MEMORANDUM

TO: Airport Board
FROM: Patrick Dame, C.M., Executive Director
DATE: March 8, 2022
RE: Approval Mead & Hunt Task Order No. 2022—2
Terminal Expansion and Renovation Architectural and Engineering Services
Airport Project No. 19-5271

Mead & Hunt Task Order No. 2022-2 is to provide architecture and engineering services and to prepare bidding documents for four major work parts of this project. Once designed, the construction will be completed by specific parts based on timing, resources, and available funding.

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

These services will initially be paid for with Airport Capital Funds. As previously indicated, there are funds available specifically for Terminal projects through the Bipartisan Infrastructure Law (BIL). The Airport intends to submit an application for the Terminal funding through BIL. The BIL legislation also provides additional entitlement funds for the Airport. If we are unsuccessful in receiving the Terminal BIL funds, the entitlement BIL funds will be used for this project.

In addition, as required by the FAA, an Independent Fee Estimate (IFE) was obtained for these services.

STAFF’S RECOMMENDATION: Approve Mead & Hunt Task Order 2022-2 in an amount not to exceed $6,797,397.00 for the Terminal Expansion and Renovation Architectural and Engineering Services.
TASK ORDER NO. 2022-2

In accordance with Paragraph 1.01, Main Agreement, of the Agreement Between Owner and Engineer for Professional Services—Task Order Edition dated January 1, 2021, Owner and Engineer agree as follows:

1. TASK ORDER DATA

<table>
<thead>
<tr>
<th>a.</th>
<th>Effective Date of Task Order:</th>
<th>March 8, 2022</th>
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<tbody>
<tr>
<td>b.</td>
<td>Owner:</td>
<td>Rapid City Regional Airport</td>
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<td>c.</td>
<td>Architect / Engineer:</td>
<td>Mead &amp; Hunt, Inc.</td>
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<td>d.</td>
<td>Specific Project (title)</td>
<td>Terminal Expansion and Renovation</td>
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<th>e.</th>
<th>Specific Project (description):</th>
<th>Provide architecture and engineering services to prepare bidding and construction documents for four major work parts:</th>
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<td>• Part A: Ticket Counter/Checked Baggage/Baggage Makeup</td>
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2. BASELINE INFORMATION

Baseline Information. Owner has furnished the following Specific Project information to Architect / Engineer as of the Effective Date of the Task Order. Engineer’s scope of services has been developed based on this information. As the Specific Project moves forward, some of the information may change or be refined, and additional information will become known, resulting in the possible need to change, refine, or supplement the scope of services.

Specific Project Title: Terminal Expansion and Renovation

Previous Studies: KLJ / Allience Terminal Planning Study - April 2021
3. SERVICES OF ENGINEER (“SCOPE”)

A. The specific Basic Services to be provided or furnished by Architect / Engineer under this Task Order are as follows:

Project Understanding

Rapid City Regional Airport seeks to expand and renovate its airport terminal to accommodate existing and projected passenger growth, and to accommodate shifts in aircraft. The Rapid City Regional Airport (RAP) Terminal was built in 1986, and has evolved over the last four decades, with the last major renovation and improvement project finished in 2012. Based on recent growth of passenger enplanements, RAP completed a Terminal Planning Study (TPS) in April 2021 (refer to Attachment A). The study assessed existing conditions, forecasted enplanement growth and demand, developed alternative concepts for improvements, and arrived at a pre-design concept to expand and improve the Terminal Building to support future growth. This Project will advance and evolve the design of the selected alternative for renovation and expansion. The construction budget for the work is estimated at $75M to $80M in 2022 dollars without escalation for mid-point of construction.

RAP fundamentally requires additional gates to meet existing and near-term air service demands. In the process of expanding the terminal to meet these demands, the airport also desires to modernize key portions of the terminal as noted below, improve the passenger experience throughout the facility, enhance revenue generation, and leverage potential federal funding available for portions of the work, including checked baggage screening systems.

The scope of work, for which these professional architecture and engineering services are being provided, is comprised of four major work parts:

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

Unless otherwise noted below, renovated, and new areas shall extend existing construction and finishes or complement existing finishes and color palettes. HVAC, plumbing, electrical, technology, security, fire alarm and fire suppression, lighting, and other systems shall be evaluated for replacement or reuse. Secured access points shall be designed to include multi-factor authentication protocol including biometric technology.
Site work is limited to airside and landside modifications to accommodate building modifications and additions. Modifications to expand the apron to accommodate aircraft parking and movement will be addressed in a separate project.

![Diagram of Work Parts]

**Figure 1: Diagram of Work Parts**

**Extent of Project Work – Parts A thru D:**

1. **Part A: Ticketing Counter/Checked Baggage/Baggage Makeup**
   a. Renovation of approximately 22,500 SF
   b. Addition of approximately 28,500 SF
   c. Specific Components include:
      i. **Ticketing Counter:**
         1. Replacement of approximately 12,750 SF counter.
         2. Counter design shall be straight.
         3. Counter to accept standard airline inserts.
      ii. **Airline Ticketing Offices (ATOs):** New shell spaces of approximately 9,750 SF for ATOs shall be designed. Shell space includes demising walls with taped gypsum board, concrete floor slab, exposed ceiling, electrical and telecommunications raceways and
mechanical equipment for future connection. Design for fit-out of ATOs is by others or will be provided as an additional service.

iii. Outbound Baggage Screening: At the direction of RAP, Consultant shall design an in-line Checked Baggage Inspection System (CBIS) or a traditional baggage belt system. CBIS shall include conveying systems from the ticket counters to the screening devices to carousels for airline retrieval. Traditional Baggage Belt Conveyor System shall include conveyors from ticketing to screening devices for airline retrieval. With either system, post-screening baggage make-up shall be designed for tug maneuvering. Additional power will be provided for electric ground support equipment (GSE) identified in the TPS.

2. **Part B: Concourse Expansion and Renovation**

   a. Renovation of approximately 26,260 SF of existing concourse for new wayfinding and signage and renovation to engineered systems as needed for building addition. Existing floors, walls, and ceilings shall remain, unless impacted by engineered systems modifications.

   b. Addition of approximately 24,000 SF concourse: The expansion shall include new gates, gate queuing areas, gate seating, and concourse circulation.

   c. Program elements within the renovation or addition include: a Mother’s Room, Quiet Room (potentially combined with Mother’s Room), Service Animal Relief Area (SARA), concessions space (approximately 4,000 SF), and an outdoor deck for peak season overflow waiting/seating on the post-secure side of the terminal.

   d. Consultant shall design enclosure of existing stairs leading from the gate areas down to the apron.

   e. Consultant shall conduct Airspace Analysis, Air Traffic Control Visibility Analysis (Shadow Study), define gate lead-in lines and determine safety envelopes, and develop appropriate paths for tug maneuvering and routing.

   f. New passenger boarding bridges (PBB’s) comprised of the following scope:

      i. Aircraft movement study as required for planning of new PBBs.

      ii. Apron pavement markings as required.

      iii. Three (3) new PBBs with electric ground power unit (GPU) including fixed walkway, rotunda, and connections to the terminal. Pre-conditioned air (PCA) units shall be included as a bid alternate for each PBB.

      iv. Addition of baggage belts at bottom of three (3) new PBB’s.

   g. At apron lighting, provide new Light Emitting Diode (LED) fixtures at new gates; for apron lighting not already converted to LED, replace existing apron
lighting with LED fixtures. Consideration shall be given to shielding of apron lights for dark sky requirements.

h. New shell spaces for concessions and tenant use for future build-out by others. Design shall include:
   i. Walls: perimeter walls with taped gypsum board, concrete floor slab or exposed subbase for future floor, exposed ceiling
   ii. Mechanical: heating and cooling unit for future connection, sized and located based on Owner direction
   iii. Electrical: power to subpanel, sized and located based on Owner direction
   iv. Plumbing: domestic water to single location, sized and located based on Owner direction
   v. Sanitary: sanitary piping to a single location, sized and located based on Owner direction
   vi. Fire Protection: coverage of shelled space
   vii. Telecommunications: raceway to communications closet
   viii. Design shall not include actual vendor buildouts or extensions of utilities or systems within the spaces provided. Design for fit-out of vendor spaces is by others or will be provided as an additional service.
   i. Add an outdoor peak season waiting/seating area.
   i. Design to include Wi-Fi coverage.

