Sitka Seaplane Base Master Plan

Prepared for:
City & Borough of Sitka

Prepared by:
HDR Alaska, Inc.

August 2002

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1.0 Seaplane Base Master Plan Overview

The City and Borough of Sitka developed this Seaplane Base Master Plan as a guide for relocating and upgrading seaplane base facilities to Japonski Island. The plan is intended to meet the demand and facility requirements for a 20-year period. The existing seaplane float is in poor condition and is not large enough to meet current or future needs. In addition, there are safety concerns with the present location and conflicts with adjacent uses. The master plan process encompassed two phases: (1) analysis of the conditions and needs of seaplane facilities in Sitka, and (2) development and evaluation of alternatives that will resolve the identified issues and meet future seaplane needs in the community. Each of these phases was documented in a technical report that was presented at public meetings and evaluated by a seaplane advisory committee and City and Borough of Sitka officials.

The first phase of planning concluded with the development of the *Sitka Seaplane Base Master Plan Condition and Needs Assessment Report* (HDR 2002). This report documents the condition of the existing seaplane base facilities (Figure 1), the need for seaplane base improvements and relocation, and includes a forecast of future aviation demand. The report also outlined the seaplane base facility requirements. The inventory of existing conditions was based on an onsite inspection of the seaplane base, published data, and the public involvement efforts made during the first phase of the plan.

The second phase identified and analyzed possible alternative sites for a new seaplane base. The report concludes that there are only three reasonable relocation options and recommends a preferred site (Figure 1) and conceptual layout for the seaplane facilities. The results of this study are reported in the *Alternatives Report* (HDR 2002).

This master plan provides a summary of the two previous phases of the study, proposes a seaplane layout plan for the preferred site alternative, and presents an initial environmental evaluation of the preferred location. The two technical reports supporting the plan should be consulted for additional information.

2.0 Existing Conditions

2.1 Community Overview

Sitka, population 8,835, is located on Sitka Sound on the west coast of Baranof Island fronting the Pacific Ocean. Sitka is accessible only by air or water. It is approximately 95 miles from Juneau and 150 miles from the Alaska road system at Haines. Due to its geographical isolation, Sitka is heavily dependent on air travel. The State-owned Rocky Gutierrez Airport on Japonski Island has a 6,500-foot paved and lighted runway. Daily jet service

is provided, and a scheduled air taxi and air charters are available. The City & Borough operates five boat harbors with 1,350 slips in addition to the seaplane base on Sitka Channel (http://www.dced.state.ak.us).

Figure 1. Seaplane Base Location

Despite its relative isolation, Sitka serves as a hub for health care, goods distribution, and transportation for a number of neighboring communities. Southeast Alaska Health Consortium is based in Sitka, and its Mt. Edgecumbe Hospital serves the entire Southeast Region. Most of the smaller communities served are accessible only by seaplane. As such, seaplane access to Sitka makes up a critical component to the health and welfare of residents in communities in the region. The availability of floatplane transportation is also very important to the economy of Sitka and adjacent communities — related to medical, personal, and tourism transportation.

2.2 Existing Seaplane Base

The existing Sitka Seaplane Base is owned by the City and Borough of Sitka and is located on the industrial waterfront on Sitka Channel northwest of the North Pacific Processors, Inc. facility (Figure 1). The seaplane base consists of a float and an adjacent water runway (sea lane). All eight ramps are leased and, according to the Federal Aviation Administration (FAA), there are approximately 100 operations per week on average.

The current water operating area and sea lane for the Sitka Seaplane Base is in the Sitka Channel. The Channel is bounded by Baranof Island and Japonski Island. The Alaska Supplement lists the seaplane sea lane as 4,000 feet long by 200 feet wide.

Aircraft departing to the northwest or landing to the southeast fly over Western Anchorage and the western end of the channel. Aircraft departing to the southeast must either fly over the O'Connell Bridge or taxi under the bridge prior to departure. For safety reasons, pilots are not allowed to fly under the bridge. Southeast of the bridge, seaplanes are exposed to increased boat traffic and ocean swells.

The existing seaplane docking structure consists of a pier, a gangway and three floats. The floats have space for eight leaseholders and three or four transient seaplanes, depending on aircraft size and spacing on the float. The existing seaplane base has approximately 24 feet of shoreline from which to access the seaplane dock. This 24-foot wide space provides only enough room for two 9-foot wide vehicle parking stalls and the 6-foot wide pier leading to the gangway. There is no room to provide any other shoreline facility at this location, unless additional land were to be purchased.

The seabed condition under the current seaplane dock is rocky with a very shallow slope, causing the water's edge to travel a large horizontal distance between high and low tides. During extreme low tides, the tidal range leaves no room between the shoreline and the ramps for maneuvering. Also, exposed rocks make navigation into and out of the anchorage area difficult and unsafe.

3.0 Purpose and Need for Upgrade and Relocation

This section describes the conditions at the existing seaplane base that necessitate its relocation. The primary reasons for relocating and reconstructing the facility are:

- Insufficient capacity and space at the existing site to accommodate current and future demand;
- A congested location with conflicting adjacent uses;
- An unsafe operating area;
- Poor, unsafe dock conditions for fueling and maneuvering on the docks; and
- A congested sea lane and bird hazard conditions in the immediate vicinity of the seaplane base affect the safety of the existing location.

3.1 Insufficient Capacity

The current seaplane facility is too small and the site too constrained to accommodate the demand for seaplane ramp space and associated services. Currently, each of the eight ramps is leased and there are seven people on the waiting list. The harbormaster indicates that this situation has persisted for a number of years. Unfortunately, the current site leaves little room to accommodate the demand for additional ramp space or for the expansion of upland facilities.

Not having sufficient seaplane docking space is a safety issue. Because there is not enough capacity, a number of pilots are unable to put their planes on floats, which means local pilots must use amphibious floats (if their plane can accommodate them) or wheels. Many choose wheels because of the expense of buying and maintaining the amphibious floats. Due to the shortage of land-based airports in the area around Sitka, flying with wheels is not as safe because of the limited locations to land in case of an emergency. It is not possible for wheeled planes to land at lakes and villages near Sitka.

In addition to being unable to accommodate the demand for seaplane ramp space, the lack of upland and waterfront area at the current site leaves no room for associated facilities such as vehicle parking, fixed base operations, terminal development, restrooms, fuel facilities, or a drive-down ramp. The congested upland and waterfront conditions provide only 2 vehicle parking spaces for the 8 ramps and no room to add additional spaces.

Figure 2. The entire upland area is limited to two parking stalls (pictured above) in front of the guardrail.

3.1.1 Boat Traffic and Adjacent Land Uses

The current seaplane dock is located in a constrained and busy location. The primary location for the unloading of fishing boats is at the north side of the Sitka Sound Seafoods dock. There is very little maneuvering room into and out of the seaplane ramps when tenders and other fishing boats are unloading. This is an unsafe condition and has caused conflicts between the seaplanes and the fishing boats. Because planes must operate in this constrained location, there is very little room for error on the part of seaplane and boat pilots. Mishaps have occurred in the past where boats have lost power and drifted into airplanes and seaplanes have also struck boats.

Figure 3. This photo shows the location of the seaplane dock relative to Sitka Sound Seafoods. The dock frontage at the left of the photo is the location where tenders unload. It is also the channel used to access the 4 ramps on the landside of the seaplane dock.

3.1.2 Insufficient Space Coupled with Tides Limit Safe Operation at the Base

Figure 4. Large rocks in the turning basin landward of the dock cause a serious navigation hazard at low tides.

The turning basin on the landward side of the dock is too small to safely maneuver a seaplane. The limited maneuvering space is exacerbated by low tides and rocky bottom conditions. The situation is such that at low tides there is not enough room between the landward seaplane ramps and the water's edge for seaplanes to safely maneuver. In addition, there are a number of large rocks in the turning basin that are exposed at low tides. In fact, airplane floats have been ripped open by these rocks. This problem limits the utilization of the dock for several hours around low tide.

3.1.3 Personal Safety

The conditions of the dock itself present personal safety problems for users. The dock surface is relatively narrow causing tie-down lines to cross the central walkway, meaning that users must step over each set of tie-down lines. In addition, the dock surface is typically wet and slippery (a condition exacerbated by bird guano).

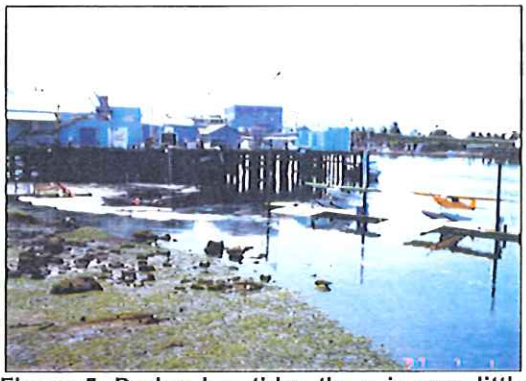


Figure 5. During low tides there is very little maneuvering room landward of the dock. During minus tides the water goes out as far as the ramps.

Another condition affecting personal safety is the design of the ramps themselves. Essentially, the ramps are just wide enough to accommodate the seaplane floats such that most of the wing extends over the water. This means there is no dock surface to stand on for tying down planes, fueling, or for maintenance. The narrow ramps are also difficult to maneuver the planes onto, especially in gusting winds or congested conditions.

Figure 6. The dock is narrow, slippery (a condition exacerbated by bird guano), and congested with tie-down lines.

3.1.4 Fueling Conditions

There is no fueling facility at the seaplane base and no ramp for trucked delivery of fuel. This makes fueling planes very difficult and necessitates that owners haul jerry

cans of fuel down a steep, slippery gangway, across a narrow slippery dock, which is crisscrossed by tie-down lines. This fueling situation raises concerns for:

- Personal safety in handling and loading fuel.
- Contamination of the fuel with water — which would cause engine problems resulting in safety issues for pilots.
- Water quality concerns in the channel.

3.1.5 Potential for Plane-Boat Conflicts in the Channel

The water lane used for takeoffs and landings is located in Sitka Channel along an industrial segment of the waterfront. Land uses fronting the Sitka Channel — particularly on the Baranof Island side — are largely industrial, characterized by fish processing facilities, dock space, and harbors. The industrial nature of the channel results in heavy boat traffic.

Boat traffic is heavy both parallel with the channel as well as perpendicular across the channel. All boats needing to go north or south without going out to open ocean must transit the Channel; thus, there is considerable boat use year round. The boat fueling facility that is located on the east side of the bridge attracts significant numbers of boats and results in a large number of boats crossing the channel. The commercial boat dock (work float) is also located on the west side of the bridge across the channel from supply stores and lodging. This location creates considerable cross-channel skiff traffic.

The chance for boats to cross into the path of a seaplane during takeoff or landing is high. Buildings, dock structures, and large vessels obscure boats entering the channel. This causes "blind" intersections along the channel; an unsafe condition for seaplanes performing high-speed operations. Because the channel is narrow, the maneuverability and the opportunity to avoid collisions are more limited.

3.1.6 Bird Hazards

There are a number of bird attractants located near the existing seaplane base and sea lane that create an unsafe situation. According to the Wildlife Hazard Assessment for the Sitka Rocky Gutierrez Airport (USDA 1999), the primary attractants are fish waste from processing facilities located along the channel. The waste includes fish waste discharged in underwater outfalls, miscellaneous waste generated during dockside transfer and cleaning operations, and fish remains from sport fish cleaning throughout the harbor.

In particular, large flocks of mixed gull species feed directly above the waste outfall pipes of Seafood Producers Cold Storage and Sitka Sound Seafoods. These outfall pipes discharge in the channel approximately 200 yards out from the dock area of the processors at the bottom of the channel. The waste consists mainly of water with chunks of fish ground to ½ inch in size.

Some of the waste floats to the surface where it attracts sea gulls. The outfall of this facility is located in the middle of Sitka Channel approximately 300 feet from the seaplane dock. The birds gather on the roof of Sitka Sound Seafood's buildings and on the seaplane dock. These sea gulls also spend time floating in the middle of Sitka Channel feeding on the processing waste; this feeding area is located in the middle of the sea lane.

The location of bird attractants relative to the seaplane base and sea lane creates a safety concern relating to bird strikes. The FAA has specifically identified fish waste outfalls as a wildlife attractant and has found that such attractants in close proximity to aviation activity significantly increases the potential for wildlife and aircraft collisions and creates conditions hazardous to aircraft safety. The FAA considers such uses in close proximity incompatible land uses. The FAA also recommends against siting land uses that attract or sustain populations of hazardous wildlife within the vicinity of airports or which cause movement of hazardous wildlife onto, into, or across the approach or departure airspace, aircraft movement area, loading ramps, or aircraft parking area of airports.

Figure 7. Bird activity in the direct vicinity of the seaplane base is heavy due to the location of the adjacent fish processing plant (pictured).

In addition to safety concerns, the heavy bird use of the area causes unpleasant conditions affecting the use of the seaplane base. The birds leave a thick layer of sea gull guano covering the dock and parts of some aircraft. This feces causes unsanitary conditions on the dock, damages the dock surface, damages the paint and finish on planes, and makes the decking extremely slippery. Moreover, birds have pecked through the fabric on planes and have caused serious damage to multiple aircraft.

