AIRPORT MASTER PLAN

Final Report

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT

LEWISTON, IDAHO | JANUARY 2016

ARMSTRONG

KELLER associates

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INTRODUCTION

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN

Introduction

The Lewiston-Nez Perce County Regional Airport Authority, as the Airport Sponsor, is continuing its efforts to plan for future development of the Lewiston-Nez Perce County Regional Airport. Armstrong Consultants, Inc. was tasked to undertake this Airport Master Plan (AMP) update for the Lewiston-Nez Perce County Regional Airport in Lewiston, Idaho. The overall study will follow the process outlined in the Federal Aviation Administration's (FAA) Advisory Circular 150/5070-6B, *Airport Master Plans*. The future development shown in the AMP is designed to: enhance air and ground operations and safety and accommodate existing and forecasted aircraft and passenger demand. The preparation of this AMP is evidence that the Lewiston-Nez Perce County Regional Airport Authority recognizes the significance of air transportation to the community as well as the requirement for a systematic approach to evaluating the Airport's unique operating and improvement needs.

An AMP is intended to be a proactive document which identifies and plans for future facility needs well in advance of the actual need for the facilities. This is done to ensure that the Airport Authority can coordinate project approvals, design, financing and construction to avoid experiencing unfavorable effects due to inadequate or constrained airport facilities. With a sound and realistic AMP, Lewiston-Nez Perce County Regional Airport can maintain its role as an important link to the national air transportation system for the region.

Purpose

The purpose of the AMP is to provide a framework to guide future airport development that cost-effectively satisfies local and regional aviation demand, while producing an efficient, economical and environmentally compliant facility and the mitigation of potential impacts. The AMP considers the possible environmental, socioeconomic and financial costs associated with alternative development concepts as well as the possible means of avoiding, minimizing, or mitigating impacts to an appropriate level of detail for facilities planning.

The document describes and depicts the overall concept for long-term development of an airport. It presents the concepts graphically in the Airport Layout Plan (ALP) drawing set and reports the data and logic upon on which the concept is based in the AMP report.

Objectives

The primary objectives of the AMP are to produce an attainable phased development plan concept that will satisfy the airport's needs in a safe, efficient, economical and environmentally sound manner. Goals and objectives are integral to the definition and validity of any plan and serve to frame and direct the definition of options, and more importantly, to establish evaluation criteria to be used in assessing the viability and benefits of such options. The plan serves as a guide to decision makers, airport users and the general public for implementing airport development actions while considering both airport and community concerns and objectives. There are a number of objectives that the Airport would like to achieve as a result of this AMP.

Objectives of the Airport Master Plan include:

- Document the information that the proposed development will address.
- Justify the proposed development through the technical, economic and environmental investigation of concepts and alternatives.
- Provide an effective graphic presentation of the development of the airport and anticipated land uses in the vicinity of the airport.
- Establish a realistic schedule for the implementation of the development proposed in the plan, particularly the short-term Capital Improvement Program (CIP).
- Propose an achievable financial plan to support the implementation schedule.
- Provide sufficient project definition and detail for subsequent environmental evaluations that may be required before the project is approved.
- Present a plan that adequately addresses the information and satisfies local, state and Federal regulations.
- Document policies and future aeronautical demand to support municipal or local deliberations on spending, debt, land use controls and other policies necessary to preserve the integrity of the airport and its surroundings.
- Set the stage and establish the framework for a continuing planning process that will monitor key conditions and permit changes in plan recommendations as required.

Airport Master Plan Process and Schedule

Airport planning takes place at a national, state, regional and local level. These plans are formulated on the basis of overall transportation demands and are coordinated with other transportation planning and comprehensive land use planning agencies. The National Plan of Integrated Airport Systems (NPIAS) is a ten-year plan continually updated and published by the FAA. The NPIAS lists developments at public use airports that are considered to be of national interest and thus eligible for financial assistance for airport planning and development under the Airport and Airway Improvement Act of 1982. Statewide Integrated Airport Systems Planning identifies the general location and characteristics of new airports and the general expansion needs of existing airports to meet statewide air transportation goals. This planning is performed by state transportation or aviation planning agencies. Regional Integrated Airport Systems Planning identifies airport needs for a large regional or metropolitan area. Needs are stated in general terms and incorporated into statewide systems plans. The Airport Master Planning process involves collecting data, forecasting demand, determining facility requirements, studying various alternatives and developing plans and schedules. The flow chart in **Figure 1** depicts the steps in the master planning process. This process will take into consideration the needs and concerns of the airport sponsor, airport tenants and users, as well as the general public. The AMP is prepared by the operators of individual airports and is usually completed with the assistance of consultants.

Figure 1 Airport Master Planning Process

Technical Advisory Committee

The Lewiston-Nez Perce County Airport Technical Advisory Committee (TAC) for this Master Plan consists of members of Airport Management, City and County governments, airport tenants, air traffic control, citizens and the FAA. The TAC is comprised of twelve members, four citizen stakeholders and eight technical/agency members. Their involvement throughout the Master Plan process will aid in keeping interested parties informed and will foster consensus for future development actions.

TAC REPRESENTATIVES

- Bruce MacLachlan, A.A.E., Airport Manager
- Robin Turner, A.A.E., Airport Manager (Retired April 2014)
- Wendy Fredrickson, Serco Management Services
- Felicia Kelly, Horizon Air
- DeAnn Scrabeck, Friends of the Airport
- Ralph Stout, Stout Flying Service
- Karen Davis, Citizen/Neighbor
- Mark Ridinger, Nez Perce County Roads & Bridges
- Chris Davies, City of Lewiston Public Works
- Shannon Grow, Metropolitian Planning Organization
- Ron Gustin, Gustin Aviation
- Gary Gates, Federal Aviation Administration
- Scott Eaton, Federal Aviation Administration

CHAPTER ONE

AIRPORT INVENTORY

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER ONE
INVENTORY

1.1 Airport History and Introduction

Lewiston-Nez Perce County Regional Airport is a publically owned and operated commercial service airport located in Lewiston, Idaho. The airport is owned by the City of Lewiston and Nez Perce County, operated by the Lewiston-Nez Perce County Regional Airport Authority and is located within the Lewiston city limits. The Airport Manager oversees the long-term strategic plan of the airport and provides recommendations to the Airport Authority Board regarding airport operations, maintenance, and future development. The Airport Manager and staff are responsible for the daily oversight of the airport.

Figure 1-1 Lewiston-Nez Perce County Regional Airport Terminal Entrance Sign

The Lewiston area has been home to the indigenous Nez Perce people for several thousand years. In 1803, the area encountered their first European settlers who were scouting locations for fur trading posts. In 1805, Meriwether Lewis and William Clark passed through the location of the future city on their historic expedition to the Pacific Ocean. It is believed the name of Lewiston was chosen in honor of their passage Lewiston was officially founded in 1861 when the surrounding area encountered a massive economic boom from the discovery of gold in the surrounding areas. The city briefly served as the original capital of the Idaho Territory before being moved to the current location of Boise.

Lewiston-Nez Perce County Regional Airport was founded on a 50 acre parcel of land in 1931 as a Lewiston Chamber of Commerce project. Realizing federal funds could be obtained for future growth; the city purchased the airport in January 1934. At the time, the airport received extensive use from the United States Forest Service. World War II created a large demand for aviation activity and the existing space was considered to be inadequate, in 1942 the airport was moved to its current location on 615 acres of land. The airport was completed in 1944.

Airline service started in 1945 with Zimmerley Air Transport serving various points throughout the State of Idaho. Lewiston-Nez Perce County Regional Airport received their first jet aircraft with the introduction of the Douglas DC-9 in 1969. Today, the airport has non-stop flights to a variety of destinations in Idaho, Utah and Washington.

Throughout the years, the airport underwent several transformations to become the existing facility. In the 1970's, Lewiston-Nez Perce County Regional Airport installed an Instrument Landing System (ILS), lighting visual aids, Airport Rescue and Firefighting (ARFF) facility, air traffic control tower and undertook expansions to the terminal building, aircraft parking apron and land acquisition surrounding the airport. During the 1980's and 1990's, various enhancements to the taxiways, fencing, electrical systems and snow removal equipment were made.

Chapter 1 – Inventory, documents the airport's facilities and degree to which standards and regulations are met at the airport today. Deficiencies in the existing conditions are evaluated and improvement alternatives are presented in later chapters within the report. The preparation and collection of meaningful data on the airport usage and the condition of its components are basic to developing a sound master plan. The development of this master plan requires the collection and evaluation of baseline information relating to the airport's property, facilities, services and local vicinity. The information presented in this chapter combined with aviation activity forecasts and the demand/capacity analysis will serve as the basis in determining any necessary airport improvements, maintenance or expansions. Inventory information was obtained during field visits and interviews with Airport Management, City of Lewiston staff, tenants and users.

1.2 Airport Management and Ownership Structure

Lewiston-Nez Perce County Regional Airport is under joint-ownership between the City of Lewiston and Nez Perce County. The two governmental bodies assume equal responsibility to provide financing and operational support to the airport. Lewiston-Nez Perce County Regional Airport is operated under an airport authority structure through a joint-powers agreement established in 2010. Through this organizational structure a board of commissioners collectively decides on airport planning and strategy. Currently, the Lewiston Airport Authority Board is comprised of five commissioners: one appointed by Airport Management, two appointed by the City of Lewiston and two appointed by Nez Perce County. The Airport Manager reports directly to the Lewiston Airport Authority Board to implement their decisions and oversee day-to-day airfield operations.

1.3 Airport Location

Lewiston-Nez Perce County Regional Airport is located in the northwest portion of Idaho within the northwest portion of Nez Perce County. The airport is situated in Section 18 of Township 35 North and Range 5 West of the Principal Meridian. Figure 1-2 provides a graphic depiction of the location of the airport in relation to the City of Lewiston. The airport is designated by the FAA as Site Number 04234.*A with the three-letter identifier LWS and is a public-use airport. The Airport Reference Point (ARP) is Latitude 46° 22' 28.2" North and Longitude 117° 00' 55.4" West according to the 2009 Airport Layout Plan. The airport's elevation is 1,442 feet Mean Sea Level (MSL) and has a C-III Airport Reference Code (ARC). The ARC is determined from the highest Runway Design Code (RDC) at the airport. The existing airport property line encompasses approximately 868 acres which is owned by the City of Lewiston and Nez Perce County.

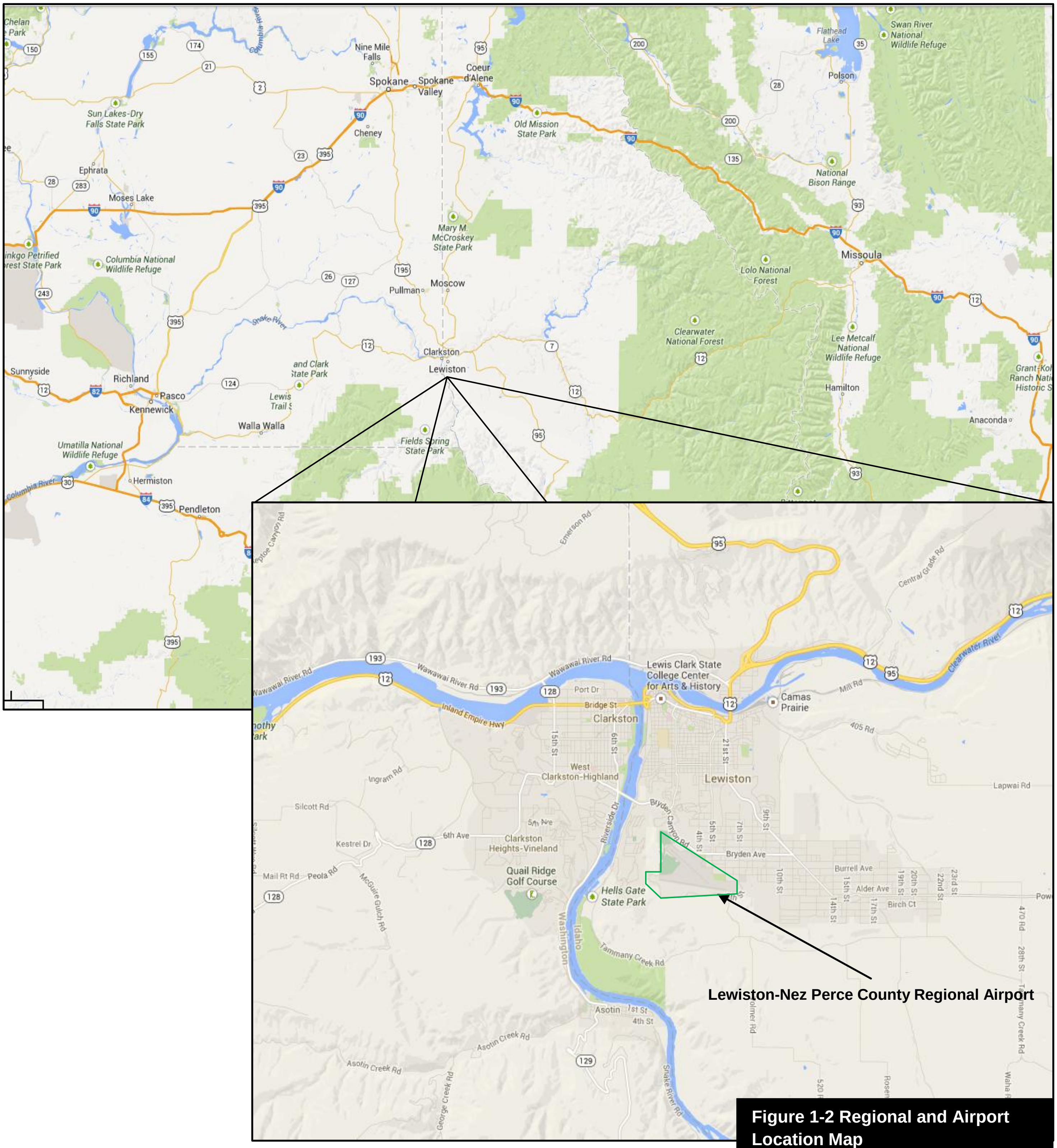


Figure 1-2 Regional and Airport Location Map

Source: Google Maps, 2013

Note: Outline denoting airport location does not depict actual Airport Property Line

1.4 Airport Grant History

The Airport Improvement Program (AIP) is the FAA grant program that provides grants to public agencies for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS). For small primary, reliever and general aviation airports, the grant covers up to 93.75 percent of eligible costs. Eligible projects include improvements related to enhancing airport safety, capacity, security and environmental concerns. Airports can use AIP funds on most airfield capital improvements or repairs and in some specific situations, for terminals and hangars. Professional services necessary for eligible projects such as planning, surveying and design are eligible; however, aviation demand at the airport must justify the projects and also meet federal environmental and procurement requirements. A federal grant history for the capital improvements at the Lewiston-Nez Perce County Regional Airport is provided in **Table 1-1**.

Under the most recent FAA AIP legislation, capital improvement projects for small hub and nonhub airports within the State of Idaho are typically funded at 93.75 percent by the FAA. The Airport Sponsor is responsible for contributing the remaining 6.25 percent.

Table 1-1 Airport Grant History

Year	Grant Number	Description	Entitlement	Discretionary	Total
1982	001-1982	Improve Airport Drainage	$10,350.00	$0.00	$10,350.00
1982	001-1982	Acquire Aircraft Rescue and Firefighting Safety Equipment	$4,280.00	$0.00	$4,280.00
1982	001-1982	Install Apron Lighting	$11,250.00	$0.00	$11,250.00
1982	001-1982	Improve Access Road	$196,113.00	$4,545.00	$200,658.00
1982	001-1982	Extend Runway	$2,570.00	$0.00	$2,570.00
		1982 Totals:	**$224,563.00**	**$4,545.00**	**$229,108.00**
1983	002-1983	Rehabilitate Taxiway	$10,000.00	$0.00	$10,000.00
1983	002-1983	Install Runway Lighting	$140,920.00	$0.00	$140,920.00
		1983 Totals:	**$150,920.00**	**$0.00**	**$150,920.00**
1984	003-1984	Improve Airport Drainage	$0.00	$9,928.00	$9,928.00
1984	003-1984	Rehabilitate Apron	$0.00	$49,629.00	$49,629.00
1984	003-1984	Rehabilitate Runway	$70,000.00	$0.00	$70,000.00
1984	003-1984	Rehabilitate Taxiway	$35,300.00	$104,323.00	$139,623.00
1984	003-1984	Construct Apron	$0.00	$39,705.00	$39,705.00
1984	003-1984	Expand Apron	$0.00	$79,407.00	$79,407.00
		1984 Totals:	**$105,300.00**	**$282,992.00**	**$388,292.00**
1985	004-1985	Improve Snow Removal Equipment Building	$0.00	$151,095.00	$151,095.00
1985	004-1985	Install Apron Lighting	$0.00	$6,389.00	$6,389.00
1985	004-1985	Construct Apron	$0.00	$85,477.00	$85,477.00
1985	004-1985	Rehabilitate Taxiway	$0.00	$31,925.00	$31,925.00
1985	004-1985	Rehabilitate Runway Lighting	$0.00	$10,510.00	$10,510.00
1985	004-1985	Improve Service Road	$0.00	$9,030.00	$9,030.00

Table 1-1 Airport Grant History Continued

Year	Grant Number	Description	Entitlement	Discretionary	Total
1985	004-1985	Acquire Aircraft Rescue and Firefighting Safety Equipment	$0.00	$18,244.00	$18,244.00
1985	004-1985	Improve Airport Drainage	$0.00	$55,319.00	$55,319.00
		1985 Totals:	**$0.00**	**$367,989.00**	**$367,989.00**
1986	005-1986	Conduct Airport Master Plan Study	$0.00	$79,441.00	$79,441.00
1986	006-1986	Rehabilitate Runway	$0.00	$448,362.00	$448,362.00
1986	006-1986	Rehabilitate Runway Lighting	$0.00	$9,500.00	$9,500.00
		1986 Totals:	**$0.00**	**$537,303.00**	**$537,303.00**
1987	-	No Projects Recorded	$0.00	$0.00	$0.00
		1987 Totals:	**$0.00**	**$0.00**	**$0.00**
1988	007-1988	Improve Access Road	$26,379.00	$0.00	$26,379.00
1988	007-1988	Acquire Security Equipment	$26,379.00	$0.00	$26,379.00
1988	007-1988	Extend Taxiway	$504,352.00	$0.00	$504,352.00
1988	007-1988	Install Apron Lighting	$72,856.00	$1.00	$72,857.00
		1988 Totals:	**$629,966.00**	**$1.00**	**$629,967.00**
1989	-	No Projects Recorded	$0.00	$0.00	$0.00
		1989 Totals:	**$0.00**	**$0.00**	**$0.00**
1990	008-1990	Acquire Land For Approaches	$149,880.00	$1.00	$149,881.00
1990	008-1990	Construct Taxiway	$124,583.00	$0.00	$124,583.00
		1990 Totals:	**$274,463.00**	**$1.00**	**$274,464.00**
1991	-	No Projects Recorded	$0.00	$0.00	$0.00
		1991 Totals:	**$0.00**	**$0.00**	**$0.00**
1992	009-1992	Rehabilitate Taxiway	$259,939.00	$0.00	$259,939.00
1992	009-1992	Install Miscellaneous NAVAIDS	$18,000.00	$0.00	$18,000.00
1992	009-1992	Acquire Aircraft Rescue and Firefighting Safety Equipment	$137,800.00	$0.00	$137,800.00
1992	009-1992	Install Guidance Signs	$198,918.00	$0.00	$198,918.00
		1992 Totals:	**$614,657.00**	**$0.00**	**$614,657.00**
1993	-	No Projects Recorded	$0.00	$0.00	$0.00
		1993 Totals:	**$0.00**	**$0.00**	**$0.00**
1994	-	No Projects Recorded	$0.00	$0.00	$0.00
		1994 Totals:	**$0.00**	**$0.00**	**$0.00**
1995	010-1995	Acquire Aircraft Rescue and Firefighting Vehicle	$0.00	$313,830.00	$313,830.00
1995	010-1995	Improve Terminal Building	$1,650,042.00	$0.00	$1,650,042.00
		1995 Totals:	**$1,650,042.00**	**$313,830.00**	**$1,963,872.00**
1996	-	No Projects Recorded	$0.00	$0.00	$0.00
		1996 Totals:	**$0.00**	**$0.00**	**$0.00**
1997	011-1997	Conduct Airport Master Plan Study	$170,126.00	$0.00	$170,126.00
1997	012-1997	Acquire Handicap Passenger Lift Device	$34,370.00	$0.00	$34,370.00
1997	012-1997	Rehabilitate Taxiway	$317,908.00	$0.00	$317,908.00

Table 1-1 Airport Grant History Continued

Year	Grant Number	Description	Entitlement	Discretionary	Total
1997	012-1997	Construct Taxiway	$110,500.00	$0.00	$110,500.00
		1997 Totals:	**$632,904.00**	**$0.00**	**$632,904.00**
1998	013-1998	Rehabilitate Apron	$89,962.00	$0.00	$89,962.00
1998	013-1998	Rehabilitate Taxiway	$266,411.00	$0.00	$266,411.00
		1998 Totals:	**$356,373.00**	**$0.00**	**$356,373.00**
1999	014-1999	Construct Taxiway	$25,200.00	$0.00	$25,200.00
1999	014-1999	Extend Taxiway	$206,164.00	$0.00	$206,164.00
1999	014-1999	Acquire Security Equipment	$51,300.00	$0.00	$51,300.00
1999	014-1999	Rehabilitate Runway	$81,000.00	$0.00	$81,000.00
1999	015-1999	Extend Taxiway	$136,336.00	$130,665.00	$267,001.00
		1999 Totals:	**$500,000.00**	**$130,665.00**	**$630,665.00**
2000	016-2000	Remove Obstructions	$640,722.90	$0.00	$640,722.90
2000	016-2000	Improve Runway Safety Area	$0.00	$3,000,000.10	$3,000,000.10
2000	016-2000	Update Miscellaneous Study	$20,000.00	$0.00	$20,000.00
		2000 Totals:	**$660,722.90**	**$3,000,000.10**	**$3,660,723.00**
2001	017-2001	Rehabilitate Runway	$9,000.00	$0.00	$9,000.00
2001	017-2001	Acquire Security Equipment	$18,000.00	$0.00	$18,000.00
2001	017-2001	Improve Runway Safety Area	$0.00	$1,397,113.00	$1,397,113.00
2001	017-2001	Install Runway Vertical/Visual Guidance System	$0.00	$90,000.00	$90,000.00
2001	017-2001	Remove Obstructions	$973,000.00	$0.00	$973,000.00
		2001 Totals:	**$1,000,000.00**	**$1,487,113.00**	**$2,487,113.00**
2002	018-2002	Security Enhancements	$49,107.00	$0.00	$49,107.00
2002	018-2002	Groove Runway	$75,000.00	$0.00	$75,000.00
		2002 Totals:	**$124,107.00**	**$0.00**	**$124,107.00**
2003	-	No Projects Recorded	$0.00	$0.00	$0.00
		2003 Totals:	**$0.00**	**$0.00**	**$0.00**
2004	020-2004	Rehabilitate Runway	$1,950,000.00	$0.00	$1,950,000.00
2004	021-2004	Rehabilitate Runway	$72,000.00	$3,000,000.00	$3,072,000.00
		2004 Totals:	**$2,022,000.00**	**$3,000,000.00**	**$5,022,000.00**
2005	022-2005	Rehabilitate Taxiway	$100,000.00	$0.00	$100,000.00
2005	022-2005	Security Enhancements	$753,599.00	$0.00	$753,599.00
		2005 Totals:	**$853,599.00**	**$0.00**	**$853,599.00**
2006	023-2006	Rehabilitate Taxiway	$1,970,000.00	$0.00	$1,970,000.00
2006	023-2006	Conduct Miscellaneous Study	$30,000.00	$0.00	$30,000.00
		2006 Totals:	**$2,000,000.00**	**$0.00**	**$2,000,000.00**
2007	024-2007	Rehabilitate Apron	$11,822.00	$0.00	$11,822.00
2007	024-2007	Rehabilitate Taxiway	$198,000.00	$0.00	$198,000.00
2007	025-2007	Update Airport Master Plan Study	$97,147.00	$0.00	$97,147.00
		2007 Totals:	**$306,969.00**	**$0.00**	**$306,969.00**

Table 1-1 Airport Grant History Continued

Year	Grant Number	Description	Entitlement	Discretionary	Total
2008	026-2008	Rehabilitate Apron	$979,961.00	$0.00	$979,961.00
2008	026-2008	Rehabilitate Taxiway	$100,000.00	$0.00	$100,000.00
2008	026-2008	Acquire Snow Removal Equipment	$175,000.00	$0.00	$175,000.00
2008	027-2008	Rehabilitate Apron	$287,261.00	$0.00	$287,261.00
2008	027-2008	Runway Incursion Markings	$50,000.00	$0.00	$50,000.00
2008	027-2008	Rehabilitate Taxiway	$100,000.00	$0.00	$100,000.00
		2008 Totals:	**$1,692,222.00**	**$0.00**	**$1,692,222.00**
2009	028-2009	Rehabilitate Taxiway	$100,000.00	$0.00	$100,000.00
2009	028-2009	Rehabilitate Apron	$200,000.00	$0.00	$200,000.00
2009	028-2009	Runway Incursion Markings	$24,621.00	$0.00	$24,621.00
2009	029-2009	Conduct Miscellaneous Study	$30,000.00	$0.00	$30,000.00
2009	029-2009	Rehabilitate Apron	$125,000.00	$0.00	$125,000.00
2009	029-2009	Runway Incursion Markings	$10,000.00	$0.00	$10,000.00
2009	029-2009	Rehabilitate Taxiway	$20,456.00	$0.00	$20,456.00
		2009 Totals:	**$510,077.00**	**$0.00**	**$510,077.00**
2010	030-2010	Acquire Equipment	$41,230.00	$0.00	$41,230.00
2010	031-2010	Wildlife Hazard Assessments	$150,000.00	$0.00	$150,000.00
		2010 Totals:	**$191,230.00**	**$0.00**	**$191,230.00**
2011	032-2011	Construct Apron	$85,000.00	$0.00	$85,000.00
2011	032-2011	Construct Taxiway	$117,397.00	$0.00	$117,397.00
		2011 Totals:	**$202,397.00**	**$0.00**	**$202,397.00**
2012	033-2012	Construct Apron	$619,900.00	$0.00	$619,900.00
2012	033-2012	Construct Taxiway	$2,083,625.00	$0.00	$2,083,625.00
		2012 Totals:	**$2,703,525.00**	**$0.00**	**$2,703,525.00**
2013	034-2013	Update Airport Master Plan Study	$468,750.00	$0.00	$468,750.00
2013	035-2013	Rehabilitate Apron	$117,172.00	$0.00	$117,172.00
2013	035-2013	Rehabilitate Runway	$250,000.00	$0.00	$250,000.00
		2013 Totals:	**$835,922.00**	**$0.00**	**$835,922.00**
		1982-2013 Totals:	**$18,241,958.90**	**$9,124,429.10**	**$27,366,388.00**

1.5 Airport Classification

The state of Idaho has a wide range of aviation facilities from unpaved airstrips to large commercial service airports. Due to this variety, there is a need for classification of these facilities to determine operating parameters and design standards.

Lewiston-Nez Perce County Regional Airport is classified by two separate methods:

- National Plan of Integrated Airport System – This method is evaluated by the FAA to determine the purpose an airport serves the United States.

- Idaho Airport System Plan – This plan is similar to the NPIAS, however, at a state level only. The plan was developed by the Idaho Transportation Department (ITD).

These classifications establish the abilities and purpose the airport serve at a state and national level.

1.5.1 Service Level (NPIAS)

The NPIAS is a report that establishes and identifies the role an airport serves in the National Airport System (NAS). To be eligible for AIP funding, the facility is required to be included in the NPIAS. In the 2013-2017 Report, a total of 3,280 airports, 10 heliports, 40 seaplane bases, and 25 proposed airports comprised the 3,355 NPIAS facilities in the United States. The NPIAS distinguishes airports into the following categories:

- Commercial Service Airports – These are defined as public airports receiving scheduled passenger service and having 2,500 or more enplaned passengers per year. These commercial service airports are broken into two categories:

    - Primary – These airports enplane more than 10,000 passengers annually, they are further broken down into Large Hub, Medium Hub, Small Hub, and Nonhub Primary. The additional classifications are determined by percentage of total U.S. passenger enplanements. There are 378 airports classified as Primary.

    - Nonprimary – These airports enplane between 2,500 and 9,999 passengers annually. There are 121 airports classified as Nonprimary.

- General Aviation Airports – These airports do not meet commercial service criteria but typically have at least 10 based aircraft and are at least 20 miles from the nearest NPIAS airport. There are 2,563 airports classified as General Aviation.

- Reliever Airports – These airports are designated to relieve general aviation traffic from hub airports. They are located primarily near major metropolitan areas. The requirements for this classification are: for public-use and have more than 100 based aircraft OR at least 25,000 annual itinerant operations. There are 268 airports classified as Reliever.

- New Airports – These are airports that are anticipated for development within the five year planning window. There are 25 airports classified as New.

The Lewiston-Nez Perce County Regional Airport is classified by the NPIAS as a Commercial Service - Nonhub Primary airport. According to the FAA, this is defined as a commercial service airport that enplanes less than 0.05 percent of all commercial passenger enplanements but have more than 10,000 annual enplanements.

Table 1-2 Airport Classification Criteria

Classification		Hub Type: Percentage of Annual Passengers Enplaned
Commercial Service: Airports that receive scheduled passenger and have >2,500 enplaned passengers per year.	Primary: >10,000 enplaned passengers per year	Large: 1% or greater
		Medium: >0.25% but <1%
		Small: >0.05% but <0.25%
		Nonhub: <0.05% but >10,000 annual enplanements
	Nonprimary: >2,500 but <10,000 enplaned passengers per year	Not Applicable
General Aviation: >10 based aircraft and >20 miles to nearest NPIAS airport.		Not Applicable
Reliever: Public use, near congested hub airport and >100 based aircraft OR >25,000 annual itinerant operations		Not Applicable
New: To be developed within the five year planning window		Not Applicable

Source: FAA, 2013

1.5.2 Idaho Airport System Plan

In 2010, the Idaho Transportation Department (ITD) funded the Idaho Airport System Plan (IASP) which is comprised of 75 public-use airports of the 119 total in the state. IASP evaluated the facilities by the purpose they serve. IASP categorized and defined the airports into the following classifications:

- Commercial Service – Accommodate scheduled major/national or regional/commuter commercial air carrier service in addition to air cargo, business aviation, and all types of general aviation.
- Regional Business – Support regional economic activities, connecting to state and national economies, and serve all types of general aviation aircraft. They also accommodate local business activities and various types of general aviation users.
- Community Business – Serve a limited role in regional economies, primarily supporting community economies. They accommodate a variety of general aviation activities such as business, recreational, and personal flying.
- Local Recreational – Serve a supplemental role in local economies, primarily accommodating recreational, personal flying, and limited local business activities.
- Basic Service – Serve a limited role in local economy, primarily accommodating recreational and personal flying.

Airports not included in the IASP generally consist of dirt landing strips or private use airports. The Lewiston-Nez Perce County Regional Airport is classified by the IASP as a Commercial Service airport.

Table 1-3 Idaho Airports by Classification

Classification	Total
Commercial Service Airports	7
Regional Business Airports	16
Community Business Airports	19
Local Recreational Airports	16
Basic Service Airports	17
Airports not included in IASP	41
Total	**116**

Source: Idaho Airport System Plan, 2013

1.6 Airport Role

The Lewiston-Nez Perce County Regional Airport provides aviation access to the Cities of Lewiston, Clarkston, and entire region of northern Idaho, northeastern Oregon, and southeastern Washington. Airport users include:

- Airline Transportation – Airline passengers at the Lewiston-Nez Perce County Regional Airport are currently served by two airlines: Horizon Airlines (dba Alaska Airlines) and Skywest Airlines (dba Delta Connection/Delta Air Lines). Non-stop flights are operated to Boise, Idaho, Pullman, Washington, Salt Lake City, Utah and Seattle, Washington. Airline fleet mix aircraft include the Canadair Regional Jet 200 and the Bombardier Q-400 Turboprop.

- Air Cargo Transportation – Two cargo carriers serve the airport: Ameriflight (dba UPS) and Empire Airlines (dba Federal Express/FedEx). Daily flights are operated to sorting facilities at Seattle - Boeing Field and Spokane International Airport in Washington. Cessna 208 Grand Caravans and Fairchild Dornier Metroliners turboprops are utilized for the cargo operations.

- Business Transportation – Business aviation users benefit by being able to travel to or from local business centers to conduct activities in a single day, without requiring an overnight stay or extensive group travel time. Local and other small businesses generally utilize single and multi-engine piston aircraft or helicopters. Medium sized businesses and larger corporations having a need to travel to the Lewiston area generally utilize multi-engine piston, turboprop, or light to medium business jets. This user category also includes all travel conducted by governmental authorities.

- Personal Transportation – These users desire the utility and flexibility offered by general aviation aircraft. The types of aircraft utilized for personal transportation vary with individual preference or resources. The mix of aircraft includes a variety of single or multi-engine and occasionally turbojet aircraft.

- Recreational and Tourism – These users include transient pilots flying into the region to visit recreational and tourist attractions. These users typically utilize single-engine piston aircraft; however, a small percentage may operate helicopters, multi-engine piston or larger aircraft. Other types of aircraft in this category often include home-built, experimental aircraft, gliders and ultralights.

- Flight Training – These users conduct local and itinerant flights in order to meet flight proficiency requirements for obtaining FAA pilot certifications. These flights include touch-and-goes, day and night local and cross-country flights and practice approaches. Pilot certifications include Sport, Private, Instrument, Commercial, Instructor and Airline Transport ratings. Depending on the level of interest and aircraft availability, a multi-engine rating may or may not be available. A commercial rating may be accomplished with either a single-engine or multi-engine aircraft. Air transport ratings are usually obtained at larger regional FAR Part 141 certificated flight schools. Flight training is provided by AeroFlight Pilot Training, Odonata and Stout Flying Service.

- Aircraft Maintenance – There are multiple facilities located on the airport that provide maintenance services to based and transient aircraft including Gustin Aviation, Hillcrest Aircraft Company and Stout Flying Service . Services include but are not limited to: 100-hour inspections, annual inspections, powerplant rehabilitation and various repairs. Also, there is a large-scale inspection and maintenance facility for AirTractor aircraft, an agricultural spray aircraft.

- Air Medivac – Air medivac provides essential emergency medical transport in life threatening situations and patient transfers to and from other hospitals and health care facilities throughout the region. These users utilize a variety of fixed – wing multi-engine turboprop and turbojet aircraft and helicopters. Life Flight has a fixed-wing and helicopter base at the airport. They operate Twin Commanders, Eurocopter EC135 and AStar AS350s.

- Military – The airport is currently utilized by the military for occasional fuel stops and local operations.

- Agricultural Spray Operations – The area surrounding Lewiston is utilized for agricultural activities and the airport serves as a base for agricultural spraying operators for the local area. The aircraft used for aerial spraying are primarily single-engine piston, single-engine turbine and rotorcraft.

1.7 Regional Setting

The City of Lewiston is located at an elevation of approximately 745 feet MSL at the confluence of the Snake and Clearwater Rivers in the Lewis-Clark Valley. The Town of Clarkston, Washington is located directly across the Snake River. The two localities are connected by two vehicular bridges. Nez Perce National Historical Park is located approximately twelve miles east of Lewiston and contains over 38 cultural sites to the indigenous Nez Perce people. Hells Gate State Park is located along the Snake River in the southwest area of Lewiston. Hells Gate State Park provides a broad variety of recreational opportunities such as camping, horseback riding, archery facilities, bicycle and pedestrian paths, and boat ramp and marina services. Hells Gate State Park also houses the Jack O'Connor Hunting Heritage Education Center, the permanent home of the O'Connor wildlife collection and the Lewis and Clark Discovery Center which has displays and information about the Corp of Discovery and the Nez Perce Tribe. Lewiston-Nez Perce County Regional Airport is the nearest commercial service airport to the Hells Canyon National Recreational Area, located at the start 32 miles upstream on the Snake River and ending 83 miles upstream at Hells Canyon Dam. The area is open to several recreational activities including rafting, jet boating, horseback riding, fishing, hunting, and hiking. Lewiston serves as a regional center for business, healthcare, manufacturing, shopping and entertainment.

1.7.1 Topography and Terrain

The elevation of Lewiston-Nez Perce County Regional Airport is 1,442 feet MSL. The airport is located within an area surrounded by mountains and a convergence of the Snake and Clearwater rivers. The terrain surrounding the airport within a ten mile radius is generally considered mountainous.

Figure 1-3 Lewis-Clark Valley

Lewiston, Idaho

Figure 1-4 Topography Map of Idaho

Source: ezilion.com, 2013

1.8 Socioeconomic Factors

Examining the specific socioeconomic characteristics of Nez Perce County, Asotin County, the City of Lewiston, the City of Clarkston and the airport service area will help determine the factors that influence aviation activity and the extent to which aviation facility developments are needed at Lewiston-Nez Perce County Regional Airport. Characteristics, such as employment, demographic patterns and income, will help in establishing the potential growth rate of aviation within the City and the County. By analyzing the information in this chapter, forecasts and projections of aviation activity can be developed and are provided in Chapter 2 – Forecasts of Aviation Activity.

1.8.1 Local Profile

The Cities of Lewiston and Clarkston are large commercial/industrial centers for northwest Idaho and eastern Washington. According to the U.S. Census Bureau, between 2000 and 2009 the largest single industries in the region were government, trade/utilities/transportation, health/educational services and manufacturing. Lewiston is also a center for paper production, ammunition manufacturing and various agricultural enterprises.

1.8.2 Population

There were 31,894 people residing in Lewiston and 7,229 people residing in Clarkston as indicated by the 2010 U.S. Census Bureau. According to recent population estimates from the U.S. Census Bureau, the population for Lewiston grew to 32,051 and 7,283 for Clarkston in 2012. The Lewiston, Idaho Metropolitan Statistical Area (MSA) indicates 62,333 residents in 2013. Historical and future population projection growth is shown on **Table 1-4** and **Figure 1-5**.

Projections pertaining to population data were developed for the Lewiston MSA, Nez Perce County, Idaho and Asotin County, Washington by the Idaho Department of Labor and the Washington State Office of Financial Management. Population projections, as shown in **Table 1-4,** indicates a 0.33 percent annual average growth (AAG) for the Lewiston MSA, 1.24 percent AAG for Asotin County and a 0.29 percent AAG for Nez Perce County from 2013 to 2023. As the current projections do not extend for the full 20-year planning period, the 10-year projection percentages are assumed to continue at the same rate. **Figure 1-5** shows the historical and projected population outlook for Asotin County, Nez Perce County and the Lewiston MSA.

Table 1-4 Historical and Forecasted Population

	Nez Perce County	Asotin County	Lewiston MSA
Historical			
2010	39,316	24,230	61,019
2011	39,543	24,498	61,474
2012	39,837	24,791	61,948
2013	40,046	25,085	62,333
Forecast			
2015	40,402	25,678	62,988
2020	41,065	27,263	64,158
2025	41,660	28,816	65,216
2030	42,615	30,371	66,292
AAG	**0.29%**	**1.24%**	**0.33%**

Source: Idaho Department of Labor & Washington State Office of Financial Management, 2013

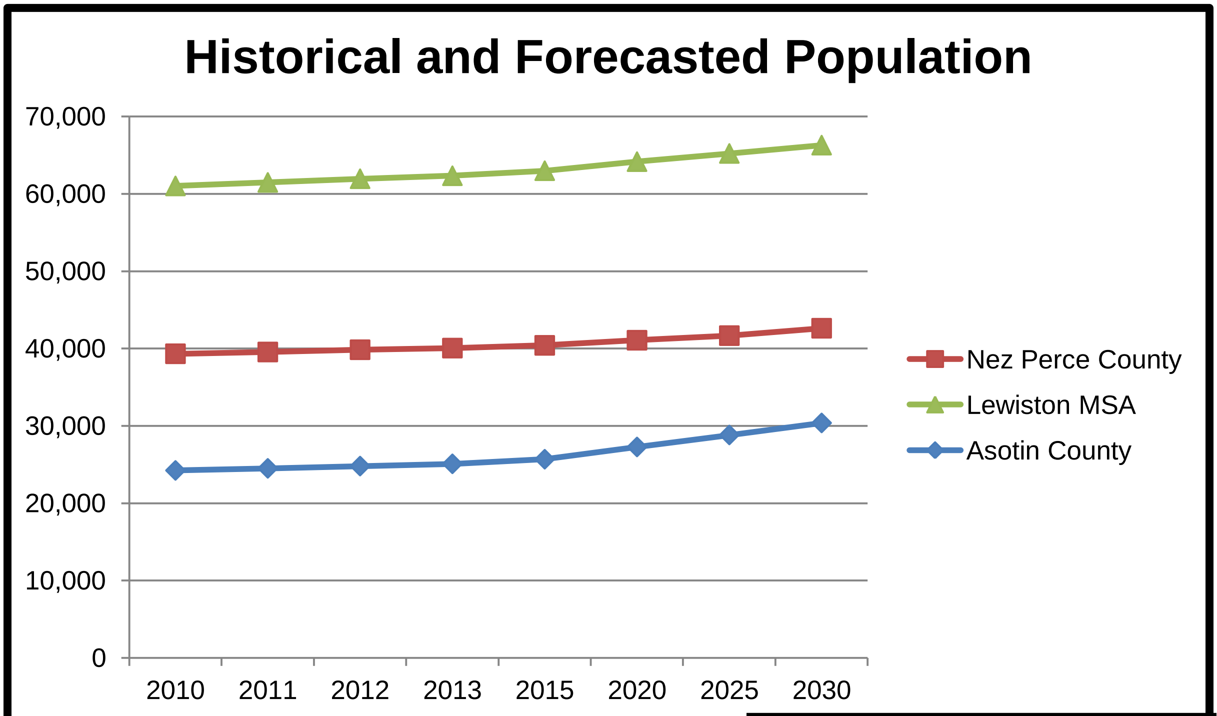


Figure 1-5 Historical and Forecasted Population Graph

1.8.3 Employment

As previously noted, according to the 2009 U.S. Census Bureau, the largest industries in the Lewiston MSA are government, trade/utilities/transportation, health/educational services and manufacturing. According to the U.S. Census, there are 1,119 businesses in Nez Perce County and 1,456 businesses in Asotin County. Area industries include paper and lumber mills, ammunition manufacturing, jet boat manufacturing, agricultural industries, and recreation and tourism. The types of jobs within the Airport's service area affect aviation demand. Typically, careers in manufacturing and service industries tend to generate more aviation activity than resource industries such as agricultural or mining.

According to the U.S. Bureau of Labor Statistics, the unemployment rate for Lewiston was 5.7 percent in July 2013 – less than that of the United States (7.3 percent), Asotin County (6.0 percent) and Nez Perce County (6.1 percent). In 2011, Forbes Magazine projected the annual job growth at 1.9 percent. Employment distribution by industry for Lewiston is shown in **Table 1-5**.

Table 1-5 Nez Perce County Employment Distribution

Industry	2011	Percent of Total
Agriculture	216	1.1%
Mining	77	0.3%
Construction	690	3.5%
Manufacturing	2,711	13.6%
Trade, Utilities and Transportation	3,763	18.8%
Information Technology	380	1.9%
Financial Activities	1,419	7.1%
Professional and Business Services	1,156	5.8%
Education and Health Services	3,482	17.4%
Leisure and Hospitality	1,847	9.2%
Other Services	500	2.5%
Government	3,755	18.8%
Total	**19,996**	**100%**

Source: Idaho Department of Labor, 2013

1.8.4 Income

Historical and future projections for per capita personal income (PCPI) are shown in **Table 1-6**. In 2011, the PCPI for Lewiston MSA was $35,796 and increased approximately 25 percent from 2001 to 2011. This represents an average annual growth (AAG) rate of approximately 2.5 percent. It is assumed the PCPI will continue to grow at the same average annual rate of approximately 2.5 percent through the 20 year planning period.

According to the 2011 U.S. Census Bureau, the median income for a household in the City of Lewiston was $43,927 and $29,877 in the City of Clarkston. The median household income for the State of Idaho was $46,890 and $58,890 in the State of Washington. The percentage of families living below the poverty line in 2011 was 11.3 percent within Lewiston, 23.5 percent within Clarkston, 14.3 percent for the State of Idaho and 12.5 percent for the State of Washington.

Table 1-6 Per Capital Personal Income (PCPI) Growth

Year	Lewiston MSA
Historical	
2001	$26,842
2002	$27,135
2003	$27,711
2004	$28,789
2005	$29,453
2006	$30,951
2007	$33,083
2008	$35,110
2009	$33,938
2010	$34,751
2011	$35,796
Forecast	
2015	$39,376
2020	$44,298
2025	$49,835
2030	$56,064
AAG	**2.50%**

Source: St. Louis Federal Reserve, 2011

1.8.5 Growth Indicators

Additional growth indicators include building permits, taxable sales and net assessed valuation. According to the City of Lewiston, there were 1,975 commercial building/trade permits which includes 57 residential permits issued in 2012. The total valuation for these permits is approximately 60.98 million dollars.

1.9 Certificated Pilots and Registered Aircraft

The FAA Aircraft Registration Inquiry and Certificated Airmen databases were reviewed to determine current distribution of pilots and registered aircraft in the Lewiston and Nez Perce County area. This data indicates there are 119 certificated pilots and 173 registered aircraft in Nez Perce County. The data also indicates there are 66 certificated pilots and 63 registered aircraft in Asotin County.

1.10 Based Aircraft and Operations

The number of based aircraft, operations and fleet mix was based on the information found in the FAA Form 5010 – Airport Master Record. According to the Form 5010 for 2012, there were 145 based aircraft. The presence of an air traffic control tower helps to provide accurate annual operation data. According to the 5010 in 2012, there were 35,219 total annual operations. Based on discussions with air traffic control and airport management, the 5010 activity levels are considered to be accurate. **Table 1-7** depicts the number current based aircraft and total annual operations.

Table 1-7 Based Aircraft and Operations in 2012

Based Aircraft	
Fixed Wing Single-Engine	117
Fixed Wing Multi-Engine	12
Jet	2
Helicopters	14
Total	**145**
Operations	
Air Carrier	1,817
Air Taxi and Commuter	3,997
General Aviation – Local	13,875
General Aviation – Itinerant	14,717
Military	813
Total	**35,219**

Source: FAA Form 5010 – Airport Master Record

1.11 Passenger Enplanements

Lewiston-Nez Perce County Regional Airport receives both scheduled and unscheduled passenger service. The airport is served by Horizon Airlines (dba Alaska Airlines) and Skywest Airlines (dba Delta Connection/Delta Air Lines) with five total round trips Monday through Friday, four departures and three arrivals on Saturday and five departures and four arrivals on Sunday to Boise Airport (BOI), Pullman-Moscow Regional Airport (PUW), Salt Lake City International Airport (SLC) and Seattle/Tacoma International Airport (SEA). Flights are operated on the Bombardier Q-400 Turboprop and Canadair Regional Jet 200. In 2012, the airport served a total of 62,197 enplanements, a decrease from 2011's total of 62,845 enplanements and was ranked 254th in the nation for total enplanements. Airline passenger enplanements are defined as the total number of revenue passengers boarding aircraft, including originating, stopover and transfer passengers, in scheduled and nonscheduled air carriers and are recorded by service providers and reported to the FAA. The number of enplanements depends on several factors including socioeconomic, aviation trends and ticket prices amongst other things. **Figure 1-7** depicts all existing non-stop destinations served from Lewiston-Nez Perce County Regional Airport. **Table 1-8** and **Figure 1-8** show the Airport's historical enplanement data. Chapter 2 – Forecasts of Aviation Activity, includes the enplanement forecast for the 20 year planning period.

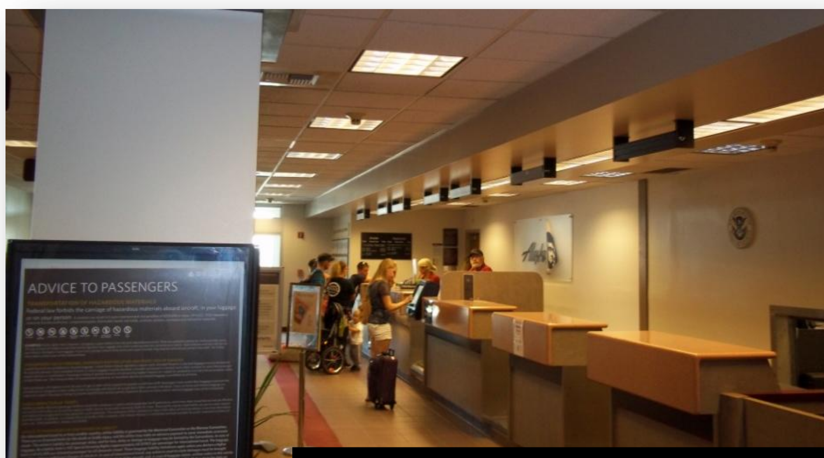


Figure 1-6 Passengers Checking in at LWS

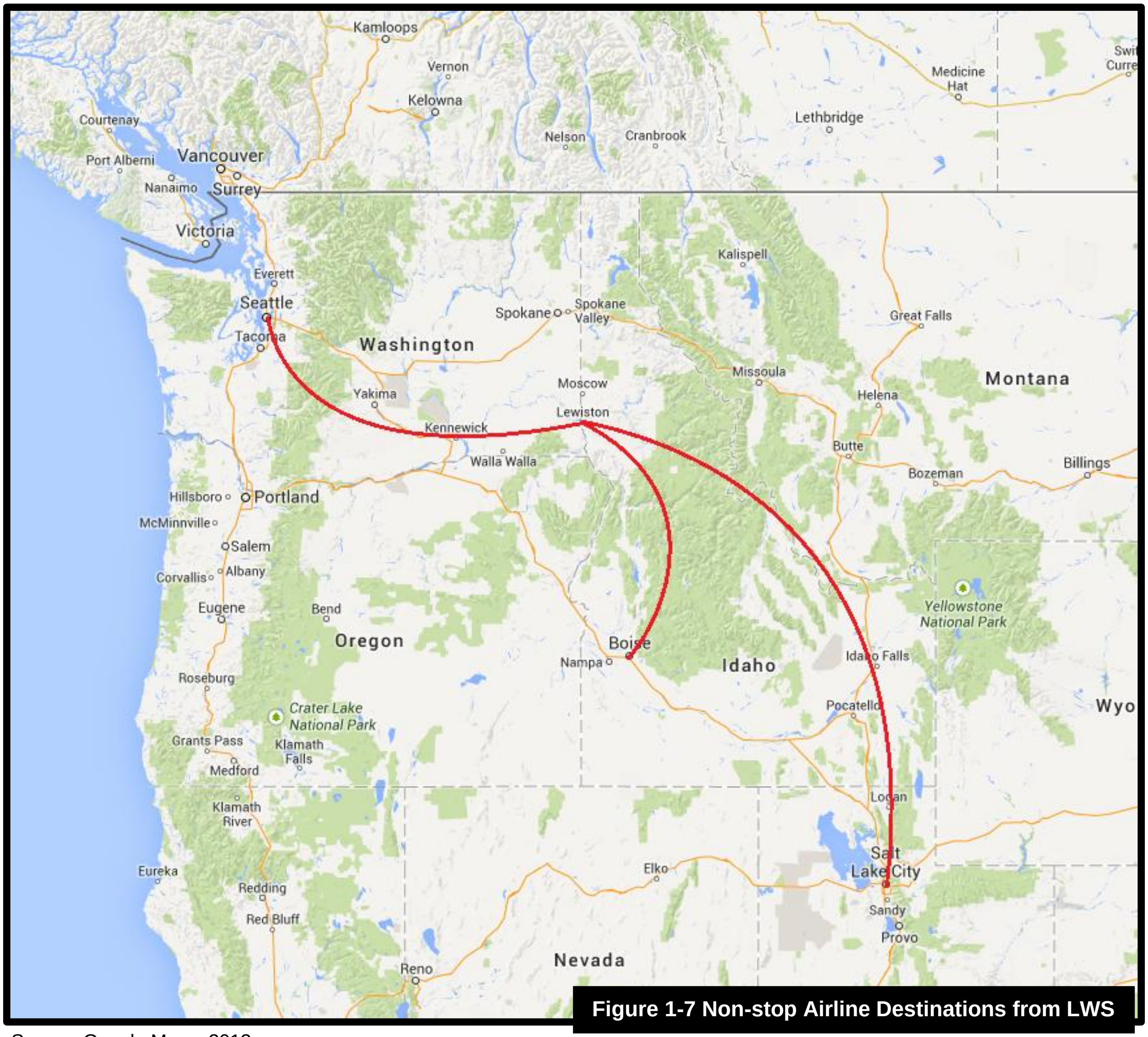


Figure 1-7 Non-stop Airline Destinations from LWS

Source: Google Maps, 2013

Table 1-8 Historical Enplanement Data

Year	Total Enplanements	Annual % Change	National Ranking
2002	60,245	-3.4%	237
2003	53,907	-10.5%	250
2004	43,436	-19.4%	271
2005	66,444	53.0%*	242
2006	66,357	-0.1%	243
2007	67,469	5.1%	244
2008	64,379	-7.7%	252
2009	62,210	-3.4%	250
2010	61,737	-0.8%	255
2011	62,845	1.8%	251
2012	62,197	-1.0%	254

Source: FAA, 2013

*Note: Denotes introduction of Delta Connection service to Salt Lake City

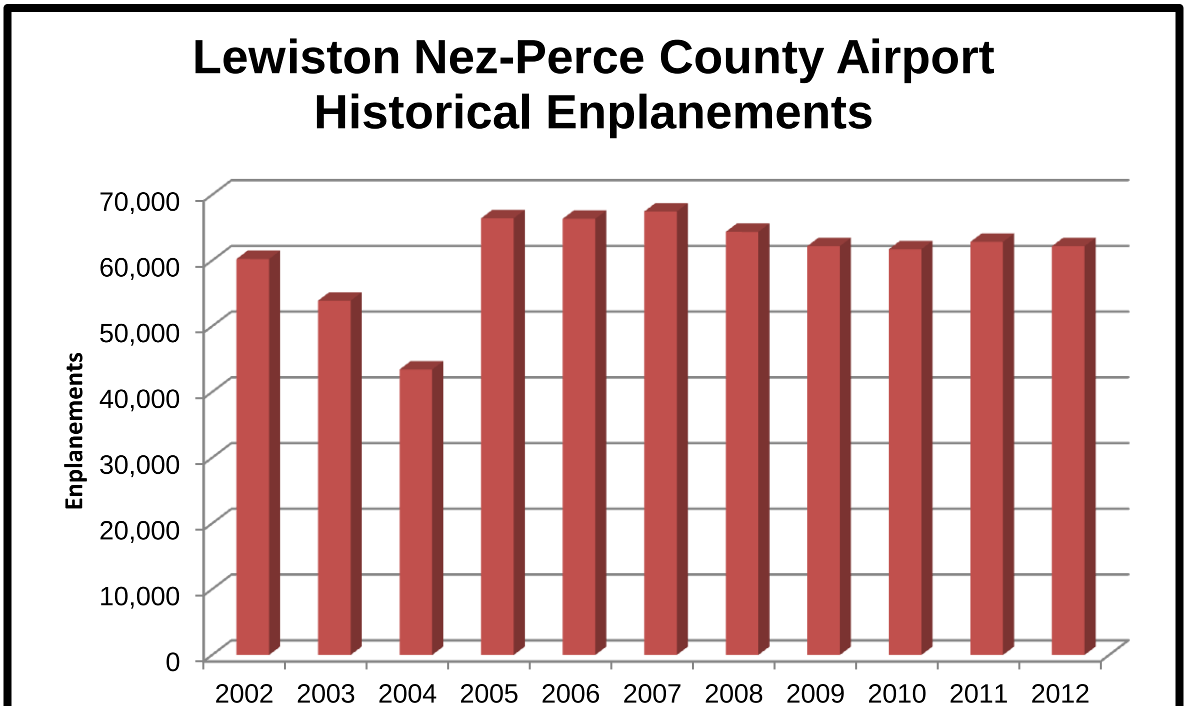


Figure 1-8 Historical Enplanement Graph

Source: FAA, 2013

1.12 Cargo

Cargo operations are conducted at the airport by Ameriflight (dba UPS) and Empire Airlines (dba Federal Express/FedEx). Ameriflight operates the Fairchild Dornier Metroliner Turboprop to Seattle – Boeing Field (BFI). Empire Airlines operates the Cessna 208 Grand Caravan to Spokane International Airport (GEG). There is no available reported data for estimated cargo tonnage transported to and from Lewiston-Nez Perce County Regional Airport. The FedEx facility is 14,250 square feet and the existing size is reported to meet current demand. Ameriflight conducts direct truck to aircraft loading/off loading on the ramp. **Figure 1-11** depicts the existing non-stop cargo routes.

Figure 1-9 Ameriflight Metroliner

Figure 1-10 FedEx Cessna 208 Grand Caravan

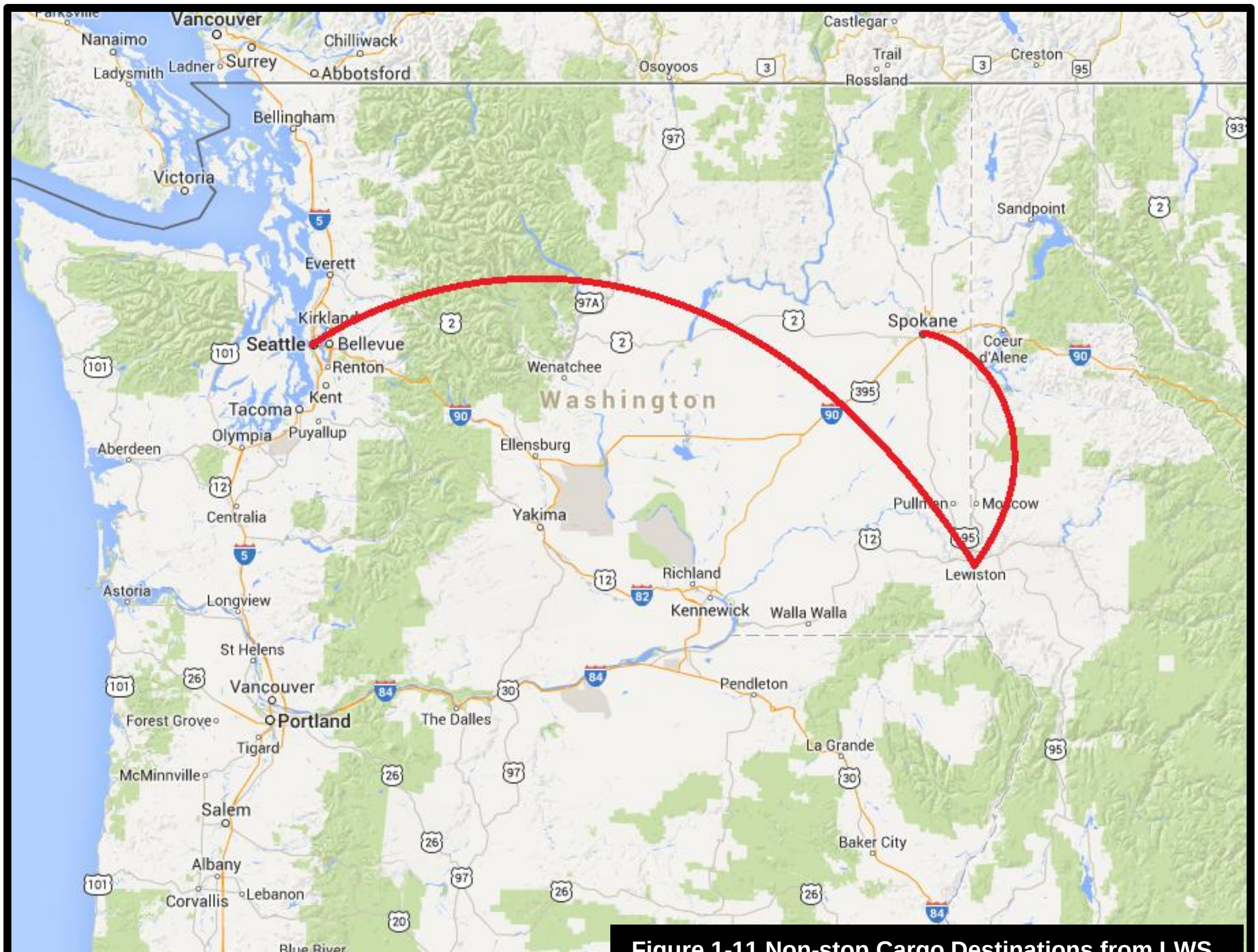


Figure 1-11 Non-stop Cargo Destinations from LWS

Source: Google Maps, 2013

1.13 Airport Service Area

1.13.1 Airline Passenger Service Area

An airport service area is defined by the communities and surrounding areas served by the airport facility. For example, factors such as the airport's surrounding topographical features (mountains, rivers, etc.); proximity to its users; quality of ground access; required driving time to the airport; and, the proximity of the facility to other airports that offer the same or similar services can all affect the size of a particular airport's service area. To define the service area for Lewiston-Nez Perce County Regional Airport, the airports in the area and their specific services and facilities were reviewed. The Service Area is depicted in **Figure 1-12** and is home to approximately 144,089 people.

The nearest airline passenger service to Lewiston is located in Pullman, Washington approximately 38 miles north of Lewiston. The Pullman-Moscow Regional Airport is served by Horizon Airlines (dba Alaska Airlines) to Lewiston, Idaho and Seattle, Washington. Since the Pullman-Moscow Regional Airport does not provide service to Boise, Idaho or Salt Lake City, Utah the airport would be included in the Lewiston-Nez Perce County Regional Airport service area.

Although out of the primary service area, Spokane International Airport is approximately 111 miles to the northwest. Spokane is served by Alaska Airlines, Allegiant Air, Delta Air Lines, Frontier Airlines, Southwest Airlines, United Airlines and US Airways serving several destinations in Hawaii, the Midwest and Western United States.

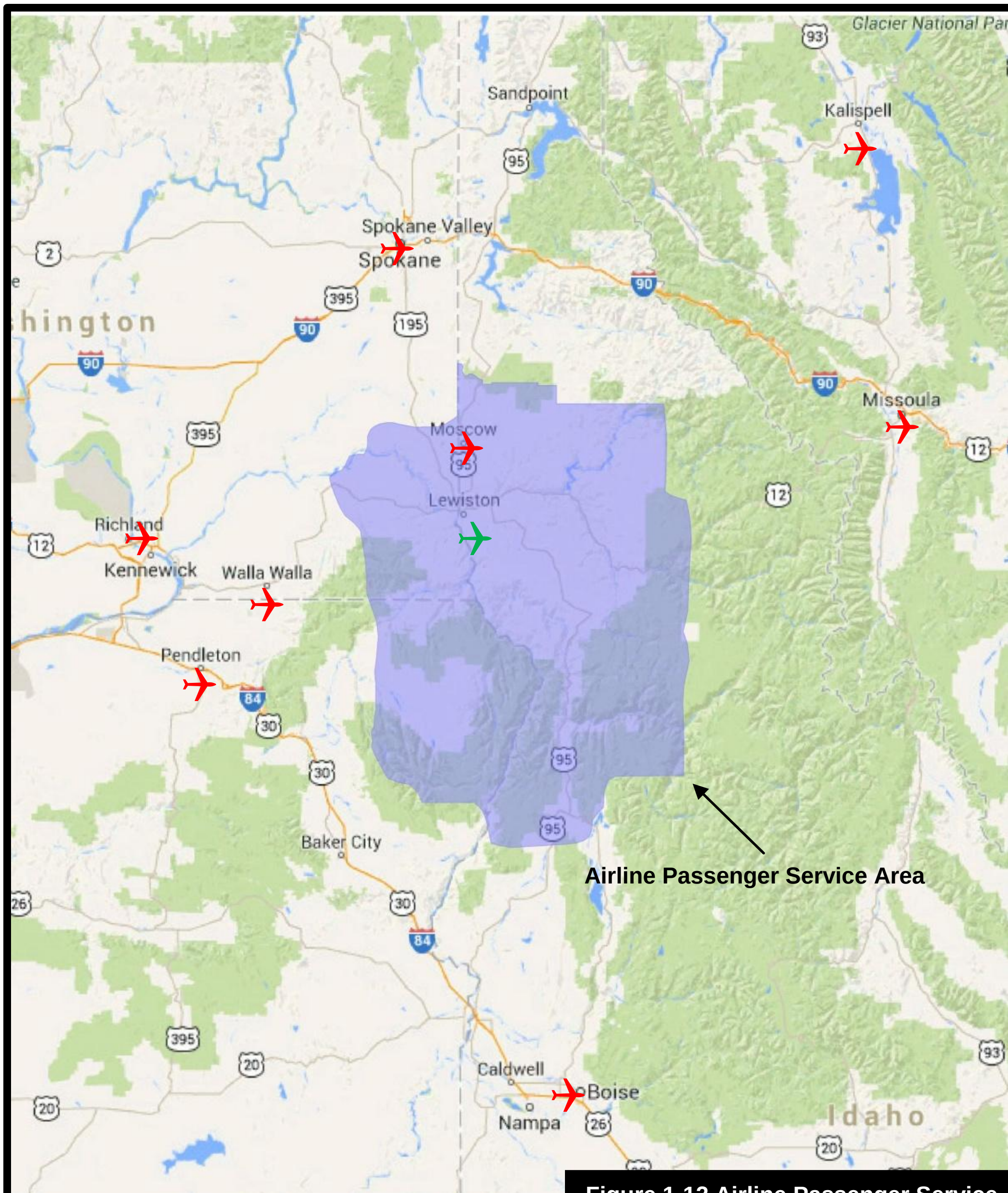


Figure 1-12 Airline Passenger Service Area

1.13.2 General Aviation Service Area

The general aviation service area, much like the airline passenger service area, is defined by the communities and surrounding areas served by the airport facility. To define the general aviation service area for Lewiston, the airports in the area and their specific services and facilities were reviewed.

The nearest public use general aviation airport with a paved surface and an instrument approach is located approximately 38 nautical miles north in Pullman, Washington. The service area includes the area within half the distance of the nearest airport with an instrument approach from Lewiston-Nez Perce County Regional Airport. **Table 1-9** depicts the closest airports with instrument approaches.

There are no additional airports within the vicinity of the service area of Lewiston. The general aviation service area is shown in **Figure 1-13**.

Table 1-9 Lewiston and Nearby Airports With Instrument Approaches

Airport	ID	Distance (NM)	Distance (Road)	NPIAS Status	Runway Lengths & Widths	Pavement Type	Inst. Approach	Fuel
Lewiston-Nez Perce County Regional Airport, Lewiston, ID	LWS	-	-	P-CS	6,512'x150' 5,000'x100'	Asphalt Asphalt	ILS/VOR GPS	100LL & Jet-A
Pullman-Moscow Regional Airport, Pullman, WA	PUW	22	38.1	P-CS	6,730'x100'	Asphalt	GPS/VOR	100LL & Jet-A
Idaho County Airport, Grangeville, ID	GIC	45	74.9	GA	5,101'x75'	Asphalt	GPS	100LL & Jet-A
Walla Walla Regional Airport, Walla Walla, WA	ALW	55	101	P-CS	6,527'x150' 5,948'x150'	Asphalt Mix*	ILS/VOR GPS/NDB	100LL & Jet-A
La Grande/Union County Airport, La Grande, OR	LGD	77	185	GA	5,600'x100' 3,876'x60'	Asphalt Asphalt	GPS/NDB	100LL & Jet-A
Spokane International Airport, Spokane, WA	GEG	78	111	P-S	11,002'x150' 8,199'x150'	Mix* Mix*	ILS/GPS VOR/Visual	100LL & Jet-A

Source: AirNav.com, 2013
*indicates mix of asphalt and concrete pavement types used

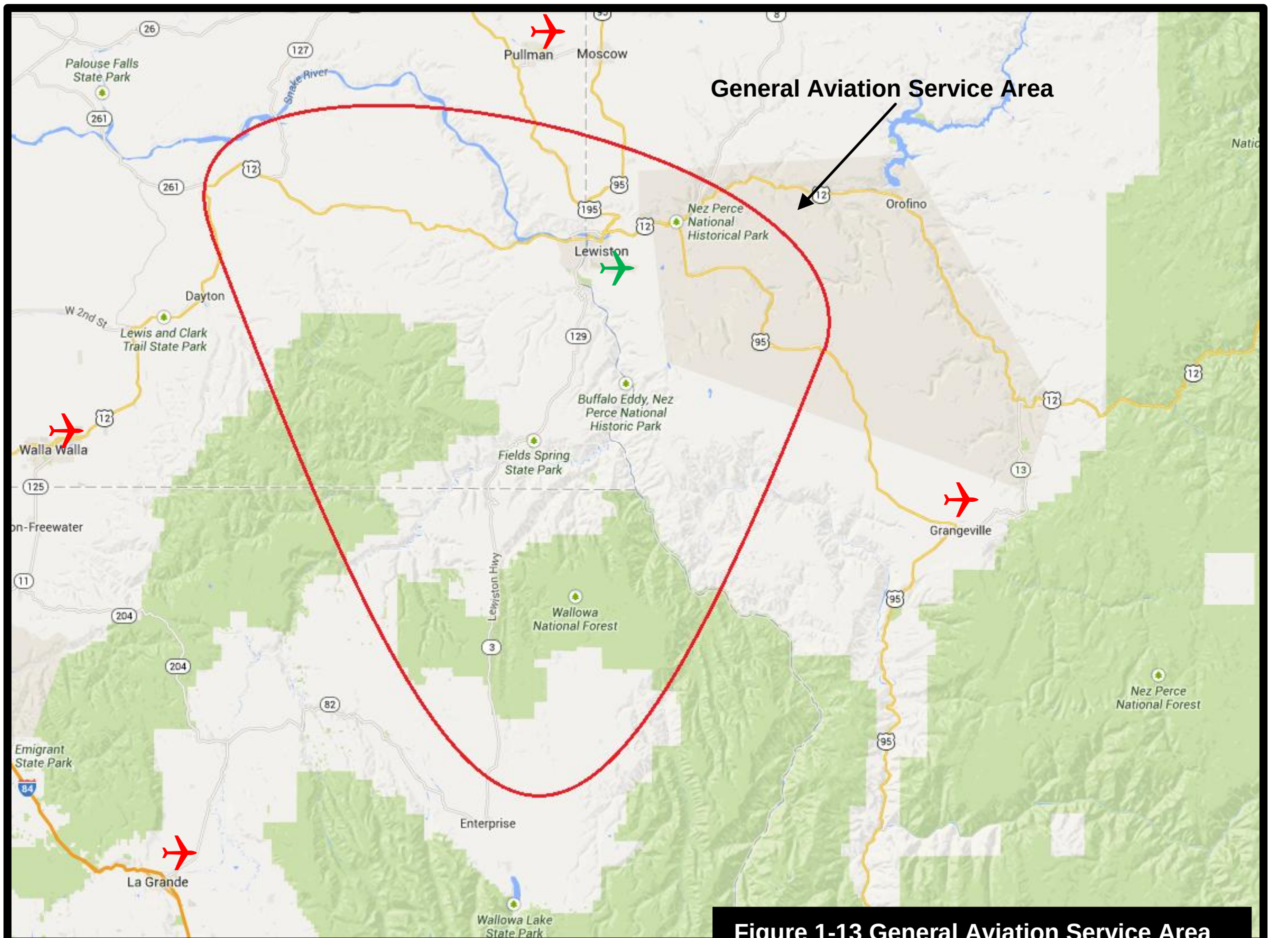
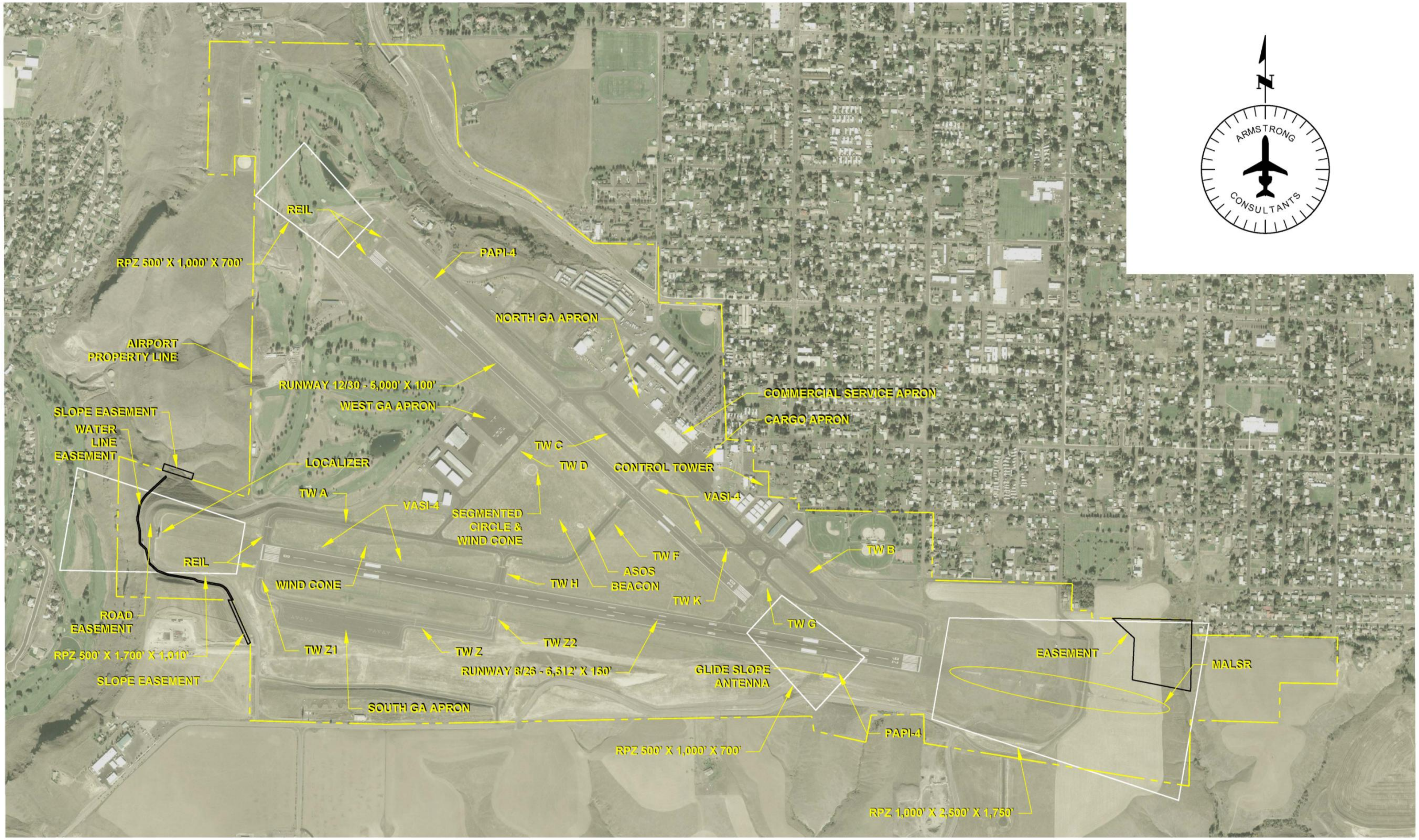


Figure 1-13 General Aviation Service Area

Source: Google Maps, 2013

1.14 Existing Airside Facilities

The “airside” of an airport is the portion typically located within the security fenced area, in which aircraft, support vehicles and equipment are located; and in which aviation-specific operational activities take place. **Figure 1-13** provides a visual depiction of existing airside facilities and the facilities are summarized in **Table 1-13**.



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Lewiston-Nez Perce County Airport Lewiston, Idaho			
Existing Airside Facilities			
SCALE:	NOT TO SCALE	DATE:	11.12.13
DRAWN:	JOS	FILE:	6159401
CHK'D:	JMR	JOB NO.:	136159

Figure 1-14 Existing Airside Facilities

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1.14.1 Runways

Runways are a defined rectangular surface on an airport prepared or suitable for the landing or takeoff of aircraft. Lewiston-Nez Perce County Regional Airport has two asphalt-surfaced runways (Runways 8/26 & 12/30).

Figure 1-15 Runway 8/26

Runway 8/26, the primary runway, is 6,512 feet long and 150 feet wide and has a published pavement strength of 150,000 pounds Single Wheel Gear (SWG), 180,000 pounds Dual Wheel Gear (DWG) and 400,000 pounds Dual Wheel Tandem (DWT). Runway 8/26 is an asphalt runway and considered to be in excellent condition. The runway has a porous friction course (PFC) which is a thin asphalt course designed to drain internally to remove surface water off the runway. The runway has a Runway Design Code (RDC) of C-III and the design aircraft is listed on the current ALP as the Boeing 737-300. RDC C-III indicates the runway is designed to accommodate Category C aircraft with an approach speed of 126 knots or more but less than 141 knots and aircraft with a tail height of 30 feet but less than 45 feet and a wingspan greater than 118 feet but less than 171 feet. The pavement is considered to be in excellent condition due to a mill and overlay project completed in 2014. Runway 8 has nonprecision markings and Runway 26 has precision instrument markings which are considered to be in good condition. Runway 8/26 is equipped with High Intensity Runway edge Lights (HIRLs).

Runway 12/30 is 5,000 feet long and 100 feet wide and has a published pavement strength of 70,000 pounds SWG, 94,000 pounds DWG, and 150,000 pounds DWT. Runway 12/30 is an asphalt runway and considered to be in good condition. The runway has an RDC of B-II and the design aircraft is the Beechcraft 1900 turboprop. RDC B-II indicates the runway is designed to accommodate Category B aircraft with an approach speed of 91 knots or more but less than 121 knots and aircraft with a tail height of 20 feet but less than 30 feet and a wingspan greater than 49 feet but less than 118 feet. Runway 12/30 is marked with basic markings; both ends are in good condition. Runway 12/30 is equipped with Medium Intensity Runway Lights (MIRLs).

1.14.2 Taxiway System

Taxiways provide a surface for aircraft to transition from the parking apron to and from the runways. They expedite aircraft departures from the runway and increase operational safety and efficiency. All taxiways at Lewiston-Nez Perce County Regional Airport are 50 feet wide and adhere to the design standards for Taxiway Design Group (TDG) III, with the exception of taxiway fillets which meet design standards for TDG II.

Taxiway A is a partial parallel taxiway serving Runway 8 via connector Taxiway H. Taxiway B connects to Taxiway C and provides access to private hangars on the north portion of the airport. Taxiways D and F are connectors linking Taxiway A and Runway 8 to the passenger terminal and primary general aviation apron via crossings within the middle third of Runway 12/20 and Taxiway C. Taxiway C is a full-length partial parallel taxiway serving Runway 12/30 and is a partial parallel for Runway 26. Taxiway K is a connector taxiway for Runway 12/30 and provides a high-speed turnoff for Runway 12 arrivals.

Taxiway G is a turn off for Runway 8 arrivals. Taxiway G crosses the threshold of Runway 30. In discussion with ATC personnel, runway incursions have been known to occur because of the existing Runway 30/Taxiway G configuration. A runway incursion is when an aircraft enters a movement area without prior permission from ATC and poses a significant risk to aviation safety.

Taxiway Z is a partial parallel taxiway on the south end of Runway 8. It is connected to Runway 8/26 via connector Taxiways Z1 and Z2. Taxiway Z has been constructed to supplement future development along the south side of the airport.

Figure 1-16 Taxiway C

1.14.3 Aircraft Apron Area

The aircraft apron provides a defined area intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking or maintenance. The apron is typically connected to the runway via taxiways. There are five concrete or asphalt aircraft parking aprons located at Lewiston-Nez Perce County Regional Airport which serves commercial service, cargo and general aviation aircraft. The commercial service apron is located in the northern portion of the airport property in the immediate vicinity of the passenger terminal. The commercial service apron is marked with a red line indicating a Security

Identification Area (SIDA). Deicing operations occur on the commercial service apron after the aircraft has been relocated to a suitable distance from the passenger terminal building. An additional portion of the commercial service apron outside of the SIDA is designated for charter activity. The total square footage of the commercial service apron is 8,139 square yards. FedEx utilizes 1,667 square yards of apron adjacent to their facility east of the passenger terminal. The remaining 6,839 square yards of apron is utilized for charter activity. The apron area directly west of the passenger terminal is utilized by Stout Flying Service. There are 12 tiedowns south of Stout Flying Service. Additionally, there is one helicopter parking area that is marked with non-standard markings. There is an apron west of Stout Flying Service utilized by Gustin Aviation for aircraft storage. There is an apron located within the infield area between Runway 12/30 and Runway 8/26 which has 30 tiedowns and is utilized by Hillcrest Aircraft Company. A newly constructed aircraft parking apron exists on the apron south of Runway 8 and contains 10 aircraft tie-downs. The commercial service and general aviation aprons are considered to be in poor to excellent condition according to a 2009 Pavement Strength Survey. **Table 1-10** lists the existing apron data.

Figure 1-17 Commercial Service and Cargo/Charter Apron

Table 1-10 Existing Apron Data

Apron	Size (In Square Yards)	Pavement Type	Pavement Condition
Commercial Service	8,139	Concrete	Poor
Cargo/Charter Operations	8,506	Asphalt	Poor
North GA	13,567	Asphalt	Poor
West GA	13,033	Asphalt	Very Good
South GA	30,533	Asphalt	Excellent

1.14.4 Airfield Lighting, Signage and Visual Aids

Airport lighting enhances safety during periods of inclement weather and nighttime operations by providing visual guidance to pilots in the air and on the ground. Several common airfield lighting features for commercial service airports include:

- Rotating Beacon – This visual aid is equipped with high intensity lamps mounted on an assembly which rotates 360 degrees every six seconds while emitting flashes of light.

The designation for Lewiston-Nez Perce County Regional Airport, a civilian land airport, is alternating green and white lights in equal duration. The beacon is activated by a photocell from dusk to dawn and can also be activated by the Air Traffic Control Tower (ATCT). If the beacon is activated during other hours it typically indicates that the airport is operating under instrument flight rules (IFR). The rotating beacon is located midfield between Runway 12/30 and Runway 8/26.

- Wind Cone – This visual aid provides visual surface wind information to pilots. The primary wind cone is collocated with a segmented circle and located in the central portion of the airport. Lighted supplemental wind cones are located approximately 1,000 feet from the end of each runway.

- Retroreflectors – This visual aid is used in lieu of taxiway lighting and consists of a single row bordering each side of the taxiway of reflective blue tape mounted on a pole. There are retroreflectors currently installed along all taxiways excluding Taxiway Z and taxiway connectors on Runway 8/26.

- Runway Edge Lights – This visual aid consist of a single row of white lights bordering each side of the runway and can be classified according to three intensity levels. High intensity runway lights (HIRL) are the brightest runway lights available. Medium intensity runway lights (MIRL) and low intensity runway lights (LIRL) are the lowest in intensity. At most towered airports, runway lights are activated and under the control of the ATCT when in operation. When the ATCT is not open, the runway lights are activated from the aircraft cockpit by transmitting a series of “clicks” on the radio transmitter on the common traffic advisory frequency (CTAF/ATCT: 119.4 MHz). Instrument runways incorporate amber/white runway remaining lights on the last half of the runway or last 2,000 feet of runway, whichever distance is less. Runway 8/26 is equipped with HIRLs, and Runway 12/30 has MIRLs installed, and both runway edge lights have white colored lenses (with amber/white lights on the last 2,000 feet).

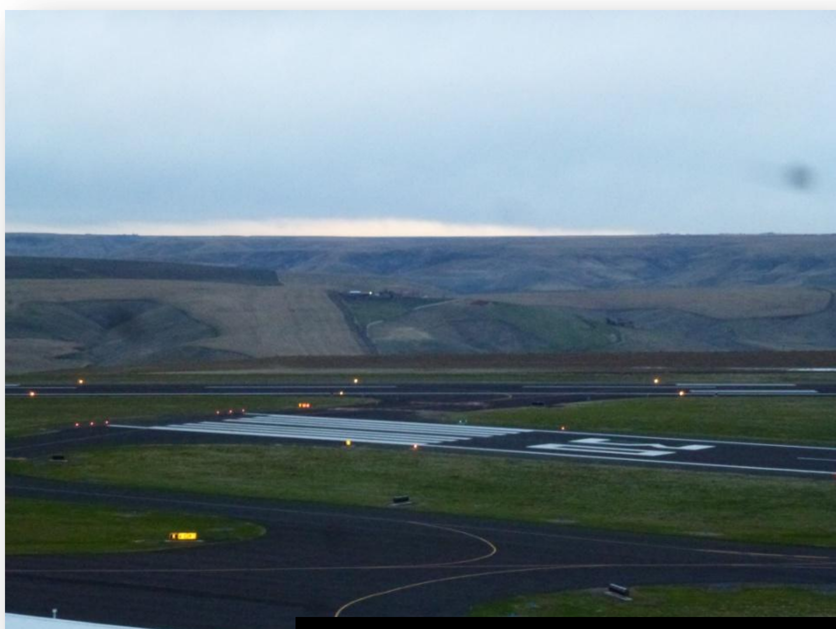


Figure 1-18 Various Lighting in use at LWS

- Runway End Identifier Lights – This visual aid consists of a pair of lights on each end of the runway threshold which flash in unison to provide identification of the approach area. This can be used to identify the runway surface from surrounding terrain or in poor visibility. Runways 8 and 12 are equipped with REILs.

- Taxiway Edge Lights – This visual aid consists of a single row of blue lights bordering each side of the taxiway. These lights mark the edge of the taxiways and guide aircraft from the runway to the ramp or apron area. Taxiway Z and Runway 8/26 connectors are equipped with High Intensity Taxiway Lights (HITLs).

- Threshold Lights – This visual aid consist of a single row of green lights used to indicate the beginning of the usable landing surface. These lights are two-directional and appear red from the opposite end of the runway to mark the end of the usable runway. Runway 26 is equipped with 16 threshold lights, Runway 8 is equipped with 8 threshold lights and each end of Runway 12/30 is equipped with 6 threshold lights.

- Marking – This visual aid varies depending on whether the runway is used exclusively for visual flight rule operations (VFR) or instrument flight rule (IFR) operations. A visual runway is typically marked with the runway designator numbers and a dashed white centerline. Runway 26 is a precision instrument runway, and its pavement markings include runway numbers (i.e., designators), centerlines, runway thresholds, aiming points, and the touchdown zone. Runway designators indicate the magnetic azimuth of the runway centerline. The runway centerlines provide alignment guidance during takeoff and landing. The runway threshold markings consist of twelve longitudinal stripes of uniform dimensions painted systematically along the runway centerline. The aiming point markings are located approximately 1,000 feet from the runway ends which serve as a visual aiming point for landing aircraft. Runway touchdown markings identify the touchdown zone for landing operations and are spaced to provide distance information in 500 foot increments. These markings consist of one, two or three rectangular bars systematically arranged in pairs on either side of the runway centerline. The total number of markings is based on the runway length. Both runways have full sets (three on either side of the runway centerline) of runway threshold markings on each runway end.

Figure 1-19 Runway Markings at LWS

Runway 8 and Runway 12/30 are marked with nonprecision instrument runway markings. The pavement markings are similar to those on Runway 21 end, but do not include touchdown zone markings. In addition, the Runway 12/30 threshold marking consists of only eight longitudinal stripes. Precision markings on Runway 26 are in good condition. The nonprecision marking on Runway 8 and Runway 12/30 are in good condition.

All taxiways at Lewiston-Nez Perce County Regional Airport have visible taxiway centerline stripes with hold-short lines located at the required locations. These markings ensure that aircraft taxi along designated passageways for proper wingtip clearance and to warn of the areas protected for runway operations. Marking width is six to 12 inches as required by 14 CFR Part 139. Current centerline markings are considered enhanced markings and are applied to the extended runway holding position markings, taxiway centerline marking and surface painted hold signs. Enhanced taxiway centerline marking begins 150 feet prior to all holding position markings and consists of a yellow dashed line on either side of the taxiway centerline. These dashes are nine feet long with three foot gaps. Enhanced taxiway centerlines are only installed at holding positions where aircraft immediately enter a runway. Surface painted holding position signs are required at all 14 CFR Part 139 airports with more than one runway. Surface painted holding position signs (SPHPS) are located both to the left and to the right of the taxiway centerline, however, if the taxiway centerline is less than 45 feet from the left and right edge of the taxiway, then the SPHPS on the right side may be omitted.

- <u>Segmented Circle</u> – This visual aid is located around the wind direction indicator. The segmented circle has two purposes, including identifying the location of the wind direction indicator and identifying any non-standard traffic patterns. As previously stated, Lewiston-Nez Perce County Regional Airport is equipped with a segmented circle near the center of the airport.

- <u>Signage</u> – Signs serve as a visual aid providing guidance for aircraft and vehicles on the airfield. Airfield signs include: mandatory instruction, location, direction, destination, information and runway distance remaining signs. Lewiston-Nez Perce County Regional Airport is equipped with lighted runway entrance signs, runway hold position signs, taxiway and runway location, directional and destination signs, runway boundary signs, and runway distance remaining signs.

Figure 1-20 Taxiway Signage at LWS

- <u>Visual Approach Slope Indicator (VASI)</u> – This visual aid serves as a system of lights on the side of a runway threshold that is designed to provide pilots with visual descent guidance information during the approach to the runway. These lights may be visual from up to five miles during the day and up to 20 miles or more during at night. Each light is designed so that it appears as either white or red, depending on the angle at which the lights are viewed. Lewiston-Nez Perce County Regional Airport is equipped with a four box VASI at the approach end of Runway 8, approach end of Runway 12 and approach end of Runway 30. The VASI at Lewiston-Nez Perce County Regional Airport is owned and maintained by the airport.

- Precision Approach Path Indicator (PAPI) – This visual aid is located on the left side of the runway and consists of two or four lights installed in a single row. A PAPI provides visual approach path guidance by emitting a series of white and red lights. On a four light PAPI, three white lights denote the aircraft is above the glide path. Three red lights denote the aircraft as being below the glide path. A split two red lights and two white lights mean the aircraft is on the glide path. These lights have an effective visual range of five miles during the day and up to 20 miles at night. This four box visual aid is installed on the approach end of Runway 26. The PAPI at Lewiston-Nez Perce County Regional Airport is owned and maintained by the airport.

- Approach Lighting System (ALS) – This visual aid is a lighting system installed at the approach end of a runway and consists of a series of lights that provide the pilot with transition from the aircraft instrument to the visual runway environment. For traditional ground-based NAVAID approaches (e.g., Very High Frequency Omni-Directional Range (VOR), ILS, NDB) an ALS is required for visibility minimums of less than 1-mile; however, for GPS approaches with vertical guidance (e.g., LPV) they are only recommended, not required. Medium-Intensity Approach Lighting System with Runway Alignment Indicator (MALSR) are a type of ALS. The MALSR is a medium approach intensity lighting system installed in airport runway approach zones along the extended centerline of the runway. The MALSR, consisting of a combination of threshold lamps, steady burning light bars and flashers, provides visual information to pilots on runway alignment, height perception, guidance, and horizontal references for Category I Precision Approaches. Lewiston-Nez Perce County Regional Airport is equipped with a MALSR at the approach end of Runway 26. The MASLR is owned and operated by the FAA.

1.14.5 Navigational Aids and Instrument Approaches

A Navigational Aid (NAVAID) is the primary means of enroute navigation and includes any ground based or satellite based electronic device used to provide course or altitude information to pilots. NAVAIDs include Very High Omnidirectional Range (VORs), Very High Frequency Omnidirectional Range with Tactical Information (VOR-TAC), Nondirectional Beacons (NDBs), Tactical Air Navigational Aids (TACANs), Global Positioning System (GPS), and Instrument Landing Systems (ILS) as examples. There is also a published departure procedure which depicts a route to facilitate an efficient transition from the departure airport to the enroute route structure. **Figure 1-22** through **Figure 1-32** depicts the published approach minima for the equipment below. Available NAVAIDs present at Lewiston include:

- Instrument Landing System – The ILS is designed to provide an approach path for precise alignment and descent of an aircraft on approach to a runway providing both lateral and vertical guidance. The ILS is considered the standard precision approach navigational aid. Ground equipment that comprises an ILS consists of two highly directional transmitting systems and, along the approach, up to three marker beacons. The ILS consists of a localizer antenna capture-effect glide slope antenna, MALSR, and markers.

  The localizer provides horizontal electronic course guidance, while the glide slope provides vertical electronic course guidance, enabling a pilot to align the aircraft with the runway centerline and descend along a path clear of obstacles to the runway threshold. The approach lighting system provides the pilot with a transition from the aircraft instrument to the visual runway environment. The distance markers emit audible signals to the cockpit, indicating distance information from the runway threshold. The ILS approach provides the best instrument approach minimums for the Airport. Lewiston-Nez Perce County Regional Airport is equipped with an ILS precision instrument approach to Runway 26. Middle and Outer markers are also present at Lewiston. These marker beacons are used to alert pilots that an action is needed (e.g., altitude check). The marker beacons are located at specified intervals along the ILS approach and are identified by discrete audio and visual characteristics. The outer marker (blue beacon) is located between four to seven miles from the runway threshold. The middle marker (yellow beacon) is located 3,500 feet from the runway threshold and alerts the pilot that they have passed the missed approach point. This is typically the location where an aircraft on approach will be at an altitude of approximately 200 feet above the elevation of the landing area and the runway should be visible. Included with the ILS is the localizer which provides horizontal guidance, enabling a pilot to align the aircraft with the runway centerline and the glide slope provides vertical guidance so the pilot can descend along a path clear of obstacles to the runway threshold.

Figure 1-21 Glideslope at LWS

- Global Positioning System (GPS) – GPS is a satellite-based navigation system comprised of ground stations and user receivers. An aircraft GPS receiver can track the position of the aircraft by calculating and comparing signal distance from several satellites. The system is reliable in all terrain and all weather conditions and is typically accurate within 100 feet. Runway 8/26 and Runway 12/30 are equipped with precision/nonprecision GPS approaches with minimums as low as ½-statue miles visibility and ceiling minimums of 250-feet (AGL).

- Wide Area Augmentation System (WAAS) – WAAS is a GPS-based navigation system which augments the existing GPS signals to provide the user highly accurate position and tracking information.

- Localizer Precision with Vertical Guidance (LPV) – LPV is an instrument approach procedure utilizing WAAS technology to provide both vertical and horizontal guidance to aircraft. WAAS and LPV approaches are available in all weather and terrain conditions. All GPS approaches at Lewiston are LPV approaches.

- Very High Frequency Omni-Directional Range – This VOR-B operates by emitting a steady 360 degree signal, as well as producing a rotating signal which compares aircraft position information with a steady signal in order to transmit course information back to the aircraft. Its low altitude standard service volume has a range of 40 nautical miles (nm) between 1,000-feet and 18,000-feet MSL. The NEZ PERCE VOR-B is incorporated as a NAVAID into all of the published instrument approaches at Lewiston and is located 4.2 miles northwest of the Airport along the 246-degree radial. The VOR is used for instrument approaches to Runway 8 and Runway 26. The Airport is equipped with VOR approach minimums as low as ½ -statue mile visibility and ceiling minimums of 700-feet (AGL).

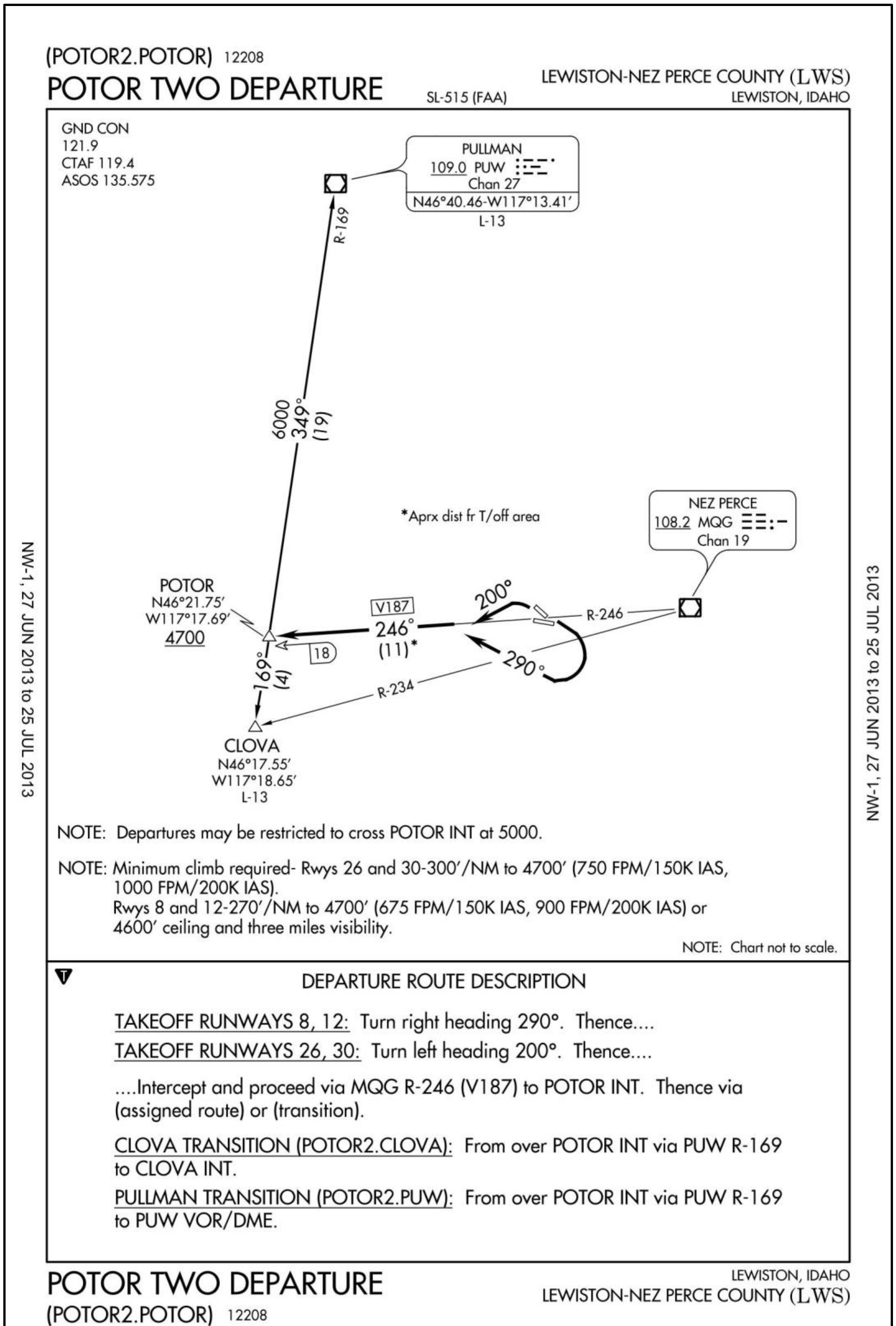


Figure 1-22 Instrument Departure Procedure (Not for Navigational Use)

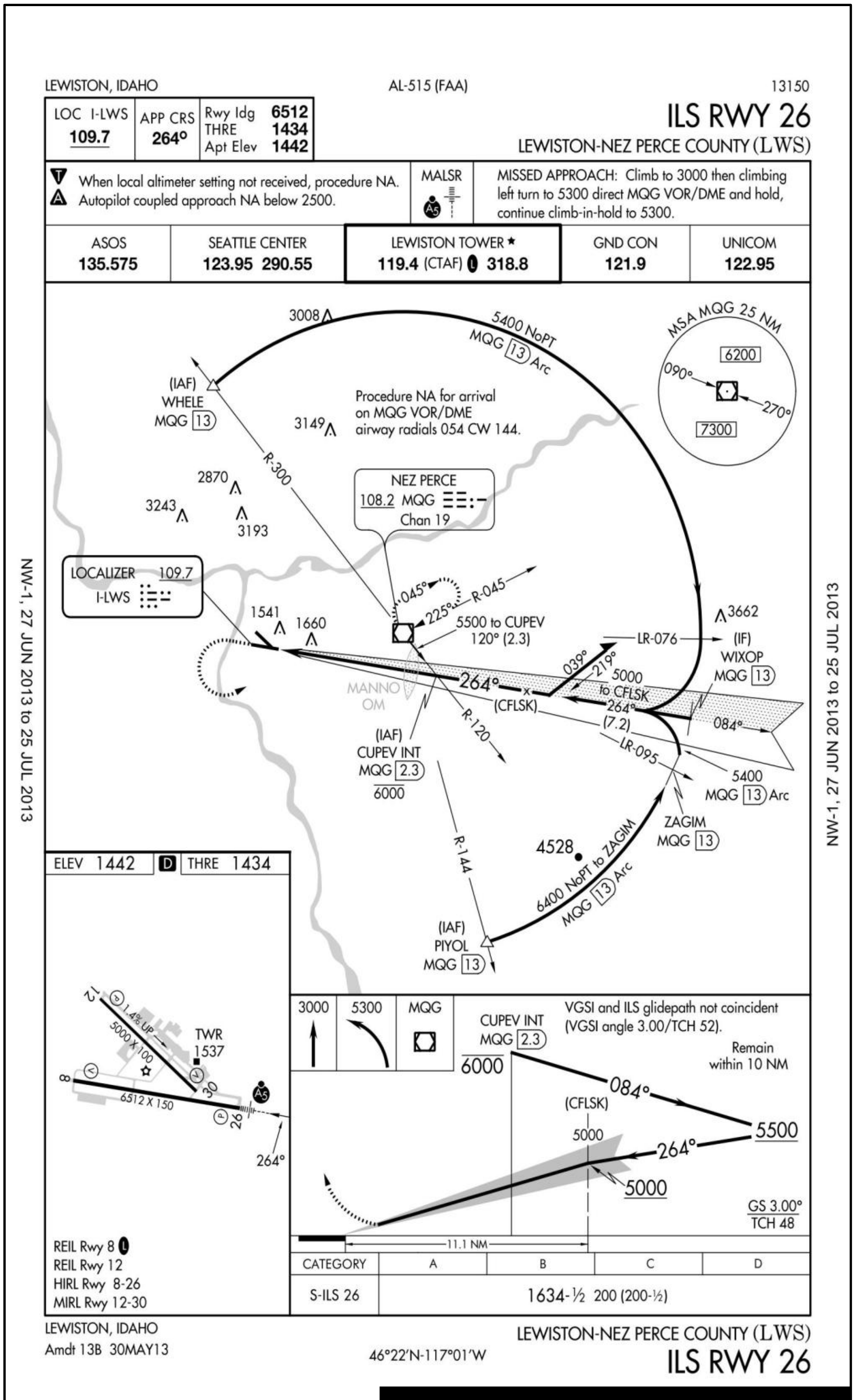


Figure 1-23 Instrument Approach Procedure (Not for Navigational Use)

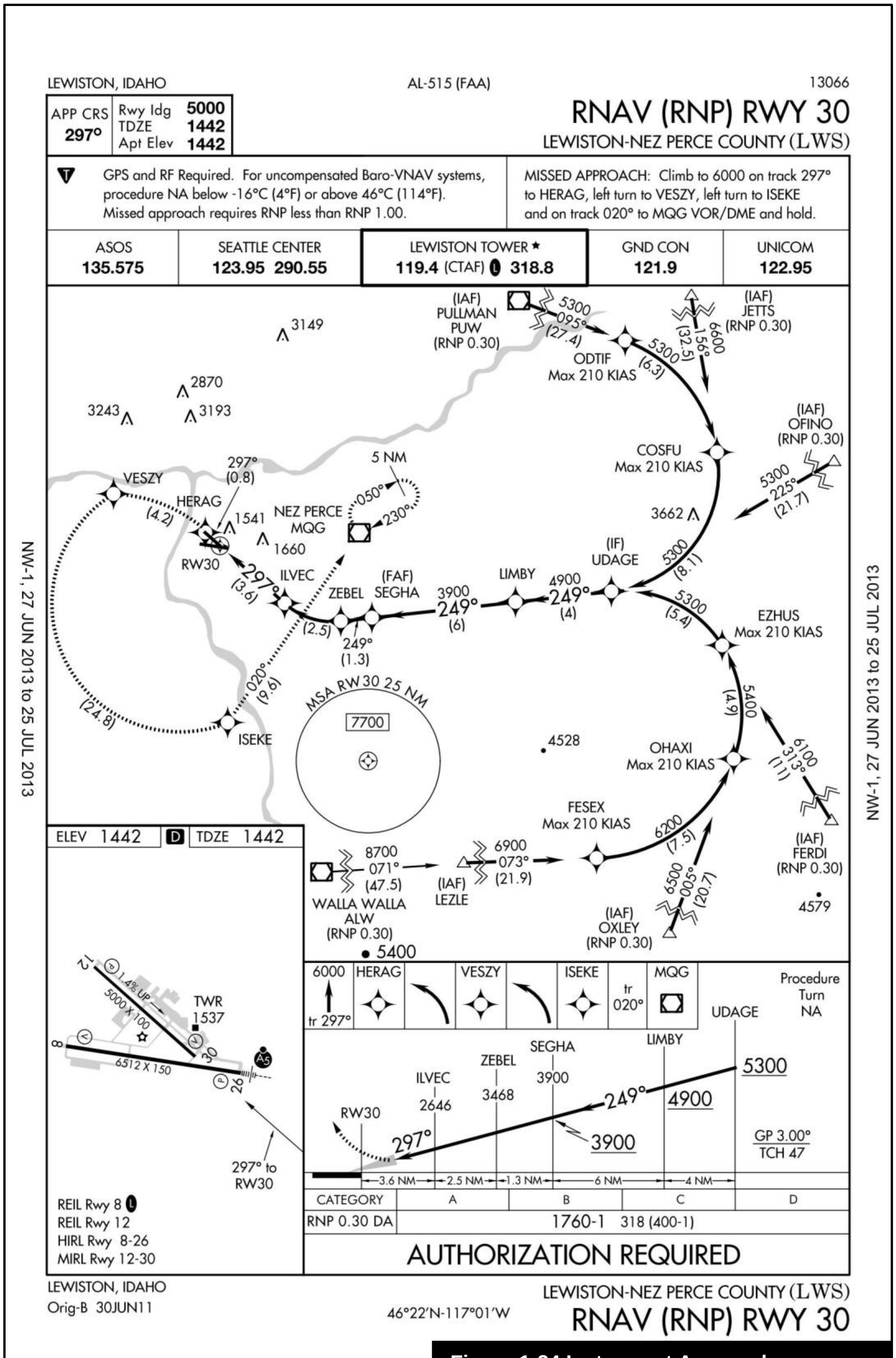


Figure 1-24 Instrument Approach Procedure (Not for Navigational Use)

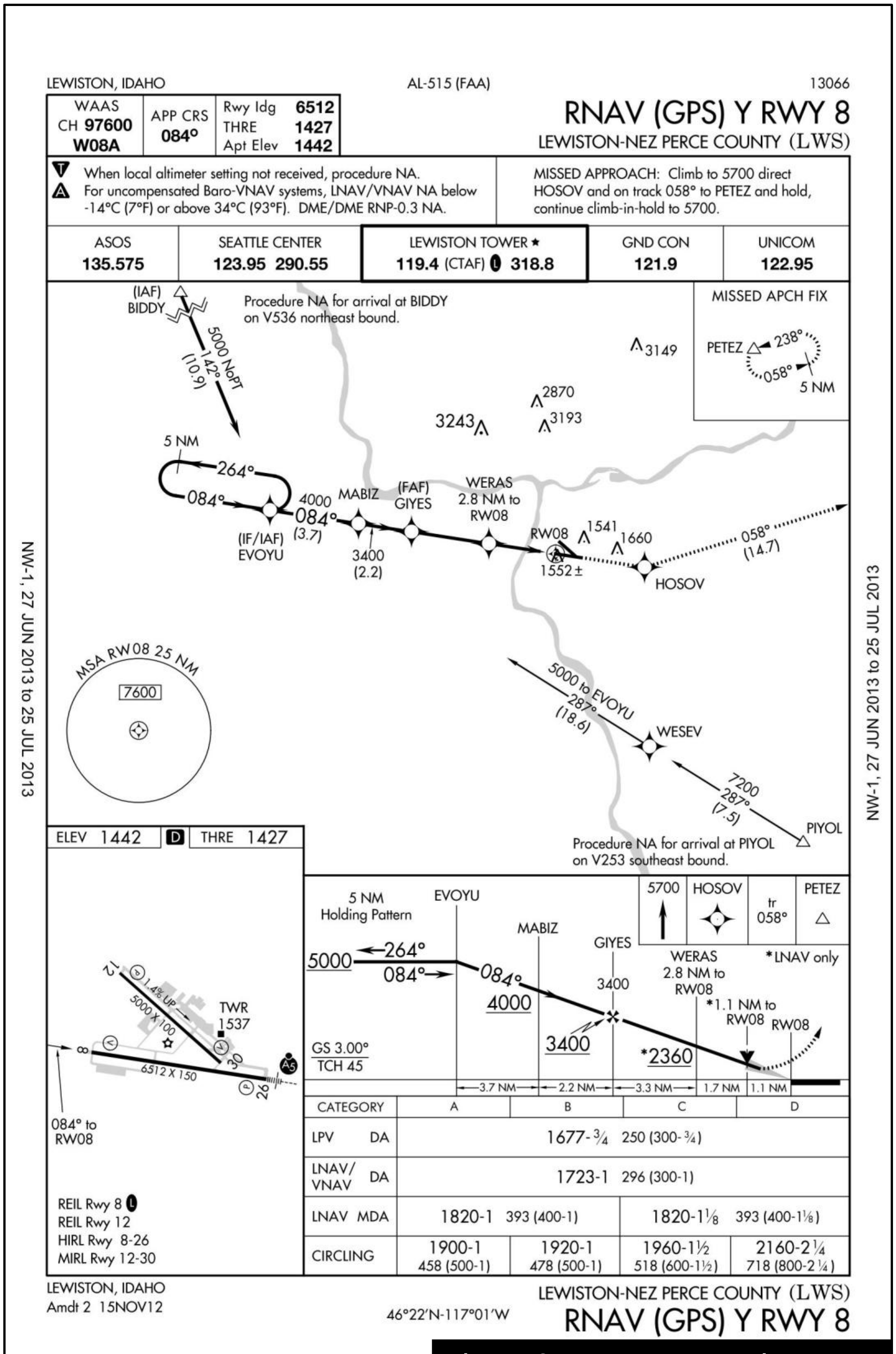


Figure 1-25 Instrument Approach Procedure (Not for Navigational Use)

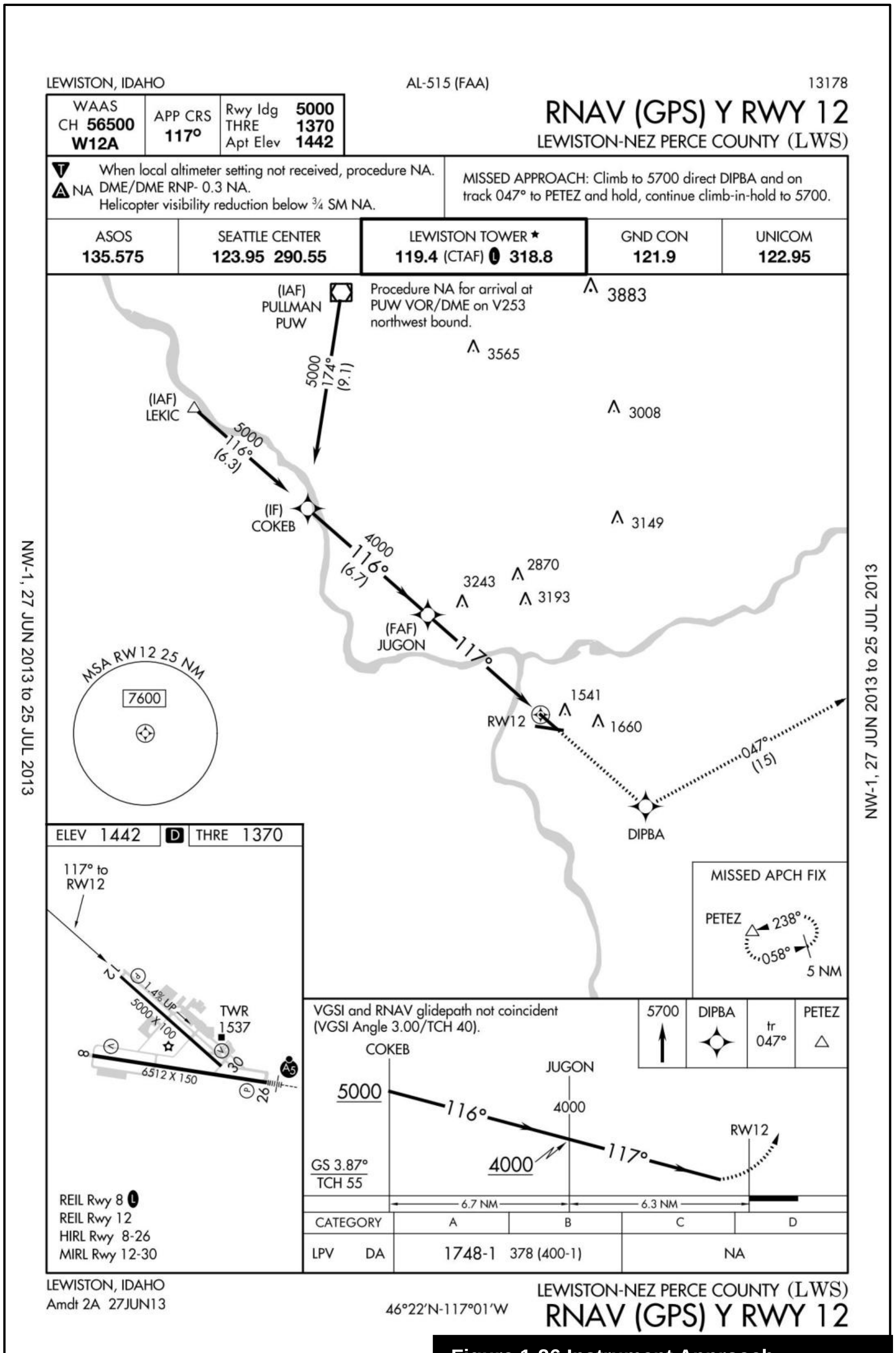
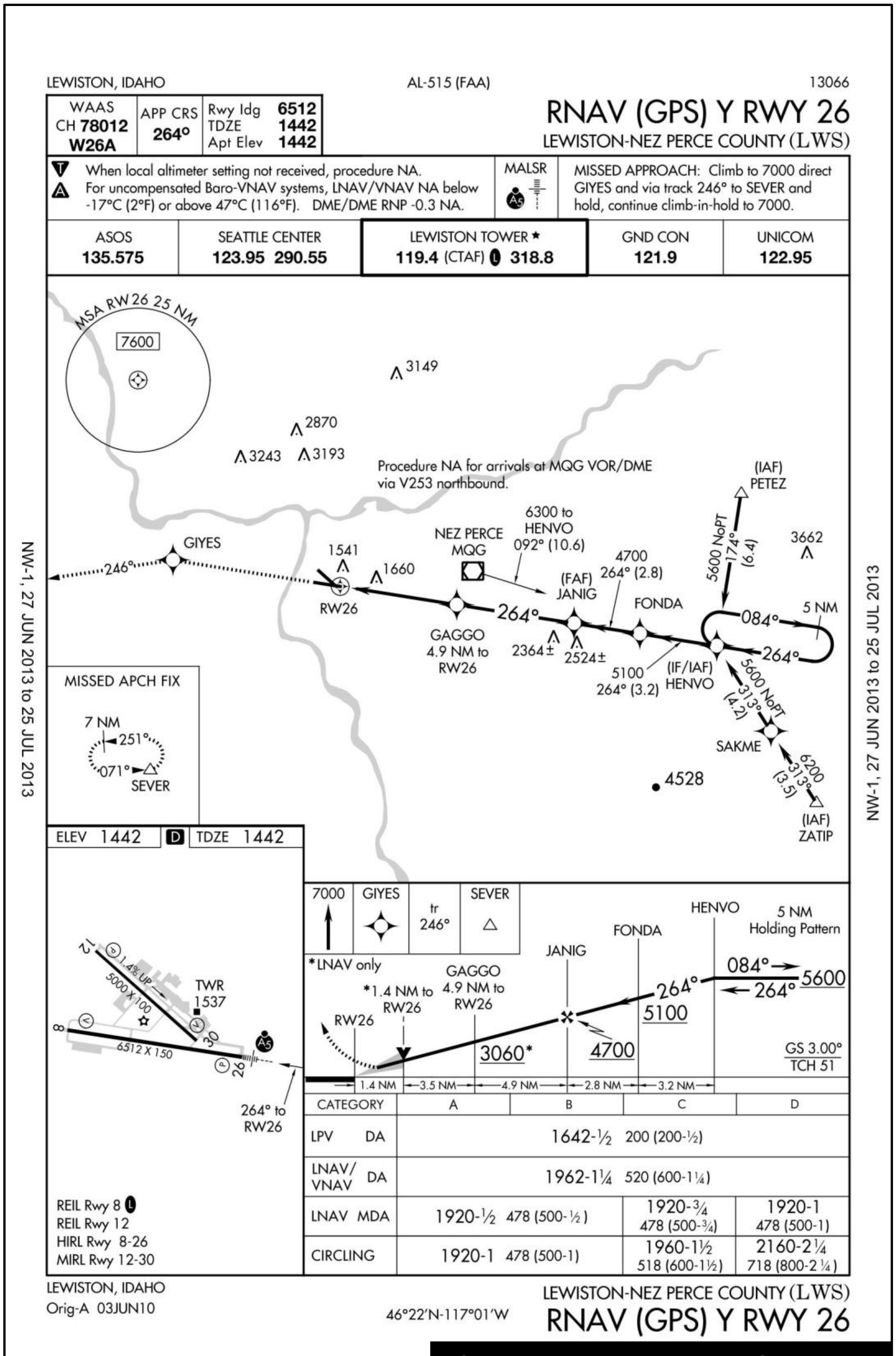


Figure 1-26 Instrument Approach Procedure (Not for Navigational Use)



CATEGORY	A	B	C	D
LPV DA	1642-½ 200 (200-½)			
LNAV/VNAV DA	1962-1¼ 520 (600-1¼)			
LNAV MDA	1920-½ 478 (500-½)		1920-¾ 478 (500-¾)	1920-1 478 (500-1)
CIRCLING	1920-1 478 (500-1)		1960-1½ 518 (600-1½)	2160-2¼ 718 (800-2¼)

Figure 1-27 Instrument Approach Procedure (Not for Navigational Use)

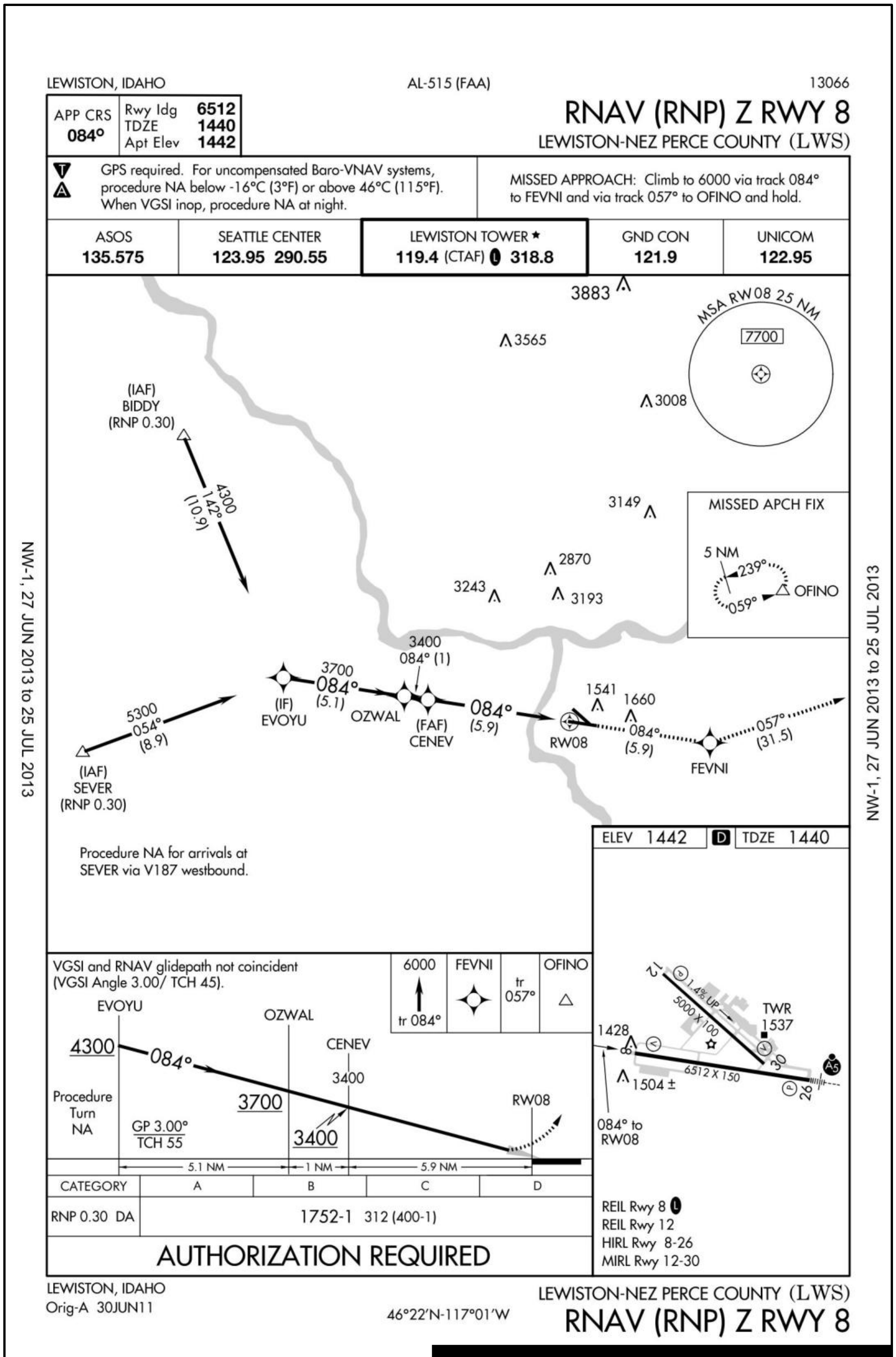


Figure 1-28 Instrument Approach Procedure (Not for Navigational Use)

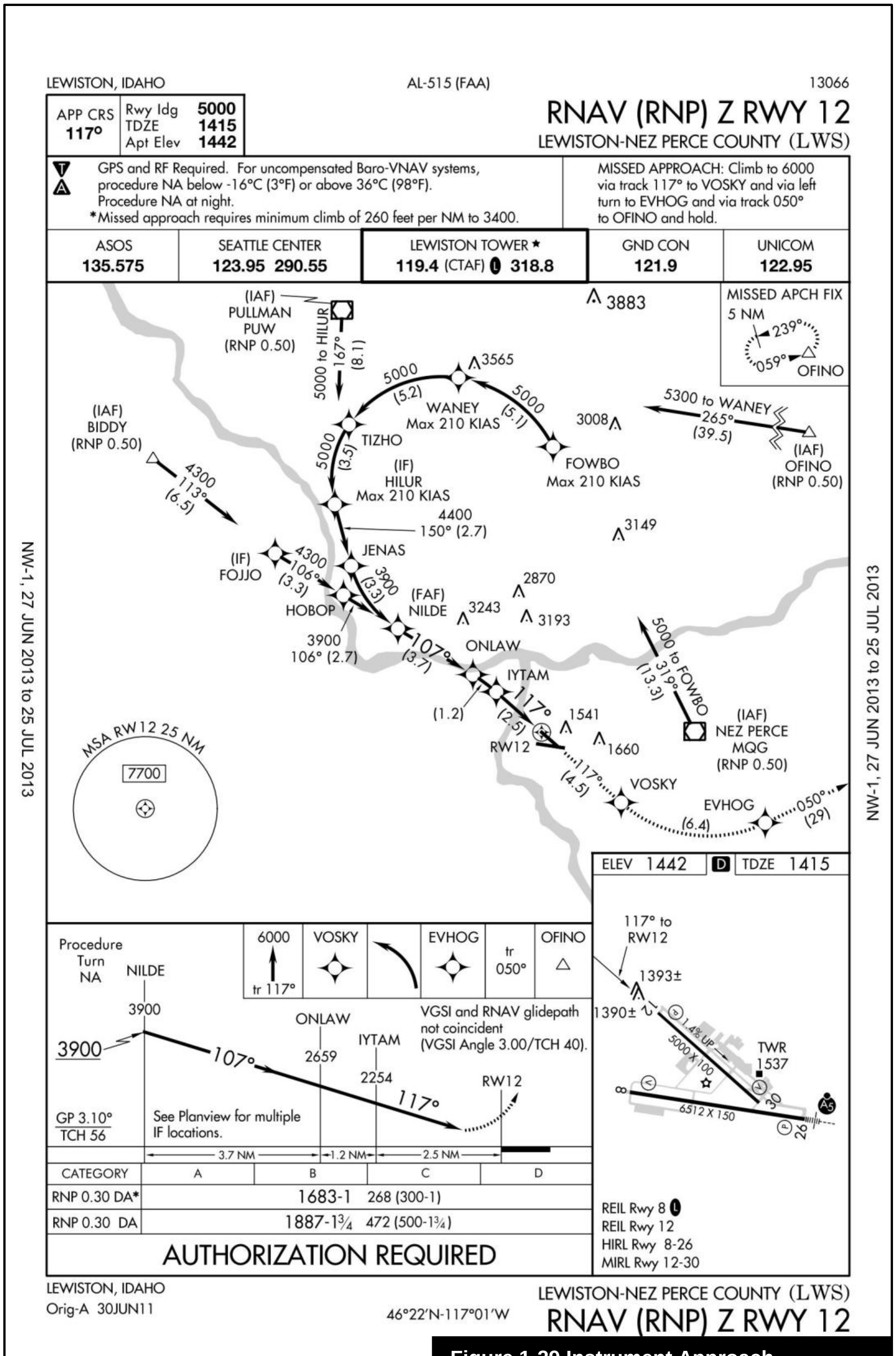
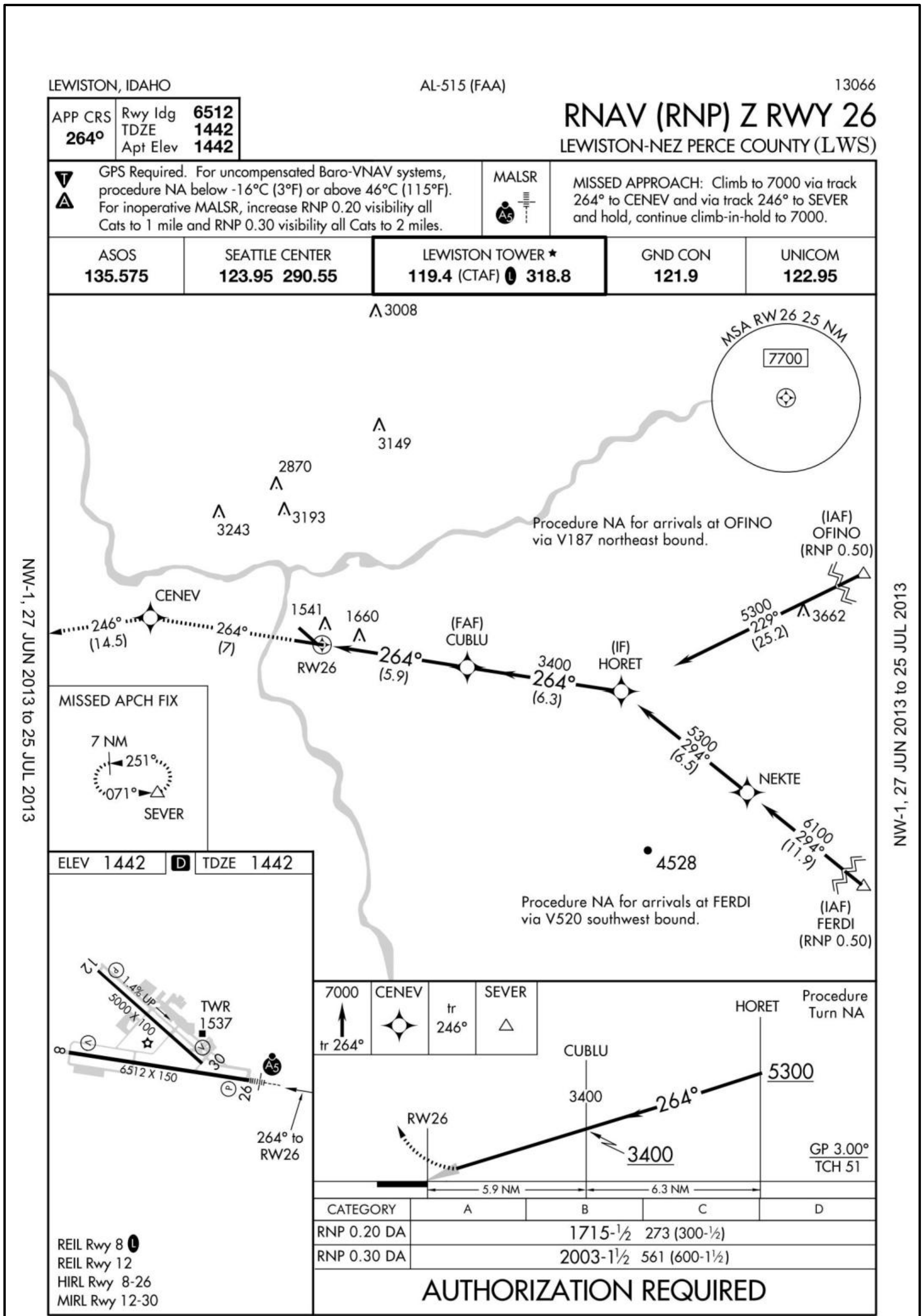


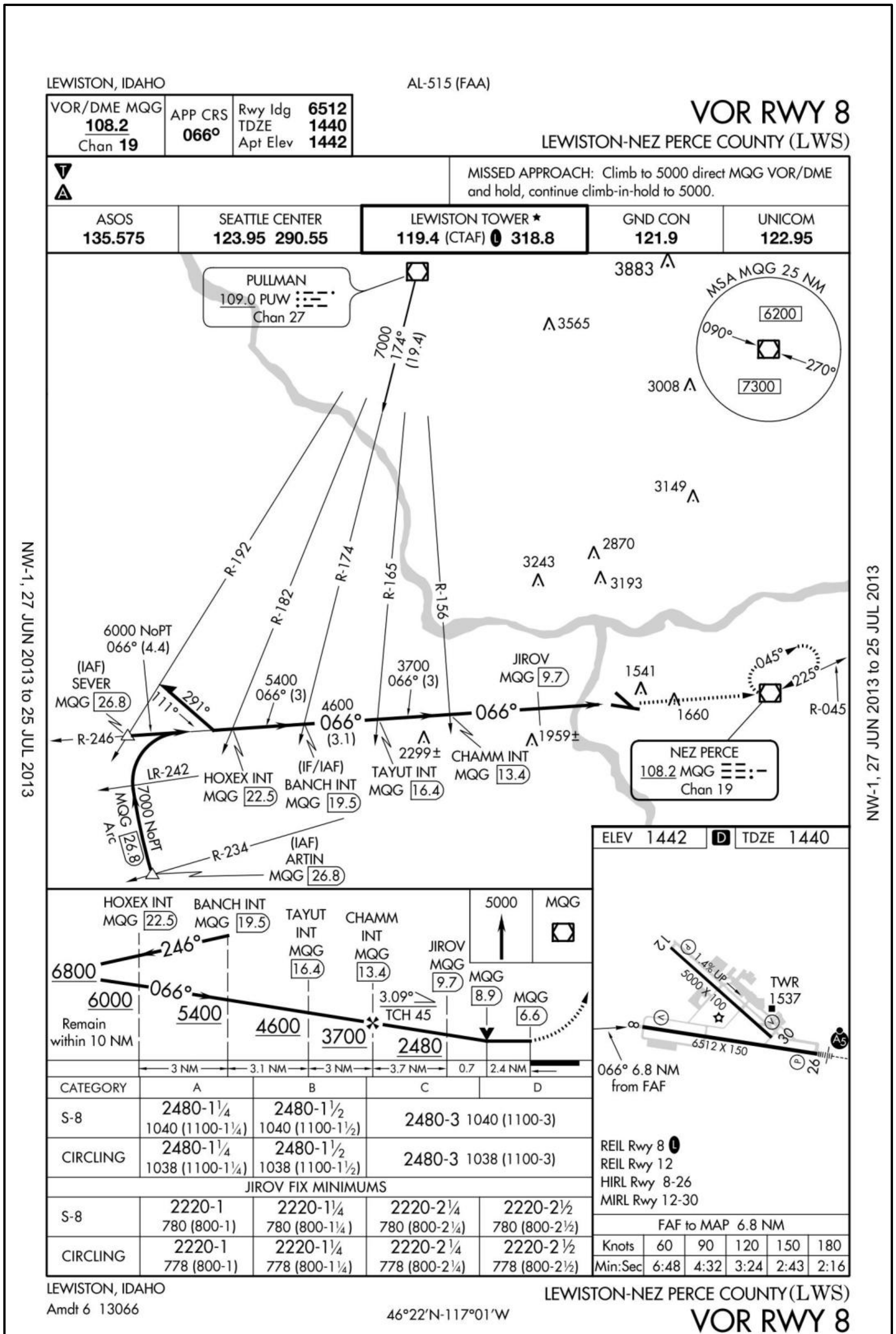
Figure 1-29 Instrument Approach Procedure (Not for Navigational Use)



CATEGORY	A	B	C	D
RNP 0.20 DA	1715-½ 273 (300-½)			
RNP 0.30 DA	2003-1½ 561 (600-1½)			

AUTHORIZATION REQUIRED

Figure 1-30 Instrument Approach Procedure (Not for Navigational Use)

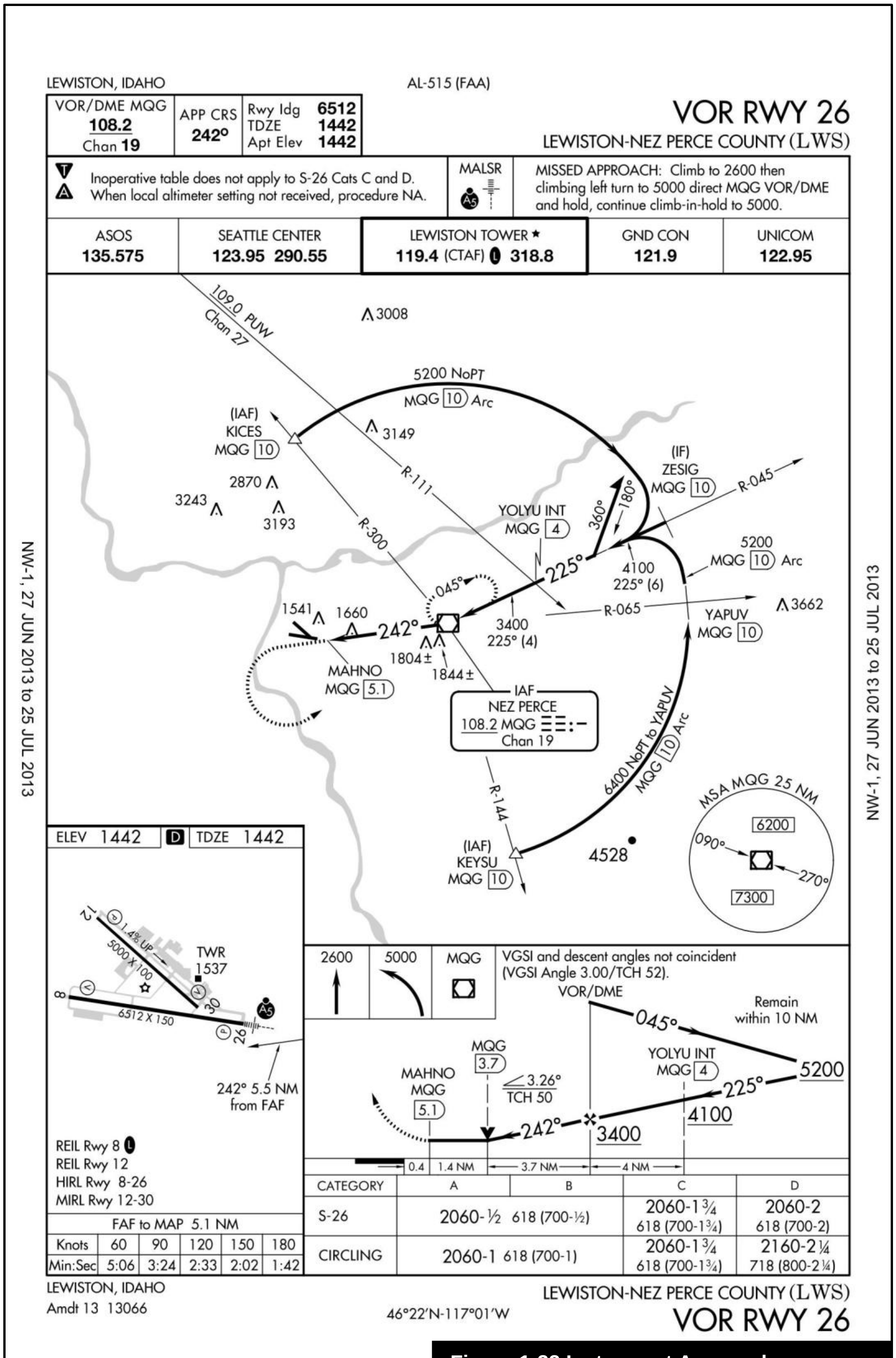


CATEGORY	A	B	C	D
S-8	2480-1¼ 1040 (1100-1¼)	2480-1½ 1040 (1100-1½)	2480-3 1040 (1100-3)	
CIRCLING	2480-1¼ 1038 (1100-1¼)	2480-1½ 1038 (1100-1½)	2480-3 1038 (1100-3)	
JIROV FIX MINIMUMS				
S-8	2220-1 780 (800-1)	2220-1¼ 780 (800-1¼)	2220-2¼ 780 (800-2¼)	2220-2½ 780 (800-2½)
CIRCLING	2220-1 778 (800-1)	2220-1¼ 778 (800-1¼)	2220-2¼ 778 (800-2¼)	2220-2½ 778 (800-2½)

FAF to MAP 6.8 NM

Knots	60	90	120	150	180
Min:Sec	6:48	4:32	3:24	2:43	2:16

Figure 1-31 Instrument Approach Procedure (Not for Navigational Use)



CATEGORY	A	B	C	D
S-26	2060-½ 618 (700-½)		2060-1¾ 618 (700-1¾)	2060-2 618 (700-2)
CIRCLING	2060-1 618 (700-1)		2060-1¾ 618 (700-1¾)	2160-2¼ 718 (800-2¼)

FAF to MAP 5.1 NM

Knots	60	90	120	150	180
Min:Sec	5:06	3:24	2:33	2:02	1:42

Figure 1-32 Instrument Approach Procedure (Not for Navigational Use)

1.15 Existing Landside Facilities

The landside facilities of an airport consist of those facilities that are not included as airside characteristics. Examples of such landside facilities include any structure adjoining the airfield, terminal buildings, hangars, the access routes to and from the airport, automobile parking areas, airport fencing, utilities, fuel provisions and snow removal and maintenance equipment. The Lewiston-Nez Perce County Regional Airport existing landside facilities are shown in **Figure 1-36**.