3. **Part C: TSA Checkpoint Reconfiguration**
   a. Renovate 6,300 SF and provide a 4,300 SF addition to accommodate the reconfigured checkpoint.
   b. The layout of the existing TSA Checkpoint shall be reconfigured to accommodate a third lane of TSA Security Screening Checkpoint (SSCP)/Queuing. The existing floor slopes along the TSA Checkpoint path; elevations shall be verified, and the sloping condition considered in the redesign of this area.
   c. TSA Supervisor stations shall be reconfigured as appropriate to meet current standards.
   d. During concept design, Consultant shall review potential relocation of the administrative office spaces to accommodate the TSA-compliant checkpoint.
   e. In conjunction with this checkpoint reconfiguration, the secure exit lane (also known as “flip-flow”) devices for arriving passengers shall be moved to the far south end of the exit corridor to reduce congestion in the concourse.
4. Part D: Rental Car and Baggage Claim Addition:
   a. Rental Car Addition: addition of approximately 2,800 SF shall include shell space for new Rental Car Offices and Customer Service Counters. Shell space includes demising walls with taped gypsum board, concrete floor slab, exposed ceiling, electrical and telecommunications raceways and mechanical equipment for future connection. Design for fit-out of Rental Car Offices is by others or will be provided as an additional service.
   b. Customer queuing shall be designed to accommodate peak summer travelers with consideration being given to circulation flow.
   c. Canopies at the Car Rental Parking Lot shall be designed for weather protection and snow removal access.
   d. Baggage Claim Addition: addition of approximately 6,000 SF shall include new baggage carousel and passenger circulation space; total of three bag claim devices (two existing, relocated devices and one new device).
   e. Consultant shall develop appropriate paths for tug maneuvering and routing from aircraft to baggage claim.

Scope of Services

The fundamental sequence of the Project is anticipated to be the following:

Design:
1. Conceptual Design
2. Schematic Design
3. Design Development
4. Contract Documents

Bidding/Permitting:
1. Bidding
2. Permitting

Construction:
1. Construction (future phase, not in scope)
2. Warranty Phase (future phase, not in scope)

Basic Services

The tasks that comprise the scope of basic architectural and engineering services are the following:

Project Management

Project Management shall take place throughout the course of this project. The Consultant shall coordinate project progress and issues with the Owner, manage the Consultant’s activities, provide oversight and quality control, check documents, and
organize project information. The Consultant shall communicate with other project team members. The Consultant shall disseminate updated information and design input. Specific tasks related to Project Management are listed below:

- Scoping and fee negotiations and responses to Independent Fee Estimate Review
- Project invoicing and accounting
- Owner and subconsultant communications
- Direction to and coordination of in-house personnel
- Direction to and coordination with subconsultants
- Management of project budget and schedule
- Coordination and facilitation of Quality Checks at the end of each phase

**Conceptual Design**

At the onset of the Conceptual Design phase, the design team will review and confirm the Owner’s project requirements and establish the Basis of Design. This information will be used to set all performance expectations for the project.

Based on the Owner’s approved program (space requirements and functional relationships) of January 2021 and preferred alternative selected in April 2021, the Consultant shall prepare one (1) to three (3) concept designs which incorporate the four (4) work parts described above (Part A through Part D). Concepts shall include site plan with optimized aircraft parking positions, floor plans and a preliminary massing study, and a rough order of magnitude (ROM) cost opinion.

This phase will also include an existing building utility systems analysis. Engineers shall review existing system documentation, provide site observation of the systems to determine the general condition, and meet with facilities engineers to discuss anecdotal information on system performance. Information gathered from the above-mentioned effort will be used to develop an opinion of system condition and capacity and probable system modifications needed to accommodate the renovation and expansion. As part of the analysis, the engineers will identify preliminary strategies and priorities for building system design and layout to accommodate Parts A through D as separate packages. A brief (one page/system) narrative shall be included as part of the deliverables.

As part of this Concept Design process, the team can explore sustainable design solutions with the Owner. Exploring sustainable design would be addressed through a charrette process while the team is on site. Design fees for sustainable design are not included in the base budget, but this service can be provided if requested.
At the completion of the concept design phase, the Owner shall select the preferred concept to be developed further in the schematic design phase.

**Schematic Design**

Based on the Owner’s preferred concept, Consultant shall perform the schematic design and prepare the related documents. The Schematic Design (SD) determines the preliminary design, scale, and relationships among the components of the project. The primary objective is to develop a clearly defined design with a comprehensive scope, as well as define significant materials and building systems.

This phase of the design will include refinement of the conceptual floor plans and development of exterior elevations. Preliminary selections of major building systems and construction materials shall be noted on the drawings or described in a narrative. This phase will consider integration of structural, mechanical, electrical, and plumbing systems and components. It will also establish basic relationships and layout of site improvements.

The deliverables provided at the conclusion of the Schematic Design shall be schematic level site plan, architectural floor plans, building elevations, key building sections, narratives for civil, architectural, and interior design, and building systems narratives for structural, passenger boarding bridges, baggage handling, plumbing, HVAC, electrical, fire protection and technology.

Work includes the following:

- Existing conditions coordination.
  - Coordinate with surveyor (subconsultant) to complete a site survey, including existing structures, topographical elevations, private and public utility locations, and concourse elevations at existing passenger boarding bridges
  - Coordinate with geotechnical engineering subconsultant to provide borings and geotechnical report
  - Coordinate site plan and building elevation with site survey
  - Review geotechnical report for impacts to conceptual and schematic design of building
  - Confirm existing conditions of areas of renovation, including dimensions, utilities, equipment, and elements to remain
  - Confirm existing conditions of areas of demolition
• Develop schematic level plans
  √ Architectural
  √ Structural
  √ Civil/Site
• Develop preliminary floor plans, elevations, and sections
  - Resolve building massing and layout to schematic level
  - Refine Floor Plans
  - Develop preliminary demolition plans
  - Indicate major spaces showing typical furniture, fixtures, and equipment
  - Develop preliminary wall and building sections
  - Develop preliminary building elevations
  - Select primary interior and exterior finishes
• Develop preliminary civil plans, composed of the following:
  - Identify conceptual paving and drainage scope
  - Research storm water regulatory requirements and develop conceptual design solution
  - Develop preliminary utility line routes, connection locations and building entry points
  - Develop preliminary site demolition plans
• Develop preliminary structural concept
  - Review the geotechnical report and develop preliminary foundation, slab and structural frame criteria
  - Develop preliminary structural systems and materials
  - Identify lateral resistance requirements and conceptual design solutions
• Provide preliminary building code review
• Prepare schematic level 3D perspective imagery
• Develop schematic level engineering calculations
• Evaluate options for building systems
• Prepare life cycle assessment of systems equipment
• Determine extent of systems demolition
• Provide narratives of proposed building systems
• Provide narratives of proposed technology systems composed of the following:
  - Structured cabling, composed of data closet layout, data cabling & pathway design
  - Basic cabling layout for wireless access points (WAP) based on a grid pattern
  - Security system (access control system and video surveillance).
• Identify up to (3) three Alternate Bid Items (ABI’s)
• List key materials and surface finishes
• Develop SD Level Opinion of Probable Cost
At the completion of the Schematic Design phase, the Consultant shall deliver the following documents to the Owner:

- Documents, provided electronically in PDF format
- One (1) hard copy of the documents (drawings and narratives) provided to the Owner
  - Additional printed copies requested shall be provided on a reimbursable cost basis
- SD Level Opinion of Probable Cost

**Design Development**

In the Design Development Phase, the building systems and materials established in the Schematic Design Phase shall be further developed and incorporated into the documents.

The documents shall consist of drawings and other documents including plans, sections, elevations, typical construction details, and diagrammatic layouts of building systems to fix and describe the size and character of the Project as to architectural, structural, mechanical, and electrical systems, and such other elements as may be appropriate. Cross-discipline coordination will confirm appropriate room sizes, spaces, circulation, and adjacencies. Detailed building code investigation will identify rated construction elements, exiting requirements, building classification and other life-safety requirements.

The deliverables provided at the conclusion of the Design Development Phase shall be design development level site plans, architectural floor plans, elevations, sections, preliminary details, and schedules. The plans shall be developed to show proposed architectural and engineering systems. Draft technical specifications shall be provided.

Work includes the following:

- **Building code**
  - Advance building code review
  - Apply building code requirements to plans

- **General**
  - Building/Zoning Code Review
    - Site setbacks (including FAA requirements)
    - Height Restrictions
    - Public Rights-of-Way
    - Construction Type
    - Occupancy Type
    - Area Summary
    - Exiting Requirements
    - Room Occupancies
- Preliminary Energy Modeling
  - Construction Staging Plans
    - Proposed Construction Staging Plans
    - Preliminary Phasing Plans

- Site/Civil
  - Topographic/Utility Survey results
  - Project limit lines delineated
  - Site Demolition Identified
  - Building footprint
  - Rough grading plan
  - Site utilities plans – existing and proposed
  - Site drainage contours, conveyance devices and grading
  - Pavement design, grading and extents
  - Environmental compliance work assessments or reviews, including SEPA, NEPA, CEQA, Categorical Exclusions (CATEX). Note that a CATEX may be required in a future phase if the Project will be added to the ALP