4.0 Aviation Forecast

This section summarizes the air traffic forecast presented in the *Condition and Needs Assessment Report* (HDR 2002). The air traffic forecast analysis followed the process recommended in FAA Advisory Circular 150/5070-6A, *Airport Master Plans* and is updated in *Forecasting Aviation Activity by Airport* (FAA). For a more complete discussion of the aviation forecast, see the *Condition and Needs Assessment Report.*

The existing seaplane dock is most heavily used during the summer tourist season from June to September, with shoulder seasons from March to May, and October, depending on the weather. There are two commercial air charter operators in Sitka that use seaplanes. Air Sitka is based in the harbor on a private dock and operates a Cessna 185 on floats. Harris Aircraft

is based at Sitka Rocky Gutierrez Airport and operates a Cessna 185 and a DeHavilland Beaver, both on amphibious floats (floats with retractable landing gear). The eight seaplane ramps at the existing seaplane dock are fully leased and there are seven names on the waiting list.

Sitka is a regional transportation and health services hub, serving the smaller communities of Pelican, Elfin Cove, Tenakee Springs, Angoon, Kake, Port Alexander, and Baranof Warm Springs. The seaplane base also serves a number of lodges, flightseeing, logging camps, and government land management functions. Medical evacuations are often conducted by seaplane, bringing patients to Southeast Alaska Health Consortium's Mt. Edgecumbe Hospital.

According to the City and Borough of Sitka and research done during phase 1 of the master plan, a number of commercial operators in the region would like to expand their operations to Sitka, either to unload passengers or to conduct flight seeing or other operations, but public commercial facilities are not available. The current seaplane facility is not available for commercial operations. In addition, the U.S. Forest Service and other agencies would like to lease floatplane dock facilities, but no space exists.

Based on the information analyzed during the planning process, the moderate growth scenario is the recommended baseline to use for seaplane facility planning. (See the *Conditions and Needs Assessment Report* [HDR 2002] for additional forecast data and information). The moderate growth scenario represents the most realistic estimate of existing and future based aircraft demand. Under the moderate growth scenario, the Sitka Seaplane Base should accommodate the following:

- A short-term (5-year) forecast of 13 slips.
- An intermediate-term (10-year) forecast of 14 slips.
- A long-term (20-year) forecast of 15 slips.

The ultimate size of 15 slips should be planned to satisfy the long-term forecast for development. This would accommodate immediate demand and allows for future growth of seaplane activity in Sitka. It is recommended that the seaplane base have sufficient expansion capability for up to 20 slips in the event that the demographic or economic climate were to change and the community finds itself under the high demand scenario.

5.0 Alternatives

A summary of the alternatives selected for further consideration is presented below. A complete description of the alternative selection process can be found in the *Alternatives Report* (HDR 2002).

5.1 Alternatives Considered

Twelve alternatives were evaluated for their ability to safely accommodate the anticipated seaplane demand and to resolve the safety and capacity deficiencies that have been identified at the existing seaplane base. The sites considered included:

- Charcoal Island shore
- Jamestown Bay
- Sawmill Cove
- Herring Cove
- Starrigavan Bay
- Thomsen Harbor/Turnaround area
- Sitka Rock Gutierrez Airport lagoon
- Former Safe Harbor site next to Japonski Island
- Work float site next to Japonski Island
- Site near Mt. Edgecumbe School on Japonski Island
- Site west of Southeast Alaska Regional Health Consortium (SEARHC) facilities on Japonski Island
- Existing seaplane base site in Sitka Channel

For the locations and analysis of these sites see the *Alternatives Report* (HDR 2002).

The sites were analyzed for their ability to safely accommodate seaplane base facilities and operations, and were compared against the FAA planning criteria found in the seaplane base advisory circular (AC 150/5395-1). Sites determined to have fatal flaws were eliminated from further consideration. Fatal flaws are obvious site characteristics that make the site unreasonable from a safety, environmental, or capacity perspective. Not having the site characteristics to provide a safe operating and docking environment was the overriding factor used to eliminate sites from further consideration.

The primary reasons for determining that alternative sites were unsafe were topography, wind and wave conditions, and safety of the operating environment. Topography is a crucial limiting factor affecting the location of aviation facilities. Airports and seaplane bases are required to have sufficient airspace in the vicinity of their operating areas to allow safe operations. Because Sitka is located in an extremely mountainous area, finding a site with safe airspace was critical. Finding a site protected from wind and waves proved to be equally challenging. Unlike the more protected, Inland Passage areas of Southeast Alaska, Sitka is directly exposed to storms from the Gulf of Alaska with few islands or reefs to protect it or absorb wave energy. Sea swells and open ocean conditions limit the potential for seaplane base development to only a few locations that have adequate protection. Crowded, high activity areas also contributed to the dropping of some alternatives.

5.2 Alternatives Considered in Detail

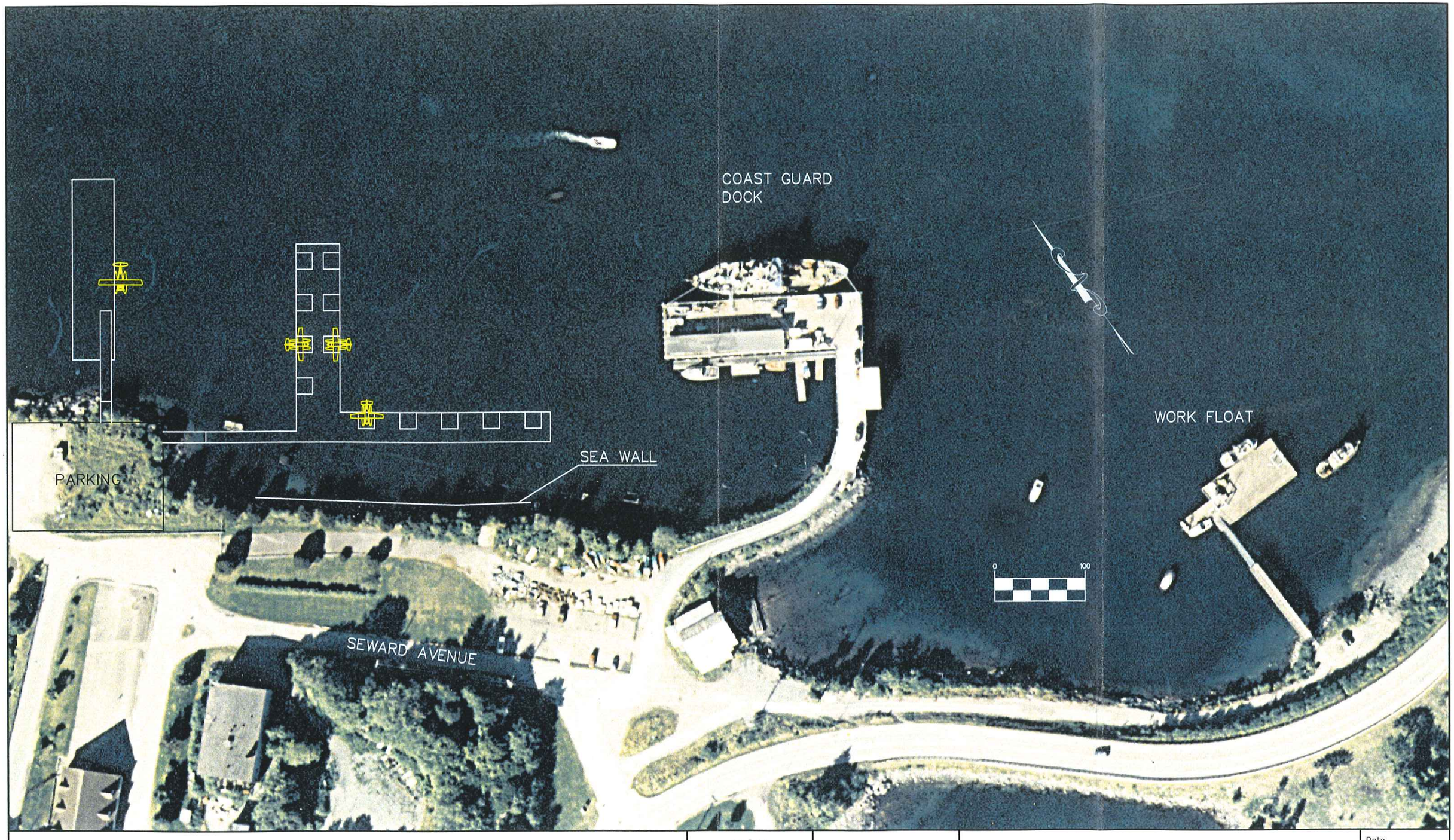
Of the 12 alternative sites considered, three sites (Figure 8) were selected for further consideration. These sites were deemed to be the only sites providing safe basing and operating conditions with sufficient room to accommodate demand. For each of theses sites, conceptual engineering layouts were prepared to determine if they would be feasible, relative to the facility requirements for the seaplane base in Sitka. These sites are considered reasonable and should be further evaluated under the National Environmental Policy Act, if such analysis becomes required.

Figure 8. Sites Considered in Detail

5.2.1 Site One

Site 1 proposes development of a new seaplane facility at the former location of Safe Harbor adjacent to Japonski Island. Safe Harbor was the location of the airport ferry dock prior to the construction of O'Connell Bridge. Under this alternative, the relocated seaplane base facility (Figure 9) would be on Japonski Island, directly across Sitka Channel from the existing seaplane base and between the U.S. Coast Guard dock and University of Alaska property.

This area of Sitka Channel provides improved seaplane maneuvering room as compared with the existing facility and is large enough to accommodate safe taxiing and turning movements into the facility. Dredging and construction of a seawall are proposed as a means of tightening its position as close as possible to the shoreline to keep it out of Sitka Channel. This would protect the facility from boat traffic. The U.S. Coast Guard dock would further



SITKA SEAPLANE BASE
MASTER PLAN

CITY AND BOROUGH OF SITKA
DECEMBER 2, 1971

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FIGURE 9

Date
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Figure

protect the takeoff and landing area from swell, waves, and wind coming up the channel. Japonski Island protects the area from open-ocean wave action and the site provides a relatively sheltered moorage area from local winds. Nautical charts indicate that there are submerged piles in this location, which would need to be removed. The dredging and seawall construction would also ensure that the bottom is free of hazards and that sufficient water depth is maintained at the full tidal range.

It is expected that a seaplane base at Site 1 would continue to use the FAA-designated landing and takeoff area along the centerline of Sitka Channel. This lane is well aligned for the prevailing winds, but bird and boat hazards associated with the landing and takeoff area would remain. If the facility were to be relocated to the Safe Harbor site, bird hazard mitigation measures recommended in the Wildlife Hazard Assessment report prepared for the Sitka Rocky Gutierrez Master Plan (DOT&PF 1999) should be implemented. The takeoff and landing lane should be marked on all charts. Because the lane is split by O'Connell Bridge (an obstruction) at its southeastern end, taxiing under the bridge would continue to be required for approach and departure operations in that direction.

Access to the new facility would be along Seward Avenue. The area proposed for vehicle parking is currently paved and used as a parking lot on property managed by the University of Alaska, SE. Because of the large amount of parking area available in front of UAS, the area proposed for seaplane base vehicle parking is not currently used.

The upland area adjacent to this site is zoned as "Public" land (see Appendix B) and is owned by the State of Alaska, Department of Education. The State of Alaska also owns and manages the tidelands. Nearby land uses include the U.S. Coast Guard dock, the University of Alaska, Southeast campus, and Mt. Edgecumbe High School dormitories. Access and upland development of parking facilities would require acquisition of land from the Department of Education.

Noise would be the primary impact to the upland properties. Because takeoffs and landings would occur on the same water operating area and in an identical manner as the existing conditions, no noticeable change in noise conditions is anticipated. Zoning and ownership maps for Japonski Island are contained in Appendix B.

The adjacent dock is used by the Coast Guard as the homeport for the "Maple." The primary mission of the Maple and its crew is maintaining navigational aids and secondarily supporting other Coast Guard functions and responsibilities such as law enforcement, homeland security, and search and rescue operations. The location and design of any future seaplane base adjacent to the Coast Guard dock would need to take into consideration the docking and maneuvering requirements of the Maple, and may in fact be incompatible with the Coast Guard operations in this area. In discussions

with the Coast Guard, the configuration shown in Layout 1 would affect the ability of the Maple to safely navigate into and out of their dock. Any seaplane layout at Safe Harbor should be tucked into shore as much as possible.

The location of Alternative 1 would be close to the wildlife attractant created by the fish processing waste outfalls in Sitka Channel. Safe Harbor is approximately 600 feet from the processing facility itself. Site 1 might be a slight improvement over the existing seaplane facility, in that the birds tend to gather at the processing plant, which is directly adjacent to the existing facility. The Wildlife Hazard Assessment (USDA 1999) reports that a meeting was held with two of the seafood processors to inform them of the problem. Several possible remedies were discussed, including night dumping and a possible increase in fish waste composting. The WHA recommends further study to understand the relationship between the discharge of seafood wastes and seabird movements in the area.

The estimated cost of Alternative 1 is $5,200,000. Please note that this is a planning estimate only. Details of the cost estimate are contained in Appendix C.

Advantages	*Disadvantages*
▪ Sufficient upland area to develop vehicle parking. ▪ Provides protection from sea swells, wind, and waves. ▪ Can be easily accessed from the existing road system. ▪ Least constrained future landside development of the three alternatives.	▪ Seaplane operations (noise) remain in Sitka Channel. ▪ Seaplanes operations in close proximity to the U.S. Coast Guard vessels and dock. ▪ Operations still in a relatively congested boat traffic area. ▪ No substantial improvement from bird hazards. ▪ Substantial pedestrian and vehicle traffic and congestion on uplands area

5.2.2 Site Two

Alternative 2 (Figure 10) explores relocating the new seaplane facility to the northern end of Japonski Island in the cove adjacent to the Mt. Edgecumbe High School (MEHS) at a seaplane ramp formerly used by the U.S. Navy.

