HAINES PORTAGE COVE HARBOR MASTER PLAN

Photo by Lori Stepansky

Prepared for
Haines Borough
US Army Corps of Engineers, Alaska District
State of Alaska Dept. of Transportation

November 2009

HAINES PORTAGE COVE HARBOR
MASTER PLAN

Prepared for project planning partners:
Haines Borough
US Army Corps of Engineers, Alaska District
State of Alaska Department of Transportation & Public Facilities, Division of Ports & Harbors

Initially prepared by URS Corporation in association with Tryck Nyman Hayes, Inc. (July 2008) and modified by the Haines Borough (November 2009)

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ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act of 1990
ADF&G	Alaska Department of Fish and Game
ADOT&PF	Alaska Department of Transportation and Public Facilities
aka	also known as
AMHS	Alaska Marine Highway System
b/c	benefit-cost
CATV	community access television
CFEC	Commercial Fishing Entry Commission
COE	US Army Corps of Engineers, Alaska District
cm/sec	centimeters per second
EA	Environmental Assessment
EFH	essential fish habitat
HPS	high pressure sodium
LED	light emitting diode
MARPOL	maritime pollution
MH	metal halide
MLLW	Mean Lower Low Water
NED	National Economic Development Plan
URS	URS Corporation
US	United States
USFWS	US Fish and Wildlife Service
VE	value engineering

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EXECUTIVE SUMMARY

Purpose of Portage Cove Harbor Master Plan

For the last decade, the citizens of Haines have hoped and planned for improvement and expansion of its small boat harbor. The project grew increasingly complex as the natural harbor characteristics presented funding challenges. The urgency of needed repairs in the existing basin competed for attention and funds.

At the suggestion of officials with the Alaska District Office of the U.S. Army Corps of Engineers (COE), the Haines Borough agreed that a master plan was needed to guide further planning of the harbor improvements and expansion. This document, the *Haines Borough Portage Cove Harbor Master Plan* (the Master Plan) is a collaboration between the planning team: the Haines Borough, the State of Alaska Department of Transportation and Public Facilities (ADOT&PF), and the Corps of Engineers. It documents the project currently referred to as **Portage Cove Harbor Improvements and Expansion** and describes 1) the existing conditions, 2) desired improvements, 3) options for improvements and expansion, and 4) a plan to finance and implement the improvements. The Master Plan is intended to provide guidance in the continued planning of harbor improvements and expansion efforts, as well as guidance in the implementation plans. It can ensure that the challenges presented by geological, political, and economic realities are adequately addressed and that the potentials for achieving an improved and expanded harbor facility are maximized. The plan's purpose is to:

1. Support phased improvements to the Haines Portage Cove small boat harbor, with focus on upgrades that have funding
2. Identify considerations for harbor expansion
3. Select preferred alternatives by achieving consensus on issues and effecting changes needed to achieve implementation.
4. Identify scheduling and funding requirements for specific harbor improvements
5. Define roles and responsibilities of participating parties
6. Define specific steps and actions for implementation of the Harbor Master Plan

Planning Background

Planning efforts began in earnest in 1999 when the City of Haines entered into a project feasibility cost share agreement with the Corps of Engineers, Alaska District, to investigate and report on the project feasibility. A State-Municipality Cooperation Agreement, Project No. 74160.1, *Haines Navigation Improvements*, described the relationship between the City of Haines, the State of Alaska Dept. of Transportation & Public Facilities and the US Army Corps of Engineers during the study process. Project No. 68711, *Haines Harbor Expansion*, includes project activity through plans, engineering and design (PED), professional services contracts and construction contracts.

Planning efforts have resulted in the following achievements to date:

- Establishing project feasibility and acquisition of FONSI

- Establishing eligibility for federal funding
- Identifying existing conditions
- Identifying desired improvements
- Identifying possible design alternatives
- Design, bid process, and contract award for improvements to existing harbor

Project Structure

The project is subdivided into **two major components**: 1) existing basin improvements, and 2) expansion basin developments. These two components are further categorized in accordance with the various considerations: a) breakwaters and dredging, b) in-water services and amenities, and c) uplands acquisition and improvements.

The project can further be defined by recognizing the focus and the limitations of the participating entities. The roles and responsibilities of each of the partners are:

Corps of Engineers (General Navigation Features)
- Breakwaters
- Navigation channel and turning basin dredging (within specified federal limits)
- Existing harbor mooring area dredging (within specified federal limits)

Haines Borough (Local Sponsor)
- Local mooring basin dredging (existing and new harbor outside of federal limits)
- Inner harbor facilities (floats, ramps, utilities) for both existing basin and expansion basin
- Upland development, all

State of Alaska (Technical Advisor)
- Planning and design partner
- Funding and cost sharing for local improvements

The Master Plan describes the COE's project track in terms of **phases**; it describes the Local Sponsor's track in terms of **tasks**. The project structure is diagrammed in figure 2-1, *Project Planning Structure*.

Harbor Design Considerations

Considerations for The Portage Cove Harbor Improvements and Expansion Project include

- **in-water services and amenities** including potable water, power and lighting, fire protection, communications, sewer, fuel concession and sport boat launch;
- **upland development**, including harbor planform, parking, boat storage, waste oil, restrooms, laundry and harbormaster support and uplands concessions; and
- uses common to both basins, including ADA Accessibility, Segregation of user groups and environmental consideration.

These considerations , in addition to Financial Considerations are discussed extensively in Chapter 4, *Harbor Development Considerations*.

Findings and Recommendations

The need for improvements to the existing harbor and for expansion of the harbor to meet current and projected demand is well documented by the planning effort. Both project components are urgently needed, however, plans and work for existing harbor improvements have and will continue to move ahead since funding for these activities is available.

Existing Basin Improvements. Planning and construction in the existing basin are moving forward concurrently. The Portage Cove Harbor Replacement project was advertised for bid November 2008 and awarded to Western Dock & Bridge, Inc of Ketchikan, AK on January 13, 2009.

Additional desired improvements to the existing harbor call for a redesign of the existing south harbor entrance as described later in this document. The funding strategy for the second component of existing harbor construction is pending design that will provide the following:

- South breakwater to protect existing harbor (if pursued without federal participation)
- New sport boat launch ramp
- F Float improvements
- ADA compliant Gangway to F Float
- Parking for vehicles and trailers
- Storage and repair areas for boats
- Local dredging

Expansion Basin Developments. The federal program design effort is currently under way as Phase III (a), development of COE Alternative 4(modified) and concurrently as Phase III (b) which investigates other design alternatives in light of fiscal constraints. Although the mapping of alternatives allows the planning partners to prepare for the possibility that funding for the preferred alternative cannot be secured on an appropriate schedule, forcing changes to the project, **it is the intent of all planning partners to move forward with design and construction of COE Alt. 4**. Once a design is finalized, the harbor expansion component will include:

- New and modified breakwaters for expansion basin
- Dredging within federal limits
- Local dredging within the basin
- New floats, gangways, and in-water amenities
- Uplands development for parking and support facilities

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1.0 PURPOSE OF PLAN

1.1 Planning Background

The Haines Small Boat Harbor was originally constructed by Alaska Public Works Agency in 1958. The US Army Corps of Engineers, Alaska District (COE) constructed an expanded (current) harbor at Portage Cove in 1976.

Project Justification. There are several significant problems with the Portage Cove Small Boat Harbor related to operations and maintenance, and the ability to meet the existing and forecast demand for harbor facilities in Haines. The existing harbor is inadequate by size and design to accommodate the needs of residents and transient users. Especially during the summer season the harbor is overcrowded; the Harbormaster turns vessels away and other vessels avoid the area altogether. The harbor is exposed to southeast winds, which can damage vessels and facilities. With the harbor at capacity, these conditions cause:

- Delays in entering and maneuvering in the harbor
- Hot-berthing where transient vessels are moored in vacant resident stalls.
- Rafting transient vessels

The 2004 *Navigation Improvement Interim Feasibility Report* documents the problem succinctly: “Sixty percent of the vessels permanently moored in the existing harbor exceed the design length of the slips they occupy. Larger vessels requesting moorage have to use alternate facilities, adding to the cost of their operations. Additional moorage is also needed to improve or provide services such as oil spill response, water taxi service, and to reduce costs associated with subsistence harvesting”. (COE 2004)

The Portage Cove Harbor is an aging facility. The harbor floats are deteriorated and damaged. The utility system serving the floats is old and of limited capacity. The Harbormaster’s office is inadequate. It is very small, old, and need of relocation in order to allow for summer 2009 construction activities. A more central location between existing and expansion basins may be desirable. As additional use and facilities have been added to the harbor, such as the floatplane dock and icehouse, harbor congestion has increased, particularly during the peak summer season.

Float Deterioration

Initial Planning Efforts. On February 23, 1999, the (then) City of Haines entered into a project feasibility cost share agreement (PFCSA) with COE to investigate and report on harbor expansion feasibility. The project plan and later alternatives were developed and reported by the COE in *Navigation Improvements Draft Feasibility Report and Environmental Assessment, Haines Alaska, July 2002*. In May 2005, the Haines Borough and the State of Alaska signed an agreement to participate in COE Project No. 68711 Haines Harbor Expansion, the scope including project activity through plans, engineering and design

(PED), professional services contracts and construction contracts. Below is a summary of key steps in the COE work to improve and expand the Haines Portage Cove Harbor:

- Phase I: Reconnaissance, 1999.
- Phase II: Feasibility, January 2000– March 2004. This resulted in the US army Corps of Engineers Report "*Navigation Improvements Interim Feasibility Report and Environmental Assessment, Haines, AK, July 2004*" which found that the project meets national economic development criteria and has no significant environmental impacts.
- Phase III: Design, June 2004–present.
    - A Value Engineering Study was conducted July 2005 to look for potential cost reductions and project improvements while maintaining quality and project features.
    - Efforts to create a Master Plan to guide continued planning and implementation was begun in early 2008. This document is the result.