Figure 1-33 Delta Air Lines Check-in Counter

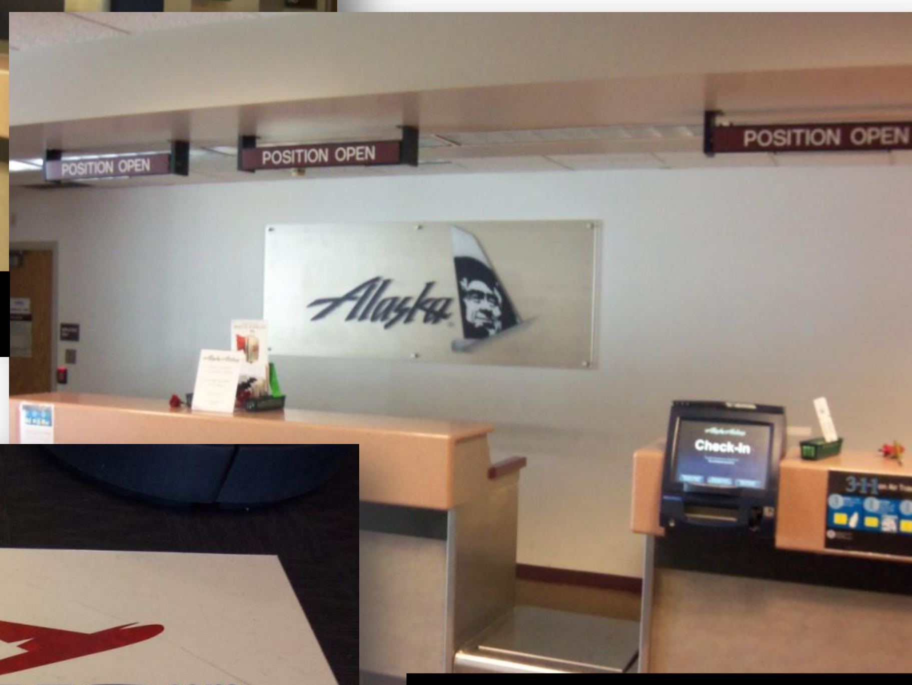


Figure 1-34 Alaska Airlines Check-in Counter

Figure 1-35 LWS Logo in Terminal Lobby

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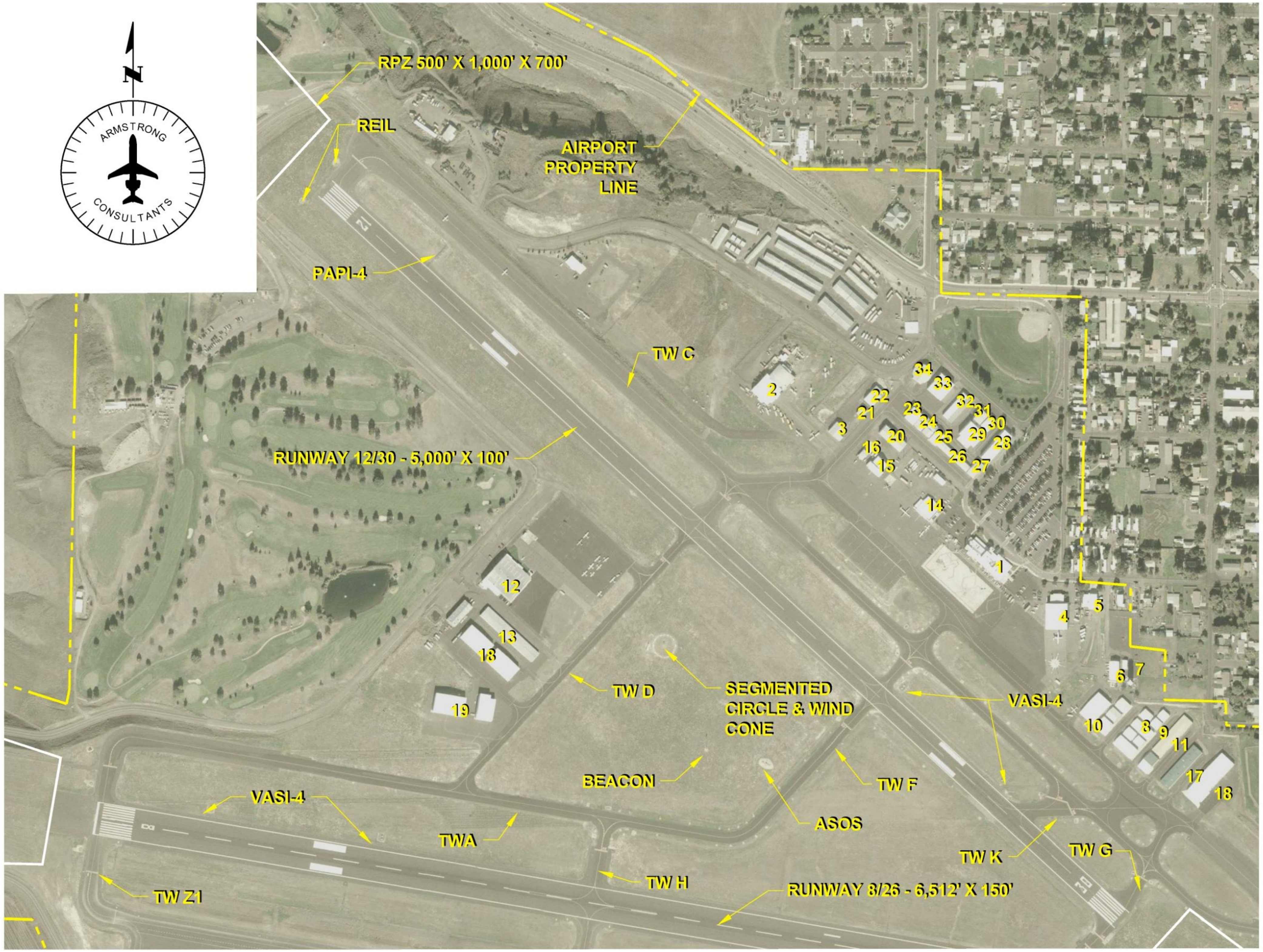

1	TERMINAL BUILDING
2	GUSTIN AVIATION
3	AIR FREIGHT FACILITY
4	FEDERAL EXPRESS BUILDING
5	CRASH/FIRE/RESCUE FACILITY
6	AIRPORT MAINTENANCE BUILDING
7	FAA AIR TRAFFIC CONTROL TOWER
8	EXECUTIVE HANGAR
9	EXECUTIVE HANGAR
10	EXECUTIVE HANGAR
11	T-HANGAR
12	HILLCREST AIRCRAFT COMPANY
13	T-HANGAR
14	STOUT FLYING SERVICE
15	STOUT FLYING SERVICE
16	STOUT FLYING SERVICE
17	T-HANGAR
18	EXECUTIVE HANGAR
19	EXECUTIVE HANGAR
20	EXECUTIVE HANGAR
21	EXECUTIVE HANGAR
22	EXECUTIVE HANGAR
23	EXECUTIVE HANGAR
24	EXECUTIVE HANGAR
25	EXECUTIVE HANGAR
26	T-HANGARS
27	EXECUTIVE HANGAR
28	EXECUTIVE HANGAR
29	EXECUTIVE HANGAR
30	EXECUTIVE HANGAR
31	EXECUTIVE HANGAR
32	EXECUTIVE HANGAR
33	EXECUTIVE HANGAR
34	EXECUTIVE HANGAR

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Lewiston-Nez Perce County Airport
Lewiston, Idaho

Existing Landside Facilities

SCALE:	NOT TO SCALE	DATE:	11.14.13
DRAWN:	JOS	FILE:	6159402
CHK'D:	JMR	JOB NO.:	136159

Figure 1-36 Existing Landside Facilities

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1.15.1 Passenger Terminal Building

The airport passenger terminal building is a building used to transfer passengers between aircraft and ground transportation and provides facilities for passengers enplaning and deplaning aircraft. The terminal building houses ticket counters for airlines serving the airport, including space for issuing tickets, transferring checked baggage, security screening of checked bags, area for the Transportation Security Administration (TSA) personnel to screen passengers and sterile waiting area for passengers that have been processed through the security checkpoint. The terminal building also provides gates to provide passengers access to and from the aircraft. The number of gates varies depending on the volume of airline traffic utilizing the airport. The terminal building also provides baggage claim areas which usually include baggage carousels for passengers to retrieve checked baggage upon arrival at the airport. The terminal building is typically utilized by airport management for office space and by airport tenants including rental car companies, restaurants and gift shops.

Figure 1-37 LWS Passenger Terminal Building

The size of these different areas varies depending on the amount of traffic the facility receives. Large commercial service airports have several concourses which may be connected by walkways, sky-bridges or underground tunnels. Concourses can be set up to accommodate one or two specific airlines depending on the size. Smaller commercial service airports typically share one satellite concourse with gates. Smaller regional aircraft may be accessed through either a jet-bridge or through ground loading.

Lewiston-Nez Perce County Regional Airport has a three-story, 29,649 square foot terminal building. The most recent renovation occurred in 1997, where the original passenger terminal building was completely renovated, with minor updates in 2001 to meet TSA screening area requirements. The passenger terminal building is shown in **Figure 1-37**. The layout of the passenger terminal building is shown in **Figure 1-39** and **1-40**. Square footages for individual uses of the passenger terminal building are listed in **Table 1-11**.

1.14.2 Airline Ticket Counters and Offices

There are three airline ticket counter, office space and baggage processing areas located in the eastern wing of the passenger terminal building. Horizon Air and Skywest Airlines each lease one area. Access to Alaska Air Cargo services exist on the exterior of the east wing connected to the Horizon Air office and baggage processing area. Passengers are able to obtain boarding passes, check-in luggage for their flight or obtain customer services at these locations. The remaining counter and office space in the terminal building is used for TSA baggage screening. All outgoing luggage receives security screening and evaluation in this TSA's designated area.

1.15.3 Security Screening Area

The passenger screening area is located in the central portion of the passenger terminal building adjacent to the main entry doors. The TSA owns and operates aviation security equipment such as a metal detector and X-ray to detect any foreign devices which can pose harm to other passengers, flight crew or the general population. A secondary screening room is available to provide the TSA a secure location to conduct further investigation.

1.15.4 Passenger Lounge and Gates

A passenger lounge is located in the central portion of the passenger terminal building and can only be accessed after completing TSA screening. There are chairs, vending facilities and a restroom available for passengers. There are two passenger boarding gates, which directly connects the passenger lounge to a designated path on the commercial service apron to the parked aircraft. Horizon Air and Skywest Airlines each lease and operate one passenger boarding gate. All passengers access their aircraft via a ramp connected by ground personnel.

1.15.5 Baggage Claim, Greeter's Lobby and Concessions

There is baggage claim and greeter's lobby located in the western portion of the passenger terminal building. The area consists of one baggage carousel, chairs, vending facilities and local tourism information. Arriving passengers access the baggage claim and greeter's lobby via a one-way door connecting the commercial service apron to the passenger terminal building. This area acts as an outgoing passenger lounge if they arrive between the TSA hours of operation. A concession stand is also located there and sells food, beverages, souvenirs and periodicals to users of the Lewiston-Nez Perce County Regional Airport. The baggage claim and greeter's lobby is shown in **Figure 1-38**.

1.15.6 Rental Car Services

There are three rental car counter and office spaces located in the west wing of the passenger terminal building. Budget/Avis and Hertz rental car agencies each utilize one counter and corresponding office space. One counter and office space is currently unoccupied. The rental car services are available to Lewiston-Nez Perce County Regional Airport passengers, general aviation users and the general public. Customers are able to check-in for car rentals and obtain customer services at these locations. The rental cars are obtained and returned to two designated parking lots on the east and west sides of the passenger terminal building.

1.15.7 Curb Side

Passengers departing or arriving from Lewiston-Nez Perce County Regional Airport who are utilizing taxi, limousine, hotel shuttle or private automobiles can use a curbside staging area located along the northern portion of the passenger terminal building. This area allows passengers to be dropped off or picked up at a fast rate without requiring the vehicle to use the short-term parking lot. The curbside access point can be reached via a one-way road connecting to Bryden Avenue.

1.15.8 Miscellaneous Services and Facilities

The ground floor also contains restrooms, a hair salon and a travel agency. The second floor was constructed to contain a restaurant. However, the TSA uses this space for operational and administrative support. The third floor contains office space and a conference room for Airport Management. Additionally, there is a badging office. The second and floor can be accessed via the elevator or stairs, the third floor can be accessed by elevator only.

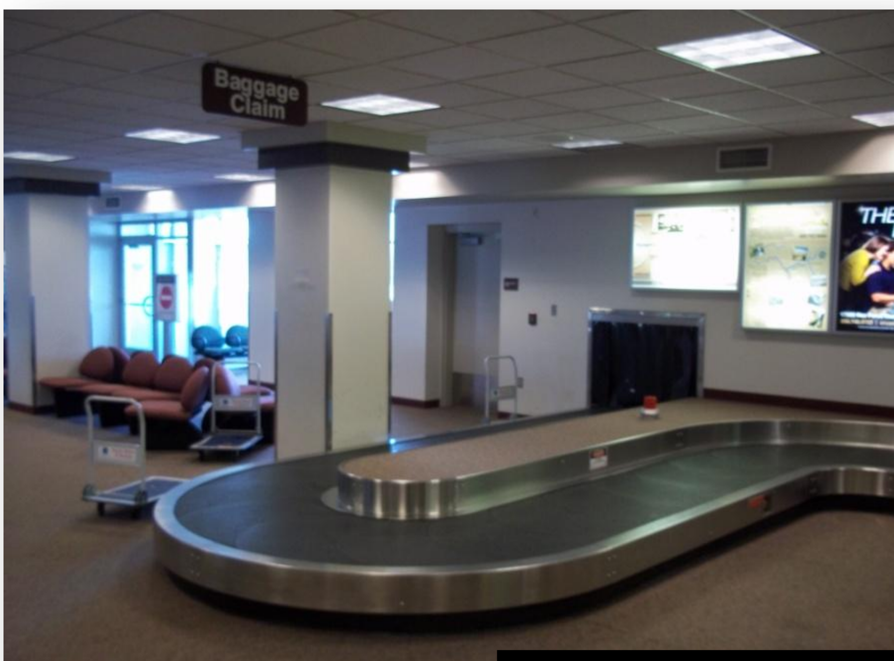


Figure 1-38 LWS Baggage Claim

Table 1-11 Passenger Terminal Building Square Footages

Use	Size (In Square Feet)
Ground Floor	
Horizon Air	1,170
Transportation Security Admin. Offices	670
Skywest Airlines	670
Sterile Concourse	1,490
Security	495
Kid's Area	215
Baggage Off-Load	850
Conference	330
Offices	630
Hair Salon	610
Gift Shop	310
Car Rental	1000
Rest Rooms	890
Janitorial	110
Storage	275
Tickets	540
Concourse/Lobby/Seating/etc.	6,970
Second Floor	
Lounge	1,740
Dining	1,370
Banquet	520
Serving	325
Kitchen	600
Freight Access	215
Workroom	215
Restroom	435
Janitorial	55
Electrical	55
Storage	530
Corridors/Vestibules etc.	1,290
Third Floor	
Administrative Offices	1,355
Stairs	2,990
Total Square Footage	**29,649**

Figure 1-39 Ground Floor Layout

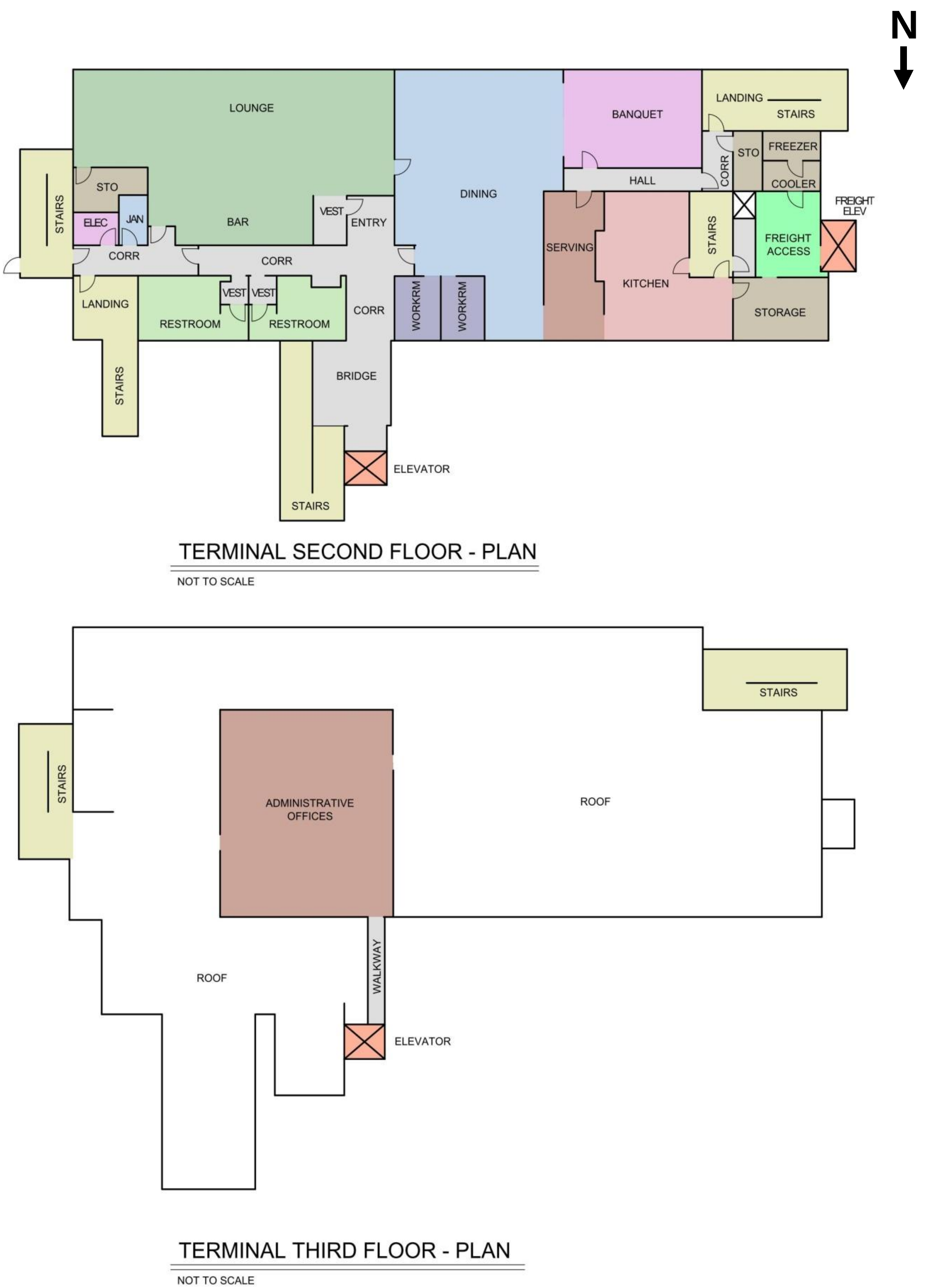


Figure 1-40 Second and Third Floor Layout

1.15.9 Air Traffic Control Tower

The Lewiston-Nez Perce County Regional Airport is served by a contract Air Traffic Control Tower (ATCT) operated by Serco Management Services. The ATCT function is to provide arrival and departure clearances, instrument approach clearance, ground control and air traffic separation services as well as weather and airport information. The Lewiston ATC tower is a contract tower, which is not directly managed by the FAA. The Lewiston tower is a part of the FAA's Contract Tower Program, which provides funding to airports to construct and support the operation of federal contract towers (FCTs).

The Lewiston ATCT operates on the frequencies of 119.4 Megahertz (MHz) for air traffic and 121.9 MHz for ground traffic and clearance delivery. Lewiston ATCT directs all traffic at the Airport and in the immediate Class D airspace, up to five miles from the tower and from the ground up to 2,500 feet above ground level (AGL). The Lewiston ATCT is a standalone building that is located in the central quadrant of the airfield and southeast of the passenger terminal. The building is approximately 80 feet tall and in good condition. The ATCT is operational from 6:00 AM to 10:00 PM local time. The Boise Flight Service Station provides additional weather data and other pertinent weather information to pilots on the ground and enroute. The ATCT is depicted in **Figure 1-41**.

Figure 1-41 Maintenance Building and Air Traffic Control Tower

1.15.10 Airport Services/Fixed Based Operators

A Fixed Base Operator (FBO) is typically a private enterprise that leases land from the airport sponsor on which to provide services to based and transient aircraft. The extent of the services provided varies from airport to airport; however, these services frequently include: aircraft fueling; maintenance and repair; aircraft rental and/or charter services; flight instruction; pilot lounge and flight planning facilities; and, aircraft tie down and/or hangar storage. A Specialized Aviation Service Operator (SASO) is a private enterprise which does not provide full

Figure 1-42 Stout Flying Service

FBO services, but focuses on an area of specialty for based and transient aircraft (i.e. maintenance, aircraft charter or aircraft refueling).

FBO services at Lewiston-Nez Perce County Regional Airport are provided by Stout Flying Service. SASO services at the airport are provided by Gustin Aviation, Odonata and Hillcrest Aircraft Company.

Stout Flying Service (see **Figure 1-42**) is located in the north central portion of the main apron. Stout Flying Service provides a range of services including: full service Jet-A and Avgas 100 low lead (LL) fuel, on-site certificated aircraft airframe and power-plant maintenance technicians, flight training, aircraft rental, charter, and hangar storage. The FBO is accessible via Burrell Avenue, a two-lane road that surrounds the northern portion of the terminal roadways and property.

Figure 1-43 Gustin Aviation

Odonata is located in the north central portion of the airport. Odonata provides self-service 100LL at an above ground storage tank on the apron near the Federal Express facility. Odonata also maintains an office on the airport which is used for the administration of flight training and aircraft rentals.

Gustin Aviation (see **Figure 1-43**) is located in the northwest portion of the airport. Services include aircraft maintenance and aircraft sales. Gustin is known for their experience in maintaining agricultural aircraft, in particular AirTractors.

Hillcrest Aircraft Company (see **Figure 1-44**) is located in the west portion of the airport. Hillcrest specializes in the maintenance, charter and sale of helicopters. Hillcrest is an Authorized Customer Service Center for Bell Helicopters.

Figure 1-44 Hillcrest Aircraft Company

Source: Hillcrest Aircraft Company, 2013

1.15.11 Airport Maintenance and Equipment

Airport maintenance is conducted under the authority of the Airport Manager. The airport owns and operates several pieces of maintenance equipment including: snow removal equipment vehicles and various maintenance support trucks. The current inventory of support vehicles includes:

- 1978 International 4WD dump truck with 12-foot plow
- 1997 International 2WD Truck with 12-foot plow and sander
- Massey-Ferguson Tractor with front-end loader
- Massey-Ferguson Tractor with broom, box blade, and front-end loader
- GMC Tug with 10-plow
- Gravely Tractor with 48-inch broom

Figure 1-45 LWS Snow Removal and Maintenance Equipment

Airport management maintains an active snow and ice control plan. The existing maintenance building (see **Figure 1-41**) is located northeastern portion of the airport property. The maintenance building is a 6,750 square foot building with four storage bays that are in good condition. There is a maintenance office and supply room in the equipment storage facility. **Figure 1-45** depicts a portion of Lewiston-Nez Perce County Regional Airport's snow removal and maintenance equipment.

1.15.12 Hangars

Figure 1-46 Conventional Hangars at LWS

Hangars are typically classified as either T-hangars (small multi-unit storage complexes that usually accommodate one single engine aircraft in each unit) or conventional box hangars, which range from small to very large accommodating a variety of aircraft types or corporate fleets. The number of aircraft that each conventional hangar can hold varies according to manufacturer and specification of airport owners or operators. The existing aircraft hangars consist of 44 conventional hangars and T-hangars which are currently occupied. The existing hangars are either owned by private organizations or the airport. **Figure 1-46** show examples of hangars located at Lewiston-Nez Perce County Regional Airport.

1.15.13 Utilities

Available utilities at Lewiston-Nez Perce County Regional Airport include power, water, sewer, gas, phone and internet. The electricity and natural gas is provided by Avista Utilities. Telephone and internet services are provided by Qwest Communications. The water and sewer are provided by the City of Lewiston Department of Public Works.

A detailed inventory of available utilities is located in Appendix A.

1.15.14 Access Routes, Signage and Automobile Parking

Lewiston-Nez Perce County Regional Airport can be reached by following 5th Street south from downtown, to Bryden Avenue. The airport is located approximately two miles south of downtown Lewiston. Burrell Avenue provides public and non-public access, however Bryden Avenue is the main circulation roadway to the Airport. There is signage available on Bryden Avenue to incoming direct traffic to the airport. A new airport entrance sign has recently been installed by the Authority. The general aviation ramp from accessed via multiple points on the north and west sides of the airport. Burrell Avenue is a two lane loop roadway in the terminal area that provides access to the public and employee parking lots and terminal curbside. This inbound roadway serves as a multilane roadway that can service both the ticketing and baggage claim areas. Traffic leaving the terminal area will follow the remainder of the loop roadway to the connector road.

Access to the Fixed Based Operator is same of the aforementioned directions to the airport. Air cargo is accessed through the FBO facility. The secondary general aviation apron and hangar development is located in the west quadrant of the Airport and can be accessed from O'Conner Road.

The parking lot encompasses the terminal building to the east, north and west with 462 paved parking spaces, eight of which are designated handicapped. Automobile parking is provided prior to reaching the terminal building on Burrell Avenue and is free to airport users. There is a separation of lots for public parking and employee parking. Rental cars have designated parking spots in the east and west parking lot sections. The parking lot is a paved asphalt surface. There is an over flow grass parking located to the northwest of the paved lot that provides additional unpaved parking spaces.

1.15.15 Intermodal Transportation

The ground transportation network within the City of Lewiston consists of private automobile transportation, public transportation buses, hotel courtesy transportation, and taxi and limo service. There is no passenger rail service to Lewiston. The nearest passenger rail service is located 150 miles north in Spokane, WA. Railroad service to Lewiston is provided by WATCO. The railroad is used for shipping agricultural products, lumber, paper, and fertilizer. The City of Lewiston is served by regional bus service provided by Northwestern Trailways. State Highway 95 runs north-south of Lewiston intersecting with Interstate 90 in Coeur D'Alene, Idaho and Interstate 84 in Fruitland, Idaho. State Highway 12 runs east-west toward the Montana state line going northeast connecting to Interstate 90 in Missoula, Montana and west connecting with Interstate 82 in Pasco, Washington. The Port of Lewiston is located within the Lewiston city limits on the north side of the Clearwater River. The Port of Lewiston is the most inland seaport on the west coast and provides barge facilities for the shipment of agricultural commodities, lumber, paper, and mining and oil field equipment. The Port of Lewiston also provides the connection and access to the railroad and highway transportation system facilities.

1.15.16 Aircraft Fuel Facilities

A FBO or the airport sponsor typically provides aircraft fuel services. Combinations of 100 low lead (LL) and 80 Octane Aviation Gas and/or Jet-A fuel are usually provided depending on the aircraft traffic mix.

Three organizations provide fuel service at Lewiston-Nez Perce County Regional Airport. Stout Flying Service has a 12,000 and 10,000 gallon above ground Jet-A storage tanks and one 12,000 gallon above ground 100LL storage tank. All tanks are single wall and within containment areas. Stout also operates a 1,200, 1,700 and 2,500 gallon Jet-A dispensing fuel truck and an 800 gallon 100LL dispensing fuel truck. The fuel available at Stout Flying Service is full service and self-serve. Hillcrest Aircraft Company operates two 11,000 gallon below ground Jet-A single-wall storage tanks and one 20,000 gallon below ground 100LL single-walled storage tank which is for self-fueling with a credit card reader. Hillcrest also operates a 2,000 gallon Jet-A dispensing fuel truck for off-airport fueling operations. Hillcrest maintains a Spill Prevention, Control and Countermeasure plan. Odonata operates a 6,000 gallon above ground 100LL double-wall self-serve tank with a credit card reader.

Figure 1-47 Stout Self-Serve Fuel at LWS

1.15.17 Security

The primary purpose of airport fencing is to prevent unwanted intrusions by persons or animals on to airport property. Airport fencing provides increased safety and security for the airport. It is normally installed along the perimeter of the property and outside any of the safety areas defined by the Federal Aviation Administration (FAA) in Advisory Circular (AC) 150/5300-13A, *Airport Design* and 14 Code of Federal Regulation (CFR) Part 77*, Objects Affecting Navigable Airspace.*

The Airport is entirely fenced with an eight foot chain link fence with three strand barbed wire along the top - as required under Part 139. According to Airport Management records, there are 54 controlled access points to the airport. These access points are a variety of pedestrian gates, doors, and manual or automatic vehicle gates. Each access point is controlled by either a proximity card reader, padlock or cipher lock. A perimeter fencing and access gate at Lewiston-Nez Perce County Airport is shown in **Figure 1-48**. The Airport has a Security Coordinator who handles all security issues at the Airport. The Security Coordinator is the liaison between the Transportation Security Administration (TSA), the City of Lewiston Police Department and the Airport. The Security Coordinator also takes care of all security directives and procedures. The City Police are not located on Airport property, but respond as needed. The Airport is equipped with Closed Circuit Television (CCTV).


Figure 1-48 Access Gate and Perimeter Fence

1.15.18 Emergency Services

Operators of Part 139 airports are required to provide aircraft rescue and fire fighting (ARFF) services during air carrier operations that require a Part 139 certificate. Lewiston-Nez Perce County Regional Airport is classified as a Class I FAR Part 139 Airport which means the Airport is certificated to serve scheduled operations of large air carrier aircraft (e.g. more than 31 passenger seats). The Airport can also serve unscheduled passenger operations of large air carrier aircraft and/or scheduled operations of small air carrier aircraft (e.g. more than 9 passenger seats but less than 31). As a result of being classified as a Class I airport certain criteria must be met by the Airport including providing a certain level of emergency response.

FAR Part 139 also establishes the level of aircraft rescue and fire fighting (ARFF) equipment and agents required for an airport. The ARFF Index level required is determined by the longest passenger aircraft with an average of five daily departures serving the airport as follows:

- Index A – Aircraft less than 90 ft in length;
- Index B – Aircraft at least 90 ft but less than 126 ft;
- Index C – Aircraft at least 126 ft but less than 159 ft;
- Index D – Aircraft at least 159 ft but less than 200 ft; and
- Index E – Aircraft greater than 200 ft in length.

Lewiston-Nez Perce County Regional Airport is classified as an Index A airport.

The ARFF station is located on the Airport and provides fire fighting and rescue services for aircraft, buildings located on the Airport (main terminal, storage hangars), parking areas, and the fuel farm with a three minute response time to any area of the Airport. Ambulance services are also provided by the City of Lewiston. The ARFF building provides two vehicle storage bays. The ARFF building was constructed in 1975, is 4,250 square feet and located north of the Airport terminal. There is one ARFF truck, an E-One Titan 4x4, manufactured in 1995. It has the ability to contain 1,500 gallons of water, 200 gallons of foam or 500 pounds of dry chem. For additional support, there is one fire engine and one rescue vehicle. The ARFF vehicles and equipment are in fair condition and owned by the City of Lewiston. The ARFF station is depicted in **Figure 1-49**.

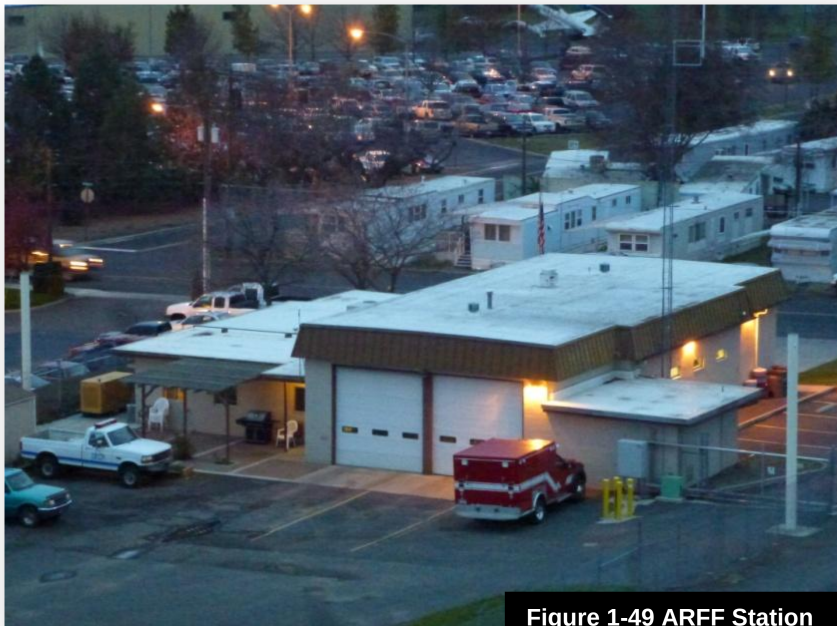


Figure 1-49 ARFF Station

There are three firefighters based at the Airport fire station 24 hours a day, seven days a week. Personnel consist of two engineers and one captain. The nearest ambulance is provided by the Lewiston Fire Department and has a response time of four minutes. Mutual Aid Agreements exist with Asotin County Fire District #1, City of Asotin Fire Department, City of Pullman Fire Department, City of Moscow Fire Department and Moscow Rural Fire. The Airport fire station has the capability to respond to City structural fires in addition to the Airport ARFF

Figure 1-50 LWS ARFF Truck

response. Two of the bays open to the airside and to the landside.

There is one hospital located in Lewiston: St. Joseph Regional Medical Center. St. Joseph Regional Medical Center has 136 licensed beds and 146 physicians on medical staff. **Table 1-12** depicts all rescue services available for Lewiston-Nez Perce County Regional Airport.

Table 1-12 Lewiston-Nez Perce County Regional Airport Rescue Data

Equipment/Facilities/Etc.	Operational Data
Personnel	3 per shift, 2 engineers and 1 captain
E-One Titan 4x4	1,500 gallons of water, 200 gallons of foam or 500 pounds of dry chem. For airport use only
Pumper Engine	Pumper used for structural fires.
Rescue Vehicle	Provides immediate medical support and coordination
St. Joseph Regional Medical Center	136 licensed beds, 146 total physicians

1.15.19 Weather Reporting Services

The weather reporting system at Lewiston-Nez Perce County Regional Airport includes an Automated Surface Observing System (ASOS). The ASOS program is a joint effort of the National Weather Service (NWS), the Federal Aviation Administration (FAA), and the Department of Defense (DOD). The ASOS systems serve as the nation's primary surface weather observing network. ASOS is designed to support weather forecast activities and aviation operations and, at the same time, support the needs of the meteorological, hydrological and climatological research communities. The ASOS is connected to the National Airspace Data Interchange Network (NADIN) which disseminates weather conditions to pilots through various aviation weather websites including the FAA Terminal Aerodrome forecast. The ASOS is owned and operated by the National Oceanic and Atmospheric Administration. The ASOS is available at 135.575 MHz or by dialing (208) 746-4185.

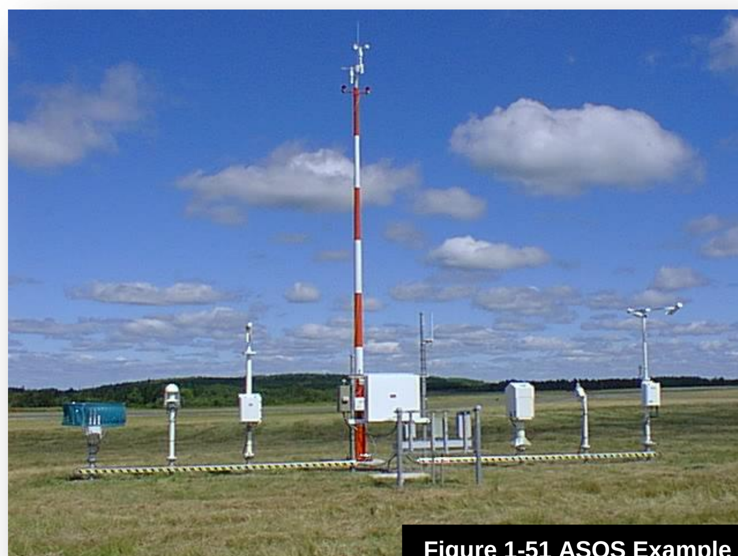


Figure 1-51 ASOS Example

Source: noaa.gov, 2013

Table 1-13 Existing Airport Facilities Summary

Facility Information		
Identifier	LWS	
FAA Site Number	04234.*A	
NPIAS Number	16-0022	
Owner/Sponsor	City of Lewiston/Nez Perce County	
Airport Elevation	1,442-feet Mean Sea Level	
Runway and Taxiway Data		
Runway 8/26	Length: 6,512' Width: 150' Surface: Asphalt - PFC Marking: RW 8: NPI / RW 26: Precision Lighting: HIRLs	
Runway 12/30	Length: 5,000' Width: 100' Surface: Asphalt Marking: RW 12: NPI / RW 30: NPI Lighting: MIRLs	
Pavement Strength	Runway 8/26: 150,000 lbs. SWG 180,000 lbs. DWG 400,000 lbs. DTG	Runway 12/30: 70,000 lbs. SWG 94,000 lbs. DWG 150,000 lbs. DTG
Visual Aids	RW8: VASI, RW26: PAPI/MALSR, RW12: PAPI, RW30: VASI	
Approach Minimums	½ SM (RW 26), ¾ SM (RW 8) and 1 SM (RW 12/30)	
Taxiways	A,B,C,D,F,G,H and Z	
Taxiway Lighting	Retroflectors/MITL	
Aircraft Apron	19,556 square yards	
Tie Downs	36	
Navigational Aids		
Air Navigation Aids	ILS, VOR-B, GPS	
Airport Beacon	Clear-Green (Civil Airport)	
Wind Indicator	Lighted	
Segmented Circle	Yes	
Unicom/Tower	122.95 MHz/ 119.4 MHz	
Airport Building and Services		
T-Hangars / Hangars	44 Hangars	
Terminal Area	29,649 square feet	
Automobile Parking	462 designated spots	
Perimeter Fencing	8' chain link with 3 strand barbed wire	
Fuel	100LL & Jet-A	
Services	Car rental, taxi, hotel/airport shuttles, wireless internet, airframe repairs, maintenance, travel agent, deicing, flight instruction, restrooms, hair salon, aircraft rental, charter and pilot lounge.	
Weather Equipment	ASOS	
FBO	Stout Flying Service	
SASOs	Gustin Aviation, Odonta, Hillcrest Aircraft Service	
Utilities	Electrical, natural gas, water and sewer, telephone and internet	

1.16 Federal Aviation Administration Safety and Design Standards

FAA AC 150/5300-13A, *Airport Design*, establishes design standards for airports based on the ARC and visibility minimums of the airport. When design standard deficiencies exist, the FAA recommends correction of such deficiencies as soon as practicable. The ARC is a combination of the wingspan, tail height and approach speed of the critical aircraft. Selected design standard categories are discussed below and **Table 1-17** shows the current design standards at Lewiston-Nez Perce County Regional Airport.

1.16.1 Airport Design Standards

The Airport Reference Code (ARC) is a coding system established by the FAA and used to relate airport design criteria to the operational and physical characteristics of the aircraft intended to operate at the airport. The ARC is established from the highest Runway Design Code (RDC) for the airport. The RDC has three components relating to the airport design aircraft.

The first component, depicted by a letter (e.g. A, B, C, D, or E), is the Aircraft Approach Category (AAC) and relates to the aircraft approach speed based upon operational characteristics. An aircraft fits into a category based on 1.3 times the stall speed of that aircraft at maximum gross weight in the landing configuration.

The second component of the ARC is the Aircraft Design Group (ADG) and is depicted by a Roman numeral (e.g. I, II, III, IV V or VI). The aircraft design group is based on an aircraft's physical characteristics (wingspan or tail height, whichever is most demanding).

The third component of the ARC is the visibility minimums and depicted by the Runway Visual Range (RVR) distances (e.g. 5,000, 4,000, 2,400, 1,600, or 1,200). For a runway which only has visual approaches the identifier is VIS. **Tables 1-14, 1-15 and 1-16** provide a breakdown of AAC, ADG and RVR.

Table 1-14 Aircraft Approach Category (AAC)

Aircraft Approach Category	Approach Speed
A	<91 knots
B	>91 knots but <121 knots
C	>121 knots but <141 knots
D	>141 knots but <166 knots
E	166 knots or greater

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

Table 1-15 Airplane Design Group

Group #	Wingspan (Ft.)	Tail Height (Ft.)
I	< 49'	< 20'
II	49' - < 79'	20' - < 30'
III	79' - < 118'	30' - < 45'
IV	118' - < 171'	45' - < 60'
V	171' - < 214'	60' - < 66'
VI	214' - < 262'	66' - < 80'

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

Table 1-16 Visibility Minimums

RVR (FT)	Flight Visibility Category (Statue Mile)
VIS	Visual
5,000	Not lower than 1 mile (NPA > 2 miles)
4,000	Lower than 1 mile but not lower than 3/4 mile (APV ≥ 3/4 but < 1 mile)
2,400	Lower than 3/4 mile but not lower than 1/2 (CAT - I PA)
1,600	Lower than 1/2 mile but not lower than 1/4 mile (CAT - II PA)
1,200	Lower than 1/4 mile (CAT - III PA)

Source: FAA AC 15/3500-13A *Airport Design*

The RDCs at the airport are C-III for Runway 8/26 and B-II for Runway 12/30 with visibility minimums of RVR 4,000 for Runway 12/30 and RVR 2,400 for Runway 8/26. The ARC for the airport is C-III-2,400.

1.16.2 Safety Areas

AC 150/5300-13A defines a Runway Safety Area (RSA) as “an identified surface surrounding the runway prepared and suitable for reducing risk of damage to airplanes in the event of an undershoot, overshoot or excursion from the runway.” The RSA has dimensional requirements as well as clearing, grading and drainage requirements.

The dimensional requirements for an RSA (and a subsequent Taxiway Safety Area) reflect the aircraft types utilizing the runway. As defined in AC 150/5300-13A, both the ADG (defined by the aircraft’s wingspan) and the AAC (defined by an aircraft approach speed) are the basis for establishing the RSA dimensions.

The Safety Areas must be:

- Cleared and graded and have no potentially hazardous surface variations.
- Drained so as to prevent water accumulation.
- Capable, under dry conditions, of supporting snow removal equipment, ARFF equipment and the occasional passage of aircraft without causing structural damage to the aircraft.
- Free of objects, except for objects that need to be located in the runway or taxiway safety area because of their function; and
- Installation of storm sewers is permissible within the RSA, but elevation of the storm water inlets may not vary more than three inches from surface elevation.

The locations of objects identified on the ALP were visually inspected and the results of these findings are outlined in this section. The RSAs surrounding Runways 8/26 and 12/30 at Lewiston-Nez Perce County Regional Airport are clear of obstructions and in good condition.

1.16.3 Obstacle Free Zone and Object Free Area

The Obstacle Free Zone (OFZ) is a three dimensional volume of airspace which supports the transition of ground to airborne aircraft operations. The clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual Navigational Aids (NAVAIDs) that need to be located in the OFZ because of their function. The OFZ is similar to the 14 Code of Federal Regulation (CFR) Part 77 Primary Surface insofar that it represents the volume of space longitudinally centered on the runway and it extends 200 feet beyond the end of each runway. The Runway Object Free Area (ROFA) is a two-dimensional ground area surrounding the runway. The ROFA standard precludes parked airplanes, agricultural operations and objects, except for objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes. Both the OFZ and OFA at Lewiston meets the requirements defined within FAA AC 150/5300-13A, *Airport Design*.

1.16.4 Runway Protection Zone (RPZ)

The Runway Protection Zone (RPZ) is trapezoidal in shape and centered about the extended runway centerline. The RPZ dimension for a particular runway end is a function of the type of aircraft and approach visibility minimum associated with that runway end.

At the end of Runway 8/26 and Runway 12/30, the RPZs begin 200 feet from the runway. For Runway 8, the RPZ is 500 feet wide at the inner end and 1,010 feet wide at the outer end and extend 1,700 feet. For Runway 26 the RPZ is 1,000 feet wide at the inner and 1,750 feet wide at the outer end and extends 2,500 feet. Runway 26 is designated as a precision, greater than utility runway. The RPZs for Runway 12/30 are 500 feet wide at the inner end and 700 feet wide at the outer end and extend 1,000 feet.

The land uses not recommended within the RPZ are residences and places of public assembly (e.g., churches, schools, hospitals, parking lots, office buildings, shopping centers and other uses with similar concentrations of persons typify places of public assembly). The FAA recommends that airport's control RPZs through fee simple ownership or avigation easements.

The approach and departure RPZs for Runway 8/26 and Runway 12/30 begin at 200 feet from the pavement edge and are located on Airport property. Lewiston-Nez Perce County Regional Airport controls the RPZs through fee simple ownership or avigation easements.

Table 1-17 Current Airfield Design Standards

Runway	**8**	**26**
Runway Design Code	C-III	C-III
Approach Visibility Minimums	¾ SM	½ SM
RW Length	6,512’	6,512’
RW Width	150’	150’
RW Safety Area width	500’	500’
RW Safety Area length beyond runway end	1,000’	1,000’
RW Object Free Area width	800’	800’
RW Object Free Area length beyond runway end	1,000’	1,000’
Obstacle Free Zone width	400’	400’
Obstacle Free Zone length beyond runway end	200’	200’
Runway Protection Zone	500’ x 1,700’ x 1,010’	1,000’ x 2,500’ x 1,750’
RW Centerline to taxiway/taxilane centerline	400’	400’
RW Centerline to aircraft parking area	500’ (546’ actual)	500’ (546’ actual)
Runway	**12**	**30**
Runway Design Code	B-II	B-II
Approach Visibility Minimums	1 SM	1 SM
RW Length	5,000’	5,000’
RW Width	75’ (100’ actual)	75’ (100’ actual)
RW Safety Area width	150’	150’
RW Safety Area length beyond runway end	300’	300’
RW Object Free Area width	500’	500’
RW Object Free Area length beyond runway end	300’	300’
Obstacle Free Zone width	400’	400’
Obstacle Free Zone length beyond runway end	200’	200’
Runway Protection Zone	500’ x 1,000’ x 700’	500 x 1,000’ x 700’
RW Centerline to taxiway/taxilane centerline	240’ (276’ actual)	240’ (276’ actual)
RW Centerline to aircraft parking area	250’ (371’ actual)	250’ (371’ actual)
Taxiway Design Group	**II**	**III**
TW Width	35’	50’
TW Safety Free Area width	79’	118’
TW Object Free Area width	131’	186’
TW Centerline to Parallel TL Centerline	105’	152’
TL Object Free Area width	115’	162’

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

1.17 Federal Aviation Regulation (FAR) Part 77 Imaginary Surfaces

14 Code of Federal Regulation (CFR) Part 77 establishes several Imaginary Surfaces that are used as a guide to provide a safe, unobstructed operating environment for aviation activity. The Primary, Approach, Transitional, Horizontal and Conical Surfaces identified in CFR Part 77 are applied to each runway. The FAA defines runway types as the following:

- Visual/utility runway – a runway that is intended to be used by propeller driven aircraft of 12,500 pound maximum gross weight or less.
- Nonprecision instrument/utility runway – a runway that is intended to be used by aircraft of 12,500 pounds maximum gross weight and less with a straight-in instrument approach procedure and instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan or by any planning document submitted to the FAA by competent authority.
- Nonprecision instrument/larger-than-utility runway – is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure.
- Precision Instrument – is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure.

The Primary Surface is an imaginary surface of specific width longitudinally centered on a runway. Primary Surfaces extend 200 feet beyond each end of the paved surface of runways, but do not extend past the end of non-paved runways. The elevation of any point on the Primary Surface is the same as the elevation of the nearest point on the runway centerline. The width of the Primary Surface varies from 250, 500 or 1,000 feet depending on the type of approach and approach visibility minimums.

The Approach Surface is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the Primary Surface. An Approach Surface slope is applied to each end of the runway based upon the type of approach available or planned for that runway, either 20:1, 34:1 or 50:1. The inner edge of the surface is the same width as the Primary Surface. It expands uniformly to a width corresponding to the CFR Part 77 runway classification criteria.

The Transitional Surfaces extend outward and upward at right angles to the runway centerlines from the sides of the Primary and Approach Surfaces at a slope of 7:1 and end at the Horizontal Surface.

The Horizontal Surface is a horizontal plane 150 feet above the established airport elevation. The airport elevation is defined as the highest point of an airport’s useable runways, measured in feet above mean sea level. The perimeter is constructed by arcs of specified radius from the center of each end of the Primary Surface of each runway. The radius of each arc is 5,000 feet for runways designated as utility or visual and 10,000 feet for all other runways.

The Conical Surface extends outward and upward from the periphery of the Horizontal Surface at a slope of 20:1 for a horizontal distance of 4,000 feet.

The Part 77 surfaces for Lewiston-Nez Perce County Regional Airport are shown in **Table 1-18** and **1-19.**

Table 1-18 Part 77 Surfaces – Runway 8/26

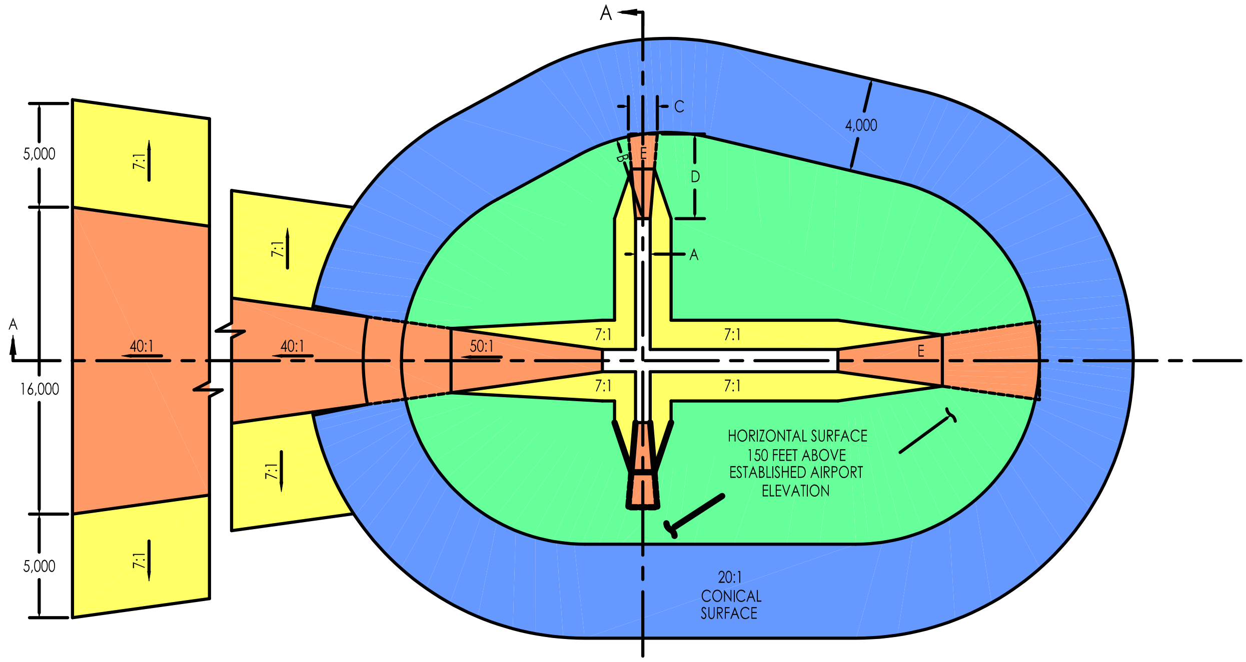
	Runway 8/26
Runway 8	Nonprecision – Greater Than Utility > ¾ Mile
Runway 26	Precision – Greater Than Utility < ¾ Mile
Primary Surface Width	1,000’
Primary Surface beyond RW end	200’
Approach Surface dimensions	RW 8: 1,000’ x 4,000’ x 10,000’ RW 26: 1,000’ x 16,000’ x 50,000’
Approach Surface slope	RW 8: 34:1 RW 26: 50:1/40:1
Transitional Surface slope	7:1

Source: 14 CFR Part 77

Table 1-19 Part 77 Surfaces – Runway 12/30

	Runway 12/30
Runway 12	Nonprecision – Greater Than Utility > 1 Mile
Runway 30	Nonprecision – Greater Than Utility > 1 Mile
Primary Surface Width	500’
Primary Surface beyond RW end	200’
Approach Surface dimensions	RW 12: 500’ x 3,500’ x 10,000’ RW 30: 500’ x 3,500’ x 10,000’
Approach Surface slope	RW 12: 34:1 RW 30: 34:1
Transitional Surface slope	7:1

Source: 14 CFR Part 77

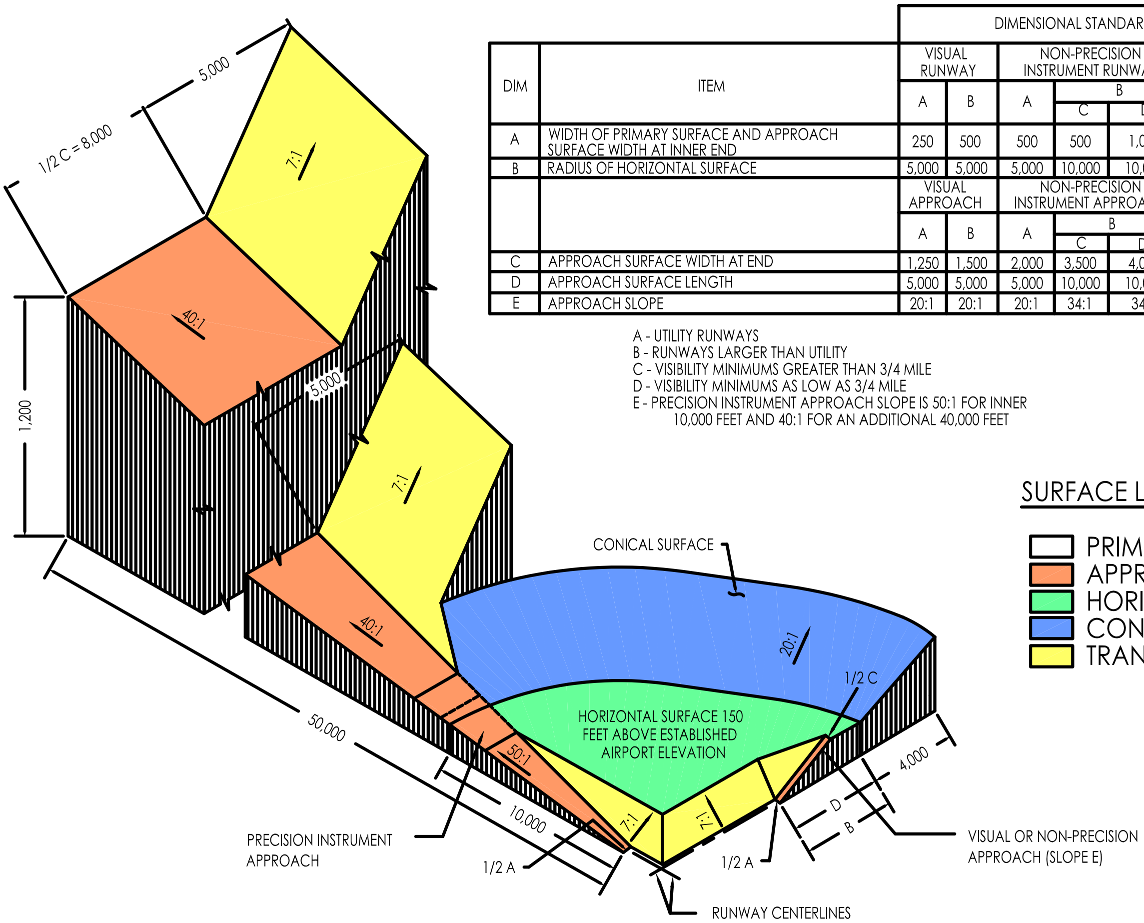


DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000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

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

SURFACE LEGEND

- PRIMARY
- APPROACH
- HORIZONTAL
- CONICAL
- TRANSITIONAL



ISOMETRIC VIEW OF SECTION A-A

Figure 1-52 14 CFR Part 77 Surfaces

1.18 Airspace

1.18.1 National Airspace System

The National Airspace System consists of various classifications of airspace that are regulated by the FAA and is considered controlled or uncontrolled airspace. Pilots flying in controlled airspace are subject to Air Traffic Control (ATC) regulations and must follow either Visual Flight Rule (VFR) or Instrument Flight Rule (IFR) requirements. These requirements include combinations of operating rules, aircraft equipment and pilot certification and vary depending on the Class of airspace and are described in Federal Aviation Regulations (FAR) Part 71, Class designations; Airways; Routes; and Reporting Points and FAR Part 91, General Operating and Flight Rules.

General definitions of the Classes of airspace are provided below and depicted in **Figure 1-53**:

- Class A Airspace – Airspace from 18,000 feet Mean Sea Level (MSL) up to and including Flight Level (FL) 600.
- Class B Airspace – Airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of IFR operations or passenger enplanements.
- Class C Airspace – Generally airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower, are serviced by radar approach control and that have a certain number of IFR operations or passenger enplanements. The airspace usually consists of a 5 nautical mile (nm) radius core surface area that extends from the surface up to 1,200 feet above the airport elevation and a 10 nm radius shelf area that extends from 1,200 feet up to 4,000 feet above the airport elevation.
- Class D Airspace – Airspace from the surface up to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports with an operational control tower.
- Class E Airspace – Generally controlled airspace that is not Class A, Class B, Class C or Class D.
- Class G Airspace – Generally uncontrolled airspace that is not designated Class A, Class B, Class C, Class D or Class E.
- Victor Airways – These airways are low altitude flight paths between ground based VHF Omnidirectional Receivers (VORs).

Figure 1-54 illustrates that the airspace surrounding Lewiston-Nez Perce County Regional Airport is Class D from the ground to 2,500-feet AGL when ATC is operational. During hours when ATC is not operational, surrounding airspace is Class E.

The traffic patterns to Lewiston-Nez Perce County Regional Airport are standard left hand traffic for Runways 26 & 30 and right hand traffic for Runways 8 & 12. The published pattern altitude (TPA) is 1,560 feet above ground level (AGL) for heavy and turbine powered aircraft, 1,060 feet AGL for all others. Airspace and future land use planning are further discussed in Chapter 3, *Facility Requirements*.

Figure 1-53 Airspace Classifications

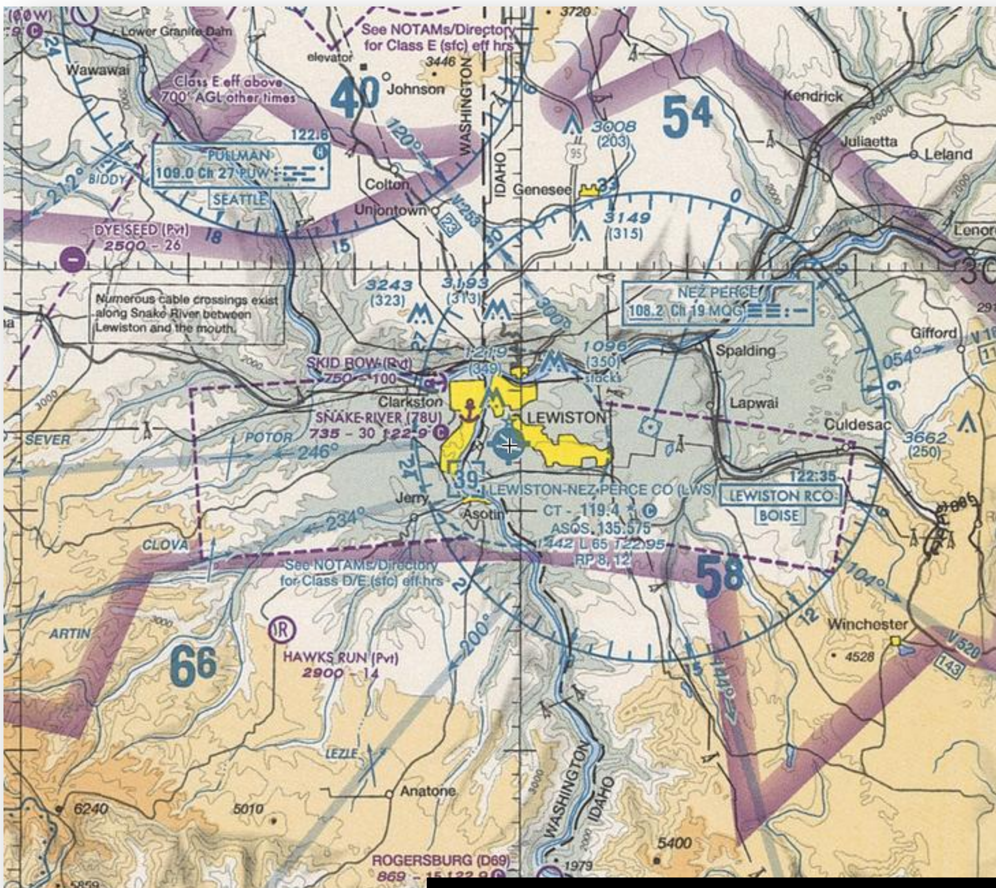


Figure 1-54 VFR Sectional Map of Lewiston, ID

1.18.2 Airspace Jurisdiction

Lewiston-Nez Perce County Regional Airport is located within the jurisdiction of the Lewiston-Nez Perce County Regional Airport ATCT which is within the jurisdiction of the Seattle Route Control Center (ARTCC) and the Boise Flight Service Station (FSS). The altitude of radar coverage by the Seattle ARTCC may vary as a result of the FAA navigational/radar facilities in operation, weather conditions and surrounding terrain. The Boise FSS provides additional weather data and other pertinent information to pilots on the ground and enroute.

1.18.3 Airspace Restrictions

Military Operations Areas (MOAs) consist of airspace with defined vertical and lateral limits established for the purpose of separating certain military training activities from general IFR traffic which separate certain nonhazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted.

Whenever an MOA is being used, nonparticipating IFR traffic may be cleared through an MOA if IFR separation can be provided by Air Traffic Control (ATC). Otherwise, ATC reroutes or restricts nonparticipating IFR traffic. MOAs are depicted on sectional, VFR terminal area, and en route low altitude charts. The MOAs are also further defined on the back of the sectional charts with times of operation, altitudes affected, and the controlling agency. There are no MOAs, restricted or prohibited airspace within 50 nautical miles of the airport.

1.19 Climate and Meteorological Conditions

Meteorological conditions play an important role in the planning and development of an airport. Wind direction and speed are essential in determining optimum runway orientation. Temperatures substantially affect aircraft performance and are a major factor in runway length determination. The percentage of time an airport experiences low visibility due to meteorological conditions is a key factor in determining the need for instrument approach procedures and the type of procedure and facilities needed. The type of instrument approach procedure that might be needed, in turn, determines airspace and imaginary surface requirements. The amount and type of precipitation that occurs at an airport affects visibility and runway friction, or runway braking effectiveness. It also affects the type of maintenance equipment required (e.g., snow and ice removal equipment).

1.19.1 Local Climatological Data

Lewiston experiences a four-season climate generally experiencing hot, dry weather in the summer and cooler temperatures in the winter. The fall and spring season provide a good transition between the two extremes. Lewiston receives approximately 12.25 inches of precipitation annually. Average annual snowfall for Lewiston is 9.3 inches. The average maximum temperature of the hottest month is 89.3 degrees Fahrenheit in July, while the average minimum temperature of the coldest month is 28.0 degrees Fahrenheit in December. The annual average maximum temperature is 63.4 degrees Fahrenheit and the annual average minimum temperature is 42.5 degrees Fahrenheit. **Figure 1-55** shows the average annual precipitation for the state of Idaho which shows that Lewiston is located within the dry portion of the state.

1.19.2 Ceiling and Visibility Conditions

Ceiling and visibility conditions are important considerations since the occurrence of low ceiling and/or poor visibility conditions limit the use of an airport. Under poor visibility conditions or Instrument Meteorological Conditions (IMC), the pilot must operate under Instrument Flight Rules (IFR), rather than Visual Flight Rules (VFR). Under IFR, the pilot maneuvers the aircraft through sole reference to instruments in the aircraft and navigational aids on the ground. When flight conditions are visual or Visual Meteorological Conditions (VMC), the pilot can maneuver the aircraft by reference to the horizon and objects on the ground.

There are several instrument approach procedures to the Airport including an Instrument Landing System (ILS) to Runway 26. According to the National Western Climatic Data Center there are approximately 196 cloudy days per year in Lewiston.

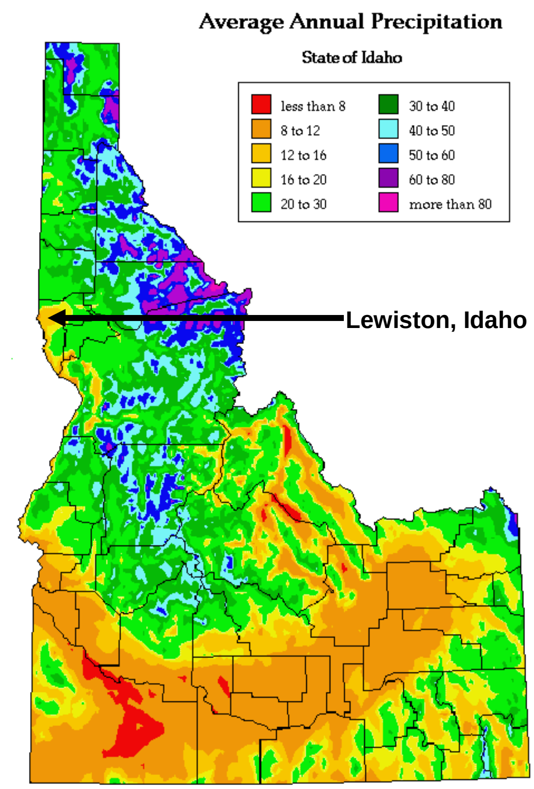


Figure 1-55 Idaho Precipitation Map

Source: Spatial Climate Analysis Service, 2013

1.19.3 Wind Conditions

FAA Advisory Circular 150/5300-13A, *Airport Design*, recommends that a runway should yield 95 percent wind coverage under stipulated crosswind components. If one runway does not meet this 95 percent coverage, then construction of an additional runway may be advisable. The crosswind component of wind direction and velocity is the resultant vector, which acts at a right angle to the runway. It is equal to the wind velocity multiplied by the trigonometric sine of the angle between the wind direction and the runway direction. The allowable crosswind component for each Airport Reference Code is shown in **Table 1-20**.

Table 1-20 Crosswind Components

Allowable Crosswind in Knots	Airport Reference Code
10.5 knots	A-I & B-I
13 knots	A-II & B-II
16 knots	A-III, B-III & C-I through D-III
20 knots	A-IV through D-VI

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

Wind conditions are based on weather observations taken in the Lewiston area during the period from 2000-2009. This data, obtained from the National Oceanic and Atmospheric

Administration (NOAA) Climate Data Center, consists of 79,268 hourly observations separated by visual meteorological conditions (VMC) and instrument meteorological conditions (IMC), and "all weather" conditions as described below. Data was obtained from the ASOS located on the airfield which indicates that Runway 8/26 and Runway 12/30 provide more than 96.37 percent wind coverage for aircraft in the ARC A-I through C-III, the percentage values are provided in **Table 1-21** and **Figure 1-56**. Therefore, the existing runway configuration is adequate for aircraft in categories A-I through C-III. **Table 1-22** and **Figure 1-57** indicates winds in IFR conditions favor Runway 26 which is consistent with Runway 26 offering the lowest approach minimums with the ILS approach.

Table 1-21 Lewiston-Nez Perce County Regional Airport Wind Data – All Weather

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 8/26	96.37%	97.99%	99.24%	99.75%
Runway 12/30	97.09%	98.32%	99.33%	99.81%
Combined	98.21%	99.01%	99.60%	99.91%

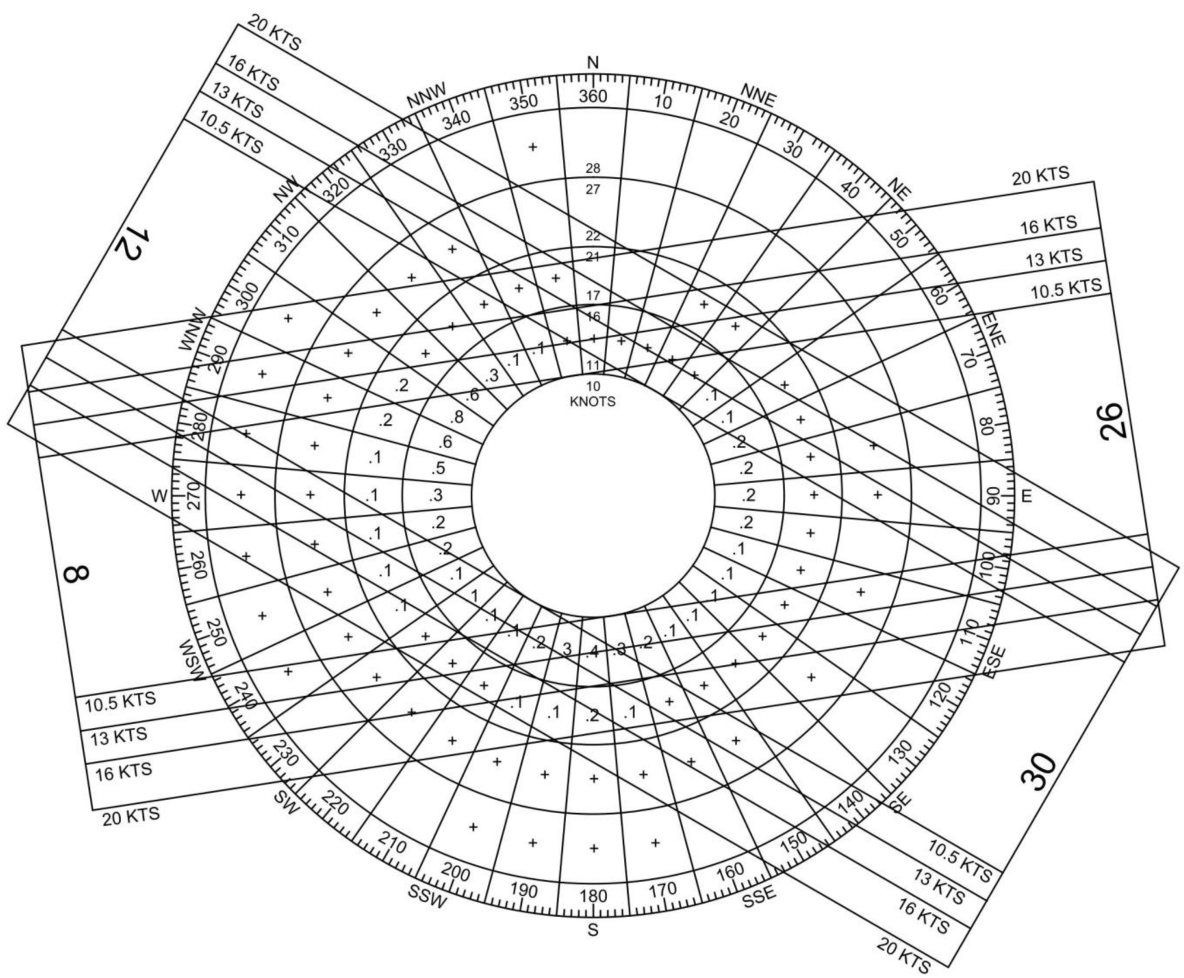


Figure 1-56 All Weather Wind Rose

Source: KLWS ASOS, based on 79,268 observations from 2000-2009

Table 1-22 Lewiston-Nez Perce County Regional Airport Wind Data – IFR Weather

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 8/26	99.59%	99.71%	99.73%	99.86%
Runway 12/30	99.29%	99.56%	99.89%	99.95%
Combined	99.82%	99.96%	100%	100%

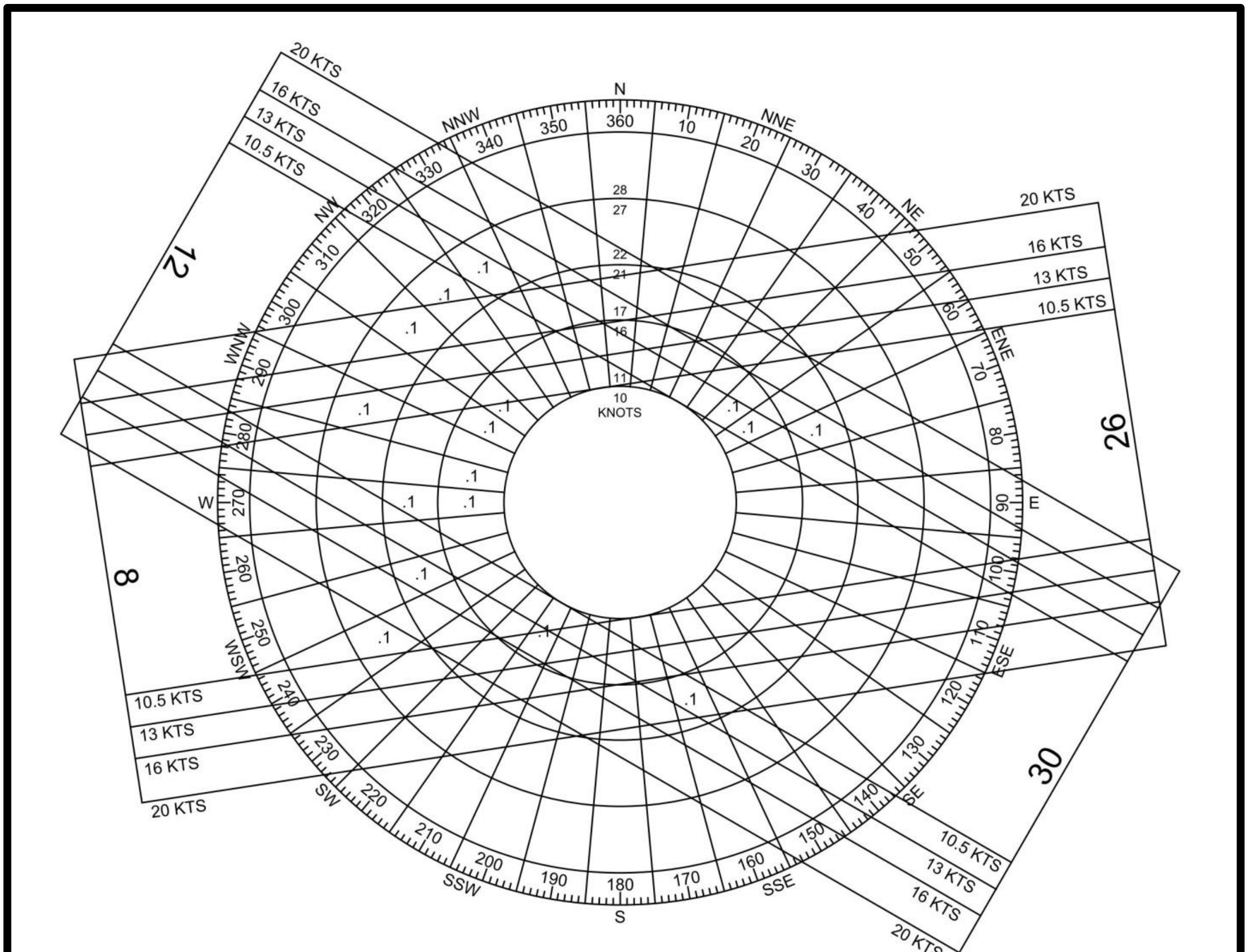


Figure 1-57 IFR Weather Wind Rose

Source: KLWS ASOS, based on 79,268 observations from 2000-2009

When conducting a wind coverage evaluation analysis, the FAA suggests that historical weather information for the last ten consecutive years be utilized. Records of lesser duration may be acceptable on a case-by-case basis. In some instances, it may be desirable to obtain and assemble wind information for periods of particular significance, for example: seasonal variations; instrument weather conditions; daytime versus nighttime; and regularly occurring gusts.

1.20 Environmental Inventory

The requirements of the National Environmental Policy Act (NEPA) require an environmental determination before implementing proposed airport improvement projects. The purpose of the environmental inventory is to identify key environmental resources that may be affected by potential airport development. The data compiled in this section will be used later in this study. Background research was completed by reviewing available documentation from the U.S. Environmental Protection Agency (EPA), Flood Insurance Rate Maps (FIRM), National Register of Historic Places (NHRP), and Federal Emergency Management Agency (FEMA).

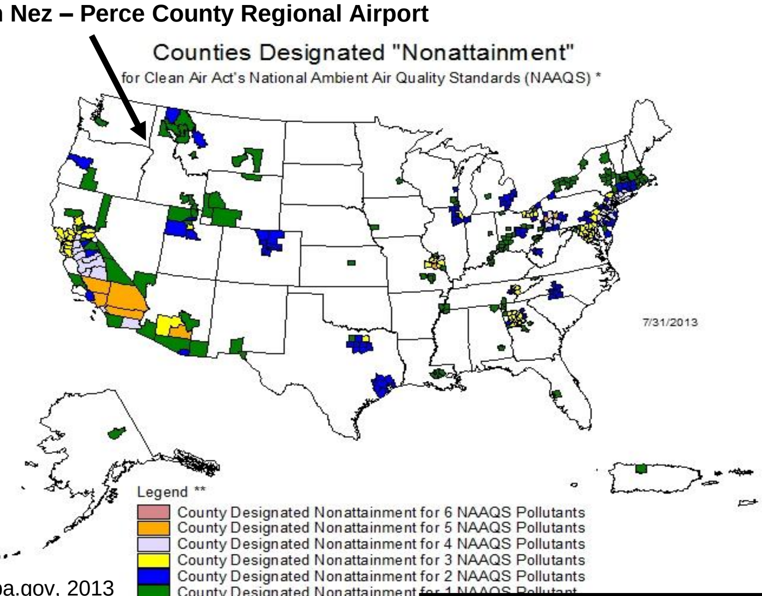
The level of the NEPA documentation required is usually based on the results of the environmental overview and the requirements specified in FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures,* and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*. Typical levels of analysis and determinations include Categorical Exclusions (CatEx), Environmental Assessments (EA) with Finding of No Significant Impacts (FONSI), and Environmental Impact Statements (EIS) with a Record of Decision (ROD).

1.20.1 Air Quality

The National Ambient Air Quality Standards (NAAQS) are set forth by the Clean Air Act Amendments of 1997 and establish the pollutant concentrations that states, cities and towns must comply with within specified timeframes.

Air quality attainment maps were obtained from the U.S. Environmental Protection Agency's (EPA) Green Book's 2013 map of nonattainment and attainment areas. Lewiston and Nez Perce County is located within an attainment area (see **Figure 1-58**). An attainment area is a zone within which the level of a pollutant is considered to meet National Ambient Air Quality Standards. Air pollutants are emitted by a variety of means and sources at airports including: aircraft, ground support equipment (GSE), auxiliary power units, motor vehicle operations, and construction activities.

Lewiston Nez – Perce County Regional Airport



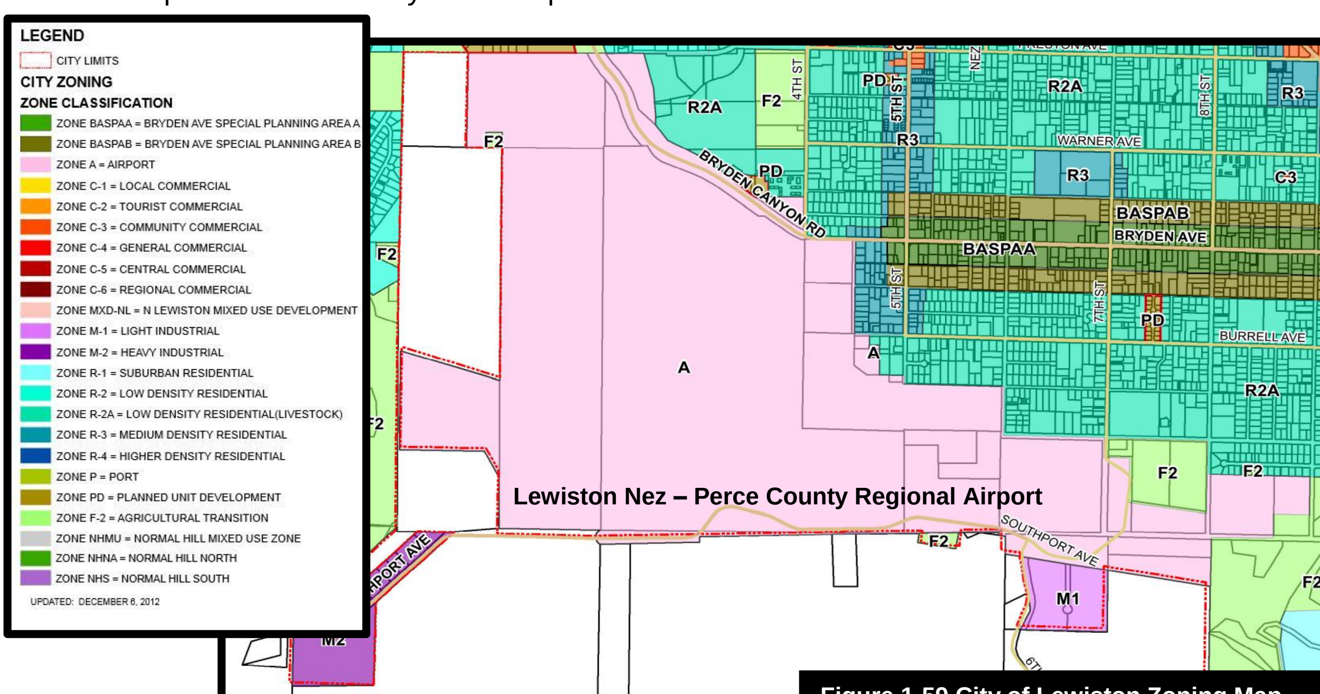
Source: epa.gov, 2013

Figure 1-58 Nonattainment Map

1.20.2 Compatible Land Use Planning

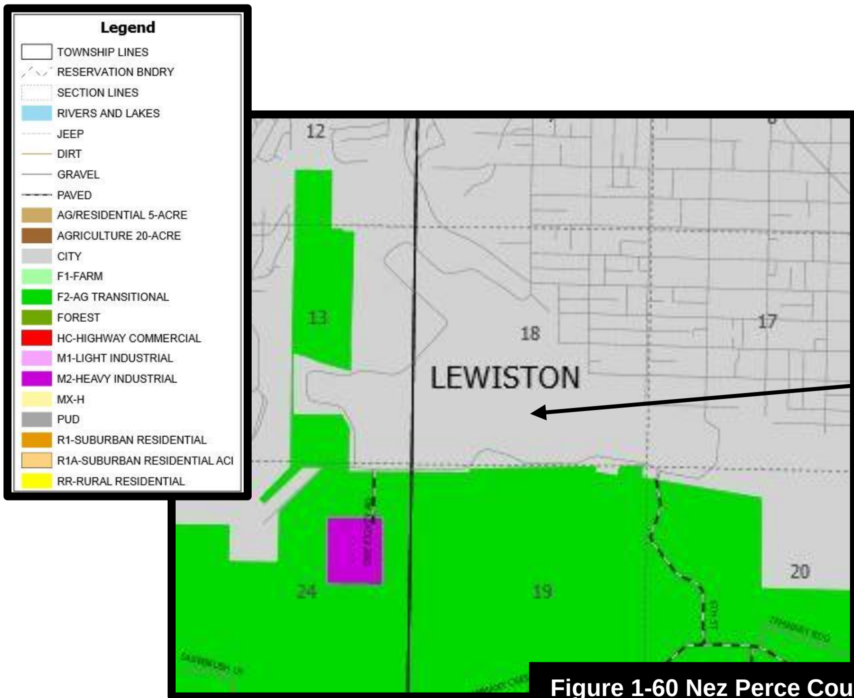
The FAA recommends that airport sponsors protect the areas surrounding an airport from incompatible development. Incompatible development includes those land uses which would be sensitive to aircraft noise or over flight, such as residences, schools, churches and hospitals and those uses which could attract wildlife and cause a hazard to aircraft operations such as landfills, ponds and wastewater treatment facilities. The land uses surrounding the Airport include industrial and commercial development. The zoning maps for the City of Lewiston, City of Clarkston and Nez Perce County are shown in **Figures 1-59** through **1-61**.

The Airport is located within the Lewiston incorporated city limits and falls within the A zoning classification which is noted as an Airport. According to City of Lewiston Zoning Plans, projects within the Airport Zone A are to "provide for uses, buildings, and structures in which airport or aviation facilities may be installed and used including taxiways and runways, commercial aviation, general aviation, terminal buildings, aircraft hangars, air navigational aids, related accessory uses and other uses, structures, and facilities as may be compatible with and useful to the airport." The City ordinance also states there is a height restriction within the Airport Zone A, which is a 45 foot and/or three story height restriction. The Airport is surrounded to the north by Low Density Residential – Animal (R2A), Agriculture Transitional (F2), Planned Unit Development (PD) and Medium Residential (R3). To the east of the airport is additional R2A and F2 zoning. The western boundaries of the airport are in contact with non-zoned land and a F2 zone. The southern portion of the airport borders are zoned by Nez Perce County as Agricultural and the City of Lewiston as F2, and Light Industrial (M1). Compatible Land Use and Height Restriction drawings are included as part of this Airport Layout Plan should be used as a tool for the City and County to use in reviewing and evaluating the compatibility of proposed development in the vicinity of the Airport.



Source: City of Lewiston, 2013

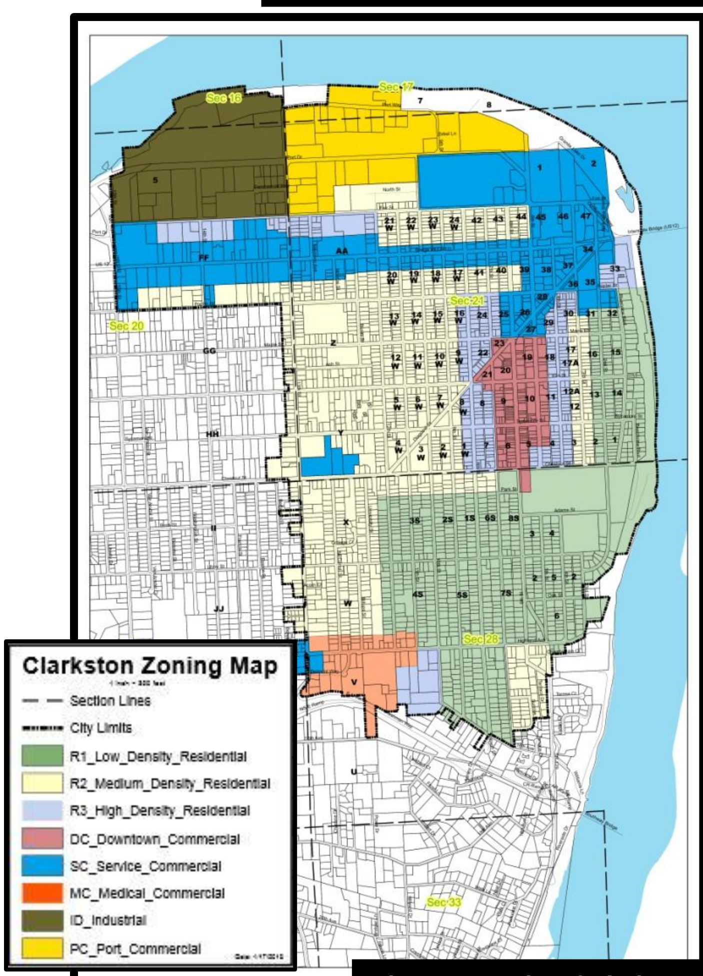
Figure 1-59 City of Lewiston Zoning Map Surrounding LWS



Lewiston Nez – Perce County Regional Airport

Source: Nez Perce County, 2013

Figure 1-60 Nez Perce County Zoning Map Surrounding LWS



Source: City of Clarkston, 2013

Figure 1-61 City of Clarkson Zoning Map

1.20.3 Department of Transportation Act – Section 4 (f)

The Department of Transportation Act (DOT Act) of 1966 included a special provision - Section 4(f) - which stipulated that the Federal Highway Administration (FHWA) and other DOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless the following conditions apply:

- There is no feasible and prudent alternative to the use of land.
- The action includes all possible planning to minimize harm to the property resulting from use.

An additional Section, 6(f), follows the same guidelines but applies to the aforementioned areas if Land and Wildlife Conservation Funds were used. There is currently the Bryden Canyon Public Golf Course, a baseball field, a park and the Lewis and Clark Memorial Gardens within the vicinity of the airport property which have the potential to be designated as Section 4(f) and/or Section 6(f) properties. There are currently no wildlife and waterfowl refuge of national, state or local significance or land from an historic site of national, state or local significance located in the vicinity of the Airport. The nearest wilderness area is the Hells Canyon Wilderness Area which is located approximately 50 miles northeast of Lewiston.

1.20.4 Prime and Unique Farmlands

The Farmland Protection Policy Act (FPPA) authorizes the Department of Agriculture to develop criteria for identifying the effects of Federal programs upon the conversion of farmland to uses other than agriculture.

Conversion of "Prime or Unique" farmland may be considered a significant impact. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed or fiber without intolerable soil erosion as determined by the Secretary of Agriculture. Unique farmland is land other than prime farmland which is used to produce specific high value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits and vegetables.

Figure 1-62 shows the land surrounding the Lewiston-Nez Perce County Regional Airport. The red mapping indicates that the land is not classified as prime or unique by the U.S. Department of Agriculture (USDA). Land that is shown in tan indicates that the land is classified as prime farmland, if irrigated. Land that is shown in green indicates areas are prime farmland. As the existing airport property is not used for farming activities, none of the property is considered to be prime or unique farmland. According to the *Farmland Protection Policy Act*, the regulation does not apply to land already committed to "urban development or water storage" (i.e., airport developed areas), regardless of its importance as defined by the National Resources Conservation Service.

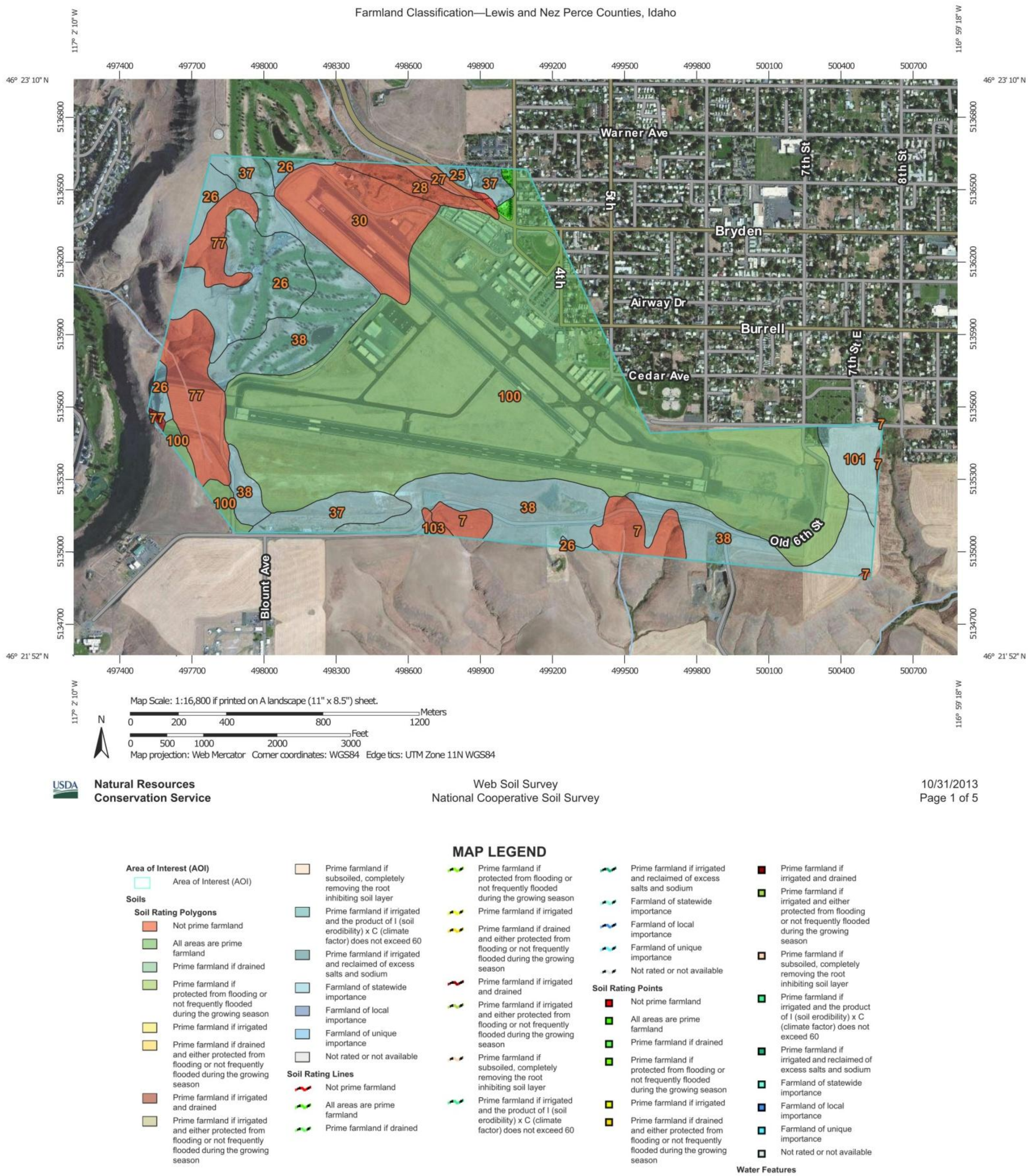


Figure 1-62 Farmland Classification Surrounding LWS

1.20.5 Floodplains

Executive Order 11988, *Federal Floodplain Management*, states that agencies must reduce the risk of flood loss, minimize the impacts of floods on human safety, health, and welfare, and restore and preserve natural and beneficial values served by floodplains. Federal Emergency Management Agency (FEMA) floodplain maps were not available for the airport property. Data for the surrounding areas show a Floodplain C which is of minimal flood hazard above the 500-year flood plan. Historical data shows there have been no flooding events at the airport. Based on the airport elevation and surrounding drainages no floodplains at the airport are known to exist. The airport is located approximately 732 feet above and one mile east of the Snake River.

1.20.6 Fish, Wildlife and Plants

The *Endangered Species Act* (16 U.S.C. §1531 et. Seq. (1973)) provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The law requires federal agencies, in consultation with the U.S. Fish and Wildlife Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designed critical habitat of such species.

The U.S. Fish and Wildlife Service website was consulted concerning the possibility of any impacts to threatened and endangered species and candidate species that may occur within the Airport environment. A list of federally threatened or endangered species was obtained for Nez Perce County. Future development projects should be evaluated to determine if any of the listed species occur or would be impacted.

The species shown are currently listed for Nez Perce and Asotin County but do not necessarily occur at or in the vicinity of Lewiston-Nez Perce County Regional Airport.

Threatened – Designated Critical Habitat

- Bull Trout, *Salvelinus confluentus* (within Nez Perce County)

Threatened

- Canada Lynx, *Lynx canadensis*
- Spalding's Catchfly, *Silene spaldingii*
- Bull Trout, *Salvelinus confluentus* (within Asotin County)

Recovery

- Gray Wolf, *Canis lupus*

1.20.7 Wetlands

Executive Order 11990, *Protection of Wetlands,* requires federally supported projects to preserve wetlands and to avoid and minimize wetland impacts to the maximum extent practicable. The use of National Wetlands Inventory (NWI) mapping, field reconnaissance, and county soil survey can aid in identifying potential wetlands and jurisdictional waters of the U.S. subject to the permitting jurisdiction of the U.S. Corp of Engineers (USACE). There do not appear to be any jurisdictional wetlands within the Airport boundary as shown in **Figure 1-63**.

Figure 1-63 Wetlands surrounding LWS

1.20.8 Noise

FAR Part 150 is a voluntary program that U.S. airports may undertake to seek a balance between their operational needs and the noise impacts their operations are having on the surrounding community. The study of airport noise and land use compatibility authorized under the Code of Federal Regulations (14 CFR) Part 150, *Airport Noise Compatibility Planning*, which sets out rules and guidelines and authorizes Federal assistance for the preparation of airport noise compatibility programs. There are two principal technical elements:

- <u>Noise Exposure Maps (NEM)</u> – describe existing noise conditions are the Airport area and projected future conditions if no noise abatement actions were taken.

- <u>Noise Compatibility Program (NCP)</u> – provides guidelines for the mitigation of existing incompatible land uses and the prevention of development that would introduce new incompatible uses.

The level of sound can be measured objectively, but noise, unwanted sound, is a very subjective matter. Techniques have been developed that measure single events in an effort to measure the noise in objective terms, giving extra weight to those sound frequencies that are most annoying to the human ear. The FAA has suggested, but not mandated, guidelines for determining land use compatibility with a given Ldn or DNL level (day/night average sound level). Ideally, residentially areas should be located in areas below 65 DNL. The existing 65 DNL noise contour does not extend beyond the Airport boundary; therefore there are no noise sensitivity or incompatible land uses within the 65 DNL noise contour. The existing noise contour is shown in **Figure 1-64**. There are no existing noise abatement programs currently in use for Lewiston-Nez Perce County Regional Airport.

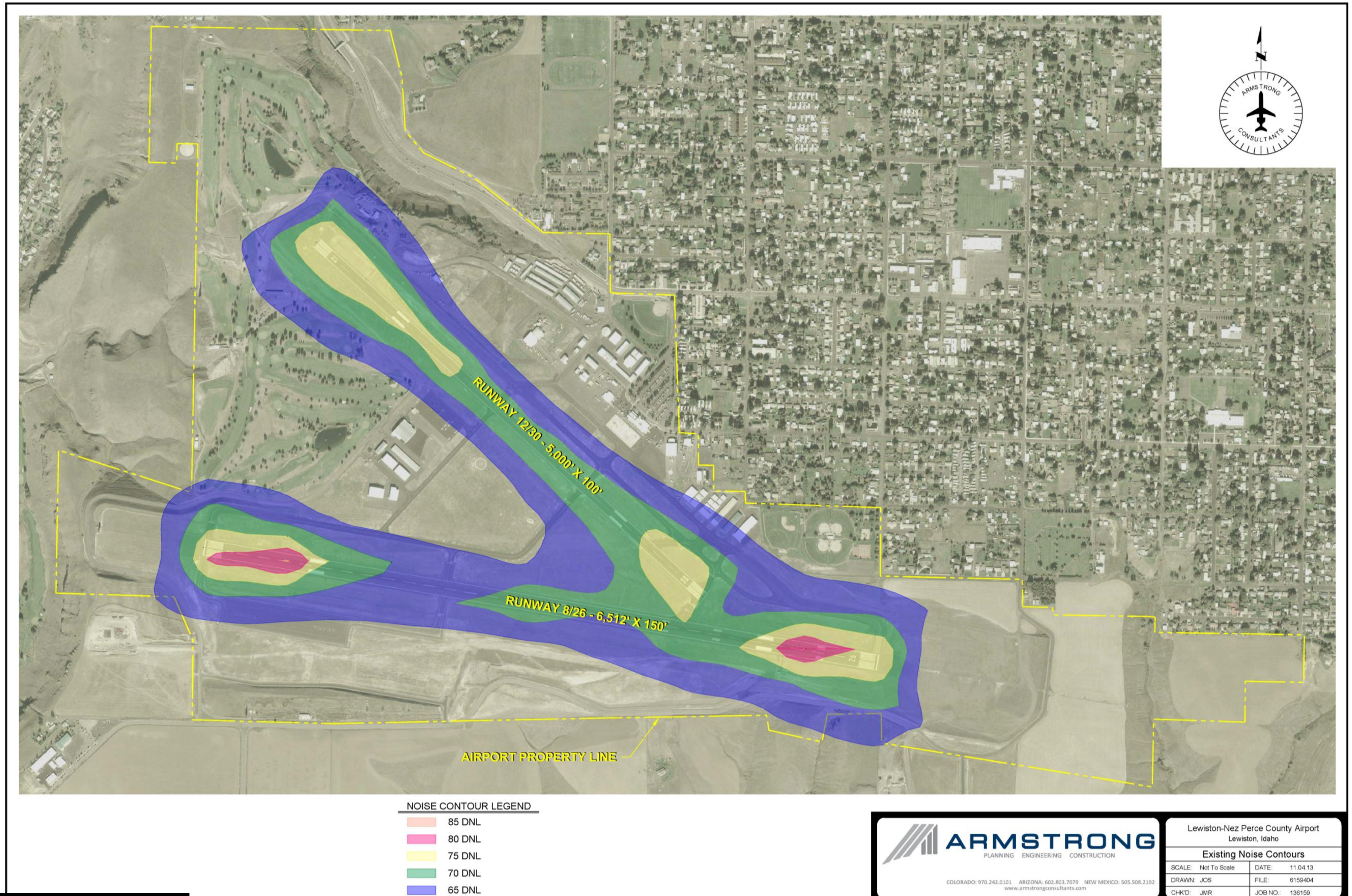


Figure 1-64 Existing Noise Contour Map

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1.21 Financial Inventory

The primary goal of gathering financial data is to develop an understanding of the financial structure, constraints, requirements, and opportunities for airport activities as it relates to the development of the future airport improvements.

Table 1-23 provides a brief overview of historical financial information for the Airport. Financial statements have been gathered for fiscal years 2012 through 2008. A review of the financial documentation for Lewiston-Nez Perce County Regional Airport indicates that the airport is not operationally self-sufficient. Primary sources of revenue for the Airport include: grant receipts, Passenger Facility Charges (PFCs), land and non-terminal facility leases and revenues and passenger airline landing fees. Primary expenses include: salaries/benefits, supplies/materials and communications/utilities.

Table 1-23 Airport Revenue and Expenditures

Airport Revenue	**2008**	**2009**	**2010**	**2011**	**2012**
Passenger Airline Aeronautical Revenue	$486,072	$155,908	$160,138	$165,642	$151,575
Non-Passenger Aeronautical Revenue	N/A	$101,366	$109,218	$84,627	$118,526
Non-Aeronautical Revenue	$185,126	$206,787	$218,474	$214,791	$279,397
Total Airport Revenue	**$671,198**	**$464,061**	**$487,830**	**$465,060**	**$549,498**
Airport Expenditures	**2008**	**2009**	**2010**	**2011**	**2012**
Operating Expenses	$581,431	$1,103,773	$570,443	$518,917	$662,933
Debt Service	$0	$252,227	$252,228	$252,228	$252,228
Total Airport Expenditures	**$581,431**	**$1,356,000**	**$822,671**	**$771,145**	**$915,161**
Net Airport Income	**$89,767**	**($891,939)**	**($334,841)**	**($306,085)**	**($365,663)**

Source: FAA Form 127 – Airport Financial Reporting, 2013

Note: Red text indicates a subsidy by the City of Lewiston and Nez Perce County tax revenues

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Chapter Two

Forecasts of Aviation Demand

Lewiston-Nez Perce County Regional Airport

Airport Master Plan

Chapter Two
Forecasts of Aviation Demand

2.1 Introduction

Forecasts of aviation activity serve as a guideline for the timing required for implementation of airport improvement programs. While such information is necessary for successful comprehensive airport planning, it is important to recognize that forecasts are only approximations of future activity, based upon historical data and viewed through present situations. They must therefore, be used with careful consideration, as they may lose their validity with the passage of time.

For this reason, an ongoing program of examination of local airport needs and national and regional trends is recommended and encouraged in order to promote the orderly development of aviation facilities at Lewiston-Nez Perce County Regional Airport.

At airports served by air traffic control towers comprehensive logs of aircraft operations are available. The existing aviation activity levels are based upon this data to form the baseline to which forecasted aviation activity trends are applied. Activity projections are made based upon estimated growth rates, area demographics, industry trends and other indicators. Forecasts are prepared for the Initial-Term (0-5 years); the Intermediate-Term (6-10 years) and the Long-Term (11-20 years) time frames. Utilizing forecasts within these time frames will allow airport improvements to be timed to meet demand, but not so early as to remain idle for an unreasonable length of time.

There are four types of aircraft operations considered in the planning process. These are termed "local, based, itinerant and transient." They are defined as follows:

<u>Local operations</u> are defined as aircraft (departures or arrivals) for the purpose of training, pilot currency or pleasure flying within the immediate area of the local airport. These operations typically consist of touch-and-go operations, practice instrument approaches, flights to and within local practice areas and pleasure flights that originate and terminate at the airport under study.

<u>Based aircraft operations</u> are defined as the total operations made by aircraft based (stored at the airport on a permanent, seasonal or long-term basis) with no attempt to classify the operations as to purpose.

<u>Itinerant operations</u> are defined as arrivals and departures other than local operations and generally originate or terminate at another airport. These types of operations are closely tied to local demographic indicators, such as local industry and business use of aircraft and usage of the facility for recreational purposes.

<u>Transient operations</u> are defined as the total operations made by aircraft other than those based at the airport under study. These operations typically consist of business or pleasure flights originating at other airports, with termination or a stopover at the study airport.

The terms transient and itinerant are sometimes erroneously used interchangeably. This study will confine analysis to local and itinerant operations.

2.2 National and Regional Trends

The FAA annually convenes expert panels in aviation and develops forecasts for future activity in all areas of aviation. The national trends listed below are from the FAA forecast fiscal years 2013-2033. Given the current instability in the global economy uncertainty remains in the timing for the recovery of demand in the aviation industry, therefore the FAA has placed a larger variance around these forecasts than in other years.

2.2.1 Regional Carriers

The FAA 2013-2033 forecast predicts regional carrier enplanements to decrease 0.2 percent to 161.7 million in 2013, and grow 2.2 percent a year thereafter, reaching 250.4 million in 2033. The regional carrier revenue passenger miles are forecast to increase 0.4 percent in 2013 and grow at an average annual rate of 3.2 percent for the remaining 20 years of the forecast period. The regional carrier passenger aircraft fleet is projected to increase from 2,403 aircraft in 2012 to 2,436 aircraft in 2033, an average annual increase of 0.2 percent. Regional jets are anticipated to increase from 1,645 aircraft in 2012 to 2,082 aircraft in 2033, an annual increase of 0.8 percent. All of the increase is attributed to jet aircraft in the 70 to 90 seat category. There will be additional discussion on the capacity gain trend and possible impact on Lewiston-Nez Perce County Regional Airport later in this chapter.

2.2.2 Cargo

Total air cargo revenue ton miles (RTMs) (freight/express and mail) increased from 36.4 billion in 2012 to 89 billion in 2033 up an average of 4.6 percent a year; domestic RTMs are forecasted to increase 0.8 percent a year; international RTMs increase 5.7 percent a year. The cargo fleet is expected to increase from 840 aircraft in 2012 to 1,211 aircraft in 2033, an average increase of 1.8 percent per year.

2.2.3 General Aviation

The general aviation fleet is anticipated to increase from 220,670 aircraft in 2012 to 246,375 in 2033, growing an average of 0.5 percent a year. Fixed-wing turbine aircraft are expected to grow at a rate of 2.8 percent per year, fixed-wing piston aircraft are projected to decline at a rate of 0.3 percent per year and rotorcraft are projected to grow at a rate of 2.7 percent per year. General aviation hours flown is forecast to increase from 24.6 million in 2012 to 33.6 million in 2033, an average annual growth of 1.5 percent per year. Fixed-wing turbine aircraft hours flown grow at a rate of 3.5 percent per year, fixed-wing piston aircraft hours flown are anticipated to decline at a rate of 0.5 percent per year and rotorcraft hours flown are forecasted grow at a rate of 2.7 percent per year.

2.2.4 Operations at Airports with FAA Traffic Control and Contract Tower Services

At airports served by air traffic control towers, total operations are forecast to grow from 50.4 million at an average annual rate of 1.0 percent for over the forecast period, reaching 61.1 million in 2033. The average annual growth rate for the entire 21-year forecast period is 0.9

percent. Commercial operations are expected to grow at a rate of 1.6 percent thereafter, reaching 30.0 million in 2033. General aviation operations are forecasted to grow at a rate of 0.5 percent thereafter, totaling 28.5 million in 2033.

2.2.5 Aviation Industry Trends

One important aviation industry trend is the increasing amount of research funding for programs like NextGen. The National Aeronautics and Space Administration (NASA), Federal Aviation Administration, States, industry and academic partners have joined forces to pursue NextGen. This long-term strategic undertaking seeks to bring next-generation technologies and improved air access to small communities. The envisioned outcome is to improve travel between remote communities and transportation centers in urban areas by utilizing a new generation of single-pilot light aircraft for personal and business transportation between the nation's 5,400 public use general aviation airports. Current NASA investments in aircraft technologies are enabling industry to bring affordable, safe and easy-to-use features to the marketplace, including "Highway in the Sky" glass cockpit operating capabilities, affordable crashworthy composite airframes, more efficient IFR flight training and revolutionary aircraft engines. To facilitate this initiative, a comprehensive upgrade of public infrastructure must be planned, coordinated and implemented within the framework of the national air transportation system. State partnerships are proposed to coordinate research support in key public infrastructure areas. Ultimately, NextGen may permit more than tripling aviation system throughput capacity by tapping the under-utilized general aviation facilities to achieve the national goal of doorstep-to-destination travel at four times the speed of highways for the nation's suburban, rural and remote communities.

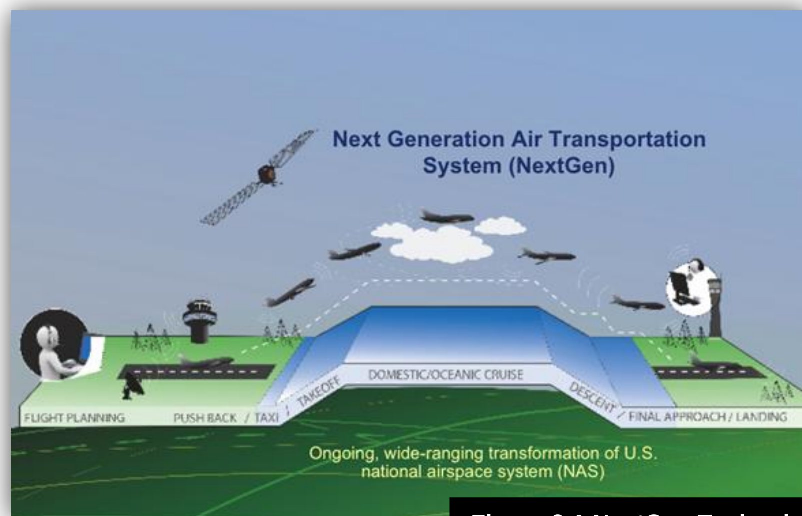


Figure 2-1 NextGen Technology

Figure 2-2 NextGen Precision

2.3 FAA and Airport Records of Based Aircraft and Operations

The FAA Form 5010-1, Airport Master Record, for January 2013 indicates 145 based aircraft and 35,219 total annual operations at the airport. The FAA reports 64,725 passenger enplanements in 2012. Airport management records indicate a total of 145 based aircraft and 35,219 total annual operations in 2012.

2.4 Available Activity Forecasts

It is crucial to evaluate historical and existing activity levels alongside currently available forecasts from external sources in order to formulate strong forecast figures. The FAA Terminal Area Forecasts (TAF) (August, 2013) indicates 146 existing based aircraft, 28,482 existing annual operations and 64,725 annual enplanements for Lewiston-Nez Perce County Regional Airport. The TAF projects 170 based aircraft, 30,915 annual operations and 114,078 annual enplanements in 2033. The 2008 Idaho Airport System Plan forecasts 171 based aircraft, 110,200 annual operations and 156,200 annual enplanements in 2027. The 1999 Lewiston-Nez Perce County Regional Airport Master Plan forecasted 151 based aircraft, 68,100 annual operations and 104,352 annual enplanements in 2017.

2.5 Forecasts of Aviation Activity

2.5.1 Factors Influencing Aviation Demand at Lewiston-Nez Perce County Regional Airport

A major factor impacting forecasted aviation demand at Lewiston-Nez Perce County Regional Airport will be the southside apron development. Lewiston-Nez Perce County Regional Airport will benefit by having additional general aviation development area on the airport property. There has been interest by several general aviation operations in the possibility of developing the southside area. Much of the infrastructure is in place for the development, including close proximity to existing utilities and apron pavement.

The southside development area expansion is anticipated to include additional Fixed Base Operator opportunities, cargo apron, hangar development and non-aeronautical revenue development. Depending on the nature of future businesses utilizing the proposed development area, this can increase total annual operations, based aircraft and passenger enplanements. Factors that could impact the success of the anticipated southside apron development would primarily be attached to availability of services and facilities, cost of operating at the developed area, local demand for additional services and the marketing of the proposed development. Once the facilities are developed there is a high probability for an increase in based aircraft and total annual operations.

Another important factor in aviation activity is Delta Air Lines' December 2012 decision for the fleet reduction of the 50-seat Canadair Regional Jet 200 and transition to the 76-seat Canadair Regional Jet 900 (**Figure 2-3**) and 110-seat Boeing 717. In doing so, the airline can eliminate the smaller, less efficient aircraft from their fleet while adding capacity and increasing passenger experience on the CRJ-900 and Boeing 717. Delta has stated the goal of the transition is to "replace the 50-seat aircraft on a capacity-neutral basis." This may have an effect on the peak-hour passenger terminal use and air carrier operations at the airport. By transitioning to larger aircraft, there is a possibility Delta may reduce their schedule from the existing two flights a day to one flight a day to maintain current capacity levels. Although no announcement by the airline has been made in regards to adjusting Delta's fleet mix at the airport, historically these changes have occurred on short notice and must be planned for accordingly.

Figure 2-3 Delta Connection Canadair Regional Jet

The Port of Lewiston, located two miles north of the Lewiston-Nez Perce County Regional Airport, has undertaken a campaign to highlight their strategic location as the furthest inland port on the West Coast of the United States. The Port of Lewiston is marketing their geographical proximity to eastern Montana and western North Dakota, where large scale oil drilling operations are occurring. The Port of Lewiston's Strategic Plan highlights positive growth throughout the coming years, tied directly to the oil industry growth. Lewiston-Nez Perce County Regional Airport would likely receive an increase in total operations, passenger enplanements and cargo tonnage to assist in the development and the following secondary effects of the anticipated Port growth. The Port of Lewiston is depicted in **Figure 2-4**.


Figure 2-4 Port of Lewiston

2.5.2 Enplanement Forecast

A comparative analysis of enplanement forecasts was accomplished using five methodologies to derive a preferred forecast of enplanements for Lewiston-Nez Perce County Regional Airport. The forecast methodologies consider growth rates for the City, County, State and region for comparative analysis.

The first method projected annual enplanement growth based on the historical and forecasted increase in Personal Per Capita Income for the City of Lewiston. This method results in 95,702 enplanements for the Lewiston-Nez Perce County Regional Airport in 2033. The first method results are shown in **Table 2-1**.

Table 2-1 Local Income Method

Year	Per Capita Personal Income	Total Enplanements
2013	28,709	64,725
2018	32,144	72,469
2023	35,579	80,214
2028	39,014	87,958
2033	42,449	95,702

The second method projected enplanements using a bottom up per capita approach in direct proportion to the projected population of Lewiston MSA. There is an anticipated 0.43 percent average annual population growth over the 20 year period. This results in 70,553 enplanements in 2033. The Per Capita Method results are shown in **Table 2-2**.

Table 2-2 Per Capita Method

Year	Forecasted Population	Total Enplanements
2013	62,933	64,725
2018	64,304	66,135
2023	65,705	67,576
2028	67,137	69,048
2033	68,599	70,553

The third method applied the FAA Regional Airline Forecast enplanements forecasted growth rate for regional airlines. The annual growth rate of 2.2 percent results in 115,993 annual enplanements in 2033. This method has been selected as the preferred method as it represents a sustained positive growth that coincides with the aforementioned local development. The Regional Airline Method results are shown in **Table 2-3**.

Table 2-3 FAA Regional Airline Forecast Method

Year	Annual Average Growth	Total Enplanements
2013	2.2%	64,725
2018	2.2%	74,451
2023	2.2%	86,309
2028	2.2%	100,056
2033	2.2%	115,993

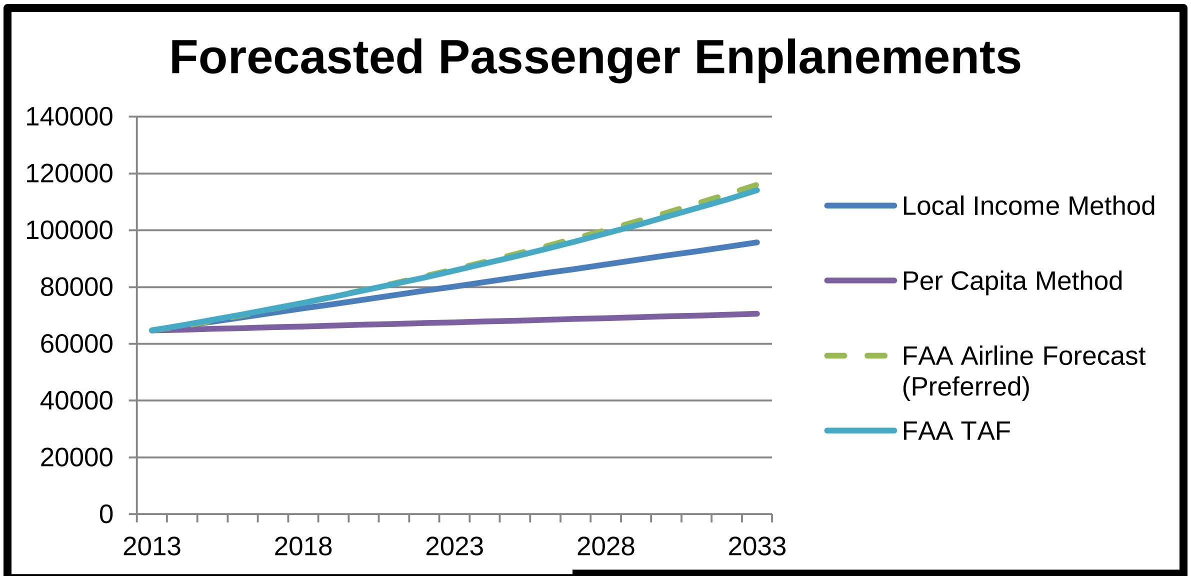


Figure 2-5 Forecasted Passenger Enplanements

2.5.3 Based Aircraft Forecast

A comparative analysis of based aircraft forecasts was accomplished using three methodologies to derive a preferred forecast of based aircraft for Lewiston-Nez Perce County Regional Airport. The forecast methodologies consider growth rates for the City, County, State and region for comparative analysis.

The first method is a market share forecast which applies the existing number of based aircraft as a percentage of the total based aircraft in the State of Idaho. In the 2013 FAA TAF for the State of Idaho shows 2,634 based aircraft. According to the Airport Master Record Form 5010-1, there are 131 based aircraft at Lewiston-Nez Perce County Regional Airport. Lewiston has a 4.9 percent share of the total based aircraft market in Idaho. The 2013 FAA TAF projects 3,441 based aircraft in the State of Idaho in 2033. By applying the 4.9 percent share, Lewiston would be projected to have 189 based aircraft in 2033. The first method results are shown in **Table 2-4**.

Table 2-4 Market Share Method

Year	FAA TAF – Idaho	Total Based Aircraft
2013	2,634	145
2018	2,843	157
2023	3,058	168
2028	3,259	179
2033	3,441	189

The second method utilized a per capita approach that projects the number of based aircraft in direct proportion to the projected population of the Lewiston MSA. This resulted in 158 based aircraft in 2033. The second method results are shown in **Table 2-5**.

Table 2-5 Per Capita Method

Year	Total Population	Total Based Aircraft
2013	62,933	145
2018	64,304	148
2023	65,705	151
2028	67,137	155
2033	68,599	158

The third forecasting method uses anticipated growth figures as a direct correlation to the development on the south apron. As future hangar development occurs on the airfield it is likely this would cause a growth in based aircraft which other forecasting methods have not incorporated. There has been interest expressed to develop the Southside Apron Area from various users. This method anticipates a higher growth percent in the initial years of development to coincide with increased hangar availability followed by a steady growth to accommodate future demand. This resulted in 191 based aircraft in 2033. The third method results are shown in **Table 2-6**.

Table 2-6 Southside Apron Development Growth

Year	Total Based Aircraft
2013	145
2018	169
2023	176
2028	184
2033	191

It is anticipated that Lewiston-Nez Perce County Regional Airport based aircraft growth rate will continue to rise as projected. A cohort forecast was utilized averaging the projected market share forecast and Southside Development forecast against the FAA TAF. This method combines the FAA's local and national projections with the pending increase in aviation demand once additional facilities associated with the southside apron development become available. This method projected a total of 184 based aircraft in 2033. All forecasts are depicted in **Table 2-7** and **Figure 2-6**. The projected based aircraft fleet mix is shown in **Table 2-8**.

Table 2-7 Forecasted Based Aircraft

Year	Market Share Based Aircraft	FAA TAF Forecast	Apron Development Based Aircraft	Cohort (Preferred)
2013	145	145	145	145
2018	157	153	169	159
2023	168	160	176	168
2028	179	165	184	176
2033	189	170	191	184

Table 2-8 Forecasted Based Aircraft Fleet Mix

	2013	2018	2023	2028	2033
Single Engine Aircraft	117	128	136	142	148
Multi Engine /Turbo-Prop Aircraft	12	13	14	15	15
Jet Aircraft	2	2	2	2	3
Rotorcraft	14	15	16	17	18
Total Based Aircraft	**145**	**159**	**168**	**176**	**184**

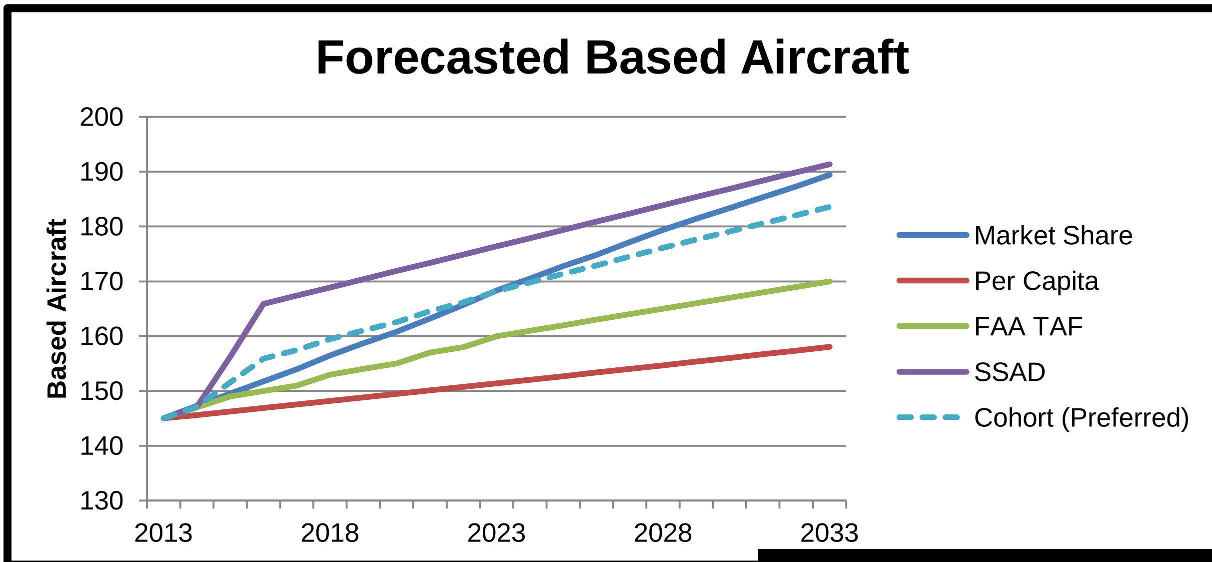


Figure 2-6 Forecasted Based Aircraft

2.5.4 Aircraft Operations Forecast

In order to develop a preferred method of forecasting aircraft operations at Lewiston-Nez Perce County Regional Airport, a number of methods were analyzed. Each method utilizes the preferred based aircraft forecast of 184 based aircraft in 2033, and then applies an OPBA to the based aircraft forecast. The methods are summarized as follows:

Method 1: Existing operations and based aircraft (243 OPBA)

Method 2: FAA Order 5090.3C (450 OPBA)

Method 3: 2008 Idaho Airport System Plan (644 OPBA)

Method 4: Cohort (346 OPBA)

For the first method, the base year level of operations per based aircraft of 243 was applied to the preferred based aircraft forecast. Applying 243 OPBA to the preferred based aircraft forecast results in 44,692 annual operations in 2033.

For the second method, a general guideline from FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS) of 450 OPBA for busy reliever airports was applied to the based aircraft forecast. Applying 450 OPBA to the preferred based aircraft forecast results in 82,800 forecast operations in 2033.

The third method is the OPBA calculated from the 2008 Idaho Airport System Plan forecast for 2027. The projected OPBA for Lewiston-Nez Perce County Regional Airport is 644. Applying 644 OPBA to the preferred based aircraft forecast results in 118,578 annual operations in 2033.

The fourth method is an average between Method 1 and Method 2 of 346 OPBA. This method accounts for the increase in growth that would occur from future facility development within the southside apron. The planned development is anticipated to increase operations of both based and transient aircraft at Lewiston-Nez Perce County Regional Airport. Applying 346 OPBA to the preferred based aircraft forecast results in 63,746 annual operations in 2033.

These estimates provide a likely range of activity for future operations at Lewiston-Nez Perce County Regional Airport and are shown in **Table 2-9** and **Figure 2-7**. Aircraft operations are expected to increase with the additional based aircraft and future development. It is reasonable to anticipate that the OPBA will increase at a moderate rate in the initial time frame as a result of the southside apron development and projected economic growth in the Lewiston/Clarkston area. Therefore, Method 4 has been selected as the preferred operations forecast.

2.5.5 Itinerant and Local Operations

Local operations consist of training, business and recreational flights in the area. Itinerant flights, including those by locally based aircraft, primarily consist of airline, cargo, personal transportation, business transportation and recreational flights to and from other airports. The existing split of 60 percent itinerant operations and 39 percent local operations is expected to remain fairly constant over the 20 year planning period. Anticipated users whose operations would likely be considered local include agricultural, aerial observation and surveying, recreation, tourism and flight training. The breakdown of itinerant operations is approximately 11 percent air carrier, 5 percent air taxi, 41 percent general aviation and 2 percent military.

Currently, Delta Air Lines and Alaska Airlines offer scheduled passenger service with the Canadair Regional Jet 200 and Bombardier Q400, respectively. The direct passenger connections include Boise, Idaho, Pullman-Moscow, Washington, Salt Lake City, Utah, and Seattle, Washington. Combined, the two carriers accounted for 5,538 total annual operations in 2012 at the airport. If either airline were to adjust their fleet or there were efforts to pursue additional air service this may change the number of total annual operations, total passenger enplanements and total number of commercial service operations.

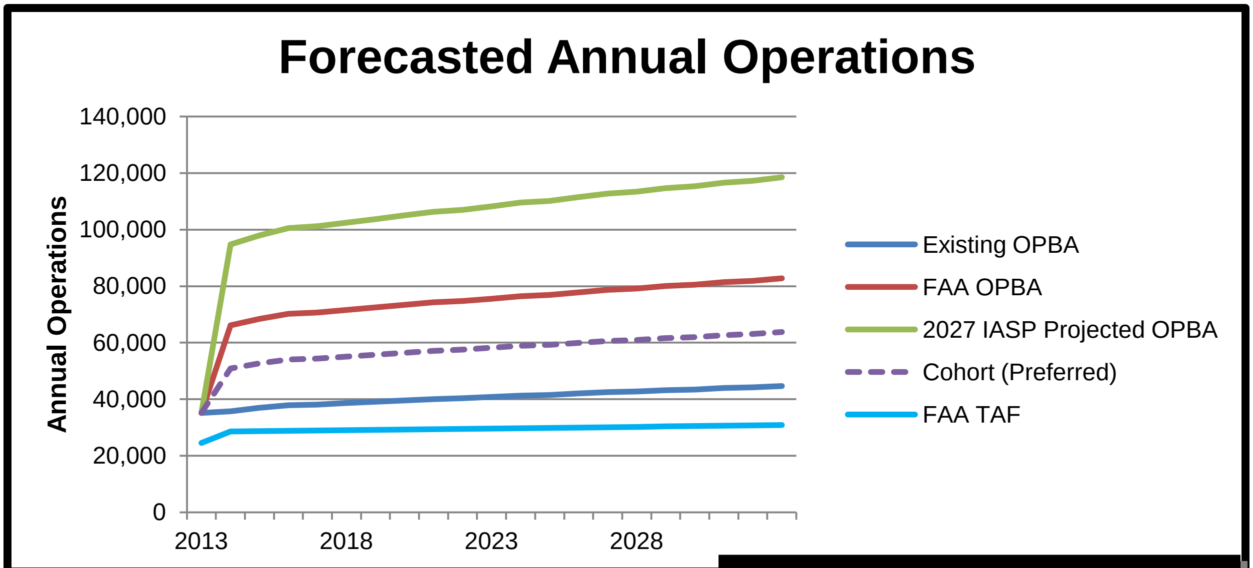


Figure 2-7 Forecasted Annual Operations

Table 2-9 Forecasted Annual Operations

Year	Air Carrier	Air Taxi	GA-Local	GA-Itinerant	Military	Total Ops
2013	1,817	3,997	13,875	14,717	813	35,219
2018	2,842	6,252	22,160	23,018	813	55,085
2023	3,003	6,605	23,461	24,321	813	58,203
2028	3,146	6,920	24,617	25,479	813	60,974
2033	3,289	7,235	25,773	26,638	813	63,746

2.6 Airport Seasonal Use Determination

A seasonal fluctuation in aircraft operations can be expected at any airport. This fluctuation is most apparent in regions with severe winter weather patterns and non-towered general aviation airports. The fluctuation is less pronounced at major airports, with a high percentage of commercial and scheduled airline activity.

A review of the Lewiston-Nez Perce County Regional Airport aircraft movement data for 2012 collected by Air Traffic Control provides an accurate depiction of the airport's seasonal use trends, shown in **Figure 2-8.** The peak month for total operations was July.

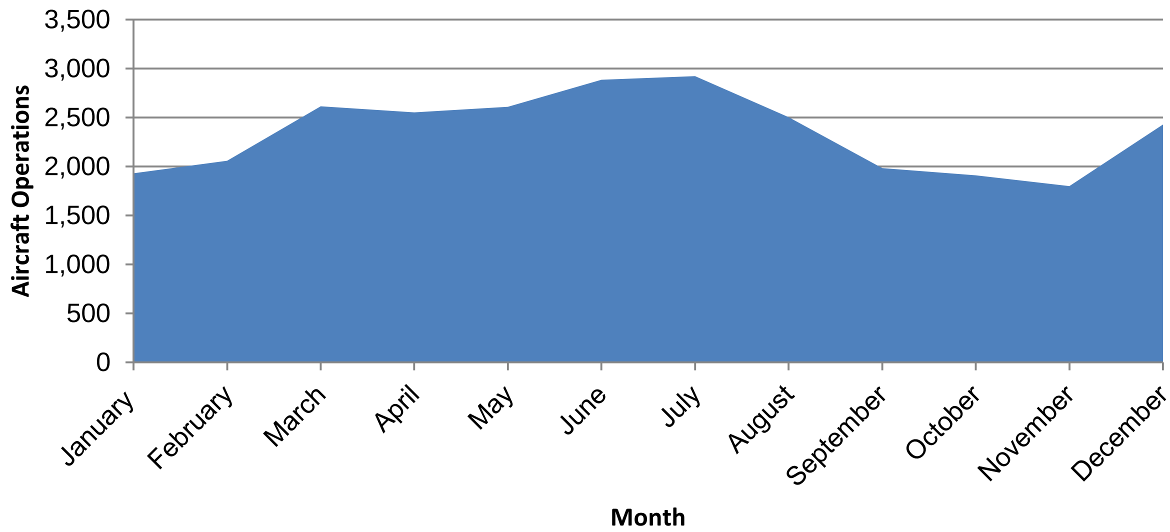


Figure 2-8 Aircraft Movement Data

Source: Lewiston ATCT, 2012

2.7 Hourly Demand and Peaking Tendencies

In order to arrive at a reasonable estimate of demand at the airport facilities, it was necessary to develop a method to calculate the levels of activity during peak periods. The periods normally used to determine peaking characteristics are defined below:

Peak Month: The calendar month when peak enplanements or operations occur.

Design Day: The average day in the peak month derived by dividing the peak month enplanements or operations by the number of days in the month.

Busy Day: The Busy Day of a typical week in the peak month. In this case, the Busy Day is equal to the Design Day.

Design Hour: The peak hour within the Design Day. This descriptor is used in airfield demand/capacity analysis, as well as in determining terminal building, parking apron and access road requirements.

Busy Hour: The peak hour within the Busy Day. In this case, the Busy Hour is equal to the Design Hour.

Airport management recorded monthly operations from January to December 2012 which was used as a tool to determine the peaking characteristics for Lewiston-Nez Perce County Regional Airport. Using the operation records, a formula was derived which will calculate the average daily operations in a given month, based on the percentage of the total annual operations for that month, as determined by the curve. The formula is as follows:

M	=	A (T / 100)
D	=	M / (365 / 12)

Where T	=	Monthly percent of use (from curve)
M	=	Average monthly operations
A	=	Total annual operations
D	=	Average Daily Operations in a given month

Approximately 90% of total daily operations occur between the hours of 7:00 AM and 7:00 PM (12 hours) at a typical general aviation airport, meaning the maximum peak hourly occurrence may be 50% greater than the average of the hourly operations calculated for this time period.

The Estimated Peak Hourly Demand (P) in a given month was, consequently, determined by compressing 90% of the Average Daily Operations (D) in a given month into the 12-hour peak use period, reducing that number to an hourly average for the peak use period and increasing the result by 50% as follows:

$$P = 1.5\,(0.90D / 12)$$

Where D	=	Average Daily Operations in a given month.
P	=	Peak Hourly Demand in a given month.

The calculations were made for each month of each phase of the planning period. The results of the calculations are shown in **Table 2-9**. As is evident in **Table 2-9**, the Design Day and Design Hour peak demand in the planning year occurs under VFR weather conditions in the month of July (highlighted in bold), with an average of 217 daily operations and approximately 2.44 operations per hour in 2033.

Figure 2-9 Horizon Air Q400

Figure 2-10 SkyWest Airlines CRJ-200

Source: Erwin van Hassel

Table 2-10 Estimated Monthly/Daily/Hourly Demand – Operations

MONTHLY/DAILY/HOURLY DEMAND									
Planning Year: 2018					Planning Year: 2023				
Operations:	55,085				Operations:	58,203			
		Operations					Operations		
Month	% Use	Monthly	Daily	Hourly	Month	% Use	Monthly	Daily	Hourly
January	6.84%	3,770	124	13.9	January	6.84%	3,984	131	14.7
February	7.30%	4,021	132	14.9	February	7.30%	4,248	140	15.7
March	9.27%	5,108	168	18.9	March	9.27%	5,397	177	20.0
April	9.05%	4,987	164	18.4	April	9.05%	5,269	173	19.5
May	9.26%	5,098	168	18.9	May	9.26%	5,387	177	19.9
June	10.24%	5,638	185	20.9	June	10.24%	5,957	196	22.0
July	**10.37%**	**5,710**	**188**	**21.1**	**July**	**10.37%**	**6,034**	**198**	**22.3**
August	8.88%	4,891	161	18.1	August	8.88%	5,168	170	19.1
September	7.03%	3,874	127	14.3	September	7.03%	4,093	135	15.1
October	6.77%	3,729	123	13.8	October	6.77%	3,940	130	14.6
November	6.38%	3,514	116	13.0	November	6.38%	3,713	122	13.7
December	8.61%	4,744	156	17.5	December	8.61%	5,013	165	18.5

Planning Year: 2028					Planning Year: 2033				
Operations:	60,974				Operations:	63,746			
		Operations					Operations		
Month	% Use	Monthly	Daily	Hourly	Month	% Use	Monthly	Daily	Hourly
January	6.84%	4,173	137	15.4	January	6.84%	4,363	143	16.1
February	7.30%	4,451	146	16.5	February	7.30%	4,653	153	17.2
March	9.27%	5,654	186	20.9	March	9.27%	5,911	194	21.9
April	9.05%	5,520	181	20.4	April	9.05%	5,771	190	21.3
May	9.26%	5,643	186	20.9	May	9.26%	5,900	194	21.8
June	10.24%	6,241	205	23.1	June	10.24%	6,524	215	24.1
July	**10.37%**	**6,321**	**208**	**23.4**	**July**	**10.37%**	**6,608**	**217**	**24.4**
August	8.88%	5,414	178	20.0	August	8.88%	5,660	186	20.9
September	7.03%	4,288	141	15.9	September	7.03%	4,483	147	16.6
October	6.77%	4,128	136	15.3	October	6.77%	4,316	142	16.0
November	6.38%	3,890	128	14.4	November	6.38%	4,067	134	15.0
December	8.61%	5,251	173	19.4	December	8.61%	5,490	181	20.3

Peak passenger enplanements were also calculated to determine the passenger terminal building holding capacity. Airport management records indicate July as the busiest month for passenger enplanements. The existing peak hour of enplanements was calculated using the total number of aircraft passenger seats available with the Bombardier Q400 and Canadair Regional Jet 200 (126 seats) on the ground at the airport at the same time. The forecasted peak hour was determined by the percentage of the existing peak hour directly related to forecasted yearly enplanements. The estimated monthly, daily and hour passenger enplanement demand is shown in **Table 2-11**.

Table 2-11 Estimated Monthly/Daily/Hourly Demand – Passenger Enplanements

	2018	2023	2028	2033
Yearly Enplanement	74,451	86,309	100,056	115,993
Peak Month	6,164	7,146	8,284	9,603
Peak Month Average Day	199	231	267	310
Peak Hour	146	169	196	228

2.8 Forecast Summary

Forecasts of activity were developed for based aircraft, operations and the ultimate fleet mix at the airport. These forecasts represent low, medium and high expected activity trends. The FAA TAF does not accurately reflect future total annual operations and based aircraft as it does not account for existing airport activity levels. It is assumed the existing hangar facilities are constrained as current demand exceeds availability. The southside apron and hangar development will eliminate these constraints and there will be a significant short-term increase in based aircraft and total annual operations which will normalize in the medium to long term. For this reason, future operations exceed the TAF by more than 10 percent. Future based aircraft or total passenger enplanements do not exceed the TAF by more than 10 percent. **Table 2-12** shows a summary of the preferred forecast for the Lewiston-Nez Perce County Regional Airport through the 20 year planning period, while utilizing the most current based aircraft data for the baseline year.