- Architectural
  - Floor Plans
    - Project limit lines
    - Selective demolition identified
    - Room sizes and configurations
    - Doors, windows, furniture and equipment located
    - Building core elements and vertical penetrations
    - Key dimensions and overall dimensions
    - Room names and functions
    - Mechanical and Electrical room layouts and sizes
    - Technology Room layout and sizes
    - Exterior Elevations
    - Window fenestrations, mullion spacing and other visual elements
    - Materials identified
    - Floor Lines
    - Finish grades and relationship to existing
    - Setbacks and overhangs
  - Building Sections
    - Floor to floor heights
    - General Ceiling heights
    - Wall/roof/floor section components
    - Structural system
- **Roof Plan**
  - Slopes and drain locations
  - Roof material
  - Major roof mounted MEP equipment, openings, skylights
  - Antenna pathways or placement
- **Wall Sections**
  - Interior and exterior wall conditions
- **Interiors**
  - Selection of materials and finishes for floors, walls, and ceilings
  - Room finish schedule
  - Assist RAP with Furniture, Fixture and Equipment (FFE) selection
  - Coordination of furniture samples to be sent to RAP for review, testing and approval
  - Coordinate selections of finishes/fabrics for furnishings
  - Coordination of miscellaneous equipment furnished/installed by contractor and furnished by owner/installed by contractor, such as desktop scanners and printers, multifunction devices, breakroom equipment

**Preliminary furniture, fixtures, and equipment layout**
- **Presentation Materials**
  - 3-D renderings (up to 4 describing major spaces or design components)
  - A 3-D digital animation

**Structural**
- Governing code and design criteria
- Selective demolition identified
- Foundation plans
- Floor and roof framing plans
- Framing elevations
- Primary construction details

**Mechanical / Plumbing/Fire Protection**
- Narrative of Owner specific design criteria
- Drawings indicating specific approach, type of system and major equipment
- Building utilities identified and coordinated with Civil
- Selective Demolition Identified
- Description of scope of proposed control system(s)
- Mechanical room size(s) coordinated
- System schematics – key equipment and main distribution located
- Coordinated building sections and plans to indicate routing and equipment size limitations

- **Electrical and Technology**
  - Drawing showing the scope and design of the following:
    - Selective demolition
    - Lighting
    - Power
    - Voice/Data (structured cabling)
    - Paging
    - Television
    - Access Control
    - Intrusion Detection
    - Video Surveillance
    - Audio/Visual
    - Design, placement coordination and integration of FID’s, BID’s, and GID’s onto the SCS platform
  - Fire Alarm

- **Passenger Boarding Bridges (PBBs)**
  - Narrative of Passenger Boarding Bridge work scope
  - Coordination with Civil on PBB layout, aircraft parking positions and aircraft gate schedules
  - Design Development Level PBB plans and outline specifications

- **Baggage Handling Systems (BHS)**
  - Updated Narrative of systems for outbound and inbound baggage
  - Design Development Level Baggage plans and outline specifications for outbound baggage, security screening and inbound baggage claim carousels
  - Coordination with TSA requirements

- **Wayfinding and Signage**
  - Narrative of Wayfinding and Signage systems
  - Design Development Level Signage and Wayfinding Plans
  - Preliminary Signage Message Schedule

- **Design development level calculations**
  - Architectural
  - Civil
  - Structural
  - Mechanical
  - Electrical
  - Plumbing
- Fire Protection
- Technology

• Prepare draft technical (outline) specifications
• Cost Opinion
  - Develop DD Level opinion of Probable Cost

At the completion of the Design Development phase the Consultant shall deliver the following documents to the Owner:

✓ Documents, provided electronically in PDF format
✓ One (1) hard copy of the documents (drawings, narratives and specifications) provided to the Owner.
  - Additional printed copies requested shall be provided on a reimbursable cost basis
✓ Preliminary finish samples for interior and exterior materials
✓ DD Level 3-Dimensional Renderings and Animation
✓ DD Level Opinion of probable cost

Construction Documents - Parts A through D

In the Construction Documents (CD) Phase, drawings and specifications shall be generated for bidding and construction purposes. Discipline drawings and specifications shall be finalized which incorporate the comments from previous phases. This proposal is based upon the simultaneous production of construction documents for Parts A – D. The deliverables provided at the conclusion of the Construction Document Phase shall be bid plans and specifications, separated into (4) bid packages, one for each of these four major work parts:

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

In this phase, the Bid Sets for the four parts will be submitted to permitting authority for review. The costs for plan application, review fees and permit fees shall be paid by Owner.

The work for each part includes the following:

• Building code
  ✓ Finalize building code review
  ✓ Apply code requirements to plans
• Finalize design calculations
- Finalize drawings
  - Civil
  - Structural
  - Architectural
  - Interior Design
  - Wayfinding and Signage
  - Passenger Boarding Bridges
  - Baggage Handling Systems
  - Mechanical
  - Plumbing
  - Fire Protection
  - Electrical (includes special systems)
  - Technology
- Finalize building rendering (5 views)
- Finalize technical specifications, including Division 1 General Requirements
- Prepare front-end solicitation documents, coordinating the Owner’s standard documents with the technical specifications and the Division 1, General Requirements
- Updated Opinion of Probable Cost (90% CD)

At the 90% and at the 100% completion milestones and at the completion of Bid Documents during the Contract Documents phase, the Consultant shall deliver the following documents for each of the four parts:

- Owner Construction Document (CD) review
  - Deliver 90% Construction Documents including: drawings, rendering, specifications, and Opinion of Probable Cost to Owner for review
  - One (1) hard copy and one set in PDF format to Owner
- 100% Construction Documents submittal to plan review agency
  - Submit, electronically, plans, specifications, and calculations to plan review agency
  - Incorporate revisions resulting from plan review into Bid documents
  - One (1) hard copy and one set in PDF format to Owner
- Bid Documents distribution
  - Deliver digital bid documents (plans and specifications) to Owner or Owner’s printer for printing and distribution to bidders.
  - One (1) hard copy of Bid Set (plans and specifications) to Owner
**Bidding Services [Design-Bid-Build] - Parts A through D**

In the Bidding Phase, Consultant shall manage the bidding process, which will be completed in the four parts noted above. For each part, bidding documents shall be distributed to interested bidders and plan-houses. Consultant shall coordinate and facilitate a scheduled pre-bid meeting, answer questions from contractors and provide clarifications of the building portions of the bidding documents. Consultant shall also review requests for substitutions of specified materials and, if required, prepare addenda for issuance to plan holders and bidders.

The scope of architectural/engineering services includes preparation of one complete set of construction documents (plans and specifications) for each individual work part (Parts A through D), together comprising the entire scope of the work. Work parts may be issued in up to four (4) packages, one set of documents for each Part.

Our proposal is based on all packages being bid concurrently. Supplemental design fees will be incurred if bidding of any package is delayed. In addition to fees for increases in employee wages, fees may be incurred for program changes and code changes that occur during the period between when the initial package(s) is(are) bid and the date for bidding of the remaining packages.

Work includes the following for each of the four parts:

- Issue clarifications during bid period
  - Provide answers to contractor bidding questions
  - Prepare addenda
  - Investigate requested substitutions
  - Advise Owner as to acceptability of substituted materials/equipment
- Bid evaluation
  - Assist Owner in evaluating the bids
- Attend bid opening and tabulate bid results, as noted in “Meetings and Travel/Trips” scope below

**Meetings and travel/trips – Design and Bidding Phases**

The tables below indicate attendee designations and meetings that the consultant’s team members will attend during the design, bidding and permitting phases, in-person or remote online. Attendees noted below are those that are planned; actual attendees may vary based on issues to be addressed and ability to coordinate schedules of all parties.
Attendee designations are:

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<th>Attendee Designation</th>
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<tr>
<td>PP</td>
<td>Project Principal</td>
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<tr>
<td>CC</td>
<td>Client Contact *</td>
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<tr>
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<td>A</td>
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<td>G</td>
<td>Geotechnical Engineer</td>
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<td>Su</td>
<td>Surveyor/ Topographical and Utility</td>
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<td>L</td>
<td>Landscape Architect</td>
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<td>CE</td>
<td>Cost Estimator</td>
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* asterisk = Core Team (CC, PrM, PM, A, D)

**Milestone** | **Attendees in-person** | **Remote Attendees on Teams**
---|---|---
Conceptual Design Kick-off | Core Team, PP, C, M, S, P, E, T | |
End of Conceptual Design and Schematic Design Kick-off | Core Team, PP, C | |
50% Schematic Design | | All team
End of Schematic Design | Core Team, ID, C, S, M, P, E, T | PP
Permitting Authority Meeting | PM, A, and/or FP | |
50% Design Development | Core Team, ID, C | S, M, P, E, T
End of Design Development | Core Team, PP, ID, C, S, M, P, E, T | |
50% Construction Documents | Core Team, ID, C, D, M, P, E, T | |
90% Construction Documents | Core Team, ID, C | PP, D, S, M, P, E, T
100% Construction Documents | All team | |
Pre-bid meeting | PM or A or D | |
Bid Opening/Evaluation | PM or A or D | |

**Special Services – which are included in this scope of work:**
The tasks that comprise the scope of included additional services are the following:
1. FAA Related Services
2. TSA Related Services
3. Stakeholder Outreach and Presentations
4. Sustainable Design
5. Site Topographic Survey
6. Geotechnical Investigation and Report
7. Opinions of Probable Construction Cost
**FAA Related Services**

Provide the following FAA related services and coordination:

- Develop, with input from Owner, justification package for FAA and the State of South Dakota. This shall include up to five (5) meetings.
- Preliminary design report, including an updated FAA Airport Improvement Program (AIP) Eligibility analysis.
- FAA Eligibility Review meeting (by phone) with FAA.
  - PDF and one hard copy shall be provided to the FAA.
- Coordinate and incorporate FAA required contract terms and conditions into the Owner’s standard solicitation and contract form.
- Update FAA Design report, including updated eligibility analysis.
- Attend a progress meeting with the Airport and FAA at the Airport District Offices (ADO) to finalize eligibility analysis.
  - Attend 1 meeting at ADO (1 PM, 1 CC)
  - Attend 1 meeting (by phone) (1 PrM, 1 A)
- Updated FAA required engineer’s design report
  - PDF and one hard copy shall be provided to the FAA
  - Updated FAA AIP eligibility analysis.