Future Planning Efforts. Geotechnical, engineering, and financial obstacles have prevented the realization of a product in Phase III. The Master Plan promotes the continuation of Phase III efforts as follows:

- Continued effort to design and fund the preferred COE alternative 4, modified
- Design & Funding Alternatives – Identify design alternatives and funding strategies that meet current political and economic realities. This calls for creative collaboration and decisive action that result in the construction of a successful new breakwater in Portage Cove to the north of the existing harbor basin, possibly with reconfigured or demolished segments of the old harbor to complete an expanded basin.

Concurrently, the Master Plan identifies non-federally funded project tasks to begin June 2009 and to include replacing floats and utilities, followed by design and installation of a new sport boat launch ramp, additional parking, design of additional breakwater protection for the sport ramp and development of adjacent upland area to the existing harbor in 2009 and 2010.

1.2 Haines Reconnaissance Visit

On April 21 and 22, 2008, RISE Alaska and the URS Corporation (URS) as subcontractors to Tryck Nyman Hayes, Inc. facilitated a Boat Harbor Advisory Committee meeting to develop the Haines Harbor improvement project list to be included within this plan. Meeting materials and notes, such as project worksheets, maps, and attendance records are in Appendix B. Meeting participants reviewed funding sources and the proposed project's strengths and weaknesses. All attendees cited multiple opportunities to develop additional revenue from commerce and tourism.

1.2.1 PROJECT STRENGTHS

- Road access to Canadian border
- Market with growth and demand

- Community focus and interest
- Beauty of the waterfront
- Sheltered harbor versus Lynn Canal
- Sources of ice, fuel, power, water
- Smaller tour boats
- High speed ferry/plane
- Case for road system extension
- Freight boarding
- International recreation
- Private yachts
- Opportunity for seafood processing and boat repair
- New local tour opportunities, such as Sea Lion Rock

1.2.2 PROJECT WEAKNESSES

The existing small boat harbor layout has several deficiencies that influence the expansion efforts; these items are further described in Section 2, *Planning Issues* and Section 3, *Existing Conditions*. The following are summary statements regarding the existing small boat harbor deficiencies:

- There is no sewer, showers, or disposal system for marine waste.
- The location of the restroom facility is not convenient; the restroom design does not permit winter use.
- The location of the ice house is not convenient; larger vessels cannot access the auger.
- The road that provides access to the harbor needs improvement to better manage traffic impacts to the harbor operation.
- The existing waterfront contains residential and private lots creating limited space for expansion in the current area.
- Overall, the current facility is aging and diminishing in function, as described in the introduction to this chapter.

The community cited concerns about possible external impacts to the harbor expansion project. These concerns include the change in the Alaska Congressional delegation, a weakening international and national economy, potential delays due to archaeological finds and environmental challenges, difficulties in permit acquisition and the ever-increasing cost of materials and breakwater construction due to design.

1.2.3 SUGGESTED IMPROVEMENTS

The proposed harbor expansion includes upland projects that directly support the increased movement of personnel, cargo, and visitors/tourists utilizing the Portage Cove Harbor. The Advisory Committee meeting participants created the following prioritized checklist to plan upland improvements to the harbor expansion accordingly:

- Secure Uplands
- Provide a Harbormaster facility that includes adequate space for maintenance/storage
- Petition the Borough to address Front Street and Main Street traffic issues to mitigate congestion and maintain safety
- Determine amount and location of parking for boat trailers and vehicles
- Provide for private fuel concessionaire
- Provide utilities: water, electrical, including a utility float with junctions
- Identify preferred method and provide fire suppression
- Provide for hazardous waste disposal and waste oil recovery
- Provide for year-round sewer hookup and pump-out using the shortest distance to beach access
- Provide for restrooms/showers
- Identify areas of land that might be leased for marine-related commercial or retail use
- Identify areas of land that might provide public enjoyment of the waterfront: parks, recreation, landscaping, trails
- ROW acquisition for future development
- Provide additional vertical dock face for cranes
- Acquire and site a travel hoist
- Provide for a floatplane dock near harbor entrance
- Provide for seafood processing; seafood haul-out
- Provide a freight or warehousing facility

2.0 PLANNING ISSUES, GOALS AND OBJECTIVES

2.1 Master Planning Structure

This Master Plan is intended to provide guidance to the Portage Cove Harbor Improvement and Expansion Project. It is important to understand several key details about this project. First, the project effort is subdivided into **two major components**: 1) existing basin improvements, and 2) expansion basin developments. These two components can each be subdivided into categories: a) breakwaters and dredging, b) moorage features and amenities, and c) uplands acquisition and improvements.

Second, the project, including the planning effort, can further be defined by recognizing the focus and the limitations of the participating entities. COE, operating under federal authority, can only participate in funding construction of breakwaters and dredging within federal limits. The COE program consists of a five phases: Phase I, Reconnaissance; Phase II, Feasibility; Phase III, Design; Phase IV, Construction: and Phase V, Operations & Maintenance. All references to **phases** in this document are in reference to the COE program and project elements.

The Haines Borough and ADOTP&F do not have the same limitations of participation. In addition to participating in breakwater construction and dredging, they can fund and construct in-water improvements and uplands features. The Borough defines the project as containing numbered project **tasks** for both components: existing basin improvements and expansion basin development. The Borough and ADOTP&F have primary funding responsibility (100%) for the existing basin improvements, and the COE has primary funding responsibility (80%) for breakwaters and navigational dredging in both components: existing and expansion.

The purpose of this plan is to identify and prioritize requirements and engage participating parties in meeting the remaining project timeline. The project is concurrently in Phase III, Design, for the expansion aspect of the project and Task 1, Inner Harbor Replacement, relative to aspects of existing harbor improvements. The planning structure is diagrammed in figure 2-1.

The plan is to move forward within Phase III with a preferred design, COE Alternative 4 modified. This action is identified as Phase III (a). The funding challenges of the project mandate that the partners be prepared to respond to 2009 US Congressional action without jeopardizing the project with a triggering of further studies, assessments or analysis. Therefore, while Phase III (a) continues to promote COE Alternative 4 modified, Phase III (b) addresses the action items associated with the proposed new breakwater while enabling the planning partners to align design with adequate funding strategies. The COE, The Haines Borough and the State of Alaska will continue to consider and analyze different harbor configurations, thereby ensuring that the resulting project meets the goals and objectives outlined in Section 2.2.

2.2 Harbor Planning and Development Issues

This plan identifies a number of planning issues that address the impact of existing harbor configuration and the challenges of continuing to provide services during phased expansion. The Haines Borough, the State of Alaska, and COE must coordinate planning efforts to ensure that funds are secured to facilitate timely harbor improvements through all project phases and tasks. Funding for harbor improvements must be identified to ensure that the harbor is continually operated and maintained even while it is improved and expanded. Key issues cited about the existing harbor point to the current need for the following:

Electrical Hookup

- Additional slips of greater length
- Floats capable of 40 years' service
- State-of-the-art utility delivery systems: electricity, water
- Adequate basin depth and room to maneuver commercial capacity vessels
- Additional uplands and upland development to support harbor and waterfront activities
- Understanding the impacts of glacial rebound

The following subsections outline the goals and objectives that provide planners with key milestones while expanding Haines Harbor.

2.3 Goals and Objectives

The 2004 *Navigation Improvement Interim Feasibility Report* documented the number of industries that rely on Haines Portage Cove Harbor as a source of commerce, fuel, and other related services. To continue supporting key revenue sources, the new harbor must meet the following criteria:

- Adequately sized to accommodate current and projected user needs and allow for development of harbor-related facilities.
- Upland support: Legal and efficient access to uplands for support of land-based harbor-related services and facilities
- Safety: Design features must protect against wind-generated waves and boat wakes. Design must also provide adequate depths throughout the harbor and at entry
- Technically feasible, cost effective design of a protected harbor entrance

Listed are the goals for aspects of the Portage Cove Harbor Master Plan:

Harbor Improvements

- Reduce damage to vessels incurred from the overcrowded conditions in the existing harbor
- Reduce vessel costs incurred from overcrowded conditions in the existing harbor
- Reduce float maintenance costs incurred by the current lack of protection in the existing harbor
- Improve access for residents and visitors using trailerable boats
- Deliver utilities and fire suppression via safe and economical systems

Operations and Maintenance

- Design facilities to minimize liability and maintenance costs
- Provide a rate structure so that revenues cover operations and maintenance costs
- Manage harbor facilities to minimize damage to facility and vessels

Economic Growth

- Provide berth space for larger commercial vessels
- Improve efficiencies for commercial fishing fleet
- Aid development of the tourism industry and resident recreational opportunities
- Support local businesses that depend on tourism and marine commerce tourism and provide opportunities for private landowners

Funding Harbor Improvements and Expansion

- Coordinate available Federal, State and Borough sources of funding for harbor expansion
- Program and sequence harbor expansion to anticipate and obtain available funding
- Consider use of local quarries, dredged materials, and decommissioned breakwaters to minimize construction costs

Environment and Mitigation

- Develop any required mitigation triggered by harbor expansion
- Obtain permits for in water work and new fill
- Provide opportunities for improved waste handling

These goals are attainable throughout the expansion process. They support the continued growth of the local economy and provide a safe harbor for local and transient users. Overall, the recommended improvements, as detailed in Section 5 and Appendix A, are based on sound engineering principles that mitigate the impact of the local climate. They are accompanied by an operations and maintenance plan that stabilizes the area and assigns responsibilities to the appropriate project sponsor.

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3.0 EXISTING CONDITIONS

3.1 Uplands Characteristics

Within the area identified for harbor expansion, there are limited public lands, existing private residential and commercial uses. Harbor expansion may conflict with existing private activities such as the restaurant, marine repair and seasonal RV park upland of the existing and proposed basins. Front Street along the waterfront is utilized for local traffic as well as some through traffic to Lutak Inlet. The current road design has limited capacity and would need to be improved to accommodate projected traffic resulting from the improved Harbor. Funding for this improvement has been included in the Governor's FY10 budget proposal.