Table 2-12 Forecast Summary

		Aircraft Operations						
Year	Passengers Enplaned	Air Carrier	Air Taxi	GA – Local	GA - Itinerant	Military	Total Ops	Based Aircraft
2013	64,725	1,817	3,997	13,875	14,717	813	35,219	145
2018	74,451	2,842	6,252	21,701	23,018	813	55,085	159
2023	86,309	3,003	6,605	22,930	24,321	813	58,203	168
2028	100,056	3,146	6,920	24,022	25,479	813	60,974	176
2033	115,993	3,289	7,235	25,114	26,638	813	63,746	184

CHAPTER THREE

FACILITY REQUIREMENTS

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN

Chapter Three
Facility Requirements

3.1 Introduction

One of the primary objectives of this planning study is to determine the size and configuration of airport facilities needed to accommodate the types and volume of aircraft expected to utilize the airport. Data from Chapter 1 – Inventory and Chapter 2 – Forecasts of Aviation Demand are coupled with established planning criteria to determine the improvements that are necessary for airside and landside areas.

The time frame for addressing development needs usually involves short-term (up to five years), medium-term (six to ten years) and long-term (eleven to twenty year) periods. Long range planning primarily focuses on the ultimate role of the airport and protects for post-planning period development. Medium-term planning focuses on a more detailed assessment of needs, while the short-term analysis focuses on immediate action items and correction of design standard deficiencies.

3.2 Design Standards

The runway design code (RDC) is a system established by the FAA to relate airport design criteria to the operational and physical characteristics of the aircraft that are currently operating and/or forecast to operate at the airport. The RDC has three primary components relating to airport design. The first component, depicted by letters A through E, is categorized by the design aircraft approach speed which determines the runway approach category (operational characteristic). The second component, depicted by Roman numerals I through VI, is categorized by either the design aircraft wingspan or tail height, utilizing the characteristic that places the aircraft in the highest design group (physical characteristic). The third component relates to the visibility minimums expressed by Runway Visual Range (RVR) values which are listed in feet (1,200, 1,600, 2,400, 4,000 and 5,000). If the airport does not have an instrument approach it is listed as VIS. In general, the approach category of the design aircraft will determine the required design parameters for runway and runway facilities while the aircraft

Table 3-1 Runway Design Code

Approach Category	Approach Speed	
Category A	less than 91 knots	
Category B	91 to 120 knots	
Category C	121 to 140 knots	
Category D	141 to 165 knots	
Category E	166 knots or more	
Design Group	**Wingspan**	**Tail Height**
Group I	< than 49 feet	< than 20 feet
Group II	49 to 78 feet	20 to 29 feet
Group III	79 to 117 feet	30 to 44 feet
Group IV	118 to 170 feet	45 to 59 feet
Group V	171 to 213 feet	60 to 65 feet
Group VI	214 to 261 feet	66 to 79 feet
RVR (ft)	**Flight Visibility Category (Statue Mile)**	
5,000	Not lower than 1 mile	
4,000	Lower than 1 mile but not lower than 3/4 mile (APV ≥ 3/4 but < 1 mile)	
2,400	Lower than 3/4 mile but not lower than 1/2 mile (CAT - I PA)	
1,600	Lower than 1/2 mile but not lower than 1/4 mile (CAT - II PA)	
1,200	Lower than 1/4 mile (CAT - III PA)	

Source: FAA AC 150/5300-13A, *Airport Design* wingspan or tail height will determine the required taxiway and taxilane separation criteria. **Table 3-1** has been included to provide a definition of both aircraft approach categories and aircraft design groups. Examples of each of these RDC are depicted in **Figure 3-2**.

To ensure that all airport facilities are designed to accommodate the expected air traffic and to meet FAA criteria, the specific RDC for the runway must be determined. In order to designate a specific RDC for a runway, aircraft in that RDC should perform a minimum of 500 annual operations. The aircraft currently using the Lewiston-Nez Perce County Regional Airport on a regular basis have a RDC of A-I, B-I, B-II, C-II and C-III.

The majority of typical business jet aircraft and very light jet aircraft which operate at Lewiston fall into the B-I, C-I, B-II and C-II RDC. The majority of commercial service aircraft fall into the C-III to D-IV RDC. Commercial service aircraft operating into Lewiston-Nez Perce County Regional Airport fall into the C-II to D-III RDC. Airport users and fleet mix were discussed in the Forecast Chapter. Examples of aircraft with a RDC of A-I and B-I are listed in **Table 3-2**. Examples of aircraft with a RDC of A-II and B-II are listed in **Table 3-3**. Examples of aircraft with a RDC of C-II and D-II are listed in **Table 3-4**. Examples of aircraft with a RDC of C-III and D-III are listed in **Table 3-5**. Aircraft with a RDC of A-I through C-III are expected to utilize the airport in the short, medium and long-term time frames.

As discussed in the Forecast Chapter, an emerging trend occurring for various airlines is a reduction in 50-seat regional jet aircraft operations. Delta Air Lines has begun to reduce their fleet of the Bombardier Canadair Regional Jet 200 in favor of the larger Canadair Regional Jet 700/900 and the Boeing 717-200. Destinations that are considered to be “capacity neutral” are less reliant on a higher frequency of flights with smaller aircraft and can be adequately served by a reduced schedule with larger aircraft. This allows the airline to transport an equal amount of passengers at a reduced cost. It is likely within the planning period the fleet mix of commercial service aircraft at Lewiston-Nez Perce County Regional Airport will change along with industry trends.

The future and ultimate design aircraft for this study is identified as the Boeing B717-200 for Runway 8/26 and the Cessna Citation III for Runway 12/30. Furthermore, the Boeing B717-200 and Cessna Citation III aircraft were selected as the design aircraft as they are common commercial service and corporate aircraft which either use the airport or are expected to increase utilization during the 20-year planning period.

Figure 3-1 Boeing 717-200

Source: aerospace-technology.com

This information indicates that the fundamental development items for the short, medium and long term will remain at a RDC of C-III for Runway 8/26 for aircraft weighing up to 400,000 pounds and B-II for Runway 12/30 for aircraft weighing up to 150,000 pounds. It is anticipated that operations A-I through D-III aircraft will continue to during the short, medium and long term.

Table 3-2 Example Aircraft Having a RDC of A-I or B-I

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Beech Baron 58P	101	37.8	9.1	6,200
Beech Bonanza V35B	70	33.5	6.6	3,400
Beech King Air B100	111	45.9	15.3	11,799
Cessna 150	55	33.3	8.0	1,670
Cessna 172	60	36.0	9.8	2,200
Cessna 177	64	35.5	8.5	2,500
Cessna 182	64	36.0	9.2	2,950
Cessna 340	92	38.1	12.2	5,990
Cessna 414	94	44.1	11.5	6,750
Cessna Citation I	108	47.1	14.3	11,850
Gates Learjet 28/29	120	42.2	12.3	15,000
Mitsubishi MU-2	119	39.1	13.8	10,800
Piper Archer II	86	35.0	7.4	2,500
Piper Cheyenne	110	47.6	17.0	12,050
Rockwell Sabre 40	120	44.4	16.0	18,650
Swearingen Merlin	105	46.3	16.7	12,500
Raytheon Beechjet	105	43.5	13.9	16,100
Eclipse 500 Jet	90	37.9	13.5	5,920

Source: FAA AC 150/5300-13A, *Airport Design* or Aircraft Manufacturer Performance Data

Table 3-3 Example Aircraft Having a RDC of A-II or B-II

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Air Tractor 802F	105	58.0	11.2	16,000
Beech King Air C90-1	100	50.3	14.2	9,650
Beech Super King Air B200	103	54.5	14.1	12,500
Cessna 441	100	49.3	13.1	9,925
Cessna Citation Bravo	112	52.2	15.0	14,800
Cessna Citation II	108	51.6	15.0	13,300
Cessna Citation III	114	50.6	16.8	17,000
Dassault Falcon 200	114	53.5	17.4	30,650
Dassault Falcon 50	113	61.9	22.9	37,480
Dassault Falcon 900	100	63.4	24.8	45,500
DHC-6 Twin Otter	75	65.0	19.5	12,500
Embraer 120	120	65.0	21.0	26,455
Grumman Gulfstream I	113	78.5	23.0	35,100
Pilatus PC-12	85	52.3	14.0	9,920

Source: FAA AC 150/5300-13A, *Airport Design* or Aircraft Manufacturer Performance Data

Table 3-4 Example Aircraft Having a RDC of C-II or D-II

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
1329 JetStar	132	54.5	20.4	43,750
Astra 1125	126	52.5	18.1	23,500
Bombardier CRJ-200	125	61.8	20.7	41,250
Bombardier CRJ-700	135	76.3	24.1	75,000
Cessna Citation 650	126	53.6	16.8	23,000
Cessna Citation 750 X	131	63.6	18.9	36,100
Embraer 145	135	65.8	22.2	48,501
Falcon 900 EX	126	63.5	24.2	48,300
Gulfstream-II	141	68.8	24.5	65,300
Gulfstream-III	136	77.8	24.4	68,700
Gulfstream-IV	145	77.8	24.4	71,780
Hawker 125-1000	130	61.9	17.1	36,000
Rockwell 980	121	52.1	14.9	10,325

Source: FAA AC 150/5300-13A, *Airport Design* or Aircraft Manufacturer Performance Data

Table 3-5 Example Aircraft Having a RDC of C-III or D-III

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Airbus A-319	138	111.9	39.7	166,449
Airbus A-320	136	111.9	39.6	171,961
Boeing 717-200	139	93.2	29.8	121,000
Boeing 737-700	130	112.5	41.7	154,500
Boeing 737-800	142	117.5	41.2	174,200
Bombardier CRJ-900	142	81.7	24.1	84,500
Bombardier Q400	129	93.3	27.4	65,200
Embraer 175	124	85.3	31.9	82,673
Gulfstream G550	140	93.5	25.8	85,100
MDC MD-83	144	107.9	30.2	160,000
MDC MD-90	138	107.9	31.2	156,000

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

AI
Primarily Single-Engine Propeller Aircraft, some light twins

BI
Primarily Light Twin-Engine Propeller Aircraft

Example Type: Cessna 172 Skyhawk

Example Type: Piper Navajo

BII
(<12,500 lbs)
Primarily Light Turboprops

BII
(>12,500 lbs)
Mid-sized corporate jets and commuter airliners

Example Type: Beechcraft King Air

Example Type: Cessna Citation II

A/BIII
Primarily large commuter-type aircraft

CI, DI
Primarily small and fast corporate jets

Example Type: De Havilland Dash 8

Example Type: Lear Jet 36

C/DII
Large corporate jets and regional-type commuter jets

C/DIII
Commercial airliners (approx. 100-200 seats)

Example Type: Gulfstream IV

Example Type: Boeing 737

C/DIV
Large commercial airliners (approx. 200-350 seats)

DV
Jumbo commercial airliners (approx. 350+ seats)

Example Type: Boeing 767

Example Type: Boeing 747

Figure 3-2 Aircraft Characteristics Diagram

3.3 Airfield Capacity

The Annual Service Volume (ASV) is a calculated reasonable estimate of an airport's annual capacity; taking into account differences in runway utilization, weather conditions and aircraft mix that would be encountered in one year. When compared to the forecasts or existing operations of an airport, the ASV will give an indication of the adequacy of a facility in relationship to its activity level. The ASV is determined by reference to the charts contained in FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*.

FAA Advisory Circular 150/5060-5, *Airport Capacity and* Delay, was used to calculate the ASV for a two-runway airport with the forecasted operation levels determined in Chapter 2 – Forecast. Based on the Advisory Circular, the ASV for the existing and future runway configuration and fleet mix is 260,000 operations per year. The current operations account for approximately 14 percent of the airport's ASV. The forecasted operations account for 25 percent of the airport's ASV. Under these conditions, the existing runway facilities will adequately meet the demand within the time frame of this study. **Table 3-6** summarizes the projected ASV within the planning period.

Table 3-6 Annual Service Volume Summary

Year	Annual Operations	Annual Service Volume	Annual Capacity Ratio
2013	35,219	260,000	14%
2018	55,085	260,000	21%
2023	58,203	260,000	22%
2028	60,974	260,000	23%
2033	63,746	260,000	25%

Source: Armstrong Consultants, 2014

3.4 Airside Facility Requirements

The airside facilities of an airport are described as the runway configuration, the associated taxiway system, the ramp and aircraft parking area and any visual or electronic approach aids.

3.4.1 Runway Requirements

Runway Length: FAA Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design*, provides guidance for determining runway length requirements. The information required to determine the recommended runway lengths includes, airfield elevation, mean maximum temperature of the hottest month and the effective gradient for the runway. The following information for the Lewiston-Nez Perce County Regional Airport was used for the analysis:

Field Elevation: 1,442 feet MSL
Mean Maximum Temperature of Hottest Month: 89.3^{o} F
Effective Gradient: 6 Feet

The process to determine recommended runway lengths for a selected list of critical design airplanes begins with determining the weights of the critical aircraft that are expected to use the airport on a regular basis. For aircraft weighing 60,000 pounds or less, the runway length is determined by family groupings of aircraft having similar performance characteristics. The first family grouping is identified as small airplanes, which is defined by the FAA as airplanes weighing 12,500 pounds or less at Maximum Takeoff Weight (MTOW). The second family grouping is identified as large airplanes, which is defined by the FAA as airplanes exceeding 12,500 pounds but weigh less than 60,000 pounds. Aircraft weighing more than 60,000 pounds are classified as an individual large airplane. The required runway length is determined by aircraft-specific length requirements. **Table 3-7** shows the aircraft families defined by the FAA.

Table 3-7 Airplane Weight Categorization for Runway Length Requirements

Airplane Weight Category Maximum MTOW			Design Approach
≤ 12,500 Pounds	Approach Speed < 30 knots		Family groupings of small airplanes
	Approach Speed ≥ 30 knots, but < 50 knots		Family groupings of small airplanes
	Approach Speed ≥ 50 knots	With < 10 Passengers	Family groupings of small airplanes
		With ≥ 10 Passengers	Family grouping of small airplanes
Over 12,500 pounds, but < 60,000 pounds			Family groupings of large airplanes
≥ 60,000 pounds or more, or Regional Jets			Individual large airplane
Note: All regional jets, regardless of their MTOW, are assigned to the 60,000 pounds or more weight category.			

Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*

Recommended runway lengths to serve large aircraft weighing over 12,500 pounds, but less than 60,000 pounds are determined using a certain percentage of the useful load. According to FAA Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design*, 75 percent of fleet at 60 and 90 percent useful load requires runway lengths of 5,500 and 7,000 feet respectively. The Advisory Circular shows 100 percent of fleet at 60 and 90 percent useful load requires a runway length of 5,900 feet and 8,850 feet respectively. **Table 3-8** provides the recommended runway length information.

Recommended runway lengths are determined using charts in FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, based on the seating capacity and the mean daily maximum temperature of the hottest month of the year at the airport. The existing runway lengths of Runway 8/26 and Runway 12/30 accommodate 100 percent of all small aircraft weighing less than 12,500 pounds. The existing runway length for Runway 12/30 accommodates 74 percent of large aircraft weighing over 60,000 pounds at 60 percent useful load. The existing runway length for Runway 8/26 can accommodate 100 percent of large aircraft weighing over 60,000 pounds at 60 percent useful load. Large aircraft weighing over 60,000 pounds typically will be weight restricted as the length of Runway 8/26 is unable to accommodate 75 percent of planes at 90 percent useful load. The term useful load, as defined by the FAA, is the difference between the maximum allowable structural gross weight and the operating empty weight. A typical operating empty weight includes the airplane's empty weight, crew, baggage, other crew supplies, removable passenger service equipment, removable emergency equipment, engine oil and unusable fuel.

Table 3-8 Recommended Runway Length

Description	Runway Length
Existing Runway Length	RW 8/26: 6,512’ RW 12/30: 5,000’
Recommended to accommodate:	
Small Aircraft (<12,500 lbs.,< 10 passenger)	
75 percent of these small airplanes	2,990’
95 percent of these small airplanes	3,550’
100 percent of these small airplanes	4,190’
Large Aircraft (≥60,000 lbs.)	
75 percent of these planes at 60 percent useful load	5,500’
75 percent of these planes at 90 percent useful load	7,000’
100 percent of these planes at 60 percent useful load	5,900’
100 percent of these planes at 90 percent useful load	8,850’

Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*

Takeoff Distance Requirements: When determining runway length requirements for an airport it is necessary to consider the types of aircraft (aircraft design group and critical aircraft) that will be using the airport and their respective takeoff distance requirements. **Figure 3-3** gives examples of takeoff distance requirements for some of the aircraft currently using and projected to utilize Lewiston-Nez Perce County Regional Airport.

The takeoff distance requirements for commercial service aircraft will vary depending on the stage length the aircraft will be travelling. Typically, a commercial service aircraft will carry less fuel if it is operating to a destination at a distance less than the maximum range. With less fuel on board, the takeoff distance can be reduced from the requirement for an aircraft at MTOW. While the Bombardier CRJ-700 and CRJ-900 at MTOW require a runway length greater than provided at Lewiston-Nez Perce County Regional Airport, the two aircraft can operate at full useful load with a reduced range. The Bombardier CRJ-700 and CRJ-900 are both operated by SkyWest Airlines which operates on behalf of both Alaska Airlines and Delta Air Lines. According to Bombardier performance data, the CRJ-700 and CRJ-900 could reach destinations such as Denver, Colorado; Las Vegas, Nevada; Phoenix, Arizona; San Francisco, California; Salt Lake City, Utah; and Seattle/Tacoma, Washington when operating from Lewiston.

The conditions at Lewiston-Nez Perce County Regional Airport include a low elevation above MSL, moderate temperatures and the relatively flat runway gradients. The existing field conditions provide aircraft with enhanced performance including shorter takeoff and landing distances. The existing runway lengths are considered to be adequate for the existing and forecasted aircraft fleet mix.

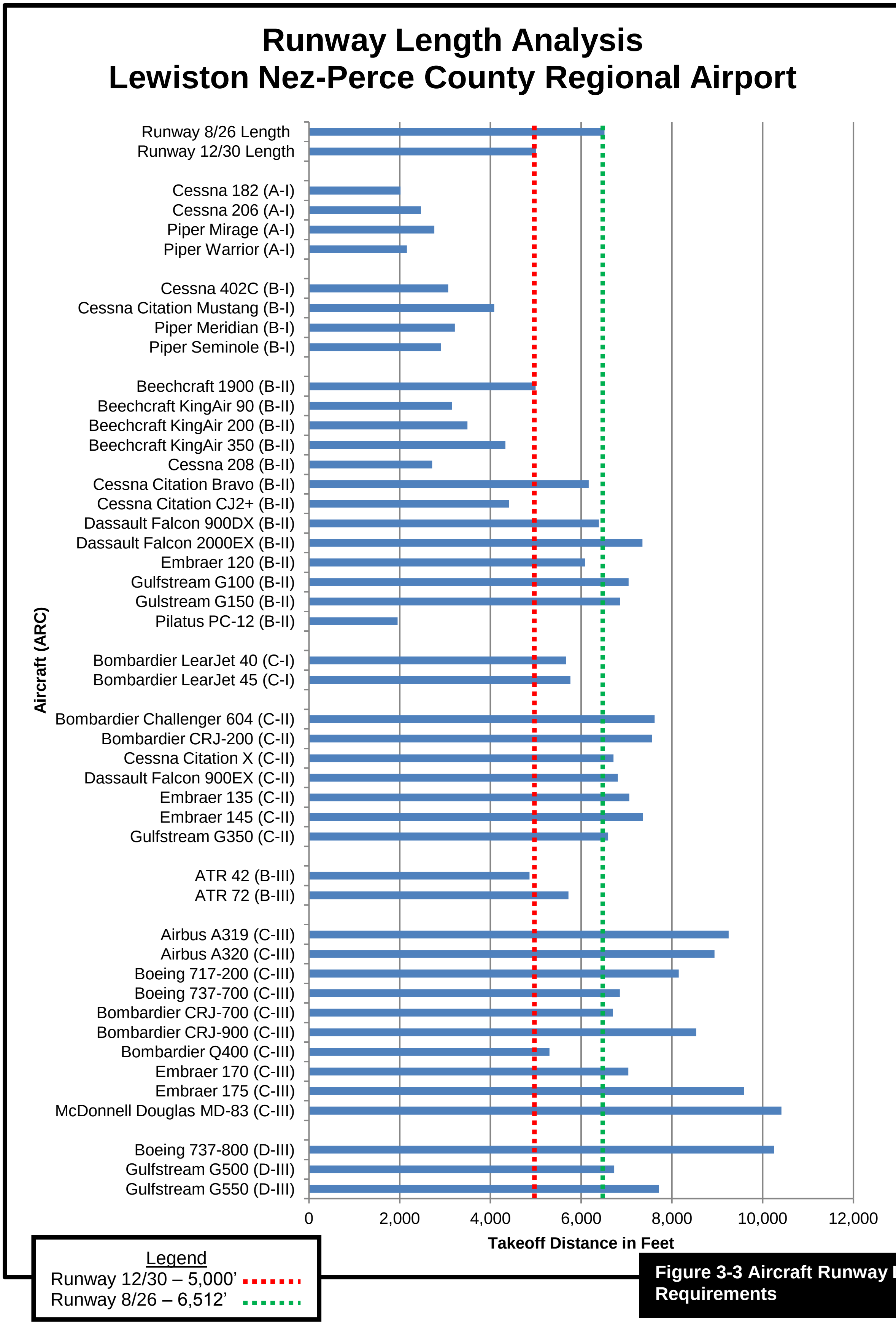


Figure 3-3 Aircraft Runway Length Requirements

Runway Strength and Width: Runway strength requirements are normally based upon the design aircraft that may be expected to use the airport on a regular basis. The existing strength of Runway 8/26 is 150,000 pounds Single Wheel Gear (SWG), 180,000 pounds Dual Wheel Gear (DWG) and 400,000 pounds Dual Tandem Wheel Gear (DTG). Given the design aircraft for Runway 8/26 is the Boeing 717-200 weighing 121,000 pounds, the existing pavement strength of Runway 8/26 is considered adequate for the planning period. The existing strength of Runway 12/30 is 70,000 pounds SWG, 94,000 pounds DWG and 150,000 pounds DTG. Given the design aircraft for Runway 12/30 is the Cessna Citation III weighing 22,000 pounds, the existing strength of Runway 12/30 is also considered adequate for the planning period.

FAA design standards for runways serving aircraft having a RDC C-III serving aircraft with a MTOW greater than 150,000 pounds require a minimum runway width of 150 feet. Runway 8/26 is 150 feet wide and therefore meets the standard. FAA design standards for runways serving aircraft having a RDC B-II with visibility minimums of ¾-mile or greater require a minimum runway width of 75 feet. Runway 12/30 is 100 feet wide and therefore exceeds the standard. It is recommended to maintain the existing Runway 12/30 width for increased utility and safety.

Runway Surface: Runway surfaces for commercial service airports are typically constructed of either asphalt or concrete. Asphalt is a mixture of sand or gravel combined with bituminous liquid, which is a more flexible pavement type. An asphalt constructed runway has a typical useful life of 15 to 20 years. Concrete is a mixture of broken stone, sand, cement and water to form a more rigid pavement type. A runway constructed of concrete has a typical useful life of 20 to 40 years. In most cases, concrete runways have a higher initial cost to construct versus asphalt runways. Runway 12/30 is constructed of a grooved asphalt pavement. The last reconstruction of Runway 12/30 was completed in 2002. It is recommended to rehabilitate Runway 12/30 within the next five to ten years. Runway 8/26 is constructed of asphalt pavement with grooving and was rehabilitated in 2014.

3.4.2 Runway Orientation

The FAA recommends that a runway's orientation provide at least 95 percent crosswind coverage. If the wind coverage of the runway does not meet this 95 percent minimum for the appropriate RDC, then a crosswind runway should be considered. Hourly wind data collected by the National Oceanic and Atmospheric Administration (NOAA) Climate Data Center from the automated surface observation system (ASOS) located at the airport indicates that Runway 8/26 provides more than 95 percent wind coverage for aircraft in ARC A-I through C-III. The seasonal wind coverage was also evaluated to ensure adequate wind coverage. The wind coverage for Runway 8/26 at 10.5 knots is 96.37 percent, 97.99 percent for 13 knots and 99.24 percent for 16 knots. The combined wind coverage of Runway 8/26 and 12/30 is over 99 percent for ARC A-I through C-III. Crosswind Runway 12/30 is currently utilized primarily by general aviation aircraft including small piston aircraft and business jets. Runway 12/30 is utilized by aircraft for approximately 75 percent of operations at the airport due to favorable wind conditions and proximity to ground services. Use of Runway 12/30 by larger aircraft, including air carriers is limited due to the runway's length. The wind coverage for Lewiston-Nez Perce

County Airport is depicted in **Figure 1-56** and **1-57**. Due to magnetic declination, it is recommended to renumber Runway 8/26 to Runway 9/27 during the next pavement marking project. This would also include changing signage panels, aeronautical charts and operations manuals.

3.4.3 Runway Incursions and Line of Sight

The airport is controlled by the air traffic control tower from 6:00 AM to 10:00 PM local time, during which time the air traffic control tower assists pilots, maintenance and airport operations by providing ground control and clearances to minimize the potential for runway incursions. The air traffic control tower reported they have unrestricted line of sight to all airport surfaces. When the air traffic control tower is closed pilots and those operating at the airport are responsible for maintaining communication on the common traffic advisory frequency (CTAF) to avoid runway incursions. The airport is fenced by perimeter fencing and terminal area chain link fencing which helps to avoid inadvertent access to the airport operating area by animals and humans.

According to FAA AC 150/5300-13A, *Airport Design*, there must be a direct line of sight between any two points located five feet above the runway pavement surface if a parallel taxiway is unavailable. Runway 8/26 does not meet existing line of sight requirements. During hours of air traffic control tower closure, the potential for runway incursions increases due to the lack of the required line of sight along Runway 8/26. It is recommended to correct the line of sight constraints on Runway 8/26. Options for correcting the line of sight deficiencies are evaluated in Chapter 4 – Development Alternatives.

Due to the overlapping RSAs between Runway 12/30 and Runway 8/26, the use of a Runway Visibility Zone (RVZ) is required. A RVZ is an area formed by imaginary lines connecting the two runways' line of sight points. The RVZ at Lewiston-Nez Perce County Regional Airport is clear of obstructions.

3.4.4 Taxiway Requirements

<u>Length and Width</u>: The primary function of a taxiway system is to provide access between runways and the terminal area. The taxiways should be located so that aircraft exiting the runway will have minimal interference with aircraft entering the runway or remaining in the traffic pattern. Taxiways expedite aircraft departures from the runway and increase operational safety and efficiency.

According to FAA Advisory Circular 150/5300-13A, *Airport Design*, the minimum runway centerline to taxiway centerline separation for a runway with a RDC of C-III-2400 is 400 feet. The minimum taxiway width for Group III is 50 feet. The minimum runway centerline to taxiway centerline separation for a runway with a RDC of B-II-5000 is 240 feet. The minimum taxiway width of Group II is 35 feet. The design standards for Group II, Group III, Group IV and Group V are listed in **Table 3-20**.

Runway 8/26 is served by two partial parallel taxiways with associated connector taxiways. Taxiway A is a partial parallel taxiway located north of the Runway 8 threshold which is 50 feet wide, is located 400 feet from runway centerline to taxiway centerline and therefore meets the standards for RDC C-III. Taxiway Z is a partial parallel taxiway located south of the Runway 8 threshold, is 50 feet wide and is located 400 feet from runway centerline to taxiway centerline and therefore meets the standards for RDC C-III. Taxiway G is a connector taxiway located south of the Runway 30 threshold connecting to Runway 8/26, is 50 feet wide and meets the standards for RDC C-III and exceeds the standards for RDC B-II for Runway 12/30. The most frequent commercial service aircraft operating at Lewiston-Nez Perce County Regional Airport is the Bombardier Q400, which requires TDG 5 design standards. It is recommended to upgrade the taxiways utilized by the Bombardier Q400 to TDG 5 due to the length of the cockpit to main landing gear and main landing gear width. It is recommended to widen the fillets to accommodate the main gear track of the Bombardier Q400 through the turns. The 50 foot wide taxiway is considered adequate for the straight portions of the taxiway.

Runway 12/30 is served by a parallel taxiway (Taxiway C) with associated connector taxiways. Taxiway C is 50 feet wide, is located 276 feet from runway centerline to taxiway centerline and therefore meets and exceeds the standards for RDC B-II. Two connector taxiways, Taxiway D and F, are located within the middle third of the runway. The middle third of the runway is designated as high energy area due to the speed aircraft typically operate at either takeoff or landing within this area.

Taxiway C is connected to the Commercial Service Apron, Air Cargo Apron and North GA Apron via Taxiways D, F, K and G. Each of these connector taxiways provides a direct route from the apron to the runway. The locations of the existing direct route taxiway geometries are depicted in **Figure 3-4**. Options for reconfiguring the taxiway geometry and correct these deficiencies are evaluated in the Development Alternatives Chapter.

Upon evaluation of the existing taxiway system at Lewiston-Nez Perce County Regional Airport; the following recommendations are listed below.

- Upgrade taxiway fillets to meet TDG 5 standards.
- Limit the number of aircraft crossing an active runway.
- Construct full length parallel taxiway for Runway 8/26.
- Optimize pilot’s recognition of entry to the runway (i.e. increase situational awareness) through design of taxiway layout including:
    - Use of right angle for taxiway/runway intersections.
    - Limit the number of taxiways intersecting in one spot.
    - Avoid wide expanse of pavement at runway entry.
    - Avoid high energy intersections in the middle third of the runway.
    - Layout taxiways to account for operational requirements.
    - Avoid using runways as taxiways.

- Correct runway incursion hot spots.

Strength: The strength of the taxiways should be maintained at a strength equal to that of the associated runway pavement.

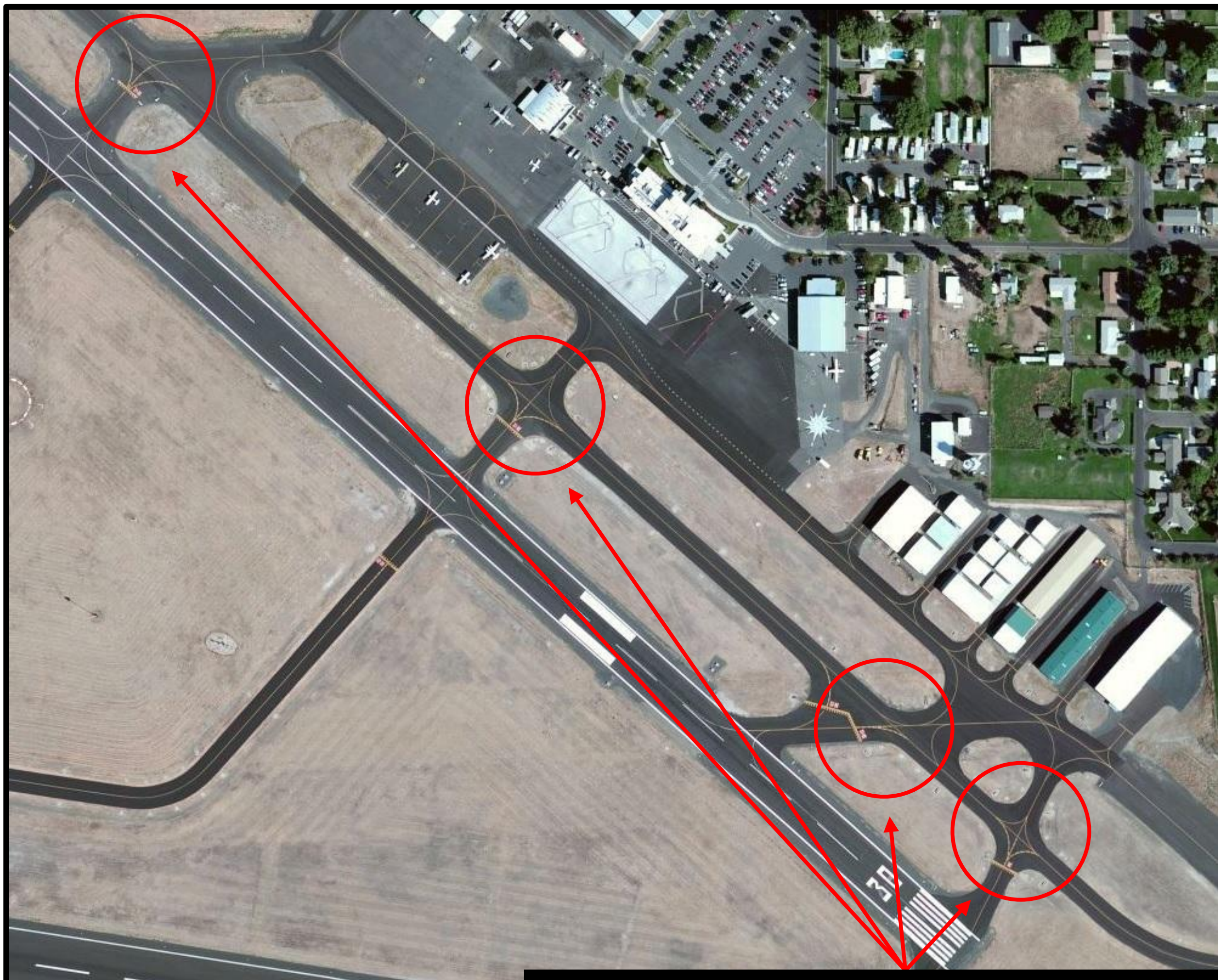


Figure 3-4 Non-Standard Taxiway Design Geometry Locations

3.4.5 Aircraft Apron

The apron space requirements as shown in this planning document were developed according to recommendations given in FAA Advisory Circular 150/5300-13A, *Airport Design*. Consideration must be made in the overall apron requirements for aircraft parking and tiedown requirements, taxilanes, adjacent taxiways and proximity to all aircraft expected to use the airport, including turboprops and jets. The existing south GA aircraft parking apron is depicted in **Figure 3-5**.

Figure 3-5 South GA Apron

General Aviation Apron and Helicopter Parking Pads:
Aircraft tiedowns should be provided for those small and medium sized aircraft utilizing the airport. These aircraft risk being damaged or may cause damage or injury in sudden wind gusts if not properly secured. A number of tiedowns are required to accommodate the peak daily transient aircraft and overnight transient aircraft, plus based aircraft that are not hangared. Apron size and tiedown requirements for the 20-year planning period are listed in **Table 3-9**, indicate that approximately 21,300 square yards of additional general aviation apron will be required over the planning period. The current tiedown layout is based on Group I, II and III taxilane OFAs. The future apron layout should continue to be planned to provide for Group I, II and III taxilane OFAs. Typically large aircraft, including business jets, are not tied down and can usually occupy multiple tiedown spaces.

Helicopter parking pads are marked areas of pavement designed specifically to accommodate the outdoor storage of helicopters not in use. The designated parking pad is utilized to provide safe distances between ground personnel and other objects. A helicopter parking pad is not intended to be used for the takeoff or landing of helicopters. The helicopter parking pad differs from a heliport which is designed to provide clear approach and departure paths, area for ground maneuvers, a Final Approach and Takeoff Area (FATO), Touchdown and Liftoff Area (TLOF), safety area and wind cone. It is recommended to develop a helicopter TLOF. Helicopter parking pad requirements and square yardages are listed in **Table 3-9**. The future design helicopter will be the Bell 412.

The general aviation apron tiedown area should allow approximately 360 square yards per transient aircraft and 300 square yards per based aircraft. This square yardage per aircraft provides adequate space for tiedowns, circulation and fuel truck movement. The general aviation apron should also allow approximately 36 yards per transient helicopter parking. It is assumed that 100 percent of based helicopter will be stored in conventional hangars. This square yardage would provide adequate space for circulation and rotor diameter. Lewiston-Nez Perce County Regional Airport should plan for additional apron expansion and taxilane expansion to hangar development areas.

Table 3-9 General Aviation Apron and Helicopter Parking Pad Requirements

Apron Requirements	2013	2018	2023	2028	2033
Single and Multi Engine Aircraft Area (in S.Y.)	38,700	42,300	45,000	47,100	48,900
Turboprop and Corporate Aircraft Area (in S.Y.)	21,000	22,500	24,000	25,500	27,000
Itinerant Aircraft Area (in S.Y.)	16,000	16,800	17,600	18,400	19,200
Total General Aviation Apron (in S.Y.)	**75,700**	**81,600**	**86,600**	**91,000**	**95,100**
Total General Aviation Apron Deficiency (in S.Y.)	**1,922**	**7,822**	**12,822**	**17,222**	**21,322**
Tiedowns (Based Aircraft)	25	27	29	30	31
Tiedowns (Itinerant Aircraft)	20	21	22	23	24
Hardstands for Turboprops and Corporate AC	4	6	8	10	12
Total Tiedowns and Hardstands	**49**	**54**	**59**	**63**	**67**
Helicopter Parking Pads	4	5	6	7	8
Helicopter Parking Area (in S.Y.)	144	180	216	252	288

Source: Armstrong Consultants, 2014

Commercial Service Apron:

The commercial service apron should be able to accommodate the projected types and volume of airliners that are anticipated to use the airport during the planning period. The commercial service apron needs to provide adequate space for the movement of baggage carts, fuel trucks and other aircraft service equipment. The commercial service apron should accommodate adequate spacing to conduct deicing operations. The airliners utilizing the Lewiston-Nez Perce County Regional Airport are able to park in front of the terminal building and utilize a loading ramp for loading and unloading; once the aircraft is loaded the airplane is able to turn around on its own power without requiring a push back from an aircraft tug. This type of loading and unloading is preferred by the airlines to help reduce the turnaround time at the gate and ground support equipment. Additional commercial service apron space is recommended to accommodate increased passenger service along with meeting the requirements of the peak hourly demand, simultaneous parking and increasing aircraft size. Additional apron space should be planned for to accommodate irregular operations which may exceed peak hourly demand. Areas for additional commercial apron space will be further evaluated during the Development Alternatives Chapter. **Table 3-10** summarizes the commercial service apron requirements for the 20-year planning period, indicating that approximately 13,874 square yards of additional commercial service apron will be required over the planning period.

Table 3-10 Commercial Service Apron Requirements

Year	Number of Passenger Boarding Gates	Fleet Mix	Square Yardage	Deficiency (in S.Y.)
2013 (Existing)	2	2 x Bombardier Q400	8,139	N/A
2013 (Recommended)	3	2 x Bombardier Q400 1 x Canadair Regional Jet 200	11,660	3,521
2018	3	1 x Bombardier Q400 1 x Boeing 717-200 1 x Canadair Regional Jet 200	12,212	4,073
2023	3	2 x Bombardier Q400 1 Boeing 717-200	13,946	5,807
2028	4	2 x Bombardier Q400 2 x Boeing 717-200	18,492	10,353
2033	4	3 x Boeing 717-200 1 x Canadair Regional Jet 700	22,013	13,874

Source: Armstrong Consultants, 2014

3.4.6 Navigational Aids

A Navigational Aid (NAVAID) is any visual or electronic device used to provide course or altitude information to pilots. NAVAIDs include Very High Omnidirectional Range (VORs), Very High Frequency Omnidirectional Range with Tactical Information (VOR-TACs), Nondirectional Beacons (NDBs) and Tactical Air Navigational Aids (TACANs), as examples.

There are multiple ground based NAVAIDs at the Lewiston-Nez Perce County Regional Airport including, a VOR and an Instrument Landing System (ILS). The existing VOR is located approximately four miles to the northwest of the airport along the 246-degree radial. The existing ILS sitting locations and ILS Critical Area currently meet design standards. The existing ground based NAVAIDs are considered to be adequate for the planning period.

3.4.7 Instrument Approach Procedures

The current approach procedures at Lewiston-Nez Perce County Regional Airport include a precision instrument approach procedure utilizing ILS to Runway 26, Global Positioning System (GPS) approaches with vertical guidance (LPV) to Runways 8, 26, 12 and 30 with relatively low visibility minimums and VOR approaches to Runway 8, 26, 12 and 30. The existing approach procedures at the airport are considered adequate for the planning period and no additional approach procedures are recommended. Existing instrument approach procedures are depicted in **Figures 1-23** through **1-32**.

3.4.8 Airfield Lighting, Signage, Marking and Visual Aids

Airport lighting enhances safety during periods of inclement weather and nighttime operations by providing visual guidance to pilots in the air and on the ground. Lighting and visual aids can consist of a variety of equipment or a combination thereof as described in the Inventory Chapter. Airfield lighting at Lewiston-Nez Perce County Regional Airport consists of High

Intensity Runway Lights (HIRL's) on Runway 8/26 and Medium Intensity Runway Lights (MIRL's) on Runway 12/30. Taxiway Z and associated connectors are lighted with Medium Intensity Taxiway Lights (MITLs) and all other taxiways are marked with retroreflective edge markers. Existing visual aids include a segmented circle, tetrahedron, lighted wind cone and rotating airport beacon, Medium Intensity Approach Lights with Runway Alignment Indicator (MALSR) to Runway 26. Precision Approach Path Indicators (PAPIs) are located on the ends of Runways 12 and 26, Visual Approach Slope Indicators (VASIs) are on the ends of Runways 8 and 30 and Runway End Identifier Lights (REILs) are located at the approach ends of Runways 8 and 12.

It is recommended that all taxiways have MITLs installed to increase pilot situational awareness especially during night and adverse weather conditions. It is also recommended to mark each runway threshold with a centerline connecting the adjacent taxiway centerline. Apron, taxiway and runway markings should be remarked as necessary throughout the planning period. Signage should be adequately maintained until they have reached the end of their useful life in which they should be replaced.

3.4.9 Airport Perimeter Road

Automobiles operating within the airside portions of the airport property, such as fuel dispensing trucks, are required to cross Runway 12/30 to access the Hillcrest Aircraft Company apron or Runway 8/26 to access the Southside Apron. Allowing automobiles to transit across the runway surface increases the risk of a runway incursion. To reduce the threat of runway incursions and increase the overall safety of the airport, the construction of a perimeter road is recommended. This would allow automobile traffic to avoid runway surfaces while operating within the airside portion of the airport property.

3.5 Landside Facility Requirements

Landside facilities serve as the processing interface between the surrounding community and the airport operating environment. Likewise, it offers the traveler the first impression of the airport and the local area. Landside facilities house the support infrastructure for airside operations and often generate substantial revenues for the airport.

3.5.1 Terminal Building

The existing passenger terminal at the Lewiston-Nez Perce County Regional Airport is a multilevel building located in the northeast portion of the Airport property. The terminal building has a total square footage of 29,649 square feet. The terminal building has undergone several renovations including the most recent in 1997 which modified the terminal building to Americans with Disability Act of 1992 compliance. Overall the existing terminal building is in good condition. The building has been well maintained and the areas within the terminal building are neat and clean. The following recommendations focus on the condition, configuration and capacity of the specific facilities or areas at the time they were reviewed during the inventory. Modifications, additions and equipment upgrades will be necessary during the planning period to maintain an efficient terminal building as shown in **Table 3-11** and described in the following sections.

The following facilities were reviewed:

- Baggage Claim and Non-Sterile Waiting Area
- Airline Ticket Counters and Baggage Screening
- Transportation Security Administration (TSA) Passenger Screening Checkpoint
- Sterile Passenger Lounge and Gates
- Restrooms
- Rental Car Facilities
- Restaurant and Concessions
- Airport Administrative Offices

3.5.1.1 Baggage Claim and Non-Sterile Waiting Area

The baggage claim area is located on the first floor in the central portion of the terminal building. Arriving passengers enter the terminal from the commercial service apron through a one-way door into the baggage claim/non-sterile waiting area. The baggage claim area has one u-shaped baggage carousel along the south wall in the baggage claim area. It is recommended that a larger carousel replace the existing carousel. Additional space for circulation within proximity of the baggage claim is also recommended to accommodate peak hour passenger flow. It is also recommended to integrate exit lane breach control technologies to the one-way door from the commercial service apron to baggage claim/non-sterile waiting area.

Adjacent to the baggage claim area is the non-sterile waiting area which departing passengers utilize prior to TSA opening and arriving passengers and greeters utilize while waiting for baggage. The non-sterile waiting area and baggage claim share the same space which can become congested during peak periods. The existing configuration of the baggage claim and non-sterile waiting area is depicted in **Figure 3-6**.

Figure 3-6 Baggage Claim and Non-Sterile Waiting Area Layout

3.5.1.2 Airline Ticket Counter and Baggage Screening

The three airline ticket counters are located on the first floor in the eastern portion of the terminal building. The airline ticketing offices are located directly behind the ticket counter. Baggage screening currently takes place in the unoccupied airline office space. Additional space is recommended for the baggage screening as well as additional ticket counter space. The increased size of the baggage screening area should enhance efficiency of the baggage screening process.

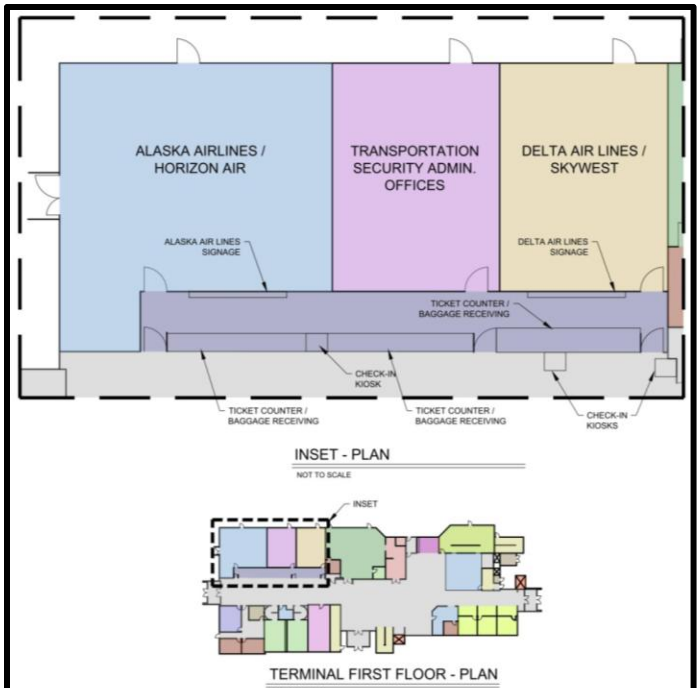


Figure 3-7 Airline Ticket Counter and Baggage Screening Layout

The addition of new technology has been helping to reduce the amount of ticket counters needed by airlines by including the use of automated check-in kiosks at Lewiston-Nez Perce County Regional Airport. Airlines have been trying to reduce the amount of space as much as possible to reduce cost. Both Alaska Airlines and Delta Air Lines have been allowing the use of mobile phone integrated boarding passes which may further reduce the necessity of airline ticket counter space. The existing configuration of the airline ticket counter and baggage screening area is depicted in **Figure 3-7**.

It is also recommended to transition the current airline ticket counters from individual airline leaseholders to a Common Use Terminal Equipment (CUTE) system. A CUTE system is a method of converting brick and mortar branding of ticketing and gate counters to digital technology. This system allows multiple airlines to share the ticketing and gate counters. By utilizing digital signage, the CUTE system would allow greater flexibility for new entrant or charter carriers to Lewiston. Currently, several airlines and airports are collaborating for a transition to a Common Use Passenger Processing System (CUPPS) which will provide a uniform technological platform for passenger processing between airlines and will utilize existing CUTE systems. An example of a CUTE system is depicted in **Figure 3-8**.

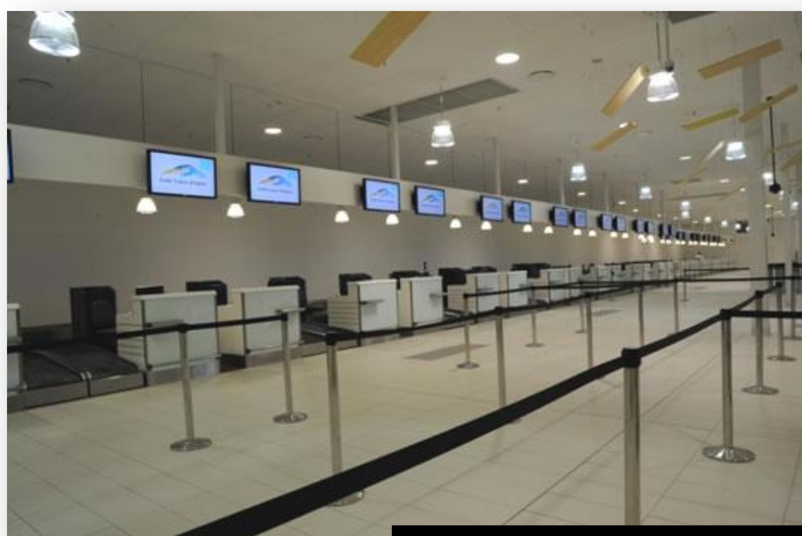


Figure 3-8 CUTE System Example

Source: Passenger Terminal Today

3.5.1.3 TSA Passenger Screening Checkpoint

TSA passenger screening begins in the lobby in front of the seating area. Doors divide the sterile potion and the non-sterile portion of the terminal building. Passenger screening occurs in a single linear checkpoint through the doors at the entry to the sterile passenger lounge. Greeters typically wait for arriving passengers in the baggage claim area adjacent to the security checkpoint. Arriving passengers disembark the sterile portion of the terminal through one-way doors which provide direct access to the baggage claim area. Some congestion and circulation conflicts occur during peak times within the passenger lobby in front of the TSA checkpoint. Additional space is recommended for the screening checkpoint to facilitate potential modifications to security screening procedures. The existing configuration of the TSA passenger screening checkpoint is depicted in **Figure 3-9**.

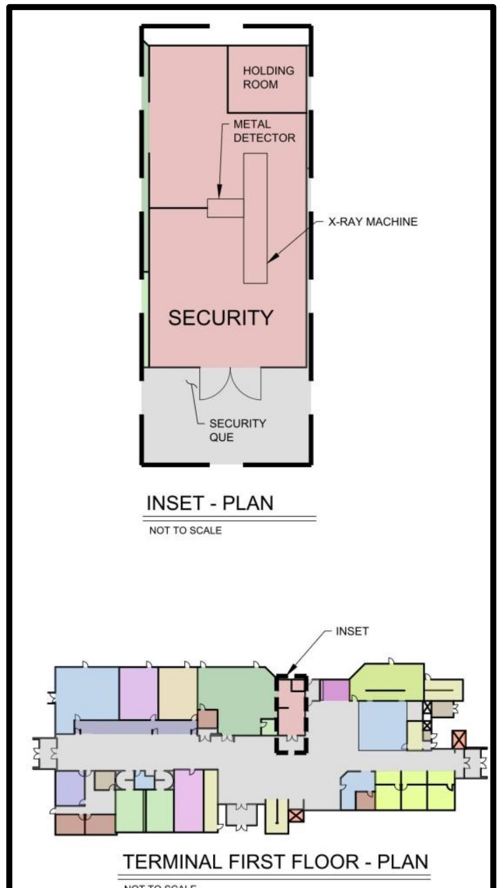


Figure 3-9 TSA Passenger Screening Checkpoint Layout

3.5.1.4 Sterile Passenger Lounge and Gates

The airport has two departure gates. Gates 1 and 2 are located on the ground floor and provide direct access to the commercial service apron. There are vending machines and a restroom available in the passenger boarding lounge. It is recommended to expand the sterile passenger lounge and add additional gate areas to accommodate forecasted demand. Additionally, it is also recommended to convert the existing departure gates to a CUTE system. The existing configuration of the sterile passenger lounge and gates is depicted in **Figure 3-10**.

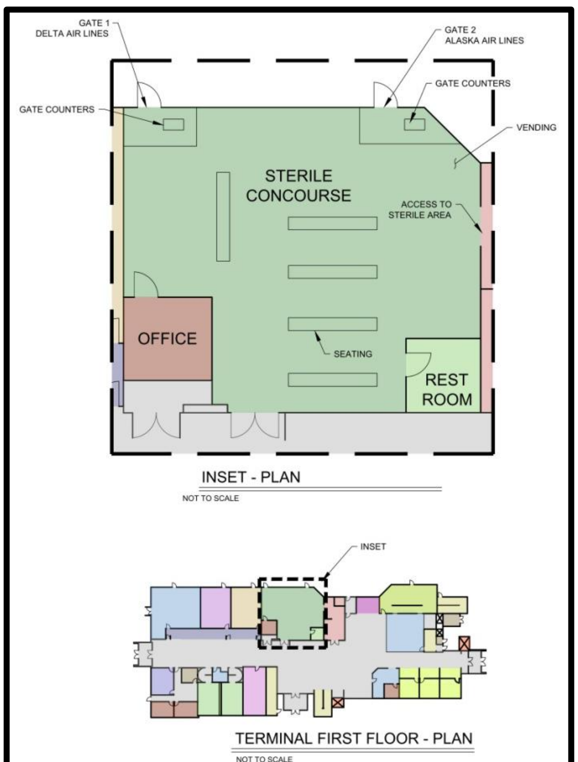


Figure 3-10 Sterile Passenger Lounge and Gates Layout

3.5.1.5 Restrooms

Public restrooms are available in the eastern wing of the terminal building with a single-occupant men's/women's shared restroom available in the sterile passenger lounge. Restrooms are also available for the airport administrative personnel within the administrative office area. Restrooms are also available on the second floor adjacent to the restaurant area. It is recommended to add an additional sterile public restroom to the passenger lounge as future expansions occur.

3.5.1.6 Rental Car Facilities

The existing rental car facilities are located in the western wing of the terminal building. Two of the three rental car counters are currently occupied. These facilities are considered to be adequate for the planning period; however, renovations to the rental car facilities may be necessary within the planning period. The existing configuration of the rental car facilities is shown in **Figure 3-11**.

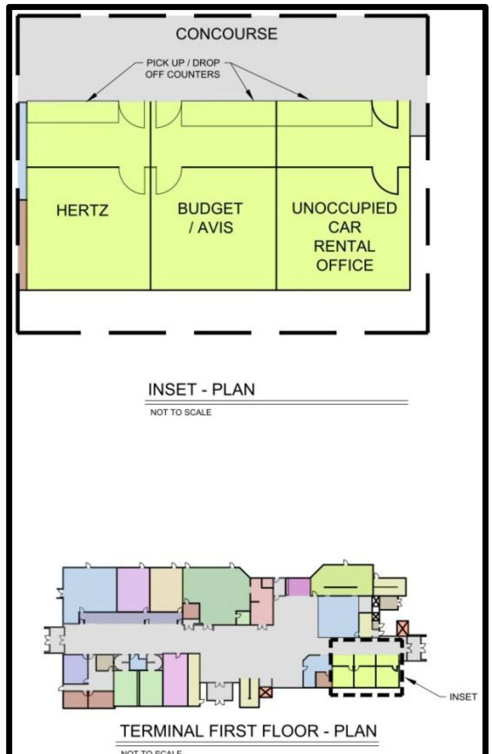


Figure 3-11 Rental Car Facilities Layout

3.5.1.7 Restaurant and Concessions

The terminal has restaurant space located on the second floor of the building which is currently unoccupied. The airport also has a gift shop located on the first floor within the non-sterile portion of the terminal building. Vending services are located within the sterile passenger lounge and non-sterile waiting area/baggage claim area. It is recommended to evaluate potential leaseholders for the unoccupied restaurant area to enhance non-aeronautical revenue generation.

3.5.1.8 Airport Administrative Offices

The airport administrative offices are located on the third floor of the building. There is an airport manager's office, an airport badging office, conference room and a restroom within the administrative portion of the building. It is recommended to expand the airport administrative offices to accommodate additional airport employees throughout the planning period.

3.5.2 Terminal Building Square Footage Analysis

As passenger activity increases the need for additional space to accommodate those users will be needed. This section provides information on the current capacity of the terminal building facilities and provides spatial recommendations for the planning period. Currently, during peak hour operations congestion frequently occurs in the non-sterile waiting area/baggage claim or the TSA Passenger Screening Checkpoint and adjacent lobby area depending on if passengers are arriving or departing. This analysis shows the deficient areas and the recommended space allocations.

FAA Advisory Circular 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Nonhub Locations*, notes that information contained within the document provides general guidelines and approximations for determining spaces and terminal facility requirements for planning purposes. It is not intended that they be used to replace detailed architectural or engineering analysis necessary for the specific design of individual airport terminal facilities. The square footage recommendations in **Table 3-11** are for planning purposes only. Further detailed analysis is recommended prior to actual design. The recommended square footage was based on the peak hourly passenger demand and annual enplanements for each time period.

Table 3-11 Passenger Terminal Facility Space Requirements (Square Feet)

	2013 (Existing)	2013 (Recommended)	2018	2023	2028	2033
Annual Enplanements	64,725	64,725	74,451	86,309	100,056	115,993
Baggage Claim	1,120	1,120	1,120	1,120	1,200	1,250
Airline Ticket Counter, Offices, Baggage Screening and Queuing	3,801	3,801	3,801	3,801	4,000	4,250
TSA Passenger Screening	495	2,772	3,212	3,718	4,312	5,016
Number of Passenger Gates	2	3	3	3	4	4
Airline Passenger Gates	1,490	2,235	2,235	2,235	2,980	2,980
Restrooms	1,325	1,760	1,760	1,760	1,760	1,760
Rental Car Facilities	1,000	1,000	1,000	1,000	1,000	1,000
Restaurant and Concessions	7,225	7,225	7,225	7,225	7,225	7,225
Airport Administrative Office	1,355	1,355	1,655	1,955	2,255	2,555
Miscellaneous Circulation, Facilities and Storage	10,658	10,958	11,458	11,958	12,458	12,958
Total Space	**29,649**	**32,226**	**33,466**	**34,772**	**37,190**	**38,994**

Source: FAA AC 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Nonhub Locations* and Armstrong Consultants

3.5.3 Terminal Building Environmental Considerations

It is recommended to upgrade several terminal building features to reduce the environmental footprint of the building. High-efficiency windows should be retrofitted to minimize the required heating required and provide greater insulation. Restroom fixtures such as sinks and toilets should be upgraded to reduce water consumption. The use of solar energy, in accordance with the FAA *Interim Solar Glare Policy*, should also be evaluated as an alternative power source for the terminal building. The applications of these recommendations serve to reduce the airport's environmental footprint and provide several long-term savings for utility expenses.

3.5.4 Cargo Facilities

FedEx currently operates out of an on-airport building and apron located adjacent to the passenger terminal building as shown in **Figure 1-17**. Ameriflight currently uses the apron adjacent to Stout Flying Service for transferring ground cargo to air cargo as shown in **Figure 1-42**. It is recommended to construct a cargo apron to accommodate both Ameriflight and FedEx operations. The future cargo apron should provide approximately 7,040 square yards of space to accommodate two ATR-72 turboprop aircraft for future cargo operations. The optional layouts for additional cargo facilities will be further evaluated during Chapter 4 – Development Alternatives.

3.5.5 Air Tanker Facilities

Wildfires are prevalent in Idaho, eastern Washington and western Montana during times of draught and high temperatures. Due to Lewiston-Nez Perce County Regional Airport's central location it is recommended to construct facilities and apron space to accommodate future air tanker operations to protect and preserve regional interests. These facilities would include but are not limited to: Air Operations and Administration building, loading ramp with two or three aircraft loading positions, secondary containment for apron runoff, helicopter, observation and smoke jumper ramp, slurry mixing and loading equipment and vehicle parking facilities. The apron should be constructed to accommodate two C-130's and one Single Engine Air Tanker (SEAT). The optional layouts and locations for future air tanker facilities will be evaluated in Chapter 4 – Development Alternatives.

3.5.6 Unmanned Aerial Systems and Vehicles Facilities

The integration of Unmanned Aerial Systems/Vehicles (UAS/UAV) into the National Airspace System is currently an ongoing development. UAS/UAVs are being evaluated for uses in several different sectors including wildlife monitoring, wildfire detection and homeland security. Within the planning period, it is likely UAS/UAV will operate at the Lewiston-Nez Perce County Regional Airport. It is recommended to plan for an apron area capable of accommodating future UAS/UAVs while segregating the traffic from manned aircraft.

3.5.7 Hangar Facilities

Hangars are typically classified as either T-hangars, (small multi-unit storage complexes that usually accommodate one single engine aircraft in each unit) or conventional box hangars, (small to very large units,) which accommodate a variety of aircraft types or corporate fleets. The number of aircraft that each conventional hangar can hold varies according to the size of the aircraft and building. Hangars at Lewiston Nez-Perce County Regional Airport consist of a mix of 26 T-hangar units and 18 conventional hangars. Examples of the existing hangar facilities are depicted in **Figure 1-46**.

<u>Based Aircraft Hangar Requirements</u>: The facility requirements for based aircraft typically determine the number of tiedown locations, number of shaded spaces, number of T-hangars and number of conventional type hangars required for the future. Development areas will be identified on the ALP for a mix of T-hangars, box hangars and larger corporate style hangars.

<u>Transient Aircraft Hangar Requirements</u>: Transient single-engine aircraft operators generally do not require aircraft storage facilities unless there is inclement weather expected (such as hail or snow) or if the operator is planning an extended stay. Some higher performance single-engine and multi-engine aircraft operators may desire overnight aircraft storage or a heated hangar in the winter. Additional transient hangar space is recommended during the planning period.

3.5.8 Aviation Fuel Facilities

Both Jet-A and 100LL Avgas are available at the airport. Fuel services are available from Stout Flying Service, Odonata and Hillcrest Aircraft Company. Stout Flying Service owns and operates a 12,000 and a 10,000 gallon Jet-A tank and one 12,000 gallon 100LL tank. Stout Flying Service also owns and operates three Jet-A fuel trucks and one 100LL fuel truck. Odonata owns and operates a 6,000 gallon 100LL storage tank. Hillcrest Aircraft Company owns and operates two 11,000 gallon Jet-A tanks and one 20,000 gallon 100LL tank. Hillcrest Aircraft Company also owns and operates one Jet-A fuel truck for off-airport use. The existing fuel facilities are considered adequate for the planning period; however, as development on the south side occurs, it is recommended that both AvGas and Jet-A fuel be made available at this location.

3.5.9 Airport Access, Vehicle Parking and Public Transit Connectivity

Lewiston-Nez Perce County Regional Airport can be reached by vehicle by following 18th Street (which transitions into 5th Street) south from downtown Lewiston, to Bryden Avenue, onto 4th Street. The airport is located approximately two miles south of downtown Lewiston. A high visibility airport entrance sign has been installed at the intersection of Bryden Avenue and 4th Street. Egress from the airport is done by heading eastbound on Burrell Avenue. Burrell Avenue is in fair condition, improvements to the road are recommended including widening to provide increased traffic circulation and flow. There are 462 paved public automobile parking spaces available for airport employees, users, visitors and rental car companies. The terminal building parking lot serves both short and long term users. The airport does not charge users of the terminal building parking lot.

Automobile parking projections were developed for the 20 year planning period. FAA Advisory Circular 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Nonhub Locations*, was used to determine the number of required future public automobile parking spaces. Based on the forecasted number of enplanements approximately 230 parking spaces are recommended. However, the existing public automobile parking spaces often times are utilized to 100 percent capacity. It is recommended to expand the public automobile parking spaces to 650 spaces to accommodate forecasted airport user demand.

Access to the North GA apron and hangars is accessed via Burrell Avenue, similar to the passenger terminal building. The west and south GA areas are accessed via O'Conner Road which connects to Bryden Avenue. It is recommended to increase the automobile parking spaces for GA users as future hangar development is constructed.

The nearest public transit stop is located approximately 411 feet east of the main terminal building entrance on the northeast corner of the 4th Street and Burrell Avenue intersection. There is no marked crosswalk connecting the public transit stop across the intersection to the passenger terminal building. It is recommended to provide greater access to public transit by relocating the stop to a position adjacent to the passenger terminal building entrance. This will reduce the distance travelled for passengers utilizing public transit. It is also recommended to adequately mark a crosswalk to the proposed public transit spot to enhance user safety.

3.5.10 Fencing

The airport is currently fenced with an eight foot tall chain link fence with three stand barbed wire that follows the existing airport property line as shown in **Figure 1-48**. The perimeter contains 54 controlled access points including pedestrian gates, doors and manual or automatic vehicle gates. The primary purpose of this fencing is to restrict inadvertent and unauthorized access to the airport by wildlife and persons. The existing fence system is considered to be adequate for the planning period.

3.5.11 Aircraft Rescue and Fire Fighting (ARFF) Station and Equipment

Lewiston-Nez Perce County Regional Airport is required to meet a specified level of ARFF requirements based on the current role of the airport. The ARFF Index is set forth in FAR Part 139 and is determined by the length of the largest air carrier aircraft which serves the airport with an average of five daily departures. A detailed list of the requirements for ARFF Indexes A through C is listed in **Table 3-12**. Lewiston-Nez Perce County Regional Airport is classified as a FAR Part 139 Class I Index A airport. Index A is categorized as five or more departures of aircraft with a capacity greater than nine seats and an aircraft length of less than 90 feet. However, the airport meets the requirements of FAR Part 139 Class I Index B airport based on existing equipment. Lewiston-Nez Perce County Regional Airport currently operates one truck dedicated for ARFF purposes manufactured in 1995. The acquisition of a new ARFF truck designed to accommodate Index B extinguishing agent capacity requirements is recommended in the short to medium-term to maintain the current level of service at the airport. As the role of the airport changes and airline fleet mix changes it is recommended that the requirements are kept up to date and equipment acquired as necessary. The existing ARFF station is depicted in **Figure 1-49** and the existing ARFF truck is depicted in **Figure 1-50**.

Figure 3-12 Conceptual ARFF Station

Table 3-12 ARFF Requirements

Index	Aircraft Length	Vehicle and Extinguishing Agent Requirements
A	Less than 90 ft	One Vehicle carrying the following: Once vehicle carrying at least 500 pounds of sodium based dry chemical, halon 1211, or clean agent, or One vehicle carrying 450 pounds of potassium based dry chemical and water with a commensurate quantity of ARFF to total 100 gallons.
B	At least 90 ft but less than 126 ft	Either of the following: One vehicle carrying at least 500 pounds of sodium based dry chemical or halon 1211 and 1,500 gallons of water and the commensurate quantity of AFFF for foam production Two vehicles: One vehicle carrying the extinguishing agents as specified for in Index A; and one vehicle carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons
C	At Least 126 but less than 159 ft	Either of the following: Three vehicles: One carrying the extinguishing agents as specified for Index A; and two vehicles carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam Two vehicles: One vehicle carrying the extinguishing agents as specified for in Index B; and one vehicle carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 3,000 gallons Each ARFF vehicle used to comply with Index B and C requirements with a capacity of at least 500 gallons, but less than 2,000 gallons shall be equipped with a turret. Vehicle turret discharge rate should be at least 500 gallons per minute but less than 1,000 gallons per minute. Required discharge capacity for dry chemical through a handline is 5 lbs/sec; and 16 lbs/sec through a turret.

Source: 14 CFR Part 139

According to FAA Advisory Circular 150/5210-15A, *Aircraft Rescue and Firefighting Station Building Design*, an ARFF station is required to meet several operational considerations in order to provide effective response performance. The existing ARFF station was constructed in 1975 and is considered to be in poor condition. The ARFF station serves as a mixed-use municipal firefighting facility. According to a 2011 Facility Overview of the ARFF station, several areas of the facility have been identified as deficient per FAA Advisory Circular 150/5210-15A, *Airport Design*, which have an impact on safety and response times and reducing operational capacity and working environment. The deficient areas are listed in **Table 3-13**.

The existing facility cannot house a new generation Index B ARFF vehicle or reserve ARFF vehicle. Currently, the reserve ARFF equipment is stored outdoors to the south of the station. It is recommended to construct a new or expanded 11,624 square foot ARFF station which would accommodate mixed-use and meets all other requirements for support facilities and vehicle bays as described in AC 150/5210-15A, *Aircraft Rescue and Firefighting Station Building Design*, and City of Lewiston Fire Department requirements. A Conceptual design for a potential ARFF station is depicted in **Figure 3-12**. The space allocations for each functional area within the ARFF station are listed in **Table 3-14**. Optional layouts and locations for a new or expanded ARFF station will be evaluated in the Chapter 4 – Development Alternatives.

Table 3-13 Lewiston ARFF Station Deficiencies

Area of Deficiency	Standard or Allocation	Existing Condition	Impact to ARFF
ARFF Station Location			
Airfield Surveillance	Maximum surveillance of the airfield	Surveillance limited to small portions of Taxiway B, C and Runway 8/26. No visibility of terminal building or apron	Reduces situational and directional awareness during emergencies
Apparatus Bay			
Minimum Apparatus Door Dimensions	16' x 16'	12' x 12'	Increases response time and reduces safe and efficient operation
Distance Between Vehicle and Wall/Storage	6' 0"	4' 5"	
Distance Between Vehicles Parked Side by Side	8' 0"	3' 6"	
Distance Between Vehicles Parked End to End	5' 0"	2' 4"	
Distance Between Vehicle and Stall Bay Doors	5' 0"	1' 11"	
Distance Between Ceiling and ARFF Vehicle Work Platform	7' 0"	5' 6" (3' 2" from ceiling obstacles)	
Duration of Door Fully Opening	16 Seconds	18-20 seconds, experiences occasional failures	
Fume Exhaust	The ARFF station will prevent exposure to firefighters and contamination of living and sleeping areas from exhaust emissions	Small manual fume exhaust fan was retrofitted and does not meet current ventilation standards	Creates hazards to ARFF personnel
Vehicle Bay Door Window	Window should provide visibility from vehicle bay floor and vehicle driver's seat	Window does not provide visibility from vehicle driver's seat.	Reduced safety by limited visibility and increased risk to pedestrians
Personnel Movement	Objects should be out of personnel movement areas to allow optimum circulation	Constraints to circulation	Obstructed access areas due to maintenance and work areas located within apparatus bay
Foam Agent Recharge	A source of foam agent recharge must be provided. Capacity must be sufficient to fill all vehicles with at least twice assigned capacity 80 gallons of foam agent is required for Index A	30 gallons of recharge is held between six five-gallon containers with no central recharge location	Significantly increases response time during emergency events
Overhead Hoist	One overhead hoist with a capacity of one ton	No overhead hoist exists	Reduces operational efficiency
ARFF Station Facilities			
Watch/Alarm Room Size	130 Square Feet, except for Index A which can combine functions with Administrative Offices	96 square feet with combined Administrative Office area	Does not provide adequate working area
Watch/Alarm Room Location	Location of room should allow for vehicle bay supervision and airfield surveillance	Has limited vehicle bay supervision which is often restricted by vehicles and no airfield surveillance as the area faces away from the apron	Reduces situational and directional awareness during emergencies

Table 3-13 Lewiston ARFF Station Deficiencies (Continued)

Area of Deficiency	Standard or Allocation	Existing Condition	Impact to ARFF
ARFF Vehicle Fueling	If no diesel fuel facilities exist on airport property, one should be positioned adjacent to the apron	The nearest diesel fuel facility is 1.5 miles away requiring the vehicle to leave the airport	Requires airport to be out of ARFF Index while refueling
Dormitory Size	140 square feet per person	50 square feet per person	Discomfort to ARFF personnel
Lack of Required Spaces	ARFF Stations should have the following: Telecommunications Center, electrical, mechanical and janitorial closets, Medical Decon Room, Gear Wash/Drying Room	None of the aforementioned facilities exist at the Lewiston ARFF station	Creates occupational health issues, limited circulation and operational inefficiencies

Source: FAA AC 150/5210-15A, *Aircraft Rescue and Firefighting Station Building Design* and *Lewiston-Nez Perce County Regional Airport Aircraft Rescue and Firefighting Facility Overview*, 2011

Table 3-14 ARFF Station Space Allocation Requirements

Facility	Size Allocation (In S.F.)	Notes
Watch/Alarm Room	130	
Medical Decon Room	150	
Gear Wash/Drying Room	200	
First Aid and Medical Storage	120	
Complementary Agent Storage	350	
Self-Contained Breathing Apparatus	200	
ARFF Administrative Offices	-	
Chief's Office	200	
Deputy Chief's Office	160	
Lt./Captain's Office	200	
Conference Room	100	
Training Officer	250	
Workshop	200	
Hose-Drying Facilities	150	
Day Room	160	Assumes 8 occupants @ 20 s.f. per person (5 ARFF/3 City)
TV Room	160	Assumes 8 occupants @ 20 s.f. per person (5 ARFF/3 City)
Dormitories	700	Assumes 5 personnel @ 140 s.f. per person (3 ARFF/2 City)
Male Locker Room	240	Assumes 10 personnel @ 24 s.f. per person
Female Locker Room	48	Assumes 20 percent of Male Locker Room
Male Lavatories	150	
Female Lavatories	30	Assumes 20 percent of Male Lavatories
Laundry Room	100	
Kitchen	600	400 s.f. for ARFF, 200 s.f. for City
Training Room	480	Assumes 3 personnel @ 48 s.f. per person (144 s.f. for ARFF, 336 s.f. for City)
Computer Training Room	24	
Mechanical Room	75	Assumed Figure
Storage Room	50	Assumed Figure
Telecommunications and Electronics Room	80	
Trash and Recycling Room	150	
Exercise Facilities	200	Assumed Figure
Janitor Closet	30	
Bay 1	600	Assumes Class IV ARFF Vehicle
Bay 2	600	Assumes Class IV ARFF Vehicle
Bay 3	1,400	Maintenance Bay (Designed to accommodate Class IV ARFF Vehicle)
Bay 4	1,400	City Required
Total Space Required	**9,987**	
Total Space Required + 20% Growth	**11,984**	

3.5.12 Airport Maintenance Equipment and Storage

The existing equipment storage building is located in the northeastern portion of the airport property and houses a variety of Snow Removal Equipment (SRE) and airfield maintenance vehicles. The existing airport maintenance building and equipment is 6,750 square feet in size and in good condition. However, the existing structure is unable to house the airport's entire fleet of snow removal and airfield maintenance vehicles. Additionally, as the forecasted operations are anticipated to exceed 40,000 total annual operations, the airport will be required to clear all primary runway, taxiway and apron surfaces in 30 minutes or less. This will facilitate the acquisition of three additional pieces of snow removal equipment including a sweeper/broom, a 3,000 to 4,000 ton per hour blower, and a 20 foot wide plow with sand capability. All of these items are required to be sheltered. It is recommended to expand the existing structure or construct a new Equipment Storage Building to a size of 16,000 square feet to accommodate all equipment and meet the design standards set forth in FAA Advisory Circular 150/5220-18A, *Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials*. Optional layouts and locations for a new or expanded Equipment Storage Building will be evaluated in Chapter 4 – Development Alternatives.

3.5.13 Air Traffic Control Tower

Lewiston-Nez Perce County Regional Airport is served by an 80 foot tall air traffic control tower as shown in **Figure 1-41**. The air traffic control tower currently has unrestricted visibility of all aircraft movement surfaces and is considered to be in good condition. The air traffic control tower is staffed by Serco Management through a contract with the FAA between the hours of 6:00 A.M to 10:00 P.M. The existing air traffic control tower is considered to be adequate for the planning period. However, periodic maintenance is recommended to maintain the existing structure condition.

3.5.14 Non-Aeronautical Revenue Generation

Currently, Lewiston-Nez Perce County Regional Airport has entered into non-aeronautical revenue generating enterprises with various commercial leases on airport property. Types of non-aeronautical revenue generation could include but are not limited to: retail, concessions, industrial development, corporate business parks, solar power, and limited agricultural use which would not conflict with airport land use compatibility. The designation of areas for the aforementioned uses could enhance the revenue the airport can achieve leading towards future economic sustainability. Non-aeronautical revenue parcels will be further reviewed and discussed in Chapter 4 – Development Alternatives. Non-aeronautical revenue generating activities do not need access to the airfield.

3.6 Infrastructure Needs

3.6.1 Utility Requirements

Refer to **Appendix A – Existing Utility Inventory** for a listing of the available utilities and corresponding service provider(s) and the related availability to various airport facilities and businesses.

Table A-1 in Appendix A shows the areas with their respective utility providers, as well as the areas that have no access to certain utilities. These areas are the Experimental Aviation Association, Hillcrest Aviation, the Northeast Hangar Complex, the Southside Development, and the Future NE Development. A comprehensive evaluation of the utilities at Lewiston-Nez Perce County Regional Airport is included in **Appendix B – Utility Requirements**.

While most of the areas on the airport already possess functioning utilities, some of the areas do not have access to all of the necessary utilities. Areas which are currently undeveloped will require extensions and connections into nearby utilities. Minor utility additions are also recommended for existing facilities as listed in **Appendix B – Utility Requirements**.

3.6.2 Weather Reporting

Local weather information is currently provided by an Automated Surface Observation System (ASOS). The ASOS uses various sensors, a voice synthesizer and a radio transmitter to provide real-time weather data. ASOS transmits over a VHF frequency or the voice portion of a NAVAID. The transmission can be received within 25 nautical miles of the site or above 3,000 feet AGL. The frequency for the ASOS is published on aeronautical charts as well as in the airport facilities directory. The ASOS at Lewiston-Nez Perce County Regional Airport is connected to the telephone service at (208) 746-4185, therefore, allowing pilots to check current weather conditions at the airport. The ASOS frequency at Lewiston-Nez Perce County Regional Airport is 135.575 MHz. The ASOS reports all weather parameters needed and no upgrades are recommended.

3.7 Land Use Compatibility and Control

3.7.1 Airport Property

Existing airport property encompasses approximately 868 acres of land. Land located within the Runway Protection Zones are currently controlled either fee simple or through avigation easements. O'Conner Road runs through the Runway 8 approach RPZ and Runway 26 departure RPZ. A portion of Bryden Canyon Public Golf Course lies within the Runway 30 approach RPZ and Runway 12 departure RPZ. The current RPZ land uses are considered to be compatible with the airport.

3.7.2 Compatibility with State/Regional Plans

Future state and regional transportation plans should be coordinated with the Lewiston-Nez Perce County Regional Airport Master Plan to ensure conformance. The Airport Master Plan Update for Lewiston-Nez Perce County Regional Airport is compatible with existing, state, regional and local plans.

3.7.3 Zoning and Land Use

Development around airports can pose certain hazards to air navigation if appropriate steps are not taken to ensure that buildings and other structures do not penetrate the FAR Part 77 Airspace Surfaces (described in the following section). The FAA, therefore, recommends that the City and County implement height restrictions in the vicinity of the airport to protect these

Part 77 Surfaces. The Lewiston-Nez Perce County Regional Airport is located within the City of Lewiston Zone A - Airport. The zoning ordinance states there is 45 foot building and/or three story height restriction. Additionally, the airport located within Zone A may enforce additional design standards to protect airport property and surrounding airspace. Upon evaluation of each City of Lewiston and Nez Perce County zoning classification surrounding Lewiston-Nez Perce County Regional Airport, either appropriate building height restrictions or measures to ensure compatible development adjacent to the Airport are utilized. It is recommended the City of Lewiston and Nez Perce County continue to update the airport overlay zone to further protect the Airport from any incompatible development in proximity of the airport property.

In addition to ensuring that obstructions to Part 77 Surfaces are avoided or appropriately marked and lighted, it is recommended that the City and County make reasonable efforts to prevent incompatible land uses from the immediate area of the airport. For example, the FAA states in FAA Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*, that landfills and/or transfer stations are incompatible land uses with airports. Therefore, these types of facilities should be located at least 5,000 feet from any point on a runway that serves piston type aircraft and 10,000 feet from any point on a runway that serves turbine type aircraft. Furthermore, any facility which may attract wildlife (especially birds) such as sewage treatment ponds and wastewater treatment plants should also be located this same distance from any point on the runway. Currently, an indoor recycling center is located approximately 550 feet north of the Runway 12 threshold. According to FAA Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*, recycling centers which accept non-food items are considered to be an acceptable land use. The nearest landfill and wastewater treatment plant are both located in excess of 10,000 feet from the runway surfaces. High density residential development within approach and departure corridors can also be a concern. Development proposals should also be reviewed to ensure compatibility in the vicinity of the airport.

3.8 Part 77 Airspace Surfaces

14 CFR Part 77, *Safe, Efficient Use, and Preservation of Navigable Airspace*, establishes several imaginary surfaces that are used as a guide to provide a safe, unobstructed operating environment for aviation activities. A graphical depiction of Part 77 surfaces are depicted in **Figure 3-13**. The Primary, Approach, Transitional, Horizontal and Conical Surfaces identified in Part 77 are applied to each runway. For the purpose of this section, a visual/utility runway is a runway that is intended to be used by propeller driven aircraft of 12,500 pound maximum gross weight or less. A non-precision instrument/utility runway is a runway that is intended to be used by aircraft of 12,500 pounds maximum gross weight or less with a straight-in instrument approach procedure and instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan or by any planning document submitted to the FAA by competent authority. A non-precision instrument/larger-than-utility runway is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure. A precision instrument larger than utility runway is a runway intended for the operation of aircraft weighing more than 12,500 pounds that

also has a straight-in instrument approach procedure with visibility minimums lower than ¾-mile. Runways with only "circling" instrument approaches are considered "visual" for Part 77 purposes.

Lewiston-Nez Perce County Regional Airport currently has an ILS approach to Runway 26 and GPS approaches to Runways 8, 12, 26 and 30. Runway 26 is currently considered a larger than utility precision instrument runway. Runways 8, 12 and 30 are currently considered larger than utility nonprecision instrument runways. The existing and future Part 77 Airspace Surfaces for Runway 8/26 and Runway 12/30 are listed in **Tables 3-15** and **3-16**. The Part 77 Airspace Surfaces for these classifications are described in the following paragraphs. While it is desirable to eliminate penetrations of Part 77 airspace surfaces, in some cases, penetrations (also known as obstructions) may be mitigated with appropriate marking and/or lighting. A detailed obstruction analysis is included as a part of the Airport Master Plan and will be indentified on the Airport Layout Plan drawing set.

3.8.1 Primary Surface

The Primary Surface is an imaginary surface of specific width longitudinally centered on a runway. The Primary Surface extends 200 feet beyond each end of the paved runway surface, but begins at the end of non-paved runways. The elevation of any point on the Primary Surface is the same as the elevation of the nearest point on the runway centerline. The width of the Primary Surface varies from 250, 500 or 1,000 feet depending on pavement strength, type of approach and approach visibility minimums.

3.8.2 Approach Surface

The Approach Surface is a surface longitudinally centered on the extended runway centerline that extends outward and upward from each end of the associated runway's Primary Surface. An Approach Surface is applied to each runway end and has a slope of 20:1, 34:1 or 50:1 based upon the type of approach that is available or planned for that runway. Approach surfaces extend upward depending on the type of approach available. The inner edge of the surface is the same width as the Primary Surface. It expands uniformly to a width corresponding to the Part 77 runway classification criteria.

3.8.3 Transitional Surface

The Transitional Surfaces extend outward and upward at right angles from the runway centerline and sides of the Primary and Approach Surfaces at a slope of 7:1 ending at the Horizontal Surface.

3.8.4 Horizontal Surface

The Horizontal Surface is considered necessary for the safe and efficient operation of aircraft in the vicinity of an airport. As specified in Part 77, the Horizontal Surface is a horizontal plane 150 feet above the established airport elevation. The airport elevation is defined as the highest point of an airport's useable runways, measured in feet above mean sea level. The perimeter is constructed by arcs of a specified radius from the center of each end of the Primary Surface of each runway. The radius of each arc is 5,000 feet for runways designated as utility or visual and 10,000 feet for all other runways.

3.8.5 Conical Surface

The Conical Surface extends outward and upward from the periphery of the Horizontal Surface at a slope of 20:1 for a horizontal distance of 4,000 feet.

Table 3-15 Existing and Future Part 77 Surfaces – Runway 8/26

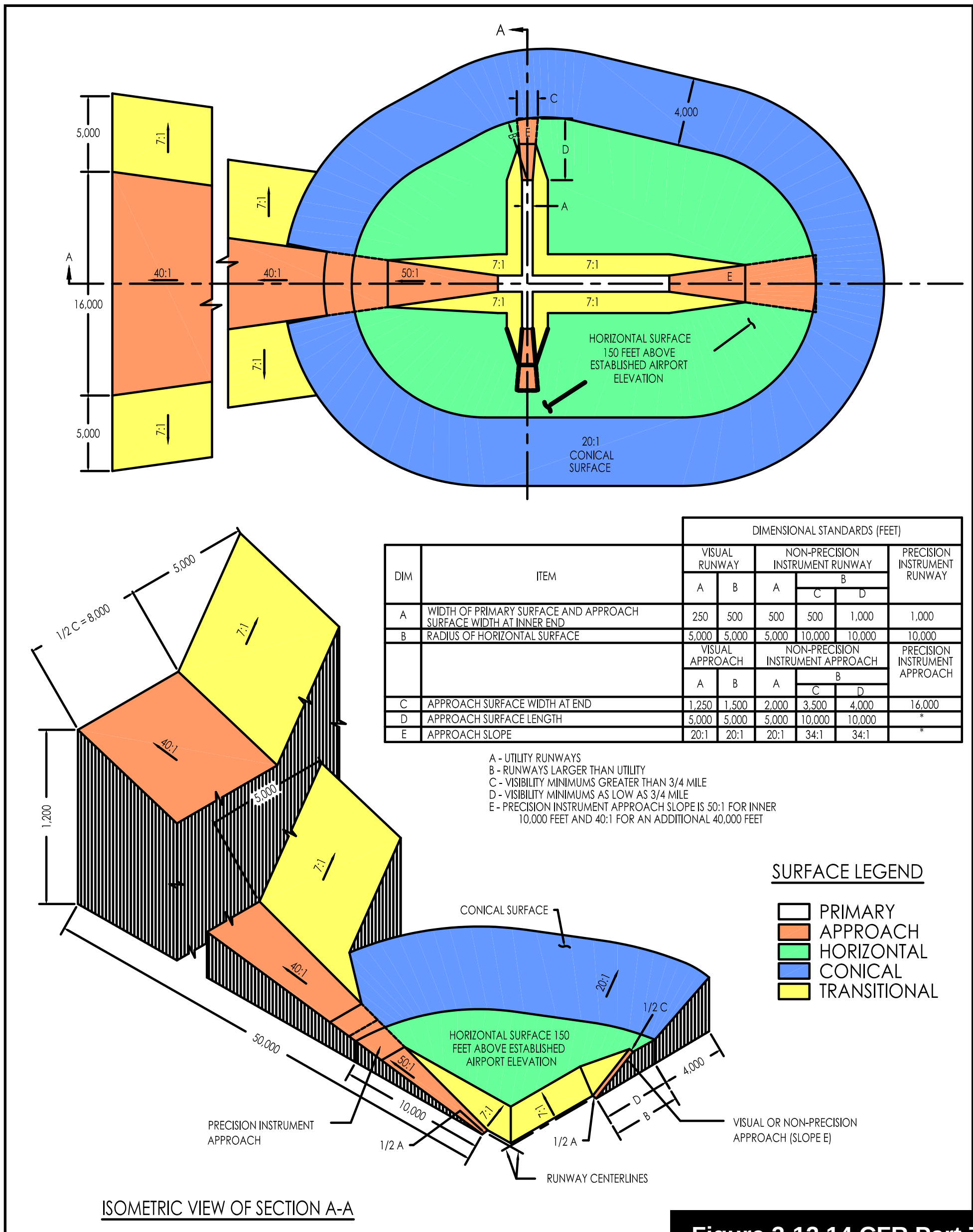
	Existing	Future
Runway 8	Nonprecision – Greater Than Utility ≥ ¾ Mile	Nonprecision – Greater Than Utility ≥ ¾ Mile
Runway 26	Precision – Greater Than Utility < ¾ Mile	Precision – Greater Than Utility < ¾ Mile
Primary Surface width	1,000’	1,000’
Primary Surface beyond RW end	200’	200’
Approach Surface dimensions	RW 8: 1,000’ x 4,000’ x 10,000’ RW 26: 1,000’ x 16,000’ x 50,000’	RW 8: 1,000’ x 4,000’ x 10,000’ RW 26: 1,000’ x 16,000’ x 50,000’
Approach Surface slope	RW 8: 34:1 RW 26: 50:1/40:1	RW 8: 34:1 RW 26: 50:1/40:1
Transitional Surface slope	7:1	7:1

Source: 14 CFR Part 77

Table 3-16 Existing and Future Part 77 Surfaces – Runway 12/30

	Existing	Future
Runway 12	Nonprecision – Greater Than Utility > 1 Mile	Nonprecision – Greater Than Utility > 1 Mile
Runway 30	Nonprecision – Greater Than Utility > 1 Mile	Nonprecision – Greater Than Utility > 1 Mile
Primary Surface width	500’	500’
Primary Surface beyond RW end	200’	200’
Approach Surface dimensions	RW 12: 500’ x 3,500’ x 10,000’ RW 30: 500’ x 3,500’ x 10,000’	RW 12: 500’ x 3,500’ x 10,000’ RW 30: 500’ x 3,500’ x 10,000’
Approach Surface slope	RW 12: 34:1 RW 30: 34:1	RW 12: 34:1 RW 30: 34:1
Transitional Surface slope	7:1	7:1

Source: 14 CFR Part 77



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B: C	B: 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	B: 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	*

Figure 3-13 14 CFR Part 77 Surfaces

3.9 Summary of Facility Requirements and FAA Design Standards

In summary, the facility requirements for Lewiston-Nez Perce County Regional Airport are based on the types and volume of aircraft and passengers expected to use the airport in the short, medium and long-term timeframes. These facilities will enable the airport to serve its users in a safe and efficient manner. The recommended airside and landside facilities are summarized in **Table 3-17**. The recommended FAA design standards, detailed in Chapter 1 – Inventory, for Runway 8/26 and Runway 12/30 are listed in **Table 3-18** and **3-19** and the taxiway system is listed in **Table 3-20** and **Table 3-21**.

Table 3-17 Summary of Airport Facility Requirements

Facility		Existing	Future
Runway 8/26	Runway Design Code	C-III	C-III
	Length (feet)	6,512’	6,512’
	Width (feet)	150’	150’
	Strength (pounds)	150,000 lbs. SWG 180,000 lbs. DWG 400,000 lbs. DTG	150,000 lbs. SWG 180,000 lbs. DWG 400,000 lbs. DTG
Marking	Runway 8	Non-Precision	Non-Precision
	Runway 26	Precision	Precision
Runway 12/30	Runway Design Code	B-II	B-II
	Length (feet)	5,000’	5,000’
	Width (feet)	100’	100’
	Strength (pounds)	70,000 lbs. SWG 94,000 lbs. DWG 150,000 lbs. DTG	70,000 lbs. SWG 94,000 lbs. DWG 150,000 lbs. DTG
Marking	Runway 12	Non-Precision	Non-Precision
	Runway 30	Non-Precision	Non-Precision
Taxiways			
	Taxiway Design Group	Group 3	Group 3*
	Parallel	RW 8/26: No RW 12/30: Yes	RW 8/26: Yes RW 12/30: Yes
	Bypass Taxiways/Turnarounds	No	Yes
	Width (feet)	50’	50’*
Apron			
	Tie Downs & Hard Stands	57	67**
	Total Apron Area	73,778 SY	95,100 SY**
NAVAIDs			
	Approaches	ILS, VOR-B, and GPS	ILS, VOR-B, and GPS
	Lowest Visibility Minimums	½-mile	½-mile
Lighting & Visual Aids			
	Signs	Lighted	Lighted
	Runway Edge	HIRL/MIRL	HIRL/MIRL
	Taxiway/Apron Edge	MITL/Reflectors	MITL
	Threshold Lights	Yes	Yes
	REILs	Yes	Yes
	Approach Slope Indicator (PAPI)	Yes	Yes
	Segmented Circle/Wind Cone	Yes	Yes
	Rotating Beacon	Yes	Yes
	Approach Lighting System	MALSR Runway 26	MALSR Runway 26
Access & Parking			
	Automobile Parking	462	650**
Hangar Facilities			
	T-Hangars	26	100**
	Conventional-Medium/Large	18	70**
Fuel Facilities			
	100 LL (gallons)***	6,000 Tank 12,000 Tank 20,000 Tank 800 Truck	6,000 Tank 12,000 Tank 20,000 Tank 800 Truck

Table 3-17 Summary of Airport Facility Requirements (Continued)

Facility		Existing	Future
	Jet-A (gallons)***	10,000 Tank 11,000 Tank 11,000 Tank 12,000 Tank 1,200 Truck 1,700 Truck 2,000 Truck 2,500 Truck	10,000 Tank 11,000 Tank 11,000 Tank 12,000 Tank 1,200 Truck 1,700 Truck 2,000 Truck 2,500 Truck
	Self Serve***	Yes	Yes
Other			
	ASOS	Yes	Yes
	Unicom	Yes	Yes
	Air Traffic Control Tower	Yes	Yes
	ARFF Index	A	B
	ARFF Station	4,250 SF	11,984 SF
	Terminal Building	29,649 SF	38,994 SF

*Taxiways utilized by the Bombardier Q400 should have fillets modified to TDG 5 to accommodate the aircraft's main gear track
** As required based on demand
***Additional service on south side recommended

Table 3-18 Existing and Future Airfield Design Standards – Runway 8/26

		Existing	Future
Runway Design Code		C-III	C-III
Approach Visibility Minimums	RW 8	¾-Mile	¾-Mile
	RW 26	½-Mile	½-Mile
Line of Sight Requirements Met*		No	Yes
RW Length		6,512’	6,512’
RW Width		150’	150’
RW Shoulder width		25’	25’
RW Safety Area width		500’	500’
RW Safety Area length beyond runway end		1,000’	1,000’
RW Object Free Area width		800’	800’
RW Object Free Area length beyond runway end		1,000’	1,000’
Obstacle Free Zone width		400’	400’
Obstacle Free Zone length beyond runway end		200’	200’
Runway Protection Zone	RW 8	500’ x 1,700’ x 1,010’	500’ x 1,700’ x 1,010’
	RW 26	1,000’ x 2,500’ x 1,750’	1,000’ x 2,500’ x 1,750’
Blast Pad length		200’	200’
Blast Pad width		200’	200’
RW Centerline to taxiway/taxilane centerline		400’	400’
RW Centerline to aircraft parking area		500’ (546’ actual)	500’ (546’ actual)

Source: FAA AC 150/5300-13A *Airport Design*
*Line of sight mitigation will be evaluated in Chapter 4 – Development Alternatives

Table 3-19 Existing and Future Airfield Design Standards – Runway 12/30

		Existing	Future
Runway Design Code		B-II	B-II
Approach Visibility Minimums	RW 12	1-Mile	1-Mile
	RW 30	1-Mile	1-Mile
Line of Sight Requirements Met		Yes	Yes
RW Length		5,000’	5,000’
RW Width		75’ (100’ actual)	75’ (100’ actual)
RW Shoulder width		10’	10’
RW Safety Area width		150’	150’
RW Safety Area length beyond runway end		300’	300’
RW Object Free Area width		500’	500’
RW Object Free Area length beyond runway end		300’	300’
Obstacle Free Zone width		400’	400’
Obstacle Free Zone length beyond runway end		200’	200’
Runway Protection Zone	RW 12	500’ x 1,000’ x 700’	500’ x 1,000’ x 700’
	RW 30	500’ x 1,000’ x 700’	500’ x 1,000’ x 700’
RW Centerline to taxiway/taxilane centerline		240’ (276’ actual)	240’ (276’ actual)
RW Centerline to aircraft parking area		250’ (371’ actual)	250’ (371’ actual)

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

Table 3-20 Design Standards – Taxiway System

Taxiway Design Group	1	2	3
TW Width	25’	35’	50’
TW Safety Free Area width	49’	79’	118’
TW Object Free Area width	89’	131’	186’
TW Centerline to Parallel TL Centerline	70’	105’	152’
TL Object Free Area width	79’	115’	162’

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

Table 3-21 Existing and Future Taxiway Design Group

Taxiway	Existing TDG	Future TDG
A	3	3*
B	3	3*
C	3	3*
D	3	3*
F	3	3*
G	3	3*
H	3	3*
K	3	3*
Z	3	3
Z1	3	3
Z2	3	3

*With TDG 5 Fillets

CHAPTER FOUR

DEVELOPMENT ALTERNATIVES

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN

Chapter Four
Development Alternatives

4.1 Introduction

While there are theoretically a broad range of options and variations for each aspect of airport development, an organized approach to identifying and evaluating alternatives that reasonably meet future aviation demand and a community's strategic goals and objectives is essential for effective airport master planning. The preceding chapters have established the projected activity levels at Lewiston-Nez Perce County Regional Airport and identified facilities that will be needed to accommodate growth for the 20-year planning horizon. Determining the best options for achieving airside and landside development needs will allow the Airport to invest in long-term capital infrastructure.

Included herein is a comprehensive breakdown of alternatives and recommended development options for the airside and landside improvements. Airside alternatives primarily focus on mitigating the existing line of sight deficiency for Runway 8/26, correcting non-standard taxiway geometries, and expanding the commercial service and helicopter parking aprons. Landside alternatives focus on passenger terminal building improvements and expansion, development of air cargo, air tanker, helicopter parking and unmanned aerial systems and vehicles (UAS/UAV) facilities, expanding the Snow Removal Equipment (SRE) storage building, upgrading or replacing the Aircraft Rescue and Fire Fighting (ARFF) station and industrial and business park development.

4.2 Development Objectives

The overall objectives of the alternatives analysis are to 1) define a path for future development that is capable of accommodating the forecast demand and facility needs of the airport and 2) evaluate the best way to implement the facility requirements as presented in Chapter 3 – Facility Requirements.

There is countless variety for potential development options for any particular airport and Lewiston-Nez Perce County Regional Airport is no exception. The selection of a favored approach to a project can often result from a straightforward and logical discussion of the options at hand. In other cases, a comparative analysis is necessary to determine the preferred alternative.

4.3 Airside Development Alternatives

Whereas there are no major changes recommended for the runways at Lewiston-Nez Perce County Regional Airport, the recommended airside projects focus primarily on correcting non-standard conditions for both Runway 8/26 and the taxiway system. As described in Chapter 3 –

Facility Requirements, the existing runways and taxiways provide sufficient length and strength for the existing and forecasted operations and fleet mix. The instrument approach minimums meet future requirements and do not require the installation of any additional Navigational Aids (NAVAIDs), marking or lighting.

4.3.1 Runway 8/26 Line of Sight Correction

The Facility Requirements Chapter discussed the existing Runway 8/26 Line of Sight (LOS) deficiency. The FAA has indicated the LOS deficiency should be corrected to ensure safe operation and compliance with FAA Advisory Circular 150/5300-13A, *Airport Design*. The LOS deficiency can be corrected by one of two approaches: (1) provide a full-length parallel taxiway or (2) changing the grades of the runway. Several alternatives for these approaches have been evaluated for correcting the LOS deficiency. **Figures 4-1** through **4-6** depict the Runway 8/26 LOS correction alternatives.

Line of Sight Correction Alternative 1 (See Figure 4-1)

Alternative 1 would add approximately 1,960 linear feet of parallel Taxiway A between Taxiway F and Taxiway C on the north side of Runway 8/26. This would intersect the threshold to Runway 30. To minimize the possibility of runway incursions, Runway 12/30 would be closed, and runway lighting disabled, from 10:00 P.M. to 6:00 A.M. when the Air Traffic Control Tower (ATCT) is closed.

The major advantages to this alternative are:

- Maintains existing runway length for both runways
- Provides a full length parallel taxiway for Runway 8/26
- No land acquisition required

The major disadvantages to this alternative are:

- Intersects Runway 30 threshold increasing risk of runway incursions
- Will contribute to existing hot spot at the Runway 30 intersection
- Intersects Runway 30 at an angle greater than 90 degrees
- Requires the displacement of Runway 12/30 during portions of construction
- Requires the closure of Runway 12/30 during ATCT closure hours (10:00 P.M. to 6:00 A.M.)

Line of Sight Correction Alternative 2 (See Figure 4-2)

Alternative 2 would add approximately 4,150 linear feet of parallel Taxiway Z from Taxiway Z2 to the approach end of Runway 26, including two additional connector taxiways, on the south side of Runway 8/26. This alternative would result in a full length parallel taxiway and associated connector taxiways located 400 feet south of Runway 8/26. The taxiway could be constructed in phases to meet funding availability.

The major advantages to this alternative are:

- Avoids taxiway intersecting Runway 12/30
- Provides a full length parallel taxiway to Runway 8/26

- Eliminates hot spot on Runway 30
- Land is compatible with airport operations
- Provides direct access to proposed Southside Apron Development
- Keeps Runway 12/30 operational during ATCT closure hours

The major disadvantages to this alternative are:
- Requires acquisition of +/- three acres of land
- Requires in-depth environmental evaluation
- Requires embankment construction of adjacent terrain for taxiway grade requirements
- Requires the realignment of Southport Avenue
- Requires the closure or shortening of Runway 12/30 during portions of construction

Line of Sight Correction Alternative 3 (See Figure 4-3)
Alternative would add approximately 1,960 linear feet of parallel Taxiway A between Taxiway F and Taxiway C on the north side of Runway 8/26. Alternative 3 also includes the de-coupling of Runway 12/30 and Taxiway A pavements. Runway 12/30 would need to be shortened by 358 feet to create a separation of pavement for Runway 12/30 and Taxiway A. Runway 30 threshold would also be displaced by 596 feet to provide the threshold sitting surface to clear the future design aircraft tail taxiing along Taxiway A.

The major advantages to this alternative are:
- Increases aircraft circulation and reduces time spent on Runway 8/26
- Mitigates existing Runway 8/26 LOS deficiency
- Provides full length parallel taxiway for Runway 8/26
- Eliminates Runway 30 intersection hot spot

The major disadvantages to this alternative are:
- Requires the closure of Runway 12/30 during portions of construction
- Reduces the existing length of Runway 12/30 by 358 feet
- Requires the displacement of the Runway 30 threshold by 596 feet
- Requires the future use of declared distances
- Requires the use of marked hold bar and lighted signage on Taxiway A to protect for departures on Runway 12

Line of Sight Correction Alternative 4 (See Figure 4-4)
Similar to Alternative 1, Alternative 4 would add a portion of parallel Taxiway A between Taxiway F and C; however Runway 12/30 would be shifted (i.e. Runway 30 end shortened and Runway 12 end extended) approximately 2,000 feet to the northwest to provide compatible land use within the RPZ.

The major advantages to this alternative are:
- Maintains existing runway length for Runway 12/30
- Provides a full length parallel taxiway to Runway 8/26

- Provides recommended taxiway and runway intersection geometry
- Eliminates Runway 30 intersection hot spot
- Keeps Runway 12/30 operational during ATCT closure hours

The major disadvantages to this alternative are:

- Requires the acquisition of +/- 21 acres of land
- Requires in-depth environmental evaluation
- Requires embankment construction to maintain extended grades of Runway 12/30
- Impacts adjacent golf course to accommodate the runway shift
- Impacts to Golf Course (Section 4(f) properties)
- Requires the relocation or closure of O'Conner Road
- Shifts runway towards incompatible land use including residential properties, places of worship and schools
- Requires the closure of Runway 12/30 during portions of construction

Line of Sight Correction Alternative 5 (See Figure 4-5)

Alternative 5 would reconstruct Runway 8/26 and elevate each runway end to eliminate the existing LOS deficiency.

The major advantages to this alternative are:

- Maintains existing runway length for Runway 12/30
- Does not encroach upon Runway 12/30
- No land acquisition required

The major disadvantages to this alternative are:

- Requires the closure of Runway 8/26 during construction
- Negative economic impacts related to runway closure
- Does not provide a full length parallel taxiway on Runway 8/26
- Does not reduce time aircraft spend on Runway 8/26
- Requires embankment construction to meet grade requirements for runway
- Impacts existing ILS approach and MALSR on Runway 8/26, requiring elevation adjustments
- Requires the reconstruction of three connector taxiways to meet grade requirements

Line of Sight Correction Alternative 6 (See Figure 4-6)

Alternative 6 would reconstruct a portion of Runway 8/26 by lowering the central segment of the runway surface profile to eliminate the existing LOS deficiency.

The major advantages to this alternative are:

- Maintains existing runway length for Runway 12/30
- Does not encroach upon Runway 12/30
- No land acquisition required

The major disadvantages to this alternative are:

- Requires the closure of Runway 8/26 during construction
- Negative economic impacts related to runway closure
- Does not provide a full length parallel taxiway on Runway 8/26
- Requires the reconstruction of two connector taxiways to meet grade requirements
- Requires significant cut to meet grade requirements for runway
- Impacts existing ILS approach and MALSR on Runway 8/26, requiring elevation adjustments

Line of Sight Correction Alternative 7

Alternative 7 is the no action alternative. This alternative would not resolve the existing Runway 8/26 LOS deficiency.

The major advantages to this alternative are:

- Requires no federal or local investment
- No potential environmental impacts
- No runway closures
- Requires no construction or adjustment to existing airport layout configuration

The major disadvantages to this alternative are:

- Would not mitigate Runway 8/26 LOS deficiency
- Diminished level of operational safety
- Could jeopardize future FAA grant funding

Cost Estimates and Recommended Line of Sight Alternative

A summary of the cost estimates for Alternatives 1 through 6 are included in **Table 4-1**. Alternative 7 was omitted from the cost estimates as it does not require any funding. Based on the analysis conducted, Alternative 2 provides greater physical, environmental, safety and operational benefits over the other alternatives evaluated and is therefore the recommended development. While Alterative 2 is not the least expensive alternative, the benefits associated with eliminating the Runway 12/30 hot spot, correcting LOS deficiencies and enhanced operational benefits on the southside outweigh the project cost.

Table 4-1 Estimates of Runway 8/26 LOS Deficiency Mitigation Alternatives

Alternative	Total Cost	Federal Share	Local Share
1	$2,105,600	$1,974,000	$131,600
2	$10,215,875	$9,577,383	$638,492
3	$2,353,600	$2,206,500	$147,100
4	$20,846,750	$19,543,828	$1,302,922
5	$12,454,800	$11,676,375	$778,425
6	$11,719,350	$10,986,891	$732,459

Note: All figures use 2014 dollars

4.3.2 Correction of Non-Standard Conditions – Taxiway System Geometries

The Facility Requirements Chapter discusses the necessity to correct non-standard taxiway geometries which provide direct access to Runway 12/30 from the North General Aviation and Commercial Service Apron. Currently, the geometries of Taxiways D, F, G and K provide direct access to Runway 12/30. According to FAA Advisory Circular 150/5300-13A, *Airport Design*, Paragraph 401, Section 5, Subpart (g); "Do not design taxiways to lead directly from an apron to a runway. Such configurations can lead to confusion when a pilot typically expects to encounter a parallel taxiway." It is recommended to reconfigure the connector taxiway system at Taxiways D, F, K and G to provide indirect access from the North General Aviation and Commercial Service Aprons. This will increase situational awareness, prevent runway incursions and enhance airfield safety. The recommended taxiway system layout is depicted in **Figure 4-7**.

4.3.3 Commercial Service Apron

As discussed in the Facility Requirements Chapter, it is anticipated that an apron expansion of approximately 22,000 square yards will be necessary to accommodate forecasted enplanements. This size would accommodate peak hour operations plus one aircraft to accommodate any possible irregular operations such as mechanical delays, diversions or charter activity. Two alternatives have been evaluated to accommodate the future commercial service apron and are discussed further in the Passenger Terminal Building section.

4.3.4 Helicopter Parking Apron and Heliport

Currently, there are 14 helicopters based at Lewiston-Nez Perce County Regional Airport with no designated helicopter parking pads. It is recommended to construct a total of five helicopter parking pads and one heliport to accommodate based and transient helicopter operations. The recommended location and helicopter parking apron layout is depicted in **Figure 4-7**. Additional future helicopter parking aprons could be accommodated in the Southside Apron Development area.

4.3.5 Airport Perimeter Road

The Facility Requirement Chapter recommended the construction of an airport perimeter road for vehicles within the Airside Operations Area to operate with minimal use of the movement surfaces. The airport perimeter road would be primarily utilized by aircraft refueling vehicles, airport maintenance crews and operation inspections.

Airport Perimeter Road Alternative 1 (See Figure 4-8)

Alternative 1 would include the construction of an 8-foot wide airport perimeter road connecting the North General Aviation apron to the Hillcrest Aircraft Company apron. The road would be constructed along the perimeter adjacent to the Runway 12 threshold and would remain outside of the RSA, ROFA and ROFZ length beyond the Runway 12 end. Alternative 1 would also include the construction of an 8-foot wide airport perimeter road connecting the North General Aviation apron to the South General Aviation Apron and would remain outside of the Runway 8/26 RSA, ROFA and ROFZ.

The major advantages to this alternative are:

- Would not impact Runway 12/30
- Would provide connection from North General Aviation apron to Hillcrest Aircraft Company apron
- Would reduce the risk of runway incursions
- Would increase vehicle circulation outside of the AOA
- Would reduce workload of Air Traffic Control services

The major disadvantages to this alternative are:

- Would require fill of +/- 10,000 cubic yards to accommodate perimeter road
- Would require the construction of retaining walls near the Runway 12 threshold and south of Runway 8/26
- Would require minor adjustments to the airport perimeter fence
- Would require minor realignment of O'Connor Road
- Would impact adjacent golf course

Airport Perimeter Road Alternative 2 (See Figure 4-9)

Alternative 2 would include the conversion of a portion of O'Connor Road to an airport perimeter road connecting the North General Aviation apron to the Hillcrest Aircraft Company and South General Aviation aprons. A two-lane access road would also be constructed to run parallel to the converted airport perimeter road to maintain vehicle circulation.

The major advantages to this alternative are:

- Would provide connection from North General Aviation apron to Hillcrest Aircraft Company apron
- Would reduce the risk of runway incursions
- Would increase vehicle circulation outside of the AOA
- Would reduce workload of Air Traffic Control services

The major disadvantages to this alternative are:

- Would require realignment of O'Connor Road
- Would impact adjacent golf course
- Would require +/- 676,200 cubic yards of cut to accommodate perimeter road
- Would require +/- 9,900 linear feet of a two-lane asphalt access road
- Would require +/- 9,900 linear feet of perimeter fencing
- Would require the construction of a retaining wall in vicinity of the Runway 26 Instrument Landing System Localizer
- Would require adjustments to airport perimeter fence

Airport Perimeter Road Alternative 3 (See Figure 4-10)

Alternative 3 would include the construction of a tunnel under Runway 12/30 connecting the North General Aviation apron to the Hillcrest Aircraft Company apron. The tunnel would be constructed at the north end of the existing North General Aviation apron, go

under Runway 12/30 and resurface adjacent to the Hillcrest Aircraft Company apron. This tunnel would measure +/- 400 feet in length.
A second tunnel would also be constructed connecting Taxiway A to the South General Aviation apron. This tunnel would be located approximately 950 feet from the Runway 8 threshold and go under Runway 8/26. This tunnel would measure +/- 500 feet in length.

The major advantages to this alternative are:
- Would not impact Runway 12/30 or Runway 8/26 once constructed
- Would provide shortest and most direct connection time between North General Aviation apron and Hillcrest Aircraft Company apron
- Would reduce the need for vehicular traffic to operate within the AOA
- Would reduce the risk of runway incursion
- Would reduce workload of Air Traffic Control services
- Would not impact surrounding land uses

The major disadvantages to this alternative are:
- Cost associated is far greater than all other alternatives
- Would have significant impacts to the airport during construction
- Would require extensive geotechnical surveying
- Would require the closure of Runway 12/30 and Runway 8/26 during portions of construction

Airport Perimeter Road Alternative 4 (See Figure 4-11)
Alternative 4 would include the installation of AvGas and Jet-A fuel dispensing tanks at both the Hillcrest Aircraft Company and South General Aviation aprons.

The major advantages to this alternative are:
- Would not impact Runway 12/30 or Runway 8/26
- Would reduce the need for vehicular traffic to operate within the AOA
- Would eliminate the risk of runway incursion caused by fuel dispensing truck movement
- Would eliminate workload of Air Traffic Control services related to fuel dispensing truck movement
- Would not impact surrounding land uses
- Most cost effective Alternative while meeting Sponsor needs and goals

The major disadvantages to this alternative are:
- Would not be eligible for Airport Improvement Program funding
- Would need to be entirely funded by local sources
- Would not eliminate the risk of runway incursion or reduce workload of Air Traffic Control Services related to the maintenance vehicles

Airport Perimeter Road Alternative 5

Alternative 5 is the no action alternative. Vehicular traffic operating between the North General Aviation apron and the Hillcrest Aircraft Company apron would be required to utilize their existing route of travel including transit over Runway 12/30 and potential impacts to Runway 8/26 in the future.

The major advantages to this alternative are:

- Would require no federal or local investment
- Would have no environmental impacts
- Would not impact surrounding land uses
- Would not provide optimum vehicular circulation within the AOA

The major advantages to this alternative are:

- Does not mitigate existing risk of runway incursion
- Does not reduce workload of Air Traffic Control services
- Does not meet the goals and needs of the airport sponsor

Cost Estimates for Airport Perimeter Road Alternatives

A summary of the cost estimates for Alternatives 1 through 4 are included in **Table 4-2.** Alternative 5 was omitted from the cost estimates as it does not require any funding.

Table 4-2 Estimates of Airport Perimeter Road Alternatives

Alternative	Total Cost	Federal Share	Local Share
1	$5,900,000	$5,310,000	$590,000
2	$6,850,000	$6,165,000	$685,000
3	$8,100,000	$7,290,000	$810,000
4	$1,100,000	$0	$1,100,000

Note: All figures use 2014 dollars

4.4 Landside Development Alternatives

Landside development consists of all portions of the airport designed to serve the passengers, users and tenants which are not aircraft movement surfaces. These areas consist of the passenger terminal building, vehicle roads, parking facilities, airport maintenance and support, Aircraft Rescue and Fire Fighting, general aviation hangar and services development areas and industrial park.

4.4.1 Passenger Terminal Building

The Facility Requirements Chapter evaluated the existing passenger terminal building and the building's ability to handle existing and forecasted enplanements. The analysis determined an existing deficiency of 2,577 square feet to accommodate the current number of enplanements and an additional 9,345 square feet needed to accommodate the long-term forecasted demand. The current areas of deficiency have been identified as the TSA Passenger Screening Checkpoint and terminal circulation. The passenger terminal building also lacks an additional gate to accommodate an unscheduled aircraft or irregular operation. It is recommended to replace or expand the terminal building to a total size of 38,994 square feet to provide adequate space to accommodate peak hourly enplanements over the 20-year planning period. The replacement or expansion would also accommodate a total of four passenger gates. Environmental sustainability should be considered during the terminal building expansion and upgrades. This could include items such as utilization of natural light and energy efficient lighting and equipment. The development of solar panels on the terminal building could also be evaluated. Two alternatives were evaluated to provide a terminal building of 38,994 square feet and aircraft parking apron of 22,000 square yards. Alternative 1 is expanding the existing terminal building, Alternative 2 is constructing a new terminal building on the southside and Alternative 3 is the no action alternative.

Passenger Terminal Building Alternative 1 (See Figure 4-12)

Alternative 1 would expand the first floor of the existing passenger terminal building by 9,345 square feet to the north and west. Alternative 1 would also expand the existing commercial service apron by 13,874 square yards to a size of 22,000 square yards by replacing existing asphalt pavement within the vicinity of the passenger terminal building with concrete.

The major advantages to this alternative are:

- Cost of expansion would be less than constructing a new building
- Existing infrastructure is capable of handling expanded building
- Reduced potential for environmental impact

The major disadvantages to this alternative are:

- Would impact rental car parking lot
- Commercial service apron would move closer to Runway 12/30
- Would require adjustment to vehicle parking and access to accommodate enplanements
- Comparatively, greater taxi time for commercial service using Runway 8/26 than Alterative 2
- Retrofitting existing facilities to achieve environmental sustainability

Passenger Terminal Building Alternative 2 (See Figure 4-13A)

Alternative 2 would construct a new 38,994 square foot passenger terminal building, 22,000 square yard commercial service apron and vehicle access roads and parking south of Runway 8/26.

The major advantages to this alternative are:

- Flexible configuration to achieve optimal area use
- Building would be constructed to achieve environmental sustainability
- Reduced taxing time for commercial service aircraft using Runway 8/26
- Existing passenger terminal building and automobile parking lots could be modified to accommodate general aviation development (See **Figure 4-13B**)

The major disadvantages to this alternative are:
- Cost of constructing a new passenger terminal building is greater than expanding the existing building
- Constrains other planned development south of Runway 8/26
- Increased potential for environmental impacts
- Requires significant infrastructure development to accommodate terminal facility
- Less convenient location for public access to the terminal
- Requires parking garage structure to accommodate automobile parking due to limited space

Passenger Terminal Building Alternative 3
Alternative 3 is the no action alternative. This would not increase the passenger terminal building or commercial service apron.

The major advantages to this alternative are:
- Requires no federal or local investment
- No potential environmental impacts
- Requires no construction or adjustment to existing landside layout configuration

The major disadvantages to this alternative are:
- Would not accommodate corrections to existing and future facility constraints
- Would not increase commercial service aircraft parking apron
- Negative economic impacts related to future activity constraints

Cost Estimates for Passenger Terminal Alternatives
A summary of the cost estimates for Alternatives 1 and 2 are included in **Table 4-3**. Alternative 3 was omitted from the cost estimates as it does not require any funding. Other alternatives such as utilizing and expanding the second floor of the existing passenger terminal were eliminated for a lack of feasibility. The timeline for the building expansion is included in Chapter 7 – Airport Development and Financial Plan.

Table 4-3 Estimates of Passenger Terminal Building Alternatives

Alternative	Total Cost	Federal Share	Local Share
1	$2,200,000	$2,062,500	$137,500
2	$21,500,000	$20,156,250	$1,343,750

Note: All figures use 2014 dollars and account for terminal building construction/reconfiguration only

4.4.2 Vehicle Parking and Access
Passenger Terminal Building Alternative 1 would require future, modifications to the existing vehicle parking and access. Passenger Terminal Alternative 2 does not require alternative evaluation due to the configuration and layout of the vehicle parking and access being included with the facility design. Three alternatives have been evaluated to provide additional automobile parking and increase curbside circulation at the existing location. Alternatives 1 and 2 would also include the construction of a rental car/employee/restaurant customer parking lot and an

overflow long-term parking lot. Alternative 3 would construct a parking garage located on the area of the existing parking lot. These will accommodate growth in rental car fleets, increase in airport employment and increase access to the terminal building restaurant.

Vehicle Parking and Access Alternative 1 (See Figure 4-14)
Alternative 1 would increase the terminal building curbside from two lanes (one shared-use parking and one shared-use bypass) to five lanes (two private vehicle parking, one vehicle bypass, one public transit/hotel shuttle/taxi parking and one public transit/hotel shuttle/taxi bypass). The existing access road would be expanded to two lanes leading to and departing from the terminal building curbside.

The major advantages to this alternative are:

- Provides optimum vehicle circulation
- Segregates private automobile traffic from public use ground transportation
- Provides area for development of Public Transit Center

The major disadvantages to this alternative are:

- Would require removal and relocation of existing parking spots to accommodate lane expansions
- No access to the airport east along Burrell Avenue

Vehicle Parking and Access Alternative 2 (See Figure 4-15)
Alternative 2 would increase the airport access and circulation by constructing a combined overflow / “cell phone” parking lot which would accommodate automobiles unable to park in the existing parking lot or vehicles waiting for passengers in a designated holding lot rather than the terminal building curbside. Environmental considerations regarding Alternative 2 are further discussed in Chapter 6 – Environmental Overview.

The major advantages to this alternative are:

- Does not interfere with the existing configuration of the terminal building curbside
- Does not reduce number of existing automobile parking spots
- Increases vehicle circulation

The major disadvantages to this alternative are:

- Effectiveness of cell phone lot may diminish depending on variations in airline schedules.
- Does not provide optimum vehicle circulation

Vehicle Parking and Access Alternative 3 (See Figure 4-16)
Alternative 3 would construct a multi-story parking garage structure to be located in the same area as the existing vehicle parking lot. The structure would be constructed with a flexible design to allow for vertical expansion once warranted by demand. The structure would be approximately 228,000 square feet in size.

The major alternatives to this alternative are:

- Increases number of automobile parking spots
- Does not move future automobile parking spots away from passenger terminal building
- Allows for post planning period expansion
- Would consolidate all vehicle parking including short-term, long-term, rental car, employee and restaurant customer parking lots into one central location

The major disadvantages to this alternative are:

- Impacts to vehicle parking during the construction of the parking garage
- Cost of constructing a parking garage is greater than the other Alternatives
- Increased potential for environmental impacts
- Increased long-term maintenance costs

Vehicle Parking and Access Alternative 4

Alternative 4 is the no action alternative. This alternative would not increase the existing number of automobile parking spots or increase vehicle circulation near the terminal building curbside.

The major advantages to this alternative are:

- Requires no federal or local investment
- No potential environmental impacts
- Requires no construction or adjustment to existing landside layout configuration

The major disadvantages to this alternative are:

- Would not increase number of automobile parking spots
- Would not increase vehicle circulation
- Negative economic impacts related to future activity constraints

Cost Estimates for Vehicle Parking and Access Alternatives

A summary of the cost estimates for Alternatives 1 through 3 are included in **Table 4-4.** Alternative 4 was omitted from the cost estimates as it does not require any funding.

Table 4-4 Estimates of Vehicle Parking and Access Alternatives

Alternative	Total Cost	Federal Share	Local Share
1	$280,000	$262,500	$17,500
2	$750,000	$703,125	$46,875
3	$16,500,000	$15,468,750	$1,031,250

Note: All figures use 2014 dollars. Vehicle parking facilities are not AIP eligible if utilized for revenue generation.

4.4.3 SRE Storage Building

The existing SRE Storage Building is currently unable to accommodate the existing inventory of snow removal and airport maintenance equipment. It is recommended to expand the existing facility to a size of 16,000 square feet with increased door width to accommodate existing and future snow plows to adequately protect snow removal and airport maintenance equipment from natural elements and therefore extend the equipment's useful life.

4.4.4 Public Transit Center

The current connection of the passenger terminal building to the nearest public transit stop requires walking approximately 411 feet to the east and crossing a three-way intersection with no marked crosswalk. To enhance the safety and experience of passengers utilizing public transit, it is recommended to increase connectivity to the public transit system during the recommended passenger terminal building expansion. The recommended layout of the public transit center is depicted in **Figure 4-14**.

4.4.5 General Aviation Facilities

Lewiston-Nez Perce County Regional Airport has currently undertaken the expansion of facilities along the southern portions of the airport property, also known as the Southside Airport Business Park. It is recommended to construct additional box hangars and T-hangars to accommodate existing and forecasted based aircraft. Additional hangars should also be constructed to accommodate transient aircraft which may require a covered parking area. Corporate parcels and aircraft parking apron space should also be adequately protected to allow future development of aeronautical businesses such as Jet Centers, Fixed Base Operators, fixed-wing and helicopter Specialized Aviation Service Operators or Flight Training Centers. Future aircraft fueling facilities should also be incorporated to serve future users of the Southside Apron Development.

The development of the general aviation facilities within the Southside Apron Development area would be a significant undertaking which would require substantial earthwork and costs. The development should be pursued once there is documented demand.

The recommended layout of the general aviation facilities is depicted in **Figure 4-17**. The recommended layout is considered to be a high-level land use analysis and not a detailed layout. As demand for expansion along the southside continues; detailed layouts should be developed to accommodate the demand.

4.4.6 Air Cargo Facilities

As discussed in the Facility Requirements Chapter, air cargo operations are conducted out of two locations within the northern portion of Lewiston-Nez Perce County Regional Airport. Ameriflight is required to transfer cargo to the aircraft directly from the truck on the North General Aviation Apron. When cargo volume growth exceeds existing capacity, it is recommended to construct a centralized air cargo facility in the south portion of the airport property adjacent to Runway 8/26. Once the air cargo facility has relocated to the south, it is recommended to demolish the existing structure to develop more passenger automobile parking. The recommended air cargo facility location is depicted in **Figure 4-17**. Detailed air cargo facilities configuration would be developed by the air cargo provider based on actual demand.

4.4.7 Air Tanker Facilities

The Facility Requirements Chapter recommended the construction of an air tanker facility to respond to local and regional wildfire occurrences. It is recommended to construct the air tanker facility adjacent to the planned Southside Apron Development area. This project would not be eligible for AIP funding. The recommended air tanker facility location is depicted in **Figure 4-17**. Detailed air tanker facilities configuration would be developed by the Bureau of Land Management based on actual demand.

4.4.8 Unmanned Aerial Systems and Vehicles Facilities

With the use of UAS/UAVs forecasted to increase throughout the United States, it is prudent to plan for a designated area to accommodate this developing technology. It is recommended to construct a facility which would include a UAS/UAV parking apron, conventional hangars, an aerial operations center and vehicle parking. It is recommended to locate the facility within the south portion of the airport property and ensure segregation from manned aircraft operations. The recommended layout and location of the UAS/UAV facility is depicted in **Figure 4-17**.

4.4.9 Aircraft Rescue and Fire Fighting Station

The Facility Requirements Chapter identified several key constraints and deficiencies effecting the existing Aircraft Rescue and Fire Fighting (ARFF) Station. Additionally, the existing ARFF station has limited surveillance of airfield surfaces including no visibility of the commercial service apron. To meet the design standards listed in FAA Advisory Circular 150/5210-15A, *Aircraft Rescue and Firefighting Station Building Design*, the existing station should be expanded to a size of 11,984 square feet or a new facility should be constructed to match the required size. The current ARFF station is also utilized by the City of Lewiston Fire Department for structural fires. The joint-use of the facility is anticipated to continue into the future and was therefore taken into account in the siting of the structure. The alternatives take into account both the ARFF requirements as well as the City Fire Station requirements. **Figure 4-18** depicts the proposed layout and location of the following ARFF station alternatives. **Table 4-5** assigns a rating score to each alternative based on the site selection criterion listed in FAA Advisory Circular 150/5210-15A, *Aircraft Rescue and Firefighting Station Building Design.* A list of station facilities and associated sizes are listed in **Table 3-14**.

Aircraft Rescue and Fire Fighting Station Alternative 1

Alternative 1 would construct a new ARFF station located within the northeastern portion of the airport property to the southeast of the Northeast General Aviation Hangars. The existing ARFF station would be demolished. ARFF vehicles would access the airfield via Taxiway B. Municipal vehicles would access the community via a Cedar Avenue.

The major advantages to this alternative are:

- Maintains municipal rescue response time due to proximity to residential areas
- Enhanced airfield surveillance
- Facility would meet FAA ARFF Station design standards
- Opens space in existing ARFF station location for passenger automobile parking

The major disadvantages to this alternative are:
- Increased distance to midfield of furthest runway
- Would require the elevation of watch/alarm room to provide sufficient surveillance of Commercial Service Apron
- Costs associated with accessing utility services located south of Runway 8/26
- Possible removal of public baseball field to provide direct access to Cedar Avenue
- Costs associated with construction of new ARFF station
- Infrastructure development would be required
- Potential impact to surrounding land uses

Aircraft Rescue and Fire Fighting Station Alternative 2

Alternative 2 would construct a new ARFF station located in the eastern portion of the airport property to the north of the Runway 26 threshold. The existing ARFF station would be demolished. ARFF vehicles would access the airfield via a proposed ARFF access road connecting to Taxiway C. Municipal fire vehicles would access the community via Grelle Avenue.

The major advantages to this alternative are:
- Enhanced airfield surveillance
- Facility would meet FAA ARFF station design standards
- Maintains municipal rescue response time due to proximity to residential areas
- Direct access to Grelle Avenue for municipal rescue response
- Opens space for passenger automobile parking

The major disadvantages to this alternative are:
- Longest distance to midfield of furthest runway of alternatives
- Would require highest elevation of alternatives to achieve increased airfield surveillance
- Costs associated with construction of new ARFF station
- Costs associated with accessing city water services located south of Runway 8/26
- Would require the construction of access road connecting ARFF station to airfield pavements
- Infrastructure and additional utility development would be required

Aircraft Rescue and Fire Fighting Station Alternative 3A

Alternative 3A would remodel and expand the existing ARFF station at its current location. ARFF vehicles would access the airfield via a new ARFF access road.

The major advantages to this alternative are:
- Reduced response time to midfield of furthest runway due to increase in operational efficiency
- Would not require construction of new ARFF station
- Facility would meet FAA ARFF Station design standards
- Reduced potential for environmental impacts

- Would not require substantial utility line extensions
- Would allow for the use of existing utility infrastructure on site

The major disadvantages to this alternative are:

- Would require elevation of watch/alarm room to provide sufficient surveillance of airfield pavements
- Existing ARFF station would require substantial overhaul to achieve FAA design standard compliance
- Would require the construction of a new ARFF access road
- Would require the acquisition of +/- 0.30 acres of land and removal of residential property

Aircraft Rescue and Fire Fighting Station Alternative 3B

Alternative 3B would construct a new ARFF station at its current location, requiring the existing station to be torn down. ARFF vehicles would access the airfield via a new ARFF access road. The ultimate configuration of the proposed ARFF access road is contingent upon the constructed layout of the ARFF station.

The major advantages to this alternative are:

- Would remain at existing location without requiring retrofit of existing structure
- Reduced response time to midfield of furthest runway due to increase in operational efficiency
- Facility would meet FAA ARFF Station design standards
- Reduced potential for environmental impacts
- Would not require substantial utility line extensions
- Would allow for the use of existing utility infrastructure on site

The major disadvantages to this alternative are:

- Costs associated with construction of new ARFF station and demolition of existing ARFF station
- Would require the construction of a new ARFF access road
- Would require the elevation of watch/alarm room to provide sufficient surveillance of Commercial Service Apron
- Would require the acquisition of +/- 0.30 acres of land and removal of residential property

Aircraft Rescue and Fire Fighting Station Alternative 4

Alternative 4 is the no action alternative. This alternative would not resolve the existing facility size or airfield surveillance deficiencies.

The major advantages to this alternative are:

- Requires no federal or local investment
- No potential environmental impacts
- Requires no construction or adjustment to existing airport layout configuration

The major disadvantages to this alternative are:

- Would not mitigate existing facility size or airfield surveillance deficiencies
- Negative economic impacts related to future activity constraints
- Does not meet the objectives of the community

Table 4-5 ARFF Site Selection Analysis Score

	Site 1	Site 2	Site 3A	Site 3B	No Action
Response Time Analysis					
Activation Time/Turn-Out Time	3	4	3	4	1
Travel Speeds	3	4	2	4	1
Operational Factors					
Immediate and straight access	3	4	3	3	1
Unimpeded access routes with minimal turns	3	4	3	3	1
Direct access to aprons	2	1	4	4	3
Non-Interference with ATC line of sight	4	2	4	3	3
Maximum surveillance of the airfield	4	3	3	3	1
Adherence to the Building Restriction Line	4	4	4	4	4
Future expansion without:					
Limiting or reducing airfield surveillance	4	2	1	4	1
Blocking fire lanes	4	4	1	4	1
Impacting other structures	3	4	1	1	1
Planned Airport Improvements	4	4	1	4	3
Non-interference with ARFF Vehicle or station communication equipment or navigational facilities	4	4	4	4	1
Adherence to FAR Part 77, Imaginary Surfaces	4	4	4	4	4
Ease of integration/connection to the airports security system	2	1	4	4	4
Site Size					
Accommodation of the station	4	4	1	3	1
Future expansion	3	4	2	2	1
Exterior features	4	4	2	3	2
Apparatus apron to accommodate the largest or future ARFF vehicle	4	4	4	4	1
Removal of trash	2	3	4	4	4
Site Proximity					
Electrical or alternative energy sources	2	1	3	4	4
Essential communication and telecommunication networks (fiber optics/copper backbones)	2	1	3	4	4
Existing or future airport access and airfield service roads	3	1	4	4	4
Existing or future water supply systems and sanitary sewer systems	3	1	3	4	4
Topography and Station Orientation					
Is the site level	2	3	3	3	3
Does orientation reduce yearly energy operating cost	4	4	2	4	1
Does orientation mitigate exterior noise and costs of acoustical treatments	4	4	2	3	1
Total Score (Out of 108):	**89**	**83**	**75**	**95**	**60**

Scoring Criteria:
1- Poor
2- Fair
3- Average
4- Good

Comparison of ARFF Station Response Times

Based on the analysis conducted in **Table 4-5**, Alternatives 1 and 3B have been selected as the preferred locations for the future ARFF Station. Airport Management has indicated that an ARFF access road must accompany the future location. The construction of an access route would minimize the amount of turns a responding ARFF vehicle would be required to take while en route to the midpoint of the furthest runway. The current ARFF response time from the existing ARFF Station is two minutes and 58 seconds, according to the Airport Manager.

Alternative 1 Access Road

The access road serving the site for Alternative 1 would consist of an asphalt road connecting Taxiway B to Taxiway C. The access road would not extend beyond Taxiway C as it would impact the Runway 12/30 imaginary surfaces. Additionally, a connection to Runway 8/26 would not be beneficial as the furthest runway midpoint is on Runway 12/30.

The Alternative 1 Access Road would have a linear foot distance of approximately 2,800 feet to the furthest runway midpoint on Runway 12/30 and requires three turns.

The Airport Manager conducted a timed run from the site to the midpoint of Runway 8/26 which resulted in a 55 second drive time. This did not factor personnel gearing up and entering the vehicle.

Estimated Cost: approximately $200,000

Alternative 3B Access Road

The access road service the site for Alternative 3B would consist of an asphalt road connecting Taxiway B to Runway 8/26, crossing at Taxiway C and Runway 12/30. The furthest runway midpoint is located on Runway 8/26.

The Alternative 3B Access Road would have a linear foot distance of approximately 2,000 feet to the furthest runway midpoint on Runway 8/26 and would not require any turns.

The Airport Manager conducted a timed run from the site to the midpoint of Runway 8/26 which resulted in a 1:12 minute drive time. This did not factor personnel gearing up and entering the vehicle.

Estimated Cost: approximately $450,000

Cost Estimates for ARFF Station Alternatives

A summary of the cost estimates for Alternatives 1 through 3B are included in **Table 4-6.** Alternative 4 was omitted from the cost estimates as it does not require any funding. These cost estimates are based on a simple pro-rated breakdown between Municipal and Airport use. Utilities are considered to be AIP funding eligible because of the fundamental need to support ARFF services. A detailed cost analysis will be part of the ARFF/City Station design.

Table 4-6 Estimates of ARFF Station Alternatives

Alternative	Total Cost	Federal Share (Airport Only)	Local Share (Total)	Local Share (Airport Portion)	Local Share (City Portion)
1	$5,364,565	$3,369,617	$1,994,948	$224,641	$1,770,306
2	$5,900,000	$3,705,938	$2,194,063	$247,063	$1,947,000
3A	$4,100,000	$2,575,313	$1,524,688	$171,688	$1,353,000
3B	$4,932,671	$3,098,334	$1,834,337	$206,556	$1,627,781

Note: All figures use 2014 dollars

4.4.10 Non-Aeronautical Revenue Generation

The airport property includes approximately 16 acres of land between the south apron access road and Southport Avenue. This area is situated at a significantly higher elevation than the southside aeronautical development area and has been identified for non-aeronautical revenue generating development. Additional areas identified as possible for non-aeronautical revenue generating include the baseball parks to the north and northeast of the airport boundary. These areas are not currently utilized for revenue generation, should the baseball fields eventually be relocated, it is recommended to lease the land to enhance non-aeronautical revenue generation. Lease revenues generated from the property would help contribute funds toward operations and maintenance of the airport and towards future airport capital improvement projects. Examples of potential non-aeronautical revenue generation opportunities include hotel, corporate office park, retail center or industrial complexes. It is also recommended to utilize the expansion of the passenger terminal building to enhance non-aeronautical revenue generation in the form of restaurants or concessionaires. The recommended configuration for Non-Aeronautical Revenue Generating Parcels in the northern portion of the airport is depicted in **Figure 4-15**. The recommended configuration for the Airport Industrial Park and Non-Aeronautical Revenue Generating Parcels are depicted in **Figure 4-17**.

4.4.11 North Landside Development

Prior to the development of Lewiston-Nez Perce County Regional Airport, a portion of the present-day property was used as a landfill. Soil borings were obtained in December 2013 to determine the viability of development within the northern portion of the airport property. The geotechnical report is located in **Appendix G**. The results of the soil boring test concluded that the residual effects of the landfill have diminished the ability of the land to adequately accommodate future development.

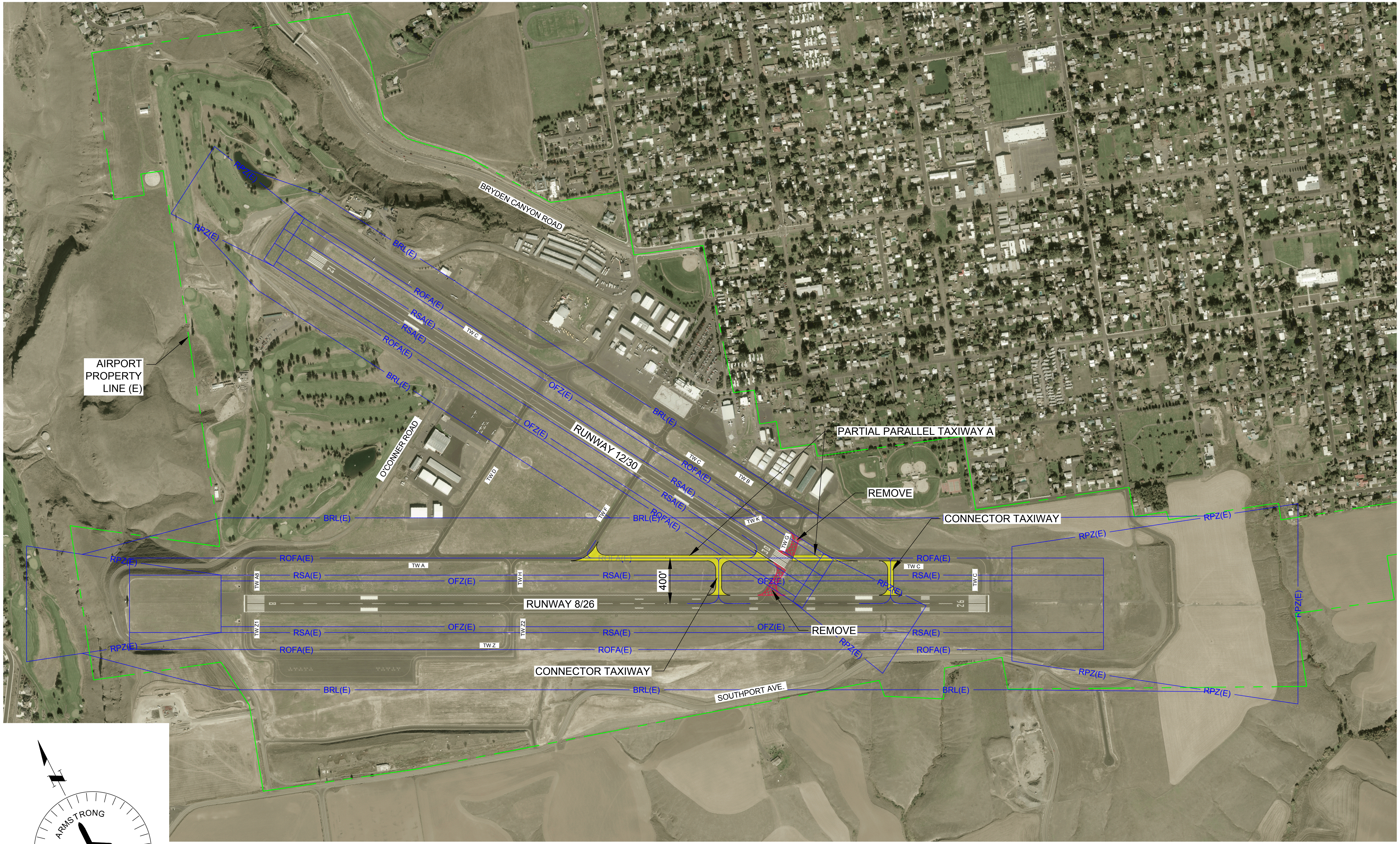
4.5 Recommendations and Conclusion

Based on the results of the Technical Advisory Committee meeting held in Lewiston the following alternatives have been selected as the preferred development to be shown on the Airport Layout Plan:

- Runway 8/26 Line of Sight Mitigation: Alternative 2
- Airport Perimeter Road: Alternative 1
- Passenger Terminal Building: Alternative 1
- Vehicle Access and Parking: Alternative 2

Based on extensive evaluation by Airport Management and the City of Lewiston, Alternative 1 has been selected as the preferred location for the future Aircraft Rescue and Fire Fighting Station.

