AIRPORT MASTER PLAN

South Central Regional Airport

City of Pella • Mahaska County • City of Oskaloosa

February 2015

SOUTH CENTRAL REGIONAL AIRPORT

AIRPORT MASTER PLAN

South Central Regional Airport Agency (SCRAA)
City of Pella – Mahaska County – City of Oskaloosa

Agency Members
Jim Hansen, Chairperson
David Barnes, Vice Chairperson
Joe Warrick, Secretary
Pamela Blomgren
Donna Smith
Steve Van Weelden

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DGR Engineering
Garden & Associates
Quantum Spatial

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February 2015

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CHAPTER ONE – BACKGROUND

GOAL STATEMENT

The primary goal of the Airport Master Plan is to provide the framework needed to guide development of the proposed South Central Regional Airport. While a benefit cost analysis of the proposed development is not required, it is important that the development will cost-effectively satisfy aviation needs while considering potential environmental and socioeconomic impacts.

AIRPORT MASTER PLAN OBJECTIVES:

- Provide justification for the proposed development (based in part on past studies) that considered alternatives to development of the proposed South Central Regional Airport.
- Document the creation of a public entity that has the authority to implement plan recommendations.
- Summarize the airport site selection process.
- Establish a realistic schedule for land acquisition and implementation for the proposed airport facilities based on the 0-5 year, 6-10 year and 11-20 year time frame.
- Provide sufficient detail for subsequent environmental documentation as may be required.
- Establish the framework for a continuing planning process that provides for changes in plan recommendation.
- Propose an achievable financial plan that supports the implementation schedule.
- Encourage the adoption of a land use plan within the immediate vicinity of the proposed South Central Regional Airport.
- Encourage the adoption of the appropriate zoning regulations that will protect approaches to each runway and ensure land use compatibility.

The Airport Master Plan represents the views of the South Central Regional Airport Agency. The Federal Aviation Administration approves two (2) components of the Master Plan.

- Forecasts of Demand
    - FAA reviews the Forecasts (Chapter Two) for consistency with FAA's Terminal Area Forecasts (TAF).
- Airport Layout Plan (ALP)
    - All airport development at Federally-obligated airports (South Central Regional Airport) must be done in accordance with an FAA-approved ALP.
    - FAA approval indicates that the proposed development conforms to FAA design standards in effect at the time.
    - FAA approval indicates that the FAA finds the proposed development to be safe and efficient.

The South Central Regional Airport Master Plan was prepared in accordance with FAA advisory Circular (AC) 150/5300-13A Airport Design; FAA AC 150/5070-6A Airport Master Plans; and other appropriate FAA Advisory Circulars and Orders.

Several studies have been completed in the past that are relevant to recommendations set forth herein. Recommendations and findings from those studies and technical memorandums are summarized for the period 1999 to the present.

JOINT AIRPORT INITIATIVE: HISTORIC PERSPECTIVE

The City of Pella and the City of Oskaloosa have explored the concept of a new airport and closure of their existing airports since 2000.

1999-2005

In 1999, the City of Pella commissioned a Feasibility Study to assess future needs of the Pella Municipal Airport. The study, completed in July 2000 by Kirkham Michael Consulting Engineers, concluded:

- The Airport Reference Code (ARC) for the existing Pella Airport, B-II is not sufficient due to significant use by a based "C" category airplane as well as future activity by "C" category aircraft.
- The airport should be developed to ARC C-II standards.
- The cost to develop the existing airport to ARC C-II standards would exceed the cost of developing a new site.

The Feasibility Study-2000 also recommended that the City of Pella seek to involve participation of other nearby communities. Based in part on this recommendation, the City of Pella, together with the cities of Knoxville and Oskaloosa, sought and received a grant from the Iowa Department of Transportation (IA DOT) Office of Aviation to examine the feasibility of developing a regional facility to replace three (3) public owned airports.

The Study, initiated by HR Green in 2001, culminated with the preparation of an Airport Master Plan in 2005. After the initial site selection, the City of Knoxville declined further participation. The cities of Pella and Oskaloosa proceeded with development of an Airport Master Plan for the preferred site. A draft of the Airport Master Plan referenced as the Red Rock Regional Airport was completed in August 2005 (see Exhibit 1 – Site H).

2006-2010

During the development of the Red Rock Airport Master Plan, part of the proposed site was listed on the National Historic Register. Given the potential classification as a Section 4(f) resource, work was discontinued.

Following termination of the joint effort in 2005, the City of Pella formed an Aviation Review Committee to provide recommendations to the Mayor and Council. The Pella Aviation Review Committee prepared and submitted a report to the City in 2006. The Pella Aviation Review Committee recommended the City of Pella proceed with development of an airport to replace the existing Pella Municipal Airport.

Snyder & Associates, Inc. was retained by the City to assist in preparing the required studies for a replacement airport.

The City of Pella requested assistance from the Federal Aviation Administration to fund, in part, the planning process. The scope of work provided for the ultimate preparation of four (4) stand-alone documents.

- Airport Feasibility Study
- Benefit-Cost Analysis
- Airport Master Plan/Airport Layout Plan
- Environmental Assessment

An Airport Improvement Program (AIP) Grant (3-19-0112-05-2007) was provided to the City of Pella. The City issued a Notice to Proceed (NTP) to Snyder & Associates, Inc. on June 19, 2007.

The City of Pella created a task force to assist in the preparation of the Feasibility Study. The Aviation Task Force consisted of nine (9) members representing the City of Pella, Marion County, airport users, and the public.

The primary assignment given to the Aviation Task Force was to consider alternative sites and recommend a preferred site for consideration by the Pella City Council. The Aviation Task Force met eight (8) times (dates listed below) and participated in the development of criteria used to identify and rank the candidate sites. The meetings were open to the public and attended by City staff.

- October 13, 2006
- October 25, 2006
- November 17, 2006
- May 18, 2007
- September 24, 2007
- October 16, 2007
- December 10, 2007*
- January 4, 2008

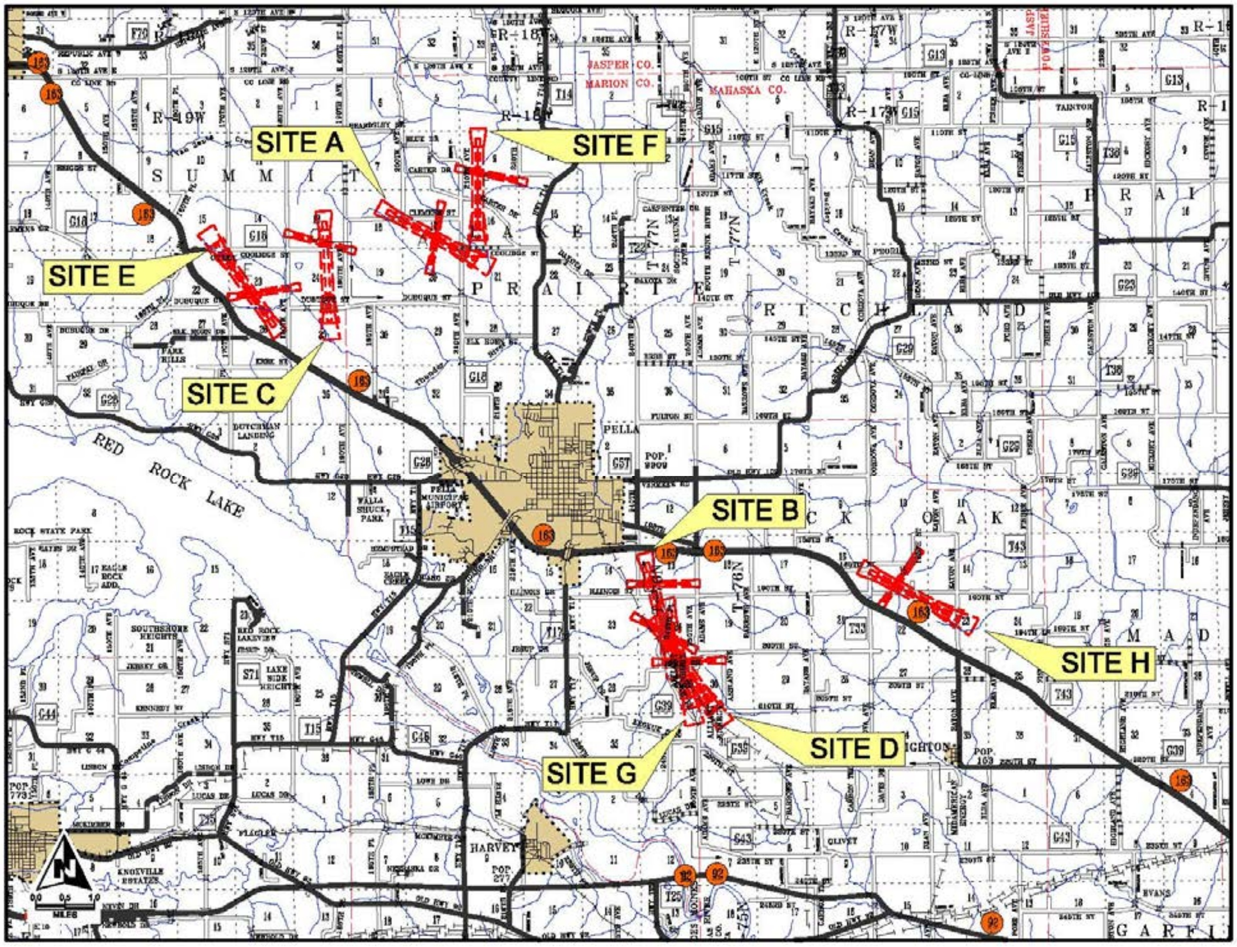
* A public information meeting was held on December 10, 2007. The meeting was attended by 139 persons.

The search area extended out 10 miles from the City of Pella and was confined, with the exception of the Red Rock Study Site, to Marion County.

Six (6) sites were submitted to FAA for airport study. The FAA issued an airport determination on August 31, 2007. (FAA Airport Case No. 2007-ACE-380 through 385 NRA).

The Aviation Task Force recommended Site C (near Otley) as the preferred site for the proposed Pella Replacement Airport. The Pella City Council considered the recommendations from the Aviation Task Force and passed a resolution of March 4, 2008 to continue further evaluation of the preferred site near Otley.

Exhibit 1-1



Pella Replacement Airport
Candidate Airport Sites

Notes:
Site H: Red Rock Site – HR Green Study 2005
Site C: Otley Site – Snyder & Associates Study 2012

The FAA, in a letter dated September 10, 2009, directed the City of Pella to re-evaluate the existing Pella Municipal Airport site. The change in scope by FAA was based on the rationale that the Red Rock Study-2005 was developed around the concept of a regional airport that would combine aeronautical activity within two (2) or more existing airport service areas. FAA concluded that prior studies did not fully evaluate alternatives that may be available at the existing Pella Municipal Airport if the intent was to develop a replacement airport just to serve Pella.

The City of Pella considered a range of alternatives within the Airport Feasibility Study. These included:

- No Build Alternative-Existing Site
- ARC B-II Build Alternative-Existing Site
- Limited ARC C-II Alternative-Existing Site
- Full ARC C-II Build Alternative-Replacement Sites
- Service from another public owned airport

The No-Build Alternative would not accommodate forecast aeronautical activity.

Due to site constraints, it was not reasonable to consider an ARC C-II Full Build Alternative that would support a precision instrument approach with minimums down to ½-mile visibility and a decision height of 200 feet. Furthermore, the existing Pella Municipal Airport site could not provide for the development of a crosswind runway to the desired length of 3,900 feet.

Two limited build alternatives were developed for the existing Pella Municipal Airport.

- Limited ARC B-II Build Alternative
- Limited ARC C-II Build Alternative

Expanding the existing Pella Municipal Airport with the limited ARC C-II Build alternative was shown to be more expensive than constructing a new replacement airport at full C-II standards. The cost associated with the ARC C-II Limited Build was greater than the replacement ARC C-II Full Build.

Representatives from the City of Pella and staff from FAA Central Region met on March 3, 2010 to discuss site constraints associated with the existing site and the limited build alternatives. The meeting also provided the opportunity to review the outcome from previous initiatives to include the replacement airport alternative. Following the March 3, 2010 meeting, FAA authorized the City of Pella to continue with work on a Replacement Airport for the existing Pella Municipal Airport.

The FAA Central Region, in their comments dated March 9, 2010, stated that all proceeds from the closure and disposal of the existing Pella Municipal Airport site must be allocated to development of landside needs at the Replacement Airport site.

Based on the desired level of service and probable cost to implement, the Full Build ARC C-II Alternative represented the most prudent choice.

The FAA approved the Aviation Forecast and accepted the Airport Feasibility Study recommending replacement of the existing Pella Municipal Airport on May 7, 2010.

The City of Pella proceeded to develop an Airport Layout Plan (ALP) based on the Otley Alternative Site C-3 for the Replacement Airport.

The Airport Layout Plan was submitted to FAA for airspace analysis and review. A determination "Conditional No Objection" was issued on May 4, 2011. Reference may be made to Airspace Case No. 2010-ACE-1392-NRA.

The FAA, in an email dated September 1, 2011, recommended the Airport Layout Plan for the Pella Replacement Airport be submitted for "Conditional Approval." The FAA gave "Conditional Approval" to the Pella Replacement Airport Layout Plan on December 16, 2011.

2011 – March 2012

The City of Pella and the City of Oskaloosa are members of a Central Iowa Coalition that was formed in 2010 to discuss transportation issues. While the primary focus was on the surface transportation network, the group also discussed the need to replace the existing Pella Municipal Airport.

The City of Pella and the City of Oskaloosa renewed their joint airport dialogue. Through a series of meetings in 2011, the City of Pella, the City of Oskaloosa and Mahaska County developed a 28E Agreement creating the South Central Regional Airport Agency (SCRAA). The FAA Office of Regional Council (via email dated February 24, 2012) determined that the South Central Regional Airport Agency had the legal authority to act as a "Sponsor" and enter into agreements with the FAA.

The 28E Agreement was filed with the Iowa Secretary of State on March 29, 2012.

The FAA approved entry of the proposed regional airport into the National Plan of Integrated Airport Systems (NPIAS) on September 20, 2012. The FAA issued a planning grant (3-19-0136-001-2013) on August 28, 2013 for site selection and an Airport Master Plan to further study the regional airport proposal.

STATEMENT OF NEED-SUMMARY

The City of Pella and City of Oskaloosa along with Mahaska County created, in 2012, a multi-jurisdictional entity South Central Regional Airport Agency to own, develop and operate a new airport. The purpose of the new airport is to combine two (2) airport service areas that would ultimately be served by a single public owned airport. More specifically, the new airport is intended to:

- Better accommodate existing and future aeronautical demand activity.
- Sustain and enhance the delivery of aeronautical services to the general aviation community.

Past studies have documented site constraints associated with the existing Pella Municipal Airport that inhibit the ability of the airport to accommodate aeronautical activity. These constraints include:

- Runway length constraints (displaced thresholds each end).
- Airport environs that prohibit development of lower instrument approach minimums.
- Land use compatibility issues.
- Crosswind runway site development constraints (i.e. land use, terrain).

An assessment of the existing Pella Municipal Airport concluded that the cost to develop a "Limited Build" ARC C-II facility would be comparable to the cost associated with a "Full Build" ARC C-II airport at an alternative airport.

The airport service area associated with the Oskaloosa Municipal Airport is constrained by its location. While the airport presently serves small airplanes, it cannot accommodate large airplane traffic generated within the service area. Furthermore, the airport cannot sustain the delivery of aeronautical services because facilities such as a fixed based operator (FBO) needed to attract and retain larger aircraft are not available, and efforts to attract an FBO have not been successful.

Closing two public owned airports and constructing a new airport facility to serve users within the Pella Municipal Airport and Oskaloosa Municipal Airport service area will benefit the general aviation community. The Regional Airport will:

- Provide a critical mass of based aircraft that will generate a threshold of activity to support a wide range of aeronautical services including:
  - Aircraft maintenance: Piston, Turbine
    - Power
    - Airframe
  - Aircraft Fuel
    - 100LL, Jet A
  - Aircraft rental
  - Charter service
    - Passenger
    - Freight
  - Aircraft sales
  - Avionics sales and maintenance
  - Flight instruction

- Provide an airport facility that can accommodate large airplanes (on a regular basis) with the following characteristics:
  - Approach Speed: Under 141 knots
  - Wing Span: Less than 79 feet
  - Gross Weight: Up to 65,000 lbs. dual wheel load

- Provide airport environs that will accommodate approach minimums as low as 200 feet decision height and ½-mile forward visibility.

- Accommodate aircraft operations generated by several large manufacturing, processing and service companies located in the two service areas:
  - Continental U.S. trips to the east/west coasts
  - International trips to all continents

- Reduce vehicle travel distance and drive times by:
  - Utilizing the public investment already made in the Iowa Highway 163 corridor
  - Complementing existing and future improvements to the surface transportation system in South Central Iowa.

SITE SELECTION-SEARCH AREA PARAMETERS

The search area for the proposed replacement airport was established within the 28E Agreement entered into by the City of Oskaloosa, Mahaska County and the City of Pella.

Two (2) conditions were set forth within the 28E Agreement that were to be adhered to. The search area was defined as extending no more than four (4) miles from Iowa Highway 163. Furthermore, the candidate site identified for consideration could not be located more than ten miles from either city. The search area is depicted in Exhibit 1-2.

The 28E Agreement also established several facility development parameters including:

- The site must be able to accommodate a primary runway having a potential ultimate length of 7,500 feet.
- The primary runway must be able to support a precision instrument approach with minimums as low as 200 feet and one-half mile forward visibility.
- The site must be able to accommodate a crosswind runway no less than 4,200 feet in length.

The search area, based entirely within Mahaska County, extends over approximately 66 square miles. Nine (9) locations where a replacement airport could possibly be developed were identified. Within the nine locations, eleven concepts were developed based on the following facility parameters set forth in the 28E Agreement (see Exhibit 1-3).

Primary Runway Facility:

- 100’ (Width) x 7500’ (Ultimate Length)
  - Precision Instrument Approach (Primary End)
    - PA – CAT I – (Visibility minimums as per FAA AC 150/5300-13A)
    - PIR < 3/4 mile (FAR part 77).
  - Approach Procedures with Vertical Guidance (Opposite End)
    - APV > 3/4 mile - (Visibility minimums as per FAA AC 150/5300-13A)
    - D(NP) > 3/4 mile (FAR Part 77)

Crosswind Runway Facility:

- 75’ (Width) x 4200’ (Ultimate Length)
  - Non-Precision Instrument Approach (Both End)
    - NPA – 1 mile – (Visibility minimums as per FAA AC 150/5300-13A)
    - C(NP) - (FAR Part 77)

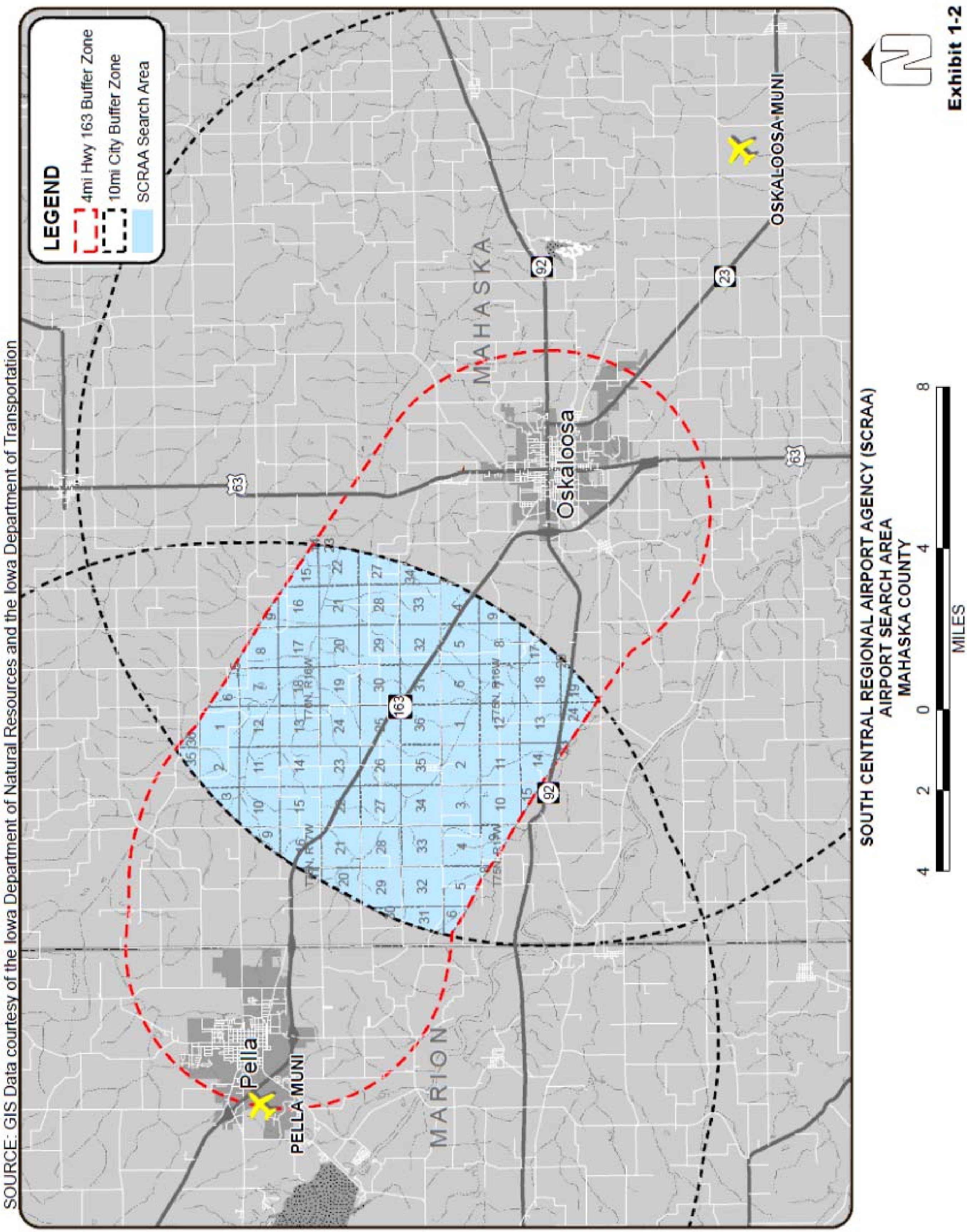

SOURCE: GIS Data courtesy of the Iowa Department of Natural Resources and the Iowa Department of Transportation
LEGEND
4mi Hwy 163 Buffer Zone
10mi City Buffer Zone
SCRAA Search Area
Pella
PELLA MUNI
Oskaloosa
OSKALOOSA MUNI
MARION
MAHASKA
163
92
63
23
SOUTH CENTRAL REGIONAL AIRPORT AGENCY (SCRAA)
AIRPORT SEARCH AREA
MAHASKA COUNTY
4 2 0 4 8
MILES

Exhibit 1-2

The footprint shows each runway as well as the Runway Protection Zone (RPZ) anticipated for each runway end. The size of the approach and departure RPZ were obtained from FAA AC 150/5300-13A – Airport Design. The Footprint represents the area at minimum to be acquired in fee title or easement.

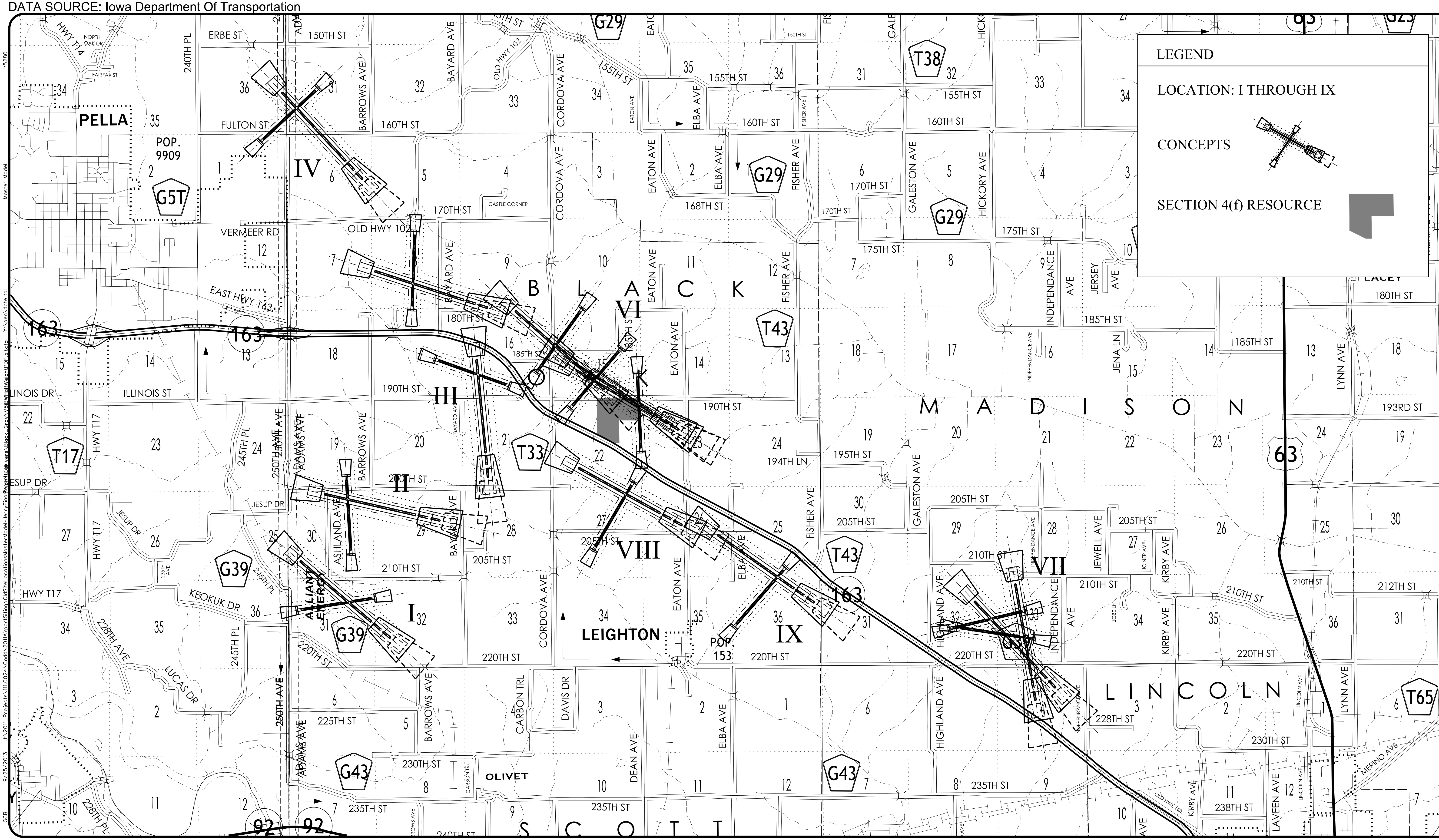
As evident in Exhibit 1-3, the primary runways are aligned in a north/northwesterly direction.

The crosswind runways generally extended in a northeast/southwesterly direction. The objective was to align the primary runway to obtain the best possible wind coverage while considering other site features. The runway orientation was also influenced by existing terrain, drainage patterns, roads, farmsteads evident from aerial photography and topographic maps.

Staff from each member government (City of Oskaloosa, Mahaska County, and City of Pella) met on October 11, 2012 to review and discuss each of the eleven airport concepts. The intent of the initial screening was to determine if the candidate sites satisfied criteria set forth in the 28E Agreement.

If all or a substantial part of the footprint was located outside the search area, the site was eliminated. In addition, any one of the candidate footprints that extended into a Section 4(F) resource (Vander Wilt Farmstead Historic District) was discarded.

DATA SOURCE: Iowa Department Of Transportation



JOINT PELLA / OSKALOOSA REGIONAL AIRPORT
INITIAL CANDIDATE AIRPORT LOCATIONS
MARION AND MAHASKA COUNTIES, IOWA

1 0 1/2 1 2
MILE

COORDINATE REFERENCE SYSTEM (CRS):

Exhibit 1-3

CANDIDATE SITES

Three (3) sites (see Exhibit 1-4) that met site parameters set forth in the 28E Agreement and did not extend into any part of Vander Wilt Farmstead Historic District were retained for continued evaluation and refinement. The three sites were referenced as:

- Site A - Preliminary Concept Plan
- Site B - Preliminary Concept Plan
- Site C - Preliminary Concept Plan

A preliminary airport concept plan for each of the three candidate sites was prepared. The sites were presented to the SCRAA Board on January 4, 2013.

The Preliminary Concept Plans prepared for Site A, B, and C show three runway lengths for the primary runway. The three lengths were intended to show, at minimum (5,500'), a length that would accommodate ARC C-II aircraft. The ultimate (7,500') length was established in the 28E Agreement. The length to be shown on the airport layout plan will be one that is justified based on aeronautical activity.

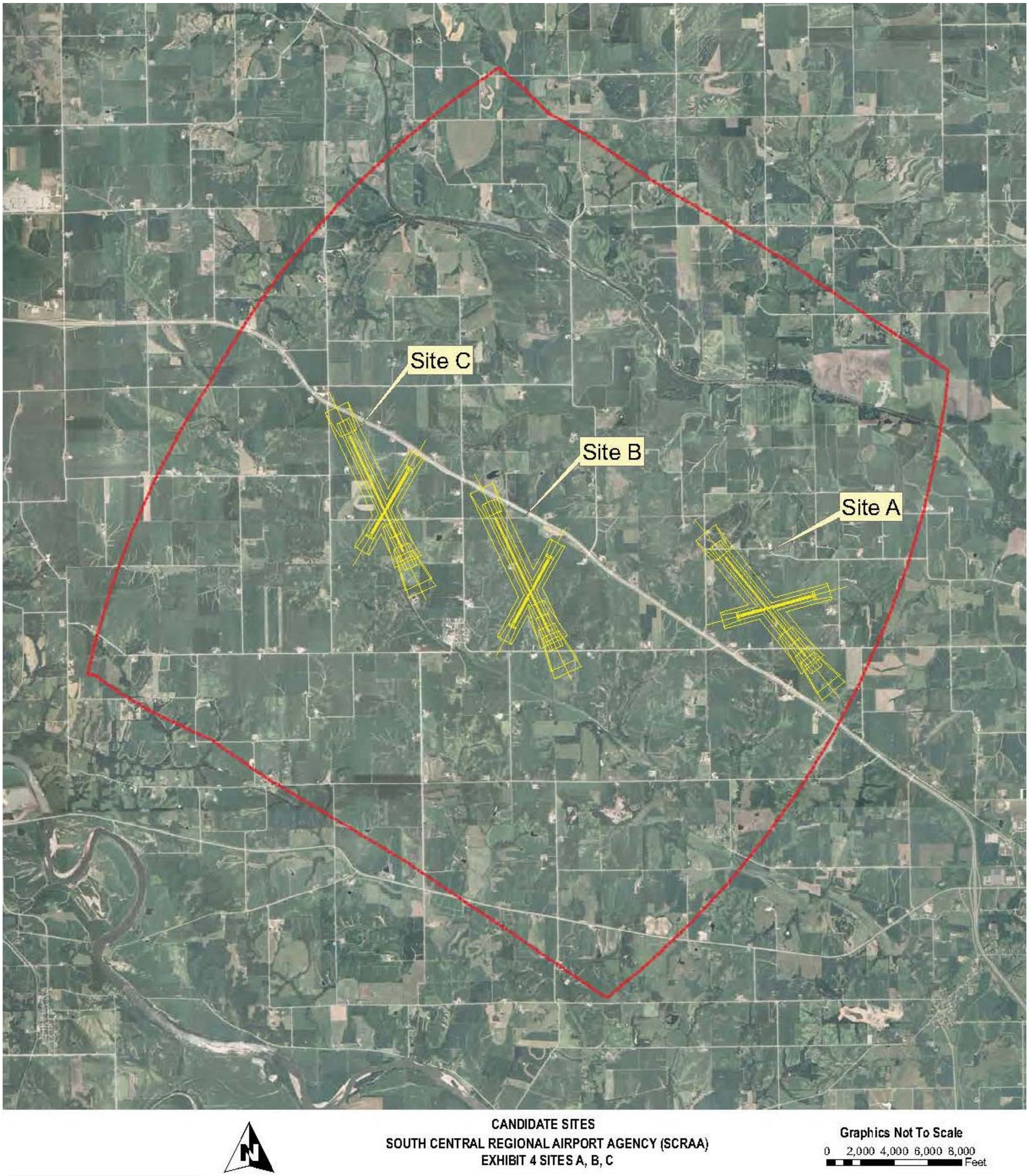
The Preliminary Concept Plan depicts a crosswind runway. The crosswind runway is justified based on the need to provide the site a 95% level of wind coverage at a 10.5-knot crosswind component value. The runway length (4,200') shown in the concept plan is based on the 28E Agreement.

The Preliminary Concept Plans depict the runway safety area (RSA), runway object free area (ROFA) and the building restriction line (BRL). The runway protect zones (RPZ) are shown as trapezoid shapes located beyond each runway end. The areas noted above, along with an area to develop the terminal area, must be under the control of the South Central Regional Airport Agency.

The runway end coordinates (latitude/longitude) are shown for each runway end. The runway end elevation was also established for each runway.

The Preliminary Concept Plans are intended to be used as a tool to first identify potential candidate airport sites and then as a footprint by which to determine if the sites satisfied conditions set forth in the 28E Agreement.

Exhibit 1-4


Site C
Site B
Site A
CANDIDATE SITES
SOUTH CENTRAL REGIONAL AIRPORT AGENCY (SCRAA)
EXHIBIT 4 SITES A, B, C
Graphics Not To Scale
0 2,000 4,000 6,000 8,000
Feet

The SCRAA Board conducted a public information meeting on April 18, 2013. The meeting was attended by 243 people. The purpose of the meeting was to provide an overview of the project and to obtain public comments on the three (3) candidate sites. A PowerPoint presentation was given at the onset followed by a question and answer section. The public was also given an opportunity to submit written comments. Those attending the meeting expressed the following concerns in the form of questions and opinions.

- Why is there a need to build a new airport?
- Why not expand the existing airport in Pella and/or Oskaloosa?
- Why not use the Ottumwa and/or Newton Airports?
- Who will pay for the new airport?
- Why remove productive agricultural land out of production?
- Why disrupt existing farm operations?
- Why cause people to relocate or lose land that has been under the same family ownership for generations?
- Why raise property taxes to pay for the new airport?
- Why was the SCRAA created when so many people are in opposition?

While the above are not all-inclusive and generalized, the concerns were addressed in part by the development of a website: http://www.scraaiowa.com. A list of frequently asked questions (FAQ) was developed and posted on the website.

SCRAA
SOUTH CENTRAL REGIONAL AIRPORT AGENCY

HOME AREA INFO ABOUT CONTACT DOCUMENTS FAQS MAPS TIMELINES

Frequently Asked Questions

- Who
- What
- When
- Where
- Why
- How

Who?

1. Who are the board members of the SCRAA?

David Barnes, Pella
Pam Blomgren, Oskaloosa
Jim Hansen (Chair), Oskaloosa
Donna Smith, Pella
Steve Van Weelden, Pella
Joe Warrick, Mahaska County

Staff members include Mike Nardini, Pella City Administrator; Jerry Nusbaum, Mahaska County Engineer; and Mike Schrock, Oskaloosa City Manager.

2. Who appointed the SCRAA members?

In May and June 2012, the Pella City Council, Oskaloosa City Council, and Mahaska County Board of Supervisors appointed members. The SCRAA board meetings began in June 2012.

3. Who can I contact with questions or for more information?

The SCRAA Chairman is Jim Hansen (641.673.0411). Questions can also be directed the City Administrator of Pella Mike Nardini (641.628.4173), the City Manager of Oskaloosa Mike Schrock (641.673.9431) or any agency member. This SCRAA website will be regularly updated. Use our contact form to ask questions and be automatically contacted with upcoming meeting notices.

4. Who did the SCRAA board hire as a consultant on the regional airport?

Engineering firm interviews took place in Pella in August 2012 and a resolution approving a contract with Snyder & Associates took place in October 2012 at the SCRAA meeting held in Oskaloosa.

5. Who is responsible for the development of the Regional Airport?

In July 2010, Oskaloosa and Pella began to work jointly on regional transportation projects which included discussion about a regional airport to meet regional needs. Public council meetings and public county supervisor meetings was where the regional airport was discussed. In March 2012, Oskaloosa, Pella, and Mahaska County all unanimously approved a 28E Agreement forming a public agency, the South Central Regional Airport Agency (SCRAA) which is responsible for ushering the evaluation, construction, and operations of a regional airport on behalf of the City of Oskaloosa, City of Pella, and Mahaska County.

6. Who is paying for the FAA planning studies required for the project?

90% of these costs will be paid by the FAA; the other 10% will be split between the cities of Oskaloosa and Pella.

7. Who is paying for this new airport?

It is expected that up to 90% of the eligible airside costs will be paid by the FAA. Landside costs (known as "vertical" costs, i.e., the terminal, roads, parking, hangars, etc.) will be paid through a combination of public and private investment. City investment in this project is expected to come from the sale of the current airports.

What?

1. What is eminent domain and will it be used?

Eminent Domain is a method by which local government may force the sale of private land for public use. It will only be used as a last resort on this project. We anticipate reaching voluntary agreements with the impacted landowners. For further information, please see *Land Acquisition for Public Airports* [PDF].

2. What are my rights as a property owner?

See the *Statement of Property Owner Rights* [PDF].

What will regional airport construction costs be?

Phase I (Primary runway of 5,500 feet with future expansion capability of 7,000 feet, land acquisition, the terminal building, and t-hangars equivalent to existing sites, FBO facilities, etc.) is estimated to cost between $24-$30 million.

4. What process was and is used for public notification?

Public notice of our meetings is governed by Iowa law. In addition, the Board has used local media, websites and social media to notify the public of meetings.

5. What is a 28E agreement?

In 2012, the parties worked cooperatively with the Federal Aviation Administration to draft a 28E agreement, a document that legally solidifies the parties' intent to move forward with the evaluation and construction of a regional airport facility. The 28E agreement outlines each party's rights and responsibilities for the joint acquisition, construction, equipping, use, expansion, and operation of an airport facility. The 28E agreement also established the SCRAA which is a separate legal entity that is directed by its Board of Directors. "28E" is a reference to the Iowa Code Chapter that governs these agreements.

6. What are the different timelines involved (studies, land acquisition, construction)?

See the *Action Plan* [PDF].

7. What is the difference between a Category B and Category C airport?

The difference involves the approach speed, wingspan, size and speed of the aircraft that are allowed to land at the facility.

8. What criteria will be used to determine which potential site is selected?

The Board will use over 35 criteria to select the primary and secondary sites.

9. What happens to the existing airports?

The FAA will require the closure of the Pella and Oskaloosa airports. The land will be sold and the proceeds will go to the project.

When?

1. When did Pella, Oskaloosa, and Mahaska County begin discussions about working together?

2010

2. When was a cost analysis done?

This project has been categorized as a "safety & standards project" by the FAA. As such, it is given priority for development. A cost benefit analysis is not required by the FAA for such projects.

3. When was the 28E agreement signed?

All parties signed the 28E agreement [PDF] in March 2012, and the signed agreement was filed with Secretary of State Matt Schultz on March 29, 2012.

4. When will construction begin?

See the *Action Plan* [PDF].

Where?

1. Where will the airport be built?

A primary and secondary site will be determined by June, 2013. Once various studies are completed, the final site will be determined and land acquired. We currently anticipate construction to begin in 2019.

2. Where can I find current information?

Information is posted on this website, http://www.scraaiowa.com. Also, follow our Facebook page for updates.

Why?

1. Why can't Pella expand its airport?

Due to significant site constraints abutting and adjacent to the Pella Municipal Airport, previous analyses have concluded it is not economically feasible to upgrade this airport to a Category C level.

2. Why can't Oskaloosa expand its airport?

Currently, the Oskaloosa airport does not produce enough itinerant operations to justify expansion. In addition, expansion of the Oskaloosa airport would not effectively meet the needs of the Pella users.

3. Why can't Oskaloosa just keep their airport and Pella keep their airport and let businesses use Ottumwa or Newton airports if their planes are too big?

Although the Pella airport is currently designed to Category B standards, the FAA provides Category C approaches for use by Category C aircraft to land there. The Category C approaches are not guaranteed and the FAA could revoke them at any time. Therefore, Pella, Mahaska County, and Oskaloosa, with the support of the FAA, are proposing a new airport which meets Category C design standards. It is also important to note that Oskaloosa, Mahaska County, and Pella believe a new regional airport will help promote economic development for the entire region. These public entities recognize the importance of supporting local business that use these facilities and providing an airport that will meet both current and future needs.

How?

1. How many sites were initially considered for placement of the Regional Airport?

Nine sites were identified by Snyder and Associates as potential Regional Airport sites. The site study was conducted between October 2012 and May 2013. Thirty-two different criteria (airspace restrictions, property impacts, century farms, road disconnects, relocations, runway expansion, access to Highway 163, etc.) were used to rate the different sites, and three were approved by SCRAA board to submit to the FAA for preliminary approval.

2. How do I find out more information?

Continue to monitor this website, http://www.scraaiowa.com. Also, follow our Facebook page for updates.

3. How do you publicize meeting dates and times?

Meeting times and places will continue to be posted as required by law, but will also be made available via the news and social media, including the SCRAA Facebook page.

4. How much do SCRAA members get paid?

Nothing. This is a volunteer board.

5. How will my land be valued if I happen to own land in the selected airport site?

Refer to the *Land Acquisition for Public Airports* [PDF] flyer.

6. How much will my taxes go up when the regional airport is built?

Although we can't be certain, we do not expect county taxes to go up at all. Per the terms of the 28E Agreement, Mahaska County is not financially liable in any way for this airport.

Note: Adobe Reader may be required to view PDF files.

HOME AREA INFO ABOUT CONTACT DOCUMENTS FAQS MAPS TIMELINES

Source: http://www.scraaiowa.com/faqs.php

In addition to the frequently asked questions, the website is used as a location to post other information that may be of interest to the public.

SCRAA
SOUTH CENTRAL REGIONAL AIRPORT AGENCY

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WELCOME TO THE SCRAA

The South Central Regional Airport Agency (SCRAA) is an entity that is responsible for ushering the evaluation, construction and operations of a regional airport forward on behalf of the City of Oskaloosa, the City of Pella and Mahaska County.

In 2012, the parties worked cooperatively with the Federal Aviation Administration to draft a 28E agreement that legally solidifies the parties' intent to move forward with the evaluation and construction of a regional airport facility. The 28E agreement outlines each party's rights and responsibilities for the joint acquisition, construction, equipping, use, expansion and operation of an airport facility.

SCRAA BULLETIN

The airport concept plan graphics viewed and discussed at the 2/25/14 SCRAA meeting can be found by clicking on the *Maps* link above. The next meeting date will be posted here once it is confirmed.

The 28E agreement also established the South Central Regional Airport Agency. The SCRAA is a separate legal entity that is directed by its Board of Directors. The Board is comprised of two representatives from the City of Oskaloosa, three representatives from the City of Pella and one representative from Mahaska County.

Meetings

- At least quarterly
- Annual meeting held during February of each year
- Alternate locations between Oskaloosa and Pella
- Agendas and Minutes are available in the *Documents* section.

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Source: http://www.scraaiowa.com/index.ph

The SCRAA Board, at their May 23, 2013 meeting, passed a resolution designating Site A as the preferred location for continued evaluation and retaining Site B as a secondary site for the proposed South Central Regional Airport.

A draft report entitled: Technical Memorandum – Airport Site Selection – South Central Regional Airport – Iowa was submitted to FAA Central Regional Airport Division on October 15, 2013, for review. Comments were received from FAA on October 30, 2013 and November 22, 2013. The revised Technical Memorandum – Site Selection report was submitted to the FAA Central Region on December 3, 2013. Site A received a favorable airspace determination on March 8, 2013, (Airspace Study Case No. 2013-ACE-29-NRA).

The FAA Central Region Airport Division, in their letter dated December 6, 2013, approved Site A for continued study and development of the Airport Master Plan and Airport Layout Plan (ALP).

"In general, we concur with the conclusions and recommendations from the stand point of efficiency, utility, and safety." FAA Central Region Airports Division – 12/06/2013.

SITE A – INITIAL DEVELOPMENT CONCEPT

Site A is located in Madison Township, T 76 N, R 16 W, Sections 32 and 33 and Garfield Township, T 75 N, R 16 W, Section 4. The initial concept plan was based on requirements set forth in the 28-E Agreement. Reference may be made to Exhibit 1-5.

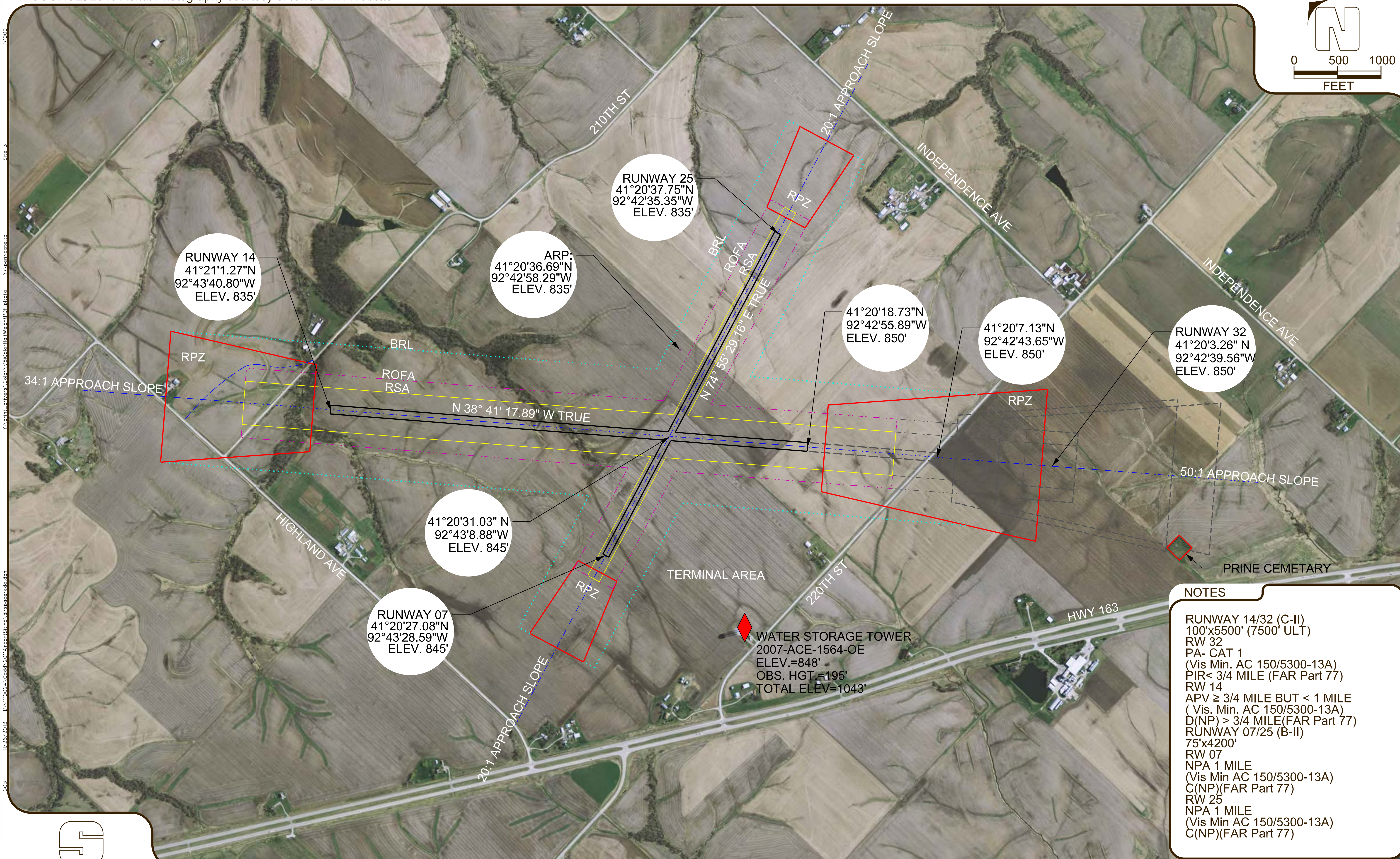
The primary runway (Runway 14/32) orientation is N 38° 41′ 17.89″ W (True). The crosswind runway orientation is N 74° 55′ 29.16″ E (True). Exhibit 1-5 shows the primary runway at a minimum length of 5,500 feet and an ultimate length of 7,500 feet. The crosswind runway (Runway 7/25) is shown at an ultimate length of 4,200 feet.

The concept plan shows a precision approach procedure to the proposed Runway 32 end and an approach with vertical guidance to Runway 14 end. Non-precision instrument approach procedures are shown to each end of the proposed crosswind runway.

Terminal area development is proposed in the southeast quadrant created by the two (2) intersecting runways. Based on facility parameters set forth in the 28E Agreement, the disconnection of 220th Street (County Road G-63) would be required. Unless the proposed Runway 14/32 is shifted to the southeast, 210th Street would also need to be disconnected or rerouted. The development, as depicted in Exhibit 1-5, would impact approximately 560 acres.

Regional access to the site is provided by Iowa Highway 163. Access from Iowa Highway 163 to the terminal area would be provided by 220th Street. An elevated rural water storage structure is located adjacent to 220th Street. There are electrical power transmission lines that extend along Iowa Highway 163 and east of the site. The proposed airport geometry shown in Exhibit 1-5 would potentially impact twelve (12) property owners. The Airport Layout Plan will be based in part on the concept plan as well as the design aircraft or family of aircraft identified in Chapter Two. Facilities needed to support the aeronautical forecasts are discussed in Chapter Three. The alternatives analysis conducted in Chapter Four provides a more refined framework upon which the Airport Layout Plan is based.

SOURCE: 2010 Aerial Photography courtesy of Iowa DNR Website



SNYDER & ASSOCIATES
Engineers and Planners

SOUTH CENTRAL REGIONAL AIRPORT AGENCY
SITE A
MAHASKA COUNTY, IOWA

SUBJECT TO CHANGE

EXHIBIT 5

AIRPORT ROLE

As previously noted, the proposed South Central Regional Airport was entered into the National Plan of Integrated Airport Systems (NPIAS) on September 20, 2012. The FAA, in concert with State aviation agencies and local planning organizations, identifies public use airports that are important to the system for inclusion in the NPIAS.

The NPIAS defines the functional role of an airport as one (1) of four (4) basic airport service levels which describe the type of service that the airport currently provides and is anticipated to provide over the next five (5) years. The four (4) airport roles are:

- Commercial Service (Primary)
- Commercial Service (Non-Primary)
- Reliever
- General Aviation

The existing Pella Municipal Airport and the Oskaloosa Municipal Airport are classified as general aviation airports.

In May 2012, the FAA issued a report entitled: General Aviation Airports: A NATIONAL ASSET. Of the 3,330 airports in the NPIAS, 2,952 was defined as general aviation airports. The FAA Modernization and Reform Act of 2012, defines a general aviation airport as a public airport that is located in a state and that as determined by the Secretary of Transportation does not have scheduled service or has scheduled service with less than 2,500 passengers boarding each year. The 2,952 general aviation airports were grouped into four (4) categories.

GROUP	DESCRIPTION
National	Serves national – global markets (Very high levels of activity with many jets and multi-engine propeller aircraft – Averaging about 200 total based aircraft, including 30 jets)
Regional	Serves regional – national markets (High levels of activity with some jets and multi-engine propeller aircraft – Averaging about 90 total based aircraft, including 3 jets)
Local	Serves local – regional markets (Moderate levels of activity with some multi-engine propeller aircraft – Averaging about 33 based propeller-driven aircraft and no jets)
Basic	Serving critical aeronautical functions within local and regional markets (Moderate – low levels of activity – Averaging about 10 propeller-driven aircraft and no jets)

The FAA submits the NPIAS to the United States Congress bi-annually. Airports included in the NPIAS were assigned to one (1) of the four (4) categories starting with the 2013-2017 NPIAS report to Congress.

The Pella Municipal Airport was classified as a "Regional" airport. The Oskaloosa Municipal Airport, Ottumwa Regional Airport, Knoxville Municipal Airport and Washington Municipal Airport were placed in the "Local" Category.

TABLE 1-1
AREA NPIAS AIRPORTS

IDENTIFIER	AIRPORT	NPIAS CATECORY
GGI	Grinnell Regional Airport	Basic
OOA	Oskaloosa Municipal Airport	Local
OTM	Ottumwa Regional Airport	Local
PEA	Pella Municipal Airport	Regional
OXV	Knoxville Municipal Airport	Local
AWG	Washington Municipal Airport	Local

Source: FAA General Aviation Airports: A National Asset, May 2012
FAA ASSET 2 - In Depth Review of the 497 Unclassified Airports, March 2014

It is reasonable to conclude that FAA will place the proposed South Central Regional Airport in the "Regional" Category given that the Pella Municipal Airport is currently classified as a "Regional" airport.

The 2010 Iowa Aviation Systems Plan recommended that consideration be given to the development of an Enhanced Airport to replace the existing airports owned and operated by the City of Pella and the City of Oskaloosa.

The Pella Municipal Airport has limited capabilities to support the operations of larger business jet aircraft. Feasibility studies, geographic constraints impacting future development opportunities and the proximity of the Oskaloosa Municipal Airport justify a regional approach towards creation of a new Enhanced Service Airport with increased levels of facilities and services to serve the region. It is recommended the cities of Pella and Oskaloosa increase cooperation to develop a new regional airport to replace existing airports serving these communities. A mutually agreed upon location, in proximity of both Pella and Oskaloosa, will be essential to the successful development of a new airport.

Source: 2010 Iowa Aviation System Plan
Iowa DOT – Office of Aviation

An Enhanced Service Airport is defined within the 2010 Iowa Aviation System Plan as follows:

> *These airports have runways 5,000 feet or greater in length with facilities and services that accommodate a full range of general aviation activity including most business jets. These airports serve business aviation and are regional transportation and economic centers.*

Chapter 2

Forecasts

CHAPTER TWO – FORECAST OF AVIATION ACTIVITY

FORECAST METHODOLOGY

Aviation activity forecasts are the basis for determining airport facilities needed to accommodate aviation activity within a defined geographic area. In estimating potential demand, consideration must be given to a number of variables, which influence demand within the airport service area.

- Aircraft Ownership (registered aircraft); hours flown
- Pilot Population
- Population Change, Income
- Employment Labor Force Characteristics
- Major Industrial and Business Users
- Area Airport Facilities and Services

Economic activity within the airport service area, along with area airport facilities and services, are the more important variables influencing aviation demand. In rural communities, the addition or elimination of a single industry can substantially change the level of activity. Airports that have a Fixed Base Operator (FBO) located on the airport typically experience a larger number of based aircraft and operational activity. Aircraft ownership and activity is influenced by socioeconomic trends within the airport service area as well as the cost associated with such ownership.

AIRPORT SERVICE AREA

The South Central Regional Airport service area includes nearly all of the geographic area that comprised the airport service area previously associated with the Oskaloosa Municipal Airport and the Pella Municipal Airports. The proposed airport site is located adjacent to Iowa Highway 163 and within two (2) miles of the proposed US-63/IA 163 interchange. The proposed US Highway 63 bypass around the west side of Oskaloosa will provide improved regional surface access.

The airport service area is shown in Exhibit 2-1. The primary airport service area includes all of Mahaska County and an area within Marion County that is defined by the Des Moines River and Iowa Highway 44. The primary service area includes the following incorporated cities:

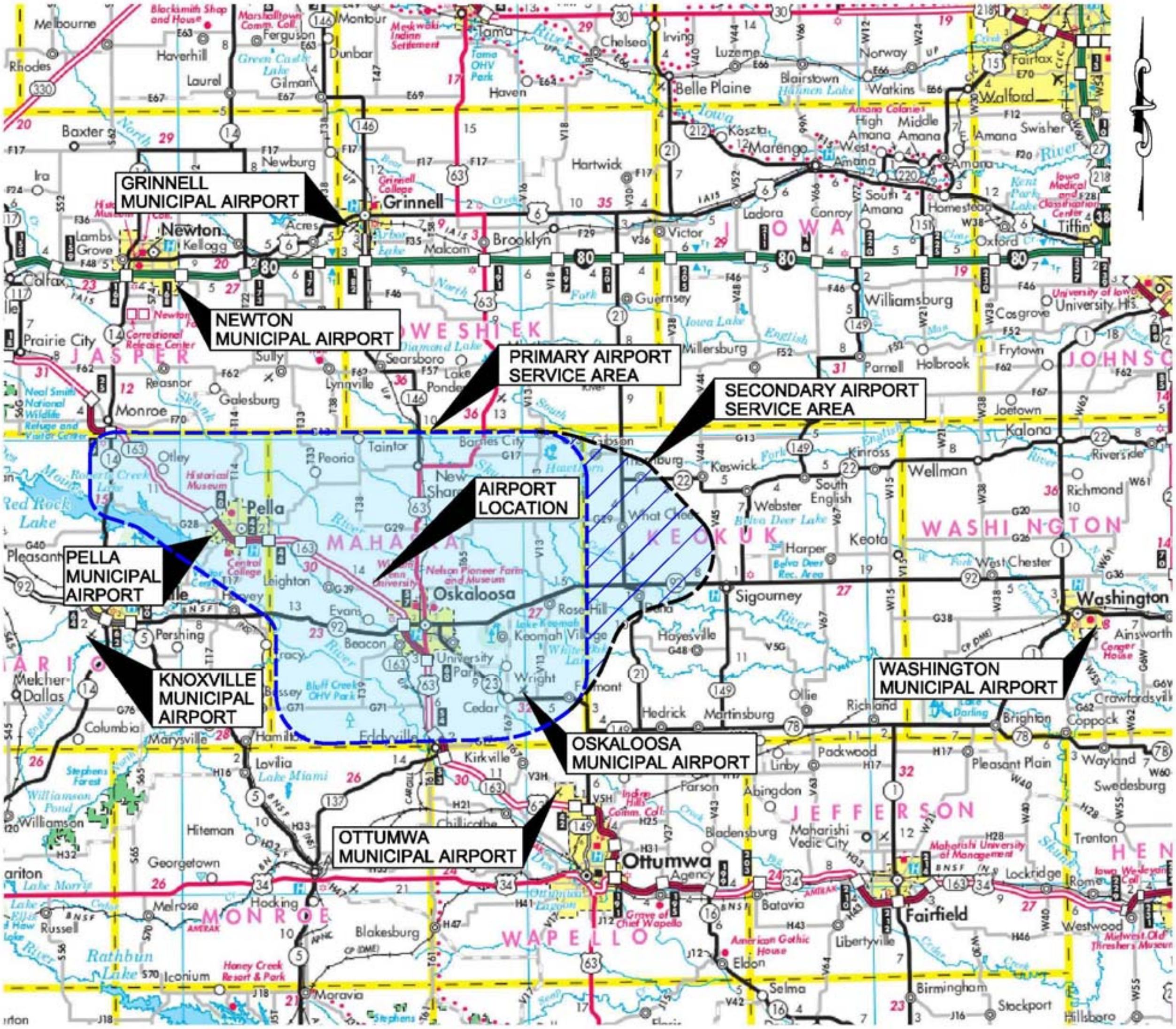
- Barnes City
- Keomah Village
- Oskaloosa
- Beacon
- Leighton
- Pella
- Fremont
- New Sharon
- Rose Hill
- University Park

A secondary service area extends into Keokuk County. Aircraft owners from this area that currently base airplanes at the Oskaloosa Municipal Airport may choose to use the proposed South Central Regional Airport, the Washington Municipal Airport or the Ottumwa Regional Airport.

Plot Date: 3/29/2015

Scale: 1:65000

Model: exhibit



LEGEND

PRIMARY SERVICE AREA

SECONDARY SERVICE AREA

File: C:\Projects\205 South Central RAA\01\dgn\figures\SCRAA_statemap.dgn

DGR ENGINEERING	Project Manager: Jerry Searle Designer: JJC Project Number: Phone: (515) 963-3488	SOUTH CENTRAL REGIONAL AIRPORT AGENCY MAHASKA COUNTY, IOWA	AIRPORT SERVICE AREA	EXHIBIT 2-1

POPULATION

There were 36,623 persons residing within the South Central Regional Airport Service Area in 2010. Of those, 69.4% resided within the eight (8) incorporated cities located in the airport service area. Oskaloosa and Pella combined account for 59.6% of the 2010 airport service area population. Table 2-1 shows, by township, the resident population for the census years 1990, 2000 and 2010.

Table 2-1
Total Population in SCRA Service Area Townships: 1990 - 2010

Geographic Area	Year			Change	
Township	**1990**	**2000**	**2010**	**No.**	**%**
Adams township, Mahaska Count	312	288	242	-70	-22.0%
Black Oak township, Mahaska County	594	637	753	159	26.8%
Cedar township, Mahaska County	1,075	1,111	1,108	33	3.1%
East Des Moines township, Mahaska County	268	281	273	5	1.9%
Garfield township, Mahaska County	1,237	1,287	1,232	-5	-0.4%
Harrison township, Mahaska County	570	622	608	38	6.7%
Jefferson township, Mahaska County	369	351	324	-45	-12.2%
Lake Prairie township, Marion County - Pella	10,771	11,763	12,498	1,727	16.0%
Lincoln township, Mahaska County	410	448	402	-8	-2.0%
Madison township, Mahaska County	434	404	361	-73	-16.8%
Monroe township, Mahaska County	290	259	232	-58	-20.0%
Oskaloosa City township, Mahaska County	10,632	10,938	11,463	831	7.8%
Pleasant Grove township, Mahaska County	355	352	297	-58	-16.3%
Prairie township, Mahaska County	1,534	1,735	1,671	137	8.9%
Richland township, Mahaska County	522	459	472	-50	-9.6%
Scott township, Mahaska County	482	425	712	230	47.7%
Spring Creek township, Mahaska County	1,443	1,647	1,583	140	9.7%
Summit township, Marion County	676	1,141	1,444	768	113.6%
Union township, Mahaska County	370	312	331	-39	-10.5%
West Des Moines township, Mahaska County	120	164	170	50	41.7%
White Oak township, Mahaska County	505	525	447	-58	-11.5%
Total	**32,969**	**35,149**	**36,623**	**3,654**	**11.1%**

Source: U.S. Bureau of the Census 1990-2010

Approximately 38% of the service area population resides in Marion County (Lake Prairie Township and Summit Township). The balance of the population resides in Mahaska County. It should be noted that there are two (2) public airports in Marion County (Pella and Knoxville). The balance of the Marion County population (62%) is served by the Knoxville Municipal Airport. As noted in Table 2-1, Lake Prairie Township (Pella City) account for 52.7% of the South Central Regional Airport Service Area population increase within the period 1990-2010. The population within Pella increased from 9,270 persons in 1990 to 10,352 in 2010 or by 11.6%. Within the same period the population of Oskaloosa increased by 863 persons or by 8.14%.

While the above discussion focused on population change within the past 20 years, Table 2-2 summarizes the population change for incorporated cities over a 40 year period. The City of Pella experienced significant growth from 1970 to 2010 with the most significant increase (55.2%) occurring between 1970 and 1990. Oskaloosa within the same period experienced a modest population loss.

TABLE 2-2
POPULATION INCORPORATED CITIES: 1970 - 2010

City	Population					Change	
	1970	1980	1990	2000	2010	No.	%
Barnes City	238	266	221	201	176	-62	-26.1%
Beacon	338	530	509	518	494	156	46.2%
Fremont	480	730	701	704	743	263	54.8%
Keomah Village	N/A	99	99	97	84	-	-
Leighton	140	137	142	153	162	22	15.7%
New Sharon	944	1,225	1,136	1,301	1,293	349	37.0%
Oskaloosa	11,224	10,989	10,632	10,938	11,463	239	2.1%
Pella	6,668	8,349	9,270	9,832	10,352	3,684	55.2%
Rose Hill	192	214	171	205	168	-24	-12.5%
University Park	534	645	598	536	487	-47	-8.8%
Total	**20,758**	**23,184**	**23,479**	**24,485**	**25,422**		

Source: U.S. Bureau of the Census 1970-2010

Given the concentration of population and employment opportunities within a 14 mile corridor extending between Oskaloosa and Pella, there is merit to the development of a new airport along the Iowa Highway 163 corridor that can serve both population and employment nodes.

Population growth in the South Central Regional Airport Service Area is expected to continue through 2025. Table 2-3, summarized forecast population change in Marion and Mahaska Counties as well as five (5) adjacent counties.

TABLE 2-3
POPULATION PROJECTION SEVEN COUNTY: 2010-2025

Area	2010	2015	2020	2025	Change	
					No.	%
Jasper	36,636	36,817	37,067	37,351	715	2.0%
Keokuk	10,608	10,402	10,215	10,037	-571	-5.4%
Mahaska	22,326	22,367	22,451	22,555	229	1.0%
Marion	32,909	33,793	34,737	35,714	2,805	8.5%
Monroe	7,532	7,430	7,342	7,262	-270	-3.6%
Poweshiek	18,658	18,853	19,083	19,331	673	3.6%
Wapello	35,328	34,913	34,566	34,251	-1,077	-3.0%

Source: Woods & Poole Economics Inc. 2010 State Profile: Iowa

COMMUNITY PATTERNS

Worker commuting patterns are an indicator of regional economic relationships. People are often employed outside the city or county within which they reside. The willingness to travel has an impact on a number of economic indicators. People will purchase goods and services in a location where they work.

The development of a new airport located between Pella and Oskaloosa represents a component of the transportation infrastructure that will contribute to the development of a regional population and employment center. Seventy (70) percent of the Pella residents work in Marion County while only 46% of the Oskaloosa residents work in Mahaska County. More specifically, 51% of the Pella residents work in Pella compared to 37% of the Oskaloosa residents who work in Oskaloosa. Five (5) percent of the Oskaloosa residents commute to Pella while 3% of the Pella residents commute to Oskaloosa.

