Orcas Island Airport

Instrument Approach
Feasibility Study & Airport Layout Plan

Prepared for the

Port of Orcas

Eastsound, Washington

March 4, 2008

BWR

Right in the Center

Orcas Island Airport

Instrument Approach Feasibility Study and Airport Layout Plan

Final Report

March 2008

Prepared for the
Port of Orcas
Eastsound, Washington

AIP Project # 3-53-0023-06

Prepared by:

BWR
Right in the Center

"The preparation of these documents was financed, in part through a planning grant from The Federal Aviation Administration as provided under Section 505 of the Airport and Airway Improvement Act of 1982. As amended, the contents do not necessarily reflect the official views or policy of the FAA. Acceptance of these Documents by the FAA does not in any way constitute a commitment on the park of the United States to participate in any development depicted herein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws."

TABLE OF CONTENTS

CHAPTER 1 - INTRODUCTION

CHAPTER 2 – AIRPORT INVENTORY

CHAPTER 3 – AVATION ACTIVITY & FORECASTS

CHAPTER 4 – CLIMATIC CHARACTERISTICS

CHAPTER 5 – INSTRUMENT APPROACH FEASIBILITY

CHAPTER 6 – LARSON PROPERTY ALTERNATIVES

CHAPTER 7 – AIRFIELD ANALYSIS

CHAPTER 8 – AIRPORT CAPITAL IMPROVEMENT PROGRAM

CHAPTER 9 – AIRPORT LAYOUT PLAN DRAWING SET

TABLES

EXHIBITS

FIGURES

APPENDIX

Chapter 1

INTRODUCTION

AIRPORT PLANNING STUDY PROGRAM

The Port of Orcas Island Airport – Eastsound Washington (Airport Sponsor) initiated the preparation of this Airport Study to inventory the existing conditions of the airport facility, to determine the feasibility of obtaining a non-precision straight-in instrument approach to the airport, to identify the impacts of a 500' Primary Surface required by a non-precision straight-in instrument approach, and to update the Airport Layout Plan drawings that depict the existing and proposed airport development for the Orcas Island Airport.

This study, following a comprehensive review of design considerations, identifies the airport improvement priorities based on obtaining a non-precision straight-in instrument approach, and the preferred development concept for the Larson Property located on the southeast section of the airport. The planned airport improvements have been designed in accordance with current FAA airport standards and airspace criteria. The approved update to the Airport Layout Plan (ALP) enables the Port of Orcas Island to apply for future federal and state-eligible airport development grants.

PLAN OBJECTIVES

The Airport Study has been designed to provide an objective look at future airport needs, and to answer some basic questions about the Orcas Island Airport, including:

- *What are the existing airport facilities, equipment and operating conditions?*
- *What are the current and forecast levels of general aviation activity?*
- *What is the feasibility of obtaining a non-precision straight-in instrument approach?*
- *What are the impacts of a non-precision straight-in instrument approach and a 500' Primary Surface?*
- *What are the opportunities for improved airport ground access?*
- *What alternative design concepts can be used to develop the Larson Property in a manner that is in accordance with FAA design standards and local, state, regional and national goals?*

PLANNING STUDY AGREEMENT

The Port of Orcas Island entered into an agreement with Bucher, Willis & Ratliff Corporation (BWR) for the preparation of the Airport Study for the Orcas Island Airport to complete an airport study. The plan was funded through a 95 percent grant by the FAA through the Airport Improvement Program (AIP), with a 5 percent local match.

AIRPORT STUDY PHASES AND DOCUMENTATION

Table 1.1, *Description of Airport Planning Program*, identifies each element and task included in the Airport Study. The study is being conducted in five (5) separate elements to allow participants the opportunity for input, to provide formal review and discussion of findings and permit coordination with regards to development priorities.

STUDY COORDINATION

Overall, the development of the Airport Study is evidence that the Port of Orcas Island recognizes the importance of aviation in the inclusive concept of community and transportation planning.

When approved by the Port Authority, the study represents the expressed intentions of all agencies regarding the location and extent of airport improvements. This permits more effective long-range programming and budgeting, reduces the review and approval periods, and provides for orderly and timely development.

DESCRIPTION OF AIRPORT PLANNING PROGRAM

Table 1.1

ELEMENT 1 – AIRPORT INVENTORY ▪ Assemble Airport Review/Steering Committee ▪ Physical Airport Site Investigation ▪ Based Aircraft/Operational Activity/Aircraft Mix ▪ Review Airport Data/Ordinances/Agreements ▪ Airport Service Area/Surrounding Facilities ▪ Identify Existing Critical Aircraft ▪ Wind Analysis using Whidbey Island NAS wind data	**ELEMENT 2 – AVIATION DEMAND FORECASTS** ▪ Gather Forecast of Future Based Aircraft and Operational Demand and input in FAA Terminal Area Forecast Format ▪ Identify Activity by FAA Airport Design Categories ▪ Identify Existing and Future Critical Aircraft
ELEMENT 3 – FACILITY REQUIREMENTS, ALTERNATIVES AND SITE SELECTION ▪ Evaluation of Airfield and Terminal Area and Develop Planning Alternatives for Larson Property ▪ Alternatives Analysis Conceptual ALP Drawing Set ▪ Airport Access and Obstructions	**ELEMENT 4 – STRAIGHT-IN INSTRUMENT APPROACH FEASIBILITY ANALYSIS** ▪ Circling and Straight-In Instrument Approach Analysis and Review Impact of 500' Primary Surface ▪ FAA Coordination
ELEMENT 5 – AIRPORT PLANS ▪ Airport Layout Drawing ▪ Airport Airspace Drawing ▪ Runway Inner Approach Surface Drawings ▪ Terminal Area/Airport Access Plan Drawing ▪ Airport Property Map	

This page intentionally left blank.

2

Chapter 2

AIRPORT INVENTORY

INTRODUCTION

The inventory is the most important step in the Airport development process. It involves a systematic data collection process that provides an understanding of past and present aviation factors at the Orcas Island Airport. A comprehensive inventory is used to form the basis for Airport recommendations throughout this feasibility study, which includes the following major inventory tasks:

- An on-site inspection (conducted in February 2006) and inventory of Airport facilities, equipment, and services to assess existing physical conditions, including the identification of both on and off-Airport land uses and the heights of objects for airspace purposes;

- Discussions with local representatives regarding recent Airport trends, operational activity, and level of service;

- Gathering Airport activity data, project records, and aeronautical background information; and a review of historical Airport information, previous Airport layout plans, maps, charts, and of Airport facilities including local Airport-related ordinances, policies, operating standards and lease agreements;

- The collection of State, Regional, County, and Village of Eastsound information to understand regional economic conditions, Airport development patterns, and land use planning, including environmental policies and plans;

- A review of local and regional comprehensive planning policies and regulations to understand land use conditions related to aviation and commercial activities. These activities include current and planned on and off-Airport land use development and property information, surrounding land use patterns, existing and proposed transportation developments, infrastructure, and utilities.

- The collection of regional climatic information, including predominate winds, cloud and visibility conditions and precipitation levels.

AIRPORT CHARACTERISTICS

AIRPORT LOCATION AND ACCESS

The Orcas Island Airport (ORS) is located approximately 1/2 mile north of the Village of Eastsound and is part of the Urban Growth Area (UGA). The Village of Eastsound is located in the northwest corner of Washington in San Juan County. San Juan is the smallest of Washington's 39 Counties with approximately 175 square miles of land area. San Juan County was established as a part of Washington Territory in 1873 and consists of 176 named islands and reefs (up to 743 at low tides). The largest islands in the County are San Juan, Orcas, Lopez, and Shaw, all of which are served by the Washington State Ferry System. Access to the Airport is provided via Mt. Baker Road and Schoen Lane.

EXHIBIT 2.1: GEOGRAPHIC LOCATION

EXHIBIT 2.2: AIRPORT LOCATION

AIRPORT CLASSIFICATION

NPIAS airports have been identified by the FAA due to their significance in the national air transportation infrastructure.

The FAA National Plan of Integrated Airport Systems (NPIAS) 2005-2009 identifies the Orcas Island Airport as a Commercial Service (CM) facility. NPIAS Airports have been identified by the FAA due to their significance in the national air transportation infrastructure. Commercial service Airports are defined as public Airports receiving scheduled passenger service and having 2,500 or more enplaned passengers per year.

Based on the application of Airport design criteria from FAA *Advisory Circular 150/5300-13, Change #9, Airport Design*, and as identified in the WSDOT State Aviation System Plan (WSASP), the Orcas Island Airport has an Airport Reference Code (ARC) of B-I, small.

The function and service level for this classification of facility is currently designed to accommodate 95 percent of the small general aviation fleet (aircraft weighing 12,500 lbs. or less), which includes all single-engine planes and most light twin piston-engine planes with approach speeds less than 121 knots and wingspans less than 49 feet in total width.

ESSENTIAL PUBLIC FACILITY DESIGNATION

Port Orcas Island Airport has been designated as an Essential Public Facility (EPF) in accordance with the provisions of the Washington State Growth Management Act (GMA) and the Planning Enabling Act (PEA).

The Orcas Island Airport has been designated as an Essential Public Facility (EPF) in accordance with the provisions of the Washington State Growth Management Act (GMA) and the Planning Enabling Act (PEA). This designation was granted to protect public use general aviation Airports that are essential to the states' aviation system, from encroachment by incompatible land uses. The EPF requires that the cities and counties planning under the GMA, through their local comprehensive plans and growth regulations, protect these facilities by discouraging the siting of incompatible land uses adjacent to such Airports and that land use actions allow for the siting of EPF's and promote the orderly expansion and development of existing EPF's.

The Orcas Island Airport Overlay District was adopted on September 9, 2003 (Ordinance 2-2003). The Airport Overlay District protects and preserves the viability of the Orcas Island Airport by imposing regulations that control the height of structures near the Airport, and that control the allowable land uses in the vicinity of the Airport. The Airport Overlay District limits land uses that may interfere with Airport operations and provides for improved levels of safety for both the flying public and the businesses located in the vicinity of the Airport.

URBAN GROWTH AREA

The Orcas Island Airport is located in an urban growth area (UGA) for San Juan County. The GMA requires that the county designate UGA's based upon the 20-year population projection made for the county by the Washington State Office of Financial Management (OFM). Specifically, UGA's are required to include areas and densities sufficient to accommodate the urban growth that is projected to occur in the county for the succeeding 20-year period. UGA's are a growth management tool used by the county to prevent urban sprawl by maintaining planned growth areas that specifically allows for higher density growth and infrastructure development.

AIRPORT OWNERSHIP AND HISTORY

The critical need for air service united Orcas Island residents to form their own port district in 1959. A public meeting took place on August 1, 1958 with an election to form the port district to create a public Airport. The vote was 130 in favor, one against and two in favor of forming a county airport. The port came into operation Jan. 12, 1959. The port then purchased property and the private airstrip for $14,000.

The port now has five commissioners and is managed by a professional airport manager. According to a state Aviation Division study, the Airport provides more than $13 million in direct, indirect and induced economic impacts through jobs, salaries and contributions to the local economy.

From the 1970s-1990s, the Airport went through expansion and construction projects with the help of Federal Aviation Administration funding. It included construction of a more than half-million dollar wildlife perimeter fence in 2002-03.

The Airport runway is now 2,900 feet long and 60 feet wide. In 2005, there were more than 58,000 aircraft operations and more than 6,400 passengers served. 75 aircraft are based on the 64-acre facility. Regular air service is provided with other firms offering freight, recreation and flight instruction.[1]

AVAITION SERVICES

Orcas Island Airport offers a wide variety of Airport and aircraft services for based and transient user. The Airport terminal area also accommodates indirect as well as non-aviation uses. **Table 2.1** lists the services and tenants currently at the Airport.

[1] Reproduced from http://www.washingtonports.org/port_information/histories/orcas.htm

Table 2.1
Airport Services
Orcas Island Airport

Direct Airport/Aviation Related Services	
Service Provider	***Services Offered***
Gashawk Services	Major and minor aircraft repair
Aeronautical Services Inc	100LL fuel service
United Parcel Service	Mail, Freight and Package Delivery
FedEx	Mail, Freight and Package Delivery
San Juan Air	Airline Passenger Service
Northwest Sky Ferry	Flight Training, Aircraft Rentals and Charter Flights
Magic Air	Scenic Flights in a TravelAir Biplane
Kenmore Air Express	Airline Passengers and Packages
In-Direct/Non-Airport Related Services	
Dallas Electric	Electrical contractor
Heritage Aviation	Aircraft Museum
Island Cabinets	Carpentry

Note: Some of these services are not necessarily aviation related but are compatible uses on Airport property.

Source: Physical Airport site inspection, BWR Corporation, February 2006.

CURRENT AIRPORT ACTIVITY

Orcas Island Airport currently has 75 based aircraft: 72 single engine, and three multi-engine.

Based on a February 2006 site inspection, and Airport records, there are currently 75 based aircraft at the Orcas Island Airport: 72 single engine, and three multi-engine. The 2005 annual aircraft operations were estimated to be 58,272 with 17,288 (30%) conducted as local, 25,000 (43%) as itinerant flights, 12,384 (21%) as air taxi, and 6,495 (11%) as air carrier operations. Table 3.1 on page 3-3, depicts the historical operational activity and the historical record of based aircraft as reported on the FAA 5010 Master Record at the Orcas Island Airport.

WIND CONDITIONS

Published first-order wind information from NAS Whidbey Island was used in this study given its proximity to Orcas Island Airport. The unusual variation of weather patterns along the coast of Washington, NAS Whidbey Island provides weather information that most closely approximates what is experienced at Orcas Island Airport. **Table 4.1** illustrates the percent of all-weather wind coverage for the 10.5 and 13.0-knot wind velocities.

AIRFIELD/AIRSIDE FACILITY INVENTORY

A listing of the major airfield facilities and equipment along with a corresponding assessment of physical conditions, based on a February 2006 BWR site visit and inspection, is listed in **Tables 2.2, 2.3,** and **2.4**.

GENERAL AIRFIELD INFORMATION

The elevation of Orcas Island Airport is 31 feet above mean sea level. The airfield reference coordinates are: 48º 42' 30" N, 122º 54' 38" W. The current magnetic declination for Orcas Island Airport is 19° 20' E (National Geophysical Data Center, 2004 - magnetic variation is approximately 7 minutes east per year).

Runway 16

Runway System

The Orcas Island Airport consists of a single runway system: a standard paved primary north-south Runway 16-34 (2,900 x 60'). Both runway ends have blast pads prior to the runway thresholds to satisfy the FAA Runway Safety Area requirements. Runway 16 has a marked blast pad of approximately 250 feet and Runway 34 has a marked blast pad of 230 feet.

Runway 34

Runway 16-34 has medium-intensity runway lighting (MIRL) system that is in good condition. Runway 16-34 is in good condition with estimated pavement strength of 12,500 lbs. single wheel gear (SWG). The basic visual runway markings are in fair condition.

Taxiway System

Taxiway System

Runway 16-34 is served by a 30 foot wide, parallel taxiway that connects the runway ends to the terminal area and aircraft parking apron. Mid-field connector taxiways provide access between the terminal area and tie down areas east of Runway 16-34 and to the hangar areas on both sides of the runway. The taxiway pavement is in good condition. The taxiway marking consists of a centerline stripe and is in fair condition. The taxiway uses a blue LED lighting system and reflective markers to outline the edges of the pavement.

Table 2.2
Existing Airfield Facilities and Condition
Orcas Island Airport

Airfield Item	Description and Size	Condition
Runway Facilities & Equipment		
RUNWAY 16-34		
Runway Surface	2,900' x 60' (paved)	Good
True Runway Bearing	180.25°	N/A
Pavement Markings	Basic markings, centerline stripe, relocated thresholds	Fair
Runway Lighting	Medium-intensity runway lighting (MIRL)	Good
Visual Approach Aids		
Runway 16	4-box VASI on left (3.40 degrees glide path)	Good
Runway 34	2-light PAPI on left (4.00 degrees glide path)	Good
Taxiway Facilities & Equipment		
Parallel Taxiway	Full standard parallel taxiway with two end connectors and two midfield connectors	Good
Taxiway Lighting	LED Lighting system and edge reflectors	Good
Additional Airfield Items		
Airport Rotating Beacon	New Beacon Installed in 2006	Good
Wind Indicator	Mid-field, east side of Runway 16-34	Good
Airport Electrical Vault	Located in an individual hangar NW of Hangar 23	Good

Source: Airport Management File & Site Inspection (BWR, February 2006)

Table 2.3
Terminal Area Structures
Orcas Island Airport

Building Number	Aviation Use	Physical Condition	Dimensions/Area (S.F.)
24	Aeronautical Services	Good	2,458.0
25	Magic Air Tours	Fair	2,400.0
N. Shack	Home Inspection Services	Fair	120.0
Terminal	Northwest Sky Ferry	Good	25.0
Terminal	San Juan Airlines/West Isle Air	Good	157.0
Terminal	Kenmore Air Express	Good	157.0
S. Shack	Empire Air / FedEx	Fair	120.0
		Total:	**5,437 S.F.**

Source: Airport Management File & Site Inspection (BWR, February 2006)

EXHIBIT 2.3 AIRPORT DIAGRAM/ LAYOUT

TERMINAL AREA COMPLEX

The Orcas Island Airport terminal area complex is located on the east side of the airfield with accommodations for small fixed-wing and rotor-wing aircraft with services ranging from basic fueling service to full aircraft maintenance. The following are major terminal area/landside facilities:

- Administrative offices
- Aircraft maintenance hangars
- Self Serve Fueling 100LL
- Aircraft storage hangars
- Aircraft tie-downs
- FedEx / UPS sorting facility
- Airline passenger terminal
- Meeting facilities
- Museum
- On-demand Charters

AIRPORT TERMINAL BUILDING

See Table 2.3 and 2.4 for building and hangar size and condition.

The terminal building contains the Airport office, passenger lounge and ticketing area, charter service, board room and public meeting facility.

The Airport office contains the administrative offices for the Airport manager, the AWOS computer system and a public meeting area for holding Port business meetings and other public meetings.

Terminal Building

Aeronautical Services Facility

Ticket Counter

San Juan Airlines offers flights to Boeing Field in Seattle, and Rugby Aviation offers "on-demand" charter service U.S. and Canada, aircraft rentals and flight training. Not all businesses located on Orcas Island Airport are directly aviation related.

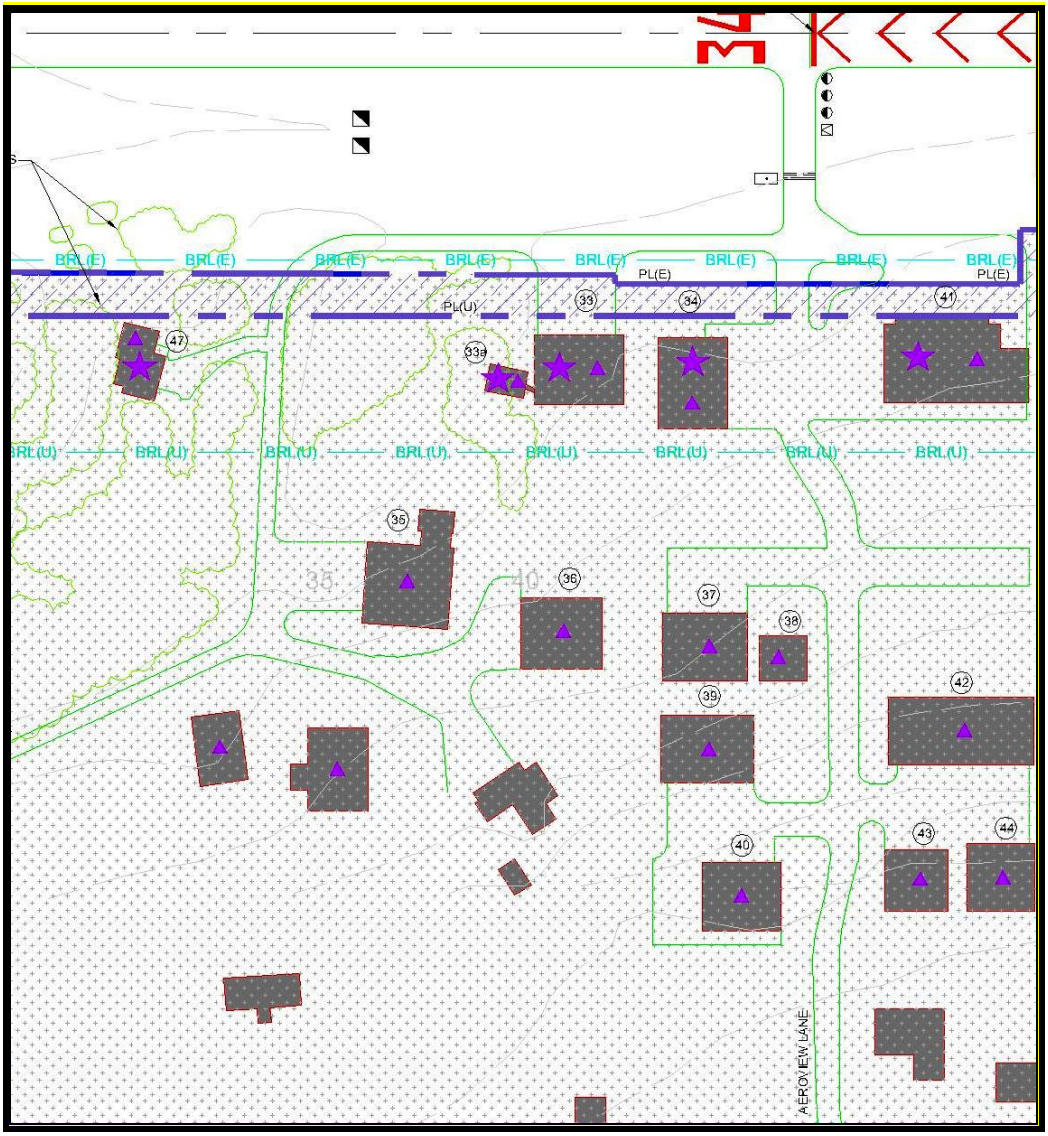
Table 2.3 lists the terminal area offices, hangars and businesses as well as the designated pilot facilities and including approximate square footage and a physical condition assessment of each structure.

Magic Air Hangar

AIRCRAFT HANGARS

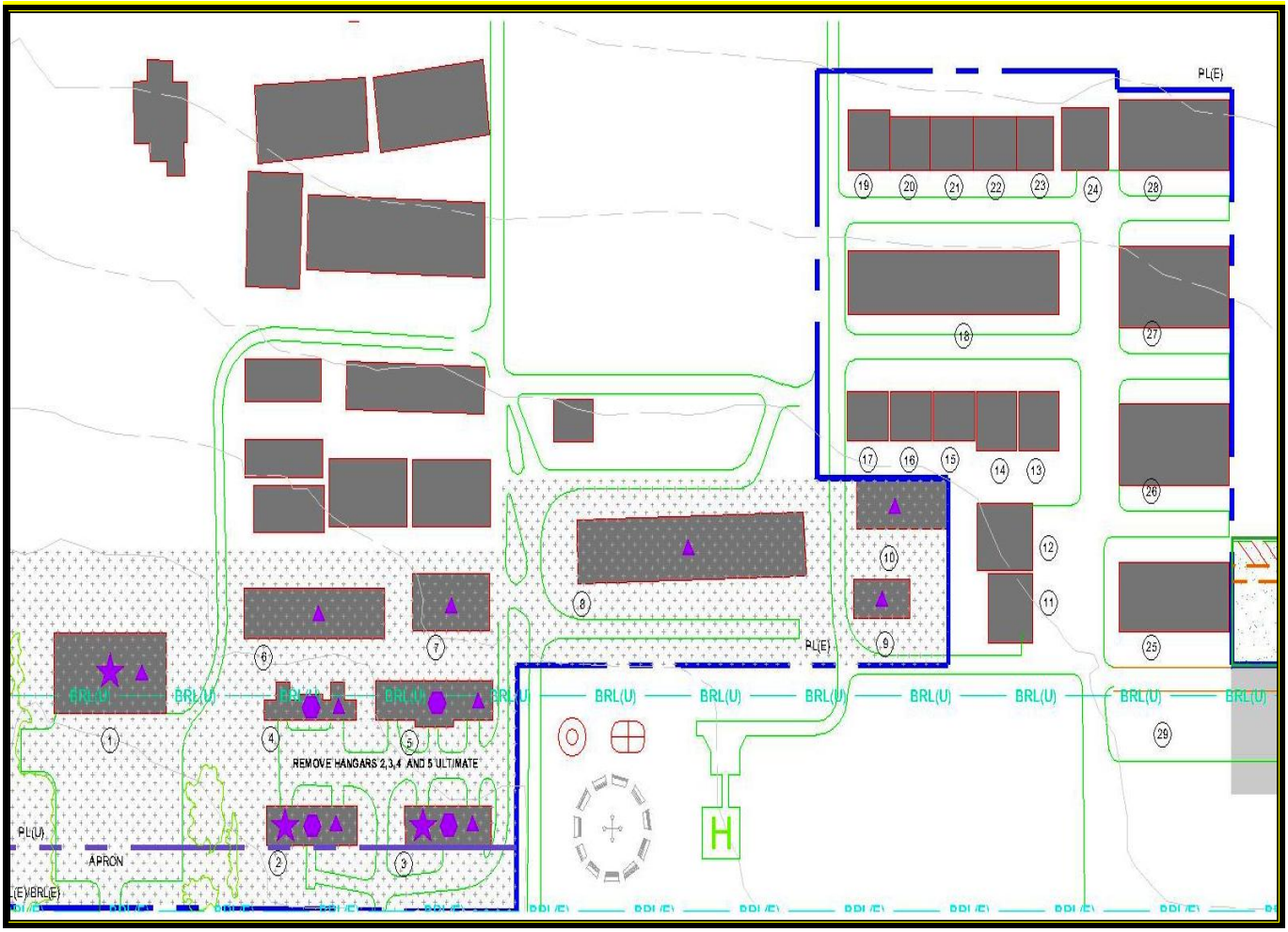
Orcas Island Airport has a number of aircraft storage hangars. **Exhibit 2.4, 2.5** and **Table 2.4** show the respective aircraft storage hangars including information regarding the structures location with respect to through the fence operations.

EXHIBIT 2.4 – WESTSIDE HANGARS



Through the fence agreement.

EXHIBIT 2.5 – EASTSIDE HANGARS



Through the fence agreement.

Table 2.4
Airport Hangar Facilities and Leases
Orcas Island Airport

★ RECOMMEND LIGHTING STRUCTURE
▲ THROUGH FENCE OPERATOR
⬢ STRUCTURE TO BE RELOCATED TO LARSON PROPERTY WHEN STRAIGHT-IN INSTRUMENT APPROACH IS ESTABLISHED

(1)	HANGAR ▲ ★	40' MSL
(2)	T-HANGAR ▲ ⬢ ★	36.5' MSL
(3)	T-HANGAR ▲ ⬢ ★	36.5' MSL
(4)	T-HANGAR ▲ ⬢	40' MSL
(5)	T-HANGAR ▲ ⬢	36.5' MSL
(6)	T-HANGAR ▲	45' MSL
(7)	T-HANGAR ▲	36' MSL
(8)	T-HANGAR ▲	46.5' MSL
(9)	SEWER PLANT / OFFICE/SLIP TREATMENT ▲	41.5' MSL
(10)	SEWER PLANT / OFFICE/SLIP TREATMENT ▲	41.5' MSL
(11)	HANGAR	49.5' MSL
(12)	HANGAR	49.5' MSL
(13)	HANGAR	49.5' MSL
(14)	HANGAR	49.5' MSL
(15)	HANGAR	49.5' MSL
(16)	HANGAR	49.5' MSL
(17)	HANGAR	49.5' MSL
(18)	T-HANGAR	54.5' MSL
(19)	HANGAR	59.5' MSL
(20)	HANGAR	59.5' MSL
(21)	HANGAR	59.5' MSL
(22)	HANGAR	59.5' MSL
(23)	HANGAR	59.5' MSL
(24)	HANGAR	59.5' MSL
(25)	CONVENTIONAL COMMON HANGAR	56' MSL
(26)	CONVENTIONAL COMMON HANGAR	66' MSL
(27)	CONVENTIONAL COMMON HANGAR	71' MSL
(28)	CONVENTIONAL COMMON HANGAR	66' MSL
(29)	FUEL	48' MSL
(30)	TERMINAL / ADMINISTRATION ⬢	40.5' MSL
(31)	HANGAR ⬢	54' MSL
(32)	HANGAR ⬢	48.8' MSL
(33)	CONVENTIONAL COMMON HANGAR ▲ ★	60' MSL
(34)	HOUSE ▲ ★	45' MSL
(35)	CONVENTIONAL COMMON HANGAR ▲ ★	60' MSL
(36)	CONVENTIONAL COMMON HANGAR ▲	60' MSL
(37)	CONVENTIONAL COMMON HANGAR ▲	65' MSL
(38)	CONVENTIONAL COMMON HANGAR ▲	70' MSL
(39)	CONVENTIONAL COMMON HANGAR ▲	70' MSL
(40)	CONVENTIONAL COMMON HANGAR ▲	75' MSL
(41)	CONVENTIONAL COMMON HANGAR ▲ ★	90' MSL
(42)	CONVENTIONAL COMMON HANGAR ▲	60' MSL
(43)	CONVENTIONAL COMMON HANGAR ▲	100' MSL
(44)	CONVENTIONAL COMMON HANGAR ▲	90' MSL
(45)	MEDICAL ★	90' MSL
(46)	MEDICAL ★	70' MSL
(47)	HANGAR ▲ ★	40' MSL
		60' MSL

Aircraft Apron/ Ramp/ Tie-Down Areas

The aircraft parking apron is used for the tie-down, fueling, maneuvering of vehicles and aircraft and consists of following areas:

Ramp and Tie-Down Area

Main Aircraft Parking Apron/Tie-Down: The main Airport apron is paved and used for San Juan Airline operations, the Rugby Aviation Fleet, transient aircraft tie-down, fueling operations and access to and from the hangar areas.

Paved Tie-Down Area: There is a paved tie-down area located north and south of the Terminal Building apron area. These tie-down areas will accommodate a minimum of 40 aircraft on the paved surface.

Grass Tie-Down Area: The Orcas Island Airport has a grass tie-down area located north of the fueling facility and south of the heliport and windsock. The grass tie-down area can accommodate 21 aircraft.

AVIATION FUEL DISTRIBUTION/STORAGE

Fuel storage at the Orcas Island Airport consists of one 10,000-gallon 100LL self-service tank. Fuel facility is an underground facility located on the north end of the main parking apron, adjacent to the grass tie-down area.

AIRPORT UTILITIES AND MAINTENANCE SERVICES

An Airport typically requires a variety of utility services in order to conduct regular business and provide basic essentials to its tenants and users. **Table 2.5** provides a listing of utilities and services currently serving the Orcas Island Airport.