All other recommended development without alternatives will be shown on the Airport Layout Plan.



ARMSTRONG CONSULTANTS

LEGEND

FUTURE DEVELOPMENT

REMOVALS

PLAN

SCALE PER BARSCALE

0 400 800

SCALE IN FEET

ARMSTRONG

PLANNING ENGINEERING CONSTRUCTION

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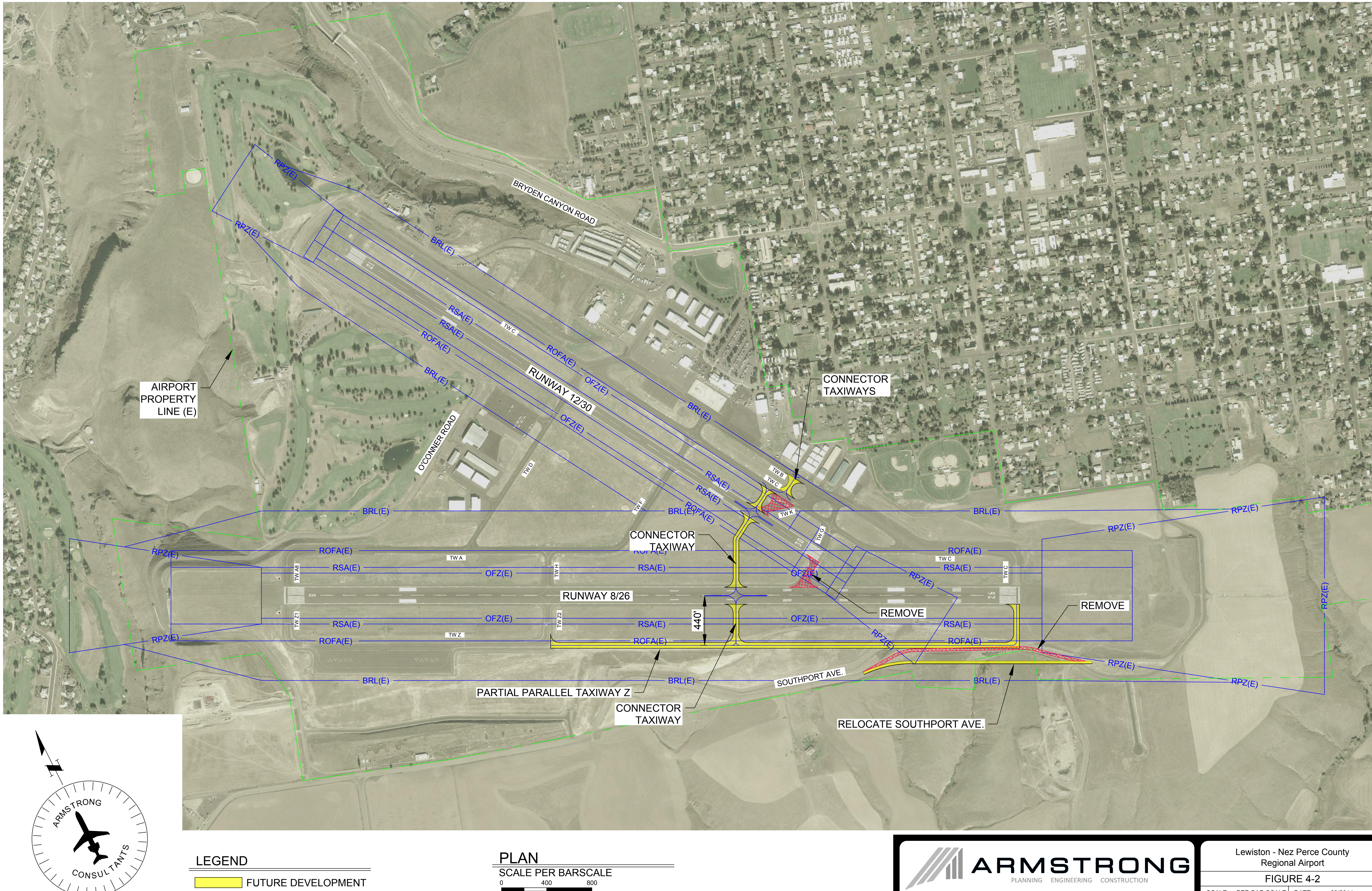
Lewiston - Nez Perce County Regional Airport

FIGURE 4-1

SCALE:	PER BAR SCALE	DATE:	JULY 2014
DRAWN:	JOS	FILE:	6159601
CHK'D:	JMR	JOB NO.:	136159



LEGEND

FUTURE DEVELOPMENT

REMOVALS

PLAN

SCALE PER BARSCALE

0 400 800

SCALE IN FEET

ARMSTRONG

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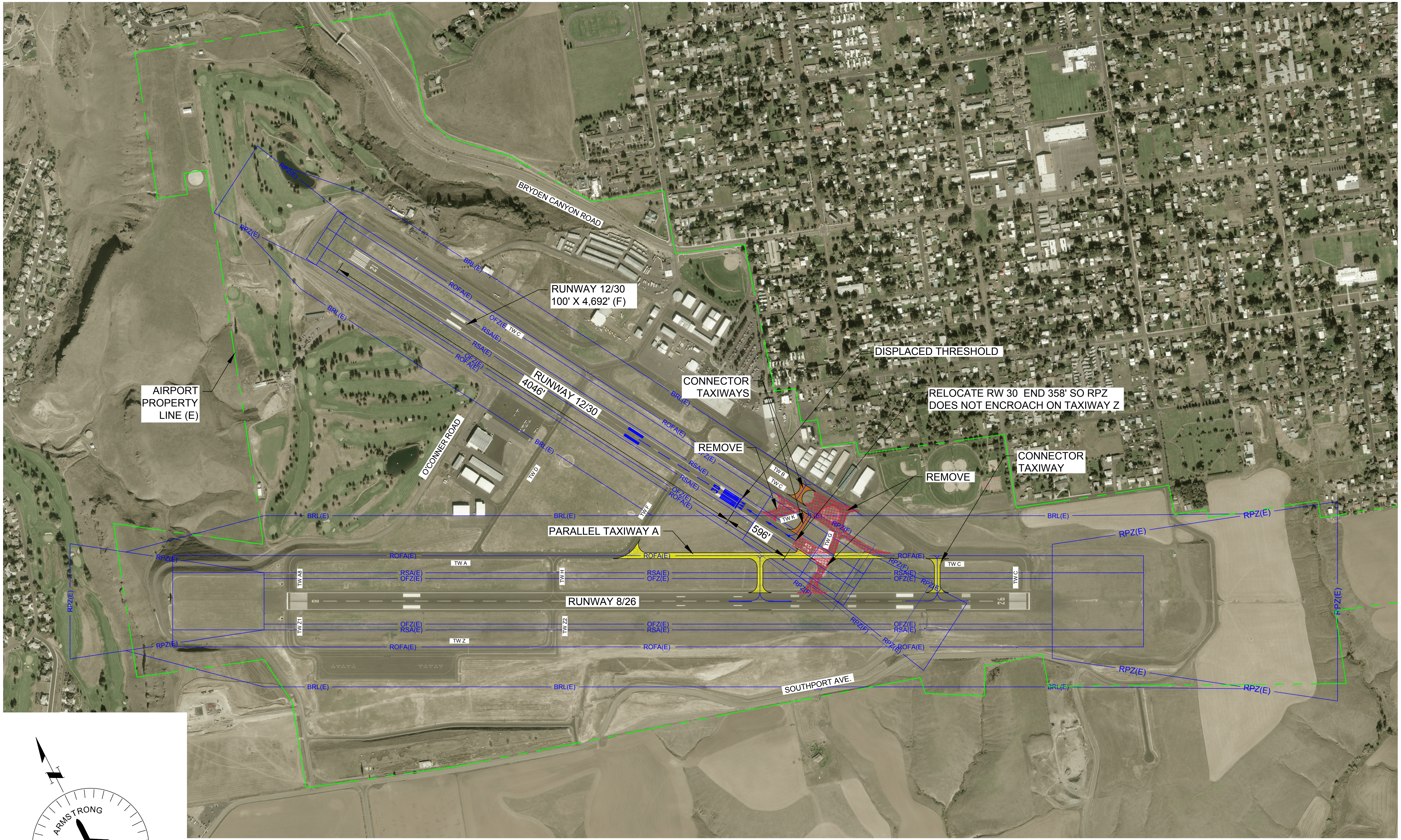
Lewiston - Nez Perce County Regional Airport

FIGURE 4-2

SCALE:	PER BAR SCALE	DATE:	09/2014
DRAWN:	JOS/GWK	FILE:	6159603
CHK'D:	JMR	JOB NO.:	136159



LEGEND

FUTURE ALT-1 DEVELOPMENT SHOWN AS EXISTING

ULTIMATE DEVELOPMENT

REMOVALS

PLAN

SCALE PER BARSCALE

0 400 800

SCALE IN FEET

ARMSTRONG

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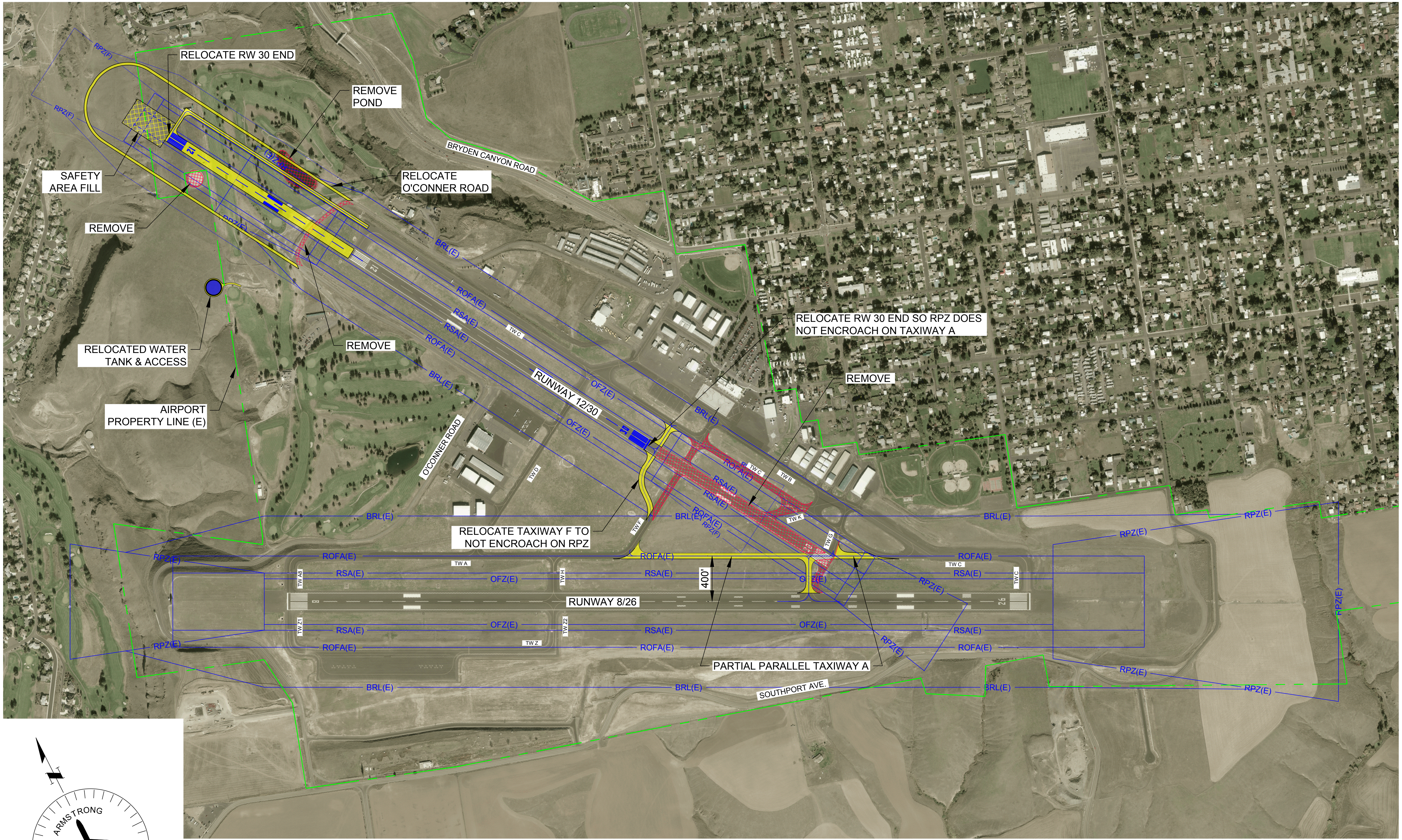
Lewiston - Nez Perce County Regional Airport	
FIGURE 4-3	
SCALE: PER BAR SCALE	DATE: JULY 2014
DRAWN: JOS	FILE: 6159607
CHK'D: JMR	JOB NO.: 136159



LEGEND

FUTURE DEVELOPMENT

REMOVALS

PLAN

SCALE PER BARSCALE

0 400 800

SCALE IN FEET

ARMSTRONG

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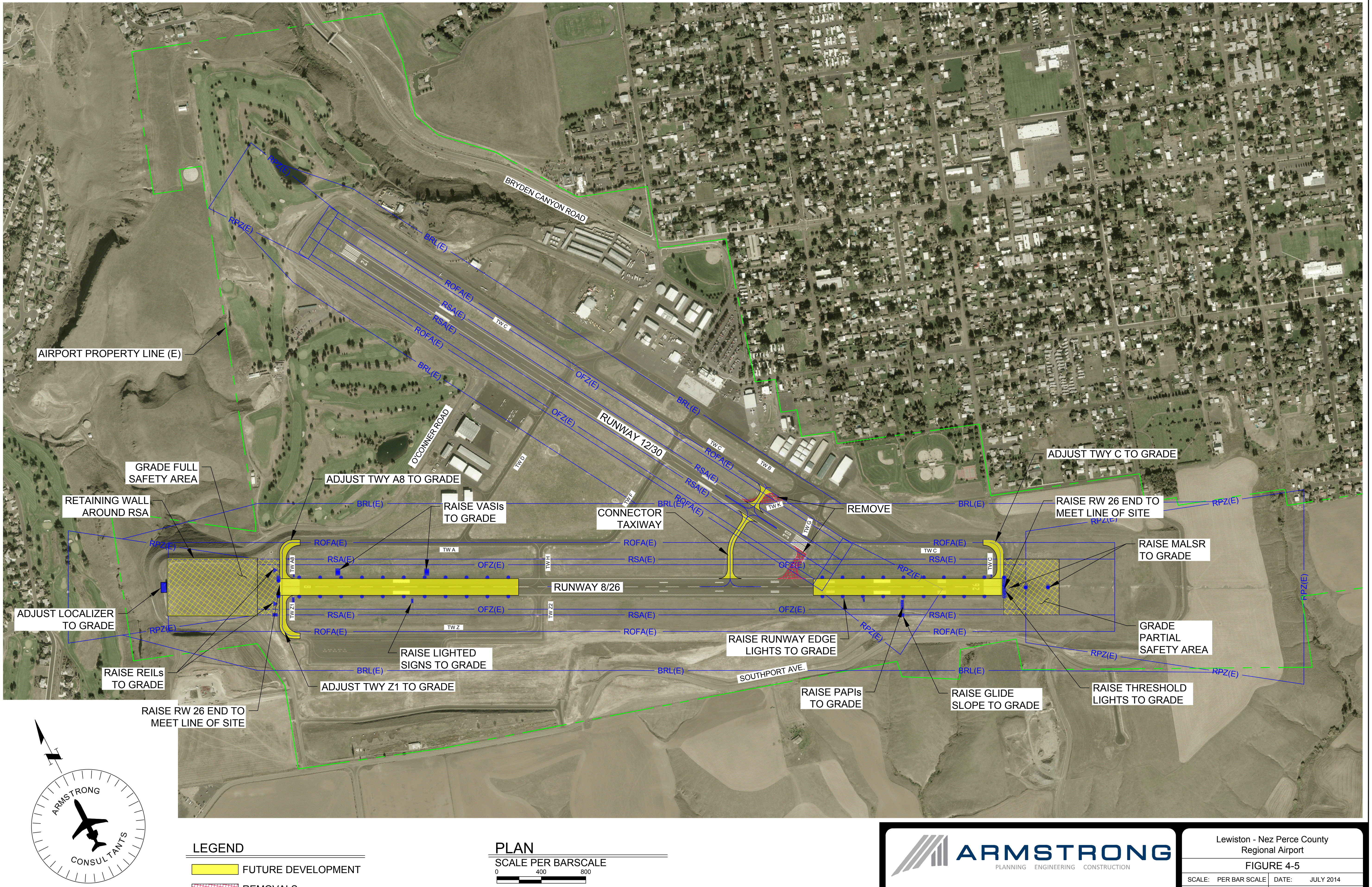
Lewiston - Nez Perce County Regional Airport

FIGURE 4-4

SCALE:	PER BAR SCALE	DATE:	JULY 2014
DRAWN:	JOS	FILE:	6159602
CHK'D:	JMR	JOB NO.:	136159



LEGEND

- FUTURE DEVELOPMENT
- REMOVALS

PLAN

SCALE PER BARSCALE

0 400 800

SCALE IN FEET

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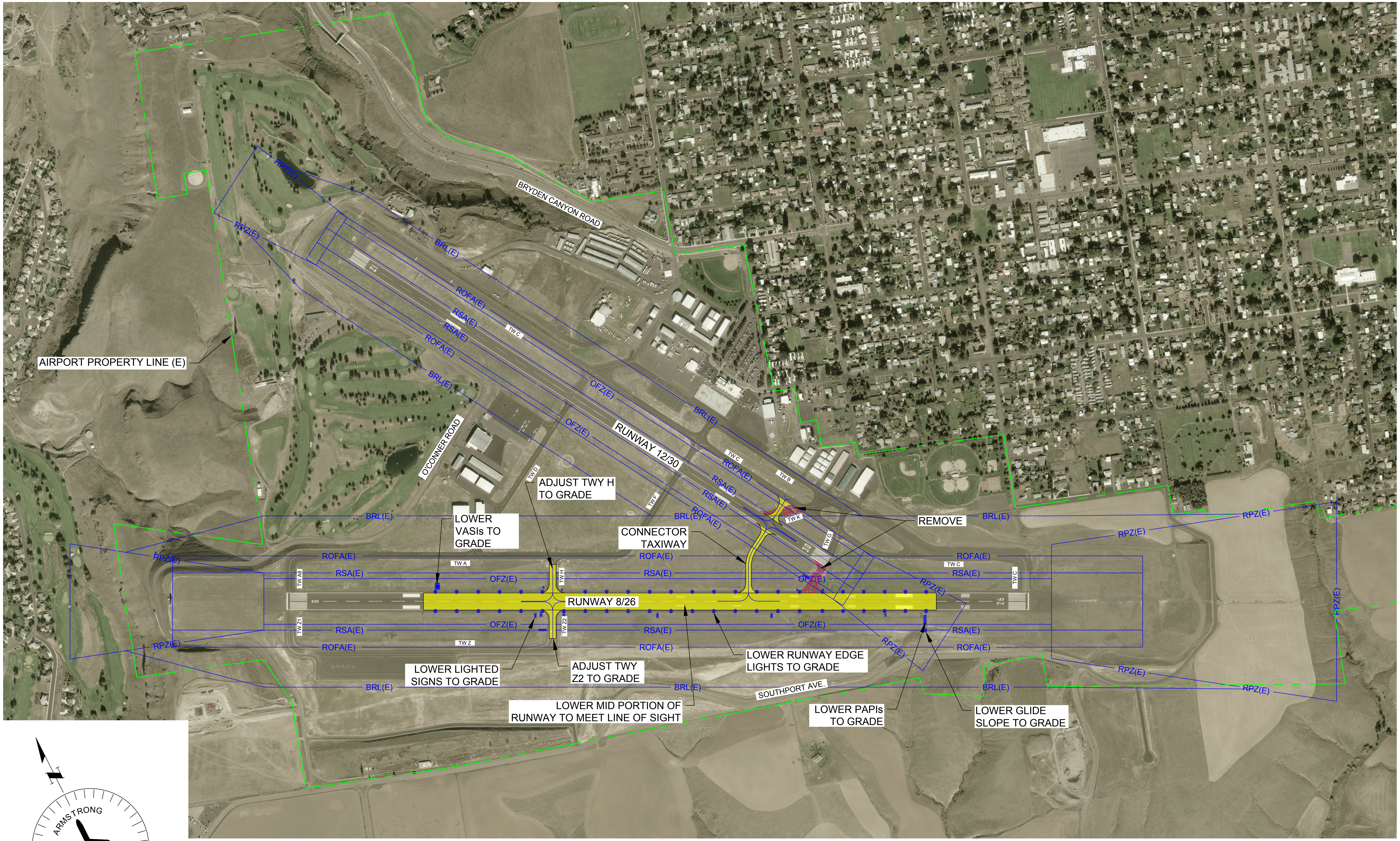
Lewiston - Nez Perce County Regional Airport

FIGURE 4-5

SCALE:	PER BAR SCALE	DATE:	JULY 2014
DRAWN:	JOS	FILE:	6159605
CHK'D:	JMR	JOB NO.:	136159



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LEGEND

FUTURE DEVELOPMENT

REMOVALS

PLAN

SCALE PER BARSCALE

0 400 800

SCALE IN FEET

ARMSTRONG

PLANNING ENGINEERING CONSTRUCTION

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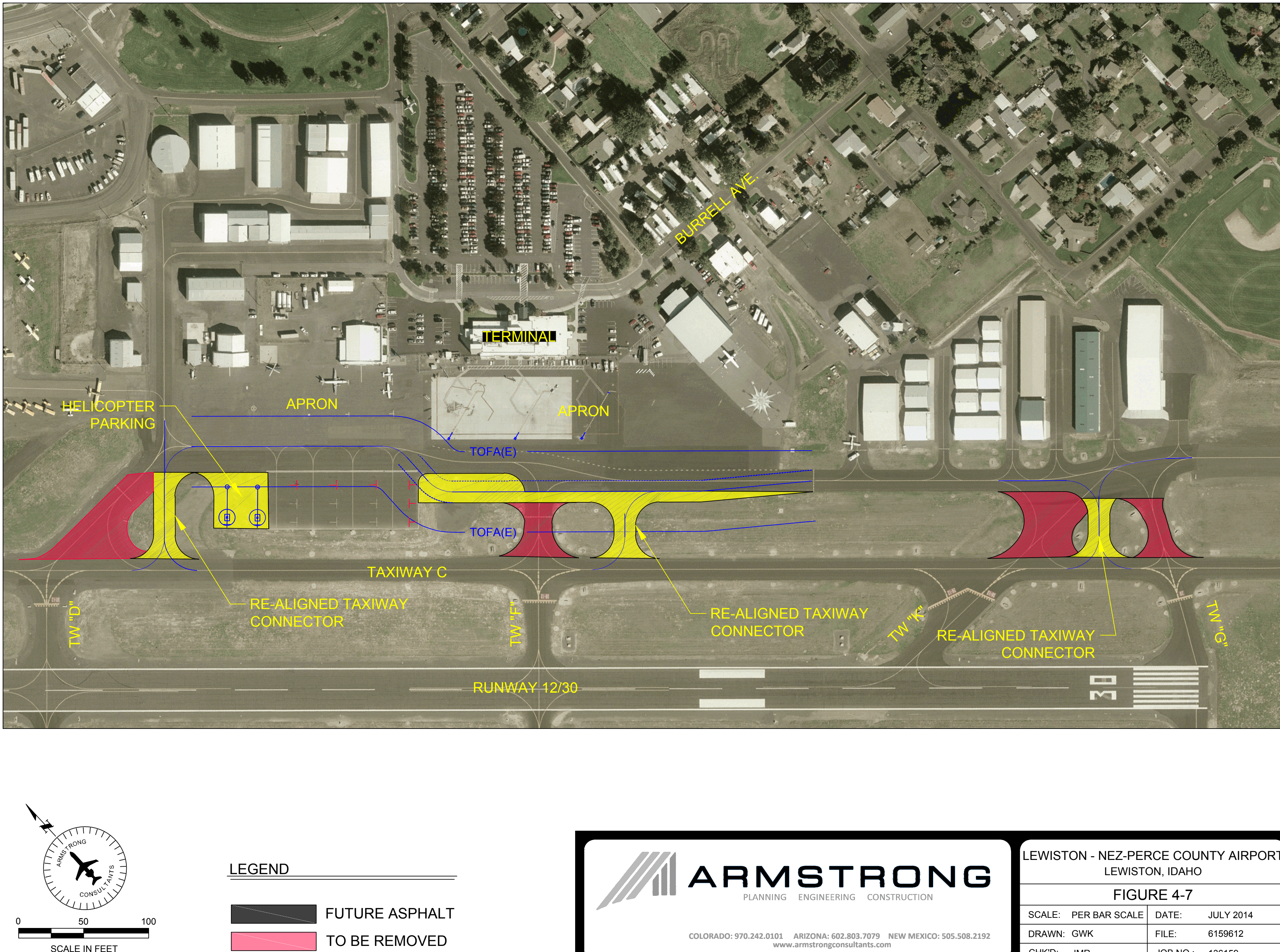
Lewiston - Nez Perce County
Regional Airport

FIGURE 4-6

SCALE:	PER BAR SCALE	DATE:	JULY 2014
DRAWN:	JOS	FILE:	6159606
CHK'D:	JMR	JOB NO.:	136159



LEGEND

FUTURE ASPHALT

TO BE REMOVED

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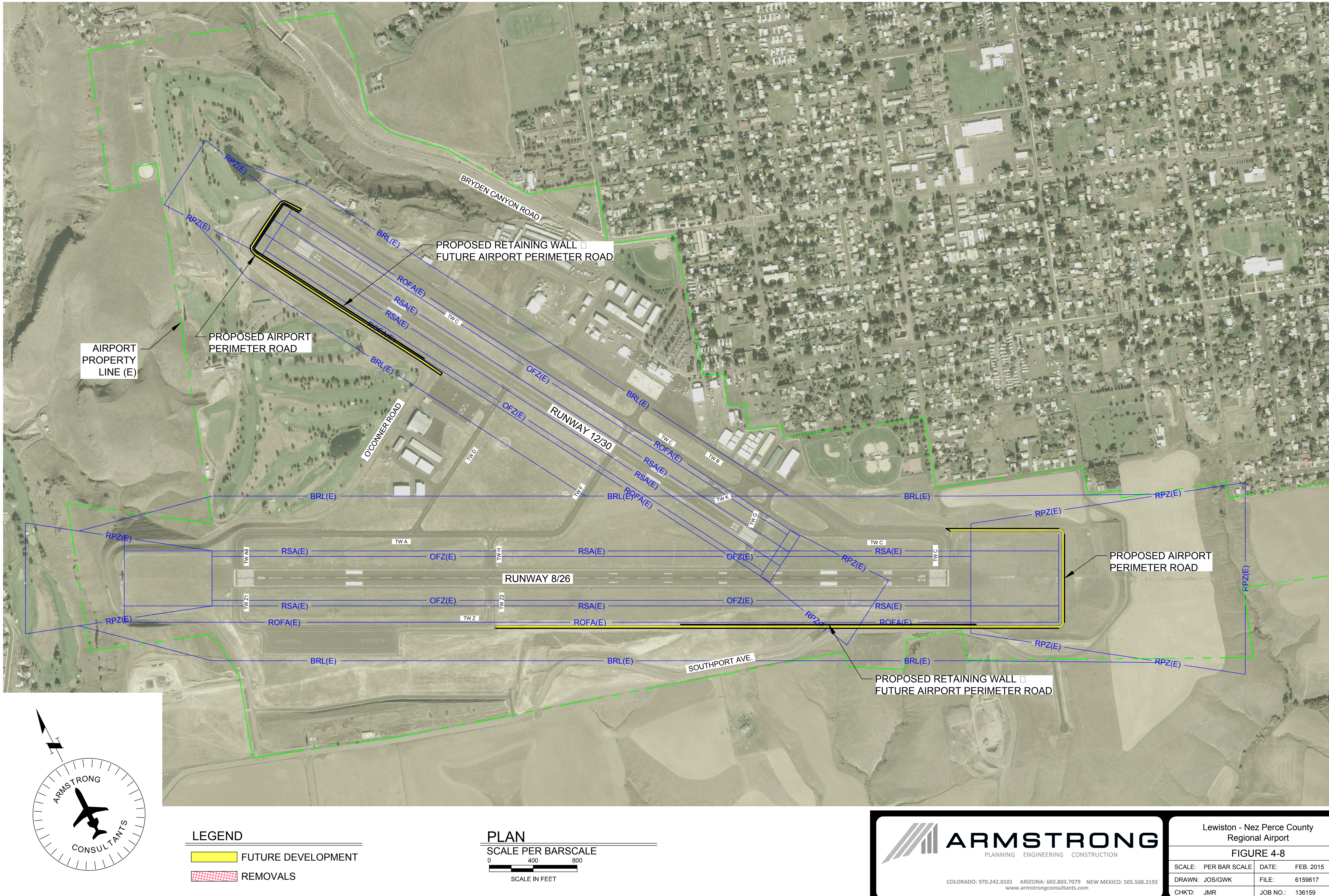
LEWISTON - NEZ-PERCE COUNTY AIRPORT
LEWISTON, IDAHO

FIGURE 4-7

SCALE:	PER BAR SCALE	DATE:	JULY 2014
DRAWN:	GWK	FILE:	6159612
CHK'D:	JMR	JOB NO.:	136159



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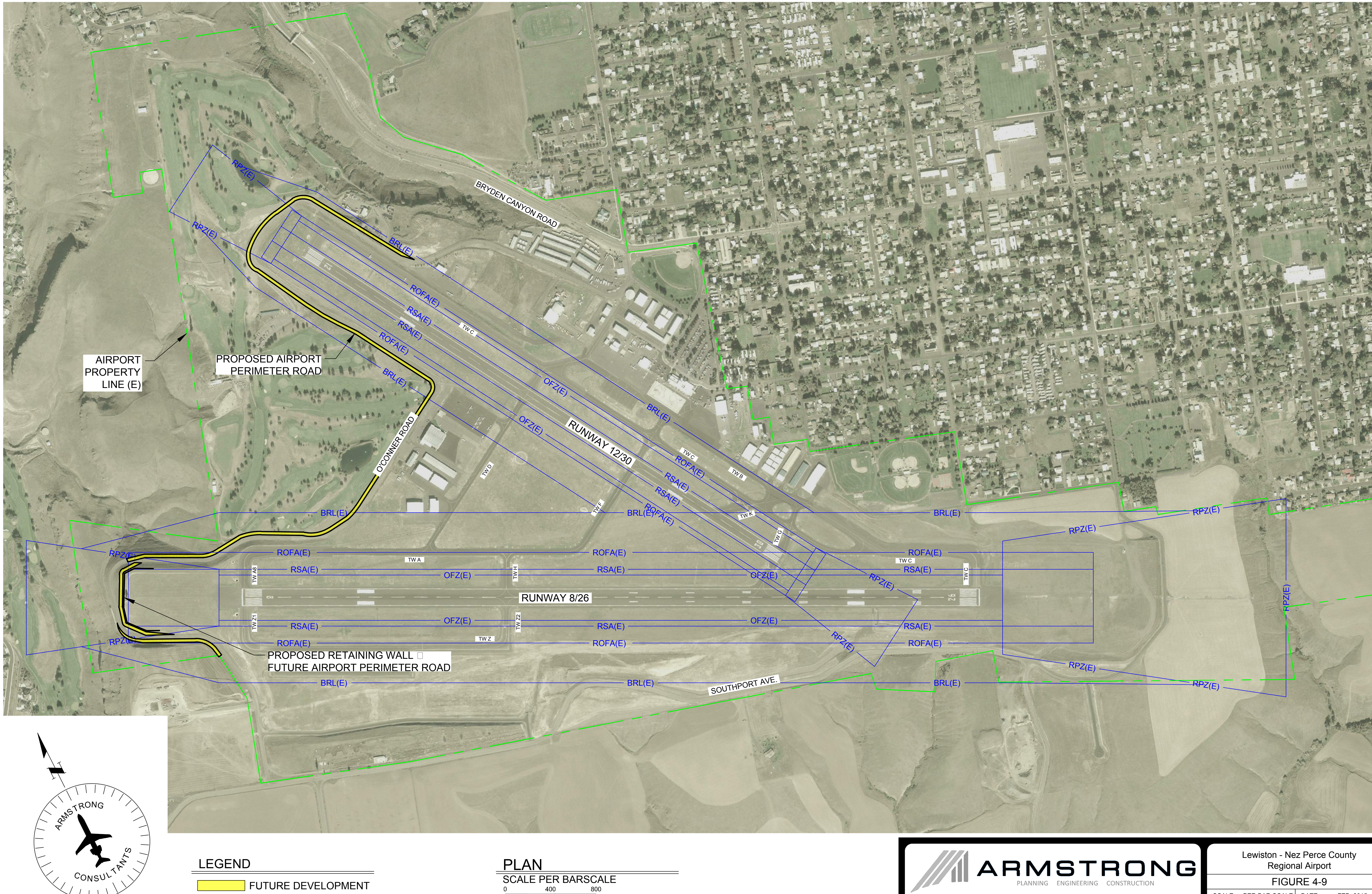
Lewiston - Nez Perce County Regional Airport

FIGURE 4-8

SCALE:	PER BAR SCALE	DATE:	FEB. 2015
DRAWN:	JOS/GWK	FILE:	6159617
CHK'D:	JMR	JOB NO.:	136159



LEGEND

FUTURE DEVELOPMENT

REMOVALS

PLAN

SCALE PER BARSCALE

0 400 800

SCALE IN FEET

ARMSTRONG

PLANNING ENGINEERING CONSTRUCTION

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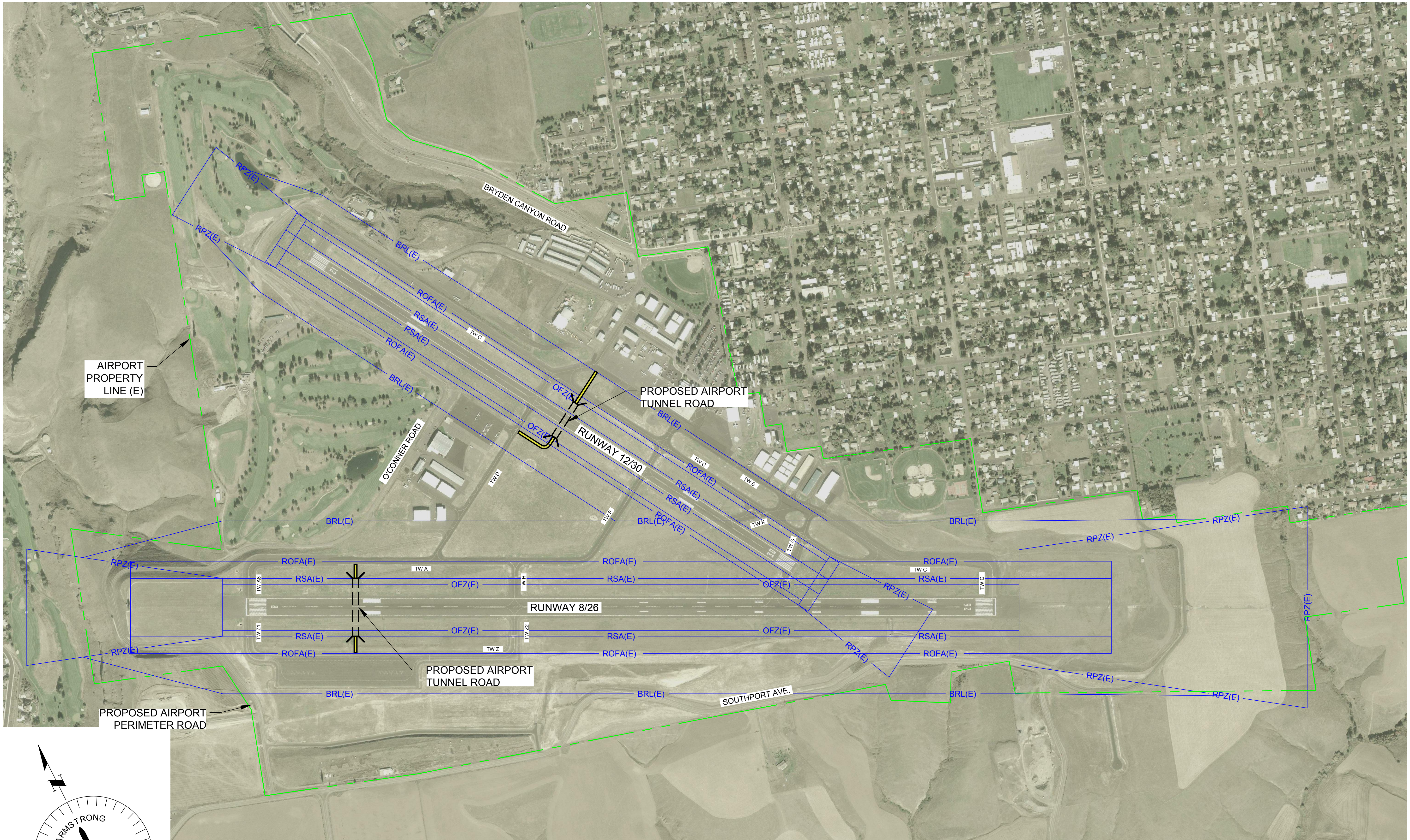
Lewiston - Nez Perce County
Regional Airport

FIGURE 4-9

SCALE:	PER BAR SCALE	DATE:	FEB. 2015
DRAWN:	JOS/GWK	FILE:	6159618
CHK'D:	JMR	JOB NO.:	136159



LEGEND

FUTURE DEVELOPMENT

REMOVALS

PLAN

SCALE PER BARSCALE

0 400 800

SCALE IN FEET

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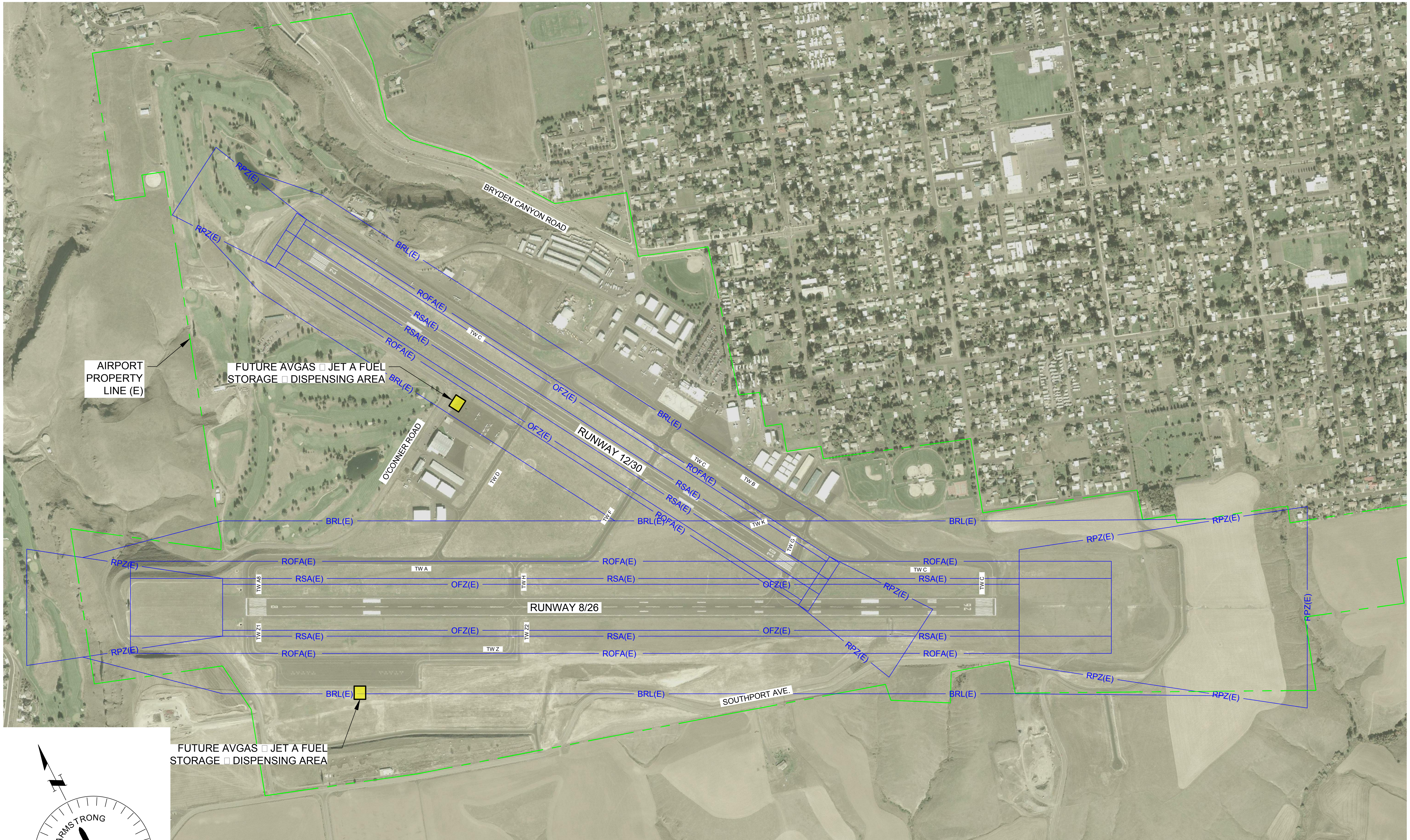
Lewiston - Nez Perce County Regional Airport

FIGURE 4-10

SCALE:	PER BAR SCALE	DATE:	FEB. 2015
DRAWN:	JOS/GWK	FILE:	6159619
CHK'D:	JMR	JOB NO.:	136159



LEGEND

FUTURE DEVELOPMENT

REMOVALS

PLAN

SCALE PER BARSCALE

0 400 800

SCALE IN FEET

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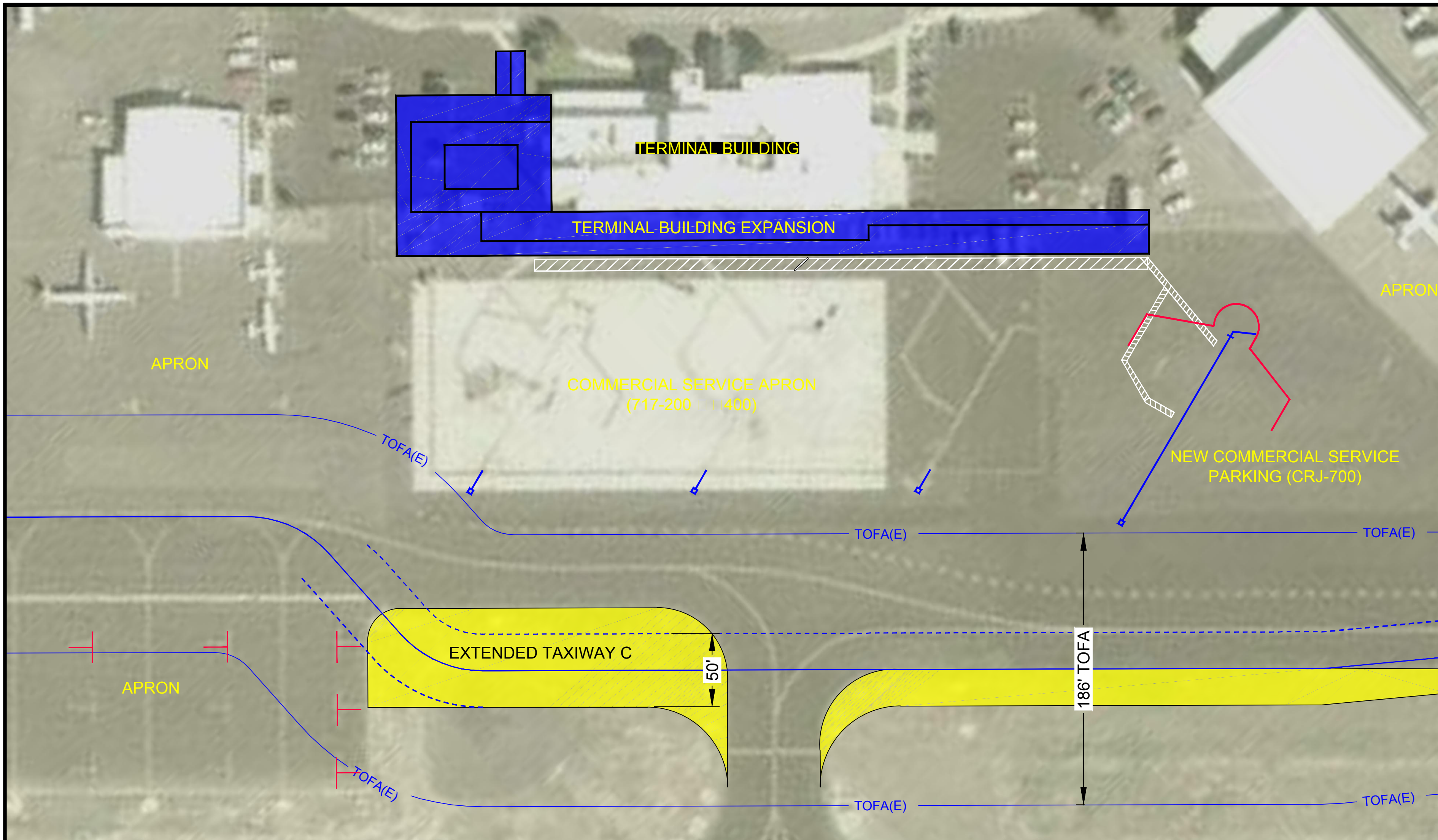
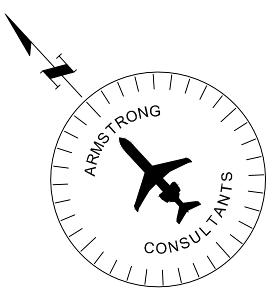
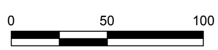
Lewiston - Nez Perce County
Regional Airport

FIGURE 4-11

SCALE:	PER BAR SCALE	DATE:	FEB. 2015
DRAWN:	JOS/GWK	FILE:	6159620
CHK'D:	JMR	JOB NO.:	136159







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LEWISTON - NEZ-PERCE COUNTY AIRPORT
LEWISTON, IDAHO

FIGURE 4-12

SCALE:	PER BAR SCALE	DATE:	JULY 2014
DRAWN:	GWK	FILE:	6159611
CHK'D:	JMR	JOB NO.:	136159

PLAN

0 150 300
SCALE IN FEET

LEGEND

- FUTURE AIRFIELD PAVEMENTS
- FUTURE PAVED ROADWAY
- REMOVALS

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Lewiston - Nez Perce County
Regional Airport

FIGURE 4-13A

SCALE:	PER BAR SCALE	DATE:	JULY 2014
DRAWN:	GWK	FILE:	6159615
CHK'D:	JMR	JOB NO.:	136159

PLAN

0 100 200
SCALE IN FEET

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LEGEND

- FUTURE AIRFIELD PAVEMENTS
- FUTURE PAVED ROADWAY
- REMOVALS

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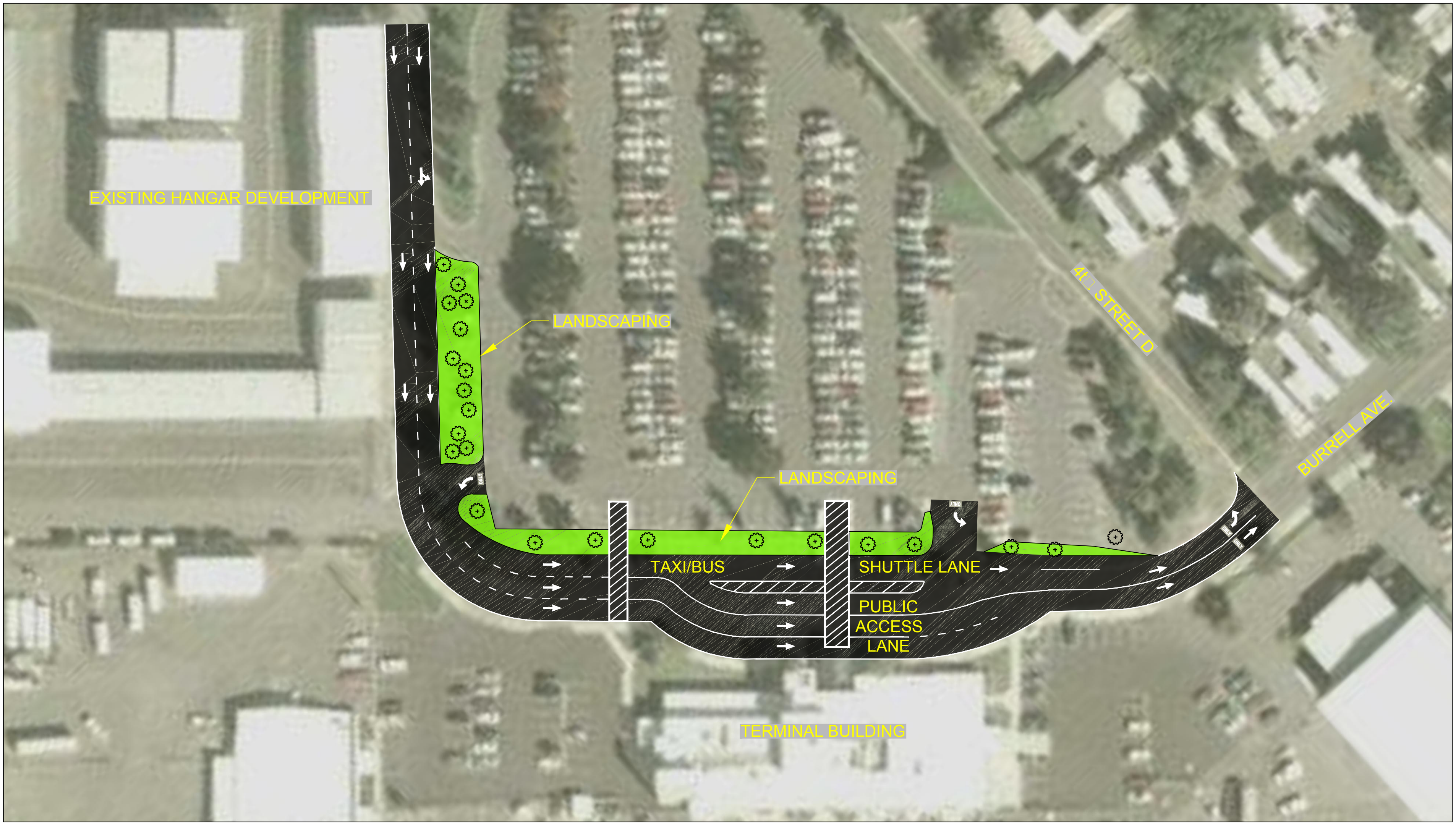
Lewiston - Nez Perce County Regional Airport			
FIGURE 4-13B			
SCALE:	PER BAR SCALE	DATE:	JULY 2014
DRAWN:	GWK	FILE:	6159615
CHK'D:	JMR	JOB NO.:	136159



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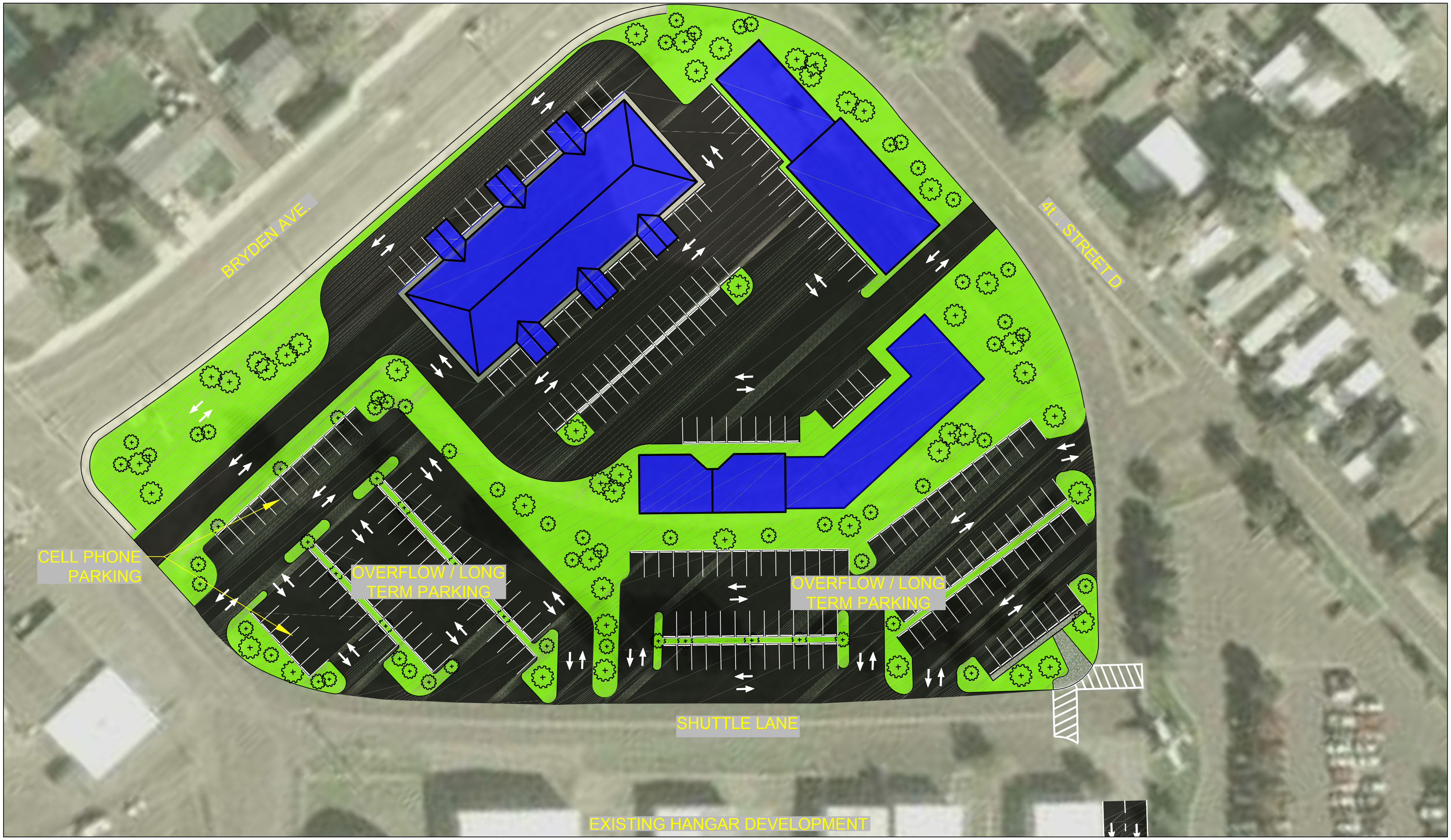
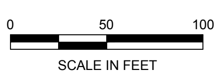
LEWISTON - NEZ-PERCE COUNTY AIRPORT
LEWISTON, IDAHO

FIGURE 4-14

SCALE:	PER BAR SCALE	DATE:	JULY 2014
DRAWN:	GWK	FILE:	6159610
CHK'D:	JMR	JOB NO.:	136159





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LEWISTON - NEZ-PERCE COUNTY AIRPORT
LEWISTON, IDAHO

FIGURE 4-15

SCALE:	PER BAR SCALE	DATE:	JULY 2014
DRAWN:	GWK	FILE:	6159610
CHK'D:	JMR	JOB NO.:	136159

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0 50 100
SCALE IN FEET

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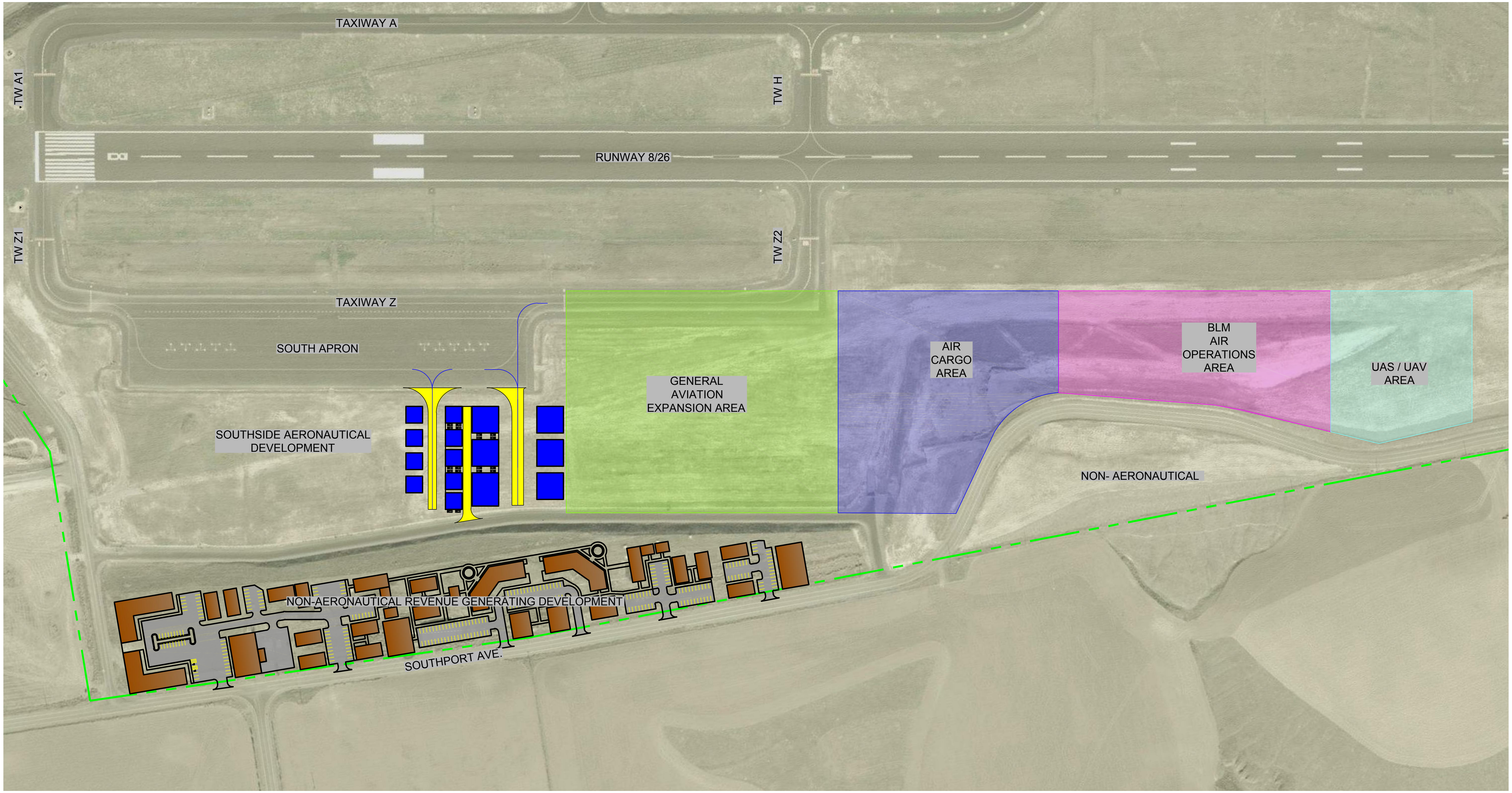
LEWISTON - NEZ-PERCE COUNTY AIRPORT LEWISTON, IDAHO			
FIGURE 4-16			
SCALE: PER BAR SCALE		DATE: AUGUST 2014	
DRAWN: GWK		FILE: 6159616	
CHK'D: JMR		JOB NO.: 136159	



PLAN

SCALE PER BARSCALE

0 150 300

SCALE IN FEET

LEGEND

- FUTURE AIRFIELD PAVEMENTS
- FUTURE PAVED ROADWAY
- REMOVALS

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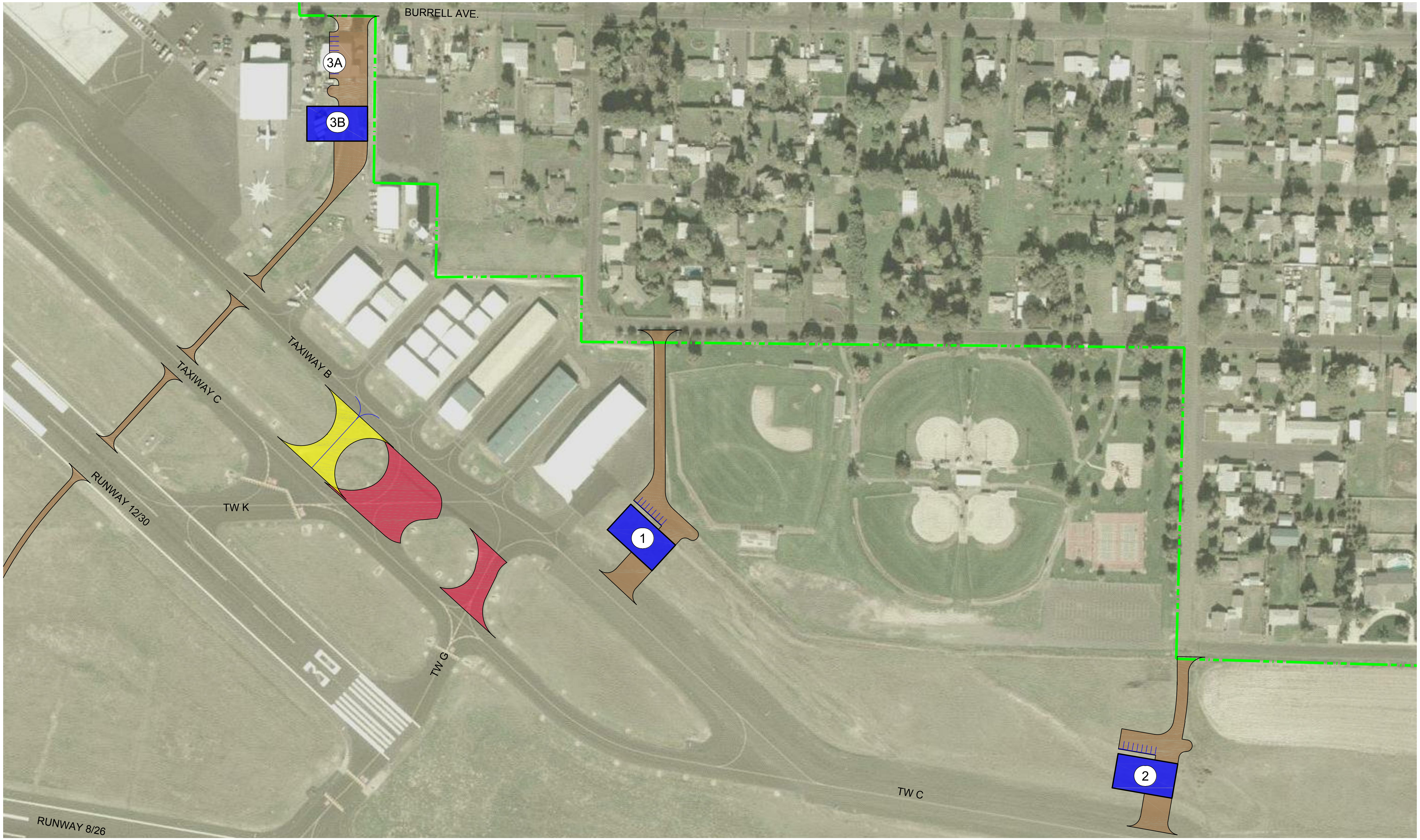
Lewiston - Nez Perce County Regional Airport

FIGURE 4-17

SCALE:	PER BAR SCALE	DATE:	AUGUST 2014
DRAWN:	GWK	FILE:	6159614
CHK'D:	JMR	JOB NO.:	136159



LEGEND

- FUTURE BUILDING / STRUCTURE
- FUTURE AIRFIELD ASPHALT
- FUTURE VEHICLE ASPHALT
- TO BE REMOVED

0 100 200
SCALE IN FEET

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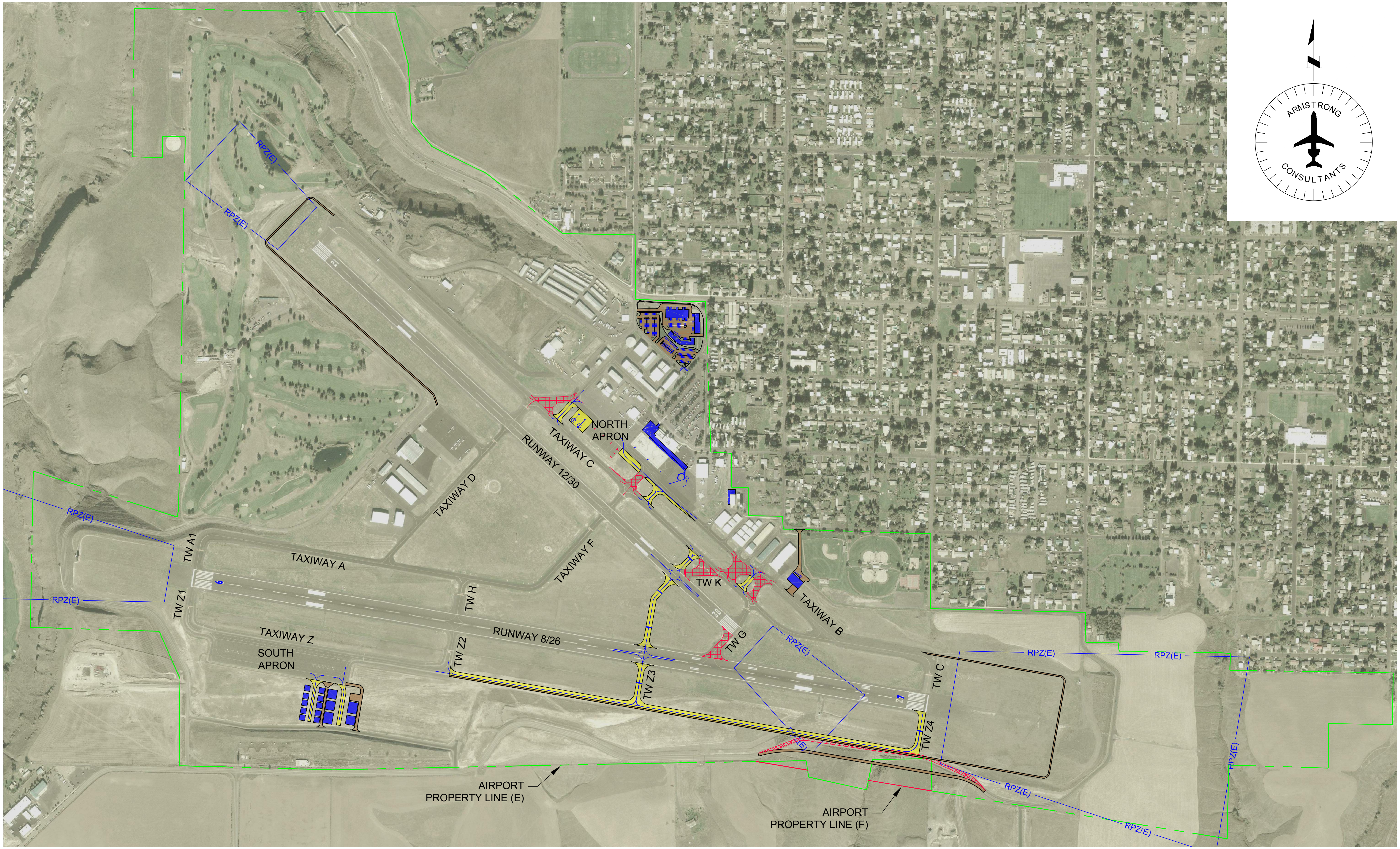
LEWISTON NEZ - PERCE COUNTY AIRPORT
LEWISTON, IDAHO

FIGURE 4-18

SCALE:	PER BAR SCALE	DATE:	FEB. 2015
DRAWN:	GWK	FILE:	6159613
CHK'D:	JMR	JOB NO.:	136159



LEGEND

- FUTURE AIRFIELD PAVEMENTS
- FUTURE STRUCTURE OR PAVEMENT MARKING
- FUTURE PAVED ROADWAY
- REMOVALS

PLAN

0 400 800

SCALE IN FEET

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Lewiston - Nez Perce County
Regional Airport

FIGURE 4-19

SCALE:	PER BAR SCALE	DATE:	02.05.15
DRAWN:	JOS	FILE:	6159626
CHK'D:	JMR	JOB NO.:	136159

CHAPTER FIVE

AIRPORT LAYOUT PLAN DRAWING SET

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN

ARMSTRONG

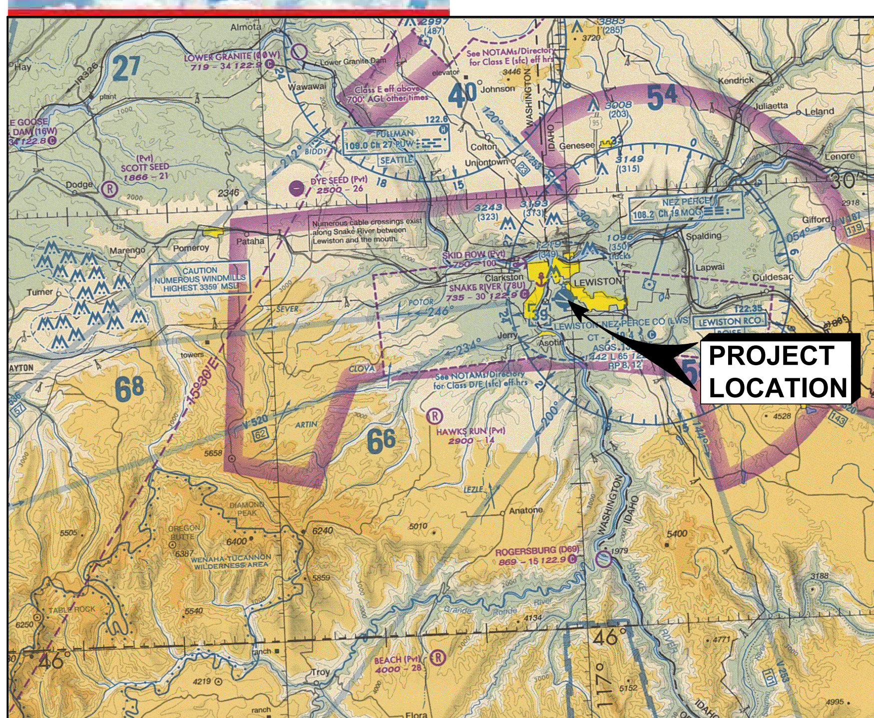
LEWISTON-NEZ PERCE COUNTY
REGIONAL AIRPORT
LEWISTON, IDAHO

AIRPORT LAYOUT PLANS

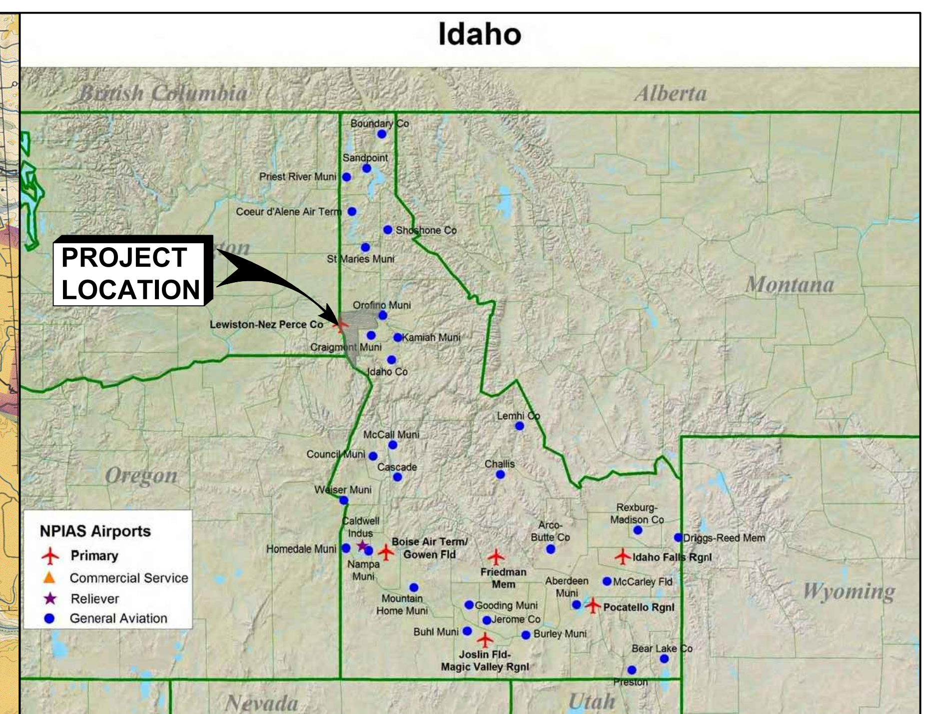
PREPARED BY:

ARMSTRONG CONSULTANTS, INC.

A.I.P. No. 3-16-022-034-2014
A.C.I. PROJECT NO. 136159
DATE: JANUARY, 2016



LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

INDEX TO SHEETS

(E = EXISTING, F = FUTURE)

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	136159	02/2015	ORIGINAL ISSUE	6159501	JOS	JMR	DAC

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

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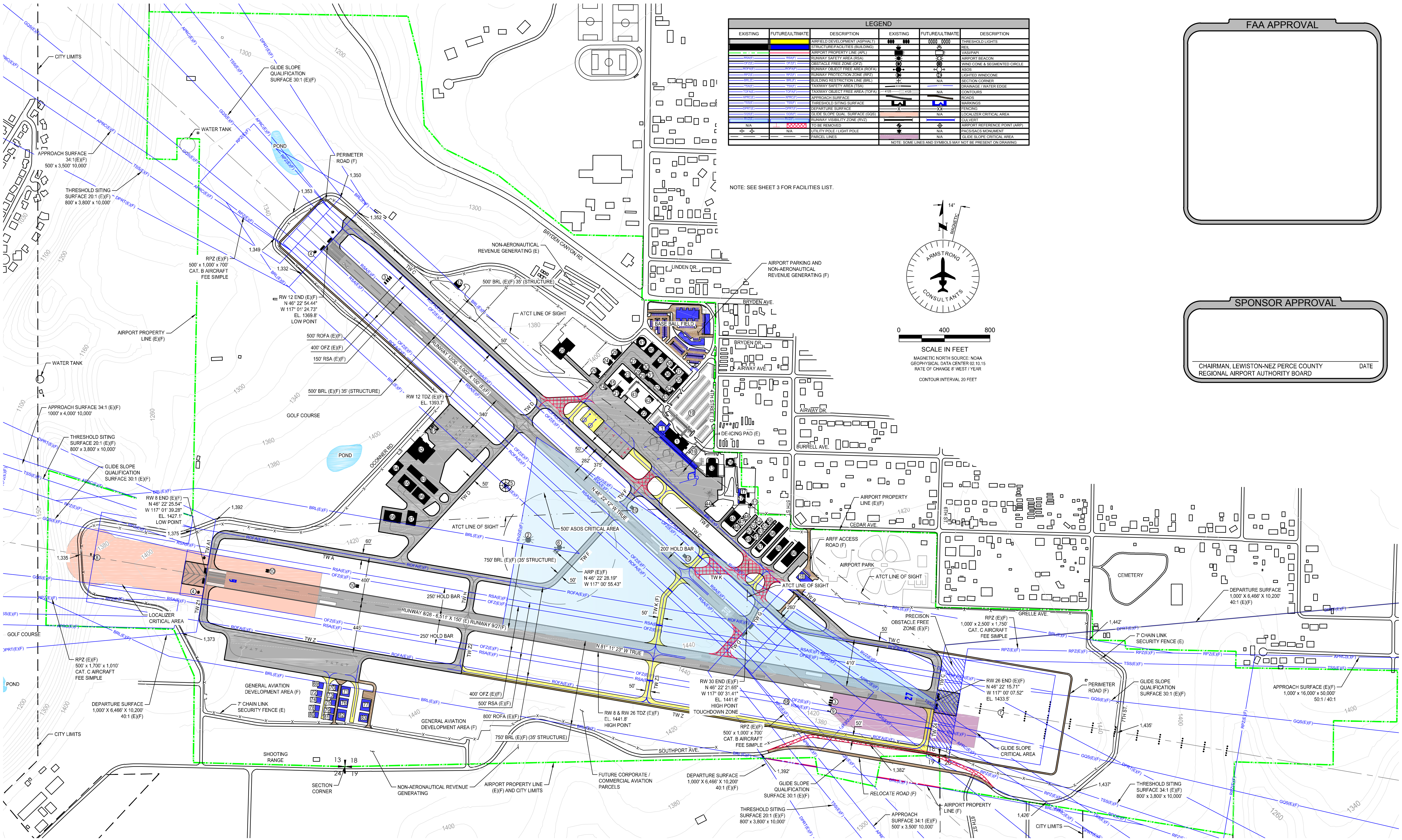

LEGEND					
EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE/ULTIMATE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			AIRPORT BEACON
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			WIND CONE & SEGMENTED CIRCLE
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ASOS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			LIGHTED WINDCONE
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)		N/A	SECTION CORNER
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			DRAINAGE / WATER EDGE
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)	4125 4125	N/A	CONTOURS
APRC(E)	APRC(F)	APPROACH SURFACE			ROADS
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE			MARKINGS
DPRT(E)	DPRT(F)	DEPARTURE SURFACE	X	XX	FENCING
GQS(E)	GQS(F)	GLIDE SLOPE QUAL. SURFACE (GQS)		N/A	LOCALIZER CRITICAL AREA
RVZ(E)	RVZ(F)	RUNWAY VISIBILITY ZONE (RVZ)			CULVERT
N/A		TO BE REMOVED			AIRPORT REFERENCE POINT (ARP)
	N/A	UTILITY POLE / LIGHT POLE		N/A	PACS/SACS MONUMENT
		PARCEL LINES		N/A	GLIDE SLOPE CRITICAL AREA
			NOTE: SOME LINES AND SYMBOLS MAY NOT BE PRESENT ON DRAWING		

NOTE: SEE SHEET 3 FOR FACILITIES LIST.

FAA APPROVAL

SPONSOR APPROVAL

CHAIRMAN, LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT AUTHORITY BOARD — DATE

0	136159	01/2016	ORIGINAL ISSUE	6159502	JOS	JMR	DAC
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.

LEWISTON-NEZ PERCE COUNTY
REGIONAL AIRPORT
LEWISTON, IDAHO

AIRPORT LAYOUT PLANS

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
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Project No: 136159
Date: 11/2015
File Name: 6159502

Drawn: JOS
Checked: JMR
Approved: DAC

AIRPORT LAYOUT PLAN

RUNWAY DATA

ITEM		RW 8/26 - EXISTING (E)		RW 9/27 - FUTURE (F)		RW 12/30 - EXISTING (E)		RW 12/30 - FUTURE (F)	
RUNWAY IDENTIFICATION		8	26	9	27	12	30	12	30
RUNWAY DESIGN CODE (RDC) / RUNWAY VISUAL RANGE (RVR)		C-III-2400		C-III-2400		B-II-5000		B-II-5000	
DEPARTURE REFERENCE CODE (DPRC)		C-III-2400		C-III-2400		B-II-5000		B-II-5000	
SURFACE MATERIAL, PAVEMENT STRENGTH & MATERIAL TYPE	SURFACE MATERIAL	ASPHALT		ASPHALT		ASPHALT		ASPHALT	
	STRENGTH BY WHEEL LOADING (LBS)	150,000 lbs. SWG 180,000 lbs. DWG 400,000 DTG		150,000 lbs. SWG 180,000 lbs. DWG 400,000 DTG		70,000 lbs. SWG 94,000 lbs. DWG 150,000 DTG		70,000 lbs. SWG 94,000 lbs. DWG 150,000 DTG	
	SURFACE TREATMENT	GROOVED		GROOVED		PFC		GROOVED	
RUNWAY GRADIENT	EFFECTIVE (%)	0.1%		0.1%		1.4%		1.4%	
	MAXIMUM (%)	0.4%		0.4%		1.5%		1.5%	
	LINE OF SIGHT MET (Y OR N)	N		Y		Y		Y	
PERCENT WIND COVERAGE	10.5 KNOTS	96.37%				97.09%			
	13 KNOTS	97.99%				98.32%			
	16 KNOTS	99.24%				99.33%			
	20 KNOTS	99.75%				99.81%			
RUNWAY DIMENSIONS (FT)		6,511' X 150'				5,002' X 100'			
RUNWAY SAFETY AREA (RSA)	WIDTH (FT)	500		500		150		150	
	LENGTH BEYOND RUNWAY END (FT)	1,000	1,000	1,000	1,000	300	300	300	300
RUNWAY COORDINATES (NAD 83)	RUNWAY END LATITUDE	N 46° 22' 25.54"	N 46° 22' 15.71"	N 46° 22' 25.54"	N 46° 22' 15.71"	N 46° 22' 54.44"	N 46° 22' 21.65"	N 46° 22' 54.44"	N 46° 22' 21.65"
	RUNWAY END LONGITUDE	W 117° 01' 39.28"	W 117° 00' 07.52"	W 117° 01' 39.28"	W 117° 00' 07.52"	W 117° 01' 24.73"	W 117° 00' 31.41"	W 117° 01' 24.73"	W 117° 00' 31.41"
	DISPLACED THRESHOLD LAT.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	DISPLACED THRESHOLD LONG.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RUNWAY ELEVATIONS (NAVD 88)(FT MSL)	RUNWAY END	1427.1	1433.5	1427.1	1433.5	1369.8	1441.6	1369.9	1441.6
	DISPLACED THRESHOLD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	TOUCHDOWN ZONE (TDZ)	1441.8	1441.8	1441.8	1441.8	1393.7	1441.6	1393.7	1441.6
	HIGH POINT	1441.8		1441.8		1441.6		1441.6	
	LOW POINT	1427.1		1427.1		1369.9		1369.9	
RUNWAY LIGHTING TYPE		HIRL		HIRL		MIRL		MIRL	
RUNWAY PROTECTION ZONE (RPZ) (FT)		500 X 1,700 X 1,010	1,000 X 2,500 X 1,750	500 X 1,700 X 1,010	1,000 X 2,500 X 1,750	500 X 1,000 X 700	500 X 1,000 X 700	500 X 1,000 X 700	500 X 1,000 X 700
RUNWAY MARKING TYPE		NON PRECISION	PRECISION	NON PRECISION	PRECISION	NON PRECISION	NON PRECISION	NON PRECISION	NON PRECISION
14 CFR PART 77 APPROACH SURFACES	APPROACH TYPE	NON PRECISION	PRECISION	NON PRECISION	PRECISION	NON PRECISION	NON PRECISION	NON PRECISION	NON PRECISION
	VISIBILITY MINIMUMS (FT)	4,000	2,400	4,000	2,400	5,000	5,000	5,000	5,000
	APPROACH SLOPE DIMENSIONS (FT)	1,000 X4,000 X 10,000	1,000 X 16,000 X 50,000	1,000 X 4,000 X 10,000	1,000 X 16,000 X 50,000	500 X 3,500 X 10,000	500 X 3,500 X 10,000	500 X 3,500 X 10,000	500 X 3,500 X 10,000
	APPROACH CATEGORY (SLOPE)	34:1	50:1 / 40:1	34:1	50:1 / 40:1	34:1	34:1	34:1	34:1
TYPE OF AERONAUTICAL SURVEY REQUIRED FOR APPROACH		SEE AC 150-5300-18							
RUNWAY DEPARTURE SURFACE (YES OR N/A)		YES	YES	YES	YES	YES	YES	YES	YES
RUNWAY OBJECT FREE AREA (ROFA)	WIDTH (FT)	800		800		500		500	
	LENGTH BEYOND RUNWAY END (FT)	1,000	1,000	1,000	1,000	300	300	300	300
OBSTACLE FREE ZONE (OFZ)	WIDTH (FT)	400		400		400		400	
	LENGTH BEYOND RUNWAY END (FT)	200	200	200	200	200	200	200	200
THRESHOLD SITING SURFACE (TSS)	DIMENSIONS (FT)	800 x 3,800 x 10,000	800 x 3,800 x 10,000	800 x 3,800 x 10,000	800 x 3,800 x 10,000	800 x 3,800 x 10,000	800 x 3,800 x 10,000	800 x 3,800 x 10,000	800 x 3,800 x 10,000
	SLOPE	20:1	34:1	20:1	34:1	20:1	20:1	20:1	20:1
	PENETRATIONS	NO TSS PENETRATIONS							
VISUAL AND INSTRUMENT NAVAIDS		REILs, PAPIs, GPS, VOR	REILs, PAPIs, ILS, MALSR, GPS, VOR	REILs, PAPIs, GPS, VOR	REILs, PAPIs, ILS, MALSR, GPS, VOR	REILs, PAPIs, GPS, VOR	REILs, PAPIs, GPS, VOR	REILs, PAPIs, GPS, VOR	REILs, PAPIs, GPS, VOR

TAXIWAY AND TAXILANE DIMENSIONS

TAXIWAYS AND TAXLINES	EXISTING (ALL)	FUTURE (ALL)
TAXIWAY AND TAXILANE DESIGN GROUP (TDG)	3	3*
TAXIWAY AND TAXILANE WIDTH (FT)	50 TO 60	50 TO 60
TAXIWAY AND TAXILANE SAFETY AREA (FT)	118	118
TAXIWAY AND TAXILANE OBJECT FREE AREA (FT)	TW: 186 TL:162	TW: 186 TL:162
TAXIWAY AND TAXILANE SEPARATION (FT)	TW: 93 TL: 81	TW: 93 TL: 81
TAXIWAY AND TAXILANE LIGHTING	REFLECTOR / MITL	MITL

HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (DAD 83); VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 88). ELEVATIONS & RUNWAY END COORDINATES FROM NGS CREATED UDDF FILE FROM THE FAA THIRD PARTY SURVEY SYSTEM, DATED JANUARY 14, 2014.

* TDG 5 FILLETS ON TWs A1, Z1, Z2, H, AND C TO ACCOMMODATE BOMBARDIER Q400.

MODIFICATION TO STANDARDS APPROVAL

ITEM	STANDARD TO BE MODIFIED	EXISTING	PROPOSED	PROPOSED ACTION	AIRSPACE CASE NO.	APPROVAL DATE
1	RUNWAY 8/26 LINE OF SIGHT	RW 8/26 LONGITUDINAL GRADE DOES NOT MEET LINE OF SIGHT REQUIREMENTS (C-III)	RDC C-III	CONSTRUCT PARALELL TAXIWAY	AW-600	NOV. 25, 1981

NOTE: RUNWAY 8/26 TO RE-DESIGNATED TO RUNWAY 9/27 DUE TO CHANGING MAGNETIC VARIATION.

AIRPORT FACILITIES LIST

NO.	EXIST.	FUTURE	FACILITY DESCRIPTION	TOP ELEV. (MSL. -EST.)
1	○	□	TERMINAL	1457'
2	○		BEACON	1485'
3	○		PAPI-4	N/A
4	○		REIL	N/A
5	○		LIGHTED WINDCONE/SEG. CIRCLE	1441'
6	○		ASOS	1452'
7	○		MALSR	N/A
8	○		LOCALIZER	1413'
9	○		GLIDE SLOPE	1465'
10	○		VASI-4	N/A
11	○		AIR TRAFFIC CONTROL TOWER	1522'
12	○		AIRPORT FIRE SUPPRESION BASE	1431'
13	○		CARGO	1447'
14	○		FUEL SYSTEM	1414'
15	○		FBO	1416'
16	○	□	AIRPORT FIRE STATION	1444'
17	○		SRE BUILDING	1464'
18	○		SUPPLEMENTAL WIND CONE	1448'
19	○		AUTO PARKING	N/A
20	○		BOX HANGAR	1426'
21	○		EXECUTIVE HANGAR	1435'
22	○		SASO HANGAR	1433'
23	○		EXECUTIVE HANGAR	1448'
24	○		BOX HANGAR	1414'
25	○		FBO	1425'
26	○		BOX HANGAR	1421'
27	○		BOX HANGAR	1428'
28	○		BOX HANGAR	1428'

AIRPORT FACILITIES LIST

NO.	EXIST.	FUTURE	FACILITY DESCRIPTION	TOP ELEV. (MSL. -EST.)
29	○		BOX HANGAR	1428'
30	○		EXECUTIVE HANGAR	1428'
31	○		EXECUTIVE HANGAR	1428'
32	○		T-HANGARS	1428'
33	○		BOX HANGAR	1428'
34	○		BOX HANGAR	1428'
35	○		EXECUTIVE HANGARS	1428'
36	○		EXECUTIVE HANGAR	1428'
37	○		BOX HANGAR	1428'
38	○		BOX HANGAR	1428'
39	○		EXECUTIVE HANGARS	1428'
40	○		EXECUTIVE HANGAR	1428'
41	○		EXECUTIVE HANGAR	1428'
42	○		MAINTENANCE BLDG.	1428'
43	○		FUEL SYSTEM	1411'
44	○		FUEL SYSTEM	1433'
45	○		EXECUTIVE HANGAR	1460'
46	○		BOX HANGAR	1463'
47	○		BOX HANGAR	1458'
48	○		BOX HANGAR	1459'
49	○		EXECUTIVE HANGAR	1461'
50	○		BOX HANGAR	1456'
51	○		BOX HANGAR	1456'
52	○		BOX HANGAR	1455'
53	○		BOX HANGAR	1461'
54	○		BOX HANGAR	1458'
55	○		BOX HANGAR	1459'
56	○		BOX HANGAR	1459'

AIRPORT FACILITIES LIST

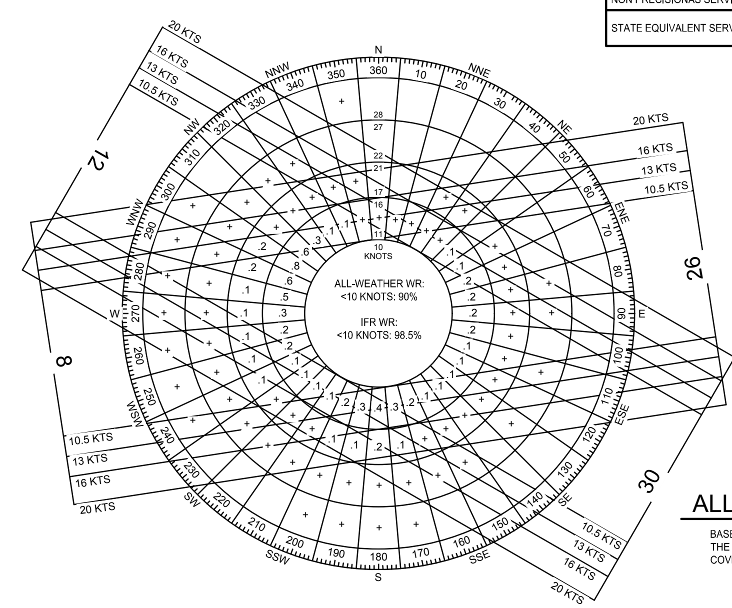
NO.	EXIST.	FUTURE	FACILITY DESCRIPTION	TOP ELEV. (MSL. -EST.)
57	○		EXECUTIVE HANGAR	1463'
58	○		T-HANGARS	1455'
59	○		T-HANGARS	1456'
60	○		EXECUTIVE HANGARS	1473'
61	○		FUEL SYSTEM	1415'
62	○		SASO HANGAR	1439'
63	○		T-HANGARS	1432'
64	○		EXECUTIVE HANGAR	1437'
65	○		EXECUTIVE HANGAR	1447'
66	○		EXECUTIVE HANGAR	1447'
67	○		EXECUTIVE HANGAR	1450'
68	○		EXECUTIVE HANGAR	1453'
69		□	BOX HANGAR	1460'
70		□	BOX HANGAR	1461'
71		□	BOX HANGAR	1462'
72		□	BOX HANGAR	1460'
73		□	BOX HANGAR	1461'
74		□	BOX HANGAR	1460'
75		□	BOX HANGAR	1461'
76		□	BOX HANGAR	1462'
77		□	BOX HANGAR	1464'
78		□	BOX HANGAR	1460'
79		□	BOX HANGAR	1461'
80		□	BOX HANGAR	1460'
81		□	BOX HANGAR	1461'
82		□	BOX HANGAR	1462'
83		□	BOX HANGAR	1464'

DECLARED DISTANCES

ITEM	EXISTING		FUTURE	
	RW 8	RW 26	RW 9	RW 27
TAKEOFF RUN AVAILABLE (TORA) (FT)	NONE		NONE	
TAKEOFF DISTANCE AVAILABLE (TODA) (FT)				
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA) (FT)				
LANDING DISTANCE AVAILABLE (LDA) (FT)				
	EXISTING		FUTURE	
	RW 12	RW 30	RW 12	RW 30
TAKEOFF RUN AVAILABLE (TORA) (FT)	NONE		NONE	
TAKEOFF DISTANCE AVAILABLE (TODA) (FT)				
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA) (FT)				
LANDING DISTANCE AVAILABLE (LDA) (FT)				

AIRPORT DATA

ITEM		EXISTING (E)	FUTURE (F)
AIRPORT REFERENCE CODE (ARC)		C-III -2400	C-III -2400
MEAN MAX. TEMP OF HOTTEST MONTH (°F) (JULY)		89.3	89.3
AIRPORT ELEVATION (MSL, FT) (NAVD 88) *		1442'	1442'
AIRPORT NAVIGATIONAL AIDS		ILS, GPS, VOR, ROTATING BEACON	ILS, GPS, VOR, ROTATING BEACON
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	LATITUDE	N 46° 22' 28.19"	N 46° 22' 28.19"
	LONGITUDE	W 117° 00' 55.43"	W 117° 00' 55.43"
MISCELLANEOUS FACILITIES		MITL, ASOS	MITL, ASOS
ARC AND CRITICAL AIRCRAFT	ARC	C-III	C-III
	AIRCRAFT	BOEING 737-300	BOEING 717-200
	WINGSPAN (FT)	94' 8"	93' 2"
	UNDERCARRIAGE (FT)	45.8' (Q400)	19' 4"
	APPROACH SPEED (KTS)	137 KNOTS	139 KNOTS
AIRPORT MAGNETIC VARIATION	VARIATION	14° E	TBD
	DATE	02.10.15	TBD
	SOURCE	NOAA	TBD
NON PRECISIONAS SERVICE LEVEL		P-CS	P-CS
STATE EQUIVALENT SERVICE		COMMERCIAL SERVICE	COMMERCIAL SERVICE



ALL WEATHER WIND ROSE

BASED ON 79,268 OBSERVATIONS BETWEEN 2000-2009 FROM THE LEWISTON ASOS. (SEE RUNWAY DATA TABLE FOR COVERAGE PERCENTAGES)

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PLANNING ENGINEERING CONSTRUCTION
COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192
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LEWISTON-NEZ PERCE COUNTY AIRPORT
LEWISTON, IDAHO

A.I.P. No. 3-16-022-034-2014
AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2							
1							
0	136159	01/2016	ORIGINAL ISSUE	6159502	JOS	JMR	DAC

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AIRPORT DATA SHEET

AIRPORT FACILITIES LIST

NO.	EXIST.	FUTURE	FACILITY DESCRIPTION	TOP ELEV. (MSL. -EST.)
1	○	□	TERMINAL	1457'
2	○		BEACON	1485'
3	○		PAPI-4	N/A
4	○		REIL	N/A
5	○		LIGHTED WINDCONE/SEG. CIRCLE	1441'
6	○		ASOS	1452'
7	○		MALSR	N/A
8	○		LOCALIZER	1413'
9	○		GLIDE SLOPE	1465'
10	○		VASI-4	N/A
11	○		AIR TRAFFIC CONTROL TOWER	1522'
12	○		AIRPORT FIRE SUPPRESION BASE	1431'
13	○		CARGO	1447'
14	○		FUEL SYSTEM	1414'
15	○		FBO	1416'
16	○	□	AIRPORT FIRE STATION	1444'
17	○		SRE BUILDING	1464'
18	○		SUPPLEMENTAL WIND CONE	1448'
19	○		AUTO PARKING	N/A
20	○		BOX HANGAR	1426'
21	○		EXECUTIVE HANGAR	1435'
22	○		SASO HANGAR	1433'
23	○		EXECUTIVE HANGAR	1448'
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26	○		BOX HANGAR	1421'
27	○		BOX HANGAR	1428'
28	○		BOX HANGAR	1428'

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AIRPORT FACILITIES LIST

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60	○		EXECUTIVE HANGARS	1473'
61	○		FUEL SYSTEM	1415'
62	○		SASO HANGAR	1439'
63	○		T-HANGARS	1432'
64	○		EXECUTIVE HANGAR	1437'
65	○		EXECUTIVE HANGAR	1447'
66	○		EXECUTIVE HANGAR	1447'
67	○		EXECUTIVE HANGAR	1450'
68	○		EXECUTIVE HANGAR	1453'
69		□	BOX HANGAR	1460'
70		□	BOX HANGAR	1461'
71		□	BOX HANGAR	1462'
72		□	BOX HANGAR	1460'
73		□	BOX HANGAR	1461'
74		□	BOX HANGAR	1460'
75		□	BOX HANGAR	1461'
76		□	BOX HANGAR	1462'
77		□	BOX HANGAR	1464'
78		□	BOX HANGAR	1460'
79		□	BOX HANGAR	1461'
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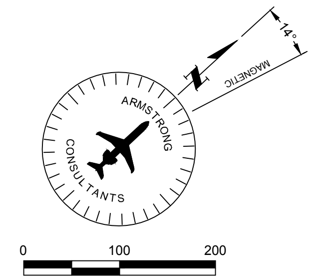
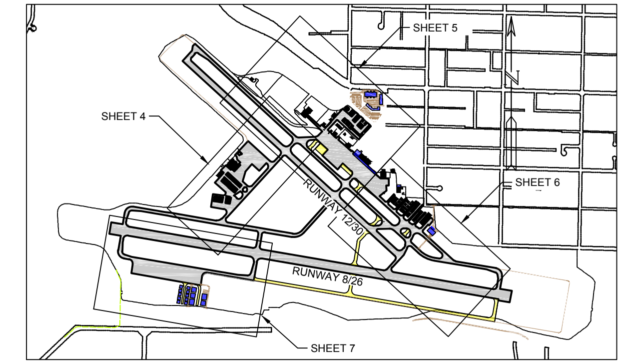
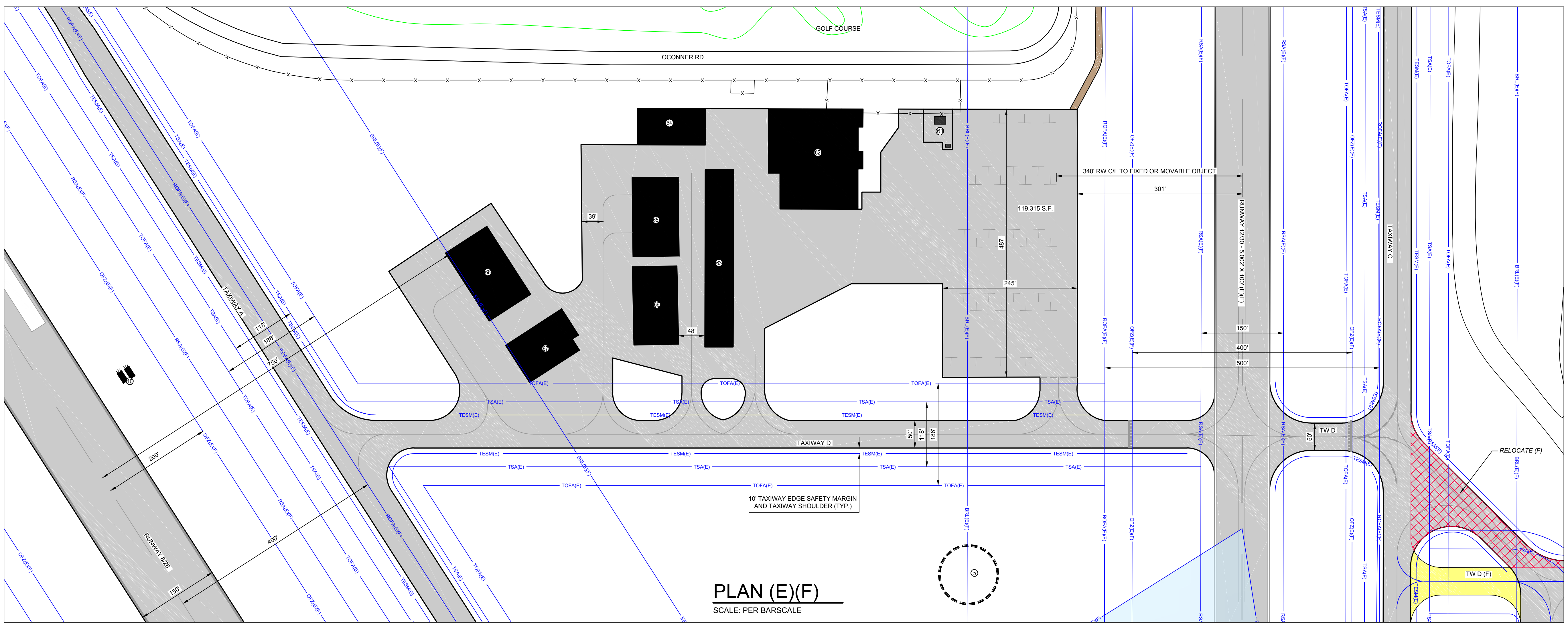




TAD SHEET KEY

LEGEND

EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE/ULTIMATE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			AIRPORT BEACON
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			WIND CONE & SEGMENTED CIRCLE
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ASOS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			LIGHTED WINDCONE
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)		N/A	SECTION CORNER
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			DRAINAGE / WATER EDGE
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)	4125 4125	N/A	CONTOURS
APRC(E)	APRC(F)	APPROACH SURFACE			ROADS
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE			MARKINGS
DPRT(E)	DPRT(F)	DEPARTURE SURFACE			FENCING
GQS(E)	GQS(F)	GLIDE SLOPE QUAL. SURFACE (GQS)		N/A	LOCALIZER CRITICAL AREA
RVZ(E)	RVZ(F)	RUNWAY VISIBILITY ZONE (RVZ)			CULVERT
N/A		TO BE REMOVED			AIRPORT REFERENCE POINT (ARP)
	N/A	UTILITY POLE / LIGHT POLE		N/A	PACS/SACS MONUMENT
		PARCEL LINES		N/A	GLIDE SLOPE CRITICAL AREA
			NOTE: SOME LINES AND SYMBOLS MAY NOT BE PRESENT ON DRAWING		



PLAN (E)(F)

SCALE: PER BARSCALE

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LEWISTON-NEZ PERCE COUNTY AIRPORT
LEWISTON, IDAHO

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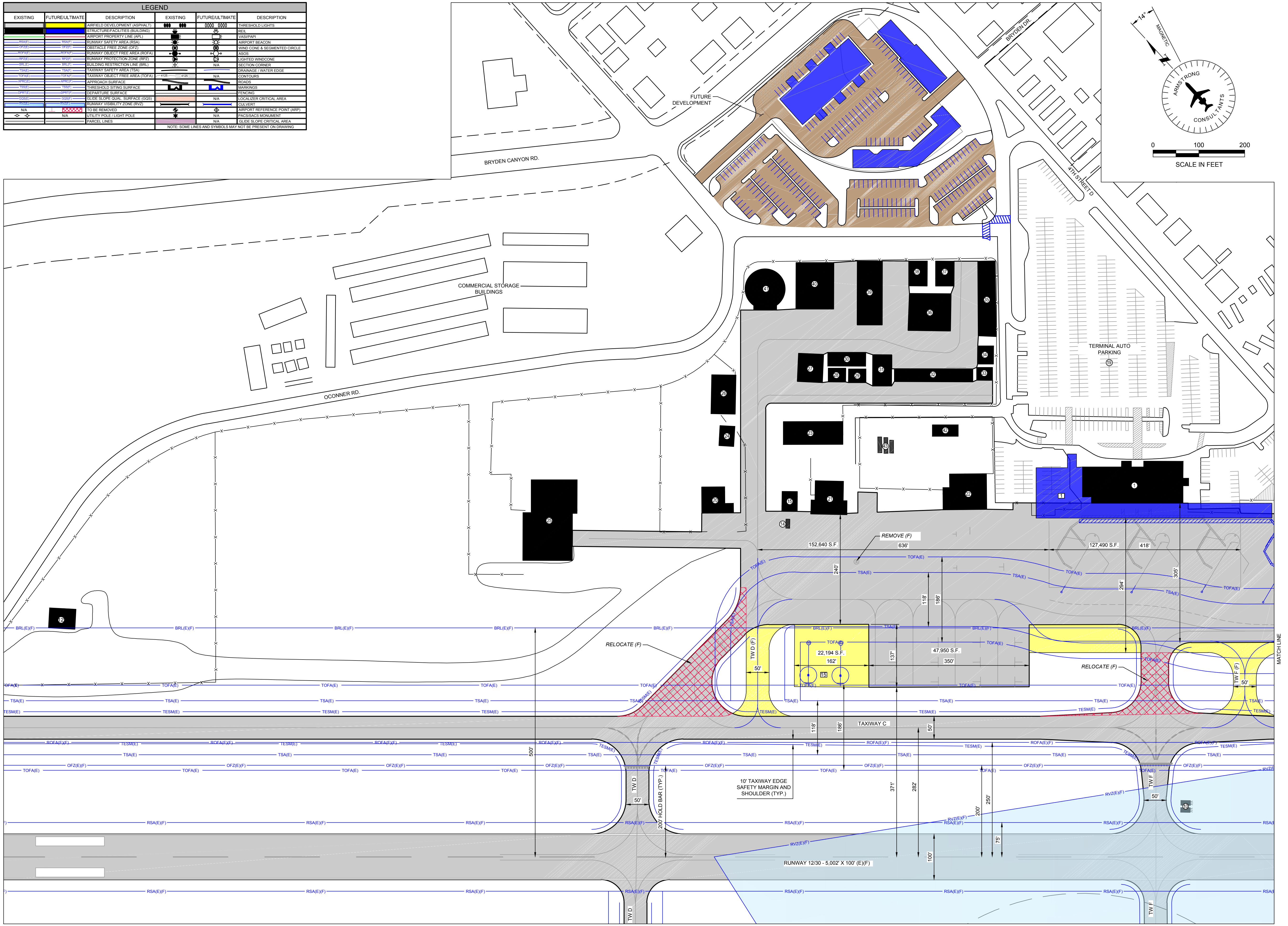
TERMINAL AREA DRAWING

LEGEND

EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE/ULTIMATE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			AIRPORT BEACON
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			WIND CONE & SEGMENTED CIRCLE
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ASOS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			LIGHTED WINDCONE
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)		N/A	SECTION CORNER
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			DRAINAGE / WATER EDGE
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)	4125 4125	N/A	CONTOURS
APRC(E)	APRC(F)	APPROACH SURFACE			ROADS
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE			MARKINGS
DPRT(E)	DPRT(F)	DEPARTURE SURFACE			FENCING
GQS(E)	GQS(F)	GLIDE SLOPE QUAL. SURFACE (GQS)		N/A	LOCALIZER CRITICAL AREA
RVZ(E)	RVZ(F)	RUNWAY VISIBILITY ZONE (RVZ)			CULVERT
N/A		TO BE REMOVED			AIRPORT REFERENCE POINT (ARP)
	N/A	UTILITY POLE / LIGHT POLE		N/A	PACS/SACS MONUMENT
		PARCEL LINES		N/A	GLIDE SLOPE CRITICAL AREA
			NOTE: SOME LINES AND SYMBOLS MAY NOT BE PRESENT ON DRAWING		



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LEWISTON-NEZ PERCE COUNTY AIRPORT
LEWISTON, IDAHO

A.I.P. No. 3-16-022-034-2014
AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2							
1							
0	136159	01/2016	ORIGINAL ISSUE	6159503	JOS	JMR	DAC

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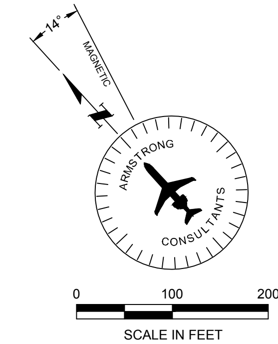
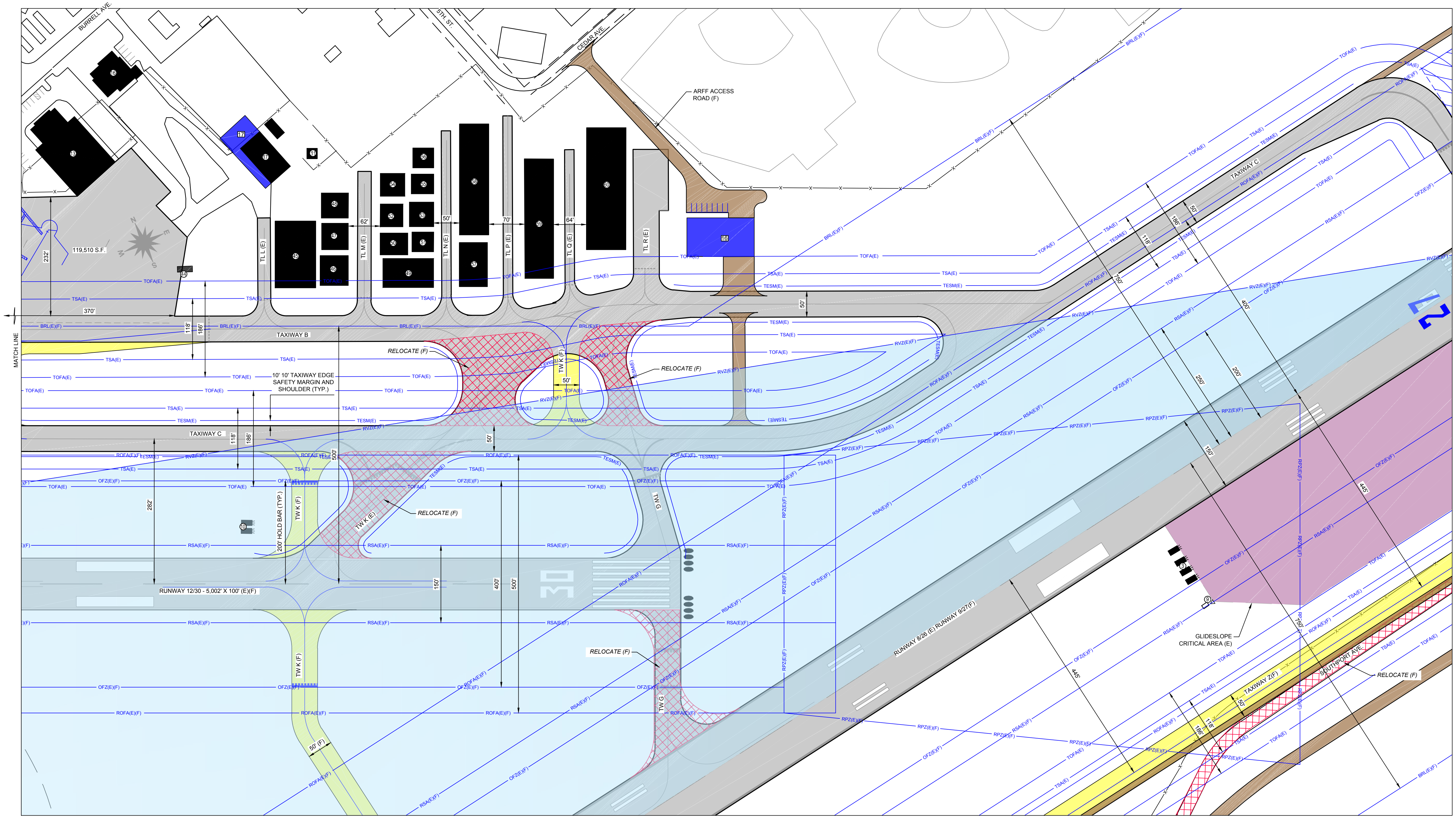
TERMINAL AREA DRAWING

Sheet: 5 of: 20

LEGEND					
EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE/ULTIMATE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			AIRPORT BEACON
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			WIND CONE & SEGMENTED CIRCLE
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ASOS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			LIGHTED WINDCONE
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)	1 2 12 11	N/A	SECTION CORNER
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			DRAINAGE / WATER EDGE
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)	4125 4125	N/A	CONTOURS
APRC(E)	APRC(F)	APPROACH SURFACE			ROADS
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE			MARKINGS
DPRT(E)	DPRT(F)	DEPARTURE SURFACE			FENCING
GQS(E)	GQS(F)	GLIDE SLOPE QUAL. SURFACE (GQS)		N/A	LOCALIZER CRITICAL AREA
RVZ(E)	RVZ(F)	RUNWAY VISIBILITY ZONE (RVZ)			CULVERT
N/A		TO BE REMOVED			AIRPORT REFERENCE POINT (ARP)
	N/A	UTILITY POLE / LIGHT POLE		N/A	PACS/SACS MONUMENT
		PARCEL LINES		N/A	GLIDE SLOPE CRITICAL AREA
			NOTE: SOME LINES AND SYMBOLS MAY NOT BE PRESENT ON DRAWING		





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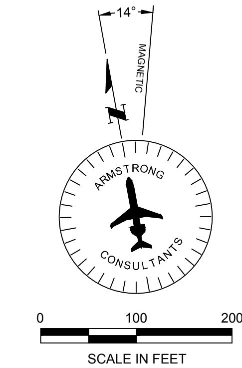
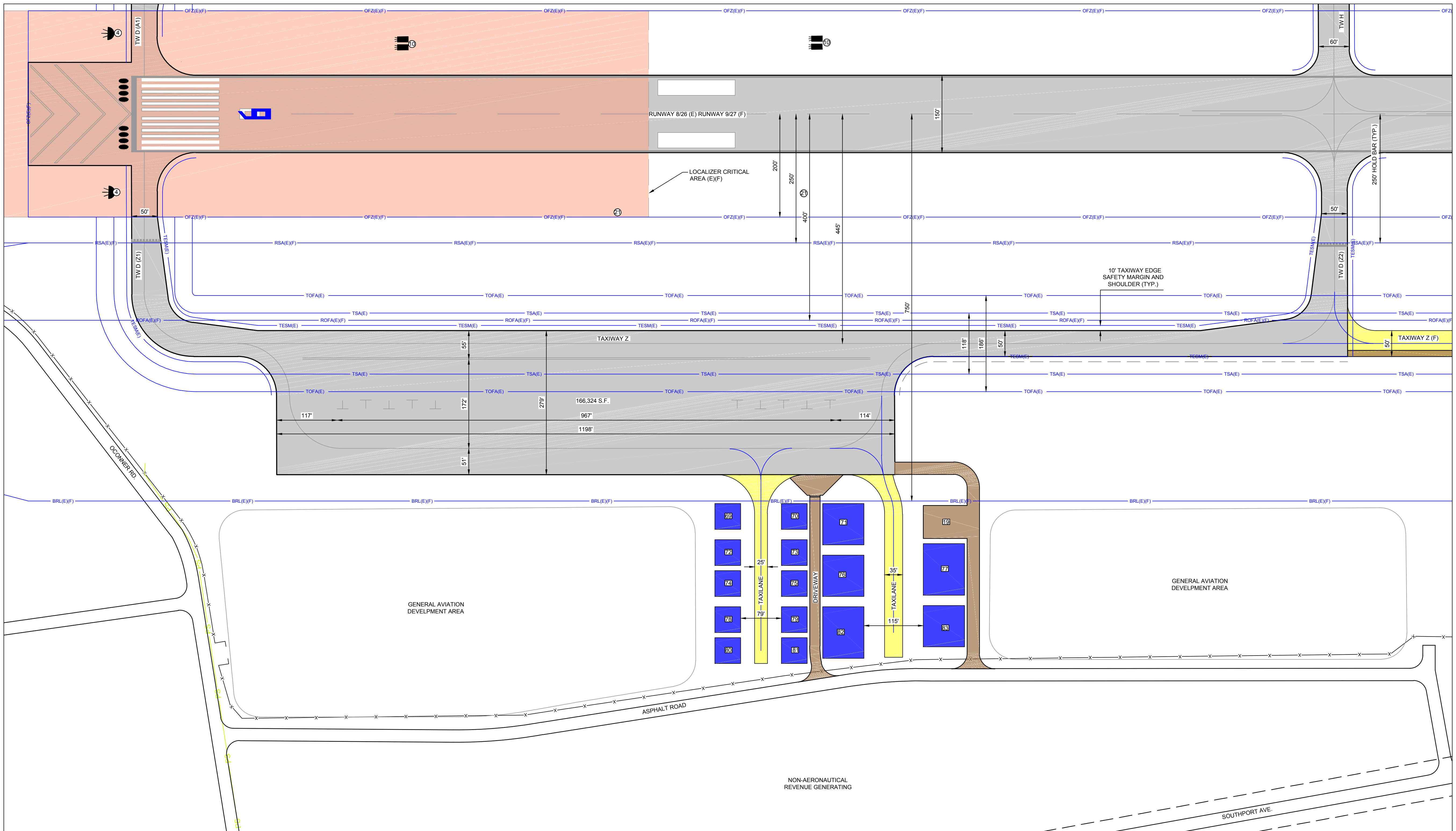
TERMINAL AREA DRAWING

Sheet: 6 of: 20

LEGEND					
EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE/ULTIMATE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			AIRPORT BEACON
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			WIND CONE & SEGMENTED CIRCLE
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ASOS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			LIGHTED WINDCONE
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)	1 2 12 11	N/A	SECTION CORNER
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			DRAINAGE / WATER EDGE
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)	4125 4125	N/A	CONTOURS
APRC(E)	APRC(F)	APPROACH SURFACE			ROADS
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE			MARKINGS
DPRT(E)	DPRT(F)	DEPARTURE SURFACE			FENCING
GQS(E)	GQS(F)	GLIDE SLOPE QUAL. SURFACE (GQS)		N/A	LOCALIZER CRITICAL AREA
RVZ(E)	RVZ(F)	RUNWAY VISIBILITY ZONE (RVZ)			CULVERT
N/A		TO BE REMOVED			AIRPORT REFERENCE POINT (ARP)
	N/A	UTILITY POLE / LIGHT POLE		N/A	PACS/SACS MONUMENT
		PARCEL LINES		N/A	GLIDE SLOPE CRITICAL AREA
			NOTE: SOME LINES AND SYMBOLS MAY NOT BE PRESENT ON DRAWING		





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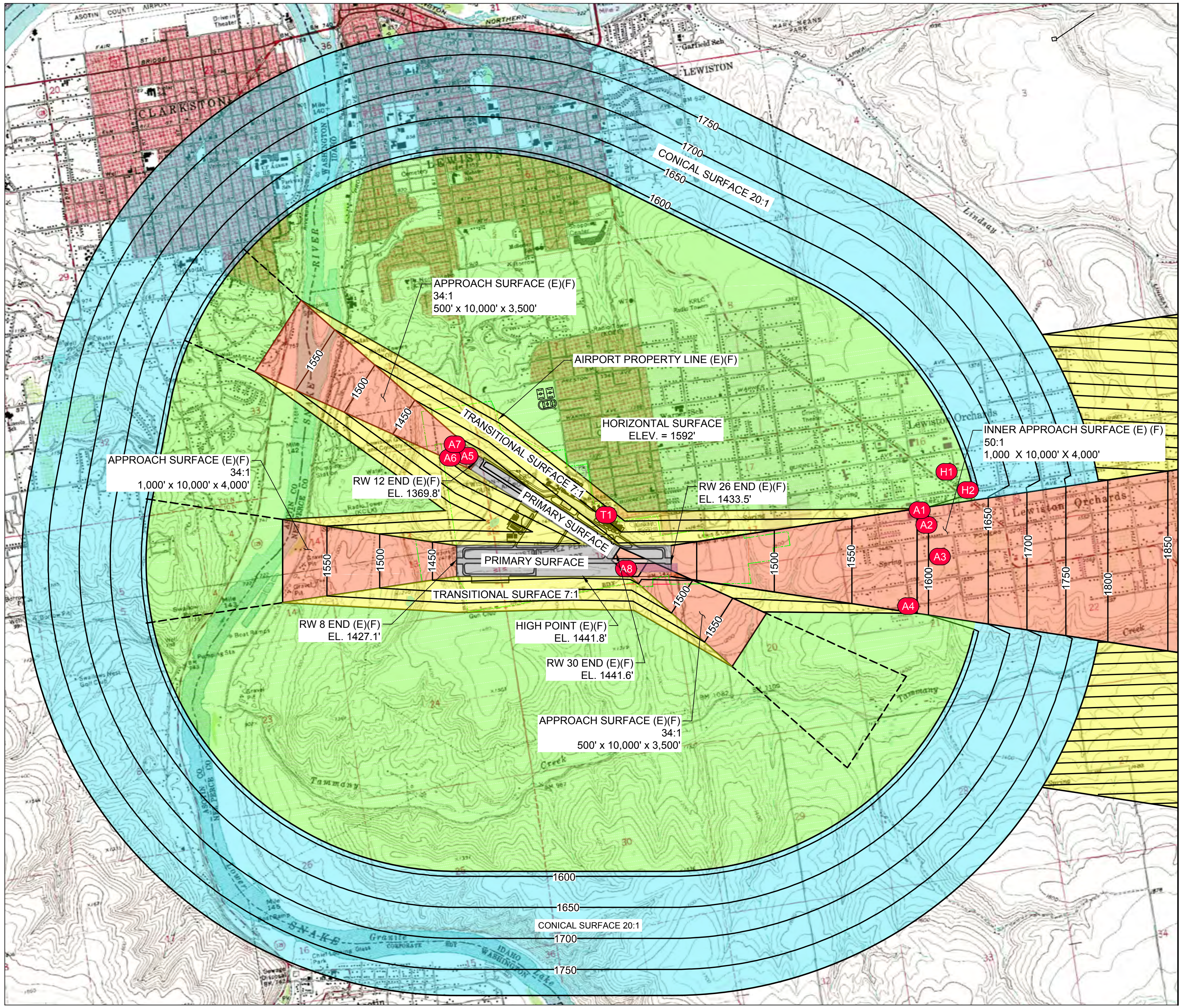
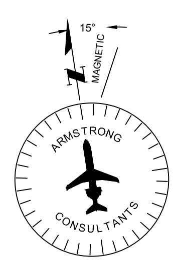
TERMINAL AREA DRAWING

Sheet: 7 of: 20





0 2000 4000

SCALE IN FEET

BASE MAP CONTOUR INTERVAL 40 FEET

PART 77 CONTOUR INTERVAL 50 FEET

LEGEND

HORIZONTAL SURFACE	TRANSITIONAL SURFACE
CONICAL SURFACE	APPROACH SURFACE
PRIMARY SURFACE	TERRAIN PENETRATION
P1 PENETRATION IDENTIFIER	

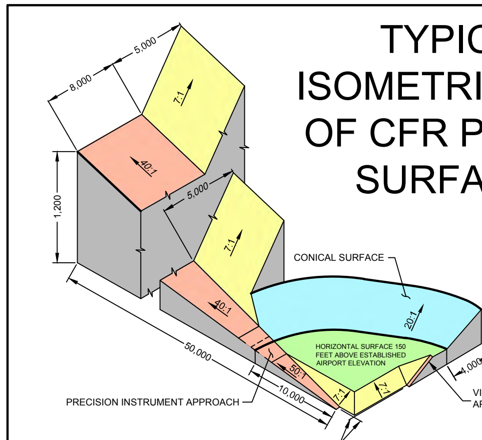
OBSTRUCTION CHART

PART 77 SURFACE	ITEM No.	DESCRIPTION	GROUND ELEVATION (MSL)(FEET)	ESTIMATED TOP ELEVATION (MSL)(FEET)	PENETRATION (FEET)	REMARKS	YEAR OF MITIGATION
PRIMARY		NONE					
APPROACH	A1	TREE	1541	1600	3	TRIM	2020
	A2	TREE	1525	1620	10	TRIM	2020
	A3	TREE	1550	1610	2	TRIM	2020
	A4	TREE	1523	1610	24	TRIM	2020
	A5	TREE	1351	1391	7	TRIM	2020
	A6	TREE	1348	1398	6	TRIM	2020
	A7	TREE	1341	1396	1	TRIM	2020
	A8	WIND CONE	1387	1447	10	RELOCATE	2020
7:1 TRANSITIONAL	T1	ANT. ON ATC	1462	1522	10	O.L. (E)	N/A
HORIZONTAL	H1	TREE	1513	1597	5	TRIM	2020
	H2	TREE	1543	1603	11	TRIM	2020
20:1 CONICAL		NONE					

NOTES:

1. SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATIONS.
2. SEE INNER APPROACH DRAWINGS FOR OBSTRUCTIONS WITHIN RPZs.
3. OBSTRUCTION INFORMATION WAS DETERMINED USING AERONAUTICAL SURVEY INFORMATION FROM WOOLPERT INC. PUBLISHED IN THE FAA THIRD PARTY SURVEY SYSTEM, DATED JANUARY 14, 2014 AND AN INQUIRY OF THE FAA OE/AAA DATABASE.
4. AIRPORT ELEVATION: 1442'

TYPICAL ISOMETRIC VIEW OF CFR PART 77 SURFACES



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LEWISTON-NEZ PERCE COUNTY AIRPORT

LEWISTON, IDAHO

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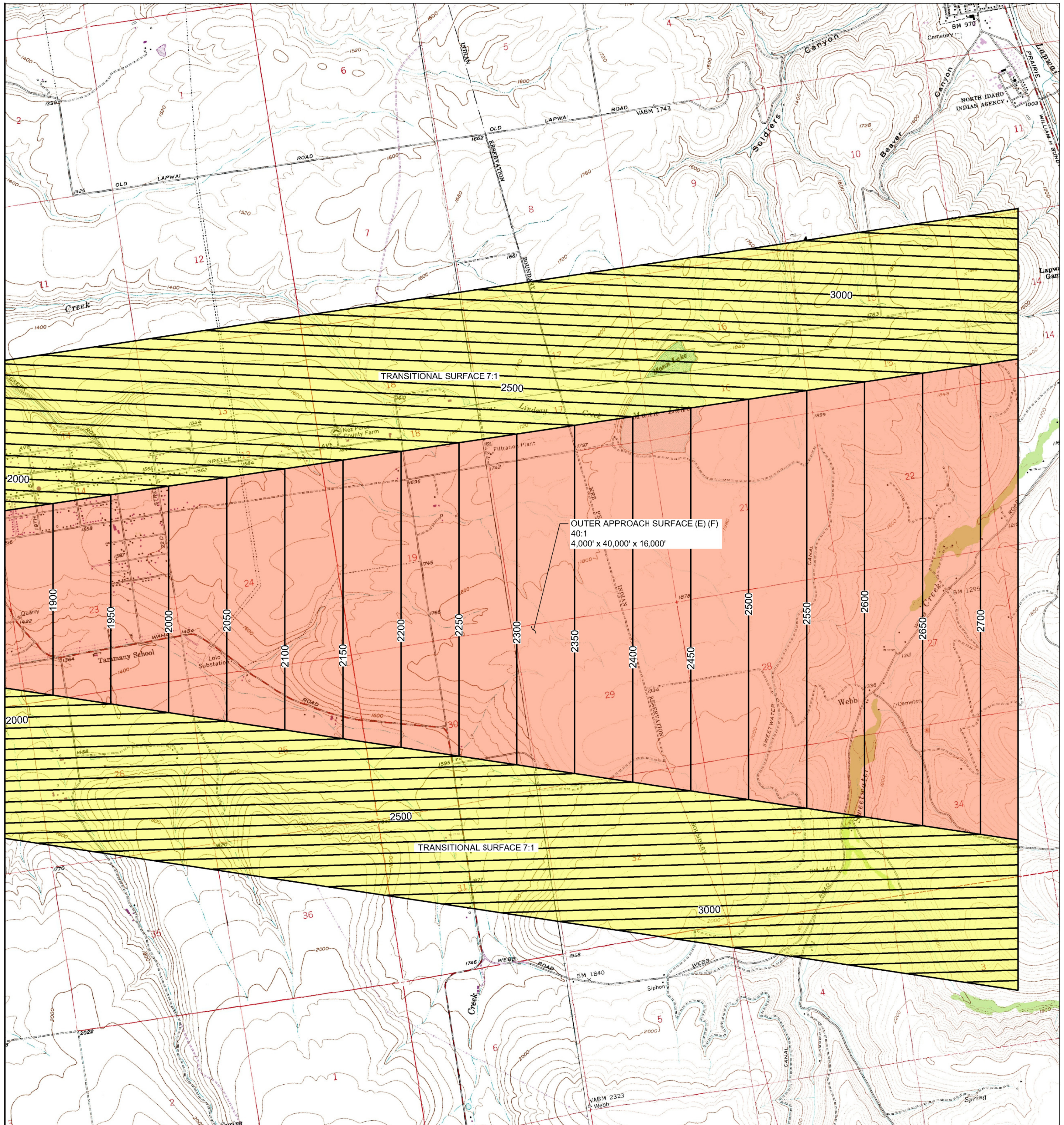
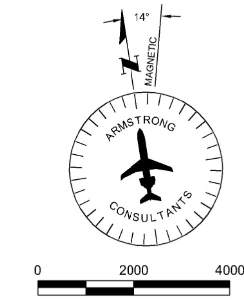
FAR PART 77 AIRSPACE



MATCH LINE



SCALE IN FEET
BASE MAP CONTOUR INTERVAL 40 FEET
PART 77 CONTOUR INTERVAL 50 FEET

LEGEND

HORIZONTAL SURFACE	TRANSITIONAL SURFACE
CONICAL SURFACE	APPROACH SURFACE
PRIMARY SURFACE	TERRAIN PENETRATION
P1 PENETRATION IDENTIFIER	

NOTES

A) REFER TO "INNER PORTION OF THE APPROACH SURFACE" DRAWINGS FOR DETAILS ON ANY CLOSE-IN APPROACH OBSTRUCTIONS.

B) AN FAA FORM 7460-1, "NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION" MUST BE SUBMITTED FOR ANY CONSTRUCTION OR ALTERATION (INCLUDING HANGARS AND OTHER ON-AIRPORT AND OFF-AIRPORT STRUCTURES, TOWERS, ETC.) WITHIN 20,000 HORIZONTAL FEET OF THE AIRPORT GREATER IN HEIGHT THAN AN IMAGINARY SURFACE EXTENDING OUTWARD AND UPWARD FROM THE RUNWAY AT A SLOPE OF 100 TO 1 OR GREATER IN HEIGHT THAN 200 FEET ABOVE GROUND LEVEL.

C) APPROACH SURFACES BASED ON ULTIMATE CONDITION.

D) OBSTRUCTION INFORMATION WAS DETERMINED USING AERONAUTICAL SURVEY INFORMATION FROM WOOLPERT INC. PUBLISHED IN THE FAA THIRD PARTY SURVEY SYSTEM, DATED JANUARY 14, 2014 AND AN INQUIRY OF THE FAA OE/AAA DATABASE.

