Update Airport Layout Plan
Chapter Five

Alternatives Analysis

Chapter Five – Alternatives Analysis

5.0 Introduction

This chapter describes various development alternatives which should be considered to accommodate the facility requirements analysis and recommendations.

Several issues are of importance.

1. Potential Accommodation of Larger Business or Corporate Aircraft
2. Plan for Additional Hangars and Apron
3. Protect Airspace and Land Use
4. FAA Design Standards Compliance.

Although apparently separate and distinct, the above issues are all related and one impacts the other in obvious and in some more subtle ways. Chapter Three established that the Airport may experience aircraft operations which suggest an airport design standards change from the current Personal (A-I) Class to Business (B-II) class.

The focus of this section is to identify the merits and deficiencies of the development alternatives and to provide the technical basis necessary for determining a preferred course of action. Airside requirements such as a range of runway lengths and apron needs, along with other airfield design standards were previously identified, and complement discussions in this chapter.

An analysis of how to adopt both current and potential business class aircraft design standards, including a runway extension, will be analyzed. Hangars of various sizes and types may be accommodated on the existing Airport property envelope or with additional land acquisition. Airspace and land use protection is integrated into the above analyses. An appendix following this document contains a recommended airport overlay district for airspace and land use protection and alternatives incorporate the spirit and intent of this TXDOT document.

Analyses will be made for the following criteria:

1) Operational effectiveness
2) Airspace considerations
3) Land resource utilization
4) Environmental considerations
5) Terminal/landside operational effectiveness
6) Flexibility and expandability issues
7) Construction/phasing issues
8) Revenue generation
9) Opportunities for private investment.

Overall, a selected course of action for the future represents the formulation of a development policy as much as the process of concept selection. The development policy should:

a) Comply with FAA standards/guidelines,
b) Be compatible with other existing and proposed uses on and off the airport,
c) Dovetail with City planning and zoning,
d) Minimize negative environmental impacts,
e) Be cost-effective,
f) And, be compatible with City economic development prerogatives.

5.1 Alternatives

First and foremost is analysis for selection of Runway 17-35's future airfield design standards, all-weather capabilities and length. The previous chapter established that the Airport may see increasing numbers of aircraft operations which are larger, heavier and faster than currently being experienced. Recommendation was formalized in previous chapters to analyze design standards compliance with Business (B-II) airport design standards along with consideration for an increase in runway length.

For purposes herein, three alternatives are described, and depictions follow the analysis:

Exhibit A1
Depicts the Airport *as is* with existing Personal (A-I) Class FAA airport design standards compliance, including a minimal runway extension and no IAP. This alternative is essentially a *no change* alternative except current FAA airport design standards are applied.

Exhibit A2
Depicts the Airport with potential future Business (B-II) Class FAA airport design standards compliance, including a runway extension to 5,000 feet and improved all-weather capabilities with 1-mile IAPs on both Runways 17 and 35.

Exhibit A3
Depicts the Airport with potential future Business (B-II) Class FAA airport design standards compliance *at an alternative location*, including a 5,000 foot runway and improved all-weather capabilities with 1-mile IAPs on both runway ends.

Features common to all alternatives include:

a) Tree clearing recommended based upon design standards to provide airspace protection for a given 80 foot tree. This light green area in the depiction constitutes *Should Buy* Land acquisition to comply with airport design standards and airspace clearances. *Should Buy* in this context means that land purchase is not a requirement, but a recommendation via purchase of an avigation/tree clearing easement.

b) *Must Buy* land acquisition to comply with airport design standards as shown in purple. The area's limits are primarily derived as a consequence of design standards compliance and the airspace necessary to clear a future perimeter fence.

c) An AWOS and its 500 foot radius critical area, within which no building should be located and easement acquired.

d) Suitable apron and hangars.

e) A 35-foot Building Restriction Line (BRL). The BRL encompasses and protects aircraft operations. The purpose of the BRL is to keep planned development, hangars and other tall objects greater than 35 feet at a distance from the runway.

More detail for each of the alternatives follows:

<u>Exhibit A1</u>
This alternative shows the recommended improvements for design standards compliance with Personal (A-I) Class airport design standards with no IAP or runway extension improvements.

Tree clearing on and off Airport property should be completed on either side of and beyond runway and extended runway centerline to provide for clear airspace. This recommendation is based upon application of a 20:1 approach surface and the 7:1 transitional surface for a surrounding average tree height of 80 feet as depicted on the typical cross-section and profile view.

Approximately 11 acres of private property is proposed for *Must Buy* fee simple acquisition. Approximately 6 acres associated with the Runway 35 RPZ, as shown in the lighter purple, is proposed for *Should Buy* fee acquisition. FAA does not currently mandate purchase of the RPZ, but requires extensive coordination and justification if it is not purchased. The remaining *Should Buy* property acquisition area is approximately 85 acres as shown in light green. This area is proposed for *Should Buy* avigation/tree clearing easement acquisition.

Other items which are addressed with this alternative include:

1. Reconstruction of Runway 17-35 with a relocation on the north end and an extension of the south end,
2. A new hangar/apron area given that the existing apron and hangar are too close to the runway,
3. And, new airport lighting and visual landing aids.

