FRESNO CHANDLER
EXECUTIVE AIRPORT

Airport Master Plan Update

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1 Introduction

This Master Plan Update (MPU) provides a strategic vision for the growth and operation of Fresno Chandler Executive Airport (FCH or the Airport) over the next 20 years and establishes an updated framework to help guide landside, airside, and development decisions on and near the Airport.

The previous Master Plan Update was adopted in 1999. Since that time there have been updates to the comprehensive document, once in 2005, *Fresno Chandler Executive Airport Focused Master Plan Update for North Side Development* and again in 2009, *Airport Layout Plan Narrative Report*. In accordance with Federal Aviation Administration (FAA) programs and guidance, this Master Plan Update will supersede the previous plans and updates to reflect the changes that have occurred in the aviation industry as well as the economy. The goals of this MPU are to address those changes and ensure that regional aviation needs are met in a feasible and fiscally responsible manner. The update also ensures that ongoing Airport development maintains a safe and efficient movement of passengers and products while being compatible with the surrounding community and environment.

1.1 The Importance of General Aviation Airports

General aviation (GA) airports like FCH support a variety of aviation functions, but do not typically provide scheduled airline service (FAA 2012). Personal and business flying account for much of the activity at these airports, and for-hire air taxi and air charter businesses may also operate at GA airports. GA airports provide benefit to their communities because they:

- Are gateways to the world that connect people, businesses, and cargo to the global air transportation network
- Support economic growth and vitality at the local, regional, and national levels through job creation, business activity, and tourism
- Relieve congestion at nearby commercial service airports by providing alternate facilities for general aviation activity
- Provide access to emergency and public safety services such as law enforcement, fire and rescue, border protection, and medical transport
- Support flight training activities to help maintain a supply of pilots for airlines and the military
- Provide door-to-door access to small and remote communities

According to the study, *Contributions of General Aviation to the U.S. Economy in 2013* – prepared by Price Waterhouse Coopers, LLP for the General Aviation Trade Association – general aviation activities contributed over $30.2 billion of total economic output to California's economy in 2013. This includes all direct and induced activities related to the manufacturing and operation of general aircraft (i.e., those not used for scheduled airline service or operated by the military). The study further estimated that 166 million passengers travel on general aviation flights each year in the U.S. These passengers tend to purchase goods and services in destination cities including hotel rooms, local meals, rental cars, and other miscellaneous items. These enabled activities provide additional economic benefits to the local communities served by general aviation. The Price Waterhouse Coopers report estimates enabled activity contributes $709 million to California's economic output and support 14,700 jobs annually (Price Waterhouse Coopers, LLP 2015).

1.2 Airport Master Planning

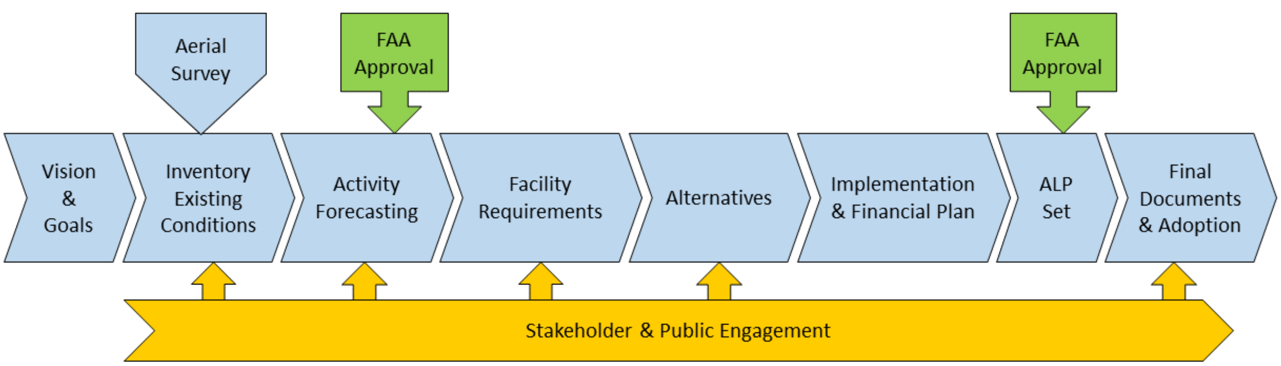
An airport master plan is a comprehensive study that evaluates an airport's existing facilities, current market trends, forecasts future activity levels, and assesses facility requirements to accommodate those needs. Airport master plans are undertaken to preserve and maximize the public benefit generated by an individual airport; focused local planning is needed to reflect the market conditions and community environment at that specific airport. Ultimately, these plans support and justify investment in specific capital improvement projects at an airport.

The results of this master plan for FCH provide the City of Fresno (as the Airport owner), stakeholders, government officials, and regulatory agencies with an organized and rational plan for maintaining and developing the Airport's facilities over near-, mid-, and long-term planning horizons (5, 10, and 20 years), with the earlier periods providing more specific detail and the latter periods providing broader guidance.

1.2.1 Planning Process

The scope of work for this MPU was developed in cooperation with the FAA, and the work elements are consistent with guidance provided in FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*. The planning process involves several key elements as identified in **Figure 1-1**. These include defining the study goals, taking an inventory on existing conditions, forecasting future activity levels, identifying user needs and facility requirements, evaluating alternative development scenarios, selecting the preferred concept, and preparing an implementation/capital improvement plan (CIP). The results of the study are documented in a technical report and set of Airport Layout Plan (ALP) drawings that depict the existing airport facilities and environs with the proposed future improvements.

Figure 1-1 – Master Planning Process



Source: Kimley-Horn & Associates

While coordination with the FAA occurs throughout the process, the two elements of a master plan study that are officially approved by the FAA are the activity forecasts and ALP drawings. These two items are used by the FAA to justify and support funding assistance for eligible projects under the FAA's Airport Improvement Program (AIP).

1.2.2 Stakeholder and Public Involvement

Master plans are local planning efforts that must address the needs of the airport owner. This MPU has been prepared to address the needs of the City and the various users and stakeholders that rely on the Airport and its facilities. For that reason – and to ensure that future development is in concert with the community and other local initiatives – outreach and public involvement was prevalent throughout the study process.

A Planning Advisory Committee (PAC) was established to provide insight on Airport operational matters and local/regional activities and concerns. The PAC also functioned as an information conduit to their respective organizations' constituencies. The PAC met three times during the study and were given the opportunity to review and comment on draft report chapters that were prepared. The PAC consists of the following organizations:

- FAA California Airports District Office
- Fresno County
- City of Fresno
- FCH Hangar Tenants & FBOs
- Other Stakeholders

In addition to the PAC meetings, two informational workshops/public meetings were held to present the study and gain input from the general public and neighboring communities. The first meeting was held during the draft activity forecast stage to provide an introduction and overview of the study findings up to that point. The second meeting was held during the selection of the preferred development concepts to gain community support and confirm no major public conflicts exist.

1.2.3 Study Goals, Vision & Mission

The overarching goal of this MPU is the accessibility and long-term operational sustainability of FCH. This includes meeting public aviation and local business needs in a feasible and fiscally responsible manner. Additionally, the study is also meant to guide optimal Airport development in accord with the community and environment.

The vision of Fresno Chandler Executive Airport is to be the general aviation airport of choice serving the economic hub of California's Central Valley. Its mission is to provide an essential transportation link to that hub while preserving its historic tradition, serving the community, and fostering innovation in aviation. This vision and mission was developed and confirmed by the Airports Department and members of the PAC.

1.3 About Fresno Chandler Executive Airport

The following provides a general overview of the Airport, including the role of FCH in the state and regional stage, a brief history of FCH, and an overview of the Airport management structure.

1.3.1 Location

Located in the heart of Central California, Fresno is the fifth largest city in the state with a diverse population of over half a million people (U.S. Census Bureau 2016). It is within a three-hour drive from San Francisco and three-and-a-half hours from Los Angeles. According to the Brooking Institution's Metropolitan Policy Program, the Fresno metropolitan area – which consists of Fresno and Madera counties – was ranked as one of the world's fastest growing economies for 2013-2014. The area was ranked the fourth fastest growing U.S.

metropolitan area preceded only by Austin and Houston, TX and Raleigh, NC (Fresno County Economic Development Corporation 2016).

FCH is one-and-a-half miles west of downtown Fresno and occupies approximately 200 acres of land. The site itself is conveniently located for business travelers traveling to and from the downtown area. In support of local economic development, FCH is also home to several businesses and supports training programs with Reedley College. **Figure 1-2** depicts the Airport location in the context of the six surrounding counties.

Figure 1-2 – Airport Location

Source: ESRI, USGS, OpenStreetMaps, prepared by Kimley-Horn & Associates

1.3.2 History

FCH is one of the oldest operational airports in California. Following World War I, FCH began informally as an airfield when the Chandler family allowed pilots to operate on their property after their crops were harvested. In 1929, the property was dedicated as a public-use airfield on a 100-acre site donated by the Chandler family. During the Great Depression, funds from the WPA – Works Progress Administration – were used to construct four buildings at the Airport in 1936-1937. The terminal, administration, bathroom, and electrical control buildings were designed by different architects in efforts to employ as many people as possible during that time. In 1938, the original runway was reoriented and lengthened. The Airport was served by commercial airlines from 1930-1947 (Mead & Hunt 2005). Today, Fresno Chandler Executive works in conjunction with Fresno Yosemite International (FAT) and continues to serve a need for the general aviation community.

1.3.3 Ownership and Management

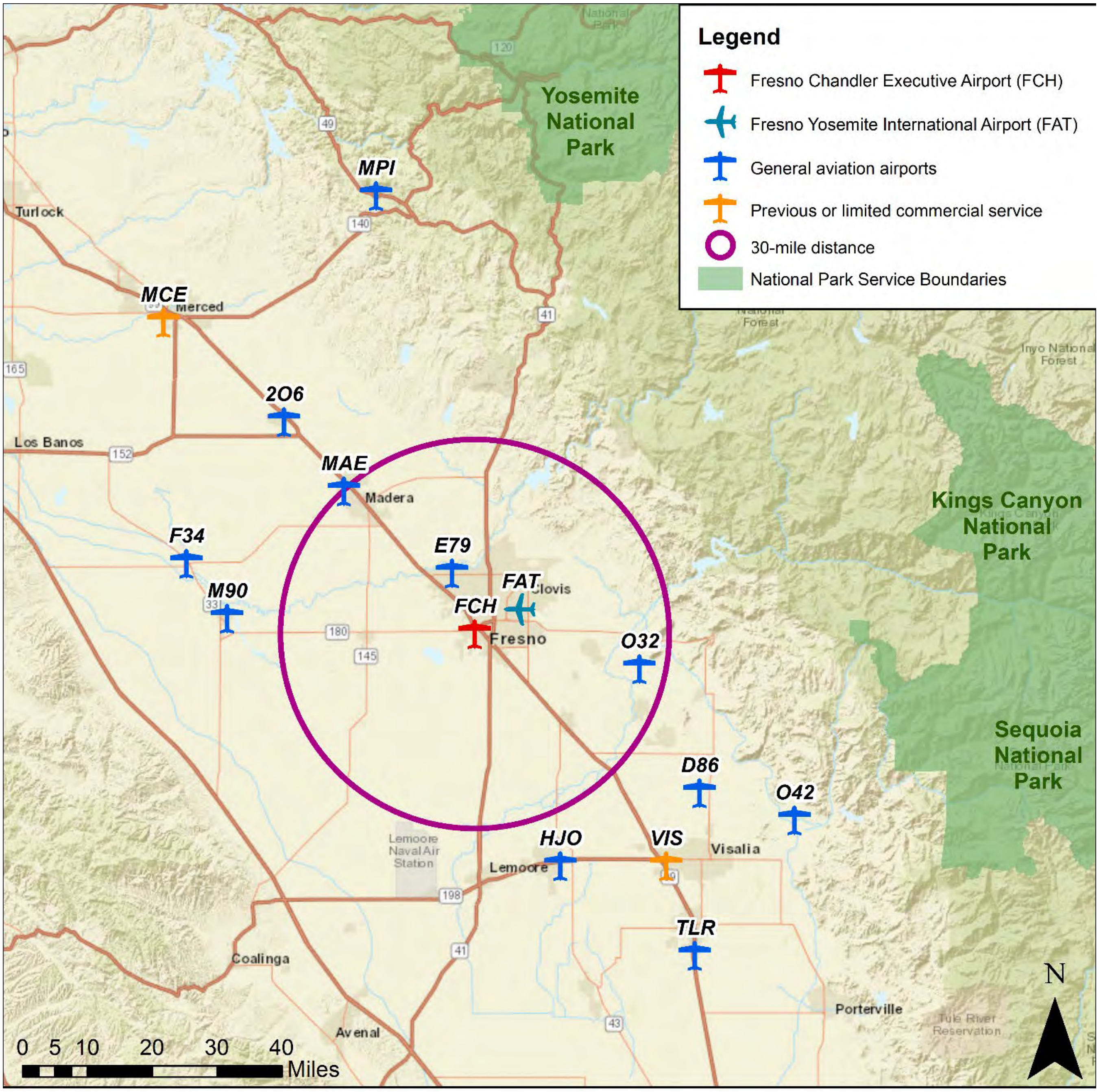
The City of Fresno owns and operates Fresno Chandler Executive and Fresno Yosemite International Airports under the Airports Department within the City's administration. Airport staff are led by the Director of Aviation (Director) who reports to the City Manager. The Director represents the City in all matters concerning FCH and FAT, including setting policy and general guidelines and approving development and maintenance programs. The Director is supported by a staff of approximately 120 people across the various organizational divisions. The team is committed to offering a quality experience at both FCH and FAT.

1.3.4 Airport Role

The FAA's National Plan of Integrated Airport Systems (NPIAS) identifies approximately 3,300 public-use airports as significant to the national air transportation system. The NPIAS is used by the FAA in managing and administering the AIP and supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility. According to the NPIAS, the FAA categorizes FCH as a 'reliever' airport. As such, FCH is intended to attract general aviation traffic – as opposed to commercial service – from FAT, thus providing improved general aviation access to the overall community and providing more operational capacity at FAT. In the context of the California Aviation System Plan, FCH is designated as a 'regional general aviation airport' (CALTRANS 2003).

While FCH works in concert with FAT, the Airport is surrounded by several other general aviation airports in the vicinity that naturally act as regional competition; regional general aviation airports within a 30-minute drive are illustrated in **Figure 1-3**.

Figure 1-3 – Regional General Aviation Competition



Source: FAA 2017 -2021 National Plan of Integrated Airport Systems (NPIAS), ESRI, USGS, OpenStreetMaps, prepared by Kimley-Horn & Associates

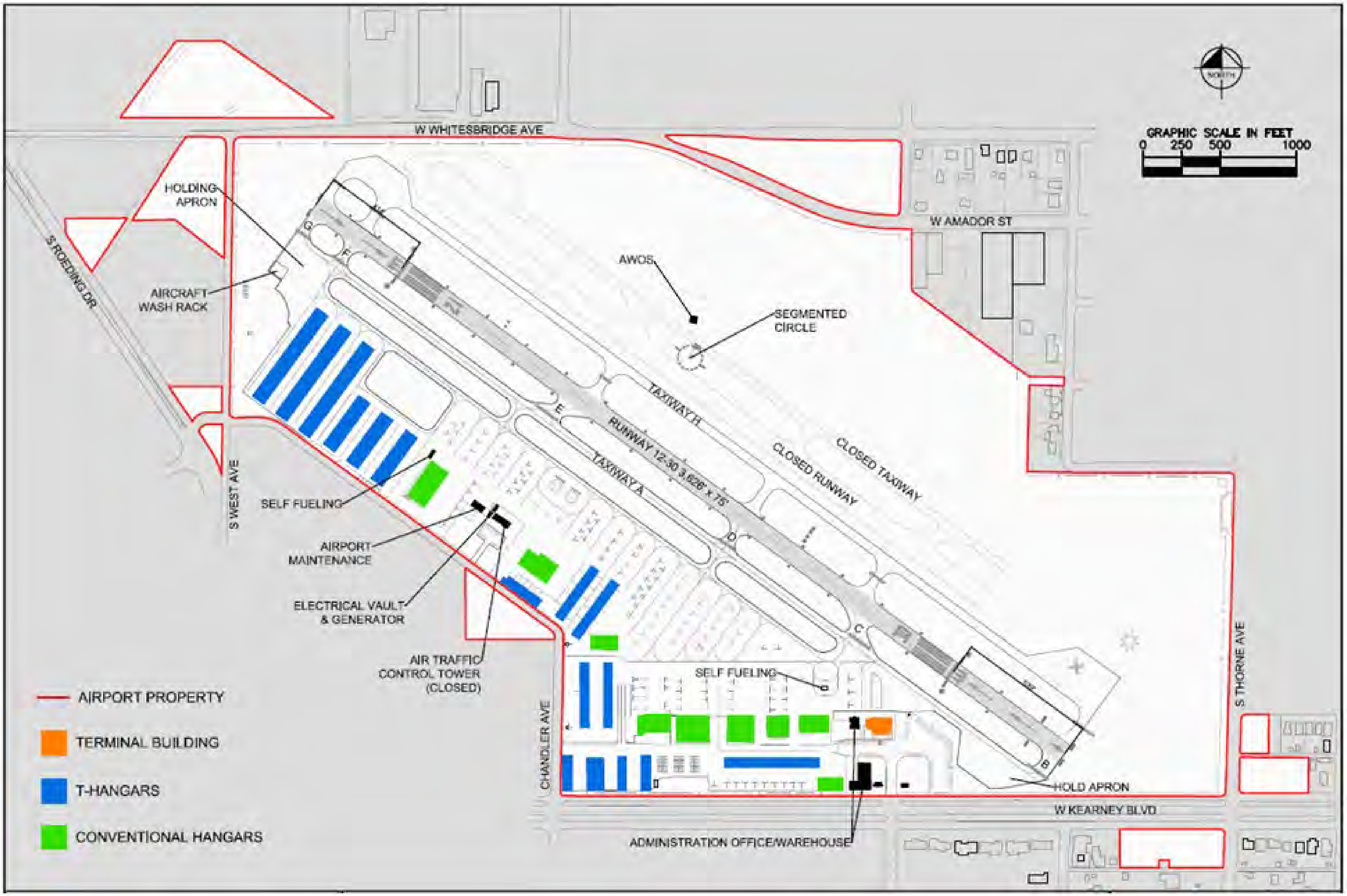
2 Inventory of Existing Conditions

The following section describes the local setting, physical assets, services, and activities supported by the Airport as of January 2018. This inventory of existing conditions provides the context, or baseline, for identifying user demand and for the subsequent analysis of the Airport's ability to meet that demand throughout the planning horizon. This information provides insight into opportunities and constraints of the Airport and its surroundings from both physical and operational perspectives. In other words, this inventory provides the starting point from which FCH's future can be envisioned. Information and data for this inventory was provided by the Airports Department, the FAA, and the PAC which includes local municipalities, planning authorities, Airport tenants, and other stakeholders. Web-based research, on-site data validation, and interviews with Airport staff and other tenants were performed to supplement information where needed.

2.1 Airport Property

FCH is situated on 200 acres, one-and-a-half miles west of downtown Fresno. The Airport is generally bounded by W Kearney Boulevard to the south, W Whitesbridge Avenue to the north, S Thorne Avenue to the east, and S West Avenue to the west. The Airport is fenced with chain link following the perimeter of the property. Airport property, landside, and airside facilities are illustrated in **Figure 2-1**.

Figure 2-1 – Airport Property and Uses for FCH



Source: City of Fresno Airports Department, prepared by Kimley-Horn & Associates, January 2018

2.2 Airside Facilities

Airside facilities accommodate the takeoff and landing of aircraft and the movement of those aircraft about the airport. The following describes the primary airfield infrastructure systems at FCH including the runways, taxiways, aprons, and navigational aids as they currently exist in January 2018.

2.2.1 Runway

FCH is served by a single paved runway. Runway 12-30 is 3,627 feet long and 75 feet wide, oriented northwest/southeast. The runway has a high point elevation of 279.9 feet mean sea level (MSL) and runway end elevations differ by 1.1 feet. The asphalt runway has a single wheel loading (SWL) strength of 17,000 pounds (FAA, Airport IQ 5010 2018) and is in 'good' condition' (FAA, Web Data Sheet 2015). As a matter of note, the Airport had a parallel runway north of Runway 12-30 that closed in 2007 due to operational constraints.

Consistent with FAA standards, Runway 12-30 pavement markings include a centerline, runway designation numbers, and displaced threshold markings. The runway is equipped with medium intensity runway lighting (MIRL) to help define the lateral limits of a runway during periods of darkness or restricted visibility conditions. Both ends of the runway are also equipped with runway end identifier lights (REILs) and precision approach path indicators (PAPIs) that provide vertical approach slope guidance to aircraft during approach to landing. **Table 2-1** summarizes the runway characteristics at FCH.

Table 2-1 – Runway 12-30 Existing Characteristics

Characteristic	Runway 12 – 30	
	Runway 12	Runway 30
Runway Length (feet)	3,627'	
Runway Width (feet)	75'	
Runway Elevation (MSL)	278.1	279.2
Surface Type / Condition	Asphalt / Good	
Pavement Strength (pounds)	17,000 (single wheel loading)	
Pavement Marking / Condition	Non-precision / Good	
Airfield Lighting	Rotating Beacon Medium Intensity Runway Lighting (MIRL) Medium Intensity Taxiway Lighting (MITL) Precision Approach Path Indicator (PAPI-2L) – Runway 12 Precision Approach Path Indicator (PAPI-4R) – Runway 30 Runway End Identifier Lights (REILs)	
Instrument Approach Procedures	Runway 12 – RNAV (GPS) – 530' ceiling, 3/4-mile visibility Runway 30 – GPS – 800' ceiling, 1-mile visibility Runway 12-30 Circling Approach – 960' ceiling, 1-mile visibility	
Navigational Aids	Segmented Circle Lighted Wind Cone Automated Weather Observing System (AWOS)	

Source: FAA 5010 (accessed October 4, 2017)

Ideally, the entire length of full-strength runway pavement is available for use at airports; this, however, is not the case for FCH. Runway 12-30 has limited use to maintain compatible land use within the Runway Protection Zones (RPZ) located in immediate approach/departure area beyond the runway ends.

In addition to displaced thresholds, declared distances were noted in the Airport's previous ALP but were never formally published. The following descriptions provide an overview of declared distances and what was identified in the previous ALP (approved July 2010). It should be noted that the published length of Runway 12-30 has changed by one foot since the previous ALP was approved; the distances presented in the descriptions below and illustrated in **Figure 2-2** reflect the existing published runway length.

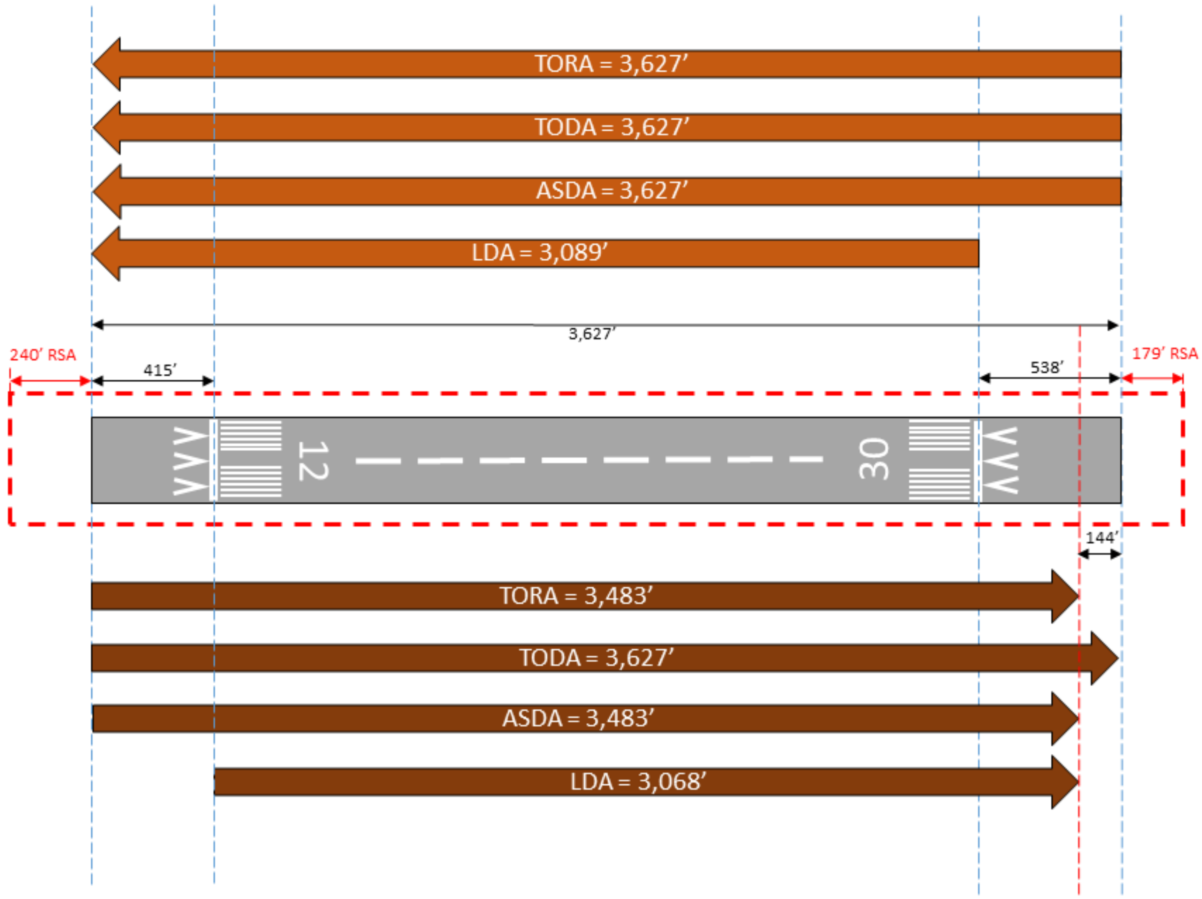
Take-off Run Available (TORA) – TORA is the length of runway available and suitable for satisfying take-off distance requirements with consideration of the departure RPZ and TODA limitations. TORA cannot exceed the length of the runway. The TORA is 3,483 feet for Runway 12 and 3,627 feet for Runway 30.

Take-off Distance Available (TODA) – TODA is the TORA plus the length of any remaining runway, or established clearway, beyond the TORA that is available for satisfying take-off distance requirements. Consideration must be given to any 40:1 instrument departure surface requirements. The TODA is 3,483 feet for Runway 12 and 3,627 feet for Runway 30.

Accelerate-Stop Distance Available (ASDA) – ASDA is the length of runway declared available for satisfying accelerate-stop distance requirements for a rejected take-off plus any established stopway. RSA and ROFA requirements beyond the end of the ASDA must be considered. For Runway 12, the ASDA is reduced to 3,483 feet; for Runway 30, the ASDA is 3,627 feet.

Landing Distance Available (LDA) – LDA is the length of runway available and suitable for satisfying landing distance requirements with consideration of threshold siting criteria, the approach RPZ, RSA, and ROFA beyond both ends of the runway. For Runway 12, the usable landing length is reduced by the 415-foot displacement, resulting in a LDA of 3,068 feet. Likewise, Runway 30 also has a shortened LDA of 3,089 feet due to the displaced threshold of 538 feet.

Figure 2-2 – Runway 12-30 Declared Distances



Source: FAA 5010 (accessed October 9, 2017), prepared by Kimley-Horn & Associates

2.2.2 Taxiways

Runway 12-30 is supported by two full-length parallel taxiways – taxiway A and taxiway H – both of which include 6 access points. Taxiway A is 40 feet wide and is spaced 150 feet from the runway centerline to taxiway centerline. Taxiway H is 35 feet wide and spaced 200 feet from the runway centerline to taxiway centerline. Taxiway A provides access to the main apron area. A holding apron is available at each end of taxiways A and H to allow for departure run-ups. This allows aircraft ready for departure to by-pass aircraft still preparing for departure off the taxiway. Refer to **Figure 2-1** for a visual cue of taxiways at FCH.

2.2.3 Aprons

As of 2018, FCH has one apron area measuring approximately 68,200 square yards or approximately 14 acres south of taxiway A. As shown in **Figure 2-1**, the apron space begins in front of the terminal area and expands to the northwest, beyond the former air traffic control tower building to the T-hangars. The apron space allows for the tie-down of both transient and based aircraft. There are 149 T-hangar units (16 hangars), 64 permanent tie-downs, 10 shade hangars, and 5 transient tiedowns on the apron.

2.2.4 Navigational Aids

Navigational aids or NAVAIDs assist pilots in locating an airport and safely and efficiently maneuvering aircraft through landing and take-off in a variety of meteorological conditions. NAVAIDs are any visual or electronic device, airborne or on the surface, that provide point-to-point guidance information or position data to aircraft in flight. Apart from the visual approach aids previously described (i.e. REILS, PAPIs), FCH is also equipped with the following (summarized in **Table 2-1**):

- A lighted windcone – provides pilots with wind velocity and directional information
- A segmented circle – provides traffic pattern information to pilots
- An automated weather observing system (AWOS) – provides weather conditions such as wind speed and direction, temperature, dew point, altimeter setting, density altitude, visibility, precipitation and cloud height

2.3 Landside Facilities

For the purposes of this MPU, landside facilities are defined as those outside of the runway/taxiway/apron environment and consist of a variety of buildings and systems that support airport operations. At FCH, these include the general aviation terminal, automobile parking, fixed base operators (FBOs), aircraft hangars, fuel storage, utilities, and security fencing.

2.3.1 General Aviation Terminal

The general aviation terminal at FCH is an iconic building appreciated by both locals and the general aviation community. The terminal building was originally constructed between 1936-1937 by the Works Progress Administration. The building is located south of Runway 12-30, nearest runway 30 and includes both lobby space as well as a restaurant. Vehicle parking is adjacent to the terminal with 90 spots available and is accessed from West Kearney Boulevard. The building is also currently used by the Airports Department for office space and storage.

Figure 2-3 – Photo of FCH Terminal Building

Source: City of Fresno Airports Department

2.3.2 Airport Tenants

FCH has several tenants and businesses including FBOs, which provide services to the aircraft at the Airport. These services range from fueling, hangar rentals, tie-down and parking, aircraft rental, and aircraft maintenance. In addition to the FBOs, FCH also has tenants that provide flight training and others associated with volunteer groups.

At the time of this writing (2018), the FCH tenants include, but are not limited to the following:

- Frank Ruiz Avionics
- American Helicopters
- Fresno Flyers Club
- Central Valley Aviation Association
- Aerial Solutions
- Golden Skies
- Fresno County Sheriff's Squadron

2.3.3 Aircraft Hangars & Tiedowns

Currently at FCH, there are a total of 25 storage hangar buildings providing approximately 256,800 square feet of storage space for aircraft. Of these hangars, nine are conventional hangars and 16 are T-hangars. T-Hangars provide storage for 149 aircraft. There are also 70 permanent tie-downs, ten shade hangars, and eight transient tiedowns. There is approximately 16,400 square feet of office space within these hangars.

2.3.4 Fuel Storage

Fresno Chandler Executive has two locations for fuel storage: one 12,000 gallon above-ground tank located north of the terminal building and the other approximately 18,000 gallon above-ground tank located midfield south of taxiway A (currently owned and maintained by Frank Ruiz Avionics). The fuel tanks are self-fueling stations and provide 100LL fuel. Flight Level Aviation does have Jet A fuel for private use only, but jet fuel is not available to the public or other Airport users.

2.4 Meteorological Conditions

Local climate and meteorological conditions affect operations at an airport in a variety of ways. Winds, precipitation, and temperature characteristics of an area can influence airport development decisions pertaining to NAVAIDs, runway orientation, and required runway length.

2.4.1 Local Climate

The average annual temperature at FCH is 78.1° Fahrenheit (F), the average low is 47.7° F, and the average high is 84.5° F (The Weather Channel 2017). The mean maximum temperature of the hottest month (July) is 99.7° F. Average monthly precipitation ranges from 0 to 2.05 inches, with an annual average of 9.5 inches. There is no measured snow or sleet precipitation at FCH.

2.4.2 Weather Conditions

When describing weather conditions at an airport, the FAA considers the following general weather classifications:

Visual Flight Rule (VFR) Conditions – VFR is the set of regulations, procedures, and conditions that permit a pilot to operate and navigate an aircraft based on visual reference to the surrounding environment with limited instrumentation. This usually requires favorable weather conditions with a ceiling of 1,000 feet above ground level (AGL) or greater and visibility of at least three statute miles (also referred to as visual meteorological conditions or VMC).

Instrument Flight Rule (IFR) Conditions – Properly trained and equipped pilots operate aircraft using navigational systems that provide lateral and/or vertical path guidance based on specific meteorological conditions. Specific IFR procedures must be used when the cloud ceiling is less than 1,000 feet AGL and/or the visibility is less than three statute miles (also referred to instrument meteorological conditions or IMC).

Poor Visibility Conditions (PVC) – This is when the cloud ceiling and visibility are below the CAT-I ILS minimums, making the airport unusable for most aircraft operations. Under these conditions only specific airports with advanced navigational systems, and appropriately trained pilots with properly equipped aircraft, may operate.

According to wind and weather conditions at FCH, Runway 30 is used approximately 70% of the time due to wind conditions (Coffman Associates, Inc. 2009).

2.4.3 Crosswind Coverage

Wind speed and direction influence runway use. A runway is ideally oriented with the prevailing wind, as landing and departing an aircraft into the wind enhances its performance. FAA planning standards indicate that the primary runway should be capable of operating under allowable wind conditions at least 95 percent of the time (FAA 2014).

As shown below in **Table 2-2**, based on historical wind data (FAA 2021) the existing runway orientation at FCH provides more than 99 percent wind coverage for VFR, IFR, and all-weather conditions for all crosswind components. The analysis indicates that Runway 12-30 is ideally oriented for the wind conditions within Central California. It should be noted that, per FAA guidelines, this analysis uses the Airport's true runway headings of 125 and 305 degrees. While runway designations represent the magnetic heading when they are created (Runway 12-30 represents the magnetic headings of 120 degrees and 300 degrees), the Earth's magnetic lines slowly drift over time causing the true runway headings to shift while the runway's name remains.

Table 2-2 – FCH Runway 12-30 Crosswind Coverage

	Crosswind Coverage (Runway 12-30)			
	10.5 knots	13 knots	16 knots	20 knots
All Weather	99.83%	99.93%	99.99%	100.00%
IFR	99.90%	99.96%	100.00%	100.00%
VFR	99.83%	99.93%	99.99%	100.00%

Source: NOAA National Climate Data Center

Notes: Based on 69,716 observations between 2015 and 2020; Station name: Fresno Chandler Executive
Analysis performed for true runway headings on 125° and 305°

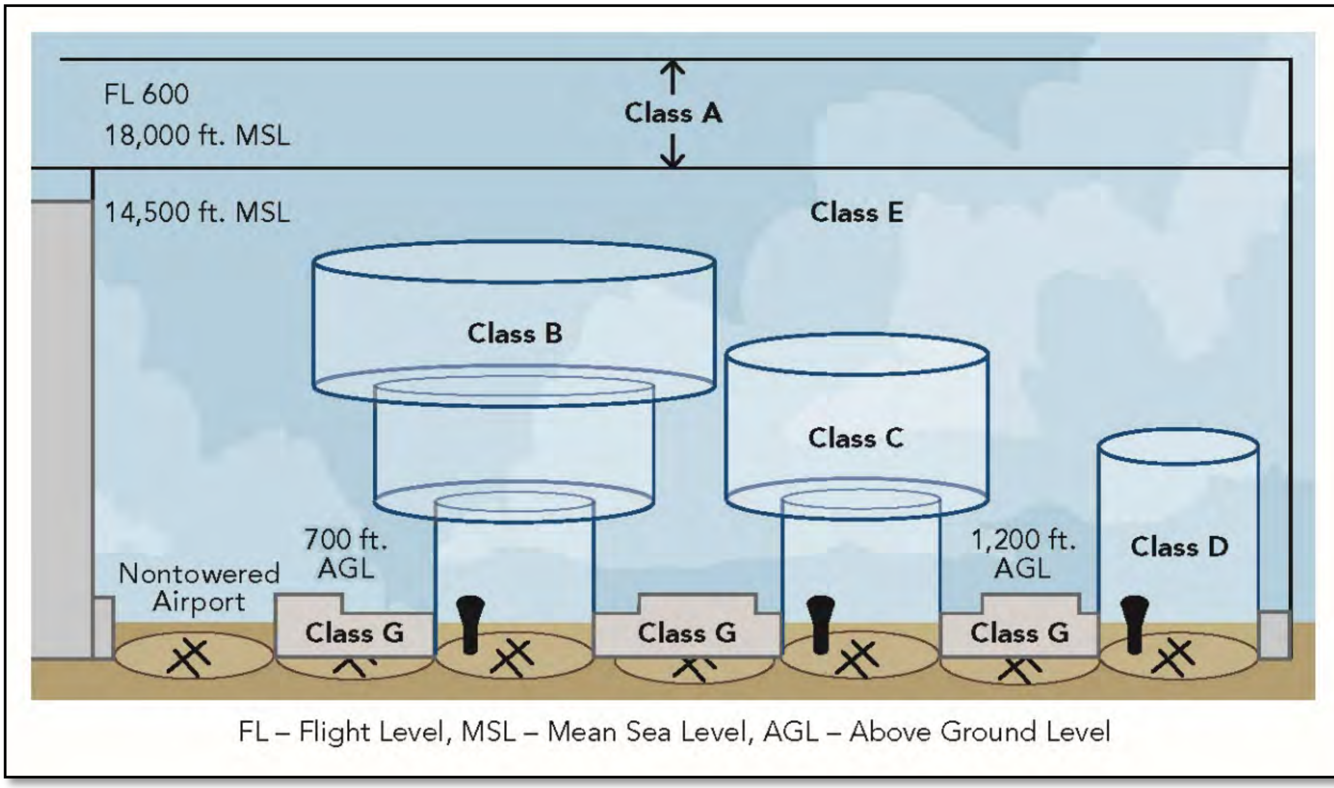
2.5 Airspace and Approach Capability

The U.S. National Airspace System (NAS) is an integrated collection of controls, procedures, and policies implemented and regulated by the FAA to ensure safe and efficient air operations. The NAS is divided into airspace classes to designate the level of service and operating rules for a given area. The following describes the airspace classifications, aeronautical charts, instrument approach capabilities, departure procedures, and air traffic control (ATC) at FCH.

2.5.1 Airspace Classifications

Airspace is generally categorized as controlled, uncontrolled, or special use. Within these categories, the Federal Aviation Regulations (FAR) Parts 71 and 73 establish specific airspace classifications that impose various requirements upon the operation of aircraft, including visibility minimums, cloud clearance, communication with the ATC, and specific aircraft equipment. The location and dimensions of these classifications are based on the airport and type of activity supported. The classifications are depicted in **Figure 2-4**.

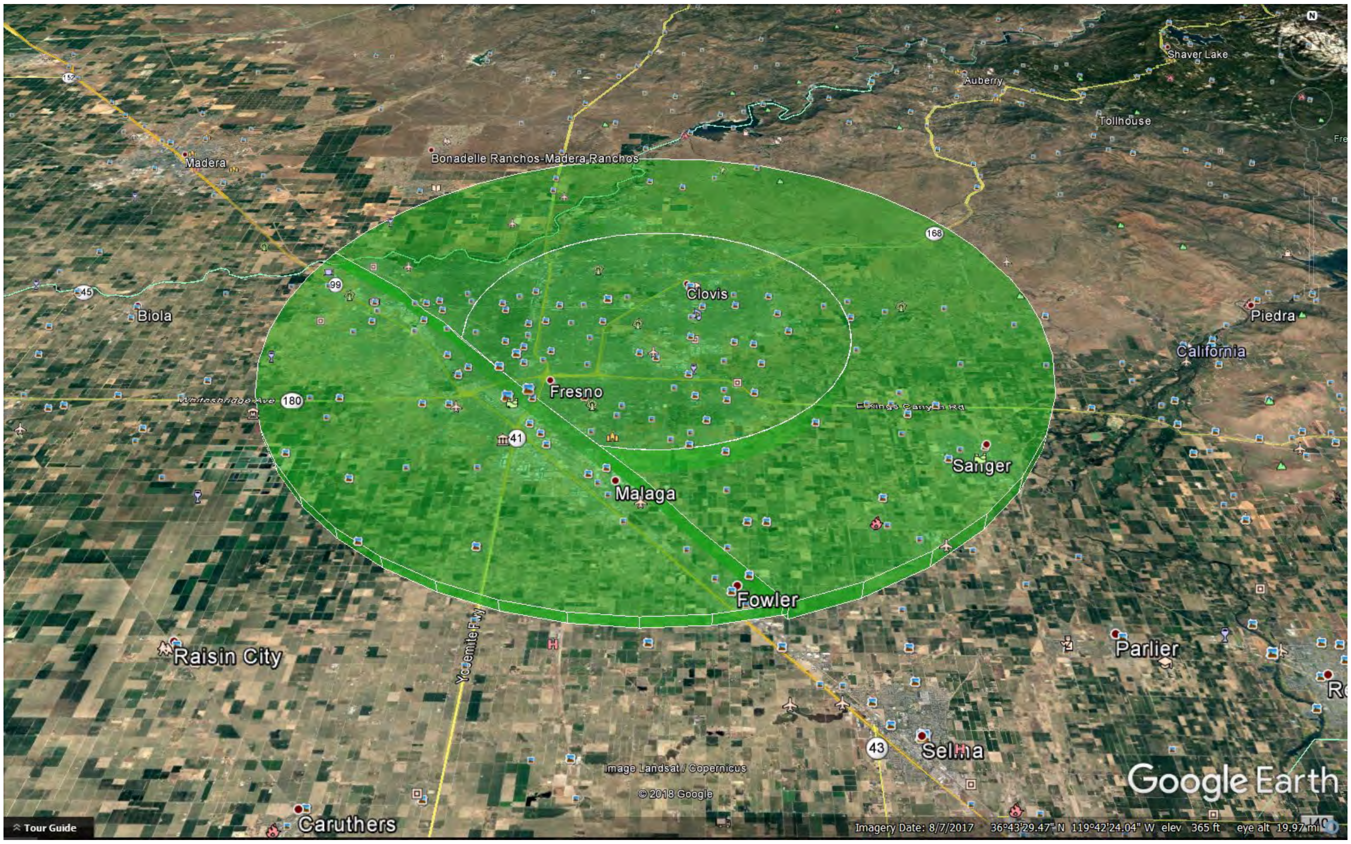
Figure 2-4 – Airspace Classifications



Source: FAA Aeronautical Information Manual

FCH falls in Class G airspace. Class G airspace is referred to as uncontrolled airspace and is not depicted on aeronautical charts. This classification of airspace comprises all airspace not identified as another class. IFR flights typically do not operate in Class G airspace, as no ATC services are provided; however, FCH has several instrument approach procedures described in **Section 2.5.2**. VFR flights are permitted as long as visibility and cloud clearance minimums are met. FCH class G airspace lies beneath FAT class C airspace. FCH airspace is presented in **Figure 2-5**.

Figure 2-5 – FCH Class G Airspace



Source: Google Earth, FAA Airspace Map Overlay, February 2018

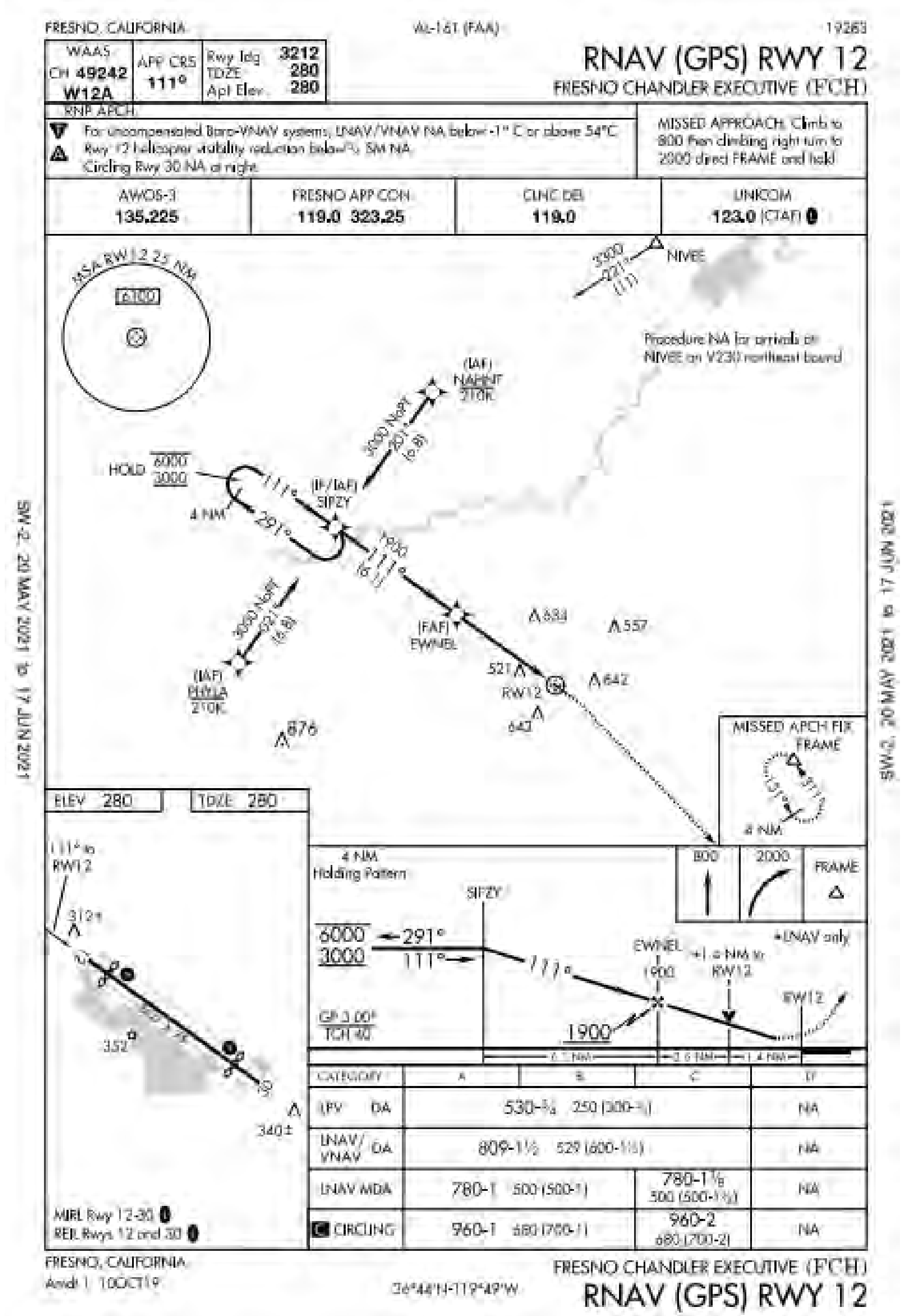
2.5.2 Approach Capability

Providing the highest level of accessibility to an airport – particularly during inclement weather conditions – is a common goal of most airport and aircraft operators. The ability of an approaching aircraft to land at an airport is predicated on the weather conditions, the level of pilot training, the type of navigation equipment both in the aircraft and on the ground, and the approach procedures established by the FAA.

Under VFR conditions – which are defined as a cloud ceiling greater than 1,000 feet AGL and visibility conditions equal to or greater than 3 statute miles – pilots may approach an airport using visual cues. Conversely, IMC occur when cloud ceilings are lower than 1,000 feet AGL and visibility becomes less than 3 statute miles. Under these conditions, properly trained pilots with adequately equipped aircraft must follow FAA-published instrument approach procedures to land at an airport.

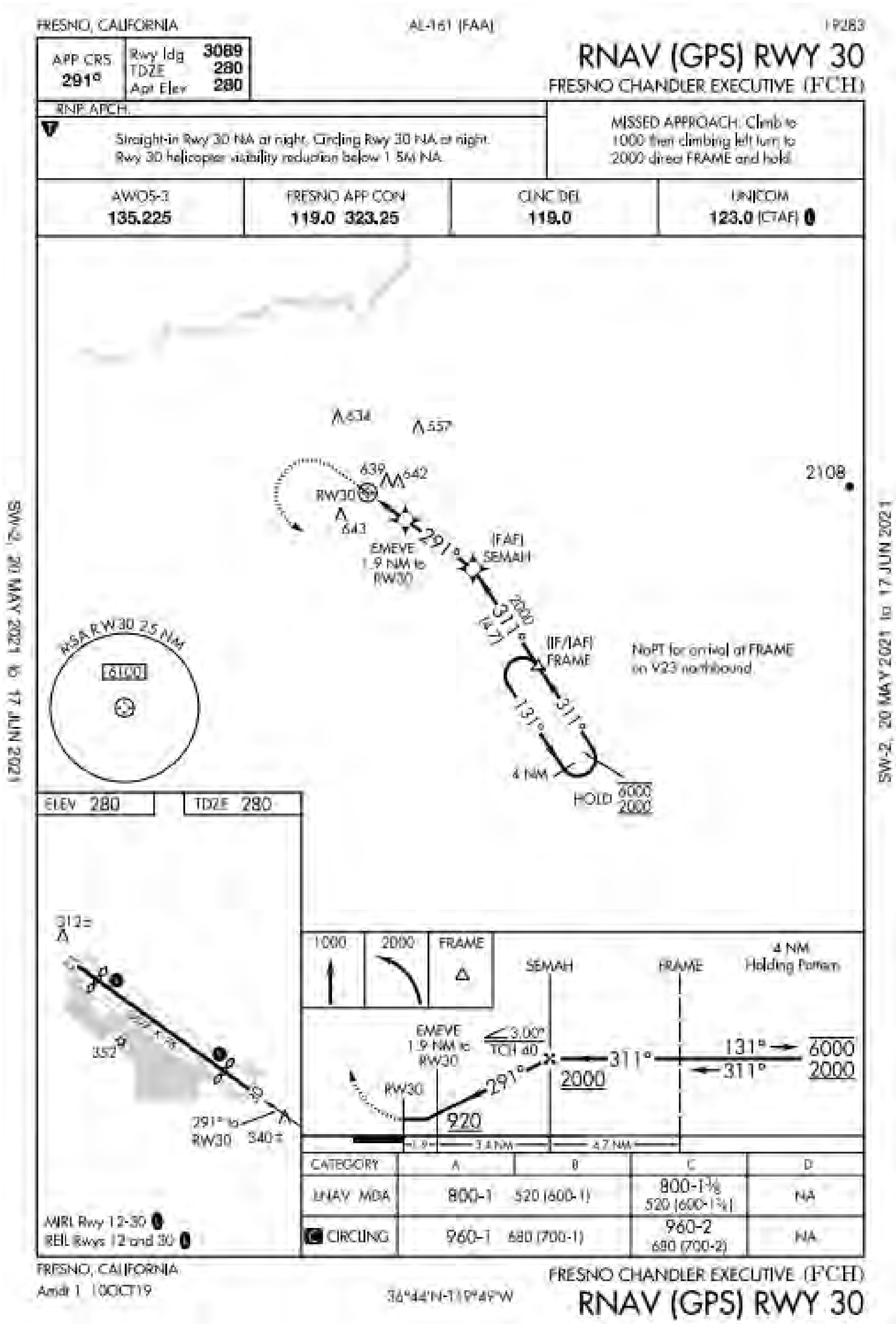
FCH has two published instrument approach procedures and one circling approach – summarized in **Table 2-1**. The Runway 12 RNAV (GPS) approach procedure allows for ¾-mile visibility to the Airport with a 530-foot ceiling. The Runway 30 RNAV (GPS) approach allows for 1-mile visibility and an 800-foot ceiling, and both Runway 12 and 30 have a Circling Approach with a 960-foot ceiling. **Figure 2-6** and **Figure 2-7** depict current instrument approach procedures for FCH.

Figure 2-6 – Instrument Approach GPS – RWY 12



Source: FAA Terminal Procedures, FCH, effective January 30, 2020 – February 27, 2020

Figure 2-7 – Instrument Approach GPS – Runway 30



Source: FAA Terminal Procedures, FCH, effective January 30, 2020 – February 27, 2020

2.5.3 Air Traffic Control

FCH had air traffic control (ATC) services into the early 1980s. The air traffic control tower (ATCT) still remains and is located in the center of the Airport property south of Runway 12-30, but remains unused. Aircraft operating in the vicinity of the Airport are not required to file any flight plan or contact any ATC facility; however, if pilots are flying with IFR conditions, a flight plan must be filed with the enroute ATC. Pilots use the common traffic advisory frequency (CTAF) to obtain airport information and communicate with other aircraft regarding their position and intentions.

2.6 Current Aviation Activity

This section provides a brief description of the current aircraft activity at FCH, including aircraft operations and based aircraft. Historical aviation activity will be discussed in subsequent sections to provide a foundation for the anticipated aviation activity forecasts.

2.6.1 Aircraft Operations

Aircraft operations are defined as either a departure or an arrival (also referred to as a take-off or landing). Because ATC services are not provided at FCH, an estimate of aircraft operations will be utilized for purposes of this MPU. The FAA's Terminal Area Forecast (TAF) system provides an estimate based on information provided to the FAA's Airport Master Record (5010). As of 2018, a total of 24,885 total operations are estimated.

Aircraft operations will be discussed further in the Forecast chapter.

2.6.2 Based Aircraft

The FAA defines based aircraft as those that are operational, airworthy, and typically located at a specific airport for the majority of the year. However, the number can fluctuate based on the needs of aircraft owner.

Prior to 2007, there were over 240 based aircraft (Coffman Associates, Inc. 2009) at FCH. Over the past 10 years, the based aircraft count has declined; the most recent estimate of based aircraft is 140, and is reported as follows:

Table 2-3 – Based Aircraft at FCH 2017

	Based Aircraft at FCH 2017	Percent of Total Fleet
Single Engine:	123	87.9%
Multi Engine:	2	1.4%
Turboprop:	2	1.4%
Jet:	0	0.0%
Helicopters:	5	3.6%
Light Sport/Experimental:	8	5.7%
TOTAL:	**140**	**100%**

Source: Airport Management, inventory count in 2017 (updated in 2018)

The based aircraft count for the base year will provide the foundation for the Forecast chapter found in subsequent sections.

3 Land Use and Environmental Setting

Due to the FAA's participation in airport planning and development projects, airport owners are obligated to incorporate the evaluation of environmental concerns affecting both the human and natural environments into their development programs. An environmental and land use inventory has been undertaken relative to FCH in concert with FAA AC 150/5070-6B, *Airport Master Plans*. The information was gathered through desktop review of existing environmental documents, agency databases, and previous studies. This includes the 2009 environmental study at FCH, *Final Environmental Assessment for the North Side Development* (Coffman Associates 2009), and the 1999 *Fresno Chandler Executive Airport Master and Environs Specific Plan* (City of Fresno 1999). This section also considers the enabling legislation, the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

The goals of this section are to provide a cursory review of the local land use and environmental conditions, identify the applicable jurisdictional authorities, and recognize environmental factors that could potentially be affected by future airport development. It is intended that the information found in this section is used to help guide and evaluate future facility development concepts.

3.1 Land Use and Zoning

In accordance with FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, the compatibility of existing and planned land uses near an airport is focused primarily on noise in the community and the safety of persons and property both on the ground and in the air. The FAA requires that airport owners seek compatible uses for the land surrounding an airport through appropriate positive control (fee-simple property or easement acquisition) and coordinated zoning and municipal planning efforts. The following describes the existing land uses surrounding FCH and various planning and zoning programs applicable to the Airport.

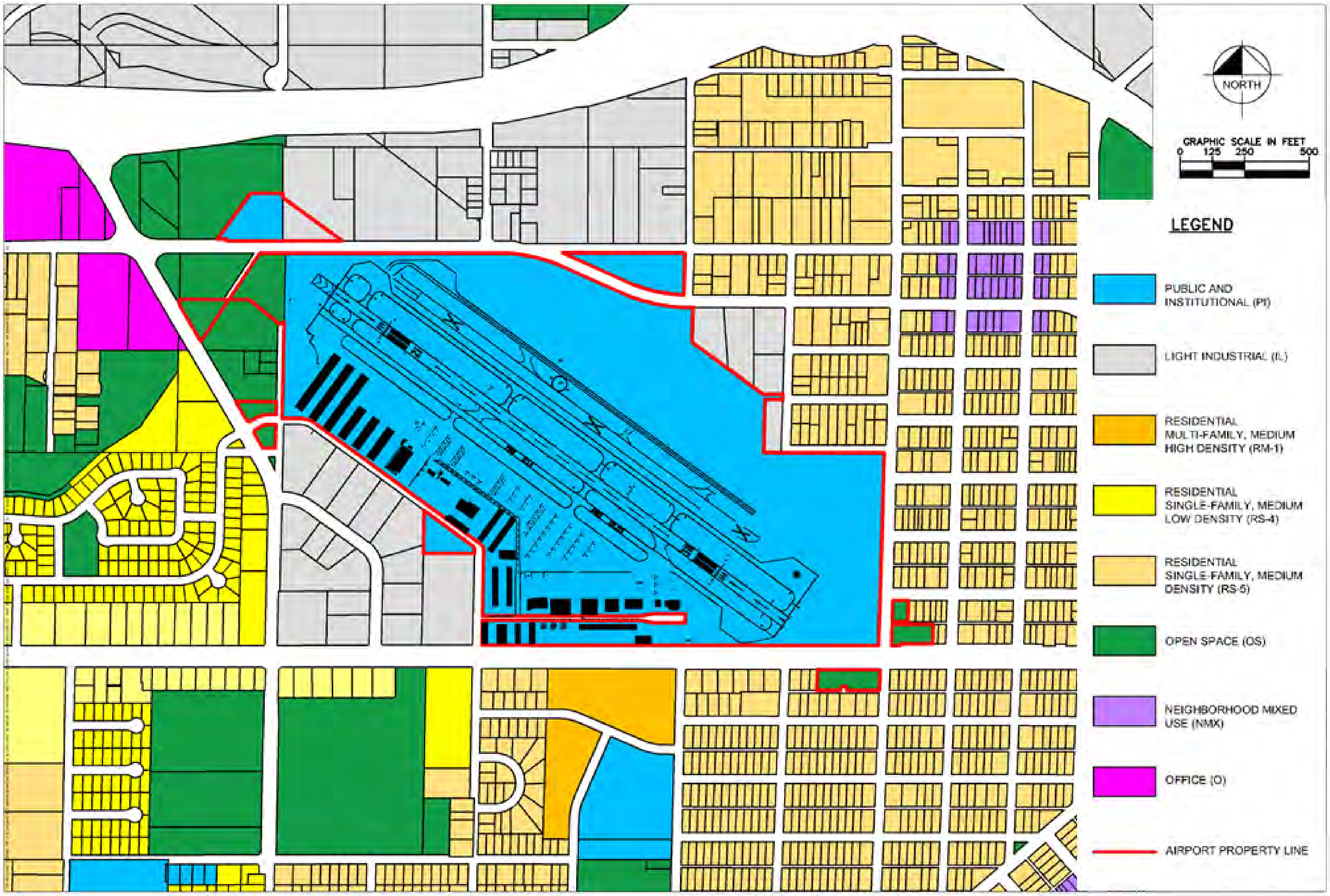
3.1.1 City of Fresno General Plan

FCH is located within the City of Fresno municipal boundary. This section describes the General Plan for the City of Fresno.

The City's most current General Plan was adopted in December 2017 (City of Fresno Development and Resource Management Planning Division 2017). The General Plan and all other City land use plans must be compatible with the FCH airport land use compatibility plan (ALUCP) or make a statement or overriding consideration justifying its incompatibility.

The Airport is mostly surrounded by residential, commercial, and industrial uses. There are several schools and parks in the surrounding area. **Figure 3-1** illustrates the existing land use around the Airport. It is noted that not all the land within the Airport property is zoned for Airport use. It is recommended that the City of Fresno Airports Department coordinate with the City Council to consider amending and/or adjusting the current General Plan for the benefit of both the Fresno Chandler Executive and the community.

Figure 3-1 – City of Fresno General Plan Land Use and Circulation Map



Source: 2017 General Plan Land Use and Circulation Map, prepared by Kimley-Horn & Associates, February 2018

3.1.2 Land Use Planning

Airport land use planning attempts to reconcile how land can be developed with consideration to the safety of those on the ground and on board aircraft, as well as the noise tolerance of the surrounding community. Compatibility issues are generally defined as, 'any airport impact that adversely affects the livability of a surrounding community, as well as any community characteristic that can adversely affect the viability of an airport' (Shalk and Ward 2010, 39). The California Department of Transportation (CALTRANS), Division of Aeronautics developed the *California Airport Land Use Planning Handbook* to provide regulatory guidance and best practices for State-compliant and effective airport land use planning (CALTRANS 2011). Most notably, the Handbook provides regulatory guidance pursuit to the 1967 California State Aeronautics Act (SAA, Public Utilities Code [PUC], Section 21001, et seq.), Article 3.5, *Airport Land Use Commissions* (ALUC or Commission).

In accordance with the regulatory guidance mentioned above, the Airport Land Use Commission for Fresno County is responsible for preparing an ALUCP for each airport within its jurisdiction. The plan's jurisdiction is bounded by the airport influence area (AIA) established by the ALUC in consultation with the various public agencies and institutions surrounding an airport (CALTRANS, 2011). The ALUC of Fresno County is responsible for the land use compatibility plan for FCH. The Commission currently has the following roles/titles, provided in **Table 3-1**.

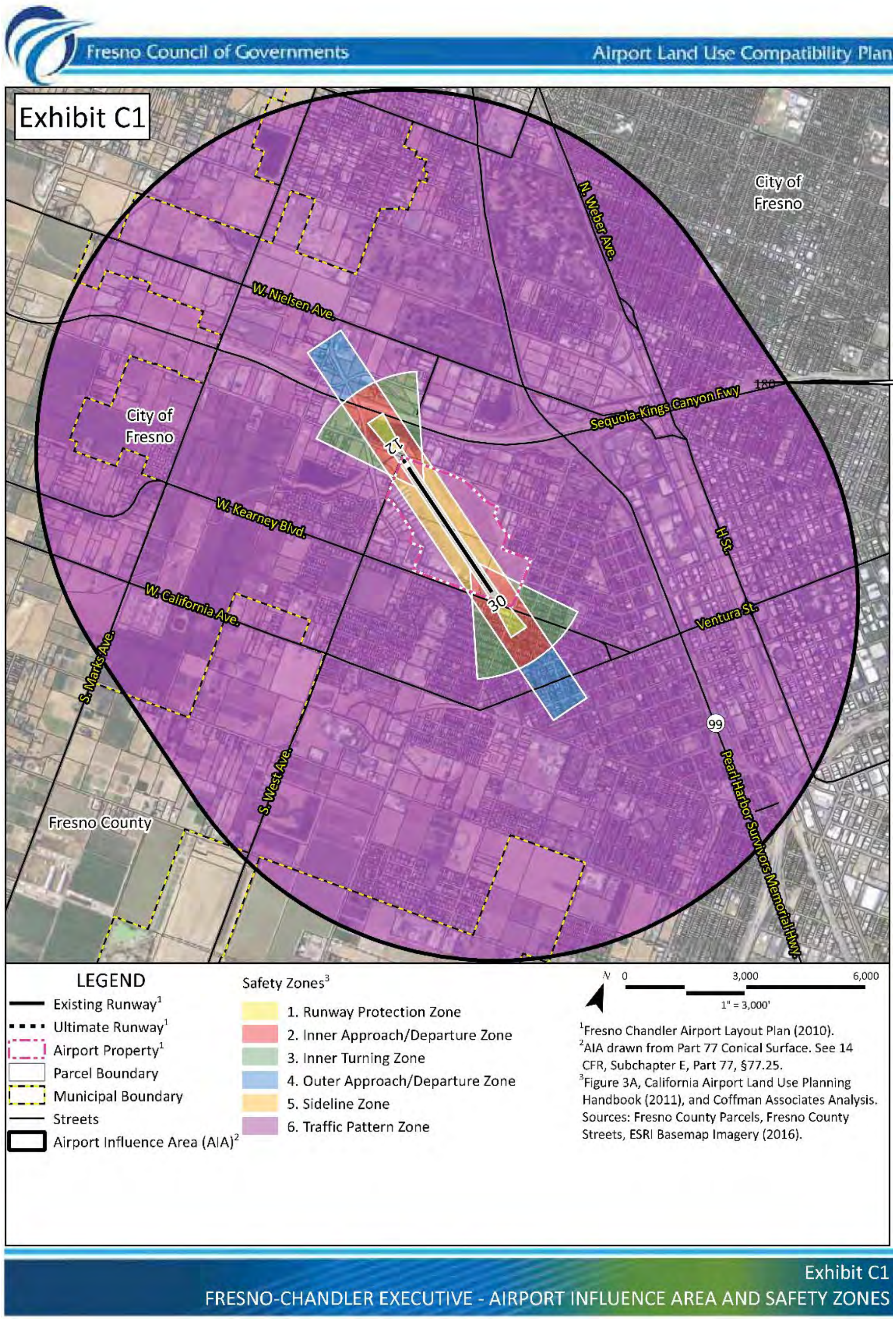
Table 3-1 – Membership of the Airport Land Use Commission of Fresno County

Role	Title
Chairman, Aviation Expert	Retired: Project Manager, City of Fresno Airports Department
Commissioner, County Representative	Fresno County Board of Supervisors, District 3
Commissioner, County Representative	Fresno County Board of Supervisors, District 5; Former Mayor Pro-Tem, City of Clovis
Commissioner, City Representative	Former Reedley Airport Commissioner
Commissioner, City Representative	Council Member, City of Mendota
Commissioner, Aviation Expert	Retired: Airports Planning Manager, City of Fresno
Commissioner, Public at Large	N/A
Proxy, Aviation Expert	Airports Planning Manager, City of Fresno
Proxy, Aviation Expert	Retired: Assistant Director of Aviation, City of Fresno
Proxy, County Representative	Former Council Member City of Reedley
Proxy, County Representative	Planning Department Director, City of Clovis
Proxy, Public at Large	N/A

Source: Airport Land Use Commission of Fresno County, http://www.fresnocog.org/airport-land-use-commission-fresno-county (accessed October 16, 2017)

The Fresno County ALUCP, adopted in 2018, describes the noise and safety compatibility in the existing land use. The document is currently being updated to reflect the most current safety zones, AIA (see **Figure 3-2**) and noise contours.

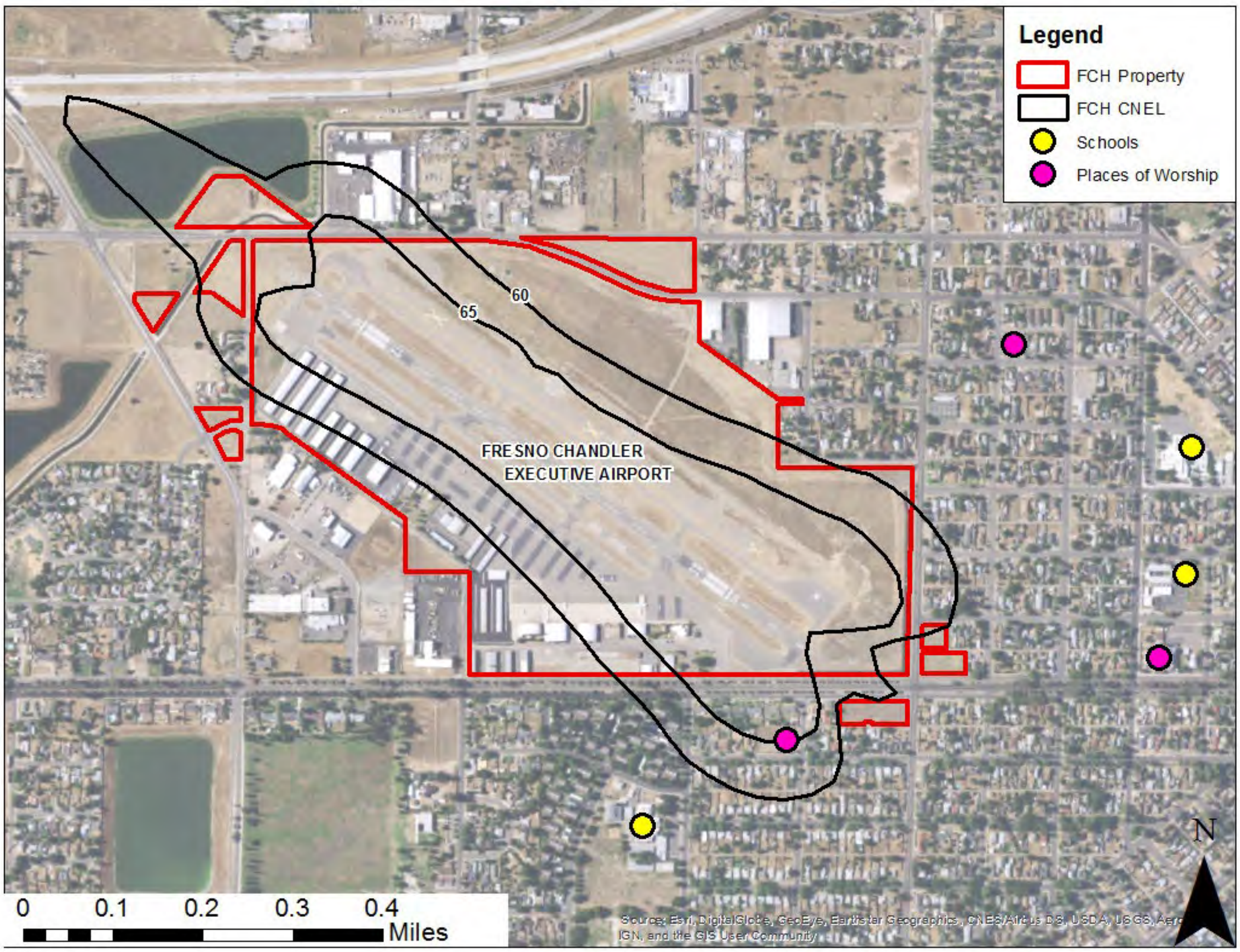
Figure 3-2 – Airport Influence Area and Safety Zones



Source: 2018 Fresno County Airport Land Use Compatibility Plan

Noise compatibility policies are intended to avoid additional exposure of aircraft noise to individuals and the establishment of new noise-sensitive land uses. State law (Public Utilities Code Section 21675(a)) requires that noise contours reflect the anticipated growth of an airport for a 20-year period. The maximum noise exposure considered normally acceptable for residential areas is 65 dB (decibels) CNEL (Community Noise Equivalent Level). Note, noise contours are currently being developed and will be presented in the ALP. **Figure 3-3** shows there are several schools and places of worship located within the Airport vicinity. A summary of permissible development within the AIA is presented in **Table 3-2**.

Figure 3-3 – Noise Sensitive Land Uses in the FCH Vicinity



Source: 2018 Fresno County Airport Land Use Compatibility Plan; EPA Environmental Justice Screening and Mapping Tool (accessed October 26, 2017); prepared by Kimley-Horn & Associates

Table 3-2 – Land Use Noise Compatibility Criteria for FCH

Land Use Category	CNEL			
	60-64	65 - 69	70 - 74	75+
Residential				
Single units – detached	Y (1,2)	N	N	N
Single units – semi-detached	Y (1,2)	N	N	N
Single unites – attached row	Y (1,2)	N	N	N
Two units	Y (1,2)	N	N	N
Multi-family, three or more units (rental or ownership)	Y (1,2)	N	N	N
Group quarters (including retirement homes; assisted living; nursing homes, college dormitories, military barracks, correctional residential facilities, extended stay hotels*)	Y (1,2)	N	N	N
Public/Institutional Facilities				
Educational facilities (including daycare centers (>14 children), children schools (K-12 grade), adult schools, colleges, universities	Y (1,2)	N	N	N
Religious facilities, libraries, museums, galleries, clubs, lodges	Y (1,2)	N	N	N
Hospitals, nursing homes, and other health care services	Y	N	N	N
Governmental services (administrative, police, fire stations**)	Y	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N
Cemeteries, cemetery chapels; mortuaries	Y	Y	Y	N
Recreational				
Outdoor sport events, stadiums, playgrounds, campgrounds, and recreational vehicle parks	Y	N	N	N
Nature exhibits, wildlife reserves, and zoos	Y	N	N	N
Indoor recreation, amusements, athletic clubs, gyms and spectator events, movie theaters, parks, outdoor recreation: tennis, golf courses, riding trails, etc.	Y	C (1)	N	N
Commercial				
Wholesale Trade	Y	Y	C (1)	N
Retail trade (eating and drinking, establishments, personal services, and dance studios)	Y	Y	C (1)	N
Finance, insurance and real estate services	Y	Y	C (1)	N
Business services	Y	Y	C (1)	N
Repair services	Y	Y	C (1)	N
Professional services	Y	Y	C (1)	N
Hotels, motels, transient lodging, and bed and breakfasts	Y	C (1)	N	N
Industrial				
Manufacturing	Y	Y	Y	Y
Printing, publishing, and allied industries	Y	Y	Y	Y
Chemicals and allied products manufacturing	Y	Y	Y	Y
Miscellaneous manufacturing	Y	Y	Y	Y
Highway and street right-of-way and other transportation, communication and utiilities	Y	Y	Y	Y

Land Use Category	CNEL			
	60-64	65 - 69	70 - 74	75+
Automobile parking car dealerships, car washes, indoor/outdoor storage facilities, gas stations, truck stops, and transportation terminals	Y	Y	Y	Y
Processing of food, wood and paper products; printing and publishing; warehouses, wholesale and storage activities	Y	Y	Y	Y
Refining, manufacturing and storage of chemicals, petroleum and related products, manufacturing and assembly of electronic components, etc	Y	Y	Y	Y
Salvage yards, solid waste facilities, natural resource extraction and processing, agricultural, mills and gins	Y	Y	Y	Y
Agriculture				
Agriculture (except livestock)	Y (1,2)	C (1,2)	C (3)	N
Livestock farming and animal breeding, animal shelters, and kennels	Y (1,2)	C (1,2)	C (3)	N
Agricultural-related activities	Y	C (1,2)	C (3)	N
Forestry activities and related services	Y	C (1,2)	C (3)	N
Fishing activities and related services	Y	C (1,2)	C (3)	N

Source: 2018 Fresno County Airport Land Use Compatibility Plan

Table Notes:
•CNEL – Community Noise Equivalent Level, in A-weighted decibels.
•Y (Yes) – Land use and related structures compatible without restrictions.
•C (Conditionally compatible) – Land use and related structures are permitted, provided that sound insulation is provided to reduce interior noise levels from exterior sources to CNEL 45 dB or lower.
•N (No) – Land use and related structures are not compatible.
•(1) Requires an avigation easement be granted to the airport operator.
•(2) Residential buildings must be sound-insulated to achieve an indoor noise level of CNEL 45 dB or less from exterior sources.
•(3) Accessory dwelling units are not compatible.

Note:
•Land uses not specifically listed shall be evaluated, as determined by the ALUC, using the criteria for similar uses.
*•*Lodging intended for stays by an individual person of no more than 25 days consecutively and no more than 90 days total per year; facilities for longer stays are in the extended-stay hotel category*
*•**Airport Rescue and Firefighting (ARFF) facilities are exempt from this requirement due to the Federal Aviation Administration regulations.*

3.1.3 Safety

The 2018 Fresno County ALUCP also contains information on land use safety compatibility to minimize the risks associated with an off-airport aircraft accident or emergency landing. The ALUCP considers risks to both people on the ground and on board the aircraft. **Table 3-3** outlines the safety compatibility of land use development in the area surrounding FCH. The zone boundaries are based on definitions provided in the *California Airport Land Use Planning Handbook* (CALTRANS 2011).

Table 3-3 – Land Use Safety Compatibility Criteria for FCH

	Maximum Densities/Intensities/Required Open Land			Additional Criteria	
Zone	Dwelling Units per Acre	Maximum Non-residential Intensity	Required Open Land	Prohibited Uses	Other Development Conditions
1 – Runway Protection Zone	None	None	All un-used	-All structures except ones with location set by aeronautical function -All assemblages of people -Objects exceeding 14 CFR Part 77 height limits -Dumps or landfills, other than those consisting entirely of earth & rock -Hazards to flight	-Airport disclosure notice required
2 – Inner Approach & Departure Zone	1 d.u per 10 acres	60 persons per acre	30%	-Residential, except for very low residential and infill in developed areas -Hazardous uses (e.g., aboveground bulk fuel storage or gas stations) -Natural gas & petroleum pipelines -Office buildings greater than 3 stories -Labor-intensive industrial uses -Children's schools, day care centers, libraries -Hospitals, nursing homes -Places of worship -Schools -Recreational uses, athletic fields, playgrounds, & riding stables -Theaters, auditoriums, & stadiums -Dumps or landfills, other than those consisting entirely of earth & rock -Waterways that create a bird hazard -Hazards to flight	-Airport disclosure notice required -Locate structures maximum distance from extended runway centerline -Airspace review required for objects > 35 feet tall
3 – Inner Turning Zone	1 d.u. per 2 acres	100 persons per acre	20%	-Residential, except for very low residential and infill in developed areas -Hazardous uses (e.g., aboveground bulk fuel storage or gas stations) -Natural gas & petroleum pipelines -Buildings with more than 3 above-ground habitable floors -Children's schools, day care centers, libraries -Hospitals, nursing homes	-Same as Inner Approach/Departure Zone

	Maximum Densities/Intensities/Required Open Land			Additional Criteria	
Zone	Dwelling Units per Acre	Maximum Non-residential Intensity	Required Open Land	Prohibited Uses	Other Development Conditions
				-Places of worship -Schools -Recreational uses, athletic fields, playgrounds, & riding stables -Theaters, auditoriums, & stadiums -Dumps or landfills, other than those consisting entirely of earth & rock -Waterways that create a bird hazard -Hazards to flight	
4 – Outer Approach & Departure Zone	1 d.u. per 2 acres	150 persons per acre	20%	-Children's schools, day care centers, libraries -Hospitals, nursing homes -Buildings with more than 3 above-ground habitable floors -Highly noise-sensitive outdoor non-residential uses -Hazards to flight	-Airport disclosure notice required -Airspace review required for objects > 70 feet tall
5 – Sideline Zone	1 d.u. per 2 acres	100 persons per acre	30%	-Same as Inner Approach/Departure Zone	-Same as Inner Approach/Departure Zone
6 – Traffic Pattern Zone	No Limit	300 persons per acre	10%	-Hazards to flight -Outdoor stadiums and similar uses with very high intensity uses	-Airport disclosure notice required -Airspace review required for objects > 100 feet tall -New structures are prohibited on existing terrain that penetrates 14 CFR Part 77 Surfaces -New structures require additional airspace analysis required within the 50-foot terrain penetration buffer
7 – Precision Approach Zone	No Limit	No Limit	0%	-None	- Same as Traffic Pattern zone minus the airport disclosure notice

Source: 2018 Fresno County Airport Land Use Compatibility Plan

Table Notes:

•Residential development must not contain more than the indicated number of dwelling units (excluding secondary units) per gross acre (d.u./ac). Clustering of units is encouraged Gross acreage includes the property at issue, plus a share of adjacent roads and any adjacent, permanently dedicated, open lands associated with the property.
•Usage intensity calculations shall include the maximum number of people (e.g., employees, customers/visitors, etc.) who may be on the parcels or site at a single point in time, whether indoors or outside.
•Open land requirements are intended to be applied with respect to an entire zone. This is typically accomplished as part of a community general plan or a specific plan, but may also apply to large (10 acres or more) development projects.
•The uses listed here are ones that are explicitly prohibited regardless of whether they meet the intensity criteria. In addition to these explicitly prohibited uses, other uses will normally not be permitted in the respective compatibility zones because they do not meet the usage intensity criteria.
•As part of certain real estate transactions involving residential property within any compatibility zone (that is, anywhere within an airport influence area), information regarding airport proximity and the existence of aircraft over flights must be disclosed. This requirement is set by state law.
•Hazards to flight include physical (e.g., tall objects), visual, and electronic forms of interference with the safety of aircraft operations. Land use development, such as golf courses and certain types of crops, as outlined in FAA's Advisory Circular 150/5200-33B, Hazardous Wildlife Attractants on or Near Airports, that may cause the attraction of birds to increase is also prohibited.
•Examples of highly noise-sensitive outdoor nonresidential uses that should be prohibited include amphitheaters and drive-in theaters. Caution should be exercised with respect to uses, such as poultry farms and nature preserves.
•Objects up to 35 feet in height are permitted. However, the FAA may require Form 7460-1, marking, and lighting of certain objects.
This height criterion is for general guidance. Shorter objects normally will not be airspace obstructions unless situated at a ground elevation well above that of the airport. Taller objects may be acceptable if determined not to be obstructions. Developers proposing structures that could penetrate 14 CFR Part 77 elevations must file Form 7460 with the FAA .

3.1.4 Airspace Protection

The ALUCP for FCH provides airspace protection policies to ensure that structures and other land uses do not cause hazards to aircraft in flight or in the Airport vicinity. Hazards to flight include physical obstructions to the navigable airspace, wildlife hazards (particularly bird strikes), and land use characteristics that create visual or electronic interference with aircraft navigation or communication. Boundaries of this zone represent the imaginary surfaces defined for the airport in accordance with FAR Part 77. Airspace protection will be addressed in subsequent sections of this MPU.

3.2 Wildlife Hazard Attractants

Airport owners have a legal responsibility to ensure that airports maintain a safe operating environment. To address these federal mandates, the FAA has released a series of ACs to provide guidance and standards for airport owners. Key ACs include 150/5200-32B, *Reporting Wildlife Aircraft Strikes*; 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports*; 150/5200-34A, *Construction or Establishment of Landfills near Public Airports*; 150/5200-36A, *Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports (change 1)*; and AC 150/5220-25, *Airport Avian Radar Systems (change 1).*

Based on the guidance described above, land use practices and habitats are the key factors determining the wildlife species and populations that are attracted to airport environments. The FAA recommends a minimum separation distance of five statute miles between the farthest edge of an airport's air operation area (AOA) and known hazardous wildlife attractants. Land use practices that present the most acute threat to aircraft safety include waste disposal operations, water management facilities (including stormwater management facilities and wastewater treatment facilities), wetlands, and dredge spoil containment areas (if those areas include standing water or the spoils contain materials attractive to wildlife), agricultural activity, and golf courses (Clearly and Dolbeer 2005).

Although FCH does not have its own Wildlife Hazard Assessment (WHA), several potential wildlife attractants were identified through a review of the aerial imagery and past studies (Coffman Associates 2009, City of Fresno 1999) (see **Table 3-4**).

Table 3-4 – Potential Wildlife Hazard Attractants adjacent to FCH

Wildlife Hazard	Type	Location
Basin 'FF' Park	Park	Corner of S West Ave and W Kearney Blvd
Retention Basin	Pond	Corner of S West Ave and W Kearney Blvd
Chandler Park	Park	On corner of S Crystal Ave, W La Sierra Dr
Water Body	Pond	North La Sierra Dr, East of S Hughes Ave
Water Body	Pond	Bounded by W Nelsen Ave, S Teilman Ave, Sequoia-Kings Canyon Fwy, Golden State Hwy
Fresno Metropolitan Flood Control Basin RR-3	Water Retention	Bounded by W Whitesbridge, S Roeding Dr, Sequoia-Kings Canyon Fwy
Fink White Park	Park	Corner of E Whitesbridge Ave and S Trinity St
Kearney Park	Park	Corner of E Kearney Blvd, Fresno St, Major Ave
Frank H. Ball Park	Park	Bounded by Mayor Ave, Mono St, A St, Inyo St
Fresno Park	Park	Between S Fruit Ave and S Delno Ave, North of W California Ave, adjacent to Neilson Park

Wildlife Hazard	Type	Location
Neilson Park	Park	Between S Fruit Ave and S Delno Ave, North of W California Ave, adjacent to Fresno Park
Agricultural land	Agricultural	Southwest of the Airport property
Agricultural land	Agricultural	Northwest of the Airport property
Agricultural land	Agricultural	West of Airport property

Source: Google Earth, City of Fresno Parks and Recreation Facilities Finder (accessed October 17, 2017)

3.3 Water Resources

Water resources on or near airport property have several implications for airport operations and development. In addition to the wildlife hazard risks associated with open sources of water, airport development can affect floodplains and the potential for flooding in a project's vicinity; this includes federally protected waters of the U.S., wetlands, wild and scenic rivers, and groundwater/stormwater management. Airport owners are thus obligated to evaluate how projects could impact regional hydrology and implement the appropriate measures to reduce or eliminate adverse impacts to water resources.

3.3.1 Floodplains

Executive Order 11988, *Floodplain Management*, defines floodplain as an "area subject to a one percent or greater chance of flooding in a given year." Federal agencies must, "take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare, and restore and preserve the natural and beneficial values served by floodplains" (FEMA 2015). The U.S. Department of Transportation (U.S. DOT) Order 5650.2, *Floodplain Management and Protection*, provides the policies and procedures for implementing this Executive Order. In short, the guidance is designed to minimize or mitigate any adverse impacts associated with floods and to avoid encroaching on the 100-year floodplain.

The Federal Emergency Management Agency (FEMA) is the federal agency charged with floodplain management. To support the National Flood Insurance Program for the U.S., FEMA has published Flood Insurance Rate Maps (FIRM) to delineate floodplains and show an area's base flood elevations and floodplain boundaries. The California Department of Water Resources Floodplain Management Branch coordinates the state's participation in and compliance with the National Flood Insurance Program.

FCH is located on FEMA FIRM **06019C2105H**, effective February 18, 2009. The FIRM indicates that most of the Airport and the immediate surroundings are beyond the flood hazard areas (i.e., less than 0.2% chance of annual flood) – see **Figure 3-4**.

3.3.2 Wetlands

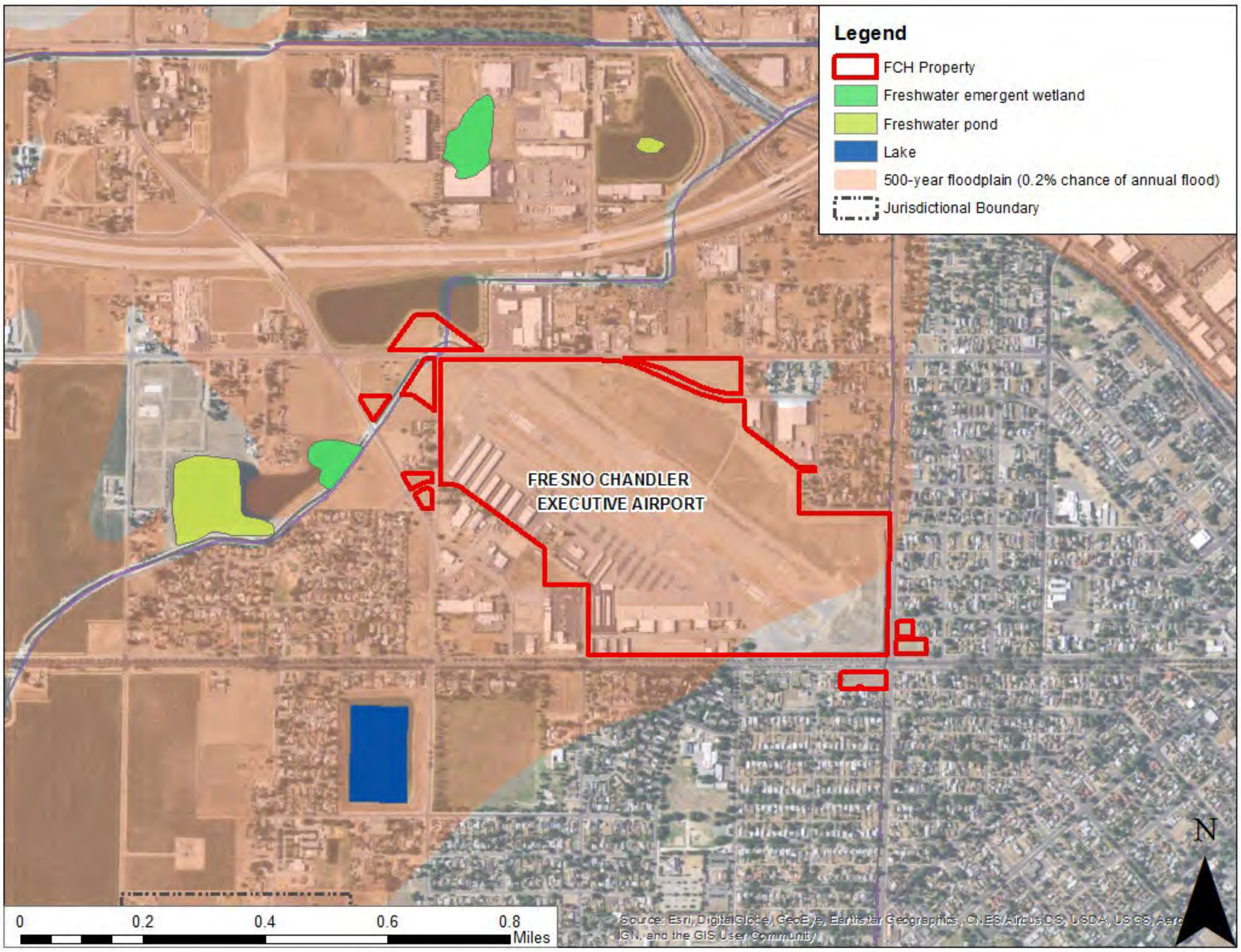
Wetlands and jurisdictional "waters of the U.S." are protected under Sections 401 and 404 of the Clean Water Act (33 U.S.C. 1251, et seq. (CWA)) and Executive Order 11990, *Protection of Wetlands*. The U.S. DOT developed Order 5660.1A, *Preservation of the Nation's Wetlands*, to provide additional guidance to transportation agencies regarding wetlands. These mandates require that federal agencies avoid impacts to wetlands to the greatest extent possible. If impacts are unavoidable, the agencies must explain that no practical alternative exists and provide measures to mitigate the proposed development's unavoidable impacts.