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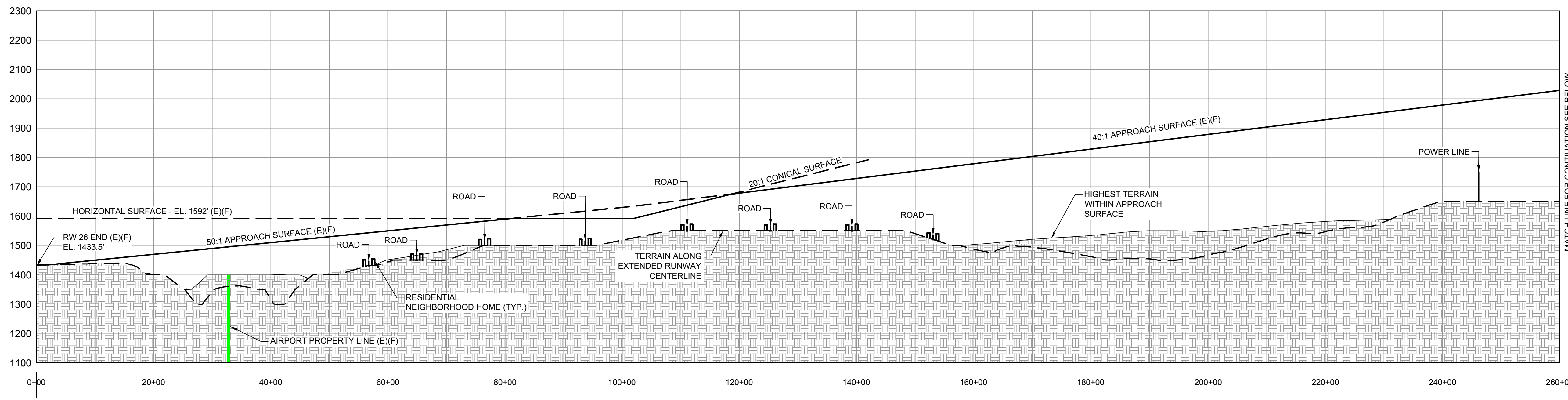
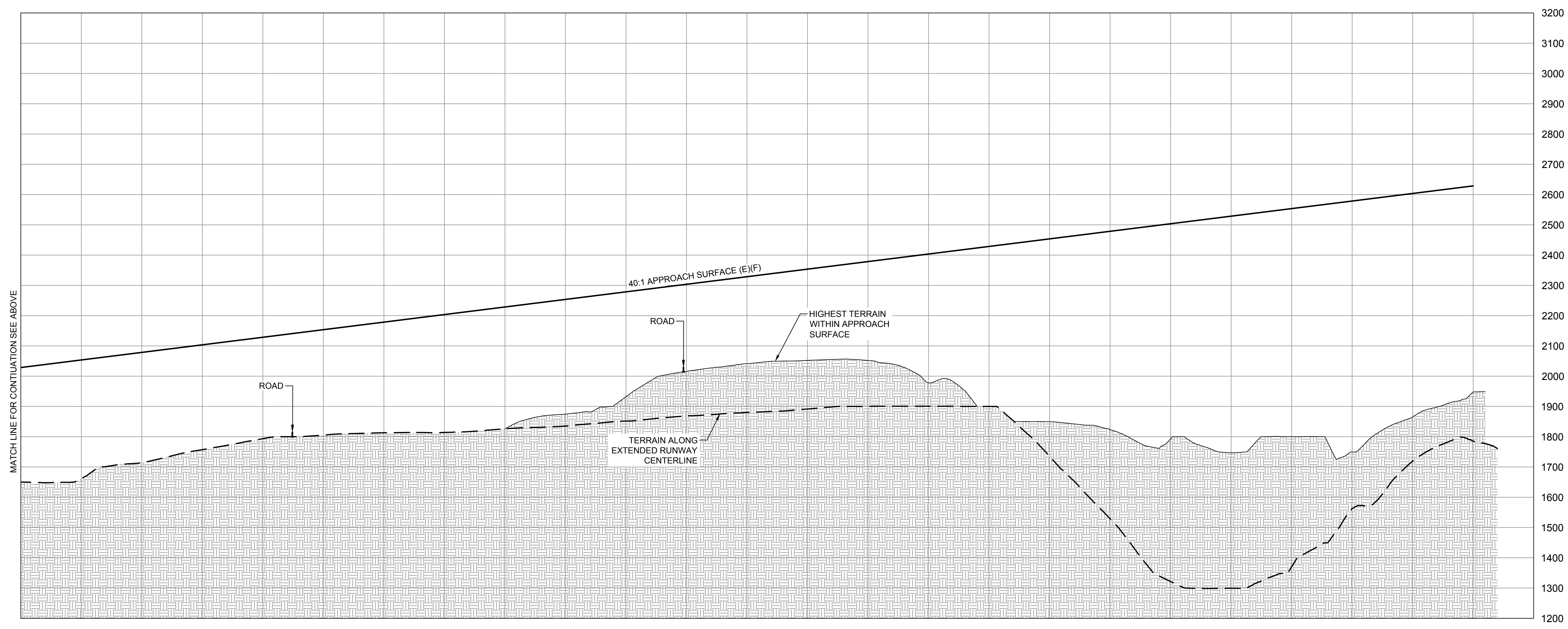
FAR
PART 77
AIRSPACE

Sheet: 9 of: 20



RUNWAY 26 EXTENDED PROFILE (E)(F)

SCALE: PER GRID



RUNWAY 26 EXTENDED PROFILE (E)(F)

SCALE: PER GRID

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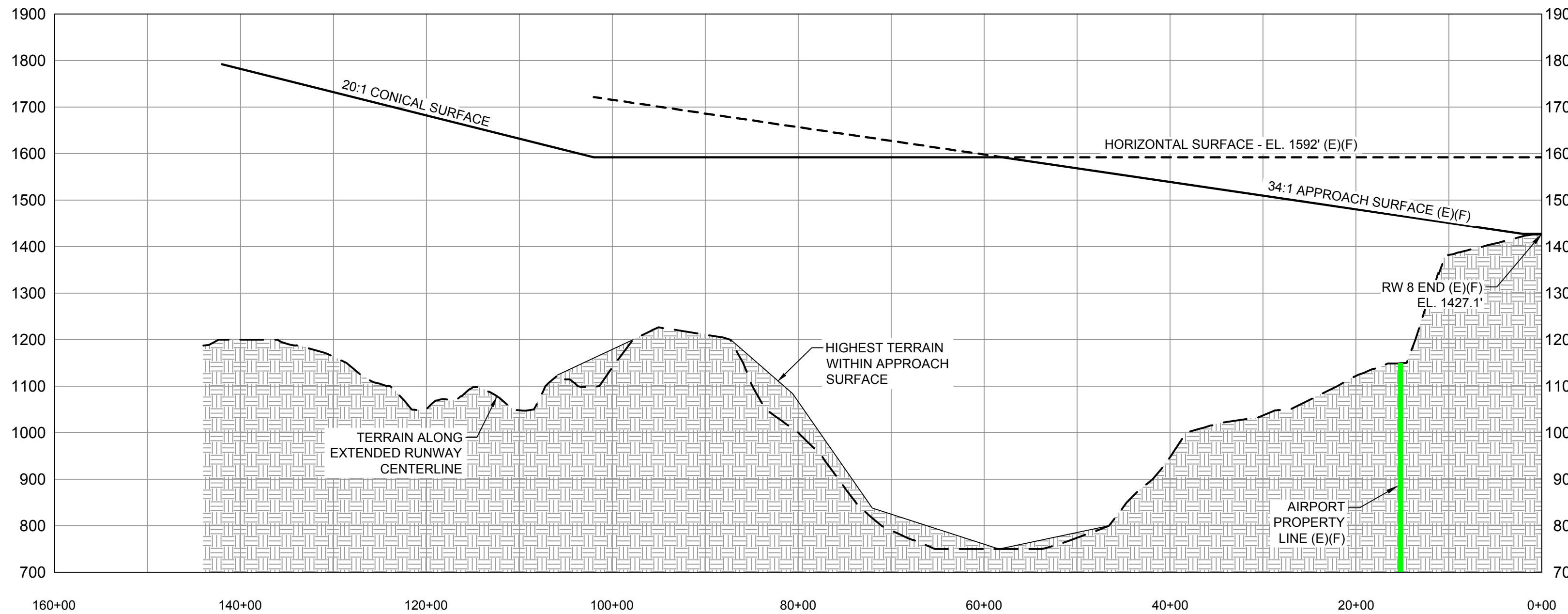
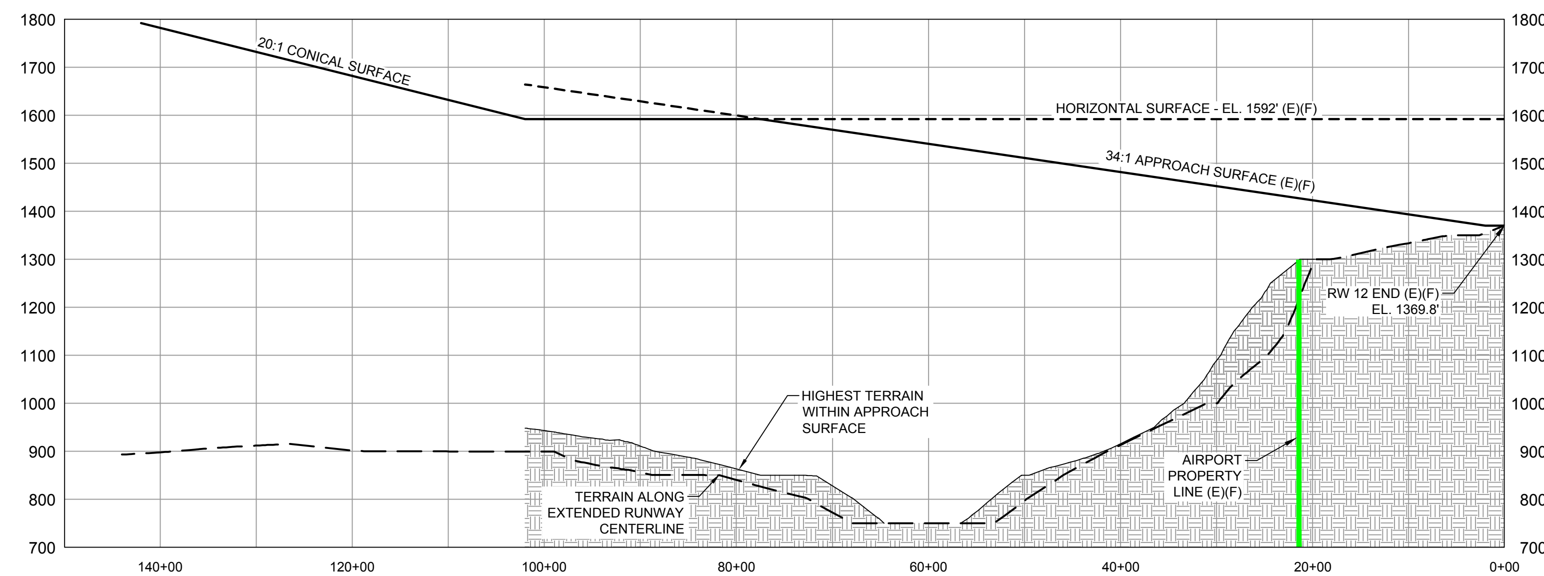
RUNWAY 26
EXTENDED
RUNWAY
PROFILE

Sheet: 10 of: 20



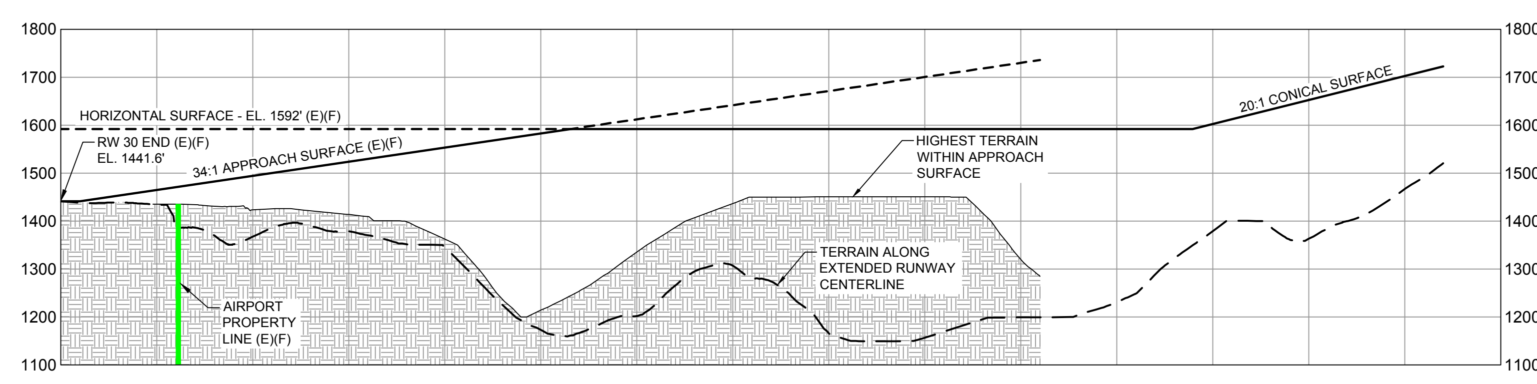
RUNWAY 8 EXTENDED PROFILE (E)(F)

SCALE: PER GRID



RUNWAY 12 EXTENDED PROFILE (E)(F)

SCALE: PER GRID



RUNWAY 30 EXTENDED PROFILE (E)(F)

SCALE: PER GRID

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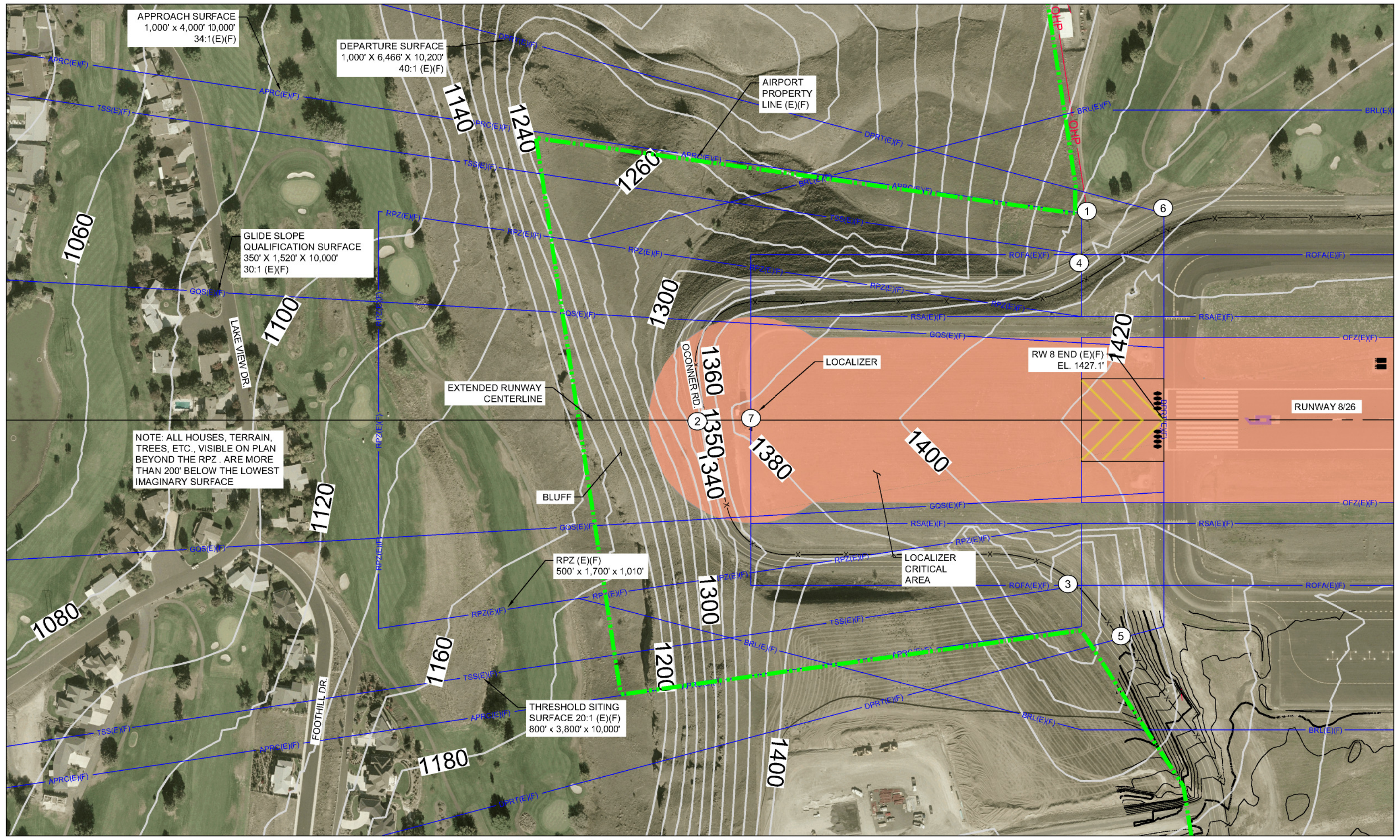
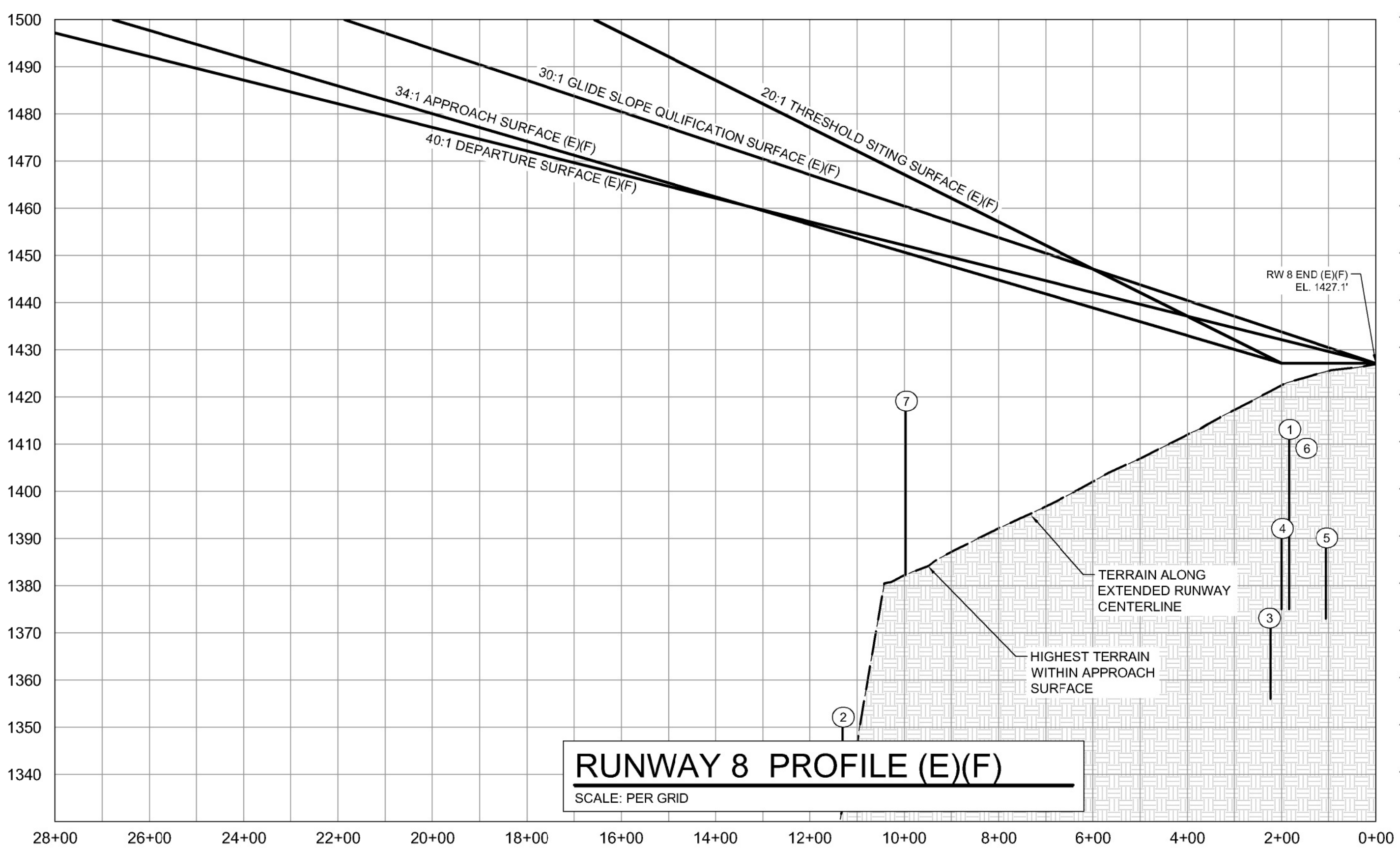
RUNWAYS 8 AND 12/30 EXTENDED PROFILES

Sheet: 11 of: 20



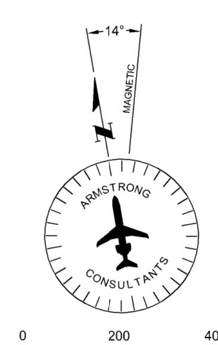
RUNWAY 8 PLAN (E)(F)

SCALE: PER BARSCALE



RUNWAY 8 PROFILE (E)(F)

SCALE: PER GRID



SCALE IN FEET
CONTOUR INTERVAL 10'

OBJECTS WITHIN RUNWAY 8 GLIDE SLOPE QUALIFICATION, APPROACH, THRESHOLD SITING AND DEPARTURE SURFACES (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	30:1 GQS PEN.	20:1 TSS PEN.	34:1 APRC PEN.	40:1 DPRT PEN.	REMARKS	YEAR OF MITIGATION
1	POLE	36'	1411'	-	-	-	-20'	**	NONE
2	ROAD	15'	1350'	-114'	-123'	-104'	-105	*	NONE
3	ROAD	15'	1371'	-	-63'	-	-61'	*	NONE
4	ROAD	15'	1390'	-	-43'	-	-42'	*	NONE
5	ROAD	15'	1388'	-	-	-	-41'	*	NONE
6	ROAD	15'	1407'	-	-	-	-20'	*	NONE
7	LOCALIZER	35'	1417'	-44'	-50'	-34'	-35'	*	NONE

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).

* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.

\- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.

● = OBJECT PENETRATION LOCATION

EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

** OBJECT INFORMATION WAS DETERMINED USING AERONAUTICAL SURVEY INFORMATION FROM WOOLPERT INC. PUBLISHED IN THE FAA THIRD PARTY SURVEY SYSTEM, DATED JANUARY 14, 2014

NOTES:

1. APPROACH SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.
2. LESS THAN 35' LOW, CLOSE-IN DEPARTURE SURFACE PENETRATIONS: ADD NOTE TO DEPARTURE PROCEDURE OR LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.

LEGEND

EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE/ULTIMATE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			AIRPORT BEACON
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			WIND CONE & SEGMENTED CIRCLE
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ASOS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			LIGHTED WINDCONE
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)		N/A	SECTION CORNER
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			DRAINAGE / WATER EDGE
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)	4125 4125	N/A	CONTOURS
APRC(E)	APRC(F)	APPROACH SURFACE			ROADS
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE			MARKINGS
DPRT(E)	DPRT(F)	DEPARTURE SURFACE			FENCING
GQS(E)	GQS(F)	GLIDE SLOPEQUAL. SURFACE (GQS)		N/A	LOCALIZER CRITICAL AREA
RVZ(E)	RVZ(F)	RUNWAY VISIBILITY ZONE (RVZ)			CULVERT
N/A		TO BE REMOVED			AIRPORT REFERENCE POINT (ARP)
	N/A	UTILITY POLE / LIGHT POLE		N/A	PACS/SACS MONUMENT
		PARCEL LINES		N/A	GLIDE SLOPE CRITICAL AREA
			NOTE: SOME LINES AND SYMBOLS MAY NOT BE PRESENT ON DRAWING		

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COLORADO: 970.242.0101 ARIZONA: 602.803.7079 NEW MEXICO: 505.508.2192

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LEWISTON-NEZ PERCE COUNTY AIRPORT
LEWISTON, IDAHO

A.I.P. No. 3-16-022-034-2014
AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2							
1							
0	136159	01/2016	ORIGINAL ISSUE	6159505	JOS	JMR	DAC

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

RUNWAY 8 INNER APPROACH DRAWING(E)(F)

Sheet: 12 of: 20

OBJECTS WITHIN RUNWAY 30 GLIDE SLOPE QUALIFICATION, APPROACH, THRESHOLD SITINGAND DEPARTURE SURFACES (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	30:1 GQS PEN.	20:1 TSS PEN.	50:1 APRC PEN.	40:1 DPRT PEN.	REMARKS	YEAR OF MITIGATION
1	ROAD	15'	1450'	-37'	-25'	-11'	-23'	*	NONE
2	ROAD	15'	1432'	-	-39'	-27'	-38'	*	NONE
3	ROAD	15'	1437'	-	-30'	-19'	-30'	*	NONE
4	BUILDING	12'	1440'	-	-25'	-15'	-25'	*	NONE
5	ROAD	15'	1427'	-	-	-	-30'	*	NONE
6	ROAD	15'	1456'	-	-	-	-8'	**	NONE
7	ROAD	15'	1405'	-	-	-	-28'	*	NONE

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).

* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.

\- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.

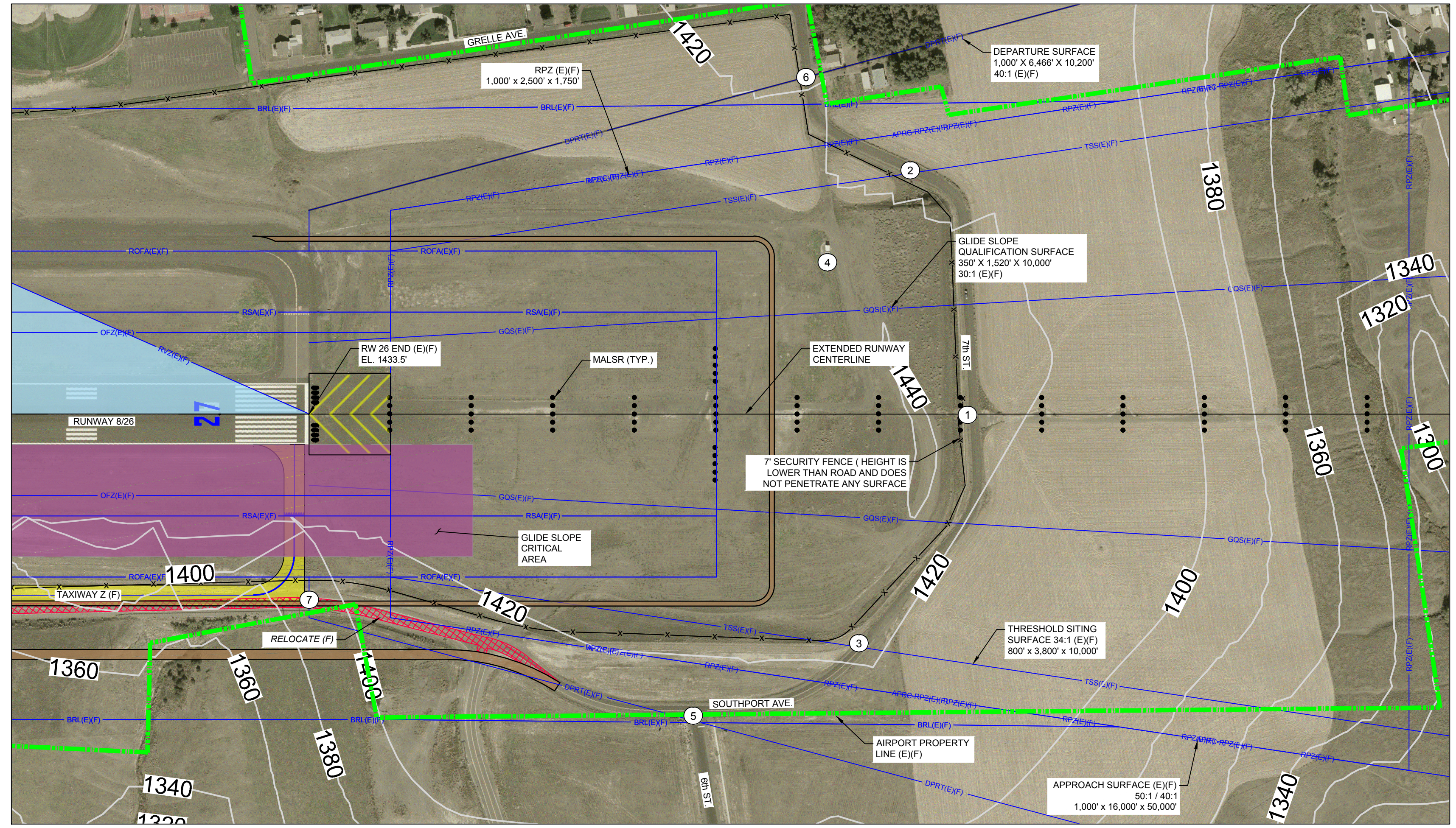
● = OBJECT PENETRATION LOCATION

EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

** OBJECT INFORMATION WAS DETERMINED USING AERONAUTICAL SURVEY INFORMATION FROM WOOLPERT INC. PUBLISHED IN THE FAA THIRD PARTY SURVEY SYSTEM, DATED JANUARY 14, 2014

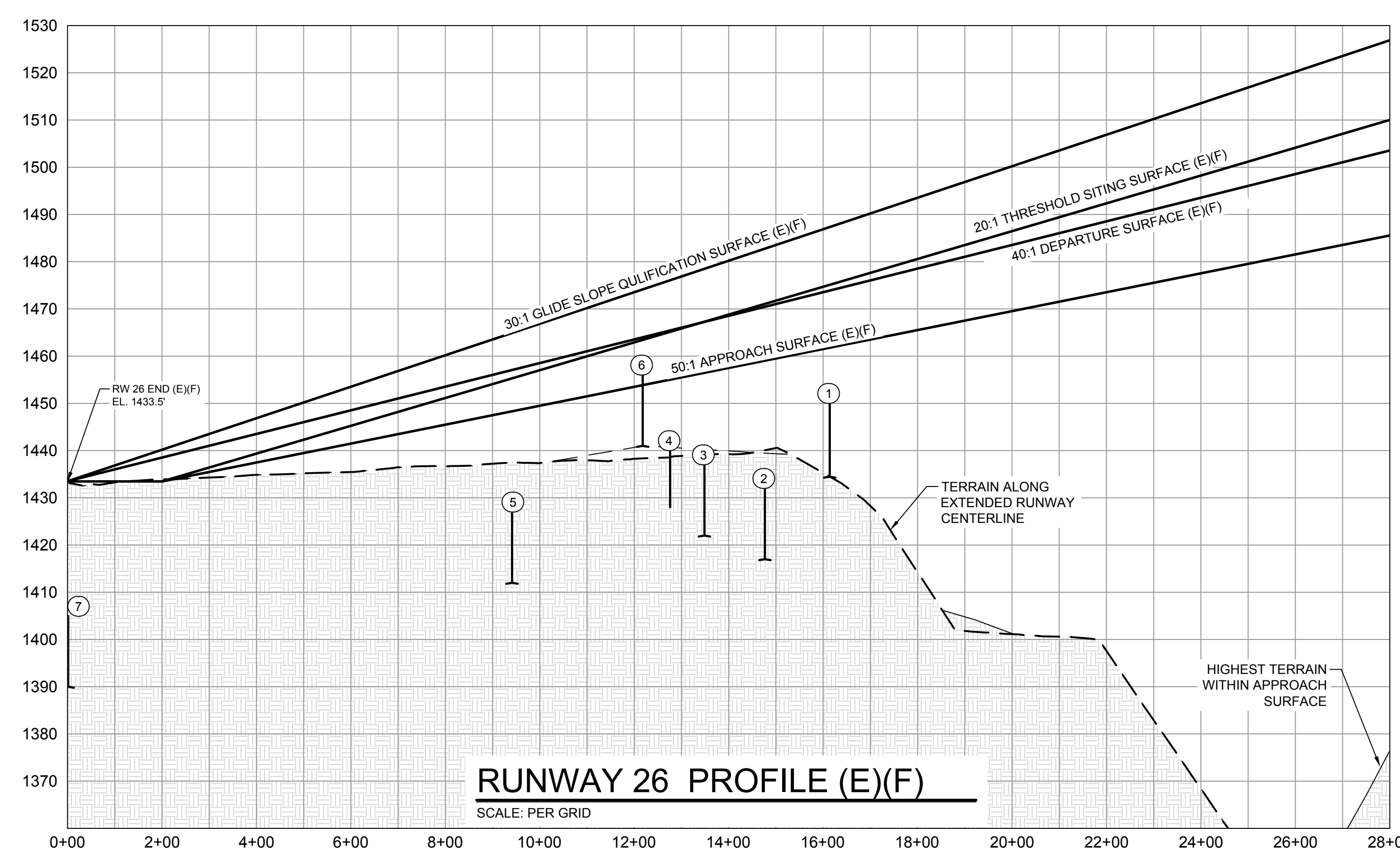
NOTES:

1. APPROACH SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.
2. LESS THAN 35' LOW, CLOSE-IN DEPARTURE SURFACE PENETRATIONS: ADD NOTE TO DEPARTURE PROCEDURE OR LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.



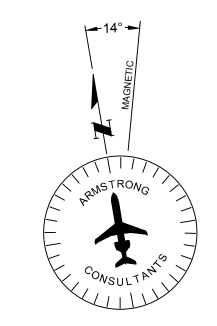
RUNWAY 26 PLAN (E)(F)

SCALE: PER BARSCALE



RUNWAY 26 PROFILE (E)(F)

SCALE: PER GRID



SCALE IN FEET

CONTOUR INTERVAL 10'

LEGEND					
EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE/ULTIMATE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			AIRPORT BEACON
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			WIND CONE & SEGMENTED CIRCLE
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ASOS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			LIGHTED WINDCONE
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)		N/A	SECTION CORNER
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			DRAINAGE / WATER EDGE
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)	4125 4125	N/A	CONTOURS
APRC(E)	APRC(F)	APPROACH SURFACE			ROADS
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE			MARKINGS
DPRT(E)	DPRT(F)	DEPARTURE SURFACE			FENCING
GQS(E)	GQS(F)	GLIDE SLOPE QUAL. SURFACE (GQS)		N/A	LOCALIZER CRITICAL AREA
RVZ(E)	RVZ(F)	RUNWAY VISIBILITY ZONE (RVZ)			CULVERT
N/A		TO BE REMOVED			AIRPORT REFERENCE POINT (ARP)
	N/A	UTILITY POLE / LIGHT POLE		N/A	PACS/SACS MONUMENT
		PARCEL LINES		N/A	GLIDE SLOPE CRITICAL AREA
			NOTE: SOME LINES AND SYMBOLS MAY NOT BE PRESENT ON DRAWING		

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LEWISTON, IDAHO

A.I.P. No. 3-16-022-034-2014
AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
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0	136159	01/2016	ORIGINAL ISSUE	6159505	JOS	JMR	DAC

RUNWAY 26 INNER APPROACH DRAWING(E)(F)

OBJECTS WITHIN RUNWAY 26 DEPARTURE SURFACE (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	30:1 GQS PEN.	20:1 TSS PEN.	50:1 APRC PEN.	40:1 DPRT PEN.	REMARKS	YEAR OF MITIGATION
1	ROAD	15'	1450'	-37'	-25'	-11'	-23'	*	NONE
5	ROAD	15'	1427'	-	-	-	-30'	*	NONE
6	ROAD	15'	1456'	-	-	-	-8'	**	NONE
7	ROAD	15'	1405'	-	-	-	-28'	*	NONE

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).

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● = OBJECT PENETRATION LOCATION

EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

** OBJECT INFORMATION WAS DETERMINED USING AERONAUTICAL SURVEY INFORMATION FROM WOOLPERT INC. PUBLISHED IN THE FAA THIRD PARTY SURVEY SYSTEM, DATED JANUARY 14, 2014

NOTES:

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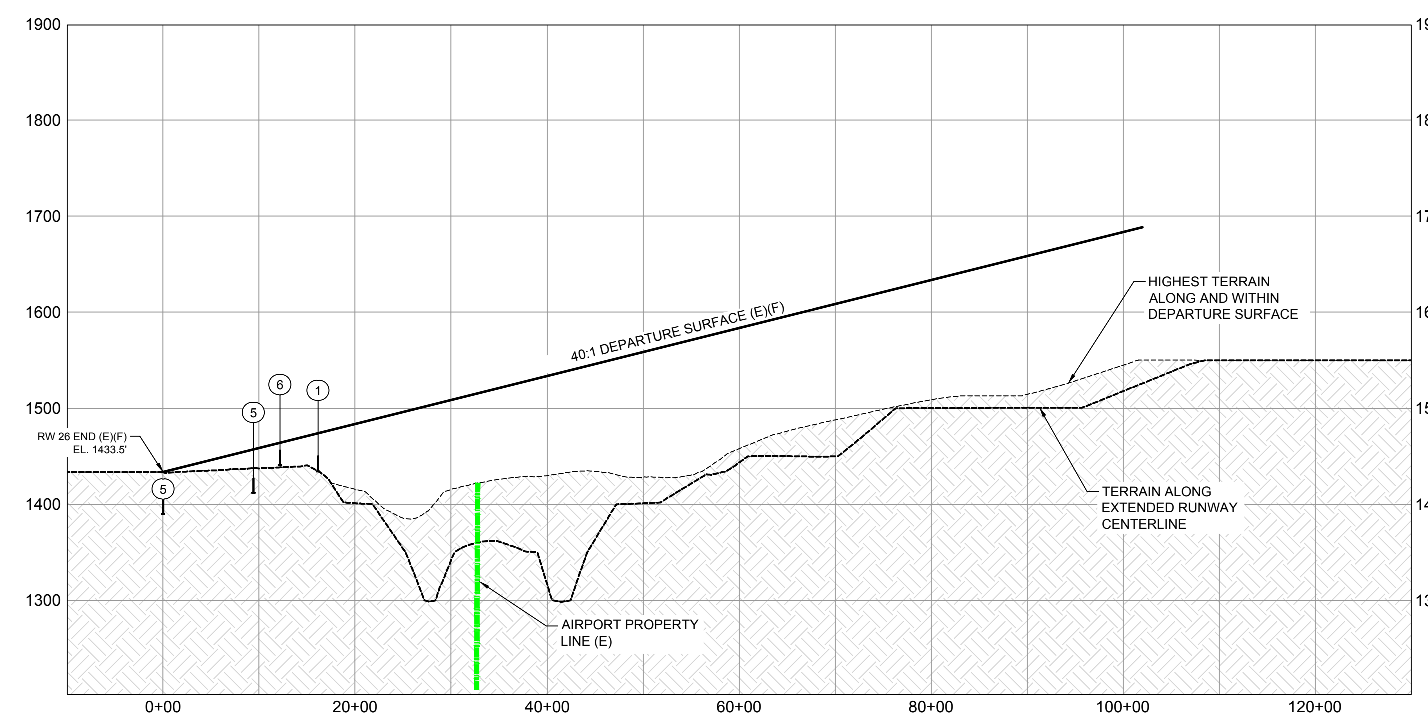
2. LESS THAN 35' LOW, CLOSE-IN DEPARTURE SURFACE PENETRATIONS: ADD NOTE TO DEPARTURE PROCEDURE OR LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.

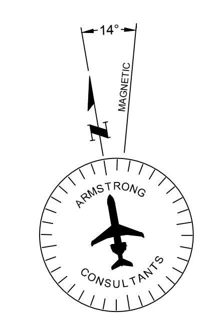
RUNWAY 26 DEPARTURE PLAN (E)(F)

SCALE: PER BARSCALE



RUNWAY 26 DEPARTURE PROFILE (E)(F)

SCALE: PER GRID



SCALE IN FEET

CONTOUR INTERVAL 10'

LEGEND

EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE/ULTIMATE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			AIRPORT BEACON
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			WIND CONE & SEGMENTED CIRCLE
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ASOS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			LIGHTED WINDCONE
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)		N/A	SECTION CORNER
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			DRAINAGE / WATER EDGE
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)	4125 4125	N/A	CONTOURS
APRC(E)	APRC(F)	APPROACH SURFACE			ROADS
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE			MARKINGS
DPRT(E)	DPRT(F)	DEPARTURE SURFACE			FENCING
GQS(E)	GQS(F)	GLIDE SLOPE QUAL. SURFACE (GQS)		N/A	LOCALIZER CRITICAL AREA
RVZ(E)	RVZ(F)	RUNWAY VISIBILITY ZONE (RVZ)			CULVERT
N/A		TO BE REMOVED			AIRPORT REFERENCE POINT (ARP)
	N/A	UTILITY POLE / LIGHT POLE		N/A	PACS/SACS MONUMENT
		PARCEL LINES		N/A	GLIDE SLOPE CRITICAL AREA
			NOTE: SOME LINES AND SYMBOLS MAY NOT BE PRESENT ON DRAWING		

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LEWISTON-NEZ PERCE COUNTY AIRPORT

LEWISTON, IDAHO

A.I.P. No. 3-16-022-034-2014

AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
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0	136159	01/2016	ORIGINAL ISSUE	6159505	JOS	JMR	DAC

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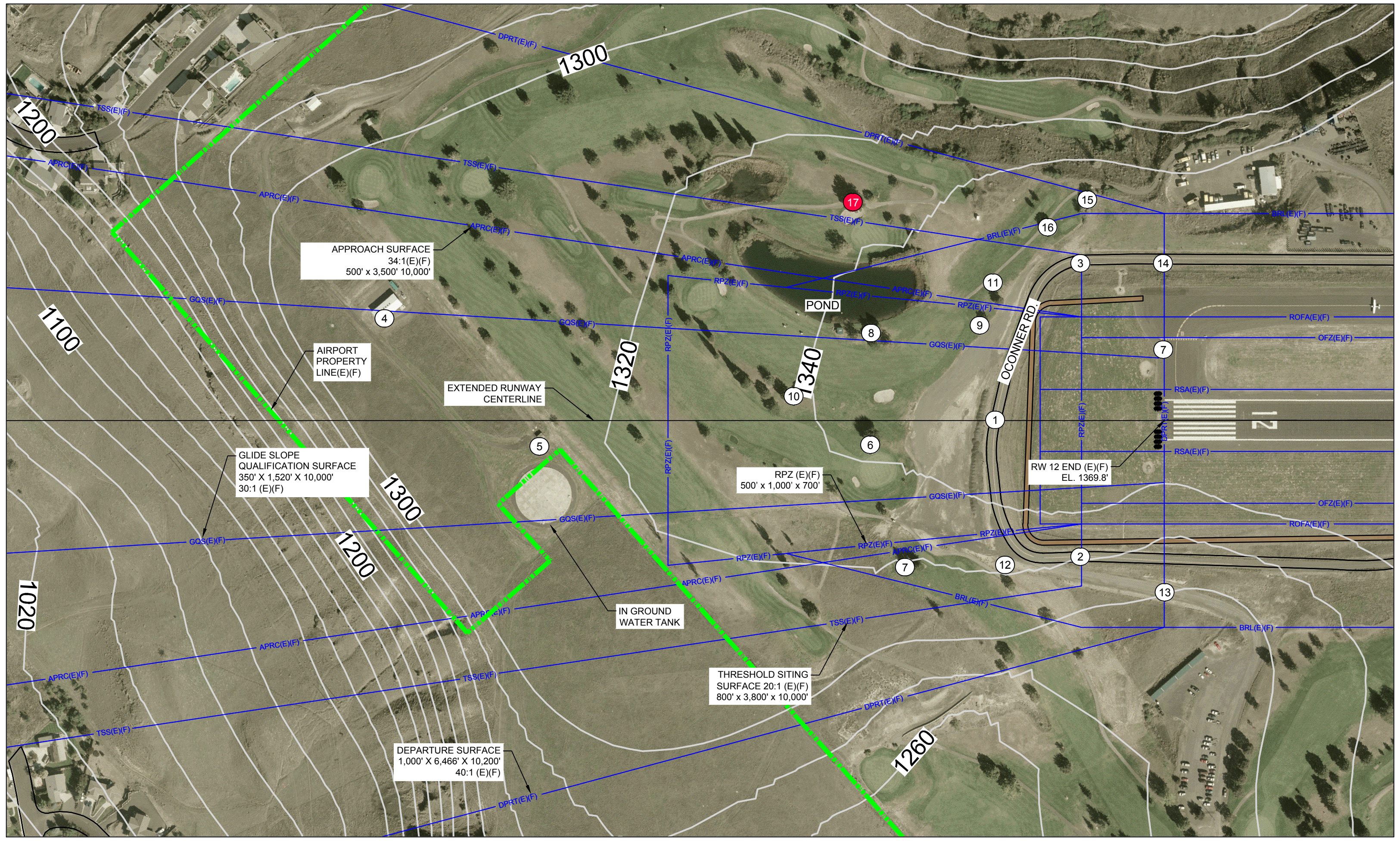
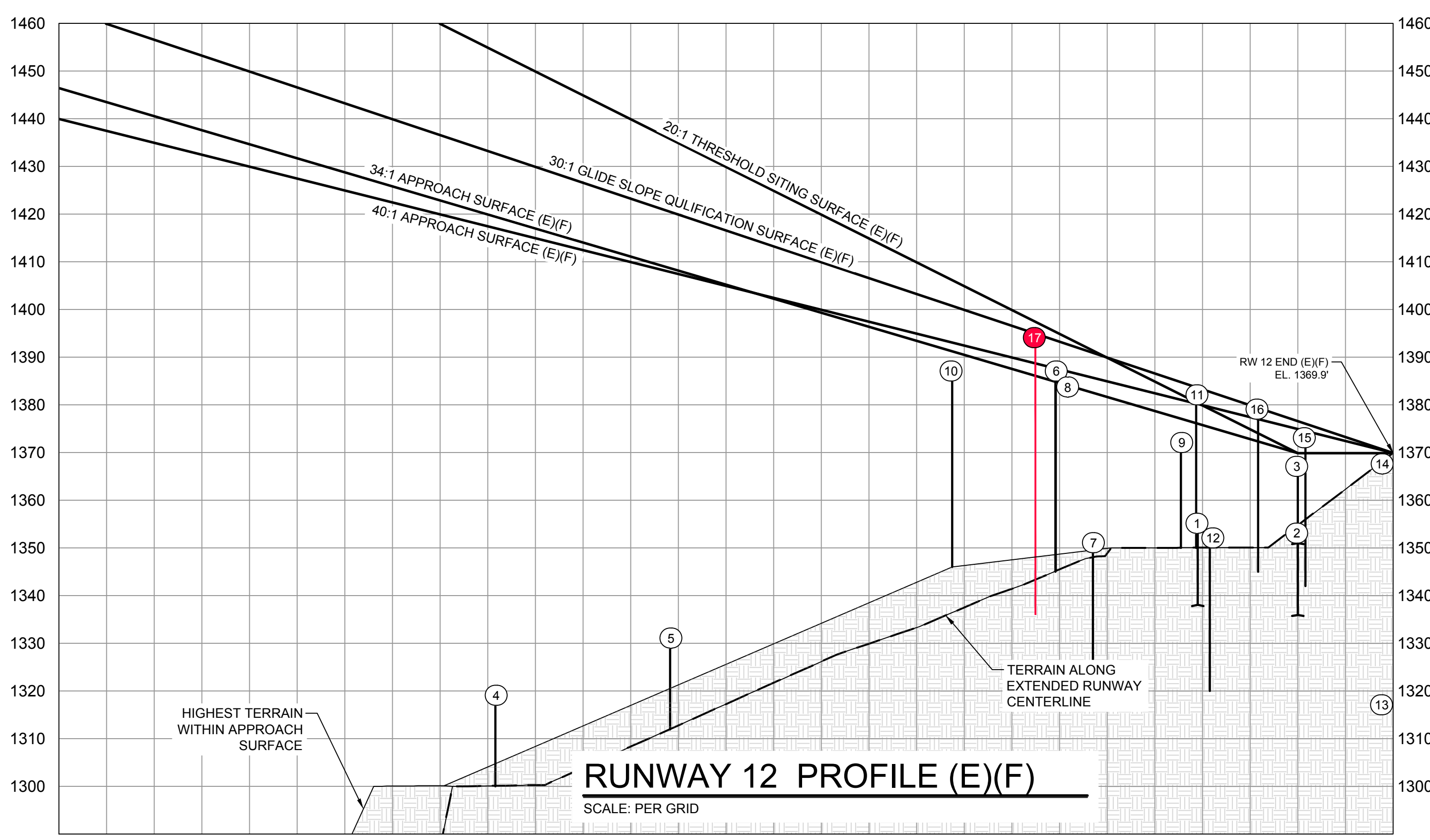
RUNWAY 26 DEPARTURE DRAWING(E)(F)



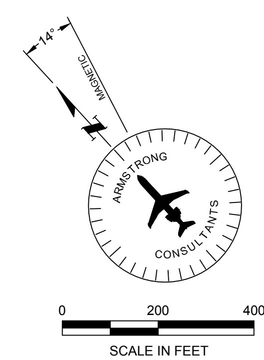
RUNWAY 12 PLAN (E)(F)

SCALE: PER BARSCALE



RUNWAY 12 PROFILE (E)(F)

SCALE: PER GRID



SCALE IN FEET

CONTOUR INTERVAL 10'

OBJECTS WITHIN RUNWAY 12 GLIDE SLOPE QUALIFICATION, APPROACH, THRESHOLD SITING AND DEPARTURE SURFACES (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	30:1 GQS PEN.	20:1 TSS PEN.	34:1 APRC PEN.	40:1 DPRT PEN.	REMARKS	YEAR OF MITIGATION
1	ROAD	15'	1353'	-30'	-27'	-23'	-27'	**	NONE
2	ROAD	15'	1351'	-	-18'	-	-23'	**	NONE
3	ROAD	15'	1365'	-	-5'	-	-9'	**	NONE
4	BUILDING	17'	1317'	-115'	-137'	-102'	-100'	*	NONE
5	BUILDING	17'	1330'	-91'	-106'	-79'	-78'	*	NONE
6	TREE	40'	1385'	-8'	-10'	0'	-2'	*	NONE
7	TREE	30'	1349'	-	-42'	-	-36'	*	NONE
8	TREE GROUP	40'	1384'	-9'	-11'	-1'	-3'	**	NONE
9	TREE	20'	1370'	-	-12.1	-7'	-11'	*	NONE
10	TREE GROUP	39'	1385'	-15'	-21'	-6'	-8'	**	NONE
11	TREE	30'	1380'	-	-3'	-	0'	*	NONE
12	TREE	30'	1350'	-	-32'	-	2'	*	NONE
13	ROAD	15'	1315'	-	-	-	-54'	*	NONE
14	ROAD	15'	1367'	-	-	-	-2'	**	NONE
15	TREE	29'	1371'	-	-	-	-3'	**	NONE
16	TREE	32'	1377'	-	-	-	0'	**	NONE
17	TREE	56'	1392'	-	-	-	3'	**	2020

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NOTES:

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LEGEND

EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE/ULTIMATE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			AIRPORT BEACON
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			WIND CONE & SEGMENTED CIRCLE
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ASOS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			LIGHTED WINDCONE
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)		N/A	SECTION CORNER
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			DRAINAGE / WATER EDGE
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)	4125 4125	N/A	CONTOURS
APRC(E)	APRC(F)	APPROACH SURFACE			ROADS
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE			MARKINGS
DPRT(E)	DPRT(F)	DEPARTURE SURFACE			FENCING
GQS(E)	GQS(F)	GLIDE SLOPE QUAL. SURFACE (GQS)		N/A	LOCALIZER CRITICAL AREA
RVZ(E)	RVZ(F)	RUNWAY VISIBILITY ZONE (RVZ)			CULVERT
N/A		TO BE REMOVED			AIRPORT REFERENCE POINT (ARP)
	N/A	UTILITY POLE / LIGHT POLE		N/A	PACS/SACS MONUMENT
		PARCEL LINES		N/A	GLIDE SLOPE CRITICAL AREA
			NOTE: SOME LINES AND SYMBOLS MAY NOT BE PRESENT ON DRAWING		

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LEWISTON, IDAHO

A.I.P. No. 3-16-022-034-2014
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0	136159	01/2016	ORIGINAL ISSUE	6159505	JOS	JMR	DAC

RUNWAY 12 INNER APPROACH DRAWING(E)(F)

OBJECTS WITHIN RUNWAY 30 GLIDE SLOPE QUALIFICATION, APPROACH, THRESHOLD SITING AND DEPARTURE SURFACES (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	30:1 GQS PEN.	20:1 TSS PEN.	34:1 APRC PEN.	40:1 DPRT PEN.	REMARKS	YEAR OF MITIGATION
1	ROAD	15'	1391'	-	-87'	-	-73'	*	NONE
2	ROAD	15'	1372'	-	-109'	-93'	-94'	*	NONE
3	ROAD	15'	1365'	115'	-124'	-105'	-105'	*	NONE
4	ROAD	15'	1397'	-96'	-111'	-84'	-83'	*	NONE
5	ROAD INTERSECTION	15'	1419'	-	-128'	-85'	-80'	*	NONE
6	ROAD	15'	1404'	-	-	-	-58'	*	NONE
7	POLE	60'	1462'	-55'	-83'	-40'	-36'	**	NONE

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
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- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
● = OBJECT PENETRATION LOCATION

EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

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NOTES:

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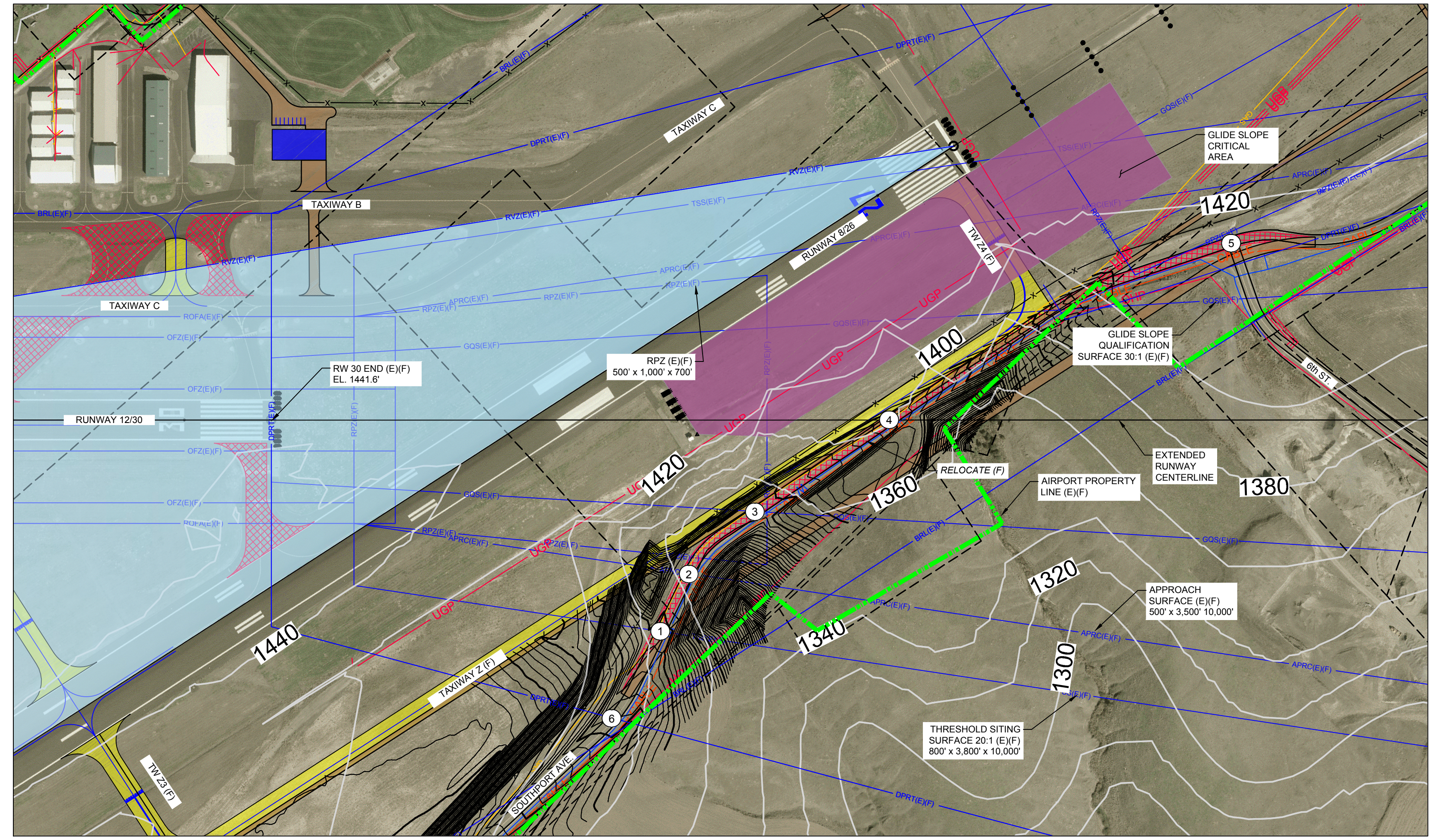
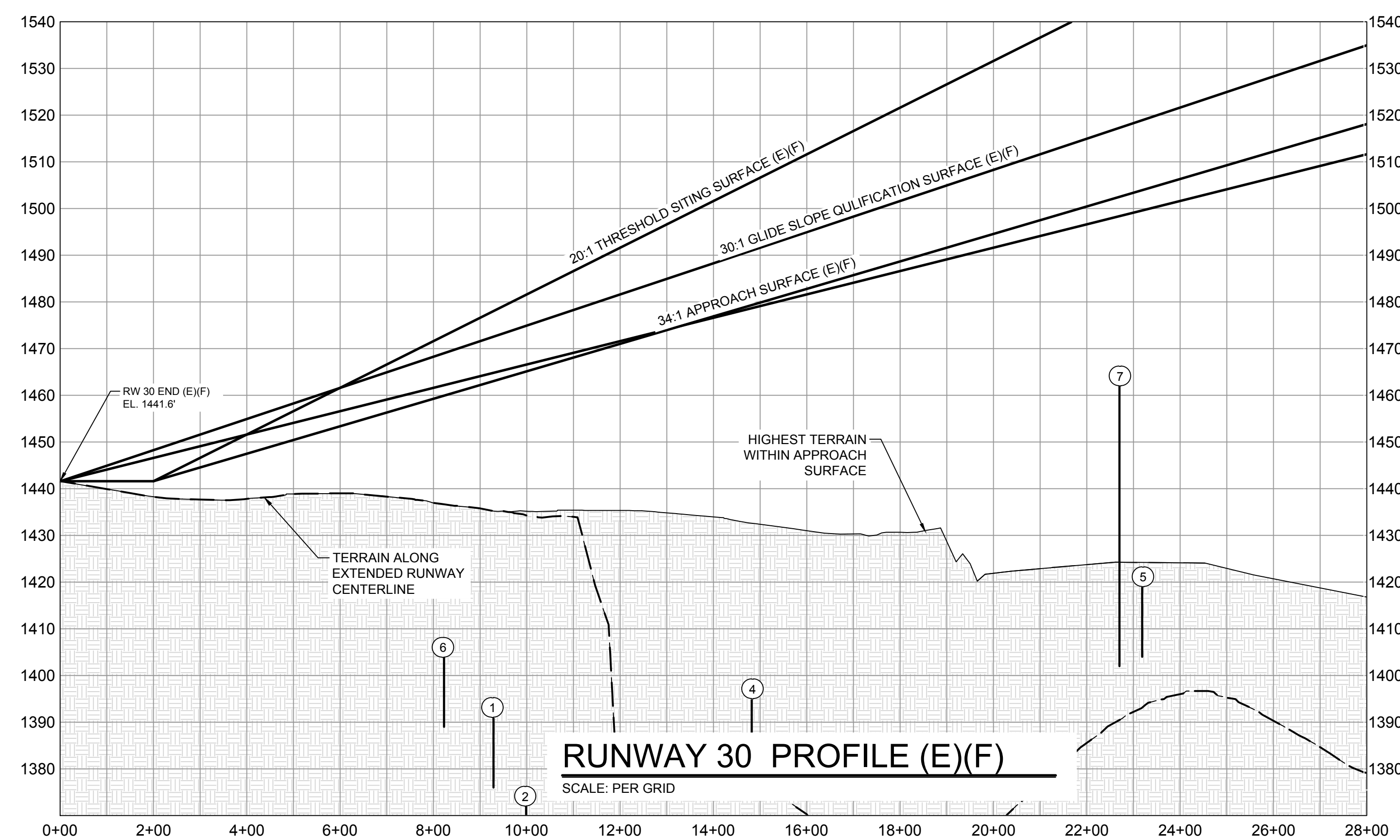
2. LESS THAN 35' LOW, CLOSE-IN DEPARTURE SURFACE PENETRATIONS: ADD NOTE TO DEPARTURE PROCEDURE OR LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.



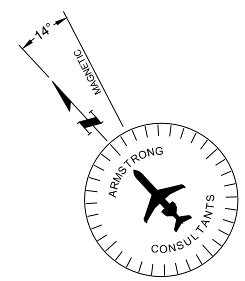
RUNWAY 30 PLAN (E)(F)

SCALE: PER BARSCALE



RUNWAY 30 PROFILE (E)(F)

SCALE: PER GRID



0 200 400

SCALE IN FEET

CONTOUR INTERVAL 10'

LEGEND

EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE/ULTIMATE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			AIRPORT BEACON
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			WIND CONE & SEGMENTED CIRCLE
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ASOS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			LIGHTED WINDCONE
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)		N/A	SECTION CORNER
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			DRAINAGE / WATER EDGE
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)	4125	N/A	CONTOURS
APRC(E)	APRC(F)	APPROACH SURFACE			ROADS
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE			MARKINGS
DPRT(E)	DPRT(F)	DEPARTURE SURFACE			FENCING
GQS(E)	GQS(F)	GLIDE SLOPE QUAL. SURFACE (GQS)		N/A	LOCALIZER CRITICAL AREA
RVZ(E)	RVZ(F)	RUNWAY VISIBILITY ZONE (RVZ)			CULVERT
N/A		TO BE REMOVED			AIRPORT REFERENCE POINT (ARP)
	N/A	UTILITY POLE / LIGHT POLE		N/A	PACS/SACS MONUMENT
		PARCEL LINES		N/A	GLIDE SLOPE CRITICAL AREA
			NOTE: SOME LINES AND SYMBOLS MAY NOT BE PRESENT ON DRAWING		

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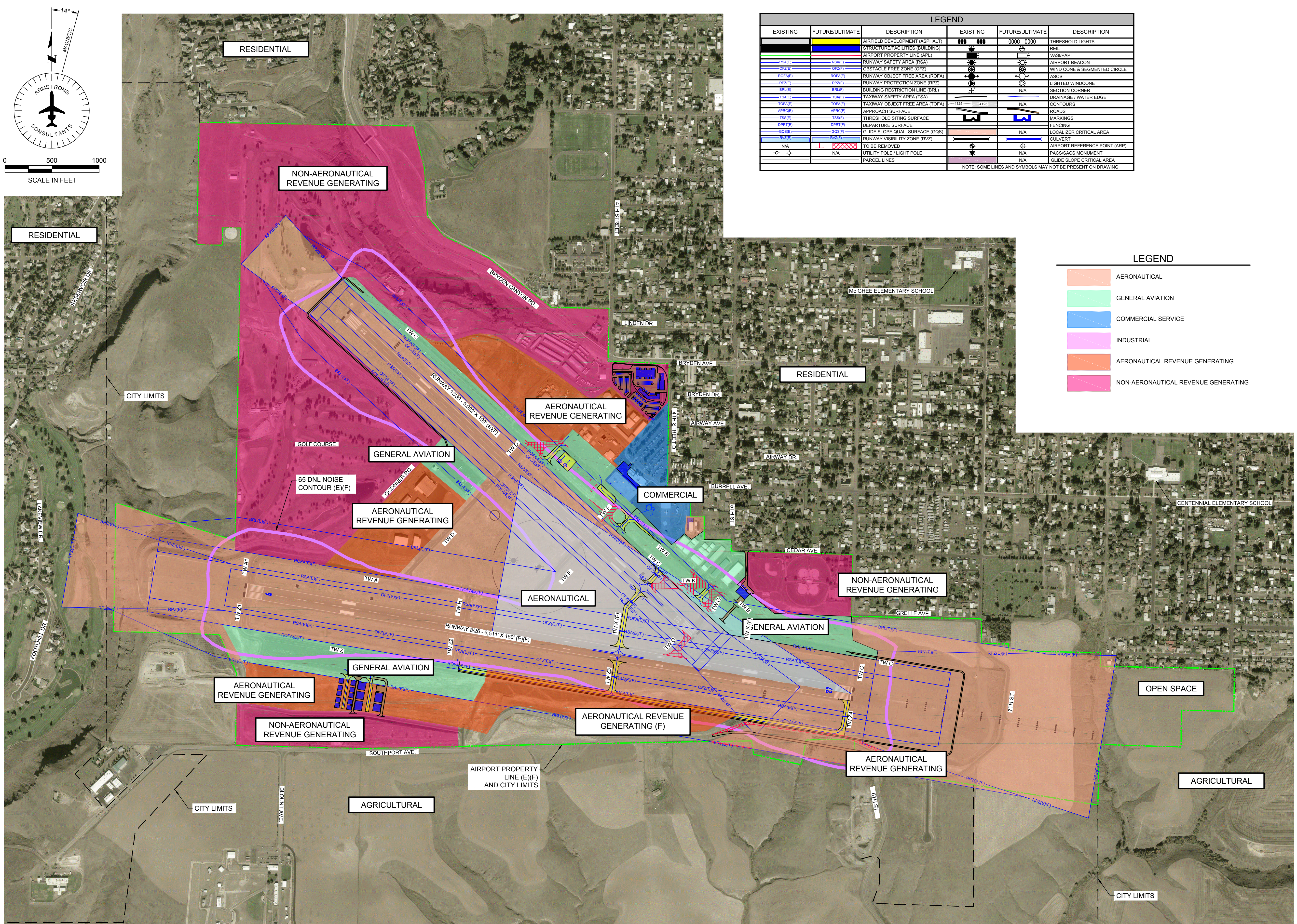
LEWISTON-NEZ PERCE COUNTY AIRPORT
LEWISTON, IDAHO

A.I.P. No. 3-16-022-034-2014
AIRPORT LAYOUT PLANS

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2							
1							
0	136159	01/2016	ORIGINAL ISSUE	6159505	JOS	JMR	DAC

RUNWAY 30 INNER APPROACH DRAWING(E)(F)



LEGEND					
EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE/ULTIMATE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			AIRPORT BEACON
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			WIND CONE & SEGMENTED CIRCLE
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ASOS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			LIGHTED WINDCONE
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)		N/A	SECTION CORNER
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			DRAINAGE / WATER EDGE
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)	4125 4125	N/A	CONTOURS
APRC(E)	APRC(F)	APPROACH SURFACE			ROADS
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE			MARKINGS
DPRT(E)	DPRT(F)	DEPARTURE SURFACE			FENCING
GQS(E)	GQS(F)	GLIDE SLOPE QUAL. SURFACE (GQS)		N/A	LOCALIZER CRITICAL AREA
RVZ(E)	RVZ(F)	RUNWAY VISIBILITY ZONE (RVZ)			CULVERT
N/A		TO BE REMOVED			AIRPORT REFERENCE POINT (ARP)
	N/A	UTILITY POLE / LIGHT POLE		N/A	PACS/SACS MONUMENT
		PARCEL LINES		N/A	GLIDE SLOPE CRITICAL AREA
			NOTE: SOME LINES AND SYMBOLS MAY NOT BE PRESENT ON DRAWING		

LEGEND

- AERONAUTICAL
- GENERAL AVIATION
- COMMERCIAL SERVICE
- INDUSTRIAL
- AERONAUTICAL REVENUE GENERATING
- NON-AERONAUTICAL REVENUE GENERATING

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LEWISTON, IDAHO

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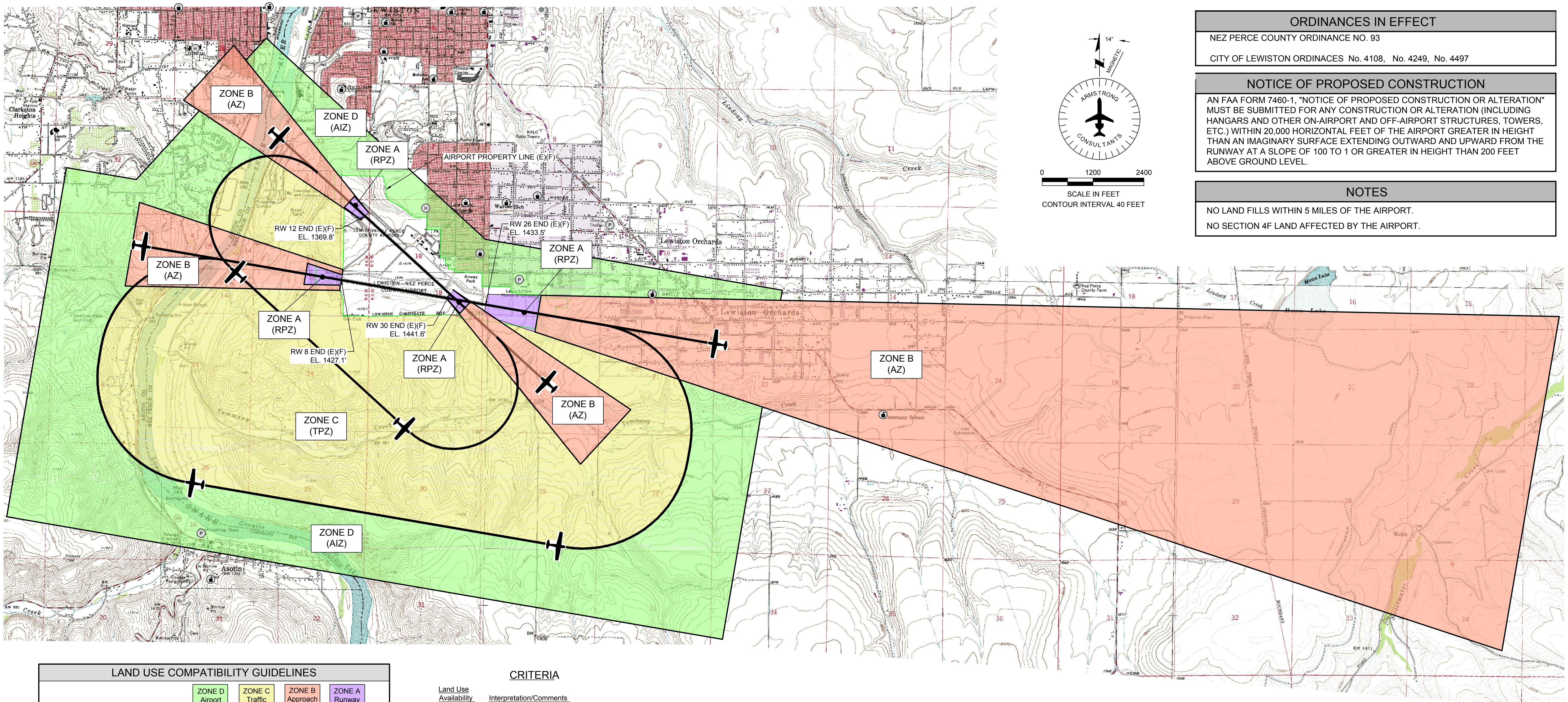
ON AIRPORT LAND USE



ORDINANCES IN EFFECT

NEZ PERCE COUNTY ORDINANCE NO. 93

CITY OF LEWISTON ORDINACES No. 4108, No. 4249, No. 4497

NOTICE OF PROPOSED CONSTRUCTION

AN FAA FORM 7460-1, "NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION" MUST BE SUBMITTED FOR ANY CONSTRUCTION OR ALTERATION (INCLUDING HANGARS AND OTHER ON-AIRPORT AND OFF-AIRPORT STRUCTURES, TOWERS, ETC.) WITHIN 20,000 HORIZONTAL FEET OF THE AIRPORT GREATER IN HEIGHT THAN AN IMAGINARY SURFACE EXTENDING OUTWARD AND UPWARD FROM THE RUNWAY AT A SLOPE OF 100 TO 1 OR GREATER IN HEIGHT THAN 200 FEET ABOVE GROUND LEVEL.

NOTES

NO LAND FILLS WITHIN 5 MILES OF THE AIRPORT.

NO SECTION 4F LAND AFFECTED BY THE AIRPORT.

LAND USE COMPATIBILITY GUIDELINES

Land Use Category	ZONE D Airport Influence (AIZ)	ZONE C Traffic Pattern (TPZ)	ZONE B Approach (AZ)	ZONE A Runway Protection (RPZ)
Residential				
single-family, nursing homes, mobile homes, multi-family, apartments, condominiums	+	o (3)	- (1,3)	- -
transient lodging, hotel, motel	+	o (3)	- (1,3)	- -
Public				
schools, libraries, hospitals	+	o (3)	- (3)	- -
churches, auditoriums, concert halls	+	o (3)	- (3)	- -
transportation, parking, cemeteries	++	++	++	- (2,5)
Commercial and Industrial				
offices, retail trade, service commercial, wholesale trade, warehousing, light industrial, general manufacturing, utilities, extractive industry	++	+	o (3)	- -
Agricultural and Recreational				
cropland	++	++	++	++
livestock breeding	++	++	++	- (2)
parks, playgrounds, zoos, golf courses, riding stables, water recreation	++	++	++	- (2)
outdoor spectator sports	++	+	- (3)	- -
amphitheaters	o	- (4)	- -	- -
open space	++	++	++	++

NOTE: DEVELOPMENT PROJECTS WHICH ARE WILDLIFE ATTRACTANT, INCLUDING SEWERAGE PONDS AND LANDFILLS, WITHIN 10,000 FEET OF THE AIRPORT ARE UNACCEPTABLE. (REF.: FAA AC 150/5200-33)

(1) If allowed, avigation easements and disclosure must be required as a condition of development.
(2) Any structures associated with uses allowed in the RPZ must be located outside the RPZ.
(3) If no reasonable alternative exists, use should be located as far from extended centerline as possible.
(4) If no reasonable alternative exists, use should be located as far from extended runway centerline and traffic patterns as possible.
(5) Transportation facilities in the RPZ (i.e. roads, railroads, waterways) must be configured to comply with Part 77 requirements.

CRITERIA

Land Use Availability	Interpretation/Comments
++ Clearly Acceptable	The activities associated with the specified land use will experience little or no impact due to airport operations. Disclosure of airport proximity should be required as a condition of development.
+ Normally Acceptable	The specified land use is acceptable in this zone or area. Impact may be perceived by some residents. Disclosure of airport proximity should be required as a condition of development. Dedication of avigation easements may also be advisable.
o Conditionally Acceptable	If appropriate disclosure avigation easements and density limitations are put in place, residential uses and uses involving indoor public assemblies are acceptable.
- Normally Unacceptable	Specified use should be allowed only if no reasonable alternative exists. Proposed location, density and clustering should be considered. Disclosure of airport proximity and avigation easements must be required as a condition of development.
- - Clearly Unacceptable	Specified use must not be allowed. Potential safety or overflight nuisance impacts are likely in this area.

RUNWAYS PLAN (E)(F)

SCALE: PER BARSCALE

LEGEND

RUNWAY PROTECTION ZONE (RPZ) AS DIMENSIONED ON SHEET 2 OF AIRPORT LAYOUT PLAN.

APPROACH SURFACE AS DESCRIBED ON THE 14 CRF PART 77 AIRSPACE DRAWING OF THE AIRPORT LAYOUT PLAN.

EXISTING AIRPORT PROPERTY LINE

CHURCH H HOSPITAL SCHOOL P PARK

TYPICAL TRAFFIC PATTERN DIRECTION AND FLIGHT TRACK AREA.

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LEWISTON-NEZ PERCE COUNTY
REGIONAL AIRPORT
LEWISTON, IDAHO
A.I.P. No. 3-16-022-034-2014
AIRPORT LAYOUT PLANS

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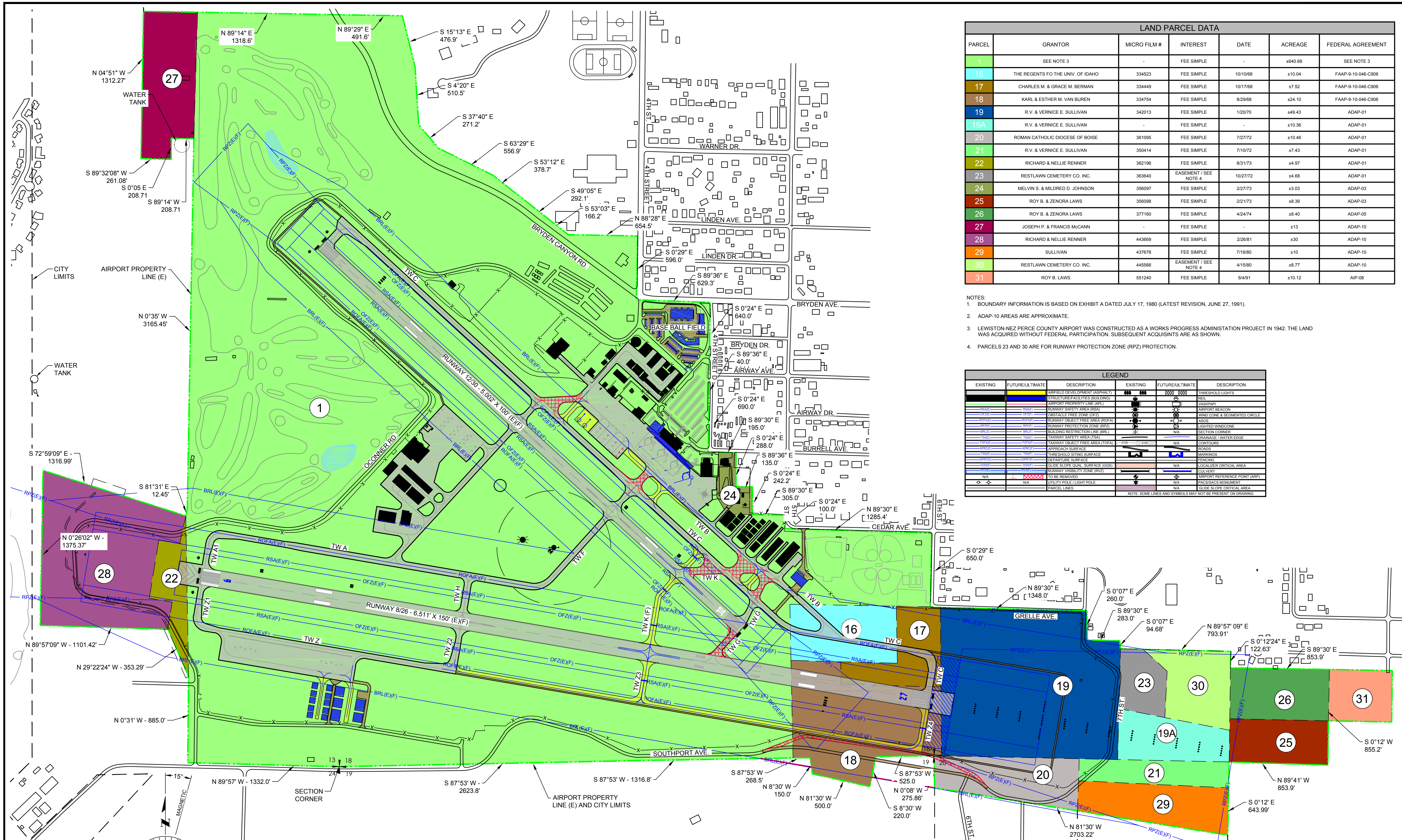
Project No: 136159
Date: 01/2016
File Name: 6159507

Drawn: JOS
Checked: JMR
Approved: DAC

OFF AIRPORT LAND USE



LAND PARCEL DATA						
PARCEL	GRANTOR	MICRO FILM #	INTEREST	DATE	ACREAGE	FEDERAL AGREEMENT
1	SEE NOTE 3	-	FEE SIMPLE	-	±640.69	SEE NOTE 3
16	THE REGENTS FO THE UNIV. OF IDAHO	334523	FEE SIMPLE	10/10/68	±10.04	FAAP-9-10-046-C906
17	CHARLES M. & GRACE M. BERMAN	334449	FEE SIMPLE	10/17/68	±7.52	FAAP-9-10-046-C906
18	KARL & ESTHER M. VAN BUREN	334754	FEE SIMPLE	8/29/68	±24.10	FAAP-9-10-046-C906
19	R.V. & VERNICE E. SULLIVAN	342013	FEE SIMPLE	1/20/70	±49.43	ADAP-01
19A	R.V. & VERNICE E. SULLIVAN	-	FEE SIMPLE	-	±10.36	ADAP-01
20	ROMAN CATHOLIC DIOCESE OF BOISE	361095	FEE SIMPLE	7/27/72	±10.46	ADAP-01
21	R.V. & VERNICE E. SULLIVAN	350414	FEE SIMPLE	7/10/72	±7.43	ADAP-01
22	RICHARD & NELLIE RENNER	362196	FEE SIMPLE	8/31/73	±4.97	ADAP-01
23	RESTLAWN CEMETERY CO. INC.	363640	EASEMENT / SEE NOTE 4	10/27/72	±4.68	ADAP-01
24	MELVIN S. & MILDRED D. JOHNSON	356097	FEE SIMPLE	2/27/73	±3.03	ADAP-03
25	ROY B. & ZENORA LAWS	356098	FEE SIMPLE	2/21/73	±8.39	ADAP-03
26	ROY B. & ZENORA LAWS	377160	FEE SIMPLE	4/24/74	±8.40	ADAP-05
27	JOSEPH P. & FRANCIS McCANN	-	FEE SIMPLE	-	±13	ADAP-10
28	RICHARD & NELLIE RENNER	443669	FEE SIMPLE	2/26/81	±30	ADAP-10
29	SULLIVAN	437678	FEE SIMPLE	7/16/80	±10	ADAP-10
30	RESTLAWN CEMETERY CO. INC.	445566	EASEMENT / SEE NOTE 4	4/15/80	±8.77	ADAP-10
31	ROY B. LAWS	551240	FEE SIMPLE	6/4/91	±10.12	AIP-08

NOTES:

1. BOUNDARY INFORMATION IS BASED ON EXHIBIT A DATED JULY 17, 1980 (LATEST REVISION, JUNE 27, 1991).
2. ADAP-10 AREAS ARE APPROXIMATE.
3. LEWISTON-NEZ PERCE COUNTY AIRPORT WAS CONSTRUCTED AS A WORKS PROGRESS ADMINISTATION PROJECT IN 1942. THE LAND WAS ACQUIRED WITHOUT FEDERAL PARTICIPATION. SUBSEQUENT ACQUISINTS ARE AS SHOWN.
4. PARCELS 23 AND 30 ARE FOR RUNWAY PROTECTION ZONE (RPZ) PROTECTION.

LEGEND					
EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE/ULTIMATE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			AIRPORT BEACON
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			WIND CONE & SEGMENTED CIRCLE
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ASOS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			LIGHTED WINDCONE
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)		N/A	SECTION CORNER
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			DRAINAGE / WATER EDGE
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)	4125 4125	N/A	CONTOURS
APRC(E)	APRC(F)	APPROACH SURFACE			ROADS
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE			MARKINGS
DPRT(E)	DPRT(F)	DEPARTURE SURFACE			FENCING
GQS(E)	GQS(F)	GLIDE SLOPE QUAL. SURFACE (GQS)		N/A	LOCALIZER CRITICAL AREA
RVZ(E)	RVZ(F)	RUNWAY VISIBILITY ZONE (RVZ)			CULVERT
N/A		TO BE REMOVED			AIRPORT REFERENCE POINT (ARP)
	N/A	UTILITY POLE / LIGHT POLE		N/A	PACS/SACS MONUMENT
		PARCEL LINES		N/A	GLIDE SLOPE CRITICAL AREA
			NOTE: SOME LINES AND SYMBOLS MAY NOT BE PRESENT ON DRAWING		

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LEWISTON-NEZ PERCE COUNTY
REGIONAL AIRPORT
LEWISTON, IDAHO

AIRPORT LAYOUT PLANS

ARMSTRONG
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Project No: 136159
Date: 01/2016
File Name: 6159502

Drawn: JOS
Checked: JMR
Approved: DAC

EXHIBIT A
PROPERTY
MAP

14°

MAGNETIC

N

ARMSTRONG CONSULTANTS

0 400 800

SCALE IN FEET

PHOTOGRAPHY DATE: 2014

WOOLPERT INC.

ARMSTRONG

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LEWISTON-NEZ PERCE COUNTY AIRPORT

LEWISTON, IDAHO

A.I.P. No. 3-16-022-034-2014

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AERIAL PHOTOGRAPH

Sheet: 20 of: 20

CHAPTER SIX

ENVIRONMENTAL OVERVIEW

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN

CHAPTER SIX
ENVIRONMENTAL OVERVIEW

6.1 Introduction

This section examines the potential environmental impacts associated with the proposed airport improvements. It is intended to provide an overview of the potential impacts and identify additional environmental documentation that may be required as a prerequisite to development.

6.2 Air Quality

Air quality has become a major component of pollution control in the last 40 to 50 years. The passing of the Clean Air Act (CAA) in 1970 marked the beginning of government regulation to monitor and ensure pollution is controlled to the maximum extent possible.

The Clean Air Act of 1970 was enacted to reduce emissions of specific pollutants via uniform Federal standards. These standards include the National Ambient Air Quality Standards (NAAQS) which set maximum allowable ambient concentrations of ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), lead (Pb) and particulate matter 10 microns or smaller (PM_{10}). Section 176(c) of the Act, in part, states that no Federal agency shall engage in, support in any way or provide financial assistance for, license or permit or approve any activity that does not conform to the State Implementation Plan.

Federal Aviation Administration Orders 5050.4B, 1050.1E and *the Aviation Emissions and Air Quality Handbook* require consideration of air quality for all improvement projects.

Construction emissions, specifically dust, are not a long-term factor. These emissions are described in the "Construction Impacts" section of this chapter. The necessary permits would be obtained before construction begins and construction projects would conform to FAA AC 150/5370-10, *Standards for Specifying Construction of Airports*.

The following Best Management Practices (BMP) are recommended to minimize construction emissions:

- Site Preparation
- Minimize land disturbance;
- Use watering trucks to minimize dust;
- Cover trucks when hauling dirt or debris;
- Stabilize the surface of dirt piles and any disturbed areas;
- Use windbreaks to prevent any accidental dust pollution; and
- Segregate storm water drainage from construction sites and material piles.
- Construction Phase
- Cover trucks when transferring materials; and
- Minimize unnecessary vehicular and machinery activities.

- Completion Phase
- Revegetate any disturbed land not used; and
- Remove unused material and dirt piles;

Temporary air pollution may occur as a result of the recommended development. The design and construction of the proposed improvements would incorporate BMP to reduce air quality impacts, including minimizing land disturbance, wetting down, using water trucks, dust suppressant, covering trucks when hauling soil and the use of wind breaks. These practices would be selected based on the site's characteristics. No significant air quality impacts are anticipated as a result of the proposed development.

The Airport is located within an attainment area. An attainment area is a zone within which the level of pollutant is considered to meet National Ambient Air Quality Standards. Air pollutants are emitted by a variety of means and sources: aircraft, ground support equipment (GSE), auxiliary power units, motor vehicle operations, and construction activities.

No significant impacts to air quality are anticipated as a result of the recommended development projects.

6.3 Coastal Resources

There are no coastal zones associated with the proposed development. Therefore, compliance with the Coastal Zone Management Act of 1972 and the Coastal Barriers Resources Act of 1982 is not a factor.

6.4 Compatible Land Use

Land use compatibility considerations include safety, height hazards and noise exposure. Although extremely rare, most aircraft accidents occur within 5,000 feet of a runway. Therefore, the ability of the pilot to bring the aircraft down in a manner that minimizes the severity of an accident is dependent upon the type of land uses within the vicinity of the airport. Land uses are reviewed in four zones surrounding the airport: the Runway Protection Zone (RPZ), the Approach Zone, Airport Influence Zone and the Traffic Pattern Zone. The RPZ is a trapezoidal area extending beyond the ends of the runway and is typically included within the airport property boundary. Residential and other uses that result in congregations of people are restricted from the RPZ. The Approach Zone generally falls within the Federal Aviation Regulation (FAR) Part 77 Approach Surface area. Within the Approach Zone, public land uses, such as schools, libraries, hospitals and churches should be avoided. New residential developments within the Approach Zone should include avigation easements and disclosure agreements. The Traffic Pattern Zone is generally the area within one mile of the airport. Within the Traffic Pattern Zone, avigation easements should be considered for residential and public uses within this area and disclosure statements should be required. The Airport Influence Zone is the area where aircraft are transitioning between cruise altitude and the standard traffic pattern altitude of 800 to 1,000 feet above airport elevation.

The airport is owned and operated by the Lewiston-Nez Perce County Regional Airport Authority. The airport is located within the City of Lewiston. The County currently has an Airport (A) land use zone to protect the airport from future incompatible development. The only developments allowed to occur within the Airport land use zone are those which directly benefit the airport. According to the Nez Perce County Zoning Ordinances, the purpose of the Airport land use zone is to "provide for uses, buildings, and structures in which airport or aviation facilities may be installed and used including taxiways and runways, commercial aviation, general aviation, terminal buildings, aircraft hangars, air navigational aids, related accessory uses and other uses, structures, and facilities as may be compatible with and useful to the airport." There is a 45 foot height restriction within the Airport zone to protect FAR Part 77 surfaces. The Nez Perce County Zoning Map is shown in **Figure 1-59**.

The Airport is surrounded to the north by Low Density Residential – Animal (R2A), Agriculture Transitional (F2), Planned Unit Development (PD) and Medium Residential (R3). To the east of the airport is additional R2A and F2 zoning. The western boundaries of the airport are in contact with non-zoned land and a F2 zone. The southern portion of the airport borders include F2 (Nez Perce County Zoning), and Light Industrial (M1). The land use surrounding the Lewiston-Nez Perce County Regional Airport is considered to be compatible with the planned airport development.

The recommended development would not have a significant impact with respect to compatible land uses, as long as appropriate disclosure, avigation easements and density limitations are reviewed. Therefore, no significant impacts to compatible land uses are anticipated as a result of the recommended development projects. Compatible Land Use and Height Restriction drawings are included as part of this Airport Layout Plan as a tool for the City and County to use in reviewing and evaluating the compatibility of proposed development in the vicinity of the Airport.

6.5 Construction Impacts

Local, State and Federal ordinances and regulations address the impacts of construction activities, including dust and noise from heavy equipment traffic, disposal of construction debris and air and water pollution.

Construction operations for the proposed development would cause specific impacts resulting solely from and limited exclusively to the construction period. Construction impacts are distinct in that they are temporary in duration and the degree of adverse impacts decreases as work is concluded. The following construction impacts can be expected:

A temporary increase in particulate and gaseous air pollution levels as a result of dust generated by construction activity and by vehicle emissions from equipment and worker's automobiles;

- Increases in solid and sanitary wastes from the workers at the site;
- Traffic volumes that would increase in the airport vicinity due to construction activity (workers arriving and departing, delivery of materials, etc.);
- Increase in noise levels at the airport during operation of heavy equipment; and
- Temporary erosion, scarring of land surfaces and loss of vegetation in areas that are excavated or otherwise disturbed to carry out future developments.

Construction projects would comply with guidelines set forth in FAA Advisory Circular 150/5370-10, Standards for Specifying the Construction of Airports. The contractor would obtain the required construction permits. The development of Storm Water Pollution Prevention and Fugitive Dust Control Plans for construction would also be required. These requirements would be specified in the contract documents for the construction of the proposed improvements.

No significant construction impacts are anticipated as a result of the recommended development.

6.6 DOT Act – Section 4(f)

Section 303c of Title 49, U.S.C., formerly Section 4(f) of DOT Act of 1966, provides that the Secretary of Transportation shall not approve any program or project that requires the use of any publicly owned land from a public park, recreation area or wildlife or waterfowl refuge of National, State or Local significance or land from an historic site of National, State or Local significance, as determined by the officials having jurisdiction thereof, unless there is no feasible and prudent alternative to the use of such land and such project includes all possible planning to minimize impacts. The proposed improvements would not require land from any public park, recreation area or wildlife or waterfowl refuge located off airport property.

As of August 2014, the City of Lewiston has plans to relocate Hathaway Field Baseball Park, located northeast of the passenger terminal building, to an alternate location in Lewiston unrelated to airport development. **Figure 4-15** depicts the proposed development. Once this relocation has occurred, the area would be suitable for the proposed airport improvements including parking and non-aeronautical development.

Therefore, no Section 4(f) impacts are anticipated as a result of the recommended development.

6.7 Farmlands

The Farmland Protection Policy Act (FPPA) authorizes the U.S. Department of Agriculture (USDA) to develop criteria for identifying the effects of Federal programs upon the conversion of farmland to uses other than agriculture. Conversion of “Prime or Unique” farmland may be considered a significant impact. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed or fiber without intolerable soil erosion as determined by the Secretary of Agriculture. Unique farmland is land other than prime farmland which is used to produce specific high value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits and vegetables.

Figure 1-62 shows the USDA farmland classification ratings for the airport and adjacent development area. The airport property is listed as Not Prime Farmland (shaded in red), Prime Farmland if Irrigated (shaded in yellow) and Farmland of Statewide Importance (shaded in blue). According to the Farmland Protection Policy Act, the regulation does not apply to land already committed to "urban development or water storage" (i.e. airport developed areas), regardless of its importance as defined by the National Resources Conservation Service (NRSC). Therefore, no impacts to prime or unique farmlands are anticipated as a result of the recommended development.

6.8 Fish, Wildlife and Plants

This category concerns potential impacts to existing wildlife habitat and threatened and endangered species. Examining both the area of land to be developed and its relationship to surrounding habitat quantify the significance of the impacts in this category. For example, removal of a few acres of habitat which represents a small percentage of the area's total similar habitat or which supports a limited variety of common species would not be considered significant. However, removal of a sizeable percentage of the area's similar habitat or habitat which is known to support rare species would be considered a significant impact. The surrounding area offers an abundance of similar habitat therefore the recommended development is not considered to be a significant habitat loss.

Section 7 of the Endangered Species Act, as amended, requires each Federal agency to insure that "any action authorized, funded or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat of such species . . .".

An Endangered Species is defined as any member of the animal or plant kingdoms determined to be in danger of extinction throughout all or a significant portion of its range. A Threatened Species is defined as any member of the plant or animal kingdoms that are likely to become endangered in the foreseeable future.

The following species are currently listed for Nez Perce County and Asotin County, but do not necessarily occur in the vicinity of the Lewiston-Nez Perce County Regional Airport or within the project areas.

<u>Threatened – Designated Critical Habitat</u>

- Bull Trout, *Salvelinus confluentus* (within Nez Perce County)

Threatened

- Canada Lynx, *Lynx canadensis*
- Spalding's Catchfly, *Silene spaldingii*
- Bull Trout, *Salvelinus confluentus* (within Asotin County)

Recovery

- Gray Wolf, *Canis lupus*

All species listed under the Endangered Species Act (ESA) for Nez Perce County, Idaho and Asotin County, Washington were evaluated for their potential to be present in the project area based on general geographic and elevation distribution, habitat requirements. **Table 6-1** lists each of the species and provides the biological basis for including or excluding each species from further evaluation of potential impacts from the project site.

Based on a review of the habitat requirements of the listed species, no listed species or their associated habitat is known to be present within the recommended development area. Therefore, no impacts to threatened or endangered species or their habitat is anticipated to occur as a result of the recommended development projects.

Table 6-1 Threatened, Endangered, and Candidate Species Potentially Occurring Within or Adjacent to the Project Area

Species	ESA Status	Habitat Requirements	Project-specific Inclusion/Exclusion Justification
Bull Trout (*Salvelinus confluentus*)	FT / FT - DCH	Cold-water habitats with stable stream channels, clean spawning and rearing gravel, complex and diverse cover, and unblocked migratory corridors	No habitat present in the project area
Canada Lynx (*Lynx canadensis*)	FT	Moist boreal forests that have cold, snowy winters and a high-density snowshoe hare prey base	No habitat present in the project area
Spalding's Catchfly (*Silene spaldingii*)	FT	Pacific Northwest bunchgrass grasslands and sagebrush-steppe, and occasionally in open-canopy pine stands	No habitat present in the project area
Gray Wolf (*Canis lupus*)	R	Temperate forests, mountains, tundra, taiga, and grasslands	Not known to occur within the project area

Source: U.S. Fish and Wildlife Service (USFWS), 2014
ESA = Endangered Species Act FT = Federally Threatened, DCH = Designated Critical Habitat, R = Recovery

6.9 Floodplains

Floodplains are defined by Executive Order 11988, Floodplain Management, as the lowland and relatively flat areas adjoining coastal water . . . including at a minimum, that area subject to a one percent or greater chance of flooding in any given year . . . "that is, an area which would be inundated by a 100-year flood. If the recommended development involves a 100-year floodplain, mitigating measures must be investigated in order to avoid significant changes to the drainage system.

As described in FAA Order 5050.4B, an airport development project would be a significant impact pursuant to NEPA if it results in notable adverse impacts on natural and beneficial floodplain values. Mitigation measures for base floodplain encroachments may include committing to special flood related design criteria, elevating facilities above base flood level, locating nonconforming structures and facilities out of the floodplain or minimizing fill placed in floodplains.

As stated in Chapter One, Federal Emergency Management Agency (FEMA) floodplain maps were not available for the airport property. Data for the surrounding areas show a Floodplain C which is of minimal flood hazard above the 500-year flood plan. Historical data shows there have been no flooding events at the airport. Based on the airport elevation and surrounding drainages no floodplains at the airport are known to exist. The airport is located approximately 732 feet above and one mile east of the Snake River. Therefore, the recommended development would not impact any floodplains.

6.10 Hazardous Materials, Pollution Prevention and Solid Waste

Four primary laws have been passed governing the handling and disposal of hazardous materials, chemicals, substances and wastes. The two statutes of most importance to the FAA in proposing actions to construct and operate facilities and navigational aids are the Resource Conservation and Recovery Act (RCRA) (as amended by the Federal Facilities Compliance Act of 1992) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA or Superfund) and the Community Environmental Response Facilitation Act of 1992. RCRA governs the generation, treatment, storage and disposal of hazardous wastes. CERCLA provides for consultation with natural resources trustees and cleanup of any release of a hazardous substance (excluding petroleum) into the environment.

Airport development actions that relate only to construction or expansion of runways, taxiways and related facilities do not normally include any direct relationship to solid waste collection, control or disposal other than that associated with the construction itself. The nature of the recommended development meets these criteria and would not significantly increase net waste output for the City of Lewiston.

Any existing and future solid waste disposal facility (i.e. sanitary landfill) which is located within 5,000 feet of all runways planned to be used by piston-powered aircraft or within 10,000 feet of all runways planned to be used by turbine aircraft, is considered by the FAA to be an incompatible land use because of the potential for conflicts between birds and low-flying aircraft. This determination is found in FAA Advisory Circular 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*. There are no existing solid waste disposal facilities within 10,000 feet of the airport. Any planned solid waste disposal facilities should be located at least

10,000 feet from the runway. The nearest solid waste disposal facility is located approximately four miles west of the Lewiston-Nez Perce County Regional Airport in Clarkston, Washington. There are no Superfund sites located on or adjacent to the Lewiston-Nez Perce County Regional Airport.

6.11 Historical, Architectural, Archaeological and Cultural Resources

The National Historic Preservation Act of 1966 requires that an initial review be made in order to determine if any properties in or eligible for inclusion in the National Register of Historic Places are within the area of the recommended development's potential environmental impact (the area within which direct and indirect impacts could occur and thus cause a change in historic, architectural, archaeological or cultural properties).

The Archaeological and Historic Preservation Act of 1974 provides for the survey, recovery and preservation of significant scientific, prehistorical, historical, archaeological or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally funded or federally licensed project.

There are 26 NRHP sites is located within the City of Lewiston, however, none are within the immediate vicinity of the airport. Future land acquisition should be evaluated and/or surveyed for historical, architectural, archaeological and cultural resources during the environmental evaluation process.

6.12 Light Emissions and Visual Impacts

Airfield lighting is the main source of light emissions emanating from an airport. The purpose of evaluating the change in light emissions is to determine the extent to which lighting improvements associated with proposed airport development would create an annoyance for inhabitants of properties in the immediate vicinity of the Airport. The determination of impact was based on the nature and intensity of lighting facilities at the Airport and its physical characteristics and anticipated uses of adjacent properties.

Light emissions from any of the development projects are expected to be localized and should not have any impacts beyond the areas of concern. Given the nature of the projects, lighting would be confined to area illumination of runways, runway ends, parking areas, aircraft apron areas, and roadway lighting as required.

Significant light emission impacts are not expected as a result of the improvements. Landside improvements would remain consistent with existing light emissions and airside light emission would remain within the local airport operating environment. The nearest residential land use is located along the northern boundary of the airport property line.

6.13 Natural Resources, Energy Supply and Sustainable Design

Executive Order 13123, Greening the Government Through Efficient Energy Management (64FR 30851, June 8, 1999), encourages each Federal agency to expand the use of renewable energy within its facilities and in its activities. E.O. 13123 also requires each Federal agency to reduce petroleum use, total energy use and associated air emissions and water consumption in its facilities.

It is also the policy of the FAA, consistent with NEPA and the CEQ regulations, to encourage the development of sustainability. All elements of the transportation system should be designed with a view to their aesthetic impact, conservation of resources such as energy, pollution prevention, harmonization with the community environment and sensitivity to the concerns of the traveling public.

Energy requirements associated with airport improvements generally fall into two categories: 1) changed demand for stationary facilities (i.e. airfield lighting and terminal building heating) and 2) those that involve the movement of air and ground vehicles (i.e. fuel consumption). The use of natural resources includes primarily construction materials and water which are in sufficient supply.

Energy requirements are not expected to significantly increase as a result of the proposed improvements. Demand for electricity and aircraft fuel is expected to increase with future development; however, the increase is not considered to be significant based on the forecasted activity levels documented in Chapter Two for the airport. Aircraft fuel should be stored in above ground tanks at the airport that conform to U.S. EPA regulations. Significant increases in ground vehicle fuel consumption are not anticipated.

The application of Leadership in Energy and Environmental Design (LEED) certification should be considered during the development of the terminal building. LEED design utilizes strategies aimed at achieving high performance in key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. LEED provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

Future development and improvement projects should take into account and apply sustainable design measures. Examples of sustainable design initiatives include, but are not limited to: adaptive shading, double skin walls, photovoltaic roof panels, induction lights on photocell, recycled flooring and carpets. Additional measures could also include reducing energy use through the installation of light-emitting diodes (LED) energy efficient airfield lighting.

6.14 Noise

Noise analysis considerations include: 1) whether the Federal thresholds of noise exposure are exceeded, 2) whether the 65 day-night level (DNL) noise contour extends beyond airport property and 3) if there are any residences, churches, schools or hospitals within the 65 DNL noise contour. The basic measure of noise is the sound pressure level that is recorded in decibels (dBA). The important point to understand when considering the impact of noise on communities is that equal levels of sound pressure can be measured for both high and low frequency sounds. Generally, people are less sensitive to sounds of low frequencies than they are high frequencies. An example of this might be the difference between the rumble of automobile traffic on a nearby highway and the high-pitched whine of jet aircraft passing overhead. At any location, over a period of time, sound pressure fluctuates considerably between high and low frequencies.

As forecasted annual jet operations are anticipated to exceed 700 operations, a noise analysis was conducted. **Figure 6-1** depicts the forecasted noise contours. The noise contours would extend beyond airport property; however, they would not encompass any noise sensitive areas or result in any incompatible land uses.

6.15 Secondary (Induced) Impacts

Secondary or induced impacts involve major shifts in population, changes in economic climate or shifts in levels of public service demand. The effects are directly proportional to the scope of the project under consideration. Assessment of induced socioeconomic impacts is usually only associated with major development at large air carrier airports, which involve major terminal building development or roadway alignments and similar work. The extent of the indirect socioeconomic impacts of the proposed development in this AMP are not of the magnitude that would normally be considered significant; however, positive impacts can be foreseen in the form of direct, indirect and induced economic benefits generated from the airport.

6.16 Socioeconomic Impacts, Environmental Justice and Children's Environmental Health and Safety Risks

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, the accompanying Presidential Memorandum and Order DOT 5610.2, Environmental Justice, require the FAA to provide for meaningful public involvement by minority and low-income populations and analysis, including demographic analysis that identifies and addresses potential impacts on these populations that may be disproportionately high and adverse. Included in this process is the disclosure of the effects on subsistence patterns of consumption of fish, vegetation or wildlife and effective public participation and access to this information. The Presidential Memorandum that accompanied E.O. 12898, as well as the CEQ and EPA Guidance, encourage consideration of environmental justice impacts in EA's especially to determine whether a disproportionately high and adverse impact may occur. Environmental Justice is examined during evaluation of other impact categories, such as noise, air quality, water, hazardous materials and cultural resources.

6.16.1 Socioeconomic Impacts

Induced socioeconomic impacts are usually only associated with major development at large air carrier airports. The socioeconomic impacts produced as a result of the recommended development to the Lewiston-Nez Perce County Regional Airport are expected to be positive in nature and would include direct, indirect and induced economic benefits to the local area. These airport improvements are expected to attract additional users and in turn encourage tourism, industry and to enhance the future growth and expansion of the community's economic base.

According to the 2008 Idaho Airport System Plan Economic Impact Study, the Lewiston-Nez Perce County Regional Airport generated $54,725,000 in economic activity in 2008 and contributed to the equivalent of 519 jobs with an annual payroll of $14,986,000. Based on an estimated 145 based aircraft this resulted in an estimated impact of $377,413 per based aircraft. Applying the same ratio to the based aircraft forecast for 2033 (184 based aircraft) provides a future annual economic impact of $69,444,137 in economic activity and approximately 658 jobs generated by the airport.

If acquisition of real property or displacement of persons is involved, 49 CFR part 24 (implementing the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970), as amended must be met for Federal projects and projects involving Federal funding. Otherwise, the FAA, to the fullest extent possible, observes all local and State laws, regulations and ordinances concerning zoning, transportation, economic development, housing, etc. when planning, assessing or implementing the recommended development. The recommended development would include approximately three acres of land to be acquired.

6.16.2 Environmental Justice

The focus of the Environmental Justice evaluation is to determine whether the recommended development results in an inequitable distribution of negative effects to special population groups, as compared to negative effects on other population groups. These special population groups include minority or otherwise special ethnicity or low-income neighborhoods.

The recommended development is not expected to result in any significant negative impacts to any population groups and therefore, would not result in disproportionate negative impacts to any special population group. Socioeconomic and induced economic impacts are expected to be positive in nature and are expected to benefit all population groups in the area.

6.16.3 Children's Environmental Health and Safety Risks

Pursuant to Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, Federal agencies are directed, as appropriate and consistent with the agency's mission, to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. Agencies are encouraged to participate in implementation of the Order by ensuring that their policies, programs, activities and standards address disproportionate risks to children that result from environmental health risks or safety risks. The recommended development projects are not expected to result in any environmental health risks or safety risks on children.

6.17 Water Quality

Water quality considerations related to airport development often include increased surface runoff and erosion and pollution from fuel, oil, solvents and deicing fluids. Potential pollution could come from petroleum products spilled on the surface and carried through drainage channels off of the airport. State and Federal laws and regulations have been established to safeguard these facilities. These regulations include standards for above ground and underground storage tanks, leak detection and overflow protection. An effective Storm Water Pollution Prevention Plan (SWPPP) identifies storm water discharge points on the airport, describes measures and controls to minimize discharges and details spill prevention and response procedures. The Lewiston-Nez Perce County Regional Airport Authority maintains a SWPPP for the Lewiston-Nez Perce County Regional Airport and would need to be updated as required to incorporate recommended airport improvements.

In July of 2002, the EPA amended the Oil Pollution Prevention Regulation at Title 40 of the Code of Federal Regulations, Part 112 (40 CFR Part 112). Subparts A through C of this regulation is often referred to as the “SPCC rule” because they describe requirements for certain facilities (including airports) to prepare and implement Spill Prevention, Control and Countermeasure (SPCC) Plans. The Lewiston-Nez Perce County Regional Airport Authority maintains a SPCC plan for the Lewiston-Nez Perce County Regional Airport. The SPCC plan would need to be updated whenever fuel improvements are made.

In accordance with Section 402(p) of the Clean Water Act, a National Pollution Discharge Elimination System (NPDES) General Permit is required from the Environmental Protection Agency for construction projects that disturb one or more acres of land. Applicable contractors would be required to comply with the requirement and procedures of the NPDES General Permit, including the preparation of a Notice of Intent, prior to the initiation of construction activities.

Recommendations established in FAA Advisory Circular 150/5370-10, Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control, would be incorporated into the project design and specifications. The design and construction of the recommended development would incorporate BMP to reduce erosion, minimize sedimentation, control non-storm water discharges and to protect the quality of surface water features potentially affected. These practices would be selected based on the site’s characteristics and those factors within the contractor’s control and may include: construction scheduling, limiting exposed areas, runoff velocity reduction, sediment trapping and good housekeeping practices.

Future fuel storage and dispensing facilities should be designed, constructed, operated and maintained in accordance with Federal, State and Local regulations. Waste fluids, including oils, coolants, degreasers and aircraft wash facility wastewater would be managed and disposed of in accordance with applicable Federal, State and Local regulations.

The Lewiston-Nez Perce County Regional Airport is located 1.5 statute miles west and approximately 700 feet in elevation above the Snake River. There are no other open water sources located on or adjacent to the airport. No significant impacts to water quality are anticipated as a result of the recommended projects.

6.18 Wetlands

Wetlands are defined in Executive Order 11990, Protection of Wetlands, as “those areas that are inundated by surface or ground water with a frequency sufficient to support and under normal circumstances does or would support, a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs and similar areas such as sloughs, potholes, wet meadows, river overflows and natural ponds. Jurisdictional Waters of the United States may also include drainage channels, washes, ditches, arroyos or other waterways that are tributaries to Navigable Water of the United States or other waters where the degradation or destruction of which could affect interstate or foreign commerce.

According to the U.S. Fish and Wildlife Service’s National Wetlands Inventory, the nearest wetlands to the Lewiston-Nez Perce County Regional Airport are located on the golf course west of the airport. The recommended development would avoid wetlands. The wetlands map for the Lewiston-Nez Perce County Regional Airport is depicted in **Figure 1-63**.

6.19 Wild and Scenic Rivers

The Wild and Scenic Rivers Act (PL 90-542) describes those river areas eligible for protection from development. As a general rule, these rivers possess outstanding scenic, recreational, geological, fish and wildlife, historical, cultural or other similar value.

The nearest Wild and Scenic River is the Snake River located 1.5 statute miles west of the airport. No Wild and Scenic Rivers would be affected by the recommended development.

6.20 Summary of Potential Environmental Impacts

Table 6-2 provides a summary of the analysis ratings for each of the environmental impact categories with regard to the recommended development. While some categories indicate a potential minor impact, they are all estimated to be below the threshold of significance as described in FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing*

Instructions for Airport Projects. It is expected that most recommended development projects would be categorically excluded.

Table 6-2 Summary of Potential Environmental Impacts

Environmental Category	Recommended Development	Description
Air Quality*	⦿	Short-term dust and exhaust during construction
Coastal Resources	○	
Compatible Land Use	○	
Construction Impacts	⦿	Short-term dust, exhaust, erosion
DOT Act Section 4 (F)	○	
Farmlands	○	
Fish, Wildlife and Plants**	○	
Floodplains	○	
Hazardous Materials Pollution Prevention and Solid Waste	⦿	Short-term solid waste during construction
Historical, Architectural, Archaeological and Cultural Resources***	○	
Light Emissions and Visual Impacts	○	
Natural Resources and Energy Supply	○	
Noise****	⦿	Increased aircraft operations
Secondary (Induced) Impacts	⦿	Positive - direct/indirect economic benefits
Socioeconomic Impacts, Environmental Justice and Children’s Environmental Health	⦿	Increased employment
Water Quality	○	
Wetlands	○	
Wild and Scenic Rivers	○	

Legend:
○ No Impact
⦿ Minor Impact
● Significant Impact
*Air Quality – Quantitative analysis will be required for some development items.
** Fish, Wildlife and Plants - Verify during environmental evaluation that no new listed need to be considered
*** Historical, Architectural, Archaeological and Cultural Resources – Potential impacts unknown without Cultural Resource Survey
**** Noise – Further analysis may be needed depending on alternatives considered.

CHAPTER SEVEN

AIRPORT FINANCIAL PLAN

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT

AIRPORT MASTER PLAN

CHAPTER SEVEN
AIRPORT DEVELOPMENT AND FINANCIAL PLAN

7.1 Introduction

The airport development plan and financial feasibility analysis provides a demonstration of the Airport's ability to fund the projects presented in the Airport Master Plan. The recommended capital plan for the Lewiston-Nez Perce County Regional Airport based on the facility requirements identified earlier in this report. The assumptions within this Chapter are contingent upon the FAA, the continuation of the existing capital funding programs and the growth of the Airport's aviation activity as projected within the report.

A goal for Lewiston-Nez Perce County Regional Airport is to be self-sustaining. The intrinsic value that a well-maintained airport brings to a community or region goes far beyond the day-to-day operational costs. In other words, the money spent and benefits received in the community or region by individuals or businesses that use the airport equals or exceeds the expenses, which are a result of operations at the Airport.

The principal objective of this Chapter is to assess the financial ability of the proposed capital improvement projects for Lewiston-Nez Perce County Regional Airport. The analysis covers a 20-year planning period including the initial, intermediate, and long-term goals and objectives. This Chapter provides costs and potential funding sources for capital projects and improvements proposed within the Master Plan.

7.2 Airport Development Plan

Future airport development at Lewiston-Nez Perce County Regional Airport as included in this Airport Master Plan covers a 20-year planning period. Development items are grouped into three phases:

- Phase I: Initial-term (1-5 years)
- Phase II: Intermediate-term (6-10 years)
- Phase III: Long-term (11-20 years)

Estimated development costs are based on the proposed improvements (as shown on the Airport Layout Plan) and are included for each item in the financial development plan. Proposed improvements are based on the recommended facility requirements discussed in Chapter 3-Facility Requirements. The phasing of projects assists the airport sponsor in budgetary planning for future construction projects. **Figure 7-1**, at the end of the Chapter, shows the phasing of each project and is included at the end of this Chapter. **Table 7-1** outlines the 20-year financial development plan. The sequence in which the projects are completed is important as the ultimate configuration of the Airport will require numerous projects.

Table 7-1 20 Year Financial Development Plan

Phase	Development Items	Total 100%	FAA 93.75%	Local 6.25%
A1	Southside Taxilane Construction	$150,000	$140,625	$9,375
A2	North Apron Reconstruction	$889,000	$833,438	$55,563
A3	Acquire Index B ARFF Truck	$700,000	$656,250	$43,750
A4	ARFF Station (Design)***	$540,000	$359,426	$177,031
A5	ARFF Station (Construction)***	$5,364,565	$3,369,617	$1,994,948
A6	Reconfigure Taxiway System	$3,215,000	$3,014,063	$200,938
A7	Runway 12/30 Rehabilitation	$1,825,000	$1,710,938	$114,063
A8	Runway 12/30 Lighting Improvements	$550,000	$515,625	$34,375
A9	Acquire Snow Removal Equipment	$375,000	$351,563	$23,438
A10	Seal Coat and Remark Runway 8/26 to 9/27	$300,000	$164,063	$10,938
A11	Replace Airport Operations Vehicle**	$50,000	N/A	$50,000
A12	Southside Taxilane Expansion (Phase I)**	$400,000	N/A	$400,000
A13	Passenger Terminal Parking Lot Expansion	$850,000	$796,875	$53,125
A14	Southside Taxilane Expansion (Phase II)**	$450,000	N/A	$450,000
	Phase I Total	**$15,530,022**	**$11,912,481**	**$3,617,541**
B1	Install Medium Intensity Taxiway Lights	$850,000	$796,875	$53,125
B2	Passenger Terminal Building Expansion	$2,200,000	$2,062,500	$137,500
B3	Airport Layout Plan Update	$250,000	$234,375	$15,625
B4	SRE Building Expansion	$2,900,000	$2,718,750	$181,250
B5	Pavement Maintenance (Taxiways)	$400,000	$375,000	$25,000
B6	Pavement Maintenance (Runway 8/26)	$330,000	$309,375	$20,625
B7	Pavement Maintenance (North Apron)	$150,000	$140,625	$9,375
B8	Southside Apron Expansion	$1,500,000	$1,406,250	$93,750
B9	Airport Perimeter Road	$5,900,000	$5,531,250	$368,750
B10	Pavement Maintenance (Runway 12/30)	$220,000	$206,250	$13,750
B11	Southside Taxilane Expansion (Phase III)**	$400,000	N/A	$400,000
	Phase II Total	**$15,100,000**	**$13,781,250**	**$1,318,750**
C1	Extend Taxiway Z	$6,021,000	$5,644,688	$376,313
C2	Construct Helicopter Parking Pads	$175,000	$164,063	$10,938
C3	Airport Master Plan Update	$400,000	$375,000	$25,000
C4	Pavement Maintenance (South Apron)	$115,000	$107,813	$7,188
C5	Pavement Maintenance (Runway 12/30)	$170,000	$159,375	$10,625
C6	Corporate Business Park Development**	$2,500,000	N/A	$2,500,000
	Phase III Total	**$9,381,000**	**$6,450,938**	**$2,930,063**
	Total Development Cost	**$39,836,022**	**$31,759,358**	**$8,075,106**

Note: All figures use 2015 dollars
**Project not eligible for FAA funding.
***Includes prorated City share for municipal fire fighting portion of the ARFF Station.

7.2.1 Proposed Start of Short-Term Projects

The anticipated schedule of the immediate airport improvement projects are listed below:

1. Southside Taxilane Construction: Summer 2015
2. North Apron Reconstruction: Summer 2015
3. Acquire Index B ARFF Truck: Spring 2016
4. ARFF Station Design: Spring 2016
5. ARFF Station Construction: Spring 2017
6. Reconfigure Taxiway System: Spring 2018
7. Runway 12/30 Rehabilitation: Spring 2019
8. Runway 12/30 Lighting Improvements: Spring 2020

7.3 Capital Development

Potential funding sources for the recommended development projects indentified in Chapter 4 - Development Alternatives provided the bases for financial analysis. Funding sources come from the FAA, State and Local contribution. This section will identify and quantify the expected sources of capital funds. As previously indicated, FAA funds represent the majority of expected capital; however, a number of sources are identified and indicated below.

7.3.1 Federal Aviation Administration

In 2012, the FAA approved a Modernization and Reform Act extending the reauthorization bill through September 2015. The bill returned the federal/local matching ratio to 90 percent/10 percent for AIP approved projects. The previous bill provided a 95 percent/5 percent federal/local matching ratio. As the State of Idaho does not provide matches on commercial service airports, the FAA further allocates an additional 3.75 percent to these airports. This reduces the local match at Lewiston-Nez Perce County Regional Airport to 6.25 percent creating a 93.75/6.25 matching ratio. The FAA levies user charges on aviation that are returned to airports to pay for eligible projects. There are three types of FAA funding that may be used to pay for Master Plan projects; each is described below.

- *Entitlement* – FAA entitlement funds are “earned” by airports based on the number of enplaned passengers using a sliding scale. An airport’s first 50,000 passengers per year earn $7.80 per passenger and the second 50,000 earn $5.20 per passenger. Additional passengers over certain levels earn $2.60 and $0.65 with passengers over 1,000,000 earning $0.50 each. The total earnings per airport are doubled if the AIP is funded over $3.35 billion per year, which has occurred in recent years. However, the minimum entitlement for FAA Primary airports (those that enplane at least 10,000 passengers per year) is $1,000,000.

- *Discretionary* – Airport capacity, safety, and security projects are funded on a national priority system based on need. Many of the most expensive projects in the CIP such as the rehabilitation of the Runway 12/30 are expected to be funded from discretionary funds. Other CIP projects may be eligible for FAA discretionary dollars, but are less highly ranked or have portions of the project that may be funded from discretionary funds. Discretionary funds provide for 93.75 percent of the cost of eligible projects.

- *State Apportionment* – The FAA also sets aside a certain amount of money per year to be distributed amongst the airports within each state. The state apportionment for Idaho in 2014 was approximately $3.1 million.

Grant eligible items typically include airfield and aeronautical related facilities such as runways, taxiways, aprons, lighting and visual aids, and equipment as well as land acquisition, planning and environmental tasks needed to accomplish the improvements. Public use (non-revenue generating) portions of passenger terminals are also grant eligible. In addition, fuel systems and hangars are also grant eligible; however, these items are considered a low priority for FAA funding.

7.3.2 Lewiston-Nez Perce County Regional Airport

The Airport sponsor has several methods available for funding the capital required to meet the local share of airport development costs. The most common methods involve cash (including Passenger Facility Charge (PFC) revenues, debt financing (which amortize the debt over the useful life of the project), force accounts, in-kind service, third-party support and donations.

The Airport will fund all remaining capital project amounts from annual earnings, PFCs or reserves. The Airport principally collects revenues from rental cars, general aviation users, and tenants such as airline ticket sales and Fixed Base Operators (FBO). As necessary, rate increases or new charges can be implemented to obtain the necessary capital funds. Borrowing can also occur, but such funds are ultimately repaid with operating earnings. Increased air traffic should also generate more revenue.

Local funding and financing alternatives are listed below:

Bank Financing. Some airport sponsors use bank financing as a means of funding airport development. Generally, two conditions are required. First, the sponsor must show the ability to repay the loan plus interest and second, capital improvements must be less than the value of the present facility or some other collateral used to secure the loan. These are standard conditions which are applied to almost all bank loan transactions.

General Obligation Bonds. General Obligation bonds (GO) are a common form of municipal bonds whose payment is secured by the full faith credit and taxing authority of the issuing agency. GO bonds are instruments of credit and because of the community guarantee, reduce the available debt level of the sponsoring community. This type of bond uses tax revenues to retire debt and the key element becomes the approval of the voters to a tax levy to support airport development. If approved, GO bonds are typically issued at a lower interest rate than other types of bonds.

Self-liquidating General Obligation Bonds. As with General Obligation bonds, Self-liquidating General Obligation Bonds are secured by the issuing government agency. They are retired, however, by cash flow from the operation of the facility. Providing the state court determines that the project is self-sustaining, the debt may be legally excluded from the community's debt limit. Since the credit of the local government bears the ultimate risk of default, the bond issue is still considered, for the purpose of financial analysis, as part of the debt burden of the community. Therefore, this method of financing may mean a higher rate of interest on all bonds sold by the community. The amount of increase in the interest rate depends, in part, upon the degree of risk of the bond. Exposure risk occurs when there is insufficient net airport operating income to cover the level of service plus coverage requirements, thus forcing the community to absorb the residual.

Revenue Bonds. Revenue Bonds are payable solely from the revenues of a particular project or from operating income of the borrowing agency, such as an airport commission which lacks taxing power. Generally, they fall outside of constitutional and statutory limitations and in many cases do not require voter approval. Because of the limitations on the other public bonds, airport sponsors are increasingly turning to revenue bonds whenever possible. However, revenue bonds normally carry a higher rate of interest because they lack the guarantees of municipal bonds. It should also be noted that the general public would usually be wary of the risk involved with a revenue bond issue for a general aviation airport. Therefore, the sale of such bonds could be more difficult than other types of bonds.

Combined Revenue/General Obligation Bonds. These bonds, also known as "Double-Barrel Bonds", are secured by a pledge of back-up tax revenues to cover principal and interest payments in cases where airport revenues are insufficient. The combined Revenue/General Obligation Bond interest rates are usually lower than Revenue Bonds, due to their back-up tax provisions.

Force Accounts, In-kind Service, Donations. Depending on the capabilities of the Sponsor, the use of force accounts, in-kind service, or donations may be approved by the FAA for the Sponsor to provide their share of the eligible project costs. An example of force accounts would be the use of heavy machinery and operators for earthmoving and site preparation of runways or taxiways; the installation of fencing; or the construction of improvements to access roads. In-kind service may include surveying, engineering or other services. Donations may include land or materials such as gravel or water needed for the project. The values of these items must be verified and approved by the FAA prior to initiation of the project.

Third-Party Support. Several types of funding fall into this category. For example, individuals or interested organizations may contribute portions of the required development funds (Pilot Associations, Economic Development Associations, Chambers of Commerce, etc.). Although not a common means of airport financing, the role of private financial contributions not only increases the financial support of the project, but also stimulates moral support to airport development from local communities. Because of the potential for hangar development, private developers may be persuaded to invest in hangar development. A suggestion would be that the Airport authorizes long-term leases to individuals interested in constructing a hangar on airport property. This arrangement generates revenue from the airport, stimulates airport activity, and minimizes the sponsor's capital investment requirements. Another method of third-party support involves permitting the fixed base operator (FBO) to construct and monitor facilities on property leased from the airport. Terms of the lease generally include a fixed amount plus a percentage of revenues and a fuel flowage fee. The advantage to this arrangement is that it lowers the sponsor's development costs, a large portion of which is building construction and maintenance.

The Airport funds some or all of the cost of capital projects by generating revenue from tenants, users and other sources. These airport funds can come from annual surplus, reserves, or borrowing. While capital projects are usually funded from a variety of sources, in the end, Airport contributed funds have a role in almost all projects, particularly as seed money to initiate projects and to provide the match of FAA or State funds.

Other methods outside the traditional methods mentioned in the above paragraph are potential suppliers of money to construct capital improvements. These include users, tenants, investors, and other sources. Tenants often construct their own facilities particularly hangar facilities.

Airport users such as corporate flight departments sometimes contribute funds for projects and agree to increased rents to recover the costs of improvements. Private capital can also be used for facilities such as general aviation and corporate hangar facilities.

7.4 Pavement Maintenance Plan

Periodic maintenance is necessary to prolong the useful life of the airport pavements. The affects of weather, oxidation and usage cause the pavement to deteriorate. The accumulation of moisture in the pavement causes heaving and cracking and is one of the greatest causes of pavement distress. The sun's ultraviolet rays oxidize and break down the asphalt binder in the pavement mix. This accelerates raveling and erosion and can reduce asphalt thickness.

The appropriate pavement maintenance will minimize the effects of weather damage and oxidation. Crack sealing is accomplished to keep moisture from accumulating inside and underneath the pavement and should be accomplished at least every five years prior to fog sealing or overlaying the pavements. Fog seals, slurry seals and coal tar emulsion (fuel resistant) seals are spread over the entire paved area to replenish the binder lost through aggregate to increase the friction coefficient of the pavement. Asphalt overlays are accomplished near the end of the useful life of the pavement. A layer of new asphalt is placed over the existing pavement to renew the life of the pavement and to recover lost strength due to deterioration. Unless specially designed, the overlay is not intended to increase the weight bearing capacity of the pavement. Overlays may be grooved to increase friction and minimize hydroplaning. Remarking of the pavement is required following a fog seal or overlay.

The recommended pavement maintenance cycle time frames are listed below in **Table 7-2**. It should be noted that the time frames are recommendations only. Actual pavement deterioration will be affected by use of the Airport and weather exposure. Maintenance actions should be programmed as necessary through close monitoring and inspection of the pavements.

Table 7-2 Pavement Maintenance Schedule

Pavement Maintenance Cycle	Approximate Time Frames
Crack Seal Pavement	1 - 2 years
Crack Seal, Seal Coat and Remark Pavements	3 - 8 years
Overlay Pavements	15 - 18 years
Seal Concrete Joints	6 - 8 years

Source: Armstrong Consultants, Inc.

7.5 Financial Plan

The principal objective in this financial plan is to assess the feasibility of the proposed capital improvements at Lewiston-Nez Perce County Regional Airport. This analysis covers a 20-year planning period including the initial, intermediate, and long-term and indicates the ability of the Airport to undertake the improvements proposed in the Airport Master Plan Capital Improvement Program (CIP). The analysis considers several elements including the following:

- The Airport's historical financial structure including revenue sources, expense categories, debt service obligations, and recent trends in operating expenses and revenues.

- The phased plan of scheduled/proposed capital projects covering the Airport Master Plan period presented in the previous chapter. The phasing plan also includes a proposed funding plan for the initial term.

- An analysis of PFC revenue and its use in funding future Airport improvements.

An airport's financial structure can vary, perhaps significantly, from year to year as changes occur in air traffic, number of tenants, rates charged, construction costs, level of operating expenses, and other factors. Financial projections for the intermediate and long-term planning phases, in particular, should be viewed as tentative and updated frequently in the future. The capital project financial plan presented in this Chapter, while representative of today's best estimate, is subject to a wide variety of influences and may prove to need adjustment in the future for several reasons including, but not limited to, the following:

- The priorities in identified capital improvements may change. For example, market conditions may cause changes in maintenance of existing facilities, require new facilities, or redefine priorities.

- Safety and security improvements, whether they are reflected in the CIP or not, may require immediate funding and force postponement of other projects.

- Cost estimates to provide improvements can fluctuate particularly when considering factor such as technological advancements, economies of scale related to undertaking several improvements at once, and the cost of raw materials such as concrete, steel, and other building materials.

- Emergency repairs or changes required by new regulations may require funds that had been programmed for other projects are reallocated.

It is recommended that the financial plan, including the CIP, be utilized as a working tool, which should be updated as necessary. Capital improvements, their associated costs, and financial projections should be re-examined periodically throughout the planning period even though the figures contained herein present a reasonable forecast of needed initiatives to implement the Master Plan recommendations.

7.5.1 Projected Revenue and Expenditure

Airport operating expenditures typically include insurance, utilities, and maintenance and management costs. Insurance costs include liability insurance for the Airport and property insurance for any real property on the Airport. Utility expenses primarily consist of electrical power to operate airfield lighting and visual aids and water for public use areas. Pavement maintenance consists of crack sealing on an annual basis and seal coating and remarking the pavements every five years. Facility maintenance consists of mowing, snow removal and repair and replacement of parts and equipment such as light bulbs, light fixtures, fences, etc. Management costs include an airport manager and staff members, maintenance and emergency response. Currently at Lewiston-Nez Perce County Regional Airport, there is a full-time airport management team which consists of an airport manager, security and operations supervisor, maintenance staff and property manager.

Airport revenues at Lewiston-Nez Perce County Regional Airport consist of land leases, user fees, fuel flowage fees, landing fees, PFCs, tenant lease space, fines and forfeitures, and property taxes generated from on-airport improvements. Descriptions of airport revenue generating opportunities are found below:

Land and Ground Leases. Property on the airport that is not devoted to airfield use, vehicle parking or contained within areas required to be cleared of structures may be leased to individual airport users or aviation related businesses. Typically, the individual is provided a long-term lease on which to construct a hangar, business or other facility. At the termination of the lease, the lessee has the option to renew the lease, sell or lease the buildings or to remove the buildings. Lewiston-Nez Perce County Regional Airport currently collects revenue through the form of land leases. The main component of the land lease is comprised of aircraft storage around the airfield.

Hangar Leases. Hangars on the airport owned by the airport sponsor can be leased to private aircraft operators or businesses. Typically, as with land leases, the individual or business is provided a long-term lease of the hangar. At the termination of the lease, the lessee has the option to renew the lease or cease use of the hangar. Lewiston-Nez Perce County Regional Airport currently collects revenue through the form of hangar leases.

Hangar Rental. The FBO Hangar is available for monthly or nightly rental. The fees are usually established on a monthly basis for based aircraft and on an overnight basis for transient aircraft. Lewiston-Nez Perce County Regional Airport currently collects revenue through the form of hangar rentals.

Fines and Forfeitures. The Airport has the ability to collect revenue through fines and penalties imposed to users through the form of flowage fees, parking fees and property damage claims.

Passenger Facility Charges (PFC). The Aviation Safety and Capacity Expansion Act of 1990 authorized the Secretary of Transportation to grant public agencies the authority to impose a PFC to fund eligible airport projects. The initial legislation set the maximum PFC level at $3.00

per enplaned passenger. AIR-21 increased the maximum PFC level form $3.00 to $4.50. In 2012, the FAA Modernization and Report Act retained the PFC cap at $4.50. Although the FAA is required to approve PFCs, the program allows for local collection of PFC revenue through the airlines operating at an airport and provides more spending flexibility to airport sponsors versus AIP funds (see **Table 7-3**). The Airport currently imposes a PFC at the $4.50 level and this charge is expected to continue. At current passenger levels, in 2013, approximately $282,525 was collected from PFCs.

Table 7-3 Potential PFC Revenues

	Calendar Year	Annual Enplanements	Potential Annual PFCs ($4.50)
Historical	2013	64,725	$282,525
Projected	2018	74,451	$324,979
	2023	86,309	$376,739
	2028	100,056	$436,744
	2033	115,993	$506,309

Prepared by: Armstrong Consultants, Inc., October 2014
Note: PFC Calculation assumes that 97 percent of enplanements are revenue passengers.

Tie-Down Fees. A fee is typically established for the use of fixed ramp tiedowns on paved apron areas. The fees are usually established on a monthly or annual basis for based aircraft and on an overnight basis for transient aircraft. Lewiston-Nez Perce County Regional Airport does not currently collect tie-down fees for aircraft.

Through-the-Fence Fees. A fee is typically charged to adjacent landowners who are provided access directly from their private parcel to the public use airport facilities. This fee ensures that the level of rates and charges assessed to on-airport users is equitable to off-airport users and that there is not an unfair economic advantage to operating through-the-fence. Additionally, through-the-fence operators are required to maintain a secure airport perimeter with fencing and/or gates and to construct paved access taxiways to the airport operating areas. However, the FAA generally discourages through-the-fence operations. Therefore, it is anticipated that all aircraft operations will be conducted from on airport and therefore will not generate through-the-fence fees. In lieu of through-the-fence fees, these aircraft would generate tie-down fees or land lease revenue from hangars. Lewiston-Nez Perce County Regional Airport does not currently collect any through-the-fence fees.

Fuel Flowage Fee. This fee is typically imposed on all aircraft fuels delivered to the airport and would include all fuels used by aircraft including AvGas and Jet-A. The fee would apply to fixed base operators, self-fueling and through-the-fence operators who conduct self-fueling. Lewiston-Nez Perce County Regional Airport currently collects a fuel flowage fee.

Airport Usage, Landing and Ramp Fee. This fee is typically imposed on commercial and charter aircraft and can be waived if the operator purchases a minimum of 50 gallons of fuel. The airport usage fee is usually charged by the FBO. Lewiston-Nez Perce County Regional Airport currently collects fees associated with airport, landing and ramp usage.

All revenues generated by the Airport must be expended by the Airport for the capital or operating costs of the Airport.

Table 7-4 shows the historically and projected revenues and expenses for Lewiston-Nez Perce County Regional Airport. The projections are based on historical data provided by the Airport Manager. Historically the revenues have exceeded the expenses at the Airport. The excess revenues can be used toward the local match for federal or state capital improvement projects, self-funded airport improvements, airport marketing and promotion or other airport generating and maintenance costs.

Table 7-4 also shows how the implementation of the Airport Layout Plan capital improvement projects would increase revenues at the Airport. The assumption is made that as infrastructure is put in place at the Airport that additional revenues would result from the increased number of based aircraft, additional hangars, increased aircraft operations and corporate influx. The Airport has additional methods of generating revenue which were not included in the calculation below such as charging for parking.

Table 7-4 Projected Airport Revenue and Expenditures

Airport Revenue	**2013**	**2018**	**2023**	**2028**	**2033**
Passenger Airline Aeronautical Revenue	$151,575	$191,791	$233,343	$283,897	$345,404
Non-Passenger Aeronautical Revenue	$118,526	$149,973	$182,465	$221,997	$270,093
Non-Aeronautical Revenue	$279,397	$353,526	$430,119	$523,305	$636,681
Total Airport Revenue	**$549,498**	**$695,290**	**$845,927**	**$1,029,199**	**$1,252,178**
Airport Expenditures	**2013**	**2018**	**2023**	**2028**	**2033**
Operating Expenses	$662,933	$662,933	$662,933	$662,933	$662,933
Debt Service	$252,228	$0	$0	$0	$0
Total Airport Expenditures	**$915,161**	**$662,933**	**$662,933**	**$662,933**	**$662,933**
Net Airport Income	**($365,663)**	**$32,357**	**$182,994**	**$366,266**	**$589,245**

Prepared by: Armstrong Consultants, Inc., 2014

1/ Projections based on the average of each time period with 4 percent annual growth (in 2014 dollars)

2/ Does not include Capital Improvement Revenue

3/ Does not include PFC Revenue

4/ Operating expense needs are unknown and expected to remain the same

7.6 Recommendations

The Lewiston-Nez Perce County Regional Airport has a limited amount of revenue collection. The most effective means of increasing revenue at the Airport is to accommodate existing unmet demand and to continue to attract new and additional users. Several potential strategies for increasing revenues are listed below:

- Increase rates for ground leases and increase the number of ground leases for aircraft storage hangars
- Increase hangar storage rates
- Increase landing fees
- Charge passengers and visitors for short-, and long-term parking

- Increase fuel flowage fee
- Focus on attracting business/corporate aviation tenants
- Increase the industrial and business development park

Increasing aircraft storage hangars at the airport would result in not only increased direct revenues generated through property leases, but would also produce indirect revenue through increased use of airport services and facilities, such as fuel purchases. Several aircraft owners have indicated an interest in leasing land from the airport to construct hangars. Locations for additional hangars have been identified on the Terminal Area Drawing (TAD) of the Airport Layout Plan. Business/corporate tenants are typically flight departments for local businesses and provide employment in the local community. They generally operate multi-engine turboprop or business jet aircraft. Their land lease parcels are usually large, the aircraft are typically operated two to three times per week and fuel purchases are typically larger than other general aviation user (several hundred gallons per fueling).

Whether the improved Lewiston-Nez Perce County Regional Airport operates at an annual surplus or subsidy depends greatly on the amount of activity and facilities that are constructed at the Airport. Existing demand is currently constrained by inadequate hangar space. With increased operations at the airport due to the availability of hangar space, the airport would then need to accommodate increased numbers of based and transient aircraft with hangars. This can be accommodated through the construction of taxilanes and providing land leases for hangars.

7.6.1 Community Support

While it would certainly be advantageous for an airport to support itself, the indirect and intangible benefits of the airport to the community's economy and growth must be considered. Members of the community are directly or indirectly employed on the airport and by individual businesses. As airport activity increases, it is probable that employment on the airport will also grow throughout the planning period. The local construction industry will also benefit directly from implementation of the development programs. Other community benefits involve business growth and development that is enhanced by the availability of air transportation including commercial service, corporate and private aviation. Clients and suppliers of area businesses will also benefit from the future improvement to the airport.

The use of corporate and business aircraft is an increasing trend throughout the United States. The movement of American industry from large metropolitan areas to smaller communities which offer lower taxes and labor costs and a better working environment has influenced this trend. Time is money in the business environment and corporate aircraft are answering the need for quick and convenient access to and from these new locations for both executives and management personnel. The ability of a community to provide convenient access to corporate aircraft will be reflected not only in benefits to existing businesses and industries but will be a strong factor in attracting new industry. These factors place Lewiston-Nez Perce County Regional Airport in a prime position to capitalize on the trends in the commercial and general aviation industry and to maximize the benefits the airport provides to the community.

7.7 Continuous Planning Process

Airport planning is a continuous process that does not end with the completion of a major capital project. The fundamental issues upon which these airport master plans are based are expected to remain valid for several years; however, several variables, such as based aircraft, annual aircraft operations, and socioeconomic conditions are likely to change over time. The continuous planning process necessitates that the Lewiston-Nez Perce County Regional Airport Authority consistently monitor the progress of the Airport in terms of growth in based aircraft and annual operations, as this growth is critical to the exact timing and need for new airport facilities as recommended within the Airport Master Plan. The information obtained from this monitoring process will provide the data necessary to determine if the development schedule should be accelerated, decelerated or maintained as scheduled.

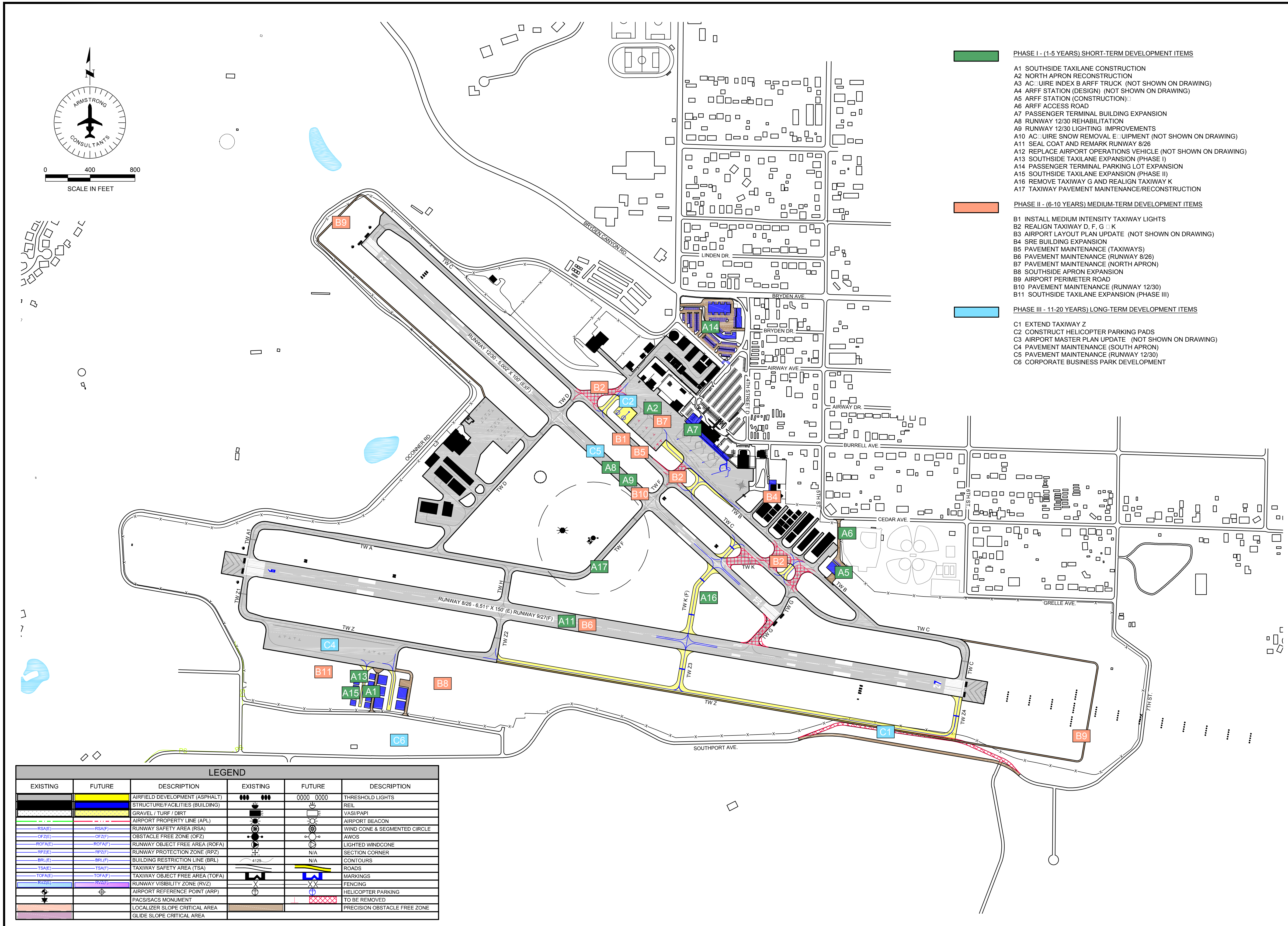
Periodic updates of the Airport Layout Plan, Capital Improvement Plan, and Airport Master Plan are recommended to document physical changes to the Airport, review changes in aviation activity and to update improvement plans for the Airport. The primary goal of the Airport Master Planning effort is to develop a safe and efficient airport that will meet the demands of its aviation users and stimulate economic development for the City of Lewiston and Nez Perce County. The continuous airport planning process is a valuable tool in achieving the strategic plans and goals for the Airport.

7.8 Summary

This Chapter indicates the funding necessary to plan, design and construct the projects identified in the Airport Master Plan. A total of 31 CIP projects have been identified of which all are programmed within the next 20-year planning period.

This financial analysis is based on the continuation FAA and State funding at the current levels. However, there is competition for FAA and State funds, so the Airport will need to aggressively communicate its CIP needs to the FAA, State, and other relevant agencies as opportunities arise.

Based on the assumptions, the financial analysis presented herein, the CIP is considered practicable and it is anticipated that Lewiston-Nez Perce County Regional Airport will be able to construct the necessary aviation facilities as recommended herein. Of course, the continued monitoring of the Airport's financial status is necessary to adapt and adjust to condition change.