With respect to the first item, the runway reconstruction projects, the following improvements are noteworthy:

- Runway markings should be modified for design standards compliance. Runway crossing conditions potentially created with hangars on both sides of the runway should be remedied via relocation of the hangar.

- Runway 17-35's longitudinal gradient exceeds FAA's required two percent; and, the runway's transverse grade may not reach FAA's required one percent in select locations. The grades should be fixed with reconstruction.

- The Runway 17 20:1 approach surface is likely penetrated by roads, power lines, trees, and buildings. The ROFA/RSA overlap Road 908 on north runway end and the property line on the south runway end. The Runway 17 threshold should be relocated 600 feet south to clear.

- TXDOT recommends a minimum 3,270 foot long runway at RCK. Given a 600 foot relocation and a minimum 3,270 foot runway, a southerly runway extension is planned. Note that an underground gas line may exist just beyond (±500 feet) the current south runway end. This line may need to be lowered or relocated.

- The 20:1 approach surface emanating from the new Runway 35 end is likely penetrated by power lines and trees.

- Incompatible land uses likely within the immediate airfield area with insufficient property ownership for 35-foot BRL. Property associated with an abandoned rail line easement within the ROFA may have been vacated/transferred. The east-side 7:1 surface is penetrated by trees, hangars, fueling station/tanks, power lines, while the west-side 7:1 is penetrated by trees.

With respect to the second item, apron/hangar area projects, the following improvements are noted:

- The holdline is at a non-standard separation (±65 feet from runway centerline, while it should be a minimum 125 feet. All aircraft parking apron/ramp and the southern-most hangar is within ROFA. Auto access is also within ROFA near its intersection with the apron. The two historical hangars may have reached the end of their useful lives, as unsafe conditions have been noted within.

With respect to the third item, airfield lighting and visual aids projects, the following improvements are noted:

- Non-standard LIRL (and other existing airfield lighting) in sub-optimal condition. RNAV IAPs, Beacon, AWOS, PAPI, REIL, other airfield signage absent. MIRL should be installed. Segmented circle in non-standard location.

ADG understands that RCK was donated by Mr. H.H. Coffield himself a number of years ago, and that upon his passing the title for properties upon which the Airport currently rests were transferred to the City with the express understanding that the property would remain City property as long as its use remained an airport.

ADG understands that it is possible that non-standard condition disposition and airspace/ obstruction mitigation will require substantial investment. Portions of property acquisition for existing agricultural residential properties around airport property and the rail right-of-way may prove difficult, given existing property owner prerogatives.

Given that the Committee is considering landside development with runway access for business development purposes, this alternative will not be responsive and expandability concerns exist. Alternative A2 was created to be responsive to City economic and business development purposes.

<u>Exhibit A2</u>
Given the potential desire/need to accommodate larger, faster and more expensive aircraft in the long-term, this alternative provides the ability to accommodate those aircraft with standards compliance.

This alternative shows planned improvements for design standards compliance with Business (B-II) Class airport design standards with an improved IAP to 1-mile for both Runway's 17 and 35.

Tree clearing on and off Airport property should be completed on either side of and beyond runway and extended runway centerline to provide for clear airspace. This recommendation is based upon application of a 34:1 approach surface and the 7:1 transitional surface for an surrounding average tree height of 80 feet as depicted on the typical cross-section and profile view.

Approximately 58 acres of private property is proposed for *Must Buy* fee simple acquisition. Approximately 10 acres associated with the Runway 35 RPZ, as shown in the lighter purple, is proposed for *Should Buy* fee acquisition. FAA does not currently mandate purchase of the RPZ, but requires extensive coordination and justification if it is not purchased. The remaining *Should Buy* property acquisition area is approximately 195 acres as shown in light green. This area is proposed for *Should Buy* avigation/tree clearing easement acquisition.

Other items which are addressed with this alternative include:

1. Reconstruction of Runway 17-35 with a relocation on the north end and an extension of the south end,
2. A new hangar/apron area given that the existing apron and hangar are too close to the runway,
3. And, new airport lighting and visual landing aids.

With respect to the first item, the runway reconstruction projects, the following improvements are noteworthy:

- Runway markings should be modified for design standards compliance. Runway crossing conditions potentially created with hangars on both sides of the runway should be remedied via relocation of the hangar.

- Runway 17-35's longitudinal gradient exceeds FAA's required two percent; and, the runway's transverse grade may not reach FAA's required one percent in select locations. The grades should be fixed with reconstruction.

- The Runway 17 34:1 approach surface is likely penetrated by roads, power lines, trees, and buildings. The ROFA/RSA overlap Road 908 on north runway end and the property line on the south runway end. The Runway 17 threshold should be relocated 1,100 feet south to clear.

- Although not likely justified for eligibility purposes at this time, an ultimate 5,000 foot runway length is shown. Given a 1,100 foot relocation and a minimum 5,000 foot runway, a southerly runway extension is planned. Note that an underground gas line may exist just beyond (±500 feet) the current south runway end. This line may need to be lowered or relocated.