TABLE 2-4
WORKER INFLOWS-OUTFLOWS PELLA/OSKALOOSA: 2011

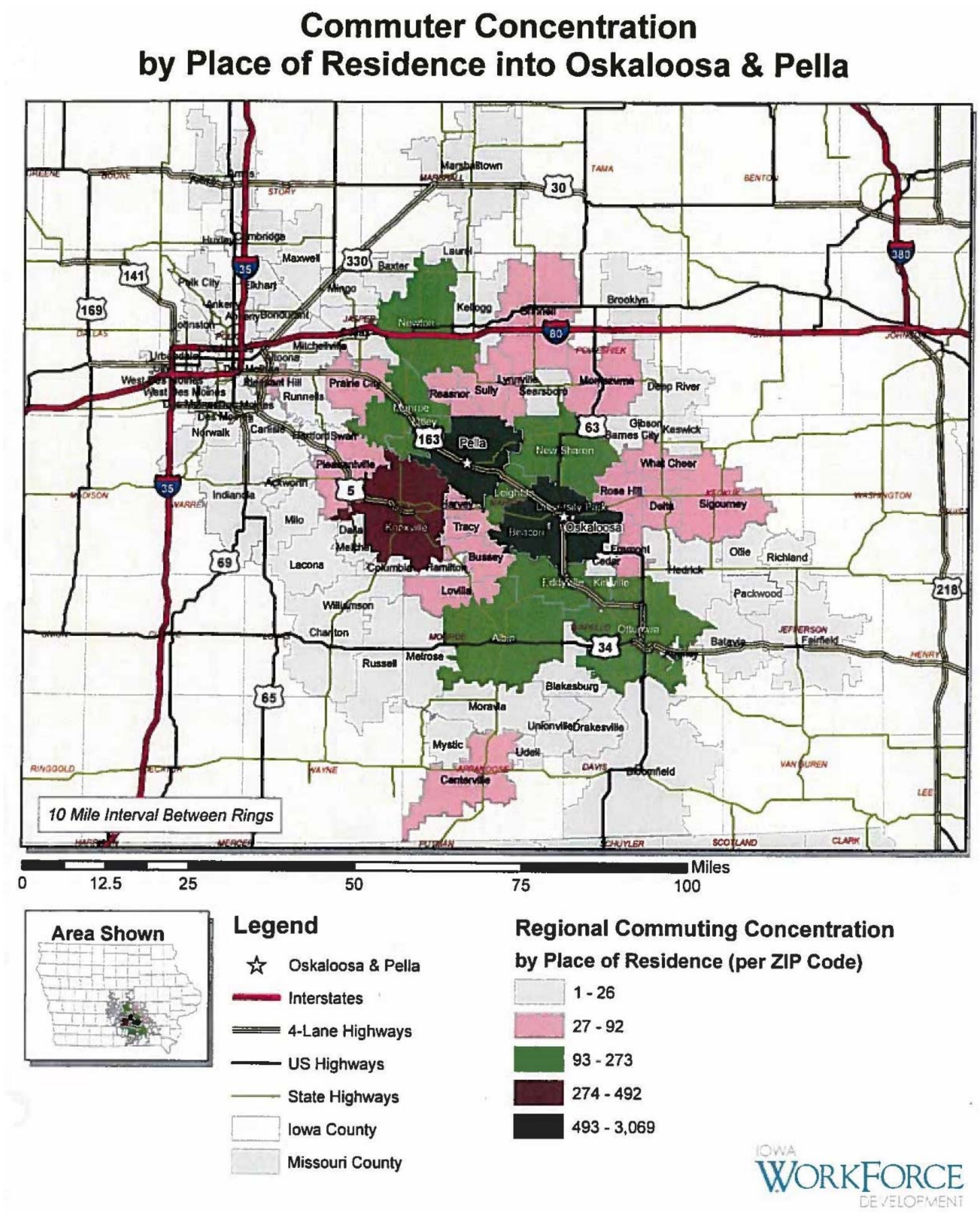
	Employed In - Living Elsewhere	Employed & Living In	Living in - Employed Elsewhere
Pella	4,268	2,183	2,129
Oskaloosa	3,947	1,903	3,260

Source: Iowa State University Department of Economics
FY 2013 Retail Trade Analysis: Pella, Oskaloosa

Given the good correlation between population and employment with aeronautical activity, it is reasonable to consider the laborshed studies for Pella and Oskaloosa (Mahaska County). The laborshed studies were published by Iowa Workforce Development – Labor Market and Workforce Information Division. The Pella Laborshed Analysis was released in February 2013. The Mahaska Community Analysis was also released in February 2013. While each of the above referenced studies followed the same methodology, it is not reasonable to simply combine the two (2) data sets. A request was made to Iowa Workforce Development to prepare an analysis for combined laborshed to more accurately represent the South Central Regional Airport Service Area.

Exhibit 2-2 shows the two major employment nodes within the combined Oskaloosa (Mahaska County) and Pella laborshed. The study concluded that persons accepting employment within the Oskaloosa and Pella employment nodes area will commute an average of 28 miles one way.

Exhibit 2-2



RETAIL SALES

Retail sales are an indicator of a community's economic well-being. The City of Pella and the City of Oskaloosa each show a trade surplus. Given the proximity to the Des Moines Metropolitan Area, a surplus indicates that persons travel to each community to purchase goods and services.

Table 2-5
Retail Trade Surplus: Pella & Oskaloosa
FY 04 - FY 13

Fiscal Year (1)	Pella		Oskaloosa	
	Surplus ($1,000)	% of Actual Sales	Surplus ($1,000)	% of Actual Sales
2006	19,110	13.5%	48,818	27.9%
2007	20,449	14.4%	50,945	29.2%
2008	26,853	18.0%	48,564	28.0%
2009	24,188	16.5%	42,225	25.4%
2010	32,681	22.7%	46,388	28.6%
2011	34,400	23.1%	49,173	29.5%
2012	36,564	23.8%	44,580	27.2%
2013	45,572	28.3%	42,712	26.6%

Source: Iowa State University Department of Economics
Retail Trade Analysis Report: Pella, Oskaloosa March 2014
[1] State Fiscal Year Ending June 30

As evident in the above table, Oskaloosa has historically been a strong retail center. Of significance, is the increase in surplus retail sales in Pella. Actual sales in Oskaloosa decreased by 7.9% while actual retail sales in Pella increased by 13.9% from FY 2006 to FY 2013. The increase in actual sales is related in part to the increase in population. The surplus sales are a more silent indicator of the geographic extent of the retail trade service area. In some communities the retail trade service area mirrors the airport service area.

EMPLOYMENT

According to the South Central Regional Airport Service Area Laborshed Analysis report, manufacturing employment accounted for 24.8% of the total employment. Those employed in education accounted for 16.8%. There are two 4-year institutions of higher learning located within the airport service area. Central College is located in Pella and has an enrollment of 1,500 students; William Penn University is located in Oskaloosa and has an on campus enrollment of 900 students.

Persons employed within the healthcare and social service occupations accounted for 12.6% of the employment followed in turn by persons employed in wholesale and retail trade.

Table 2-6
Industrial Classification of the Employed
Oskaloosa/Pella Laborshed Survey: 2013

Industry	% of Laborshed
Manufacturing	24.8%
Education	16.8%
Healthcare/Social Services	12.6%
Wholesale & Retail Trade	10.7%
Finance, Insurance, Real Estate	6.1%
Transportation, Communication Utilities	5.1%
Personal Services	4.9%
Professional Services	4.7%
Construction	3.8%
Agriculture, Forestry	3.3%
Entertainment	0.9%
Active Military	0.2%

Source: Iowa Workforce Development

The Pella Chamber of Commerce posted the following on their website (www.pella.org), "Pella Boasts 6,500 plus manufacturing and industrial jobs and ranks ninth in the state in the capacity. This abundance of jobs attracts commuters from communities within a 50 mile radius." Major employers within each of the two (2) South Central Regional Airport Service area employment nodes are summarized below:

Oskaloosa	Pella
Clow Valve Company-350	Pella Corporation-2224 (Pella Location)
Cargill, Inc.-600	Vermeer Corporation-2364 (Pella Location)
Cunningham Inc.-90	Pella Regional Health Center-819
Musco-450	Central College-469
Interpower Corp-81	Precision Inc.-193
Mahaska Bottling-97	Van Gorp Corp-60
William Penn-225	Heritage Lace-45
Midland Metals-62	Pella Products-39
Mahaska Health Partnership-489	Christian Opportunity Center-122

A number of the companies located within the airport service area use aviation on a regular basis. The Pella Corporation and MUSCO own and operate airplanes that are identified in FAA AC 150/5325-4B Table 3-2, Remaining 25 Percent of Airplanes That Make Up 100 Percent of Fleet.

GENERAL AVIATION AIRCRAFT

National Trends

The Federal Aviation Administration (FAA) prepares on a yearly basis a forecast of aeronautical activity. Reference was made to the following publications that were used.

- *FAA Aerospace Forecast, Fiscal Years 2014-2034.*
- *FAA Terminal Area Forecast Summary, Fiscal Years 2013-2040.* The FAA revised their survey methodology that was used in preparing their forecasts. In 2010, the FAA required that all aircraft be registered within the period 2011-2013. The effort was undertaken to improve the data base and methodology used in preparing national aviation forecasts. The forecasts are based on active aircraft, not total aircraft. An active aircraft is one that is registered and flies at least one (1) hour during the year.

The FAA forecasts the active aircraft fleet and hours flown for single-engine piston aircraft, multi-engine piston, turbo-props, turbojets, rotocraft, sport, experimental and other (glider, balloon).

The report entitled FAA Forecasts Fiscal Years 2014-2034 provided several observations:

- The number of active piston-powered aircraft (including rotocraft) is projected to decrease at an annual rate of 0.3% from the 2013 total of 141,325 to 131,615 by 2034. Single-engine fixed wing piston aircraft are projected to decline at a rate of 0.4% while multi-engine fixed wing are projected to decline by 5.0%.
- The turbine powered fleet (including rotocraft) is projected to increase at an average annual rate of 2.6%, growing from an estimated 29,110 aircraft in 2013 to 49,656 in 2034. The turbine jet portion of the fleet is expected to increase at 3.0% a year. The number of turbo prop aircraft is forecast to increase from 10,195 in 2013 to 14,370 in 2034 or by 4.0% over the 20 year period.
- The light sport category of aircraft forecast assumes a 4.1% annual growth rate.

Starting in 2005, the light sport category was created. Light sport aircraft are defined as aircraft that are limited to:

- 1,320 pounds maximum takeoff weight for aircraft not intended for operation on water, or 1,430 pounds maximum takeoff weight for aircraft intended for operation on water.
- A maximum airspeed in level flight with maximum continuous power (V_H) of not more than 120 knots CAS under standard atmospheric conditions at sea level.
- A maximum seating capacity of no more than two persons, including a pilot.
- A single, reciprocating engine.
- A fixed or ground-adjustable propeller in a powered aircraft other than a powered glider.
- A non-pressurized cabin, if equipped with a cabin.
- Maximum airspeed of 120 knots.
- Fixed landing gear, except for an aircraft intended for operation on water or glider.
- Fixed or repositionable landing gear, or a hull, for an aircraft intended for operation on water.

- A maximum stalling speed or minimum steady flight speed without the use of lift-enhancing devices (V_{S1}) of not more than 45 knots CAS at the aircraft's maximum certificated takeoff weight and most critical center of gravity.

Aircraft meeting the above specifications, such as a Piper J-2 or J-3, Aeronca Champ, or early model Taylorcraft, may now be flown by sport pilots.

A very light jet (VLJ) is one that has gross takeoff weight under 12,500 pounds and can operate on runways 4,000 feet or less in length. The VLJ is approved for single-pilot operation with four (4) to eight (8) seats available. Aircraft in service include:

- Cessna – Citation Mustang
- Eclipse – Eclipse 500
- Embraer – Embraer Phenom 100

Other makes are under development or undergoing flight testing. The FAA forecast assumes that the market for on-demand air taxi service will continue to grow and provide an impetus for increased demand for VLJ's.

Table 2-7
U.S. Active General Aviation and Taxi Aircraft: 2000-2034

As of Dec. 31	Fixed Wing					
	Piston			Turbine		
	Single Engine	Multi-Engine	Total	Turbo Prop	Turbo Jet	Total
Historical						
2000	149,422	21,091	170,513	5,762	7,001	12,763
2013E	123,730	14,235	137,965	10,195	11,890	22,085
Forecast						
2018	119,435	13,955	133,390	10,285	13,225	23,510
2023	116,190	13,575	129,765	10,820	15,315	26,135
2034	113,975	12,890	126,865	14,370	22,050	36,420
Avg Annual Growth						
2000-13	-1.4%	-3.0%	-1.6%	4.5%	4.2%	4.3%
2013-34	-0.4%	-0.5%	-0.4%	1.6%	3.0%	2.4%

As of Dec. 31	Rotocraft			Experimental[1]	Sport Aircraft	Other	Total General Aviation
	Piston	Turbine	Total				
Historical							
2000	2,680	4,470	7,150	20,407	NA	6,700	217,533
2013E	3,360	7,025	10,385	25,305	2,110	5,015	202,865
Forecast							
2018	3,710	8,405	12,115	27,705	2,830	5,065	204,615
2023	4,030	9,870	13,900	29,715	3,450	5,110	208,075
2034	4,750	13,145	17,895	34,440	4,880	5,200	225,700
Avg Annual Growth							
2000-13	1.8%	3.5%	2.9%	1.7%	N/A	-2.2%	-0.5%
2013-34	1.7%	3.0%	2.6%	1.5%	4.1%	0.2%	0.5%

Source: FAA Aerospace Forecast, Fiscal Year 2014-2034 Table 28

[1]Experimental Light-sport category that was previously shown under Sport Aircraft is moved under Experimental Aircraft category, as of 2012.

Note: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

The number of general aviation operations is forecast to grow at an average annual rate of 0.9% with much of the growth attributed to the increased use of the turbine fleet for business/corporate related travel.

The FAA forecasts the number of hours flown by active general aviation aircraft to increase by 1.4% within the period of 2013-2034.

- Hours flown by single-engine piston powered aircraft are forecast to decrease by 0.6% from 2013-2034 and by multi-engine piston aircraft by 0.5%.
- Hours flown by turbo-prop aircraft are forecast to increase by 1.8% over 20 years while turbo-jet hours flown is expected to increase by 4.2%.
- Piston and turbine rotocraft hours are expected to grow by 2.8% from 2013-2034 with turbine aircraft increasing by 3.1% compared to 1.8% for piston rotocraft.
- Sport aircraft hours flown are forecast to increase by 5.1% while experimental aircraft is expected to increase by 2.6% from 2013-2034.

The General Aviation Manufacturers Association (GAMA) reported in their 2013 General Aviation Statistical Databook and Industry Outlook that worldwide billings in 2013 had increased 24% from 2012.

- The business jet market stabilized in 2013, with 678 business jets delivered compared to 672 in 2012, the North American share was 52.4% compared to 49.7% in 2012.
- Turbo-prop airplane deliveries increased by 10.4% from 2012 to 2013 with 57.1% going to North America.
- The number of turbine helicopters increased by 9.2% compared to 2012.
- North America accounted for 52.8% of the piston airplanes and helicopters that were delivered in 2013. The 933 shipments in 2013 represented a 2.8% increase.

GAMA reported that general aviation (GA) supports over 1.2 million jobs, provides 150 billion dollars in economic activity, and in 2012 generated 4.8 billion dollars in exports.

Iowa Trends

The number of aircraft based at public owned airports in Iowa totaled 2,085 in 1981. The number decreased through the eighties due to significant changes in the agricultural and manufacturing sectors, as well as increased cost associated with ownership and an aging population. Within the same period, the state continued to experience a loss of employment and population in rural areas.

As noted in Table 2-8, the number of aircraft reported as based at public owned airports, since 1990, has experienced a modest increase. The increase in the number of aircraft may be attributed in part to:

- Closure of private airport facilities.
- Recent increases in manufacturing employment within Iowa
- Recovery from the "farm crises", lower interest rates and demand for food and fiber
- Increasing employment within the communications, financial and insurance sectors
- Increase in the number of sport and experimental aircraft

The number of aircraft increased from 2,221 in 1990 to 2,362 in 2000 or by 6.4%. There were 2,354 aircraft reported as based at public owned airports in 2012.

Table 2-8
Based Aircraft-Iowa Public Owned Airports: 1990-2012

Year	Based Aircraft	Year	Based Aircraft	Year	Based Aircraft
1990	2221	1998	2245	2006	2494
1991	2208	1999	2298	2007	2466
1992	2197	2000	2362	2008	2385
1993	2190	2001	2332	2009	2409
1994	2232	2002	2484	2010	2477
1995	2219	2003	2435	2011	2507
1996	2251	2004	2485	2012	2354
1997	2282	2005	2475	2013	N/A

Source: IA DOT-Office of Aviation, Dec 2014

The 2010 Iowa Aviation System Plan forecast the number of based aircraft to increase to 3,603 by 2030. General Aviation operations were forecasted at a 0.5% growth rate.

Table 2-9
Iowa Based Aircraft Projections: 2010-2030

Year	Based Aircraft	Aircraft Operations
2010	2,809	940,360
2015	2,986	998,121
2020	3,187	1,063,906
2025	3,387	1,130,612
2030	3,603	1,283,399

Source: 2010 Iowa Aviation System Plan: 2010-2030

Seven County Regional Trends

A seven (7) county area was selected to provide a comparative analysis as a sub-set of statewide historic based aircraft trends. The seven (7) counties, extending over south central Iowa, included Jasper, Keokuk, Mahaska, Marion, Monroe, Poweshiek and Wapello.

There are eight (8) public owned airports located in the seven (7) county region. As previously noted, there are two (2) public owned airports in Marion County (Pella and Knoxville). There is no public owned airport in Keokuk County (see Exhibit 2-1). The numbers of based aircraft at the eight public owned airports are summarized in Table 2-10.

TABLE 2-10
BASED AIRCRAFT PUBLIC OWNED AIRPORTS
SEVEN COUNTY REGION: 2004-2013

ID	Airport	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
4C8	Albia	9	10	10	10	8	8	8	8	8	7
GG1	Grinnell	13	13	14	13	12	12	12	12	21	20
OXV	Knoxville	29	32	30	30	30	35	42	45	44	40
TN4	Newton	23	23	23	23	18	18	18	20	18	23
OOA	Oskaloosa	32	32	32	33	33	33	34	35	35	34
OTM	Ottumwa	26	26	35	35	35	35	33	38	37	35
PEA	Pella	28	28	26	26	29	29	29	29	28	27
8C2	Sully	0	0	0	0	0	0	0	0	0	0
	Seven County Total	**160**	**164**	**170**	**170**	**165**	**170**	**176**	**186**	**191**	**186**

Source: IA DOT Office of Aviation April 2014

Within the period 2004 to 2013, the number of aircraft based at the eight (8) public owned airports increased from 160 in 2004 to 186 in 2013. The Grinnell Regional Airport recorded a 53.8% increase in based aircraft followed by the Knoxville Municipal Airport with a 37.9% increase over the ten (10) year period. The Albia Municipal Airport experienced a decrease while the remaining airports remained essentially stable. In 2013, the combined Pella and Oskaloosa airport would represent 32.8% of the seven (7) County Regional total.

As of November 2013, 256 aircraft were reported as registered within the seven (7) counties. Wapello County reported 36.3% of the total followed by Marion County with 22.6% and Mahaska County with 11.7%. As noted in Table 2-11, the number of aircraft registered in the seven (7) county region within the period 2010-2013, decreased by 9.9%. The decrease in number is comparable to the statewide decrease of 9.1%. The decrease in number may be due in part to efforts to update the Federal registry data base.

TABLE 2-11
SEVEN COUNTY REGISTERED AIRCRAFT: 2013

			Change	
County	2010	2013	Number	%
Jasper	22	22	0	0.0%
Keokuk	20	13	-7	-35.0%
Mahaska	38	30	-8	-21.1%
Marion	51	58	8	15.7%
Monroe	22	14	-8	-36.4%
Poweshiek	22	26	4	18.2%
Wapello	109	93	-16	-14.7%
Seven County Total	284	256	-28	-9.9%
State Total	4,100	3,726	374	-9.1%

Source: Iowa DOT-Office of Aviation April 2014

The larger number of registered aircraft when compared to base aircraft at public owned airports suggests that aircraft owners may base their airplanes at private owned airports or other public owned facilities. There are an estimated 25 aircraft located on the Antique Airfield in Blakesburg.

SOUTH CENTRAL AIRPORT

The number of based aircraft at the Pella Municipal Airport increased from 28 in 2004 to 35 in 2014 (see Table 2-12). The 25% increase can be attributed to the enhancement of aeronautical service provided by the Fixed Base Operator (FBO) and the significant increase in population and employment.

Aircraft based at the Oskaloosa Municipal Airport increased from 32 in 2004 to 35 in 2014 or by 9.3% (see Table 2-12). The Oskaloosa Airport Manager reported that as of April 3, 2014, that the existing hangar space was leased. There is also a lack of aircraft storage space at the Pella Municipal Airport.

TABLE 2-12
OSKALOOSA/PELLA BASED AIRCRAFT: 2004-2013

Year	Oskaloosa	Pella	Combine Total
2004	32	28	60
2005	32	28	60
2006	32	26	58
2007	33	26	59
2008	33	29	62
2009	33	29	62
2010	34	29	63
2011	34	29	63
2013	35	28	63
2013	34	27	61
2014	37(1)	35(2)	70

Source: Iowa Database 2004-2013, IA DOT Office of Aviation, April 2014
[1] Airport Manager - Oskaloosa 4-3-2014
[2] Airport Manager - Pella 4-3-2014

The combined (Pella and Oskaloosa) based aircraft number increased from 60 in 2004 to 70 in 2014.

The airport manager for each airport facility provided a listing of current (4/3/2014) based aircraft to include the "N" number, make and model. Reference may be made to Tables 2-13 and 2-14.

Of the 35 aircraft based at the Pella Municipal Airport, 24 were single engine piston powered fixed wing aircraft. There were four (4) multi-engine piston. The remaining five (5) aircraft include four (4) twin engine turbo-jets and one (1) single engine turbo-prop.

There were five (5) twin engine piston powered airplanes based at the Oskaloosa Municipal Airport. The remaining 29 aircraft were single engine piston powered aircraft.

If all 70 aircraft were relocated to the proposed new airport site, the aircraft mix would include four (4) twin engine turbo-jets, one (1) single engine turbo-prop, nine (9) twin engine piston aircraft and 56 single engine piston powered. It is unlikely that all existing based aircraft will be relocated to the proposed new airport.

It is also reasonable to assume that there are aircraft based elsewhere that may choose to relocate to the proposed airport.

Musco has indicated that the two (2) aircrafts currently based at the Ottumwa Regional Airport will be relocated to the proposed South Central Regional Airport. These aircraft include the Gulfstream 200 and Cessna Citation II.

The lack of aircraft storage space has constrained the growth of based aircraft at the Pella Municipal Airport.

Table 2-13
Based Aircraft Pella Municipal Airport: 2014

No.	Registration	Type	AAC	ADG	Notes
1	N696RK	Experimental Vans RV6	A	I	
2	N9715Y	Beech P-35	A	I	
3	N317SW	Beech S-35	A	I	
4	N6552V	Beech V-34A	A	I	
5	N4769S	Piper PA-32-260	A	I	
6	N121SS	Cessna 150	A	I	
7	N8074K	Stinson 108-2	A	I	
8	N2352V	Cessna 140	A	I	
9	N6245V	Beech V-35	A	I	
10	N32TA	Beech 36	A	I	
11	N13380	Cessna 177B	A	I	
12	N9551Y	Beech 35	A	I	
13	N2806R	Piper PA28R-200	A	I	
14	N8089C	Piper PA28-181	A	I	
15	N7127G	Cessna 172K	A	I	
16	N733NK	Cessna 172N	A	I	
17	N6468	Cirrus SR22	A	I	
18	N922B	Beech 95B-55	B	I	*Multi-engine piston
19	N3196A	Beech A36	A	I	
20	N26LM	Beech 76	A	I	*Multi-engine piston
21	N3114N	Cessna 120	A	I	
22	N3463K	Piper J3C65	A	I	
23	N853DB	Cirrus SR20	A	I	
24	N257AC	American Champion 7GCBC	A	I	
25	N77149	Cessna 120	A	I	
26	N340CF	Cessna 340A	B	I	*Multi-engine piston
27	N12VU	Learjet 45	C	I	*Multi-engine jet
28	N9LV	Raytheon Premier 1	B	I	*Multi-engine jet
29	N863CD	Cirrus SR22	A	I	
30	N48VC	EMB500	B	I	VLJ *Multi-engine jet
31	N404LR	Beechjet 400A	B	II	*Multi-engine jet
32	N583SR	Cirrus SR22	A	I	
33	4546S	BE95-B55	B	I	*Multi-engine piston
34	N4815B	TBM 850	C	I	*Single Engine Turbo prop
35	120DX	Exp. Vans RV 12	A	I	

Source: Shane VanderVoort, Airport Manager, Pella Municipal Airport, April 3, 2014
AAC = Aircraft Approach Category
ADG = Airplane Design Group

Table 2-14
Based Aircraft Oskaloosa Municipal Airport: 2014

No.	Registration	Type	AAC	ADG	Notes
1	N9003T	Challenger-Light Sport	A	I	
2		Kit-Fox	A	I	
3	N6603A	Cessna 172	A	I	
4	N75KP	Zenith 601-Kit Built	A	I	
5	N1645M	Zodiac 6DIXL-Kit Built	A	I	
6	N7515R	Piper Cherokee PA28-140	A	I	
7	N8911C	Piper PA22 Tri Pacer	A	I	
8	N819E	Aeronca 7AC Champ	A	I	
9	N15534	Piper Cherokee PA28-180	A	I	
10	N74276	Grumman Tiger	A	I	
11	N701KW	Zenith 701-Kit Built	A	I	
12	N44RG	Sonieral-Kit Built	A	I	
13	N3623G	Cougar-Built	A	I	
14	N7725F	Cessna 1724	A	I	
15	N19177	Fairchild 24	A	I	
16	N113HM	Piper PA 32 Cherokee 6	A	I	
17	N374PG	Zenith 701-Kit Built	A	I	
18	N437NG	Zenith 601-Kit Built	A	I	
19	N4106J	Piper PA 28 140 Cherokee	A	I	
20	N16269	Piper PA 28 Cherokee 6	A	I	
21	N8262D	Beech F33 Bonanza	A	I	
22	N8650E	Piper PA 28-190 Cherokee	A	I	
23	N6390E	Cessna 172	A	I	
24	N5521M	Piper PA 28-191 Warrior II	A	I	
25	N5569Q	Mooney M-20C	A	I	
26	N7678D	Cessna 140	A	I	
27	N5370	Citibria	A	I	
28	N7494P	Piper Comanche 250	A	I	
29	N421MZ	Cessna 421 B	B	I	*Multi-engine piston
30	N516HS	Spacewalker-Kit Built	A	I	
31	N501L	C421C	B	I	*Multi-engine piston
32	N88606	C421C	B	I	*Multi-engine piston
33	N6668E	Stinson 10B	A	I	
34	N2658Z	C421C	B	I	*Multi-engine piston
35	N5801X	Cessna 310F-Twin Piston	B	I	*Multi-engine piston

Source: Jerry Struck, Airport Manager, Oskaloosa Municipal Airport, April 3, 2014
ACC = Aircraft Approach Category
ADG = Airplane Design Group

The aircraft approach category (AAC) and the airplane design group (ADG) for each based aircraft was noted in Tables 2-13 and 2-14. For airport planning and design purposes, FAA defines aircraft by approach speed (see Table 2-15), and wing span (see Table 2-16).

TABLE 2-15
AIRCRAFT APPROACH CATEGORY (AAC)

Approach Category	Approach Speed (Knots)	Typical Aircraft Type
A	Less than 91	Beech Baron 55, Cessna 172
B	91 but less than 121	King Air, Citation II
C	121 but less than 141	Lear 25, Gulfstream III
D	141 but less than 166	Gulfstream II, IV, V
E	166 or greater	Blackbird 71, Tupolev 144

Source: FAA Advisory Circular 150/5300-13, "Airport Design"

TABLE 2-16
AIRPLANE DESIGN GROUP (ADG)

Airplane Design Group	Wingspan (feet)	Typical Aircraft
I	Less than 49	Cessna 172, Piper PA-23, Cessna 401, Cessna 414
II	49 but less than 79	Falcon 50, Beech King Air E-90, Citation II, Gulfstream III
III	79 but less than 118	Dash 8, Convair 580, Gulfstream V
IV	118 but less than 171	A-300, B-707, B-757, B-767, L1011, DC-10
V	171 but less than 197	B-747
VI	197 but less than 262	Future

Source: FAA Advisory Circular 150/5300-13, "Airport Design"

All 35 aircraft based at Oskaloosa have a wing span less than 49 feet. With the exception of the four (4) Cessna 421 C airplanes and one (1) Cessna 310 F airplane, the remaining 30 aircraft have an approach speed less than 91 knots (A-I). The Cessna 421 C and Cessna 310 F have an approach speed greater than 91 knots but less than 121 knots (B-I).

There are two (2) aircraft (Learjet 45, TBM850) based at Pella that have an approach speed greater than 121 knots but less than 141 knots (C-I). These two (2) airplanes have a wing span less than 49 feet. There is one (1) airplane (Beechjet 400) that has an approach speed greater than 91 knots but less than 121 knots and a wing span greater than 49 feet but less than 79 feet (B-II). There are 27 airplanes with an approach speed less than 91 knots and a wing span less than 49 feet (A-I). There are five (5) airplanes with an approach speed greater than 91 knots but less than 121 knots and a wing span less than 49 feet (B-I). Table 2-17, provides a summary of multi-engine airplanes based at the Oskaloosa and Pella Municipal Airports.

TABLE 2-17
MULTI-ENGINE SUMMARY COMBINED AIRPORTS

Aircraft Model	Wing Span (in feet)	Tail Height (in feet)	Gross Weight (in pounds)	Approach Speed (in knots)	AAC/ADG	Engine Type
Beech 95-B55	37' 10"	9' 7"	5,100	-----	B/I	Piston
Beech 76	38' 0"	9' 6"	3,900	76	B/I	Piston
Learjet 45	47' 10"	14' 1"	21,500	123	C/I	Jet
Raytheon Premier 1	44' 0"	15' 0"	12,500	112	B/I	Jet
Beech 400A	43' 6"	13' 11"	16,100	120	B/II	Jet
EMB 500	40' 4"	16' 5"	4,750	100	B/I	Jet
Cessna 421C	41' 1"	11' 5"	7,450	110	B/I	Piston
Cessna 340	38' 1"	12' 7"	5,990	107	B/I	Piston

Source: DGR Engineering

Airplane characteristics associated with the single engine turbo-prop airplane based at the Pella Municipal Airport are noted in Table 2-18.

TABLE 2-18
SINGLE ENGINE TURBO-PROP AIRCRAFT

Aircraft Model	Wing Span (in feet)	Tail Height (in feet)	Gross Weight (in pounds)	Approach Speed (in knots)	AAC/ADG	Engine Type
TBM850	41.6'	14.29'	7,394	122	C/I	Turbo-Prop

Source: DGR Engineering

Table 2-19 summarizes, by aircraft approach category and airplane design group, the number of aircraft based at the two existing airports.

TABLE 2-19
BASED AIRCRAFT MIX COMBINED AIRPORTS: 2014

	A-I	A-II	B-I	B-II	C-I	C-II
Oskaloosa	30	0	5	0	0	0
Pella	27	0	5	1	2	0
Total	57	0	10	1	2	0

Source: DGR Engineering

Three (3) of the total 70 airplanes are defined as large airplanes having a gross takeoff weight of 12,500 pounds or more.

The largest aircraft based at the two (2) existing airports is the Learjet 45 XR (C-I).

Future numbers of based aircraft at the proposed South Central Regional Airport are expected to be initially lower in the first five (5) years than the combined 2014 total presented in Tables 2-12 and 2-19. As aircraft storage space is constructed and assuming the hangar lease rates are competitive with area airports, the based aircraft number will experience a modest increase.

A majority of the based aircraft will be small airplanes with a gross landing and/or takeoff weight under 12,500 pounds. Given the business mix and scale, it would not be unreasonable to sustain the three (3) airplanes currently based at the existing airports. The designated Cirrus sales and service facility currently located at the Pella Municipal Airport will contribute to an increase in the number of airplanes based at the airport. In addition, the Citation II and Gulfstream 200 are expected to be relocated from the Ottumwa Regional Airport.

The forecast based aircraft assumes that the number of corporate aircraft based at the existing airport will be sustained over the 20 year planning period. The forecast also assumes that the airport facilities and environment will be able to accommodate approach category "C" operations.

The level of aeronautical services provided at the existing two (2) airports has contributed to the historic increase in based aircraft. The ability to sustain and expand these services (i.e. maintenance, instruction, rental, charter and sales) is a significant factor contributing to aeronautical activity. The availability of fuel and aircraft storage are additional facility components that have an impact on aeronautical activity.

The local economy is affected by national as well as global economic trends. The current downturn has had an impact on corporate air travel for one (1) company within the airport service area just as increased economic activity contributed to increased air travel by several other major employers. Over the 20 year planning horizon, air travel for business airplanes based at the existing airport will be sustained with additional corporate aircraft being attracted to the new airport.

The forecast based aircraft mix by airplane reference code is noted in Table 2-20. The based aircraft fleet will consist primarily of ARC A-I piston powered airplanes or those with wingspans under 49 feet and an approach speed less than 91 knots. The Learjet 45 XR (ARC C-I) and Gulfstream 200 (ARC C-II) represent large airplanes with an approach speed of 123 knots and 140 knots respectively. Both of these aircraft are classified as approach category "C" airplanes.

The new airport is not expected to be operational sometime within the period 2019-2020. For purpose of preparing the aeronautical forecast, the year 2020 was selected as the year the airport would be operational. As airside and landside facilities are completed, the based aircraft numbers are expected to increase following the initial startup period. Table 2-20 sets forth based aircraft by type for the period 2020 to 2040. The year 2014 is included in the table as the base line year.

Table 2-20
Based Aircraft By Type: 2014-2040

Year	Piston		Turbine		Rotocraft	Sport Other	Baseline Total	Annual Variation
	Single Engine	Multi Engine	Single Engine	Multi Engine				
2014[1]	45	9	1	4	0	11	70	----
2020	37	5	1	6	0	6	55	+/- 5
2025	41	6	2	6	0	12	67	+/- 4
2030	42	7	2	6	0	12	69	+/- 4
2040	43	7	3	6	0	13	72	+/- 4

Source: DGR Engineering

[1] 2014 Baseline Year Existing Aircraft Count

The total number of aircraft based at the new airport is forecast to reach 72 in the year 2040. In the initial year of operation, 55 aircraft are forecast to be based at the airports. The number is expected to increase to 67 within five (5) years as aircraft storage facilities are completed. The based aircraft mix (based on approach speed and wing span) for the period 2014 to 2040 is shown in Table 2-21.

TABLE 2-21
BASED AIRCRAFT MIX: 2014-2040

Year	Piston			Turbine (Prop/Jet)			
	A-I	B-I	B-II	B-I	B-II	C-I	C-II
2014	57	8	0	2	1	2	0
2020	43	5	0	2	2	2	1
2025	53	6	0	3	2	2	1
2030	54	6	1	3	2	2	1
2040	56	6	1	3	3	2	2

Source: DGR Engineering

The majority of the based aircraft will have an approach speed under 91 knots and a wing span under 49 feet (A-I). While the piston powered aircraft numbers are expected to show little change over the 20 year period, the number of turbine aircraft based at the South Central Regional Airport is expected to increase. The anticipated growth is based on the analysis of changes in the based aircraft mix that has occurred at the Pella Municipal Airport over the past five (5) years to include:

- Turbine aircraft being relocated from an area airport to the new airport
- Replacement of multi-engine piston aircraft with very light jet aircraft

Forecast operational activity at the new airport is based on a number of variables. While national trends are a factor, local events within the South Central Regional Airport Service Area are more significant. Factors include:

- Based aircraft by type
- Pilot and general population trends
- Economic trends to include employment growth in a diversified economy
- Aeronautical service and pricing
- Airport facilities to include airside, landside and approach minimums

There is a need at the existing Pella Municipal Airport for additional airplane storage space, and expanded maintenance facilities and an airport operating environment that accommodates approach category "C" operations. In addition, aircraft storage space at the Oskaloosa Municipal Airport was reported as being full.

Should the constraints noted above be addressed, it is reasonable to expect a modest increase in operational activity over the 20 year planning horizon.

An aircraft operation is defined as the airborne movement of aircraft in controlled and non-controlled airport terminal areas and about given enroute fixes or at other points where counts can be made. Each movement counts as an operation. A "touch and go," for example, counts as two operations.

Total annual aircraft operations are further broken down into local and itinerant operations. A local operation is defined as one by an aircraft that:

- Operates within the local traffic pattern or within sight of the control tower;
- Is known to be departing for or arriving from local practice areas; or
- Executes simulated instrument approaches of low passes at the airport.

An itinerant aircraft operation is one that operates outside the local traffic pattern.

A typical example of an itinerant operation is an air taxi operation. Aviation operations are most often discussed in terms of:

- Total annual aircraft operations
    - Total annual local
    - Total annual itinerant
- Peak day and peak hour operations

Table 2-22
Total Annual Local and Itinerant Operations 2020-2040

Year	Total Annual	Local	Itinerant
2020	14,700	7,056	7,644
2025	18,722	8,981	9,741
2030	19,530	9,374	10,156
2040	21,102	9,933	11,169

Source: DGR Engineering
Itinerant = 52% of total
Local = 48% of total

Approximately 52% of the total annual operations are expected to itinerant in nature. Operations by airplanes with an approach speed under 91 knots will have a larger number of local operations (60%) as opposed to those with an approach speed of 121 knots or greater.

The methodology set forth in the 2010 Iowa System Plan along with guidelines outlined in FAA Order 5090.3C Field Formulation of the National Plan of Integrated Airport Systems was used to estimate operational activity.

<u>2010 Iowa Aviation System Plan</u>

- Airports with 1 to 30 based aircraft forecasted were assigned 250 operations per aircraft, while airports with 31 to 99 based aircraft were assigned 350 operations per aircraft. Airports forecasted with 100 or more aircraft were assigned 450 operations per aircraft.

<u>FAA Order 5090.3C</u>

- 250 operations per based aircraft for rural general aviation airports.
- 350 operations per based aircraft for busier general aviation airports with more itinerant traffic.
- 450 operations per based aircraft for busy reliever airports.

The methodology used to prepare the South Central Regional Airport forecasts assume that annual operations per based aircraft will fall within the range of 250 operations for airplanes with an approach speed under 91 knots increasing to 450 operations for those with an approach speed of 121 knots or great.

- A-I Airplanes 250 operations/based airplane
- B-I, B-II Airplanes 350 operations/based airplane
- C-I, C-II Airplanes 450 operations/based airplane

Total annual aircraft operations are projected to increase from 14,700 in 2020 to 21,102 in 2040. Table 2-23 summarizes the operational mix from 2020 to 2040.

Table 2-23
Total Annual Operational Mix: 2020-2040

Year	A-I	B-I	B-II	C-I	C-II	Total
LOCAL & ITINERANT						
2020	10,750	2,450	350	900	250	14,700
2025	13,250	3,433	700	1,080	260	18,722
2030	13,500	3,717	763	1,260	290	19,530
2040	14,000	4,284	826	1,620	372	21,102
ITINERANT ONLY						
2020	4,081	2,083	350	900	250	7,664
2025	4,783	2,918	700	1,080	260	9,741
2030	4,795	3,048	763	1,260	290	10,156
2040	4,836	3,513	826	1,620	372	11,169

Source: DGR Engineering
A-1: Zero (0) % annual growth in operations/based airplane
B-I, B-II: 1.5%-1.8% annual growth
C-I, C-II: 3.5%-4.0% annual growth

Table 2-24 summarized the Terminal Area Forecasts (TAF). The FAA uses the Terminal Area Forecast in part to determine if the forecast set forth herein is reasonable. Forecast of based aircraft and total operations are considered reasonable with the TAF if they differ by less than 10% in the 5-year forecast period and by less than 15% in the 10-year forecast period.

Table 2-24
APO Terminal Area Forecast – FAA: 2014

	Oskaloosa		Pella	
Year	Based Aircraft	Total Operations	Based Aircraft	Total Operations
2010	31	13,950	22	8,399
2014	31	13,950	36	8,399
2020	32	13,950	44	8,399
2025	33	13,950	54	8,399
2030	33	13,950	64	8,399
2040	33	13,950	84	8,399

Source: FAA APO Terminal Area Forecast - February 2014

The TAF based aircraft numbers are well within 10% for the current year 2014 if Oskaloosa and Pella are combined. FAA has not prepared a terminal area forecast for a combined airport. Based on the combined TAF based aircraft numbers, the forecast for the South Central Regional Airport is considered reasonable. The TAF forecast for Oskaloosa (450 operations per based aircraft) is not consistent with the ratio of operations to based aircraft (250 operations per based aircraft) set forth in FAA Order 5090.3C.

INSTRUMENT OPERATIONS

Instrument approaches are defined as an approach made to an airport with Instrument Flight Rules (IFR) flight plan. IFR operations take place under the following conditions:

- When visibility is less than 3 miles or ceiling is at or below the minimum initial approach altitude.
- Where no weather reporting service is available at non-tower airports, the following criteria, in descending order, is used to determine valid instrument approaches:
    - A pilot report
    - If the flight has not canceled its IFR flight plan prior to reaching the initial approach fix
    - The official weather as reported for any airport located within 30 miles of the airport to which the approach is made.

An instrument operation is any aircraft operation conducted in accordance with an IFR flight plan or an operation where IFR separation between aircraft is provided by a terminal control facility or air route control center (ARTCC).

The number of instrument operations may be used as a basis for determining justification for various public investments (i.e. air traffic control, landing and approach aids, etc.).

Annual instrument operations and approaches were based on total annual itinerant operations and estimating ratios for airports within the Minneapolis Air Traffic Control Center (ARTCC). The estimating ratios were obtained from a report entitled: *1995 Iowa Weather and Navigational Aid Plan.* The Study was prepared for the Iowa DOT by Thompson Consultants International Inc. in 1995. For airports within the Minneapolis ARTCC:

Annual Instrument Approaches (AIA)	0.203573	x	Itinerant operations
Annual Instrument Operations (AIO)	0.132092	x	Itinerant operations

Table 2-25
Annual Instrument Approaches/Operations: 2020-2040

Year	Total Annual Itinerant Operations	Annual Instrument Approaches	Annual Instrument Operations
2020	7,664	1,560	1,012
2025	9,741	1,983	1,286
2030	10,156	2,067	1,342
2040	11,169	2,274	1,475

Source: DGR Engineering

Annual instrument approaches are forecast to increase from 1,560 in 2020 to 2,274 in 2040. Annual instrument operations are forecast to grow from 1,012 in 2010 to 1,475 in 2040.

PEAK MONTH / DAY

The peak month will most likely occur in June, July or August. Fuel sales are typically used to identify the peak month. Based on the past Iowa DOT activity counts and fuel sales at other general aviation airports, the peak month would typically account for 12% of the total operational activity.

TABLE 2-26
PEAK MONTH AND DAY OPERATIONS: 2020-2040

Year	Total Annual Itinerant Operations	Peak Month[1]	Average Day Peak Month[2]	Peak Hour Avg. Day[3]	50% of Avg. Day
2020	7,661	920	30	3	15
2025	9,741	1,169	38	4	19
2030	10,156	1,219	39	4	20
2040	11,169	1,340	43	4	22

Source: DGR Engineering
[1] Peak Month Operations = 12% of annual itinerant operations
[2] Peak Month divided by 31 days
[3] Peak Hour Avg. 12 hours day = 110%

The 50% of the average day peak month suggests that one-half of the itinerant aircraft will be on the ground at any one time within a 12-hour period. The ramp area should be sized to accommodate no few than 15 airplanes in 2020 and 22 airplanes by 2040.

PASSENGER ENPLANEMENTS

The South Central Regional Airport is expected to generate 10,290 enplanements in 2020 and upwards of 15,078 enplanements by 2040.

TABLE 2-27
PASSENGER ENPLANEMENTS: 2020-2040

Year	Itinerant Operations	Passenger Enplanements[1,2]	Peak Hour Day Departures	Peak Hour Passengers
2020	7,664	10,346	2	5
2025	9,741	13,150	2	5
2030	10,156	13,711	2	5
2040	11,169	15,078	2	5

Source: DGR Engineering
[1] Based on 2.7 passengers per itinerant departure
[2] Annual itinerant operations divided by two (2) = departures

DESIGN AIRCRAFT

Table 2-23 summarized the forecast operations mix for the period 2020-2040. Estimated 1,150 aircraft operations with an approach speed of 121 knots but less than 141 knots are forecast for horizon year 2020.

The Learjet 45 XR is the largest aircraft currently based at the Pella Municipal Airport and is representative of the family of airplanes that will use the South Central Regional Airport.

Learjet 45 XR

Maximum Gross Takeoff Weight	21,500 pounds
Wing Span	47'-1"
Approach Speed	123 Knots
ARC	C-I

The Beechjet 400A based at the Pella Municipal Airport is representative of turbo-jet aircraft that will use the South Central Regional Airport.

Beechjet 400A

Maximum Gross Takeoff Weight	16,100 pounds
Wing Span	37'-10"
Approach Speed	120 Knots
ARC	B-II

Musco Lighting operates two aircraft (Gulfstream 200, Cessna Citation II) that are currently based at the Ottumwa Regional Airport due to lack of adequate hangar space and runway length constraints at the existing Pella Municipal and Oskaloosa Municipal Airports. Musco Lighting has indicated their intent to base their two airplanes at the South Central Regional Airport.

The Gulfstream G-200 is defined as a large airplane.

Maximum Gross Takeoff Weight	34,450 pounds
Wing Span	58'-1"
Approach Speed	140 Knots
ARC	C-II

The Cessna Citation II, owned by the same company, would also be relocated to a Joint Pella/Oskaloosa Airport Facility.

Maximum Gross Takeoff Weight	13,300 pounds
Wing Span	51'-8"
Approach Speed	108 Knots
ARC	B-II

There are itinerant operations (on a less than regular basis) by approach Category "C" airplanes based elsewhere. These airplanes include the IAI Westwind, Beechjet 400, Citation III, Hawker 125, Learjet 55, Learjet 25, and Sabreliner 60.

A 500 annual itinerant operations threshold by critical aircraft or family of aircraft has been established by FAA to determine the Airport Reference Code (ARC) and AIP participation.

The Learjet 45 XR and Gulfstream 200 represent airplanes (up to 60,000 pound maximum certified takeoff weight) that comprise the remaining 25 percent of the airplanes that make up 100 percent of the fleet. (Reference FAA AC 150/5325-4B, Table 3-2).

Chapter 3

Facility Requirements

CHAPTER THREE – FACILITY REQUIREMENTS

This chapter identifies the airside and landside facilities needed to accommodate the forecast levels of demand at the South Central Regional Airport. Generally, these needs are determined by comparing the capacity of existing facilities with forecast demand. The facility requirements discussed in this chapter are not so narrowly defined that they point to a single solution. The facility requirements determined, together with the aviation forecasts presented in the previous chapter, will provide the foundation for identifying and selecting development alternatives that are appropriate for meeting existing and future needs at the airport. Aeronautical demand may change over time. Prior to implementing capacity related projects, the aeronautical demand must be well documented. Capacity related improvements may be accelerated in response to demand or delayed indefinitely should there be less than sufficient need.

The South Central Regional Airport should ultimately be developed to accommodate large airplanes with a gross takeoff weight up to 60,000 pounds. FAA defines a large airplane as one of more than 12,500 pounds maximum certified takeoff weight. The composite family of airplanes expected to use the South Central Regional Airport have an approach speed less than 141 knots and a wingspan up to but not including 79 feet.

FAA AC 150/5300-13A Airport Design (dated 9-28-12) set forth standards and technical requirements. The update included several principle changes to design standards relevant to the proposed South Central Regional Airport.

- Runway Reference Code (RRC)-Existing Operational Capability
- Runway Design Code (RDC)-Planned Development/Operational Capability
- Taxiway Design Group (TDG)
- Runway Protection Zone (RPZ)
- Approach Visibility Minimums (as expressed in terms of Runway Visual Range (RVR) values)

AIRFIELD DESIGN CRITERIA

Runways and taxiways are designed to satisfy operational requirements of aircraft using airport facilities. The FAA guidance on airfield dimensional standards for runways and taxiways is based on a combination of:

- Aircraft Approach Category (AAC)
- Airplane Design Group (ADG)
- Approach Visibility Minimums
- Taxiway Design Group (TDG)

These four (4) components are further discussed below:

1.) The Aircraft Approach Category (AAC) is a grouping of aircraft based on either a reference landing speed or 1.3 times the stall speed at the maximum certified landing weight. There are currently five (5) AAC's used for airport planning and airport design purposes. These AAC's are listed in Table 3-1.

Table 3-1
Aircraft Approach Category Classification

Approach Category	Approach Speed (Knots)
A	Less than 91
B	91 but less than 121
C	121 but less than 141
D	141 but less than 166
E	166 or greater

Source: FAA Advisory Circular 150/5300-13A, Airport Design

2.) The Airplane Design Group (ADG) is a classification of aircraft based on wingspan or tail height, whichever results in higher classification. There are currently six (6) ADG's used for airport planning and airport design purposes. These ADG's are listed in Table 3-2.

Table 3-2
Aircraft Wingspan Classification

Airplane Design Group	Tail Height (feet)	Wingspan (feet)
I	Less than 20	Less than 49
II	20 but less than 30	49 but less than 79
III	30 but less than 45	79 but less than 118
IV	45 but less than 60	118 but less than 171
V	60 but less than 66	171 but less and 214
VI	66 but less than 80	214 but less than 262

Source: FAA Advisory Circular 150/5300-13A, Airport Design

3.) The Approach Visibility Minimum is the distance from which a pilot on an instrument approach glide path can see landing aids at the runway threshold. There are five (5) visibility categories used for airport planning and airport design purposes. These visibility categories are listed in Table 3-3.

Table 3-3
Approach Visibility Minimums

Visibility Category	RVR[1]	Visibility Minimum
Visual (V)	N/A	Visual Flight Rules (VFR) only. No circling approach
Non-Precision Approach (NPA)	5000	≥1 mile
Approach Procedure with Vertical Guidance (APV)	4000	≥ ¾ mile but < 1 mile
Precision Approach (PA)	2400	≥ ½ mile but < ¾ mile - (CAT-I PA)
	1600	≥ ¼ mile but < ½ mile - (CAT-II PA)
	1200	Lower than 1/4 mile (CAT-III PA)

Source: FAA Advisory Circular 150/5300-13A, Airport Design

[1]The Runway Visual Range (RVR) is the distance over which a pilot of an aircraft on the centerline of the runway can see the runway surface markings delineating the runway or identifying its centerline.

4.) The Taxiway Design Group (TDG) is a classification of airplanes based on their undercarriage dimensions. These dimensions are outer to Main Gear Width (MGW) and the Cockpit Main Gear (CMG) distance or wheel based, whichever is greater.

RUNWAY DESIGN CODE (RDC)

The Runway Design Code assigned to the proposed runway facilities were determined by first identifying the most demanding aircraft expected to use the runway on a regular basis. The RDC for the proposed runway facilities at the South Central Regional Airport are as follows:

I. Runway Design Code-Primary Runway
    (A) Aircraft Approach Category - C
        (1) 121 knots or more but less than 141 knots
    (B) Airplane Design Group - II
        (1) Tail Height: 20 feet or more but less than 30 feet
        (2) Wingspan: 49 feet or more but less than 79 feet
    (C) Visibility Minimums-Runway Visual Range (RVR)
        (1) Precision Approach End
            a. Lower than ¾ mile but not lower than ½ mile
            b. RVR-2,400 feet
            c. PA-CAT I
            d. RDC=C-II-2,400 feet
        (2) Approach Procedure with Vertical Guidance
            a. Lower than 1 mile but not lower than ¾ mile
            b. RVR-4,000 feet
            c. APV ≥ ¾ mile but < 1 mile
            d. RDC=C-II-4000 feet

II. Runway Design Code-Crosswind Runway
    (A) Aircraft Approach Category – A & B
        (1) Less than 121 knots
    (B) Airplane Design Group – I
        (1) Tail Height: less than 20 feet
        (2) Wingspan: less than 49 feet
    (C) Visibility Minimums-Runway Visual Range (RVR)
        (1) Non-Precision Instrument (horizontal only)-both runway ends
        (2) NPA 1-mile straight in
            a. RDC=B-I-5000 feet

RUNWAY REFERENCE CODE (RRC)

AC 150/5300-13A, Airport Design, introduced the Runway Reference Code terminology to clarify that not only each runway but also each runway end can have a different RRC. Previously, runways were classified by Airport Reference Code, which designates an airport by the runway with the most demanding design code.

The FAA guidance for the current operational capabilities of a runway, where no special operating procedures are necessary, is based on the RRC. As previously stated, the RRC consists of the following three (3) components.

1. Aircraft Approach Category (AAC), denoted by a letter (Table 3-1)
2. Airplane Design Group (ADG), denoted by a roman numeral (Table 3-2)
3. Approach Visibility Minimums, denoted by RVR values in feet or "VIS" for runways operated under visual approach conditions only (Table 3-3)

The RRC for the runway facilities on the proposed South Central Regional Airport are:

Primary Runway	
Precision Approach End	None since facility not constructed
Opposite End	None since facility not constructed
Crosswind Runway	
Both Ends	None since facility not constructed

To achieve visibility minimums lower than ¾ mile but not lower than ½ mile – RVR of 2,400 feet (PA-CAT I), the precision instrument approach end will have to be equipped with an approach light system (ALS).

Since the runways are proposed, there are no RRC values. Once the runways are constructed, the RRC value can be established to reflect existing conditions.

WIND ANALYSIS

Prior to assigning a Runway Reference Code (RRC) and Runway Design Code (RDC) to the primary runway, a preliminary wind analysis must first be conducted. While the primary runway orientation may be slightly different after the runway alternatives analysis is completed, the change in orientation by a few degrees is not expected to result in a significant change to the wind coverage provided by the primary runway.

Within the Site Selection Phase, wind coverage provided by the primary runway orientation (N 38° 41′ 17.89″ W) for Site A was analyzed. As noted in Table 3-4, the primary runway provides a 95.01% level of wind coverage at a 13.0-knot crosswind component value.

Table 3-4
Site A Wind Coverage

Runway	10.5 Knots	13.0 Knots	16.0 Knots
Primary Runway	90.38	95.01	98.43
Crosswind Runway	80.47	88.20	95.71
Combined Runway	96.35	98.89	99.70

Source: Technical Memorandum-Airport Site Selection, November 2013
Ottumwa Regional Airport Wind Data: 2000-2009

Since the primary runway orientation for Site A provides a 95% level of wind coverage at a 13.0 knots crosswind component value, the crosswind runway may be developed to accommodate less demanding airplanes (RDC A-I and B-I).

The allowable crosswind component based on the Runway Design Code (RDC) is shown in Table 3-5.

Table 3-5
Allow Crosswind Component

Runway Design Code (RDC)	Allowable Crosswind Component
A-I and B-I	10.5 Knots
A-II and B-II	13.0 Knots
A-III and B-III	16.0 Knots
C-I through C-III	16.0 Knots
D-I through D-III	16.0 Knots

Source: FAA AC 150/5300-13A, Airport Design

The crosswind runway, based on the analysis under taken during the site selection phase, should be developed to accommodate small airplanes with an aircraft approach speed less than 121 knots and a wingspan less than 49 feet, (AAC A and B, ADG I).

RUNWAY LENGTH AND WIDTH ANALYSIS

Two (2) runway facilities are recommended for development. The primary runway length should be of sufficient length to accommodate the design aircraft or family of airplanes that are forecast to use the facility (ARC C-II). Crosswind runway should be of sufficient length to accommodate small airplanes with an approach speed less than 121 knots and a wingspan under 49 feet (ARC B-I).

While the 28-E Agreement set forth several parameters to be used in searching for and selecting candidate airport sites, this analysis is based on forecast aeronautical activity. Therefore, the recommended runway lengths will take into consideration the aircraft operational mix, runway gradient, runway elevation, and mean daily maximum temperature (hottest month).

FAA AC 150/5300-4B Runway Length Requirements for Airport Facilities provides a methodology to be used in determining runway lengths. For airport projects that receive federal funding, the use of FAA AC 150/5300-4B is mandatory. Federally funded projects require that critical design aircraft have at least 500 or more annual itinerant operations for an individual airplane or a family of airplanes.

Chapter Two provided a forecast of aeronautical activity for the period 2020-2040. Also noted were the critical design aircraft expected to use the facility. These aircrafts included the Learjet 45 XR (ARC C-I) and Beechjet 400A (ARC B-II). These two (2) aircraft are currently based at the Pella Municipal Airport. Since the Pella Municipal Airport will be closed at the time the new airport is operational, it is reasonable to conclude that the two (2) airplanes will be relocated. In addition, there are two (2) airplanes currently at the Ottumwa Regional Airport that will be relocated to the South Central Regional Airport. These airplanes include the Gulfstream 200 (ARC C-II) and Cessna Citation II (ARC B-II). Of these aircraft, the Gulfstream 200 is the largest with a maximum gross takeoff weight of 34,450 pounds. The Gulfstream 200 was originally designed by Israel Aircraft Industries (IAI) and known as the "Astra Galaxy". Reference may be made to Table 3-6 that show airplanes that make up 75% of the fleet and Table 3-7 for those that comprise the remaining 25%.

The Lear 45 XR and Gulfstream G-200 that will be based at the new airport are listed in Table 3-7. These two aircraft (Approach Category C) will each conduct between 200 and 240 itinerant operations annually.

Table 3-6
Airplanes that make up 75% of the Fleet

Manufacturer	Model	Manufacturer	Model
Aerospatiale	Sn-60 1 Corvette	Dassault	Falcon 10
BAe	125 700	Dassault	Falcon 20
Beech Jet	400A	Dassault	Falcon 50/50 Ex
Beech Jet	Premier 1	Dassault	Falcon 900/900B
Beech Jet	2000 Starship	Israel Aircraft Industries	Jet Commander 1121
Bombardier	Challenger 300	IAI	Westwind 1123/1124
Cessna	500 Citation/SOI Citation SP	Learjet	20 Series
Cessna	Citation I/II/III	Learjet	31/31A/31A ER
Cessna	525A Citation II (CI-2)	Learjet	35/35A/36/36A
Cessna	550 Citation Bravo	Learjet	40/45
Cessna	550 Citation II/Special	Mitsubishi	Mu-300 Diamond
Cessna	551 Citation II/Special	Raytheon	390 Premier
Cessna	552 Citation	Raytheon Hawker	400/400 XP
Cessna	560 Citation Encore	Raytheon Hawker	600
Cessna	560/560 XL Citation Excel	Sabreliner	40/60
Cessna	560 Citation V Ultra	Sabreliner	75A
Cessna	650 Citation VII	Sabreliner	80
Cessna	680 Citation Sovereign	Sabreliner	T-39

Source: FAA AC 150/5325-4B, Table 3-1

Table 3-7
Remaining 25% of Airplanes that make up 100% of the Fleet

Manufacturer	Model	Manufacturer	Model
BAe	Corporate 800/100	Israel Aircraft Industries	Astra 1125
Bombardier	600 Challenger	IAI	Galaxy 1126
Bombardier	601/601-3A/ER Challenger	Learjet	45 XR
Bombardier	604 Challenger	Learjet	55/55B/55C
Bombardier	BD-100 Continental	Learjet	60
Cessna	S550 Citation S/II	Raytheon Hawker	Horizon
Cessna	650 Citation III/IV	Raytheon Hawker	800/800 X
Cessna	750 Citation X	Raytheon Hawker	1000
Dassault	Falcon 900C/900EX	Sabreliner	65/75
Dassault	Falcon 2000/2000EX	Sabreliner	T-39
Cessna	680 Citation Sovereign		

Source: FAA AC 150/5325-4B, Table 3-2

Where the family of large airplanes has a maximum certified takeoff weight (MTOW) of over 12,500 pounds, but less than 60,000 pounds, Figure 3-1 or 3-2 (see Exhibit 3-1) and Table 3-1 or 3-2 from FAA AC 150/5300-4B are used to determine the primary runway length.

To use the runway length curves shown in Exhibit 3-1, the following information is required:

- Airport Elevation (850 feet AMSL)
- Mean Daily Maximum Temperature of the Hottest Month (85° F)
- Critical Design Airplanes with respect to their useful load (Gulfstream G-200)

The mean maximum temperature of 85 degrees Fahrenheit occurs during the month of July.

Table 3-8
Climatic Data: Oskaloosa

Month	Average High (° F)	Average Precip. (inches)	Average Snowfall (inches)
Jan.	31°	1.30 inches	6
Feb.	35°	1.69 inches	9
Mar.	48°	2.13 inches	4
Apr.	62°	3.58 inches	1
May	72°	4.80 inches	0
June	81°	4.92 inches	0
July	85°	4.61 inches	0
Aug.	83°	4.65 inches	0
Sept.	76°	3.74 inches	0
Oct.	64°	2.80 inches	0
Nov.	49°	2.64 inches	1
Dec.	34°	1.34 inches	6

Source: US Climate Data (www.usclimatedata.com)

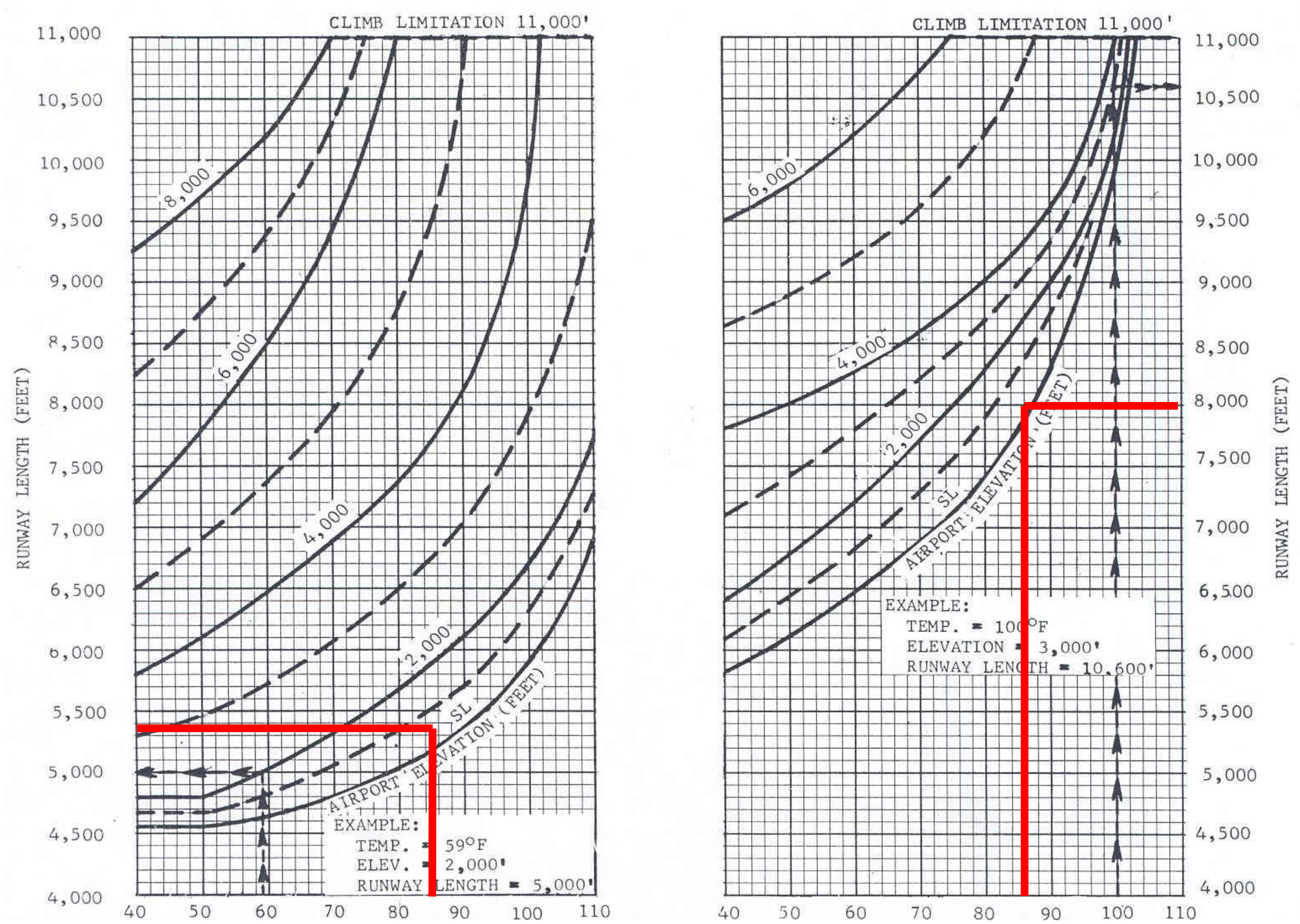
The Airport Development Concept prepared for Site A shows a ground elevation of 850 feet above mean sea level.

The runway lengths obtained from Exhibit 3-1 are then adjusted to address the following variables:

- Effective Runway Gradient
- Wet and Slippery Runway

Given the anticipated based aircraft mix and itinerant aircraft operational mix, Exhibit 3-1 showing 100% of the Fleet at 60% useful load and 90% useful load is used to compute the ultimate runway length.

Exhibit 3-1
Primary Runway Length



Mean Daily Maximum Temperature of Hottest Month of the Year in Degrees Fahrenheit

100% of fleet at 60% useful load	**100% of fleet at 90% useful load**
Primary Runway Takeoff: 5,400′ + (10′x5) =5,450′ Landing: 5,400′ x 1.15=6,210′ or up to 5,500′ whichever is less **5,500’**	**Primary Runway** Takeoff: 8,000′ + (10′x5) =8,050′ Landing: 8,000 x 1.15 =9,200′ or up to 7,000 feet whichever is less **7,000’**

Source: FAA AC 150/5325-4B

Effective Runway Gradient (Takeoff Only)

Effective runway gradient is defined as the difference between the highest and lowest elevations of the runway centerline divided by the length. The runway lengths obtained from Exhibit 3-1 are increased at the rate of 10 feet for each one (1) foot of elevation difference between the high and low points. Based on the Airport Development Concept for Site A, the maximum difference in elevation on the primary runway is five (5) feet.

Wet and Slippery Runways (Turbojet Landings ONLY)

By regulation, the runway length for turbojet-powered airplanes obtained from the 60% useful load curves are increased by 15% or up to 5,500 feet whichever is less. For a 90% useful load, the curves are increased by 15% or up to 7,000 feet whichever is less. No adjustments are required for turbo-prop airplanes.

