AIRPORT LAYOUT PLAN

MAY 2022

VERSION 1.0

Prepared by RS&H for the
Chisholm Hibbing Airport Authority

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CHAPTER 5

AIRPORT LAYOUT PLAN

5.1 INTRODUCTION

This chapter presents the Airport Layout Plan (ALP) drawing set, which has been produced as part of this Airport Master Plan process. The components of this chapter include the purpose of the ALP drawings, compliance with FAA design standards, revisions to the ALP since the previous ALP, and reduced-sized 11x17 inserts of the ALP drawing set. Additional sheets were added compared to the previous ALP set either because ALP requirements have changed since the previous ALP was submitted to the FAA for approval, or by the direction of the Airport to show additional detail in areas not previously shown.

The ALP drawing set serves as a visual representation of the Airport's existing facilities and planned future development. The preferred alternatives and the overall development plan that was derived in the Alternatives Chapter are included in the ALP, along with any other facility changes that have taken place since the last ALP was created. The drawing set was prepared using several FAA guidelines and checklists, which included the following:

- FAA Advisory Circular 150/5300-13A Change 1, *Airport Design*[1]
- FAA Advisory Circular 150/5070-6B Change 2, *Airport Master Plans*
- FAA ARP SOP 2.00 *Standard Procedure for FAA Review and Approval of Airport Layout Plans (ALPs)*
- FAA ARP SOP 3.00 *Standard Procedure for FAA Review of Exhibit 'A' Airport Property Inventory Maps*

The ALP requires FAA approval, independent of the Master Plan. As such, the review of the ALP drawing set is accomplished through several intermediate steps, including reviews by the Airport, the FAA Airports District Office (ADO), and several other FAA offices involved in the associated airspace review.

The ALP drawing set serves several needs for the Airport, the Cities of Hibbing and Chisholm, St. Louis County, and the FAA. As presented in the FAA Advisory Circular 150/5070-6B, *Airport Master Plans*, there are five primary functions of the Airport Layout Plan (ALP) that defines its purpose:

- FAA-approved ALPs are necessary to receive financial assistance under the terms of the Airport and Airway Improvement Act of 1982 (AIP), and specific passenger facility charge actions. The maintenance of, and conformity to the plan is a grant assurance requirement upon which Federal funds have been provided to HIB under the AIP program and previous programs. Previous programs include the 1970 Airport Development Aid Program (ADAP) and Federal Aid Airports Program (FAAP) of 1946.
- The ALP creates a blueprint for airport development by depicting proposed facility improvements that are consistent with the strategic vision of the Airport sponsor. They also provide a guideline by which the sponsor can assure that development maintains Airport design standards and safety requirements and is consistent with airport and community land use plans.

[1] Advisory Circular 150/5300-13B published after completion of master plan analysis.

- The ALP serves as a public document that is a record of aeronautical requirements, both present and future, and as a reference for community deliberations on land use proposals and budget resource planning.
- The approved ALP provides the FAA with a plan for airport development. This will allow compatible planning for FAA-owned facility improvements at the Airport and help the FAA to anticipate budgetary and procedural needs. The approved ALP will also give the FAA the information it needs to ensure airspace is protected for planned facility or approach procedure improvements.
- The ALP provides a working tool for use by the Airport sponsor, including development and maintenance staff.

5.2 AIRPORT COMPLIANCE WITH FAA DESIGN STANDARDS

The FAA provides airport design standards to ensure safe and efficient airport operations. The primary guidance is contained in FAA Advisory Circular 150/5300-13A Change 1, *Airport Design*. The master planning process also relies on numerous other FAA and Federal agency documents, including, but not limited to:

- Federal Aviation Regulations Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*
- FAA Advisory Circular 150/5340-30J, *Design and Installation Details for Airport Visual Aids*
- FAA Advisory Circular 150/5340-1M Change 1, *Standards for Airport Markings*
- FAA Order 8260.3E, *United States Standard for Terminal Instrument Procedures (TERPS)*
- FAA Order 8260.19I, *Flight Procedures and Airspace*
- FAA Order 6850.2B, *Visual Guidance Lighting Systems*
- FAA Order 5200.8, *Runway Safety Area Program*
- Engineering Brief No. 75, *Incorporation of Runway Incursion Prevention into Taxiway and Apron Design*

The advisory circular, 150/5300-13A Change 1, *Airport Design*, was replaced with Advisory Circular 150/5300-13B, *Airport Design* at the time the ALP was being reviewed by the FAA. Therefore, the standards being used for this ALP are from Advisory Circular 150/5300-13A Change 1, *Airport Design*.