- The 34:1 approach surface emanating from the new Runway 35 end is likely penetrated by power lines and trees.
- Incompatible land uses likely within the immediate airfield area with insufficient property ownership for 35-foot BRL. Property associated with an abandoned rail line easement within the ROFA may have been vacated/transferred. The east-side 7:1 surface is penetrated by trees, hangars, fueling station/tanks, power lines, while the west-side 7:1 is penetrated by trees.
- The above ground apparatus for the City of Rockdale water well is located within ROFA and should be lowered or relocated.

With respect to the second item, apron/hangar area projects, the following improvements are noted:

- The holdline is at a non-standard separation (±65 feet from runway centerline, while it should be a minimum 125 feet. All aircraft parking apron/ramp and the southern-most hangar is within ROFA. Auto access is also within ROFA near its intersection with the apron. The two historical hangars may have reached the end of their useful lives, as unsafe conditions have been noted within.

With respect to the third item, airfield lighting and visual aids projects, the following improvements are noted:

- Non-standard LIRL (and other existing airfield lighting) in sub-optimal condition. RNAV IAPs, Beacon, AWOS, PAPI, REIL, other airfield signage absent. MIRL should be installed. Segmented circle in non-standard location.

ADG understands that it is possible that non-standard condition disposition and airspace/ obstruction mitigation will require additional substantial investment.

Given that the Committee is considering landside development with runway access for business development purposes, expandability concerns persist; and now, through this alternatives process, may be an appropriate time to also consider other options.

It appears that selecting and developing an airport on a new property, elsewhere may be less costly and more palatable than preparing the existing airfield pursuant to Alternative No. 1, and then expanding it to accommodate the types of economic development envisioned by the Committee per Alternative No. 2.

Alternative No. 3 was created to be responsive to City economic and business development purposes at another site. It is important to note that this a sample site for purposes herein.

A formal site selection process is prerequisite to actual FAA/TXDOT investment in a new airport site. This site may not be the best. This site is considered herein because it is currently for sale, it is relatively close to the city proper, it is along FM Road 908 and its property envelope is able to accommodate business aviation activity with modifications. Specifically, ample area exists to co-locate an industrial/business park.

<u>Exhibit A3</u>

Given the potential desire/need to accommodate larger, faster and more expensive aircraft in the long-term, this alternative provides the ability to accommodate those aircraft with standards compliance at a new site.

This alternative shows planned improvements for design standards compliance with Business (B-II) Class airport design standards with an improved IAP to 1-mile for both Runways 17 and 35.

Tree clearing on and off Airport property should be completed on either side of and beyond runway and extended runway centerline to provide for clear airspace. This recommendation is based upon application of a 34:1 approach surface and the 7:1 transitional surface for surrounding an average tree height of 80 feet as depicted on the typical cross-section and profile view.

The property for sale consists of 600 total acres. Approximately 133 acres of the 600 acres requires tree clearance. Approximately 61 acres of the 600 acres would be within the fence, as depicted.

The configuration of the property is not sufficient to fully contain the airport and its desired airspace. Approximately 6 acres associated with the Runway 19 RPZ, as shown in the lighter purple, is proposed for *Should Buy* fee acquisition. FAA does not currently mandate purchase of the RPZ, but requires extensive coordination and justification if it is not purchased. The remaining *Should Buy* property acquisition area is approximately 120 acres as shown in light green. This area is proposed for *Should Buy* avigation/tree clearing easement acquisition.

Approximate ground elevations along the depicted runway alignment are such that a one percent overall centerline grade is produced. Elevations surrounding the runway alignment are relatively flat and should suit ancillary development.

The same facilities are planned with the alternative as with the previous. The following development is shown.

5.2 Landside Aviation Development

Specific aims for landside development in this section of the plan include:

1. Plan land uses and propose facilities which will meet anticipated demand, and which will also allow for continued demand accommodation in case regional economic activity is more robust than anticipated.
2. Plan land uses and propose facility locations which will allow the Airport to be as financially self-sufficient as possible.
3. Minimize runway and taxiway crossings from one side of the runway to another, and provide for an efficient airfield design.

Given that RCK may experience and wishes to plan to accommodate larger, faster and heavier aircraft, a transition from a Personal (A-I) Class facility to a more Business (B-II) Class facility has been hereto considered.

Rationale and justification for configuration and locations of future hangar and ramp are of primary importance and near-term, long-term and reserve development areas for aviation and non-aviation purposes should also be planned and potential hangar locations identified.

Examples of aviation-related land uses include:

1. General Aviation Terminal/Ramp
2. Corporate Aviation Terminal/Ramp
3. Air Cargo
4. Aircraft Maintenance and Support
5. Aircraft Rescue and Structural Firefighting
6. On-Field Agricultural/Agricultural Lease
7. Aviation-Related Light Industrial
    a. Parts Manufacturing and Assembly
    b. Flight Simulator
    c. Defense Contractor
    d. Aerial Photography/Photogrammetry
    e. Aerial Spray
8. Fixed Base Operation (FBO)
    f. Aircraft Charter, Storage, Sales
    g. Aircraft Repair and Wash
    h. Pilot Supplies
    i. Pilot Lounge, Flight Planning
    j. Flight Training
    k. Food Services/Catering
    l. Office/Overnight Accommodations
    m. Restrooms

9. Aircraft Storage
    n. T-Hangar
    o. Executive Hangar
    p. Mixed-Use Hangar
    q. T-Shade
10. U.S. Government
    r. Military
    s. Air Traffic Control
    t. Navigational Aids
    u. Homeland Security
    v. Public Safety and Emergency Facilities
    w. Weather Collection and Dissemination
    x. Satellite Communications.