Table 2.5
Airport Utilities/ Providers
Orcas Island Airport

Utility/Service	*Utility Service Provider*
Electrical Service	OPALCO
Water System	Eastsound Water Users Association (EWUA)
Telephone Service	Century Telephone
Cable Television Provider	Sun Country Cable
Fuel/ Propane Service	San Juan Propane
Waste Water Sewer System	Eastsound Water and Sewer District
High Speed Internet	Century Tel DSL
Fire Protection Services	San Juan Fire District No. 2

Source: Physical Airport site inspection, (BWR, February 2006).

AIRPORT AUTOMOBILE ACCESS AND PARKING

Airport Access/Entrance

To get to Orcas Island, traveling by boat or by air is required. There are many options for boating, including private charters or public transportation provided by Washington State Ferries. The Orcas Island Airport access is directly via Schoen Lane that connects to Mount Baker Road which is a 2-lane road.

Airport Auto Parking

Public auto parking is available at the entrance to Orcas Island Airport and north of the terminal building. The Terminal Building parking area can accommodate 8 automobiles; the long term parking area can accommodate 60 automobiles. The parking area near the Aeronautical Services building can accommodate 18 automobiles near Building 24.

Terminal Area Lighting

Lighting for the terminal area complex is provided by mounted flood-lighting located at several locations in the terminal area, including the apron/tie-down and auto parking areas.

AIRSPACE SYSTEM AND NAVIGATIONAL AIDS

Navigational Aids

Navigational aids (NAVAIDs) are used to provide information to pilots to determine their positioning in reference to the earth. These NAVAIDs may consist of ground-based or satellite-based guidance systems. Although no published instrument procedures exist at Orcas Island Airport, electronic NAVAIDs are available in the region for aircraft arriving, departing, or transitioning the airspace above the Airport.

AIRSPACE SYSTEM

Class G airspace:

The Airspace in the region of to the Orcas Island Airport is Class G airspace which is a mantle of low lying airspace beginning at the surface that is completely uncontrolled. This low lying blanket of uncontrolled airspace follows the surface elevation up to 1200 AGL where Class D airspace becomes Class E airspace. **Table 2.6** provides a listing of public use Airports within a 25 mile radius of the Orcas Island Airport. The nearest Airports to the Orcas Island Airport operate under different airspace classifications. The Bellingham Municipal Airport operates under Class D airspace and is located approximately 16 NM northeast of Orcas Island. Whidbey Island Naval Air Station operates under class C

airspace and is located 24 NM southeast of the Orcas Island Airport and the Victoria B.C. Airport is located 22NM west of the Orcas Island Airport and operates under the ICAO [2] Class C Control Zone. Refer to **Exhibit 2.3** for reference and additional information regarding the local airspace.

Table 2.6
Airport / Airspace Comparisons
Orcas Island Airport

Airport	*Distance to Orcas Island*	*Airspace*
Friday Harbor (W33)	11 NM	Class G
Lopez Island (S31)	13.5 NM	Class G
Bellingham (BLI)	15.6 NM	Class D
Victoria B.C. (CYYJ)	22.4 NM	Class C
Whidbey Island NAS (NUW)	23.7 NM	Class C
Anacortes (74S)	16 NM	Class G

Special Use Airspace Areas

Special use airspace is an area where activities must be restricted or confined due to their nature and /or where limitations may be imposed on aircraft operations that are not a part of the special use activities. Three special use airspace areas have been identified within the immediate vicinity of Orcas Island Airport.

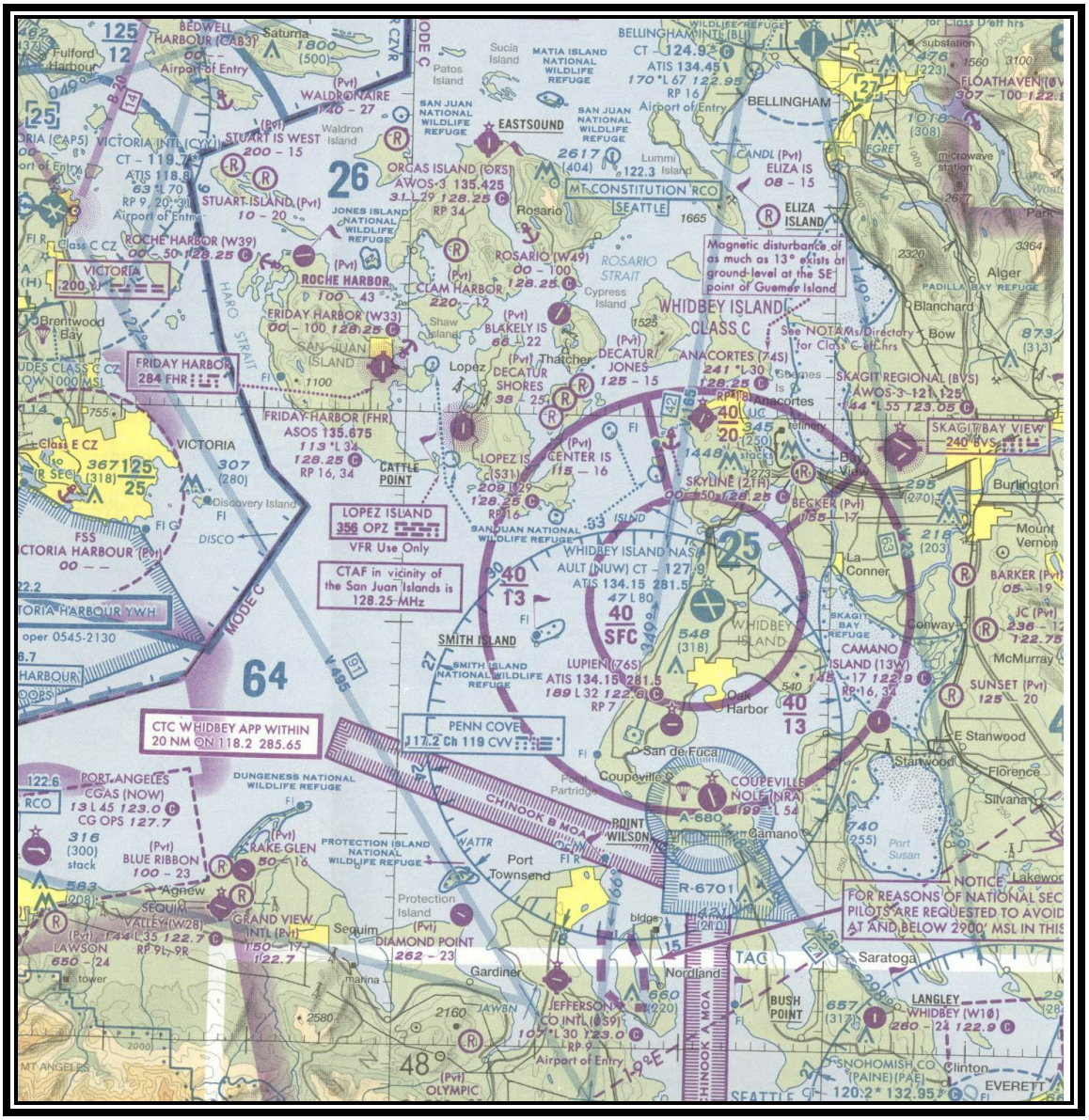
National Security Area: Airspace that restricts the flight of aircraft below certain altitudes within a specified area.

Military Operations Area (MOA): An MOA is established outside of Class A airspace to separate or segregate certain non-hazardous military activities from IFR traffic and to identify where these activities are conducted for VFR traffic.

Restricted Area: Airspace within which the flight of aircraft, while not necessarily prohibited, is subject to restriction.

[2] International Civil Aviation Organization (ICAO).

EXHIBIT 2.6 – EXISTING AIRSPACE



Source: Seattle Sectional Aeronautical Chart, May, 12, 2005, U.S. Department of Transportation

Area Communications

A Common Traffic Advisory Frequency (CTAF) is a local radio frequency operated by the FBO or Airport sponsor, which is available for Airport advisories and information at the Airport. The CTAF frequency at the San Juan Island Airports is 128.25 mHz. It should be noted that there are numerous Airports within reception and transmitter range of Orcas Island Airport and the Airport CTAF frequency can become congested with radio traffic at other Airports nearby.

Airport Noise Abatement Procedures

Due to noise sensitive residential areas north of the Airport, aircraft departing Port Orcas Island Airport are expected to follow local noise abatement procedures.

Aircraft noise is generally considered intrusive and unwanted, in the opinion of the listener. As a result, the Airport has enacted a voluntary Airport noise abatement procedure to maintain a "good neighbor" relationship with local residents. Due to noise sensitive residential areas north of the Airport, aircraft departing Orcas Island Airport are expected to follow local noise abatement procedures. Aircraft departing Runway 34 are requested to climb to 1,100' and track the runway centerline, heading of 340º and fly well past Parker Reef before turning.

Airport Traffic Patterns

The basic Airport traffic pattern altitude is 1,100 foot AGL. All aircraft are to remain east of the Airport during landing or departure operations. Therefore, landing traffic to the south will use a left-hand pattern and traffic landing to the north will use a right-hand pattern. Landing aircraft entering the Airport traffic pattern are expected to enter the traffic pattern at 1,100 feet above the Airport elevation (1,131' MSL) and land according to existing Airport wind conditions as given over the AWOS & CTAF or by visual confirmation of the Segmented Circle and windsock indicating the wind direction.

AIRPORT SERVICE AREA

The airport service area is a geographical region showing an area and population served by a select airport. A determination can be made regarding the level of service offered from the Orcas Island Airport by locating competing airports and their relative distance to population centers, assessing the role of surrounding public and private use airports, and evaluating their facilities, equipment and services. It should be noted that the demand for aviation facilities does not necessarily conform to traditional political or geographical boundaries.

For the Orcas Island Airport, two distinct airport service areas have been identified with regards to airport users: 1) National Plan of Integrated Airport Systems (NPIAS) service area and 2) general aviation service area.

NPIAS Service Area

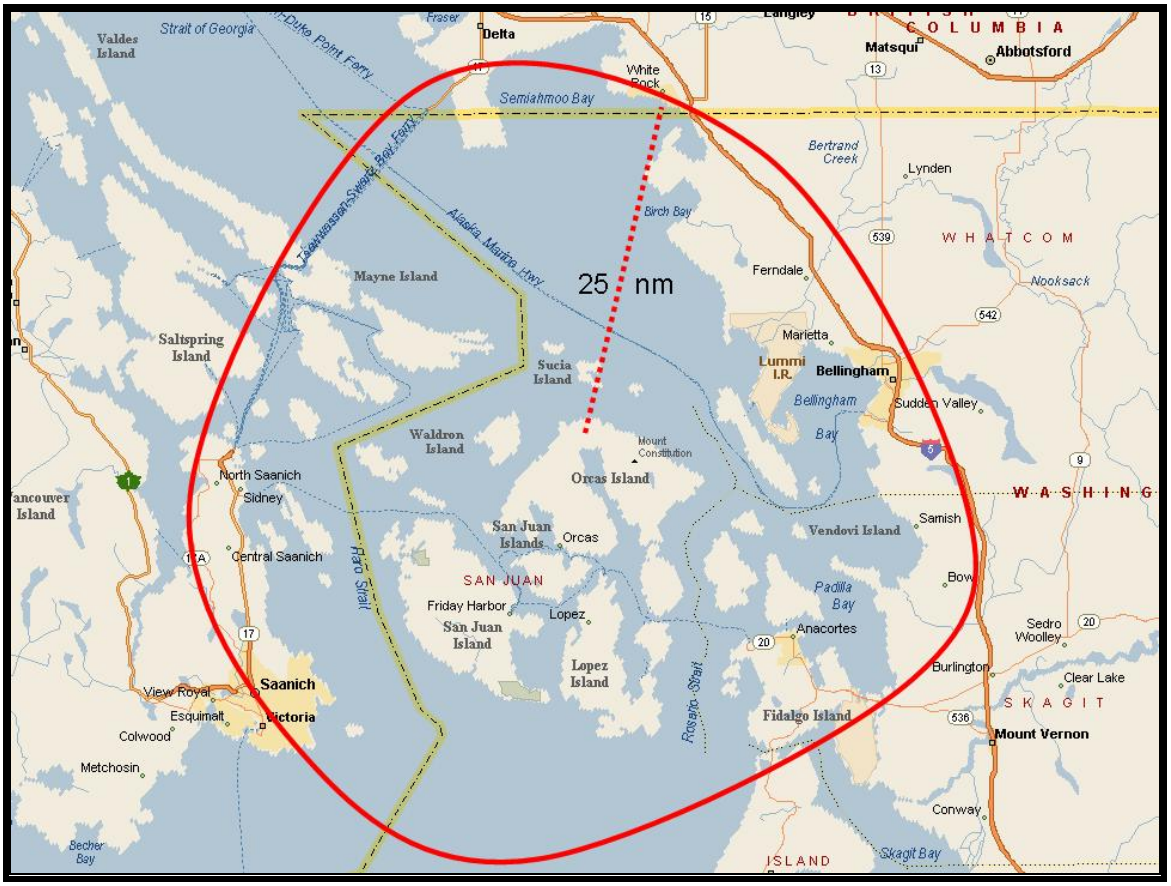
This service area is defined per FAA Order 5090.B, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS), by means of 30-minute (25-statute mile) ground access to the originating airport. Multiple public-use airports and privately owned facilities fall within this 25-mile range. Due to the fact that the Airport is located on an island, the NPIAS criteria do not realistically define the true Airport service area. Exhibit 2.7 shows the NPIAS Airport Service Area. However, none of the airports located within the 25 mile radius of the Orcas Island Airport are capable of being accessed in under 30 minutes using a surface mode of transportation.

General Aviation Service Area

This service area takes into consideration the role and service level of each civilian, public-use, general aviation airport in the immediate vicinity of the Orcas Island Airport. It factors in areas of population centers, ground access distance and travel times between the surrounding public-use, general aviation airports.

Table 2.6, Airport/Airspace Comparisons, lists information regarding public use facilities within the surrounding region. Surrounding airports have varying degrees of influence on the airport service area with respect to competing services (flight training, charters, fuel, maintenance, courtesy car, etc.), facilities/equipment, navigational aids and accessibility. Understanding the capabilities and influence of surrounding airports provides insight into potential aviation service levels and future airport service roles.

EXHIBIT 2.7 – AIRPORT SERVICE AREA



Source: Microsoft MapPoint

LAND USE CHARACTERISTICS AND REGIONAL DEVELOPMENT

The primary goal of land use planning in and around Orcas Island Airport is to provide safe airport operations and to promote compatible land uses.

The primary goal of land use planning in and around the Orcas Island Airport is to provide safe Airport operations, to promote compatible land uses and implement land use actions that allow for the orderly expansion and development of the Airport as an *Essential Public Facility*. The main features to be considered include the Runway Protection Zones (RPZ), natural and man-made obstructions to flight, aircraft noise, and development that is non-compatible to aviation in the vicinity of the Airport. As outlined earlier in the Chapter, Orcas Island Airport is designated by the Washington Growth Management Act as an *Essential Public Facility*, which requires protection of the Airport as a regional asset to the State and the regional aviation system.

San Juan County comprehensive plan

The fundamental purpose of the Comprehensive Plan is to establish a framework of goals, objectives, and policies for the more detailed growth planning and implementation actions which will occur in the near future. The San Juan County Comprehensive Plan is intended to guide growth for the next 20 years, in coordination with the new plans of its cities, towns and Villages as required under the provisions of the Growth Management Act (GMA).

San Juan County Unified Development Code

The Port of Orcas Island Airport is zoned as an Airport District and has been designated as an Urban Growth Area (UGA) under the General Policy Plan for San Juan County.

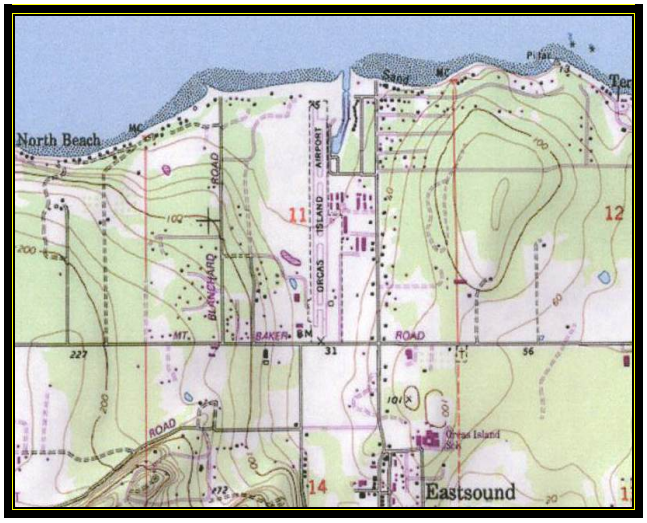
The San Juan County Council (SJCC) adopted the *Unified Development Code* on September 9, 2003. Section 18.40.032 of the SJCC specifically addresses the Orcas Island Airport overlay district. The intent of the code is to discourage the establishment of incompatible used adjacent to the Airport which is operated for the benefit of the public. The SJCC is attached as appendix A.

AIRPORT LAND USE/ DEVELOPMENT

Since Airports have unique siting and land use requirements, it's important to protect the Airport and surrounding environment from incompatible development. Currently, the Eastsound Subarea Plan classifies the zoning for the Orcas Island Airport as an *Airport District* and is located within the Urban Growth Area (UGA) under the General Policy Plan for San Juan County. Detailed growth planning and implementation actions will help insure continuity of compatible land uses and discourage the creation and/or construction of incompatible land uses surrounding the Orcas Island Airport.

SURROUNDING AIRPORT AREA/ DEVELOPMENT

Topographical Features



The Orcas Islands Airport is located on a low-lying narrow section of the Island. The width of this sections is approximately 1 ¼ miles, with an elevation of approximately 30 feet mean sea level (MSL). The terrain begins rising to the east of the Airport due to a series of mountains. West of the Airport, approximately ¾ of a mile, the terrain also rises to a height of 227' MSL.

Surrounding Airport Land Use

Orcas Island Airport is located in the San Juan County UGA and is zoned as the *Eastsound Airport District*. Existing zoned land uses surrounding Orcas Island Airport consist of *Service and Light Industrial* to the south, east and west. Southeast of the Airport is zoned *Residential*. The following exhibit depicts the zoning characteristics of the *Airport District* within the Eastsound Subarea Plan.

AIRPORT ZONING

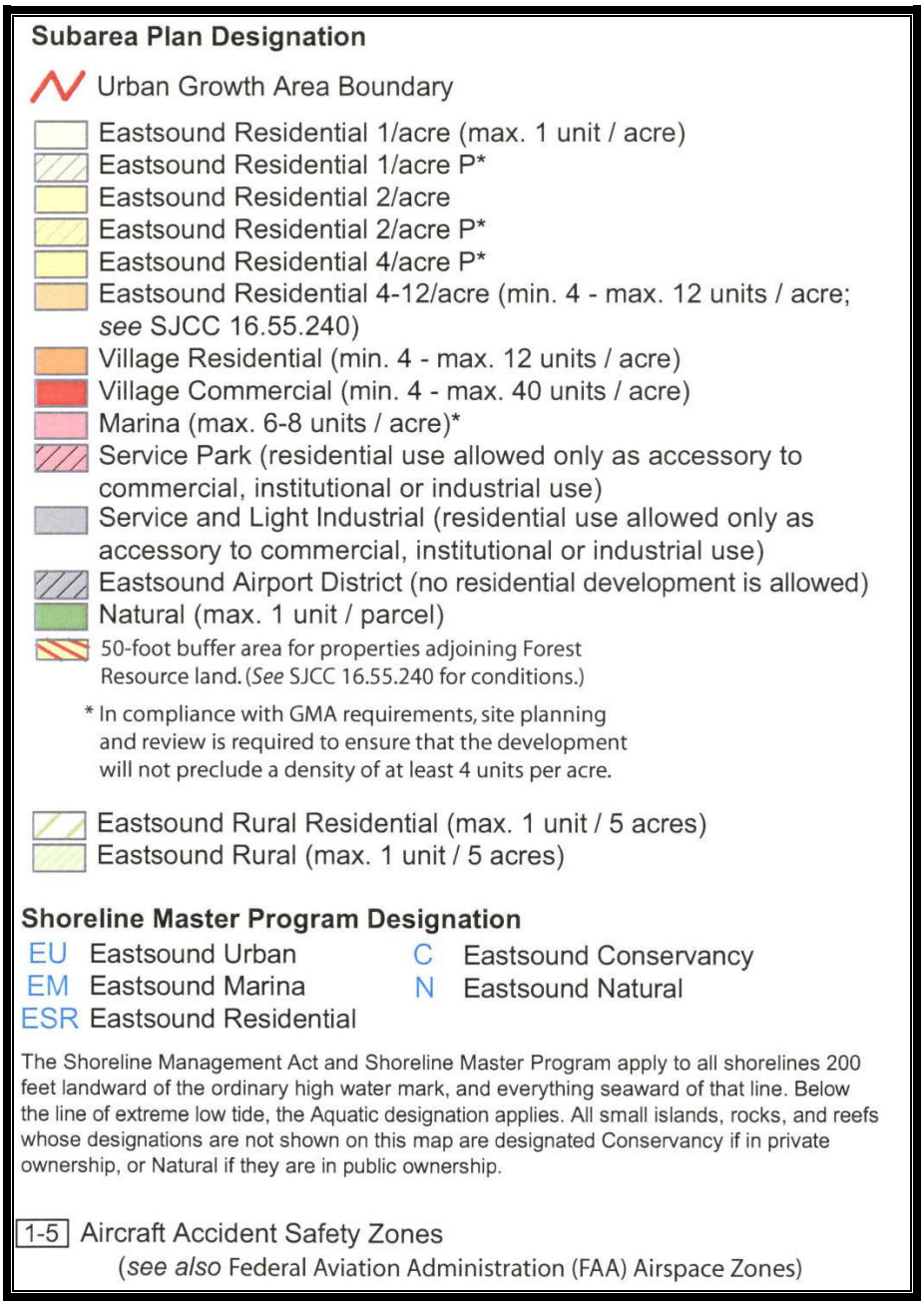
The Airport Use District is addressed under Section 16.55.280 of the San Juan County, WA Municipal Code. Item E, Number 7, under Section 16.55.280 - states the recommended restrictions are as follows:

a. All development in this district must comply with the Federal Aviation Regulations (FAR) Part 77, relating to heights of land uses proximate to airports and protection of airspaces critical to airport operations.

b. All development in this district must comply with the Federal Aviation Administration Advisory Circular 150/5370-10, Standards for Specifying Construction on Airports. (Ord. 14-2000 § 7(VV); Ord. 13-2000; Ord. 4-1996; Ord. 12-1994)

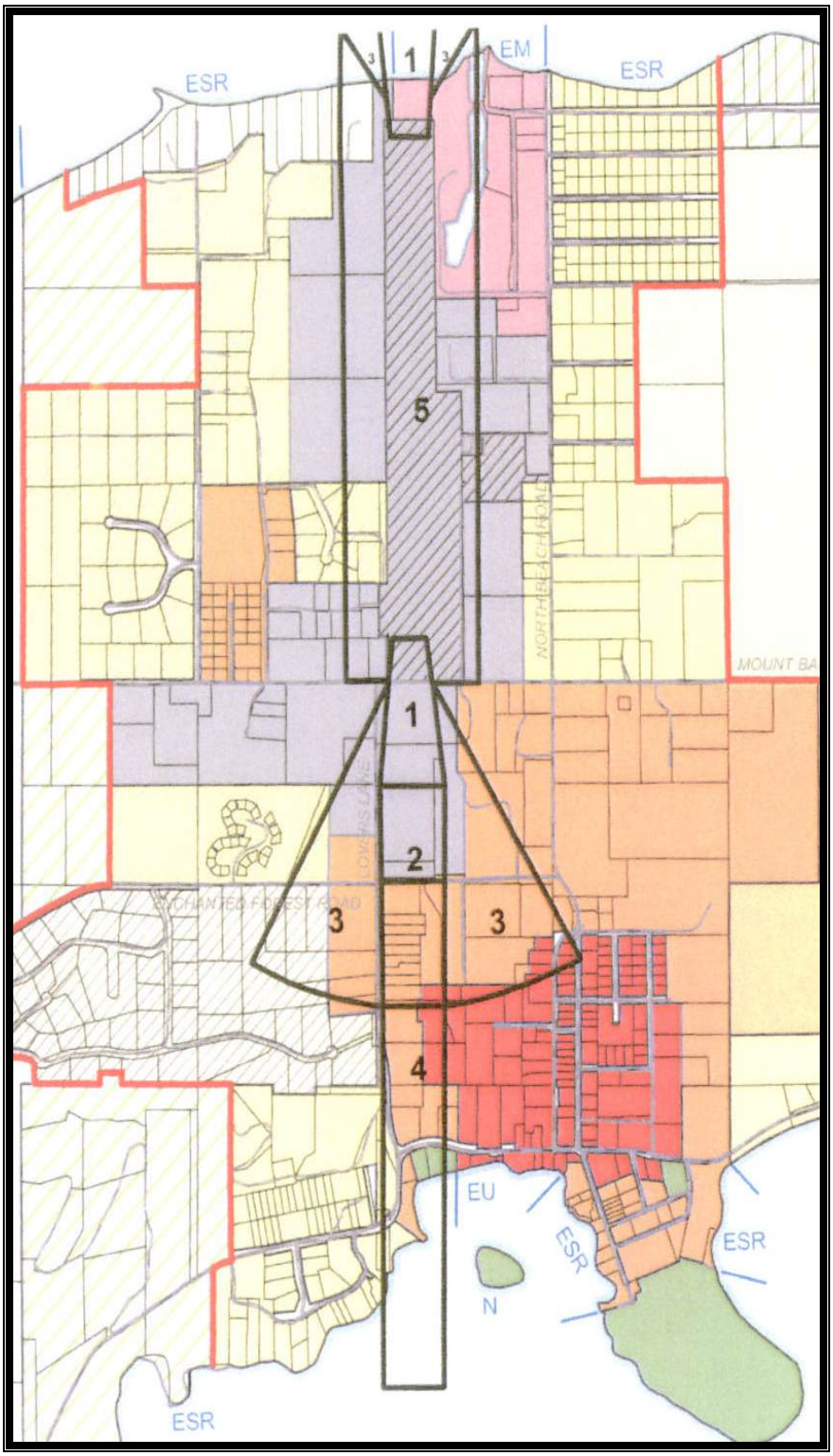
A copy of the entire Section 16.55.280 of the San Juan County, WA Municipal Code which was passed on June 13, 2006 which addresses the Airport Land Use District is included as Appendix A of this report.

EXHIBIT 2.8 – EASTSOUND SUBAREA PLAN



Note: Aircraft Accident Safety Zones exceed Federal Aviation Administration Airport Design standards. On-airport development must meet FAA design standards and criteria for federally obligated airports.

EXHIBIT 2.8 – EASTSOUND SUBAREA PLAN (Continued)



3

Chapter 3

AVIATION ACTIVITY & FORECASTS

GENERAL AVIATION FUNCTION AND ROLE

The FAA recognizes three broad categories of aviation: 1) general aviation; 2) certificated air carrier; and 3) military. General aviation includes all civilian aircraft other than the certificated air carriers, and represents the largest component of the national air transportation system, including 95 percent of all Airport landing facilities and total civilian aircraft fleet utilization (hours flown). The Orcas Island Airport runway is currently designated as a Utility type runway which is designed to accommodate aircraft weighing 12,500 pounds and less. The Ultimate runway designation will remain classified as a Utility runway for the duration of this study document.

CURRENT AIRPORT ACTIVITY

The Orcas Island Airport is home to a variety of General Aviation activities. These activities include:

- Business
- Aerial tours
- Recreational/pleasure
- Scheduled fly-in events
- Wildlife conservation/forestry
- Airframe/power plant services

HELICOPTER ACTIVITY

Orcas Island Airport has a helipad located on the north end or the aircraft parking ramp that is designated for use by EMS helicopter operations exclusively.

GENERAL AVIATION DEMAND FORECASTS

GENERAL AVIATION TRENDS

As a whole, the general aviation fleet is expected to grow in size, with future growth levels proportional with the existing aircraft types (single, multi-piston, turboprop, turbine-jet). The single-engine general aviation fleet is becoming more sophisticated, with a gradual increase in the fleet size, utilization, and pilot training. An increase in the business utilization of aircraft, combined with increasingly complex pilot and airspace regulations, has generally contributed to a more sophisticated pilot population flying more advanced and demanding aircraft. Likewise, the recent cost escalations associated with recreational flying, coupled with higher liability and taxes for those who own, rent, and operate general aviation airplanes, has contributed to an increase in business and itinerant aircraft operations relative to pilot training and recreational activity. This trend has resulted in a reduction in private pilots, and a leveling-off of single-engine, general aviation aircraft used for recreational purposes. However, the recently adopted sport pilot regulations are anticipated to stimulate activity in general aviation for small and light aircraft operators that would likely use or base their aircraft at the Orcas Island Airport.

AIRPORT FORECAST

Aviation demand forecasts are prepared to estimate future airport facility and equipment needs. The forecasts are used to identify the type, extent, and timing of airport development, along with an estimate of the financial feasibility of airport development alternatives, and evaluating potential environmental effects.

Between 1994 and 2005 the Orcas Island Airport has seen a 15% climb in based aircraft and a 41% jump in annual operations.

According to the historical FAA Airport Master Records, (FAA Form 5010) between 1994 and 2005, Orcas Island Airport has seen a 15% climb in based aircraft and a 41% jump in annual operations.[1] The majority of based aircraft consists of 72 single-engine planes along with three multi-engine planes that account for approximately 58,272 of the reported annual operations with 70% of the operations being itinerant and 30% of the operations being local operational activity.

Table 3.1 summarizes the historic number of based aircraft, registered aircraft and annual operations (local, itinerant and air taxi) at the Orcas Island Airport since 1984. The following observations were identified at the Airport as part of the inventory of historical and current Airport activity levels as shown on the Airport Master Record (FAA Form 5010).

[1] An operation is defined as either a takeoff or landing at the airport

Table 3.1
Historic Aviation Activity (Based Aircraft and Annual Operations) [2]
Orcas Island Airport

Year	Single Engine	Multi Engine	Rotor Wing	Jet	Total Based Aircraft	Air Taxi & Commuter Operations	Total Local Operations	Total Itinerant Operations	Total Annual Operations
1984	22				22		3,000	8,300	11,300
1986	30				30		3,000	8,300	11,300
1987	30				30		3,000	8,300	11,300
1989	40	2			42		10,266	23,952	34,218
1990	40	2			42		10,266	23,952	34,218
1992	40	3		1	44		10,266	23,952	34,218
1994	60	3		1	64		10,266	23,952	34,218
1999	60	3	1		64		16,180	25,000	41,180
2004	86	3	3		92	5,071*	17,288	25,000	58,272
2005	86	3			89	6,495*	17,288	25,000	58,272
2006	72	3			75	6,632			

Based Aircraft – An actively registered general aviation airplane based at a select Airport, which regularly uses the Airport as the primary "home-base" for filing flight plans, frequently uses available Airport amenities, and/or maintains a formal commitment for long-term parking/storage.