3.1.1 GENERAL LAND USE AND OWNERSHIP

Existing Small Boat Harbor

Within the vicinity of the existing small boat harbor, the majority of uplands are in private ownership. Land immediately across Beach Road is utilized by the Sheldon Museum and Cultural Center. Across Beach Road to the south is zoned commercial and is held as open space by the Presbyterian Church. The northeast corner of the harbor is commercial (bar/restaurant). The Borough owns the tidelands in the existing small boat harbor; tideland is specifically waterfront related, and similarly zoned.

Existing Harbor Upland

Proposed Harbor Expansion

Within the area encompassed by COE Alternative 4, the majority of the uplands are in private ownership, and upland development for harbor-related activities such as parking or gear storage would involve lease, owner development or municipal purchase of private lands. Forty-five (45) of forty-six (46) tideland parcels are held by seven (7) private entities; the Borough owns only one non-strategic tideland parcel. Land use of uplands across Front Street is primarily residential and is zoned residential. Uplands and tidelands on the water side of Front Street are zoned waterfront; almost one-half of the uplands is developed and used for commercial purposes including a restaurant, a marine repair and RV park.

3.1.2 EXISTING ACCESS AND TRAFFIC

Haines is accessible via road, sea, and air. It is the terminus of the Haines Cutoff Highway, connecting the Haines Highway to central and northern Alaska and the contiguous US via Canada. The Haines Cutoff Highway is a two-lane, paved road that serves as a federal-aid primary route. Improvement to the Haines Cutoff Highway through Canada has been a laborious process, plagued with drainage and design issues. ADOT&PF maintains 70 miles of unpaved and 60 miles of paved road providing service to Haines. (COE 2004)

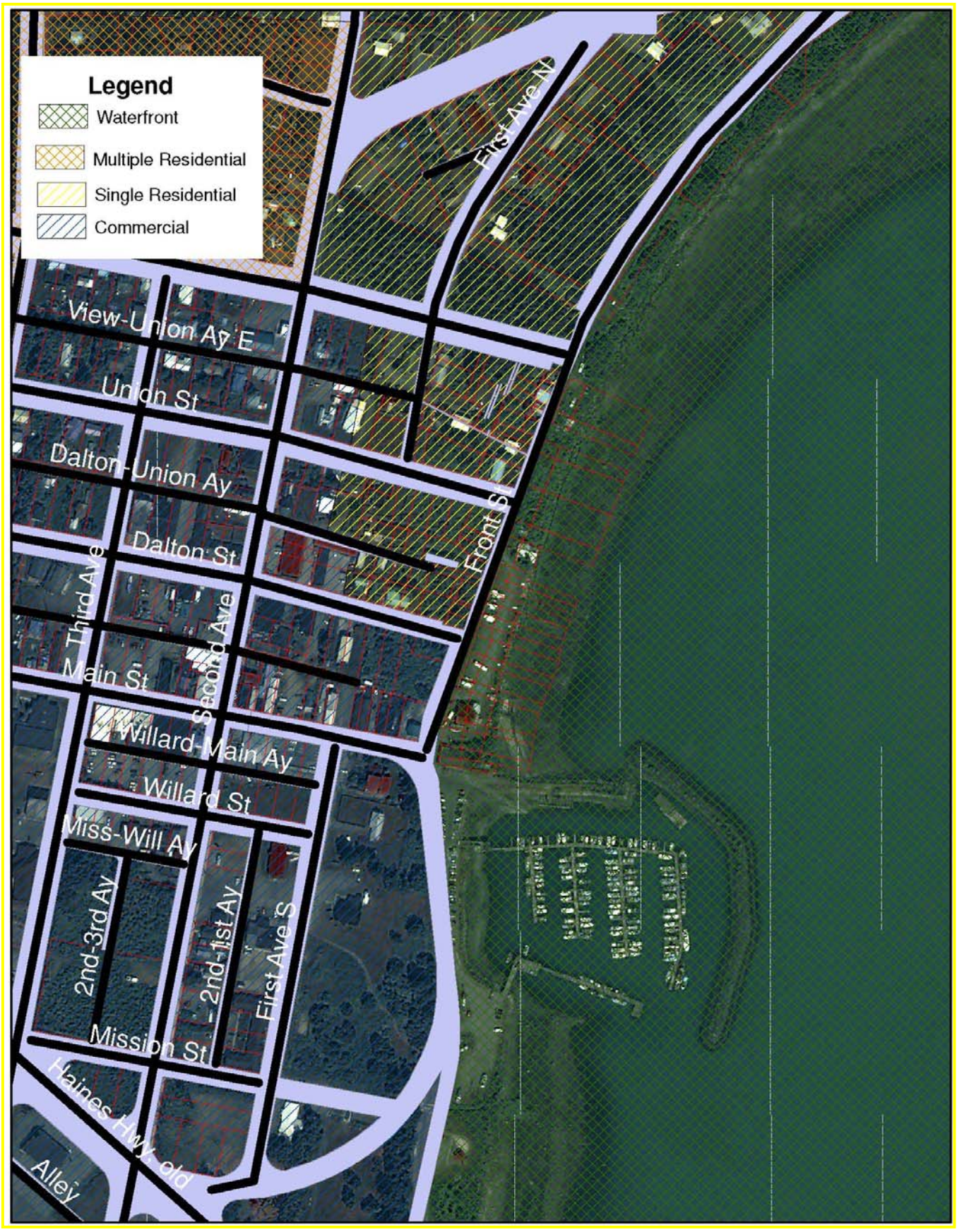


Figure 3-1: Zoning in Vicinity of the Existing Harbor and Proposed Expansion Area.

Haines is a terminal for the Alaska Marine Highway System, which carries people and cargo throughout the Inside Passage and connects Haines to southeast Alaska, Prince Rupert, British Columbia and Bellingham, Washington. Tug and barge operations carry goods between Seattle and the freight terminal at the Lutak Dock; petroleum fuel is also unloaded and stored at the Lutak facility. Alaska Marine Lines/Lynden Transport is the only freight transfer business currently operating in the area. Seven different docks capable of supporting seagoing operations:

- Lutak Dock: Contains 6 acres of staging area, three quarters (4.5 acres) owned by Haines Borough. The barge facility and upland service lots make this one of the best deepwater port facilities in southeast Alaska.
- Haines Small Boat Harbor: Utilized by commercial fishing, water taxis, and recreational vessels. Because of economic benefits of services such as eco-cruises, upgrades to this dock are a top priority under the expansion program.
- AMHS Ferry Terminal: After Juneau, this is the largest volume passenger port in southeast Alaska.
- Federal US Army Petroleum-Oil-Lubricants Dock: decommissioned.
- Chilkoot Lumber Company Dock: This 1,000-foot long dock served a dismantled mill and is currently of questionable structural integrity
- Port Chilkoot Dock: Owned and operated by the Haines Borough and hosts cruise ships.
- Chilkat Cruises Dock: Privately owned facility accommodating catamaran shuttle service; currently under lease.

The Haines Airport runway is owned by the State of Alaska; Wings of Alaska, a local commuter airline, owns a facility that serves as the airport terminal facility through an agreement with the Borough. The airport hosts one scheduled airline and three charter services. The airport does not have traffic control and has a limited airport-operating certificate. Further, no expansion is possible due to an abutting historical site. For information on floatplanes, see Section 3.2.5. (COE 2004)

3.1.3 Existing Commercial Use and Portage Cove Harbor Operations Areas

Existing small boat harbor upland facilities are both public and commercial use. The harbor parking area is ADA (Americans with Disabilities Act of 1990) compliant and accommodates harbor users indiscriminately and inadequately. Near the parking lot are public restrooms and a dumpster intended for harbor users. The floats support a fish cleaning station accessible to all users.

The harbor facility is meager and poorly equipped to serve the commercial fishing industry. There is one crane, no hoist. Fuel is dispensed by a concessionaire off a work dock. An ice house is sited nearby and dispenses ice utilizing an extended auger that works well intermittently. Fuel and ice are not accessible by the largest vessels due to vessel draw. A net repair float is sinking and inaccessible. The waste disposal system consists of 55 gallon drums to collect maritime pollution (MARPOL), a dumpster for garbage and a mobile waste oil receptacle. The fuel dock and associated transient float is the busiest area of the harbor during the peak season.

Figure 3-2: Water and Sewer Lines in Vicinity of the Existing Harbor and Proposed Expansion Area.

3.1.4 EXISTING GENERAL STORAGE

There is extremely limited space for general storage and additional harbor operations in the existing boat harbor. Most boat and gear storage occurs in the Lutak Dock areas or on private property. The Harbormaster office is less than 100 sq. ft., outdated and dangerously situated.

3.1.5 UTILITIES AND CAPACITY

Potable Water: The Haines Borough townsite is serviced via a water treatment plant, whose water source is Lily Lake. Water is treated for color and chlorinated. Potable water is available at varying rates per vessel. The total volume is 11,000 to 12,500 gallons per day at peak capacity. Current limitations at the Harbor prohibit year round service, which requires a location beneath the water line and frost-free hose bibs at each berth and at 40-foot intervals along the transient floats, conduits and chaseways.

Harbor Water System

Sa*nitary Sewer:* The inner harbor hosts a designated pump-out station and a portable pump-out unit, whose capacity is 20 gallons per day, per vessel. Upland facilities are serviced via the Haines Borough's package wastewater treatment plant.

Fire Protection and Safety Features: A hydrant is located at the top of each gangway. Further, there is a dry standpipe (i.e., hydrant charged) system with standpipe or fire extinguishers in enclosures spaced a maximum of 150 feet apart.