The U.S. Army Corps of Engineers (Corp) is primarily responsible for the protection of wetlands, with additional jurisdictional authority provided by the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Natural Resource Conservation Service (NRCS) and U.S. Environmental Protection Agency (U.S. EPA).

Several state agencies, most notably the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCB) operating under the California EPA, also have authority over California's wetland resources.

Figure 3-4 illustrates wetlands on or near Airport property. As a matter of note, this cursory inventory of wetlands has an inherent margin of error due to the nature of aerial imagery. A detailed ground inspection would be needed to confirm the presence and extent of any wetlands on or near the Airport.

Figure 3-4 – Floodplain and Potential Wetland Areas Surrounding FCH



Source: FEMA Flood Map Service (accessed October 17, 2017); USFWS National Wetlands Inventory (accessed October 17, 2017); prepared by Kimley-Horn & Associates

3.3.3 Ground Water and Stormwater Management

The California Water Boards (collectively referring to the SWRCB and the RWQCBs) and the U.S. EPA regulate runoff and the treatment of stormwater in California. The U.S. EPA delegated authority to the California Water Boards for the implementation of the CWA. Most notable, the California Water Boards are responsible for regulating stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) Permitting

Program. Additionally, California agencies, including the City of Fresno Airports Department, are subject to the provisions of the California Water Code and Porter-Cologne Water Quality Control Act.

According to the most recent environmental assessment, “the airport has three existing on-site drainage systems. One system connects to the FMFCD drainage area FF collection and disposal system located southeast of the airport. A second system connects to the FMFCD’s drainage area ZZ collection and disposal system located west of the airport (this system is currently connected to the RR-3 drainage system, located northwest of the airfield, on an interim basis). The third system is located north of the existing runway and is abandoned in place. Runoff from the airport is currently discharged into FMFCD Drainage Basin FF and RR-3. Ultimately, runoff that is currently discharged into Basin RR-3 will be discharged into Basin ZZ” (Coffman Associates 2009).

3.3.4 Wild and Scenic Rivers

Wild and scenic rivers are defined as having “remarkable scenic, recreational, geologic, fish, wildlife, historic or cultural value.” The U.S. Department of the Interior (DOI) and U.S. Department of Agriculture (USDA) implement the Wild and Scenic Rivers Act (16 U.S.C. Sections 1271-1287), which strives to balance river development with permanent protection of the country’s most outstanding, free-flowing rivers. In conjunction with the National Park Service (NPS), these agencies manage the Wild and Scenic Rivers System (WSRS) and the National River Inventory (NRI).

A segment of Kings River, located within Kings Canyon National Park approximately 60 miles west of the Airport, is designated as a wild and scenic river (Coffman Associates 2009). However, this river is not located within proximity of the Airport and would therefore not be at risk from Airport development.

3.4 Section 4(f) and 6(f) Resources

Section 4(f) of the U.S. DOT Act of 1966 (Title 49, U.S.C. Section 1653(f); amended and recodified in 49 U.S.C. Section 303) states that the Secretary of Transportation will not approve any program or project that requires the use of publicly owned land from a park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance or land from a historic site of national, state, or local significance unless there is no feasible alternative that would avoid such use and the program includes all possible planning efforts to minimize resultant harm.

Section 6(f) of the Land and Water Conservation Fund Act (L&WCFA) (16 U.S.C. Section 4601 et. seq.; Title 36 C.F.R. Part 59) prohibits the conversion of lands purchased with L&WCFA funds to non-recreational uses without the explicit approval of the Secretary of the DOI through the NPS and the replacement of those lands with a reasonable equivalent.

There are several public parks and recreation areas surrounding the Airport, including:

- Basin ‘FF’ Park, corner of S West Ave and W Kearney Blvd
- Chandler Park, on corner of S Crystal Ave, W La Sierra Dr
- Fink White Park, corner of E Whitesbridge Ave and S Trinity St
- Kearney Park, corner of E Kearney Blvd, Fresno St, Major Ave
- Frank H. Ball Park, bounded by Mayor Ave, Mono St, A St, Inyo St
- Fresno Park, between S Fruit Ave and S Delno Ave, North of W California Ave, adjacent to Neilson Park
- Neilson Park, between S Fruit Ave and S Delno Ave, North of W California Ave, adjacent to Fresno Park

Additional future research would be needed to determine if any L&WCFA funds were used in the development of these or other nearby recreational facilities. Future Airport development actions must take into consideration the potential for direct and constructive-use impacts to any local Section 4(f) or Section 6(f) resources.

3.5 Air Quality

The U.S. EPA is the federal agency that has jurisdiction over air quality issues and regulations. The federal Clean Air Act (CAA) (42 U.S.C. Sections 7401-7671q) has established National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants. These six pollutants are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter (PM), and sulfur dioxide. NAAQS compliance means that ambient outdoor levels of these pollutants are safe for human and public health and the environment. States with pollutant levels that exceed the NAAQS must prepare a State Implementation Plan (SIP) to improve air quality.

In accordance with the 1989 Health and Safety Code (HSC) section 39607(e), the Air Resource Board (ARB) is responsible for California's compliance with the CAA. In conjunction with the six pollutants regulated by the NAAQS, the ARB has established additional pollution standards for visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. In general, the state standards established for California by the ARB are more rigorous than the NAAQS. These state-specific standards are known as the California Ambient Air Quality Standards (CAAQS).

FCH is located within the San Joaquin Valley Air Pollution Control District (SJVAPCD), which encompasses the counties of Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, Tulare, and the San Juaquin Valley Air Basin portion of Kern straddling the Sierra Nevada and Tehachapi mountains. **Table 3-5** provides the federal and state attainment status of the San Joaquin Valley.

Table 3-5 – San Joaquin Valley Attainment Status

Pollutant	Designation/Classification	
	NAAQS	**CAAQS**
Ozone (one hour)	No federal standard	Nonattainment/severe
Ozone (eight hour)	Nonattainment/extreme	Nonattainment
PM 10	Attainment	Nonattainment
PM 2.5	Nonattainment	Nonattainment
Carbon monoxide	Attainment/unclassified	Attainment/unclassified
Nitrogen dioxide	Attainment/unclassified	Attainment
Sulfur dioxide	Attainment/unclassified	Attainment
Lead (particulate)	No designation/classification	Attainment
Hydrogen sulfide	No federal standard	Unclassified
Sulfates	No federal standard	Attainment
Visibility reducing particles	No federal standard	Unclassified
Vinyl chloride	No federal standard	Attainment

Source: SJVAPCD Ambient Air Quality Standards and Valley Attainment Status (accessed October 17, 2017);
Note: Attainment = Meets NAAQS/CAAQS standards; Nonattainment = Does not meet NAAQS/CAAQS standards; Unclassified = no data available

3.6 Biotic Resources and Endangered Species

Biotic resources include the various types of flora (plants) and fauna (fish, birds, reptiles, amphibians, marine mammals, coral reefs, etc.) in a particular area. Biotic resources also include rivers, lakes, wetlands, forests, upland communities, and other habitat types supporting the identified flora and fauna.

Several statutes protect fish, wildlife, and plant resources of the U.S., including the Fish and Wildlife Coordination Act of 1958 (16 U.S.C. Section 661-667e), Fish and Wildlife Conservation Act of 1980 (16 U.S.C. Section 2901-2911), Migratory Bird Treaty Act of 1918 (16 U.S.C. Section 703-712), Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. Section 668-668c), and Endangered Species Act (ESA) of 1973 (16 U.S.C. Section 1531, et seq.). The ESA, as amended, was enacted to provide a program for the preservation of endangered and threatened species and the ecosystems upon which they depend for survival. The ESA requires federal agencies, including the FAA, to implement protection programs for listed species and to use their authorities to further the purposes of the Act. In California, agencies are also subject to the provisions of the California ESA of 1984 (Fish and Game Code Section 2050, et seq.) and the California Native Plan Protection Act of 1977 (Fish and Game Code Section 1900, et seq).

In March 2015, the USFWS entered into a cooperative agreement with the California Department of Fish and Wildlife (CDFW) to carry out the duties of the ESA for the endangered; threatened; and candidate fish, wildlife, and plants in the state. Under this agreement, the USFWS and CDFW agree to cooperatively enforce the mandates of the ESA and related state statutes, including law enforcement activities, funding applications, listing processes, and the provision of scientific or technical expertise.

In total, the CDFW California Natural Diversity Database reports 218 state-listed and 187 federally listed plants in the state (California Department of Fish and Wildlife 2017). (Listed plant species include rare, threatened, or endangered designations. Animals are designated only as rare or endangered). Forty federally listed threatened or endangered species are known or believed to occur in Fresno County. Within the general vicinity of FCH, there are an estimated 8 endangered species, and 22 migratory birds of concern. These are listed in **Table 3-6**.

Table 3-6 – Protected Species Potentially Within the Airport Environs

Common Name	Scientific Name	Status
Migratory Birds		
Bald eagle	Haliaeetus leucocephalus	Birds of Concern
Black Swift	Cypseloides niger	
Black-chinned Sparrow	Spizella atrogularis	
Burrowing owl	Athene cunicularia	
California Thrasher	Toxostoma redivivum	
Clark's Grebe	Aechmophorus clarkii	
Costa's hummingbird	Calypte costae	
Golden Eagle	Aquila chrysaetos	
Lewis's woodpecker	Melanerpes lewis	
Long-billed curlew	Numenius americanus	
Marbled godwit	Limosa fedoa	
Mountain Plover	Charadrius montanus	
Nuttall's woodpecker	Picoides nuttallii	
Oak titmouse	Baeolophus inornatus	

Common Name	Scientific Name	Status
Migratory Birds		
Rufous Hummingbird	Selasphorus rufus	
Short-billed Dowitcher	Limnodromus griseus	
Tricolored Blackbird	Agelaius tricolor	
Whimbrel	Numenius phaeopus	
White Headed Woodpecker	Picoides albolarvatus	
Willet	Tringa semipalmata	
Wrentit	Chamaea fasciata	
Yellow-billed magpie	Pica nuttalli	
Amphibians		
California red-legged frog	Rana draytonii	Threatened
California tiger salamander	Ambystoma californiense	
Bird		
Yellow-billed cuckoo	Coccyzus americanus	Threatened
Crustaceans		
Vernal pool fairy shrimp	Branchinecta lynchi	Threatened
Fish		
Delta smelt	Hypomesus transpacificus	Threatened
Flowering plant		
Greene's tuctoria	Tuctoria greenei	Endangered
Mammals		
Fresno kangaroo rat	Dipodomys nitratoides exilis	Endangered
San Joaquin kit fox	Vulpes macrotis mutica	
Reptiles		
Blunt-nosed leopard lizard	Gambelia silus	Endangered
Giant garter snake	Thamnophis gigas	Threatened

Source: USFWS IPaC Information for Planning and Conservation (accessed January 3, 2018)

3.7 Coastal Resources

The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. Section 1451 – 1464) provides for the management of the nation's coastal resources. The CZMA is managed by National Oceanic and Atmospheric Administration's (NOAA) Office for Coastal Zone Management. As a state-specific compendium of the CZMA, California passed the California Coastal Act (CCA) in 1976. Together, the CZMA and CCA manage and regulate all land and water in California's coastal zone. Under the state's federally approved Coastal Management Program, the California Coastal Commission manages development along the entire coast except the San Francisco Bay.

With few exceptions in urban and very rural areas, the California coastal zone is principally defined as 1,000 yards inland from the mean high-tide line (National Oceanic and Atmospheric Administration Office for Coastal Management 2016). FCH is not located within the limits of the California coastal zone.

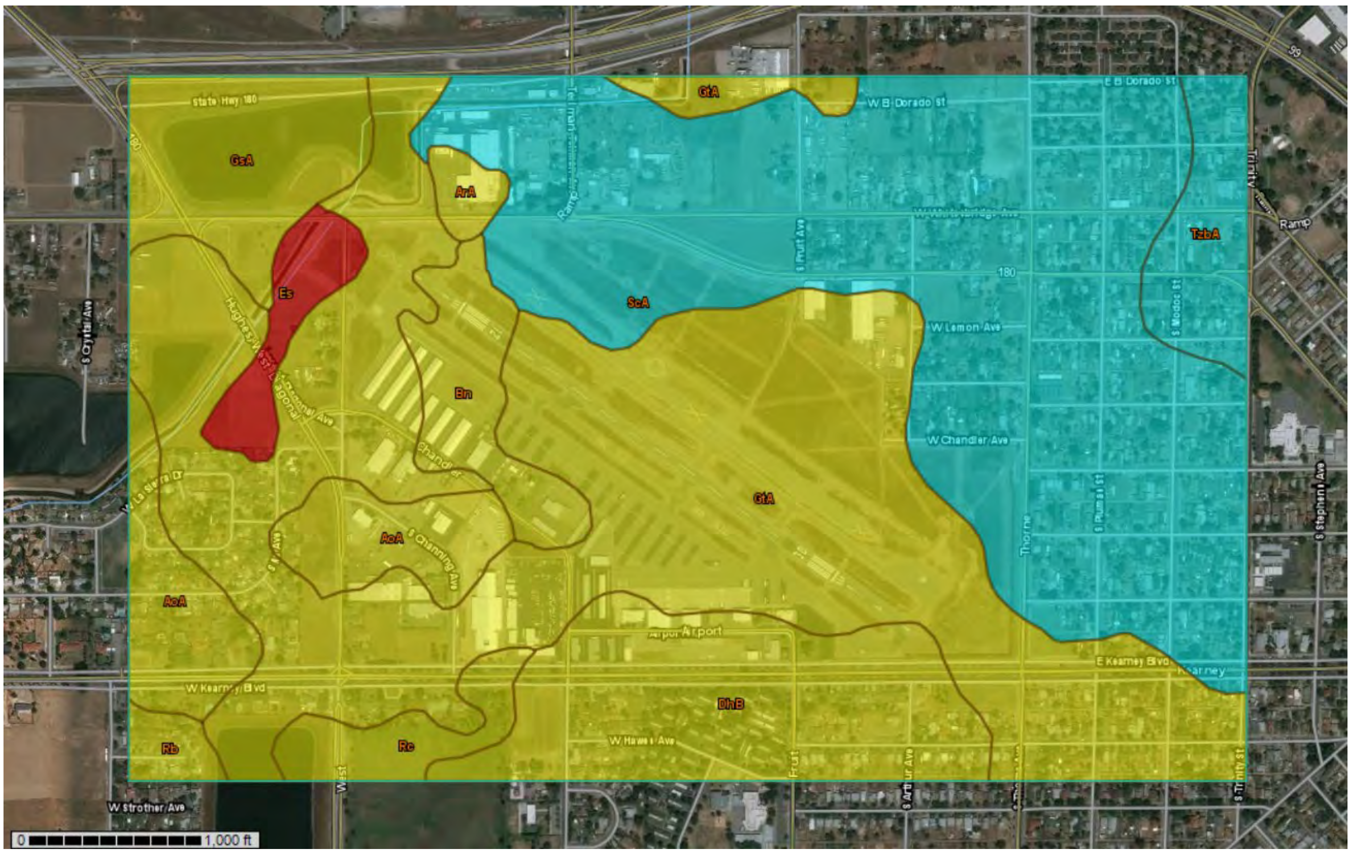
3.8 Farmlands

The Farmland Protection Policy Act (FPPA) of 1981 (PL 90-542) authorizes the USDA to minimize federal programs' contribution to unnecessary and irreversible conversion of farmland to nonagricultural uses.

Prime farmland, as defined by the USDA, is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor and without intolerable soil erosion.

FPPA guidelines apply to farmland classified as prime or unique, or of state or local importance as determined by the appropriate government agency with concurrence by the Secretary of Agriculture. The majority of the soil on Airport property is classified as 'prime farmland if irrigated.' However, because much of the land is already committed to urban development or water storage, the soil types do not meet the definition of prime or unique farmland. **Figure 3-5** illustrates the soils content within the vicinity of the Airport while **Table 3-7** describes the soil types.

Figure 3-5 – FCH Soils Inventory



Source: USDA NRCS Web Soil Survey (accessed November 24, 2017)

Table 3-7 – FCH Soils Inventory Data

Map Symbol	Soil Type	Rating	Area in Map (Acres)	Area in Map (Percent)
AoA	Atwater loamy sand	Prime farmland if irrigated	32.5	5.3%
ArA	Atwater sandy loam	Prime farmland if irrigated	4.0	0.7%
Bn	Borden loam	Prime farmland if irrigated	19.0	3.1%
DhB	Dehli loamy sand	Prime farmland if irrigated	57.8	9.5%
Es	Exeter sandy loam	Not prime farmland	10.6	1.7%
GsA	Greenfield coarse sandy loam	Prime farmland if irrigated	30.0	4.9%
GtA	Greenfield sandy loam	Prime farmland if irrigated	224.9	37.0%
Rb	Ramona sandy loam, hard substratum	Prime farmland if irrigated	4.5	0.7%
Rc	Ramona loam	Prime farmland if irrigated	11.5	1.9%
ScA	San Joaquin sandy lam	Farmland of statewide importance	213.3	29.1%
TzbA	Tujunga loamy sand	Farmland of statewide importance	31.3	4.3%

Source: USDA NRCS Web Soil Survey (accessed November 24, 2017)

3.9 Hazardous Materials

The term 'hazardous material' is generally associated with industrial wastes, petroleum products, dangerous goods or other contaminated substances. The statutory framework regarding hazardous materials in FAA actions is provided by the Resource Conservation and Recovery Act (42 U.S.C. Section 6901, et seq. (RCRA)), the Comprehensive Environmental Response Compensation and Liability Act (42 U.S.C. Section 9601 (CERCLA)), and the Community Environmental Response Facilitation Act (Public Law [P.L.] 102-426). These statutes address the use, storage, and disposal of hazardous materials and the environmental threats caused by mishandling these materials.

Additionally, California entities that handle hazardous materials in quantities equal to or greater than 55 gallons of a liquid, 500 pounds of a solid, or 200 cubic feet of a compressed gas; extremely hazardous substances above the threshold planning quantity defined by federal statutes; or certain radioactive materials are required to comply with the Hazardous Materials Business Plan (Business Plan) program of the California HSC (Section 2550 – 25519). The Fresno County Environmental Health Division administers the Business Plan Program in Fresno County.

As a separate provision of the HSC (Sections 25531-25543.3), an owner or operator of a stationary source that has more than a threshold quantity of a regulated substance as defined by California Code of Regulations, Title 19 (Section 2770.5, Tables 1-3) is also required to comply with the California Accidental Release Prevention (CalARP) program. The CalARP requires covered entities to prepare a Risk Management Plan. This plan provides first responders with the information needed to prevent or mitigate damage to public health and safety and the environment from the release of hazardous materials while satisfying community right-to-know laws.

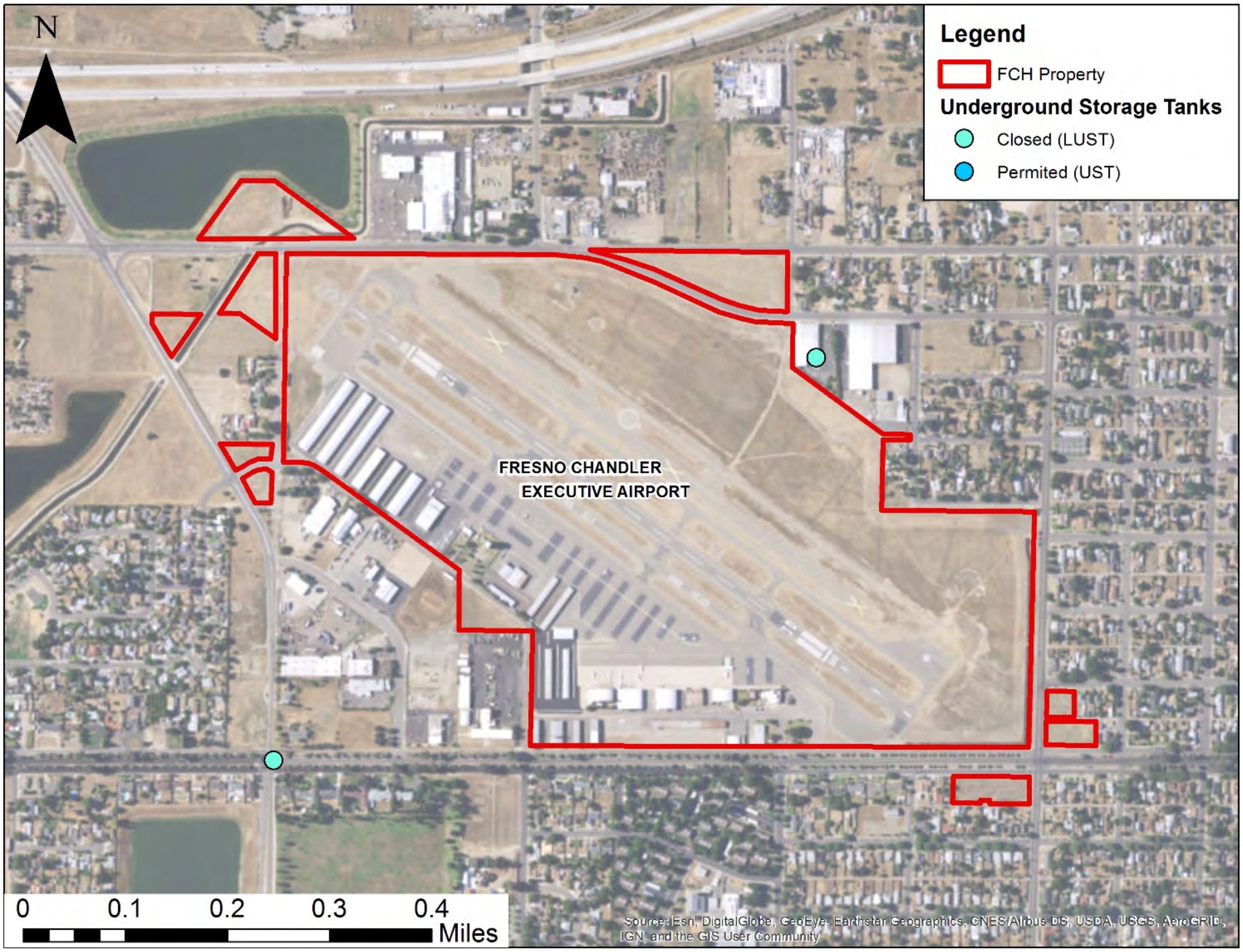
Hazardous substances in regular use at FCH include aircraft and vehicle fuels. Smaller amounts of hazardous substances are also stored on the Airport, including lubricants and solvents, used oils, filters, cleaning residues, and spent batteries, herbicides, fertilizers, paints, fire-fighting foam, and de-icing fluids. Airline operators are responsible for storage compliance, disposal, and care of de-icing fluids or spills. Further analyses would be needed to determine if the Airport or its tenants possess a threshold quantity of the regulated substances under the Hazardous Materials Business Plan or CalARP programs.

3.10 Underground Storage Tanks

On July 15, 2015, the U.S. EPA issued revised underground storage tank (UST) regulations with specific provisions regarding field-constructed tanks and airport hydrant fuel distribution systems (40 C.F.R. Section 280). While FAT does not have a hydrant fueling system, the Airport and its tenants are also subject to California's UST Regulations (CCR Title 23, Division 3, Chapter 16), UST Cleanup Fund Regulations (CCR Title 23, Division 3, Chapter 18), and the Unified Program Regulations (CCR Title 27, Division 1, Subdivision 4, Chapter 1, Sections 15100-15620). The Fresno County Division of Environmental Health administers the UST program for FAT. This program is responsible for ensuring UST operators comply with applicable laws and regulations so hazardous materials are not released into the groundwater and the surrounding environment. Operators are required to obtain a Permit to Operate and have annual inspections conducted by a third-party technician.

At the time of this writing, there are no permitted USTs or leaking UST (LUST) cleanup program sites near FCH. However, the UST sites in the general vicinity of the Airport are depicted in **Figure 3-6**.

Figure 3-6 – Underground Storage Tanks near FCH



Source: State Water Resources Control Board GeoTracker (accessed November 22, 2017)

3.11 Historical and Cultural Resources

The National Historic Preservation Act (36 C.R.F. Part 800 (NHPA)), as amended, provides for the preservation of cultural resources eligible for inclusion in the National Register of Historic Places (NRHP). Section 106 of the NHPA directs heads of federal or independent agencies that have direct or indirect jurisdiction over a federal or federally-assisted undertaking to 'take into account the effect on any district, site, building, structure, or object that is included in or eligible for the inclusion in the National Register.'

Four on-Airport buildings built by the Works Progress Association (WPA) in 1936-1937 have been identified as being eligible for listing on the National Register of Historical Places (Coffman Associates 2009). These buildings include the Administration Building/Terminal, the Administration Building Annex, the Electrical Control Building, and the Bathroom Building. However, as of the time of this writing, the NRHP does not recognize these buildings or any other sites on or near Airport property (National Park Service 2017).

Additionally, Kearney Boulevard is on the local register of historic places (Coffman Associates 2009).

4 Forecasts of Aviation Activity

Projections of future aviation activity at an airport provide the foundation for effective decision-making in airport planning and development. Such forecasts are used to determine the type, size, and timing of new or expanded airport facilities to meet anticipated user needs. They are also used to help justify the financial investment in those improvements.

Forecasts of aviation activity for FCH include several methodologies that are typical of airport master plans, but also include methodologies that analyze the Fresno airport system, which includes FAT. Both FCH and FAT are owned and operated by the City of Fresno. Analysis of activity on a system level allows the City's Department of Airports to make educated decisions regarding existing and future facility needs at both airports.

Forecasts of aviation-related demand are presented in the following sections:

- Trends and Factors
- Historical Activity
- Previous Forecasts
- Based Aircraft Forecasts
- Aircraft Operations Forecasts
- Peak Activity Forecasts
- Critical Aircraft
- Forecast Summary
- FAA Forecast Review and Approval

It should be noted that the forecasts presented in this Chapter are derived using existing and historical data from various sources, which varied significantly in terms of aviation-related activity at the Airport. As such, two separate forecasts were developed for based aircraft and total operations. A Baseline Forecast that utilizes historical data from FAA sources was developed and submitted to the FAA for review and approval. An Accelerated Baseline Forecast that utilizes historical data reported by Airport Management was also developed specifically for facility planning purposes but was not submitted to the FAA. The purpose and methodologies used to define these various forecasting efforts is described in subsequent sections of this Chapter.

4.1 Trends and Factors

Local, regional, and national trends can impact aviation activity at individual airports. A general understanding of recent and anticipated trends in the aviation industry is crucial in the preparation of an airport's forecasts. This understanding provides direction and credence to the forecast methodology outcomes, and aids in the selection of a preferred forecast. Since activity at FCH is associated with GA, this section focuses on past and anticipated trends in the GA industry.

4.1.1 National General Aviation Trends

Historically, aviation demand has been driven by economic factors. General aviation activity in the U.S. has experienced decline in the past few years. The FAA projects that the number of aircraft in the national GA fleet will only increase by approximately 200 over the next 20 years; this minor increase is attributed to a projected rise in turbine (including rotorcraft), experimental, and light sport aircraft, which are anticipated to offset the decline in fixed wing piston aircraft. Overall, future growth is anticipated to be focused in the corporate and business aviation sectors that are most often tied to turboprop and jet aircraft. These projections are identified in the *2018-2038 FAA Aerospace Forecast* (FAA 2018).

Another national trend that impacts the general aviation sector is an increasing demand for commercial airline pilots. Pilots pursuing commercial licenses utilize GA aircraft in their initial flight training phases. According to the *2018-2038 FAA Aerospace Forecast*, the number of active commercial and air transport (ATP) pilot certificates is anticipated to increase 0.7 percent annually through 2038. While tenants at the Airport do provide flight training, there is not a designated commercial pilot training program currently active at the Airport.

One aviation trend that has unknown consequences on the demand for GA activity is the requirement for the transition to unleaded aviation gas (AvGas). Multiple companies that produce petroleum products have been testing the use of unleaded AvGas in recent years. Based on a cursory examination of airports that offered both 100LL and unleaded AvGas, the two fuels were similar in cost, yet in many cases, unleaded AvGas was less expensive. While it is estimated that two-thirds of the current piston-engine GA aircraft fleet can operate with unleaded AvGas, the technology has been slow in mass distribution.

Two additional items that have impacted the aviation industry in recent years include implementation of NextGen technologies and increased use of Unmanned Aircraft Systems (UAS). NextGen is an initiative from the FAA to develop technology geared toward making air travel safer and more efficient by replacing older/existing technology to better manage airspace. There are many initiatives being developed specifically for airports to help accommodate the demand for additional capacity in a safe, efficient, and environmentally responsible manner, such as the FAA's En Route Automation Modernization (ERAM), which processes data from 64 radars and tracks 1,900 aircraft at a time. While NextGen is an FAA-driven initiative, it requires aircraft operators of both private and airline carriers to equip aircraft and pursue NextGen practices. Specifically, the FAA will require that aircraft, including those in the GA fleet, be equipped with Automatic Dependent Surveillance-Broadcast Out (ADS-B) equipment by January 1, 2020, to fly in most controlled airspace. This equipment continuously transmits aircraft data, such as airspeed, altitude, and location, to ADS-B ground stations. While certain exemptions may apply, and there are rebates for the installation of this equipment, the requirement of ADS-B equipment in all aircraft may be a minor deterrent to small and recreational aircraft activity in the future.

UAS, commonly referred to as drones, have had significant impacts on the NAS in recent years. Developments in UAS technology and growth in their demand and use in several industries have increased concerns due to the current NAS not being tailored to accommodate manned and unmanned aircraft operating in the same environment. For UAS and manned aircraft to operate safely and efficiently in an integrated system within the NAS, continued study is needed that may affect policies at multiple levels of government and administration. To compound the issue, requirements and regulations regarding the operation of UAS are ever-evolving, and, in many instances, are not followed. The FAA has promoted numerous outreach efforts, such as B4UFLY to support the safe integration of UAS into the NAS, but the effects are difficult to determine due to the difficulty involved with collecting accurate data on their use. The presence of UAS in the NAS, and the expansion of their abilities based on improved battery life, improved range, and reduced cost, will ultimately have an ever-increasing impact on the NAS and on all aviation activity, especially smaller GA aircraft that typically operate at lower altitudes. It is unknown at this juncture how UAS will impact future activity at the Airport or at other airports throughout the U.S. This growing segment of the aviation industry will continue to be monitored.

General aviation related to business travel is expected to increase in the next 20 years. According to the *2018-2038 FAA Aerospace Forecast*, the turbojet fleet is expected to increase at 2.2 percent a year (FAA 2018, 23).

While FCH experiences a limited amount of small jet and turboprop activity, this upward trend could have a minor impact on the Airport's aircraft activity. Other trends, such as the emergence of electric aircraft, and continued popularity of light sport aircraft present potential future opportunities for growth at the Airport. As noted throughout this Airport Master Plan Update, the Airport bases three electric aircraft as part of a pilot program sponsored by two nearby airports. This segment of the aviation industry has potential for significant growth in based aircraft both locally and nationally.

4.1.2 Local General Aviation Trends

Previous planning documents acknowledged a decline in aviation activity at the Airport due to the economic downturn that started in 2008 (Coffman Associates, Inc. 2009). That trend continued at most GA airports in the U.S., including FCH, through 2014, when activity began a slow recovery. While economic factors have most significantly impacted activity at the Airport, other trends also play a role. To highlight types of activity at FCH, and trends that occur at a local level, the PAC participated in a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis. The results of this analysis were used to assess the overall health of the Airport and identify opportunities for future development (see **Figure 4-1**).

Figure 4-1 – Airport SWOT Analysis

Strengths	Weaknesses	Opportunities	Threats
• Historical significance • Convenient location • GA airport focus without ATCT, military activity, or commercial service • Competitive hangar rents	• Runway length • Aging infrastructure • No full-service FBO • No precision instrument approach • Security issues	• Educational opportunities with local trade schools and community colleges • New aviation industries • Developable land • Flexibility to adjust rates and fees to attract regional aircraft	• Encroachment • Changing FAA guidance and policy • Economic constraints • Historical area and Airport facilities

Source: Kimley-Horn & Associates, February 2018

Strengths – Though the existing fleet is comprised primarily of single-engine piston aircraft, the Airport has seen an increase in experimental and ultra-light aircraft. In March 2018, FCH became the hub for three electric aircraft obtained via a grant administered to two nearby airports. The Airport's climate and location provide an opportunity to expand electric aircraft and other potential activities/innovations in California such as Uber Elevate, a new initiative that explores the feasibility of using electric vertical takeoff and landing (VTOL) aircraft as a common mode of transportation in the future.

Specific to the region, the Airport is in a geographically advantageous location with its proximity to the Bay Area that could help capture additional growth in the general aviation sector. Furthermore, the Airport is close to downtown Fresno and conveniently located in the region. Competitive hangar rents compared with other regional airports and the Airport's historical significance were also identified as strengths.

Weaknesses – One of the main concerns for the Airport is that aircraft activity is limited by existing facilities – most notably runway length. Displaced thresholds on both runway ends limit the size and type of aircraft that can operate at FCH. Additionally, the Airport is not equipped with a precision approach and much of the

Airport's infrastructure is in need of improvement. These limitations were identified as the primary causes of the Airport's lack of a full-service fixed-base operator (FBO). PAC members also identified Airport security as a weakness.

Opportunities – Members of the PAC and Airport Management identified educational opportunities for flight training and ground school at the Airport. The Airport also has developable land to the north of the airfield that could accommodate or attract new tenants/users. Airport Management also noted that they have the ability to adjust rates and fees to attract additional aircraft owners as demand merits.

Threats – Due to economic pressures, the Airport may struggle to attract new tenants and aircraft owners. Additionally, the facilities face encroachment and are spatially constrained with the property generally being bounded by residential communities on the south, east, and west, and Sequoia Kings Canyon Freeway to the north. Furthermore, due to the historic nature of the Airport, a general desire by the community to preserve the facilities may lead to a resistance to change. General trends in FAA guidance and policy (as described in the previous **Section 4.1.1**) may also hamper aviation activity at the Airport.

4.2 Historical Activity

At general aviation airports such as FCH, there are two primary indicators of activity: based aircraft and aircraft operations. A based aircraft is generally defined as an aircraft that is considered airworthy and is stored at an airport for the majority of the year. An aircraft operation represents either a take-off or landing conducted by an aircraft; as a result, a take-off and a landing—such as those that occur with flight training "touch-and-go" (T&G) practice flights—count as two operations.

Historical data is largely limited and sporadic. While there was previously an active ATCT at the Airport, the FAA decommissioned ATC services at the Airport meaning there is no actual count of operational activity. Previous planning documents however, do indicate historical annual based aircraft and aircraft operations. In 1998, the Airport had a total of 183 based aircraft (City of Fresno 1999). In 2003, that based aircraft count had grown to 246 according to Airport staff (Mead & Hunt 2005). In 2007, City records confirmed there were 247 based aircraft at the Airport (Coffman Associates, Inc. 2009, 14). Likewise, in 2007 it was estimated that 48,000 aircraft operations had occurred based on acoustical counters. Despite the limited historical data available, these figures provide context for forecasting efforts in this Airport Master Plan Update.

4.3 Previous Forecasts

In addition to historical activity, previous planning and forecasting efforts have also been evaluated to inform the forecasts presented in this Chapter; the results are shown in **Table 4-1**, and including the following:

- The *2005 Focused Master Plan for North Side Development* used a base year of 2003 and identified 246 based aircraft. The forecast projected based aircraft to increase at 0.9 percent annually for a low-growth scenario and 2.9 percent for a high-growth scenario (Mead & Hunt 2005). This was consistent with the national forecasts at that time and resulted in 277 based aircraft and 61,300 operations by 2017 for the low-growth scenario and 378 based aircraft and 87,200 operations by 2017 for the high-growth scenario.
- The *2009 Airport Layout Plan Narrative Report* identified 247 based aircraft in 2007 to forecast 374 based aircraft and 87,200 operations by 2017 (Coffman Associates, Inc. 2009).

While these forecasts represented trends occurring at the time they were developed, updated forecasts were needed to accurately reflect existing and projected levels of activity and subsequent facility needs.

Table 4-1 – Previous Forecasts

Previous Forecast Source	Based Aircraft by 2017		Aircraft Operations by 2017	
	Low Growth	High Growth	Low Growth	High Growth
2005 Focused Master Plan for the North Side Development (2003 Base Year – 246 Based Aircraft)	277	378	61,300	87,200
2009 Airport Layout Plan Narrative Report (2007 Base Year – 247 Based Aircraft)	374		87,200	

Sources: 2005 Focused Master Plan for North Side Development prepared by Mead & Hunt, 2009; Airport Layout Plan Narrative Report prepared by Coffman Associates

4.4 Forecasting Assumptions

Based aircraft and aircraft operations have fluctuated since the previous Master Plan was conducted. Aviation activity at airports is typically driven by controllable factors (hangar rents, services provided, maintenance of facilities, etc.) and non-controllable factors (local/national economic conditions, availability of funding, etc.). As such, the following assumptions have been identified as they pertain to forecast development:

- The Airport will continue to be a general aviation airport and not serve commercial activity.
- It is assumed that socioeconomic data provided by Woods & Poole Economics Inc. are indicative of existing and future conditions at the state and local level.
- The FAA will continue to include FCH in its NPIAS, meaning it will be eligible to receive grants under the AIP.
- Based on historical activity and existing facilities and services at the Airport, it is assumed that FCH will continue to sustain its FAA-designated “reliever” status by catering to smaller GA aircraft and divert much of that activity from nearby FAT. Such aircraft types include single and twin piston, and small to medium-sized turboprop and jet aircraft. FAT is equipped with longer runways, precision instrument approaches, FBOs and other amenities that attract a greater proportion of larger turboprop and jet aircraft. As such, the roles that these two airports provide and the aircraft they serve are anticipated to remain relatively consistent over the next 20 years as they pertain to GA activity within the region.

4.5 Based Aircraft Forecasts

As previously noted, based aircraft are defined by the FAA as those considered airworthy and stored at an airport for the majority of the year (in hangars or on tie-down spaces). The forecasts of based aircraft influence the planning and development of required hangar space, apron space, and other related facilities needed to accommodate these aircraft.

There are several sources that identify the number of based aircraft at the Airport. The reported number varies by source. The FAA’s National Based Aircraft Inventory Program (sometimes referred to by its website, www.basedaircraft.com), reported 110 based aircraft with 90 ‘validated’ or confirmed at the Airport as of April

2015 (FAA 2015). The FAA's TAF published in January 2018 indicated there were 127 based aircraft in 2017. Additionally, the latest FAA Form 5010-1, *Airport Master Record,* reported 118 based aircraft, which included five helicopters and eight ultra-lights as of May 2017. The discrepancies between sources may be due to the nature of how and when the numbers were reported. Aircraft owners sometimes choose to store their planes at more than one airport throughout the year and this can affect the reported numbers. Furthermore, historical based aircraft numbers may not be precise due to any number of reasons but provide a rough estimate.

A thorough in-person inventory of based aircraft at the Airport was conducted by the Airports Department in September 2018 which identified 140 non-itinerant aircraft that were stored on apron areas utilizing tie-downs or in hangars. The FAA's National Based Aircraft Inventory Program was updated in October 2018 to reflect these 140 aircraft; 111 of the aircraft were validated after the update was made. The remainder were either registered at other regional airports, registered out-of-state, or de-registered. Additionally, though several aircraft that were counted in the inventory were registered at other regional airports or registered out-of-state, they rented tie-downs and hangars at the Airport and were anticipated to continue to be based at FCH on a permanent or semi-permanent basis.

Based on discussions with the FAA, utilization of 118 based aircraft reported in the Form 5010-1, *Airport Master Record* in base year 2017 was identified as the recommended source for forecasting purposes. Forecasts derived using this figure were submitted to the FAA and approved and are referred to as the Baseline Forecast in this document.

Given that 140 aircraft were actually utilizing available storage space at the time this Airport Master Plan was developed (on tie-downs or in hangars) and that new aircraft that decide to base at the Airport will require additional storage facilities beyond what is occupied now, a second forecast, referred to as the Accelerated Baseline Forecast was also developed. The Accelerated Baseline Forecast utilized 140 based aircraft in base year 2017 and assumed the fleet mix identified by the Airport. This forecast is intended for facility planning purposes only, was not submitted to the FAA for approval, and is intended to provide the Airport a realistic scenario-based forecast to ensure spatial requirements for long-term apron and aircraft storage facilities are planned. **Table 4-2** presents based aircraft by type for 2017 based on the Form 5010-1, Airport Master Record as well as the based aircraft by type identified during the on-site inventory, which are used to develop the Baseline Forecast and Accelerated Baseline Forecast, respectively.

The Accelerated Baseline Forecast for based aircraft was derived using the same methodology as the preferred methodology for the Baseline Forecast except that it utilized a base year estimate of 140 aircraft instead of 118. The following sections present the methodologies used to identify the Baseline Forecast for based aircraft. Summaries of both the Baseline and Accelerated Baseline Forecasts are presented at the end of this Section.

Table 4-2 – Based Aircraft at FCH 2017

	5010 Airport Master Record Based Aircraft – 2017 (Baseline)	Percent of Total Fleet	2018 Airport Count Based Aircraft (Accelerated Baseline)	Percent of Total Fleet
Single Engine:	102	86.4%	123	87.9%
Multi Engine:	3	2.5%	2	1.4%
Turboprop:	0	0.0%	2	1.4%
Jet:	0	0.0%	0	0.0%
Helicopters:	5	3.6%	5	3.6%
Light Sport/Experimental:	8	5.7%	8	5.7%
TOTAL:	**118**	**100%**	**140**	**100%**

Sources: Form 5010-1, Airport Master Record, City of Fresno Airports Department, inventory count in 2017 (updated in 2018)

4.5.1 Based Aircraft Forecast Methodologies

Because there has been significant fluctuation in historical aviation activity compared to current activity – attributed to volatile economic conditions and other factors – the overall approach to develop forecasts for this Airport Master Plan Update is based on analysis of existing activity and identification of trends that will most likely impact activity in the future. This analysis requires data collected from various resources including Airport records, FAA databases, Woods and Poole Inc., the U.S. Census, and previous Airport planning documents. In addition, data and qualitative information were obtained through interviews with Airport tenants and the PAC. This information provides a more thorough understanding of tenant goals, facility needs, and potential impacts to future aviation activity at the Airport. Because accurate, annual estimates of historical based aircraft are limited, the accuracy of certain types of methodologies, such as trend analysis, are not utilized.

4.5.1.1 Based Aircraft Forecast – Socioeconomic

Socioeconomic characteristics provide insight to the economic health of a specific locality or region. Population, per capita personal income (PCPI), employment, and other indicators can reflect propensity to own or operate aircraft. Socioeconomic data were provided by Woods and Poole Economics, Inc., an independent firm that specializes in long-term economic and demographic projections. Socioeconomic data were analyzed and grouped in regions: Fresno-Madera combined statistical area (CSA), 6-County area surrounding Fresno (including Fresno, Madera, Mariposa, Merced, Kings, and Tulare Counties), and the State of California. The grouping by area was done intentionally because while some airports are tied to more local conditions, other airports are influenced more by regional or statewide factors depending on the type of role that they serve. As such, an overview of several regions provides a more comprehensive analysis. The following socioeconomic factors were considered in this section and are detailed in **Table 4-3**:

- Population – the total number of persons residing within a specific geographic area
- Employment – the total number of employed persons within a specific geographic area
- PCPI – a composite measure of market potential which indicates the general ability of persons to purchase products and services. It should be noted that PCPI data obtained from Woods and Poole was reported in constant dollars (year 2016) to adjust for inflation over time.

Table 4-3 – Socioeconomic Data (Population, Employment, Per Capita Personal Income)

	Fresno-Madera CSA			6-County Region			California		
Year	Population	Employment	PCPI ($2016)	Population	Employment	PCPI ($2016)	Population	Employment	PCPI ($2016)
Historic									
2000	924,880	452,590	$28,270	1,652,710	765,550	$25,460	33,987,980	19,280,930	$45,190
2010	1,083,790	483,050	$32,100	1,954,490	823,100	$30,140	37,336,010	19,803,750	$46,940
2017	1,162,410	558,640	$37,030	2,081,800	937,600	$35,210	39,943,420	23,144,510	$53,970
CAGR 2000-2017	1.01%	2.10%	2.06%	0.91%	1.88%	2.25%	0.97%	2.25%	2.01%
Projected									
2022	1,236,020	601,990	$39,670	2,202,030	1,006,110	$37,740	41,943,130	24,957,950	$57,700
2027	1,312,980	644,750	$42,240	2,326,730	1,072,350	$40,180	44,002,730	26,756,950	$61,510
2037	1,467,640	727,100	$46,290	2,574,270	1,200,110	$43,990	47,971,810	30,258,190	$68,930
CAGR 2017-2037	1.17%	1.33%	1.12%	1.07%	1.24%	1.12%	0.92%	1.35%	1.23%

Source: Woods & Poole Economics Inc.

Notes: CAGR = Compounded Annual Growth Rate, Income is per capita estimates in USD, the 6-county region includes Merced, Mariposa, Madera, Fresno, Kings, and Tulare Counties

Socioeconomic forecasts assumed that the number of based aircraft at the Airport (beyond base year 2017) will mimic population, employment, and PCPI projections for the compared geographic areas through 2037. The resulting forecasts for based aircraft at the Airport using this methodology are shown in **Table 4-4**.

Table 4-4 – Baseline: Based Aircraft Forecasts – Socioeconomic

	Fresno-Madera CSA			6-County Region			California		
Year	Population	Employment	PCPI ($2016)	Population	Employment	PCPI ($2016)	Population	Employment	PCPI ($2016)
2017	118	118	118	118	118	118	118	118	118
2022	125	127	126	125	127	126	124	127	126
2027	133	136	135	132	135	135	130	136	134
2037	149	154	148	146	151	147	142	154	151
CAGR 2017-2037	1.17%	1.33%	1.12%	1.07%	1.24%	1.12%	0.92%	1.35%	1.23%

Source: Kimley-Horn & Associates, October 2018

The based aircraft forecasts predicated on socioeconomic data indicate that based aircraft at the Airport could range from 142 to 154 by 2037 depending on the geographic areas that are considered. This range reflects compound annual growth rates (CAGR) of 0.92 percent to 1.35 percent over the planning horizon.

4.5.1.2 Based Aircraft Forecast – Regional Market Share

Market share forecasts compare an individual airport's share of a certain component or indicator (such as based aircraft at FCH) with that of a larger market. The market share analysis was developed using FAA TAF projections of based aircraft at the 12 airports within a 50-mile radius of the Airport, which included: Fresno Chandler Executive Airport (FCH), Chowchilla Airport (2O6), Sequoia Field Airport (D86), Firebaugh Airport (F34), Fresno Yosemite International Airport (FAT), Hanford Municipal Airport (HJO), William Robert Johnston Municipal Airport (M90), Madera Municipal Airport (MAE), Reedley Municipal Airport (O32), Woodlake Airport (O42), Mefford Field Airport (TLR), and Visalia Municipal Airport (VIS). These data are shown in **Table 4-5**.

Table 4-5 – Baseline: FCH Regional Market Share of Based Aircraft

Year	FCH	2O6	D86	F34	FAT	HJO	M90	MAE	O32	O42	TLR	VIS	Total	% FCH Market Share
2008	125	20	15	12	208	49	1	97	60	21	66	140	814	15.4%
2009	126	20	15	12	208	67	0	112	60	21	66	162	869	14.5%
2010	103	12	13	12	170	67	0	82	45	19	65	161	749	13.8%
2011	103	12	13	12	142	67	0	82	45	19	65	133	693	14.9%
2012	124	13	13	12	170	39	0	79	49	2	48	154	703	17.6%
2013	132	18	11	12	174	38	0	88	49	2	46	162	732	18.0%
2014	132	19	11	12	155	38	0	87	53	2	45	161	715	18.5%
2015	122	19	9	12	152	36	0	77	45	0	43	151	666	18.3%
2016	127	19	11	12	193	35	0	140	50	16	44	148	795	16.0%
2017	118	19	11	12	193	35	0	140	50	16	44	150	797	14.8%

Source: 2018 FAA Terminal Area Forecast

The purpose for examining regional airports is to account for factors that could affect based aircraft forecasts at FCH – for example, nearby airport facilities, services, rates etc. The regional market share forecast of based aircraft included low-, medium-, and high-growth scenarios (refer to **Table 4-6**).

The Low-Growth Scenario assumed that the market share at the Airport would remain 14.8 percent of total based aircraft in the region throughout the planning horizon, the same percentage that FCH represented in 2017. This figure was applied to FAA TAF forecasts of based aircraft at airports within the region and resulted in 122 based aircraft at FCH in 2037, which represents a CAGR of 0.17 percent.

The High-Growth Scenario assumed that the Airport's market share of regional based aircraft would increase by 0.10 percent annually through the 20-year planning horizon. This modest increase is supported by a number of factors including 1) Incremental projected growth in based aircraft at regional airports as reported in the TAF, 2) Recent growth in the Airport's based aircraft fleet including three electric aircraft in 2018, and 3) Airport Management's ability to adjust tenant rates and fees to remain competitive with other airports the region, which could attract aircraft owners at nearby airports to FCH in the future. These factors combined with anticipated population and economic growth within the Fresno MSA support a High-Growth methodology that increases the Airport's market share of regional based aircraft gradually over the 20-year planning horizon.

The Medium-Growth Scenario was developed by averaging the product of the high- and low-growth scenarios, which resulted in 135 based aircraft in 2037 and a 0.69 CAGR.

Table 4-6 – Baseline: Based Aircraft Forecasts – Regional Market Share

Year	Regional Based Aircraft	FCH Based Aircraft (Low)	FCH Market Share (Low)	FCH Based Aircraft (Medium)	FCH Market Share (Medium)	FCH Based Aircraft (High)	FCH Market Share (High)
2017	797	118	14.8%	118	14.8%	118	14.8%
2022	804	119	14.8%	122	15.2%	125	15.6%
2027	810	120	14.8%	126	15.6%	132	16.4%
2037	824	122	14.8%	135	16.4%	149	18.1%
CAGR 2017-2037	0.17%	0.17%	N/A	0.69%	N/A	1.17%	N/A

Sources: Kimley-Horn & Associates, October 2018, 2018 FAA Terminal Area Forecast

4.5.2 Preferred Forecast

The vision and mission of the Airport is to be the "general aviation airport of choice serving the economic hub of California's Central Valley" and "provide an essential transportation link…while preserving [the Airport's] historic tradition, serving the community, and fostering innovation in aviation."

To realize these goals, Airport Management has indicated it has flexibility to adjust rates and fees to be competitive in the region (in accordance with the economic climate), and desires to maximize investment in innovation and attract additional tenants and aircraft owners. While the FAA TAF forecasts minimal growth in the number of based aircraft in the Fresno region and flat growth at FCH, it is anticipated that the Airport's efforts will allow it to capture a greater share of the regional market over the next 20 years. These efforts have already occurred to some extent, evidenced by the recent acquisition of three electric aircraft in March 2018. As such, the Regional Market Share – Medium Growth Scenario is the preferred based aircraft forecast for long-term planning at the Airport.

4.5.3 Accelerated Baseline Forecast

The Accelerated Baseline Forecast was derived utilizing the same Regional Market Share – Medium Growth Scenario identified in the Baseline Forecast but assumed a base year estimate of 140 based aircraft. As noted, the Accelerated Baseline Forecast was developed to aid the City in facility planning at the Airport. This forecast has not been submitted to the FAA for approval, although certain facility requirements for the Accelerated Baseline Forecast are described in a subsequent Chapter.

As shown in **Table 4-7**, the Regional Market Share – Medium Growth Scenario in the Accelerated Baseline Forecast results in 161 based aircraft by 2037.

Table 4-7 – Accelerated Baseline: Based Aircraft Forecasts – Regional Market Share

Year	Regional Based Aircraft	FCH Based Aircraft (Medium)	FCH Market Share (Medium)
2017	797	140	17.6%
2022	804	145	18.0%
2027	810	150	18.5%
2037	824	161	19.5%
CAGR 2017-2037	0.17%	0.69%	N/A

Sources: Kimley-Horn & Associates, October 2018, 2018 FAA Terminal Area Forecast

4.5.4 Based Aircraft Fleet Mix Forecast

An airport's fleet mix dictates facility needs pertaining to size and type of aircraft storage hangars, aircraft tie-downs, aircraft parking apron, and others. As with many GA airports, most of the based aircraft fleet at the Airport is composed of single-engine piston aircraft. The current and future based aircraft fleet mix at FCH is described in **Table 4-8** and **Table 4-9**. **Table 4-7** presents the Airport's Baseline Forecast fleet mix and **Table 4-8** presents the Airport's Accelerated Baseline Forecast fleet mix. Based on current national general aviation trends – as described in **Section 4.1.1** and in the *2018-2038 FAA Aerospace Forecast* – and existing conditions at the Airport such as constraints on ultimate runway length, the following assumptions were used to project the future based aircraft fleet mix:

- The proportion of single-engine piston aircraft compared with the entire fleet is anticipated to decline gradually through 2037, although the total number of aircraft is expected to increase overall. This is consistent with FAA projections that single-engine piston aircraft in the national fleet will decline.
- Multi-engine piston and turboprop aircraft are expected to assume a slightly greater proportion of the fleet at the Airport through 2037.
- It is not anticipated that jet aircraft will be based at the Airport due to constraints that limit the ability to significantly extend Runway 12-30.
- Helicopter growth is anticipated to be linear relative to projected growth in the overall fleet. This growth is consistent with FAA projections of rotorcraft (helicopters) in the national fleet.

- Other aircraft such as light sport, experimental, and electric aircraft are anticipated to increase gradually through 2037. FCH has a significant number of ultra-light and electric aircraft, and it is anticipated that this segment of activity will continue to increase in the future. The FAA also projects significant growth in this sector through 2037.

Based on the assumptions listed above, **Table 4-8** describes the existing and projected aircraft fleet mix for the Baseline Forecast and **Table 4-9** describes the existing and projected aircraft fleet mix for the Accelerated Baseline Forecast.

Table 4-8 – Baseline: Based Aircraft Fleet Mix Forecast

Aircraft Type	2017		2022		2027		2037	
	#	%	#	%	#	%	#	%
Single Engine:	102	86.4%	105	85.5%	106	85.0%	114	84.2%
Multi Engine:	3	2.5%	3	2.8%	4	2.8%	4	3.1%
Turboprop:	0	0.0%	0	0.0%	1	0.4%	1	0.5%
Jet:	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Helicopters:	5	4.2%	5	4.4%	6	4.5%	6	4.5%
Experimental/Other:	8	6.8%	8	7.3%	9	7.3%	10	7.7%
TOTAL:	**118**	**100%**	**121**	**100%**	**126**	**100%**	**135**	**100%**

Source: Kimley-Horn & Associates, October 2018

Table 4-9 – Accelerated Baseline: Based Aircraft Fleet Mix

Aircraft Type	2017		2022		2027		2037	
	#	%	#	%	#	%	#	%
Single Engine:	123	87.9%	125	86.6%	128	85.4%	134	83.0%
Multi Engine:	2	1.4%	2	1.6%	3	1.7%	3	2.0%
Turboprop:	2	1.4%	2	1.6%	3	1.7%	3	2.0%
Jet:	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Helicopters:	5	3.6%	5	3.9%	6	4.3%	8	5.0%
Experimental/Other:	8	5.7%	9	6.3%	10	6.9%	13	8.0%
TOTAL:	**140**	**100%**	**144**	**100%**	**150**	**100%**	**161**	**100%**

Source: Kimley-Horn & Associates, October 2018

4.6 Aircraft Operations Forecasts

Annual aircraft operations are used to determine funding and design criteria at airports. Accurately gauging aircraft operations can help inform the adequacy of the runway capacity and other facility needs at the Airport. Aircraft operations for GA airports comprise nearly all segments of the overall aviation industry, except for commercial air carrier and military operations. GA operations incorporate flight training, corporate aviation, law enforcement, medical operations, and personal/recreational activity, among others. As previously noted, an operation is defined as a takeoff or a landing. This section presents forecasts of annual aircraft operations at the Airport over the 20-year planning horizon.

FCH has a decommissioned ATCT and as such is considered a non-towered airport. Subsequently, development of accurate operational estimates is challenging since there is no actual record of aircraft takeoffs and landings. The FAA TAF issued January 2018 estimated 24,885 total annual operations at the Airport in base year 2017. This figure is used as the base year estimate of total aircraft operations at FCH.

Similar to based aircraft, two forecasts have been developed for aircraft operations. The operational Baseline Forecast projects anticipated activity based on existing and projected trends, and the operational Accelerated Baseline Forecast projects anticipated activity that incorporates the Accelerated Baseline Forecast for based aircraft. The following sections present the methodologies used to identify the Baseline Forecast for aircraft operations. Summaries of both the Baseline and Accelerated Baseline Forecasts are presented at the end of this Section.

4.6.1 Aircraft Operations Forecast Methodologies

Aircraft operations forecasts were developed using several methodologies including socioeconomic, regional market share, local market share, operations per based aircraft (OPBA), and an FAA TAF comparison. These methodologies are presented in the following sections.

4.6.1.1 Aircraft Operations Forecast – Socioeconomic

Similar to based aircraft forecasts presented in the previous section, forecasts of aircraft operations were developed using the same socioeconomic methodologies. The forecasts were developed using a socioeconomic regression approach that utilized population, employment and PCPI data for Fresno CSA, the 6 surrounding counties, and the State of California. Socioeconomic data were shown previously in **Table 4-3**. Results of the socioeconomic forecast for aircraft operations are found in **Table 4-10**. As noted previously, PCPI data are reported in constant dollars ($2016) to adjust for inflation over time.

Table 4-10 – Baseline: Aircraft Operations Forecasts – Socioeconomic

	Fresno-Madera CSA			6 County Region			California		
Year	Population	Employment	PCPI ($2016)	Population	Employment	PCPI ($2016)	Population	Employment	PCPI ($2016)
2017	24,885	24,885	24,885	24,885	24,885	24,885	24,885	24,885	24,885
2022	26,461	26,816	26,662	26,322	26,703	26,667	26,131	26,834	26,606
2027	28,108	28,721	28,390	27,813	28,462	28,391	27,414	28,769	28,365
2037	31,419	32,389	31,110	30,772	31,852	31,086	29,887	32,534	31,786
CAGR 2017-2037	1.17%	1.33%	1.12%	1.07%	1.24%	1.12%	0.92%	1.35%	1.23%

Source: Kimley-Horn & Associates, October 2018

The aircraft operations forecasts based on socioeconomic data show CAGR of 0.92 percent to 1.35 percent over the planning horizon which translates to between 29,887 and 32,389 operations per year by 2037.

4.6.1.2 Aircraft Operations Forecast – Regional Market Share

The regional market share forecast compared the Airport's market share of aircraft operations to GA operations at 12 airports within a 50-mile radius – as described in **Section 4.5.1.2**. Because FCH does not have military or commercial operations, only GA operations were evaluated. Like the regional market share forecasts for based aircraft, this methodology compared activity at the Airport with FAA TAF forecasts of GA operations at regional airports (see **Table 4-11**). Three regional market share forecasts were developed for aircraft operations.

Table 4-11 – FCH Regional Market Share of Aircraft Operations

Year	FCH	2O6	D86	F34	FAT	HJO	M90	MAE	O32	O42	TLR	VIS	Total	% FCH Market Share
2008	25,000	6,709	12,000	10,000	105,967	28,500	13,000	50,150	33,000	12,000	26,180	22,000	344,506	7.3%
2009	25,000	6,709	12,000	10,000	83,145	28,500	4,000	50,150	33,000	12,000	26,180	35,000	325,684	7.7%
2010	25,000	6,700	12,000	10,000	73,049	28,500	4,000	50,150	33,000	12,000	26,180	35,000	315,579	7.9%
2011	25,000	6,700	12,000	10,000	82,554	28,500	4,000	50,150	33,000	12,000	26,180	58,500	348,584	7.2%
2012	25,000	6,700	12,000	10,000	77,893	28,500	4,000	50,150	33,000	12,000	26,180	75,000	360,423	6.9%
2013	25,000	6,700	12,000	10,000	84,386	28,500	4,000	50,150	33,000	12,000	26,180	6,500	298,416	8.4%
2014	26,250	6,700	12,000	10,000	79,735	28,500	4,000	50,150	33,000	12,000	26,180	25,000	313,515	8.4%
2015	24,885	6,700	12,000	10,000	69,421	28,500	4,000	50,150	33,000	12,000	26,180	25,000	301,836	8.2%
2016	24,885	6,700	12,000	10,000	60,677	28,500	4,000	50,150	33,000	12,000	26,180	25,000	293,092	8.5%
2017	24,885	6,700	12,000	10,000	48,802	28,500	4,030	50,150	33,000	12,000	26,180	25,000	281,247	8.8%

Source: 2018 FAA Terminal Area Forecast, Kimley-Horn & Associates, October 2018

In 2017, FCH accounted for 8.8 percent of GA operations in the region. The Low-Growth Scenario held this figure constant throughout the 20-year planning horizon and resulted in a decrease in operations from 24,885 in 2017 to 24,680 in 2037 representing a CAGR of -0.04 percent. This decline is attributed to forecast activity in the FAA TAF, which projected a decrease in GA activity at regional airports over 20 years.

Between 2008 and 2017, the Airport's market share of aircraft operations increased from 7.3 percent to 8.8 percent. The High-Growth Scenario assumed that the annual increase in FCH's market share that occurred between 2008 and 2017 would continue throughout the 20-year planning horizon. The high-growth scenario resulted in 33,558 operations in 2037 (growing to 12.0% market share), representing a CAGR of 1.51 percent.

The Medium-Growth Scenario was developed by averaging the product of the high and low-growth scenarios, which resulted in an increase from 24,885 operations in 2017, to 29,119 operations in 2037 representing a CAGR of 0.79 percent. All aircraft operations forecasts based on regional market share methodology are shown in **Table 4-12.**

Table 4-12 – Baseline: Aircraft Operations Forecast – Regional Market Share

Year	Regional Aircraft Operations	FCH Operations (Low)	FCH Market Share (Low)	FCH Operations (Medium)	FCH Market Share (Medium)	FCH Operations (High)	FCH Market Share (High)
2017	281,250	24,885	8.8%	24,885	8.8%	24,885	8.8%
2022	277,320	24,538	8.8%	24,641	9.2%	26,744	9.6%
2027	277,850	24,585	8.8%	26,795	9.6%	29,006	10.4%
2037	278,930	24,680	8.8%	29,119	10.4%	33,558	12.0%
CAGR 2017-2037	-0.04%	-0.04%	N/A	0.79%	N/A	1.51%	N/A

Sources: Kimley-Horn & Associates, March 2018, 2017 FAA Terminal Area Forecast

4.6.1.3 Aircraft Operations Forecast – FAA Aerospace Forecast Fleet Mix

As noted previously, the FAA reports aviation trends and forecasts in its annual Aerospace Forecast. The operational fleet mix methodology assumed that growth rates by aircraft type at FCH would mimic projections of GA hours flown by aircraft type described in the *2018-2038 FAA Aerospace Forecast*:

- Single-engine piston operations will **decrease** at an annual rate of 1.10 percent through 2037.
- Multi-engine piston operations will **decrease** at an annual rate of 0.30 percent through 2037.
- Turboprop operations will **increase** at an annual rate of 1.80 percent through 2037.
- Helicopter operations will **increase** at an annual rate of 2.20 percent through 2037.
- "Other" operations, which include light sport and experimental activity will **increase** at an annual rate of 2.60 percent through 2037.
- Though the Airport does experience some small jet operations, the proportion of jet operations compared with total annual operations is so small that it was not considered in this methodology.

These annual growth rates were applied to base year operations by aircraft type. Base year operations by aircraft type were determined by applying the based aircraft fleet mix percentages presented in **Table 4-9** to the base year estimate of aircraft operations described in **Section 4.6.** Results of these forecasts are shown in **Table 4-13**. As shown, this methodology projects a decrease in operations from 24,885 in 2017 to 22,427 by 2037, which reflects an annual growth rate of -0.52 percent.

Table 4-13 – Baseline: Aircraft Operations Forecast – FAA Aerospace Fleet Mix

Year	Single-Engine Piston	Multi-Engine Piston	Turboprop	Helicopter	Other/ Experimental	Total
2017	21,401	498	249	995	1,742	24,885
2022	20,250	490	272	1,110	1,980	24,102
2027	19,160	483	297	1,237	2,252	23,430
2037	17,154	469	356	1,538	2,837	22,427
AAGR 2017-2037	-1.10%	-0.30%	1.80%	2.20%	2.60%	-0.52%

Sources: Kimley-Horn & Associates, October 2018, 2018-2038 FAA Aerospace Forecast

4.6.1.4 Aircraft Operations Forecast – Operations per Based Aircraft

The OPBA estimate utilized in this Airport Master Plan Update was based on an actual based aircraft count and acoustical counter samples of operations developed for the previous Airport Master Plan Update. At the time those forecasts were developed, each based aircraft represented 194 total annual operations performed at the Airport. The OPBA methodology applied 194 operations to the preferred forecast for based aircraft presented in **Section 4.6**; the resulting forecasts are presented in **Table 4-14**.

Table 4-14 – Baseline: Aircraft Operations Forecast – Operations per Based Aircraft

Year	OPBA	Preferred Methodology - Based Aircraft	Total Operations
2017	--*	118	24,885
2022	194	122	23,682
2027	194	126	24,482
2037	194	135	26,273
CAGR 2017-2037	N/A	0.27%	

Source: Kimley-Horn & Associates, October 2018
**Note: 194 OPBA for 2017 is not presented because total operations are derived from the FAA Terminal Area Forecast and are independent from the OPBA calculation.*

As shown, this methodology forecasted an increase in operations from 24,885 in 2017 to 26,273 in 2037, representing a CAGR of 0.27 percent.

4.6.2 Preferred Forecast

Based on data provided by the FAA TAF and feedback received from Airport management and tenants, it was identified that operational activity at the Airport has remained relatively flat in recent years, though the introduction of electric aircraft and increases in turboprop and helicopter operations should foster modest growth at FCH throughout the 20-year planning horizon. It is estimated that operational growth will roughly mimic projected growth in based aircraft at the Airport. As such, it is recommended that the Regional Market Share – Medium Growth Scenario be used for long-range operational forecast-related planning.

4.6.3 Accelerated Baseline Forecast

In order to plan for anticipated based aircraft growth under the Accelerated Baseline Forecast, a subsequent Accelerated Baseline Forecast for aircraft operations was developed. This forecast was derived by applying the OPBA figure of 194 developed in the previous Airport Master Plan to the Accelerated Baseline Forecast for based aircraft described in **Section 4.5.3**.

As shown in **Table 4-15**, the Accelerated Baseline Forecast results in 31,172 total operations by 2037.

Table 4-15 – Accelerated Baseline: Aircraft Operations Forecast – Operations per Based Aircraft

Year	OPBA	Preferred Methodology - Based Aircraft	Total Operations
2017	--*	140	24,885
2022	194	145	28,097
2027	194	150	29,047
2037	194	161	31,172
CAGR 2017-2037	N/A	1.13%	

Source: Kimley-Horn & Associates, October 2018
**Note: 194 OPBA for 2017 is not presented because total operations are derived from the FAA Terminal Area Forecast and are independent from the OPBA calculation.*

4.6.3.1 Forecast of Local/Itinerant Operations

General aviation operations are classified as either local or itinerant operations. Local operations are those that remain within a 20-mile radius of an airport and include T&G and most training activity. Itinerant operations are performed by an aircraft that lands at an airport, arriving from outside the airport area, or departs an airport and leaves the airport's 20-mile radius prior to its return.

In 2017, the Airport experienced approximately 72 percent local operations and 28 percent itinerant operations based on historical TAF data. As confirmed by the PAC, and based on limitations to the Airport's runway length, it was assumed that the 72/28 split of local and itinerant traffic is likely to remain consistent throughout the forecasting period. Local and itinerant operations forecasts are presented in **Table 4-16**.

Table 4-16 – Baseline: Forecast of Local/Itinerant Operations

Year	Total Operations	Local Operations	Itinerant Operations	Percent Local/Itinerant	
				Local	Itinerant
2017	24,885	17,955	6,930	72%	28%
2022	25,641	18,500	7,141	72%	28%
2027	26,795	19,333	7,462	72%	28%
2037	29,119	21,010	8,109	72%	28%

Sources: Kimley-Horn & Associates, January 2017, 2017 FAA Terminal Area Forecast

4.6.3.2 Forecast of Daytime/Evening Operations

Identification of daytime and evening operations is an important element to include in the planning process because noise impacts created by aircraft arriving or departing at night are greater than during the day. The forecast of daytime and evening operations can also help drive facility requirements such as improvements to airport lighting and NAVAIDs.

The FAA defines nighttime operations as those that are conducted between 10:00PM and 7:00AM. Based on conversations with Airport staff and the PAC, approximately three percent of aircraft operations are estimated to occur between these hours. This is consistent with the previous ALP Narrative (Coffman Associates, Inc. 2009). It is anticipated that the percentage of daytime/evening operations will remain constant throughout the planning horizon (see **Table 4-17**).

Table 4-17 – Baseline: Forecast of Daytime/Evening Operations

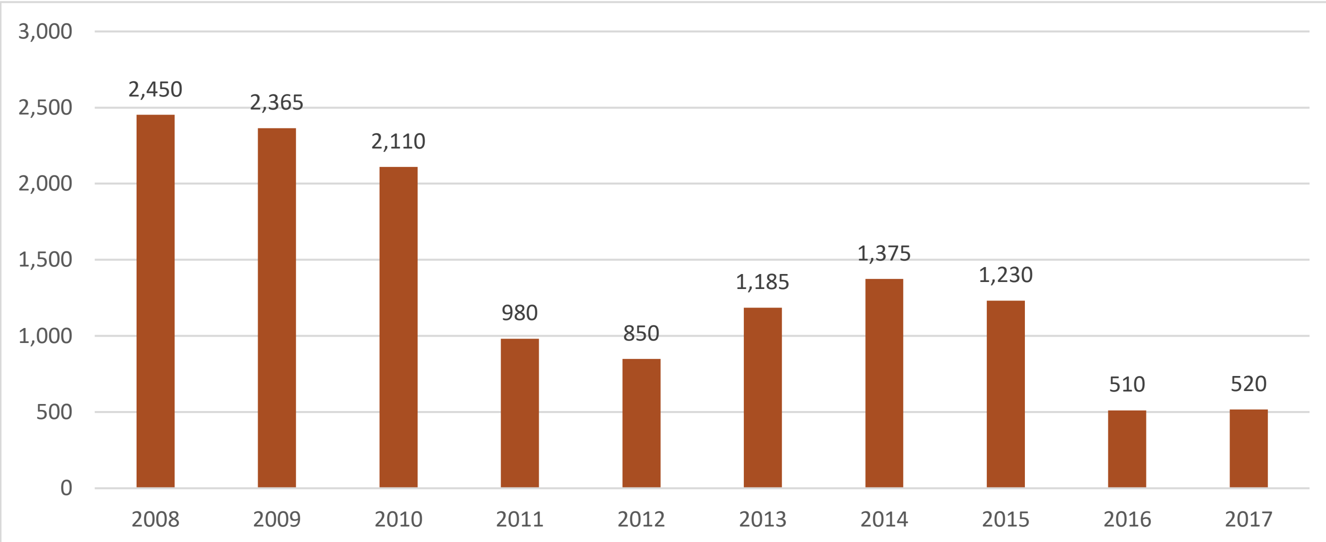
Year	Total Operations	Daytime Operations	Evening Operations	Percent Daytime/Evening Split	
				Daytime	Evening
2017	24,885	24,138	747	97%	3%
2022	25,641	24,872	769	97%	3%
2027	26,795	25,992	804	97%	3%
2037	29,119	28,245	874	97%	3%

Sources: Kimley-Horn & Associates, January 2017, 2017 FAA Terminal Area Forecast

4.6.3.3 Forecast of Annual Instrument Approaches

Because the Airport does not have a functioning ATCT, the precise number of annual instrument approaches (AIA) cannot be decisively established. However, the FAA's Traffic Flow Management System Counts (TFMSC) database includes data for flights that fly under IFR and are captured by the FAA's enroute computers. Most VFR and some non-enroute IFR traffic is excluded from reported data. **Figure 4-2** depicts annual instrument operations from 2008 to 2017 as reported in the TFMSC database.

Figure 4-2 – Historical Aircraft Operations from FAA TFMSC



Sources: Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM), Kimley-Horn & Associates, March 2018

The TFMSC database identified that between 2008 and 2017 instrument operations accounted for an average of 5.4 percent of annual operations at the Airport. This figure is held constant throughout the 20-year projection period to forecast IFR operations. It was assumed that instrument approaches account for half of total IFR operations. **Table 4-18** presents forecast annual instrument approaches.

Table 4-18 – Baseline: Forecast of Annual Instrument Approaches

Year	Total Operations	IFR Operations	Annual Instrument Approaches	VFR Operations	Percent IFR/VFR Split	
					IFR	VFR
2017	24,885	520	260	24,365	2.1%	97.9%
2022	25,641	1,388	694	24,253	5.4%	94.6%
2027	26,795	1,451	725	25,345	5.4%	94.6%
2037	29,119	1,576	788	27,543	5.4%	94.6%

Source: Kimley-Horn & Associates, October 2018

4.6.3.4 Forecast of Touch-and-Go Operations

A T&G operation is defined as an operation conducted by an aircraft that lands and departs on a runway without stopping or exiting. This type of operation is typically associated with flight training. T&G operations forecasts are important to identify because they impact airfield capacity, which is presented in a subsequent chapter.

As confirmed by the PAC, it was assumed that T&G operations account for approximately 65 percent of total activity at the Airport (see **Table 4-19**). This figure was held constant throughout the 20-year planning horizon to identify annual T&G operations. It should be noted that T&G operations are not permitted on Runway 12 due to noise sensitive residential areas southeast of the Airport.

Table 4-19 – Baseline: Forecast of Touch-and-Go Operations

Year	Total Operations	% Touch and Go	Touch-and-Go Operations
2017	24,885	65%	16,175
2022	25,641	65%	16,667
2027	26,795	65%	17,417
2037	29,119	65%	18,927

Sources: Kimley-Horn & Associates, January 2017, 2017 FAA Terminal Area Forecast

4.7 Peak Activity Forecasts

The capacity of an airport relates to activity levels during a peak (or design) period. Annual forecasts are used to determine the operational peaking characteristics and are used to inform the facility requirements.

To ensure that a facility isn't overbuilt, several factors are used to analyze needs. The average day of the peak month, or the design day, is an accepted industry methodology used in evaluating peaking characteristics. Metrics such as average annual day don't adequately take into consideration increased activity at certain times of the year. Planning for only the busy or peak day of the peak month, however, may result in facilities that are overbuilt.

The periods used in the capacity analysis and facility requirements are as follows:

- **Peak Month** — the calendar month when peak passenger volumes of aircraft operations occur
- **Peak Month Average Day (PMAD)** — the average day in the peak month; derived by dividing the peak month operations by the number of days in a month
- **Design Hour** — the peak hour within the design day

Without an operational ATCT or physical operations counts, it is difficult to gauge peak activity at the Airport. The 2009 ALP Narrative identified 12 percent of annual activity occurred in the peak month, and 15 percent of operations during PMAD occurred within the peak hour (Coffman Associates, Inc. 2009). These estimates were considered acceptable based on existing levels of activity at the Airport and were held constant throughout the 20-year planning horizon for both the Baseline Forecast and the Accelerated Baseline Forecast (shown in **Table 4-20** and **Table 4-21**).

Table 4-20 – Baseline: Peak Activity Forecasts

Year	Total Operations	Peak Month Operations	Peak Month Average Day	Peak Hour
2017	24,885	2,986	100	15
2022	25,641	3,077	103	15
2027	26,795	3,215	107	16
2037	29,119	3,494	116	17

Source: Kimley-Horn & Associates, October 2018

Table 4-21 – Accelerated Baseline: Peak Activity Forecasts

Year	Total Operations	Peak Month Operations	Peak Month Average Day	Peak Hour
2017	24,885	2,986	100	15
2022	28,097	3,372	112	17
2027	29,047	3,486	116	17
2037	31,172	3,741	125	19

Source: Kimley-Horn & Associates, October 2018

4.8 Critical Aircraft

The FAA has established design criteria and guidance for airport facility planning based on the operational and physical characteristics of aircraft that operate at an airport. This design criteria – as described in FAA AC 150/5300-13A, Change 1, *Airport Design* – include runway and taxiway dimensions, separation distances between aircraft and various objects, airspace protection requirements, and land use controls (FAA 2014). In support of these requirements, the FAA classifies and groups aircraft with similar approach speeds and sizes into an Airport Reference Code (ARC). Furthermore, each airport has a 'critical' or 'design' aircraft – as designated by its ARC – which represents the most demanding aircraft or grouping of aircraft with similar characteristics currently using or anticipated to use an airport on a 'regular basis', defined as 500 annual operations, excluding T&G operations. The following section describes the ARC classification system and identifies the existing and future critical aircraft for FCH.

4.8.1 Airport Reference Code

There are two components that comprise the ARC. The first is the Airport Approach Category (AAC), which relates to the approach speed of an aircraft and consists of grouping aircraft based on reference landing speed at the maximum certificated landing weight. This classification affects runway length requirements and exit taxiway locations; the AAC is depicted as a letter. Approach categories, corresponding approach speed thresholds, and example aircraft are depicted in **Table 4-22**.

Table 4-22 – Aircraft Approach Category (AAC)

Approach Category	Approach Speed	Example Aircraft
A	Less than 91 knots	Cessna 172, Beech Bonanza A36
B	91 knots or more but less than 121 knots	Cessna Citation CJ3/4, King Air 200
C	121 knots or more but less than 141 knots	Airbus A319/320, Boeing 737-700
D	141 knots or more but less than 166 knots	Boeing 737-800/900, MD-83/88
E	166 knots or more	Boeing F-15 Eagle/F-18 Hornet

Source: FAA AC 150/5300-13A Airport Design; prepared by Kimley-Horn & Associates, June 2017

The second component of the ARC is the Airplane Design Group (ADG), which relates to the physical size of the aircraft, namely the wingspan and tail height (FAA 2014, 3). The ADG is represented by a Roman numeral. Dimensional standards of aircraft affect airfield geometry design including separation criteria for runways, taxiways and aircraft parking areas. ADG design groups, corresponding aircraft tail height and wingspan thresholds, and example aircraft are depicted in **Table 4-23**.

Table 4-23 – Airplane Design Group (ADG)

Design Group	Aircraft Tail Height	Aircraft Wingspan	Example Aircraft
I	Less than 20'	Less than 49'	Beechcraft Bonanza 35, King Air 90
II	20' but less than 30'	49' but less than 79'	Cessna Citation III, Gulfstream IV
III	30' but less than 45'	79' but less than 118'	Airbus A319/320, Boeing 737-800
IV	45' but less than 60'	118' but less than 171'	Boeing 757-200F, Lockheed C-130
V	60' but less than 66'	171' but less than 214'	Airbus A340, Boeing 777
VI	66' but less than 80'	214' but less than 262'	Airbus A380, C-5 Galaxy

Source: FAA AC 150/5300-13A Airport Design; prepared by Kimley-Horn & Associates, June 2017

The AAC and ADG collectively identify the ARC, which is used to classify both airports and aircraft. It is worth noting that the ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely at the airport (FAA 2014, 3). A lower ARC typically represents smaller, slower aircraft used for recreation/training. Higher ARCs usually indicate larger commercial or military aircraft. ARC designations in the middle categories usually include turboprops and corporate jets.

4.8.2 Existing Critical Aircraft

The 2009 ALP Narrative cited the Cessna Mustang (ARC B-I Small) as the critical aircraft for FCH (Coffman Associates, Inc. 2009). Small aircraft are those that weigh less than 12,500 pounds. The 2011 approved ALP identified a Beechcraft 58P as the critical aircraft (also an ARC B-I Small).

Without a functioning ATCT or operational monitoring equipment at the Airport, the exact number of annual operations by aircraft type is unknown. The FAA's TFMSC database was used to obtain information on operations recorded between 2010 and 2017. In 2017, TFMSC did not show 500 operations conducted by any single aircraft type or grouping of aircraft. The aircraft models with the highest number of operations reported in the database in 2017 included the Cirrus SR 22, Cessna Skyhawk 172, and the Piper PA-28 Cherokee with 59, 50, and 50 operations, respectively. The TFMSC database identified that in 2017 there were 76 operations at the Airport conducted by aircraft with an ARC greater than A-I, and five operations conducted by aircraft weighing more than 12,500 pounds. While the TFMSC database captures only a fraction of operational activity at non-towered airports, discussions with Airport Management, tenants, the FAA, and PAC members concluded that A-I (Small) was an appropriate existing ARC designation.

Because no individual aircraft type or grouping of aircraft with similar ARCs could be identified as having conducted 500 operations in 2017, an existing critical aircraft based on FAA criteria could not be determined. Based on feedback from the FAA, it was recommended that the existing critical aircraft be considered the entire fleet of A-I (Small) aircraft, but that justification for specific potential improvements such as an extension to the runway be based on composite characteristics of an individual or grouping of aircraft within the A-I (Small) ARC designation.

4.8.3 Future Critical Aircraft

Based on the forecasts presented in this chapter, there is not enough evidence to suggest that the Airport's existing A-I (Small) ARC or entire fleet of A-I (Small) aircraft as the critical aircraft will change during the 20-year planning horizon. However, it is recommended that the Airport obtain operational monitoring equipment to more accurately track operations by aircraft type in the future. This would provide additional data that would accurately record operational activity that could be used to provide justification for requisite changes in the critical aircraft or ARC.

A significant proportion of future growth in general aviation activity nationwide is anticipated to occur among turboprop and jet type aircraft. Although FCH may experience a small increase in this type of activity, it is expected that the majority of jet and turboprop operations in the region will remain at FAT.

A change in ARC would necessitate different dimensional criteria that would be hampered by the Airport's runway length. It should also be noted that a change to the Airport's ARC (and its Runway Design Code or RDC) would have a substantial impact on RPZs. A change in the Airport's ARC from A-I (Small) to A-I or B-I without the "Small" designation would expand the size of the RPZs – from approximately 8 acres to nearly 14 acres – and require additional off-Airport areas to be controlled by the Airport via easements or fee simple acquisition. As such, it is recommended that the Airport's ARC remain A-I (Small) in the future. Based on feedback provided by the FAA, without adequate operational data, the future critical aircraft should also be considered the entire fleet of A-I (Small) aircraft.

4.9 Forecast Summary

Table 4-24 and **Table 4-25** present the preferred Baseline Forecast and Accelerated Baseline Forecast for based aircraft and aircraft operations at FCH. As noted, aircraft operations are anticipated to increase relatively commensurate with based aircraft, which is consistent with historical activity at FCH. While the number of based aircraft and operations declined locally following the 2008 economic recession, both have slowly increased in recent years – a trend that is anticipated to continue at the Airport and nationwide throughout the 20-year planning horizon for small/light sport aircraft (FAA 2018, 23). Historically, FCH has captured a relatively constant share of the regional GA market. Airport Management has indicated that it has the ability to adjust rates and fees to ensure that FCH can not only remain competitive within the region, but potentially enhance its market share. These trends, coupled with a growing local population base, proximity to Fresno's central business district, and continued investments in innovative technologies such as electric aircraft, should sustain steady growth in aviation activity for the long-term.

Table 4-24 – Baseline: Forecast Summary

Year	Total Based Aircraft	Total Operations
2017	118	24,885
2022	122	25,641
2027	126	26,795
2037	135	29,119
CAGR 2017-2037	0.69%	0.79%

Source: Kimley-Horn & Associates, October 2018

Table 4-25 – Accelerated Baseline: Forecast Summary

Year	Total Based Aircraft	Total Operations
2017	140	24,885
2022	145	28,097
2027	150	29,047
2037	161	31,172
CAGR 2017-2037	0.69%	1.13%

Source: Kimley-Horn & Associates, October 2018

4.10 FAA Forecast Review and Approval

FAA Airport District Offices (ADOs) or Regional Airports Divisions are responsible for forecast approvals. When reviewing a sponsor's forecast, the FAA must ensure that the forecast is based on reasonable planning assumptions, uses current data, and is developed using appropriate forecast methods. Additional discussion on assumptions, data, and methodologies can be found in the APO report, *Forecasting Aviation Activity by Airport* (GRA, Inc. 2001). After a thorough review of the forecast, FAA then determines if the forecast is consistent with the TAF.

For all classes of airports, forecasts for based aircraft and total operations are considered consistent with the TAF if they meet the following criterion: Forecasts differ by less than 10 percent in the five-year forecast period, and 15 percent in the 10-year forecast period. If forecasts are not consistent with the TAF, they are subject to FAA Headquarters review. Differences must be resolved if the forecast is to be used in FAA decision-making. This may involve revisions to the airport sponsor's submitted forecasts, adjustments to the TAF, or both. If a forecast is inconsistent with the TAF, it may still be reviewed by an ADO if:

- Five and ten-year forecasts do not exceed 200 based aircraft or 200,000 total annual operations, AND
- Any related development associated with the forecasts will not require an Environmental Impact Study (EIS) and/or Benefit/Cost Analysis (BCA)

FAA-template comparisons of Baseline Forecasts and the TAF are presented in **Table 4-26** and **Table 4-27**. As shown, forecasts of based aircraft and total aircraft operations are consistent with the TAF based on FAA criteria.

Table 4-26 – FAA Template for Comparing Airport Planning and TAF Forecasts

Template for Comparing Airport Planning and TAF Forecasts (1)

Based Aircraft	Year	FCH Forecast	TAF	FCH/TAF % Difference
Base yr.	2017	118	127	-7.1%
Base yr. + 5yrs.	2022	122	127	-3.9%
Base yr. + 10yrs.	2027	126	127	-0.6%
Base yr. + 15yrs.	2032	131	127	2.9%
Itinerant GA Operations				
Base yr.	2017	6,930	6,930	0.0%
Base yr. + 5yrs.	2022	7,141	6,930	3.0%
Base yr. + 10yrs.	2027	7,462	6,930	7.7%
Base yr. + 15yrs.	2032	7,785	6,930	12.3%
Local GA Operations				
Base yr.	2017	17,955	17,955	0.0%
Base yr. + 5yrs.	2022	18,500	17,955	3.0%
Base yr. + 10yrs.	2027	19,333	17,955	7.7%
Base yr. + 15yrs.	2032	20,170	17,955	12.3%
Total GA Operations				
Base yr.	2017	24,885	24,885	0.0%
Base yr. + 5yrs.	2022	25,641	24,885	3.0%
Base yr. + 10yrs.	2027	26,795	24,885	7.7%
Base yr. + 15yrs.	2032	27,954	24,885	12.3%

Note: TAF data is on a U.S. government fiscal year basis (October through September).

(1) Table is developed from Appendix C in the FAA Report, "Forecasting Aviation Activity By Airport."