This site is adjacent to a wider open area of the harbor known as the Western Anchorage. The Western Anchorage provides a significant improvement over the existing location for providing maneuvering room to accommodate safe taxiing and turning movements into the facility. The area would also increase pilot flexibility for choosing the direction and location for take off and landing to take advantage of wind conditions or to avoid hazards such as birds and boats.

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FIGURE 10

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Figure

Site 2 provides a relatively sheltered moorage area. Japonski Island and breakwaters forming the harbor protect the site from open-ocean wind and wave action. Sea swells have been a problem at Thomsen Harbor and could be a concern at Site 2. An expansion of the harbor breakwaters is, however, being prepared by the U.S. Army Corps of Engineers that would add 150 feet to the smaller, near-shore breakwater and 200 feet to the larger, central-channel breakwater. Such additions would further reduce wave activity for seaplane facilities and seaplane operations. Dredging and construction of a seawall are proposed as a means of moving the moorage area close to shore to take advantage of the sheltering effect of the slight cove offered by the location. These activities would also ensure that the bottom is free of hazards and that there would be sufficient water depth at the full tidal range.

A question has been raised about the lack of protection from west and north winds at this site. West and north winds, particularly during winter storms, would be a concern and wind damage to planes during these events is a possibility. Analysis of the wind data, however, indicates that such events are not common. South and southeast winds are not only the prevailing winds, they are also consistently the strongest winds experienced in Sitka.

The site is adjacent to the main school buildings of Mt. Edgecumbe High School. The State of Alaska, Department of Education, and the Southeast Alaska Regional Health Consortium own the upland area above the site, which is zoned as "Public" land. The tidelands are owned and managed by the State of Alaska, Department of Natural Resources. Appendix B contains the zoning and ownership maps.

A primary concern with this alternative is noise. Idling and taxiing seaplanes would be in relatively close proximity to the school, but landing and takeoff operations would not occur as consistently in Sitka Channel as presently occurs. This may actually reduce noise effects at the school. The school is at the north end of the channel and experiences considerable noise from northbound departures and southbound arrivals to the current seaplane base. Southbound departures are also conducted by back-taxiing in front of the high school to the north end of the harbor. Southbound departures will likely occur in a manner similar to current operations.

If the seaplane base were relocated, some northbound departures might start at or near the seaplane base and occur in a direction taking them away from the high school. There would be approximately 3,000 feet of useable water due north. The minimum sea lane length recommended by FAA is 2,500 feet. Depending on wind conditions, pilots might use this departure route. Because pilots tend to land as close to the seaplane base as possible, and with prevailing winds from the south and southeast, most landings would have an approach path from the north over Western Anchorage, with landing occurring before the noise would affect the school.

This site is accessible from Seward Avenue. Parking could occur in the existing parking lot behind the high school or could be developed in an undeveloped upland area across Seward Avenue. Land would need to be acquired from the Alaska Department of Education to develop the recommended parking spaces. The existing cement seaplane launch ramp provides an opportunity to be used for minor maintenance or airplane fueling. It is, however, unlikely that Mt. Edgecumbe High School would support use of the ramp or the upland parking area.

The site is approximately 2,000 feet from the main concentration of birds in Sitka Channel. Pilots may choose to operate out of the Western Anchorage near the new facility rather than in Sitka Channel, which could potentially reduce the bird strike hazard.

Advantages	*Disadvantages*
▪ Most seaplane operations would be in Western Anchorage, not in the narrow part of Sitka Channel, increasing flexibility and reducing congestion in the channel. ▪ Well protected from south and SE winds. ▪ Would increase the separation from the primary source of bird attraction to 2,000 feet. ▪ Existing ramp provides an opportunity for light maintenance and fueling.	▪ Aircraft noise would be more audible near residential and institutional areas, but quieter in Sitka Channel. ▪ More exposure of dock location to wind and wave action than the existing site. ▪ Concern over north and west winds. ▪ Insufficient upland area available for future seaplane base development. ▪ Mt. Edgecumbe High School has been unsupportive to having seaplanes near the school in the past and is incompatible conflict with Mt. Edgecumbe students. ▪ Concerns about increased vehicle traffic through the school campus and hospital area. ▪ Mt. Edgecumbe High School is unlikely to support use of the existing ramp or vehicle parking area.

The estimated cost of Alternative 2 is $5,800,000. This is a planning estimate only. Details of this cost estimate are contained in Appendix C.

5.2.3 Site Three

Alternative 3 (Figure 11) would develop a seaplane facility along the shoreline on the northern end of Japonski Island between the U.S. Coast Guard Base and the SEARHC clinic, daycare, and staff residential buildings.

Similar to Alternative 2, this site is adjacent to the area of the harbor known as the Western Anchorage, which would provide sufficient maneuvering room to accommodate safe taxiing and turning movements into the proposed facility. Like Alternative 2, the area would also increase pilot flexibility and choice of take off and landing directions to take advantage of wind conditions or to avoid bird and boat hazards.

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FIGURE 11

Date
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Figure

Like the other two alternatives, this location provides a relatively sheltered moorage area. The concerns about sea swells, west and north winds, and the breakwater improvements discussed above for Alternative 2 apply to this alternative as well.

For this alternative, there are two options for accessing the site. The proposed access would be routed from the Sitka Rocky Gutierrez Airport access road and traverse across property managed by the U.S. Coast Guard generally following the proposed security fence around the base (The Coast Guard is currently designing security improvements including fencing and clearing to secure the perimeter of the base). The second option would be to access the site with an extension of Seward Avenue. Parking could be developed adjacent to the access road or on a dock structure over the water. Land would need to be acquired from the U.S Coast Guard or Department of Education depending on the specific access option and design configuration of the vehicle parking area. The tidelands in the area are managed by the Alaska Department of Natural Resources.

With development of this alternative, noise would increase in the area from taxiing planes and idling aircraft engines. As with Alternative 2, depending on wind and wave conditions, northbound departures may start at or near the seaplane base and occur in a direction away from the adjacent properties. Southbound departures would likely require taxiing across Western Anchorage and occur on an alignment with the channel. With prevailing winds from the south and southeast, and because pilots tend to land as close to the seaplane base as possible, most landings would have an approach path from the north over the Western Anchorage. Landings would occur before the noise affected properties near the seaplane base.

The site is approximately 3,500 feet from the primary fish processing facility. Because many operations would move to the west end of the harbor, they would occur even farther from the primary bird attractant in Sitka Channel than the other alternatives.

Advantages	*Disadvantages*
▪ Most seaplane operations in the Western Anchorage, not in the Sitka Channel. ▪ The seaplane dock size not constrained by the surrounding land. ▪ May be the best location operationally. ▪ Reduces proximity to the primary bird hazard in Sitka channel. ▪ Increases separation from the primary source of bird attraction to 3,500 feet. ▪ Access directly from the airport would provide a number of locational advantages. It would facilitate the transfer of passengers and improve accessibility to fuel and maintenance personnel.	▪ Dock location exposed to more sea swells as they come in between the breakwater and Japonski Island. ▪ Seaplane operations very close to the SEARHC clinic and residential areas. ▪ Limited upland area for seaplane base development. ▪ More seaplane noise for land uses at the north end of Japonski Island. ▪ May require floating breakwater or rubble mound protection. ▪ New access road to airport needed.

The estimated cost of Alternative 3 is $5,800,000. This is only a planning estimate; for more details, see Appendix C.

5.2.4 Evaluation of Alternatives

None of the alternatives presented meet the minimum FAA recommended distance between wildlife attractants and a seaplane facility. The lack of available land without topographical constraints and lack of shelter from open ocean waves and wind, confines the study area for a new seaplane facility to those inside the harbor. The existing seaplane facility represents the least desirable location regarding proximity to a known wildlife attractant. All of the proposed relocation sites presented in this report increase separation from the attractant, but not sufficiently to be in compliance with FAA recommendations.

Alternative 1 provides the shortest separation from the wildlife attractants in Sitka Channel and keeps seaplane operations in a congested, narrow part of the harbor. It creates potential hazardous conditions for the docking of the Maple at the Coast Guard dock. Alternatives 2 and 3 increase the separation from wildlife attractants and increase operational flexibility and maneuvering room for seaplane operations. Each of these options is likely to reduce operations in the channel thereby improving operational safety.

The three alternatives were the only feasible sites of those identified offering protection from Gulf of Alaska wave action. Alternatives 2 and 3 appear to be the most sheltered from the prevailing wind direction, which is also the direction of the strongest frequent winds. Storm winds from the north and west could result in aircraft damage. Alternative 1 appears to offer better protection for north and west winds.

Each of the alternatives requires the acquisition of land from the State of Alaska, Department of Education. Alternative 2 could require acquisition from SEARHC. Access at site 3 would most likely require land from the U.S. Coast Guard and Department of Transportation and Public Facilities.

The following table summarizes the analysis of the three alternatives.

Table 1. Summary of Alternatives Analysis

	Alternative 1	Alternative 2	Alternative 3
Wind	Well protected.	Moderately well protected. North and west winds are a concern.	Moderately well protected. North and west winds are a concern.
Waves	Well protected.	Likely well protected after Corps of Engineers breakwater expansion.	Likely well protected if Corps of Engineers extends breakwater.
Tideland Ownership	State of Alaska, Department of	State of Alaska, Department of	State of Alaska, Department of

	Alternative 1	Alternative 2	Alternative 3
	Natural Resources.	Natural Resources.	Natural Resources.
Upland Ownership	Department of Education.	Department of Education/SEARHC.	Department of Education, U.S Coast Guard, DOT&PF.
Land Use	U.S. Coast Guard Dock & University of Alaska, Southeast.	Adjacent to Mt. Edgecumbe High School.	Adjacent to SEARHC facilities and Coast Guard Air Station. Near to day care and residential treatment programs.
Bird Hazard	600 feet from the primary hazard source.	2,000 feet from the primary hazard source.	3,500 feet from the primary hazard source.
Access	Via Seward Avenue	Via Seward Avenue	Via new road From Airport through U.S. Coast Guard property or via Seward Avenue.
Operations	Heavy boat traffic. Conflicts with Maple docking operation.	Minor boat traffic, increased flexibility for operating.	Minor boat traffic, increased flexibility for operating.
Cost	$5,200,000	$5,800,000	$5,800,000

5.2.5 Preferred Alternative Recommendation

This section presents the recommendation of a preferred location and conceptual layout for advancement. The recommended, preferred alternative is at site 3. Site 3 would develop a seaplane facility on the northern end of Japonski Island between the Coast Guard Base and the cove behind the SEARHC buildings along Seward Avenue. We recommend pursuing access to the facility from the Sitka Rocky Gutierrez Airport across U.S. Coast Guard property generally following their proposed security fence (currently in design) as the preferred access option. Because permission for an easement or right-of-way across Coast Guard property may not be obtainable, we recommend keeping open the option of accessing the site via an extension of Seward Avenue.

Alternative 3 is advantageous for a number of reasons.

- It provides the greatest separation from bird hazards in the channel and is therefore the most fundable from an FAA standpoint.
- It will increase the seaplane operational flexibility by providing a wider body of water (Western Anchorage) directly adjacent to the seaplane facility.
- This location will result in a reduction of aircraft operations in the narrow part of Sitka Channel, which will reduce boat-plane interaction and conflict and thereby improve safety.
- The reduction of aircraft operations in the narrow part of Sitka Channel will reduce aircraft noise to the most heavily developed stretch of the channel.

- Road access directly from the airport will provide an excellent opportunity for transferring passengers and freight between wheel planes and seaplanes and would benefit commercial seaplane operations.
- Access directly to the airport would facilitate fuel transfer and storage.
- The access road, if done in conjunction with the Coast Guard fence/security project, would make the Coast Guard's fence maintenance easier and allow for security patrols of the perimeter of the Coast Guard base.
- Access directly from the airport via Coast Guard property would alleviate traffic concerns for SEARHC and Mt. Edgecumbe High School.
- The site provides one of the most sheltered locations from prevailing winds.
- If done in conjunction with the Corps of Engineers proposed harbor breakwater extension, the site should provide a protected moorage location from waves and sea swells.
- The site has sufficient upland space for vehicle parking.
- The site has sufficient shoreline and tidelands to meet forecast seaplane docking demand.
- This site would have no affect on docking operations of the Maple.
- This site has the least impact to Mt Edgecumbe High School, and may in fact reduce noise impacts there.

The primary concern with this site has been expressed by SEARHC related to noise and activity. The seaplane facility would be located near several residential structures currently used for day care and residential alcohol treatment. According to SEARHC personnel, their decision to locate these uses along this stretch of Seward Avenue was primarily for its secluded, quiet setting. The layout as propose, attempts to minimize some of SEARHC's concerns by not relying on Seward Avenue for access. The concept depicted has been rotated and oriented away from the SEARHC buildings as much as possible. This was done to use the natural terrain as screening to minimize visual and noise impacts at SEARHC. Further refinement to minimize impacts should be explored during design and as part of the NEPA process.

6.0 Facility Requirements

This section presents a summary of the facility requirements and conditions needed to provide a safe and efficient seaplane base and operating area in Sitka that will meet the forecast demand for the next 20 years. A number of site-specific design concepts are possible. Layout and design elements will be used to enhance the locational attributes of the preferred site during design to further protect based aircraft from wind and wave activity and to facilitate ingress and egress of the seaplanes into parking positions.

6.1 Design Aircraft

Figure 12. DeHavilland Beaver Operated by Harris Air, Sitka.

