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Executive Summary

Waterfront facilities are a critical element to the City of Kodiak, supporting a large portion of the City’s commerce, industry, transportation and recreational needs. The City’s waterfront lands and facilities have been evaluated with regard to current use, construction type, condition, relative importance to the community and the needs of the City. The recommendations included herein are geared toward assisting the City achieve its primary goals which include the following:

1) **Provide Waterfront Facilities that allow for Efficient Transportation of Goods:** The existing Pier 3 facility provides the City with efficient means of transporting goods in and out of the city, but it is at the end of its useful life. In order to maintain this key City service, replacement of Pier 3 should be a top priority as all containerized cargo entering Kodiak arrives here. The structural condition is generally poor, upland layout space is limited and current cargo handling capacity does not meet modern standards.

2) **Support the Fishing Industry:** The fishing industry is the core of the Kodiak community. This relationship must be maintained by fostering the industry in the City as well as attracting new commercial fishing-related businesses. Facilities for the fishing fleet in Kodiak must be maintained and areas need to be upgraded or replaced to meet continued and future demand. In order to maintain and grow support of this fishing industry, development of the boatyard on Near Island, continued replacement of floats in St. Herman Harbor, the addition of upland amenities and repair/replacement of St. Paul Harbor docks are priorities. Additionally, new multipurpose dock facilities should be considered as demand grows.

3) **Preserve and Maintain Open Spaces and Kodiak’s Natural Beauty:** Preservation of the natural beauty of Kodiak and the surrounding area greatly enhances Kodiak’s livability. Public desire to add amenities, improve trail systems and expand open spaces is high. Consideration should be given to designation of certain properties as recreational and/or wildlife viewing areas.

4) **Foster a Growing Tourism Industry:** The tourism industry is taking off in Kodiak, especially the cruise ship industry. Shops, charters and other services are already developing to meet this demand. Potential economic benefits to the City and its residents can be given meaningful foresight and planning.

The recommendations herein have been provided to assist the City in prioritizing future actions needed to meet these goals. These recommendations include facility replacements, shifts in use, improvements and expansion of existing facilities as well as possible rezoning and land use designation modifications. Schedule and cost considerations are presented as part of the recommendations.
1 Purpose and Introduction

The purpose of this report is to help the City in planning for the future use and development of City-owned waterfront properties and facilities. This report inventories existing facilities, their uses and recommended actions for all City-owned waterfront properties and facilities based on City needs, priority of use and physical condition of existing facilities.

The focus of this report is on City-owned waterfront lands and facilities. The lands covered in this report are illustrated in Figure 1. Input and comments were collected from the public and City through public meetings, presentations to the Ports and Harbors Advisory Board (PHAB) and public outreach through the local media. Information was also shared individually by email and telephone.

This report details the findings of the waterfront portion of the study. First, each of the existing facilities are listed and described including location, type of facility and current use. Following this list is a section detailing the City’s needs. The following section presents recommendations on implementation of a plan designed to address the City’s needs and meet its goals. An attempt was made to address every comment received from the public, but feasibility precluded certain suggestions from inclusion in the recommendations section.

Appendices A and B contains future land use and property ownership information. Appendix C contains an analysis if the Kodiak Fleet. Appendix D is a memorandum related to expansion of the Near Island quarry. Appendix E contains several documents related to the Comprehensive Plan for Near Island Development. Appendix F contains historical background information regarding Pillar Mountain and issues surrounding development under its active scree slope. Appendix G includes information gathered during public outreach, responses received during the public input phase of the study and the City’s subsequent responses. Appendix H presents draft rough order of magnitude (ROM) cost estimates for the recommendations presented.

2 Existing Facilities

Waterfront facilities are critical to the City of Kodiak, supporting a large portion of the City’s commerce, industry, transportation and recreation needs. The users of the waterfront facilities in Kodiak which support all of these activities are varied. A draft study report was prepared for the City in February 2010, which analyzed the Kodiak Fleet in terms of vessel size, type, moorage location and primary purpose. The pertinent information from this report is included in Appendix C. The length of waterfront encompassed within the Kodiak city limits is approximately twelve miles, plus or minus one mile of shoreline (see Figure 1). There are approximately five miles of shoreline along the mainland from the south end of Gibson Cove to just south of Shahafka Cove, including the St. Paul Harbor rock breakwater. Another four and one-half miles of shoreline are on Near Island. Gull Island has approximately one and one-half miles of shoreline, including the rock breakwater, and Uski and Round Islands contain about one mile of shoreline.
Of the twelve miles of waterfront within the city limits, approximately three quarters (nine and one-half miles) is currently City-owned (see the Planning Area Parcels in Appendix B). Some of the private properties adjacent to the waterfront may become available for sale at a future date. This study also evaluates the potential use of new properties by the City.

In 2005, the Kodiak Island Borough developed a Proposed Future Land Use map of the Kodiak Urban Area found in Appendix A. The City has used this map as a guideline for planning; however, the proposed future land use designations assigned by the Borough may be changed based on the City’s needs and the outcome of the information within this report. Portions of the Proposed Future Land Use map extend beyond the scope of this study. Also, according to Kodiak Island Borough personnel, the land use designations provided on this map do not necessarily reflect current Borough intent and are subject to change.

The following sections describe the City’s existing waterfront facilities, their uses and physical condition.

2.1 Gibson Cove

According to the Assessor’s Parcel maps, the City owns several properties in the Gibson Cove area, totaling approximately three-quarters of a mile of waterfront. These properties include a dock and warehouse structure at the southwest corner of the cove, currently leased by Ocean Beauty Seafoods.
Non-City-owned properties include the National Marine Fisheries Service dock, Bureau of Land Management land and a privately owned fishmeal processing plant at the north end of the cove. There are some unresolved issues regarding tidelands in this area with both the State of Alaska and Federal Government claiming title. These clouded title claims are likely to impact any type of potential waterfront development in the area. Gibson Cover is also susceptible to an extreme storm surge caused by easterly storms.

2.2 Pier 3

Pier 3 is the City of Kodiak’s economic and physical lifeline. Currently leased by Horizon Lines, Pier 3 is the City of Kodiak’s only facility for handling containerized cargo shipped into and out of Kodiak. Horizon’s D-7 class container vessels deliver freight twice weekly into Kodiak at Pier 3 and all supplies for the City’s residents are received here. Containers are offloaded directly onto semi-tractor trailer trucks using a rail mounted container crane. Freight is moved from Pier 3 via state-owned Rezanof Drive.

Pier 3, located at the foot of Pillar Mountain, was initially constructed in 1972 with dimensions of approximately 365 feet long by 60 feet wide. This original portion of the pier (Main Pier) consists of a heavy concrete haunch panel deck supported by concrete pile caps over steel H-piles and pipe piles. The Main Pier includes a set of parallel rail tracks which service the container crane.

In 1984, an addition along the shore of the pier was constructed, referred to as the Shoreside Extension. This addition added 32 feet of width to the pier, and ran the full length of the existing Main Pier. The Shoreside Extension is composed of concrete deck panels supported by steel girders and piles. In 1986, two 30-foot by 60-foot wing additions, referred to as the East and West Extensions, were added to either side of the Main Pier. These additions were also composed of concrete deck panels supported by steel pile caps and steel pipe piles. The entire Pier 3 deck is overlain with asphalt/concrete pavement.
Four mooring dolphins are included within the Pier 3 facility. Two dolphins are located on each side of the pier. The innermost dolphins are large concrete cap gravity dolphins supported by multiple H-pile batter piles. The outermost dolphins are supported by five steel pipe piles, one vertical and four batters. Catwalks connect the dolphins to one another as well as to the Main Pier. The steel catwalks are supported by intermediate steel pipe piles. Steel frame and timber faced fender units with cylindrical rubber energy absorbers, installed during the mid 1980’s, are located along the face of the Main Pier and East and West Extensions. Utilities are provided to support the crane and operations at Pier 3.

![Figure 3 Pier 3 Phases of Construction](image)

**Figure 3** Pier 3 Phases of Construction

Generally, the structural condition of Pier 3 is poor. Heavy corrosion is evident in the support piles and superstructure elements are severely deteriorating. The container crane is comparatively undersized and limits the size of vessels that can call on Pier 3 while also creating operational limitations on speed and volume of containers that can be moved. Additionally, the available upland storage and staging space is tight. Access from Pier 3 is restricted to Rezanof Drive where high speed traffic and restricted sightlines make efficient and safe cargo transport challenging.

Adjacent to the Pier 3 site is large, historically active scree slope on the southeast face of Pillar Mountain. This talus slope has been the subject of extensive study, mixed discussion and some controversy for nearly 40 years. The United States Geologic Survey first conducted research studies of this slope in the early 1970’s. Subsequent generalized studies have been conducted as recently as 2002.
Copies of these studies and other background information on the Pillar Mountain Scree Slope are found in Appendix F of this report. Through the course of the last four decades various hazard designations have been assigned to this site ranging from Hazard Warning (strongest) to Notice of Potential Hazard (less strong).

Currently, the slope is listed with the weaker designation of Notice of Potential Hazard, which provides information on the location and possible magnitude of a potentially hazardous geologic condition. However, available evidence is insufficient to suggest that a hazardous event is imminent or evidence has not been developed to determine the time of occurrence.

In short, this designation does not preclude activities at the base of the mountain. It does, however, warrant additional studies if a new structure were to be constructed at its base, specific to perceived risks to the structure or operational activities.

**Figure 4** Pile Condition at Pier 3

### 2.3 Pier 2

Pier 2 is the City’s large multi-use dock located at the base of Pillar Mountain in a rather exposed portion of waterfront. A wide variety of users call on Pier 2 including the local fishing fleet, cruise ships and a National Oceanic and Atmospheric Administration (NOAA) research vessel. Activities at this facility include net tending, pot loading, temporary gear storage, cruise ship berthing and passenger terminal, and homeporting of the NOAA research vessel “Oscar Dyson.” Upland facilities consist of a 21,600 square foot warehouse and ample upland layout area.
Pier 2 was built in two phases. Phase 1, the west half, measuring 72-foot by 400-foot was constructed in 1988. The pier was constructed from steel pipe pile, steel girders and stringers and a prestressed concrete panel deck with asphalt overlay. Steel frame and timber faced fender units with cylindrical rubber energy absorbers are located along the face of the pier. Three steel mooring dolphins supported on steel pipe piles are located at the west end of the pier. A timber approach dock supported on steel pipe piles is located behind the center dolphin connecting it to the shore, and steel catwalks connect the dolphins to one another.

Phase 2, the east half, measuring 72-foot by 475-foot was constructed in 2006. This phase was constructed from steel pipe pile, steel caps and a prestressed concrete panel deck with asphalt overlay. Fender units matching the west portion of Pier 2 line the east face. Dockside utilities consist of potable water, electrical service, sewer hook-up and dry fire suppression lines.

![Figure 5 Oscar Dyson at Pier 2](image)

![Figure 6 Pier 2 Looking East](image)
Generally, the structural condition of Pier 2 is good, maintaining 400 pounds per square foot live load capacity over the deck surface. Corrosion protection is provided by galvanized coating on the steel elements and anode sleds. The placement of Pier 2 in the main waterway puts it in a rather exposed position during rough weather and seas.

**Figure 7** Pier 2 Phases of Construction
2.4 St. Paul Harbor Floats

St. Paul Harbor, located near the downtown core, is the City’s floating dock marina for moorage of small to medium (up to 60-foot) vessels. Users of the floats in St. Paul Harbor include the fishing fleet, recreational boaters and tourism charters.

![Figure 8 Downtown Area Overview](image)

The harbor floats, approach piers, access gangways and associated utilities in St. Paul Harbor were constructed in 2000. The float units are constructed of heavy treated timber with encapsulated polystyrene floatation integrated into the units. Galvanized steel pipe piles secure the floats into place. The approach piers are timber supported by steel pipe piles and the access gangways are 80-foot long aluminum ramps with roof covers. Utilities on the floats include lighting, electrical service and potable water at each slip and a fire suppression system.

Parking and upland amenities are also part of the facility. Two parking lots are located northeast of the mooring basin, on either side of the Harbormaster’s office. Parking is also available along Shelikof Street; half as parallel spaces and half as perpendicular pull-in spaces. Additional parking is available on Oscar’s Spit to the southeast of the basin. There is a restroom and shower building in the northeast parking lot, although showers were not installed at the time. A portion of the Harbormaster’s office/Fisherman’s Hall was also originally set up to accommodate restrooms and showers, but they were not constructed.
The condition of St. Paul Harbor’s moorage floats and associated elements is good. Parking appears to be somewhat limited for users of St. Paul Harbor, because the neighboring downtown businesses use a share of the available spaces.

2.5 Dock 1

Dock 1 is a timber dock located adjacent to the Harbormaster’s building within St. Paul Harbor. It is a multi-purpose dock used primarily by fisherman for loading their vessels.

Dock 1 is approximately 60-foot by 200-foot and was constructed in 1965. The original Dock 1 was U-shaped and constructed of timber deck, stringers, caps and piles. The interior portion of the U-shape was filled with similar timber construction at a later date. An extension dock composed of steel piles, timber stringers and deck, was
built in 2000 as part of the float reconstruction work in St. Paul Harbor. See Figure 11 for phasing reference. Creosote-treated timber fender piles line the sides of Dock 1.

Figure 11 Dock 1 and Oscar’s Dock – Phases of Construction

Generally, the condition of Dock 1 is poor with severe load restrictions limiting traffic to small pick-up trucks. The deck surface elevation is also too high for many of the vessels in the harbor; although local tides preclude appreciably lowering the working surface.
2.6 Boat Grid

The Boat Grid is a tidal work grid located just to the southeast of Dock 1 in St. Paul Harbor. The Boat Grid is used for maintenance and repair work on small to medium sized vessels. Tidal fluctuations are utilized to ground out vessels in order to perform work on vessels in the dry.

The Boat Grid was constructed in 2001. It is constructed of steel pile caps supported on steel pipe piles, sloping from elevation 0.0 to +6.0 feet MLLW (Mean Lower Low Water). Steel pipe fender and mooring piles are spaced along the shoreside of the grid to support vessels resting on the grid. A geotextile and timber bulkhead forms the uplands and overhead work platform. A concrete slab provides access to the edge of the grid and supports the fender piles, guardrails, amenities, etc. as well as forming the parking lot area. The area upland from the Boat Grid serves as the location of the annual Crab Festival. Enhanced hidden electrical service is also provided for the Crab Festival without the need for exposed extension cords throughout the site.

The condition of the Boat Grid and associated uplands is good.

2.7 St. Paul Boat Ramp

A boat ramp with courtesy float and boat trailer parking is located just to the south of the Boat Grid in St. Paul Harbor. The boat ramp is used to launch and retrieve smaller trailered vessels. Pull-through trailer parking for the boat ramp is provided at Oscar’s Spit.

The condition of the boat ramp and courtesy float is poor.

2.8 Oscar’s Dock (Dock 2)

Oscar’s Dock, also known as Dock 2, is located at the south side of St. Paul Harbor, adjacent to the upland area known as Oscar’s Spit. Oscar’s Dock is a multi-purpose dock used primarily by fisherman for loading vessels, laying out and tending nets and gear, etc.
Overall, Oscar’s Dock is approximately 75-foot by 250-foot. It is a composed of three separate dock systems, which are designated as Phase 1, 2 and 3, in order of construction. Timber fender piles line the face of Phase 1 and 2 docks.

Phase 1 is the original C-shaped dock structure built in approximately 1972 and is the westernmost portion. Phase 1 is composed of concrete deck panels, timber pile caps and piles. The creosote protected piles are braced at each bent along the main portion of the dock, to provide lateral load resistance.

Phase 2 is an extension of Phase 1, built in approximately 1979. Forming an L-shape against the north side of Phase 1, this section is constructed from hollow-core concrete panels, steel stringers and steel pipe piles. Galvanizing provides the corrosion protection.

Phase 3 consists of two net mending platforms, built in approximately 2000. The platforms fill the gaps left between the Phase 1 and 2 docks. The platforms are constructed from steel piles, timber stringers and timber deck. The platforms are built flush with the top of the bullrails along Phase 1 and 2 docks. See Figure 11 for phasing reference.

Figure 13 Vessel at Oscar’s Dock

Figure 14 Condemned Area at Oscar’s Dock
Generally, the condition of Oscar’s Dock is moderate for Phases 1 and 2 and very poor for Phase 3. The Phase 3 sections are of considerable concern as the timber stringers and deck are susceptible to collapse from heavy snow loads. These sections of Oscar’s Dock have been condemned and fenced off to enforce restricted access.

2.9 Oscar’s Spit

Oscar’s Spit is the peninsula at the south side of St. Paul Harbor, directly adjacent to Oscar’s Dock and at the mouth of the moorage basin. This piece of upland contains restroom facilities and the boat trailer parking lot that supports the nearby boat ramp.

The spit also provides access to the City’s snow dump pier and the Water Dock. These City-owned structures are both located at the end of Oscar’s Spit. The Water Dock provides potable water service for medium-sized vessels prior to heading out to sea. The Snow Dump Pier is used by City snow removal crews to push plowed snow off the streets into the channel.

2.10 Pier 1 (Ferry Terminal)

Pier 1 is located on the channel at the intersection of Marine Way and Center Street. It is currently a multi-purpose dock used for transfer of general cargo and fuel, although its primary function is as the ferry terminal for the Alaska State Ferry M/V Tustumena. The State of Alaska is considering relocating the ferry terminal to a new location, leaving Pier 1 for use as a purely multi-use facility. According to a condition assessment prepared by the Alaska Department of Transportation and Public Facilities, Pier 1, is in good condition. The shape of the dock and the terminal building currently on the property are not especially conducive to laydown space or storage. Removal or relocation of the building would greatly enhance the available open space. However, the terminal building is home to several tenants and the tenants would need to be relocated in order to gain this space.

![Figure 15 Alaska State Ferry M/V Tustumena at Pier 1](image-url)
Pier 1 is a horseshoe-shaped timber structure constructed in about 1960. The main portion of the dock is approximately 30 feet by 200 feet. Two 30 foot by 100 foot long approach trestles, one at each end of the dock, provide access to the main pier. Steel frame and timber faced fender units with cylindrical rubber energy absorbers are located along the face of the pier. Timber fender piles line the edges of the main pier. A 2,500 square foot terminal building is located on the shoreline between the approach trestles.

Generally, Pier 1 is in good condition with only minor deterioration of the structural timber piles.

2.11 Transient Floats

Located east of Pier 1, but before reaching the Near Island Bridge, 380 feet of transient moorage floats (seen in the foreground of Figure 16) are provided by the City. The floats are of timber construction fabricated in the 1960’s and are in generally poor condition. Users of the transient floats typically have permanent moorage elsewhere in the City, but choose to use the transient floats for convenience. The private Petro Marine fuel dock is located between Pier 1 and the Transient Floats. The Transient Floats property is well situated and the site could provide a prime location for future dockage facilities. This site is also a prime candidate for relocation of the M/V Tustumena ferry terminal.

2.12 Near Island

Near Island, located south of downtown, sits east of St. Herman Harbor. It features a boat ramp, upland facilities for St. Herman Harbor floats, boatyard development, quarry area, and open spaces. Determining the future use of Near Island has been an ongoing process. In 1987 the Borough adopted the Near Island Comprehensive Plan (see Appendix E) that included recommendations for parks, greenbelts and commercial and residential areas. Rezoning was completed in 1988 to implement the recommendations within the Comprehensive Plan. Details of the rezone, including maps, are included in Appendix E. Much of the Near Island Comprehensive Plan has been implemented or is solidly in the development phase. One notable exception is the development of the Near Island Trail System, which is discussed in the Open Spaces Recommendations section of this report.

2.13 St. Herman Harbor Floats

St. Herman Harbor, located in Dog Bay at Near Island, is the City’s floating dock marina for moorage of small to large (up to 150 foot) vessels. St. Herman Harbor float users include the commercial fishing
fleet, recreational boaters and tourism charters. St. Herman Harbor provides moorage for about two-thirds of the vessels in Kodiak.

The floats, approach piers, access gangways and associated utilities in St. Herman Harbor were originally constructed several decades ago. The City started a phased float replacement plan that started at the southwest end of the harbor and moved northeast. In 1999, the first phase included the construction of a new headwalk, mainwalk and set of finger floats (N-Floats), along with the approach pier and gangway (Ramp 3) at the southwest end. See Figure 25 for reference to labels. The next phase occurred in 2008 with headwalk replacement (P-Float), and the next mainwalk and finger floats replaced (M-Floats). The new float units installed in 2008 are constructed of large monolithic concrete float units. Galvanized steel pipe piles secure the floats in place. The timber approach pier is supported by steel pipe piles and the access gangway (Ramp 3) is an 80 foot long aluminum ramp with roof cover. Utilities on the floats include lighting, electrical service and potable water at each slip and a fire suppression system.

Additional parking has not been part of the redevelopment plan at the southwest portion of the harbor, as quarrying operations and boatyard development have been prominent in this area. Parking for St. Herman Harbor users is located along the northeast portion of the mooring basin. There is also a restroom building near the northeast end of the harbor.

Figure 17 Near Island Overview
The new construction is in excellent condition. The older portions of the harbor floats and associated facilities are in fair to poor condition and will require replacement in the coming years.

2.14 Near Island Boat Ramp
A boat ramp with courtesy float and boat trailer parking is located just to the northeast corner of St. Herman Harbor. The boat ramp is used to launch and retrieve smaller trailered vessels. Boat trailer parking to support the boat ramp is located nearby.

2.15 Fishing Dock
The Fishing Dock is a 20-foot by 100-foot long fixed dock attached to Uski Island in St. Herman Harbor. This structure is used by fishing vessels to load, sort, tend and temporarily store fishing nets, pots and other equipment. There is currently no upland access to the Fishing Dock and moorage space is limited.

2.16 Boatyard Development (Boat Lift and Boatyard)
The St. Herman Harbor Boatyard was constructed in 2009 to allow servicing of large vessels. It is ultimately hoped that trades, facilities and services necessary to serve the large commercial fishing fleet that operates out of the Kodiak area will continue to develop around the newly constructed lift. Before construction of the lift, most vessel operators opted to go to the lower 48 or mainland Alaska for major service of their vessels; however, development of the boatyard offers the opportunity to now perform this work in Kodiak.

The site of this new development is the south end of Near Island and Dog Bay. This facility has the capability to lift vessels up to 660 tons and is expected to ultimately provide major dry moorage repairs.
and maintenance operations in the boatyard. Other improvements planned for the boatyard area include enclosed machine and workshop space, added parking, improved access and, possibly, gated entry.

In order to accommodate the future plans for the boatyard, the upland area must be expanded by quarrying material out of the existing hillside. This will provide the relatively flat grade necessary for successful functioning of the work areas. It is estimated that 910,000 cubic yards of material must be removed to accomplish this. At this time, material is only removed at the rate needed to support construction of other projects. At current production rates, it will take more than 30 years to complete the full quarry expansion. In order to expedite use of material and full construction of the boatyard, certain options in the recommendations section include projects that would be designed to incorporate large amounts of fill.

![The 600 Tonne Travelift at the Boatyard Development](image)

**Figure 19** The 600 Tonne Travelift at the Boatyard Development

The Boat Lift Pier and Marine Travelift Machine were constructed in 2009. The Boat Lift consists of two parallel steel box girder piers supported by steel pipe piles. Two breasting dolphins are located at the offshore end of the northernmost pier and have floating donut-type fenders on the plumb piles. Plastic camel logs provide standoff distance between the piers for vessels that use the Boat Lift.
The upland boatyard development currently has a heated washdown slab to support year-round repair and maintenance operations. Electrical service is provided at work stations and amenities include a restroom located within the washdown equipment enclosure.

2.17 Trident Seaplane Base

The Trident Seaplane Base is located on the east side of Near Island. Users of this facility include single-engine seaplane pilots, servicing both recreational and tourism charters.

The base currently has 18 berths for single-engine floating aircraft, a launch facility with courtesy floats for pulling seaplanes onto land and fueling service. The basin has an FAA-designated landing area measuring 4,400 foot by 200 foot in the relative shelter provided by Near Island to the northwest, Crooked Island to the south and Holiday Island to the east.

The Trident Seaplane Base was upgraded in 2007. This included removal of obstacles in the waterway, refurbishing of the moorage floats, addition of the launch ramp and expansion of the upland area by quarrying material from the south end of the base.

2.18 Current Open Spaces

Several areas along the Kodiak waterfront are designated as Open Space. According to the Borough’s Proposed Future Land Use map, these include: the peninsula portion of Gibson Cove, the beach at Pearson Cove and approximately half of the shoreline of Near Island. See Figure 21 for approximate extent of current Open Spaces in Kodiak.

Features and facilities within these areas vary widely. A non-contiguous system of trails has been established on Near Island to reach portions of the island inaccessible by vehicle. Some amenities, including benches and trash cans, are found at other locations.
3  Needs

A key component of this waterfront master plan was to assess and identify the City’s greatest needs as they pertain to achieving its overall goals. These needs are identified below with proposals to address these needs presented in the recommendations.

3.1  Maintaining Containerized Cargo Capability

The containerized cargo transshipment facility is of great importance to the City and the majority of containerized cargo arrives/departs in Kodiak at Pier 3. Maintaining the usability of Pier 3 is critical to the City’s economic viability and growth. The condition of Pier 3 is poor and its age lacks the efficiency of modern facilities. Planning for replacement should be one of the City’s top priorities.

3.2  Providing Adequate Parking for Waterfront Users

Addition of parking, especially in the Downtown area around St. Paul Harbor, has been identified as a need. As the City has grown, development in the downtown area has created competition for parking space between business patrons and harbor users. This competition has created some hardship for locals using St. Paul Harbor, as well as the downtown business district, and runs counter to the City’s goals of encouraging growth and support of the fishing industry. Options for additional parking in this area should thus be addressed.

Figure 21  Currently Proposed and Existing Open Spaces in Kodiak (reference KIB land use map)
3.3 Providing Amenities for Harbor Users

Development and improvement of amenities at both boat harbors has been identified as a need. In order to attract growth of the fishing industry, as well as provide services needed by the budding tourism industry, amenities are needed at several locations. Restrooms should be provided at the head of most access ramps and shower facilities should be available at both St. Paul and St. Herman Harbors. Laundry facilities should also be provided to better enhance the harbor usability, although laundry facilities could possibly be better provided by private enterprise.

Included in development of amenities, should be a plan to oversee and maintain the facilities. The City has struggled in the past with maintaining cleanliness in showers and restrooms. Thus controlled access or other means to control amenities should be implemented to minimize maintenance and repair costs.

3.4 Maintaining Wharfage and Harbor Moorage Facilities

The City’s existing dock and harbor facilities are vital to preserving the core values of the community. As such, the existing waterfront infrastructure must be maintained in order to provide the continued level of service that locals and visitors have come to expect.

Continued work in St. Herman Harbor, including replacing the floats and access ramps in St. Herman Harbor, further development of the Boatyard and addition/improvement of amenities, has been identified as a need. In support of the City’s goal to support and grow the fishing industry, these items should be a priority.

Maintaining and improving the usability of Dock 1 and Oscar’s Dock are also priorities as these facilities realize significant current use. Both facilities currently have load limitations that should be addressed through either repair/upgrades or full replacement of the structures. The Transient Floats also require repair or replacement.

3.5 Preserving and Improving Open Spaces

Preservation and development of Kodiak’s open spaces and public lands has also been identified as a need by the community. In order to enhance the local community and promote tourism, open spaces should be maintained, enhanced and further dedicated throughout the community.

4 Wish List

In addition to the needs identified in Section 3, above, enhancements to the waterfront should also include the following items. These ‘wish list’ items will further enhance the waterfront infrastructure of Kodiak and should be examined for implementation as demand grows and funding allow.

4.1 Provision of Additional Multi-Use Dock Space

With continued maintenance and repair of existing dock facilities, the current waterfront infrastructure is typically adequate to support the needs of the community and transient vessels. However, future
growth may necessitate the need for additional multi-use dock space. Therefore, the City should plan for additional multi-use dock space as demand grows and funding becomes available.

