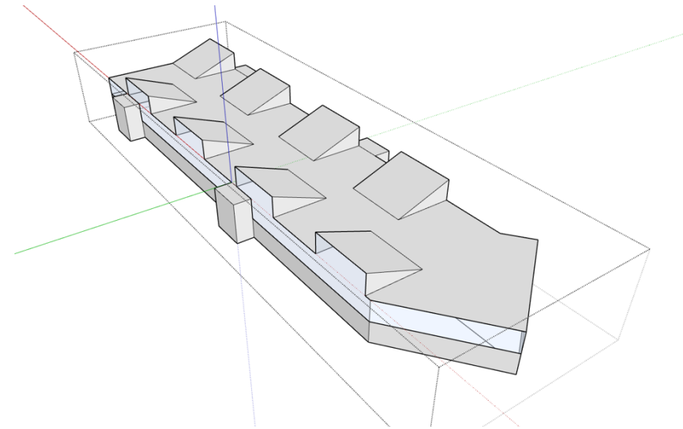
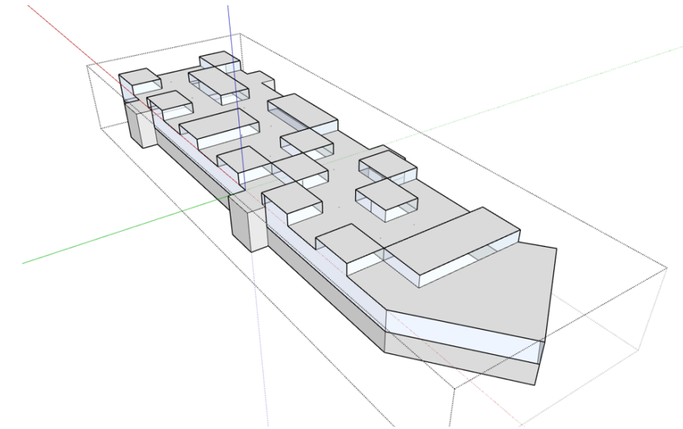
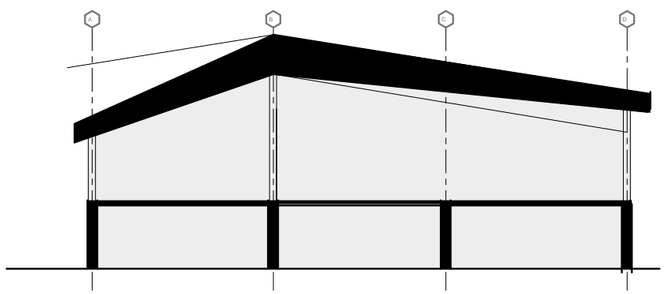
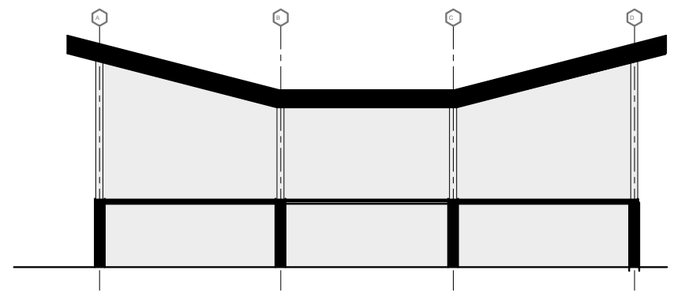








OPTION 3



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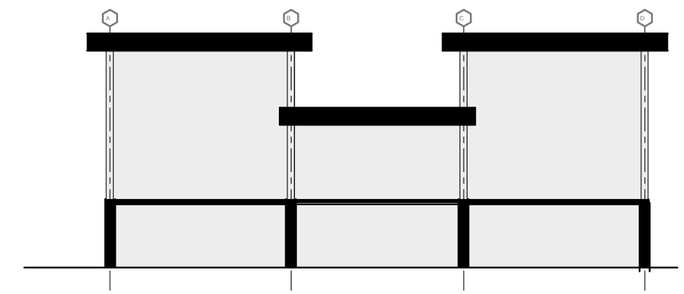


OPTION 5

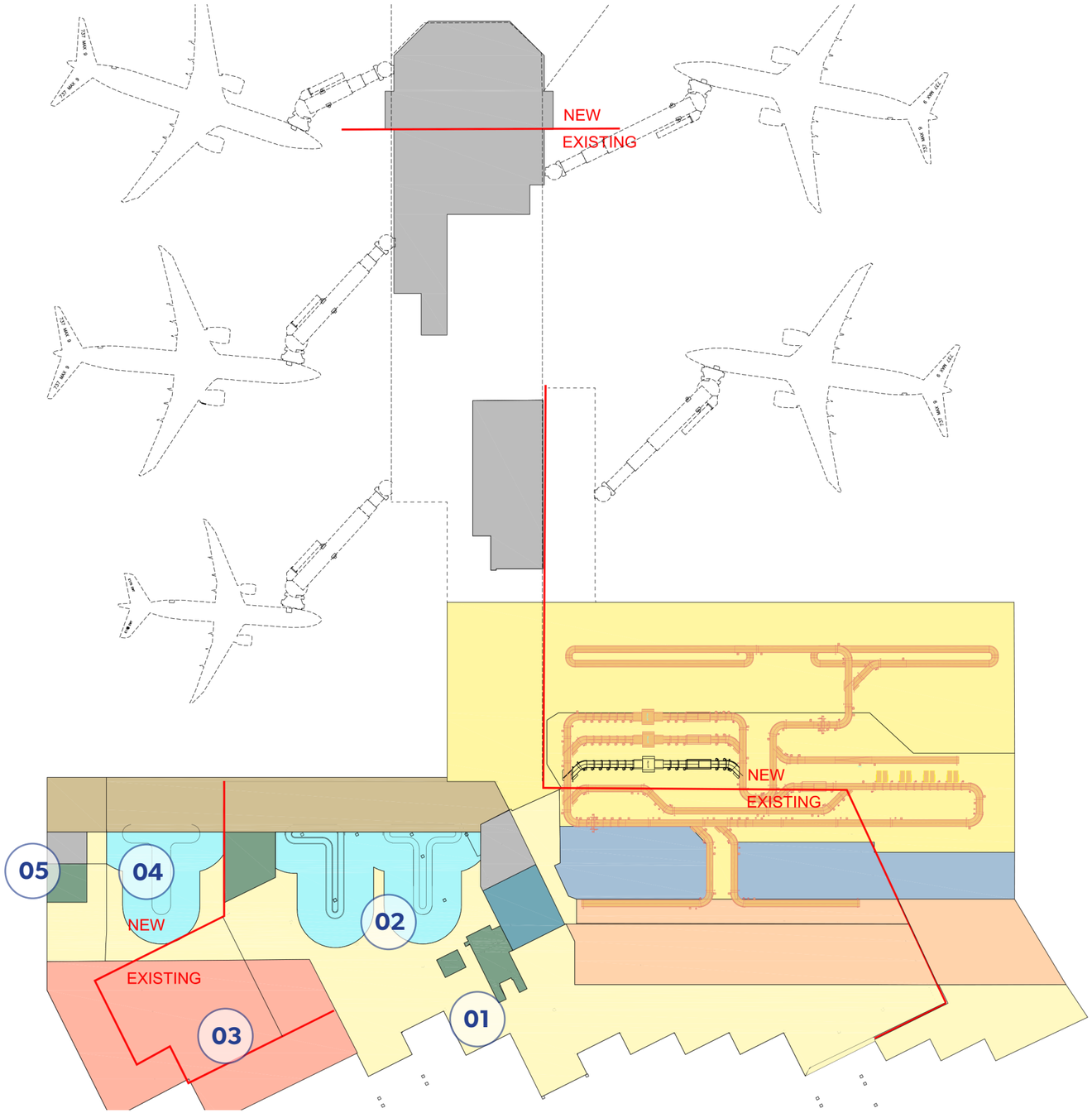
BAGGAGE CLAIM & CAR RENTAL

RENDERING

Bag Claim: As the last stop on the journey through the airport the new extended baggage claim and car rental center offers large open spaces for passengers.

BAGGAGE CLAIM & CAR RENTAL

PLAN DIAGRAM / NARRATIVE



MAIN LEVEL PLAN - PROPOSED CONDITIONS

PROPOSED IMPROVEMENTS

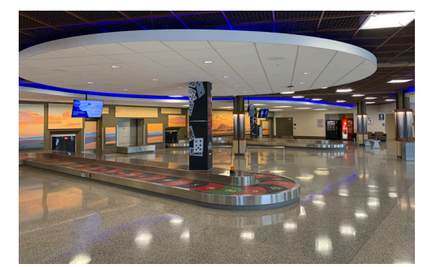
01 The recently renovated vertical circulation node brings passengers from ticketing up to departures and also carries arrivals down to the main level to the baggage claim and curbside. This zone recently upgraded terrazzo and vertical circulation equipment and will not be renovated as part this project.

02 Expanded baggage devices will for increased linear frontage of claim device, allowing more bags to exchange back to passengers.

03 The car rental area will be heavily modified to double the space available for increased passenger demand. Increased circulation space is provided to allow passengers to flow through car rental freely to the parking lot.

04 One additional baggage claim device is added as part of an addition for increased capacity. The expansion is a two story expansion and allows offices to sit above the space, and also expands the tug drive. Selective demolition of the existing car rental addition may be required to accommodate new construction.

05 Vertical circulation is added at the exterior face to allow for proper egress from above directly to the exterior.



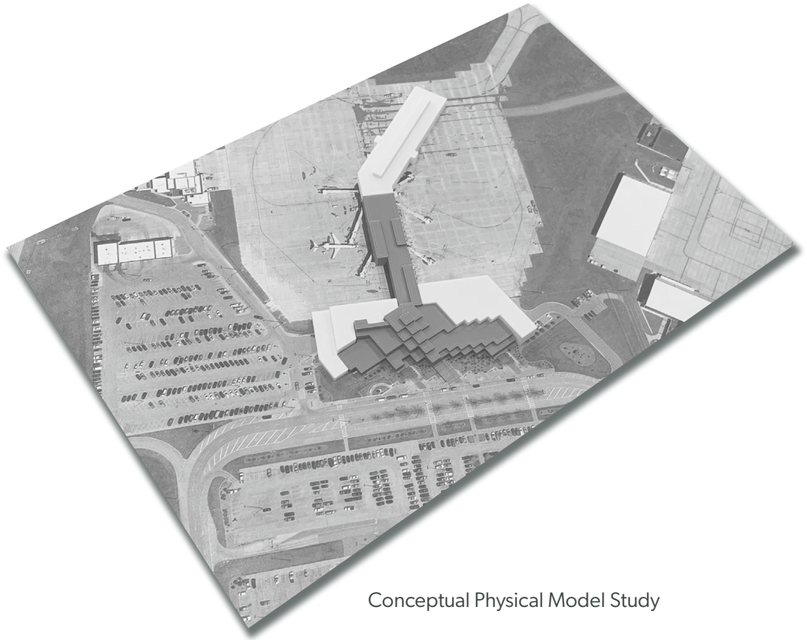
Existing Conditions

Existing Conditions

NARRATIVES

ARCHITECTURE

NARRATIVE



Conceptual Physical Model Study

OBSERVATIONS

The architectural language of the existing Rapid City Regional Airport closely resembles the staggered nature of the Black Hills and the surrounding landscape in Rapid City. Constructed in 1987, the existing terminal can be enhanced, both internally and externally, while simultaneously bringing the structure into the future with the proposed renovation and expansion project.

Through our on-site walk-through of the spaces, the feel and ambiance of the existing concourse and terminal is reminiscent of the prairie with abstracted plantings on column covers and stone wall coverings. However, additional clarity and cohesion is required with the proposed renovation and expansion project to connect the spaces more directly with the surrounding environment and enhance the passenger experience.

Structural limitations exist with the existing head house, making it difficult to build on top of or partially remove structural elements such as pre-cast planks, beams, and columns. This will require a heavy consideration for building outside of the existing footprint for the baggage makeup area and security checkpoint. This condition may be favorable to phasing of the airport by not disturbing existing conditions and allowing redundancy while construction is underway. Constructing new building areas outside of the existing footprint allows the new construction to be phased in while minimizing disruption to airport operations.

The breath of the current renovation and expansion project has the ability to drastically improve the passenger experience while also allowing for additional capacity of the airport for peak seasons. Architectural focus on the local aesthetics found in the Black Hills, including the terrain, earth tones, and variation of the dramatic skies characteristic of Western South Dakota offer a strong foundation for exploration of strong sense of place.

EXISTING CONDITIONS

- Passenger Experience
  - General flow from ticketing to security checkpoint not intuitive
  - Areas lack amenities and environments expected in regional airports today
- Interior Environment
  - Signage appears small and inefficient
  - Art program is extensive and would benefit from an architectural complement
  - Gate-holds are cramped and overcrowded with beam seating
  - Acoustic Performance mitigation by wall panels and ceiling panels
  - Thermal comfort are often compromised to weather and sun
  - Glare in the concourse is a concern and mitigated with shades
- Exterior / Building Envelope
  - Curbside appeal of structure is strong
  - Ramping structure of existing bridge poses limitations to TSA equipment
  - High winds often cause disturbances to roof structures
  - Thermal bridging in existing structure may require mitigation

CHALLENGES WITH EXISTING ARCHITECTURE

- Interior theme / concept not easily comprehended unless explained
- Spaces are often too bright or too dark
- Structural integrity of existing beams and columns raises issues for expansion
- Expansion to the west is difficult due to structural, electrical, and egress limitations
- Phasing of the security checkpoint is a major challenge
- Landside concessions are underutilized and oversized

OPPORTUNITIES FOR EXPANSION AND RENOVATION

- Room for expansion to the north-east of the head-house allows great opportunities for baggage screening and also a new security checkpoint
- Concourse expansion will allow for additional gates and enhanced amenities and revenue
- Existing interior theme can be refined and expanded upon for more vivid connections to surrounding natural features and culture
- Ticketing area alignment with roadside is a simple solution to maximize visibility and functionality
- Solar orientation of new concourse expansion creates opportunities for sight lines to the Black Hills to the west and solar on the south face

PASSENGER EXPERIENCE

The future of the Rapid City airport is one that immerses passengers in an experience inspired by the surrounding expansive skies and dramatic landscapes. The passenger experience is essential to both welcoming frequent travelers and visitors alike. We also want to provide an environment that is functional, accessible, and comfortable for all. By utilizing existing aviation standards including the ACRP guidelines and evolving ideas of accessibility and wayfinding, our proposed renovation and expansion will enhance the spirits of all who experience the revitalized airport. We are enthusiastic about the opportunities to enhance the local culture, including art and nature, into the vocabulary of the future Rapid City Regional Airport interior environment.

INTERIOR SPACE AND QUALITIES

Much like visitors who explore all that Rapid City has to offer, the airport's interiors are all about providing a variety of spaces to explore and discover, whether in the concessions or in the gate-holds. Restrooms and amenities must balance with wayfinding and architecture to provide a cohesive and comfortable space. Mead and Hunt supports this by putting people first, celebrating the local community and landscapes through thoughtful selections of interior color, patterns, lighting, art, seating, and so much more.

INTERIOR FINISHES

Interior finishes will blend cohesively across old and new parts of the airport to give passengers one seamless journey from arrival to exit. Material content, patterns, and palettes will be chosen for their durability, ease of maintenance, and ability to perform under high traffic conditions. The selections will meet necessary, sustainable guidelines, and ADA, life/safety codes and will adhere to environmentally friendly criteria.

FURNITURE SELECTION

The variety of passengers who travel through the airport require a variety of furnishing options. Hold room seating includes a mix of beam seating and loose furniture pieces placed with maximized seating allowances, access to concessions, amenities, and comfort in mind for the passengers. Furnishings will include integrated power to allow for maximum passenger functionality.

PODIUMS

Passenger gate podiums will be similar to podiums in the existing concourse, with casework and transaction counters. Surface materials will be durable and will meet high traffic durability and sustainability requirements. Signage and electronic equipment will be configured for common use of podiums by multiple airlines.

INTERIOR AND EXTERIOR DOORS

For the interior concourse level and public areas in the existing building, 1.75-inch solid core flush wood doors will be veneer with stainless kickplates (height will vary). Interior storage/utility areas and exterior exit stairs doors and frames will be hollow metal. Doors integrated with curtainwall systems will be aluminum entrance doors with glazing.

TOILET ROOM MATERIALS/QUALITY

Hard surfaces such as those for the walls, floors, and sinks will meet or exceed acceptable high-traffic contract grade requirements for low maintenance, performance, and wear.

Wall mounted sinks with integrated sensor-activated deck-mounted soap dispenser, faucet (with adjustable flow rates) and hand dryer will be utilized.

Stall partitions will be constructed of durable materials that meet or exceed acceptable high-traffic contract grade requirements for low maintenance, performance, and wear. Material surfaces will be selected for performance, cleanability, and appearance.

Restroom accessories such as hand towel dispensers, waste containers, TP dispensers, etc. will be constructed of durable materials that meet or exceed acceptable high-traffic contract grade requirements for low maintenance, performance, and wear.

EXISTING CONDITIONS – TERMINAL (1987)

EXISTING FOUNDATIONS:

The existing foundation system for the terminal area consists of conventional, shallow concrete spread footings at column locations and continuous, shallow concrete footings at interior walls and exterior walls. All continuous concrete wall footings are twelve inches thick, unreinforced and project four inches beyond each face of the supported wall. Where a continuous footing meets a thicker concrete spread footing, the bottom of the continuous wall footing was sloped 1:2 to meet the bottom of the spread footings. Exterior spread footings and continuous footings are located below frost depth, approximately four feet below finished grade. Interior footing elevations vary depending on location and are positioned anywhere from eight inches to four feet below finished floor.

- The interior slab-grade is a four-inch-thick concrete slab with 6x6-W1.4xW1.4 WWF reinforcing.
- The exterior slab-grade north of the terminal is a five-inch-thick concrete slab with 6x6-W1.4xW1.4 WWF reinforcing.
- The foundation system for the terminal area is designed for an allowable bearing pressure of 4,000 psf.
- All cast in place foundations have a compressive strength of 3,000 psi. The slab-on-grade has a compressive strength of 4,000psi. All concrete reinforcing is ASTM A615, GR 60.

EXISTING SUPERSTRUCTURE:

The existing terminal superstructure consists of an elevated floor system consisting of eight-inch structural precast hollowcore plank supported by monolithically, cast-in-place continuous beams and cast-in-place columns. A three-inch composite topping slab was added to the precast plank at the interior terminal spaces. There is no topping slab present at the exterior precast plank at the roof areas.

All cast in place concrete for topping slabs, columns and beams were designed for a compressive strength of 4,000 psi. All concrete column and beam reinforcing is ASTM A615, GR 60. The compressive strength, reinforcement, or strand patterns for the existing hollowcore plank are unknown.

The existing terminal was designed per the 1985 Uniform Building Code (UBC). The existing terminal roof was designed to support a dead load of 90psf consisting of 60psf hollowcore slab weight and a 30psf superimposed dead load. The existing terminal roof was designed to support a snow load of 30psf. The indicated snow drift load employed was 60psf with a tributary width of twenty feet where applicable.

The existing terminal floor was designed to support a dead load of 135psf consisting of 60psf hollowcore slab weight, 38psf for the composite topping slab and a 37psf superimposed dead load. The existing terminal floor was designed to support a live load of 100psf. The mechanical room has a separate live load rating of 150psf.

EXISTING LATERAL RESISTANCE:

The existing terminal main wind and seismic force resisting system are ordinary reinforced concrete moment frames. The design wind pressure for the terminal was 30.5psf for elevations up to twenty feet and 33.0psf for elevations over twenty feet. Seismic loads were not available for review on the existing structural drawings. A one-inch expansion joint exists between the terminal and the concourse structures.

EXISTING CONDITIONS – CONCOURSE (1987)
EXISTING FOUNDATIONS:

The existing foundation system for the concourse area consists of conventional, shallow concrete spread footings at column locations and continuous, shallow concrete footings at interior walls and exterior walls. All continuous concrete wall footings are twelve inches thick, unreinforced and project four inches beyond each face of the supported wall. Where a continuous footing meets a thicker concrete spread footing, the bottom of the continuous wall footing was sloped 1:2 to meet the bottom of the spread footings. Exterior spread footings and continuous footings are located below frost depth, approximately four feet below finished grade. Interior footing elevations vary depending on location and are positioned anywhere from eight inches to four feet below finished floor.

The interior cast-in-place concrete slab-grade is a four-inch-thick concrete slab with 6x6-W1.4xW1.4 WWF reinforcing.
The foundation system for the concourse area was designed for an allowable bearing pressure of 4,000 psf.

All cast in place foundations have a compressive strength of 3,000 psi. The slab-on-grade has a compressive strength of 4,000psi. All concrete reinforcing is ASTM A615, GR 60.

EXISTING SUPERSTRUCTURE:

The existing concourse superstructure consists of an elevated floor system consisting of eight-inch structural precast hollowcore plank supported by monolithically, cast-in-place continuous beams and cast-in-place columns. A three-inch composite topping slab was added to the precast plank at the interior terminal spaces. There is no topping slab present at the exterior precast plank at the roof areas.

All cast in place concrete for topping slabs, columns and beams were designed for a compressive strength of 4,000 psi. All concrete column and beam reinforcing is ASTM A615, GR 60. The compressive strength, reinforcement, or strand patterns for the existing hollowcore plank are unknown.

The existing concourse was designed per the 1985 UBC. The existing concourse roof was designed to support a dead load of 135psf consisting of 60psf hollowcore slab weight, 38psf for the composite topping slab and a 37psf superimposed dead load. The existing concourse roof was designed to support a snow load of 30psf. The indicated snow drift load employed was 60psf with a tributary width of twenty feet where applicable.

The existing concourse floor was designed to support a dead load of 120psf consisting of 60psf hollowcore slab weight, 38psf for the composite topping slab and a 22psf superimposed dead load. The existing concourse floor was designed to support a live load of 100psf.

EXISTING LATERAL RESISTANCE:

The existing concourse main wind and seismic force resisting system are ordinary reinforced concrete moment frames. The design wind pressure for the concourse was 30.5psf for elevations up to twenty feet and 33.0psf for elevations over twenty feet. Seismic loads were not available for review on the existing structural drawings. A one-inch expansion joint exists between the terminal and the concourse structures.

EXISTING CONDITIONS – TERMINAL EXPANSION – CAR RENTAL (2012)

EXISTING SUBSTRUCTURE:

The existing foundation system for the terminal expansion area consists of conventional, shallow concrete spread footings at column locations and continuous, shallow concrete footings at interior walls and exterior walls. All continuous concrete wall footings are two feet wide and one foot thick and reinforced with two #5 bars continuous. Exterior spread footings and continuous footings are located below frost depth, approximately four feet below finished grade. Interior footings are positioned eight inches below finished floor.

The interior slab-grade is a four-inch-thick concrete slab with poly fiber. There is no reinforcement present within the slab-on-grade.

The exterior slab-grade north of the terminal is a five-inch-thick concrete slab with poly fiber. There is no reinforcement present within the slab-on-grade.

The foundation system for the existing terminal area addition was designed for an allowable bearing pressure of 2,500 psf. All cast in place concrete was designed for a compressive strength of 4,000 psi. All concrete reinforcing is ASTM A615, GR 60.