5.3 MODIFICATION OF STANDARDS

The previous Airport Master Plan identified no modification to standards. Since the previous master plan, the FAA has implemented FAA Order 5300.1G *Modifications to Agency Airport Design, Construction and Equipment Standards*, replacing Order 5300.1F. This order establishes the process for initiation, revision, coordination, and management of MOS applicable to airport design construction, and equipment procurement projects. Based on the type of modification to standard being submitted, additional Safety Risk Management panels may be required. In addition, any MOS should be submitted to the FAA prior to review and approval of an ALP. The proposed development within the 20-year planning period meets current FAA design standards and does not require any MOS to be filed.

5.4 AIRPORT LAYOUT PLAN HIGHLIGHTS AND MODIFICATIONS

This section highlights key elements and modifications that have been made since the Airport's last ALP update. The modifications to the plan are based either on the Master Plan's analyses of identified future needs, changes related to the vision of the Airport, a change in FAA design criteria, or a combination of all these factors.

Airfield improvements include a future 642-foot extension to Runway 31 with an additional ultimate extension of 600 feet. Taxiway C, the parallel taxiway to Runway 13-31, would also be extended and include an entrance/exit taxiway connector at the new Runway 31 end. A new taxiway connector is added within the outer third of the ultimate Runway 13-31 length to avoid any runway incursions or the middle third, high-energy area, of the runway allowing for the removal of the Taxiway B connector between Runway 13-31 and Taxiway C.

Other airfield improvements are the realignment of Taxiways A and B that will create a right-angle intersection at the end of Runway 22. Taxiway A will be further realigned so that it is parallel to Runway 4-22 and connect back into existing Taxiway A along the south edge of the existing apron. Moving Taxiway A out further will allow adequate apron space to accommodate commercial aircraft deicing operations. The Taxiway B and B1 intersection will also be realigned. Also shown is an ultimate layout of a taxiway to replace Taxiway B and a taxiway connecting Taxiway A to a future partial taxiway, both being aligned with Runway 13-31.

On the east side of the Airport, new FBO facilities, including transient apron and fuel farm, are shown with airside access provided by a new partial taxiway running parallel to Taxiway C and landside access from S Hughes Rd. Also shown is a taxiway connector from the new partial taxiway to Taxiway C. At the end of the partial taxiway is a new Administration/ARFF/Maintenance facility with landside access to S Hughes Rd. Also on the east side is a single nested T-hangar with airfield access via Taxiway B. Ultimate hangars and T-hangars are also shown on this side of the airport.

In the terminal area there are two new hangars with an apron expansion to the northeast apron, a replacement hangar on the east side of the northwest apron and Maintenance building expansion allowing up to ADG II aircraft access to the northwest apron.

5.5 AIRPORT LAYOUT PLAN DRAWINGS SHEETS

The airport layout plan set graphically illustrates the proposed development of the Airport over the 20-year planning period, while also providing general guidance for the ultimate vision. An ALP set is required by the FAA for airport's to be considered for future funding, and to be compliant with the airport's Federal Grant Assurances. The complete ALP set for the Range Regional Airport consists of the following sheets, defined in the following subsections.

- Sheet 1 – Cover Sheet
- Sheet 2 – Airport Data Sheet
- Sheet 3 – Airport Layout Drawing
- Sheet 4 – Terminal Area Plan