**TSA Related Services**

Provide the following TSA related services and coordination:

- Attend initial and subsequent progress meetings with the Airport and TSA as required for outbound and inbound Checked Baggage, and TSA Checkpoint.
- Follow TSA Guidelines and standards for checkpoint and checked baggage.
  - For CBIS follow process and requirements as outlined in current version of the Planning Guidelines and Design Standards (PGDS) for Checked Baggage Inspection Systems
- Provide required deliverables at defined TSA milestones.
- Coordinate/incorporate TSA required contract terms and conditions into the Owner’s contract form.

**Stakeholder Outreach and Presentations**

At the end of the Schematic Phase and again at the end of Design Development phase, conduct formal in-person presentations of the design to the various stakeholders including the Board, Airlines, FAA, TSA, and tenants, as desired or directed by the Owner, including up to ten (10) in person meetings total, or five (5) meetings per SD and DD phases. Additional presentations to South Dakota Department of Transportation (SD DOT), City Officials and regional economic development team are also planned in this work scope, including up to three (3) virtual and three (3) in-person meetings.
**Sustainable Design**
Consultant shall conduct Sustainable Design presentations and develop alternatives for implementing sustainable design solutions.

Services to be implemented for sustainable design include:
- Sustainability/LEED Consulting, including up to three (3) workshops and coordination meetings to develop sustainable basis of design, project vision, and develop a proposed LEED scorecard. Based on the sustainability goals developed in this process, Division 1 sustainability specifications will be prepared.
- Energy Modeling: Prepare up to five (5) design options for architectural, mechanical, electrical, or renewable energy systems.
- Energy and water analysis: Explore opportunities for reducing energy consumption and to evaluate potable and onsite non-potable water sources and use.
- Provide a whole building life-cycle assessment including strategies for embodied carbon reduction.
- Develop strategies for the procurement of low carbon construction materials.
- Provide daylighting analysis.
- Provide fundamental and enhanced commissioning (design phase services only).
- Provide building envelope commissioning (design phase services only).

**Site Topographic Survey**
Consultant shall facilitate completion of a field topographic survey of the proposed site to document existing site topography and planimetrics. Substantial, visible improvements will be located on and directly adjacent to the site, including buildings, walks, curbs, drives, gutters, walls and fences. Visible indications of surface utilities lying within the project limits shall be located, as will rim elevations for drainage structures present. Project site is assumed to be completely located within airport property. Utilities shall be researched via locates. Utility easements shall be researched via preparation of a title report. A boundary survey showing property lines is not included; however, a boundary survey may be required in the future if utility easements are identified in the project area.

**Geotechnical Investigation and Report**
Consultant shall facilitate completion of soil borings and a geotechnical report to define subsurface soil conditions, site seismic parameters, and allowable bearing pressures for foundations and pavement design parameters in the area(s) of the project.

**Opinions of Probable Construction Cost**
The table below indicates the milestones at which the Cost Estimator (subconsultant) will provide an opinion of probable construction cost and the basis for the development of that cost. Costs are based on the consultant’s and subconsultant’s previous experience.
with similar construction projects and/or data from industry historical costing resources, such as RS Means.

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept Design</td>
<td>Rough Order-of-Magnitude cost or cost range, based on project type and overall size</td>
</tr>
<tr>
<td>Schematic Design</td>
<td>Budget level estimate based on cost per square foot of each of the major building systems and site scope</td>
</tr>
<tr>
<td>Design Development</td>
<td>Detailed estimate based on designed quantities and quality of materials, products, equipment and systems.</td>
</tr>
<tr>
<td>90% Construction Documents</td>
<td>Detailed estimate based on final quantities and quality of materials, products, equipment and systems.</td>
</tr>
</tbody>
</table>

**Construction Administration and Warranty Phases (future phases)**

Mead & Hunt, Inc. shall provide a future proposal for Construction Administration and Warranty Phase services as required, associated with the project as described above.

**Work Not Included in the Scope; can be added upon request with associated fee:**

- Tenant Improvement Designs, including: ATOs, concessions, restaurants, car rental
- Coordination of Owner’s consultants
- Traffic studies
- Upgrades/re-design of site utilities to meet facility demand requirements (water, electrical, steam, hot water, chilled water)
- Design of auxiliary structures (i.e. fuel farm, etc.)
- Construction administration services (future phase)
- Warranty phase services (future phase)
- Redesign due to changes in Owner or FAA directives established in previous stages of design
- Multiple bid packages, beyond the four parts described above
- The cost to re-bid or redesign the project in the event the project bids exceed project budget
- Value engineering
- Contractor negotiations after bidding
- Submittals or presentations to Local Neighborhood Groups, Planning Commission, Design Review Board
- Planning and Building Inspection Department review meetings beyond those indicated in scope of services
- Development applications and reviews
- Plan review and permit fees, fees related to Building Department and related agency (including utilities) review
- Contract-award/reconciled drawing set ("Issued for Construction" Set)
• Physical modeling of the facility. As noted above, facility will be modeled using 3-dimensional graphic programs to illustrate the design intent.
• Three-dimensional building/floor plan survey of existing facility, utilizing Matterport® 3D equipment and software, to document existing conditions.
• Site utility re-design, other than lateral connections from nearby utility mains
• Utility main extensions – it is assumed that utilities are adjacent the site
• Hazardous materials investigation or mitigation efforts. If hazardous materials are found in the work, the Owner shall contract separately to mitigate and/or have them removed
• Landscape Design
• Inventory of Owner’s existing furniture, fixtures and equipment
• Drawings and specification printing other than as described in deliverables
• Supplemental information documents for unknown existing conditions, field changes, Owner design changes
• Custom furniture and fixture design
• Additional parking development to offset lost parking
• Flood plain management. Site is assumed to be clear of relevant flood plains
• Completion or update of Master drainage report(s).
• Design, specification, integration, upgrade or overhaul of existing or new Parking and Revenue Control System (PARCS). (Completed in 2021)
• Specification, ordering, extending or coordinating telecommunications carrier services (e.g., POTS, DSL, T1, fiber-optic based services, CATV, DSS). Design, specification, and integration of wired network (e.g., LAN/ WAN/SAN) or voice communication systems including systems architecture, active hardware (e.g., switches, routers, servers, desktop PCs) and software applications.
• Design and specification of wireless voice or data systems.
• Design, specification, integration, or coordination of distributed antenna systems (DAS) including Public Safety, cellular and Wi-Fi frequencies.
• RF (radio frequency) design, specification, or integration for existing or new systems and equipment.
• IT cutover, migration or relocation planning and coordination.
• Design and specification of sound masking for speech privacy system.
• Design, specification, integration, upgrade or overhaul of existing or new Emergency Communications Systems (e.g., ‘blue light telephones’). Design services beyond the schedule durations noted in this Scope of Services document, including delays in the project schedule due to (but not limited to) issues such as modification to scope, funding delays, Owner decisions. Fees for design services for Parts prepared after the durations noted in this Scope of Services document will be subject to modification for salary rate increases and other associated cost increases.
4. ADDITIONS TO OWNER’S RESPONSIBILITIES

A. Owner shall have those responsibilities set forth in Article 2 of the Main Agreement, and the following supplemental responsibilities that are specific to this Task Order:

**Responsibilities of Owner**

Consultant’s Scope of Services and Compensation are based on the Owner performing or providing the following:

- A designated representative with complete authority to transmit instructions and information, receive information, interpret policy, and define decisions (Owner)
- Access to the project site and airport campus
- Protection of Mead & Hunt-supplied digital information or data, if any, from contamination, misuse, or changes
- Copies of available data on existing facilities and property
- Copies of previous related investigations
- Contact information for local utilities and agencies when needed
- Copies of local ordinances and covenants pertinent to this project
- Lists and data on equipment and vehicles required for accommodation
- Timely reviews and comments

5. TASK ORDER SCHEDULE

A. A formal schedule shall be developed at the onset of the project as part of the Project Management activities. Our proposal is based upon the following estimated durations:

- Concept Design Phase: 12 weeks
- Schematic Design Phase: 12 weeks
- Design Development: 15 weeks
- Construction Documents: 23 weeks
- Bid Phase: 6 weeks
- Total Project Schedule: 68 weeks
6. **ARCHITECT / ENGINEER’S COMPENSATION**