Source: Kimley-Horn & Associates, October 2018

Table 4-27 – FAA Template for Summarizing and Documenting Airport Planning Forecasts

Template for Summarizing and Documenting Airport Planning Forecasts (1)

A. Forecast Levels and Growth Rates

Airport Name: Fresno Chandler Airport (FCH)

Specify base year: 2017

	2017	2022	2027	2032	Average Annual Compound Growth Rates		
	Base Yr. Level	Base Yr.+5yrs.	Base Yr.+10yrs.	Base Yr.+15yrs.	Base Yr. to +5	Base Yr. to +10	Base Yr. to +15
Operations							
Itinerant							
General aviation	6,930	7,141	7,462	7,785	0.6%	0.7%	0.8%
Local							
General aviation	17,955	18,500	19,333	20,170	0.6%	0.7%	0.8%
TOTAL OPERATIONS	24,885	25,641	26,795	27,954	0.6%	0.7%	0.8%
Instrument Operations	520	1,388	1,451	1,513	21.7%	10.8%	7.4%
Peak Hour Operations	15	15	16	17	0.6%	0.7%	0.8%
Based Aircraft							
Single Engine (Nonjet)	102	105	106	110	0.6%	0.4%	0.5%
Multi Engine (Nonjet)	3	3	4	4	2.6%	2.9%	1.8%
Turbo-Prop	0	0	1	1	N/A	N/A	N/A
Jet Engine	0	0	0	0	N/A	N/A	N/A
Helicopter	5	5	6	6	0.7%	1.8%	1.1%
Other	8	9	9	10	2.4%	1.2%	1.2%
TOTAL	118	123	126	130	0.8%	0.7%	0.7%

B. Operational Factors

	Base Yr. Level	Base Yr.+5yrs.	Base Yr.+10yrs.	Base Yr.+15yrs.
GA operations per based aircraft	211	209	213	215

(1) Table is developed from Appendix B in the FAA Report, "Forecasting Aviation Activity By Airport."

Source: Kimley-Horn & Associates, October 2018

5 Facility Requirements

The purpose of this chapter is to identify the Airport's infrastructure and facility development needs over the 20-year planning horizon. The needs are determined by comparing the Airport's existing facilities to the projected aviation-related activity levels which identifies the enhancements that will be necessary to meet user demand and/or FAA design standards.

The demand, capacity, design standards and overall facility requirements for FCH were evaluated using guidance sourced from several FAA publications:

- AC 150/5060-5, Airport Capacity and Delay
- AC 150/5300-13A, Airport Design
- AC 150/5325-4B, Runway Length Requirements for Airport Design
- Engineering Brief No. 99, Changes to Tables 3-2 and 3-4 of AC 150/5300-13A, Airport Design
- Order 5090.5, Formulation of the National Plan of Integrated Airport Systems (NPIAS) and the Airport Capital Improvement Plan (ACIP)

In addition, there are other documents that were referenced including Airport Cooperative Research Program (ACRP) Report 113, *Guidebook on General Aviation Facility Planning* and Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*.

Where applicable, facility needs were developed for both Baseline Forecasts (FAA-approved) and Accelerated Baseline Forecasts to provide the Airport greater flexibility for long-term planning purposes. The Baseline and Accelerated Baseline Forecasts described in the previous chapter are summarized in **Table 5-1**.

Table 5-1 – Forecast Summary

Year	Baseline Based Aircraft Forecast	Accelerated Baseline Based Aircraft Forecast	Baseline Operations Forecast	Accelerated Baseline Operations Forecast
2017	118	140	24,885	24,885
2022	122	145	25,641	28,097
2027	126	150	26,795	29,047
2037	135	161	29,119	31,172
CAGR 2017-2037	0.69%	0.69%	0.79%	1.13%

Source: Kimley-Horn & Associates, February 2020
Note: CAGR = Compound Annual Growth Rate, a ratio that provides a constant rate over the 20-year forecast period.

5.1 Airfield Demand and Capacity Assessment

Airfield and airspace capacity requirements were developed based on the following objectives:

- Confirm the airfield provides sufficient capacity throughout the planning horizon
- Confirm that access to runways, taxiways and aprons can meet operational demands, future requirements, and FAA design criteria

5.1.1 Airfield Capacity

Airfield capacity refers to the maximum number of aircraft operations (takeoffs and landings) an airfield can accommodate in a specified amount of time (i.e. hourly or annually). Delay is the difference between constrained and unconstrained aircraft operating times. As demand approaches capacity, congestion and the average amount of delay per aircraft can increase. As the cumulative level of delay increases, operational costs increase, and operator satisfaction decreases. While specific aircraft maintenance and weather-related delays are unavoidable, optimizing airfield configuration to enhance traffic flow efficiency can help reduce the overall amount of aircraft delay.

Using methodologies described in FAA AC 150/5060-5, *Airport Capacity and Delay* (effective September 23, 1983), an assessment of airfield capacity was performed to evaluate the Airport's ability to handle current and projected levels of aircraft activity. This evaluation is used in long-range planning to help identify and justify any *capacity-related* airfield improvements that may be needed over the planning horizon. The analysis also calculated the average amount of aircraft delay that could be expected during peak periods of activity. The estimated airfield capacity and delay at FCH can be expressed in the following measurements:

- Hourly Capacity is the maximum number of aircraft operations the airfield can safely accommodate under continuous demand in a one-hour period.
- Annual Service Volume (ASV) is the maximum number of aircraft operations the airfield can accommodate in a one-year period without excessive delay.
- Peak Period Delay is the total amount of aircraft delay, expressed in minutes, that could be experienced during the average peak hour of the peak month.

5.1.1.1 Airfield Capacity Calculation Factors

Calculations of airfield capacity and delay take into consideration six key operational factors and assumptions specific to FCH. Consistent with the guidance provided in FAA AC 150/5060-5, these are described in the following subsections.

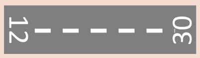
Meteorological Conditions

Meteorological conditions influence the utilization of an airfield's runway. Variations in wind and visibility minimums typically reduce airfield capacity. Using meteorological data collected for this Master Plan Update, it was identified that VFR conditions occur at the Airport approximately 94.6 percent of the time while IFR conditions occur approximately 5.4 percent of the time.

Runway-Use Configurations

An airfield's overall capacity is directly related to the number and orientation of the runways available during various operating conditions. An airfield may have multiple operating configurations that are dependent on weather conditions, time of day, and/or type of approach procedures available. Runway 12-30 at FCH has two available configurations that are outlined in **Table 5-2**.

Table 5-2 – Runway-Use Configurations at FCH

Runway Configuration	Conditions	% of Time (Annual)	Basis
	VFR Day or Night	94.6%	No operational restrictions
	IFR Day or Night	5.4%	Lighted runway with instrument approaches to both ends

Source: Kimley-Horn & Associates, October 2017

Aircraft Fleet Mix Index

The aircraft fleet mix index is a ratio of the various classes of aircraft operating at an airport based on weight. Due to differing performance characteristics, the size of aircraft operating at an airport have a significant impact on an airfield's capacity. The FAA states that heavier aircraft operating at an airfield require greater separation between other aircraft upon approach and departure to avoid wake turbulence. The FAA has established four classes of aircraft based on their maximum certificated takeoff weight (MTOW):

- Class A – 12,500 pounds or less, single engine
- Class B – 12,500 pounds or less, multi-engine
- Class C – 12,500 to 300,000 pounds
- Class D – over 300,000 pounds

A mix index is then calculated for each of the runway-use configurations by adding the percentage of Class C aircraft to three-times the percentage of Class D aircraft (*C+3D).* Flight plan information was collected from the FAA's TFMSC database to identify specific aircraft models that operate at FCH. Based on 2017 TFMSC data, it was estimated that for both VFR and IFR conditions, less than 1 percent of total aircraft operations at FCH were performed by Class C aircraft and zero operations were performed by Class D aircraft. Therefore, according to the FAA AC 150/5060-5, during VFR and IFR conditions at FCH, the aircraft mix index is zero (0).

Percentage of Aircraft Arrivals and Touch-and-Go Operations

A T&G operation is defined as a landing followed by an immediate takeoff without coming to a stop or exiting the runway. It is a practice maneuver typically associated with flight training activity. This factor is the ratio of T&G operations to total aircraft operations at an airport. An airfield with a higher percentage of T&Gs typically has a greater airfield capacity. Based on feedback provided by Airport Management and the PAC, it was estimated that approximately 65 percent of the operations at the Airport are touch-and-go.

Location of Taxiway Exits

The location and number of exit taxiways affect airfield capacity because they directly relate to runway occupancy time. Runway capacities are highest when the runways are complimented with full-length, parallel taxiways, ample runway entrance and exit taxiways, and no active runway crossings. These components reduce the amount of time an aircraft remains on the runway. FAA AC 150/5060-5 identifies the criteria for determining taxiway exit factors based on the mix index, percentage of aircraft arrivals, the number of exit taxiways, and an exit taxiway's distance from the landing threshold. At FCH, the runway is complemented by full-length, parallel taxiways with a total of 12 taxiway/runway connectors – six each from taxiways A and H.

Aircraft Activity Peaking Characteristics

A review of TFMSC operational data showed that monthly activity at FCH is relatively consistent throughout the year with May through September experiencing approximately 12 percent of the annual operations each month. As noted in Chapter 4, this figure was used to identify existing and forecast peak month operations. PMAD operations were determined by dividing peak month operations by 30, and peak hour operations were determined to be 15 percent of PMAD operations. Existing and forecast peak operations were described in the previous chapter. It should be noted that the demand/capacity analysis utilized the Accelerated Baseline Forecast to demonstrate that the Airport is not anticipated to experience any delays or negative impacts attributed to operational activity.

5.1.2 Weighted Hourly Airfield Capacity

The weighted runway capacity is a function of the different annual runway use configurations, the percent of time each runway use configuration is used, the hourly capacity for each runway use configuration, and the ASV weighted factor – as demonstrated in the following equation.

$$c_w = \left(\frac{(p_1 \cdot c_1 \cdot w_1) + (p_2 \cdot c_2 \cdot w_2) + \cdots + (p_n \cdot c_n \cdot w_n)}{(p_1 \cdot w_1) + (p_2 \cdot w_2) + \cdots + (p_n \cdot w_n)} \right)$$

Where:

- Cw = weighted hourly capacity
- Pn = percent of time configuration "n" is used
- Cn = hourly capacity of configuration "n"
- Wn = ASV weighting factor (based on the percent of maximum capacity)

The result of the weighted hourly capacity is approximately 133 aircraft operations. The ASV is thereby determined using the following equation:

Annual Service Volume = (C_w x D x H) where:

- Cw = weighted hourly capacity
- D = ratio of annual demand to the average daily demand during the peak month
- H = ratio of average daily demand to the design hour demand during the peak month

There were 24,885 total operations at the Airport in 2017. The average daily demand during the peak month in 2017 was approximately 100 operations per day. The ratio of annual demand to average daily demand during the peak month was 248 (24,885 ÷ 100). The ratio of average daily demand during the peak month to the average peak hour demand during the peak month was 6.7 (100 ÷ 15).

The resultant ASV for the Airport in 2017 equals approximately 220,077 aircraft operations (133 x 249 x 6.6). This equation was repeated for Accelerated Baseline Forecast activity levels to identify future ASV at FCH.

Table 5-3 – Airfield Capacity Summary

Year	Annual Demand	ASV	Percent Capacity	Weighted Hourly Capacity
2017	24,885	220,077	11.3%	133
2022	28,097	214,492	13.1%	130
2027	29,046	221,737	13.1%	130
2037	31,172	212,916	14.6%	130

Sources: Kimley-Horn & Associates, February 2020; FAA AC 150/5060-5, Airport Capacity and Delay
Notes: ASV = Annual Service Volume, the weighted calculation for annual airfield capacity. Utilizes Accelerated Baseline Forecast to demonstrate no anticipated capacity improvements.

The preceding information was used to calculate the capacity of the Airport in accordance with accepted industry methodologies. These calculations were based on the specific airfield configuration, operational, and meteorological characteristics of the Airport on a typical day.

A demand that exceeds the ASV will likely result in significant delays on the airfield. However, regardless of how substantial an airport's capacity may appear, delays can occur even before an airport reaches its stated capacity. According to FAA Order 5090.5, *Formulation of the National Plan of Integrated Airport Systems (NPIAS) and the Airport Capital Improvement Plan (ACIP)*, for most every type of capacity-enhancing project, the FAA recommends beginning to plan for such improvements when the activity levels reach 60 to 75 percent of the annual capacity. A summary of airfield capacity is shown in **Table 5-3**. Based on the existing airfield configurations and the results of the capacity analysis, the Airport is not expected to reach the point in the planning horizon where the FAA would recommend additional capacity enhancement improvements.

5.2 FAA Design Standards

This section describes FAA runway and taxiway design criteria and how they apply to the relevant airfield facilities at the Airport. As described in the previous chapter, FAA design standards at an airport are determined based on the most demanding aircraft or grouping of aircraft that conduct 500 annual operations. For design purposes, a design or critical aircraft was selected to help guide planning and development at the Airport over the planning horizon. As noted in the previous chapter, sufficient justification of a single aircraft type could not be determined. As such, the FAA has approved the design aircraft as an A-I (small) piston-powered aircraft.

Design standards, as identified in the FAA AC 150/5300-13A, *Airport Design*, describe dimensions and separation criteria that apply to runways, taxiways, and other related airfield facilities to provide clearance from potential hazards affecting routine aircraft movements on the airfield. Application of these standards is determined by the RDC and relate to separation distances, hold lines, taxiways, aircraft parking areas, obstacle free areas, and safety areas. The RDC is comprised of the AAC and ADG – as described in the previous chapter – along with the runway's visibility minimums. The minimums are described in feet of Runway Visibility Range (RVR), shown in **Table 5-4**.

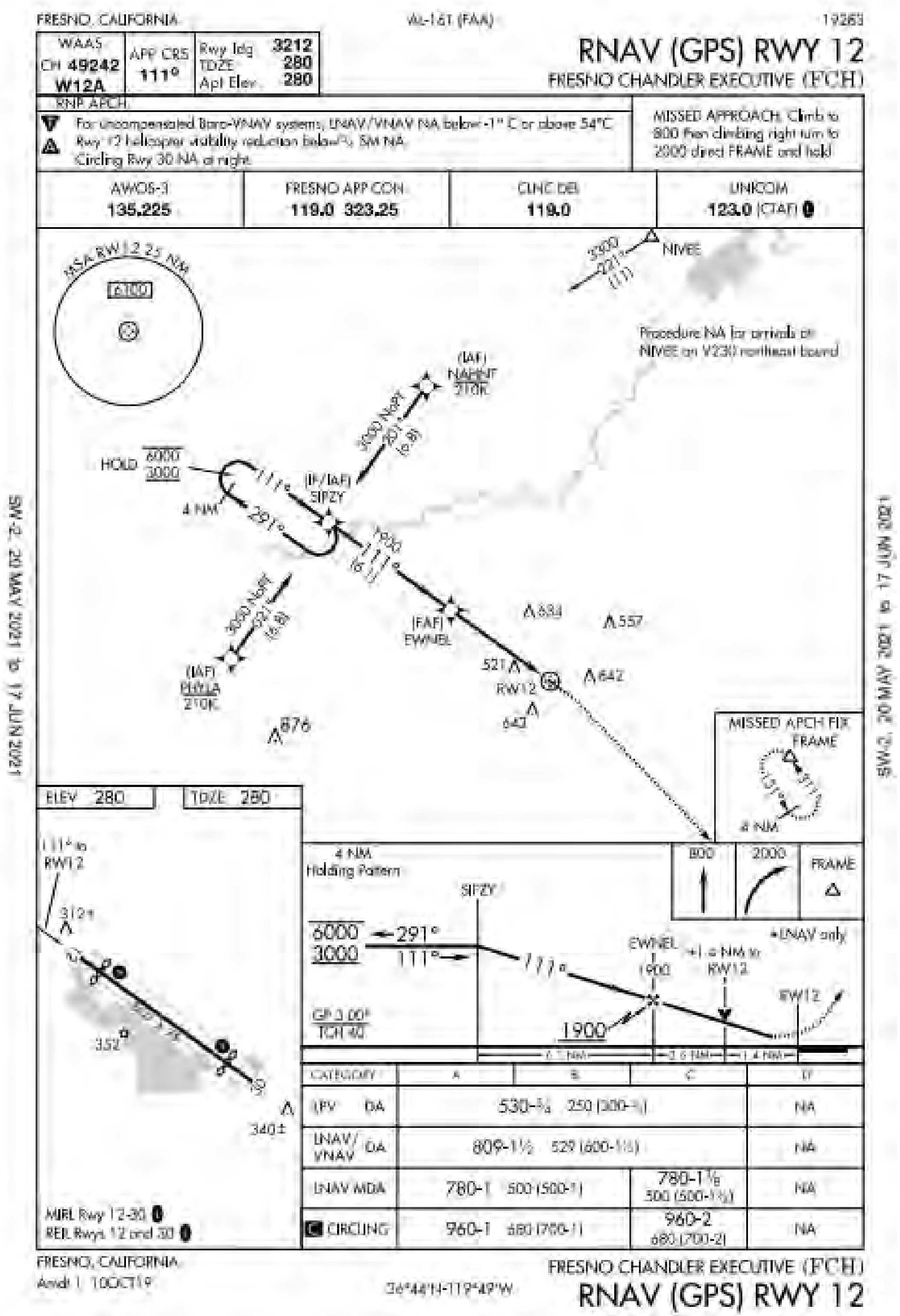
Table 5-4 – Visibility Minimums

Runway Visibility Range (in feet)	Flight Visibility Category (statute miles)
VIS	Visual approaches only
5000	Not lower than one mile
4000	Lower than one mile, but not lower than ¾ mile
2400	Lower than ¾ mile, but not lower than ½ mile
1600	Lower than ½ mile, but not lower than ¼ mile
1200	Lower than ¼ mile

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

The Airport's most recent published procedures are presented in **Figure 5-1** and **Figure 5-2**. As shown, Runway 12 has visibility minimums which are congruent with category 4000 RVR for aircraft equipped for LPV approaches and 5000 RVR for aircraft equipped for LNAV or VNAV approaches. Runway 30 only has visibility minimums congruent with category 5000 RVR.

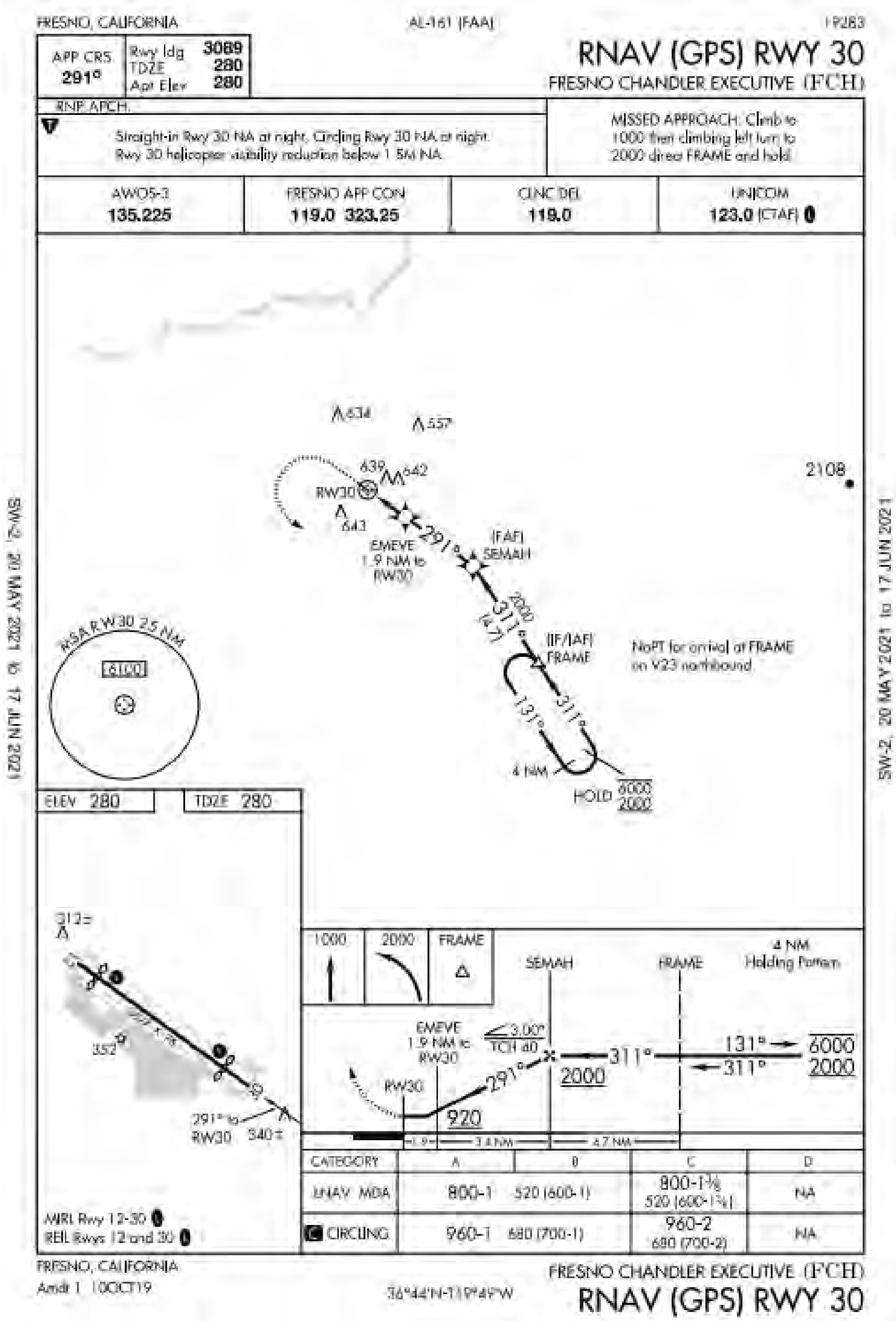
Figure 5-1 – Runway 12 Instrument Approach Procedure



CATEGORY	A	B	C	D
LPV DA	530-¾ 250 (300-¾)			NA
LNAV/VNAV DA	809-1½ 529 (600-1½)			NA
LNAV MDA	780-1 500 (500-1)		780-1⅛ 500 (500-1⅛)	NA
CIRCLING	960-1 680 (700-1)		960-2 680 (700-2)	NA

Source: FAA Terminal Procedures, FCH, effective May 20, 2021 – June 17, 2021

Figure 5-2 – Runway 30 Instrument Approach Procedure



Source: FAA Terminal Procedures, FCH, effective May 20, 2021 – June 17, 2021

Table 5-5 compares the existing characteristics of Runway 12-30 to the FAA design standards for a A-I-5000 (small) and A-I-4000 (small) runway as described in FAA AC 150/5300-13A, Airport Design. Note that non-standard conditions (depicted in red text) are addressed in **Section 5.3.1**.

Table 5-5 – Runway Design Standards

Design Criteria	A-I-4000 (small) Standards (Not Lower than ¾ mi.)	A-I-5000 (small) Standards (Not Lower than 1 mi.)	Runway 12-30 Existing Conditions	
			12	30
Runway Design:				
Width	60’		75’	
Shoulder Width	10’		N/A	
Blast Pad Width	80’		75’	None
Blast Pad Length	60’		150’	None
Runway Protection:				
Runway Safety Area (RSA) Length beyond runway end	240’		240’	177’
RSA Length prior to threshold	240’		240’	240’
RSA Width	120’		120’	120’*
Runway Object Free Area (ROFA) Length beyond runway end	240’		240’	87’
ROFA Length prior to threshold	240’		240’	
ROFA Width	250’		250’	250’*
Runway Object Free Zone (ROFZ) Length	200’ beyond RWY		200’	87’
ROFZ Width	250’		250’	250’*
Runway Protection Zone (RPZ) Length	1700’	1000’	1700’	1000’
RPZ Inner Width	1000’	250’	1000’	250’
RPZ Outer Width	1510’	450’	1510’	450’
RPZ Area (Acres)	49.9 ac	8 ac	49.9 ac	8 ac
Approach OCS Inner Width	400’	400’	400’	400’
Approach OCS Outer Width	3,400’	3,400’	3,400’	3,400’
Approach OCS Length	10,000’	10,000’	10,000’	10,000’
Departure OCS Inner Width	1,000’	1,000’	1,000’	1,000’
Departure OCS Outer Width	6,466’	6,466’	6,466’	6,466’
Departure OCS Length	10,200’	10,200’	10,200’	10,200’
Runway Separation:				
Holding Position	125’	125’	160’+	
Aircraft Parking	125’	125’	400’+	
Red – indicates non-standard condition; Black – indicates standard condition				

Sources: Kimley-Horn & Associates, April 2018; FAA AC 150/5300-13A, Airport Design

*Notes for *: RSA, ROFZ, and ROFA widths are not considered non-standard conditions as these areas already have non-standard lengths beyond Runway 30 end, however, they are depicted in red because both width and length beyond runway end are conditions requiring mitigation.*

It is recommended that non-standard conditions including the RSA, ROFA, and ROFZ length beyond Runway 30 be mitigated. Based on discussions with the FAA, these non-standard conditions must be addressed prior to any geometric modifications to Runway 12-30. Additionally, modifications to design standards (MOS) for the Runway 30 ROFA and the use of declared distances are considered as a potential development alternative in a subsequent chapter. The FAA indicated that a MOS for the RSA should not be considered, and that a MOS for the ROFZ would require coordination with FAA Headquarters, and would likely not be granted. It is also recommended that the blast pad on Runway 12 be widened to the standard 80 feet, and that a blast pad be constructed on Runway 30.

Taxiway Design Group (TDG) is a classification administered to aircraft based on outer-to-outer main gear width (MGW) and cockpit to main gear (CMG) distance. Based on the critical aircraft (A-I-small) the existing and ultimate TDG for the Airport was determined to be 1A, design standards for which are described in **Table 5-6**.

Table 5-6 – Taxiway Design Standards

Design Criteria	FAA Design Standard for ADG I and TDG 1A	Existing Conditions Taxiway A	Existing Conditions Taxiway H
Runway Centerline to Parallel Taxiway Centerline	150’	150’	200’
Taxiway Centerline to Fixed or Movable Object	44.5’	44.5’	44.5’
Taxiway Width	25’	35’	35’
Taxiway Safety Area (TSA)	49’	49’	49’
Taxiway Object Free Area (TOFA)	89’	89’	89’
Taxiway Shoulder Width*	10’	N/A	Turf
Black – indicates standard condition; Red – indicates non-standard condition			
*Paved shoulders are not required for ADG I and ADG II aircraft.			

Sources: Kimley-Horn & Associates, April 2018; FAA AC 150/5300-13A, Airport Design

Although taxiways and taxiway connectors at the Airport meet or exceed all standard geometry requirements described by the FAA, there are multiple taxiways that provide direct access from aprons to the runway. Direct access between an apron and a runway increases the risk of runway incursions. Additional discussion of non-standard taxiways is presented in **Section 5.3.3**. Applicable taxiways should also be reconstructed to meet FAA standard width and fillet design.

5.3 Airside Facilities

Airside facilities consist of those related to aircraft arrival, departure, and ground movement, along with all associated navigational aids, airfield lighting, pavement markings, and signage. This section presents the required facilities in both a quantitative and qualitative manner for the airside portion of the Airport; the results of forecast aviation demand provided quantitative findings, whereas interviews, discussions, and a survey with Airport personnel, PAC members, tenants, and users provided qualitative findings.

5.3.1 Runway Requirements

This section summarizes requirements, standards, and recommendations for Runway 12-30.

5.3.1.1 Runway Length & Width

Runway 12-30 is 3,627 feet long and 75 feet wide. As described in **Chapter 2**, declared distances were established for Runway 12-30 in the Airport's previous ALP. However, these declared distances were not formally published by the FAA. For documentation purposes, **Table 5-7** lists the declared distances at FCH as reported in the Airport's 2009 ALP.

Table 5-7 – Runway 12-30 Declared Distances

Declared Distance	Runway 12	Runway 30
Take Off Run Available (TORA)	3,483'	3,627'
Take Off Distance Available (TODA)	3,627'	3,627'
Accelerate Stop Distance Available (ASDA)	3,483'	3,627'
Landing Distance Available (LDA)	3,068'	3,089'

Source: Kimley-Horn & Associates, April 2018

Recommended runway lengths are determined using charts published in FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*. Runway length is based on several factors including aircraft using or expected to use the airport on a regular basis, elevation, aircraft seat capacity, and mean daily maximum temperature of the hottest month of the year at an airport. Figure 2-1 in FAA AC 150/5325-4B details runway length requirements for small airplanes (those that weigh less than 12,500 pounds) having fewer than 10 seats, which includes examining both the current and future fleet. Figure 2-1 also identifies recommended runway lengths for 95 percent of the operational fleet and 100 percent of the operational fleet. The 95 percent category applies to airports that are primarily intended to serve medium size population communities with a diversity of usage and a greater potential for increased aviation activities. Also included in this category are airports that are primarily intended to serve low-activity locations, small population communities, and remote recreational areas. The 100 percent category includes airports primarily intended to serve communities located on the fringe of a metropolitan area or a relatively large population remote from a metropolitan area. Based on these descriptions, Runway 12-30 should be designed to accommodate 100 percent of the operational fleet of small aircraft with fewer than 10 seats.

According to 10-year data published by the National Oceanic and Atmospheric Administration's National Centers for Environmental Information, the mean daily maximum temperature of the hottest month of the year at the Airport was 100.4° Fahrenheit. The Airport's published elevation is 279.7 feet above mean sea level (MSL). Application of these factors to Figure 2-1 of FAA AC 150/5325-4B results in a recommended runway length of 3,900 feet. To achieve this ideal runway length, the existing 3,627-foot long runway would need to be extended.

A runway extension to Runway 12 is feasible, though it will be impacted by the presence of Fresno Metropolitan Flood Control District (FMFCD) Drainage Basin RR-3 and State Route 180. Though the existing length of Runway 12-30 significantly limits the volume and type of aircraft activity that can occur at FCH, a runway extension is not considered justifiable within the 20-year planning horizon according to input from the FAA provided during the review of operational forecasts and the future critical aircraft. This restricts the viability of specific facilities and services at the Airport such as jet fuel sales, a full-service FBO, and others given that larger aircraft are not as capable of operating routinely without restricting their fuel load and/or stage length or distance flown.

Based on forecast operational activity, a runway extension is not recommended as a necessary improvement within the 20-year planning horizon. However, a supplemental drawing sheet will be included in the ALP for planning purposes only (not subject to FAA review and approval) that depicts a runway extension to the maximum length possible without adversely impacting the surrounding Airport environment. This supplemental drawing provides the Airport Sponsor a graphical representation of necessary land use protection areas and airspace considerations in the event that operational activity merits an extension within the 20-year planning horizon or beyond.

Runway 12-30 is 75 feet in width, which exceeds the FAA design standard of 60 feet for a A-I (small) runway with not lower than 3/4-mile (Runway 12) and not lower than 1-mile (Runway 30) visibility minimums. The existing width of the runway is adequate to meet current and projected levels of demand. It is recommended that the Airport Sponsor coordinate with the FAA to determine grant eligibility of portions of the runway that exceed standard if maintaining a 75-foot runway width is desired.

5.3.1.2 Runway Orientation

Ideally, a runway is oriented with the prevailing wind direction, as taking off and landing into the wind enhances aircraft performance. The FAA recommends that the primary runway have at least 95 percent wind coverage, which means that 95 percent of the time, the wind at an airport is within acceptable crosswind limitations.

Runway 12-30 is ideally oriented for crosswind coverage and has nearly 100 percent crosswind coverage at 10.5 knots for all-weather (99.81 percent), IFR (99.79 percent), and VFR (99.88 percent) conditions (**Section 2.4.3**). The existing configuration of Runway 12-30 is anticipated to accommodate existing and projected levels of demand.

5.3.1.3 Runway Protection Zones

Runway Protection Zones (RPZs) are designated areas beyond the runway ends mandated by the FAA to maintain compatible land use and enhance the protection of people and property on the ground. These areas begin 200 feet beyond the runway end (unless there is a displaced threshold), are trapezoidal in shape, and are centered on the extended runway centerline. When an RPZ begins at a location other than 200 feet beyond the end of runway (such as what occurs with a displaced threshold), two RPZs are required, i.e., a departure RPZ and an approach RPZ.

With a displaced threshold, the approach RPZ extends 200 feet from the runway threshold, and the departure RPZ begins 200 feet beyond the runway end or, if the TORA and the runway end are not the same, 200 feet beyond the far end of the TORA.

Airports should maintain control of approach and departure RPZs through fee-simple acquisition, easements, or use-restrictions/agreements. Areas within the RPZ should be cleared of incompatible objects and activities, which includes habitable buildings and congregations of people. **Figure 5-3** illustrates the existing approach and departure RPZs at the Airport.

Approach RPZs

Since there are displaced landing thresholds at the Airport, two RPZs are required at each runway end (an approach and departure RPZ). The Runway 12 approach RPZ measures 1,000 feet (inner width) x 1,510 feet (outer width) x 1,700 feet (length). The Runway 30 approach RPZ measures 250 feet (inner width) x 450 feet (outer width) x 1,000 feet (length). The Runway 12 approach RPZ starts 200 feet prior to the displaced threshold, covers land that is partially owned by the Airport, and extends over W. Whitesbridge Avenue, State Route 180, a portion of a surface parking lot owned by AmeriPride Services, Inc. to the north, and a portion of one residence to the south. As noted previously in **Table 5-5**, the Runway 12 approach RPZ encompasses 49.9 acres. The Airport owns approximately 24 acres of land within the RPZ.

The Runway 30 approach RPZ starts 200 feet prior to the displaced threshold and extends off-Airport property over residential areas and W. Kearney Boulevard. Based on an examination of aerial photography, one residence is located within the Runway 30 approach RPZ. An area of the RPZ less than one acre in size is not owned by the Airport; the majority of this is occupied by W. Kearny Boulevard and S. Thomas Avenue.

Departure RPZs

The departure RPZ for Runway 12 starts 200 feet from the runway end and extends over W. Whitesbridge Avenue and Fresno Metropolitan Flood Control District (FMFCD) Drainage Basin RR-3. Approximately 3.9 acres of the Runway 12 departure RPZ are not owned by the Airport. The majority of this area is occupied by Drainage Basin RR-3.

The Runway 30 departure RPZ starts 200 feet from the departure threshold extending over residential areas and W. Kearney Boulevard. Based on an examination of aerial photography, 19 residences are located within the Runway 30 departure RPZ. Approximately three acres of the Runway 30 departure RPZ are not owned by the Airport.

It is recommended that the Airport continue to pursue land use control over its RPZs via avigation easements or fee simple acquisition. If a runway extension does occur sometime in the future, this action would shift the Runway 12 approach and Runway 30 departure RPZs further off Airport property requiring additional land acquisition and/or easements.

Figure 5-3 – Existing RPZs

Sources: Kimley-Horn & Associates, February 2020, Google Earth (accessed April 2018)

5.3.1.4 Magnetic Declination

The runway end designation is a whole number, rounded to the nearest one-tenth of the magnetic azimuth along the runway centerline when viewed from the direction of the approach. Due to the changing magnetic declination of the earth, runway end designations are subject to change over time. Based on the changing magnetic declination of 0.09° W per year (NOAA 2018), it is estimated the runway designators for FCH will change from 30 to 31, and from 12 to 13 in year 2051, well beyond the 20-year planning horizon of this study.

5.3.2 Decommissioned Runway 12L-30R

Prior parallel runway 12L-30R on the northern portion of the airfield was decommissioned and is no longer necessary. The pavement has deteriorated and occupies land that could be redeveloped. When the need for additional land materializes, it is recommended that the decommissioned runway be redeveloped to enhance revenue and/or accommodate potential future aviation use.

5.3.3 Taxiway Requirements

As described in the Inventory chapter, Runway 12-30 is supported by two full-length parallel taxiways – taxiway A and taxiway H – both of which include six access points. Taxiway A is 40 feet wide and is spaced 150 feet from the runway centerline to taxiway centerline. Taxiway H is 35 feet wide and spaced 200 feet from the runway centerline to taxiway centerline.

The taxiway geometry meets FAA standards as shown previously in **Table 5-6**. However, beyond the standard criteria, the FAA also provides additional guidance on taxiway geometry intended to enhance safety and reduce the risk of runway incursions. This runway incursion mitigation (RIM) criteria is meant to prevent incursions, which are the unauthorized presence of an aircraft, vehicle, or person in the runway environment. A runway incursion is not a collision or accident but could result in one. Incursions can occur from a pilot's loss of situational awareness, poor communication, an error by ATC personnel (not applicable at FCH), inadequate or confusing airfield marking and signage, and complex or non-standard taxiway geometries.

Two taxiway connectors violate current FAA design standards that were promulgated to reduce runway incursions. Both taxiway D and taxiway F provide direct access from an apron to Runway 12-30. It is recommended that these connectors be removed or replaced with relocated taxiway connectors compliant with current FAA design standards. Such mitigation alternatives are presented in a subsequent chapter.

5.3.4 NAVAID and Lighting Requirements

NAVAIDs are any visual or electronic devices airborne or on the surface which provide point-to-point guidance information or position data to aircraft on the ground or in flight. As described previously, FCH is equipped with the following NAVAIDs:

- Lighted Windcone
- Segmented Circle
- Runway End Identification Lights (REILs)
- Precision Approach Path Indicators (PAPIs)
- Automated Weather Observing System (AWOS)
- Rotating Beacon
- Compass Rose
- Airfield Signage

The lighted windcone and segmented circle are in working condition and should continue to be maintained. The PAPI on the Runway 30 end (PAPI-4R) and each of the Airport's REILs are functioning and in good condition. It is recommended that as the PAPI and REILs age, they are replaced with more efficient LED fixtures, as appropriate. The PAPI on the Runway 12 end (PAPI-2L) has not been functioning properly and, as revealed in discussions with Airport staff, replacement parts are not readily available due to the age of the PAPI. Therefore, it is recommended the Airport replace the 2-light PAPI on the Runway 12 end with a new 4-light PAPI.

Members of the PAC have noted that in the past, the AWOS was not always functional though it has not been an issue in recent years. It is recommended that an inspection take place, maintenance be performed, and/or replacement is made, if needed. The 2016 Airport Capital Improvement Plan (ACIP) identified updating and modernizing obsolete and unserviceable components of the AWOS.

The Airport is also equipped with a rotating beacon, which provides directional guidance to and from a transmitting antenna. The Airport's 2019 ACIP identified that the tower supporting the beacon requires replacement. Because NAVAIDs enhance pilot safety, it is recommended that this project be pursued as a near-term (0-5 year) improvement.

Members of the pack also noted that pilots frequently use the Airport's compass rose (located on the Runway 30 end) to calibrate their aircrafts' magnetic compasses. It was identified by Airport management that the compass rose likely requires recalibration. As such, it is recommended that the compass rose is recalibrated and repainted in its current location.

The Airport's airfield signage provides directional guidance for taxing aircraft. The current signs are aging, and replacement light bulbs are no longer produced by the original manufacture. Therefore, it is recommended that all airfield signage (runway, taxiway, apron, etc.) is replaced with new LED signs.

5.3.5 Airfield Pavement

Pavement strength rating is related to the operating weight of aircraft anticipated to regularly utilize an airport, the landing gear type and geometry, and the volume of annual aircraft operations, by type. Aircraft weighing more than the certified strength can operate on the runways on an infrequent basis, however, frequent activity by heavier aircraft can reduce the useful life of the pavement.

Runway 12-30 is constructed of asphalt and has a SWL strength of 17,000 pounds. According to the latest FAA Form 5010-1, *Airport Master Record*, the pavement is in good condition.

A Pavement Maintenance/Management Plan (PMMP) was conducted for the Airport in October 2015 that delineated existing PCI values for all runway, taxiway/taxilane, and apron pavements. The PMMP also identified recommended rehabilitation and maintenance projects for all pavements through 2031, which are incorporated into the ACIP in the Financial Analysis chapter of this Airport Master Plan Update.

Figure 5-4 presents PCI values presented from the PMMP. PCI is the standard used by the aviation industry to assess pavement condition. PCI surveys denote various types of deterioration that are identified, recorded, and analyzed. Pavement defects are characterized in terms of type of distress, severity of distress, and amount of distress. This information is then used to develop a composite index (PCI number) that represents the overall condition of the pavement in numerical terms, ranging from 0 (failed) to 100 (excellent). In general, pavements above a PCI of 85 that are not exhibiting significant load-related distress may require routine maintenance actions, such as periodic crack sealing or patching. Pavements with a PCI of 56 to 85 may require pavement preservation, such as a surface treatment or thin overlay. Pavements with a PCI of 55 or less may need major rehabilitation, such as a thick overlay or reconstruction due to the substantial damage to the pavement structure.

As shown in **Figure 5-4**, the 2015 PCI rating for Runway 12-30 was 75. Parallel taxiways H and A had PCI values of 88 and 75, respectively. Taxiway H connectors had PCI values of 85, and taxiway A connectors had PCI values ranging from 63 to 65. The primary aircraft parking aprons also had PCI values ranging from 63 to 65. Taxilanes on the Airport's west side generally had higher PCI values compared with those adjacent to the terminal building and hangars to the south. Pavements with the most significant rehabilitation and reconstruction needs included hangar areas 13 (PCI 25), 5 (PCI 15), 7 (PCI 14), 10 (PCI 38), 11 (PCI 25), and vehicle parking areas adjacent to the terminal building. The FAA's AIP Handbook notes that for an airfield pavement project, the FAA ADO may justify pavement rehabilitation when PCI is less than 70, and pavement reconstruction when PCI is less than 55.

It is recommended that the Airport continue to maintain and resurface pavements as needed per the PMMP. Failing pavements should undergo appropriate rehabilitation and reconstruction. Additionally, an updated PMMP Study is recommended prior to the date when proposed projects identified in the existing PMMP are no longer current.

Figure 5-4 – 2015 Pavement Condition Index Map

PAVEMENT SEGMENT ID	PAVER BRANCH ID
RW1	R1, T1, T11–T18
RW2	R2
TW1	TW1–2015
TW2	TW2–2015
TW3	TW3–2015
TW4	TW4–2015
TW5	TW5–2015
TW6	TW6–2015
TW7	TW7–2015
TW8	T2
TW9	T10
TW10	T9
TW11	T4, T8
TW12	T3, T7
TW13	T6
TW14	T5
AP1	A4
AP2	A3A, TD1, A1A
AP3	A1B

PAVEMENT SEGMENT ID	PAVER BRANCH ID
H1	A3B
H2	A3C
H3	A3C
H4	A3D
H5	A3C
H6	A2A, A2D
H7	A2B
H8	T19, T20B
H9	T20A
H10	H10–2015
H11	A8
H12	A9
H13	A9
H14	A10
P1	P1–2015
P2	P2–2015

Source: Fresno Chandler Executive Airport Pavement Evaluation Study, 2015

5.3.6 Helicopter Parking Area Requirements

The Airport currently has two designated helicopter parking areas in front of the decommissioned ATCT. It should be noted that these areas are not helipads, which require FAA-approved approach and departure procedures. Although the designated helicopter areas are regularly used, they lack proper markings. Itinerant helicopters typically park on the designated areas and based helicopters park on the apron near American Helicopters. Based on discussions with the PAC, the two helicopter parking areas should remain in their existing location though it is recommended that they be properly marked as helicopter parking areas according to FAA standard.

5.3.7 Air Traffic Control Tower

As noted, the Airport's ATCT was decommissioned, and based on existing and projected levels of activity, as well as anticipated renovation costs, it is extremely unlikely that the facility will be recommissioned. Members of the PAC identified that some pilots prefer to operate at non-towered FCH rather than FAT because the additional coordination with the ATCT at FAT can cause confusion for those unfamiliar with larger, more complex airport operating environments.

The fenced-in area occupied by the ATCT building and associated vehicle parking area encompasses approximately 35,000 square feet. It is recommended that the ATCT building be demolished and the area redeveloped prior to development occurring on the north side of Runway 12-30. The south portion of the airfield, including the area where the existing ATCT is located, is equipped with utility infrastructure, vehicle parking, and access, and is adjacent to facilities and services that are conducive to aviation-related development. Redevelopment of this parcel is contingent on actual demand, however, in the interim the parcel could be used for aircraft storage hangars, vehicle parking, or other purposes.

5.4 Airspace Protection

The purpose of this section is to identify *existing* obstructions to airspace. Data from aerial surveys (from Quantum Spatial, Inc. dated April 9, 2018) and the FAA Digital Obstacle Files (DOF) dated April 22, 2018 were used to analyze potential obstructions to airspace at FCH. The analysis considered FAR Part 77 Surfaces, Terminal Instrument Procedures (TERPS), and Obstacle Clearance Requirements from FAA AC 150/5300-13A. Hazardous wildlife attractants at the Airport are also presented.

The Part 77 surfaces analysis offers a basic screening for potential airspace threats. In conjunction with this, TERPS and FAA AC 150/5300-13A Obstacle Clearance Requirements provide a secondary level of screening and are stricter in the sense that there is less tolerance for potential airspace obstructions. Additionally, wildlife can also present challenges to airspace protection, primarily as it pertains to bird strikes. Detailed graphical representations of airspace surfaces and obstacles are presented in the ALP drawing set.

5.4.1 FAR Part 77 Surfaces

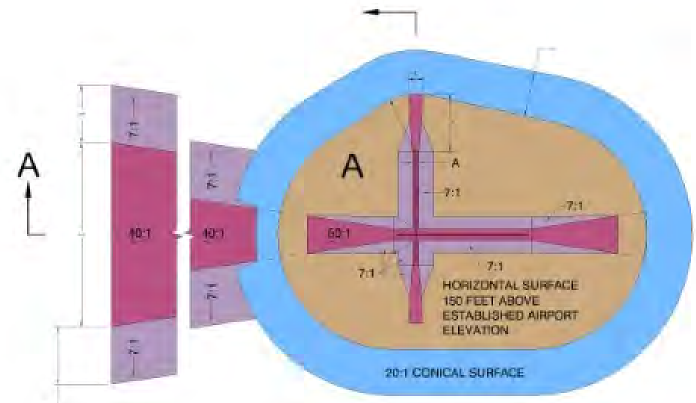
FAR Part 77 establishes imaginary surfaces around an airfield to identify potential hazards to air navigation. These standards promote compatible land use and limit the height of objects on and near an airport. The surfaces can vary in shape, size, and slope depending on the available approach procedures to the runway ends. The Part 77 Surfaces are depicted in **Figure 5-5** and described as follows:

- Primary Surface – The surface is longitudinally centered on the runway. The elevation of any point on the surface is the same as the elevation of the nearest point on the runway centerline. For Runway 12-30, the Primary Surface is 500 feet wide and extends 200 feet beyond the ends of each runway.

- Approach Surface – The surface is longitudinally centered on the extended runway centerline and extends outward and upward from the end of the Primary Surface. The inner width of the Approach Surface is the same width of the Primary Surface. For Runways 12 and 30, the Approach Surface is 5,000 feet long with a slope of 20 to 1 (20:1), expanding to an outer width of 2,000 feet.
- Horizontal Surface – This surface is a horizontal plane, 150 feet above the established Airport elevation. The Horizontal Surface extends 5,000 feet from the ends of the Primary Surface.
- Conical Surface – This surface extends outward and upward from the periphery of the Horizontal Surface. The Conical Surface extends at a slope of 20:1 for a horizontal distance of 4,000 feet.
- Transitional Surface – This surface extends outward and upward from the sides of the Primary Surface and from the sides of the Approach Surfaces at a slope of 7:1, up to the height of the Horizontal Surface.

Penetrations to these imaginary surfaces, either natural or manmade, are identified as obstructions and must be evaluated by the FAA. If not removable, obstacles can be mitigated through appropriate marking and/or lighting. If not mitigated appropriately, obstacles could adversely affect approach and departure minimums and/or operational procedures.

Figure 5-5 – Part 77 Imaginary Surfaces

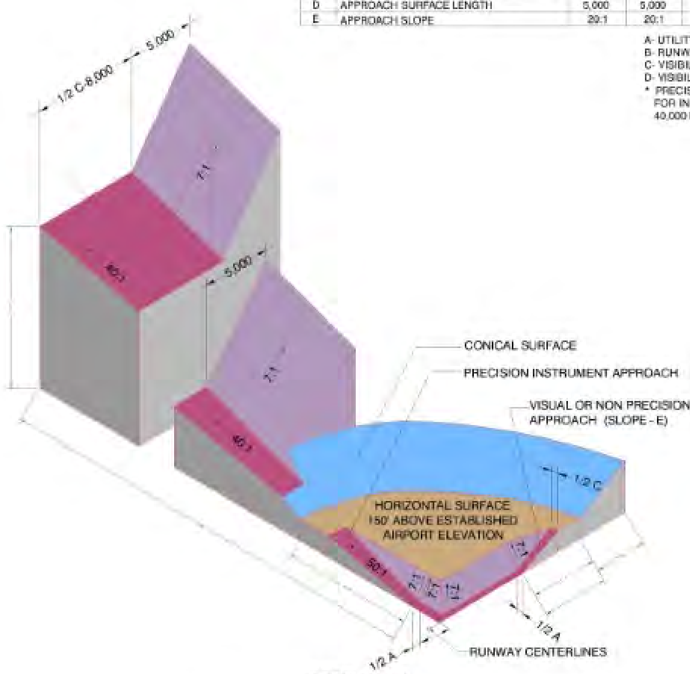


PLAN

AIRPORT AIRSPACE PLAN VIEW

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



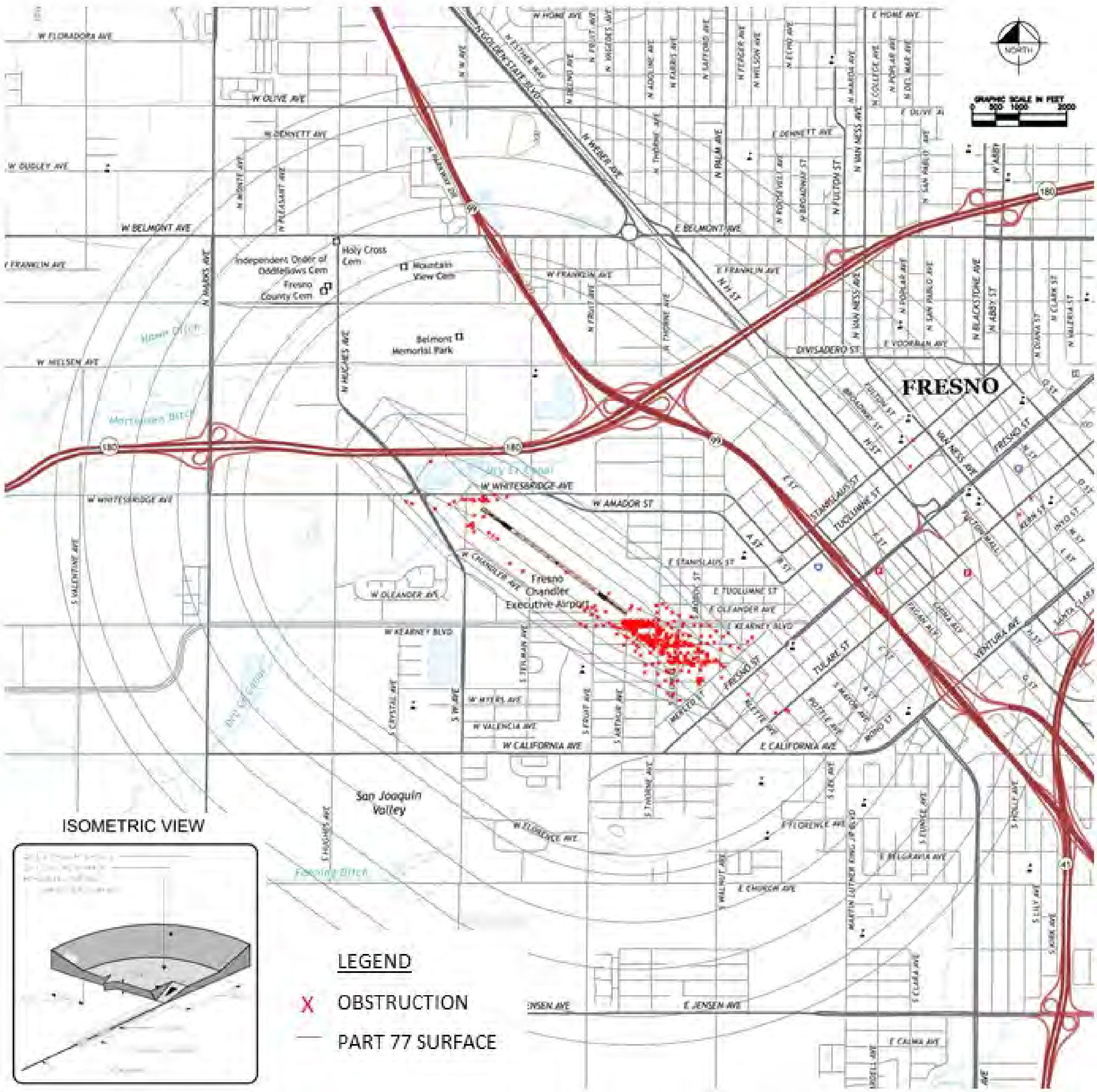
SECTION A-A

PART 77 ISOMETRIC

Source: 14 CFR Part 77 Safe Efficient Use and Preservation of Navigable Airspace, 2015

Figure 5-6 illustrates all runway obstructions based on the existing conditions at the Airport, including those that impact FAR Part 77 Surfaces. Approximately half of the obstructions identified (217) penetrate the FAR Part 77 surfaces. These obstructions include trees, towers, and poles that require mitigation in accordance with FAA guidance. The ALP drawing set at the conclusion of the Master Plan Update provides plan-view and profile-view obstruction analyses for existing and ultimate runway configurations as well as a detailed summary of all obstructions to imaginary surfaces with recommendations to address areas of concern.

Figure 5-6 – FAR Part 77 Obstructions



Source: Kimley-Horn & Associates, July 2018

5.4.2 Terminal Instrument Procedures

Terminal Instrument Procedures (TERPS) criteria specify the minimum measure of obstacle clearance that is considered by the FAA to supply a satisfactory level of vertical protection from obstructions and are predicated on normal aircraft operations. As outlined in TERPS, the FAA has established surfaces used in the design and approval of instrument flight procedures. These are intended to provide obstacle-free paths for aircraft descending on a glide path to landing or climbing in a departure or missed approach. The basic TERPS surfaces are also referenced in FAA AC 150/5300-13A, *Airport Design*, and are used to establish landing threshold and departure end of runway locations. Like the FAR Part 77 Surfaces, these surfaces can vary in shape, size, and slope based on the approach capability of each specific runway end. Penetrations to TERPS are depicted in **Figure 5-7**.

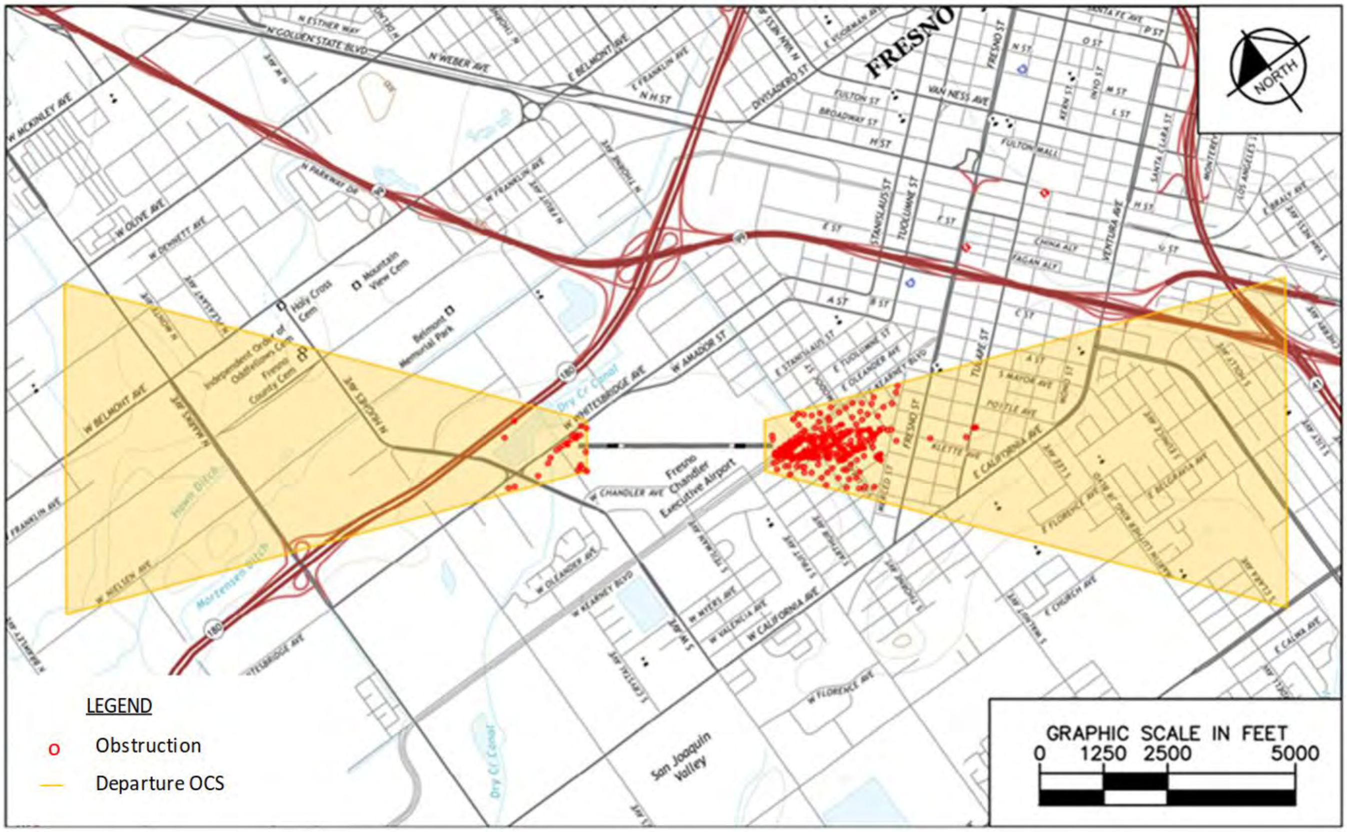
5.4.2.1 Departure Obstacle Clearance Surface

The Departure Obstacle Clearance Surface (OCS) is a trapezoid shape that begins at the end of the runway or the end of the TODA if Declared Distances are applied. The surface begins at an inner width of 1,000 feet, extends along the extended runway centerline for 10,200 feet at a slope of 40:1, to an outer width of 6,466 feet for both runway ends.

Departure Surfaces, when clear, allow pilots to follow standard departure procedures with standard rates of climb. According to FAA AC 150/5300-13A, obstacles frequently penetrate departure surfaces. Known penetrations to these surfaces are identified in the FAA’s flight procedure publications used by pilots for flight planning. If the penetrations are substantial enough, the FAA may require non-standard rates of climb, higher departure minimums, or reduction in runway length available for takeoff.

Approximately 366 penetrations to Departure Surfaces at FCH have been identified, many of which are also identified as penetrations to the FAR Part 77 Surfaces. These penetrations range from a little over 1 foot to approximately 53 feet and are illustrated in **Figure 5-7**. Refer to the ALP drawing set at the conclusion of the Master Plan Update for a detailed summary of obstructions and proposed dispositions to address the areas of concern.

Figure 5-7 – TERPS Departure OCS



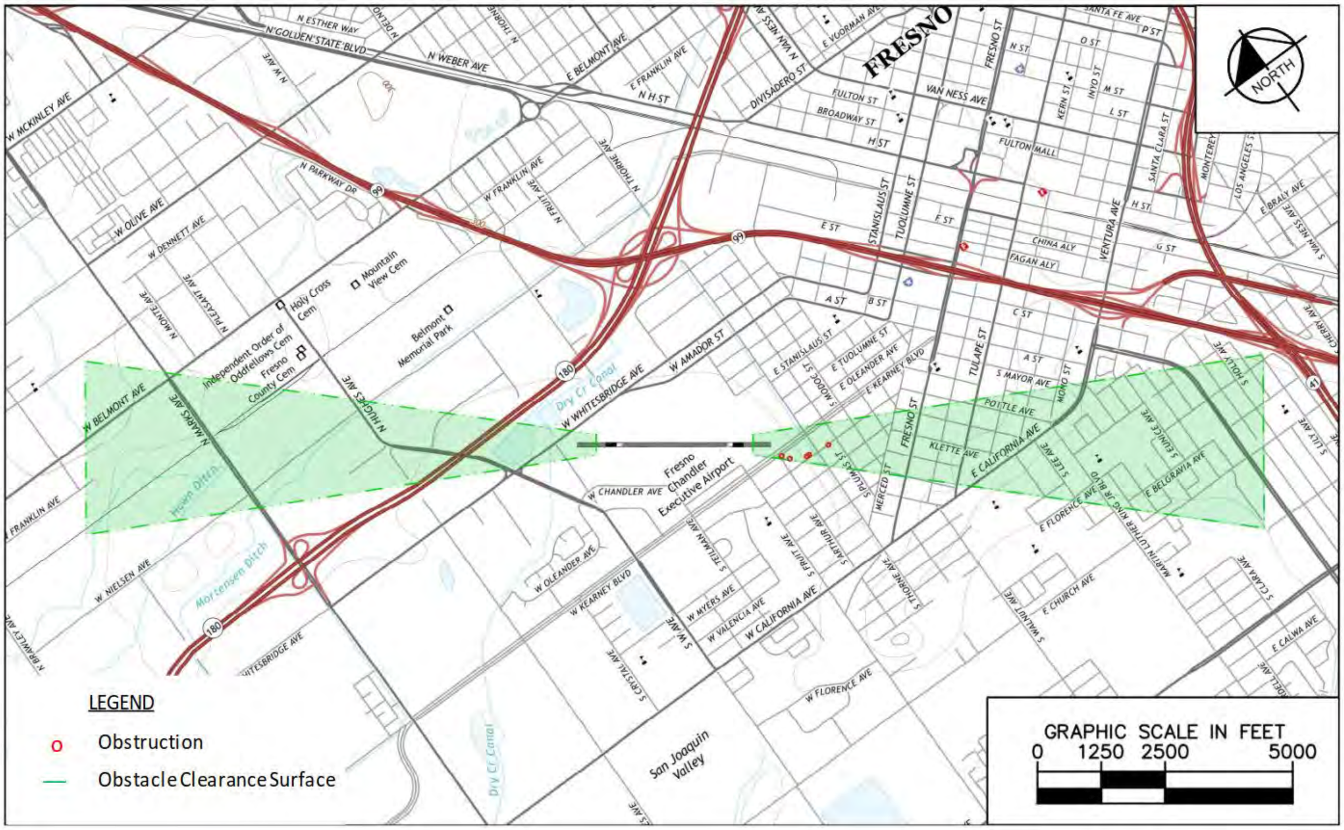
Source: Kimley-Horn & Associates, February 2020

5.4.3 FAA AC 150/5300-13A Obstacle Clearance Requirements

Dimensional standards for FAA AC 150/5300-13A Obstacle Clearance Requirements have been updated to reflect recent changes identified in Engineering Brief No. 99. These approach surfaces are designed to protect the use of the runway in both visual and instrument meteorological conditions near an airport. Per Engineering Brief No. 99, Runway 12-30 has a Type 4 approach (accommodates instrument approaches having visibility greater than or equal to ¾ statute mile) meaning the 20:1 sloped approach starts 200 feet from the runway threshold, has an inner width of 400 feet, an outer width of 3,400 feet, and a total length of 10,000 feet. These surfaces and the identified obstructions to these surfaces are shown in **Figure 5-8**.

The airspace analysis identified 5 obstructions off the end of Runway 30 (4 trees, one telephone pole). Trees penetrate the OCS between 2 and 14 feet, and the telephone pole penetrates the surface by 5 feet. The pole has not been analyzed by the FAA to date, and based on an inspection of aerial imagery, it is unclear if the pole is lighted. It is recommended that trees be cut/trimmed, and the telephone pole be lighted if it is not currently. The ALP drawing set at the conclusion of the Master Plan Update provides a detailed summary of obstructions and proposed dispositions to address areas of concern.

Figure 5-8 – FAA AC 150/5300-13A Obstacles Clearance Requirements



Source: Kimley-Horn & Associates, February 2020

5.4.4 Hazardous Wildlife Attractants

Tenant interviews identified that bird strikes occasionally occur at the Airport, primarily on approach to Runway 30. This could be a result of the birds that nest in trees along W. Kearney Boulevard and S. Thorne Street. Tenants also indicated that bird strikes can be an issue particularly in the evening during dusk. It should also be noted that the canal and basin adjacent to the Airport may serve as wildlife hazard attractants, however, both have significant slopes, which deter birds from nesting in those locations. If bird strikes continue to be an issue, it is recommended that the Airport conduct a WHA to identify potential mitigation options.

5.5 Landside Facilities

This section includes evaluation of the general aviation terminal building, aircraft parking aprons, aircraft storage hangars, vehicle access and parking, and FBO requirements.

5.5.1 General Aviation Terminal Building

Terminal buildings provide essential services for passengers and pilots, as well as a facility for the transfer of passengers and flight crews to and from the aircraft. Terminal facilities range in size based on several factors, most important being the type of airport users. For general aviation services, buildings can range from a small pilot room for flight planning and resting to a large multi-room building that provides services for multiple uses.

Airport Cooperative Research Program (ACRP) Report 113, *Guidebook on General Aviation Facility Planning* recommends that terminals at general aviation airports should offer the following minimum services:

- Passenger Lounge
- Restrooms
- Pilot Lounge
- Vending

The terminal building at FCH has approximately 5,110 square feet of interior space, including the restaurant. ACRP Report 113 provides planning guidelines to develop spatial requirements of terminal buildings at general aviation airports. A factor of 2.5 people (pilots and passengers) per peak hour operation was assumed based on the guidance. An area of 100 square feet of space per person was considered adequate to accommodate peak hour traffic. Because terminal building improvements are eligible for FAA funding, these spatial factors were applied to the FAA-approved Baseline Forecast for peak hour operations and the results are presented in **Table 5-8**. As shown, the Airport's terminal building is anticipated to accommodate projected levels of peak hour operations and passenger activity through the 20-year planning horizon. It should be noted that when the Accelerated Baseline Forecast for operations is applied to planning criteria identified in ACRP Report 113, the Airport's terminal building has a surplus of approximately 310 square feet by 2037.

Table 5-8 – Terminal Building Requirements

Year	Design Hour Operations	Design Hour Passengers	Terminal Size Required (SF)	Existing Terminal Building (SF)	Surplus/Shortage (SF)
2017	15	38	3,800	5,110	1,310
2022	15	38	3,800	5,110	1,310
2027	16	40	4,000	5,110	1,110
2037	17	43	4,300	5,110	810

Sources: Kimley-Horn & Associates, April 2018; ACRP Report 113, Guidebook on General Aviation Facility Planning
Note: Design hour passenger forecasts include pilot.

As described in the Inventory Chapter, the terminal building has historic significance and dates to the mid 1930's. As such, it is recommended that preventative maintenance and care be exercised to preserve the character of the facility.

Immediately west of the terminal building is an administration office that is rented out by the City to tenants as needed. The structure is approximately 1,000 square feet in size. It is anticipated that between the terminal building and the adjacent administration building, there is adequate administration/office space for long-term needs at the Airport.

5.5.2 Apron Requirements

The layout and size of an apron is dependent on the aircraft that frequent an airport, ground vehicle circulation needs, and FAA airfield design standards. ACRP Report 113 provides design criteria for apron layout and capacity. For the purpose of calculating required aircraft parking apron needs, the FAA-approved Baseline Forecast was applied to the following planning assumptions:

- 500 SY of apron per aircraft required for helicopters
- 800 SY of apron per aircraft required for single-engine, multi-engine and experimental/other aircraft
- 1,200 SY of apron per aircraft required for turbo-props
- 30 percent of single-engine and experimental/other based aircraft require apron parking
- 10 percent of multi-engine based aircraft require apron parking
- All helicopters and turbo-prop aircraft are parked in hangars
- Itinerant aircraft apron requirements are based on design hour operations; itinerant operations are anticipated to account for 25 percent of peak hour operations

The apron is situated south of taxiway A and measures approximately 65,000 square yards or roughly 14 acres. Approximately 4,000 square yards of this area are used for itinerant aircraft parking. Apron areas include requisite taxilanes and movement areas. While there are additional unpainted or non-City owned tiedowns on various portions of the landside portion of the Airport, the most recent aerial survey conducted as a component of this Airport Master Plan Update identified 64 painted tie-down spots for based aircraft and 5 for itinerant aircraft in front of the terminal building.

Table 5-9 through **Table 5-11** identify tie-down and apron requirements for based aircraft, itinerant aircraft, and total aircraft using the assumptions described above.

Table 5-9 – Based Aircraft Apron and Tie-Down Requirements

	Apron Required (SY)*					Tie-Downs Required			
Aircraft Type	**Apron Required (SY)**	**2017**	**2022**	**2027**	**2037**	**2017**	**2022**	**2027**	**2037**
Single-Engine	800	24,800	25,600	25,600	28,000	31	32	32	35
Multi-Engine	800	800	800	800	800	1	1	1	1
Experimental/ Other	800	2,400	2,400	2,400	2,400	3	3	3	3
Total		***28,000***	***28,800***	***28,800***	***31,200***	***35***	***36***	***36***	***39***
Existing		***61,000***	***61,000***	***61,000***	***61,000***	***64***	***64***	***64***	***64***
Surplus/(Deficit)		***33,000***	***32,200***	***32,200***	***29,800***	***29***	***28***	***28***	***25***

Sources: Kimley-Horn & Associates, April 2018; ACRP Report 113, Guidebook on General Aviation Facility Planning
Notes: Required apron space and tie-downs are rounded up as a fraction of an aircraft cannot be accommodated. Turbo-prop and helicopter aircraft are not depicted as these types were assumed to be stored in hangars.

Table 5-10 – Itinerant Apron and Tie-Down Requirements

	Apron Required (SY)					Tie-Downs Required			
Aircraft	Apron Required (SY)	2017	2022	2027	2037	2017	2022	2027	2037
Single-Engine	800	2,400	2,400	2,400	2,400	3	3	3	3
Multi-Engine	800	800	800	800	800	1	1	1	1
Turboprop	1200	-	-	-	800	-	-	-	1
Helicopter	500	-	-	-	-	-	-	-	-
Experimental/ Other	800	-	-	-	-	-	-	-	-
Total		***3,200***	***3,200***	***3,200***	***4,000***	***4***	***4***	***4***	***5***
Existing		***4,000***	***4,000***	***4,000***	***4,000***	***5***	***5***	***5***	***5***
Surplus/(Deficit)		***800***	***800***	***800***	***0***	***1***	***1***	***1***	***0***

Sources: Kimley-Horn & Associates, April 2018; ACRP Report 113-Guidebook on General Aviation Facility Planning
Note: Required apron space and tie-downs are rounded up as a fraction of an aircraft cannot be accommodated.

Table 5-11 – Total Apron and Tie-Down Requirements

	Apron Required (SY)				Tie-Downs Required			
Year	2017	2022	2027	2037	2017	2022	2027	2037
Total	*31,200*	*32,000*	*32,000*	*35,200*	*39*	*40*	*40*	*44*
Existing	***65,000***	***65,000***	***65,000***	***65,000***	***69***	***69***	***69***	***69***
Surplus/(Deficit)	***33,800***	***33,000***	***33,000***	***29,800***	***30***	***29***	***29***	***25***

Sources: Kimley-Horn & Associates, April 2018; ACRP Report 113, Guidebook on General Aviation Facility Planning
Note: Required apron space and tie-downs are rounded up as a fraction of an aircraft cannot be accommodated.

As shown, the analysis indicated that a total of 44 tie-downs and 35,200 SY of aircraft parking apron will be needed for based and itinerant aircraft by 2037. As such, the Airport was projected to have a surplus of approximately 29,800 SY of apron and 25 tie-downs at the end of the 20-year planning horizon. It should be noted that when applying the same assumptions identified above to the Accelerated Baseline Forecast, the analysis projected a surplus of approximately 23,000 SY of aircraft parking apron and 13 tie-downs by 2037.

As noted, tenants and the PAC have identified that additional itinerant aircraft parking is needed near the terminal building. While existing aircraft parking apron space and tie-downs are anticipated to satisfy projected demand, it is recommended that areas near the terminal building be reconfigured to accommodate additional itinerant aircraft and maximize available apron area. Reconfiguration options are presented in a subsequent chapter.

5.5.3 Aircraft Storage Hangar Requirements

Based and itinerant aircraft that are not accounted for in the analysis presented in **Section 5.5.2** can be stored in a variety of ways beyond tie-down/apron storage including conventional (box) hangars or T-shades. While FCH does not currently have T-shades, they can be an alternative to apron or T-hangar storage facilities. Indoor aircraft hangar storage is typically desired within the California Central Valley due to the sun exposure and heat.

Storage hangar requirements were determined using guidelines suggested in ACRP Report 113. The following were assumed for conventional storage hangars:

- 1,200 square feet for single-engine and experimental aircraft
- 1,400 square feet for multi-engine aircraft
- 1,800 square feet for turboprop aircraft
- 1,500 square feet for helicopters

For T-hangar storage requirements, 1,300 square feet was assumed for all types of applicable aircraft (single-engine, multi-engine, and experimental aircraft). It was assumed that 70 percent of based aircraft requiring hangar storage would be in T-hangars, and 30 percent would be in conventional hangars. All itinerant aircraft (100 percent) not stored on the apron were assumed to be stored in conventional hangars.

The Airport has 149 T-hangar units (16 hangar buildings) that encompass approximately 175,500 square feet and 9 conventional hangars that encompass approximately 72,000 square feet (including FBO hangars). Based on the spatial assumptions described above, the Airport has capacity to accommodate 208 aircraft in T-hangars or conventional hangars. A summary of conventional and T-hangar storage requirements is shown in **Table 5-12**. As shown, the Airport has adequate hangar storage to accommodate demand throughout the 20-year planning horizon.

Table 5-12 – Aircraft Storage Hangar Requirements

Hangar Type	2017	2022	2027	2037
Aircraft Requiring Conventional Hangars	23	23	24	25
Aircraft Requiring T-hangars	64	66	70	76
Total	87	89	94	101
Conventional Hangar SF Required	28,009	28,009	29,227	30,445
Existing (SF)	*72,000*	*72,000*	*72,000*	*72,000*
Surplus/Deficit (SF)	43,991	43,991	42,773	41,555
T-Hangar SF Required	83,200	85,800	91,000	98,800
Existing (SF)	*175,500*	*175,500*	*175,500*	*175,500*
Surplus/Deficit (SF)	92,300	89,700	84,500	76,700
Total Hangar Space Required (SF)	**111,209**	**113,809**	**120,227**	**129,245**
Existing (SF)	**247,500**	**247,500**	**247,500**	**247,500**
Surplus/Deficit (SF)	**136,291**	**133,691**	**127,273**	**118,255**

Source: Kimley-Horn & Associates, April 2018; ACRP Report 113, Guidebook on General Aviation Facility Planning

Although additional storage hangar capacity is not anticipated during the 20-year planning horizon, it is recommended that the Airport preserve areas for hangar development in the event that demand exceeds projected activity levels. Additionally, during tenant interviews and discussions with Airport Management and the PAC, it was noted that several storage hangars are aging, and some are in need of repair or replacement. The Airport may want to rehabilitate and/or replace hangars that it owns based on condition of the structure, leases in place, and availability of funding. Renovation of existing hangars could act as an attractant for other based aircraft owners in the region.

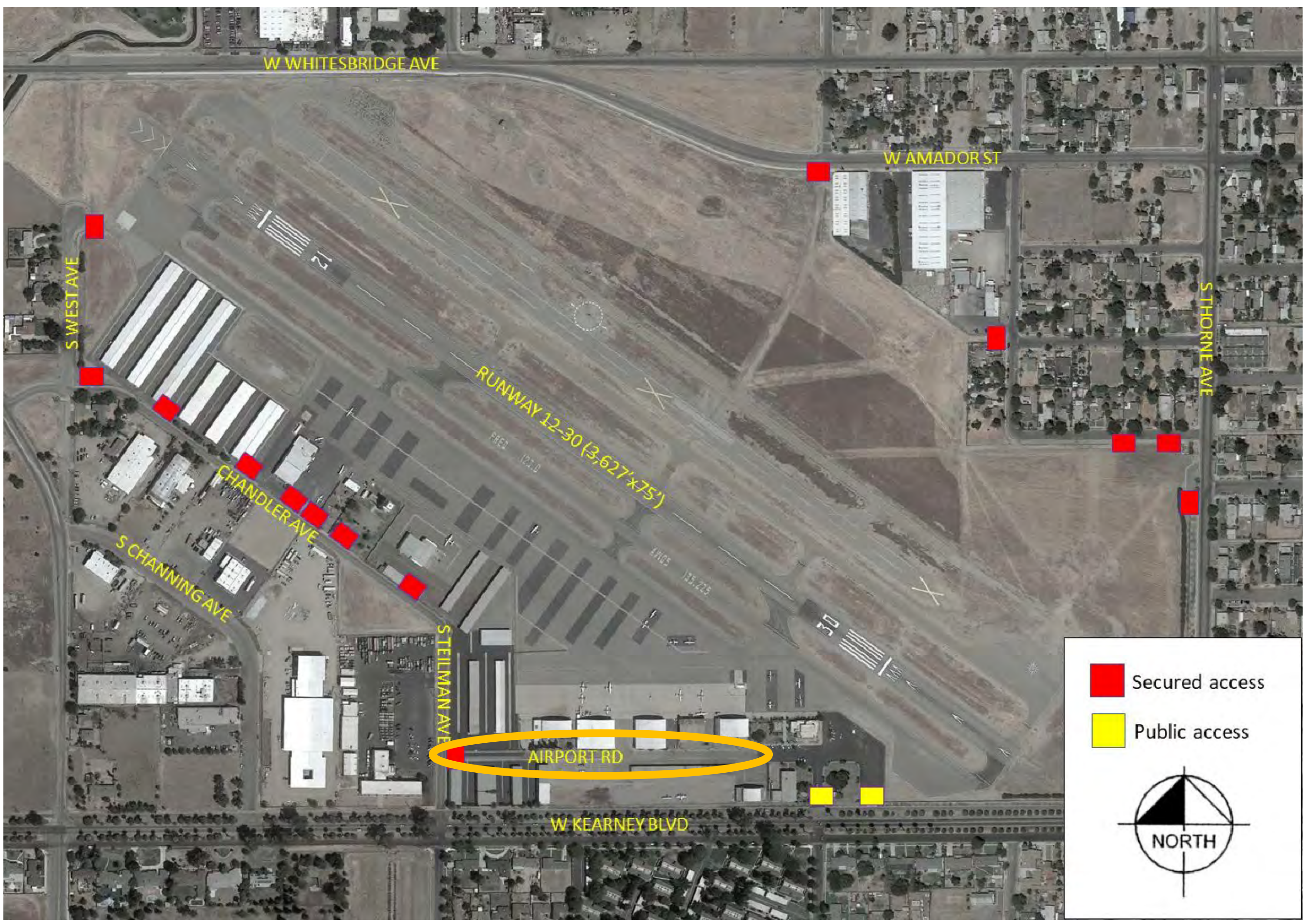
Another issue that was analyzed was the configuration of Airport Road where it connects via secure access to areas directly adjacent to box hangars and T-hangars west of the terminal building. This configuration presents a situation where vehicles utilize taxilanes intended for aircraft use (depicted in orange in **Figure 5-9**). As Airport Road enters the secure side of the access gate, it essentially becomes an active taxilane. Without some form of notification from oncoming aircraft that are accessing the taxilane (such as coordination from an active ATCT), there exists a significant risk of vehicle-aircraft incursion. A similar issue exists on the west side of the taxilane where it intersects with S. Teilman Avenue via a secure access gate. Additionally, the road is owned by the City, but is not under the jurisdiction of the Airport Sponsor. City maintenance vehicles must enter secure access to perform routine inspection and maintenance, which compounds complications to safety for aircraft that utilize the taxilane.

This issue could be mitigated by multiple solutions such as relocation of the secure vehicle access gates to the W. Kearney Frontage Road and require vehicles to park in a designated lot instead of using the taxilane to access storage hangars. Other options to mitigate this safety risk could include relocation of storage hangars where vehicle traffic utilizing the adjacent taxilane could be problematic, or the use of striping and signage to identify areas where vehicles are prohibited. Additionally, it is recommended that the impacted portion of Airport Road that accesses tenant areas be vacated by the City to the Airport Sponsor using a no-cost transaction so the Sponsor can coordinate inspection and maintenance requirements. Alternatives to mitigate this issue are presented in a subsequent chapter.

5.5.4 Airport Access and Vehicle Parking

The Airport is primarily accessed from W. Kearney Boulevard. There is one entrance to the terminal facilities and another to the parking lot. Although these entrances are not gated, secured entrances are located beyond the parking lot adjacent to the administration building that access tenant and hangar areas to the north and west. Other gated entrances include one on S. Teilman Avenue, seven on Chandler Avenue (leading to the apron, decommissioned ATCT area, etc.), one on S. West Avenue, one on W. Amador Drive, one on S. Arthur Avenue, two on W. Chandler Avenue, and one on S. Thorne Avenue. **Figure 5-9** illustrates the Airport access locations.

Figure 5-9 – Airport Access Locations



Sources: Kimley-Horn & Associates, Google Earth (accessed April 2018)

There are restricted access points for Airport and maintenance staff as well as coded gates surrounding the Airport for tenants. Restricted access points can be converted to public and/or secure access as development on the north portion of the airfield dictates.

As noted, Airport Road becomes an active taxilane on the secure side of access gates on both the east and west portions. Development alternatives presented in the following chapter include options to mitigate this security issue.

ACRP Report 113 identifies recommended vehicle parking spaces by type of facility. For the purposes of this Airport Master Plan Update, parking requirements have been identified for the terminal building, conventional hangar storage space, T-hangars, and the based aircraft apron. While pilots and tenants often park vehicles in aircraft storage hangars or non-movement apron areas, designated parking spaces are desirable. The following assumptions were used to develop vehicle parking facility requirements:

- Conventional (box) hangars require one parking space per 1,000 square feet of floor space
- T-hangars require one parking space per 2 units
- Terminal building requires 2.5 spaces per peak hour (design hour) operation, and one space per 200 square feet of office space
- Based aircraft parking apron requires one space for every 2 tie-downs

It should be noted that vehicle parking requirements are based on projected need, not existing conditions. For example, based on projected peak hour activity, the terminal building's existing size is larger than what is needed in the 20-year planning horizon; therefore, terminal parking requirements are based on the projected size needs rather than the facility's existing footprint. Basing facility needs on projected demand rather than existing conditions avoids "over-planning" and allows flexibility to develop or re-develop underutilized facilities.

The Airport has 90 public parking spaces south and east of the terminal building, and an additional 22 spaces are located near T-hangars south of Airport Road. Tenants such as Frank Ruiz Avionics and American Helicopters have approximately 45 parking designated spaces, though several are not striped.

Existing vehicle parking supply and forecast demand are shown in **Table 5-13**. As shown, the existing terminal/public parking supply is more than adequate to accommodate projected levels of demand, however, designated parking spaces are needed to accommodate Airport users and tenants who utilize conventional hangars, T-hangars, and aircraft tie-downs. Though tenants and aircraft owners often park adjacent to or inside aircraft storage hangars, this is considered an incompatible use for hangars. The designated lot south of Airport Road is approximately 2,500 feet from the northwesternmost T-hangars and the lot adjacent to the terminal building is approximately 3,000 feet from those hangars. It is recommended that the Airport construct designated parking spaces (approximately 38) on secure portions of the airfield to accommodate tenants. This need is highest on south and west portions of the airfield where there is a greater concentration of T-hangars.

Table 5-13 – Vehicle Parking Requirements

Parking Facility	2017	2022	2027	2037
Conventional Hangar Demand (SF)	28,009	28,009	29,227	30,445
Parking Spaces Required	28	28	30	31
Existing Supply	45	45	45	45
Surplus/Deficit	17	17	15	14
T-hangar Demand (Units)	64	66	70	76
Parking Spaces Required	32	33	35	38
Existing Supply	22	22	22	22
Surplus/Deficit	-10	-11	-13	-16
Aircraft Tie-Down Demand	39	40	40	44
Parking Spaces Required	20	20	20	22
Existing Supply	0	0	0	0
Surplus/Deficit	-20	-20	-20	-22
Terminal/Public Demand (SF)	4,000	4,300	4,300	4,800
Parking Spaces Required	40	43	43	48
Existing Supply	90	90	90	90
Surplus/Deficit	50	47	47	42
Total Surplus/Deficit	37	33	29	18

Sources: Kimley-Horn & Associates, April 2018; ACRP Report 113, Guidebook on General Aviation Facility Planning. Note: Red text indicates deficit.

5.5.5 Fixed Base Operator (FBO)

The Airport does not currently have a full service FBO. However, tenants including Frank Ruiz Avionics, American Helicopters, and Fresno Flyers Club provide limited FBO services such as fueling, ground handling, flight training, and aircraft parking/hangar leasing. The PAC has identified that additional aircraft and rotorcraft maintenance facilities are needed. While the Airport cannot dictate how existing and future tenants operate, service and facility improvements could entice an a new FBO tenant or an existing tenant to expand services at the Airport.

5.5.6 Airport Security

Airport security currently consists of a fenced perimeter and several security gates. Airport Management and tenants have identified that unauthorized personnel have entered the airfield on occasion and that there have been other security concerns on the Airport. It is recommended that the security fence be heightened to 8 feet to deter unauthorized persons from entering the airfield. Furthermore, security coded doors in the terminal building should be considered to deter unauthorized users from entering secure areas of the Airport.

5.6 Support Facilities

Support facilities at the Airport include fuel storage, an aircraft wash rack facility, and Airport maintenance building.

5.6.1 Aviation Fuel Storage and Supply

Fuel storage and supply at the Airport is currently located in two areas on the airfield. One 12,000 gallon above-ground tank containing 100LL fuel is currently owned by Linda Memly and is located north of the terminal building and the other approximately 18,000-gallon 100LL above-ground tank is located midfield south of taxiway A (currently owned and maintained by Frank Ruiz Avionics). Based on tenant interviews, tanks are refilled with 3,000 gallons of 100LL at a time, approximately 2 to 3 times a month.

It is typically recommended that general aviation airports have sufficient fuel storage capacity for up to a week of fueling demands. The size of the existing 100LL tanks is anticipated to meet forecast demand with additional refueling as needed. Flight Line Aviation does have limited jet fuel, though it is not available to the public or other Airport users. FCH does experience a small amount of light jet and turboprop traffic, as well turbine-powered helicopter activity. Based on fleet mix and operational forecasts, it is not anticipated that jet fueling facilities will be needed in the 20-year planning horizon.

5.6.2 Aircraft Wash Rack

The Airport's wash rack is located on the westernmost portion of the airfield, south of Runway 12 and is clear of any facilities and vehicle movement areas. While future development is anticipated to occur near the wash rack, the facility is not projected to be impacted. The size and location of the wash rack is anticipated to be adequate throughout the 20-year planning horizon.

5.6.3 Airport Maintenance and Storage

On-Airport maintenance equipment is stored in a building approximately 300 square feet in size that is adjacent to the decommissioned ATCT. Typical maintenance equipment includes lawn mowers and landscaping tools, cleaning supplies, and petroleum spill clean-up chemicals. The size of the existing maintenance building is anticipated to be adequate to accommodate these types of items.

Tenants have indicated that gravel is found on airfield pavements on a regular basis. Pieces of gravel and other items are considered foreign object debris (FOD), which is a safety hazard as objects can get blown by propellers and cause injury to persons or damage aircraft. The Airport should either obtain pavement sweeping equipment to conduct regular sweeping of runway, taxiways, and apron areas, or pave infield and shoulder areas where loose rock or gravel exists. If sweeping equipment is desirable, a larger maintenance facility may be required.

5.7 Utility Systems Infrastructure

The ability of existing utility infrastructure to accommodate future development needs to be considered for long-term planning at the Airport. No field investigations were conducted to assess utility conditions for the purposes of this Airport Master Plan Update. Anecdotally, the Airport has identified that a gas line to one of the tenants (Frank Ruiz Avionics) has broken and gas has been shut off to the maintenance building located on the north side of the airfield. Beyond this identified issue, the extent of required maintenance and repair to gas lines and other utilities is not known.

The following sections identify baseline conditions of various utilities at the Airport, and general recommendations for any potential improvements that may be needed currently or in the future. Utility maps that identify locations of various existing infrastructure are presented in **Appendix B**.