- Sheet 5 – East Development Area Plan
- Sheet 6 – Airport Airspace
- Sheet 7 – Airport Airspace Conical Surface
- Sheet 8 – Airport Airspace Profiles
- Sheet 9 – Inner Portion of the Approach Surface Runway 13
- Sheet 10 – Inner Portion of the Approach Surface Runway 31 (Existing)
- Sheet 11 – Inner Portion of the Approach Surface Runway 31 (Future)
- Sheet 12 – Inner Portion of the Approach Surface Runway 31 (Ultimate)
- Sheet 13 – Runway 13 and Runway 31 Obstruction Tables
- Sheet 14 – Inner Portion of the Approach Surface Runway 4
- Sheet 15 – Inner Portion of the Approach Surface Runway 22
- Sheet 16 – Land Use Plan (Existing)
- Sheet 17 – Land Use Plan (Future)
- Sheet 18 – Exhibit 'A' Airport Property Inventory Map (1 of 4)
- Sheet 19 – Exhibit 'A' Airport Property Inventory Map (2 of 4)
- Sheet 20 – Exhibit 'A' Airport Property Inventory Map (3 of 4)
- Sheet 21 – Exhibit 'A' Airport Property Inventory Map (4 of 4)
- Sheet 22 – Environmental Considerations
- Sheet 23 – Utility Plan
- Sheet 24 – Conceptual Development Phasing Plan

5.5.1 Sheet 1 – Cover Sheet

This sheet denotes the Airport name and an index chronicling the ALP drawing sheets contained in the drawing set. The sheet also provides an airport location and vicinity map, as well as a title block organized to include approval signatures for Minnesota Department of Transportation Aeronautics and the Chisholm/Hibbing Airport Authority and a history of ALP revisions.

5.5.2 Sheet 2 – Airport Data Sheet

This sheet provides data tables containing detailed information about the Airport's existing and anticipated conditions. This sheet also provides critical information about the Airport's runways and safety area dimensions. Major components on this sheet include:

- Airport Data Table
- Wind Rose Data
- Runway Data Table
- Taxiway / Taxilane Data Table
- Survey Monuments
- Declared Distance Table

» Modification to Standards Table

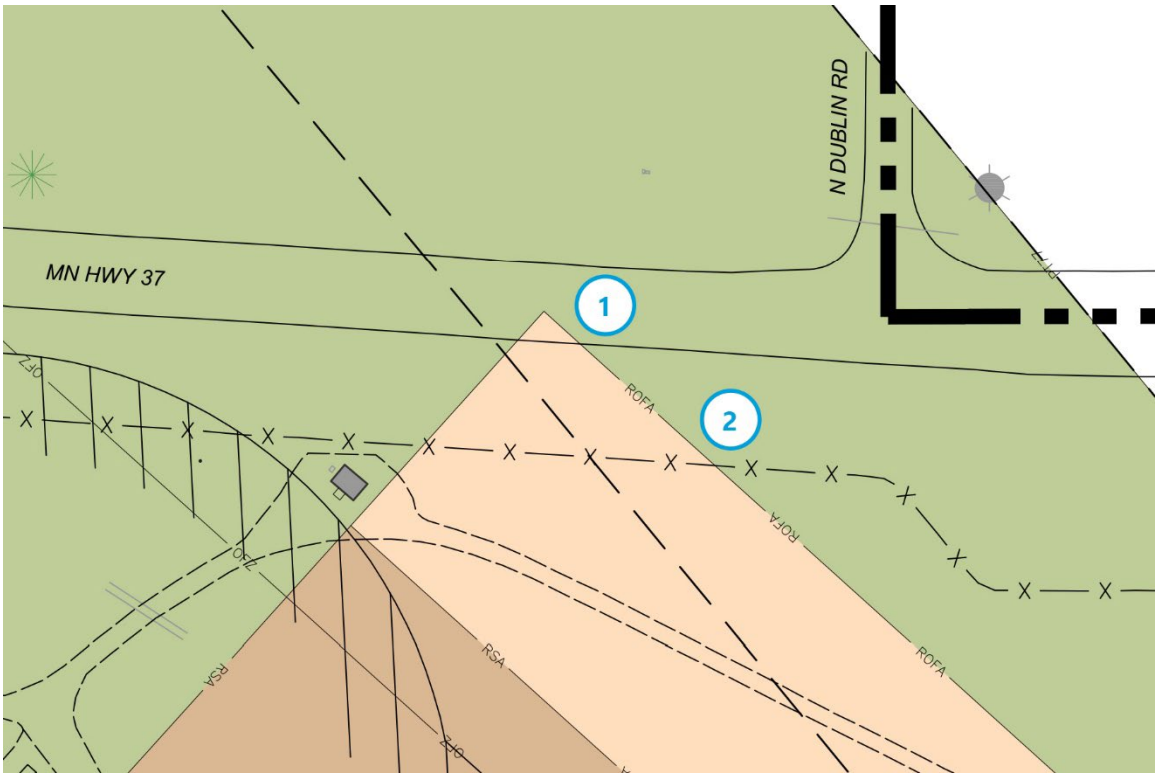
5.5.3 Sheet 3 – Airport Layout Drawing

The Airport Layout Drawing is a key document which serves as a graphic representation of existing and future Airport facilities. The future Airport facilities include those that are scheduled to be completed during the 20-year planning period. Additionally, this sheet includes ultimate facility build-out, which are those outside the 20-year planning period. One of the primary purposes of this drawing is to depict those areas that future and ultimate facilities are planned to be constructed upon so the associated land can be reserved for their use.