Aircraft Operation – One aircraft *operation* is one take off or one landing of an aircraft. Aircraft operations are identified as *local* and *itinerant*. Local operations consist of those within 20-nautical miles of the local Airport vicinity. Itinerant operations include a terminus of flight from another Airport at least 25 miles away.

Based upon the information gathered from the historical Airport Master Records (FAA - Form 5010), Washington State System Planning documents and FAA Terminal Area Forecasts, **Table 3.2** through **Table 3.5** summarizes the forecast of based aircraft and annual operations at the Orcas Island Airport for each year through 2026. At airports that do not have operating control towers to record the number of actual air traffic operations, the FAA recommends utilizing a formula to establish the operational activity at the Airport. For an airport with medium activity and a moderate to high level of itinerant traffic, 350 operations are allocated to each aircraft based at the Airport (67% itinerant and 33% local).

[2] FAA 5010 Airport Master Record 1982 - 2006

* Orcas Island Air Taxi & Commuter Operations Commercial Activity Reports

Table 3.2
Comparison of Airport Planning and TAF Forecasts

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base yr.	2005	4,364	3,362	29.8%
Base yr. + 5yrs.	2010	5,084	3,837	32.5%
Base yr. + 10yrs.	2015	5,922	4,355	36.0%
Base yr. + 15yrs.	2020	6,899	4,944	39.5%
Commercial Operations				
Base yr.	2005	6,928	13,456	-48.5%
Base yr. + 5yrs.	2010	8,071	13,456	-40.0%
Base yr. + 10yrs.	2015	9,401	13,456	-30.1%
Base yr. + 15yrs.	2020	10,623	13,456	-21.1%
Total Operations				
Base yr.	2005	26,250	54,636	-52.0%
Base yr. + 5yrs.	2010	28,000	54,636	-48.8%
Base yr. + 10yrs.	2015	29,750	54,636	-45.5%
Base yr. + 15yrs.	2020	31,150	54,636	-43.0%

Table 3.3
Operational Factors

	Base Year Level	Base Year + 1yr.	Base Year + 5yrs.	Base Year + 10yrs.	Base Year + 15 yrs.
Average aircraft size (seats)					
Air carrier	0	0	0	0	0
Commuter/Air Taxi	9	9	9	9	9
Average enplaning load factor					
Air carrier	0	0	0	0	0
Commuter	41.8%	40.0%	40.6%	41.2%	42.0%
GA operations per based aircraft	350	350	350	350	350

Table 3.4
Airport Planning Forecast Summary

Orcas Island Airport (ORS)	Forecast Levels and Growth Rates Base year: 2005								
						Average Annual Compound Growth Rates			
	Base Year Level	Base Year + 1yr.	Base Year + 5yrs.	Base Year + 10yrs.	Base Year + 15 yrs.	Base Year + 1 yr.	Base Year + 5yrs.	Base Year + 10yrs.	Base Year + 15 yrs.
Passenger Enplanements									
Air Carrier	0	0	0	0	0				
Commuter/air taxi	4,364	4,499	5,084	5,922	6,899	3.1%	3.1%	3.1%	3.1%
TOTAL	4,364	4,499	5,084	5,922	6,899	3.1%	3.1%	3.1%	3.1%
Operations									
Itinerant									
Air carrier	0	0	0	0	0				
Commuter/air taxi	6,928	7,143	8,071	9,401	10,623	3.1%	3.1%	3.1%	2.9%
Total Commercial Ops	6,928	7,143	8,071	9,401	10,623	3.1%	3.1%	3.1%	2.9%
General aviation	17,588	17,588	18,760	19,933	21,340	0.0%	1.3%	1.3%	1.3%
Military	0	0	0	0	0				
Local									
General aviation	8,663	8,663	9,240	9,818	10,511	0.0%	1.3%	1.3%	1.3%
Military	0	0	0	0	0				
TOTAL OPERATIONS	26,250	26,250	28,000	29,750	31,850	0.0%	1.3%	1.3%	1.3%
Instrument Operations	0	0	0	0	0				
Peak Hour Operations	0	0	0	0	0				
Cargo/mail	0	0	0	0	0				
Based Aircraft									
Single Engine (Nonjet)	72	72	77	81	87	0.0%	1.4%	1.2%	1.3%
Multi Engine (Nonjet)	3	3	3	4	4	0.0%	0.0%	2.9%	1.9%
Jet Engine	0	0	0	0	0				
Helicopter	0	0	0	0	0				
Other	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
TOTAL	75	75	80	85	91	0.0%	1.3%	1.3%	1.3%

Table 3.5 identifies specific aircraft types (models) by Airport Reference Code (ARC) that are capable of operating from the Orcas Island Airport. The aircraft approach category (AAC) is classified from A to E, and the airplane design group (ADG) is classified from I to IV. Combined, the two classifications produce an Airport Reference Code (ARC) which yields specific characteristics about the type of airplane that the Airport is designed to accommodate. Due to the geographical constraints of the location of the Orcas Island Airport, with water to the north of the runway and Mount Baker Road to the south of the airport, it is likely that the existing and ultimate ARC of B-I will remain the same for the duration of this 20 year planning period.

Table 3.5
Common General Aviation Business Aircraft By Airport Reference Code (ARC)
Orcas Island Airport

Airport Reference Code (ARC A-I) Small	Airport Reference Code (ARC B-I) Small
Single-Engine:	**Twin-Engine:**
Beech (Bonanza Series)	Beech (Baron Series)
Cessna (152/172/210)	Cessna (310 Series)
Cessna (208/208B)	Cessna 404 (Titan)
Cirrus (SR20/22)	Beech (Duke Series)
DeHavilland Beaver	Beech (King Air B100)
Luscombe	DeHavilland Twin Otter
Mooney Bravo	Piper PA-30-210 (Navajo)
Mooney Eagle	Piper (Chieftan)
Mooney Ovation	Piper PA-60-602P (Aerostar)
Piper Warrior	
Piper Archer	
Piper Arrow	
Taylorcraft	

Source: BWR Aircraft Performance Files; *FAA Advisory Circular 150/5300-13, Change #9, Airport Design.*

EXISTING CRITICAL AIRCRAFT/FAMILY OF AIRCRAFT

Table 3.6 outlines information regarding the existing *critical* aircraft at the Orcas Island Airport, which is the largest, most demanding aircraft within a family of aircraft conducting at least 500 itinerant operations (combination of takeoffs or landings) per year at the Airport. The critical aircraft is important for determining Airport design standards and the structural and equipment requirements for both the airside and landside development.

The existing and ultimate critical family of aircraft for Orcas Island Airport is represented by the *Cessna 402 (C-402)* which falls under the Airport Reference Code (ARC) B-I Small category, conducting at least 500 annual itinerant operations. The **Cessna 402** is a light-medium twin-engine piston aircraft developed by Cessna Aircraft Corporation. The **Cessna 402** can be configured for passenger six to eight seats in corporate configuration or 10 seats as an airliner.

Table 3.6
Existing Critical Aircraft Information
Orcas Island Airport

Aircraft Type & ARC	Wing Span	Aircraft Length	Aircraft Height	Max. Gross Takeoff Weight	Ground Roll Distance*	Approach Speed
Cessna 402 C-402	44.2'	36.5'	11.6'	6,300 lbs	2,220'	96 Knots

Note 1: Takeoff distance computed using pressure altitude, and the following operating conditions: 59°F (standard ambient atmospheric) no wind, *normal* aircraft operating takeoff conditions, including no flap setting and no runway grade differential.
Note 2: (*) Indicates ground roll distance over 50 foot obstacle.

Critical Aircraft

Cessna 402

Chapter 4

CLIMATIC CHARACTERISTICS

Climatic characteristics are used to determine required runway length, crosswind coverage, navigational and lighting aids, and instrument approaches. The frequency and duration of instrument meteorological conditions (IMC) are used to provide an indication of critical weather occurrences, and is useful in determining the need for navigational facilities based on FAA and WSDOT Aviation Division criteria.

GEOLOGICAL SETTING

Orcas Island is shaped in a horseshoe configuration, with the western and eastern sides joined by a narrow, low-lying section. The Village of Eastsound and the Orcas Islands Airport are located in this low-lying narrow section. The width of this sections is approximately 1 ¼ miles, with an elevation of approximately 30 feet mean sea level (MSL). The terrain rises east of the Airport due to a series of mountains: Buck Mountain (1,472'), Mount Constitution (2,407') and Entrance Mountain (1,189') that extend along the eastern side of the island. West of the Airport, approximately ¾ of a mile, the terrain rises to 227' MSL. Southwest of the Airport, approximately ¾ of a mile, the terrain rises form 200' MSL to a high point of 630' MSL at Lookout Mountain. The western side of Orcas Island also has mountainous terrain: Mount Woolard (1,180'), Turtleback Mountain (1,497'), Orcas Knob (1,050') and Diamond Hill (1,020').

CLIMATIC ANALYSIS

The climate of the Orcas Island is predominantly maritime as a result of its proximity to the Pacific Ocean. This fluctuation of the water temperature is less dramatic than that of land; therefore, the relatively stable water temperature helps regulate the temperature of the nearby environment which results in a milder climate opposed to inland continental climates that are not affected directly by the ocean influence.

Orcas Island is protected by surrounding ocean waters, and mountain ranges. The ocean temperatures average 45 degrees in the winter and 52 degrees in the summer, thus cooling the air in the summer and warming it in the winter. The Cascade Mountains are approximately 50 miles east and help to block the freezing cold weather systems that come down from Canada. The Olympics and Vancouver

Island tend to push most prevailing winds up into cooler air and force them to dump their rain, giving Orcas Island less than half the rainfall that Seattle gets.

The mean high temperature on Orcas Island varies only 28 degrees between January and July, normally the coldest and hottest months. The mean low temperature varies only 18 degrees. The weather is eternally moderate. Temperatures rarely top 80 degrees in the summer and rarely fall below 30 degrees in the winter.

In the dry summer months and especially during September and early October, the islands go for weeks without a cloud in the sky. Rainfall in the islands averages 29 inches a year. The highest official temperature reached 93 degrees (July 1941) and the lowest was 8 degrees (January 1950). The wettest month was January 1935 when 13.04 inches of precipitation was recorded at the weather station on Olga. The highest summer temperatures and coldest winter weather occur when the winds come out of the northeast.

The prevailing winds are from the south or southwest during the wet season and northwest in spring and summer with the average wind velocity for this region at less than 10 m.p.h.

ALL-WEATHER WIND CONDITIONS

Runway 16-34 provides 95.55% percent wind coverage at 10.5-knots.

In aviation, there are two weather conditions: Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC). VMC can be defined as visibility over three miles and cloud ceiling height above 1,000 feet. IMC can be defined as any condition not meeting minimum VMC visibility and cloud heights. The rules governing flight during these weather conditions are referred to as Visual Flight Rules (VFR) and Instrument Flight Rules (IFR). Therefore, all-weather conditions are comprised of both VFR and IFR conditions.

Published first-order wind information from NAS Whidbey Island was used given its proximity to Orcas Island Airport. Given the unusual variation of weather patterns along the coast of Washington, NAS Whidbey Island provides weather information that most closely approximates what is experienced at Orcas Island Airport. **Table 4.1** illustrates the percent of all-weather wind coverage for the 10.5 and 13.0-knot wind velocities. Runway 16-34 provides 92.08% percent wind coverage at 10.5-knots which is below the FAA recommended 95 percent wind coverage for Airport design standards for small aircraft (ARC A-I & B-I) at 10.5 knots. Due to the geographical constraints of location of the Orcas Island Airport, the wind coverage below the FAA recommended 95% is considered acceptable because realigning Runway 16-34 is not a reasonable alternative.

INSTRUMENT METEOROLOGICAL CONDITIONS (IMC) WIND CONDITIONS

A published instrument approach provides guidance information to aircraft with intent to land when the visibility is less than the minimum VFR conditions. Instrument approaches to the Airport not only increase the margin of safety to the pilot and general public, but enhance overall reliability, as well. The frequency of IFR conditions in the region is experienced with the following circumstances:

…the region experiences Marginal VFR, or below, approximately 7.7 percent of the time, or 28 days out of the year according to the weather conditions measured at NAS Whidbey Island.

- Ceiling 1,000 feet/visibility ≤ 3-miles: **7.7 %** (Marginal VFR)
- Ceiling 800 feet/visibility ≤ 1-mile: **5.5%**
- Ceiling 600 feet/visibility ≤ 1-mile: **4.5%**

Source: International Station Meteorological Climate Summary (NAS Whidbey Island)

These weather conditions are based a 50 year history as measured from the weather station at NAS Whidbey Island (46' MSL). According to the figures, the region experiences Marginal VFR, or below, approximately 7.7 percent of the time, or 28 days out of the year.

Table 4.1 shows the percent wind coverage during IFR conditions. As indicated in this table, Runway 16-34 provides 98.28 percent wind coverage during IFR conditions when wind velocities are at 10.5 knots, or less.

STRONG ALL-WEATHER WIND CONDITIONS

Nearly 53 percent of the strong wind conditions are within 30 degrees of Runway 16-34 centerline alignment.

Table 4.1 shows the percentage of all-weather, strong wind conditions (greater than 10.5-knots) for the runway alignments (145.5º-345.5º) at Orcas Island Airport, which include 16-34. Approximately 15.3 percent of all winds observations occur as strong winds. Nearly 53 percent of the strong wind conditions/observations are within 30 degrees of Runway 16-34 centerline alignment. Runway 16 experiences 80 percent of total strong wind activity while Runway 34 experiences 20 percent.

Table 4.1
Percent Crosswind Runway Wind Coverage for All-Weather and IFR Wind Conditions
Orcas Island Airport

Runway Alignment (True Bearing)	Crosswind Component Wind Speed & Corresponding ARC	Percent All-Weather Wind Coverage	Percent IFR/ IMC Wind Coverage
Runway 16-34 (345.1º)	10.5 knots (A-I and B-I) 13.0 knots (A-II and B-II)	92.08% 95.54%	98.13% 99.28%
Total – Calm and Light Winds Total – Strong Winds		80.54% 19.46%	
Strong Winds within 30° of Runway Bearing		28.29%	
Optimum All-Weather Primary Runway Alignment		311º (95.75% coverage at 10.5 knots)	
Range of 95% Wind Coverage Alignment: All-Weather IFR Conditions		117° to 146° (95% at 10.5 knots) 001° to 360° (95% at 10.5 knots)	

Note 1: The percentage (%) indicates the percent of time wind coverage is provided for a particular velocity. The greater the percent, the more desirable the wind coverage.

Note 2: True runway bearing(s) are used to calculate wind calculations. Calm winds = 0 to 10 knots; Strong winds = greater than 10 knots

Source: First-order wind station, NAS Whidbey Island, (1994-2004).

Chapter 5

INSTRUMENT APPROACH FEASIBILITY

There are several factors that must be taken into consideration prior to, and in conjunction with, the development of an instrument approach procedure at the Orcas Island Airport. The following factors have been considered in order to determine the feasibility of establishing a non-precision straight-in instrument approach to the Orcas Island Airport:

Geography of Airport Area – The natural geographic surroundings of Orcas Island present several challenges when evaluating the feasibility of an instrument approach procedure to the airport. The island is shaped in a horseshoe configuration; the airport is located in a low-lying narrow section of land with terrain rising east of the airport due to a series of mountains: Buck Mountain (1,472'), Mount Constitution (2,407') and Entrance Mountain (1,189') that extend along the eastern side of the island; west of the airport, approximately ¾ of a mile, the terrain rises to 227' MSL; southwest of the airport, approximately ¾ of a mile, the terrain rises form 200' MSL to a high point of 630' MSL at Lookout Mountain; and the western side of Orcas Island also has mountainous terrain: Mount Woolard (1,180'), Turtleback Mountain (1,497'), Orcas Knob (1,050') and Diamond Hill (1,020').

Airport Requirements/Capacity – The Orcas Island Airport has an Airport Reference Code of B-I with a Beechcraft Baron BE-58 as the Critical Aircraft for the airport. The number of based aircraft, local operations, itinerant operations, air taxi operations and scheduled airline activity at the airport meet the justification requirements to have a non-precision straight-in instrument approach published for the airport. The airport facility is in excellent condition and both the airport and airspace capacity are capable of supporting a published instrument approach at the Orcas Island Airport.

Currently, the existing 250' wide Primary Surface of the Orcas Island Airport is designated under the airspace obstruction notification criteria for runways with a visual approach. The FAA airspace obstruction standards require a 500' wide Primary Surface for a runway with a non-precision, straight-in instrument approach. The increase in Primary Surface area will require the Port of Orcas Island to acquire an additional 7.5 acres of land in order to control the entire Primary Surface area of the airport. The blue shaded area of **Exhibit 5.1** shows the additional airport property required in order to control the 500' Primary Surface. The acreage to the east of the Runway is 1.76 acres and the acreage to the west of the runway is 5.74 acres.

The existing terminal building and adjacent structures penetrate the 7:1 Part 77 imaginary surfaces and will need to be relocated. As shown on the Terminal Area Drawing in Chapter 6, buildings 2, 3, 30, 31 and 32 will ultimately be removed from the existing terminal area and relocated to the Larson property. Building 45 on the southwest

quadrant of the airport may need to have an obstruction light installed on top of the structure because of the FAA - Part 77 transitional surface requirements.

Exhibit 5.1
500' Primary Surface Land Requirement

Approach Light System – An Approach Light System is currently not a component of the planned non-precision straight-in instrument approach. However, one may be considered in the future if it is determined that the installation of an ALS would lower the approach minimums.

Alterations in Traffic Patterns – An instrument approach to the Orcas Island Airport would not alter the existing traffic patterns at the airport.

Compatibility with the Existing Airport Master Plan – The most recent Master Plan and ALP were approved in 1993 and do not reflect the changes in economic activity, based aircraft and operational activity that have occurred over the past decade. The needs of the community to obtain a non-precision straight-in instrument approach have been clearly stated by the Airport Management and Port of Orcas Island Commissioners. As discussed in Chapter 4, the historical weather conditions of the region experiences Marginal VFR, or below, approximately 7.7 percent of the time, or 28 days out of the year. An instrument approach not only improves the operational and safety aspects of the airport, it also enhances the economic attributes of the community by allowing commerce to take place via the air transportation system even when the weather conditions deteriorate to Instrument Meteorological Conditions.

Runway Dimensions and Weight-bearing Capacity – The Orcas Island Airport is 2,900' x 60' asphalt runway with full length parallel taxiway system. The estimated weight-bearing capacity is 12,500lbs single wheel configured aircraft.

Impact to the Air Traffic Control (ATC) System – Air Traffic Control capacity is sufficient to provide controlling service to aircraft operating under IMC conditions at the Orcas Island Airport. As discussed in Chapter 4, the historical weather conditions of the region experiences Marginal VFR, or below, approximately 7.7 percent of the time, or 28 days out of the year.

Instrument Approach Alternatives – The following alternatives were evaluated with the intent of obtaining an instrument approach at the Orcas Island Airport with minimums below 800' MSL:

1. Point-in-Space" Approach: Due to the geographical constraints near the Orcas Island airport, a "Point-in-Space" approach was considered where the Missed Approach Point (MAP) would be located over a body of water such as "President Channel.". If the airport is in sight at the MAP, then the pilot would proceed to the airport visually. However, Chapter 3 of the TERPS manual indicates that a "Point-in-Space" approached is exclusively for helicopter operations.

2. RNAV/GPS Approach: The FAA has programmed a Circling Approach for the Orcas Island Airport. It is scheduled to be published in the summer of 2007. Since this approach is a circling approach, the Minimum Descent Altitude (MDA) will be in the vicinity of 1,100' MSL. While this approach provides the aviation community the benefit of filing an IFR flight plan to and from the Orcas Island Airport, it does not provide an approach for operations at the airport under Instrument Meteorological Conditions.[1]

[1] The AIP funded survey that was originally scheduled the summary of 2007 was redirected due to the limited nature of a LPV instrument approach procedure (IAP). A preliminary study, conducted by FAA Flight Procedures Office, determined the minimums would be too high due to existing obstructions prohibiting the establishment of an LPV IAP. A RNAV procedure may provide better minimums then the LPV. A RNAV procedure is also a non-precision IAP.

3. Climb Gradient Change: The FAA has recently had an approach procedures change, allowing more flexibility in the missed approach climb gradient. This change may offer the potential to lower the MDA of the Orcas Island circling approach that is scheduled to be published in the summer of 2007.

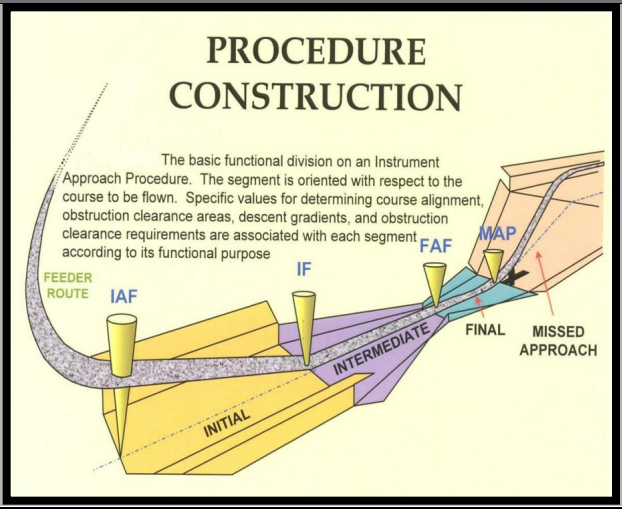
4. Waiver: The possibility of obtaining a "Waiver" from the FAA allowing a lower approach to the airport by waiving some of the FAA requirements. This has been considered at other airports in the country. However, "Waivers" of this nature transfer all the safety responsibilities from the FAA to the airport sponsor and directly impact airport insurance premiums. A cost benefit analysis would need to be considered when considering "Waivers."

5. Proceed Visual Approach: This type of procedure allows an aircraft to begin the instrument approach and once below a given altitude, to proceed under VFR. The challenge with this type of procedure is that if a missed approach is required, the aircraft can not re-enter the controlled IFR Airspace. Additionally, scheduled airlines are not approved to execute these types of approaches.

6. LPV-RNAV(GPS): A straight- in LPV approach could be published at Orcas Island with minimums of 588' and 1 ¼ mile visibility. The approach and missed approach requirements are obtainable with an LPV approach. However, this straight in approach requires the airport sponsor control the primary surface of 500' (250' both sides of runway centerline). In order to be considered for an LPV approach, an LPV survey will need to be accomplished.

Probable Minimums – Several scenarios were examined to determine the best configuration for an instrument approach at the Orcas Island Airport. **Exhibits 5.3** through **Exhibit 5.9** depict a mixture of non-precision straight-in and non-precision circling approaches that have been evaluated for the Orcas Island Airport. **Exhibit 5.2** shows the four segments of an instrument approach. When obstructions such as mountains, antennas or other structures penetrate any of these surfaces, the Minimum Descent Altitude (MDA) of an instrument approach is penalized and thus has the effect of raising the MDA.

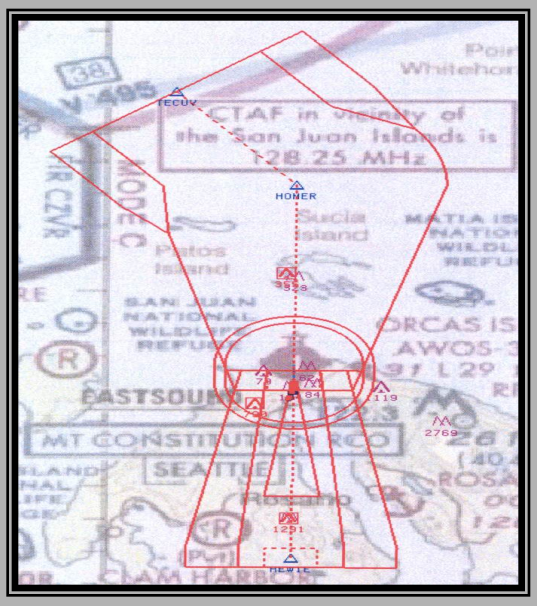
Exhibit 5.2
Instrument Approach Segments



- Intermediate Segment Distance – 6 nautical miles
- Final Segment Distance - 5 nautical miles
- Missed Segment Distance – 11 nautical miles

Exhibit 5.3 below illustrates a straight-in approach to Runway 34. A standard non-precision straight-in approach to Runway 34 would normally have a MDA of 580' MSL. However, due to the constraints of the geography in the vicinity of the airport, the MDA for this approach is 1,500 MSL or 1,468' above the airport. The controlling obstruction is Mt. Woolard (1,180' in height) which impacts this approach during the final approach segment of the instrument approach procedure.

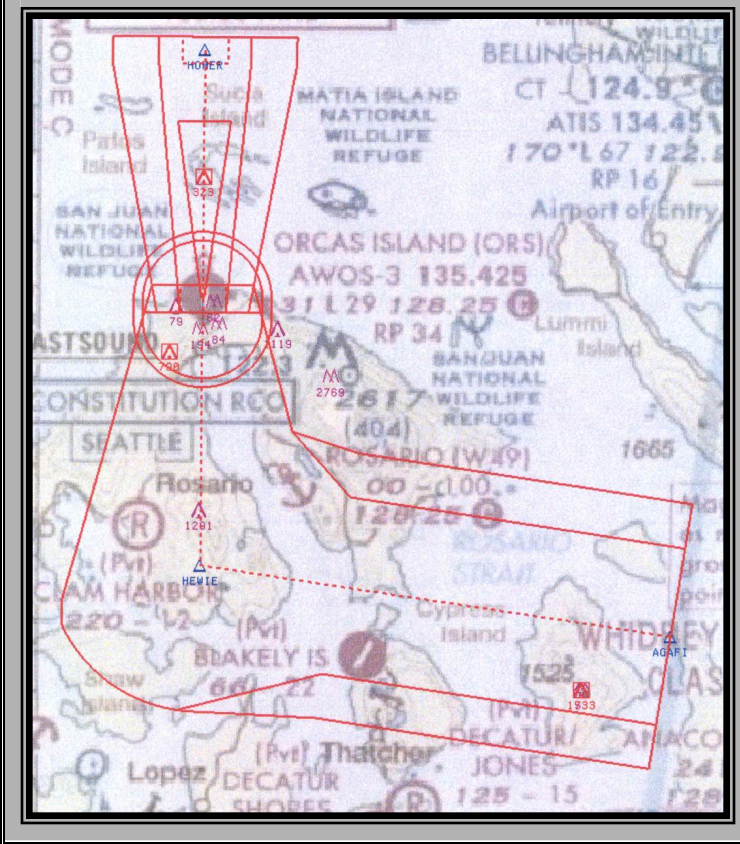
Exhibit 5.3
Straight-In Approach – Runway 34



- MDA 1,500' MSL
- Missed Adjustment 911'
- MDA 580' MSL w/o Missed Adjustment
- HAA 1,468'
- VIS A – 1 ¼
- VIS B – 1 ½
- Angle 3.77°

Exhibit 5.4 below illustrates a straight-in approach to Runway 16. A standard non-precision straight-in approach to Runway 16 would normally have a MDA of 580' MSL. However, due to the constraints of the geography in the vicinity of the airport, the MDA for this approach is 1,500 MSL or 1,468' above the airport. The controlling obstruction for this approach is Mt. Woolard (1,180' in height) which impacts this approach during the missed approach segment of the instrument approach procedure.

Exhibit 5.4
Straight-In Approach – Runway 16



- MDA 1,500' MSL
- Missed Adjustment 911'
- MDA 580' MSL w/o Missed Adjustment
- HAA 1,468'
- VIS A – 1 ¼
- VIS B – 1 ½
- Angle 3.77°

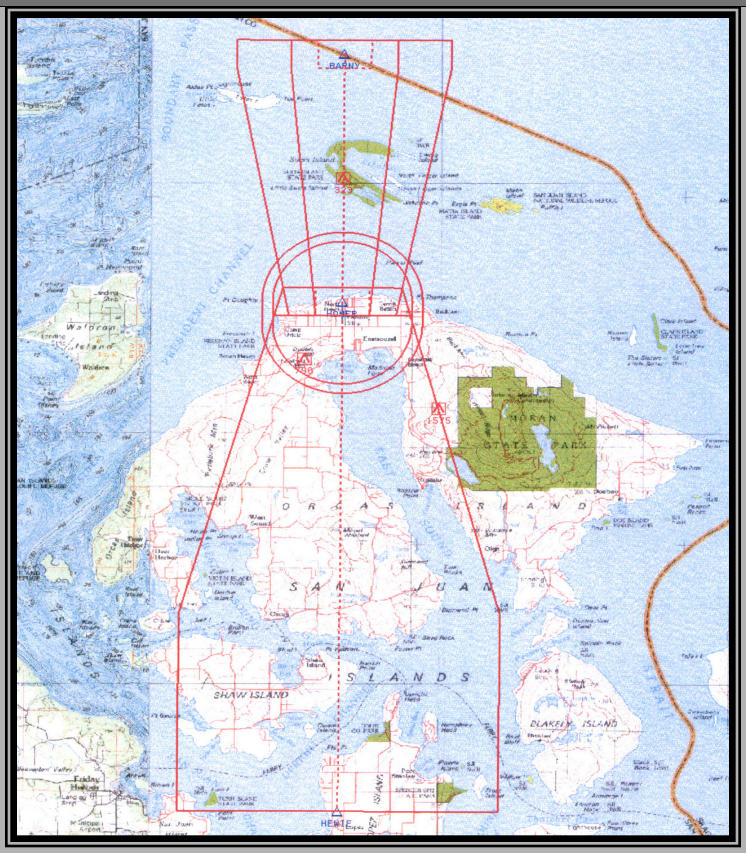
Exhibit 5.5 below illustrates a circling approach from the east. A standard non-precision circling approach to airport would normally have a much lower MDA than shown. However, due to the constraints of the geography in the vicinity of the airport, the MDA for this approach is 2,248' MSL or 2,280' above the airport. The controlling obstruction for this approach is the antenna farm on Mt. Constitution (2,556' in height) which impacts this approach during the final approach segment of the instrument approach procedure.

Exhibit 5.5
Circling Approach From the East

- MDA 2,280' MSL
- HAA 2,248'
- VIS A – 1 ¼
- VIS B – 1 ½

Exhibit 5.6 below illustrates a circling approach from the north. A standard non-precision circling approach to airport would normally have a much lower MDA of 580' MSL. However, due to the constraints of the geography in the vicinity of the airport, the MDA for this approach is 1,500 MSL or 1,469' above the airport. The controlling obstruction for this approach is Sucia Island impacting the approach segment of the procedure and Mt. Woolard which impacts this approach during the missed approach segment of the instrument approach procedure.