Examples of non-aviation related land uses which are generally compatible in the airport area/ environment include:

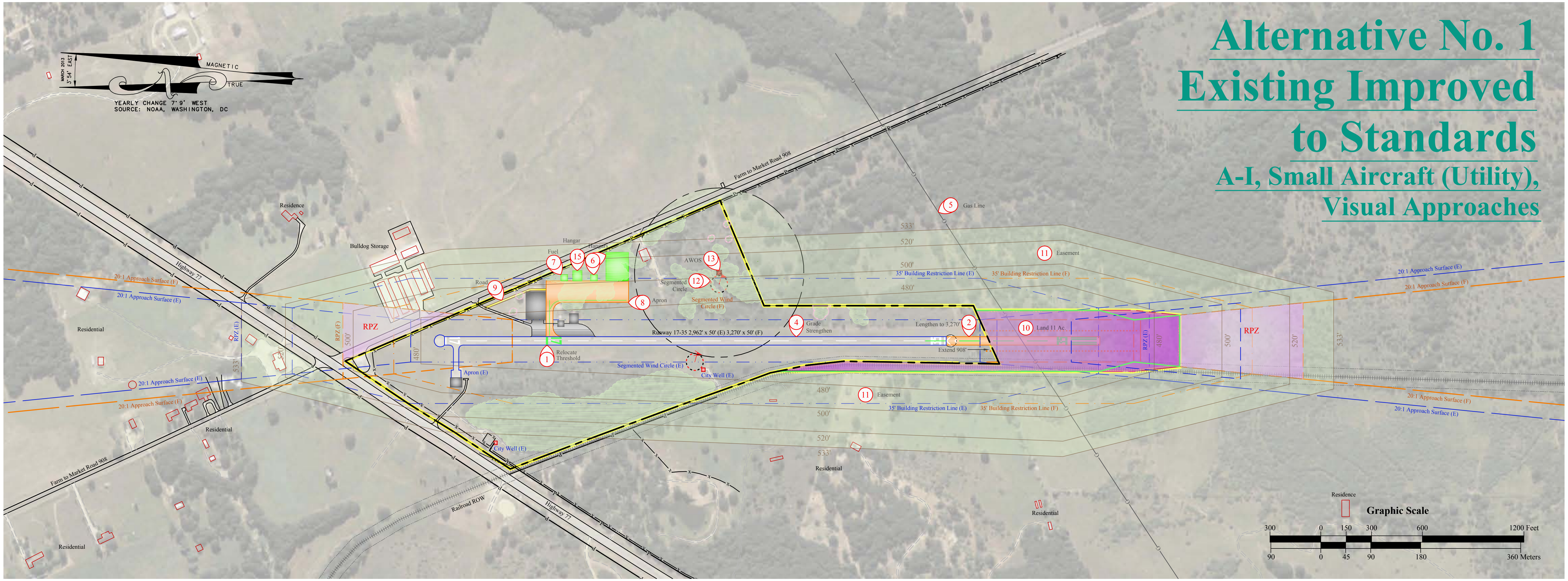
1. Postal Annex
2. Telecommunications Facilities
3. Greenhouses
4. Auto Mall/Large-Scale Retail
5. Rental Car Ready Return/Storage
6. Auto/Boat Storage and Mini-Storage
7. Light and Heavy Manufacturing
8. Warehousing/Storage
9. Data Storage
10. Recreational; Fields and Golf Course
11. Hotel/Motel
12. Support/Regional Businesses
    a. Bank
    b. Convenience Store
    c. Restaurant
    d. Coffee/Snack Shop.

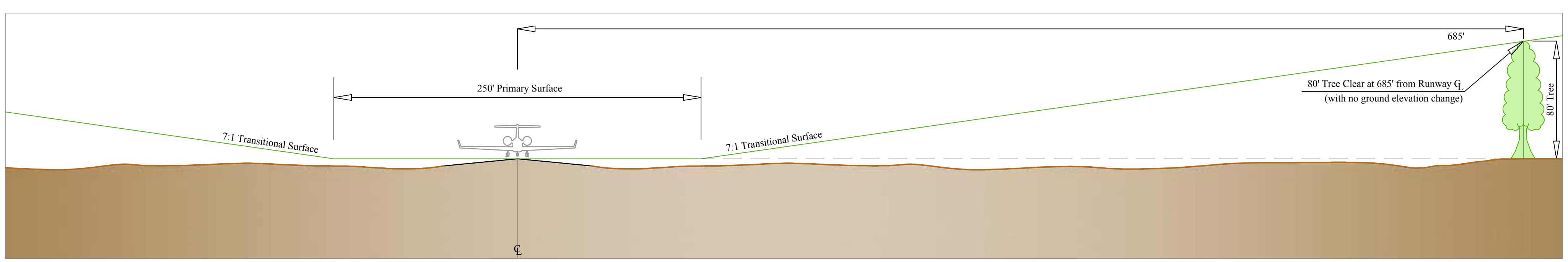
5.3 Consensus and Summary

These alternatives were presented to and discussed with the Committee in October 2012 at the presentation for Working Paper No. 1. The Committee and meeting participants were generally supportive of development to accommodate larger aircraft as discussed and depicted on Alternatives No. 2 and No. 3. This support was limited to the reality of the funding situation, in that meeting participants understood that general City and TXDOT funds is and will be limited for the foreseeable future.