EXISTING SUPERSTRUCTURE:

The existing superstructure consists of an elevated roof consisting of either twenty-gauge steel deck or eight-inch structural precast hollowcore plank supported by structural steel beams and concrete masonry walls. The portion of the concourse addition roof that has precast plank is supporting a roof garden system with concrete pavers. The canopy over the roof garden system consists of a grillage of steel framed HSS sections

The existing concourse addition was designed as per the 2009 International Building Code. The existing concourse addition roof was designed to support the superimposed dead load of the green roof system, precast plank and self-weight of beams and girders. The existing concourse addition roof garden system was designed to support a live load of 100psf.

The existing concourse addition roof was designed to support a snow load of 30psf. There are no indicated snow drift loads.

EXISTING LATERAL RESISTANCE:

The existing concourse addition wind and seismic force resisting system are ordinary reinforced concrete masonry walls. A one-inch expansion joint exists between the existing terminal (1987) and the terminal addition structure (2012).

IMPROVEMENTS/NEW SCOPE OF WORK (2022)

The existing cast-in-place concrete framing superstructure for the existing terminal and concourse was designed to support the structural gravity and lateral load design requirements for those structural elements at the time of construction. The existing terminal and concourse structural cast-in-place concrete framing do not have additional available capacity for any proposed vertical additions/alterations beyond what has been indicated on the structural design documents. Any structural design parameters (compressive strength, reinforcement, pre-stress strands, etc.) or design information for the precast plank is currently unavailable. Also, the available structural drawings for the terminal and concourse do not indicate any provisions for a potential future addition.

The end of the concourse (1987) north of Grid 14C and the car rental (2012) west of Grid A have been identified as potential areas of selective demolition. These areas would be removed in their entirety. Partial demolition of the cast-in-place ordinary moment frames for the structural framing at the terminal and concourse is not a viable option as this would negatively impact the gravity and lateral capacity of the complete structural system. Furthermore, partial demolition or alterations to the existing gravity and lateral resistance system construction would become costly and require extensive structural modifications.

The proposed project will consist of design, new construction and renovations of the existing regional airport in Rapid City, South Dakota. The project will include:

1) Part A: Ticket Counter/Checked Baggage/Baggage Makeup
2) Part B: Concourse Expansion and Renovation
3) Part C: TSA Checkpoint Expansion
4) Part D: Rental Car and Baggage Carousel Addition

It is anticipated that the substructure for the proposed additions would be conventional, shallow concrete spread footings at column locations and continuous, shallow concrete footings at interior walls and exterior walls similar to existing construction.

The selected superstructure for the proposed additions has yet to be selected. The roof system for the proposed additions could consist of steel roof deck or precast plank with composite topping supported by a structural steel framed super structure. The floor system for the proposed additions could consist of either concrete on form deck or precast plank with composite topping supported by a structural steel framed super structure. The main wind force and seismic lateral resistance system has yet to be determined.

CIVIL

EXISTING CONDITIONS

The existing apron associated with the present Rapid City Regional Airport terminal and concourse area was constructed in conjunction with the structure in 1986-1987 currently providing access to seven gates. Minor areas of expansion have occurred through the years, and maintenance efforts have consisted of normal joint resealing, minor spall repairs and a few full depth panel replacements near the Gate 1 and 2 boarding bridges. The airport will connect a new lift station, eliminating the existing sewage lagoon in May of 2023.

Pavement demolition and replacement will be required in conjunction with the building expansion for the bag screening addition and any relocation of existing boarding bridges. A standalone project is in the design phase to provide additional apron area for terminal construction remote parking during these activities.

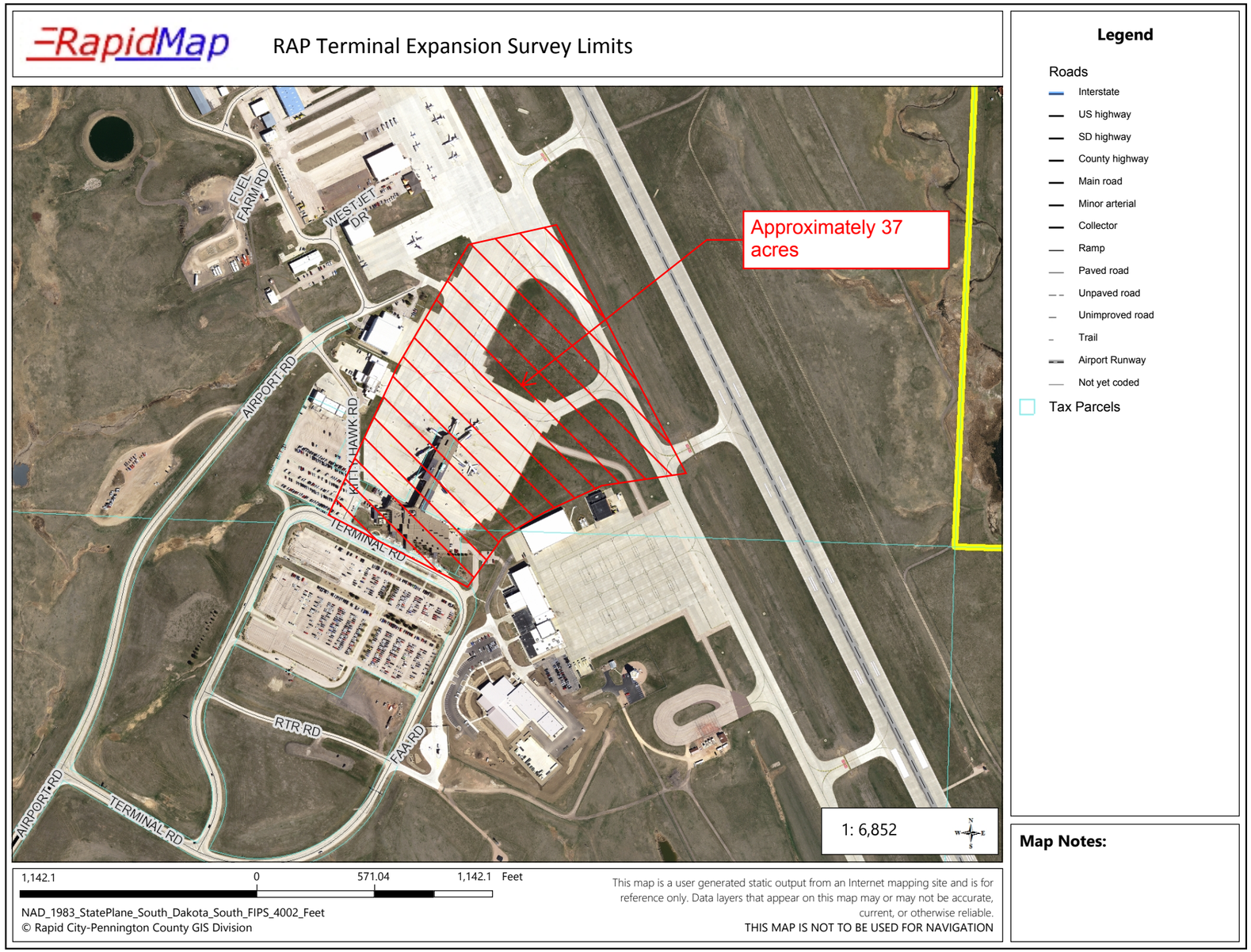
IMPROVEMENT / NEW SCOPE OF WORK

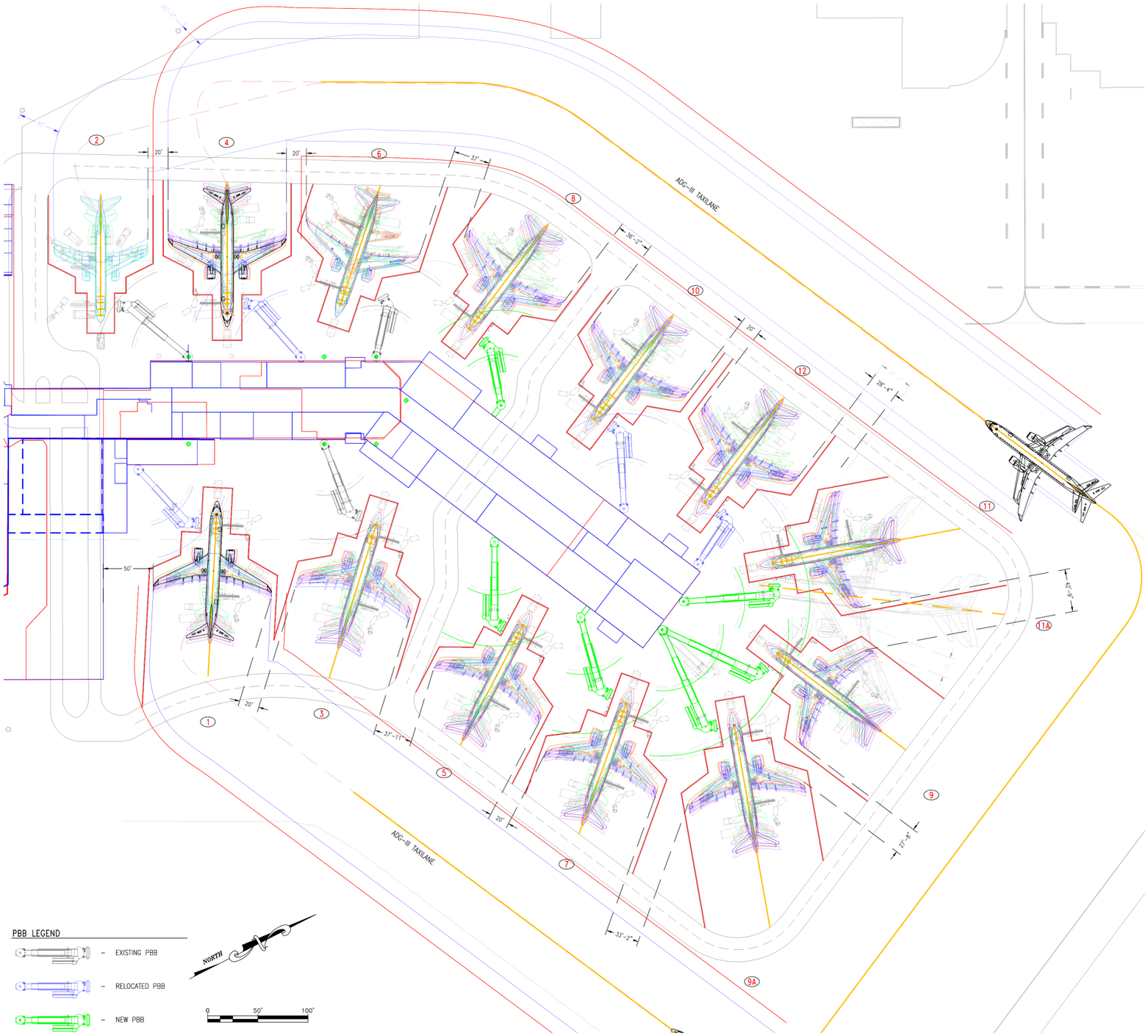
With the ultimate concourse expansion, the apron will be expanded to accommodate the new concourse and associated gates and required aircraft movements. The two gates adjacent to the existing terminal will continue to be used by the smaller Group II aircraft while the remaining area will be configured to accommodate Group III aircraft with locations at the end of the new concourse expansion available for the larger Group IV aircraft. The apron expansion will be addressed in a separate design contract and will also include the reconstruction of the existing apron based on the deterioration of the existing pavement and the fact it is nearing the end of its useful life. A designated area for the deicing of aircraft will be provided in the ultimate apron design and construction.

At this stage of the project, it is not anticipated that the existing water and sanitary sewer systems serving the terminal building will need to be relocated. Additional services for the expanded building will be evaluated as the final design parameters are identified. With the expanded paved surfaces, either modifications to or new storm sewer networks will be required to meet local stormwater design criteria.

On the landside, modification will be required to concrete sidewalks, curb and gutter, asphalt pavement parking lots, irrigation systems and landscaping to accommodate the new building envelope. An expanded terminal employee parking lot will be evaluated based on available space and funding.

To provide a consistent visual effect and enhance the building design, landscaping options will be evaluated and proposed to include the entire landside areas of the overall terminal building. Associated plant selection, landscaping materials and irrigations systems will be provided in keeping with the environment and theme of the building.





AERO SYSTEMS ENGINEERING SUMMARY

The Rapid City Regional Airport currently has 7 gates that service a mixture of regional and mainline aircraft. A proposed expansion of the concourse perpendicular to the runway off of the end of the existing concourse was explored during this concept phase and will expand total parking positions from (9) to (13), and expand gates from (7) to (12).

The existing passenger boarding bridges are equipped with ground power units which provide 400Hz or 28VDC to the aircraft. Currently, there are no pre-conditioned air units installed at the gates to heat or cool the aircraft. The proposed layout will provide (6) new apron-drive boarding bridges and will relocate (1) from existing Gate 5 position to the expanded concourse.

The new boarding bridges will include ground power units, possible rooftop HVAC units, and baggage conveyors at new gate. New rooftop HVAC units can potentially be installed on the (7) existing bridges. The boarding bridges and associated electrical infrastructure within the bridge will be specified to allow for the future installation of pre-conditioned air units.

Due to the reconfiguration of the security checkpoint, Gate 1 will be expanded outside of the existing footprint to accommodate increase seating capacity. The boarding bridge at Gate 1 will be relocated to the new holdroom.

Gate 4 passenger boarding bridge will be relocated within the existing holdroom to reduce the angle of the bridge relative to the concourse and providing clearer views of the Black Hills to the west.

The height of the existing concourse is 12'6" from finished floor to the apron, which is an ideal level to be carried throughout the new expansion. All aircraft parking positions will be able to service the indicated fleet mix without exceeding ADA slopes.

The proposed aircraft parking layout will accommodate mainline ADG-III aircraft at all positions with the exception of Gate 2. An alternate position capable of servicing up to ADG-V aircraft will be incorporated into the layout to accommodate charters and/or diversions.

A tail of stand corridor* is proposed behind all aircraft parking positions to allow for safe and efficient ground support equipment and passenger vehicle traffic. A drive lane will be incorporated through the middle of the concourse to reduce travel times when driving from either side of the concourse to the other.

Additional apron will be added to the site under a separate project, and only apron, curbs, and striping directly related to the concourse will be included in this project.

* Tail of stand corridor – a corridor that runs parallel to a terminal or cargo facility, at the outer boundary of the aircraft stands where the tail of aircraft ends.

EXISTING CONDITIONS

Air Handling Unit (AH-0)

Air Handling Unit (AH-0) is the primary and largest air handling unit (AHU) in the facility. It serves the following areas:

- Baggage Claim
- Ticketing
- Ticketing Offices
- Main Lobby
- Baggage Lobby
- Waiting
- 2nd floor circulation areas
- 2nd floor Circulation restrooms

This built-up air handling unit consists of a fan wall of eight supply fans in parallel drawing 50,000 cubic feet per minute (cfm) air through a MERV-8 filter bank and a 132 refrigeration ton chilled water cooling coil bank. AH-0 does not include a heating coil. The unit also includes a return fan. AH-0 appears to be in good working order and condition with some components replaced in 2012.

Zone control for AH-0 is accomplished by fan powered and pressure independent variable air volume boxes with hot water reheat coils and distribution ductwork installed as part of the 2012 building remodel.

Outside air for AH-0 is ducted to the return air plenum of the unit from make up air unit MA-2 which pre-heats the outside air.

Air Handing Unit (AHU-3)

This is a traditional variable volume air handling unit servicing the rental car area. It is sized for 5,700 cfm, with a MERV-8 filter bank, 11.6 ton chilled water cooling coil and 110,000 btu/hr hot water heating coil. There is a remote 5,700 cfm exhaust fan (EF-T115) giving this system 100% economizer capability. The condition of this system was not observed during the May 2022 site visit but is assumed to be in good condition as it was installed during the 2012 building addition project.

Zone control for AHU-3 is accomplished by pressure independent variable air volume boxes with hot water reheat coils.

Air Handling Unit (AH-1)

This is a variable air volume air handling unit servicing the west portion and northern tip of the second level concourse area as well as the ground level concourse maintenance area. It is sized for 29,000 cfm, with a MERV-8 filter bank, 78 ton chilled water cooling coil. There is no heating coil in this AHU. There is a adjacent 6,500 cfm exhaust fan (EF-1) giving this system limited economizer capability. This unit appears to be the original unit installed in 1987 and as such is beyond it's useful life.

Zone control for AH-1 is accomplished by pressure independent variable air volume boxes with hot water reheat coils. Mead & Hunt believes these VAV boxes are the original ones installed in 1987, and as such are beyond their useful life.

Outside air for AH-1 is ducted to the mixed air plenum of the unit from make-up air unit MA-1 which pre-heats the outside air to 55°F-65°F.

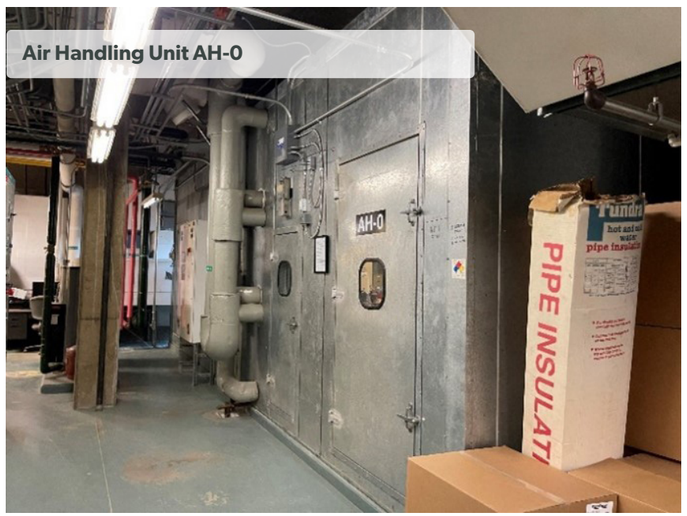
Air Handling Unit (AH-2)

This is a variable air volume air handling unit servicing the terminal dining area south of the concourse including the following areas:

- Kitchen Offices
- Kitchen
- Service Area
- Dining
- Seating

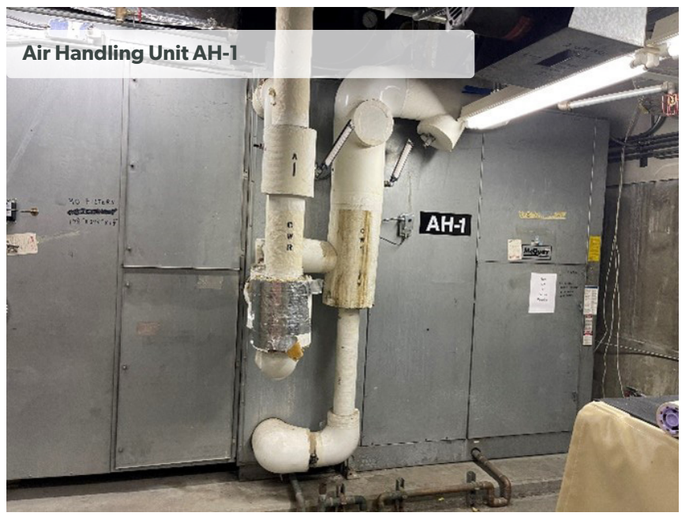
It is sized for 10,000 cfm, with a 23 ton cooling coil. There is no heating coil in this AHU. This unit appears to be the original unit installed in 1987 and as such is beyond it's useful life.

Zone control for AH-2 is accomplished by fan powered variable air volume boxes with hot water reheat coils. Mead & Hunt believes these VAV boxes are the original ones installed in 1987.



Air Handling Unit AH-0

Make-Up Air Handling Unit MA-2



Air Handling Unit AH-1

Outside air for AH-2 is ducted to the mixed air plenum of the unit from make-up air unit MA-2 (see below) which pre-heats the outside air to 55°F-65°F.

Air Handling Unit (AHU-4)

This is a rooftop variable air volume air handling unit servicing the east portion of the second level concourse (including the TSA secure screening area). It is sized for 18,000 cfm, with a 47 ton direct expansion (DX) R-410A refrigerant cooling coil and a 324,000 btu/hr hot water heating coil. There is also a return fan and mixing section in the unit giving it full economizer capability. This unit appears was installed as a part of the 2012 building remodel and addition and appears to be in good condition.

This unit has a MERV-8 filter bank as well as a canister carbon air filter system due to it's location over the concourse area where contaminated vehicle/plane exhaust ventilation intake is a concern.

Zone control for AH-1 is accomplished by pressure independent variable air volume boxes with hot water reheat coils. These VAV boxes were installed in the 2012 building project and should be in good condition.

Associated with AHU-4 is an adjacent roof mounted four stage air cooled compressor/condensing unit (ACCU) which provides the refrigeration source for the AHU-4 cooling coil

Make-Up Air Handling Unit (MA-1)

This is a simple draw through air handling unit with a pre-filter section, MERV-8 filter bank, 530,000 btu/hr hot water heating coil, and 7,500 cfm supply fan. It provides tempered 100% outside air at a minimum of 55°F for code required ventilation air and building pressurization air to AH-1 located in the concourse (see above). The unit fan appears to be speed controlled by a VFD. It also appears this unit was installed as part of the original building construction and as such has reached the end of it's useful life and should be replaced

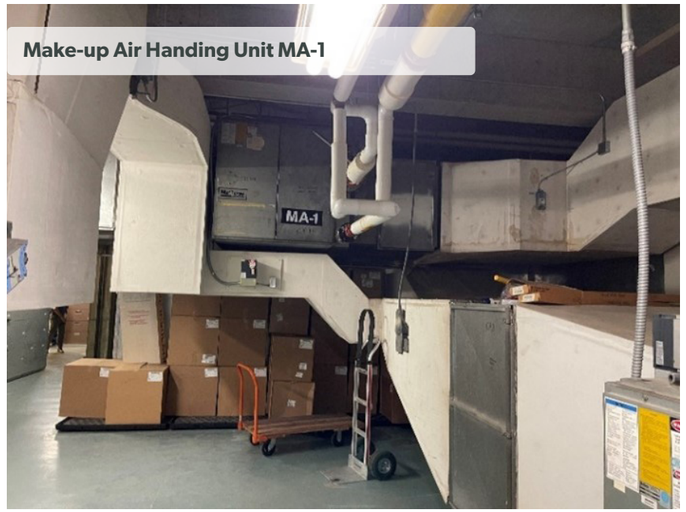
Make-Up Air Handling Unit (MA-2)

This unit is configured the same as MA-1 with a 13,000 cfm supply fan and 941,000 btu/hr hot water heating coil. It provides minimum 55°F code required ventilation air and building pressurization air to AH-0 and AH-2 located in the terminal south of the concourse (see above). The unit fan appears to be speed controlled by a VFD. It also appears this unit was installed as part of the original building construction and as such has reached the end of it's useful life and should be replaced

Vestibule Hot Water Cabinet Unit Heaters

The three main front entrance vestibules are heated by overhead cabinet unit heaters (CUH's) with hot water heating coils.