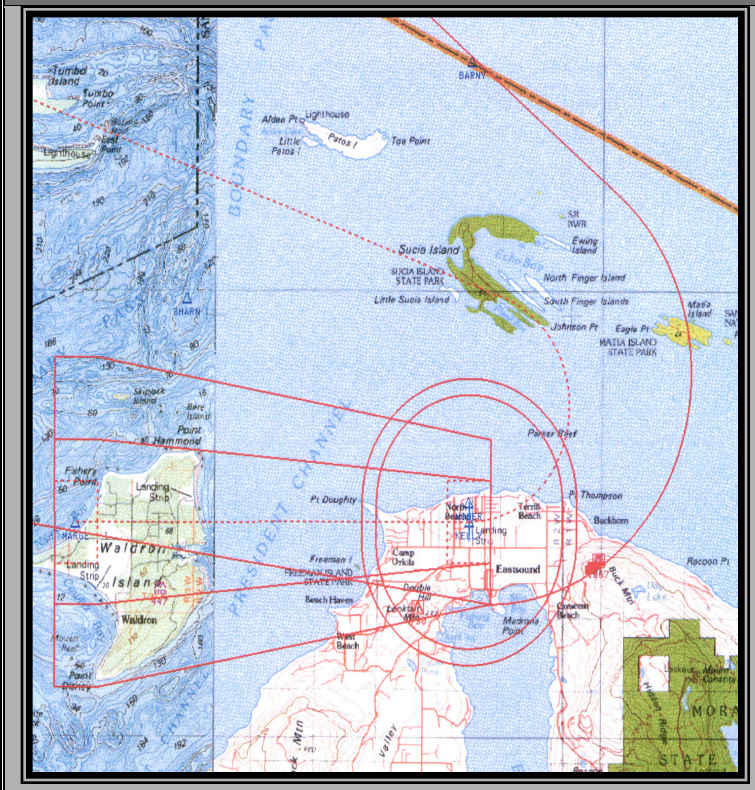
Exhibit 5.6
Circling Approach from the North



- MDA 1,500' MSL
- Obstacle Adjustment 911'
- MDA 580' MSL w/o Obstacle Adjustment
- HAA 1,469'
- VIS A – 1 ¼
- VIS B – 1 ½

Exhibit 5.7 below illustrates a circling approach from the west. A standard non-precision circling approach to airport would normally have a much lower MDA of 580' MSL. However, due to the constraints of the geography in the vicinity of the airport, the MDA for this approach is 1,500 MSL or 1,468' above the airport. The controlling obstruction for this approach is the antenna farm on Mt. Constitution (2,556' in height) which impacts this approach during the missed approach segment of the instrument approach procedure.

Exhibit 5.7
Circling Approach from the West



- MDA 1,500' MSL
- Missed Adjustment 1,467'
- MDA 580' MSL w/o Missed Adjustment
- HAA 1,468'
- VIS A – 1 ¼
- VIS B – 1 ½

Exhibit 5.8 below illustrates a circling approach from the southwest. A standard non-precision circling approach to airport would normally have a much lower MDA. However, due to the constraints of the geography in the vicinity of the airport, the MDA for this approach is 1,500 MSL or 1,468' above the airport. The controlling obstructions for this approach are Double Hill and Lookout Mountain which impact this approach during the final approach segment of the instrument approach procedure.

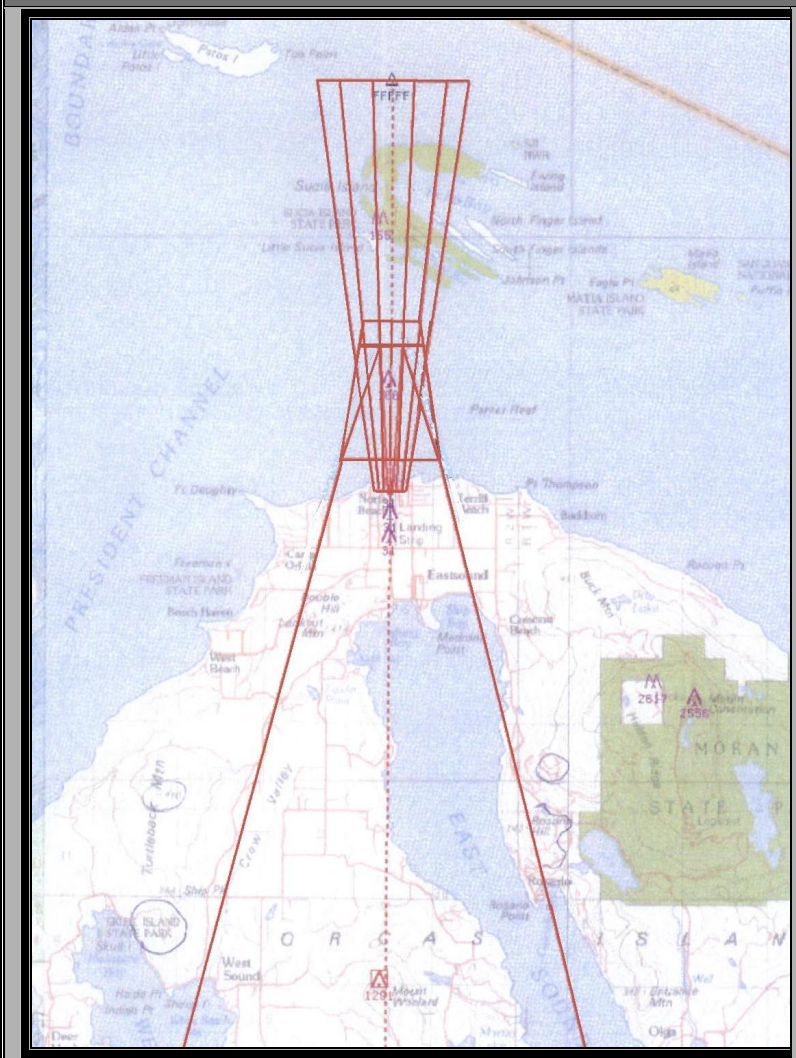
Exhibit 5.8
Circling Approach from the Southwest

- MDA 1,100' MSL
- HAA 1,069'
- VIS A – 1 ¼
- VIS B – 1 ½

Exhibit 5.9 below illustrates the recommended approach to the airport. A LPV-RNAV/GPS straight-in approach to Runway 16. This non-precision straight-in approach to Runway 16 will have a MDA of 588' MSL. This approach provides a MDA that allows operations to take place at the airport when IMC weather conditions exist.

This approach requires the existing 250' wide Primary Surface of the runway to be widened to 500' in order to meet the FAA runway design standards for a runway with a non-precision, straight-in instrument approach.

Exhibit 5.9
Non-Precision, Straight-In
LPV-LNAV/GPS Approach to Runway 16



- MDA 588' MSL
- HAA 556'
- VIS A – 1 ¼
- VIS B – 1 ½

Obstruction Evaluations – An FAA Type 405 survey will need to be completed to determine the nature of obstructions in the airport area. This FAA 405 survey has been scheduled for the Orcas Island Airport to document the obstructions at the airport and specifically in the airport approach segment areas as identifies in Exhibit 5.2 – Instrument Approach Segments. This survey will provide information required to allow night time operational use of the circling approach and will remove the day time use only classification. The 405 survey is also a prerequisite to the creation of the LPV-RNAV/GPS straight-in approach to Runway 16.

Air Traffic Control - All the approaches identified will require air traffic approval from four different facilities. The airspace with respect to these approaches is controlled by Seattle Center but also have an effect on Whidbey Approach, Victoria Approach and Vancouver Center.

This page intentionally left blank.

Chapter 6

LARSON PROPERTY ALTERNATIVES

Four development alternatives were considered for the development of the Larson Property. Each of the alternatives was designed to provide expansion capability for T-hangar development, smaller executive style hangar development and the potential for a larger terminal facility for scheduled and non-scheduled passengers using the airport.

Alternative One provides for expansion of T-hangars on the southern most section of the Larson Property, and executive style hangars north of the T-hangars. The main airport entrance point for automobile traffic to the airport is shown to be via North Beach Road turning west onto the Larson Property, paralleling a new auto parking area to access the relocated Terminal building. The long-term auto parking area is shown paralleling the main airport entrance road with short-term parking shown adjacent to the Airport Terminal Building. The existing long-term parking area and the property where the existing Terminal and adjacent buildings are located will be converted to airport ramp and tie-down space. The remaining southeastern section of the Larson Property is open space.

Alternative Two provides for expansion of T-hangars on the southern most section of the Larson Property, and executive style hangars north and west of the T-hangars. The main airport entrance point for automobile traffic to the airport is shown to be via North Beach Road turning west onto the Larson Property, paralleling a new auto parking area to access the relocated Terminal building. The long-term auto parking area is shown paralleling the main airport entrance road with short-term parking shown adjacent to the Airport Terminal Building. The existing long-term parking area and the property where the existing Terminal and adjacent buildings are located will be converted to airport ramp and tie-down space. The remaining southeastern section of the Larson Property is open space.

Alternative Three provides for expansion of T-hangars on the eastern section of the Larson Property, executive style hangars west of the T-hangars and corporate / business hangars with room for office space are shown located south of the T-hangars. The main airport entrance point for automobile traffic to the airport is shown to be via Mount Baker Road turning onto the Larson Property. Auto parking is shown paralleling both Mount Baker Road and North Beach Road. Short-term auto parking is shown in front of the relocated Terminal building and the corporate / business hangars. Long-term auto parking area is shown paralleling North Beach Road. The existing long-term parking area and the property where the existing Terminal and adjacent buildings are located will be converted to airport ramp and tie-down space. The remaining southeastern section of the Larson Property is open space.

Alternative Four provides for expansion of T-hangars and executive style hangars on the Larson Property. In order to preserve and improve visual appearance of the airport and improvements a greenbelt is depicted north of Mt. Baker Road and west of North Beach Road. The main airport entrance point for automobile traffic to the airport is shown to be via North Beach Road turning onto the airport property travelling west to the ultimate long term parking area and terminal building. This alternative also shows an exchange of the Enderline property for Larson Property with the planned airport entrance road located south of the ultimate Enderline property. The existing Enderline property will ultimately be used for long term auto parking, additional ramp area and the relocated terminal building. Short-term auto parking is shown in front of the relocated terminal building. An additional long-term auto parking area for the corporate hangars is shown paralleling Mt. Baker Road behind the greenbelt. The remaining southeastern section of the Larson Property is open space.

Alternative Four is the Preferred Alternative. This alternative will have the effect of improving the perception of the airport within the community. This alternative offers an excellent mix of new T-hangars and individual hangars at the airport, as well as providing long-term and short-term automobile parking spaces. The traffic flow to the airport is via North Beach Road is also an improvement to the existing surface transportation access design. As can be seen on **Exhibit 6.4 & 6.5,** the proposed Airport entrance road is via North Beach Road and is not aligned with the northern border of the Airport property (Larson property). According to traffic safety principals, any new curb access point should be aligned with an existing "curb cut" or access point. Therefore, the Airport entrance road is shown in alignment with the "curb cut" east of North Beach Road.

The ultimate entrance road limits a section of airport property from aircraft use, and it is recommended that the constrained property be exchanged with the Enderline property as described below.

Exhibit 6.5 - Enderline Property, depicts an exchange of privately held property located east of the existing terminal building and entrance road that will be developed as aviation use property. Currently, the property is not accessible for aeronautical purposes. The exchange will offer the ability to relocate the terminal building and create long term parking for users of the airport. The property shown as ultimate Enderline property will not have direct access to the airport for aircraft activity due to the construction of the new airport entrance road.

Exhibit 6.1
Larson Property Plan Alternative One

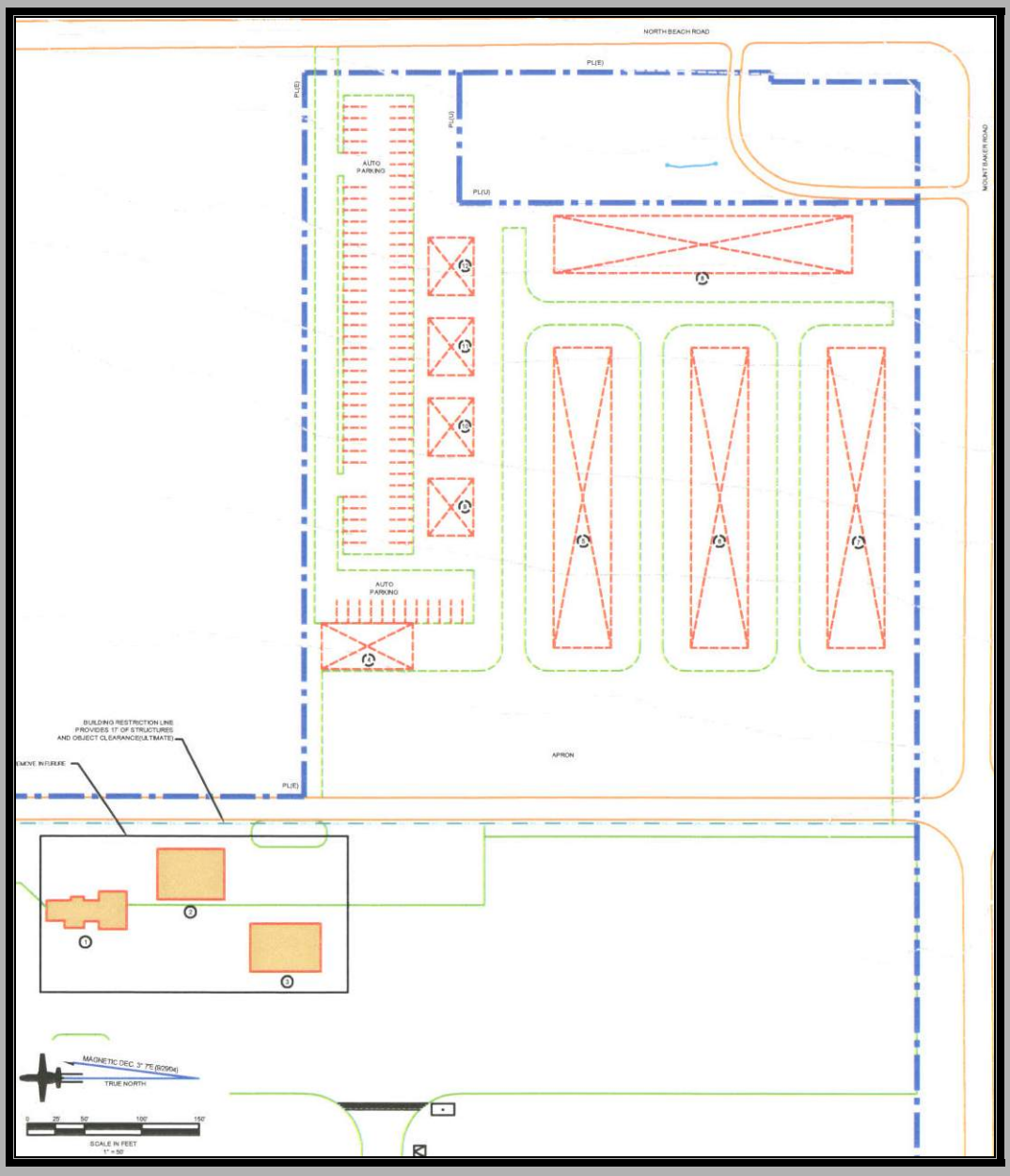


Exhibit 6.2
Larson Property Plan Alternative Two

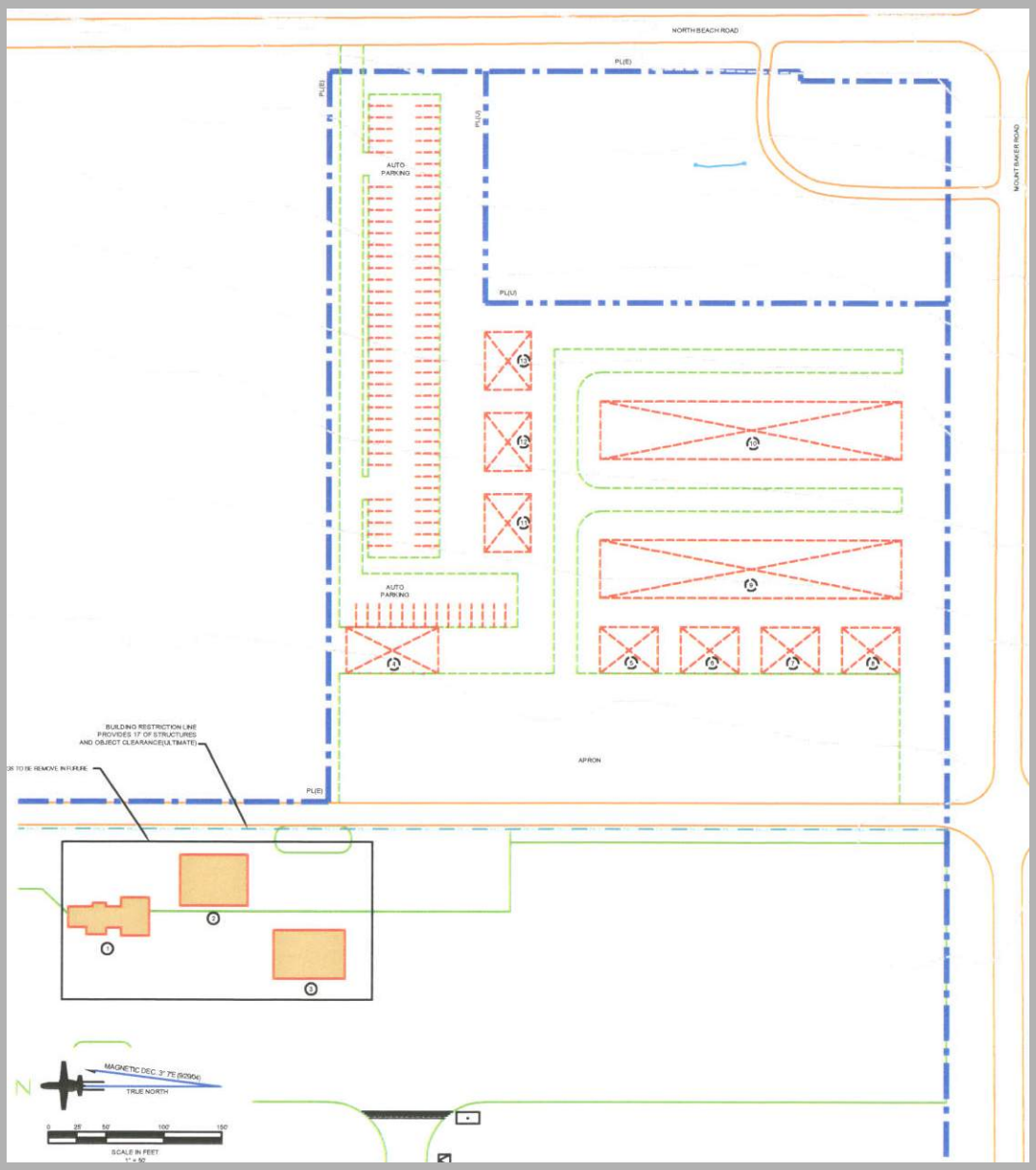


Exhibit 6.3
Larson Property Plan Alternative Three

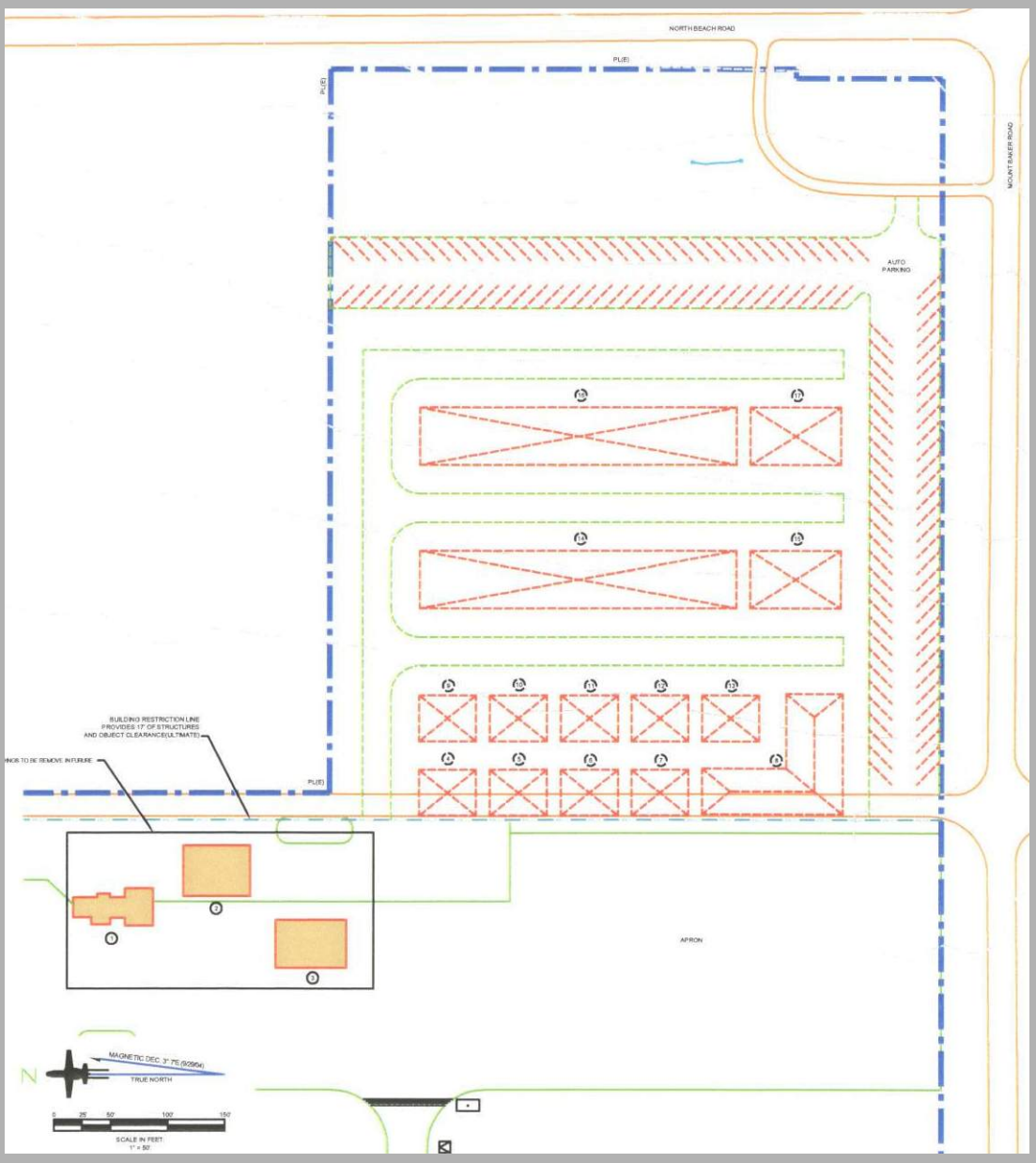


Exhibit 6.4
Larson Property Plan Alternative Four

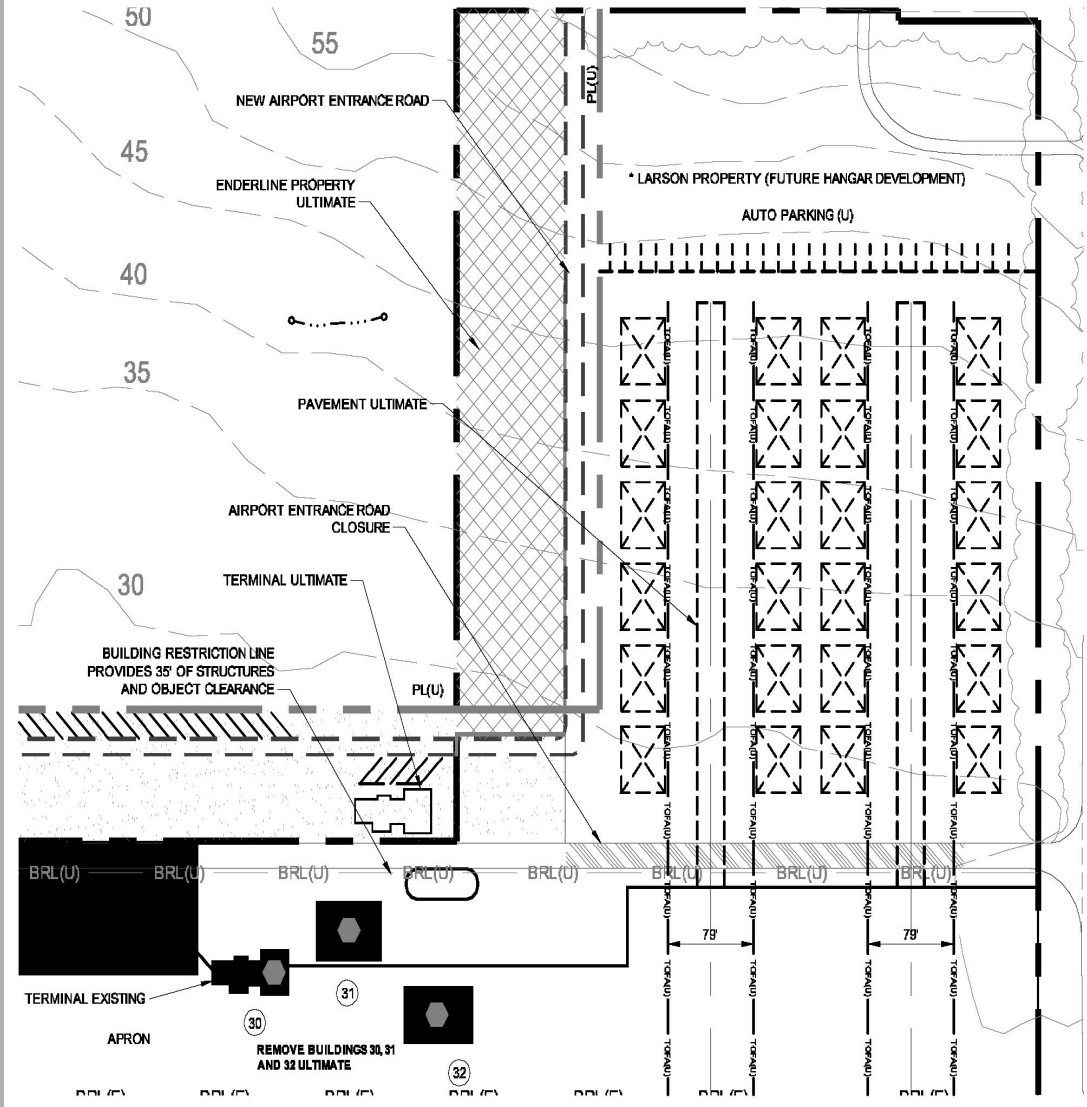
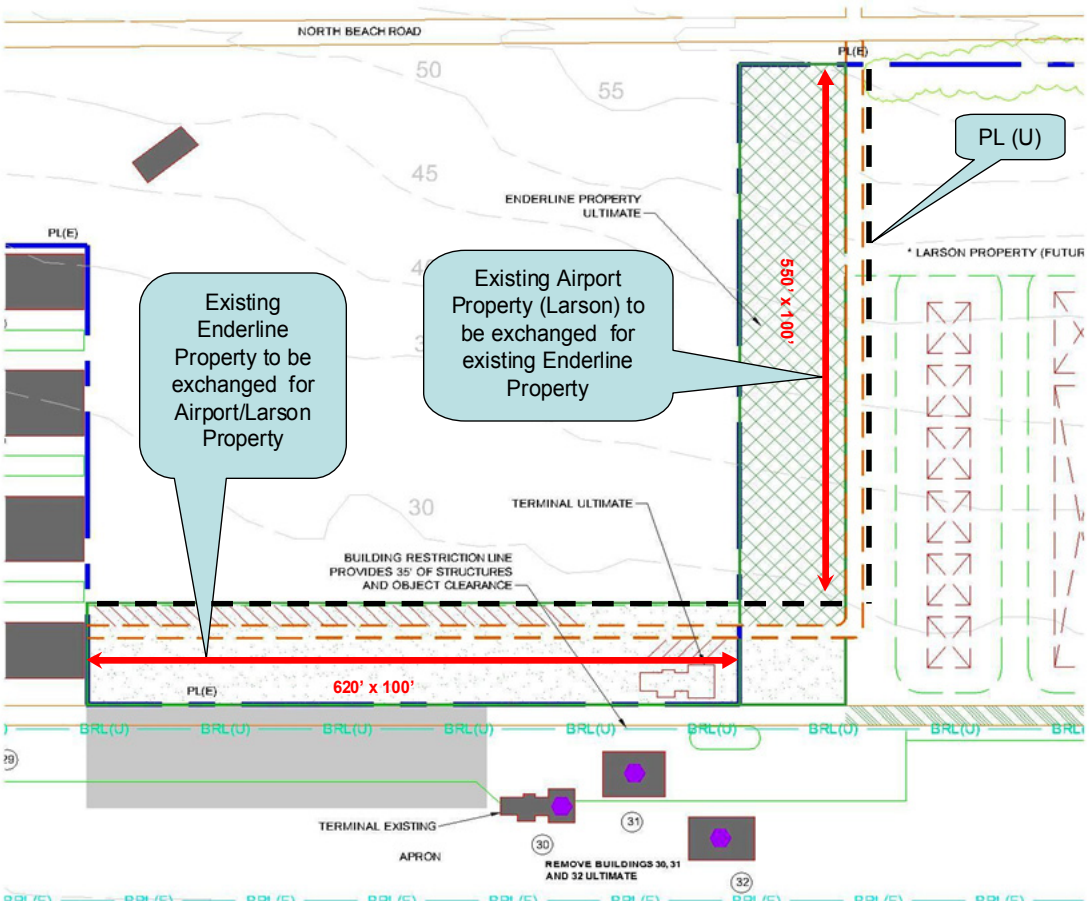


Exhibit 6.5
Enderline Property Exchange



This page intentionally left blank.

7

Chapter 7

AIRFIELD ANALYSIS

INTRODUCTION

This chapter identifies the airfield and terminal area facility needs and is based upon the inventory and forecast findings illustrated in Chapters 2 and 3. The airport facility evaluation is based on the accumulation of inventory information and aviation demand forecast elements, and has been accomplished in accordance with FAA design standards and airspace criteria. It should be noted that identification of needed facilities does not constitute a "requirement" in terms of design standards; however, this provides an "option" for facility improvements to accommodate future aviation activity.

AIRPORT REFERENCE CODE (ARC) CLASSIFICATION

As discussed in Chapter 2, the Critical Aircraft for the Orcas Island Airport will be in the ARC B-I small category throughout the 20-year planning period. The Airport Reference Code (ARC) for the Orcas Island Airport during each of the planning periods is shown in Table 7.1, Existing and Ultimate Airport Reference Code.