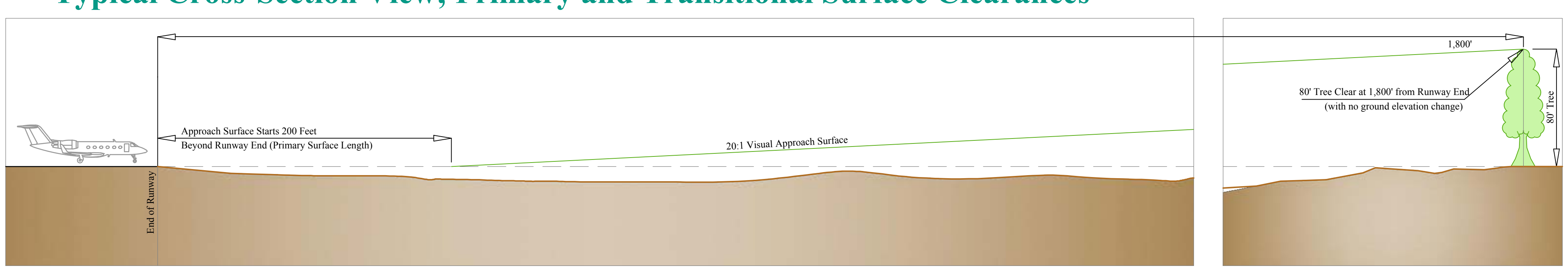
A good amount of discussion centered about the possibility of a new airport site using alternative financing mechanisms. An interested resident and business persons fielded the idea of one such mechanism; the sale of the existing airport property (were that found to be permitted), may be used to somewhat front airport development at an alternative site.

Alternative No. 1
Existing Improved to Standards
A-I, Small Aircraft (Utility), Visual Approaches





Typical Cross-Section View; Primary and Transitional Surface Clearances



Typical Profile View; Approach Surface Clearances

Legend

(E), (F)

- Existing, Future
- Existing Property Line
- Future Property Line
- Building Restriction Line (BRL)
- Runway Protection Zone (RPZ)
- Approach Surface
- Existing Pavement
- Future Pavement
- Existing Pavement To Be Removed
- Existing Buildings
- Future Buildings
- Existing Buildings To Be Removed
- Dirt Road
- Existing Paved Roads
- Future Paved Roads
- Drainage Line

Short-Term Improvements (2014 - 2018)

Improvement	Rough Cost Estimate
Reconstruct Runway 17-35: 1. Relocate Runway 17 Threshold 600' 2. Lengthen to 3,270' 4. Fix Longitudinal Grade, Fix Transverse Grade, Strengthen to 12,500 SWG 5. Relocate/Lower Gas Line	$2,550,000
New Hangar/Apron Area: 6. Relocate/Build 2 New Hangars 7. Relocate Self-Serve Fueling 8. Relocate Apron 9. Relocate Entrance Road	$1,675,000
10. Acquire Land To Clear Fence (11 Ac.) 11. Airspace/Tree Clearing Easement (±92 Ac.) (Clear 80' Tree)	$255,000
12. Relocate Segmented Circle	$6,000
13. Install Beacon, AWOS, Supplemental Windcones	$185,000
14. Install MIRL, REILs and PAPI (17 and 35), Airfield Signage	$1,220,000
15. Relocate West-side Hangar (requires inline taxiway)	$520,000
TOTAL ESTIMATE	$6,411,000

No.	Revision	Ckd	Date

H.H. Coffield Regional Airport
Rockdale, TX

AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 950
Denver, Colorado 80210-3802
303.782.0882 / 303.782.0842 fax
www.ADGAirports.com