The resulting runway lengths are not cumulative since the length adjustments apply independently and specifically either to takeoff or landings.

The adjusted runway length requirements for the Primary Runway are summarized as follows:

100% of Fleet at 60% useful load:
Takeoff 5,400ft + 50ft =5,450ft
Landing 5,400ft x 1.15 =6,210ft or up to 5,500ft whichever is less
Recommended runway length at 60% useful load =5,500ft

100% of Fleet at 90% useful load:
Takeoff 8,000ft + 50ft =8,050ft
Landing 8,000ft x 1.15 = 9,200ft or up to 7,000ft whichever is less
Recommended runway length at 90% useful load=7,000ft

Based on 100% of the fleet at a 60% useful load, the primary runway should be no less than 5,500 feet in length. Where a 90% useful load factor is considered, a runway length no less than 7,000 feet should be provided. The runway length recommendations obtained from Exhibit 3-1 are based on a no wind condition, dry runway surface and a zero (0) effective runway gradient.

Less demanding aircraft or those that make up 75% of the fleet (See Table 3-6) will make a majority of the turbo-jet operations forecasted at the South Central Regional Airport. There are two aircraft found in Table 3-7 that will be based at the airport.

Given the Lear XR and G-200 along with operations from itinerant aircraft that currently use the Pella Municipal Airport, the total number of operations by airplanes found in Table 3-7 are forecast to exceed 500 annual itinerant operations.

The operator of the Gulfstream 200 provided additional insight regarding operational requirements. The following data was provided.

Takeoff at gross takeoff weight of 35,450lbs no wind condition and a standard barometric pressure of 29.92in.

-50º/-10c	Dry: 5,647ft	Wet: 6,099ft
32º/0c	Dry: 5,837ft	Wet: 6,303ft
59º/15c	Dry: 6,177ft	Wet: 6,665ft
86º/30c	Dry: 7,437ft	Wet: 8,014ft

Takeoff at a more typical weight of 28,500lbs no wind and standard barometric pressure of 29.92in.

-50º/-10c	Dry: 3,952ft	Wet: 5,027ft
32º/0c	Dry: 4,072ft	Wet: 5,172ft
59º/15c	Dry: 4,194ft	Wet: 5,317ft
86º/30c	Dry: 4,622ft	Wet: 5,531ft

Landing at max landing weight of 30,000lbs no wind

-50º/-10c	Dry: 3,917ft	Wet: 4,481ft
32º/0c	Dry: 4,033ft	Wet: 4,616ft
59º/15c	Dry: 4,149ft	Wet: 4,750ft
86º/30c	Dry: 4,380ft	Wet: 5,018ft

In dealing with a contaminated runway at gross weight and 32ºF

Takeoff	Landing
Compact snow: 5,885ft	Compact snow: 7,422ft
	Loose snow: 8,271ft

Source: MUSCO 5/5/2013

Based on what is described as takeoff at a more typical weight of 28,500 pounds, no wind, 86ºF and a standard barometric pressure of 29.92 inches, a runway length of 5,531ft under wet conditions would (at minimum) accommodate the more restricted weight.

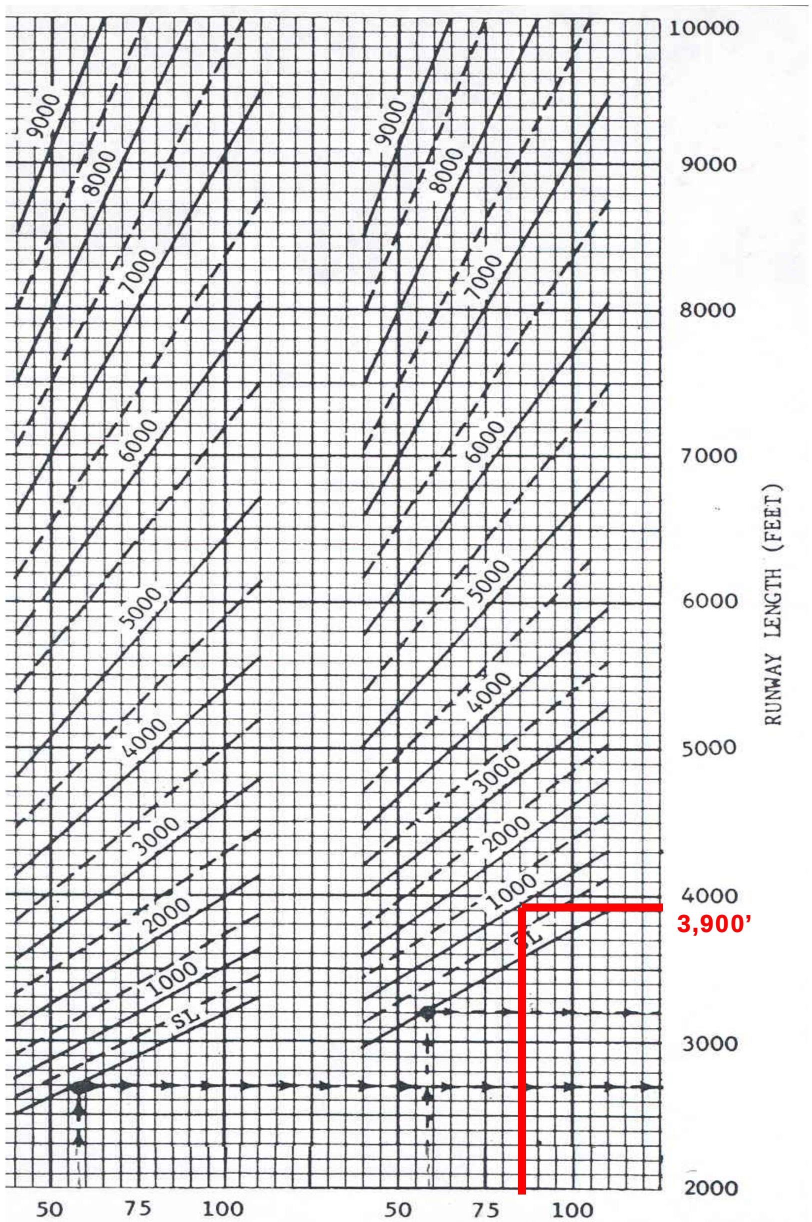
Takeoff at gross weight, no wind, 59ºF, and a standard barometric pressure of 29.92 inches requires a 6,177ft of runway under dry pavement conditions and 6,665ft under wet conditions.

Where the runway is contaminated with compact or loose snow at gross weight and 32ºF, landing length requirements increase significantly. Under such runway conditions, an alternative airport (Des Moines International) that may be inconvenient is a reasonable alternative to constructing a runway 8,271ft in length.

Given the anticipated usage, a primary runway constructed to an ultimate length of 6,500ft to 7,000ft would provide a reasonable level of service (RDC C-II). To accommodate airplanes with an approach speed less than 141 knots and wingspan less than 79ft, the primary runway should be constructed to a width no less than 100ft.

The crosswind runway should be designed to accommodate small airplanes having less than 10 passenger seats (RDC B-I-NPA). Given the VLJ (very light jet) currently based at the Pella Municipal Airport, the 100% of fleet should be used to determine the ultimate length for the proposed crosswind runway.

Exhibit 3-2
Crosswind Runway Length



Mean Daily Maximum Temperature of the Hottest Month of Year
(Degrees Fahrenheit)

Based on the mean maximum daily temperature of 85ºF and an airport elevation of 850ft, a crosswind runway constructed to an ultimate length of 3,900ft will provide an adequate level of service. To accommodate A/B-I aircraft, the runway should be constructed to a width of no less than 60ft.

Wide Area Augmentation System (WAAS) is a very precise navigation system that provides the additional accuracy, availability, continuity, and integrity necessary to enable pilots to rely on the Global Positioning System (GPS) for all phases of flight. WAAS provides service for all classes of aircraft in all phases of flight including enroute navigation, airport departures, and airport arrivals. This includes vertically-guided landing approaches in instrument meteorological conditions at all qualifed locations. It provides improved service for considerably less than using conventional land-based navigation aids.

WAAS works by having a network of ground reference stations collecting GPS satellite data. This data is set through ground communication lines to master stations which calculate corrections to make the data more accurate and ensure its integrity.

The correction data is broadcast to user aircraft through two or more geostationary satellite communication links. The aircraft use the WAAS signal, in addition to the GPS service fly area navigation and Localizer Performance with Vertical Guidance (LPV) instrument approaches, equivalent to the legacy Instrument Landing System (ILS).

GPS NPA (LNAV) refers to a Non-Precision Approach (NPA) procedure which uses GPS and/or WAAS for Lateral Navigation (LNAV). On an LNAV approach, the pilot flies the final approach lateral course, but does not receive vertical guidance for a controlled descent to the runway. Instead, when the aircraft reaches the final approach fix, the pilot descends to a minimum descent altitude using the barometric altimeter.

LNAV approaches are less precise (556m lateral limit) than GPS and/or WAAS and verical guidance provided by either the barometric altimeter or WAAS. Aircraft that do not use WAAS for the vertical guidance portion must have VNAV-capable altimeters, which are typically part of a flight management system (FMS). When the pilot flies a LNAV/VNAV approach, lateral and verical guidance is provided to a controlled descent, a safer maneuver, to the runway. The decision altitudes on these appraoches are usually 350ft above the runway.

Visual (V) flight rules (VFR) means rules that govern the procedures for conducing flight under visual conditions. Runways classified as visual are not designed to handle any instrument flight rule (IFR) operations now or in the future. Instrument flight rules means rules governing the procedures for conducting flight under instrument meteorological conditions. VFR meteorological conditions exist when the ceiling is greater than 1,000ft and visibily is greater than three (3) miles or better than the specified minimum.

Precision Approach (PA) An instrument approach procedure providing course and vertical path guidance conforming to ILS, or MLS, precision system performance standards contained in International Civil Aviation Organization (ICAO) annex 10. (ILS, LAAS, WAAS, MLS, and other precision are designed to handle instrument approach operations supporting instrument approach with HATH (Height Above Threshold) lower than 250ft and visibilities lower than ¾ statute mile.

Approach Procedure with Veritcal Guidance (APV) An instrument approach procedure providing course and vertical path guidance that does not conform to ILS or MLS system performance standards contained in ICAO annex 10, or a precision approach system that does not meet Terminal TERPS alignment critieria (WAAS and authroized barometric VNAV).

Runways classified as APV are designed to handle instrument approaches down to 250ft HATH (Height Above Threshold) and visibilities as low as ¾ statute mile.

Non-precision Approach (NPA) An instrument approach procedure providing course guidance without vertical path guidance (VOR, NDB, LDA, GPS (TSO-129) or other authroized RNAV system). NPA runways will only support instrument flight rule (IFR) approach operations to visibilites of one (1) statute mile or greater.

LPV (Localizer Performance with Vertical Guidance) is similar to LNAV/VNAV except it is much more precise (40m lateral limit), enables descent to 200-250ft above the runway, and can only be flown with a WAAS receiver. LPV apporaches are operationally equivalent to the legacy instrument landing systems (ILS) but are more economical because no navigation infrastructure has to be installed at the runway.

LP (Localizer Performance) is a future Non-precision instrument approach (NPA) procedure that uses the high precision of LPV for lateral guidance and barometric altimeter for vertical guidance. These approaches are needed at runways where due to obstacles or other infrastructure limitations, a vertically guided approach (LPV or LNAV/VNAV) cannot be published.

LP approaches can only be flown by aircraft equipped with WAAS receivers. The minimum descent altitude for the LP approach is expected to be approximately 300ft above the runway. GPS "Stand-Alone" approaches continue to decrease nationwide as they are replaced by RNAV (WAAS-capable) approach procedures. The WAAS allows GPS to be used as the primary means to navigation for enroute travel and non-precision instrument approaches.

A second augmentation system is referred to as the Local Area Augmentation System (LAAS) and will augment GPS to support Category I, II and III precision approaches. LAAS is intended to replace the Instrument Landing System.

APPROACH / DEPARTURE STANDARDS

The runway threshold must be located so that there are no obstacle penetrations to the desired approach surface, rRunway Safety Sreas (RSA), Runway Object Free Areas (ROFA), and Runway Protection Zones (RPZ).

The thresholds associated with the primary and crosswind runways are located at the beginning of the takeoff roll and end of the landing roll.

As per FAA AC 150/5325-4B, Runway Length Requirements, new runways must meet design standards when constructed. The application of a displaced threshold to overcome safety deficiences is not intended for new runways.

Table 3-9 sets forth the dimensional standards used to locate the runway threshold. Line 4 applies to both ends of the crosswind runway. The approach surface beigns 200ft from the threshold and extends out 10,000ft.The width at the inner edge is 400ft and 3,800ft at the outer edge. The approach extends outward and upward at a 20:1 slope. The crosswind runway is expected to support instrument night operations serving A/B-I airplanes only.

Lines 5 and 6 apply to the primary runway end opposite the precision instrument approach end. The approach surface begins 200ft from the threshold and extends out 10,000ft. The width at the inner edge is 800ft and 3,800ft at the outer edge. The approach slope extends upward and outward at a 20:1 slope. The approach is expected to accommodate instrument approaches equal to or greater than ¾ mile but less than 1 statute mile.

Line 7 applies to the primary runway end that supports a precision instrument approach. The approach surface begins 200ft from the threshold and extends out 10,000ft to a width of 3,800ft. The width at the inner edge is 800ft. The approach surface extends outward and upward at a 34:1 slope. The approach is expected to accommodate an instrument approach having visibility minimums less than ¾ mile day or night.

Where the approach surface is not entirely clear of obstacles, the optimum approach procedure may not be realized and result in:

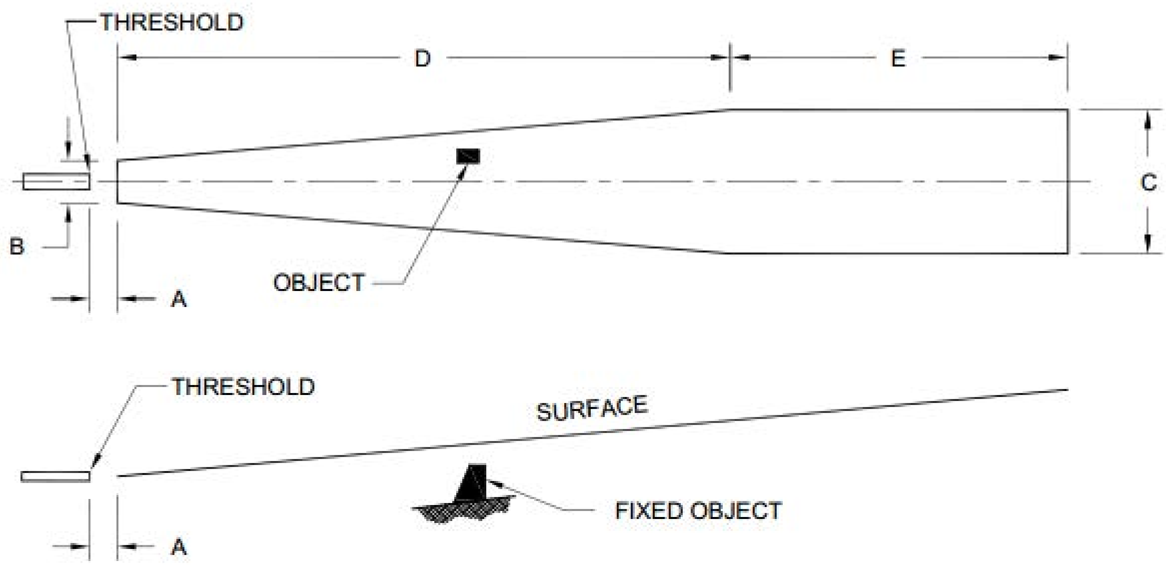
- Higher instrument landing minimums
- Higher than normal glide path angles
- Non-standard threshold crossing heights (TCH)
- Final approach offset

The departure surface for instrument runways is a trapezoid shape that begins at the end of the Takeoff Distance Available (TODA) and extends out 10,200ft at a 40:1 slope to a width of 6,466ft (see Table 3-9, Line 11 and Exhibit 3-4).

The Approach/Departure Standards for siting runway thresholds should not be confused with approach surface criteria associated with FAR Part 77-Airport Imaginary Surface.

The glide path qualification surface (GQS) applies to the approach ends of runways expected to accommodate approaches with vertical guidance. The GQS applies to each end of the primary runway. (see Table 3-9, Line 8)

Exhibit 3-3
Threshold Siting



Source: FAA AC 150-13A

Exhibit 3-3, depicts the shape and associated dimensions for each of the eight (8) runway approach ends described in Table 3-9.

Primway Runway
    Precision Instrument Approach End – Line 7 and 8
    Opposite Precision Instrument Approach End – Line 5 and 6

Crosswind Runway
    Each End – Line 4

Table 3-9
Approach/Departure Standards

Runway Type		DIMENSIONAL STANDARDS* Feet (Meters)					Slope/ OCS
		A	B	C	D	E	
1	Approach end of runways expected to serve small airplanes with approach speeds less than 50 knots. (Visual runways only, day/night)	0 (0)	120 (37)	300 (91)	500 (152)	2,500 (762)	15:1
2	Approach end of runways expected to serve small airplanes with approach speeds of 50 knots or more. (Visual runways only, day/night)	0 (0)	250 (76)	700 (213)	2,250 (686)	2,750 (838)	20:1
3	Approach end of runways expected to serve large airplanes (Visual day/night); or instrument minimums ≥ 1 statute mile (1.6 km) (day only).	0 (0)	400 (122)	1000 (305)	1,500 (457)	8,500 (2591)	20:1
4	Approach end of runways expected to support instrument night operations, serving approach Category A and B aircraft only. [1]	200 (61)	400 (122)	3,800 (1158)	10,000 [2] (3048)	0 (0)	20:1
5	Approach end of runways expected to support instrument night operations serving greater than approach Category B aircraft. [1]	200 (61)	800 (244)	3,800 (1158)	10,000 [2] (3048)	0 (0)	20:1
6	Approach end of runways expected to accommodate instrument approaches having visibility minimums ≥ 3/4 but <1 statute mile (≥ 1.2 km but < 1.6 km), day or night.	200 (61)	800 (244)	3,800 (1158)	10,000 [2] (3048)	0 (0)	20:1
7	Approach end of runways expected to accommodate instrument approaches having visibility minimums < 3/4 statute mile (1.2 km) or precision approach (ILS or GLS), day or night.	200 (61)	800 (244)	3,800 (1158)	10,000 [2] (3048)	0 (0)	34:1
8 [3, 5, 6, 7]	Approach end of runways expected to accommodate approaches with vertical guidance (Glide Path Qualification Surface [GQS]).	0 (0)	Runway width + 200 (61)	1520 (463)	10,000 [2] (3048)	0 (0)	30:1
9	Departure runway ends for all instrument operations.	0 [4] (0)	See Figure 3-4.				40:1

* The letters are keyed to those shown in Figure 3-2.

Notes:

1. Marking and lighting of obstacle penetrations to this surface or the use of a Visual Guidance Slope Indicator (VGSI), as defined by Order 8260.3, may avoid displacing the threshold.
2. 10,000 feet (3048 m) is a nominal value for planning purposes. The actual length of these areas is dependent upon the visual descent point position for 20:1 and 34:1, and DA point for the 30:1.
3. When objects exceed the height of the GQS, an APV (ILS, PAR, LPV, LNAV/VNAV, etc.) is not authorized. Refer to Table 3-4 and its footnote 3 for further information on GQS.
4. Dimension A is measured relative to TODA (to include clearway).
5. Surface dimensions / OCS slope represent a nominal approach with 3 degree Glide Path Angle (GPA), 50 feet (15 m) TCH, < 500 feet (152 m) HATh. For specific cases, refer to Order 8260.3. The OCS slope (30:1) supports a nominal approach of 3 degrees (also known as the GPA). This assumes a TCH of 50 feet (15 m). Three degrees is commonly used for ILS systems and VGSI aiming angles. This approximates a 30:1 approach slope that is between the 34:1 and the 20:1 approach surfaces of Part 77. Surfaces cleared to 34:1 should accommodate a 30:1 approach without any obstacle clearance problems.
6. For runways with vertically guided approaches the criteria in row 8 is in addition to the basic criteria established within the table, to ensure the protection of the GQS.
7. For planning purposes, determine a tentative DA based on a 3 degree GPA and a 50-foot (15 m) TCH.

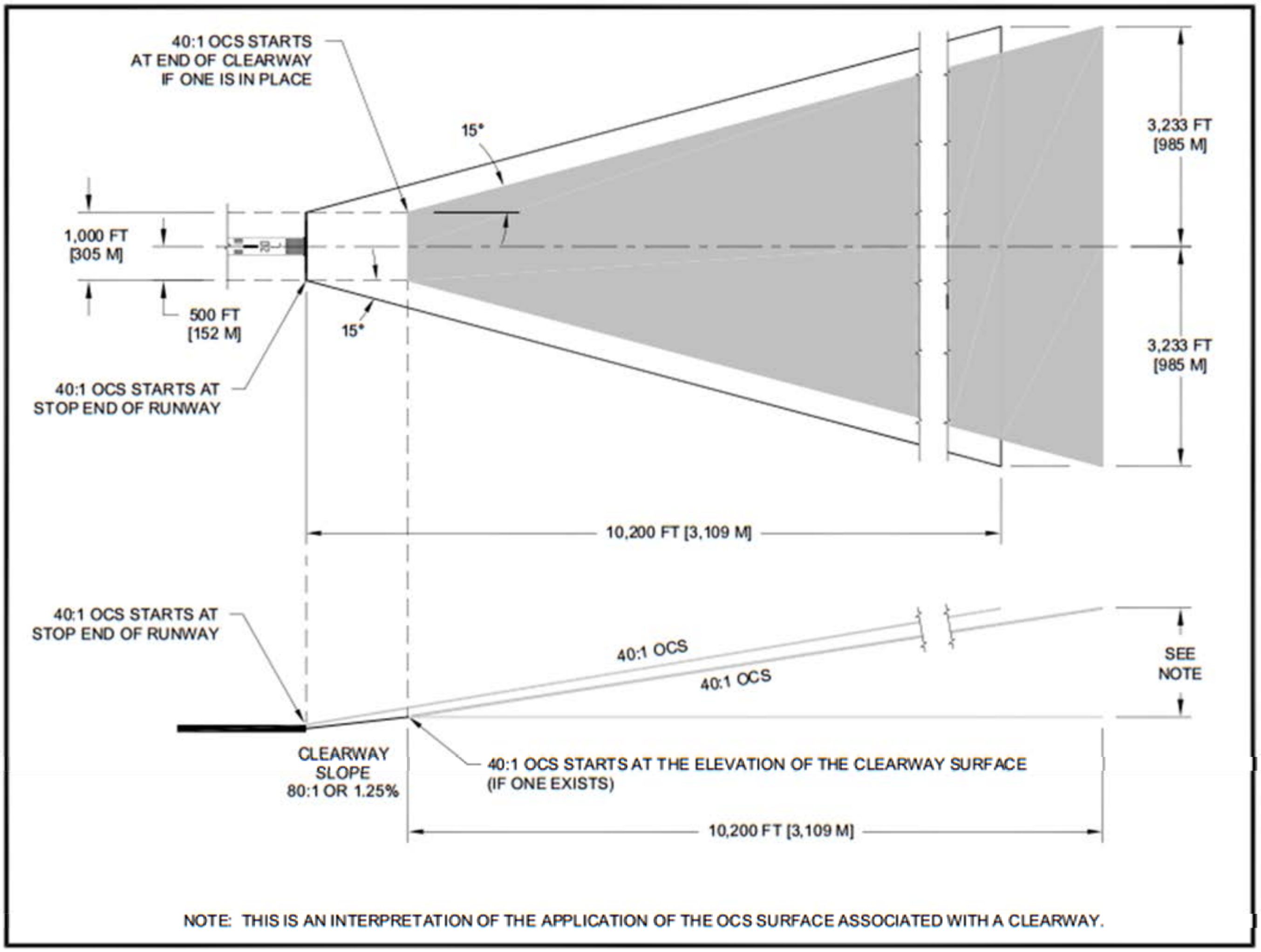
Primary Runway-Precision Instrument Approach End (200' – ½ mile)

Primary Runway-Opposite Precision Instrument Approach End

Crosswind Runway-Both Ends

Source: FAA AC 150/5300-13A 9-28-2012

Exhibit 3-4
Departure Surface for Instrument Runways (40:1)



Source: FAA AC 150/5300-13A

Table 3-10 sets forth standards associated with the precision approach procedures end of the primary runway. The precision approach procedures end must support an approach light system (ALS) in order to achieve less than ¾ statute mile visibility minimums and height above touchdown (HAT) of 250ft or less. The runway end must provide a Precision Obstacle Free Zone (POFZ) beyond the runway threshold.

Table 3-11 summarizes standards for a precision approach procedure with vertical guidance and visibility minimums greater than ¾ statute mile. An approach light system is not planned to the primary runway end opposite the precision approach end.

Table 3-12 summarizes the standards associated with the crosswind runway. The crosswind runway is intended to accommodate small A/B-I airplanes. Fewer than 500 itinerant operations by aircraft with a gross takeoff weight of greater than 12,500 pounds are forecast to use the crosswind runway.

TABLE 3-10
STANDARDS FOR PRECISION APPROACH PROCEDURES WITH VERTICAL GUIDANCE (APV) LOWER THAN 250 FT. HEIGHT ABOVE THRESHOLD (HATHH)

Visibility Minimums[1]	< 3/4-statute mile	< 1-statute mile
Height Above Touchdown (HAT)[2]	250 ft.	250 ft.
TERPS Glide path Qualification Surface (GQS)[3]	Table 3-2, Row 8, Clear	
TERPS precision final surfaces	Clear	See Note 4
TERPS Chapter 3, Section 3	34:1 Clear	20:1 Clear
Precision Obstacle Free Zone (POFZ) 200 x 800[4]	Required	Not Required
Airport Layout Plan[5]	Required	
Minimum Runway Length	4,200 ft (Paved)	
Runway Markings (See AC 150/5340-1)	Precision	Nonprecision
Holding Position Signs & Markings (See AC	Precision	Nonprecision
Runway Edge Lights[6]	HIRL / MIRL	
Parallel Taxiway[7]	Required	
Approach Lights[8]	MALSR, SSALR, or ALSF	Recommended
Applicable Runway Design Standards; e.g., OFZ	<3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums
Threshold Siting Criteria To Be Met[9]	Reference paragraph 303 and Table	Reference paragraph 303 and Table
Survey Required for Lowest Minima	Vertically Guided Airport Airspace Analysis Survey criteria in AC 150/5300-18	

Source: FAA AC 150/5300-13A 9-28-2012

1 Visibility minimums are subject to the application of FAA Order 8260.3 (TERPS) and associated orders or this table, whichever is higher.
2 The HATh indicated is for planning purposes only. Actual obtainable HATh is determined by TERPS.
3 The GQS is applicable to approach procedures providing vertical path guidance.
4 If the final surface is penetrated, HATh and visibility will be increased as required by TERPS.
5 An ALP is only required for obligated airports in the NPIAS; it is recommended for all others.
6 Runway edge lighting is required for night minimums. High intensity lights are required for RVR-based minimums.
7 A full-length parallel taxiway meeting separation requirements.
8 To achieve lower visibility minimums based on credit for lighting, an approach light system is required.
9 Circling procedures to a secondary runway from the primary approach will not be authorized when the secondary runway does not meet threshold siting (reference Appendix 2), OFZ (reference paragraph 303) OFZ (reference paragraph 308 criteria, and TERPS Chapter 3, Section 3.

Color Key

Primary Runway-Precision Instrument Approach End

Table 3-11
Standards for Precision Approach Procedures with Vertical Guidance (APV) Lower than 250 ft. Height Above Threshold (HATh)

Visibility Minimums[1]	< 3/4-statute mile	< 1-statute mile
Height Above Touchdown (HAT)[2]	250 ft.	250 ft.
TERPS Glidepath Qualification Surface (GQS)[3]	Table 3-2, Row 8, Clear	
TERPS precision final surfaces	Clear	See Note 4
TERPS Chapter 3, Section 3	34:1 Clear	20:1 Clear
Precision Obstacle Free Zone (POFZ) 200 x 800[4]	Required	Not Required
Airport Layout Plan[5]	Required	
Minimum Runway Length	4,200 ft (Paved)	
Runway Markings (See AC 150/5340-1)	Precision	Nonprecision
Holding Position Signs & Markings (See AC 150/5340-1 and AC 150/5340-18)	Precision	Nonprecision
Runway Edge Lights[6]	HIRL / MIRL	
Parallel Taxiway[7]	Required	
Approach Lights[8]	MALSR, SSALR, or ALSF	Recommended
Applicable Runway Design Standards; e.g., OFZ	<3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums
Threshold Siting Criteria To Be Met[9]	Reference paragraph 303 and Table 3-2, Rows 7 and 8	Reference paragraph 303 and Table 3-2, Rows 6 and 8
Survey Required for Lowest Minima	Vertically Guided Airport Airspace Analysis Survey criteria in AC 150/5300-18	

Source: FAA AC 150/5300-13A 9-28-2012

1 Visibility minimums are subject to the application of FAA Order 8260.3 (TERPS) and associated orders or this table, whichever is higher.

2 The HATh indicated is for planning purposes only. Actual obtainable HATh is determined by TERPS.

3 The GQS is applicable to approach procedures providing vertical path guidance.

4 If the final surface is penetrated, HATh and visibility will be increased as required by TERPS.

5 An ALP is only required for obligated airports in the NPIAS; it is recommended for all others.

6 Runway edge lighting is required for night minimums. High intensity lights are required for RVR-based minimums.

7 A full-length parallel taxiway meeting separation requirements. See Table 3-8.

8 To achieve lower visibility minimums based on credit for lighting, an approach light system is required.

9 Circling procedures to a secondary runway from the primary approach will not be authorized when the secondary runway does not meet threshold siting (reference paragraph 303), OFZ (reference paragraph 308) OFZ, and TERPS Chapter 3, Section 3.

Color Key

Primary Runway-Runway End Opposite the Precision Instrument Approach End

Table 3-12
Standards for Non-Precision Approaches (NPAs) and APV with ≥250 ft HATh

Visibility Minimums[1]	< 3/4-statute mile	< 1-statute mile	≥1-statute mile Straight In	Circling[10]
Height Above Touchdown[2]	250	400	450 ft.	Varies
TERPS GQS (APV only)		Table 3-2, Row 8 Clear		
TERPS Chapter 3, Section 3	34:1 clear	20:1 clear	20:1 clear or penetrations lighted for night minimums (See AC 70/7460-1)	
Airport Layout Plan[3]	Required			Recommended
Minimum Runway Length	4,200 ft (Paved)	3,200 ft[4] Paved)	3,200 ft[4,5]	
Runway Markings (See AC 150/5340-1)	Precision	Nonprecision[5]		Visual (Basic)[5]
Holding Position Signs & Markings (See AC 150/5340-1 and AC 150/5340-18)	Precision	Nonprecision[5]		Visual (Basic)[5]
Runway Edge Lights[6]	HIRL / MIRL		MIRL / LIRL	MIRL / LIRL (Required only for night minimums)
Parallel Taxiway[7]	Required		Recommended	
Approach Lights[8]	MALSR, SSALR, or ALSF Required	Required[9]	Recommended[9]	Not Required
Applicable Runway Design e.g. OFZ	<3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums		Not Required
Threshold Siting Criteria To Be Met[10]	Table 3-2, Row 7,	Table 3-2, Row 6,	Table 3-2, Rows 1–5,	Table 3-2, Rows 1–4,
Survey Required for Lowest Minima	Vertically Guided Airport Airspace Analysis Survey AEC 150/5300-18	Non-Vertically Guided Airport Airspace Analysis Survey AC 150/5300-18		

Source: FAA AC 150/5300-13A 9-28-2012

1. Visibility minimums are subject to the application of FAA Order 8260.3 (TERPS) and associated orders or this table, whichever is higher.
2. The Height Above Touchdown (HATh) indicated is for planning purposes only. Actual obtainable HATh is determined by TERPS.
3. An ALP is only required for obligated airports in the NPIAS; it is recommended for all others.
4. Runways less than 3,200 feet are protected by Part 77 to a lesser extent; however, runways as short as 2,400 feet could support an instrument approach provided the lowest HATh is based on clearing any 200-foot obstacle within the final approach segment.
5. Unpaved runways require case-by-case evaluation by RAPT.
6. Runway edge lighting is required for night minimums. High intensity lights are required for RVR-based minimums.
7. A full-length parallel taxiway must lead to the threshold.
8. To achieve lower visibility minimums based on credit for lighting, a full approach light system (ALSF-1, ALSF-2, SSALR, or MALSR) is required for visibility < 1-statute mile. Intermediate (MALSF, MALS, SSALF, SSALS, SALS/SALSF) or Basic (ODALs) systems will result in higher visibility minimums.
9. ODALS, MALS, SSALS, SALS are acceptable.
10. Circling procedures to a secondary runway from the primary approach will not be authorized when the secondary runway does not meet threshold siting (reference paragraph 303), OFZ (reference paragraph 308), and TERPS Chapter 3, Section 3.

Color Key

Crosswind Runway-Both Ends

PRIMARY RUNWAY DESIGN STANDARDS

Table 3-13 summarizes design standards associated with the primary runway. As noted in Table 3-10, a full parallel taxiway is required. A 400ft separation distance between the runway centerline and taxiway centerline must be provided in order to attain the desired approach minimums previously discussed.

In addition to providing the desired ultimate runway length (7,000ft) and width (100ft), the runway environment must be able to provide the following safety critical elements:

- Runway Safety Areas (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
    - Approach RPZ
    - Departure RPZ

CROSSWIND RUNWAY DESIGN STANDARDS

Design standards associated with the crosswind runway are summarized in Table 3-14. Should a parallel taxiway be constructed to the crosswind runway, a minimum separational distance is 125ft for A/B-I airplanes. Given the initial cost associated with the taxiway facility, a 240ft separational distance is recommended.

In addition to providing the desired ultimate runway length (3,900ft) and width (60ft), the runway enviornment must be able to provide the following safety critical elements:

- Runway Safety Areas (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
    - Approach RPZ
    - Departure RPZ

Where a new airport is being developed, the South Central Regional Airport Agency Board will need to acquire sufficient property interest in order to construct and/or provide the required level of protection.

SEPARATIONAL DISTANCE REQUIREMENTS

Standard dimensional requirements for runway and taxiway clearances were obtained from FAA Advisory Circular AC 150/5300-13A. Tables 3-13 and 3-14 summarize the minimum separational distance requirements for the runways and taxiways.

Table 3-13
Primary Runway Design Standards Matrix, C/D/E-II

Runway Design Code (RDC)		**C/D/E-II**			
ITEM	**DIM** [1]	VISIBILITY MINIMUMS			
		Visual	Not Lower than 1 mile	Not Lower than 3/4 mile	Lower than 3/4 mile
RUNWAY DESIGN					
Runway Length	A	*Refer to Paragraphs 302* and *304*			
Runway Width	B	100 ft	100 ft	100 ft	100 ft
Shoulder Width		10 ft	10 ft	10 ft	10 ft
Blast Pad Width		120 ft	120 ft	120 ft	120 ft
Blast Pad Length		150 ft	150 ft	150 ft	150 ft
Crosswind Component		16 knots	16 knots	16 knots	16 knots
RUNWAY PROTECTION					
Runway Safety Area (RSA)					
Length beyond departure end[10,11]	R	1,000 ft	1,000 ft	1,000 ft	1,000 ft
Length prior to threshold[12]	P	600 ft	600 ft	600 ft	600 ft
Width	C	500 ft	500 ft	500 ft	500 ft
Runway Object Free Area (ROFA)					
Length beyond runway end	R	1,000 ft	1,000 ft	1,000 ft	1,000 ft
Length prior to threshold[12]	P	600 ft	600 ft	600 ft	600 ft
Width	Q	800 ft	800 ft	800 ft	800 ft
Runway Obstacle Free Zone (ROFZ)					
Length		*Refer to paragraph 308*			
Width		*Refer to paragraph 308*			
Precision Obstacle Free Zone (POFZ)					
Length		N/A	N/A	N/A	200 ft
Width		N/A	N/A	N/A	800 ft
Approach Runway Protection Zone (RPZ)					
Length	L	1,700 ft	1,700 ft	1,700 ft	2,500 ft
Inner Width	U	500 ft	500 ft	1,000 ft	1,000 ft
Outer Width	V	1,010 ft	1,010 ft	1,510 ft	1,750 ft
Acres		29.465	29.465	48.978	78.914
Departure Runway Protection Zone (RPZ)					
Length	L	1,700 ft	1,700 ft	1,700 ft	1,700 ft
Inner Width	U	500 ft	500 ft	500 ft	500 ft
Outer Width	V	1,010 ft	1,010 ft	1,010 ft	1,010 ft
Acres		29.465	29.465	29.465	29.465
RUNWAY SEPARATION					
Runway centerline to:					
Parallel runway centerline	H	*Refer to paragraph 316*			
Holding Position[9]		250 ft	250 ft	250 ft	250 ft
Parallel taxiway/taxilane centerline[2]	D	300 ft	300 ft	300 ft	400 ft
Aircraft parking area	G	400 ft	400 ft	400 ft	500 ft
Helicopter touchdown pad		*Refer to AC 150/5390-2*			

Source: FAA AC 150/5300-13A 9-28-2012
Note: Values in the table are rounded to the nearest foot. 1 foot=0.305 meters.

Color Key

Primary Runway-End Opposite Precision Approach End (pink)

Primary Runway-Precision Approach End (yellow)

TABLE 3-14
CROSSWIND RUNWAY-ARC A/B-I SMALL AIRCRAFT

Runway Design Code (RDC)		**A/B-I Small Aircraft**			
ITEM	**DIM**[1]	VISIBILITY MINIMUMS			
		Visual	Not Lower than 1 mile	Not Lower than 3/4 mile	Lower than 3/4 mile
RUNWAY DESIGN					
Runway Length	A	*Refer to Paragraphs 302 and 304*			
Runway Width	B	60 ft	60 ft	60 ft	75 ft
Shoulder Width		10 ft	10 ft	10 ft	10 ft
Blast Pad Width		80 ft	80 ft	80 ft	95 ft
Blast Pad Length		60 ft	60 ft	60 ft	60 ft
Crosswind Component		10.5 knots	10.5 knots	10.5 knots	10.5 knots
RUNWAY PROTECTION					
Runway Safety Area (RSA)					
Length beyond departure end[10,11]	R	240 ft	240 ft	240 ft	600 ft
Length prior to threshold[12]	P	240 ft	240 ft	240 ft	600 ft
Width	C	120 ft	120 ft	120 ft	300 ft
Runway Object Free Area (ROFA)					
Length beyond runway end	R	240 ft	240 ft	240 ft	1,000 ft
Length prior to threshold[12]	P	240 ft	240 ft	240 ft	600 ft
Width	Q	250 ft	250 ft	250 ft	800 ft
Runway Obstacle Free Zone (ROFZ)					
Length		*Refer to paragraph 308*			
Width		*Refer to paragraph 308*			
Precision Obstacle Free Zone (POFZ)					
Length		N/A	N/A	N/A	N/A
Width		N/A	N/A	N/A	N/A
Approach Runway Protection Zone (RPZ)					
Length	L	1,000 ft	1,000 ft	1,700 ft	2,500 ft
Inner Width	U	250 ft	250 ft	1,000 ft	1,000 ft
Outer Width	V	450 ft	450 ft	1,510 ft	1,750 ft
Acres		8.035	8.035	48.978	79.000
Departure Runway Protection Zone (RPZ)					
Length	L	1,000 ft	1,000 ft	1,000 ft	1,000 ft
Inner Width	U	250 ft	250 ft	250 ft	250 ft
Outer Width	V	450 ft	450 ft	450 ft	450 ft
Acres		8.035	8.035	8.035	8.035
RUNWAY SEPARATION					
Runway centerline to:					
Parallel runway centerline	H	*Refer to paragraph 316*			
Holding Position[9]		125 ft	125 ft	125 ft	175 ft
Parallel taxiway/taxilane centerline[2]	D	150 ft	150 ft	150 ft	200 ft
Aircraft parking area	G	125 ft	125 ft	125 ft	400 ft
Helicopter touchdown pad		*Refer to AC 150/5390-2*			

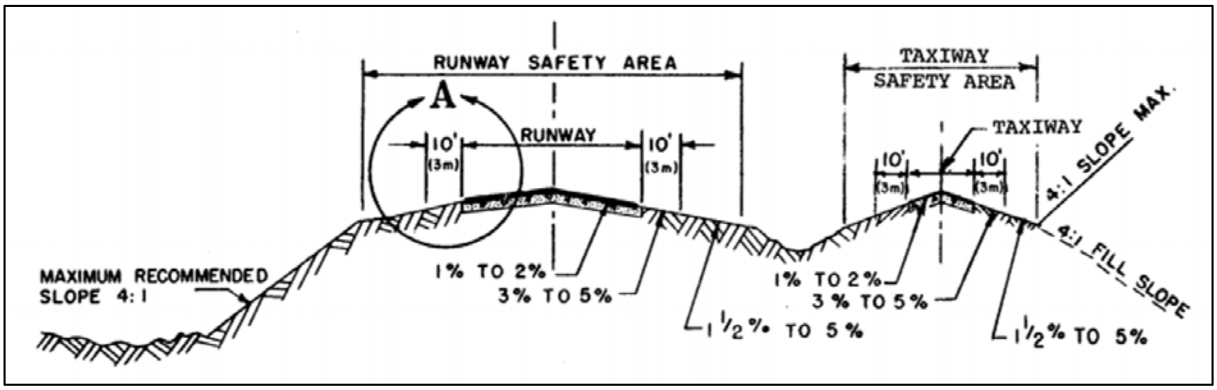
Source: FAA AC 150/5300-13A 9-28-2012
Note: Values in the table are rounded to the nearest foot. 1 foot=0.305 meters,

RUNWAY LONGITUDINAL AND TRANSVERSE GRADE REQUIREMENTS

FAA AC 150/5300-13A sets forth design criteria for runway grade changes. The terrain on Site A is described relatively level with greater relief occurring beyond each end of the primary runway, (See Exhibit 1-5). It is important to consider longitudinal grade and line-of-sight requirements should any improvements be made to the airport facility beyond the initial development phase.

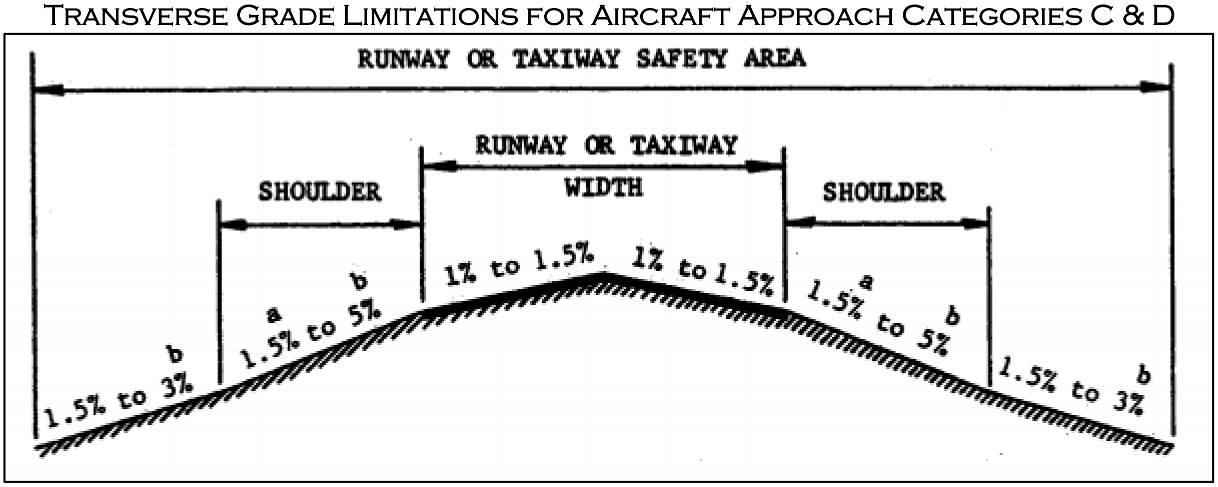
Adequate transverse slopes should be provided to prevent the accumlation of water on the pavement surface. Transverse slopes should fall within the ranges shown in Exhibit 3-5 below. A 1-½ inch pavement edge drop is recommended between paved and unpaved surfaces to facilitate draingage away from the pavement surface. It is desireable to maintain a 3% to 5% slope for the first 10 feet of the unpaved surface immediately adjacent to the pavement edge.

EXHIBIT 3-5
TRANSVERSE GRADE LIMITATIONS FOR AIRCRAFT APPROACH CATEGORIES A & B



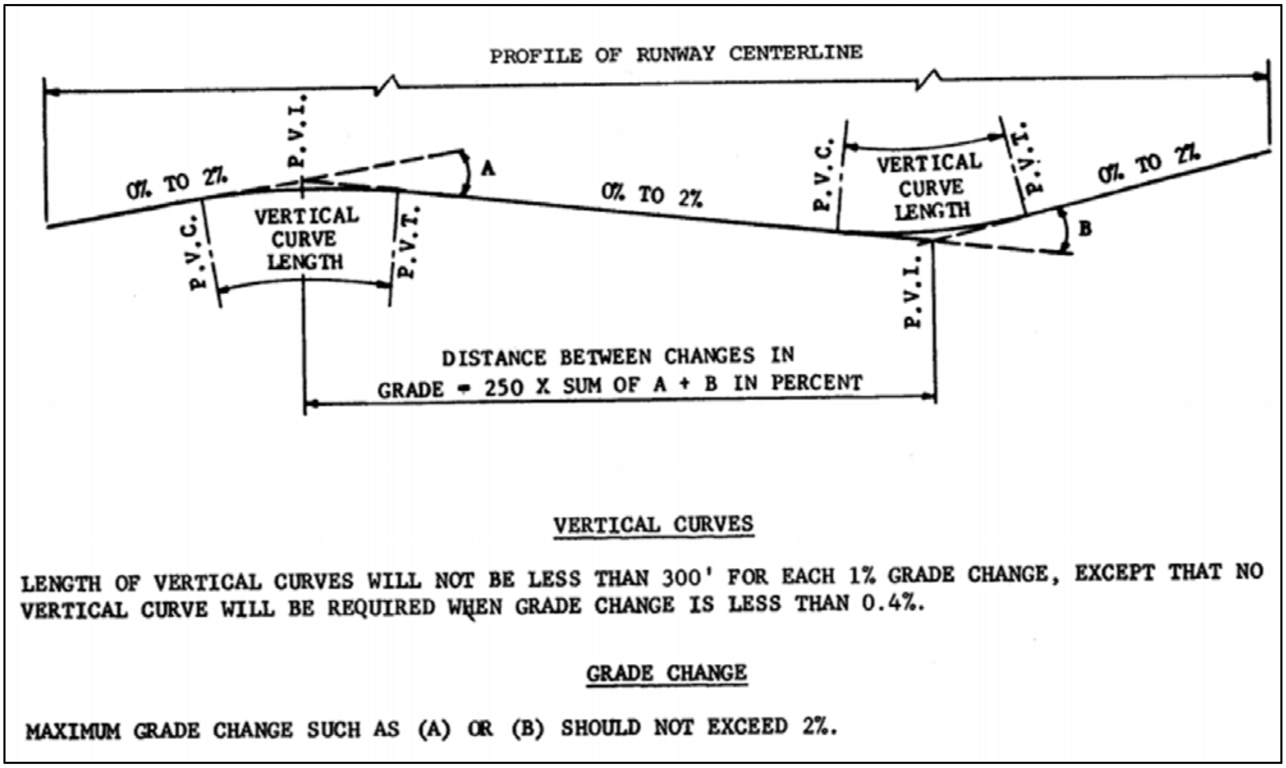
Source: FAA AC 150/5300-13

EXHIBIT 3-6
TRANSVERSE GRADE LIMITATIONS FOR AIRCRAFT APPROACH CATEGORIES C & D



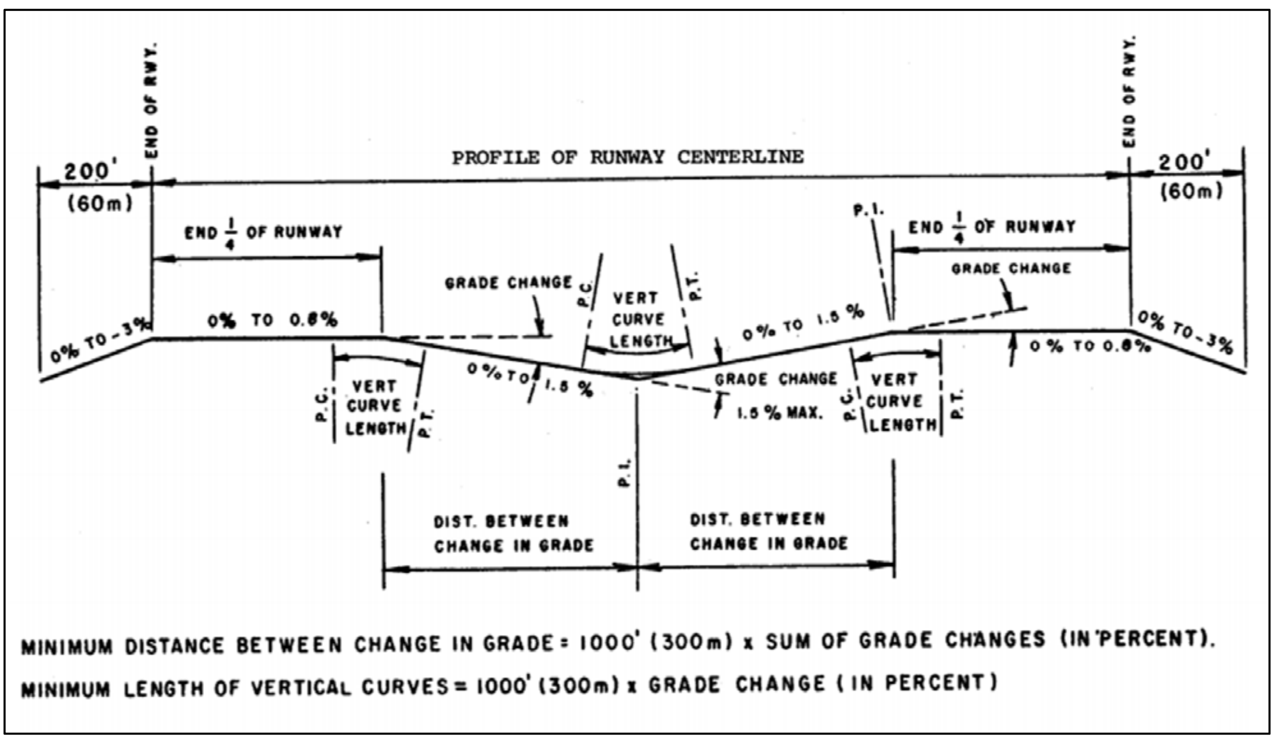
Source: FAA AC 150/5300-13

Exhibit 3-7
Longitudinal Grade Limitations for Aircraft Approach Categories A & B



Source: FAA AC 150/5300-13

Exhibit 3-8
Longitudinal Grade Limitations for Aircraft Approach Categories C & D



Source: FAA AC 150/5300-13

RUNWAY SAFETY AREA (RSA)

The Runway Safety Area (RSA) is a graded area that extends along and beyond the runway surface. Dimensional requirements associated with the RSA is related to the aircraft approach speed and wingspan.

The area is located symmetrically about the runway, extends out 240ft beyond each runway end designed to RDC B-I NPA standards. The width of RSAs with approach visibility minimums NOT lower than ¾ mile is 120ft.

The RSA associated with the primary runway extends out 1,000ft beyond the runway threshold and is 500ft in width for runways with approach visibility lower than ¾ mile.

The primary function of the RSA is to provide a degree of safety should an aircraft veer off the runway, and it should be void of all structures except those fixed by function. The RSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions or other surface variations. The RSA should be drained and be capable of supporting snow removal equipment, firefighing equipment and the occasional aircraft.

The RSA should be generally free of objects, except for objects that need to be located in the RSA because of their function. Objects higher than 3 inches above grade should be constructed of low impact resistant supports (frangible mounted structures) of the lowest practical height with the frangible point no higher than 3 inches above grade.

RSA standards cannot be modified.

OBJECT FREE AREA (OFA)

An Object Free Area (OFA) is a two dimensional area centered on the runway, taxiway and taxilane centerlines clear of objects except those fixed by function. Except where precluded by other clearing standards, it is acceptable to place objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes and to taxi and hold aircraft in the OFA. Objects non-essential for air navigation or aircraft ground maneuvering purposes are not to be placed in the OFA. This includes parked airplanes and agricultural operations. Extension of the OFA beyond the standard length is encouraged by the FAA.

Based on Runway Design Code C-II-2,400ft, the Runway Object Free Area (ROFA) associated with the primary runway extends 1,000ft beyond the runway and is 800ft in width.

The ROFA associated with the crosswind runway extends 240ft beyond the threshold. The width is 250ft. The Taxiway Object Free Area (TOFA) associated with the primary runway is 131ft in width or 65.5ft on either side of the taxiway centerline. The TOFA that will extend through the aprons is 79ft in width.

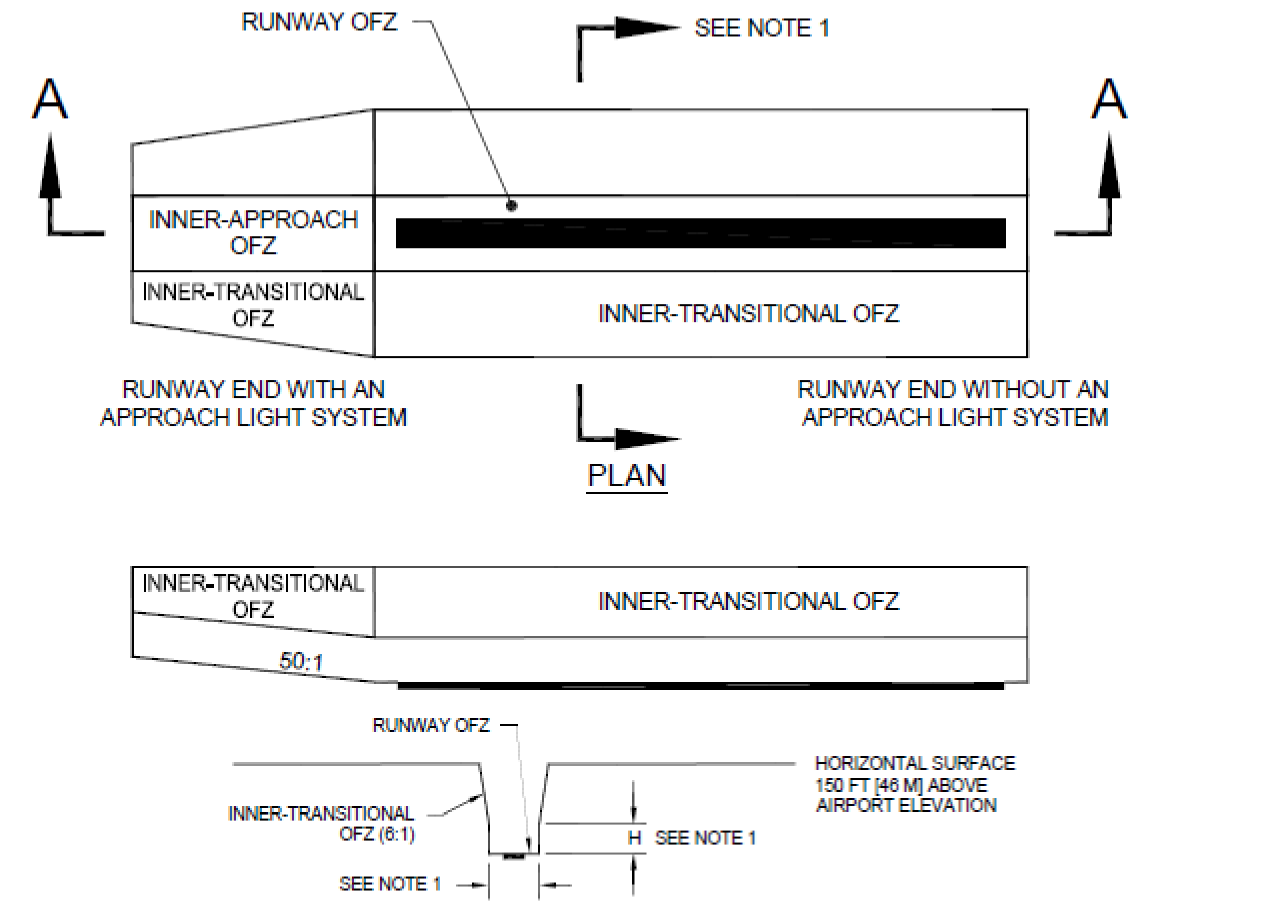
RUNWAY OBSTACLE FREE ZONE (ROFZ)

The Runway Obstacle Free Zone (ROFZ) is a three dimensional volume of airspace (which differentiates it from two dimensional areas such as the OFA). The ROFZ clearing standards precludes taxiing and parked airplanes and object penetrations, except frangible visual NAVAIDs that need to be located in the ROFZ because of their function. The ROFZ extends 200ft beyond each end of the runway. The width of the ROFZ is 250ft for runways serving small airplanes with approach speeds greater than 50 knots. For runways serving large airplanes, the width of the ROFZ is 400ft.

The inner-transitional ROFZ applies only to runway with lower than ¾ statute mile approach visibility minimums. Based on planned approach minimums, the inner-approach OFZ and inner-transitional surface applies to the primary runway end supporting a precision approach procedure.

The inner-approach OFZ applies only to runways with an Approach Light System (ALS). The width is 400ft and extends 200ft beyond the last light unit. The inner approach OFZ begins 200ft from the threshold and rises at a 50:1 slope.

Exhibit 3-9
Obstacle Free Zones



Source: FAA AC 150/5300-13A

The inner-transitional ROFZ begins at the edges of the runway ROFZ and inner-approach ROFZ, then rises vertically to a height of 50ft. It then extends upward at a 6:1 slope to a height 150ft above the established airport elevation.

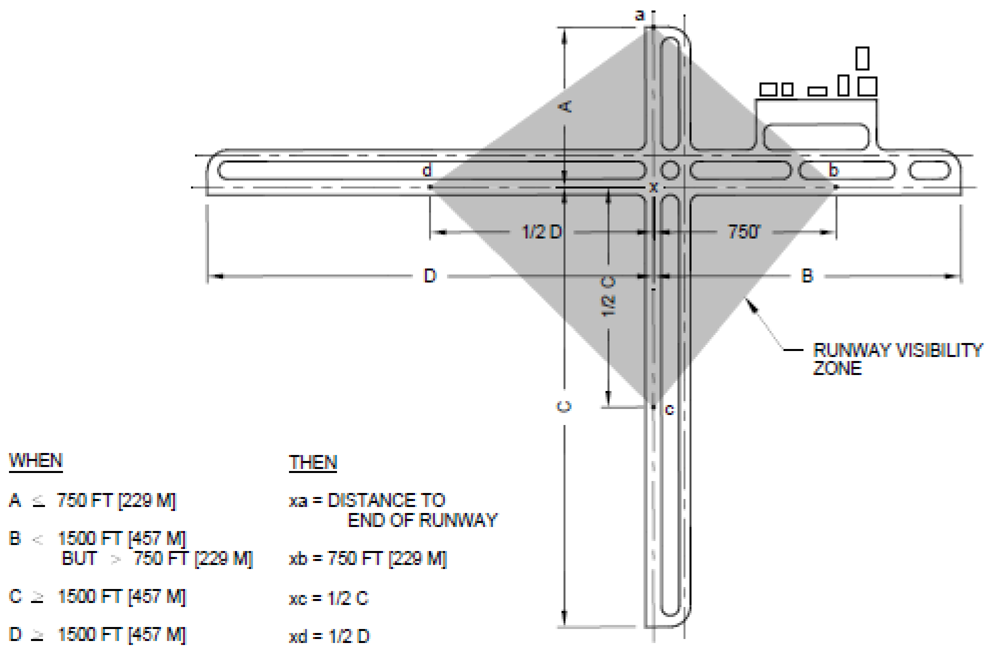
PRECISION OBSTACLE FREE ZONE (POFZ)

The Precision Obstacle Free Zone (POFZ) associated with the primary runway is centered on the runway centerline extended, beginning at the runway threshold, 200ft long and 800ft wide. The POFZ applies only to the runway end for which a precision approach procedure is planned.

RUNWAY VISIBILITY ZONE (RVZ)

Where two runways are being planned, the required visibility zone between the two runways must be provided. Any point five (5)ft above the runway centerline and in the Runway Visibility Zone (RVZ) must be visible with any other point five (5)ft above the runway centerline.

Exhibit 3-10
Runway Visibility Zone



Source: FAA AC 150/5300-13A

RUNWAY PROTECTION ZONE (RPZ)

The Runway Protection Zone (RPZ) is designed to provide additional protection for people and equipment on the ground. This protection is provided through airport owner control of RPZ, preferably through the acquisition of sufficient property interest in the RPZ, and by maintaining the RPZ areas free from incompatible objects and activites.

The FAA Office of Airports must evaluate and approve any proposed land uses located within the limits of land controlled by the airport that include uses other than those listed as follows:

- Farming (See Crop Restriction Criteria)
- Irrigaton channels as long as they do not attract birds.
- Airport service roads as long as they are not public roads and are controlled by the airport
- Underground facilities
- Install NAVAIDs considered fixed by function

The RPZ is trapezoidal in shape and centered about the extended runway centerline. The RPZ consists of a central portion that is equal to the width of the ROFA and extends to the end of the RPZ. The balance of the RPZ is a controlled activity area.

The approach RPZ dimensions are a function of a aircraft approach category and visibility minimums associated with the approach end of the runway.

The departure RPZ dimensions are a function of the aircraft approach category and departure procedures assoicated with the runway.

TABLE 3-15
RPZ DIMENSIONS

Primary Runway	Approach	Departure
C-II RVR 4,000ft	1000'x2500'x1750'	500'x1700'x1010'
C-II NPA	1000'x1700'x1510'	500'x1700'x1010'
Crosswind Runway	**Approach**	**Departure**
B-I NPA	250'x1000'x450'	250'x1000'x450'
B-I NPA	250'x1000'x450'	250'x1000'x450'

Source: FAA Advisory Circular 150/5300-13A

AIRFIELD PAVEMENT REQUIREMENTS

The purpose of airport pavements is to provide a smooth and safe all weather surface free from debris that may be picked up by the propeller wash or ingested into jet engines. The pavement should be of sufficient thickness and strength to accommodate the anticipated loads without undue pavement distress.

- Primary Runway 60,000 pounds dual wheel
- Crosswind Runway 12,500 pounds single wheel

AIRFIELD DRAINAGE REQUIREMENTS

An adequate drainage system is important for the safety of aircraft operations and for the longevity of the pavement. Improper drainage can result in the formation of puddles on pavement, which are hazardous to aircraft landing or taking off. Improper drainage can also reduce the load bearing capacity of subgrades and the anticipated life of the existing pavement structures.

Surface drainage systems should be designed on a five-year frequency storm. Methods of computation are contained in FAA Advisory Circular 150/5300-5C.

Subsurface drainage systems are desirable where water may rise within one foot of the pavement section. Water in the subgrade contributes directly to frost boil and heaving action. Also, saturated subgrades exhibit a greatly reduced load bearing capacity. For these reasons, soil conditions and subsurface water conditions play an important role in airport design.

A subsurface drainage system consisting of a 4-and 6-inch perforated tile is recommended under all furture paved areas of the airport to facilitate drainage.

AIRFIELD LIGHTING

Runway lights are used to outline the edges of a runway during periods of darkness or low visbility. Each runway edge light fixture emits a white light except on instrument runways where yellow is substituted for white on the last 2,000ft or one-half the runway length whichever is less. The yellow lights are located on the end opposite the landing threshold or instrument approach end. The edge light fixtures should be located no more than ten (10)ft from the defined runway edge and spaced 200ft on center. The runway light stake should be no less than 30 inches high due to snow removal and grass cutting. The lights, located on both sides of the runway should be directly across from each other and perpendicular to the runway centerline. Special requirements exist at runway intersections.

Two groups of threshold lights, the second part of a runway lighting system, are located symmetrically about the runway centerline. The threshold lights emit a 180 degree red light inward and 180 degree green light outward. The threshold lights should be located no closer than two (2)ft and not more than ten (10)ft from the runway threshold. The two groups of lights contain no less than three (3) fixtures for a VFR runway and four (4) fixtures for an IFR runway. The outer most light is located in line with the runway edge lights. The remaining lights are placed on ten (10) foot centers towards the runway centerline extended. Air-to-ground radio control for the runway light system should also be maintained.

High intensity threshold and edge lights are recommended for installation on the primary runway and parallel taxiway. Medium intensity threshold and edge lights are recommended on the crosswind runway and parallel taxiway.

RUNWAY END IDENTIFIER LIGHTS (REIL)

Runway End Identifier Lights (REIL's) are recommended for installation on the primary and crosswind runways. The REIL consists of a flashing white high-intensity light that assists the pilot in identifying the runway threshold. The REIL units are positioned in line with the runway threshold lights and at least 40ft (optimum location) out from the runway edge and/or taxiway.

PRECISION APPROACH PATH INDICATOR LIGHTS (PAPI)

Precision Approach Path Indicator (PAPI) Lights are recommended for installation on the primary and crosswind runways. The system consists of four (4) (equally spaced) units that provide a visual indication of an aircrafts position relative to the designated glide slope for that runway. The system has an effective visual range of approximately five (5) miles during the day and up to 20 miles at night. Each light unit emits a two-color (red and white) light beam.

The PAPI should be located on the left side to the approach end of the runway and aimed so that no obstacle penetrates the obstruction clearance surface (OCS). The OCS extends 10º degrees on either side of the runway centerline to a distance of four (4) miles from the point of origin.

The PAPI must be aligned to produce the required threshold crossing height and obstacle clearance for the runway approach path. The minimum threshold crossing height (TCH) is based on the type of aircraft using the runway. A 40ft TCH is recommended based on the TCH-Height Group I (general aviation, corporate turbo-jets).