The FAA has established airport design criteria corresponding with an airport's role and ARC designation. This criterion provides minimum safety standards with respect to the performance characteristics represented by the airport's critical aircraft. This particular aircraft, as determined with respect to approach speed and wingspan, is within a design category of airplanes that conduct at least 500 itinerant operations (combination of landings and takeoffs) per year.

The following information in this chapter will focus on applying the FAA Design standards to the existing conditions of the Orcas Island Airport, and will include recommendations to improve the airport in order to bring it into compliance with the safety standards.

Table 7.1
Existing and Ultimate Airport Reference Code (ARC)
Orcas Island Airport

Runway	Existing ARC	Phase 1 ARC (0-5 Years)	Phase 2 ARC (6-10 Years)	Phase 3 ARC (11-20 Years)
Primary Runway	B-I, Small	B-I, Small	B-I, Small	B-I, Small
Crosswind Runway	N/A	N/A	N/A	N/A

Note 1: The most demanding (greatest) runway ARC per planning phase indicates the airport's ARC.

Note 2: Aircraft Approach Category groups have the following performance characteristics:
Aircraft Approach Category A = approach speed less than 91 knots.
Aircraft Approach Category B = approach speed of 91 knots or more, but less than 121 knots.

Airplane Design Groups are based on aircraft wingspans as follows:
Airplane Design Group I = wingspan up to but not including 49 feet.
Airplane Design Group II = wingspan of 49 feet up to but not including 79 feet.

Source: BWR, Designated Airport Reference Code (ARC) Forecast – July, 2006.

AIRFIELD SAFETY AREA REQUIREMENTS

Compliance with airport design standards is required to maintain a minimum level of operational safety. The major airport design elements, as follows, are established from FAA Advisory Circular 150/5300-13, Change #10, Airport Design and FAR Part 77, Objects Affecting Navigable Airspace, and should conform with FAA airport design criteria without a modification to the standards.

Runway Safety Area (RSA): The RSA is a two-dimensional area surrounding and extending beyond the runway and taxiway centerlines that the airport must own in "fee simple" title. The RSA for the Orcas Island Airport (ARC B-I small aircraft) is 240' prior to the landing threshold, 240' beyond the runway end and 120' wide. This safety area is provided to reduce the risk of damage to airplanes in the event of undershoot, overshoot, or excursion from the runway. In addition, it must be cleared and free of objects except those required for air navigation and graded to prevent water accumulation, as consistent with local drainage requirements. Under dry conditions, the RSA must support an airplane without causing structural damage to the airplane or injury to the occupants. No object may be located in the safety area except those that need to be because of their function in airport operations (i.e. REIL or PAPI). In those cases, they must be constructed on frangible-mounted structures where practical.

As identified in Chapter 2, the airport runway is 2,900' x 60'. The RSA requirements to the north and south ends of the runway have adequate runway safety areas of 240'.

Object Free Area (OFA): The Runway Object Free Area (OFA) is defined as a two dimensional ground area surrounding runways, taxiways, and taxi lanes which is clear of objects except for objects whose location is fixed by function to assist air navigation or for ground maneuvering reasons. The OFA standard for Runway 16 - 34 is 250 feet wide (125' on each side of the runway centerline) and extends 240 feet beyond the runway end.

The OFA for the runway is free of obstructions.

Obstacle Free Zone (OFZ): The OFZ is airspace above a surface centered on the runway centerline, and precludes taxiing and parked airplanes and object penetrations except for frangible post mounted NAVAIDs expressly located in the OFZ by function such as runway edge lights and runway threshold lights. Similar to the OFA, the OFZ is 250' wide (125' on each side of the runway centerline), however, the OFZ only extends 200' beyond each end of the runway.

As shown on the ALP drawing set, the standard hold line location for a visual runway is 125'. The area of the OFZ appears to be free of obstructions.

Taxiway / Taxilane Safety Area: The taxiway system at the Orcas Island Airport consists of a parallel taxiway on the east side of the runway and an access taxiway system connecting the through the fence operations on the west side of the. The airport areas adjacent to the taxiways are free of obstructions.

Taxiway / Taxilane Object Free Area: For taxiway systems under the Aircraft Design Group 1, the taxiway OFA width is 89'. The existing hangars are located well outside the taxiway OFA.

Parked aircraft positioned near the existing taxiways are located with a minimum setback of at least 44.5 feet from the taxiway centerline and 39.5 feet from the taxilane centerline.

Building Restriction Line: A 370 foot Building Restriction Line (BRL) is recommended which would allow for a structure with a height of 35' above the elevation of the runway to be constructed without penetrating this transitional surface. It is important to note that the contours of the airport property increase to the east and west of the runway. This should be considered by those who may be interested in building new facilities on the airport.

Currently, 14 structures penetrate this 370' BRL. Three are on airport property and the remaining structures are located off airport property. The structures on airport property will be relocated to meet the FAA obstruction requirements. The structures off airport property are shown on sheet 3 of the ALP drawing set which included the recommended disposition and mitigation with respect to each structure.

Runway Protection Zone (RPZ): The RPZ is a two-dimensional trapezoid area beginning 200 feet beyond the paved runway end, and extends along the runway centerline. The purpose of the RPZ is to enhance the protection of people and property on the ground, and to prevent obstructions potentially hazardous to aircraft. RPZ dimensions are determined by the type of aircraft expected to operate at the airport (small) and the type of approach planned for the runway ends (visual).

The recommended visibility minimums for the runway ends are determined with respect to approach procedures, the ultimate runway ARC, airfield design standards, instrument meteorological wind conditions, and physical constraints (approach slope clearance) beyond the extended runway centerline. The FAA recommends that airports own the entire RPZ in "fee simple" title and that the RPZ be clear of any non-aeronautical structure or object that would interfere with the arrival and departure of aircraft. The RPZ dimensions at Orcas Island are based upon "small aircraft" with approach visibility minimums of visual and not lower than 1 – mile.

With the current configuration, the RPZs for both runway ends are beyond the airport property and are not owned by the airport. There are no incompatible land uses in the runway RPZs. However, Mt. Baker Road transitions through the Runway 34 RPZ and Nina Lane transitions through the Runway 16 RPZ. Avigation easements have been acquired to protect the approach ends of the runways, to protect the airport from incompatible land use development and to keep the RPZs free of obstructions. See the Airport Property Map, Sheet 7 of the ALP drawing set for additional information regarding these easements.

Aircraft Parking Line (APL): The aircraft parking areas at the airport are all greater than 125' from the runway centerline and are outside the OFA, OFZ and primary surface. For the aircraft parking areas, the apron is located 44.5 feet from the taxiway centerline which is clear of the taxiway OFA.

Runway-Parallel Taxiway Separation: FAA design standards between runways and parallel taxiways are based on the ARC for that particular runway and the type of instrument approach capability. The standards for a runway/taxiway separation distance of ARC B-I

(small aircraft exclusively) specifies a runway/taxiway separation distance of 150 feet from centerline to centerline. Figure 7.1 – Runway Safety Areas, on the following page gives a visual representation of the Safety Areas just discussed.

FAR PART 77 SURFACES

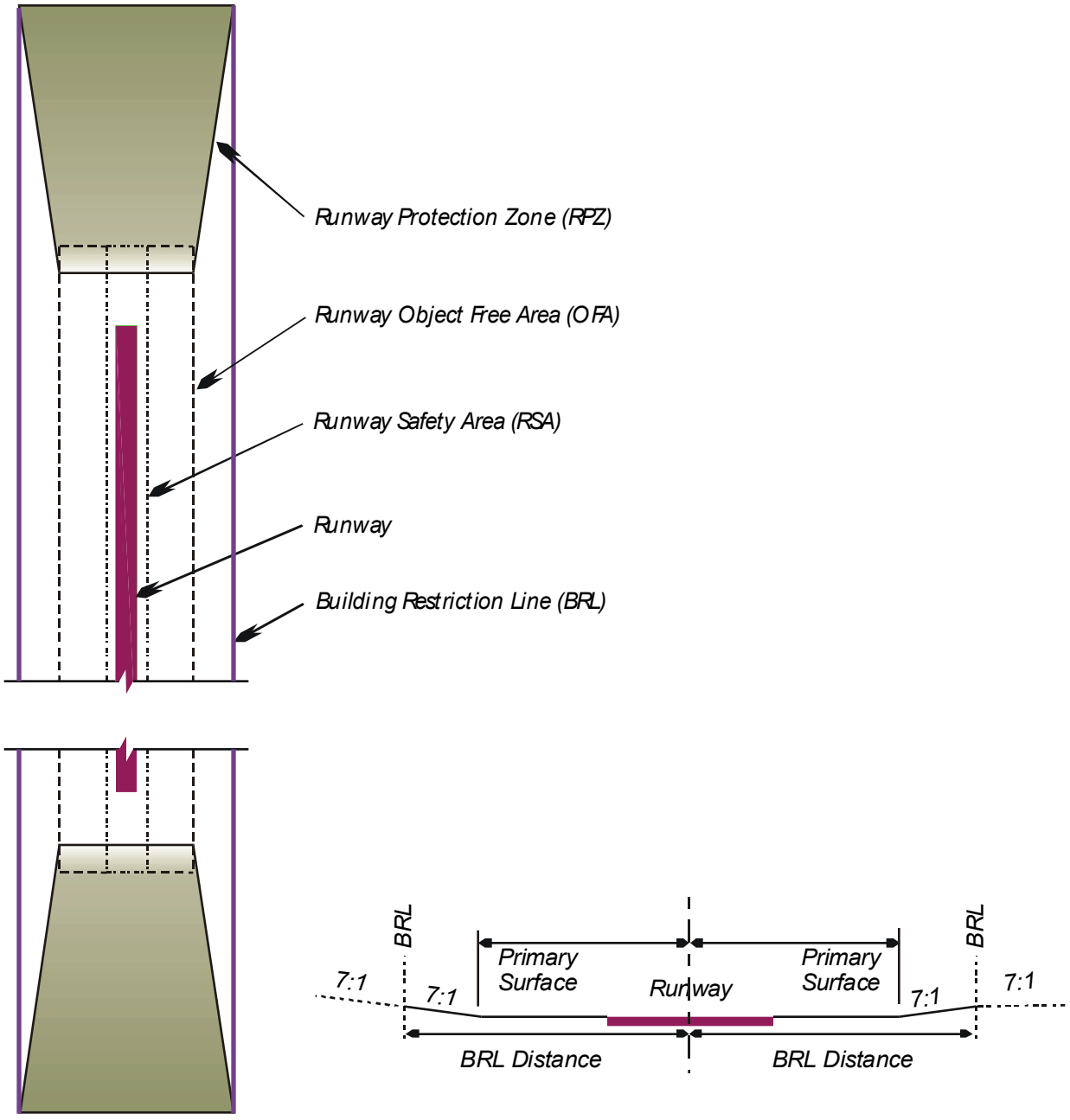
Airspace planning for airports in the United States is delineated under Federal Air Regulation (FAR) Part 77 – Objects Affecting Navigable Airspace. Part 77 represents the boundary that separates the airside and landside facilities and identifies suitable building area locations based on airspace and visibility criteria. Figure 7.2 shows a visual representation of the FAA Part 77 surfaces.

Based on the geographic constraints of the airport as described in Chapter 5, the airspace planning has been based upon visual approaches to the existing runway. Table 7.2 summarizes the FAR Part 77 standards for the Orcas Island Airport runway and visual approach.

Table 7.2
FAR Part 77 Airspace Surfaces
Orcas Island Airport

Item	Utility Visual
Width of Runway Primary Surface	250 feet
Radius of Horizontal Surface	5,000 feet
Runway Approach Surface Width at End	1,250 feet
Runway Approach Surface Length	5,000 feet
Runway Approach Slope	20:1

Figure 7.1
RUNWAY SAFETY AREAS
Orcas Island Airport Study

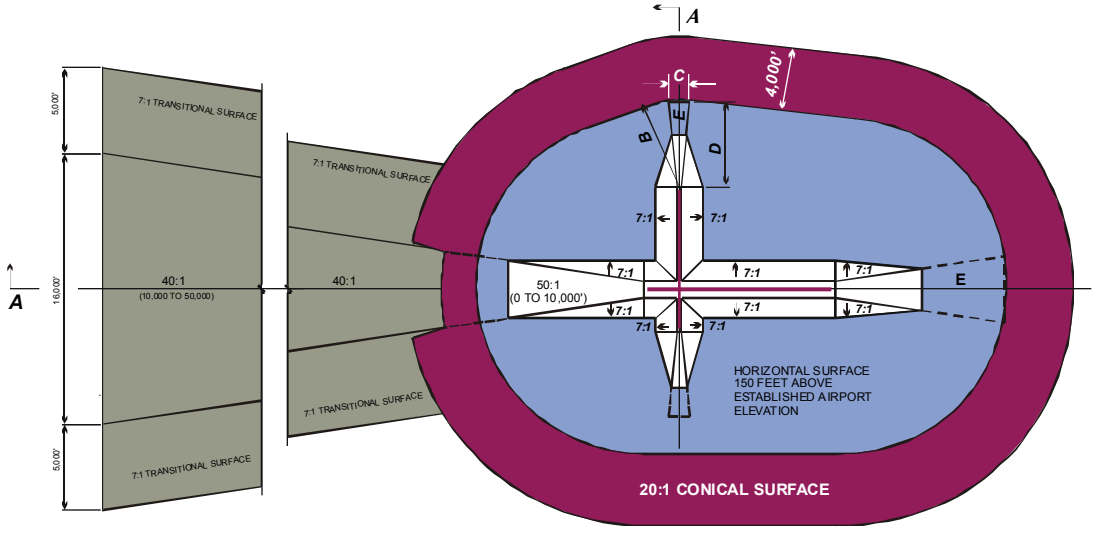


Source: FAA FAR Part 77, *Objects Affecting Navigable Airspace*.

Approach Surfaces: The approach surface is longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end. The inner edge of the approach surface is the same width as the primary surface and it expands uniformly to a width of 450 feet for the runway ends of an airport with visual approaches and designated as a "Small Aircraft Exclusively" airport.

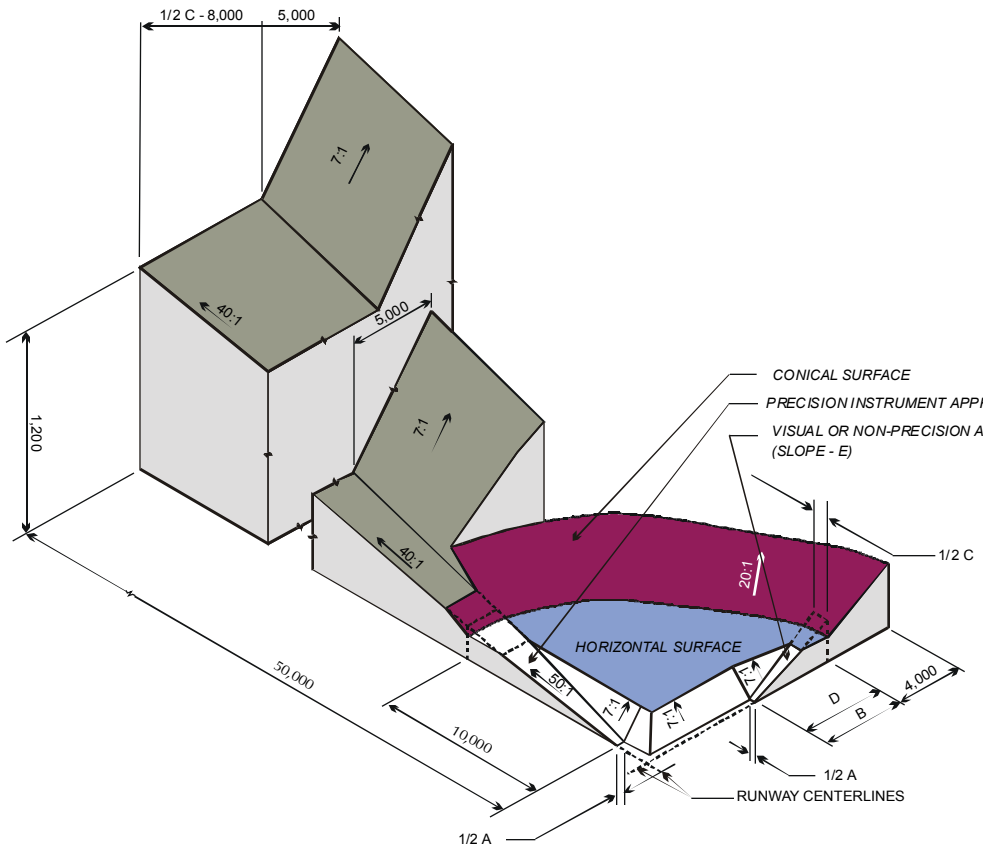
The helicopter landing area has one defined approach surface from the east that extends 4,000 feet from the paved surface at a slope of 8:1. There are no obstructions.

Figure 7.2
FAR PART 77 - IMAGINARY AIRPORT SURFACES
Orcas Island Airport Study



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 & APPROACH SURFACE 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 RUNWAY
		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 ¾ MILE
D - VISIBILITY MINIMUMS AS LOW AS ¾ MILE
* - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET



Source: FAA FAR Part 77, *Objects Affecting Navigable Airspace.*

Primary Surface: The primary surface is 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. 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 a primary surface is 250 feet for utility runways having only visual approaches. The primary surface should be free of obstructions except those items that are fixed by function such as PAPIs, REILS and taxiway lights. There are no obstructions to the primary surface area

The primary surface for the helicopter pad is defined by the flight operations area 40' wide surrounding the paved landing area. There are no obstructions to the area.

Transitional Surface: These surfaces extend outward and upward at right angles to the runway centerline and the 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. Transitional surfaces for those portions of the visual approach surface which project through and beyond the limits of the conical surface and extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

Based on information obtained during airport inventory, six structures (33, 34, 41, 45, 46 and 47) penetrate the transitional surface. It is recommended that roof top obstruction light be installed on the remaining buildings. Due to the fact that the airport is predominately a VFR use facility, the surface penetration (if lighted) created by the structure is considered minor.

Horizontal Surface: The horizontal surface is a flat plane of airspace 150' above the elevation of the runway. The outer boundary of the horizontal surface is defined by two 5,000 foot radii extending from the runway ends. The outer points of the radii for each runway end are connected to form an oval which is then referred to as the horizontal surface. The elevation of the horizontal surface is determined by the elevation of the airport, plus 150' or 181' for the Orcas Island Airport. There are no penetrations of the horizontal surface.

Conical Surface: The conical surface is the outer band of the Part 77 Airspace. It begins at the elevation of the horizontal surface and extends outward 4,000 feet at a slope of 20:1. The ceiling of the conical surface is 200' above the horizontal surface or 350' above the airport elevation. As shown on sheet 3 of the ALP drawing set, Double Hill, Lookout Hill and Buck Mountain penetrate this conical surface.

AIRSIDE REQUIREMENTS

Runway Length: FAA Advisory Circular 150/5325-4A, Runway Length Requirements, Computer Program Version 4.2, was used to determine the recommended runway length requirements for the Orcas Island Airport.

Table 7.3, Airport Runway Length Data, illustrates the runway design lengths as determined with respect to local conditions in order to achieve minimum safety levels. These conditions were considered as follows: 1) the airport elevation for the Orcas Island Airport – 31 feet mean sea level; 2) the average mean maximum daily temperature of 69°F for the hottest month; 3) the effective runway gradient of .005° between runway ends; 4) dry versus wet runway pavement (utility runway); and 5) the corresponding critical aircraft family of airplanes forecast to use the runway.

Based on the FAA runway length model, a design length and width of 2,300' x 60' accommodates 75 percent of small airplanes under wet and slippery pavement conditions and 2,840' x 60' accommodates 95 percent of small airplanes under wet and slippery

pavement conditions. The runway length at Orcas Island is 2,900' x 60' which accommodates 95% of the small airplane fleet.

Pavement Strength: Pavements designed in accordance with the standards set forth in FAA AC 150/5320-6D are intended to provide a structural life of 20 years without major maintenance, provided that aviation demand is not significantly greater than forecast levels and routine maintenance activities are performed. Pavement strength is normally achieved through sufficient initial design and periodic overlays, and is maintained through routine crack seal, slurry seal maintenance and upkeep projects. At a minimum, the design pavement strength should accommodate the existing and future mix of aircraft expected to use the airport. The ultimate runway pavement strength of 12,500 lbs. is recommended.

Table 7.3
Airport Runway Data Length
Orcas Island Airport

Airport and Runway Data	Orcas Island Input
Airport elevation	31.0'
Mean daily maximum temperature of the hottest month	69° F
Maximum difference in runway centerline elevation	22.0'
Recommended Runway Length/Corresponding ARC	Length – Dry/Wet
Small airplanes with less than 10 passenger seats:	
75 percent of these small airplanes (ARC B-I Small)	2,300'
95 percent of these small airplanes (ARC B-I Small)	2,840'
Existing Runway Design/Corresponding ARC	*Design Length*
Runway (ARC B-I Small)	2,900'

Note 1: Wet & slippery apply to landing distance; runway end elevation applies to takeoff distance.

Source: AC 150/5325-4A (FAA Computer Model),
Runway Length Requirements for Airport Design.

Airfield Capacity: The capacity of a general aviation airport with a single runway configuration has a range between 20 to 30 operations per hour during day time visual meteorological conditions (VFR). Based upon the projected aviation activity described in chapter 3 of this report, the existing facility will accommodate the forecast demand without much delay.

SECONDARY / CROSSWIND RUNWAY LENGTH REQUIREMENTS

Crosswind runways are normally constructed to accommodate wind conditions and/or increase airfield capacity and safety. Based on wind coverage and geographic constraints, a crosswind runway is not feasible at the Orcas Island Airport.

TAXIWAY SYSTEM

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access between the aprons and runways, whereas other taxiways become necessary as activity increases at an airport to provide safe and efficient use of the airfield.

The FAA has established standards for taxiway width and runway/taxiway separation distances. Taxiway width is determined by the ADG of the most demanding aircraft to use the taxiway. According to FAA design standards, the minimum taxiway width for ADG I is 25 feet. This width applies to all taxiways serving the runway and corporate and FBO hangar areas serving large business aircraft. Design standards for the separation distances between runways and parallel taxiways are based primarily on the ARC for that particular runway and the type of instrument approach capability. FAA design standards specify a runway/taxiway separation distance of ARC B-I (small aircraft exclusively) standards specific a runway/taxiway separation distance of 150 feet. The parallel taxiway system at the Airport meets this FAA design standard.

Taxiway Safety Standards: All entry taxiways must provide acceptable hold-short locations in compliance with threshold siting surface (TSS) and obstacle free zone (OFZ) criteria. All non-aeronautical objects must also be located beyond the taxiway object free area (TOFA), which is a total of 89 feet wide (Design Group I) along the taxiway (44.5' on both sides of the centerline). Existing and planned taxiways are shown on the Airport Layout and Terminal Area Drawings per FAA airport design standards. The Taxiway Safety Area width is 49' (24.5' on both sides of the centerline). There are no obstructions to the taxiway safety areas.

Taxilane Requirements: Taxilanes provide access to airplane parking areas, fueling areas and hangars. Typically, taxilanes should provide for a minimum 15 feet of wing tip clearance

on both sides of the aircraft wing. The taxilane object free area (TOFA) is 79 feet wide (Design Group I).[1] There are no obstructions to the taxiway safety areas.

Segmented Circle Marking System: A segmented circle is a 100-foot diameter circle with at least 18 segments is constructed around the airport's wind direction indicator. The circle helps the visiting pilot to locate the wind indicator. It also serves as another visual identification of an airport. Segments are similar to those used to mark unpaved runways. Airports having nonstandard traffic patterns are able to convey this information with traffic pattern indicators located adjacent to the segmented circle. (See AC 150/5340-5B). The circle should be readily discernable from the air as well as the ground. The color(s) used should provide the best possible contrast with the surroundings. Aviation White is the recommended color for the Segmented Circle at Orcas Island.

VEHICLE PARKING

Automobile parking is available near the entrance road to the airport and near the Terminal Building. The parking is adequate to meet the future needs of the airport. However, the development of the Larson Property as shown in chapter six shows several long term auto parking planning concepts associated with future hangar development and airport access.

Figure 7.3
Existing Auto Parking
Orcas Island Airport

[1] Critical Aircraft wingspan of 49' (49+15+15=79')

SUMMARY / FINDINGS

- The Port of Orcas Island was formed on January 12, 1959 and began operating the Airport as a public use Airport. The Orcas Island Airport is located ½ mile north of the Village of Eastsound. The airfield consists of a single Runway 16-34 (2,900' x 60') paved surface.

- This Airport has been designated by the State of Washington as an Essential Public Facility. This designation directs Cities and Counties to protect these facilities by discouraging the siting of incompatible land uses adjacent to such Airports.

- Orcas Island Airport is classified as a small (12,500 lbs SWG and below) commercial service Airport with only visual approaches. An instrument approach to the Airport would significantly improve the safety and viability of the facility while maintaining its status as crucial component to the regional transportation system. Climatic analysis indicates that this region experiences *marginal VFR* approximately 7.7 percent annually. In other words, this would equal about 28 days out of the year that the Airport is not able to serve the regional transportation system.

- The National Plan of Integrated Airport Systems (NPIAS) identifies Orcas Island Airport as a commercial service Airport with Airport Reference Code (ARC) of B-I, Small.

- The critical aircraft for the Orcas Island Airport is represented by the *Cessna C-402* which falls under the Airport Reference Code (ARC) B-I category. The **C 402** is a light-medium twin-engine piston aircraft developed and manufactured by Cessna Aircraft Corporation.

- The Airport offers a variety of aviation related services. Aviation services include aircraft fueling, maintenance, charter, flight training and bi-plane excursion rides.

- The weather conditions for the Orcas Island Airport region experiences Marginal VFR, or below, approximately 7.7 percent of the time, or 28 days out of the year.

- A Non-Precision Circling (Day Time Use only) approach to the airport will be published in the summer of 2007 and as RNP (Required Navigation Performance) approaches are developed for the general aviation community, further study should be done to determine the feasibility of establishing this type of instrument approach at the Airport.

- An FAA 405 survey has been scheduled through the FAA for the Orcas Island Airport to document the obstructions at the airport and in the airport area as identified in Exhibit 5.2 – Instrument Approach Segments. This survey will provide information required to allow night time operational use of the circling approach and remove the day time use only classification. The 405 survey is also a prerequisite to the creation of the LPV-RNAV/GPS straight-in approach to Runway 16.

- Alternative Four is the Preferred Alternative providing for expansion of T-hangars and executive style hangars on the Larson Property. In order to preserve and improve visual appearance of the airport and improvements a greenbelt is depicted north of Mt. Baker Road and west of North Beach Road. The main airport entrance point for automobile traffic to the airport is shown to be via North Beach Road turning onto the airport property travelling west to the ultimate long term parking area and terminal building. This alternative also shows an exchange of the Enderline property for Larson Property with the planned airport entrance road located south of the ultimate Enderline property. The existing Enderline property will ultimately be used for long term auto parking, additional ramp area and the relocated terminal building. Short-term auto parking is shown in front of the relocated terminal building. An additional long-term auto parking area for the corporate hangars is shown paralleling Mt. Baker Road behind the greenbelt. The remaining southeastern section of the Larson Property is open space.

Table 7.4 Airport Design Standard Summary shows the airfield design standards for ADG I small aircraft.

Table 7.4
Airport Design Standard Summary
Orcas Island Airport

Item	Runway 16/34 *Existing Conditions*	ADG I [1] (small aircraft exclusively)
Runway Length	2900	2840 [2]
Runway Width	60	60
Runway Shoulder Width	<10	10
Runway Safety Area Width	120	120
Runway Safety Area Lengthen (Beyond Rwy End)	240	240
Obstacle-Free Zone Width	250	250
Object Free Area Width	250	250
Object Free Area Length (Beyond Rwy End)	240	240
Primay Surface Width	250	250
Primary Surface Length (Beyond Rwy End)	200	200
Runway Protection Zone Length	1000 [3]	1,000
Runway Protection Zone Inner Width	250	250
Runway Protection Zone Outer Width	450	450
Runway Centerline to:		
Parallel Taxiway/Taxilane Centerline	150	150
Aircraft Parking Area	200	100
Building Restriction Line	370 [4]	370 [4]
Taxiway Width	25	25
Taxiway Shoulder Width	N/A	10
Taxiway Safety Area Width	>49	49
Taxiway Object Free Area Width	>89	89
Taxiway Centerline to Fixed/Movable Object	>44.5	44.5
Taxilane Object Free Area Width	>79	79
Taxilane Centerline to Fixed/Movable Object	>39.5	39.5

1. Utility (visual) runways per FAR Part 77 dimensions. All RPZ and AC 150/5300-13 dimensions reflect visual runways.
2. Runway length required to accommodate 95 fleet of GA fleet weighing 12,500 lbs. or less.
3. The Coastal Road - Nina Lane is located in the RPZ to Runway 16 and Mount Baker Road is located in the RPZ to Runway 34.
4. 370' provided for a 35' MSL building or hangar construction.

Table 7.5
Airport Runway Data[2]
Orcas Island Airport

AIRPORT AND RUNWAY DATA

Airport elevation	31 feet
Mean daily maximum temperature of the hottest month	69.00 F.
Maximum difference in runway centerline elevation	22 feet
Length of haul for airplanes of more than 60,000 pounds	500 miles

Wet & Slippery Runways

RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN

Small airplanes with approach speeds of less than 30 knots	300 feet
Small airplanes with approach speeds of less than 50 knots	800 feet
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	2300 feet
95 percent of these small airplanes	2840 feet
100 percent of these small airplanes	3360 feet
Small airplanes with 10 or more passenger seats	3900 feet

[2] Chapter 2 of AC 150/5325-4A, Runway Length Requirements for Airport Design.

Table 7.6
Airport Design Airplane and Airport Data[3]
Orcas Island Airport

Aircraft Approach Category B
Airplane Design Group I (Small Airplanes Exclusively)
Airplane wingspan . . . . . 48.99 feet
Primary runway end approach visibility minimums are visual exclusively
Other runway end approach visibility minimums are visual exclusively
Airplane undercarriage width (1.15 x main gear track) . . . 16.00 feet

RUNWAY AND TAXIWAY WIDTH AND CLEARANCE STANDARD DIMENSIONS

Airplane Group/ARC
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is not treated as a factor:

VFR operations with no intervening taxiway . . . . . 700 feet
VFR operations with one intervening taxiway . . . . . 700 feet
VFR operations with two intervening taxiways . . . . . 700 feet
IFR approach and departure with approach to near threshold 2500 feet less 100 ft for each 500 ft of threshold stagger to a minimum of 1000 feet.

Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is treated as a factor:

VFR operations . . . . . 2500 feet
IFR departures . . . . . 2500 feet
IFR approach and departure with approach to near threshold . . 2500 feet
IFR approach and departure with approach to far threshold 2500 feet plus 100 feet for each 500 feet of threshold stagger.
IFR approaches . . . . . 3400 feet

Runway centerline to parallel taxiway/taxilane centerline . 149.5 150 feet
Runway centerline to edge of aircraft parking . . . . . 125.0 125 feet
Runway width . . . . . 60 feet
Runway shoulder width . . . . . 10 feet
Runway blast pad width . . . . . 80 feet

[3] AC 150/5300-13, Airport Design.

Runway blast pad length	60 feet
Runway safety area width	120 feet
Runway safety area length beyond each runway end or stopway end, whichever is greater	240 feet
Runway object free area width	250 feet
Runway object free area length beyond each runway end or stopway end, whichever is greater	240 feet
Clearway width	500 feet
Stopway width	60 feet
Obstacle free zone (OFZ)	
Runway OFZ width	250 feet
Runway OFZ length beyond each runway end	200 feet
Inner-approach OFZ width	250 feet
Inner-approach OFZ length beyond approach light system	200 feet
Inner-approach OFZ slope from 200 feet beyond threshold	50:1
Inner-transitional OFZ slope	0:1
Runway protection zone at the primary runway end	
Width 200 feet from runway end	250 feet
Width 1200 feet from runway end	450 feet
Length	1000 feet
Runway protection zone at other runway end	
Width 200 feet from runway end	250 feet
Width 1200 feet from runway end	450 feet
Length	1000 feet
Departure runway protection zone	
Width 200 feet from the far end of TORA	250 feet
Width 1200 feet from the far end of TORA	450 feet
Length	1000 feet
Threshold surface at primary runway end	
Distance out from threshold to start of surface	0 feet
Width of surface at start of trapezoidal section	250 feet
Width of surface at end of trapezoidal section	700 feet
Length of trapezoidal section	2250 feet
Length of rectangular section	2750 feet
Slope of surface	20:1

Threshold surface at other runway end

Distance out from threshold to start of surface	0 feet
Width of surface at start of trapezoidal section	250 feet
Width of surface at end of trapezoidal section	700 feet
Length of trapezoidal section	2250 feet
Length of rectangular section	2750 feet
Slope of surface	20:1

Taxiway centerline to parallel taxiway/taxilane centerline	68.8	69 feet
Taxiway centerline to fixed or movable object	44.3	44.5 feet
Taxilane centerline to parallel taxilane centerline	63.9	64 feet
Taxilane centerline to fixed or movable object	39.4	39.5 feet
Taxiway width	26.0	26 feet
Taxiway shoulder width		10 feet
Taxiway safety area width	49.0	49 feet
Taxiway object free area width	88.6	89 feet
Taxilane object free area width	78.8	79 feet
Taxiway edge safety margin		5 feet
Taxiway wingtip clearance	19.8	20 feet
Taxilane wingtip clearance	14.9	15 feet

This page intentionally left blank.

8

Chapter 8

AIRPORT CAPITAL IMPROVEMENT PROGRAM

Through the evaluation of the airfield analysis and inventory phase of the airport layout plan, the improvements needed at Orcas Island Airport over the next 10-year period have been determined. The capital improvement plan provides the basis for planning the funding of these improvements.

CAPITAL IMPROVEMENT PROJECTS

The Capital Improvement Plan (CIP) develops both the timeline for the airport improvements and estimated costs for those improvements.

PROJECT COSTS

A list of improvements and costs over the next 10-years are included on the following page of this chapter. All costs are estimated in 2007 dollars. Total project costs include construction, temporary flagging and signing, construction staking, testing, engineering, administration, and contingency, as applicable. Utilities including phone and power are not included in the new hangar projects, along with septic costs. No water service cost was added for the hangar developments.

FUNDING SOURCES

Funding for a CIP can come from several different sources, including the Federal Aviation Administration, State of Washington, the Port of Orcas, and private sources. Each project listed in the CIP has been assigned a total cost, which is then assigned a percentage based on its funding source(s) eligibility.

ESTIMATED DEVELOPMENT COSTS

Overall, ultimate airport development costs are an important consideration in the planning process. Traditionally, costs have tended to play a less significant and conclusive role when compared with other types of site selection factors, including land acquisition and the consequences of undetermined political influences.

As part of the airport development program, detailed costs for development and improvement projects have been estimated using the traditional funding patterns (95% federal/ 5% local).

Airport CIP
Eastsound

#	Project	Cost	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1	Stormwater Detention and Treatment [1]	750,000		750,000								
2	Terminal vehicle parking - phase one [2]	47,000		47,000								
3	Improve access road [2]	131,000			131,000							
4	Construct T-hangar taxilanes (Larson site) [2]	144,000			144,000							
5	Terminal Building - phase one [4]	390,000	Other Funds			390,000						
6	Rehab Terminal apron	90,000				90,000						
7	Rehab GA apron	600,000				600,000						
8	Rehab taxiways (slurry seal)	40,000					40,000					
9	Overlay rwy 16-34	950,000					950,000					
10	Environmental Assessment [2]	50,000						50,000				
11	Property Appraisals [3]	50,000						50,000				
12	Property Acquisition [3]	1,000,000							500,000	500,000		
13	Hangar Construction [2]	1,000,000	Private Funds						350,000	350,000	350,000	350,000
14	Update Master Plan	80,000									80,000	
	Total	5,322,000	-	797,000	275,000	690,000	990,000	100,000	500,000	500,000	80,000	-
		@ 95%	@ 95%	@ 95%	@ 95%	@ 95%	@ 95%	@ 95%	@ 95%	@ 95%	@ 95%	@ 95%
	FAA Share	4,105,900	-	717,300	261,250	655,500	940,500	95,000	450,000	450,000	72,000	-
	Source of FAA funds:											
	passenger entitlement EP carryover											
	non-primary entitlement NP			600,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
	NP carryover				107,700				55,000			
	state apportionment ST			117,300	3,550	505,500	790,500		245,000	300,000		
	discretionary DI											
	carryover		-	-	-	-	-	55,000	-	-	78,000	150,000

Notes:
1 Stormwater detention project includes airport property only.
2 Environmental Assesment work for ultimate development of Larson Property and relocation of terminal building
3 Property to be acquired for future aeronautical / aviation reserve.
4 Other Funding to be used if FAA AIP money is not available.

Chapter 9

AIRPORT LAYOUT PLAN DRAWING SET

A set of scaled *Airport Layout Plan* (ALP) drawings has been prepared for the Phillipsburg Municipal Airport, which graphically depicts the proposed facilities necessary for the operation and development of the Airport through the 20-year planning program. A reduced set is included in this chapter. The set includes:

- ***Airport Layout Drawing*** – A scaled single-page drawing depicting phased and ultimate airport development based on proposed land, facilities and equipment recommended for the short and long-term operation and development of the Airport. In addition, the Airport Layout Drawing displays separation and clearance distances for future unrestricted development of the airport and navigational (NAVAID) facilities. The layout is the result of a series of analyses to determine the optimum plan to yield a safe and cost-effective facility. The proposed improvements include projects needed to meet the projected aviation demands of the airport service area throughout the planning period.

- ***Airport Airspace Drawing*** - Includes a graphical depiction showing the land use area covered by FAR Part 77 imaginary surface criteria, which is used as a federal guideline to determine whether existing or proposed structures represent an obstruction to air navigation (penetrate any of the FAR Part 77 imaginary airspace surfaces). Once approved by the FAA, the FAR Part 77 airspace is reserved for aeronautical purposes. Therefore, it is recommended that the controlling government entities adopt *Height and Hazard* zoning to reflect the updated ALP, and to the extent reasonable, restrict and enforce the height of structures and objects of natural growth as appropriate within the FAR Part 77 airspace surface.

- ***Inner-Most Approach Surface Drawing*** - Large-scale drawings showing the plan *and* profile views of the approach surfaces. The plans are designed to identify current and potential structures (roadways, power lines, trees, etc.) in relation to the existing and ultimate runway threshold, and to determine the height elevations (clearance or violation) along the extended runway centerline approach slope. Each obstruction is identified in table format, with appropriate

future mitigation measures to ensure no threshold siting or obstacle free zone violations.

- ***Terminal Area Drawing*** - A large-scale drawing of the terminal area that depicts the phased construction of facilities to meet future terminal area requirements. The primary features of this plan include improvements and new development of facilities and equipment. The ultimate planned design for the terminal area is to provide adequate functional layout for aircraft parking, maneuvering, hangar and building development, and other types of airport-related development planned for the Airport. Additionally, the plan will provide adequate separation and clearances for future unrestricted development of all terminal facilities and equipment.

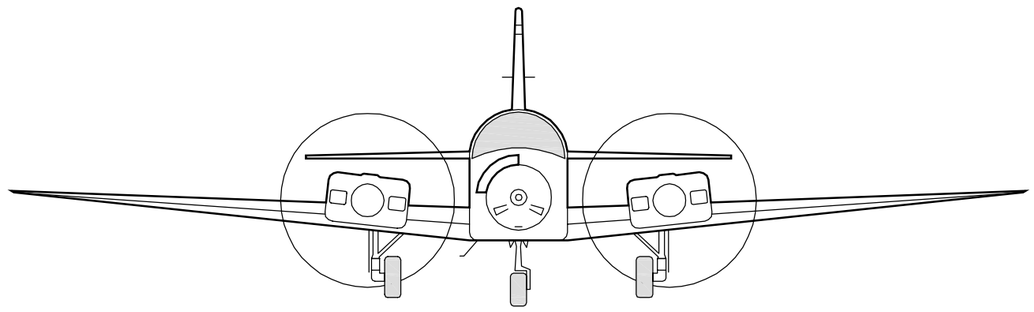
- ***Airport Land Use Drawing*** - A single-page drawing identifying on-airport and vicinity land use recommendations. The objective of the plan is to coordinate uses of airport property in a manner compatible with the functional design of the airport facility. Airport land-use planning is also important for the orderly development and efficient use of available spaces. This drawing depicts airport and adjacent land uses, identifies adjacent land users, and shows the location of major utilities (water, sewer, electric lines, etc.) in the vicinity of the airport site. When required by FAA Order 5050.4A, a noise exposure map in included as an overlay to the Land Use Plan for identification of areas unsuitable for existing and future development.

- ***Airport Property Drawing*** - A single-page drawing showing an overlay of all relevant tracts of existing and ultimate airport property and easement interests: including the size (acres), date (grant agreement) and existing ownership status of proposed airport property acquisition.

AIRPORT LAYOUT PLAN
FOR THE
ORCAS ISLAND AIRPORT
PORT OF ORCAS ISLAND, WASHINGTON

LOCATION MAP

NOT TO SCALE



VICINITY MAP

NOT TO SCALE

INDEX OF DRAWINGS

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

AIP PROJECT # 3-53-0023-06

PORT OF ORCAS, WASHINGTON
ORCAS ISLAND AIRPORT

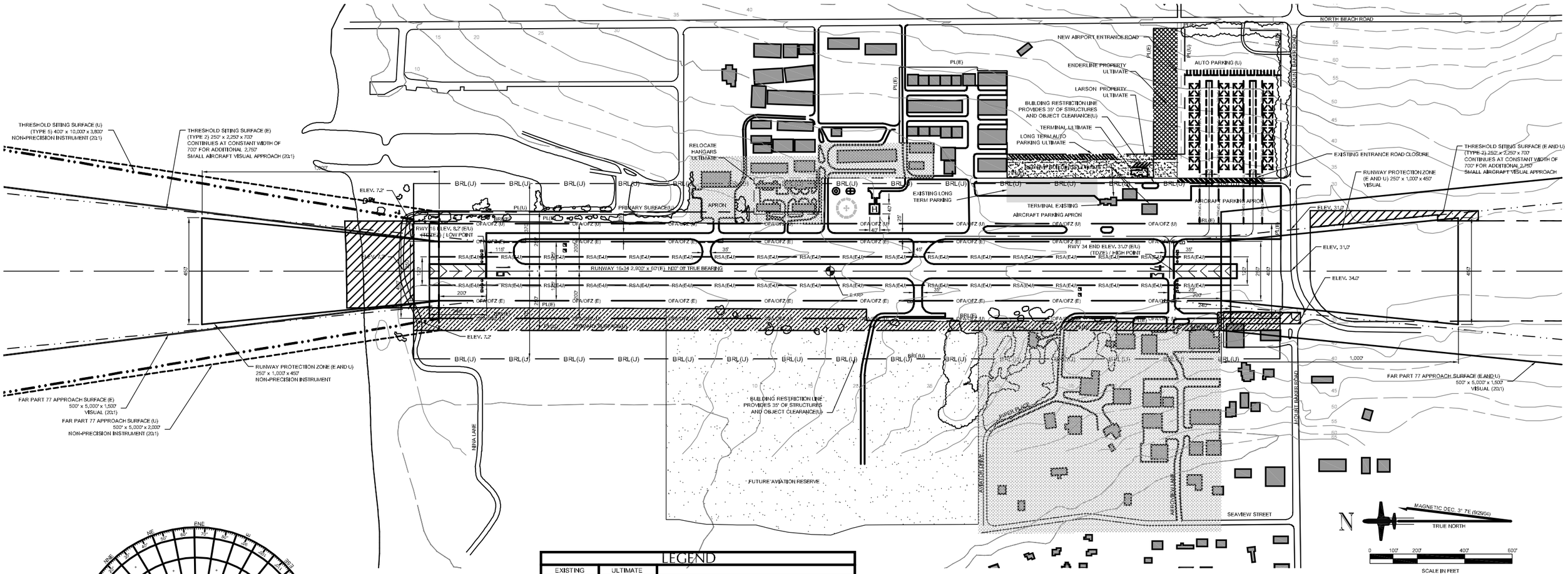
TITLE SHEET

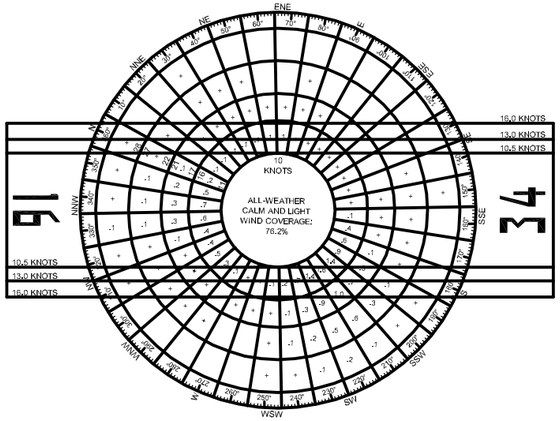
JOB NO. 2005-0201	DESIGNED BY: CHR	DATE: 03/23/06	REVISIONS:
DRAWING NO. ONE	DRAWN BY: MFL	DATE: 03/06/08	
SCALE AS SHOWN	CHECKED BY: BCW	DATE: 03/06/08	
SHEET: 1 OF 7	BUCHER, WILLIS & RATLIFF CORPORATION		

720 OLIVE WAY, SUITE 1200 SEATTLE, WASHINGTON 98101-1867 (206) 448-2123

KANSAS • MISSOURI • TEXAS • COLORADO • WASHINGTON • OKLAHOMA

AIRPORT LAYOUT DRAWING





LEGEND

EXISTING	ULTIMATE	
		FACILITIES
		BUILDINGS/STRUCTURES AND FUTURE HANGARS
		THROUGH THE FENCE OPERATORS (TTF)
		RELOCATE EXISTING LONG TERM AUTO PARKING TO LARSON PROPERTY
		FUTURE HANGAR DEVELOPMENT, LARSON PROPERTY
		ENDERLINE PROPERTY
		LARSON PROPERTY
		AIRPORT ROAD CLOSURE
		AIRPORT PROPERTY LINE
		AVIGATION EASEMENTS
BRL(E)	BRL(U)	BUILDING RESTRICTION LINE (BRL)
RSA(E)	RSA(U)	RUNWAY SAFETY AREA (RSA)
OFA(E)	OFA(U)	OBJECT FREE AREA (OFA)
RPZ(E)	RPZ(U)	RUNWAY PROTECTION ZONE (RPZ)
OFZ(E)	OFZ(U)	OBSTACLE FREE ZONE (OFZ)
TOFA(E)	TOFA(U)	TAXILANE OBJECT FREE AREA (TOFA)
		AIRPORT REFERENCE POINT (ARP)
		ROTATING BEACON
		SUPER AWOS (WEATHER STATION)
		PRECISION APPROACH PATH INDICATORS (PAPI-2L)
		HOLD POSITION MARKING
		LIGHTED WIND CONE & SEGMENTED CIRCLE
		RUNWAY THRESHOLD LIGHTS
		RUNWAY END IDENTIFIER LIGHTS (REIL)
		GROUND CONTOUR (USGS MAP)
		PAVED/GRAVEL/DIRT ROADWAY
X	XX	FENCING

MODIFICATION TO STANDARDS

NONE.

GENERAL NOTES

1. THERE ARE NO RUNWAY OBSTACLE FREE ZONE (ROFZ) OBJECT PENETRATIONS.
2. EXISTING AND FUTURE NON-AERONAUTICAL LAND USE IS SUBJECT TO ADDITIONAL STUDY AND COORDINATION WITH FAA.
3. RELOCATION OF BUILDINGS 30,31 AND 32 PREDICATED ON PUBLISHED STRAIGHT IN INSTRUMENT APPROACH PROCEDURE.
4. COMMUNITY GOAL IS TO CONTROL 50:1 PART 77 PRIMARY SURFACE FOR STRAIGHT IN INSTRUMENT APPROACH.

RUNWAY DATA TABLE

	RUNWAY 16-34 EXISTING		RUNWAY 16-34 ULTIMATE	
APPROACH CATEGORY/DESIGN GROUP	B-I SMALL		B-I SMALL	
RUNWAY LENGTH/WIDTH	2,900' x 60'		2,900' x 60'	
RUNWAY LIGHTING	MIRL		MIRL	
RUNWAY TYPE/MARKINGS	UTILITY		NON-PRECISION INSTRUMENT (NPI)	
EFFECTIVE RUNWAY GRADIENT (%)	1.2%		1.2%	
PAVEMENT MATERIAL	ASPHALT		ASPHALT	
PAVEMENT STRENGTH (LBS.)	12,500 (SWG)		12,500 (SWG)	
PRIMARY SURFACE	250' X 3,300'		500' X 3,300'	
RUNWAY PROTECTION ZONE (RPZ)	VISUAL, B-I SMALL		VISUAL, B-I SMALL	
	STANDARD	ACTUAL	STANDARD	ACTUAL
RSA DIMENSIONS (WIDTH)/LENGTH FROM RUNWAY APPROACH END)	120'	120'	120'	120'
OFA DIMENSIONS (WIDTH)/LENGTH FROM RUNWAY APPROACH END)	240'	240'	240'	240'
OFZ DIMENSIONS (WIDTH)/LENGTH FROM RUNWAY APPROACH END)	250'	250'	250'	250'
	200'	200'	200'	200'
HOLDING POSITION	125'		125'	
TAXIWAY WIDTH / TAXILANE WIDTH	25' / 13'		25' / 13'	
TAXIWAY MARKING/ LIGHTING	MITL		MITL	
	16	34	16	34
INSTRUMENT APPROACH AIDS	NONE	NONE	NONE	NONE
INSTRUMENT APPROACH	VISUAL	VISUAL	NON-PRECISION INSTRUMENT	VISUAL
VISUAL APPROACH AIDS	VASI-4L/REILS	PAPI-2L/REILS	PAPI-2L/REILS	PAPI-2R/REILS
RUNWAY VISIBILITY MINIMUMS	VISUAL	VISUAL	NPI	VISUAL
FAR PART-77 APPROACH SLOPE	20:1	20:1	34:1	20:1
TOUCHDOWN ZONE ELEVATION (TDZE)	8.2'	31.0'	8.2'	31.0'
(SWG)=SINGLE WHEEL GEAR				

AIRPORT DATA TABLE

		EXISTING	ULTIMATE
AIRPORT REFERENCE POINT COORDINATES (ARP)	NORTH LATITUDE	N 48° 42' 29.376"	N 48° 42' 29.376"
	WEST LONGITUDE	W 122° 54' 37.666"	W 122° 54' 37.666"
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		69° F	69° F
AIRPORT ELEVATION - MEAN SEA LEVEL (MSL)		31'	31'
AIRPORT ELECTRONIC NAVIGATIONAL AIDS		NONE	NONE
AIRPORT REFERENCE CODE (ARC)		B-I SMALL	B-I SMALL
CRITICAL AIRCRAFT		C-402	C-402
NPIAS SERVICE ROLE		NPIAS	NPIAS

RUNWAY END COORDINATES

RUNWAY END	LAT/LONG	EXISTING	ULTIMATE
RUNWAY 16	NORTH LATITUDE	N 48° 42' 44.3190"	N 48° 42' 44.3190"
	WEST LONGITUDE	W 122° 54' 38.0670"	W 122° 54' 38.0670"
RUNWAY 34	NORTH LATITUDE	N 48° 42' 15.6960"	N 48° 42' 15.6960"
	WEST LONGITUDE	W 122° 54' 38.2560"	W 122° 54' 38.2560"

WIND ROSE ANALYSIS

ALIGNMENT	WIND VELOCITY	ALL-WEATHER WIND COVERAGE
RUNWAY 16-34	10.5-KNOTS (ARC A-II & B-II)	88.08%
	13.0-KNOTS (ARC A-II & B-II)	93.99%
	16.0-KNOTS (ARC A-II, B-II & C-I TO D-II)	98.72%

SOURCE: WHIDBEY ISLAND NAVAL AIR STATION, WASHINGTON WEATHER STATION PERIOD: 1994 - 2004
ALL-WEATHER WIND OBSERVATIONS = 81,132

CALM WIND OBSERVATIONS (0-3 KNOTS): 12,052 OBS, ==> 14.8%
LIGHT WIND OBSERVATIONS (3-10.5 KNOTS): 55,626 OBS, ==>68.7%
CALM AND LIGHT WINDS (0-10.5 KNOTS): 66,688 OBS, ==> 84.6%
STRONG WINDS (GREATER THAN 10.5 KNOTS): 12,444 OBS, ==>15.3%D

DECLARED DISTANCE TABLE

EXISTING

RUNWAY	TORA	TODA	ASDA	LDA
16	2,900'	2,900'	2,900'	2,900'
34	2,900'	2,900'	2,900'	2,900'

ULTIMATE

RUNWAY	TORA	TODA	ASDA	LDA
16	2,900'	2,900'	2,900'	2,900'
34	2,900'	2,900'	2,900'	2,900'

DECLARED DISTANCES IN ACCORDANCE WITH AC 150/5300-13, CHANGE 8G

FEDERAL AVIATION ADMINISTRATION
NORTHWEST MOUNTAIN REGION
APPROVAL BLOCK

FAA OFFICIAL: DATE:

OFFICIAL TITLE: MANAGER, SEATTLE AIRPORTS DISTRICT OFFICE APPROVAL LETTER DATE:

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

PORT OF ORCAS, WASHINGTON
APPROVAL BLOCK

SUBMITTED BY:

OFFICIAL TITLE: DATE:

AIP PROJECT # 3-53-0023-06

PORT OF ORCAS, WASHINGTON
ORCAS ISLAND AIRPORT

AIRPORT LAYOUT DRAWING

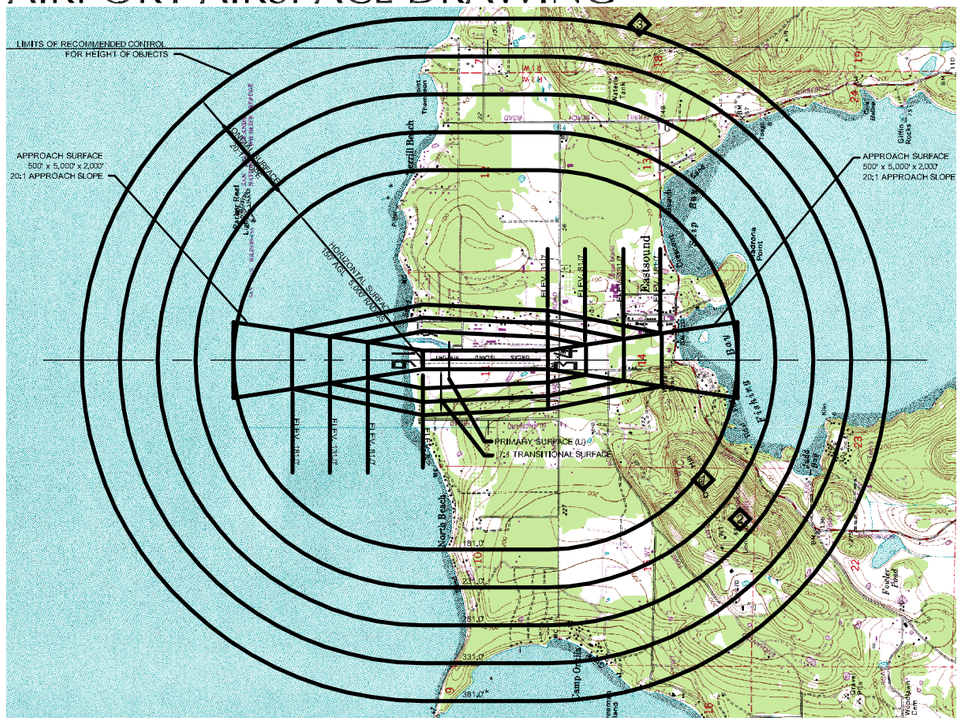
JOB NO. 2005-0201	DESIGNED BY: CHR	DATE: 03/23/06	REVISIONS:
DRAWING NO. TWO	DRAWN BY: MFL	DATE: 03/06/08	
SCALE AS SHOWN	CHECKED BY: BCW	DATE: 03/06/08	
SHEET: 2 OF 7	BUCHER, WILLIS & RATLIFF CORPORATION		

726 OLIVE WAY, SUITE 1200 SEATTLE, WASHINGTON 98101-1867 (206) 448-2123

KANSAS • MISSOURI • TEXAS • COLORADO • WASHINGTON • OKLAHOMA

I:\2005-0201\01-1st Project\ALP\ALP Orcas Island WA.dwg Mar 07, 2008 - 9:00am

AIRPORT AIRSPACE DRAWING



AIRSPACE LAYOUT

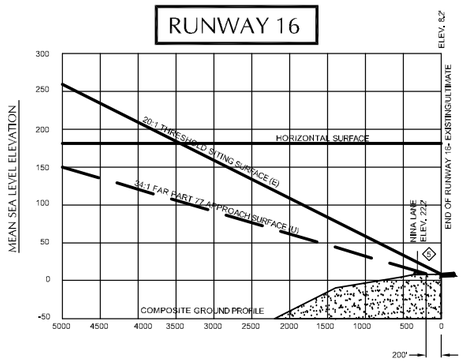
N

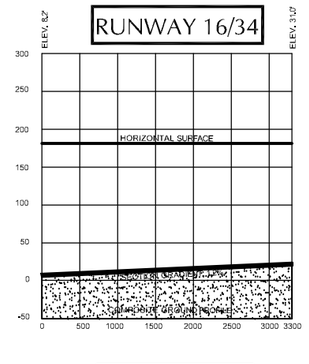
MAGNETIC DEC. 17.7E (9/2004)

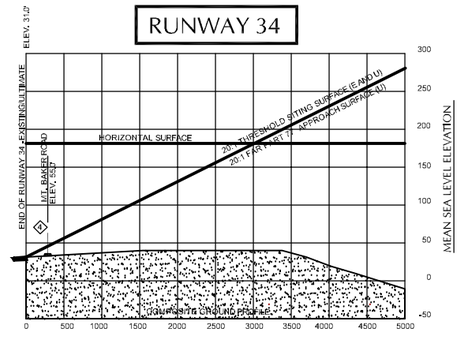
TRUE NORTH

0 1000' 2000' 4000' 6000'

SCALE IN FEET
1" = 2000'
ALL COORDINATES IN NAD 83







APPROACH PROFILE
SCALE IN FEET
HORIZONTAL SCALE 1" = 1000'
VERTICAL SCALE 1" = 100'

USGS MAPS

7.5 MINUTE USGS TOPOGRAPHICAL MAPS USED FOR CONTOUR BASEMAP. (YEAR PUBLISHED OR REVISED)

- MT CONSTITUTION, WA (1994)
- EASTSOUND, WA (1994)

AIRPORT DATA

AIRPORT ELEVATION (E) = 31.0'
HORIZONTAL SURFACE ELEVATION (E) = 181.0'
RUNWAY 16-34 LENGTH (E) = 2,900'

NOTES

1. REFER TO TERMINAL AND RUNWAY 16-34 INNER PORTION OF THE APPROACH SURFACE DRAWING FOR CLOSE-IN AIRPORT OBSTRUCTIONS.
2. ALL TREES SHOULD BE REMOVED/TOPPED WITHIN THE PRIMARY, TRANSITIONAL, AND APPROACH SURFACES IN ACCORDANCE WITH FAR PART 77. THE APPROACH SURFACE SHOULD BE CLEARED TO ESTABLISH AND MAINTAIN OBSTRUCTION FREE APPROACHES TO EACH RUNWAY END.
3. ELEVATIONS HAVE BEEN OBTAINED FROM THE MOST RECENT USGS MAPPING INFORMATION. TOWER ELEVATIONS WERE OBTAINED FROM THE FAA DIGITAL OBSTACLE FILE DATABASE (05/03).
4. CONTOUR ELEVATIONS CREATED FROM PREVIOUS AIRPORT LAYOUT PLAN, ENGINEERING DRAWING INFORMATION AND USGS DIGITAL ELEVATION MAPS. NO FAA-405 SURVEY WAS COMPLETED TO DETERMINE THE HEIGHTS OF OBJECTS IN THE AIRPORT VICINITY.
5. THE PROFILE VIEW DEPICTS THE MINIMUM FAR PART 77 CLEARANCE FOR PUBLIC ROADS 15.0' (PROFILE ELEVATION = TOP ELEVATION PLUS 15' FOR PUBLIC ROADS.)