5.7.1 Water (City of Fresno)

The Airport and surrounding area are served by 12-inch water mains with 8-inch branches in a grid pattern. The Airport is bound by 12-inch water mains along W. Kearney Boulevard, West Avenue, Whitesbridge Avenue, and Thorne Avenue. Eight-inch lines are located along Channing, Chandler, and Airport roads on the southern portion of the property. An 8-inch line is located along Amador Avenue on the northeast portion of the airfield.

The existing network of water lines provides adequate capacity for proposed facility requirements presented in this chapter. The existing distribution system is sufficient to meet anticipated demand. Any increases in potential demand are mitigated by the ability to utilize a recycled water line which is available for the site.

5.7.2 Recycled Water (City of Fresno)

There is currently no recycled water used at FCH, however, the City of Fresno recently installed a recycled water line along Whitesbridge Avenue that provides the Airport a potential additional water source. This resource provides capacity and may offset additional potable water demand or provide a net reduction of water used at the Airport.

5.7.3 Sanitary Sewers

The City of Fresno provides sanitary sewer service to the Airport. A 30-inch sewer main traverses the Airport along S. Fruit Avenue. Future demand from recommended facility requirements is compatible with sewer capacity identified in the City's General Plan land use designation. There are no known deficiencies in the collection system; the existing infrastructure is anticipated to satisfy projected levels of demand.

5.7.4 Irrigation

The Airport is adjacent to a major Fresno Irrigation District (FID) canal (Dry Creek Canal), located on the northwest portion of the airfield. The Airport does not use water from, nor discharge storm water to, the FID irrigation utility. No impacts on FID delivery operations and no direct impacts on FID Flood Control operations have been identified. All storm water flows from the site are collected by FMFCD, which has 2 basins adjacent to the Airport; one approximately 1/3 mile west of the airfield, and one approximately 1/3 mile to the southwest.

5.7.5 Flood Control

FMFCD provides flood control for the area including the Airport, which is located within two FMFCD watersheds, Basin RR-3 and Basin FF. On-site storm drain lines ranging from 12-inches to 42-inches collect and transfer storm water into the FMFCD system. Proposed improvements that significantly increase impervious surface area may require additional on-site collection system infrastructure. Proposed grading and on-site drainage improvements can accommodate anticipated increases in runoff with existing collection system and storage capacity.

5.7.6 Electrical Service

Electrical service is provided from two directions by Pacific Gas and Electric (PG&E) via 3-6C 12 kV lines. Circuit CA 1111 provides power to the western and main portions of the Airport area and West Fresno circuits serve the portions of the 3-6C 12 kV distribution system on the east portion of the Airport. Most electrical service at the Airport is provided by aerial lines. There are existing buried lines on both ends of Runway 12-30, and at locations along Airport Road and between Chandler and Channing avenues. Detailed load demand information will be required on a per-site basis for recommended facility requirements to determine if additional capacity is needed.

Increased development at the Airport may be expected to increase electricity consumption, particularly as it pertains to potentially accommodating additional based electric aircraft in the future. Proposed land use and density will not significantly change compared with historical levels. Detailed load demand information will be required on a per-site basis for proposed development. It is recommended that all aerial lines be transferred underground, however, this action will require coordination between the City of Fresno and PG&E.

5.7.7 Natural Gas

Natural gas at the Airport is also provided by PG&E. Buried natural gas lines serve the Airport and surrounding area. Detailed natural gas distribution line information will be required in areas slated for significant development. Increased development can be expected to increase natural gas consumption. Proposed land use and density will not significantly change compared with historical levels. Detailed load demand information will be required on a per-site basis for proposed development.

5.7.8 Communications

AT&T and Comcast serve the Airport and surrounding area via communications lines. Most off-site lines are aerial and onsite lines are a mixture of aerial and buried lines. Detailed communication line information will be required in areas slated for development.

Increased development can be expected to require additional communication services. Proposed land use and density will not significantly change compared with historical levels. Detailed load demand information will be required on a per-site basis for proposed development. Communications infrastructure is anticipated to meet projected demand or can be easily be augmented to accommodate proposed improvements.

5.7.9 On-site Ancillary Utilities

Ancillary utilities including runway lighting, communications, and security systems associated with the functionality of the airfield are provided and monitored by the Airport. Augmentation and updates to these ancillary systems should occur as demand merits.

5.7.10 Off-site Ancillary Utilities

Off-site ancillary utilities such as street lighting, traffic signalization and controls, and others are operated and monitored by the City of Fresno. Existence of such ancillary infrastructure has been observed in other utility plans. No potential impacts on these systems are anticipated.

5.8 Facility Requirements Summary

A summary of facility improvements by type is presented in **Table 5-14**. Facility improvements are categorized as near-term (0-5 years), intermediate-term (6-10 years), and long-term (11-20 years) needs based on projected levels of aviation demand. Development alternatives for these facility requirements are presented in Chapter 6, Alternatives Analysis.

Table 5-14 – Facility Requirements Summary

Facility Requirement	Near-Term (0-5 Years)	Intermediate-Term (6-10 Years)	Long-Term (11-20 Years)
Airside Facilities			
Runway 12-30 Extension			Environmental documentation and design of extension pending changes in fleet mix
Direct Apron-Runway Connector Taxiway Mitigation on Taxiways D and F	Design standard taxiway connectors D and F	Construct and/or mark standard taxiway connectors	
Standardization of Runway 30 RSA, ROFA, ROFZ	Design standard Runway 30 and relocated connector taxiway	Construct standard Runway 30 and relocated connector taxiway	
Blast Pads		Widen blast pad on Runway 12 to 80' and design/ construct 60'x80' blast pad on Runway 30	
RPZ Land Use Control	Acquire properties within existing and future approach and departure RPZs via easement or fee simple	Acquire properties within existing and future approach and departure RPZs via easement or fee simple	Acquire properties within existing and future approach and departure RPZs via easement or fee simple
AWOS Maintenance	Inspect AWOS and update/modernize as needed	Replace AWOS if modernization is not sufficient	
Rotating Beacon Tower Relocation	Design relocated rotating beacon	Install relocated beacon	
ATCT Demolition	Prepare environmental documentation for demolition of ATCT	Demolition of ATCT, site cleanup and environmental mitigation (if necessary)	
NAVAIDS	Upgrade PAPIs, REILs, MIRLs, and TWY A/connector Lights to LED based on useful life	Upgrade PAPIs, REILs, MIRLs, and TWY A/connector Lights to LED based on useful life	Upgrade PAPIs, REILs, MIRLs, and TWY A/connector Lights to LED based on useful life
Airfield Pavements	Maintain and rehabilitate Airport pavements per PMMP	Maintain and rehabilitate Airport pavements per PMMP	Maintain and rehabilitate Airport pavements per PMMP

Facility Requirement	Near-Term (0-5 Years)	Intermediate-Term (6-10 Years)	Long-Term (11-20 Years)
Airspace Protection			
Obstruction Removal and Lighting	Remove/light obstructions within approach, departure, and Part 77 imaginary surfaces	Remove/light obstructions within approach, departure, and Part 77 imaginary surfaces	Remove/light obstructions within approach, departure, and Part 77 imaginary surfaces
Landside Facilities			
Security Fence Enhancements	Design upgraded perimeter security fence (8')	Install upgraded perimeter security fence (8')	
Terminal Building Security Improvements	Install secure access in terminal building or at access point to airside		
Improvements to Airport Road and incompatible vehicle access	City to vacate portion of Airport Road that is shared taxilane to the Airport Sponsor	Design, construction, and relocation of facilities impacted by incompatible Airport Road/Taxilane	
Vehicle Parking Expansion		Design and construct ~40 vehicle parking spaces for based aircraft	
Helicopter Parking Area	Install standard helicopter parking area markings in existing location		
Reconfiguration of Itinerant Aircraft Parking		Design and reconfigure itinerant aircraft parking area	
Support Facilities			
Obtain Pavement Sweeper or Pave Infield Areas	Purchase airfield sweeper or design and pave infield areas to reduce FOD		
Utility Facilities			
Maintain and Upgrade Utility Infrastructure		Relocate aerial electrical lines underground (requires City coordination with provider)	
Miscellaneous Studies			
Wildlife Hazard Assessment		Conduct wildlife hazard assessment if bird strikes increase	
Pavement Management Plan			Update 2015 PMMP

Source: Kimley-Horn & Associates, February 2020

6 Alternatives Analysis

This chapter presents development alternatives for various functional areas of FCH. Alternatives are intended to accommodate the aviation demand forecasts and facility requirements identified in previous chapters of this Master Plan Update. Additionally, feedback from the Master Plan Advisory Committee, Airport Management, the FAA, various stakeholders, and the public was incorporated in the development and analysis of alternatives. The recommended alternative for each functional area and overall recommended development and land use plans are also included within this chapter.

6.1 Evaluation Criteria

As presented in Chapter 5, the facility requirements identified future infrastructure needs to accommodate forecast demand. Based on the facility requirements and stakeholder input, the following evaluation criteria were established to guide development and compare the alternatives described within this chapter. Alternatives should consider the following:

- **Satisfy forecast demand**: Accommodate future demand volumes and forecast fleet mix
- **Minimize off-Airport impacts**: Minimize the need for additional land acquisition, incursions into safety areas, requirements for road relocations and other impacts to the community and natural environment
- **Minimize on-Airport impacts**: Be compatible with existing and planned airside and landside facilities and minimize the need for modifications to FAA design standards
- **Mitigate non-standard conditions**: Reduce the occurrence of non-standard conditions for design implementation
- **Facilitate safety**: Enhance the operational safety of the Airport
- **Enhance Airport's ability to generate revenue**: Provide new or additional opportunities for the Airport to generate revenue

6.2 No-Analysis Alternatives

Generally, facility improvements may be categorized as those that require in-depth alternatives analyses and those that do not. For the purposes of this Master Plan Update, improvements that do not require in-depth analyses are primarily focused on upgrading existing Airport infrastructure and/or standardizing conditions per FAA guidance. These improvements typically do not offer alternatives as the conditions or needs should be met and there are no other options to achieving the infrastructure improvement. Such recommended improvements at FCH are listed below and depicted later in this chapter in **Figure 6-9**:

- Standardization of blast pads
- Land acquisition or easements for parcels within RPZs
- Relocation of the rotating beacon
- Mitigation of airspace obstacles
- Security improvements (perimeter fencing, secure terminal access)
- Standardization of markings for helicopter operating area
- Utility upgrades (underground electrical lines)
- Installation of new airfield signage and LED lighting
- Mitigation of runway incursion issues (direct apron-runway connector taxiways)
- Replacement of PAPI-2L of the Runway 12 end with a 4-light PAPI or PAPI-4L
- Recalibration and repainting of the Airport's compass rose

- Removal of non-standard or unused airfield pavements (e.g. decommissioned runway, non-standard taxiway fillets)

The following sections present alternative options for improvements that require additional analysis to identify a recommended alternative.

6.3 Airside Alternatives

The development of airside alternatives focused on two specific issues: mitigation of non-standard runway protection areas and reconfiguration of the itinerant aircraft parking apron located immediately north of the terminal building. As such, this section presents various airside alternatives for Runway 12-30 and the itinerant apron. Additionally, recommended alternatives for these airfield components, described below in **Sections 6.3.1.6** and **6.3.2.3**, were determined based on the aforementioned evaluation criteria.

6.3.1 Runway 12-30 Alternatives

Runway alternatives were developed primarily to mitigate the existing non-standard runway safety area (RSA), runway object free area (ROFA), and runway obstacle free zone (ROFZ) on Runway 12-30. The standardization of these safety areas according to FAA criteria is critical to support safe operations at the Airport. For alternatives that cannot fully mitigate non-standard conditions, modifications to FAA standards (MOSs) are required, as applicable. FAA's latest AC, 150/5300-13A, Change 1, *Airport Design*, is clear that a MOS cannot be issued for any RSA and that RSA standards must be met.

Runway Alternatives 1, 2, and 3 improve non-standard conditions by reducing pavement length on the Runway 30 end, while Alternatives 4 and 5 include implementation of declared distances. These alternatives are assessed below, and a recommended alternative is presented at the end of this section.

It should be noted that based on the Airport's existing and future aircraft fleet mix, an extension to Runway 12-30 was not considered within the 20-year planning horizon. It is recommended that the Airport continue to monitor operational activity by aircraft type to determine if a future extension may be justified.

6.3.1.1 Runway 12-30 Alternative 1

Runway 12-30 Alternative 1, presented in **Figure 6-1**, proposes removal of 153 feet of runway pavement on the Runway 30 end to achieve a standard RSA, ROFA, and ROFZ. The ultimate physical length of Runway 12-30 in this alternative would be 3,474 feet.

To accommodate the shortened runway, Taxiway B, which connects parallel Taxiways A and H to Runway 12-30, would be relocated to the new runway end. The reconstructed taxiway connectors would be designed to the FAA's current design standards as published in FAA AC 150/5300-13A. The portion of Taxiway B east of Runway 12-30 would require approximately 4,083 square feet of new pavement and the western portion of Taxiway B would require 2,667 square feet of new pavement. Removal of approximately 12,377 square feet of taxiway pavement would also be required, and new taxiway pavements would need associated markings as well as relocated lighting.

Currently, there is no blast pad present on the Runway 30 end. Runway 12-30 Alternative 1 includes the construction of a standard blast pad to achieve standards for RDC A-I (Small), measuring 60 feet long by 80 feet wide. Therefore, the majority of a new blast pad could be developed utilizing existing runway pavement. As Runway 12-30 is currently 75 feet wide and a standard blast pad for the Airport is 80 feet wide, approximately 175 square feet of new pavement would be added on both sides of the blast pad (approximately 350 total square feet). Additionally, the remaining unusable portion of runway pavement would be removed as part of this alternative (approximately 6,973 total square feet). The new blast pad will require standard blast pad markings, including chevrons and a runway demarcation bar.

The advantages and disadvantages of Runway 12-30 Alternative 1 are summarized below.

Advantages:

- Achieves standard RSA, ROFA, and ROFZ
- Shortening Runway 12-30 provides a permanent solution to the existing non-standard runway protection areas without a MOS, which must be applied for every five years
- Changes to the runway are physical, which improves pilot awareness

Disadvantages:

- Reduces runway length by 153 feet
- Requires substantial amount of taxiway and unusable runway pavement removal (approximately 19,350 square feet)
- Requires reconstruction of taxiway connectors (approximately 6,750 square feet of new pavement)
- Requires relocation of taxiway lighting
- Requires construction of blast pad (350 square feet of new pavement and blast pad markings)

6.3.1.2 Runway 12-30 Alternative 2

Runway 12-30 Alternative 2, presented in **Figure 6-1**, proposes removal of 112 feet of runway pavement at the Runway 30 end to achieve a standard RSA and ROFZ. The ultimate physical length of Runway 12-30 in this alternative would be 3,515 feet. Alternative 2 does not provide a standard ROFA, therefore, a MOS would be required. If approved by the FAA, the MOS for a non-standard ROFA would require renewal every five years.

Like Runway 12-30 Alternative 1, the taxiway connectors (Taxiway B) would be relocated to the new runway end, requiring 4,083 square feet of new pavement east of Runway 12-30 and 2,667 square feet of new pavement west of Runway 12-30. Removal of approximately 12,377 square feet of taxiway pavement would also be required, and new taxiway pavements would need marking and relocated lighting.

Similar to the previous alternative, Runway 12-30 Alternative 2 includes the construction of a standard blast. The majority of the new blast pad would utilize existing runway pavement and need to be widened to meet FAA design standards. Additionally, the remaining unusable portion of runway pavement would be removed as part of this alternative (approximately 3,903 total square feet). The new blast pad will require standard markings and a runway demarcation bar.

The advantages and disadvantages of Runway 12-30 Alternative 2 are summarized below.

Advantages:

- Achieves standard RSA and ROFZ
- Changes to the runway are physical, which improves pilot awareness
- Shortening Runway 12-30 provides a permanent solution to the two of the three existing non-standard runway protection areas (MOS is still required for the ROFA standard)

Disadvantages:

- Reduces runway length by 112 feet
- MOS for ROFA is required and must be renewed every five years (FAA approval is not guaranteed)
- Requires substantial amount of taxiway and unusable runway pavement removal (approximately 16,280 square feet)
- Requires reconstruction of taxiway connectors (approximately 6,750 square feet of new pavement)
- Requires relocation of taxiway lighting
- Requires construction of blast pad (350 square feet of new pavement and blast pad markings)

6.3.1.3 Runway 12-30 Alternative 3

Runway 12-30 Alternative 3, presented in **Figure 6-1**, proposes removal of 63 feet of pavement at the Runway 30 end to achieve a standard RSA. The ultimate length of Runway 12-30 in this alternative would be 3,564 feet, and a MOS would be required for the non-standard ROFA and ROFZ. As previously noted, the Airport Sponsor must submit a MOS application to the FAA for each component requiring a MOS every five years. Based on feedback from the FAA's San Francisco ADO, it was noted that approval of a MOS for the ROFZ would require coordination with FAA Headquarters in Washington, D.C.

Like Runway 12-30 Alternatives 1 and 2, the taxiway connectors (Taxiway B) would be relocated to the new runway end and constructed to meet current FAA design standards. The eastern taxiway connector would require approximately 4,083 square feet of new pavement and the western taxiway connector would require 2,667 square feet of new pavement. Removal of approximately 12,377 square feet of taxiway pavement would also be needed, and new taxiway pavements would need marking and relocated lighting.

Runway 12-30 Alternative 3 includes the construction of a standard blast pad measuring 60 feet long by 80 feet wide, which would require standard blast pad markings and a runway demarcation bar.

The advantages and disadvantages of Runway 12-30 Alternative 3 are summarized below.

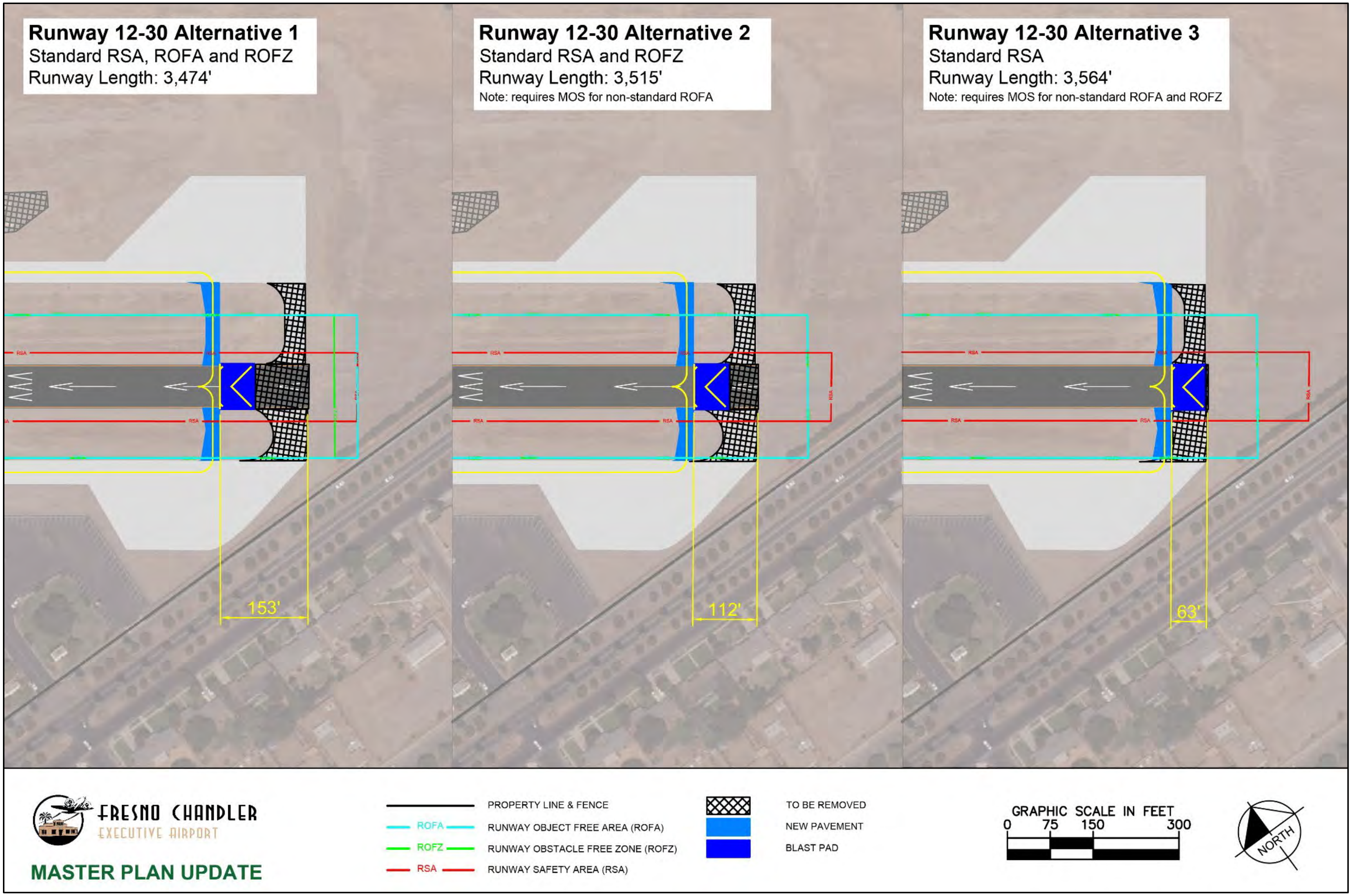
Advantages:

- Achieves standard RSA
- Changes to the runway are physical, which improves pilot awareness
- Shortening Runway 12-30 provides a permanent improvement
- Requires least amount of runway pavement removal of the three non-declared distance alternatives

Disadvantages:

- Requires MOS for ROFA and ROFZ (MOS for ROFZ requires coordination with FAA Headquarters)
- Requires substantial amount of pavement removal for the taxiway connectors and unused runway pavement (approximately 12,580 square feet)
- Requires reconstructed taxiway connectors (approximately 6,750 square feet of new pavement)
- Requires construction of blast pad (350 square feet of new pavement and blast pad markings)

Figure 6-1 – Runway 12-30 Alternatives 1-3



6.3.1.4 Runway 12-30 Alternative 4

As previously discussed, Runway 12-30 Alternatives 4 and 5 differ from the first three runway alternatives in that they achieve standard runway protection areas through the implementation of declared distances rather than physical alterations in the runway's length. Declared distances denote the usable length of runway available for aircraft takeoff and landings. Published by the FAA, declared distances may be used to alter the length of the usable runway without physical improvements (e.g., pavement removal) to meet airport design standards, including RSAs, ROFAs, and ROFZs. The FAA defines declared distances for the following components:

- **Take Off Run Available (TORA):** Declared length of a runway suitable for the ground run of an aircraft taking off. The TORA is measured from the start of the takeoff point to 200 feet from the beginning of the departure RPZ.
- **Take Off Distance Available (TODA)**: Includes the declared length of the TORA and additional remaining clearway or runway beyond the end of the TORA (FCH does not have a clearway).
- **Accelerated Stop Distance Available (ASDA)**: Declared runway length required for an aircraft to accelerate to a certain speed, and in case of engine failure, be able to come to a safe stop on the runway. The ASDA is equal to the TORA plus the length of the stopway. A stopway is an area beyond the takeoff runway able to support an aborted takeoff (FCH does not have a stopway).
- **Landing Distance Available (LDA):** Declared length suitable for the ground run of an aircraft landing.

Previously, the FAA reserved the publishing of declared distances only for runways whose critical aircraft is turbine powered, which includes turbojets or turboprop powered aircraft. However, in FAA Airports (ARP) Policy Guidance: *Declared Distances for Non-Turbine Powered Airplanes* (dated July 22, 2020), the FAA approved the use of declared distances for runways with piston-powered critical aircraft in order to meet design standards. Since the Airport's future critical aircraft was determined to be the entire fleet of A-I (Small) aircraft in **Chapter 4**, which consists of non-turbine powered aircraft, this new guidance allows for the evaluation of declared distances as potential runway alternatives for FCH.

As previously noted in **Chapter 2**, declared distances were identified for Runway 12-30 in the Airport's previous ALP (approved July 2010). However, these declared distances were not formally published by the FAA. For comparison purposes, the declared distances for Runway 12-30 reported in the Airport's previous ALP are presented in **Table 6-1**. It should be noted that the published length of Runway 12-30 has changed slightly since 2010; the distances identified in Table 6-1 have been updated to reflect existing conditions. Additionally, because obstacles south of Runway 12-30 require southbound takeoffs to occur before the end of pavement, it is estimated that the previously identified TODA of 3,627 feet for Runway 12 should have been calculated as 3,483 feet.

Table 6-1 – Runway 12-30 Existing Declared Distances

Declared Distance	Runway 12	Runway 30
Take Off Run Available (TORA)	3,483'	3,627'
Take Off Distance Available (TODA)	3,627'*	3,627'
Accelerate Stop Distance Available (ASDA)	3,483'	3,627'
Landing Distance Available (LDA)	3,068'	3,089'

Source: 2010 Fresno Chandler Executive Airport ALP

**Note: Runway 12 TODA should be 3,483' due to obstacles south of Runway 30*

As shown in **Table 6-2** and illustrated in **Figure 6-2**, Runway 12-30 Alternative 4 utilizes declared distances to provide for a standard RSA and ROFZ on Runway 30. A MOS for the ROFA would still be required. It is important to note that declared distances for Runway 30 are identical in Alternatives 4 and 5. Alternative 4 provides an additional 89 feet of ASDA and 93 feet of LDA for Runway 12 compared to Alternative 5. Based on feedback provided by Airport Management and the PAC, it was established that the majority of takeoffs and landings at the Airport occur on the Runway 30 end, so the benefit of additional ASDA and LDA for Runway 12 would be considered a marginal benefit.

Table 6-2 – Runway 12-30 Alternative 4 Declared Distances

Declared Distance	Runway 12	Runway 30
Take Off Run Available (TORA)	3,483’	3,627’
Take Off Distance Available (TODA)	3,483’	3,627’
Accelerate Stop Distance Available (ASDA)	3,564’	3,627’
Landing Distance Available (LDA)	3,149’	3,089’

Source: Kimley-Horn & Associates

The advantages and disadvantages of Runway 12-30 Alternative 4 are summarized below.

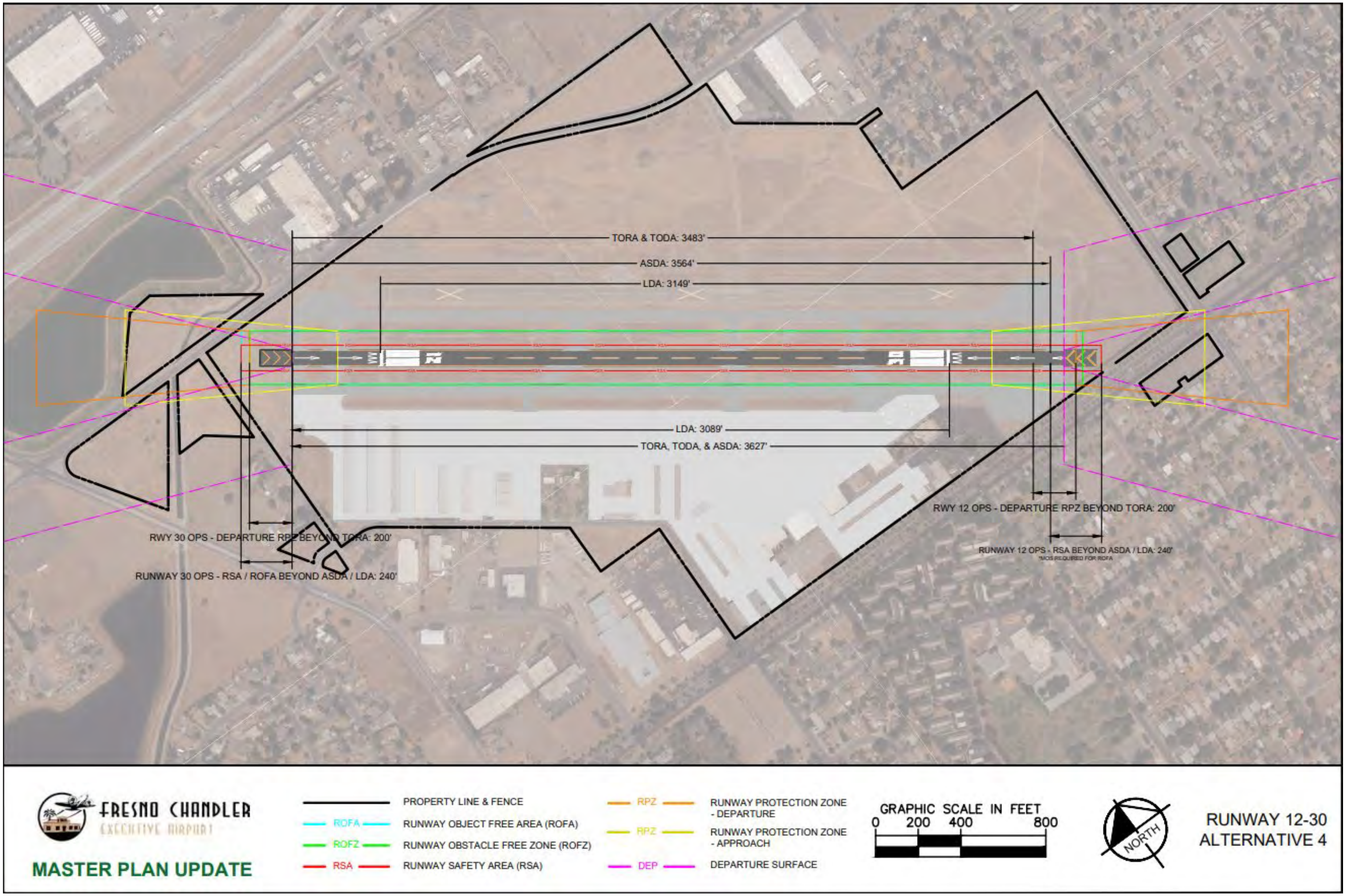
Advantages:

- Achieves standard RSA and ROFZ
- Does not require pavement removal or physical alterations to existing conditions
- Provides an additional 89 feet of ASDA and 93 feet of LDA for Runway 12 operations compared to Alternative 5

Disadvantages:

- Declared distances rely on pilot awareness and compliance
- Requires MOS for ROFA, which must be renewed every five years (FAA approval is not guaranteed)

Figure 6-2 – Runway 12-30 Alternative 4



6.3.1.5 Runway 12-30 Alternative 5

Like Runway 12-30 Alternative 4, Runway 12-30 Alternative 5 utilizes declared distances to achieve standard runway protection areas. While Alternative 4 requires a MOS for the ROFA, Alternative 5 applies declared distances that provide a standard RSA, ROFZ, and ROFA without the need for a MOS. The proposed declared distances for Runway 12-30 Alternative 5 are presented in **Table 6-3** and illustrated in **Figure 6-3.**

Table 6-3 – Runway 12-30 Alternative 5 Declared Distances

Declared Distance	Runway 12	Runway 30
Take Off Run Available (TORA)	3,483’	3,627’
Take Off Distance Available (TODA)	3,627’	3,627’
Accelerate Stop Distance Available (ASDA)	3,475’	3,627’
Landing Distance Available (LDA)	3,060’	3,089’

Source: Kimley-Horn & Associates

The advantages and disadvantages of Runway 12-30 Alternative 5 are summarized below.

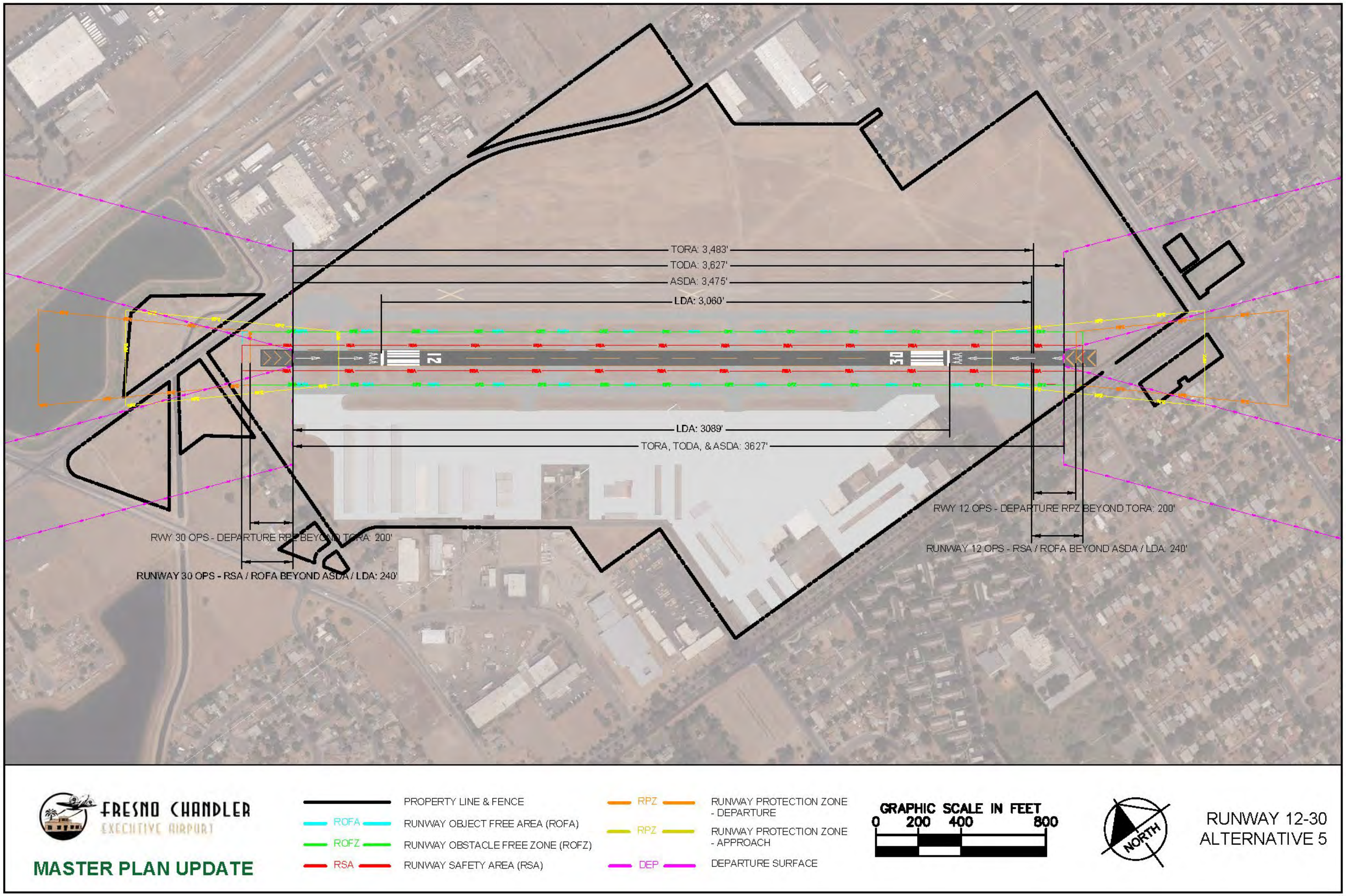
Advantages:

- Achieves standard RSA, ROFA, and ROFZ
- Does not require MOS
- Does not require pavement removal or physical alterations to existing conditions
- Declared distances for Runway 30 (predominant runway use configuration) are the same as those in Alternative 4

Disadvantages:

- Provides less ASDA (89 feet) and LDA (93 feet) for Runway 12 operations compared to Alternative 4
- Declared distances rely on pilot awareness and compliance

Figure 6-3 – Runway 12-30 Alternative 5



6.3.1.6 Recommended Runway 12-30 Alternative

Table 6-4 presents a summary of the characteristics pertaining to the five Runway 12-30 alternatives. These characteristics include whether the runway protection areas (RSA, ROFA, and ROFZ) are met or require a MOS, the physical runway length, declared distances, and the need for taxiway modifications, whether additional or removal of pavement.

Table 6-4 – Comparison of Runway 12-30 Alternatives

Runway 12-30 Alternatives	Meets Standard (Y) / MOS Required (MOS)			Runway Length (ft.)	Declared Distances (ft.)								Taxiway Additions / Removal[2] (Y/N)
					Runway 12				Runway 30				
	RSA	ROFA	ROFZ		TORA	TODA	ASDA	LDA	TORA	TODA	ASDA	LDA	
Existing	N[1]	N[1]	N[1]	3,627	3,482	3,627	3,482	3,068	3,627	3,627	3,627	3,089	-
1	Y	Y	Y	3,474	-	-	-	-	-	-	-	-	Y
2	Y	MOS	Y	3,515	-	-	-	-	-	-	-	-	Y
3	Y	MOS	MOS	3,564	-	-	-	-	-	-	-	-	Y
4	Y	MOS	Y	3,627	3,482	3,482	3,564	3,149	3,627	3,627	3,627	3,089	N
5	Y	Y	Y	3,627	3,483	3,483	3,475	3,060	3,627	3,627	3,627	3,089	N

Source: Kimley-Horn & Associates

Notes: 1 = The existing RSA, ROFA, and ROFZ do not meet design standards

2 = Alternatives 1, 2, and 3 require the construction of two new taxiway connectors and the removal of existing taxiway connectors

As presented in **Table 6-5**, an analysis of proposed alternatives was conducted to determine the recommended solution for mitigating the non-standard runway protection areas based on the evaluation criteria previously described in this chapter. As shown, alternatives that require MOS or that reduce the physical condition of Runway 12-30 and taxiway system scored lower in minimizing off- and on-Airport impacts.

Conversely, Alternatives 4 and 5 rely of the implementation of declared distances to achieve standard runway protection areas rather than physical airfield changes. Although there is a learning curve for pilots to understand and follow declared distances, the overall negative impacts are less compared to physical runway length reductions.

Alternative 5 was ultimately selected as the recommended Runway 12-30 Alternative for FCH and the scores for each criterion are highlighted in **bold**. While Alternative 5 scores similar to other alternatives in terms of satisfying forecast demand and enhancing revenue generation capabilities, it stands out and scores highest in terms of facilitating safety and minimizing on-Airport impacts. This alternative is recommended because it does not require physical alterations to Runway 12-30 and fully adheres to FAA standards without a MOS. Overall, the use of declared distances provides a permanent and cost-effective solution that maximizes the length of usable runway.

Table 6-5 – Evaluation of Runway 12-30 Alternatives

Runway 12-30 Alternatives	Satisfy Forecast Demand	Minimize off-Airport Impacts	Minimize on-Airport Impacts	Mitigate non-Standard Conditions	Facilitate Safety	Enhance Revenue Generation Capabilities	Total Score
Alternative 1	2	3	0	4	1	2	12
Alternative 2	2	2	1	1	1	2	9
Alternative 3	2	1	1	0	1	2	7
Alternative 4	2	2	2	1	3	2	12
Alternative 5	**2**	**3**	**3**	**4**	**3**	**2**	**17**

Source: Kimley-Horn & Associates

Scoring:
0 – Substantial Negative Impact
1 – Moderate Negative Impact
2 – No Measurable Impact
3 – Moderate Positive Impact
4 – Substantial Positive Impact

6.3.2 Itinerant Aircraft Parking Alternatives

As noted in **Chapter 5**, discussions with the PAC and Airport tenants identified that additional itinerant aircraft parking is needed near the terminal building. In its existing configuration, the itinerant aircraft parking apron has five tie-downs allocated for itinerant aircraft. While existing aircraft parking apron space and tie-downs are anticipated to satisfy forecast demand, it is recommended that areas near the terminal building be reconfigured to accommodate additional itinerant aircraft and maximize available apron area. Itinerant parking near the terminal is desired because of its proximity to the Airport's facilities and amenities, including the restaurant, pilot lounge, and automobile parking/pick-up areas for transient users.

This section presents two proposed alternatives designed to increase tie-down capacity on the itinerant aircraft parking apron. Additionally, an alternatives analysis and a summary of the recommended itinerant aircraft parking alternative are presented below. Included in these alternatives is the reconfiguration of Taxiway D that, in its existing state, provides direct access from an apron to a runway without situational awareness turns for pilots. These alternatives eliminate the wide expanse of pavement at the intersection of Taxiways A, C, and the itinerant aircraft parking apron, and also mitigate direct access between the itinerant aircraft parking apron and Runway 12-30 via Taxiway D.

6.3.2.1 Itinerant Apron Alternative 1

Presented in **Figure 6-4**, Itinerant Apron Alternative 1 reconfigures the apron to accommodate five additional tie-downs for a total of 10 itinerant aircraft parking tie-downs. To mitigate the wide expanse of pavement and direct access between the apron and Runway 12-30, this alternative proposes the removal of 7,073 square feet of pavement between the itinerant aircraft parking apron and Taxiway A while converting a portion of existing pavement to a new taxilane, providing an access point to the apron. Additionally, a second access point is provided via a new taxiway connector between the apron and Taxiway A, requiring construction of approximately 3,227 square feet of pavement. Itinerant Apron Alternative 1 provides optimal circulation by including two ingress/egress taxilanes for the itinerant aircraft parking apron. This alternative also requires restriping of standard taxilane centerlines throughout the itinerant aircraft parking apron.

Also of note is Taxiway C, east of the itinerant aircraft parking apron, which is an acute-angle taxiway connector that connects Taxiway A and Runway 12-30. As part of Itinerant Apron Alternative 1, this taxiway would remain in its existing location but modified to meet FAA design standards, requiring the removal of 5,060 square feet of existing pavement.

The advantages and disadvantages of Itinerant Apron Alternative 1 are summarized below.

Advantages:

- Adds five tie-downs (for a total of 10 itinerant aircraft parking tie-downs) without requiring new pavement
- Mitigates wide expanse of pavement at intersection of Taxiways A, C, and the aircraft parking apron, and mitigates direct apron-to-runway access along Taxiway D
- Provides two access points to itinerant aircraft parking apron to promote efficient aircraft circulation

Disadvantages:

- Multiple taxilanes reduce the number of aircraft tie-downs that can be added

6.3.2.2 Itinerant Apron Alternative 2

Also presented in **Figure 6-4**, Itinerant Apron Alternative 2 reconfigures the apron to accommodate seven additional tie-downs for a total of 12 itinerant aircraft parking tie-downs. The main difference between the itinerant apron alternatives is that Itinerant Apron Alternative 2 proposes the removal of the entire strip of pavement (approximately 9,079 square feet) between Taxiway A and the aircraft parking apron, providing a single apron access point.

With a single access taxilane, the apron could accommodate two additional itinerant aircraft parking tie-downs compared to the previous alternative and the pavement removal creates a clear distinction between Taxiway A and the apron. Itinerant Apron Alternative 2 provides the maximum number of itinerant aircraft parking spaces without construction of additional pavement. Like Itinerant Apron Alternative 1, a new taxiway connector is proposed to be constructed north of the apron, requiring approximately 3,227 square feet of pavement and standard taxiway striping.

Itinerant Apron Alternative 2 also proposes the relocation and redesign of Taxiway C closer to the Runway 30 end, which is necessary due to the removal of the second apron access point. The relocation of Taxiway C requires removal of 10,463 square feet of pavement, construction of 3,135 square of pavement, and standard taxiway centerline striping and lighting.

The advantages and disadvantages of Itinerant Apron Alternative 2 are summarized below.

Advantages:

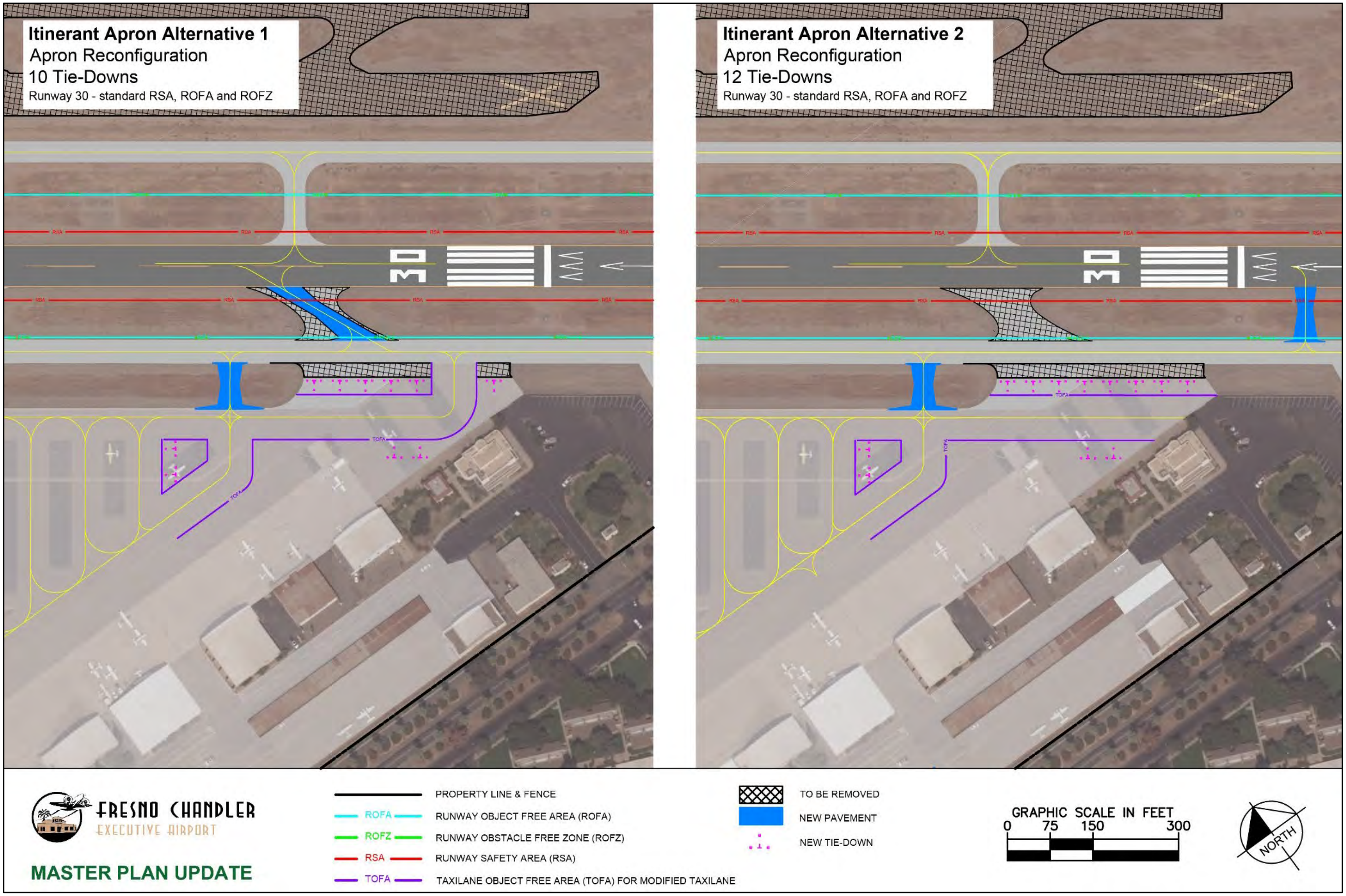
- Adds seven tie-downs (for a total of 12 itinerant aircraft parking tie-downs) without increasing apron pavement
- Maximizes apron space for itinerant aircraft parking tie-downs

- Mitigates wide expanse of pavement at intersection of Taxiways A, C, and the aircraft parking apron, and mitigates direct apron-to-runway access along Taxiway D
- Simplifies apron ingress/egress with one access point to itinerant aircraft parking apron
- Creates clear distinction between Taxiway A and itinerant apron through pavement removal

Disadvantages:

- Requires more removal of pavement compared to Itinerant Apron Alternative 1
- Reduces circulation with a single access taxilane
- Relocates and redesigns Taxiway C (from acute-angle to 90-degree taxiway connector)

Figure 6-4 – Itinerant Aircraft Parking Apron Alternatives 1 and 2



6.3.2.3 Recommended Itinerant Apron Alternative

Itinerant apron alternatives were analyzed based on the evaluation criteria presented in **Section 6.1**. Based on discussions with Airport Management, the single access taxilane associated with Alternative 2 that limits circulation was not considered to be a negative compared to maximizing the number of aircraft tie-down spaces. Additional itinerant spaces could provide a slight revenue-enhancing opportunity as a greater number of aircraft could park near the restaurant. Itinerant Apron Alternative 2 also proposes a relocated Taxiway C that adheres to FAA design standards. As shown in **Table 6-6**, Itinerant Apron Alternative 2 (in **bold**) achieved the highest score based on the analysis and, therefore, is the recommended alternative. It scores highest in terms of satisfying forecast demand, mitigating non-standard conditions, and enhancing revenue generation capabilities.

Table 6-6 – Evaluation of Alternatives for the Itinerant Apron

Itinerant Apron Alternatives	Satisfy Forecast Demand	Minimize off-Airport Impacts	Minimize on-Airport Impacts	Mitigate non-Standard Conditions	Facilitate Safety	Enhance Revenue Generation Capabilities	Total Score
Alternative 1	3	2	3	3	3	3	17
Alternative 2	**4**	**2**	**3**	**4**	**3**	**4**	**20**

Source: Kimley-Horn & Associates

Scoring:
0 – Substantial Negative Impact
1 – Moderate Negative Impact
2 – No Measurable Impact
3 – Moderate Positive Impact
4 – Substantial Positive Impact

6.4 Landside Alternatives

As described in **Chapter 5**, the Airport has adequate based aircraft parking and storage space to accommodate forecast demand. However, discussions with the PAC and Airport tenants revealed that several aging hangars are in need of repairs or replacement. Additionally, the locations of many hangars do not provide adequate clearance to meet FAA standard taxilane object free areas (TOFAs) or taxilane-to-fixed object separation standards.

While based aircraft parking is sufficient, there is a lack of dedicated, secure vehicle parking for the hangars north of the Airport maintenance facility. On the northwest side of the airfield, for example, vehicles currently access the airfield via Chandler Avenue and park adjacent to or inside the storage hangars, directly on the non-movement area apron, rather than in designated vehicle parking facilities.

Also noted in **Chapter 5**, the configuration of Airport Road where it connects via secure access to areas directly adjacent to box hangars and T-hangars west of the terminal building is a concern. The current configuration allows for shared use of the taxilane by aircraft and vehicles, presenting possible security issues and a substantial risk of vehicle-aircraft incursion.

This section presents three proposed landside alternatives that address the considerations described above and provide for an optimized overall landside area. While each alternative proposes a different combination of Airport improvements, there are several commonalities among all three. The following features are present in each of the landside alternatives and are considered as equal benefits for all.

- **Removal/relocation of hangars to mitigate non-standard TOFAs:** Published in FAA AC 150/5300-13A, airports with an ADG of I must maintain a TOFA of no less than 79 feet. In other words, there must be 39.5 feet of unobstructed space on either side of a taxilane centerline. At FCH, most adjacent hangars do not provide sufficient clearance for a standard TOFA. Therefore, hangars must be removed as part of all landside alternatives to mitigate non-standard TOFAs throughout the airfield. Aware of this non-standard condition, the FAA has commented that the hangars may remain in their existing locations until the end of their useful lives. Once obsolete, hangars must be removed and relocated to accommodate standard TOFAs.
- To provide replacement hangars for those being removed as a result of non-standard TOFA mitigation and to accommodate future hangar demand, a new based aircraft parking apron and associated vehicle parking lot are proposed as part of all three landside alternatives. This apron, located on the southeast portion of the airfield, consists of approximately 350,693 square feet of new pavement for the apron (including the taxiway connectors to Taxiway H) and approximately 52,836 square feet of pavement for the vehicle parking. The landside alternatives propose the construction of 74 T-hangars (approximately 82,605 square feet of new T-hangar space) and 12 box hangars (approximately 1,345 square feet each; 16,140 square feet of new box hangar space).
- **Addition of dedicated vehicle parking facilities:** As part of all three landside alternatives, vehicle parking lots are proposed to be constructed on the Airport's west side to serve aircraft hangars around the airfield. In addition to the aforementioned vehicle parking lot associated with the new based aircraft parking apron, two other facilities are represented in all landside alternatives. On the northwest portion of the airfield, with access from South West Avenue, an approximate 36,937-square-foot surface lot is proposed to serve the existing T-hangars west of the Airport maintenance building. West of the terminal building, an existing vehicle parking lot provides approximately 16,616 square feet of parking area. To increase vehicle parking near the aircraft hangars in this area, the landside alternatives propose an approximate 17,134-square-foot extension of this facility with a new access point off of West Kearney Boulevard's frontage road.
- **Modifications to secure access points:** The new vehicle parking facilities will require secure access points. As shown in **Figures 6-5**, **6-6**, and **6-7**, new security gates are proposed to be added off of South West Avenue, West Kearney Boulevard's frontage road, and South Thorne Avenue. Additionally, to mitigate safety risks associated with Airport Road (the shared-use vehicle/aircraft area), all landside alternatives propose closure of existing security gates (to remain for emergency and Airport maintenance vehicles) off of South Teilman Avenue and Airport Road to prevent the crossflow of vehicle traffic through aircraft apron areas. It should be noted that, in addition to these common secure access point modifications, Landside Alternatives 2 and 3 propose additional secure access gates that are not reflected in Landside Alternative 1.

Landside Alternatives 1, 2, and 3 are presented individually below. As the commonalities are described in detail above, the following descriptions focus on the unique features of these alternatives.

6.4.1 Landside Alternative 1

As previously noted, Airport Road runs directly through the non-movement apron west of the terminal building. This roadway may be accessed via a security gate located north of the former School of Aeronautics hangar and is currently utilized by both vehicle traffic and taxiing aircraft, which presents potential safety risks for Airport users. Landside Alternative 1, presented in **Figure 6-5**, mitigates the dual-use roadway/taxiway by removing all aeronautical activity from the apron and designating it for future landside facilities, including vehicle access, parking, and other non-aeronautical uses. As part of this alternative, the aging T-hangar and former School of Aeronautics hangar are proposed to be removed. To make up for the lost hangar space, an existing 10-unit T-hangar west of the Airport maintenance facility would be extended to include an additional 10 T-hangars (approximately 10,165 square feet of new hangar space). This would require paving approximately 56,752 square feet of infield to accommodate hangar construction and taxing aircraft.

As noted in **Chapter 5**, the 35,000 square feet of land on which the Airport's decommissioned ATCT facilities currently reside presents a future development opportunity. Since the area is equipped with utility infrastructure and is adjacent to airfield facilities, this parcel would be highly suitable for future hangar development and associated secure vehicle parking. To make up for the loss of hangar space associated with the removal of the former School of Aeronautics hangar, Landside Alternative 1 proposes the development of six box hangars (approximately 1,632 square feet each; approximately 9,792 square feet total), a small aircraft parking apron, and vehicle parking. In addition to the construction of the hangars, the development of this area would require demolition and cleanup of the ATCT site and associated facilities (including the existing vehicle parking lot), relocation of the Airport's rotating beacon (currently located atop of the ATCT), approximately 15,169 square feet of new aircraft parking apron, and approximately 17,134 square feet of pavement for the vehicle parking facility.

It should be noted that the improvements mentioned within this subsection are in addition to the common landside alternative improvements described in **Section 6.4**. The advantages and disadvantages of Landside Alternative 1 are summarized below.

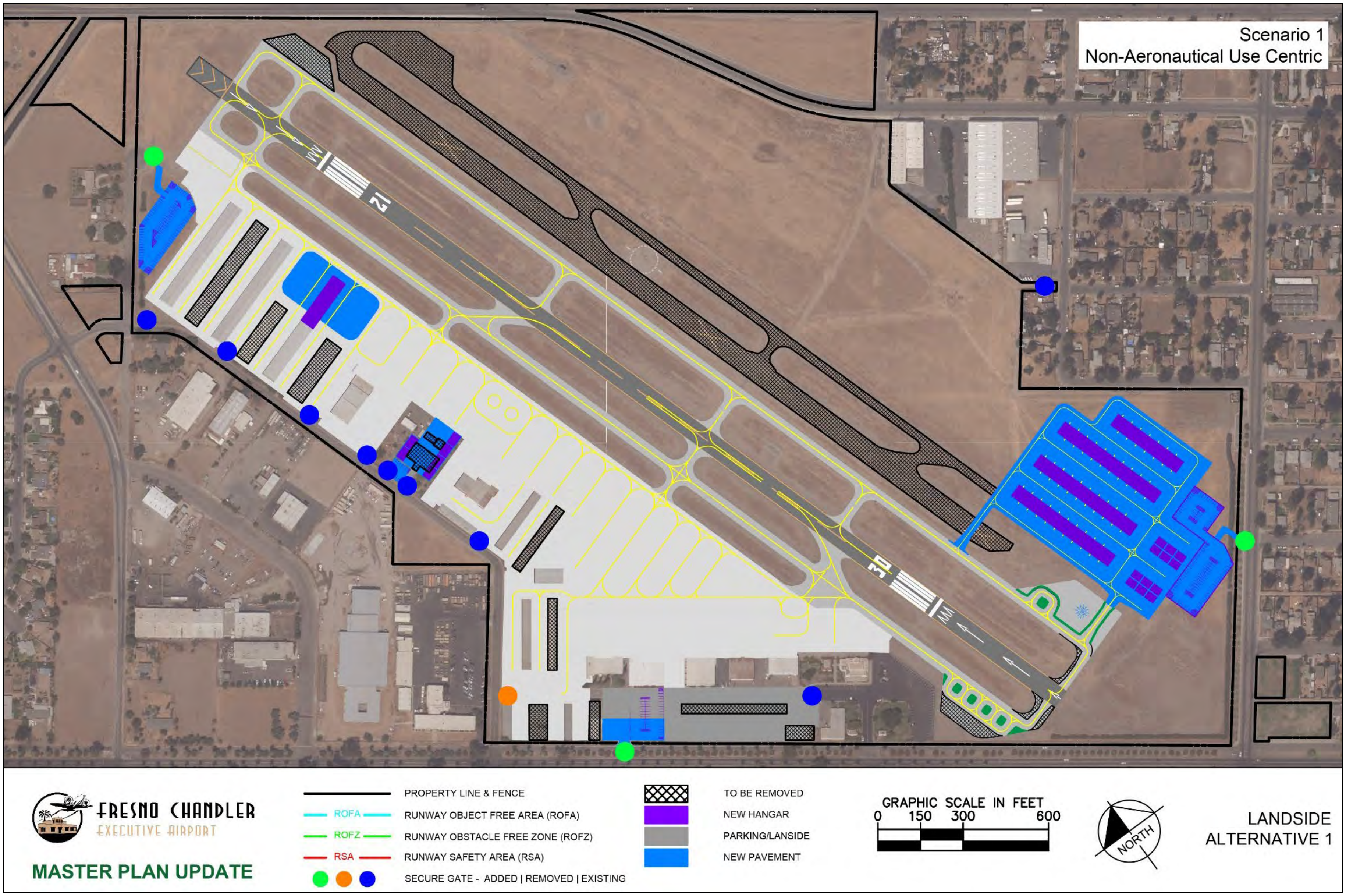
Advantages:

- Mitigates dual use of Airport Road as a vehicle roadway and taxilane
- Enhances landside area by removing aging T-hangar and former School of Aeronautics hangar
- Increases area for non-aeronautical use
- Adds new 10-unit T-hangar
- Redevelops obsolete ATCT facilities and site (6 new box hangars, new aircraft apron, new vehicle parking facility)

Disadvantages:

- Loss of apron space and T-hangars near terminal building
- Costs associated with redeveloping the existing ATCT site
- Costs associated with hangar extension and new pavement west of Airport maintenance facility

Figure 6-5 – Landside Alternative 1



6.4.2 Landside Alternative 2

Whereas Landside Alternative 1 mitigates the existing shared-use vehicle/aircraft area by converting it for future non-aeronautical use, Landside Alternative 2 reconfigures this area for aeronautical use only. As shown in **Figure 6-6**, this alternative does not propose the removal of the former School of Aeronautics hangar. Rather, only the aging T-hangar would be removed in favor of six new box hangars. At 1,345 square feet each, the new box hangars would provide approximately 8,071 square feet of new hangar space in total and mitigate the non-standard separation between the existing T-hangar and School of Aeronautics hangar. Approximately 12,465 square feet of new apron pavement would be constructed in the footprint of the removed T-hangar to accommodate aircraft operations. Additionally, taxilane striping would be added to the apron to provide efficient aircraft circulation.

Since Airport Road will no longer bisect the apron, the existing security gate located north of the former School of Aeronautics hangar is proposed to be relocated along West Kearney Boulevard's frontage road (a common improvement among all three landside alternatives). The loss of apron space as a result of the removal of the aging T-hangar (in addition to the hangars being removed to mitigate non-standard separation) would be made up for with the development of the new based aircraft parking apron on the southeast portion of the apron (another common improvement among all three landside alternatives).

It should be noted that the improvements described within this subsection are in addition to the common landside alternative improvements described in **Section 6.4**. The advantages and disadvantages of Landside Alternative 2 are summarized below.

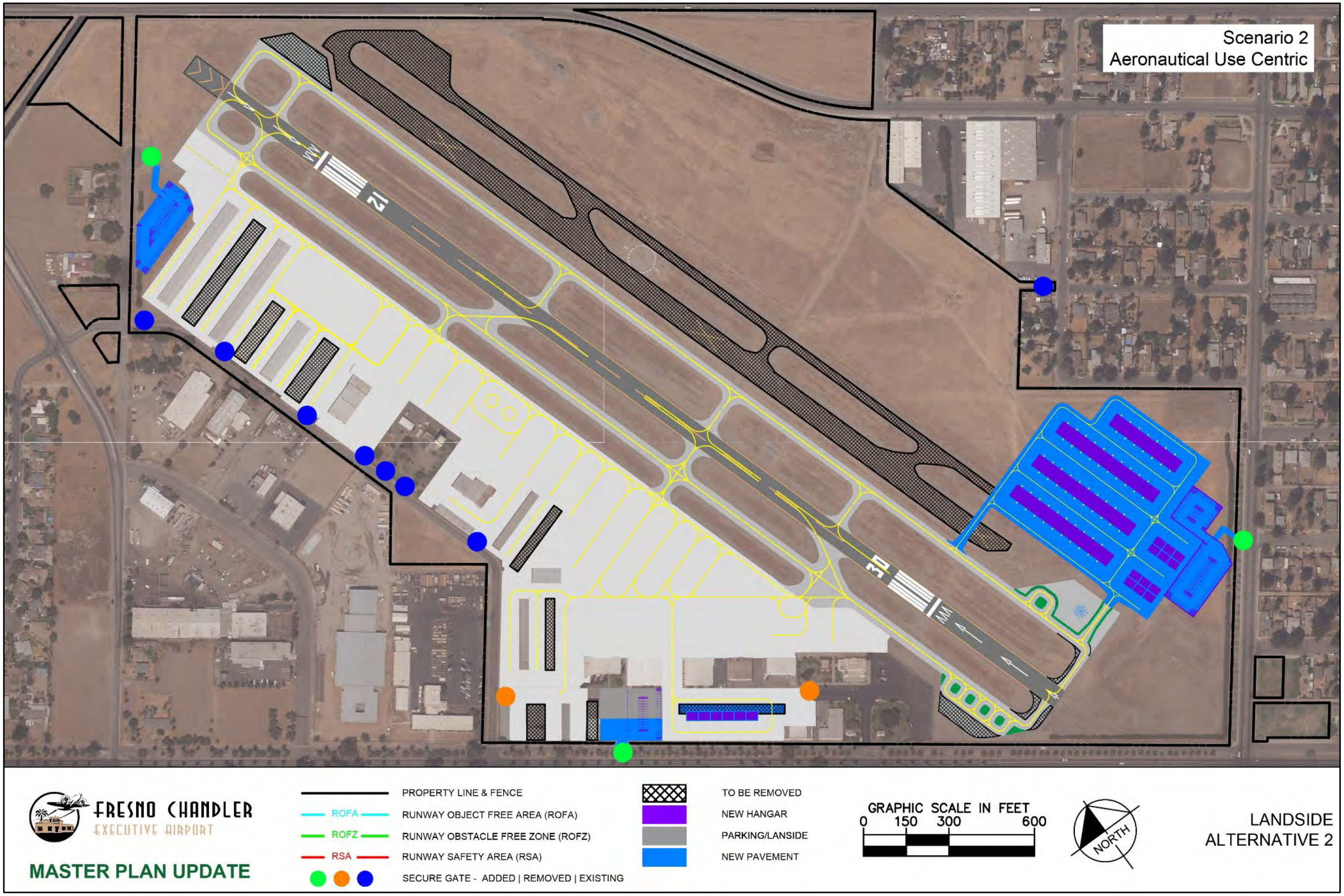
Advantages:

- Mitigates dual use of Airport Road as a vehicle roadway and taxilane
- Increases capacity for aeronautical uses in former location of Airport Road
- Mitigates non-standard hangar separation
- Adds six new box hangars
- Does not require removal of School of Aeronautics building
- Cost savings due to no T-hangar extension, infield paving, or ATCT site redevelopment

Disadvantages:

- Loss of apron space and existing T-hangars near terminal building
- Obsolete ATCT facilities and prime airfield development site remain undeveloped

Figure 6-6 – Landside Alternative 2



6.4.3 Landside Alternative 3

Landside Alternatives 1 and 2 were initially presented to Airport Management and the PAC for input. Feedback from the presentation informed Landside Alternative 3, shown in **Figure 6-7**, which is a hybrid of the two alternatives that maximizes aeronautical use. Though the relocated hangars that will ultimately be developed on the southeast portion of the airfield are still planned for, it was noted that because the costs associated with this relocation will be substantial, the Airport's west side should be redeveloped for aeronautical use to the extent possible before development east of Runway 12-30 occurs.

Like Landside Alternative 2, Landside Alternative 3 mitigates the dual-use roadway/taxiway (Airport Road) by reconfiguring the area for aeronautical use through the removal of the aging T-hangars and the addition of six new box hangars (approximately 8,071 square feet of new hangar space). This improvement would eliminate the vehicle roadway from the apron and mitigate the non-standard separation between the existing T-hangar and School of Aeronautics hangar. The security access gate north of the School of Aeronautics hangar would be relocated along West Kearney Boulevard's frontage road.

Though new hangar space is proposed to be constructed in the Airport Road area, Landside Alternative 3 also proposes the hangar development previously described as part of Landside Alternative 1. As part of this alternative, an additional 10 T-hangars (approximately 10,165 square feet of new hangar space) would be added to an existing 10-unit T-hangar located west of the Airport maintenance facility. This would require paving approximately 56,752 square feet of infield to accommodate hangar construction and taxiing aircraft. Additionally, the site of the existing ATCT and associated facilities would also be redeveloped as part of this alternative. This involves the demolition and cleanup of the ATCT and associated facilities as described in Alternative 1.

It should be noted that the improvements mentioned within this subsection are in addition to the common landside alternative improvements described in **Section 6.4**. The advantages and disadvantages of Landside Alternative 3 are summarized below.

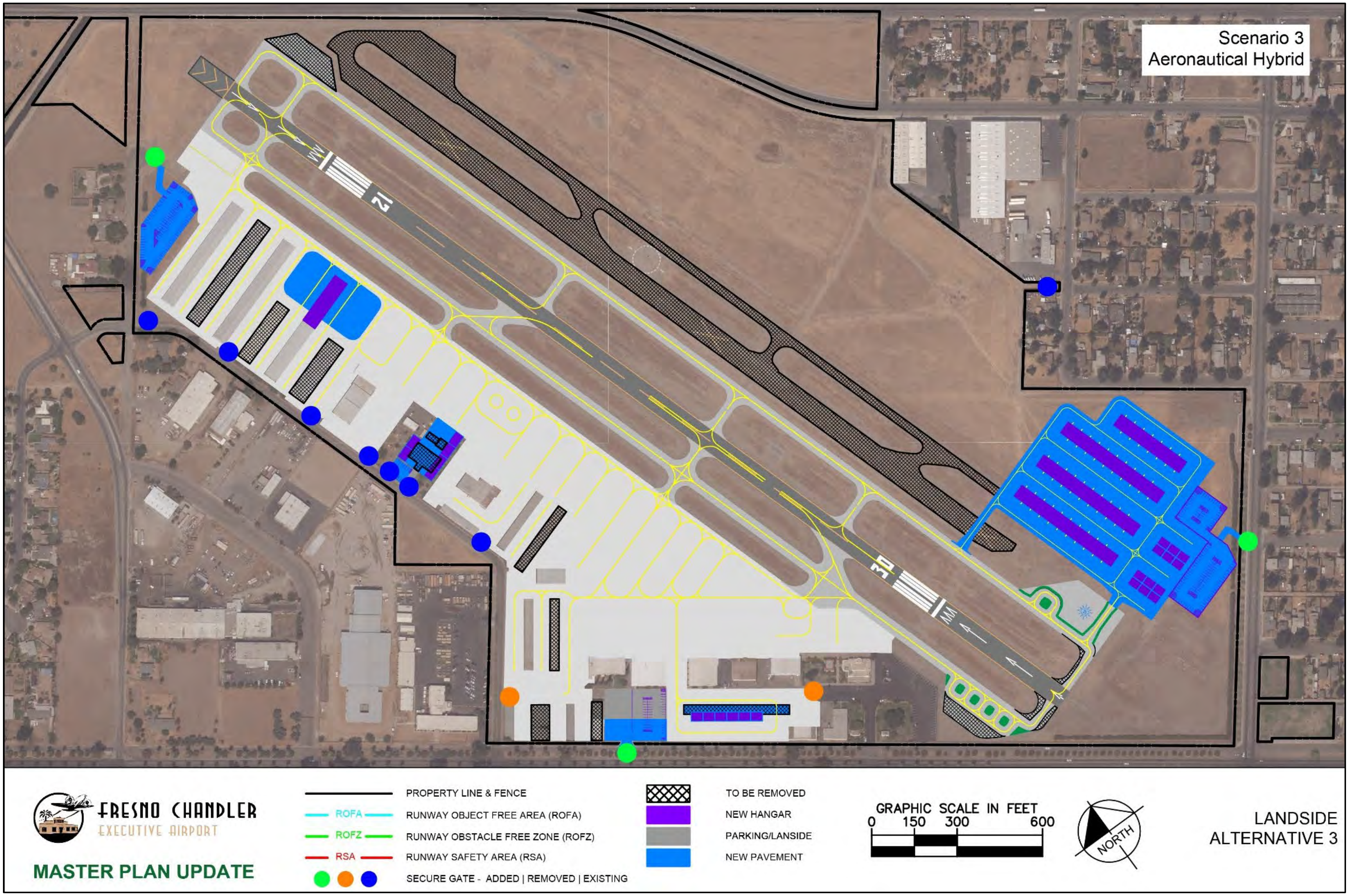
Advantages:

- Mitigates dual use of Airport Road as a vehicle roadway and taxilane
- Maximizes capacity for aeronautical use
- Adds six new box hangars
- Adds new 10-unit T-hangar
- Does not require removal of School of Aeronautics building
- Redevelops obsolete ATCT facilities and site (6 new box hangars, new aircraft apron, new vehicle parking facility)
- Allows for the maximum build-out of aeronautical use on the Airport's west side before development occurs east of Runway 12-30

Disadvantages:

- Loss of apron space and existing T-hangars near terminal building
- Costs associated with redeveloping the existing ATCT site
- Costs associated with hangar extension and new pavement west of Airport maintenance facility

Figure 6-7 – Landside Alternative 3



6.4.4 Recommended Landside Alternative

The three landside alternatives were analyzed based on the evaluation criteria presented in **Section 6.1**. Of the three alternatives, Landside Alternative 3 best satisfies forecast demand and enhances revenue generation capabilities with its emphasis on maximizing aircraft hangar space. Utilizing the Airport's west side for redevelopment prior to construction on the east side of Runway 12-30 was also considered a near term cost-saving benefit. As shown in **Table 6-7**, Landside Alternative 3 (in **bold**) received the highest score according to this analysis and is therefore the recommended alternative.

Table 6-7 – Evaluation of Alternatives for Landside Development

Alternative	Satisfy Forecast Demand	Minimize off-Airport Impacts	Minimize on-Airport Impacts	Mitigate non-Standard Conditions	Facilitate Safety	Enhance Revenue Generation Capabilities	Total Score
Alternative 1	2	2	3	3	4	3	17
Alternative 2	2	2	2	3	4	3	16
Alternative 3	**4**	**2**	**4**	**3**	**4**	**4**	**21**

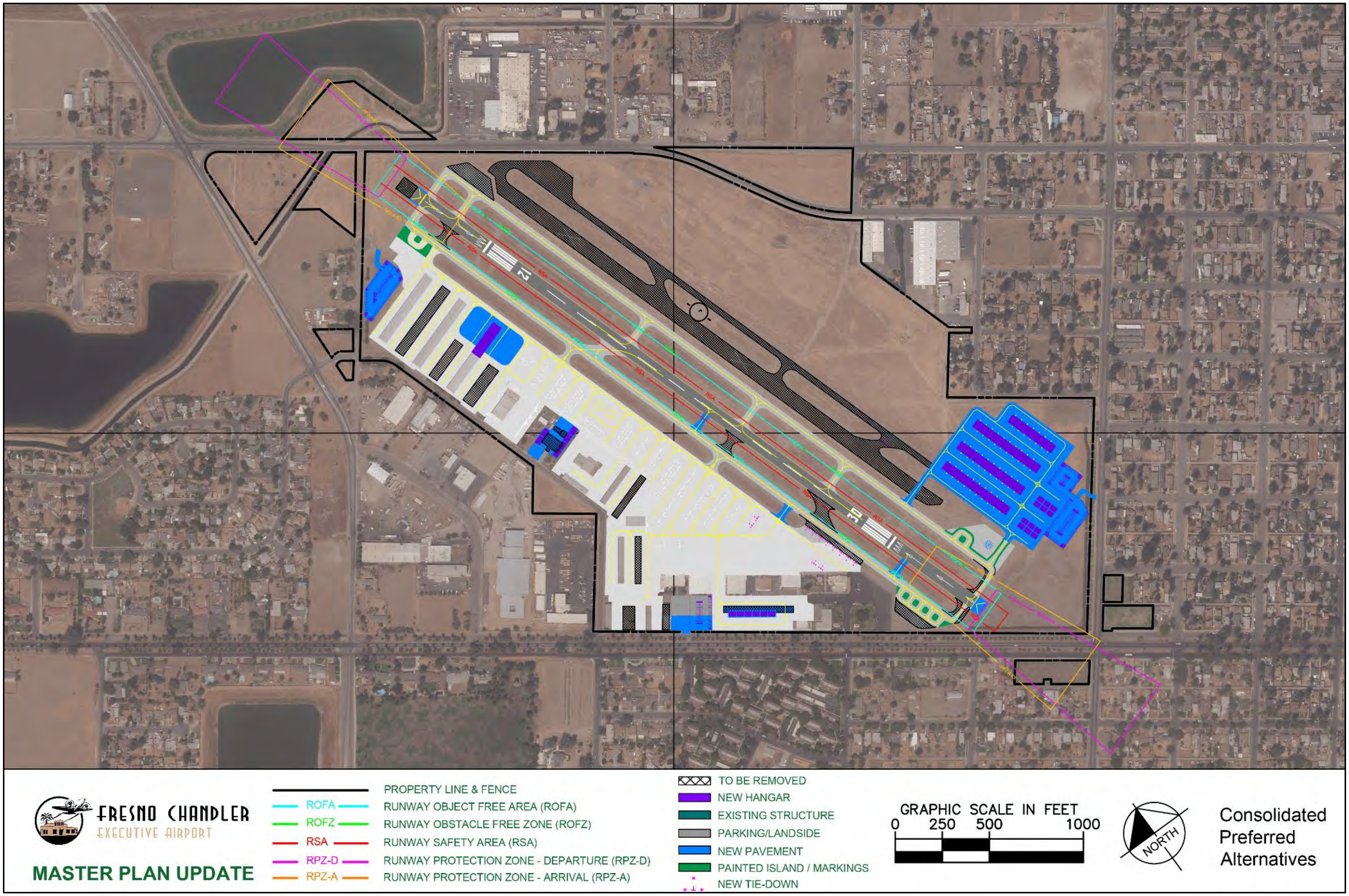
Source: Kimley-Horn & Associates

Scoring:
0 – Substantial Negative Impact
1 – Moderate Negative Impact
2 – No Measurable Impact
3 – Moderate Positive Impact
4 – Substantial Positive Impact

6.5 Consolidated Recommended Alternative

The recommended alternatives for Runway 12-30, the itinerant aircraft parking apron, and the Airport's landside facilities described in previous sections of this chapter were combined into a Consolidated Recommended Alternative, shown in **Figure 6-8**. The individual improvements that comprise the projects represented in the Consolidated Recommended Alternative, the facility improvements that did not require in-depth analysis presented in **Section 6.2**, and pavement rehabilitation and reconstruction projects from the Airport's pavement management plan (PMP) are depicted in the Recommended Development Plan (**Figure 6-9**). A recommended phasing plan for these improvements and project cost estimates with funding sources are presented in **Chapter 7 - Financial Analysis**. It should be noted that project quantities and costs identified in the PMP have been re-evaluated and updated as some of those projects are impacted by recommended improvements presented in this Master Plan Update.

Figure 6-8 – Consolidated Recommended Alternative



6.6 Recommended Development Plan

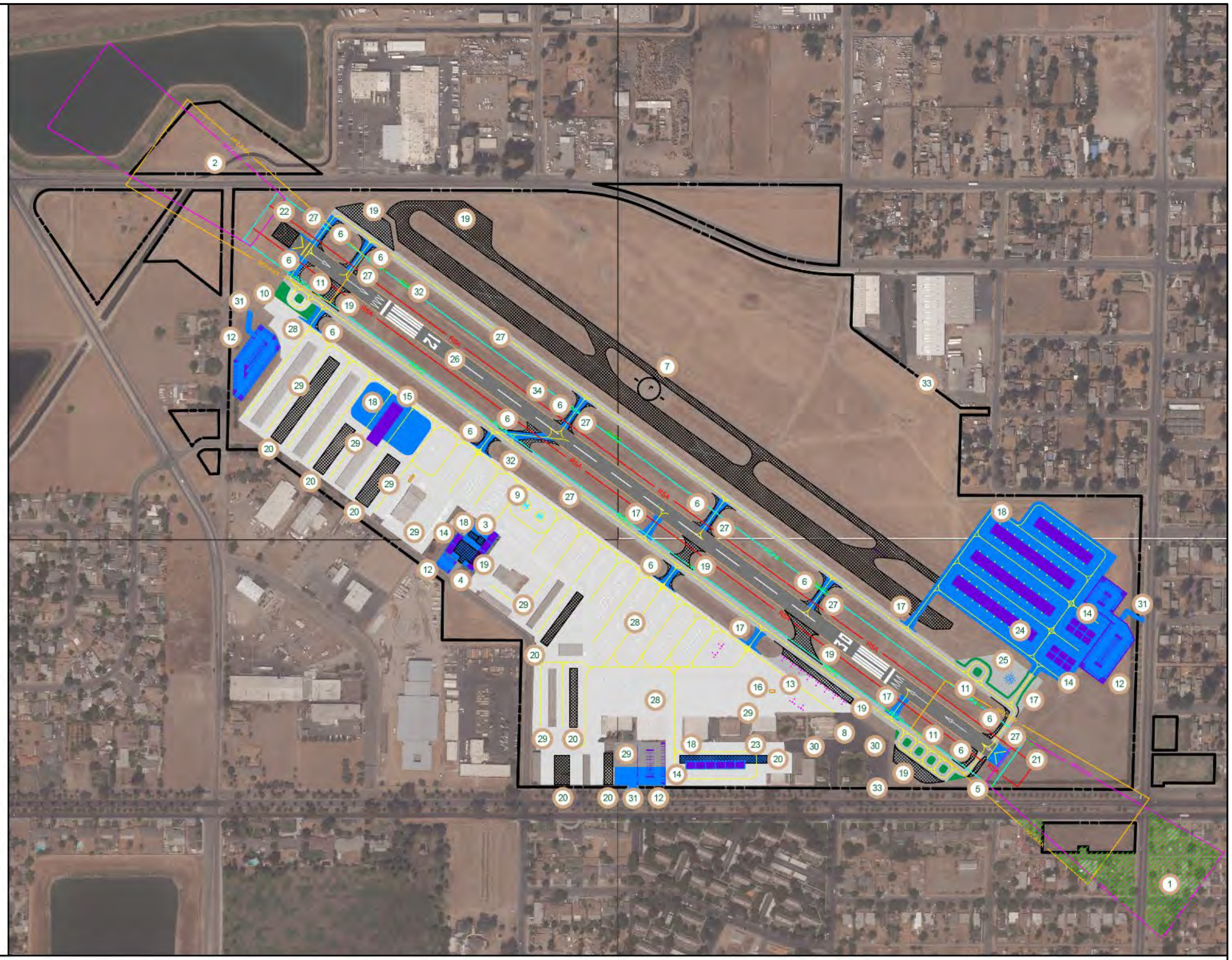
Previous chapters of this Master Plan Update documented analyses of the Airport's facility needs based on existing infrastructure and forecasts of aviation demand. In this chapter, various development alternatives to address these facility needs were presented and recommended alternatives were identified. The Recommended Development Plan, shown in **Figure 6-9**, presents a singular exhibit that combines the Consolidated Recommended Alternative (**Figure 6-8**), facility needs that do not require substantial analysis, and projects associated with the Airport's PMP.

The Recommended Development Plan represents ultimate conditions of FCH at the end of the 20-year planning horizon, which are also depicted on the ALP. As previously noted, a phased implementation plan for these improvements as well as cost estimates and potential funding sources are presented in **Chapter 7 - Financial Analysis**.

Figure 6-9 – Recommended Development Plan

1. ACQUISITION / EASEMENT OF PROPERTY WITHIN RPZs
2. OBSTRUCTION REMOVAL AND LIGHTING*
3. ATCT DEMOLITION AND SITE CLEANUP
4. RELOCATION OF ROTATING BEACON
5. STANDARDIZATION OF RUNWAY 30 RSA, ROFA, ROFZ
6. DESIGN / CONSTRUCTION OF STANDARD TAXIWAY CONNECTORS
7. AWOS INSPECTION AND MODERNIZATION
8. TERMINAL BUILDING SECURE ACCESS INSTALLATION
9. PAINTING OF STANDARD HELICOPTER LANDING AREA MARKINGS
10. ADDITION OF PAINTED ISLAND
11. PAINTING OF STANDARD RUN-UP AREA MARKINGS
12. ADDITION OF VEHICLE PARKING LOT
13. INSTALLATION AND MARKING 12 TIE-DOWNS
14. ADDITION OF 6 BOX HANGARS
15. HANGAR EXTENSION
16. REMOVAL OF TAXILANES ON RECONFIGURED ITINERANT APRON
17. ADDITION OF CONNECTOR TAXIWAY
18. ADDITION OF APRON PAVEMENT
19. PAVEMENT REMOVAL
20. HANGAR REMOVAL *(SEE PROJECT #25)*
21. ADDITION OF RUNWAY 30 BLAST PAD
22. WIDENING OF RUNWAY 12 BLAST PAD
23. REMOVE VEHICLE ROADWAY MARKINGS
24. ADDITION OF 74 T-HANGARS
25. RECALIBRATION / REPAINTING OF COMPASS ROSE
26. PAVEMENT REHABILITATION: RUNWAY 12-30
27. PAVEMENT REHABILITATION: TAXIWAYS A, B, C, D, E, F, G, H
28. PAVEMENT REHABILITATION: APRONS 1, 2, 3
29. PAVEMENT REHABILITATION: HANGARS H1 - H14 TAXILANES
30. PAVEMENT REHABILITATION: EAST / WEST VEHICLE PARKING LOTS
31. NEW VEHICLE SECURE ACCESS POINT
32. INSTALLATION OF NEW AIRFIELD SIGNAGE
33. REPLACEMENT OF PERIMETER FENCING
34. REPLACEMENT OF PAPI ON RUNWAY 12 END

Detailed obstruction analysis provided in Airport Layout Plan



FRESNO CHANDLER EXECUTIVE AIRPORT

MASTER PLAN UPDATE

PROPERTY LINE
ROFA — RUNWAY OBJECT FREE AREA (ROFA)
ROFZ — RUNWAY OBSTACLE FREE ZONE (ROFZ)
RSA — RUNWAY SAFETY AREA (RSA)
RPZ-D — RUNWAY PROTECTION ZONE - DEPARTURE (RPZ-D)
RPZ-A — RUNWAY PROTECTION ZONE - ARRIVAL (RPZ-A)
NEW TIE-DOWN
\# AIRPORT IMPROVEMENTS

TO BE REMOVED
NEW HANGAR
EXISTING STRUCTURE
PARKING / LANDSIDE
NEW PAVEMENT
PAINTED ISLAND
EASEMENT TO BE ACQUIRED

NORTH

GRAPHIC SCALE IN FEET
0 250 500 1000

Recommended Development Plan

6.7 Airport Land Use

The recommended Airport Land Use Plan defines future land use for occupied and vacant land within the Airport's boundaries. This Plan provides a framework for development that is compatible with existing and proposed facilities as described in the various recommended alternatives within this chapter. Additionally, as identified in discussions with the PAC, Airport tenants, City representatives, and other stakeholders, land use objectives include optimizing return on investment and potential revenue generating opportunities, regional and local community integration, and retaining the flexibility to respond to future redevelopment opportunities.

The Airport Land Use Plan reflects the ultimate conditions of the Airport as shown in the Recommended Development Plan (**Figure 6-9**). For undeveloped areas, the plan does not indicate immediate development or relocation of facilities but designates the areas where facilities would be developed as needs arise. The specific layouts of airside, landside, and support facilities within the areas will be informed by the recommended alternatives and as facilities are designed and constructed.

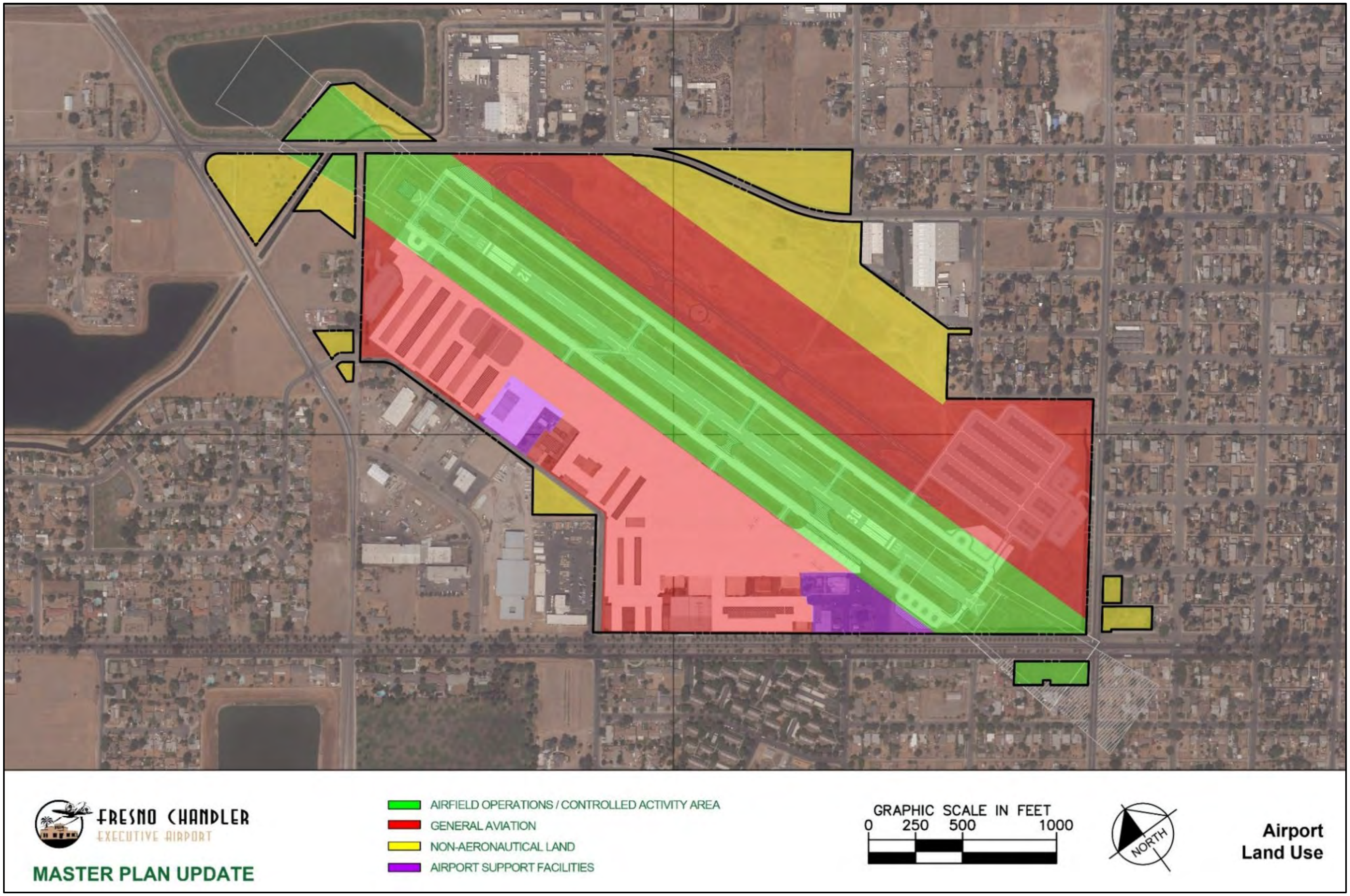
The Airport Land Use Plan identifies four functional categories of land use. As presented in **Figure 6-10**, these categories are:

- **Airfield Operations / Controlled Activity Area:** Airfield operations and controlled activity areas are those dedicated to aircraft landings and takeoffs, including Runway 12-30, taxiways, run-up areas, and Airport property within runway and taxiway protection areas (e.g., RSA, RPZs, TSAs).
- **General Aviation:** General aviation land uses include aircraft parking aprons, hangars, tie-down areas, taxilanes and movement areas, aviation-related tenants and businesses, and associated vehicle parking facilities.
- **Non-Aeronautical Land:** Non-aeronautical land uses are on-Airport parcels not needed for long-term aviation or aeronautical purposes. Development in these areas are intended to increase revenue-generating opportunities for the Airport sponsor so long as that development is compatible with Airport operations.
- **Airport Support Facilities:** Airport support facilities include the terminal building, Airport maintenance and administration facilities, and associated vehicle parking facilities.