A. The terms of payment are set forth in Article 4 of the Main Agreement.

<table>
<thead>
<tr>
<th>Description of Service</th>
<th>Amount</th>
<th>Basis of Compensation</th>
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</thead>
<tbody>
<tr>
<td>1. Basic Services</td>
<td></td>
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<tr>
<td>a. Concept</td>
<td>$639,973.00</td>
<td>Lump Sum</td>
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<td>b. Schematic Design</td>
<td>$964,262.00</td>
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</tr>
<tr>
<td>c. Design Development</td>
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<tr>
<td>d. Construction Documents</td>
<td>$2,588,424.00</td>
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<tr>
<td>e. Bidding</td>
<td>$235,935.00</td>
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<td>f. FAA Related Services</td>
<td>$109,317.00</td>
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<td>g. TSA Related Services</td>
<td>$144,345.00</td>
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<td>h. Stakeholder Outreach and Presentations</td>
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<tr>
<td>i. Sustainable Design</td>
<td>$207,888.00</td>
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<tr>
<td>2. Resident Project Representative Services</td>
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<tr>
<td>TOTAL COMPENSATION (Items 1 and 2)</td>
<td>$6,797,397.00</td>
<td>Lump Sum</td>
</tr>
<tr>
<td>3. Additional Services under Section 2.D above</td>
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<td></td>
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B. Compensation items and totals based in whole or in part on Hourly Rates or Direct Labor are estimates only. Lump sum amounts and estimated totals included in the breakdown by phases incorporate Engineer’s labor, overhead, profit, reimbursable expenses (if any), and Subconsultants’ charges, if any. For lump sum items, Architect / Engineer may alter the distribution of compensation between individual phases (line items) to be consistent with services actually rendered, but shall not exceed the total lump sum compensation amount unless approved in writing by the Owner.
7. ENGINEER'S PRIMARY SUBCONSULTANTS FOR TASK ORDER, AS OF THE EFFECTIVE DATE OF THE TASK ORDER:

A. Mead & Hunt, Inc. will self-perform the Architectural, Interior Design, Civil, Structural, Mechanical, Plumbing, Fire Protection, Electrical, and Technology work. The services of the following subconsultants will be retained:

- Geotechnical Engineering Consultant: FMG, Inc.
  Rapid City, SD 57702
- Topographical and Utility Surveyor: FMG, Inc.
  Rapid City, SD 57702
- Passenger Boarding Bridge Engineer: AERO Systems Engineering, Inc.
  Marietta, GA 30067
- Baggage Handling Consultant: Logplan LLC
  Denver, Colorado 80111
- Wayfinding and Signage Consultant: Eidahl Environmental
  St. Paul, MN
- Concessions Planning Consultant: ICF
  Cambridge, MA 02140
- Cost Estimating Consultant: Concord Group
  Chicago, IL 60603

8. EXHIBITS AND ATTACHMENTS:

A. Mead and Hunt Fee Proposal Summary (67 pages)
B. "Exhibit A" - KLJ / Alliiance Terminal Planning Study - April 2021 (38 pages)
Execution of this Task Order by Owner and Architect / Engineer makes it subject to the terms and conditions of the Main Agreement and its exhibits and appendices, which Main Agreement, exhibits, and appendices are incorporated by this reference.

OWNER: RAPID CITY REGIONAL AIRPORT
By: __________________________
Print Name: Rod Pettigrew
Title: Airport Board of Directors President

ARCHITECT / ENGINEER: MEAD & HUNT, INC.
By: __________________________
Print Name: Mary Shaffer
Title: Vice President

Architect / Engineer's License or Firm's Certificate No. (if required): C-6713
State of: South Dakota

DESIGNATED REPRESENTATIVE FOR TASK ORDER:
Name: Patrick Dame
Title: Airport Executive Director
Address: 4550 Terminal Road – Suite 102
Rapid City, SD  57703
E-Mail Address: Patrick.Dame@rcgov.org
Phone: 605.394.4195
Date: March 8, 2022

DESIGNATED REPRESENTATIVE FOR TASK ORDER:
Name: Dave Provencher
Title: Project Manager
Address: 2440 Deming Way
Middleton, WI  53562
E-Mail Address: Dave.Provencher@meadhunt.com
Phone: 608.443.0307
Date: February 22, 2022
DESIGN TEAM

ARCHITECT
Alliance
400 Clifton Avenue
Minneapolis, MN 55403
612.874.4100
www.alliance.us

CIVIL ENGINEER
KLJ Engineering
330 Knollwood Drive
Rapid City, SD 57701
605.721.5553
www.kljeng.com

BAGGAGE HANDLING CONSULTANTS
BNP Associates
1999 Broadway, Suite 4250
Denver, CO 80202
720.374.4930
www.bnpassociates.com
TABLE OF CONTENTS

TABLE OF CONTENTS
Abbreviations, Acronyms, and Initialisms 4

01 PROJECT OVERVIEW
Project Introduction 5
Project Location 6

02 DEMAND/CAPACITY AND FACILITY REQUIREMENTS
Overall Project Demand 8
Outbound Baggage: EDS Screening 9
Outbound Baggage: Makeup 10
Inbound Baggage: Claim Frontage 11

03 SITE PLANNING OPTIONS
Site Layout: Preferred Option — Full Build 12
Site Layout: Preferred Option — Reduced Build 13
Site Layout: Initial Options 14
Air Traffic Control Tower — Line of Sight (LOS) 15
Airspace — 14 CFR Part 77 Analysis 16

04 CONCEPTUAL DESIGN
Concourse Expansion Plan — Full BUILD 17
Concourse Expansion Plan — Reduced Build 18
Checkpoint Expansion — Future 19
Pre-Security Concessions and Administration Offices 20
Ticketing, Baggage Screening, Baggage Makeup, Claim Hall, and Car Rentals 21
Building Massing 22

05 ROUGH ORDER OF MAGNITUDE (ROM) COSTING
ROM Costing Summary 23

APPENDIX
Initial Options — Linear 30
Initial Options — Dog-Leg 31
ATCT Line of Sight: Preferred Option — Small Aircraft 32
Other Options: Administration Suite and Concourse Level 33
Pre-Security Commons 34
Other Options: Baggage Claim and Laydown 35
Other Options: EDS Baggage Screening 36

ISSUE HISTORY

<table>
<thead>
<tr>
<th>Rev</th>
<th>Date</th>
<th>Description</th>
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<tr>
<td>1</td>
<td>04.16.2021</td>
<td>Issued to Owner</td>
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## Abbreviations, Acronyms, and Initialisms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AC</td>
<td>Advisory Circular (FAA)</td>
</tr>
<tr>
<td>ACRP</td>
<td>Airport Cooperative Research Program</td>
</tr>
<tr>
<td>ADG</td>
<td>Aircraft Design Group</td>
</tr>
<tr>
<td>ADRM</td>
<td>Airport Development Reference Manual (IATA)</td>
</tr>
<tr>
<td>ASL</td>
<td>Automated Screening Lanes</td>
</tr>
<tr>
<td>ATCT</td>
<td>Air Traffic Control Tower</td>
</tr>
<tr>
<td>ATO</td>
<td>Airline Ticket Office</td>
</tr>
<tr>
<td>BHS</td>
<td>Baggage Handling System</td>
</tr>
<tr>
<td>BPH</td>
<td>Bags per Hour</td>
</tr>
<tr>
<td>BPM</td>
<td>Bags per Minute</td>
</tr>
<tr>
<td>BSO</td>
<td>Baggage Service Offices</td>
</tr>
<tr>
<td>CBIS</td>
<td>Checked Baggage Inspection System</td>
</tr>
<tr>
<td>CBRA</td>
<td>Checked Baggage Resolution Area</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>CRPG</td>
<td>Checkpoint Requirements and Planning Guide (TSA)</td>
</tr>
<tr>
<td>CT</td>
<td>Computed Tomography</td>
</tr>
<tr>
<td>DDFS</td>
<td>Design Day Flight Schedule</td>
</tr>
<tr>
<td>EDS</td>
<td>Explosive Detection System</td>
</tr>
<tr>
<td>FAA</td>
<td>Federal Aviation Administration</td>
</tr>
<tr>
<td>F&amp;B</td>
<td>Food and Beverage</td>
</tr>
<tr>
<td>GSE</td>
<td>Ground Service Equipment</td>
</tr>
<tr>
<td>HVAC</td>
<td>Heating, Ventilation, and Air Conditioning</td>
</tr>
<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
</tr>
<tr>
<td>LP</td>
<td>Linear Foot or Linear Feet</td>
</tr>
<tr>
<td>LOS</td>
<td>Level of Service (IATA)</td>
</tr>
<tr>
<td>LOS</td>
<td>Line-of-Sight</td>
</tr>
<tr>
<td>OE/AAA</td>
<td>Obstruction Evaluation / Airport Airspace Analysis (FAA)</td>
</tr>
<tr>
<td>PBB</td>
<td>Passenger Boarding Bridge</td>
</tr>
<tr>
<td>PDGS</td>
<td>Planning Guidelines and Design Standards (TSA)</td>
</tr>
<tr>
<td>PHP</td>
<td>Peak Hour Passenger</td>
</tr>
<tr>
<td>PMAD</td>
<td>Peak Month Average Day</td>
</tr>
<tr>
<td>RAP</td>
<td>Rapid City Regional Airport</td>
</tr>
<tr>
<td>RON</td>
<td>Remain Overnight</td>
</tr>
<tr>
<td>SF</td>
<td>Square Foot or Square Feet</td>
</tr>
<tr>
<td>TRB</td>
<td>Transportation Research Board</td>
</tr>
<tr>
<td>TSA</td>
<td>Transportation Security Administration</td>
</tr>
<tr>
<td>VSR</td>
<td>Vehicle Service Road</td>
</tr>
</tbody>
</table>
01 PROJECT OVERVIEW
Due to recent air service and industry changes, Alliance was retained by KLJ, the prime consultant, to reassess conceptual alternatives previously developed as the basis of design for the Outbound Baggage Expansion and Check-in Reconfiguration. Together with BNP Associates, Alliance provided refinements and developed new options to serve as the revised basis of design. In addition, Alliance assessed high-level conceptual concourse and gate expansion options based on the results from the Terminal Facilities Demand/Capacity analysis. This study included taking an inventory and tabulating the existing facilities’ terminal spaces including both public and non-public areas in order to compare demand associated with future facility requirements using a provided 20-Year Air Demand Forecast. Additional studies included alternative layouts for administration offices, pre-security concessions, inbound baggage claim expansion, and relocation of rental car facilities.