Shore Power and Lighting: Alaska Power Company provides electric power service and has subsidized rates based on the State's cost equalization program. Each berth has a metered power pedestal and features incandescent lighting; these are often installed with intermittent light bollards to improve saturation. These pedestals are located at 40-foot intervals along transient floats.

Security and Communications: The harbor has no surveillance; it is not gated. Cell phone service is available in the harbor area; the harbor master building is equipped with telephone.

Marine Fuel: The harbor offers concession gasoline and diesel fueling near the harbor entrance. Above ground tanks are sited nearby.

The utilities and delivery systems will be addressed substantially by the Portage Cove Harbor Replacement project, scheduled to begin June 2009.

3.2 Harbor Facilities Characteristics

The harbor sits in a cove on the western side of the Lynn Canal. It is protected by rubble mound breakwaters and has a dredged entrance channel. The harbor is equipped with floating docks, a tidal grid, a launch ramp, ice production and fuel dispensary. Demand for moorage greatly exceeds availability and the harbormaster maintains a waiting list of people desiring

permanent moorage. There is currently a waiting list of 250 boats; 60 percent commercial and 40 percent recreational sport users.

3.2.1 BREAKWATER/HARBOR ENTRANCE

Rubble mound breakwaters on the eastern and northern boundaries of the harbor protect the existing harbor. Entrance is from the south via a dredged channel with a depth of -15 feet Mean Lower Low Water (MLLW). Boat traffic shares the entrance with seaplanes that moor on the end of the first float. The harbor entrance can become congested, especially in the summer when the commercial fishing fleet is in, seaplanes and water taxis are busy, and pleasure vessel use is high.

Haines Harbormaster Office

The harbor entrance is exposed to strong waves from the southeast. Storm generated waves enter the harbor and damage exposed vessels and the float system. Additionally, these waves can make navigation within the harbor difficult and hazardous.

3.2.2 INNER HARBOR FLOAT CONFIGURATION

The harbor can accommodate approximately 150 boats, with berths for small boats between 24 and 40 feet in length and float moorage for boats up to about 80 feet in length. See PND graphic for a layout of the following floats: Floats A through E are accessed from land in the northwest corner of the harbor via a gangway that services A Float. Floats B through E are

finger floats perpendicular to A float. A floating breakwater float referred to as the transient float extends from the fuel dock at the southwestern corner of the harbor and extends towards the harbor entrance. A detailed description of each float follows:

- A Float is an 8 by 464 foot float with twenty 24-foot stalls
- B Float is the first perpendicular float accessed from A Float. B Float is 8 by 200 feet with eight 24-foot stalls, permanent side moorage for a 50-foot long water taxi, a fish cleaning station, and 130 feet of transient moorage.
- C Float is perpendicular to A float and is 8 by 248 feet with sixteen 30 foot stalls

Haines Harbor Transient Float

- D Float is perpendicular to A Float and is 8 by 288 feet with eighteen 30 foot stalls
- E Float is 8 by 248 feet with six 40 foot stalls, permanent side moorage for one 66 feet and one 86 feet vessel, and 96 feet of transient moorage.
- The Breakwater Float is a 12 by 237 foot float with 237 feet of usable transient moorage on its inner side. Transient vessels also utilize the outer side of this float during favorable weather. Boats moor lengthwise to this float and seaplanes use the end of the float.

The floats have a concrete surface, wood plank sides, and steel piles. The floats are nearing the end of their usable life as evidenced by spalling concrete, concrete that has been removed and replaced with wood decking, rotten wood, and missing stall separating floats. Additionally, the average vessel beam has increased since the floats were installed resulting in several double stalls that can only accommodate single vessels.

Major aspects of the float system configuration are addressed substantially by the Portage Cove Harbor Replacement project, scheduled to begin June 2009.

3.2.3 BOAT LAUNCH

A one-lane concrete boat launch ramp is in the extreme northwest corner of the harbor. There is no designated parking for vehicles with attached boat trailers, and use of this ramp often conflicts with private upland activities

3.2.4 ICE HOUSE

A 23-ton ice house with an auger system currently serves vessels just off the fuel dock. Due to low draft, larger vessels are not served.

Harbor Boat Grid

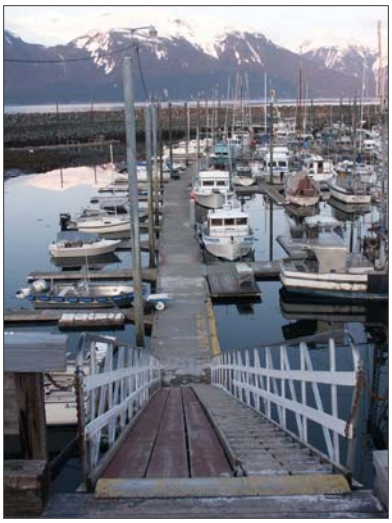
3.2.5 BOAT REPAIR GRID

A grid for vessel repair is located in the harbor along the northern breakwater. The grid can accommodate two 40 foot vessels at once and has vehicle access to the dock and also on the beach at low tide. The timber frame structure is scheduled for repair during the Portage Cove Harbor Replacement project, in 2009.

3.2.6 USER GROUPS/USE CHARACTERISTICS

The Haines Portage Cove Harbor serves commercial and recreational users. Users are local residents, Canadian residents and transients entering the harbor via the Lynn Canal. There is demand for long term moorage, short term moorage and use of the boat launch ramp.

Commercial Fishing Vessels: According to the Commercial Fishing Entry Commission (CFEC) database, 82 commercial fishing vessels were homeported in Haines in 2007 (Reference: http://www.cfec.state.ak.us/vbycen/2007/18.htm, 5/2/08). These vessels were primarily gillnet and longline vessels with an average length of about 35 feet. The fleet also includes two tenders and several boats that participate in the troll fishery; the tenders are probably the largest vessels in the fleet.



Haines Harbor Ramp

Guided Sport and Water Taxi Vessels: The FJORDLAND, a passenger vessel conducting excursions daily between Haines, Skagway and Juneau, homeports in Haines. Additionally, four (4) Charter Fishing Vessels operate from the harbor.

Seaplanes: The seaplane float is located at the end of the Breakwater Float and can accommodate one seaplane. The dock does not offer tie downs to transient planes. Seaplanes land in Portage Cove and taxi to the float; clients access the plane from the Breakwater Float.
Recreational/Subsistence Vessels: According to the Navigation Improvements Interim Feasibility Report dated March 2004 (COE 2004), at that time there were 68 recreational/subsistence vessels with permanent moorage and another 61 vessels that used Haines Portage Cove Harbor but without secure moorage. According to the report, most recreational/subsistence vessels were somewhat smaller than the commercial fishing vessels, with the majority under about 23 feet in length, and only nine vessels longer than about 37 feet; five of which did not have moorage.

3.3 Environmental Conditions and Considerations

Haines has a maritime climate with cool summers and mild to severe winters. Summer temperatures average 57.4 degrees Fahrenheit and winters 26.7 degrees Fahrenheit. Total precipitation averages 48 inches per year with 123 inches of snowfall (Source Western Region Climate Center http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?akhain, May 7, 2008).

Appendix A of the Navigation Improvements Interim Feasibility Report (COE 2004) presents a summary for wind information for the area. Low-pressure systems create the predominant winds in Haines. These winds track in an easterly direction across the Eastern Pacific Ocean and Gulf of Alaska. Strong winds occur throughout the year; however, wind patterns have a strong seasonal component. Summer winds are generally from the south-southeast and are lighter. Winter winds are predominantly from the north and are generally stronger. The region is known for intense storms that generate wind from the south-southeast direction. According to local residents, the severe and damage-causing storms usually occur in the fall and produce wind from the south-southeast.

Tides at Haines are generally diurnal with two highs and two lows occurring each day. The highest predicted tide is +22.3 feet and the lowest predicted tide is -5 feet. Water surfaces under combinations of extreme high or low pressure have been measured as high as +22.6 and as low as -6 feet. The regional currents in Portage Cove and Chilkat Inlet are driven primarily by tides and only partially by wind. In general, current velocities average 5.1 to 25.7 centimeters per second (cm/sec) along the western shores of Portage Cove. A maximum flood current velocity of 25.7 cm/sec and a maximum ebb current velocity of 41.1 cm/sec are predicted in Tides & Currents 1997 for the Haines area. US Fish and Wildlife Service (USFWS) divers conducting dive surveys in 2000 reported that there was little current in Portage Cove.

USFWS divers conducted surveys along 200-meter transects at several locations in Portage Cove. (COE 2004) Survey results indicate that the marine substrate is boulder or cobble approximately 50 yards from land. It then turns to sand, then to mud or a mixture of mud and sand. These areas support brown algae, sugar kelp, sea lettuce, and rockweed. Invertebrates observed include the six-armed star, acorn barnacles and blue mussels. Fish observed include sole and snake pricklebacks in the harbor and pricklebacks and sculpin north of the harbor.

The Environmental Assessment (EA) (COE 2004) evaluated the potential impacts on marine life within the Haines Harbor. There may be essential fish habitat (EFH) within the areas proposed for harbor expansion. Possible EFH species concluded rockfish and Pacific cod, Pacific salmon, and eulachon; while sculpins were observed during surveys, sablefish (black cod) are known to be present in the deepwater of Lynn Canal. There are no known threatened of endangered species managed by USFWS in the project vicinity. Sea lions in southeast Alaska are listed as threatened and although they may occasionally visit the Haines area, the closest known rookery is Graves Rocks, about 80 miles to the southwest. Several species of whale including the endangered humpback whale may ascend Lynn Canal as far as Haines but they are uncommon. No Alaska salmon stocks are listed as endangered and the likelihood that listed species from California, Oregon or Washington would occur in the area is very small. (COE 2004)

Area north of existing harbor: Harbor Expansion

3.4 Physical/Geotechnical Issues

A geotechnical investigation was conducted in 2005 to support completing the final design of COE Alternative 4. The drilling program discovered that the area for the proposed new outer breakwater alignment is underlain with 150 feet of soft clay. Unaltered foundation design for Alternative 4 will require wick drains to ensure the stability of the structure. This reality, with an estimated cost of an additional $13 million, compromises the Master Plan goal of economical construction, given the known available funding. This reality necessitated introduction of Phase III (b), offering alternative designs that may lower project costs.