On runways equipped with an ILS, the PAPI angle normally coincides with the electronic guide slope angle. On other runways, the normal glide slope angle is 3 degrees. The angle may be as high as 4.5 degrees for proper obstacle clearance.

BENEFIT/COST CRITERIA

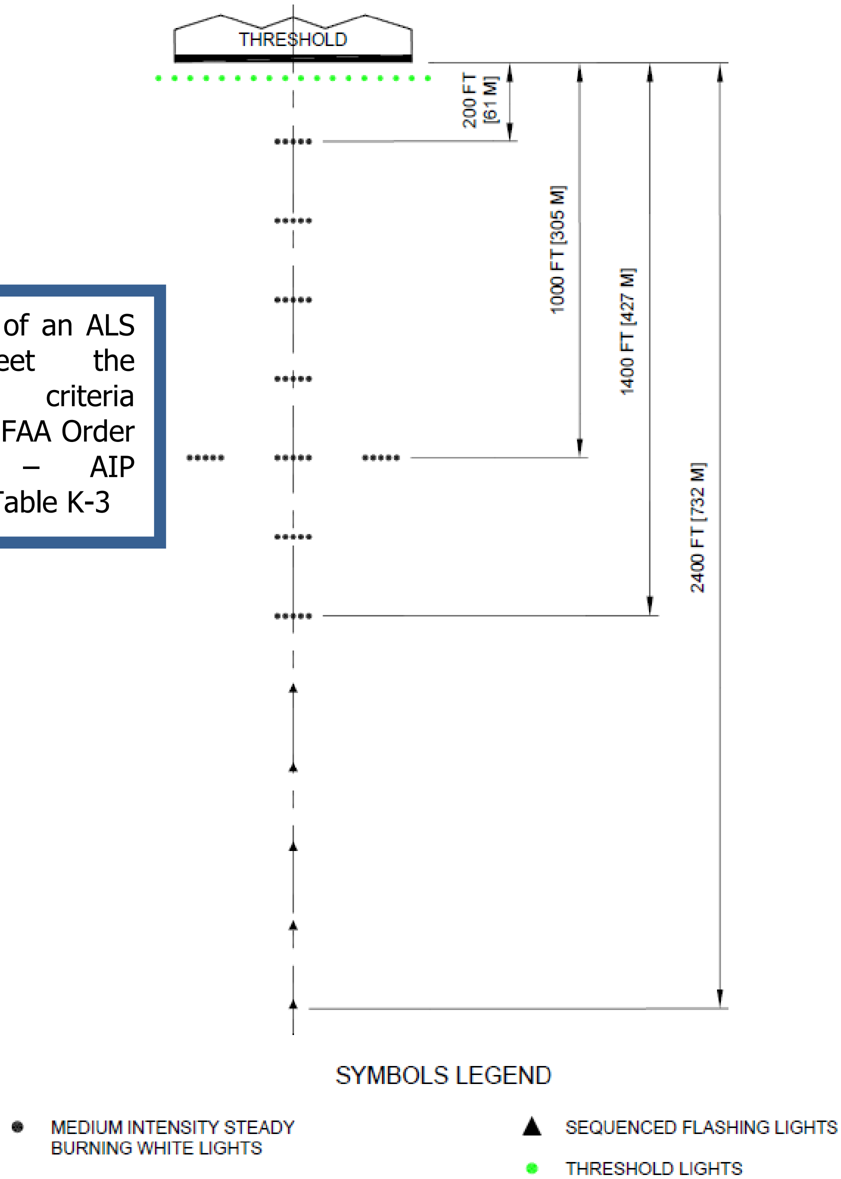
While this Chapter recommends the ultimate installation of several facility components, these facilities (ALS, RVR and AWOS) must meet the benefit/cost criteria set forth in FAA Order 5100.38D – AIP Handbook Table K-3.

APPROACH LIGHT SYSTEM (ALS)

The MALSR is a 2,400ft Medium Intensity Approach Lighting System with light stations positioned every 200ft and includes sequenced flashing Runway Alignment Indicator Lights (RAILS). The MALSR will compliment a CAT-I precision approach. Consideration may also be given to the installation of a Simplifed Short Approach Light System with sequenced flashing lights (SSALR). The SSALR has the same configuration as the MALSR but uses high intensity lights.

Reference to Table 3-10, requires an approach light system for precision approach procedures with vertical guidance lower than 250ft above the threshold.

EXHIBIT 3-11
MEDIUM INTENSITY APPROACH LIGHTING SYSTEM (MALS)
WITH RUNWAY ALIGNMENT INDICATOR LIGHTS (MALSR)



Installation of an ALS must meet the benefit/cost criteria set forth in FAA Order 5100.38D – AIP Handbook Table K-3

Source: FAA AC 150-5300-13A, 9-28-2012

RADIO CONTROL EQUIPMENT

The air-to-ground radio control equipment permits the pilot to turn on the airfield lights and select any one of the three intensity types (low, medium, high). Obstruction lights (if any) and the airport rotating beacon light may not be operated by air to ground radio control.

ROTATING BEACON LIGHT

A rotating beacon light (L-802A) must be installed on the South Central Regional Airport. Airport rotating beacons indicate the location of an airport by projecting an alternating white/green flashes 180 degrees apart. The beacon light should be located on the airport and within the terminal area. The beacon should be mounted at a height so the beam sweep, when aimed two (2) degrees above the horizon, is not blocked.

Runway Visual Range (RVR)

Consideration may be given to the installation of Runway Visual Range equipment on the precision approach procedure primary runway end (Touchdown RVR). RVR systems may be installed on non-towered airports provided there is a favorable benefit/cost determination. RVR measures the atmospheric transmissivity along runways and translates this visibility value to the air traffic user. The touchdown RVR visibility sensors are located zero (0) to 2,500ft from the runway threshold.

WIND CONES

Wind cones visually provide surface wind direction and are recommended for installation on each end of the primary and crosswind runways.

AIRPORT SIGNAGE

Airfield signage is recommended where applicable and is required.

- Holding Position Signs:
    - Taxiway/Runway Intersections
    - Runway/Runway Intersections
    - POFZ Boundary
    - Runway Approach Area (if applicable)
- Location Signs
    - Taxiway
    - Runway
- Boundary Signs (if applicable)
    - POFZ Boundary
- Direction Signs
    - Taxiway
    - Runway Exit
- Designation Signs
    - Apron, FBO, Fuel

PAVEMENT MARKINGS

The surface marking schemes for the primary runway and crosswind runway are based on the approach category planned to each runway. The required marking based on the threshold approach category to each runway threshold is shown in Table 3-16.

TABLE 3-16
MINIMUM REQUIRED RUNWAY SURFACE MARKING SCHEMES FOR PAVED RUNWAYS

Runway Surface Marking Scheme	Visual Approach	Non-precision Approach (and approaches with vertical guidance not lower than ¾ statute mile visibility)	Precision Approach (Approaches with vertical guidance lower than ¾ statute mile visibility)
Landing Designator	X	X	X
Centerline	X	X	X
Threshold Markings	Note 1	X	X
Aiming Point	Note 2	Note 3	X
Touchdown Zone			X
Edge Markings	Note 4	Note 4	X

Source: FAA AC 150/5340-1J

Note 1: Required on runways serving approach categories C and D airplanes and for runways used, or intended to be used, by international commercial air transport

Note 2: Required on 4,200ft (1,280 m) or longer runways serving approach categories C and D airplanes

Note 3: Required on 4,200ft (1,280 m) or longer instrumented runways

Note 4: Used when the full runway pavement width may not be available for use as a runway

The recommended marking scheme for the primary runway should ultimately include those associated with an approach with vertical guidance lower than ¾ statute mile visibility. Non-precision approach markings are recommended on the crosswind runway.

Below is a list of runway markings by type.

- **Runway Designation Marking** A runway designation marking identifies a runway by its magnetic azimuth.

- **Runway Centerline Marking** Identifies the physical center of the runway and provides alignment guidance during takeoff and landing operations

- **Runway Threshold Marking** Identifies the beginning of the runway that is available for landing

- **Runway Aiming Point Marking** Serves as a visual aiming point for landing operations.Runway Touchdown Zone Marking Identifies the touchdown zone for landing operations and are coded to provide distance information.

- **Runway Side Strip Marking** Provides a visual contrast between the runway and surrounding terrain and delineates the width of the paved area that is intended to be used as the runway.

- **Runway Threshold Bar** Delineates the beginning of the runway that is available for landing.

Taxiways are marked by a continuous strips along the taxiway centerline. Hold lines will also be required for the POFZ and where the taxiway(s) intersect with the runway. The hold line on the entrance taxiway to the primary runway should be located 250ft from the runway centerline. The entrance taxiway hold line associated with the crosswind runway should be located 125ft from the runway centerline.

ALL WEATHER OBSERVING STATION (AWOS)

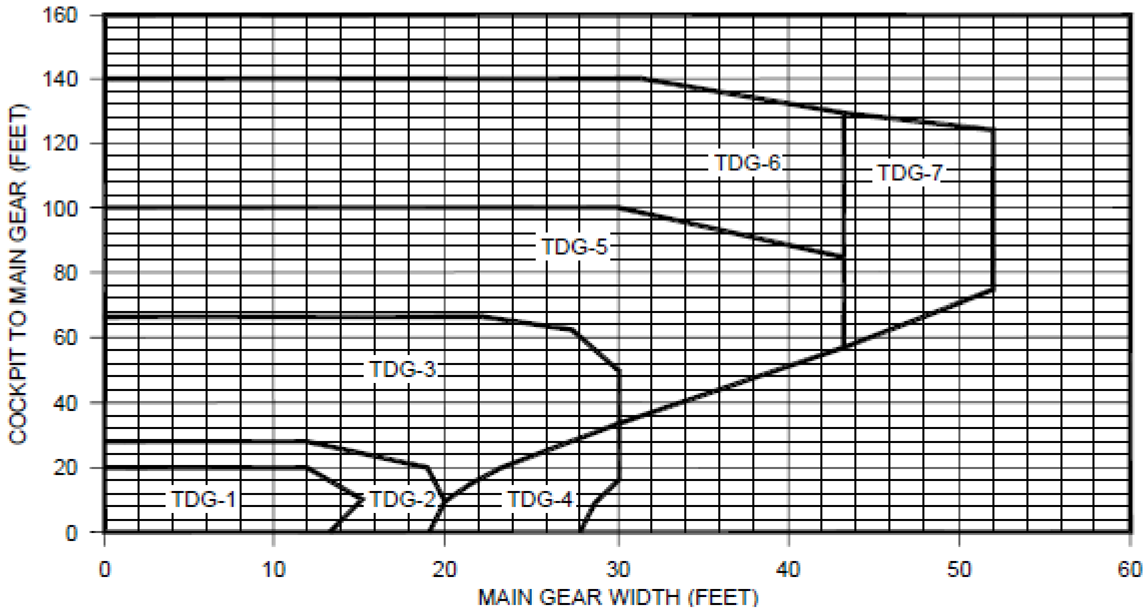
An AWOS is a computerized system that automatically measures certain weather parameters and reports those observations. An AWOS I reports the altimeter setting, wind data, and usually temperature, dew point, and density altitude. An AWOS III measures wind speed, direction and gusts, temperature, dew point, pressure, visibility, and cloud height. The measurements are reported by a computer-generated voice. An AWOS III is recommended for installation provided the benefit/cost criteria set forth in FAA Order 5100.38D AIP Handbook Table K-3 is met.

TAXIWAY REQUIREMENTS

Existing taxiway geometries and other elements will be improved whenever feasible to accommodate the aircraft with the most demanding taxiway dimension requirements.

Pavement width requirements for taxiways are based upon the undercarriage dimensions of the most demanding aircraft, that is the Main Gear Width (MGW) and distance from the Cockpit to the Main Gear (CMG) the MGW and CMG are both used to determine the Taxiway Design Group (TDG) classification that is used as the basis of taxiway design per FAA AC 150/5300-13A (lastest version). The G-200 has a MGW of 12.5ft and CMG distance up to 26ft both of which correspond to a TDG 3 classification per FAA AC 150/5300-13A. (Exhibit 3-12)

Exhibit 3-12
Taxiway Design Group (TDG) Classifications



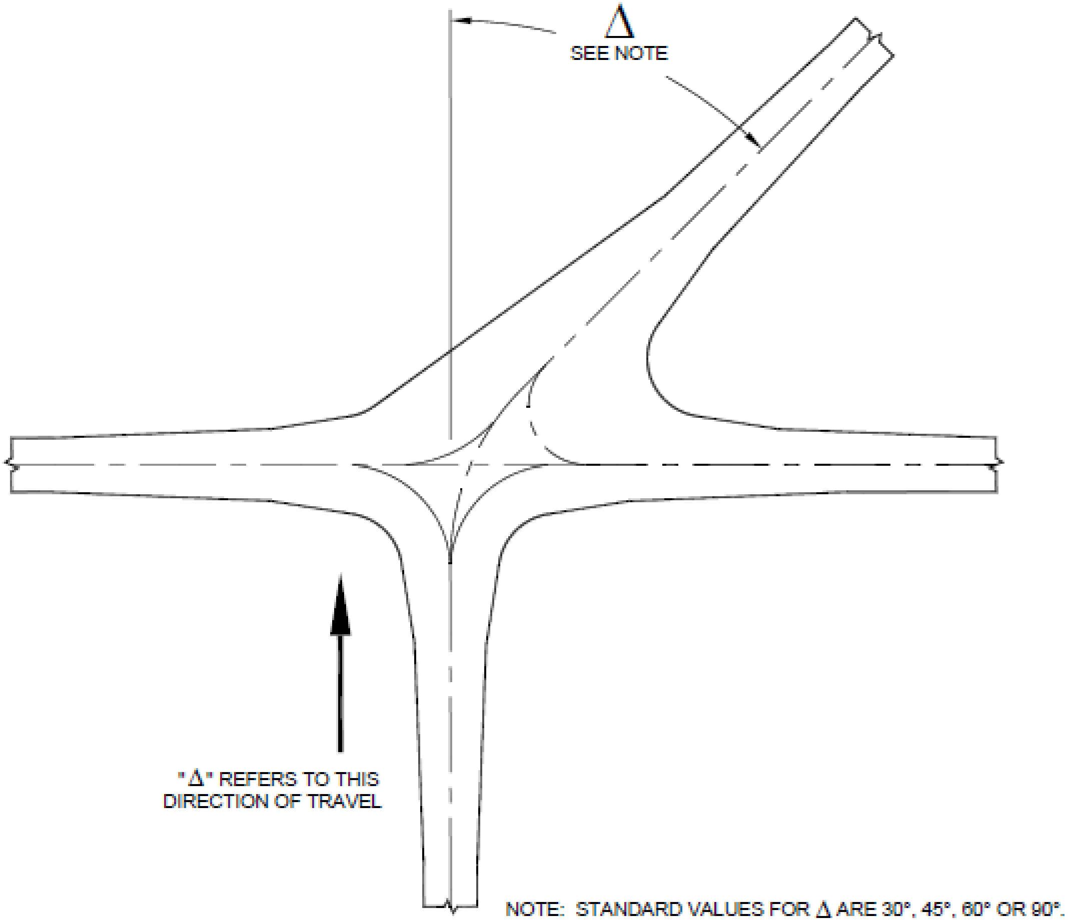
Source: FAA AC 150/5300-13A

It should be noted that the CMG dimensions for the Gulfstream 200, Learjet 45 and other mid-size corporate jets coincide with the boundary value between the TDG 2 and TDG 3 classifications and the MGW dimensions are located fairly close to the same boundary line as shown in Exhibit 3-12 above. Therefore, it will be practical and economical to consider designing taxiway elements that require the least amount of pavement such as widths of all straight taxiway sections to the lesser classification (TDG 2) and other taxiway elements that typically require additional pavement such as taxiway intersections, taxiway turns, and taxiway fillets to the greater classification (TDG 3). Also, taxiways associated with the crosswind runway do not need be designed to greater design standards as they are not intended to accommodate the larger aircraft (see Table 3-17 TDG 1).

All taxiway intersections will be designed for cockpit over centerline taxiing to guide aircraft around turns while maintaining adequate clearances between the outside of the main gear and edges of pavement. Existing taxiway configurations that require large aircraft to intentionally steer the cockpit outside the marked centerline will be improved whenever feasible.

A "three node" taxiway intersection concept (Exhibit 3-13), will be used to design new taxiway intersections to minimize the number of taxiways intersecting at a single location and present pilots with no more than three choices, ideally left turn, right turn and straight ahead. This concept also simplifies the placement of airfield markings, signage and lighting.

Exhibit 3-13
"Three Node" Taxiway Intersection Concept



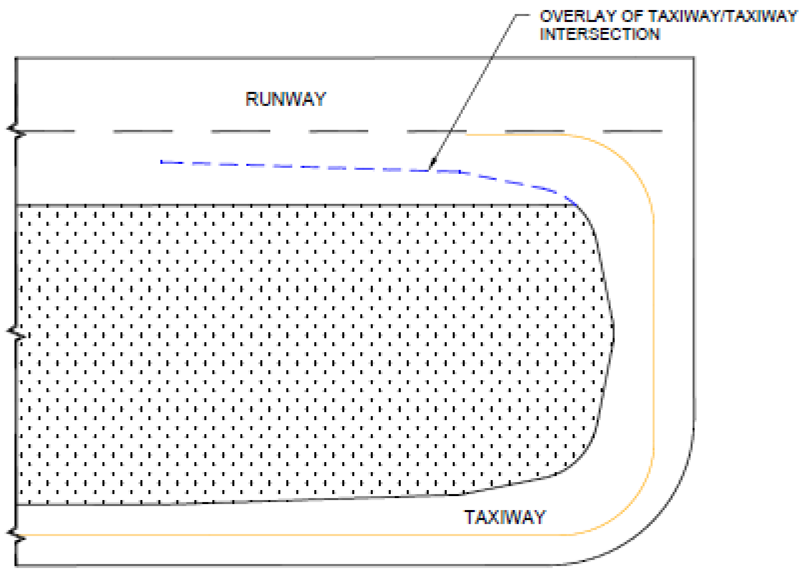
Source: FAA AC 150/5300-13A

All future taxiway intersections will be designed at standard angles of 90 degrees wherever feasible. Right angle taxiways will provide the best visual persepctive to pilots approaching intersections. Any location that requires an intersection angle other than 90 degrees will be designed such that the nose gear steering angle of larger aircraft will not exceed 50 degrees so as to minimize tire scrubbing.

Future taxiway system layouts will avoid non-standard elements such as complex intersections, unnecessarily wide pavements, unnecessary runway crossings, taxiways that lead directly from an apron to the runway and etc., so as to minimize the probability for runway incursions.

Exhibit 3-14 shows the recommended layout for the proposed taxiway connection between the parallel taxiway and primary runway end.

Exhibit 3-14
Right Angle Entrance Configuration with Rounded Outer Pavement Edge



Source: FAA AC 150/5300-13A

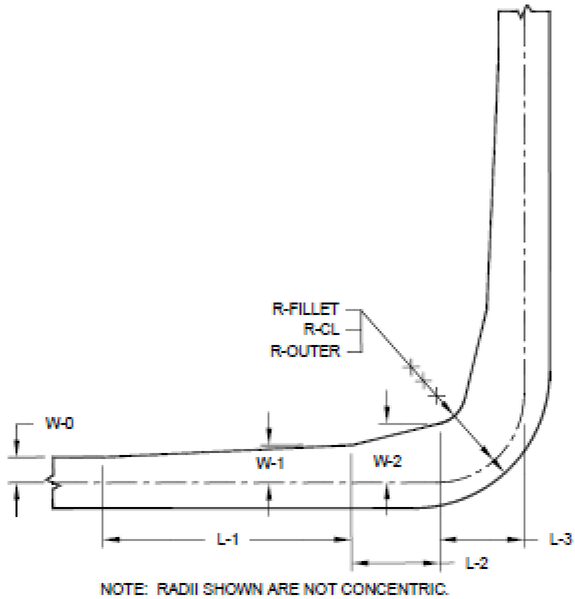
Table 3-17
Taxiway/Taxilane Dimensional Requirements

	Taxiway Design Group 1	Taxiway Design Group 2	Taxiway Design Group 3
Taxiway width	25 feet	35 feet	50 feet
Taxiway edge safety margin	5 feet	7.5 feet	10 feet
Taxiway shoulder width	10 feet	10 feet	10 feet
Taxiway safety area width	49 feet	79 feet	118 feet
Taxiway object free area width	89 feet	115 feet	162 feet
Taxilane object free area width	79 feet	131 feet	186 feet
Taxiway wingtip clearance	20 feet	26 feet	34 feet
Taxilane object free area	79 feet	115 feet	162 feet
Taxilane wingtip clearance	15 feet	18 feet	23 feet

Source: FAA Advisory Circular 150/5300-13A, 9-28-2012
TDG 1 = Crosswind Runway
TDG 2 = Primary Runway
TDG 3 = Primary Runway Intersections

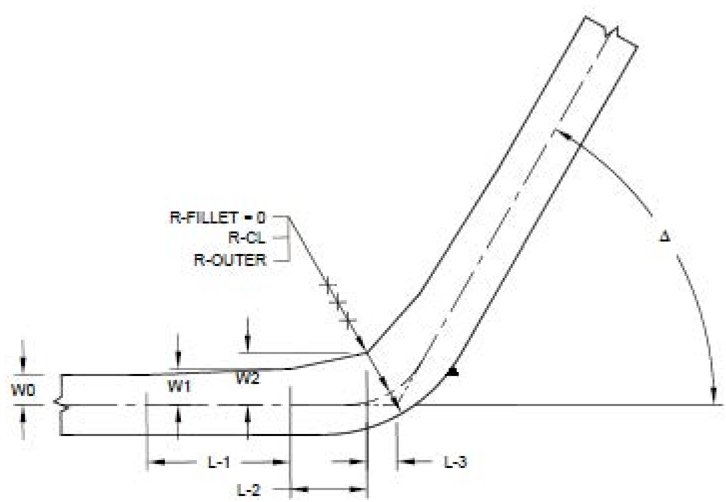
All taxiway intersections and turns should conform to the three node taxiway intersection concept (see Exhibit 3-13) and as shown in Exhibits 3-15, 3-16 and 3-17.

Exhibit 3-15
90 Degree Taxiway Turn



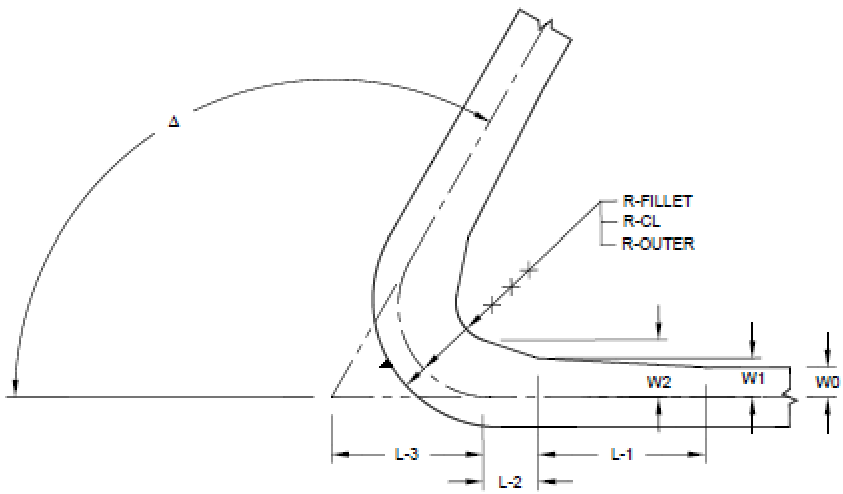
Source: FAA AC 150/5300-13A

Exhibit 3-16
Less than 90 Degree Taxiway Turn



Source: FAA AC 150/5300-13A

EXHIBIT 3-17
GREATER THAN 90 DEGREE TAXIWAY TURN



Source: FAA AC 150/5300-13A

Details for the standard intersection dimensions shown in Exhibits 3-15, 3-16 and 3-17 are presented in Tables 3-18, 3-19 and 3-20.

TABLE 3-18
STANDARD INTERSECTION DETAILS FOR TDG 2

° (degrees)	30	45	60	90	120	135	150	180
W-0 (ft)	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
W-1 (ft)	20	22	25	25	25	25	25	25
W-2 (ft)	20	22	25	23	25	25	25	25
W-3 (ft)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	54
L-1 (ft)	25	35	35	40	35	35	35	35
L-2 (ft)	0	0	0	0	0	0	0	0
L-3 (ft)	5	9	13	25	58	82	128	35
R-Fillet (ft)	0	0	0	0	10	10	10	10
R-CL (ft)	35	35	35	30	35	35	35	35

Source: FAA Advisory Circular 150/5300-13A, 9-28-2012

TABLE 3-19
STANDARD INTERSECTION DETAILS FOR TDG 3

º (degrees)	30	45	60	90	120	135	150	180
W-0 (ft)	25	25	25	25	25	25	25	25
W-1 (ft)	30	30	30	30	30	35	35	35
W-2 (ft)	35	40	45	50	50	51	55	62
W-3 (ft)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	96
L-1 (ft)	90	100	100	100	90	120	125	103
L-2 (ft)	50	55	70	80	80	50	55	60
L-3 (ft)	9	17	26	50	122	173	283	60
R-CL (ft)	0	0	0	0	25	25	25	20
R-Outer TDG-3 (ft)	200	155	135	98	105	103	107	N/A

Source: FAA Advisory Circular 150/5300-13A, 9-28-2012

TABLE 3-20
STANDARD INTERSECTION DETAILS FOR TDG 1A

º (degrees)	30	45	60	90	120	135	150
W-0 (ft)	12.5	12.5	12.5	12.5	12.5	12.5	12.5
W-1 (ft)	16	18	20	21	22	23	24
W-2 (ft)	16	18	20	21	22	23	24
L-1 (ft)	39	46	52	53	55	56	56
L-2 (ft)	0	0	0	0	0	0	0
L-3 (ft)	4	8	12	21	39	56	89
R-Fillet (ft)	0	0	0	0	0	0	0
R-CL (ft)	50	50	50	25	25	25	25
R-Outer (ft)	62	62	62	37	37	37	37

Source: FAA Advisory Circular 150/5300-13A, 9-28-2012

TERMINAL AREA CONCEPT

The terminal area represents the landside component of the airport. At general aviation airports the primary emphasis is typically placed upon structures for aircraft storage, facilities and services provided by Fixed Base Operators (FBO), queuing and tiedown space for itinerant aircraft, vehicle access and parking, fuel storage, and terminal building activities.

The terminal area should be organized into functional areas with space for future development. These areas are identified as follows:

- Corporate Hangar Area
- FBO Maintenance/Services
- Tee Hangar Area
- Terminal Building/Public Area
- Airfield Maintenance/Equipment Storage
- Fuel Storage
- Vehicle Parking
- Vehicle Access

Development of the terminal area plan should consider that the vertical infrastructure most likley will be constructed over a 20 year time horizon. Space requirements may change in response to the ultimate mix of based aircraft. Therefore, it is important to provide a building footprint that can accommodate a building structure that satisfies a given tenant.

TERMINAL BUILDING

The terminal building may be constructed as a stand alone structure or attached to the FBO aircraft storage or maintenance facility. A stand alone structure separated but connected to the FBO aircraft storage hangar is recommended.

The terminal building should provide for the following:

- Public Lobby
    - o 20 person @ 100 SF/person (2,000 SF)
- Pilot Lounge
    - o Six (6) persons @ 100 SF/person (600 SF)
    - o Two (2) sleep rooms (200 SF)
- Vending Area (100 SF)
- Restrooms (240 SF)
- Conference Room – Large
    - o Handicap accessible, room divider (1,200 SF)
- Conference Room – Small (160 SF)
- Flight Planning/Weather (160 SF)
- Mechanical Room (120 SF)
- Custodial Room (100 SF)
- Office
    - o Airport Manager/Operations (240 SF)

A terminal building providing 4,500 to 5,000 square feet minimum of floor area is recommended.

BOX / CORPORATE HANGARS

The South Central Regional Airport Agency Board should provide space for the ultimate development of four (4) large hangar building pads. A footprint providing 10,000 square feet has worked well at other airport locations supporting corporate flight departments. The structure should be placed so the hangar door opens to the east, south or west and has direct access to the apron. The hangar footprint (100′ x100′) should be spaced 50ft apart to allow some flexibility to provide a larger structure. A lobby/office may also be attached to the hangar.

Vehicle parking requirements will vary with the user. For planning purposes, six (6) to ten (10) vehicle parking stalls per hangar structure is recommended. Consideration may also be given to incorporating covered vehicle parking at the time the hangar design is initiated.

TEE HANGARS

A majority of the aircraft will be placed in tee hangars. The largest number of aircraft to be stored are small airplanes with a wingspan under 49 feet and a tail height less than 12 feet. Space should be provided for the ultimate development of 40 tee hangar stalls with the following clear door dimension (41.5′ x 12′). Consideration should also be given to the ultimate development of 20 tee hangar stalls designed to accommodate larger cabin class aircraft.

Where possible, the tee hangars should be oriented in a north/south direction so as to minimize icing conditions on the north side. A minimum separation of 80ft between rows of tee hangars is recommened. The pre-engineered hangars may contain four (4) to ten (10) plus units per structure. Full partitions along with bi-fold or hydroswing doors, and personnel door are recommended.

TABLE 3-21
TEE HANGAR DIMENSIONS

Nested Tee	Width	Length				Wing Depth	Tail Width
		6 Unit	8 Unit	10 Unit	Depth		
41'-6 x 12'-0" Clear Door	51 FT	147 FT	189 FT	231 FT	33 FT	18 FT	21 FT
59'-6" x 18'-0" Clear Door	72 FT	210 FT	270 FT	330 FT	48 FT	24 FT	30 FT
Box Hangar	**Width**	**2 Unit**	**4 Unit**	**Depth**			
55'-6" x 16'-0" Clear Door	52 FT	0	0	0			

Source: Erect-a-Tube

FIXED BASE OPERATOR (FBO)

Aeronautical services are typically provided by the Fixed Base Operator. At small general aviation airports, the FBO may provide a range of services to include, but not limited to, the following:

- Flight Instruction
- Fuel
- Aircraft Maintenance
- Charter
- Itinerant Aircraft Storage
- Aircraft Sales

To accommodate FBO services at the proposed South Central Regional Airport, a hangar structure dedicated to maintenance is recommended.

In addition to the maintenance hangar, a heated aircraft storage hangar is recommended. This hangar may be used by the FBO to store based aircraft as well as overnight itinerant aircraft.

• FBO Maintenance Facility	10,000 SF
• FBO Aircraft Storage Hangar	10,000 SF

VEHICLE ACCESS AND PARKING

Vehicle access will be provided to Site A via Iowa Highway 163 and disconnected 220th Street. A hard surface internal vehicle circulation system that provides access to the terminal, FBO, corporate and tee hangar vehicle parking areas is recommended. The following number of vehicle parking stalls is recommended (at minimum):

• Terminal Building	30 Stalls
• FBO	12 Stalls
• Corporate	6 Stalls
• Tee Hangar/Public	40 Stalls

SUMMARY

Chapter Three provides an overview of desired airport facilites that may ultimately be constructed. The design parameters set forth herein are used to develop the Airport Layout Plan. Justification is based in part on the forecast of aeronuatical activity, design aircraft and benefit/cost considerations. The proposed improvements discussed herein will be implemented over a 20 year time horizon. Design parameters, aeronautical activity and benefit/cost criteria may change over this timeframe.

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Chapter 4

Site A Alternatives

CHAPTER FOUR – SITE A ALTERNATIVES

The report entitled: Technical Memorandum Airport Site Selection identified three (3) sites for possible airport development. The South Central Regional Airport Agency Board designated Site A as the preferred site. Following a favorable airspace determination, the FAA authorized the SCRAA (on December 6, 2013) to proceed with development of an Airport Layout Plan (ALP) for Site A.

The Concept Plan initially developed for Site A was based on conditions within the Site A airport environs. Thirty-two (32) evaluation criteria were used to develop the airport concept plan. Exhibit 1-5 (see Chapter One) shows the initial concept plan for Site A that was included in Technical Memorandum – Site Selection Report. From this exhibit, two (2) alternatives were developed. The two (2) alternatives were also included in the Site Selection Technical Memorandum. Alternative Two was identified as the preferred alternative for continued evaluation.

ALTERNATIVE ONE

Alternative One shows the primary runway oriented N 85^{o} 31′ 12.58″ W. The orientation provides optimum wind coverage when considering site conditions. Proposed in Alternative One is a primary runway 5,500ft in length and 100ft in width. A parallel taxiway 35ft in width is shown extending along the entire length. As noted in the exhibit, Alternative One requires 220th street to be disconnected.

A precision instrument approach (PA-CAT I) is proposed to Runway 32 while an instrument approach with vertical guidance is proposed to the opposite end (Runway 14). The precision instrument approach with the ultimate installation of an approach light system (ALS) would provide approach minimums of ½-mile forward visibility and a 200 foot decision height. The vertically guided approach to Runway 14 would provide visibility minimums equal to or greater than ¾-mile and a decision height as low as 250ft (APV $\geq$ ¾ mile).

Grading associated with the proposed runway would extend no less than 1000ft beyond each runway threshold. The site would be graded so as to provide for the required Runway Safety Area (RSA), Runway Obstacle Free Zone (ROFZ) and Runway Object Free Area (ROFA). A more in depth discussion is provided in Chapter Three. As noted in Exhibit 4-1, there are two drainage ways that extend in a northerly direction. Within the northeast quarter of Section 32, there is approximately a 90 foot difference in ground elevation. As shown in Exhibit 4-1, the site can accommodate the primary runway (Runway 14/32). The runway profile may be described as level (zero percent grade change) over 3,000ft and a 0.2 percent downward slope over the remaining 2,500ft.

The entire site, with the exception of the two un-named drainage courses, is under cultivation. A line of trees is located along the drain course. Based on the Runway 14 threshold location, development of Runway 14/32 to a length of 5,500ft would have minimal impact when compared to a length beyond 5,500ft.

The FAA requires that the sponsor (SCRAA) acquire a sufficient property interest so as to provide the required Runway Protection Zones (RPZ) extending beyond each runway end. Based on the desired approach minima, the approach RPZ associated with Runway 32 begins 200ft beyond the threshold and extends out 2,500ft to a width of 1,750ft. The width at the inner edge is 1,000ft. The approach RPZ located beyond Runway 14 begins 200ft from the threshold and extends out 1,700ft to a width of 1,510ft. The RPZs are under cultivation.

The proposed crosswind runway (Runway 7/25) provides supplemental wind coverage to Runway 14/32. As discussed in Chapter Two and Three, the crosswind runway is intended to serve small airplanes with a wingspan under 79ft and an approach speed under 121 knots. Envisioned in Alternative One is a crosswind runway 3,900ft in length and 75ft in width.

A non-precision instrument (NPA-1 mile) approach procedure to each runway end was recommended. The RPZs associated with Runway 7 and 25 would begin 200ft from the threshold and extend out 1,000ft to a width of 700ft. The inner width is 500ft.

The orientation (N 75^{o} 55′ 29.16 E) extends over terrain with modest relief with no more than a ten (10) foot difference in elevation between each runway end.

The highest point (850 feet) on either Runway 14/32 or Runway 7/25 is located on the Runway 14 end; therefore, the established airport elevation is 850ft above mean sea level (AMSL).

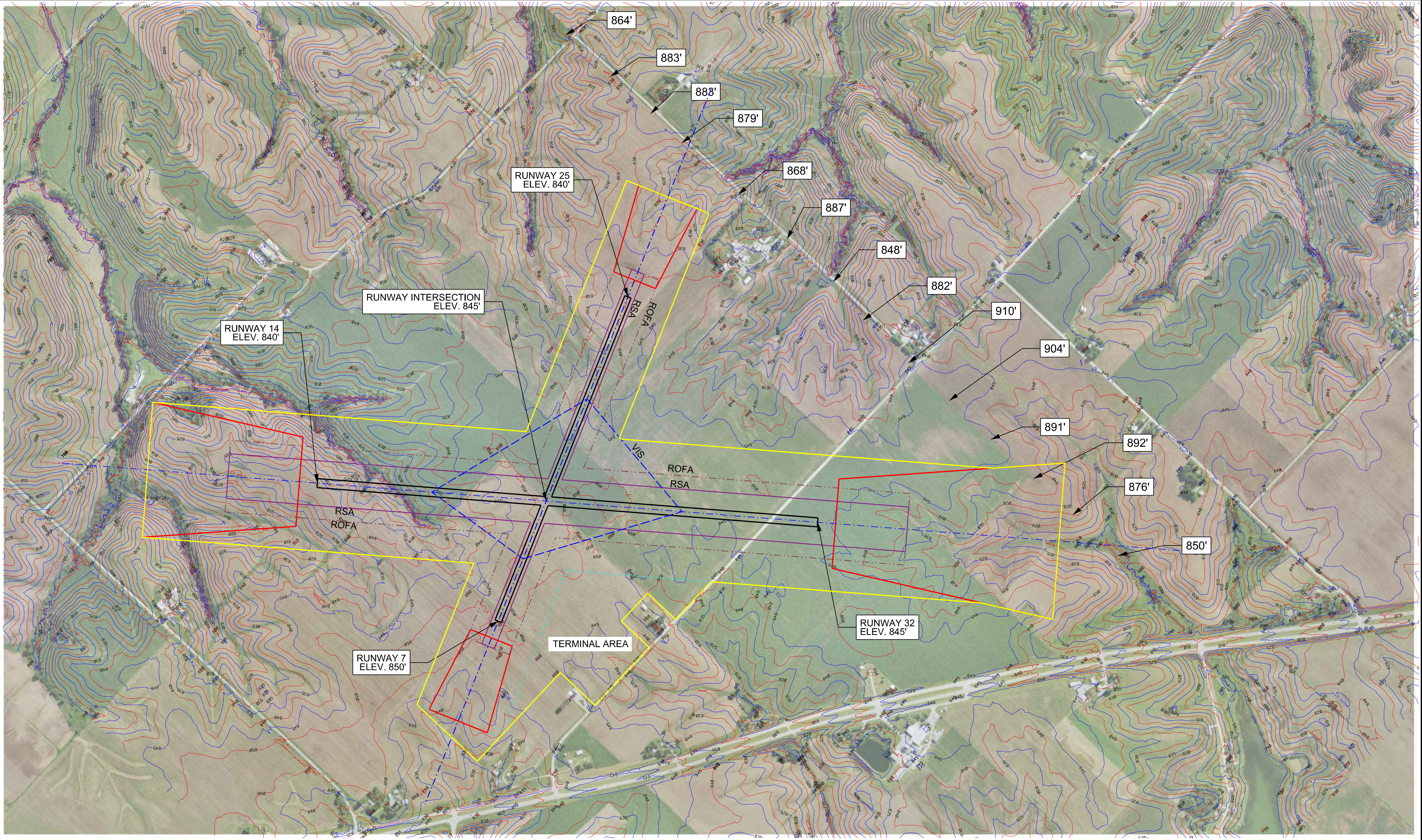
A parallel taxiway is envisioned to ultimately be constructed to serve each runway. The taxiway to runway separation distance and other associated design criteria was discussed in Chapter Three.

High intensity runway threshold and edge lights are proposed on Runway 14/32 and the parallel taxiway. Medium intensity threshold and edge lights are proposed on the crosswind runway and parallel taxiway.

Precision Approach Path Indicator Light (PAPI) units are recommended for installation on each end of the primary runway and crosswind runway. Runway End Identifier Lights (REIL) are also recommended to each end with the exception of Runway 32, (see Chapter Three). As noted, an approach light system (MALSR) is proposed for installation on Runway 32.

Alternative One identifies an area southeast of Runway 14/32 and south of Runway 7/25 for the ultimate development of the terminal area. Access to the terminal area is provided from Iowa Highway 163 by 220th Street.

Alternative One reflects a scenario based on the minimum level of development. It would not accommodate the G-200 or Lear XR on a regular basis.



DGR ENGINEERING

Project Manager:	Jerry Searle
Designer:	Jeremy C.
Project Number:	720501
Phone:	(515) 963-3488

SNYDER & ASSOCIATES
Engineers and Planners

SOUTH CENTRAL
REGIONAL AIRPORT AGENCY
MAHASKA COUNTY, IOWA

SITE A ALT 1

500 0 500 1000
1 inch = 500 ft.

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Unknown Provider
Aerial Date:
Unknown

FIGURE
4-1

ALTERNATIVE TWO

Alternative Two differs from Alternative One in that it provides for a primary runway no less than 6,500ft in length. It also shows a different crosswind runway orientation (see Exhibit 4-2).

While the primary runway (Runway 14/32 orientation N 85^{o} 31' 12.58" W) remains the same, an additional 1,000ft was placed on the Runway 32 end to provide an ultimate length of 6,500ft. A runway 6,500ft in length would accommodate the design aircraft Gulfstream 200 when the runway pavement was dry and temperatures were within the 60 to 70 degree Fahrenheit and there was no wind. Reference may be made to Chapter Three page 3-11 that summarizes runway length requirements of the Gulfstream 200 under various operational conditions.

As with Alternative One, a precision instrument approach was recommended to Runway 32 with a vertical approach procedure recommended to Runway 14.

The rationale for placing additional length on Runway 32 was based on existing topography and land uses. In either scenario, 220th Street would have to be disconnected. There are no residential and/or business relocations anticipated. The topography beyond Runway 32 would better accommodate the Runway Safety Area (RSA), Runway Obstacle Free Zone (ROFZ) and Runway Object Free Area (ROFA), based on existing land uses, power transmission line and the desired approach. Placing the additional 1,000ft of runway length on Runway 14 would require significantly more grading and encroaches more into the two existing drainage ways located south of 210th Street.

An effort was made in Alternatives One and Two to locate the threshold of each runway so that no part of the required RPZ would extend across an existing road. Placing additional length on Runway 14 would place 210th Street within the RPZ (see Chapter Three).

The crosswind runway alignment (S 83^{o} 45' 40.84" E) shown in Alternative Two would require less grading than the alignment shown in Alternative One. The alignment shown in Alternative Two would appear to be less disruptive to farming operations while providing adequate wind coverage. The crosswind runway (Runway 10/23) as shown in Exhibit 4-2 is intended to be constructed to the same length and width as that proposed in Alternative One.

A non-precision instrument (NPA-1 mile) approach procedure is recommended to Runways 10 and 28.

Runway threshold and edge lighting improvements recommended in Alternative One would also be applicable in Alternative Two. An Approach Light System (ALS) could be installed on Runway 32 with the only difference being the approach mast would be higher to compensate for the terrain that slopes away from Runway 32.

The terminal area is located west of Runway 14/32 and south of Runway 10/28. As in Alternative One, access is provided from Iowa Highway 163 via 220th Street.

Based on comments from airport users, a Third Alternative was developed. The primary concern was that a runway 6,500ft in length would not provide an adequate level or service.

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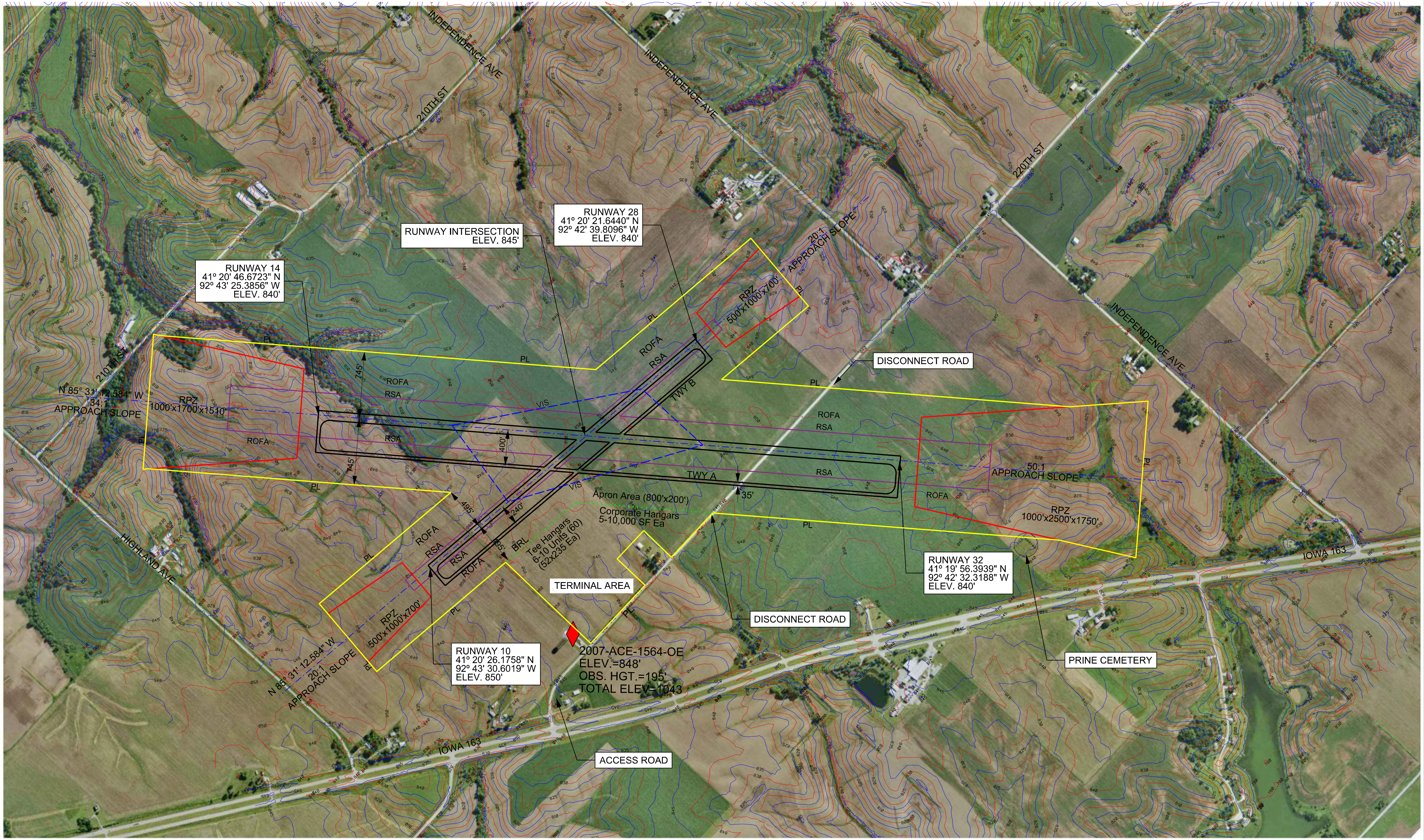


DGR ENGINEERING	Project Manager: Jerry Searle Designer: Jeremy C. Project Number: 720501 Phone: (515) 963-3488	SNYDER & ASSOCIATES Engineers and Planners	SOUTH CENTRAL REGIONAL AIRPORT AGENCY MAHASKA COUNTY, IOWA	SITE A ALT 2	Aerial Provided By: Unknown Provider Aerial Date: Unknown

FIGURE 4-2

500 0 500 1000
1 inch = 500 ft.

ALTERNATIVE THREE

Alternative Three incorporates comments from a users group meeting (held April 16, 2014). Several comments were made regarding the primary runway and the use of a clearway to provide additional takeoff distance beyond the 6,500 feet of runway shown in Alternative Two.

The concept of using a clearway was found to be acceptable and could be applied to Runway 14 to provide a computed takeoff distance of 7,000ft. Where a clearway is used, the RSA is increased by the length of the clearway. Given a 500 foot clearway, a Runway Safety Area, 1500ft in length would be required. The same safety requirement would be applied to Runway 32. The use of the clearway concept when applied to Runway 14/32 is illustrated in Exhibit 4-3. After review by FAA Flight Standards and the Airports Division, it was concluded that while the concept was acceptable, it would not provide a significant cost savings since the grading with an extended RSA would have to be provided. Exhibit 4-3 shows the declared distances if a 500 foot clearway was placed on each end of the primary runway.

Application of the clearway was also discussed with the Flight Departments operating the two (2) most demanding aircraft that will use the airport on a regular basis. It was generally agreed that since the additional safety area had to be graded, having 7,000ft of pavement useable in both directions was a more acceptable alternative.

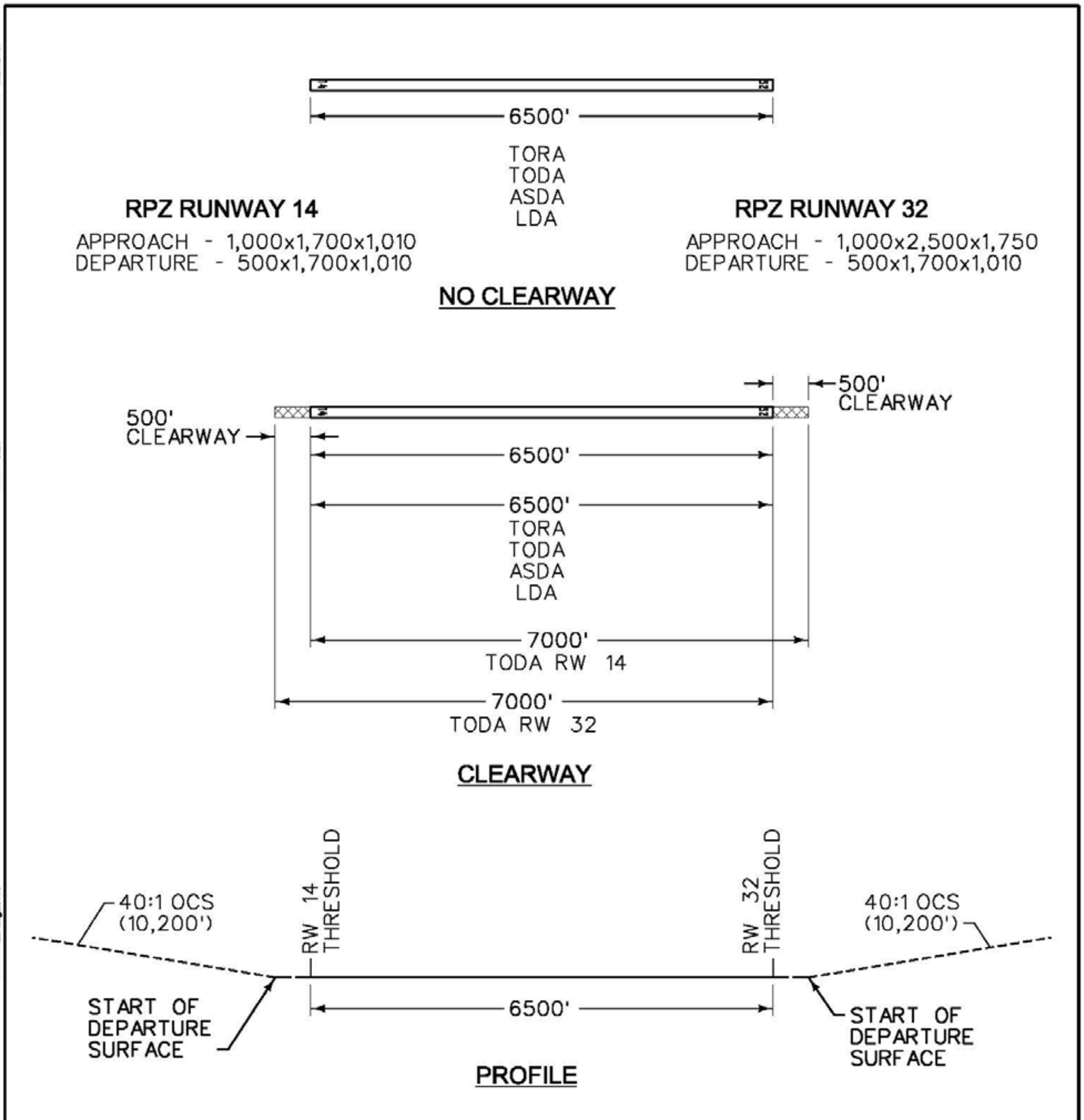
As a result of the analysis, a primary runway 7,000ft in length and 100ft in width was evaluated. The Runway 32 end, in Alternative Two, was moved approximately 1° 33′ to the west so as to place an existing residential structure located north of 210th Street beyond the RPZ.

Given the proposed ultimate length of 7,000ft, the approach/departure standards were applied to each runway end (see Chapter Three). There are no known penetrations to the approach and departure surfaces (TSS).

Proposed is a precision instrument approach (PA-CATI) to Runway 32 with visibility minimums down to ½ mile forward visibility and a 200 foot decision height. As in Alternatives One and Two, an approach light system is recommended. A vertically guided approach (APV $\geq$ ¾ mile) is recommended on Runway 14. Non-precision approaches (NPA) are recommended to each end of the crosswind runway.

Alternative Three depicts the crosswind runway being constructed to an ultimate length of 3,900ft. As noted in Chapter Three, Runway 10/28 should be designed to accommodate Approach Category A and B airplanes with a wingspan less than 49ft (A-I, B-I). A runway, 60ft in width, is expected to provide an adequate level of service. Based on usage by A-I and B-I airplanes, a taxiway 25ft in width is recommended (see Chapter Three).

High Intensity runway threshold and edge lights are recommended on Runway 14/32. A medium intensity threshold and edge light system is recommended on Runway 10/28. Precision Approach Path Indicator (PAPI) light units are recommended for installation on Runway 14/32 and Runway 10/28. Runway End Identifier Light (REIL) units are recommended on Runways 14, 10 and 28.



NOTES:

1. 40:1 DEPARTURE SURFACE
   1,000' x 10,200' x 6,466'
2. RUNWAY SAFETY AREA (RSA)
   500' x 9,500'
3. RUNWAY OBJECT FREE AREA (ROFA)
   800' x 9,500'
4. DEPARTURE RPZ
   500' x 1,700' x 1,010'
5. APPROACH RPZ (PRECISION END)
   1,000' x 2,500' x 1,750'
6. APPROACH RPZ (OPPOSITE END)
   1,000' x 1,700' x 1,010'

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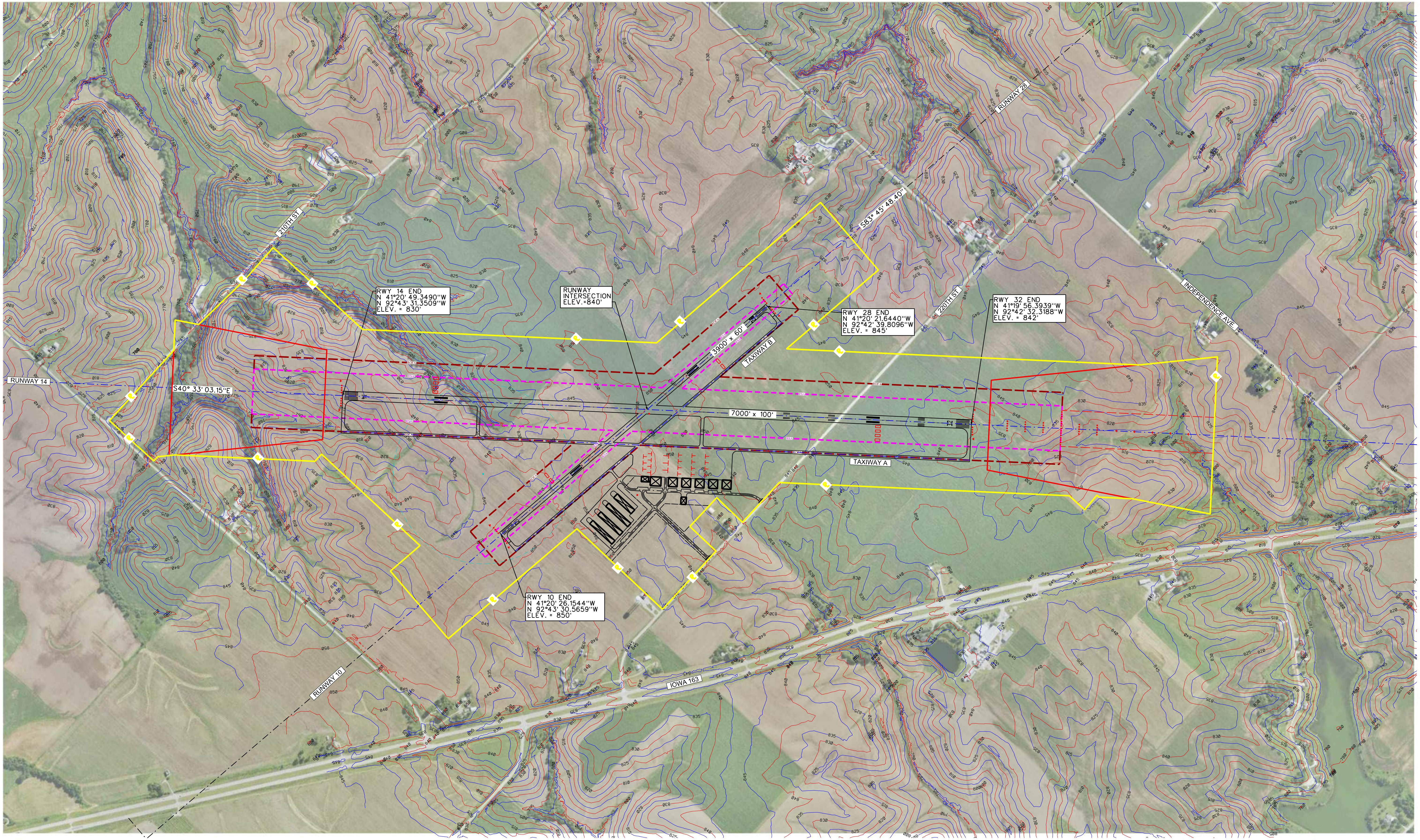
SOUTH CENTRAL REGIONAL AIRPORT AGENCY
MAHASKA COUNTY, IOWA

CLEARWAY CONCEPT
PRIMARY RUNWAY

EXHIBIT 4-3



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SNYDER & ASSOCIATES
Engineers and Planners

SOUTH CENTRAL
REGIONAL AIRPORT AGENCY
MAHASKA COUNTY, IOWA

SITE A ALT 3

500 0 500 1000
1 inch = 500 ft.

Aerial Provided By:
Unknown Provider
Aerial Date:
Unknown

FIGURE
4-4

The RPZ is shown as beginning 200ft from the thresholds associated with Runway 10, 28, 14 and 32. Other applicable RPZ dimensions are as follows:

Runway 10	250 x 1000 x 450	(Approach & Departure)
Runway 28	250 x 1000 x 450	(Approach & Departure)
Runway 14	1000 x 1700 x 1510	(Approach)
	500 x 1700 x 1010	(Departure)
Runway 32	1000 x 2500 x 1750	(Approach)
	500 x 1700 x 1010	(Departure)

Interim guidance on land uses within the RPZ identifies a public road as being an incompatible land use. Reference may be made to FAA Memorandum entitled: Interim Guidance on Land Uses Within a Runway Protection Zone dated 9-27-2012 regarding the approval process (see page 4-14 to 4-16).

The RPZ beyond Runway 14 extends across 400ft of 210th Street. While the road Right-Of-Way is located in the RPZ, it is outside the controlled activity area. 210th Street is owned by Mahaska County and is a low volume gravel rural road.

Exhibits 4-5 and 4-6 show wind coverage by Runway14/32 and Runway 10/28. Wind data from the Ottumwa Regional Airport was used to estimate wind coverage provided by the primary (Runway 14/32) and crosswind (Runway 10/28) runway facilities. The runway alignments proposed in Alternative Three provide a combined 97.45% level of wind coverage at a crosswind value of 13.0-knots.

Based on input from airport users and representatives from the SCRAA, it was concluded that a primary runway (Runway 14/32) 6,700ft in length would provide an acceptable level of service. The recommendation was to develop the Airport Layout Plan to show an ultimate primary runway length of 6,700ft. As such, 210th Street is located outside the RPZ associated with Runway 14.

Federal Aviation Administration

Memorandum

Date:	SEP 27 2012
To:	Regional Airports Division Managers 610 Branch Managers 620 Branch Managers ADO Managers
From:	Benito De Leon, Director Office of Airport Planning and Programming (APP-1) Michael J. O'Donnell, Director Office of Airport Safety and Standards (AAS-1)
Subject:	Interim Guidance on Land Uses Within a Runway Protection Zone

Background

The FAA Office of Airports (ARP) has identified the need to clarify our policy on land uses within the Runway Protection Zone (RPZ). This memorandum presents interim policy guidance on compatible land uses within Runway Protection Zones (RPZ) to address recurrent questions about what constitutes a compatible land use and how to evaluate proposed land uses that would reside in an RPZ. While Advisory Circular 150/5300-Change 17(Airport Design) notes that "it is desirable to clear all objects from the RPZ," it also acknowledges that "some uses are permitted" with conditions and other "land uses are prohibited."

RPZ land use compatibility also is often complicated by ownership considerations. Airport owner control over the RPZ land is emphasized to achieve the desired protection of people and property on the ground. Although the FAA recognizes that in certain situations the airport sponsor may not fully control land within the RPZ, the FAA expects airport sponsors to take all possible measures to protect against and remove or mitigate incompatible land uses.

ARP is developing a new guidance document for the Regional Office (RO) and Airport District Office (ADO) staff that clarifies our policy regarding land uses in the RPZ. This new guidance document will outline a comprehensive review process for existing and proposed land uses within an RPZ and is slated for publication in 2013. We also intend to incorporate RPZ land use considerations into the ongoing update to the Land Use Compatibility Advisory Circular (AC) which is slated for publication in 2014.

This memorandum outlines interim guidance for ARP RO and ADO staff to follow until the comprehensive RPZ land use guidance is published.

Interim Guidance

New or Modified Land Uses in the RPZ

Regional and ADO staff must consult with the National Airport Planning and Environmental Division, APP-400 (who will coordinate with the Airport Engineering Division, AAS-100), when any of the land uses described in **Table 1** would enter the limits of the RPZ as the result of:

1. An airfield project (e.g., runway extension, runway shift)
2. A change in the critical design aircraft that increases the RPZ dimensions
3. A new or revised instrument approach procedure that increases the RPZ dimensions
4. A local development proposal in the RPZ (either new or reconfigured)

Table 1: Land Uses Requiring Coordination with APP-400
• Buildings and structures (Examples include, but are not limited to: residences, schools, churches, hospitals or other medical care facilities, commercial/industrial buildings, etc.) • Recreational land use (Examples include, but are not limited to: golf courses, sports fields, amusement parks, other places of public assembly, etc.) • Transportation facilities. Examples include, but are not limited to: o Rail facilities – light or heavy, passenger or freight o Public roads/highways o Vehicular parking facilities • Fuel storage facilities (above and below ground) • Hazardous material storage (above and below ground) • Wastewater treatment facilities • Above-ground utility infrastructure (i.e. electrical substations), including any type of solar panel installations.

Land uses that may create a safety hazard to air transportation resulting from wildlife hazard attractants such as retention ponds or municipal landfills are not subject to RPZ standards since these types of land uses do not create a hazard to people and property on the ground. Rather, these land uses are controlled by other FAA policies and standards. In accordance with the relevant Advisory Circulars, the Region/ADO must coordinate land use proposals that create wildlife hazards with AAS-300, regardless of whether the proposed land use occurs within the limits of an RPZ.

Alternatives Analysis

Prior to contacting APP-400, the RO and ADO staff must work with the airport sponsor to identify and document the full range of alternatives that could:

1. Avoid introducing the land use issue within the RPZ
2. Minimize the impact of the land use in the RPZ (i.e., routing a new roadway through the controlled activity area, move farther away from the runway end, etc.)

3. Mitigate risk to people and property on the ground (i.e., tunneling, depressing and/or protecting a roadway through the RPZ, implement operational measures to mitigate any risks, etc.)

Documentation of the alternatives should include:

- A description of each alternative including a narrative discussion and exhibits or figures depicting the alternative
- Full cost estimates associated with each alternative regardless of potential funding sources.
- A practicability assessment based on the feasibility of the alternative in terms of cost, constructability and other factors.
- Identification of the preferred alternative that would meet the project purpose and need while minimizing risk associated with the location within the RPZ.
- Identification of all Federal, State and local transportation agencies involved or interested in the issue.
- Analysis of the specific portion(s) and percentages of the RPZ affected, drawing a clear distinction between the Central Portion of the RPZ versus the Controlled Activity Area, and clearly delineating the distance from the runway end and runway landing threshold.
- Analysis of (and issues affecting) sponsor control of the land within the RPZ.
- Any other relevant factors for HQ consideration.

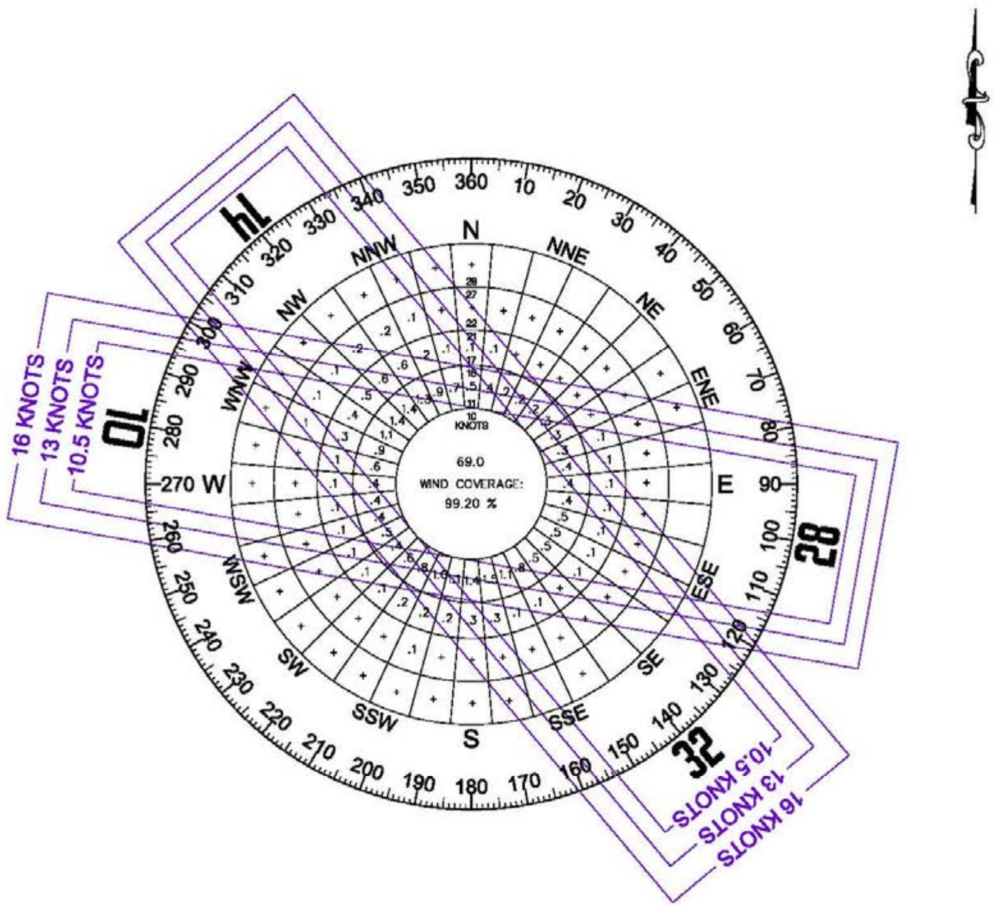
APP-400 will consult with AAS-100 when reviewing the project documents provided by the RO/ADO. APP-400 and AAS-100 will work with the Region/ADO to make a joint determination regarding Airport Layout Plan (ALP) approval after considering the proposed land use, location within the RPZ and documentation of the alternatives analysis.