Air Handling Unit AH-2



Make-up Air Handing Unit MA-1

Rooftop Air Handling Unit AHU-4

MECHANICAL

NARRATIVE

Chilled Water System

The existing chilled water system consists of the following main system components:

- One oil free HFC-134a refrigerant magnetic bearing 225 ton centrifugal chiller (CH-1) installed in 2019.
- One rooftop induced draft stainless steel cooling tower (CT-1) with associated sump tank located in the mechanical mezzanine adjacent to the chiller to provide condenser heat removal for the chiller.
- One primary base mounted end suction 675 gallon per minute (gpm) chilled water pump (P-3) to circulate the chilled water to loads throughout the building and back to the chiller evaporator heat exchanger. There is no secondary loop chiller water system pump.
- One base mounted end suction condenser water pump to circulate cooling tower water between the chiller condenser heat exchanger and cooling tower.

Hot Water Boiler System

The hot water heating system consists of the following main system components:

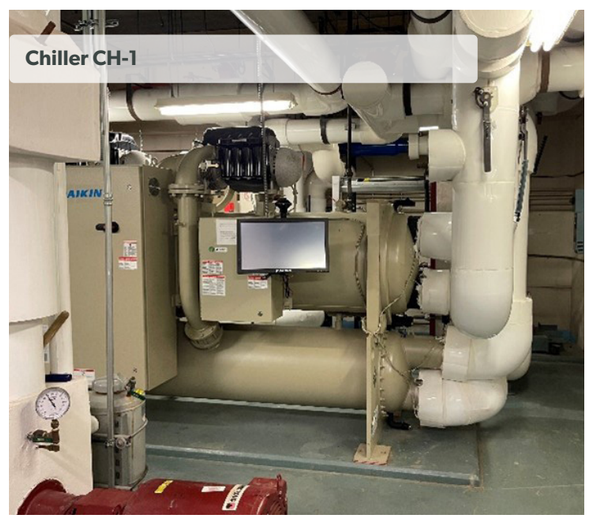
- Two natural gas fired high efficiency condensing hot water boilers (B-1 & B-2), each sized for 2.5MM/2.15MM Btu/hr (input/output). Each boiler includes a dedicated small in-line circulation pump (primary loop).
- Two 440 gpm secondary loop base mounted end suction pumps to circulate hot water between the boiler system and the building heating loads.

DDC Control System

There is a Johnson Controls Direct Digital Control (DDC) HVAC control system in place with electric actuation to control most of the HVAC equipment in the building, including the air handling units, chiller, boilers, and VAV boxes.


Rooftop Cooling Tower CT-1


Boilers B-1 & B-2


Chiller CH-1

NEW WORK SCOPE

The following new work scope is preliminary and is subject to change as the facility concept design and schematic design evolve. Mead & Hunt will look to design energy efficiency features such as economizer control, energy recovery, and CO2 demand control ventilation into the HVAC systems where feasible.

Chiller System

- Renovation project will require adding more chilled water-cooling capacity as the new total load will be roughly twice the current building load.
- Add one new magnetic bearing centrifugal chiller similar to the existing chiller – estimated size of 300 tons.
- Add another cooling tower with capacity to match the new chiller.
    - Option: will investigate replacing existing cooling tower with a larger evaporative fluid cooler to conserve off peak water consumption.
- Replace the existing primary chilled water pump with a larger one sized for roughly 1500 gpm and add a second lag pump for redundancy. Both pumps with new VFD's.
- Replace expansion tank and air separator with larger one or add a second one in parallel.
- There is not enough room in the mechanical mezzanine for the new chiller. The renovation project will explore relocating the chiller plant to another location and relocating the retained chiller and cooling tower as they are in good condition. New 10" chiller system supply and return headers can then backfeed the existing 6" headers in the mechanical mezzanine.
- Re-balance entire system after installation.
- Tie new system components into Johnson Controls DDC system and re-connect relocated ones.

Hot Water Boiler System

- There is space available in the mechanical mezzanine for additional boiler system components.
- Add two new 2.5MM Btuh input high efficiency condensing hot water boilers (Thermal Solutions) with dedicated circulation (primary) pumps.
- Replace the two secondary hot water pumps with larger ones estimated to be 600 gpm. Both to be provided with new VFD's.
- Tie new boilers into existing 6" HWS/R headers.
- Replace/upsize expansion tank and air separator.

Air side systems

- Existing Systems
    - Re-balance AH-0, AHU-3, to new required airflow (TBD). Re-balance VAV boxes to new required airflow rates as needed.
    - Replace AH-1 and AH-2 with modular AHU's roughly the same size and configuration as the units to be replaced. Will look for the opportunity to improve the economizer capability of these units.
- Replace existing VAV boxes for AH-1 and AH-2 with new pressure independent boxes.
- Replace MA-1 and MA-2 with similar make up air handling units with new VFD's.
- Concourse Expansion
    - Assume two VAV Air Handling Units (AHU's) at 25,000 cfm each with HW heating and chilled water-cooling coils, airside economizer configuration, 26 VAV boxes with HW reheat coils.
    - Three concessions power roof ventilator systems.
- New TSA Security Checkpoint Area
    - Assume one VAV AHU at 12,000 cfm with HW heating and chilled water-cooling coils, airside economizer configuration, 8 VAV boxes with HW reheat coils.
- Existing Ticketing
    - Relocate rework existing fan powered VAV boxes and ductwork over this area to facilitate removal of overhead duct chases.
- Expanded Ticketing
    - Will evaluate possibility of extending existing AH-1 air system to serve this area but for purposes of cost estimating will assume one VAV AHU at 10,000 cfm with HW heating and chilled water-cooling coils, airside economizer configuration, 4 fan powered VAV boxes with HW reheat coils.
- Baggage Screening/Circulation – Outbound
    - 10,000 cfm make-up air handling unit with HW coil and four associated rooftop power ventilators controlled by CO/NO2 detection system.
    - Four hot water unit heaters.
    - Rental Car Expansion.
    - Assume one VAV AHU at 6,000 cfm with HW heating and chilled water-cooling coils, airside economizer configuration, 6 VAV boxes with HW reheat coils.

DDC Controls

- Expand existing system to accept new control points associated with new HVAC system components.
- If applicable, update DDC system software to current version and update graphical user interface.

ELECTRICAL

NARRATIVE

EXISTING CONDITIONS

- The existing electrical service is provided by West River Electric. A single pad-mounted step-down transformer is located on the west side of the airport. This pad mounted transformer feeds two electrical services (both services are jointly metered):
- Service #1 – 1600A to SWBD#1 (located in basement).
- Service #2 – 1600A to SWBD#2 (located in basement).
- The existing switchboards are manufactured by I-T-E and are both original to the building. The existing branch circuit breakers are starting to fail, and the airport has indicated replacement parts are getting harder and harder to find.
- Most of the electrical distribution system is manufactured by I-T-E and is original to the building. Equipment installed from the 2012 terminal renovation project is manufactured by GE and is relatively good condition.
- The existing 350kW generator is manufactured by Kohler and is in a walk-in enclosure on the west side of the airport. This generator was installed in June 1992. It is served from a 560 gallon above ground fuel tank adjacent to the walk-in enclosure. A 300kW load bank is also installed in this area. The generator currently is connected into the existing electrical distribution system with a single 400A automatic transfer switch. This configuration does not meet current National Electrical Code segregation of load requirements.
- The building is fully protected with an existing lightning protection system. The original system has been added on to over the years. The existing system is showing signs of corrosion.
- The building wide lighting control system is provided by Leviton and was installed in 2012. Components are sporadically located throughout the facility and the system does not operate correctly.
- The existing light fixtures are a combination of fluorescent, HID, and LED. The airport has on-going maintenance projects to replace one-for-one existing fluorescent / HID light fixtures with LED versions.
- The existing building mounted apron lights are LED and were replaced roughly 8 years ago. Not all light pole bases seemed to be connected to the building-wide lightning protection system. The existing light fixtures are wide flood lights and do not provide adequate control of the light distribution nor are dark-sky compliant.
- The existing Uninterruptable Power Supply was installed in 2002.

REPLACEMENTS / ENHANCEMENTS

- The existing electrical service transformer, generator, fuel tank, and load bank are all currently located in the footprint of the new building and will need to be relocated.
- The existing electrical service is not adequate to provide the required power to the proposed Concourse Expansion, new CBIS, and additional passenger boarding bridges.
- The existing I-T-E switchboard, transformers, and panelboards that are original to the building are past their useful life and will be replaced.
- The existing generator and load bank are past their useful life and will be replaced. The existing 560 gallon above grade fuel tank is new and can be relocated.
- The existing building mounted apron lighting will be replaced to allow for a single cohesive look around the exterior of the airport. The existing wide flood lights will be turned over to the airport for spare parts.
- The existing lighting controls do not function correctly and will be removed and replaced in its entirety.
- The existing Uninterruptable Power Supply is past its useful life and will be replaced.

IMPROVEMENTS / NEW SCOPE OF WORK

- It is anticipated that three new normal power electrical rooms (approx. size 25' x 15') will need to be located throughout the additions based on new power demands and construction phasing requirements.
    - Electrical Room #1: CBIS Area
    - Electrical Room #2: Under Concourse Expansion
    - Electrical Room #3: Baggage and Rental Car Expansion
- o There are two different electrical distribution system options that will be determined based on ability to be expanded in the future and overall front-end costs.
    - Option #1: Utility provided medium voltage service to airport-owned Medium Voltage Switchgear consisting of fused primary switch, metering section, and four fused feeder switches (one spare). Each electrical room noted above would be provided with a medium voltage feeder, unit substation, and panelboards / transformers as required.
    - Option #2: Three electrical services at various locations around the site to serve each of the electrical rooms noted above. Each electrical room noted above would be provided with a switchboard and panelboards / transformers as required.
- It is anticipated a new 2-hour rated emergency electrical room will be required (approx. size 20' x 20') to house the code required emergency electrical equipment per NFPA 110. This will want to be located near the CBIS area due to phasing requirements.
- It is anticipated that a new diesel generator (preliminary size of 600kW), will be located on the east side of the terminal outside the new CBIS area due to phasing requirements. The generator will be sized (at a minimum) to allow the airport to function under a power outage (i.e. get passengers on plans and through the terminal). Exact loads throughout the airport to be determined.
- Panelboards: Comparable to Square D I-Line style; Lighting and appliance panelboards comparable to Square D NF (480V) and NQOD (208V) style; rated for 3 phase, 4 wire, 60 Hz service. All panelboards will be sized for 20% future growth.
- Grounding System: Provide a new grounding system for the new electrical service and each separately derived system originating at the respective grounding electrode(s) and radiating to every electrical power controlling and consuming device in the system.
- Surge Protective Device: A surge protective device will be installed on the load side of the main service disconnect, at the service entrance switchboard, and Article 700 panelboards.
- A new digital metering system will be installed throughout the airport.
- Miscellaneous Power: Devices will be located throughout the building to allow for ample connectivity for all users.
- The new electrical infrastructure will be sized to allow all aircraft to plug into the passenger boarding bridge GPUs and sized for the future addition of PCA.
- The new electrical infrastructure will be sized to all for the future electrification of all ground service equipment.
- The building-wide lightning protection system will be replaced.
- A new building-wide lighting control system will be installed.
- Lighting System: All Lighting will be of the dimmable (0-10V), DMX, or line voltage LED type. Lighting density will be based on IECC2021 for lighting power allowances per space. Exact vocabulary of light fixtures will be determined in next phase of design. Lighting controls will consist of a combination of dimming and occupancy sensors and low-voltage programmable lighting control system. Photocell will be installed on the roof and will be tied into lighting control system. All lighting controls for mandatory shutoff, uniform light reduction, and daylighting will meet requirements of IECC 2021.
- A new centralized lithium-ion based Uninterruptable Power Supply will be provided.

PLUMBING

NARRATIVE

EXISTING CONDITIONS

- The terminal building is served by a 16″ storm sewer on the south side. The north side of the terminal building is served by an 8″ storm sewer and a 10″ storm sewer.
- The terminal building is served by (2) 6″ sanitary mains on the north side. The 4″ sanitary serving the trench drains goes through a sand/oil interceptor before tying in with the 6″ sanitary main.
- The concourse is served by (2) 8″ storm sewers, one on the west side and one on the north side.
- The concourse is served by (2) 4″ sanitary mains, one on the west side and one on the south side.
- The airport is served by a 6″ domestic water service. There is a 4″ backflow preventer and the 4″ domestic service is distributed out to the facility.
- The concourse has a 3″ domestic water main fed off this 4″ domestic water main.
- The terminal building is served by a single tank water heater in the 3rd floor mechanical room with hot water distribution and return circulation. There are two tank water heaters that have been capped off and no longer in use in the 3rd floor mechanical space. The concession tenant has a single water heater located in the 3rd floor mechanical space.
- The concourse restrooms are served by tank water heaters located on the first floor with hot water distribution and return circulation. The concession tenant has a single water heater located on the first floor.

REPLACEMENTS / ENHANCEMENTS

- The existing hot water supply and return to the lavatory faucets is not circulated properly down into the chase behind the low flow faucets. We will reroute the hot water and return piping so that hot water is delivered properly to these faucets and all faucets in the system.

IMPROVEMENTS / NEW SCOPE OF WORK

- New sanitary, domestic cold water, domestic hot water, and storm systems will be provided as required for new build-outs and remodeled spaces.

TECHNOLOGY SYSTEMS

NARRATIVE

TECHNOLOGY SPACES

Existing Conditions

- The existing technology spaces consist of a Main Technology Room (MTR) in the basement, a Building Entrance Facility (BEF) DEMARC in the basement, a fiber distribution room in a shared space in the basement, a Technology Room (TR) on the ground level under the Concourse, a wall-mounted cabinet TR in the American Airlines ATO/Baggage Handling Room, and a TR closet located off the conference room in the Administration suite.
- TSA has their own TR in their suite and the airlines and rental car agencies house their electronics within their office spaces.

Technology Space Improvements/Enhancements

- The MTR, BEF, and Concourse TR will largely remain the same with additional and replacement infrastructure being installed to support new and existing spaces and technology. The MTR has room for expansion in both areas of additional rack space and wall fields. These rooms will be brought up to current ANSI/TIA standards as opportunities are presented based off the work being performed in these spaces.
- New TRs will be constructed to support the areas of expansion and renovation using the latest industry standards and guidelines. The use of colocation cabinets will provide centralized infrastructure management for both the Airport and tenants. TSA will require independent technology spaces per their guidelines.

STRUCTURED CABLING

Existing Conditions

- The copper cabling infrastructure installed throughout the Airport consists of multiple generations of cabling technology; from Cat1 multi-pair cable up to current Cat6 UTP have been implemented. Additionally, RG-6 and RG-11 coaxial cabling has been installed for both television signals and some legacy data services.
- Optical fiber consists of various types of multimode as well as single-mode fiber.

Structured Cabling Improvements/Enhancements

- All data cabling will be Cat6 for typical network and voice outlets and Cat6a for Wireless Access Points(s). Any legacy cabling will be removed to point of origin that is located in any of the affected areas.

PHYSICAL SECURITY

Existing Conditions

- Physical security consists of a Milestone Video Management System (VMS) with most cameras being Axis products. Access Control is a S2 modular platform with variations of door hardware including electric strikes, motion detector REXs, etc. A current issue with the system is the current design of the REX controls often resulting in alarms at their monitoring sites. Monitoring is performed by ARFF, Operations staff, and at the LEO "Fishbowl" at the end of the Security Checkpoint.

Physical Security Improvements/Enhancements

- The Milestone VMS will be upgraded to the most current software release and set up to be unified with the Access Control System (ACS). Server and Network Video Recorders (NVRs) will be assessed for refresh and new NVRs will be added for additional capacity for the new cameras. NVRs will be sized to retain video for 45 days minimum for a combination of cameras set for record on motion and others set to record 24/7. Axis cameras will be used as the basis of design products on the project with considerations to comparable models that are compliant with NDAA. Varying levels of analytics will be included in the cameras to allow streamlined incident surveillance, suspect tracking, and advanced search features.
- The S2 ACS will be replaced with an open-architecture solution capable of full unified integration with the Milestone VMS. Door hardware will primarily be electrified locksets with integrated REXs to be operated through the Access Control Panels (ACPs) using combinations of smart card credential readers, credential readers with pin pads for standard dual authentication access control, and advanced dual authentication at specific Sterile/Secure doors containing both smart card and biometrics. Local audio/visual door alarms will be installed on Public to Sterile and Public/Sterile to Secure doors to provide local and remote alert notifications and minimize accidental alarms.

AUDIOVISUAL SYSTEMS

Existing Conditions

- The Public Address (PA) system is comprised of a Biamp Vocia solution with a distributed loudspeaker system. Some of the issues are the zoning of the loudspeakers and the configuration of the ambient noise sensors not functioning as intended to properly manage the audio volume output. The system setup is not a user-friendly configuration and often involves resetting of the entire system when the system loses function.
- Electronic Video Information Display Systems (EVIDS) currently includes Flight Information Display System (FIDS), Baggage Information Display System (BIDS) and Gate Information Display System (GIDS) content provided to the displays by Terminal Systems International (TSI). Other displays receive content for marketing, general information, and entertainment purposes.

Audiovisual Systems Improvements/Enhancements

- The entire PA system will be fully assessed; the Biamp Vocia is a good product but may not be a good fit. Biamp will be consulted on the ease-of-use and other issues but depending on the hardware assessment a new replacement system may be considered. The loudspeaker zoning will be revamped, with ambient noise sensors correctly calibrated to each zone. Additional considerations will be made for ambient noise sensor control regarding maintenance modes to disable the sensor and establish a baseline volume while loud work is being performed in that zone.
- TSI is a recent system rollout in the Airport; discussions will occur regarding system limitations and the path forward for all FIDS, GIDS, BIDS, general information, marketing, and entertainment display media sources and management.

CRASH PHONE

Existing Conditions

- The current crash phone system is a legacy unit that uses physical switches and relays to manage the ringing and talk paths in any events. These systems are reliable but the age of the technology is susceptible to a higher failure rate with additional difficulty is sourcing replacement parts.

Crash Phone System Upgrade

- The Crash Phone System will be upgrade to an IP-based system working off the fiber backbone. All current active crash phone reporting areas will be included: ARFF, 911 Dispatch, ATCT, Airport Administration Offices, and the National Guard. An assessment will need to be made regarding direct fiber connectivity to the National Guard. The system will be designed for ease-of-use, reliability, and survivability.

COMMON USE

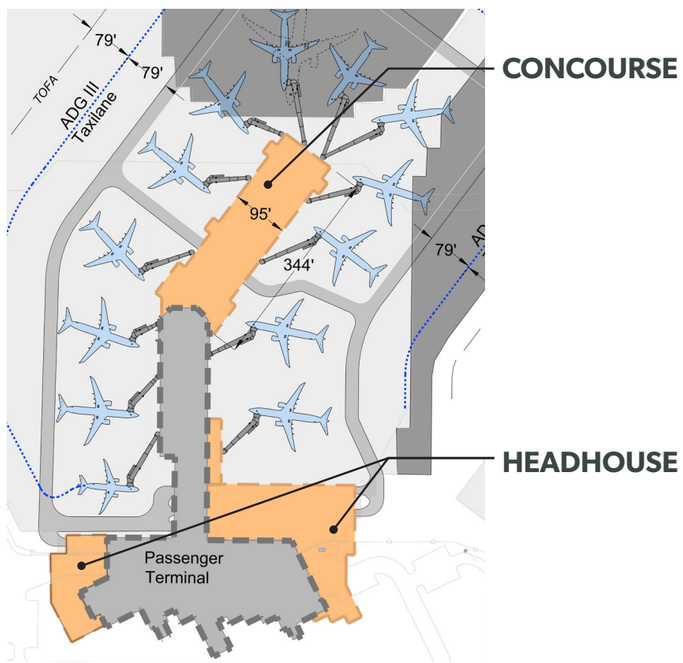
- Common Use vendors will be assessed to bring a Common Use Passenger Processing System (CUPPS) and Common Use Terminal Equipment (CUTE) functions into the Airport. This system will allow for flexible Ticket Counter and Gate Podium assignments to allow more functionality during peak times. Additional potential services by these vendors include Self Check-In kiosks, mobile gate podiums, and FIDS/GIDS content management. The Structured Cabling will be designed to support any configuration.

CELLULAR DISTRIBUTED ANTENNA SYSTEM (DAS)

- T-Mobile is assessing the possibility of installing a vendor-neutral cellular DAS throughout the Airport to provide optimum cellular coverage for any service provider (T-Mobile, Verizon, AT&T, etc.) that would provide hardware to join the system. Considerations for this system will include space, cooling, and power in addition to the type of agreement T-Mobile would require from the Airport.

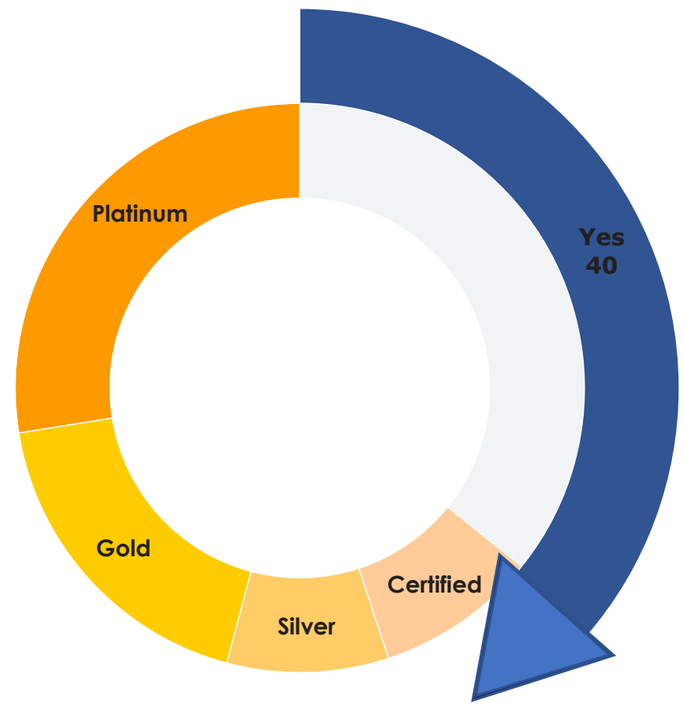
LEED CERTIFICATION AND FAA FUNDING

Rapid City Regional Airport (RAP) is pursuing LEED certification as part of a grant application process for federal funding with the U.S. Department of Transportation Federal Aviation Administration (FAA). LEED certified buildings are prevalent in the area including 18 LEED certified buildings located in Rapid City and 102 LEED certified buildings statewide. Based on the timing and funding of the scope included in the Terminal Remodel and Expansion, there may be two individual separate LEED certifications, one for the concourse and one for ticketing / baggage.