PHASE I - (1-5 YEARS) SHORT-TERM DEVELOPMENT ITEMS

A1 SOUTHSIDE TAXILANE CONSTRUCTION
A2 NORTH APRON RECONSTRUCTION
A3 AC□UIRE INDEX B ARFF TRUCK (NOT SHOWN ON DRAWING)
A4 ARFF STATION (DESIGN) (NOT SHOWN ON DRAWING)
A5 ARFF STATION (CONSTRUCTION)□
A6 ARFF ACCESS ROAD
A7 PASSENGER TERMINAL BUILDING EXPANSION
A8 RUNWAY 12/30 REHABILITATION
A9 RUNWAY 12/30 LIGHTING IMPROVEMENTS
A10 AC□UIRE SNOW REMOVAL E□UIPMENT (NOT SHOWN ON DRAWING)
A11 SEAL COAT AND REMARK RUNWAY 8/26
A12 REPLACE AIRPORT OPERATIONS VEHICLE (NOT SHOWN ON DRAWING)
A13 SOUTHSIDE TAXILANE EXPANSION (PHASE I)
A14 PASSENGER TERMINAL PARKING LOT EXPANSION
A15 SOUTHSIDE TAXILANE EXPANSION (PHASE II)
A16 REMOVE TAXIWAY G AND REALIGN TAXIWAY K
A17 TAXIWAY PAVEMENT MAINTENANCE/RECONSTRUCTION

PHASE II - (6-10 YEARS) MEDIUM-TERM DEVELOPMENT ITEMS

B1 INSTALL MEDIUM INTENSITY TAXIWAY LIGHTS
B2 REALIGN TAXIWAY D, F, G □ K
B3 AIRPORT LAYOUT PLAN UPDATE (NOT SHOWN ON DRAWING)
B4 SRE BUILDING EXPANSION
B5 PAVEMENT MAINTENANCE (TAXIWAYS)
B6 PAVEMENT MAINTENANCE (RUNWAY 8/26)
B7 PAVEMENT MAINTENANCE (NORTH APRON)
B8 SOUTHSIDE APRON EXPANSION
B9 AIRPORT PERIMETER ROAD
B10 PAVEMENT MAINTENANCE (RUNWAY 12/30)
B11 SOUTHSIDE TAXILANE EXPANSION (PHASE III)

PHASE III - 11-20 YEARS) LONG-TERM DEVELOPMENT ITEMS

C1 EXTEND TAXIWAY Z
C2 CONSTRUCT HELICOPTER PARKING PADS
C3 AIRPORT MASTER PLAN UPDATE (NOT SHOWN ON DRAWING)
C4 PAVEMENT MAINTENANCE (SOUTH APRON)
C5 PAVEMENT MAINTENANCE (RUNWAY 12/30)
C6 CORPORATE BUSINESS PARK DEVELOPMENT

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)	1 2 12 11	N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)	4125	N/A	CONTOURS
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)			ROADS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			MARKINGS
RVZ(E)	RVZ(F)	RUNWAY VISIBILITY ZONE (RVZ)			FENCING
		AIRPORT REFERENCE POINT (ARP)			HELICOPTER PARKING
		PACS/SACS MONUMENT			TO BE REMOVED
		LOCALIZER SLOPE CRITICAL AREA			PRECISION OBSTACLE FREE ZONE
		GLIDE SLOPE CRITICAL AREA			

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LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
LEWISTON, IDAHO
A.I.P. No. 3-16-022-034-2014
AIRPORT LAYOUT PLANS

No.	Pro□ect No.	Date	Re□ision / Description	File	Drwn.	C□□d.	Appr□d.
3							
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0	136159	02.12.15	ORIGINAL ISSUE	6159510	JOS	JMR	DAC

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20 YEAR FINANCIAL DEVELOPMENT PLAN

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APPENDIX A

EXISTING UTILITY INVENTORY

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN

Appendix A
Existing Utility Inventory

A1.0 - Existing Utility Inventory

A1.1 - Introduction

As part of an update to the Airport Master Plan existing utilities that service the Lewiston Regional airport were inventoried and identified. For this inventory, utilities were identified for the following key areas: Airport Terminal, Northeast Hangar Complex, North Hangar Complex, Stout Flying Services, Gustin Aviation, Experimental Aircraft Association (EAA), Hillcrest Aviation, and the Southside Development. See **Figure A-1** below for these locations.

Figure A-1 Lewiston Regional Airport; Key Utility Service Areas

A1.2 – Existing Utilities Summary

In the vicinity of the airport utilities, are divided up among the City of Lewiston, the Lewiston Orchards Irrigation District (LOID), the Lewiston Orchards Sewer District (LOSD), Centurylink, and Avista Utilities. **Table A-1** on the following page summarizes these findings. The utility locations should be considered approximate, and should be verified before digging in the area.

Table A-1 Utility Service Providers

Utility Type	Airport Terminal	North Hangar Complex	Experimental Aircraft Association	Stout Flying Services Inc.	Gustin Aviation	Hillcrest Aviation	Northeast Hangar Complex	Southside Development
Sanitary	LOSD	LOSD	Unknown	LOSD	LOSD	Septic	LOSD	LEW
Potable Water	LOID	LOID	LEW	LOID	LEW	LEW	LOID	LEW
Telephone	CL	CL	CL	CL	CL	CL	NONE	NONE
Electricity	AU	AU	AU	AU	AU	AU	AU	AU
Natural Gas	AU	AU	NONE	AU	AU	NONE	AU	AU

LEW – City of Lewiston; LOID – Lewiston Orchards Irrigation District; LOSD – Lewiston Orchards Sewer District; CL – Centurylink; AU – Avista Utilities

A1.3 – Sanitary Sewer

Sanitary sewer service can generally be divided by a north-south boundary, as depicted in **Figure A-2** below. Everything on the south side of the airport is served by an 8" main sewer line that runs approximately parallel to Taxiway Z. This 8" main is tied into a nearby sewer lift station located adjacent to O'Conner Road just west of the Southside Development. This lift station then pumps wastewater to a City of Lewiston gravity sewer manhole located on Southport Avenue approximately 2000 feet to the southwest. The 8" main appears to be offset from the existing tarmac and has several 8" stubs.

LOSD provides all sanitary sewer service on the north side of the Airport and the City of Lewiston maintains it. All facilities connected to this system drain into nearby 8" sewer mains.

Hillcrest Aviation is not connected to the public sewer system. They are serviced by an onsite septic system. The location of this system is unknown.

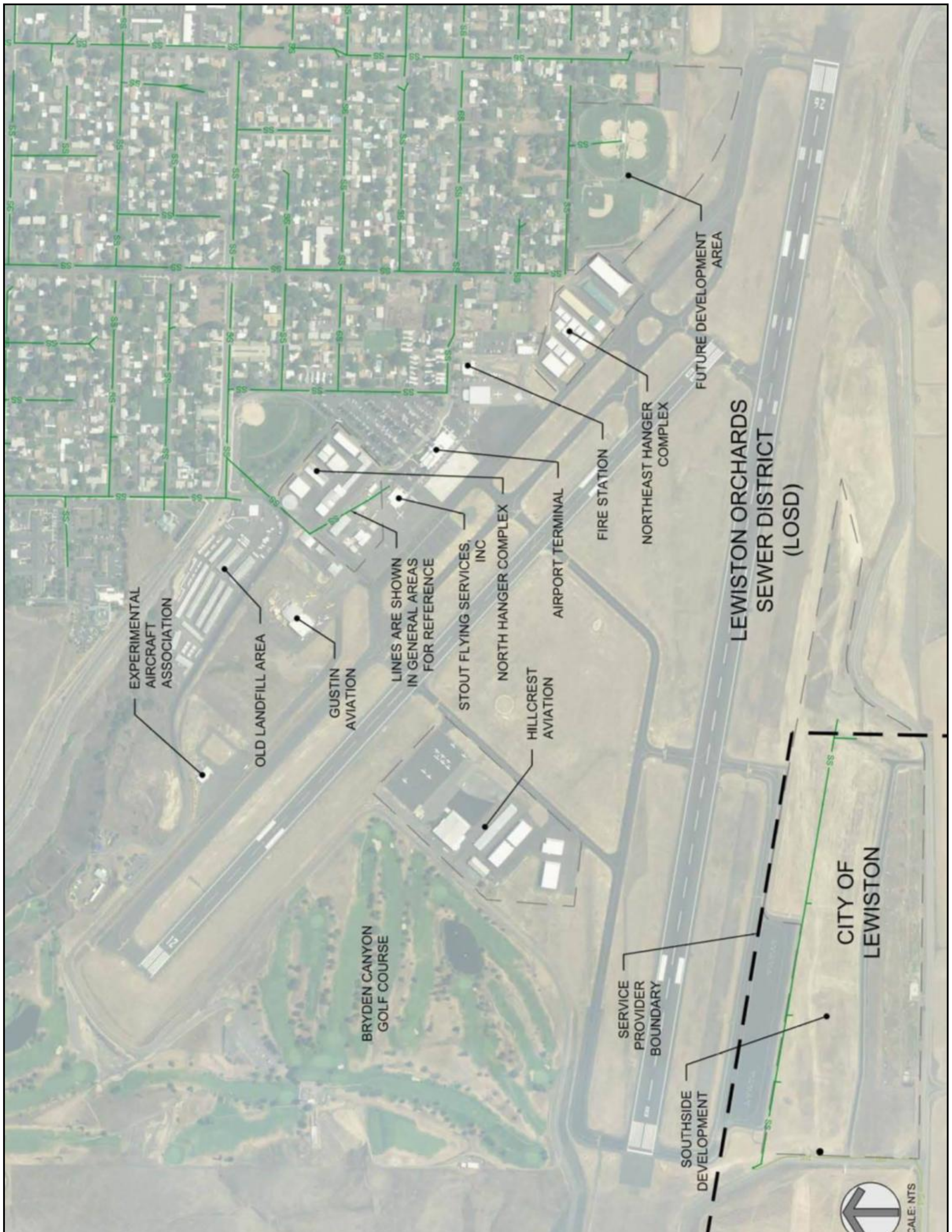

Figure A-2 Sewer Utility Providers; Existing Sewer Service

A1.4 – Potable Water

Potable water service to the airport is provided by both the City of Lewiston and LOID. Providers are separated similar to sewer services, with the City of Lewiston generally providing service on the South end of the Airport and LOID on the North end, as shown in **Figure A-3** below. Potable services served by LOID are tied into nearby 6” and 12” main lines.

Potable water for Hillcrest Aviation is provided by the City of Lewiston. The service is taken from a nearby 12” main line that crosses the airfield in an approximate north/south orientation. The water service for the proposed southside development will be provided by the City of Lewiston.

There are existing main lines along Southport Avenue, and O’Conner Road near the project location that service one building. There is an existing 12” mainline that parallels the southern right of way of Southport Avenue. There is also an existing 12” mainline that parallels the eastern right of way on O’Conner Road.

There were also some additional fire lines installed during the construction of Taxiway Z. These lines run approximately parallel to the new taxiway and eventually run north beneath the runways to the airport terminal area.

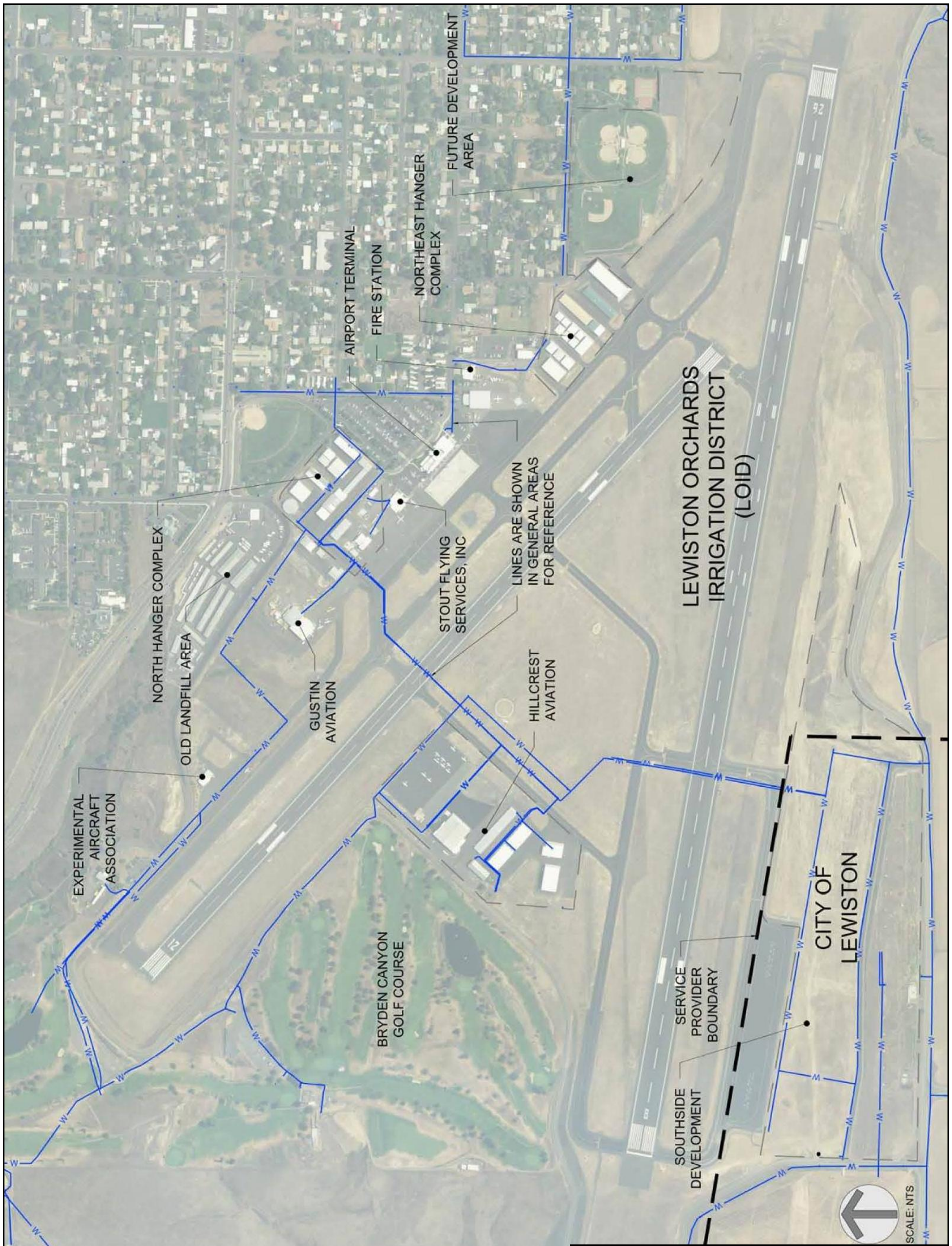

Figure A-3 Water Utility Providers; Existing Water Service

A1.5 - Telephone

Telephone service in the area is provided by Centurylink. Centurylink maintains their own mapping in the area. **Figure A-4** below depicts mapped existing services in and around the airport. There are no other known telephone service providers other than internet service provided phonelines (e.g. CableOne). At this time it appears that Centurylink is either provided or available to provide telephone access to all areas of the airport except the new Southside Development and the Northeast Hangar Complex.

New telephone service to the Southside Development will need to be established. The nearest telephone line locations are adjacent to Hillcrest and at the northwest corner of the intersection of O'Connor Road and Southport Road. These lines will need to be extended into the southside development area. Before telephone service can be provided to the area, further communication with CenturyLink will be needed. The specific requirements will be discussed further in **Appendix B - Utility Requirements**.

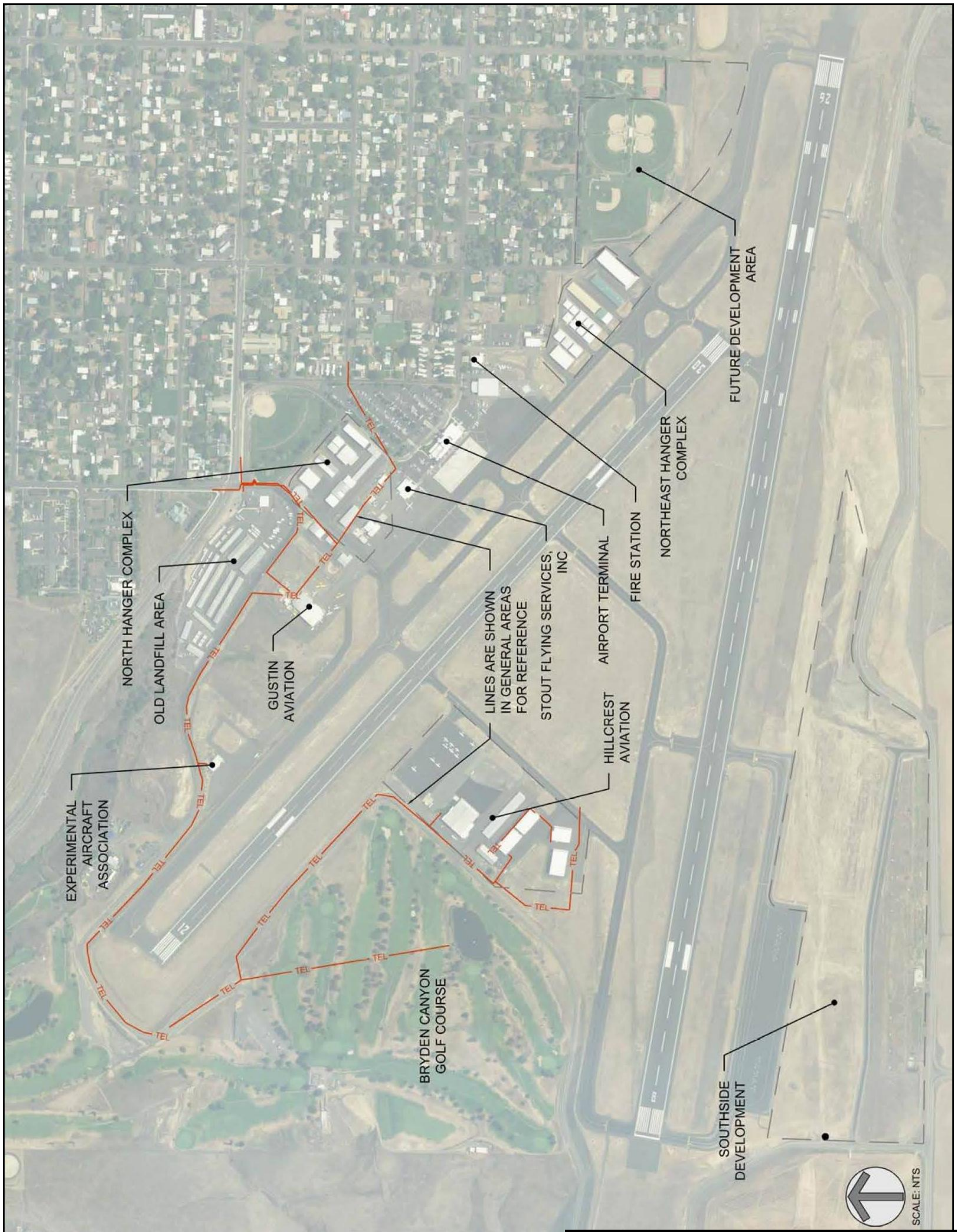

Figure A-4 Existing Telephone Service

A1.6 – Cable Television/Internet

Cable television and internet service to the area is provided by Cableone. No mapping information was provided by Cableone, so actual locations on the north end of the aiport is unknown. The cable network is comprised of fiberoptic and coaxial cable. Cable is accessable on the north side of the airport from 4th Street east to 7th Street where residential development is adjacent to the airport. The Southside Development has access to cable located at the intersection of O'Connor Road and Southport Road running north on the west side of O'Connor road to the Seekins Manufacturing facility and adjacent to airport property along the north side of Southport Road. **Figure A-5** below depicts the approximate location of known cable service on the south side of the Airport.

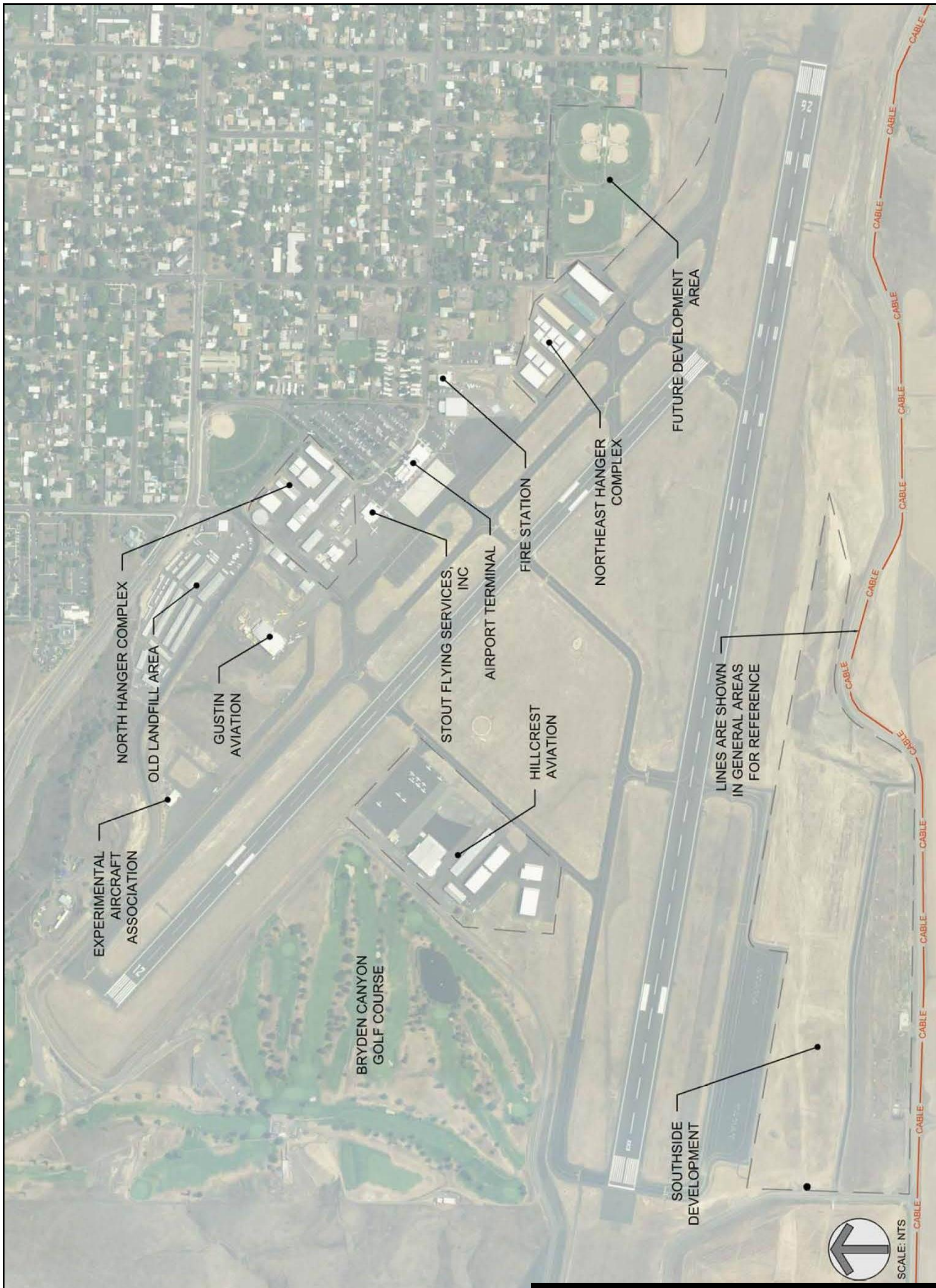

Figure A-5 Existing Cable Service

A1.7 – Natural Gas & Electricity

Natural gas and electrical service in the area are provided by Avista Utilities. It appears that natural gas service is provide to all areas of the Airport except for EAA and Hillcrest. Further communications with Avista will be needed to establish service in these areas. Power service is available to all areas of the airport. Avista maintains GIS mapping of gas & electric services and mains in the area. **Figure A-6** below depicts available mapping for the Airport area.

Figure A-6 Existing Gas & Power Service

APPENDIX B

UTILITY REQUIREMENTS

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT

AIRPORT MASTER PLAN

ARMSTRONG

B1.0 Utility Requirements

B1.1 Experimental Aircraft Association (EAA)

The EAA has existing utility service for all utilities with the exception of Natural Gas.

B1.1.1 Natural Gas

The nearest natural gas pipeline to EAA is just northeast of Gustin Aviation at approximately 1,500' away. The natural gas pipeline would need to be extended for use in this area. The natural gas line would have to be routed between Gustin Aviation and the taxiway paralleling Runway 12/30 to avoid the landfill area. The FAA and the Airport Authority will have to grant their permission to extend the natural gas pipeline through airport property.

Excavation would need to take place to expose the pipeline so that it could be extended. Excavation of a trench would be necessary between the two structures to keep the pipeline safely underground. The minimum allowable depth for the gas pipeline is 24" below the ground surface. Depending on the quality of the soil, Avista may also require an approved base be used under the pipeline. There would be no rocks over 4" allowed in the soil backfill around the conduit.

The developer would be responsible for the excavation and backfill after the pipeline is complete, along with hauling and compaction requirements. All steps must be approved by Avista before proceeding with the next, running required tests along the way. The developer would also be responsible for any fittings and connections to the buildings. A typical trench cross section can be found in Avista's (Blue Book) "2014 Electric Service Requirements," which can be seen below in Figure 3-13. Each required permit would be the developer's responsibility.

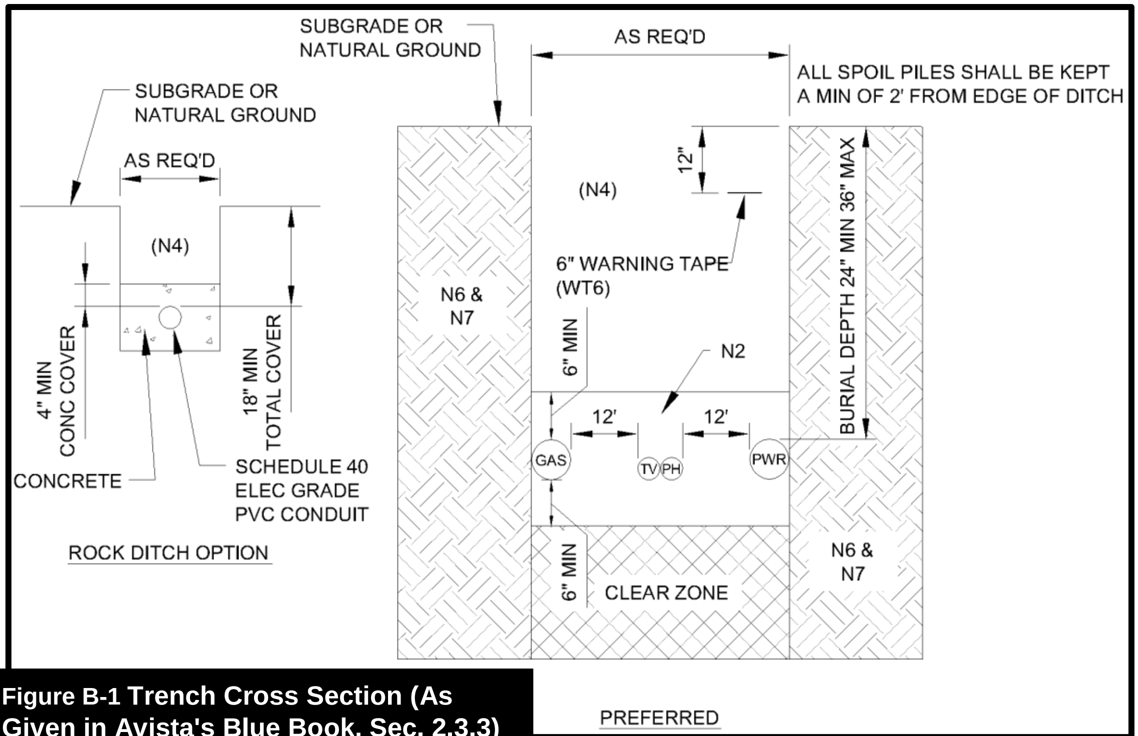

Figure B-1 Trench Cross Section (As Given in Avista's Blue Book, Sec. 2.3.3)

B1.1.2 Hillcrest Aviation

Much like the EAA, Hillcrest has existing utility service for all utilities with the exception of Natural Gas. The one caveat to this is that Hillcrest currently provides its own sewer service with an onsite septic and infiltration facility.

B1.1.3 Natural Gas

Gustin Aviation is the closest natural gas pipeline location at approximately 1,700' away. The natural gas line would have to be routed between Gustin Aviation and the taxiway paralleling Runway 12/30 to avoid the landfill area. The developer would need to either bore under the runway to bring natural gas to Hillcrest or continue to route the natural gas pipeline around the west end of Runway 12/30. The developer would also be responsible for fittings and connections to the buildings. The FAA and the Airport Authority would need to give their permission extend the natural gas pipeline across airport property.

B1.1.4 Sanitary Sewer

If Hillcrest were to ever abandon their existing onsite sewer facility in favor of connecting to a public sewer main neither of the two options seem to standout. Hillcrest rests approximately halfway between existing Lewiston Orchards Sewer District service and the City of Lewiston's service. Line and grade do not favor this site due to its location and will likely require that an onsite lift station be considered to be able to connect to either system. This will need to be further evaluated in the event that Hillcrest indicates further interest in connecting to either public system.

B1.2 Northeast Hangar Complex

The Northeast Hangar Complex has existing utility service available for all utilities with the exception of telephone.

B1.2.1 Telephone

CenturyLink is the proprietor of all the telephone lines and service in the area. The nearest telephone line is located to the north next to the softball field and the Airport Terminal parking lot. This line would need to be extended to the south approximately 1,700' for the Northeast Hangar Complex to receive telephone services. CenturyLink would complete the extension of the telephone lines for this process after arrangements have been made.

The developer would be required to trench, lay conduit, and backfill the trench. 2" diameter schedule 40 PVC pipe is the minimum size of conduit permitted for application. If the area would be experiencing future development, a larger conduit can be used to handle the increased demand. The conduit must be buried at a minimum depth of 30" below the ground surface; a 36" depth is ideal. CenturyLink would pull the cable through the conduit after the trench has been dug and backfilled, provided that adequate pull cable had been installed.

The current cellular telephone and wireless technology may provide a sufficient level of service that the cost of bringing in telephone lines to this area may not be economically feasible.

Figure B-2 Looking SW at NE Hangar Development

B1.3 Southside Development

Much of the utility infrastructure for the Southside area is new and will need further expansion to provide service to any planned improvements or infrastructure added on that end of the airport. All utilities are nearby and available.

B1.3.1 Sanitary Sewer

The City of Lewiston would be providing sanitary sewer services to the proposed Southside Development via an 8” main sewer line. There is currently a lift station in close proximity to this site to the west and adjacent to O’Conner Road. This station should be utilized for the system. The developer would be responsible for connecting to the existing 8” stubs, and installing new lines and connections to new buildings. There is a buy-in connection fee to connect to the existing system. Communication with the City of Lewiston would be necessary as construction began so that the City could perform plan review and approval, and review required tests and inspections as needed. The property owner would be responsible for maintenance and repair of the line from the property line to the building.

Figure B-3 Southeast corner of Southside Development looking northwest

B1.3.2 Potable Water

The City of Lewiston will be providing potable water services to the new development. There is an existing water main running through the Southside Development, as well as along the property line. This line is 12” in diameter. To extend the water main, the new water main must be physically separated from the existing system until flushing, pressure tests, disinfection, and bacterial sampling have been completed. The City of Lewiston will provide the taps for these sections at the current fee rate. The developer would furnish all materials, labor, and supplies. All interiors of pipes and fittings must be swabbed or sprayed with a 1% hypochlorite solution. The developer would be responsible for flushing and pressure testing the new water main. After the tests have been completed and inspected, the City of Lewiston would be contacted to proceed with disinfection and sampling of the main, which would adhere to American Water Works Association (AWWA). A minimum of two samples must be taken from each section of pipe, which the City of Lewiston will charge a fee for.

The developer would be responsible for creating the final grade of the site, and paying the appropriate fees. The site would also have to be listed with the Underground Utilities Locate Center, with the developer knowing the exact desired tap location. With these criteria met, the City of Lewiston would provide water taps for the site. Similar procedure applies to water meters. The developer will be responsible for the raising or lowering of the meter boxes as needed.

Figure B-4 Southside Development looking north

The City of Lewiston would be responsible for the water mains and laterals located within the right-of-way. The property owner would be responsible for installation and maintenance of the water main from right-of-way or property line to the building. More detailed information can be found in the City of Lewiston's documents *New Water Main Construction Procedures* and *Water Tap Information.*

B1.3.3 Telephone

Telephone services for the Southside Development will be required as commercial development takes place. The nearest telephone lines are located south of the development, along Southport Avenue approximately 1500' away to the southwest. CenturyLink would complete the extension and service of the telephone lines.

The developer would be required to trench, lay conduit, and backfill the trench. 2" diameter schedule 40 PVC pipe is the minimum size of conduit permitted for application. If the area will be experiencing future development, a larger conduit can be used to handle the increased demand. The conduit must be buried at a minimum depth of 30" below the ground surface; a 36" depth is ideal. CenturyLink would pull the cable through the conduit after the trench has been dug and backfilled, provided adequate pull cord has been run through the conduit.

B1.3.4 Electricity

Avista Utilities will be providing electricity to the proposed Southside Development. There are currently underground power lines running around the property line, as well as under some of the existing developments. The developer would need to excavate and backfill the trench for Avista to install the lines. All Avista regulations and requirements must be followed, which can be found in Avista's (Blue Book) "2014 Electric Service Requirements." The developer would be responsible for obtaining all necessary permits for each of the tasks. Avista must approve and inspect the trench, conduit, and backfill.

B1.3.5 Natural Gas

Avista Utilities will be responsible for providing natural gas to the proposed development. There are underground natural gas pipelines running along the southern property line and along Southport Avenue. The developer would be responsible for exposing the pipeline for extension, as well as the corresponding trench. The minimum depth below the ground surface for natural gas pipelines is 24". The developer would be responsible for backfilling the trench after extension has been completed as stated under the EAA and Hillcrest sections, using Figure 3.1 as reference. All steps must be approved by Avista, and all of their regulations followed, found in Avista's (Blue Book) "2014 Electric Service Requirements."

B1.4 Future Northeast Development Area

There is some developable ground east of the terminal building and northeast hangar development area. Part of this area is located outside of the airport fence. This area consists of a park area used for baseball fields and tennis courts. The remaining area is located inside the existing airport fence and runs east from the east hangar area to the end of airport property that runs along 7th Street.

Figure B-5 Northwest corner of Future NE Development looking Southeast

B1.4.1 Natural Gas

Avista Utilities will be responsible for providing natural gas to the proposed development. There are underground natural gas pipelines running along the northern property line along Cedar Ave. and Grelle Ave. The developer would be responsible for extension of the natural gas pipeline into airport property. The minimum depth below the ground surface for natural gas pipelines is 24". The developer would be responsible for backfilling the trench after extension has been completed using Figure 3.1 as reference. All steps must be approved by Avista, and all of their regulations followed, found in Avista's (Blue Book) "2014 Electric Service Requirements."

B1.4.2 Telephone

The Northeast Hangar Complex does not currently have telephone services. CenturyLink is the proprietor of all the telephone lines and service in the area. The nearest telephone line is located along Cedar Ave. and Grelle Ave. along the north side of airport property. Telephone could be extended south into airport property as development occurs. CenturyLink would complete the extension of the telephone lines for this process after arrangements have been made.

The developer would be required to trench, lay conduit, and backfill the trench. 2" diameter schedule 40 PVC pipe is the minimum size of conduit permitted for application. If the area would be experiencing future development, a larger conduit can be used to handle the increased demand. The conduit must be buried at a minimum depth of 30" below the ground surface; a 36" depth is ideal. CenturyLink would pull the cable through the conduit after the trench has been dug and backfilled, provided that adequate pull cable had been installed.

B1.4.3 Electricity

Avista Utilities will be providing electricity to the proposed Future NE Development Area. There are currently overhead power lines running along the north side of the airport property line. Electrical lines could be run southward from Cedar Ave. and Grelle Ave. underground into airport property. The developer would need to excavate and backfill the trench for Avista to install the lines. All Avista regulations and requirements must be followed, which can be found in Avista's (Blue Book) "2014 Electric Service Requirements." The developer would be responsible for obtaining all necessary permits for each of the tasks. Avista must approve and inspect the trench, conduit, and backfill.

B1.4.4 Potable Water

Lewiston Orchards Irrigation District (LOID) will be providing potable water services to the proposed Future NE Development Area. LOID provides potable water services as well as irrigation and fire suppression water to the Northeast Hangar complex. Irrigation/Fire suppression is provided through a gravity fed line from Mann's Lake. Potable water is provided through its own water line which is supplied by wells. This line would need to be exposed and accessed to provide potable water services to the new development area. The developer would be responsible for all materials, labor, and supplies necessary to complete the work. The developer would also be responsible for flushing and pressure testing the new water main.

A fire system will need to be designed with the development of buildings based on their use and size in square feet. A capacity analysis will have to be performed to verify that the lines will be able to handle the increased demand. If the lines cannot handle the demand, a redesign of the irrigation/fire water system will be necessary. At this time, it appears there is not adequate line size to accommodate the fire flow required for development on the site. There is a 4" PVC potable water line and a 4" steel or PVC irrigation water line bordering airport property along Cedar Avenue and Grelle Avenue.

B1.4.5 Sanitary Sewer

Lewiston Orchards Sewer District (LOSD) will be responsible for providing sanitary sewer services to the Future NE Development. LOSD already serves the northern part of the airport's facilities, so there are lines in close proximity to the development site. The developer would be responsible for excavating and trenching for all new sewer line necessary for the development, as well as all labor, materials, and supplies. Due to the topography of the site, a pressure sewer system may be required for part of the development. Any fees for connections or permits to complete the work would be the responsibility of the developer. All of LOSD's standards would need to be met and followed by the developer as work progresses, as well as any necessary requirements from the City of Lewiston.

The developer would be responsible for creating the final grade of the site, and paying the appropriate fees. The site would also have to be listed with the Underground Utilities Locate Center, with the developer knowing the exact desired tap location.

Figure B-6 Looking east at Future NE Development area inside airport fence

APPENDIX C

FAA TERMINAL AREA FORECAST COMPARISON

FAA FORECAST APPROVAL LETTER

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT

AIRPORT MASTER PLAN

ARMSTRONG

From:	Scott.Eaton@faa.gov
To:	John Rostas; Justin Pietz
Cc:	Gary.Gates@faa.gov
Subject:	Lewiston, ID Forecast Approval
Date:	Tuesday, April 22, 2014 7:57:36 AM

John,

The Helena ADO has reviewed the locally developed forecast for Lewiston-Nez Perce County Airport, Lewiston, Idaho, provided in the FY 2014 Master Plan. The FAA concurs that submitted comments by this office has been addressed in the revised chapter and the following forecasts, as submitted in the 2014 Lewiston-Nez Perce County Airport Master Plan, are approved:

Table 2-12 Forecast Summary

Year	Passengers Enplaned	Aircraft Operations: Air Carrier	Air Taxi	GA – Local	GA - Itinerant	Military	Total Ops	Based Aircraft
2013	64,725	1,817	3,997	13,875	14,717	813	35,219	145
2018	74,451	2,842	6,252	21,701	23,018	813	55,085	159
2023	86,309	3,003	6,605	22,930	24,321	813	58,203	168
2028	100,056	3,146	6,920	24,022	25,479	813	60,974	176
2033	115,993	3,289	7,235	25,114	26,638	813	63,746	184

Please call me if you have any questions.

Scott Eaton
Airport Planner
Federal Aviation Administration
Helena Airports District Office
PH: (406) 449-5291
FAX: (406) 449-5274

Template for Comparing Airport Planning and TAF Forecasts

AIRPORT NAME: LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Itinerant Operations				
Base yr.	2013	21,344	19,198	11.2%
Base yr. + 5yrs.	2018	32,925	19,725	66.9%
Base yr. + 10yrs.	2023	34,742	20,299	71.2%
Base yr. + 15yrs.	2028	36,358	20,919	73.8%
Base yr. + 20yrs.	2033	37,974	21,591	75.9%
Local Operations				
Base yr.	2013	13,875	9,284	49.5%
Base yr. + 5yrs.	2018	21,701	9,294	133.5%
Base yr. + 10yrs.	2023	22,930	9,304	146.5%
Base yr. + 15yrs.	2028	24,022	9,314	157.9%
Base yr. + 20yrs.	2033	25,114	9,324	169.3%
Total Operations				
Base yr.	2013	35,219	28,482	23.7%
Base yr. + 5yrs.	2018	55,085	29,019	89.8%
Base yr. + 10yrs.	2023	58,203	29,603	96.6%
Base yr. + 15yrs.	2028	60,974	30,233	101.7%
Base yr. + 20yrs.	2033	63,746	30,915	106.2%

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Total Enplanements				
Base yr.	2013	64,725	64,725	0.0%
Base yr. + 5yrs.	2018	74,451	74,473	0.0%
Base yr. + 10yrs.	2023	86,309	85,778	0.6%
Base yr. + 15yrs.	2028	100,056	98,882	1.2%
Base yr. + 20yrs.	2033	115,993	114,078	1.7%
Total Based Aircraft				
Base yr.	2013	145	146	-0.7%
Base yr. + 5yrs.	2018	159	153	3.9%
Base yr. + 10yrs.	2023	168	160	5.0%
Base yr. + 15yrs.	2028	176	165	6.7%
Base yr. + 20yrs.	2033	184	170	8.2%

NOTES: TAF data is on a U.S. Government fiscal year basis (October through September).
AF/TAF (% Difference) column has embedded formulas.

APPENDIX D

RUNWAY 12/30 JUSTIFICATION LETTER

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN

ARMSTRONG

Serco Management Services, Inc.

Lewiston Control Tower
426 Burrell Avenue
Lewiston, ID 83501
USA

T 208-743-1537
F 208-750-0572

serco

www.serco.com

July 16, 2014

Gary Gates, P.E.
Project Manager
Federal Aviation Administration
2725 Skyway Drive, Suite 2
Helena, MT 59602

Subject: Lewiston-Nez Perce County Regional Airport Runway 12/30

Mr. Gates:

I am writing you to express the integral role that runway 12/30 plays in the safety and operational efficiency at the Lewiston-Nez Perce County Regional Airport (LWS), Idaho. According to our observations, runway 12/30 is utilized for approximately 75 percent of operations at LWS throughout the year. Runway 12/30 is also supported by instrument approach procedures which enhance safety and utility for the operations at our airport. Operationally, runway 12/30 is better positioned to serve general aviation and medevac traffic due to the prevailing winds, close proximity and direct access to the existing aprons along the northern boundaries of the airport. In terms of safety considerations, runway 12/30 is used to accommodate the separation of slower general aviation traffic away from the commercial service and large corporate jet traffic utilizing runway 8/26. Runway 12/30 also serves operations during the closure periods and maintenance of runway 8/26.

It is for these critical reasons we strongly affirm the justification of runway 12/30 to serve LWS and the community which relies on our airport.

If you wish to discuss the importance of runway 12/30 in the safe and efficient operation at LWS, please feel free to contact us via phone at (208) 743-1537 or email at lws.tower@serco-na.com.

Sincerely,

Wendy Fredrickson
LWS Air Traffic Manager

APPENDIX E

ARFF STATION COST ESTIMATES

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN

Preliminary Cost Report
Project Name: City of Lewiston - Aircraft Rescue and Firefighting Station

CSHQA
200 Broad Street
Boise, ID 83702
208.343.4635

Model Type: Fire Station, Decorative Concrete Block / Steel Joists
Stories (Ea.): 1
Story Height (L.F.): 16/ 24 at bays
Floor Area (S.F.): 9987
Basement: Not Included

Location: Lewiston, ID
Data Release: Jan, 2015
Wage Rate: Davis Bacon
January 7, 2015

AIP Eligible = 5106 S.F. / Possible AIP Eligible = 1335 S.F. / City Portion only = 3546 S.F.		Unit	Unit Cost	AIP Eligible - 5106 X Unit Cost	Possible AIP Eligible - 1335 X Unit Cost	City Portion only - 3546 X Unit Cost	Total
A Substructure							
A1010	Standard Foundations	S.F.	$2.64	$13,479.84	$3,524.40	$9,361.44	$26,365.68
A1030	Slab on Grade	S.F.	$9.15	$46,719.90	$12,215.25	$32,445.90	$91,381.05
A2010	Foundation Excavation	S.F.	$0.65	$3,318.90	$867.75	$2,304.90	$6,491.55
A2020	Foundation Walls	S.F.	$4.01	$20,475.06	$5,353.35	$14,219.46	$40,047.87
B Shell							
B1020	Roof Construction	S.F.	$15.08	$76,998.48	$20,131.80	$53,473.68	$150,603.96
B2010	Exterior Walls	S.F.	$17.69	$90,325.14	$23,616.15	$62,728.74	$176,670.03
B2020	Exterior Windows	S.F.	$4.09	$20,883.54	$5,460.15	$14,503.14	$40,846.83
B2030	Exterior Doors	S.F.	$10.29	$52,540.74	$13,737.15	$36,488.34	$102,766.23
B3010	Roof Coverings	S.F.	$8.81	$44,983.86	$11,761.35	$31,240.26	$87,985.47
C Interiors							
C1010	Partitions	S.F.	$7.06	$36,048.36	$9,425.10	$25,034.76	$70,508.22
C1020	Interior Doors	S.F.	$3.23	$16,492.38	$4,312.05	$11,453.58	$32,258.01
C1030	Fittings	S.F.	$0.69	$3,523.14	$921.15	$2,446.74	$6,891.03
C2010	Wall Finishes	S.F.	$5.28	$26,959.68	$7,048.80	$18,722.88	$52,731.36
C2020	Floor Finishes	S.F.	$2.94	$15,011.64	$3,924.90	$10,425.24	$29,361.78
C2030	Ceiling Finishes	S.F.	$4.55	$23,232.30	$6,074.25	$16,134.30	$45,440.85
D Services							
D2010	Plumbing Fixtures	S.F.	$14.20	$72,505.20	$18,957.00	$50,353.20	$141,815.40
D2020	Domestic Water Distribution	S.F.	$3.40	$17,360.40	$4,539.00	$12,056.40	$33,955.80
D2040	Rain Water Drainage	S.F.	$1.15	$5,871.90	$1,535.25	$4,077.90	$11,485.05
D3050	Terminal & Package Units	S.F.	$36.20	$184,837.20	$48,327.00	$128,365.20	$361,529.40
D3060	Infloor Heating System - Bays only	S.F.	$22.50	$45,900.00	$11,700.00	$32,400.00	$90,000.00
D4010	Sprinklers	S.F.	$6.53	$33,342.18	$8,717.55	$23,155.38	$65,215.11
D4020	Standpipes	S.F.	$1.94	$9,905.64	$2,589.90	$6,879.24	$19,374.78
D5010	Electrical Service/Distribution	S.F.	$3.54	$18,075.24	$4,725.90	$12,552.84	$35,353.98
D5020	Lighting and Branch Wiring	S.F.	$8.68	$44,320.08	$11,587.80	$30,779.28	$86,687.16
D5030	Communications and Security	S.F.	$2.66	$13,581.96	$3,551.10	$9,432.36	$26,565.42

D5040	Generator system including 2000 gal underground storage tank	S.F.	$10.79	$55,093.74	$14,404.65	$38,261.34	$107,759.73
E1010	Food Service Equipment - commercial grade (note: square foot times unit cost calculation does not apply)	LS	$37,500.00	$19,125.00	$4,875.00	$13,500.00	$37,500.00
	SUB TOTAL			**$1,010,911.50**	**$263,883.75**	**$702,796.50**	**$1,977,591.75**
	GENERAL CONDITIONS (Overhead & Profit)			$252,727.88	$65,970.94	$175,699.13	$494,397.94
	DESIGN FEES - PRE DESIGN 2%			$20,218.23	$5,277.68	$14,055.93	$39,551.84
	DESIGN FEES - CONSTRUCTION DOCS			$60,654.69	$15,833.03	$42,167.79	$118,655.51
	DESIGN TEAM EXPENSES - $20,000			$10,200.00	$2,600.00	$7,200.00	$20,000.00
	GEOTECH - $10,000			$5,100.00	$1,300.00	$3,600.00	$10,000.00
	DEMO EXISTING BUILDINGS			Unknown	Unknown	Unknown	Unknown
	CONTINGENCY 20%			$271,962.46	$70,973.08	$189,103.87	$532,039.41
	TOTAL BUILDING COST			**$1,631,774.75**	**$425,838.47**	**$1,134,623.21**	$3,192,236.43

It is unknown at this time whether demo of existing buildings will be required. Demolition costs for an existing building are estimated to be $10.77 per cubic foot and haul & dump charges are estimated to be $12.41 per cubic foot.

The following design fees are included:
a. Geotechnical Investigation
b. Architectural
c. Structural
d. Mechanical
e. Electrical
f. Communications

ARMSTRONG CONSULTANTS, INC. (ACI)
861 ROOD AVE.
GRAND JCT., CO 81501

Lewiston-Nez Perce County Regional Airport
ARFF Civil Site **By: MDY @ ACI** **Revised: 5/21/2015**
Engineer's Conceptual Opinion of Probable Q&C Est.
PER: LWS ~ A.M.P. ARFF SITE LOCATION ALT - 1

NOTE #1: THIS PRORATED ENGINEER'S OPINION OF PROBABLE CONCEPTUAL CONSTRUCTION QTY & COST ESTIMATES ARE PER ACI'S A.M.P. DRAFT REPORT'S ARFF SITE ALT -
NOTE #2: This Estimate Represents 100% ARFF Cost Share of Civil Site Work: Including Access Roadways, Parking Lot, Utilities, Landscaping and Fencing Improvements.
NOTE #3: THE 2-17-15 & 5-18-15 ESTIMATE HAS BEEN CORRECTED IN RED ON 05-21-15 RE: LWS - ARFF BUILDING CIVIL SITE IMPROVEMENTS COST ESTIMATE FOR THE A.M.P. RPT.

ITEM	DESCRIPTION	QTY.	UNIT	UNIT PRICE	EXTENSION
	NOTE: CONCEPTUAL ESTIMATE ITEMS FOR UTILITY IMPROVEMENTS				
1	Mobilization For Off-Site & On-Site Civil Site & Utility Upgrades & Extensions	1	LS	$500,000.00	$500,000.00
2	On-Site & Off-Site Demolition	1	LS	$30,000.00	$30,000.00
3	On-Site Sanitary Sewer System Upgrades & Extension (SSMHs, 8"SS & 4"SS LAT)	1	LS	$50,000.00	$50,000.00
4	On-Site Domestic Water System Upgrades & Extension (8"WM, WVs, FH & Meter)	1	LS	$50,000.00	$50,000.00
5	On-Site Irrigation Water System Upgrades & Ext. (2"PIP, Valves, Pop-Ups & Pump)	1	LS	$20,000.00	$20,000.00
6	On-Site Storm Drainage System Upgrades & Ext. (18" RCP & SD Inlets w/ G & F)	1	LS	$100,000.00	$100,000.00
7	On-Site Electrical System Upgrades & Extension (Coordinate w/ Avista)	1	LS	$100,000.00	$100,000.00
8	On-Site Telecommunications Upgrades & Extension (Coordinate w/ Phone Company)	1	LS	$50,000.00	$50,000.00
9	On-Site Cable Television Upgrades & Extension (Coordinate w/ Cable Company)	1	LS	$20,000.00	$20,000.00
10	On-Site Landscaping Improvements (Coordinate Requirements w/ City of Lewiston)	1	LS	$50,000.00	$50,000.00
11	Off-Site Sanitary Sewer System Upgrades & Extension (SSMHs, 8"SS & 4"SS LAT)	1	LS	$100,000.00	$100,000.00
12	Off-Site Domestic Water System Upgrades & Extension (8"WM, WVs, FH & Meter)	1	LS	$500,000.00	$500,000.00
13	Off-Site Irrigation Water System Upgrades & Ext. (2"PIP, Valves, Pop-Ups & Pump)	1	LS	$50,000.00	$50,000.00
14	Off-Site Storm Drainage System Upgrades & Ext. (18" RCP & SD Inlets w/ G & F)	1	LS	$200,000.00	$200,000.00
15	Off-Site Electrical System Upgrades & Extension (Coordinate w/ Avista)	1	LS	$200,000.00	$200,000.00
16	Off-Site Telecommunications Upgrades & Extension (Coordinate w/ Phone Company)	1	LS	$100,000.00	$100,000.00
17	Off-Site Cable Television Upgrades & Extension (Coordinate w/ Cable Company)	1	LS	$50,000.00	$50,000.00
18	Off-Site Landscaping Improvements (Coordinate Requirements w/ City of Lewiston)	1	LS	$100,000.00	$100,000.00
				Const Cost Sub-Total	**$2,270,000.00**
	NOTE: CONCEPTUAL ESTIMATE ITEMS FOR ARFF ACCESS ROADWAYS & PARKING LOT IMPROVEMENTS				
11	2' Deep Cut Unclassified Excavation For ARFF Station Parking Lot (P. L.)	5,000	CY	$20.00	$100,000.00
12	12" Thick Subgrade Scarification, Preparation & Compaction / Parking Lot	6,400	SY	$5.00	$32,000.00
13	12" Thick Aggregate Sub-Base Course (Pulverized Asphalt Millings)/(P. L.)	6,400	SY	$8.00	$51,200.00
14	6" Thick Aggregate Base Course (Class 6) / Parking Lot	6,400	SY	$10.00	$64,000.00
15	6" Thick Aggregate Base Course (Class 6)/(Sidewalks, V-Pans, C & G)	400	SY	$10.00	$4,000.00
16	3" Thick Asphalt Pavement / Parking Lot	1,100	Ton	$150.00	$165,000.00
17	6" Thick Reinforced Concrete ARFF Apron Pads w/ #5 Rebar @ 12" O.C.E.W. T&B (50' Wide x 54' Long)	100	CY	$500.00	$50,000.00
18	Bituminous Material (PG 64 - 34) / Parking Lot	90	Ton	$1,000.00	$90,000.00
19	Pavement Marking / Parking Lot	1,000	S.F.	$1.00	$1,000.00
20	2' Wide Vertical Concrete Curb & Gutter	1,000	LF	$20.00	$20,000.00
21	4" Thick x 4' Wide Concrete Sidewalk	4,000	SF	$10.00	$40,000.00
22	8" Thick x 6' Wide Concrete Valley Pan w/ #4 Rebars @ 12" O.C.E.W.)	600	SF	$30.00	$18,000.00
23	8" Thick Concrete Return Fillets w/ #4 Rebars @ 12" O.C.E.W.)	4	EA	$1,000.00	$4,000.00
24	8" Thick Concrete Handi-Cap Access Ramp	4	EA	$2,000.00	$8,000.00
25	Adjust Manhole to Grade	2	EA	$1,000.00	$2,000.00
26	Adjust Clean Out to Grade	2	EA	$500.00	$1,000.00
27	Remove Existing Fence	400	LF	$5.00	$2,000.00
28	Install New 7-Foot Chain-Link Security Fence	1,000	LF	$20.00	$20,000.00
29	Install New 7-Foot Chain-Link Drive-Thru Electric Gate (24-Feet Wide)	2	EA	$30,000.00	$60,000.00
30	Miscellaneous Hydraulic Seeding and Mulching	1.0	Acre	$5,000.00	$5,000.00
				Const Cost Sub-Total	**$737,200.00**
		TOTAL Const Sub-Totals			**$3,007,200.00**

Consulting Fees	
Architectural LS Fees	$30,072.00
Environmental Fees	$15,036.00
Geotechnical Fees	$45,108.00
Surveying Fees	$60,144.00
Engineering Fees	$150,360.00
Const Adm & Inspec	$75,180.00
Total Consulting Fees	**$375,900.00**
Total 30% Contingency	**$1,014,930.00**
GRAND TOTAL	**$4,398,030.00**

NOTE: SEE CONCEPTUAL QUANTITY AND COST ESTIMATING PREPARATION NOTES BELOW:

1) This Conceptual Estimate Has Been Prepared Without An Architectural Site Plan (See Below).
2) Contingent Upon Note #1 Above, A Total Project Site Area of Two Acres Has Been Assumed.
3) Contingent Upon Note #1 Above, Minor Utility Upgrades & Extensions Have Been Assumed.
4) Contingent Upon Note #1 Above, Minimal Landscaping Improvements Have Been Assumed.
5) Contingent Upon Note #1 Above, Minimal On-Site Demolition Has Been Assumed.
6) This Conceptual Estimate Has Been Prepared Without Engineered Plans & Reports.

CAUTIONARY NOTE: This Engineer's Conceptual Construction Cost Estimate Includes A 30% Contingency On ALL Cost Items Listed Herein As Referenced Above.

67% of GRAND TOTAL	**$2,946,680.10**
33% of GRAND TOTAL	**$1,451,349.90**

ARMSTRONG CONSULTANTS, INC. (ACI)
861 ROOD AVE.
GRAND JCT., CO 81501

Lewiston-Nez Perce County Regional Airport
ARFF Civil Site Work By: MDY @ ACI 1/13/2015
Engineer's Preliminary Opinion of Probable Qty & Cost Est.
LWS - ARFF Civil Site ALT-3B Conceptual Cost Estimate

NOTE: THIS PRELIMINARY OPINION OF PROBABLE CONSTRUCTION QTY & COST ESTIMATES ARE PER ACI'S FUTURE ARFF ACCESS ROAD PLAN DATED 11/2014 AS OF 01/13/15.

CIVIL IMPROVEMENTS: TO CONSTRUCT PARKING LOT AND FUTURE ARFF ACCESS ROAD TO CONNECT TO RUNWAY 12/30.

ENGINEER'S ESTIMATE

ITEM	DESCRIPTION	QTY.	UNIT	UNIT PRICE	EXTENSION
	NOTE: PRELIMINARY ESTIMATE ITEMS FOR PARKING LOT PROJECT & UTILITY IMPROVEMENTS				
1	Mobilization	1	LS	$50,000.00	$50,000.00
2	On-Site Demolition	1	LS	$5,000.00	$5,000.00
3	Sanitary Sewer System Upgrades & Extension (SSMHs, 8"SS & 4"SS LAT)	1	LS	$10,000.00	$10,000.00
4	Domestic Water System Upgrades & Extension (8"WM, WVs, FH & Meter)	1	LS	$15,000.00	$15,000.00
5	Irrigation Water System Upgrades & Ext. (2"PIP, Valves, Pop-Ups & Pump)	1	LS	$5,000.00	$5,000.00
6	Storm Drainage System Upgrades & Ext. (18" RCP & SD Inlets w/ G & F)	1	LS	$20,000.00	$20,000.00
7	Electrical System Upgrades & Extension (Coordinate w/ Avista)	1	LS	$20,000.00	$20,000.00
8	Telecommunications Upgrades & Extension (Coordinate w/ Phone Company)	1	LS	$10,000.00	$10,000.00
9	Cable Television Upgrades & Extension (Coordinate w/ Cable Company)	1	LS	$5,000.00	$5,000.00
10	Landscaping Improvements (Coordinate Requirements w/ City of Lewiston)	1	LS	$10,000.00	$10,000.00
	NOTE: PRELIMINARY ESTIMATE ITEMS FOR PARKING LOT IMPROVEMENTS				
11	2' Deep Cut Unclassified Excavation For ARFF Station Parking Lot (P. L.)	2,500	CY	$20.00	$50,000.00
12	12" Thick Subgrade Scarification, Preparation & Compaction / Parking Lot	3,200	SY	$5.00	$16,000.00
13	12" Thick Aggregate Sub-Base Course (Pulverized Asphalt Millings)/(P. L.)	3,200	SY	$8.00	$25,600.00
14	6" Thick Aggregate Base Course (Class 6) / Parking Lot	3,200	SY	$10.00	$32,000.00
15	6" Thick Aggregate Base Course (Class 6)/(Sidewalks, V-Pans, C & G)	200	SY	$10.00	$2,000.00
16	3" Thick Asphalt Pavement / Parking Lot	550	Ton	$150.00	$82,500.00
17	Bituminous Material (PG 64 - 34) / Parking Lot	40	Ton	$1,000.00	$40,000.00
18	Pavement Marking / Parking Lot	500	S.F.	$1.00	$500.00
19	2' Wide Vertical Concrete Curb & Gutter	500	LF	$20.00	$10,000.00
20	4" Thick x 4' Wide Concrete Sidewalk	2,000	SF	$10.00	$20,000.00
21	8" Thick x 6' Wide Concrete Valley Pan w/ #4 Rebars @ 12" O.C.E.W.)	300	SF	$30.00	$9,000.00
22	8" Thick Concrete Return Fillets w/ #4 Rebars @ 12" O.C.E.W.)	2	EA	$1,000.00	$2,000.00
23	8" Thick Concrete Handi-Cap Access Ramp	2	EA	$2,000.00	$4,000.00
24	Adjust Manhole to Grade	1	EA	$1,000.00	$1,000.00
25	Adjust Clean Out to Grade	1	EA	$500.00	$500.00
26	Remove Existing Fence	200	LF	$5.00	$1,000.00
27	Install New 7-Foot Chain-Link Security Fence	500	LF	$20.00	$10,000.00
28	Install New 7-Foot Chain-Link Drive-Thru Electric Gate (24-Feet Wide)	1	EA	$30,000.00	$30,000.00
29	Miscellaneous Hydraulic Seeding and Mulching	0.1	Acre	$5,000.00	$500.00
				Const Cost Sub-Total	**$486,600.00**
				Geotechnical Fees	$10,000.00
				Surveying Fees	$20,000.00
				Engineering Fees	$50,000.00
				Const Adm & Inspec	$25,000.00
				GRAND TOTAL	**$591,600.00**
				GRAND TOTAL + 30%	**$769,080.00**

NOTE: SEE PRELIMINARY QUANTITY AND COST ESTIMATING PREPARATION NOTES BELOW:

1) This Preliminary Estimate Has Been Prepared Without An Architectural Site Plan (See Below).
2) Contingent Upon Note #1 Above, A Total Project Site Area of One Acre Has Been Assumed.
3) Contingent Upon Note #1 Above, Minor Utility Upgrades & Extensions Have Been Assumed.
4) Contingent Upon Note #1 Above, Minimal Landscaping Improvements Have Been Assumed.
5) Contingent Upon Note #1 Above, Minimal On-Site Demolition Has Been Assumed.
6) This Preliminary Estimate Has Been Prepared Without Engineered Plans & Reports.

APPENDIX F

TAC MEETING SUMMARIES

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN

LEWISTON - NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN UPDATE

PLANNING ADVISORY COMMITTEE KICKOFF MEETING

October 16, 2013
5:45 P.M. – 6:45 P.M.
Lewiston - Nez Perce County Regional Airport Conference Room

MEETING SUMMARY

Purpose: Present the Airport Master Planning process to the Lewiston - Nez Perce County Regional Airport Technical Advisory Committee and garner feedback pertaining to the schedule, process, and expected deliverables.

Attendees:
Justin Pietz, ACI
Robin Turner, A.A.E., Airport Manager
William McCann, Airport Board
Pat Nuxoll, Airport Board
Doug Zenner, Nez Perce County Commissioner
Ron Gustin, Gustin Aviation
DeAnn Scrabeck, Friends of the Airport
Greg Reed, Private Pilot
John Rostas, ACI
Stillman Norton, Keller Associates
Verl Long, Airport Board
Bob Tippett, Nez Perce County Commissioner
Felicia Nando, Horizon Air
Ralph Stout, Stout Flying Service
Doug Black, Friends of the Airport
Member of Lewiston City Council

A Technical Advisory Committee (TAC) kickoff meeting was held on October 16, 2013 to present the Airport Master Planning (AMP) process to the TAC. Attendance at the meeting comprised of fifteen individuals, including representatives from Airport Management, Lewiston - Nez Perce County Regional Airport Board, Nez Perce County Commissioners, Lewiston City Council, Horizon Air, Stout Flying Service, Gustin Aviation, private citizens, Keller Associates and Armstrong Consultants, Inc (ACI).

ACI presented the AMP process and the elements involved with the plan. The importance of the TAC was emphasized, with input from the community. Working Paper #1 was described, which includes inventory and forecast chapters.

Following Working Paper #1, the next phase of the AMP is the facility requirements chapter which will evaluate future development requirements to sustain forecasted demand. The next TAC meeting will be held after Working Paper #2 is distributed for review by the TAC, Federal Aviation Administration (FAA) and Idaho Transportation Department (ITD). The FAA and ITD will be invited to attend the next TAC meeting to ensure agency support of selected alternatives.

The technical aspects of the AMP were discussed by ACI. Design standards, types of aircraft, approach categories and design dimensions were explained. The FAA generally requires 250 takeoffs and 250 landings per year of the aircraft within a particular group in order to assign the Runway Design Code (RDC). The current RDC for Runway 8-26 is C-III and the types of aircraft up to and including that category were discussed, which include single-engine piston, multi-engine piston, turbo-prop, turbo-jet and commercial airliner aircraft. Runway 12-30 is RDC B-II and the type of aircraft that fall into the category include single-engine piston, multi-engine piston, turbo-prop, and turbo-jet aircraft. The Airport Reference Code (ARC) is the highest RDC available, which is C-III. The airport configuration, existing facilities and instrument approach minimums were also discussed.

ACI presented the published existing and forecasted activity levels for the airport which included based aircraft and operations. ACI explained that due to the availability of air traffic control tower services and reliable airport management, the existing based aircraft and operation figures are regarded to be accurate. Further discussion included the differences between the FAA Terminal Area Forecast and

Idaho State Airport System Plan Forecast figures and how ACI has factored the data into the proposed AMP forecast.

Planning considerations were further discussed, specifically aviation demand. ACI stated the importance of the Airport Layout Plan (ALP) and the need to be realistic about future development. The ALP drawing set depicts the existing and future layout of the airport from several different viewpoints. The drawings include the ALP sheet showing the overall airport configuration and FAA imaginary surfaces surrounding the runway. The terminal area drawing details existing and future landside development. The airspace drawing illustrates FAR Part 77 surfaces, with the inner approach drawings showing objects at the end of the runway. Finally, the airport Exhibit A property map illustrates existing and future airport property. The FAA requires future capital improvement projects to be shown on the ALP in order to be eligible for FAA grant funding.

The South Side Apron development was discussed. ACI discussed the importance the development will have by allowing prospective aeronautical and non-aeronautical revenue enhancements to occur at the airport. ACI further discussed their active involvement in the cost estimation and planning of the prospective facilities.

The importance of public involvement with the AMP was discussed. The Airport Board and TAC are an important way to incorporate public involvement. ACI discussed the administration of user surveys and tenant discussions to aid in obtaining public input. Potential venues for public involvement were discussed as well as appropriate public notice methods including local paper, local internet webpages and open house events. The public involvement process will include education to the public on airport funding, improvements and impacts. ACI asked the TAC which method they would prefer for public involvement. The method will be discussed by the TAC for further consideration.

ACI presented the next step for AMP which will be to distribute Working Paper #1 to the TAC, State and FAA. When the first working paper is complete, ACI will begin formulating the facility requirements (Chapter 3). This information will later be distributed in the form of Working Paper #2 to participating parties for review and comment. Working Paper #3, Alternatives Analysis, will be compiled upon the completion and review of Working Paper #2. After the dissemination and review of the third working paper by the TAC, FAA and ITD, a meeting will be held to discuss and present the information and receive input based on the future layout and configuration.

Upon the conclusion of the presentation, members of the Airport Board and TAC asked questions of the Master Planning Process to ACI. A question was asked regarding how frequently ACI will report to the FAA regarding the AMP. ACI stated they keep in frequent communication with the FAA by providing updates of the report progress. ACI went on to state the forecast figures will need FAA approval before it can be allowed in the AMP and explained the FAA's forecast approval process. A question was asked on what input is received from the State for the AMP. ACI stated the ITD will be included on all review of documents for input and correspondence coordination. A question was asked if ACI would be willing to attend a city council meeting to further explain the AMP process. ACI stated they can attend the meetings and would be happy to educate the public on the planning process, in particular noise and environmental considerations which generally affect non-users of the airport. The Airport Board Chairman advised ACI on the importance of communicating with TAC members as the selected members possess valuable involvement and experience at the airport. ACI affirmed they will coordinate with each specific TAC member and welcomes all TAC input to create a stronger report.

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN UPDATE

TECHNICAL ADVISORY COMMITTEE DEVELOPMENT ALTERNATIVES MEETING

August 19, 2014
5:30 P.M. – 7:45 P.M.
Lewiston-Nez Perce County Regional Airport Second Floor Conference Room

MEETING SUMMARY

Purpose: Present the Development Alternatives to the Lewiston-Nez Perce County Regional Airport Technical Advisory Committee and garner feedback pertaining to development to be carried forward onto the Airport Layout Plan.

Attendees:
Bruce MacLachlan, A.A.E., Airport Manager
Ralph Stout, Stout Flying Service
Shannon Grow, Lewiston MPO
Leroy Chausse, Friends of the Airport
Tye Harper, Lewiston-Nez Perce Regional Airport
Dennis Corsi, ACI
John Rostas, ACI
Wendy Fredrickson, Serco N.A.
Karen L. Davis, Citizen
DeAnn Scrabeck, Friends of the Airport
Doug Black, Friends of the Airport
Stillman Norton, Keller Associates
Justin Pietz, ACI

A Technical Advisory Committee (TAC) meeting was held on August 19, 2014 to present the Development Alternatives to the TAC. Attendance at the meeting comprised of thirteen individuals, including representatives from Airport Management, Lewiston-Nez Perce County Regional Airport staff, Lewiston-Nez Perce County Regional Airport Air Traffic Control Tower, Friends of the Lewiston-Nez Perce County Regional Airport, private citizens, Keller Associates and Armstrong Consultants, Inc (ACI).

ACI presented the meeting agenda followed by a brief project overview with updates on the status and schedule of the Airport Master Plan (AMP). ACI described the tasks completed to date which included the Inventory, Forecasts of Aviation Activity, Facility Requirements and Development Alternatives. ACI noted the importance of this meeting in determining the recommended development to carry forward into the ALP drawing set.

ACI began describing the airside development alternatives which were evaluated for the AMP. The airside development alternatives included mitigation of the Runway 8/26 line of sight deficiency, correction to non-standard geometries, construction of helicopter parking pads and the construction of an airport perimeter road.

The six alternatives for the mitigation of the Runway 8/26 line of sight deficiency were presented to the TAC. Numerous questions were raised regarding the alternatives proposed. Concerns were primarily raised towards the potential impacts to Runway 12/30, closure time associated with correcting the grades for Runway 8/26 and the overall cost associated with each alternative. The TAC further expressed the importance of Runway 12/30 to the operation and safety at Lewiston-Nez Perce County Regional Airport. Runway 12/30 has been noted to be utilized by approximately 75 percent of all air traffic at the airport and provides the shortest distance to the aircraft parking aprons. The TAC preference for this alternative are to request the FAA to leave the configuration “as-is” with the no-action alternative. The possibility of having a 24-hour air traffic control tower was discussed as the TAC’s second ranked preference. The TAC’s third ranked preference would be Alternative 1 with no reconfiguration of Runway 12/30 or associated taxiways.

The advantages and disadvantages for each alternative were discussed in detail. The TAC expressed that correction of the line of sight deficiency on Runway 8/26 is a low priority to the Lewiston-Nez Perce County Regional Airport and noted that other enhancements to safety, such as the installation of a taxiway lighting system, were of far greater importance. The TAC also indicated that the development of a full-length parallel taxiway on the north side of Runway 8/26 would not be utilized based on existing taxiway and airfield configuration. Runway 8/26 is currently served by taxiways on both runway ends to and from the aircraft parking aprons which provide aircraft circulation. There are no back taxi operations that take place on Runway 8/26. The purpose of a full-length parallel taxiway is to reduce the risk associated with two aircraft on the active runway at the same time. Air traffic control management stated that installation of a full-length parallel taxiway would not provide optimal paths for aircraft transitioning from Runway 8/26 to the aircraft parking aprons and would be utilized on a very limited basis. ACI concurred to further discussion with the FAA regarding Runway 8/26 line of sight deficiencies.

ACI further discussed the correction of non-standard geometries to the taxiway system in the vicinity of the commercial service and north general aviation aprons. The FAA design standards do not permit “straight-through” access from an apron to a runway crossing a parallel taxiway. The FAA priority is to reduce the potential for runway incursions. Therefore, the augmentation of taxiway geometries has been identified to increase situational awareness by requiring aircraft to make a turn prior to entering a runway. ACI stated that several taxiways provide this “straight-through” access from the apron to Runway 12/30 including Taxiways D, F, K and G. A question was raised by the TAC regarding the timeline of implementation of the aforementioned standard. ACI stated that this reconfiguration of taxiways would occur at the end of the useful life of the existing pavements. Additionally, the commercial service and north general aviation apron centerline is recommended to be relocated south towards Runway 12/30 to provide adequate taxilane object free area with the future design aircraft. ACI also recommended the construction of concrete helicopter parking pads adjacent to the existing north general aviation apron to accommodate forecasted helicopter operations.

A discussion of landside development alternatives included the passenger terminal building, vehicle access and parking, uses of the south apron area, non-aeronautical revenue generation possibilities, north landside development, the Aircraft Rescue and Firefighting station and airport perimeter road.

ACI presented the alternatives for the expansion and reconfiguration of the passenger terminal building. Alternative 1 would include the expansion of the first-floor of the existing passenger terminal building to the west with the additional construction of a covered pier walkway for an increased gate area. This alternative is estimated to cost $2,200,000. As part of Alternative 1, options were considered to utilize the unused second floor of the existing passenger terminal building. However, it was considered impractical based on the configuration of the building. The existing and future needs for the terminal building include increased passenger screening, gate access, baggage claim and passenger circulation, for which the second floor is not conducive to accommodate these needs.

Passenger Terminal Building Alternative 2 would include the construction of a new facility along the south portion of the airport property. The estimated cost of the structure is $21,500,000 which does not include upgrades or expansions to the associated aircraft parking apron, access road or vehicle parking structure. Although this alternative would meet forecasted needs, segregate commercial service operations from general aviation, would allow for the redevelopment of the existing passenger terminal building and parking lot for expanded general aviation use and provide a new facility, it was not considered to be financially feasible or practicable. Concerns raised regarding Alternative 2 were primarily directed towards the inadequacy of the automobile access to the proposed location and the high development costs.

The TAC preferred the expansion and reconfiguration of the existing passenger terminal building (Alternative 1). The driving factors for this decision included the associated costs and the justification and inaccessibility of Alternative 2.

ACI further discussed the alternatives for vehicle parking and access. Alternative 1 would add one extra lane to the passenger terminal building’s curbside drop-off/pick-up area. This alternative would increase vehicle circulation but reduce the amount of vehicle parking adjacent to the terminal building. Alternative 2 would include the construction of an overflow parking lot and “cell-phone” lot adjacent to the existing baseball field. Alternative 2 would also incorporate the eventual redevelopment of the baseball field to accommodate non-aeronautical revenue generation land uses such as retail, hotel and/or restaurant. It is assumed that Alternative 2 would not occur until the planned relocation of the baseball field is completed by the City. Alternative 2 results in increased walking distance to the passenger terminal building. Alternative 3 was also presented which included the development of a multi-level vehicle parking structure within the boundaries of the existing parking lot. While Alternative 3 provides shorter walking distance to the terminal building and protection for post-planning development, the cost associated with the construction of the structure is substantially greater than Alternative 2. The TAC selected Alternative 2 as their preferred vehicle parking and access development plan.

ACI discussed land use within the south boundary of the airport property. ACI presented a flexible layout to accommodate future general aviation expansion, air cargo operations, an air tanker base and an Unmanned Aerial Systems/Vehicles area. The purpose of the flexible layout was designed to illustrate the area's ability to accommodate these future uses. The TAC expressed the area's inability to accommodate future vehicular traffic. All development along the southside assumes that roadway improvements would occur. There was additional discussion regarding the potential uses of the south apron area, but for planning purposes, the TAC supported the overall layout shown.

ACI then presented alternatives to provide the recommended facility size for the Aircraft Rescue and Firefighting Station. Alternatives 1 and 2 both included the construction of a replacement ARFF/Municipal Fire Station in new locations along the eastern boundary of the airport property. Alternative 3A and 3B included either the reconfiguration of the existing structure or construction of a new facility at the existing location. The costs associated with each alternative were presented. The largest difference in cost was related to utility and infrastructure development. The TAC preferred a modification to Alternative 3A, in which the existing structure is expanded and reconfigured to the south, rather than the east as shown in the Development Alternatives Chapter. Additional layout configuration of this alternative will be included in the Draft Master Plan Report.

Additionally, the Airport Manager requested further evaluation of the airport perimeter road to be included in the Draft Report. Options for the perimeter road will be completed and coordinated with the Airport Manager prior to completion of the Draft ALP and Draft Report. Following the discussion of the alternatives, ACI detailed the next steps of the AMP process which include carrying forward the recommended development into the ALP drawing set, the completion of the Environmental and Capital Improvement Plan Chapters and distributing the Draft Report to the Airport Sponsor, TAC and FAA.

APPENDIX G

GEOTECHNICAL SURVEY REPORT

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN

ARMSTRONG

GEOTECHNICAL ENGINEERING EVALUATION
PROPOSED RUNWAY 8/26 REHABILITATION
LEWISTON-NEZ PERCE COUNTY AIRPORT
406 BURRELL AVENUE
LEWISTON, IDAHO
ALLWEST PROJECT NO. 313-218G

January 22, 2014

Prepared for:

Armstrong Consultants, Inc.
861 Rood Avenue
Grand Junction, Colorado 81501

Prepared By:

ALLWEST Testing & Engineering, LLC
2705 E. Main Street
Lewiston, Idaho 83501

WWW.ALLWESTTESTING.COM

January 22, 2014

Armstrong Consultants, Inc.
861 Rood Avenue
Grand Junction, Colorado 81501

Attention: Mr. Scott Woodrow, Field Engineering Supervisor

RE: Geotechnical Engineering Evaluation
Lewiston-Nez Perce County Airport Runway 8/26 Rehabilitation
406 Burrell Avenue
Lewiston, Idaho
ALLWEST Project No.: 313-218G

Dear Mr. Woodrow,

ALLWEST Testing & Engineering, LLC (ALLWEST) has completed the authorized geotechnical engineering evaluation for the proposed runway rehabilitation for the Lewiston-Nez Perce County Airport located at 406 Burrell Avenue in Lewiston, Idaho. The purpose of this evaluation was to characterize the soil and geologic conditions at the site. The attached report presents the results of the field evaluation and our recommendations to assist with design and construction of the proposed improvements.

We appreciate the opportunity to work with you on this project. If you have any questions or need additional information, please do not hesitate to call us at (208) 743-5710.

Sincerely,

ALLWEST Testing & Engineering, LLC

Prepared by:

PROFESSIONAL ENGINEER
LICENSED
1-22-14
15220
STATE OF IDAHO
SHAWN TURPIN

Shawn Turpin, P.E
Senior Geotechnical Engineer

Reviewed by:

Colin J. Meehan, P.E
Hayden Area Manager

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Geotechnical Engineering Evaluation
Lewiston-Nez Perce County Airport Runway 8/26 Rehabilitation
406 Burrell Avenue
Lewiston, Idaho

ALLWEST Testing & Engineering, LLC (ALLWEST) has completed the authorized geotechnical engineering evaluation for the proposed runway and apron rehabilitation for the Lewiston-Nez Perce County Airport located in Lewiston, Idaho. The general location of the project is shown on the Vicinity Map, Figure A-1, in Appendix A of this report. The purpose of the evaluation was to assess the subsurface soil conditions at the site with respect to the proposed construction. This report details the results of the field evaluation and laboratory testing and presents our recommendations to assist the design and construction of the proposed runway and apron rehabilitation or reconstruction.

1.0 SCOPE OF SERVICES

To complete the geotechnical engineering evaluation we accomplished the following scope of work:

1) Reviewed soil and geologic mapping and aerial photographs of the site and surrounding area.

2) Completed a site reconnaissance by walking the property and observing exposed soil conditions, vegetation, surface drainage and erosion features.

3) Drilled at total of 22 borings along the runway; five (5) borings in the apron area; and 12 borings in suspected landfill areas. The total number of borings along the runway was reduced by 12 by the client due to the condition of the existing pavement and rate of drilling. The borings were drilled with a truck mounted drill rig equipped with hollow-stem augers to depths ranging from approximately 3½ to 19 feet below the existing grade. The subsurface profiles were logged by the field engineer at the time of drilling.

   Disturbed standard Penetration Test (SPT) or relatively undisturbed Modified California drive samples were generally obtained at approximate depths of 1, 2½, 4 and 10 feet. The borings in suspected landfill were not sampled at the request of the client.

   The borings were backfilled with cuttings and/or bentonite after drilling. Borings in pavement areas were completed with concrete or cold patch asphalt. The areas around the boring locations were thoroughly cleaned at the time of backfilling and completion.

4) Performed laboratory tests on select soil samples to assess the soil and asphalt properties and characteristics. Laboratory testing included in-place moisture content, in-place dry density, gradation (sieve analysis), Atterberg Limits, water soluble sulfates, one-dimensional consolidation/collapse, moisture-density relationship (modified Proctor), and California Bearing Ratio (CBR).

5) Reviewed the results of the field evaluation and laboratory testing with respect to the proposed construction.

6) Performed engineering analyses and provided findings/recommendations for:
   a) Subsurface profile and soil characteristics
   b) Site preparation and earthwork (construction methods, excavation, fill materials and placement, wet weather construction, utility trench backfill and subgrade stabilization)
   c) Drainage
   d) Construction monitoring.

7) Prepared this report.

Our services were provided in general accordance with our proposal number P313-127 dated October 25, 2013 and request for additional services dated November 21, 2013.

2.0 PROJECT DESCRIPTION

We understand the existing apron and runway 8/26 will be rehabilitated or reconstructed. We anticipate the proposed rehabilitation or reconstruction will likely match the existing grades for the runway and apron.

3.0 EVALUATION PROCEDURES

To complete this evaluation, we drilled a total of 37 borings. The borings were drilled with a truck mounted drill rig equipped with hollow-stem augers. The boring locations were selected by Armstrong Consultants, Inc. The runway and apron boring locations were determined with a measuring wheel. The suspected landfill boring locations were determined by terrain association.

4.0 SITE CONDITIONS

The project is located in Sections 13 and 18, Township 35 North, and Range 5 West of the Boise Meridian. The project area includes an existing apron and runway paved with asphalt.

4.1 General Geologic Conditions

The project site is mapped on the "Surficial Geologic Map of the Lewiston Orchards South Quadrangle and Part of the Clarkston Quadrangle, Nez Perce County, Idaho", prepared Othberg, et al (2003), as fill and loess (wind-blown silt) underlain by duripan (caliche). The geologic mapping is shown in the following figure.

4.2 General Soil Conditions

The USDA Soil Conservation Service (SCS) (currently the USDA Natural Resources Conservation Service) has mapped the soil on the majority of the site as Chard-Urban land complex (unit 30) and Oliphant silt loam (unit 100). The Chard-Urban land complex unit consists of loess and/or loamy alluvium. The Oliphant silt loam unit consists of loess and colluvium derived from basalt. The SCS mapping is shown in the following figure.

The soils encountered in the borings are generally consistent with the SCS and geologic mapping.

4.3 Hydrogeologic Conditions

Site-specific groundwater reports were not identified for this project area. The wells in the area have reported a static water level on the order of 100 feet below the existing ground surface. We did not encounter groundwater, except for boring RB-2, or surface water during our site evaluation of the property. Perched groundwater was observed on the bedrock in boring RB-2 at an approximate depth of 13 feet. Changes in precipitation, irrigation, construction or other factors may impact depth to groundwater on the property.

The project site is underlain by the Lewiston Basin aquifer. The Lewiston Basin aquifer is a fractured basalt aquifer. Groundwater in fractured basalt is transmitted through fractures in the basalt and thin layers of sediment which are present between basalt layers.

5.0 EXPLORATION AND SAMPLING

The borings were drilled with a truck mounted drill rig equipped with hollow-stem augers. The borings were drilled at the approximate locations shown on the Boring Location Map, Figure A-2, in Appendix A of this report. The drilling locations were selected by Armstrong Consultants, Inc. and located in the field by use of a measuring wheel (runway and apron) or terrain association (landfill).

The soil conditions observed in the borings were visually described and classified in general accordance with ASTM D 2487 and D 2488 and the subsurface profiles were logged. Disturbed Standard Penetration Test (SPT) split spoon samples, relatively undisturbed Modified California samples, and disturbed bulk samples were obtained from the runway and apron borings for laboratory testing. The landfill borings were not sampled at the request of the client. The borings were backfilled with drill spoils and/or bentonite and completed with concrete or cold patch asphalt.

5.1 Subsurface Soil Conditions

The subsurface profile observed in the borings drilled in paved areas generally consisted of asphalt concrete underlain by base course. The base course was underlain by fill and/or interbedded layers of silt, silty sand and silty gravel with sand. Detailed logs of the subsurface conditions observed in the borings are provided in Appendix B.

A summary of the observed materials and section thicknesses for the borings drilled in pavement areas are provided in the following table.

Boring No.	Section Thickness		Subgrade
	Asphalt (in.)	Base (in.)	
RB-1	NA	NA	Fill; silty gravel with sand (GM)
RB-2	6	18	Subbase; basalt cap rock (GP)
RB-3	5 ¾	30	Sandy silt with gravel (ML)
RB-4	6 ½	34	Silty sand with gravel (SM)
RB-5	6 ½	30	Clayey gravel with sand (GC)
RB-6	7	23	Silty gravel with sand (GM)
RB-7	7 ½	29	Silty gravel with sand (GM)
RB-8	6 ¾	29	Silty gravel with sand (GM)
RB-9	7 ¼	29	Silty clayey gravel with sand (GC-GM)
RB-10	6 ¾	32	Silty gravel with sand (GM)
RB-11	6 ½	30	Silty gravel with sand (GM)
RB-12	7	32	Silty gravel with sand (GM)
RB-13	7	29	Silty gravel with sand (GM)
RB-14	7 ¼	29	Silty gravel with sand (GM)
RB-15	7	29	Silty gravel with sand (GM)
RB-16	6 ¾	26	Silty gravel with sand (GM)
RB-17	6 ¾	26	Silty clayey gravel with sand (GC-GM)
RB-18	7	26	Poorly graded gravel with silt and sand (GP-GM)
RB-19	6 ¾	32	Silty gravel with sand (GM)
RB-20	7	23	Clayey sand with gravel (SC)
RB-21	7 ½	26	Silty gravel with sand (GM)
RB-22	NA	18	Silt with sand (ML)
AB-1	4 ¾	None	Silt with sand (ML)
AB-2	8	10	Silt with sand (ML)
AB-3	4 ½	8	Silt with sand (ML)
AB-4	5	19	Silt with sand (ML)
AB-5	5 ¼	13	Silt with sand (ML)

The subsurface profile observed in the borings drilled in suspected landfill areas, except LB-9, LB-11 and LB-12 generally consisted of topsoil underlain by fill. The fill was underlain by silty to clayey gravel or basalt. The fill generally consisted of silty to clayey gravel with sand and varied amounts of debris. Fill was not observed in borings LB-9, LB-11 and LB-12. The subsurface profile observed in borings LB-9, LB-11 and LB-12 generally consisted of silty gravel with sand with occasional interbedded layers of silty sand and silt with sand. The approximate fill thicknesses observed in the borings drilled in suspect landfill areas are summarized in the following table.

Boring No.	**Approximate Fill Thickness (feet)**	**Boring No.**	**Approximate Fill Thickness (feet)**
LB-1	10 ½	LB-7	11
LB-2	<19	LB-8	11
LB-3	12	LB-9	None observed
LB-4	<14 ½	LB-10	13 ½
LB-5	<19	LB-11	None observed
LB-6	12 ½	LB-12	None observed

5.2 Subsurface Water

Perched groundwater was observed in boring RB-2 at the time of drilling. The water appeared to be perched on the underlying bedrock at a depth of approximately 13 feet. Subsurface water was not observed in the other borings at the time of drilling. Changes in precipitation, irrigation, construction or other factors may impact the depth to groundwater on the property. Fluctuations in the presence of groundwater or the groundwater level should be expected.

Detailed descriptions of the soil observed in the borings are presented on the Boring Logs in Appendix B of this report. The descriptive soil terms used on the boring logs and in this report can be referenced by the Unified Soil Classification System (USCS). A copy of the USCS is included in Appendix B. The subsurface conditions may vary between boring locations. Such changes in conditions would not be apparent until construction. **If the subsurface conditions do change from those observed in the boring locations, the construction timing, plans and costs may change.**

6.0 LABORATORY TESTING

Laboratory testing was performed to supplement field classifications and to assess some of the soil engineering parameters. The laboratory tests conducted included water content (ASTM D2216), particle-size analysis (ASTM C117, C136 and D422), Atterberg Limits (ASTM D4318), one-dimensional consolidation/collapse (ASTM D4546 and D2435), moisture-density relationship (ASTM D1557), California Bearing Ratio (ASTM D1883) and water soluble sulfates (EPA Method 300.0). The laboratory test results are presented in Appendix C. The laboratory testing, except for water soluble sulfates, was performed by ALLWEST. The water soluble sulfate testing was performed by Anatek Labs, Inc.

6.1 Water Content and Dry Density

The in-place water content and dry density test results are summarized in the following table. The silt soils contain varied amounts of sand and gravel. The sand and gravel soils contain varied amounts of silt and clay.

Soil Type	Water Content (%)	Dry Density (pcf)
Lean clay	17	-
Silt	5 - 23	81 - 126
Sand	4 - 18	92 - 122
Gravel	3 - 22	87 - 135
Base course	1 - 20	104 - 138

The in-place water content of the subsurface soils in the apron area are generally greater than the in-place water contents of the subsurface soils in the runway. The lower measured densities for the gravel and base course are likely the result of disturbance during sampling.

6.2 Particle-size Analysis

A summary of the test results is provided in the following table. The 200 wash gradations (ASTM C117) were screened through the No. 4 sieve to provide additional information for sample classification.

Soil Type	Gravel (%)	Silt/Clay (%)	Finer than 0.02 mm (%)
Lean clay	3 - 16	65.4 – 73.5	-
Silt	0 – 41	50.4 – 82.5	-
Sand	3 - 37	17.8 – 49.3	-
Gravel	27 - 61	3.5 – 47.0	-
Base Course	20 - 67	1.7 – 13.8	1.5 - 4.6

The sieve analysis test results for the base course samples obtained at an approximate depth of one (1) foot in borings RB-9, RB-11 and RB-15 indicate the base course in these areas may be contaminated, fines content (percent passing the No. 200 sieve for these samples ranged from 37.8 to 49.3 percent. These results are not included in the preceding table as they are likely localized results.

6.3 Atterberg Limits

Atterberg Limits tests were conducted on samples of the fat clay and one sample of the fill. The test results are summarized in the following table.

Soil Type	Liquid Limit (%)	Plasticity Index (%)
Lean clay (CL)	45	19
Silty clay (CL-ML) / Silt (ML)	26 - 27	4 - 7
Clayey sand (SC) / Silty clayey sand (SC-SM)	26 - 42	7 - 21
Clayey gravel with sand (GC)	29 - 53	9 - 28
Silty gravel with sand (GM)	29	6

6.4 Moisture-Density Relationship

The moisture-density relationship (Modified Proctor) test results are summarized in the following table.

Boring No.	Depth (feet)	Soil Type	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
RB-3	1 - 4	Clayey sand (SC)	123.9	11.3
RB-6	1 - 5	Silty clayey sand with gravel (SC-SM)	144.8	6.2
RB-9	1 - 5	Clayey sand with gravel (SC)	135.1	9.1
RB-11	1 - 4	Clayey sand (SC)	123.6	13.3
RB-13	1 - 4	Clayey gravel with sand (SC)	134.7	9.7
RB-15	1 - 4	Clayey gravel with sand (SC)	128.0	11.6
RB-17	½ - 2	Silty gravel with sand (GM)	132.9	8.7
RB-19	1 - 3	Clayey gravel with sand (SC)	129.6	10.1
RB-22	1 - 5	Sandy silty clay (CL-ML)	123.5	12.4
AB-4	3 - 5	Silty clay with sand (CL-ML)	124.1	12.7
AB-5	1 - 5	Silty clay with sand (CL-ML)	117.4	12.8

6.5 California Bearing Ratio

The single-point California Bearing Ratio (CBR) test were remolded to approximately 95 percent of the maximum dry density as determined by ASTM D1557. The CBR test results are summarized in the following table.

Boring No.	Depth (feet)	Soil Type	CBR (%)	Remolded Density (% of MDD)
RB-3	1 - 4	Clayey sand (SC)	46.9	95.3
RB-6	1 - 5	Silty clayey sand with gravel (SC-SM)	67.2	95.6
RB-9	1 - 5	Clayey sand with gravel (SC)	64.4	95.6
RB-11	1 - 4	Clayey sand (SC)	61.8	96.3
RB-13	1 - 4	Clayey gravel with sand (SC)	42.3	96.1
RB-15	1 - 4	Clayey gravel with sand (GC)	18.5	95.3
RB-17	½ - 2	Silty gravel with sand (GM)	14.0	95.9
RB-19	1 - 3	Clayey gravel with sand (GC)	33.1	95.5
RB-22	1 - 5	Sandy silty clay (CL-ML)	36.7	96.1
AB-4	3 - 5	Silty clay with sand (CL-ML)	16.6	95.8
AB-5	1 - 5	Silty clay with sand (CL-ML)	19.3	94.9

Several of the measured CBR values are higher than anticipated for the respective soils types. We anticipate the higher results are likely due to the presence of gravel near the penetration location. It is our opinion the CBR results for the samples obtained from RB-15, RB-17, RB-19 and AB-4 are likely more representative of CBR values for the on-site soils.

6.6 One-dimensional Consolidation/Collapse

The one-dimensional consolidation/collapse tests conducted on samples of the on-site fine-grained soils indicate is the soils are non-moisture sensitive (collapsible) when wetted under a constant pressure of 500 pounds per square foot (psf) at in-place moisture contents. The in-place water contents, in-place dry densities and fines contents of the consolidation/collapse test samples are summarized in the following table.

Boring No.	Depth (feet)	Soil Type	Fines Content (%)	Water Content (%)	Dry Density (pcf)
RB-3	2 ½	Silt (ML)	89.1	11	122
RB-4	4	Silt with sand (ML)	75.7	13	112
RB-17	4	Silt (ML)	88.0	20	103
RB-22	4	Silt (ML)	87.2	16	105
AB-1	9	Sandy silt (ML)	62.9	17	96
AB-2	1	Silt with sand (ML)	83.2	12	107
AB-2	4	Silt (ML)	87.2	18	98
AB-3	4	Silt (ML)	89.3	14	88
AB-4	4	Silt (ML)	87.4	23	91
AB-5	2 ½	Silt (ML)	87.9	22	95
AB-5	4	Silt with sand (ML)	83.3	24	93

6.7 Water Soluble Sulfates

The water soluble sulfate test results are summarized in the following table.

Boring No.	Depth (feet)	Soil Type	Water Soluble Sulfates (ppm)
RB-3	1 - 4	Clayey sand (SC)	13
RB-6	1 - 5	Silty clayey sand with gravel (SC-SM)	19
RB-9	1 - 5	Clayey sand with gravel (SC)	27
RB-11	1 - 4	Clayey sand (SC)	52
RB-13	1 - 4	Clayey gravel with sand (SC)	16
RB-15	1 - 4	Clayey gravel with sand (SC)	53

The test results indicate the sulfate concentrations of the on-site soils are generally negligible with respect to sulfate attack potential on cement.

7.0 CONCLUSIONS AND RECOMMENDATIONS

It is our opinion the site is suitable for the proposed construction provided the recommendations in this report are followed. The fill observed in the borings drilled in the suspected landfill area is not suitable to support future construction.

The following recommendations are presented to assist the planning and design of the proposed construction. The recommendations are based on our understanding of the proposed construction, the conditions observed in the borings and laboratory test results. **If the scope of the construction changes, or if conditions are encountered during construction that are different than those described in this report, we should be notified so we can review our recommendations and provide revisions if necessary**.

7.1 Planning Considerations

The subgrade soils in the runway generally consist of silty to clayey gravel with sand and are generally near the optimum moisture content for compaction. The subgrade soils in the apron area generally consist of silt with sand and are generally over the optimum moisture content for compaction. These soils will be easily disturbed by construction traffic, particularly rubber tire construction equipment. Track-mounted construction equipment should be used to traffic the site to reduce the potential for disturbance of the subgrade. An access road should be constructed outside of pavement areas for rubber tire construction equipment. Additionally, subgrade stabilization may be required to provide suitable support for construction equipment necessary to construct the new pavement in the apron area.

Perched groundwater was observed in boring RB-2 at a depth of approximately 13 feet at the time of drilling. The water appeared to be perched on the underlying bedrock.

7.2 Grading Recommendations

A grading plan was not available at the time this report was prepared. Based on existing site topography, we anticipate cut and fill on the order of two feet or less will be required to grade the pavement areas if they are reconstructed. If site grading is significantly different than described, ALLWEST should be notified so we may reevaluate our recommendations.

7.2.1 Site Preparation

Prior to conducting site grading, vegetation, topsoil, existing pavement and base course, and undocumented fill should be removed from pavement areas. Deleterious material and disturbed soil, if encountered, should also be removed. Undocumented fill was observed in borings B-1, B-4, B-5, B-7, B-8, B-10, B-12 and B-14.

Subsequent to grubbing and removal of unsuitable soil, the exposed subgrade should be scarified to a depth of approximately eight (8) inches; properly moisture conditioned and compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM D 1557 if it consists of cohesive soil or a minimum of 100 percent if it consists of non-cohesive soil. If the subgrade is observed to significantly deflect it should be over-excavated to firm, non-yielding soil and replaced with properly compacted fill or stabilized as recommended in the Subgrade Stabilization section of this report.

7.2.2 Subgrade Stabilization

If the subgrade is observed to pump or deflect significantly, it should be stabilized prior to placement of fill. Based on the relatively high in-situ moisture contents in the apron area, we anticipate subgrade stabilization could be required to support construction traffic. The subgrade may be stabilized using either crushed, angular cobble or with geosynthetic reinforcement in conjunction with imported structural fill. The section thickness for subgrade stabilization, if required, will be dependent on the construction traffic which is unknown at this time.

We anticipate a minimum unreinforced stabilization section of 24 inches of cobble is or a minimum reinforced section of 18 inches of structural fill underlain by Tensar TX-160 geogrid. Alternatives to Tensar TX-160 should be approved by the geotechnical engineer prior to use on site. These anticipated section thicknesses may require revision when construction traffic is known.

If crushed, angular cobble is selected to stabilize the subgrade it should have a maximum particle size of 8-inches and should have less than five (5) percent material passing the No. 4 sieve. The first layer of cobble should be placed in an 18-inch thick loose lift and trafficked with tracked-construction equipment until it is observed to densify. The cobble should then be vibrated with a large smooth drum vibratory compactor. If the cobble is placed in a confined excavation, it should be mechanically densified from outside the excavation with vibratory compaction equipment. Vibratory compaction should be discontinued if it reduces the subgrade stability.

The following recommendations are provided for subgrade stabilization using geosynthetic reinforcement.

- Geosynthetic reinforcement materials should be placed on a properly prepared subgrade with smooth surface. Loose and disturbed soil should be removed prior to placement of geosynthetic reinforcement materials.

- A 4-ounce, non-woven filter fabric should be placed on the properly prepared subgrade. The geosynthetic reinforcement should be placed directly on top of the filter fabric. The filter fabric and geosynthetic reinforcement should be unrolled in the primary direction of fill placement and should be over-lapped at least 3 feet.

- The geosynthetic materials should be pulled taught to remove slack and pinned in place. If the material does not remain taut during fill placement its effectiveness will be reduced.

- Construction equipment should not be operated directly on the geosynthetic materials. Fill should be placed from outside the excavation to create a pad to operate equipment on. We recommend a minimum of 12 inches of structural fill be placed over the geosynthetic reinforcement before operating construction equipment on the fill. Low pressure, track-mounted equipment should be used to place fill over the geosynthetic reinforcement.

- Fill placed directly over the geosynthetic reinforcement should be properly moisture conditioned prior to placement and should meet the following gradation.

Sieve Size	% Passing
1 ½ inch	100
¾ inch	50 - 100
#4	25 - 50
#40	10 - 20
#100	5 - 15
#200	less than 10

  Consideration may be given to the use of cap rock which meets Idaho Transportation Department (ITD) gradations for Class II or Class III cap rock. The cap rock should consist of angular, crushed material.

- The fill material should be properly compacted. Care should be taken with the use of vibratory compaction equipment. Vibration should be discontinued if it reduces the subgrade stability.

A representative of the geotechnical engineer should be on-site during subgrade stabilization activities to verify our recommendations are followed and to provide additional recommendations as appropriate.

7.2.3 Excavation

The on-site soil can be excavated with standard soil excavation equipment. If excavations extend into the underlying basalt, heavy duty excavation equipment will be required. We recommend excavations greater than four (4) feet deep be sloped no steeper than 1.5:1 (horizontal to vertical). Alternatively, deeper excavations may be shored or braced in accordance with OSHA specifications and local codes. Regarding trench wall support, the site soil is considered Type C soil according to Occupational Safety and Health Administration (OSHA) guidelines. The contractor is responsible to provide appropriate trench wall support and/or sloping.

7.2.4 Materials

The on-site soil is suitable for use as site grading fill and utility trench backfill provided it is properly moisture conditioned prior to use. Import materials should be granular soil free of organics, debris and other deleterious material and meet the following recommendations in accordance with Airport Construction Standard 150/5370-10F. Import materials should be approved by the Geotechnical Engineer prior to delivery to the site.

P-154 Subbase Gradation Recommendations

Sieve designation (square openings) as per ASTM C 136 and ASTM D 422	Percentage by weight passing sieves
3 in (75.0 mm)	100
No. 10 (2.0 mm)	20-100
No. 40 (0.450 mm)	5-60
No. 200 (0.075 mm)	0-8

The portion of the material passing the No. 40 (0.450 mm) sieve should have a liquid limit of 25 or less and a plasticity index six (6) or less. The maximum amount of material finer than 0.02 mm in diameter should be less than three (3) percent.

Portions of the existing base course materials do not meet these recommendations due to high fines content (percent passing the No. 200 sieve) and are not suitable for reuse as subbase. The percent passing the No. 200 sieve exceeds eight (8) percent for six (6) of the base course samples tested. In addition, the amount of material finer than 0.02 mm in diameter exceeds three (3) percent for three (3) of the base course samples tested. The higher fines content and percent of material finer than 0.02 mm may be due to contamination from subgrade soils.

P-208 Base Course Gradation Recommendations

Sieve Designation	Percentage by weight passing sieves		
	2” maximum	1 1/2” maximum	1” maximum
2 in (50.0 mm)	100	--	--
1-1/2 in (37.0 mm)	70-100	100	--
1 in (25.0 mm)	55-85	70-100	100
3/4 in (13.0 mm)	50-80	55-85	70-100
No. 4 (4.75 mm)	30-60	30-60	35-65
No. 40 (0.45 mm)	10-30	10-30	10-25
No. 200 (0.075 mm)	0-8	0-8	0-8

The maximum amount of material finer than 0.02 mm in diameter should be less than three (3) percent.

The existing base course materials generally do not meet these recommendations and are not suitable for reuse as base course. The percent passing the ¾-inch sieve exceeds the upper band limit for six (6) of the samples tested. The percent passing the No. 200 sieve exceeds eight (8) percent for six (6) of the base course samples tested. In addition, the amount of material finer than 0.02 mm in diameter exceeds three (3) percent for three (3) of the base course samples tested. The higher fines contents and percent of material finer than 0.02 mm may be due to contamination from subgrade soils.

7.2.5 Fill Placement and Compaction

Fill should be placed in lift thicknesses which are appropriate for the compaction equipment used. Typically, six (6) to eight (8) inch loose lifts are appropriate for typical rubber tire and steel drum compaction equipment. Lift thicknesses should be reduced to four (4) inches for hand operated compaction equipment. Fill should be moisture conditioned to within two (2) percentage points of the optimum moisture content prior to placement to facilitate compaction. In wet weather or spring conditions, using silty or fine-grained soil for fill may delay construction and increase costs.

Fill should be compacted to the following percentages of the maximum dry density as determined by ASTM D 1557.

Fill Area	**Compaction (%)**
Subgrade	95 (cohesive soil) 100 (non-cohesive soil)
Subbase	100
Base Course	100
Utility Trench Backfill	100

*If the subgrade is observed to pump or significantly deflect it should be over-excavated and replaced with imported structural fill or stabilized as recommended in the Subgrade Stabilization section of this report.

7.2.6 Utilities

Support soil for possible underground utilities will likely consist of silt or gravel. It is our opinion these soils will provide adequate support for utilities. The on-site fine-grained soils may be difficult to properly moisture condition and compact. Consideration should be given to the use of imported granular soils, such as P-154 or base course, for use as utility trench backfill.

7.2.7 Stormwater and Drainage

We anticipate stormwater runoff will be directed to edge drains which discharge to a stormwater drain system. We recommend the grading plan include slopes such that stormwater run-off is directed away from the pavement areas. The subgrade soil should be sloped to provide drainage of water away from the pavement.

7.2.8 Wet Weather Construction

We recommend earthwork for this site be scheduled for the drier seasons of the year. If construction is undertaken in wet periods of the year, it will be important to slope the ground surface to provide drainage away from construction. The on-site silt soils will likely become unstable and easily disturbed when significantly wetted.

7.2.9 Cold Weather Construction

The soils encountered in the borings are generally considered to be moderately to highly frost susceptible. If site grading and construction are anticipated during cold weather, we recommend good winter construction practices be observed. Snow and ice should be removed from excavated and fill areas prior to additional earthwork or construction. Structural portions of the construction should not be placed on frozen ground; nor should the supporting soils for buildings be permitted to freeze during or after construction. Frozen soils should not be used as backfill or fill.

The subsurface soils at the site generally consist of silt or contain high silt contents. The soils at the site generally classify as Frost Group FG-4.

8.0 ADDITIONAL RECOMMENDED SERVICES

We recommend ALLWEST Testing & Engineering, LLC be retained to provide construction monitoring to verify the soil and geologic conditions and the report recommendations are incorporated into the actual construction. Compaction testing should be performed by an experienced engineering technician at the time of construction to verify the recommended levels of compaction are achieved. If we are not retained to provide the recommended plan review and construction monitoring services, we cannot be responsible for soil engineering related construction errors or omissions.

9.0 EVALUATION LIMITATIONS

This report has been prepared to assist the planning and design of the runway 8/26 and the apron area to be reconstructed or rehabilitated at the Lewiston-Nez Perce County Airport located at 406 Burrell Avenue, Idaho. Our services consist of professional opinions and conclusions made in accordance with generally accepted geotechnical engineering principles and practices. This acknowledgement is in lieu of all warranties either expressed or implied.

The following plates complete this report:

Appendix A – Figure A-1 - Vicinity Map
Figure A-2a and A-2b - Boring Location Maps

Appendix B – Boring Logs
Unified Soil Classification System

Appendix C – Table C-1 – Summary of Laboratory Test Results
Figures C-1 through C-24 – Gradation Test Results
Figures C-25 through C-35 – Moisture-Density Relationship Test Results
Figure C-36 through C-46 – California Bearing Ratio Test Results
Figures C-47 through C-57 – One-dimensional Consolidation/Collapse Test Results

Appendix A

Vicinity Map
Boring Location Maps

ALLWEST
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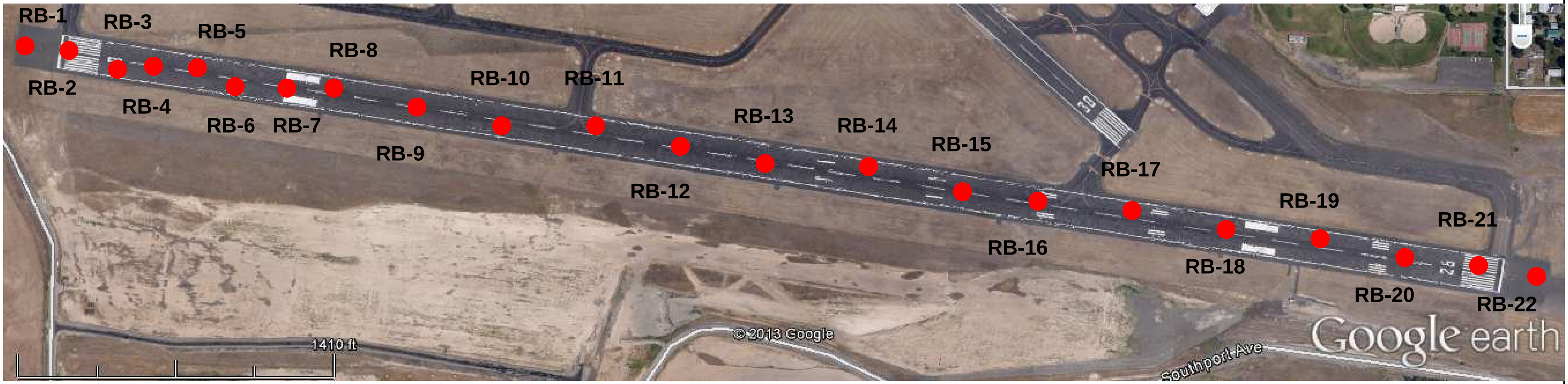
GOOGLE EARTH, 2013

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

N W E S	ALLWEST Testing & Engineering	**FIGURE A-1 - SITE VICINITY MAP**
		Lewiston-Nez Perce County Airport Runway 8/26 Rehabilitation
		406 Burrell Avenue
		Lewiston, Idaho
	2705 E. Main Street Lewiston, Idaho **www.allwesttesting.com**	Client Name: Armstrong Consultants
		Project No.: 313-218G
		Date: January 22, 2014



● Approximate boring location

N
W E
S

ALLWEST
Testing & Engineering

2705 E. Main Street
Lewiston, ID 83501

Phone: 208-743-5710 Fax: 208-743-8270

Figure A-2a - Boring Location Map - Runway

Lewiston-Nez Perce County Airport 8/26 Rehabilitation

406 Burrell Avenue

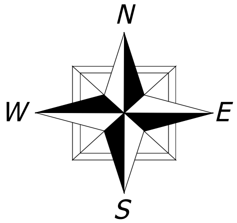
Lewiston, Idaho

Client Name: Armstrong Consultants, Inc.

Project No.: 313-218G

Date: January 22, 2014

Approximate boring location



ALLWEST Testing & Engineering

2705 E. Main Street
Lewiston, ID 83501

Phone: 208-743-5710 Fax: 208-743-8270

Figure A-2b - Boring Location Map - Apron and Landfill
Lewiston-Nez Perce County Airport 8/26 Rehabilitation
406 Burrell Avenue
Lewiston, Idaho
Client Name: Armstrong Consultants, Inc.
Project No.: 313-218G
Date: January 22, 2014

Appendix B

Boring Logs
Unified Soil Classification System

ALLWEST
Testing & Engineering

LOG OF BORING

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **RB-1** LOCATION: **STA 98+50, CL** ELEVATION: DATE: **12/10/13** SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	FILL	Silty GRAVEL with sand; occassional silt and clay zones, some cobbles, medium dense to very dense, moist, brown.	20		WC = 17% +4 = 16% -200 = 68.0% LL = 45% PI = 19%
			50-5"		WC = 7% +4 = 37% -200 = 57.1%
3.5		Practical auger refusal at approximately 3 1/2 feet.			

Depth scale: 0, 2, 4, 6, 8, 10, 12, 14

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

ALLWEST Materials Testing • Geotechnical Engineering

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **RB-2** LOCATION: **STA 100+50, 60' left of CL** ELEVATION: DATE: **12/10/13** SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, tan to light brown.	50-3"		
2	GP	Crushed subbase; basalt cap rock, dense to very dense, moist, gray-brown.	78 47		WC = 10% DD = 105pcf +4 = 24% -200 = 68.1%
7	ML	Sandy SILT with gravel; occasional cobbles, medium dense to very dense, moist, non-plastic, calacreous, tan to light brown.	75-11"		WC = 22% DD = 93pcf +4 = 42% -200 = 32.8%
13		Practical auger refusal at approximately 13 feet on basalt bedrock. Perched groundwater at refusal depth.			

Depth scale: 0, 2, 4, 6, 8, 10, 12, 14

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	313-218G **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**
BORING:	**RB-3**
LOCATION:	**STA 102+50, 60' Right of CL**
ELEVATION:	
DATE:	**12/10/13**
SCALE:	**1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; very dense, moist, gray.	91		WC = 5% DD = 128pcf +4 = 56% -200 = 1.8%
2					
	ML	Sandy SILT with gravel; very dense, moist, non-plastic, brown.	81-11"		WC = 14% DD = 110pcf +4 = 20% -200 = 3.5%
4	CL	Sandy lean CLAY with gravel; occasional cobbles, very dense, moist to very moist, low plastic, tan to light brown.	50-1"		Bulk sample obtained near RB-3 outside pavement area from 1 to 4 feet. +4 = 14% -200 = 49.3% LL = 33% PI = 15% MDD = 123.9pcf OMC = 11.3% CBR = 46.9% WSS = 13ppm
		End of boring at approximately 5 feet.			
6					
8					
10					
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	313-218G	BORING:	RB-4
	Lewiston- Nez Perce County Airport	LOCATION:	STA 104+50, CL
	Runway 8/26 Rehabilitation	ELEVATION:	
	Nez Perce County, Idaho		
	Armstrong Consultants	DATE: 12/10/13	SCALE: 1" = 2'

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; very dense, moist, gray.	77		WC = 4% +4 = 49% -200 = 9.3% <0.02mm = 2.1%
			50-2"		WC = 11% DD = 113pcf +4 = 19% -200 = 32.8%
	SM	Silty SAND with gravel; cobbles, very dense, moist, non-plastic, brown.			
4	ML	SILT with sand; trace gravel, dense, moist, non-plastic, brown.	35		WC = 7% DD = 110pcf +4 = 38% -200 = 51.9%
	ROCK	BASALT; weathered to hard, moist, vesicular, brown-mottled white.	50-4"		
14		Practical auger refusal at approximately 14 feet on basalt.			

Depth scale: 0, 2, 4, 6, 8, 10, 12, 14

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	313-218G Lewiston- Nez Perce County Airport Runway 8/26 Rehabilitation Nez Perce County, Idaho Armstrong Consultants	BORING: **RB-5** LOCATION: STA 106+50, 60' LT ELEVATION: DATE: 12-10-13 SCALE: 1" = 2'

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, gray.	50-5" 50-2"		WC = 3% +4 = 46% -200 = 10.4%
2					
	GP	Crushed aggregate subbase; cap rock, dense to very dense, moist, non-plastic, gray.			
4	GC	Clayey GRAVEL with sand; dense, moist, low plastic, calcareous, tan to light brown.	62		WC = 10% DD = 122pcf +4 = 30% -200 = 17.8%
		End of boring at approximately 5 1/2 feet.			
6					
8					
10					
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT: 313-218G Lewiston- Nez Perce County Airport Runway 8/26 Rehabilitation Nez Perce County, Idaho Armstrong Consultants	BORING: **RB-6** LOCATION: STA 108+50, 60' RT 15' ELEVATION: DATE: 12-11-13 — SCALE: 1" = 2'

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crush aggregate base; very dense, moist, non-plastic, gray.	50-5"		WC = 4% +4 = 56% -200 = 3.9%
2	GM	Silty GRAVEL with sand; cobbles, very dense, moist, non-plastic, brown.	50-5"		WC = 8% +4 = 47% -200 = 8.3%
4			50-4"		Bulk sample obtained oustide runway near RB-6 from 1 to 5 feet. +4 = 37% -200 = 25.7% LL = 26% PI = 7% MDD = 144.8pcf OMC = 6.2% CBR = 67.2% WSS = 19ppm
6					
	ROCK	BASALT, slight weathered to hard, moderatley fractured, vesicular.			
8		Practical auger refusal at approximately 8 feet on basalt.			
10					
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

ALLWEST Materials Testing • Geotechnical Engineering

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **RB-7** LOCATION: **STA 110+50, CL** ELEVATION: DATE: **12-11-13** SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, gray to brown.	96-11" 50-3"		WC = 3% DD = 138pcf +4 = 62% -200 = 3.0% WC = 5% +4 = 21% -200 = 66.3%
2					
	GM	Silty GRAVEL with sand; cobbles, very dense, moist, non-plastic, brown.			
4		Borings abandoned at approximately 4 feet, no sample due to unscheduled flight arriving.			
6					
8					
10					
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **RB-8** LOCATION: **STA 112+50, + 60' LT** ELEVATION: DATE: **12-11-13** SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, gray.	50-5"		WC = 5% +4 = 49% -200 = 3.5%
2			50-4"		WC = 7% +4 = 24% -200 = 64.4%
	GM	Silty GRAVEL with sand; cobbles, very dense, moist, non-plastic, brown.			
4	ROCK	BASALT; slightly weathered to hard, moderately fractured, vesicular.	50-5"		
		Practical auger refusal at approximately 5 1/2 feet on basalt.			
6					
8					
10					
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT: 313-218G **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **RB-9** LOCATION: **STA 116+50, CL** ELEVATION: DATE: **12-11-13** SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed base aggregate; very dense, moist, non-plastic, gray to brown.	50-5"		WC = 3% +4 = 45% -200 = 47.1%
2					
	GC-GM	Silty clayey GRAVEL with sand; very dense, moist to very moist, low plastic, brown.	87		WC = 11% DD = 125pcf +4 = 46% -200 = 11.8%
4			50-1"		Bulk sample obtained outside runway area near RB-9 from 1 to 5 feet. +4 = 25% -200 = 36.8% LL = 28% PI = 8% MDD = 135.1pcf OMC = 9.1% CBR = 64.4% WSS = 27ppm
	ROCK	BASALT; slightly weathered to hard, moderately fractured, vesicular.			
6		Practical auger refusal at approximately 6 feet on basalt.			
8					
10					
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT: 313-218G Lewiston- Nez Perce County Airport Runway 8/26 Rehabilitation Nez Perce County, Idaho Armstrong Consultants	BORING: **RB-10** LOCATION: ELEVATION: DATE: **12-12-13** SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, gray.	83		WC = 5% DD = 130pcf +4 = 54% -200 = 8.1% <0.02mm = 1.8%
2			73-7"		WC = 11% DD = 125pcf +4 = 54% -200 = 12.4% <0.02mm = 4.0%
	GM	Silty GRAVEL with sand; very dense, moist, non-plastic, brown.			
4		Practical auger refusal at approximately 4 feet on basalt.			
6					
8					
10					
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

ALLWEST Materials Testing • Geotechnical Engineering

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **RB-11** LOCATION: **STA 124+50, 60' LT** ELEVATION: DATE: **12-12-13** SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, gray.	50-3"		WC = 4% +4 = 45% -200 = 49.3%
2					
	GM	Silty GRAVEL with sand; cobbles, very dense, moist, non-plastic, calcareous, brown to tan.	79-10"		WC = 14% DD = 108pcf +4 = 42% -200 = 9.3%
4	ROCK	BASALT, slightly weathered to hard, moderately fractured, hard, vesicular.	50-3"		Bulk sample obtained near RB-11 from 1 to 4 feet. +4 = 14% -200 = 29.1% LL = 42% PI = 21% MDD = 123.6pcf OMC = 13.3% CBR = 61.8% WSS = 52ppm
		Practical auger refusal at approximately 4 1/4 feet on basalt.			
6					
8					
10					
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	313-218G **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **RB-12** LOCATION: **STA 128+50, CL** ELEVATION: DATE: **12-12-13** SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
2	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, gray.	70 80-1"		WC = 4% DD = 126pcf +4 = 57% 200 = 38.9% WC = 6% DD = 126pcf +4 = 34% -200 = 60.2%
4	GM	Silty GRAVEL with sand; very dense, moist, non-plastic, brown.			
		Practical auger refusal at approximately 4 feet on basalt.			
6					
8					
10					
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

ALLWEST Materials Testing • Geotechnical Engineering

PROJECT:	313-218G Lewiston- Nez Perce County Airport Runway 8/26 Rehabilitation Nez Perce County, Idaho Armstrong Consultants	BORING:	RB-13
		LOCATION:	STA 132+50, 60' RT
		ELEVATION:	
		DATE: 12-12-13	SCALE: 1" = 2'

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
2	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, trace organics, gray.	89		WC = 5% DD = 135pcf +4 = 53% -200 = 42.5%
			50-3"		WC = 10% DD = 120pcf +4 = 41% -200 = 51.4%
4	GM	Silty GRAVEL with sand; cobbles, very dense, moist, non-plastic, brown.	50-5"		Bulk sample obtained oustide runway near RB-13 from 1 to 4 feet. +4 = 40% -200 = 21.8% LL = 33% PI = 15% MDD = 134.7pcf OMC = 9.7% CBR = 42.3% WSS = 16ppm
		Practical auger refusal at approximately 4 1/2 feet on basalt.			
6					
8					
10					
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	313-218G Lewiston- Nez Perce County Airport Runway 8/26 Rehabilitation Nez Perce County, Idaho Armstrong Consultants	BORING:	RB-14
		LOCATION:	STA 136+50, 60' LT
		ELEVATION:	
		DATE: 12-12-13	SCALE: 1" = 2'

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, gray.	50-5'		WC = 4% +4 = 56% -200 = 11.1% <0.02mm = 2.9%
2			50-4"		WC = 13% DD = 106pcf +4 = 48% -200 = 9.9%
	GM	Silty GRAVEL with sand; cobbles, very dense, moist, non-plastic, brown.			
4	ROCK	BASALT, slightly weathered to hard, moderately fractured, vesicular.	50-2"		
		Practical auger refusal at approximately 4 1/4 feet on basalt.			
6					
8					
10					
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **RB-15** LOCATION: **STA 140+50, CL** ELEVATION: DATE: **12-12-13** SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, gray.	50-5"		WC = 4% DD = 127pcf +4 = 42% -200 = 37.8%
2–4	GM	Silty sandy GRAVEL with sand, medium dense to very dense, moist, non-plastic, fine grained, dark brown.	50 50-4"		WC = 22% DD = 91pcf +4 = 13% -200 = 22.7% pH = 10 Bulk sample obtained outside runway near RB-15 from 1 to 4 feet. WC = 4% DD = 108pcf +4 = 44% -200 = 20.2% LL = 53% PI = 28% MDD = 128.0pcf OMC = 11.6% CBR = 18.5% pH = 11 WSS = 53ppm
6–8	ML	Sandy SILT, dense to very dense, moist, slightly plastic, dark gray.			Bulk sample obtained from 7.5 to 10 feet. WC = 20% +4 = 5% -200 = 82.5% LL = 27% PI = 4%
10–14	GM	Silty GRAVEL with sand, very dense, moist, non-plastic, mottled (slightly weathered basalt), with trace of clay at 14 feet.	50-5"		WC = 18% +4 = 35% -200 = 55.2%
		End of boring at 15 feet.			

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	**313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING:	**RB-16**
		LOCATION:	**STA 144+50, 60' RT**
		ELEVATION:	
		DATE: **12-12-13**	SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, gray.	97		WC = 4% DD = 122pcf +4 = 65% -200 = 2.8%
2	GM	Silty GRAVEL with sand; cobbles, very dense, moist, non-plastic, brown.	50-5"		WC = 6% +4 = 42% -200 = 7.1%
4	ROCK	BASALT, slightly weathered to hard, moderately fractured, vesicular.	50-1"		
		Pratical auger refusal at approximately 4 1/2 feet on basalt.			
6					
8					
10					
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	**313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**
BORING:	**RB-17**
LOCATION:	**STA 148+50, 60' LT**
ELEVATION:	
DATE: **12-13-13**	SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement, fair, black.			
2	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, gray.	87		WC = 1% +4 = 57% -200 = 6.8% <0.02mm = 1.5% Bulk sample obtained from 1/2 to 2 feet.
	GC-GM	Silty Clayey GRAVEL with sand; very dense, moist, low plastic, red-brown.	95-10"		+4 = 41% -200 = 34.9% LL = 29% PI = 6%
4	GM	Silty GRAVEL with sand; medium dense, moist, non-plastic, brown.			MDD = 132.9pcf
	ML	Sandy SILT; very stiff, moist, low plastic, brown.	28		OMC = 8.7% CBR = 14.0%
6	CL	Sandy LEAN CLAY with gravel; very stiff, moist to very moist, medium plastic, tan to white.			WC = 10% DD = 113pcf WC = 18% DD = 116pcf +4 = 22% -200 = 35.6%
8 10 12 14	GC-GM	Silty Clayey GRAVEL with sand; occasional cobbles, very dense, moist, low plastic, tan to light brown to brown.	50-5"		WC = 17% DD = 109pcf +4 = 32% -200 = 31.3%

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	**313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **RB-17** LOCATION: **STA 148+50, 60' LT** ELEVATION: DATE: **12-13-13** SCALE: **1" = 2'**

Depth 15.6	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
16		Practical auger refusal at approximately 16 feet on basalt.			
18					
20					
22					
24					
26					
28					
30					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **RB-18** LOCATION: **STA 152+50, CL** ELEVATION: DATE: **12-13-13** SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
2	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, gray to brown.	91		WC = 4% +4 = 49% -200 = 8.0% <0.02mm = 1.6%
4 6 8 10 12 14	GP-GM	Poorly graded GRAVEL with silt and sand; cobbles, dense to very dense, moist, non-plastic, brown to light brown.	50-5" 49 67		WC = 7% DD = 119pcf +4 = 61% -200 = 3.5% WC = 8% DD = 109pcf +4 = 60% -200 = 4.5%
		End of boring at approximately 15 feet.			

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **RB-19** LOCATION: **STA 156+50, 60' LT** ELEVATION: DATE: **12-13-13** SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, gray.	50-5"		WC = 5% DD = 133pcf +4 = 56% -200 = 1.7%
2			73		WC = 7% DD = 133pcf +4 = 51% -200 = 12.0% <0.02mm = 3.7%
4	GM	Silty GRAVEL with sand; medium dense to very dense, moist, non-plastic, brown.	50-4"		Bulk sample obtained outside runway near RB-19 from 1 to 3 feet. +4 = 27% -200 = 48.1% LL = 29% PI = 9% MDD = 129.6% OMC = 10.1% CBR = 33.1%
6	GP-GM	Poorly graded GRAVEL with silt and sand; cobbles, very dense, moist to dry, non-plastic, gray.			
8					
10			50-5"		
		Boring terminated at approximately 10 1/2 feet in very dense gravel.			
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

ALLWEST Materials Testing • Geotechnical Engineering

PROJECT:	**313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**
BORING:	**RB-20**
LOCATION:	**STA 160+50, 60' LT**
ELEVATION:	
DATE:	**12-13-13**
SCALE:	**1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; very dense, moist, gray.	50-5"		WC = 5% DD = 125pcf +4 = 67% -200 = 3.0%
2	SC	Clayey SAND with gravel; very dense, moist, low plastic, tan.	50-5"		WC = 18% DD = 109pcf +4 = 36% -200 = 21.4%
4			50-4"		
	ROCK	BASALT; slightly weathered to hard and slightly fractured.			
5		Practical auger refusal at approximately 5 feet on basalt.			
6					
8					
10					
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	313-218G **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **RB-21** LOCATION: **STA 164+50, CL** ELEVATION: DATE: **12-13-13** SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; very dense, moist, non-plastic, gray.	50-4"		WC = 5% DD = 119pcf +4 = 51% -200 = 2.5%
2					
	GM	Silty GRAVEL with sand; very dense, moist, non-plastic, brown.	50-4"		
4			50-4"		WC = 6% DD = 114pcf +4 = 60% -200 = 8.2%
	ROCK	BASALT; slightly weathered to hard.			
		Practical auger refusal at approximately 5 feet on basalt.			
6					
8					
10					
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	313-218G Lewiston- Nez Perce County Airport Runway 8/26 Rehabilitation Nez Perce County, Idaho Armstrong Consultants	BORING: **RB-22** LOCATION: STA 166+50, 60' LT ELEVATION: DATE: 12-13-13 SCALE: 1" = 2'

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	GW-GM	Crushed aggregate base; asphalt millings, dense, moist, non-plastic, brown to black.			
2	ML	SILT with sand; trace gravel, medium dense to dense, moist, non-plastic, dark brown.	40		WC = 12% DD = 111pcf +4 = 34% -200 = 21.4% Bulk sample obtained from 1 to 5 feet.
			28		WC = 12% DD = 117pcf +4 = 15% -200 = 50.4
4			28		WC = 17% DD = 105pcf +4 = 1% -200 = 80.1% Bulk sample obtained from 1 to 5 feet. +4 = 9% -200 = 65.4% LL = 26% PI = 7% MDD = 123.5pcf OMC = 12.4% CBR = 36.7%
6					
8					
10		End of boring at approximately 10 feet.			
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	**313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **AB-1** LOCATION: **See Figure A-2** ELEVATION: DATE: **12-16-13**	SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair to poor condition, cracked, black.			
0.3–3.5	ML	SILT with sand; stiff, moist, low plastic, brown.	13 24		
3.5–5.5	SM	Silty SAND with gravel; medium dense, moist, non-plastic, light brown to tan.	13		WC = 14% DD = 87pcf +4 = 37% -200 = 47.0%
5.5–12.5	ML	SILT with sand; stiff, moist, low plastic, brown.	9		WC = 18% DD = 81% +4 = 3% -200 = 58.0%
12.5		Practical auger refusal at approximately 12 1/2 feet on basalt.			

Depth scale: 0, 2, 4, 6, 8, 10, 12, 14

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

ALLWEST Materials Testing • Geotechnical Engineering

PROJECT: 313-218G Lewiston- Nez Perce County Airport Runway 8/26 Rehabilitation Nez Perce County, Idaho Armstrong Consultants	BORING: **AB-2** LOCATION: See Figure A-2 ELEVATION: DATE: 12-16-13 SCALE: 1" = 2'

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement- poor condition, cracked, black.			
	GW-GM	Crushed aggregate base; loose, moist, brown.			WC = 20% DD = 104pcf +4 = 51% -200 = 2.5%
2	ML	SILT with sand; very stiff, moist, low plastic, brown.	23		
	GM GM	Silty GRAVEL with sand; medium dense, moist, low plastic, slightly calcareous , tan to brown.	20		Calcareous at 3 feet.
4					WC = 19% DD = 90pcf +4 = 0% -200 = 82.0%
6 8	ML	SILT with sand; medium stiff, moist, low plastic, brown.	7		
10 12	GM	Silty GRAVEL with sand; occasional cobble, dense to very dense, moist to dry, non-plastic, calcareous, brown to tan.	50-3		WC = 12% +4 = 47% -200 = 8.0%
14		End of boring at approximately 14 feet.	50-1		

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT: 313-218G Lewiston- Nez Perce County Airport Runway 8/26 Rehabilitation Nez Perce County, Idaho Armstrong Consultants	BORING: **AB-3** LOCATION: See Figure A-2 ELEVATION: DATE: 12-16-13 SCALE: 1" = 2'

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair to poor condition, cracked, rotted at base, black.			
	GW-GM	Crushed aggregate base; loose, moist, non-plastic, brown.			
	ML	SILT with sand; stiff, moist, low plastic, brown.	10		
2					
	SM	Silty SAND with gravel; loose, moist, low plastic, tan.	8		WC = 18% DD = 80pcf +4 = 0% -200 = 73.2%
4					WC = 15% DD = 92pcf +4 = 3% -200 = 21.4%
	ML	SILT with sand; medium stiff, moist, low plastic, brown.	6		
6					
8					
10			12		
12					
14		End of boring at approximately 14 feet.	50-2		

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

ALLWEST Materials Testing • Geotechnical Engineering

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **AB-4** LOCATION: **See Figure A-2** ELEVATION: DATE: **12-16-13** SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Asphalt pavement; fair condition, black.			
	GW-GM	Crushed aggregate base; dense, moist, brown.	36		WC = 6% DD = 119pcf +4 = 51% -200 = 13.8% <0.02mm = 4.6%
2	ML	SILT with sand; medium stiff to stiff, moist, low plastic, dark to light brown.	9		WC = 18% DD = 95pcf +4 = 0% -200 = 53.7%
4			7		WC = 23% DD = 94pcf +4 = 0% -200 = 80.8% Bulk sample obtained from 3 to 5 feet. +4 = 4% -200 = 72.3% LL = 26% PI = 7% MDD = 124.1pcf OMC = 12.7% CBR = 16.6%
6					
8			50-2		
10	GM	Silty GRAVEL with sand; cobbles, very dense, moist, non-plastic, light brown.			
		Practical auger refusal at approximately 11 feet on basalt.			
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

ALLWEST Materials Testing • Geotechnical Engineering

PROJECT: 313-218G Lewiston- Nez Perce County Airport Runway 8/26 Rehabilitation Nez Perce County, Idaho Armstrong Consultants	BORING: **AB-5** LOCATION: See Figure A-2 ELEVATION: DATE: 12/16/13 SCALE: 1" = 2'

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	AC	Aspahlt pavement; fair to poor condition, cracked, black.			
	GW-GM	Crushed aggregate base; very dense, moist, brown.	56		Bulk sample obtained from 1/2 to 1 foot. WC = 6% +4 = 51% -200 = 6.1% <0.02mm = 2.3%
2	ML	SILT with sand; stiff, medium dense, moist, non-plastic to low plastic, brown to tan.	11		WC = 20% DD = 92pcf +4 = 0% -200 = 74.7%
4			9		WC = 20% DD = 101pcf +4 = 6% -200 = 72.3% Bulk sample obtained from 1 to 5 feet. +4 = 3% -200 = 73.5% LL = 24% PI = 5% MDD = 117.4pcf OMC = 12.8% CBR = 19.3%
6					
8	GM	Silty GRAVEL with sand; cobble, very dense, moist, non-plastic, brown to tan.	50-4"		
10		Practical auger refusal at approximately 10 feet on basalt.			
12					
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

ALLWEST Materials Testing • Geotechnical Engineering

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **LB-1** LOCATION: **See Figure A-2.** ELEVATION: DATE: **12-16-13** SCALE: **1" = 4'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0 – 4	FILL	Silty clayey GRAVEL with sand; loose to medium dense, moist to wet, low plastic, brown.			
4 – 10.5	FILL	Silty clayey GRAVEL with sand; contains some cloth, paper, rubber, wood, and plastic debris, loose to medium dense, moist to wet, slightly plastic, brown to dark gray.			
10.5 – 12.5	CL	Sandy lean CLAY; soft to medium stiff, moist to wet, medium plastic, dark gray.			
12.5 – 13.5	ROCK	BASALT; slightly weathered, moderately fractured, hard.			
		Practical auger refusal at approximately 13 1/2 feet on basalt.			

Depth scale: 0, 4, 8, 12, 16, 20, 24, 28

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

ALLWEST Materials Testing • Geotechnical Engineering

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **LB-2** LOCATION: **See Figure A-2** ELEVATION: DATE: **12-17-13** SCALE: **1" = 4'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	TS	Topsoil, silty SAND with gravel; loose, moist, non-plastic, brown.			
	FILL	SILT with sand and gravel; appears loose to medium dense, moist, non-plastic, light brown.			
4	FILL	Silty GRAVEL with sand; appears medium dense, moist, non-plastic, brown.			
8	FILL	Silty GRAVEL with sand; debris, appears loose, moist, non-plastic, gray.			Metal, rubber, plastic, paper, wood debris at approximately 10 to 19 feet.
12					
16					
		End of boring at approximately 19 feet.			
20					
24					
28					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	313-218G **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **LB-3**
		LOCATION: **See Figure A-2**
		ELEVATION:
		DATE: **12-17-13** SCALE: **1" = 4'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	FILL	Silty GRAVEL with sand; appears loose to medium dense, moist, non-plastic, brown.			
4	FILL	Silty clayey GRAVEL with sand; wood, metal, plastic, ceramic debris, appears loose to medium dense, low plastic, dark gray.			
8	FILL	Sandy lean CLAY with gravel; trace wood debris, appears soft to medium stiff, wet, medium plastic, dark gray.			
12	GM	Silty GRAVEL with sand; cobbles, very dense, moist, non-plastic, light gray.			
		Practical auger refusal at approximately 12 1/2 feet on basalt.			
16					
20					
24					
28					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	**313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **LB-4** LOCATION: **See Figure A-2** ELEVATION: DATE: **12-17-13** SCALE: **1" = 4'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	TS	Topsoil; silty SAND with gravel; appears loose to medium dense, moist, non-plastic, brown.			
	FILL	Silty GRAVEL with sand; appears medium dense, non-plastic, brown.			
4	FILL	Silty clayey GRAVEL with sand; appears loose to medium dense, moist to wet, low plastic, dark brown to gray.			
8	FILL	Clayey GRAVEL with sand; wood, glass, rubber, and metal debris, appears loose to very loose, wet, low plastic, dark gray.			
12					
16		End of boring at approximately 14 1/2 feet.			
20					
24					
28					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **LB-5** LOCATION: **See Figure A-2** ELEVATION: DATE: **12-17-13** SCALE: **1" = 4'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	FILL	Silty GRAVEL with sand; cobbles, appears medium dense, moist, non-plastic, brown			
	FILL	SILT with sand and gravel; appears loose to medium dense, moist, non-plastic, light brown.			
4	FILL	Silty GRAVEL with sand; cobbles, appears medium dense, moist, non-plastic, brown.			
8, 12, 16	FILL	Silty GRAVEL with sand; paper, wood, plastic, metal, insulation, glass debris, appears loose, moist, non-plastic, gray to black.			
20, 24, 28		End of boring at approximately 19 feet.			

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	313-218G **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **LB-6** LOCATION: **See Figure A-2** ELEVATION: DATE: **12-17-13** SCALE: **1" = 4'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	FILL	Silty GRAVEL with sand; cobbles, appears medium dense, moist, non-plastic, brown.			
4					
8	FILL	Silty GRAVEL with sand; cobbles, wood, rubber, plastic debris, appears loose, moist to wet, non-plastic, dark gray.			
12	GC	Clayey GRAVEL with sand; loose, wet, low plastic, dark gray to black.			
		Practical auger refusal at approximately 13 1/2 feet on basalt.			
16					
20					
24					
28					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

ALLWEST Materials Testing • Geotechnical Engineering

PROJECT:	313-218G Lewiston- Nez Perce County Airport Runway 8/26 Rehabilitation Nez Perce County, Idaho Armstrong Consultants	BORING: LB-7 LOCATION: See Figure A-2 ELEVATION: DATE: 12-17-13 SCALE: 1" = 4'

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	FILL	Silty GRAVEL with sand; appears medium dense, moist, non-plastic, brown.			Some glass/metal debris at surface.
4	FILL	Silty GRAVEL with sand; wood, glass, plastic, metal, insulation, debris at approximately 4 feet, appears loose, moist to wet, non-plastic, gray to black.			
8	FILL				
12	GM	Silty GRAVEL with sand; very dense, moist, non-plastic, brown to gray.			
		Practical auger refusal at approximately 12 feet on basalt.			
16					
20					
24					
28					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

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Materials Testing • Geotechnical Engineering

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **LB-8** LOCATION: **See Figure A-2** ELEVATION: DATE: **12-16-13** SCALE: **1" = 2'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	TS	Topsoil; silty SAND with gravel; loose, moist, non-plastic, brown.			
	FILL	Silty GRAVEL with sand; cobbles, appears loose, moist, non-plastic, brown.			
2	FILL	SILT with sand; appears loose, moist, low plastic, tan.			
4	FILL	SILT with sand; appears loose, moist, non-plastic, brown.			
6					
8	FILL	Silty GRAVEL with sand; appears loose, moist, low plastic, tan.			
10					Trace of glass debris at approximately 10 feet.
	ROCK	BASALT, slightly weathered, moderately fractured, hard.			
12		Practical auger refusal at approximately 11 1/2 feet on basalt.			
14					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	**313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **LB-9** LOCATION: **See Figure A-2** ELEVATION: DATE: **12-17-13**	SCALE: **1" = 4'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	SM	Silty SAND with gravel; appears loose, moist, non-plastic, brown.			
	GM	Silty GRAVEL with sand; appears loose to medium dense, moist, non-plastic, brown.			
4					
	CL	Sandy lean CLAY; appears soft to medium, wet, medium plastic, light brown to tan.			
8	GC	Clayey GRAVEL with sand; appears medium dense to dense, moist to wet, light brown to tan.			
	ROCK	BASALT; slightly weathered, slightly fractured, hard.			
		Practical auger refusal at approximately 10 feet on basalt.			
12					
16					
20					
24					
28					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

ALLWEST Materials Testing • Geotechnical Engineering

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **LB-10** LOCATION: **See Figure A-2** ELEVATION: DATE: **12-16-13** SCALE: **1" = 4'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	TS	Topsoil; silty SAND with gravel; appears loose, moist, non-plastic, brown.			
	FILL	SILT with sand and gravel; appears loose, moist, non-plastic, light brown to tan.			
9	FILL	Silty GRAVEL with sand; wood, glass, metal, rubber debris, appears loose, moist, non-plastic, red-brown to black.			
13.5	ROCK	BASALT; slightly weathered, moderately fractured and hard.			
14		Practical auger refusal at approximately 14 feet on basalt.			