In addition, APP-400 and AAS-100 will work with the Region/ADO to craft language for inclusion in the airspace determination letter regarding any violations to ensure that all stakeholders (including tenants, operators, and insurers) are fully apprised of the issues and potential risks and liabilities associated with permitting such facilities within the RPZ.

Existing Land Uses in the RPZ

This interim policy only addresses the introduction of new or modified land uses to an RPZ and proposed changes to the RPZ size or location. Therefore, at this time, the RO and ADO staff shall continue to work with sponsors to remove or mitigate the risk of any existing incompatible land uses in the RPZ as practical.

For additional information or questions regarding this interim guidance, please contact either Ralph Thompson, APP-400, at ralph.thompson@faa.gov or (202) 267-8772 or Danielle Rinsler, APP-401, at danielle.rinsler@faa.gov or (202) 267-8784.



WIND DATA			
CROSSWIND COMPONENT	RUNWAY 10/28	RUNWAY 14/32	COMBINED
10.5 KNOTS	83.93%	90.30%	94.23%
13.0 KNOTS	90.79%	94.96%	97.45%
16.0 KNOTS	97.01%	98.42%	99.20%

SOURCE: OTTUMWA INDUSTRIAL AIRPORT
OTTUMWA, IOWA
ALL WEATHER
PERIOD: 2000–2009

File: C:\Projects\205 South Central RAA\01\dgn\figures\Figures_narrative.dgn Model: FIG 4-5 Scale: 1:500 Plot Date: 3/29/2015

DGR ENGINEERING

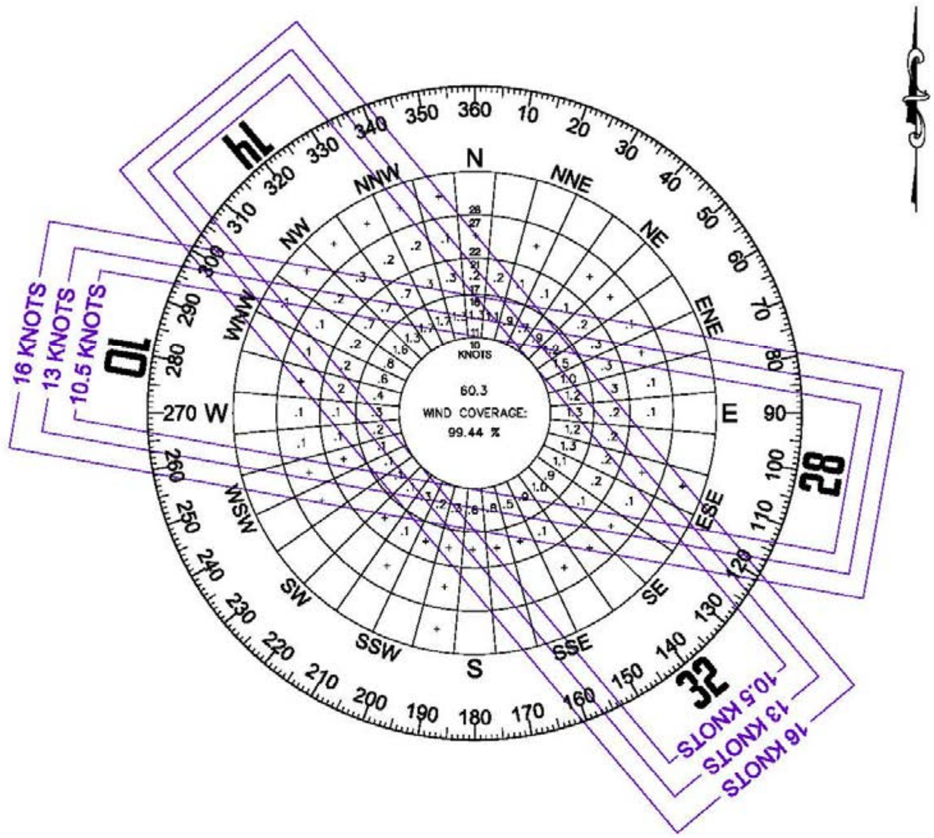
Project Manager: Jerry Searle
Designer: Jeremy C.
Project Number: 720501
Phone: (515) 963-3488

SNYDER & ASSOCIATES
Engineers and Planners

SOUTH CENTRAL
REGIONAL AIRPORT AGENCY
MAHASKA COUNTY, IOWA

ALL WEATHER
WIND ROSE

EXHIBIT
4-5



WIND DATA			
CROSSWIND COMPONENT	RUNWAY 10/28	RUNWAY 14/32	COMBINED
10.5 KNOTS	82.68%	86.52%	93.83%
13.0 KNOTS	90.67%	92.72%	97.64%
16.0 KNOTS	97.10%	97.64%	99.44%

SOURCE: OTTUMWA INDUSTRIAL AIRPORT
OTTUMWA, IOWA
CEILING – 200', VIS. – 1/2 MILE
PERIOD: 2000–2009

Plot Date: 3/29/2015
Scale: 1:500
Model: FIG 4-6
File: C:\Projects\205 South Central RAA\01\dgn\figures\Figures_narrative.dgn

DGR ENGINEERING	Project Manager: Jerry Searle Designer: Jeremy C. Project Number: 720501 Phone: (515) 963-3488	SNYDER & ASSOCIATES Engineers and Planners	SOUTH CENTRAL REGIONAL AIRPORT AGENCY MAHASKA COUNTY, IOWA	IFR WIND ROSE	EXHIBIT 4-6

TERMINAL AREA ALTERNATIVES

The terminal area concept plan was presented to the airport users group in April 2014 (see Exhibit 4-7). Several recommendations were made by those in attendance.

- Provide vehicle parking for tee hangar tenants
- Create an open space area adjacent to the apron
- Locate the FBO Facility adjacent to the proposed terminal building
- Provide a heated hangar that may be used for overnight itinerant aircraft storage
- Provide a sidewalk to facilitate pedestrian movement from the vehicle parking areas to the terminal building
- Provide security fencing and additional gate locations with access control

Several comments that were taken into consideration included the following:

- Fuel trucks would most likely be used to upload fuel to aircraft
- Above ground fuel storage may not necessarily be located adjacent to the apron
- One or more of the tee hangars structure should be sized to accommodate cabin class airplanes

Vehicle access to the proposed terminal area is provided by an airport access road extending north from 220th Street. Envisioned within the terminal area is the ultimate development of the following infrastructure components:

- Three (3) 14 unit tee hangar structures
  - 42 aircraft
  - Clear door: 41.5’ x 12’
- One (1) 10 unit tee hangar structure
  - 10 aircraft (cabin class twins)
  - Clear door: 47.5’ x 14’
- FBO Maintenance/Storage Hangar
  - 4 to 6 aircraft
  - 14,000 SF
- Aircraft Storage Hangar
  - 5 to 10 aircraft
  - 10,000 SF +/- (heated overnight itinerant use)
- Four (4) Large Box Hangars
  - 2 to 6 aircraft each
  - 10,000 SF +/-
  - May be constructed by the private sector
- Terminal Building
  - 4,800 SF +/-
- Airport Maintenance Equipment Storage
  - 4,800 SF +/- (60’ x 80’)
- Vehicle Parking
  - As needed
  - 50 to 90 stalls

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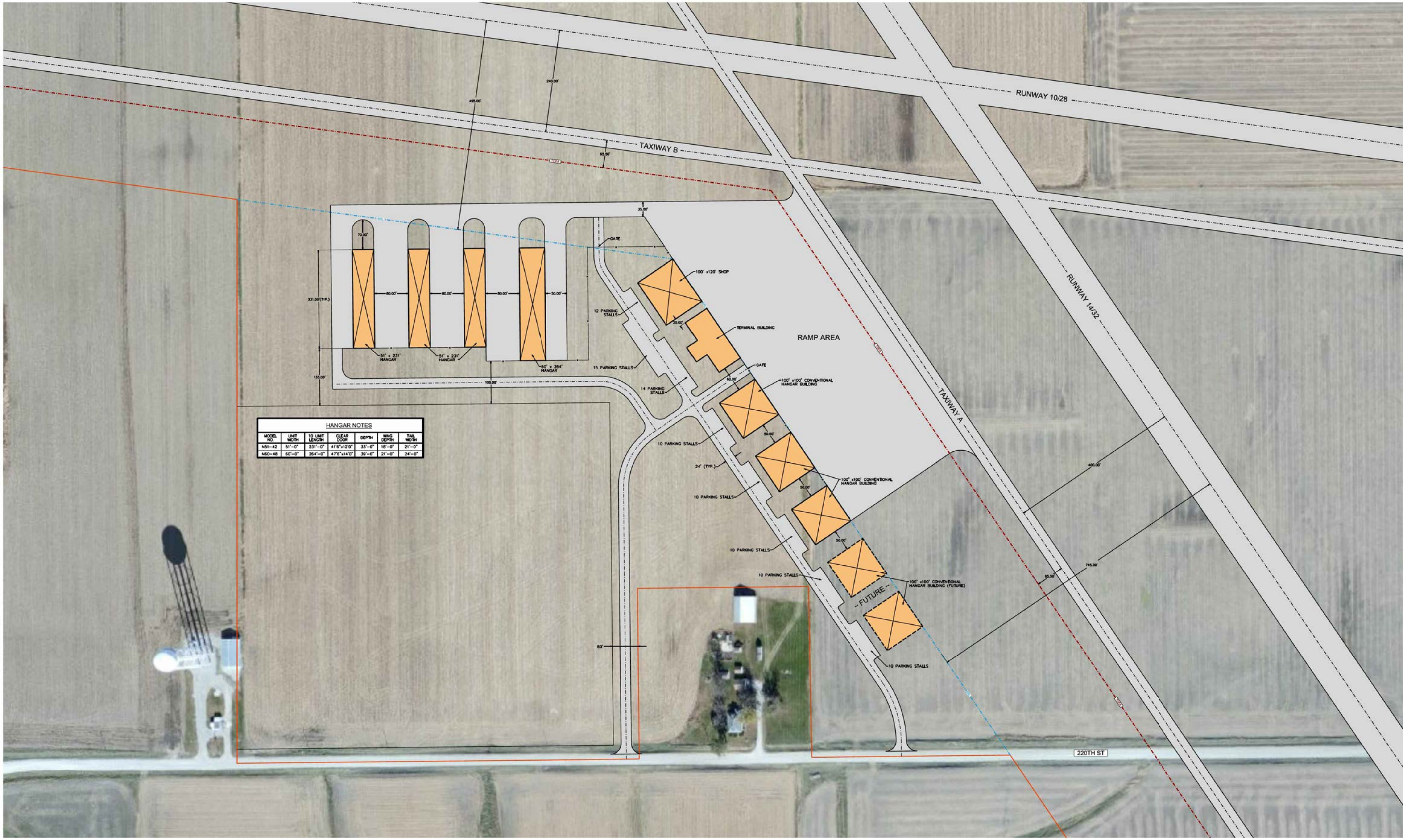


HANGAR NOTES

MODEL NO.	UNIT WIDTH	10 UNIT LENGTH	CLEAR DOOR	DEPTH	WING DEPTH	TAIL WIDTH
N51-42	51'-0"	231'-0"	41'6"x12'0"	33'-0"	18'-0"	21'-0"
N60-48	60'-0"	264'-0"	47'6"x14'0"	39'-0"	21'-0"	24'-0"

DGR ENGINEERING

Project Manager: Jerry Searle
Designer: Jeremy C.
Project Number: 720501
Phone: (515) 963-3488

SNYDER & ASSOCIATES
Engineers and Planners

SOUTH CENTRAL
REGIONAL AIRPORT AGENCY
MAHASKA COUNTY, IOWA

TERMINAL CONCEPT ALT 1

500 0 500 1000
1 inch = 500 ft.
NOT TO SCALE

Aerial Provided By:
Unknown Provider
Aerial Date:
Unknown

FIGURE
4-7

Exhibit 4-7 shows two (2) access points. Non-primary airports are AIP eligible for only one (1) access road/drive. The access point nearest the corporate hangars is optional and/or may be constructed without federal assistance.

US HIGHWAY 63 IMPROVEMENTS

The Iowa Department of Transportation (Iowa DOT) is considering several improvement projects within the US Highway 63 corridor. Proposed is a by-pass around the City of Oskaloosa. The Iowa DOT has identified three alternative alignments within the study project area (See Exhibit 4-8). Proposed is an interchange with Iowa Highway 163 that is located approximately 6,600ft southeast of Runway 32. From the proposed US 63/IA 163 interchange, US Highway 63 would extend north/northeasterly to a point of intersection with the existing US Highway 63 Right-Of-Way. (see Exhibit – Page 4-8)

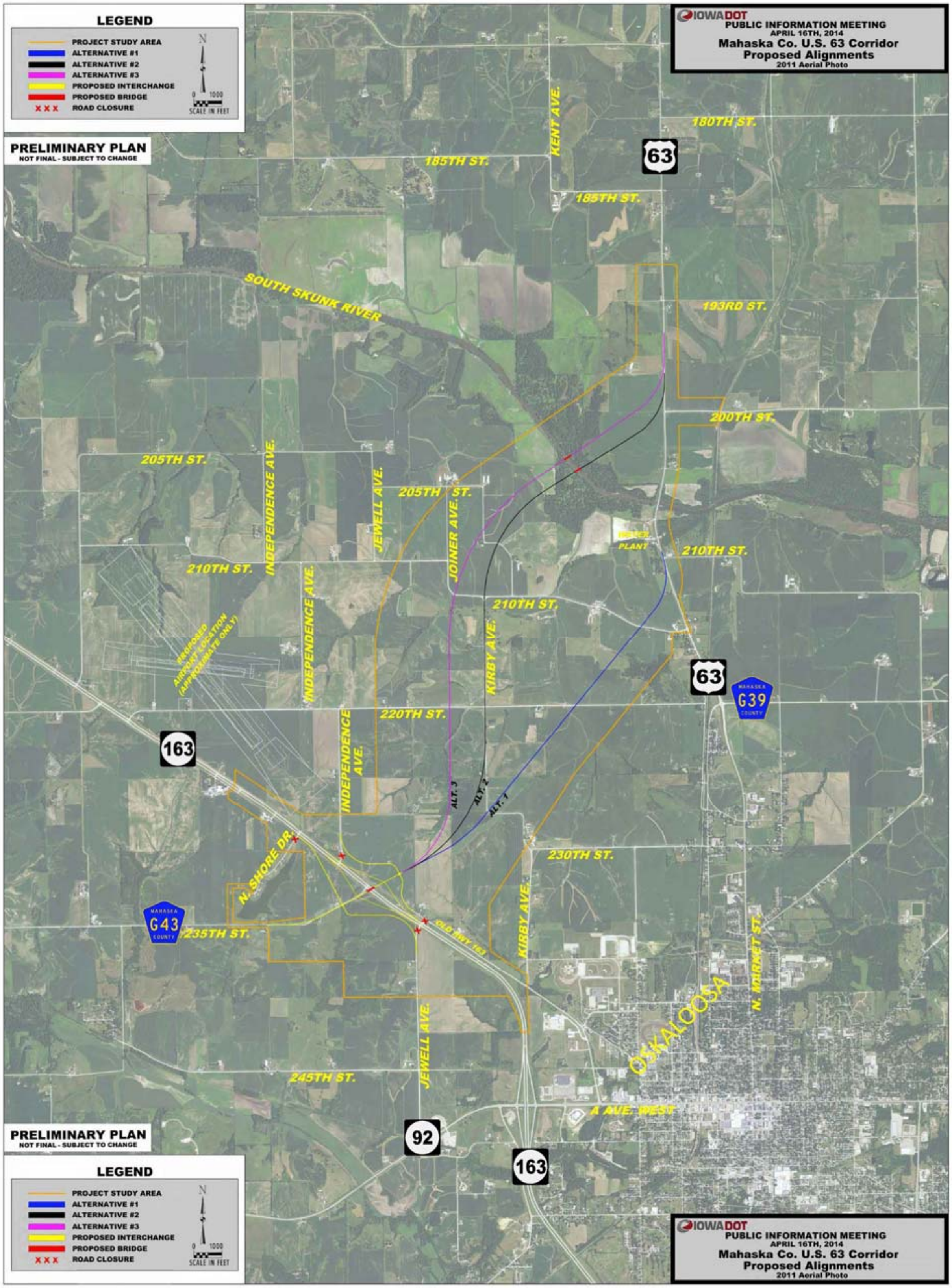
The concept plan shows the extension of Old Highway 163 (north and parallel to IA 163) extended to connect with Independence Avenue. The at grade intersection of Independence Avenue and Old Highway 163 is located approximately 1,100ft northeast of the interchange.

The approach surface (FAR Part 77-50:1) extends over the proposed interchange. The approach surface elevation (based on the Runway 32 threshold elevation of 842ft AMSL) is 970ft AMSL. The ground elevation, where the approach surface intersects the interchange, is approximately 840ft AMSL. Based on the interchange concept plan, there are no known conflicts with a runway approach surface and interchange. A coordination effort was established between the South Central Regional Airport Agency, Iowa DOT, and Mahaska County to address issues that may arise. A joint meeting attended by representatives from the Iowa DOT, the SCRAA, Mahaska County, City of Pella and the City of Oskaloosa was held on July 8, 2014. It was generally agreed that the two projects would complement each other. Given the proposed improvement to the regional highway network and development of the airport, the primary concern regarding the disconnect of 220th Street related to the movement of farm equipment across Iowa Highway 163.

220TH STREET DISCONNECT

Each of the three (3) alternatives discussed within this Chapter requires 220th Street to be disconnected. Representatives from the SCRAA met with the Mahaska County Engineer and Board of Supervisors. The County Engineer in a letter dated July 1, 2013, indicated that action to disconnect would be taken if the potential impact to the county road network is addressed and acceptable mitigation actions are identified.

Exhibit 4-8 US 63 Alternatives



Phone: (641) 672-2897 *Fax: (641) 672-1385*

Mahaska County Highway Department

2074 Old Hwy. 163
Oskaloosa, Iowa 52577

July 01, 2013

Mr. Jim Hansen, Chairperson
South Central Regional Airport Agency
825 Broadway
Pella, IA 50219

RE: SITE A – MAHASKA COUNTY
220th STREET

Dear Mr. Hansen:

The South Central Regional Airport Board has selected Site A as the preferred airport site. The airport concept plan shows the primary runway extending through the 220th Street right-of-way. In order to construct the primary runway, 220th Street will have to be disconnected.

Upon completion of the required environmental documentation and a favorable environmental determination from the Federal Aviation Administration, Mahaska County will disconnect 220th Street to accommodate development of the proposed airport.

The action to disconnect will be undertaken if the potential impact to the county road network is addressed within the environmental assessment and acceptable mitigation actions are identified.

Sincerely,

Mahaska County

Jerome T. Nusbaum, PE
County Engineer

cc: Mahaska County Board of Supervisors
Jerald Searle, Snyder & Associates
Michael Shrock, City of Oskaloosa
Mike Nardini, City of Pella

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Chapter 5

Airport Layout Plan

CHAPTER FIVE – AIRPORT LAYOUT PLAN

The Airport Layout Plan (ALP) is a series of exhibits used to depict existing facilities and proposed airport development. When airport sponsors accept funds from FAA – administered airport financial programs, the recipient agrees to maintain and operate the facility safely and efficiently and in accordance with specified conditions. The airport sponsor (South Central Regional Airport Agency) has agreed to certain obligations which are set forth (in part) in the Federal Assurances that become part of the federal grant agreement. One of these obligations (Condition Number 29) obligates the SCRAA to keep an airport layout plan of the airport showing:

- Boundaries of the airport – existing and proposed property interest.
- Location of existing and proposed airport facilities and structures.
- Location of existing and proposed non-aviation areas and of all existing improvements therein.
- All proposed and existing access points used to taxi aircraft across the airport property line.

In preparing the ALP, reference was made to FAA AC 150/5070-6B Airport Master Plans, and Standard Operating Procedure for FAA Review and Approval of Airport Layout Plans (ARP SOP 2.00). All airport development at federally obligated airports must conform to an FAA approved ALP.

The Airport Layout Plan for the South Central Regional Airport consists of the following exhibits:

- Title Sheet — Sheet 1
- Airport Layout Plan — Sheet 2
- Airport Airspace/F.A.R Part 77 Surfaces — Sheet 3-4
- Approach Plan and Profile Runway 14/32 — Sheet 5
- Approach Plan and Profile Runway 10/28 — Sheet 6
- Inner Approach Surface Runway 14 — Sheet 7
- Inner Approach Surface Runway 32 — Sheet 8
- Inner Approach Surface Runway 10/28 — Sheet 9
- Runway Centerline Profile Runway 14/32 and 10/28 — Sheet 10
- Terminal Area Plan — Sheet 11
- Land Use Plan — Sheet 12
- Property Map – Exhibit A — Sheet 13
- Airport Departure Surfaces Runway 14/32 — Sheet 14

TITLE SHEET – SHEET 1

The title sheet provides a list of drawing sheets, location and vicinity maps.

AIRPORT LAYOUT PLAN (ALP) – SHEET 2

The ALP depicts existing site conditions and the ultimate extent of development contemplated over the 20-year planning period. Spot elevations and a contour interval of five (5) feet provide an indication of present topographic and drainage conditions. The following information is shown graphically and/or summarized in table form:

- True and Magnetic North
- Airport Reference Point
- All Weather/IFR Wind Rose
- Contours – Topographic
- Aircraft Parking
- Fences
- Survey documentation
- Runway and Taxiway Features/Details
- Buildings, Structures and Facilities
- Safety and Object Clearing Areas
- Approach Surface
- Roads
- Airport Property Line

AIRPORT AIRSPACE – SHEETS 3, 4, 5 and 6

The Airport Airspace exhibit shows the FAR Part 77 imaginary surfaces over 7.5 minutes USGS quadrangle base maps. The airport airspace is depicted in plan view Sheets 3 and 4. The approach surfaces extending beyond each runway are shown in plan and profile view on Sheets 5 and 6. The proposed approach surfaces are as follows:

	Initial	Ultimate
Runway 14	D/34:1	D/34:1
Runway 32	PIR/50:1	PIR/50:1
Runway 10	A(NP) 20:1	A(NP) 20:1
Runway 28	A(NP) 20:1	A(NP) 20:1

Safe and efficient landing and takeoff operations at an airport require that certain areas on and near the airport are clear of objects or restricted to objects with a certain function, composition, and/or height. These clearing standards and criteria are established to create a safer environment for the aircraft operating on or near the airport. The airport operator is not required to prevent or clear penetrations to the Part 77, Subpart C, imaginary surfaces when the FAA determines these penetrations are not hazards. However, any existing or proposed objects, whether man-made or of natural growth that penetrates these surfaces is classified as an obstruction and is presumed to be a hazard to air navigation. These obstructions are subject to an FAA aeronautical study, after which the FAA issues a determination stating whether the obstruction is in fact considered a hazard.

The FAA completed (on December 8, 2014) an airspace analysis of:

- Runway 10/28 – 3,900' x 60', A (NP)/A (NP) Paved
- Runway 14/32 – 5,500' x 100', D/PIR, Paved
- Runway 14/32 – 6,700' x 100', D/PIR, Paved

The aeronautical study determined that the proposed runway development will not adversely affect the safe and efficient use of airspace by aircraft (see Airspace Review Case: 2014-ACE-3492-NRA-Appendix A).

FAA PART 77 IMAGINARY SURFACES

Imaginary Surfaces

Imaginary surfaces establish areas where any object penetrating that surface would be considered an obstruction to air navigation. The imaginary surface established is an imaginary line or plane that separates ground activities from aircraft activities (See Exhibit 5-1). The type of approach (determined by ARC and visibility minimums) must be considered when determining the applicable surfaces.

The surface heights, radii, and angles are determined by the type of runway and planned instrumentation. Approach minimums greater than ¾ mile should be maintained on Runway 10/28 (crosswind runway) and the primary runway (Runway 32) opposite the precision instrument end (Runway 14).

Obstruction Standards

Part 77 of Volume XI, Federal Aviation Regulations, sets forth a number of standards to be used in identifying obstructions to air navigation. These standards are of considerable importance. The discussion herein is primarily extracted from Part 77. These standards are used as a guide in the assessment of airport development alternatives as well as the basis for tall structure zoning.

An obstruction is considered to be any object of natural growth, terrain, or structure(s) of permanent or temporary construction if it is higher than any of the following heights or surfaces:

- A height of 500ft above ground level at the site of object.
- A height that is 200ft above ground level or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport. The allowable height by 100 feet of each additional nautical mile of distance from the airport up to a maximum height of 500ft.
- A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.
- The surface of a takeoff and landing area of an airport or any imaginary surface established under Sec. 77.25.

The standards on the previous page apply to traverse ways used or to be used for the passage of mobile objects only after the height of these traverse ways are increased by:

- 17ft for an Interstate Highway
- 15ft for any other public roadway
- 10ft or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road.
- 23ft for a railroad
- For a waterway or other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it

Primary Surface

The Primary Surface is longitudinally centered on a runway centerline. For hard surface runways with a non-precision instrument approach and visibility minimums greater than ¾ mile, the primary surface extends 200ft beyond each end of the runway and is 500ft wide (250ft on either side of the runway centerline). The elevation of any point on the Primary Surface is the same as the elevation of the nearest point on the runway centerline. For runways with a precision instrument approach, the Primary Surface extends 200ft beyond each end and is 1,000ft in width.

Horizontal Surface

The Horizontal Surface is located 150ft above the established airport elevation. The perimeter of the horizontal surface is a 10,000 foot radius arc (180º) centered on the end of each end of the Primary Surface. The perimeter is completed by connecting the adjacent arcs by lines tangent to those arcs.

Conical Surface

The Conical Surface extends outward and upward from the periphery of the Horizontal Surface at a slope of 20 to 1 (20:1) for a horizontal distance of 4,000ft. The outer edge of the Conical Surface would then be 13,000 horizontal feet from the center of the end of the Primary Surface at each end of the runway. The height of the outer edge of the Conical Surface would be 200ft above the Horizontal Surface and 350ft above the Primary Surface.

Runway Approach Surface

The Approach Slope is longitudinally centered on the extended runway centerline and extending outward and upward from each end of the Primary Surface. An Approach Surface is applied to each end of each runway based upon the type of approach available or planned.

The inner edge of the Approach Surface is the same width as the Primary Surface. The precision instrument approach slope is 50:1 for the inner 10,000ft and 40:1 for an additional 40,000ft. The surface expands uniformly to a width of 16,000ft for the end of a larger than utility runway with a precision instrument approach, and to a width of 4,000ft for the end of a larger than utility runway with non-precision instrument approach and visibility minimums as low as ¾ mile.

The inner edge of the approach surface for a larger than utility runway with a non-precision instrument approach is 500ft, and visibility minimums greater than ¾ mile. The approach surface extends outward and upward 10,000ft at a 34:1 slope to a width of 3,500ft.

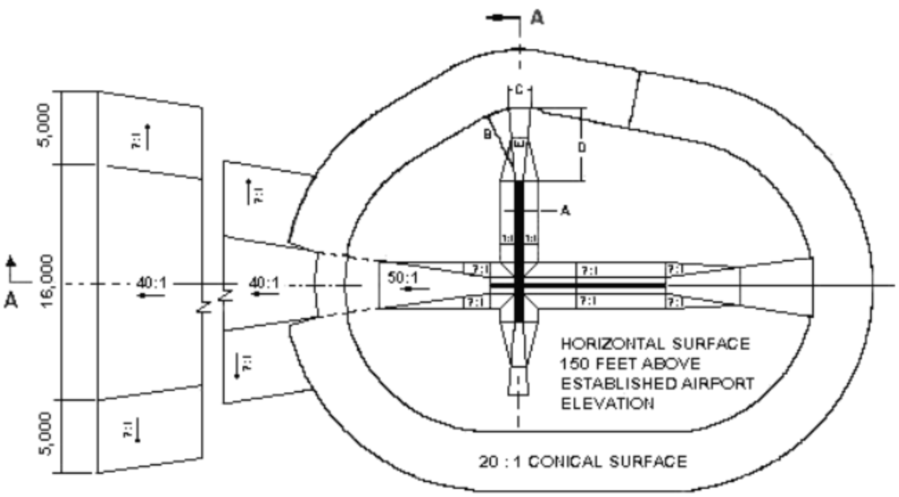
The inner edge of the approach surface for a utility runway with a non-precision approach is 500ft. The approach surface extends outward and upward 5,000ft at a 20:1 slope to a width of 1,500ft.

The approach slope for a utility runway with a visual approach is 250ft. The surface extends out 5,000ft at a 20:1 to a width of 1,250ft.

Transitional Surfaces

The Transitional Surfaces extend outward and upward at right angles to the runway centerline. The surfaces extend at a slope of 7 to 1 (7:1) from the sides of the Primary Surface and from the sides of the Approach Surfaces. The Transitional Surfaces have a height of 150ft which coincides with the height of the Horizontal Surface.

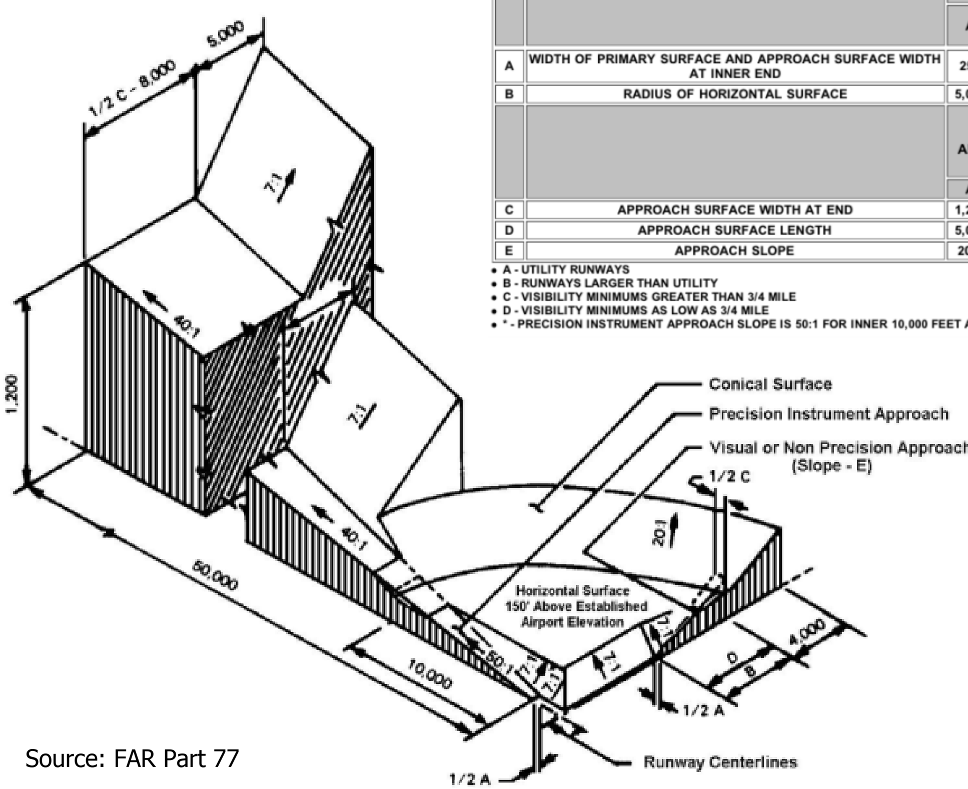
Exhibit 5-1



OBSTRUCTION IDENTIFICATION SURFACES
FEDERAL AVIATION REGULATIONS PART 77

DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON - PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON - PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
				A	B		
		A	B		C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

- A - UTILITY RUNWAYS
- B - RUNWAYS LARGER THAN UTILITY
- C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
- D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
- * - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET



Source: FAR Part 77

INNER APPROACH SURFACE – SHEETS 7, 8 AND 9

Sheets 7 and 8 show the inner approach surface area for Runway 14/32. The area is shown in plan and profile view. Sheet 9 depicts the inner approach surface area for Runway 10/28. The exhibit shows the slope for the following surfaces that extend beyond each runway end.

- FAR Part 77 Approach Surface
- Glideslope Qualification Surface (GQS)
- Threshold Siting Surface (TSS)
- Departure Surface

The exhibits depict the following design surface:

- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- NAVAID Critical Areas

Obstruction and Clearance Tables are included on each drawing sheet.

RUNWAY PLAN AND PROFILE – SHEET 10

The runway profile for each proposed runway is shown on a double plan and profile sheet. The exhibit notes the runway grade and line sight.

TERMINAL PLAN – SHEET 11

The terminal plan shows the proposed location of aircraft storage facilities, terminal building, aircraft parking, vehicle access and parking. The drawing also shows the proposed location for a rotating beacon light, airport ground maintenance building and above ground fuel storage.

Fuel is expected to be uploaded to aircraft by truck.

LAND USE PLAN – SHEET 12

Sheet 12 depicts the proposed on-site airport land uses. The drawing also includes a table that sets forth crop restriction requirements.

Land uses beyond the airport property line (as proposed) are related to agricultural activities. Site topography to include off site drainage patterns is also depicted. The drawing also shows area roads (County, State, and Federal).

PROPERTY MAP-EXHIBIT A – SHEET 13

The property map shows the airport property interest recommended for acquisition. Since none of the land has been acquired, the Exhibit A property map will be updated throughout the land acquisition process.

The property map was prepared in accordance with APP SOP Number 3.00.

RUNWAY DEPARTURE SURFACE – SHEET 14

Sheet 14 shows the runway departure surface for Runways 14 and 32. The departure surface is shown in plan and profile view.

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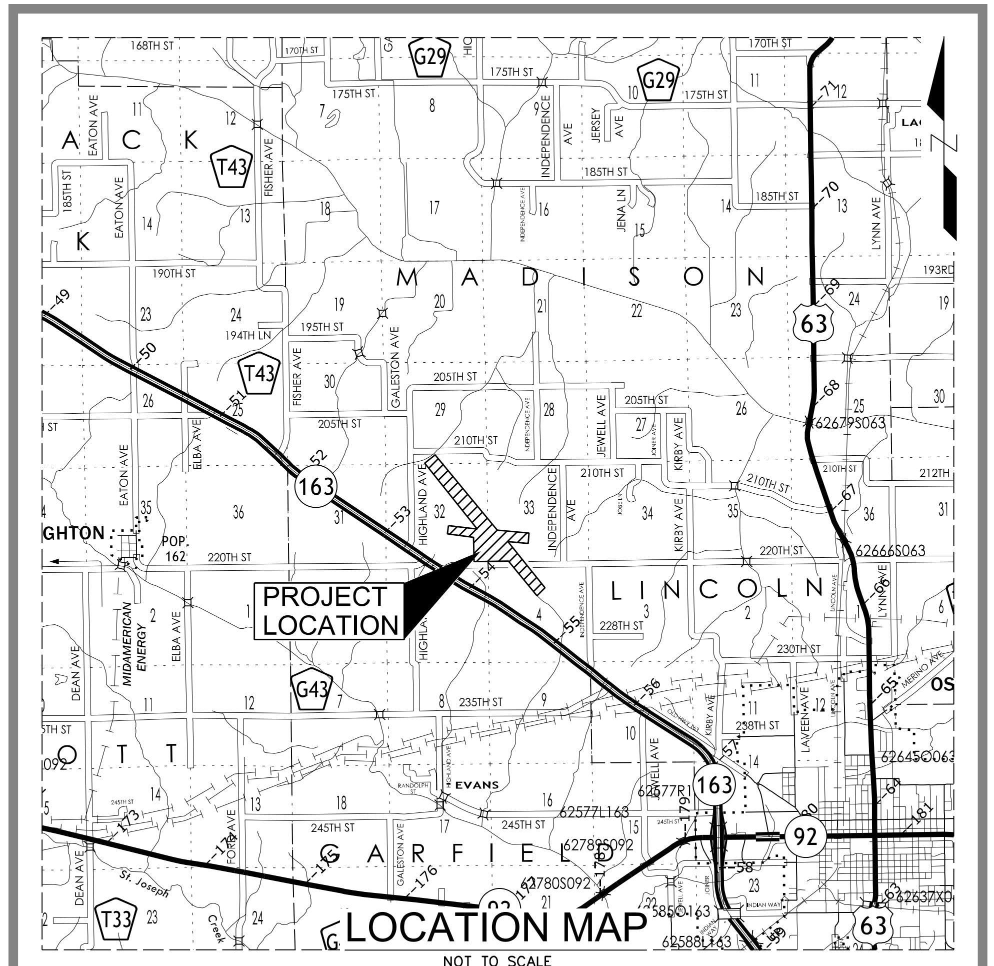
SOUTH CENTRAL REGIONAL AIRPORT
AIRPORT LAYOUT PLAN

MAHASKA COUNTY, IOWA

FAA AIP 3-19-0136-001-2013

Index of Sheets



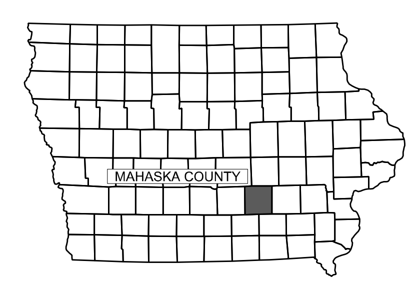
APPROVAL - South Central regional Agency Airport

CHAIR PERSON DATE

DISCLAIMER STATEMENT

THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER AIP 3-19-0136-001-2013) AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

811 Know what's below. Call before you dig.



SOUTH CENTRAL REGIONAL AIRPORT AGENCY BOARD	
JIM HANSEN	CHAIR PERSON
DAVID BARNES	VICE CHAIR PERSON
PAMELA BLOMGREN	BOARD MEMBER
DONNA SMITH	BOARD MEMBER
STEVE VAN WEELDEN	BOARD MEMBER
JOE WARRICK	BOARD MEMBER

AIRPORT LAYOUT PLAN APPROVAL		
APPROVED BY:		
DATE APPROVED:		
REV	DATE	DESCRIPTION

DGR ENGINEERING

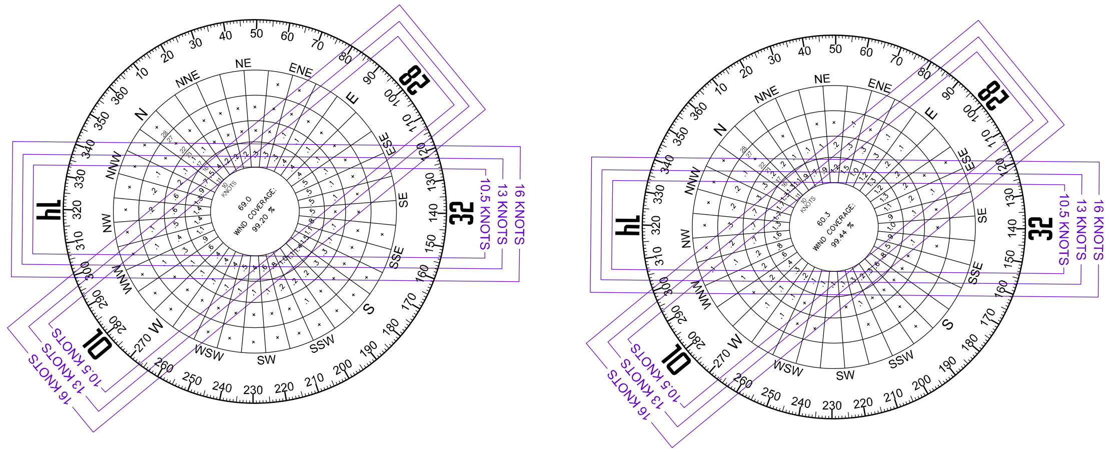
Project Manager: Jerry Searle
Designer: Jeremy Cswercko
Project Number: 720501
Phone: (515) 963-3488

SNYDER & ASSOCIATES
Engineers and Planners

SOUTH CENTRAL
REGIONAL AIRPORT
MAHASKA COUNTY, IOWA

TITLE SHEET

SHEET 1



WIND DATA

CROSSWIND COMPONENT	RUNWAY 10/28	RUNWAY 14/32	COMBINED
10.5 KNOTS	83.93%	90.30%	94.23%
13.0 KNOTS	90.79%	94.96%	97.45%
16.0 KNOTS	97.01%	98.42%	99.20%
SOURCE: OTTUMWA INDUSTRIAL AIRPORT OTTUMWA, IOWA ALL WEATHER PERIOD: 2000-2009			

WIND DATA

CROSSWIND COMPONENT	RUNWAY 10/28	RUNWAY 14/32	COMBINED
10.5 KNOTS	82.68%	86.52%	93.83%
13.0 KNOTS	90.67%	92.72%	97.64%
16.0 KNOTS	97.10%	97.64%	99.44%
SOURCE: OTTUMWA INDUSTRIAL AIRPORT OTTUMWA, IOWA CEILING - 200', VIS. - 1/2 MILE PERIOD: 2000-2009			

NOTES

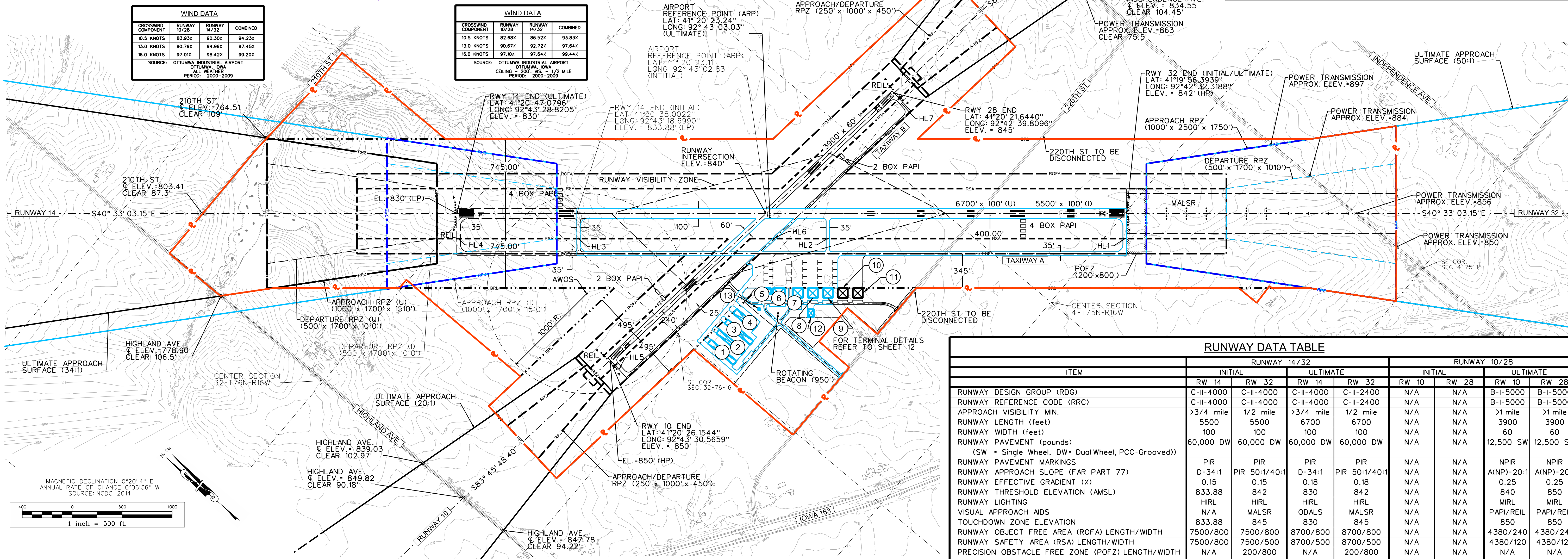
- THERE ARE NO OBSTACLE FREE ZONE (OFZ) PENETRATIONS
- THERE ARE NO THRESHOLD SITING SURFACE OBJECT PENETRATIONS
- THERE ARE NO MODIFICATIONS TO DESIGN STANDARDS
- RUNWAY(S) MEET LINE OF SIGHT REQUIREMENTS

BUILDING IDENTIFICATION

I.D.	DESCRIPTION
1	HANGAR 51x334 (41'-6"x12'-0")
2	HANGAR 51x334 (41'-6"x12'-0")
3	HANGAR 51x334 (41'-6"x12'-0")
4	HANGAR 60x264 (47'-6"x14'-0")
5	TERMINAL BLDG (4800 sf)
6	MAINTENANCE HANGAR 140x100 (14,000sf)
7	BOX HANGAR 100x100
8	BOX HANGAR 100x100
9	BOX HANGAR 100x100
10	BOX HANGAR 100x100
11	BOX HANGAR 100x100
12	EQUIPMENT STORAGE 60x80
13	ELECTRICAL VAULT BLDG

LEGEND

DESCRIPTION	INITIAL	ULTIMATE
AIRPORT PROPERTY LINE		
AIRPORT EASEMENT LINE		
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY VISIBILITY ZONE / LINE OF SIGHT		
RUNWAY PROTECTION ZONE	RPZ	RPZ
RUNWAY SAFETY AREA AND OBJECT FREE AREA	ROFA	ROFA
EASEMENT		
BUILDING - STRUCTURES		
PRECISION APPROACH PATH INDICATOR (PAPI)		
RUNWAY END IDENTIFIER LIGHTS (REIL)		
THRESHOLD LIGHTS		
FENCE		
AIRCRAFT PARKING LOCATION		



SURVEY TYPE

RW 14	VGS(PA & APV)-NVGS
RW 32	VGS
RW 10	NVGS
RW 28	NVGS

AIRPORT SERVICE LEVEL

GENERAL AVIATION PROPOSED REPLACEMENT	(FAA ORDER 5090.32)
ENHANCED NEW AIRPORT	(IOWA DOT 2010 SASP)

SURVEY CONTROL

THE COORDINATE SYSTEM USED FOR THE GROUND CONTROL CHECKPOINTS AT THE SOUTH CENTRAL REGIONAL AIRPORT SITE WAS THE NORTH AMERICAN DATUM OF 1983/2011 (NAD83(2011), IOWA SOUTH ZONE 1402, (VERTICAL DATUM: NAVD 88- GEOID 12A), AS BROADCAST BY THE IOWA REAL TIME NETWORK.

HOLDING POSITION TABLE

HOLDING POSITION	HOLD TYPE	DISTANCE
HL1	RUNWAY	250'
HL2	RUNWAY	250'
HL3	RUNWAY	250'
HL4	RUNWAY	250'
HL5	RUNWAY	250'
HL6	RUNWAY	125'
HL7	RUNWAY	125'

DISTANCE FROM THE HOLD LINE IS MEASURED PERPENDICULAR FROM RUNWAY CENTERLINE.

AIRPORT DATA - NAVD 88

ITEM	INITIAL	ULTIMATE
AIRPORT ELEVATION (MSL)	845	850
AIRPORT REFERENCE POINT (ARP)	41°20' 23.11"	41°20'23.24"
	92°43' 02.83"	92°43'03.03"
MEAN MAX. TEMPERATURE	85° F	85° F
AIRPORT NAVAIDS	GPS	GPS
ROTATING BEACON, AWOS	YES	YES
SEGMENTED CIRCLE	NO	NO
LIGHTED WIND INDICATOR(S)	YES	YES
AIRPORT REFERENCE CODE	C-II	C-II

RUNWAY DATA TABLE

ITEM	RUNWAY 14/32				RUNWAY 10/28			
	INITIAL		ULTIMATE		INITIAL		ULTIMATE	
	RW 14	RW 32	RW 14	RW 32	RW 10	RW 28	RW 10	RW 28
RUNWAY DESIGN GROUP (RDG)	C-II-4000	C-II-4000	C-II-4000	C-II-2400	N/A	N/A	B-I-5000	B-I-5000
RUNWAY REFERENCE CODE (RRC)	C-II-4000	C-II-4000	C-II-4000	C-II-2400	N/A	N/A	B-I-5000	B-I-5000
APPROACH VISIBILITY MIN.	>3/4 mile	1/2 mile	>3/4 mile	1/2 mile	N/A	N/A	>1 mile	>1 mile
RUNWAY LENGTH (feet)	5500	5500	6700	6700	N/A	N/A	3900	3900
RUNWAY WIDTH (feet)	100	100	100	100	N/A	N/A	60	60
RUNWAY PAVEMENT (pounds) (SW = Single Wheel, DW= Dual Wheel, PCC-Grooved))	60,000 DW	60,000 DW	60,000 DW	60,000 DW	N/A	N/A	12,500 SW	12,500 SW
RUNWAY PAVEMENT MARKINGS	PIR	PIR	PIR	PIR	N/A	N/A	NPIR	NPIR
RUNWAY APPROACH SLOPE (FAR PART 77)	D-34:1	PIR 50:1/40:1	D-34:1	PIR 50:1/40:1	N/A	N/A	A(NP)-20:1	A(NP)-20:1
RUNWAY EFFECTIVE GRADIENT (%)	0.15	0.15	0.18	0.18	N/A	N/A	0.25	0.25
RUNWAY THRESHOLD ELEVATION (AMSL)	833.88	842	830	842	N/A	N/A	840	850
RUNWAY LIGHTING	HIRL	HIRL	HIRL	HIRL	N/A	N/A	MIRL	MIRL
VISUAL APPROACH AIDS	N/A	MALSR	ODALS	MALSR	N/A	N/A	PAPI/REIL	PAPI/REIL
TOUCHDOWN ZONE ELEVATION	833.88	845	830	845	N/A	N/A	850	850
RUNWAY OBJECT FREE AREA (ROFA) LENGTH/WIDTH	7500/800	7500/800	8700/800	8700/800	N/A	N/A	4380/240	4380/240
RUNWAY SAFETY AREA (RSA) LENGTH/WIDTH	7500/800	7500/500	8700/500	8700/500	N/A	N/A	4380/120	4380/120
PRECISION OBSTACLE FREE ZONE (POFZ) LENGTH/WIDTH	N/A	200/800	N/A	200/800	N/A	N/A	N/A	N/A
RUNWAY OBSTACLE FREE ZONE (ROFZ) LENGTH/WIDTH	5900/400	5900/400	7100/400	7100/400	N/A	N/A	4300/250	4300/250
TAXIWAY WIDTH (feet)	35'	35'	35'	35'	N/A	N/A	25'	25'
TAXIWAY LIGHTING	HITL	HITL	HITL	HITL	N/A	N/A	MITL	MITL
TAKEOFF RUN AVAILABLE (TORA)	5500	5500	6700	6700	N/A	N/A	3900	3900
TAKEOFF DISTANCE AVAILABLE (TODA)	5500	5500	6700	6700	N/A	N/A	3900	3900
ACCELERATE STOP DISTANCE AVAILABLE (ASDA)	5500	5500	6700	6700	N/A	N/A	3900	3900
LANDING DISTANCE AVAILABLE (LDA)	5500	5500	6700	6700	N/A	N/A	3900	3900
PAVEMENT MATERIAL	PCC	PCC	PCC	PCC	N/A	N/A	PCC	PCC

RUNWAY END COORDINATES - NAD 83

	RUNWAY 14		RUNWAY 32		RUNWAY 10		RUNWAY 28	
	INITIAL	ULTIMATE	INITIAL	ULTIMATE	INITIAL	ULTIMATE	EXISTING	ULTIMATE
LATITUDE	41°20' 38.0022"	41°20' 47.0796"	N41° 19' 56.39"	N41° 19' 56.39"	N41° 20' 26.15"	N41° 20' 26.15"	N41° 20' 21.64"	N41° 20' 21.64"
LONGITUDE	92°43' 18.6990"	92°43' 28.8205"	W92° 42' 32.32"	W92° 42' 32.32"	W92° 43' 30.56"	W92° 43' 30.56"	W62° 42' 39.80"	W62° 42' 39.80"

AIRPORT LAYOUT PLAN APPROVAL	
APPROVED BY:	
DATE APPROVED:	

REV	DATE	DESCRIPTION

DGR ENGINEERING

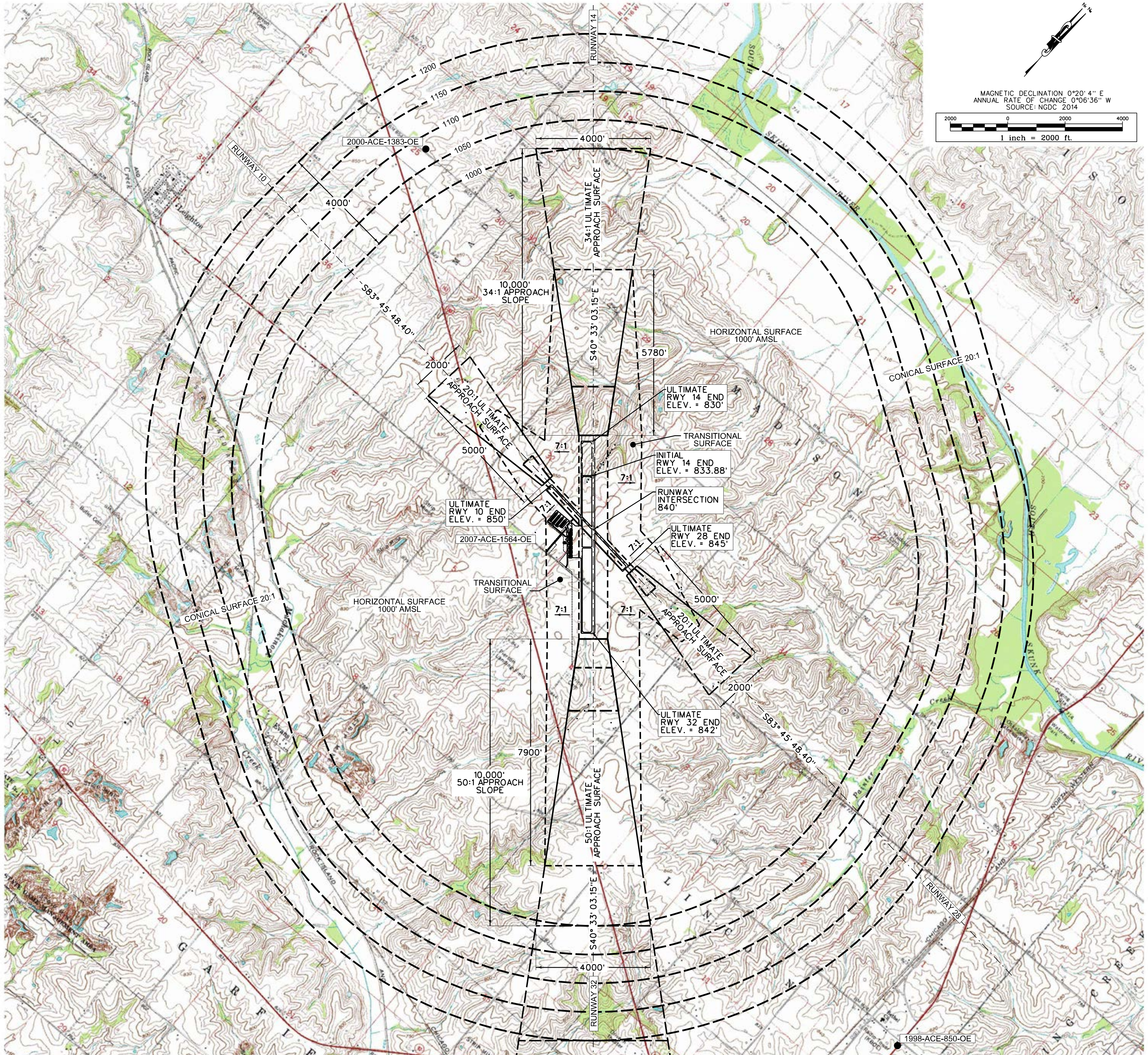
Project Manager: Jerry Searle
Designer: Jeremy Cswercko
Project Number: 720501
Phone: (515) 963-3488

SNYDER & ASSOCIATES
Engineers and Planners

SOUTH CENTRAL REGIONAL AIRPORT MAHASKA COUNTY, IOWA

AIRPORT LAYOUT PLAN

SHEET 2



MATCH LINE

REFER TO SHEET 4

MAGNETIC DECLINATION 0°20' 4" E
ANNUAL RATE OF CHANGE 0°06'36" W
SOURCE: NGDC 2014

2000 0 2000 4000

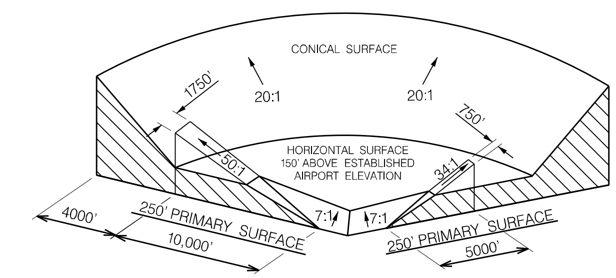
1 inch = 2000 ft.