LEED CERTIFICATION LEVELS

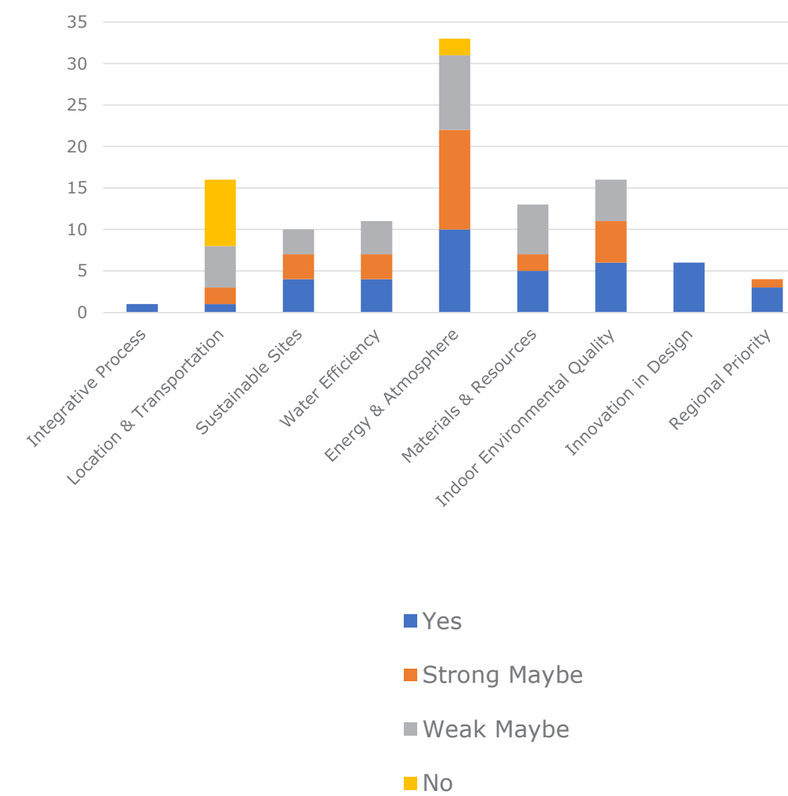
Based on an initial evaluation, the terminal remodel and expansion projects will be able to achieve a minimum LEED Certified certification level with a minimum of 40 LEED points identified.



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

LEED STATUS BY CATEGORY

During Workshop 2 on June 2, 2022, the LEED categories that were identified as the best match to the RAP team's goals of prioritizing the passenger experience and long-term efficiency are Energy & Atmosphere, Indoor Environmental Quality, and Water Efficiency. The status of LEED credits by category is shown below.



LEED
SCORECARD

LEED BD+C: New Construction and Major Renovation v4 & v4.1
RAP Terminal Remodel and Expansion Project

Date Registered: TBD
Date Updated: 6/14/2022
Goal: Certified

ambient energy
A Mead & Hunt Company

Cells highlighted in salmon color indicate alternative compliance paths using LEED v4.1

Yes	SM	WM	No				
42	26	32	10		**Project Totals (Pre-certification estimates)**		
Current Yes's = Certified					Certified 40-49 Silver 50-59 points Gold 60-79 points Platinum 80-110 points	d = Design Submittal c = Construction Submittal	
1					**Integrative Process (IP) - 1 Point Available**		**Champion**
1				IPc1	**Integrative Process (1)**	d	Architect, Mechanical, Civil, Landscape, Owner, Ambient Energy
1	2	5	8		**Location and Transportation (LT) - 16 Points Available**		**Champion**
				LTc1	**LEED for Neighborhood Development Location (8-16)**	d	
1				LTc2	**Sensitive Land Protection (1)**	d	Ambient Energy
	1		1	LTc3 (v4.1)	**High Priority Site (1-2)**	d	Ambient Energy
	1	1	3	LTc4 (v4.1)	**Surrounding Density and Diverse Uses (1-5)**	d	Ambient Energy
		2	3	LTc5 (v4.1)	**Access to Quality Transit (1-5)**	d	Ambient Energy
			1	LTc6 (v4.1)	**Bicycle Facilities (1)**	d	
		1		LTc7 (v4.1)	**Reduce Parking Footprint (1)**	d	Architect, Landscape
		1		LTc8 (v4.1)	**Electric Vehicles (1)**	d	Architect, Landscape
4	3	3			**Sustainable Sites (SS) - 10 Points Available**		**Champion**
Y				SSp1 (v4.1)	**Construction Activity Pollution Prevention (P)**	c	Civil, Contractor
1				SSc1 (v4.1)	**Site Assessment (1)**	d	Civil, Architect, Energy Modeler, Landscape Architect
		2		SSc2 (v4.1)	**Protect or Restore Habitat (1-2)**	d	Landscape, Owner
		1		SSc3 (v4.1)	**Open Space (1)**	d	Landscape, Owner
	3			SSc4 (v4.1)	**Rainwater Management (1-3)**	d	Landscape or Civil
2				SSc5 (v4.1)	**Heat Island Reduction (1-2)**	d	Architect, Landscape
1				SSc6 (v4.1)	**Light Pollution Reduction (1)**	d	Electrical
4	3	4			**Water Efficiency (WE) - 11 Points Available**		**Champion**
Y				WEp1 (v4.1)	**Outdoor Water Use Reduction, 30% (P)**	d	Landscape
Y				WEp2 (v4.1)	**Indoor Water Use Reduction, 20% (P)**	d	Ambient Energy
Y				WEp3 (v4.1)	**Building-level Water Metering (P)**	d	Plumbing
1	1			WEc1 (v4.1)	**Outdoor Water Use Reduction (1-2)**	d	Landscape
3	1	2		WEc2 (v4.1)	**Indoor Water Use Reduction (1-6)**	d	Ambient Energy
		2		WEc3 (v4.1)	**Optimize Process Water Use (1-2)**	d	Mechanical
	1			WEc4 (v4.1)	**Water Metering (1)**	d	Plumbing
12	10	9	2		**Energy and Atmosphere (EA) - 33 Points Available**		**Champion**
Y				EAp1 (v4.1)	**Fundamental Commissioning and Verification (P)**	c	Commissioning Agent
Y				EAp2	**Minimum Energy Performance, 5% (P)**	d	Energy Modeler
Y				EAp3	**Building-level Energy Metering (P)**	d	Mechanical
Y				EAp4	**Fundamental Refrigerant Management (P)**	d	Mechanical
5	1			EAc1 (v4.1)	**Enhanced Commissioning (2-6)**	c	Commissioning Agent
7	3	8		EAc2	**Optimize Energy Performance (1-18)**	d	Energy Modeler
	1			EAc3	**Advance Energy Metering (1)**	d	Mechanical / Electrical
			2	EAc4 (v4.1)	**Grid Harmonization (1-2)**	c	
	5			EAc5 (v4.1)	**Renewable Energy (1-5)**	d	Energy Modeler, Mechanical, Architect, Owner
		1		EAc6 (v4.1)	**Enhanced Refrigerant Management (1)**	d	Mechanical

LEED BD+C: New Construction and Major Renovation v4 & v4.1
RAP Terminal Remodel and Expansion Project

Date Registered: TBD
Date Updated: 6/14/2022
Goal: Certified

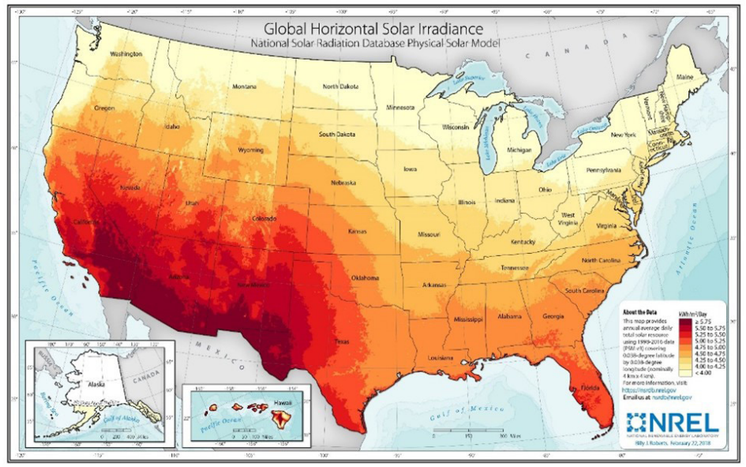
ambient energy
A Mead & Hunt Company

Cells highlighted in salmon color indicate alternative compliance paths using LEED v4.1

Yes	SM	WM	No				
5	2	6			**Materials & Resources (MR) - 13 Points Available**		**Champion**
Y				MRp1	**Storage and Collection of Recyclables (P)**	d	Ambient Energy, Owner
1	1	3		MRc1 (v4.1)	**Building Life-cycle Impact Reduction (1-5)**	c	Architect, Structural or Ambient Energy
1		1		MRc2 (v4.1)	**Environmental Product Declarations (1-2)**	c	Architect, Contractor
1		1		MRc3 (v4.1)	**Sourcing of Raw Materials (1-2)**	c	Architect, Contractor
1		1		MRc4 (v4.1)	**Material Ingredients (1-2)**	c	Architect, Contractor
1	1			MRc5 (v4.1)	**Construction and Demolition Waste Management (1-2)**	c	Architect, Contractor
6	5	5			**Indoor Environmental Quality (EQ) - 16 Points Available**		**Champion**
Y				EQp1	**Minimum IAQ Performance (P)**	d	Mechanical
Y				EQp2 (v4.1)	**Environmental Tobacco Smoke (ETS) Control (P)**	d	Ambient Energy, Owner, Architect/Landscape
1	1			EQc1	**Enhanced Indoor Air Quality Strategies (1-2)**	d	Architect, Mechanical
2	1			EQc2 (v4.1)	**Low Emitting Materials (1-3)**	c	Architect, Contractor
1				EQc3	**Construction Indoor Air Quality Management Plan (1)**	c	Contractor
		2		EQc4 (v4.1)	**Indoor Air Quality Assessment (1-2)**	c	Mechanical, Contractor or IAQ Testing Consultant
1				EQc5 (v4.1)	**Thermal Comfort (1)**	d	Mechanical
1	1			EQc6 (v4.1)	**Interior Lighting (1-2)**	d	Electrical
	1	2		EQc7 (v4.1)	**Daylight (1-3)**	d	Daylight Consultant, Architect
	1			EQc8	**Quality Views (1)**	d	Architect
		1		EQc9 (v4.1)	**Acoustic Performance (1)**	d	Architect
6					**Innovation (IN) - 6 Points Available**		**Champion**
1				INc1.1	**Innovation, Occupant Comfort Survey**	d/c	TBD
1				INc1.2	**Innovation, EQc1 v4 Enhanced Indoor Air Quality Strategies (EP)**	d/c	TBD
1				INc1.3	**Innovation, EQc4 v4.1 Indoor Air Quality Assessment (EP)**	d/c	TBD
1				INc1.4	**Innovation, Integrative Analysis of Building Materials (Pilot)**	d/c	TBD
1				INc1.5	**Innovation, Procurement of low Carbon Construction Materials (Pilot)**	d/c	TBD
1				INc2	**LEED® Accredited Professional**	c	Ambient Energy
3	1				**Regional Priority (RP) - 4 Points Available**		**Champion**
	1			RPc1.1	**Renewable Energy Production (Meet 1 point Threshold)**	d/c	See above.
1				RPc1.2	**Optimize Energy Performance (Meet 7 points Threshold)**	d/c	See above.
1				RPc1.3	**Indoor Water Use Reduction (Meet 3 points Threshold)**	d/c	See above.
1				RPc1.4	**Sensitive Land Protection (Meet 1 point Threshold)**	d/c	See above.
				Alt	**Rainwater Management (Meet 2 points Threshold)**	d/c	
				Alt	**Outdoor Water Use Reduction (Meet 2 points Threshold)**	d/c	

CLIMATE DESIGN CONSIDERATIONS
SOLAR RESOURCE

There is good solar resource at Rapid City, with 4.50-4.75 kWh/m2 for the average day and an average annual sky cloud cover of less than 30%.



HAIL

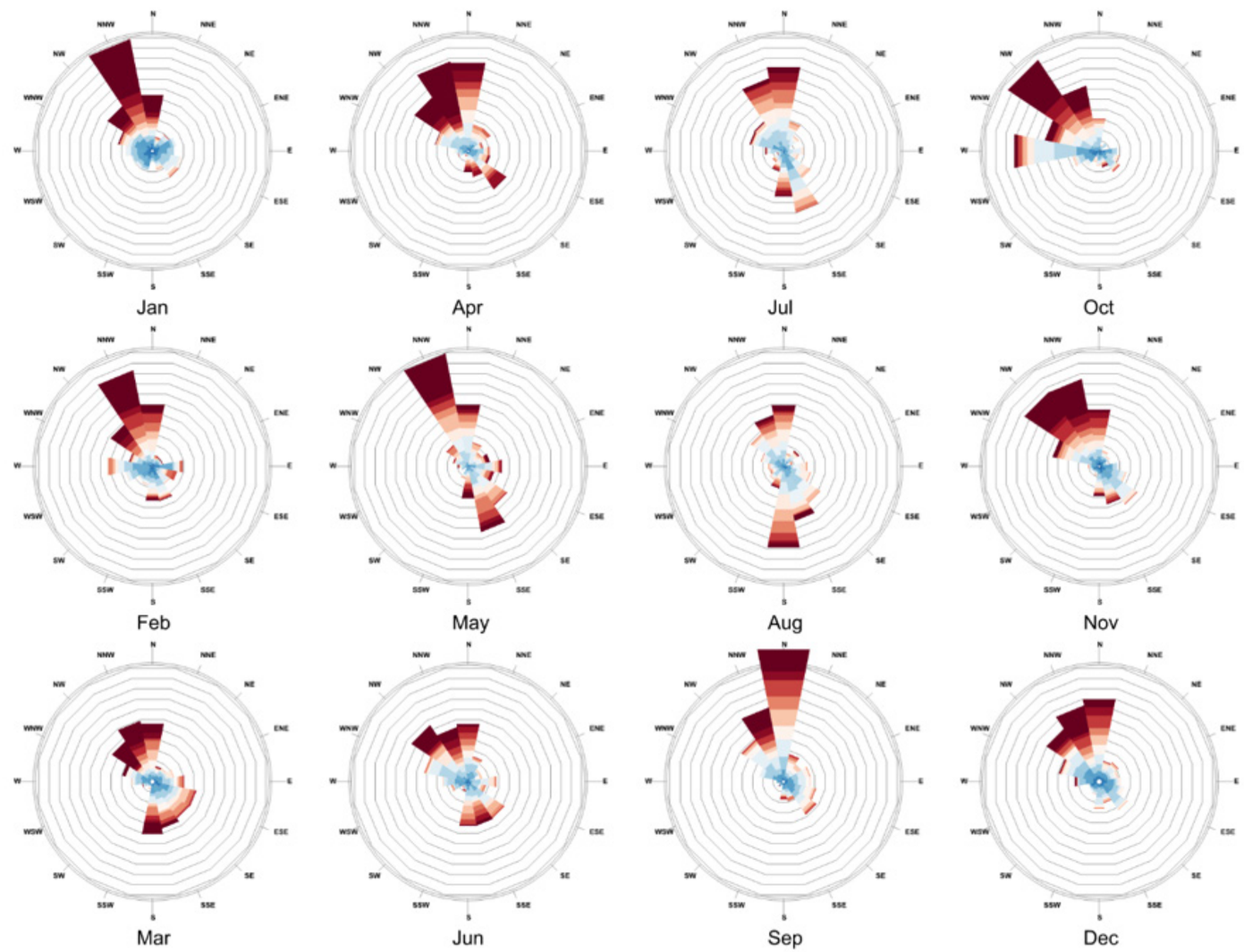
Hail damage is a concern for resiliency at the Rapid City Regional Airport. The area has a Hail Risk Score of 5 out of 10 which is considered Moderate, with damaging hail likely to occur every other year. During the last 10 years, there were 429 hail reports within 10 miles of the city center. In 2021, there were 10 hail reports with hail sized one inch or larger and one report of hail sized three inches. The largest report of hail near Rapid City is 4.25 inches about 14 years ago.

Vehicle damage can occur with hail sized one inch or larger which is a concern for the rental car companies among others, prompting Rapid City Regional Airport to consider installing hail guards or carports with photovoltaics.

Photovoltaic modules are designed and UL tested for object impacts including hail; photovoltaic modules withstand a minimum of one inch hail falling at 50 mpg. More anecdotally about photovoltaic modules durability, a hail storm in 2018 with 3 inch hail that collapsed the Colorado Mills Mall in Golden, Colorado, only broke one module out of over 10,000 panels at the adjacent National Renewable Energy Laboratory site. Therefore, with proper design, a photovoltaic system can have a long life even in a hail prone location.

WIND

High winds are a design consideration for resiliency for the Terminal Remodel and Expansion. Based on the Rapid City Climatic and Geographic Design Criteria which accounts for storms and wind events, the building shall at a minimum be designed to an ultimate wind speed velocity is 115 mpg. The speed and direction of wind in the typical meteorological year is shown below with the strongest winds in the winter months originating from the North. The typical wind pattern will be used to inform features such as a new outdoor patio in the concourse.



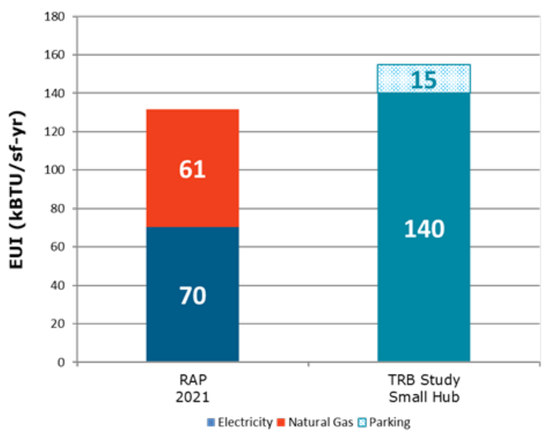
HIGH PERFORMANCE DESIGN AND OPERATION

NARRATIVE

ENERGY PERFORMANCE

The current annual energy use (also called Energy Use Intensity, EUI, with units of kBtu/sf) and cost for the terminal building and jetways from 2021 is approximately 130 kBtu/sf and $160,000/yr or $2.40/sf based on utility data provided by the airport. While airports can be difficult to benchmark, current energy use is compared to the 2016 Airport Cooperative Research Program Transportation Research Board airport benchmarking for small hub airports below at 140 kBtu/sf, excluding parking. This shows that the Rapid City Regional Airport is performing similarly to peer airports.

TERMINAL BUILDING ENERGY USE INTENSITY

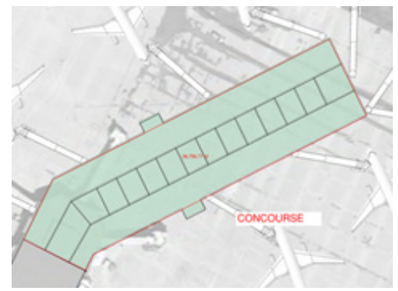


A goal identified at the June 2, 2022 Workshop 2 is for energy use and energy cost on a per square foot basis after the terminal remodel and expansion to be no higher than or reduced from the current energy use and cost, even with increased numbers of flights and passengers. With planned improvements including building envelope, central plant, HVAC and controls, design for daylight, and daylight controls, an initial target for the performance after the terminal remodel and expansion is 100 kBtu/sf or a 20% reduction in the energy use of the overall building. If renewable energy is incorporated at the airport, the energy use could be reduced further.

ENERGY PERFORMANCE

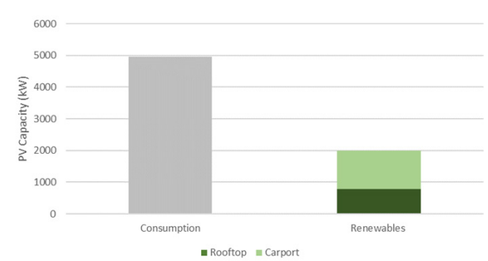
A conceptual phase renewable energy assessment was performed to identify the potential capacity and production of a photovoltaic (PV) system on the new roofs of the concourse, offices, and security checkpoint, the existing roof of ticketing, and new carports at the car rental area as shown below.

The potential PV array size is estimated to be 770 kW for rooftop arrays and 1200 kW for the car rental area which could offset 40% of the anticipated energy use of the terminal remodel and expansion.



PV CAPACITY FOR ANNUAL ENERGY CONSUMED VS POTENTIAL ENERGY GENERATED

At a minimum, the portions of the project with new construction and roof updates will be designed to be solar ready. Additional design and feasibility studies for photovoltaic systems will be done during subsequent design phases including the FAA glare study per the FAA Technical Guidance for Evaluating Selected Solar Technologies on Airports.



COMMISSIONING

Commissioning is a quality assurance process which improves the delivery of building projects to a client. Commissioning for HVAC, lighting, domestic hot water, controls, and renewable energy systems and is a prerequisite for LEED Certification. LEED recognizes building enclosure commissioning as a credit. Additionally, commissioning can be performed for other building systems where third-party quality assurance is desired. Commissioning for the Terminal Remodel and Expansion Project will be provided by Mead & Hunt.

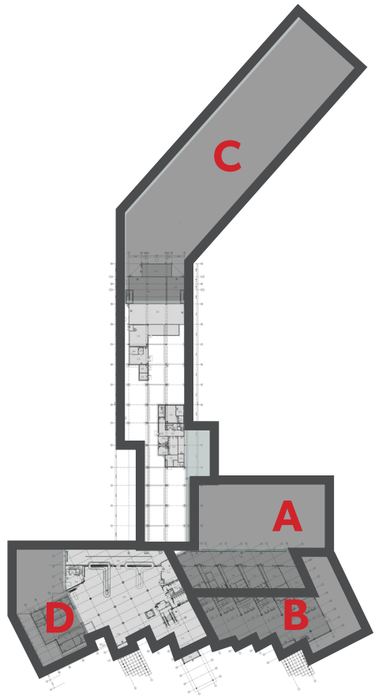
Stakeholders for the ownership team often include occupants and operators in the commissioning process from early design. This is to ensure that the systems included in the commissioning process are designed, installed, and operate according to the Owner's Project Requirements. This can include considerations such as desired light levels and controls, mechanical equipment access for maintenance and indoor air quality.

The commissioning process ensures that systems are ready for turn-over to the owner. Each system is rigorously tested in all modes of operation. Issues are tracked through to resolution so that the owner receives a complete, functioning building. Documentation is also provided with operations manuals delivered to the building operators so they have all the tools needed to effectively maintain and operate their buildings.

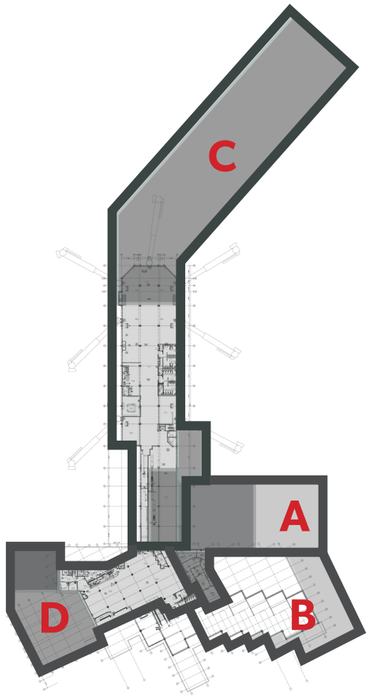
The commissioning process can also be extended through occupancy with continuous or periodic trend analysis for fault detection and diagnosis and energy optimization, also known as monitoring-based commissioning. This will assess the building operation under occupant load and generate energy savings recommendations to keep the building optimized with high levels of occupant comfort. A recent Lawrence Berkley National Laboratory study concluded that period trend analysis results in energy savings of 3%-10% with a median of 6% and an average simple payback of 2.2 years.

COST ESTIMATE

SUMMARY



MAIN LEVEL PLAN



CONCOURSE LEVEL PLAN

A concept level estimate has been prepared for the project.