TxDOT Contract Number: 2X1AV064

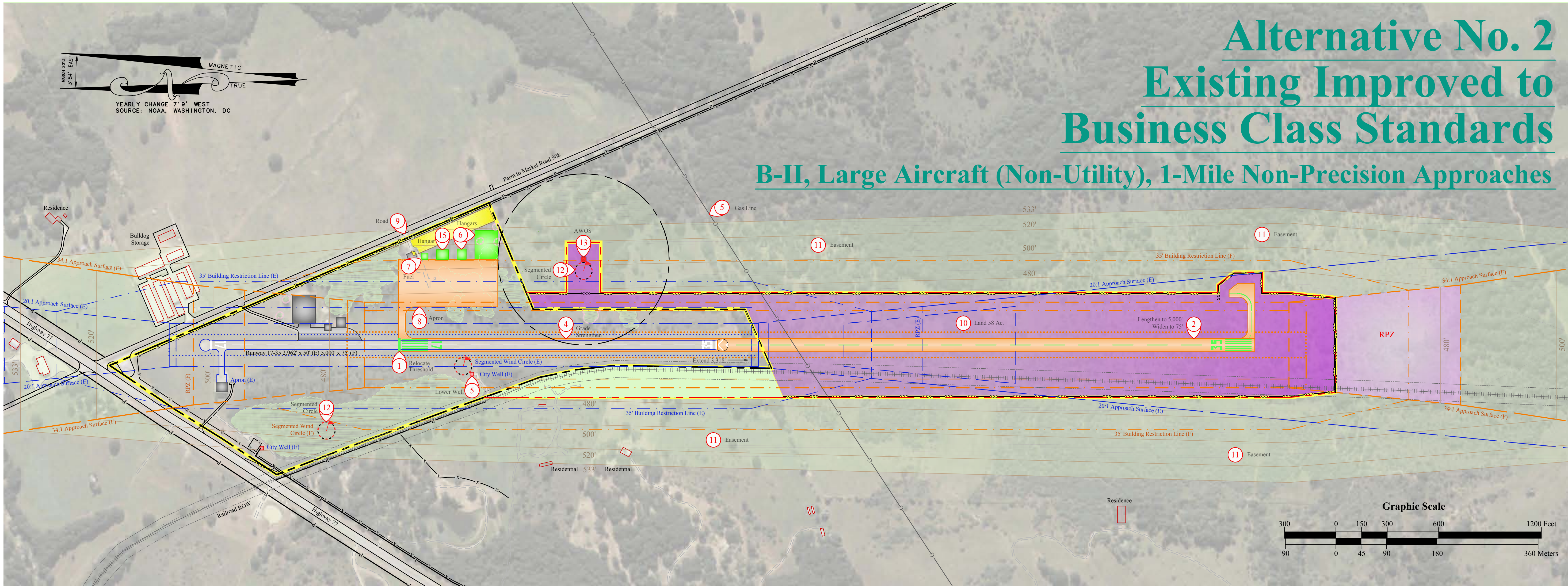
Project No.:	RCK1400M
Designed By:	SPM
Drawn By:	MTP
Approved By:	SMP
Date:	April 2013

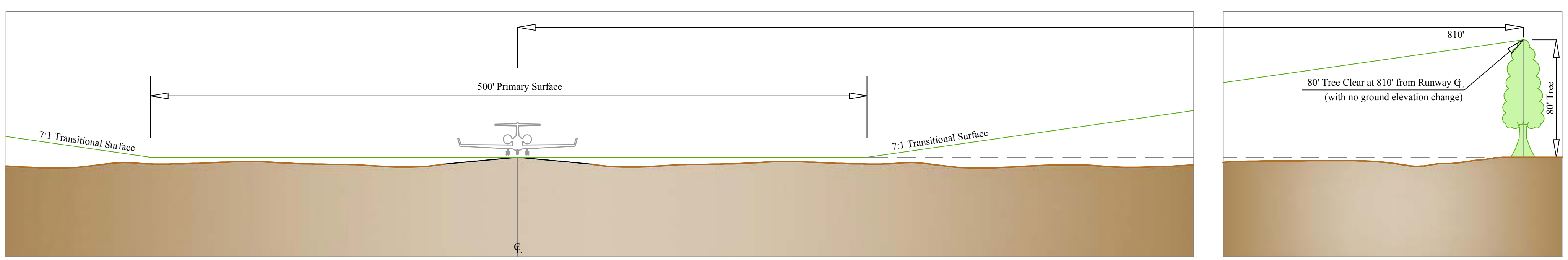
Alternative No. 1 Existing Improved To Standards

Exhibit:
A1
of 4 Exhibits

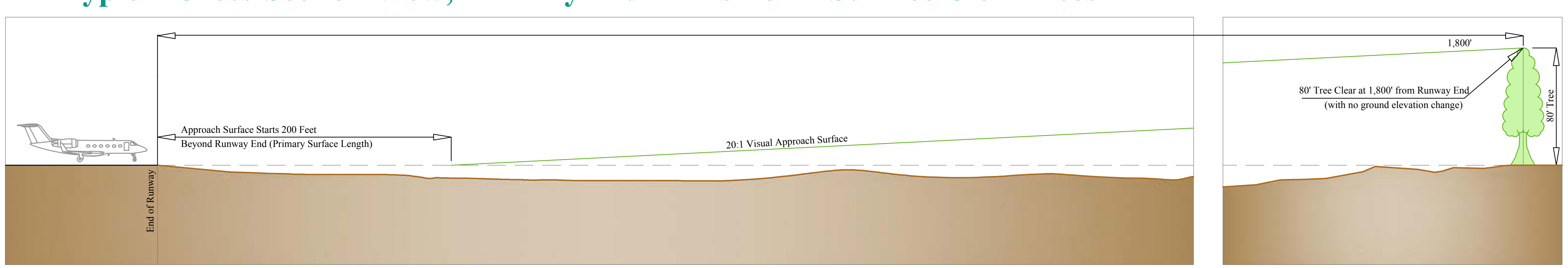
Alternative No. 2
Existing Improved to Business Class Standards