Depth scale: 0, 4, 8, 12, 16, 20, 24, 28

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT: **313-218G** **Lewiston- Nez Perce County Airport** **Runway 8/26 Rehabilitation** **Nez Perce County, Idaho** **Armstrong Consultants**	BORING: **LB-11** LOCATION: **See Figure A-2** ELEVATION: DATE: **12-16-13** SCALE: **1" = 4'**

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	TS	Topsoil, silty SAND with gravel; appears loose, moist, non-plastic, brown.			
	GM	Silty GRAVEL with sand; appears loose, moist, non-plastic, brown.			
4					
8	GM	Silty GRAVEL with sand; some cobbles, appears loose to medium dense, moist, low plastic, tan.			
		Practical auger refusal at approximately 10 feet on basalt.			
12					
16					
20					
24					
28					

(See Report and Standard Plates for elevation and descriptive terminology.)

LOG OF BORING

PROJECT:	313-218G Lewiston- Nez Perce County Airport Runway 8/26 Rehabilitation Nez Perce County, Idaho Armstrong Consultants	BORING: LB-12 LOCATION: See Figure A-2 ELEVATION: DATE: 12-16-13 SCALE: 1" = 4'

Depth 0.0	ASTM D2487 Symbol	Description of Materials	N	WL	Tests or Notes
0	TS	Topsoil; silty SAND with gravel; organics, appears loose, moist, non-plastic, brown.			
	ML	SILT with sand and gravel; appears medium stiff, moist to dry, low plastic, tan.			
4					
	GM	Silty GRAVEL with sand; cobbles, appears loose to medium dense, moist, low plastic, tan.			
8		Practical auger refusal at approximately 8 1/2 feet on basalt.			
12					
16					
20					
24					
28					

(See Report and Standard Plates for elevation and descriptive terminology.)

Unified Soil Classification System

MAJOR DIVISIONS			SYMBOL	TYPICAL NAMES
COARSE GRAINED SOILS	GRAVELS	CLEAN GRAVELS	GW	Well-Graded Gravel, Gravel-Sand Mixtures.
			GP	Poorly-Graded Gravel, Gravel-Sand Mixtures.
		GRAVELS WITH FINES	GM	Silty Gravel, Gravel-Sand-Silt Mixtures.
			GC	Clayey Gravel, Gravel-Sand-Clay Mixtures.
	SANDS	CLEAN SANDS	SW	Well-Graded Sand, Gravelly Sand.
			SP	Poorly-Graded Sand, Gravelly Sand.
		SANDS WITH FINES	SM	Silty Sand, Sand-Silt Mixtures.
			SC	Clayey Sand, Sand-Clay Mixtures.
FINE GRAINED SOILS	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50%		ML	Inorganic Silt, Silty or Clayey Fine Sand.
			CL	Inorganic Clay of Low to Medium Plasticity, Sandy or Silty Clay.
			OL	Organic Silt and Clay of Low Plasticity.
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH	Inorganic Silt, Elastic Silt, Micaceous Silt, Fine Sand or Silt.
			CH	Inorganic Clay of High Plasticity, Fat Clay.
			OH	Organic Clay of Medium to High Plasticity.
Highly Organic Soils			PT	Peat, Muck and Other Highly Organic Soils.

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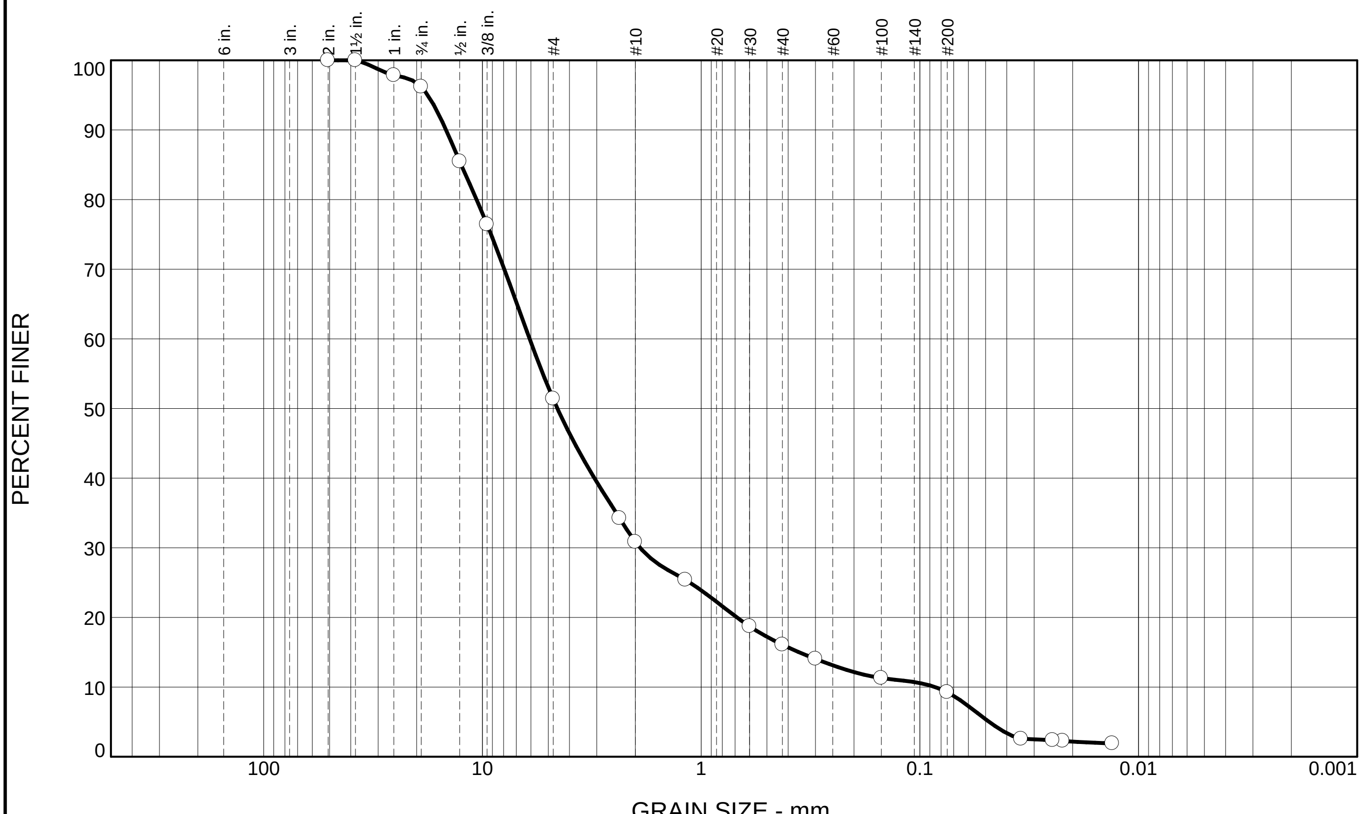
Appendix C

Laboratory Test Results
Summary of Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.8	44.8	20.6	14.7	6.8	9.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	100.0		
1"	97.9		
3/4"	96.2		
1/2"	85.5		
3/8"	76.4		
#4	51.4		
#8	34.3		
#10	30.8		
#16	25.4		
#30	18.7		
#40	16.1		
#50	14.1		
#100	11.3		
#200	9.3		

* (no specification provided)

Material Description

Crushed aggregate base

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 14.6700 D_{85}= 12.5083 D_{60}= 6.0830
D_{50}= 4.5381 D_{30}= 1.9014 D_{15}= 0.3558
D_{10}= 0.0849 C_u= 71.68 C_c= 7.00

Classification

USCS= AASHTO=

Remarks

<0.02mm = 2.1%

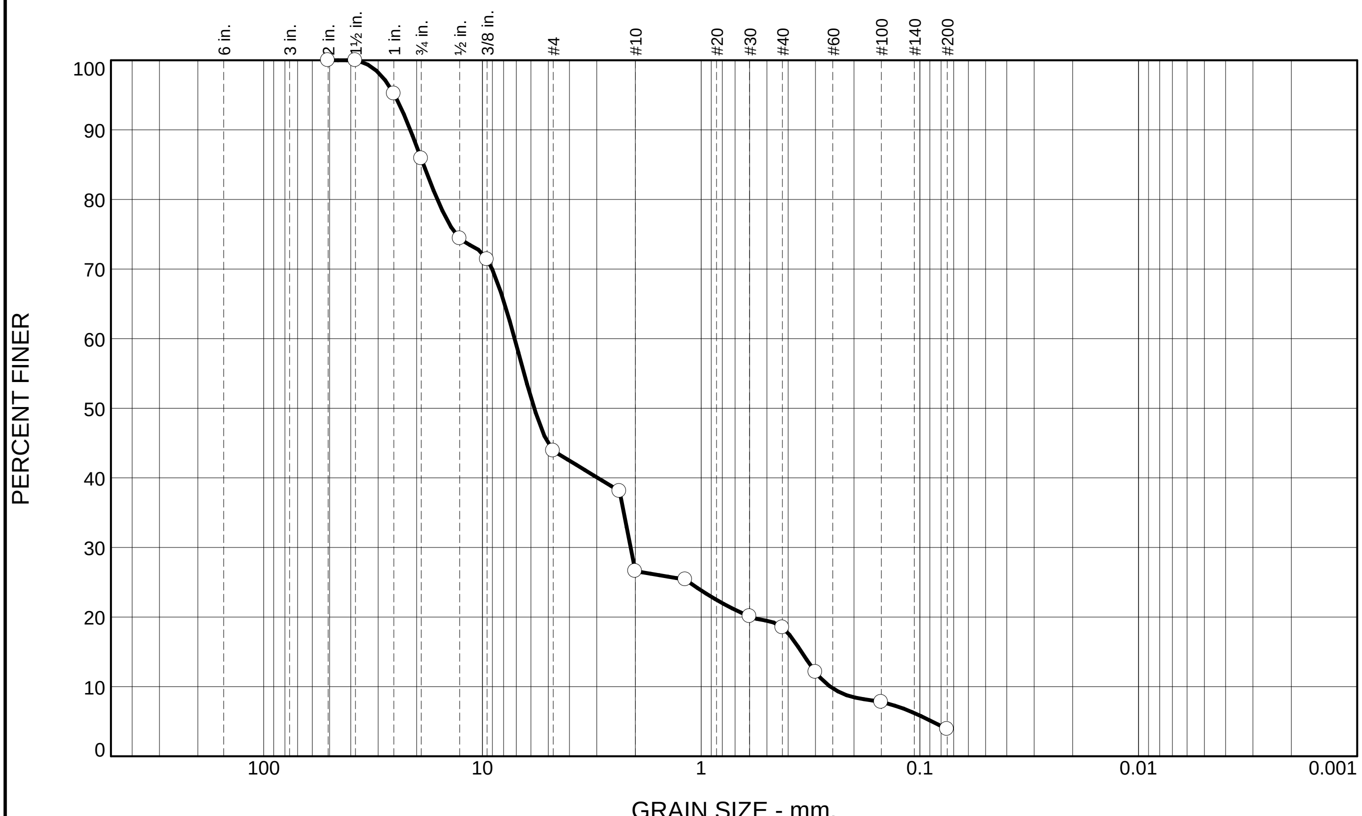
Source of Sample: RB-4 **Depth:** 1'
Sample Number: S313-317

Date: 1/16/14

ALLWEST
TESTING & ENGINEERING
Hayden, ID

Client: Armstrong Consultants
Project: Lewiston - Nez Perce County Airport
Runway 8/26 Rehabilitation
Project No: 313-218G **Figure** C-1

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	14.1	42.0	17.3	8.1	14.6	3.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	100.0		
1"	95.2		
3/4"	85.9		
1/2"	74.4		
3/8"	71.4		
#4	43.9		
#8	38.1		
#10	26.6		
#16	25.4		
#30	20.1		
#40	18.5		
#50	12.1		
#100	7.8		
#200	3.9		

* (no specification provided)

Material Description

Crushed aggregate base

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 21.3771 D_{85}= 18.5790 D_{60}= 7.1296
D_{50}= 5.7935 D_{30}= 2.1063 D_{15}= 0.3475
D_{10}= 0.2565 C_u= 27.80 C_c= 2.43

Classification

USCS= GW AASHTO=

Remarks

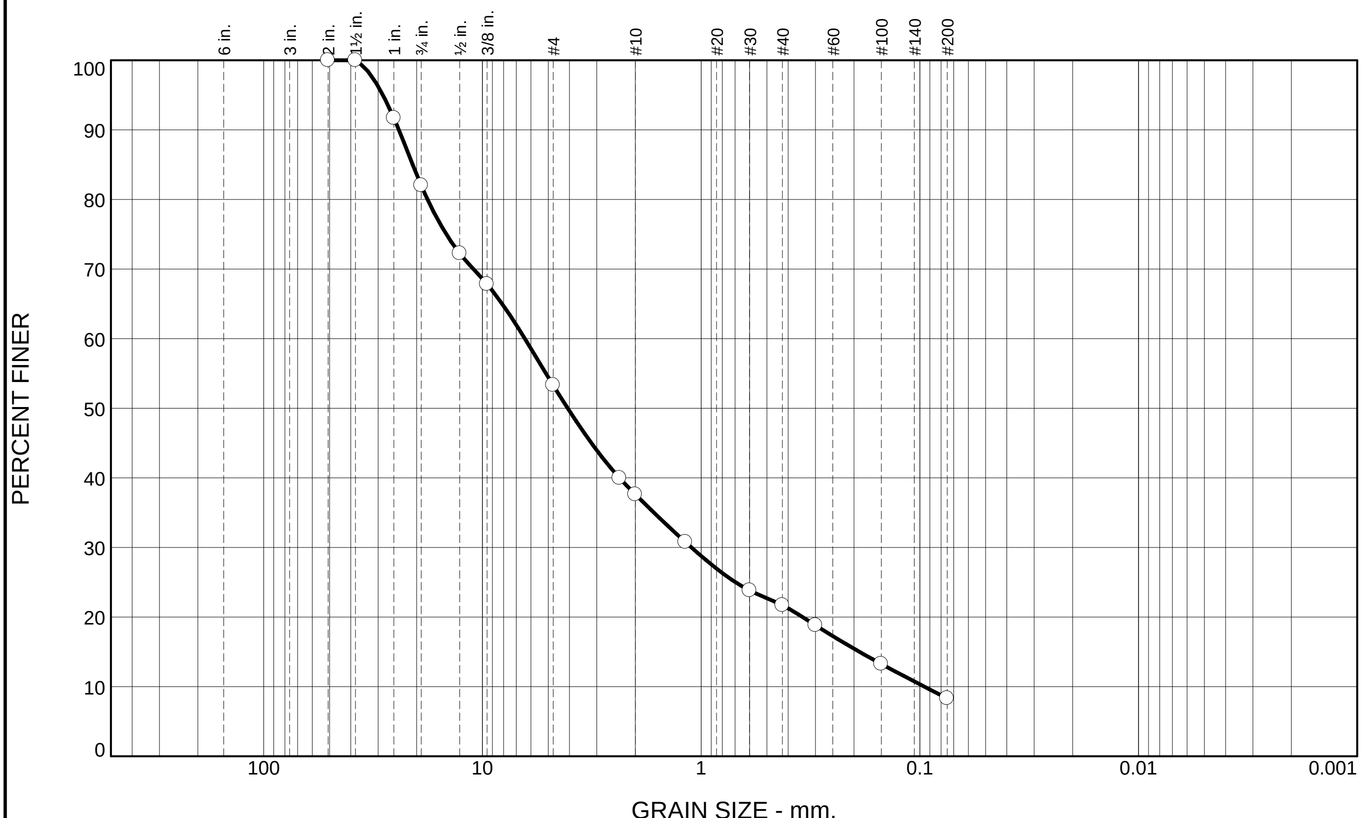
Source of Sample: RB-6 **Depth:** 1'
Sample Number: S313-321

Date: 1/16/2014

ALLWEST TESTING & ENGINEERING
Hayden, ID

Client: Armstrong Consultants
Project: Lewiston - Nez Perce County Airport
Runway 8/26 Rehabilitation
Project No: 313-218G **Figure** C-2

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	18.0	28.7	15.7	15.9	13.4	8.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	100.0		
1"	91.7		
3/4"	82.0		
1/2"	72.2		
3/8"	67.8		
#4	53.3		
#8	40.0		
#10	37.6		
#16	30.8		
#30	23.8		
#40	21.7		
#50	18.8		
#100	13.3		
#200	8.3		

* (no specification provided)

Material Description

Poorly graded gravel with silt and sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 24.1106 D_{85}= 20.8381 D_{60}= 6.3969
D_{50}= 4.0757 D_{30}= 1.1065 D_{15}= 0.1884
D_{10}= 0.0952 C_u= 67.20 C_c= 2.01

Classification

USCS= GP-GM AASHTO=

Remarks

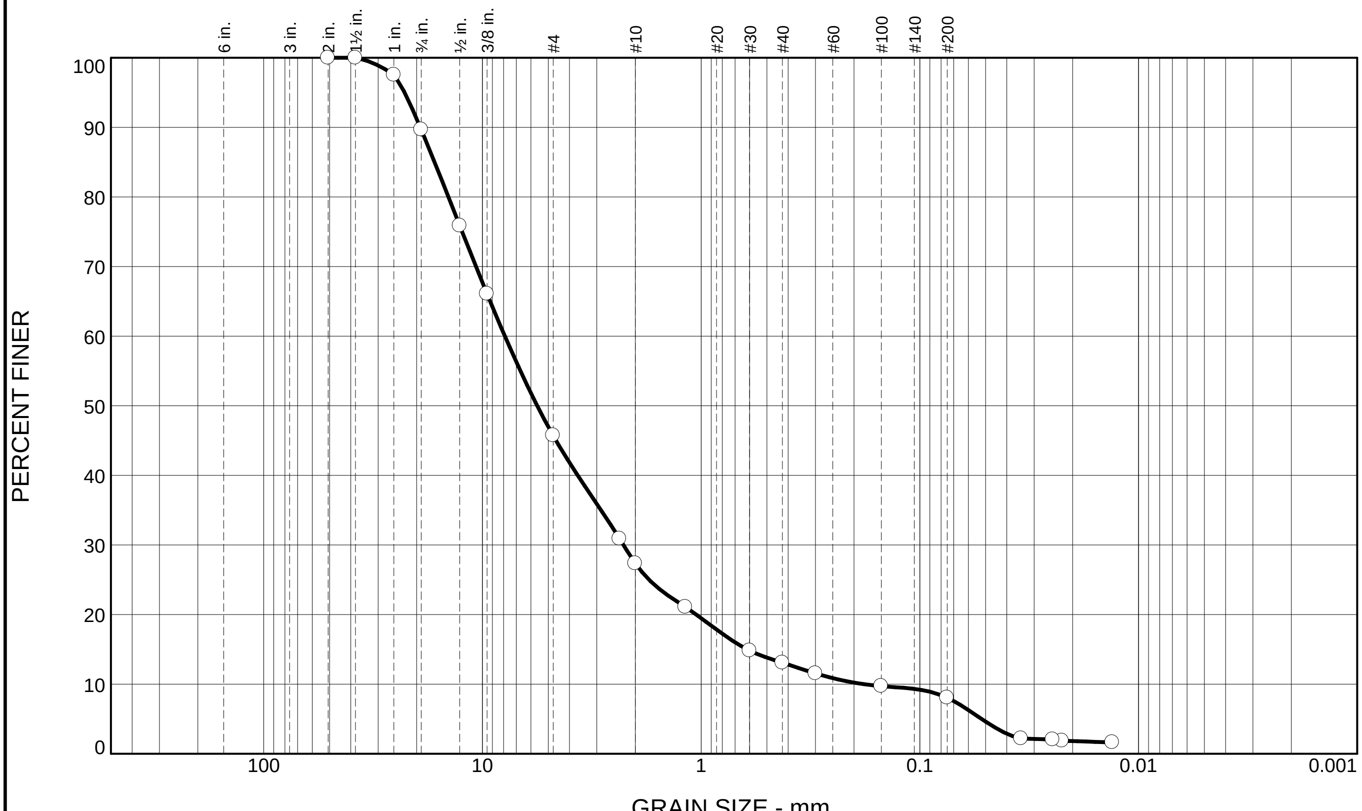
Source of Sample: RB-6 **Depth:** 2 1/2'
Sample Number: S313-322

Date: 1/16/2014

ALLWEST TESTING & ENGINEERING
Hayden, ID

Client: Armstrong Consultants
Project: Lewiston - Nez Perce County Airport
Runway 8/26 Rehabilitation
Project No: 313-218G **Figure** C-3

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.3	44.0	18.3	14.3	5.0	8.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	100.0		
1"	97.5		
3/4"	89.7		
1/2"	75.9		
3/8"	66.1		
#4	45.7		
#8	30.9		
#10	27.4		
#16	21.1		
#30	14.8		
#40	13.1		
#50	11.5		
#100	9.7		
#200	8.1		

* (no specification provided)

Material Description

Crushed aggregate base

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 19.2350 D_{85}= 16.5530 D_{60}= 7.8947
D_{50}= 5.6148 D_{30}= 2.2660 D_{15}= 0.6152
D_{10}= 0.1795 C_u= 43.98 C_c= 3.62

Classification

USCS= AASHTO=

Remarks

<0.02mm = 1.8%

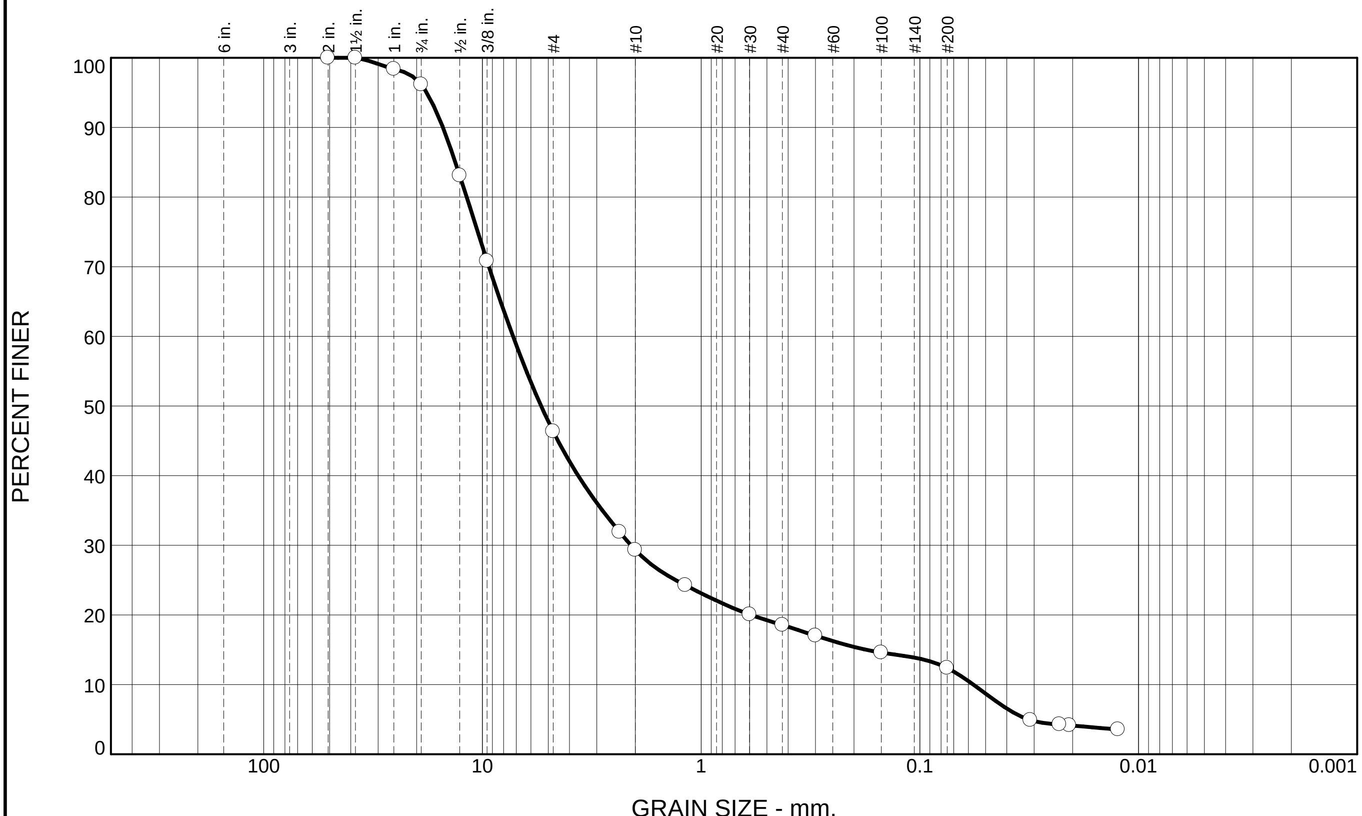
Source of Sample: RB-10 **Depth:** 1'
Sample Number: S313-329

Date: 1/16/2014

ALLWEST
TESTING & ENGINEERING
Hayden, ID

Client: Armstrong Consultants
Project: Lewiston - Nez Perce County Airport
Runway 8/26 Rehabilitation
Project No: 313-218G **Figure** C-4

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.8	49.8	17.1	10.7	6.2	12.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	100.0		
1"	98.4		
3/4"	96.2		
1/2"	83.1		
3/8"	70.8		
#4	46.4		
#8	31.9		
#10	29.3		
#16	24.3		
#30	20.1		
#40	18.6		
#50	17.0		
#100	14.6		
#200	12.4		

* (no specification provided)

Material Description

Crushed aggregate base

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 15.1634 D_{85}= 13.3014 D_{60}= 7.2457
D_{50}= 5.3884 D_{30}= 2.0948 D_{15}= 0.1750
D_{10}= 0.0569 C_u= 127.37 C_c= 10.65

Classification

USCS= AASHTO=

Remarks

<0.02mm = 4.0%

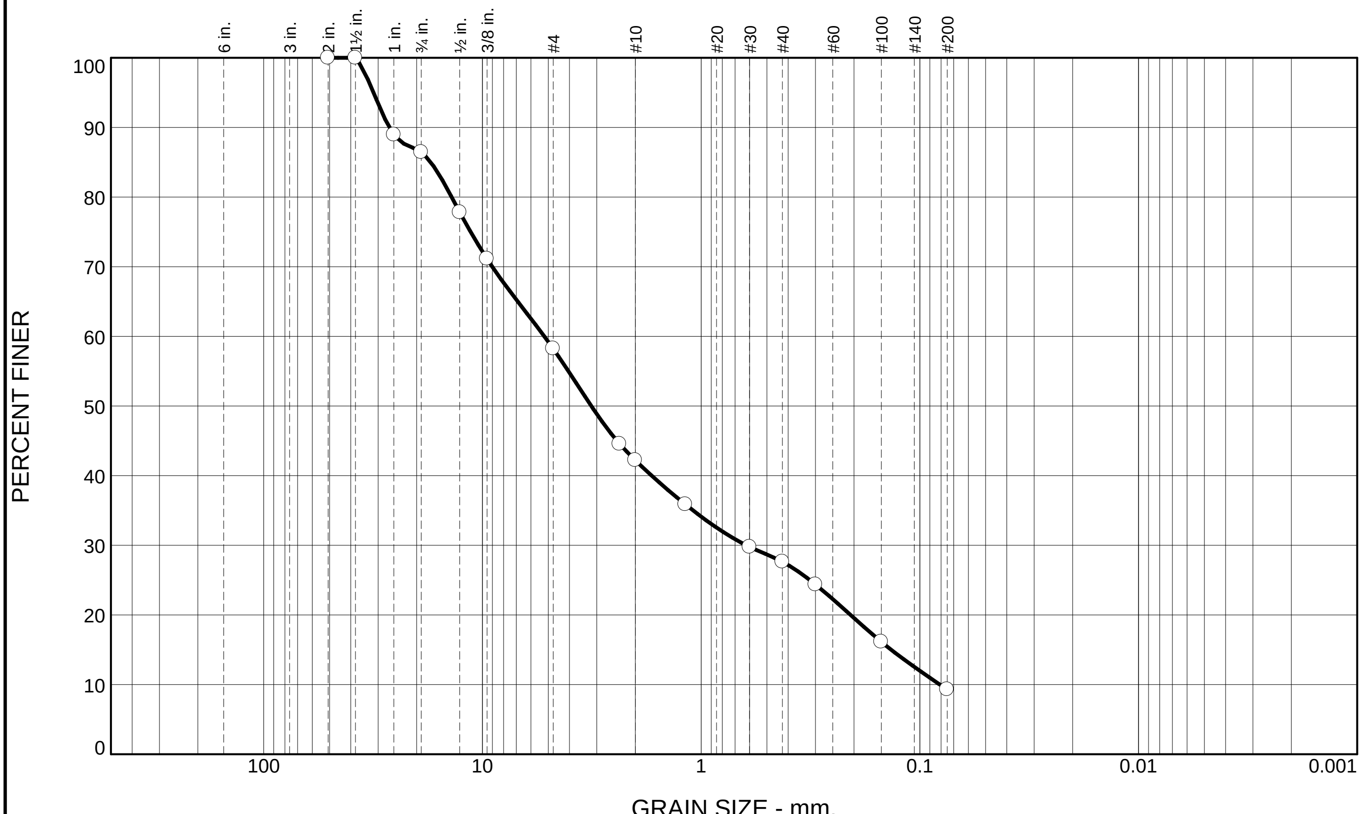
Source of Sample: RB-10 **Depth:** 2 1/2'
Sample Number: S313-330

Date: 1/16/2014

ALLWEST TESTING & ENGINEERING
Hayden, ID

Client: Armstrong Consultants
Project: Lewiston - Nez Perce County Airport Runway 8/26 Rehabilitation
Project No: 313-218G **Figure** C-5

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.6	28.2	16.0	14.6	18.3	9.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	100.0		
1"	89.0		
3/4"	86.4		
1/2"	77.8		
3/8"	71.1		
#4	58.2		
#8	44.6		
#10	42.2		
#16	35.9		
#30	29.8		
#40	27.6		
#50	24.4		
#100	16.2		
#200	9.3		

* (no specification provided)

Material Description

Crushed aggregate base

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 26.6606 D_{85}= 17.2194 D_{60}= 5.2109
D_{50}= 3.1763 D_{30}= 0.6212 D_{15}= 0.1350
D_{10}= 0.0809 C_u= 64.45 C_c= 0.92

Classification

USCS= AASHTO=

Remarks

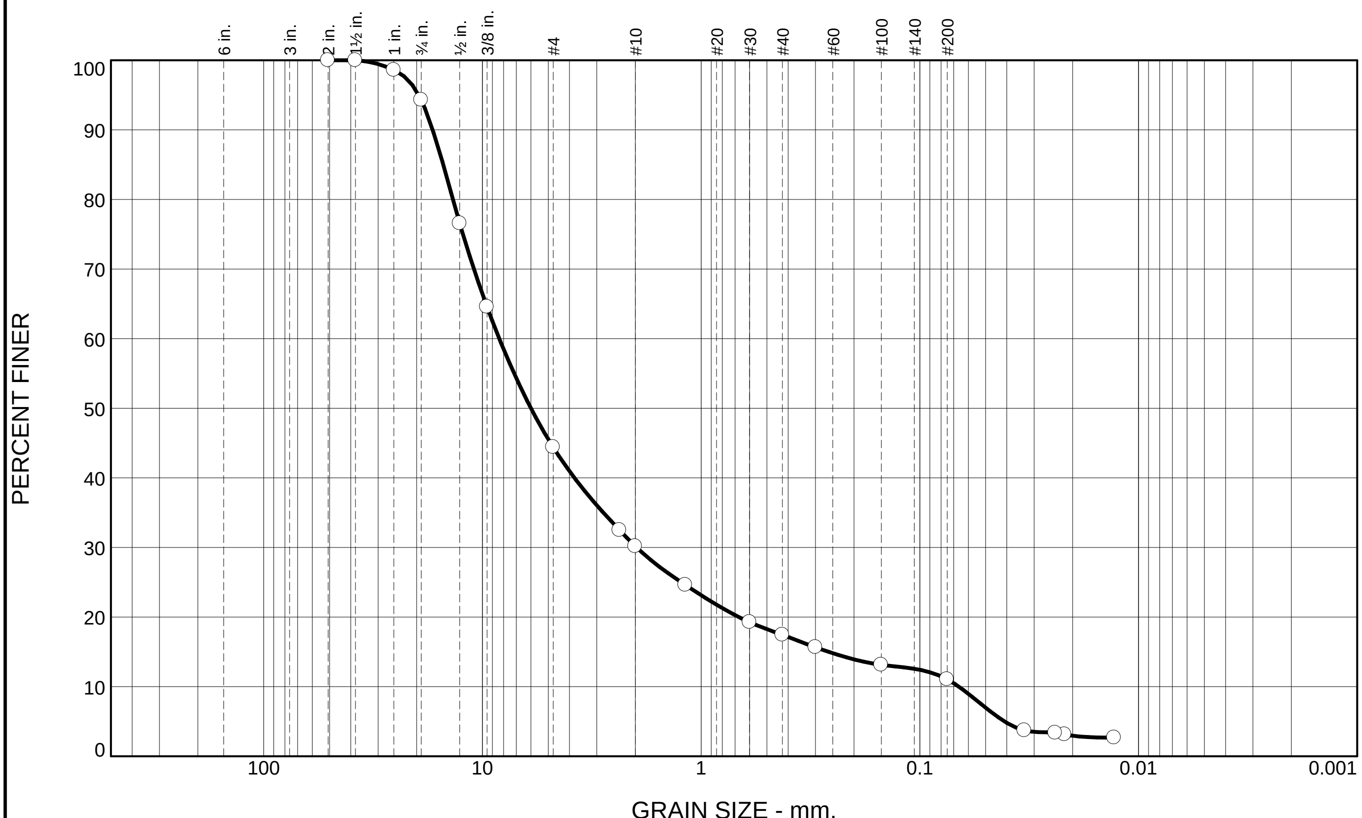
Source of Sample: RB-11 **Depth:** 2 1/2'
Sample Number: S313-334

Date: 1/16/2014

ALLWEST TESTING & ENGINEERING
Hayden, ID

Client: Armstrong Consultants
Project: Lewiston - Nez Perce County Airport
Runway 8/26 Rehabilitation
Project No: 313-218G **Figure** C-6

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.7	49.9	14.2	12.8	6.3	11.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	100.0		
1"	98.6		
3/4"	94.3		
1/2"	76.6		
3/8"	64.6		
#4	44.4		
#8	32.5		
#10	30.2		
#16	24.6		
#30	19.3		
#40	17.4		
#50	15.7		
#100	13.1		
#200	11.1		

* (no specification provided)

Material Description

Crushed aggregate base

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 16.8800 D_{85}= 15.1117 D_{60}= 8.3731
D_{50}= 5.9984 D_{30}= 1.9734 D_{15}= 0.2607
D_{10}= 0.0663 C_u= 126.28 C_c= 7.01

Classification

USCS= AASHTO=

Remarks

<0.02mm = 2.9%

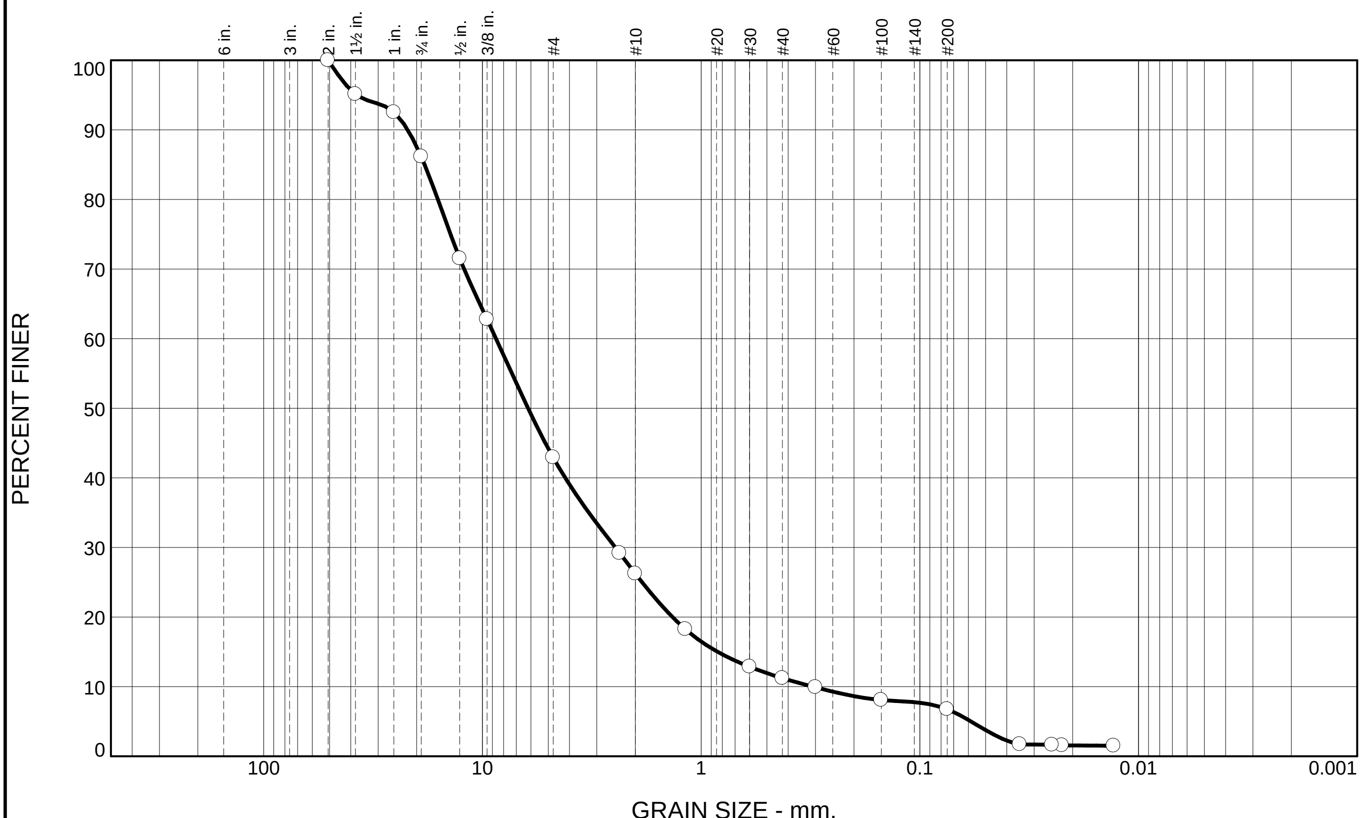
Source of Sample: RB-14 **Depth:** 1'
Sample Number: S313-337

Date: 1/16/2014

ALLWEST
TESTING & ENGINEERING
Hayden, ID

Client: Armstrong Consultants
Project: Lewiston - Nez Perce County Airport
Runway 8/26 Rehabilitation
Project No: 313-218G **Figure** C-7

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.8	43.3	16.7	15.0	4.4	6.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	95.1		
1"	92.5		
3/4"	86.2		
1/2"	71.5		
3/8"	62.8		
#4	42.9		
#8	29.2		
#10	26.2		
#16	18.3		
#30	12.9		
#40	11.2		
#50	9.9		
#100	8.1		
#200	6.8		

* (no specification provided)

Material Description

Crushed aggregate base

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 21.9695 D_{85}= 18.3806 D_{60}= 8.6655
D_{50}= 6.1820 D_{30}= 2.4683 D_{15}= 0.8399
D_{10}= 0.3076 C_u= 28.17 C_c= 2.29

Classification

USCS= AASHTO=

Remarks

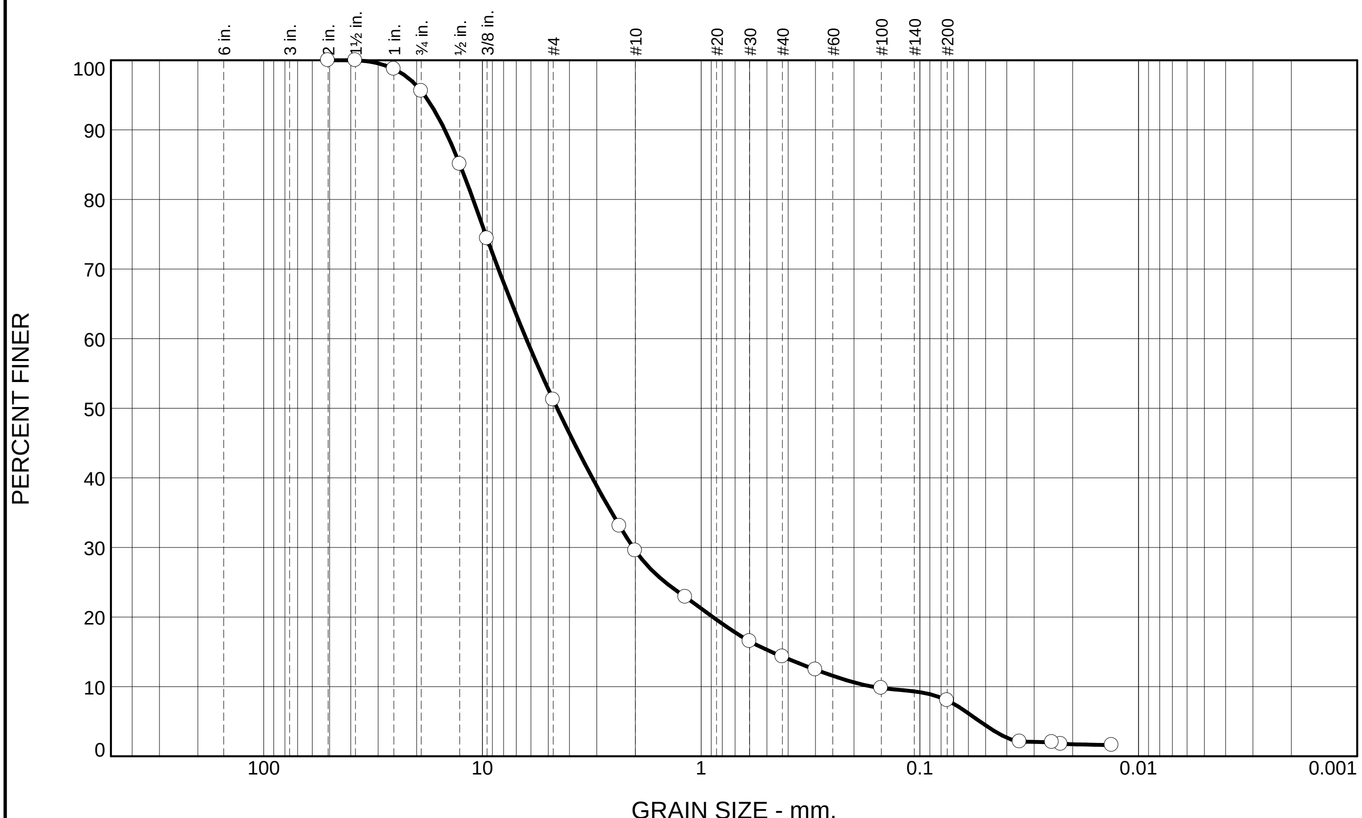
<0.02mm = 1.5%

Source of Sample: RB-17 **Depth:** 1'
Sample Number: S313-362 **Date:** 1/16/2014

ALLWEST TESTING & ENGINEERING
Hayden, ID

Client: Armstrong Consultants
Project: Lewiston - Nez Perce County Airport
Runway 8/26 Rehabilitation
Project No: 313-218G **Figure** C-8

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.4	44.4	21.7	15.2	6.3	8.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	100.0		
1"	98.7		
3/4"	95.6		
1/2"	85.1		
3/8"	74.4		
#4	51.2		
#8	33.1		
#10	29.5		
#16	22.9		
#30	16.5		
#40	14.3		
#50	12.5		
#100	9.8		
#200	8.0		

* (no specification provided)

Material Description

Crushed aggregate base

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 14.8675 D_{85}= 12.6689 D_{60}= 6.3096
D_{50}= 4.5518 D_{30}= 2.0467 D_{15}= 0.4768
D_{10}= 0.1639 C_u= 38.50 C_c= 4.05

Classification

USCS= AASHTO=

Remarks

<0.02mm = 1.6%

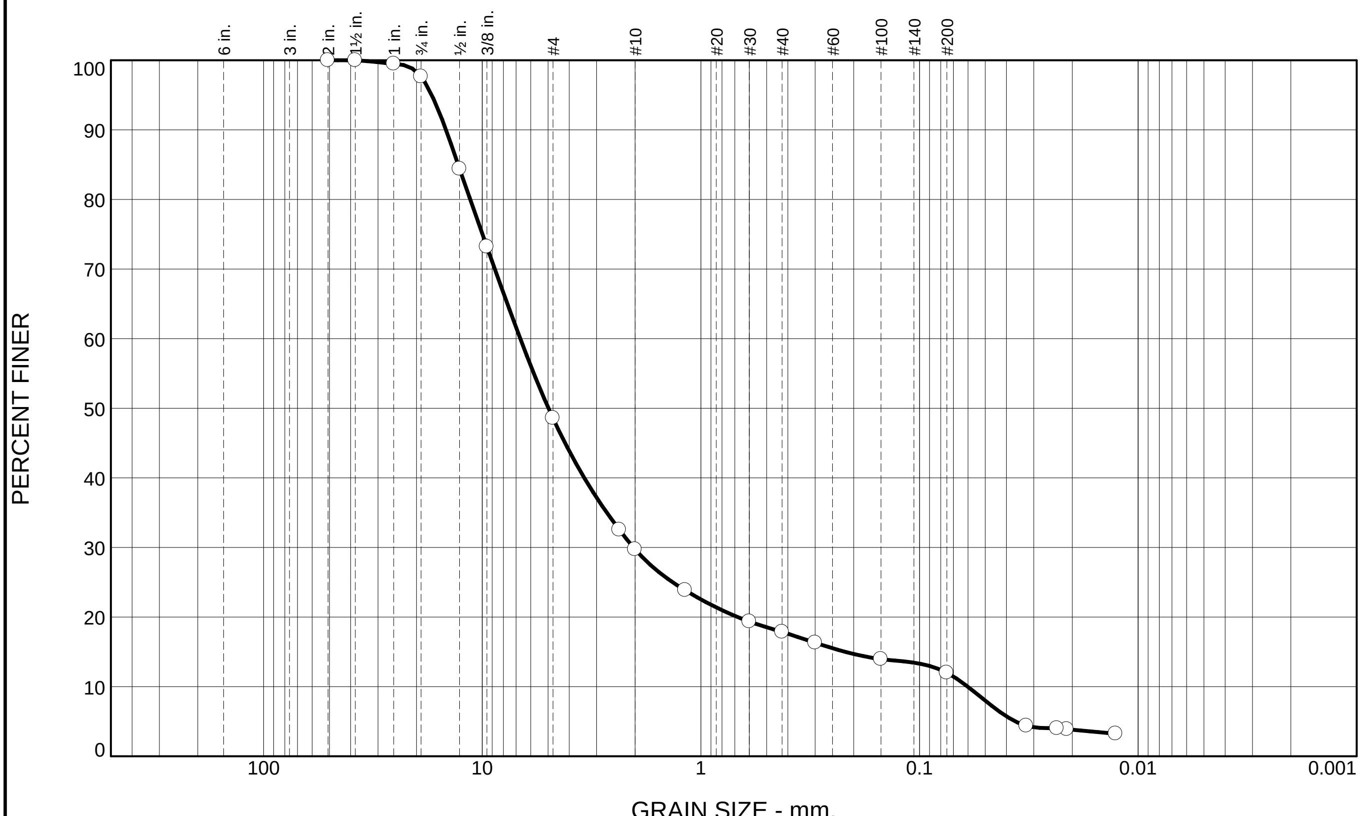
Source of Sample: RB-18 **Depth:** 1'
Sample Number: S313-365

Date: 1/16/2014

ALLWEST
TESTING & ENGINEERING
Hayden, ID

Client: Armstrong Consultants
Project: Lewiston - Nez Perce County Airport
Runway 8/26 Rehabilitation
Project No: 313-218G **Figure** C-9

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.3	49.1	18.9	11.8	5.9	12.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	100.0		
1"	99.5		
3/4"	97.7		
1/2"	84.4		
3/8"	73.2		
#4	48.6		
#8	32.5		
#10	29.7		
#16	23.9		
#30	19.4		
#40	17.9		
#50	16.3		
#100	14.0		
#200	12.0		

* (no specification provided)

Material Description

Crushed aggregate base

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 14.6564 D_{85}= 12.8926 D_{60}= 6.6998
D_{50}= 4.9765 D_{30}= 2.0341 D_{15}= 0.2177
D_{10}= 0.0601 C_u= 111.47 C_c= 10.27

Classification

USCS= AASHTO=

Remarks

<0.02mm = 3.7%

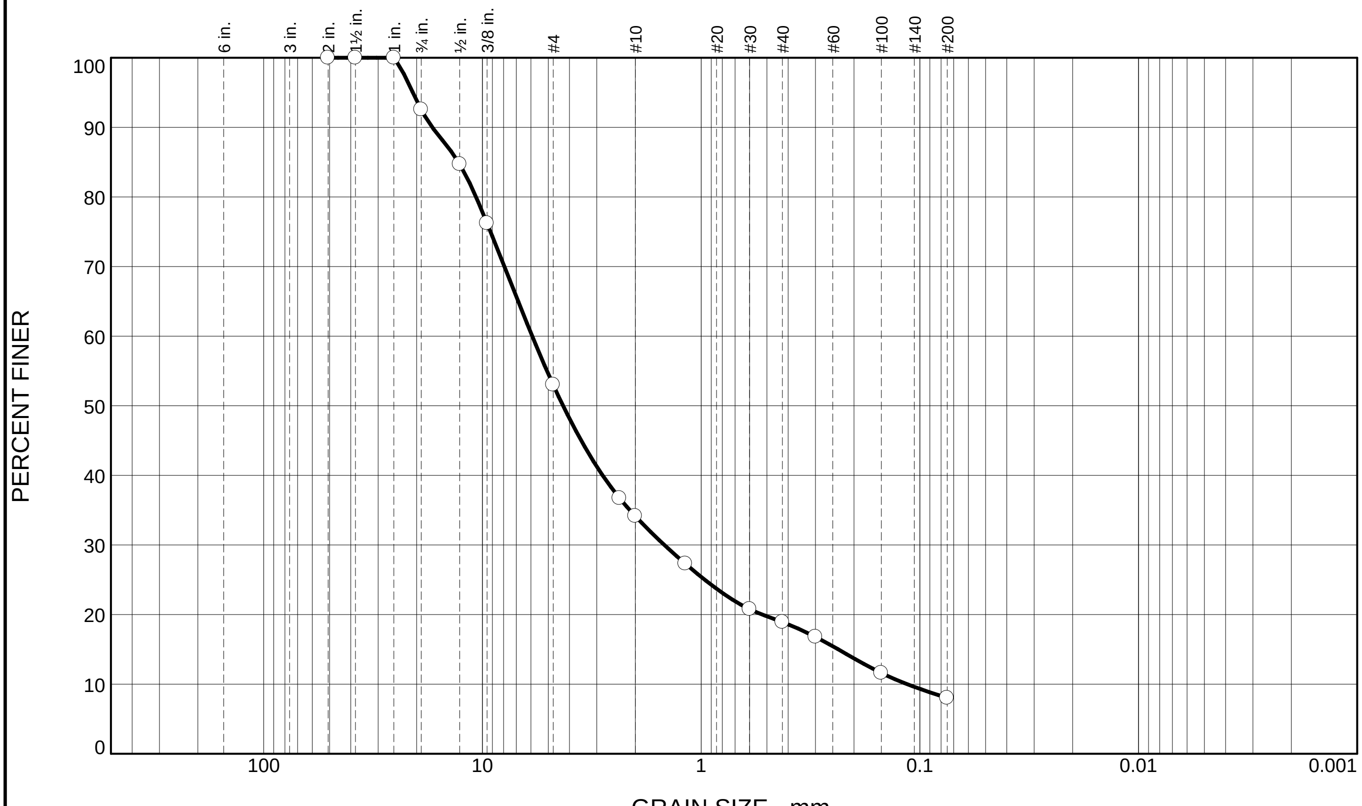
Source of Sample: RB-19 **Depth:** 2 1/2'
Sample Number: S313-368

Date: 1/16/2014

ALLWEST TESTING & ENGINEERING
Hayden, ID

Client: Armstrong Consultants
Project: Lewiston - Nez Perce County Airport
Runway 8/26 Rehabilitation
Project No: 313-218G **Figure** C-10

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.5	39.5	18.9	15.2	10.9	8.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	100.0		
1"	100.0		
3/4"	92.5		
1/2"	84.7		
3/8"	76.2		
#4	53.0		
#8	36.7		
#10	34.1		
#16	27.3		
#30	20.8		
#40	18.9		
#50	16.8		
#100	11.6		
#200	8.0		

* (no specification provided)

Material Description

Poorly graded gravel with silt and sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 16.9322 D_{85}= 12.8709 D_{60}= 5.9179
D_{50}= 4.2781 D_{30}= 1.4721 D_{15}= 0.2359
D_{10}= 0.1141 C_u= 51.88 C_c= 3.21

Classification

USCS= GP-GM AASHTO=

Remarks

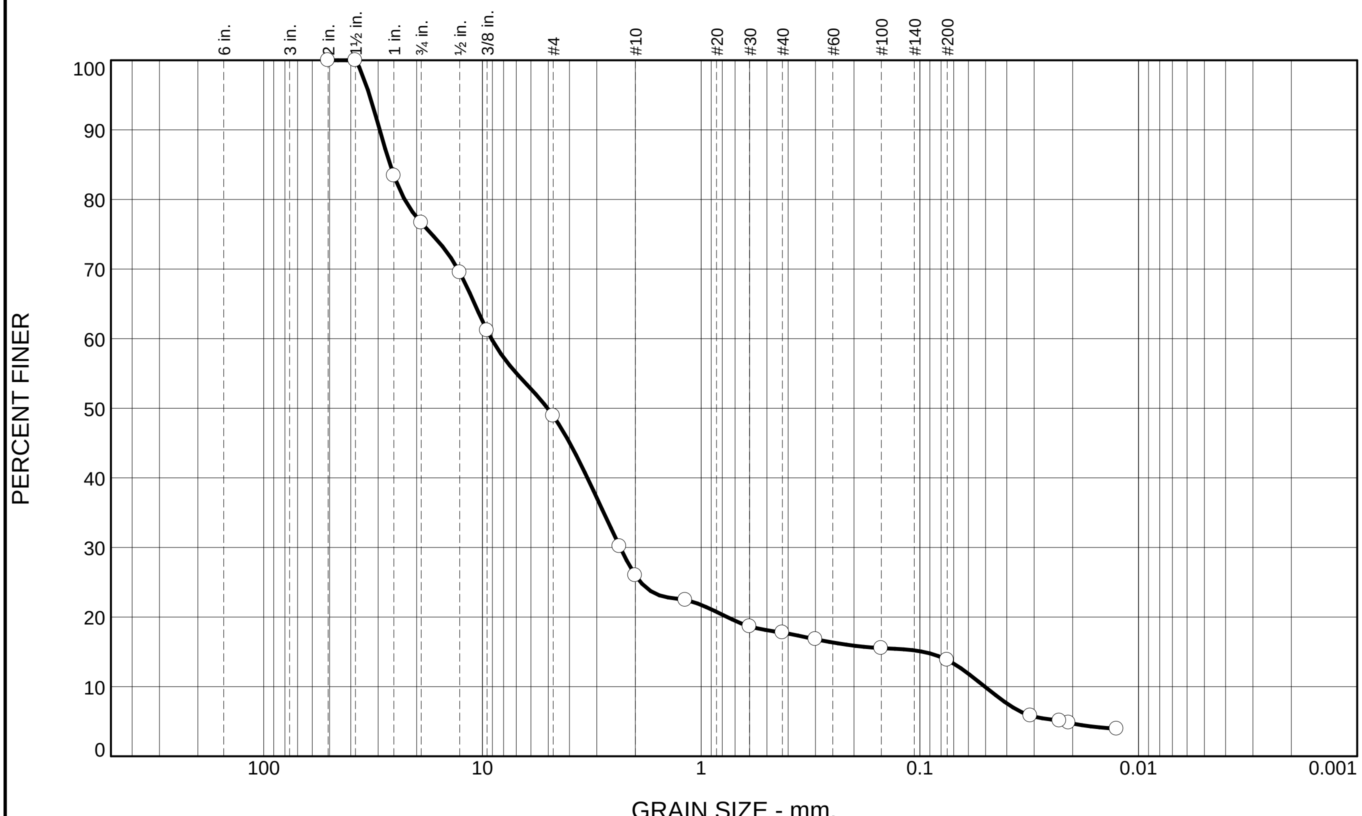
Source of Sample: AB-2 **Depth:** 10'
Sample Number: S313-348

Date: 1/16/2014

ALLWEST
TESTING & ENGINEERING
Hayden, ID

Client: Armstrong Consultants
Project: Lewiston - Nez Perce County Airport
Runway 8/26 Rehabilitation
Project No: 313-218G **Figure** C-11

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	23.3	27.8	22.9	8.2	4.0	13.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	100.0		
1"	83.4		
3/4"	76.7		
1/2"	69.5		
3/8"	61.2		
#4	48.9		
#8	30.2		
#10	26.0		
#16	22.5		
#30	18.7		
#40	17.8		
#50	16.8		
#100	15.5		
#200	13.8		

* (no specification provided)

Material Description

Crushed aggregate base

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 29.4865 D_{85}= 26.4321 D_{60}= 9.0932
D_{50}= 5.0320 D_{30}= 2.3456 D_{15}= 0.0960
D_{10}= 0.0504 C_u= 180.47 C_c= 12.01

Classification

USCS= AASHTO=

Remarks

<0.02mm = 4.6%

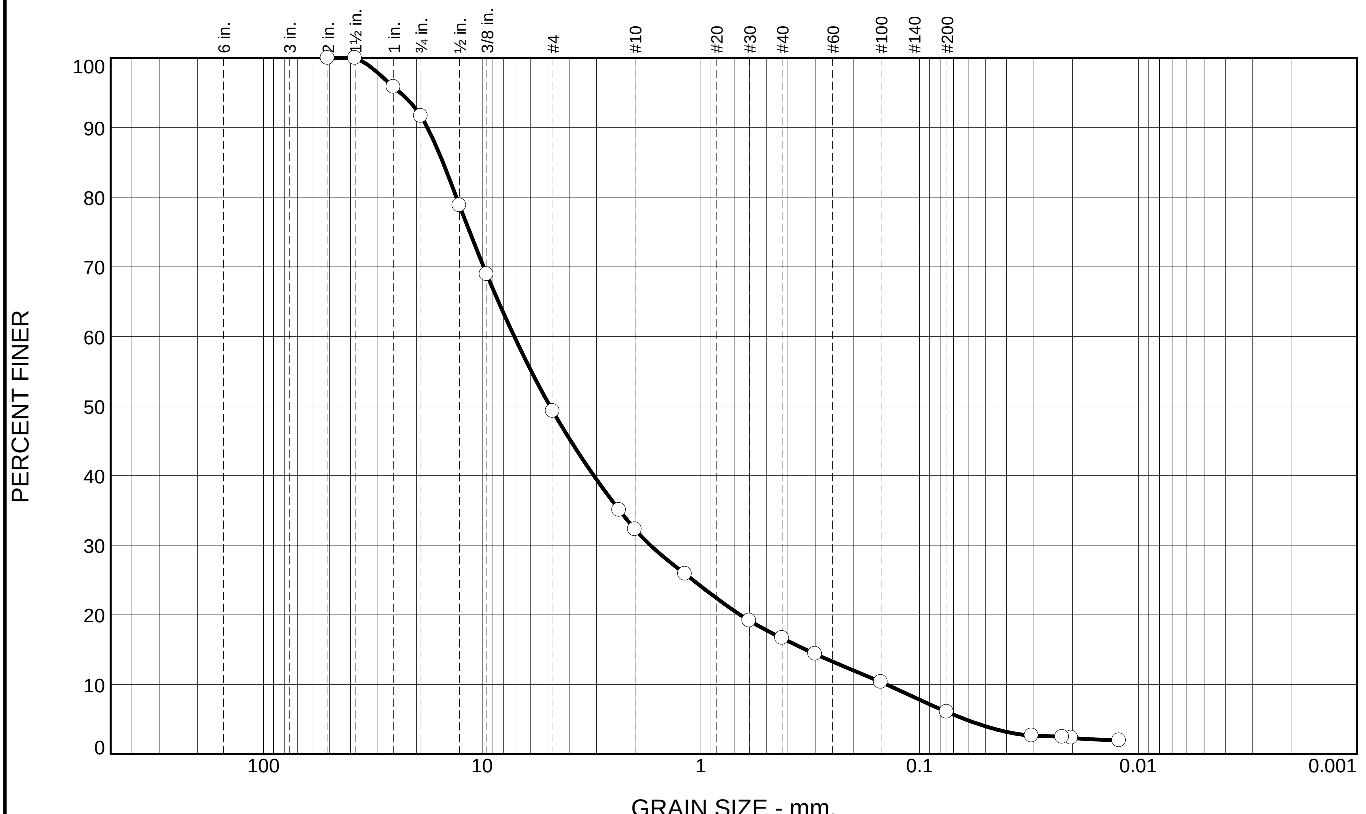
Source of Sample: AB-4 **Depth:** 3/4'
Sample Number: S313-352

Date: 1/16/2014

ALLWEST
TESTING & ENGINEERING
Hayden, ID

Client: Armstrong Consultants
Project: Lewiston - Nez Perce County Airport
Runway 8/26 Rehabilitation
Project No: 313-218G **Figure** C-12

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	8.3	42.4	17.0	15.6	10.6	6.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1 1/2"	100.0		
1"	95.8		
3/4"	91.7		
1/2"	78.8		
3/8"	68.9		
#4	49.3		
#8	35.0		
#10	32.3		
#16	25.9		
#30	19.2		
#40	16.7		
#50	14.4		
#100	10.3		
#200	6.1		

* (no specification provided)

Material Description

Crushed aggregate base

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 17.7864 D_{85}= 15.1151 D_{60}= 7.1361
D_{50}= 4.8988 D_{30}= 1.7023 D_{15}= 0.3310
D_{10}= 0.1419 C_u= 50.29 C_c= 2.86

Classification

USCS= AASHTO=

Remarks

<0.02mm = 2.3%

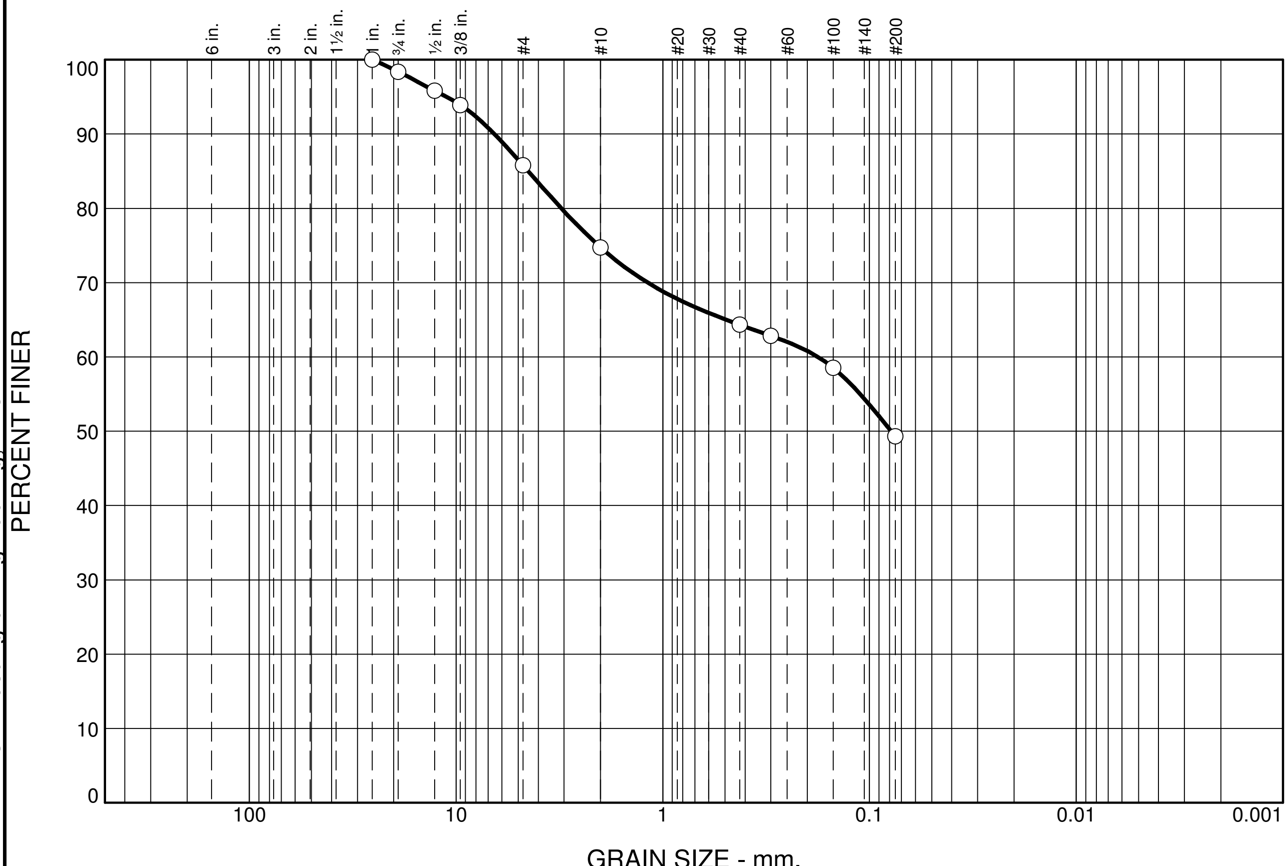
Source of Sample: AB-5 **Depth:** 1/2' - 1'
Sample Number: S313-349

Date: 1/16/2014

ALLWEST
TESTING & ENGINEERING
Hayden, ID

Client: Armstrong Consultants
Project: Lewiston - Nez Perce County Airport
Runway 8/26 Rehabilitation
Project No: 313-218G **Figure** C-13

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.6	12.6	11.1	10.4	15.0	49.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	98.4		
1/2"	95.8		
3/8"	93.9		
#4	85.8		
#10	74.7		
#40	64.3		
#50	62.8		
#100	58.6		
#200	49.3		

* (no specification provided)

Material Description

Clayey sand

Atterberg Limits

PL= 18 LL= 33 PI= 15

Coefficients

D_{90}= 6.5304 D_{85}= 4.4756 D_{60}= 0.1776
D_{50}= 0.0785 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-6(4)

Remarks

ASTM C117, C136

Location: RB-3 @ 1-4'
Sample Number: S213-518

Date: 1-16-14

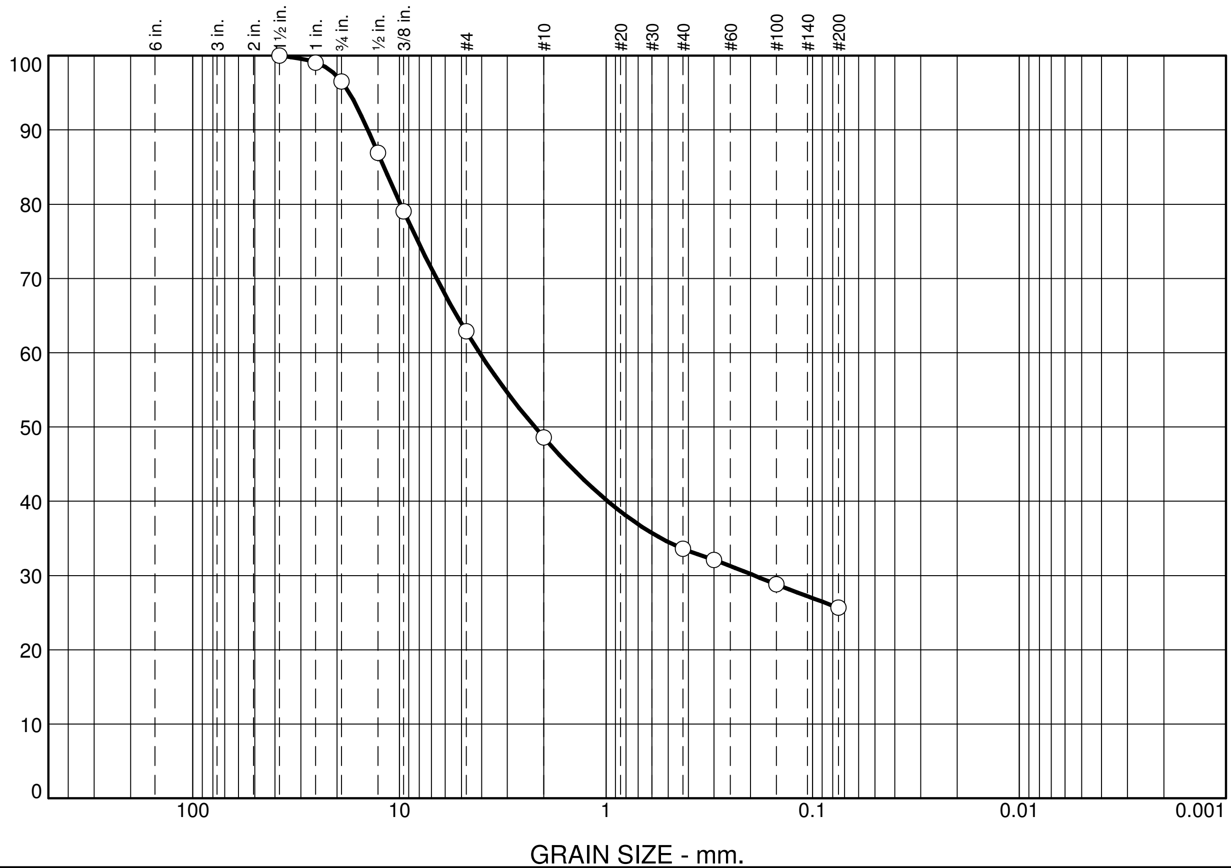
ALLWEST TESTING & ENGINEERING, LLC
Spokane, WA

Client: Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway

Project No: 313-218G **Figure: C-14**

Tested By: D.Schmitz **Checked By:** S.Turpin

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.5	33.6	14.3	15.0	7.9	25.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 1/2"	100.0		
1"	99.0		
3/4"	96.5		
1/2"	86.9		
3/8"	79.1		
#4	62.9		
#10	48.6		
#40	33.6		
#50	32.1		
#100	28.8		
#200	25.7		

* (no specification provided)

Material Description

Silty, clayey sand with gravel

Atterberg Limits

PL= 19 LL= 26 PI= 7

Coefficients

D_{90}= 14.2087 D_{85}= 11.8574 D_{60}= 4.0915
D_{50}= 2.2119 D_{30}= 0.1916 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC-SM AASHTO= A-2-4(0)

Remarks

ASTM C117, C136

Location: RB-6 @ 1-5'
Sample Number: S213-519

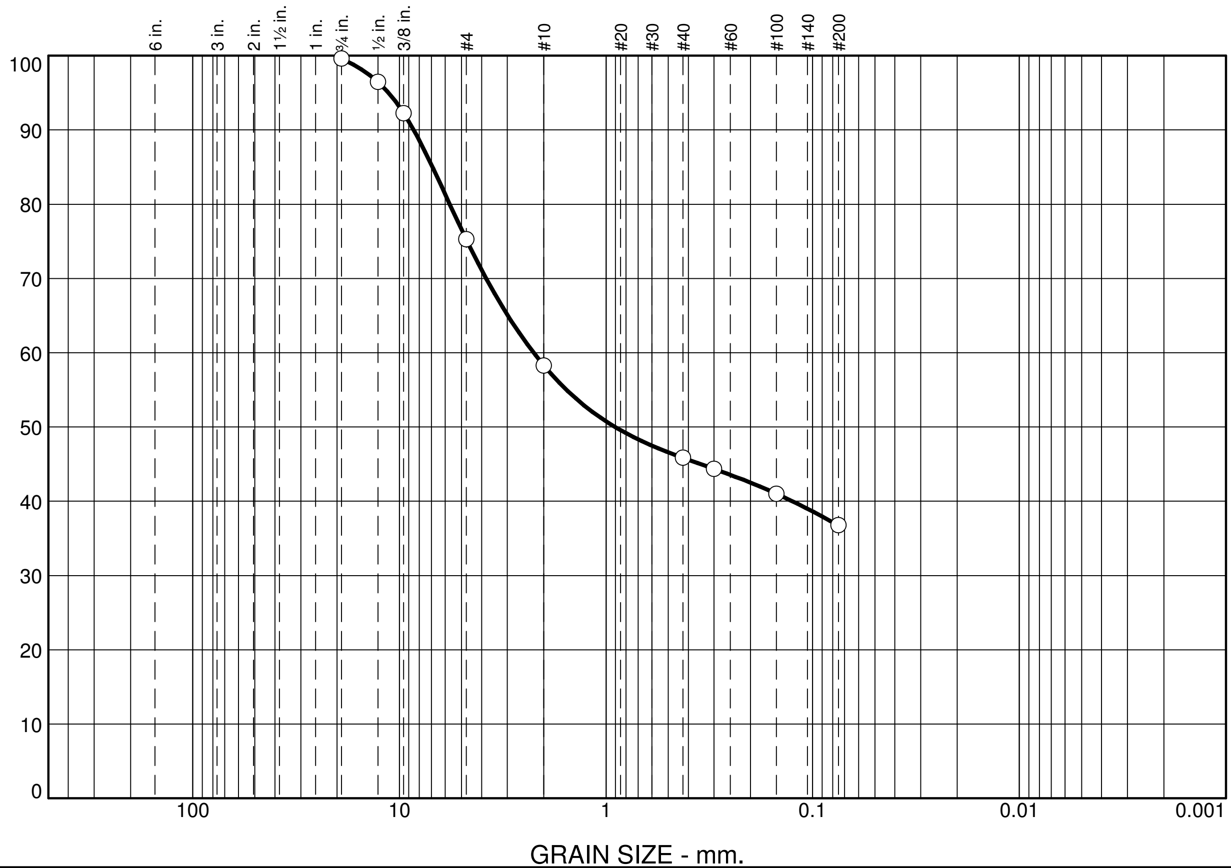
Date: 1-16-14

ALLWEST TESTING & ENGINEERING, LLC Spokane, WA

Client: Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway
Project No: 313-218G **Figure:** C-15

Tested By: D.Schmitz **Checked By:** S.Turpin

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
		24.3	17.0	12.4	9.1	36.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	99.6		
1/2"	96.5		
3/8"	92.2		
#4	75.3		
#10	58.3		
#40	45.9		
#50	44.4		
#100	41.0		
#200	36.8		

* (no specification provided)

Material Description

Clayey sand with gravel

Atterberg Limits

PL= 20 LL= 28 PI= 8

Coefficients

D_{90}= 8.5347 D_{85}= 6.9171 D_{60}= 2.2399
D_{50}= 0.9042 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(0)

Remarks

ASTM C117, C136

Location: RB-9 @ 1-5'
Sample Number: S213-520

Date: 1-16-14

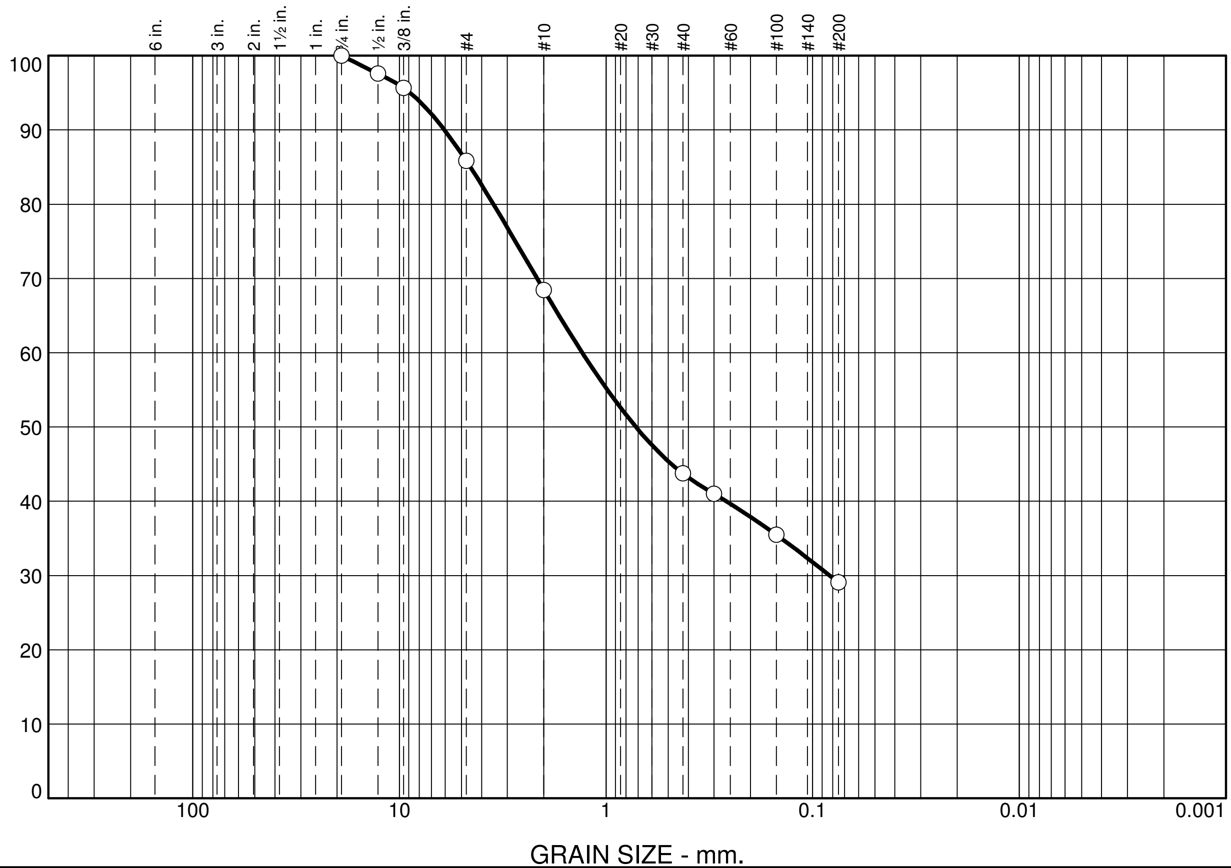
ALLWEST TESTING & ENGINEERING, LLC
Spokane, WA

Client: Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway

Project No: 313-218G **Figure:** C-16

Tested By: D.Schmitz **Checked By:** S.Turpin

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	14.1	17.5	24.7	14.6	29.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	97.6		
3/8"	95.6		
#4	85.9		
#10	68.4		
#40	43.7		
#50	41.0		
#100	35.5		
#200	29.1		

* (no specification provided)

Material Description

Clayey sand

Atterberg Limits

PL= 21 LL= 42 PI= 21

Coefficients

D_{90}= 6.0556 D_{85}= 4.5352 D_{60}= 1.3018
D_{50}= 0.7169 D_{30}= 0.0827 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-2-7(2)

Remarks

ASTM C117, C136

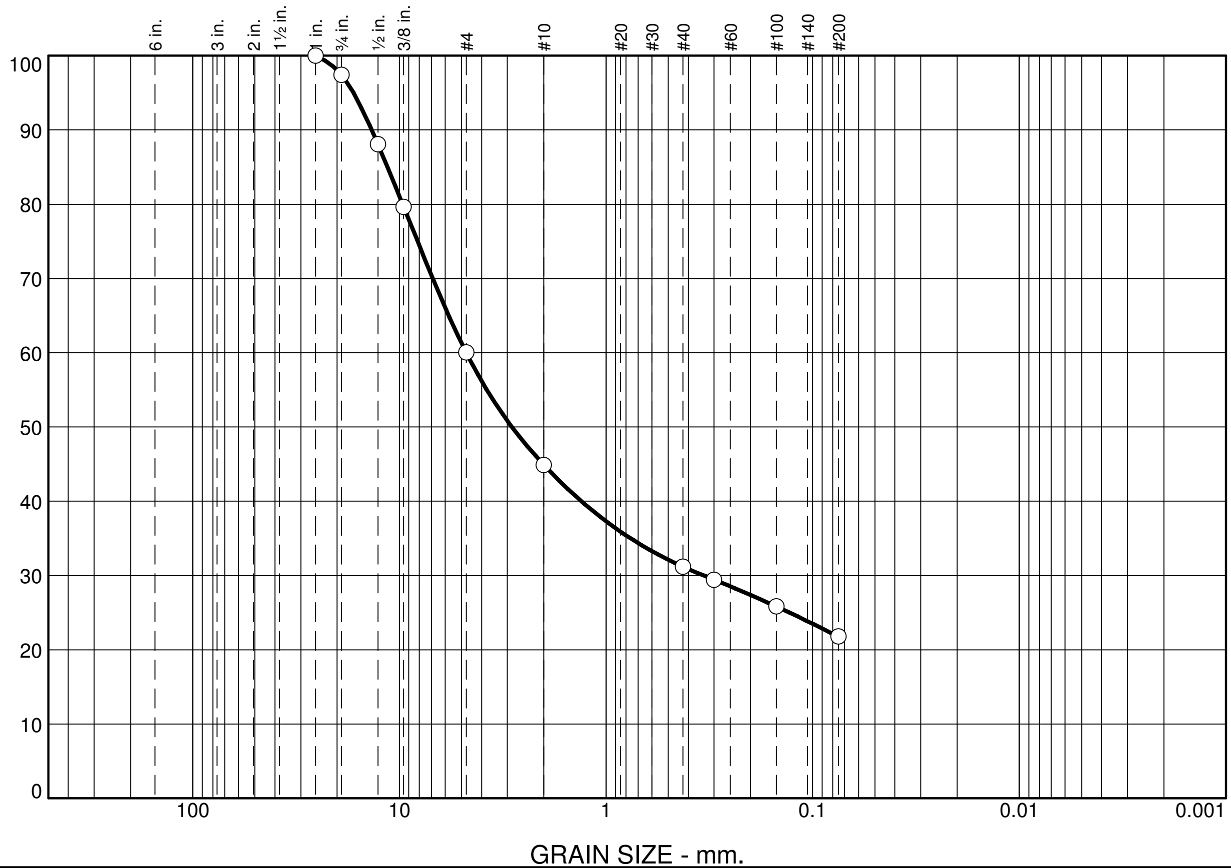
Location: RB-11 @ 1-4'
Sample Number: S213-521
Date: 1-16-14

ALLWEST TESTING & ENGINEERING, LLC
Spokane, WA

Client: Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway
Project No: 313-218G **Figure: C-17**

Tested By: A.Packer **Checked By:** D.Schmitz

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.6	37.4	15.1	13.7	9.4	21.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	97.4		
1/2"	88.1		
3/8"	79.6		
#4	60.0		
#10	44.9		
#40	31.2		
#50	29.4		
#100	25.8		
#200	21.8		

* (no specification provided)

Material Description

Clayey gravel with sand

Atterberg Limits

PL= 18 LL= 33 PI= 15

Coefficients

D_{90}= 13.6082 D_{85}= 11.4126 D_{60}= 4.7451
D_{50}= 2.8527 D_{30}= 0.3363 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GC AASHTO= A-2-6(0)

Remarks

ASTM C117, C136

Location: RB-13 @ 1-4'
Sample Number: S213-522

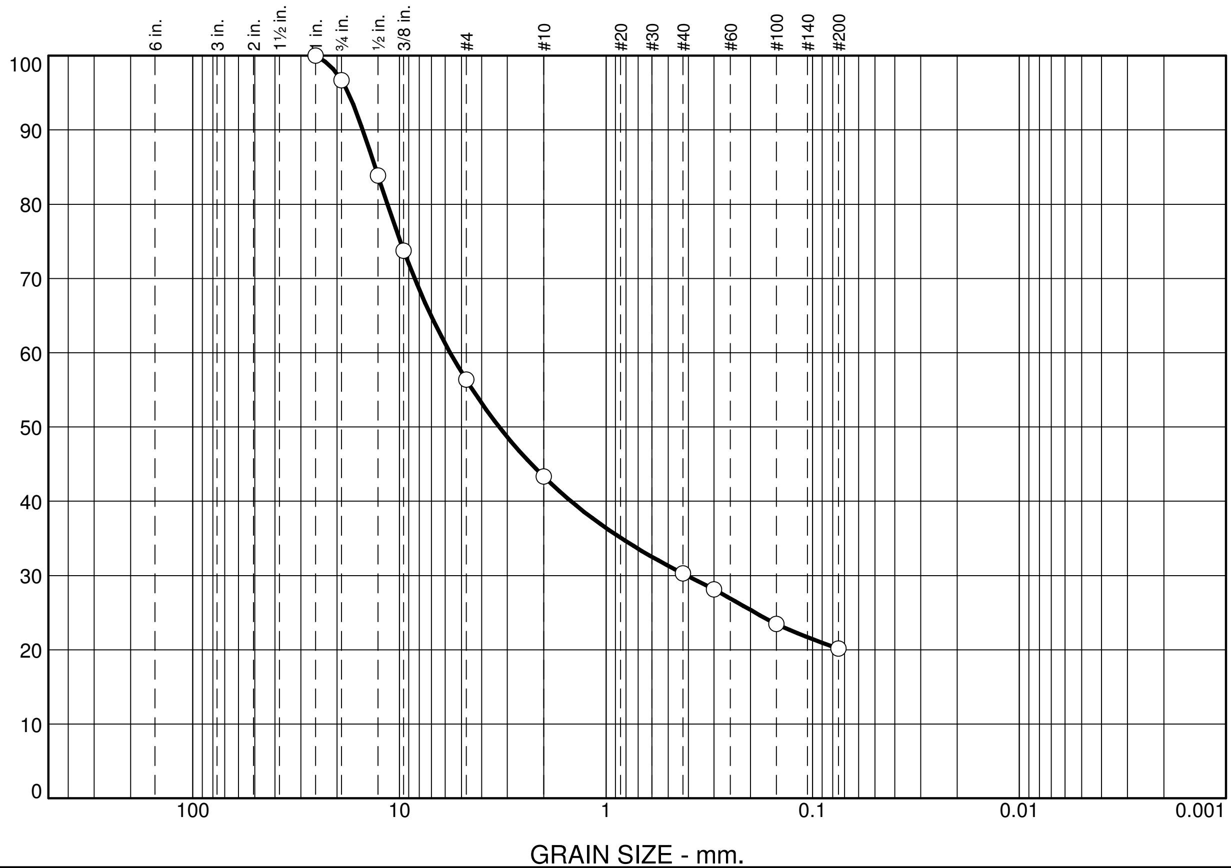
Date: 1-16-14

ALLWEST TESTING & ENGINEERING, LLC Spokane, WA

Client: Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway
Project No: 313-218G **Figure:** C-18

Tested By: A.Packer **Checked By:** D.Schmitz

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.3	40.3	13.1	13.0	10.1	20.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	96.7		
1/2"	83.9		
3/8"	73.8		
#4	56.4		
#10	43.3		
#40	30.3		
#50	28.1		
#100	23.5		
#200	20.2		

* (no specification provided)

Material Description

Clayey gravel with sand

Atterberg Limits

PL= 25 LL= 53 PI= 28

Coefficients

D_{90}= 15.0363 D_{85}= 13.0937 D_{60}= 5.6762
D_{50}= 3.2850 D_{30}= 0.4058 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GC AASHTO= A-2-7(1)

Remarks

ASTM C117, C136

Location: RB-15 @ 1-4'
Sample Number: S213-523

Date: 1-16-14

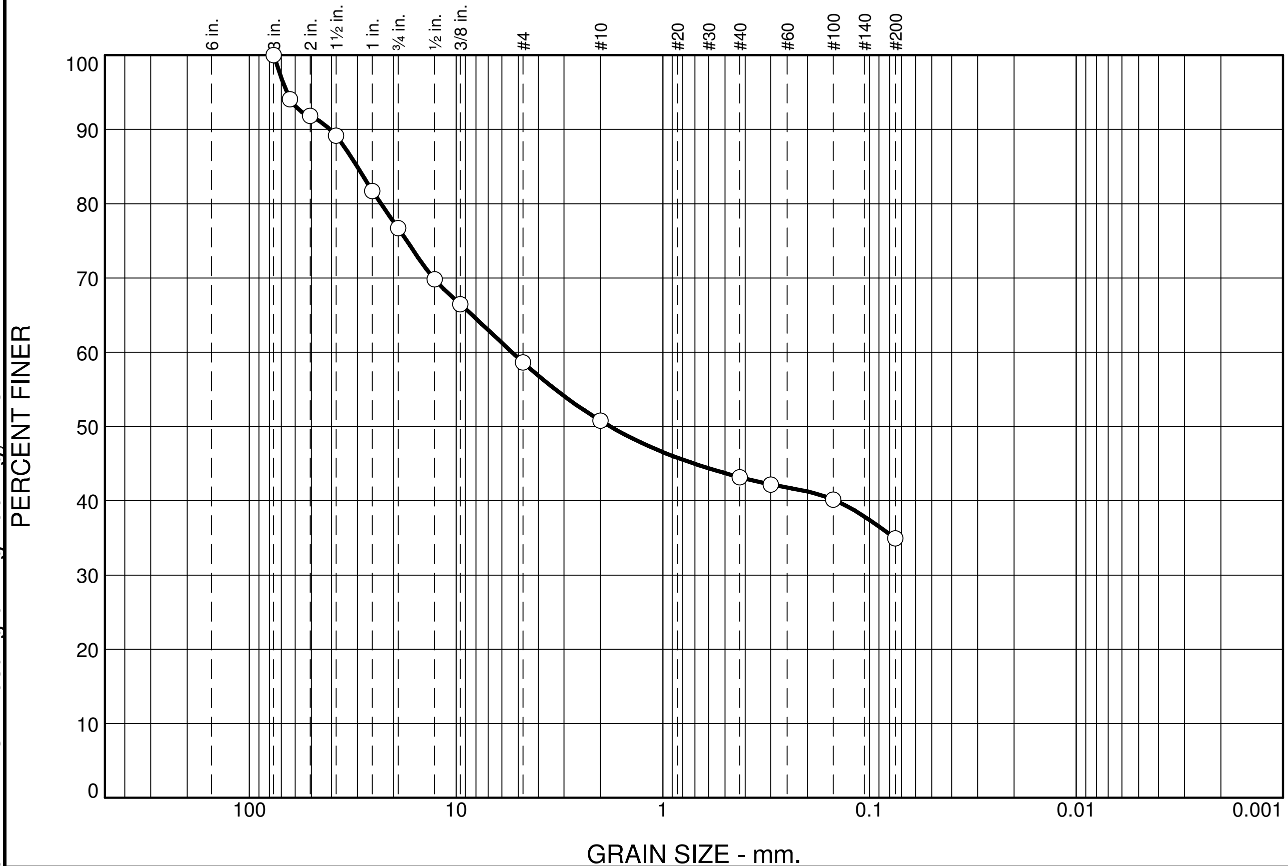
ALLWEST TESTING & ENGINEERING, LLC
Spokane, WA

Client: Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway

Project No: 313-218G **Figure: C-19**

Tested By: A.Packer **Checked By:** D.Schmitz

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	23.3	18.1	7.8	7.6	8.3	34.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3"	100.0		
2 1/2"	94.1		
2"	91.8		
1 1/2"	89.2		
1"	81.7		
3/4"	76.7		
1/2"	69.8		
3/8"	66.5		
#4	58.6		
#10	50.8		
#40	43.2		
#50	42.2		
#100	40.2		
#200	34.9		

* (no specification provided)

Material Description

Silty gravel with sand

Atterberg Limits

PL= 23 LL= 29 PI= 6

Coefficients

D_{90}= 40.6994 D_{85}= 30.0643 D_{60}= 5.3745
D_{50}= 1.7937 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GM AASHTO= A-2-4(0)

Remarks

ASTM C117, C136

Location: RB-17 @ 0.5-2'
Sample Number: S213-524

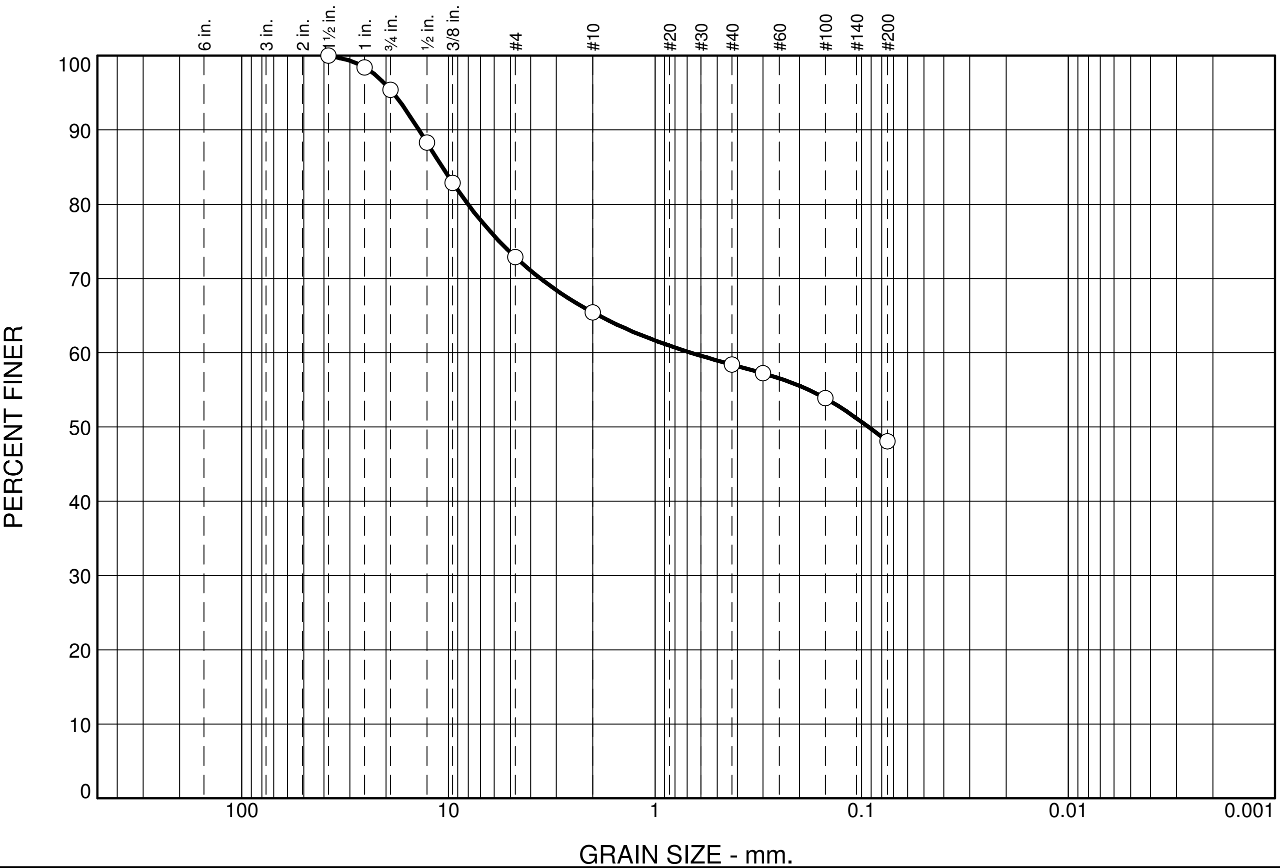
Date: 1-16-14

ALLWEST TESTING & ENGINEERING, LLC
Spokane, WA

Client: Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway
Project No: 313-218G **Figure:** C-20

Tested By: D.Schmitz **Checked By:** S.Turpin

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.6	22.5	7.5	7.0	10.3	48.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 1/2"	100.0		
1"	98.4		
3/4"	95.4		
1/2"	88.3		
3/8"	82.9		
#4	72.9		
#10	65.4		
#40	58.4		
#50	57.2		
#100	53.9		
#200	48.1		

* (no specification provided)

Material Description

Clayey gravel with sand

Atterberg Limits

PL= 20 LL= 29 PI= 9

Coefficients

D_{90}= 13.8771 D_{85}= 10.6973 D_{60}= 0.6704
D_{50}= 0.0926 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= GC AASHTO= A-4(2)

Remarks

ASTM C117, C136

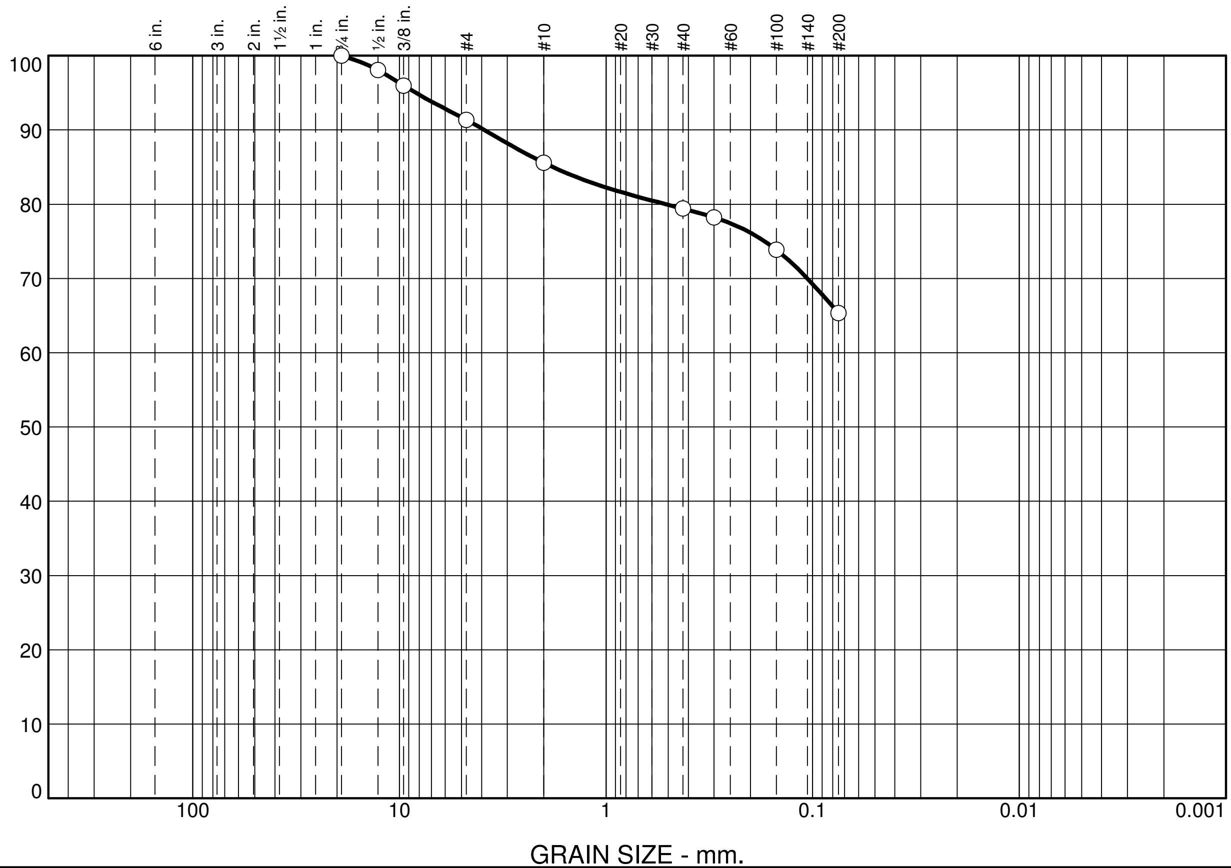
Location: RB-19 @ 1-3'
Sample Number: S213-525
Date: 1-16-14

ALLWEST TESTING & ENGINEERING, LLC
Spokane, WA

Client: Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway
Project No: 313-218G **Figure:** C-21

Tested By: A.Packer **Checked By:** D.Schmitz

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	8.6	5.8	6.2	14.0	65.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	98.1		
3/8"	96.0		
#4	91.4		
#10	85.6		
#40	79.4		
#50	78.2		
#100	73.9		
#200	65.4		

* (no specification provided)

Material Description

Sandy silty clay

Atterberg Limits

PL= 19 LL= 26 PI= 7

Coefficients

D_{90}= 3.8849 D_{85}= 1.8101 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL-ML AASHTO= A-4(2)

Remarks

ASTM C117, C136

Location: RB-22 @ 1-5'
Sample Number: S213-526

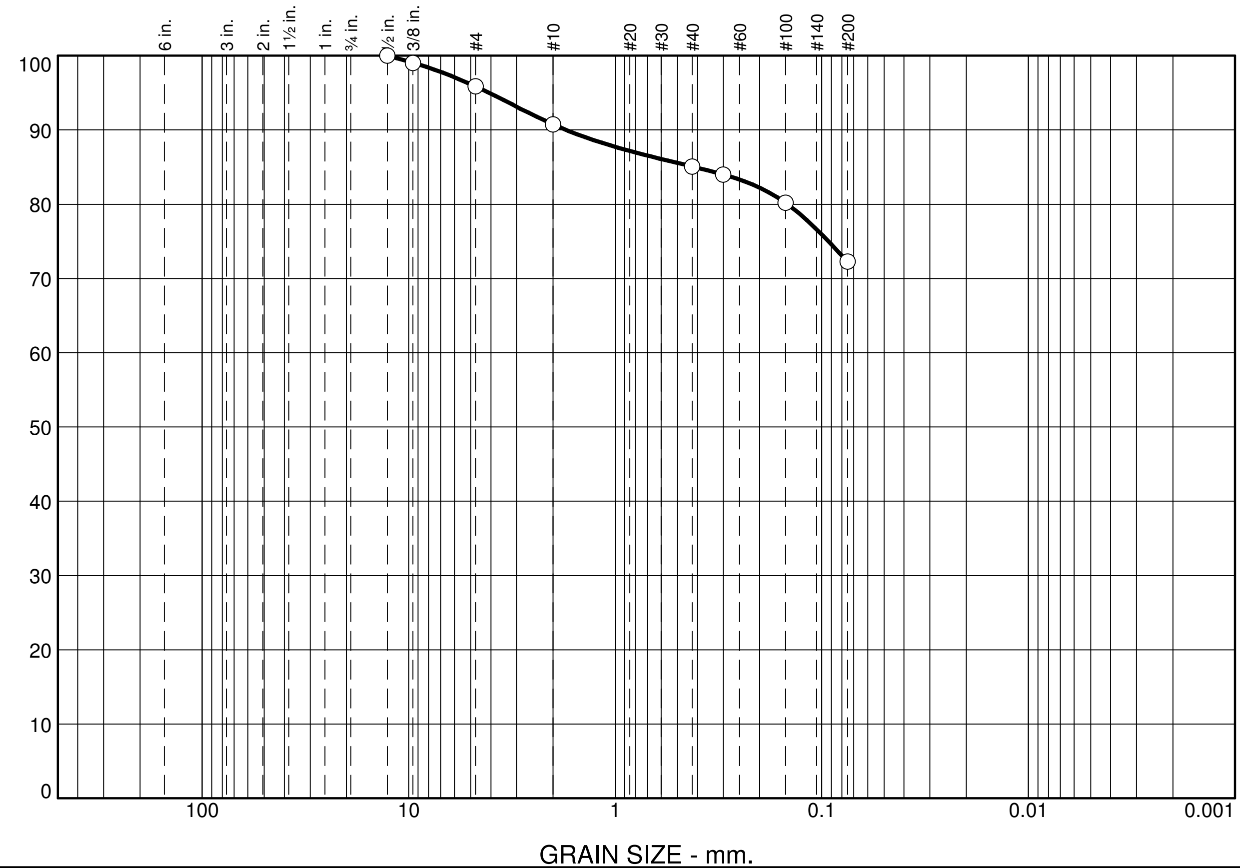
Date: 1-16-14

ALLWEST TESTING & ENGINEERING, LLC
Spokane, WA

Client: Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway
Project No: 313-218G **Figure:** C-22

Tested By: A.Packer **Checked By:** D.Schmitz

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.1	5.2	5.6	12.8	72.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.0		
#4	95.9		
#10	90.7		
#40	85.1		
#50	84.0		
#100	80.2		
#200	72.3		

* (no specification provided)

Material Description

Silty clay with sand

Atterberg Limits

PL= 19 LL= 26 PI= 7

Coefficients

D_{90}= 1.7304 D_{85}= 0.4130 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL-ML AASHTO= A-4(3)

Remarks

ASTM C117, C136

Location: AB-4 @ 3-5'
Sample Number: S213-545

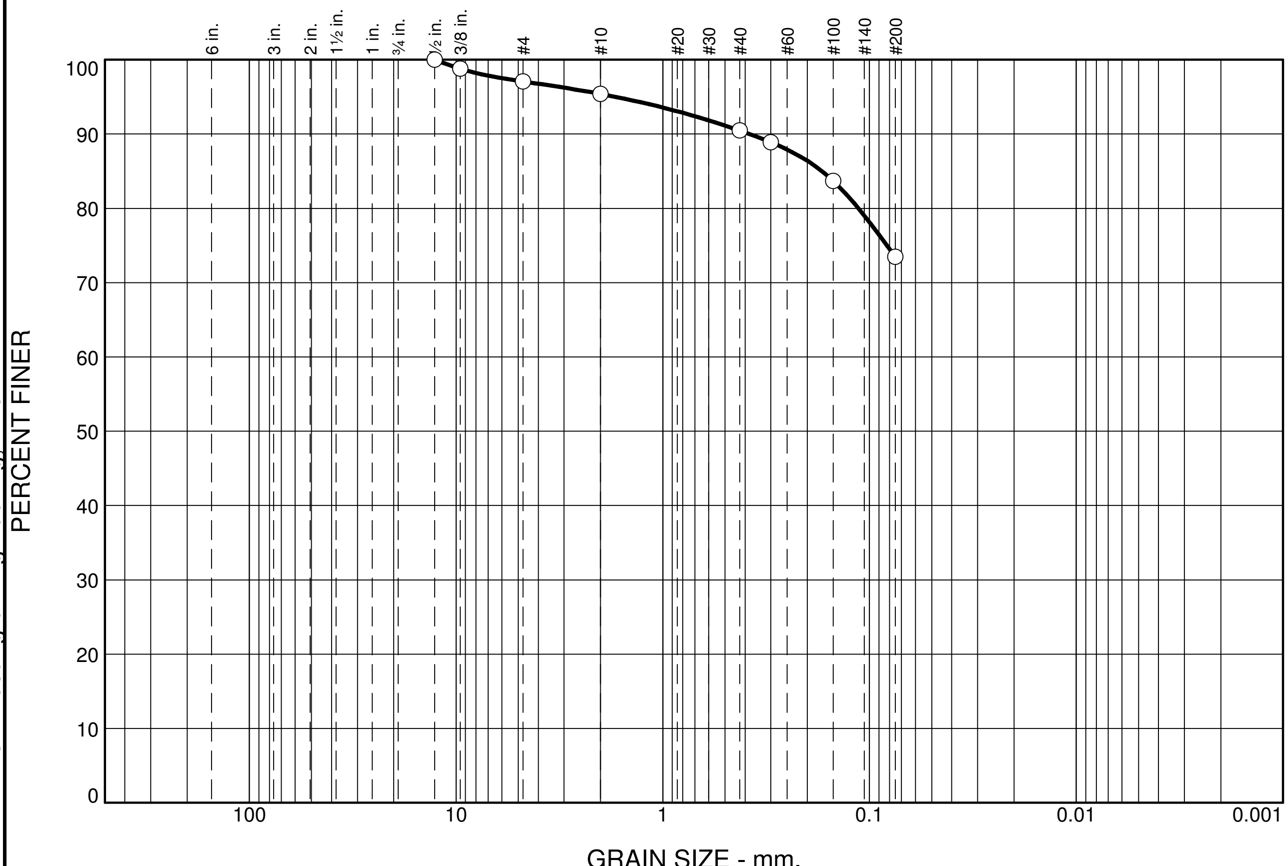
Date: 1-16-14

ALLWEST TESTING & ENGINEERING, LLC
Spokane, WA

Client: Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway
Project No: 313-218G **Figure:** C-23

Tested By: N.White **Checked By:** D.Schmitz

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.9	1.7	4.9	17.0	73.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	98.8		
#4	97.1		
#10	95.4		
#40	90.5		
#50	88.9		
#100	83.7		
#200	73.5		

* (no specification provided)

Material Description

Silty clay with sand

Atterberg Limits

PL= 19 LL= 24 PI= 5

Coefficients

D_{90}= 0.3804 D_{85}= 0.1699 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL-ML AASHTO= A-4(2)

Remarks

ASTM C117, C136

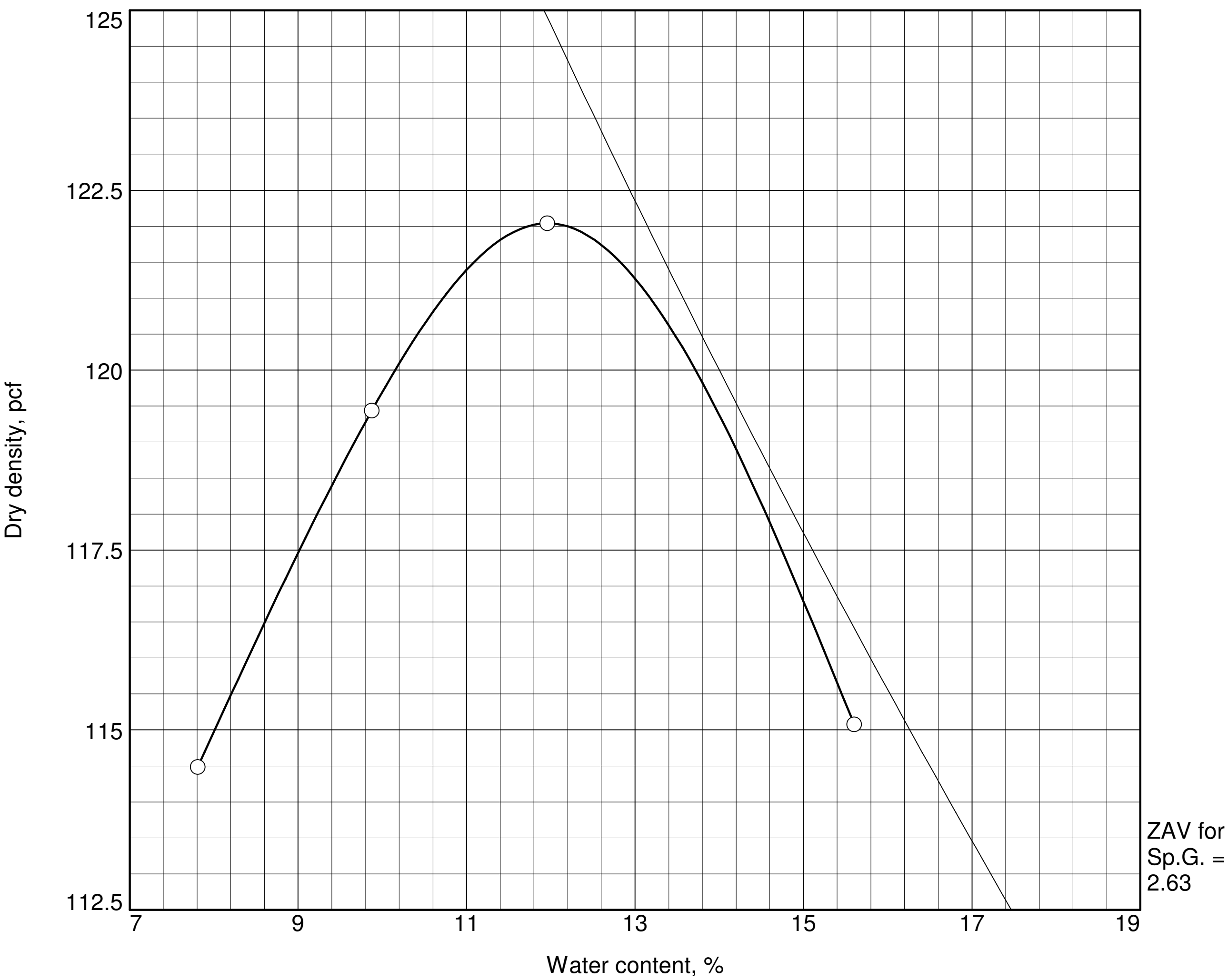
Location: AB-5 @ 1-5'
Sample Number: S213-544
Date: 1-16-14

ALLWEST TESTING & ENGINEERING, LLC
Spokane, WA

Client: Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway
Project No: 313-218G **Figure:** C-24

Tested By: N.White **Checked By:** D.Schmitz

Moisture Density Curve



Test specification: ASTM D 1557-07 Method B Modified
ASTM D 4718-87 Oversize Correction Applied to Final Results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	SC	A-6(4)			33	15	6.1	49.3

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 123.9 pcf	122.0 pcf	Clayey sand
Optimum moisture = 11.3 %	12.0 %	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway

○ **Location:** RB-3 @ 1-4' **Sample Number:** S213-518

Remarks:

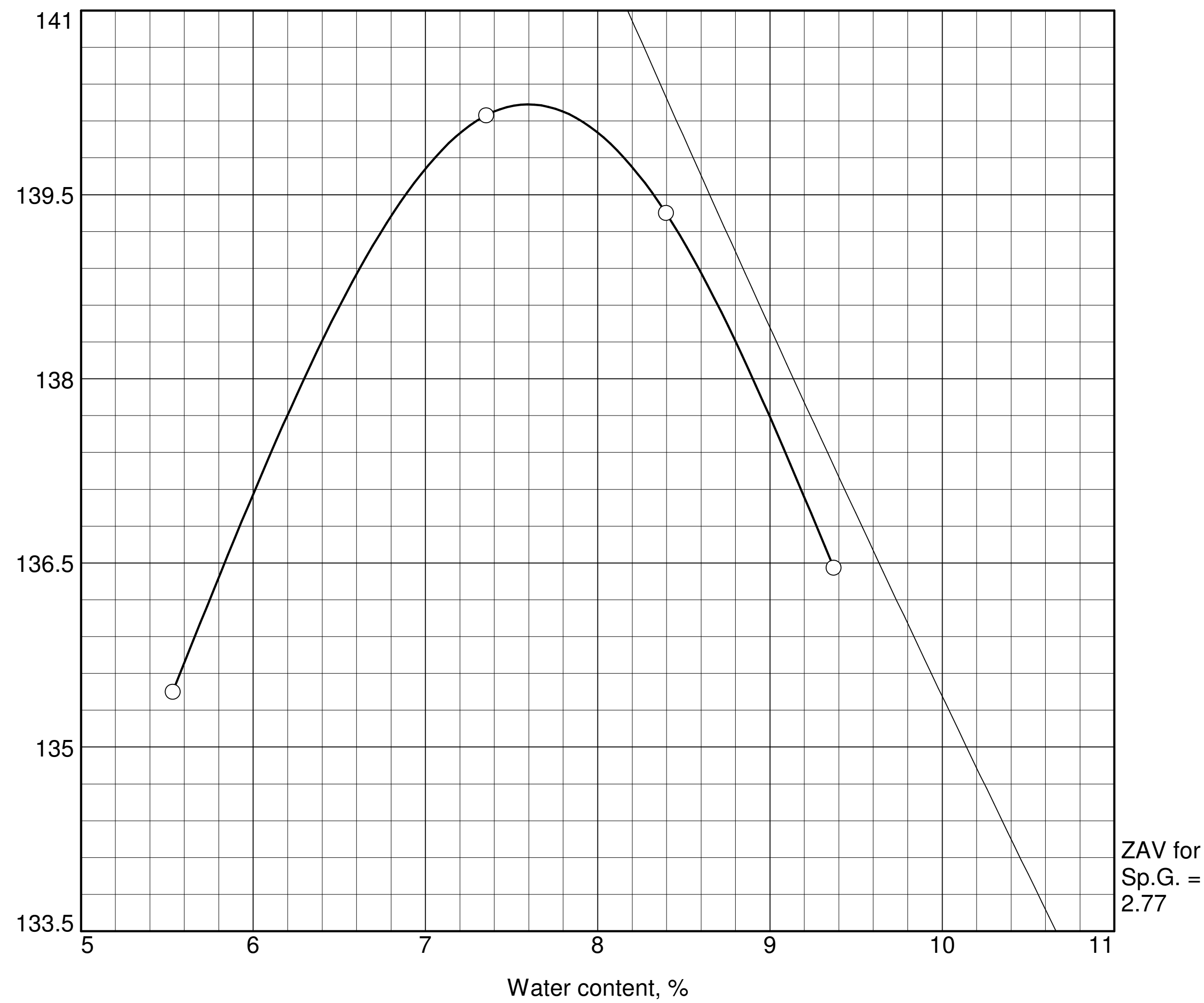
ALLWEST TESTING & ENGINEERING, LLC

Spokane, WA

Figure: C-25

Tested By: A.Packer **Checked By:** D.Schmitz

Moisture Density Curve



Test specification: ASTM D 1557-07 Method B Modified
ASTM D 4718-87 Oversize Correction Applied to Final Results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	SC-SM	A-2-4(0)			26	7	20.9	25.7

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 144.8 pcf	140.2 pcf	Silty, clayey sand with gravel
Optimum moisture = 6.2 %	7.6 %	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway

○ **Location:** RB-6 @ 1-5' **Sample Number:** S213-519

ALLWEST TESTING & ENGINEERING, LLC

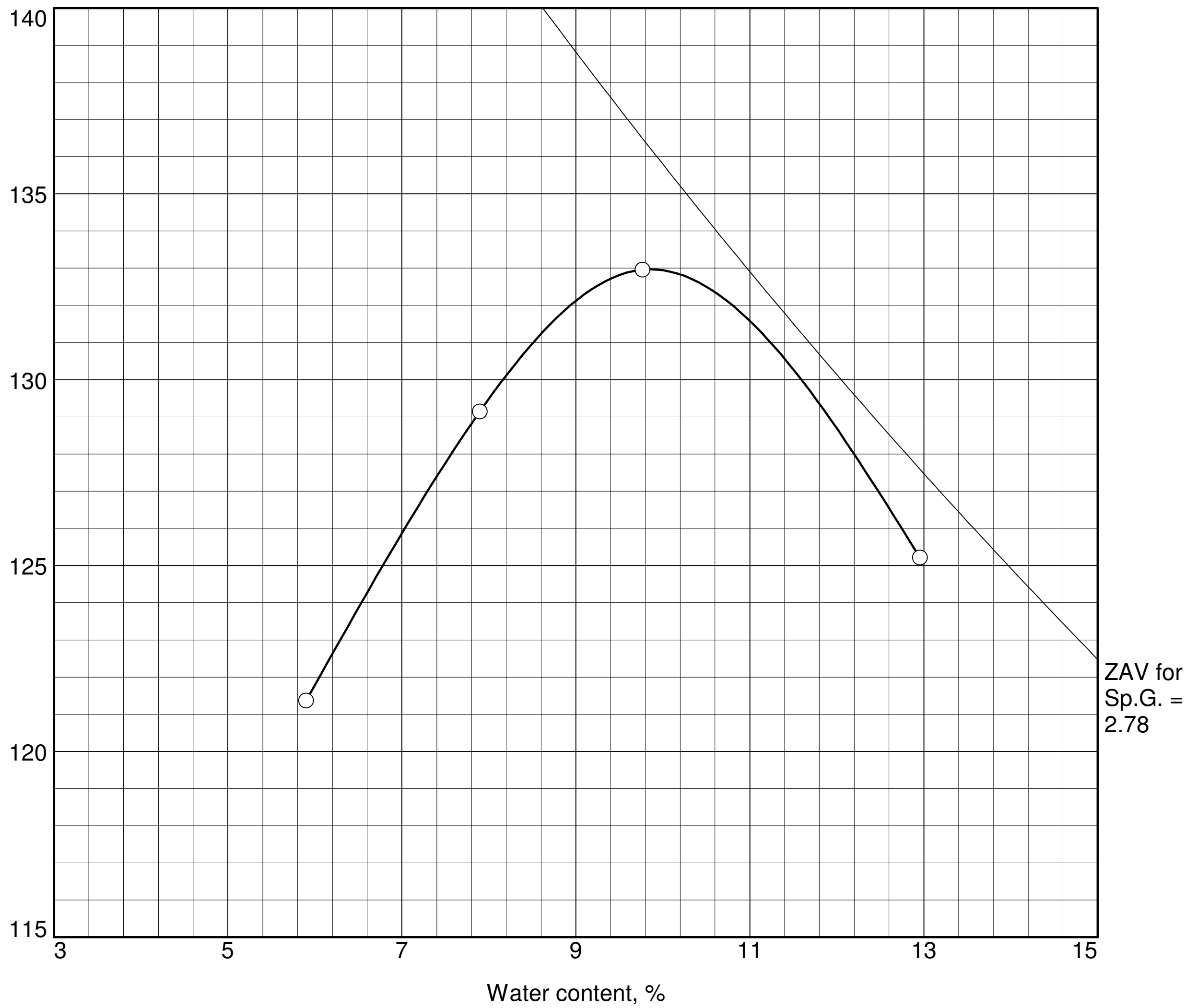
Spokane, WA

Remarks:

Figure: C-26

Tested By: A.Packer **Checked By:** D.Schmitz

Moisture Density Curve



Test specification: ASTM D 1557-07 Method B Modified
ASTM D 4718-87 Oversize Correction Applied to Final Results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	SC	A-4(0)			28	8	8	36.8

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 135.1 pcf	133.0 pcf	Clayey sand with gravel
Optimum moisture = 9.1 %	9.9 %	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway

○ **Location:** RB-9 @ 1-5' **Sample Number:** S213-520

Remarks:

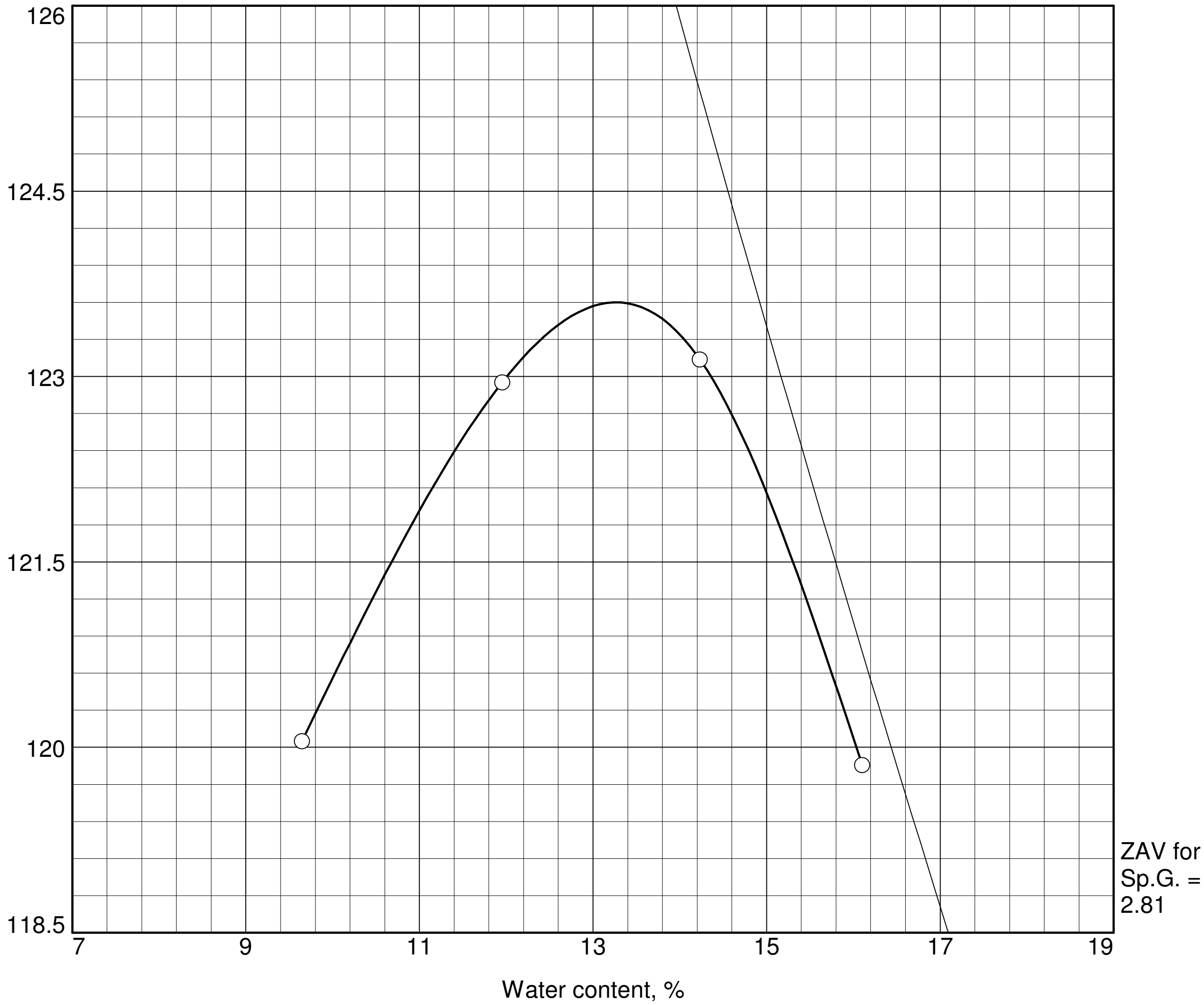
ALLWEST TESTING & ENGINEERING, LLC

Spokane, WA

Figure: C-27

Tested By: D.Schmitz **Checked By:** S.Turpin

Moisture Density Curve



Test specification: ASTM D 1557-07 Method B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	SC	A-2-7(2)			42	21	4.4	29.1

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 123.6 pcf Optimum moisture = 13.3 %	Clayey sand

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

○ **Location:** RB-11 @ 1-4' **Sample Number:** S213-521

Remarks:

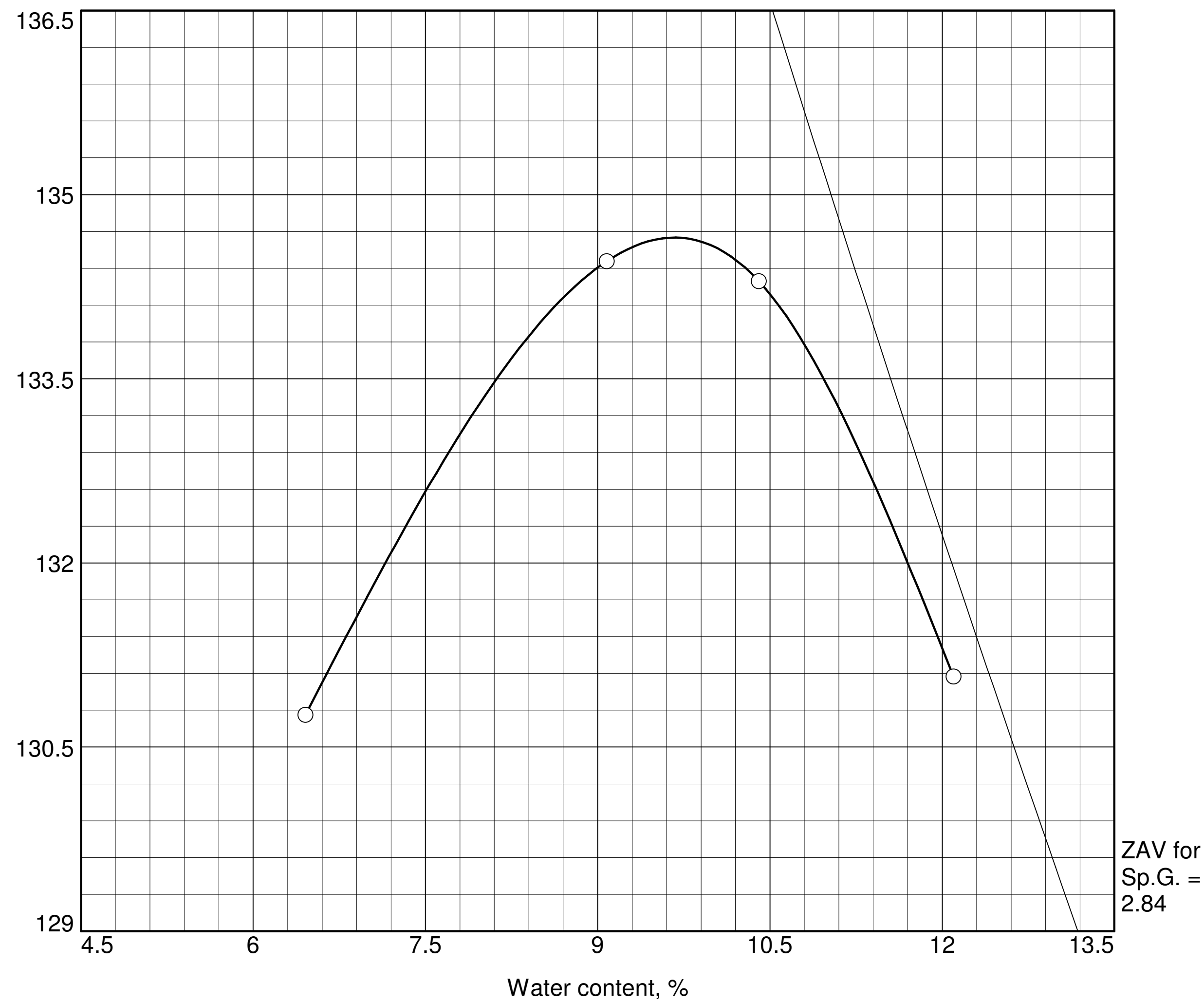
ALLWEST TESTING & ENGINEERING, LLC

Spokane, WA

Figure: C-28

Tested By: D.Schmitz **Checked By:** S.Turpin

Moisture Density Curve



Test specification: ASTM D 1557-07 Method C Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
	GC	A-2-6(0)			33	15	2.6	21.8

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 134.7 pcf Optimum moisture = 9.7 %	Clayey gravel with sand

Project No. 313-218G **Client:** Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway

○ **Location:** RB-13 @ 1-4' **Sample Number:** S213-522

ALLWEST TESTING & ENGINEERING, LLC

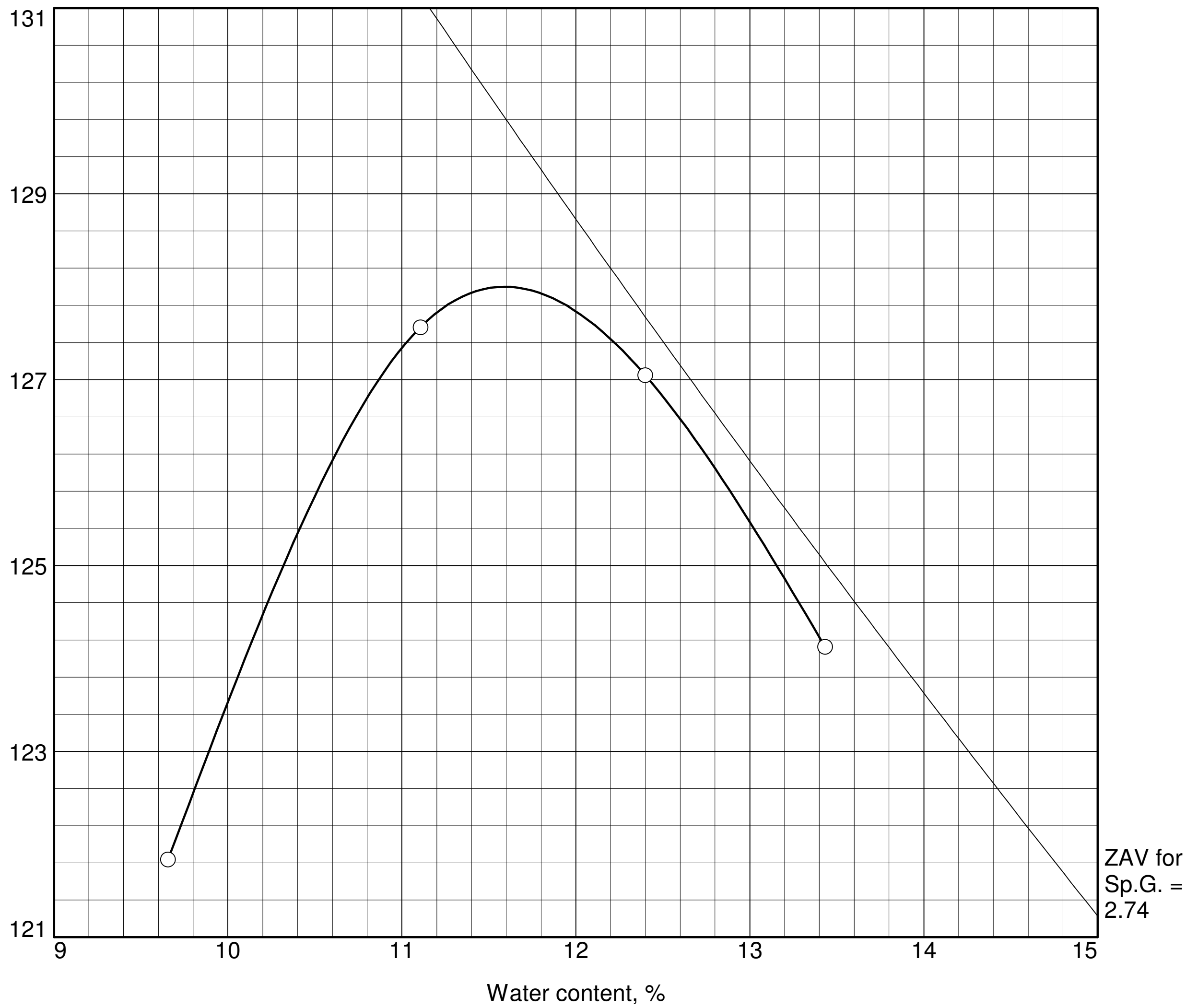
Spokane, WA

Remarks:

Figure: C-29

Tested By: ____________________ **Checked By:** ____________________

Moisture Density Curve



Test specification: ASTM D 1557-07 Method C Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
	GC	A-2-7(1)			53	28	3.3	20.2

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 128.0 pcf Optimum moisture = 11.6 %	Clayey gravel with sand

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

○ **Location:** RB-15 @ 1-4' **Sample Number:** S213-523

Remarks:

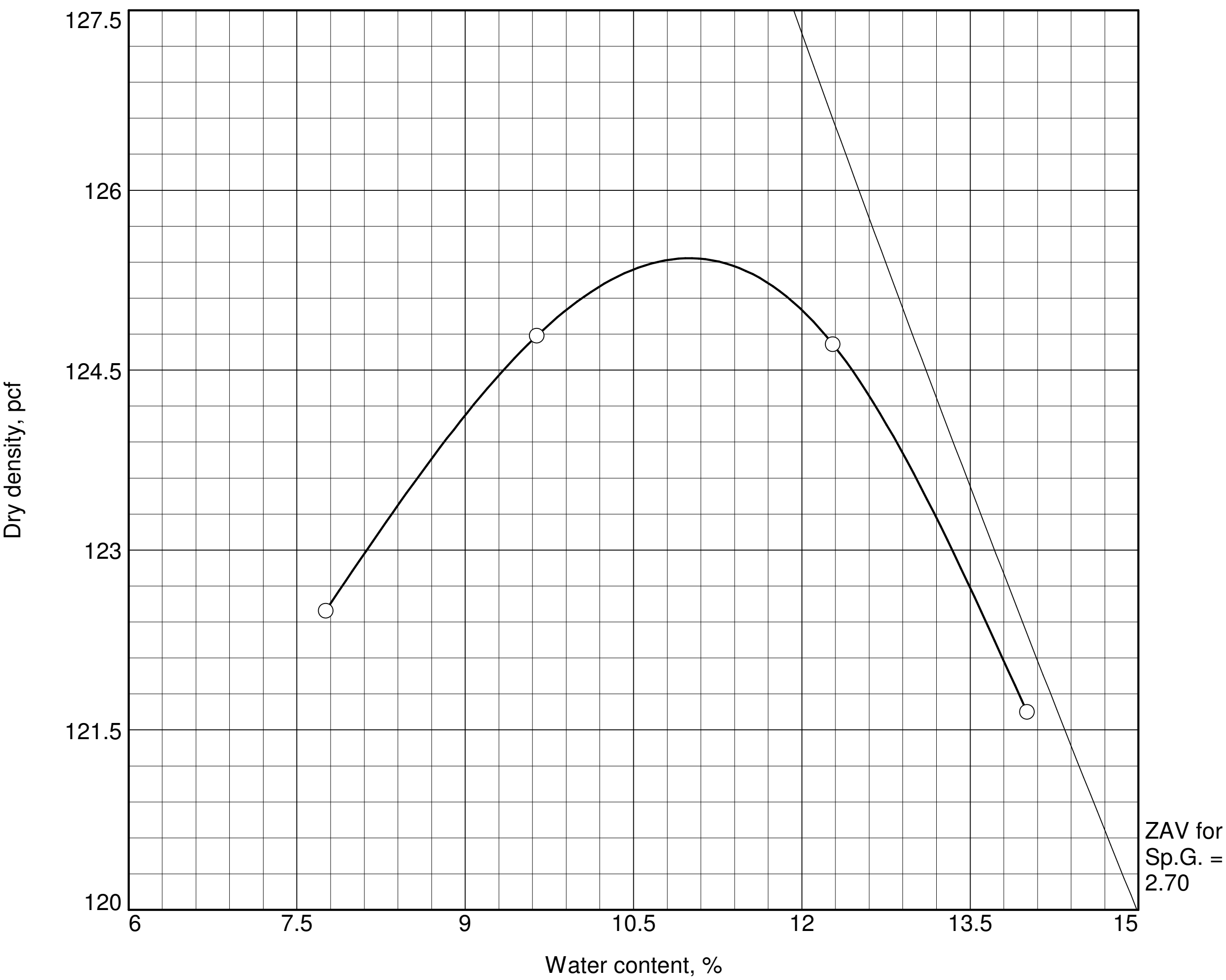
ALLWEST TESTING & ENGINEERING, LLC

Spokane, WA

Figure: C-30

Tested By: D.Schmitz **Checked By:** S.Turpin

Moisture Density Curve



Test specification: ASTM D 1557-07 Method C Modified
ASTM D 4718-87 Oversize Correction Applied to Final Results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
	GM	A-2-4(0)			29	6	23.3	34.9