A: BAGGAGE SCREENING / TSA SECURITY CHECKPOINT

$48,453,799

B: TICKETING RENOVATION / EXPANSION

$10,538,745

C: CONCOURSE RENOVATION / EXPANSION

$77,364,693

D: CAR RENTAL / BAGGAGE CLAIM / OFFICES

$33,014,220

TOTAL ESTIMATED PROJECT COST

$169,371,458

At the conceptual level, the estimate includes significant cost multipliers to account for the uncertainties of the project given the early stage of design. The expectation is these multipliers will decrease in value as more information becomes available to establish actual quantities for the various building systems.

While the draft estimate is included as part of the report, the design team will continue to review the estimate to ensure that the estimator has interpreted the design intent correctly and adjustments will be made accordingly.

Items to note:

1. 1) A 20% contingency for design is included in the estimate. This value will decrease throughout the course of design.
2. 2) There is an additional 15% contingency for inflation.
3. 3) Construction durations will be reviewed and discussed over the course of the design. Given current economic conditions, escalation is a critical factor that needs to be considered.
4. 4) The contractors fee of 5% will be reviewed and discussed with the estimator.
5. 5) Passenger boarding bridges (new and renovated) are included as part of the Concourse cost.

The list above is not all inclusion, but represents initial comments.

The full estimate is included in the Appendix of the report.

The project documents will be organized in construction packages to provide flexibility to the Rapid City Airport in determining which portions of the project to move forward with based on available funding.

The parts of the project identified in the task order include the ticketing area/checked baggage area, the TSA checkpoint, the concourse renovation/expansion, and the baggage claim/rental car area.

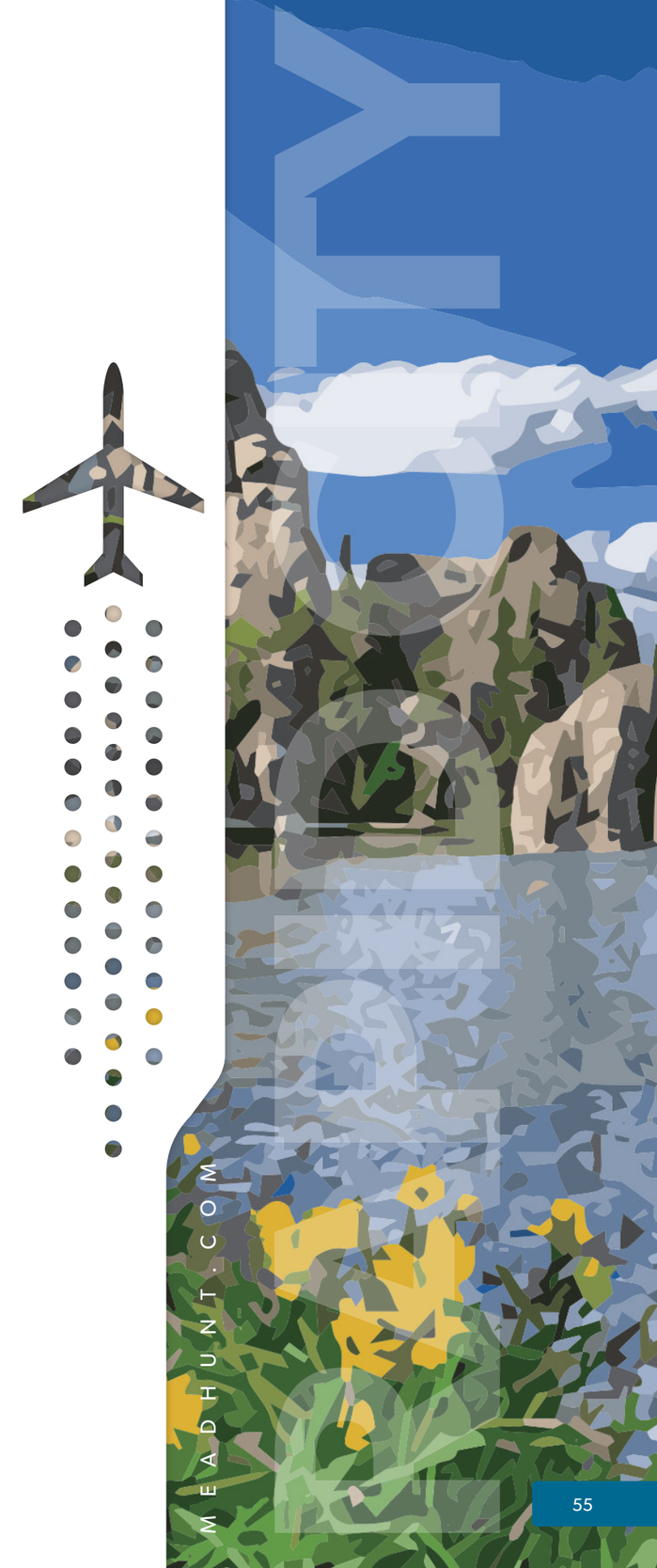
Within each of the parts of the project, there are opportunities to defer equipment, materials, and finishes to provide additional flexibility for cost control.

Examples of cost savings measures include:

1. Defer purchase of passenger boarding bridge(s) until passenger enplanements warrant the need for additional gates and passenger boarding bridges.
2. Defer the purchase and construction of a full in-line baggage handling system until passenger enplanements warrant the additional equipment to meet demand.
3. In conjunction with Item 2, build temporary partitions in the checked baggage area, to reduce MEP system demands. The space allocated for future baggage handling can be used for storage in the near term.
4. Defer the purchase of the additional baggage carousel in baggage claim.
5. Defer a portion of the construction of the ATO's.
6. In the short term, use space allocated for future TSA checkpoint lanes for administration space.

As the project moves forward, other potential cost savings and deferment items will be noted.

APPENDIX



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Rapid City Regional Airport

Terminal Expansion & Renovation

4550 Terminal Rd.
Rapid City, SD 57703

Conceptual Estimate

July 7, 2022
DRAFT

Project: 2021A281

Prepared For:
Mead & Hunt
2440 Deming Way
Middleton, WI 53562

NOTES REGARDING PREPARATION OF ESTIMATE

This estimate was prepared based on the following documents provided by Mead & Hunt:

1. Concept Design Pricing Package received June 15, 2022.
2. CBIS ROM estiamte received June 22, 2022.
3. RAP Preliminary Cost Estimate received June 29, 2022.
4. Information regarding the project was also obtained via meetings, phone conversations, and email messages that clarified the project scope.

BIDDING PROCESS - MARKET CONDITIONS

This document is based on the measurement and pricing of quantities wherever information is provided and/or reasonable assumptions for other work not covered in the drawings or specifications, as stated within this document. Unit rates have been generated from current material/labor rates, historical production data, and discussions with relevant subcontractors and material suppliers. The unit rates reflect current bid costs in the area. All unit rates relevant to subcontractor work include the subcontractors overhead and profit unless otherwise stated.

Pricing reflects probable construction costs obtainable in the Rapid City, South Dakota area on the bid date. This estimate is a determination of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all subcontractors with a minimum of 3 bidders for all items of subcontracted work and a with a minimum of 3 bidders for a general contractor. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.

Since The Concord Group has no control over the cost of labor, material, equipment, or over the contractor's method of determining prices, or over the competitive bidding or market conditions at the time of bid, this statement of probable construction cost is based on industry practice, professional experience and qualifications, and represents The Concord Group's best judgment as professional construction cost consultants familiar with the construction industry. However, The Concord Group cannot and does not guarantee that the proposals, bids, or the construction cost will not vary from opinions of probable cost prepared by them.

CURRENT MARKET CONDITIONS

It should be noted that there is ongoing volatility in the construction materials market due to the effects of the pandemic on both the production and supply of materials. Due to the lack of in stock materials suppliers are struggling to fulfill orders in a timely manner, which in turn leads to much longer than normal lead times. The impact of ongoing global raw material shortages and fuel price increases adds to the overall spike in material pricing coupled with the increased demand for construction that the construction industry is now seeing. These factors should be considered when determining the bidding strategy and schedule for projects.

ASSUMED CONSTRUCTION PARAMETERS

The pricing is based on the following project parameters:

1. A construction notice to proceed date of August, 2023.
2. A construction duration of 36-42 months.
3. The contract will be competitively bid to multiple contractors.
4. All contractors will be required to pay prevailing wages.
5. There are phasing requirements.
6. The contractors will have full access to the site during normal working hours
7. Estimate detail includes pricing as of July 2022.

EXCLUSIONS
The following are excluded from the cost of this estimate:

1. Professional Design Fees
2. Testing Fees
3. Owner Contingencies/Scope Changes
4. Construction Contingency
5. Premium Time / Restrictions on Contractor Working Hours
6. Cost Escalation Beyond a Construction Mid-Point Date of May 2025
7. Finance and Legal Charges
8. Environmental Abatement Costs
9. Temporary Owner Facilities
10. Moisture Mitigation
11. Exterior Wall Replacement/Repairs at Existing Building
12. Equipment (Owner Furnished/Installed)
13. TSA Equipment
14. Artwork
15. Third Party Commissioning
16. Non-fixed Audio/Visual Equipment & Wiring
17. Telephone / Data Equipment
18. Contaminated Soil Removal
19. Structurally Unsuitable Soil Removal
20. Future Cost Impacts Based on Supply Chain Impacts

COST SUMMARY	GFA SF	$/SF	BUILDING TOTAL
BAGGAGE SCREENING/TSA SECURUTY CHECKPOINT	51,309	$944.35	$48,453,799
TICKETING RENOVATION/EXPANSION	19,269	$546.93	$10,538,745
CONCOURSE RENOVATION/EXPANSION	91,354	$846.87	$77,364,693
CAR RENTAL/BAGGAGE CLAIM/AIRPORT OFFICES	56,014	$589.39	$33,014,220
TOTAL ESTIMATED CONSTRUCTION COSTS	**217,946**	**$777.13**	**$169,371,458**

ALTERNATES INCLUDING MARKUPS

Alternate #1: Electrical Option 2 ILO Option 1	**DEDUCT**	($318,611)

CONCORD GROUP

Rapid City Regional Airport
Terminal Expansion & Renovation

Conceptual Estimate
07/07/2022
DRAFT

	BAGGAGE SCREENING/TSA SECURUTY CHECKPOINT	51,309 GSF	$/SF	BUILDING TOTAL
A	SUBSTRUCTURE			
A100	FOUNDATIONS		$16.00	$820,897
A200	BASEMENTS		$0.00	$0
B	SHELL			
B100	SUPERSTRUCTURE		$43.48	$2,230,768
B200	EXTERIOR ENCLOSURE		$31.70	$1,626,342
B300	ROOFING		$13.35	$685,025
C	INTERIORS			
C100	INTERIOR CONSTRUCTION		$35.94	$1,843,798
C200	STAIRS		$0.00	$0
C300	INTERIOR FINISHES		$27.31	$1,401,280
D	SERVICES			
D100	CONVEYING		$209.03	$10,725,000
D200	PLUMBING		$2.34	$120,287
D300	HVAC		$97.46	$5,000,577
D400	FIRE PROTECTION		$5.30	$272,005
D500	ELECTRICAL		$82.68	$4,242,041
E	EQUIPMENT & FURNISHINGS			
E100	EQUIPMENT		$0.00	$0
E200	FURNISHINGS		$6.00	$307,854
F	SPECIAL CONSTRUCTION & DEMOLITION			
F100	SPECIAL CONSTRUCTION		$0.00	$0
F200	SELECTIVE BUILDING DEMOLITION		$3.92	$200,950
G	SITEWORK			
G100	SITE PREPARATION		$3.14	$161,357
G200	SITE IMPROVEMENTS		$6.77	$347,348
G300	CIVIL & MECHANICAL UTILITIES		$0.00	$0
G400	SITE ELECTRICAL UTILITIES		$9.16	$470,000
G900	OTHER SITE CONSTRUCTION		$0.00	$0
Z100	GENERAL REQUIREMENTS		$0.00	$0
	SUBTOTAL		**$593.57**	**$30,455,528**
Z201	DESIGN CONTINGENCY	20.0%	$118.71	$6,091,106
Z100	GENERAL CONDITIONS/BOND/INSURANCE	9.75%	$69.45	$3,563,297
Z106	CONTRACTOR'S FEES	5.0%	$39.09	$2,005,497
Z202	ESCALATION TO MID-POINT OF CONSTRUCTION	15.1%	$123.53	$6,338,372
	TOTAL ESTIMATED CONSTRUCTION COSTS		**$944.35**	**$48,453,799**

ALTERNATES INCLUDING MARKUPS

Alternate #1: Electrical Option 2 ILO Option 1	**DEDUCT**	($72,379)

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Rapid City Regional Airport
Terminal Expansion & Renovation

Conceptual Estimate
07/07/2022
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	TICKETING RENOVATION/EXPANSION	19,269 GSF	$/SF	BUILDING TOTAL
A	SUBSTRUCTURE			
A100	FOUNDATIONS		$12.82	$247,117
A200	BASEMENTS		$0.00	$0
B	SHELL			
B100	SUPERSTRUCTURE		$11.61	$223,628
B200	EXTERIOR ENCLOSURE		$18.84	$363,090
B300	ROOFING		$9.77	$188,239
C	INTERIORS			
C100	INTERIOR CONSTRUCTION		$58.20	$1,121,389
C200	STAIRS		$0.00	$0
C300	INTERIOR FINISHES		$63.42	$1,222,000
D	SERVICES			
D100	CONVEYING		$0.00	$0
D200	PLUMBING		$4.55	$87,695
D300	HVAC		$66.22	$1,275,938
D400	FIRE PROTECTION		$4.63	$89,304
D500	ELECTRICAL		$68.12	$1,312,546
E	EQUIPMENT & FURNISHINGS			
E100	EQUIPMENT		$0.00	$0
E200	FURNISHINGS		$6.00	$115,614
F	SPECIAL CONSTRUCTION & DEMOLITION			
F100	SPECIAL CONSTRUCTION		$0.00	$0
F200	SELECTIVE BUILDING DEMOLITION		$8.43	$162,425
G	SITEWORK			
G100	SITE PREPARATION		$1.61	$30,991
G200	SITE IMPROVEMENTS		$9.56	$184,130
G300	CIVIL & MECHANICAL UTILITIES		$0.00	$0
G400	SITE ELECTRICAL UTILITIES		$0.00	$0
G900	OTHER SITE CONSTRUCTION		$0.00	$0
Z100	GENERAL REQUIREMENTS		$0.00	$0
	SUBTOTAL		**$343.77**	**$6,624,105**
Z201	DESIGN CONTINGENCY	20.0%	$68.75	$1,324,821
Z100	GENERAL CONDITIONS/BOND/INSURANCE	9.75%	$40.22	$775,020
Z106	CONTRACTOR'S FEES	5.0%	$22.64	$436,197
Z202	ESCALATION TO MID-POINT OF CONSTRUCTION	15.1%	$71.55	$1,378,602
	TOTAL ESTIMATED CONSTRUCTION COSTS		**$546.93**	**$10,538,745**

ALTERNATES INCLUDING MARKUPS

Alternate #1: Electrical Option 2 ILO Option 1	**ADD**	$0

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Terminal Expansion & Renovation

Conceptual Estimate
07/07/2022
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	CONCOURSE RENOVATION/EXPANSION	91,354 GSF	$/SF	BUILDING TOTAL
A	SUBSTRUCTURE			
A100	FOUNDATIONS		$13.59	$1,241,829
A200	BASEMENTS		$0.00	$0
B	SHELL			
B100	SUPERSTRUCTURE		$54.93	$5,018,146
B200	EXTERIOR ENCLOSURE		$95.80	$8,751,304
B300	ROOFING		$11.23	$1,026,338
C	INTERIORS			
C100	INTERIOR CONSTRUCTION		$47.31	$4,321,671
C200	STAIRS		$0.36	$33,269
C300	INTERIOR FINISHES		$38.41	$3,509,175
D	SERVICES			
D100	CONVEYING		$3.28	$300,000
D200	PLUMBING		$5.30	$483,933
D300	HVAC		$36.87	$3,368,455
D400	FIRE PROTECTION		$5.20	$475,440
D500	ELECTRICAL		$75.71	$6,916,092
E	EQUIPMENT & FURNISHINGS			
E100	EQUIPMENT		$0.00	$0
E200	FURNISHINGS		$10.00	$913,540
F	SPECIAL CONSTRUCTION & DEMOLITION			
F100	SPECIAL CONSTRUCTION		$68.97	$6,300,375
F200	SELECTIVE BUILDING DEMOLITION		$8.98	$820,128
G	SITEWORK			
G100	SITE PREPARATION		$5.73	$523,561
G200	SITE IMPROVEMENTS		$34.70	$3,170,209
G300	CIVIL & MECHANICAL UTILITIES		$15.37	$1,403,943
G400	SITE ELECTRICAL UTILITIES		$0.55	$50,000
G900	OTHER SITE CONSTRUCTION		$0.00	$0
Z100	GENERAL REQUIREMENTS		$0.00	$0
	SUBTOTAL		**$532.30**	**$48,627,407**
Z201	DESIGN CONTINGENCY	20.0%	$106.46	$9,725,481
Z100	GENERAL CONDITIONS/BOND/INSURANCE	9.75%	$62.28	$5,689,407
Z106	CONTRACTOR'S FEES	5.0%	$35.05	$3,202,115
Z202	ESCALATION TO MID-POINT OF CONSTRUCTION	15.1%	$110.78	$10,120,284
	TOTAL ESTIMATED CONSTRUCTION COSTS		**$846.87**	**$77,364,693**

ALTERNATES INCLUDING MARKUPS

Alternate #1: Electrical Option 2 ILO Option 1	**DEDUCT**	($100,722)

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Rapid City Regional Airport
Terminal Expansion & Renovation

Conceptual Estimate
07/07/2022
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	CAR RENTAL/BAGGAGE CLAIM/AIRPORT OFFICES	56,014 GSF	$/SF	BUILDING TOTAL
A	SUBSTRUCTURE			
A100	FOUNDATIONS		$10.66	$596,957
A200	BASEMENTS		$0.00	$0
B	SHELL			
B100	SUPERSTRUCTURE		$17.98	$1,007,371
B200	EXTERIOR ENCLOSURE		$26.62	$1,491,066
B300	ROOFING		$6.56	$367,273
C	INTERIORS			
C100	INTERIOR CONSTRUCTION		$49.41	$2,767,496
C200	STAIRS		$0.00	$0
C300	INTERIOR FINISHES		$47.84	$2,679,950
D	SERVICES			
D100	CONVEYING		$71.41	$4,000,000
D200	PLUMBING		$1.57	$87,695
D300	HVAC		$41.76	$2,338,940
D400	FIRE PROTECTION		$4.74	$265,510
D500	ELECTRICAL		$65.54	$3,670,964
E	EQUIPMENT & FURNISHINGS			
E100	EQUIPMENT		$0.00	$0
E200	FURNISHINGS		$10.00	$560,140
F	SPECIAL CONSTRUCTION & DEMOLITION			
F100	SPECIAL CONSTRUCTION		$0.00	$0
F200	SELECTIVE BUILDING DEMOLITION		$8.54	$478,212
G	SITEWORK			
G100	SITE PREPARATION		$1.82	$102,170
G200	SITE IMPROVEMENTS		$5.13	$287,271
G300	CIVIL & MECHANICAL UTILITIES		$0.00	$0
G400	SITE ELECTRICAL UTILITIES		$0.89	$50,000
G900	OTHER SITE CONSTRUCTION		$0.00	$0
Z100	GENERAL REQUIREMENTS		$0.00	$0
	SUBTOTAL		**$370.46**	**$20,751,015**
Z201	DESIGN CONTINGENCY	20.0%	$74.09	$4,150,203
Z100	GENERAL CONDITIONS/BOND/INSURANCE	9.75%	$43.34	$2,427,869
Z106	CONTRACTOR'S FEES	5.0%	$24.39	$1,366,454
Z202	ESCALATION TO MID-POINT OF CONSTRUCTION	15.1%	$77.10	$4,318,679
	TOTAL ESTIMATED CONSTRUCTION COSTS		**$589.39**	**$33,014,220**

ALTERNATES INCLUDING MARKUPS

Alternate #1: Electrical Option 2 ILO Option 1	**DEDUCT**	($145,510)

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
BASE BID				
(A) BAGGAGE SCREENING/TSA SECURUTY CHECKPOINT				
A100000 FOUNDATIONS				
03100 Concrete Formwork				
Formwork for strip footings	890	SQFT	8.42	7,491
Formwork for isolated column footings	3,610	SQFT	9.58	34,568
Formwork for piers	1,320	SQFT	17.98	23,736
Formwork for foundation walls	3,400	SQFT	9.08	30,885
Subtotal: Concrete Formwork				**$96,680**
03200 Concrete Reinforcement				
Reinforcement in strip footings, avg 65 lbs/cy	2	TONS	3,008.14	6,016
Reinforcement in isolated column footings, avg 80 lbs/cy	17	TONS	3,008.14	51,138
Reinforcement in piers, avg 200lbs/cy	3	TONS	3,544.19	10,633
Reinforcement in foundation walls, avg 115 lbs/cy	6	TONS	3,186.83	19,121
Subtotal: Concrete Reinforcement				**$86,908**
03300 Cast in Place Concrete				
Concrete in strip footings	50	CUYD	193.61	9,680
Concrete in isolated column footings	370	CUYD	200.80	74,297
Concrete in piers	25	CUYD	228.33	5,708
Concrete in foundation walls	100	CUYD	198.63	19,863
Concrete slab on grade, 6" thk	26,950	SQFT	6.10	164,268
Aggreagte base at concrete slab on grade	500	CUYD	55.18	27,592
Vapor barrier at slab	26,950	SQFT	0.95	25,624
Subtotal: Cast in Place Concrete				**$327,033**
07200 Thermal Insulation				
Foundation insulation	2,700	SQFT	3.73	10,069
Subtotal: Thermal Insulation				**$10,069**
31300 Foundation Excavation & Fill				
Excavate for foundations	3,775	CUYD	12.83	48,442
Backfill with imported fill	3,230	CUYD	45.00	145,355
Haul off excavated material as CCDD	3,775	CUYD	28.19	106,411
Subtotal: Foundation Excavation & Fill				**$300,208**
TOTAL: FOUNDATIONS				**$820,897**
B100000 SUPERSTRUCTURE				
03400 Cementitious Decks				
NLWT Concrete on metal deck, 3" thk	11,290	SQFT	6.09	68,775
Subtotal: Cementitious Decks				**$68,775**
05100 Structural Steel				
Structural steel beams & columns, floor, assumes 15 lbs/sf	93	TONS	6,892.70	641,021
Structural steel beams & columns, roof, assumes 10 lbs/sf	162	TONS	6,892.70	1,116,618
Shear studs	2,825	EACH	5.60	15,817