4.2 Completion of the Boatyard Quarry and Enhancement of Boatyard Facilities

The recent construction of the boatyard has provided the City with great potential to become a location for first class large vessel maintenance. In order to reach this level of service, support facilities must be established and structures to protect vessels under maintenance should be erected. Adequate space will become available for these structures on Near Island when the quarry operation is completed. Therefore, completion of the quarry and encouragement of site development is identified as a desire to further enhance the boatyard.

4.3 Drive-Down Float Facility

A means of providing vehicular access at boat level would greatly enhance the facilities in Kodiak. A drive-down float has been reviewed and partially designed for St. Herman Harbor. As funds become available, this facility should be constructed to provide ready access to vessels from land-based vehicles.

4.4 Cold Storage Facility

A public cold storage facility could provide a boon to the local economy. Traditionally, cold storage has been provided by individual refrigerated trailers, often far away from fishing vessel loading and off loading operations. Refrigerated trailers are notoriously inefficient and consume large amounts of electricity to cool individual refrigerated units. It has been found that modern cold storage facilities can achieve ten times the energy efficiency of individual refrigerated units. Individual reefer units are also inefficient at maintaining optimum temperatures for preserving seafood products. This negatively affects the quality and freshness of the product as well as limiting market availability to a narrow calendar window. Improvements in storage technology would benefit the community by providing a year round fresh seafood market while reducing power consumption.

5 Recommendations

The following recommendations are based on current level of use, existing condition and assessments of the City’s greatest needs. Rough Order of Magnitude (ROM) costs are estimated for each recommended project, in 2010 dollars, and are intended to present anticipated costs for base level planning only. Estimated ROM costs include soft costs, such as construction contingencies, planning, permitting, design, contract administration, QA/QC services, etc. Based on these parameters, the recommendations are presented below in order of priority.

A proposed schedule for completing the recommendations provided in this report is presented in Figure 35 located after the closing statement of this report.
5.1 Pier 3 Replacement to Maintain Containerized Cargo Capability

ROM cost estimates range from $18 to $82 million (not including crane)

Pier 3 is the only facility in Kodiak for handling containerized cargo. Therefore, it is a critical piece of infrastructure to sustain the local economy and enable future development in Kodiak. Replacement of Pier 3 within the next five years should be a priority. Ongoing and extensive maintenance is the only thing that has allowed the existing facility to survive beyond its initial design life. The current facility suffers from corrosion, wear, limited offloading/vessel capacity, limited upland storage space and access difficulties in moving freight off of Pier 3 into town. Planning, design and permitting should proceed within the next year to establish budgets and seek potential funding sources. A final design should be completed by 2011 and construction underway by 2012.

Upfront planning should begin this year with emphasis on completion of a design study report to evaluate the most appropriate structure type, alignment and construction phasing. A new facility should take into account the improved efficiency of modern container cranes, optimum methods of land-based freight movement, moorage of larger vessels and ability to move more cargo in a shorter amount of time. The new pier should provide a low maintenance structure to reduce operating costs and increase facility life. The new structure could also take advantage of the ongoing quarry operations on Near Island by utilizing borrow fill from the quarry to increase upland staging space at Pier 3. This would also provide added benefit to the Near Island Boatyard Development expansion project by generating an immediate need for quarry materials within Kodiak. The Pier 3 project could utilize up to 350,000 cubic yards of fill depending on the option chosen.

Two layout options for a new Pier 3 are presented here for review and consideration:

Option A – ROM cost estimate = $60 to $82 million (not including crane)

Option A provides the ultimate multi-use wharfage space to support a large number of vessels and meet Kodiak’s needs for decades. Construction of this option may best be phased over time as the community grows, but the overall concept is presented as a whole in this report.
Figure 23 presents a model showing two phase construction, allowing the facility to continue to operate with only minimal interruption. The structure would extend from the corner of Pier 2 at the east end and run the full length of the property toward the west. The face of the dock would be at about -40 feet of draft, sufficient for larger class container ships. Crane rails would be integrated into the dock structure and fender units would line the face of the dock. Upland space would be more than double the existing space and an access road separate from Rezanof Drive could directly connect to Pier 2. Costs provided also include upland utilities to support refrigerated container storage.

The scree slope on adjacent Pillar Mountain is a concern for the construction of this project as a seismic event could cause the slope to move onto the eastern portion of the new facility and beyond into the bay. The area had been previously identified as a Geologic Hazard by the USGS, however that designation has since been relisted as Notice of Potential Hazard, which is a less binding category. In November 2002, a report prepared for the City concluded that there is no apparent evidence of significant ongoing deep-seated movement. This report as well as historical documents and various other reports related to the scree slope on Pillar Mountain are found in Appendix F of this report. If this alternative is moved forward, it is recommended that a more specific geotechnical study be commissioned to evaluate this concern and help determine perceived risks to benefits. This study would evaluate the City’s risk with construction at the base of the slope.
Option B – ROM cost estimate = $18 to $30 million (not including crane)

Option B would be constructed in two phases, allowing modified operations to occur with minimal interruption to the cargo operations. This dock option follows the same alignment and general configuration as the existing dock. An additional fill area could be included, optional, to increase the upland space. Mooring and breasting dolphins would be included to increase the length of the berth. The face of the dock would be at about 40 feet of draft and lined with fender units. The structural support for the crane rails would be integrated into the platform dock or bulkhead structure. Upland utilities to support refrigerated container storage could be included as needed. This option does not include separate road access from Rezanof Drive, avoiding potential Pillar Mountain scree slope issues.

![Figure 24 Pier 3 Expansion Option B](image)

**5.2 St. Herman Harbor Floats**

ROM cost estimate = $23 to $28 million

The age and condition of the older St. Herman Harbor floats are outpacing routine maintenance efforts and predicates that the replacement program should continue, working toward the northeast end of the harbor. Separation of future boatyard operations and marina traffic, access and parking will need to be considered.
Recommended improvements in St. Herman Harbor include replacing the remaining approximately 80,000 to 85,000 square foot of floating docks in the northeast portion of the harbor, replacing gangways, adding parking, improved access and amenities. Reconstruction would likely use timber floats, supported with steel pipe piles. Full utilities should be integrated into the float system, including electrical service pedestals and potable water for each slip, adequate lighting and a complete fire suppression system. Standard life safety features, such as ladders, life rings, fire extinguishers and appropriate signage should also be integrated into the float system. Covered aluminum gangways meeting ADA access standards will be needed in at least two locations along the retrofitted section. Amenities such as restrooms and shower facilities should be provided near the top of the Ramp 2 access point. A small restroom and shower facility currently exists near Ramp 1, but that facility may need expansion depending upon future demand.

**Figure 25 St. Herman Harbor Float Layout**

Float replacement, consisting of all the previously mentioned work could be implemented in four separate phases, working toward the northeast. See Figure 26 for reference. Phase 1 could include replacing L Float with new timber float units with ROM cost of approximately $5.2 million. Phase 2 could include replacing K and Q Floats with new timber float units, and the addition of new restroom/shower/laundry facilities at the head of Ramp 2. The ROM cost for Phase 2 would be approximately $7.6 million. Phase 3 could include replacing J and R Floats with new timber float units with ROM cost of approximately $4.3 million. Phase 4 could consider replacing the remaining floats: EE.
E, F, G, H, I and S, and replacing the gangway Ramps 1 and 2. The ROM cost for Phase 4 would be approximately $8.3 million.

The advantages of a phased approach are that it spreads the capital cost burden, minimizes tenant displacement and it allows for lessons learned and improvements in design elements to be incorporated into each subsequent phase. The potential disadvantages are that overall costs may be higher than a single full replacement schedule and the length of time to complete the entire project will be lengthened by several years.

Planning, design and permitting for the first phase (L Float replacement) should commence in the near future in order to provide full replacement within the decade.

5.3 St. Paul Harbor Improvements

ROM cost estimates range from $2.1 million to $6 million

St. Paul Harbor, located at the downtown core, provides moorage for approximately one-third of the vessels in Kodiak. The floats and gangways, which were replaced in 1999, appear to be in good condition and adequately serve the needs of boaters with safe, secure moorage, utility hook-ups and ready access. However, other site improvements are needed to more fully meet the needs of the fishing fleet, recreational boaters, support tourism, improve safety at the facilities and enhance the downtown area.

![St. Paul Harbor Improvements](image-url)
Shower amenities should be a priority and can be easily incorporated into either Fisherman’s Hall or the existing restroom building north of the Harbormaster office. Restrooms should also be considered at the Shelikof Street access ramp. Laundry facilities should also be provided either by the City or private individuals for harbor users. Incorporation of shower facilities within existing structures would likely cost around $100,000, while construction of a new facility on Shelikof would cost between $200,000 and $300,000 depending upon configuration.

In order to address parking issues, continuation of the bulkhead along Shelikof Street should take priority to provide additional perpendicular pull-in parking stalls. The bulkhead could be constructed to match the existing structure east of the access ramp and could provide approximately 40 parking spaces. It would cost approximately $750,000 to extend the bulkhead along Shelikof Street and provide the parking. This work could also have a positive effect on the sidewalk improvements work being considered.

Other improvements that should be considered, but not included as priority items at this time, include substantial repair or replacement of Dock 1 and Oscar’s Dock, and addition of a public hoist at one of the dock facilities. The poor condition of Dock 1 and Oscar’s Dock greatly reduces their usefulness and, in some cases, is a safety issue. Additionally, room exists for expansion of Oscar’s dock primarily to the east and this extension could easily be incorporated into repair work. Repair or replacement of both facilities, including the possible extension of Oscar’s Dock, should be planned and implemented within the next decade.
The cost to repair Dock 1 to achieve an adequate load rating would be approximately $450,000. Replacement with a filled bulkhead structure would cost about $2 million and could use 8,000 cubic yards of backfill, assumed from the quarry on Near Island. Repairs to achieve adequate load rating at Oscar’s Dock would cost approximately $220,000 by replacing the interior portions that are currently condemned. Complete replacement of Oscar’s Dock with a filled bulkhead would cost approximately $2.2 million and could use 10,000 cubic yards of backfill, assumed from the quarry on Near Island.

Alternatively, a 3-Tiered Dock could be constructed to replace Dock 1, but it is believed that the drive-down float planned at the boatyard development facility would provide a more versatile and usable working platform for a wider variety of vessels. The 3-tiered dock would limit also usability in that laydown space and maneuverability would be affected. The Kodiak tides would also limit the applicability of the tiered dock.

During the public review period of this project, there were some discussions about possible development on the south side of Oscar’s Spit. Permanent development of this area is not recommended. This area is fairly well-used and supports a variety of user groups, including the landing craft area, Oscar’s Dock operations and the boat trailer parking lot for the Boat Ramp. The spit area serves an important City function as a non-dedicated, general use space, and additional development would probably have an adverse effect on the current users.

Planning, design and permitting, for the bulkhead and added parking along Shelikof, as well as for addition of shower facilities should be completed by the end of 2010. Planning, design and permitting for repair or replacement of Oscar’s Dock, should begin as funding allows. Replacement of Dock 1 could be included six to twelve years out.

5.4 Open Space Development

ROM cost estimates range from $0 to $2 million

Kodiak possesses a great resource in its existing open spaces and recreational opportunities in and around the city. Public input made it clear that preserving, improving and possibly expanding current open spaces is a priority to many residents.
Concepts for improving the existing facilities include expansion of the trail systems on Near Island to connect all parts of the island, especially to provide access to areas that are affected by the boatyard development, etc. Appendix E contains a Comprehensive Report and background information dealing with development of Near Island. The report includes recommendations on expansion of the trail system including a 1996 City of Kodiak resolution in support of its development. It is recommended that continued focus on the development of the trail system, as set forth by the Near Island Task Force, and more specifically the Trail Committee, remains a priority. Planning should proceed with that goal in mind, while carefully considering the other developments on the island. For example, the currently proposed alignment of the perimeter trail should be modified to avoid conflicts and potential safety issues in the area of the boatyard development. Pedestrians should be routed around the activity in the boatyard to avoid safety conflicts with the industrial activity.

The addition of benches, picnic tables and trash receptacles at Pearson Cove, the peninsula at Gibson Cove, the north portion of Near Island overlooking the channel, St. Paul Harbor, the St. Paul Breakwater and other locations would also enhance the existing open spaces. The addition of open spaces for wildlife and bird viewing should be considered and could include larger portions of Gibson Cove and maybe the rock breakwater west of St. Paul Harbor.

Figure 29 Proposed Open Space
Preliminary planning by the Borough identified Uski and Gull Islands as industrial development areas. However, access to these areas for industrial activities is difficult and costly, and the current demand does not appear to support an expansion of these activities at this time. Therefore, it is recommended that Uski and Gull be temporarily designated as Open Space with long-term dedication to industrial development as demand grows.

Some improvements could be started immediately and community involvement should be used in planning, developing and constructing trails and installing park amenities and improvements in existing open spaces. Larger scale improvements can be undertaken as opportunities arise. Land acquisitions, such as space at Gibson Cove should also be considered to enhance and expand the open spaces.

5.5 Boatyard Development (Near Island)

ROM cost estimates range from $3 to 22 million

The City has shown a strong commitment to developing the Near Island boatyard facility. By constructing the Boat Lift Pier and purchasing the new 600-tonne Marine Travelift machine, the City has clearly made the boatyard project a priority. The next challenge will be to attract vessel operators to use the Kodiak boatyard for regular dry dock maintenance and repairs. The key to accomplishing this goal will be to encourage growth of the support services needed in a working boatyard. The City will need to encourage development of businesses that provide critical boatyard support services. It is possible that private development will take the lead in construction and lease of buildings and shops to provide the machining, welding, painting, parts vendors and other services that are part of a working boatyard, but the City may need to take a leading role. Either way, the upland space needed to accommodate these services will require expansion of the quarrying operations on Near Island.

Figure 30 Boatyard Development Plan Rendering
Based on existing engineering design plans for expanding the quarry to the full limits, the quantity of material to be removed is approximately 910,000 cubic yards. There are currently three contractors working the Near Island quarry, but material is only quarried when it is needed for another project. At the rate that local projects are consuming material quarried from the boatyard development area, 30,000 cubic yards per year, it will take more than 30 years to complete the excavation. It is recommended that projects needing structural fill be found and executed to allow development of this site as soon as possible. Additionally, the City should examine possibilities to construct a material stockpile that would allow mining of the material and expedited completion of the boatyard.

The future boatyard is anticipated to include development of a heavy duty loading dock (approximately $3 million), commercial building developments as lease lots, enhanced parking, access and user separation, and amenities. The cost of quarrying the remaining materials to expand the boatyard to its full capacity is estimated to be about $14 million.

Planning, design and permitting of the loading dock, upland support facilities, buildings, etc. for the next phase should begin by the time the quarrying effort extends north of the dock site, to establish budgeting and seek potential funding sources for continued development. The timeline is principally dependent upon the schedule of the quarry activity.
5.6 Cold Storage Facility

ROM cost estimates range from $500,000 to $2 million

A cold storage facility could be constructed on City property and leased to an owner/operator to provide services for the local commercial fishing fleet and recreational fishing charters. Services provided by the operator could include short and long term storage, flash freezing, packaging and shipping, etc.

Some recommended locations for a potential cold storage facility would include:

- Near St. Paul Harbor, possibly at Oscar’s Dock
- At Pier 1
- At a new multi-use dock
- At a replacement structure in the vicinity of the Transient Float

The upfront capital cost for a modern public cold storage facility would be anywhere from $150 to $200 per square foot.

5.7 Pier 1 and Pier 2 Upgrades

ROM cost estimates range from $150,000 to $1.5 million

If Pier 1 is abandoned by the State Ferry system, the City should consider removal of the terminal building, including relocation of current building tenants, and build out the dock to create one contiguous dock surface. Alternatively, a cold storage building could be constructed on the property to serve the needs of fishermen; see earlier discussion of cold storage facility for costs and benefits. Parking along Marine Way could be reorganized to use the space more efficiently. If the ferry continues to use Pier 1, the structure should remain as a multi-use facility sharing space with the ferry. Schedule for upgrades to Pier 1 will depend on what the State Ferry decides to do in the future, and if the City decides to build another multi-use dock at another location. It would be in the City’s best interest to request a firm decision and timeline from Alaska Department of Transportation and Public Facilities on their intentions regarding continued use of Pier 1 as a Ferry Terminal.

Pier 2 functions well as a cruise terminal, homeport for the NOAA research vessel, Oscar Dyson, servicing the Alaska State ferry M/V Kennicott, and for net tending and other fishery support operations during mild seas. The open exposure at Pier 2 makes year round use for some vessels impractical and the wide variety of users of the facility can overcrowd its capacity. As demand grows, another location for fishing industry work should be established to support these activities. Upgrades appropriate for Pier 2, particularly because it is the terminal for cruise lines visiting Kodiak, would include amenities such as a covered structure with courtesy phone, information kiosk and possibly restrooms. These upgrades should be considered and implemented, if practical, in a ten year schedule. Some multi-use functions may be better suited at an alternate location.
5.8 Petro Marine Facility and Transient Floats

Currently, the City’s Pier 1 and Transient Floats are separated by the Petro Marine fuel dock facility. There may be an advantage to swapping or reorganizing ownership of the Transient Float property with the neighboring Petro Marine property to increase the contiguous City property. This would allow room for expansion of the Pier 1 facility. It is recommended that the City investigate the feasibility of making a property swap with Petro Marine.

![Figure 31 Fuel Dock and Transient Floats](image-url)
5.9 St. Herman Drive-Down Float

ROM cost estimate = $13 million

The addition of a Drive-Down Float at St. Herman Harbor would greatly enhance the function of the boatyard, as well as provide a constant freeboard working platform for all kinds of industrial activities. The future Drive-Down Float could be located just to the east of the boat lift pier and serve dual purpose by providing additional queuing space for the boat lift pier along the west edge. The Drive-Down Float should be large enough to allow vehicle turn-around and maneuvering space. A 240-foot long transfer bridge would provide access to the float from the boatyard area. The float could also include three 100-foot fingers for transient moorage.

Preliminary plans for the Drive-Down Float were created several years ago and had been put on hold. Further planning for the Drive-Down Float project should be undertaken after the boatyard has been established. At that time, final design, permitting and budget analysis can be generated to determine potential funding sources. This work is probably in the ten to fifteen year range, unless boatyard development and demand for services is accelerated.

Figure 32 Proposed Drive-Down Float at St. Herman Harbor
5.10 Other potential Multi-Use Docks

ROM cost estimates range from $6 to $7 million

Figure 33 Proposed Multi-Use Dock at Near and Uski Islands

Multi-use dock facilities are key to providing minimum level-of-service to meet the goals of the community. Several structures currently exist that meet these needs and demand is typically currently met. However, as demand grows, additional facilities may be required in the future. Two potential locations for new multi-use docks have been identified and reviewed at a concept level basis. The first is located on Near Island just north of the boat ramp, facing into the channel. This site has the advantages of 30 feet of water depth, adequate space to accommodate upland work area and vessel moorage, easy access from Dog Bay Road and plenty of upland space for parking, equipment tending or temporary storage. The site’s primary disadvantage is that it is located outside of the protected harbor, although the site is still more sheltered than Pier 2. This facility could also potentially serve as the new terminal for the Alaska State Ferry, thus further freeing up Pier 1 for other City uses. Cost for a filled sheet pile bulkhead dock with typical accoutrements would be approximately $6 million and use about 35,000 cubic yards of quarry material.

A second concept level, potential multi-use dock location identified in this study is located on Uski Island inside St. Herman Harbor, where the current Fishing Dock is located. This site has the advantage of being inside the protected harbor, adequate space available to accommodate vessel moorage and it is near to
the St. Herman Harbor floats. Primary disadvantages include relatively shallow water depth of 5 to 10 feet, limited fairway space in the harbor and the lack of upland access. This site would require construction of a bridge to Uski Island and creation of uplands to increase layout space. Other alternatives on Uski Island may also be available on the channel side of the island. Cost for a filled sheet pile bulkhead dock, access bridge and typical accoutrements would be approximately $7 million and would use about 6,000 cubic yards of Near Island quarry material.

Either of these locations could also host a cold storage facility to serve the needs of fishermen. See earlier discussion of Cold Storage Facility for costs and benefits.

Development of new dock facilities, prior to repair or replacement of existing facilities should be carefully considered. Design studies should be implemented to determine if current facility locations are appropriate for expected use, and if new locations may have added benefit.

5.11 Expansion of City Owned Property

The City should consider procuring additional waterfront property as it becomes available. Waterfront space can be utilized for a number of the items discussed in this report. For example, acquisition of the Alaska Fresh Seafoods property, located just to the east of Oscar’s Spit, would create ideal expansion potential for additional parking at St. Paul Harbor and the downtown area, and potential location for a cold storage facility.

Figure 34 Other Waterfront Properties
6 Project Funding

In recognizing that the scope of this master plan report encompasses a large quantity of capital projects, a statement must be made for project funding. In order to implement the recommendations in this report, the City will need to identify and pursue all available and potential funding sources.

The recommendations presented in the report could be funded using revenue bonds. The revenue bonds could be repaid based solely on tariffs collected for all materials received at Pier 3, for example, or some related revenue based formula.

Funding opportunities are available in many forms, in addition to municipal bonds. Grant programs through Federal and State government agencies are often offered on an annual schedule, though from time to time unique grant programs arise as a one-time-only opportunity (such as the Federal TIGER I and II Grants, of which submission dates have passed). Economic development entities offer loan assistance programs to help spur local economic development across the state. The following are examples of grant and funding resources that some of the proposed projects in Kodiak might be eligible for.

- Alaska DOT Municipal Harbor Facility Grant program: Offers 50/50 matching funds for small boat harbor facilities in Alaska. For construction funding only. Planning, acquisitions, engineering, etc. are not eligible. Funded on an annual basis. Applications typically due mid-summer. http://www.dot.state.ak.us/stwddes/desports/harbor_grant.shtml
- US Fish & Wildlife Service – Boating Infrastructure Grant (BIG) Program: Offered to construct, renovate and maintain tie-up facilities with features for transient boaters in vessels 26 feet or more in length. Up to 75% of project costs may be funded. Requires 25% matching funds. Multi-tier opportunities. Funded annually by the Sport Fish Restoration and Boating Trust Fund. http://wsfrprograms.fws.gov/subpages/GrantPrograms/BIG/BIG.htm
- US Fish & Wildlife Service – Clean Vessel Act Grant Program: For the construction, renovation, operation, and maintenance of pump-out stations and waste reception facilities for recreational boaters and also for educational programs that inform boaters of the importance of proper disposal of their sewage. Funded annually by the Sport Fish Restoration and Boating Trust Fund. http://wsfrprograms.fws.gov/subpages/GrantPrograms/CVA/CVA.htm
- AIDEA: Alaska Industrial Development and Export Authority loan guarantee and assistance programs for rural communities geared toward small business development and job generation related projects. www.aidea.org
- Economic Development Administration American Recovery Program Grant (Federal Department of Commerce): Goal to advance economic growth by assisting communities and regions experiencing chronic high unemployment and low per capita income to create an environment that fosters innovation, promotes entrepreneurship, and attracts increased private capital investment; applications accepted on continuing basis; competitive solicitation. Funds remain available until September 30, 2010; Grant amount varies from 50-100%; cost sharing or matching fund requirements apply. http://www.eda.gov/PDF/FY09%20ARRA%20FFO%20-%20FINAL.pdf
7 Conclusion

This report was prepared to help identify and refine the City’s waterfront needs, wishes and goals and to determine priorities for action. Alternatives presented to meet the City’s goals have been prioritized by needs and wishes to best realize these goals.

The primary goals of the City’s waterfront development revolve around supporting the fishing industry, providing an efficient means of transportation of goods, supporting the growing tourism industry and establishing/maintaining open spaces. Recommendations to meet these goals include:

**Waterfront Needs**
1. Maintain containerized cargo capability by replacement of Pier 3.
2. Maintain existing facilities including continued phased replacement of floats and access ramps in St. Herman Harbor. Also, Dock 1 and Oscar’s Dock must be maintained, repaired and modified to accommodate intended use.
3. Increase parking capacity.
4. Improve amenities at both harbors.
5. Develop and maintain open spaces to enhance recreation.

**Waterfront Wishes**
1. Continue development of the boatyard and encourage private investment.
2. Construct additional multi-use dock facilities as demand requires.
3. Provide a cold storage facility at one of the multi-use docks.
4. Construct a drive-down float for ready vehicle access to vessels.

A proposed waterfront development schedule is provided below (Figure 35) to serve as a guide for planning purposes and is intended to address the goals and needs of the City. The schedule should be modified as funding and other resources become available.
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**Key**

- Planning, Design, Permitting, Financing, etc.
- Bidding, Contract Award
- Construction Activities
- Anticipated Private Development
- Contingent upon Other Activities

Figure 35 Proposed Waterfront Development Schedule
Appendix A

Kodiak Island Borough

Kodiak Urban Area: Proposed Future Land Use
Appendix B

City of Kodiak Parcels Maps and Legend
Legend

- Parcels
- City Owned Parcels
- Within Study Area

Planning Area Parcels Key Map
Figure 1
February 24, 2010

Gibson Cove
St. Herman Boat Harbor
Trident Basin

Figure 1
Figure 2
Figure 3
Figure 4
Figure 5
Legend

- Parcels
- City Owned Parcels
- Within Study Area

NOTES:
1. See Table 1 for property ownership summary

Figure 2
February 24, 2010

Planning Area Parcels
NOTES:
1. See Table 1 for property ownership summary
NOTES:
1. See Table 1 for property ownership summary
Legend

- Parcels
- City Owned Parcels
- Within Study Area

NOTES:
1. See Table 1 for property ownership summary

Planning Area Parcels
February 24, 2010

Legend

Parcels
City Owned Parcels
Within Study Area

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Appendix C

Kodiak Fleet Analysis
Kodiak Fleet Summary

Introduction

The City of Kodiak is preparing a Waterfront Master Plan, with emphasis on piers, docks, and maritime users. This survey was prepared to outline the type and variety of ships, fishing vessels, and other commercial, cruise, or recreational vessels homeported or calling at Kodiak’s waterfront. The current “Kodiak Fleet” is comprised of well over 700 vessels, many of which are from the commercial fishing fleet homeported in Kodiak. To a lesser extent, cargo, cruise, sport fishing, and government research vessels make calls in Kodiak. Primary use times coincide with the schedules of the fishing fleet, when the fleet is either outfitting before heading out or off-loading product.

The number of fishing vessels, ships, barges, and other vessels served by the City of Kodiak is significant. Of the approximately 700 fishing and commercial vessels berthed in Kodiak, approximately 600 use St. Herman and St. Paul Harbors. Others are served by other public and private facilities in the area. Kodiak has three main publically owned commercial piers. These are Pier 1 (primarily used by the Alaska Marine Highway System), Pier 2 (the Port’s primary commercial pier, used by fishing vessels, cruise ships, government, and other commercial vessels), and Pier 3 (used for container and freight shipments).

Process/Methodology

This survey is a snapshot of current vessels and vessel types using the Kodiak waterfront. It does not include a projection of potential or future fleet changes that may occur as, for example, fishing methods, quotas, or management priorities change.

Information for this survey was gathered through telephone interviews, review of existing published reports, and data from the Kodiak Harbormaster and his staff.

Demand

St. Paul and St. Herman Harbors

For recreational vessels, the highest demand is for 28-foot to 34-foot slips, with a mix of potential tenants on the waiting list. The waiting list at both harbors is generally accommodated at existing slips on a transient basis or at other private facilities in Kodiak.

Demand is also high for 35-foot and 40-foot slips at St. Paul Harbor. The harbormaster’s office feels this demand is partially because St. Paul Harbor is near the downtown area and provides more convenient access. A significant number of the 40-foot-and-under vessels on the wait list are tenants awaiting reassignment to Floats A or B in St. Paul Harbor. The primary vessels using Kodiak’s St. Paul and St. Herman Harbors facilities are tabulated in the attached summary chart (page 3).
Vessels Mooring Out

There is not a significant number of ships mooring out in the harbor. Most commercial vessels have permanent moorage at Kodiak. Recreational vessels rarely moor out. There is capacity to hot-bunk transient vessels in vacant marina slips during summer months because a large part of the commercial fleet is typically out fishing at this time.

Pier 1

Pier 1 is primarily used by the Alaska Marine Highway System to berth the Tustumena during its regularly scheduled calls. The pier is also used by Petro Marine to tie up their barge for fuel deliveries to the adjacent upland tank farm. Pier 1 can accommodate temporary berthing or fishing gear loading if Pier 2 or other facilities are congested.