LEGEND

- RUNWAY
- TOPOGRAPHIC CONTOURS
- AERIAL CONTOURS
- ZONE BOUNDARY

NOTES:

1. BASE MAPS U.S.G.S. TOPOGRAPHIC MAPS. MAHASKA COUNTY QUAD MAP – 2011
2. CONTOUR INTERVAL 10'. IMAGINARY SURFACES ARE BASED ON F.A.R. PART 77.25 (CIVIL AIRPORT IMAGINARY SURFACES) FOR ULTIMATE RUNWAYS.
3. THE AERIAL CONTOURS ILLUSTRATE THE HEIGHT LIMITATIONS WITHIN EACH ZONE.
4. A SLOPE, SUCH AS 20:1, EXPRESSES THE HORIZONTAL DISTANCE OF 20 FEET TO THE VERTICAL DISTANCE OF 1'.
5. EXISTING TOPOGRAPHICAL SYMBOLS ARE THOSE USED BY THE U.S. GEOLOGICAL SURVEY.
6. ESTABLISHED AIRPORT ELEVATION: 850 feet AMSL



ISOMETRIC SECTION

FAR PART 77 APPROACH SURFACE

	INITIAL	ULTIMATE
RWY 14	D/34:1	D/34:1
RWY 32	PIR/50:1	PIR/50:1
RWY 10	---	A(NP)/20:1
RWY 28	---	A(NP)/20:1

AIRSPACE AIR CASE NO.	DATE	REF.
2013-ALP-29 NPA	3-8-2014	SITE A
---	---	---
---	---	---
---	---	---

OBSTRUCTIONS

REFERENCE	CITY NAME	LATITUDE	LONGITUDE	OBJECT	AGL HGT	AMSL	*IMAGINARY SURFACE	(PENETRATION)	REMARKS	DISPOSITION
XXXX-XXX-XXXX-XX	ENTER NAME	NXX° XX' XX.XX"E	NXX° XX' XX.XX"E	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX

* C=CONICAL SURFACE, H=HORIZONTAL SURFACE, T=TRANSITIONAL SURFACE, A=APPROACH SURFACE

OBJECTS

REFERENCE	CITY NAME	LATITUDE	LONGITUDE	OBJECT	AGL HGT	AMSL	*IMAGINARY SURFACE	CLEARANCE (PENETRATION)	REMARKS	DISPOSITION
XXXX-XXX-XXXX-XX	ENTER NAME	NXX° XX' XX.XX"E	NXX° XX' XX.XX"E	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX

* C=CONICAL SURFACE, H=HORIZONTAL SURFACE, T=TRANSITIONAL SURFACE, A=APPROACH SURFACE

AIRPORT LAYOUT PLAN APPROVAL

APPROVED BY:

DATE APPROVED:

REV	DATE	DESCRIPTION

DGR ENGINEERING

Project Manager: Jerry Searle
Designer: Jeremy Cswercko
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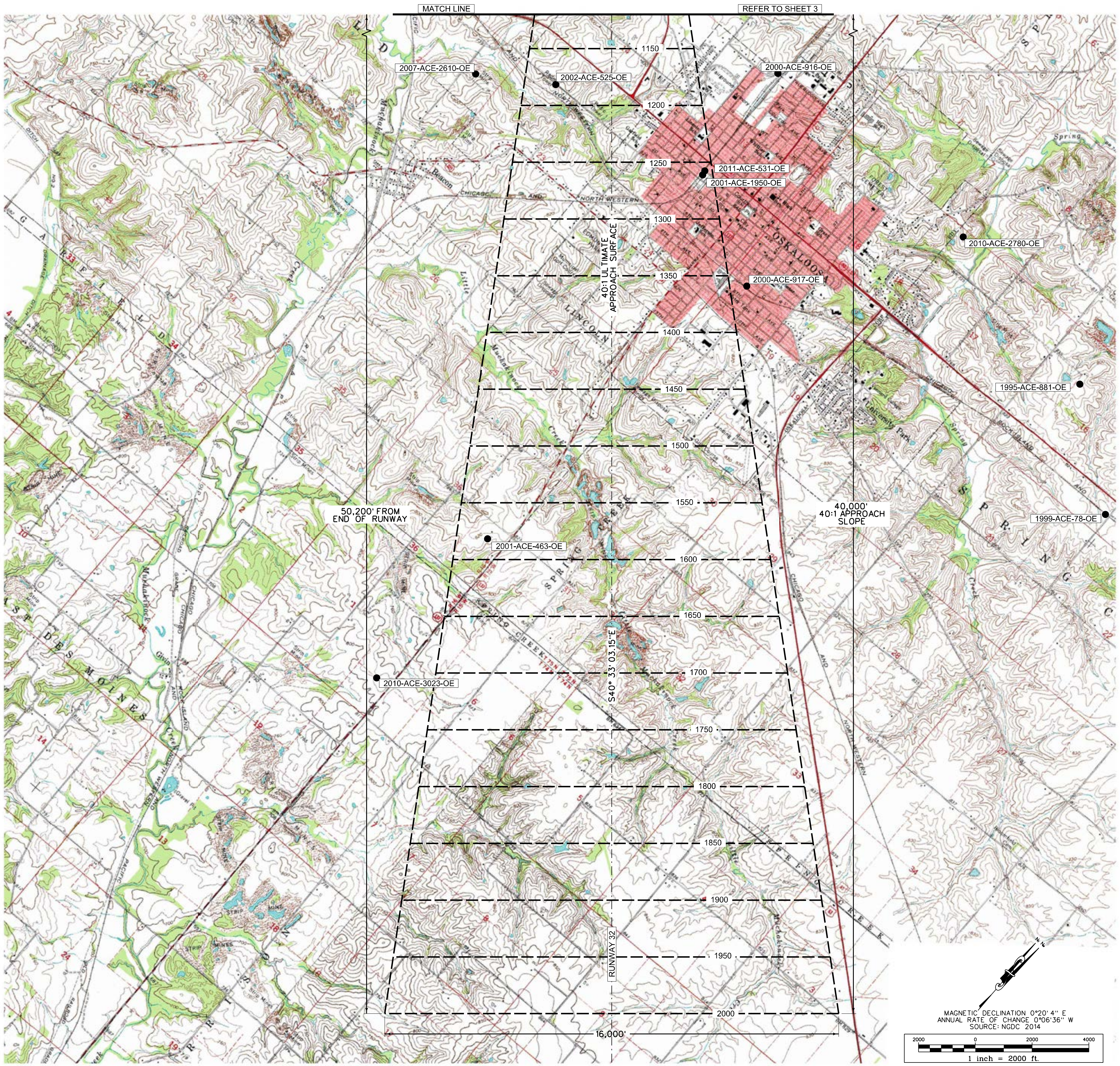
SOUTH CENTRAL REGIONAL AIRPORT MAHASKA COUNTY, IOWA

AIRPORT AIRSPACE/F.A.R. PART 77 IMAGINARY SURFACES SHEET 1 OF 2

SHEET 3



LEGEND

RUNWAY
TOPOGRAPHIC CONTOURS
AERIAL CONTOURS
ZONE BOUNDARY

NOTES:

1. BASE MAPS U.S.G.S. TOPOGRAPHIC MAPS. MAHASKA COUNTY QUAD MAP – 2011
2. CONTOUR INTERVAL 10'. IMAGINARY SURFACES ARE BASED ON F.A.R. PART 77.25 (CIVIL AIRPORT IMAGINARY SURFACES) FOR ULTIMATE RUNWAYS.
3. THE AERIAL CONTOURS ILLUSTRATE THE HEIGHT LIMITATIONS WITHIN EACH ZONE.
4. A SLOPE, SUCH AS 20:1, EXPRESSES THE HORIZONTAL DISTANCE OF 20 FEET TO THE VERTICAL DISTANCE OF 1'.
5. EXISTING TOPOGRAPHICAL SYMBOLS ARE THOSE USED BY THE U.S. GEOLOGICAL SURVEY.
6. ESTABLISHED AIRPORT ELEVATION: 850 feet AMSL

FAR PART 77 APPROACH SURFACE

	INITIAL	ULTIMATE
RWY 14	D/34:1	D/34:1
RWY 32	PIR/50:1	PIR/50:1
RWY 10	---	A(NP)/20:1
RWY 28	---	A(NP)/20:1

OBSTRUCTIONS

REFERENCE	CITY NAME	LATITUDE	LONGITUDE	OBJECT	AGL HGT	AMSL	*IMAGINARY SURFACE	(PENETRATION)	REMARKS	DISPOSITION
XXXX-XXX-XXXX-XX	ENTER NAME	NXX° XX' XX.XX"E	NXX° XX' XX.XX"E	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX

* C=CONICAL SURFACE, H=HORIZONTAL SURFACE, T=TRANSITIONAL SURFACE, A=APPROACH SURFACE

OBJECTS

REFERENCE	CITY NAME	LATITUDE	LONGITUDE	OBJECT	AGL HGT	AMSL	*IMAGINARY SURFACE	CLEARANCE (PENETRATION)	REMARKS	DISPOSITION
XXXX-XXX-XXXX-XX	ENTER NAME	NXX° XX' XX.XX"E	NXX° XX' XX.XX"E	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX

* C=CONICAL SURFACE, H=HORIZONTAL SURFACE, T=TRANSITIONAL SURFACE, A=APPROACH SURFACE

AIRPORT LAYOUT PLAN APPROVAL
APPROVED BY:
DATE APPROVED:

REV	DATE	DESCRIPTION

DGR ENGINEERING

Project Manager: Jerry Searle
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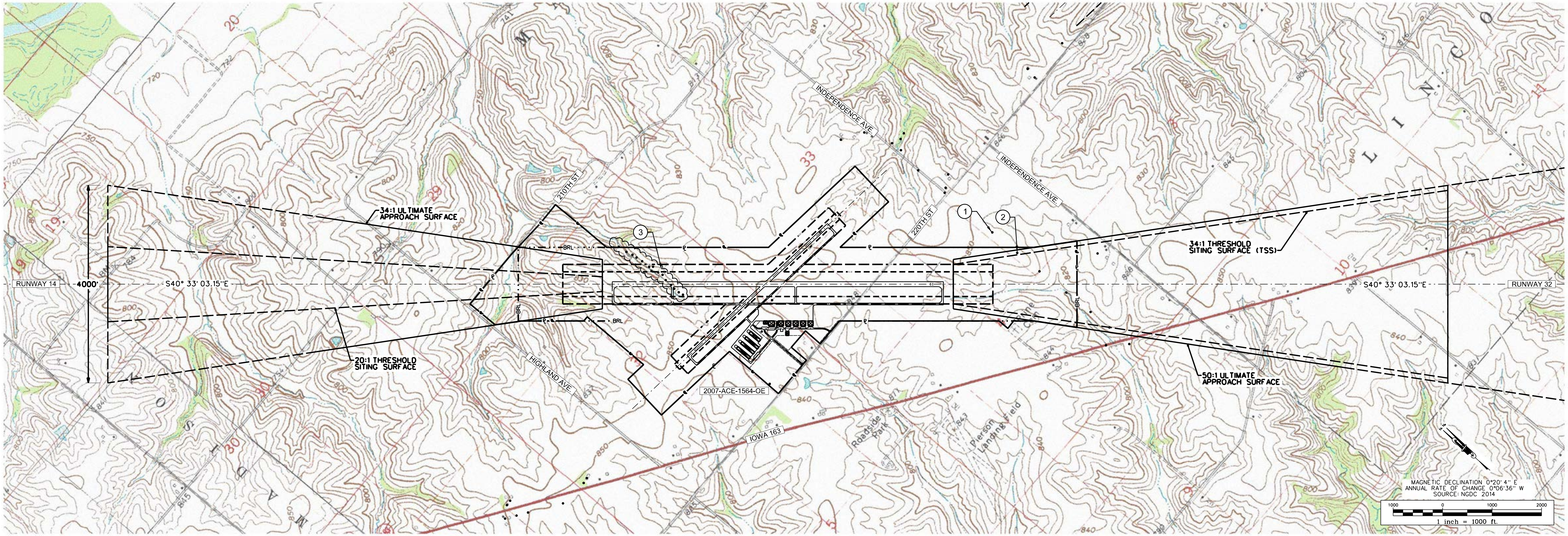
SOUTH CENTRAL REGIONAL AIRPORT
MAHASKA COUNTY, IOWA

AIRPORT AIRSPACE/F.A.R. PART 77 IMAGINARY SURFACES SHEET 2 OF 2

SHEET 4



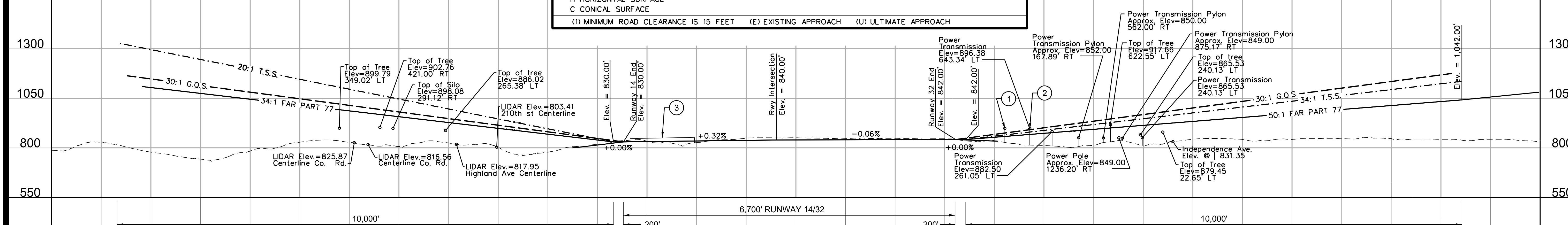
RUNWAY 14/32 APPROACH/DEPARTURE OBSTRUCTION

NO.	DESCRIPTION	OBJECT ELEVATION	FAR PART 77 SURFACE ELEV.	(PENETRATION)	DISPOSITION	REMARKS
1	TRANSMISSION POLE	896.38	A-867.84	(28.54)	Lower/Relocate	Aeronautical Study
2	TREE	917.66	A-900.32	(17.34)	Lower/Relocate	Aeronautical Study
3	TREE LINE	varies	varies	varies	Remove All	Inital Grading RW 14/32

FAR PART 77 SURFACE ELEV. CODES:
P PRIMARY SURFACE
A APPROACH SURFACE
T TRANSITIONAL SURFACE
H HORIZONTAL SURFACE
C CONICAL SURFACE

NOTE: NO TSS PENETRATIONS

(1) MINIMUM ROAD CLEARANCE IS 15 FEET (E) EXISTING APPROACH (U) ULTIMATE APPROACH



AIRPORT LAYOUT PLAN APPROVAL		
APPROVED BY:		
DATE APPROVED:		
REV	DATE	DESCRIPTION

DGR ENGINEERING

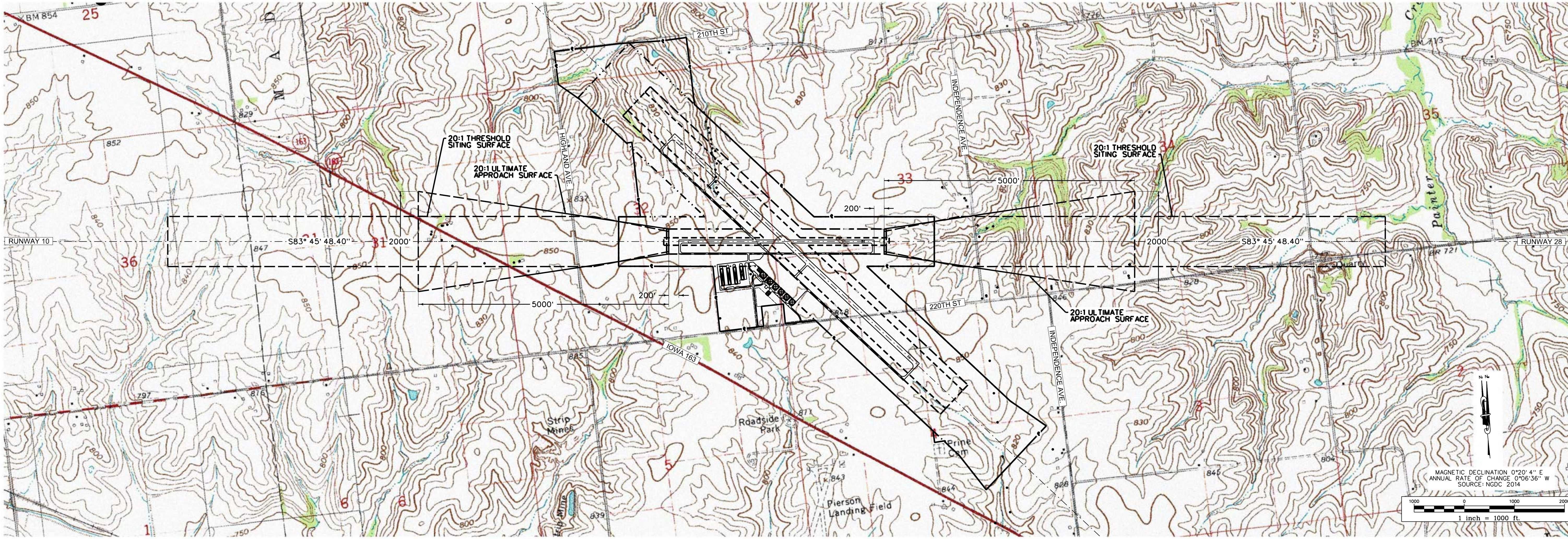
Project Manager: Jerry Searle
Designer: Jeremy Cswercko
Project Number: 720501
Phone: (515) 963-3488

SNYDER & ASSOCIATES
Engineers and Planners

SOUTH CENTRAL REGIONAL AIRPORT
MAHASKA COUNTY, IOWA

APPROACH ALIGNMENT & PROFILE ULTIMATE RUNWAYS 14/32

SHEET 5



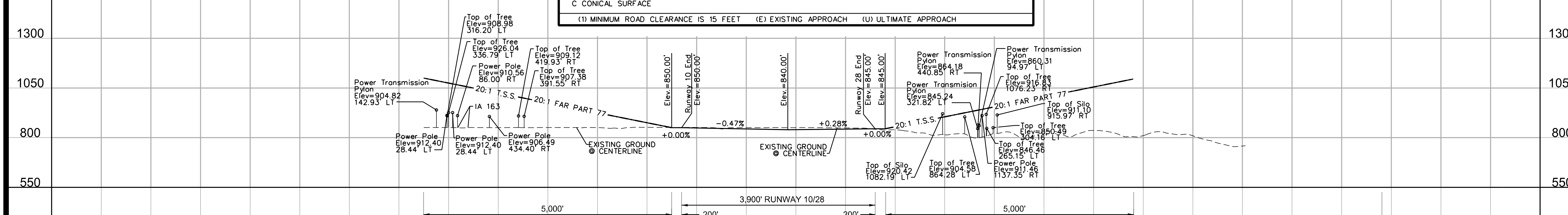
RUNWAY 10/28 APPROACH/DEPARTURE OBSTRUCTION

NO.	DESCRIPTION	OBJECT ELEVATION	FAR PART 77 SURFACE ELEV.	(PENETRATION)	DISPOSITION	REMARKS
1	NONE	---	---	---	---	---
2						
3						

FAR PART 77 SURFACE ELEV. CODES:
P PRIMARY SURFACE
A APPROACH SURFACE
T TRANSITIONAL SURFACE
H HORIZONTAL SURFACE
C CONICAL SURFACE

NOTE: NO TSS PENETRATIONS

(1) MINIMUM ROAD CLEARANCE IS 15 FEET (E) EXISTING APPROACH (U) ULTIMATE APPROACH



AIRPORT LAYOUT PLAN APPROVAL		
APPROVED BY:		
DATE APPROVED:		
REV	DATE	DESCRIPTION

DGR ENGINEERING

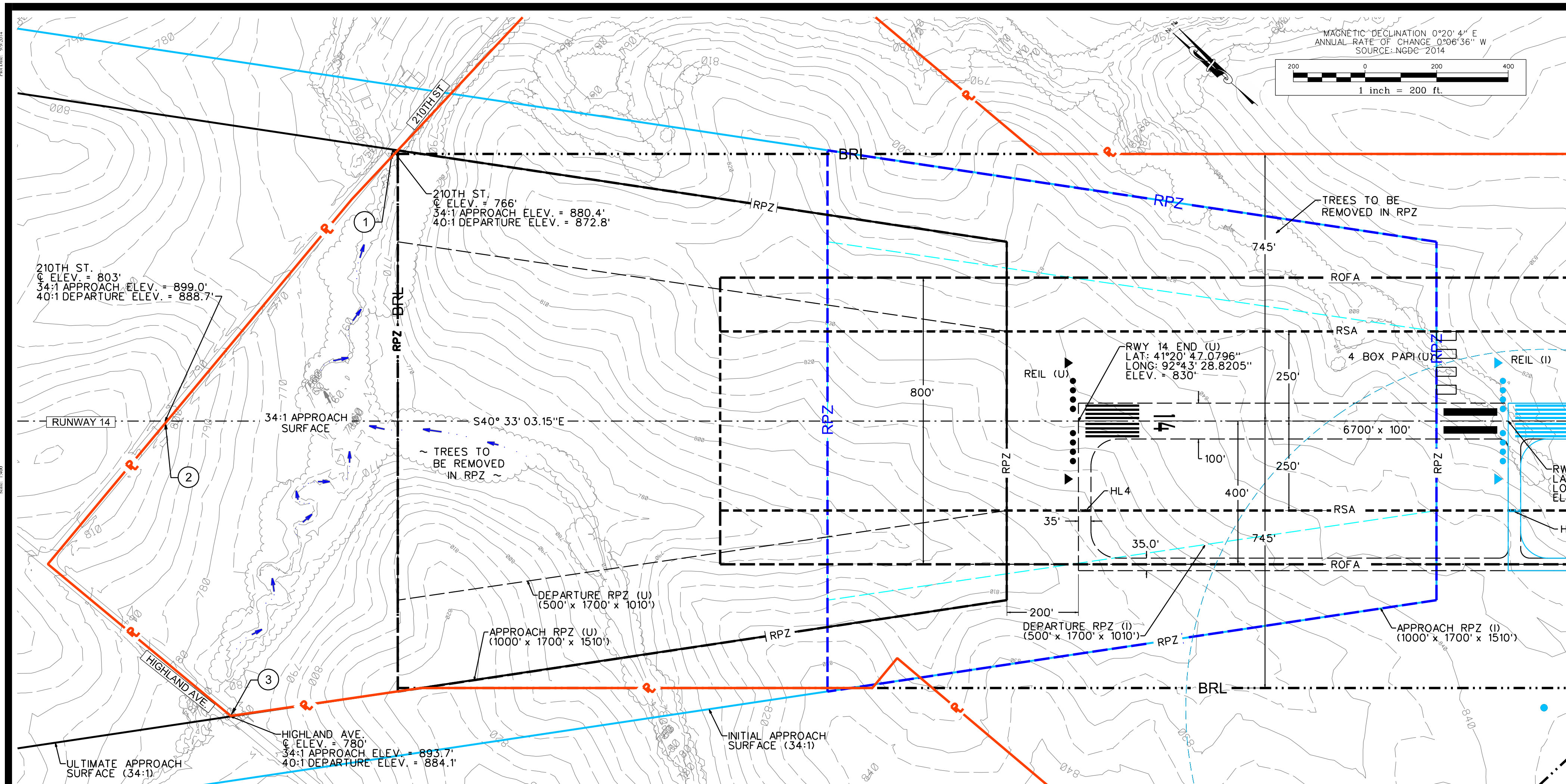
Project Manager: Jerry Searle
Designer: Jeremy Cswercko
Project Number: 720501
Phone: (515) 963-3488

SNYDER & ASSOCIATES
Engineers and Planners

SOUTH CENTRAL REGIONAL AIRPORT
MAHASKA COUNTY, IOWA

APPROACH ALIGNMENT & PROFILE
ULTIMATE RUNWAY 10/28

SHEET
6



RUNWAY 14 THRESHOLD SITING CRITERIA OBSTRUCTION - ULTIMATE

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	(PENETRATION)	DISPOSITION	REMARKS
---	NONE	---	---	---	---	---

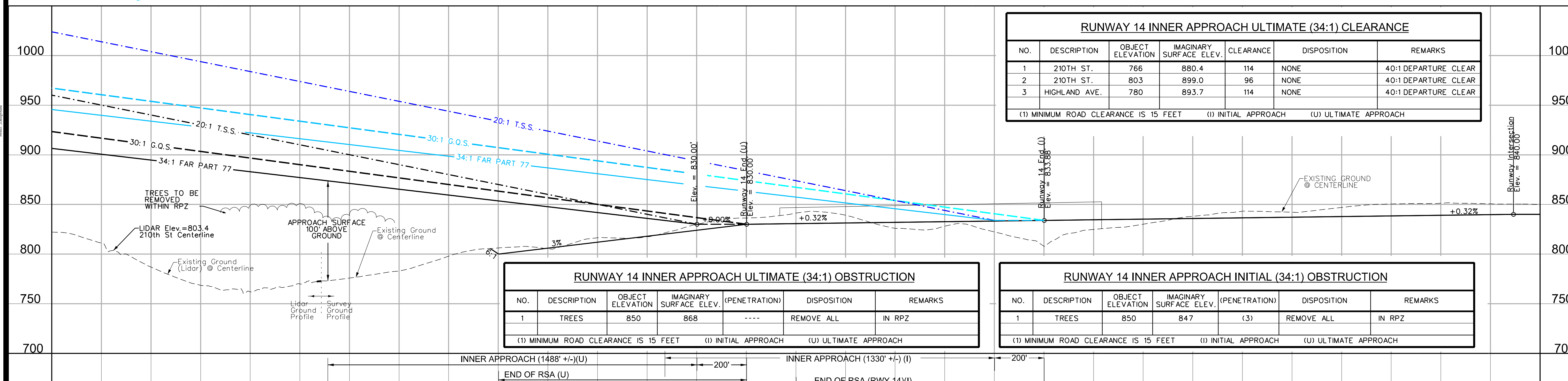
RUNWAY 14 GQS OBSTRUCTION - ULTIMATE

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	(PENETRATION)	DISPOSITION	REMARKS
---	NONE	---	---	---	---	---

RUNWAY 14 INNER APPROACH INITIAL (34:1) CLEARANCE

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	CLEARANCE	DISPOSITION	REMARKS
1	210TH ST.	766	919.6	153	NONE	40:1 DEPARTURE CLEAR
2	210TH ST.	803	938.3	135	NONE	40:1 DEPARTURE CLEAR
3	HIGHLAND AVE.	780	932.9	152	NONE	40:1 DEPARTURE CLEAR

(1) MINIMUM ROAD CLEARANCE IS 15 FEET (I) INITIAL APPROACH (U) ULTIMATE APPROACH



RUNWAY 14 INNER APPROACH ULTIMATE (34:1) CLEARANCE

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	CLEARANCE	DISPOSITION	REMARKS
1	210TH ST.	766	880.4	114	NONE	40:1 DEPARTURE CLEAR
2	210TH ST.	803	899.0	96	NONE	40:1 DEPARTURE CLEAR
3	HIGHLAND AVE.	780	893.7	114	NONE	40:1 DEPARTURE CLEAR

(1) MINIMUM ROAD CLEARANCE IS 15 FEET (I) INITIAL APPROACH (U) ULTIMATE APPROACH

RUNWAY 14 INNER APPROACH ULTIMATE (34:1) OBSTRUCTION

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	(PENETRATION)	DISPOSITION	REMARKS
1	TREES	850	868	----	REMOVE ALL	IN RPZ

(1) MINIMUM ROAD CLEARANCE IS 15 FEET (I) INITIAL APPROACH (U) ULTIMATE APPROACH

RUNWAY 14 INNER APPROACH INITIAL (34:1) OBSTRUCTION

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	(PENETRATION)	DISPOSITION	REMARKS
1	TREES	850	847	(3)	REMOVE ALL	IN RPZ

(1) MINIMUM ROAD CLEARANCE IS 15 FEET (I) INITIAL APPROACH (U) ULTIMATE APPROACH

AIRPORT LAYOUT PLAN APPROVAL
APPROVED BY:
DATE APPROVED:

REV	DATE	DESCRIPTION

DGR ENGINEERING

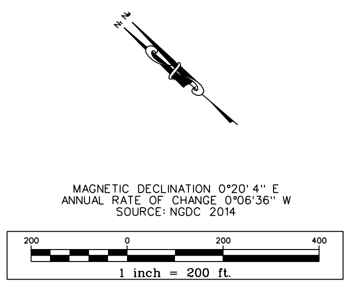
Project Manager: Jerry Searle
Designer: Jeremy Cswercko
Project Number: 720501
Phone: (515) 963-3488

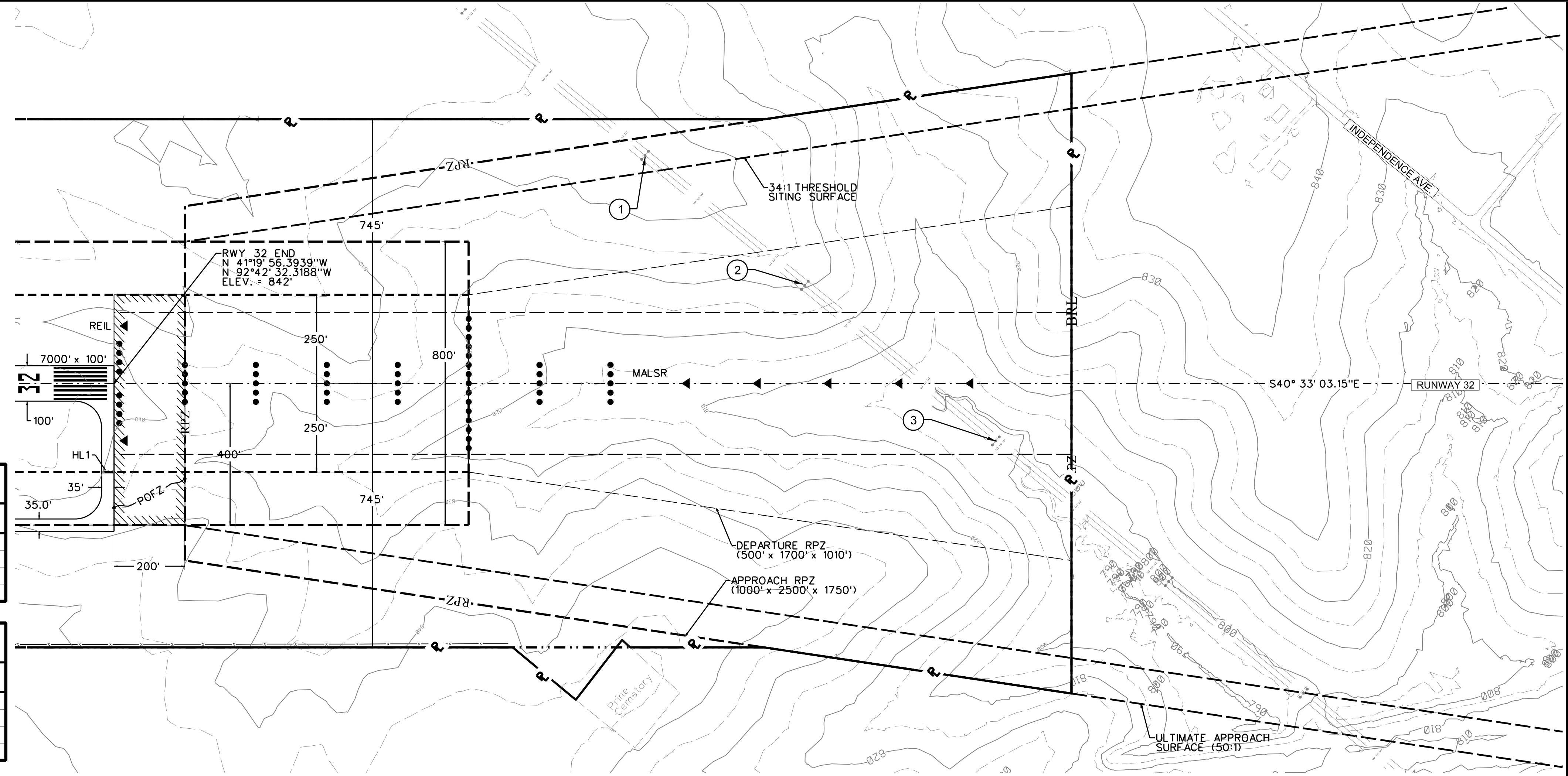
SNYDER & ASSOCIATES
Engineers and Planners

SOUTH CENTRAL REGIONAL AIRPORT
MAHASKA COUNTY, IOWA

INNER APPROACH SURFACE
ULTIMATE RUNWAY 14

SHEET
7





RUNWAY 32 THRESHOLD SITING CRITERIA OBSTRUCTION

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	(PENETRATION)	DISPOSITION	REMARKS
---	NONE	---	---	---	---	---

RUNWAY 32 GQS OBSTRUCTION

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	(PENETRATION)	DISPOSITION	REMARKS
---	NONE	---	---	---	---	---

RUNWAY 32 INNER APPROACH INITIAL/ULTIMATE OBSTRUCTION

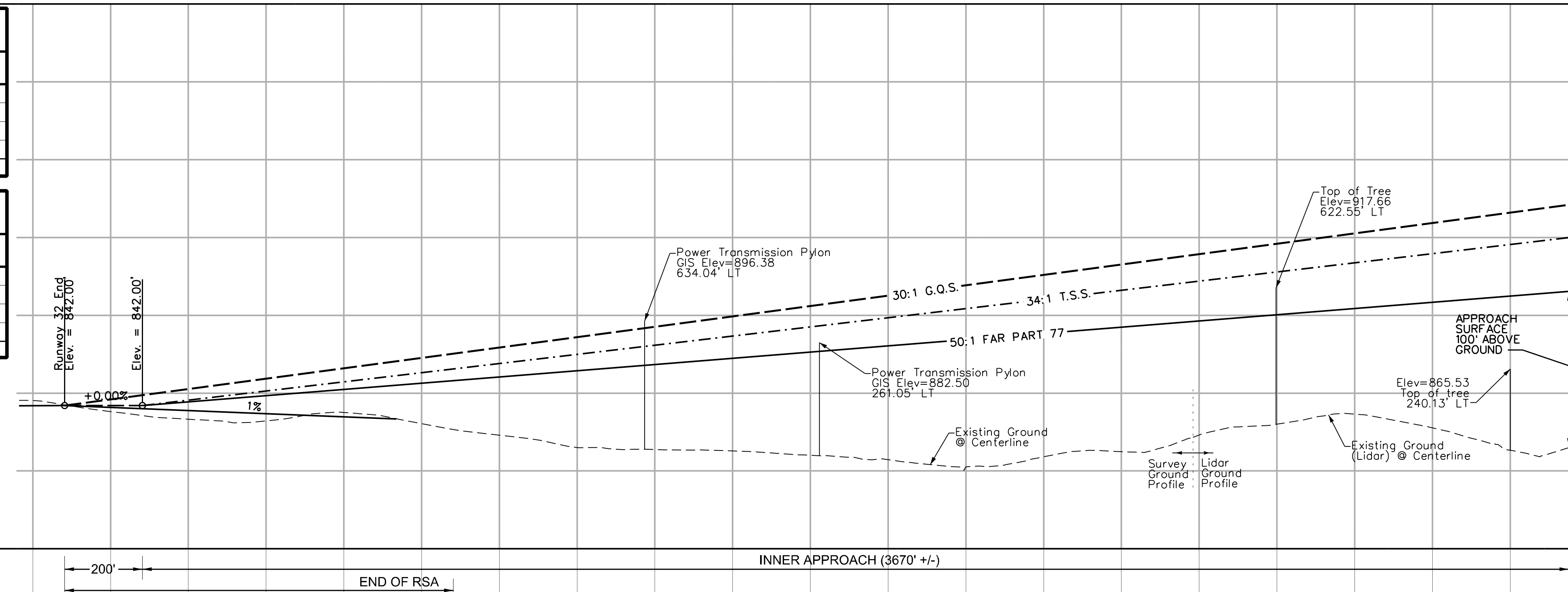
NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	(PENETRATION)	DISPOSITION	REMARKS
1	POWER TRANS. LINE	896.4	867.8	(71.4)	RELOCATE	APPROACH 50:1
2	POWER TRANS. LINE	882.5	876.8	(5.7)	LOWER, MARK, LIGHT	APPROACH 50:1

(1) MINIMUM ROAD CLEARANCE IS 15 FEET (I) INITIAL APPROACH (U) ULTIMATE APPROACH

RUNWAY 32 INNER APPROACH INITIAL/ULTIMATE CLEARANCE

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	CLEARANCE	DISPOSITION	REMARKS
3	POWER TRANS. LINE	852	887.0	35'	NONE	APPROACH 50:1

(1) MINIMUM ROAD CLEARANCE IS 15 FEET (I) INITIAL APPROACH (U) ULTIMATE APPROACH



AIRPORT LAYOUT PLAN APPROVAL		
APPROVED BY:		
DATE APPROVED:		
REV	DATE	DESCRIPTION

DGR ENGINEERING

Project Manager: Jerry Searle
Designer: Jeremy Cswercko
Project Number: 720501
Phone: (515) 963-3488

SNYDER & ASSOCIATES
Engineers and Planners

SOUTH CENTRAL REGIONAL AIRPORT
MAHASKA COUNTY, IOWA

INNER APPROACH SURFACE
ULTIMATE RUNWAY 32

SHEET
8

RUNWAY 10 INNER APPROACH INIITAL/ULTIMATE (20:1) OBSTRUCTION

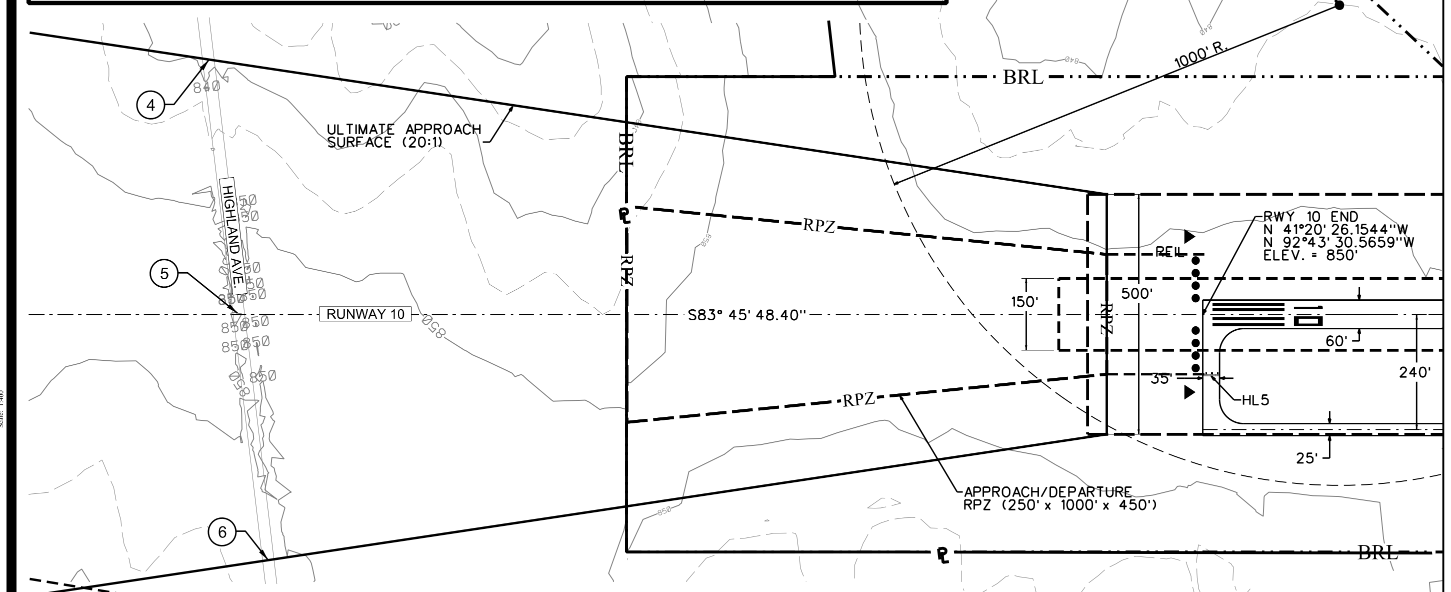
NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	(PENETRATION)	DISPOSITION	REMARKS
1	NONE	---	---	---	---	---

(1) MINIMUM ROAD CLEARANCE IS 15 FEET (I) INITIAL APPROACH (U) ULTIMATE APPROACH

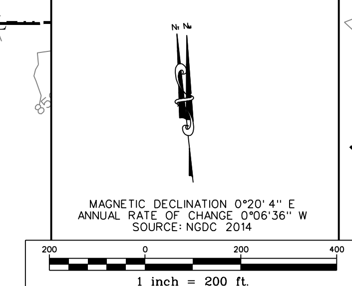
RUNWAY 28 INNER APPROACH INITIAL/ULTIMATE (20:1) OBSTRUCTION

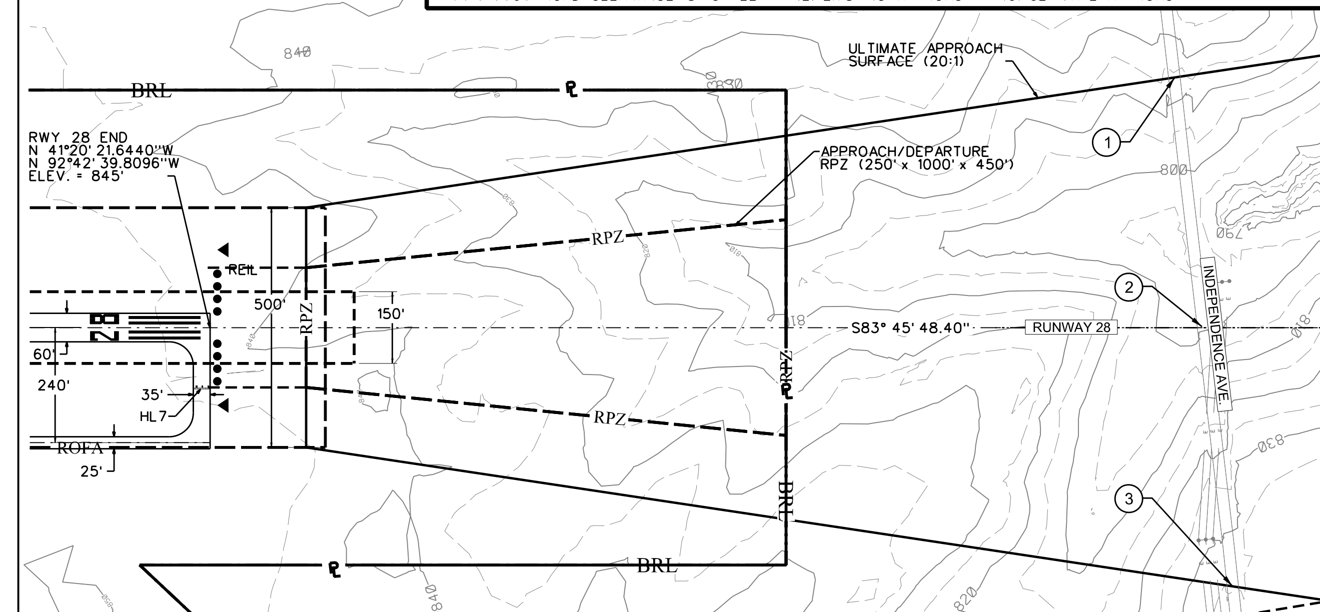
NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	(PENETRATION)	DISPOSITION	REMARKS
1	NONE	---	---	---	---	---

(1) MINIMUM ROAD CLEARANCE IS 15 FEET (E) EXISTING APPROACH (U) ULTIMATE APPROACH



NOTE:
NO TSS PENETRATIONS ON RW 10/28.





RUNWAY 10 INNER APPROACH INITIAL/ULTIMATE (20:1) CLEARANCE

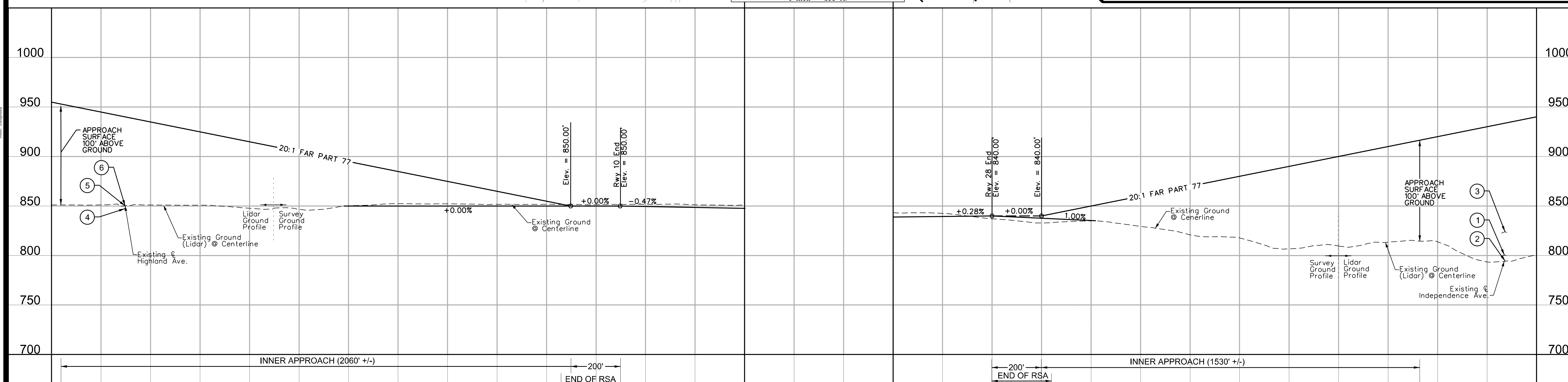
NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	CLEARANCE	DISPOSITION	REMARKS
4	HIGHLAND AVE.	839	942.5	103.5	NONE	---
5	HIGHLAND AVE.	850	940.0	90.0	NONE	---
6	HIGHLAND AVE.	848	938.5	90.5	NONE	---

(1) MINIMUM ROAD CLEARANCE IS 15 FEET (I) INITIAL APPROACH (U) ULTIMATE APPROACH

RUNWAY 28 INNER APPROACH INITIAL/ULTIMATE (20:1) CLEARANCE

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	CLEARANCE	DISPOSITION	REMARKS
1	INDEPENDENCE AVE.	813	942	129	NONE	---
2	INDEPENDENCE AVE.	798	936.5	138.5	NONE	---
3	INDEPENDENCE AVE.	834	940.5	106.5	NONE	---

(1) MINIMUM ROAD CLEARANCE IS 15 FEET (E) EXISTING APPROACH (U) ULTIMATE APPROACH



AIRPORT LAYOUT PLAN APPROVAL		
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DATE APPROVED:		
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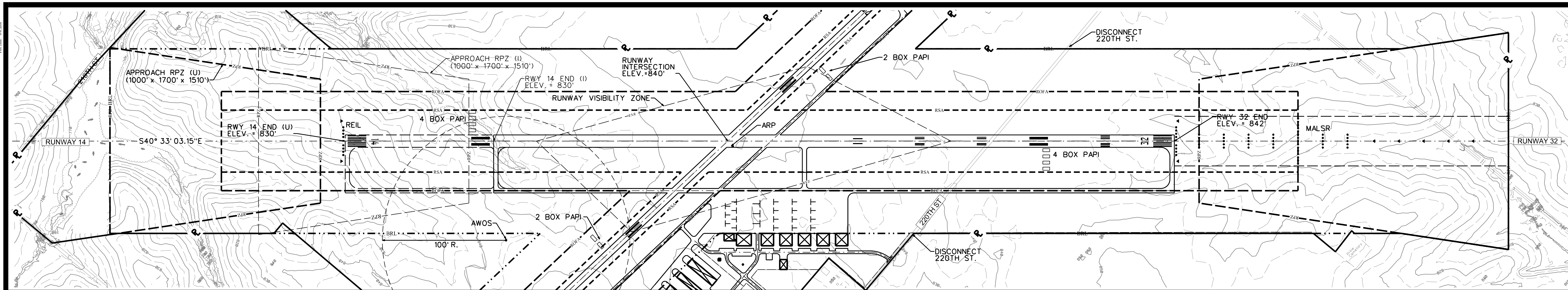
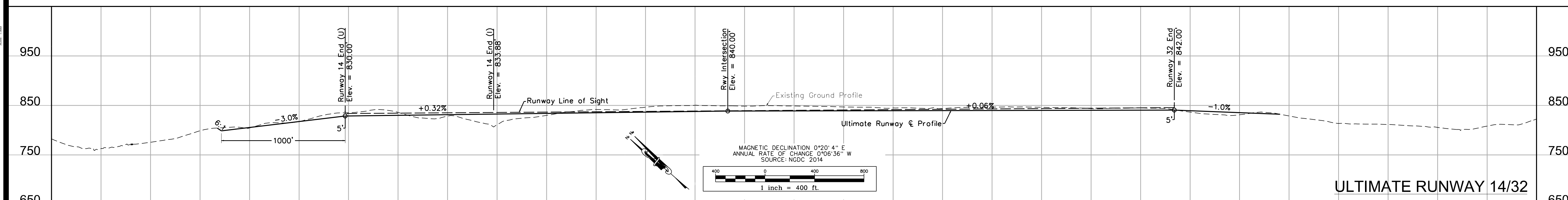
SNYDER & ASSOCIATES
Engineers and Planners

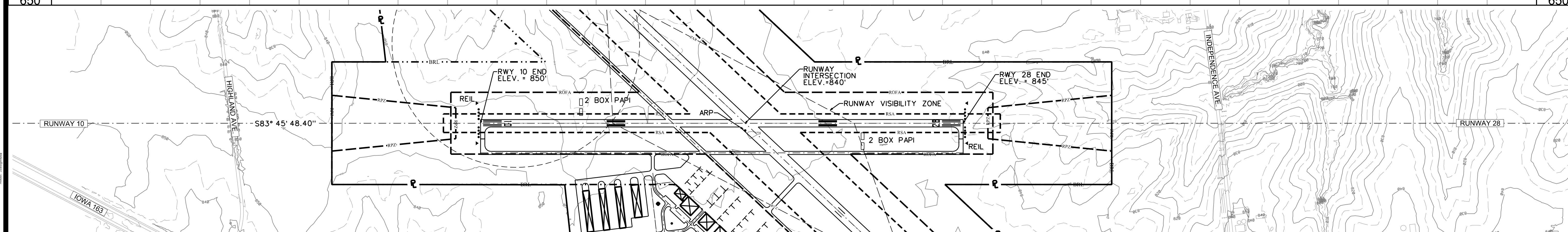
SOUTH CENTRAL REGIONAL AIRPORT
MAHASKA COUNTY, IOWA

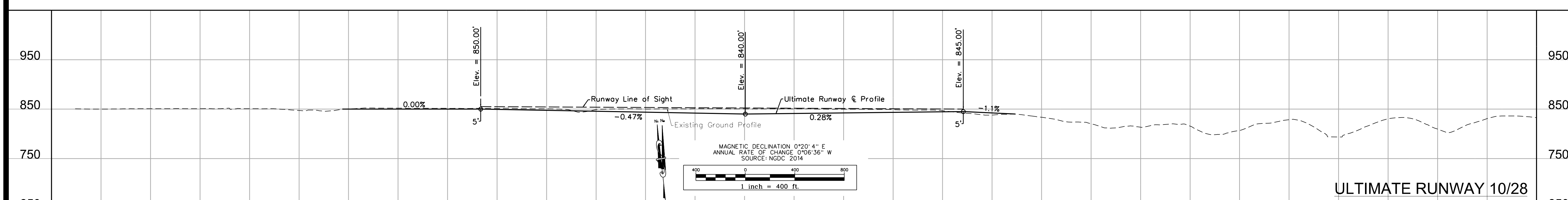
INNER APPROACH SURFACE
ULTIMATE RUNWAY 10/28

SHEET
9









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Snyder & Associates
Engineers and Planners

SOUTH CENTRAL
REGIONAL AIRPORT
MAHASKA COUNTY, IOWA

CENTERLINE PROFILES
RUNWAY 14/32 AND
RUNWAY 10/28

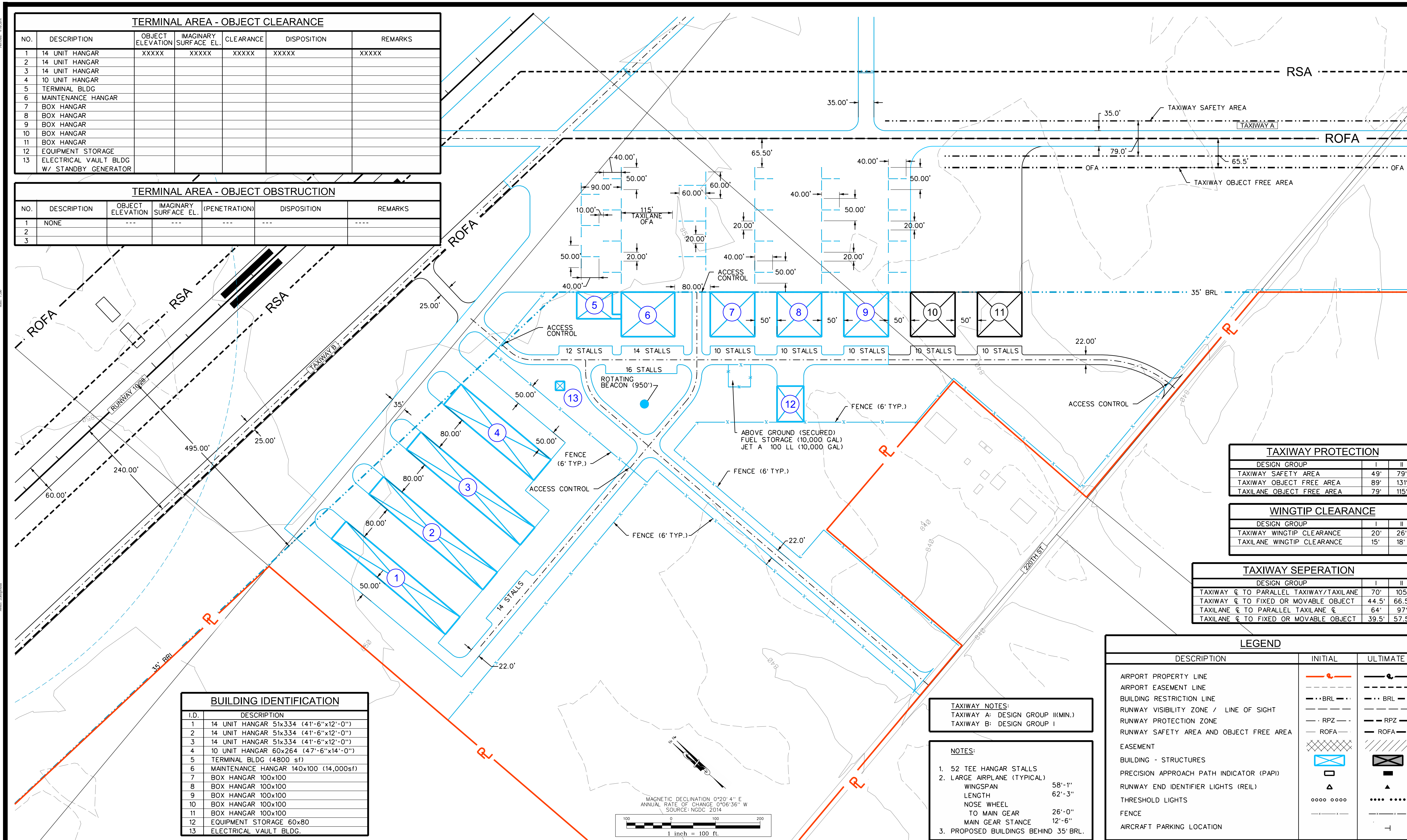
SHEET
10

TERMINAL AREA - OBJECT CLEARANCE

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE EL.	CLEARANCE	DISPOSITION	REMARKS
1	14 UNIT HANGAR	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX
2	14 UNIT HANGAR					
3	14 UNIT HANGAR					
4	10 UNIT HANGAR					
5	TERMINAL BLDG					
6	MAINTENANCE HANGAR					
7	BOX HANGAR					
8	BOX HANGAR					
9	BOX HANGAR					
10	BOX HANGAR					
11	BOX HANGAR					
12	EQUIPMENT STORAGE					
13	ELECTRICAL VAULT BLDG W/ STANDBY GENERATOR					

TERMINAL AREA - OBJECT OBSTRUCTION

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE EL.	(PENETRATION)	DISPOSITION	REMARKS
1	NONE	---	---	---	---	----
2						
3						



TAXIWAY PROTECTION

DESIGN GROUP	I	II
TAXIWAY SAFETY AREA	49'	79'
TAXIWAY OBJECT FREE AREA	89'	131'
TAXILANE OBJECT FREE AREA	79'	115'

WINGTIP CLEARANCE

DESIGN GROUP	I	II
TAXIWAY WINGTIP CLEARANCE	20'	26'
TAXILANE WINGTIP CLEARANCE	15'	18'

TAXIWAY SEPERATION

DESIGN GROUP	I	II
TAXIWAY ℄ TO PARALLEL TAXIWAY/TAXILANE	70'	105'
TAXIWAY ℄ TO FIXED OR MOVABLE OBJECT	44.5'	66.5'
TAXILANE ℄ TO PARALLEL TAXILANE ℄	64'	97'
TAXILANE ℄ TO FIXED OR MOVABLE OBJECT	39.5'	57.5'

BUILDING IDENTIFICATION

I.D.	DESCRIPTION
1	14 UNIT HANGAR 51x334 (41'-6"x12'-0")
2	14 UNIT HANGAR 51x334 (41'-6"x12'-0")
3	14 UNIT HANGAR 51x334 (41'-6"x12'-0")
4	10 UNIT HANGAR 60x264 (47'-6"x14'-0")
5	TERMINAL BLDG (4800 sf)
6	MAINTENANCE HANGAR 140x100 (14,000sf)
7	BOX HANGAR 100x100
8	BOX HANGAR 100x100
9	BOX HANGAR 100x100
10	BOX HANGAR 100x100
11	BOX HANGAR 100x100
12	EQUIPMENT STORAGE 60x80
13	ELECTRICAL VAULT BLDG.

TAXIWAY NOTES:
TAXIWAY A: DESIGN GROUP II(MIN.)
TAXIWAY B: DESIGN GROUP I

NOTES:

1. 52 TEE HANGAR STALLS
2. LARGE AIRPLANE (TYPICAL)
   - WINGSPAN 58'-1"
   - LENGTH 62'-3"
   - NOSE WHEEL TO MAIN GEAR 26'-0"
   - MAIN GEAR STANCE 12'-6"
3. PROPOSED BUILDINGS BEHIND 35' BRL.

LEGEND

DESCRIPTION	INITIAL	ULTIMATE
AIRPORT PROPERTY LINE		
AIRPORT EASEMENT LINE		
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY VISIBILITY ZONE / LINE OF SIGHT		
RUNWAY PROTECTION ZONE	RPZ	RPZ
RUNWAY SAFETY AREA AND OBJECT FREE AREA	ROFA	ROFA
EASEMENT		
BUILDING - STRUCTURES		
PRECISION APPROACH PATH INDICATOR (PAPI)		
RUNWAY END IDENTIFIER LIGHTS (REIL)		
THRESHOLD LIGHTS	oooo oooo	•••• ••••
FENCE		
AIRCRAFT PARKING LOCATION		

AIRPORT LAYOUT PLAN APPROVAL		
APPROVED BY:		
DATE APPROVED:		
REV	DATE	DESCRIPTION

DGR ENGINEERING

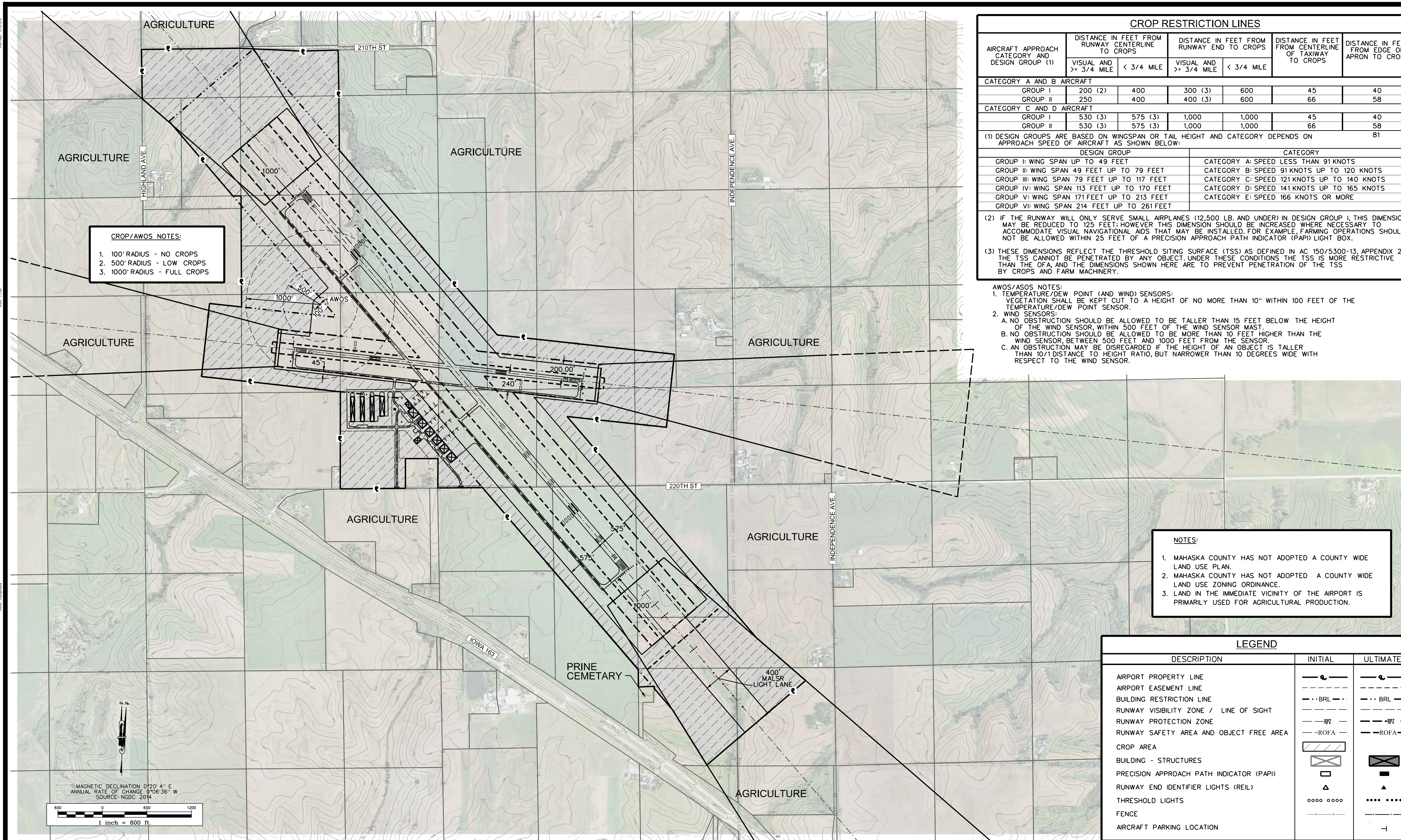
Project Manager: Jerry Searle
Designer: Jeremy Cswercko
Project Number: 720501
Phone: (515) 963-3488

SNYDER & ASSOCIATES
Engineers and Planners

SOUTH CENTRAL REGIONAL AIRPORT MAHASKA COUNTY, IOWA

TERMINAL AREA PLAN

SHEET
11



CROP/AWOS NOTES:

1. 100' RADIUS - NO CROPS
2. 500' RADIUS - LOW CROPS
3. 1000' RADIUS - FULL CROPS

CROP RESTRICTION LINES

AIRCRAFT APPROACH CATEGORY AND DESIGN GROUP (1)	DISTANCE IN FEET FROM RUNWAY CENTERLINE TO CROPS		DISTANCE IN FEET FROM RUNWAY END TO CROPS		DISTANCE IN FEET FROM CENTERLINE OF TAXIWAY TO CROPS	DISTANCE IN FEET FROM EDGE OF APRON TO CROPS
	VISUAL AND >= 3/4 MILE	< 3/4 MILE	VISUAL AND >= 3/4 MILE	< 3/4 MILE		
CATEGORY A AND B AIRCRAFT						
GROUP I	200 (2)	400	300 (3)	600	45	40
GROUP II	250	400	400 (3)	600	66	58
CATEGORY C AND D AIRCRAFT						
GROUP I	530 (3)	575 (3)	1,000	1,000	45	40
GROUP II	530 (3)	575 (3)	1,000	1,000	66	58
						81

(1) DESIGN GROUPS ARE BASED ON WINGSPAN OR TAIL HEIGHT AND CATEGORY DEPENDS ON APPROACH SPEED OF AIRCRAFT AS SHOWN BELOW:

DESIGN GROUP	CATEGORY
GROUP I: WING SPAN UP TO 49 FEET	CATEGORY A: SPEED LESS THAN 91 KNOTS
GROUP II: WING SPAN 49 FEET UP TO 79 FEET	CATEGORY B: SPEED 91 KNOTS UP TO 120 KNOTS
GROUP III: WING SPAN 79 FEET UP TO 117 FEET	CATEGORY C: SPEED 121 KNOTS UP TO 140 KNOTS
GROUP IV: WING SPAN 113 FEET UP TO 170 FEET	CATEGORY D: SPEED 141 KNOTS UP TO 165 KNOTS
GROUP V: WING SPAN 171 FEET UP TO 213 FEET	CATEGORY E: SPEED 166 KNOTS OR MORE
GROUP VI: WING SPAN 214 FEET UP TO 261 FEET	

(2) IF THE RUNWAY WILL ONLY SERVE SMALL AIRPLANES (12,500 LB. AND UNDER) IN DESIGN GROUP I, THIS DIMENSION MAY BE REDUCED TO 125 FEET; HOWEVER THIS DIMENSION SHOULD BE INCREASED WHERE NECESSARY TO ACCOMMODATE VISUAL NAVIGATIONAL AIDS THAT MAY BE INSTALLED. FOR EXAMPLE, FARMING OPERATIONS SHOULD NOT BE ALLOWED WITHIN 25 FEET OF A PRECISION APPROACH PATH INDICATOR (PAPI) LIGHT BOX.

(3) THESE DIMENSIONS REFLECT THE THRESHOLD SITING SURFACE (TSS) AS DEFINED IN AC 150/5300-13, APPENDIX 2. THE TSS CANNOT BE PENETRATED BY ANY OBJECT. UNDER THESE CONDITIONS THE TSS IS MORE RESTRICTIVE THAN THE OFA, AND THE DIMENSIONS SHOWN HERE ARE TO PREVENT PENETRATION OF THE TSS BY CROPS AND FARM MACHINERY.

AWOS/ASOS NOTES:
1. TEMPERATURE/DEW POINT (AND WIND) SENSORS:
   VEGETATION SHALL BE KEPT CUT TO A HEIGHT OF NO MORE THAN 10" WITHIN 100 FEET OF THE TEMPERATURE/DEW POINT SENSOR.
2. WIND SENSORS:
   A. NO OBSTRUCTION SHOULD BE ALLOWED TO BE TALLER THAN 15 FEET BELOW THE HEIGHT OF THE WIND SENSOR, WITHIN 500 FEET OF THE WIND SENSOR MAST.
   B. NO OBSTRUCTION SHOULD BE ALLOWED TO BE MORE THAN 10 FEET HIGHER THAN THE WIND SENSOR, BETWEEN 500 FEET AND 1000 FEET FROM THE SENSOR.
   C. AN OBSTRUCTION MAY BE DISREGARDED IF THE HEIGHT OF AN OBJECT IS TALLER THAN 10/1 DISTANCE TO HEIGHT RATIO, BUT NARROWER THAN 10 DEGREES WIDE WITH RESPECT TO THE WIND SENSOR.

NOTES:

1. MAHASKA COUNTY HAS NOT ADOPTED A COUNTY WIDE LAND USE PLAN.
2. MAHASKA COUNTY HAS NOT ADOPTED A COUNTY WIDE LAND USE ZONING ORDINANCE.
3. LAND IN THE IMMEDIATE VICINITY OF THE AIRPORT IS PRIMARILY USED FOR AGRICULTURAL PRODUCTION.

LEGEND

DESCRIPTION	INITIAL	ULTIMATE
AIRPORT PROPERTY LINE		
AIRPORT EASEMENT LINE		
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY VISIBILITY ZONE / LINE OF SIGHT		
RUNWAY PROTECTION ZONE	RPZ	RPZ
RUNWAY SAFETY AREA AND OBJECT FREE AREA	ROFA	ROFA
CROP AREA		
BUILDING - STRUCTURES		
PRECISION APPROACH PATH INDICATOR (PAPI)		
RUNWAY END IDENTIFIER LIGHTS (REIL)		
THRESHOLD LIGHTS		
FENCE		
AIRCRAFT PARKING LOCATION		

AIRPORT LAYOUT PLAN APPROVAL		
APPROVED BY:		
DATE APPROVED:		
REV	DATE	DESCRIPTION

DGR ENGINEERING

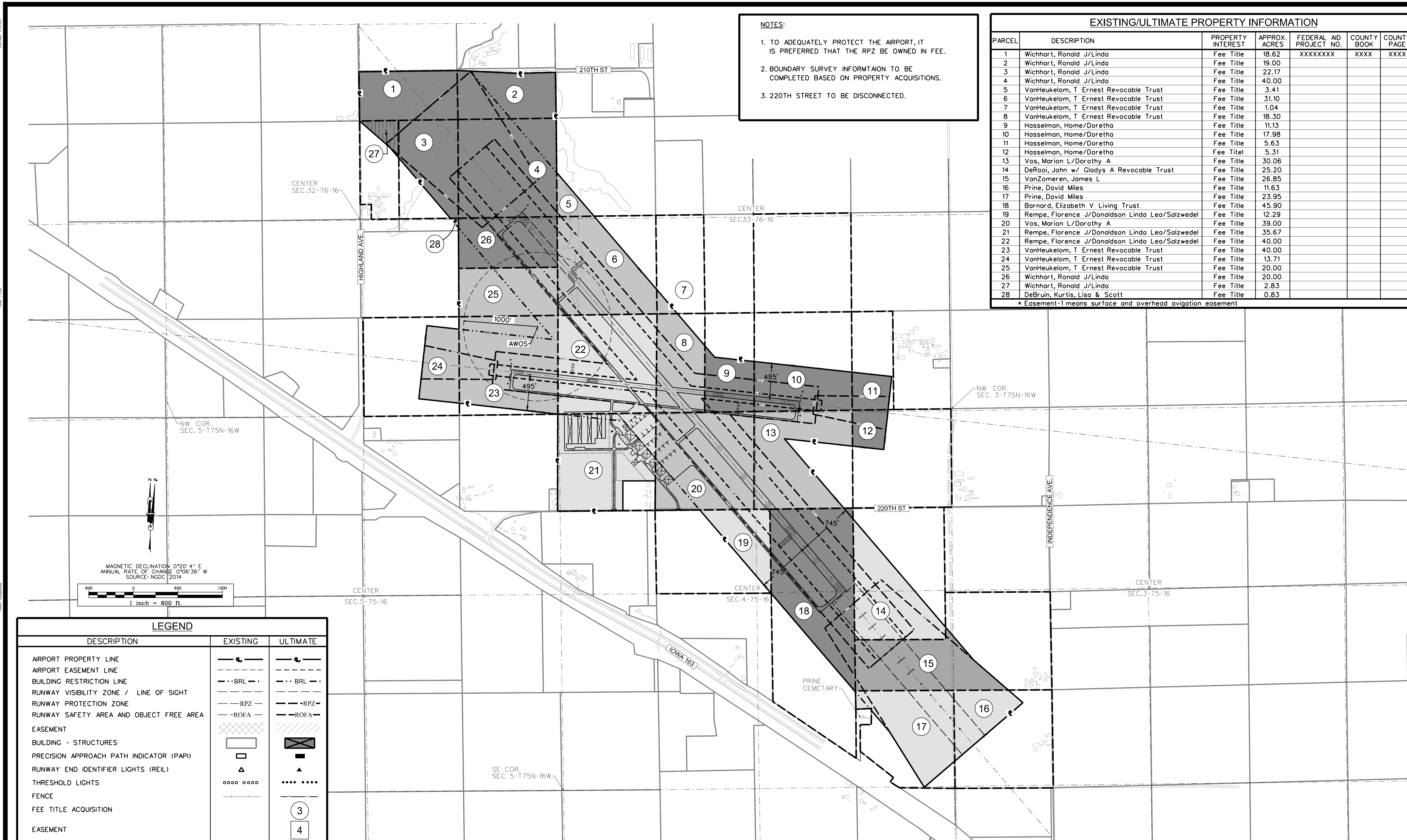
Project Manager: Jerry Searle
Designer: Jeremy Cswercko
Project Number: 720501
Phone: (515) 963-3488

SNYDER & ASSOCIATES
Engineers and Planners

SOUTH CENTRAL REGIONAL AIRPORT MAHASKA COUNTY, IOWA

LAND USE PLAN

SHEET
12



NOTES:

1. TO ADEQUATELY PROTECT THE AIRPORT, IT IS PREFERRED THAT THE RPZ BE OWNED IN FEE.
2. BOUNDARY SURVEY INFORMTAION TO BE COMPLETED BASED ON PROPERTY ACQUISITIONS.
3. 220TH STREET TO BE DISCONNECTED.