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Composite metal floor deck, 2" thk, 20 ga	11,290	SQFT	5.97	67,427
Metal roof deck, 1 1/2" thk, 20 ga	29,485	SQFT	5.12	150,931
Subtotal: Structural Steel				**$1,991,814**
07700 Fireproofing & Firestopping				
Fireproof steel floor structure	40,775	SQFT	4.17	170,179
Subtotal: Fireproofing & Firestopping				**$170,179**
TOTAL: SUPERSTRUCTURE				**$2,230,768**
B200000 EXTERIOR ENCLOSURE				
07900 Miscellaneous Thermal & Moisture Protection				
Expansion joint	465	LNFT	109.50	50,918
Exterior facade allowance	12,155	SQFT	129.61	1,575,424
Subtotal: Miscellaneous Thermal & Moisture Protection				**$1,626,342**
TOTAL: EXTERIOR ENCLOSURE				**$1,626,342**
B300000 ROOFING				
07400 Roofing				
Membrane roof system including insulation	29,500	SQFT	18.28	539,266
Flashing & counterflashing	1,005	LNFT	34.66	34,834
Metal coping	670	LNFT	46.49	31,149
Patch existing roof system	3,000	SQFT	26.59	79,777
Subtotal: Roofing				**$685,025**
TOTAL: ROOFING				**$685,025**
C100000 INTERIOR CONSTRUCTION				
05900 Miscellaneous Metals				
Miscellaneous angles, channels, lintels, etc.	51,309	SQFT	2.51	128,909
Subtotal: Miscellaneous Metals				**$128,909**
06200 Rough Carpentry				
Miscellaneous wood blocking & rough carpentry	51,309	SQFT	2.15	110,089
Subtotal: Rough Carpentry				**$110,089**
07800 Caulking & Sealants				
Miscellaneous caulking & sealants	51,309	SQFT	0.59	30,108
Subtotal: Caulking & Sealants				**$30,108**
09800 Interior Construction				
Interior construction - restrooms	1,150	SQFT	65.00	74,750
Interior construction - circulation	5,818	SQFT	40.00	232,720
Interior construction - TSA security checkpoint	8,922	SQFT	50.00	446,100
Interior construction - baggage screening/handling loading space	35,693	SQFT	10.00	356,930
Subtotal: Interior Construction				**$1,110,500**
10200 Signage				
Signage allowance	51,309	SQFT	9.05	464,193
Subtotal: Signage				**$464,193**
TOTAL: INTERIOR CONSTRUCTION				**$1,843,798**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
C300000 INTERIOR FINISHES				
09900 Miscellaneous Finishes				
Interior finishes - restrooms	1,150	SQFT	75.00	86,250
Interior finishes - circulation	5,818	SQFT	65.00	378,170
Interior finishes - TSA security checkpoint	8,922	SQFT	65.00	579,930
Interior finishes - baggage screening/handling loading space	35,693	SQFT	10.00	356,930
Subtotal: Miscellaneous Finishes				**$1,401,280**
TOTAL: INTERIOR FINISHES				**$1,401,280**
D100000 CONVEYING				
14900 Special Conveying Equipment				
Outbound baggage CBIS system per Logplan	1	LSUM	10,725,000.00	10,725,000
Subtotal: Special Conveying Equipment				**$10,725,000**
TOTAL: CONVEYING				**$10,725,000**
D200000 PLUMBING				
22400 Domestic Water, Waste & Vent, & Storm Drainage Piping				
Reroute existing domestic HW piping to provide HW flow to existing fixtures - allowance	2,000	LNFT	39.37	78,749
Pipe and valve tagging	2,000	LNFT	1.05	2,101
System pressure testing, water pipe chlorination, and pipe flushing - domestic plumbing	1	LSUM	6,844.50	6,845
Subtotal: Domestic Water, Waste & Vent, & Storm Drainage Piping				**$87,695**
23100 Selective Demolition				
Remove/demo existing CHW, cooling tower piping - allowance	1,000	LNFT	32.59	32,593
Subtotal: Selective Demolition				**$32,593**
TOTAL: PLUMBING				**$120,287**
D300000 HVAC				
23100 Selective Demolition				
Disconnect and remove water-cooled chillers; salvage for relocation	1	EACH	11,084.00	11,084
Disconnect and remove cooling towers; salvage for relocation	1	EACH	14,126.00	14,126
Disconnect and remove existing CHW pump	1	EACH	1,521.00	1,521
Disconnect and remove existing CT pump	1	EACH	1,901.25	1,901
Disconnect and remove air separator	2	EACH	760.50	1,521
Disconnect and remove expansion tank	2	EACH	1,085.79	2,172
Subtotal: Selective Demolition				**$32,325**
23200 Ventilation & Exhaust				
Air handling unit, TSA, 12,000 cfm, CHW, HW coils, fans, filters	1	EACH	121,761.20	121,761
Provide new makeup air unit, 10,000 cfm packaged, HW coil, fan, filter	1	EACH	45,840.80	45,841
CHW coil connections, AHU - valves, fittings, specialties, and pipe insulation	1	EACH	9,283.79	9,284
HW coil connections, AHU/MAU - valves, fittings, specialties, and pipe insulation	2	EACH	7,338.50	14,677
Variable air volume terminals w/HW reheat coil (TSA)	8	EACH	1,065.05	8,520
Reheat coil connections, VAV - valves, fittings, and insulation (TSA)	8	EACH	925.31	7,403

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Galvanized steel duct & insulation	38,101	SQFT	14.93	568,848
Registers, grilles and diffusers - allowance	60	EACH	126.51	7,590
Subtotal: Ventilation & Exhaust				**$783,924**
23300 Central Hydronic & Steam Equipment & Specialties				
HW boilers, condensing, 2500 mbh	2	EACH	62,182.75	124,366
CA duct, HW boilers	100	LNFT	34.85	3,485
Boiler flue/breeching	100	LNFT	325.19	32,519
Chiller, water-cooled, 300 tons magnetic bearing	1	EACH	216,084.00	216,084
Relocate and reinstall salvaged chiller	1	EACH	19,126.00	19,126
Cooling tower, 300 tons heat rejection	1	EACH	59,126.00	59,126
Relocate and reinstall salvaged cooling tower	1	EACH	22,168.00	22,168
CHW system pumps, 1500 gpm base-mount	2	EACH	21,281.50	42,563
HW secondary pumps, base-mount	2	EACH	7,640.75	15,282
HW boiler primary pumps, inline	2	EACH	2,880.25	5,761
Variable frequency drive, CHW pumps	2	EACH	4,090.48	8,181
Variable frequency drive, HW pump	2	EACH	2,390.48	4,781
Vibration isolation, pumps	2	EACH	1,690.13	3,380
Isolation valves, pumps, butterfly	4	EACH	1,247.84	4,991
Flexible pump connections	8	EACH	505.13	4,041
Suction diffuser	4	EACH	2,222.84	8,891
Triple duty valve	4	EACH	5,322.84	21,291
Pump strainer, Y-type	4	EACH	1,481.84	5,927
Expansion tank	2	EACH	12,181.50	24,363
Air separator	2	EACH	8,640.75	17,282
Subtotal: Central Hydronic & Steam Equipment & Specialties				**$643,608**
23500 HVAC Piping				
Cooling tower supply/return piping - allowance	6,000	LNFT	226.91	1,361,445
CHWS/R piping, 10" - allowance	6,000	LNFT	226.91	1,361,445
HHWS/R mains - allowance	1,500	LNFT	138.83	208,252
HHWS/R pipe, type L copper pipe, fittings, and supports - runouts	900	LNFT	34.23	30,809
Natural gas piping, std. wgt. blk. steel pipe, fittings, and supports, welded/flanged, 4"	600	LNFT	91.58	54,945
Pipe insulation, CHWS/R, 10" - allowance	6,000	LNFT	29.97	179,816
Pipe insulation, HHWS/R mains - allowance	1,500	LNFT	17.46	26,196
Pipe insulation, HHWS/R - runouts	900	LNFT	8.06	7,254
Pipe and valve tagging - interior bldg HVAC piping	15,000	LNFT	1.10	16,509
Subtotal: HVAC Piping				**$3,246,670**
23600 Temperature Controls				
DDC controls - air handling units	1	EACH	35,000.00	35,000
DDC controls - makeup air units	1	EACH	25,000.00	25,000
DDC controls - VAV terminals w/reheat coil	8	EACH	2,250.00	18,000
DDC controls - HW boilers	2	EACH	2,800.00	5,600
DDC controls - chiller, water-cooled	2	EACH	5,000.00	10,000
DDC controls - cooling towers	2	EACH	5,000.00	10,000

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
DDC controls - hydronic pumps, constant speed	2	EACH	2,800.00	5,600
DDC controls - hydronic pumps, variable speed	4	EACH	6,500.00	26,000
Thermostats/temperature sensors	8	EACH	650.00	5,200
CO sensors	1	EACH	650.00	650
Emergency boiler shutoff switch	2	EACH	1,500.00	3,000
Miscellaneous points & devices	1	LSUM	25,000.00	25,000
Interface with existing building BAS-DDC system	1	LSUM	15,000.00	15,000
Programming, testing, and training	1	LSUM	25,000.00	25,000
Subtotal: Temperature Controls				**$209,050**
23700 Testing, Balancing, & Commissioning				
Air testing and balancing	1	LSUM	30,000.00	30,000
Pipe system testing and balancing	1	LSUM	20,000.00	20,000
HVAC system commissioning	1	LSUM	35,000.00	35,000
Subtotal: Testing, Balancing, & Commissioning				**$85,000**
TOTAL: HVAC				**$5,000,577**
D400000 FIRE PROTECTION				
21200 Fire Sprinkler Equipment & Specialties				
Extend wet sprinkler system to addition	38,101	SQFT	5.65	215,210
Reconfigure existing wet sprinkler system for renovation/buildout	13,208	SQFT	4.30	56,796
Subtotal: Fire Sprinkler Equipment & Specialties				**$272,005**
TOTAL: FIRE PROTECTION				**$272,005**
D500000 ELECTRICAL				
26100 Selective Demolition				
Disconnect and remove existing service and switchboard	1	LSUM	30,000.00	30,000
Disconnect and remove obsolete switchboards, transformers, panels and associated feeder	1	LSUM	52,171.61	52,172
Selective demolition and removal of light fixtures, devices and associated branch wiring	13,208	SQFT	0.90	11,874
Subtotal: Selective Demolition				**$94,046**
26200 Main Power Distribution				
Electrical and LV provisions for the new emergency power electrical room	1	EACH	10,000.00	10,000
Electrical and LV provisions for the new normal power electrical room	1	EACH	10,000.00	10,000
New unit substation	1	EACH	260,968.94	260,969
Service and distribution - Main switchboard, distribution panels, transformers, panelboards and associated feeders	51,309	SQFT	6.62	339,414
New digital metering system	1	LSUM	26,714.95	26,715
Emergency Service and distribution - Main distribution panels, ATS, panelboards and associated feeders	51,309	SQFT	2.34	120,227
New centralized lithium-ion based Uninterruptable Power Supply	1	EACH	125,000.00	125,000
Temporary power	1	EACH	50,000.00	50,000
Subtotal: Main Power Distribution				**$942,325**
26400 Grounding & Lightning Protection System				
Grounding System per code	1	LSUM	22,984.51	22,985

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Lightning protection system per code	1	LSUM	67,960.64	67,961
Subtotal: Grounding & Lightning Protection System				**$90,945**
26500 Lighting				
Lighting System - Light fixtures including installation and hook up	51,309	SQFT	12.87	660,183
Lighting System - Exterior light fixtures	1	LSUM	12,195.68	12,196
Lighting controls, dimming, occupancy sensors and low-voltage programmable lighting control system	51,309	SQFT	3.24	166,113
Lighting System - Branch wiring installation 600 V, including 3/4" EMT conduit and THWN wire, 20A	51,309	SQFT	4.38	224,728
Subtotal: Lighting				**$1,063,219**
26600 Branch Power Distribution & Devices				
Branch Power - Miscellaneous receptacles and electrical equipment hook up	51,309	SQFT	1.06	54,536
Branch Power - Branch wiring installation 600 V, including 3/4" EMT conduit and THWN wire, 20A	51,309	SQFT	7.18	368,214
Subtotal: Branch Power Distribution & Devices				**$422,750**
26700 Mechanical Equipment Connections & Feeders				
Motors connection, disconnect switches and associated feeders - HW system pump	2	EACH	2,200.00	4,400
Motors connection, disconnect switches and associated feeders - Makeup air units, 10,000 cfm	1	EACH	4,000.00	4,000
Motors connection, disconnect switches and associated feeders - HW boilers, condensing, 2500 mbh	2	EACH	1,600.00	3,200
Motors connection, disconnect switches and associated feeders - Cooling tower, 300 tons	1	EACH	4,000.00	4,000
Motors connection, disconnect switches and associated feeders - CHW system pumps, 1500 gpm	2	EACH	2,200.00	4,400
Motors connection, disconnect switches and associated feeders - baggage conveyor system	1	EACH	25,000.00	25,000
Motors connection, disconnect switches and associated feeders - Chiller, water-cooled, 300 tons	1	EACH	6,500.00	6,500
Subtotal: Mechanical Equipment Connections & Feeders				**$51,500**
27200 Tele/Data Systems				
Update current MTR up to current ANSI/TIA standards	1	EACH	75,000.00	75,000
New TR	1	EACH	50,000.00	50,000
Telecommunication/Data & Television System, complete upgrade	51,309	SQFT	13.09	671,794
Cellular Distributed Antenna System	51,309	SQFT	1.51	77,261
Subtotal: Tele/Data Systems				**$874,055**
27300 Intercom & Public Address Systems				
Public Address System, complete	51,309	SQFT	3.72	190,618
Subtotal: Intercom & Public Address Systems				**$190,618**
27600 Audio/Visual & Television System				
Audio/visual System, rough-in only	51,309	SQFT	0.71	36,527
Common Use Passenger Processing System rough-in only	51,309	SQFT	0.80	41,170
Subtotal: Audio/Visual & Television System				**$77,697**
28200 Fire Alarm Systems				

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Fire alarm System, complete replacement	51,309	SQFT	2.85	146,087
Subtotal: Fire Alarm Systems				**$146,087**
28400 CCTV System				
CCTV System, complete replacement	51,309	SQFT	5.63	288,798
Subtotal: CCTV System				**$288,798**
TOTAL: ELECTRICAL				**$4,242,041**
E200000 FURNISHINGS				
12900 Miscellaneous Furnishings				
Furniture allowance	51,309	SQFT	6.00	307,854
Subtotal: Miscellaneous Furnishings				**$307,854**
TOTAL: FURNISHINGS				**$307,854**
F200000 SELECTIVE DEMOLITION				
02100 Selective Demolition				
Demolish exterior wall & back up	4,880	SQFT	14.23	69,419
Selective interior demolition	13,208	SQFT	9.96	131,531
Subtotal: Selective Demolition				**$200,950**
TOTAL: SELECTIVE DEMOLITION				**$200,950**
G100000 SITE PREPARATION				
31200 Site Grading				
Site grading incl rough & fine grading	42,100	SQFT	0.36	15,287
Excavate for pavement/sitework	1,115	CUYD	8.82	9,837
Haul off excavated material as CCDD	1,115	CUYD	28.19	31,430
Subtotal: Site Grading				**$56,553**
31800 Site Demolition				
Site demolition	42,100	SQFT	2.49	104,804
Subtotal: Site Demolition				**$104,804**
TOTAL: SITE PREPARATION				**$161,357**
G200000 SITE IMPROVEMENTS				
32100 Pavement				
Aggregate base	1,115	CUYD	61.78	68,889
Pavement striping	1	LSUM	20,000.00	20,000
Concrete pavement, 15" thk	15,100	SQFT	13.81	208,459
Subtotal: Pavement				**$297,348**
32600 Landscaping				
Landcape allowance	1	LSUM	50,000.00	50,000
Subtotal: Landscaping				**$50,000**
TOTAL: SITE IMPROVEMENTS				**$347,348**
G400000 SITE ELECTRICAL UTILITIES				
33800 Site Electrical				

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Disconnect and remove the existing obsolete electrical service transformer, generator, and load bank	1	LSUM	70,000.00	70,000
Relocate the existing electrical service infrastructures	1	LSUM	100,000.00	100,000
New diesel generator (assumed 600kW) and associated feeder	1	LSUM	250,000.00	250,000
New MV service provisions and coordination with utility company	1	EACH	50,000.00	50,000
Subtotal: Site Electrical				**$470,000**
TOTAL: SITE ELECTRICAL UTILITIES				**$470,000**
TOTAL: (A) BAGGAGE SCREENING/TSA SECURUTY CHECKPOINT				**$30,455,528**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
(B) TICKETING RENOVATION/EXPANSION				
A100000 FOUNDATIONS				
03100 Concrete Formwork				
Formwork for strip footings	370	SQFT	8.42	3,114
Formwork for isolated column footings	1,100	SQFT	9.58	10,533
Formwork for piers	390	SQFT	17.98	7,013
Formwork for foundation walls	2,260	SQFT	9.08	20,529
Subtotal: Concrete Formwork				**$41,190**
03200 Concrete Reinforcement				
Reinforcement in strip footings, avg 65 lbs/cy	1	TONS	3,008.14	3,008
Reinforcement in isolated column footings, avg 80 lbs/cy	5	TONS	3,008.14	15,041
Reinforcement in piers, avg 200lbs/cy	1	TONS	3,544.19	3,544
Reinforcement in foundation walls, avg 115 lbs/cy	3	TONS	3,186.83	9,560
Subtotal: Concrete Reinforcement				**$31,154**
03300 Cast in Place Concrete				
Concrete in strip footings	20	CUYD	193.61	3,872
Concrete in isolated column footings	110	CUYD	200.80	22,088
Concrete in piers	7	CUYD	228.33	1,598
Concrete in foundation walls	45	CUYD	198.63	8,938
Concrete slab on grade, 6" thk	4,660	SQFT	6.10	28,404
Aggreagte base at concrete slab on grade	385	CUYD	55.18	21,245
Vapor barrier at slab	4,660	SQFT	0.95	4,431
Subtotal: Cast in Place Concrete				**$90,577**
07200 Thermal Insulation				
Foundation insulation	1,130	SQFT	3.73	4,214
Subtotal: Thermal Insulation				**$4,214**
31300 Foundation Excavation & Fill				
Excavate for foundations	1,025	CUYD	12.83	13,153
Backfill with imported fill	843	CUYD	45.00	37,936
Haul off excavated material as CCDD	1,025	CUYD	28.19	28,893
Subtotal: Foundation Excavation & Fill				**$79,982**
TOTAL: FOUNDATIONS				**$247,117**
B100000 SUPERSTRUCTURE				
05100 Structural Steel				
Structural steel beams & columns, floor, assumes 15 lbs/sf	26	TONS	6,892.70	179,210
Metal roof deck, 1 1/2" thk, 20 ga	4,780	SQFT	5.12	24,468
Subtotal: Structural Steel				**$203,679**
07700 Fireproofing & Firestopping				
Fireproof steel floor structure	4,780	SQFT	4.17	19,950
Subtotal: Fireproofing & Firestopping				**$19,950**
TOTAL: SUPERSTRUCTURE				**$223,628**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
B200000 EXTERIOR ENCLOSURE				
07900 Miscellaneous Thermal & Moisture Protection				
Expansion joint	120	LNFT	109.50	13,140
Exterior facade allowance	2,700	SQFT	129.61	349,950
Subtotal: Miscellaneous Thermal & Moisture Protection				**$363,090**
TOTAL: EXTERIOR ENCLOSURE				**$363,090**
B300000 ROOFING				
07400 Roofing				
Membrane roof system including insulation	4,780	SQFT	18.28	87,379
Flashing & counterflashing	340	LNFT	34.66	11,785
Metal coping	200	LNFT	46.49	9,298
Patch existing roof system	3,000	SQFT	26.59	79,777
Subtotal: Roofing				**$188,239**
TOTAL: ROOFING				**$188,239**
C100000 INTERIOR CONSTRUCTION				
05900 Miscellaneous Metals				
Miscellaneous angles, channels, lintels, etc.	19,269	SQFT	2.51	48,411
Subtotal: Miscellaneous Metals				**$48,411**
06200 Rough Carpentry				
Miscellaneous wood blocking & rough carpentry	19,269	SQFT	2.15	41,344
Subtotal: Rough Carpentry				**$41,344**
07800 Caulking & Sealants				
Miscellaneous caulking & sealants	19,269	SQFT	0.59	11,307
Subtotal: Caulking & Sealants				**$11,307**
09800 Interior Construction				
Interior construction - ticketing	10,353	SQFT	45.00	465,885
Interior construction - circulation/lobby	8,447	SQFT	45.00	380,115
Subtotal: Interior Construction				**$846,000**
10200 Signage				
Signage allowance	19,269	SQFT	9.05	174,327
Subtotal: Signage				**$174,327**
TOTAL: INTERIOR CONSTRUCTION				**$1,121,389**
C300000 INTERIOR FINISHES				
09900 Miscellaneous Finishes				
Interior finishes - ticketing	10,353	SQFT	65.00	672,945
Interior finishes - circulation/lobby	8,447	SQFT	65.00	549,055
Subtotal: Miscellaneous Finishes				**$1,222,000**
TOTAL: INTERIOR FINISHES				**$1,222,000**
D200000 PLUMBING				
22400 Domestic Water, Waste & Vent, & Storm Drainage Piping				

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Reroute existing domestic HW piping to provide HW flow to existing fixtures - allowance	2,000	LNFT	39.37	78,749
Pipe and valve tagging	2,000	LNFT	1.05	2,101
System pressure testing, water pipe chlorination, and pipe flushing - domestic plumbing	1	LSUM	6,844.50	6,845
Subtotal: Domestic Water, Waste & Vent, & Storm Drainage Piping				**$87,695**
TOTAL: PLUMBING				**$87,695**
D300000 HVAC				
23100 Selective Demolition				
Disconnect and remove fan-powered terminal w/reheat coil	14	EACH	182.53	2,555
Demo and remove existing ductwork and insulation	14,489	SQFT	4.11	59,503
Subtotal: Selective Demolition				**$62,059**
23200 Ventilation & Exhaust				
Air handling unit, 10,000 cfm, CHW, HW coils, fans, filters (expanded ticketing)	1	EACH	103,761.20	103,761
Makeup air unit, baggage screening (new), 10,000 cfm, HW coils, fans, filters	1	EACH	63,340.80	63,341
CHW coil connections, AHU - valves, fittings, specialties, and pipe insulation	1	EACH	9,283.79	9,284
HW coil connections, AHU/MAU - valves, fittings, specialties, and pipe insulation	2	EACH	7,338.50	14,677
Exhaust fan, rooftop, w/curb, backdraft damper, (concourse)	4	EACH	2,395.15	9,581
Fan-powered terminals w/HW reheat coil (expanded ticketing)	4	EACH	1,365.05	5,460
Fan-powered terminals w/HW reheat coil (existing ticketing)	14	EACH	1,365.05	19,111
Reheat coil connections, FPB - valves, fittings, and insulation - all	18	EACH	925.31	16,656
Galvanized steel duct & insulation	14,489	SQFT	14.93	216,321
Registers, grilles and diffusers - allowance	125	EACH	126.51	15,813
Subtotal: Ventilation & Exhaust				**$474,004**
23400 Heating & Ventilating Terminals				
Unit heaters, HW hydronic	4	EACH	1,580.25	6,321
HW connections - valves, fittings, and specialties	4	EACH	490.13	1,961
Subtotal: Heating & Ventilating Terminals				**$8,282**
23500 HVAC Piping				
CHWS/R piping mains - allowance	1,200	LNFT	111.85	134,220
HHWS/R mains - allowance	1,500	LNFT	138.83	208,252
HHWS/R pipe, type L copper pipe, fittings, and supports - runouts	1,800	LNFT	34.23	61,617
Pipe insulation, CHWS/R mains	1,200	LNFT	15.18	18,219
Pipe insulation, HHWS/R mains - allowance	1,500	LNFT	17.46	26,196
Pipe insulation, HHWS/R - runouts	1,800	LNFT	8.06	14,507
Pipe and valve tagging - interior bldg HVAC piping	4,800	LNFT	1.10	5,283
Subtotal: HVAC Piping				**$468,294**
23600 Temperature Controls				
DDC controls - air handling units	1	EACH	35,000.00	35,000
DDC controls - makeup air units	1	EACH	25,000.00	25,000
DDC controls - exhaust fan, general, toilet	4	EACH	2,800.00	11,200
DDC controls - fan-powered terminals w/reheat coil	18	EACH	2,800.00	50,400
Thermostats/temperature sensors	18	EACH	650.00	11,700