The seaplane base should be able to accommodate a mix of aircraft. The largest commercial seaplane on floats to historically land in the Sitka Channel is a DeHavilland DHC-6 Twin Otter, with a wingspan of 65 feet. While this is the largest seaplane likely to use the facility, it is not anticipated to constitute sufficient usage to be recommended as the design aircraft. The aircraft anticipated to routinely use the facility that would have the greatest dimensional requirements (the design aircraft) is the DeHavilland Beaver.

Table 2. Design Aircraft Specifications

Wingspan	Length	Height	Weight		Speed
48′	30′	9′	Empty 2,850 lbs	Max Takeoff 5,100 lbs	140 mph

6.2 Water Operating Area Characteristics

The water operating area is that part of the seaplane base used or intended to be used for the landing and takeoff of aircraft, as well as taxiing, turning, and maneuvering of aircraft on the water surface. The area needs to have sufficient size and water characteristics to allow the safe operation of aircraft during all phases of flight. The following characteristics are recommended (see AC 150/5395-1, Seaplane Bases):

Sufficient Size—The existing water operating area dimensions (4,000 feet by 200 feet) are sufficient and are recommended to be used for planning the upgraded seaplane base. The minimum water operating area recommended by FAA is 2,500 feet by 200 feet. The water operating area depicted on the layout plan set (Appendix A) meets this criterion.

Slow Currents—Landing and takeoff areas in locations where the currents are less than 3.5 mph are preferable. Locations where the currents exceed 7.0 mph should be avoided. The proposed site meets these criteria.

Sufficient Water Level—The minimum depth for seaplane operation is 3 feet, although 6 feet is preferable. Seaplane base design should accommodate this water depth through dredging or float placement.

Safe from Wave Action—Locations where large swells occur or are frequently created by vessels should be avoided. Wave analysis should be conducted at the existing location to determine the wave affects and taking into account the proposed runway safety area expansion at Sitka

Rocky Gutierrez Airport and the U.S. Army Corps of Engineers harbor breakwater expansion project. The design may need to incorporate additional wave protection.

Debris Free Area—Areas subject to excessive debris or to debris over extended periods of time should be avoided. The proposed location meets this criterion.

Safe Maneuvering Space—Ample maneuvering and turning areas should be provided, considering boats, prevailing winds, and currents. The proposed location meets this criterion.

Sheltered Moorage—A sheltered mooring or anchorage area, protected from winds and currents, is recommended. The existing site provides a relatively sheltered location that would improve if the breakwater extension proposed by the U.S. Army Corps of Engineers and the Runway Safety Area Expansion planned by DOT&PF are constructed in the future. During design, wave analysis should be conducted at the proposed site and necessary wave protection incorporated into the design through further extension of the rubble mound breakwaters protecting the harbor or some type of wave barrier protection on the seaplane facility itself. However, in the event these projects are not constructed, the facility may require additional wave protection.

Safe Bottom Conditions—A facility should be free of bottom hazards. Objects that project from the bottom and constitute a hazard should be removed. If this is impractical, the objects should be conspicuously marked to alert users to their presence. During design, detailed bathymetry of the site should be undertaken and any hazards removed.

Free from Wildlife Attractants—To the extent practicable, the distance between the seaplane base's aircraft movement areas, loading ramps, or aircraft parking areas and a wildlife attractant should be 5,000 feet for facilities serving piston-powered aircraft. The proposed location is approximately 3,000 feet away from the primary bird attractant.

Operational Flexibility—An unmarked water lane or water operating area is normally the choice of seaplane pilots and is recommended. The area known as Western Anchorage at the northwest end of the harbor, provides an open and flexible location for operations and has been marked on the layout plan set.

Prevailing Winds—If a water lane is marked, it should be aligned to provide maximum wind coverage. Sitka Channel is oriented with the prevailing winds and has sufficient wind coverage.

Approach and Departure Paths—The approach and departure paths should be clear of established shipping or boating lanes and airspace

hazards. An over-water approach or departure is preferable to an approach-departure path over populated areas, beaches, and shore developments. Western Anchorage provides an area where over-water approaches and departures should be feasible such that operations will not occur over populated areas or shore developments.

Recommendation. In addition to the existing designated landing area in Sitka Channel, a future water operating area has been depicted on the seaplane base layout plan that encompasses the area known as Western Anchorage. This area is likely to experience increased operations if the seaplane base is relocated to the preferred location and depicting it on the layout plan more accurately depicts the area likely to be used for operations. This area would increase operational flexibility, increase the separation from know wildlife attractants, provide approach and departure paths that are further removed from populated areas, and would provide a greater space for conducting operations thereby minimizing boat-plane conflicts and increasing safety. Being located within the harbor breakwaters, this area will be protected from waves.

6.3 Shoreside Facilities

This section presents a description of the shoreside facilities proposed at the relocated seaplane base.

Floating Dock—Because of the large tidal variation at Sitka, a floating seaplane dock that provides slips with individual ramps and an associated gangway designed to accommodate a 19-foot variation is the recommended design. The following table shows the tides in Sitka. The docks should be wide enough to accommodate tie down lines, pedestrian traffic, and a drive-down for a vehicle.

Table 3. Tide Observations at Sitka

Highest observed water level (1948)	14.68′
Mean higher high water	9.91′
Mean lower low water	0.00′
Lowest observed water level (1978)	-3.82′
Tide variation used for design	19′

Source: The Center for Operational Oceanographic Products & Services (Co-ops), http://co-ops.nos.noaa.gov/co-ops.html

Ramps—The seaplane tie down ramps should be 18 feet square and designed to allow a walking platform under the wings. The minimum docked seaplane wingtip to wing tip separation distance should be 10 feet. The dock should be designed to allow easy access into and out of the ramps.

Figure 13. Ramp design, such as these at Wrangell, should allow pilots to walk under the wing to inspect the plane and provide access to tiedown lines.

Size—Under the moderate growth scenario, the Sitka Seaplane Base should accommodate a short-term (5-year) forecast of 13 slips, an intermediate-term (10-year) forecast of 14 slips and a long-term (20-year) forecast of 15 slips. It is recommended that the seaplane base have sufficient expansion capability for up to 20 slips. Reserve areas for future ramps have been identified on the layout plan. Should demand warrant, an additional finger float could be added to the concept, or additional length could be added to the proposed floats.

Gangways—A gangway of sufficient length and width should be provided to permit easy walking and the passage of baggage carts and allow for driving a truck down onto the floats. The gangway should meet all requirements contained in the accessibility guidelines of the Americans with Disabilities Act (42 USC 126, Section 12101 et seq.). The gangway should be 12 feet x 170 feet with a maximum 12% grade at low tide. A short pier is recommended to connect the gangway with the seaplane float. The pier should be 20 feet wide.

Figure 14. The seaplane base design should consider upland fuel storage with fuel pumps located on the floats, like the facility in Kodiak.

Services—Fuel, electricity, and fresh water for wash downs should be made available at the dock and considered in the design.

Lease Lots—Lease lot development is not essential to the functioning of the seaplane base. There could be demand for up to three lease lots during the 20-year planning horizon. Over water lease lots depicted as a "reserve" area are shown on the layout plans. The minimum dimension of each lease lot should be 50 feet by 70 feet.

Haul-out Ramp—The most recent airport master plan (DOT&PF 1999) for the Sitka Rocky Gutierrez Airport recommends development of a haul-out at

the eastern end of the airport. An additional haul-out ramp at the relocated seaplane facility is not recommended.

6.4 Upland Facilities

Administration Building—Administration facilities are not recommended for short-term development. An administration building could be incorporated as an upland facility or on an over-water lease lot.

Access—Vehicle access to the seaplane base should be by an all-weather road (paved or gravel) with adequate width (a 24-foot-wide road consisting of two 12-foot lanes plus 2-foot shoulders on either side).

Parking Areas—A minimum of 15 parking spaces should be provided for seaplane pilots and commercial users. The recommended parking space per vehicle is 9 feet by 18.5 feet.

7.0 Initial Environmental Evaluation

This section presents an initial environmental assessment of the preferred site location and conceptual design. The intention of the discussion is to provide an analysis of the environmental conditions of the site and identify at a conceptual level the kinds of impacts and permits likely to be needed as the site is developed. The analysis does not take the place of environmental analysis that would be required under the National Environmental Policy Act (NEPA).

7.1 Anadromous Fish Streams

According to the Anadromous Stream Catalog maintained by the Alaska Department of Fish and Game (ADF&G), there are no anadromous fish streams on Japonski Island. Initial field investigations also indicate there are no perennial or intermittent streams in the project area. A Fish Habitat Permit from ADF&G will not be required. Sitka Sound is, however, mapped as essential fish habitat (EFH) for a variety of species (see EFH section below).

7.2 Essential Fish Habitat

The Magnuson Stevens Fishery and Conservation and Management Act (MSFCMA) defines essential fish habitat as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (NMFSa). The MSFCMA notes that "for the purpose of interpreting the definition of essential fish habitat, 'waters' include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; 'substrate' includes

sediment, hard bottom, structures underlying the waters, and associated biological communities; 'necessary' means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and 'spawning, breeding, feeding, or growth to maturity' covers a species' full life cycle (NMFSa).

According to Section 600.810 of Subpart J of the MSFCMA, adverse effect is "any impact which reduces quality and/or quantity of EFH." This section also notes that "adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, or reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions" (NMFSa).

According to the National Marine Fisheries Service Interactive Essential Fish Habitat website, EFH for several species of fish occurs in the marine waters surrounding Sitka. Those species include walleye pollock, Pacific cod, the sculpin family, rock sole, salmon species, the skate family, yelloweye rockfish, sablefish, shortraker and rougheye rockfish, Pacific perch, dusky rockfish, flathead sole, and arrowtooth flounder (NMFSb). As this project will require dredging and the placement of fill into Sitka Sound, an EFH assessment will be required for this project. It is likely that NMFS will require project design and construction to incorporate mitigation techniques to offset potential impacts to EFH associated with this project.

Herring spawning habitat has been an issue in Sitka Sound. It is reported that herring spawn on the partially exposed rocks directly west of the proposed site. Coordination with resource agencies will be required regarding this issue during NEPA.

7.3 Wetlands and Fill

All dredging or filling activities that occur below mean high water require a Corps of Engineers Section 10 permit. The seaplane base would consist of a gangway and a floating dock supported by piles. This project may also require extending a breakwater in Sitka Harbor as well as potentially constructing a seawall. A portion of the seaplane base may be located on a shallow shelf that becomes exposed at low tide. Depending upon final design, the construction may require dredging this shelf to increase the depth to prevent the base from grounding. All of these activities will require a Section 10 permit.

The National Wetlands Inventory (NWI) has mapped estuarine and palustrine wetlands on Japonski Island. Palustrine wetlands (likely forested or shrub wetlands) may be located along the proposed road alignment and parking lot. Although the NWI mapping indicates the proposed road and parking lot would be located on uplands and preliminary field investigations indicate the area is well drained, a wetland delineation will likely be necessary to determine if there are any jurisdictional wetlands in the project area. If fill is

placed in estuarine or palustrine wetlands, a Corps of Engineers Section 404 permit will be required.

7.4 Coastal Management Program

Japonski Island falls within the Sitka Coastal Management Plan (CMP) boundary. The CMP states that priority for waterfront and intertidal development shall be given to water-dependent activities such as water-based transportation facilities (City and Borough of Sitka, 1989). The CMP does not contain any unusual conditions for seaplane projects although the plan states facilities should be moored in at least 12 feet of water (to the extent possible). Since the entire project area is within the CMP zone, the City and Borough of Sitka and the Alaska Division of Governmental Coordination would review the project for consistency during the acquisition of permits.

7.5 Water Quality

According to the Sitka District Coastal Management Program there have been four concerns over water quality in Sitka Sound. These concerns include effluent from the pulp mill (the pulp mill closed in the early 1990's and therefore is no longer a water quality concern), the potential for oil spills, solid waste treatment (including fish processing waste), and concern over drifting logs from Peril Straits to Sitka Sound (City and Borough of Sitka, 1989). There is no fueling facility at the existing seaplane base. This makes fueling conditions difficult as plane owners are forced to haul fuel to their planes and refuel with a gasoline jug. This situation causes concern over water quality and safety. The proposed seaplane base would either provide a fueling facility or would have a ramp that would allow fuel trucks to deliver fuel directly to the seaplanes. In either case, the risks of spilling fuel into Sitka Sound would be dramatically reduced from the current situation. If a fueling facility is incorporated into the seaplane base design, it is likely clearances will be required from the Alaska Department of Environmental Conservation, the Environmental Protection Agency, the local Fire Marshall, and the Coast Guard. Once the size of any storage tank/fueling facility is determined, additional investigation will be needed to determine what agencies would actually have regulatory authority over the fuel storage.

7.6 Air Quality

Sitka meets the National Ambient Air Quality Standards (NAAQS) for most if not all the major air pollutants. Smoke from wood stoves and emissions from the solid waste incinerator have raised concerns over air quality in Sitka especially during times of temperature inversions (City and Borough of Sitka, 1998). Under the prevention of significant deterioration of air quality program, Sitka is a class II area. Stringent air quality standards in class II areas have been established for sulfur dioxide, nitrogen oxides and

particulate matter and cannot be exceeded. Relocation of the seaplane base is not expected to cause air quality concerns.

7.7 Section 4(f) Properties

Publicly owned wildlife refuges, parks and recreation areas, and historic sites eligible for the National Register of Historic Places are all potential properties protected from transportation impacts by Section 4(f) of the Department of Transportation Act. There are no wildlife refuges, parks, or recreation areas located in the project area. The project area is, however, within the Sitka Naval Base Operating Base historic district and historical sites are located within the vicinity of the proposed access road. It is expected that the seaplane base and associated facilities can be designed to avoid disturbing historical sites, but a Section 4(f) evaluation may be required if using federal aviation administration funding. SHPO must evaluate the project during the next phase to determine whether the project area can be occupied without adversely affecting the integrity of the historic district.