Pier 2

Pier 2 is Kodiak's primary cargo pier, and due to the fact that a majority of the pier's upland area is used for container staging and storage, the pier is rarely scheduled for any other use. The uplands are very congested and industrial, and for that reason, not pedestrian-friendly for, say, cruise ship or other short-term use. The pier is also further from in-town attractions and not as convenient or safe for visitors walking into town. Pier 2 is safer and more convenient in this regard.

Horizon Lines is Pier 3's primary tenant. The company's cargo vessels normally arrive at Pier 3 on Mondays and Wednesdays of each week.

Horizon Lines is Pier 3's primary tenant. The company's cargo vessels normally arrive at Pier 3 on Mondays and Wednesdays of each week.

Other Piers

Sampson Tug & Barge utilizes its own privately owned facilities on Women's Bay for twice-weekly cargo shipments. Its barges are approximately 400 feet long with a 100-foot beam.

On those occasions when multiple users are vying for berthing and upland laydown space at Pier 2, the smaller fishing vessels are given lower priority. This is an infrequent occurrence because the pier is "intensively" managed, and its use is typically scheduled months in advance.

If Pier 2 becomes congested, Pier 1 and Pier 3 can be called on to provide support for the short-term loading of gear. Local seafood processors also have dock space available from time to time. In general, all normal tie-up needs are met, even at peak times.
### Vessels Using Kodiak

#### Fishing and Other Vessels at St. Paul and St. Herman Harbors

*Source: Harbormaster’s Office, City and Port of Kodiak*

<table>
<thead>
<tr>
<th>Slip Length</th>
<th>Slips at Each Harbor</th>
<th>Total Slips</th>
<th>Status</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>St. Paul Harbor</td>
<td>St. Herman Harbor</td>
<td>Total Slips</td>
<td>Vacant</td>
<td>Wait List$^3$</td>
<td>Transient Occupied</td>
<td>Pending Offer</td>
<td>Wait List for Transfer</td>
</tr>
<tr>
<td>Over 124 feet$^4$</td>
<td>19</td>
<td>19</td>
<td>0</td>
<td>10</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>100-124 feet$^4$</td>
<td>39</td>
<td>39</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>81-99 feet</td>
<td>28</td>
<td>28</td>
<td>4</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>60-80 feet</td>
<td>36</td>
<td>22</td>
<td>8</td>
<td>15</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>50-59 feet</td>
<td>21</td>
<td>18</td>
<td>8</td>
<td>15</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>41-49 feet</td>
<td>46</td>
<td>49</td>
<td>2</td>
<td>47$^2$</td>
<td>8</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>35-40 feet</td>
<td>92</td>
<td>92</td>
<td>2</td>
<td>47$^2$</td>
<td>8</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>24-34 feet and below</td>
<td>43</td>
<td>105</td>
<td>95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 24 feet</td>
<td>30</td>
<td>30</td>
<td>Note 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HTF slip</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>193</strong></td>
<td><strong>402</strong></td>
<td><strong>595</strong></td>
<td><strong>14</strong></td>
<td><strong>79</strong></td>
<td><strong>13</strong></td>
<td><strong>5</strong></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>

**Notes:**

1. The linear moorage slips at the R and S floats at St. Herman Harbor, are not considered desirable berths. At low tide, many of these berths become too shallow for boats over 18 feet to 20 feet in length. Smaller 15- to 16-foot boats could use these spaces, but most owners of boats this size prefer to trailer and launch their boats rather than pay moorage fees. Because of their limited usability, these berthing spaces are not included in the above vacancy tabulations.

2. A significant number of the 47 boats under 40 feet in length (approximately two-thirds of the wait list) are awaiting space on Floats A and B at St. Paul Harbor.

3. Wait list includes pending and vessels awaiting transfer. Some transient vessels may also be on the wait list awaiting access to a preferred space.

4. Depending on demand, linear slips at St. Herman Harbor (including M and P Floats) that berth vessels from 100 to 170 feet could also be used to accommodate smaller vessels.
## Alaska Marine Highway

<table>
<thead>
<tr>
<th>Ship</th>
<th>Dimensions</th>
<th>Capacity</th>
<th>Days</th>
<th>Pier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Beam</td>
<td>Draft</td>
<td>Pass.</td>
</tr>
<tr>
<td>Tustumena</td>
<td>296’</td>
<td>59’</td>
<td>14’ 5”</td>
<td>174</td>
</tr>
<tr>
<td>Kennicott</td>
<td>382’</td>
<td>85’</td>
<td>17’ 6”</td>
<td>499</td>
</tr>
</tbody>
</table>

## NOAA

<table>
<thead>
<tr>
<th>Ship</th>
<th>Dimensions</th>
<th>Capacity</th>
<th>Days</th>
<th>Pier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Beam</td>
<td>Draft</td>
<td>Pass.</td>
</tr>
<tr>
<td>Oscar Dyson</td>
<td>209’</td>
<td>49.2’</td>
<td>19.4/29.7’</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* Includes space for 15 scientists; has priority berthing rights when in port.

## Cruise Ships

<table>
<thead>
<tr>
<th>Carrier/Ship</th>
<th>Dimensions</th>
<th>Capacity*</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Beam</td>
<td>Draft</td>
</tr>
<tr>
<td>Princess/Royal Princess</td>
<td>592’</td>
<td>83’ 6&quot;</td>
<td>19’ 8”</td>
</tr>
<tr>
<td>Princess/Diamond Princess</td>
<td>952’</td>
<td>123’</td>
<td>28’</td>
</tr>
<tr>
<td>Holland America/HAL Amsterdam</td>
<td>780’</td>
<td>105’ 10”</td>
<td>25’</td>
</tr>
<tr>
<td>Regent Seven Seas/Seven Seas Navigator</td>
<td>565’</td>
<td>81’</td>
<td>23’</td>
</tr>
<tr>
<td>Silversea/Silver Shadow</td>
<td>610’</td>
<td>81’ 10”</td>
<td>19’</td>
</tr>
<tr>
<td>Zegrahm &amp; Eco Expeditions/Clipper Odyssey</td>
<td>335’</td>
<td>51’</td>
<td>14’</td>
</tr>
</tbody>
</table>

* Combined passenger and crew visits for 2010 (assuming full occupancy) would total 20,242 passengers and 9,858 crew, for a combined total of 30,100 potential visits.
Commercial Ships and Barges

**Sampson Tug & Barge**
Sampson Tug & Barge has twice-a-week service at its pier on Women’s Bay.

<table>
<thead>
<tr>
<th>Ship</th>
<th>Dimensions</th>
<th>Capacity</th>
<th>Days</th>
<th>Pier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Beam</td>
<td>Draft</td>
<td>Ton</td>
</tr>
<tr>
<td>Barges (various)</td>
<td>400</td>
<td>100</td>
<td>2,600 to 5,900</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Petro Marine**
Petro Marine provides barge service to deliver fuels, liquids, and petroleum supplies.

<table>
<thead>
<tr>
<th>Ship</th>
<th>Dimensions</th>
<th>Capacity</th>
<th>Days</th>
<th>Pier</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Beam</td>
<td>Draft</td>
<td>Pass.</td>
</tr>
<tr>
<td>Pacific Challenger</td>
<td>263’</td>
<td>78’</td>
<td>18.3’</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</table>

**North Pacific Fuel (Petro Star, Inc.)**
North Pacific Fuel provides fueling services at its 200-foot private pier and a 40-foot fuel float adjacent to Pier 2.

<table>
<thead>
<tr>
<th>Ship</th>
<th>Dimensions</th>
<th>Capacity</th>
<th>Days</th>
<th>Pier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Beam</td>
<td>Draft</td>
<td>Pass.</td>
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<tr>
<td>Fuel barge</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Horizon Lines (Sea Land)**

<table>
<thead>
<tr>
<th>Ship</th>
<th>Dimensions</th>
<th>Capacity</th>
<th>Days</th>
<th>Pier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Beam</td>
<td>Draft</td>
<td>Pass.</td>
</tr>
<tr>
<td>Horizon Anchorage</td>
<td>710’ (approx.)</td>
<td>100’ (approx.)</td>
<td>35’-40’</td>
<td>N/A</td>
</tr>
<tr>
<td>Horizon Kodiak</td>
<td>710’ (approx.)</td>
<td>100’ (approx.)</td>
<td>35’-40’</td>
<td>N/A</td>
</tr>
<tr>
<td>Horizon Tacoma</td>
<td>710’ (approx.)</td>
<td>100’ (approx.)</td>
<td>35’-40’</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Summary

The City of Kodiak is currently able to accommodate berthing demands using good planning and advance scheduling as well as the use of non-City-owned transient facilities if needed. Cargo and supply services are served by existing facilities at Pier 3 (Horizon Lines) and at Sampson Tug & Barge's private facility on Women's Bay. The primary stress points related to use and demand appear to be at Pier 2. This pier can get very busy at peak use times, when fishing boats are loading gear, or in the summer, when a combination of fishing boats, cruise ships, Alaska ferries (Kennicott), and NOAA's Oscar Dyson have the potential to call at the same time. Careful scheduling and the ability to refer vessels to private piers or to Pier 1 or Pier 3 when cargo vessels are not at the piers have reduced most conflicts.

The demand for pier space and fleet mix will likely change somewhat in the future. These changes will probably be most apparent in three areas. These are:

- The installation of a 660-ton travel lift at St. Herman Harbor, along with higher fuel costs, may encourage owners to homeport additional fishing vessels at Kodiak. This may add demand for more berthing facilities.

- Many of the users of Pier 2 are there less than 24 hours. Others, doing more gear work and loading, may tie up for up to three days. Between 2 and 12 vessels per year will be at dockside for over 10 days. These are generally vessels doing engine or other major maintenance or repair work. Most of these vessels use Pier 2 for the convenience of being able to drive up next to the vessel to unload gear and supplies or make repairs. These demands may increase if more maintenance work can be accommodated at Kodiak.

- The new St. Herman Harbor travel lift allows maintenance work on larger vessels. In the past, these vessels typically went out of the area for their maintenance work. These boats may also need side-tie space for final topside work once they are back in the water. This could potentially increase demand for pier space to support this work.

- The cruise industry is an important new user on the Kodiak waterfront. If the cruise business expands, it will increase user needs and potential congestion at Pier 2. Cruise operators are continually looking for new venues to attract customers, and it is difficult to predict their loyalty to a port of call. Their long-term impact is, therefore, hard to predict, but they currently provide a significant summertime presence at the waterfront. In 2010, 21 vessel calls with over 20,000 potential visitors (passengers) will occur in Kodiak.
Appendix D

 Quarry Expansion Memorandum
MEMORANDUM

To: Howard Weston
Cc:
From: Kenton Braun
Subject: St. Herman Harbor - Quarry Expansion

Howard:

Attached are Quarry Development Plans. As part of the Quarry Expansion layout, PND was asked to determine the quarry extraction quantity, and provide a time estimate for completion. Based on the layout provided in the drawing set dated December 28, 2009, and the survey data collected November 3-6, 2009, PND estimates that 910,000 cubic yards of material will be excavated, not including overburden, and work will be completed in 31 years based on an average rate of excavation of 30,000 cubic yards per year.

If you have any comments or questions regarding the plans or estimates, please let us know.
Appendix E

Near Island Comprehensive Plan Documents
NEAR ISLAND COMPREHENSIVE

DEVELOPMENT PLAN

Prepared By

NEAR ISLAND TASK FORCE

Adopted By

KODIAK CITY COUNCIL

August 27, 1987

KODIAK ISLAND BOROUGH
PLANNING AND ZONING COMMISSION

September 16, 1987

KODIAK ISLAND BOROUGH ASSEMBLY

November 5, 1987
KODIAK ISLAND BOROUGH
ORDINANCE NO. 87-31-0


WHEREAS, the Kodiak Island Borough has responsibility for land use planning throughout the Borough; and

WHEREAS, the City of Kodiak as land owner prepared the plan through a public process by appointing the Near Island Task Force, charging them with the responsibility of writing a development plan for Near Island; and

WHEREAS, after extensive public participation including six public hearings, the Near Island Task Force presented the final development plan for Near Island to the Kodiak City Council; and

WHEREAS, the Kodiak City Council, on August 27, 1987, formally adopted the Near Island Development Plan and authorized its submittal to the Kodiak Island Borough Planning and Zoning Commission; and

WHEREAS, the Kodiak Island Borough Planning and Zoning Commission held a formal public hearing on September 16, 1987, and the Commission has recommended adoption of the plan by the Assembly.

NOW, THEREFORE, BE IT ORDAINED by the Kodiak Island Borough Assembly that:

Section 1: This ordinance is of a general and permanent nature and shall become a part of the code of ordinances of the Kodiak Island Borough.

Section 2: The document entitled Near Island Development Plan, August 27, 1987, is hereby adopted as the Near Island Comprehensive Plan and incorporated into the Kodiak Island Borough Comprehensive Plan.

Section 3: That Chapter 17.02, Comprehensive Plan of the Borough Code, is hereby repealed and replaced as follows:

17.02.030 Comprehensive Plan. For the purpose of this Title the Kodiak Island Borough Comprehensive Plan consists of the following adopted documents:

Section 3: This ordinance shall be in full force and effect upon passage and adoption.


KODIAK ISLAND BOROUGH

BY

Jerome Selby, Borough Mayor

BY

Lornie White, Presiding Officer

ATTEST:

BY

Gaye Vaughan, Borough Clerk

First Reading, Approval Date: 1 October 1987
Second Reading, Public Hearing, Approval Date: 5 November 1987
Effective Date: 5 November 1987

Distribution List:

Community Development Department
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<tr>
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</tr>
</tbody>
</table>
1. EXECUTIVE SUMMARY
1. EXECUTIVE SUMMARY

The Near Island Task Force was appointed by the Kodiak City Council on December 19, 1985. The original members were as follows:

- Alan Beardsley
- Chris Blackburn
- Mike Brechan
- Charles Davidson
- Benjie Doctolero*
- Ron Doubt
- Wayne Haerer
- Wally Johnson
- Carol Lechner
- Bob Pederson
- Tom Sweeney*

*Due to conflicts with time requirements and other reasons, Benjie Doctolero and Tom Sweeney resigned and André Nault and Dennis Smedley were appointed.

The efforts of this committee came about through weekly meetings beginning in January, 1986. From January through April this committee adopted a set of By-Laws (see Appendix A) to govern its own behavior, elected officers, and began to review approximately 20 years of previous studies involving Near Island. Toward the end of April, the Committee mapped out a preliminary suggested land use plan. Public hearings were then held for four consecutive weeks to get public input on this "preliminary" plan. The committee reviewed all public input and discussed at length the merits of the suggestions and ideas.

After a summer adjournment, the Task Force began meeting again in late September to complete its task. In the fall an Interim Report was prepared and presented to the City Council at a worksession. The Council's input and comments were noted and discussed and a final public hearing was held Monday, January 26, 1987. Input from this hearing was evaluated and the presentation of the final Near Island Development Plan to the City Council was scheduled for February 12.

Although not previously part of this report, I have used my prerogative as Chairman to make the following observations and comments.

This report reflects the collective negotiated work of the independent individuals who made up this Task Force. The range of backgrounds and approaches varied as widely as any group with which I have ever served. No ideas went unchallenged. All ideas were listened to, examined, and negotiated or rejected. This final report represents the best efforts of these eleven democratic, free-thinking individuals at this time and place in the history of Kodiak. In the future, economics, politics, personalities, egos, community needs and pressure groups will mold and develop Near Island. It was the intent of the Near Island Task
1. EXECUTIVE SUMMARY (Cont.)

Force that future generations would accept this report as a foundation and that the needs of all of the people and a need to make this property an economic success would be blended without favor to any special interest group or individual.

In over thirty years of working with various groups I have never served with a more conscientious, non-political, giving group of individuals than these ten people with whom I have served on this Task Force. It has been a personal pleasure for me.

CHAIRMAN

[Signature]

WALTER E. JOHNSON
2. INTRODUCTION/GOALS AND OBJECTIVES
2. INTRODUCTION/GOALS AND OBJECTIVES

The most current existing comprehensive plan for Near Island was adopted by the Kodiak Island Borough in 1980. Ensuing years have seen the development of the small boat harbor in St. Herman Harbor (Dog Bay), the linking of Near Island and the City of Kodiak by bridge, siting for the proposed Fishery Industrial Technology Center (FITC), and suggested uses demonstrated the need for a comprehensive strategy to manage future development on Near Island.

The City of Kodiak, as property owner, recognized this need and created the Near Island Task Force in November, 1985. Appointed for two years, Task Force Members were given the charge of making recommendations to the City Council for planning for future development of Near Island. Expressed goals for the development to be considered by the Task Force included:

1. An economic return to the City of Kodiak.
2. Aesthetic concerns.
3. Consideration of the needs and concerns of community residents.
4. Physical constraints and environmental limitations.
5. Recognition of certain given land uses and their locations. These include retention of the north end of the island as a park, the FITC site, and potential boat harbors.

Since the initial meeting in January, 1986, the Task Force has met on a weekly basis. Past studies and plans were reviewed, input from governmental agencies, knowledgeable individuals, and special interest groups was solicited and four (4) public hearings were held. The result of these efforts is this report to the City Council.

The Report proposes a variety of land uses with the intent to allow for flexibility as more specific development proposals arise. The land use categories include commercial, industrial, residential, institutional, future reserve, greenbelts, and parks. It is proposed that this interim report, following review and input by the City Council, be returned to the Task Force for preparation of a draft that would then be reviewed at a final public hearing. The Task Force will then complete the report and submit it to the City Council for adoption.

Since the Task Force felt that previous studies have not accurately projected growth and resulting needs of the community, the Members spent little time forecasting future demand for Near Island facilities. The Task Force felt its categories for end
use mirror the needs presently identified in the community based on the goals and objectives of the Task Force and the public input given it.

Likewise, specific categories have not been included for a large portion of the island. This is intended to allow future decision makers flexibility in developing these portions of the island as the infrastructure and needs of the community grow.

As there is little possibility of access to Gull and Uski Islands at this time and there are existing grazing leases, the Task Force felt that these islands should be held as future reserve.
3. BACKGROUND AND TECHNICAL INFORMATION
During the last eleven months, the Near Island Task Force has reviewed a large amount of information pertaining to Near Island. A list of that information follows:

NEAR ISLAND DOCUMENTS

1964 - 1975  Boat Harbor - Near Island File
1968        Patent #6000 - Near Island - U.S. to City
1970        Tideland Application File #2034
1971 - 1980  Small Boat Harbor - Dog Bay Site File
1972 (?)     Engineering Study - Docks
1974        Annexation - Near Island - File #22
1974        Comprehensive Development Plan - Tryck Nyman & Hayes
1975        Feasibility Study - Corps of Engineers (Revised)
1976        Final Environmental Impact Statement - Proposed
             Kodiak Small Boat Harbor - Alaska Corps of
             Engineers
1979 - 1983  Near Island Development File
1979 - 1985  Near Island Bridge Development File
1980        Near Island Comprehensive Plan - Tryck Nyman & Hayes
1980        Port Development Strategy - PRC Harris
1980 - 1981  Proposals File - Dog Bay and Near Island Land Use
1981        Kodiak Near Island Crossing Study - Environmental
             Assessment
1982        Port of Kodiak Development and Near Island Master
             Plan - Williams-Kuebelbeck and Associates, Inc.
1982        Development Plan - Peratrovich and Nottingham
1982        Fishery Center (FITC) Agreement File
1982        Near Island Platting/Zoning File (1982 - Present)
1982        Quitclaim Deed #274 - Near Island Crossing - City
             To State
1983        Alaska Factbook Series - Kodiak
1984        Congress House Resolution 36-78, Breakwater Funding
1984        Corps of Engineers - Dog Bay Breakwater
1984        Deep Draft Navigation Study (2 volumes)
1984        Quitclaim Deed #278 - Uski, Gull, & Round Islands
             (Borough to City)
### 3.A Historical Documents and Studies Reviewed (Cont.)

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<th>Year</th>
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<tr>
<td>1985</td>
<td>P&amp;Z Commission Case S-85-010 - Subdivision of Portion of USS 4947, FITC Site (04-17-85)</td>
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<td>1985</td>
<td>Water Resources Development in Alaska (Port-Related)</td>
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<td>1986</td>
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<td>1986</td>
<td>Walking Tour with City Engineer</td>
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<td>DOT/PF Kodiak Ferry Terminal Environmental Assessment (Draft)</td>
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<td>Minutes of Regular Council Meetings and Public Hearings, Port Operation Advisory Board, and Worksession Notes</td>
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3.C Summary of Testimony from Four Public Hearings

The Near Island Task Force has reviewed oral and written testimony received at four public hearings. The hearings were held on May 12, 19, and 26, and June 2, 1986. The following tables summarize the issues raised and the number of persons and/or groups in favor and opposed. The comments reflect the individual ideas of those speaking and reactions to the development concepts presented by the Task Force.

<table>
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<tr>
<th>ISSUES</th>
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<td>6-Restrictions on use (i.e., height, etc.)</td>
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*Neutral Comments - 3
4. PRELIMINARY CONCLUSIONS AND FINDINGS
4. A Description of Development Categories and Allowable Land Uses

The Task Force has developed preliminary development categories for discrete areas or blocks on Near Island. A variety of permissible land uses and/or activities within each category have been identified and are outlined below:

Greenbelt Areas.

Greenbelt designations are areas where no structural development is permitted and natural vegetation and landforms are left undisturbed. These are essentially natural areas with human activities limited to passive recreation, picnics, and the like. Possible exceptions to leaving greenbelt areas undisturbed would be the trail system around Near Island.

Park Areas.

Park areas are similar to greenbelts with the possible exception of minor structural developments. Development would be limited to picnic facilities, restrooms, and recreational facilities such as a basketball hoop, volleyball net, horseshoes, etc.

Commercial Areas.

Areas designated for commercial development are intended to allow a broad range of retail and commercial activities. These activities could be oriented to the needs of the fishing fleet and the visitor industry. Specifically excluded from the commercial designations are all industrial land uses and residential development. Commercial and industrial activities carry the definitions of the existing Kodiak Island Borough Zoning Code. Commercial areas should be designed to accommodate adequate off-street parking, provide alleys at rear property lines, limit the visibility of structures from Kodiak through height restriction, and provide sidewalks for pedestrians. This classification would also include a boat ramp in the Marine Support area.

Borrow Strips.

Alternative areas for borrow or rock extraction pits are included for possible construction of a permanent breakwater. If these areas are utilized for borrow, redevelopment of the borrow strips would allow for commercial development. For the present time, these designations would allow for pioneer road access construction.
Float Plane Facility.

Areas identified as possible float plane facilities would include docking and tie-down areas, a shore-based haul out area for maintenance, and parking areas.

Future Reserve.

This designation in any category is intended to identify future reserve areas for development or preservation as the need arises. At present, no development other than the trail around the island would be allowed. Decisions on the appropriate use of reserve areas will be made in the future.

Fishery Industrial Technology Center.

The FITC designation relates to the land areas which are being deeded by the City to the State of Alaska for the Fishery Technology Information Center.

Industrial.

Industrial relates to those land uses as designated in the Kodiak Island Borough Code 17.24.

Institutional Support.

The main emphasis in planning the Institutional Support Area is to insure that the FITC be supported by related development. This may include, but is not limited to, a museum, a convention center, multi-family residential, student-related activity buildings, and a possible area for commercial development.

Residential.

Residential designations are included because the Task Force feels residential land use is appropriate for portions of Near Island.

Public input on residential land uses has been mixed. Specific designations as to low or high density (i.e., single-family homes and/or apartments and/or condominiums) are purposely omitted at this time.
4.B Assumptions and Descriptions of Block Designations

NEAR ISLAND RECREATIONAL TRAIL

Such a system should provide a Public Use easement no less than 20 feet wide circumnavigating the perimeter of Near Island as well as a trail bisecting the island through the designated observation point. The intended purpose of the easement is for a trail which would allow the community access to the major portions of Near Island. The trail is intended for hiking, biking, and jogging. All motorized vehicles would be prohibited.

To protect against possible conflicts with a specific development proposal for any area, an alternative easement shall be provided within reasonable proximity of the existing trail.
NORTH END PARK

North end Park Area is defined as the most northerly portion of the island including the lagoon and the adjacent islands created during periods of high tide, the southern boundaries of which are to be contiguous with the proposed Fishery Technology Industrial Center (FITC) site and the bridge access road.

It is proposed that this portion of the island be developed as a natural setting day park. Development should be minimal, including a trail system providing access throughout, picnic sites, and possible observation points. Exceptions to the minimal impact philosophy might include an "overburden" fill site and an FITC construction access road (for the purpose of future waterfront development.) The suggested overburden fill site should be confined to a bog area located in the central-most portion of the park with safeguards agreed upon giving due consideration to the delicate environmental conditions associated with a lagoon.

It is strongly suggested that guidelines controlling such fill activity be established, monitored, and enforced. Prior to any fill activity, firm commitment should be made toward restoring the fill site to a usable property compatible with a park setting.

To address the question of a long-term transient camp site, it is the recommendation of the Task Force that camping be prohibited in the park. Justification for this action is that such activity would certainly be overwhelming to both the park environment and to the resident population wanting to utilize the park.

Moreover, if the City did designate a camping area, Alaska Department of Environmental Conservation (ADEC) regulations would have to be met. The capital improvements necessary to provide toilets, showers, water, etc. would be a considerable cost to the taxpayers.
4.B Assumptions and Descriptions of Block Designations (Cont.)

INSTITUTIONAL SUPPORT AREA

(INCLUDING RESIDENTIAL SUPPORT)

This area is located between the State Highway and the Fishery Industrial Technology Center (FITC). It contains a narrow strip along the highway that extends down to the harbor and has potential for commercial use. The remainder of this area is well suited to construction of institutional and community building projects that are desirable in a University and cultural environment.

The western portion of this unit, that is past the fill area and above the harbor parking lot, is an excellent location to construct a small number of family residences. Access will require an additional roadway or an extension of the proposed FITC road.
4.B Assumptions and Descriptions of Block Designations (Cont.)

BLOCK I

1.) Public input dictates that we should maintain a green belt visible from town and parallel to Near Island to preserve the existing view and skyline. It was generally felt that Near Island was too steep and the channel was too narrow in this area to allow any channel side development.

2.) There should be a business commercial strip parallel to the Near Island access road created by excavating the existing topography to road level and at such a depth as to allow frontage parking, a minimum 60' building depth, and a 20' alleyway for services. The intent of this development is to provide rock borrow for the necessary road construction and commercial development on Near Island and thereby produce usable commercial building lots. This commercial zone should have a height restriction to preserve the existing skyline.

TYPICAL COMMERCIAL DEVELOPMENT SECTION BLOCK I

1/4:1 in rock

10' Service Alley | 60' Bldg. Depth | 20' Frontage Parking

3.) The south end of Block I (approximately five acres) shall be uniform high density development and shall be in two or three parcels. While there is no intent to preserve the skyline, the development should be pleasant to view from the City of Kodiak.
OBSERVATION POINT

The highest point on Near Island, which reaches an altitude of approximately 200 feet, is located at the mid-section of the island.

It is proposed that this observation point be reserved in perpetuity in a natural mini-park setting for access by the public.

The area shall be approximately three acres according to the topography and ease of access to this area.
PICNIC SPIT

Kodiak's waterfront area is not only important as a commercial zone, but as a recreation area and a unique attraction for visitors.

With this in mind, it is suggested for the short term plan that the small spit (approximately one acre located west of the parking area) be dedicated as a natural picnic area providing a pleasant and scenic view overlooking both St. Herman and St. Paul Harbors.

When access to Gull and Uski Islands is required, portions of this park will be required for future bridge abutments and road construction.
4.B Assumptions and Descriptions of Block Designations (Cont.)

MARINE SUPPORT AREA

It is suggested that a Marine Support Area should be established adjacent to the present parking area at the north end of St. Herman Harbor. The intent of this designation would be for the development of marine-related and/or waterfront dependent land use. Development in this area should give priority to those types of businesses and services that are most affected by or dependent on their proximity to the water and harbor.