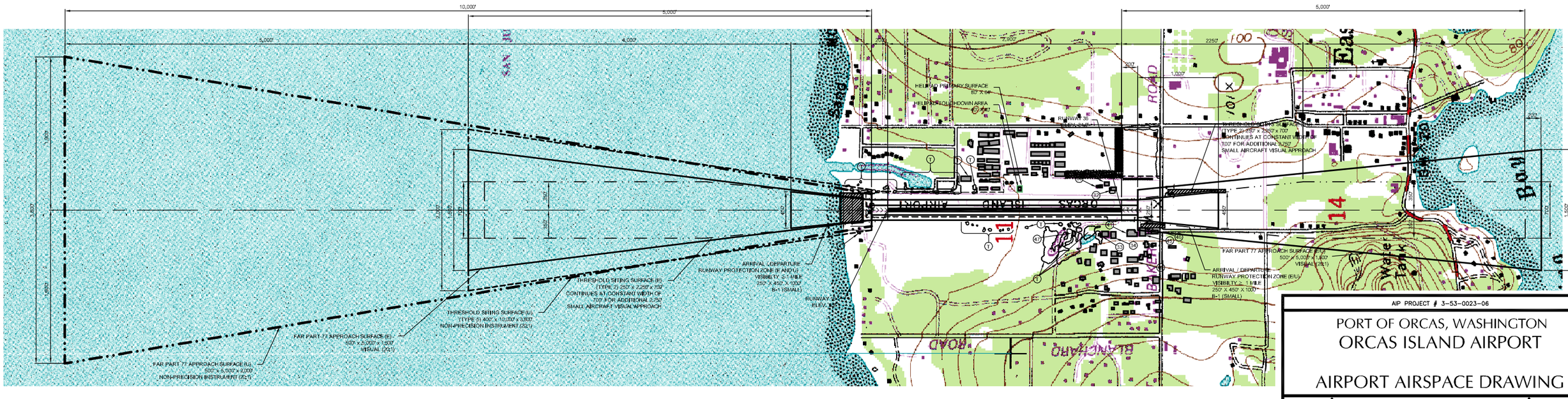
PART 77 OBSTRUCTION TABLE

NUMBER	ITEM	AFFECTED SURFACE	TOP ELEVATION	PENETRATION	MITIGATION
1	DOUBLE HILL TERRAIN	CONICAL SURFACE	500'	(+) 119'	LIGHT
2	LOOKOUT HILL TERRAIN	CONICAL SURFACE	690'	(+) 460'	LIGHT
3	BUCK MOUNTAIN TERRAIN	CONICAL SURFACE	400'	(+) 219'	LIGHT
4	MT. BAKER ROAD	TRANSITIONAL	55'	(+) 8'	LIGHT
5	NINA LANE	TRANSITIONAL	22.2'	(+) 12.57'	LIGHT
T	HANGAR ★	TRANSITIONAL	40' MSL	(+) 11.00'	LIGHT
30	TERMINAL / ADMINISTRATION ⬢	TRANSITIONAL	40.5' MSL	N/A	RELOCATE
31	HANGAR ⬢	TRANSITIONAL	54' MSL	N/A	RELOCATE
32	HANGAR ⬢	TRANSITIONAL	48.8' MSL	N/A	RELOCATE
33	CONVENTIONAL COMMON HANGAR ★	TRANSITIONAL	60' MSL	10'	LIGHT
34	CONVENTIONAL COMMON HANGAR ★	TRANSITIONAL	60' MSL	10'	LIGHT
41	CONVENTIONAL COMMON HANGAR ★	TRANSITIONAL	60' MSL	12'	LIGHT
42	CONVENTIONAL COMMON HANGAR ★	TRANSITIONAL	100' MSL	4'	LIGHT
45	MEDICAL ★	TRANSITIONAL	70' MSL	26'	LIGHT
46	MEDICAL ★	TRANSITIONAL	70' MSL	22'	LIGHT
47	HANGAR ★	TRANSITIONAL	60' MSL	12'	LIGHT
T	TREES	TRANSITIONAL	VARIES	VARIES	TRIM / REMOVE

NOTES:
NEGATIVE NUMBER REPRESENTS PENETRATION TO FAA PART 77.
FAA FORM 74-60 WILL BE FILED FOR OBSTRUCTIONS IN DATA TABLE.
STRUCTURES TO BE LIGHTED.

★ RECOMMEND LIGHTING STRUCTURE

⬢ STRUCTURE TO BE RELOCATED TO LARSON PROPERTY



THRESHOLD SITING REQUIREMENTS (PER AC 5300-13 APPENDIX 2 AND FAA PART 77 APPROACH SURFACES)
NTS

AIP PROJECT # 3-53-0023-06

PORT OF ORCAS, WASHINGTON
ORCAS ISLAND AIRPORT

AIRPORT AIRSPACE DRAWING

JOB NO. 2005-0201	DESIGNED BY: CHR	DATE: 03/23/06	REVISIONS:
DRAWING NO. THREE	DRAWN BY: MFL	DATE: 03/06/08	
SCALE AS SHOWN	CHECKED BY: BCW	DATE: 03/06/08	
SHEET: 3 OF 7	BUCHER, WILLIS & RATLIFF CORPORATION		

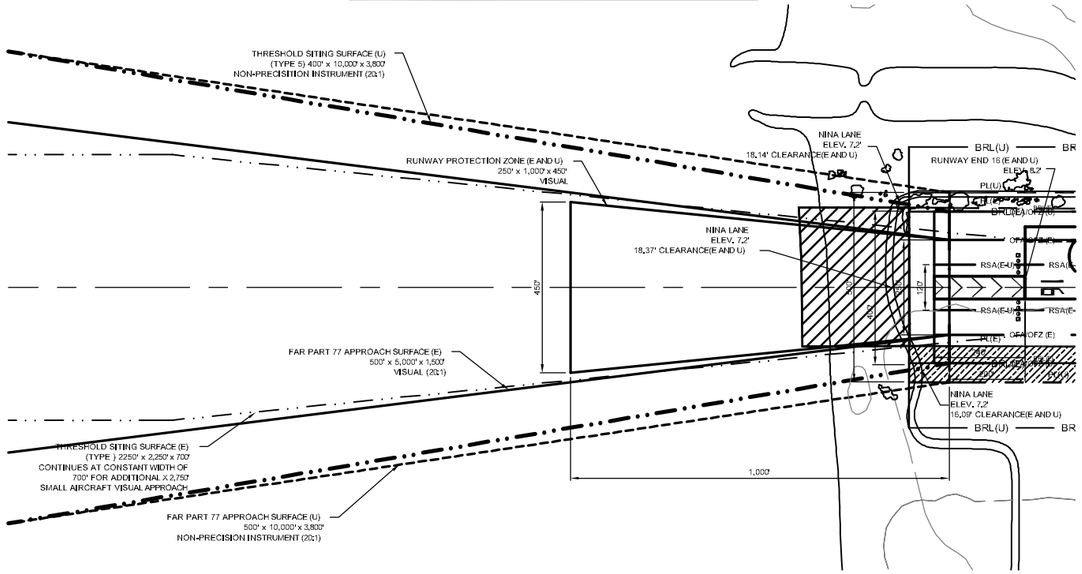
720 OLIVE WAY, SUITE 200 SEATTLE, WASHINGTON 98101-1867 (206) 448-2123

KANSAS • MISSOURI • TEXAS • COLORADO • WASHINGTON • OKLAHOMA

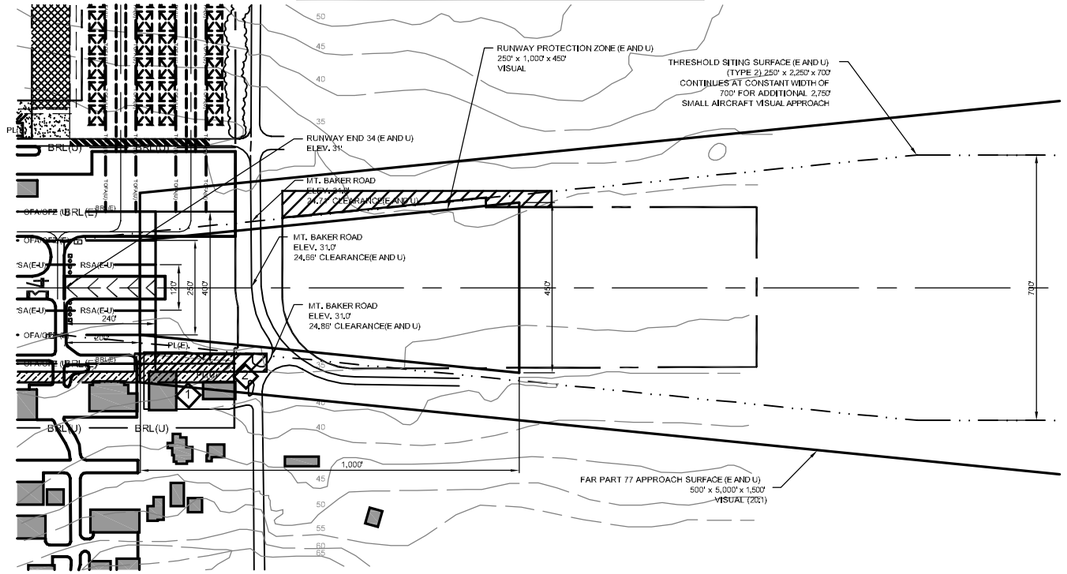
P:\2005-0201\01-1st Project\ACAD\Final ALD\ALPSET Orcas Island WA.dwg Mar 11, 2008 - 10:15am

RUNWAY 16-34 INNER PORTION OF THE APPROACH SURFACE DRAWING

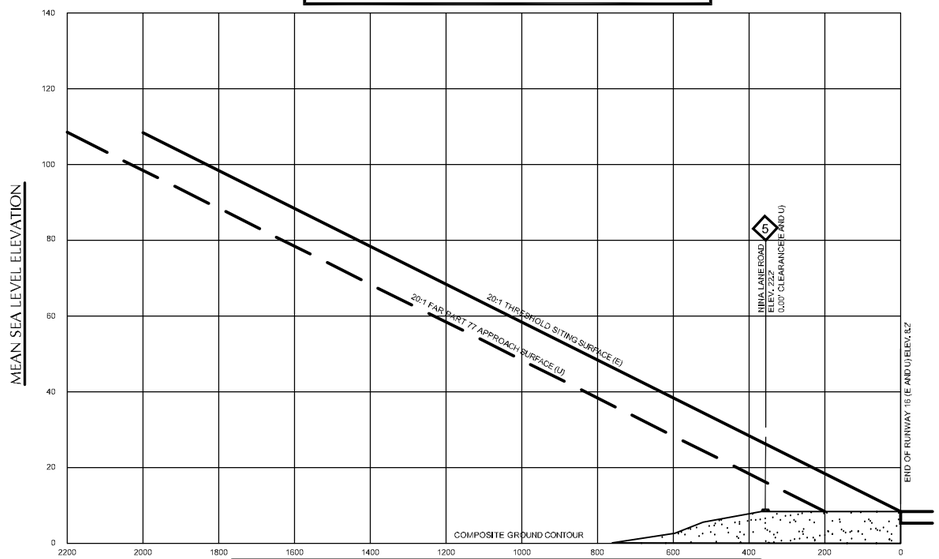
RUNWAY 16 PLAN VIEW



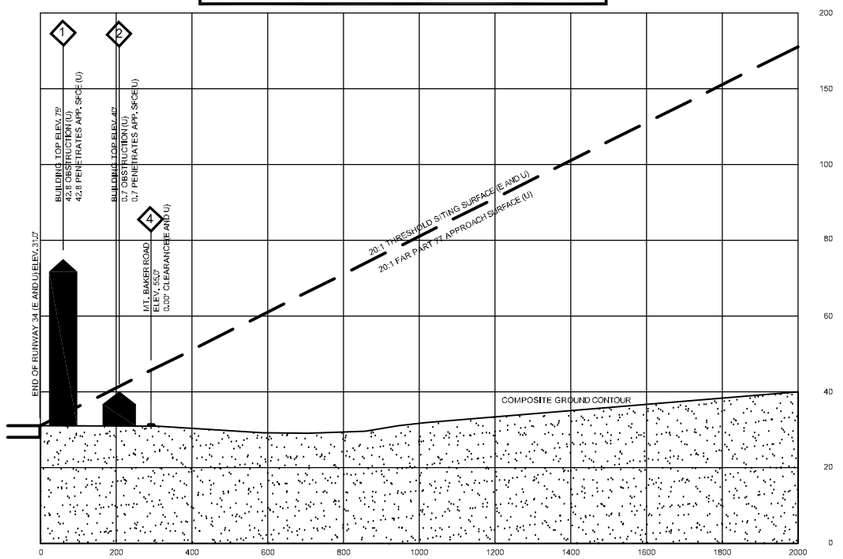
RUNWAY 34 PLAN VIEW



RUNWAY 16 PROFILE VIEW



RUNWAY 34 PROFILE VIEW



N

MAGNETIC DEC. 3° 7'E (6/29/04)

TRUE NORTH

0 100' 200' 400' 600'

SCALE IN FEET
HORIZONTAL SCALE 1" = 200'
VERTICAL SCALE 1" = 20'
ALL COORDINATES IN NAD 83

RUNWAY 16 OBSTRUCTION TABLE

ITEM	TOP ELEVATION	DESCRIPTION	AFFECTED SURFACE	OBSTRUCTION / PENETRATION	MITIGATION
5	22.2'	NINA LANE	TRANSITIONAL	12.51'	LIGHT STRUCTURE

CONTOUR ELEVATIONS CREATED FROM PREVIOUS AIRPORT LAYOUT PLAN, ENGINEERING DRAWING INFORMATION AND USGS DIGITAL ELEVATION MAPS. NO FAA 405 SURVEY WAS COMPLETED TO DETERMINE THE HEIGHTS OF OBJECTS IN THE AIRPORT VICINITY.

THE PROFILE VIEW DEPICTS THE MINIMUM FAR PART 77 CLEARANCE FOR PUBLIC ROADS 15.0'.

NO OBSTACLE FREE ZONE (OFZ) OBJECT PENETRATIONS

PENETRATION LISTED ABOVE IS FOR FAR PART 77 APPROACH SURFACE (AT 72' FROM THE END OF THE RUNWAY). NOTE THAT NINA LANE ALSO INTERCECTS THE 20:1 THRESHOLD SITING SURFACE WITH A PENETRATION OF 8.22' (AT 75' FROM THE END OF THE RUNWAY).

RUNWAY 34 OBSTRUCTION TABLE

ITEM	TOP ELEVATION	DESCRIPTION	AFFECTED SURFACE	OBSTRUCTION / PENETRATION	MITIGATION
1	75.0'	BUILDING	APPROACH SURFACE	42.8'	LIGHT STRUCTURE
2	40.0'	BUILDING	APPROACH SURFACE	0.7'	LIGHT STRUCTURE
4	55.0'	MT. BAKER ROAD	TRANSITIONAL	7.7'	LIGHT STRUCTURE

CONTOUR ELEVATIONS CREATED FROM PREVIOUS AIRPORT LAYOUT PLAN, ENGINEERING DRAWING INFORMATION AND USGS DIGITAL ELEVATION MAPS. NO FAA 405 SURVEY WAS COMPLETED TO DETERMINE THE HEIGHTS OF OBJECTS IN THE AIRPORT VICINITY.

THE PROFILE VIEW DEPICTS THE MINIMUM FAR PART 77 CLEARANCES FOR RAILROADS 23.0', INTERSTATE HIGHWAYS 17.0', PUBLIC ROADS 15.0', AND PRIVATE ROADS 15.0'.

LEGEND

EXISTING	ULTIMATE		EXISTING	ULTIMATE	
		FACILITIES			ROTATING BEACON
		BUILDINGS/STRUCTURES AND FUTURE HANGARS			SUPER AWOS (WEATHER STATION)
		AIRPORT PROPERTY LINE			PRECISION APPROACH PATH INDICATORS (PAPI-2L)
		AVIGATION EASEMENTS			HOLD POSITION MARKING
BRL(E)	BRL(U)	BUILDING RESTRICTION LINE (BRL)			LIGHTED WIND CONE & SEGMENTED CIRCLE
RSA (E)	RSA (U)	RUNWAY SAFETY AREA (RSA)			RUNWAY THRESHOLD LIGHTS
OFA (E)	OFA (U)	OBJECT FREE AREA (OFA)			RUNWAY END IDENTIFIER LIGHTS (REIL)
		RUNWAY PROTECTION ZONE (RPZ)			GROUND CONTOUR (USGS MAP)
OFZ (E)	OFZ (U)	OBSTACLE FREE ZONE (OFZ)			PAVED/GRAVEL/DIRT ROADWAY
		AIRPORT REFERENCE POINT (ARP)		XX	FENCING

AIP PROJECT # 3-53-0023-06

PORT OF ORCAS, WASHINGTON
ORCAS ISLAND AIRPORT
RUNWAY 16-34 INNER PORTION OF THE APPROACH SURFACE DRAWING

JOB NO. 2005-0201	DESIGNED BY: CHR	DATE: 03/23/06
DRAWING NO. FOUR	DRAWN BY: MFL	DATE: 03/06/08
SCALE AS SHOWN	CHECKED BY: BCW	DATE: 03/06/08
SHEET: 4		
OF 7		

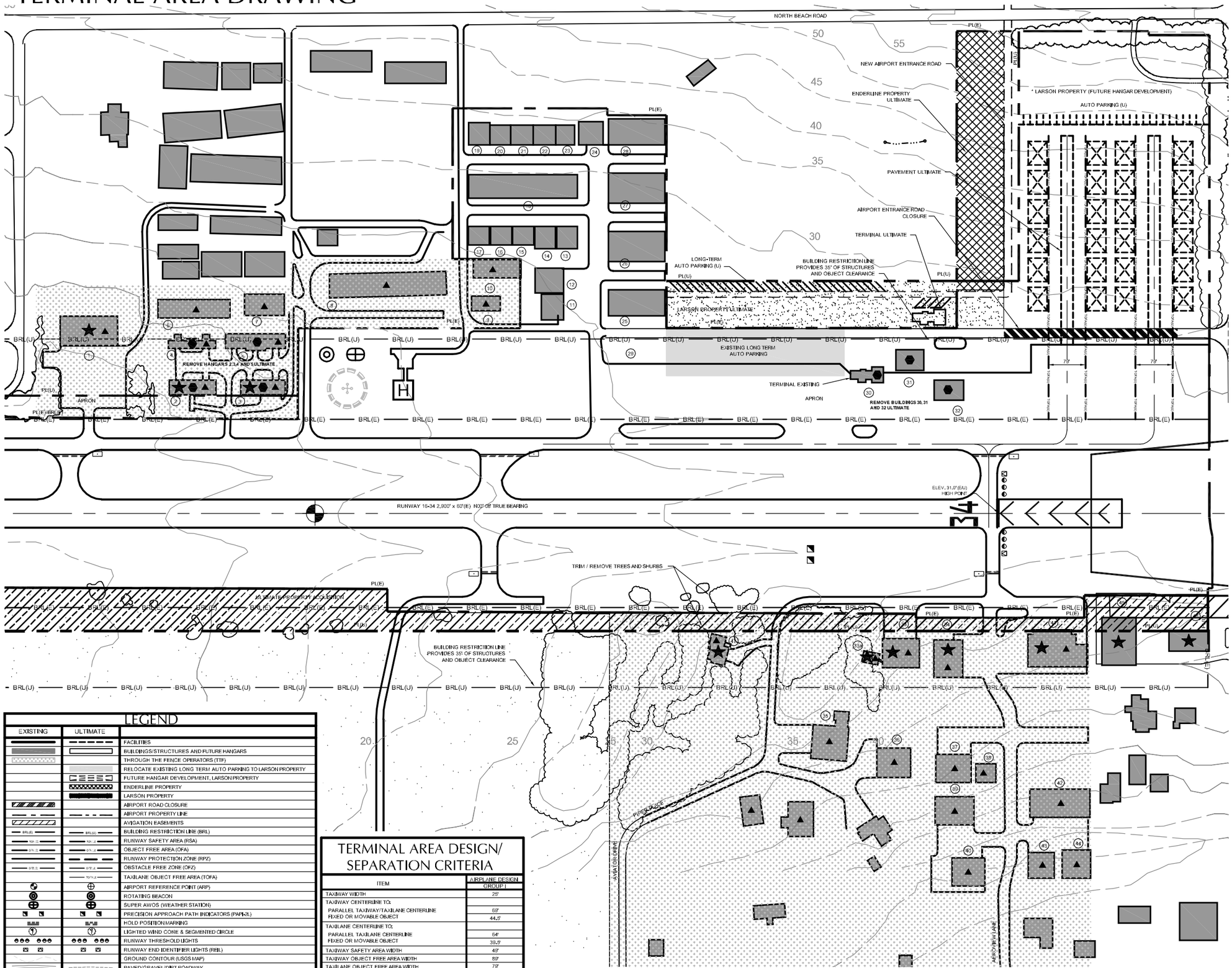
REVISIONS:

BUCHER, WILLIS & RATLIFF CORPORATION
720 OLIVE WAY, SUITE 1200 SEATTLE, WASHINGTON 98101-1857 (206) 448-2123

KANSAS • MISSOURI • TEXAS • COLORADO • WASHINGTON • OKLAHOMA

P:\2005-0201\01-1st Project\ACAD\Final ALP\ALPSET Orcas Island WA.dwg Mar 07, 2008 - 9:11am

TERMINAL AREA DRAWING



BUILDINGS AND FACILITIES

EXISTING

NO.	DESCRIPTION	TOP ELEVATION
1	HANGAR ▲ ★	40' MSL
2	T-HANGAR ▲ ⬢ ★	35.5' MSL
3	T-HANGAR ▲ ⬢ ★	35.5' MSL
4	T-HANGAR ▲ ⬢	40' MSL
5	T-HANGAR ▲ ⬢	35.5' MSL
6	T-HANGAR ▲	49' MSL
7	T-HANGAR ▲	39' MSL
8	T-HANGAR ▲	46.5' MSL
9	SEWER PLANT / OFFICE / SLIP TREATMENT ▲	41.5' MSL
10	SEWER PLANT / OFFICE / SLIP TREATMENT ▲	41.5' MSL
11	HANGAR	49.5' MSL
12	HANGAR	49.5' MSL
13	HANGAR	49.5' MSL
14	HANGAR	49.5' MSL
15	HANGAR	49.5' MSL
16	HANGAR	49.5' MSL
17	HANGAR	49.5' MSL
18	T-HANGAR	54.5' MSL
19	HANGAR	59.5' MSL
20	HANGAR	59.5' MSL
21	HANGAR	59.5' MSL
22	HANGAR	59.5' MSL
23	HANGAR	59.5' MSL
24	HANGAR	59.5' MSL
25	CONVENTIONAL COMMON HANGAR	59' MSL
26	CONVENTIONAL COMMON HANGAR	69' MSL
27	CONVENTIONAL COMMON HANGAR	71' MSL
28	CONVENTIONAL COMMON HANGAR	69' MSL
29	FUEL	48' MSL
30	TERMINAL / ADMINISTRATION ⬢	40.5' MSL
31	HANGAR ⬢	54' MSL
32	HANGAR ⬢	48.8' MSL
33	CONVENTIONAL COMMON HANGAR ▲ ★	60' MSL
34	HOUSE ▲ ★	45' MSL
35	CONVENTIONAL COMMON HANGAR ▲ ★	60' MSL
36	CONVENTIONAL COMMON HANGAR ▲	60' MSL
37	CONVENTIONAL COMMON HANGAR ▲	65' MSL
38	CONVENTIONAL COMMON HANGAR ▲	70' MSL
39	CONVENTIONAL COMMON HANGAR ▲	75' MSL
40	CONVENTIONAL COMMON HANGAR ▲	90' MSL
41	CONVENTIONAL COMMON HANGAR ▲ ★	60' MSL
42	CONVENTIONAL COMMON HANGAR ▲	100' MSL
43	CONVENTIONAL COMMON HANGAR ▲	90' MSL
44	CONVENTIONAL COMMON HANGAR ▲	90' MSL
45	MEDICAL ★	70' MSL
46	MEDICAL ★	40' MSL
47	HANGAR ▲ ★	60' MSL

NOTES:

★ RECOMMEND LIGHTING STRUCTURE

▲ THROUGH FENCE OPERATOR

⬢ STRUCTURE TO BE RELOCATED TO LARSON PROPERTY WHEN STRAIGHT-IN INSTRUMENT APPROACH IS ESTABLISHED

1. ULTIMATE PROPERTY ACQUISITION FOR CONTROL OF 50' PRIMARY SURFACE WILL BE DETERMINED AS NEEDED FOR STRAIGHT-IN INSTRUMENT APPROACH PROCEDURE.

* 2. CONCEPTUAL LAYOUT OF LARSON PROPERTY MAY CHANGE DUE TO SLOPE OF PROPERTY CONTOURS AS DETERMINED DURING THE ENGINEERING AND DESIGN PHASE OF PROJECT DEVELOPMENT.

3. AIRPORT IS OBLIGATED TO MAKE THE AIRPORT AS SELF SUSTAINING AS POSSIBLE. THE EXTENT OF THE NATIVE PLANTINGS IN AND AROUND THE AIRPORT WILL REQUIRE PLANNING AND COORDINATION WITH THE FAA.

N

MAGNETIC DEC. 3° 7E (9/29/04)

TRUE NORTH

0 50' 100' 200' 300'

SCALE IN FEET
1" = 100'

ALL COORDINATES IN NAD 83

LEGEND

EXISTING	ULTIMATE	
		FACILITIES
		BUILDINGS/STRUCTURES AND FUTURE HANGARS
		THROUGH THE FENCE OPERATORS (TTF)
		RELOCATE EXISTING LONG TERM AUTO PARKING TO LARSON PROPERTY
		FUTURE HANGAR DEVELOPMENT, LARSON PROPERTY
		ENDERLINE PROPERTY
		LARSON PROPERTY
		AIRPORT ROAD CLOSURE
		AIRPORT PROPERTY LINE
		AVIGATION EASEMENTS
BRL(E)	BRL(U)	BUILDING RESTRICTION LINE (BRL)
RSA	RSA	RUNWAY SAFETY AREA (RSA)
OFA	OFA	OBJECT FREE AREA (OFA)
RPZ	RPZ	RUNWAY PROTECTION ZONE (RPZ)
OFZ	OFZ	OBSTACLE FREE ZONE (OFZ)
TOFA	TOFA	TAXILANE OBJECT FREE AREA (TOFA)
		AIRPORT REFERENCE POINT (ARP)
		ROTATING BEACON
		SUPER AWOS (WEATHER STATION)
		PRECISION APPROACH PATH INDICATORS (PAPI-2L)
		HOLD POSITION MARKING
		LIGHTED WIND CONE & SEGMENTED CIRCLE
		RUNWAY THRESHOLD LIGHTS
		RUNWAY END IDENTIFIER LIGHTS (REIL)
		GROUND CONTOUR (USGS MAP)
		PAVED/GRAVEL/DIRT ROADWAY
X	XX	FENCING

TERMINAL AREA DESIGN/ SEPARATION CRITERIA

ITEM	AIRPLANE DESIGN GROUP I
TAXIWAY WIDTH	25'
TAXIWAY CENTERLINE TO:	
PARALLEL TAXIWAY/TAXILANE CENTERLINE FIXED OR MOVABLE OBJECT	69' 44.5'
TAXILANE CENTERLINE TO:	
PARALLEL TAXILANE CENTERLINE FIXED OR MOVABLE OBJECT	64' 39.5'
TAXIWAY SAFETY AREA WIDTH	49'
TAXIWAY OBJECT FREE AREA WIDTH	89'
TAXILANE OBJECT FREE AREA WIDTH	79'

BASED ON FAA ADVISORY CIRCULAR 150/5300-13, CHANGE #11

AIP PROJECT # 3-53-0023-06

PORT OF ORCAS, WASHINGTON
ORCAS ISLAND AIRPORT

TERMINAL AREA DRAWING

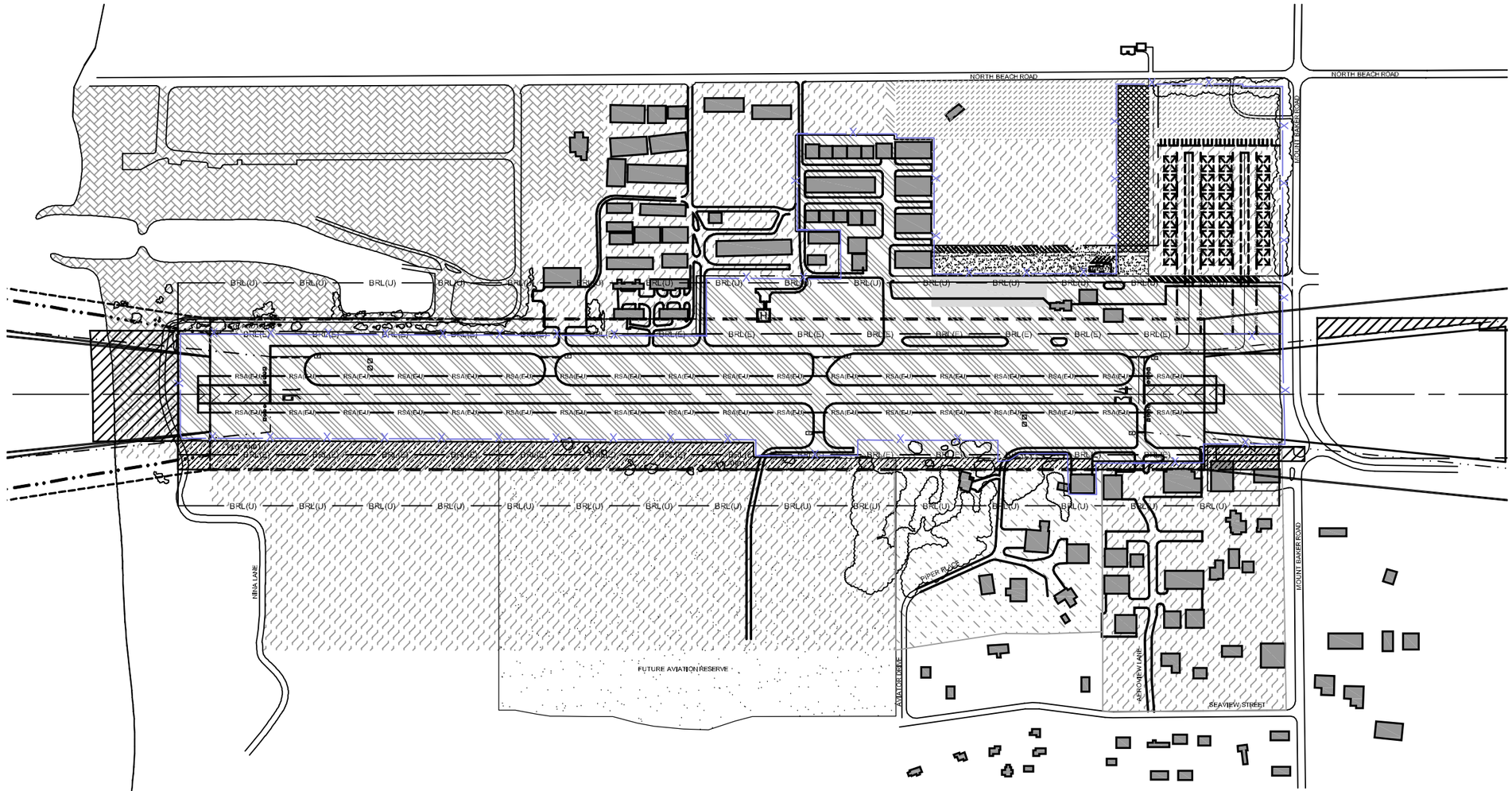
JOB NO. 2005-0201	DESIGNED BY: CHR	DATE: 03/23/06	REVISIONS:
DRAWING NO. FIVE	DRAWN BY: MFL	DATE: 03/06/08	
SCALE AS SHOWN	CHECKED BY: BCW	DATE: 03/06/08	
SHEET: 5 OF 7			

BUCHER, WILLIS & RATLIFF CORPORATION
720 OLIVE WAY, SUITE 1200 SEATTLE, WASHINGTON 98101-1867 (206) 448-2123

KANSAS • MISSOURI • TEXAS • COLORADO • WASHINGTON • OKLAHOMA

P:\2005-0201\01-1st Project\ACAD\Final ALP\ALPSET Orcas Island WA.dwg Mar 07, 2008 - 9:12am

AIRPORT LAND USE DRAWING



LEGEND

EXISTING	ULTIMATE	
		FACILITIES
		BUILDINGS/STRUCTURES AND FUTURE HANGARS
		THROUGH THE FENCE OPERATORS (TTF)
		RELOCATE EXISTING LONG TERM AUTO PARKING TO LARSON PROPERTY
		FUTURE HANGAR DEVELOPMENT, LARSON PROPERTY
		ENDERLINE PROPERTY
		LARSON PROPERTY
		AIRPORT ROAD CLOSURE
		AIRPORT PROPERTY LINE
		AVIGATION EASEMENTS
BRL(E)	BRL(U)	BUILDING RESTRICTION LINE (BRL)
RSA(E)	RSA(U)	RUNWAY SAFETY AREA (RSA)
OFA(E)	OFA(U)	OBJECT FREE AREA (OFA)
RPZ(E)	RPZ(U)	RUNWAY PROTECTION ZONE (RPZ)
OFZ(E)	OFZ(U)	OBSTACLE FREE ZONE (OFZ)
	TOFA(U)	TAXILANE OBJECT FREE AREA (TOFA)
		AIRPORT REFERENCE POINT (ARP)
		ROTATING BEACON
		SUPER AWOS (WEATHER STATION)
		PRECISION APPROACH PATH INDICATORS (PAPI-2L)
		HOLD POSITION MARKING
		LIGHTED WIND CONE & SEGMENTED CIRCLE
		RUNWAY THRESHOLD LIGHTS
		RUNWAY END IDENTIFIER LIGHTS (REIL)
		GROUND CONTOUR (USGS MAP)
		PAVED/GRAVEL/DIRT ROADWAY
X	XX	FENCING

LAND USE LEGEND

	MARINA
	SERVICE AND LIGHT INDUSTRIAL
	EASTSOUND RESIDENTIAL, 2/ACRE P*
	EASTSOUND RESIDENTIAL, 4/ACRE P*
	EASTSOUND AIRPORT DISTRICT

* IN COMPLIANCE WITH GMA REQUIREMENTS, SITE PLANNING AND REVIEW IS REQUIRED TO ENSURE THAT THE DEVELOPMENT WILL NOT PRECLUDE A DENSITY OF AT LEAST 4 UNITS PER ACRE.