7.8 Threatened and Endangered Species

The National Marine Fisheries Service (NMFS) has identified the endangered humpback whale (*Megaptera novaeangliae*) and threatened Stellar sea lion (*Eumetopias jubatus*) as species likely to occur in the waters off Sitka. Humpback whales are known to frequent Sitka Sound, particularity for feeding in the summer and fall (Straley, 1990). The nearest Stellar sea lion haulout is located on the coast of Biorka Island, approximately 15 miles southwest of Sitka. Because of these species, an informal consultation under section 7 of the Endangered Species Act with NMFS will be required for this project.

Southeast Alaska does not currently have any threatened or endangered species that are monitored by the US Fish and Wildlife Service (USFWS). A verbal consultation with the Service will, however, be required.

7.9 Historic, Architectural, Archaeological, and Cultural Resources

The Alaska Heritage Resources Survey, maintained by the Office of History and Archaeology, was reviewed for this project. According to the survey, the project area is within the Sitka Naval Operating Base historic district. The Sitka Naval Operating Base was one of two Alaskan Naval Air Stations used during World War II (SHPO, 2002). Several historic sites are located in the vicinity of the proposed access road. The sites range from fuse and detonator buildings to log magazines. Further investigation will be required to identify the exact location of these historical structures relative to the access road. It is expected that seaplane facilities, including the access road and parking lot, can be designed to avoid disturbing historical sites. There is a chance that additional war relics may be found during construction. If artifacts were discovered during site investigation or construction, all work

that would impact the resources would be halted and the State Historic Preservation Officer (SHPO) would be contacted; work would not resume until SHPO clearance was obtained.

Native entities and organizations, including the Sitka Tribe of Alaska, Shee Atika Incorporated, and Sealaska Incorporated would be contacted to determine if there are areas of cultural significance within the project area. If areas of importance are located within the project area, project planners would design the seaplane base and associated facilities to avoid impacting these sites. A beach located on the Coast Guard Air Base is known to have cultural significance. The seaplane base will not impact this beach.

7.10 Land Use

Japonski Island is zoned as public land. Japonski Island houses a variety of facilities including the Sitka Rocky Gutierrez Airport, the US Coast Guard Air Station, the Waste Water Treatment Plant, SEARHC Mt. Edgecumbe Hospital and the Mt. Edgecumbe High School. A SEARHC clinic, day care center, and office building, and several government-owned residences are located within the immediate project vicinity.

The Draft Comprehensive Plan (City and Borough of Sitka, 1998) states that one goal or policy of the urban-public land is to eliminate conflicts between floatplane operators and boats in Sitka Channel. This project would, therefore, be consistent with land use plans for publicly zoned areas because relocating the seaplane base would reduce traffic conflicts in Sitka Channel. This project would also be consistent with other transportation related uses of Japonski Island including the Sitka Rocky Gutierrez Airport and U.S Coast Guard Air Station.

The SEARHC residential treatment programs are adjacent to the project site. Project designers have attempted to minimize land use conflicts by proposing access to the seaplane base directly from the airport (through Coast Guard land) and not via Seward Avenue and through design considerations that attempt to screen the seaplane base from the adjacent properties.

7.11 Noise and Visual Impacts

At various community meetings the Southeast Alaska Regional Health Consortium has expressed concern over visual and noise impacts of the proposed seaplane base. Project planners have designed several seaplane base alternatives at the preferred site to take advantage of natural cover that reduces some of the visual and noise impacts of the seaplane base on adjacent upland land users. Reducing visual impacts will likely require dredging a rocky, intertidal shelf to prevent the facility from grounding at low tide. Further efforts will be required to balance visual impacts and shoreline impacts.

Facilities adjacent to the preferred site will likely experience an increase in noise as a result of this project. Primary noise sources include idling and taxiing seaplanes. Baseline noise levels have not been measured within the project vicinity. Further investigations, including baseline noise measurements and noise modeling studies may be advisable to determine the extent of noise impacts associated with this project.

7.12 Biotic Communities

Japonski Island is dominated by typical coastal rainforest plants such as Sitka spruce and western hemlock. Understory species include salmonberry and devil's club. Areas that have experienced past disturbances are vegetated by Sitka alder and cottonwood. A gravel road, cul-de-sac, and former roadbed are located within the immediate project area. Project planners will limit disturbance of vegetation by maximizing use of an already disturbed area. In addition, the proposed access road would follow a new Coast Guard security fence thereby collocating the facilities to minimize new disturbance.

The proposed location of the actual seaplane base is a rocky, intertidal and subtidal area. The rocky shoreline is dominated by various species of kelp and seaweed. The shoreline provides habitat for barnacles, mussels, clams, sea stars, limpets and chitons in addition to providing potential spawning habitat for Pacific herring (USDA, 1999). A variety of birds including gulls, eagles, ravens, crows, dabbling and diving ducks also utilize Japonski Island. Mammals that are found on the island or in the surrounding waters include river and sea otters, mink, harbor porpoise, and harbor seals (USDA, 1999). The beach area also shows signs of past disturbances and exhibits evidence of buried cables.

7.13 Energy

The increase in energy usage attributable to the project will be negligible.

7.14 Light Emissions

It is anticipated that light impacts from the seaplane base would be negligible.

7.15 Solid Waste Impacts

Solid waste production is not expected to sizably increase as a result of this project.

7.16 Economic Impacts

The existing seaplane base is small and cannot accommodate the demand for seaplane ramp space and associated services. Once the facility is relocated,

demand for ramp space over the next 20 years can be met. Providing additional seaplane ramp space will allow for the economic growth of seaplane-dependant industries including tourism. Additional ramp space will also allow for safe and more efficient emergency activities including medical evacuations.

7.17 Environmental Justice

The project is not expected to have an adverse effect on minority or low-income populations.

7.18 Coastal Barriers

Alaska does not have any coastal barriers as defined in the Coastal Barriers Resources Act of 1982.

7.19 Wild and Scenic Rivers

There are no wild and scenic rivers in the vicinity of the project area.

7.20 Farmland

No farmland is located in the project vicinity.

7.21 Hazards

7.21.1 Flooding

The Federal Emergency Management Agency has mapped Japonski Island in flood Zone D. This zone is defined as an area of undetermined but possible flood hazard. The waters surrounding Japonski Island are mapped as Zone V. This zone is defined as an area of 100-year coastal flood with velocity (wave run-up). Base flood elevations and flood hazards factors are not determined for Zone V. It is likely that the City and Borough of Sitka will review the proposed seaplane project to ensure its compliance with National Flood Insurance Program.

Tsunamis generated in the Pacific Ocean have the potential to be a hazard in Sitka. The largest tsunami runup in Sitka was 7.8 feet (recorded after the 1964 Good Friday Earthquake). Studies indicate there is a 65 percent chance of a maximum wave height of at least 32 feet each 100 years at the Rocky Gutierrez Airport (City and Borough of Sitka, 1989b). The damage associated with a wave of this magnitude is dependant on the tide level at the time of impact. If a large event occurs at high tide, damage to the shoreline is likely. Project planners will design seaplane base to account for the threat posed by tsunamis.

7.21.2 Wildlife Hazards

The Sitka Channel, located northeast of Japonski Island, attracts a large number of birds that creates a safety concern for aviation activities. Fish waste from processing facilities is discharged from an outfall in Sitka Channel. The existing seaplane base is located approximately 300 feet from the North Pacific Processors, Inc fish waste outfall. A large number of sea gulls and other birds are attracted to this area that creates hazardous conditions for aircraft. The preferred alternative for the seaplane base is located approximately 3,500 feet from the primary source of bird attraction. Of the alternatives for the seaplane base, the preferred site is located the farthest away from primary source of bird hazard and would be an improvement to the situation.

7.21.3 Seismic Activity

Sitka is geologically young and unstable. Numerous faults, including the Fairweather fault cross the Sitka region. The U.S. Army Corps of Engineers has classified Sitka as Seismic Zone 3, an area liable to receive major structural damage from earthquakes. Due to the tectonics and origin of Sitka, the numerous faults located in the area, and Sitka's relative geographic position on the Pacific rift zone make it likely that an earthquake with a minimum magnitude of 8 on the Richter scale will occur in the future (City and Borough of Sitka, 1998). Seaplane base design will adhere to Sitka building codes.

Volcanoes. According to the soils in Sitka, it is estimated that the Kruzof Island volcanoes erupted approximately 10,000 years ago. An eruption 3,000 years ago may also have occurred. These volcanoes are currently considered dormant. A hazardous situation would exist to Sitka if these volcanoes were to become active (City and Borough of Sitka, 1989b). A volcanic eruption is not considered an imminent threat to the facility.

Mass Wasting. Due to the deposits of volcanic ash, which is prone to sliding, numerous landslides have occurred in Sitka. Snow avalanches have also occurred in Sitka (City and Borough of Sitka, 1989b). Project engineers should consider the threat of land and snow slides on Japonski Island and minimize the potential impacts by employing appropriate design measures.

Safety and Traffic. The existing seaplane base is located within a congested and constrained portion of Sitka Channel. By relocating the base into the Western Anchorage and out of Sitka Channel, traffic conflicts between seaplanes and boats will be greatly reduced. Concerns over additional vehicular traffic around the SEARHC hospital, daycare center, and residential substance abuse program have been resolved by moving seaplane access from Seward Avenue to Coast Guard land adjacent to the airport. Vehicular traffic associated with the seaplane base will be routed from the airport to the seaplane base via a new access road. Traffic on Seward Avenue is not expected to increase.

Hazardous Waste Sites. The Alaska Department of Environmental Conservation (ADEC) maintains an inventory of spills and contaminated sites. ADEC databases include the Inventory of Registered Underground Storage Tanks, Leaky Underground Storage Tanks, and Contaminated Sites Database for Alaska. According to these databases, there are or have been underground storage tanks and leaking underground storage tanks on Japonski Island. The Sitka Rocky Gutierrez Airport, Mt. Edgecumbe Hospital, Sitka Naval Base Operations, and U.S. Coast Guard Air Station are facilities reported on ADEC's website as having underground storage tanks or leaking tanks (ADEC 2002). Preliminary research of these sites indicate that the immediate project area does not contain known hazardous materials but additional research for the exact location of these underground storage tanks will be necessary to determine if ADEC has reports of any releases of hazardous materials within the immediate project vicinity. As Japonski Island was used during WW II, there is a potential of discovering hazardous material during construction.

8.0 References

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APPENDIX A
Seaplane Layout Plan Set

SITKA SEAPLANE BASE
LAYOUT PLAN

SITKA ALASKA

2002

AIRPORT LAYOUT PLAN CONDITIONAL APPROVAL
SUBJECT TO ALP APPROVAL LETTER DATED _____

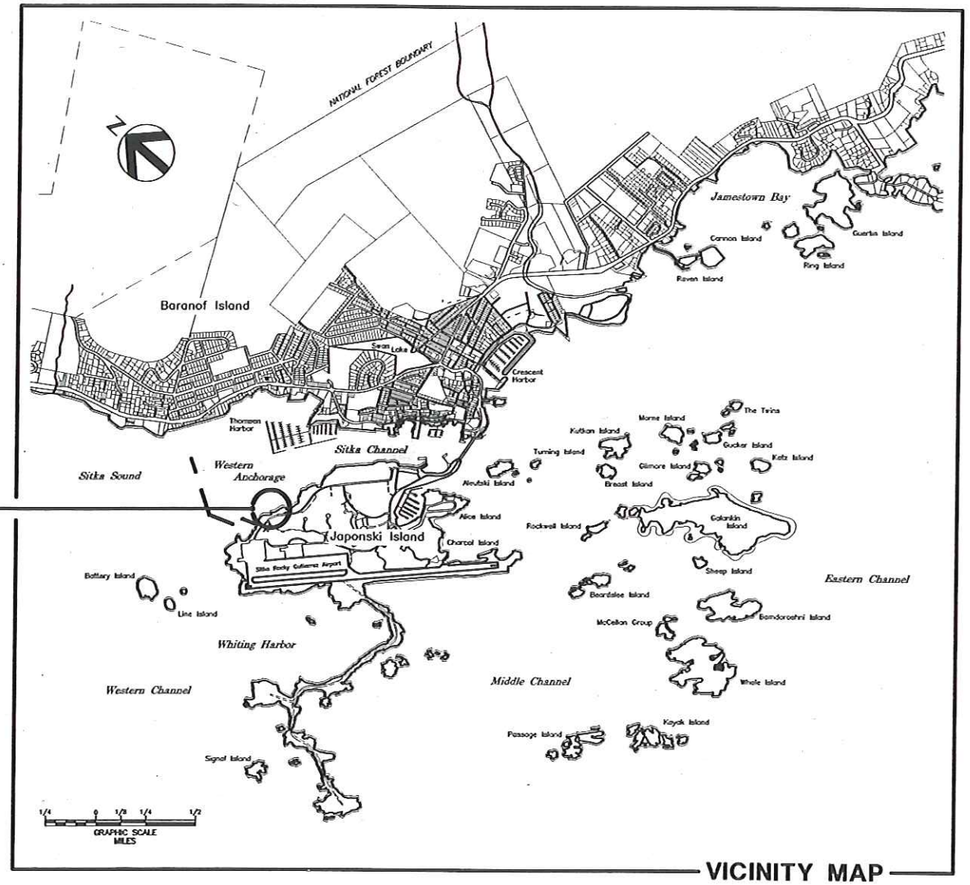
By: _____ DATE: _____
FAA, AIRPORTS DIVISION
ALASKAN REGION, AAL-600

FAA AIRSPACE REVIEW NUMBER: XX XXX

DRAFT

HDR Alaska, Inc.