Rapid City Regional Airport (RAP) serves as a gateway into Rapid City, the surrounding region, and the Black Hills National Forest with its numerous attractions and adventures. RAP is located roughly four miles southeast of downtown Rapid City, South Dakota. RAP is a portal for passengers from near and far, and the airport serves as the entry point to downtown businesses, cultural events, or shopping; National Parks and Monuments; and caves, badlands, canyons, and forests.
01 PROJECT OVERVIEW

INTRODUCTION

PROJECT CONTEXT

RAP Airport

Rapid City Regional Airport | PLANNING STUDY FINAL REPORT
DEMAND/CAPACITY AND FACILITY REQUIREMENTS
02 DEMAND/CAPACITY AND FACILITY REQUIREMENTS

OVERALL FACILITY DEMAND

The overall terminal facility requirements were developed through the application of a variety of industry-accepted planning standards and guidelines including: ACRP Report 25, Airport Passenger Terminal Planning and Design; FAA AC 150/5360-13A, Airport Terminal Planning; FAA AC 150/5300-13A, Airport Security; the Transportation Security Administration (TSA) Checkpoint Requirements and Planning Guide; the TSA Planning Guidelines and Design Standards (PGDS) for Checked Baggage Inspection Systems Version 7.0; ACRP Report 130, Guidebook for Airport Terminal Restroom Planning and Design; and the International Air Transport Association (IATA) Airport Development Reference Manual (ADRM), 11th Edition. Additionally, planning factors from comparable airports around the U.S. as well as those unique to RAP, input from Airport and local TSA staff, and knowledge of industry trends informed the development of facility requirements for RAP.

IATA’s Level of Service (LoS) standards are typically utilized by airport planners to qualitatively or quantitively provide LoS planning factors at various processing functions within the terminal building. An “Optimum” LoS, often referred to as LoS “C”, was utilized when validating the functional passenger spaces; this classification is defined by IATA as providing “Good LoS; condition of stable flow; acceptable brief delays; good level of comfort.” Current utilization ratios were determined using the existing terminal lease CAD plans provided by the airport and the 2019 Design Day Flight Schedule (DDFS), which serves to establish a baseline condition of demand compared to current facility capacities.

Airport terminal facilities are typically programmed using demand associated with future projections of annual and peak hour passengers and operations. Although annual activity is a good indicator of overall airport size, peak hour volumes more accurately reflect demand for specific passenger processing functions within the terminal facilities. These peak hours are typically calculated from the peak month’s average day (PMAD) and are commonly referred to as Design Hour passengers. A ten-year 2029 DDFS was utilized for future calculations and represents the demand requirements to which all conceptual options were developed to meet.

This analysis used two types of peak passenger levels based on Preferential Use and Common Use. Preferential Use passenger levels refer to the peak activity for each carrier that occurs over a “rolling” 60-minute period based on that airline’s flight schedule. As a result, these Preferential Use peaks may happen at different times of the day and therefore do not typically coincide in the same clock hour. The assumption is that this peak demand is appropriate to use when determining the facility requirements for individual airlines that are operating under a Preferential Use agreement with the Airport. These areas include individual airline’s ticket counters, gates/holdrooms, and the baggage claim facilities. Common use peak passenger levels refer to the cumulative peak passenger volume in a given “rolling” hour for all airlines at the Airport. These common use peak demand levels are typically used for calculating non-airline specific functions such as passenger security screening, baggage screening, and public areas including general seating and meeter-greeter lobbies.

Results from the 2029 DDFS indicated a need for ten contact gates with associated passenger boarding bridges (PBB). Upon discussions with the airport, two additional gates were provided in the concourse expansion options for a total of twelve gates. This included a total of six large regional and six narrowbody size gates. The airport terminal includes a total of nearly 105,000 gross square feet. The ten-year forecast requires a total programmed area of approximately 182,000 square feet which exceeds current capacity by approximately 77,000 square feet. A majority of this additional area is allocated to areas such as outbound baggage screening and makeup, passenger gate holdrooms, and baggage claim and laydown areas. The results of the baggage space and unit requirements are described in greater detail in the following sections.
The flight schedule provided for a flight analysis was from 2019 and contains a total of 41 departure and 41 arrival flights. Following the TSA Planning Guidelines and Design Standards (PGDS) V7 guidelines in determining Explosive Detection System (EDS) equipment requirements, the surge-adjusted 10-minute demand of the design day in the design year (Date of Beneficial Use + 5) shall be used. On-screen resolution station and baggage inspection station requirements were based on the capacity of the EDS equipment. The passenger arrival profile used in the flight analysis was per PGDS V7. The design year for the new BHS in RAP is considered to be 2029.

Flight analysis shows a bag demand of 6.4 BPM or 384 BPH at the 10-min peak. This demand requires a Type I EDS for bag screening as the demand exceeds the capacity of Type II EDS device. Checked Baggage Inspection System (CBIS) and Checked Baggage Resolution Area (CBRA) are designed with Type I EDS device in an Inline configuration. One non-redundant and one redundant EDS of Type I, L3-6700 with 505 BPH capacity, will be adequate for the bag screening demand until 2042. Then two non-redundant and one redundant EDS will be required. The outbound inline system requires an estimated minimum combined area for CBIS and CBRA of 16,000 square feet. This area has space allocated for a third EDS shunt line which can be added in the future to meet the anticipated bag screening demand in 2042. Graph 1 to the left presents the bag screening demand calculated for design year 2029.
OUTBOUND BAGGAGE: MAKEUP

It is assumed that the make-up devices are opened for a flight starting 120 minutes before and ending 20 minutes prior to standard time departure. The total number of flights in process at the peak is 12 and the total number of cart presentation required is 29. Since the cart presentation peak is only for a short period of time, ten minutes, the following peaks were considered for sizing the make-up devices. Graph 2 at right shows that most of the peaks require a maximum of 24 cart presentation, therefore a total of two make-up devices will be adequate for the projected demand in design year 2029, each with a capacity of 12 cart presentation.
INBOUND BAGGAGE: CLAIM FRONTAGE

The results of the flight analysis for the inbound portion are illustrated in Graph 3 at right. A total of 282 linear feet of claim presentation is required and five concurrent flight arrivals will be processed at the peak. There are two claim devices currently in operation in RAP, each with a claim presentation of 84 linear feet for a total of 164 linear feet of frontage. Two additional new claim devices, with the same size as existing, will be adequate for the projected demand in design year 2029.

GRAPH 3: BAGGAGE CLAIM FRONTAGE REQUIREMENTS
03 SITE PLANNING OPTIONS
The preferred option provides a total of twelve bridged gates plus an additional remain overnight (RON) parking position which shares a passenger boarding bridge (PBB) with the adjacent gate. This increases existing parking capacity by four positions and PBB gates by five. These gates consist of six Large Regional (CR7/9, E75) and seven Narrowbody (739, A320) type aircraft including the RON position. In order to provide the greatest apron parking flexibility, nine of the thirteen parking positions allow for Narrowbody aircraft (739). Due to existing site constraints, the three existing gates on the southwest (Gates 2, 4, and 6) and existing Gate 1 to the southeast are restricted to Regional aircraft. Due to the existing ARFF building and tenant (Fugro) to the northwest, the preferred option “dog-legs” the concourse to the northeast a length of approximately 362 feet. This allows Narrowbody aircraft parking capability along the north face of the new expanded concourse. Apron access to the gates is from existing Taxiway A and is facilitated by the use of Aircraft Design Group (ADG) III taxilanes along all sides of the concourse, with the exception of Gates 2, 4, and 6 where the taxilane narrows to an ADG II. A new vehicle service road (VSR) located at the tails of the aircraft, runs the entire perimeter of the concourse. The VSR has a cross-over running under the departure level occurring just after the “elbow” of the new expansion. The double-loaded expanded concourse provides a width of nearly 100 feet allowing for increased gate holdroom depths.