NOTE:
THE AIRPORT IS AN ESSENTIAL PUBLIC FACILITY.

N

MAGNETIC DEC. 17.7E (9/2004)

TRUE NORTH

0 100' 200' 400' 600'

SCALE IN FEET
1" = 200'
ALL COORDINATES IN NAD 83

AIP PROJECT # 3-53-0023-06

PORT OF ORCAS, WASHINGTON
ORCAS ISLAND AIRPORT

AIRPORT LAND USE DRAWING

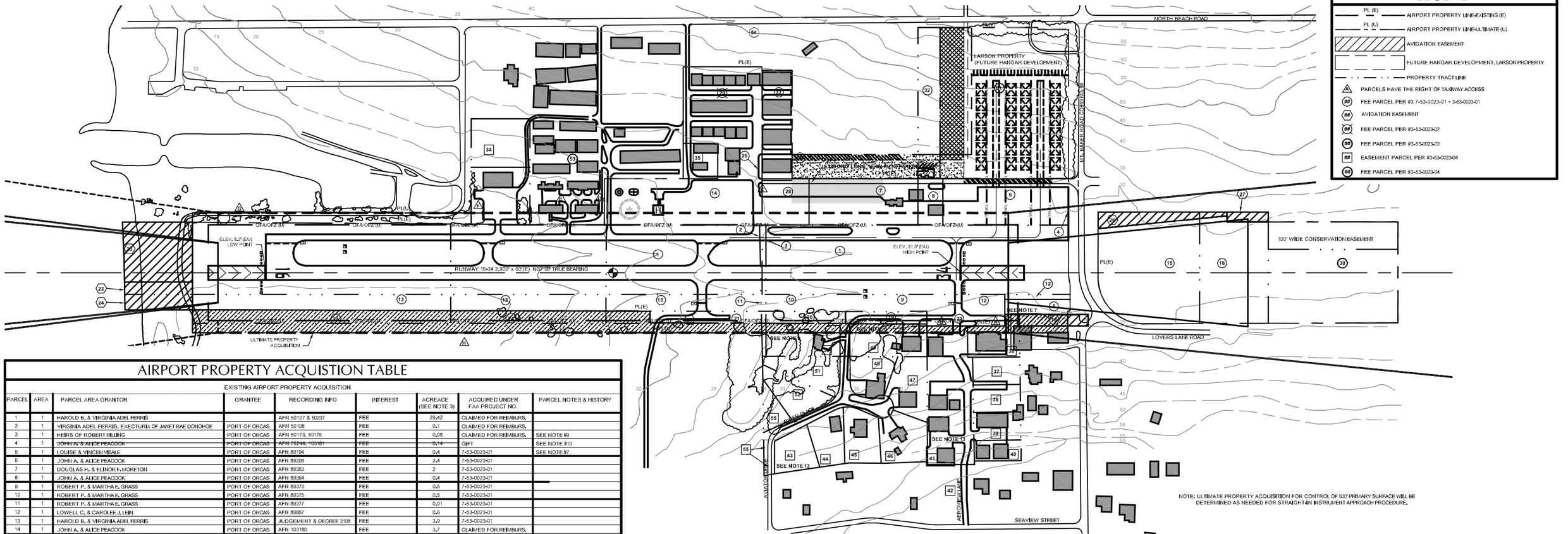
JOB NO. 2005-0201	DESIGNED BY: CHR	DATE: 03/23/06	REVISIONS:
DRAWING NO. SIX	DRAWN BY: MFL	DATE: 02/28/08	
SCALE AS SHOWN	CHECKED BY: BCW	DATE: 02/28/08	
SHEET: 6 OF 7	BUCHER, WILLIS & RATLIFF CORPORATION		

720 OLIVE WAY, SUITE 1200 SEATTLE, WASHINGTON 98101-1857 (206) 448-2123

KANSAS • MISSOURI • TEXAS • COLORADO • WASHINGTON • OKLAHOMA

P:\2005-0201\01-1st Project\ACAD\Final ALD\ALPSET Orcas Island WA.dwg Mar 07, 2008 - 9:15am

AIRPORT PROPERTY MAP



LEGEND

- PL (E) — AIRPORT PROPERTY LINE-EXISTING (E)
- PL (U) — AIRPORT PROPERTY LINE-ULTIMATE (U)
- AVIGATION EASEMENT
- FUTURE HANGAR DEVELOPMENT, LARSON PROPERTY
- PROPERTY TRACT LINE
- (A) PARCELS HAVE THE RIGHT OF TAXIWAY ACCESS
- (##) FEE PARCEL PER #3 7-53-0023-01 + 3-53-0023-01
- (##) AVIGATION EASEMENT
- (##) FEE PARCEL PER #3-53-0023-02
- (##) FEE PARCEL PER #3-53-0023-03
- (##) EASEMENT PARCEL PER #3-53-0023-04
- (##) FEE PARCEL PER #3-53-0023-04

AIRPORT PROPERTY ACQUISTION TABLE

EXISTING AIRPORT PROPERTY ACQUISITION

PARCEL	AREA	PARCEL AREA GRANTOR	GRANTEE	RECORDING INFO	INTEREST	ACREAGE (SEE NOTE 3)	ACQUIRED UNDER FAA PROJECT NO.	PARCEL NOTES & HISTORY
1	1	HAROLD B. & VIRGINIA ADEL FERRIS		AFN 50107 & 50237	FEE	29.42	CLAIMED FOR REIMBURS.	
2	1	VIRGINIA ADEL FERRIS, EXECTURIX OF JANET RAE DONOHOE	PORT OF ORCAS	AFN 50108	FEE	0.1	CLAIMED FOR REIMBURS.	
3	1	HEIRS OF ROBERT RILLING	PORT OF ORCAS	AFN 50173, 50176	FEE	0.08	CLAIMED FOR REIMBURS.	SEE NOTE #9
4	1	~~JOHN A. & ALICE PEACOCK~~	~~PORT OF ORCAS~~	~~AFN 75244, 103181~~	FEE	0.14	GIFT	SEE NOTE #10
5	1	LOUISE & VINCEN VITALE	PORT OF ORCAS	AFN 89194	FEE	0.4	7-53-0023-01	SEE NOTE #7
6	1	JOHN A. & ALICE PEACOCK	PORT OF ORCAS	AFN 89208	FEE	2.4	7-53-0023-01	
7	1	DOUGLAS H. & ELINOR F. MORETON	PORT OF ORCAS	AFN 89363	FEE	2	7-53-0023-01	
8	1	JOHN A. & ALICE PEACOCK	PORT OF ORCAS	AFN 89364	FEE	0.4	7-53-0023-01	
9	1	ROBERT P. & MARTHA E. GRASS	PORT OF ORCAS	AFN 89373	FEE	0.5	7-53-0023-01	
10	1	ROBERT P. & MARTHA E. GRASS	PORT OF ORCAS	AFN 89375	FEE	0.5	7-53-0023-01	
11	1	ROBERT P. & MARTHA E. GRASS	PORT OF ORCAS	AFN 89377	FEE	0.01	7-53-0023-01	
12	1	LOWELL C. & CAROLEE J. LEIN	PORT OF ORCAS	AFN 89867	FEE	0.6	7-53-0023-01	
13	1	HAROLD B. & VIRGINIA ADEL FERRIS	PORT OF ORCAS	JUDGEMENT & DECREE 3108	FEE	3.9	7-53-0023-01	
14	1	JOHN A. & ALICE PEACOCK	PORT OF ORCAS	AFN 103180	FEE	3.7	CLAIMED FOR REIMBURS.	
15	1	MARY SLOAN NEILL WASHINGTON HOUSE, INC. DBA LAVENDER HOLLOW ASSOC.; WALLACE F. GUDGELL, JR. & GRETCHEN GUDGELL, RONALE L. SHER & EVA SHER DBA LAVENDER HOLLOW ASSOC.	PORT OF ORCAS	AFN 86140470, 86140472	FEE	3.2	7-53-0023-01	
16	1	MARY SLOAN NEILL WASHINGTON HOUSE, INC. DBA LAVENDER HOLLOW ASSOC.; WALLACE F. GUDGELL, JR. & GRETCHEN GUDGELL, RONALE L. SHER & EVA SHER DBA LAVENDER HOLLOW ASSOC.	PORT OF ORCAS		FEE	2.47	7-53-0023-01	
17								
18	3	LOUISE & VINCEN VITALE	PORT OF ORCAS	AFN 89193	AVIGATION EST. 7:1	0.4	7-53-0023-01	
19	3	ROBERT P. & MARTHA E. GRASS	PORT OF ORCAS	AFN 89374	FEE	0.4	7-53-0023-01	SEE NOTE #11
20	3	ROBERT P. & MARTHA E. GRASS	PORT OF ORCAS	AFN 89376	FEE	0.4	7-53-0023-01	SEE NOTE #11
21	3	ROBERT P. & MARTHA E. GRASS	PORT OF ORCAS	AFN 89378	FEE	0.01	7-53-0023-01	SEE NOTE#11
22	1	LOWELL C. & CAROLEE J. LEIN	PORT OF ORCAS	90375	FEE	0.4	7-53-0023-01	FORMERLY AREA 3, AVIGATION EST. 7:1 PER AFN 89858
23	3	L.D. McINTYRE, WANDA McNIRE, & MARLO, INC.	PORT OF ORCAS	JUDGEMENT & DECREE 3108	AVIGATION EST. 20:1	0.39	7-53-0023-01	
24	3	HAROLD B. & VIRGINIA ADEL FERRIS	PORT OF ORCAS	JUDGE MENT & DECREE 3108	AVIGATION EST. 7:1	3.2	7-53-0023-01	
25	3	L.D. McINTYRE, WANDA McNIRE, & MARLO, INC.	PORT OF ORCAS	JUDGEMENT & DECREE 3108	AVIGATION EST. 20:1	1.1	7-53-0023-01	
26	3	L.D. McINTYRE, WANDA McNIRE, & MARLO, INC.	PORT OF ORCAS	JUDGEMENT & DECREE 3108	AVIGATION EST. 20:1	7.4	7-53-0023-01	
27	3	L.D. McINTYRE, WANDA McNIRE, & MARLO, INC.	PORT OF ORCAS	JUDGEMENT & DECREE 3108	AVIGATION EST. 20:1	0.21	7-53-0023-01	
28	1	JOHN A. & ALICE M. PEACOCK	PORT OF ORCAS	AFN 103180	FEE	0.4	7-53-0023-01	20-YR LEASE EXPIRED 8/185
29	1	ROY & MARGARET A. FRANKLIN	PORT OF ORCAS	AFN 87148481	FEE	4.49	3-53-0023-02	SEE NOTE #12
30	1	WALLACE F. GUDGELL, JR. & GRETCHEN GUDGELL, RONALE L. SHER & EVA SHER DBA LAVENDER HOLLOW ASSOC.	PORT OF ORCAS	AFN 90170645	FEE	4.89	3-53-0023-03	
31	1	MARY-EDITH GERMEAU, JAMES B. LARSON & KATHERINE LOUISE LARSON	PORT OF ORCAS		FEE	~~3.48~~ 8.22	3-53-0023-03	SEE NOTE #12
32		PORT OF ORCAS	MARGARET E. ENDERLEIN			1.26		SEE NOTE #12
33		MARGARET E. ENDERLEIN	PORT OF ORCAS		FEE	1.26		SEE NOTE #12
34		PAPA MIKE, INC.	PORT OF ORCAS	AFN 2002 0701022	EASEMENT		3-53-0023-04	SEE NOTE #13
35		EASTSOUND WATER DISTRICT	PORT OF ORCAS	AFN 2002 0701021	EASEMENT		3-53-0023-04	SEE NOTE #13
36		AEROVIEW, LOT 1	PORT OF ORCAS	AFN 2002 0701014	EASEMENT		3-53-0023-04	SEE NOTE #13
37		AEROVIEW, LOT 3	PORT OF ORCAS	AFN 2002 0701015	EASEMENT		3-53-0023-04	SEE NOTE #13
38		AEROVIEW, LOT 5	PORT OF ORCAS	AFN 2002 0701016	EASEMENT		3-53-0023-04	SEE NOTE #13
39		AEROVIEW, LOT 7	PORT OF ORCAS	AFN 2002 0701017	EASEMENT		3-53-0023-04	SEE NOTE #13
40		AEROVIEW, LOT 9	PORT OF ORCAS	AFN 2002 0701018	EASEMENT		3-53-0023-04	SEE NOTE #13
41		AEROVIEW, LOT 10	PORT OF ORCAS	AFN 2002 0701019	EASEMENT		3-53-0023-04	SEE NOTE #13
42		AEROVIEW, LOT 11	PORT OF ORCAS	AFN 2002 0701020	EASEMENT		3-53-0023-04	SEE NOTE #13
43		GRASYLVANIA, LOT 1	PORT OF ORCAS	AFN 2002 0701023	EASEMENT		3-53-0023-04	SEE NOTE #13
44		GRASYLVANIA, LOT 2	PORT OF ORCAS	AFN 2002 0701024	EASEMENT		3-53-0023-04	SEE NOTE #13
45		GRASYLVANIA, LOT 3	PORT OF ORCAS	AFN 2002 0701025	EASEMENT		3-53-0023-04	SEE NOTE #13
46		GRASYLVANIA, LOT 4	PORT OF ORCAS	AFN 2002 0701026	EASEMENT		3-53-0023-04	SEE NOTE #13
47		GRASYLVANIA, LOT 5	PORT OF ORCAS	AFN 2002 0701027	EASEMENT		3-53-0023-04	SEE NOTE #13
48		GRASYLVANIA, LOT 6	PORT OF ORCAS	AFN 2002 0701028	EASEMENT		3-53-0023-04	SEE NOTE #13
49		GRASYLVANIA, LOT 7	PORT OF ORCAS	AFN 2002 0701029	EASEMENT		3-53-0023-04	SEE NOTE #13
50		GRASYLVANIA, LOT 8	PORT OF ORCAS	AFN 2002 0701030	EASEMENT		3-53-0023-04	SEE NOTE #13
51		GRASYLVANIA, LOT 9	PORT OF ORCAS	AFN 2002 0701031	EASEMENT		3-53-0023-04	SEE NOTE #13
52		GRASYLVANIA, LOT 10	PORT OF ORCAS	AFN 2002 0701032	EASEMENT		3-53-0023-04	SEE NOTE #13
53		PORT OF ORCAS	ORCAS AIRCRAFT LEASING, INC.	AFN 2002 1112030 TO AFN 2002 1112034	FEE		3-53-0023-04	SEE NOTE #14
54		ORCAS AIRCRAFT LEASING, INC.	PORT OF ORCAS	AFN 2002 1112030 TO AFN 2002 1112034	FEE		3-53-0023-04	SEE NOTE #14
55		GRASYLVANIA, LOTS 1-10	PORT OF ORCAS	SEE INDIVIDUAL LOTS	EASEMENT		3-53-0023-04	SEE NOTE #13
56		JAN FERRIS KOLTUN	PORT OF ORCAS	AFN 2002 1212025	FEE		3-53-0023-04	SEE NOTE #15

GENERAL NOTES

1. THE FOLLOWING PARCELS HAVE THE RIGHT OF TAXIWAY ACCESS ONTO PORT OF ORCAS PROPERTY BASE ON NOTED DOCUMENTATION.
   - (A) APOGEE FLIGHT, INC. — AFN 50107 H. FERRIS TO PORT OF ORCAS SEE NOTE 5.
   - (A) GRASYLVANIA HOMEOWNERS ASSOC. — AVIGATION EASEMENT GRANTED TAXI ACCESS TO PORT AND ADJACENT PROPERTY OWNERS.
   - (A) H. FERRIS — AFN 50237
   - (A) ORCAS AIRCRAFT LEASING, INC. — AFN 50237 H. FERRIS TO PORT OF ORCAS
   - (A) G. LARSEN — AFN 50237 H. FERRIS TO PORT OF ORCAS
   - (A) PAPA MIKE, INC. — AFN 50237 H. FERRIS TO PORT OF ORCAS
   - (A) MARLO — AFN 50107 H. FERRIS TO PORT OF ORCAS
   - (A) BELLEVUE MORTGAGE — AFN 50237 H. FERRIS TO PORT OF ORCAS
2. REFER TO SAN JUAN CO. SUPERIOR COURT. CASE NO. 3108 AND AFN'S 89374, 89376, 89378, AND 89858 FOR INFORMATION REGARDING AVIGATION EASEMENTS.
3. ALL ACREAGES REPORTED HEREIN ARE COPIED FROM PRIOR PORT OF ORCAS PROPERTY MAPS OR SAN JUAN COUNTY ASSESSOR MAPS. AREAS MAY CHANGE WHEN AND IF A BOUNDARY SURVEY IS PERFORMED.
4. FIRST RIGHT OF REFUSAL FOR BEACH PROPERTY NORTH OF THE AIRPORT WAS GRANTED TO THE PORT OF ORCAS IN AFN 50237. CURRENT STATUS UNKNOWN.
5. LOWELL C. LIEN ASSIGNEE OF H. FERRIS, CONVEYED RIGHT OF LIGHT AIRCRAFT ACCESS TO ORCAS ISLAND AIRPORT FOR LOT 1 OF THE SHORT PLAT OF LIEN NO. 1 RECORDED AT VOLUME 6 OR SHORT PLATS, PAGE 13, RECORDS OF SAN JUAN COUNTY, WASHINGTON. THE ACCESS IS ASSUMED TO BE ACROSS LOT 2 OR SAID SHORT PLAT, CURRENTLY OWNED BY APOGEE FLIGHT, INC.
6. ADDITIONAL COUNTY ROAD RIGHT-OF-WAY WAS DEEDED TO THE COUNTY PER AFN 116898, THE DESCRIPTION FOR THIS RIGHT-OF-WAY IS WRITTEN SO THAT THERE ARE ALTERNATIVE POSITIONS FOR SAID RIGHT-OF-WAY. PRIOR CORRESPONDENCE BETWEEN THE PORT OF ORCAS AND SAN JUAN COUNTY PUBLIC WORKS DEPT. IN 1987 APPEARS TO INDICATE THAT A SOLUTION WAS AGREED TO AND A NEW DESCRIPTION WAS WRITTEN, HOWEVER, NO CORRECTION DEED OR OTHER CONVEYANCE WAS RECORDED.
7. THE OWNERSHIP OF THE WEST 12' OF PARCEL #5 WAS CONVEYED BY THE PORT OF ORCAS TO LOWELL C. LIEN AND CAROLEE J. LIEN BY THE STAUTORY WARRANTY DEED RECORDED AT AFN 90180. ON DEC. 30, 1994, WILLIAM A. ANDERS BY QUIT CLAIM DEED, CONVEYED HIS INTEREST IN THE SAME 12' WIDE STRIP OF LAND TO THE PORT OF ORCAS IN DEED RECORDED AT AFN 94123023.
8. THERE ARE SEVEN QUIT CLAIM DEEDS SIGNED BY THE HEIRS OF SOPHIA RILLING ALL TRANSFERRING THEIR INTEREST, IF ANY, TO THE PORT OF ORCAS AS FOLLOWS.
   AFN 89711 MARGARET WHITE TO THE PORT OF ORCAS
   AFN 89712 CLARA VON SLATE TO THE PORT OF ORCAS
   AFN 90261 MARGARET L. CRAWFORD TO THE PORT OF ORCAS
   AFN 90232 WALTER REED TO THE PORT OF ORCAS
   AFN 90265 GRACE HUTTON TO THE PORT OF ORCAS
9. THERE ARE FOUR QUIT CLAIM DEEDS SIGNED BY THE HEIRS OF ROBERT RILLINGS, ALL TRANSFERRING THEIR INTEREST, IF ANY, TO THE PORT OR ORCAS AS FOLLOW.
   AFN 50173 CLARA SCOTT NELSON TO THE PORT OT ORCAS
   AFN 50174 LOUISE MAHLER TO THE PORT OF ORCAS
   AFN 50175 KATHRYN REED TO THE PORT OF ORCAS
   AFN 50176 LOUISE RILLING TO THE PORT OF ORCAS
10. FORMER PARCEL #4 WAS CONVEYED TO SAN JUAN COUNTY FOR ROAD PROPOSED IN AFN 97031415, THE PORT HAS RETAINED AVIGATION EASEMENT ON THEIR PARCEL.
11. THIS DRAWING SHOWS A CORRECTION IN OWNERSHIP INTEREST FROM AVIGATION EASEMENT TO FEE PER AFN 89158173 FOR PARCEL 19, 20, 21.
12. AN EQUAL AREA TRADE BY APPROVED BLM PER AFN 199911117021 AND QUIT CLAIM DEEDS ADDED PARCEL 33 TO PARCEL 29 AND SUBTRACED PARCEL 32 FROM 31.
13. THE EASEMENT HAS BEEN PROVIDED TO ALLOW THE PORT OF ORCAS TO ENTER UPON OVER OR UNDER THE EASEMENT TO CONSTRUCT, RECONSTRUCT, OPERATE, MAINTAIN, REPAIR, REPLACE AND INSPECT THE AIRPORT'S PERIMETER FENCE EASEMENTS ARE GENERALLY 5' WIDE UNLESS NOTED OTHERWISE IN THE EASEMENT DOCUMENT.
14. THE PORT OR ORCAS AND ORCAS AIRCRAFT LEASING COMPLETED A PROPERTY EXCHANGE AND EASEMENT AGREEMENT FOR TAX PARCEL NUMBERS 271142014 AND 271142024.
15. QUIT CLAIM DEED TRANSFERRING INTEREST FROM JAN FERRIS KOLTUN TO THE PORT OF ORCAS IN AFN 2002 1212025.
16. AFN QCD 2005 0214001.

N — MAGNETIC DEC. 3° 7E (6/2004) — TRUE NORTH

0 100' 200' 400' 600'

SCALE IN FEET
1" = 200'
ALL COORDINATES IN NAD 83

AIP PROJECT # 3-53-0023-06

PORT OF ORCAS, WASHINGTON
ORCAS ISLAND AIRPORT

AIRPORT PROPERTY MAP

JOB NO. 2005-0201	DESIGNED BY: CHR DATE: 03/23/06	REVISIONS:
DRAWING NO. SEVEN	DRAWN BY: MFL DATE: 03/06/08	
SCALE AS SHOWN	CHECKED BY: BCW DATE: 03/06/08	
SHEET: 7 OF 7	BUCHER, WILLIS & RATLIFF CORPORATION	

720 OLIVE WAY, SUITE 1200 SEATTLE, WASHINGTON 98101-1857 (206) 448-2123

KANSAS • MISSOURI • TEXAS • COLORADO • WASHINGTON • OKLAHOMA

P:\2005-0201\01-1st Project\ACAD\Final ALD\ALPSET Orcas Island WA.dwg Mar 11, 2008 - 10:28am

A

Appendix A

16.55.280 Airport Use District.

A. Purpose.

1. To accommodate the existing airport and provide for airport-related facilities and services within the airport use district sufficient to meet the air traffic needs of the local citizens.

2. To allow for new airport-related facilities and services that are compatible with other commercial and residential uses in the subarea and consistent with the adopted Orcas Island Airport Master Plan.

3. To create an airport use district separate and distinct from the service and light industrial district so that airport uses do not compete for available land in the service and light industrial district and allowable service and light industrial district uses do not occupy available land needed for future airport-related needs and facilities.

4. To allow for limited service and light industrial uses only when it can be clearly established that they are compatible with other airport and airport-related uses in the subarea and sufficient land is not available in the service and light industrial district. Uses which substantially reduce the land area available to accommodate other allowable uses in the airport use district are to be discouraged.

5. To establish a land use district that is separate and distinct from an airport overlay district as described in SJCC 18.30.180.

6. To prohibit new residential development.

B. Allowable and Prohibited Uses. Land uses not specifically listed in this subsection as either allowable or prohibited may be allowed subject to conditional use permit approval only if the proposed use will be consistent with the purpose of this district and sufficient land is not available in other districts which list the uses in question as permitted uses. Allowable uses are subject to the required permits and use limitations and site development and performance standards stated in this section.

The following uses are allowable in the airport use district:

Commercial/Industrial:

1. Airport and nonstructural uses such as fuel storage, tie-down areas and parking facilities

2. Airport-related uses such as hangars, aircraft parking, and aircraft sales and repair facilities, including their related incidental office and retail activities

3. Restaurant, which may include one bar or cocktail lounge as an accessory use. The maximum size of the restaurant and accessory use is 2,500 square feet

Institutional:

1. Aviation-related museums

2. Fire stations

Utilities:

1. Water, power, cable TV, telephone and sewer distribution lines

2. Sewage and water treatment facilities

3. Utility service office

4. Utility storage building

The following uses are prohibited in the airport use district:

Commercial/Industrial:

1. Retail sales and services not aviation-related

2. Offices not aviation-related

3. Restaurants and food service except as provided in this section

4. Warehousing not aviation-related; provided, that this shall not preclude storage of incoming or outgoing air cargo

5. Any public or private meeting place designed to accommodate more than 25 persons when located within the FAA-designated approach zone

Institutional:

1. Schools other than flight schools

2. Churches and religious assembly facilities

3. Museums not aviation-related

Recreational:

1. All recreational uses

Residential:

1. Residential units of any type

C. Lot Size. There is no minimum or maximum lot size.

D. Required Permits and Use Limitations.

1. Site plan review is required for allowable uses if total use area (the gross area of buildings, outdoor storage and other area including required parking area devoted to the proposed use and any accessory residential use) exceeds 10,000 square feet and conditional use permit approval is required if total use area exceeds 20,000 square feet. However, if the administrator determines that a proposed use which would otherwise be allowed outright would likely produce significant air, water or noise pollution or otherwise constitute a nuisance, site plan review shall be required.

2. Construction of or improvements to streets, pedestrian paths and off-site parking areas shall be subject to site plan review requirements. (Parking spaces, driveways and paths required for an allowable use shall not require a permit separate from any permit required for the use served; provided, that a road access permit must be obtained for construction of any driveway entering a public road.)

3. New developments with primary access from the Mount Baker Road Bypass shall be required to obtain or provide for shared access with at least one adjoining parcel by establishing common driveway easements and/or locating access at property lines. No use permitted in this district shall be designed in a manner that would result in traffic backing onto a public or private street or road right-of-way.

4. Museums allowed in this district shall be limited to those devoted to aviation and/or aircraft history and shall be allowed only north of Mount Baker Road. Any retail sales associated with such use shall be clearly incidental and secondary to the museum use.

5. No use shall be allowed which is likely to attract an unusual quantity of birds, particularly birds which normally fly at high altitudes.

E. Performance and Site Development Standards.

1. Building Height. No building shall exceed 32 feet measured from average grade to the highest point of the highest roof structure.

2. Building Setbacks.

   a. No structure shall be built within 40 feet of the centerline of a public right-of way.

   b. Structures shall be set back from side and rear property lines by at least 10 feet. Architectural appendages (i.e., roof overhangs, chimneys, bay windows, and decks not over 30 inches above grade) may extend two feet into required yards.

3. Outside Storage. Outside storage shall be screened from view from adjoining properties and from public roadways by fencing, nondeciduous vegetation or other means. Any such screening shall be at least five feet high. Any outside storage associated with any nonresidential use allowed in this district shall also be so screened before any occupancy permit is issued.

4. Utilities. Utilities installed to serve new development shall be underground.

5. Lot Coverage. The maximum floor area ratio is 0.5.

6. Vibration. None permitted beyond building wall.

7. FAA Recommended Restrictions.

   a. All development in this district must comply with the Federal Aviation Regulations (FAR) Part 77, relating to heights of land uses proximate to airports and protection of airspaces critical to airport operations.

   b. All development in this district must comply with the Federal Aviation Administration Advisory Circular 150/5370-10, Standards for Specifying Construction on Airports. (Ord. 14-2000 § 7(VV); Ord. 13-2000; Ord. 4-1996; Ord. 12-1994)

BWR | Right in the Center

www.bwrcorp.com

2005-0201