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
CO/NO2 detection system	1	LSUM	45,000.00	45,000
Miscellaneous points & devices	1	LSUM	10,000.00	10,000
Interface with existing building BAS-DDC system	1	LSUM	10,000.00	10,000
Programming, testing, and training	1	LSUM	10,000.00	10,000
Subtotal: Temperature Controls				**$208,300**
23700 Testing, Balancing, & Commissioning				
Air testing and balancing	1	LSUM	25,000.00	25,000
Pipe system testing and balancing	1	LSUM	15,000.00	15,000
HVAC system commissioning	1	LSUM	15,000.00	15,000
Subtotal: Testing, Balancing, & Commissioning				**$55,000**
TOTAL: HVAC				**$1,275,938**
D400000 FIRE PROTECTION				
21200 Fire Sprinkler Equipment & Specialties				
Extend wet sprinkler system to addition	4,780	SQFT	5.65	26,999
Reconfigure existing wet sprinkler system for renovation/buildout	14,489	SQFT	4.30	62,304
Subtotal: Fire Sprinkler Equipment & Specialties				**$89,304**
TOTAL: FIRE PROTECTION				**$89,304**
D500000 ELECTRICAL				
26100 Selective Demolition				
Selective demolition and removal of light fixtures, devices and associated branch wiring	14,489	SQFT	0.90	13,026
Subtotal: Selective Demolition				**$13,026**
26200 Main Power Distribution				
Service and distribution - Main switchboard, distribution panels, transformers, panelboards and associated feeders	19,269	SQFT	6.62	127,466
Subtotal: Main Power Distribution				**$127,466**
26400 Grounding & Lightning Protection System				
Grounding System per code	1	LSUM	3,493.65	3,494
Lightning protection system per code	1	LSUM	10,871.53	10,872
Subtotal: Grounding & Lightning Protection System				**$14,365**
26500 Lighting				
Lighting System - Light fixtures including installation and hook up	19,269	SQFT	12.87	247,930
Lighting System - Exterior light fixtures	1	LSUM	2,728.68	2,729
Lighting controls, dimming, occupancy sensors and low-voltage programmable lighting control system	19,269	SQFT	3.24	62,383
Lighting System - Branch wiring installation 600 V, including 3/4" EMT conduit and THWN wire, 20A	19,269	SQFT	4.38	84,396
Subtotal: Lighting				**$397,439**
26600 Branch Power Distribution & Devices				
Branch Power - Miscellaneous receptacles and electrical equipment hook up	19,269	SQFT	1.06	20,481
Branch Power - Branch wiring installation 600 V, including 3/4" EMT conduit and THWN wire, 20A	19,269	SQFT	7.18	138,282

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Subtotal: Branch Power Distribution & Devices				**$158,763**
26700 Mechanical Equipment Connections & Feeders				
Motors connection, disconnect switches and associated feeders - Fan-powered terminals	4	EACH	450.00	1,800
Motors connection, disconnect switches and associated feeders - Air handling unit, 10,000 cfm	1	EACH	4,000.00	4,000
Subtotal: Mechanical Equipment Connections & Feeders				**$5,800**
27200 Tele/Data Systems				
New TR	1	EACH	35,000.00	35,000
Telecommunication/Data & Television System, complete upgrade	19,269	SQFT	13.09	252,291
Cellular Distributed Antenna System	19,269	SQFT	2.30	44,311
Subtotal: Tele/Data Systems				**$331,602**
27300 Intercom & Public Address Systems				
Public Address System, complete	19,269	SQFT	3.72	71,586
Subtotal: Intercom & Public Address Systems				**$71,586**
27600 Audio/Visual & Television System				
Audio/visual System, rough-in only	19,269	SQFT	0.71	13,718
Common Use Passenger Processing System rough-in only	19,269	SQFT	0.80	15,461
Subtotal: Audio/Visual & Television System				**$29,179**
28200 Fire Alarm Systems				
Fire alarm System, complete replacement	19,269	SQFT	2.85	54,863
Subtotal: Fire Alarm Systems				**$54,863**
28400 CCTV System				
CCTV System, complete replacement	19,269	SQFT	5.63	108,457
Subtotal: CCTV System				**$108,457**
TOTAL: ELECTRICAL				**$1,312,546**
E200000 FURNISHINGS				
12900 Miscellaneous Furnishings				
Furniture allowance	19,269	SQFT	6.00	115,614
Subtotal: Miscellaneous Furnishings				**$115,614**
TOTAL: FURNISHINGS				**$115,614**
F200000 SELECTIVE DEMOLITION				
02100 Selective Demolition				
Demolish exterior wall & back up	1,275	SQFT	14.23	18,137
Selective interior demolition	14,489	SQFT	9.96	144,287
Subtotal: Selective Demolition				**$162,425**
TOTAL: SELECTIVE DEMOLITION				**$162,425**
G100000 SITE PREPARATION				
31200 Site Grading				
Site grading incl rough & fine grading	14,000	SQFT	0.36	5,083
Excavate for pavement/sitework	700	CUYD	8.82	6,175

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Haul off excavated material as CCDD	700	CUYD	28.19	19,732
Subtotal: Site Grading				**$30,991**
31800 Site Demolition				
Subtotal: Site Demolition				**$0**
TOTAL: SITE PREPARATION				**$30,991**
G200000 SITE IMPROVEMENTS				
32100 Pavement				
Aggregate base	700	CUYD	61.78	43,249
Pavement striping	1	LSUM	10,000.00	10,000
Concrete pavement, 8" thk	9,400	SQFT	8.60	80,881
Subtotal: Pavement				**$134,130**
32600 Landscaping				
Landcape allowance	1	LSUM	50,000.00	50,000
Subtotal: Landscaping				**$50,000**
TOTAL: SITE IMPROVEMENTS				**$184,130**
TOTAL: (B) TICKETING RENOVATION/EXPANSION				**$6,624,105**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
(C) CONCOURSE RENOVATION/EXPANSION				
A100000 FOUNDATIONS				
03100 Concrete Formwork				
Formwork for strip footings	1,405	SQFT	8.42	11,826
Formwork for isolated column footings	6,960	SQFT	9.58	66,647
Formwork for piers	1,890	SQFT	17.98	33,985
Formwork for foundation walls	7,750	SQFT	9.08	70,399
Subtotal: Concrete Formwork				**$182,857**
03200 Concrete Reinforcement				
Reinforcement in strip footings, avg 65 lbs/cy	3	TONS	3,008.14	9,024
Reinforcement in isolated column footings, avg 80 lbs/cy	37	TONS	3,008.14	111,301
Reinforcement in piers, avg 200lbs/cy	4	TONS	3,544.19	14,177
Reinforcement in foundation walls, avg 115 lbs/cy	9	TONS	3,186.83	28,681
Subtotal: Concrete Reinforcement				**$163,184**
03300 Cast in Place Concrete				
Concrete in strip footings	80	CUYD	193.61	15,489
Concrete in isolated column footings	845	CUYD	200.80	169,679
Concrete in piers	35	CUYD	228.33	7,991
Concrete in foundation walls	145	CUYD	198.63	28,801
Concrete slab on grade, 6" thk	19,645	SQFT	6.10	119,742
Aggreagte base at concrete slab on grade	365	CUYD	55.18	20,142
Vapor barrier at slab	19,645	SQFT	0.95	18,678
Subtotal: Cast in Place Concrete				**$380,523**
07200 Thermal Insulation				
Foundation insulation	3,875	SQFT	3.73	14,450
Subtotal: Thermal Insulation				**$14,450**
31300 Foundation Excavation & Fill				
Excavate for foundations	6,400	CUYD	12.83	82,126
Backfill with imported fill	5,295	CUYD	45.00	238,284
Haul off excavated material as CCDD	6,400	CUYD	28.19	180,405
Subtotal: Foundation Excavation & Fill				**$500,815**
TOTAL: FOUNDATIONS				**$1,241,829**
B100000 SUPERSTRUCTURE				
03400 Cementitious Decks				
NLWT Concrete on metal deck, 3" thk	41,100	SQFT	6.09	250,369
Subtotal: Cementitious Decks				**$250,369**
05100 Structural Steel				
Structural steel beams & columns, floor, assumes 15 lbs/sf	339	TONS	6,892.70	2,336,626
Structural steel beams & columns, roof, assumes 10 lbs/sf	228	TONS	6,892.70	1,571,536
Shear studs	10,260	EACH	5.60	57,445
Composite metal floor deck, 2" thk, 20 ga	41,100	SQFT	5.97	245,462
Metal roof deck, 1 1/2" thk, 20 ga	41,450	SQFT	5.12	212,178

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Subtotal: Structural Steel				**$4,423,246**
07700 Fireproofing & Firestopping				
Fireproof steel floor structure	82,550	SQFT	4.17	344,531
Subtotal: Fireproofing & Firestopping				**$344,531**
TOTAL: SUPERSTRUCTURE				**$5,018,146**
B200000 EXTERIOR ENCLOSURE				
07900 Miscellaneous Thermal & Moisture Protection				
Expansion joint	260	LNFT	109.50	28,470
Exterior facade allowance	67,300	SQFT	129.61	8,722,834
Subtotal: Miscellaneous Thermal & Moisture Protection				**$8,751,304**
TOTAL: EXTERIOR ENCLOSURE				**$8,751,304**
B300000 ROOFING				
07400 Roofing				
Membrane roof system including insulation	41,450	SQFT	18.28	757,714
Flashing & counterflashing	2,900	LNFT	34.66	100,515
Metal coping	1,900	LNFT	46.49	88,332
Patch existing roof system	3,000	SQFT	26.59	79,777
Subtotal: Roofing				**$1,026,338**
TOTAL: ROOFING				**$1,026,338**
C100000 INTERIOR CONSTRUCTION				
05900 Miscellaneous Metals				
Miscellaneous angles, channels, lintels, etc.	91,354	SQFT	2.51	229,518
Subtotal: Miscellaneous Metals				**$229,518**
06200 Rough Carpentry				
Miscellaneous wood blocking & rough carpentry	91,354	SQFT	2.15	196,009
Subtotal: Rough Carpentry				**$196,009**
07800 Caulking & Sealants				
Miscellaneous caulking & sealants	91,354	SQFT	0.59	53,607
Subtotal: Caulking & Sealants				**$53,607**
09800 Interior Construction				
Interior construction - offices/admin space	1,771	SQFT	35.00	61,985
Interior construction - concession	9,423	SQFT	20.00	188,460
Interior construction - support/mechanical space	22,686	SQFT	8.00	181,488
Interior construction - restrooms	4,491	SQFT	65.00	291,915
Interior construction - circulation/lobby	21,760	SQFT	45.00	979,200
Interior construction - gate/holdroom	29,178	SQFT	45.00	1,313,010
Subtotal: Interior Construction				**$3,016,058**
10200 Signage				
Signage allowance	91,354	SQFT	9.05	826,480
Subtotal: Signage				**$826,480**
TOTAL: INTERIOR CONSTRUCTION				**$4,321,671**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
C200000 STAIRS				
03400 Cementitious Decks				
Concrete filled metal pan stair, 2 flights, 1/2 landing	1	EACH	33,268.69	33,269
Subtotal: Cementitious Decks				**$33,269**
TOTAL: STAIRS				**$33,269**
C300000 INTERIOR FINISHES				
09900 Miscellaneous Finishes				
Interior finishes - offices/admin space	1,771	SQFT	25.00	44,275
Interior finishes - concession	9,423	SQFT	15.00	141,345
Interior finishes - support/mechanical space	22,686	SQFT	5.00	113,430
Interior finishes - restrooms	4,491	SQFT	75.00	336,825
Interior finishes - circulation/lobby	21,760	SQFT	65.00	1,414,400
Interior finishes - gate/holdroom	29,178	SQFT	50.00	1,458,900
Subtotal: Miscellaneous Finishes				**$3,509,175**
TOTAL: INTERIOR FINISHES				**$3,509,175**
D100000 CONVEYING				
14300 Hydraulic Elevators				
Service elevator, 2 stop	1	EACH	300,000.00	300,000
Subtotal: Hydraulic Elevators				**$300,000**
TOTAL: CONVEYING				**$300,000**
D200000 PLUMBING				
22200 Plumbing Fixtures				
Water closet, wall hung, hardwired sensor-op flush valve	15	EACH	2,410.18	36,153
Lavatory, wall hung, hardwired sensor-op faucet	13	EACH	2,483.40	32,284
Urinal, wall hung, hardwired automatic flush valve	8	EACH	2,346.29	18,770
Mop basin, floor fixture	1	EACH	2,087.55	2,088
Subtotal: Plumbing Fixtures				**$89,295**
22300 Plumbing Equipment & Specialties				
Domestic water heater, gas-fired	2	EACH	9,267.18	18,534
DHW recirculating pump	2	EACH	2,204.20	4,408
Expansion tank	2	EACH	1,289.45	2,579
Thermostatic mixing valve - central	1	EACH	3,880.25	3,880
Thermostatic mixing valve - 1/2", point of use	13	EACH	297.53	3,868
Circuit setter balancing valve, 3/4"	4	EACH	158.03	632
Floor drains	8	EACH	476.72	3,814
Cleanouts - floor	10	EACH	366.72	3,667
Roof drains	15	EACH	667.02	10,005
Roof drains - overflow	15	EACH	767.02	11,505
Subtotal: Plumbing Equipment & Specialties				**$62,894**
22400 Domestic Water, Waste & Vent, & Storm Drainage Piping				

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Reroute existing domestic HW piping to provide HW flow to existing fixtures - allowance	2,000	LNFT	39.37	78,749
Domestic water pipe, fittings, and supports, type L copper	1,100	LNFT	46.52	51,168
Pipe insulation, domestic water piping	1,100	LNFT	8.44	9,289
Sanitary/waste pipe, fittings, and supports, CI no-hub	500	LNFT	61.72	30,858
Vent pipe, fittings, and supports, CI no-hub, AG	900	LNFT	46.71	42,041
Storm drainage pipe, fittings, and supports, CI no-hub, AG	1,200	LNFT	81.04	97,247
Pipe insulation, AG horizontal storm drainage, 6"	800	LNFT	15.36	12,291
Pipe and valve tagging	3,100	LNFT	1.05	3,257
System pressure testing, water pipe chlorination, and pipe flushing - domestic plumbing	1	LSUM	6,844.50	6,845
Subtotal: Domestic Water, Waste & Vent, & Storm Drainage Piping				**$331,745**
TOTAL: PLUMBING				**$483,933**
D300000 HVAC				
23100 Selective Demolition				
Disconnect and remove air handling unit AH-1	1	EACH	8,650.50	8,651
Disconnect and remove makeup air unit MA-1	1	EACH	6,650.50	6,651
Disconnect and remove VAV terminal w/reheat coil	30	EACH	273.79	8,214
Subtotal: Selective Demolition				**$23,515**
23200 Ventilation & Exhaust				
Air handling unit AH-1(new), 29,000 cfm modular, CHW, HW coils, humidifiers, fans, filters	1	EACH	373,761.20	373,761
Air handling units, concourse expansion, 25,000 cfm, CHW, HW coils, fans, filters	2	EACH	208,761.20	417,522
Makeup air unit MA-1(new), 7,500 cfm, HW coils, fans, filters	1	EACH	55,110.70	55,111
CHW coil connections, AHU - valves, fittings, specialties, and pipe insulation	3	EACH	9,283.79	27,851
HW coil connections, AHU/MAU - valves, fittings, specialties, and pipe insulation	4	EACH	7,338.50	29,354
Exhaust fan, rooftop, w/curb, backdraft damper, (concourse)	3	EACH	2,395.15	7,185
Variable air volume terminals w/HW reheat coil - concourse expansion	26	EACH	1,065.05	27,691
Variable air volume terminals w/HW reheat coil - to replace existing	30	EACH	1,065.05	31,951
Reheat coil connections, VAV - valves, fittings, and insulation - all	56	EACH	925.31	51,817
Galvanized steel duct & insulation	61,269	SQFT	14.93	914,746
Registers, grilles and diffusers - allowance	500	EACH	126.51	63,253
Subtotal: Ventilation & Exhaust				**$2,000,244**
23300 Central Hydronic & Steam Equipment & Specialties				
CA duct, domestic water heaters	100	LNFT	16.62	1,662
Water heater flue	100	LNFT	69.60	6,960
Subtotal: Central Hydronic & Steam Equipment & Specialties				**$8,622**
23500 HVAC Piping				
CHWS/R piping mains - allowance	1,200	LNFT	111.85	134,220
HHWS/R mains - allowance	3,000	LNFT	138.83	416,503
HHWS/R pipe, type L copper pipe, fittings, and supports - runouts	5,400	LNFT	34.23	184,852
Pipe insulation, CHWS/R mains	1,200	LNFT	15.18	18,219
Pipe insulation, HHWS/R mains - allowance	3,000	LNFT	17.46	52,392
Pipe insulation, HHWS/R - runouts	5,400	LNFT	8.06	43,522

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Pipe and valve tagging - interior bldg HVAC piping	9,600	LNFT	1.10	10,566
Subtotal: HVAC Piping				**$860,274**
23600 Temperature Controls				
DDC controls - air handling units	3	EACH	35,000.00	105,000
DDC controls - makeup air units	1	EACH	25,000.00	25,000
DDC controls - exhaust fan, general, toilet	3	EACH	2,800.00	8,400
DDC controls - VAV terminals w/reheat coil	56	EACH	2,250.00	126,000
Thermostats/temperature sensors	56	EACH	650.00	36,400
Miscellaneous points & devices	1	LSUM	10,000.00	10,000
Interface with existing building BAS-DDC system	1	LSUM	10,000.00	10,000
Programming, testing, and training	1	LSUM	10,000.00	10,000
Subtotal: Temperature Controls				**$330,800**
23700 Testing, Balancing, & Commissioning				
Air testing and balancing	1	LSUM	90,000.00	90,000
Pipe system testing and balancing	1	LSUM	25,000.00	25,000
HVAC system commissioning	1	LSUM	30,000.00	30,000
Subtotal: Testing, Balancing, & Commissioning				**$145,000**
TOTAL: HVAC				**$3,368,455**
D400000 FIRE PROTECTION				
21200 Fire Sprinkler Equipment & Specialties				
Extend wet sprinkler system to addition	61,269	SQFT	5.65	346,072
Reconfigure existing wet sprinkler system for renovation/buildout	30,085	SQFT	4.30	129,369
Subtotal: Fire Sprinkler Equipment & Specialties				**$475,440**
TOTAL: FIRE PROTECTION				**$475,440**
D500000 ELECTRICAL				
26100 Selective Demolition				
Disconnect and remove existing service and switchboard	1	LSUM	30,000.00	30,000
Disconnect and remove obsolete switchboards, transformers, panels and associated feeder	1	LSUM	67,171.61	67,172
Selective demolition and removal of light fixtures, devices and associated branch wiring	30,085	SQFT	0.90	27,046
Subtotal: Selective Demolition				**$124,218**
26200 Main Power Distribution				
Electrical and LV provisions for the new emergency power electrical room	1	EACH	10,000.00	10,000
Electrical and LV provisions for the new normal power electrical room	1	EACH	10,000.00	10,000
New unit substation	1	EACH	318,621.90	318,622
Service and distribution - Main switchboard, distribution panels, transformers, panelboards and associated feeders	91,351	SQFT	4.90	447,547
New digital metering system	1	LSUM	26,714.95	26,715
Emergency Service and distribution - Main distribution panels, ATS, panelboards and associated feeders	91,351	SQFT	1.54	140,516
Temporary power	1	EACH	75,000.00	75,000
Subtotal: Main Power Distribution				**$1,028,400**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
26400 Grounding & Lightning Protection System				
Grounding System per code	1	LSUM	34,936.45	34,936
Lightning protection system per code	1	LSUM	104,185.52	104,186
Subtotal: Grounding & Lightning Protection System				**$139,122**
26500 Lighting				
Lighting System - Light fixtures including installation and hook up	91,351	SQFT	18.20	1,662,415
Lighting System - Exterior light fixtures	1	LSUM	25,839.09	25,839
Lighting controls, dimming, occupancy sensors and low-voltage programmable lighting control system	91,351	SQFT	3.49	318,870
Lighting System - Branch wiring installation 600 V, including 3/4" EMT conduit and THWN wire, 20A	91,351	SQFT	5.05	461,158
Subtotal: Lighting				**$2,468,282**
26600 Branch Power Distribution & Devices				
Branch Power - Miscellaneous receptacles and electrical equipment hook up	91,351	SQFT	1.06	97,097
Branch Power - Branch wiring installation 600 V, including 3/4" EMT conduit and THWN wire, 20A	91,351	SQFT	5.23	477,382
Power and LV provisions at gates	10	SQFT	15,000.00	150,000
Subtotal: Branch Power Distribution & Devices				**$724,479**
26700 Mechanical Equipment Connections & Feeders				
Motors connection, disconnect switches and associated feeders - Service elevator, 2 stop	1	EACH	4,500.00	4,500
Motors connection, disconnect switches and associated feeders - Air handling unit, 12,000 cfm	1	EACH	4,800.00	4,800
Motors connection, disconnect switches and associated feeders - Miscellaneous equipment	1	EACH	15,000.00	15,000
Motors connection, disconnect switches and associated feeders - Exhaust fan, rooftop	3	EACH	2,600.00	7,800
Motors connection, disconnect switches and associated feeders - Air handling unit, 25,000 cfm	2	EACH	5,500.00	11,000
Motors connection, disconnect switches and associated feeders - baggage conveyor	5	EACH	3,500.00	17,500
Motors connection, disconnect switches and associated feeders - reconditioned air unit	12	EACH	3,500.00	42,000
Subtotal: Mechanical Equipment Connections & Feeders				**$102,600**
27200 Tele/Data Systems				
New TR	2	EACH	35,000.00	70,000
Telecommunication/Data & Television System, complete upgrade	91,351	SQFT	10.91	996,731
Cellular Distributed Antenna System	91,351	SQFT	1.51	137,556
Subtotal: Tele/Data Systems				**$1,204,287**
27300 Intercom & Public Address Systems				
Public Address System, complete	91,351	SQFT	3.72	339,378
Subtotal: Intercom & Public Address Systems				**$339,378**
27600 Audio/Visual & Television System				
Audio/visual System, rough-in only	91,351	SQFT	0.71	65,033
Common Use Passenger Processing System rough-in only	91,351	SQFT	0.80	73,300