Of note, the Airport Land Use Plan shows recommended uses within the Airport's existing boundary. Based on future facility requirements as described in **Chapter 5**, it is not anticipated that the Airport will require the purchase of additional land for expansion purposes over the 20-year planning horizon, however, the Airport may wish to acquire additional parcels if they become available. As noted, proposed long-term hangar development on the Airport's southeast side is expected to be expensive, and it may be financially advantageous to acquire and develop other parcels near the Airport west of Runway 12-30 before those hangars are relocated. This Master Plan Update and the ALP do not identify specific parcels that could be obtained.

Additionally, it is uncertain if land south of the Airport within the Runway 30 approach and departure RPZ outside of the Airport's existing boundary (approximately 153,362 acres), designated by green striping in the Recommended Development Plan, will be acquired within the 20-year planning horizon, and is therefore not included in the land use categories.

Figure 6-10 – Airport Land Use



7 Implementation Plan and Financial Analysis

Previous chapters of this Master Plan Update analyzed the Airport's facility needs based on existing infrastructure and forecasts of aviation demand. Various development alternatives to address these facility needs were evaluated and a Recommended Development Plan was established, which also included projects previously identified in the ACIP and PMMP.

This chapter summarizes projects included in the Recommended Development Plan, presents estimates of probable cost for these projects, outlines the Airport's anticipated phasing plan, provides an updated ACIP that identifies potential funding sources, and presents a cash flow analysis of existing and forecast net operating budget for the Airport.

7.1 Project Phasing and Estimates of Probable Cost

The various improvements identified in the Recommended Development Plan have been grouped into phased projects. The phasing of these projects was informed by the Airport Sponsor and input from the PAC. The project groupings are intended to create cost savings by consolidating design and construction of like projects in proximity to one another that can be implemented within a similar timeframe (e.g. rehabilitation of a portion of parallel Taxiway A and adjacent connector taxiways). Phased projects with descriptions, justifications, and estimates of probable cost are presented in **Table 7-1**. Also noted in the table are the applicable improvements from the Recommended Development Plan presented previously in the prior chapter in **Figure 6-9**.

Phase I projects are recommended to be implemented within a 0-5-year timeframe, Phase II projects within a 6-10-year timeframe, and Phase II within an 11-20-year timeframe. Cost estimates include a 10 percent escalator for Phase II (6-10-year) projects and 20 percent escalator for Phase III (11-20-year) projects to account for inflation.

Table 7-1 – Estimates of Probable Cost

Project	Description	Justification	Phase	Recommended Development Plan #	Estimate of Probable Cost
Project 1	Land Acquisition or Easement for RPZs	Airport Sponsor control of RPZs. Acquisition and easements should be pursued as parcels become available, not associated with a specific Phase.	I, II, III	1	TBD
Project 2	Obstruction Removal and Lighting	Reduce/eliminate airspace obstacles. Vegetation removal/trimming not associated with a specific Phase.	I, II, III	2	$230,000
Project 3	Publish Declared Distances	Publish declared distances to standardize Runway 30 RSA, ROFA, and ROFZ.	I	N/A	--
Project 4	ATCT Demo and Site Cleanup, Beacon Relocation, Vehicle Parking, Apron Pavement Construction and Removal	Aging infrastructure should be removed – future hangar demand should be accommodated on Airport's south side prior to expansion north. Beacon is located atop ATCT and requires replacement. Site preparation for future hangars includes apron and vehicle parking.	I	3,4,12,18,19	$4,131,700
Project 5	Standardize Taxiway Connectors, Paint Run-Up Area, Runway 30 Blast Pad, Phase I Reconstruct Taxiway A and B, Re-Paint Compass Rose	Taxiway connectors should adhere to ADG I standards. Standard markings for run-up area and blast pad on Runway 30. Compass Rose paint is fading and requires re-painting, Phase I of Taxiway A reconstruction (PMMP project).	I	6,11,17,19,21,27	$1,488,800
Project 6	Relocate Taxiway D, Phase II Reconstruct Taxiway A, Remove Taxiway D	Relocate portion of Taxiway D between Runway 12-30 and Apron to mitigate direct apron-runway access. Phase II of Taxiway A reconstruction (PMMP Project), and removal of Taxiway D (direct apron-runway connector).	I	6,17,19,27	$839,400
Project 7	Two New Secure Gates, Replace Perimeter Fencing	Addition of new vehicle secure access point off Kearney Frontage Road to mitigate shared road and taxilane, and along S. West Ave. to access future vehicle parking.	I	8, 31	$2,247,000
Project 8	Addition of Automobile Parking, Phase I Hangar Removal, 6 Box Units, Hangar Pavement Rehab	Replacement of non-standard separation T-hangar with 6 box hangars and replacement/rehabilitated apron. Additional vehicle parking needed for hangar area.	I	12,18,20,23,25,29	$4,949,400
Project 9	Pavement Rehabilitation (Automobile Parking Lots) Mill and Fill	Rehabilitation of terminal building vehicle parking lot.	I	30	$201,900
Project 10	Replace Runway 12 PAPI	Replace existing 2-light PAPI with 4-light PAPI.	I	34	$169,700
Project 11	Replace Airfield Lighting with LED fixtures	Airfield lighting upgrades.	I	32	$1,704,000
Project 12	Install and Mark Tie-Downs, New Connector Taxiway C, Phase III Rehab Taxiway A, Rehab Taxiway C	Reconfiguration of itinerant apron with new tie-downs/markings, standardize Taxiway C west of Runway 12-30 and new connector Taxiway C to mitigate direct apron-runway access. Phase III of Taxiway A rehabilitation (PMMP project).	II	6,13,16,17,19,27	$823,680
Project 13	Phase IV Reconstruct Taxiway A, Rehab Taxiway E	Phase IV Taxiway A reconstruct (PMMP project) and standardization of connector Taxiway E.	II	6,27	$1,117,600
Project 14	Standardize Taxiway Connectors F/G, Paint Run-Up Area, Blast Pad, Phase V Reconstruct Taxiway A	Standardization of connector Taxiways F and G with standard run-up area and blast pad on Runway 12 end. Phase V of Taxiway A reconstruction (PMMP project).	II	6,10,11,19,22,27	$1,368,180
Project 15	Runway 12-30 Crack Seal, Mill and Fill	Runway 12-30 rehabilitation (PMMP project).	II	26	$971,740
Project 16	Paint Helicopter Landing Area, Apron Pavement, Apron Rehab	Paint standard helicopter landing area markings, new apron pavement on open area south of Runway 12 end, apron rehabilitation near Runway 12 end.	II	9,15,18,28	$5,568,310
Project 17	Apron 3 Rehab	Rehabilitation of Apron 3 (PMMP project).	II	28	$305,140
Project 18	New Box Hangars (6) and T-hangar Extension	New hangars constructed on former ATCT site and extension of midfield T-hangar. Additional hangars required to replace non-standard separation of existing hangars.	II	14	$5,654,660
Project 19	Apron 1 Repair, Crack Seal, Mill and Fill	Rehabilitation of Apron 1 (PMMP project).	II	28	$197,280
Project 20	Taxiway H Crack Repair and Crack Seal	Rehabilitation of Taxiway H (PMMP project).	III	27	$497,280
Project 21	AWOS Component Replacement	Recently installed AWOS has had issues with UHF radio communication. Recommend inspection and upgrades as needed.	III	7	TBD
Project 22	New Hangars (74 T-Units, 12 Box), Apron Pavement, Taxilanes, Secure Gate	Future hangar demand and mitigation of non-standard hangar separation. Requires requisite apron and taxilane movement areas, and access gate improvements.	III	12,14,17,18,24,31	$57,593,040
Project 23	Addition of Automobile Parking off S West Ave	Vehicle parking for hangars.	III	12	$1,560,120
Project 24	Phase II Hangar Removal, Hangar Pavement Rehab	Mitigation of non-standard hangar separations. Rehabilitation of underlying pavement.	III	20,29	$3,362,160
Project 25	Phase III Hangar Removal, Hangar Pavement Rehab	Mitigation of non-standard hangar separations. Rehabilitation of underlying pavement.	III	20,29	$2,439,960
Project 26	Decommissioned Runway Pavement Removal	Removal of decommissioned runway – area needed for potential long-term aviation use.	III	19	$1,287,480
				TOTAL	**$98,708,530**

Source: Kimley-Horn & Associates, March 2021

7.2 Funding Sources

The projects presented in **Table 7-1** represent the basis for the Airport's 20-year CIP. This section discusses potential funding sources for projects listed in the 20-year CIP. Each of these sources is later evaluated for each project based on eligibility and likely use to implement the project.

7.2.1 Federal Grants

The Airport currently serves as a general aviation airport and is classified by the FAA as a nonprimary reliever airport in the 2021-2025 National Plan of Integrated Airports System (NPIAS). The NPIAS has an estimated total 5-year development cost of $2.2 million for the Airport. So long as the annual congressional appropriation to the AIP exceeds $3.2 billion, nonprimary airports such as Fresno Chandler Executive can expect to receive the lesser of $150,000 of annual entitlement funds or one-fifth of the annual development costs specified in NPIAS. The Airport may also apply for AIP discretionary funding. These AIP grants can fund 90 percent of total eligible costs at the Airport and may reach 100 percent under special legislation such as the grants specified in the Coronavirus Aid, Relief, and Economic Security Act.

The Airport received an entitlement grant of $475,000 in 2017 to update its Airport Master Plan and $111,761 in 2018 to install weather reporting equipment. For the financial analysis presented later in this chapter, the annual entitlements for 2019 through 2021 were carried over into future years.

7.2.2 State Grants

Before the Airport Sponsor starts a grant-funded project, it may also apply for a state matching share, which is calculated at 5 percent of the federal grant, or 4.5 percent of total project cost if the FAA provides 90 percent of project funding. For the financial analysis presented in this chapter, state grant matching was calculated to be approximately $1.44M over the course of the 20-year planning horizon.

7.2.3 Private Funding

With the forecast increase of aviation activities and required mitigation of non-standard conditions, the Airport will need additional hangars for aircraft storage. The 20-Year ACIP included three aircraft storge hangar projects and subsequent vehicle parking and apron improvements that utilize private funding.

7.2.4 Other Funding Sources

The City of Fresno Airports Department manages both FAT and FCH as a combined enterprise fund and determines the resources to invest at each airport. At nonprimary airports, internally generated cash is a major funding source, after obtaining necessary external funding sources. As shown in **Table 7-2**, the 20-Year CIP requires an annual average local funding amount of $88,262 over the 20-year planning horizon, and an average of $138,560 in years 0 to 5.

The Airports Department's financial situation and its willingness to fund projects at the Airport may affect the timing of the projects in the 20-Year CIP. The Airports Department generated $6.2 million of net revenues after debt service in fiscal year (FY) 2019 and $2.3 million in FY 2020. The lower financial metrics in FY 2020 are partially due to the impact of the COVID-19 pandemic.

7.2.5 Anticipated Funding Sources - Summary

The 20-Year CIP is intended to be funded through a combination of federal grants, state grants, private funding, and internally generated funds. **Table 7-2** presents a summary of the CIP's anticipated funding sources by phase. As shown, the 20-Year CIP assumed an average annual entitlement usage of $142,264 of the $150,000 annual allocated amount, and average annual discretionary funding of $1,302,022. If the Airport plans to proceed with any grant-funded projects in the 20-Year CIP, the Airport will need to coordinate with the FAA and phase the projects in a manner that accommodates AIP funding availability. If the AIP grants are not available at the recommended time of implementation, the Airport Sponsor may need to defer the project, consistent with past practice.

Table 7-2 – Summary of Anticipated Funding Sources

Phase	FAA Entitlements	FAA Discretionary	State Grant	Private Funding	Local Funding	Total
Phase I	$541,440	$10,795,237	$566,834	$3,365,592	$692,797	$15,961,900
Phase II	$452,178	$8,864,559	$465,837	$5,654,660	$569,356	$16,006,590
Phase III	$1,851,660	$6,380,640	$411,615	$57,593,040	$503,085	$66,740,040
Total	**$2,845,278**	**$26,040,436**	**$1,444,286**	**$66,613,292**	**$1,765,238**	**$98,708,530**
Average Annual	$142,264	$1,302,022	$72,412	$3,330,665	$88,262	$4,935,427

Source: Kimley-Horn & Associates, March 2021
Notes: Phase I Entitlements include carryover from FY 2019 and 2020.

7.3 Airport Capital Improvement Plan

The Airport's detailed 20-year CIP is presented in **Table 7-3**. It is anticipated that approximately 29.3 percent of overall project funding will come from federal grants, 1.5 percent from state grants, 67.5 percent from private funding, and 1.8 percent from local funding. **Section 7.4** provides a financial feasibility analysis that identifies an assessment of the ability of the Airport Sponsor to satisfy local matching requirements.

A detailed 5-year CIP with estimated years when projects will start is presented in **Table 7-4.** It should be noted that projects requiring construction may be phased into multiple years. The programmed year reflects when project design and environmental documentation (if applicable) would start.

Table 7-3 – 20-Year Airport Capital Improvement Plan

Project	Description	Estimate of Probable Cost	FAA	State	Private	Local
Project 1	Land Acquisition or Easement for RPZs	TBD	TBD	TBD	--	TBD
Project 2	Obstruction Removal and Lighting	$230,000	$207,000	$10,350	--	$12,650
Project 3	Publish Declared Distances	--	--	--	--	--
Project 4	ATCT Demo and Site Cleanup, Beacon Relocation, Vehicle Parking, Apron Pavement Construction and Removal	$4,131,700	$3,718,530	$185,927	--	$227,244
Project 5	Standardize Taxiway Connectors, Paint Run-Up Area, Runway 30 Blast Pad, Phase I Reconstruct Taxiway A and B, Re-Paint Compass Rose	$1,488,800	$1,339,920	$66,996	--	$81,884
Project 6	New Apron Connector Taxiway, Phase II Reconstruct Taxiway A, Remove Taxiway D	$839,400	$755,460	$37,773	--	$46,167
Project 7	Two New Secure Gates, Replace Perimeter Fencing	$2,247,000	$2,022,300	$101,115	--	$123,585
Project 8	Addition of Automobile Parking, Phase I Hangar Removal, 6 Box Units, Hangar Pavement Rehab	$4,949,400	$1,425,427	$71,271	$3,365,592	$87,109
Project 9	Pavement Rehabilitation (Automobile Parking Lots) Mill and Fill	$201,900	$181,710	$9,086	--	$11,105
Project 10	Replace Runway 12 PAPI	$169,700	$152,730	$7,637	--	$9,334
Project 11	Replace Airfield Lighting with LED fixtures	$1,704,000	$1,533,600	$76,680	--	$93,720
Project 12	Install and Mark Tie-Downs, New Connector Taxiway C, Phase III Rehab Taxiway A, Rehab Taxiway C	$823,680	$741,312	$37,066	--	$45,302
Project 13	Phase IV Reconstruct Taxiway A, Rehab Taxiway E	$1,117,600	$1,005,840	$50,292	--	$61,468
Project 14	Standardize Taxiway Connectors F/G, Paint Run-Up Area, Blast Pad, Phase V Reconstruct Taxiway A	$1,368,180	$1,231,362	$61,568	--	$75,250
Project 15	Runway 12-30 Crack seal, mill and fill	$971,740	$874,566	$43,728	--	$53,446
Project 16	Paint Helicopter Landing Area, Apron Pavement, Apron Rehab	$5,568,310	$5,011,479	$250,574	--	$306,257
Project 17	Apron 3 Rehab	$305,140	$274,626	$13,731	--	$16,783
Project 18	New Box Hangars (6) and T-hangar Extension	$5,654,660	--	--	$5,654,660	
Project 19	Apron 1 Repair, Crack Seal, Mill and Fill	$197,280	$177,552	$8,878	--	$10,850
Project 20	Taxiway H Crack Repair and Crack Seal	$497,280	$447,552	$22,378	--	$27,350
Project 21	AWOS Inspection and Modernization (maintenance, possible replacement)	TBD	TBD	TBD	--	TBD
Project 22	New Hangars (74 T-Units, 12 Box), Apron Pavement, Taxilanes, Secure Gate	$57,593,040	--	--	$57,593,040	--
Project 23	Addition of Automobile Parking off S West Ave	$1,560,120	$1,404,108	$70,205	--	$85,807
Project 24	Phase II Hangar Removal, Hangar Pavement Rehab	$3,362,160	$3,025,944	$151,297	--	$184,919
Project 25	Phase III Hangar Removal, Hangar Pavement Rehab	$2,439,960	$2,195,964	$109,798	--	$134,198
Project 26	Decommissioned Runway Pavement Removal	$1,287,480	$1,158,732	$57,937	--	$70,811
	TOTAL	**$98,708,530**	**$28,885,714**	**$1,444,286**	**$66,613,292**	**$1,765,238**

Sources: Kimley-Horn & Associates, March 2021, DWU Consulting
Notes: Cost estimates include a 10 percent escalator for Phase II (6-10-year) projects and 20 percent escalator for Phase III (11-20-year) projects to account for inflation.

Table 7-4 – Detailed 5-year Airport Capital Improvement Plan

Project	Description	Programmed Calendar Year	Estimate of Probable Cost	FAA	State	Private	Local
Project 1*	Land Acquisition or Easement for RPZs	Ongoing	TBD	TBD	TBD	--	TBD
Project 2	Obstruction Removal and Lighting	Ongoing	$230,000	$207,000	$10,350	--	$12,650
Project 3	Publish Declared Distances	2021	--	--	--	--	--
Project 4*	ATCT Demo and Site Cleanup, Beacon Relocation, Vehicle Parking, Apron Pavement Construction and Removal	2022	$4,131,700	$3,718,530	$185,927	--	$227,244
Project 5*	Standardize Taxiway Connectors, Paint Run-Up Area, Runway 30 Blast Pad, Phase I Reconstruct Taxiway A and B, Re-Paint Compass Rose	2023	$1,488,800	$1,339,920	$66,996	--	$81,884
Project 6*	New Apron Connector Taxiway, Phase II Reconstruct Taxiway A, Remove Taxiway D	2024	$839,400	$755,460	$37,773	--	$46,167
Project 7	Two New Secure Gates, Replace Perimeter Fencing	2024	$2,247,000	$2,022,300	$101,115	--	$123,585
Project 8*	Addition of Automobile Parking, Phase I Hangar Removal, 6 Box Units, Hangar Pavement Rehab	2025	$4,949,400	$1,425,427	$71,271	$3,365,592	$87,109
Project 9	Pavement Rehabilitation (Automobile Parking Lots) Mill and Fill	2025	$201,900	$181,710	$9,086	--	$11,105
Project 10	Replace Runway 12 PAPI	2026	$169,700	$152,730	$7,637	--	$9,334
Project 11*	Replace Airfield Lighting with LED fixtures	2026	$1,704,000	$1,533,600	$76,680	--	$93,720
	TOTAL		**$15,961,000**	**$11,336,677**	**$566,834**	**$3,365,592**	**$692,797**

Sources: Kimley-Horn and Associates, March 2021, DWU Consulting
*Note: *Denotes likely NEPA documentation, expected to be Categorical Exclusions. Project 1 would not require NEPA documentation unless land acquisition, which may require an Environmental Assessment.*

7.4 Financial Feasibility Analysis

This section presents the anticipated funding plan for implementation of projects identified in the Airport's CIP and assesses the Sponsor's ability to fund these projects. While an implementation schedule has been developed, the actual execution of specific projects and the resulting financial requirements may change based on local economic conditions, actual aviation-related activity, or other factors.

Based on discussions with the Sponsor, it was identified that the Airport incurred an operating loss of $43,000 in FY 2020. The Airports Department may adjust rates to increase revenues at the Airport but is not obligated to realize breakeven financial results at the Airport. Therefore, the analysis assumed that the surplus revenues generated at FAT could continue to fund the operation expenses and capital investments at FCH.

FY 2020 numbers are based on actual results; FY 2021 numbers are based on estimates provided by the Airports Department; numbers for FY 2022 and future years are forecast as discussed below. Due to uncertainty regarding the timing and contractual arrangements, the forecasts of revenues and expenses have not taken into consideration impacts by implementing new capital projects, such as building additional hangars using private funding.

7.4.1 Airport Revenues

The Airport generated $398,000 of operating revenues in FY 2020 from the following categories:

- Rentals ($376,000), including rentals for hangars developed by the Airports Department, land rental for fixed-based operators, land rental for private hangar developers, and minor rental revenues from the terminal. Several aviation tenants operate at the Airport and pay land rent to the Airports Department. The rental rate for hangars and land is adjusted occasionally based on inflation adjustments or appraisals. Rental revenues are estimated to increase from $376,000 in FY 2020 to $393,000 in FY 2021 and are forecast to increase at an assumed inflation rate of 2.5 percent annually.
- Fuel flowage fee and tie-down fees ($12,000). Due to the impact of the COVID-19 pandemic, general aviation activities at the Airport declined in FY 2021, causing the fuel flowage fee and tie-down fees to decline in FY 2021. This category of revenues is assumed to recover gradually to the 2020 level in FY 2024 and is expected to experience growth commensurate with forecast operations and inflation thereafter.
- Concession and other revenues ($10,000), including food and beverage concession revenues and miscellaneous revenues. This category of revenues is assumed to recover gradually to the 2020 level in FY 2024 and driven by operation growth and inflation thereafter.

7.4.2 Airport Expenses

The Airport incurred $441,000 of operating expenses in FY 2020 in the following categories. Operating expenses were assumed to increase by 3.0 percent annually.

- Personnel services ($173,000) for salaries and wages and related personnel benefits.
- Outside services ($61,000) for professional services and outside maintenance and other services.
- Utilities ($87,000) for electricity, gas, and water and sewer related expenses.
- Supplies ($29,000) for materials, parts, and other supplies.
- Interdepartmental charges ($91,000) for indirect cost allocation, self-insurance charges, and other interdepartmental charges from the City.

7.4.3 Cash Flow Analysis

The cash flow analysis compares existing and forecast Airport revenues and expenses based on the assumptions identified in the previous section and identifies projected net operating income or loss. The results of this analysis are presented in **Table 7-5**.

Table 7-5 – Forecast Revenues and Expenses

Item	2020A	2021E	2022F	2023F	2024F	2030F	2035F	2040F
Operating Revenues								
Hangar Rentals	$163,318	$170,743	$175,012	$179,387	$183,871	$213,235	$241,255	$272,958
FBO Rentals	$160,010	$167,285	$171,467	$175,753	$180,147	$208,915	$236,369	$267,429
Land Rentals	$47,040	$49,179	$50,408	$51,668	$52,960	$61,417	$69,488	$78,619
Other Rentals	$5,542	$5,794	$5,939	$6,087	$6,239	$7,236	$8,187	$9,263
Fuel Flowage and Tie-down Fees	$12,432	$3,300	$5,243	$9,092	$12,943	$15,781	$18,594	$21,879
Concession and Other Revenues	$9,824	$2,300	$3,728	$6,559	$9,392	$11,451	$13,493	$15,876
Total FCH Revenues	***$398,166***	***$398,600***	***$411,796***	***$428,547***	***$445,553***	***$518,036***	***$587,386***	***$666,025***
Operating Expenses								
Personnel Services	$172,949	$216,100	$244,400	$251,732	$259,284	$309,599	$358,910	$416,075
Outside Services	$60,687	$38,500	$47,800	$49,234	$50,711	$60,552	$70,196	$81,376
Utilities	$86,933	$114,400	$114,400	$117,832	$121,367	$144,918	$168,000	$194,758
Supplies	$28,950	$31,200	$56,800	$58,504	$60,259	$71,953	$83,413	$96,698
Interdepartmental Charges	$91,685	$120,700	$57,800	$59,534	$61,320	$73,219	$84,881	$98,401
Total FCH Expenses	***$441,204***	***$520,900***	***$521,200***	***$536,836***	***$552,941***	***$660,241***	***$765,400***	***$887,308***
Operating Income/(Loss)	$(43,038)	$(122,300)	$(109,404)	$(108,289)	$(107,389)	$(142,205)	$(178,014)	$(221,283)

Sources: Actual and Estimated: City of Fresno, Airports Department; Forecast - Kimley-Horn, DWU Consulting
Notes: A=Actual, E=Estimated, F=Forecast

As shown, the Airport is currently and is forecast to continue to experience an annual net loss in terms of operating budget, which is not uncommon at most general aviation airports. As noted, the City of Fresno Airports Department has the ability to allocate financial resources to both of its airports as needed. Furthermore, if the Airport Sponsor desires, it can adjust lease and rental rates, flowage fees, and other sources of revenue to reduce the forecast funding gap.

7.5 Summary

Due to limited revenue generation capabilities, nonprimary airports typically rely on external funding sources for major capital projects and rely on the support of the sponsor agencies as well. The projected cash requirement to implement the 20-Year CIP is $88,262 annually on average, and therefore is not a significant burden on the finances of the Airports Department. Therefore, the timing and funding of the planned projects primarily depends on the availability of the FAA AIP grants.

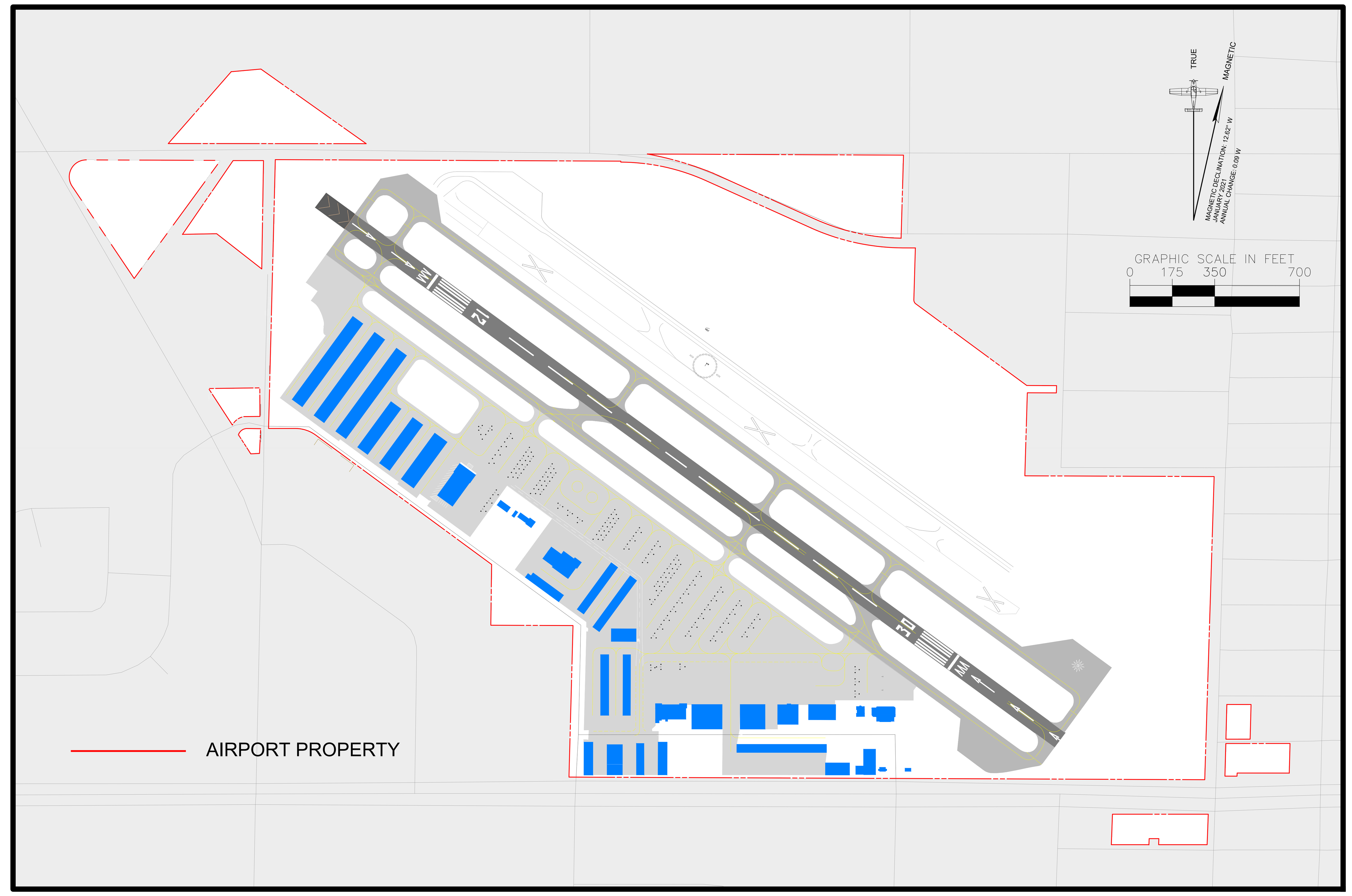
Appendix A – Airport Layout Plan

FRESNO CHANDLER
EXECUTIVE AIRPORT

AIRPORT LAYOUT PLAN

PRELIMINARY DRAWING SET

JUNE 2021

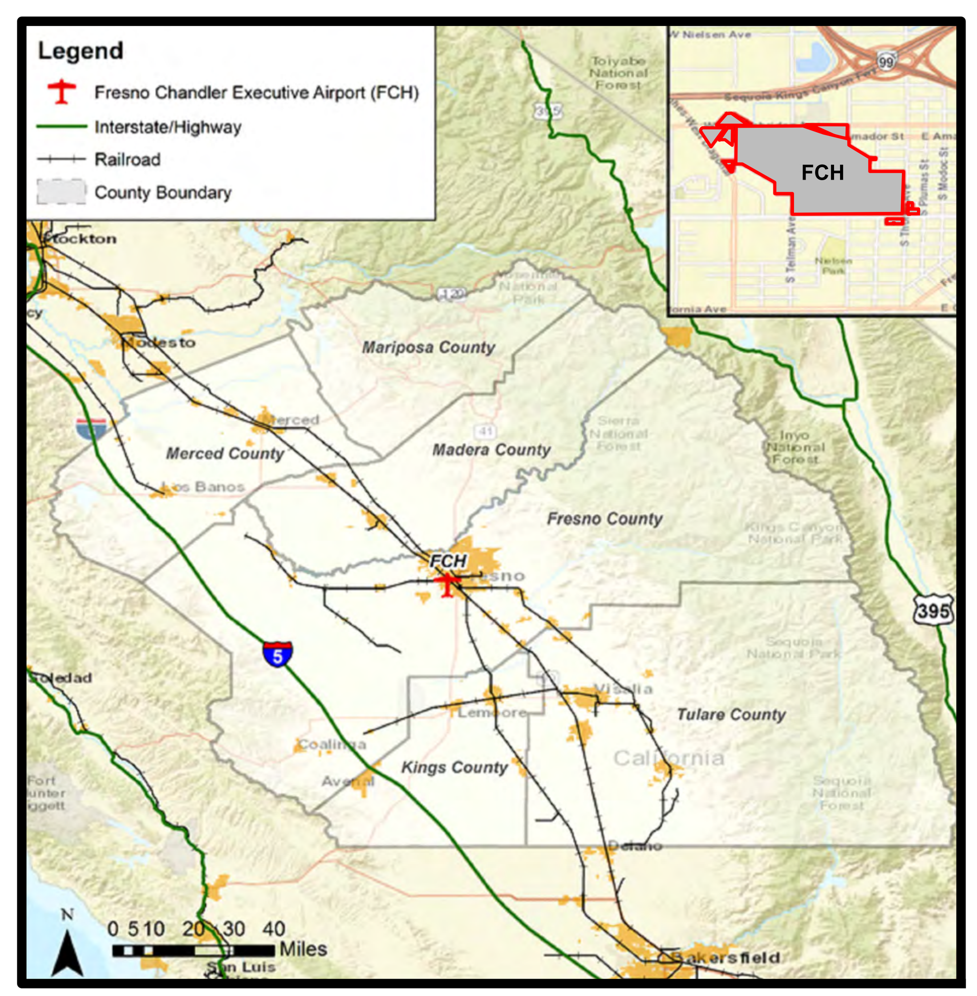


PROPERTY MAP

SHEET INDEX

SHEET NO.	SHEET TITLE	REVISION DATE
1	TITLE SHEET	JUNE 2021
2	AIRPORT DATA SHEET (1 OF 2)	JUNE 2021
3	AIRPORT DATA SHEET (2 OF 2)	JUNE 2021
4	AIRPORT LAYOUT PLAN - EXISTING FACILITIES	JUNE 2021
5	AIRPORT LAYOUT PLAN - FUTURE LAYOUT	JUNE 2021
6	DECLARED DISTANCES DRAWING	JUNE 2021
7	AIRPORT AIRSPACE DRAWING: PLAN VIEW	JUNE 2021
8	AIRPORT AIRSPACE DRAWING: PROFILE VIEW	JUNE 2021
9	INNER PORTION OF THE APPROACH SURFACE DRAWING	JUNE 2021
10	INNER PORTION OF THE APPROACH SURFACE: OBSTRUCTION TABLES	JUNE 2021
11	RUNWAY DEPARTURE SURFACE DRAWING	JUNE 2021
12	RUNWAY DEPARTURE SURFACE: OBSTRUCTION TABLES	JUNE 2021
13	ON-AIRPORT LAND USE	JUNE 2021
14	OFF-AIRPORT LAND USE	JUNE 2021
15	AIRPORT PROPERTY MAP / EXHIBIT A	JUNE 2021

STATE MAP



VICINITY MAP

FAA APPROVAL

SPONSOR APPROVAL

FRESNO CHANDLER
EXECUTIVE AIRPORT

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AIRPORT LAYOUT PLAN
DRAWING SET

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PROJECT NUMBER: 091733014
DATE: JUNE 2021
DRAWN BY: JC
REVIEWED BY:
APPROVED BY:

No.	REVISIONS	DATE

SHEET TITLE: TITLE SHEET
SHEET NUMBER: 1 OF 15

THE PREPARATION OF THIS PLAN WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REPRESENT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATED IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE N ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

RUNWAY DATA

	DESCRIPTION	RUNWAY 12		RUNWAY 30	
		EXISTING	FUTURE	EXISTING	FUTURE
RUNWAY AND AIRSPACE DESIGN	RUNWAY DESIGN CODE (RDC)	A-I(S)-4000	A-I(S)-5000	A-I(S)-5000	SAME
	APPROACH REFERENCE CODE (APRC)	A-I(S)-4000	A-I(S)-5000	A-I(S)-5000	SAME
	DEPARTURE REFERENCE CODE (DPRC)	A-I(S)	SAME	A-I(S)	SAME
	RUNWAY DESIGNATION	UTILITY	SAME	UTILITY	SAME
	APPROACH TYPE	NON-PRECISION	SAME	NON-PRECISION	SAME
	VISIBILITY MINIMUMS ‡	3/4 MILE	1 MILE	1 MILE	SAME
	14 CFR PART 77 APPROACH CATEGORY (SLOPE)	20:1	SAME	20:1	SAME
	DEPARTURE SURFACE (40:1 SLOPE)	YES	SAME	YES	SAME
	AERONAUTICAL SURVEY REQUIREMENT	VERTICALLY GUIDED	NON-VERTICALLY GUIDED	NON-VERTICALLY GUIDED	SAME
	THRESHOLD SITING SURFACE (TSS) - SLOPE / TYPE *	20:1 / TYPE 4	SAME	20:1 / TYPE 4	SAME
	THRESHOLD SITING SURFACE (TSS) - PENETRATIONS	SEE SHEETS 9 AND 10	SAME	SEE SHEETS 9 AND 10	SAME
	DEPARTURE SURFACE - SLOPE / TYPE *	40:1 / TYPE 7	SAME	40:1 / TYPE 7	SAME
	DEPARTURE SURFACE - PENETRATIONS	SEE SHEETS 11 AND 12	SAME	SEE SHEETS 11 AND 12	SAME
	GLIDESLOPE QUALIFICATION SURFACE (GQS) - SLOPE / TYPE *	30:1 / TYPE 6	N/A	N/A	N/A
	GLIDESLOPE QUALIFICATION SURFACE (GQS) - PENETRATIONS	SEE SHEETS 9 AND 10	N/A	N/A	N/A
RUNWAY CHARACTERISTICS	RUNWAY LENGTH	3,627'	SAME	3,627'	SAME
	RUNWAY WIDTH	75'	SAME	75'	SAME
	RUNWAY SHOULDER WIDTH	10' (UNPAVED)	SAME	10' (UNPAVED)	SAME
	RUNWAY BLAST PAD (LENGTH X WIDTH)	152' X 76'	60' x 80'	N/A	60' x 80'
	RUNWAY END LATITUDE (NAD83)	36° 44' 06.10" N	SAME	36° 43' 45.19" N	SAME
	RUNWAY END LONGITUDE (NAD83)	119° 49' 31.30" W	SAME	119° 48' 55.09" W	SAME
	RUNWAY END ELEVATION (NAVD 88)	278.2'	SAME	279.4'	SAME
	RUNWAY HIGH-POINT ELEVATION (NAVD 88)	279.9'	SAME	279.9'	SAME
	RUNWAY HIGH-POINT LATITUDE (NAD83)	36° 43' 46.41" N	SAME	36° 43' 46.41" N	SAME
	RUNWAY HIGH-POINT LONGITUDE (NAD83)	119° 48' 57.21" W	SAME	119° 48' 57.21" W	SAME
	RUNWAY LOW-POINT ELEVATION (NAVD 88)	277.9'	SAME	277.9'	SAME
	RUNWAY LOW-POINT LATITUDE (NAD83)	36° 44' 04.24" N	SAME	36° 44' 04.24" N	SAME
	RUNWAY LOW-POINT LONGITUDE (NAD83)	119° 49' 28.08" W	SAME	119° 49' 28.08" W	SAME
	RUNWAY TOUCHDOWN ZONE ELEVATION (TDZE) (NAVD 88)	279.9'	SAME	279.9'	SAME
	DISPLACED THRESHOLD DISPLACEMENT	415'	SAME	538'	SAME
	DISPLACED THRESHOLD LATITUDE (NAD 83)	36° 44' 03.71" N	SAME	36° 43' 48.29" N	SAME
	DISPLACED THRESHOLD LONGITUDE (NAD 83)	119° 49' 27.16" W	SAME	119° 49' 00.47" W	SAME
	DISPLACED THRESHOLD ELEVATION (NAVD 88)	278.2'	SAME	279.4'	SAME
	EFFECTIVE RUNWAY GRADIENT	0.05%	SAME	0.05%	SAME
	MAXIMUM RUNWAY GRADIENT	0.05%	SAME	0.05%	SAME
	PAVEMENT STRENGTH - SINGLE WHEEL (LBS.) †	17,000	SAME	17,000	SAME
	PAVEMENT STRENGTH - DUAL WHEEL (LBS.) †	N/A	SAME	N/A	SAME
	PAVEMENT STRENGTH - DUAL TANDEM WHEEL (LBS.) †	N/A	SAME	N/A	SAME
	PAVEMENT STRENGTH - DOUBLE DUAL TANDEM WHEEL (LBS.) †	N/A	SAME	N/A	SAME
	SURFACE TYPE	ASPHALT	SAME	ASPHALT	SAME
	PAVEMENT SURFACE TREATMENT	NONE	SAME	NONE	SAME
MISCELLANEOUS	RUNWAY LIGHTING	MIRL	SAME	MIRL	SAME
	RUNWAY MARKINGS	NON-PRECISION	SAME	NON-PRECISION	SAME
	VISUAL APPROACH NAVIGATIONAL AIDS	PAPI-2L, REIL	PAPI-4L, REIL	PAPI-4R, REIL	SAME
	INSTRUMENT APPROACH NAVIGATIONAL AIDS	GPS	SAME	GPS	SAME
	TYPE OF INSTRUMENT APPROACH	NON-PRECISION	SAME	NON-PRECISION	SAME
	WIND COVERAGE REQUIREMENT	10.5 KNOTS	SAME	10.5 KNOTS	SAME
	PERCENT WIND COVERAGE (ALL WEATHER, 10.5 KNOTS)	99.83%	SAME	99.83%	SAME
RUNWAY SAFETY AREAS	**RUNWAY PROTECTION ZONE (RPZ)**				
	INNER WIDTH (APPROACH / DEPARTURE) ‡	1,000' / 250'	250' / 250'	250' / 250'	SAME
	OUTER WIDTH (APPROACH / DEPARTURE) ‡	1,510' / 450'	450' / 450'	450' / 450'	SAME
	LENGTH (APPROACH / DEPARTURE) ‡	1,700' / 1,000'	1,000' / 1,000'	1,000' / 1,000'	SAME
	RUNWAY SAFETY AREA (RSA)				
	LENGTH BEYOND RUNWAY END (EXISTING / STANDARD)	240' / 240'	SAME	177' / 240'	240' / 240'
	WIDTH (EXISTING / STANDARD)	120' / 120'	SAME	120' / 120'	SAME
	RUNWAY OBJECT FREE AREA (ROFA)				
	LENGTH BEYOND RUNWAY END (EXISTING / STANDARD)	240' / 240'	SAME	87' / 240'	240' / 240'
	WIDTH (EXISTING / STANDARD)	250' / 250'	SAME	250' / 250'	SAME
	RUNWAY OBSTACLE FREE ZONE (ROFZ)				
	LENGTH BEYOND RUNWAY END (EXISTING / STANDARD)	200' / 200'	SAME	87' / 200'	200' / 200'
	WIDTH (EXISTING / STANDARD)	250' / 250'	SAME	250' / 250'	SAME

NOTES:
COORDINATE DATA IS BASED ON CALIFORNIA ZONE IV, HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83), VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
* TRESHOLD SITING SURFACE RUNWAY TYPE WAS DETERMINED IN ENGINEERING BRIEF NO. 99, TABLE 3-2.
† PAVEMENT STRENGTH AS LISTED BY THE AIRPORT MASTER RECORD
‡ A REQUEST TO MODIFY THE RUNWAY 12 RNAV (GPS) APPROACH UNDER THE LPV CATEGORY WAS SUBMITTED TO FAA INSTRUMENT FLIGHT PROCEDURES IN NOVEMBER 2020. THE FAA FLIGHT TECHNOLOGIES AND PROCEDURES DIVISION HAS NOTIFIED THE AIRPORT THAT AN UPDATED APPROACH PROCEDURE WILL BE PUBLISHED IN MARCH 2022.

AIRPORT DATA

DESCRIPTION		EXISTING	FUTURE
AIRPORT REFERENCE CODE		A-I (SMALL)	SAME
CRITICAL AIRCRAFT *		ENTIRE FLEET OF A-I (SMALL) AIRCRAFT	SAME
AIRPORT REFERENCE POINT (ARP) (NAD83)	LATITUDE	36° 43' 56.08" N	SAME
	LONGITUDE	119° 49' 13.95" W	SAME
AIRPORT ELEVATION (MSL) (NAVD88)		279.9'	SAME
MEAN MAXIMUM TEMPERATURE OF THE HOTTEST MONTH		99.7° F (JULY)	SAME
MAGNETIC DECLINATION		12.62° E ± 0.35° changing by 0.09° W per year	SAME
AIRPORT NAVAIDS		ROTATING BEACON (OWNER: CITY OF FRESNO)	SAME
MISCELLANEOUS FACILITIES		PAPI-2L (RUNWAY 12) PAPI-4R (RUNWAY 30) REIL (RUNWAYS 12 & 30) SEGMENTED CIRCLE LIGHTED WIND CONE AWOS-3	PAPI-4L (RUNWAY 12) PAPI-4R (RUNWAY 30) REIL (RUNWAYS 12 & 30) SEGMENTED CIRCLE LIGHTED WIND CONE AWOS-3
NPIAS SERVICE LEVEL		RELIEVER	SAME
STATE AIRPORT CLASSIFICATION		BUSINESS / CORPORATE	SAME

SOURCES:
MAGNETIC DECLINATION DATA SOURCED ON JANUARY 28, 2021 (HTTPS://WWW.NGDC.NOAA.GOV/GEOMAG/CALCULATORS/MAGCALC.SHTML?USEFULLSITE=TRUE)
MEAN MAXIMUM TEMPERATURE OF THE HOTTEST MONTH WAS SOURCED FROM NOAA CLIMATE SERVICES CENTER (HTTPS://WWW.W2.WEATHER.GOV/CLIMATE/)

NOTES:
* THE CRITICAL AIRCRAFT IS THE ENTIRE FLEET OF A-I (SMALL) AIRCRAFT AS APPROVED BY THE FFA. CRITICAL AIRCRAFT CHARACTERISTICS REFLECT TABLES 4-22 AND 4-23 IN THE FORECASTS CHAPTER OF THE FCH MASTER PLAN UPDATE FOR AAC A AND ADG I: APPROACH SPEED = 90.9 KNOTS, WINGSPAN = 48.9', TAIL HEIGHT = 19.9'
COORDINATE DATA IS BASED ON CALIFORNIA ZONE IV, HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83), VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

EXISTING NON-STANDARD CONDITIONS

NO.	DESCRIPTION	EXISTING	STANDARD	ACTION
1	RUNWAY 30 RSA LENGTH BEYOND RUNWAY END	177'	240'	MODIFICATION OF DECLARED DISTANCES TO OBTAIN ADEQUATE SPACE FOR STANDARD RSA
2	RUNWAY 30 ROFA LENGTH BEYOND RUNWAY END	87'	240'	MODIFICATION OF DECLARED DISTANCES TO OBTAIN ADEQUATE SPACE FOR STANDARD ROFA
3	RUNWAY 30 ROFZ LENGTH BEYOND RUNWAY END	87'	200'	MODIFICATION OF DECLARED DISTANCES TO OBTAIN ADEQUATE SPACE FOR STANDARD ROFZ
4	RUNWAY 12 BLAST PAD WIDTH	76'	80'	ADDITION OF PAVEMENT TO MEET BLAST PAD WIDTH STANDARDS
5	AIRCRAFT HANGARS PENETRATE TSA / TAXILANE OFA	VARIES	49' / 79'	HANGARS TO BE REMOVED AT THE END OF THEIR USEFUL LIVES TO OBTAIN ADEQUATE SPACE FOR STANDARD TSA / TOFA

NOTE:
NON-STANDARD CONDITIONS ARE EXISTING CONDITIONS THAT DO NOT SATISFY FAA DESIGN STANDARDS AND FOR WHICH THE AIRPORT HAS NOT BEEN GRANTED A MODIFICATION TO STANDARD BY THE FAA.

DECLARED DISTANCES

DECLARED DISTANCES	RUNWAY 12		RUNWAY 30	
	EXISTING	FUTURE	EXISTING	FUTURE
TAKEOFF RUN AVAILABLE (TORA)	N/A	3,483'	N/A	3,627'
TAKEOFF DISTANCE AVAILABLE (TODA)	N/A	3,627'	N/A	3,627'
ACCELERATE STOP DISTANCE AVAILABLE (ASDA)	N/A	3,475'	N/A	3,627'
LANDING DISTANCE AVAILABLE (LDA)	N/A	3,060'	N/A	3,089'

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AIRPORT LAYOUT PLAN DRAWING SET

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PROJECT NUMBER: 091733014
DATE: JUNE 2021
DRAWN BY: JC
REVIEWED BY:
APPROVED BY:

No.	REVISIONS	DATE

SHEET TITLE: AIRPORT DATA SHEET 1 of 2

TAXIWAY DATA

TAXIWAY*		TWY TYPE	LOCATION ON AIRPORT DESCRIPTION	TWY LIGHTING	TAXIWAY DESIGN STANDARDS - BY TAXIWAY DESIGN GROUP (TDG): TWY DESIGN GROUP (TDG)	TWY WIDTH		TWY EDGE SAFETY MARGIN (TESM)		TWY SHOULDER WIDTH †		TAXIWAY DESIGN STANDARDS - BY AIRPLANE DESIGN GROUP (ADG): AIRPLANE DESIGN GROUP (ADG)	TWY SAFETY AREA (TSA)		TWY OBJECT FREE AREA (TOFA)		TWY SEPARATION: TWY CENTERLINE TO PARALLEL RWY CENTERLINE		TWY SEPARATION: HOLD POSITION MARKING TO RWY CENTERLINE		TWY SEPARATION: TWY CENTERLINE TO FIXED OR MOVABLE OBJECT	
						COND	STD	COND	STD	COND	STD		COND	STD	COND	STD	COND	STD	COND	STD	COND	STD
EXISTING	TAXIWAY A	PARALLEL	FULL-LENGTH PARALLEL TWY; SOUTH OF RWY 12-30	MITL	1A	40'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	150'	150'	N/A	125'	44.5'	44.5'
EXISTING	TAXIWAY B	CONNECTOR	CONNECTS TWYS A AND H TO RWY 30 END; INCLUDES SEGMENTS NORTH AND SOUTH OF RWY 12-30	MITL	1A	NORTH OF RWY 12-30: 35' SOUTH OF RWY 12-30: 59'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	NORTH OF RWY 12-30: 125' SOUTH OF RWY 12-30: 125'	125'	44.5'	44.5'
EXISTING	TAXIWAY C	CONNECTOR	CONNECTS TWYS A AND H TO TO RWY 12-30; INCLUDES SEGMENTS NORTH AND SOUTH OF RWY 12-30	MITL	1A	NORTH OF RWY 12-30: 35' SOUTH OF RWY 12-30: 45'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	NORTH OF RWY 12-30: 125' SOUTH OF RWY 12-30: 242'	125'	44.5'	44.5'
EXISTING	TAXIWAY D	CONNECTOR	CONNECTS TWYS A AND H TO TO RWY 12-30; INCLUDES SEGMENTS NORTH AND SOUTH OF RWY 12-30	MITL	1A	NORTH OF RWY 12-30: 35' SOUTH OF RWY 12-30: 40'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	NORTH OF RWY 12-30: 125' SOUTH OF RWY 12-30: 125'	125'	44.5'	44.5'
EXISTING	TAXIWAY E	CONNECTOR	CONNECTS TWYS A AND H TO TO RWY 12-30; INCLUDES SEGMENTS NORTH AND SOUTH OF RWY 12-30	MITL	1A	NORTH OF RWY 12-30: 35' SOUTH OF RWY 12-30: 37'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	NORTH OF RWY 12-30: 125' SOUTH OF RWY 12-30: 218'	125'	44.5'	44.5'
EXISTING	TAXIWAY F	CONNECTOR	CONNECTS TWYS A AND H TO RWY 12; IMMEDIATELY SOUTH OF TWY G; INCLUDES SEGMENTS NORTH AND SOUTH OF RWY 12-30	MITL	1A	NORTH OF RWY 12-30: 35' SOUTH OF RWY 12-30: 40'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	NORTH OF RWY 12-30: 125' SOUTH OF RWY 12-30: 125'	125'	44.5'	44.5'
EXISTING	TAXIWAY G	CONNECTOR	CONNECTS TWYS A AND H TO RWY 12 END; INCLUDES SEGMENTS NORTH AND SOUTH OF RWY 12-30	MITL	1A	NORTH OF RWY 12-30: 35' SOUTH OF RWY 12-30: 40'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	NORTH OF RWY 12-30: 125' SOUTH OF RWY 12-30: 125'	125'	44.5'	44.5'
EXISTING	TAXIWAY H	PARALLEL	FULL-LENGTH PARALLEL TWY; NORTH OF RWY 12-30	MITL	1A	35'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	200'	150'	N/A	125'	44.5'	44.5'
FUTURE ‡	TAXIWAY A	PARALLEL	FULL-LENGTH PARALLEL TWY; SOUTH OF RWY 12-30	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	150'	150'	N/A	N/A	44.5'	44.5'
FUTURE ‡	TAXIWAY A1	CONNECTOR	CONNECTS TWY A AND AIRCRAFT RUN-UP AREAS TO RWY 30 END (FORMELY THE SEGMENT OF TWY B SOUTH OF RWY 30 END)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	125'	125'	44.5'	44.5'
FUTURE ‡	TAXIWAY A2	CONNECTOR	CONNECTS TWY A TO RWY 30; IMMEDIATELY SOUTH OF RWY 30 THRESHOLD (NEWLY CONSTRUCTED TWY)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	242'	125'	44.5'	44.5'
FUTURE ‡	TAXIWAY A3	CONNECTOR	CONNECTS TWY A TO MIDDLE OF RWY 12-30 (RELOCATED SEGMENTED OF FORMER TWY D BETWEEN TWY A AND RWY 12-30)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	125'	125'	44.5'	44.5'
FUTURE ‡	TAXIWAY A4	CONNECTOR	ACCUTE-ANGLE TWY; CONNECTS TWY A TO RWY 12-30 (FORMERLY THE SEGMENT OF TWY E BETWEEN TWY A AND RWY 12-30)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	218'	125'	44.5'	44.5'
FUTURE ‡	TAXIWAY A5	CONNECTOR	CONNECTS TWY A AND AIRCRAFT RUN-UP AREA TO RWY 12 END (FORMERLY THE SEGMENT OF TWY G BETWEEN TWY A AND RWY 12 END)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	125'	125'	44.5'	44.5'
FUTURE ‡	TAXIWAY B1	CONNECTOR	CONNECTS ITINERANT PARKING APRON TO TWY A (NEWLY CONSTRUCTED TWY)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	N/A	N/A	44.5'	44.5'
FUTURE ‡	TAXIWAY B2	CONNECTOR	CONNECTS PARKING APRON TO TWY A (FORMERLY THE SEGMENT OF TWY D BETWEEN THE PARKING APRON AND TWY A)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	N/A	N/A	44.5'	44.5'
FUTURE ‡	TAXIWAY B3	CONNECTOR	CONNECTS PARKING APRON TO TWY A (FORMERLY THE SEGMENT OF TWY E BETWEEN THE PARKING APRON AND TWY A)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	N/A	N/A	44.5'	44.5'
FUTURE ‡	TAXIWAY B4	CONNECTOR	CONNECTS PARKING APRON TO TWY A (FORMERLY WIDE EXPANSE OF PAVEMENT NORTH OF HANGARS)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	N/A	N/A	44.5'	44.5'
FUTURE ‡	TAXIWAY H	PARALLEL	FULL-LENGTH PARALLEL TWY; NORTH OF RWY 12-30	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	200'	150'	N/A	N/A	44.5'	44.5'
FUTURE ‡	TAXIWAY H1	CONNECTOR	CONNECTS TWS H AND I TO RWY 30 END (FORMERLY THE SEGMENT OF TWY B NORTH OF RWY 30 END)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	125'	125'	44.5'	44.5'
FUTURE ‡	TAXIWAY H2	CONNECTOR	CONNECTS TWY H TO RWY 12-30 (FORMERLY THE SEGMENT OF TWY C NORTH OF RWY 12-30)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	125'	125'	44.5'	44.5'
FUTURE ‡	TAXIWAY H3	CONNECTOR	CONNECTS TWY H TO RWY 12-30 (FORMERLY THE SEGMENT OF TWY D NORTH OF RWY 12-30)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	125'	125'	44.5'	44.5'
FUTURE ‡	TAXIWAY H4	CONNECTOR	CONNECTS TWY H TO RWY 12-30 (FORMERLY THE SEGMENT OF TWY E NORTH OF RWY 12-30)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	125'	125'	44.5'	44.5'
FUTURE ‡	TAXIWAY H5	CONNECTOR	CONNECTS TWY H TO RWY 12; IMMEDIATELY NORTH OF RWY 12 THRESHOLD (FORMERLY THE SEGMENT OF TWY F NORTH OF RWY 12-30)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	125'	125'	44.5'	44.5'
FUTURE ‡	TAXIWAY H6	CONNECTOR	CONNECTS TWY H TO RWY 12 END (FORMERLY THE SEGMENT OF TWY G NORTH OF RWY 12 END)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	125'	125'	44.5'	44.5'
FUTURE ‡	TAXIWAY I	CONNECTOR	CONNECTS NEW BASED AIRCRAFT APRON TO TWY H; SOUTH OF AIRPORT COMPASS ROSE (NEWLY CONSTRUCTED TWY)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	N/A	N/A	44.5'	44.5'
FUTURE ‡	TAXIWAY J	CONNECTOR	CONNECTS NEW BASED AIRCRAFT APRON TO TWY H; NORTH OF AIRPORT COMPASS ROSE (NEWLY CONSTRUCTED TWY)	MITL	1A	25'	25'	5'	5'	N/A	10'	I (SMALL)	49'	49'	89'	89'	N/A	N/A	N/A	N/A	44.5'	44.5'

NOTES:
COND = EXISTING / FUTURE CONDITION
STD = FAA STANDARD
* EXISTING AND FUTURE TAXIWAYS ARE LISTED IN ALPHABETICAL ORDER BY NAME, THEN FROM SOUTH TO NORTH ON THE AIRFIELD.
† TAXIWAY SHOULDERS ARE NOT REQUIRED FOR AIRPORTS ACCOMODATING ADG-I (SMALL) AIRCRAFT. HOWEVER, ACCORDING TO AC 150/5300-13A CHANGE 1, TURF, AGGREGATE-TURF, SOIL CEMENT, LIME, OR BITUMINOUS STABLIZED SOIL ARE RECOMMENDED ADJACENT TO PAVED TAXIWAYS ACCOMODATING ADG-I (SMALL AIRCRAFT).
‡ FUTURE TAXIWAYS ARE DISPLAYED ON THE AIRPORT LAYOUT DRAWING.

WIND DATA

RUNWAY †	CROSSWING COVERAGE *: ALL WEATHER				IFR				VFR			
	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
12-30	99.83%	99.93%	99.99%	100.00%	99.90%	99.96%	100.00%	100.00%	99.83%	99.93%	99.99%	100.00%

SOURCE:
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) NATIONAL CLIMATIC CENTER

NOTES:
* BASED ON 69,716 OBSERVATIONS BETWEEN 2015 AND 2020; STATION NAME: FRESNO CHANDLER EXECUTIVE
† ANALYSIS PERFORMED FOR TRUE RUNWAY HEADINGS OF 125° AND 305°

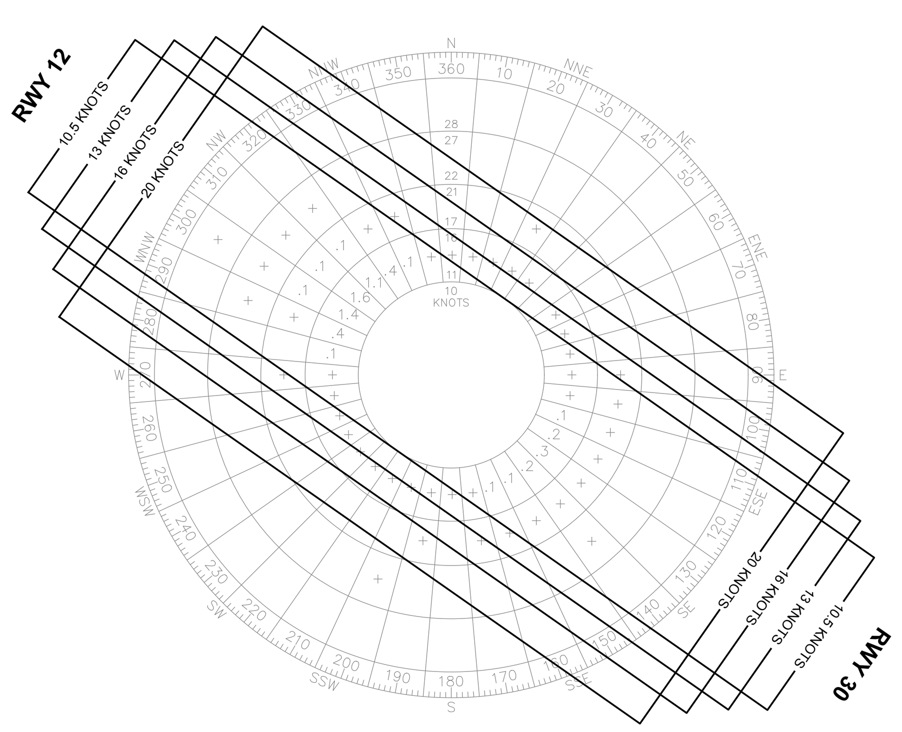
PACS AND SACS MONUMENTATION

DESIGNATION	MONUMENT TYPE	LATITUDE	LONGITUDE	ELEVATION
FCH AP 1967 STA A	SACS	36° 44' 05.98" N	119° 49' 28.98" W	277.3'
FCH AP 1967 STA B	SACS	36° 43' 45.61" N	119° 48' 53.72" W	279.3'
FCH ARP	PACS	36° 43' 56.33" N	119° 49' 10.96"' W	277.1'

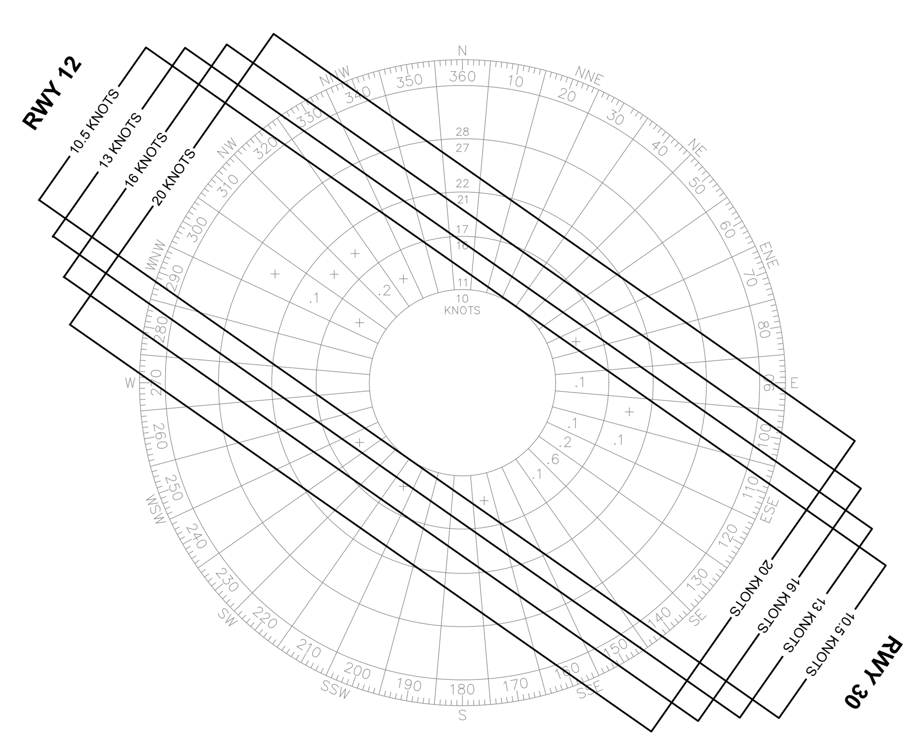
SOURCE:
NOAA NATIONAL GEODETIC SURVEY, AIRPORTS WITH PAC AND SAC MARKS (HTTPS"//WWW.NGS.NOAA.GOV/CGI-BIN/AIRPORTS.PRL?TYPE=PACSAC)

NOTES:
PACS = PRIMARY AIRPORT CONTROL STATION
SACS = SECONDARY AIRPORT CONTROL STATION
COORDINATE DATA IS BASED ON CALIFORNIA ZONE IV, HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83), VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

ALL WEATHER



IFR



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AIRPORT LAYOUT PLAN DRAWING SET

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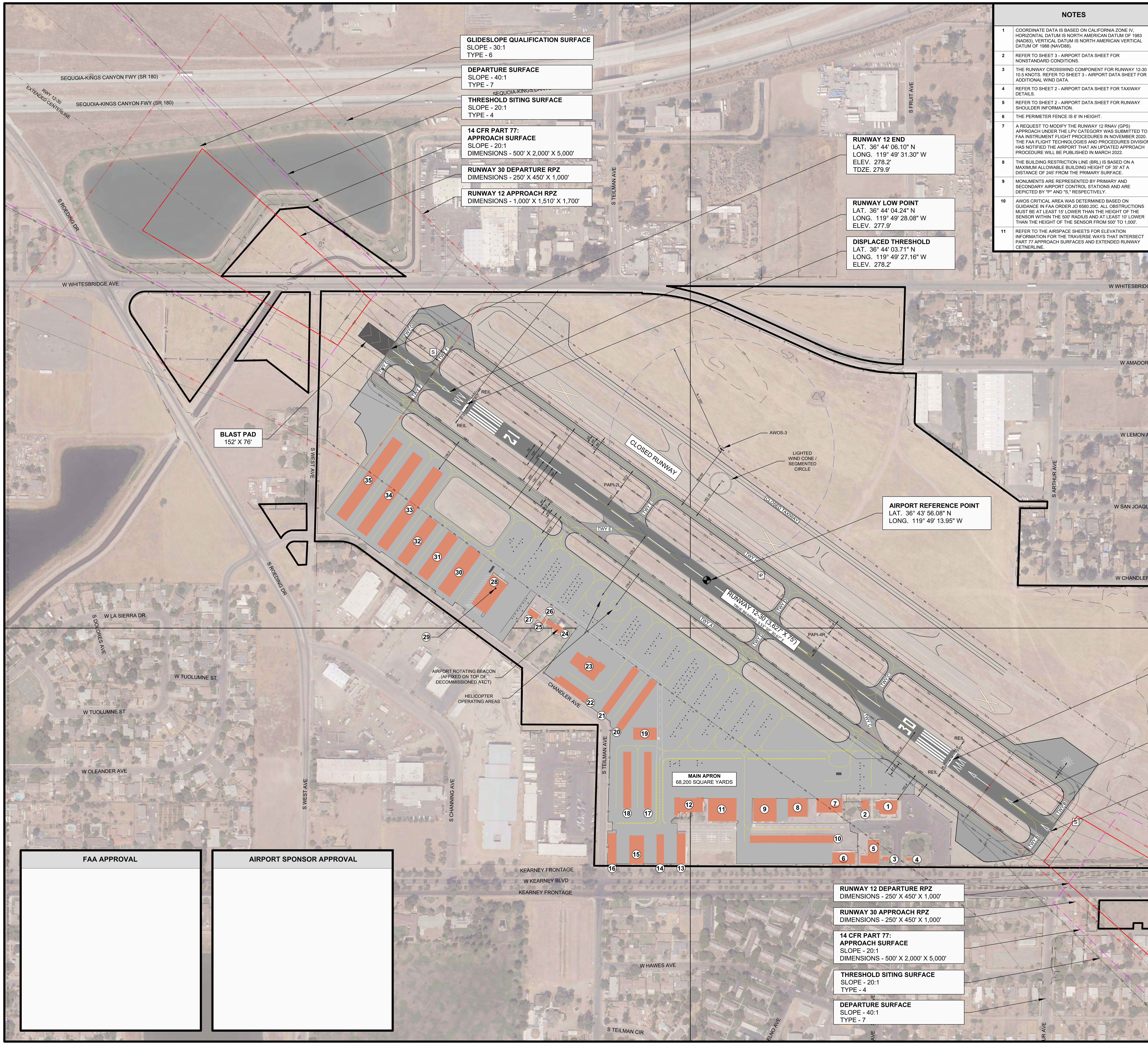
PROJECT NUMBER: 091733014
DATE: JUNE 2021
DRAWN BY: JC
REVIEWED BY:
APPROVED BY:

No.	REVISIONS	DATE

SHEET TITLE: AIRPORT DATA SHEET 2 of 2

THE PREPARATION OF THIS PLAN WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REPRESENT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATED IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE N ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.



FAA APPROVAL

AIRPORT SPONSOR APPROVAL

NOTES

1	COORDINATE DATA IS BASED ON CALIFORNIA ZONE IV, HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83), VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
2	REFER TO SHEET 3 - AIRPORT DATA SHEET FOR NONSTANDARD CONDITIONS.
3	THE RUNWAY CROSSWIND COMPONENT FOR RUNWAY 12-30 IS 10.5 KNOTS. REFER TO SHEET 3 - AIRPORT DATA SHEET FOR ADDITIONAL WIND DATA.
4	REFER TO SHEET 2 - AIRPORT DATA SHEET FOR TAXIWAY DETAILS.
5	REFER TO SHEET 2 - AIRPORT DATA SHEET FOR RUNWAY SHOULDER INFORMATION.
6	THE PERIMETER FENCE IS 6' IN HEIGHT.
7	A REQUEST TO MODIFY THE RUNWAY 12 RNAV (GPS) APPROACH UNDER THE LPV CATEGORY WAS SUBMITTED TO FAA INSTRUMENT FLIGHT PROCEDURES IN NOVEMBER 2020. THE FAA FLIGHT TECHNOLOGIES AND PROCEDURES DIVISION HAS NOTIFIED THE AIRPORT THAT AN UPDATED APPROACH PROCEDURE WILL BE PUBLISHED IN MARCH 2022.
8	THE BUILDING RESTRICTION LINE (BRL) IS BASED ON A MAXIMUM ALLOWABLE BUILDING HEIGHT OF 35' AT A DISTANCE OF 245' FROM THE PRIMARY SURFACE.
9	MONUMENTS ARE REPRESENTED BY PRIMARY AND SECONDARY AIRPORT CONTROL STATIONS AND ARE DEPICTED BY "P" AND "S," RESPECTIVELY.
10	AWOS CRITICAL AREA WAS DETERMINED BASED ON GUIDANCE IN FAA ORDER JO 6560.20C. ALL OBSTRUCTIONS MUST BE AT LEAST 15' LOWER THAN THE HEIGHT OF THE SENSOR WITHIN THE 500' RADIUS AND AT LEAST 10' LOWER THAN THE HEIGHT OF THE SENSOR FROM 500' TO 1,000'.
11	REFER TO THE AIRSPACE SHEETS FOR ELEVATION INFORMATION FOR THE TRAVERSE WAYS THAT INTERSECT PART 77 APPROACH SURFACES AND EXTENDED RUNWAY CETNERLINE.

BUILDINGS & FACILITIES

NO.	FACILITY TYPE	STRUCTURE ELEVATION (MSL) (NAVD88)
1	ADMINSITRATION BUILDING	311.43'
2	ADMINSITRATION BUILDING ANNEX	299.25'
3	BATHROOM BUILDING	N/A
4	ELECTRICAL CONTROL BUILDING	N/A
5	FBO / SHOP / OFFICE	298.49'
6	CONVENTIONAL HANGAR	307.73'
7	CONVENTIONAL HANGAR	311.54'
8	CONVENTIONAL HANGAR	299.93'
9	CONVENTIONAL HANGAR	308.84'
10	T-HANGARS	292.62'
11	CONVENTIONAL HANGAR	307.97'
12	CONVENTIONAL HANGAR	310.03'
13	T-HANGARS	N/A
14	T-HANGARS	N/A
15	T-HANGARS	N/A
16	T-HANGARS	N/A
17	T-HANGARS	292.77'
18	T-HANGARS	314.74'
19	CONVENTIONAL HANGAR	292.33'
20	T-HANGARS	290.16'
21	T-HANGARS	290.59'
22	T-HANGARS	297.34'
23	CONVENTIONAL HANGAR	299.30'
24	ATCT (DECOMMISSIONED)	352.58'
25	ELECTRICAL VAULT	N/A
26	FUEL TANK FOR EMERGENCY GENERATOR	N/A
27	AIRPORT MAINTENANCE SHOP	296.35'
28	CONVENTIONAL HANGAR	302.77'
29	TOWER (AFFIXED ON TOP OF HANGAR)	346.70'
30	T-HANGARS	299.99'
31	T-HANGARS	294.88'
32	T-HANGARS	295.54'
33	T-HANGARS	296.89'
34	T-HANGARS	297.30'
35	T-HANGARS	296.96'

NOTE:
N/A = DATA NOT AVAILABLE

LEGEND

DESCRIPTION	SYMBOLOGY
AIRPORT REFERENCE POINT	
LIGHTED WIND CONE	
SEGMENTED CIRCLE	
AIRCRAFT TIE--DOWNS	
FUEL TANK	
MONUMENTS (PACS & SACS)	P / S
RUNWAY THRESHOLD LIGHTS	
AWOS	AWOS
AWOS CRITICAL AREA	
GROUND CONTOURS	
FENCE	X X
AIRPORT PROPERTY LINE	
HOLD LINE	
DASHED TAXIWAY / TAXILANE EDGE	
RUNWAY SAFETY AREA (RSA)	RSA RSA
RUNWAY OBJECT FREE AREA (ROFA)	ROFA ROFA
RUNWAY OBSTACLE FREE ZONE (ROFZ)	OFZ OFZ
RUNWAY PROTECTION ZONE (RPZ) - APPROACH	RPZ RPZ
RUNWAY PROTECTION ZONE (RPZ) - DEPARTURE	RPZ RPZ
TAXIWAY / TAXILANE SAFETY AREA (TSA)	TSA TSA
TAXIWAY / TAXILANE OBJECT FREE AREA (TOFA)	TOFA TOFA
PART 77 APPROACH SURFACE	
THRESHOLD SITING SURFACE (TSS)	TSS TSS
DEPARTURE SURFACE	DEP DEP
GLIDESLOPE QUALIFICATION SURFACE (GQS)	
BUILDING RESTRICTION LINE (BRL)	BRL BRL
AIRFIELD PAVEMENT (RWY / TWY / APRON)	
ON-AIRPORT BUILDINGS	

TRUE
MAGNETIC
MAGNETIC DECLINATION: 12.62° W
JANUARY 2021
ANNUAL CHANGE: 0.09 W

GRAPHIC SCALE IN FEET
0 100 200 400

FRESNO CHANDLER
EXECUTIVE AIRPORT
4995 E CLINTON WAY, FRESNO, CA 93727
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AIRPORT LAYOUT PLAN DRAWING SET

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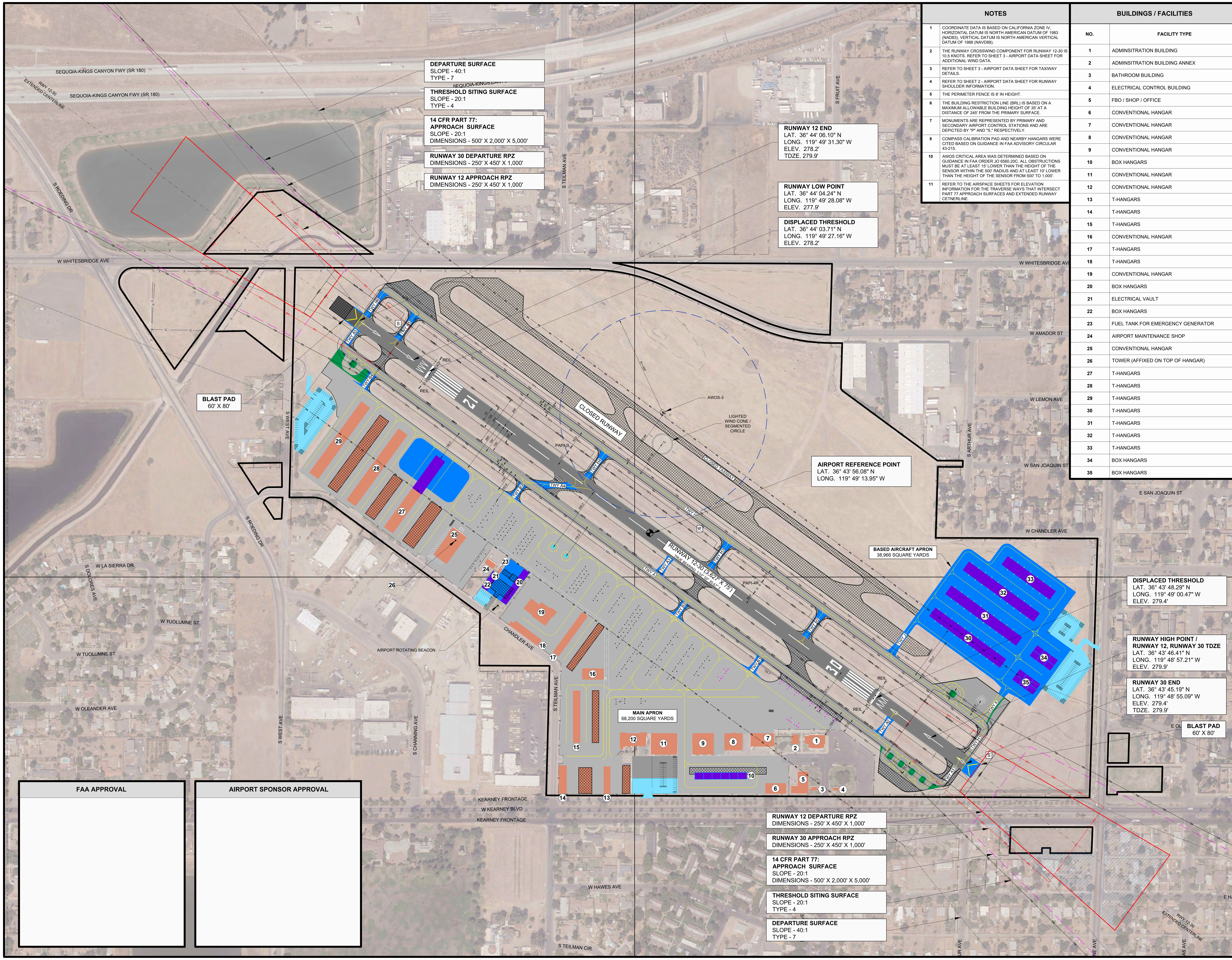
PROJECT NUMBER: 091733014
DATE: JUNE 2021
DRAWN BY: JC
REVIEWED BY:
APPROVED BY:

No.	REVISIONS	DATE

SHEET TITLE: EXISTING FACILITIES

SHEET NUMBER: 4 OF 15

THE PREPARATION OF THIS PLAN WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REPRESENT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATED IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE N ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.



NOTES

1	COORDINATE DATA IS BASED ON CALIFORNIA ZONE IV, HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983 (NAD83), VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
2	THE RUNWAY CROSSWIND COMPONENT FOR RUNWAY 12-30 IS 10.5 KNOTS. REFER TO SHEET 3 - AIRPORT DATA SHEET FOR ADDITIONAL WIND DATA.
3	REFER TO SHEET 3 - AIRPORT DATA SHEET FOR TAXIWAY DETAILS.
4	REFER TO SHEET 2 - AIRPORT DATA SHEET FOR RUNWAY SHOULDER INFORMATION.
5	THE PERIMETER FENCE IS 8' IN HEIGHT.
6	THE BUILDING RESTRICTION LINE (BRL) IS BASED ON A MAXIMUM ALLOWABLE BUILDING HEIGHT OF 35' AT A DISTANCE OF 245' FROM THE PRIMARY SURFACE.
7	MONUMENTS ARE REPRESENTED BY PRIMARY AND SECONDARY AIRPORT CONTROL STATIONS AND ARE DEPICTED BY "P" AND "S," RESPECTIVELY.
8	COMPASS CALIBRATION PAD AND NEARBY HANGARS WERE CITED BASED ON GUIDANCE IN FAA ADVISORY CIRCULAR 43-215.
10	AWOS CRITICAL AREA WAS DETERMINED BASED ON GUIDANCE IN FAA ORDER JO 6560.20C. ALL OBSTRUCTIONS MUST BE AT LEAST 15' LOWER THAN THE HEIGHT OF THE SENSOR WITHIN THE 500' RADIUS AND AT LEAST 10' LOWER THAN THE HEIGHT OF THE SENSOR FROM 500' TO 1,000'.
11	REFER TO THE AIRSPACE SHEETS FOR ELEVATION INFORMATION FOR THE TRAVERSE WAYS THAT INTERSECT PART 77 APPROACH SURFACES AND EXTENDED RUNWAY CETNERLINE.

BUILDINGS / FACILITIES

NO.	FACILITY TYPE
1	ADMINSITRATION BUILDING
2	ADMINSITRATION BUILDING ANNEX
3	BATHROOM BUILDING
4	ELECTRICAL CONTROL BUILDING
5	FBO / SHOP / OFFICE
6	CONVENTIONAL HANGAR
7	CONVENTIONAL HANGAR
8	CONVENTIONAL HANGAR
9	CONVENTIONAL HANGAR
10	BOX HANGARS
11	CONVENTIONAL HANGAR
12	CONVENTIONAL HANGAR
13	T-HANGARS
14	T-HANGARS
15	T-HANGARS
16	CONVENTIONAL HANGAR
17	T-HANGARS
18	T-HANGARS
19	CONVENTIONAL HANGAR
20	BOX HANGARS
21	ELECTRICAL VAULT
22	BOX HANGARS
23	FUEL TANK FOR EMERGENCY GENERATOR
24	AIRPORT MAINTENANCE SHOP
25	CONVENTIONAL HANGAR
26	TOWER (AFFIXED ON TOP OF HANGAR)
27	T-HANGARS
28	T-HANGARS
29	T-HANGARS
30	T-HANGARS
31	T-HANGARS
32	T-HANGARS
33	T-HANGARS
34	BOX HANGARS
35	BOX HANGARS

LEGEND

DESCRIPTION	SYMBOLOGY
AIRPORT REFERENCE POINT	
LIGHTED WIND CONE	
SEGMENTED CIRCLE	
AIRCRAFT TIE--DOWNS	
FUTURE ITINERANT AIRCRAFT TIE-DOWNS	
HELICOPTER OPERATING AREA	H
FUEL TANK	
MONUMENTS (PACS & SACS)	P / S
RUNWAY THRESHOLD LIGHTS	
AWOS	AWSOS
AWOS CRITICAL AREA	
GROUND CONTOURS	
FENCE	X X
AIRPORT PROPERTY LINE	
HOLD LINE	
DASHED TAXIWAY / TAXILANE EDGE	
RUNWAY SAFETY AREA (RSA)	RSA RSA
RUNWAY OBJECT FREE AREA (ROFA)	ROFA ROFA
RUNWAY OBSTACLE FREE ZONE (ROFZ)	OFZ OFZ
RUNWAY PROTECTION ZONE (RPZ) - APPROACH	RPZ RPZ
RUNWAY PROTECTION ZONE (RPZ) - DEPARTURE	RPZ RPZ
TAXIWAY / TAXILANE SAFETY AREA (TSA)	TSA TSA
TAXIWAY / TAXILANE OBJECT FREE AREA (TOFA)	TOFA TOFA
PART 77 APPROACH SURFACE	
THRESHOLD SITING SURFACE (TSS)	TSS TSS
DEPARTURE SURFACE	DEP DEP
BUILDING RESTRICTION LINE (BRL)	BRL BRL
AIRFIELD PAVEMENT (RWY / TWY / APRON)	
NEW AIRFIELD PAVEMENT	
NEW VEHICLE PARKING PAVEMENT	
EXISTING ON-AIRPORT BUILDINGS	
NEW ON-AIRPORT BUILDINGS	
PAINTED ISLAND	
PAVEMENT / BUILDINGS TO BE REMOVED	
FUTURE AVIGATION EASEMENT	

FAA APPROVAL

AIRPORT SPONSOR APPROVAL

FRESNO CHANDLER
EXECUTIVE AIRPORT

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AIRPORT LAYOUT PLAN DRAWING SET

PREPARED BY:

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PROJECT NUMBER: 091733014

DATE: JUNE 2021

DRAWN BY: JC
REVIEWED BY:
APPROVED BY:

No.	REVISIONS	DATE

SHEET TITLE: FUTURE LAYOUT

SHEET NUMBER: 5 OF 15

THE PREPARATION OF THIS PLAN WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REPRESENT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATED IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE N ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

FUTURE RUNWAY 12 DECLARED DISTANCES

FUTURE RUNWAY 30 DECLARED DISTANCES

DECLARED DISTANCES

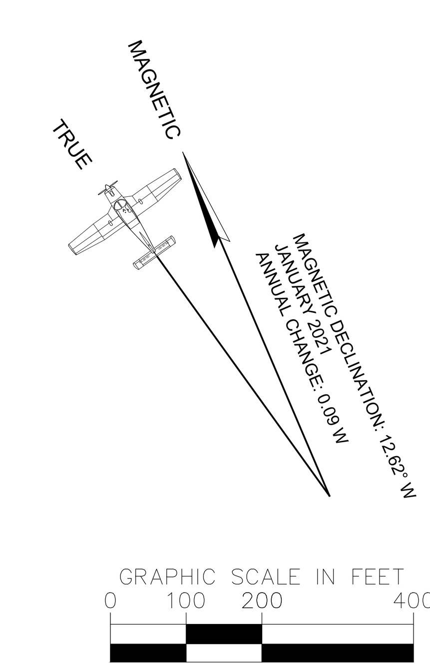
DECLARED DISTANCES	RUNWAY 12		RUNWAY 30	
	EXISTING	FUTURE	EXISTING	FUTURE
TAKEOFF RUN AVAILABLE (TORA)	N/A	3,483'	N/A	3,627'
TAKEOFF DISTANCE AVAILABLE (TODA)	N/A	3,627'	N/A	3,627'
ACCELERATE STOP DISTANCE AVAILABLE (ASDA)	N/A	3,475'	N/A	3,627'
LANDING DISTANCE AVAILABLE (LDA)	N/A	3,060'	N/A	3,089'

NOTES

1	E = EXISTING F = FUTURE
2	RUNWAY DESIGN AREAS ARE BASED ON THE FUTURE AIRPORT REFERENCE CODE A-I (SMALL).

LEGEND

DESCRIPTION	SYMBOLOGY	DESCRIPTION	SYMBOLOGY	DESCRIPTION	SYMBOLOGY
AIRCRAFT TIE-DOWNS (E)		RUNWAY PROTECTION ZONE (RPZ) - DEPARTURE (E / F)	RPZ RPZ	ON-AIRPORT BUILDINGS (E)	
ITINERANT AIRCRAFT TIE-DOWNS (F)		DEPARTURE SURFACE (E / F)	DEP DEP	ON-AIRPORT BUILDINGS (F)	
AIRPORT PROPERTY LINE (E / F)		THRESHOLD SITING SURFACE (TSS) (TYPE 4) (E / F)	TSS TSS	PAINTED ISLAND (F)	
RUNWAY SAFETY AREA (RSA) (E / F)	RSA RSA	AIRFIELD PAVEMENT (RWY / TWY / APRON) (E)		PAVEMENT / BUILDINGS TO BE REMOVED (F)	
RUNWAY OBJECT FREE AREA (ROFA) (E / F)	ROFA ROFA	AIRFIELD PAVEMENT (F)		AVIGATION EASEMENT (F)	
RUNWAY PROTECTION ZONE (RPZ) - APPROACH (E / F)	RPZ RPZ	VEHICLE PARKING PAVEMENT (F)			



FRESNO CHANDLER EXECUTIVE AIRPORT

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AIRPORT LAYOUT PLAN DRAWING SET

PREPARED BY:

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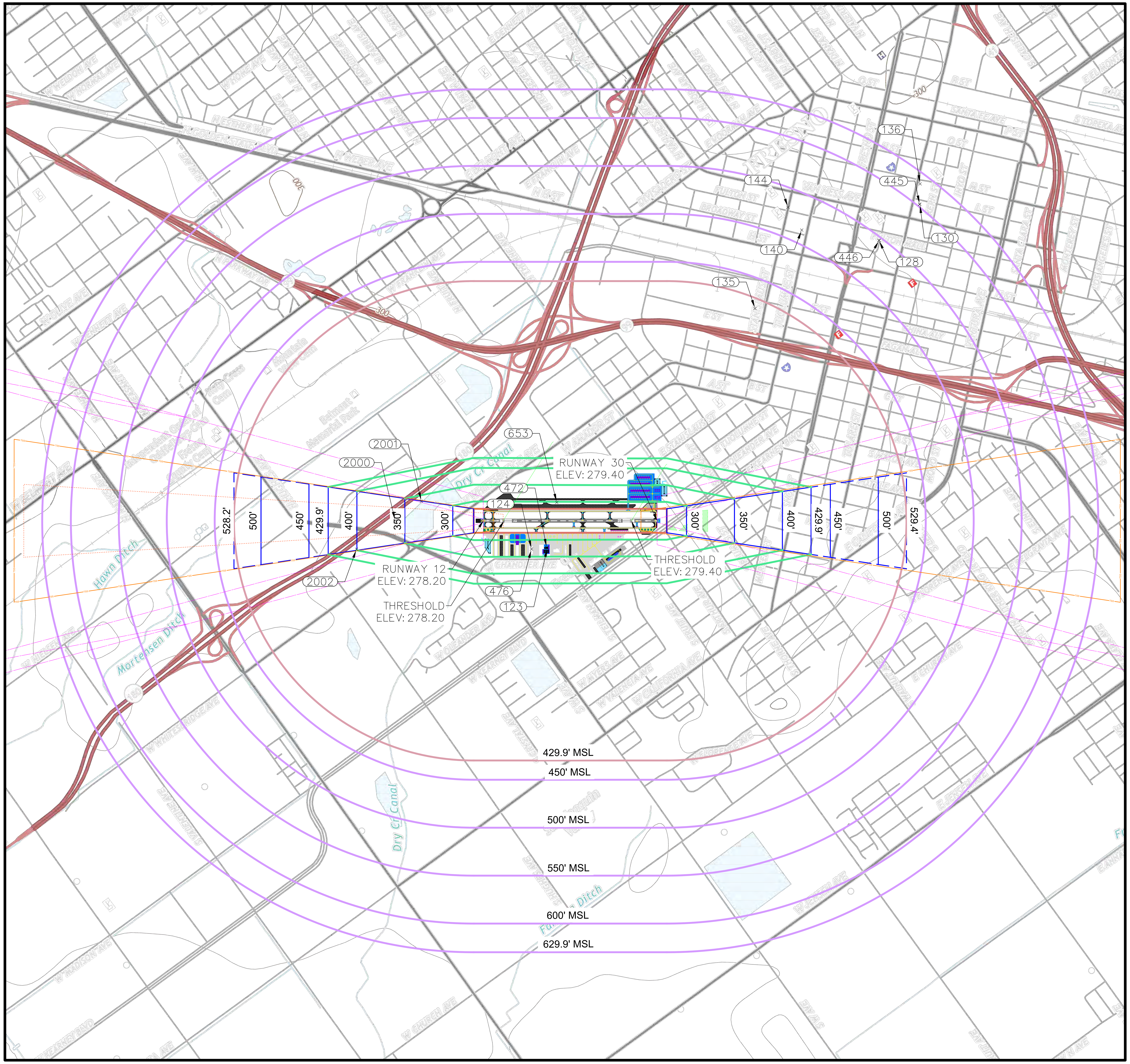
PROJECT NUMBER: 091733014
DATE: JUNE 2021
DRAWN BY: JC
REVIEWED BY:
APPROVED BY:

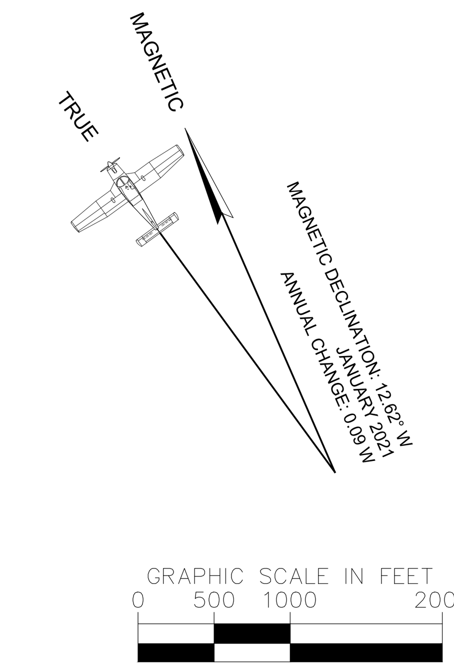
No.	REVISIONS	DATE

SHEET TITLE: FUTURE RUNWAY 12-30 DECLARED DISTANCES

SHEET NUMBER: 6 OF 15

THE PREPARATION OF THIS PLAN WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REPRESENT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATED IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE N ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.