This area could accommodate a variety of commercial marine-related uses such as hardware and tackle, electronic shops, fishing gear supply outlets (both commercial and sport), net hanging and repair facilities, etc. Businesses such as welding and engine repair and sales should be considered. Restaurants, grocery and supply stores, and other public sales and services could help to maximize visitor attraction to the waterfront, while providing a convenience area for the users of the harbor.

It is recommended that the shallow area at the head of St. Herman Harbor be filled as much as practical to create usable uplands. The adjacent parking area should be well lit to help Police and Harbor personnel keep close watch on the area.
ACCESS TO SOUTH END OF ST. HERMAN HARBOR

One of the primary development goals of Near Island is to obtain access to the south end of St. Herman Harbor to make this facility more usable to the commercial fishing fleet. This poses some unique development problems and benefits. Because of the steep terrain, the area also provides an excellent opportunity for development if a permanent breakwater is developed for St. Herman Harbor.

The Task Force recommends that this area be utilized for a portion, if not all, of the rock required for the breakwater. In doing this we produce usable business and commercial lots to support our fishing industry. The trade-off in this type of construction is that we will expose a much higher rock face, 60 - 80 feet high, to view from the City. A portion of this rock face will be covered by building construction and by bench type construction. The upper area can be landscaped to minimize the appearance of the rock face. Stripping and unusable waste shall be used to fill in the shallow water adjacent to the main float and thereby creating parking area. In the future, a bulkhead or seawall might be constructed to maximize utilization of the area.

As the development of the permanent breakwater construction may be in the distant future, the Task Force recommends that a preliminary access road of minimum standards and a ramp be constructed to provide access to the South end of St. Herman Harbor. This primary access would be used for the future construction of a permanent breakwater and the ramp should be designed to be re-usable.

It is recommended that a 160 - 200 foot wide strip be set aside as borrow and future commercial land at this time.
During the course of the Near Island Task Force's deliberations a number of ideas and suggestions were discussed which, while not falling in the assignment to produce a development plan, the Task Force felt should be included for future reference.

1. Consideration should be given to making topsoil removed by construction available to the public.

2. Consideration should be given to assuring adequate eagle roosting areas. A map of current roosting areas developed by the Kodiak Audubon Society is included.

3. Water quality should be maintained so that a future aquarium or marine park is not precluded.

4. As the harbor area is developed, consideration should be given to including rest rooms and areas for working on gear.
5. PRIORITIES FOR IMPROVEMENTS
The Near Island Task Force initially suggests the following priorities be considered in whatever order the City Council assigns.

Plan for disposal of property

Establishment of Development Authority

Completion of final engineering plan

Extending water and sewer to St. Herman Harbor and access to the floats

Construction of minimum standard access road and ramp to the extreme south end of the St. Herman Harbor floats

Extension to Fishery Industrial Technology Center access road with utilities

Development of north end park and recreation sites as funding is available

Preparation of hiking trail around the island (suggested trail flagged by Audubon Society)
6. APPENDIX A
BY-LAWS
CITY OF KODIAK
NEAR ISLAND TASK FORCE

ARTICLE I

Name

Section 1. Name. The official name shall be the "Near Island Task Force of the City of Kodiak".

ARTICLE II

Organization

Section 1. Members. This committee shall consist of eleven members appointed for two-year terms. All appointments end on November 26, 1987.

Section 2. Officers. A chairman, vice-chairman, and secretary shall be selected annually by and from the regular members.

Section 3. Duties of Chairman. The chairman shall preside over committee meetings. The chairman may call any special meetings.

Section 4. Duties of Vice-Chairman. The vice-chairman shall preside over meetings in the absence of the chairman.

Section 5. Duties of the Secretary. The secretary shall oversee the recording of the minutes of all regular and special meetings. Such minutes shall record the vote of each member upon every question and the original of such minutes shall, upon approval, be immediately filed in the office of the City Clerk. Every decision or finding of the committee shall be directed to the City Council at the earliest possible date.

Section 6. Meetings. Proceedings of the committee are open to the public and the minutes of the proceedings shall be a public record open to inspection by any person. The committee shall meet regularly at least once per month and on such other occasions as it deems necessary. The time, place, and conduct of the meetings shall be agreed upon by the committee members. All regular meetings will be publicized prior to the meeting date. Special meetings may be called by the chairman or a quorum of the committee.
Section 7. Attendance. Any committeemember not able to attend a particular meeting shall notify the City Clerk's office as far in advance as possible. Three consecutive absences without notification will require that the position be declared vacant. City staff members will be available, as required, for any meeting upon reasonable advance notice.

Section 8. Vacancies. The Mayor shall appoint a successor for the remainder of the unexpired term of any vacant position.

Section 9. Governing Rules. All meetings will be governed by Roberts Rules of Order. The Chairman shall be a voting member of the committee. Six members constitute a quorum for the conduct of business before the committee.

ARTICLE III

Functions

Section 1. Powers and Duties. The committee shall not have direct power to affect policy determinations, but shall discuss issues related to Near Island development planning and make recommendations to the City Council. The committee shall interpret community needs and desires, as indicated through public hearings and other forms of public input, and shall recommend general planning policies for the development of Near Island.

Section 2. Budget. The committee shall also make recommendations to the City Council for sources and uses of funding necessary for platting and other costs associated with the development of Near Island.

ARTICLE IV

Amendment of By-Laws

Section 1. Amendment. These by-laws may be amended by a majority vote of the committee. The originals of these by-laws and any such amendments shall be filed with the City Clerk.

ADOPTED this 20th day of January, 1986.
7. APPENDIX B
KODIAK ISLAND BOROUGH
ORDINANCE NO. 88-01-0

AN ORDINANCE OF THE KODIAK ISLAND BOROUGH ASSEMBLY REZONING NEAR ISLAND FROM THE EXISTING B--BUSINESS, I--INDUSTRIAL, AND C--CONSERVATION DISTRICTS TO B--BUSINESS, I--INDUSTRIAL, C--CONSERVATION, AND PL--PUBLIC USE LANDS AS SHOWN ON THE ATTACHED MAP.

WHEREAS, the intent of this rezoning ordinance is to implement the Near Island Comprehensive Development Plan by bringing the zoning of Near Island into conformance with the Plan; and

WHEREAS, the specific intent of the Near Island Task Force, the Near Island Development Authority, the City of Kodiak, and the Kodiak Island Borough Planning and Zoning Commission is to establish the boundary between the channel greenbelt and adjoining commercial designations as the crest of the hill; therefore:

The Kodiak Island Borough Assembly hereby ordains that:

Section 1: Near Island is rezoned from the existing B--Business, I--Industrial, and C--Conservation designations to B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands as shown on the attached map.

Section 2: Specific Zoning District boundaries will be established at the time a final plat(s) is filed, subject to the specific intent stated above, using the attached map as a guideline.

Section 3: The official zoning map shall be updated to reflect this rezoning.

Section 4: This ordinance shall be in full force and effect upon passage and adoption.


KODIAK ISLAND BOROUGH

BY [Signature]
Jerome Selby, Borough Mayor

BY [Signature]
Lorne White, Presiding Officer

ATTEST:

BY [Signature]
Gaye Vaughan, Borough Clerk

First Reading, Approval Date: 7 January 1988
Second Reading, Public Hearing, Approval Date: 4 February 1988
Effective Date: 4 February 1988

Distribution List:
Assessing Department
Community Development Department
Engineering Department

ORDINANCE 88-01-0
PAGE 1 OF 1
KODIAK ISLAND BOROUGH
ORDINANCE NO. 88-01-0

AN ORDINANCE OF THE KODIAK ISLAND BOROUGH ASSEMBLY REZONING NEAR ISLAND FROM THE EXISTING B--BUSINESS, I--INDUSTRIAL, AND C--CONSERVATION DISTRICTS TO B--BUSINESS, I--INDUSTRIAL, C--CONSERVATION, AND PL--PUBLIC USE LANDS AS SHOWN ON THE ATTACHED MAP.

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WHEREAS, the specific intent of the Near Island Task Force, the Near Island Development Authority, the City of Kodiak, and the Kodiak Island Borough Planning and Zoning Commission is to establish the boundary between the channel greenbelt and adjoining commercial designations as the crest of the hill; therefore:

The Kodiak Island Borough Assembly hereby ordains that:

Section 1: Near Island is rezoned from the existing B--Business, I--Industrial, and C--Conservation designations to B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands as shown on the attached map.

Section 2: Specific Zoning District boundaries will be established at the time a final plat(s) is filed, subject to the specific intent stated above, using the attached map as a guideline.

Section 3: The official zoning map shall be updated to reflect this rezoning.

Section 4: This ordinance shall be in full force and effect upon passage and adoption.


KODIAK ISLAND BOROUGH

BY
Jerome Selby, Borough Mayor

BY
Lorne White, Presiding Officer

ATTEST:
BY Gaye Vaughan, Borough Clerk

First Reading, Approval Date: 7 January 1988
Second Reading, Public Hearing, Approval Date: 4 February 1988
Effective Date: 4 February 1988

Distribution List: Assessing Department
Community Development Department
Engineering Department

ORDINANCE 88-01-0
PAGE 1 OF 1
CITIZEN'S COMMENTS

Mayor Selby presented the Employee of the Month award to Wayne Haarer of the Assessing Department.

Ron Berntsen, president of the Tribal Council of Old Harbor, requested that the assembly leave the science room in the new school construction plans. He said he was aware statistics indicated there were not enough students to warrant a larger school; however, he pointed out that HUD had made a survey and planned to construct fifteen new homes whose occupants would increase enrollment. Also, he added there was the prospect of several more bottom fish processors moving to Old Harbor which could increase enrollment. He thought by adding the classroom now money would be saved.

Darrell Berntsen, Old Harbor High School senior and student council president, requested the science room be left in the plans. He explained how four of his six classes are now meeting in the gym. He read one letter from an Old Harbor student and submitted several other letters from concerned students.

Phyllis Clough, teacher's aide in Old Harbor, noted the school was very short of adequate teaching areas.

COMMITTEE REPORTS

Ken Gregg reported on the first meeting of the Garbage Task Force and noted the committee's goals. A tour of the baler facility is scheduled for Tuesday, February 9, 1988, he added.

Ann Barker, representative to Hospital Board, stated the board was continuing to work towards a new hospital even though the funding picture for capital projects did not look good.

Alan Austerman, reported teacher negotiations had commenced and since the meetings are closed, he said he could not report again until the negotiations were concluded.

Tom Merriman, assembly representative for budget review, reported the committee had met twice and the meetings had been informative. The committee meets every Thursday at noon and he invited anyone who might be interested to sit in on the meetings.

PUBLIC HEARING

A. Ordinance No. 88-01-0 Rezoning Near Island From The Existing B--Business, I--Industrial, And C--Conservation Districts To B--Business, I--Industrial, C--Conservation, And PL--Public Use Lands.

Gregg, seconded by Stevens

The presiding officer called for public testimony.

Wally Johnson spoke in favor of Ordinance 88-01-0 and hoped the assembly would adopt it.

The presiding officer closed the public hearing and reconvened the assembly.

VOTE ON MOTION TO ADOPT

Ayes: Austerman, Barker, Gregg, McFarland, Merriman, Stevens, White

Noes: None

MOTION CARRIED Unanimous
C. ORDINANCES FOR INTRODUCTION


This item was previously approved in first reading under the "Consent Agenda."

2. Ordinance No. 88-02-0 Appropriating Proceeds Of Insurance Claim For Construction Of Port Lions Gymnasium.

This item was previously approved in first reading under the "Consent Agenda."

3. Ordinance No. 88-03-0 Determining The Disposition Of Tax Foreclosure Properties.

This item was previously approved in first reading under the "Consent Agenda."

D. OTHER ITEMS

None

INFORMATIONAL MATERIALS (No action required)

A. MINUTES OF OTHER MEETINGS


B. REPORTS

1. Staff Reports - Community Development, Facilities

CITIZENS' COMMENTS

None

ASSEMBLYMEN'S COMMENTS

Assemblyman Merriman noted for the record that he would be out of town until January 22nd.

Assemblyman Gregg complimented the mayor and the Finance Department and staff upon receiving an unqualified audit from the auditors.

Assemblyman White thanked the staff for the handling of the wood cutting project in the community. He said that he had heard a lot of favorable comments on the way it was handled. He announced the assembly would be making a trip to Port Lions and Larsen Bay on Wednesday, January 13th (weather permitting) and there will be an assembly work session on January 14, 1988 at 7:30 p.m. Also, the assembly would be traveling to King Salmon for the Southwest Alaska Municipal Conference on January 15-17, 1988. He added there would be an assembly/city council joint work session on January 19th at 7:30 p.m.
MEMORANDUM

TO: Kodiak Island Borough Assembly
THRU: Jerome Selby, Borough Mayor
FROM: Community Development Department
DATE: December 17, 1987
SUBJECT: Ordinance 88-01-0

RE: CASE 87-069. Request for the rezoning of Near Island from B--Business, I--Industrial, and C--Conservation to PL--Public Use Lands, B--Business, I--Industrial, and C--Conservation in accordance with Chapter 17.72 (Amendments and Changes) of the Borough Code. The proposed rezoning will bring the Zoning Districts on Near Island into conformance with the newly adopted Near Island Comprehensive Development Plan. (City of Kodiak)

MANNER OF INITIATION

This request for the rezoning of Near Island originates from the City of Kodiak as property owner.

PURPOSE

The proposed B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands Zoning Districts will bring the zoning of Near Island into conformance with the newly adopted Near Island Comprehensive Development Plan. Please see the attached staff report for additional information.

RECOMMENDATION

The Kodiak Island Borough Planning and Zoning Commission held a public hearing on the rezoning on December 16, 1987. Following the public hearing, the Commission moved to recommend that the Kodiak Island Borough Assembly rezone:

Near Island from the existing B--Business, I--Industrial, and C--Conservation designations to B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands as shown on the attached map. Specific zoning district boundaries will be established at the time a final plat(s) is filed and the specific boundary between the "channel greenbelt" designation (PL--Public Use Lands Zoning District) and the commercial designation (B--Business Zoning District) shall be established as the crest of the hill.

Section 17.72.020 of the Borough Code states that the Commission shall report in writing to the borough assembly on any proposed change or amendment regardless of the manner in which such change is initiated and such report shall find:

RE: ORDINANCE 88-01-0 1st Reading January 7, 1988
1. Findings as to the Need and Justification for a Change or Amendment.

A rezone of Near Island to B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands is needed because the existing zoning district boundaries do not coincide with the land use designations contained in the new Near Island Comprehensive Development Plan. A rezone to B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands is justified because the categories will be appropriate for the lands in question, will permit development or land uses that are envisioned in the comprehensive plan, consistent with the comprehensive plan designations, and compatible with land uses on surrounding properties.

2. Findings as to the Effect a Change or Amendment would have on the Objectives of the Comprehensive Plan.

A rezone to B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands will be consistent with the objectives of the newly adopted Near Island Comprehensive Development Plan because the plan specifically addresses the permissible land uses intended for each area of Near Island. The proposed B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands Zoning Districts permit development that is consistent with the comprehensive plan designations.
December 16, 1987

Samuel G. Gesko, Jr.
Manager, City of Kodiak
Box 1397
Kodiak, Alaska 99615

RE: CASE 87-069. Request for the rezoning of Near Island from B--Business, I--Industrial, and C--Conservation to PL--Public Use Lands, B--Business, I--Industrial, and C--Conservation in accordance with Chapter 17.72 (Amendments and Changes) of the Borough Code. The proposed rezoning will bring the Zoning Districts on Near Island into conformance with the newly adopted Near Island Comprehensive Development Plan. (City of Kodiak)

Dear Mr. Gesko:

The Kodiak Island Borough Planning and Zoning Commission at their meeting on December 16, 1987, moved to forward your request for the rezone cited above to the Borough Assembly and adopted the following findings of fact in support of their decision:

1. **Findings as to the Need and Justification for a Change or Amendment.**

   A rezone of Near Island to B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands is needed because the existing zoning district boundaries do not coincide with the land use designations contained in the new Near Island Comprehensive Development Plan. A rezone to B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands is justified because the categories will be appropriate for the lands in question, will permit development or land uses that are envisioned in the comprehensive plan, consistent with the comprehensive plan designations, and compatible with land uses on surrounding properties.

2. **Findings as to the Effect a Change or Amendment would have on the Objectives of the Comprehensive Plan.**

   A rezone to B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands will be consistent with the objectives of the newly adopted Near Island Comprehensive Development Plan because the plan specifically addresses the permissible land uses intended for each area of Near Island. The proposed B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands Zoning Districts permit development that is consistent with the comprehensive plan designations.
This item will appear for first reading at the Assembly's January 7, 1988 regular meeting and if approved will appear for second reading and a public hearing at the Assembly's February 4, 1987 regular meeting.

If you have any questions about the action of the Commission, please contact me.

Sincerely,

Robert H. Pederson, AICP, Associate Planner
Community Development Department
DAVE MENKE, on his own behalf, appeared before the Commission and stated that he was neither for or against this request but that fishermen from Old Harbor fish salmon around Sitkink and perhaps ought to be notified of the public hearing.

BOB PEDERSON noted that full time, onsite caretakers for the grazing leaseholder reside on Sitkink, and that a U.S. Coast Guard keeps a fuel dump there for emergency uses.

Public Hearing Closed.
Regular Session Opened.

COMMISSIONER KNUDSEN requested that public hearing notices be send to all Old Harbor fishermen.

COMMISSIONER HENDEL requested information on the impacts on nesting wildlife being near human populations. BOB PEDERSON stated he would contact Roger Smith at ADF&G for further information.

COMMISSIONER HEINRICHS noted that this request was the equivalent of 30 dump truck loads per day and questioned whether this was an appropriate amount for Sitkink Island each and every day or if the request should be reduced.

COMMISSIONER KNUDSEN requested updated information on stream classification (i.e., anadromous).

COMMISSIONER HENDEL MOVED TO TABLE Case 87-068 for a second public hearing at the January 20, 1988 regular meeting. The motion was seconded and CARRIED by unanimous roll call vote.

H) CASE 87-069. Request for the rezoning of Near Island from B--Business, I--Industrial, and C--Conservation to PL--Public Use Lands, B--Business, I--Industrial, and C--Conservation in accordance with Chapter 17.72 (Amendments and Changes) of the Borough Code. The proposed rezoning will bring the Zoning Districts on Near Island into conformance with the newly adopted Near Island Comprehensive Development Plan. (City of Kodiak)

BOB PEDERSON indicated 7 public hearing notices were mailed for this case and none were returned. Staff noted that the purpose of this rezoning request was to bring the zoning of Near Island into conformance with the newly adopted Near Island Comprehensive Development Plan. The Near Island Comprehensive Plan was adopted by the Kodiak Island Borough Assembly on November 5, 1987. The existing zoning districts on Near Island (adopted in 1980) do not match the new comprehensive plan designations.

BOB PEDERSON also noted that the proposed B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands Zoning Districts for Near Island closely follow and are in conformance with the new Near Island Comprehensive Development Plan. Zoning regulations are one means of implementing a comprehensive plan. Because the Near Island Comprehensive Development Plan designations are intended to be flexible and refined through the platting and land disposal processes, it is proposed to establish the effective date of the new zoning districts as the date(s) final plats for each comprehensive plan designation are on Near Island are filed.

Staff found that this rezone request meets all the required findings and therefore recommends that the Commission forward this rezone request to the Borough Assembly recommending approval.

Regular Session Closed.
Public Hearing Opened:

DAVE MENKE, on his own behalf, appeared before the Commission and stated that he had presented testimony to the Near Island Task Force regarding the Near Island Comprehensive Development Plan. Mr. Menke also noted that he resides directly across the channel from Near Island. Mr. Menke object to the fact that the presentation map depicted Business Zoning going directly through
the crest of the hill and noted it was the intent of the Task Force that businesses established in this area ought not be seen from across the channel. Mr. Menke stated that he wanted a wider greenbelt.

A discussion ensued amongst the Commissioners, Mr. Menke, and Community Development Department staff regarding the boundaries of the zoning districts proposed for Near Island and the intent of the recent comprehensive plan developed for Near Island.

WALLY JOHNSON, Vice Chairman of the Near Island Development Authority and Chairman of the former Near Island Task Force, appeared before the Commission and stated it was the intent of the Near Island Task Force that the boundary line being discussed by Mr. Menke was to be the crest at its highest single point and that the presentation map was in error.

A discussion ensued amongst the Commissioners, Mr. Johnson, and Community Development Department staff regarding the boundary line. It was noted that the motion before the Commission stated that the specific zoning boundaries would be determined at the time of platting. Mr. Johnson noted that it was the specific intent of the Near Island Task Force to keep the channel green.

WAYNE HAERER, a member of both the Near Island Task Force and the Near Island Development Authority, appeared before the Commission and expressed support for keeping the channel green.

A discussion ensued amongst the Commissioners, Mr. Haerer, and Community Development Department staff regarding the Development Authority's authority in regards to platting and enforcement of the Near Island Comprehensive Development Plan.

MIKE BRECHAN, a member of the Near Island Development Authority, appeared before the Commission and reconfirmed the testimony given regarding the channel greenbelt.

A discussion ensued amongst the Commissioners and Mr. Brechan about the presentation map. Mr. Brechan stated that he had not seen this particular presentation map before.

SCOTT ARNDT appeared before the Commission and expressed support for redrawing the presentation map before submitting this request to the Assembly.

A discussion ensued amongst the Commissioners, Mr. Arndt, and Community Development Department staff regarding the presentation map.

Public Hearing Closed.
Regular Session Opened.

A discussion ensued amongst the Commissioners and Community Development Department staff regarding the wording of a motion which would incorporate the concerns of those testifying at the public hearing.

COMMISSIONER KNUDSEN MOVE[d] TO recommend that the Kodiak Island Borough Assembly approve the rezoning of Near Island from the existing B—Business, I—Industrial, and C—Conservation designations to B—Business, I—Industrial, C—Conservation, and PL—Public Use Lands as shown on the attached map. Specific zoning district boundaries will be established at the time a final plat(s) is filed and the specific boundary between the "channel greenbelt" designation (PL—Public Use Lands Zoning District) and the commercial designation (B—Business Zoning District) shall be established as the crest of the hill in accordance with Chapter 17.72 of the Borough Code and to adopt the findings contained in the staff report dated December 8, 1987, as "Findings of Fact" for this case. The motion was seconded.
A discussion ensued amongst the Commissioners and Community Development Department staff regarding the presentation map. Community Development Department staff were directed to revise the presentation map as discussed during the public hearing prior to submission to the Assembly. Linda Freed stated that the map would be revised based on the motion. The discussion continued with a clarification of the reasons that particular zoning districts were established for specific areas on Near Island.

The question was called and the motion CARRIED by majority roll call vote. Commissioner Smedley voted "no."

FINDINGS OF FACT

1. Findings as to the Need and Justification for a Change or Amendment.

A rezone of Near Island to B—Business, I—Industrial, C—Conservation, and PL—Public Use Lands is needed because the existing zoning district boundaries do not coincide with the land use designations contained in the new Near Island Comprehensive Development Plan. A rezone to B—Business, I—Industrial, C—Conservation, and PL—Public Use Lands is justified because the categories will be appropriate for the lands in question, will permit development or land uses that are envisioned in the comprehensive plan, consistent with the comprehensive plan designations, and compatible with land uses on surrounding properties.

2. Findings as to the Effect a Change or Amendment would have on the Objectives of the Comprehensive Plan.

A rezone to B—Business, I—Industrial, C—Conservation, and PL—Public Use Lands will be consistent with the objectives of the newly adopted Near Island Comprehensive Development Plan because the plan specifically addresses the permissible land uses intended for each area of Near Island. The proposed B—Business, I—Industrial, C—Conservation, and PL—Public Use Lands Zoning Districts permit development that is consistent with the comprehensive plan designations.

I) CASE 87-070. Request for a conditional use permit in accordance with Section 17.13.030 (Conditional Uses) of the Borough Code to bring an existing communication facility located in a C—Conservation Zoning District into conformance with Borough Code and to allow for its future expansion. The existing facility consists of a 160 square foot equipment building and three (3) satellite dish antennas on a 3,298 square foot area leased from the City of Kodiak. The facility is located on a Portion of Tract B, U.S. Survey 2538-A on the Pillar Mountain Road approximately 700 feet west of the end of Maple Street. (Kodiak Cablevision/City of Kodiak)

BOB PEDERSON indicated 3 public hearing notices were mailed for this case and none were returned. Staff recommended approval of this request subject to one condition of approval.

Regular Session Closed.
Public Hearing Opened:

Seeing and hearing none.

Public Hearing Closed.
Regular Session Opened.

COMMISSIONER HENDEL MOVED TO GRANT a request for a conditional use permit in accordance with Section 17.13.030 of the Borough Code to permit a communication facility consisting of a 160 square foot structure and three (3) satellite dish antennas to locate in the C—Conservation Zoning District within a Portion of U.S. Survey 2538-A, subject to the condition of approval outlined in the staff report dated December 7, 1987, and to adopt the findings contained
MEMORANDUM

DATE: December 8, 1987
TO: Planning and Zoning Commission
FROM: Community Development Department
SUBJECT: Information for the December 16, 1987 Regular Meeting

RE: CASE 87-069. Request for the rezoning of Near Island from B--Business, I--Industrial, and C--Conservation to PL--Public Use Lands, B--Business, I--Industrial, and C--Conservation in accordance with Chapter 17.72 (Amendments and Changes) of the Borough Code. The proposed rezoning will bring the Zoning Districts on Near Island into conformance with the newly adopted Near Island Comprehensive Development Plan. (City of Kodiak)

Seven (7) public hearing notices were distributed on December 2, 1987.

PURPOSE:

The purpose of this rezoning request is to bring the zoning of Near Island into conformance with the newly adopted Near Island Comprehensive Development Plan. The Near Island Comprehensive Plan was adopted by the Kodiak Island Borough Assembly on November 5, 1987. The existing zoning districts on Near Island (adopted in 1980) do not match the new comprehensive plan designations.

PROPOSED ZONING DISTRICTS:

Four zoning categories - Business, Industrial, Public Use Lands, and Conservation - are proposed for Near Island. These areas are shown on the attached map and are briefly described below:

1. PL--Public Use Lands. Areas proposed for PL--Public Use Lands zoning are the north end park, south end park, picnic spit, channel greenbelt, observation point, FITC tracts, and the institutional support area. The PL--Public Use Lands Zoning Districts were selected for the parks, greenbelt, picnic spit, and observation point because all parks and recreational facilities in Kodiak are zoned PL--Public Use Lands and "parks, playgrounds, playfields, and open space" are specifically listed as permitted uses in the PL--Public Use Lands Zoning District. The PL--Public Use Lands Zoning District was chosen for the FITC and institutional support areas because "community buildings and halls, museums, and schools" are listed as permitted uses. In addition, the uses envisioned in the comprehensive plan for areas to be zoned PL--Public Use Lands are consistent with the description and intent of the PL--Public Use Lands Zoning District which states in part, "The public lands district is established as a land use district for publicly owned land containing recreational, educational and institutional uses" and "To identify lands owned by governments that are used for public purposes..."

2. B--Business. Areas proposed for B--Business zoning are the commercial strip along the road to St. Herman's Harbor and the area between the harbor parking
lot and the institutional support area. The comprehensive plan identifies these areas for commercial and/or high density (apartments or condominiums) residential development.

3. **I--Industrial.** The area proposed for I--Industrial zoning is the strip along the harbor from the parking lot to the south end park. This parcel is designated for commercial/industrial and borrow strip for breakwater in the comprehensive plan. The I--Industrial Zoning District was selected because all permitted business land uses are permitted in the I--Industrial Zoning District and many of the businesses typically found nearby a boat harbor (e.g., machine shop, warehousing, boat building, repair, and storage, outdoor storage, metal working, welding shops, etc.) are defined as industrial land uses in Title 17.

4. **C--Conservation.** The area proposed for C--Conservation zoning is designated as future reserve in the comprehensive plan. No specific land uses are mentioned for this area as it is unlikely to be developed in the foreseeable future. This is consistent with one specific intention of the C--Conservation Zoning District which is "to encourage the continued use of land for open space areas."