The Chilkat River Fault originates on land at Haines and continues north into the Yukon. This major fault and several smaller faults are active and frequently cause small earthquakes. The Haines Harbor is on the border between seismic risk zones 3 and 4 and has had at least one earthquake of a magnitude between 5 and 6 between 1899 and 1972. There is no record of tsunamis occurring in the Haines area.

The EA documented that sediment deposition in the existing dredged harbor and entrance channel were minor and would not need frequent maintenance dredging. However, the Haines area is experiencing a phenomenon referred to as glacial rebound, which is causing the land to rise at a rate of about one inch per year. As this continues, it will eventually require harbors to be re-dredged to maintain the designed and constructed water depths.

Sediments in the existing and proposed harbor areas were chemically evaluated in 2001 to determine the presence of contaminants to aid in evaluating dredged material disposal

options. All sediments were found suitable for unconfined ocean disposal except for sediments near the fuel dock and the boat grid. If dredging were conducted at these locations, an alternate form of disposal may be required, a situation that would increase cost.

4.0 HARBOR DESIGN CONSIDERATIONS

The modification/reconfiguration of the existing harbor and development/construction of an expanded harbor dictates numerous interrelated planning and engineering considerations for in-water improvements and upland support features. This section outlines planning and layout considerations that must be considered in COE project phases and the Haines Borough project tasks.

The feasibility study for the proposed new breakwater developed the following table to forecast moorage needs based on public input and economic forecasts:

Table 4-1 Harbor Expansion Design Fleet Assumptions

CATEGORY	EXISTING MOORAGE	FUTURE MOORAGE	TRANSIENT MOORAGE	TOTAL MOORAGE
Commercial Fishing	62	61	31	154
Charter Fishing	8	8	---	16
Other Commercial	4	7	---	11
Recreational / Subsistence	68	61	15	144
TOTAL VESSELS	142	137	46	325

Source: COE 2004

Industry design standards were referenced in the development of this narrative: *Planning and Design Guidelines for Small Craft Harbors,* American Society of Civil Engineers, 1994; and *Marinas and Small Craft Harbors,* Tobiasson & Kollmeyer, 1991. The "rules-of-thumb" and recommended amenities are applicable to nationwide marina and harbor development and are neither geared towards southeast Alaska mixed-use harbors in general, nor specifically tailored for direct application to Haines. The intent is to provide COE, the Haines Borough and the design planner/engineer with a framework for discussion and general guidance for further development of in-water and upland projects.

The following parameters—used to estimate in-water and upland requirements for Haines based on the referenced rules-of-thumb—were calculated using COE Alternative #4:

Existing Harbor = 5.6 Acres
New Basin = 16.3 Acres
Total = 21.9 Acres

Existing + New Basin = 279 designated berths
3,150 lineal feet of transient moorage / 40 lineal feet (average) = 79 equivalent transient berths
Total = 358 berths

Guidelines suggest between 15 and 25 berths per Acre (35- to 40-foot average length). COE Alternative #4 provides for 358 equivalent berths over a total of 21.9 acres, or 16.3 berths per acre.

4.1 In-water Services and Amenities

The following in-water amenities and services were considered in designing the harbor reconfiguration/float replacement in the existing harbor (Task 2), and will be further considered in Phase III (a) and III (b) new basin construction:

Potable Water

Referenced guidelines recommend a capacity of 25 gallons per day per recreational vessel and 65 gallons per day for commercial vessels. Water service generally runs below waterline along floats (for winter freeze protection) or alternatively installed in conduits or chaseways above waterline for seasonal use only, or heat-traced if needed year-round. Hose bibbs for each designated berth and at 40-foot centers along the transient (side-tie) slips are recommended. Hose bibbs must be designed frost free unless the system is for seasonal use only.

Shore Power and Lighting

Industry guidelines recommend 3-phase (50A) service to vessels 50-feet and longer with 30A service to smaller vessels. Metered power pedestals should be provided to each designated berth and at 40-foot centers along the transient (side-tie) slips. Lighting is typically installed on the power pedestals, often with intermittent light bollards to improve overall saturation. Upland lighting typically employs matching luminaire or high-level mast lighting. High Pressure Sodium (HPS) lighting (aka yellow light) provides greater visibility in rain, fog and snow than Metal Halide (MH) lighting (aka white light) and should be specified for overhead lighting unless security is an issue, and then, MH lighting is specified where surveillance cameras are installed , as it allows color definition that enhances identification. There is a local interest in investigating the use of LED (Light Emitting Diode) lighting at the harbor. The initial cost for LED lighting is more expensive than the customary high pressure sodium fixtures, but maintenance and operating costs are significantly lower. Since there is a concern about the quality of LED lighting, Haines Borough will be conducting a test program to determine the viability of LED lighting in a harbor application.

Fire Protection and Safety Features

A dry standpipe (hydrant charged) system is recommended with standpipes spaced a maximum of 500 feet apart along the floats; or alternatively, fire extinguishers in enclosures spaced a maximum of 150 feet apart along the floats. Life ring cabinets are commonly installed beside fire extinguisher cabinets to “concentrate” the obstruction at a single location. Bright yellow safety ladders should be installed at ends of alternating fingers; spaced no more than 100 feet apart.

Communications

Typical communications include telephone, cable or satellite television (CATV) and wireless Internet. Cell phone use is making phone lines in harbors obsolete. The Cost benefit of installing a hard-wire system should be addressed by the provider.

Sanitary Sewer

Sewage pump-out can take the form of a designated pump-out station in the harbor or a portable peristaltic pump operated by harbor staff. Industry guidelines suggest 20 gallons per day per vessel and one pump-out station for every 100 slips; i.e., three or four pump-out stations for full build-out of both harbors.

Marine Fuel

Gasoline and diesel should be provided at a 2:1 ratio near the harbor entrance in underground tanks. Delta Western is a likely operator/lessee. Fuel dispensary attracts transient traffic into port where they will likely spend money.

Boat Launch

Industry guidelines suggest that the proposed boat launch ramp, operating at full capacity, could launch and retrieve up to 50 vessels per lane per day (i.e., 100 boats per day for the proposed double ramp). Another guideline suggests an operational capacity of six boats per lane per hour and suggests a 4-hour peak launch and a subsequent 4-hour peak retrieval period. It is unlikely that Haines would project this level of activity; the ultimate design will be limited by projected demand, not capacity. It is recommended that the ramp be ADA compliant.

4.2 Alternatives to Rubble Mound Breakwater

A breakwater extension for the existing harbor has been abandoned due to the soft, cohesive underlying material and the costly surcharging and/or wick drains that would be necessary for its construction. A floating wave attenuator, a curtain wall or vertical wave barrier, and a redesign of the harbor entrance utilizing shore-based construction elements are all alternatives to a rubble mound extension.

Floating Wave Attenuator

This alternative was considered and rejected in the Value Engineering study conducted in 2005. Guidelines exist in numerous technical journals and texts that quantify the effectiveness of floating breakwaters based on empirical experience. In general, floating breakwaters are ineffective for wave periods exceeding 4 seconds. Based on accepted industry guidelines, for incident waves perpendicular to a modern floating breakwater, wave attenuation (the percentage of wave height that passes through) is on the order of:

- 85 percent for 2-second waves
- 60 percent for 3-second waves
- 45 percent for 4-second waves
- 30 percent for 5-second waves

Considering the wave analysis results (Table A-4) in *Appendix A Hydraulic Design, Navigation Improvements, Appendices, Volume 2* and the geometry of the proposed breakwater, and neglecting wave diffraction around the end of the rubble-mound breakwater, we could surmise that the worst-case conditions would be under design waves of the following magnitude, period and direction:

Southeast (4.3-feet high, 3.15-seconds): A floating breakwater with a 6-foot draft would attenuate approximately 55 percent of this design wave, resulting in a 2.4-foot transmitted wave. This is borderline acceptable under infrequent (design level) conditions.

East-Southeast (6.9-feet high, 4.30-seconds): A floating breakwater with a 6-foot draft would attenuate approximately 40 percent of this design wave, resulting in a 4.1-foot transmitted wave. This would result in unacceptable inner harbor wave action and the wave itself would likely overstress the breakwater.

A more detailed analysis is needed including diffraction of incident waves from other directions around the rubble-mound breakwater head, but based on the above, the partners agree that the floating breakwater would be ineffective under design wave conditions.

Vertical Wave Barrier

A partially penetrating (aka "curtain wall") vertical wave barrier can be effective for incident waves of 4 seconds and less but ineffective for long-period swell. It appears that a vertical wave barrier could be an effective solution under design wave conditions if it could be shown to provide adequate lateral resistance in the soft in-situ clay or a deeper founding layer. Significant engineering analysis will be needed to assess the potential effectiveness of this solution and the ability of in-situ soils to provide adequate resistance under design wave conditions.

Under design conditions for the design wave from the east-southeast direction (6.9-feet, 4.30-seconds) it appears the transmitted wave might be on the order of 15 to 18 inches high, which could be acceptable under infrequent conditions. Note that vertical attenuators, whether full-depth (i.e., to below mudline) or partially penetrating result in reflected waves that can make the harbor entrance difficult to navigate, and standing waves in excess of the incident wave height may be possible under certain conditions. These effects should be considered in the design and layout of the harbor with a vertical wave barrier.

Note that for water 40-feet or deeper there may be a benefit to using a curtain wall wave barrier as opposed to a full-depth vertical barrier driven to below mudline. They are generally effective for short period, locally-generated waves of 4-second period or less but are generally ineffective for long-period swell. It is likely that for relatively shallow water (as at the Haines Harbor entrance) a sheet pile or concrete panel/king pile wall driven full-depth to mudline would be more cost effective than a curtain wall wave barrier.