OBSTRUCTION TO PART 77 SURFACES								
POINT ID	OBJECT PENETRATION (FT)	DESCRIPTION	OBSTRUCTION ELEVATION (FT)	PART 77 ELEVATION (FT)	PART 77 SURFACE	EG ELEVATION (FT)	FAA STUDY ID	PROPOSED DISPOSITION
123	31	BLDG	355	324	TRANSITIONAL	280	N/A	LIGHT
124	19	BLDG	346	327	TRANSITIONAL	278	N/A	LIGHT
128	95	BLDG-TWR	642	547	CONICAL	UNKNOWN	0092_AW00959OE	NONE
130	27	BLDG-TWR	630	603	CONICAL	UNKNOWN	2002AWP04052OE	NONE
135	209	TOWER	639	430	HORIZONTAL	UNKNOWN	0066_SF00007OE	LIGHT
136	14	TOWER	634	620	CONICAL	UNKNOWN	0069_SF00237OE	NONE
140	19	BLDG-TWR	533	514	CONICAL	UNKNOWN	N/A	NONE
144	34	TOWER	565	531	CONICAL	UNKNOWN	N/A	NONE
445	5	ANTENNA	607	602	CONICAL	UNKNOWN	N/A	NONE
446	28	BUILDING	574	547	CONICAL	UNKNOWN	N/A	NONE
472	29	CONTROL TOWER	353	323	TRANSITIONAL	280	N/A	REMOVE
476	20	ANTENNA	347	327	TRANSITIONAL	278	N/A	LIGHT
653	5	NAVAID	303	298	TRANSITIONAL	278	N/A	NONE
2000	-87	PRIMARY ROAD	273	360	APPROACH RWY 12	256	N/A	NONE
2001	-48	PRIMARY ROAD	285	333	APPROACH RWY 12	268	N/A	NONE
2002	-117	PRIMARY ROAD	283	400	APPROACH RWY 12	266	N/A	NONE

NOTES:

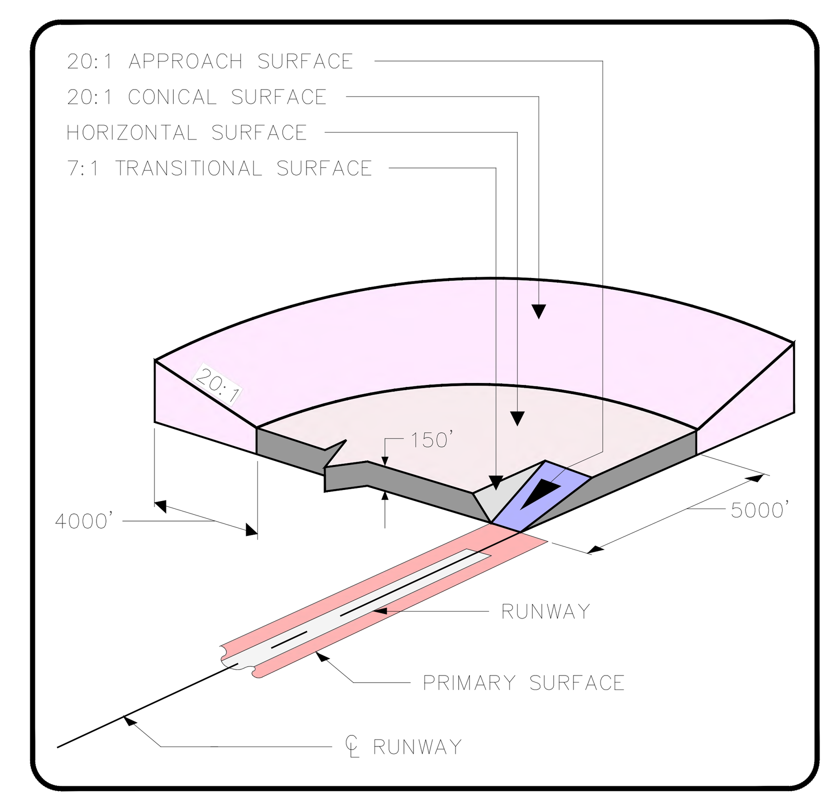
1. SURVEY DATA FROM 11/16/2018.
2. QUAD MAP SOURCE: USGS FRESNO SOUTH, CA 2015.
3. TRAVERSE WAY ELEVATIONS ARE ADJUSTED AS SHOWN:
   - 23' FOR RAILWAYS
   - 17' FOR INTERSTATE HIGHWAYS
   - 15' FOR OTHER PUBLIC ROADS
   - 10' FOR PRIVATE ROADS
4. NEGATIVE PENETRATION VALUES INDICATE THE CLEAR DISTANCE FROM THE TOP OF THE OBJECT TO THE PART 77 SURFACE.
5. THE CITY OF FRESNO HAS NO HEIGHT RESTRICTIONS ZONING ORDINANCES IN PLACE.

ABBREVIATIONS:

- EG EXISTING GROUND
- BLDG BUILDING
- TWR TOWER
- NAVAID NAVIGATIONAL AIDS

SEE SHEET 7 FOR RUNWAY 12-30 CENTERLINE PROFILE

ISOMETRIC VIEW



FRESNO CHANDLER
EXECUTIVE AIRPORT

4995 E CLINTON WAY, FRESNO, CA 93727
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AIRPORT LAYOUT PLAN
DRAWING SET

PREPARED BY:

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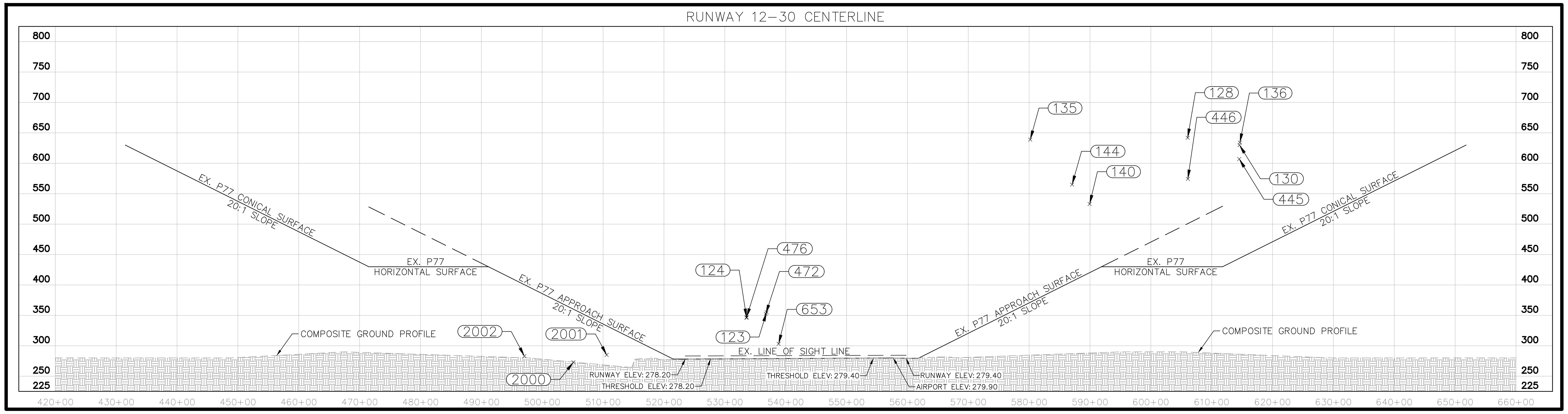
PROJECT NUMBER: 091733014
DATE: JUNE 2021
DRAWN BY: JC
REVIEWED BY:
APPROVED BY:

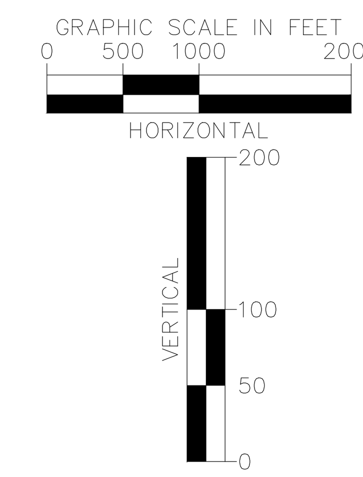
No.	REVISIONS	DATE

SHEET TITLE: AIRPORT AIRSPACE DRAWING: PLAN VIEW

SHEET NUMBER: 7 OF 15

THE PREPARATION OF THIS PLAN WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REPRESENT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATED IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE N ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.





OBSTRUCTION TO PART 77 SURFACES								
POINT ID	OBJECT PENETRATION (FT)	DESCRIPTION	OBSTRUCTION ELEVATION (FT)	PART 77 ELEVATION (FT)	PART 77 SURFACE	EG ELEVATION (FT)	FAA STUDY ID	PROPOSED DISPOSITION
123	31	BLDG	355	324	TRANSITIONAL	280	N/A	LIGHT
124	19	BLDG	346	327	TRANSITIONAL	278	N/A	LIGHT
128	95	BLDG-TWR	642	547	CONICAL	UNKNOWN	0092_AW00959OE	NONE
130	27	BLDG-TWR	630	603	CONICAL	UNKNOWN	2002AWP04052OE	NONE
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136	14	TOWER	634	620	CONICAL	UNKNOWN	0069_SF00237OE	NONE
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446	28	BUILDING	574	547	CONICAL	UNKNOWN	N/A	NONE
472	29	CONTROL TOWER	353	323	TRANSITIONAL	280	N/A	REMOVE
476	20	ANTENNA	347	327	TRANSITIONAL	278	N/A	LIGHT
653	5	NAVAID	303	298	TRANSITIONAL	278	N/A	NONE
2000	-87	PRIMARY ROAD	273	360	APPROACH RWY 12	256	N/A	NONE
2001	-48	PRIMARY ROAD	285	333	APPROACH RWY 12	268	N/A	NONE
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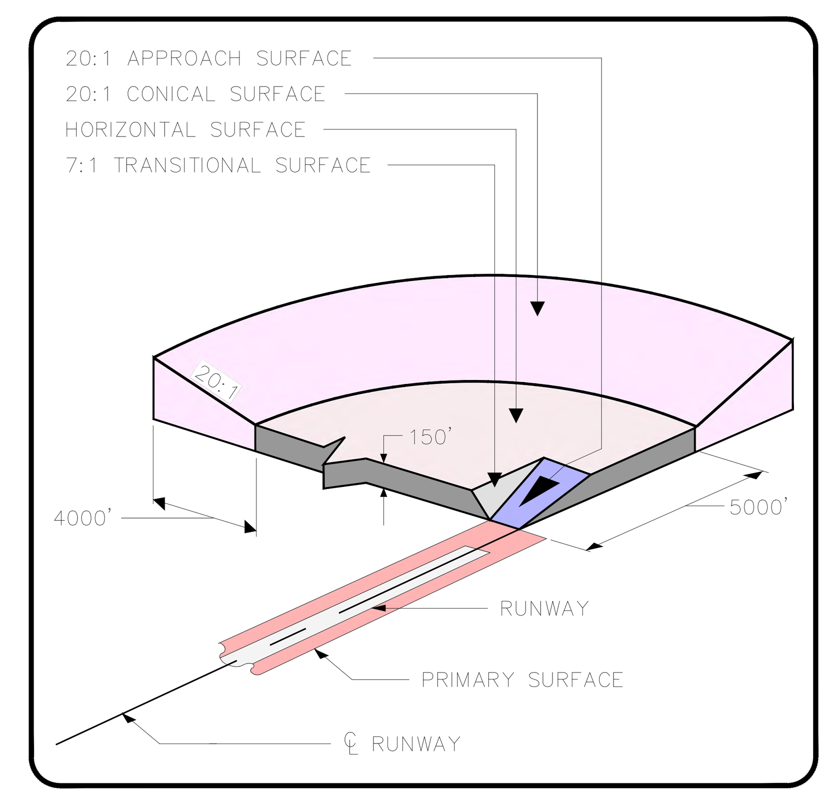
NOTES:

1. SURVEY DATA FROM 11/16/2018
2. TRAVERSE WAY ELEVATIONS ARE ADJUSTED AS SHOWN:
   - 23' FOR RAILWAYS
   - 17' FOR INTERSTATE HIGHWAYS
   - 15' FOR OTHER PUBLIC ROADS
   - 10' FOR PRIVATE ROADS
3. NEGATIVE PENETRATION VALUES INDICATE THE CLEAR DISTANCE FROM THE TOP OF THE OBJECT TO THE PART 77 SURFACE.

ABBREVIATIONS:

- BLDG — BUILDING
- EG — EXISTING GROUND
- NAVAID — NAVIGATIONAL AIDS
- TWR — TOWER

ISOMETRIC VIEW



FRESNO CHANDLER EXECUTIVE AIRPORT

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AIRPORT LAYOUT PLAN DRAWING SET

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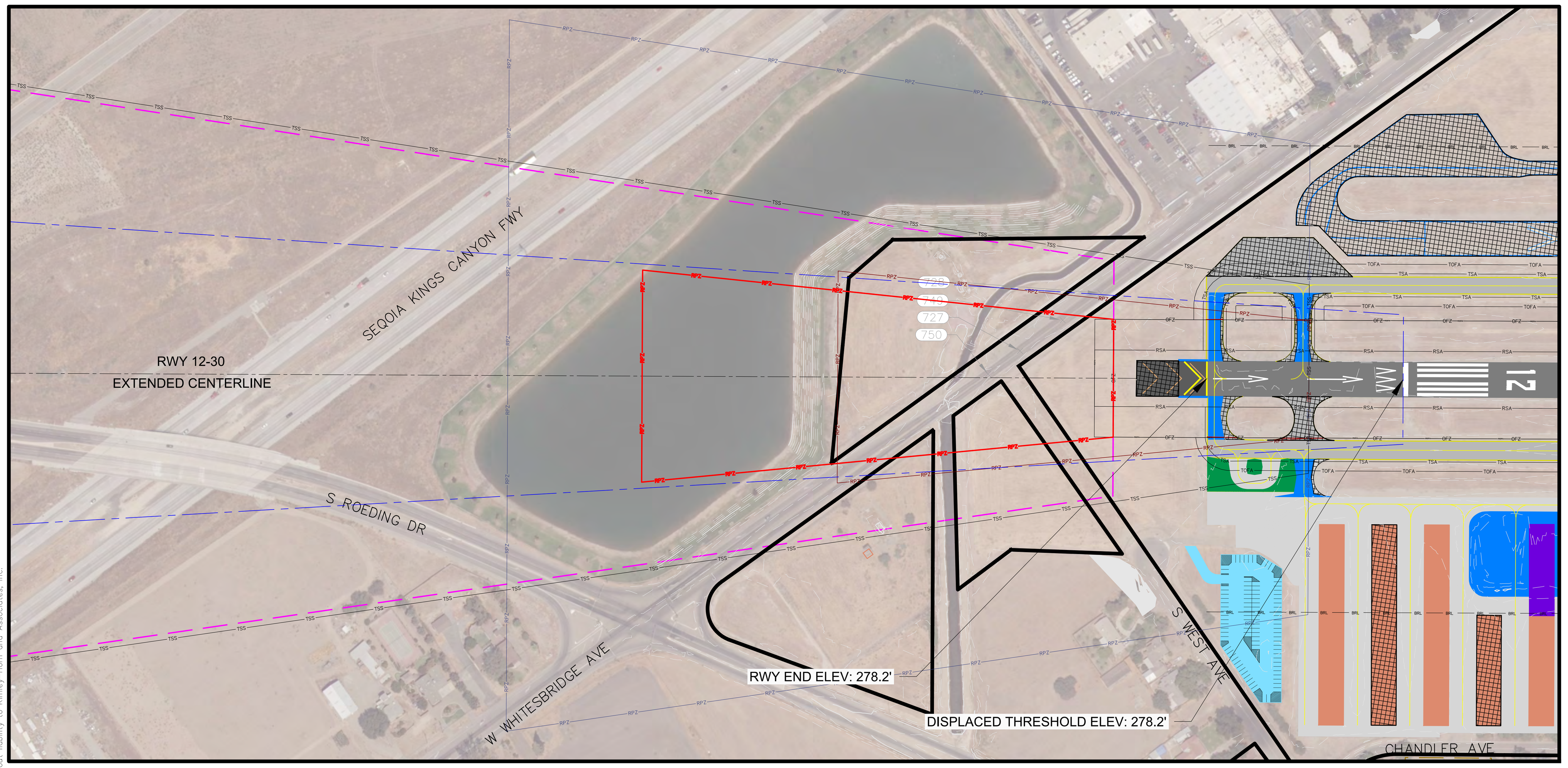
PROJECT NUMBER: 091733014
DATE: JUNE 2021
DRAWN BY: JC
REVIEWED BY:
APPROVED BY:

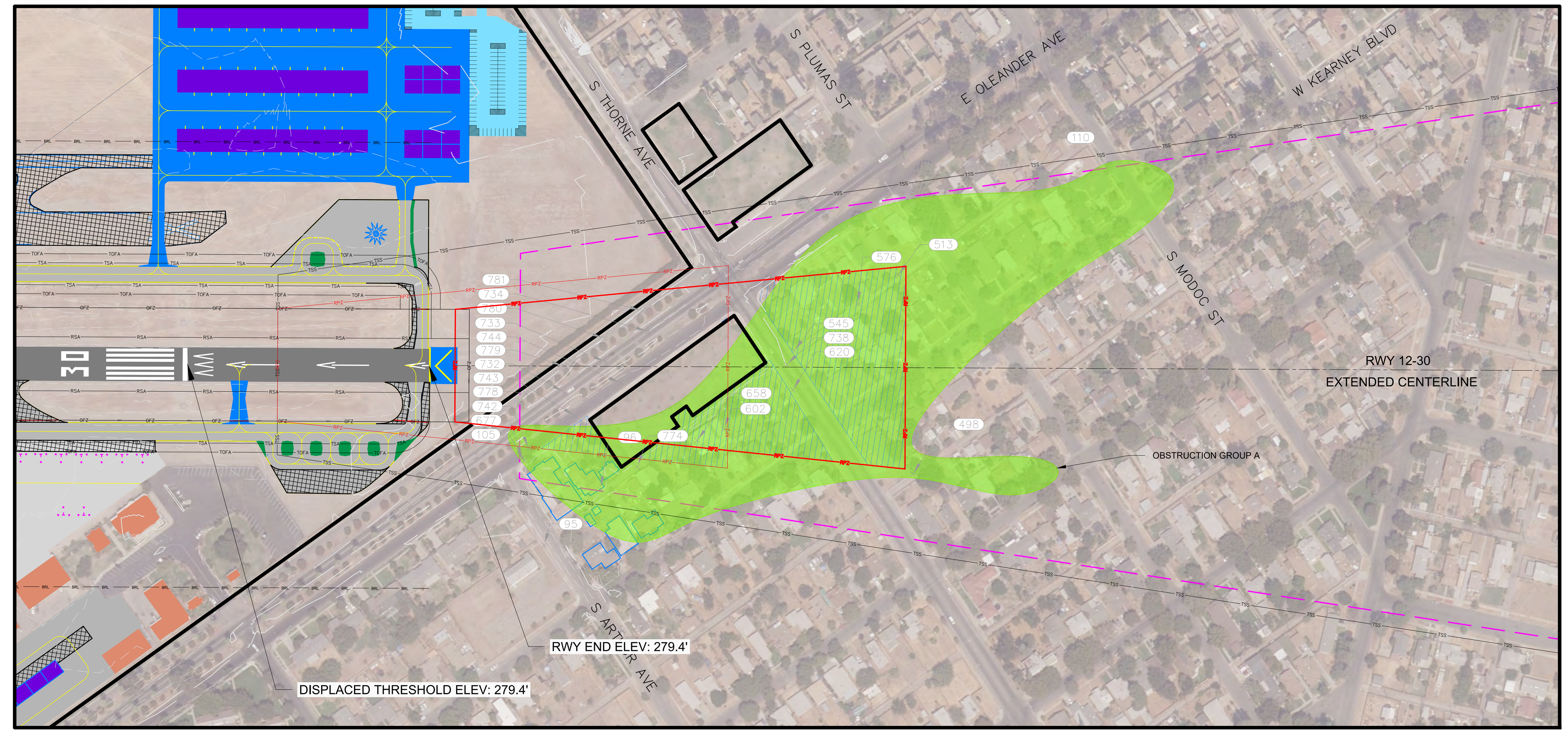
No.	REVISIONS	DATE

SHEET TITLE: AIRPORT AIRSPACE DRAWING: PROFILE VIEW

SHEET NUMBER: 8 OF 15

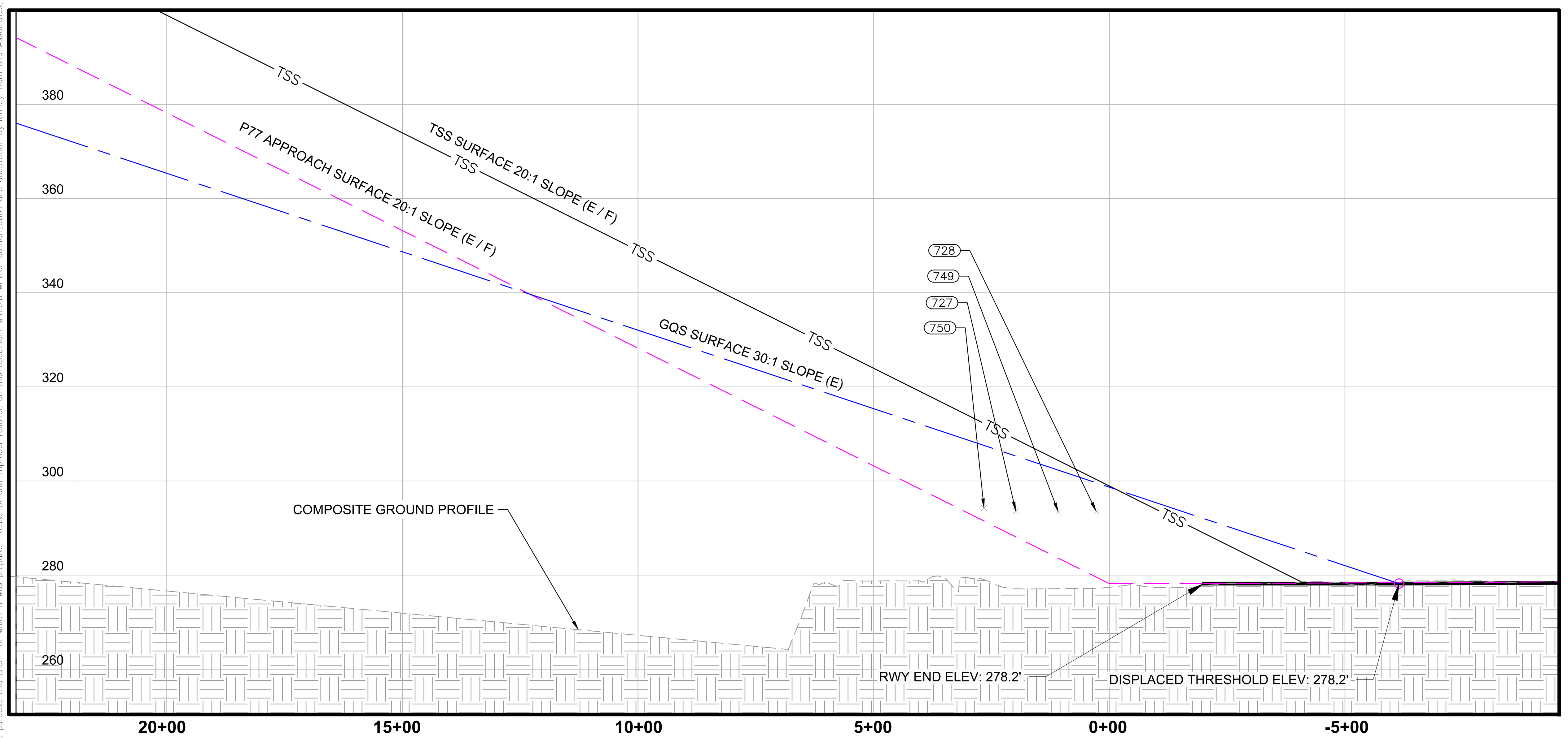
THE PREPARATION OF THIS PLAN WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REPRESENT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATED IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE N ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

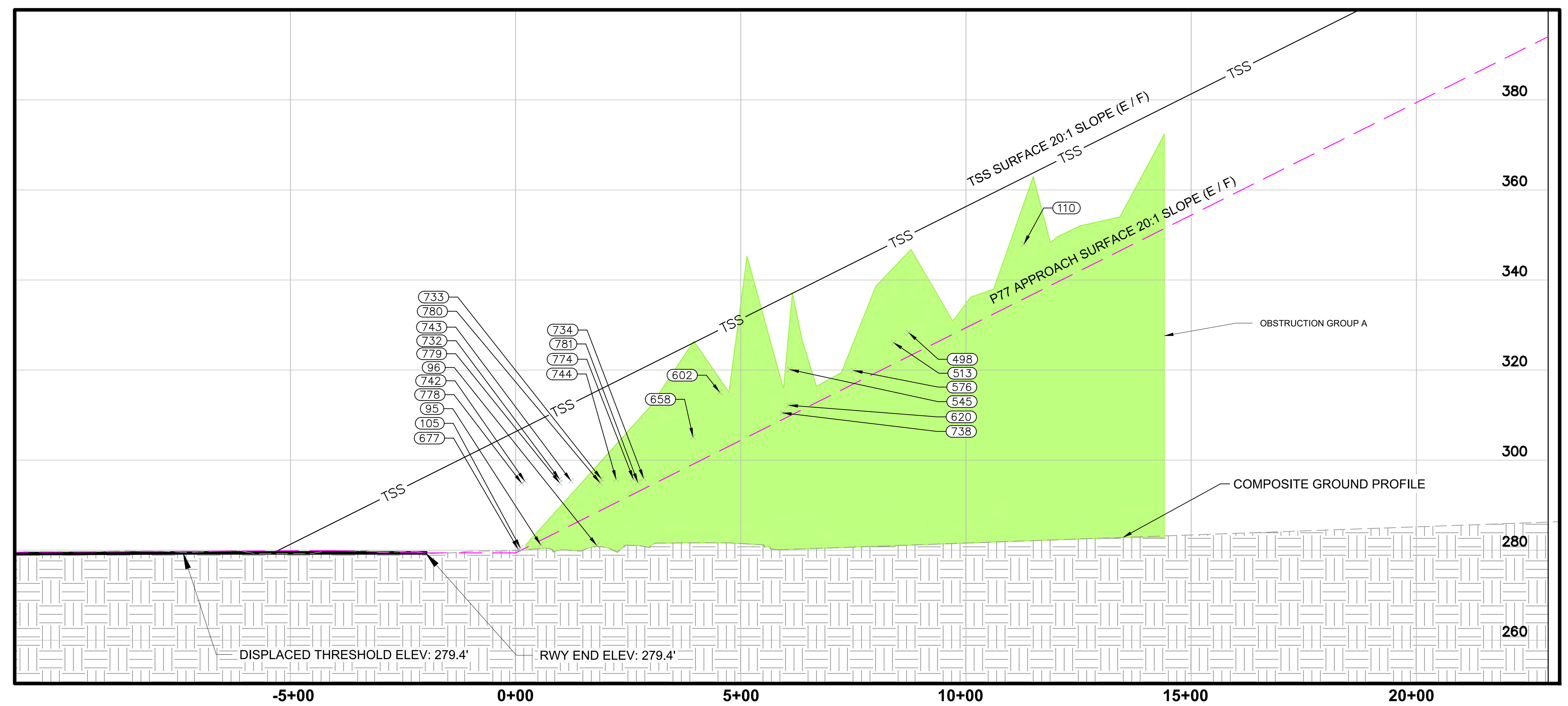




RUNWAY 12 END

RUNWAY 30 END



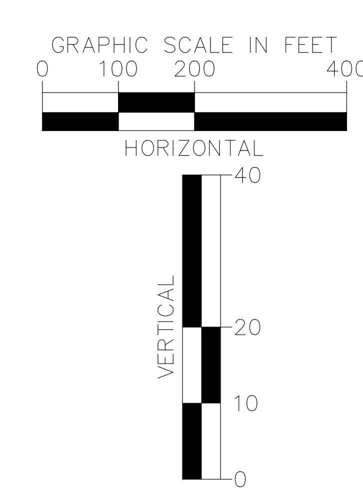


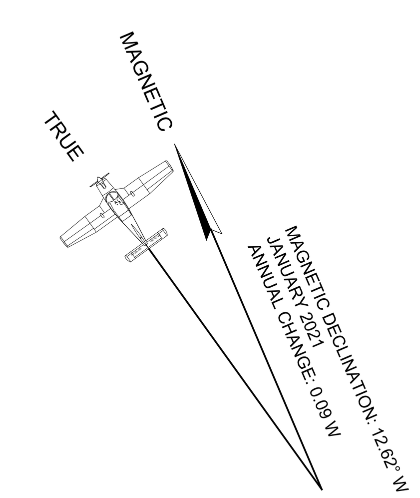
LEGEND			
DESCRIPTION	SYMBOLOGY	DESCRIPTION	SYMBOLOGY
AIRCRAFT TIE--DOWNS		GLIDESLOPE QUALIFICATION SURFACE (GQS)	
FUTURE ITINERANT AIRCRAFT TIE-DOWNS		BUILDING RESTRICTION LINE (BRL)	BRL BRL
AIRPORT PROPERTY LINE		AIRFIELD PAVEMENT (RWY / TWY / APRON)	
DASHED TAXIWAY / TAXILANE EDGE		NEW AIRFIELD PAVEMENT	
RUNWAY SAFETY AREA (RSA)	RSA RSA	NEW VEHICLE PARKING PAVEMENT	
RUNWAY OBJECT FREE AREA (ROFA)	ROFA ROFA	EXISTING ON-AIRPORT BUILDINGS	
RUNWAY OBSTACLE FREE ZONE (ROFZ)	OFZ OFZ	NEW ON-AIRPORT BUILDINGS	
RUNWAY PROTECTION ZONE (RPZ) - DEPARTURE (E / F)	RPZ RPZ	PAINTED ISLAND	
RUNWAY 12 RPZ - APPROACH (E)	RPZ RPZ	PAVEMENT / BUILDINGS TO BE REMOVED	
RUNWAY 12 RPZ - APPROACH (F)	RPZ RPZ	FUTURE AVIGATION EASEMENT	
RUNWAY 30 RPZ - APPROACH (E / F)	RPZ RPZ	OBSTRUCTION OBJECT	#XXX
TAXIWAY / TAXILANE SAFETY AREA (TSA)	TSA TSA	OBSTRUCTION GROUP A (45 TREES)	
TAXIWAY / TAXILANE OBJECT FREE AREA (TOFA)	TOFA TOFA	EXISTING MAJOR CONTOUR	
PART 77 APPROACH SURFACE		EXISTING MINOR CONTOUR	
DEPARTURE SURFACE	DEP DEP		
THRESHOLD SITING SURFACE (TSS)	TSS TSS		

SEE SHEET 10 FOR OBSTRUCTION TABLES

NOTES:

1. SURVEY DATA FROM 11/16/2018
2. AERIAL SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY
3. FUTURE DEVELOPMENT WILL NOT CREATE NEW OBSTRUCTIONS TO THE APPROACH SURFACES
4. TRAVERSE WAY ELEVATIONS ARE ADJUSTED AS SHOWN:
   - 23' FOR RAILWAYS
   - 17' FOR INTERSTATE HIGHWAYS
   - 15' FOR OTHER PUBLIC ROADS
   - 10' FOR PRIVATE ROADS
4. THERE AREA NO PENETRATIONS TO THE THRESHOLD SITING SURFACE ON THE RUNWAY 12 END





FRESNO CHANDLER
EXECUTIVE AIRPORT

4995 E CLINTON WAY, FRESNO, CA 93727
PHONE: 559-621-4500 FAX: 559-251-4825

AIRPORT LAYOUT PLAN
DRAWING SET

PREPARED BY:

Kimley»Horn

11400 COMMERCE PARK DR., SUITE 400, RESTON, VA 20191
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PROJECT NUMBER: 091733014
DATE: JUNE 2021
DRAWN BY: JC
REVIEWED BY:
APPROVED BY:

No.	REVISIONS	DATE

SHEET TITLE
INNER PORTION OF THE APPROACH SURFACE DRAWING

SHEET NUMBER
9 OF 15

THE PREPARATION OF THIS PLAN WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REPRESENT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATED IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE N ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

OBSTRUCTIONS TO APPROACH SURFACES

RUNWAY 30

POINT ID	DESCRIPTION	OBJECT ELEVATION (FT) (AGL)	SURFACE PENETRATION (FT) - P77 APPROACH SURFACE (20:1)	SURFACE PENETRATION (FT) - TSS (20:1)	PROPOSED DISPOSITION
105	POLE	280	1	-	PROVIDE OL
110	POLE	348	12	-	PROVIDE OL
498	POLE	328	5	-	PROVIDE OL
513	POLE	326	5	-	PROVIDE OL
545	POLE	320	10	-	PROVIDE OL
576	POLE	320	3	-	PROVIDE OL
602	POLE	315	13	-	PROVIDE OL
620	POLE	312	2	-	PROVIDE OL
658	BUILDING	305	6	-	TO REMAIN
677	POLE	280	1	-	PROVIDE OL
732	PRIMARY ROAD	296	11	-	NONE
733	PRIMARY ROAD	296	7	-	NONE
734	PRIMARY ROAD	296	2	-	NONE
738	PRIMARY ROAD	311	1	-	NONE
742	PRIMARY ROAD	295	15	-	NONE
743	PRIMARY ROAD	295	10	-	NONE
744	PRIMARY ROAD	296	5	-	NONE
774	SECONDARY ROAD	296	3	-	NONE
778	SECONDARY ROAD	295	15	-	NONE
779	SECONDARY ROAD	295	11	-	NONE
780	SECONDARY ROAD	295	6	-	NONE
781	SECONDARY ROAD	295	2	-	NONE
OBSTRUCTION GROUP A					
954	TREE	319	4	-	TRIM / REMOVE
955	TREE	338	5	-	TRIM / REMOVE
957	TREE	348	10	-	TRIM / REMOVE
966	TREE	355	29	2	TRIM / REMOVE
967	TREE	330	2	-	TRIM / REMOVE
968	TREE	336	6	-	TRIM / REMOVE
971	TREE	348	13	-	TRIM / REMOVE
972	TREE	348	12	-	TRIM / REMOVE
976	TREE	363	26	-	TRIM / REMOVE
977	TREE	350	10	-	TRIM / REMOVE
978	TREE	347	10	-	TRIM / REMOVE
980	TREE	352	10	-	TRIM / REMOVE
982	TREE	344	1	-	TRIM / REMOVE
983	TREE	354	8	-	TRIM / REMOVE
1015	TREE	336	3	-	TRIM / REMOVE
1016	TREE	346	11	-	TRIM / REMOVE
1209	TREE	342	34	7	TRIM / REMOVE
1210	TREE	327	15	-	TRIM / REMOVE
1211	TREE	338	19	-	TRIM / REMOVE
1212	TREE	322	1	-	TRIM / REMOVE
1213	TREE	347	23	-	TRIM / REMOVE
1256	TREE	299	5	-	TRIM / REMOVE
1257	TREE	303	5	-	TRIM / REMOVE
1258	TREE	326	27	-	TRIM / REMOVE
1259	TREE	311	12	-	TRIM / REMOVE
1260	TREE	305	6	-	TRIM / REMOVE
1261	TREE	301	4	-	TRIM / REMOVE
1265	TREE	345	40	13	TRIM / REMOVE
1270	TREE	315	12	-	TRIM / REMOVE
1279	TREE	316	4	-	TRIM / REMOVE
1286	TREE	319	5	-	TRIM / REMOVE
1287	TREE	318	4	-	TRIM / REMOVE
1292	TREE	337	27	-	TRIM / REMOVE
1293	TREE	316	7	-	TRIM / REMOVE
1294	TREE	308	1	-	TRIM / REMOVE
1314	TREE	333	12	-	TRIM / REMOVE
1315	TREE	321	1	-	TRIM / REMOVE
1319	TREE	328	6	-	TRIM / REMOVE
1325	TREE	328	3	-	TRIM / REMOVE
1331	TREE	316	4	-	TRIM / REMOVE
1349	TREE	297	3	-	TRIM / REMOVE
1350	TREE	296	2	-	TRIM / REMOVE
1396	TREE	372	21	-	TRIM / REMOVE
1412	TREE	281	1	-	TRIM / REMOVE
1424	TREE	312	18	-	TRIM / REMOVE

OBSTRUCTIONS TO APPROACH SURFACES

RUNWAY 12

POINT ID	DESCRIPTION	OBJECT ELEVATION (FT) (AGL)	SURFACE PENETRATION (FT) - P77 APPROACH SURFACE (20:1)	SURFACE PENETRATION (FT) - TSS (20:1)	SURFACE PENETRATION (FT) - GQS (30:1)	PROPOSED DISPOSITION
727	PRIMARY ROAD	294	5	-	-	NONE
728	PRIMARY ROAD	294	14	-	-	NONE
749	PRIMARY ROAD	293	10	-	-	NONE
750	PRIMARY ROAD	294	3	-	-	NONE

OBSTRUCTIONS TO OFZ SURFACE

RUNWAY ENDS 12 & 30

POINT ID	RUNWAY END	DESCRIPTION	OBJECT ELEVATION (FT) (AGL)	PROPOSED DISPOSITION
95	30	AIRFIELD SIGN	282	NONE
96	12	AIRFIELD SIGN	279	NONE

NOTES:

1. SURVEY DATA FROM 11/16/2018
2. ALL ELEVATIONS ROUNDED TO THE NEAREST WHOLE NUMBER
3. TRAVERSE WAY ELEVATIONS ARE ADJUSTED AS SHOWN:
   - 23' FOR RAILWAYS
   - 17' FOR INTERSTATE HIGHWAYS
   - 15' FOR OTHER PUBLIC ROADS
   - 10' FOR PRIVATE ROADS

ABBREVIATIONS:

- FT FEET
- AGL ABOVE GROUND LEVEL
- OL OBSTRUCTION LIGHT

FRESNO CHANDLER EXECUTIVE AIRPORT
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PHONE: 559-621-4500 FAX: 559-251-4825

AIRPORT LAYOUT PLAN DRAWING SET

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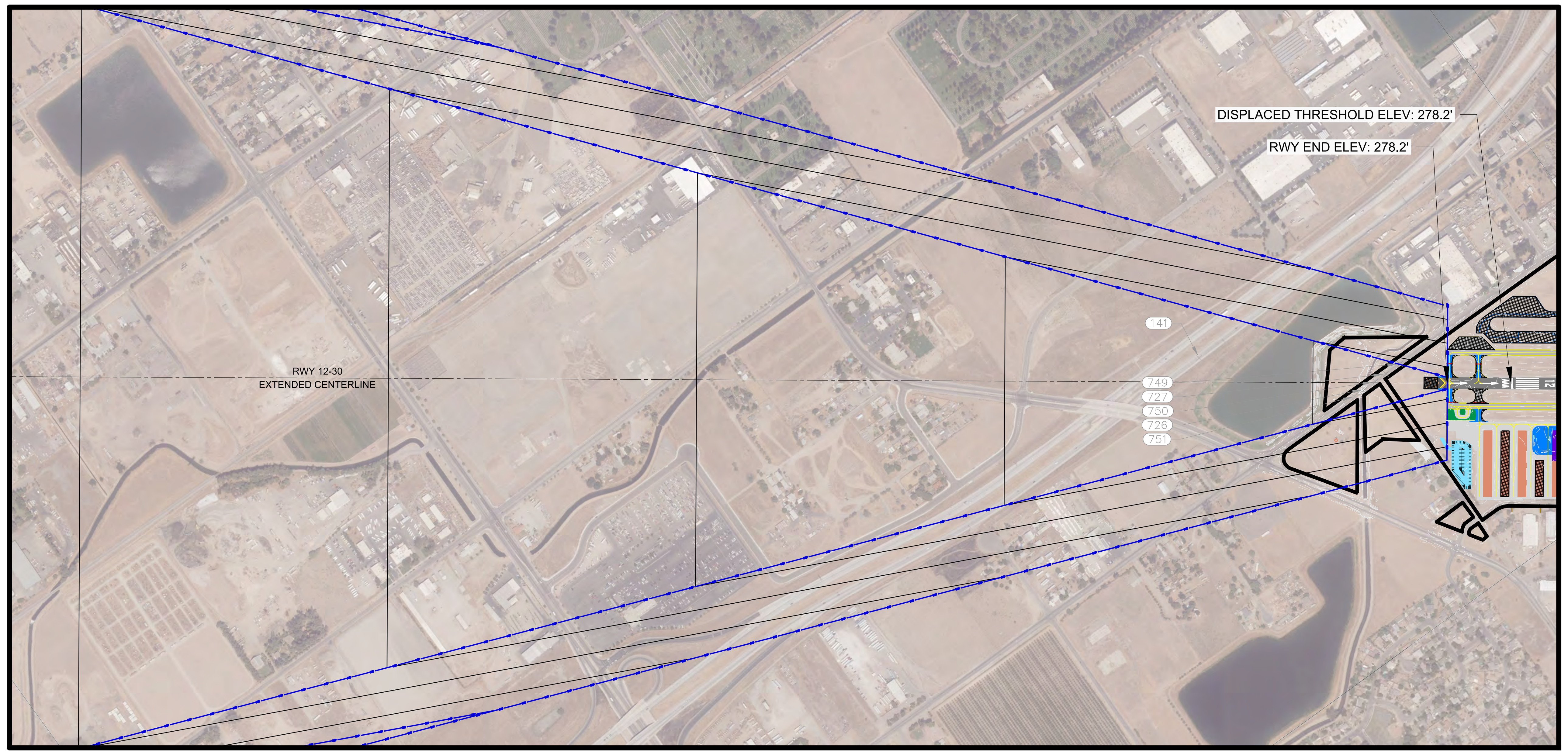
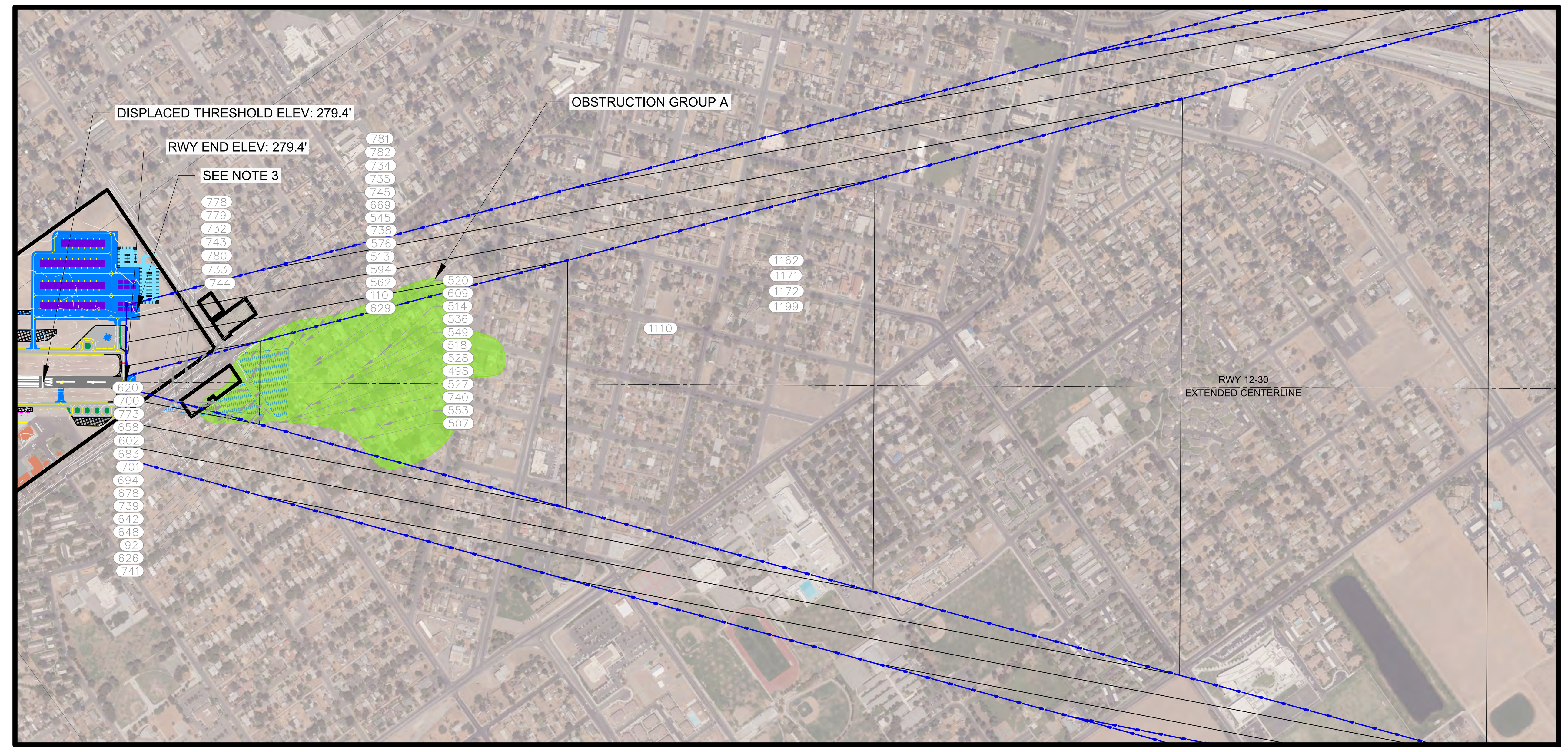
PROJECT NUMBER: 091733014
DATE: JUNE 2021
DRAWN BY: JC
REVIEWED BY:
APPROVED BY:

No.	REVISIONS	DATE

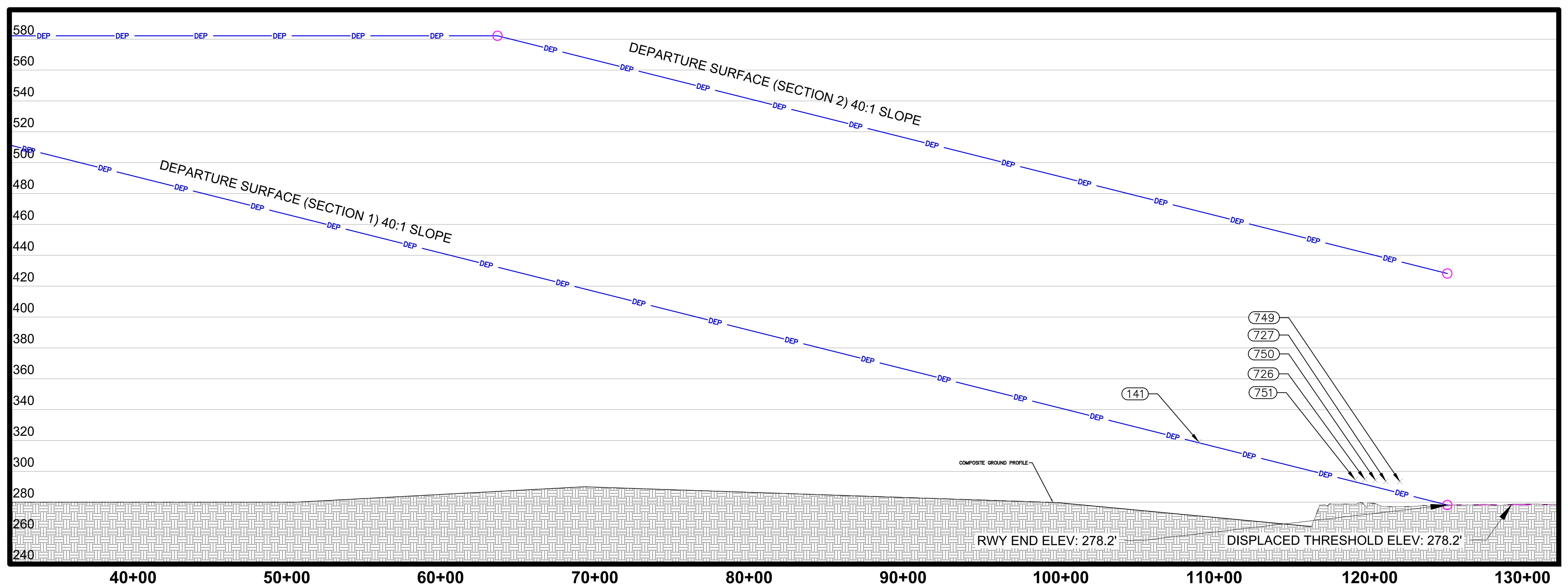
SHEET TITLE: INNER PORTION OF THE APPROACH SURFACE: OBSTRUCTION TABLES

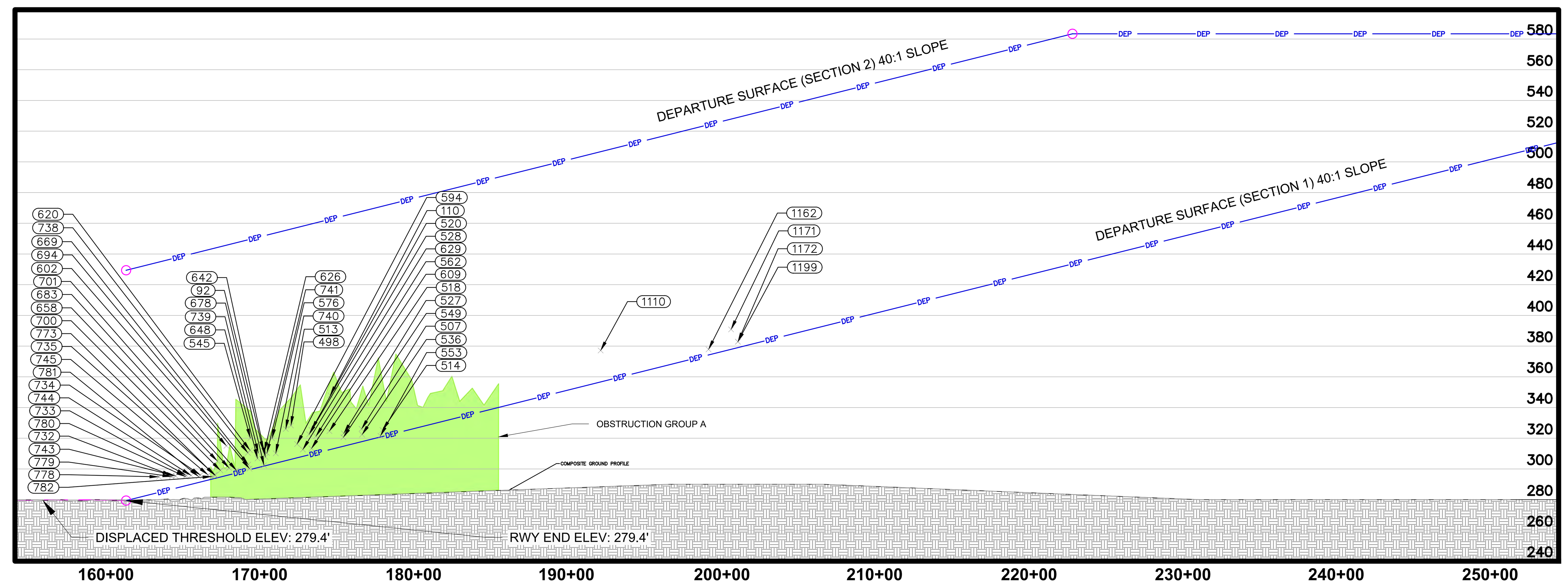




RUNWAY 12 END

RUNWAY 30 END





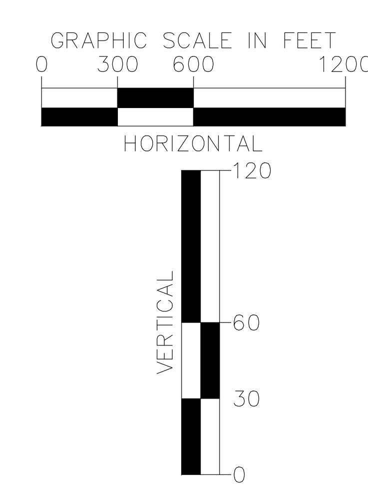
SEE SHEET 12 FOR OBSTRUCTION TABLES

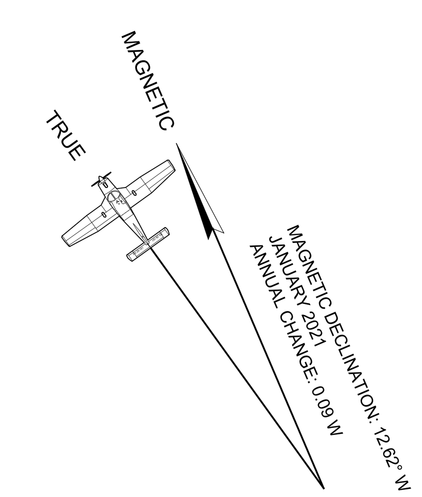
LEGEND

DESCRIPTION	SYMBOLOGY	DESCRIPTION	SYMBOLOGY
ITINERANT AIRCRAFT TIE-DOWNS (F)		VEHICLE PARKING PAVEMENT (F)	
AIRPORT PROPERTY LINE (E / F)		ON-AIRPORT BUILDINGS (E)	
DEPARTURE SURFACE (40:1) (E / F)		ON-AIRPORT BUILDINGS (F)	
DEPARTURE SURFACE 50' ELEVATION CONTOURS		PAINTED ISLAND (F)	
MAJOR CONTOUR (E)		PAVEMENT / BUILDINGS TO BE REMOVED (F)	
MINOR CONTOUR (E)		AVIGATION EASEMENT (F)	
AIRFIELD PAVEMENT (RWY / TWY / APRON) (E)		OBSTRUCTION OBJECT	#XXX
AIRFIELD PAVEMENT (F)		OBSTRUCTION GROUP A - 139 TREES	

NOTES:

1. SURVEY DATA FROM 11/16/2018
2. AERIAL SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY
3. FUTURE DEVELOPMENT WILL NOT CREATE NEW OBSTRUCTIONS TO THE DEPARTURE SURFACE
4. TAKEOFF MINIMUMS AND OBSTACLE DEPARTURE PROCEDURES ARE IN PLACE AT FRESNO CHANDLER EXECUTIVE AIRPORT
5. TRAVERSE WAY ELEVATIONS ARE ADJUSTED AS SHOWN:
   - 23' FOR RAILWAYS
   - 17' FOR INTERSTATE HIGHWAYS
   - 15' FOR OTHER PUBLIC ROADS
   - 10' FOR PRIVATE ROADS





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PROJECT NUMBER: 091733014
DATE: JUNE 2021
DRAWN BY: JC
REVIEWED BY:
APPROVED BY:

No.	REVISIONS	DATE

SHEET TITLE: RUNWAY DEPARTURE SURFACE DRAWING

SHEET NUMBER: 11 OF 15

THE PREPARATION OF THIS PLAN WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REPRESENT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATED IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE N ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

OBSTRUCTIONS TO DEPARTURE SURFACES				
RUNWAY 30				
POINT ID	DESCRIPTION	OBJECT ELEVATION (FT) (AGL)	DEPARTURE SURFACE PENETRATION (FT)	PROPOSED DISPOSITION
92	POLE	312	10	PROVIDE OL
110	POLE	348	30	PROVIDE OL
498	POLE	328	22	PROVIDE OL
507	POLE	326	8	PROVIDE OL
513	POLE	326	21	PROVIDE OL
514	POLE	325	4	PROVIDE OL
518	POLE	325	12	PROVIDE OL
520	POLE	325	16	PROVIDE OL
527	POLE	323	8	PROVIDE OL
528	POLE	323	13	PROVIDE OL
536	POLE	322	5	PROVIDE OL
545	POLE	320	20	PROVIDE OL
549	POLE	321	6	PROVIDE OL
553	POLE	322	1	PROVIDE OL
562	POLE	321	11	PROVIDE OL
576	POLE	320	17	PROVIDE OL
594	POLE	316	9	PROVIDE OL
602	POLE	315	19	PROVIDE OL
609	POLE	313	4	PROVIDE OL
620	POLE	312	13	PROVIDE OL
626	POLE	312	10	PROVIDE OL
629	POLE	313	4	PROVIDE OL
642	POLE	308	6	PROVIDE OL
648	POLE	307	6	PROVIDE OL
658	BUILDING	305	11	TO REMAIN
669	BUILDING	303	4	TO REMAIN
678	BUILDING	302	1	TO REMAIN
683	BUILDING	301	4	TO REMAIN
694	BUILDING	300	1	TO REMAIN
700	BUILDING	299	4	TO REMAIN
701	BUILDING	299	2	TO REMAIN
732	PRIMARY ROAD	296	9	NONE
733	PRIMARY ROAD	296	7	NONE
734	PRIMARY ROAD	296	4	NONE
735	PRIMARY ROAD	296	2	NONE
738	PRIMARY ROAD	311	11	NONE
739	PRIMARY ROAD	311	10	NONE
740	PRIMARY ROAD	310	6	NONE
741	PRIMARY ROAD	310	8	NONE
743	PRIMARY ROAD	295	8	NONE
744	PRIMARY ROAD	296	6	NONE
745	PRIMARY ROAD	296	3	NONE
773	SECONDARY ROAD	296	2	NONE
778	SECONDARY ROAD	295	10	NONE
779	SECONDARY ROAD	295	8	NONE
780	SECONDARY ROAD	295	6	NONE
781	SECONDARY ROAD	295	4	NONE
782	SECONDARY ROAD	295	1	NONE
1010	TREE	351	27	TRIM / REMOVE
1162	TREE	378	4	TRIM / REMOVE
1171	TREE	391	13	TRIM / REMOVE
1172	TREE	383	4	TRIM / REMOVE
1199	TREE	383	4	TRIM / REMOVE
OBSTRUCTION GROUP A				
954	TREE	319	17	TRIM / REMOVE
955	TREE	338	27	TRIM / REMOVE
956	TREE	335	22	TRIM / REMOVE
957	TREE	348	34	TRIM / REMOVE
958	TREE	330	17	TRIM / REMOVE
959	TREE	324	9	TRIM / REMOVE
960	TREE	316	2	TRIM / REMOVE
961	TREE	329	14	TRIM / REMOVE
962	TREE	330	15	TRIM / REMOVE
963	TREE	333	18	TRIM / REMOVE
964	TREE	314	2	TRIM / REMOVE

OBSTRUCTIONS TO DEPARTURE SURFACES				
RUNWAY 30				
POINT ID	DESCRIPTION	OBJECT ELEVATION (FT) (AGL)	DEPARTURE SURFACE PENETRATION (FT)	PROPOSED DISPOSITION
965	TREE	316	5	TRIM / REMOVE
966	TREE	355	47	TRIM / REMOVE
967	TREE	330	21	TRIM / REMOVE
968	TREE	336	27	TRIM / REMOVE
969	TREE	315	4	TRIM / REMOVE
970	TREE	317	5	TRIM / REMOVE
971	TREE	348	36	TRIM / REMOVE
972	TREE	348	35	TRIM / REMOVE
973	TREE	317	7	TRIM / REMOVE
974	TREE	323	14	TRIM / REMOVE
975	TREE	314	5	TRIM / REMOVE
976	TREE	363	50	TRIM / REMOVE
977	TREE	350	35	TRIM / REMOVE
978	TREE	347	34	TRIM / REMOVE
979	TREE	335	21	TRIM / REMOVE
980	TREE	352	36	TRIM / REMOVE
981	TREE	339	22	TRIM / REMOVE
982	TREE	344	28	TRIM / REMOVE
983	TREE	354	36	TRIM / REMOVE
984	TREE	327	9	TRIM / REMOVE
985	TREE	319	1	TRIM / REMOVE
986	TREE	325	5	TRIM / REMOVE
987	TREE	335	14	TRIM / REMOVE
988	TREE	337	17	TRIM / REMOVE
989	TREE	327	9	TRIM / REMOVE
990	TREE	339	22	TRIM / REMOVE
991	TREE	341	22	TRIM / REMOVE
992	TREE	325	3	TRIM / REMOVE
993	TREE	324	2	TRIM / REMOVE
994	TREE	328	5	TRIM / REMOVE
995	TREE	335	11	TRIM / REMOVE
996	TREE	332	9	TRIM / REMOVE
997	TREE	333	10	TRIM / REMOVE
998	TREE	350	25	TRIM / REMOVE
999	TREE	319	2	TRIM / REMOVE
1000	TREE	325	3	TRIM / REMOVE
1001	TREE	327	5	TRIM / REMOVE
1002	TREE	337	7	TRIM / REMOVE
1003	TREE	351	20	TRIM / REMOVE
1004	TREE	357	25	TRIM / REMOVE
1005	TREE	360	28	TRIM / REMOVE
1006	TREE	332	1	TRIM / REMOVE
1007	TREE	340	12	TRIM / REMOVE
1008	TREE	328	3	TRIM / REMOVE
1009	TREE	328	5	TRIM / REMOVE
1011	TREE	349	26	TRIM / REMOVE
1012	TREE	332	11	TRIM / REMOVE
1013	TREE	343	22	TRIM / REMOVE
1014	TREE	344	22	TRIM / REMOVE
1015	TREE	336	25	TRIM / REMOVE
1016	TREE	346	34	TRIM / REMOVE
1017	TREE	340	11	TRIM / REMOVE
1018	TREE	335	8	TRIM / REMOVE
1019	TREE	341	14	TRIM / REMOVE
1020	TREE	331	4	TRIM / REMOVE
1021	TREE	338	10	TRIM / REMOVE
1022	TREE	328	1	TRIM / REMOVE
1023	TREE	347	18	TRIM / REMOVE
1024	TREE	337	8	TRIM / REMOVE
1025	TREE	332	2	TRIM / REMOVE
1026	TREE	338	6	TRIM / REMOVE
1060	TREE	349	20	TRIM / REMOVE
1061	TREE	335	7	TRIM / REMOVE
1067	TREE	328	2	TRIM / REMOVE

OBSTRUCTIONS TO DEPARTURE SURFACES				
RUNWAY 30				
POINT ID	DESCRIPTION	OBJECT ELEVATION (FT) (AGL)	DEPARTURE SURFACE PENETRATION (FT)	PROPOSED DISPOSITION
1079	TREE	348	17	TRIM / REMOVE
1097	TREE	353	17	TRIM / REMOVE
1098	TREE	344	10	TRIM / REMOVE
1099	TREE	342	4	TRIM / REMOVE
1110	TREE	377	20	TRIM / REMOVE
1125	TREE	356	15	TRIM / REMOVE
1209	TREE	342	43	TRIM / REMOVE
1210	TREE	327	26	TRIM / REMOVE
1211	TREE	338	34	TRIM / REMOVE
1212	TREE	322	17	TRIM / REMOVE
1213	TREE	347	40	TRIM / REMOVE
1258	TREE	326	19	TRIM / REMOVE
1259	TREE	311	11	TRIM / REMOVE
1260	TREE	305	10	TRIM / REMOVE
1261	TREE	301	8	TRIM / REMOVE
1262	TREE	298	5	TRIM / REMOVE
1263	TREE	301	5	TRIM / REMOVE
1264	TREE	301	4	TRIM / REMOVE
1265	TREE	345	48	TRIM / REMOVE
1269	TREE	301	5	TRIM / REMOVE
1270	TREE	315	19	TRIM / REMOVE
1275	TREE	300	2	TRIM / REMOVE
1278	TREE	303	4	TRIM / REMOVE
1279	TREE	316	15	TRIM / REMOVE
1280	TREE	302	2	TRIM / REMOVE
1281	TREE	300	1	TRIM / REMOVE
1285	TREE	313	11	TRIM / REMOVE
1286	TREE	319	17	TRIM / REMOVE
1287	TREE	318	16	TRIM / REMOVE
1292	TREE	337	37	TRIM / REMOVE
1293	TREE	316	17	TRIM / REMOVE
1294	TREE	308	9	TRIM / REMOVE
1295	TREE	300	1	TRIM / REMOVE
1297	TREE	302	4	TRIM / REMOVE
1298	TREE	301	2	TRIM / REMOVE
1299	TREE	299	1	TRIM / REMOVE
1300	TREE	303	4	TRIM / REMOVE
1302	TREE	304	4	TRIM / REMOVE
1303	TREE	313	9	TRIM / REMOVE
1304	TREE	308	4	TRIM / REMOVE
1305	TREE	312	6	TRIM / REMOVE
1307	TREE	312	6	TRIM / REMOVE
1310	TREE	314	10	TRIM / REMOVE
1314	TREE	333	28	TRIM / REMOVE
1315	TREE	321	17	TRIM / REMOVE
1316	TREE	306	2	TRIM / REMOVE
1317	TREE	320	15	TRIM / REMOVE
1318	TREE	314	9	TRIM / REMOVE
1319	TREE	328	22	TRIM / REMOVE
1320	TREE	309	3	TRIM / REMOVE
1322	TREE	310	2	TRIM / REMOVE
1323	TREE	312	6	TRIM / REMOVE
1324	TREE	312	5	TRIM / REMOVE
1325	TREE	328	21	TRIM / REMOVE
1331	TREE	316	15	TRIM / REMOVE
1352	TREE	310	7	TRIM / REMOVE
1355	TREE	315	8	TRIM / REMOVE
1368	TREE	342	11	TRIM / REMOVE
1369	TREE	358	3	TRIM / REMOVE
1380	TREE	322	11	TRIM / REMOVE
1396	TREE	372	52	TRIM / REMOVE
1399	TREE	337	19	TRIM / REMOVE
1400	TREE	375	50	TRIM / REMOVE
1436	TREE	342	14	TRIM / REMOVE

OBSTRUCTIONS TO DEPARTURE SURFACES				
RUNWAY 12				
POINT ID	DESCRIPTION	OBJECT ELEVATION (FT) (AGL)	DEPARTURE SURFACE PENETRATION (FT)	PROPOSED DISPOSITION
141	POLE	319	1	LIGHT
726	PRIMARY ROAD	295	3	NONE
727	PRIMARY ROAD	294	5	NONE
749	PRIMARY ROAD	293	7	NONE
750	PRIMARY ROAD	294	4	NONE
751	PRIMARY ROAD	295	2	NONE

NOTES:

1. SURVEY DATA FROM 11/16/2018
3. ALL ELEVATIONS ROUNDED TO THE NEAREST WHOLE NUMBER
4. TRAVERSE WAY ELEVATIONS ARE ADJUSTED AS SHOWN:
   - 23' FOR RAILWAYS
   - 17' FOR INTERSTATE HIGHWAYS
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   - 10' FOR PRIVATE ROADS

ABBREVIATIONS:

- FT FEET
- AGL ABOVE GROUND LEVEL
- OL OBSTRUCTION LIGHT

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APPROVED BY:

No.	REVISIONS	DATE

SHEET TITLE: RUNWAY DEPARTURE SURFACE: OBSTRUCTION TABLES

SHEET NUMBER: 12 OF 15

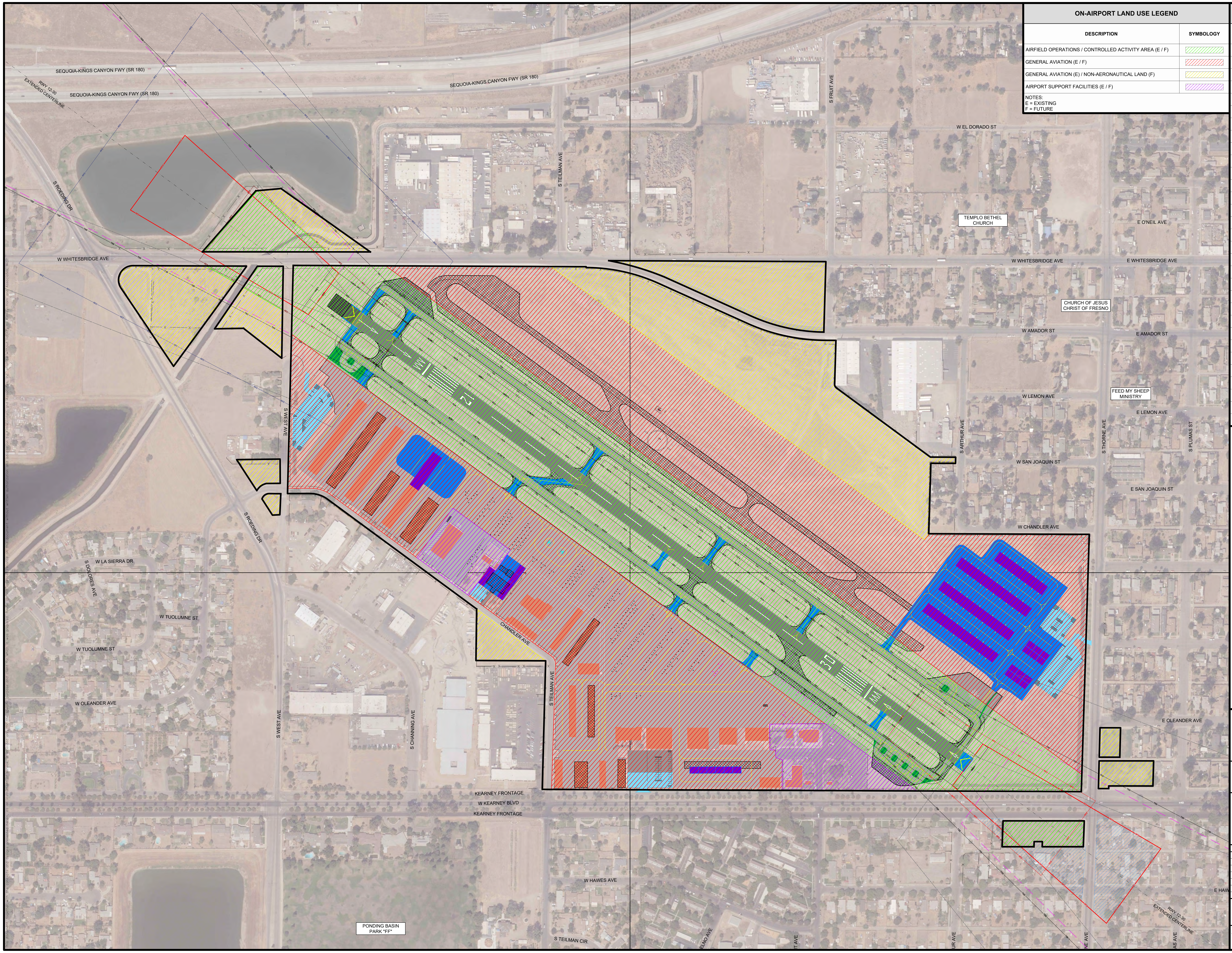
ON-AIRPORT LAND USE LEGEND

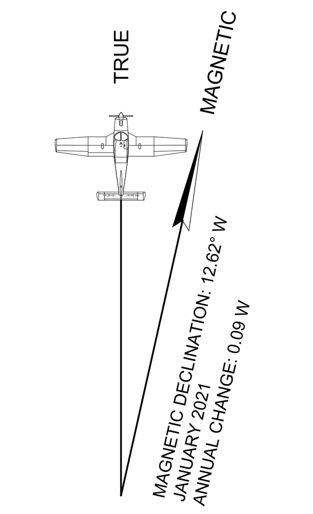
DESCRIPTION	SYMBOLOGY
AIRFIELD OPERATIONS / CONTROLLED ACTIVITY AREA (E / F)	
GENERAL AVIATION (E / F)	
GENERAL AVIATION (E) / NON-AERONAUTICAL LAND (F)	
AIRPORT SUPPORT FACILITIES (E / F)	

NOTES:
E = EXISTING
F = FUTURE

AIRPORT FACILITIES LEGEND

DESCRIPTION	SYMBOLOGY
LIGHTED WIND CONE	
SEGMENTED CIRCLE	
AIRCRAFT TIE--DOWNS	
FUTURE ITINERANT AIRCRAFT TIE-DOWNS	
HELICOPTER OPERATING AREA	H
FUEL TANK	
AWOS	AWOS
FENCE	x x
AIRPORT PROPERTY LINE	
HOLD LINE	
DASHED TAXIWAY / TAXILANE EDGE	
RUNWAY SAFETY AREA (RSA)	RSA RSA
RUNWAY OBJECT FREE AREA (ROFA)	ROFA ROFA
RUNWAY OBSTACLE FREE ZONE (ROFZ)	OFZ OFZ
RUNWAY PROTECTION ZONE (RPZ) - DEPARTURE (E / F)	RPZ RPZ
RUNWAY 12 RPZ - APPROACH (E)	RPZ RPZ
RUNWAY 12 RPZ - APPROACH (F)	RPZ RPZ
RUNWAY 30 RPZ - APPROACH (E / F)	RPZ RPZ
TAXIWAY / TAXILANE SAFETY AREA (TSA)	TSA TSA
TAXIWAY / TAXILANE OBJECT FREE AREA (TOFA)	TOFA TOFA
PART 77 APPROACH SURFACE	
THRESHOLD SITING SURFACE (TSS)	TSS TSS
DEPARTURE SURFACE	DEP DEP
AIRFIELD PAVEMENT (RWY / TWY / APRON)	
NEW AIRFIELD PAVEMENT	
NEW VEHICLE PARKING PAVEMENT	
EXISTING ON-AIRPORT BUILDINGS	
NEW ON-AIRPORT BUILDINGS	
PAINTED ISLAND	
PAVEMENT / BUILDINGS TO BE REMOVED	
FUTURE AVIGATION EASEMENT	





GRAPHIC SCALE IN FEET
0 100 200 400

FRESNO CHANDLER
EXECUTIVE AIRPORT

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PHONE: 559-621-4500 FAX: 559-251-4825

AIRPORT LAYOUT PLAN DRAWING SET

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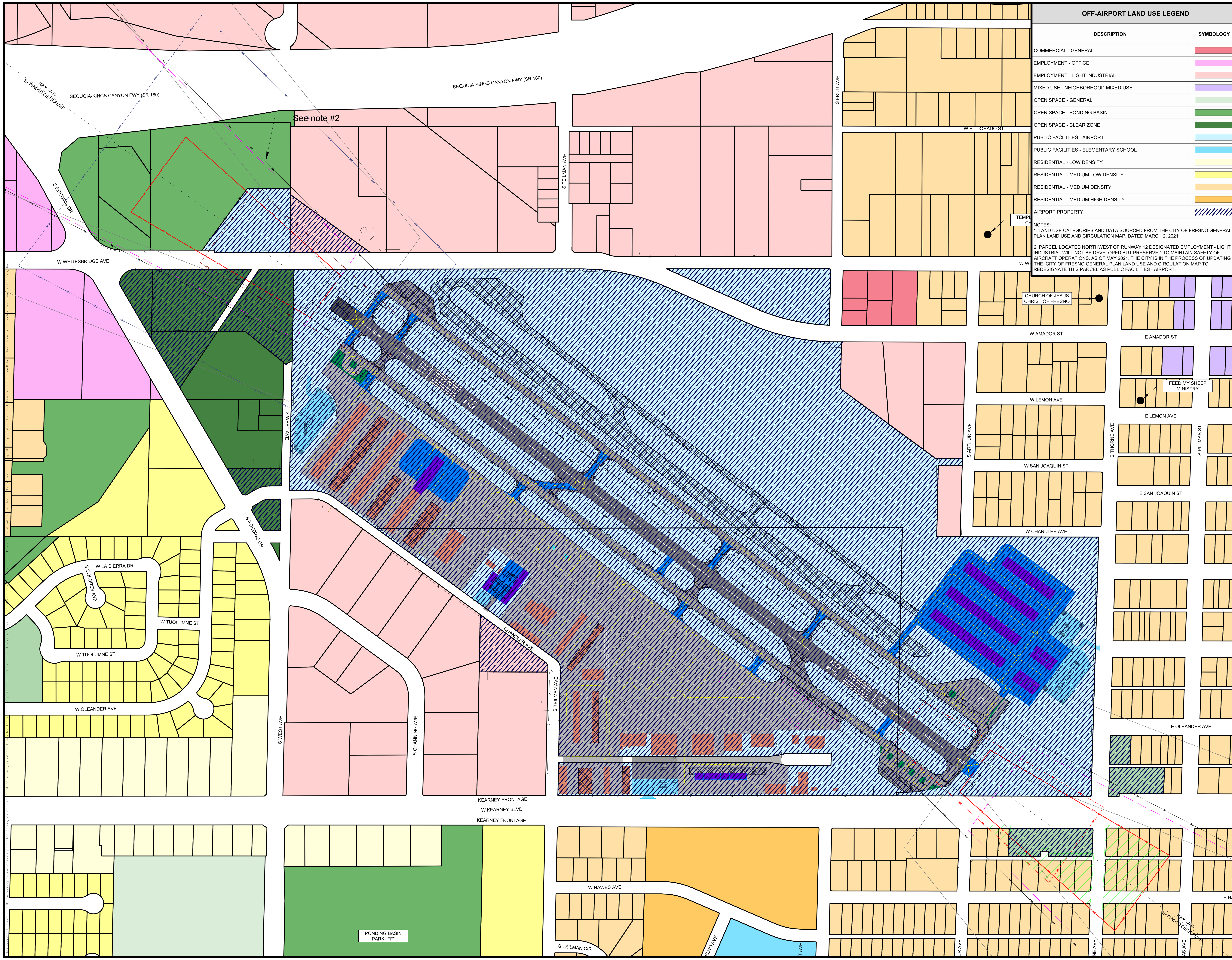
PROJECT NUMBER: 091733014
DATE: JUNE 2021
DRAWN BY: JC
REVIEWED BY:
APPROVED BY:

No.	REVISIONS	DATE

SHEET TITLE	SHEET NUMBER
ON-AIRPORT LAND USE	13 OF 15

THE PREPARATION OF THIS PLAN WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REPRESENT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATED IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE N ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.



OFF-AIRPORT LAND USE LEGEND

DESCRIPTION	SYMBOLOGY
COMMERCIAL - GENERAL	
EMPLOYMENT - OFFICE	
EMPLOYMENT - LIGHT INDUSTRIAL	
MIXED USE - NEIGHBORHOOD MIXED USE	
OPEN SPACE - GENERAL	
OPEN SPACE - PONDING BASIN	
OPEN SPACE - CLEAR ZONE	
PUBLIC FACILITIES - AIRPORT	
PUBLIC FACILITIES - ELEMENTARY SCHOOL	
RESIDENTIAL - LOW DENSITY	
RESIDENTIAL - MEDIUM LOW DENSITY	
RESIDENTIAL - MEDIUM DENSITY	
RESIDENTIAL - MEDIUM HIGH DENSITY	
AIRPORT PROPERTY	

NOTES:

1. LAND USE CATEGORIES AND DATA SOURCED FROM THE CITY OF FRESNO GENERAL PLAN LAND USE AND CIRCULATION MAP, DATED MARCH 2, 2021.

2. PARCEL LOCATED NORTHWEST OF RUNWAY 12 DESIGNATED EMPLOYMENT - LIGHT INDUSTRIAL WILL NOT BE DEVELOPED BUT PRESERVED TO MAINTAIN SAFETY OF AIRCRAFT OPERATIONS. AS OF MAY 2021, THE CITY IS IN THE PROCESS OF UPDATING THE CITY OF FRESNO GENERAL PLAN LAND USE AND CIRCULATION MAP TO REDESIGNATE THIS PARCEL AS PUBLIC FACILITIES - AIRPORT.

AIRPORT FACILITIES LEGEND

DESCRIPTION	SYMBOLOGY
LIGHTED WIND CONE	
SEGMENTED CIRCLE	
AIRCRAFT TIE-DOWNS	
FUTURE ITINERANT AIRCRAFT TIE-DOWNS	
HELICOPTER OPERATING AREA	H
FUEL TANK	
AWOS	
FENCE	
AIRPORT PROPERTY LINE	
HOLD LINE	
DASHED TAXIWAY / TAXILANE EDGE	
RUNWAY SAFETY AREA (RSA)	
RUNWAY OBJECT FREE AREA (ROFA)	
RUNWAY OBSTACLE FREE ZONE (ROFZ)	
RUNWAY PROTECTION ZONE (RPZ) - DEPARTURE (E / F)	
RUNWAY 12 RPZ - APPROACH (E)	
RUNWAY 12 RPZ - APPROACH (F)	
RUNWAY 30 RPZ - APPROACH (E / F)	
TAXIWAY / TAXILANE SAFETY AREA (TSA)	
TAXIWAY / TAXILANE OBJECT FREE AREA (TOFA)	
PART 77 APPROACH SURFACE	
THRESHOLD SITING SURFACE (TSS)	
DEPARTURE SURFACE	
AIRFIELD PAVEMENT (RWY / TWY / APRON)	
NEW AIRFIELD PAVEMENT	
NEW VEHICLE PARKING PAVEMENT	
EXISTING ON-AIRPORT BUILDINGS	
NEW ON-AIRPORT BUILDINGS	
PAINTED ISLAND	
PAVEMENT / BUILDINGS TO BE REMOVED	
FUTURE AVIGATION EASEMENT	

TRUE
MAGNETIC
MAGNETIC DECLINATION: 12.62° W
JANUARY 2021
ANNUAL CHANGE: 0.09 W

GRAPHIC SCALE IN FEET
0 100 200 400

FRESNO CHANDLER
EXECUTIVE AIRPORT

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AIRPORT LAYOUT PLAN DRAWING SET

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PROJECT NUMBER: 091733014
DATE: JUNE 2021
DRAWN BY: JC
REVIEWED BY:
APPROVED BY:

No.	REVISIONS	DATE

SHEET TITLE: OFF-AIRPORT LAND USE
SHEET NUMBER: 14 OF 15

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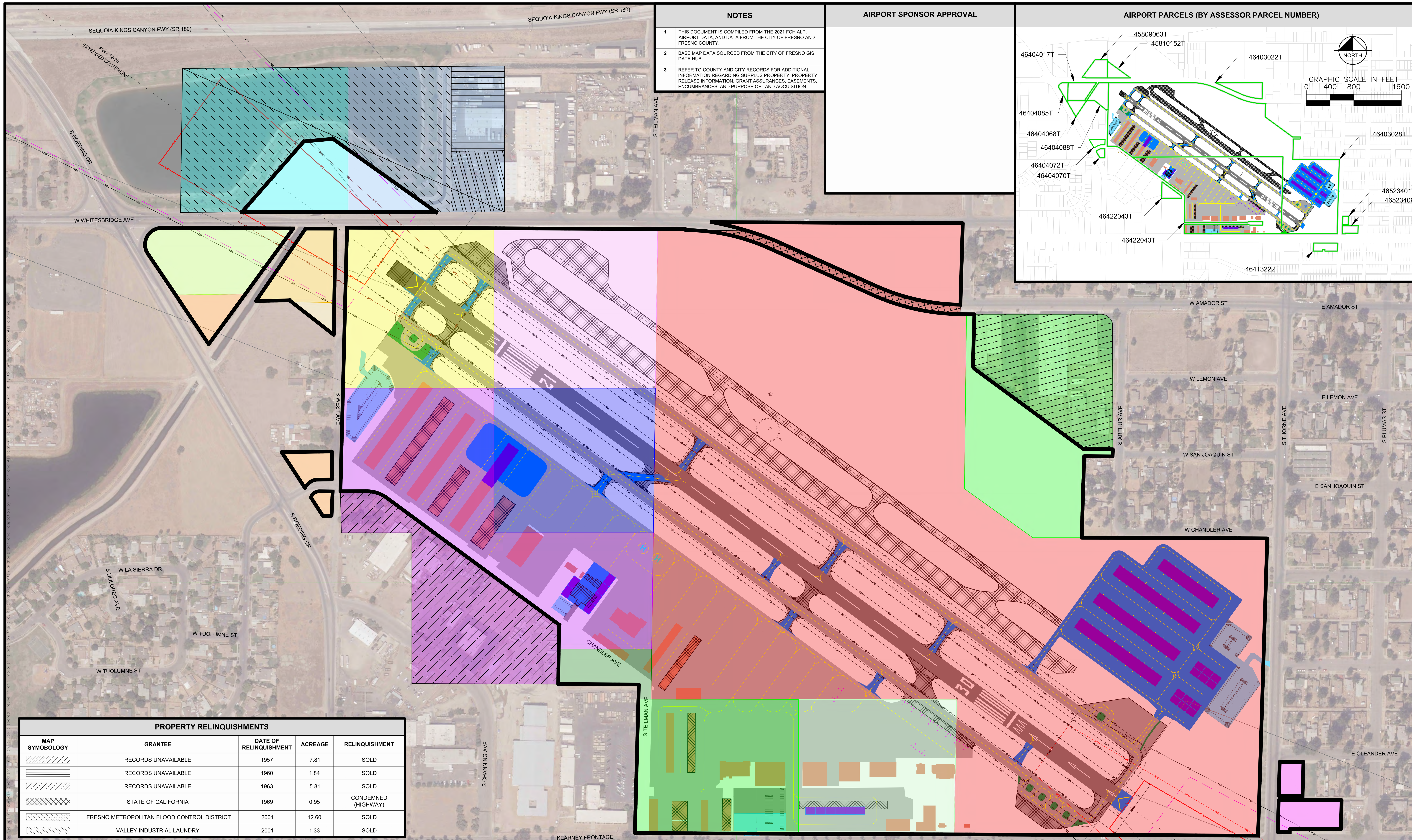


NOTES

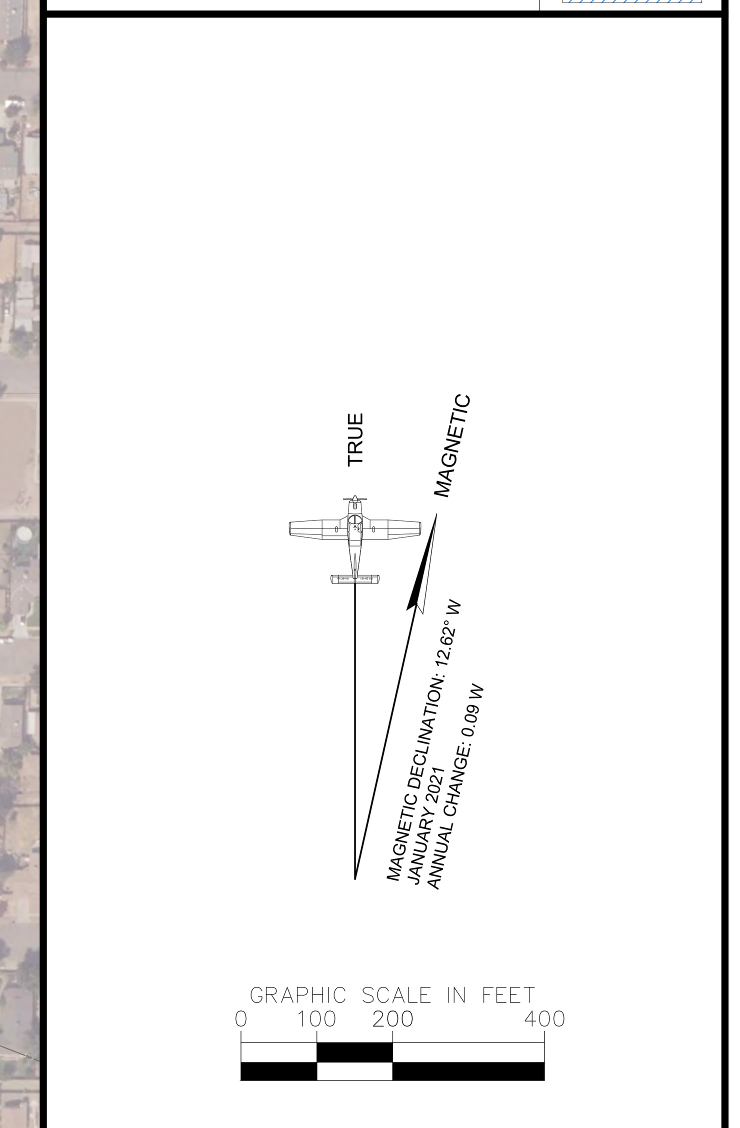
1	THIS DOCUMENT IS COMPILED FROM THE 2021 FCH ALP, AIRPORT DATA, AND DATA FROM THE CITY OF FRESNO AND FRESNO COUNTY.
2	BASE MAP DATA SOURCED FROM THE CITY OF FRESNO GIS DATA HUB.
3	REFER TO COUNTY AND CITY RECORDS FOR ADDITIONAL INFORMATION REGARDING SURPLUS PROPERTY, PROPERTY RELEASE INFORMATION, GRANT ASSURANCES, EASEMENTS, ENCUMBRANCES, AND PURPOSE OF LAND AQCUISITION.