An expansion of the building to the east of the existing terminal (a) allows for a new consolidated EDS baggage screening matrix and makeup area. A two-bay ticketing expansion (b) to the southeast is also provided to meet the 10-year demand requirements. The increased footprint for the checkpoint will be accomodated by an expansion to the west (c) at the existing checkpoint. An additional flat plate “T” baggage claim device and increased baggage laydown and circulation is also provided in a building expansion (d) to the northwest face of the existing terminal. Additionally, rental car counters and offices are relocated to a curbside building expansion (e) opening space for additional baggage claim retrieval and circulation.
Should funding capacity become a constraint, a reduced ten gate option was developed in order to meet the gate capacity need derived from the 2029 DDFS. This option provides six bridged regional gates and four bridged narrowbody gates, plus an additional narrowbody RON parking position. This position shares a PBB with the adjacent gate located at the end of the concourse. The expansion requires a build-out of approximately 207 feet in length, a reduction of 155 feet from the Full Build option. All other characteristics of the terminal and concourse expansion follow that of the Full Build.

### DIAGRAM KEY NOTES

- **Site Context**
  1. Fugro
  2. Runway 14/32
  3. Army National Guard

- **Building Expansion**
  a. Baggage Screening
  b. Ticketing
  c. Checkpoint
  d. Baggage Claim and Laydown
  e. Rental Cars

### SITE CONCEPT: PREFERRED OPTION FULL BUILD

Not to Scale
SITE LAYOUT: INITIAL OPTIONS

Several site expansion layout options were studied based on existing site constraints that include Runway 14/32 to the north, the Army National Guard to the east, and Fugro to the west. The development of each site option utilized industry-accepted planning parameters such as those identified in FAA AC 150/5300-13A and ACRP Report 25 relative to taxiway and taxilane dimensional criteria, aircraft parking depth and wingtip spacing, concourse width, and associated gate planning. A total of eleven options were developed and grouped according to two major site expansion orientations ("Linear" and "Dog-Leg") and subgrouped by the initial 10-year demand and future long-term potential. These options were developed to evaluate the extents of the site in regards to providing the most effective layout in terms of initial ten-year and future long-term gate capacity and apron aircraft parking and maneuvering efficiency. Refer to the appendix for additional content regarding the other options studied.
**AIR TRAFFIC CONTROL TOWER — LINE OF SIGHT (LOS)**

As stated in the FAA Advisory Circular on Terminal Planning (AC 150/5360-13A):

"It is critical to ensure the terminal building, related structures, and aircraft parked at gates will not compromise visibility from the ATCT. An unobstructed view of all controlled movement areas is required. This includes all runways, taxiways, any other landing areas, and air traffic in the vicinity of the airport."

Full Build and Reduced Build concourse options were reviewed for potential line-of-sight (LOS) issues as shown below.

**FULL BUILD**

The Full Build concourse expansion stops close to, but short of the LOS from the ATCT to the end of Runway 5. Aircraft parked on on the east end of the concourse may obstruct LOS depending on aircraft tail height. While further analysis would be required to determine potential limitations on aircraft parked on the end of the concourse, Figure 1 provides a general idea of shadowing from "taller" aircraft operating out of RAP like the Airbus A-320 and Boeing 737-800 for the Full Build. Refer to the Appendix (pg. 41) for a general idea of shadowing from "shorter" aircraft operating out of RAP like the CRJ-900.

**REDUCED BUILD**

The Reduced Build concourse expansion and parked aircraft associated with this option are not expected to obstruct LOS from the ATCT as shown in Figure 2.
AIRSPACE — 14 CFR PART 77 ANALYSIS

The FAA Advisory Circular on Terminal Planning (AC 150/5360-13A) states:

“Airport owner/operators must site passenger terminal facilities and associated vehicles (e.g., aircraft at gate positions) in compliance with airport imaginary surfaces and airspace.”

FULL BUILD

The “full build” concourse expansion building footprint would be below Part 77 Imaginary Surfaces as shown at right. Aircraft with tail heights greater than 38 feet may penetrate the Transitional Surface for parking positions on the east end of the concourse. The FAA Obstruction Evaluation / Airport Airspace Analysis (OE/AAA) process may result in a “Determination of No Hazard to Air Navigation” if analysis finds aircraft tail penetrations to the Transitional Surface will not have a “substantial aeronautical impact to air navigation” as detailed in 14 CFR Part 77.31.

REDUCED BUILD

The Reduced Build concourse and parked aircraft associated with this option would not penetrate Part 77 Imaginary Surfaces.
CONCOURSE EXPANSION PLAN — FULL BUILD

The design approach for the interior planning of the Full Build concourse expansion concept focused on providing appropriately-sized gate holdrooms for all gates, in line with their scheduled aircraft. Gate holdroom spaces within the modernized existing portion of the concourse were sized to work within the existing 75-foot width of the concourse, while still maintaining adequate central circulation space. The 25-foot depth of these gate holdrooms is less than the recommended 35 feet, but the overall gate holdroom areas meet the recommended size guidelines. The width at the concourse expansion increases to 95 feet to provide the recommended 35-foot clear depth at all gate holdroom spaces.

The existing concessions and restroom spaces within the existing concourse are modernized with a somewhat reduced footprint to serve the initial gates. Additional concessions and restroom spaces are identified in the expansion providing the required overall areas for each, while placing them at a convenient location for the remaining larger gates. Additional support spaces including vertical circulation, mechanical and service spaces are also allotted space within the concourse; the position of these spaces will adjust in later phases based on the requirements of the systems selected as the design progresses.

While not shown, twenty percent additional apron level tempered space would be provided for areas such as mechanical, electrical, and operations space.
04 CONCEPTUAL DESIGN
PREFERRED OPTION

CONCOURSE EXPANSION PLAN — REDUCED BUILD

The design approach for the interior planning for the ten-gate reduced build concourse expansion concept focused on providing appropriately-sized gate holdrooms for all gates with the exception of Gate 1. This Reduced Build option looked at minimizing the impact to operations within the existing spaces while modernizing all areas of the existing concourse. All gate holdroom spaces within the modernized existing portion of the concourse were sized to work within the existing 75-foot width of the concourse, while still maintaining adequate central circulation space. The 25-foot depth of these gate holdrooms is less than the recommended 35 feet, but the overall gate holdroom areas meet the recommended size guidelines. The width at the concourse expansion increases to 95 feet to provide the recommended 35-foot clear depth at all gate holdroom spaces.

In this lower impact option, the existing restroom is modernized but not relocated. This results in a slightly undersized area available for Gate 1. The existing concessions are modernized although the footprint is reduced somewhat to provide additional area for Gate 2. This layout works to preserve the existing back of house / kitchen zone to maintain existing services and pathways. Additional concessions and restroom spaces are identified in the expansion to provide the required overall areas for each, while placing them at a convenient location for the remaining larger gates. Additional support spaces including vertical circulation, mechanical, and service spaces are also allotted space within the concourse. The position of these spaces will adjust in later design phases based on the requirements of the systems selected as the design progresses.
Results from the Facility Requirements analysis indicate the potential that a third security screening lane would be required by the 2029 demand year. Future planning requirements and layouts are based on the TSA Checkpoint Requirements and Planning Guide (CRPG) published in May 2020. Demand calculations were based on the common use peak hour since all airlines utilize a single consolidated checkpoint for passenger screening. Requirements were also based on the following planning guidelines and communication from local TSA:

- A peak 30-minute demand of approximately 36 percent of the departing peak hour calculated from the 2029 DDFS
- A passenger split of approximately 30% PreCheck versus 70% Standard passengers
- Average throughput of 225 and 150 passengers per lane per hour for PreCheck and Standard passengers, respectively
- An additional 10% of the daily enplanement activity added for capacity for employee and crew screening
- Industry acceptable maximum waiting time of ten minutes in the queue
- TSA planning recommendation of 600 square feet queuing area per lane

While the total overall length of the existing checkpoint appears to be adequate, additional width would be required for the installation of a new, third screening lane meeting current and future TSA equipment spacing and space required guidelines. The additional width would also allow the implementation of Computed Tomography (CT) X-ray equipment, part of TSA’s Checkpoint Property Screening Systems (CPSS) program, as well as the potential use of a variety of Automated Security Lane (ASL) systems.
04 CONCEPTUAL DESIGN

PREFERRED OPTION

PRE-SECURITY CONCESSIONS AND ADMINISTRATION OFFICES

The concourse level Commons area, just outside of the security screening checkpoint (SSCP), provides a great opportunity to maximize views to the Black Hills for passengers and meeters-greeters alike. The Preferred Option focuses on right-sizing the pre-security concessions zone while maintaining the existing back-of-house zone, in addition to providing a greater range of seating options and locations, including both lounge seating and tables and chairs. The updated Concessions space is envisioned to offer both table and bar service as well as grab-and-go options, supporting meeters-greeters wishing to wait in the soft seating lounge or along the updated observation deck with its views to the Black Hills.