Harbor Entrance Redesign

The harbor entrance should be improved to minimize the impact of southerly wind and waves. An upland jetty or spur that behaves as a breakwater against wave action is proposed in the tidelands, oriented as appropriate from the existing parking lot adjacent to Beach Road, in the area between the fuel dock and Look Out Park. See Figure 3-2. The breakwater should be designed to move the flood tide along the inside of the main breakwater, setting up a counterclockwise circulation gyre.

4.3 Upland Support Services and Amenities

Quantitative rules-of-thumb for upland support installations include:

Harbor Planform

Industry standards recommend a supporting upland area for a full-service harbor approximately 80 percent of the basin area; i.e., 4.5 acres for the existing harbor or 17.5 acres for existing and new basins combined, based on COE Alternative #4. The uplands' use and ownership realities present a challenge to meet the guidelines.

Parking

Parking areas typically accommodate 25 to 30 pull-through (car/trailer) spaces or 80 to 100 car-only spaces per acre including circulation lanes. Trailered vessels are typically under 30-feet long. The guidelines recommend one parking space for every two equivalent berths; i.e. 180 spaces for the full harbor build-out. Parking for the existing harbor is less than 0.5 spaces

per berth and is insufficient. Most trailered vessels are pulled by trucks, typically 15' min. Handicapped parking requirements are as follows:

- 15 to 25 spaces: One handicapped accessible space
- 26 to 40 spaces: 5 percent but not less than two
- 41 to 100spaces: 4 percent but not less than three
- 101 to 200 spaces: 3 percent but not less than four

This would result in five handicapped spaces based on the 180 spaces. A fully accessible path would be required from the parking area to floats (refer to ADA accessibility below).

Upland Boat Storage

Storage on blocks or trailers typically accommodates 55 to 65 boats per acre based on an average length of 35- to 40-feet. The idea to remove pull trailerable vessels boats (i.e., those under 30-feet long) out of wet berths and store them on trailers in the trailer park upland from the new basin is worth exploring as it will eliminate the skiff stalls that are both costly to construct and generate relatively little revenue.

Waste Oil Receptacles

Industry guidelines recommend providing a receptacle of 250- to 275-gallons capacity for every 150 vessels.

Restrooms

For the full build-out (358 slips), the guidelines suggest the following:

Women: Seven toilets, 3 to 4 showers and five sinks.

Men: 3 to 4 toilets, 3 to 4 urinals, 3 to 4 showers and five sinks.

Laundry

If desired, the guidelines suggest providing eight washers and ten dryers per 300 slips; ten washers and twelve dryers for the anticipated 358 slips. These facilities are more commonly seen in harbors with a significant liveaboard component. HBC prohibits live aboard between Oct 15 and April 1 annually. This may reduce the number of washers and dryers needed.

Harbormaster Office

Provisions for the Harbormaster should accommodate fee collection, private office and quasi-public space in addition to housing communications and surveillance equipment. The Harbormaster area should also integrate storage for maintenance supplies and equipment, and parts inventory.

Additional upland features and amenities should be considered for implementation in the project:

- Private Sector Concessions: Restaurants and retail shops , marine supply, commercial fish processing and sales, charter tour/fishing sale kiosk
- Vessel Support: Covered or uncovered work area for vessel repair, adjacent to tidal grid Vessel shrink wrapping (for winter storage) Heavy loading dock with cranes

- Public Space for Waterfront Access/Enjoyment: Picnic/day use areas, green areas, landscaping, and picnic tables, etc.
- Fish cleaning station (public) and/or fish processing (commercial/charter)
- Garbage dumpsters
- Waste oil disposal

Land Ownership

As indicated in Section 3 of this plan, the availability of publicly-owned uplands in the vicinity of the existing harbor and expansion area is extremely limited. Borough-owned tidelands are present in the existing harbor and can be utilized for existing harbor development; however, the borough owns only one small tideland parcel in the area designated for expansion.. Private upland and tideland owners must either become partners in development or be willing to sell their property for harbor development. It is recommended that this land ownership issue be addressed sooner rather than later.

Transportation and Traffic Considerations

As indicated in Section 3, Existing Conditions, Front Street is transportation route between the Lutak Dock and the downtown Haines area. It does not meet current construction standards, is relatively narrow and is not adequate for additional levels of traffic associated with the expanded boat harbor.

The location of vehicle entrances to the boat harbor for parking, boat launch and dock access should be carefully considered to minimize traffic impacts to Front Street and Beach Road.

Main Street intersects the conjoining of Front Street and Beach Road, making a 3-way intersection. The location of a bar and restaurant and a marine equipment repair shop at this intersection further complicates traffic congestion and planning improvements.

Access to Beach Road from the south (Haines Highway) and Front Street from the north (Lutak Road) utilize 45 degree angle turns, and may be prohibitive for trucks towing trailered vessels.

4.4 Combined In-water/Upland Considerations

ADA Accessibility

All new harbor development and significant alterations to existing harbors (the proposed reconfiguration of the existing basin would qualify as such) require compliance with ADA guidelines. Based on the combined number of berths, a total of six handicapped-accessible slips will be required with a fully ADA-compliant path to designated handicapped parking, and evenly distributed among available slips sizes. Slips can be made accessible with design modifications providing adequate clearance around and between obstructions and access to the vessel; e.g., using removable bullrail sections. If the accessible slips are grouped into a single basin then only one 6-foot wide by 80-foot long gangway would be needed; otherwise at least one 80-foot gangway would be required for each basin.

Segregation of User Groups

Industry standards and guidelines typically recommend segregating commercial and recreational uses. The project will meet those standards; the proposed harbor expansion coupled with the existing basin provides segregation by design. Upland amenities specific to each user group could then be separated and "shared" amenities made available to each. Segregating user groups would eliminate upland conflicts and improve public safety. While segregation should be considered and discussed, it is important to note that the National Economic Development Plan (NED) and the associated benefit-cost (B/C) ratio consider only commercial and not recreational benefits. Notwithstanding, separating public and recreational access from commercial operations—in-water and upland—should be explored. Similarly, segregating large commercial vessels from small sport and trailerable vessels should also be considered in the design and layout of floats.

Environmental Considerations and Conditions

Environmental conditions are a factor in obtaining permits for a number of harbor related uses:

- Placement of harbor facilities, dredging and placement of fill (COE Responsibility)
- Harbor circulation features to maintain water quality (State of Alaska DOT)
- Location of boat grids and repair facilities (Haines Borough)
- Location and design of fueling facilities (Haines Borough)

Areas considered important habitat may be difficult to permit for placement of bottom founded structures, such as rubble mound breakwaters or fill to create uplands. Alternatives to using these habitats should always be investigated and documented, and, if they cannot be avoided, mitigation would likely be required. Proper design of waste disposal and fueling facilities can reduce potential adverse impacts to water quality.

Physical and Geotechnical Considerations

Design and placement of in-water and upland facilities must consider physical environmental and geotechnical characteristics such as wave exposure, prevailing winds and storm track, bathymetry, substrate, seismic and glacial rebound. Such characteristics are particularly important to the design and location of breakwaters, and placement of solid fill structures to create dock space and uplands. Glacial rebound has been documented in the Haines area, and is a consideration in the design, location and maintenance dredging of basins and entrance channels.

4.5 Financial Considerations

The design and construction of the Haines Portage Cove Harbor improvements and expansion will ultimately be determined by the amount of money available for the project. The project will be realized with a combination of federal, state, municipal and possibly, private funds.

The COE document *Navigation Improvements Draft Feasibility Report and Environmental Assessment* states that the total project cost for Alternative 4 (expansion plus federal participation in breakwater and dredging for existing harbor south entrance) was estimated to

be $22,400,000 (July, 2002). In July 2005 the COE revised its fully funded cost of the project to $23,600,000.

In June 2008 COE revised the project costs in reaction to the discovery that the area for the proposed new outer breakwater alignment is underlain with 150 feet of soft clay. As a result, engineers determined that the foundation design for Alternative 4 will require wick drains to ensure the stability of the structure. The revised cost resulting from the inclusion of wick drains in Alternative 4 is estimated at $30,000,000.

Cost sharing. The Federal share of the WRDA funded portion of the project breaks down as follows:

- 80% breakwater
- 80% Dredging the entrance channel
- 80% construction management
- 80% mitigation

The local cost for the following project elements, some of which are not part of the WRDA funded portion of the project, break down as follows:

- 20% breakwater
- 20% dredging the entrance channel
- 20% construction management
- 20% mitigation
- 100% dredging the new mooring basin
- 100% floats
- 100% of the costs to widen any breakwater into a vehicular causeway

The percentage non-federal share illustrated above applies to any and all project designs. The revised cost of constructing COE Alternative 4 has introduced uncertainty to the project. The interplay between design, cost and funding availability generates the need for Haines Borough to reassess its position. The planning partners are looking realistically at the opportunities for securing construction funds of this magnitude, and will adjust either the funding strategy or the project design or both.

Funding shortfall. Based on most recent estimates (inclusive of COE Alt. 4), the non-federal (local) share of the harbor expansion cost could be as much as $6,000,000 for breakwaters and dredging and another $12,000,000 for in-water structures and uplands improvements. The non-federal (local) share of improvements to the existing harbor basin (inclusive of 2009 construction and future improvement to the south and west sides) could be as much as $10,000,000. The total non-federal (local) cost for all planned project components could be as much as $28,600,000. Of this amount, only $5,482,975 has been secured. **The current local funding shortfall for the total project is over $23,000,000.**

At this writing the US Congress has passed the American Recovery and Reinvestment Act of 2009, which intends to finance maintenance and construction projects targeting national infrastructure. The COE is expected to receive $4.3 billion to fund COE projects. Concern exists that any requests for funds in excess of the Congressional WRDA authorization of

$10,858,000 plus the maximum 20% overrun or any delay in the project could create an opportunity for the federal government to revisit a cost benefit analysis, which could jeopardize the project.