The drawing also reflects changes to physical features on and in the vicinity of the Airport that may affect navigable airspace or the ability of the Airport to operate. Development shown on the ALP corresponds to the Airport's Capital Improvement Program (CIP) for the 20-year period. Specifically, the sheet depicts the limits of the Airport property interests and configuration of facilities in compliance with geometric design separation and clearance standards. It also includes airspace and navigational aid (NAVAID) facilities.

Additionally, the ALP includes the dimensional information for recommended development to be designed in accordance with FAA planning and design specifications outlined in FAA Advisory Circular 150/5300-13A – Change 1 *Airport Design* and 150/5070-6B - Change 2, *Airport Master Plans*. Dimensional information aids users of the ALP to determine and plan for adequate separation between future development and existing and future runways, taxiways, taxilanes, and associated airspace.
One area to note that does not meet FAA standards is at the end of Runway 13. **Figure 5-1** shows how Mn-37 (1) and the airport perimeter fence (2) fall within the Runway 13 Runway Object Free Area (ROFA). The highway crosses the ROFA at approximately 21 feet while the fence is approximately 94 feet inside the ROFA at its furthest point. Realignment of Mn-37 is shown on the ALP as the preferred long-term solution.

FIGURE 5-1
RWY 13 ROFA



Source: RS&H Analysis, 2022

Per the FAA ARP SOP 2.00 *Standard Procedure for FAA Review and Approval of Airport Layout Plans (ALPs)* an approval block for the FAA approval stamp is also included on the Airport Layout Drawing.