Z:\08486 City of Sitka\004 Seaplane Base MP\Sitka ALP



VICINITY MAP

TIDAL DATUM	
OBSERVATION	TIDE ELEVATION (FEET)
HIGHEST OBSERVED WATER LEVEL (11/02/1948)	14.68
MEAN HIGHER HIGH WATER (MHHW)	9.91
MEAN HIGH WATER (MHW)	9.14
MEAN HIGH TIDE LEVEL (MTL)	5.29
MEAN LOW WATER (MLW)	1.45
MEAN LOWER LOW WATER (MLLW)	0.00
LOWEST OBSERVED WATER LEVEL (07/21/1978)	-3.82

BATHOMETRIC CONTOURS SOUNDED AT MEAN LOWER LOW WATER (MLLW)

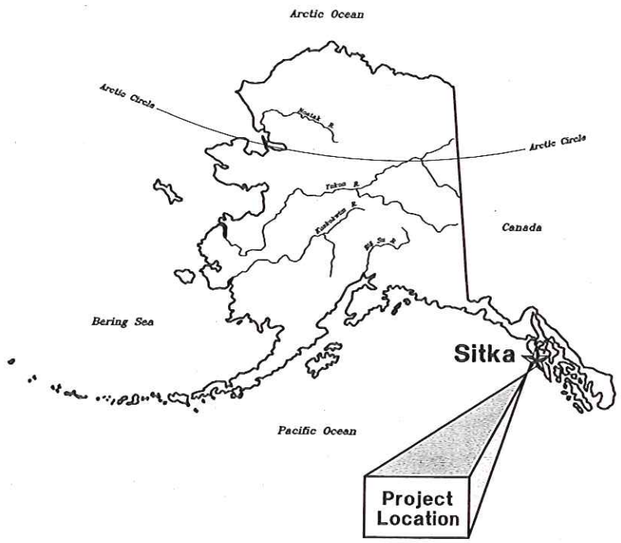
BATHYMETRY DIGITIZED FROM:
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)
NOAA CHART – SITKA HARBOR No. 17327
(1979)

WIND ROSE

SOURCE: STATION SITKA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)
SITKA, ALASKA 1996–2001 (5 YRS.)
RUNWAY ORIENTATION: 316.00 DEGREE
CROSSWIND COMPONENT: 13.0 KNOTS
TAILWIND COMPONENT: 60.00 KNOTS
WIND COVERAGE: 96.40%

NOTE:
THE WIND ROSE WAS GENERATED BASED ON THE ALIGNMENT OF SITKA CHANNEL

MAG NORTH
MAGNETIC DECLINATION
23° 31' E (2002)



SEAPLANE FACILITY DATA	
ITEM	
AIRPORT TYPE	UTILITY (AIRCRAFT < 12500 lbs.)
AIRPORT ELEVATION	MEAN SEA LEVEL (MSL)
AIRPORT LATITUDE	57°-3.4' W
AIRPORT LONGITUDE	135°-21.8' N
MEAN MAXIMUM TEMPERATURE	62° F
AIRPORT TERMINAL NAVAIDS	NONE
AIRPORT APPROACH CATEGORY	A
AIRPORT DESIGN GROUP	II
DESIGN AIRCRAFT	DeHAVILLAND BEAVER
WING SPAN	48'
LENGTH	30'
WEIGHT EMPTY	2,850 Lbs.
MAXIMUM TAKEOFF WEIGHT	5,100 Lbs.
SEA LANE DIMENSIONS	200' x 4000'
% WIND COVERAGE	96.40%
CROSS WIND COMPONENT	13.0 KNOTS
SEA LANE MARKING AND LIGHTING	NONE
SEAPLANE BASE OPERATING AREA DIMENSIONS	900'± x 3400'± (VARIES)
FLOAT DIMENSIONS	230' x 380'
GANGWAY DIMENSIONS	12' x 120' MINIMUM
GANGWAY GRADIENT	12% MAXIMUM AT MLLW
PULL-OUT RAMP DIMENSIONS	18' x 18"
BASED AIRCRAFT FORECAST:	
5-YEAR	13 AIRCRAFT
10-YEAR	14 AIRCRAFT
20-YEAR	15 AIRCRAFT
LEASE LOT RESERVE DIMENSIONS	50' x 70'
SERVICES AVAILABLE:	FLOAT LIGHTING; ELECTICAL POWER; FRESH WATER WASHDOWN; AVIATION FUEL

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

AIRPORT LAYOUT PLAN CONDITIONAL APPROVAL
SUBJECT TO ALP APPROVAL LETTER DATED _____

By: _____ DATE: _____
FAA, AIRPORTS DIVISION
ALASKAN REGION, AAL-600

FAA AIRSPACE REVIEW NUMBER: XX XXX

BY	DATE	REVISIONS

Date Drawn: 10-08-02
Designer: DJH
Drawn by: TJH
Checked by: DAH

HDR Engineering, Inc.

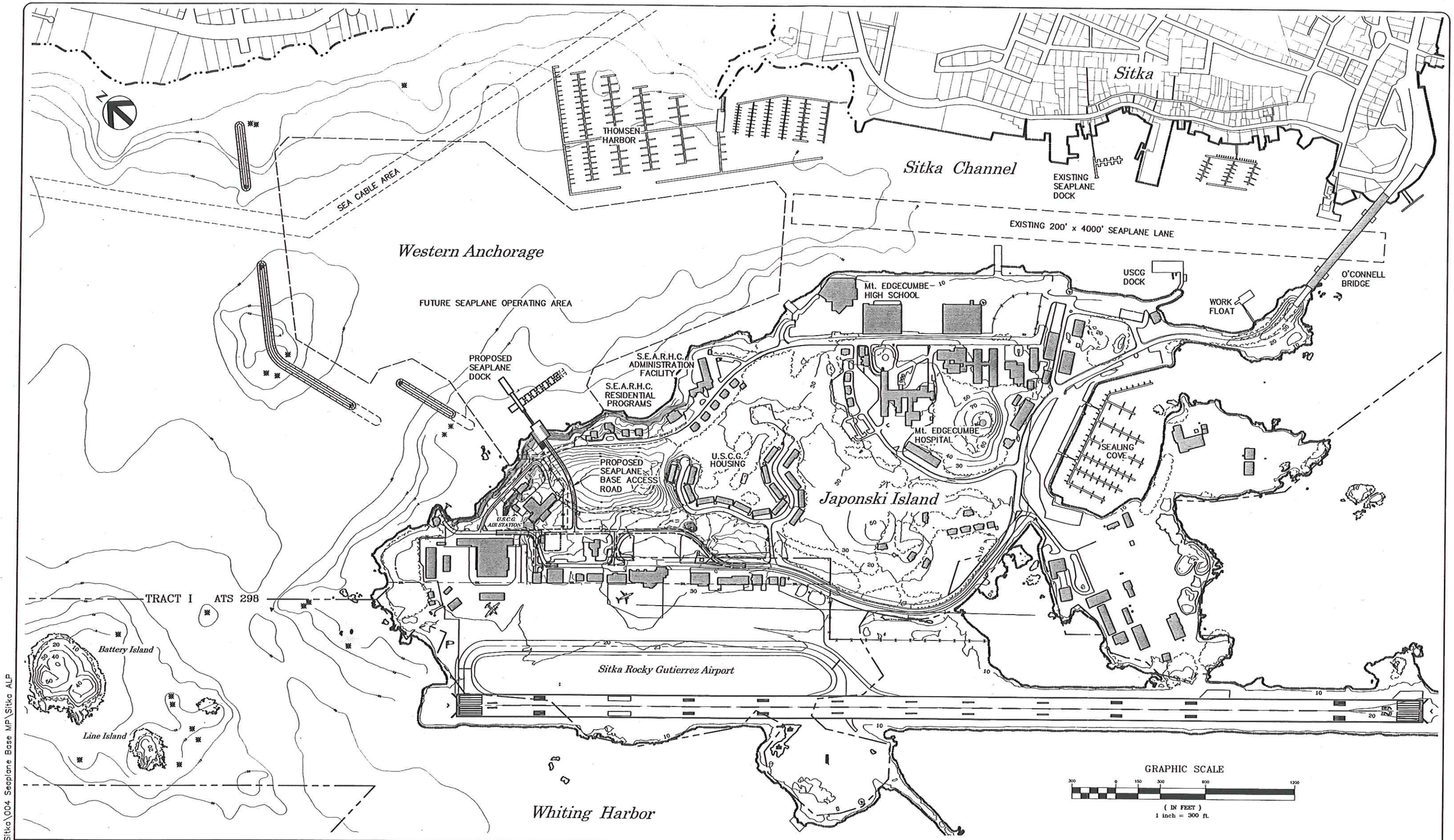
CITY AND BOROUGH OF SITKA DECEMBER 7, 1971

SITKA SEAPLANE BASE

LAYOUT PLAN
– DRAFT –

SHEET 2 OF 4

Z:\08486 City of Sitka\004 Seaplane Base MP\Sitka ALP



VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	AIRPORT LAYOUT PLAN CONDITIONAL APPROVAL SUBJECT TO ALP APPROVAL LETTER DATED _____ By: _____ DATE: _____ FAA, AIRPORTS DIVISION ALASKAN REGION, AAL-600 FAA AIRSPACE REVIEW NUMBER: XX XXX	BY / DATE / REVISIONS
Date Drawn: 10-08-02 Designer: DJG Drawn by: TJH Checked by: DAH	HDR Engineering, Inc.	CITY AND BOROUGH OF SITKA DECEMBER 2, 1971
SITKA SEAPLANE BASE LAYOUT PLAN – DRAFT –	SHEET 3 OF 4	

Z:\08486 City of Sitka\004 Seaplane Base MP\Sitka ALP

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

N

PHASE I: 13 RAMPED SEAPLANE SLIPS (18'x18')

ULTIMATE: 15 RAMPED SEAPLANE SLIPS (18'x18')

FUTURE SEAPLANE OPERATING AREA

40' x 120' SEAPLANE FLOAT

30' x 150' ACCESS FLOAT

12' x 120' DRIVE DOWN RAMP & GANGWAY

40' x 60' ACCESS TURNAROUND FLOAT

100' X 125' PARKING AREA (18 PARKING SPACES)

332'

380'

40'

48'

48'

EXISTING SITKA HARBOR BREAKWATER

U.S. ARMY CORPS OF ENGINEERS PROPOSED BREAKWATER EXTENSIONS

UPLAND AVIATION FUEL STORAGE AREA

EMERGENCY VEHICLE ACCESS GATE (OPTIONAL)

PROPOSED SEAPLANE BASE SECURITY FENCE

PROPOSED SEAPLANE BASE ACCESS ROAD

PROPOSED USCG SECURITY FENCE (APPROXIMATE LOCATION)

PROPOSED U.S.C.G. 30' PERIMETER SECURITY FENCE CLEAR ZONE

24' WIDTH

12' LANE

PROPOSED SECURITY GATE

U.S.C.G. AIR STATION

S.E.A.R.H.C. ADMINISTRATION FACILITY

S.E.A.R.H.C. RESIDENTIAL PROGRAMS

Seward Avenue

U.S.C.G. HOUSING

NEW CIRCULATION ROAD (UNDER CONSTRUCTION)

SITKA ROCKY GUTIERREZ AIRPORT

BRL

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

AIRPORT LAYOUT PLAN CONDITIONAL APPROVAL
SUBJECT TO ALP APPROVAL LETTER DATED _____

By: _____ DATE: _____
FAA, AIRPORTS DIVISION
ALASKAN REGION, AAL-600

FAA AIRSPACE REVIEW NUMBER: XX XXX

BY	DATE	REVISIONS

Date Drawn: 10-08-02
Designer: DJG
Drawn by: TJH
Checked by: DAH

HDR Engineering, Inc.