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Subtotal: Audio/Visual & Television System				**$138,333**
28200 Fire Alarm Systems				
Fire alarm System, complete replacement	91,351	SQFT	2.85	260,095
Subtotal: Fire Alarm Systems				**$260,095**
28400 CCTV System				
CCTV System, complete replacement	91,351	SQFT	4.24	386,899
Subtotal: CCTV System				**$386,899**
TOTAL: ELECTRICAL				**$6,916,092**
E200000 FURNISHINGS				
12900 Miscellaneous Furnishings				
Furniture allowance	91,354	SQFT	10.00	913,540
Subtotal: Miscellaneous Furnishings				**$913,540**
TOTAL: FURNISHINGS				**$913,540**
F100000 SPECIAL CONSTRUCTION				
13300 Fabricated Engineered Structures				
Passenger boarding bridge, new	5	EACH	725,000.00	3,625,000
Passenger boarding bridge, relocate, gates 1 & 4	2	EACH	75,000.00	150,000
Passenger boarding bridge, relocate, gates 5 & 7	2	EACH	115,000.00	230,000
Preconditioned air unit, cool/heat, 45 ton	12	EACH	120,000.00	1,440,000
Ground power unit, 90kVa/28VDC combo unit	5	EACH	65,000.00	325,000
KCI baggage conveyor	5	EACH	30,000.00	150,000
Extended corridor gate 8	9	EACH	44,750.00	380,375
Subtotal: Fabricated Engineered Structures				**$6,300,375**
TOTAL: SPECIAL CONSTRUCTION				**$6,300,375**
F200000 SELECTIVE DEMOLITION				
02100 Selective Demolition				
Remove membrane roof system	4,180	SQFT	2.07	8,662
Demolish floor/roof structure	8,360	SQFT	34.89	291,718
Demolish exterior wall & back up	8,880	SQFT	14.23	126,321
Selective interior demolition	30,085	SQFT	9.96	299,598
Demolish slab on grade & foundations	4,180	SQFT	22.45	93,829
Subtotal: Selective Demolition				**$820,128**
TOTAL: SELECTIVE DEMOLITION				**$820,128**
G100000 SITE PREPARATION				
31200 Site Grading				
Site grading incl rough & fine grading	178,000	SQFT	0.36	64,632
Excavate for pavement/sitework	12,400	CUYD	8.82	109,394
Haul off excavated material as CCDD	12,400	CUYD	28.19	349,535
Subtotal: Site Grading				**$523,561**
31800 Site Demolition				

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Subtotal: Site Demolition				**$0**
TOTAL: SITE PREPARATION				**$523,561**
G200000 SITE IMPROVEMENTS				
32100 Pavement				
Aggregate base	12,400	CUYD	61.78	766,122
Pavement striping	1	LSUM	100,000.00	100,000
Concrete pavement, 15" thk	166,900	SQFT	13.81	2,304,088
Subtotal: Pavement				**$3,170,209**
TOTAL: SITE IMPROVEMENTS				**$3,170,209**
G300000 CIVIL & MECHANICAL UTILITIES				
33100 Selective Site Demolition				
Demolition - existing domestic water, sewer, and storm drainage	1	LSUM	95,334.90	95,335
Subtotal: Selective Site Demolition				**$95,335**
33200 Site Water Service				
Domestic water provisions/reroute existing around addition	1	LSUM	198,285.43	198,285
Relocate/reroute existing domestic water	1	LSUM	438,979.45	438,979
Subtotal: Site Water Service				**$637,265**
33300 Site Sanitary & Storm Sewer				
Reroute existing storm and sanitary sewers	1	LSUM	671,342.73	671,343
Subtotal: Site Sanitary & Storm Sewer				**$671,343**
TOTAL: CIVIL & MECHANICAL UTILITIES				**$1,403,943**
G400000 SITE ELECTRICAL UTILITIES				
33800 Site Electrical				
New MV service provisions and coordination with utility company	1	EACH	50,000.00	50,000
Subtotal: Site Electrical				**$50,000**
TOTAL: SITE ELECTRICAL UTILITIES				**$50,000**
TOTAL: (C) CONCOURSE RENOVATION/EXPANSION				**$48,627,407**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
(D) CAR RENTAL/BAGGAGE CLAIM/AIRPORT OFFICES				
A100000 FOUNDATIONS				
03100 Concrete Formwork				
Formwork for strip footings	1,070	SQFT	8.42	9,006
Formwork for isolated column footings	2,465	SQFT	9.58	23,604
Formwork for piers	900	SQFT	17.98	16,183
Formwork for foundation walls	6,110	SQFT	9.08	55,502
Subtotal: Concrete Formwork				**$104,296**
03200 Concrete Reinforcement				
Reinforcement in strip footings, avg 65 lbs/cy	2	TONS	3,008.14	6,016
Reinforcement in isolated column footings, avg 80 lbs/cy	11	TONS	3,008.14	33,090
Reinforcement in piers, avg 200lbs/cy	2	TONS	3,544.19	7,088
Reinforcement in foundation walls, avg 115 lbs/cy	7	TONS	3,186.83	22,308
Subtotal: Concrete Reinforcement				**$68,502**
03300 Cast in Place Concrete				
Concrete in strip footings	60	CUYD	193.61	11,616
Concrete in isolated column footings	255	CUYD	200.80	51,205
Concrete in piers	20	CUYD	228.33	4,567
Concrete in foundation walls	115	CUYD	198.63	22,842
Concrete slab on grade, 6" thk	12,625	SQFT	6.10	76,953
Aggreagte base at concrete slab on grade	235	CUYD	55.18	12,968
Vapor barrier at slab	12,625	SQFT	0.95	12,004
Subtotal: Cast in Place Concrete				**$192,155**
07200 Thermal Insulation				
Foundation insulation	3,055	SQFT	3.73	11,392
Subtotal: Thermal Insulation				**$11,392**
31300 Foundation Excavation & Fill				
Excavate for foundations	2,800	CUYD	12.83	35,930
Backfill with imported fill	2,350	CUYD	45.00	105,754
Haul off excavated material as CCDD	2,800	CUYD	28.19	78,927
Subtotal: Foundation Excavation & Fill				**$220,611**
TOTAL: FOUNDATIONS				**$596,957**
B100000 SUPERSTRUCTURE				
03400 Cementitious Decks				
NLWT Concrete on metal deck, 3" thk	5,660	SQFT	6.09	34,479
Subtotal: Cementitious Decks				**$34,479**
05100 Structural Steel				
Structural steel beams & columns, floor, assumes 15 lbs/sf	47	TONS	6,892.70	323,957
Structural steel beams & columns, roof, assumes 10 lbs/sf	68	TONS	6,892.70	468,704
Shear studs	1,420	EACH	5.60	7,950
Composite metal floor deck, 2" thk, 20 ga	5,660	SQFT	5.97	33,803

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Metal roof deck, 1 1/2" thk, 20 ga	12,360	SQFT	5.12	63,270
Subtotal: Structural Steel				**$897,684**
07700 Fireproofing & Firestopping				
Fireproof steel floor structure	18,020	SQFT	4.17	75,208
Subtotal: Fireproofing & Firestopping				**$75,208**
TOTAL: SUPERSTRUCTURE				**$1,007,371**
B200000 EXTERIOR ENCLOSURE				
07900 Miscellaneous Thermal & Moisture Protection				
Expansion joint	360	LNFT	109.50	39,420
Exterior facade allowance	11,200	SQFT	129.61	1,451,645
Subtotal: Miscellaneous Thermal & Moisture Protection				**$1,491,066**
TOTAL: EXTERIOR ENCLOSURE				**$1,491,066**
B300000 ROOFING				
07400 Roofing				
Membrane roof system including insulation	12,400	SQFT	18.28	226,674
Flashing & counterflashing	950	LNFT	34.66	32,927
Metal coping	600	LNFT	46.49	27,894
Patch existing roof system	3,000	SQFT	26.59	79,777
Subtotal: Roofing				**$367,273**
TOTAL: ROOFING				**$367,273**
C100000 INTERIOR CONSTRUCTION				
05900 Miscellaneous Metals				
Miscellaneous angles, channels, lintels, etc.	56,014	SQFT	2.51	140,730
Subtotal: Miscellaneous Metals				**$140,730**
06200 Rough Carpentry				
Miscellaneous wood blocking & rough carpentry	56,014	SQFT	2.15	120,184
Subtotal: Rough Carpentry				**$120,184**
07800 Caulking & Sealants				
Miscellaneous caulking & sealants	56,014	SQFT	0.59	32,869
Subtotal: Caulking & Sealants				**$32,869**
09800 Interior Construction				
Interior construction - offices/admin space	4,268	SQFT	35.00	149,380
Interior construction - car rental area	9,527	SQFT	40.00	381,080
Interior construction - concession	2,780	SQFT	20.00	55,600
Interior construction - support/mechanical space	1,035	SQFT	8.00	8,280
Interior construction - circulation/lobby	29,107	SQFT	45.00	1,309,815
Interior construction - baggage screening/handling loading space	6,280	SQFT	10.00	62,800
Subtotal: Interior Construction				**$1,966,955**
10200 Signage				
Signage allowance	56,014	SQFT	9.05	506,759
Subtotal: Signage				**$506,759**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
TOTAL: INTERIOR CONSTRUCTION				**$2,767,496**
C300000 INTERIOR FINISHES				
09900 Miscellaneous Finishes				
Interior finishes - offices/admin space	4,268	SQFT	25.00	106,700
Interior finishes - car rental area	9,527	SQFT	60.00	571,620
Interior finishes - concession	2,780	SQFT	15.00	41,700
Interior finishes - support/mechanical space	1,035	SQFT	5.00	5,175
Interior finishes - circulation/lobby	29,107	SQFT	65.00	1,891,955
Interior finishes - baggage screening/handling loading space	6,280	SQFT	10.00	62,800
Subtotal: Miscellaneous Finishes				**$2,679,950**
TOTAL: INTERIOR FINISHES				**$2,679,950**
D100000 CONVEYING				
14900 Special Conveying Equipment				
Inbound baggage conveyor system, new baggage conveyor	1	EACH	1,300,000.00	1,300,000
Inbound baggage conveyor system, replacement baggage conveyor	2	EACH	1,350,000.00	2,700,000
Subtotal: Special Conveying Equipment				**$4,000,000**
TOTAL: CONVEYING				**$4,000,000**
D200000 PLUMBING				
22400 Domestic Water, Waste & Vent, & Storm Drainage Piping				
Reroute existing domestic HW piping to provide HW flow to existing fixtures - allowance	2,000	LNFT	39.37	78,749
Pipe and valve tagging	2,000	LNFT	1.05	2,101
System pressure testing, water pipe chlorination, and pipe flushing - domestic plumbing	1	LSUM	6,844.50	6,845
Subtotal: Domestic Water, Waste & Vent, & Storm Drainage Piping				**$87,695**
TOTAL: PLUMBING				**$87,695**
D300000 HVAC				
23100 Selective Demolition				
Disconnect and remove air handling unit AH-2	1	EACH	8,650.50	8,651
Disconnect and remove makeup air unit MA-2	1	EACH	6,650.50	6,651
Disconnect and remove VAV terminal w/reheat coil	40	EACH	182.53	7,301
Subtotal: Selective Demolition				**$22,602**
23200 Ventilation & Exhaust				
Air handling unit AH-2(new), 10,000 cfm modular, CHW, HW coils, fans, filters	2	EACH	147,185.68	294,371
Air handling unit, rental car expansion 6,000 cfm packaged, CHW, HW coils, fans, filters	1	EACH	53,610.70	53,611
Makeup air unit MA-2(new), 13,000 cfm, HW coils, fans, filters	1	EACH	70,840.80	70,841
CHW coil connections, AHU - valves, fittings, specialties, and pipe insulation	3	EACH	9,283.79	27,851
HW coil connections, AHU/MAU - valves, fittings, specialties, and pipe insulation	4	EACH	7,338.50	29,354
Variable air volume terminals w/HW reheat coil - expanded car rental	6	EACH	1,065.05	6,390
Variable air volume terminals w/HW reheat coil - to replace existing	40	EACH	1,065.05	42,602

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Reheat coil connections, VAV - valves, fittings, and insulation - all	46	EACH	925.31	42,564
Galvanized steel duct & insulation	18,278	SQFT	14.93	272,891
Registers, grilles and diffusers - allowance	400	EACH	126.51	50,602
Subtotal: Ventilation & Exhaust				**$891,077**
23500 HVAC Piping				
CHWS/R piping mains - allowance	3,000	LNFT	111.85	335,550
HHWS/R mains - allowance	3,000	LNFT	138.83	416,503
HHWS/R pipe, type L copper pipe, fittings, and supports - runouts	4,500	LNFT	34.23	154,044
Pipe insulation, CHWS/R mains	3,000	LNFT	15.18	45,548
Pipe insulation, HHWS/R mains - allowance	3,000	LNFT	17.46	52,392
Pipe insulation, HHWS/R - runouts	4,500	LNFT	8.06	36,268
Pipe and valve tagging - interior bldg HVAC piping	10,500	LNFT	1.10	11,556
Subtotal: HVAC Piping				**$1,051,861**
23600 Temperature Controls				
DDC controls - air handling units	3	EACH	35,000.00	105,000
DDC controls - makeup air units	1	EACH	25,000.00	25,000
DDC controls - VAV terminals w/reheat coil	46	EACH	2,250.00	103,500
Thermostats/temperature sensors	46	EACH	650.00	29,900
Miscellaneous points & devices	1	LSUM	10,000.00	10,000
Interface with existing building BAS-DDC system	1	LSUM	10,000.00	10,000
Programming, testing, and training	1	LSUM	10,000.00	10,000
Subtotal: Temperature Controls				**$293,400**
23700 Testing, Balancing, & Commissioning				
Air testing and balancing	1	LSUM	40,000.00	40,000
Pipe system testing and balancing	1	LSUM	20,000.00	20,000
HVAC system commissioning	1	LSUM	20,000.00	20,000
Subtotal: Testing, Balancing, & Commissioning				**$80,000**
TOTAL: HVAC				**$2,338,940**
D400000 FIRE PROTECTION				
21200 Fire Sprinkler Equipment & Specialties				
Extend wet sprinkler system to addition	18,278	SQFT	5.65	103,241
Reconfigure existing wet sprinkler system for renovation/buildout	37,736	SQFT	4.30	162,269
Subtotal: Fire Sprinkler Equipment & Specialties				**$265,510**
TOTAL: FIRE PROTECTION				**$265,510**
D500000 ELECTRICAL				
26100 Selective Demolition				
Disconnect and remove existing service and switchboard	1	LSUM	30,000.00	30,000
Disconnect and remove obsolete switchboards, transformers, panels and associated feeder	1	LSUM	67,171.61	67,172
Selective demolition and removal of light fixtures, devices and associated branch wiring	37,736	SQFT	0.90	33,925
Subtotal: Selective Demolition				**$131,096**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
26200 Main Power Distribution				
Electrical and LV provisions for the new normal power electrical room	1	EACH	10,000.00	10,000
Electrical and LV provisions for the new emergency power electrical room	1	EACH	10,000.00	10,000
New unit substation	1	EACH	202,550.67	202,551
New digital metering system	1	LSUM	21,371.96	21,372
Service and distribution - Main switchboard, distribution panels, transformers, panelboards and associated feeders	56,014	SQFT	4.90	274,424
Emergency Service and distribution - Main distribution panels, ATS, panelboards and associated feeders	56,014	SQFT	1.54	86,161
Temporary power	1	EACH	50,000.00	50,000
Subtotal: Main Power Distribution				**$654,507**
26400 Grounding & Lightning Protection System				
Grounding System per code	1	LSUM	27,581.41	27,581
Lightning protection system per code	1	LSUM	63,417.27	63,417
Subtotal: Grounding & Lightning Protection System				**$90,999**
26500 Lighting				
Lighting System - Light fixtures including installation and hook up	56,014	SQFT	10.97	614,731
Lighting System - Exterior light fixtures	1	LSUM	8,613.03	8,613
Lighting controls, dimming, occupancy sensors and low-voltage programmable lighting control system	56,014	SQFT	3.24	181,345
Lighting System - Branch wiring installation 600 V, including 3/4" EMT conduit and THWN wire, 20A	56,014	SQFT	4.38	245,336
Subtotal: Lighting				**$1,050,025**
26600 Branch Power Distribution & Devices				
Branch Power - Miscellaneous receptacles and electrical equipment hook up	56,014	SQFT	1.06	59,537
Branch Power - Branch wiring installation 600 V, including 3/4" EMT conduit and THWN wire, 20A	56,014	SQFT	4.25	237,908
Subtotal: Branch Power Distribution & Devices				**$297,446**
26700 Mechanical Equipment Connections & Feeders				
Motors connection, disconnect switches and associated feeders - baggage conveyor	1	EACH	10,000.00	10,000
Motors connection, disconnect switches and associated feeders - Miscellaneous equipment	1	EACH	15,000.00	15,000
Motors connection, disconnect switches and associated feeders - Air handling unit, 6,000 cfm	1	EACH	3,200.00	3,200
Subtotal: Mechanical Equipment Connections & Feeders				**$28,200**
27200 Tele/Data Systems				
New TR	1	EACH	50,000.00	50,000
Telecommunication/Data & Television System, complete upgrade	56,014	SQFT	10.91	611,169
Cellular Distributed Antenna System	56,014	SQFT	1.51	84,346
Subtotal: Tele/Data Systems				**$745,515**
27300 Intercom & Public Address Systems				
Public Address System, complete	56,014	SQFT	3.72	208,098
Subtotal: Intercom & Public Address Systems				**$208,098**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
27600 Audio/Visual & Television System				
Audio/visual System, rough-in only	56,014	SQFT	0.71	39,876
Common Use Passenger Processing System rough-in only	56,014	SQFT	0.51	28,483
Subtotal: Audio/Visual & Television System				**$68,359**
28200 Fire Alarm Systems				
Fire alarm System, complete replacement	56,014	SQFT	2.85	159,483
Subtotal: Fire Alarm Systems				**$159,483**
28400 CCTV System				
CCTV System, complete replacement	56,014	SQFT	4.24	237,236
Subtotal: CCTV System				**$237,236**
TOTAL: ELECTRICAL				**$3,670,964**
E200000 FURNISHINGS				
12900 Miscellaneous Furnishings				
Furniture allowance	56,014	SQFT	10.00	560,140
Subtotal: Miscellaneous Furnishings				**$560,140**
TOTAL: FURNISHINGS				**$560,140**
F200000 SELECTIVE DEMOLITION				
02100 Selective Demolition				
Demolish exterior wall & back up	7,200	SQFT	14.23	102,422
Selective interior demolition	37,736	SQFT	9.96	375,790
Subtotal: Selective Demolition				**$478,212**
TOTAL: SELECTIVE DEMOLITION				**$478,212**
G100000 SITE PREPARATION				
31200 Site Grading				
Site grading incl rough & fine grading	24,400	SQFT	0.36	8,860
Excavate for pavement/sitework	880	CUYD	8.82	7,763
Haul off excavated material as CCDD	880	CUYD	28.19	24,806
Subtotal: Site Grading				**$41,429**
31800 Site Demolition				
Site demolition	24,400	SQFT	2.49	60,741
Subtotal: Site Demolition				**$60,741**
TOTAL: SITE PREPARATION				**$102,170**
G200000 SITE IMPROVEMENTS				
32100 Pavement				
Aggregate base	880	CUYD	61.78	54,370
Pavement striping	1	LSUM	20,000.00	20,000
Concrete pavement, 15" thk	11,800	SQFT	13.81	162,901
Subtotal: Pavement				**$237,271**
32600 Landscaping				
Landcape allowance	1	LSUM	50,000.00	50,000

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
Subtotal: Landscaping				**$50,000**
TOTAL: SITE IMPROVEMENTS				**$287,271**
G400000 SITE ELECTRICAL UTILITIES				
33800 Site Electrical				
New MV service provisions and coordination with utility company	1	EACH	50,000.00	50,000
Subtotal: Site Electrical				**$50,000**
TOTAL: SITE ELECTRICAL UTILITIES				**$50,000**
TOTAL: (D) CAR RENTAL/BAGGAGE CLAIM/AIRPORT OFFICES				**$20,751,015**
TOTAL: BASE BID				**$106,458,055**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
ALTERNATE #1 OPTION #2 ELECTRICAL SERVICE				
(A) BAGGAGE SCREENING/TSA SECURUTY CHECKPOINT				
D500000 ELECTRICAL				
26200 Main Power Distribution				
New unit substation	-1	EACH	260,968.94	-260,969
Coordination with utility company - transformer service	1	EACH	17,418.79	17,419
New 480/277V 3ph 4w service provisions and coordination with utility company	1	EACH	103,706.46	103,706
New 480/277V 3ph 4w Main switchboard	1	EACH	144,350.29	144,350
Subtotal: Main Power Distribution				**$4,507**
TOTAL: ELECTRICAL				**$4,507**
G400000 SITE ELECTRICAL UTILITIES				
33800 Site Electrical				
New MV service provisions and coordination with utility company	-1	EACH	50,000.00	-50,000
Subtotal: Site Electrical				**($50,000)**
TOTAL: SITE ELECTRICAL UTILITIES				**($50,000)**
TOTAL: (A) BAGGAGE SCREENING/TSA SECURUTY CHECKPOINT				**($45,493)**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
(C) CONCOURSE RENOVATION/EXPANSION				
D500000 ELECTRICAL				
26200 Main Power Distribution				
New unit substation	-1	EACH	318,621.90	-318,622
Coordination with utility company - transformer service	1	EACH	17,418.79	17,419
New 480/277V 3ph 4w service provisions and coordination with utility company	1	EACH	103,706.46	103,706
New 480/277V 3ph 4w Main switchboard	1	EACH	184,187.87	184,188
Subtotal: Main Power Distribution				**($13,309)**
TOTAL: ELECTRICAL				**($13,309)**
G400000 SITE ELECTRICAL UTILITIES				
33800 Site Electrical				
New MV service provisions and coordination with utility company	-1	EACH	50,000.00	-50,000
Subtotal: Site Electrical				**($50,000)**
TOTAL: SITE ELECTRICAL UTILITIES				**($50,000)**
TOTAL: (C) CONCOURSE RENOVATION/EXPANSION				**($63,309)**

DESCRIPTION	QTY	UM	UNIT COST	TOTAL COST
(D) CAR RENTAL/BAGGAGE CLAIM/AIRPORT OFFICES				
D500000 ELECTRICAL				
26200 Main Power Distribution				
New unit substation	-1	EACH	260,968.94	-260,969
Coordination with utility company - transformer service	1	EACH	17,418.79	17,419
New 480/277V 3ph 4w service provisions and coordination with utility company	1	EACH	86,287.67	86,288
New 480/277V 3ph 4w Main switchboard	1	EACH	115,802.74	115,803
Subtotal: Main Power Distribution				**($41,460)**
TOTAL: ELECTRICAL				**($41,460)**
G400000 SITE ELECTRICAL UTILITIES				
33800 Site Electrical				
New MV service provisions and coordination with utility company	-1	EACH	50,000.00	-50,000
Subtotal: Site Electrical				**($50,000)**
TOTAL: SITE ELECTRICAL UTILITIES				**($50,000)**
TOTAL: (D) CAR RENTAL/BAGGAGE CLAIM/AIRPORT OFFICES				**($91,460)**
TOTAL: ALTERNATE #1 OPTION #2 ELECTRICAL SERVICE				**($200,262)**

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