Project funding history:

1. **Federal Funds**
   a. US Congress
      i. Nov 2007: Water Resources Development Act authorized $11,232,000 (Manager's Report 11/20/07) for federal share of the project ($24,267,000 total)
   b. Army Corps of Engineers
      i. Feb. 1998. Project # 74160 COE, $162,600
      ii. May 2005: Federal Funds allocated to the project total $811,963. $602,274 was allocated by the Planning, Engineering and Design Agreement and $59,250 was allocated to the development of the Master Plan. The COE holds a balance of $150,439 for the project.
      iii. Jan 2009: Inexplicably, the project lost a Senate appropriation of $1,000,000 in COE General Construction Budget "new start" funds. (This Senate appropriation did not survive Conference Committee negotiations in February of 2009; a new appropriations request for FY 10 has been submitted.)
   c. Denali Commission
      i. April 2008: $800,000 authorized for existing harbor improvements

2. **State of Alaska**: Department of Transportation & Department of Fish & Game
   a. May 2005:The DOT matched $100,000 in COE funds for project planning, engineering and design (PED), professional services and construction contracts
   b. July 2008:The DOT FY09 Municipal Harbor Facility granted $3,285,425 for existing harbor in-water improvements, which is contracted under the project title "Portage Cove Harbor Replacement."
   c. Alaska Dept. of Fish & Game appropriated $750,000 within its budget for construction of a boat launch ramp.

3. **Haines Borough**
   a. The State of Alaska transferred ownership of the Portage Cove Harbor and $3,366,000 in deferred maintenance to the Haines Borough. Deferred maintenance funds in the amount of $2,485,425 were allocated to the Portage Cove Harbor Replacement project.
   b. The Borough has a Capital Improvement Fund.
   c. The Borough is currently carrying bonded indebtedness of $17,500,000, 70% of which is reimbursed by the State of Alaska in annual installments, for construction of a school. [Note: The assessment to pay the local 30% share ($5,250,000) over twenty (20) years at 4.1% is 1.65 mils.]

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5.0 IMPLEMENTATION PLAN

Implementation of the Haines Harbor Master Plan requires a working partnership between the Haines Borough, COE, and ADOT&PF. This Harbor Master Plan is intended to guide action by these partners. There are two parallel programs in motion: (1) the COE Program that includes Phase I through PhaseV with Borough cost sharing, and (2) The Haines Borough Program that includes Tasks 1-8, and does not include federal cost sharing.

Since 1999, the planning partners have taken steps aimed at improving the harbor facility and navigation capabilities in Haines. Phase I : Reconnaissance, identified the need for improvements and expansion. Phase II: Feasibility, established that the project met national economic development objectives and environmental impact criteria. In Phase III: Design, planning activities addressed design construction and funding issues. The nature and urgency of design and funding requirements of harbor improvements and expansion recapped in this plan have necessitated division of Phase III into two components, III(a) and III(b).

The Haines Borough has undertaken Task 1. Existing Harbor Improvements.

5.1 Phase III: (a) Design, COE Alternative 4 modified, and (b) Design Alternatives for Expansion Basin.

Phase components III(a) and III(b) focus on the documented need for constructing a new breakwater for expanding the harbor. The planning partners prefer COE Alternative 4 modified at the south entrance. However, the amount of funding needed for Alternative 4 requires additional cooperation among the planning partners to secure the closest approximation to Alternative 4 that immediate funding will allow. The Master Plan calls for the partners to continue with Phase III(a) Design, COE Alternative 4 design and budge, while also developing, but holding in reserve Phase III(b) Design, Other Options. *See figure 2-1, page 41.*

The following priorities for harbor design in a new basin are based on the results of the COE harbor expansion feasibility and VE studies (recommended Alternative 4), guidance from the Haines Borough Harbor Advisory Committee and public input to this planning effort:

- Breakwater for new harbor
- Uplands acquisition and fill to create space for public, administrative, and commercial uses
- Installation of new floats
- Construction of new Harbormaster office
- Public facilities (restrooms, fish cleaning, picnic areas)
- Waste disposal (garbage, waste oil, hazardous materials)
- Front Street and other local road improvements including pedestrian access
- Straddle hoist/hydraulic trailer
- Pole float

5.2 Phase IV- Federal Construction

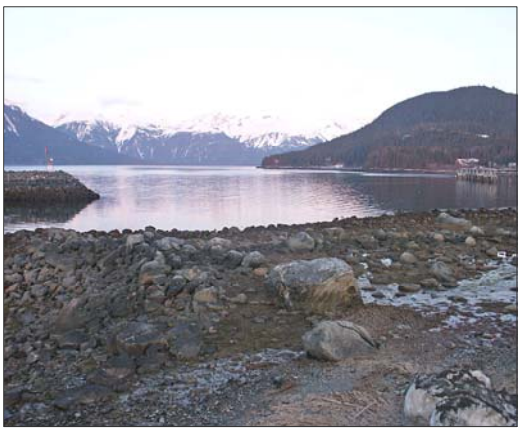
Once a design is completed and related funding is secured, Haines Borough and the Corps of Engineers will undertake the Harbor Expansion construction as an 80/20 cost share effort. This effort will address only the construction of breakwaters and dredging within federal limits, at both the existing and expansion basins.

5.3 Non-federal Project Elements (existing and expansion basins)

The non-federal (Haines Borough) elements consist of the following tasks:

Task 1: Inner harbor improvements address the short-term priorities of improving the existing Boat Harbor. The age of harbor facilities, limited capacity of in-water and upland facilities, facility condition/deterioration, and likelihood of additional damage support immediate action for these improvements. A collaborative funding strategy utilizing federal, state and borough funds produced $6,570,850 in late 2008 for improving the existing harbor. Improvements include:

- Replacement of A, B, C, D and E floats,
- Realignment of float systems to improve navigation
- ADA covered gangway
- Dry fire suppression system
- Overhead pole lighting
- Electric service to slips
- Repair of existing boat grid
- Seasonal dry water system; domestic water system to transient floats
- Removable finger floats to facilitate seasonal transient moorage
- Replacement of Seaplane Float



South Bulkhead Fill Area

Task 2: Southside Improvements addresses the redesign of the existing harbor entrance as illustrated in figure 5-1. The redesign eliminates the need for a “nose” on the existing harbor breakwater. A spur or jetty constructed from shore adjacent to a sport boat launch ramp sited immediately south of the transient float will serve to move the flood tide along the inside of the main breakwater. The redesign involves filling tidelands and uplands immediately south of the existing harbor. The funding strategy for Task 2 of existing harbor improvements is pending design. Task elements include:

- South breakwater to protect existing harbor
- New sport launch ramp and

- F Float improvements
- ADA compliant Gangway to F Float
- Parking for vehicles and trailers
- Storage for trailered boats
- Local shore-based dredging (for G Float)
- Improved access to Ice House for larger vessels

Task 3: West Uplands Improvements. This task represents the third and final segment of work plan for the existing harbor improvements. Design costs of these improvements will be a local responsibility, with construction costs being shared by local, state and federal funding sources. Task 3 contains the following elements:

- Sheet pile retaining wall along harbor west side
- Improved working deck (below street level) for cargo handling and maintenance repairs
- Fixed crane equipment
- Improved parking

Task 4: Design, Engineering and Funding Strategy, **Harbor Expansion Local Elements, Uplands/Tidelands.** This task involves dynamic coordination with Phase III(a) and III(b) to identify land requirements for harbor support facilities and services. Preliminary evaluation and design will precede uplands acquisition efforts, and final design will be necessary after uplands are secured or not. Design work will be paid for with local funds.

Task 5: Design, Engineering and Funding Strategy, Harbor Expansion Local Elements, In-water facilities, utilities and support services. This task involves design, engineering and funding strategies for floats, gangways, harbor master facility, and boat grid. Cost for elements in this task are not yet been estimated, and funding has not yet been identified.

Task 6: Local dredging includes non-federal dredging for the development of the expansion basin and improvement to the existing basin.

Task 7: **Non-federal Construction/ harbor expansion** consists of construction of in-water facilities and uplands features required for harbor expansion. Task elements include:

- Construction of uplands improvements including retaining walls, parking areas, working decks, and support facilities (Task 4)
- Construction of floats, gangways, and utility systems (Task 5)
- Task 6

Task 8: Operation and Maintenance consists of all O&M for Portage Cove Harbor facilities. This task is consistent with and includes Phase V of the COE project plan, and the party responsible for this task is Haines Borough. Funding for this task will be derived from Harbor revenues.