**DISTRICT BOUNDARIES:**

Similar to other comprehensive plans, the land use designations contained in the Near Island plan are broad and general in description and intended to be flexible as more specific development proposals arise. Likewise, the designated limits of each land use category are not cast in stone. However, it should also be recognized that zoning district classifications must be tied to specific, legally described boundaries, which can only be changed by ordinance. In other words, zoning boundaries cannot be flexible.

Commonly, zoning district boundaries follow platted property lines, geographic features, or aliquot parts of the township and range system. To date, only the FITC tracts (Tracts A and B, U.S. Survey 4947) have been platted on Near Island. Other areas will be platted as the City of Kodiak prepares to sell property on Near Island. One method of providing some small degree of flexibility in zoning district boundaries is to establish the effective date of the ordinance rezoning Near Island as the date the final plats for subdivisions of Near Island are filed. This allows for the specific dimensions of the zoning district to coincide with the specific dimensions established by plat.

**SUMMARY:**

The proposed B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands Zoning Districts for Near Island closely follow and are in conformance with the new Near Island Comprehensive Development Plan. Zoning regulations are one means of implementing a comprehensive plan. Because the Near Island Comprehensive Development Plan designations are intended to be flexible and refined through the platting and land disposal processes, it is proposed to establish the effective date of the new zoning districts as the date(s) final plats for each comprehensive plan designation are on Near Island are filed.
FINDINGS

Section 17.72.020 states that the Commission shall incorporate the following criteria into their report to the Assembly:

1. **Findings as to the Need and Justification for a Change or Amendment.**

   A rezone of Near Island to B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands is needed because the existing zoning district boundaries do not coincide with the land use designations contained in the new Near Island Comprehensive Development Plan. A rezone to B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands is justified because the categories will be appropriate for the lands in question, will permit development or land uses that are envisioned in the comprehensive plan, consistent with the comprehensive plan designations, and compatible with land uses on surrounding properties.

2. **Findings as to the Effect a Change or Amendment would have on the Objectives of the Comprehensive Plan.**

   A rezone to B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands will be consistent with the objectives of the newly adopted Near Island Comprehensive Development Plan because the plan specifically addresses the permissible land uses intended for each area of Near Island. The proposed B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands Zoning Districts permit development that is consistent with the comprehensive plan designations.

**RECOMMENDATION:**

Staff finds that this rezone request meets all the required findings and therefore recommends that the Commission forward this rezone request to the Borough Assembly recommending approval.

**APPROPRIATE MOTION:**

Should the Commission agree with the staff recommendation, the appropriate motion is:

Move to recommend that the Kodiak Island Borough Assembly approve the rezoning of Near Island from the existing B--Business, I--Industrial, and C--Conservation designations to B--Business, I--Industrial, C--Conservation, and PL--Public Use Lands as shown on the attached map in accordance with Chapter 17.72 of the Borough Code and to adopt the findings contained in the staff report dated December 8, 1987, as "Findings of Fact" for this case. Specific zoning district boundaries will be established at the time a final plat(s) is filed.
MINUTES OF THE REGULAR DECEMBER 10 COUNCIL MEETING
OF THE CITY OF KODIAK
RESCHEDULED AND HELD DECEMBER 14, 1987

I. MEETING CALLED TO ORDER

Mayor Brodie called the meeting to order at 7:43 p.m. Councilmembers Blackburn, Cratty, Iani, and Ramaglia were present and constituted a quorum. Councilmembers Perrozzi and Thompson were absent.

II. PREVIOUS MINUTES

Councilmember Ramaglia MOVED, seconded by Councilmember Cratty, to approve the minutes of the rescheduled regular meeting of November 17, 1987.

The roll call vote was Councilmembers Blackburn, Cratty, Iani, and Ramaglia in favor and Councilmembers Perrozzi and Thompson absent. The motion carried.

III. PERSONS TO BE HEARD

a. Planning and Zoning Commission

Commissioner Hendel said the Planning and Zoning Commission would be considering the proposed rezoning for Near Island at its December 16 meeting. In response to a question from Mayor Brodie, Mr. Hendel said the actual delineation of the various zones would be set by the subsequent subdivision of the land. Mr. Hendel thanked the Council for its part in his appointment to the Single Unit of Local Government Committee and the support for his reappointment as a "City" representative on the Planning and Zoning Commission.

b. Public Comments

None.

IV. OLD BUSINESS

a. Public Hearing (Cont.), Ordinance Number 809 RE: Annexing Contiguous Property into the City and Setting an Effective Date

Manager Gesko said this ordinance was presented, following the Council’s October 9, 1986, unanimous direction and approved in the first reading at the October 23, 1986, Council meeting. At that meeting, the ordinance was amended to reflect annexation of only that territory lying northerly of the present City limits out to and including the VFW property. Also at the October 23 meeting, the second reading and public hearing was postponed to the December 2 meeting to allow the Council an opportunity to meet with the affected service districts. The Council had several work sessions with the Service Districts and public hearings were held December 4, 1986, February 17, March 26, July 23, and September 24, 1987. Ordinance Number 809 and the public hearing was continued to this meeting. The required submittals to the Local Boundary Commission were prepared in draft form.

Mayor Brodie said the Council intended to fail Ordinance Number 809 in the interest of facilitating the work before the Single Unit of Local Government Committee.

Councilmember Ramaglia MOVED, seconded by Councilmember Cratty, to remove Ordinance Number 809 from the table.

The roll call vote was Councilmembers Blackburn, Cratty, Iani, and Ramaglia in favor with Councilmembers Perrozzi and Thompson absent. The motion passed. The motion on the floor was now "Move to approve Ordinance Number 809 in the second reading."

Mayor Brodie closed the regular meeting, opened and closed the continued public hearing when no one came forward to testify, and reopened the regular meeting.

Councilmember Ramaglia said his motion had begun the annexation process in 1986 and he felt the ordinance had sparked interest in the local government process which eventually led to the formation of the Single Unit of Local Government Committee. He thought the ordinance had served a positive purpose. Depending on the recommendations of the committee another annexation, possibly of the entire road system, could be initiated. He urged the Council to defeat Ordinance Number 809 to uncumber the committee during its deliberations.

Councilmember Cratty agreed with Councilmember Ramaglia and felt the committee should start with a clean slate.

The roll call vote was Councilmembers Blackburn, Cratty, Iani, and Ramaglia opposed, Councilmembers Perrozzi and Thompson absent, and the motion failed.

b. Resolution 51-87 RE: Supporting the Alaska Craftsman Home Program

Mr. Gesko said this resolution was presented at the request of Public Works Director Reukers. Resolution Number 51-87 encouraged the building of homes to the energy efficient standards of the Alaska Craftsman Home Program and further
stated the City of Kodiak supported Alaska State Senate Bill 308 and House Bills 318 and 319 to establish similar state policy and state support for the Alaska Craftsmen Home Program. Resolution Number 51-87 was tabled at the November 17 meeting to research the source of funding for the program. City Building Inspector Sullivan met with the Council at its December 8 worksession to outline the proposed source of funding.

Councilmember Blackburn MOVED, seconded by Councilmember Cratty, to remove Resolution Number 51-87 from the table.

The roll call vote was Councilmembers Blackburn, Cratty, Iani, and Ramaglia in favor and Councilmembers Perrozzi and Thompson absent. The motion passed. The motion now on the floor was "Move to pass and approve Resolution Number 51-87."

Councilmember Blackburn said her concerns the $7,000,000 cost of the program could endanger area funding for vital local projects had been alleviated and she withdrew her objections.

The roll call vote was Councilmembers Blackburn, Cratty, Iani, and Ramaglia in favor, Councilmembers Perrozzi and Thompson absent, and the motion carried.

V. NEW BUSINESS

a. Resolution Number 53-87 RE: Supporting Requested Change to Alaska Statute 44.62.220 Regarding Elk Hunting

Mayor Brodie read Resolution Number 53-87 by title. City Manager Gesko said the people of Port Lions had requested the City's support for proposed amendments to the Alaska Statutes regarding elk hunting. They wished to be allowed to harvest four elk per year for the elders of Port Lions.

Councilmember Ramaglia MOVED, seconded by Councilmember Iani, to pass and approve Resolution Number 53-87.

Councilmember Ramaglia clarified that the total number of elk to be harvested for the use of the elders was four per year.

The roll call vote was Councilmembers Blackburn, Cratty, Iani, and Ramaglia in favor, Councilmembers Perrozzi and Thompson absent, and the motion carried.

b. Resolution Number 54-87 RE: Establishing a Nine-Member Port and Harbors Advisory Board

The Mayor read Resolution Number 54-87 by title. Mr. Gesko said this resolution was presented at the Council's request to add two alternate positions to the Port Operations Advisory Board and to give direction to the members of the board. Resolution Number 54-87 rescinded Resolution Number 49-81 that originally formed the board to advise the Council on port related matters and established a nine-member Port and Harbors Advisory Board. Boardmembers whose terms had not expired were to be appointed to serve on the newly established board.

Councilmember Iani MOVED, seconded by Councilmember Cratty, to pass and approve Resolution Number 54-87.

The roll call vote was Councilmembers Blackburn, Cratty, Iani, and Ramaglia in favor and Councilmembers Perrozzi and Thompson absent. The motion passed.

Mayor Brodie appointed Kap Heiberg and Doug Hoedel to terms expiring December 31, 1988, and Andrè Nault and Mickey Serwold to terms expiring December 31, 1989.

Councilmember Iani MOVED, seconded by Councilmember Cratty, to confirm the Mayoral appointments to the Port and Harbors Advisory Board.

The roll call vote was Councilmembers Blackburn, Cratty, Iani, and Ramaglia in favor, Councilmembers Perrozzi and Thompson absent, and the motion carried.

c. Resolution Number 55-87 RE: Creating a Department of Christmas

Mayor Brodie read Resolution Number 55-87 by title. City Manager Gesko said this resolution was presented in the spirit of the season and carried the best wishes of the Mayor, Council, and City staff to all residents of the community, which were Merry Christmas and a Happy and Prosperous New Year.

Councilmember Cratty MOVED, seconded by Councilmember Iani, to pass and approve Resolution Number 55-87.

The roll call vote was Councilmembers Blackburn, Cratty, Iani, and Ramaglia in favor and Councilmembers Perrozzi and Thompson absent. The motion passed.

d. Membership Appointments RE: Various Advisory Boards

Mr. Gesko said a number of terms on City Advisory Boards would expire December 31, 1987. The openings were advertised and interviews with volunteers and incumbents wishing to continue serving were held December 1.

Mayor Brodie announced the following appointments:
NEAR ISLAND DEVELOPMENT AUTHORITY

MINUTES OF NOVEMBER 18, 1987, MEETING

Boardmembers Jim Bruskotter, Wayne Haerer, Wally Johnson, and Kehli McIntyre were present. Boardmember John Puqh arrived late. Boardmembers Mike Brechan and Dave Woodruff were excused and Boardmember John French was absent.
Staff Present: Secretary Recorder Jeri Jensen

Guest: Bob Pederson, Associate Planner, Community Development Department, Kodiak Island Borough

The meeting was called to order by Vice-Chairman Wally Johnson at 7:09 p.m.

Boardmember Haerer MOVED, seconded by Boardmember Bruskotter, to approve the November 4, 1987 minutes as presented. The roll call vote was unanimously favorable and the motion carried.

Bob Pederson addressed the need for zoning recommendations to be forwarded for the Planning and Zoning agenda, with the deadline to be Friday, November 20th. He clarified that, under State law, land that was not platted could not be sold.

Boardmember Johnson related the sentiment of the public during the development of the Near Island Task Force Comprehensive Plan regarding the desire that development not be visible over the area designated as Greenbelt.

Boardmember John Puqh arrived at 7:15 p.m.

Boardmember Haerer spoke of his disappointment that after all the meetings with the individual groups, and the Audubon Society in particular, that at the last minute Richard MacIntosh, "representing" the Audubon Society, spoke against the Near Island Task Force Plan. The entire plan was the result of meetings and compromise.

Boardmember Haerer MOVED, seconded by Boardmember Puqh that the Near Island Development Authority recommend the North End Park site, two Fishery Industrial Technology Center tracts, south-end park site, greenbelt, observation point, and institutional support site be zoned as Public Use Lands contingent upon actual surveying of sites and tracts, as per approximate lines illustrated and defined by the Near Island Development Task Force Plan map.

Boardmember Puqh stated during further discussion that he would like to send a strong message that these particular areas were
"sacred" and should be preserved as the original Near Island Development Task Force members intended.

Boardmember Pugh MOVED, seconded by Member Haerer, that the motion be amended to recommend that the North End Park site, south-end park site, and greenbelt be zoned Conservation. Discussion of the interpretations of usage under the Conservation zoning ensued. The roll call vote was unanimously opposed and the motion failed.

The roll call vote on the original motion was unanimously favorable and the motion carried.

Boardmember Haerer MOVED, seconded by Boardmember Bruskotter, to recommend that the property north of the unnamed highway to St. Herman Harbor, abutting the greenbelt, be designated as Commercial. Boardmember Johnson was bothered by the apparent "plat lines" drawn into the area designated Commercial that was presently under discussion, and would like them to be removed. Boardmember Pugh assured him that these were in no way official and the area could be discussed as if they were not there. Boardmember Johnson continued with his interpretation from having served on the original Task Force, that the greenbelt was to follow the highest natural elevation. Any development on the commercial property would be below that grade and not be visible from across the channel. General discussion followed on height restrictions, alley access, access to dumpsters - all without restricting future commercial development. The question of the proposed foot trail through the commercial property was brought up and would be addressed later, though it was the general consensus that this trail would be deleted when the property was developed.

The roll call vote on the motion was unanimously favorable and the motion carried.

Boardmember Haerer MOVED, seconded by Boardmember Pugh, to recommend that the area currently designated as borrow strip for Breakwater/Commercial/Industrial (abutting area designated as Commercial/Residential) be zoned Industrial. The roll call vote was unanimously favorable and the motion carried.

Boardmember Bruskotter spoke to the future or desired needs for single family residential lots on Near Island. Member Haerer expressed support for multifamily housing development. Boardmember Pugh stressed need for commercial/industrial land availability for a strong economic base and tax base for services.

Boardmember Pugh MOVED, seconded by Member Bruskotter, to recommend the area designated as Commercial/Residential be zoned
Business. The roll call vote was unanimously favorable and the motion carried.

Boardmember Pugh assumed the chair and the agenda was set for the next meeting.

1. Approval of minutes
2. Final adoption of zoning recommendations
3. Development of work task time frames
4. Division into subcommittees for discussion
5. Discussion of absence from meetings
6. Request for staff to prepare overlay of current downtown for use in comparing proposed development plans
7. Potential land valuation

The meeting schedule was set as follows:

December 2 7:00 p.m., Near Island Development Authority regular meeting

December 8 7:30 p.m., Forward recommendation to City Work-session - all members encouraged to attend.

December 16 7:00 p.m., Near Island Development Authority regular meeting

January 6 7:00 p.m., Near Island Development Authority regular meeting

Boardmember Bruskotter would be out of town for the December 2nd meeting. Bob Pederson would be invited to the December 2nd meeting.

The meetings were open to the public and notices would be placed in the community calendar and/or press release.

At this time Bob Pederson returned to the meeting and briefly addressed planning for future reserve. Public Use Lands permitted a higher intensity of use than did Conservation, which had the intent for "open lands."

Boardmember Bruskotter MOVED, seconded by Member Haerer, to recommend that the future reserve lands be zoned Conservation. The roll call vote was unanimously favorable and the motion passed.

Bob volunteered to "color pen" a map with the recommended zoning designations and bring it to the next meeting for final review.
The meeting adjourned at 9:11 p.m.


CHAIRMAN


ATTEST:


SECRETARY RECORDER
NEAR ISLAND DEVELOPMENT AUTHORITY
MINUTES OF THE NOVEMBER 4, 1987 MEETING

Board members present: John Pugh, Jim Bruskotter, Wally Johnson, John French, and student representative Kehli McIntyre. Wayne Haerer arrived at 7:10 p.m. Boardmembers Mike Brechan and Dave Woodruff were excused and it was noted that the Clerk's office had been notified.
Staff present: Jeri Jensen

Guest: Bob Pederson, Acting Director and Associate Planner, Community Development Department, Kodiak Island Borough

Chairman John Pugh called the meeting to order at 7:04 p.m. The meeting was held in the City Conference Room.

Kehli McIntyre, Kodiak High School student representative, who was appointed to the Near Island Development Authority by the City Council at its November 3, 1987 meeting, was introduced.

Boardmember Bruskotter MOVED, seconded by Boardmember Johnson, to approve the October 21, 1987 minutes as presented. The roll call vote was unanimously favorable and the motion carried.

Wayne Haerer arrived.

Bob Pederson was given time to make a request of the Board. He briefly reviewed the procedure that the Near Island Task Force Plan had gone through, with final adoption by the Borough expected at its November 5 meeting. After adoption of this comprehensive plan would come the Zoning designations for future development. He initially recommended that areas on the Near Island Task Force Plan map be Zoned as:

1. Greenbelts, parks, observation point, and spit be designated as Public Use;
2. Commercial areas be designated as Business;
3. Commercial/Industrial areas along the harbor should be designated Industrial;
4. Future Reserve should be Public Use Lands or Conservation; and
5. FITC/Institutional Support should be Public Use Lands which would not be in conflict with FITC development or proposed KANA museum.

Bob foresaw that the Development Authority would need to decide in the near future what the block designated on the plan as Commercial/Residential was to be zoned and that a recommendation be forwarded to the appropriate hierarchy soon.
At the next meeting, November 18, the Board would designate the recommended zoning for the commercial/residential area. Bob was invited to attend that meeting to answer questions the Board might have. Due to another meeting, he would only be available for the first 30 minutes.

Each Boardmember presented his or her personal insights as to the development of Near Island and the task ahead.

Pugh: Desired to turn over land into private hands in a smooth and rapid manner, but with some checks and balances to prevent speculation and holding of the land. His preference was to not plat lots but recommend that platting be done at time of need. He was totally opposed to residential development on Near Island. Additional comments included the philosophy that monies from the sale/lease of Near Island lands should be used for Near Island development, not put into the general fund. He clarified his position on residential development by saying he would be in favor of multifamily-high density units.

Bruskotter: Agreeable to rapid disposal but did not see need for more commercial property. He would personally support development of prime residential areas with prompt development. He might desire to get into the actual platting of lots. In additional comments, he would like to see all Board members at meetings or be replaced if they could not participate.

Haerer: His comment for the oversight functions of the Development Authority was that it possibly take the form of a non-profit development corporation similar to Hilton Head or North Shore Development Corporation. He was aware that past public hearings addressed the desire that any development be aesthetically pleasing and would like to assure quality and aesthetics through development of covenants. This group should play watch-dog over Near Island development. He stated that the Development Authority should create marketing strategies and make zoning recommendations. He would favor multifamily residential construction, such as condos or apartments. In additional comments, he stated the need for Kodiak to develop commercially and stay competitive with Dutch Harbor and Sand Point. Marketing strategy would be important in this competitiveness.

French: He would like to see the Near Island waterfront developed to its best utilization with development of commercial/industrial areas first and building Kodiak as a competitive port for vessel support industry. Multifamily residential might be compatible near harbor, though his first reaction was against residential use on Near Island. He felt the Authority needed to act in a timely manner and should have oversight of enforcements of covenants created.
Johnson: Near Island should be considered as part of the entire city development plan. The breakwater would enhance the entire port/harbor. Development of Near Island would expand the tax base for City services. He was in agreement with non-speculative covenants as speculation would retard growth, did not see platting of lots in the immediate future, did not believe single family residences would be in the best interest of future commercial/industrial development, and approved of multifamily residences. In an additional statement, he noted that Kodiak had an advantage over other coastal communities because of its family oriented services: schools, parks, etc.

McIntyre: She chose to be appointed to this Board because she was interested in seeing something done with Near Island. She would hold future comment until she had an opportunity to read the available materials. She would, however, initially support residential development with family settings and aesthetics.

Next meeting agenda to be:
1. Approval of minutes
2. Adoption of zoning recommendations
3. Development of work task time frames
4. Division into subcommittees for discussion

Boardmember Johnson MOVED, seconded by Bruskotter, to adjourn. The motion passed.

The meeting adjourned at 8:15 p.m.

_____________________________
CHAIRMAN

ATTEST:

_____________________________
SECRETARY
PUBLIC HEARING NOTICE

A public hearing will be held on Wednesday, December 16, 1987. The meeting will begin at 7:30 p.m. in the Borough Assembly Chambers, 710 Mill Bay Road, Kodiak, Alaska, before the Kodiak Island Borough Planning and Zoning Commission, to hear comments, if any, on the following request:

CASE 87-069. Request for the rezoning of Near Island from B--Business, I--Industrial, and C--Conservation to PL--Public Use Lands, B--Business, I--Industrial, and C--Conservation in accordance with Chapter 17.72 (Amendments and Changes) of the Borough Code. The proposed rezoning will bring the Zoning Districts on Near Island into conformance with the newly adopted Near Island Comprehensive Development Plan. (City of Kodiak)

If you do not wish to testify verbally, you may provide your comments in the space below, or in a letter to the Community Development Department prior to the meeting.

You are being notified because you are a property owner in the area of the request. If you have any questions about the request, please call us at 486-5736, extension 255.

Your Name: ___________________________ Mailing Address: ___________________________

Your property description: ___________________________________________________________

Comments: ______________________________________________________________________

_________________________________________________________________________________

_________________________________________________________________________________

_________________________________________________________________________________
December 2, 1987

Samuel G. Gesko, Jr.
Manager, City of Kodiak
Box 1397
Kodiak, Alaska 99615

RE: CASE 87-079. Request for the rezoning of Near Island from B--Business, I--Industrial, and C--Conservation to PL--Public Use Lands, B--Business, I--Industrial, and C--Conservation in accordance with Chapter 17.72 (Amendments and Changes) of the Borough Code. The proposed rezoning will bring the Zoning Districts on Near Island into conformity with the newly adopted Near Island Comprehensive Development Plan. (City of Kodiak)

Dear Mr. Gesko:

Please be advised that the above-referenced request has been scheduled for review and action by the Planning and Zoning Commission at their December 16, 1987 regular meeting. This meeting will begin at 7:30 p.m. in the Borough Assembly Chambers, 710 Mill Bay Road, Kodiak, Alaska. Your attendance at this meeting is recommended.

The week prior to the regular meeting, on Wednesday, December 9, 1987, at 7:30 p.m. in the Borough conference room, the Commission will hold a worksession to review the packet material for the regular meeting. You are invited to attend this worksession in order to respond to any questions the Commission may have regarding this request.

If you have any questions, please call the Community Development Department at 486-5736, extension 255.

Sincerely,

Patricia Miley, Secretary
Community Development Department
January 9, 1990, worksession:

Near Island Parks Board Chairman Chris Bublitz distributed printed information and an overhead projector presentation on the proposed Near Island Trail. A trail committee had been established to look at the trail concept. University of Alaska Fairbanks personnel had spent two days in Kodiak looking at Near Island. They had helped develop goals and objectives and a draft plan. The Council approved permanent trail development in the North End Park, Greenbelt, and Tract A. The Public Works Department would work with the Parks Board to assure proper planning. The Council repeated its conception that the trail and development had equal priority.

February 27, 1990, worksession:

Near Island Development At the August 14, 1989, worksession, the Council had targeted approximately 20 acres at the head of St. Herman Harbor (to include some industrial- and some business-zoned land) as the area to be developed first. After considerable discussion, the target area was changed to the land lying between the St. Herman Harbor access road and the green belt. This parcel was self-contained and unlikely to have the "ripple effect" development on the east side of the road would have. The deliberation included sale vs. long-term lease (50 years) and/or lease with option to purchase, discounts for cash sale, the need for an overall development plan for the entire island, underground utilities including electrical service, the ability to encourage varied uses within the same zoning district by creating different size lots, and some dissatisfaction with the requirement for development plans. The Council requested staff hire a planner, preferably local, to assist in preliminary decisions such as optimum size of commercial lots at a cost not to exceed $2,000 without further Council approval. Following the planner's report and the Council's review and setting of parameters, a survey would be ordered and a plat prepared. Upon approval of the subdivision, bids would be solicited for removal of the rock to bring the lots to the appropriate grade level for development. Following that and a final determination of the method of disposal, an appraisal would be ordered in preparation for the sale/lease of the lots.

Suggested Development Standards for Near Island On August 29, 1989, the Council met with the Kodiak Island Borough Planning and Zoning Commission. The Council requested the Commission recommend development standards for Near Island. Suggestions were submitted by the Commission on November 29, 1989. The Council reviewed each with the following comments:

Business Core Area

1. Roads paved with distinct gutter and a minimum of ten foot pedestrian/bike path paralleling the road. The Council agreed the main
roads should be paved and provision made for pedestrians and bikes but felt eight feet was sufficient.

2. **Alley access provided to all lots with a frontage road to reduce vehicle conflicts with pedestrians; no on-street parking allowed on arterials.** The Council felt requiring each developer to provide a restricted service access at the rear of lot through the use of setbacks could replace the need for a City alley. Frontage roads similar to Fairbanks were considered unnecessary. All agreed to restricting on-street parking.

3. **Parking lots for businesses should be connected and accessed via the alley or frontage road with mandatory landscaping.** The Council had no problem with connected parking lots (see #2 for thoughts on alleys and frontage roads). Landscaping was considered a good idea.

4. **Utilities should be hidden or made an integral part of the development design.** The Council agreed with the requirement for underground utilities. Common dumpster areas could be designated on the plat. A number of problems associated with common dumpster areas, dumpsters, and solid waste disposal in general were discussed at some length and the Council agreed the topic would need additional thought.

5. **Road and utility installation be coordinated and provide for future growth; long-term drainage control measures to be included.** The Council agreed.

6. **Common design theme established and mandatory for all structures; i.e., covered pedestrian walkways separated from vehicle traffic, common signage, etc.** The Council felt this idea had merit and thought would be given to a theme. Requiring zero lot line development with identical set backs would allow a continuous covered walkway to be constructed by each developer.

7. **Development should include a good mix of businesses.** The Council was not sure how this could be done.

8. **Permitted outdoor storage should be visually screened and secured for safety reasons.** The Council agreed.

**Generally**

1. **Plan now for the future of all Near Island with, at a minimum, previously identified standards.** The Council agreed.

2. **Develop an industrial-use area adjacent to the harbor including space for inside and outside fishing gear storage.** The Council agreed.

3. **Consider creation of a development authority or a design review board.** The Council took this suggestion under advisement.

**Near Island Trail Development Plan** The Council reviewed the Near Island Trail Development Plan for possible conflicts with the direction given to proceed with the commercial area between the St. Herman Harbor access road and the green belt
along the channel. None was foreseen and the Clerk was asked to let the Trail Committee know about the results of this meeting.

February 13, 1992, Council meeting, under New Business:

d. Consideration of Bid Award RE: 1992 Park Projects

City Manager Bloomquist said ten letters of interest were received from architectural firms for the following projects: Near Island trail development, Pearson Cove passive park development, renovation of the Baranof Park tennis courts, and Teen Center landscaping. After a thorough review of all submittals, Parks and Recreation Director Fulp and City Engineer Holmstrom recommended a professional services agreement be entered into with Land Design North in the amount of $66,745. City Manager Bloomquist concurred with this recommendation.

Councilmember Ballao MOVED, seconded by Councilmember Thompson, to award a professional services agreement for four 1992 park projects to Land Design North in the amount of $66,745; of which $16,305 will be expended from Parks & Recreation Capital Project Fund – Pearson Cove Passive Park account 309.319.746.470.710 ENGINEERING/INSPECTION, $23,975 from Near Island Trails account 309.319.747.470.710 ENGINEERING/INSPECTION, $18,950 from Tennis Courts account 309.319.748.470.710 ENGINEERING/INSPECTION, $7,515 from Teen Center Landscaping account 309.319.780.470.710 ENGINEERING/INSPECTION.

Councilmember Woodruff realized that the funds had already been allocated, but he questioned $23,975 for design of Near Island trails. Councilmember Blackburn said the project would correct erosion problems. Councilmember Thompson said she also understood the funds had been budgeted and that the Parks and Recreation Advisory Board had worked on the projects, but she objected to expending this amount for engineering design only. She felt this type of expenditure would not be considered in the future as $68,000 would go a long way toward constructing a community project. Councilmember Woodruff agreed. He felt any engineering needed for this type of project could be done in–house. City Manager Bloomquist said the engineering staff was over committed and internal assistance was not available. He appreciated the Councilmembers' viewpoint and it would be considered when drafting the budget.