CITY AND BOROUGH OF SITKA DECEMBER 2, 1971

SITKA SEAPLANE BASE

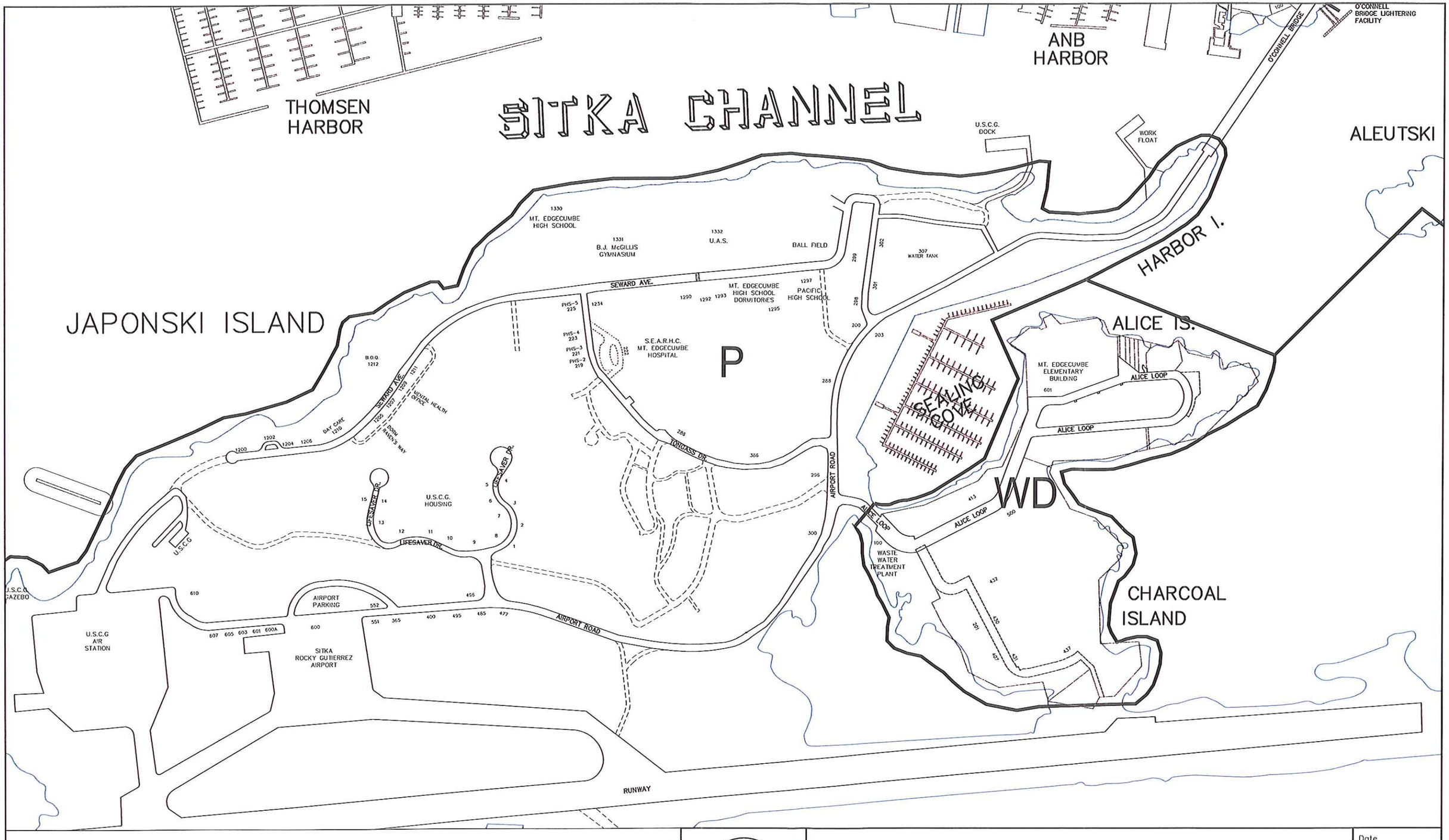
LAYOUT PLAN

– DRAFT –

SHEET 4 OF 4

Z:\08486 City of Sitka\004 Seaplane Base MP\Sitka ALP

APPENDIX B
Zoning and Land Ownership Maps



SITKA SEAPLANE BASE MASTER PLAN

CITY AND BOROUGH OF SITKA DECEMBER 2, 1971

JAPONSKI ISLAND ADDRESS & ZONING

Date 4/30/02

Figure

LEGEND

- TONGASS/SEWARD FY03
- NEW WATER LINE FY03?
- PEDESTRIAN CONNECTION FY04
- AIRPORT ACCESS FY03
- EXISTING AIRPORT PROPERTY BOUNDARY
- ULTIMATE AIRPORT PROPERTY BOUNDARY
- AIRPORT EXPANSION (CURRENTLY D.O.E.)
- D.O.E.
- S.E.A.R.H.C.
- U.A.S.

SITKA CHANNEL

PEDESTRIAN CONNECTION

HARBOR I.

ALICE IS.

SEALING COVE

ALICE LOOP ROAD

CHARCOAL ISLAND

MEHS

MEHS

UAS

TANK

TANK

SEARHC/ME

TANK

BEHM AVE.

AIRPORT ACCESS ROAD

UFESAVER DR.

5.5 Ac.

AIRPORT ACCESS ROAD

KRUZOF

CHARCOAL DRIVE

GALERIA DR.

GALEHA DR.

FAIRWAY DR.

WWTP

U.S.C.G. AIRSTATION SITKA

SITKA ROCKY GUTIERREZ AIRPORT

RUNWAY

NOTE: LOCATION OF PROPERTY BOUNDARIES IS APPROXIMATE.

NOTE: DO NOT SCALE FROM THESE PLANS–USE DIMENSIONS

PATH:		
PLOT:		
BY:	DATE:	DESCRIPTION OF CHANGE:

RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

SITKA ALASKA

JAPONSKI ISLAND
LAND STATUS & DRAFT PROJECT INFORMATION

DESIGNED BY: D. HAWES	PROJECT NO. 67985
DRAWN BY: D. STEVENS	DATE: 2001
CHECKED BY: D. HAWES	SHEET 1 OF 1

APPENDIX C
Cost Estimates

Sitka Seaplane Base Cost Estimate
Layout 1

Pay Item	Pay Unit	Unit Price	Quantity	Amount
Parking Lot	ft^2	$15	10,000	$150,000
Floating Dock	ft^2	$50	20,000	$1,000,000
Wood Piles	ft	$25	1,000	$25,000
Piles, driving	each	$1,500	15	$22,500
Electric system & lighting	LS	$160,000	--	$160,000
Water system	LS	$10,000	--	$10,000
Excavation	yd^3	$50	8,000	$400,000
Seawall, sheet pile	ft^2	$2,000	300	$600,000
Misc construction items	LS	-	-	$1,183,750

	With Seawall	**Without Seawall**	**Without Seawall & Ex.**
Construction Cost	$3,600,000	$3,000,000	$2,600,000
Engineering & Administration	$900,000	$750,000	$650,000
Subtotal =	$4,500,000	$3,750,000	$3,250,000
Contingency	$675,000	$562,500	$487,500
Project Estimate =	**$5,200,000**	**$4,300,000**	**$3,700,000**

Assumptions:
Parking lot includes 18, 10 x 20 stalls and 200' of 24' wide road
Contingency includes the gangway and pier
No land acquisition costs included
Launch Ramp not included
No rock excavation or blasting
Without excavation, dock will be located approx. 60' offshore to float at extreme low t

Estimating factors		
Excavation near shore	50	$/yd^3$
Asphalt and Structural section	15	$/ft^2$
Sheet pile	2000	$/ft
Engineering & Admin	25%	
Contingency	15%	

7/23/2002

Sitka Seaplane Base Cost Estimate
Layout 2

Pay Item	Pay Unit	Unit Price	Quantity	Amount
Parking Lot	ft^2	$15	10,000	$150,000
Floating Dock	ft^2	$50	20,000	$1,000,000
Wood Piles	ft	$25	1,000	$25,000
Piles, driving	each	$1,500	15	$22,500
Electric system & lighting	LS	$160,000	--	$160,000
Water system	LS	$10,000	--	$10,000
Excavation	yd^3	$50	16,000	$800,000
Seawall, sheet pile	ft^2	$2,000	250	$500,000
Misc Construction Items	LS	--	--	$1,333,750

	With Seawall	**Without Seawall**	**Without Seawall & Ex.**
Construction Cost	$4,000,000	$3,500,000	$2,700,000
Engineering & Administration	$1,000,000	$875,000	$675,000
Subtotal =	$5,000,000	$4,375,000	$3,375,000
Contingency	$750,000	$656,250	$506,250
Project Estimate =	**$5,800,000**	**$5,000,000**	**$3,900,000**

Assumptions:
Parking lot includes 18, 10 x 20 stalls and 200' of 24' wide road
Contingency includes the gangway and pier
No land acquisition costs included
Launch Ramp not included
No rock excavation or blasting
Without excavation, dock will be located approx.100' offshore to float at extreme low

Estimating factors		
Excavation near shore	50	$/yd^3$
Asphalt and Structural section	15	$/ft^2$
Sheet pile	2000	$/ft
Engineering & Admin	25%	
Contingency	15%	

7/23/2002

Sitka Seaplane Base Cost Estimate
Layout 3

Pay Item	Pay Unit	Unit Price	Quantity	Amount
Access Road	ft^2	$8	25,200	$201,600
Parking Lot	ft^2	$8	5,200	$41,600
Floating Dock	ft^2	$50	20,000	$1,000,000
Wood Piles	ft	$25	1,000	$25,000
Piles, driving	each	$1,500	15	$22,500
Electric system & lighting	LS	$160,000	--	$160,000
Water system	LS	$20,000	--	$20,000
Excavation	yd^3	$50	16,000	$800,000
Seawall, sheet pile	ft^2	$2,000	250	$500,000
Misc Construction Items	LS	--	--	$1,385,350

	With Seawall	**Without Seawall**	**Without Seawall & Ex.**
Construction Cost	$4,000,000	$3,500,000	$2,700,000
Engineering & Administration	$1,000,000	$875,000	$675,000
Subtotal =	$5,000,000	$4,375,000	$3,375,000
Contingency	$750,000	$656,250	$506,250
Project Estimate =	**$5,800,000**	**$5,000,000**	**$3,900,000**

Assumptions:
Parking lot includes 18, 10 x 20 stalls
Contingency includes the gangway and pier
No land acquisition costs included
Launch Ramp not included
No rock excavation or blasting
Without excavation, dock will be located approx.100' offshore to float at extreme low ti

Estimating factors		
Excavation near shore	50	$/yd^3$
Asphalt and Structural section	8	$/ft^2$
Sheet pile	2000	$/ft
Engineering & Admin	25%	
Contingency	15%	

7/23/2002

APPENDIX D
Proposed Road Centerline Survey

O'NEILL
SURVEYING AND ENGINEERING
P.O. BOX 1849, SITKA, ALASKA 99835
(907) 747-6700

FAX COVER SHEET

SUBJECT:

DATE: 2 Aug 02

FROM: Wayne Dye

FAX PHONE: (907)-747-7590

VOICE PHONE: (907)-747-6700

EMAIL: sitkasurveys@worldnet.att.net

TO: John McPherson

FAX PHONE: (907) 274-2022.

4 PAGES SENT INCLUDING THIS COVER SHEET

COMMENTS/MESSAGES:

Sending station/offset report of p-line topo shots.

PLEASE CALL IF YOU DO NOT RECIEVE ALL THE PAGES. THANK YOU.

AUTHORIZATION SIGNATURE

FLOAT PLANE RW

User Name: Patrick O'Neill
Project: 30374-02
Report Station/Offset

Date: 07-31-02
Time: 17:43:23
Page: 1

Report Station/Offset

ID	RD STA	RD OFFSET	Elev	Desc	RW STA	RW OFF
1	N/A	N/A	39.05		5000.00	940.00
2	N/A	N/A	40.20	AC52-50	5260.000	940.000
3	N/A	N/A	39.09	50+00, 940 RT	AL 4999.995	940.000
4	0+20.35	6.81 R	38.27	H/T	5539.206	1200.710
5	1+25.66	18.32 L	42.56	H/T	5586.032	1299.175
6	1+99.38	27.89 L	50.76	NAIL ED RD	5579.919	1377.252
7	3+14.95	34.52 L	56.13	H/T	5572.685	1447.532
8	4+09.34	31.14 L	49.64	STAUB TK	5645.673	1508.345
9	5+44.79	11.75 L	48.34	STAUB TK	5739.533	1608.963
10	6+73.97	9.16 R	31.52	STAUB TK	5823.515	1707.739
11	7+82.48	1.09 L	22.95	H/T	5911.987	1772.400
12	8+28.00	3.94 L	10.10	P/K ROCK	5947.959	1800.161
13	7+27.37	69.25 L	30.39	H/T	5916.748	1686.451
14	5+46.79	102.22 L	39.45	PK ED PVMT	5799.113	1540.843
15	4+13.80	171.45 L	44.89	PK ED PVMT	5735.265	1400.270
16	1+15.34	20.34 L	43.32	SPIKE	5589.262	1289.163
17	N/A	N/A	37.41	TK STUMP	5410.179	982.723
18	N/A	N/A	39.96	OLD 1	5250.506	939.630
19	N/A	N/A	0.00	CLOSE	5000.495	939.464
101	N/A	N/A	57.81	TOP CUT	5682.669	1227.363
102	N/A	N/A	59.98	TOP CUT	5635.883	1239.247
103	0+59.85	38.93 L	49.33	TOP CUT	5598.661	1216.087
104	0+00.00	0.00	35.80	ROCK SHLD	5536.586	1179.126
105	0+07.70	0.00	34.30	BTM DT	5539.274	1186.338
106	0+21.52	0.00	38.80	TOP CUT	5545.765	1198.538
107	0+41.87	0.00	39.74	CL TOPO	5555.781	1216.258
108	0+65.44	0.00	41.37	CL TOPO	5565.745	1237.614
109	0+81.46	0.00	42.20	CL TOPO	5569.503	1253.187
110	0+95.39	0.00	42.08	CL TOPO	5571.576	1266.963
111	1+11.97	0.00	43.35	CL TOPO	5569.463	1283.408
112	1+27.87	0.00	40.54	CL TOPO	5567.582	1299.198
113	1+45.00	0.00	40.13	CL TOPO	5565.442	1316.194
114	1+66.32	0.00	42.26	CL TOPO	5561.322	1337.115
115	1+80.01	0.00	50.92	CL TOPO	5558.697	1350.582
116	3+85.85	113.16 L	47.53	ED RD	5678.100	1429.631
117	2+02.05	49.52 L	50.16	ED RD	5599.837	1386.113
118	1+94.13	8.67 R	50.83	ED RD	5546.481	1361.564
119	1+90.77	60.99 R	51.75	ED RD	5497.421	1343.085
120	1+94.50	103.27 R	52.22	ED RD	5455.898	1334.328
121	2+03.46	96.22 R	52.22	ED RD	5460.020	1344.949
122	2+00.72	34.27 R	51.40	ED RD	5520.074	1360.396
123	2+09.00	19.12 L	50.67	ED RD	5569.446	1382.357
124	4+06.00	105.60 L	47.40	ED RD	5688.708	1447.497
125	2+05.46	0.00	50.82	CL TOPO	5551.474	1374.926
126	2+19.93	0.00	51.25	CL TOPO	5548.475	1389.082
127	2+33.49	0.00	50.58	CL TOPO	5543.798	1401.816
128	2+53.11	0.00	50.43	CL TOPO	5541.061	1421.243