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<table>
<tr><td colspan="6">HAINES BOROUGH PORTAGE COVE HARBOR
IMPROVEMENTS & EXPANSION</td></tr>
<tr><td colspan="3">Federal Component: US Army Corps of Engineers</td><td colspan="3">Local Component: Haines Borough, State of Alaska</td></tr>
<tr><td colspan="3">Aeas of Responsibility:
• 80 % Cost share
• Breakwater design and construction
• Expansion basin dredging</td><td colspan="3">Areas of Responsibility:
• 20% cost-share with USCOE
• Uplands acquisition, land use designation, construction
o Parking
o Concessions, services
• In-water amenities
o Floats
o Sport boat launch
o Gangways
• Utilities</td></tr>
<tr><td>Time</td><td colspan="2">Project Phases</td><td>Time</td><td colspan="2">Project Tasks</td></tr>
<tr><td>1999</td><td>I.</td><td>Reconnaissance: Identified Need</td><td>2008 - 2009</td><td>1</td><td>Inner Harbor Improvements, Design & Construction
• Floats, utilities, grid</td></tr>
<tr><td>2000-2004</td><td>II.</td><td>Feasibility: Project meets NED criteria and has no significant impact</td><td></td><td>2</td><td>Southside Improvements, Design & Construction
• Uplands parking
• Jetty
• Sport boat launch
• Dredging/Ice Access
• F Float & Gangway</td></tr>
<tr><td rowspan="4">2005-</td><td rowspan="4">III.</td><td>Design & Engineering</td><td rowspan="2"></td><td>3</td><td>West uplands Improvements, Design & Construction
• Sheet pile retaining wall
• Parking
• Working deck, equipped</td></tr>
<tr><td>(a) Alt. 4 modified
(b) Other options</td></tr>
<tr><td>Seek Funds</td><td>1. Pull E brkwtr W to align w/existing
2. Opt. 1 connected to existing, brkwtr & remove existing N brkwtr</td><td>4</td><td>Harbor Expansion Design, Uplands, Support services:
• Preliminary design
• Uplands acquisition
• Final design</td></tr>
<tr><td colspan="2"></td><td>5</td><td>Harbor Expansion Design, In-water Floats, utilities</td></tr>
<tr><td></td><td>IV.</td><td colspan="2">Construction
• Breakwater
• Dredging</td><td>6
7</td><td>Local Dredging: existing & expansion basins
Construction: Expansion Basin
• In-water
• Uplands</td></tr>
<tr><td></td><td>V.</td><td colspan="2">Maintenance</td><td>8</td><td>Maintenance</td></tr>
</table>

PORTAGE COVE HARBOR IMPROVEMENTS & EXPANSION PROJECT

FIGURE 5-1. COE Alternative 4 MODIFIED

Figure 5-1

PORTAGE COVE HARBOR IMPROVEMENTS & EXPANSION PROJECT

FIGURE 5-2. Expansion Project OPTION # 1

Figure 5-2

PORTAGE COVE HARBOR IMPROVEMENTS & EXPANSION PROJECT

FIGURE 5-3. Expansion Project OPTION # 2

Figure 5-3

PORTAGE COVE HARBOR IMPROVEMENTS & EXPANSION PROJECT

FIGURE 5-4. HARBOR IMPROVEMENTS TASKS 1-3

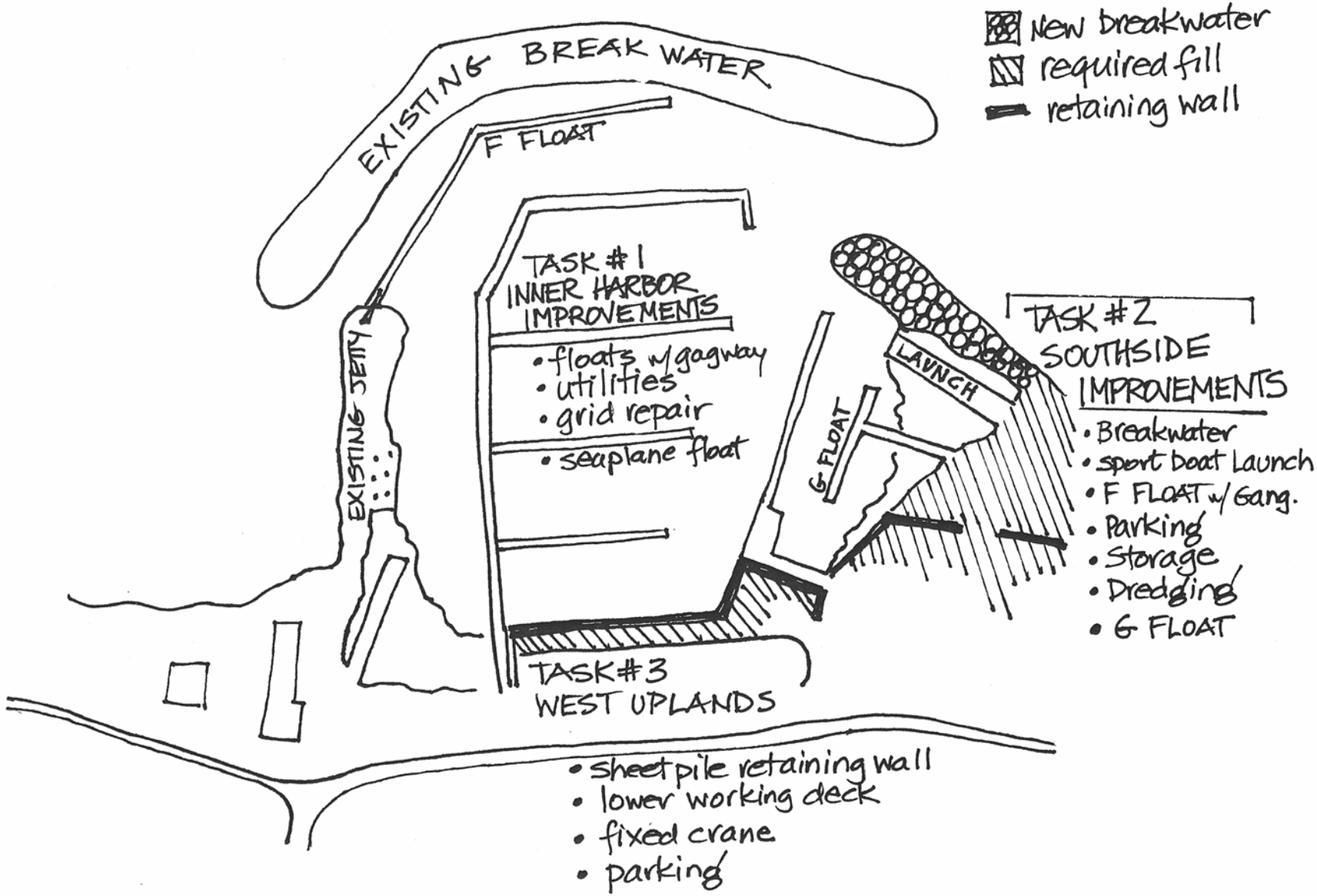

FIGURE 5-4

PORTAGE COVE HARBOR IMPROVEMENTS & EXPANSION PROJECT

FIGURE 5-5 EXPANSION PROJECT - NON FED. TASKS 4&5

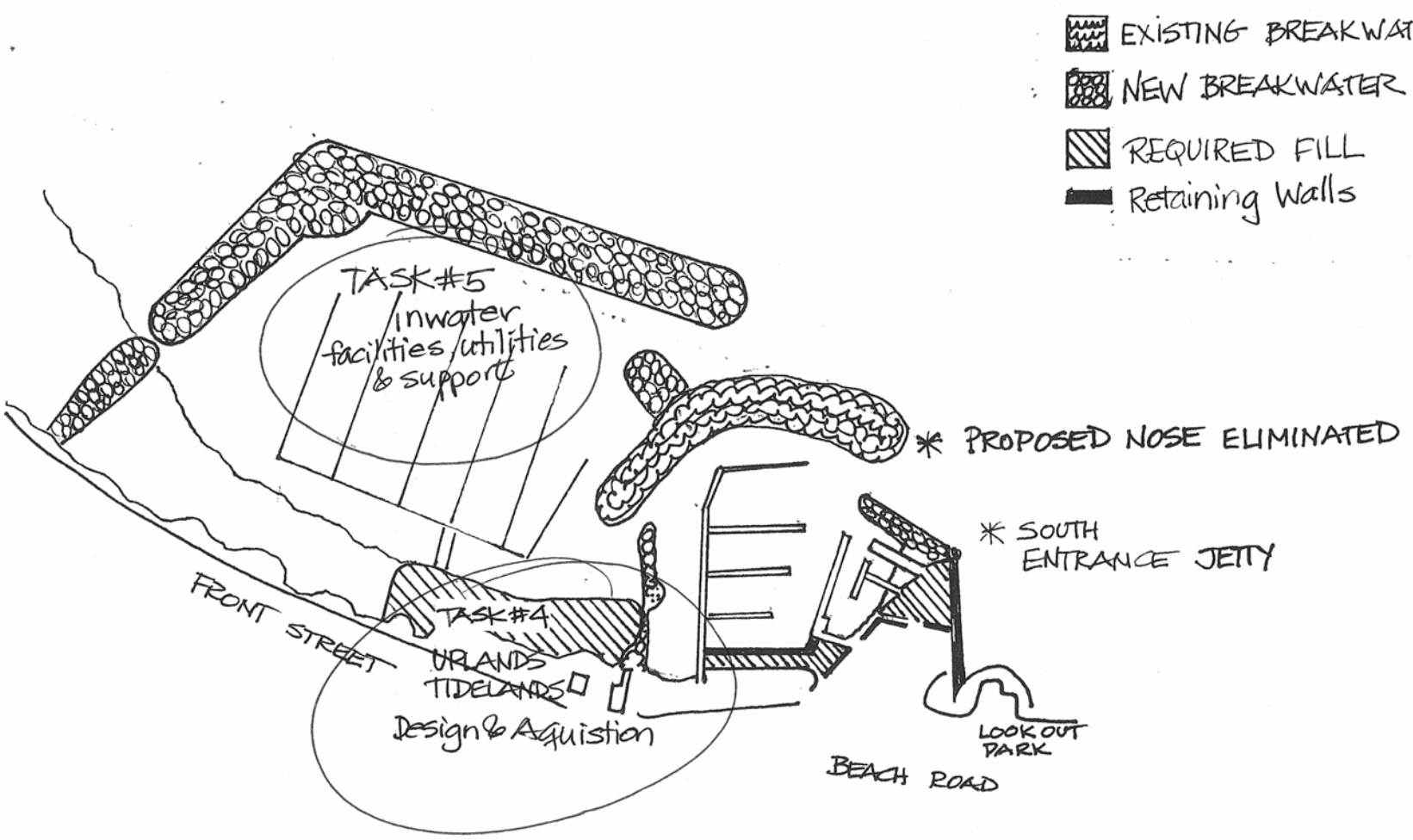

FIGURE 5-5