Parks and Recreation Director Fulp said the source of funding was the one–tenth of one percent of the sales tax allocated for parks projects. Mr. Fulp said the Pearson Cove passive park had been on the agenda for a long time. Estimates of construction costs could not be made until the engineering design was completed. Once the engineering and estimates had been obtained, grant funds would be sought. The original Near Island trails had been brushed out by the Audubon Society and the Kiwanis Club had built two foot bridges. The formal plan would allow service clubs to continue improving the amenities in a more orderly, long–range manner. Mr. Fulp said the tennis court project would correct a design deficiency dating from the time of original construction nineteen years ago. The intent had been for the facility to be
used for tennis in the summer and ice skating in the winter. Unfortunately, a two-foot slope for summer drainage made it impossible to flood the courts for skating. In any case, the asphalt surface had hydro-heaves and had aged past its design life.

The roll call vote was Councilmembers Ballao, Blackburn, Thompson, and Woodruff in favor, Councilmembers Crowe and Gilbert absent, and the motion passed.

**June 7, 1994, worksession:**

**Near Island Trails** Parks and Recreation Advisory Board Chair Chris Bublitz said there may be an opportunity to utilize some of the Exxon settlement monies for parks. The Board would be analyzing the possible application of this money to finish the Near Island trail system.

**May 11, 1995, Council meeting**, in the City Manager's Report:

**Near Island Trail** In response to a question from Councilmember Davidson, the City Manager explained that the recreational trail around Near Island had not been completed because its design, and in some places its construction, had to await completion of plans for other improvements.
DRAFT

NEAR ISLAND TRAIL DEVELOPMENT PLAN

SUBMITTED TO:

THE CITY OF KODIAK

DEVELOPED AND COMPILED BY:

NEAR ISLAND TRAIL COMMITTEE
CITY OF KODIAK PARKS AND RECREATION ADVISORY BOARD

C. BUBLITZ, CHAIRMAN     B. HIMELBLOOM, VICE-CHAIRMAN
R. MACINTOSH     R. KNECHT
S. STUDEBAKER     J. FRENCH

IN CONJUNCTION WITH:

SUSAN A. DICKINSON

DIVISION OF RESOURCES MANAGEMENT
SCHOOL OF AGRICULTURE AND LAND RESOURCES MANAGEMENT
UNIVERSITY OF ALASKA
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Executive Summary

The Near Island Trail Committee, an ad hoc committee of the Parks and Recreation Advisory Board for the City of Kodiak, was established to consider a comprehensive trail plan for Near Island. The committee was charged with addressing access to recreational and educational opportunities offered by a trail system which would encompass the island's unique resources yet be compatible with planned and future development.

Members of the committee were selected for their interest and ability to provide expertise in various fields. The Parks and Recreation Advisory Board appointed Chris Bublitz chairman of the committee and Brian Himelbloom vice-chair. Members of the committee included: Rich MacIntosh, National Marine Fisheries Service (birds); Stacey Studebaker, High School Teacher (plants); John French, Fishery Industrial Technology Center (Near Island Task Force member); and Rick Knecht, Kodiak Area Native Association (Native culture and archeology).

The committee held its initial meeting February 28, 1989 with five additional working meetings through the summer. Meetings were held on an irregular basis due to tight schedules resulting from the Exxon Valdez oil spill. Meetings were open to the public, however, public testimony was not solicited. Committee members felt that the committee's purpose was to implement approved City Council policy, which had already received public input through the Near Island Task Force.

At the March meeting of the Parks and Recreation Advisory Board, Ian Scholz of the City's Parks and Recreation Department informed the board that the Division of Resources Management in the School of Agriculture and Land Resources Management at the University of Alaska was available to assist in parks and recreation development. At the recommendation of the trail committee and approval of the Parks and Recreation Advisory Board, the Division of Resource Management was contacted to ascertain the type and extent of assistance which was available.

Dr. Alan Jubenville, Director of the Division of Resources Management was contacted and the Near Island trail concept was reviewed. He felt and the committee concurred that this would be an excellent student project. Arrangements were made for Ms. Susan Dickinson, with the supervision of Drs. Jubenville and Gallagher, to work with the Near Island Trail Committee in the development of its goals and objectives.

Ms. Dickinson and Dr. Jubenville visited Kodiak May 18-20 to assess the proposed Near Island trail route. This trip was sponsored by the University of Alaska and no funds were provided by the City of Kodiak. Ms. Dickinson and Dr. Jubenville met with the committee on May 18 and spent two days with the committee chairman walking alternate routes on the Island and reviewing the committee's concerns, concepts, and priorities.

An initial draft of goals and objectives was submitted to the committee on June 12. The committee reviewed these recommendations and a final draft of goals and objectives was received on October 1, 1989. The goals and objectives developed by Ms. Dickinson were
completed under the direction of the committee and were reviewed by Drs. Jubenville and Gallagher. These recommendations reflect what the committee feels are accomplishable goals which will enhance the development of Near Island.

The Near Island Trail Committee wishes to gratefully acknowledge the assistance and contributions of Ms. Dickinson, Dr. Jubenville, Dr. Gallagher and the University of Alaska to the development of this project.
Introduction

The Alaska Outdoor Recreation Plan indicates trail-related activities are the largest category of recreational use in Alaska. This is the result of a strong public interest in the physical, cultural, and spiritual benefits of outdoor recreation. In conjunction with increasing public interest, state and federal policies have been developed to preserve and make accessible the resources necessary for individual enjoyment of the outdoors. To address the needs of trail-related activities required a commitment to the development of long range plans which make the best possible use of available recreation resources.

National and state priorities reflect this commitment through the development of linear parks and greenways. These are being established to provide citizens in local communities with safe and convenient areas in which to jog, hike, or ride bicycles. In a number of states, greenways are also being developed to provide public access to and protect rivers and streams. Similarly, the rails to trails concept utilizes abandoned right-of-ways for trail and conservation purposes.

In some communities, the development of public greenways raised concerns over the potential for decreased property values, vandalism, and future commercial development. Contrary to this, in communities where greenways have been developed, these are the most popular and heavily used parks. In addition, property values close to greenways have increased substantially, vandalism has proven to be minimal, and development has not been excluded or restricted. The San Francisco Bay area, for example, is developing two trails, a shoreline trail and a ridge trail, around San Francisco Bay without adversely impacting industrial or residential development. The only major problem which has been encountered in the development of greenways is that these trails are so popular they can quickly become overused.

The greater emphasis on physical, mental, and spiritual fitness has played a major role in the development of trails. The surgeon general has recognized that public parks and recreation systems play a crucial role in disease prevention and health promotion. The proposed development of a Governor's Commission on Recreation and Parks in Alaska stated that there is an "increasing public awareness of the important relationship between environmental quality, the quality of life and provision of parks and leisure services." In addition, it stated that "improved leisure services will have a strong positive impact on the prevention of social problems such as substance and alcohol abuse among youth and adults."

The Near Island Comprehensive Development Plan, adopted by the Kodiak City Council and the Kodiak Island Borough Assembly, recommended the development of a public trail system on the island. This system included a loop trail around the perimeter of the island, a trail bisecting the island, and a trail accessing the high point of the island. The stated purpose of this recommendation was to provide community access to Near Island for hiking, biking, and jogging as well as to reserve the highest point on the island as a mini-park. Public comment solicited by the Near Island Task Force indicated overwhelming support for the development of park and trail facilities on the island. Testimony from four public
hearings showed 95% of the individuals and 100% of the groups supporting these uses.

Use of Near Island as a recreation site by residents of Kodiak has risen considerably since completion of the Near Island bridge. This increase is undoubtedly due to easier access and the development of marked trails and picnic areas in the North End Park. Residents enjoy relaxing in this easily accessible and undeveloped setting and the potential for use is probably many times present levels, even with no increase in general population. In addition to picnicking, beachcombing, and walking; the perimeter (waterfront) of the Island is also seeing increased use by hikers, amateur photographers, beachcombers, and people who are just curious about the island.

Near Island is a perfect setting for the development of a trail system. It is easily accessible and offers a variety of activities within close proximity to schools and population centers. The island offers a diversity of environments, scenery, and terrain which are excellent for individual and family activities or small groups of people on social outings such as walks, berry picking, and nature observations. Vegetation ranges from wooded areas to alder and berry thickets and from bogs to an open alpine meadow. From various points on the island, views change from open panoramic vistas of Cape Chiniak and Spruce Cape to restricted "peeks" of Trident Basin. In addition to seascapes, Near Island provides an excellent view of Kodiak's harbor, it's activities, and fleet.

The educational opportunities offered by Near Island are also varied. The island provides easy access to incredibly rich and diversified intertidal habitats. The rocky shoreline ranges from an exposed habitat found at the south end to protected areas found in Trident Basin. The north end of the island also encompasses a mud flat, an uncommon intertidal feature of Kodiak Island. The intertidal environment of Kodiak Island contains over 200 species of intertidal animals and 100 species of algae. Approximately 115 species of animals and 40 species of algae are common and most can easily be found by one person during a few hours observing the intertidal habitat. The range of intertidal habitats found on Near Island contains most of these algae and animals and, therefore, offers an excellent educational resource for the City of Kodiak. Not only will our children benefit, but these resources also offer an educational activity for visitors as well as providing unique opportunities for photography.

Use of this trail system by visitors to Kodiak must also be considered. The more activities a community can provide for its visitors, the longer they will stay and the more positive will be their impressions. Visitors who generally have limited time usually want easily accessed, safe, contiguous, and attractive trails; the Near Island trail system will offer all of these. Many visitors also want to be able to experience and photograph the unique aspects of the area they are visiting as conveniently as possible. Trails which therefore highlight a region's natural, historic, cultural, and scenic features are extremely popular. The presence of the boat harbor, view of the processing plants and waterfront activity, presence of the Fishery Industrial Technology Center and Native Cultural Center, archeological digs, easily accessible intertidal environments, pleasing landscapes, and scenic vistas make Near Island a natural destination during a walking tour of Kodiak.

In addition to scenery, visitors to coastal communities enjoy walking the docks and
observing fishing related activities. A 1987 study of the Seward charter boat industry indicated the local activities visitors enjoyed most were eating out and walking around the harbor. Visitor interest in harbors and fishing activities can easily be incorporated in the trail system by encouraging observations of harbor activities and bringing visitors close enough to see what is going on yet creating a traffic pattern that will not obstruct harbor activities. The Near Island trail system will offer excellent sightseeing opportunities without accessibility problems and may well provide a rewarding enough experience to entice many visitors to remain longer.
Purpose and Scope

The Near Island Trail Plan is an access plan to the varied education and recreation opportunities offered to the citizens of Kodiak by Near Island. Most of these opportunities are currently not easily accessible due to the thick alder and underbrush which covers most of the island. This trail system will offer the principal means by which residents and visitors will enjoy the magnificent seascapes, rich and highly diversified tide pools, beachcombing, birdwatching, or just a relaxing walk.

This plan establishes guidelines for the future use and development of the Near Island trail system. It is based on an analysis of existing access points, environment, and current and anticipated trends in recreational use.

The primary purpose of this plan is to provide guidelines for the development of a trail system which will:

1. maximize education and recreational use of the area while preserving the natural environment,
2. provide access for the public to take advantage of the excellent scenery and viewing opportunities,
3. provide a walking trail with circumnavigates the island,
4. provide short walking loops and tie-ins to points of interest, and
5. provide a safe, stable walkway which mitigates existing and future erosion problems.

It is always necessary to monitor the progress of any plan and periodic review will be required. The Near Island Trail Committee encourages the Parks and Recreation Advisory Board to reassess the progress made in implementing the Near Island Trail Plan annually and reset priorities as necessary.
Goals and Objectives

The goals of the Near Island Trail Plan address concerns identified by the Near Island Trail Committee of the Kodiak Parks and Recreation Advisory Board. This set of goals addresses concerns involving education, visual resources, social and cultural values, the environment, safety, and vehicle and pedestrian circulation. The objectives offer suggestions about how to accomplish these goals.

For convenience, goals are listed in numerical order and does not imply a ranking or prioritized order.

EDUCATION: The North and South End Parks offer unique educational opportunities. The short walking distance from three schools makes Near Island ideal for field trips. The intertidal areas adjacent to Near Island contain over 150 species of intertidal plants and animals which are accessible to residents, students, and visitors. In addition, the North End Park encompasses an intertidal mud flat, a very uncommon habitat on Kodiak Island. The relatively untouched intertidal environment makes this an ideal living classroom for marine education.

Without the presence of grazing by domestic animals, most species of local terrestrial plants would be found on the island. The potential safety concerns which these animals present must also be considered and the committee urges that this problem be addressed.

Since easy access to the island is relatively recent and overuse will lead to the demise of particularly fragile areas, i.e. intertidal and bog areas, an educational program which identifies the area's frailty must be included in trail development.

The goals of this section are:

Goal 1. Route the trail to take advantage of educational opportunities.

Objective: There are several unique habitats located in the North and South End Parks. The trail should be routed to provide access to intertidal areas (both rocky and mud flats), bogs, alder growths, spruce stands, and alpine meadows. This will allow residents, students, and visitors the greatest opportunity for learning about plant and animal species found in each area.

Goal 2. Educate public about the frailty of the various habitats, particularly the intertidal and bog habitats, found on the island.

Objective: Recent vehicle and pedestrian access to Near Island dictates an effort be made to educate users about how the ecosystems work and the effects of overuse on them. This can best be accomplished by erecting a series of informational and interpretive signs within the parks
describing plant and animal species and their function within the ecosystem. The frailty of the soils due to the presence of volcanic ash should also be described.

Goal 3. Provide livestock-free areas to allow the vegetation to re-establish itself under natural conditions.

Objective: Certain representative areas of natural vegetation could be fenced off and livestock-proof gates installed so that natural vegetation can regrow and be enjoyed by visitors and students.

VISUAL RESOURCES: Near Island's hilly terrain offers excellent viewing opportunities along the proposed trail system. Studies have shown that people enjoy a trail more if there is variety and mystery, where a view is given and taken away as one moves along the trail.

The goals of this section are:

Goal 4. Provide a trail route that is aesthetically pleasing, takes maximum advantage of viewing opportunities and provides visual variety and mystery.

Objective: There are a number of places along the trail where spruce and alder stands are thick and provide a visual barrier to the seascape beyond. By winding the trail toward and away from the viewing opportunities, the trail remains interesting. The casual user never knows when the view will again be given and remains intrigued. This method adds mystery to the trail system which adds to the user's enjoyment.

Goal 5: Provide passive viewing areas, i.e. benches, along the trail system.

Objective: People like to take time to enjoy beautiful scenery without being rushed. The placement of benches slightly away from the bustle of the trail gives people the opportunity to sit and take in the view. The placement of benches should be decided by a group of local users during an on-site assessment.

Goal 6: Provide an observation area at the high point of the island.

Objective: In order to take maximum advantage of the view from the high point, a trail around the knoll just below the spruce stand is recommended. This leaves the stand of spruce on top of the knoll intact while providing numerous views to be enjoyed by visitors. The trail should be a widened and stabilized path.
SOCIAL: In addition to commercial reasons, residents of Kodiak use Near Island for recreation and to enjoy the view of the waterfront. Senior citizens need a place close to the road system where they can visit with family and friends and watch the waterfront activities. Picnic areas offer a place where people can relax and enjoy a meal. Individual areas should be kept small and concentrated in the North End Park.

The goals for this section are:

**Goal 7:** Provide a space where senior and handicapped citizens, tourists, and others can enjoy passive viewing of the waterfront.

**Objective:** The site should be easily accessible by the senior van, and provide easy foot and wheelchair access. Appendix 1, Channel Viewing Area location map, indicates possible sites. Site #1 located near St. Hermans Harbor is recommended. The access is easy and the site provides the closest view of the waterfront.

Design of the viewing space can be simple or elaborate from a covered platform with a wind shelter to a glass-fronted building with amenities such as toilet facilities and benches. Maps of Kodiak during the Russian era indicate that the Site #1 area was a small fort. It is recommended that the design of a viewing kiosk should maintain this theme.

Disabled persons would benefit from the construction of recreation trails designed to meet their specific needs. Trails which feature fairly flat grades, compacted and mud-free surfaces, and interpretive features are well-suited for their use and enjoyment. Trails suitable for handicapped use should be sited in a variety of environments which provide a variety of views. Well-designed handicapped accessible trails can provide enjoyable outdoor experiences and new challenges for handicapped persons. Handicapped trails should be restricted to 6 to 8 percent grades and should be surfaced with gravel or equivalent material.

**Goal 8:** Provide a number of individual picnic sites for family or small group use.

**Objective:** Picnic areas should be limited to one or two tables and scattered within the North End Park. Areas should be located as unobtrusively as possibly and not detract from the natural beauty or interfere with other users. Facilities for fires should be provided only in those areas designated by the city fire chief.

In addition to the North End Park, other individual picnic sites should be considered. These sites should be evaluated by a group of local
users but be limited to one table with no provision for fires.

CULTURAL: Kodiak and the adjacent islands have long been home to Alaska Native peoples and their culture is an important facet of Kodiak’s history. Several archaeological sites are located near the water of Trident Basin and may contain significant artifacts.

The goal for this section is:

Goal 9: Route the trail to allow people a view of the archaeological sites while protecting the integrity of the sites.

**Objective:** People, especially visitors, will be curious about the sites but must be encouraged to enjoy them from a distance. The trail should skirt the sites and interpretive signs describing excavations should be installed. This will help visitors understand the frailty of the site and the importance of protecting the discoveries.

ENVIRONMENTAL: There are a number of environmental concerns on Near Island: protection of the spruce stands, impact of grazing on native vegetation, protection of the primitive character of the South End Park, protection of the primitive character of the two “islands” adjacent to the North End Park, protection of natural drainage and bogs, treatment of garbage in primitive areas, and concentration of use as a method of protecting primitive areas.

Goals for this section are:

Goal 10: Preserve existing Sitka spruce stands.

**Objective:** The existing Sitka spruce stands on the island are aesthetically pleasing, allow easy walking since there is little undergrowth within the stands, and act as wind breaks. These old stands are important and development should be approached with the idea of preserving or producing minimal impact on these stands.

Goal 11: Mitigate damage to native vegetation and trail surface material by livestock.

**Objective:** The island's resident ponies and cattle have altered the natural environment by their presence. Their removal would have a positive impact on local vegetation.

Goal 12: Maintain the primitive nature of the South End Park.

**Objective:** The primitive nature of the South End Park will make maintenance difficult. Without access, there is no convenient way to put developments on the South end and allow for easy maintenance.
The open nature of this area also excludes development. This area is currently primitive in nature and requires some effort to get there which offers solitude to users. Picnicking sites, trash and toilet facilities should be discouraged within the South End Park.

Rather than developing a formal trail within the South End Park, visitors should be left to find their favorite viewing spot or a place to spread a picnic blanket. This will preserve the primitive character and avoid maintenance costs.

**Goal 13:** Maintain the primitive character of the two small “islands” adjacent to the North End Park.

**Objective:** The “islands” adjacent to the North End Park are currently primitive in nature and should remain so. This can be accomplished by a no-development standard for the area.

**Goal 14:** Preserve marsh areas and existing natural drainage creeks, particularly the large bog within the North End Park.

**Objective:** The marsh areas located on Near Island provide a special environment for various plants that are common only to waterlogged soils and their existence should be protected. Natural drainages are aesthetically pleasing and provide the best route for runoff and should be preserved.

**Goal 15:** Encourage the public to “pack it in, pack it out” when using the parks and trail system.

**Objective:** Garbage receptacles will not be located in undeveloped parts of the trail system, i.e. South End Park and “islands” adjacent to the North End Park. To encourage the "pack it in, pack it out" idea, it is recommended that dumpsters be located at convenient trailheads.

**SAFETY:** There are a number of safety concerns that must be addressed in planning a trail system. Sheer dropoffs and inviting edges must be evaluated for their hazard potential. Erosion-prone soils require special safety considerations when building trails.

The goals for this section are:

**Goal 16:** Develop a trail plan that assures safety and minimizes hazards.

**Objective:** Recent excavations along St. Hermans Harbor have left sheer dropoffs that are not apparent from the bluff. The trail should be located well away from the dropoff. Appropriate warning signs must be posted and railings installed where the edge is inviting, since human
curiosity will draw people to the edge. Serious injury can be avoided by anticipating these hazards.

Goal 17: Provide a stable trail bed which mitigates existing and future erosion problems.

Objective: The soils on Near Island are predominately Kodiak series which means a bed of organic matter underlain by volcanic ash. This ash is highly conducive to erosion and care must be taken when stabilizing the trail bed. Where possible, the trail bed should be recessed and the surface covered with gravel. Borders of four by four timbers filled with gravel will help eliminate exposed edges which ordinarily might erode. This flush surface will be easily negotiated by trail users.

Goal 18: Provide safe access to the intertidal regions and two small "islands" adjacent to the North End Park.

Objective: To protect the cliff face from erosion, provide a safe trail, and prevent damage from use; a slightly raised wooden walkway with stairs negotiating the steep sections is recommended. Formal design drawings should be prepared by an architect or engineer. Pressure-treated wood for the supports, rails, and decking with a slip-guard on the stair treads and landings is recommended. This raised walkway will provide safe, durable access to this area.

The soils along the bluff are susceptible to erosion. Providing access by cutting into the bluff face may lead to severe erosion. For this reason the structure should be anchored to bedrock using concrete footing for support. A handrail should be installed along the downhill side of the walkway. Landings between stair sections with room for several people and a resting bench are recommended.

Construction of a viewing area at the top of the bluff where people can take advantage of the panoramic view and recover from the climb is also recommended. This area could contain one or several benches placed back from the bluff face.

CIRCULATION: In addition to providing access to the North and South End Parks and circumnavigating the island, the trail system should incorporate access to the Fishery Industrial Technology Center, Native Cultural Center, and the observation point. In addition, parking must be considered during the development of Near Island and the trail system to direct use to desired areas.
Priorities and Recommendations

The Near Island trail project should be completed in a series of phases. Phase one development would map and brush-out the trail system and improve access to the North End Park intertidal region; phase two would improve the North End Park trail facilities by up-grading the trail surface and sighting picnic tables and benches; phase three would improve the Trident Basin and scenic overlook trails through the addition of rustic bridges and up-grading the trail surface; this development would connect the FITC and KANA Cultural Center with the viewing area at the high point of the island; and phase four would develop the greenbelt trail along the Near Island Channel, including facilities for senior and disabled persons.

The following priorities are suggested to allows segments to be completed as money and time allows. This does not mean that the phases and priorities suggested can not be deviated from, especially regarding projects for volunteer organizations. The City should seek and be prepared to utilize the efforts of volunteer organizations in the best way possible to achieve trail development. It is suggested that development start at the trailhead(s) and emanate smoothly and logically from these points; otherwise, the trail loses much of its useful function and may result in a maze of random trails.

(1) Map, flag, and brush-out the primary (and temporary, i.e. Dog Bay section) trails. Due to recent construction of the Fishery Industrial Technology Center and the Dog Bay breakwater road plus the anticipated construction of the Kodiak Area Native Association Museum, the trails need to be established. This priority can easily be addressed by volunteer organizations and labor.

(2) Improve the safety of the North End Park trail leading to the intertidal regions through the construction of a stairway (preferred) or switch back system.

(3) Re-establish the North End Park section of the trail system to provide permanence and access to the large bog area. This park is currently one of the most utilized sections of the island and the trail should include the sighting of picnic tables and benches.

(4) Up-grade the Trident Basin and scenic overlook trail sections through the addition of a crushed rock surface, rustic bridges, and benches. The addition of picnic tables to this route is discouraged because of the problems associated with trash accumulation and pickup.

(5) Develop the greenbelt trail along the Near Island Channel. This area is best suited for use by senior and handicapped persons and should be developed with the special needs of these users in mind. Trails should have moderate grades and a minimum tread width of 4 to 6 feet. These trails are generally not hard surfaced and must be carefully located and assigned for uses which do not result in degradation or mudholes. In addition, the development of
a kiosk and/or sheltered benches should be incorporated.

(6) Complete development of trail around island through the permanent sighting and upgrading of the trail section along Dog Bay. This development should be phased with the City’s development strategies for this region.

Hikers generally find motorized use of the same trail or area incompatible due to the impact of noise and exhaust fumes; consequently trail development should insure that there are enough impediments to guarantee no mechanized use.

Directions and signs are also needed to guide users away from particularly hazardous conditions such as away from cliffs. A sign plan should be prepared to function on all trails and access points soon after the sighting of the trail. This is necessary to coordinate and provide adequate information to trail users regarding destination distance, permitted activities, and potential hazards. Special interpretive signs should also be incorporated in the sign plan. In addition, a recreational opportunity guide should be prepared for the park which would function as a guide and index for interested visitors.
Appendix I

Map of Predominant View/Observation Points

Map of Proposed Trail Route
CITY OF KODIAK
RESOLUTION NUMBER 02-96

A RESOLUTION OF THE COUNCIL OF THE CITY OF KODIAK PROVIDING FOR THE PRESERVATION, DEDICATION, AND EVENTUAL CONSTRUCTION OF THE PEDESTRIAN TRAIL AROUND NEAR ISLAND

WHEREAS, the City of Kodiak is the principal land owner on Near Island except those parcels currently used for the University of Alaska; and

WHEREAS, the people of Kodiak desire to preserve and develop a trail around the island near to and/or along the shoreline wherever feasible; and

WHEREAS, the City of Kodiak has undertaken development of Trident Basin, Saint Herman Harbor, and limited natural resource extraction with plans for additional development; and

WHEREAS, the City Council wishes to preserve the existing trail, reserve the historical route, and eventually construct the trail around the island,

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Kodiak, Alaska, as follows:

Section 1. The City Council finds and determines that the preservation and dedication of a pedestrian trail around Near Island near to and/or along the shoreline is in the public interest.

Section 2. All future subdivision or land development on Near Island shall consider the impacts to the trail corridor as shown in the Near Island Plan of March, 1987, and shall provide for its dedication or suitable relocation as a condition of approval.

Section 3. Unless specifically removed by City Council action, all land permits, leases, sales, or other conveyances shall contain or be subject to the provisions of Section 2.

PASSED and APPROVED this 11th day of January, 1996.

CITY OF KODIAK

MAYOR
 Appendix F

Pillar Mountain Background
Earthquakes & Volcanoes
Volume 19, Number 1, 1987

4 A Chronology of U.S. Geological Survey Hazards
Warnings: 1976-1986
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Lake Nyos, Cameroon, Africa. Photograph by Michele Tuttle.

by Paula L. Gori and Clement F. Shearer
U.S. Geological Survey
Reston, Va.

Hazard Warnings, Preparedness, and Technical Assistance

The U.S. Geological Survey (USGS) has general and broad authority to investigate geologic and hydrologic hazards, to notify appropriate Federal, State, and local authorities of these hazards, and to provide information as necessary to assure that timely and effective warning of potential disasters is provided. The USGS has been given these responsibilities under the Organic Act of 1972 and Executive Order delegations of the Disaster Relief Act of 1974.

The Director of the U.S. Geological Survey is charged with the Federal responsibility to issue geologic hazards warnings, and, in particular, earthquake predictions. Specifically, Section 202(a and b) of the Disaster Relief Act of 1974 stipulate that "The President shall assure that appropriate Federal agencies are prepared to issue warnings of disasters to State and local officials," and that "appropriate Federal agencies provide technical assistance to State and local governments to assure that timely and effective disaster warning is provided." In the 1980 reauthorization of the Earthquake Hazards Reduction Act of 1977, the Director of the USGS was given the authority to issue an earthquake advisory or prediction as deemed necessary.

Hazard warnings issued by the USGS are sent to concerned State agencies. Principal State contacts are designated by the State governors and are usually an official of the State's office of emergency services or the State geologist. Two general systems have been used for issuing hazards warnings. The first system served the USGS from 1976 to 1984; the second after 1984.