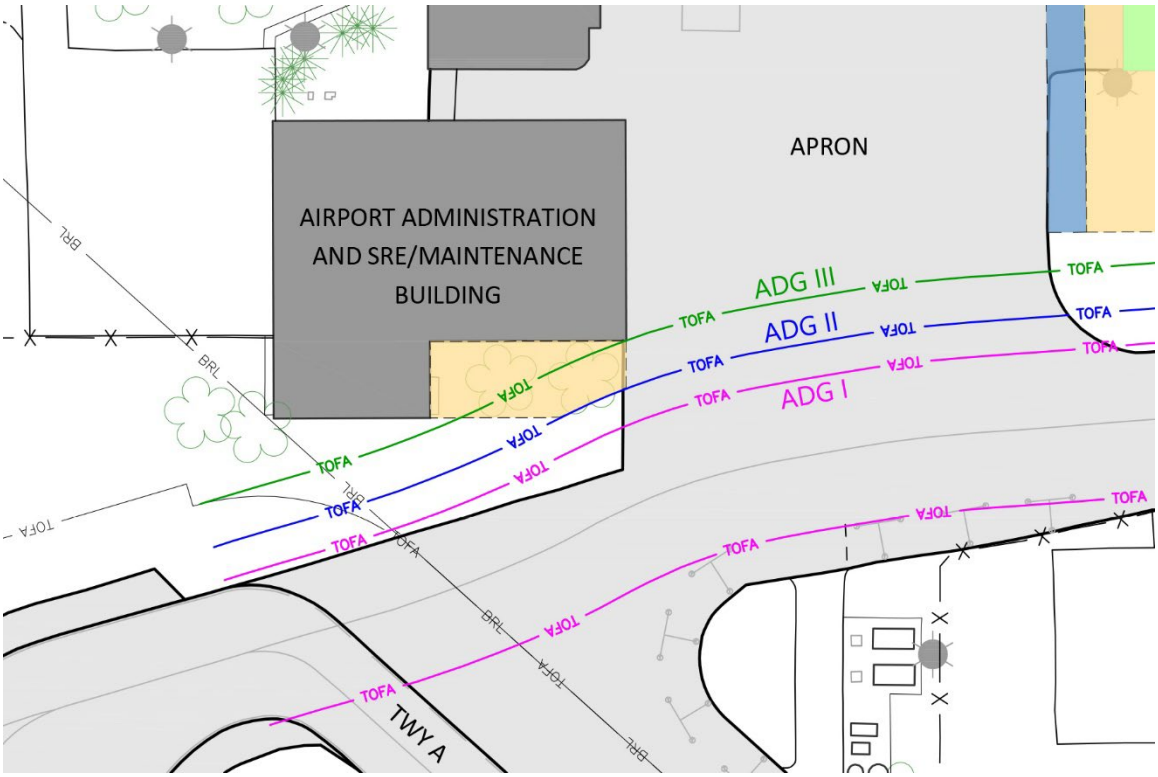
5.5.4 Sheet 4 – Terminal Area Plan

The Terminal Area Plan sheet is centered on the existing and future areas used for commercial passenger and general aviation operations. The sheet depicts existing and future facilities as well as dimensional criteria involving runway and taxiway surfaces.

Airside improvements include the realignment of Taxiway A at the end of Runway 22 to meet FAA design standards and along the south side of the apron. A future segmented circle with lighted windcone is also shown.

The future expansion to the Airport Administration and SRE/Maintenance Building is being shown to allow a maximum of ADG II aircraft through the adjacent taxilane and to the apron. See **Figure 5-2** for the differences in ADG widths at the location of the building expansion.

FIGURE 5-2
MAINTENANCE BUILDING EXPANSION



Source: RS&H Analysis, 2022

5.5.5 Sheet 5 – East Development Area Plan

The East Development Area Plan depicts existing and future facilities on the East portion of the Airport, as well as dimensional criteria involving runway and taxiway surfaces.

5.5.6 Sheet 6 through 8 – Airport Airspace Drawings

These scaled drawings identify obstacle identification surfaces. The surfaces define the limits of recommended land use control for the height of objects surrounding the Airport's 14 Code of Federal Regulations (CFR) Part 77 Imaginary Surfaces. A digital USGS map is used as the base map for the drawings in which each of the 14 CFR Part 77, Subpart C, Imaginary Surfaces (Primary, Approach, Transitional, Horizontal, and Conical) are depicted. These drawings depict the ultimate airspace configuration for the Airport.

The sheets also provide numerical data for all obstructions visually depicted in the plan view of the Airport Airspace Conical Surface drawing. Each obstruction is identified with a description, a top elevation, the surface the object is penetrating, the surfaces' elevation at the penetrating point, the amount of penetration, and a recommended disposition. Obstructions vary from vegetation to man-made objects. Some objects are defined as fixed-by-function, such as NAVAIDS, because of current siting requirements and the role they play in ensuring the safe navigation of flight. Obstructions include various types of vegetation, which can be mitigated through removal or trimming. The proposed disposition for vegetation located off airport property is listed to be trimmed but should be coordinated with the

landowner to determine the proper mitigation. The proposed disposition for vegetation on airport property is listed to be trimmed or removed depending on the location or whether it is affected by future/ultimate improvements.

A plan and profile view of each of the runway ends shows the Imaginary Surfaces out to 50,200 feet for the ultimate precision runway, Runway 13-31, and out to 5,200 feet for the Visual runway, Runway 4-22. Roadways, creeks, and power lines have been depicted where they cross the extended runway centerline.

5.5.7 Sheet 9 through 15 – Runway Inner Approach Plan and Profile

Sheets 9 through 15 provide a plan and profile view of each of the Airport's runway approach surfaces. These sheets provide a more detailed view of the first 5,400 feet for the existing/future/ultimate precision runway, Runway 13-31, and the first 2,800 feet for the Visual runway, Runway 4-22. Obstructions are depicted in blue and identified with an object number. Additionally, the runway protection zone, navigational aids, and roadways are identified, and applicable data is provided. Roadways are depicted with a solid line that intersects the extended runway centerline, and dashed lines represent the roadway intersection to the edge of the Part 77 approach surface. Roadways intersecting the edge of the Part 77 surface may be above or below the grade of the extended centerline.