AIRPORT SPONSOR APPROVAL

AIRPORT PARCELS (BY ASSESSOR PARCEL NUMBER)

AIRPORT FACILITIES LEGEND

DESCRIPTION	SYMBOLOGY
LIGHTED WIND CONE	
SEGMENTED CIRCLE	
AIRCRAFT TIE–DOWNS	
FUTURE ITINERANT AIRCRAFT TIE-DOWNS	
HELICOPTER OPERATING AREA	H
FUEL TANK	
AWOS	
EXISTING / FUTURE AIRPORT PARCELS	
PROPERTY LINE	
HOLD LINE	
DASHED TAXIWAY / TAXILANE EDGE	
RUNWAY SAFETY AREA (RSA)	
RUNWAY OBJECT FREE AREA (ROFA)	
RUNWAY OBSTACLE FREE ZONE (ROFZ)	
RUNWAY PROTECTION ZONE (RPZ) - DEPARTURE	
RUNWAY PROTECTION ZONE (RPZ) - APPROACH	
TAXIWAY / TAXILANE SAFETY AREA (TSA)	
TAXIWAY / TAXILANE OBJECT FREE AREA (TOFA)	
PART 77 APPROACH SURFACE	
THRESHOLD SITING SURFACE (TSS)	
DEPARTURE SURFACE	
AIRFIELD PAVEMENT (RWY / TWY / APRON)	
NEW AIRFIELD PAVEMENT	
NEW VEHICLE PARKING PAVEMENT	
EXISTING ON-AIRPORT BUILDINGS	
NEW ON-AIRPORT BUILDINGS	
PAINTED ISLAND	
PAVEMENT / BUILDINGS TO BE REMOVED	
FUTURE AVIGATION EASEMENT	



PROPERTY RELINQUISHMENTS

MAP SYMOBOLOGY	GRANTEE	DATE OF RELINQUISHMENT	ACREAGE	RELINQUISHMENT
	RECORDS UNAVAILABLE	1957	7.81	SOLD
	RECORDS UNAVAILABLE	1960	1.84	SOLD
	RECORDS UNAVAILABLE	1963	5.81	SOLD
	STATE OF CALIFORNIA	1969	0.95	CONDEMNED (HIGHWAY)
	FRESNO METROPOLITAN FLOOD CONTROL DISTRICT	2001	12.60	SOLD
	VALLEY INDUSTRIAL LAUNDRY	2001	1.33	SOLD

PROPERTY ACQUISITIONS AND EASEMENTS

MAP SYMOBOLOGY	GRANTOR	DATE OF ACQUISITION	FEDERAL PROJECT NO.	METHOD OF ACQUISITION	INSTRUMENT OF CONVEYENCE	ACREAGE	ASSESSORS PARCELS NUMBER (APN) (2021)*	DEED RECORDING	PURPOSE OF ACQUISITION
	W.F. CHANDLER	FEBRUARY 28, 1929	N/A	FEE SIMPLE	GRANT DEED	93.31	46403022T, 46403028T	VOL. 964, PG. 91	MUNICIPAL USE
	W.F. CHANDLER	MARCH 18, 1932	N/A	FEE SIMPLE	GRANT DEED	21.25	46403028T, 46403002, 46422043T	VOL. 1205, PG. 307	MUNICIPAL USE
	JOHNIE REDDEN	MARCH 19, 1934	N/A	FEE SIMPLE	GRANT DEED	9.45	46403028T, 46422043T	VOL. 1327, PG. 178	AERONAUTICAL USE
	MISSAK H. JIQQERIAN	NOVEMBER 4, 1935	N/A	FEE SIMPLE	GRANT DEED	10.41	46403028T	VOL. 1454, PG. 202	AERONAUTICAL USE
	ITALIAN ENTERTAINMENT PARK CO.	DECEMBER 24, 1935	N/A	FEE SIMPLE	GRANT DEED	8.59	46422043T	VOL. 1451, PG. 349	AERONAUTICAL USE
	EMMA HANSEN	DECEMBER 3, 1940	N/A	FEE SIMPLE	GRANT DEED	9.19	45810152T	VOL. 1879, PG. 52	AERONAUTICAL USE
	JOSEPH & ALMA CORATO	DECEMBER 27, 1940	N/A	FEE SIMPLE	GRANT DEED	0.32	46404088T	VOL. 1883, PG. 190	AERONAUTICAL USE
	CHARLES NISHKIAN	DECEMBER 19, 1940	N/A	FEE SIMPLE	GRANT DEED	22.38	46403028T, 46422043T	VOL. 1940, PG. 493	AERONAUTICAL USE
	HELEN MOOMJIAN	DECEMBER 16, 1940	N/A	FEE SIMPLE	GRANT DEED	9.49	46403028T	VOL. 1882, PG. 248	AERONAUTICAL USE
	C.J. APPLLING	JANUARY 3, 1941	N/A	FEE SIMPLE	GRANT DEED	1.41	46422043T	VOL. 1179, PG. 339	AERONAUTICAL USE
	AGANVI & HACHICK HAGOPIAN	JANUARY 6, 1941	N/A	FEE SIMPLE	GRANT DEED	9.78	45809063T	VOL. 1887, PG. 1	AERONAUTICAL USE
	MARIE L. KEESLING; HERBERY C. & VIOLET V. DYER	DECEMBER 21, 1940	N/A	FEE SIMPLE	GRANT DEED	1.89	46404088T	VOL. 1916, PG. 19	AERONAUTICAL USE
	VARIOUS OWNERS	1959 - 1964	FAAP 09-04-091-0801	RECORDS UNAVAILABLE	GRANT DEED	24.60	46413222T, 46523409T, 46523401T	VARIOUS RECORDS	AERONAUTICAL USE
	CALTRANS	JANUARY 1, 2005	N/A	RECORDS UNAVAILABLE	GRANT DEED	1.40	46404068T, 46404072T, 46404070T	RECORDS UNAVAILABLE	AERONAUTICAL USE
	STATE OF CALIFORNIA	JANUARY 21, 2010	N/A	RECORDS UNAVAILABLE	GRANT DEED	3.41	46404085T, 46404017T	RECORDS UNAVAILABLE	AERONAUTICAL USE

NOTE:
*DUE TO PARCEL CONSOLIDATION BY THE CITY OF FRESNO, SOME PROPERTIES ACQUIRED SEPARATELY ARE NOW PART OF ONE OR MORE DIFFERENT PARCELS THAN AT THE TIME OF ACQUISITION.

FRESNO CHANDLER EXECUTIVE AIRPORT

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PROJECT NUMBER: 091733014
DATE: JUNE 2021
DRAWN BY: JC
REVIEWED BY:
APPROVED BY:

No.	REVISIONS	DATE

SHEET TITLE
AIRPORT PROPERTY MAP / EXHIBIT A

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Appendix B – Utility Infrastructure Inventory

1. Utility Inventory Matrix
2. Water Main Diagram
3. Recycled Water Diagram
4. Sanitary Sewer Diagram
5. Irrigation Facilities Diagram
6. Electric and Communications Utility Diagram
7. FMFCD Off-Site Storm Drain Diagram
8. On-Site Storm Drainage System Details
    a. Figure 1 Location Map
    b. Figure 2 Existing Storm Drainage System
    c. Figure 3 Interim Storm Drainage System
    d. Figure 4 Ultimate Storm Drainage System
    e. Interim Plan Storm Drain System Junction Key Map
    f. Master Plan Storm Drain System Junction Key Map
    g. Storm Drain Sheet SD-1 (10-08-03)
    h. Storm Drain Sheet SD-2 (02-14-02)
    i. Plans: Draper Taxilane Reconstruction (8-15-15, 9 Sheets)

Note: The following pages for Appendix B includes sub-Appendices 1 through 8 that correspond with the items listed above.

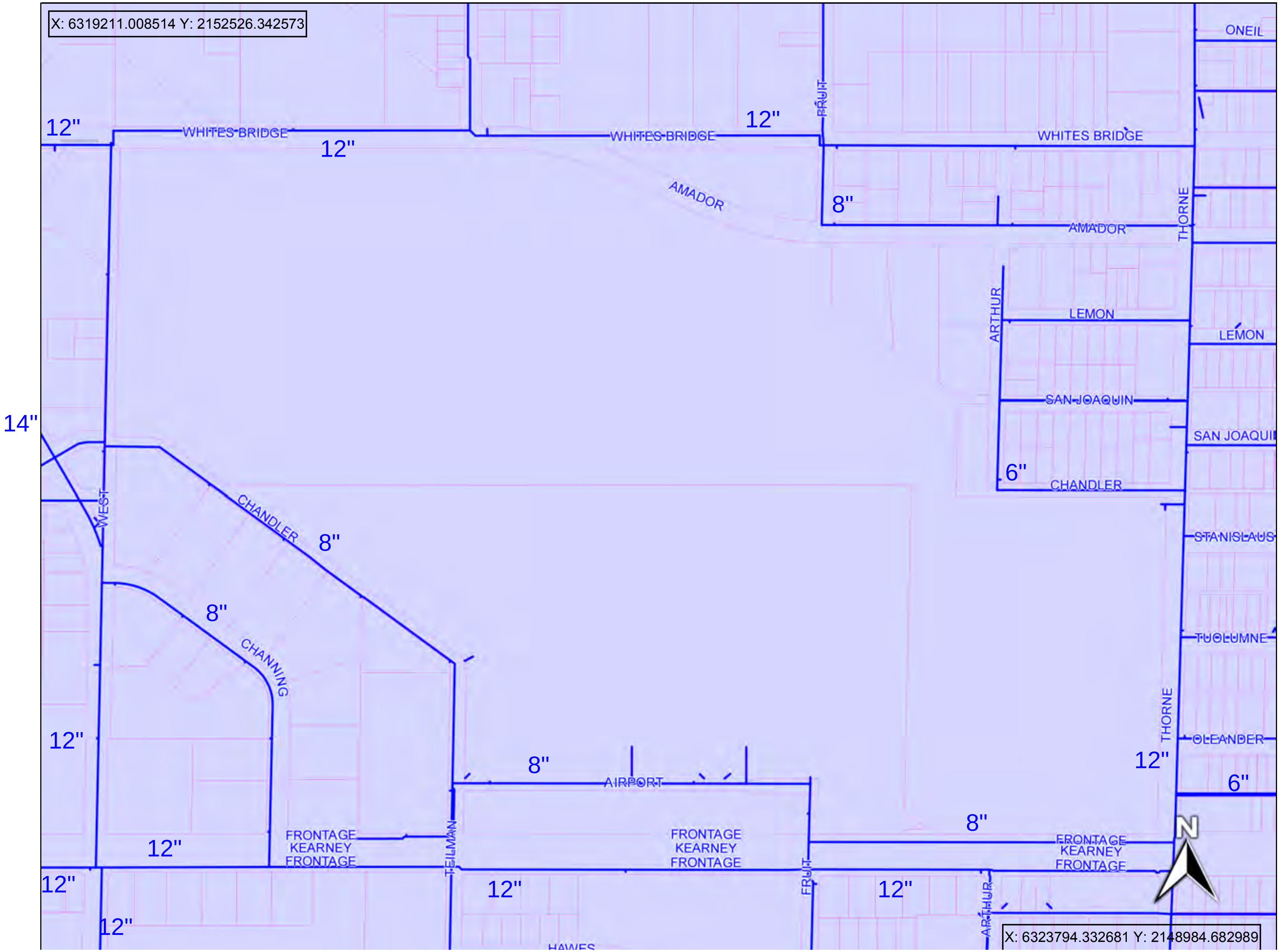
Appendix 1

Chandler Downtown Airport Utility Inventory Matrix																	
Utility	Owner	General Description of Utility	On-site	W. Whites Bridge Ave	W. Amador	S. Arthur Ave.	W. Chandler Ave. (E	S. Thorne Ave.	W. Kearney Blvd.	S. Fruit Ave.	Airport Road	S. Tielman Ave.	Chandler Ave. (S)	S. West Ave.	S. Channing Ave.	S. Roeding Ave.	Notes
Gas	PG&E	Natural Gas Distribution Lines	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Electricity - Aerial	PG&E	Electrical Distribution	✓			✓	✓		✓		✓		✓		✓	✓	3-6C 12 kV
Electricity - Buried	PG&E	Electrical Distribution	✓	✓							✓			✓			Various 12 kV
Water	COF	Water Mains	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	6, 8, and 12-inch
Recycled Water	COF	Recycled Water Pipeline	✓	✓													24-inch
Telephone	AT&T	Aerial Lines (Wire and FO)	✓			✓			✓								
Cable	Comcast+	Cable/FO Communications	✓														
Storm Drain	FMFCD	Storm Drain Lines and Basins	✓	✓	✓		✓	✓	✓	✓				✓			18 to 96-inch
Sewer	COF	Sanitary Sewer	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	6 to 33-inch
Ancillary Utilities	COF	Security and other	✓	✓				✓	✓					✓			
Irrigation	FID	South Dry Creek Canal No. 77		✓													Canal
Street Lighting	COF	Street Lights	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Traffic/Telemetry	COF	Traffic and Emergency Svc. Related	✓	✓													
Other/Misc.	UNK	Not Identified	✓														

Fresno Chandler Airport Utilities
Water Mains

Appendix 2

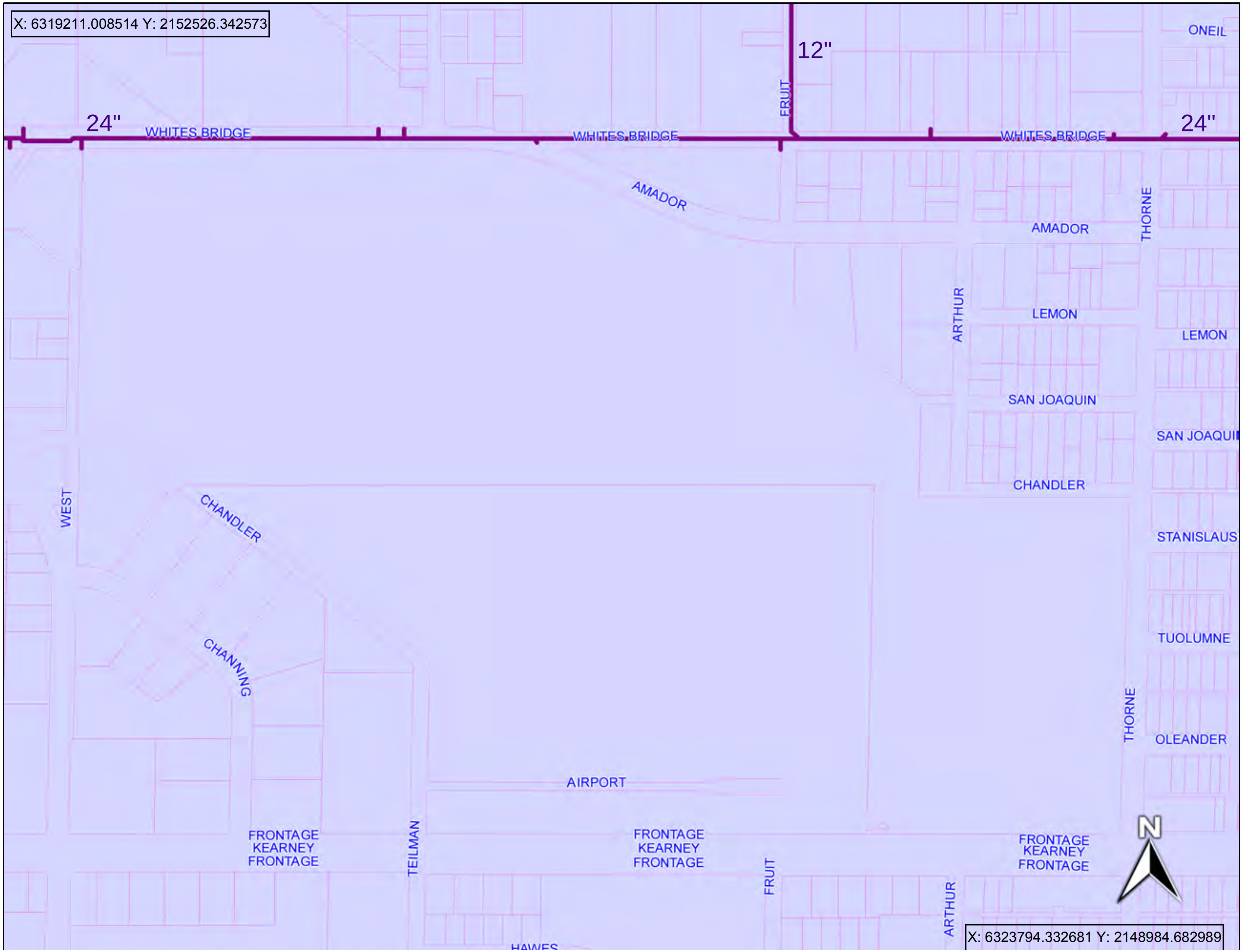
11/12/2018
Scale: 1 : 5000



Fresno Chandler Airport Utilities
Recycled Water Mains

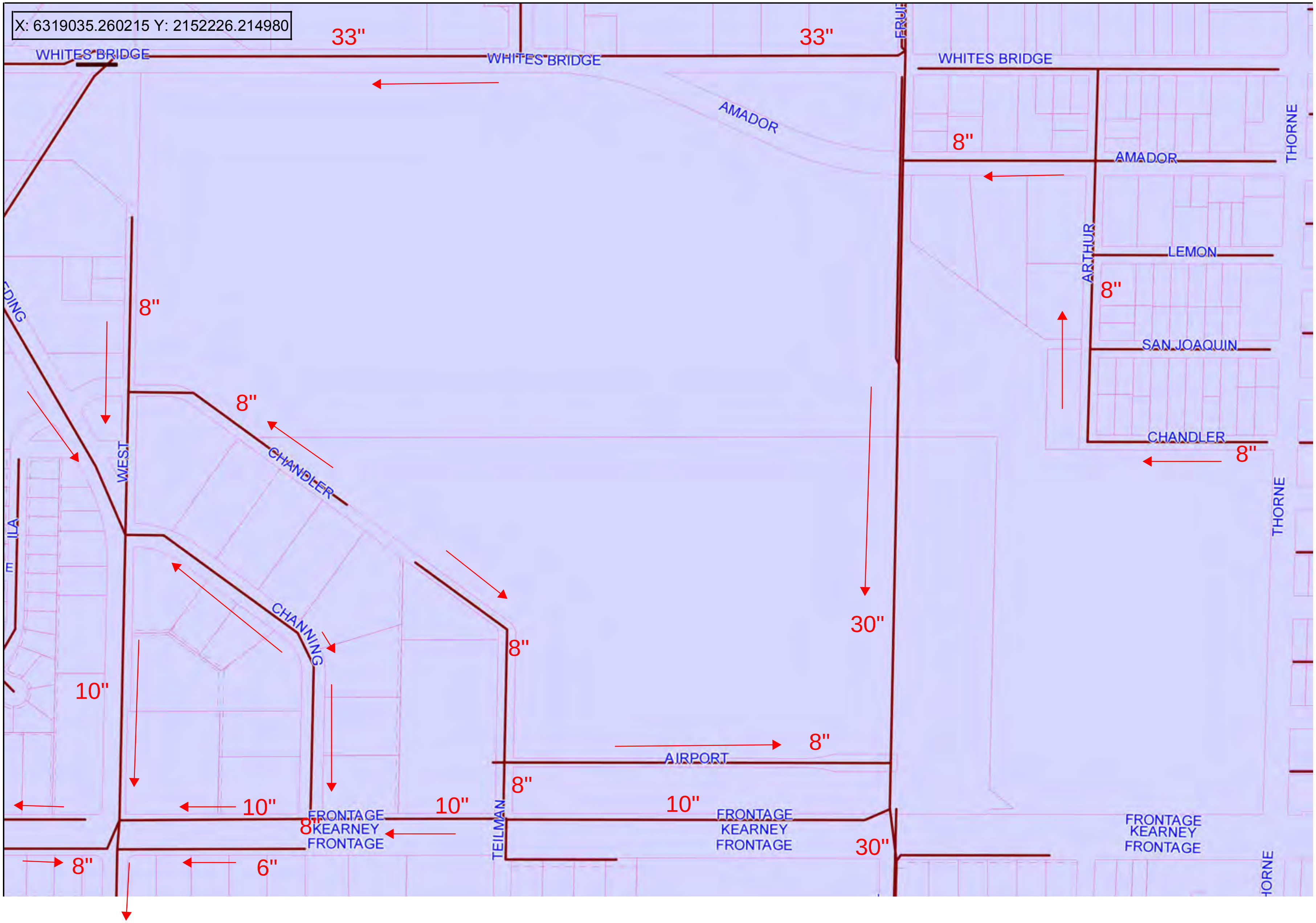
Appendix 3

11/12/2018
Scale: 1 : 5000



Fresno Chandler Airport
Sanitary Sewers

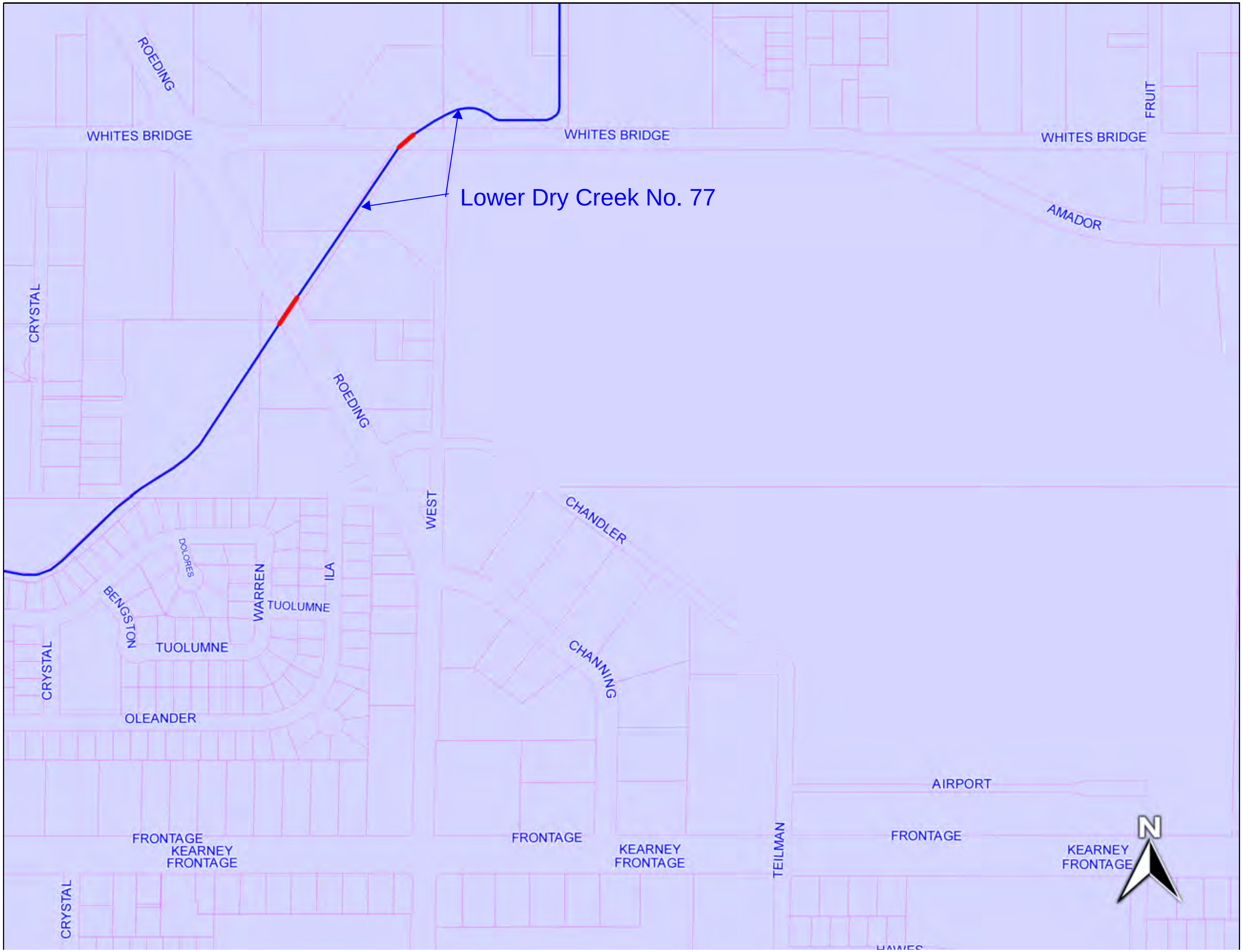
Appendix 4



Fresno Chandler Airport Utilities
Fresno Irrigation District

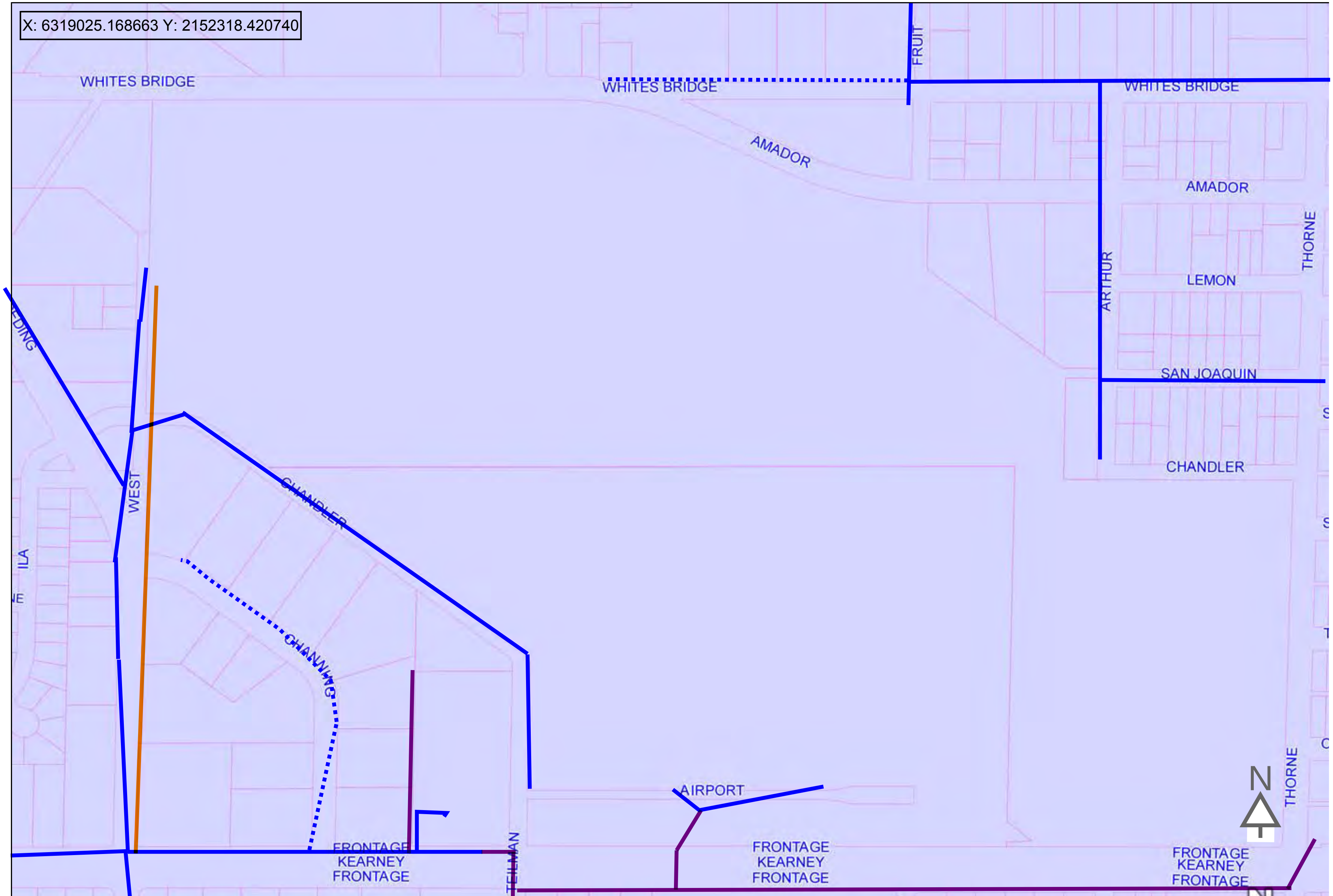
Appendix 5

11/12/2018
Scale: 1 : 5000



Fresno Chandler Airport Utilities
Electric and Communications Utilities

Appendix 6A
Airport and Perimeter Road Area

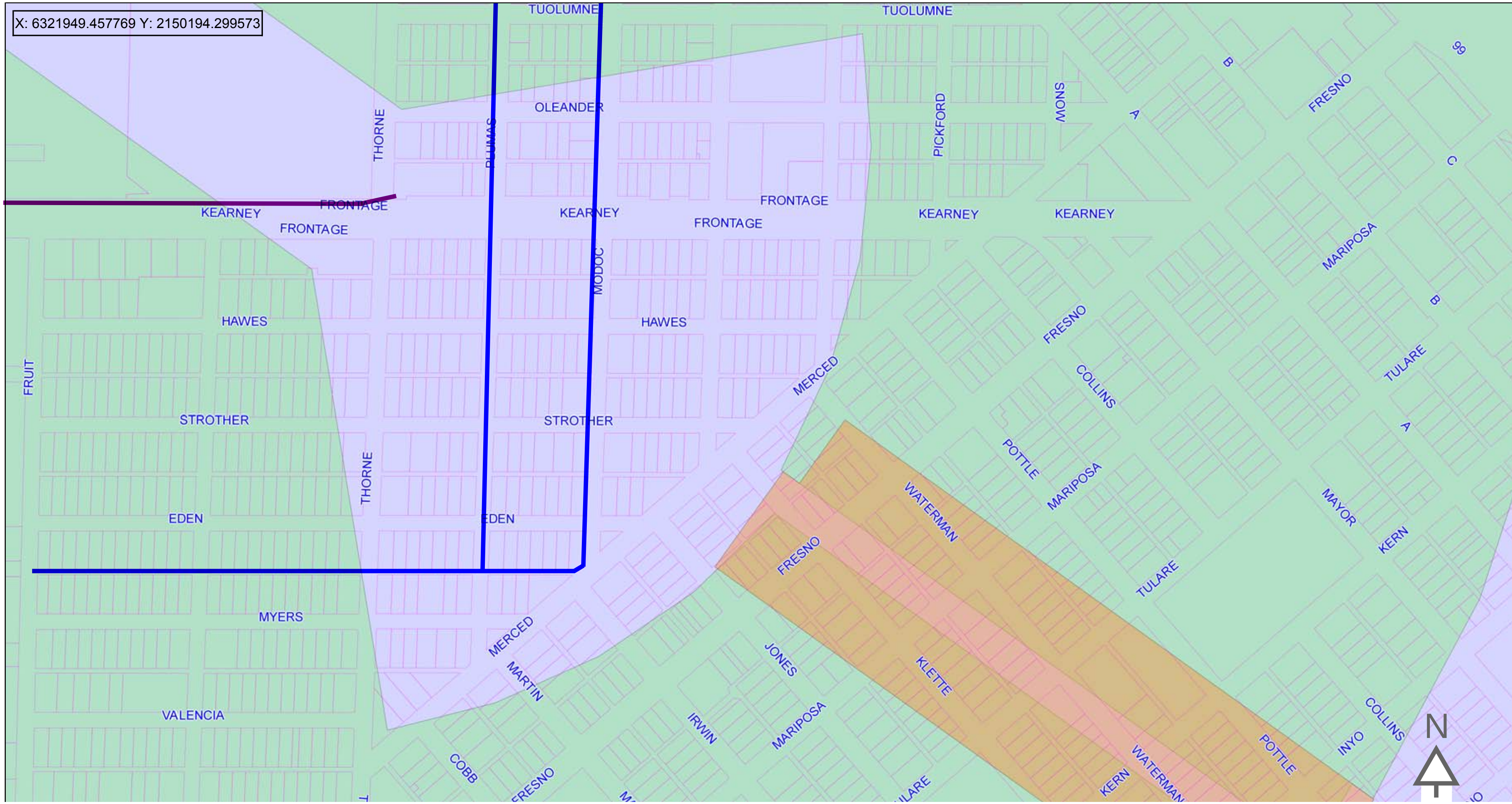


Electrical (12kV) - Buried
Electrical (12kV)- Aerial
Communications - Buried
Communications - Aerial

Note: Line locations based on based on select PG&E Distribution Maps and ground observation. No survey was conducted. All lines may not be shown.

Fresno Chandler Airport Utilities
Electric and Communications Utilities

Appendix 6B
Electric Lines
Southeast Approach Area

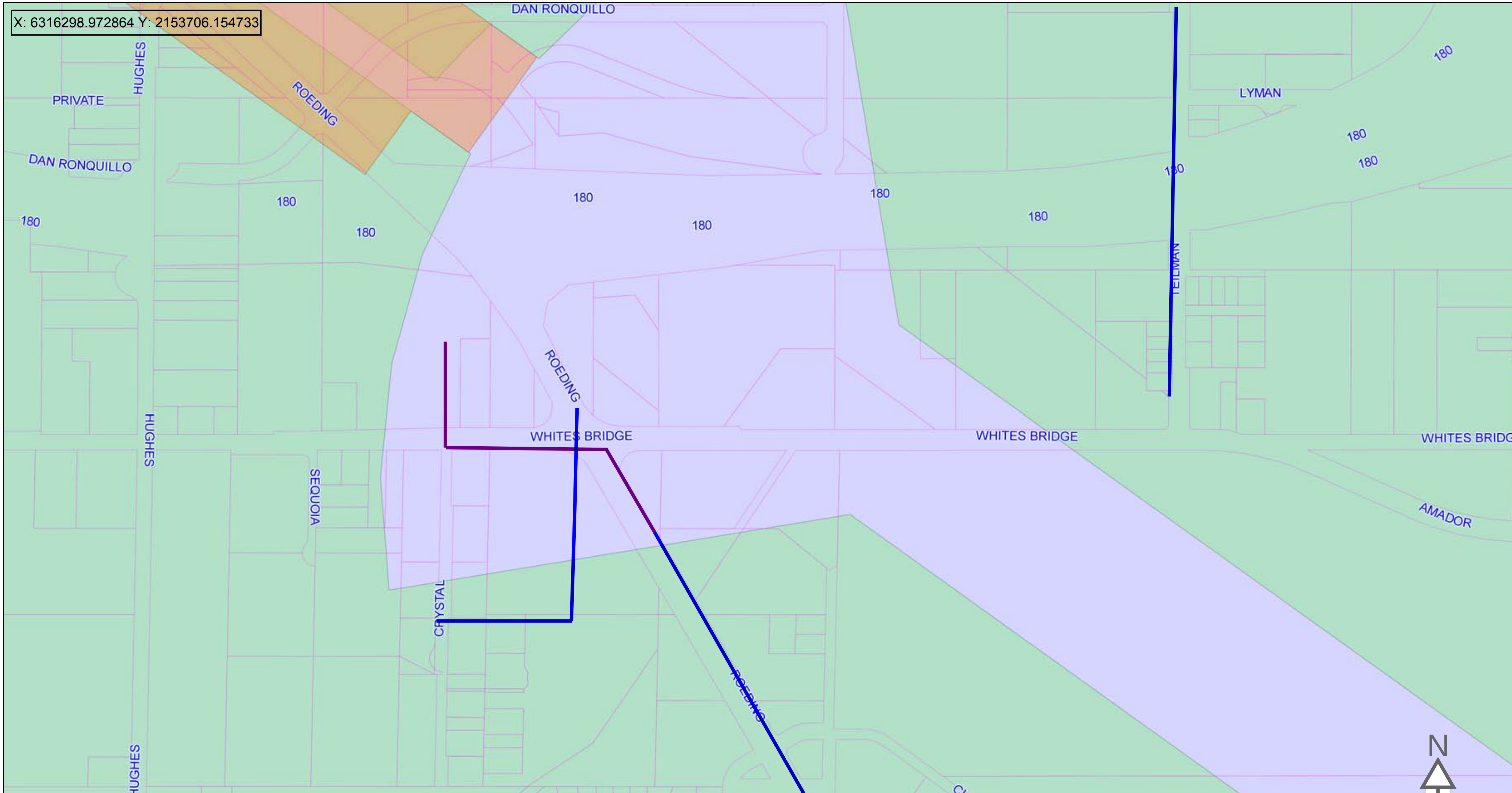


Electrical (12kV) - Buried
Electrical (12kV)- Aerial

Note: PG&E line locations based on based on select PG&E Distribution Maps and ground observation. No survey was conducted. All lines may not be shown.

Fresno Chandler Airport Utilities
Electric and Communications Utilities

Appendix 6C
Electric Lines
Northwest Approach Area



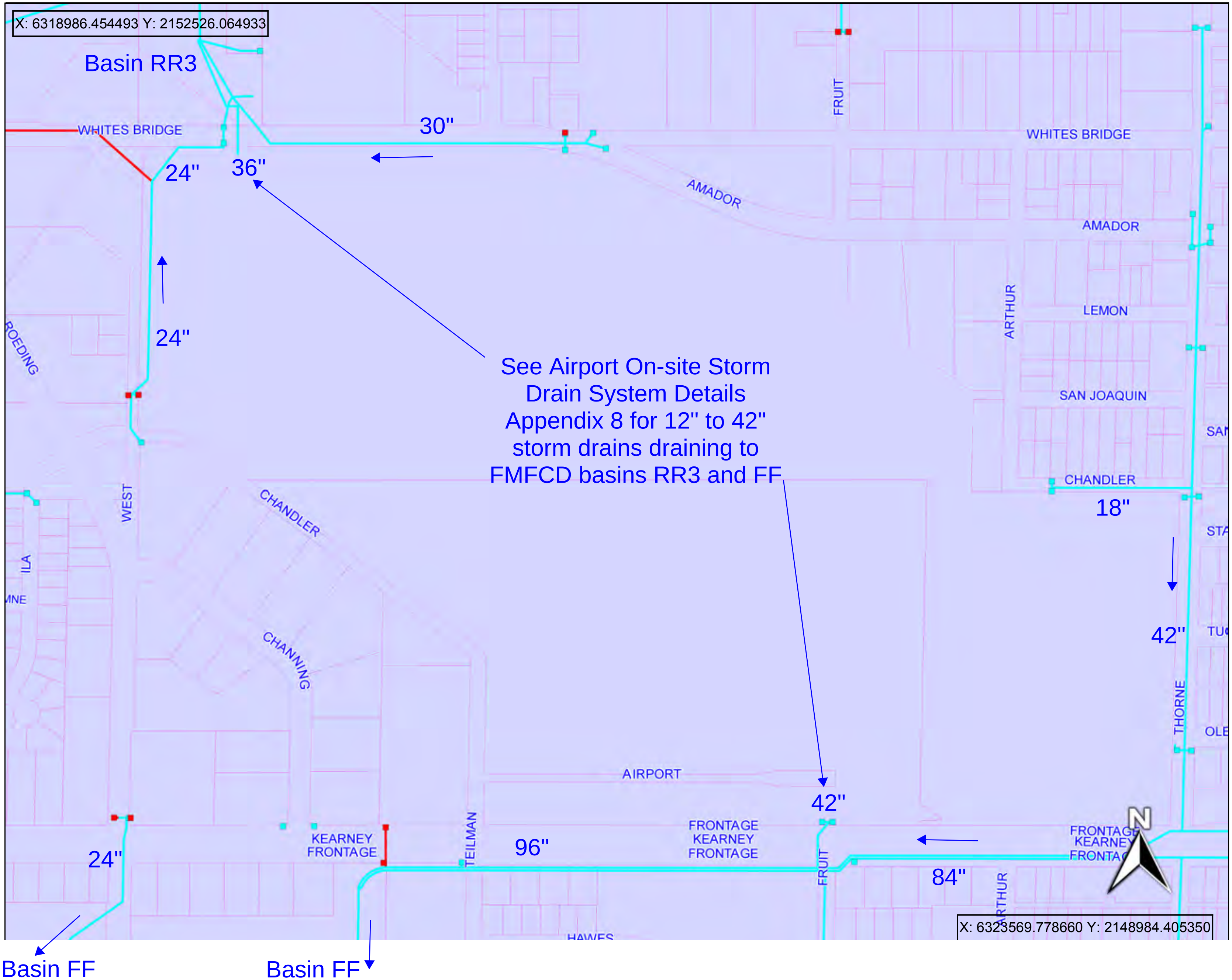
Electrical (12kV) - Buried
Electrical (12kV)- Aerial

Note: PG&E line locations based on based on select PG&E Distribution Maps and ground observation. No survey was conducted. All lines may not be shown.

Fresno Chandler Airport Utilities
Storm Drains

Appendix 7

11/12/2018
Scale: 1 : 5000



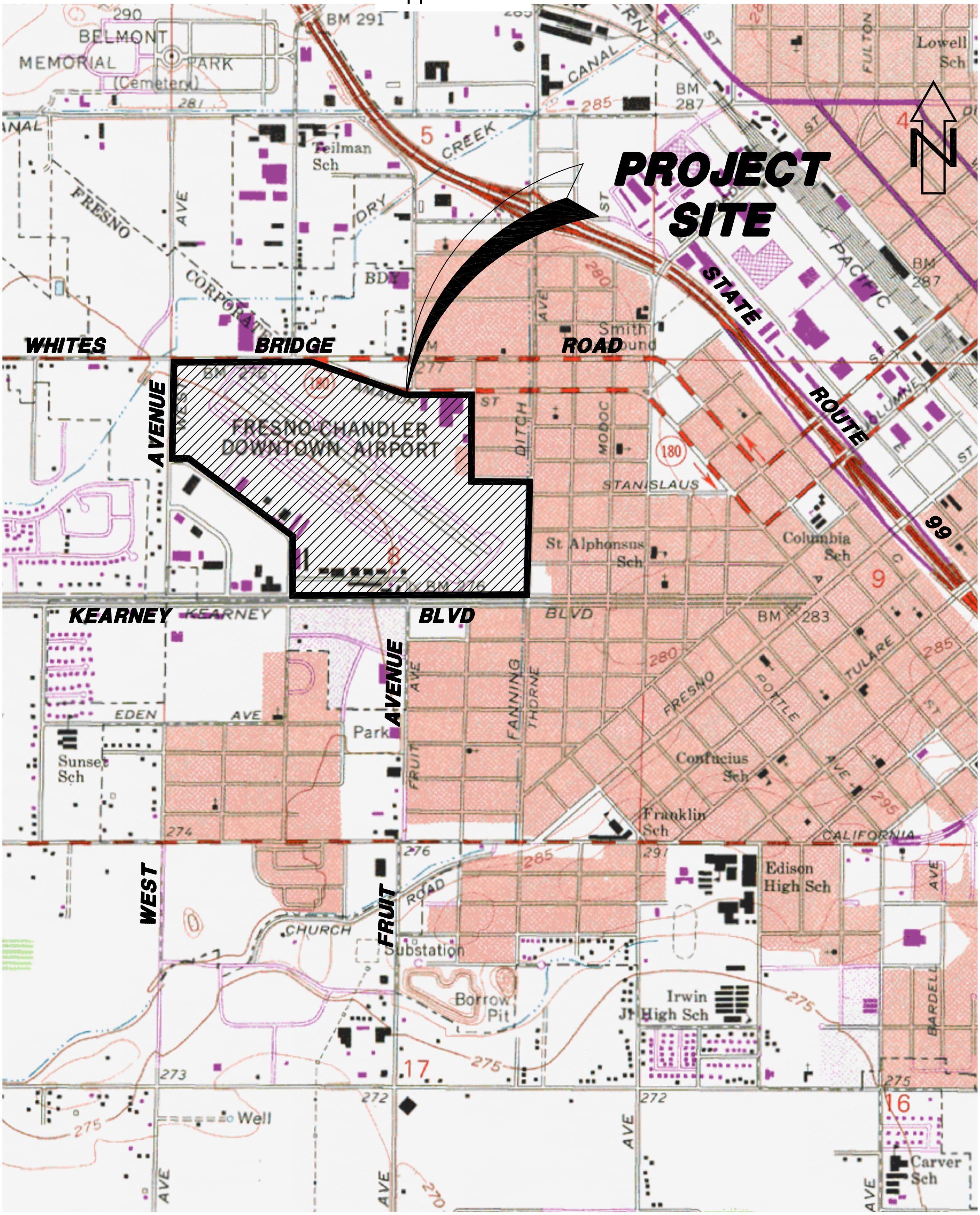


FIGURE 1
LOCATION MAP
CHANDLER DOWNTOWN AIRPORT

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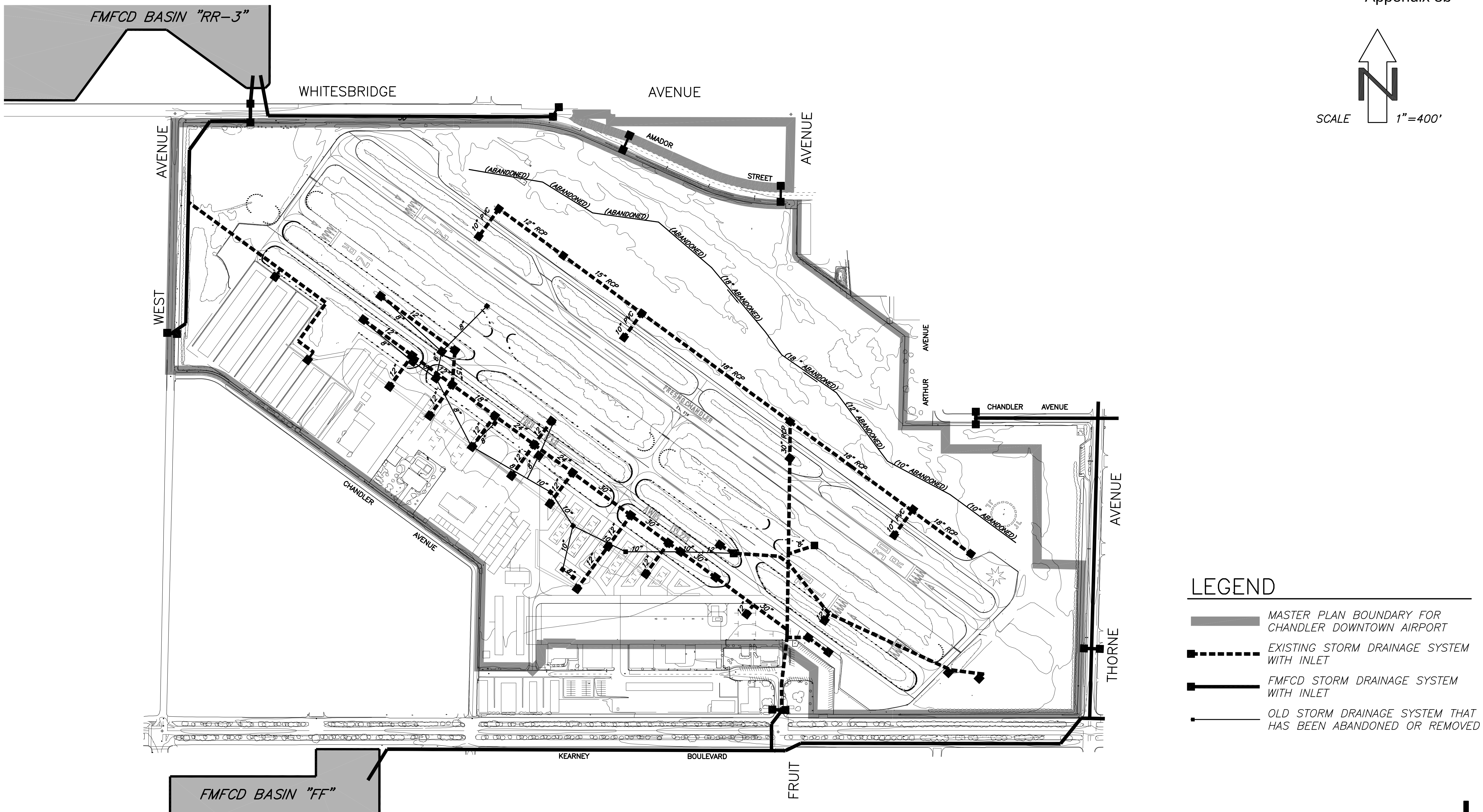
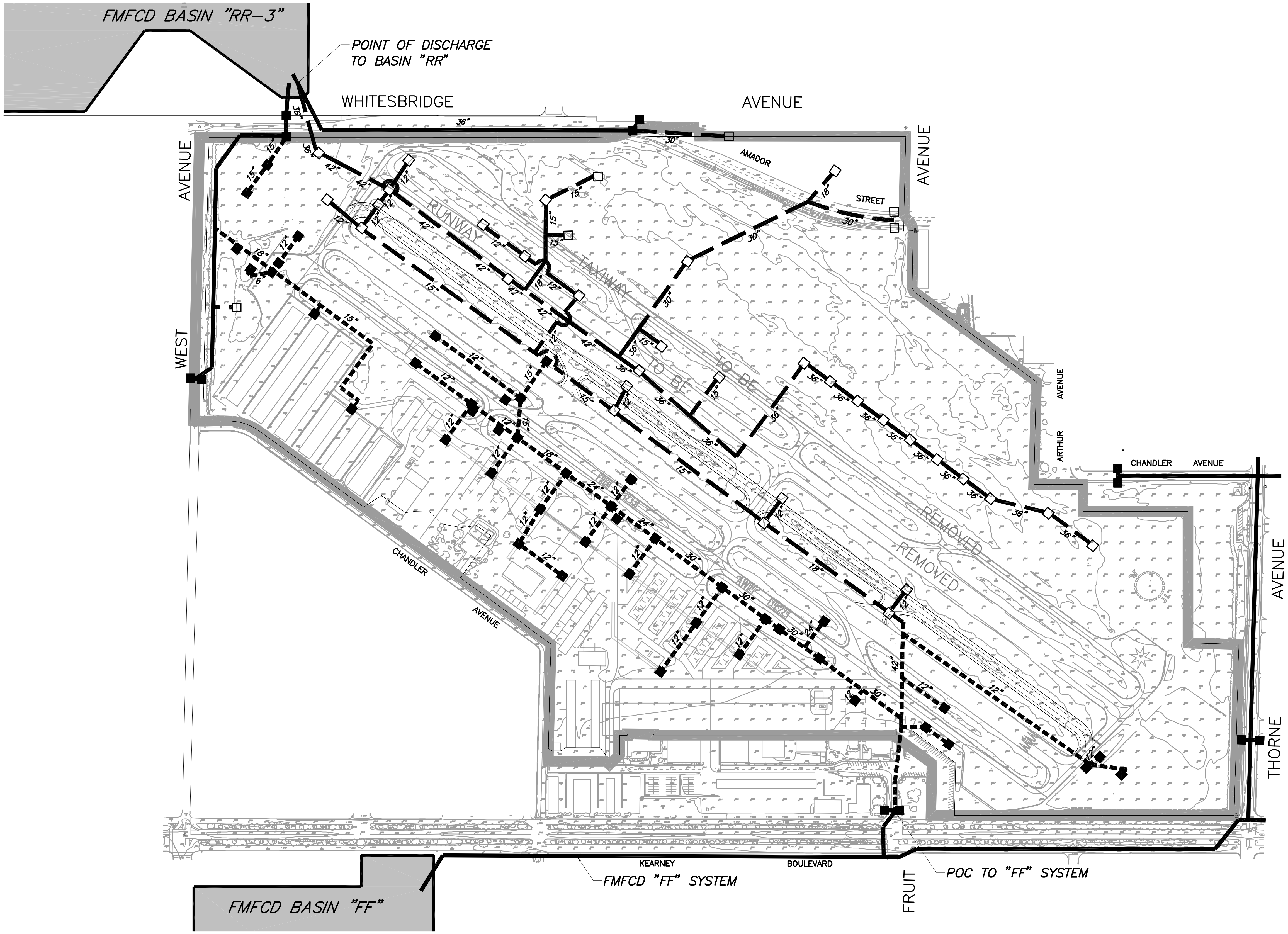


FIGURE 2

EXISTING STORM DRAINAGE SYSTEM
CHANDLER DOWNTOWN AIRPORT

Blair, Church and Flynn Consulting Engineers

Drawing: P:\201-0270\Dwg-Study\dwg\201270-EXIST.dwg; FIGURE 2
Plot by: robert Oct 06, 2003 - 3:56pm



LEGEND

	MASTER PLAN BOUNDARY FOR CHANDLER DOWNTOWN AIRPORT
	EXISTING STORM DRAINAGE SYSTEM WITH INLET
	PROPOSED STORM DRAINAGE SYSTEM WITH INLET
	FMFCD STORM DRAINAGE SYSTEM WITH INLET
POC	POINT OF CONNECTION
FMFCD	FRESNO METROPOLITAN FLOOD CONTROL DISTRICT

FIGURE 3
INTERIM STORM DRAINAGE SYSTEM CHANDLER DOWNTOWN AIRPORT

Blair, Church and Flynn Consulting Engineers

Drawing: P:\201-0270\Dwg-Study\dwg\201270-EXIST&PROP.dwg; FIGURE 3
Plot by: Coralie Jun 28, 2006 - 12:56pm

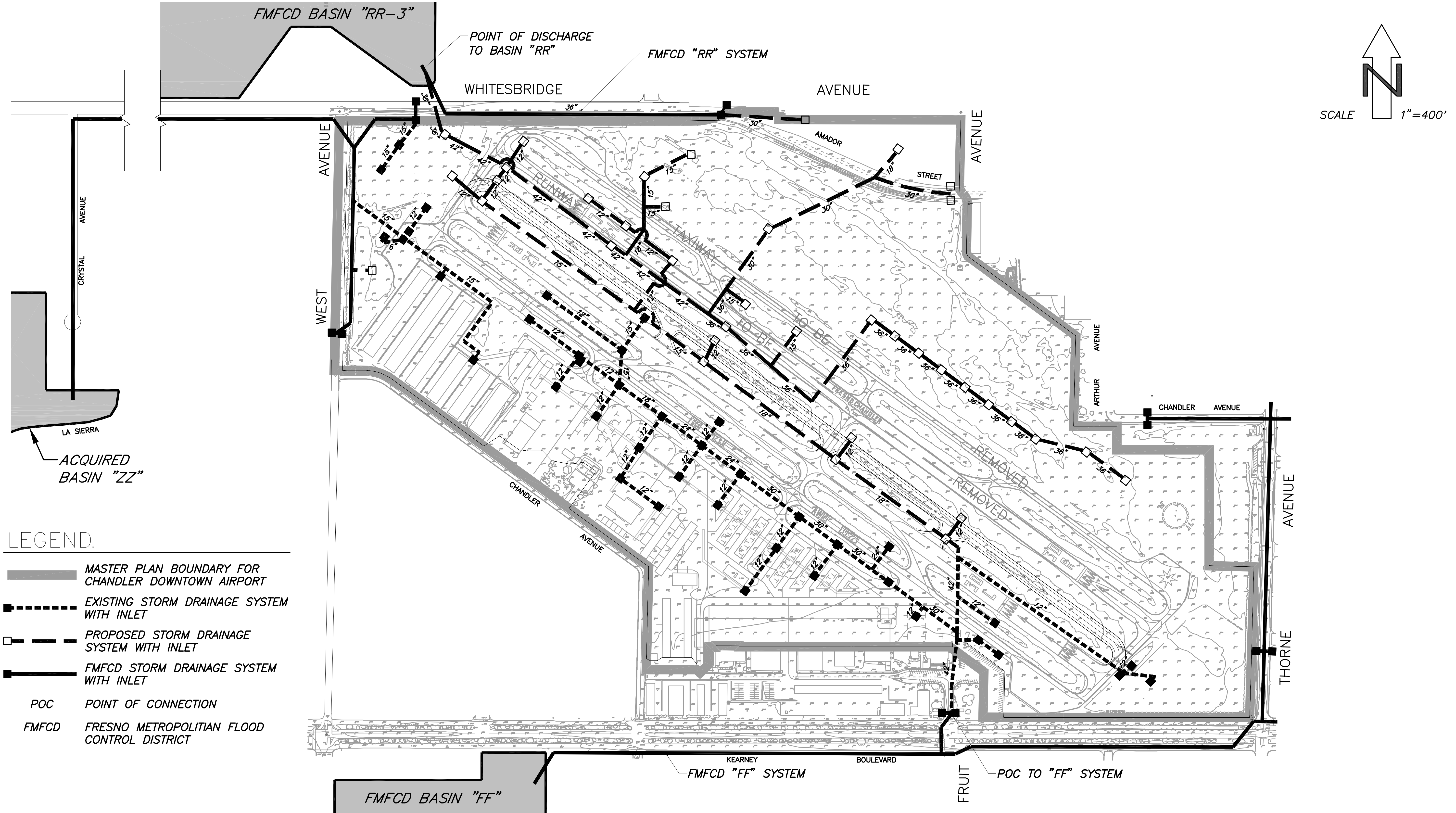
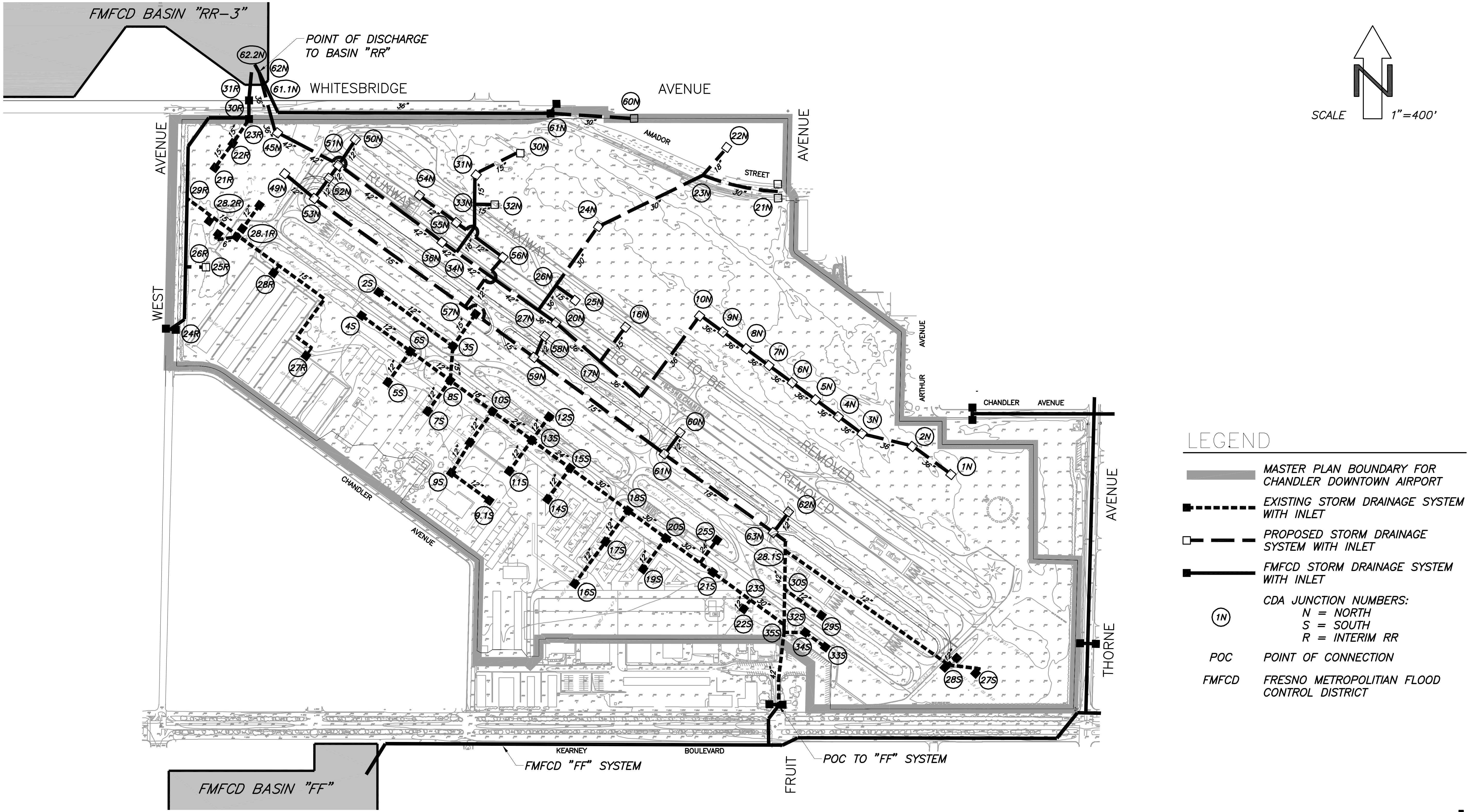


FIGURE 4

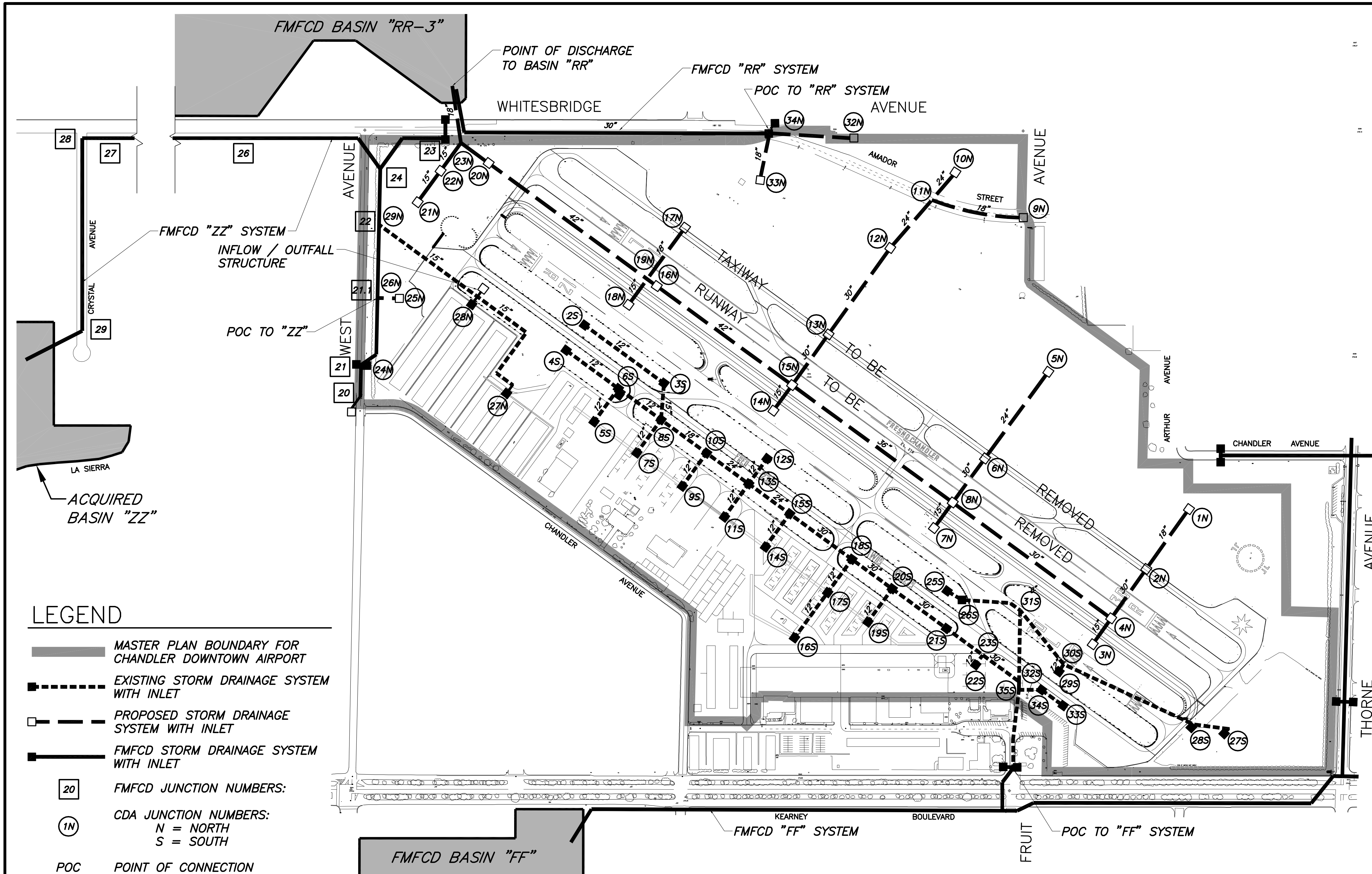
ULTIMATE STORM DRAINAGE SYSTEM CHANDLER DOWNTOWN AIRPORT



MASTER PLAN STORM DRAINAGE SYSTEM JUNCTION KEY MAP
INTERIM STORM DRAINAGE SYSTEM
CHANDLER DOWNTOWN AIRPORT

Blair, Church and Flynn Consulting Engineers

Drawing: P:\201-0270\Dwg-Study\dwg\201270-intermdrainage.dwg; 1
Plot by: Cordie Jun 28, 2006 – 11:42am

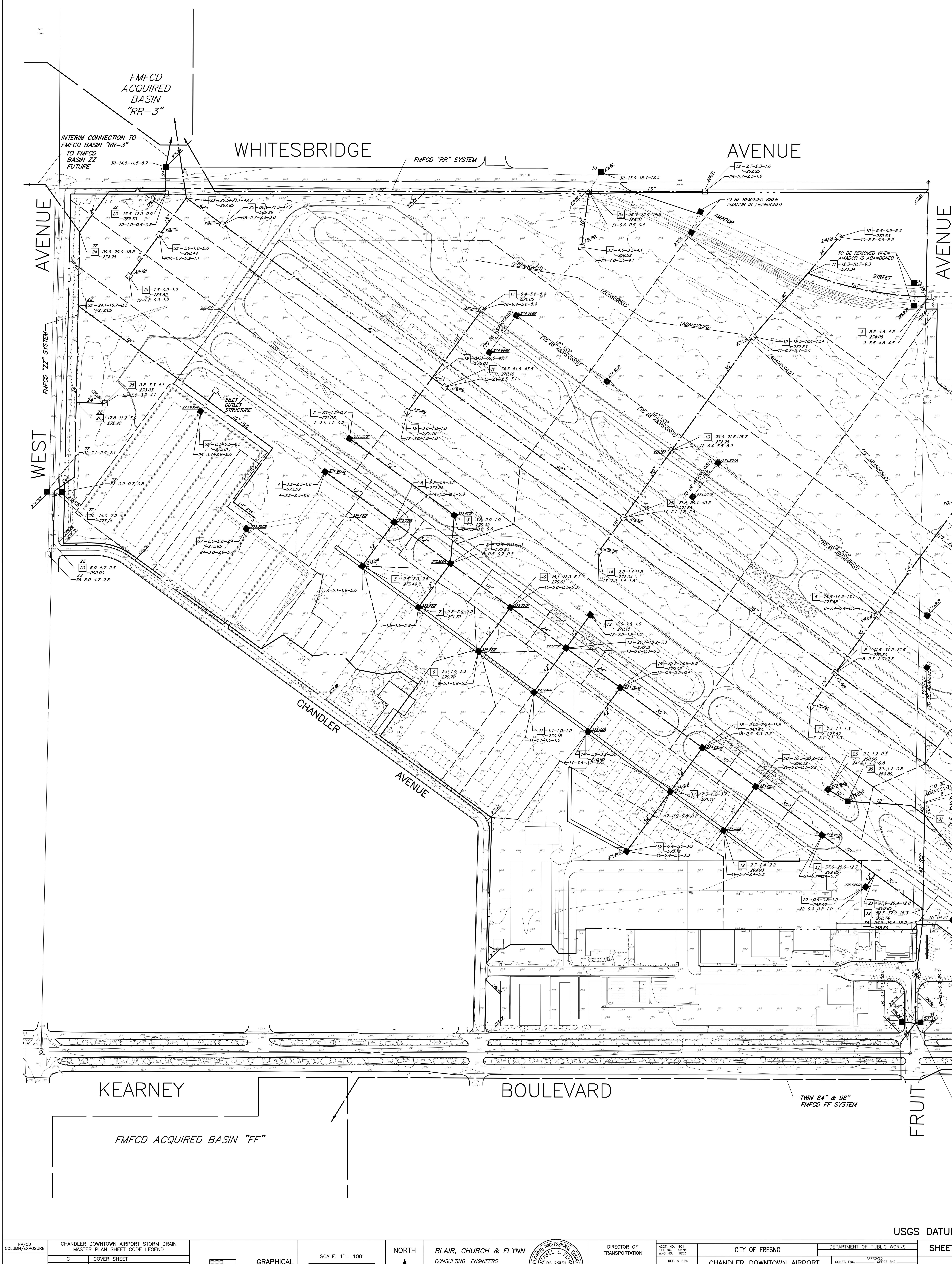


MASTER PLAN STORM DRAIN SYSTEM JUNCTION KEY MAP
ULTIMATE STORM DRAINAGE SYSTEM
CHANDLER DOWNTOWN AIRPORT

Blair, Church and Flynn Consulting Engineers

Drawing: P:\201-0270\Dwg-Study\dwg\201270-ult-intermdrainage.dwg; 1
Plot by: robert Oct 06, 2003 - 4:01pm

Appendix 8g



FMFCD COLUMN/EXPOSURE	CHANDLER DOWNTOWN AIRPORT STORM DRAIN MASTER PLAN SHEET CODE LEGEND	
23-19	C	COVER SHEET
	T	TOPOGRAPHIC SHEET
	SD	STORM DRAIN SHEET
	LU	LAND USE SHEET
	L	LEGEND SHEET

1 2 GRAPHICAL INDEX

SCALE: 1" = 100'
0 25 50 100 200 400
SCALE IN FEET

NORTH

BLAIR, CHURCH & FLYNN
CONSULTING ENGINEERS
FRESNO-CLOVIS CALIFORNIA
MICHAEL E. FLYNN

REGISTERED PROFESSIONAL ENGINEER MICHAEL E. FLYNN No. 23,828 EXP. 12/31/01 CIVIL STATE OF CALIFORNIA

DIRECTOR OF TRANSPORTATION
NOAH LAGOS
DATE

ACCT. NO. 401
FILE NO. 9675
W/O NO. 1853
REF. & REV.

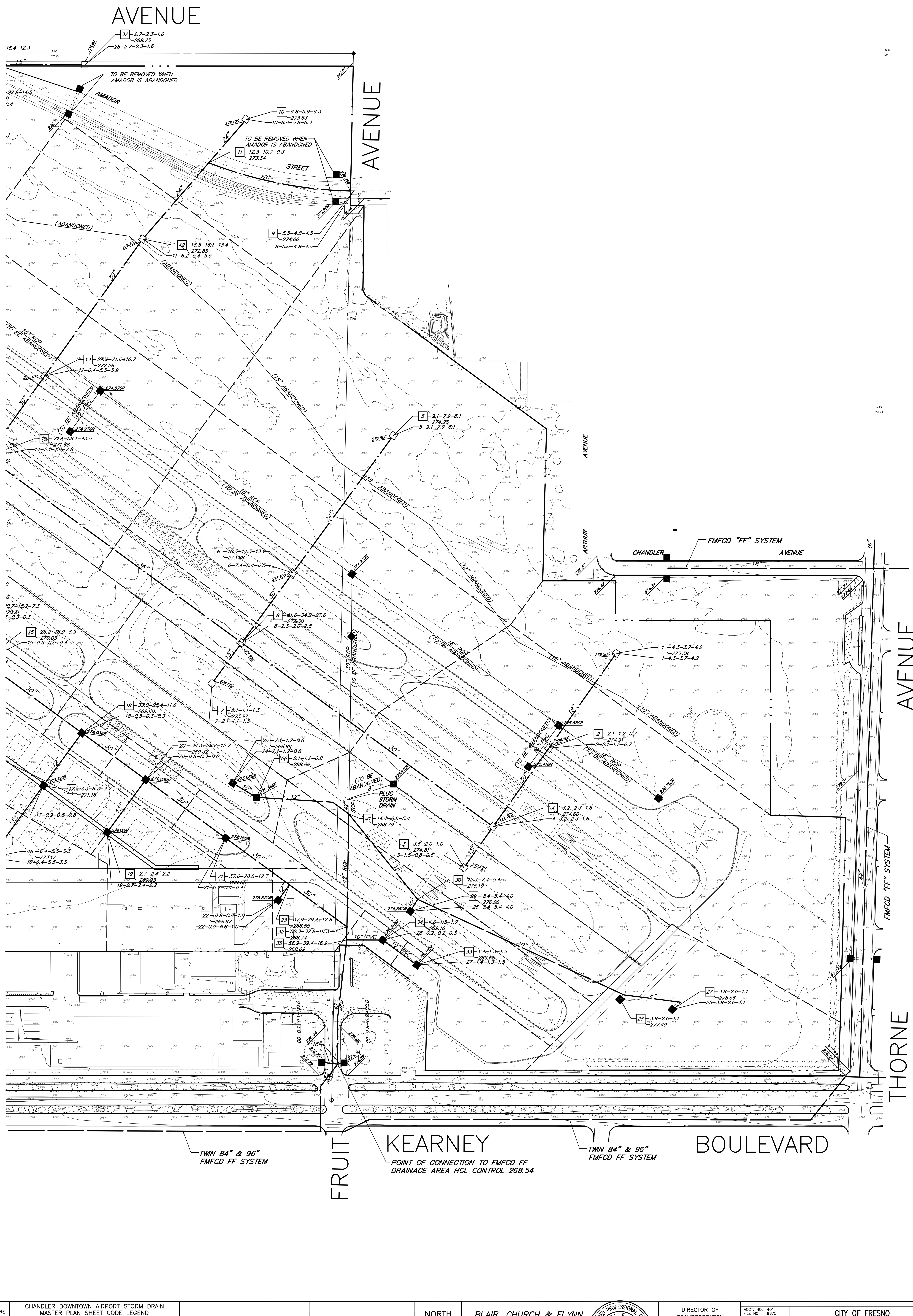
CITY OF FRESNO
CHANDLER DOWNTOWN AIRPORT STORM DRAINAGE MASTER PLAN
STORM DRAIN SHEET

DEPARTMENT OF PUBLIC WORKS
APPROVED
CONST. ENG. OFFICE ENG.
CITY DESIGN ENG.
DR. BY JPD
CH. BY CRQ
DATE 10-08-03
SCALE: 1"=100'
SHEET NO. 4 OF 10 SHEETS
XX-X-XXX

SHEET
SD-1

B.C. & F. FILE NO.: 201-0270
COMP. FILE NO.: 20127087.DWG

Appendix 8h



USGS DATUM

FMFCD COLUMN/EXPOSURE	CHANDLER DOWNTOWN AIRPORT STORM DRAIN MASTER PLAN SHEET CODE LEGEND	
24-19	C	COVER SHEET
	T	TOPOGRAPHIC SHEET
	SD	STORM DRAIN SHEET
	LU	LAND USE SHEET
	L	LEGEND SHEET

1 2 GRAPHICAL INDEX

SCALE: 1" = 100'
0 25 50 100 200 400
SCALE IN FEET

NORTH

BLAIR, CHURCH & FLYNN
CONSULTING ENGINEERS
FRESNO–CLOVIS CALIFORNIA
MICHAEL E. FLYNN

REGISTERED PROFESSIONAL ENGINEER MICHAEL E. FLYNN EXP. 12/31/01 No. 23,828 CIVIL STATE OF CALIFORNIA

DIRECTOR OF TRANSPORTATION
NOAH LAGOS
DATE

ACCT. NO. 401
FILE NO. 9675
W/O NO. 1853
REF. & REV.

CITY OF FRESNO
CHANDLER DOWNTOWN AIRPORT
STORM DRAINAGE MASTER PLAN
STORM DRAIN SHEET

DEPARTMENT OF PUBLIC WORKS
APPROVED
CONST. ENG. ______ OFFICE ENG. ______
CITY DESIGN ENG. ______
DR. BY JPD
CH. BY CRQ
DATE 02-14-02
SCALE: 1"=100'
SHEET NO. 5 OF 10 SHEETS
XX–X–XXX

SHEET
SD-2

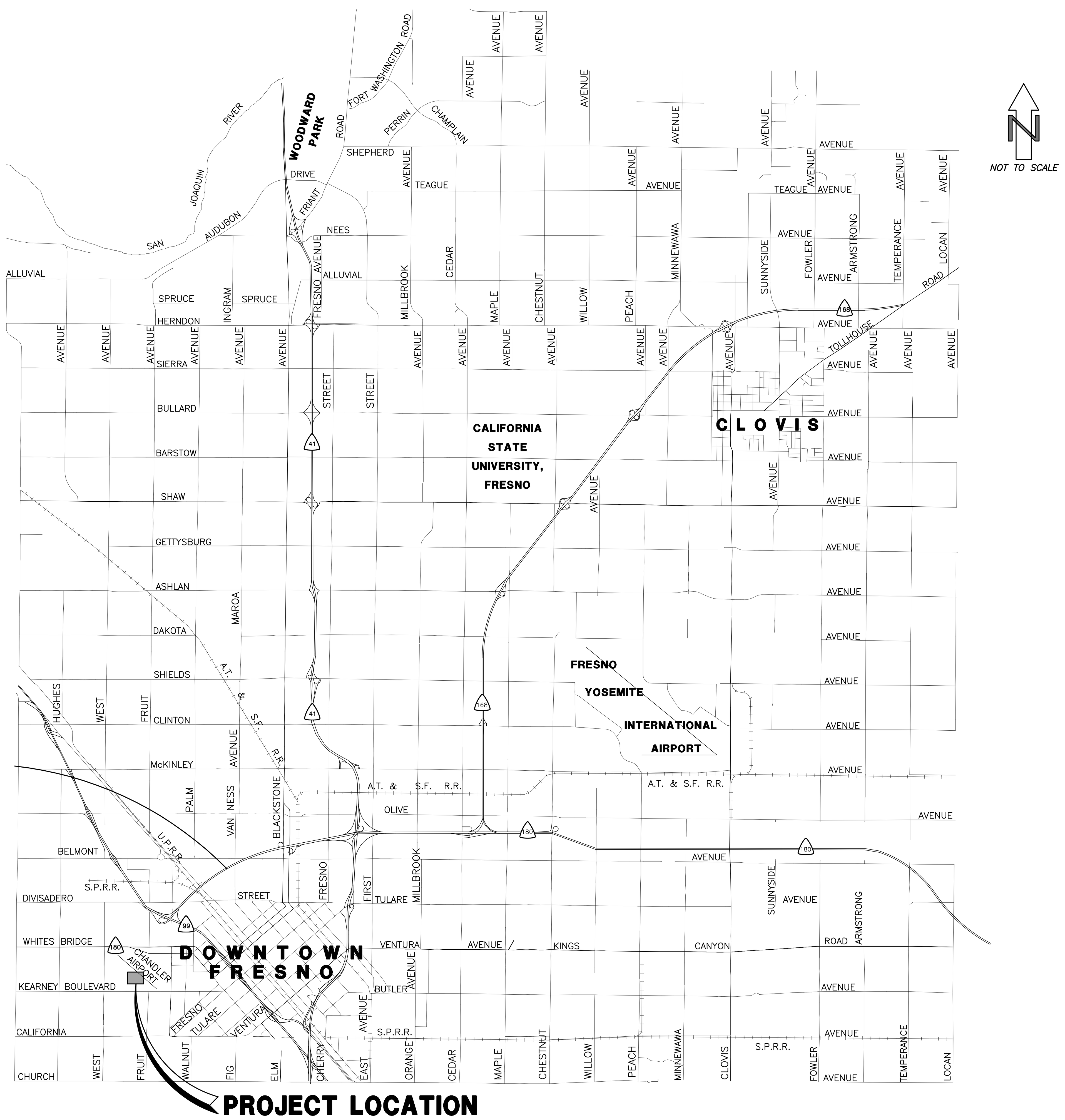
B.C. & F. FILE NO.: 201-0270
COMP. FILE NO.: 201270BT.DWG
Z – MP-200.ctb

Appendix 8i
(9 Sheets)

C I T Y   O F   F R E S N O

FRESNO YOSEMITE
INTERNATIONAL AIRPORT

DEPARTMENT OF AIRPORTS
DRAPER TAXILANE RECONSTRUCTION
AT
FRESNO CHANDLER AIRPORT



VICINITY MAP

GENERAL NOTES

1. ALL CURB AND GUTTER SHALL BE WATER TESTED UNDER THE DIRECTION AND IN THE PRESENCE OF THE CITY INSPECTOR PRIOR TO ANY STREET OPERATION.
2. ALL SEWER, OTHER MANHOLES AND ALL OTHER UTILITY COVERS (EXCEPT CITY OF FRESNO WATER VALVES), CAP AND LID, AFFECTED BY THIS PROJECT SHALL BE ADJUSTED TO GRADE AS NECESSARY AND INCLUDED IN THIS WORK.
3. NO WATER MAIN VALVES SHALL BE CLOSED BY THE CONTRACTOR EXCEPT IN THE CASE OF BROKEN MAIN. THE CONTRACTOR SHALL NOTIFY THE CITY IMMEDIATELY AFTER A LINE IS BROKEN.
4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CURRENT CITY OF FRESNO STANDARD DRAWINGS AND SPECIFICATIONS ANY APPLICABLE SECTIONS OF THE JULY, 2004 CALTRANS STANDARD SPECIFICATIONS AND JULY 2002 STANDARD DRAWINGS, AND FAA STANDARD SPECIFICATIONS, LATEST EDITION. THE CONTRACTOR SHALL COMPLY WITH ADVISORY CIRCULAR 150/5370–25, OPERATIONAL SAFETY ON AIRPORTS, DURING CONSTRUCTION.
5. BEFORE COMMENCING WORK, THE CONTRACTOR SHALL NOTIFY ALL UTILITY AUTHORITIES OR UTILITY COMPANIES HAVING POSSIBLE INTEREST IN THE WORK OF THE CONTRACTOR'S INTENTION TO EXCAVATE PROXIMATE TO EXISTING FACILITIES AND THE CONTRACTOR SHALL VERIFY THE LOCATION OF ANY UTILITIES IN THE WORK AREA. NOTIFY U.S.A. A MINIMUM OF TWO (2) DAYS PRIOR TO EXCAVATION, TOLL FREE AT 1–800–227–2600, OR 811.
6. THE CONTRACTOR SHALL PROVIDE AND PAY FOR QUALITY CONTROL TESTING IN ACCORDANCE WITH FAA STANDARD SPECIFICATIONS.
7. ANY EXISTING SECTION CORNER OR PROPERTY CORNER MONUMENTS DAMAGED BY THIS CONTRACT SHALL BE RESET BY THE CONTRACTOR AT NO COST TO THE CITY PER CITY STANDARD DRAWINGS P–36.
8. ALL DELETERIOUS MATERIAL WITHIN THE STREET RIGHT OF WAY IS TO BE REMOVED BY THE CONTRACTOR, AND PROPERLY DISPOSED OF.
9. THE CONTRACTOR SHALL SECURE PERMITS BUT AIRPORT WILL PAY FOR PERMITS. SEE GENERAL CONDITIONS.
10. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING AND LAWFULLY DISPOSING ANY EXISTING CONCRETE, ASPHALT, VEGETATION, SPRINKLERS, STUMPS, AND ANY OTHER MISCELLANEOUS DEBRIS AS NECESSARY TO COMPLETE THE DEMOLITION AND CONSTRUCTION OF THIS PROJECT.
11. ALL SIGNING, DETOURING, AND BARRICADING SHALL CONFORM TO THE AIRPORT SAFETY OPERATIONS INSTRUCTIONS, LATEST EDITION.
12. SIDEWALKS SHALL NOT BE POURED UNTIL ALL WATER METER BOXES AND SERVICES HAVE BEEN INSPECTED BY THE CITY AND ANY NECESSARY STREET SIGNS HAVE BEEN INSTALLED. NOTIFY THE STREET DEPARTMENT 48 HOURS PRIOR TO POURING AND/OR INSTALLING ANY STREET SIGNS, STRIPING OR MARKINGS AT 621–1492.
13. THE CONTRACTOR SHALL OBTAIN WRITTEN AUTHORIZATION FROM ANY ADJACENT PROPERTY OWNER GIVING HIM PERMISSION TO ENTER HIS PROPERTY FOR PURPOSES OF CONSTRUCTING THE IMPROVEMENTS DELINEATED ON THESE PLANS AND TRANSITIONS THERETO. THE CONTRACTOR SHALL PROVIDE THE CITY WITH A COPY PRIOR TO START OF WORK.
14. WHERE UNDERGROUND AND SURFACE STRUCTURES ARE SHOWN ON THE PLANS, THE LOCATIONS, DEPTH AND DIMENSIONS OF STRUCTURES ARE BELIEVED TO BE REASONABLY CORRECT, BUT ARE NOT GUARANTEED. SUCH STRUCTURES ARE SHOWN FOR THE INFORMATION OF THE CONTRACTOR, BUT INFORMATION SO GIVEN IS NOT TO BE CONSTRUED AS A REPRESENTATION THAT SUCH STRUCTURES WILL, IN ALL CASES, BE FOUND WHERE SHOWN, OR THAT THEY REPRESENT ALL OF THE STRUCTURES WHICH MAY BE ENCOUNTERED.
16. ANY DIRT OR DEBRIS TRACKED ONTO ANY TAXIWAY OR AIRPORT FACILITY FROM THIS PROJECT SHALL BE CLEANED OFF IMMEDIATELY TO THE SATISFACTION OF THE CONSTRUCTION MANAGER.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL TRAFFIC CONTROL AND TRAFFIC SAFETY DEVICES AND PERFORMING ALL WORK NECESSARY TO PROVIDE NECESSARY TRAFFIC DETOURS AS SPECIFIED.
18. THE CONTRACTOR SHALL HAUL OFF AND LAWFULLY DISPOSE OF ALL EXCESS SOIL GENERATED FROM EXCAVATION AND GRADING OF THE PROJECT.
19. THE CONTRACTOR SHALL NOTIFY THE AIRPORT CONSTRUCTION MANAGER FOR BENCH MARK AND SURVEY CONTROL INFORMATION 72 HOURS PRIOR TO NEEDING BENCH MARK AND SURVEY CONTROL INFORMATION.
20. THE CONTRACTOR SHALL DILIGENTLY AND EFFECTIVELY MAINTAIN DUST CONTROL MEASURES DURING THE LIFE OF THIS PROJECT, 24 HOURS PER DAY, 7 DAYS PER WEEK.
21. THE CONTRACTOR SHALL PROTECT ALL EXISTING IMPROVEMENTS NOT DESIGNATED FOR REMOVAL.
22. ALL SITE GRADING SHALL COMPLY WITH THE 2013 CALIFORNIA BUILDING CODE.
23. THIS GRADING PLAN IS FOR APPROVAL OF ON–SITE ELEVATIONS ONLY. THE ELEVATIONS SHOWN WITH IN THE PUBLIC RIGHT–OF–WAY REQUIRE SEPARATE PUBLIC WORKS DEPARTMENT APPROVAL & PERMIT. ANY NOTES THAT APPLY TO THE PUBLIC RIGHT–OF–WAY ARE FOR REFERENCE ONLY. IF ON–SITE ELEVATIONS SHOWN DO NOT COINCIDE WITH APPROVAL STREET PLANS, AN APPROVED AMENDMENT IS REQUIRED.