B-II, Large Aircraft (Non-Utility), 1-Mile Non-Precision Approaches

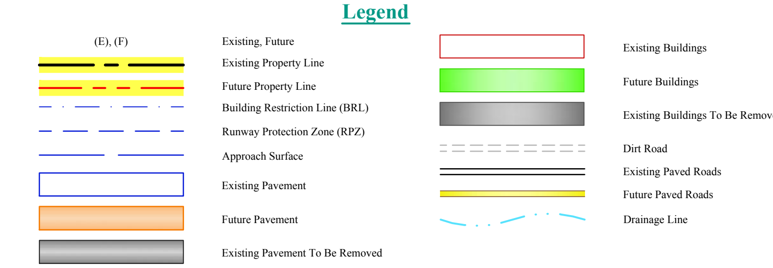




Typical Cross-Section View; Primary and Transitional Surface Clearances



Typical Profile View; Approach Surface Clearances



Inermediate-Term Improvements (2019-2023)	
Improvement	Rough Cost Estimate
Expand Runway 17-35: 1. Relocate Runway 17 Threshold 1,100' 2. Lengthen to 5,000' and widen to 75' 4. Fix Longitudinal Grade, Fix Transverse Grade, Strengthen to 30,000 DWG 5. Relocate/Lower Gas Line and City Well	$4,510,000
New Hangar/Apron Area: 6. Relocate/Build 2 New Hangars 7. Relocate Self-Serve Fueling 8. Relocate Apron 9. New Entrance Road	$2,800,000
10. Acquire Land To Clear Fence (58 Ac.) 11. Airspace/Tree Clearing Easement (±195 Ac.) (Clear 80' Tree)	$1,020,000
12. Relocate Segmented Circle	$6,000
13. Install Beacon, AWOS, Supplemental Windcones	$185,000
14. Install MIRL, REILs and PAPI (17 and 35), Airfield Signage	$1,650,000
15. Relocate West-side Hangar (requires inline taxiway)	$520,000
TOTAL ESTIMATE	$10,691,000

No.	Revision	Ckd	Date

H.H. Coffield Regional Airport
Rockdale, TX

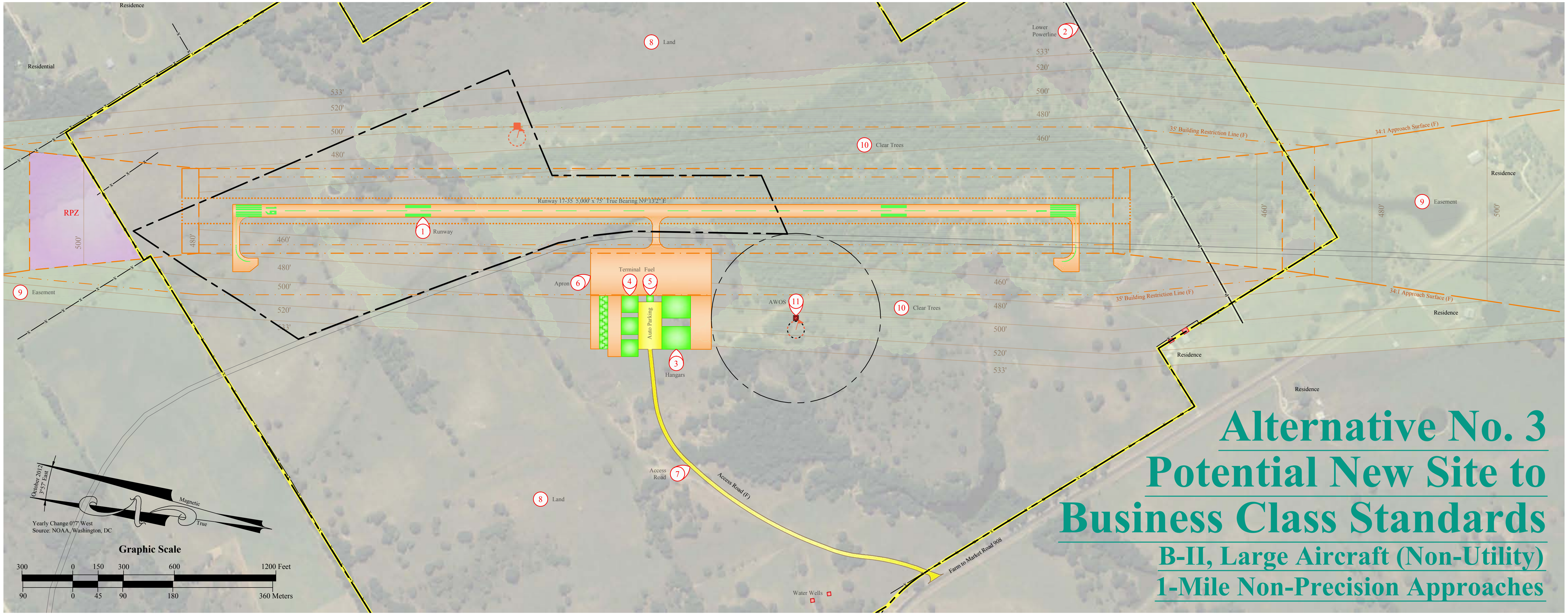
ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street | Suite 950
Denver, Colorado 80210-3802
303.782.0882 | 303.782.0842 fax
www.ADGAirports.com