The obstruction analysis performed during this master plan study identified obstructions off each runway end, mainly vegetation. Due to the high density of trees around the Airport some of the obstructions are depicted by using the highest treetop within a 200-foot by 200-foot grid starting from each runway end. Vegetation obstructions found on airport property should be mitigated under routine maintenance. Obstructions off airport property will require coordination with the landowner to determine the proper mitigation.

5.5.8 Sheet 16 – Land Use Plan (Existing)

The Existing Airport Land Use Plan depicts the existing land use for both on and off airport property. This drawing also depicts the MnDOT Airport Safety Zones, Safety Zone A, Safety Zone B and Safety Zone C. Safety Zones A and B are located off the ends of each runway and Safety Zone C is a projection of the Horizontal Surface of the Airspace that surrounds the Airport.

5.5.9 Sheet 17 – Land Use Plan (Future)

The Future On-Airport Land Use Plan redefines parcels of land within the airport property boundary to provide more specificity. The master plan process examined existing land uses and determined a strategic plan to utilize the parcels within the Airport property line most efficiently. The outcome expands the areas designated as aeronautical and non-aeronautical land use on the east side of the airport.

5.5.10 Sheet 18 through 21 – Exhibit 'A' Airport Property Inventory Map

The Airport Property Map – Exhibit 'A', divided into separate sub sheets, depicts the airport property interests consistent with the Airport Layout Drawing. This drawing documents past airport land acquisition, including fee-simple and easement tracts, and includes all those acquired, released, or sold since 2021. This sheet was developed in accordance with ARP SOP 3.00 *FAA Review of Exhibit 'A' Airport Property Inventory Maps*. Information on each of the existing 57 parcels at HIB include:

- Grantor (Selling Owner)
- Type of interest acquired
- Acreage
- Type of conveyance instrument
- Recording information
- Federal Agreement (FAA Grant Number)
- Type of Easement
- Mineral and Mining Rights

The development of the Exhibit 'A' carried forward the previous Exhibit 'A' Airport Property Map, established in 2011. Since the previous Exhibit 'A' was developed, the FAA has updated the requirements for a compliant Exhibit 'A' to the current ARP SOP 3.00 standards. The changes in standards for a compliant Exhibit 'A' require additional information be presented for each parcel compared to prior years. This planning team used readily available sources to obtain the necessary information for this task, however, some information is still unknown.

Coordination with the local FAA ADO determined the parcels and easements that were purchased using Federal Grants. The remaining parcels are graphically depicted based on the information provided from the previous Exhibit 'A' or County of St. Louis Tax Parcel information. The Airport parcels are mainly contiguous except for two parcels that are located away from the Airport. One of the separated parcels, located to the north of the Airport, allows access to the Sea Plane Base at Carey Lake. The second separated parcel is the location of the outer marker for Runway 13.

The Exhibit 'A' shows areas for future property acquisitions, five parcels on the south side are targeted for acquisition for the Airport to have full control of the future Runway Protection Zone after the extension of Runway 31. Additional property acquisitions may be needed for further improvements in this same area that fall outside of the planning period.

5.5.11 Sheet 22 – Environmental Considerations

The Environmental Considerations drawing depicts water resources, such as wetlands and floodplains, in the vicinity of the Airport. The wetlands include surface waters, Barber Creek, running through the northwest portion of airport property and Dempsey Creek to the east of the airport property.

5.5.12 Sheet 23 – Utility Plan

The Utility Plan shows where existing communication, electrical, gas, sanitary, and water lines are located on airport property. Additional survey of utilities would be needed when any future improvements are ready for design and construction.

5.5.13 Sheet 24 – Conceptual Development Phasing Plan

The Conceptual Development Phasing plan provides a visual depiction of the proposed phasing of enhancements and additions over the course of the planning period, and demand driven development

options that work to move towards the ultimate vision of the Airport. The phasing plan directly correlates with the implementation plan provided in the previous chapter. The sheet is intended to help visibly tie together the Airport's CIP to the timing and location of future projects and enhancements. Though all future development is not represented on the Airport's CIP, demand driven development, such as, hangars, are also represented over the course of the planning-period.

5.6 AIRPORT LAYOUT PLAN DRAWING SET

The Airport Layout Plan drawing set inserted as part of this report is a reduced-size version of the 24-inch by 36-inch drawings that have been reviewed and approved by the FAA, Minnesota Department of Transportation Aeronautics, and the Airport.