User Name: Patrick O'Neill
Project: 30374-02
Report Station/Offset

Date: 07-31-02
Time: 17:43:23
Page: 2

Report Station/Offset

ID	RD STA	RD OFFSET	Elev	Desc	RW STA	RW OFF
129	2+62.54	0.00	51.77	CL TOPO	5537.966	1430.148
130	2+83.63	0.00	52.93	CL TOPO	5533.898	1450.799
131	3+01.76	0.00	52.99	CL TOPO	5541.417	1467.209
132	3+26.20	0.00	53.54	CL TOPO	5560.949	1481.897
133	3+39.09	0.00	57.16	CL TOPO	5571.061	1489.898
134	3+49.46	0.00	53.40	CL TOPO	5579.334	1496.139
135	3+75.96	0.00	52.00	CL TOPO	5600.282	1512.377
136	3+92.33	0.00	51.97	CL TOPO	5613.137	1522.510
137	4+37.46	0.00	52.22	CL TOPO	5648.777	1550.192
138	4+73.83	0.00	52.89	CL TOPO	5677.280	1572.789
139	4+94.46	1.34 R	50.43	CL TOPO	5692.411	1586.852
140	6+10.06	0.00	34.82	CL TOPO	5783.954	1657.379
141	5+82.92	0.00	37.93	CL TOPO	5762.690	1640.338
142	5+69.00	0.00	41.14	CL TOPO	5751.287	1632.545
143	5+57.58	0.00	47.35	CL TOPO	5741.803	1626.177
144	5+30.28	0.00	48.50	CL TOPO	5720.860	1608.657
145	4+96.68	0.00	50.75	CL TOPO	5687.274	1580.863
146	7+86.98	0.00	23.84	CL TOPO	5914.686	1776.161
147	7+52.81	0.00	21.79	CL TOPO	5888.790	1753.873
148	7+40.27	0.00	24.56	CL TOPO	5879.057	1745.962
149	7+19.00	0.00	27.81	CL TOPO	5863.479	1731.487
150	6+87.09	0.00	29.60	CL TOPO	5839.097	1710.892
151	6+80.54	0.00	31.69	CL TOPO	5834.667	1706.076
152	6+54.79	0.00	32.54	CL TOPO	5816.730	1687.595
153	6+45.02	0.00	32.89	CL TOPO	5809.990	1680.528
154	6+31.53	0.00	32.14	CL TOPO	5800.156	1671.287
155	6+19.41	0.00	33.11	CL TOPO	5791.698	1662.608
156	8+05.16	0.00	15.15	CL TOPO	5926.472	1788.021
157	8+14.87	0.00	11.36	BEACH	5935.127	1794.811
158	8+53.21	0.00	7.04	CL TIDE	5965.047	1819.109
301	1+28.81	29.44 L	42.75	COR BLDG	5598.670	1303.810
304	1+35.54	54.11 L	44.91	CL TR	5620.310	1313.568
305	1+40.96	72.49 L	44.77	CL TR	5637.873	1321.238
306	1+56.29	97.79 L	45.97	CL TR	5659.210	1346.168
307	1+63.13	99.78 L	45.81	CLR LMTS	5659.840	1353.265
308	2+20.10	61.08 L	49.82	CLR LMTS	5605.746	1410.309
309	5+81.24	132.99 L	45.47	COR BLDG	5836.430	1529.652
310	N/A	N/A	45.21	COR BLDG	5865.720	1489.798
311	3+10.72	24.04 L	56.94	CLR LMTS	5563.023	1453.379
312	4+86.62	24.45 L	48.10	CLR LMTS	5702.593	1561.814
313	4+30.82	25.12 L	50.22	CLR LMTS	5658.947	1526.282
314	3+84.38	25.64 L	48.90	CLR LMTS	5622.760	1497.454
315	4+31.51	55.21 L	48.13	FE COR	5677.943	1502.944
316	4+31.69	75.03 L	47.64	BLDG COR	5690.243	1487.400
317	4+32.07	96.46 L	47.69	BLDG COR	5703.690	1470.702
318	4+52.50	174.25 L	45.76	BLDG COR	5768.816	1422.993

User Name: Patrick O'Neill
Project: 30374-02
Report Station/Offset

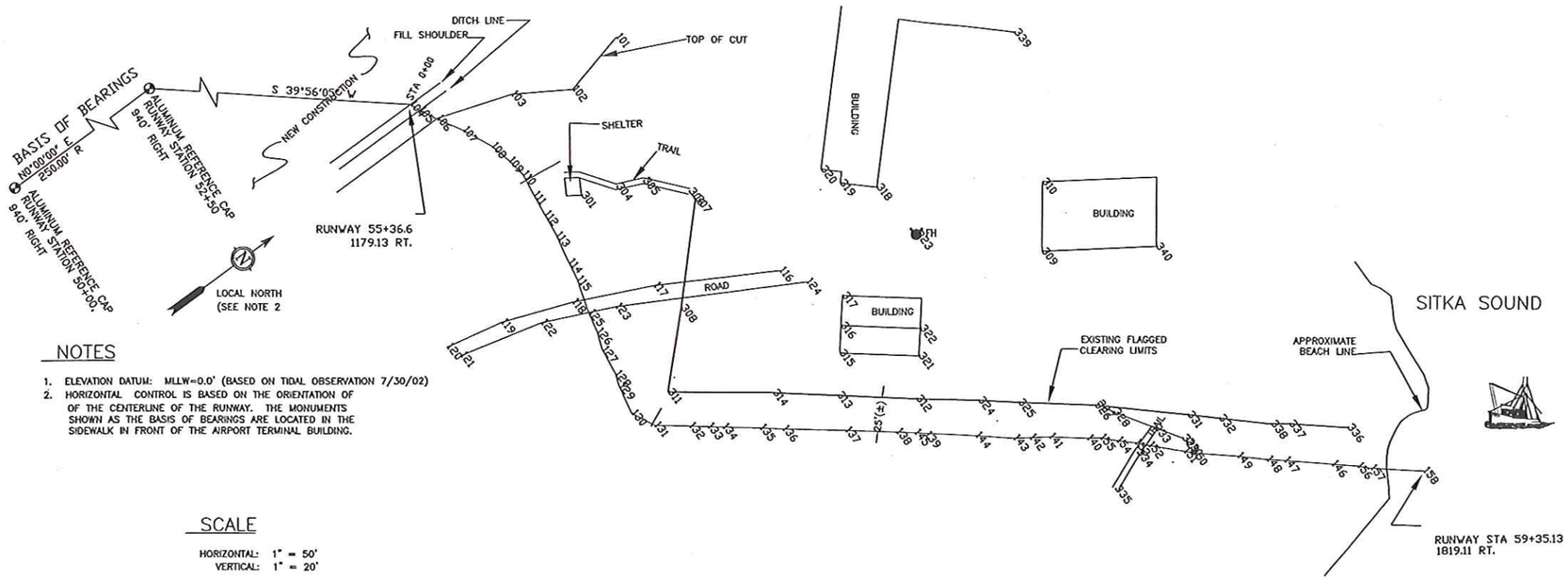
Date: 07-31-02
Time: 17:43:23
Page: 3

Report Station/Offset

ID	RD STA	RD OFFSET	Elev	Desc	RW STA	RW OFF
319	4+27.88	176.58 L	44.90	BLDG COR	5749.530	1404.857
320	4+13.70	186.04 L	44.67	BLDG COR	5744.128	1388.687
321	N/A	N/A	47.24	FE COR	5721.994	1538.153
322	N/A	N/A	47.30	COR BLDG	5734.341	1522.676
323	4+80.46	141.70 L	47.27	FIRE HYD	5771.492	1486.740
324	5+30.48	25.39 L	46.74	CLR LMTS	5737.310	1589.313
325	5+61.85	25.57 L	47.52	CLR LMTS	5759.606	1607.332
326	6+16.37	23.65 L	34.77	CLR LMTS	5802.411	1641.310
327	6+18.45	24.84 L	35.09	END FDNCE	5804.693	1641.645
328	6+25.82	19.79 L	33.36	FEN POST	5810.349	1653.385
329	6+77.69	9.20 L	32.75	FEN POST	5839.280	1697.618
330	6+81.15	6.89 L	31.97	END FENCE	5840.148	1701.854
331	6+78.57	26.27 L	31.76	CLR LMTS	5852.145	1686.368
332	7+04.05	26.29 L	29.71	CLR LMTS	5869.017	1701.755
333	6+56.81	12.97 L	32.94	CL TRL	5827.442	1680.017
334	6+47.61	6.71 R	32.84	CL TRL	5806.921	1687.030
335	6+34.86	34.47 R	32.35	CL TRL	5778.977	1698.688
336	7+95.92	27.09 L	15.80	CL LMTS	5939.135	1761.461
337	7+54.16	26.45 L	20.65	CL LMTS	5907.068	1734.704
338	7+42.04	25.64 L	25.89	CL LMTS	5896.601	1727.182
339	5+37.90	288.88 L	49.45	COR BLDG	5911.928	1392.150
340	6+42.36	141.35 L	38.22	COR BLDG	5904.837	1575.689

Alignment Name : Centerline
Beginning Station : 0+00.00
Ending Station : 8+53.21

No Station Equation

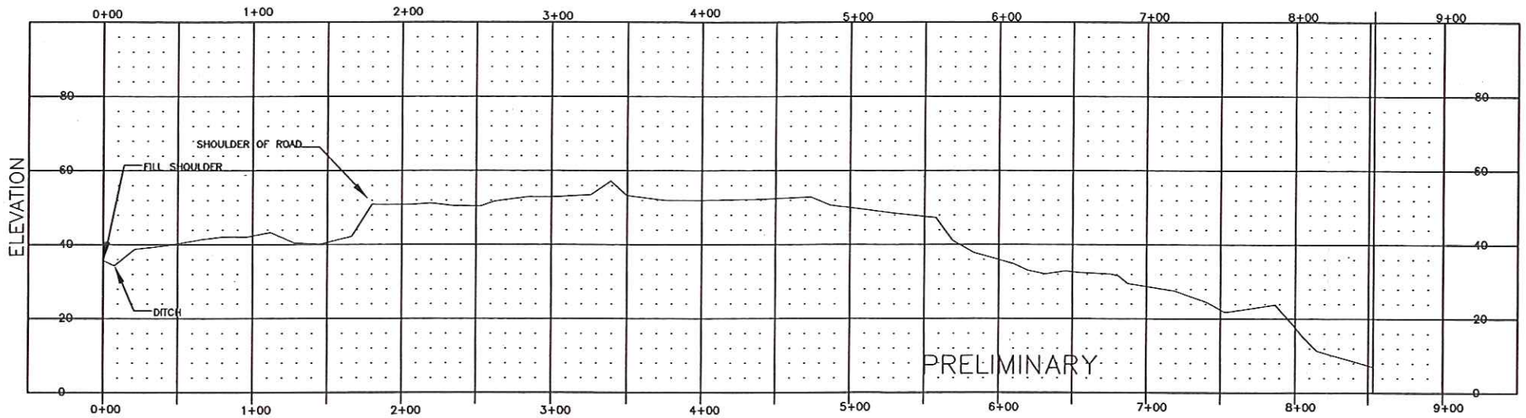


NOTES

1. ELEVATION DATUM: MLLW=0.0' (BASED ON TIDAL OBSERVATION 7/30/02)
2. HORIZONTAL CONTROL IS BASED ON THE ORIENTATION OF OF THE CENTERLINE OF THE RUNWAY. THE MONUMENTS SHOWN AS THE BASIS OF BEARINGS ARE LOCATED IN THE SIDEWALK IN FRONT OF THE AIRPORT TERMINAL BUILDING.

SCALE

HORIZONTAL: 1" = 50'
VERTICAL: 1" = 20'



O'NEILL
SURVEYING AND ENGINEERING

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EMAIL: sitkasurveys@worldnet.att.net

BY	DATE	REV.	DESCRIPTION OF CHANGE

RECORD OF REVISIONS

STATE OF ALASKA * 49TH * PATRICK K. O'NEILL LS 6304 REGISTERED PROFESSIONAL LAND SURVEYOR

DESIGNED: P. O'NEILL
DRAWN: WAD/ACAD
CHECKED: PKO
DATE OF PLAT: AUG 01, 2002 * 22:20:36
SCALE: 1" = 50'
DRAWING NAME: 30374-02.dwg
PROJECT NO. 30374-02

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT I AM A REGISTERED SURVEYOR, LICENSED IN THE STATE OF ALASKA, AND THAT IN JULY 2002 A SURVEY OF THE HEREIN DESCRIBED LANDS WAS CONDUCTED UNDER MY DIRECT SUPERVISION AND THAT THIS PLAT IS A TRUE AND ACCURATE REPRESENTATION OF THE FIELD NOTES OF SAID SURVEY, AND THAT ALL DIMENSIONS AND OTHER DETAILS ARE CORRECT ACCORDING TO SAID FIELD NOTES.

DATE PATRICK K O'NEILL LS 6304

P-LINE PROFILE

SITKA SEAPLANE BASE ACCESS ROAD
SITKA AIR STATION

CLIENT: HDR ENGINEERING, Inc., 2525 'C' STREET, SUITE 305, ANCHORAGE, ALASKA 99503-2639

SHEET 1 OF 1