EXISTING/ULTIMATE PROPERTY INFORMATION

PARCEL	DESCRIPTION	PROPERTY INTEREST	APPROX. ACRES	FEDERAL AID PROJECT NO.	COUNTY BOOK	COUNTY PAGE
1	Wichhart, Ronald J/Linda	Fee Title	18.62	XXXXXXXX	XXXX	XXXX
2	Wichhart, Ronald J/Linda	Fee Title	19.00			
3	Wichhart, Ronald J/Linda	Fee Title	22.17			
4	Wichhart, Ronald J/Linda	Fee Title	40.00			
5	VanHeukelom, T Ernest Revocable Trust	Fee Title	3.41			
6	VanHeukelom, T Ernest Revocable Trust	Fee Title	31.10			
7	VanHeukelom, T Ernest Revocable Trust	Fee Title	1.04			
8	VanHeukelom, T Ernest Revocable Trust	Fee Title	18.30			
9	Hasselman, Home/Doretha	Fee Title	11.13			
10	Hasselman, Home/Doretha	Fee Title	17.98			
11	Hasselman, Home/Doretha	Fee Title	5.63			
12	Hasselman, Home/Doretha	Fee Titel	5.31			
13	Vos, Marion L/Dorothy A	Fee Title	30.06			
14	DeRooi, John w/ Gladys A Revocable Trust	Fee Title	25.20			
15	VanZomeren, James L	Fee Title	26.85			
16	Prine, David Miles	Fee Title	11.63			
17	Prine, David Miles	Fee Title	23.95			
18	Barnard, Elizabeth V Living Trust	Fee Title	45.90			
19	Rempe, Florence J/Donaldson Linda Lea/Salzwedel	Fee Title	12.29			
20	Vos, Marion L/Dorothy A	Fee Title	39.00			
21	Rempe, Florence J/Donaldson Linda Lea/Salzwedel	Fee Title	35.67			
22	Rempe, Florence J/Donaldson Linda Lea/Salzwedel	Fee Title	40.00			
23	VanHeukelom, T Ernest Revocable Trust	Fee Title	40.00			
24	VanHeukelom, T Ernest Revocable Trust	Fee Title	13.71			
25	VanHeukelom, T Ernest Revocable Trust	Fee Title	20.00			
26	Wichhart, Ronald J/Linda	Fee Title	20.00			
27	Wichhart, Ronald J/Linda	Fee Title	2.83			
28	DeBruin, Kurtis, Lisa & Scott	Fee Title	0.83			

* Easement-1 means surface and overhead avigation easement

LEGEND

DESCRIPTION	EXISTING	ULTIMATE
AIRPORT PROPERTY LINE		
AIRPORT EASEMENT LINE		
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY VISIBILITY ZONE / LINE OF SIGHT		
RUNWAY PROTECTION ZONE	RPZ	RPZ
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EASEMENT		
BUILDING - STRUCTURES		
PRECISION APPROACH PATH INDICATOR (PAPI)		
RUNWAY END IDENTIFIER LIGHTS (REIL)		
THRESHOLD LIGHTS		
FENCE		
FEE TITLE ACQUISITION		3
EASEMENT		4

AIRPORT LAYOUT PLAN APPROVAL		
APPROVED BY:		
DATE APPROVED:		
REV	DATE	DESCRIPTION

DGR ENGINEERING

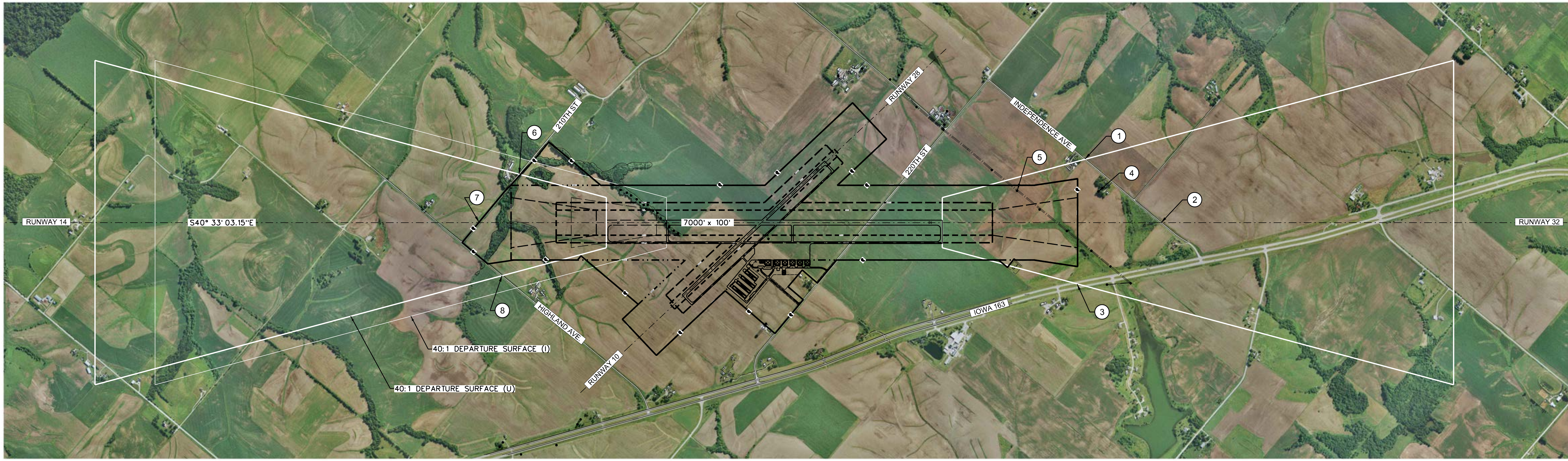
Project Manager: Jerry Searle
Designer: Jeremy Cswercko
Project Number: 720501
Phone: (515) 963-3488

SNYDER & ASSOCIATES
Engineers and Planners

SOUTH CENTRAL
REGIONAL AIRPORT
MAHASKA COUNTY, IOWA

PROPERTY MAP
EXHIBIT A

SHEET
13



INITIAL/ULTIMATE RUNWAY 14 DEPARTURE END CLEARANCE

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	CLEARANCE	DISPOSITION
6	210TH ST.	783.2	873	89.8	---
7	210TH ST.	803.4	893	89.6	---
8	HIGHLAND AVE.	791.6	882	90.4	---

INITIAL/ULTIMATE RUNWAY 14 DEPARTURE END OBSTRUCTION

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	CLEARANCE	DISPOSITION
---	NONE	---	---	---	---

MAGNETIC DECLINATION 0°20' 4" E
ANNUAL RATE OF CHANGE 0°06'36" W
SOURCE: NGDC 2014

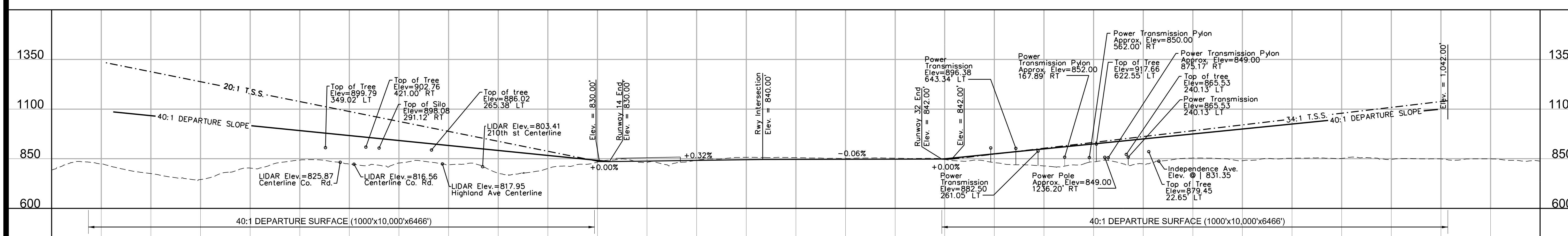
1000 0 1000 2000
1 inch = 1000 ft.

INITIAL/ULTIMATE RUNWAY 32 DEPARTURE END CLEARANCE

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	CLEARANCE	DISPOSITION
1	INDEPENDENCE AVE.	845	913	68	---
2	INDEPENDENCE AVE.	831.3	951	119.7	---
3	INDEPENDENCE AVE.	819.8	909	89.2	---

INITIAL/ULTIMATE RUNWAY 32 DEPARTURE END OBSTRUCTION

NO.	DESCRIPTION	OBJECT ELEVATION	IMAGINARY SURFACE ELEV.	CLEARANCE	DISPOSITION
4	TREE	917.7	920	2.3	---
5	POWER TRANS. LINE	896.4	879	(17.4)	MOVE, LOWER, LIGHT



AIRPORT LAYOUT PLAN APPROVAL		
APPROVED BY:		
DATE APPROVED:		
REV	DATE	DESCRIPTION

DGR ENGINEERING

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SNYDER & ASSOCIATES
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SOUTH CENTRAL REGIONAL AIRPORT
MAHASKA COUNTY, IOWA

AIRPORT DEPARTURE SURFACES
ULTIMATE RUNWAY 14/32

SHEET 14

Chapter 6

Development Program

CHAPTER SIX – DEVELOPMENT PROGRAM

The South Central Regional Airport Agency (SCRAA) envisions the ultimate development of a new airport facility located between the City of Pella and the City of Oskaloosa. The existing Pella Municipal Airport and Oskaloosa Municipal Airport will be closed at the time the new airport is operational.

The development of the South Central Regional Airport is expected to occur over a twenty year time horizon. There are several action items that must be completed prior to the South Central Regional Airport Agency proceeding with land acquisition. The FAA is bound by statutory and regulatory requirements to independently evaluate and analyze the environmental consequences of the proposed development. The FAA must first make an environmental finding on the proposed actions before the South Central Regional Airport Agency can move forward with implementing the proposed projects. In addition, the Airport Layout Plan (ALP) must be approved by FAA.

Prior to constructing any of the facilities, a sufficient property interest must be acquired. Unlike other improvements funded in part through the FAA Airport Improvement Program, the SCRAA must acquire the property and then submit an application for federal assistance. As such, the SCRAA must be in a position to carry the cost until such time the Federal share can be placed under grant.

PHASE ONE (0-8 Years)

Given the project scope, it is reasonable to assume that the improvements will be constructed in phases. The first priority is the acquisition of land upon which to construct the various facilities. Land acquisition may extend over a one (1) to four (4) year period. The recommendation herein is to acquire all land as shown on the Exhibit A Property Map.

The next priority is to construct the primary runway, apron and landside facilities. Since construction costs and funding sources may vary from year to year, the proposed improvements and cost opinions associated with those improvements have been prepared to show multiple phases.

The primary runway (Runway 14/32) is shown as ultimately developed to a length of 6,700ft with no less than 5,500ft initially being constructed. However, the grading and drainage improvements associated with Runway 14/32 should reflect the ultimate development. The rational is based on the need to establish an acceptable runway profile, drainage and storm water detention improvements. The parallel taxiway (Taxiway A) should be graded at the time Runway 14/32 is graded so as to balance grading quantities and manage storm water. Taxiway A may be paved, marked and lighted in phases with a partial parallel taxiway initially paved and lighted.

The initial development phase envisions the construction of an apron, tee hangars (52), FBO maintenance and aircraft storage facility, terminal building, internal vehicle access and parking facilities, fuel storage and corporate aircraft storage facilities.

LAND ACQUISITION

The acquisition of land must be accomplished in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act* (Uniform Act). In addition to Federal regulations, the State of Iowa requirements must be adhered to. FAA AIP assistance may be requested for land that is shown on an FAA approved airport layout plan and for which FAA has provided an environmental determination.

The SCRAA Board may choose to acquire all the land shown on the Exhibit A Property Map at one time or acquire only that required to accommodate the primary runway and terminal area. Based on the Exhibit A – Airport Property Map, approximately 581.46 acres is proposed for acquisition. A surface and overhead avigation easement may be considered if such easement provides for the acquisition of a sufficient property interest.

581.46 Acres Fee Title – Ultimate Development

The acreage (581 acres) as shown on the Exhibit A will likely change at the time the acquisition plat is prepared and the negotiation phase is completed.

The nominal unit cost of $10,000 per acre was used to develop an order of magnitude cost opinion. Actual acquisition costs will be based on a fair market value appraisal at the time of acquisition. The cost associated with the acquisition of a sufficient property interest (see ALP – Exhibit A Property Map) is expected to total $6,593,000.00.

LAND ACQUISITION

Item No.	Parcel Number	Owner	Unit	Quantity	Unit Cost	Total Cost
1	0629300007	Ronald & Linda Wichhart	Acre	18.62	$ 10,000.00	$ 186,200.00
2	0629400006	Ronald & Linda Wichhart	Acre	19.00	$ 10,000.00	$ 190,000.00
3	0632100008	Ronald & Linda Wichhart	Acre	22.17	$ 10,000.00	$ 221,700.00
4	0632200001	Ronald & Linda Wichhart	Acre	40.00	$ 10,000.00	$ 400,000.00
5	0632200004	Ernest T VanHeukelom, Rev Trust	Acre	3.41	$ 10,000.00	$ 34,100.00
6	0632200005	Ernest T VanHeukelom, Rev Trust	Acre	31.10	$ 10,000.00	$ 311,000.00
7	06333100004	Ernest T VanHeukelom, Rev Trust	Acre	1.04	$ 10,000.00	$ 10,400.00
8	0633300001	Ernest T VanHeukelom, Rev Trust	Acre	18.30	$ 10,000.00	$ 183,000.00
9	0633300002	Homer & Doretha Hasselman	Acre	11.13	$ 10,000.00	$ 111,300.00
10	0633300004	Homer & Doretha Hasselman	Acre	17.98	$ 10,000.00	$ 179,800.00
11	0633400007	Homer & Doretha Hasselman	Acre	5.63	$ 10,000.00	$ 56,300.00
12	0633400004	Homer & Doretha Hasselman	Acre	5.31	$ 10,000.00	$ 53,100.00
13	0633300005	Marion & Dorothy Vos	Acre	30.06	$ 10,000.00	$ 300,600.00
14	1004200001	John & Gladys DeRooi, Rev Trust	Acre	25.20	$ 10,000.00	$ 252,000.00
15	1004200003	James VanZomeren	Acre	26.85	$ 10,000.00	$ 268,500.00
16	1004400004	James VanZomeren	Acre	11.63	$ 10,000.00	$ 116,300.00
17	1004400002	James VanZomeren	Acre	23.95	$ 10,000.00	$ 239,500.00
18	1004100006	Elizabeth Barnard, Living Trust	Acre	45.90	$ 10,000.00	$ 459,000.00
19	1004100001	Rempe / Donaldson / Salzwedel	Acre	12.29	$ 10,000.00	$ 122,900.00
20	0633300004	Marion & Dorothy Vos	Acre	39.00	$ 10,000.00	$ 390,000.00
21	0632400006	Rempe / Donaldson / Salzwedel	Acre	35.67	$ 10,000.00	$ 356,700.00
22	0632400002	Rempe / Donaldson / Salzwedel	Acre	40.00	$ 10,000.00	$ 400,000.00
23	0632400001	Ernest T VanHeukelom, Rev Trust	Acre	40.00	$ 10,000.00	$ 400,000.00
24	0632300004	Ernest T VanHeukelom, Rev Trust	Acre	13.71	$ 10,000.00	$ 137,100.00
25	0632200003	Ernest T VanHeukelom, Rev Trust	Acre	20.00	$ 10,000.00	$ 200,000.00
26	0632200002	Ronald & Linda Wichhart	Acre	20.00	$ 10,000.00	$ 200,000.00
27	0632200011	Ronald & Linda Wichhart	Acre	2.83	$ 10,000.00	$ 28,300.00
28	0629300006	Kurtis, Lisa, & Scott Debruin	Acre	0.68	$ 10,000.00	$ 6,800.00
					SUBTOTAL =	$ 5,814,600.00
		Appraisals & Review Appraisals	EA	28	$ 4,000.00	$ 112,000.00
		Acquisition Plats	EA	28	$ 4,500.00	$ 126,000.00
		Negotiation	EA	28	$ 4,000.00	$ 112,000.00
		Legal Fees *	EA	28	$ 1,000.00	$ 28,000.00
		Relocation Assistance **	EA	0	$ -	$ -
		Utility Relocation	LS	1	$ 150,000.00	$ 150,000.00
		Fence, Perimeter (8' Chain Link)	LF	31,300	$ 8.00	$ 250,400.00
					SUBTOTAL =	$ 778,400.00
					TOTAL COST =	$ 6,593,000.00

* Assumed uniform legal fee per parcel.
** To be determined at the time of acquisition.
*** Unit cost is assumed and may vary depending on fair market appraisal.

The land acquisition process typically followed is summarized on page 6-4.

LAND ACQUISITION PROCESS

Item	Description
1.	Development Exhibit A Property Map that clearly delineates the land to be acquired
2.	Consult with the FAA Project Manager to verify that proposed parcels are identified on an approved Airport Layout Plan (ALP)
3.	Verify environments requirements for the National Environmental Policy Act (NEPA) are met
4.	Prepare surveys and plats for proposed property acquisition
5.	Order preliminary title search to confirm ownership and encumbrances on property title
6.	Certify Agricultural Land Owners – County Auditor
7.	Select and negotiate contract for qualified appraiser and review appraiser Mail 30 day Notice to Land Owners regarding Public Information Meeting and 26B Information - Iowa
8.	Select and negotiate contract for Environmental Site Assessment (ESA) consultant SCRAA sets Public Information Date
9.	Select and negotiate contract for qualified land acquisition and relocation consultant, if required, Public Notice of Public Meeting
10.	Conduct Environmental Site Assessment of property suspected of being contaminated Hold Public Information Meeting
11.	Prepare relocation plan if there are any persons to be displaced Hold Public Hearing, Pass Resolution Approving Project
12.	Perform appraisals and review appraisal, and approve appraised fair market value. The property owner shall be given the opportunity to accompany the appraiser on the inspection of the property.
13.	Submit appraisal and review appraisal reports to the FAA if required by project manager
14.	Make written offer of just compensation. At initiation of negotiations, provide general notice of the property owner's rights and entitlements of the acquisition of their property and an explanation of the relocation assistance and payment entitlements. Provide notice of relocation eligibility to displaced persons.
15.	Negotiate purchase agreement. If reasonable attempts to negotiate an agreement of acceptable settlement are unsuccessful, the acquisition may be referred to the sponsor's attorney for condemnation under the airport's eminent domain authority.
16.	Closing/court award, title conveyance, and schedule possession of acquired property. (Sponsor's attorney/title company/escrow agent.)
17.	Complete relocation assistance for displaced persons. Assure a comparable replacement dwelling has been made available for all persons displaced from their residence, (as applicable).
18.	Clear property for project use
19.	Furnish project application with Exhibit A Property Map and land acquisition cost breakdown sheet, Certification of Environmental Site Assessment, Certificate of Title, and Sponsor Certification for Real Property
20.	Execute grant agreement

GRADING/DRAINAGE IMPROVEMENTS: RUNWAY 14/32 & TAXIWAY A

The proposed grading and drainage improvements will provide for the construction of the primary runway to an ultimate length of 6,700ft. The grading project includes grading the Runway Safety Area (8,700' x 500') and Runway Object Area (8,700' x 800'). It is recommended that grading and drainage improvements associated with Taxiway A be accomplished within the same project. The Taxiway Safety Area is 79ft in width and the Taxiway Object Free Area is 131ft in width. Grading associated with the ultimate development of Runway 14/32 and Taxiway A will provide the opportunity to establish the runway and taxiway profile, minimize cut and fill areas and construct sediment and storm water detention basins.

While desirable to accomplish the grading and construction of drainage and storm water detention improvements within one construction season, past projects have often extended into the second year. The cost to construct and maintain sediment basins and provide for erosion control is included in the opinion of probable cost. Best Management Practices (BMP) to manage storm water and provide for erosion control should be incorporated into construction plans and specifications.

It is desirable to have the grading go through one freeze/thaw cycle prior to paving.

GRADE AND DRAIN RUNWAY 14/32 (100' x 6,700') AND PARALLEL TAXIWAY A

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	P-100-3.1	Mobilization / Demobilization	LS	1	$ 388,000.00	$ 388,000.00
2	P-100-3.2	Project Sign	LS	1	$ 600.00	$ 600.00
3	P-151-4.1	Clearing and Grubbing	AC	6.5	$ 5,000.00	$ 32,500.00
4	P-152-4.1	Unclassified Excavation	CY	1,250,000	$ 2.00	$ 2,500,000.00
5	P-156-5.1	Temporary Silt Fence	LF	19,200	$ 2.50	$ 48,000.00
6	P-156-5.2	Temporary Silt Fence for Ditch Checks	LF	4,000	$ 3.00	$ 12,000.00
7	P-156-5.3	Erosion Control Mat	SQS	450	$ 40.00	$ 18,000.00
8	P-156-5.4	Revetment, Class D Rip Rap	TN	240	$ 20.00	$ 4,800.00
9	P-156-5.5	Engineering Fabric	SY	180	$ 5.00	$ 900.00
10	D-701-5.1	Culvert, 36"-Dia., Rein. Concrete Pipe, Class 2000D	LF	450	$ 80.00	$ 36,000.00
11	D-701-5.2	Aprons, 36"-Dia., Rein. Concrete Pipe	EA	6	$ 1,600.00	$ 9,600.00
12	D-701-5.3	Culvert, 60"-Dia., Rein. Concrete Pipe, Class 2000D	LF	580	$ 200.00	$ 116,000.00
13	D-701-5.4	Aprons, 60"-Dia., Rein. Concrete Pipe	EA	2	$ 2,500.00	$ 5,000.00
14	T-901-5.1	Seeding and Fertilizing	AC	175	$ 1,500.00	$ 262,500.00
15	T-905-5.1	Topsoiling, Strip, Salvage, & Respread	CY	130,000	$ 5.00	$ 650,000.00
16	T-908-5.1	Mulching	AC	175	$ 1,000.00	$ 175,000.00
					SUBTOTAL =	$4,258,900.00
		DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 511,100.00
					TOTAL COST =	$4,770,000.00

The probable cost to implement grading and drainage improvements associated with construction of the primary runway (Runway 14/32) and parallel taxiway (Taxiway A) totals: $4,770,000.

PAVE, MARK & LIGHT: RUNWAY 14/32 (100' x 5,500')

The Airport Layout Plan depicts an Initial runway length of 5,500ft and an ultimate length of 6,700ft. While it is desirable to pave, mark and light the entire runway to its ultimate length of 6,700ft, the improvements may be implemented in two stages due to funding constraints. Runway 14/32 should be constructed beginning with Runway 32. With the Runway 32 threshold fixed, is it possible to initiate development of a precision instrument approach procedure to Runway 32. Should Runway 14/32 initially be constructed to 5,500ft, Runway 14 may be extended 1,200ft at some future date to provide the ultimate length of 6,700ft.

For planning purposes, an 8-inch PCC over a 10-inch aggregate base course is proposed. The pavement section is intended to accommodate a 60,000 pound dual wheel loading. Edge drains (6-inch) are recommended for installation under the runway pavement.

High intensity runway threshold and edge lights are proposed for installation. A 4-box PAPI (Precision Approach Path Indicator) is proposed for installation on each runway. Runway End Identifier Lights (REIL) are recommended for installation on Runways 14 and 32.

While consideration may be given to initially construct Runway 14/32 to 6,700ft, a more likely scenario is to construct Runway 14/32 to an initial length of 5,500ft due to Federal financial constraints. The SCRAA Board has indicated that they may consider providing funding in an amount that would enable Runway 14/32 to be constructed to the ultimate length of 6,700ft.

The probable cost opinion also provides for the construction of an electrical vault building. Lighted wind cones are proposed on Runways 14 and 32. At the time Runway 14 is extended, the PAPI, REIL, threshold lights and lighted wind cone will be relocated. The Runway 14 threshold markings will also be removed.

The probable order of magnitude cost to construct Runway 14/32 to an initial length of 5,500ft is $4,981,385. If the additional 1,200ft could be constructed at the same time the initial 5,500ft is constructed, a savings of approximately $406,141 may be realized. The lower cost is achieved by eliminating paint removal, PAPI, REIL and threshold lighting relocations, as well as eliminating mobilization cost (see Page 6-9).

PAVE, MARK & LIGHT RUNWAY 14/32 (100' x 5,500')

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	P-100-3.1	Mobilization / Demobilization	LS	1	$ 370,050.00	$ 370,050.00
2	P-100-3.2	Project Sign	LS	1	$ 600.00	$ 600.00
3	P-152-4.1	Trim, Shape, & Compact Subgrade	SY	79,400	$ 1.50	$ 119,100.00
4	P-152-4.2	Shoulder Grading	STA	140	$ 150.00	$ 21,000.00
5	P-156-5.1	Temporary Silt Fence	LF	2,000	$ 2.50	$ 5,000.00
6	P-156-5.2	Temporary Silt Fence for Ditch Checks	LF	1,000	$ 3.00	$ 3,000.00
7	P-208-5.1	10" Aggregate Base Course	SY	79,400	$ 9.00	$ 714,600.00
8	P-501-8.1	8" Portland Cement Concrete Pavement	SY	61,200	$ 42.00	$ 2,570,400.00
9	P-620-5.1	Runway Painting	SF	60,400	$ 1.00	$ 60,400.00
10	D-705-5.1	Subdrains, 6" Perforated	LF	11,200	$ 16.00	$ 179,200.00
11	D-705-5.2	Subdrain Cleanouts, 6"	EA	56	$ 400.00	$ 22,400.00
12	D-705-5.3	Subdrain Outlets, 6"	EA	20	$ 1,000.00	$ 20,000.00
13	T-901-5.1	Seeding and Fertilizing	AC	3.8	$ 1,500.00	$ 5,700.00
14	T-905-5.1	Topsoiling, Respread	CY	3,000	$ 4.00	$ 12,000.00
15	T-908-5.1	Mulching	AC	3.8	$ 500.00	$ 1,900.00
16	L-107-5.1	8-Ft Lighted Wind Cone	EA	2	$ 8,000.00	$ 16,000.00
17	L-108-5.1	Trenching, 6"-9" W x 24"-30" D w/backfill & grass seed	LF	12,280	$ 1.75	$ 21,490.00
18	L-108-5.2	Conduit, 2" PVC, In Trench	LF	12,280	$ 2.00	$ 24,560.00
19	L-108-5.3	#8 Cable, 5KV in Trench or Duct	LF	15,350	$ 0.80	$ 12,280.00
20	L-108-5.4	#8 Wire, Bare Counterpoise in Trench or Conduit	LF	15,350	$ 0.80	$ 12,280.00
21	L-108-5.5	#2 Cable, 600V in Trench or Conduit	LF	20,625	$ 0.90	$ 18,562.50
22	L-108-5.6	#10 Cable, 600V in Trench or Conduit	LF	20,625	$ 0.50	$ 10,312.50
23	L-108-5.7	Cable Markers, Concrete with Labeling	EA	80	$ 150.00	$ 12,000.00
24	L-108-5.8	Electrical Handhole, L-867	EA	8	$ 600.00	$ 4,800.00
25	L-109-6.1	15KW Constant Current Regulator	EA	2	$ 10,000.00	$ 20,000.00
26	L-109-6.2	Vault Building	LS	1	$ 60,000.00	$ 60,000.00
27	L-109-6.3	Vault, Wiring and Control	LS	1	$ 20,000.00	$ 20,000.00
28	L-110-5.1	Conduit, 2" Rigid Galvanized Duct	LF	460	$ 28.00	$ 12,880.00
29	L-112-5.1	PAPI, L-880, 4 Box System in Place	EA	2	$ 14,000.00	$ 28,000.00
30	L-114-5.1	REIL, L-849, Two Light Unit System	EA	2	$ 9,000.00	$ 18,000.00
31	L-125-5.1	HIRL, L-861, Base Mtd., 45W w/Trans. & Connectors	EA	55	$ 650.00	$ 35,750.00
32	L-125-5.2	HIRL, L-861E, Base Mtd., 45W w/Trans. & Connectors	EA	16	$ 650.00	$ 10,400.00
33	- - - - -	Field Office	LS	1	$ 5,000.00	$ 5,000.00
					SUBTOTAL =	**$ 4,447,665.00**
		(12%) DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 533,720.00
					TOTAL COST =	**$ 4,981,385.00**

PAVE, MARK & LIGHT TAXIWAY A (35' x 5,500')

It is desirable to pave, mark and light Taxiway A at the same time Runway 14/32 is paved. A full parallel taxiway is required in order to obtain approach visibility minimums less than ¾ statute mile.

Taxiway A is a parallel taxiway 35ft in width that extends the entire length of Runway 14/32. Proposed is 8-inch Portland Cement Concrete (PCC) over a 10-inch aggregate sub base. High intensity taxiway edge lights are recommended for installation.

PAVE, MARK & LIGHT TAXIWAY A (35' x 5,500') WITH THREE CONNECTIONS

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	P-100-3.1	Mobilization / Demobilization	LS	1	$ 215,000.00	$ 215,000.00
2	P-100-3.2	Project Sign	LS	1	$ 600.00	$ 600.00
3	P-152-4.1	Trim, Shape, & Compact Subgrade	SY	27,200	$ 1.50	$ 40,800.00
4	P-152-4.2	Shoulder Grading	STA	132	$ 150.00	$ 19,800.00
5	P-156-5.1	Temporary Silt Fence	LF	2,000	$ 2.50	$ 5,000.00
6	P-156-5.2	Temporary Silt Fence for Ditch Checks	LF	1,000	$ 3.00	$ 3,000.00
7	P-208-5.1	10" Aggregate Base Course	SY	27,200	$ 9.00	$ 244,800.00
8	P-501-8.1	8" Portland Cement Concrete Pavement	SY	25,760	$ 42.00	$ 1,081,920.00
9	P-620-5.1	Taxiway	SF	13,730	$ 1.00	$ 13,730.00
10	D-705-5.1	Subdrains, 6" Perforated	LF	13,900	$ 16.00	$ 222,400.00
11	D-705-5.2	Subdrain Cleanouts, 6"	EA	70	$ 400.00	$ 28,000.00
12	D-705-5.3	Subdrain Outlets, 6"	EA	24	$ 1,000.00	$ 24,000.00
13	T-901-5.1	Seeding and Fertilizing	AC	4.4	$ 1,500.00	$ 6,600.00
14	T-905-5.1	Topsoiling, Respread	CY	3,500	$ 4.00	$ 14,000.00
15	T-908-5.1	Mulching	AC	4.4	$ 500.00	$ 2,200.00
16	L-108-5.1	Trenching, 6"-9" W x 24"-30" D w/backfill & grass seed	LF	13,800	$ 1.75	$ 24,150.00
17	L-108-5.2	Conduit, 2" PVC, In Trench	LF	13,800	$ 2.00	$ 27,600.00
18	L-108-5.3	#8 Cable, 5KV in Trench or Duct	LF	17,250	$ 0.80	$ 13,800.00
19	L-108-5.4	#8 Wire, Bare Counterpoise in Trench or Conduit	LF	17,250	$ 0.80	$ 13,800.00
20	L-108-5.5	Cable Markers, Concrete with Labeling	EA	78	$ 150.00	$ 11,700.00
21	L-108-5.6	Electrical Handhole, L-867	EA	16	$ 600.00	$ 9,600.00
22	L-109-6.1	15KW Constant Current Regulator	EA	1	$ 10,000.00	$ 10,000.00
23	L-109-6.3	Vault, Wiring and Control	LS	1	$ 10,000.00	$ 10,000.00
24	L-110-5.1	Conduit, 2" Rigid Galvanized Duct	LF	220	$ 28.00	$ 6,160.00
25	L-125-5.1	HITL, L-861T, Base Mtd., 30W, Blue w/ Trans. & Con.	EA	97	$ 650.00	$ 63,050.00
					SUBTOTAL =	$ 2,111,710.00
		DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 253,405.00
					TOTAL COST =	$ 2,365,115.00

The opinion of probable cost to pave, mark and light is estimated to be Taxiway A is $2,365,115.

PAVE, MARK & LIGHT – RUNWAY 14 EXTENSION (100' x 1,200'); TAXIWAY A (35' x 1,200') – SCRAA FUNDED SCENARIO

A 1,200ft extension is recommended on Runway 14. Should there be sufficient funding available, it is recommended that the 1,200ft extension project be added to the initial 5,500 runway and Taxiway A improvement project.

PAVE, MARK, & LIGHT - RW 14 EXTENSION (100' x 1,200')
TAXIWAY A (35' x 1,200') - SCRAA FUNDED SCENARIO

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	P-152-4.1	Trim, Shape, & Compact Subgrade	SY	20,050	$ 1.50	$ 30,075.00
2	P-152-4.2	Shoulder Grading	STA	52	$ 150.00	$ 7,800.00
3	P-152-4.3	Removals, Runway Painting	SF	32,600	$ 2.00	$ 65,200.00
4	P-156-5.1	Temporary Silt Fence	LF	1,500	$ 2.50	$ 3,750.00
5	P-156-5.2	Temporary Silt Fence for Ditch Checks	LF	500	$ 3.00	$ 1,500.00
6	P-208-5.1	10" Aggregate Base Course	SY	20,050	$ 9.00	$ 180,450.00
7	P-501-8.1	8" Portland Cement Concrete Pavement	SY	19,450	$ 42.00	$ 816,900.00
8	P-620-5.1	Runway and Taxiway Painting	SF	38,530	$ 1.00	$ 38,530.00
9	D-705-5.1	Subdrains, 6" Perforated	LF	5,800	$ 16.00	$ 92,800.00
10	D-705-5.2	Subdrain Cleanouts, 6"	EA	29	$ 400.00	$ 11,600.00
11	D-705-5.3	Subdrain Outlets, 6"	EA	10	$ 1,000.00	$ 10,000.00
12	T-901-5.1	Seeding and Fertilizing	AC	3	$ 1,500.00	$ 3,750.00
13	T-905-5.1	Topsoiling, Respread	CY	2,000	$ 4.00	$ 8,000.00
14	T-908-5.1	Mulching	AC	3	$ 500.00	$ 1,250.00
15	L-108-5.1	Trenching, 6"-9" W x 24"-30" D w/backfill & grass seed	LF	6,340	$ 1.75	$ 11,095.00
16	L-108-5.2	Conduit, 2" PVC, In Trench	LF	6,340	$ 2.00	$ 12,680.00
17	L-108-5.3	#8 Cable, 5KV in Trench or Duct	LF	7,925	$ 0.80	$ 6,340.00
18	L-108-5.4	#8 Wire, Bare Counterpoise in Trench or Conduit	LF	7,925	$ 0.80	$ 6,340.00
19	L-108-5.5	#2 Cable, 600V in Trench or Conduit	LF	4,500	$ 0.90	$ 4,050.00
20	L-108-5.6	#10 Cable, 600V in Trench or Conduit	LF	4,500	$ 0.50	$ 2,250.00
21	L-108-5.7	Cable Markers, Concrete with Labeling	EA	10	$ 150.00	$ 1,500.00
22	L-108-5.8	Electrical Handhole, L-867	EA	4	$ 600.00	$ 2,400.00
23	L-110-5.1	Conduit, 2" Rigid Galvanized Duct	LF	175	$ 28.00	$ 4,900.00
24	L-125-5.1	MIRL, L-861, Base Mtd., 45W w/Trans. & Connectors	EA	12	$ 650.00	$ 7,800.00
25	L-125-5.2	MIRL, L-861E, Base Mtd., 45W, Relocate Only	EA	16	$ 400.00	$ 6,400.00
26	L-125-5.3	MITL, L-861T, Base Mtd., 30W, Blue w/ Trans. & Con.	EA	26	$ 550.00	$ 14,300.00
					SUBTOTAL =	$ 1,351,660.00
		(12%) DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 162,199.00
					TOTAL COST =	$ 1,513,859.00

The opinion of probable cost to construct the 1,200ft extension is $1,513,859.

If the additional 1,200ft of runway is completed as part of the initial build, the additional cost is $1,107,718. The total cost, if constructed to the ultimate length of 6,700ft in this scenario, is $6,089,103.

GRADE, DRAIN, PAVE, MARK & LIGHT TERMINAL APRON (27,500 SY)

The apron is sized to provide aircraft taxilanes and parking for 18 aircraft. An 8-inch PCC pavement over a 10-inch aggregate base is proposed. A 6-inch perforated subdrain system is proposed under the apron pavement.

The apron can be expanded to accommodate additional aircraft parking. The apron, as proposed, is expected to provide an acceptable level of service over a 20 year time horizon.

GRADE, DRAIN, PAVE, MARK & LIGHT TERMINAL AREA RAMP (27,500 SY)

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	P-100-3.1	Mobilization / Demobilization	LS	1	$ 200,000.00	$ 200,000.00
2	P-100-3.2	Project Sign	LS	1	$ 600.00	$ 600.00
3	P-152-5.1	Unclassified Excavation	CY	45,835	$ 3.00	$ 137,505.00
4	P-152-4.2	Trim, Shape, & Compact Subgrade	SY	27,560	$ 1.50	$ 41,340.00
5	P-156-5.1	Temporary Silt Fence	LF	900	$ 2.50	$ 2,250.00
6	P-156-5.2	Temporary Silt Fence for Ditch Checks	LF	600	$ 3.00	$ 1,800.00
7	P-208-5.1	10" Aggregate Base Course	SY	27,560	$ 9.00	$ 248,040.00
8	P-501-8.1	8" Portland Cement Concrete Pavement	SY	27,500	$ 42.00	$ 1,155,000.00
9	P-501-8.3	Aircraft Mooring Eyes (18 Aircraft)	EA	54	$ 150.00	$ 8,100.00
10	P-620-5.1	Airfield Painting	SF	3,200	$ 1.00	$ 3,200.00
11	D-701-5.1	Trench Drain, Complete	LF	800	$ 20.00	$ 16,000.00
12	D-705-5.1	Subdrains, 6" Perforated	LF	2,250	$ 16.00	$ 36,000.00
13	D-705-5.2	Subdrain Cleanouts, 6"	EA	12	$ 400.00	$ 4,800.00
14	D-705-5.3	Subdrain Outlets, 6"	EA	3	$ 1,000.00	$ 3,000.00
15	T-901-5.1	Seeding and Fertilizing	AC	1	$ 1,500.00	$ 1,800.00
16	T-905-5.1	Topsoiling, Respread	CY	22,920	$ 4.00	$ 91,680.00
17	T-908-5.1	Mulching	AC	1	$ 500.00	$ 600.00
18	L-110-5.1	Conduit, 2" Rigid Galvanized Duct	LF	350	$ 28.00	$ 9,800.00
19	L-125-5.2	Retroreflective Marker, Stake Mounted	EA	3	$ 150.00	$ 450.00
					SUBTOTAL =	**$ 1,961,965.00**
		(12%) DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 235,436.00
					TOTAL COST =	**$ 2,197,401.00**

The order of magnitude cost to construct the apron is $2,197,401. The apron is expected to be constructed in phases over several years.

GRADE, PAVE, MARK & LIGHT PRIMARY ACCESS ROAD
(220TH St. to Terminal, Internal Circulation, Vehicle Parking)

Internal vehicle circulation will be provided by an access road extending from 220th Street to the terminal building, FBO facilities, tee hangars and corporate hangar area. The proposed roadway is 22ft in width. The proposed pavement structure consists of 8-inch PCC over a 10-inch aggregate base course.

The internal access road provides access to 86 vehicle parking spaces. Fourteen (14) of the vehicle parking stalls are intended to serve tee hangar occupants. Fifty-two (52) stalls are located near the terminal building and FBO facilities. The remaining 20 all-weather parking stalls are located within the corporate hangar area.

GRADE, DRAIN, PAVE, MARK & LIGHT PRIMARY ACCESS ROAD FROM 220th STREET TO RAMP

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	P-100-3.1	Mobilization / Demobilization	LS	1	$ 125,000.00	$ 125,000.00
2	P-100-3.2	Project Sign	LS	1	$ 600.00	$ 600.00
3	P-152-5.1	Unclassified Excavation	CY	31,170	$ 3.00	$ 93,510.00
4	P-152-5.2	Trim, Shape, & Compact Subgrade	SY	9,550	$ 1.50	$ 14,325.00
5	P-152-5.3	Shoulder Grading	STA	66	$ 150.00	$ 9,900.00
6	P-156-5.1	Temporary Silt Fence	LF	1,500	$ 2.50	$ 3,750.00
7	P-156-5.2	Temporary Silt Fence for Ditch Checks	LF	600	$ 3.00	$ 1,800.00
8	P-208-5.1	10" Aggregate Base Course	SY	9,550	$ 9.00	$ 85,950.00
9	P-501-8.2	8" Portland Cement Concrete Pavement	SY	11,230	$ 42.00	$ 471,660.00
10	D-701-5.1	Culvert, 18" Dia., Rein. Concrete Pipe	LF	2,416	$ 38.00	$ 91,808.00
11	D-701-5.2	Apron, 18" Dia., Rein. Concrete Pipe	EA	2	$ 600.00	$ 1,200.00
12	D-701-5.3	Intake, Curb	EA	18	$ 2,500.00	$ 45,000.00
13	D-705-5.1	Subdrains, 6" Perforated	LF	6,600	$ 16.00	$ 105,600.00
14	D-705-5.2	Subdrain Cleanouts, 6"	EA	33	$ 400.00	$ 13,200.00
15	D-705-5.3	Subdrain Outlets, 6"	EA	11	$ 1,000.00	$ 11,000.00
16	T-901-5.1	Seeding and Fertilizing	AC	4	$ 1,500.00	$ 6,300.00
17	T-905-5.1	Topsoiling, Respread	CY	15,585	$ 4.00	$ 62,340.00
18	T-908-5.1	Mulching	AC	4	$ 500.00	$ 2,100.00
19	- - - - -	Overhead Street Light (1)	EA	17	$ 1,500.00	$ 25,500.00
					SUBTOTAL =	$ 1,170,543.00
		(12%) DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 140,465.00
					TOTAL COST =	$ 1,311,008.00

(1) Includes all wiring, base, pole, underground connection to transformer, lamp, fixture, PE sensor, etc. to be fully functional.

The estimate of probable cost to construct the internal access and parking is $1,311,008. The SCRAA Board may defer the access and vehicle parking improvements associated with the tee hangar complex.

TEE HANGARS (52 Airplanes)

Proposed is the ultimate construction of three (3) 14-unit tee hangars. The three (3) structures (clear door: 41.5' x12') are intended to provide storage of 42 airplanes. A 10 unit tee hangar (clear door: 47.5' x 14') designed to accommodate ten (10) cabin class airplanes is recommended. At the time the existing Pella and Oskaloosa Airports are closed, the South Central Regional Airport should have no less than 52 tee hangar storage units available.

TEE HANGARS (52 TEE HANGARS) (APRONS AND CONNECTING TAXILANES PREVIOUSLY CONSTRUCTED)

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	P-100-3.1	Mobilization / Demobilization	LS	1	$ 210,000.00	$ 210,000.00
2	P-100-3.2	Project Sign	LS	1	$ 600.00	$ 600.00
3	T-901-5.1	Seeding and Fertilizing	AC	1.0	$ 1,500.00	$ 1,500.00
4	T-905-5.1	Topsoiling, Respread	CY	1,790	$ 4.00	$ 7,160.00
5	T-908-5.1	Mulching	AC	1.0	$ 500.00	$ 500.00
6	L-108-5.1	Cable Markers, Concrete with Labeling	EA	8	$ 150.00	$ 1,200.00
7	- - - - -	Electrical Service Connection, All Inclusive (1)	LS	1	$ 12,000.00	$ 12,000.00
8	- - - - -	Tee Hangar Facility, 14-Unit, 12'H x 42'W Doors (2) (4)	EA	3	$ 460,000.00	$ 1,380,000.00
9	- - - - -	Tee Hangar Facility, 10-Unit, 14'H x 48'W Doors (3) (4)	EA	1	$ 365,000.00	$ 365,000.00
					SUBTOTAL =	$ 1,977,960.00
		DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 317,040.00
					TOTAL COST =	$ 2,295,000.00

(1) Includes all wiring, underground service connection to transformer, conduit into buildings, local permits, etc. to meet code requirements.
(2) Fully nested tee hangar with two end units. Building size 334' x 51'. Unit and door size will accommodate single and light twin aircraft.
(3) Fully nested tee hangar with two end units. Building size 264' x 60'. Unit and door size will accommodate single and larger twin aircraft.
(4) Buildings to include full interior partitions, wall/roof/door insulation, interior and exterior lighting, wall outlets, bi-fold doors with openers and operators, concrete floor and frost foundation, and floor drains.

TERMINAL BUILDING

Proposed is the construction of a terminal building. Based in part on comments from an airport users group meeting, the facility was located near the intersection of Runway 14/32 and Runway 10/28. The facility (4,500 to 8,500 square feet) is intended to providing space for FBO office functions, pilot training, flight line office, and public area queuing space, flight planning, pilot lounge (transient), public conference room, restroom facilities and mechanical room.

TERMINAL BUILDING

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	- - - - - - - -	Terminal	SF	6000[1]	$ 200.00	$ 1,200,000
					SUBTOTAL	$ 1,200,000
		(7%) DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL				$ 84,000
					TOTAL COST=	$ 1,284,000

1 8,500 SF based on comments from User Group. A 4,500 SF facility represents a minimum floor area. Range 4,500 SF to 8,500 SF – Use 6,000 SF

FBO MAINTENANCE/AIRCRAFT STORAGE FACILITIES

Proposed is the ultimate construction of a structure (100’ x 120’) to be used as an FBO maintenance facility. The 12,000 square foot structure should be located adjacent to the terminal building. The terminal Area Plan (see ALP) provides space for a 10,000 square foot storage hangar that may be used for FBO/Corporate airplane storage.

The probable cost for the storage hangar together with site improvements is $567,450.

FBO Maintenance Hangar

Item No.		FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	(1)(2)(3)	-----	100 x 120 Hangar	LS	1	$ 540,000	$ 540,000.00
						TOTAL COST =	$ 540,000.00

(1) Includes all wiring, underground service connection to transformer, conduit into buildings, local permits, etc. to meet code requirements.

(2) Door size approximately 100' Wide x 22' Clear. Office facilities not included.

(3) Conventional hangars to include wall/roof/door insulation, interior and exterior lighting, wall outlets, bi-fold or single-unit door with openers and operators, concrete floor and frost foundation, and floor drains. Plumbing stubs included for future development.

In addition to the maintenance hangar, the SCRAA may consider construction of a 10,000 square foot (100’ x 100’) structure that may be used by the FBO for airplane storage.

Within the initial development phase, a sanitary sewer septic tank to serve the terminal building and FBO facilities is proposed. Rural water is available on-site.

SANITARY SEWER AND WATER INFRASTRUCTURE TO SERVE THE TERMINAL AREA

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	P-100-3.1	Mobilization / Demobilization	LS	1	$ 12,500.00	$ 12,500.00
2	- - - - -	Sanitary Sewer Facility, Septic Tank (1)	LS	1	$ 40,000.00	$ 40,000.00
3	- - - - -	12" Water Main Connection to Terminal Area (2)	LF	1,650	$ 38.00	$ 62,700.00
					SUBTOTAL =	$ 115,200.00
		DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 24,800.00
					TOTAL COST =	$ 140,000.00

(1) Based on conventional system if soil conditions will allow.

(2) Connection to existing rural water main currently existing along 220th Street. Unit cost will include connection fee and extension of 12" main from roadway to airport terminal area to serve terminal facility and future facilities developed in conventional hangars.

CORPORATE AIRCRAFT STORAGE/FUEL SYSTEM

The terminal area plan provides of the location for four (4) corporate hangars. Initially, two (2) 10,000 square foot structures are proposed for construction. The construction of the two structures for corporate use are expected to be funded by the private sector.

An above ground fuel farm is proposed for construction. Fuel is expected to be uploaded to aircraft by truck. Two (2) above ground tanks (10,000 gallon 100LL and 10,000 gallon Jet A) are recommended for installation within the fuel farm area.

AIRCRAFT FUELING SYSTEM (10,000 GALLON 100LL, 10,000 GALLON JET-A)

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	P-100-3.1	Mobilization / Demobilization	LS	1	$ 80,000.00	$ 80,000.00
2	P-152-4.2	Trim, Shape, & Compact Subgrade	SY	470	$ 2.00	$ 940.00
3	P-152-4.2	Shoulder Grading	STA	1.5	$ 150.00	$ 225.00
4	P-156-5.1	Temporary Silt Fence	LF	180	$ 2.50	$ 450.00
5	P-208-5.1	6" Aggregate Base Course	SY	470	$ 9.00	$ 4,230.00
6	P-501-8.2	8" Portland Cement Concrete Pavement (1)	SY	400	$ 42.00	$ 16,800.00
7	T-901-5.1	Seeding and Fertilizing	AC	0.2	$ 1,500.00	$ 300.00
8	T-905-5.1	Topsoiling, Respread	CY	250	$ 4.00	$ 1,000.00
9	T-908-5.1	Mulching	AC	0.2	$ 500.00	$ 100.00
10	L-108-5.1	Cable Markers, Concrete with Labeling	EA	6	$ 150.00	$ 900.00
11	- - - - -	Automated 100LL Fuel System, As Per Plan (2)	LS	1	$ 185,000.00	$ 185,000.00
12	- - - - -	Automated Jet-A Fuel System, As Per Plan (2)	LS	1	$ 185,000.00	$ 185,000.00
					SUBTOTAL =	$ 474,945.00
		(7%) DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 33,246.00
					TOTAL COST =	$ 508,191.00

(1) PCC paving to include secondary containment area for above-ground tanks, parking area/containment for fuel dispensing trucks, and additional lane along access road for tanker truck to unload fuel into tanks.

(2) Includes 10,000 gallon tank, all wiring, underground electrical service, conduit, SPCC Plan, local permits, etc. to meet code requirements. Cabinets to be located adjacent to ramp with tanks adjacent to access road, approximately 250' separation.

Note: 300 GPM refueling system (conventional style) with diesel engine and automatic transmission. Systems to comply with current NFPA 385 and 407 standards. Refueling truck: $140,000 EA

The proposed rotating beacon light is shown on the Airport Layout Plan – terminal plan sheet.

ROTATING BEACON

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	P-100-3.1	Mobilization / Demobilization	LS	1	$ 10,000.00	$ 10,000.00
2	P-156-5.1	Temporary Silt Fence	LF	2,050	$ 2.50	$ 5,125.00
3	P-610-5.1	Reinforced Concrete Foundation	LS	1	$ 6,000.00	$ 6,000.00
4	T-901-5.1	Seeding and Fertilizing	AC	0.2	$ 1,500.00	$ 300.00
5	T-908-5.1	Mulching	AC	0.2	$ 500.00	$ 100.00
6	L-101-5.1	L-801A Rotating Beacon Complete, Installed	LS	1	$ 8,000.00	$ 8,000.00
7	L-108-5.1	Trenching, Backfiling, and Seeding	LF	2,000	$ 1.75	$ 3,500.00
8	L-108-5.1	Cable, #4 600V in Trench or Conduit	LF	4,000	$ 1.00	$ 4,000.00
9	L-108-5.2	Cable, #6 600V in Trench or Conduit	LF	2,000	$ 1.00	$ 2,000.00
10	L-108-5.3	#10 Ground Conductor	LF	2,000	$ 0.50	$ 1,000.00
11	L-108-5.7	Cable Markers, Concrete with Labeling	EA	4	$ 150.00	$ 600.00
12	- - - - -	Electrical Service Connection, All Inclusive	LS	1	$ 6,000.00	$ 6,000.00
13	- - - - -	Tower, 30 Ft. Tip-Down Pole	LS	1	$ 22,000.00	$ 22,000.00
					SUBTOTAL =	$ 68,625.00
		DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 11,375.00
					TOTAL COST =	$ 80,000.00

The proposed location for the AWOS facility is shown on the Airport Layout Plan.

AWOS IIIP

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	P-100-3.1	Mobilization / Demobilization	LS	1	$ 15,000.00	$ 15,000.00
2	P-156-5.1	Temporary Silt Fence	LF	250	$ 2.50	$ 625.00
3	P-610-5.1	Bi-Pad Reinforced Concrete Foundations	LS	1	$ 14,000.00	$ 14,000.00
4	T-901-5.1	Seeding and Fertilizing	AC	1.4	$ 1,500.00	$ 2,100.00
5	T-908-5.1	Mulching	AC	1.4	$ 500.00	$ 700.00
6	L-108-5.1	Trenching, Backfiling, and Seeding	LF	3,000	$ 1.75	$ 5,250.00
7	L-108-5.1	#8 Type Use Wire 600V Installed	LF	3,000	$ 1.00	$ 3,000.00
8	L-108-5.2	20 Gal., 12 Pair, Shielded, Data Cable, Installed	LF	3,000	$ 1.50	$ 4,500.00
9	L-108-5.7	Cable Markers, Concrete with Labeling	EA	4	$ 150.00	$ 600.00
10	- - - - -	Electrical Service Connection, All Inclusive	LS	1	$ 3,000.00	$ 3,000.00
11	- - - - -	AWOS IIIP System, Installed & Commissioned	LS	1	$ 90,000.00	$ 90,000.00
					SUBTOTAL =	$ 138,775.00
		DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 22,225.00
					TOTAL COST =	$ 161,000.00

The opinion of probably cost set forth in Table 6-1 will vary over the initial development phase based on need and funding constraints and opportunities.

Table 6-1
Phase One: Capital Development Cost
Cost Opinion - Phase I

Item No.	Description	Costs
I	Land Acquisition	$ 6,593,000.00
II	Grade and Drain RW 14/32 and Parallel Taxiway A	$ 4,770,000.00
III	Pave, Mark and Light RW14/32 (100 x 5,500)	$ 4,981,385.00
IV	Pave, Mark and Light Taxiway A (35 x 5,500)	$ 2,365,115.00
V	Pave, Mark and Light - RW 14 Extension (100' x 1200') Taxiway A (35' x 1200')	$ 1,513,859.00
VI	Grade, Drain, Pave, Mark, and Light Terminal Apron (27500 SY)	$ 2,197,401.00
VII	Grade, Drain, Pave, Mark and Light: Primary Access Road (220th St. to Terminal, Internal Circulation, Parking)	$ 1,311,008.00
VIII	Tee Hangars (52)	$ 2,295,000.00
IX	Terminal Building - 6,000SF; Square footage may be reduced	$ 1,284,000.00
X	FBO Maintenance Hangar	$ 540,000.00
XI	Sanitary Sewer; Water Infrastructure	$ 140,000.00
XII	Corporate Hangars - Private Sector	$ 1,016,500.00
XIII	Aircraft Fueling System (Jet A, 100 LL)	$ 508,191.00
XIV	Rotating Beacon Light	$ 80,000.00
XV	AWOS	$ 161,000.00
	Total Phase One=	$ 29,756,459.00

Since land acquisition may extend over a four (4) year period, it is more reasonable to expect that Phase One capital projects will be implemented over a 0 -7 year time frame.

The estimates of probable construction costs are based on 2013 dollars. The opinion of probable development costs have not been adjusted for inflation. The long term average annual rate of inflation from 1913 to 2012 according to the US Bureau of Labor Statistics is 3.22%.

A construction cost contingency has not been added to the opinion of probable cost. The FAA Central Region AIP Sponsors Guide (Section 610) requests that contingencies be excluded from estimated capital improvement program costs.

The estimate of probable costs should be reviewed each year to coincide with submittal of the Airport Capital Improvement Program (ACIP) to FAA Central Region and Iowa DOT Office of Aviation.

The Consultant has no control over the cost or availability of labor, equipment or materials, or over market conditions or the contractors method of pricing at the time the proposed improvement is put out to bid. The actual cost (at the time the project is bid and/or negotiated) is expected to vary from the estimated opinion of probable cost presented in this Airport Master Plan.

PHASE TWO: IMPROVEMENT PROJECTS (8-10 Years)

Within the eight (8) to ten (10) year timeframe, the SCRAA Board may consider constructing the following airport improvements:

- Install MALSR on Runway 32
- Construct crosswind Runway – Runway 10/28
- Improve 220th Street from Iowa Highway 163 to Terminal Access
- Add additional aircraft storage as needed.

The intent of the Phase One projects (0-7 years) is to have an operational airport facility within seven (7) years. The existing Oskaloosa Municipal Airport and Pella Municipal Airport will be closed at the time the South Central Regional Airport is operational.

While it is desirable to construct all the proposed improvements within the initial seven (7) year development phase, it is unlikely there will be adequate funding available without disposal of the existing airport assets. Therefore, priority should be given to implementing those improvements that will allow the airport to open and the existing airports closed.

Projects recommended for construction within the 8 to 10 year timeframe includes:

- Installation of a Medium Intensity Approach Light System (MALSR) on Runway 32
- Improve 220th Street (IA 163/Terminal Access Road)

Provided there is justification (see FAA Order 7031.2C), an Approach Light System is recommended for installation on Runway 32.

MALSR - RW 32

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	P-100-3.1	Mobilization / Demobilization	LS	1	$ 95,000.00	$ 95,000.00
2	-----	MALSR	LS	1	$ 800,000.00	$ 800,000.00
					SUBTOTAL =	$ 895,000.00
		DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 143,000.00
					TOTAL COST =	$ 1,038,000.00

Existing 220th Street is a rural gravel surface county road. Consideration should be given to improving approximately 2,800ft of 220th Street that extends between Iowa Highway 163 and the airport access road. An all-weather surface (asphalt) is proposed over the existing road bed.

HARD SURFACE ACCESS ROUTE ON 220TH STREET FROM IOWA #163
TO SECONDARY AIRPORT ACCESS INTERSECTION (Approx. 2,800')

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	- - - - - (1)	Cleaning and Preparation of Base	MI	0.53	$ 1,000.00	$ 530.00
2	- - - - - (1)	Compaction of Moisture-Density Control	CY	2,700	$ 2.00	$ 5,400.00
3	- - - - - (1)	Shoulder Construction, Earth	STA	56	$ 150.00	$ 8,400.00
4	- - - - - (1)	HMA Mixture, Surface Course, 1/2" Mix	TN	1,380	$ 45.00	$ 62,100.00
5	- - - - - (1)	HMA Mixture, Base Course, 3/4" Mix	TN	2,290	$ 40.00	$ 91,600.00
6	- - - - - (1)	Asphalt Binder, PG 64-22	TN	220	$ 550.00	$ 121,000.00
7	- - - - - (1)	HMA Pavement Samples	EA	2	$ 5,000.00	$ 10,000.00
8	- - - - - (1)	Pavement Markings	LS	1	$ 2,000.00	$ 2,000.00
9	- - - - - (1)	Traffic Control	LS	1	$ 15,000.00	$ 15,000.00
10	- - - - - (1)	Construction Survey	LS	1	$ 11,200.00	$ 11,200.00
11	- - - - - (1)	Mobilization	LS	1	$ 28,000.00	$ 28,000.00
12	- - - - - (1)	Mulching	AC	2.6	$ 2,000.00	$ 5,200.00
13	- - - - - (1)	Seed and Fertilize (Rural)	AC	2.6	$ 2,000.00	$ 5,200.00
14	- - - - - (1)	Silt Fence	LF	2,800	$ 2.00	$ 5,600.00
15	- - - - - (1)	Silt Fence - Ditch Checks	LF	1,120	$ 2.50	$ 2,800.00
16	- - - - - (1)	Removal of Silt Fence	LF	2,800	$ 0.75	$ 2,100.00
17	- - - - - (1)	Removal of Silt Fence - Ditch Checks	LF	1,120	$ 0.75	$ 840.00
					SUBTOTAL =	$ 376,970.00
		DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 53,030.00
					TOTAL COST =	$ 430,000.00

(1) Iowa DOT or SUDAS Specifications to be used on the Mahaska County Roadway.

Table 6-2
Phase Two: Captial Development Cost
Cost Opinion - Phase II

Item No.	Description	Costs
I	MALSR	$ 1,038,000.00
II	220th Street Improvement (2,800')	$ 430,000.00
	Total Phase Two=	$ 1,468,000.00

PHASE THREE (11-20 Years)

Within the 11 to 20 year time horizon, the South Central Regional Airport Agency may give consideration to constructing the following improvements:

- Crosswind Runway – Runway 10/28 (60' x 3,900') & Taxiway B (25' x 3,900')
- Apron Expansion – In response to demand
- Conventional Hangars – In response to demand

GRADE AND DRAIN RUNWAY 10/28 AND TAXIWAY B

Development of the crosswind runway may be considered within the 6 to 10 year timeframe, should funding be available. Given the substantial public and private sector investment in Phase One and Two, a more realistic scenario is construction of Runway 10/28 and Taxiway B within the 11 to 20 year time horizon.

Runway 10/28 is intended to serve small airplanes with a wing span less than 49ft and an approach speed under 121 knots. The runway 3,900ft in length and 60ft in width is expected to provide an adequate level of service. Proposed is a pavement structure consisting of 6-inch PCC over a 6-inch aggregate base course.

Medium intensity runway threshold and edge lights are recommended. Each runway end may be equipped with Runway End Identifier Lights and a lighted wind cone. Consideration may be given to the installation of a 2 box PAPI (Precision Approach Path Indicator) on each runway.

The opinion of probable cost associated with each phase of construction provides for the construction of Taxiway B. Taxiway B, 25ft in width is proposed to extend the full length of Runway 10/28. The proposed pavement structure consists of 6-inch PCC over a 6-inch aggregate sub base.

The taxiway may be equipped with a medium intensity edge light system.

GRADE AND DRAIN RUNWAY 10/28 (75' x 3,900') AND PARALLEL TAXIWAY

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	P-100-3.1	Mobilization / Demobilization	LS	1	$ 50,000.00	$ 50,000.00
2	P-100-3.2	Project Sign	LS	1	$ 600.00	$ 600.00
3	P-151-4.1	Clearing and Grubbing	AC	0.9	$ 5,000.00	$ 4,500.00
4	P-152-4.1	Unclassified Excavation	CY	120,600	$ 2.00	$ 241,200.00
5	P-156-5.1	Temporary Silt Fence	LF	8,800	$ 2.50	$ 22,000.00
6	P-156-5.2	Temporary Silt Fence for Ditch Checks	LF	1,850	$ 3.00	$ 5,550.00
7	P-156-5.3	Erosion Control Mat	SQS	100	$ 40.00	$ 4,000.00
8	P-156-5.4	Revetment, Class D Rip Rap	TN	230	$ 20.00	$ 4,600.00
9	P-156-5.5	Engineering Fabric	SY	170	$ 5.00	$ 850.00
10	D-701-5.1	Culvert, 36"-Dia., Rein. Concrete Pipe, Class 2000D	LF	340	$ 48.00	$ 16,320.00
11	D-701-5.2	Aprons, 36"-Dia., Rein. Concrete Pipe	EA	4	$ 1,200.00	$ 4,800.00
12	T-901-5.1	Seeding and Fertilizing	AC	18	$ 1,500.00	$ 27,000.00
13	T-905-5.1	Topsoiling, Strip, Salvage, & Respread	CY	13,830	$ 4.00	$ 55,320.00
14	T-908-5.1	Mulching	AC	18	$ 1,000.00	$ 18,000.00
					SUBTOTAL =	$ 454,740.00
		DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 73,260.00
					TOTAL COST =	$ 528,000.00

Should the South Central Regional Airport Agency acquire all the land as shown on the Exhibit A property map, the Board may give consideration to developing Runway 10/28 initially as a turf runway. The probable cost to grade, drain and seed a turf runway is comparable (approximately $528,000) to the initial grading and drainage costs for Runway 10/28 and Taxiway B.

Should the pavement associated with Taxiway B be eliminated and turnarounds provided on Runway 10 and 28, the paving, marking and lighting cost could be reduced by approximately 22 to 25 percent.

The Airport Layout Plan and Airport Master Plan should be updated upon completion of the Phase One and Two improvements. At that time the SCRAA Board can consider an appropriate implementation schedule for the crosswind runway (Runway 10/28).

PAVE, MARK & LIGHT RUNWAY 10/28 (60' x 3,900') AND PARALLEL TAXIWAY (TWY B)

Item No.	FAA Spec. Ref.	Description	Unit	Quantity	Unit Cost	Total Cost
1	P-100-3.1	Mobilization / Demobilization	LS	1	$ 445,000.00	$ 445,000.00
2	P-100-3.2	Project Sign	LS	1	$ 600.00	$ 600.00
3	P-152-4.1	Trim, Shape, & Compact Subgrade	SY	50,850	$ 1.50	$ 76,275.00
4	P-152-4.2	Shoulder Grading	STA	163	$ 150.00	$ 24,450.00
5	P-156-5.1	Temporary Silt Fence	LF	7,600	$ 2.50	$ 19,000.00
6	P-156-5.2	Temporary Silt Fence for Ditch Checks	LF	250	$ 3.00	$ 750.00
7	P-208-5.1	6" Aggregate Base Course	SY	50,850	$ 6.00	$ 305,100.00
8	P-501-8.1	6" Portland Cement Concrete Pavement	SY	49,015	$ 38.00	$ 1,862,570.00
9	P-620-5.1	Runway and Taxiway Painting	SF	30,100	$ 1.00	$ 30,100.00
10	D-705-5.1	Subdrains, 6" Perforated	LF	16,500	$ 16.00	$ 264,000.00
11	D-705-5.2	Subdrain Cleanouts, 6"	EA	82	$ 400.00	$ 32,800.00
12	D-705-5.3	Subdrain Outlets, 6"	EA	28	$ 1,000.00	$ 28,000.00
13	T-901-5.1	Seeding and Fertilizing	AC	5.0	$ 1,500.00	$ 7,500.00
14	T-905-5.1	Topsoiling, Respread	CY	4,000	$ 4.00	$ 16,000.00
15	T-908-5.1	Mulching	AC	5.0	$ 500.00	$ 2,500.00
16	L-107-5.1	8-Ft Lighted Wind Cone	EA	1	$ 8,000.00	$ 8,000.00
17	L-108-5.1	Trenching, 6"-9" W x 24"-30" D w/backfill & grass seed	LF	17,080	$ 1.75	$ 29,890.00
18	L-108-5.2	Conduit, 2" PVC, In Trench	LF	17,080	$ 2.00	$ 34,160.00
19	L-108-5.3	#8 Cable, 5KV in Trench or Duct	LF	21,350	$ 0.80	$ 17,080.00
20	L-108-5.4	#8 Wire, Bare Counterpoise in Trench or Conduit	LF	21,350	$ 0.80	$ 17,080.00
21	L-108-5.5	#2 Cable, 600V in Trench or Conduit	LF	14,630	$ 0.90	$ 13,167.00
22	L-108-5.6	#10 Cable, 600V in Trench or Conduit	LF	14,630	$ 0.50	$ 7,315.00
23	L-108-5.7	Cable Markers, Concrete with Labeling	EA	48	$ 150.00	$ 7,200.00
24	L-108-5.8	Electrical Handhole, L-867	EA	8	$ 600.00	$ 4,800.00
25	L-109-6.1	15KW Constant Current Regulator	EA	3	$ 10,000.00	$ 30,000.00
26	L-110-5.1	Conduit, 2" Rigid Galvanized Duct	LF	410	$ 28.00	$ 11,480.00
27	L-112-5.1	PAPI, L-881, 4 Box System in Place	EA	2	$ 14,000.00	$ 28,000.00
28	L-114-5.1	REIL, L-849, Two Light Unit System	EA	2	$ 9,000.00	$ 18,000.00
29	L-125-5.1	MIRL, L-861, Base Mtd., 45W w/Trans. & Connectors	EA	39	$ 650.00	$ 25,350.00
30	L-125-5.2	MIRL, L-861E, Base Mtd., 45W w/Trans. & Connectors	EA	16	$ 650.00	$ 10,400.00
31	L-125-5.3	MITL, L-861T, Base Mtd., 30W, Blue w/ Trans. & Con.	EA	53	$ 550.00	$ 29,150.00
32	- - - - -	Field Office	LS	1	$ 5,000.00	$ 5,000.00
					SUBTOTAL =	$ 3,410,717.00
		DESIGN & CONSTRUCTION ENGINEERING, ADMINISTRATION, AND LEGAL =				$ 409,286.00
					TOTAL COST =	$ 3,820,003.00

Table 6-3
Phase Three: Capital Development Cost (11 -20 Year)
Cost Opinion - Phase III

Item No.	Description	Costs	
I	Grade and Drain RW 10/28 (60' x 3,900') and Parallel Taxiway B (25' x 3,900')	$	528,000.00
II	Pave, Mark & Light RW 10/28 (60' x 3,900') and Taxiway B (25' x 3,900')	$	3,820,003.00
	Total Phase Three =	**$**	**4,348,003.00**

Chapter 7

Financial Plan

CHAPTER SEVEN – FINANCIAL PLAN

Chapter Six set forth an opinion of probable cost to develop a new airport while Chapter Seven discusses a financial plan which will implement the proposed facilities. Improvements associated with the new airport will occur over three (3) phases within a 20 year time horizon.