The USGS also has designed separate systems for particular situations. The Hawaiian and Cascades Volcano Observatories have developed their own systems of notifying Federal and State agencies of imminent eruptions. The two observatories have excellent records of successful predictions of eruptions and well organized warning and response procedures with the officials in the area.

Hazard Notices Issued by USGS Prior to April 1984

From 1976 to 1984, the system for evaluating and transmitting notifications of hazards included Notices of Potential Hazard, Hazard Watches, and Hazard Warnings (predictions). The three levels of notifications, which were outlined in the Federal Register, April 12, 1977, volume 42, no. 70 were defined as:

1. Notice of Potential Hazard—information on the location and possible magnitude of a potentially hazardous geologic condition. However, available evidence is insufficient to suggest that a hazardous event is imminent or evidence has not been developed to determine the time of occurrence.

2. Hazard Watch—information, as it develops from a monitoring program or from observed precursors, that a potentially catastrophic event of a generally predictable magnitude may occur within an indefinite time (possibly months or years).

3. Hazard Warning—information (prediction) as to the time, location, and magnitude of a potentially disastrous geologic event.

Table 1 lists the 16 formal hazard notices issued by the U.S. Geological Survey from March 1976 to March 1984. All notices except the last one for Mauna Loa volcano were issued under the system outlined in the Federal Register of April 12, 1977.

In 1984 the U.S. Geological Survey revised the criteria and terms used in issuing notices concerning geologic-related hazards. It should be noted that throughout this discussion, the term geologic-related hazards includes a broad range of geologic and hydrologic phenomena. As outlined in the January 31, 1984, Federal Register, Volume 49, No. 21, the term Hazard Warning is reserved for those situations posing a greater than normal risk and "warranting considerations of a timely response in order to provide for public safety. Information regarding hazardous conditions that do not meet the criteria for a Hazard Warning may, however, also be sent to public officials as it becomes available. Transmittal of such information would not constitute a Hazard Warning."
Table 1:

Formal hazard notices issued by U.S. Geological Survey, 1976-1984:

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Date of Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern California Uplift—Hazard Watch</td>
<td>06/10/76</td>
</tr>
<tr>
<td>Billings, Montana Rockfall—Notice of Potential Hazard</td>
<td>08/15/80</td>
</tr>
<tr>
<td>Ventura, California Active Fault—Notice of Potential Hazard</td>
<td>07/10/77</td>
</tr>
<tr>
<td>Las Vegas, Nevada Subsidence—Notice of Potential Hazard</td>
<td>06/13/78</td>
</tr>
<tr>
<td>Kodiak, Alaska, Pillar Mountain Landslide—Notice of Potential Hazard</td>
<td>06/10/78</td>
</tr>
<tr>
<td>Mount Shasta Volcano, California—Notice of Potential Hazard</td>
<td>08/23/78</td>
</tr>
<tr>
<td>Mount Baker &amp; Mount St. Helens Volcano, Washington—Notice of Potential Hazard (Follow-up report and news release issued 01/12/79)</td>
<td>01/12/79</td>
</tr>
<tr>
<td>Wrightwood, California, Landslide—Notice of Potential Hazard</td>
<td>02/11/73</td>
</tr>
<tr>
<td>Yakutat, Alaska, Earthquake—Notice of Potential Hazard</td>
<td>06/01/79</td>
</tr>
<tr>
<td>Odessa Fault, Houston, Texas—Notice of Potential Hazard</td>
<td>04/03/79</td>
</tr>
<tr>
<td>Mount St. Helens—Hazard Watch</td>
<td>04/03/80</td>
</tr>
<tr>
<td>Columbia Glacier, Alaska—Hazard Watch</td>
<td>06/25/80</td>
</tr>
<tr>
<td>Mount Hood Volcano, Oregon—Hazard Watch</td>
<td>07/11/80</td>
</tr>
<tr>
<td>Mammoth Lakes Earthquake, California—Notice of Potential Hazard</td>
<td>05/06/80</td>
</tr>
<tr>
<td>Mammoth Lakes, California—Notice of Potential Volcanic Hazard</td>
<td>06/25/82</td>
</tr>
<tr>
<td>China Lake and Ridgecrest, Southern California—Advisory of earthquake potential</td>
<td>09/04/82</td>
</tr>
<tr>
<td>Mauna Loa Volcano, Hawaii—Geologic Hazards Warning</td>
<td>March 30, 1984</td>
</tr>
</tbody>
</table>

(2) A Geologic-Hazard Warning consists of:
- A description of the geologic or other pertinent conditions that cause the concern;
- Factors that indicate that such conditions constitute a potential hazard;
- Location or area that may be affected;
- Estimated severity and time of occurrence, if such estimates are justified by available information;
- If possible, a probabilistic statement on the likelihood of a given event or events with a specified time period; and
- A description of continued Geological Survey involvement and estimate of what and when additional information might be available.

(1) The criteria for a Geologic-Hazard Warning are:
- A degree of risk greater than normal for the area;
- Or a hazardous condition that has recently developed or has only been recently recognized; and
- A threat that warrants consideration of a near-term public response.
As a result of the issuance of the revised hazards warning terminology, the notices listed in Table 1 were reexamined. As a consequence of this review, nine notices failed to meet the criteria for a formal hazard alert as defined above. Three other notices, those for Mt. Hood, Mauna Loa, and Mammoth Lakes, were discontinued due to reduction in risk. Table 2 outlines the disposition of each notice given between 1977 and 1984. Only Mt. St. Helens volcano and Columbia glacier meet the new criteria of a hazard warning.

The change in hazard-warning terminology of the USGS, adopted in 1984, resulted from a year-long review of the Geological Survey’s responsibility and performance in notifying State and local governments of important geologic hazards. The review considered both the utility of its public statements in assisting State and local jurisdictions in conducting their public safety functions, as well as the efficiency of internal USGS procedures in developing and distributing the warning messages. The evaluation showed that many of the Notices of Potential Hazards described geologic conditions that were well known by the public and its officials. Also some of the “Notices” were vague about the time or probability of occurrence and the hazards did not necessarily warrant any particular action to protect public safety. Furthermore, the “Hazard Warning” category established by the 1977 Federal Register was not used because the Geological Survey did not have an operational capacity to issue predictions of hazardous geologic phenomena.

The Geological Survey simplified the three-fold system into a single “Hazard Warning” category focusing on near-term public safety. Other significant information about hazards that did not satisfy the new criteria would be sent to State authorities for consideration in their hazards mitigation and public awareness programs.

<table>
<thead>
<tr>
<th>Location</th>
<th>Hazard</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Billings, Montana</td>
<td>Rockfall</td>
<td>Fails 1984 Federal Register Criteria. No new warning will be issued.</td>
</tr>
<tr>
<td>Ventura, California</td>
<td>Fault</td>
<td>Fails 1984 Federal Register criteria. No new warning will be issued.</td>
</tr>
<tr>
<td>Las Vegas, Nevada</td>
<td>Subsidence</td>
<td>Fails 1984 Federal Register criteria. No new warning will be issued.</td>
</tr>
<tr>
<td>Kodiak, Alaska</td>
<td>Landslide</td>
<td>Fails 1984 Federal Register criteria. No new warning will be issued.</td>
</tr>
<tr>
<td>Mt. Shasta, California</td>
<td>Volcano</td>
<td>Fails 1984 Federal Register criteria. No new warning will be issued.</td>
</tr>
<tr>
<td>Houston, Texas</td>
<td>Fault and Subsidence</td>
<td>Fails 1984 Federal Register criteria. No new warning will be issued.</td>
</tr>
<tr>
<td>Wrightwood, California</td>
<td>Landslide</td>
<td>Fails 1984 Federal Register criteria. No new warning will be issued.</td>
</tr>
<tr>
<td>Mammoth Lakes, California</td>
<td>Earthquake</td>
<td>Fails 1984 Federal Register criteria. No new warning will be issued.</td>
</tr>
<tr>
<td>Yakataga, Alaska</td>
<td>Earthquake</td>
<td>Decision pending.</td>
</tr>
<tr>
<td>Southern California</td>
<td>Earthquake</td>
<td>Decision pending.</td>
</tr>
<tr>
<td>Mammoth Lakes, California</td>
<td>Volcano</td>
<td>Terminated hazard notice due to reduction in hazard potential on July 11, 1984.</td>
</tr>
<tr>
<td>Mauna Loa, Hawaii</td>
<td>Volcano</td>
<td>Terminated hazard warning on April 17, 1984.</td>
</tr>
</tbody>
</table>

Eruption of Mount St. Helens, May 1980
Hazards Communications After
April 1984

Following the revision of terminology in 1984, the number of hazard-warning communications decreased because most geologic hazards did not satisfy the criteria necessary for a "geologic-hazard warning." Since 1984, however, communications about geologic hazards have continued in the form of official communications by USGS to State officials. The experiences since 1984 are summarized below.

Parkfield, California

On April 4, 1985, the Director of the USGS, formally notified the State of California, through its representative, Director of the California Office of Emergency Services, that there was "a high probability of an earthquake of about magnitude 6 within the next several years in the Parkfield region." However, the Director of the USGS stated that he did not consider that the evidence and evaluation warranted issuing a "geologic hazard warning" by the USGS at that time. The Director went on to explain what the scientists were finding and doing in the Parkfield region. A press statement was released the following day informing the public about the work being carried out in the Parkfield region which included a long-term forecast of a 5.5 to 6 earthquake within the 1985-1986 time frame. Subsequently, both the National Earthquake Prediction Evaluation Council (NEPEC) and the California Earthquake Prediction Evaluation Council (CEPEC) reviewed and advised the Geological Survey and the California Office of Emergency Services, respectively, that the Parkfield forecast constituted a scientifically credible earthquake prediction.

Bishop, California

A second communication about a geologic hazards occurred on July 21, 1985, when the Director of the USGS formally advised the Director of the California Office of Emergency Services that an earthquake swarm was in progress 15 miles north of Bishop, California, in the Chalfant Valley. The Director related information concerning the potential for a magnitude 7 event to occur in the area experiencing the earthquake swarm. The Director promised that the USGS would continue to monitor the situation and update the "advisory" on July 24, 1986, unless the situation changed significantly prior to that date. On July 24, the Director of the USGS advised the Director of California Office of Emergency Services that earthquake activity in the Chalfant Valley had diminished and that further damaging earthquakes were unlikely and that the possibility of their occurrence would diminish with time. No press releases were issued.

San Diego, California

On June 17, 1985, Geological Survey seismologists at Pasadena, California, in consultation with the Chief, Office of Earthquakes, Volcanoes, and Engineering, analyzed a swarm of earthquakes along the Rose Canyon fault in the San Diego, California, area. USGS procedures stipulate that scientists are to notify the proper local authorities directly if they believe that additional delay in warning the public would jeopardize public safety. Based upon their analysis and recent research on the pattern of foreshocks in southern California, they released the following statement to State officials: "...there is a 5% chance of a magnitude 5 or greater earthquake in the next 3-day period." This notification received neither scientific review nor Director's approval.

Conclusion

The recent experiences with communications to State officials, short of issuing a hazard warning, represent a trend in alerting States and the public about potential hazards. The communications are specific in describing the present situation and the probable future situation. They state what the USGS will do to monitor the situation and procedures it will follow in issuing further hazard communications.

The evolution of hazard communication, particularly the change in warning terminology, reflects a continual evaluation by USGS scientists and administrators as well as consideration of comments from officials of other governmental agencies, earth scientists, and social scientists.

The new hazard warning system will undoubtedly result in fewer formal hazard notices. However, by limiting hazard warnings to potentially imminent, short-term events, the need for public response will be emphasized. The effects of the recent hazard warning program upon public safety, hazards mitigation, and public awareness will be closely monitored in the coming years. And, if necessary, the program will be further modified.

Selected References

1980 reauthorization of Earthquake Hazards Reduction Act of 1977 (Section 101 [c], P.L. 96-472).
Federal Register, April 12, 1977, Volume 42, No. 70.
Organic Act of 1979 (42 U.S.C. 5101 [d]).
UNITED STATES DEPARTMENT OF THE INTERIOR

GEological Survey

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PILLAR MOUNTAIN LANDSLIDE, KODIAK, ALASKA

by

Reuben Kachadoorian and Willard H. Slater

OPEN-FILE REPORT

78-217

U.S. Geological Survey
345 Middlefield Road
Menlo Park, California 94025

1978

This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards
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PILLAR MOUNTAIN LANDSLIDE, KODIAK, ALASKA

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Reuben Kachadoorian and Willard H. Slater

Abstract

Pillar Mountain landslide on the southeast face of Pillar Mountain is about 915 m (3,000 ft) southwest of the city of Kodiak, Alaska. The landslide is about 520 m (1,700 ft) wide at its base and extends approximately from sea level to an altitude of about 343 m (1,125 ft). The slide developed on an ancient and apparently inactive landslide. Renewed movement was first detected on December 5, 1971, following removal of about 230,000 m$^3$ (300,000 yd$^3$) of material from the base of the slope. Although movement of the landslide has decreased since December, 1971, movement continues and the possibility exists that it could increase as a result of an earthquake, water saturation of the landslide mass, or other causes. In the most extreme case, as much as 3.8 to 7.6 million m$^3$ (5-10 million yd$^3$) of debris could fall into the sea at Inner Anchorage. If this took place suddenly, it could generate a wave comparable in height to the tsunami that damaged Kodiak during the Alaskan Earthquake of 1964. Therefore, we believe that the Pillar landslide is a potential hazard to the city of Kodiak and its environs that merits a thorough investigation and evaluation.

1/Alaska Department of Transportation, Fairbanks, Alaska
Introduction

An investigation of the Pillar Mountain landslide, Kodiak, Alaska, was undertaken to make a preliminary evaluation of the slide as a potential hazard to the city of Kodiak and its environs. This report is based on our field observations, slope-indicator casing data collected by the Alaska State Highway Department (now part of the Alaska Department of Transportation), coordinate measurements of survey control points by R & M Consultants, Inc., Anchorage, Alaska, and a report prepared for the Alaska Department of Highways by Dames and Moore (1973).

This report was reviewed by David J. Varnes, Robert W. Fleming, Edwin L. Harp, George W. Moore, Henry J. Moore, John R. Williams, Lynn A. Yehle, and Leslie T. Youd, all of the U.S. Geological Survey. Their comments and suggestions have largely been incorporated into this report.

Description of the Pillar Mountain landslide

Pillar Mountain landslide is on the southeast face of Pillar Mountain, about 915 m (3,000 ft) southwest of Kodiak, on the northwest shore of Inner Anchorage, a northeast reach of St. Paul Harbor (figs. 1 and 5). The location of the slide between downtown Kodiak and Gibson Cove is shown on figure 5; the configuration on figure 2 and Plate 2. The base of the slide extends about 520 m (1,700 ft) along the roadway between the new city of Kodiak dock (fig. 2, left-foreground, A) and another docking facility (fig. 2, right-foreground, B). In 1972, the altitude from which rock debris was coming was about 236 m (775 ft). However, cracks and fractures occur in the bedrock to an altitude of
Figure 2. View northwest of Pillar Mountain landslide, Kodiak, Alaska. A, new city dock; B, dock; C, abandoned highway; arrow at skyline points to White Alice station; Qlsa\textsubscript{1}, talus; Qlsa\textsubscript{1} and Qlsa\textsubscript{2}, ancient slide debris; dr, slate, argillite, and graywacke; line indicates approximate boundaries of Plate 2.
about 343 m (1,125 ft) or within 38 m (125 ft) from the top of Pillar Mountain (fig. 3 and Plate 2). Thus, the slope affected extends from about sea level to at least an altitude of 343 m (1,125 ft).

Before 1957 or 1958, the face of the slide area was crossed by a highway at about altitude 38 to 49 m (125 to 160 ft), labeled C on figure 2 and Abandoned Highway on Plate 2. The roadway was moved to its present lower location at the base of Pillar Mountain because of rockfall and maintenance problems.

Renewed movement of the Pillar Mountain landslide began during the removal of approximately 230,000 m$^3$ (300,000 yd$^3$) of rock from the toe of the slope of Pillar Mountain for use as fill for the new city of Kodiak dock (A on fig. 2). Material was quarried, pushed downhill from the abandoned highway (C, fig. 2) and collected at the base of the slope. It was then transported to the dock site. On Sunday, December 5, 1971, when the contractor had removed nearly 230,000 m$^3$ of material from the base of Pillar Mountain, showers of small rocks and occasionally large rocks began cascading down the rock slope above the abandoned highway. The source for the rockfall progressed upslope from its initial altitude of about 91 m (300 ft) to about an altitude of 215 m (700 ft) for the first four days (12/5 to 12/8, 1971) and was primarily confined to a single gully (D. S. Esch and W. H. Slater (Internal Memorandum), 1971).

Aerial observations on December 9 and December 14, 1971, by Esch and Slater (Internal Memorandum, 1971) revealed that the gully had developed along the northeast lateral scarp of a major sliding block of bedrock. Several days later heavy rockfall was observed coming from the lower left and center of the central slide mass. The crack or
Figure 3. View northeast showing fractures on Pillar Mountain landslide, Kodiak, Alaska. F, fractures at about altitude 244 m (800 ft.); Q1sa1, ancient slide debris; br, slate, argillite, and graywacke.
fracture pattern suggested that the entire center block was moving downhill. Some of these cracks can be seen in figure 3. The uppermost crack was estimated to be approximately 122 m (400 ft) horizontally and 38 m (125 ft) vertically from the White Alice communication site (arrow, fig. 2) on the crest of Pillar Mountain at about an altitude of 381 m (1,250 ft). As snow was present on the ground and none in the cracks, the observers concluded that the cracks had developed no more than a few days prior to the December 9 aerial observations.

The December 14, 1971, aerial observation was made after a snowstorm that ended about 10:00 AM, December 13. At the time of this flight, most of the cracks observed on December 9 were obscured by the snow. However, Esch noted visually that the uphill cracks were wider, about 50 percent, than when he inspected them on December 9, 1971 (Esch and Slater, Internal Memorandum, 1971). Ground inspection by Esch of the cracks on December 9 and again on December 14, 1971, indicated that they had increased in size and appeared to mirror the shape of an ancient landslide on the upper half of Pillar Mountain. The cracks or fractures were as much as 1 m (3 ft) wide. During our field observations on August 3 and 4, 1976, some cracks were as much as 1.2 m (4 ft) wide. We also noted a crack at about altitude 343 m (1,125 ft) that is not shown on Plate 1. Plate 1 is a copy of a geologic map submitted by Dames and Moore to accompany their report to the Alaska Department of Highways (1973). The crack we noted at altitude 343 m is in the vicinity of S-1 on Plate 2.

Esch and Slater (1971) estimated displacement between December 5 and December 10, 1971, to be about 1.5 m (5 ft). A comparison of survey
points (C-1 and C-2, Pl. 1) between 1968 and September, 1972, revealed that the uppermost of these points (C-1) apparently moved toward the lower (C-2) a distance of about 3.7 m (12 ft) (Dames and Moore, 1973).

To maintain traffic between Kodiak and part of the Island south and west, remedial measures were taken at the landslide. At the suggestion of Dames and Moore (1973), Maccaferri Gabions (rectangular or square baskets of woven wire) filled with rock were placed between the highway and the landslide area, mainly to prevent rockfall debris from falling upon the highway at the base of the slide.

Geology

Mappable units of the Pillar Mountain landslide area, which consist of unconsolidated deposits and bedrock, are shown on Plate 1. The unconsolidated deposits are talus (Qls), thin veneer of slide debris (Qls.), and ancient slide debris (Qlsa and Qlsa.). The map area on Plate 1 that is not ascribed to any particular unit is a thin veneer of colluvium and local glacial debris overlying bedrock.

The bedrock (br) consists of dark-gray to black, fine-grained slate and argillite interbedded with lesser amounts of graywacke. The fine-grained rocks range from thickly bedded slate to more massive beds of argillite. The slates, in which bedding typically parallels cleavage, commonly split readily into thin, platy fragments. Individual beds of slate and argillite range in thickness from less than 25 mm (1 inch) to 0.3 m (1 foot); the more massive argillite and graywacke beds are as much as 6 m (20 ft) thick. The bedding strikes N25°E to N40°E and dips northwest from 40° to 70°.
The southeast face of Pillar Mountain, which contains the landslide, is about 381 m (1,250 ft) high. The overall slope is slightly steeper than 1.5:1 (horizontal:vertical) with portions approaching 0.5:1.

There are at least four joint sets at Pillar Mountain (Dames and Moore, 1973). One set strikes N38°E to N48°E and dips S70°E to vertical. A second set strikes N61°E to N81°E and dips N68°W to S75°E. The third set strikes N75°W to N83°W and dips 75° to S1°NE. The fourth set strikes N25°W to N36°W and dips S68°W to vertical. At the intersection of these joints, the slate, argillite, and graywacke disintegrate into small rock fragments, and occasionally into large boulder-sized blocks.

Measurements of displacement

To determine the nature of failure occurring at the Pillar Mountain landslide and to estimate the nature of future activity, two slope-indicator casings were installed by Alaska Department of Highways in the landslide block at the locations shown on Plate 2 as D.H. 1 and D.H. 2.

D.H. 1, placed at an altitude of about 273 m (895 ft), is a 124-mm-(4 7/8-inch-) diameter hole 55.2 m (181 ft) deep drilled in early fall of 1972 within an area of surface cracking above the exposed bedrock. The second boring, D.H. 2, was drilled to a depth of 16.9 m (55.5 ft) at a location west of the talus cones (Qls.), above the new city of Kodiak dock, at an altitude of about 44.2 m (145 ft). Sometime before February 11, 1975, D.H. 2 became distorted. On a visit to the site, after February 11, 1975, Slater attempted to take a reading in the hole but was unable to get the sensor down the casing. He looked in the hole with a mirror but was unable to see the bottom because of a marked curve in the casing.
about 9.2 m (30 ft) from the surface. At the time of the inspection, Slater felt that the obstruction was most likely produced by improper installation of the casing. Based on recent data and observations, he now believes that it may have been caused by movement of the bedrock.

D.H. 1 penetrated fracture zones, resulting in loss of drilling fluid circulation at depths of 10.7 m (35 ft), 16.8 m (55 ft), 17.7 m (58 ft), 20.6 m (67.5 ft), 21.6 m (71 ft), 26.8 m (88 ft), 34.2 m (112 ft), 37.2 m (122 ft), 39.3 m (129 ft), 39.9 m (131 ft), 41.0 m (134.5 ft), 49.4 m (162 ft), 50.9 m (167 ft), 52.1 m (171 ft), 54.6 m (179 ft), and 55.2 m (181 ft). The largest cracks encountered were in the intervals 39.3 m to 41.0 m (129 to 134.5 ft) and 54.6 to 55.2 m (179 to 181 ft). Since fluid loss at the 55.2-m (181-ft) depth could not be controlled, the boring was terminated at that depth. D.H. 2 encountered fractures at depths of 1.2 m (4 ft) and 10.7 m (35 ft).

Slope-indicator readings on D.H. 1 (fig. 4) indicate a displacement of about 127 mm (5.0 in) in a S10°E direction between the initial reading on September 25, 1972, and readings on August 3, 1976 (plotted as dashed vector, Plate 2). More than one-half of the total displacement occurred between the depths of 33.8 to 49.1 (111 to 161 ft). Nearly 25 mm (1 in) of movement was recorded in the lower 6.1 m (20 ft) of the hole and the data do not conclusively prove that the casing extends entirely through the landslide.

To determine the amount of displacement at the bottom of the hole the U.S. Geological Survey contracted R & M Consultants, Inc., Anchorage, Alaska in 1976 to reoccupy survey points established on Pillar Mountain in 1972. The results of the survey are shown on Table 1 and displacements
Figure 4. Slope indicator data, D. H. 1, showing amount of displacement between September 25, 1972, and August 3, 1976.
Table 1. -- Summary of coordinate measurements of survey control points at Pillar Mountain, Kodiak Alaska

(Survey by R & M Consultants, Inc., 1976)

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Control Point  | Displacement | Direction       |
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plotted on solid-line vectors on Plate 2. The data are not conclusive. Movement of four of the five survey points was consistent with features observed on the landslide surface. However, the collar of D.H. 2, the unusable slope indicator installation, apparently moved uphill more than 51 mm (2 in) between October, 1972, and October, 1976. This may be the result from a rotational slide. We cannot conclusively prove this with the available data.

There is an apparent discrepancy of the data in D.H. 1. The slope-indicator data suggest 127 mm (5 in) of downslope movement between the top and bottom of the casing. The surface survey of the same point suggests 165 mm (6.5 in) of downslope displacement. The slope-indicator data suggest that movement may be occurring below the slope-indicator casing. We believe that this may be so and that the 38 mm (1.5 in) apparent discrepancy may in fact be a record of displacement below the casing between October, 1972 and October, 1976.

Slide stability

Geologic reconnaissance of the region around Pillar Mountain was made on August 4, 1975, to determine the stability of the slopes underlain by bedrock and terrain similar to that under the slopes of Pillar Mountain. The reconnaissance indicated that mountain faces to the northeast and southwest of Pillar Mountain contain numerous landslides that probably occurred after glacial ice retreated from the area. These ancient landslides moved essentially to the base of the slopes and presumably are now stable. This is not the case in the Pillar Mountain landslide, however. We noted an ancient landslide scarp at about altitude 343 m (1,125 ft) that had a displacement of about
7.6 to 13.7 m (25 to 45 ft). This suggested that the Pillar Mountain landslide is an ancient slide that had not slid to the base of the slope and is still potentially unstable.

To determine whether the Pillar Mountain landslide had, in the past, slid to the bottom of the slope, we made an analysis of the offshore bathymetry at the base of the mountain. The study showed a large submarine basin with an average depth of 12 fathoms (fig. 5). On either side of the basin, the depth of the water is about 9 fathoms, or about 3 fathoms shallower than the basin. Although it is possible that the basin is a feature of marine processes, we believe it may exist because ancient slides on both sides of Pillar Mountain slid to the base of the slope or into Inner Anchorage, resulting in the relatively shallow depths below them.

We learned in the fall of 1977 that the new city of Kodiak dock at the base of Pillar Mountain (A, fig. 2) is undergoing displacement. Five slope-indicator borings drilled to bedrock have been placed in the dock to measure displacement. The cause of the inferred displacement is unknown. It may be because of displacement in the fill or more deep-seated. The dock is at the base of an old landslide identified as Qlsa₂ in figure 2.

Discussion and conclusions

The base of the Pillar Mountain landslide cannot be identified clearly by the data available. The data do indicate, however, that movement in the vicinity of D.K. 1 is occurring to a depth of 54.9 m (180 ft) or greater. Failure plane A, identified on the cross section
Figure 5. Bathymetry of Inner Harbor, Kodiak, Alaska. Soundings in fathoms, datum MLLW; scale 1:20,000; from NOAA Chart No. 16595—Kodiak and St. Paul Harbors, May 10, 1975.
of Plate 2, assumes failure at about 54.9 m (180 ft). This suggests that there could be about 3.8 million m$^3$ (5 million yd$^3$) of material moving downslope. However, movement could be occurring at a greater depth indicated by Failure Plane B on the cross section of Plate 2. If such is the case, there could be approximately 7.6 million m$^3$ (10 million yd$^3$) of material moving downslope. The data also suggest that movement is occurring along different planes in the landslide mass (fig. 4). It is not known if the planes at which movement is occurring are interconnected. Therefore, we do not know if single or multiple surfaces have developed.

Movement of the Pillar Mountain landslide continues, although it has decelerated relative to the movement observed in December, 1971. Figure 6 shows time versus displacement between September 25, 1972, and August 3, 1976, at a depth of 33.8 m (111 ft) in D.H. 1. Because of the limited number of observations, we are unable to define the type and nature of movement.

Kodiak is in a zone of high seismic activity, and although the 1964 earthquake did not accelerate or rejuvenate the ancient Pillar Mountain landslide, seismic stresses from future earthquakes may do so. Since the removal of material to construct the new city of Kodiak dock took place after the 1964 earthquake, the performance of the Pillar Mountain landslide during a future earthquake should not be evaluated in the light of lack of activity in 1964. In an abnormally high rainfall season the numerous cracks that developed after December 5, 1971, could collect sufficient water to saturate the landslide mass. If positive pore pressures develop as a result of this saturation, accelerated sliding could occur.
Figure 6. Graph showing time vs. displacement at a depth of 111 feet (33.83 m) in D.H.1, Pillar Mountain Landslide, Kodiak, Alaska.
Although the rate of movement of the Pillar Mountain landslide has decelerated since its initial movement in 1971, it is possible that a rapidly moving landslide could develop. If such a landslide did occur, it is possible that it could move into Inner Anchorage. The critical question is: would the slide generate a wave, block the harbor, or otherwise adversely affect the city of Kodiak and its environs?