UTILITY NOTE

UTILITY INFORMATION SHOWN HEREON IS BASED ON RECORD INFORMATION SUPPLIED TO THE ENGINEER BY VARIOUS UTILITY AUTHORITIES. THE ENGINEER CAN MAKE NO GUARANTEE AS TO THE ACCURACY OR COMPLETENESS OF THE UTILITY FACILITIES SHOWN. PRIOR TO ANY SITE EXCAVATIONS, THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT (U.S.A.), 1–800–227–2600, TO REQUEST THAT THEY IDENTIFY THE LOCATION OF ALL UNDERGROUND UTILITIES ADJACENT TO AND WITHIN THE PROJECT BOUNDARIES.

TOPOGRAPHIC NOTE

THIS TOPOGRAPHIC SURVEY LOCATES SPECIFIC PHYSICAL FEATURES OF THE SITE AND THEIR ELEVATION AS DETERMINED NECESSARY BY THE PROJECT ENGINEER. THE INFORMATION SHOWN REFLECTS THE DATA OBTAINED BY FIELD SURVEY CONDUCTED IN MARCH 5, 6 AND 9, 2015.

PROJECT BENCHMARK

SBM CHISELED SQUARE ON TOP OF CONCRETE AT NORTHEAST CORNER OF HANGER BUILDING.

ELEV.= 275.15 U.S.G.S. DATUM

PROJECT ADDRESS

FRESNO CHANDLER EXECUTIVE AIRPORT
510 WEST KEARNEY BOULEVARD
FRESNO, CA 93706

TABLE OF CONTENTS

CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR ASSUMES SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE PERFORMANCE OF WORK, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, ON A CONTINUOUS BASIS NOT LIMITED TO NORMAL WORKING HOURS. CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD HARMLESS BLAIR, CHURCH & FLYNN CONSULTING ENGINEERS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF BLAIR, CHURCH & FLYNN CONSULTING ENGINEERS.

CAUTION
WATCH FOR OVERHEAD POWER LINES

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

REGISTERED PROFESSIONAL ENGINEER
No. 28,185
CIVIL
STATE OF CALIFORNIA

DATE: 8–14–15

RECORD DRAWING
5-2-2017

CONFORM
FOR CONSTRUCTION PLAN

APPROVED: CITY OF FRESNO, AIRPORTS DATE

FRESNO YOSEMITE INTERNATIONAL AIRPORT
CITY OF FRESNO
DEPARTMENT OF AIRPORTS
4995 EAST CLINTON WAY
FRESNO, CALIFORNIA 93727
PHONE: 559–621–4500

CONSULTANT INFORMATION

Blair, Church & Flynn
CONSULTING ENGINEERS

Blair, Church & Flynn
Consulting Engineers
451 Clovis Avenue,
Suite 200
Clovis, California 93612
Tel (559) 326-1400
Fax (559) 326-1500

REVISIONS/REFERENCE

REV. NO.	DATE	DESCRIPTION
1	9/9/2015	ADDENDUM

DEPARTMENT OF AIRPORTS
FRESNO CHANDLER AIRPORT
DRAPER TAXILANE RECONSTRUCTION
COVER SHEET

DIRECTOR OF AVIATION
KEVIN MEIKLE

APPROVED
CONST. ENG.
OFFICE ENG.
CITY DESIGN ENG.

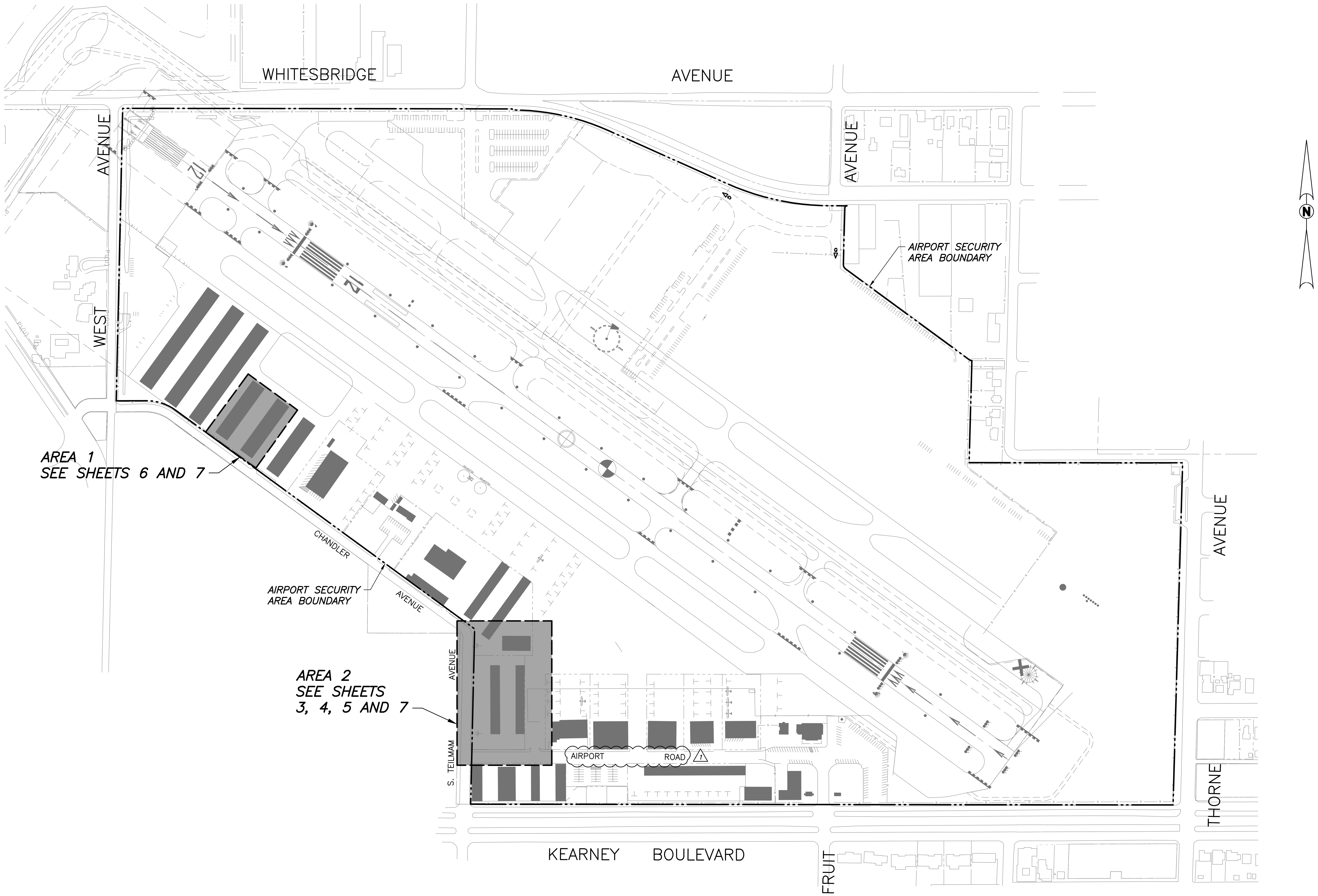
KRA # XXXXXXXXXX
FUND # XXXXX
ORG # XXXXX
ACTIVITY AIR
PROJECT I.D.

DRAWN BY: JMS
CHECKED BY: CRQ
DATE: 8–14–15
SCALE:
FILE:

CITY DRAWING NO.
XX–X–XXXX

SHEET NO.
1
1 OF 9 SHEETS

15–9510



RECORD DRAWING
5-2-2017

CONFORM
FOR CONSTRUCTION PLAN

REGISTERED PROFESSIONAL ENGINEER
GEORGE R. QUALLS
No. 28,185
CIVIL
STATE OF CALIFORNIA

DATE: 8-14-15

FRESNO YOSEMITE
INTERNATIONAL AIRPORT
CITY OF FRESNO
DEPARTMENT OF AIRPORTS
4995 EAST CLINTON WAY
FRESNO, CALIFORNIA 93727
PHONE: 559-621-4500

CONSULTANT INFORMATION

Blair, Church & Flynn
CONSULTING ENGINEERS

Blair, Church & Flynn
Consulting Engineers
451 Clovis Avenue,
Suite 200
Clovis, California 93612
Tel (559) 326-1400
Fax (559) 326-1500

REVISIONS/REFERENCE

REV NO.	DATE	DESCRIPTION
1	9/9/2015	ADDENDUM

DEPARTMENT OF AIRPORTS

FRESNO CHANDLER AIRPORT
DRAPER TAXILANE RECONSTRUCTION
INDEX SHEET

DIRECTOR
OF AVIATION
KEVIN MEIKLE

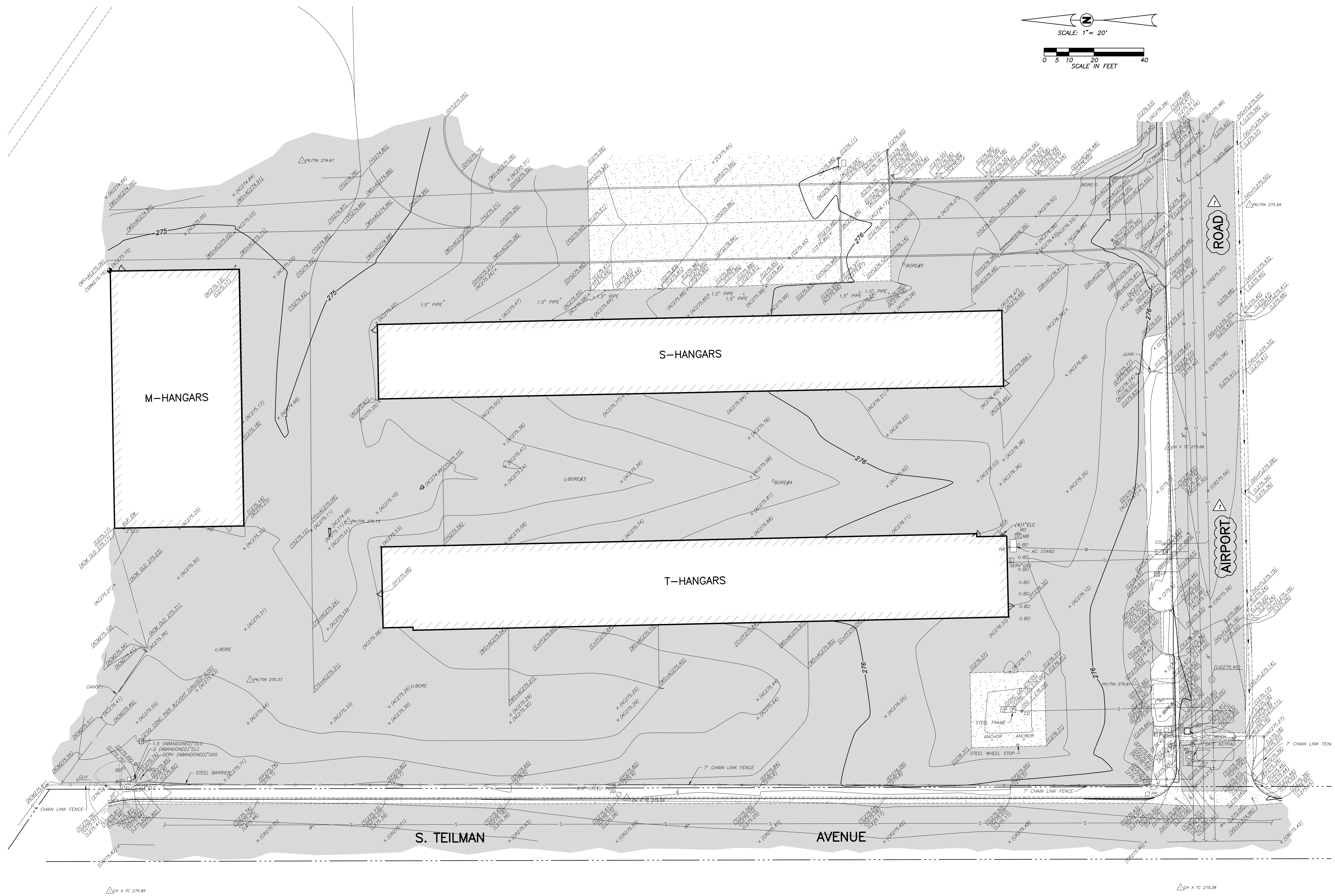
APPROVED
CONST. ENG.
OFFICE ENG.
CITY DESIGN ENG.

KRA #	XXXXXXXXXX
FUND #	XXXXX
ORG #	XXXXX
ACTIVITY	AIR
PROJECT I.D.	
DRAWN BY:	JMS
CHECKED BY:	CRQ
DATE:	8-14-15
SCALE:	
FILE:	

CITY DRAWING NO.
XX-X-XXXX

SHEET NO.
2
2 OF 9 SHEETS

15-9510



TOPOGRAPHIC LEGEND

AC	ASPHALTIC CONCRETE
ACM	ASPHALTIC CONCRETE MATCH LINE
C	CONCRETE
CD	CROSS DRAIN
CL	CENTERLINE
CO	SEWER CLEANOUT
CR	CROWN GRADE
DA	DRIVE APPROACH
DYS	DOUBLE YELLOW STRIPE
E	EAST OR EASTING
ECA	ELECTRIC CABINET
ELP	ELECTRIC PANEL
EM	ELECTRIC METER
EP	EDGE OF PAVEMENT
EPB	ELECTRIC PULLBOX
FF	FINISHED FLOOR
FL	FLOWLINE
G	GUTTER
GB	GRADE BREAK
L	LIP OF GUTTER
LID	LID OF UTILITY STRUCTURE
LP	LIGHT POLE
MS	MOWSTRIP
N	NORTH OR NORTHING
NE	NORTHEAST
NW	NORTHWEST
OE	OVERHEAD ELECTRIC
S	SOUTH
SL	STREET LIGHT
SBM	SITE BENCHMARK
SLPB	STREET LIGHT PULLBOX
SQ	SQUARE
SWL	SWALE
T	TURF
TC	TOP OF CURB
VG	VALLEY GUTTER
UE	UNDERGROUND ELECTRIC
W	WEST
WM	WATER METER
WS	WHITE STRIPE
WV	WATER VALVE
YS	YELLOW STRIPE
(335.21)	EXISTING GRADE
	BACKFLOW PREVENTER
	BM=BENCHMARK; OR TBM=TEMPORARY BENCHMARK
BO	BOLLARD
CO	SEWER CLEANOUT
212.55	SURVEY CONTROL POINT
ELC	ELECTRICAL CONDUIT
	FIRE HYDRANT
2" GAS	GAS LINE; DIAMETER AS SHOWN
	GAS METER
	ROOL GATE OR SWING GATE
GS	GAS STOP
GUY	GUY WIRE
HB	HOSE BIBB
IP	IRON PIPE
LP	LIGHT POLE
MB	MAILBOX
PP	POWER POLE
RD	ROOF DRAIN
	SIGN
	SEWER MANHOLE
12" STUMP	STUMP; DIAMETER AS SHOWN
	TREE; SPREAD SHOWN GRAPHICALLY AND TRUNK DIAMETER AS SHOWN
TSB	TELEPHONE SPLICE BOX
	WATER METER
WV	WATER VALVE
	AC PAVING IMPROVEMENTS
	BUILDING
	CONCRETE IMPROVEMENTS
	CHAIN LINK FENCE
	EDGE OF ASPHALT CONCRETE PAVEMENT
E	UNDERGROUND ELECTRIC
G	GAS LINE
SD	STORM DRAIN LINE
S 8"	SEWER LINE; SIZE AS NOTED
TS	TRAFFIC SIGNAL
W 8"	WATER LINE; SIZE AS NOTED
	DIRECTION OF FLOW
	EXISTING RIGHT OF WAY LINE
	EXISTING CENTER LINE OR SECTION LINE

RECORD DRAWING
5-2-2017

REGISTERED PROFESSIONAL ENGINEER
GORDIE R. QUALLE
No. 28,185
CIVIL
STATE OF CALIFORNIA

DATE: 8-14-15

CONFORM
FOR CONSTRUCTION PLAN

FRESNO YOSEMITE INTERNATIONAL AIRPORT

CITY OF FRESNO
DEPARTMENT OF AIRPORTS
4995 EAST CLINTON WAY
FRESNO, CALIFORNIA 93727
PHONE: 559-621-4500

CONSULTANT INFORMATION

Blair, Church & Flynn
CONSULTING ENGINEERS

Blair, Church & Flynn
Consulting Engineers
451 Clovis Avenue,
Suite 200
Clovis, California 93612
Tel (559) 326-1400
Fax (559) 326-1500

REVISIONS/REFERENCE

REV NO.	DATE	DESCRIPTION
1	9/9/2015	ADDENDUM

DEPARTMENT OF AIRPORTS

FRESNO CHANDLER AIRPORT
DRAPER TAXILANE RECONSTRUCTION
AREA 2 TOPOGRAPHIC SURVEY

DIRECTOR
OF AVIATION
KEVIN MEIKLE

APPROVED
CONST. ENG.
OFFICE ENG.
CITY DESIGN ENG.

KRA # XXXXXXXXXX
FUND # XXXXX
ORG # XXXXX
ACTIVITY AIR
PROJECT I.D.

DRAWN BY: JMS
CHECKED BY: CRQ
DATE: 8-14-15
SCALE:

FILE:

CITY DRAWING NO.
XX-X-XXXX

SHEET NO.
3
3 OF 9 SHEETS

15-9510

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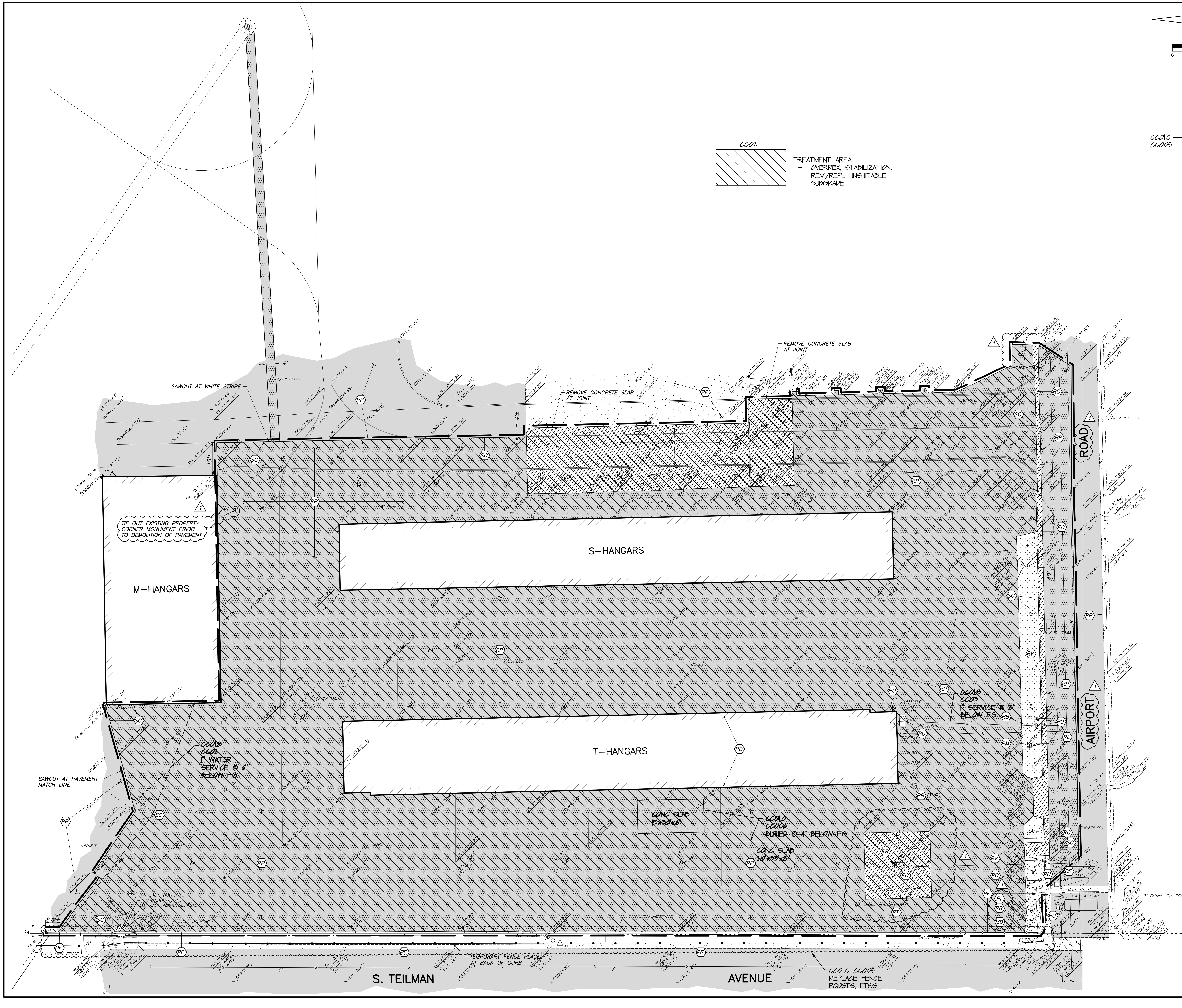
Plot by: alex May 02, 2017 - 2:03pm



DEMOLITION LEGEND

- (PB) PROTECT EXISTING BOLLARD IN PLACE.
- (PC) PROTECT CONCRETE IMPROVEMENTS TO REMAIN.
- (PD) PROTECT DOOR TRACK
- (PF) EXISTING FENCE TO REMAIN, PROTECT IN PLACE. REMOVE AND REPLACE FENCE FABRIC AS REQUIRED TO COMPLETE DEMOLITION WORK AND NEW MOWSTRIP CONSTRUCTION.
- (PP) PROTECT PAVEMENT IMPROVEMENTS TO REMAIN.
- (PU) PROTECT UTILITY, ADJUST LID TO FINISH GRADE.
- (RB) REMOVE AND SALVAGE EXISTING BACKFLOW PREVENTER TO AIRPORTS DEPARTMENT.
- (RC) REMOVE AND LAWFULLY DISPOSE OF EXISTING CONCRETE SECTION.
- (RI) REMOVE EXISTING IRRIGATION VALVES, CAP AND LAWFULLY DISPOSE OF VALVES.
- (RL) REMOVE AND LAWFULLY DISPOSE OF CONCRETE LIGHT POLE BASE. TERMINATE ELECTRICAL WIRING IN NEW PULL BOX PER CITY OF FRESNO STANDARD DRAWING E–1.
- (RM) REMOVE AND RELOCATE EXISTING WATER METER, SEE SHEET 5.
- (RP) REMOVE AND LAWFULLY DISPOSE OF EXISTING PAVEMENT SECTION.
- (RR) REMOVE EXISTING OIL–WATER SEPARATOR AND LAWFULLY DISPOSE OF OFF OF SITE. FURNISH AND PLACE SELECT BACKFILL MATERIAL TO BACKFILL CAVITY TO NEW PAVEMENT SUBGRADE, MOISTURE CONDITION MATERIAL, PLACE IN MAXIMUM 8" THICK UNCOMPACTED LIFTS AND COMPACT TO MINIMUM 95% RELATIVE COMPACTION PER ASTM D–1557. LOCATE AND CAP EXISTING CONNECTION TO SANITARY SEWER WITH 6" THICK CONCRETE PLUG. ASSUME THAT EXISTING OIL–WATER SEPARATOR IS 8' WIDE BY 8' LONG BY 8' DEEP FOR BIDDING PURPOSES. ASSUME THAT EXISTING OIL–WATER SEPARATOR IS FULL OF SOIL AND THAT THE SOIL IS NOT CONTAMINATED AND THERE ARE NO LIQUIDS THAT NEED TO BE DISPOSED OF. SOIL IN THE OIL WATER SEPARATOR MAY BE USED AS FILL FOR THE CAVITY LEFT BY THE REMOVAL OF THE OIL–WATER SEPARATOR.
- (RS) REMOVE SIGN AND SALVAGE TO OWNER.
- (RT) REMOVE AND LAWFULLY DISPOSE OF EXISTING AIRCRAFT TIE–DOWN.
- (RV) REMOVE EXISTING VEGETATION AND LANDSCAPE IRRIGATION PIPELINES AND SPRAY HEADS.
- (SC) SAWCUT FULL DEPTH.
- (MB) REMOVE METER BOX, CAP EXISTING WATER SERVICE IN METER BOX, TIE OUT END OF WATER SERVICE, AND PROTECT METER BOX FOR REINSTALLATION.
- LIMITS OF EXISTING ASPHALTIC CONCRETE STRUCTURAL SECTION TO BE REMOVED.
- LIMITS OF EXISTING CONCRETE SECTION TO BE REMOVED.
- LIMITS OF VEGETATION SECTION TO BE REMOVED.
- PROVIDE AND MAINTAIN 6' HIGH TEMPORARY CHAIN LINK FENCE WITH BARBED WIRE UNTIL PERMANENT FENCE IS INSTALLED AND APPROVED BY THE CONSTRUCTION MANAGER.
- LIMITS OF DEMOLITION

DEMOLITION NOTES

1. THE LIMITS OF DEMOLITION ARE SHOWN FOR SCHEMATIC PURPOSES ONLY. CONTRACTOR SHALL DEMOLISH EXISTING IMPROVEMENTS AS NECESSARY TO CONSTRUCT NEW IMPROVEMENTS.
2. THE CONTRACTOR SHALL PROTECT ALL EXISTING IMPROVEMENTS AND LANDSCAPE NOT DESIGNATED FOR DEMOLITION.
3. ALL DEMOLISHED MATERIALS SHALL BE REMOVED OFF–SITE AND LEGALLY DISPOSED OF.
4. THE CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES PRIOR TO DEMOLITION.
5. CONTRACTOR SHALL ADJUST VALVE BOXES, PULL BOXES, AND VAULTS WITHIN AREA OF WORK TO FINISH GRADE.

RECORD DRAWING
5-2-2017

REGISTERED PROFESSIONAL ENGINEER
DIRK R. QUALLS
No. 28,185
CIVIL
STATE OF CALIFORNIA

DATE: 8–14–15

CONFORM
FOR CONSTRUCTION PLAN

FRESNO YOSEMITE INTERNATIONAL AIRPORT

CITY OF FRESNO
DEPARTMENT OF AIRPORTS
4995 EAST CLINTON WAY
FRESNO, CALIFORNIA 93727
PHONE: 559–621–4500

CONSULTANT INFORMATION

Blair, Church & Flynn
CONSULTING ENGINEERS

Blair, Church & Flynn
Consulting Engineers
451 Clovis Avenue,
Suite 200
Clovis, California 93612
Tel (559) 326-1400
Fax (559) 326-1500

REVISIONS/REFERENCE

REV NO.	DATE	DESCRIPTION
1	9/9/2015	ADDENDUM

DEPARTMENT OF AIRPORTS

FRESNO CHANDLER AIRPORT
DRAPER TAXILANE RECONSTRUCTION
AREA 2 DEMOLITION PLAN

DIRECTOR
OF AVIATION
KEVIN MEIKLE

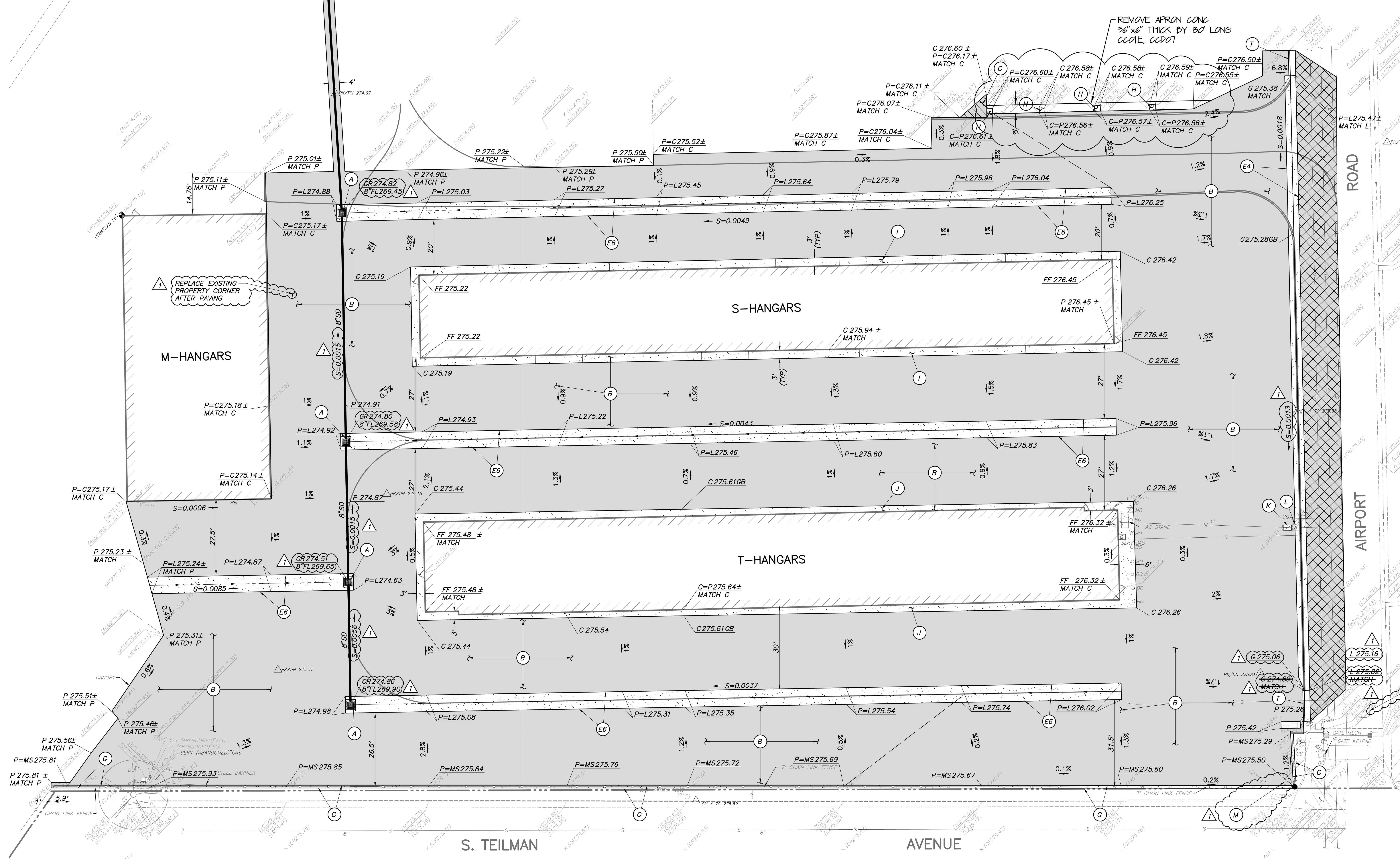
APPROVED
CONST. ENG.
OFFICE ENG.
CITY DESIGN ENG.

KRA #	XXXXXXXXXX
FUND #	XXXXX
ORG #	XXXXX
ACTIVITY	AIR
PROJECT I.D.	
DRAWN BY:	JMS
CHECKED BY:	CRQ
DATE:	8–14–15
SCALE:	
FILE:	

CITY DRAWING NO.
XX–X–XXXX

SHEET NO.
4
4 OF 9 SHEETS

15–9510

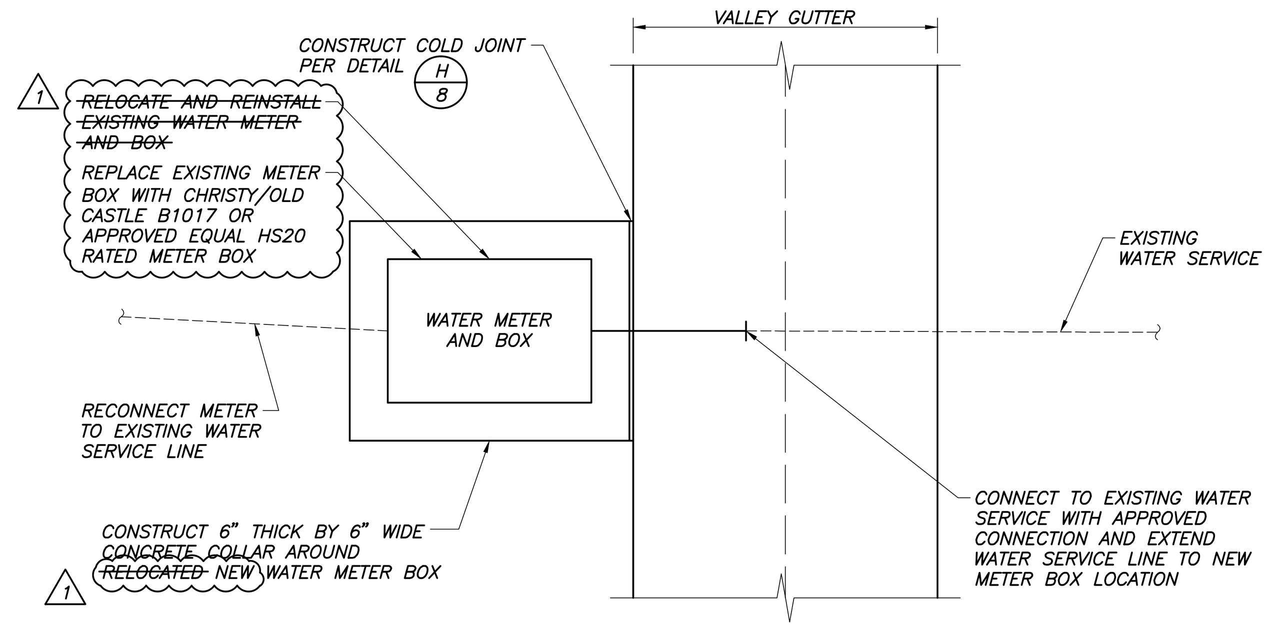


CONSTRUCTION NOTES

1. ADJUST ALL EXISTING UTILITY FACILITIES, MANHOLES, PULLBOXES, GRATES, ETC., AS NECESSARY TO MATCH FINISHED GRADE.
2. PROTECT ALL BUILDINGS AND EXISTING IMPROVEMENTS FROM DAMAGE.
3. ANY PERSON, CONTRACTOR OR SUBCONTRACTOR PLANNING TO CONDUCT ANY EXCAVATION SHALL CONTACT USA AT 811 AT LEAST TWO (2) WORKING DAYS, BUT NO MORE THAN 14 CALENDAR DAYS, PRIOR TO COMMENCING THAT EXCAVATION.

GRADING NOTES

1. THIS GRADING PLAN IS FOR APPROVAL OF ON-SITE ELEVATIONS ONLY. THE ELEVATIONS SHOWN WITHIN THE THE PUBLIC RIGHT-OF-WAY REQUIRE SEPARATE PUBLIC WORKS DEPARTMENT APPROVAL AND PERMIT. ANY NOTES THAT APPLY TO THE PUBLIC RIGHT-OF-WAY ARE FOR REFERENCE ONLY. IF ON-SITE ELEVATIONS SHOWN DO NOT COINCIDE WITH APPROVED STREET PLANS, AN APPROVED AMENDMENT IS REQUIRED.



A/5 WATER SERVICE AND METER RELOCATION
NOT TO SCALE

RECORD DRAWING
5-2-2017

SCALE: 1"= 20'
0 5 10 20 40
SCALE IN FEET

GRADING LEGEND

C	CONCRETE
FL	FLOWLINE
GR	GRATE
L	LIP
MS	MOWSTRIP
P	PAVEMENT
TC	TOP OF CURB
VG	VALLEY GUTTER
	GRADE BREAK
8"SD	HDPE STORM DRAIN PIPE WITH SIZE
0.5%	PERCENT SLOPE
S=0.0015	NEW PIPE AND VALLEY GUTTER SLOPE

CONSTRUCTION LEGEND

A	FURNISH AND INSTALL 24-INCH SQUARE INSIDE DIMENSION PRE-CAST CATCH BASIN WITH BOLT DOWN AND AIRCRAFT RATED GRATE PER DETAIL C/8
B	FURNISH AND INSTALL NEW ASPHALTIC CONCRETE PAVEMENT SECTION FOR TAXILANE, PER DETAIL A/8
C	FURNISH AND INSTALL ASPHALTIC CONCRETE OVERLAY TRANSITION
E4	CONSTRUCT 4' WIDE CONCRETE VALLEY GUTTER PER DETAIL D/8
E6	CONSTRUCT 6' WIDE CONCRETE VALLEY GUTTER PER DETAIL D/8
G	CONSTRUCT 1' WIDE CONCRETE MOWSTRIP PER DETAIL O/8
H	FURNISH AND INSTALL NEW CONCRETE SLAB SECTION PER DETAIL J/8
I	CONSTRUCT 3' WIDE BY 6" THICK CONCRETE APRON PER DETAIL L/8, MONOLITHICALLY WITH DOOR FOOTINGS PER DETAIL I/8, CONSTRUCT APRON WITH WEAKENED PLANE JOINTS AT 15' CENTERS AND ON EITHER SIDE OF DOOR HINGE PIN FOOTING PER DETAIL H/8
J	CONSTRUCT 6" THICK CONCRETE APRON PER DETAIL L/8, CONSTRUCT APRON WITH WEAKENED PLANE JOINTS AT 15' CENTERS PER DETAIL H/8
K	REMOVE AND SALVAGE EXISTING BACKFLOW PREVENTER TO AIRPORTS DEPARTMENT
L	RELOCATE EXISTING WATER METER AND INSTALL NEW WATER BOX AND EXTEND WATER SERVICE PER CITY OF FRESNO STANDARD DRAWING W-2, SEE DETAIL A/5
M	REINSTALL EXISTING METER BOX, POUR 10"WIDE BY 6" DEEP CONCRETE COLLAR AROUND BOX, AND PAVE FLUSH AROUND COLLAR
T	CONSTRUCT CONCRETE CURB AND GUTTER TRANSITION TO NEW VALLEY GUTTER
	LIMITS OF NEW ASPHALTIC CONCRETE FOR TAXILANE
	LIMITS OF NEW ASPHALTIC CONCRETE SECTION, 3" AC OVER 6" CLASS 2 AGGREGATE BASE OVER 6" COMPACTED NATIVE SOIL COMPACTED TO 95% RELATIVE COMPACTION PER ASTM D-1557
	LIMITS OF NEW CONCRETE

AS-GRADE PLANS, FINAL SOILS REPORT (IF APPLICABLE) AND COMPACTION REPORTS ARE REQUIRED TO BE SUBMITTED AND APPROVED PRIOR TO RECEIVING A "FINAL". A "SAFE-TO-OCCUPY" CAN BE GRANTED BUT WILL REQUIRE A $15,000 CASH DEPOSIT. THE DEPOSIT WILL BE FULLY REFUNDED ONCE THE "AS-GRADE" HAS BEEN APPROVED AND ALL OTHER HOLDS HAVE BEEN CLEARED FOR THE ENTIRE PROJECT. DEPOSITS ARE TYPICALLY REFUNDED FROM THE FINANCE DEPARTMENT IN THE FORM OF A CHECK APPROXIMATELY ONE WEEK AFTER THE REFUND IS REQUESTED. THERE WILL BE A ONE TIME $60.00 HANDLING FEE FOR THE "SAFE-TO-OCCUPY" TRANSACTION SHOULD IT BE REQUESTED.

REGISTERED PROFESSIONAL ENGINEER
ORDIE R. QUIN
No. 28,185
CIVIL
STATE OF CALIFORNIA

DATE: 8-14-15

CONFORM
FOR CONSTRUCTION PLAN

FRESNO YOSEMITE INTERNATIONAL AIRPORT
CITY OF FRESNO
DEPARTMENT OF AIRPORTS
4995 EAST CLINTON WAY
FRESNO, CALIFORNIA 93727
PHONE: 559-621-4500

CONSULTANT INFORMATION
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REVISIONS/REFERENCE

REV NO.	DATE	DESCRIPTION
1	9/9/2015	ADDENDUM

DEPARTMENT OF AIRPORTS

FRESNO CHANDLER AIRPORT
DRAPER TAXILANE RECONSTRUCTION
AREA 2 SITE GRADING PLAN

DIRECTOR OF AVIATION
KEVIN MEIKLE

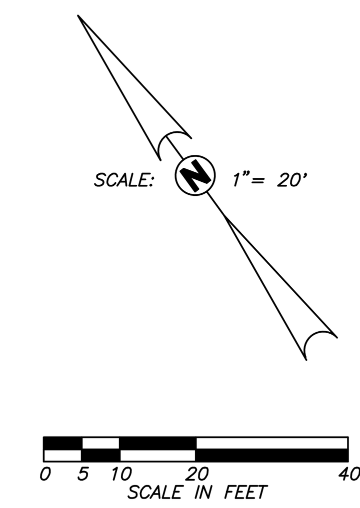
APPROVED
CONST. ENG.
OFFICE ENG.
CITY DESIGN ENG.

KRA #	XXXXXXXXXX
FUND #	XXXXX
ORG #	XXXXX
ACTIVITY	AIR
PROJECT I.D.	
DRAWN BY:	JMS
CHECKED BY:	CRQ
DATE:	8-14-15
SCALE:	
FILE:	

CITY DRAWING NO.
XX-X-XXXX

SHEET NO.
5
5 OF 9 SHEETS

15-9510



CONSTRUCTION LEGEND

(F)	APPLY SLURRY SEAL TO EXISTING PAVEMENT (E/8)
▨	LIMITS OF NEW SLURRY SEAL

CONSTRUCTION NOTES

1. ADJUST ALL EXISTING UTILITY FACILITIES, MANHOLES, PULLBOXES, GRATES, ETC., AS NECESSARY TO MATCH FINISHED GRADE.
2. PROTECT ALL BUILDINGS AND EXISTING IMPROVEMENTS FROM DAMAGE.

RECORD DRAWING
5-2-2017

REGISTERED PROFESSIONAL ENGINEER
BERDIE R. QUALLS
No. 28,185
CIVIL
STATE OF CALIFORNIA

DATE: 8-14-15

CONFORM
FOR CONSTRUCTION PLAN

FRESNO YOSEMITE INTERNATIONAL AIRPORT
CITY OF FRESNO
DEPARTMENT OF AIRPORTS
4995 EAST CLINTON WAY
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REV NO.	DATE	DESCRIPTION
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DEPARTMENT OF AIRPORTS

FRESNO CHANDLER AIRPORT
DRAPER TAXILANE RECONSTRUCTION
AREA 1 SITE GRADING PLAN

DIRECTOR OF AVIATION
KEVIN MEIKLE

APPROVED
CONST. ENG.
OFFICE ENG.
CITY DESIGN ENG.

KRA #	XXXXXXXXXX
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6 OF 9 SHEETS

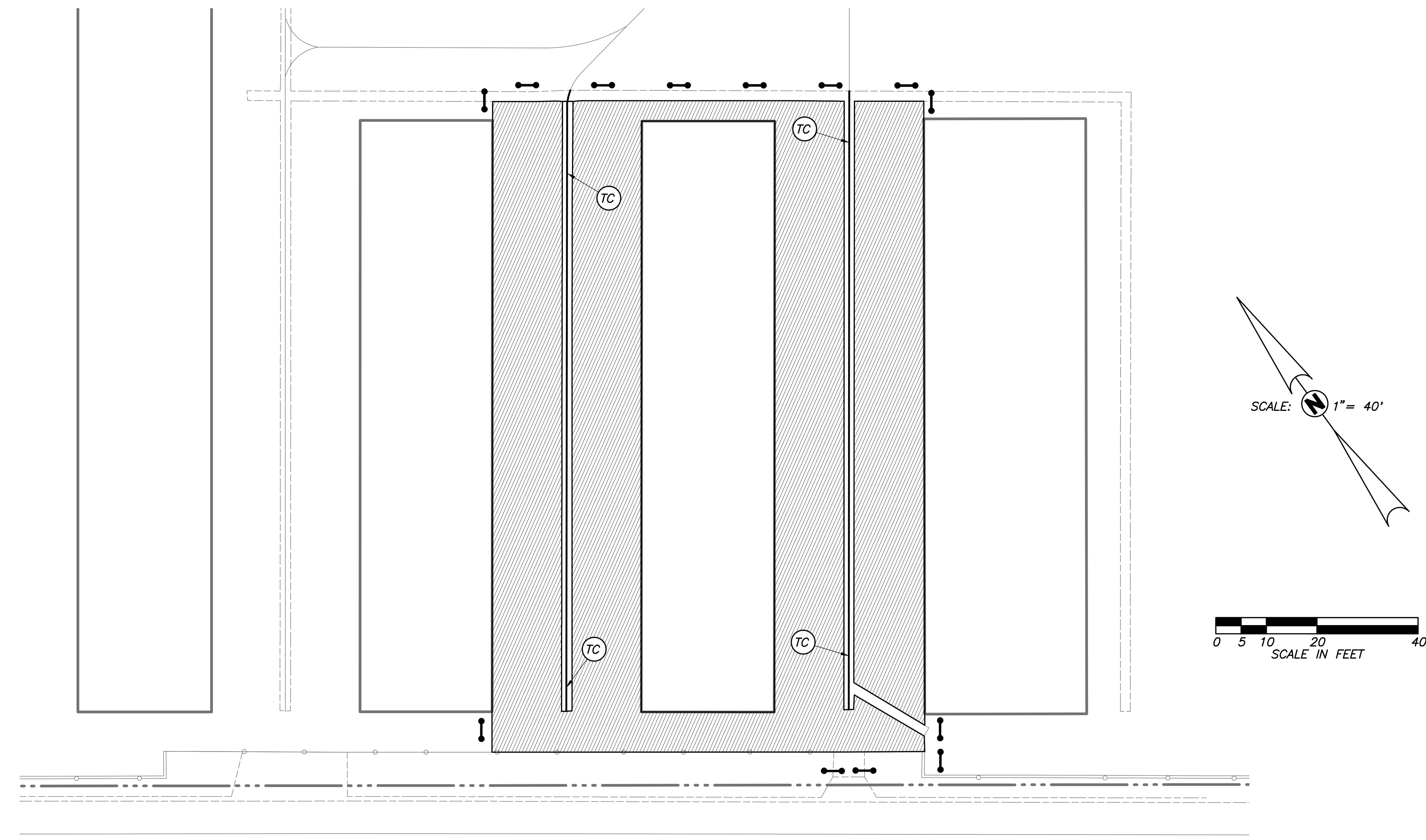
15-9510

CONSTRUCTION LEGEND

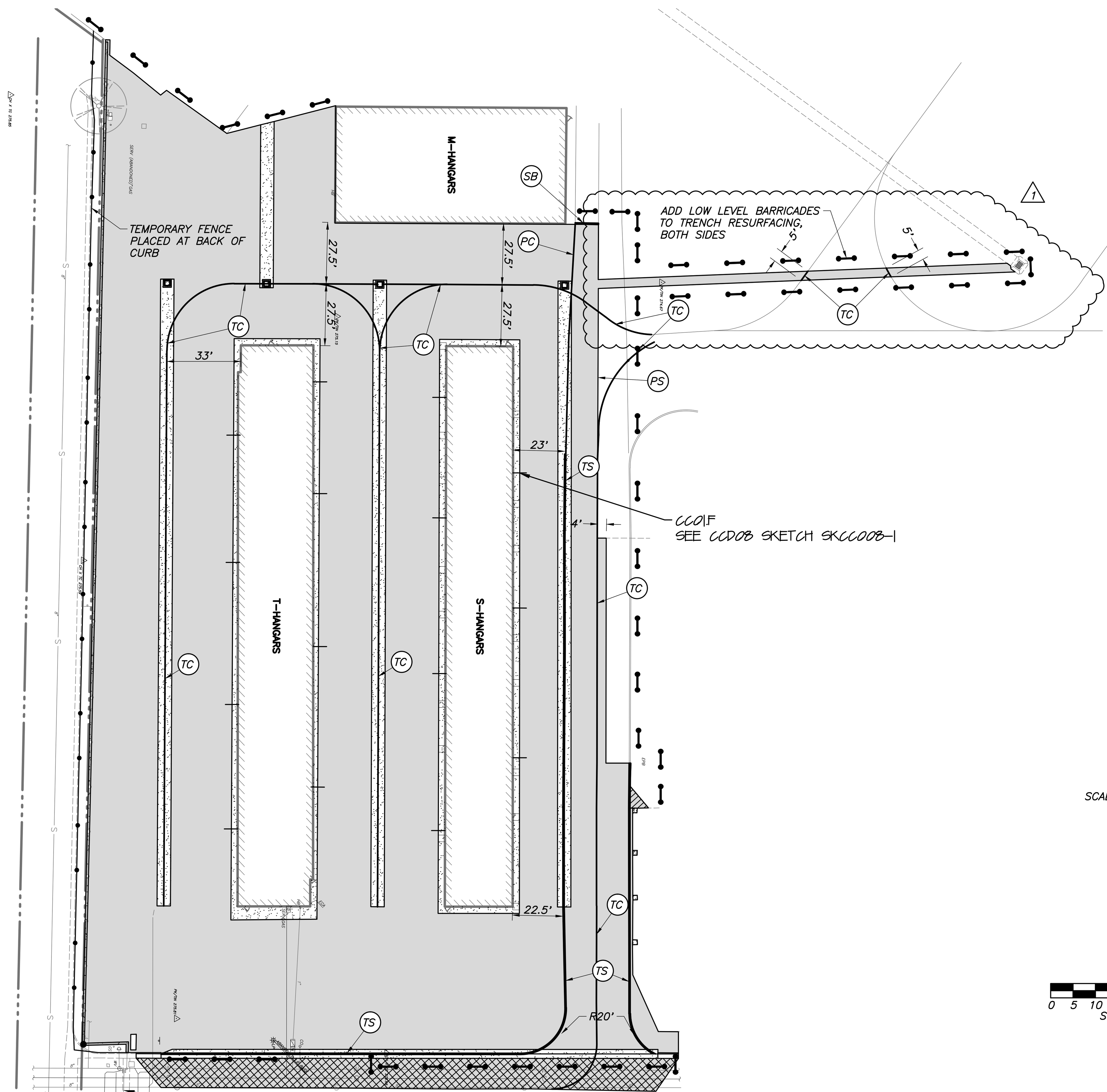
(PC)	SINGLE WHITE PERIMETER ROAD EDGE STRIPE PER DETAIL M/8
(PS)	SINGLE WHITE PERIMETER ROAD CENTER LINE STRIPE PER DETAIL K/8
(SB)	SINGLE WHITE PERIMETER ROAD STOP BAR PER DETAIL N/8
(TC)	SINGLE YELLOW TAXIWAY CENTERLINE STRIPE PER DETAIL G/8
(TS)	DOUBLE TAXIWAY EDGE STRIPE PER DETAIL F/8
●—●	TEMPORARY BARRICADE
—•—	PROVIDE AND MAINTAIN 6' HIGH TEMPORARY CHAIN LINK FENCE WITH BARBED WIRE UNTIL APPROVAL OF AIRPORT OFFICIALS FOR REMOVAL.

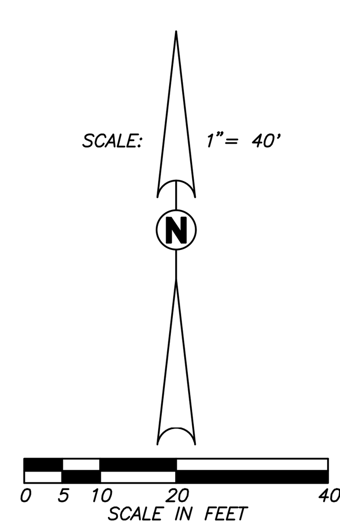
CONSTRUCTION NOTE

1. INSTALL AND MAINTAIN TEMPORARY BARRICADES IN AREA 2 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION AND AFTER CONSTRUCTION MANAGER HAS NOTIFIED CONTRACTOR THAT AREA IS READY FOR CONSTRUCTION. GATE 1 WILL BE OPERATIONAL. TEMPORARY BARRICADES TO BE REMOVED WITH APPROVAL OF CONSTRUCTION MANAGER.
2. INSTALL AND MAINTAIN TEMPORARY BARRICADES IN AREA 1 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION AND AFTER CONSTRUCTION MANAGER HAS NOTIFIED CONTRACTOR THAT AREA IS READY FOR CONSTRUCTION. TEMPORARY BARRICADES TO BE REMOVED WITH APPROVAL OF CONSTRUCTION MANAGER.



A/10 AREA 1
SCALE: 1" = 40'





B/10 AREA 2
SCALE: 1" = 40'

RECORD DRAWING
5-2-2017

REGISTERED PROFESSIONAL ENGINEER
ROBERT R. QUALLS
No. 28,185
CIVIL
STATE OF CALIFORNIA

DATE: 8-14-15

CONFORM
FOR CONSTRUCTION PLAN

FRESNO YOSEMITE INTERNATIONAL AIRPORT
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DEPARTMENT OF AIRPORTS
4995 EAST CLINTON WAY
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DEPARTMENT OF AIRPORTS

FRESNO CHANDLER AIRPORT
DRAPER TAXILANE RECONSTRUCTION
AREA 1 AND 2 STRIPING AND TRAFFIC CONTROL PLAN

DIRECTOR OF AVIATION
KEVIN MEIKLE

APPROVED
CONST. ENG.
OFFICE ENG.
CITY DESIGN ENG.

KRA #	XXXXXXXXXX
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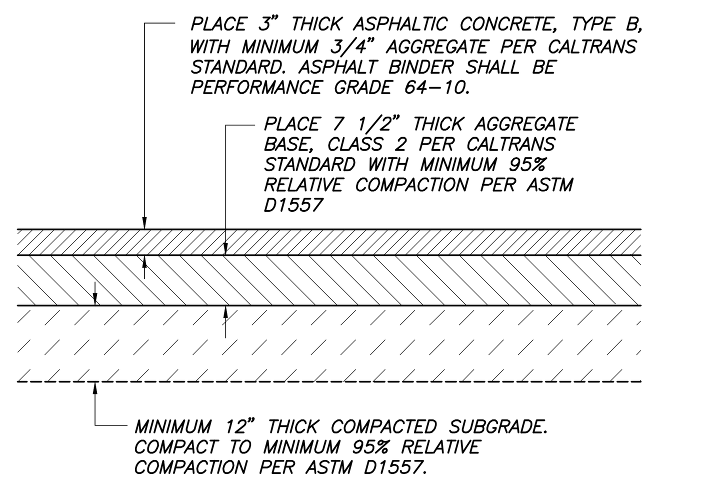
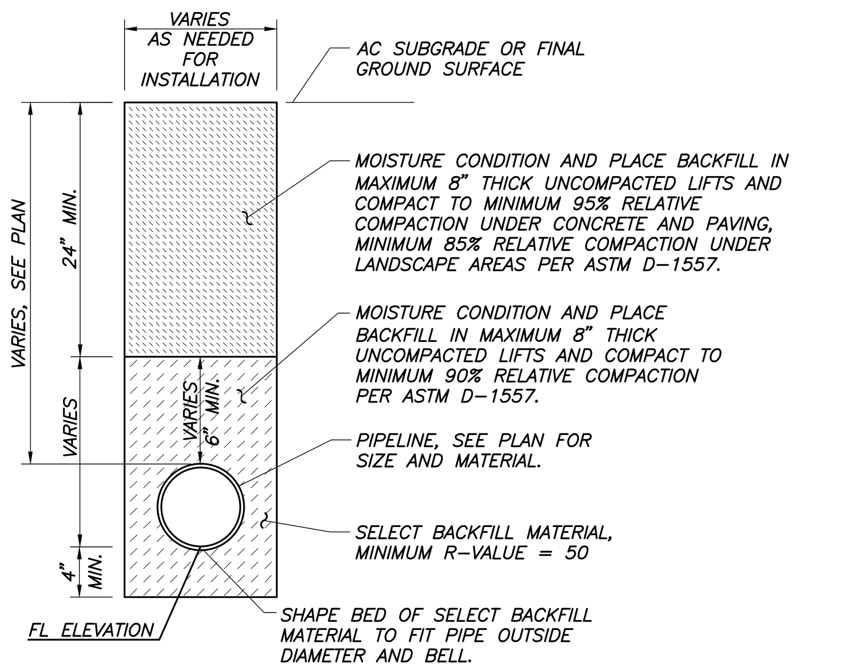
SHEET NO.
7
7 OF 9 SHEETS

15-9510



A / 8 TAXIWAY PAVEMENT SECTION
NOT TO SCALE



B / 8 TYPICAL TRENCH BACKFILL DETAIL
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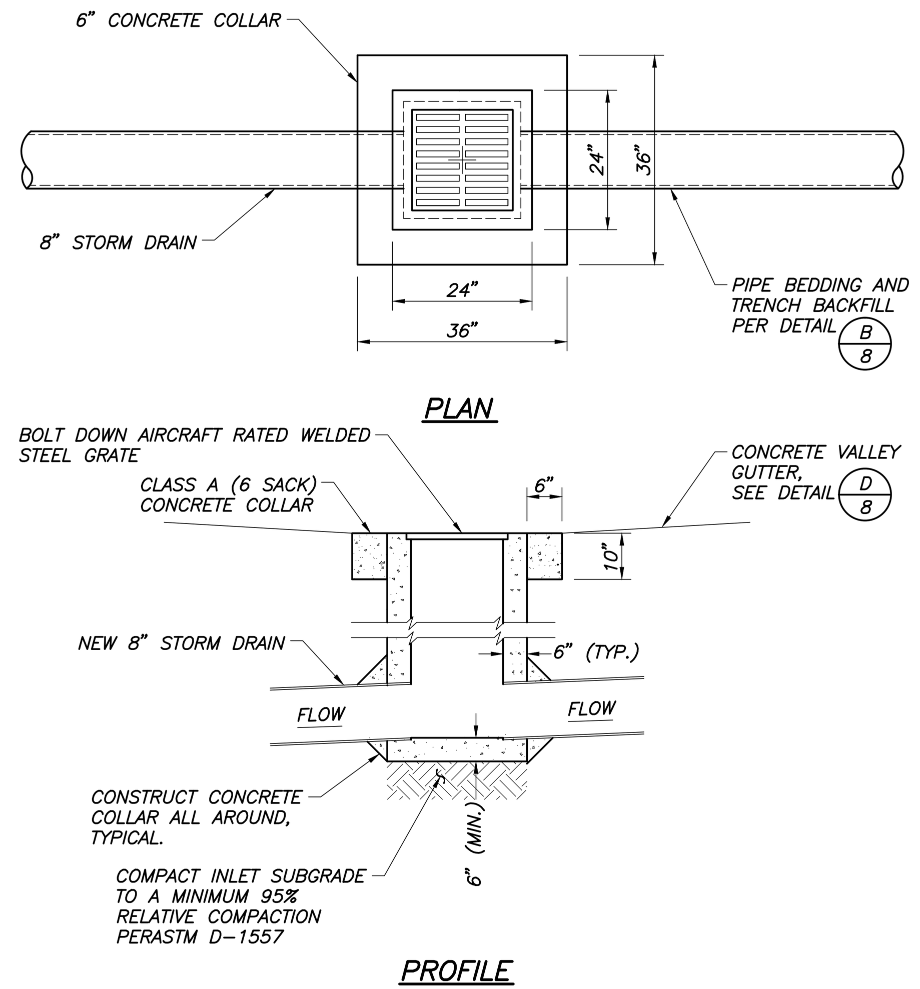

C / 8 PRE-CAST DRAIN INLET DETAIL
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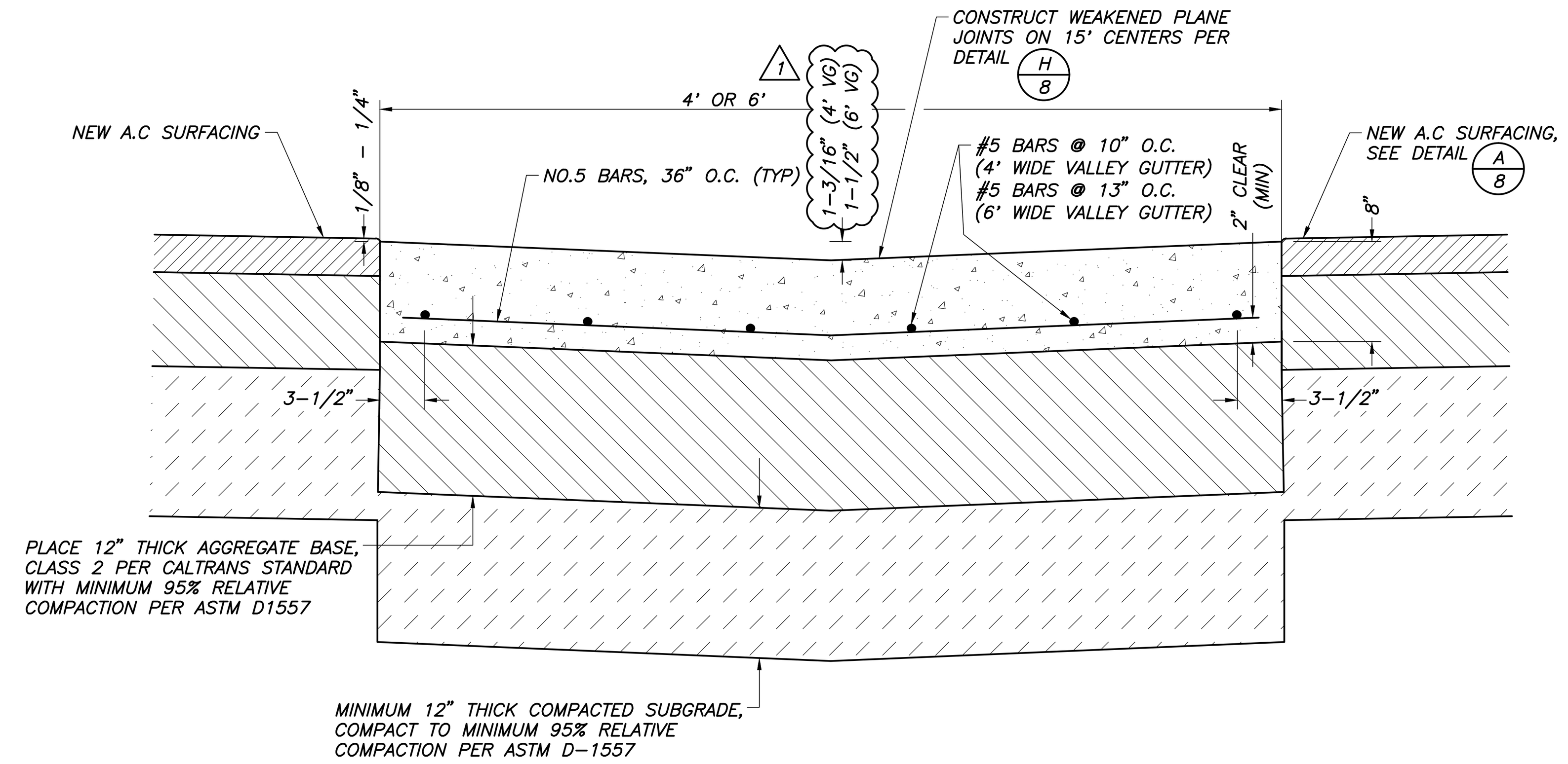
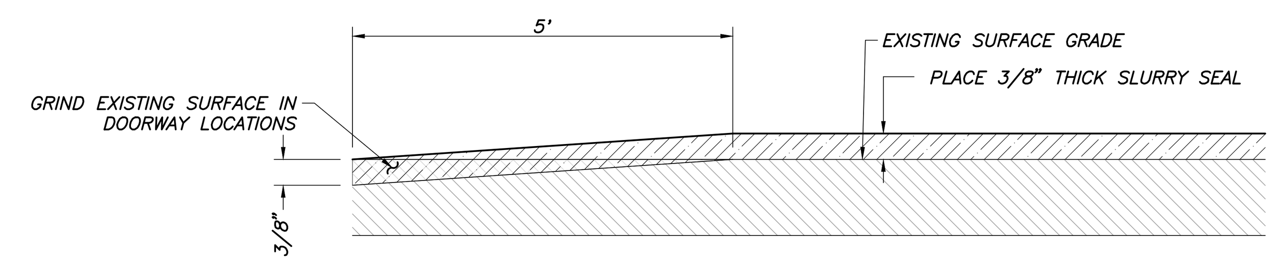


D / 8 CONCRETE VALLEY GUTTER
NOT TO SCALE



E / 8 SLURRY SEALL OVERLAY SECTION
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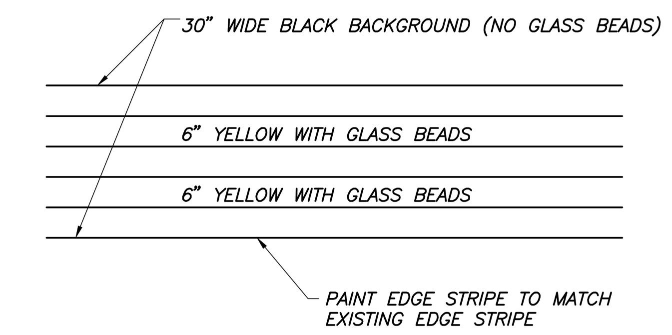
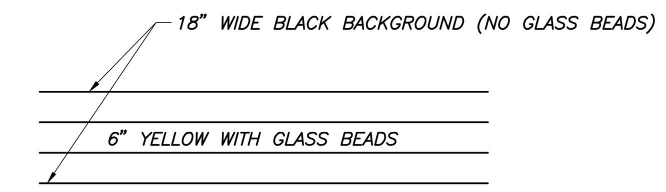
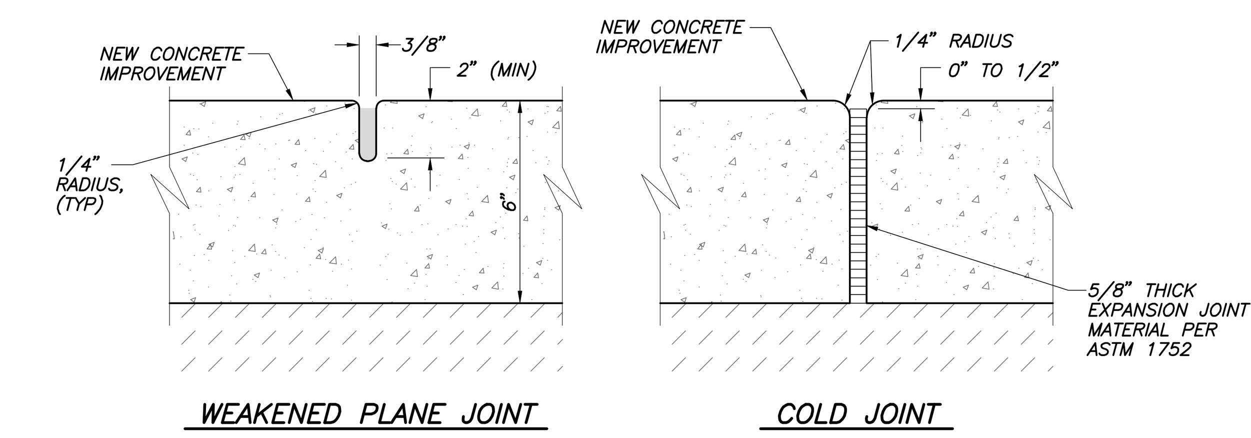


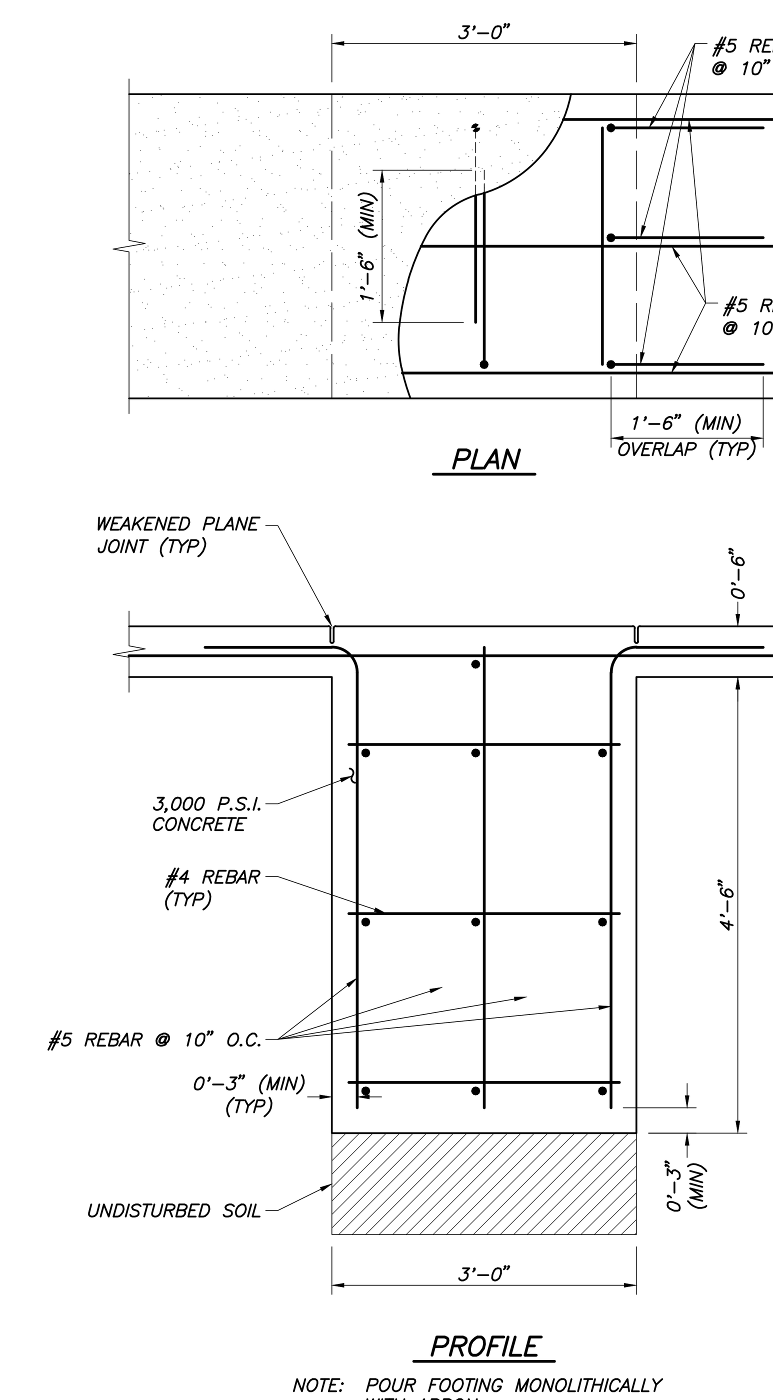
F / 8 TAXIWAY EDGE STRIPE
NOT TO SCALE



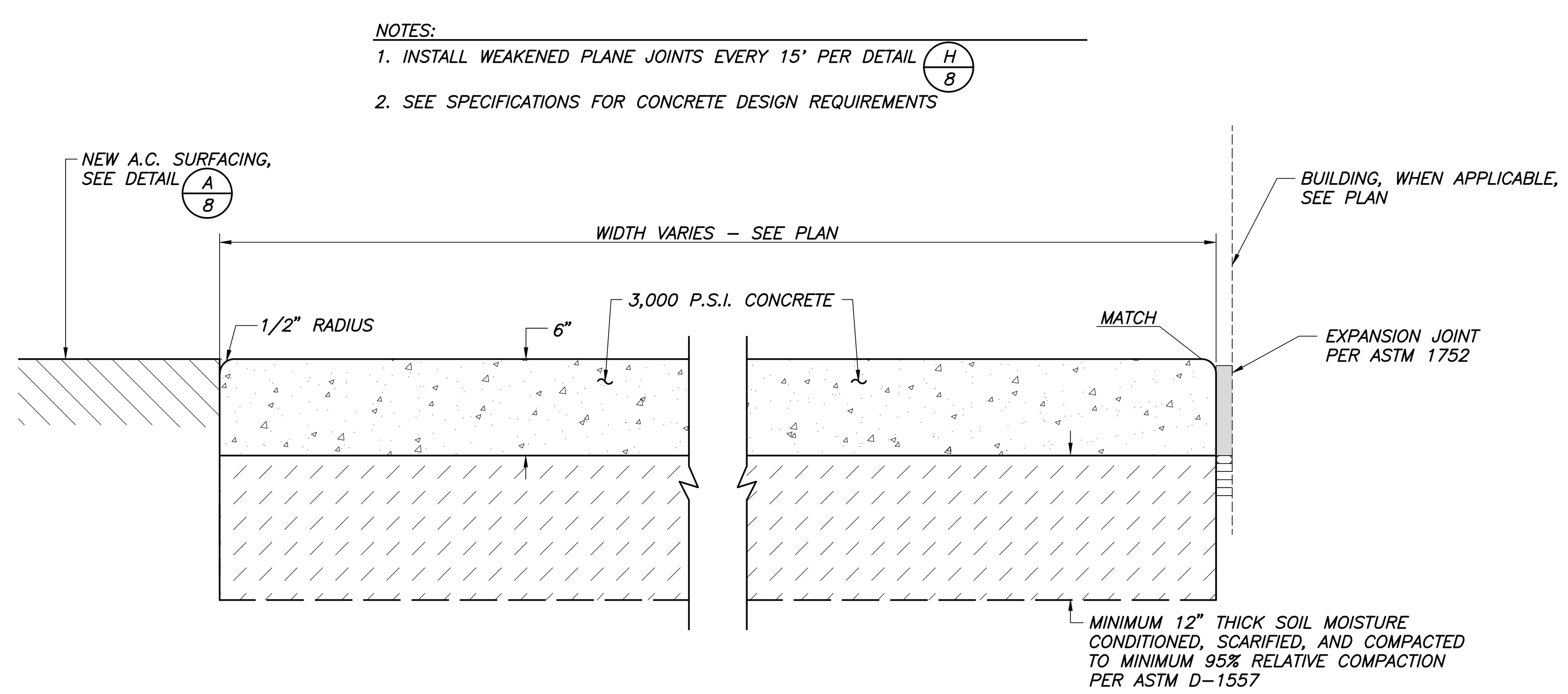
G / 8 TAXIWAY CENTERLINE STRIPE
NOT TO SCALE



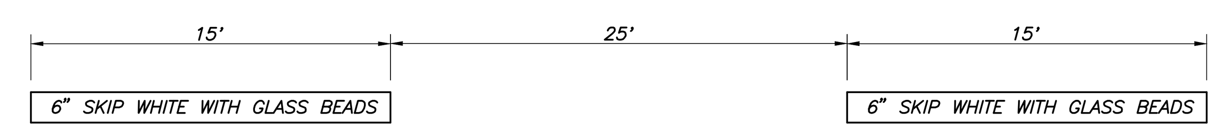
H / 8 CONCRETE JOINT DETAIL
NOT TO SCALE



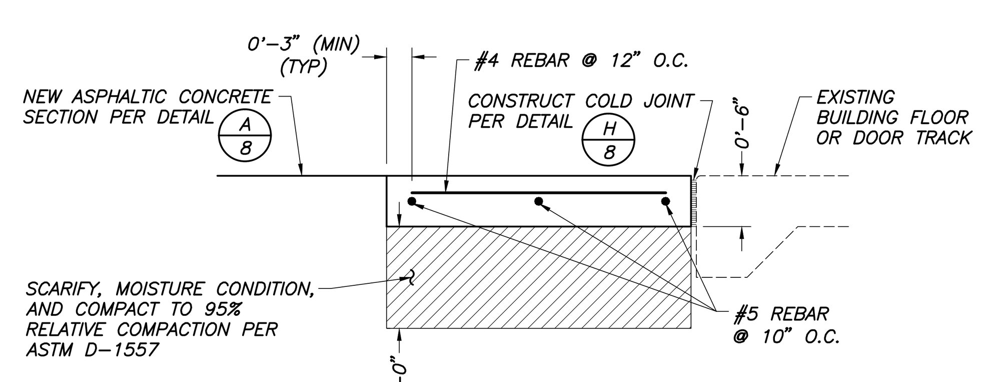
I / 8 DOOR HINGE PIVOT POINT FOOTING DETAIL
NOT TO SCALE



J / 8 CONCRETE SLAB
NOT TO SCALE

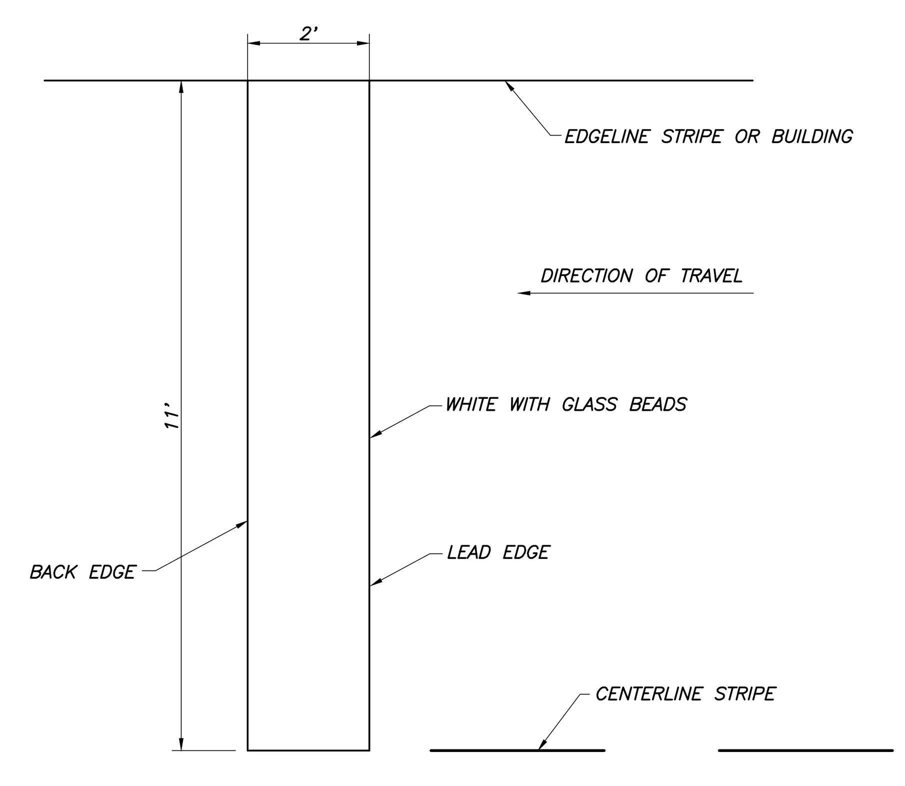


K / 8 PERIMETER ROAD CENTER LINE STRIPE
NOT TO SCALE

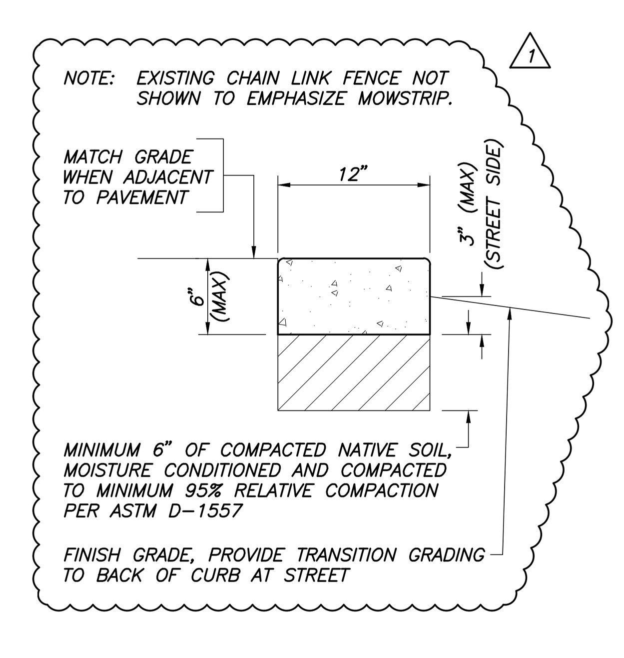


L / 8 CONCRETE APRON DETAIL
NOT TO SCALE

M / 8 PERIMETER ROAD EDGE STRIPE
NOT TO SCALE



N / 8 PERIMETER ROAD STOP BAR
NOT TO SCALE



O / 8 MOWSTRIP DETAIL
NOT TO SCALE

RECORD DRAWING
5-2-2017

REGISTERED PROFESSIONAL ENGINEER
GORDIE R. QUALLS
No. 28,185
CIVIL
STATE OF CALIFORNIA

CONFORM
FOR CONSTRUCTION PLAN

DATE: 8-14-15

FRESNO YOSEMITE INTERNATIONAL AIRPORT
CITY OF FRESNO
DEPARTMENT OF AIRPORTS
4995 EAST CLINTON WAY
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DEPARTMENT OF AIRPORTS

FRESNO CHANDLER AIRPORT
DRAPER TAXILANE RECONSTRUCTION
DETAILS

DIRECTOR OF AVIATION
KEVIN MEIKLE

APPROVED
CONST. ENG.
OFFICE ENG.
CITY DESIGN ENG.

KRA #	XXXXXXXXXX
FUND #	XXXXX
ORG #	XXXXX
ACTIVITY	AIR
PROJECT I.D.	
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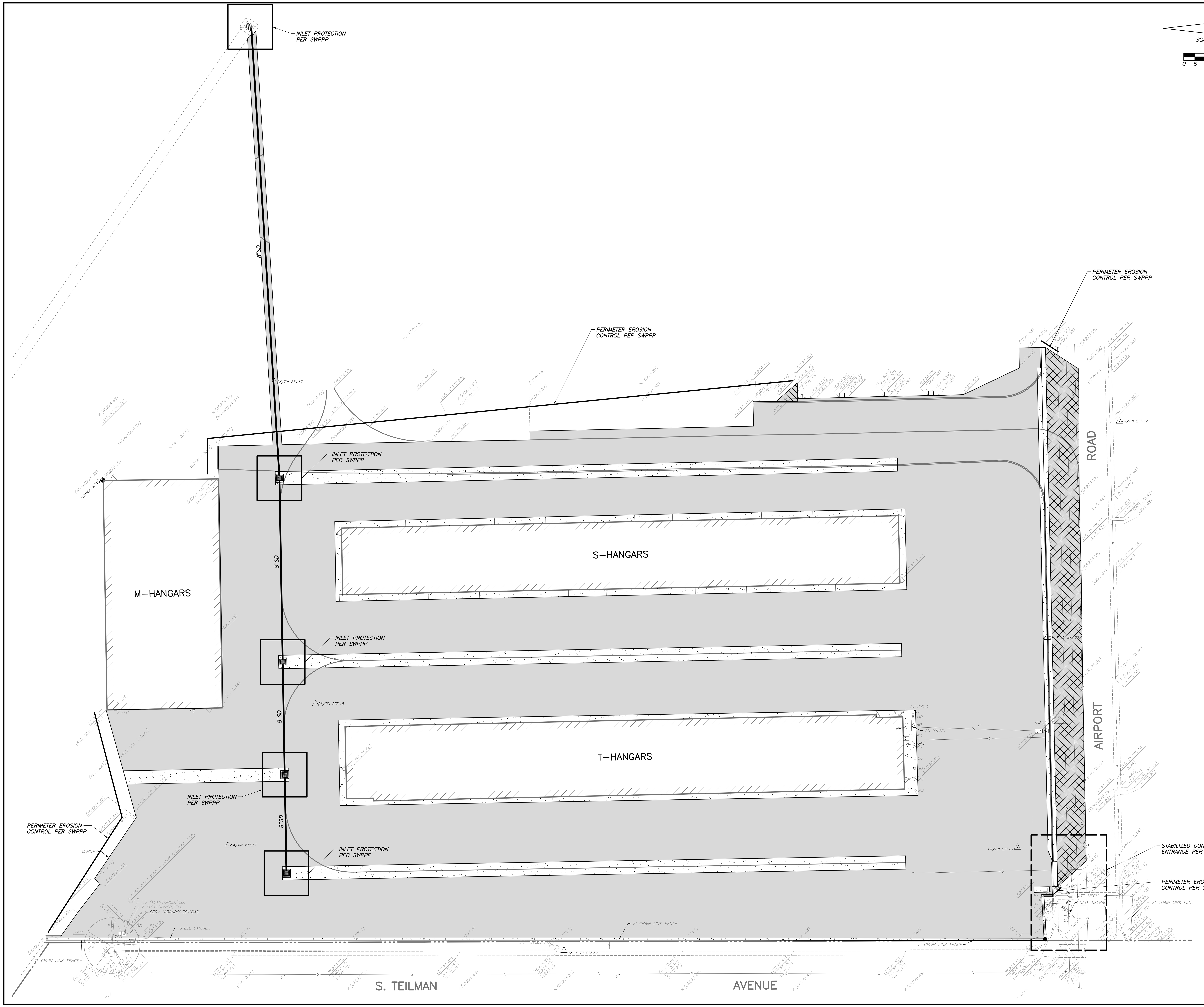
SHEET NO.
8
8 OF 9 SHEETS

15-9510



RECORD DRAWING
5-2-2017

REGISTERED PROFESSIONAL ENGINEER
CORDIE R. QUALLE
No. 28,185
CIVIL
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DEPARTMENT OF AIRPORTS

FRESNO CHANDLER AIRPORT
DRAPER TAXILANE RECONSTRUCTION
AREA 2 EROSION CONTROL PLAN

DIRECTOR OF AVIATION
KEVIN MEIKLE

APPROVED
CONST. ENG.
OFFICE ENG.
CITY DESIGN ENG.

KRA # XXXXXXXXXX
FUND # XXXXX
ORG # XXXXX
ACTIVITY AIR
PROJECT I.D.

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SHEET NO.
9
9 OF 9 SHEETS

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