The first phase (FFY 2016 to FFY 2023) includes those projects that will accommodate aeronautical demand and enable the existing Oskaloosa Municipal Airport and the Pella Municipal Airport to be closed. The second development phase (FFY 2024 and FFY 2025) provides for the construction of additional aircraft storage and the extension of Runway 14/32 to an ultimate length of 6,700ft. The third development phase (FFY 2026 to FFY 2035) provides for development of the crosswind runway and installation of an approach light system (see FAA Order 7031.2c) on Runway 32.

The following narrative is based on an implementation scenario discussed on November 14, 2014. The meeting between SCRAA staff and FAA representatives provided the opportunity to discuss Federal requirements and resources that may be available to assist in the development of the proposed airport. Since each of the existing airports are Federal Obligated facilities, the City of Oskaloosa and the City of Pella must obtain a release from the Federal obligation before the existing airport assets can be disposed of and revenue realized to develop the proposed replacement airport.

- The Pella Municipal Airport consists of approximately 109 acres of land owned by the City of Pella. The Pella Municipal Airport must remain intact until the proposed replacement airport is operational.
- The Oskaloosa Municipal Airport consists of approximately 620 acres. Of the 620 acres, approximately 337.5 acres is not needed to support facilities associated with an airport designed to accommodate operations by Approach Category A and B airplanes and a wing span less than 79ft (Design Group II).

The FAA has indicated that they will consider a release from Federal obligations so long as the request by either the City of Oskaloosa and/or City of Pella does not damage or impair the existing airports. Where the Oskaloosa Airport has agricultural land for which no aeronautical purpose has been identified, the FAA may consider granting a release for specific parcels (non aeronautical) comparable in value to land being acquired for the proposed airport.

The Implementation Plan assumes that the City of Oskaloosa will be granted a release for no less than 176 acres in FFY 2018 and the remaining airport obligated acres in FFY 2023/2024. The Implementation Plan assumes that no revenue will be available from the disposal of assets at the Pella Municipal Airport until FFY 2023/2024.

In addition to Federal assistance, the SCRAA will request assistance from the Iowa Department of Transportation (Iowa DOT) Airport Improvement Program and Revitalize Iowa Sound Economy (RISE) program. The private sector is expected to construct no less than 20,000 square feet of corporate aircraft storage space. The private sector may also contribute to the construction of the terminal building, and other facilities not intended for public use.

- Terminal building construction
- Conventional hangar construction – Exclusive Use
- Vehicle parking facilities (Exclusive Use associated with conventional hangar construction)

Other improvements financed in part by the private sector may include the purchase or lease of fuel trucks and apron area improvements.

Proposed is the acquisition of a sufficient property interest in 581 acres over a four (4) year period of time (CY 2016 – 2019). For budget purposes, the following scenario is presented.

	FFY 2016	FFY 2017	FFY 2018	FFY 2019	FFY 2020
SCRAA Outlay	$900,000	$1,280,000	$2,000,000	$2,413,000	
FAA Reimbursement		$810,000	$1,152,000	$1,800,000	$2,171,700
The probable cost opinion to acquire 581.46 acres is 6,593,000 dollars.					

Land acquired by April 1 of a given Federal fiscal year may be placed under grant the following Federal fiscal year. For example, land acquired in FFY 2016 (Oct. 1, 2015 to April 1, 2016) may be placed under grant in FFY 2017 (Oct. 1 2016 to Sept. 30, 2017). The FAA has indicated that as each parcel is acquired, a grant application should be submitted. The SCRAA may acquire one or more parcels as shown on the Exhibit A property map and summarized on page 6-3.

With the completion of the land acquisition process, the Design process can proceed. Recommended is a Design Only project for the initial grading and drainage project.

FFY 2020 – Design Only	
FAA	$459,990
SCRAA	$51,110
Total	$511,100

The SCRAA desires to complete the grading and drainage improvements associated with Runway 14/32 and the apron area in FFY 2021. It is desirable to complete the grading and drainage phase within one construction season as to allow one freeze/thaw cycle before paving.

FFY 2021 – Grade/Drain Runway 14/32, Taxiway A, Apron	
FAA	$3,883,100
SCRAA	$425,890
Total	$4,308,990

Should the entire grading and paving project not be completed within one construction season, the SCRAA should recommend grading that part of the project that will support the pavement structure. The balance of the grading, along with seeding, may be completed in the early part of the next construction season.

The development scenario identifies FFY 2023 as the target year in which there is minimal infrastructure in place to accommodate airport operations. While it is desirable to construct Runway 14/32 to an ultimate length of 6,700ft, a runway no less than 5,500ft may be considered should funding constraints be encountered. In this scenario, the parallel taxiway (Taxiway A) is proposed for construction in FFY 2023 and the remaining 1,200 foot extension to Runway 14 and Taxiway A in FFY 2024.

FFY 2022 – Pave, Mark, Light
Runway 14/32 (100' x 5,500')

FAA	$4,483,247
SCRAA	$498,138
Total	$4,981,385

In 2023, the connecting taxiway and apron (27,000SY) is proposed for construction.

FFY 2023 – Pave, Mark, Light
Connecting Taxiway/Apron

FAA	$1,977,661
SCRAA	$219,740
Total	$2,197,401

The construction of Runway 14/32 (100′ x 5,500′), connecting taxiway (35′ x 400′) and apron (27,000SY) represents the initial airside development phase.

While the airside facilities are being constructed, the SCRAA will proceed with the design and construction of landside improvements. The first priority is to construct the internal vehicle access and parking facilities. Access from Iowa Highway 163 to the terminal area is provided by 220th Street. The improvement provides for the construction of a primary access road 22 feet in width and 64 parking stalls. Additional parking associated with corporate hangar construction is expected to be developed by the private sector. Given the Federal assistance anticipated for the airside facilities, the probability of Federal assistance to develop landside facilities is low given the Federal ranking system. To complete the landside improvements, the SCRAA will seek assistance from the Iowa DOT as well as the private sector.

FFY 2023 – Vehicle Access/Parking

IA DOT	$655,504 (RISE, State AIP)
SCRAA	$655,504
Total	$1,311,008

FFY 2023 – Utility Infrastructure

IA DOT	$119,000 (State AIP)
SCRAA	$21,000
Total	$140,000

The SCRAA contemplates the construction of a terminal building (6,000SF) in FFY 2023. The Implementation Plan also contemplates the construction of a conventional hangar (100 x 120) for use as a FBO maintenance facility. As shown on the Airport Layout Plan, the two structures may be connected with the FBO having office space in the terminal building. The two facilities are expected to be funded entirely by the SCRAA.

FFY 2023 – Terminal/FBO Maintenance Facility

SCRAA	Terminal	$1,284,000
SCRAA	FBO Maintenance Facility	$540,000
Total		$1,824,000

Additional aircraft storage (100’ x 100’) may be constructed by the private sector within the period CY 2022 to CY 2025. The hangar may be used to store based (FBO) as well for overnight itinerant aircraft.

CY 2022 to CY 2025

- Conventional Hangar (100 x 100)
- Private Sector $450,000

The private sector is expected to construct two (2) conventional hangars (20,000SF Total). The two structures are intended to provide space for corporate aircraft storage and office space for corporate flight departments. The corporate use hangars are expected to be funded entirely by the private sector.

FFY 2023

- Conventional Hangars – Corporate Use
- Private Sector $1,016,500

Within FFY 2023, the SCRAA is expected to construct tee hangars. The accelerated scenario envisions one (1) 14 unit tee hangar to be constructed with state assistance in the beginning of FFY 2023 (End of CY 2022). A second 14-unit tee hangar is proposed for construction in FFY 2024 with a third 14-unit tee hangar being constructed in FFY 2025. Based on aeronautical demand and the availability of funding, the SCRAA may construct a 10-unit tee hangar sized to accommodate cabin class twin engine airplanes in FFY 2024.

Within the period FFY 2023 through FFY 2025, the SCRAA is expected to provide $1,694,000 in funding. Construction of tee hangars to accommodate 52 airplanes over a three (3) year period envisions no less than $600,000 in state assistance.

FFY 2023 – 2025

Three 14 Unit Tee Hangars One 10 Unit Tee Hangar

	FFY 2023	FFY 2024	FFY 2025
IA DOT	$150,000	$300,000	$150,000
SCRAA	$423,750	$847,000	$423,750
Total	$573,750	$1,147,000	$573,750

The development scenario will require the installation of a fuel system (100LL and Jet A) in FFY 2023. The private sector may purchase or lease fuel trucks.

FFY 2023

Fuel System (100LL, Jet A – 10,000 gallon EA)

	FFY 2020
IA DOT	$150,000
SCRAA	$358,000
Total	$508,000

An airport rotating beacon light will be required in FFY 2023. The AWOS should be constructed in FFY 2023. Federal assistance is anticipated.

FFY 2023

Rotating Beacon / AWOS

	Rotating Beacon	AWOS
FAA	$72,000	$144,900
SCRAA	$8,000	$16,100
Total	$80,000	$161,100

The Implementation Plan envisions the development of a full parallel taxiway (Taxiway A) in FFY 2023. Grading and drainage improvements associated with Taxiway A would have been (in this scenario) constructed in FFY 2021. The FFY 2020 taxiway improvement project provides for paving, marking and lighting. A full parallel taxiway is required in order to obtain the desired approach minimums.

FFY 2023

Taxiway A (35' x 5,500' – Pave, Mark, Light)

FAA	$2,128,604
SCRAA	$236,511
Total	$2,365,115

As previously discussed the accelerated development scenario envisions extending Runway 14/32 to the ultimate length of 6,700ft in FFY 2024. Taxiway A would also be extended within the same development project.

FFY 2024

Runway 14 (100' x 1,200'); Taxiway A (35' x 1,200')

FAA	$1,362,473
SCRAA	$151,386
Total	$1,513,859

While the Implementation Plan provides the opportunity to realize an operational airport facility in FFY 2023, it does create a number of challenges.

The most salient challenge is to fund and construct sufficient aircraft storage facilities so as to relocate aircraft presently based at the Oskaloosa Municipal Airport and Pella Municipal Airport. At minimum, space for 55 airplanes should be available by the end of FFY 2023. The SCRAA intends to use revenue from the disposal of existing airport assets to fund the landside improvements. Without revenue from the disposal of the existing airport assets being immediately available, the SCRAA may need some interim financing to accelerate aircraft hangar construction.

FFY 2023

- Terminal Building – SCRAA
- FBO Maintenance Hangar (12,000SF) – SCRAA
- Corporate Aircraft Storage (20,000SF) – Private
- 1 – 14 Unit Tee – SCRAA (FFY 2023 - 2025)
- Conventional Aircraft Storage (10,000SY) – Private

FFY 2024/2025 (May accomplish in 2023 if financing available)

- 2 – 14 Unit Tee – SCRAA
- 1 – 10 Unit Tee – SCRAA (Based on need)

The 10,000 square foot conventional (constructed by private sector) hangar may be able to provide storage for 10 airplanes (subject to sizing/stacking). As such consideration should be given to interim financing so as to enable construction of the three 14-unit tee hangars in FFY 2019.

Within the nine (9) year period (FFY 2016 through FFY 2024, approximately $20,395,585 in Federal financial assistance is anticipated. An additional $1,524,504 in assistance from the Iowa DOT will be requested. The private sector is expected to invest no less than $1,016,500. To accelerate the construction of aircraft storage facilities, the private sector may construct a conventional (FBO) hangar having an estimated cost of $450,000. As such the private sector investment is expected to be no less than $1,466,500. The SCRAA share is $6,819,370. The SCRAA share is nearly equal to the estimated market value of the two existing airport facilities.

Title 14 CFR Part 155.7(d) requires that any release of airport obligated land for sale or disposal shall be subject to a written commitment from the City of Oskaloosa and/or the City of Pella to receive fair market value for the airport assets. An appraisal of both airports was done in 2012. While market conditions have changed since 2012, the appraised values do provide an independent opinion of the potential value to be reinvested in the proposed replacement airport.

Pella Municipal Airport	$1,962,000
Oskaloosa Municipal Airport	$5,750,000
Total 2012 Appraised Value	$7,712,000

Based on the probable cost opinions (Chapter Six) and the Implementation Plan, the total investment from all funding sources are expected to total $29,756,459. A summary by Federal fiscal year and funding source for Phase One (FFY 2015 – FFY 2025) is set forth in Table 7-1 on the following page. The following footnotes apply to Table 7-1.

Table 7-1 Footnote (1)

- SCRAA to acquire land in FFY 2016 based on fair market value.
- SCRAA to fund 100% of land cost (approximately $6,593,000).
- FAA to reimburse 90% of land cost between FFY 2017 and FFY 2020.
- SCRAA to carry land cost until FAA can place under grant.
- Land needs to be acquired by April 1 of 2016 to be place under grant in FFY 2017.

Table 7-2, displayed on page 7-13, provides a summary by potential revenue source.

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Table 7-1 IMPLEMENTATION PLAN

PHASE ONE: 0 -8 YEAR

DESCRIPTION	FFY 15	FFY 16	FFY 17	FFY 18	FFY 19	FFY 20	FFY 21	FFY 22	FFY 23	FFY 24	FFY 25
Land Acquisition (1)											
FAA	$ -	$ -	$ 810,000	$ 1,152,000	$ 1,800,000	$ 2,171,700	$ -	$ -	$ -	$ -	$ -
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SCRAA	$ -	$ 900,000	$ 1,280,000	$ 2,000,000	$ 2,413,000	$ -	$ -	$ -	$ -	$ -	$ -
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Design Only/AGIS											
FAA	$ -	$ -	$ -	$ -	$ -	$ 459,990	$ -	$ -	$ -	$ -	$ -
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SCRAA	$ -	$ -	$ -	$ -	$ -	$ 51,110	$ -	$ -	$ -	$ -	$ -
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Grade & Drain RW 14/32/TWY A											
FAA	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,833,010	$ -	$ -	$ -	$ -
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SCRAA	$ -	$ -	$ -	$ -	$ -	$ -	$ 425,890	$ -	$ -	$ -	$ -
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Pave, Mark, Light RW 14/32 (100 x 5,500)											
FAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,483,247	$ -	$ -	$ -
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SCRAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 498,138	$ -	$ -	$ -
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Pave, Mark, Light TWY A (35 x 5,500)											
FAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,128,604	$ -	$ -
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SCRAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 236,511	$ -	$ -
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Pave, Mark, Light RW 14 Extension, (100 x 1,200) (35 x 1,200)											
FAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,362,473	$ -
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SCRAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 151,386	$ -
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Grade, Pave, Mark, Light Terminal Area											
FAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,977,661	$ -	$ -
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
SCRAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 219,740	$ -	$ -
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Grade, Pave, Mark, Light Primary Access, Circulation, Parking											
FAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
State (RISE)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 655,504	$ -	$ -
SCRAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 655,504	$ -	$ -
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tee Hangars											
FAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 150,000	$ 300,000	$ 150,000
SCRAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 423,750	$ 847,000	$ 423,750
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Notes:

1. Land costs are based on fair market value and acquired by the SCRAA prior to a grant. Land must be acquired by April 1 in order to be placed under an FAA grant the following fiscal year. The SCRAA must carry the land costs until such time the cost is placed under grant and a draw down (90%) can be made.

2. Land acquired by April 1, 2016 may be placed under grant in FFY 2017. FFY 2017 begins on October 1, 2016 and ends September 30, 2011.

3. The "Design Only" grant is for grading and drainage improvements associated with the primary runway and terminal area.

4. Initial grading is expected to begin in FFY 2021followed by paving, markingand lighting of the primary runway (100' x 5,500') space in FFY 2022 and apron in 2023.

5. With the exception of land costs, the SCRAA should not proceed with any project funded in part by Federal or State assistance until a grant has been provided and a "Notice to Proceed" issued.

6. Due to potentional funding constraints, the primary runway (RW 14/32) is shown as being constructed in two (2) phases:
100 x 5,500' (FFY 2022)
100' x 1,200' (FFY 2024)

7. Internal circulation and public parking to be funded in part by Iowa DOT RISE grant (50%).

8. The primary runway RW 14/32 may be commissioned in FFY 2023/2024. (Calendar Year 2022) The existing airports to be closed after new airport is operational.

Table 7-1 IMPLEMENTATION PLAN - Continued

DESCRIPTION	FFY 15	FFY 16	FFY 17	FFY 18	FFY 19	FFY 20	FFY 21	FFY 22	FFY 23	FFY 24	FFY 25	Notes:
Terminal Building												
FAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	9. The City of Oskaloosa may dispose of non-
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	aeronautical land commensurate with land
SCRAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,284,000	$ -	$ -	acquired for the new airport.
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	FFY 2018 176.4 plus acres
FBO Maintenance/												The balance of the existing airport may be
Storage Hangar												disposed of after RW 14/32 is commissioned
FAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	(CY 2022) (FFY 2023).
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
SCRAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 540,000	$ -	$ -	
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Sanitary Sewer/												
Water Infrastructure												
FAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	10. The City of Pella will dispose of the existing
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 119,000	$ -	$ -	airport after RW 14/32 is commissioned
SCRAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 21,000	$ -	$ -	(CY 2022, FFY 2023).
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Corporate Hangars												
FAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	11. Land Apprasial Dated 2-10-12
SCRAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	- Oskaloosa $9,275/Acre
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,016,500	$ -	$ -	- Pella $18,000/Acre
Aircraft Fueling System												Agricultural land values statewide began to trend
FAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	downward in 2014
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 150,000	$ -	$ -	
SCRAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 358,191	$ -	$ -	
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Rotating Beacon Light												
FAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 72,000	$ -	$ -	
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
SCRAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,000	$ -	$ -	
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
AWOS												
FAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 144,900	$ -	$ -	
State	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
SCRAA	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 16,100	$ -	$ -	
Private	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
FAA	**$ -**	**$ -**	**$ 810,000**	**$ 1,152,000**	**$ 1,800,000**	**$ 459,990**	**$ 3,833,010**	**$ 4,483,247**	**$ 4,323,165**	**$ 1,362,473**	**$ -**	
State	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,074,504**	**$ 300,000**	**$ 150,000**	
SCRAA	**$ -**	**$ 900,000**	**$ 1,280,000**	**$ 2,000,000**	**$ 2,413,000**	**$ 51,110**	**$ 425,890**	**$ 498,138**	**$ 3,762,796**	**$ 998,386**	**$ 423,750**	
Private	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,016,500**	**$ -**	**$ -**	
	FFY 15	**FFY 16**	**FFY 17**	**FFY 18**	**FFY 19**	**FFY 20**	**FFY 21**	**FFY 22**	**FFY 23**	**FFY 24**	**FFY 25**	**Totals**
SCRAA Outlay	$ -	$ 900,000	$ 1,280,000	$ 2,000,000	$ 2,413,000	$ 511,100	$ 4,258,900	$ 4,981,385	$ 10,176,965	$ 2,660,859	$ 573,750	**Total Outlay $ 29,755,959**
Cumulative Outlay	$ -	$ 900,000	$ 2,180,000	$ 3,370,000	$ 4,631,000	$ 3,342,100	$ 4,969,310	$ 6,117,685	$ 11,811,403	$ 8,058,093	$ 6,969,370	**$ -**
FAA Grant	$ -	$ -	$ 810,000	$ 1,152,000	$ 1,800,000	$ 2,631,690	$ 3,833,010	$ 4,483,247	$ 4,323,165	$ 1,362,473	$ -	**FAA Grant $ 20,395,585**
Outlay Balance	$ -	$ 900,000	$ 1,370,000	$ 2,218,000	$ 2,831,000	$ 710,410	$ 1,136,300	$ 1,634,438	$ 7,488,238	$ 6,695,620	$ 6,969,370	**$ -**
State Grant	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,074,504	$ 300,000	$ 150,000	**State Grant $ 1,524,504**
Private Sector Cont.	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,016,500	$ -	$ -	**Private Sector $ 1,016,500**
SCRAA Balance	$ -	$ 900,000	$ 1,370,000	$ 2,218,000	$ 2,831,000	$ 710,410	$ 1,136,300	$ 1,634,438	$ 5,397,234	$ 6,395,620	$ 6,819,370	**SCRAA $ 6,819,370**

Table 7-2
Airport Development Summary by Phase/Funding Source

PHASE ONE: 0-7 YEAR

Item No.	Description	Costs	FAA	State	SCRAA	Private	
I	Land Acquisition (5)	$ 6,593,000.00	$ 5,933,700.00	$ -	$ 659,300.00	$ -	$ -
II	Design Only - Grade and Drain	$ 511,100.00	$ 459,990.00		$ 51,110.00		
III	Grade and Drain RW 14/32 and Parallel Taxiway A	$ 4,258,900.00	$ 3,833,010.00	$ -	$ 425,890.00	$ -	$ -
IV	Pave, Mark and Light RW14/32 (100 x 5,500)	$ 4,981,385.00	$ 4,483,247.00	$ -	$ 498,138.00	$ -	$ -
V	Pave, Mark and Light Taxiway A (35 x 5,500)	$ 2,365,115.00	$ 2,128,604.00	$ -	$ 236,511.00	$ -	$ -
VI	Pave, Mark and Light - RW 14 Extension (100' x 1200') Taxiway A (35' x 1200')	$ 1,513,859.00	$ 1,362,473.00	$ -	$ 151,386.00	$ -	$ -
VII	Grade, Drain, Pave, Mark, and Light Terminal Apron (27500 SY)	$ 2,197,401.00	$ 1,977,661.00	$ -	$ 219,740.00	$ -	$ -
VIII	Grade, Drain, Pave, Mark and Light: Primary Access Road (220th St. to Terminal, Internal Circulation, Parking)	$ 1,311,008.00	$ -	$ 655,504.00	$ 655,504.00 (4)	$ -	$ -
IX	Tee Hangars (52)	$ 2,295,000.00	$ -	$ 600,000.00	$ 1,695,000.00	$ -	$ -
X	Terminal Building	$ 1,284,000.00	$ -	$ -	$ 1,284,000.00		
XI	FBO Maintenance	$ 540,000.00	$ -	$ -	$ 540,000.00	$ -	$ -
XII	Sanitary Sewer; Water Infrastructure	$ 140,000.00	$ -	$ 119,000.00	$ 21,000.00	$ -	$ -
XIII	Corporate Hangars (2)	$ 1,016,500.00	$ -	$ -	$ -	$ 1,016,500.00	
XIV	Aircraft Fueling System (Jet A, 100 LL) (1)	$ 508,191.00	$ -	$ 150,000.00	$ 358,191.00	$ -	$ -
XV	Rotating Beacon Light	$ 80,000.00	$ 72,000.00	$ -	$ 8,000.00	$ -	$ -
XVI	AWOS (3)	$ 161,000.00	$ 144,900.00	$ -	$ 16,100.00	$ -	$ -
	Total Phase One=	**$ 29,756,459.00**	$ 20,395,585.00	$ 1,524,504.00	$ 6,819,370.00	$ 1,016,500.00	$ -

PHASE TWO: 9-10 YEAR

Item No.	Description	Costs	FAA	State	SCRAA	Private	
I	MALSR (3)	$ 1,038,000.00	$ 934,200.00	$ -	$ 103,800.00	$ -	$ -
II	220th Street Improvement (2,800')	$ 430,000.00	$ -	$ 215,000.00 (4)	$ 215,000.00	$ -	$ -
	Total Phase Two=	**$ 1,468,000.00**	$ 934,200.00	$ 215,000.00	$ 318,800.00	$ -	$ -

PHASE THREE: 11-20 YEAR

Item No.	Description	Costs	FAA	State	SCRAA	Private	
I	Grade and Drain RW 10/28 (60' x 3,900') and Parallel Taxiway B (25' x 3,900')	$ 528,000.00	$ 475,200.00	$ -	$ 52,800.00	$ -	$ -
II	Pave, Mark & Light RW 10/28 (60' x 3,900') and Taxiway B (25' x 3,900')	$ 3,820,003.00	$ 3,438,003.00	$ -	$ 382,000.00	$ -	$ -
	Total Phase Three =	**$ 4,348,003.00**	$ 3,913,203.00	$ -	$ 434,800.00	$ -	$ -

(1) Two fuel trucks (100LL, Jet A) maybe leased or purchased by private sector

(2) Corporate Hangars Two (100 x 100) Structures

(3) FAA participation will require a favorable benefit cost determination

(4) IA DOT RISE Grant @ 50%

(5) Land acquisition may extend over a 4 year period if all parcels as shown on the Exhibit A property map are acquired.

(6) FAA AIP= 90%; Iowa DOT - GAVI= 150,000 MAX; DEVELOPMENT= 85% MAX

Table 7-3
ASSET DISPOSAL SCENARIO

YEAR	SCRAA CUMULATIVE OUTLAY AFTER REIMBURSEMENTS	OTHER REVENUE (1)		ANNUAL CONTRIBUTION CITY OF PELLA CITY OF OSKALOOSA	DISPOSAL OF EXISTING AIRPORT ASSETS OSKALOOSA (3)	DISPOSAL OF EXISTING AIRPORT ASSETS PELLA (4)
FFY 16	$ 900,000	$ -	+/-	$ 900,000	$ -	$ -
FFY 17	$ 1,370,000	$ 19,845	+/-	$ 450,155	$ -	$ -
FFY 18	$ 2,218,000	$ 50,053	+/-	$ 797,947	$ 1,636,110	$ -
FFY 19	$ 2,831,000	$ 145,250	+/-	$ 467,750	$ 1,494,203	$ -
FFY 20	$ 710,410	$ 50,000	+/-	$ -	$ -	$ -
FFY 21	$ 1,136,300	$ 50,000	+/-	$ -	$ -	$ -
FFY 22	$ 1,634,438	$ 50,000	+/-	$ -	$ -	$ -
FFY 23 (2)	$ 5,397,234	$ 50,000	+/-	$ 2,366,234	$ -	$ -
FFY 24	$ 6,395,620	$ 50,000	+/-	$ 948,886	$ 2,576,595	$ 1,962,000
FFY 25	$ 6,819,370	$ 50,000	+/-	$ 373,750	$ -	$ -
	$ -	$ 515,148		$ 6,304,722	$ 5,706,908	$ 1,962,000

(1) Land Lease Revenue:
- 581 acres @ $250/acre (based on ISU Land Lease Rate)
- Subject to negotiate; Date acquired; Notifications
- Approx. 200 acres available after FFY 2023/2024

(2) Target Date to Commission Runway 14/32 and open Airport
(3) Oskaloosa (Maintain Existing Airport to B-II Standards Until Closed)
- FFY 2017/18 – 176.4 AC @ $9,275/AC=$1,636,110
- FFY 2019 – 161.1 AC @ $9,275/AC=$1,494,203
- FFY 2024 – 277.8 AC @ $9,275/AC=$2,576,595 (Oskaloosa to retain credit of $2,297,223 for annual Operation and Maintenance costs)

(4) Pella (Maintain Existing Airport – Intact – Until Closed)
- Existing site contains 109 Acres. The City owns an additional 137.4 acres adjacent to the 109 acres. Of that 137.4 acres, approximately 70 acres is needed for aeronautical purposes (For example: Existing AWOS)
- FFY 2024 - 109 AC @ $18,000/AC=$1,962,000

Note: Annual contribution from City of Pella and City of Oskaloosa based on 28-E Agreement creating the South Central Regional Airport Agency (SCRAA).
- City of Oskaloosa $3,152,361
- City of Pella $3,152,362
- Total Contribution $6,304,723

Table 7-3 provides summary of revenue sources and an anticipated time frame when revenue from the disposal of existing airport assets may be realized. To implement Phase One improvements, the City of Pella and the City of Oskaloosa will be required to make an annual contribution to the SCRAA, for purposes here the assumption is that the annual contribution shown in Table 7-3 will be divided equally as per the 28-E Agreement that created the South Central Regional Airport Agency. (For example FFY 2016: Pella=$450,000; Oskaloosa=$450,000)

FEDERAL ASSISTANCE

The FAA, through the Airport Improvement Program (AIP) grants, distributes Federal funds back to the nation's airport system from the Aviation Trust Fund. The Aviation Trust Fund was originally established in 1970 and has since been amended on numerous occasions. The Aviation Trust Fund establishes a source of funds, collected only from the users of the Nation's airport system that can be used to fund airport improvements.

The AIP is funded by aviation related fees and taxes such as airline ticket taxes, segment and international travel fees, cargo fees and aircraft fuel taxes that are deposited into the Airport and Airway Trust Fund. AIP money is distributed by the FAA through formulas set by law for entitlement and discretionary grants determined by the FAA.

Only airports included in the National Plan of Integrated Airport Systems (NPIAS) are eligible to apply for FAA funding.

Federal AIP Pre-applications and the Iowa DOT

Iowa is a channeling state, which means that general aviation airports that are eligible for Federal funds and small commercial service airports with fewer than 10,000 enplanements are required to submit pre-applications for the AIP to the Iowa DOT.

Pre-applications are submitted in mid-December and forwarded to the FAA in February after the Iowa Transportation Commission has approved prioritization of the pre-applications and recommends projects based on the Federal airport improvement project prioritization and other qualitative factors.

Projects must be justified and eligible and have appropriate planning in place prior to a project being recommended for funding. General aviation airports and commercial service airports with fewer than 10,000 enplanements receive non-primary entitlement (NPE) up to $150,000 per year. Non-primary entitlement is designated for use at specific airports; however project must be eligible and justified. The NPE can be carried over and accumulate for four years. Airports are also eligible to receive state apportionment and discretionary funding that is also programmed by the FAA.

State apportionments made available for general aviation (GA) airports, non-primary commercial service airports and reliever airports, continues to be at 18.5% of the total AIP amount. Iowa gets 1.23% of the total state apportionments. This apportionment is based on the state's population and area.

A special rule for the state apportionment goes into effect when the total amount available for AIP program is $3.2 billion or more. Under this rule, the percent increases to 20%, and each general aviation, reliever, and non-primary commercial services airport included in the NPIAS will be entitled to 20% of the NPIAS airport improvement costs, up to a maximum of $150,000 (non-primary entitlement funds). The airports entitlements are deducted from the state's apportionment.

The FAA Modernization and Reform Act of 2012 (FMRA) was signed into law in February 2012 and extended the AIP Program through FY 2015.

The FMRA reduced the Federal share of AIP eligible projects from 95% to 90%.

Airports may choose to waive their entitlements funds and FAA can reallocate those funds to airports in the same geographical area or state.

Eligible AIP Projects	Ineligible AIP Projects
Airside projects	Mowing equipment and vehicles
Runway construction/rehabilitation	Office and office equipment
Taxiway construction/rehabilitation	Landscaping
Apron construction/rehabilitation	Artworks
Airfield Lighting	Industrial park development
Airfield signage	Marketing Plans
Land acquisition	Improvements for commercial enterprises
Weather observation stations (AWOS)	
NAVAIDS such as REILs & PAPIs	
Planning studies	
Environmental studies	
Safety area improvements	
Snow removal equipment	
Snow removal equipment storage	
The following items are allowed if airside needs are met	
Fuel arms	
Aircraft hangars	
General aviation terminal buildings	
Parking lots	
Approaches to hangars	

STATE AVIATION GRANT PROGRAMS

The Iowa DOT Office of Aviation administers two major categories of state aviation funding programs: the Airport Improvement Program and the Vertical Infrastructure programs. Funding allocations for the programs and project selection are approved by the Iowa Transportation Commission.

AIRPORT IMPROVEMENT PROGRAM

The Airport Improvement Program, funded by the State Aviation Fund, includes aviation safety programs and aviation planning and development programs.

Aviation Safety – All grants in this category are available on an ongoing basis throughout the year as long as funds are available.

- **Immediate Safety Enhancements (ISE)** - Program is intended to assist airports with repairs to safety related equipment and infrastructure that may malfunction or become damaged outside the typical grant application progress.
    - State share is 70%, with a maximum grant of $10,000.

- **Wildlife Mitigation** - Program is intended to assist airports in mitigating and removing wildlife from airports to reduce the potential wildlife strikes. An initial consultation or wildlife study conducted by the USDA Wildlife Services should be completed prior to applying for mitigation.
    - State share is 85%. The Iowa DOT will pay initial costs of the wildlife study and request reimbursement for the sponsor's 15% share after the project is completed.

Aviation Planning and Development – These grants, with the exception of Air Service Development and the land use planning and zoning grants, are included in the annual application package due in late April or early May. Sponsor eligibility and state share vary by type of grant.

- **Airport Development Grants** – Grant program to assist airport sponsors in the preservation and development of the airfield and related infrastructure. Projects should be supported by the aviation system plan. New construction must be shown on an airport layout plan. If sponsors are requesting security related projects, a security plan must be on file with the Office of Aviation.
    - Eligible projects include runway, apron and taxiway construction and rehabilitation; pavement maintenance, drainage, obstruction removal, signage and lighting, hangar and terminal renovation, navigation and communication aides, land acquisition, fuel facilities, security related projects such as lighting or access control, planning studies such as ALPs, master plans, and multi-jurisdictional feasibility studies.
    - Projects are reviewed and prioritized based on system plan objectives, airport role, type of project, justification, percent of local match, and whether supported by multiple jurisdictions. Projects are prioritized by the Office of Aviation Staff, and presented to the Transportation Commission for review in June. Airports are notified of projects recommended to the Commission. The Iowa Transportation Commission typically approves project applications in July.
    - State share is up to 85%, with a minimum grant of $5,000. Additional local share increases the prioritization of the project.

- **Land Use Planning and Zoning** – Program designed to encourage airports, cities, and counties to enact airport zoning that protects compatible land use near airports. Reimbursement for these grants will only occur after a zoning ordinance or comprehensive plan is adopted.

    - Eligible applicants are sponsors of public owned airports.
    - Eligible projects include update or development of airport zoning ordinance or city/county comprehensive plan.
    - Applications are accepted on an ongoing basis.
    - State share is up to 85%, with $25,000 maximum for airport zoning and $20,000 maximum for comprehensive planning.

VERITCAL INFRASTRUCTURE PROGRAMS

Vertical infrastructure programs assist airports in preserving and enhancing vertical infrastructure at the airports. Vertical infrastructure funding for general aviation and commercial service airports depends on annual appropriations from the Revitalize Iowa Infrastructure Fund and/or Restricted Capital Accounts.

General Aviation Vertical Infrastructure (GAVI) Program – Preservation and development of the vertical infrastructure at general aviation airports. Projects should be supported by the aviation system plan and new construction must be shown on an airport layout plan. Funds must be obligated within 12 months of agreement. Buildings must be owned by the airport sponsor.

- Eligible projects include landside construction and major renovation of airport terminals, hangars, maintenance buildings, and fuel facilities. Iowa Code Section 8.57.6.c excludes routine maintenance.
- State share is up to 85%, with a minimum grant of $5,000. Additional local share increases the prioritization of the project. Although maximum caps may vary depending on funding availability, the State's share is typically capped at $150,000.

PRIVATE SECTOR FUNDING/INVESTMENT

Investment of public funds should also provide an impetus for private investment. An area in which private investment may be used effectively is for the development of aircraft storage space facilities. Hangars benefit specific airplane owners. Consequently, it is reasonable to place the responsibility for hangar development with the private sector.

Such facilities constructed with private capital on the airport facility may be deeded to the airport owner in trade for a long term lease. The advantage of such an arrangement is that it relieves the airport owner (sponsor) of the burden of financing private hangar facilities while retaining possession and control of all real property on the airport.

Implementation of the capital projects proposed in each of the phases is dependent to some extent on the availability of funding from either the Iowa DOT and/or Federal Aviation Administration (FAA).

Equally important, the sponsor will have to provide the local match to projects eligible for participation in cost by IDOT and/or the FAA.

IMPLEMENTATION SCENARIOS

Airport Capital Improvement Program (ACIP) data sheets are submitted to the Iowa DOT Office of Aviation annually. Project priorities may change based on aeronautical demand, funding constraints and/or program objectives. There is no assurance that the projects will be funded by the Federal Aviation Administration or the Iowa Department of Transportation.

There are several implementation scenarios that may be considered. The project need and justification for the improvements has been documented within Chapters Two and Three.

Funding the proposed improvements may be provided from various sources other than the Federal government. Assistance may be obtained from the Iowa DOT, local governments and or the private sector. The probability of obtaining funding to implement the improvements from a single source is unlikely.

Chapter Six set forth a probably cost opinion for the various capital projects required to realize an operational facility in FFY 2023/2024 (CY 2023).

The City of Pella and City of Oskaloosa each have considerable experience with airport management and operations. It is anticipated that these resources will continue to be available to the South Central Regional Airport Agency.

- Accounting/Administrative
- Legal, Federal and State requirements
- Airfield operations and maintenance
    - Snow Removal
    - Grounds maintenance
    - Daily inspection (lighting, pavements, etc.)
    - Issuance of NOTAMS
- Management of land leases, public owned facilities
- FBO/Aeronautical Services
- Development of minimum standards

Appendices

APPENDIX A

AIRSPACE ANALYSIS/ALP

(FAA Airspace Review Case: 2014-ACE-349Z-NRA
December 8, 2014)

U.S. Department
of Transportation

**Federal Aviation
Administration**

Central Region
Iowa, Kansas,
Missouri, Nebraska

901 Locust
Kansas City, Missouri 64106
(816) 329-2600

December 8, 2014

Mr. Jim Hansen, Chairman
South Central Regional Airport Agency
825 Broadway
Pella, IA 50219

South Central Regional Airport
AIP Grant: 3-19-0136-001-2013
Airspace Review Case: 2014-ACE-3492-NRA

Dear Mr. Hansen:

We conducted an airspace review of the Airport Layout Plan (ALP) based on considerations relating to the safe and efficient utilization of airspace, factors affecting the control of air traffic, conformance with FAA design criteria, and Federal grant assurances or conditions of a Federal property conveyance. The ALP airspace study was coordinated with appropriate FAA offices. Our determination is derived from the analysis of information supplied in the ALP. We conclude that the proposal will not adversely affect the safe and efficient use of navigable airspace by aircraft, provided, certain conditions are met as explained in the attached Memorandum.

In making this determination, the FAA considered matters such as the effects the proposal would have on existing or planned traffic patterns of neighboring airports, the effects it would have on the existing airspace structure and projected programs of the FAA, the effects it would have on the safety of persons and property on the ground, and the effects that existing or proposed manmade objects (on file with the FAA), and known natural objects within the affected area would have on the airport proposal. We reviewed the ALP for structures that may adversely affect the flight or movement of aircraft, cause electromagnetic interference to NAVAIDs and communication facilities, or derogate the line-of-sight visibility from a control tower.

The FAA cannot prevent the construction of structures near an airport. The airport environs can only be protected through such means as local zoning ordinances, acquisitions of property in fee title or aviation easements, letters of agreement, or other means

This determination does not constitute FAA approval or disapproval of any of the proposed development shown on the ALP. The ALP serves as a record of aeronautical requirements and is used by the FAA in its review of proposals that may affect the navigable airspace or other missions of the FAA.

This determination does not constitute a commitment of Federal funds and does not indicate that the proposed development is environmentally acceptable in accordance with applicable federal laws. All local and state requirements and/or permits must be obtained prior to construction of this proposal. An environmental finding is a prerequisite to any major airport development project when Federal aid will be granted for the project. This approval is given subject to the condition that the proposed airport development identified below shall not be undertaken without prior written environmental approval by the FAA. These items include:

1) Land Acquisition;
2) Construct Airport;
3) Remove Obstructions;
4) Terminal Area and General Aviation Expansion;

The sponsor is advised to coordinate the completion of project construction with the FAA publications cycle for U.S. Terminal Procedures, Airport Facility Directory, etc. Notify the FAA with the required information before the cut-off date coinciding with the next publication.

If you have any questions or need additional information, please contact me at (816) 329-2639, or send me an e-mail message at scott.tener@faa.gov.

Sincerely,

Scott Tener, P.E.
Airport Planning Engineer - Iowa

cc: Ms. Michelle Mc Enany, IDOT Office of Aviation
Mr. Dustin Leo, DGR

Attachment: Airspace Determination

Memorandum

U.S. Department of Transportation
Federal Aviation Administration

Date: December 8, 2014

Subject: SOUTH CENTRAL REGIONAL (SITE A), PELLA, IOWA
Aeronautical Study Number: 2014-ACE-3492-NRA
Airport Layout Plan Update

From: Airports Airspace Specialist, ACE-620F Reply To: Jason Knipp, ext. 2646

To: Mr. Scott Tener, ACE-611C

We have completed an airspace analysis of:

RUNWAY 10/28 - 3,900' x 60', A(NP)/A(NP), Paved
RUNWAY 14/32 - 5,500' x 100', D/PIR, Paved
RUNWAY 14/32 - 6,700' x 100', D/PIR, Paved

Our aeronautical study has determined that the proposed updates will not adversely affect the safe and efficient use of airspace by aircraft. Therefore, we have no objection to the proposal.

Future structures and/or construction equipment were not evaluated as part of this study. The listing of proposed instrument flight procedures (IFPs) on the ALP does not constitute the actual request for new IFPs. The request for IFPs is a separate action that must be submitted to the FAA in writing or via the AVN website a minimum of 18 to 24 months before the desired usage. All runway data must be received a minimum of 12 months in advance. Please contact the Central FPO at 817-821-7600 when you're ready to submit your request. We will provide you the web address or other physical address and specialist contact information at that time.

This determination does not constitute FAA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground.

In making the determination, the FAA has considered matters such as the effects the proposal would have on existing or planned traffic patterns of neighboring airports, the effects it would have on the existing airspace structure and projected programs of the FAA, the effects it would have on the safety of persons and property on the ground, and the effects that existing or proposed manmade objects (on file with the FAA) and known natural objects within the affected area would have on the airport proposal. This aeronautical study was not circulated to the public for comments.

The FAA cannot prevent the construction of structures near an airport. The airport environs can only be protected through such means as local zoning ordinances, acquisitions of property in fee title or aviation easements, letters of agreements, or other means. This determination in no way preempts or waives any ordinances, laws, or regulations of any government body or agency.

This aeronautical study was not circulated to the public for comments.

APPENDIX B

DEFINITIONS AND ACRONYMS

(The acronyms and definitions within this appendix was reproduced from FAA Advisory Circular (AC) 150/5300-13A Airport Design)

102. Definitions.

The definitions in this paragraph are relevant to airport design standards.

a. *Accelerate-Stop Distance Available (ASDA).* See Declared Distances.

b. *Air Traffic Control Facilities (ATC-F)*. Electronic equipment and buildings aiding air traffic control (ATC) – for communications, surveillance of aircraft including weather detection and advisory systems.

c. *Aircraft.* For this AC, the terms aircraft and airplane are synonymous, referring to all types of fixed-wing airplanes, including gliders. Powered lift (tilt-rotors) and helicopters are not included except where specifically noted.

d. Aircraft *Approach Category (AAC).* As specified in 14 CFR Part 97 97.3, Symbols and Terms Used in Procedures, a grouping of aircraft based on a reference landing §speed (V_{REF}), if specified, or if V_{REF} is not specified, 1.3 times stall speed (V_{SO}) at the maximum certificated landing weight. V_{REF}, V_{SO}, and the maximum certificated landing weight are those values as established for the aircraft by the certification authority of the country of registry.

e. *Airplane*. A fixed-wing aircraft that is heavier than air, and is supported in flight by the dynamic reaction of the air against its wings (see Aircraft).

f. *Airplane Design Group (ADG).* A classification of aircraft based on wingspan and tail height. When the aircraft wingspan and tail height fall in different groups, the higher group is used.

g. *Airport Elevation.* The highest point on an airport's usable runways expressed in feet above mean sea level (MSL).

h. *Airport Layout Plan (ALP).* A scaled drawing (or set of drawings), in either traditional or electronic form, of current and future airport facilities that provides a graphic representation of the existing and long-term development plan for the airport and demonstrates the preservation and continuity of safety, utility, and efficiency of the airport to the satisfaction of the FAA.

i. *Airport Reference Code (ARC).* An airport designation that signifies the airport's highest Runway Design Code (RDC), minus the third (visibility) component of the RDC. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely on the airport.

j. *Airport Reference Point (ARP).* The approximate geometric center of all usable runways at the airport.

k. *Airport.* An area of land that is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any.

l. *Aligned Taxiway.* A taxiway with its centerline aligned with a runway centerline. Sometimes referred to as an "inline taxiway."

m. *Approach Procedure with Vertical Guidance (APV).* An Instrument Approach Procedure (IAP) providing both vertical and lateral electronic guidance.

n. *Approach Reference Code (APRC).* A code signifying the current operational capabilities of a runway and associated parallel taxiway with regard to landing operations.

o. *Approach Surface Baseline (ASBL).* A horizontal line tangent to the surface of the earth at the runway threshold aligned with the final approach course.

p. *Blast Fence.* A barrier used to divert or dissipate jet blast or propeller wash.

q. *Blast Pad.* A surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash. A blast pad is not a stopway.

r. *Building Restriction Line (BRL).* A line that identifies suitable and unsuitable locations for buildings on airports.

s. *Bypass Taxiway.* A taxiway used to reduce aircraft queuing demand by providing multiple takeoff points.

t. *Category-I (CAT-I)*. An instrument approach or approach and landing with a Height Above Threshold (HATh) or minimum descent altitude not lower than 200 ft (60 m) and with either a visibility not less than ½ statute mile (800m), or a runway visual range not less than 1800 ft (550m).

u. *Category-II (CAT-II)*. An instrument approach or approach and landing with a Height Above Threshold (HATh) lower than 200 ft (60 m) but not lower than 100 ft (30 m) and a runway visual range not less than 1200 ft (350m).

v. *Category-III (CAT-III)*. An instrument approach or approach and landing with a Height Above Threshold (HATh) lower than 100 ft (30m), or no HATh, or a runway visual range less than 1200 ft (350m).

w. *Circling Approach.* A maneuver initiated by the pilot to align the aircraft with a runway for landing when a straight-in landing from an instrument approach is not possible or is not desirable.

x. *Clearway (CWY).* A defined rectangular area beyond the end of a runway cleared or suitable for use in lieu of runway to satisfy takeoff distance requirements (see also Takeoff Distance Available [TODA]).

y. *Cockpit to Main Gear Distance (CMG).* The distance from the pilot's eye to the main gear turn center.

z. *Compass Calibration Pad.* An airport facility used for calibrating an aircraft compass.

aa. *Crossover Taxiway.* A taxiway connecting two parallel taxiways (also referred to as a transverse taxiway).

bb. *Decision Altitude (DA).* A specified altitude on a vertically-guided approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established. DA is referenced to mean sea level (MSL).

cc. *Declared Distances.* The distances the airport owner declares available for a turbine powered aircraft's takeoff run, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are:

(1) *Takeoff Run Available (TORA)* – the runway length declared available and suitable for the ground run of an aircraft taking off;

(2) *Takeoff Distance Available (TODA)* – the TORA plus the length of any remaining runway or clearway beyond the far end of the TORA; the full length of TODA may need to be reduced because of obstacles in the departure area;

(3) *Accelerate-Stop Distance Available (ASDA)* – the runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting a takeoff; and

(4) *Landing Distance Available (LDA)* – the runway length declared available and suitable for landing an aircraft.

dd. *Departure End of Runway (DER).* The end of the runway that is opposite the landing threshold. It is sometimes referred to as the stop end of runway.

ee. *Departure Reference Code (DPRC).* A code signifying the current operational capabilities of a runway with regard to takeoff operations.

ff. *Design Aircraft.* An aircraft with characteristics that determine the application of airport design standards for a specific runway, taxiway, taxilane, apron, or other facility (such as Engineered Materials Arresting System [EMAS]). This aircraft can be a specific aircraft model or a composite of several aircraft using, expected, or intended to use the airport or part of the airport. (Also called "critical aircraft" or "critical design aircraft.")

gg. *Displaced Threshold.* A threshold that is located at a point on the runway beyond the beginning of the runway.

hh. *End-Around Taxiway (EAT).* A taxiway crossing the extended centerline of a runway, which does not require specific clearance from air traffic control (ATC) to cross the extended centerline of the runway.

ii. *Entrance Taxiway.* A taxiway designed to be used by an aircraft entering a runway. Entrance taxiways may also be used to exit a runway.

jj. *Exit Taxiway.* A taxiway designed to be used by an aircraft only to exit a runway:

(1) *Acute-Angled Exit Taxiway* – A taxiway forming an angle less than 90 degrees from the runway centerline.

(2) *High Speed Exit Taxiway* – An acute-angled exit taxiway forming a 30 degree angle with the runway centerline, designed to allow an aircraft to exit a runway without having to decelerate to typical taxi speed.

kk. *Fixed-By-Function Navigation Aid (NAVAID).* An air navigation aid that must be positioned in a particular location in order to provide an essential benefit for aviation is fixed-by-function. Table 6-1 gives fixed-by-function designations for various NAVAIDs as they relate to the Runway Safety Area (RSA) and Runway Object Free Area (ROFA). Some NAVAIDs that are not fixed-by-function in regard to the RSA or ROFA may be fixed-by-function in regard to the Runway Protection Zone (RPZ):

(1) Equipment shelters, junction boxes, transformers, and other appurtenances that support a fixed-by-function NAVAID are not fixed-by-function in regard to the RSA or ROFA unless operational requirements require them to be located near the NAVAID.

(2) Some NAVAIDs, such as localizers (LOCs), can provide beneficial performance even when they are not located at their optimal location. These NAVAIDs are not fixed-by-function in regard to the RSA or ROFA.

ll. *Frangible.* Retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft. See AC 150/5220-23, Frangible Connections.

mm. *General Aviation.* All non-scheduled flights other than military conducted by non-commercial aircraft. General aviation covers local recreational flying to business transport that is not operating under the FAA regulations for commercial air carriers.

nn. *Glide Path Angle (GPA)*. The GPA is the angle of the final approach descent path relative to the approach surface baseline.

oo. *Glide Path Qualification Surface (GQS).* An imaginary surface extending from the runway threshold along the runway centerline extended to the Decision Altitude (DA) point.

pp. *Glideslope (GS)*. Equipment in an Instrument Landing System (ILS) that provides vertical guidance to landing aircraft.

qq. *Hazard to Air Navigation.* An existing or proposed object that the FAA, as a result of an aeronautical study, determines will have a substantial adverse effect upon the safe and efficient use of navigable airspace by aircraft, operation of air navigation facilities, or existing or potential airport capacity.

rr. *Height Above Airport (HAA)* . The height of the circling approach descent altitude (MDA) above the airport elevation.

ss. *Height Above Threshold (HATh)*. The height of the Decision Altitude (DA) or Minimum Descent Altitude (MDA) above the threshold.

tt. *Hot Spot.* A location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary.

uu. *Instrument Approach Procedure (IAP)*. A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually. It is prescribed and approved for a specific airport by competent authority.

vv. *Instrument departure runway.* A runway identified by the airport operator, through the appropriate FAA Airports Office, to the FAA Regional Airspace Procedures Team intended primarily for instrument departures.

ww. *Island.* An unused paved or grassy area between taxiways, between runways, or between a taxiway and a runway. Paved islands are clearly marked as unusable, either by painting or the use of artificial turf.

xx. *Joint-Use Airport*. An airport owned by the United States that leases a portion of the airport to a person operating and airport specified under Part 139.

yy. *Landing Distance Available (LDA).* See Declared Distances.

zz. *Large Aircraft.* An aircraft with a maximum certificated takeoff weight of more than 12,500 lbs (5670 kg).

aaa. *Low Impact Resistant (LIR) Support.* A *s*upport designed to resist operational and environmental static loads and fail when subjected to a shock load such as that from a colliding aircraft.

bbb. *Main Gear Width (MGW).* The distance from the outer edge to outer edge of the widest set of main gear tires.

ccc. *Minimum Descent Altitude (MDA)*. The lowest authorized altitude on an approach that does not have vertical guidance. MDA is referenced to mean sea level (MSL).

ddd. *Modification to Standards.* Any approved nonconformance to FAA standards, other than dimensional standards for Runway Safety Areas (RSAs), applicable to an airport design, construction, or equipment procurement project that is necessary to accommodate an unusual local condition for a specific project on a case-by-case basis while maintaining an acceptable level of safety. See Order 5300.1.

eee. *Movement Area.* The runways, taxiways, and other areas of an airport that are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft including helicopters and tilt-rotors, exclusive of loading aprons and aircraft parking areas (reference Part 139).

fff. *Navigation Aid (NAVAID)*. Electronic and visual air navigation aids, lights, signs, and associated supporting equipment.

ggg. *Non-movement area*. The areas of an airport that are used for taxiing or hover taxiing, or air taxiing aircraft including helicopters and tilt-rotors, but are not part of the movement area (i.e., the loading aprons and aircraft parking areas).

hhh. *Non-Precision Approach (NPA).* For the purposes of this AC, a straight-in instrument approach procedure that provides course guidance, with or without vertical path guidance, with visibility minimums not lower than 3/4 mile (4000 RVR).

iii. *Non-Precision Runway.* A runway (other than a precision runway) with at least one end having a non-precision approach procedure.

jjj. *Object.* Includes, but is not limited to, above ground structures, Navigational Aids (NAVAIDs), equipment, vehicles, natural growth, terrain, and parked or taxiing aircraft.

kkk. *Object Free Area (OFA).* An area centered on the ground on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by remaining clear of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

lll. *Obstacle.* An existing object at a fixed geographical location or which may be expected at a fixed location within a prescribed area with reference to which vertical clearance is or must be provided during flight operation.

mmm. *Obstacle Clearance Surface (OCS).* An evaluation surface that defines the minimum required obstruction clearance for approach or departure procedures.

nnn. *Obstacle Free Zone (OFZ).* The OFZ is the three-dimensional airspace along the runway and extended runway centerline that is required to be clear of obstacles for protection for aircraft landing or taking off from the runway and for missed approaches.

ooo. *Obstruction to Air Navigation.* An object of greater height than any of the heights or surfaces presented in Subpart C of Title 14 CFR Part 77, Standards for Determining Obstructions to Air Navigation or Navigational Aids or Facilities.

ppp. *Parallel Taxiway.* A taxiway parallel to a runway:

(1) *Dual Parallel Taxiways* – Two side-by-side taxiways, parallel to each other and the runway.

(2) *Full Parallel Taxiway* – A parallel taxiway extending the full length of the runway.

(3) *Partial Parallel Taxiway* – A parallel taxiway extending less than full length of the runway.

qqq. *Precision Approach (PA).* For the purposes of this AC, an instrument approach procedure that provides course and vertical path guidance with visibility below 3/4 mile (4000 RVR).

rrr. *Precision Runway.* A runway with at least one end having a precision approach procedure.

sss. *Runway (RW).* A defined rectangular surface on an airport prepared or suitable for the landing or takeoff of aircraft.

ttt. *Runway Design Code (RDC).* A code signifying the design standards to which the runway is to be built.

uuu. *Runway Incursion.* Any occurrence at an airport involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft.

vvv. *Runway Protection Zone (RPZ).* An area at ground level prior to the threshold or beyond the runway end to enhance the safety and protection of people and property on the ground.

www. *Runway Safety Area (RSA).* A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway.

xxx. *Shoulder.* An area adjacent to the defined edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface; support for aircraft and emergency vehicles deviating from the full-strength pavement; enhanced drainage; and blast protection.

yyy. *Small Aircraft.* An aircraft with a maximum certificated takeoff weight of 12,500 lbs (5670 kg) or less.

zzz. *Stopway (SWY).* An area beyond the takeoff runway, no less wide than the runway and centered upon the extended centerline of the runway, able to support the airplane during an aborted takeoff, without causing structural damage to the airplane, and designated by the airport authorities for use in decelerating the airplane during an aborted takeoff. A blast pad is not a stopway.

aaaa. *Takeoff Distance Available (TODA).* See Declared Distances.

bbbb. *Takeoff Run Available (TORA).* See Declared Distances.

cccc. *Taxilane (TL).* A taxiway designed for low speed and precise taxiing. Taxilanes are usually, but not always, located outside the movement area, providing access from taxiways (usually an apron taxiway) to aircraft parking positions and other terminal areas.

dddd. *Taxiway (TW).* A defined path established for the taxiing of aircraft from one part of an airport to another.

eeee. *Taxiway Design Group (TDG).* A classification of airplanes based on outer to outer Main Gear Width (MGW) and Cockpit to Main Gear distance (CMG).

ffff. *Taxiway Edge Safety Margin (TESM).* The distance between the outer edge of the landing gear of an airplane with its nose gear on the taxiway centerline and the edge of the taxiway pavement.

gggg. *Taxiway/Taxilane Safety Area (TSA).* A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft deviating from the taxiway.

hhhh. *Threshold (TH).* The beginning of that portion of the runway available for landing. In some instances, the threshold may be displaced. "Threshold" always refers to landing, not the start of takeoff.

iiii. *Threshold Crossing Height (TCH).* For the purposes of this AC, the TCH is the theoretical height above the runway threshold at which the aircraft's glideslope (GS) antenna would be if the aircraft maintains the trajectory established by the Instrument Landing System (ILS) GS, or the height of the pilot's eye above the runway threshold based on a visual guidance system.

jjjj. *Visual Runway.* A runway without an existing or planned instrument approach procedure.

kkkk. *Wingspan*. The maximum horizontal distance from one wingtip to the other wingtip, including the horizontal component of any extensions such as winglets or raked wingtips.

Appendix 9. Acronyms

A/FD	Airport/Facility Directory
AAA	Airport Airspace Analysis
AAC	Aircraft Approach Category
AAS-100	FAA Office of Airport Safety and Standards, Airport Engineering Division
AASHTO	American Association of State Highway and Transportation Officials
ABN	Airport Beacon
AC	Advisory Circular
ACM	Airport Certification Manual
ACRP	Airport Cooperative Research Program
ADG	Airplane Design Group
ADO	Airports District Office
ADRM	Airport Development Reference Manual
ADS-B	Automatic Dependent Surveillance - Broadcast
AFTIL	Airport Facilities Terminal Integration Laboratory
AGL	Above Ground Level
AIM	Aeronautical Information Manual
AIP	Airport Improvement Program
ALP	Airport Layout Plan
ALS	Approach Lighting System
ALSF	Approach Lighting System with Sequenced Flashing Lights
ALSF-1	ALS with Sequenced Flashers I
ALSF-2	ALS with Sequenced Flashers II
AOA	Aircraft Operations Area
APRC	Approach Reference Code
APV	Approach Procedure with Vertical Guidance
ARC	Airport Reference Code
ARFF	Aircraft Rescue and Fire Fighting
ARP	Airport Reference Point
ARSR	Air Route Surveillance Radar
ASBL	Approach Surface Baseline
ASDA	Accelerate Stop Distance Available
ASDE	Airport Surface Detection Equipment - (Radar)
ASDE-X	Airport Surface Detection Equipment – Model X
ASOS	Automated Surface Observing System
ASR	Airport Surveillance Radar
ASRS	Aviation Safety Reporting System
ASTM	American Society for Testing and Materials International
ATC	Air Traffic Control
ATCBI	Air Traffic Control Beacon Interrogator
ATC-F	Air Traffic Control Facilities
ATCRB	Air Traffic Control Radar Beacon
ATCT	Airport Traffic Control Tower
ATO	Air Traffic Organization
AWOS	Automated Weather Observing Systems

AWSS	Automated Weather Sensor System
BMP	Best Management Practice
BRL	Building Restriction Line
BUEC	Backup Emergency Communication System
CAD	Computer Aided Design
CAT	Category
CFR	Code of Federal Regulations
CIE	International Committee of Illumination
CL	Centerline
CWY	Clearway
CMG	Cockpit to Main Gear Distance
CNSW	Communications, Navigation, Surveillance and Weather
CPA	Continuous Power Airport
DA	Decision Altitude
DER	Departure End of Runway
DF	Direction Finder
DME	Distance Measuring Equipment
DMER	DME Remaining
DOD	Department of Defense
DPRC	Departure Reference Code
EAT	End-Around Taxiway
ECS	Emergency Communication System
EMAS	Engineered Materials Arresting System
ETB	Embedded Threshold Bar
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FATO	Final Approach and Takeoff Area
FBO	Fixed Base Operator
FM	Fan Marker
FOD	Foreign Object Debris
GBT	Ground Based Transceiver
GDL	Guidance Light Facility
GIS	Geographic Information System
GLS	Global Navigation Satellite System (GNSS) Landing System
GNSS	Global Navigation Satellite System
GPA	Glide Path Angle
GPS	Global Positioning System
GQS	Glide Path Qualification Surface
GS	Glideslope
GVGI	Generic Visual Glideslope Indicators
HAA	Height Above Airport
HATh	Height Above Threshold
HIRL	High Intensity Runway Lights
HSS	Hollow Structural Section
HTTP	Hypertext Transfer Protocol
IAP	Instrument Approach Procedures

IATA	International Air Transport Association
IES	Illuminating Engineering Society of North America
IFR	Instrument Flight Rules
IFST	International Flight Service Transmitter
ILS	Instrument Landing System
IM	Inner Marker
LDA	Landing Distance Available
LDIN	Lead-in Lighting System
LIR	Low Impact Resistant
LIRL	Low Intensity Runway Lights
LLWAS	Low Level Windshear Alert System
LMM	Compass Locator at the ILS Middle Marker
LNAV	Lateral Navigation
LOC	Localizer
LOM	Compass Locator at Outer Marker
LOS	Line of Sight
LP	Localizer Performance
LPV	Localizer Performance with Vertical Guidance
MALS	Medium Intensity Approach Lighting System
MALSF	MALS with Sequenced Flashers
MALSR	MALS with Runway Alignment Indicator Lights
MDA	Minimum Descent Altitude
MGW	Main Gear Width
MIRL	Medium Intensity Runway Lights
MM	Middle Marker
MN	Magnetic North
MODES	Mode Select Beacon System
MPH	Miles Per Hour
MSL	Mean Sea Level
MTOW	Maximum Takeoff Weight
NAS	National Airspace System
NAVAID	Navigation Aid
NCDC	National Climatic Data Center
NDB	Non-directional Beacon
NEPA	National Environmental Policy Act
NGS	National Geodetic Survey
NPA	Non-Precision Approach
NPDES	National Pollution Discharge Elimination System
NPIAS	National Plan of Integrated Airport Systems
nT	nanoTesla
NVGS	Non-Vertically Guided Survey
NXRAD	Next Generation Weather Radar
OAW	Off Airways Weather Station
OCS	Obstacle Clearance Surface
ODALS	Omnidirectional Airport Lighting System
OE/AAA	Obstruction Evaluation/Airport Airspace Analysis

OFA	Object Free Area
OFZ	Obstacle Free Zone
OM	Outer Marker
PA	Precision Approach
PAPI	Precision Approach Path Indicator
PAR	Precision Approach Radar
PCN	Pavement Condition Number
PFC	Passenger Facility Charge
PIR	Precision Instrument Runways
POFZ	Precision Obstacle Free Zone
PRM	Precision Runway Monitor
PSI	Pounds per Square Inch
RAIL	Runway Alignment Indicator Lights
RAPT	Regional Airspace Procedures Team
RBPM	Remote Beacon Performance Monitor
RCAG	Remote Communication Air to Ground
RCLR	Radio Communications Link Repeater
RCLT	Radio Communications Link Terminal
RCO	Remote Communications Outlet
RDC	Runway Design Code
REIL	Runway End Identifier Lighting
REL	Runway Entrance Lights
RMLR	Radar Microwave Link Repeater
RMLT	Radar Microwave Link Terminal
RNAV	Area Navigation
RNP	Required Navigation Performance
ROFA	Runway Object Free Area
ROFZ	Runway Obstacle Free Zone
RON	Remain Over Night
RPZ	Runway Protection Zone
RRH	Remote Readout Hygrothermometers
RSA	Runway Safety Area
RTR	Remote Transmitter/Receiver
RVR	Runway Visual Range
RW	Runway
RWSL	Runway Status Lights
SACOM	Satellite Communications Network
SAWS	Stand Alone Weather Sensors
SMS	Safety Management System
SOP	Standard Operating Procedures
SRM	Safety Risk Management
SSALR	Simplified Short Approach Light System with Runway Alignment
SSALS	Simplified Short Approach Light System
SSALF	Simplified Short Approach Light System with Sequenced Flashing Lights
SSO	Self-Sustained Outlet
SWY	Stopway

TACAN	Tactical Air Navigation
TCH	Threshold Crossing Height
TDG	Taxiway Design Group
TDWR	Terminal Doppler Weather Radar
TERPS	Terminal Instrument Procedures
TESM	Taxiway Edge Safety Margin
TH	Threshold
THL	Takeoff Hold Lights
TL	Taxilane
TMLR	Television Microwave Link Repeater
TODA	Takeoff Distance Available
TOFA	Taxiway and Taxilane Object Free Area
TORA	Takeoff Run Available
TRACON	Terminal Radar Approach Control Facility
TSA	Taxiway/Taxilane Safety Area
TSR	Transportation Security Regulation
TSS	Threshold Siting Surface
TVOR	Terminal Very High Frequency Omnidirectional Range
TW	Taxiway
UAS	Unmanned Aircraft Systems
USC	United States Code
UFC	Unified Facilities Criteria
UHF	Ultra-High Frequency
USDA	United States Department of Agriculture
USGS	U.S. Geological Survey
V	Visual
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VGS	Vertically Guided Survey
VGSI	Visual Guidance Slope Indicator
VHF	Very High Frequency
VNAV	Vertical Navigation
VOR	VHF Omnidirectional Range
VORTAC	VHF Omnidirectional Range Collocated Tactical Air
VOT	VHF Omnidirectional Range Test
WAAS	Wide Area Augmentation System
WBDG	Whole Building Design Group
WCAM	Weather Camera
WEF	Wind Equipment F-400
WME	Wind Measuring Equipment
WRS	WAAS Reference System