TxDOT Contract Number: 2X1AV064

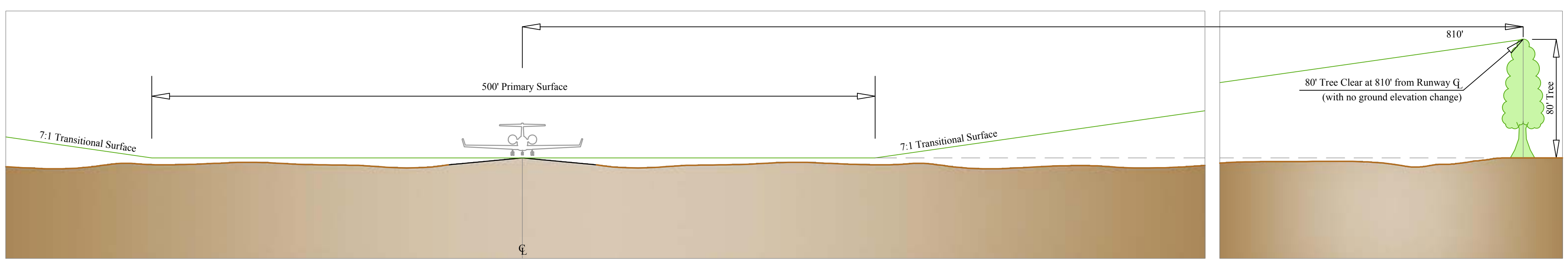
Project No.: RCK1400M
Designed By: SPM
Drawn By: MTP
Approved By: SMP
Date: April 2013

Alternative No. 2 Existing Improved to Business Class Standards

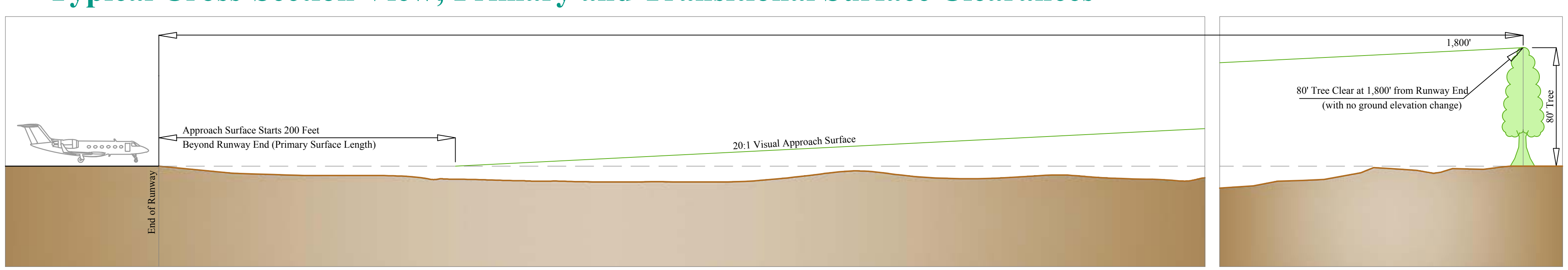
Exhibit: **A2** of 4 Exhibits



Alternative No. 3
Potential New Site to Business Class Standards
B-II, Large Aircraft (Non-Utility)
1-Mile Non-Precision Approaches



Typical Cross-Section View; Primary and Transitional Surface Clearances



Typical Profile View; Approach Surface Clearances

Legend

(E), (F) Existing, Future
- Existing Property Line
- Future Property Line
- Building Restriction Line (BRL)
- Runway Protection Zone (RPZ)
- Approach Surface
- Existing Pavement
- Future Pavement
- Existing Pavement To Be Removed
- Existing Buildings
- Future Buildings
- Existing Buildings To Be Removed
- Dirt Road
- Existing Paved Roads
- Future Paved Roads
- Drainage Line

Long-Term Improvements (2024-2033)

Improvement	Rough Cost Estimate
New Runway 1-19: 1. Construct Runway 17-35 to 5,000 feet by 75 feet at 30,000 DWG Strength 2. Relocate/Lower Power Line	$5,125,000
New Hangar/Apron Area: 3. Build 2 New Hangars (and Relocate 1 Existing Hangar) 4. New Terminal 5. Install Self-Serve Fueling 6. Construct New Apron 7. New Entrance Road	$3,250,000
8. Acquire Land (Existing Ranch for Sale (±600 Ac.) 9. Airspace/Tree Clearing Easement (±120 Ac.) (Clear 80' Tree)	$1,500,000
10. Clear Trees on Ranch for 80' Clearance (±133 Ac.)	$120,000
11. Install Beacon, AWOS, Supplemental Windcones	$195,000
12. Install MIRL, REILs and PAPI (17 and 35), Airfield Signage	$1,650,000
TOTAL	$11,840,000

No.	Revision	Ckd	Date

H.H. Coffield Regional Airport
Rockdale, TX

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 950
Denver, Colorado 80210-3802
303.782.0882 / 303.782.0842 fax
www.ADGAirports.com

TxDOT Contract Number: 2X1AV064

Project No.:	RCK1400M
Designed By:	SPM
Drawn By:	MTP
Approved By:	SMP
Date:	April 2013

Alternative No. 3 Potential New Site with Business Class Standards

Exhibit: **A3** of 4 Exhibits