The addition of the new Arrivals Corridor at the SSCP would allow the Administration Suite to expand out into the space previously required as an entrance into the screening area. The new expanded Administration Suite is reconfigured to provide a clearly organized office area, including an expanded reception area, six offices, conference and support spaces, as well as a large Board Room.

OTHER OPTIONS

Refer to appendix (pg. 34-35) for other options studied relative to the layout of the Pre-Security Concessions and Administration Offices area.

TICKETING, BAGGAGE SCREENING, BAGGAGE MAKEUP, CLAIM HALL, AND CAR RENTALS

PREFERRED OPTION

Updates to the ticketing level focused on creating a consolidated in-line baggage screening area incorporating the required TSA screening equipment as well as space for a future third screening device and oversize baggage screening. This automated system delivers the screened baggage to two baggage makeup devices with frontage for 24 carts. A dedicated zone outside of oversize screening is provided for pickup of these items. The in-line baggage screening area requires roughly 31,000 square foot addition. The existing spaces previously utilized for individual airline bag screening and makeup is reconfigured to provide ATO space and restrooms to support both airline and bag handling personnel. This preferred option also plans for the future expansion of the Ticketing Hall with areas for expanded ticket counters, ATOs, and takeback belts connected to the in-line screening area.
On the west (Arrivals) side of the Ticketing level an addition provides space to accommodate a third required claim device. There is sufficient available space to replace the existing claim device, closest to Ticketing, allowing for a larger device when needed.

The loading dock is relocated from its current position to provide the space for the third claim device. It is located on the west side of the addition, accessed by the existing service road.

Relocating car rentals to a smaller building addition adjacent to the curbside frees up much needed circulation and waiting space adjacent to the claim devices and remains directly accessible to the rental car lot. The overall Arrivals area addition and renovation totals roughly 13,000 square feet.

**OTHER OPTIONS**

Refer to appendix (pg. 36-37) for other options studied relative to the layout of these areas.

---

**PLAN KEY NOTES**

1. Addition for new Loading Dock third 100-150 LF Claim Device, and expanded laydown area (+/- 8,000 sf)
2. New enclosure at existing vertical circulation
3. New addition for Car Rental (+/- 2,800 sf)
4. Baggage Makeup addition for two 160 LF Baggage Makeup flat plate carousels, 24-cart capacity (+/- 20,000 sf)
5. EDS Baggage Screening area
6. ATOs
7. New Ticket Counters & Scales: 28 positions
8. Future Ticketing Hall expansion (+/- 6,000 sf)
04 CONCEPTUAL DESIGN

PREFERRED OPTION

BUILDING MASSING

Two building massing options were developed. Both options offer higher ceilings and increased opportunities to bring natural daylight into the concourse, while employing structural bay systems that can easily accommodate future additions to the concourse. Both options draw from the precedent of roof forms of the existing terminal and concourse. Option 1 utilizes a central clerestory to expand on the increased height in the gate holdrooms, drawing light deep into the center of the concourse. Option 2 utilizes a stepped roof form that rises across the width of the concourse directing views to the surrounding hills. The stepped bay is repeated, with every other module reversed, creating a dynamic roof expression along the length of the concourse. Maximum roof height in both studies is forty feet, well within the Part 77 height restriction of sixty feet maximum.

CONCEPTUAL SECTION OPTION 1: CENTRAL CLERESTORY

CONCEPTUAL SECTION OPTION 2: STEPPED ROOF
04 CONCEPTUAL DESIGN

PREFERRED OPTION

CONCEPTUAL MASSING OPTION 1: CENTRAL CLERESTORY

CONCEPTUAL MASSING OPTION 2: STEPPED ROOF
05 ROUGH ORDER OF MAGNITUDE (ROM) COSTING
ROM COSTING SUMMARY

High-level Rough Order of Magnitude (ROM) costs were developed for both the Full Build Concourse and Terminal Expansion Option along with a separate estimate for the Reduced Concourse Build Option. (Larger scale versions of the Full Build and Reduced Build concourse options graphics shown at right are included on pages 14 and 15). Each include “Low” and “High” unit costs providing a range of probable costs for the project. These high-level unit costs were provided based on comparable Alliance projects throughout the country and pertain to the building and baggage handling systems only. Any civil site and similar work will be addressed in the Master Plan. These costs represent 2021 construction dollars without escalation.

The ROM costs are broken down into three main categories:

1. **New Concourse**: Includes building expansion, small TSA SSCP building infill expansion; existing concourse and SSCP renovations; existing PBB relocation/installation; new PBB installation and associated GSE services.
2. **Terminal Expansion**: Includes ticket counter renovations and associated ceiling; HVAC; flooring and ATO space; EDS Baggage Screening and Makeup building addition; baggage handling conveyance and make-up devices; Arrivals Hall expansion including baggage claim device; rental car relocation; and loading dock as well as miscellaneous renovations.
3. **Administration & Concessions**: Includes Retail, Food & Beverage remodel; Administration expansion and remodel; and miscellaneous renovations.

Total program costs include the following:

- Direct costs
- Twenty-percent soft costs added to project construction direct costs
- TSA reimbursables

---

**ATTACHMENT A**
### PREFERRED OPTION

#### ROM COSTS: FULL BUILD

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<thead>
<tr>
<th>Project Description</th>
<th>QTY</th>
<th>Unit</th>
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<th>High</th>
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<td>$290</td>
<td>$500</td>
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<td>$1,688,560</td>
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<td>Existing Concourse Renovations (including renovations at SSCP)</td>
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<td>New PBB (including foundations, PCA, GPU)</td>
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Subtotal Direct Costs: 72,797.3 FS

$20,623,070 | $30,027,680

#### ADMINISTRATION & CONCESSIONS

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<td>SF</td>
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<td>$200</td>
<td>$59,150</td>
<td>$118,300</td>
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Subtotal Direct Costs: 48,082.3 FS

$3,345,360 | $6,730,680

#### SOFT COSTS

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<th>Project Description</th>
<th>Percentage</th>
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<td>Direct Costs</td>
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<td>Soft Costs</td>
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Total TSA Reimbursable: $15,193,330

TOTAL AIRPORT PROJECT COST: $47,323,071 | $96,788,538

### ROM COSTS: REDUCED BUILD

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<td>$300,000</td>
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<tr>
<td>New PBB (including foundations, PCA, GPU)</td>
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Subtotal Direct Costs: 53,781.3 FS

$16,898,760 | $24,690,920

#### ADMINISTRATION & CONCESSIONS

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Subtotal Direct Costs: 48,853.3 FS

$4,889,360 | $9,730,680

#### SOFT COSTS

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<th>Project Description</th>
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<td>Soft Costs</td>
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Total TSA Reimbursable: $12,483,330

TOTAL AIRPORT PROJECT COST: $54,798,795 | $81,172,130

### PLANNING STUDY FINAL REPORT

Alliance Project No.: 2021010 | Version 1: 16 April 2021

Rapid City Regional Airport |
INITIAL OPTIONS — LINEAR

At right are the initial linear-based options that were studied relative to the site layout of the concourse expansion.

OPTION 1: INITIAL

OPTION 1.1: INITIAL

OPTION 1.2: INITIAL

OPTION 4: LONG TERM

OPTION 6: LONG TERM

OPTION 7: LONG TERM
INITIAL OPTIONS — DOG-LEG

At right are the initial “dog leg” options that were studied relative to the site layout of the concourse expansion.
ATCT LINE OF SIGHT: PREFERRED OPTION

At right are diagrams corresponding to those on page 17. Figures 1 and 2 depict the view from the ATCT for the larger aircraft operating out of RAP for the Preferred Option, both Full Build and Reduced Build. Figure 3 depicts the view from the ATCT for the Preferred Option, Full Build for smaller aircraft parked at the concourse. Figure 4 represents Preferred Option ATCT Line of Sight shadow analysis for small aircraft.
Two additional options for the Administration Suite and three additional options for the Pre-Security Commons were considered. Ultimately, the addition of the Arrivals corridor opened up the area previously required for entry to the Security Checkpoint for expansion of the Administration Suite and a Board Room within a single space.
OTHER OPTIONS: BAGGAGE CLAIM AND LAYDOWN

Two additional options for the Baggage Claim and Laydown areas. Option A did not address the congestion around the existing devices and presented visibility and congestion concerns. Option B preserved the existing loading dock but created significant costs related to the conveyor systems required to support the new claim device locations and also did not provide sufficient relief of the congestion issues within the claim hall.

**OTHER OPTIONS: BAGGAGE CLAIM AND LAYDOWN - OPTION A**
Not to Scale

**OTHER OPTIONS: BAGGAGE CLAIM AND LAYDOWN - OPTION B**
Not to Scale
OTHER OPTIONS: EDS BAGGAGE SCREENING

A consolidated stand-alone baggage screening system was considered, but is not an approved screening system supported by the TSA.

OTHER OPTIONS: EDS BAGGAGE SCREENING - OPTION D.1

Not to Scale