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 132.9 pcf	125.4 pcf	Silty gravel with sand
Optimum moisture = 8.7 %	11.0 %	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

○ **Location:** RB-17 @ 0.5-2' **Sample Number:** S213-524

Remarks:

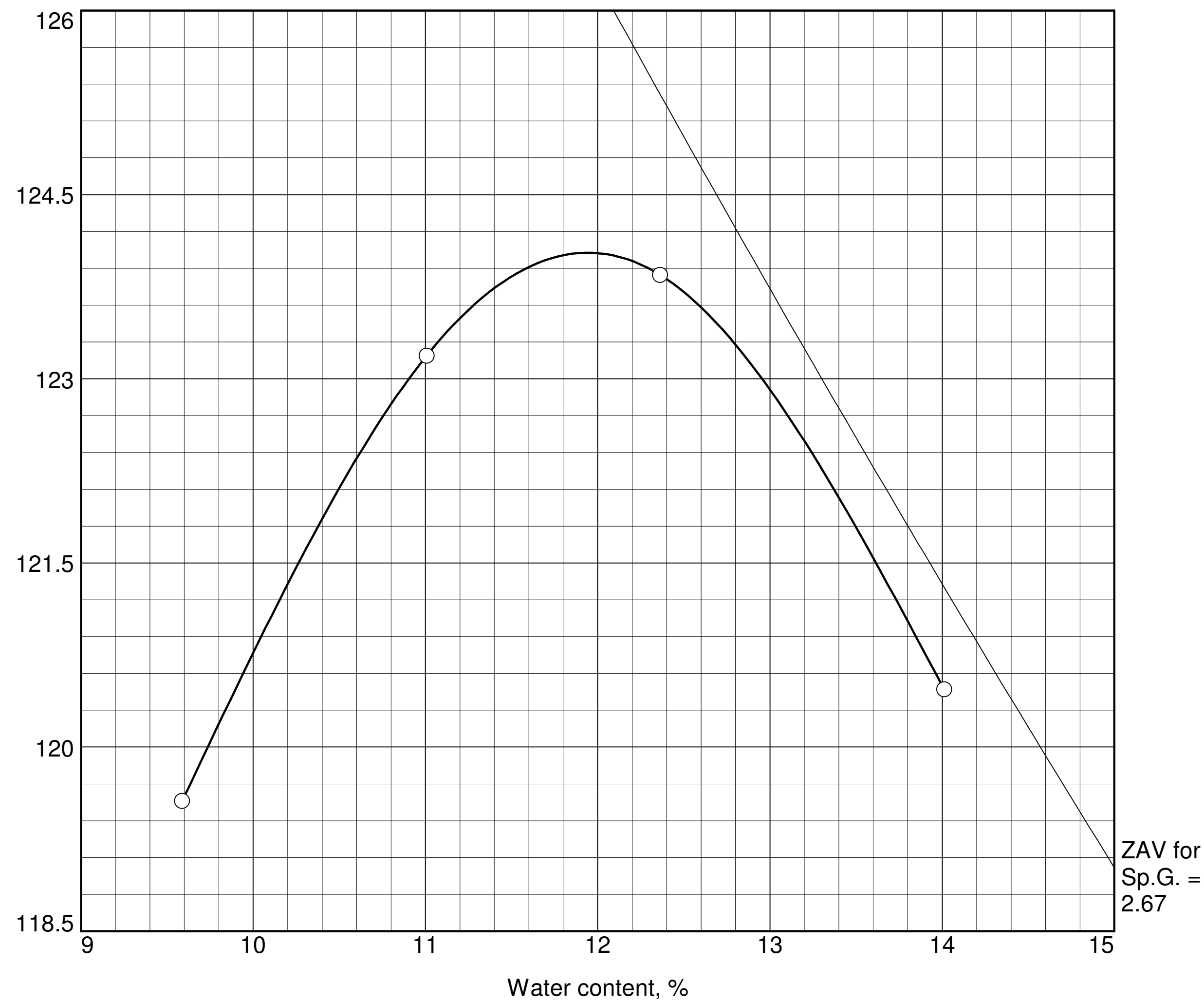
ALLWEST TESTING & ENGINEERING, LLC

Spokane, WA

Figure: C-31

Tested By: S.Fraser **Checked By:** D.Schmitz

Moisture Density Curve



Test specification: ASTM D 1557-07 Method B Modified
ASTM D 4718-87 Oversize Correction Applied to Final Results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	GC	A-4(2)			29	9	17.1	48.1

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 129.6 pcf	124.0 pcf	Clayey gravel with sand
Optimum moisture = 10.1 %	11.9 %	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway

○ **Location:** RB-19 @ 1-3' **Sample Number:** S213-525

Remarks:

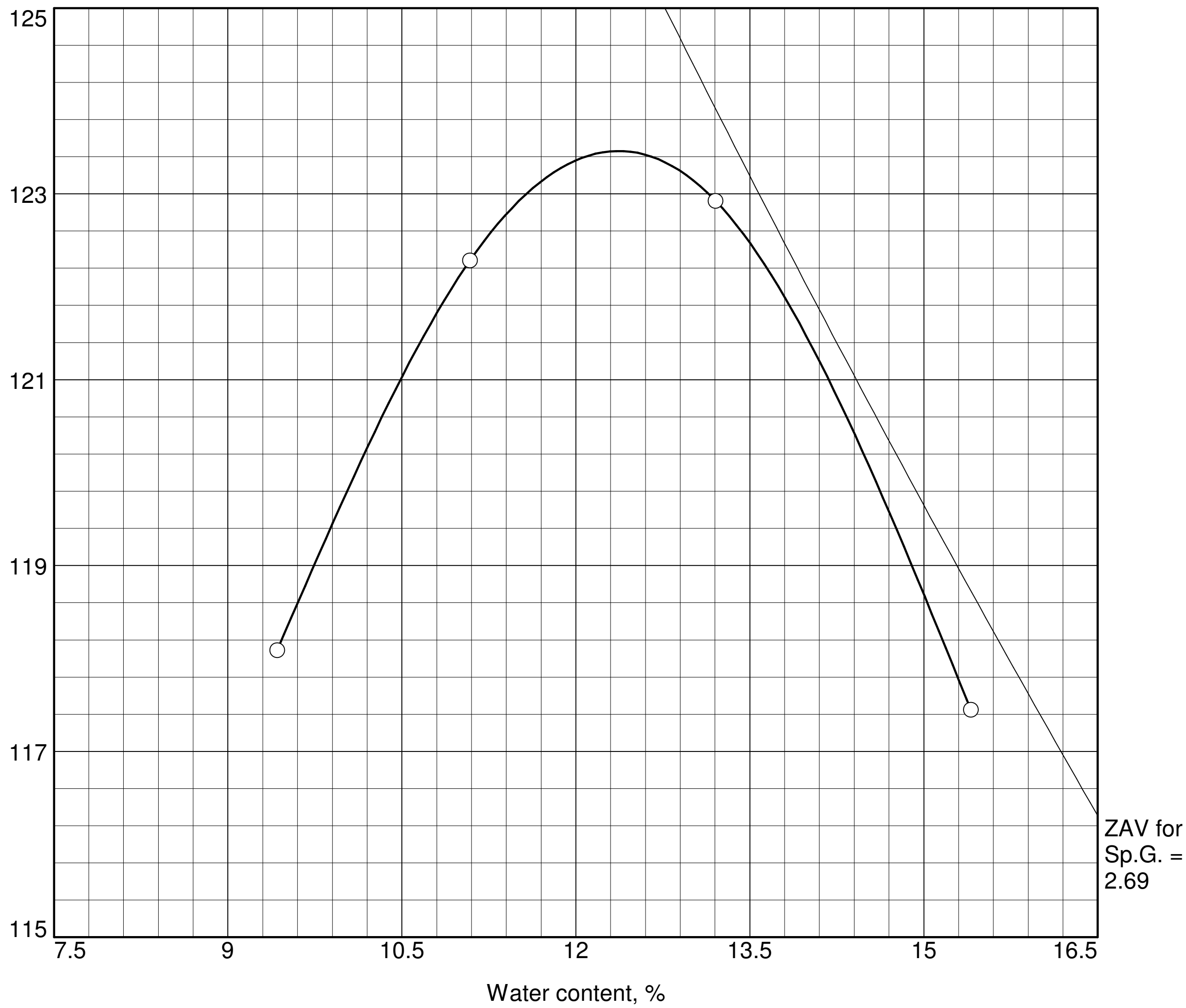
ALLWEST TESTING & ENGINEERING, LLC

Spokane, WA

Figure: C-32

Tested By: D.Schmitz **Checked By:** S.Turpin

Moisture Density Curve



Test specification: ASTM D 1557-07 Method B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	CL-ML	A-4(2)			26	7	4.0	65.4

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 123.5 pcf Optimum moisture = 12.4 %	Sandy silty clay

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

○ **Location:** RB-22 @ 1-5' **Sample Number:** S213-526

Remarks:

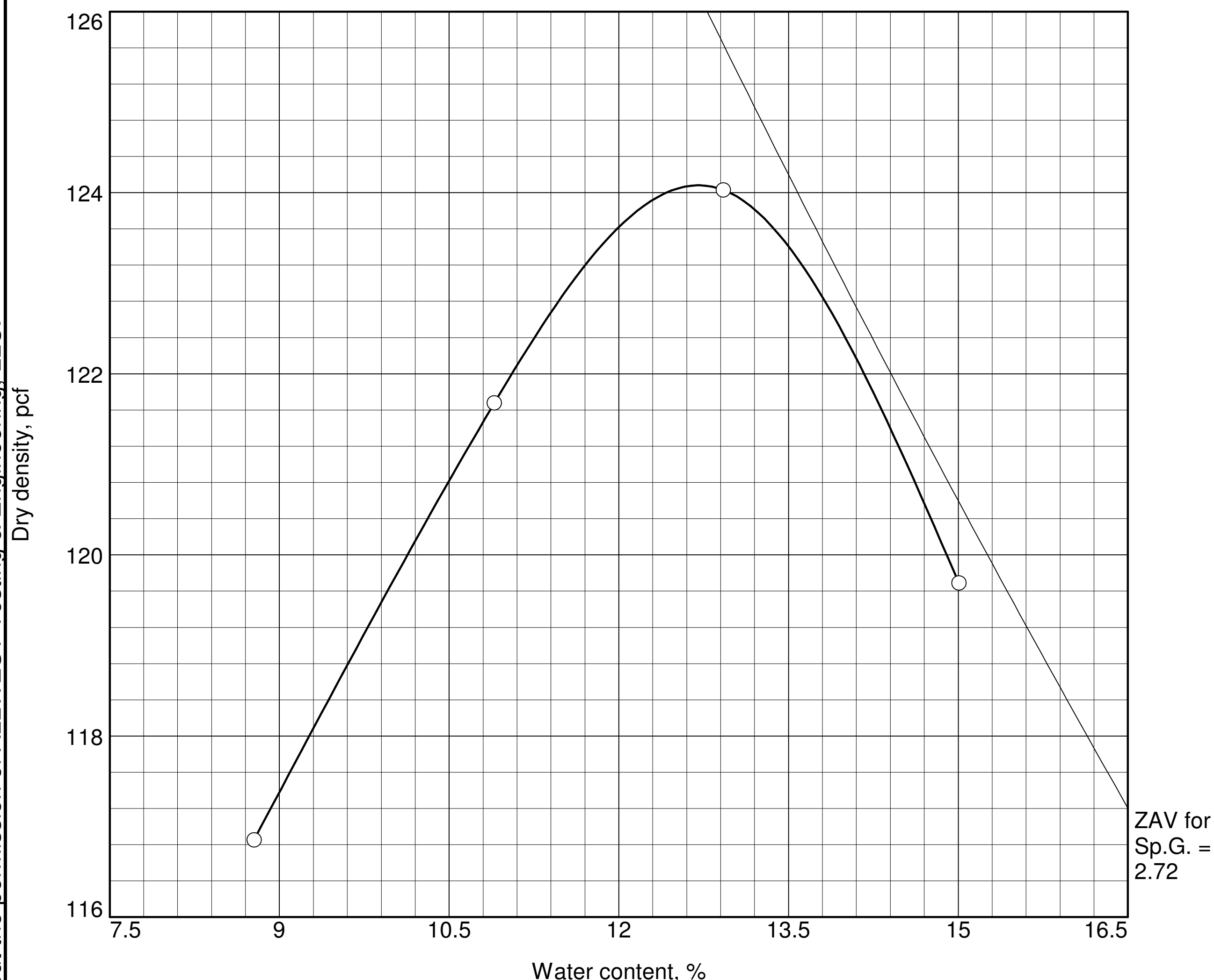
ALLWEST TESTING & ENGINEERING, LLC

Spokane, WA

Figure: C-33

Tested By: D.Schmitz **Checked By:** S.Turpin

Moisture Density Curve



Test specification: ASTM D 1557-07 Method B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	CL-ML	A-4(3)			26	7	1.0	72.3

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 124.1 pcf Optimum moisture = 12.7 %	Silty clay with sand

Project No. 313-218G **Client:** Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway

○ **Location:** AB-4 @ 3-5' **Sample Number:** S213-545

Remarks:

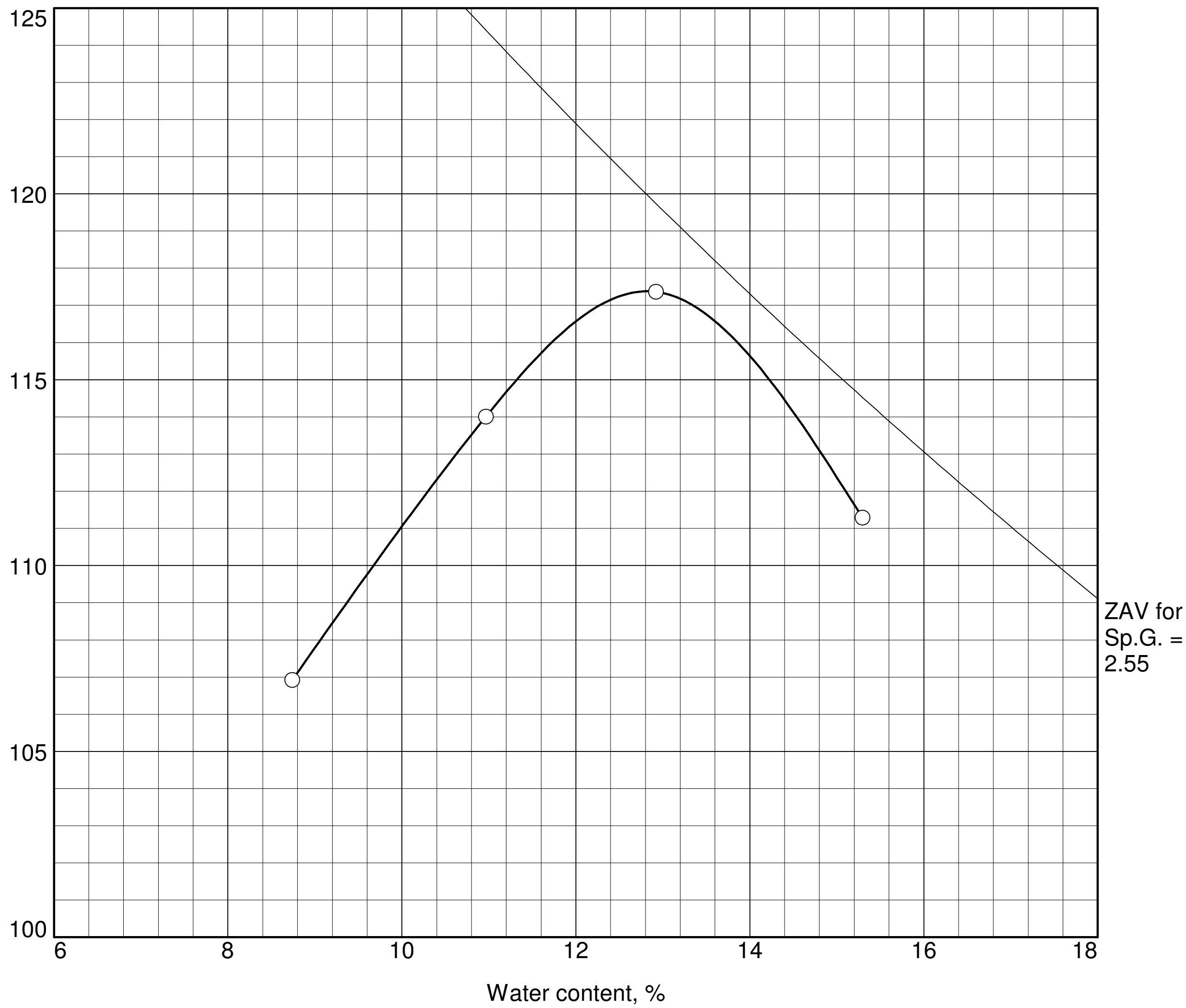
ALLWEST TESTING & ENGINEERING, LLC

Spokane, WA

Figure: C-34

Tested By: S.Fraser **Checked By:** D.Schmitz

Moisture Density Curve



Test specification: ASTM D 1557-07 Method B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	CL-ML	A-4(2)			24	5	1.2	73.5

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 117.4 pcf Optimum moisture = 12.8 %	Silty clay with sand

Project No. 313-218G **Client:** Armstrong Consultants,Inc.
Project: Lewiston Nez Perce County Airport Runway

○ **Location:** AB-5 @ 1-5' **Sample Number:** S213-544

Remarks:

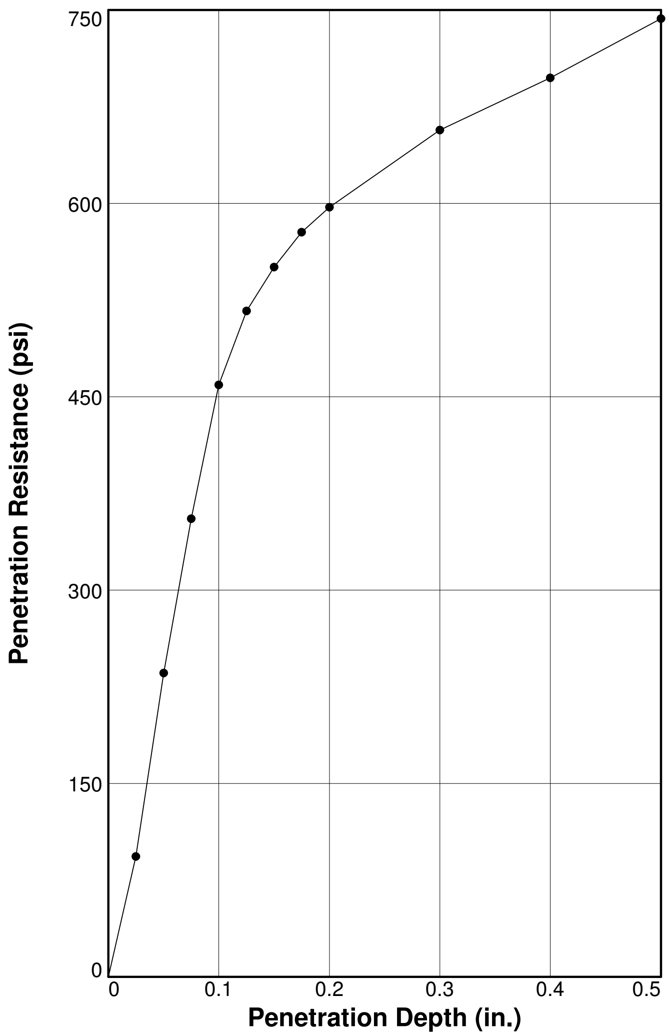
ALLWEST TESTING & ENGINEERING, LLC

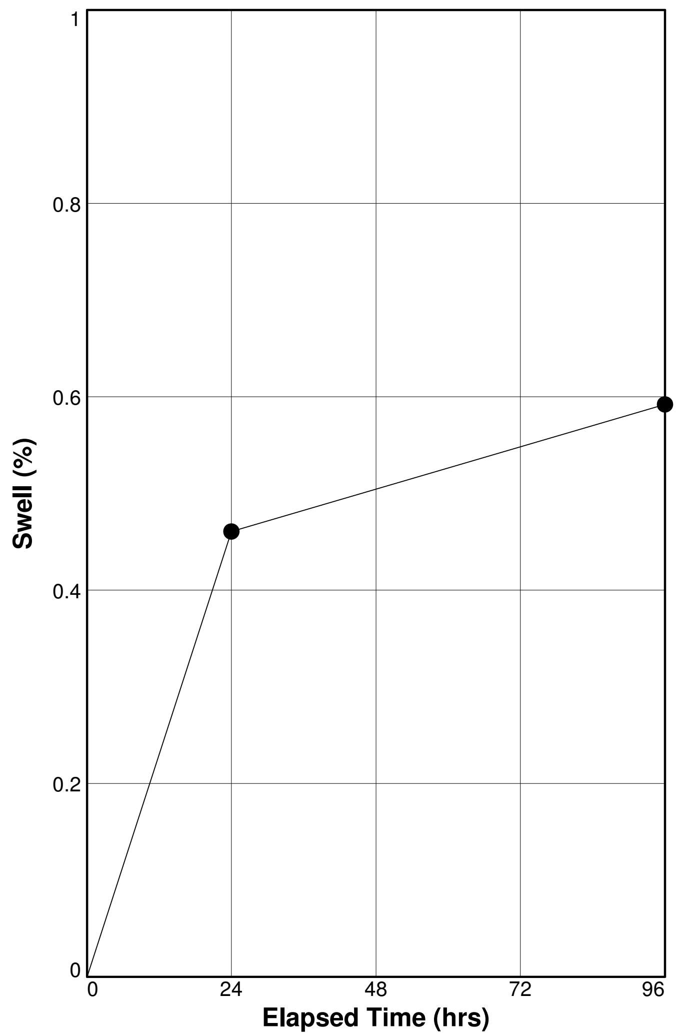
Spokane, WA

Figure: C-35

Tested By: S.Fraser **Checked By:** D.Schmitz

BEARING RATIO TEST REPORT
ASTM D 1883-07





	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	116.9	95.8	12.4	116.2	95.3	18.3	46.9	40.0	0.004	10	0.6
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Clayey sand	SC	122.0	12.0	33	15

Project No: 313-218G

Project: Lewiston Nez Perce County Airport Runway

Location: RB-3 @ 1-4'

Sample Number: S213-518

Date: 1-16-14

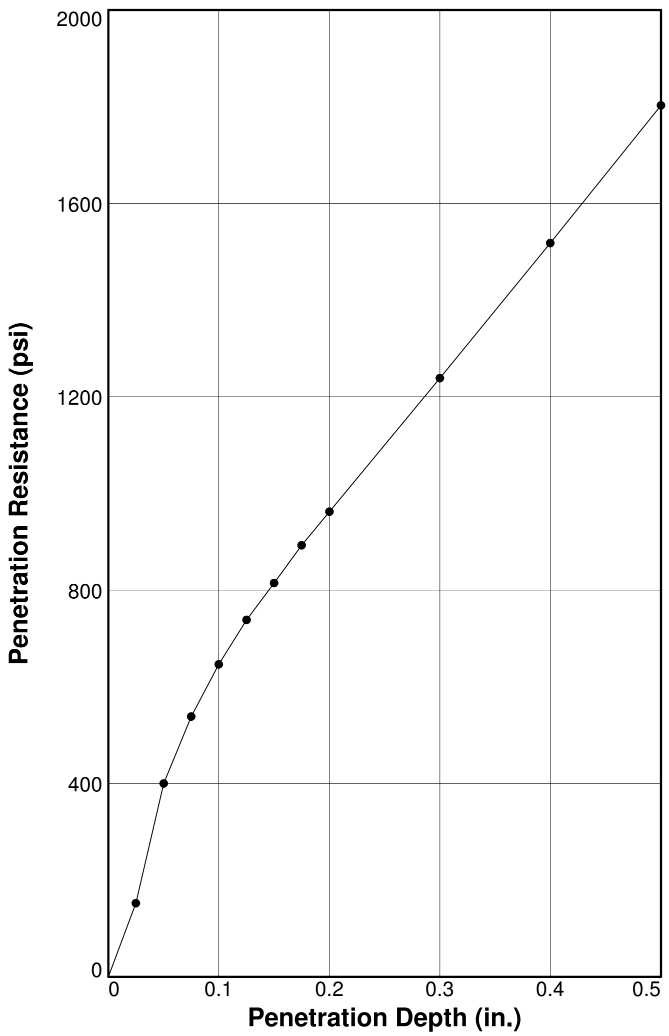
BEARING RATIO TEST REPORT

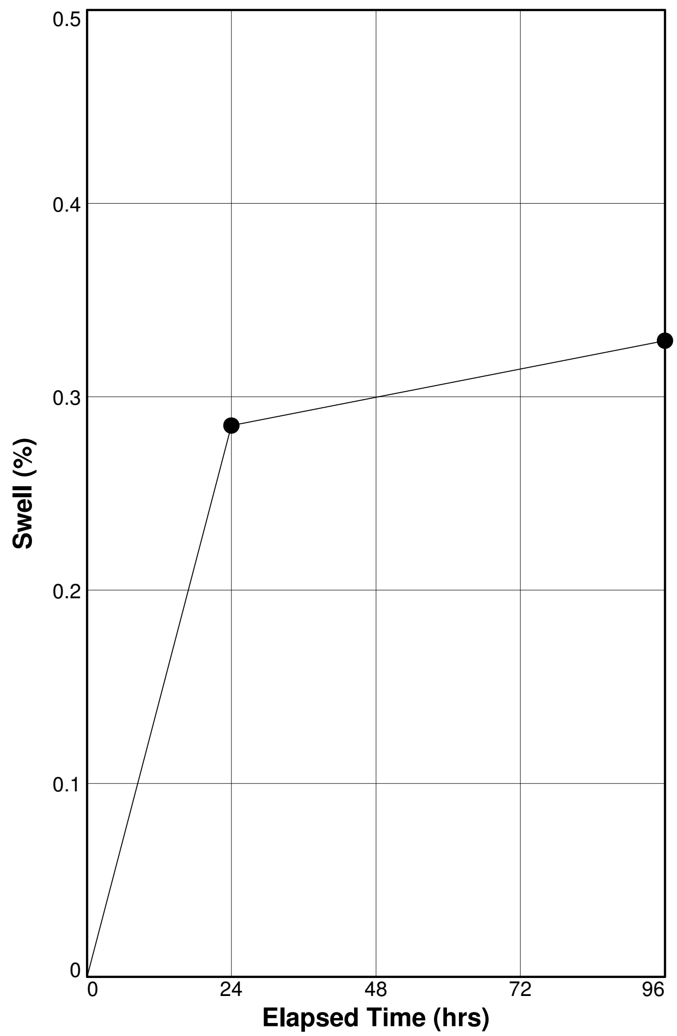
ALLWEST TESTING & ENGINEERING, LLC

Test Description/Remarks:

Figure: C-36

BEARING RATIO TEST REPORT
ASTM D 1883-07





	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	134.4	95.9	7.7	134.0	95.6	10.9	67.2	65.4	0.007	10	0.3
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Silty, clayey sand with gravel	SC-SM	140.2	7.6	26	7

Project No: 313-218G

Project: Lewiston Nez Perce County Airport Runway

Location: RB-6 @ 1-5'

Sample Number: S213-519

Date: 1-16-14

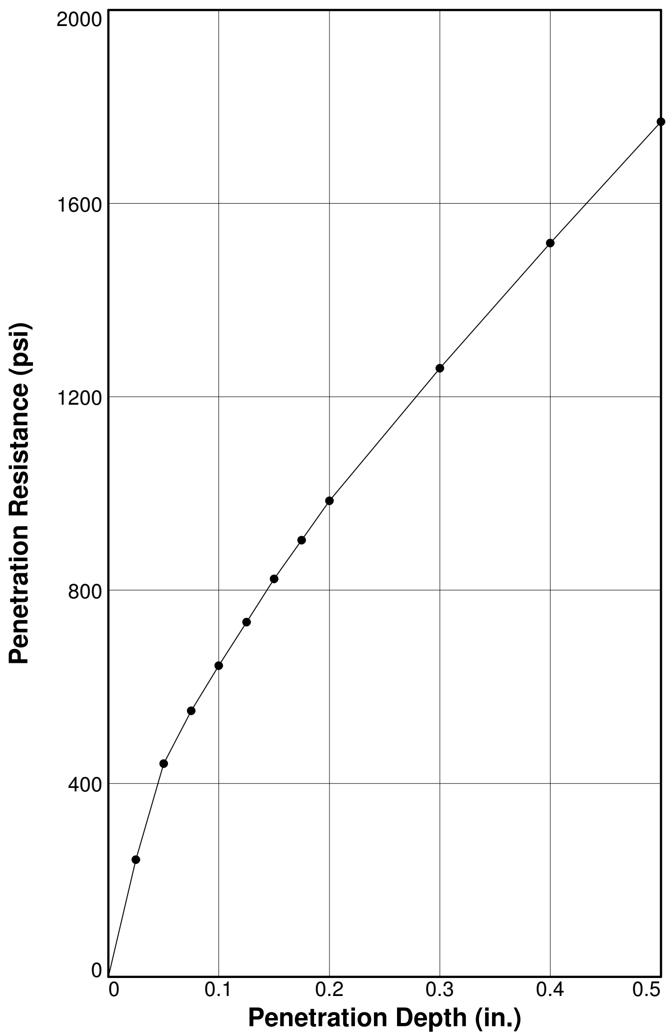
BEARING RATIO TEST REPORT

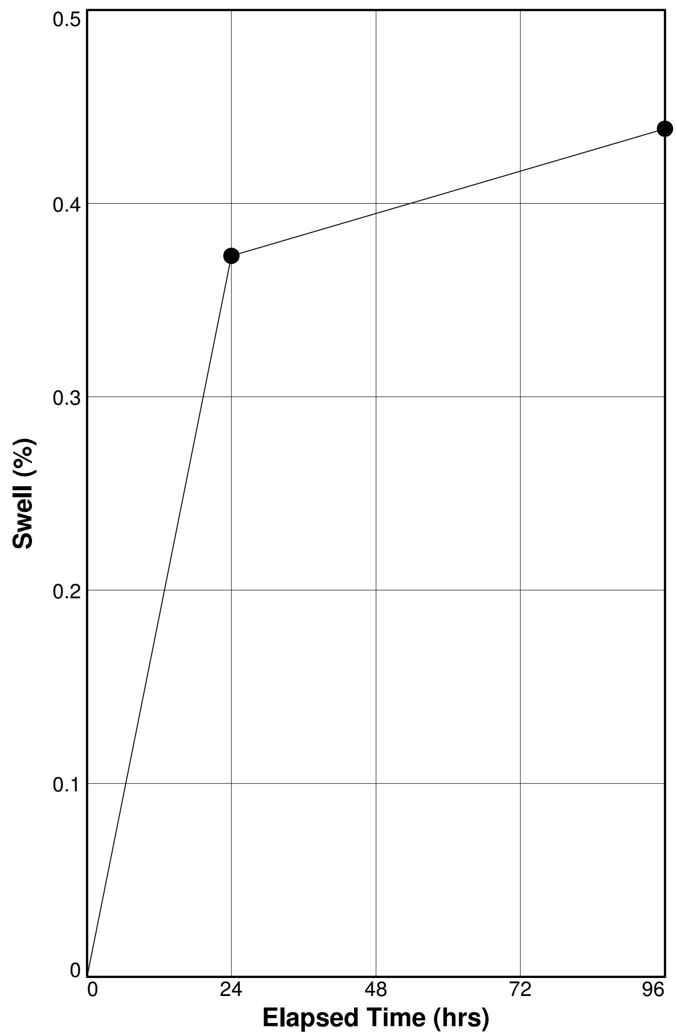
ALLWEST TESTING & ENGINEERING, LLC

Test Description/Remarks:

Figure: C-37

BEARING RATIO TEST REPORT
ASTM D 1883-07





	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	127.7	96	10.2	127.2	95.6	14.0	64.4	65.6	0.000	10	0.4
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Clayey sand with gravel	SC	133.0	9.9	28	8

Project No: 313-218G

Project: Lewiston Nez Perce County Airport Runway

Location: RB-9 @ 1-5'

Sample Number: S213-520

Date: 1-16-14

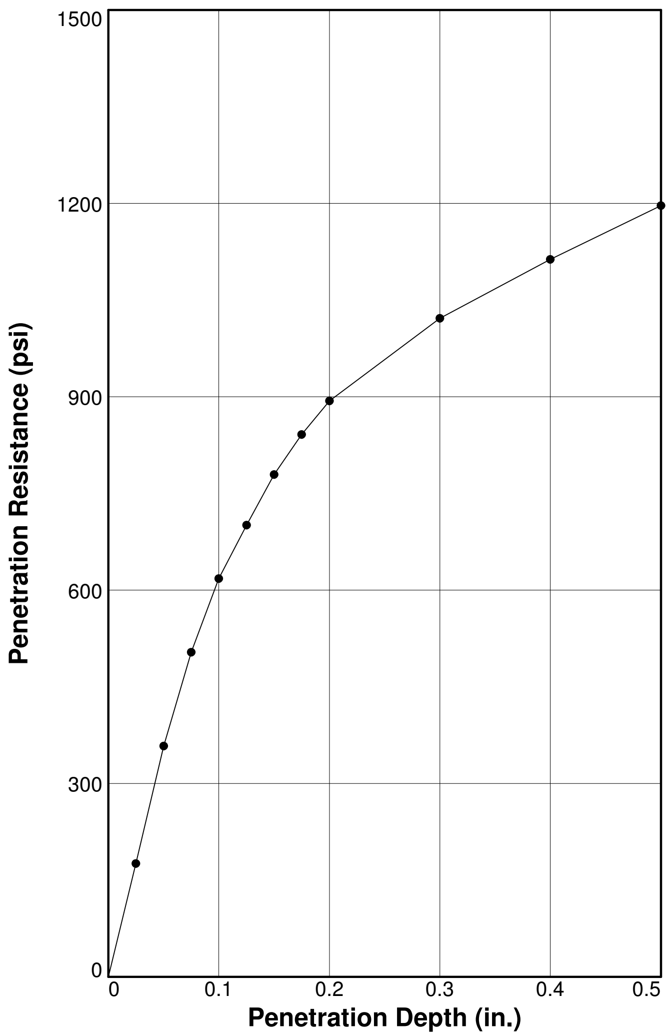
Test Description/Remarks:

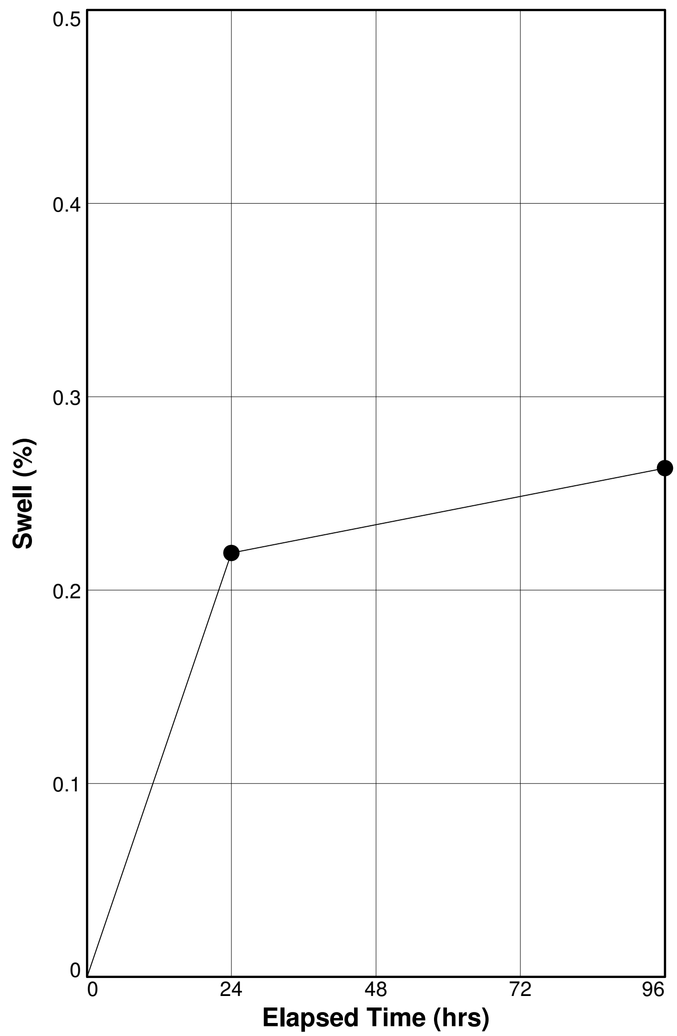
BEARING RATIO TEST REPORT

ALLWEST TESTING & ENGINEERING, LLC

Figure: C-38 ______

BEARING RATIO TEST REPORT
ASTM D 1883-07





	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	119.3	96.5	13.3	119.0	96.3	17.0	61.8	59.6	0.000	10	0.3
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Clayey sand	SC	123.6	13.3	42	21

Project No: 313-218G

Project: Lewiston Nez Perce County Airport Runway

Location: RB-11 @ 1-4'

Sample Number: S213-521

Date: 1-16-14

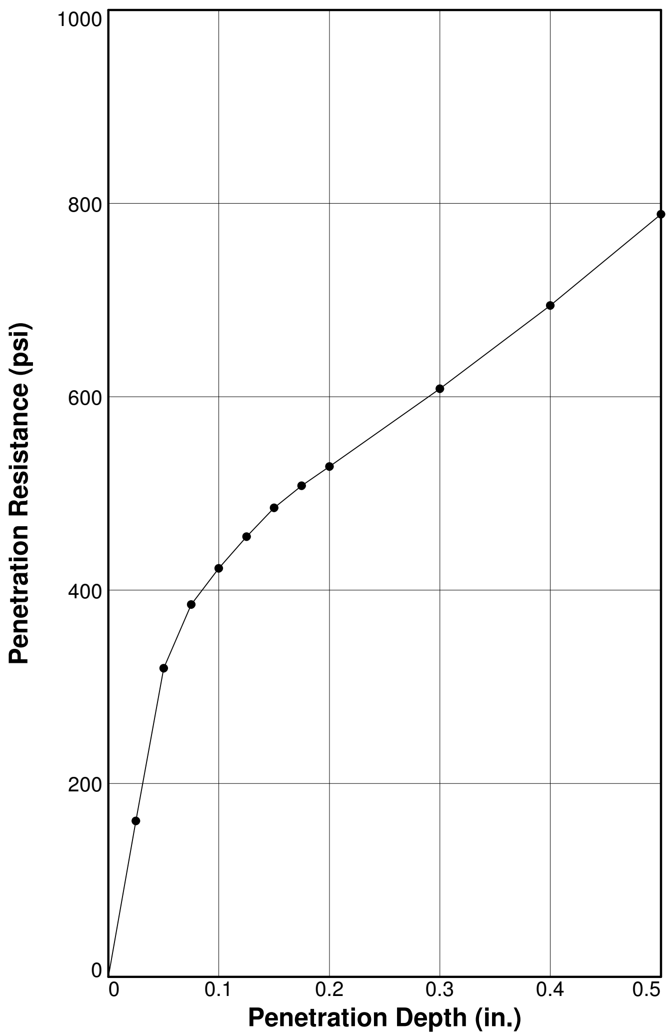
BEARING RATIO TEST REPORT

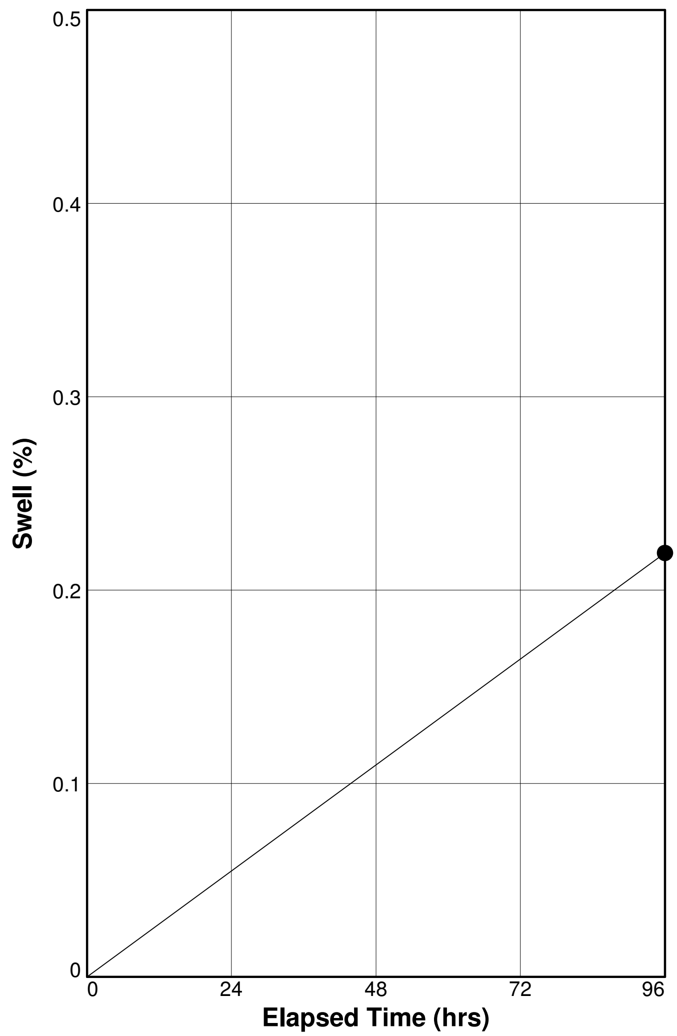
ALLWEST TESTING & ENGINEERING, LLC

Test Description/Remarks:

Figure: C-39

BEARING RATIO TEST REPORT
ASTM D 1883-07





	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	129.8	96.4	9.2	129.5	96.1	12.7	42.3	35.2	0.000	10	0.2
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Clayey gravel with sand	GC	134.7	9.7	33	15

Project No: 313-218G

Project: Lewiston Nez Perce County Airport Runway

Location: RB-13 @ 1-4'

Sample Number: S213-522

Date: 1-16-14

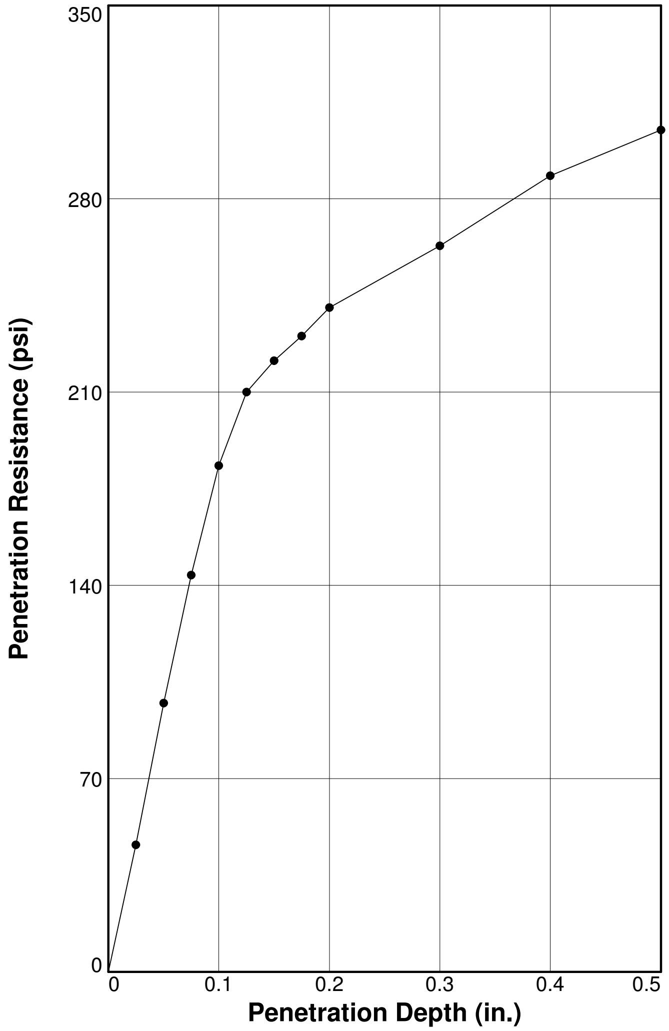
BEARING RATIO TEST REPORT

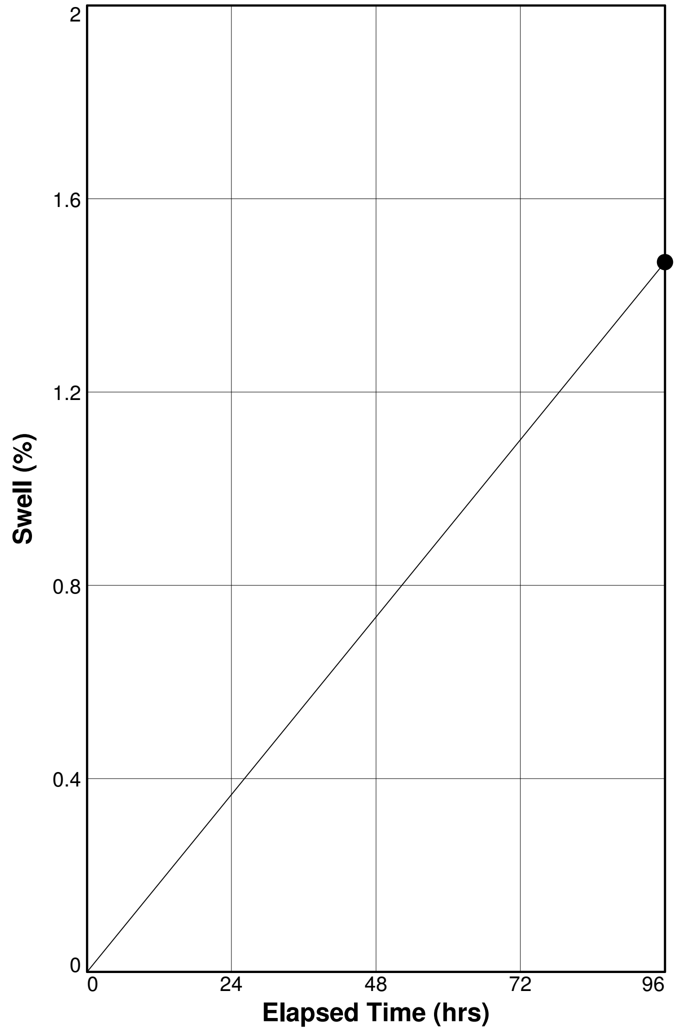
ALLWEST TESTING & ENGINEERING, LLC

Test Description/Remarks:

Figure: C-40 _______

BEARING RATIO TEST REPORT
ASTM D 1883-07





	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	122.0	95.3	11.7	120.3	94	19.9	18.5	16.1	0.002	10	1.5
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Clayey gravel with sand	GC	128.0	11.6	53	28

Project No: 313-218G

Project: Lewiston Nez Perce County Airport Runway

Location: RB-15 @ 1-4'

Sample Number: S213-523

Date: 1-16-14

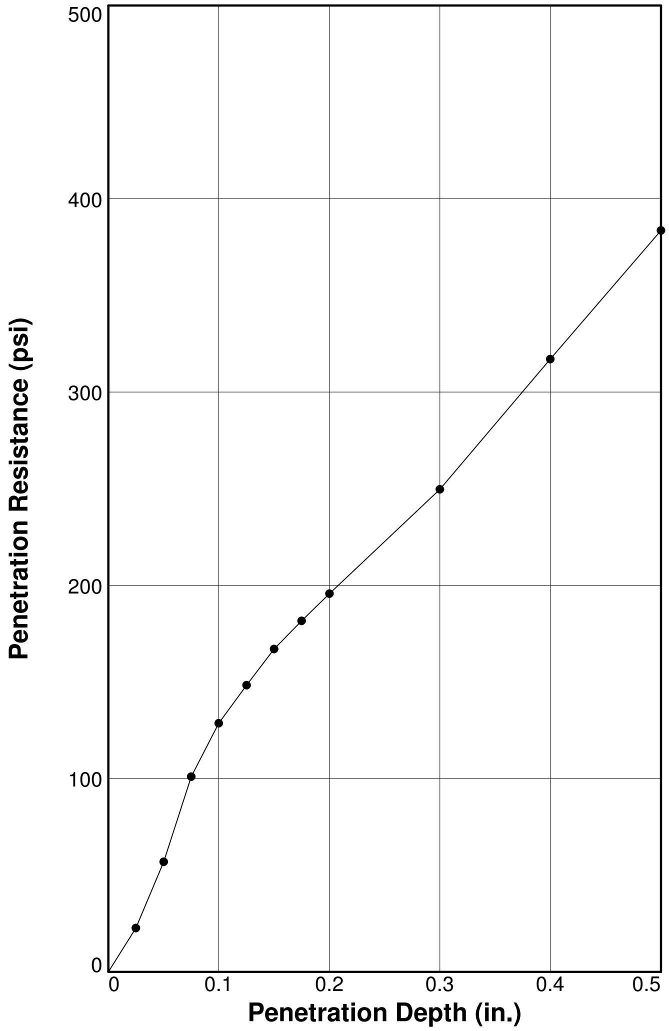
BEARING RATIO TEST REPORT

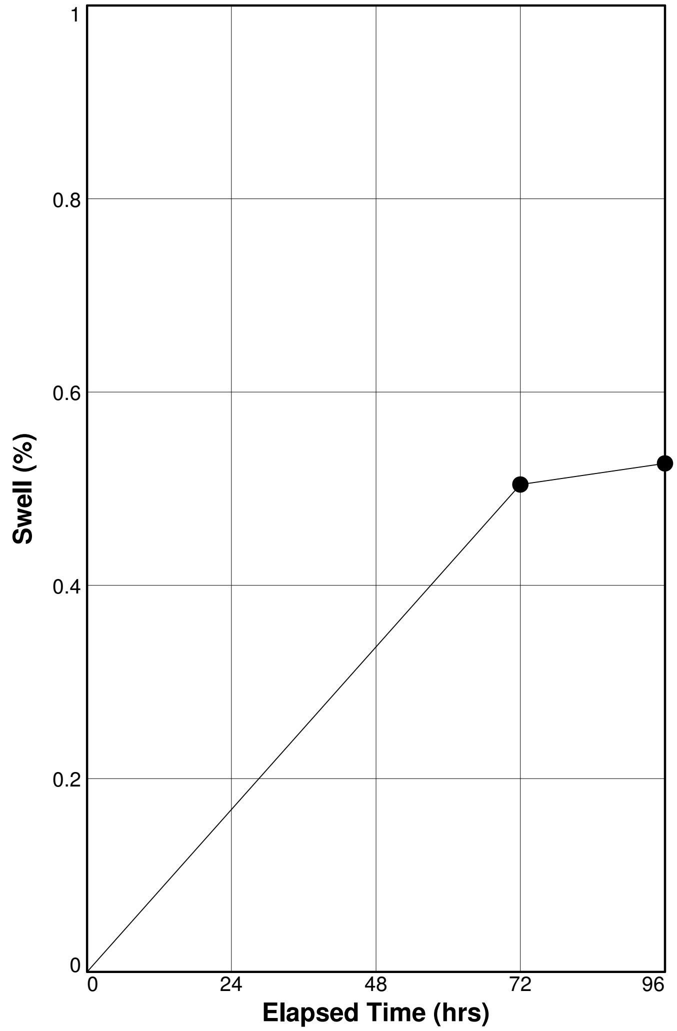
ALLWEST TESTING & ENGINEERING, LLC

Test Description/Remarks:

Figure: C-41 _______

BEARING RATIO TEST REPORT
ASTM D 1883-07





	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	120.3	95.9	10.5	119.7	95.5	14.8	14.0	13.6	0.015	10	0.5
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Silty gravel with sand	GM	125.4	11.0	29	6

Project No: 313-218G

Project: Lewiston Nez Perce County Airport Runway

Location: RB-17 @ 0.5-2'

Sample Number: S213-524

Date: 1-16-14

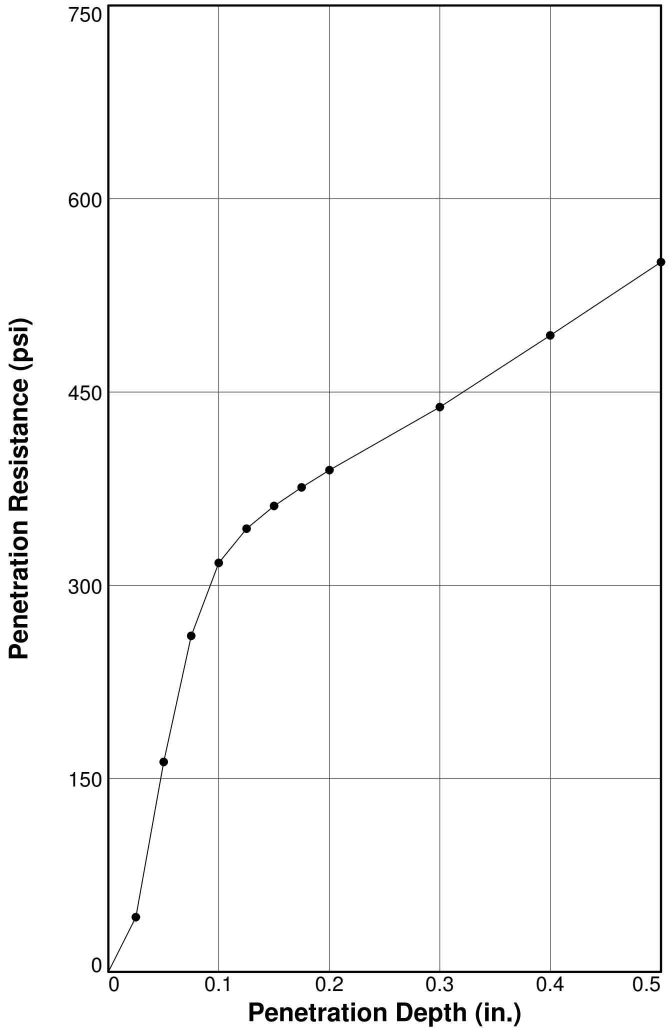
BEARING RATIO TEST REPORT

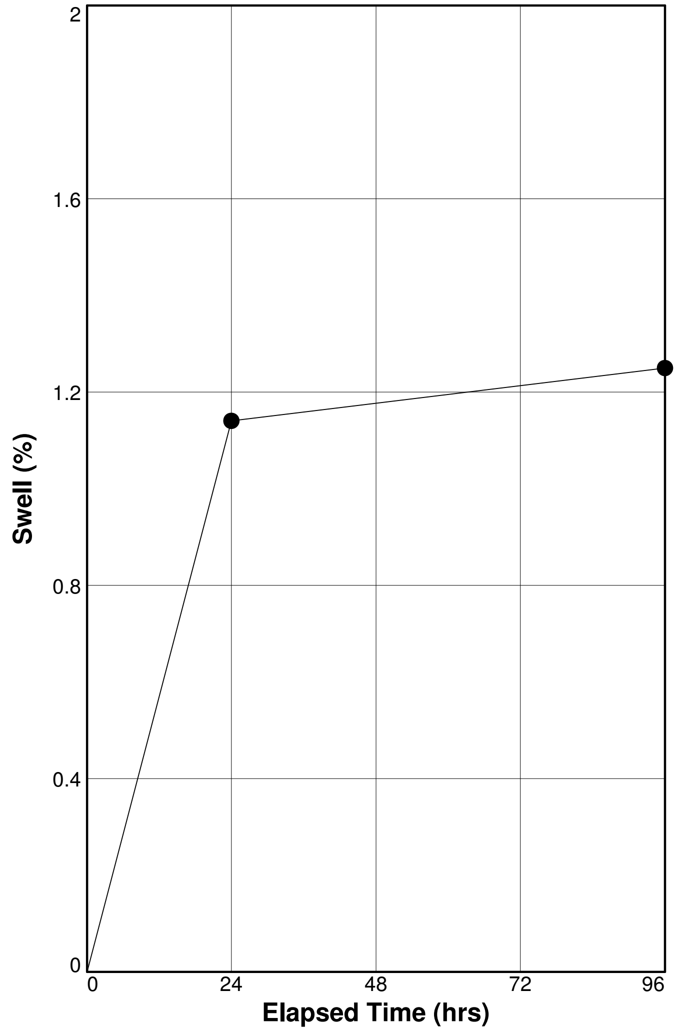
ALLWEST TESTING & ENGINEERING, LLC

Test Description/Remarks:

Figure: C-42 ______

BEARING RATIO TEST REPORT
ASTM D 1883-07





	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	118.4	95.5	12.3	116.9	94.3	20.2	33.1	26.4	0.013	10	1.3
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Clayey gravel with sand	GC	124.0	11.9	29	9

Project No: 313-218G

Project: Lewiston Nez Perce County Airport Runway

Location: RB-19 @ 1-3'

Sample Number: S213-525

Date: 1-16-14

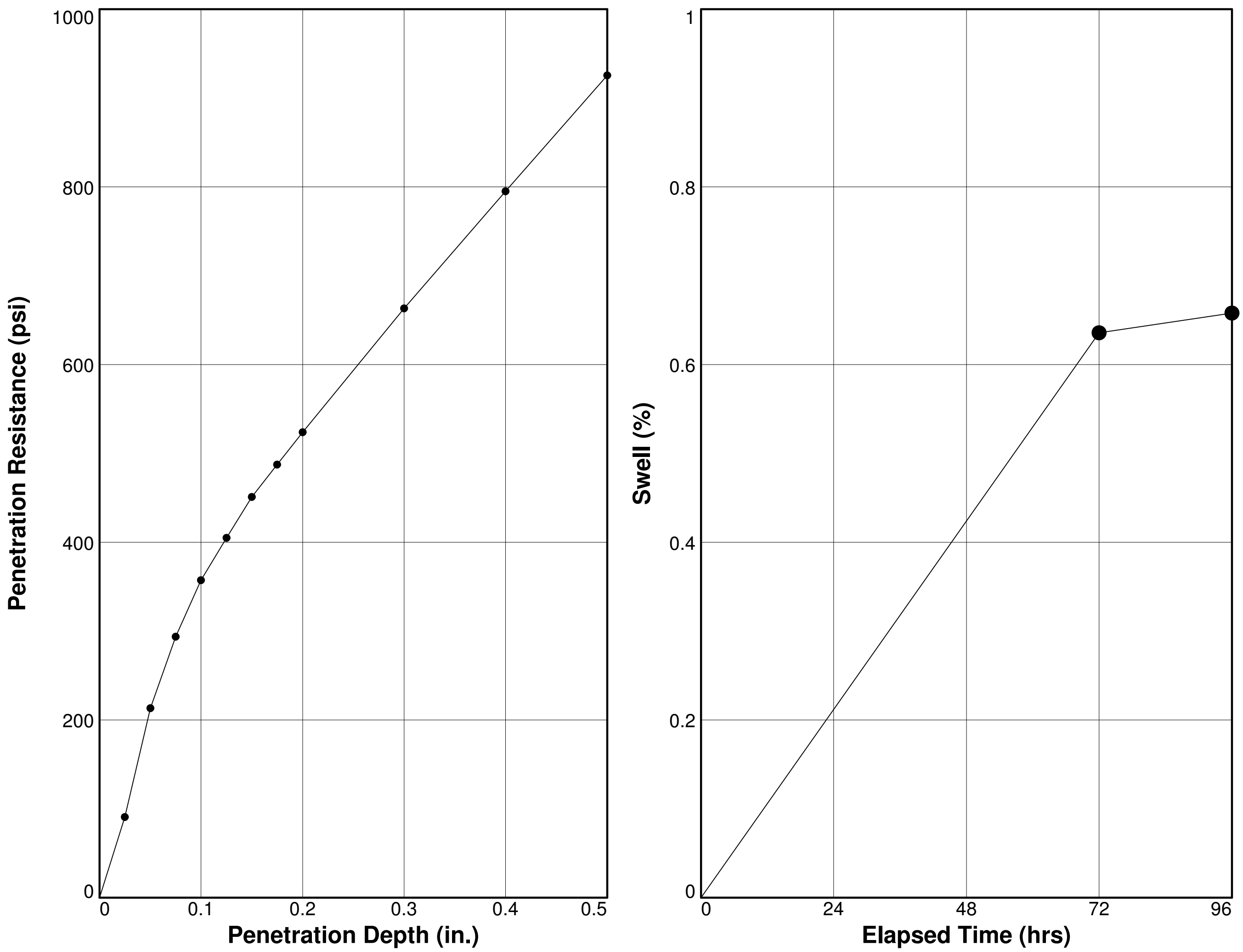
BEARING RATIO TEST REPORT

ALLWEST TESTING & ENGINEERING, LLC

Test Description/Remarks:

Figure: C-43 _______

BEARING RATIO TEST REPORT
ASTM D 1883-07



	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	118.7	96.1	12.0	117.9	95.5	16.4	36.7	35.4	0.005	10	0.7
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Sandy silty clay	CL-ML	123.5	12.4	26	7

Project No: 313-218G

Project: Lewiston Nez Perce County Airport Runway

Location: RB-22 @ 1-5'

Sample Number: S213-526

Date: 1-16-14

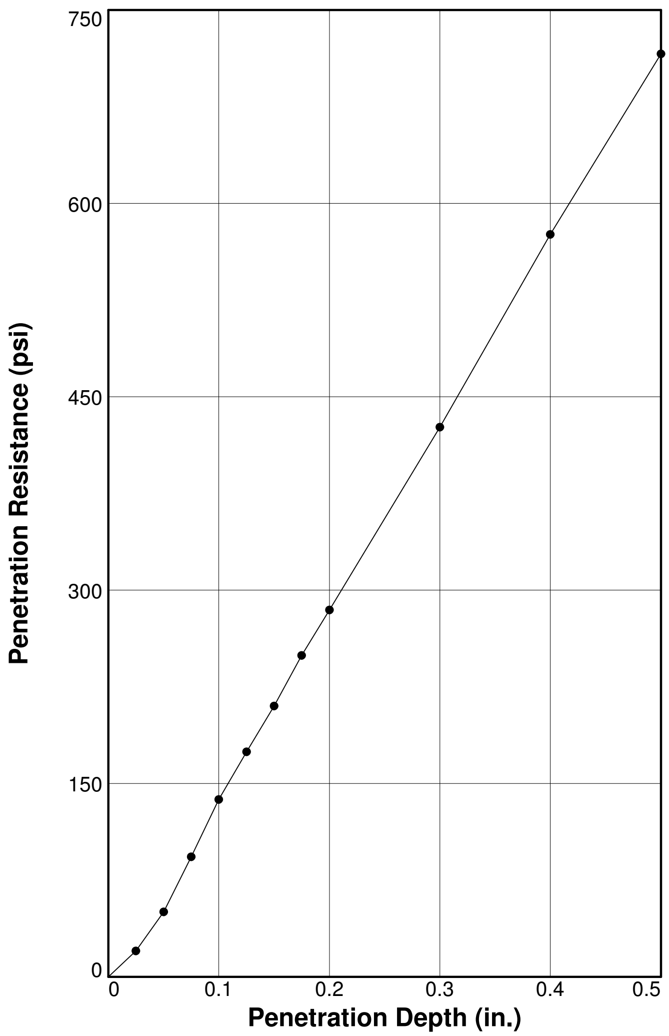
BEARING RATIO TEST REPORT

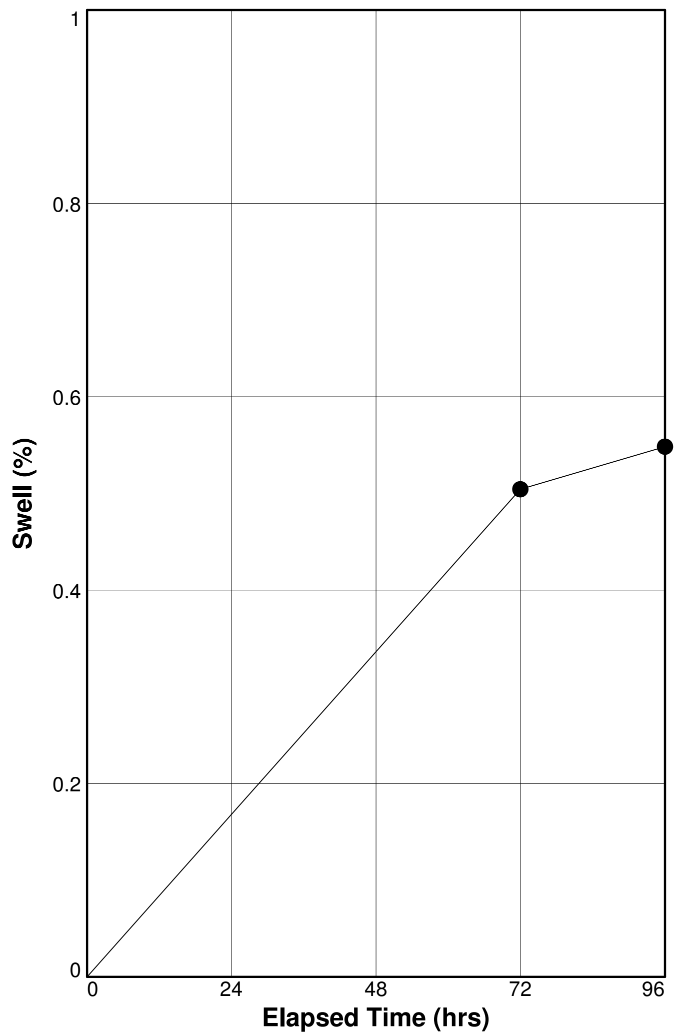
ALLWEST TESTING & ENGINEERING, LLC

Test Description/Remarks:

Figure: C-44 _______

BEARING RATIO TEST REPORT
ASTM D 1883-07





	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	119.6	96.4	12.2	118.9	95.8	17.0	16.6	20.8	0.019	10	0.5
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Silty clay with sand	CL-ML	124.1	12.7	26	7

Project No: 313-218G

Project: Lewiston Nez Perce County Airport Runway

Location: AB-4 @ 3-5'

Sample Number: S213-545

Date: 1-16-14

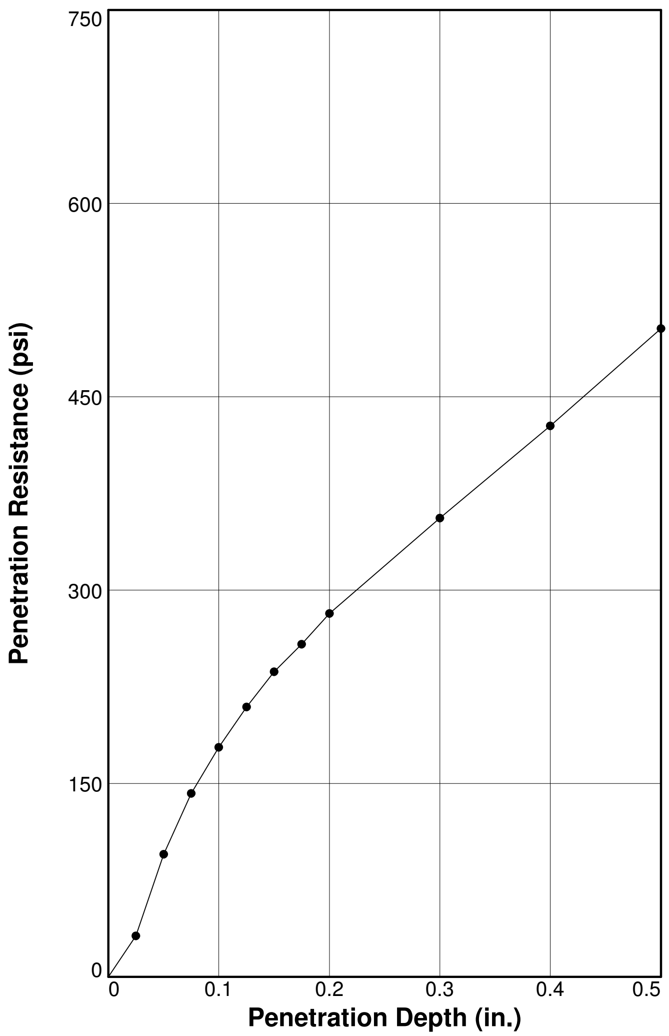
Test Description/Remarks:

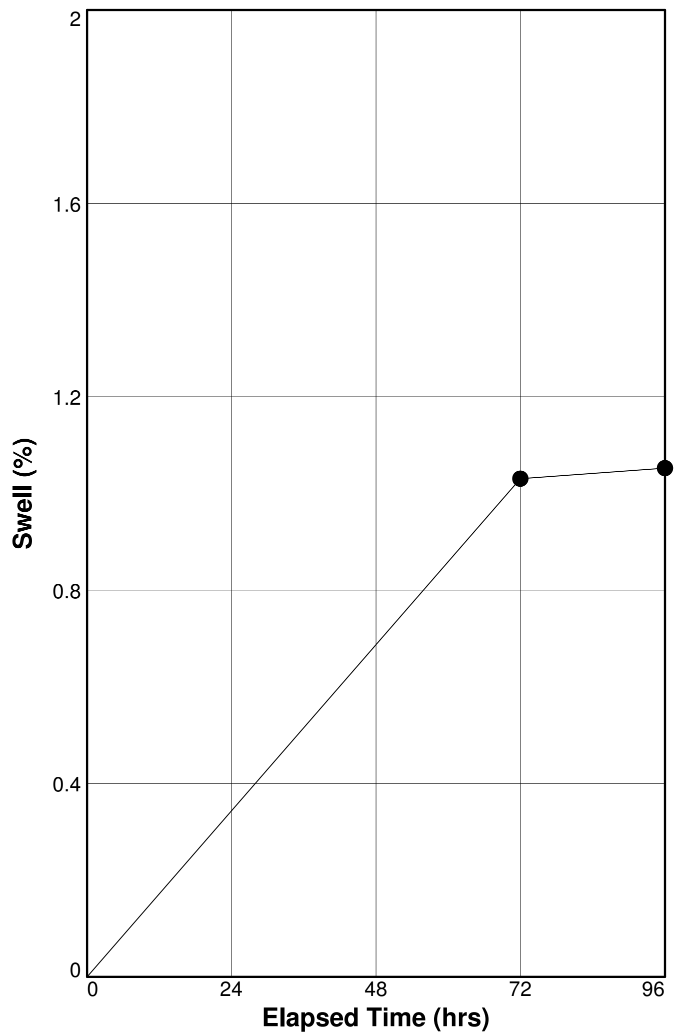
BEARING RATIO TEST REPORT

ALLWEST TESTING & ENGINEERING, LLC

Figure: C-45

BEARING RATIO TEST REPORT
ASTM D 1883-07





	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	112.6	95.9	12.4	111.4	94.9	20.0	19.3	19.4	0.012	10	1.1
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Silty clay with sand	CL-ML	117.4	12.8	24	5

Project No: 313-218G

Project: Lewiston Nez Perce County Airport Runway

Location: AB-5 @ 1-5'

Sample Number: S213-544

Date: 1-16-14

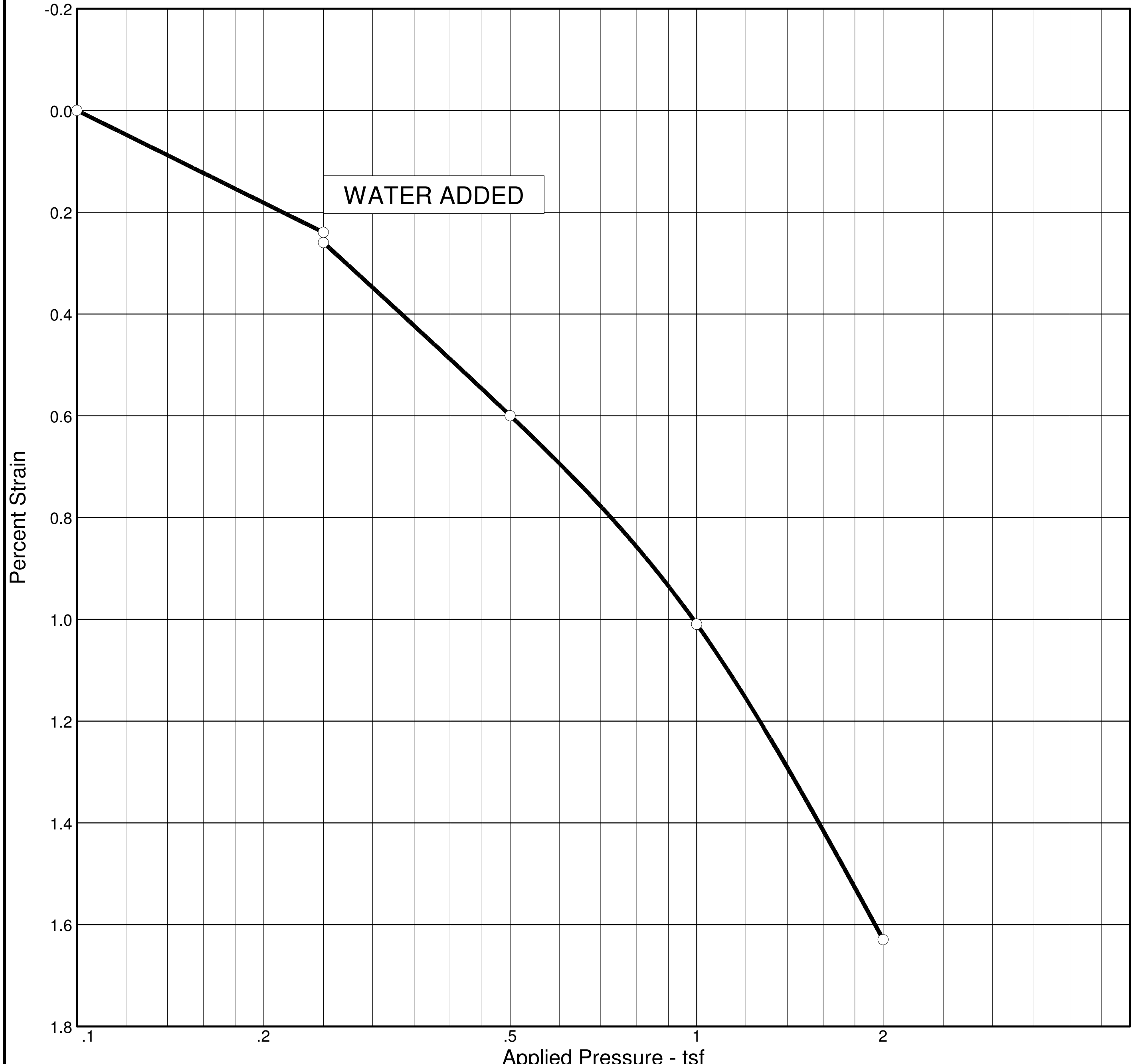
Test Description/Remarks:

BEARING RATIO TEST REPORT

ALLWEST TESTING & ENGINEERING, LLC

Figure: C-46

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Clpse. %	e_o
76.6 %	11.4 %	122.3			2.65		1.04	0.03			0.1	0.395

MATERIAL DESCRIPTION	USCS	AASHTO
Silt	ML	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

Location: RB-3 @ 2.5'

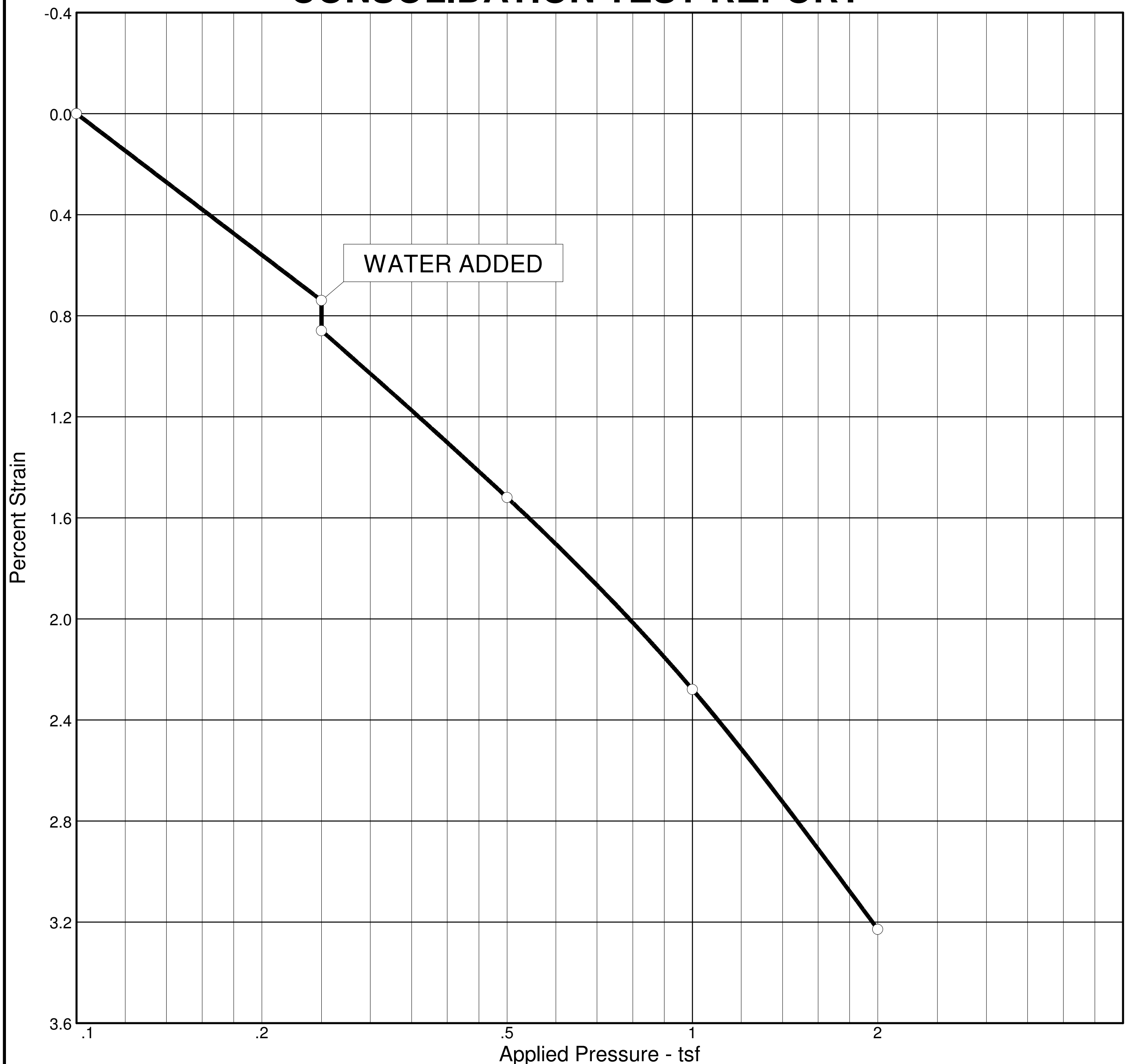
ALLWEST TESTING & ENGINEERING, LLC

Spokane, WA

Remarks:
ASTM D4546
Sample #S213-516

Figure: C-47

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Clpse. %	e_o
Sat.	Moist.											
67.5 %	12.9 %	111.9			2.65		1.03	0.05			0.2	0.505

MATERIAL DESCRIPTION	USCS	AASHTO
Silt with sand	ML	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

Location: RB-4 @ 4'

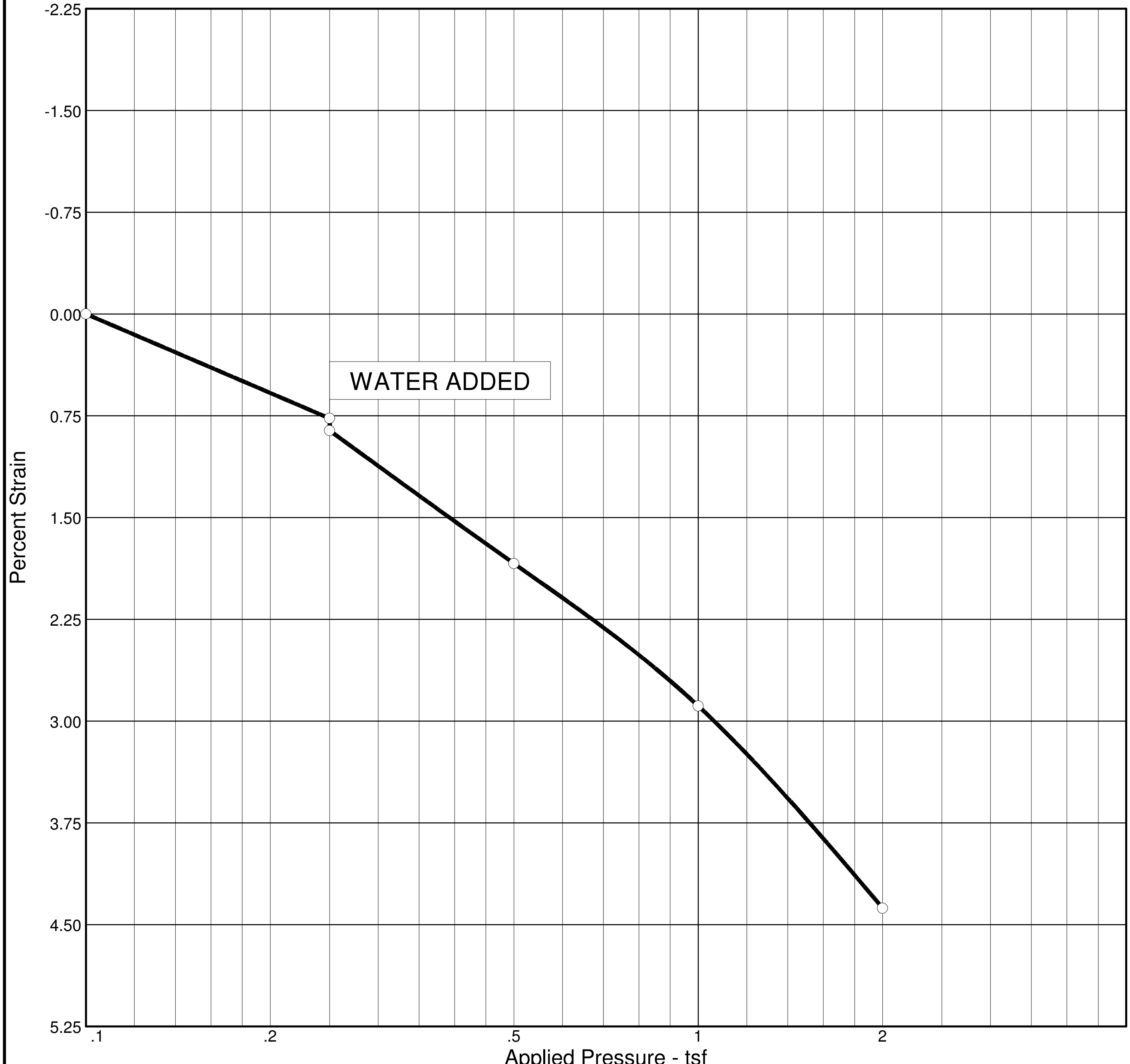
ALLWEST TESTING & ENGINEERING, LLC

Spokane, WA

Remarks:
ASTM D4546
Sample #S213-517

Figure: C-48

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Clpse. %	e_o
Sat.	Moist.											
81.2 %	20.0 %	103.4			2.65		1.05	0.08			0.1	0.654

MATERIAL DESCRIPTION	USCS	AASHTO
Silt	ML	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

Location: RB-17 @ 4'

ALLWEST TESTING & ENGINEERING, LLC

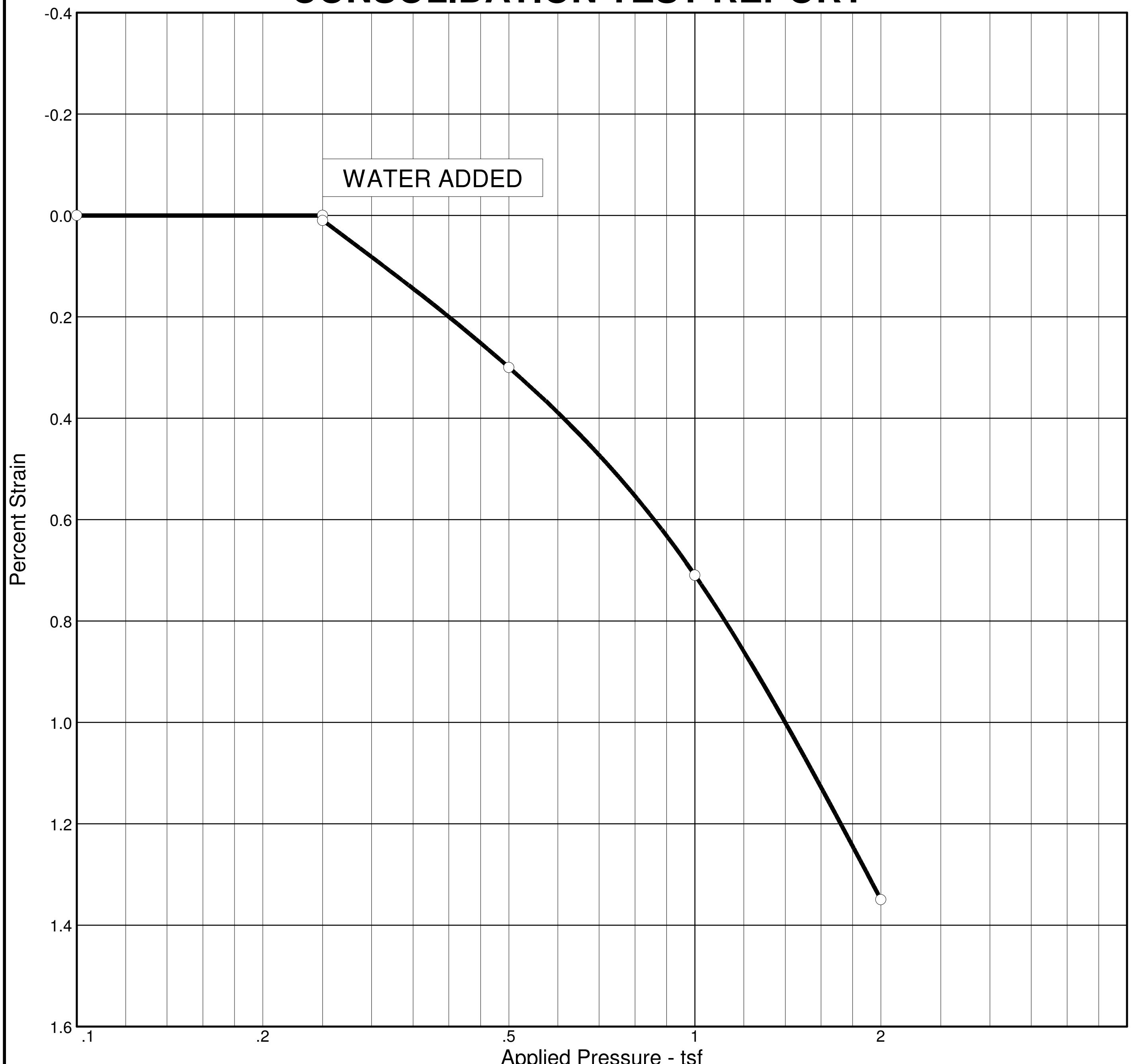
Spokane, WA

Remarks:

ASTM D4546
Sample #S213-527

Figure: C-49

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Swell %	e_o
Sat.	Moist.											
68.8 %	15.7 %	104.9			2.65		0.90	0.03				0.607

MATERIAL DESCRIPTION	USCS	AASHTO
Silt	ML	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

Location: RB-22 @ 4'

ALLWEST TESTING & ENGINEERING, LLC

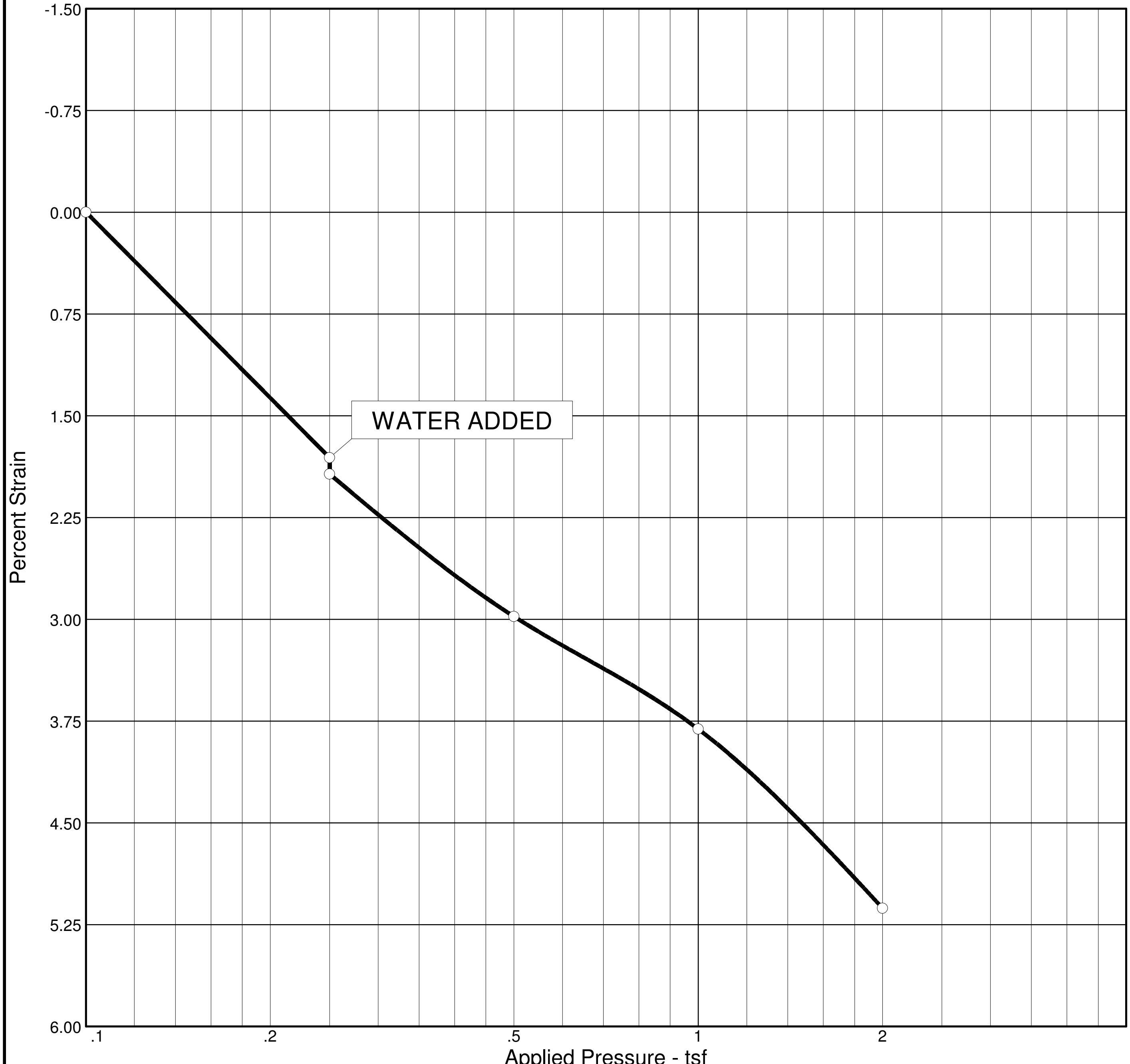
Spokane, WA

Remarks:

ASTM D4546
Sample #S213-530

Figure: C-50

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Clpse. %	e_o
Sat.	Moist.											
58.7 %	16.9 %	96.3			2.65		1.06	0.08			0.1	0.760

MATERIAL DESCRIPTION	USCS	AASHTO
Sandy silt	ML	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

Location: AB-1 @ 9'

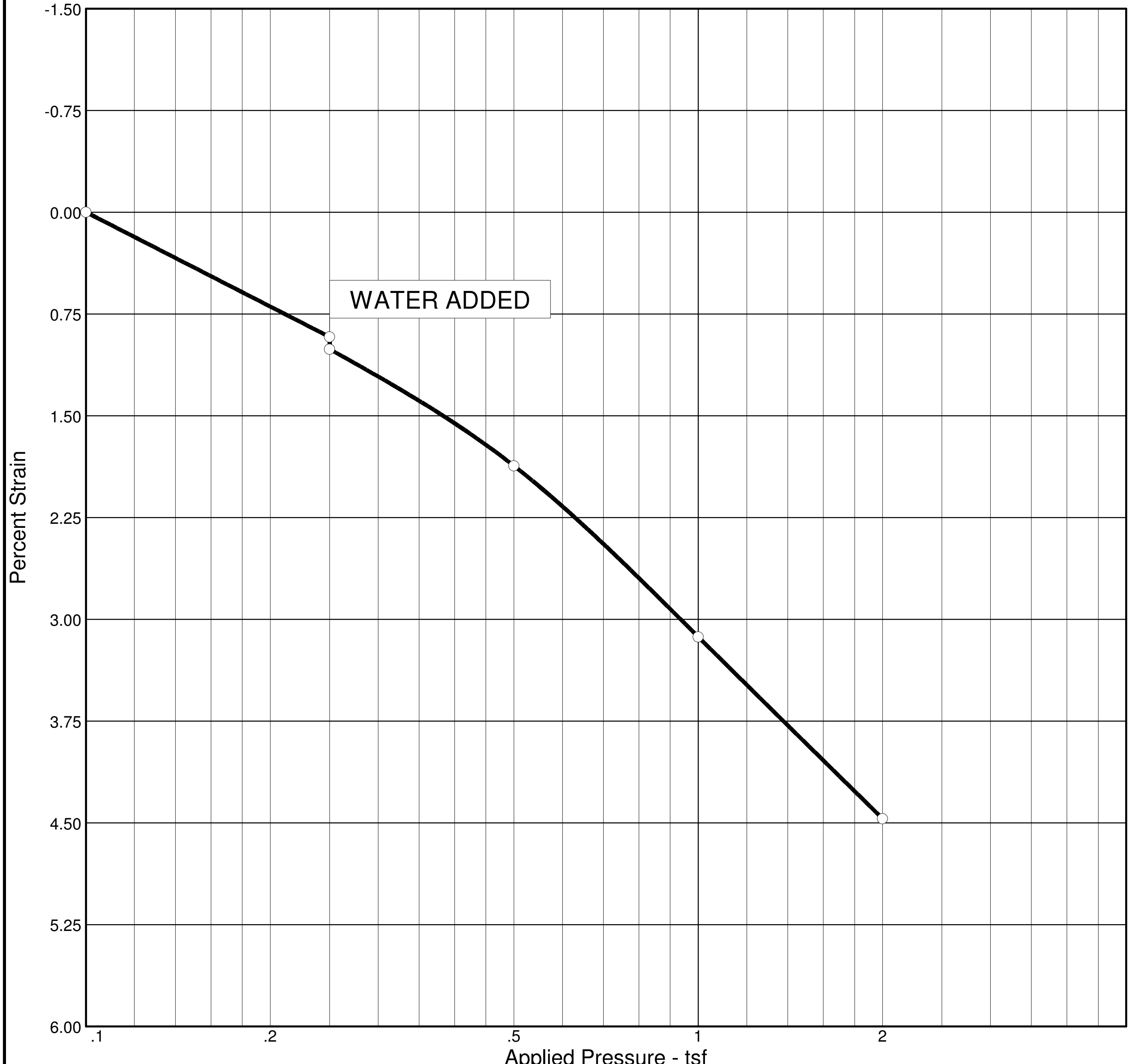
Remarks:
ASTM D4546
Sample #S213-543

ALLWEST TESTING & ENGINEERING, LLC

Spokane, WA

Figure: C-51

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Clpse. %	e_o
42.1 %	11.6 %	107.2			2.65		0.53	0.08			0.1	0.727

MATERIAL DESCRIPTION	USCS	AASHTO
Silt with sand	ML	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

Location: AB-2 @ 1'

ALLWEST TESTING & ENGINEERING, LLC

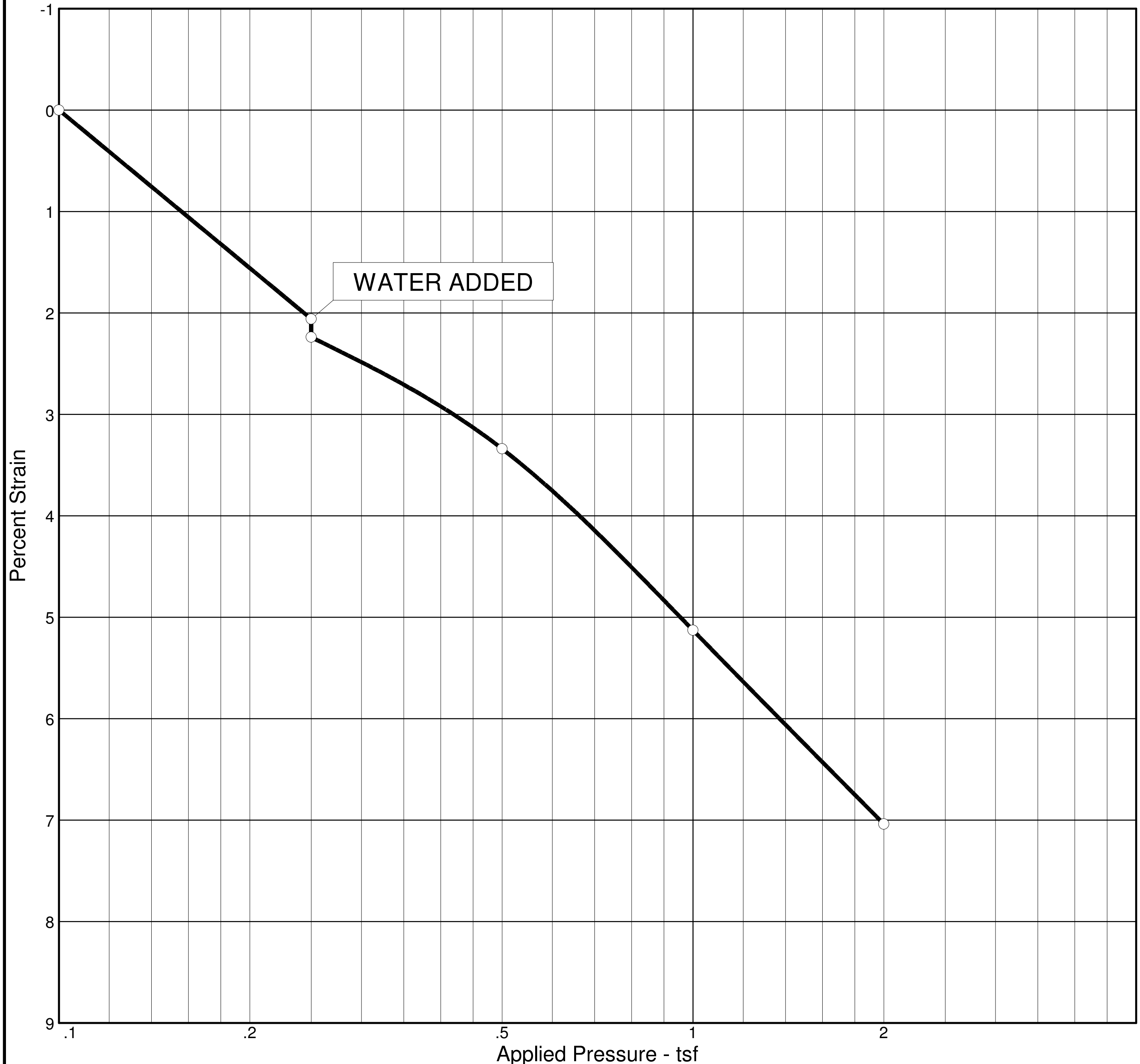
Spokane, WA

Remarks:

ASTM D4546
Sample #S213-537

Figure: C-52

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Clpse. %	e_o
Sat.	Moist.											
64.3 %	17.5 %	98.1			2.65		0.53	0.11			0.1	0.721

MATERIAL DESCRIPTION	USCS	AASHTO
Silt	ML	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

Location: AB-2 @ 4'

ALLWEST TESTING & ENGINEERING, LLC

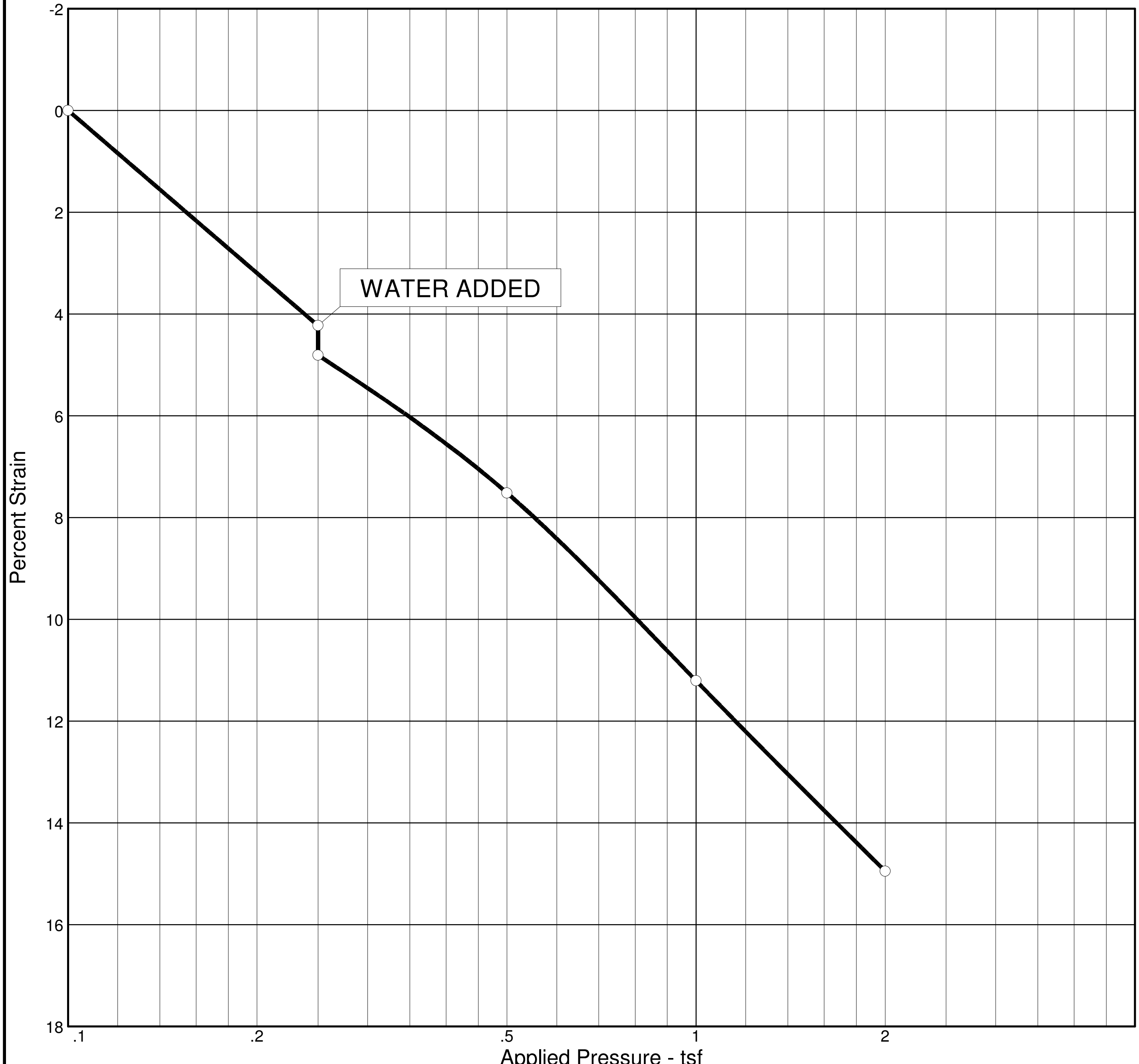
Spokane, WA

Remarks:

ASTM D4546
Sample #S213-538

Figure: C-53

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Clpse. %	e_o
Sat.	Moist.											
39.8 %	13.7 %	88.2			2.65		0.50	0.24			0.6	0.915

MATERIAL DESCRIPTION	USCS	AASHTO
Silt	ML	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

Location: AB-3 @ 4'

ALLWEST TESTING & ENGINEERING, LLC

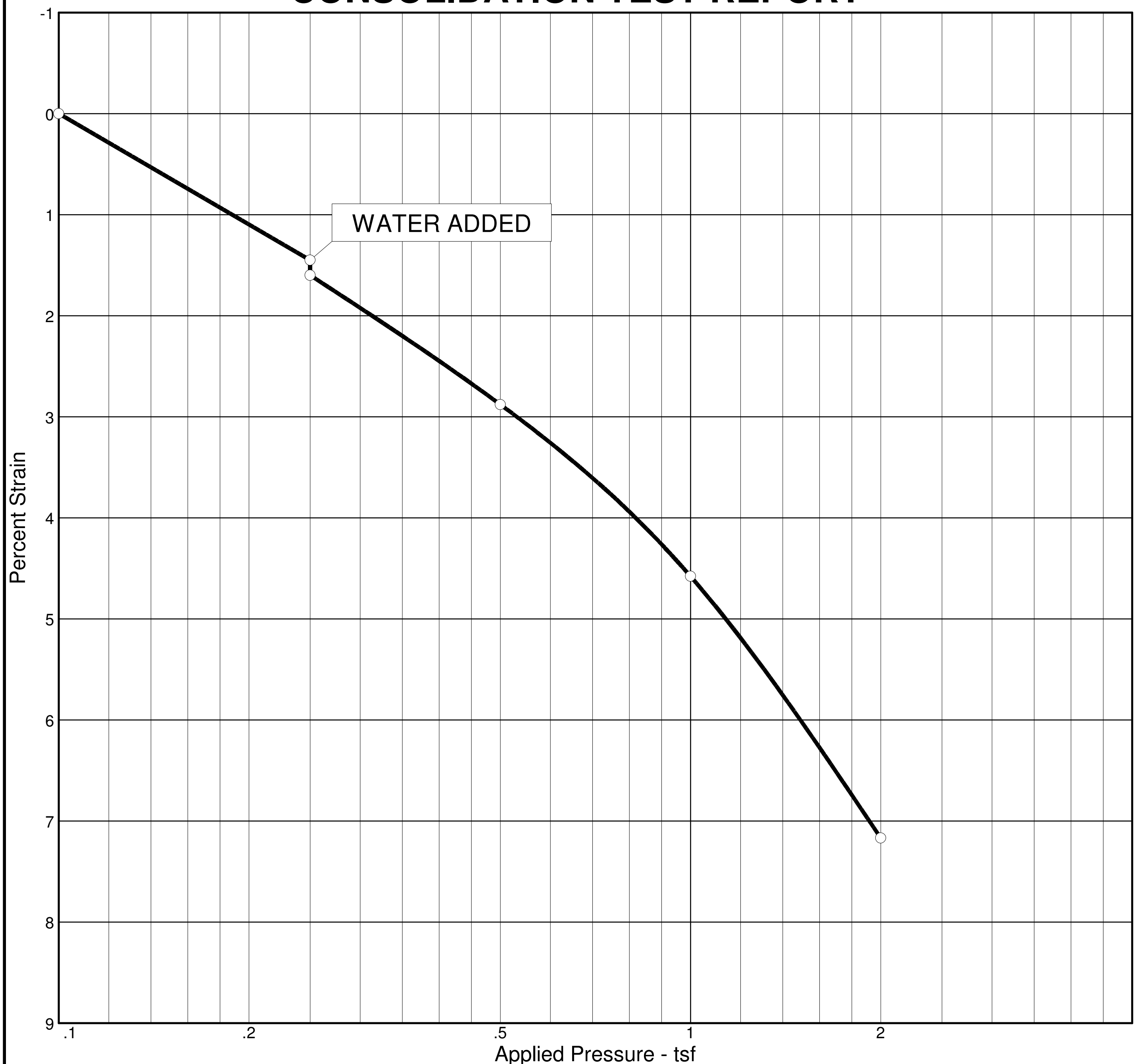
Spokane, WA

Remarks:

ASTM D4546
Sample #S213-542

Figure: C-54

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Clpse. %	e_o
Sat.	Moist.											
69.0 %	22.6 %	91.0			2.65		1.00	0.16			0.1	0.869

MATERIAL DESCRIPTION	USCS	AASHTO
Silt	ML	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

Location: AB-4 @ 4'

ALLWEST TESTING & ENGINEERING, LLC

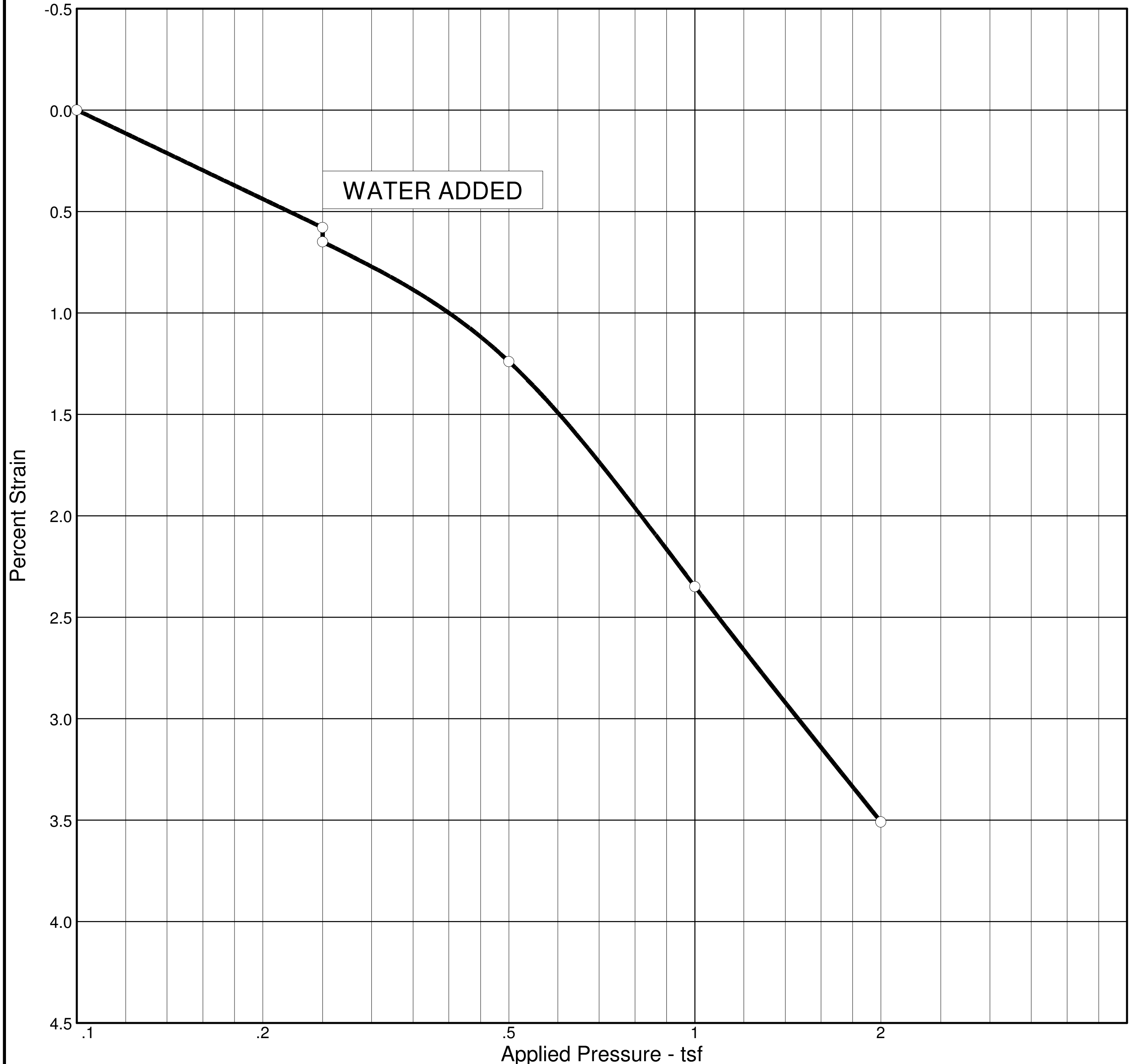
Spokane, WA

Remarks:

ASTM D4546
Sample #S213-541

Figure: C-55

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Clpse. %	e_o
81.2 %	22.3 %	94.5			2.65		0.50	0.07			0.1	0.729

MATERIAL DESCRIPTION	USCS	AASHTO
Silt	ML	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

Location: AB-5 @ 2.5'

ALLWEST TESTING & ENGINEERING, LLC

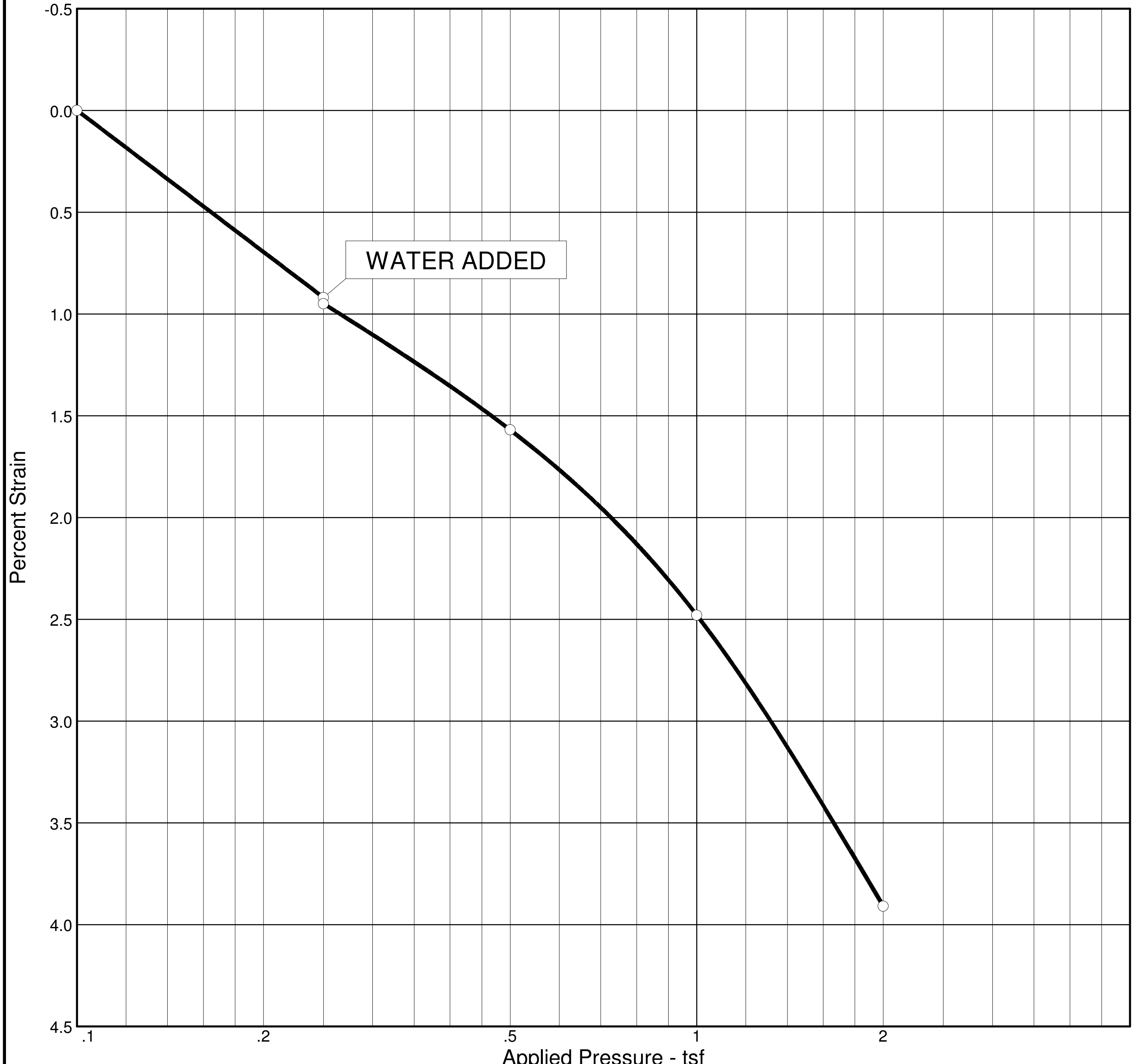
Spokane, WA

Remarks:

ASTM D4546
Sample #S213-539

Reviewed by: C-56

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Swell Press. (tsf)	Swell %	e_o
Sat.	Moist.											
78.4 %	24.0 %	92.5			2.65		0.94	0.09				0.810

MATERIAL DESCRIPTION	USCS	AASHTO
Silt with sand	ML	

Project No. 313-218G **Client:** Armstrong Consultants,Inc.

Project: Lewiston Nez Perce County Airport Runway

Location: AB-5 @ 4'

ALLWEST TESTING & ENGINEERING, LLC

Spokane, WA

Remarks:

ASTM D4546
Sample #S213-540

Figure: C-57

Table C-1: Summary of Laboratory Test Results

Boring No.	Depth (feet)	Water Content (%)	Dry Density (pcf)	Gradation: Gravel (%)	Gradation: Sand (%)	Gradation: Silt / Clay (%)	Gradation: <0.02mm (%)	Atterberg Limits: Liquid Limit (%)	Atterberg Limits: Plasticity Index (%)	Moisture-DensityRelationship: Maximum Dry Density (pcf)	Moisture-DensityRelationship: Optimum Moisture (%)	California Bearing Ratio (%)	pH	Water Soluble Sulfates (ppm)	Sample Classification
RB-1	1	17		16	16	68.0		45	19						Lean clay with sand (CL)
	2 1/2	7		37	6	57.1									Gravelly silt (ML)
RB-2	2 1/2	10	105	24	8	68.1									Gravelly silt (ML)
	10	22	93	42	25	32.8									Silty gravel with sand (GM)
RB-3	1	5	128	56	42	1.8									Base course
	2 1/2	14	110	20		3.5									Base course
	1 - 4			14	37	49.3		33	15	123.9	11.3	46.9		13	Clayey sand (SC)
RB-4	1	4		49	42	9.3	2.1								Base course
	2 1/2	11	113	19	52	32.8									Silty sand with gravel (SM)
	4	7	110	38	10	51.9									Gravelly silt (ML)
RB-5	2 1/2	3		46	44	10.4									Poorly graded gravel w/ silt & sand (GP-GM)
	4	10	122	30	52	17.8									Clayey sand with gravel (SC)
RB-6	1	4		56	40	3.9									Base course
	2 1/2	8		47	45	8.3									Poorly graded gravel w/ silt & sand (GP-GM)
	1 - 5			37	37	25.7		26	7	144.8	6.2	67.2		19	Silty,clayey sand with gravel (SC-SM)
RB-7	1	3	138	62	35	3.0									Base course
	2 1/2	5		21	13	66.3									Gravelly silt (ML)
RB-8	1	5		49	47	3.5									Base course
	2 1/2	7		24	12	64.4									Gravelly silt (ML)
RB-9	1	3		45	8	47.1									Base course (contaminated)
	2 1/2	11	125	46	53	11.8									Base course
	1 - 5			25	38	36.8		28	8	135.1	9.1	64.4		27	Clayey sand with gravel (SC)
RB-10	1	5	130	54	38	8.1	1.8								Base course
	2 1/2	11	125	54	34	12.4	4.0								Base course
RB-11	1	4		45	6	49.3									Base course (contaminated)
	2 1/2	14	108	42	49	9.3									Base course
	1 - 4			14	57	29.1		42	21	123.6	13.3	61.8		52	Clayey sand (SC)
RB-12	1	4	126	57	3	38.9									Silty gravel (GM)
	2 1/2	6	126	34	6	60.2									Gravelly silt (ML)
RB-13	1	5	135	53	4	42.5									Silty gravel (GM)
	2 1/2	10	120	41	8	51.4									Gravelly silt (ML)
	1 - 4			40	38	21.8		33	15	134.7	9.7	42.3		16	Clayey gravel with sand (GC)

ALLWEST Testing & Engineering

Summary of Laboratory Test Results
Lewiston-Nez Perce County Airport
406 Burrell Avenue
Lewiston, Idaho

ALLWEST Testing & Engineering Project No.: 313-218G

Table C-1: Summary of Laboratory Test Results

Boring No.	Depth (feet)	Water Content (%)	Dry Density (pcf)	Gradation: Gravel (%)	Gradation: Sand (%)	Gradation: Silt / Clay (%)	Gradation: <0.02mm (%)	Atterberg Limits: Liquid Limit (%)	Atterberg Limits: Plasticity Index (%)	Moisture-DensityRelationship: Maximum Dry Density (pcf)	Moisture-DensityRelationship: Optimum Moisture (%)	California Bearing Ratio (%)	pH	Water Soluble Sulfates (ppm)	Sample Classification
RB-14	1	4		56	33	11.1	2.9								Base course
	2 1/2	13	106	48	42	9.9									Base course
RB-15	1	4	127	42	20	37.8									Base course (contaminated)
	2 1/2	22	91	13	64	22.7							10		Silty sand (SM)
	4	4	108										11		Silty gravel with sand (GM)
	7 1/2	20		5	12	82.5		27	4						Silt with sand (ML)
	10	18		35	10	55.2									Gravelly silt (ML)
	1 - 4			44	36	20.2		53	28	128.0	11.6	18.5		53	Clayey gravel with sand (GC)
RB-16	1	4	122	65	32	2.8									Base course
	2 1/2	6		42	51	7.1									Base course
RB-17	1	1		57	36	6.8	1.5								Base course
	2 1/2	10	113												Silty clayey gravel with sand (GC-GM)
	4	18	116	22	42	35.6									Silty sand with gravel (SM)
	10	17	109	32	37	31.3									Silty clayey sand with gravel (SC-SM)
	1/2 - 2			41	25	34.9		29	6	132.9	8.7	14.0			Silty gravel with sand (GM)
RB-18	1	4		49	43	8.0	1.6								Base course
	2 1/2	7	119	61	35	3.5									Poorly graded gravel with sand (GP)
	10	8	109	60	35	4.5									Poorly graded gravel with sand (GP)
RB-19	1	5	133	56	42	1.7									Base course
	2 1/2	7	133	51	37	12.0	3.7								Silty gravel with sand (GM)
	1 - 3			27	25	48.1		29	9	129.6	10.1	33.1			Clayey gravel with sand (GC)
RB-20	1	5	125	67	30	3.0									Base course
	2 1/2	18	109	36	43	21.4									Clayey sand with gravel (SC)
RB-21	1	5	119	51	46	2.5									Base course
	4	6	114	60	32	8.2									Poorly graded gravel w/ silt & sand (GP-GM)
RB-22	1	12	111	34	45	21.4									Silty sand with gravel (SM)
	2	12	117	15	35	50.4									Sandy silt with gravel (ML)
	4	17	105	1	19	80.1									Silt with sand (ML)
	1 - 5			9	26	65.4		26	7	123.5	12.4	36.7			Sandy silty clay (CL-ML)

Table C-1: Summary of Laboratory Test Results

Boring No.	Depth (feet)	Water Content (%)	Dry Density (pcf)	Gradation: Gravel (%)	Gradation: Sand (%)	Gradation: Silt / Clay (%)	Gradation: <0.02mm (%)	Atterberg Limits: Liquid Limit (%)	Atterberg Limits: Plasticity Index (%)	Moisture-Density Relationship: Maximum Dry Density (pcf)	Moisture-Density Relationship: Optimum Moisture (%)	California Bearing Ratio (%)	pH	Water Soluble Sulfates (ppm)	Sample Classification
AB-1	4	14	87	37	16	47.0									Silty gravel with sand (GM)
	9	18	81	3	39	58.0									Sandy silt (ML)
AB-2	1	20	104	51	46	2.5									Base course
	4	19	90	0	18	82.0									Silt with sand (ML)
	10	12		47	45	8.0									Poorly graded gravel w/ silt & sand (GP-GM)
AB-3	2 1/2	18	80	0	27	73.2									Silt with sand (ML)
	4	15	92	3	76	21.4									Silty sand (SM)
AB-4	3/4	6	119	51	35	13.8	4.6								Base course
	2 1/2	18	95	0	46	53.7									Sandy silt (ML)
	4	23	94	0	19	80.8									Silt with sand (ML)
	3 - 5			4	24	72.3		26	7	124.1	12.7	16.6			Silty clay with sand (CL-ML)
AB-5	1/2 - 1	6		51	43	6.1	2.3								Base course
	2 1/2	20	92	0	25	74.7									Silt with sand (ML)
	4	20	101	6	22	72.3									Silt with sand (ML)
	1 - 5			3	23	73.5		24	5	117.4	12.8	19.3			Silty clay with sand (CL-ML)

ALLWEST Testing & Engineering

Summary of Laboratory Test Results
Lewiston-Nez Perce County Airport
406 Burrell Avenue
Lewiston, Idaho

ALLWEST Testing & Engineering Project No.: 313-218G

APPENDIX H

ACRONYMS

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN

ARMSTRONG

COMMONLY USED ACRONYMS

AC	Advisory Circular
AD	Airport Design
ADG	Airplane Design Group
AGL	Above Ground Level
AIP	Airport Improvement Program
ALP	Airport Layout Plan
ALS	Approach Lighting System
ARC	Airport Reference Code
ARP	Airport Reference Point
ARTCC	Air Route Traffic Control Center
ASDA	Accelerate Stop Distance
ASR	Airport Surveillance Radar
ASV	Annual Service Volume
ATC	Air Traffic Control
ATCT	Airport Traffic Control Tower
AWOS	Automated Weather Observation system
BRL	Building Restriction Line
CAT	Category
CFR	Code of Federal Regulations
CWY	Clearway
CY	Calendar Year
DME	Distance Measuring Equipment
EL	Elevation
EMT	Emergency Medical Technician
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FBO	Fixed Base Operator
FSS	Flight Service System
FY	Fiscal Year
GA	General Aviation
GPS	Global Positioning System
HIRL	High Intensity Runway Lights
IEMT	Intermediate Emergency Medical Technician
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
LDA	Landing Distance Available
LOC	Localizer
MALS	Medium Intensity Approach Lighting System
MALSF	Medium Intensity Approach Lighting System with Sequenced Flashers
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
ME	Multi-Engine
MIRL	Medium Intensity Runway Lights
MITL	Medium Intensity Taxiway Lights
MLS	Microwave Landing System
MOA	Military Operating Area
MSL	Mean Sea Level
NAVAID	Navigational Aid
NDB	Nondirectional Beacon
NM	Nautical Mile
NPIAS	National Plan of Integrated Airport Systems
ODALS	Onmnidirectional Approach Lighting System
OFA	Object Free Area
OFZ	Obstacle Free Zone
PAPI	Precision Approach Path Indicator
PAR	Precision Approach Radar
RAIL	Runway Alignment Indicator Lights
RDC	Runway Design Code
REIL	Runway End Identifier Lights
ROFA	Runway Object Free Area
RPZ	Runway Protection Zone
RSA	Runway Safety Area
RVR	Runway Visual Range
RW	Runway
SWY	Stopway
TDG	Taxiway Design Group
TH	Threshold
TL	Taxilane
TODA	Takeoff Distance Available
TOFA	Taxiway Object Free Area
TORA	Takeoff Run Available
TSA	Taxiway Safety Area
TVOR	Very High Frequency Omni range on an Airport
TW	Taxiway
USGS	United States Geological Society
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VOR	Very High Frequency Omni range

APPENDIX I

GLOSSARY OF TERMS

LEWISTON-NEZ PERCE COUNTY REGIONAL AIRPORT
AIRPORT MASTER PLAN

ARMSTRONG

GLOSSARY OF TERMS

Above Ground Level (AGL)	A height above ground as opposed to MSL (height above Mean Sea Level).
Advisory Circular (AC)	Publications issued by the FAA to provide a systematic means of providing non-regulator guidance and information in a variety of subject areas.
Airport Improvement Program (AIP)	The AIP of the Airport and Airways Improvement Act of 1982 as amended. Under this program, the FAA provides funding assistance for the design and development of airports and airport facilities.
Aircraft Mix	The number of aircraft movements categorized by capacity group or operational group and specified as a percentage of the total aircraft movements.
Aircraft Operation	An aircraft takeoff or landing.
Airport	An area of land or water used or intended to be used for landing and takeoff of aircraft includes buildings and facilities, if any.
Airport Elevation	The highest point of an airport's useable runways, measured in feet above mean sea level.
Airport Land Use Regulations	Are designed to preserve existing and/or establish new compatible land uses around airports, to allow land use not associated with high population concentration, to minimize exposure of residential uses to critical aircraft noise areas, to avoid danger from aircraft crashes, to discourage traffic congestion and encourage compatibility with non-motorized traffic from development around airports, to discourage expansion of demand for governmental services beyond reasonable capacity to provide services and regulate the area around the airport to minimize danger to public health, safety, or property from the operation of the airport, to prevent obstruction to air navigation and to aid in realizing the policies of a County Comprehensive Plan and Airport Master Plan.
Airport Layout Plan (ALP)	A graphic presentation, to scale, of existing and proposed airport facilities, their location on the airport and the pertinent applicable standards. To be eligible for AIP funding assistance, an airport must have an FAA-approved ALP.
Airport Master Record, Form 5010	The official FAA document, which lists basic airport data for reference and inspection purposes.
Airport Reference Code (ARC)	The ARC is a coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport.

Airport Reference Point (ARP)	The latitude and longitude of the approximate center of the airport.
Airspace	Space above the ground in which aircraft travel; divided into corridors, routes and restricted zones.
Air Traffic	Aircraft operating in the air or on an airport surface, excluding loading ramps and parking areas.
Approach Surface	A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.
Automated Weather Observing System (AWOS)	This equipment automatically gathers weather data from various locations on the airport and transmits the information directly to pilots by means of computer generated voice messages over a discrete frequency.
Based aircraft	An aircraft permanently stationed at an airport.
Building Restriction Line (BRL)	A line, which identifies suitable building area locations on airports.
Ceiling	The height above the earth's surface of the lowest layer of clouds or other phenomena which obscure vision.
Conical Surfaces	A surface extending outward and upward form the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.
Controlled Airspace	Airspace in which some or all aircraft may be subject to air traffic control to promote safe and expeditious flow of air traffic.
Critical/Design Aircraft	In airport design, the aircraft which controls one or more design items such as runway length, pavement strength, lateral separation, etc., for a particular airport. The same aircraft need not be critical for all design items.
Day Night Level (DNL)	24-hour average sound level, including a 10 decibel penalty for sound occurring between 10:00 PM and 7:00 AM.
Decibel	Measuring unit for sound based on the pressure level.
Design Type	The design type classification for an airport refers to the type of runway that the airport has based upon runway dimensions and pavement strength.
Federal Aviation Administration (FAA)	The federal agency responsible for the safety and efficiency of the national airspace and air transportation system.
FAR Part 77	A definition of the protected airspace required for the safe navigation of aircraft.

Fixed Base Operator (FBO)	An individual or company located at an airport and providing commercial general aviation services.
Fuel Flowage Fees	A fee charged by the airport owner based upon the gallons of fuel either delivered to the airport or pump at the airport.
General Aviation (GA)	All aviation activity in the United States, which is neither military nor conducted by major, national or regional airlines.
Glider	A heavier-than-air aircraft that is supported in flight by the dynamic reaction of the air against its lifting surfaces and whose free flight does not depend principally on an engine (FAR Part 1).
Global Positioning System (GPS)	The global positioning system is a space based navigation system, which has the capability to provide highly accurate three-dimensional position, velocity and time to an infinite number of equipped users anywhere on or near the Earth. The typical GPS integrated system will provide: position, velocity, time, altitude, groundspeed and ground track error, heading and variation. The GPS measures distance, which it uses to fix position, by timing a radio signal that starts at the satellite and ends at the GPS receiver. The signal carries with it, data that discloses satellite position and time of transmission and synchronizes the aircraft GPS system with satellite clocks.
Hazard to Air Navigation	An object which, as a result of an aeronautical study, the FAA determines will have a substantial adverse effect upon the safe and efficient use of navigable airspace by aircraft, operation of air navigation facilities or existing or potential airport capacity.
Horizontal Surface	A horizontal plane 150 feet above the established airport elevation, the perimeter which is constructed by swinging arcs of specified radii form the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs.
Imaginary Surfaces	Surfaces established in relation to the end of each runway or designated takeoff and landing areas, as defined in paragraphs 77.25, 77.28 and 77.29 of FAR Part 77, *Objects Affecting Navigable Airspace*. Such surfaces include the approach, horizontal, conical, transitional, primary and othersurfaces.
Itinerant Operations	All operations at an airport, which are not local operations.
Jet Noise	The noise generated externally to a jet engine in the turbulent jet exhaust.
Knots	Nautical miles per hour, equal 1.15 statute miles per hour.
Large Airplane	An airplane of more than 12,500 pounds maximum certified takeoff weight.

Local Operations	Operations by aircraft flying in the traffic pattern or within sight of the control tower, aircraft known to be arriving or departing from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.
Location Identifier	A three-letter or other code, suggesting where practicable, the location name that it represents.
Maneuvering Area	That part of an airport to be used for the takeoff and landing of aircraft and for the movement of aircraft associated with takeoff and landing, excluding aprons.
Master Plan	A planning document prepared for an airport, which outlines directions and developments in detail for 5 years and less specifically for 20 years. The primary component of which is the Airport Layout Plan.
Mean/Maximum Temperature	The average of all the maximum temperatures usually for a given period of time.
Mean Sea Level (MSL)	Height above sea level.
Medium Intensity Runway Lights (MIRL)	For use on VFR runways or runway showing a nonprecision instrument flight rule (IFR) procedure for either circling or straight-in approach.
Minimum Altitude	That designated altitude below which an IFR pilot is not allowed to fly unless arriving or departing an airport or for specific allowable flight operations.
National Airspace System	The common network of United States airspace, navigation aids, communications facilities and equipment, air traffic control equipment and facilities, aeronautical charts and information, rules, regulations, procedures, technical information and FAA manpower and material.
National Plan of Integrated Airport Systems (NPIAS)	A plan prepared annually by the FAA which identifies, for the public, the composition of a national system of airports together with the airport development necessary to anticipate and meet the present and future needs of civil aeronautics, to meet requirements in support of the national defense and to meet the special needs of the Postal Service. The plan includes both new and qualitative improvements to existing airports to increase their capacity, safety, technological capability, etc.
NAVAID	A ground based visual or electronic device used to provide course or altitude information to pilots.
Noise	Defined subjectively as unwanted sound. The measurement of noise involves understanding three characteristics of sound: intensity, frequency and duration.
Noise Contours	Lines drawn about a noise source indicating constant energy levels of noise exposure. DNL is the measure used to describe community exposure to noise.

Noise Exposure Level	The integrated value, over a given period of time of a number of different events of equal or different noise levels and durations.
Non-Precision Instrument	A runway having an existing instrument approach procedure utilizing air navigation facilities with only horizontal guidance for which a straight-in nonprecision instrument approach procedure has been approved.
Notice to Airmen (NOTAM)	A notice containing information (not known sufficiently in advance to publicize by other means concerning the establishment, condition or change in any component (facility, service, or procedure) of or hazard in the National Airspace System, the timely knowledge of which is essential to personnel concerned with flight operations.
Object	Includes, but is not limited to, above ground structures, NAVAIDs, people, equipment, vehicles, natural growth, terrain and parked aircraft.
Object Free Area (OFA)	A two-dimensional ground area-surrounding runways, taxiways and taxilanes which is clear of objects except for object whose location is fixed by function.
Obstacle Free Zone (OFZ)	The airspace defined by the runway OFZ and, as appropriate, the inner-approach OFZ and the inner-transitional OFZ, which is clear of object penetrations other than frangible NAVAIDs.
Obstruction	An object which penetrates an imaginary surface described in the FAA's Federal Aviation Regulations (FAR), Part 77.
Parking Apron	An apron intended to accommodate parked aircraft.
Pattern	The configuration or form of a flight path flown by an aircraft or prescribed to be flown, as in making an approach to a landing.
Precision Approach Path Indicators (PAPI)	The visual approach slope indicator system furnishes the pilot visual slope information to provide safe descent guidance. It provides vertical visual guidance to aircraft during approach and landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that they are "on path" if they see red/white, "above path" if they see white/white and "below path" if they see red/red.
Primary Surface	A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway, but when the runway has no specially prepared hard surface, or planned hard surface, the primary surface ends at each end of that runway.
Rotating Beacon	A visual navaid operated at many airports. At civil airports, alternating white and green flashes indicate the location of the airport.
Runway	A defined rectangular surface on an airport prepared or suitable for the landing or takeoff of airplanes.

Runway Design Code (RDC)
A code signifying the design standards to which the runway is to be built.

Runway End Identifier Lights (REIL)
REILs are flashing strobe lights which aid the pilot in identifying the runway end at night or in bad weather conditions.

Runway Gradient
The average gradient consisting of the difference in elevation of the two ends of the runway divided by the runway length may be used provided that no intervening point on the runway profile lies more than five feet above or below a straight line joining the two ends of the runway. In excess of five feet the runway profile will be segmented and aircraft data will be applied for each segment separately.

Runway Lighting System
A system of lights running the length of a system that may be either high intensity (HIRL), medium intensity (MIRL), or low intensity (LIRL).

Runway Orientation
The magnetic bearing of the centerline of the runway.

Runway Protection Zone (RPZ)
An area off the runway end used to enhance the protection of people and property on the ground.

Runway Safety Area (RSA)
A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion form the runway.

Segmented Circle
A basic marking device used to aid pilots in locating airports and which provides a central location for such indicators and signal devices as may be required.

Small Aircraft
An airplane of 12,500 pounds or less maximum certified takeoff weight.

Taxiway
A defined path established for the taxiing of aircraft from one part of an airport to another.

Taxiway Design Group (TDG)
A classification of airplanes based on outer to outer Main Gear Width (MGW) and Cockpit to Main Gear distance (CMG).

Terminal Area
The area used or intended to be used for such facilities as terminal and cargo buildings, gates, hangars, shops and other service buildings, automobile parking, airport motels, restaurants, garages and automobile services and a specific geographical area within which control of air traffic is exercised.

Threshold
The beginning of that portion of the runway available for landing.

Touch and Go Operations
Practice flight performed by a landing touchdown and continuous takeoff without stopping.

Traffic Pattern
The traffic flow that is prescribed for aircraft landing at, taxiing on or taking off form an airport. The usual components are the departure, crosswind, downwind, and base legs; and the final approach.

Transitional Surface	These surfaces extend outward and upward at right angles to runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces.
Universal Communications (UNICOM)	A private aeronautical advisory communications facility for purpose other than air traffic control. Only one such station is authorized in any landing area. Service available are advisory in nature primarily concerning the airport services and airport utilization. Locations and frequencies of UNICOMs are listed on aeronautical charts and publications.
Visual Flight Rules (VFR)	Rules that govern flight procedures under visual conditions.
Visual Runway	A runway intended for visual approaches only with no straight- in instrument approach procedure either existing or planned for that runway.

OUR BUSINESS IS AVIATION. OUR PRIORITY IS YOU.

Corporate Office
861 Rood Avenue
Grand Junction, Colorado 81501
970.242.0101

Denver Office
6855 South Havana Street, Suite 400
Centennial, Colorado 80112
303.296.4949

Albuquerque Office
2305 Renard Place SE, Suite 210
Albuquerque, New Mexico 87106
505.508.2192

Phoenix Office
2345 S. Alma School Road, Suite 208
Mesa, Arizona 85210
602.803.7079

www.armstrongconsultants.com