Kachadoorian and Plafker (1967), in investigating the seismic waves that inundated and devastated much of Kodiak during the 1964 earthquake, reported the maximum wave generated by the 1964 earthquake to be 3.90 m (12.8 ft) superimposed on a zero tide. The most damaging wave at Kodiak was a 3.48-m (11.4-ft) wave superimposed on a 2.26-m (7.4-ft) tide. On this basis, the height of the wave that would adversely affect Kodiak is about 3.05 m (10 ft). Mean higher high water referred to a datum of Mean Lower Low Water (MLLW, 0.0 m) is 2.6 m (8.6 ft) at Kodiak. The mean tide level is 1.3 m (4.3 ft). A 3.05-m (10-ft) wave superimposed upon the mean tide would give a 4.36-m (14.3-ft) wave above MLLW.

Of the many parameters that determine the height of a landslide-generated wave, one of the most critical is the velocity of the sliding mass. Our data do not permit a refined determination of the potential velocity of the Pillar Mountain landslide if it were to fail completely and slide to the base of the mountain into Inner Anchorage. They do, however, permit us to make a reasonable estimation of the velocity.

Shreve (1965) computed the minimum velocity of the Sherman landslide which was triggered by the Alaska earthquake of 1964, on the assumption of simple conservation of energy. Banks and Strohm (1974) report that the equation used by Shreve was: 18
\[ v^2 = 2gs(\sin i - \tan \varnothing \cos i) \]

where: \( v \) = velocity down the slide plane
\( g \) = gravitational constant
\( S \) = distance of sliding of centroid parallel to the plane
\( i \) = slope angle of plane
\( \tan \varnothing \) = equivalent coefficient of friction equal to ratio

between height of fall and horizontal distance traveled

with respect to centroid of sliding block.

Using Shreve's equation, we considered two cases to compute the
potential velocities of the Pillar Mountain landslide upon complete
failure. Case 1 assumes that the sliding mass is from the surface to
the failure plane labeled A on the cross section of Plate 2. Case 2
assumed failure on the plane labeled B. The centroids for both cases
are shown on the cross section.

The assumptions in Case 1 are:
\( S = 186.9 \text{ m (610 ft)} \)
\( i = 34^\circ \)
height of fall, relative to centroid = 76.2 m (250 ft)
horizontal distance travelled, relative to centroid = 167.6 m
(550 ft)
\( \tan \varnothing = 76.2 \text{ m/167.6 m (250 ft/550 ft)} = 0.455 \)

Case 2 assumptions are:
\( S = 277.4 \text{ m (910 ft)} \)
\( i = 36^\circ \)
height of fall, relative to centroid = 152.4 m (500 ft)
horizontal distance travelled, relative to centroid = 228.6 m (750 ft)

\[ \tan \theta = \frac{152.4 \text{ m}}{228.6 \text{ m}} = 0.667 \]

Based on the above assumptions, the velocity in Case 1 is about 25.6 m/sec (84 ft/sec). The slide will have a ballistic trajectory once it leaves the face of Pillar Mountain. The velocity of the slide in case 2 is about 16.2 m/sec (53 ft/sec). These velocities are comparable with the 18 m/sec (60 ft/sec) velocity calculated by Hsu (1960) for the Vaiont Reservoir Landslide, Italy, and are about one-half the peak velocities of 37-46 m/sec (120-150 ft/sec) that are possible in rockslides (Banks and Strohm, 1974).

A critical question then is: what is the consequence of a large mass estimated to be as much as 3.8-7.6 million m³ (5-10 million yd³) sliding into Inner Anchorage at the velocities given? The Waterways Experiment Station at Vicksburg, Miss. constructed physical and mathematical models to predict wave characteristics resulting from landslide into Koochansu Reservoir at Libby Dam, Mont. Comparing the results of their studies (Davidson and Whalin, 1974; Raney and Butler, 1975) with conditions of the Pillar Mountain landslide area, we believe it possible that a 3.05-m (10-ft) wave could be generated. A 3.05-m wave could damage the city of Kodiak, the extent depending in part on the tidal stage at the time the wave occurred.

Admittedly, the data do not provide a conclusive prediction of danger to Kodiak. The evidence of movement to great depths, enlargement of cracks, and harbor bathymetry do suggest that the slope is failing. Predictions of slide velocity and resulting wave heights are necessarily speculative. A high-velocity landslide of large volume reaching...
Inner Anchorage could be serious.

In conclusion, we infer that Pillar Mountain landslide poses a potential hazard to the city of Kodiak and its environs. Additional data are needed for a more exact evaluation of the potential hazard posed by the landslide.

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Earthquake Potential and Ground Motions for the Pillar
Mountain Landslide, Kodiak, Alaska

by

George W. Moore, Robert A. Page, and John C. Lahr

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This report is preliminary and has not been reviewed for conformity with U.S.
Geological Survey editorial standards.
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INTRODUCTION

This report has been written in response to a request from the City of Kodiak for an estimate of the maximum earthquake accelerations that are likely in the vicinity of the city, so their potential for possibly triggering movement on the Pillar Mountain landslide may be considered. A warning of possible increased movement at the landslide, which lies above part of Kodiak Harbor, was issued two years ago (Kachadoorian and Slater, 1978), and since then several organizations have investigated various aspects of the situation further. This report deals with the regional geologic framework, the presently active geologic processes, the earthquake history, the potential for faulting along the two main types of faults that cut the region, and the likely accelerations from earthquakes on those faults.

GEOLOGIC FRAMEWORK AND ACTIVE GEOLOGIC PROCESSES

The City of Kodiak is underlain by the Kodiak Formation, a firm dark-gray bedrock unit of Late Cretaceous age (Moore, 1969). This formation consists of thinly interbedded slate and hard impure sandstone (graywacke), believed to have originated from deep-sea trench deposits (Nilsen and Moore, 1979). The deposits were strongly compressed and mildly metamorphosed when they were squeezed between two tectonic plates which converged at the former trench. The outcrop of the boundary between the presently active Pacific and North American plates is farther seaward than the Kodiak Formation. It is at the Aleutian Trench, 170 km seaward from Kodiak.
Since its lithification, the bedrock at Kodiak Island has been uplifted from former great depth to the level of its present outcrops, and erosion has removed the covering materials. Glacial ice during the Pleistocene Epoch was the most recent major eroding agent. After stripping the terrain down to fresh bedrock, the moving ice carried nearly all the resulting debris offshore. Glacial abrasion smoothed the terrain and at most low-lying places on Kodiak Island left relatively gentle hillslopes. At Pillar Mountain, however, it carved an unusually steep slope, and that steepness is the principal cause for the Pillar Mountain landslide.

Southern Alaska is one of the most earthquake-prone areas in the world, and the convergence of the Pacific and North American plates causes the earthquakes (Lahr and Palfker, 1980). On the basis of computer analysis of worldwide plate-boundary slip vectors and seafloor-spreading rates, the Pacific plate at the Aleutian Trench near Kodiak is underthrusting the North American plate in the direction N. 24° W. at a long-term average rate of 6.7 cm/yr (Minster and Jordan, 1978). The upper surface of the underthrust plate lies approximately 25 km (15 mi) below the City of Kodiak and dips about 7° away from the ocean basin (von Huene and others, 1979). Farther to the northwest, where the upper surface of the underthrust Pacific plate reaches the base of the North American plate 85 km below the volcanoes of the Alaska Peninsula, the dip steepens gradually to 40°. Geologists infer that low-density magma derived from easily melted crustal layers on the descending plate rises buoyantly to produce the volcanoes.
HISTORIC SEISMIC RECORD

The record of past seismicity is important both as a basis for determining the regional tectonic regime and for estimating the probable return time for great \((M_s > 7.7)\) events. The distribution of earthquake epicenters near Kodiak Island since January 1967, based on the National Oceanic and Atmospheric Administration (NOAA) Environmental Data Service earthquake data file, are shown in Figure 1. A subset of these data with good depth control (precision of about 10 km for one standard deviation) is shown in cross section in Figure 2. The dominant feature to note on this cross section is the distribution of Benioff zone events which occur at or near the upper surface of that portion of the Pacific plate that has been thrust below Alaska. The earthquakes shallower than 40 to 60 km are predominantly thrust events and reflect slip at the interface between the underthrust oceanic and overlying continental plates. Great thrust earthquakes, such as the 1964 Prince William Sound shock, occur in this setting, that is, at shallow depth on the interface between the two plates. Below 40 to 60 km, earthquakes occur within the upper part of the underthrust oceanic plate and reflect brittle failure within the relatively cool downgoing plate rather than slip on the interface between the plates. Also seen in Figure 2 are shallow-focus earthquakes within the wedge of crust above the active megathrust zone and near the axis of the active volcanoes. The shallow earthquakes occur on smaller faults related to the main underthrusting along the shallow part of the Benioff zone.

There are limitations to the data available in the NOAA file for this region. The plot of magnitude versus time since 1900 in Figure 3 clearly
reveals the incompleteness of the data set at small magnitudes during older times. Since the 1950's, for example, the magnitude threshold for earthquake location has improved from about 5 to about 2. The available data are not sufficient at the present time to assign with confidence the events shallower than 35 km to mapped or inferred faults, or to delineate near-surface faults on the basis of seismicity.

Old faults are ubiquitous on the island, and some earthquakes may take place along their reactivated strands (Pulpan and Kienle, 1979). But known faults with significant late Cenozoic displacement are confined to a zone along the southeast coast of the island—for example, 30 km from Kodiak at Narrow Cape (Moore, 1967)—or are still farther southeastward on the continental shelf along a zone parallel with the Aleutian Trench (Fisher and von Huene, 1980; von Huene and others, 1980).

The zone of surface deformation off the southeast coast of Kodiak Island is an extension of the zone of ancient faulting that was reactivated in part during the 1964 earthquake and came ashore to the northeast on Montague Island. The deformed zone parallels contour lines of equal elevation change accompanying the 1964 earthquake. The changes ranged from about 2 meters of subsidence at Kodiak to 2 meters of uplift on the shelf (Plafker, 1972; von Huene and others, 1972).

The near-surface earthquakes in the vicinity of Kodiak are within the thin wedge-shaped edge of the North American plate and probably result from strain changes both preceding and following great earthquakes. The lack of recognized young displacement on faults near the City of Kodiak suggests that the movement along faults there is small and infrequent, or possibly not consistently in the same direction, so as to cumulate during successive earthquakes.
Effects at Kodiak from the 1964 Prince William Sound earthquake of magnitude 8.5 have been well documented (Kachadoorian and Plafker, 1967). From the start of faulting at the earthquake focus under Prince William Sound, 450 km to the northeast, the rupture propagated southwestward passing under the City of Kodiak and approximately 150 km beyond to the southwest end of Kodiak Island. Although earthquakes similar to the 1964 earthquake are expected in the future, it is difficult to estimate their frequency of occurrence. Estimates of the average dip slip during the 1964 shock range from 7 meters inferred from the radiation pattern of seismic surface waves (Kanamori, 1970) to 12.2 meters calculated from geodetically and geologically measured horizontal and vertical displacements (Hastie and Savage, 1970). If the convergence between the Pacific and North American plate were to occur episodically in earthquakes similar to the 1964 event, then the long-term average convergence rate of 6.7 cm/yr (Minster and Jordan, 1978) would suggest a recurrence time of about 100 to 200 years. This estimate is a minimum because no allowance is made for plate convergence being accommodated in nonseismic plastic deformation or for the contribution of other large shocks somewhat smaller than the 1964 earthquake.

The historic instrumental record extends only back to 1897, and then only for the largest events. Sykes and others (1980) have reviewed many Russian documents in order to extend the record for large shocks back to the 1780's. By their analysis, large events producing strong shaking and numerous aftershocks occurred near Kodiak in 1788 (produced vertical deformation of the coastline, and landslides), 1792 (produced local tsunami), 1844, 1854 (produced local tsunami), and 1900. Although instrumental data are not available for the events prior to 1897, the descriptions of their effects
suggested to Sykes and others (1980) that the magnitudes were most likely in
the range 7.7 or above. Thus, the interevent time for great shocks in the
vicinity of Kodiak based on sparse data from 1788 to 1964 has ranged from 4 to
64 years, and averaged 35 years.

GROUND MOTIONS

Based on the historic record of seismicity and current knowledge of the
seismotectonic setting, it is recommended that two types of earthquakes be
considered in evaluating the seismic stability of the Pillar Mountain
landslide. The first is a great earthquake on the Aleutian megathrust similar
to the 1964 shock, occurring on the gently dipping interface between the
Pacific and North American plates and extending directly beneath Kodiak. The
other is a local M 6.5 shock occurring on an unspecified near-surface fault at
a distance of 10 km from the site. These two events are chosen, not because
they are the most probable earthquakes, but because they would produce the
most severe shaking at the Pillar Mountain site.

During the past ten years, numerous instrumental recordings of strong
ground motion have been obtained within a few tens of kilometers of faults
elsewhere during earthquakes of about magnitude 6.5. Based on these data, the
peak horizontal bedrock acceleration most likely to be expected at a site 10
km from the fault in a magnitude 6.5 earthquake is about 0.3-0.4 g (Boore and
others, 1978; Boore and Porcella, 1980). The 90th percentile estimate of peak
acceleration, which is the value that has only a 10 percent chance of being
exceeded, is approximately twice as large. The duration of shaking, measured
as the time interval between the first and last horizontal acceleration peaks
equal to or greater than 0.05 g, is expected to be in the range of 10-20 seconds.

No instrumental recordings of strong ground motion have been obtained within 100 km of a fault during an earthquake of magnitude 8.0 or greater. At the time of the 1964 earthquake, no strong-motion seismographs were operating in Alaska. Thus, there are no instrumental data from great earthquakes to constrain estimates of shaking occurring on the Aleutian megathrust, 25 km beneath the site. Some investigators argue that ground accelerations close to the fault in a magnitude 8 earthquake are comparable to or not much greater than in a magnitude 6.5 shock. Others allow that near-fault accelerations may increase with magnitude above magnitude 6.5. In this case, the consequences of a sudden earthquake-induced landslide could be catastrophic, so presumably only a small risk of occurrence is tolerable. It would be reasonable therefore, to assume that the peak horizontal bedrock accelerations at the site during the postulated magnitude 8.5 earthquake would be significantly greater, perhaps by a factor of two, than those from the local magnitude 6.5 earthquake. The duration of shaking referred to the 0.05 g threshold amplitude of motion would also be substantially greater for the magnitude 8.5 earthquake, perhaps by a factor of three to five. During the 1964 earthquake, intense ground motion at Kodiak is reported to have lasted for approximately 2 1/2 minutes, with perceptible motion lasting an additional 2 to 3 minutes (Kachadoorian and Plafker, 1967, p. F19). What level of accelerations correspond to the intense phase of shaking is not known, however, the minimum perceptible level of acceleration is 0.001 g (Richter, 1958, p. 26).
The above estimates of peak horizontal accelerations for the two postulated earthquakes can be compared to probabilistic estimates taken from two recent maps of peak accelerations that include the Kodiak region. Woodward-Clyde Consultants (1978, v. 3, fig. 3-17) estimate the 100 year return-period peak horizontal acceleration to be about 0.3 g. Thenhaus and others (1979, plates 2 through 4) estimate peak accelerations of about 0.2, 0.4, and 0.6 g for return periods of 100, 500 and 2500 years, respectively. (There is about a 10 percent chance of exceeding the 100-year return-period value in 10 years, the 500-year value in 50 years, and the 2500-year value in 250 years.) Both of these studies assume that near-fault horizontal fault accelerations on rock do not exceed 1.0 g. Recent strong-motion recordings close to moderate-sized earthquakes (for example, Brady and others, 1980) suggest that this assumption may have to be modified once near-fault strong-motion records are obtained from earthquakes of magnitude 7 or larger.

As a parameter for use in evaluating slope stability, peak ground acceleration has limited utility. More important information is the duration of shaking above the critical acceleration, which is the acceleration needed to initiate sliding and which is a function of the geometry of the slide and the slip surfaces, the geotechnical properties of the slide materials, and local hydrologic conditions. If a physical model of the Pillar Mountain landslide were developed through further field investigations, then a dynamic analysis of its stability under earthquake loading could be undertaken and potential displacements during postulated earthquakes could be estimated (Wilson, 1979). For such analyses, representative time histories of bedrock accelerations would be needed. Representative time histories for the magnitude 6.5 shock could be selected from the suite of existing strong-motion
recordings, but the time history for the magnitude 8.5 earthquake could only be approximated by a theoretical record synthesized from strong-motion data from smaller shocks.

DISCUSSION

The thin-beded slaty rocks of the Kodiak Formation at the landslide dip into Pillar Mountain. The slip surfaces of the bedrock blockslide consist of rupture zones containing disaggregated fragments bounded by bedding cleavage and joints. Because the Pillar Mountain landslide is known to have moved, and because a total of about 20 meters of displacement has occurred on slip surfaces at its head, the critical acceleration has clearly been exceeded many times during the post-glacial period. If most of the movement of the blockslide has occurred during and immediately following great earthquakes, the average recurrence interval of 35 years for great earthquakes and the 10,000 years since the Pleistocene Epoch indicate an average movement on the order of 10 cm for one event.

Continued movement of this type causes less reason for concern than the possibility that a future earthquake or other process might reduce the resistance to sliding. If rock fragments are rotated into an unstable condition along a critically oriented slip zone, a high-speed rockslide along a slope of approximately 40° might take place (Kachadoorian and Slater, 1978).

At the present stage of investigation, work should continue that will define the rupture surfaces on which movement has occurred in the past, giving
special attention to the upper parts of the blockslide for surfaces of weakness that might favor a high-speed rockslide or rockfall. When that has been done, the accelerations of this report can be used to estimate the potential for generating a rockfall, and appropriate remedial action can be undertaken.
REFERENCES CITED


Wilson, R. C., 1979, Numerical simulation of the interaction of strong ground motion with seismically induced landslides [abs.]: Earthquake Notes, v. 49, no. 4, p. 34

Figure 1. Seismicity of Kodiak region, 1 January 1967 through July 1978. Triangles indicate focal depths of less than 50 km; crosses, 50 km or more. Smallest symbols indicate magnitudes of less than 3; intermediate, 3 to 6; largest, 6 or greater. Total of 655 shocks are plotted, of which only three are magnitude 6.0 or greater. Earthquake foci with poor depth control are included in the less than 50 km depth category.

Figure 2. Cross section of subset of seismicity shown in Fig. 1, projected on a vertical plane along line A-A'. Hypocenters determined by the University of Alaska and archived in the NOAA data file are shown for shocks from April 1976 through September 1977. These data better reflect the true depth distribution than do those of Fig. 1, because arrival times at local seismograph stations were used to determine the hypocenters. Symbol size indicates magnitude range, as in Fig. 1. Volcanic arc is indicated by V, Kodiak by K.

Figure 3. Seismicity in the area of Fig. 1, as recorded in the earthquake data file of the National Oceanic and Atmospheric Administration. Each event plots as a point at the corresponding time and magnitude. Events for which no magnitudes have been assigned are plotted on the horizontal axis. The vertical band in 1964 represents aftershocks of the great Prince William Sound earthquake.
Offshore Survey of the Pillar Mountain Landslide, Kodiak, Alaska

by

George W. Moore

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INTRODUCTION

A landslide extends to a height of about 340 meters above Kodiak Harbor on the southeast flank of 388-meter-high Pillar Mountain, about 2 kilometers west of the center of the City of Kodiak, Alaska (Fig. 1). The landslide involves thinly interbedded slate and impure sandstone (graywacke) of the Kodiak Formation of Late Cretaceous age. It is overlain on its lower slopes by a talus derived from this rock.

The landslide attracted special attention in 1971, when accelerated growth of the talus temporarily closed the shoreline highway. Subsequent investigation revealed the existence of the landslide in the bedrock (Kachadoorian and Slater, 1978), and, following established procedure (U.S. Government, 1977), the U.S. Geological Survey issued a Notice of Potential Hazard.

The main concern raised in the hazard notice was that at some future time a rock avalanche might descend Pillar Mountain and displace water in the harbor, possibly inundating part of the City of Kodiak. Former glaciers during the Pleistocene Epoch had oversteepened the face of Pillar Mountain, which now has a slope of about 45°, and fast moving landslides on such steep slopes elsewhere have been devastating (Keefer and others, 1978).

After the notice was issued, the City of Kodiak established the Pillar Mountain Geotechnical Committee (Schaff and others, 1979). The committee recommended several studies of the landslide. These included onshore geologic mapping, which delineated the main part of the slide and tension cracks at its head (Brown, 1980); and core drilling, which revealed weathered fractures to
a depth of about 140 m at the center of the slide (Lappi, 1980). The city requested assistance from the U.S. Geological Survey to evaluate the earthquake ground motions that might affect the landslide (Moore, Page, and Lahr, 1980), and to conduct a marine-geophysical survey of the area offshore from the slide, which is the subject of this report.

Objectives of the offshore survey were (1) to help define the toe of the landslide; and (2) to gather information about any past rock avalanches that may have originated from Pillar Mountain and left a record offshore.

Other U.S. Geological Survey staff members in the scientific party for the investigation at Kodiak Harbor were Harry R. Hill, Rex Sanders, and A. Richard Tagg. On behalf of the city, Laurence R. Monroe, Kodiak City Engineer, George McCorkle, Harbormaster, and Dr. Ronald Brockman, owner and captain of the survey vessel, provided valuable support. During the course of this study, I have benefited from suggestions by Robert W. Fleming, David S. McCulloch, Gerald F. Wieczorski, and Raymond C. Wilson.

SURVEY METHODS

The Sea Surgeon, a fishing boat 12 m long chartered by the City of Kodiak, was used to collect the data for this survey on October 15 and 16, 1980. The boat maintained an average speed along the tracklines of 4.2 km/hr (2.3 knots), and a microwave navigation system on the vessel measured ranges from repeater stations set up along the shore. A computer processed the ranges and plotted the track on a chart recorder aboard the vessel. The precision of location is within about 5 meters for points plotted along the track (Fig. 1).

Three acoustic-profiling systems used echoes at different sound frequencies to draw profiles of the seafloor and of the sediment layers below the seafloor. The three systems, which in combination provided both good bed-to-bed resolution and moderately good subbottom penetration, had the following characteristics:
(1) electrically pulsed crystal (echo sounder) produced sound waves at a frequency of 200 kHz, with good resolution of the seafloor and negligible seafloor penetration; (2) pulsed crystal, frequency 3.5 kHz, resolution between subbottom layers 0.5 m, penetration 10 m; (3) electromagnetically pulsed metal plate, frequency 1 kHz, resolution 3 m, penetration 50 m. Records from the three acoustic systems were used to prepare true-vertical-scale longitudinal and transverse profiles of the area offshore from the Pillar Mountain landslide (Fig. 2 and 3).

A side-scan sonar was used to map the harbor floor between the profiles. The sonar (100 kHz), which was towed amidships close to the hull, recorded seafloor irregularities out to a distance of 100 m on the port side of the vessel. Because the trackline grid has a spacing of about 100 m, the side-scan sonar saw most parts of the harbor floor, and it viewed some areas from several directions.

The original records from this survey may be studied at the U.S. Geological Survey Marine Data Center at 3475 Deer Creek Road, Palo Alto, California 94304 (415-856-7132). Microfilm copies of the subbottom, echo-sounding, and side-scan records may be purchased from the National Geophysical and Solar-Terrestrial Data Center, Code D621, 325 Broadway, Boulder, Colorado 80303 (303-497-6542).

SURVEY RESULTS

The floor of the harbor between Pillar Mountain and Gull Island, 700 m offshore, is relatively smooth, with an average depth of 20 m. Evidence from onshore areas and the islands indicates that the floor of the harbor, below a layer of weakly consolidated sediment, is underlain by a glacially smoothed bedrock surface. The subbottom profiles show that the average slope of the lower sediment layers from the shoreline to the middle of the basin is about 7°. The total depth of the basin in the center of the harbor, including both the water and the sediment, is about 50 meters.
Holes drilled near the shore during engineering investigations for the Kodiak Container Dock show that the bay-floor sediment there ranges up to 15 m thick (Lamont, 1971). The base of the sediment is a sandy gravel 2 to 8 m thick that rests directly on bedrock. Above the sandy gravel, the sediment is mainly silt.

The subbottom profiles show that many of the sediment layers in the bay-floor sediment are nearly planar, but locally they are folded and fractured (Fig. 2 and 3). Also, some subbottom reflectors cut across the reflections that are interpreted to be from the bedding. These crosscutting reflectors are believed to be low-angle shear surfaces.

The main area of reflections interpreted to be from folded bedding and shear surfaces extends offshore from Pillar Mountain for about 500 m, or about three-quarters of the way to the low glacially sculptured bedrock mound that constitutes Gull Island. It extends from Gibson Cove to a position halfway between the Kodiak City Dock and the Inner Harbor breakwater, a length along the shore of about 1500 m.

A conspicuous but relatively short 3-m uplift marks the seafloor outcrop of an apparent subbottom shear surface 150 m beyond the northeast end of the Kodiak Container Dock on trackline 30 (Fig. 2 and 4). It probably is not simply a heave ridge from artificial loading at the container dock, because the radii of ridges from such loading usually do not much exceed the thickness of the mud, there about 15 m thick. This shear surface and uplift may represent a place where fairly recent movement associated with the landslide has broken to the seafloor.

Prominent features of the deformed sediment in the harbor are several broad anticlinal ridges, generally parallel with the shore (Fig. 1). These features are about 200 m wide and as much as 9 m high. They contain slightly arched but otherwise fairly regular internal stratification. They are underlain
by crosscutting reflectors, interpreted to be shear surfaces (Fig. 2 and 4, line 30).

The regular internal stratification indicates that the ridges are not rubbly mounds of landslide material that moved downward from the face of Pillar Mountain and across the basin to their present position. They are also unlike constructional glacial features such as drumlins, which generally lack internal reflections on subbottom profiles.

I interpret the deformation of the harbor sediment as being related to push from the Pillar Mountain landslide (Fig. 5). Why the deformation should occur so far from the onshore landslide is puzzling. Possibly the deformation occurred during major earthquakes, when the bay sediment was being shaken at the same time that the onshore landslide moved slowly downward.

REFERENCES CITED


FIGURE CAPTIONS

Figure 1. Survey tracklines, onshore landslide features, and offshore geologic structures extrapolated to the seafloor near Kodiak, Alaska; 5-minute time marks along the tracklines are in Greenwich mean time, 15-16 October 1980.

Figure 2. Selected longitudinal profiles off the Pillar Mountain landslide, perpendicular to the shoreline and approximately 100 meters apart, showing subbottom reflectors interpreted to be sediment beds and shear surfaces. Time marks on the profiles are located on the tracklines of Figure 1. The profiles are mainly based on acoustic-reflection profiles at a sound frequency of 1 kHz, supplemented by profiles at 3.5 kHz and 200 kHz. The sound velocity assumed for the water is 1.5 km/s, and for the strata, 2.0 km/s. The datum is mean sea level, 1980.

Figure 3. Selected transverse profiles off the Pillar Mountain landslide, parallel with the shoreline and approximately 100 meters apart. Time marks on the profiles are located on the tracklines of Figure 1.

Figure 4. Nearshore half of the 1-kHz subbottom profile along trackline 30, perpendicular to the shoreline and approximately off the middle of the Pillar Mountain landslide. The distance between sea level and the crest of the anticlinal ridge is 15 meters, giving a vertical exaggeration of 3.9 times.

Figure 5. Sketch of relations between the Pillar Mountain landslide, the offshore anticlinal ridge, and the inferred 10° shear surface below the ridge.
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Figure 5. Sketch of relations between the Pillar Mountain landslide, the offshore anticlinal ridge, and the inferred 10° shear surface below the ridge.
IN MEMORIAM

REUBEN KACHADOORIAN
March 30, 1921 - June 30, 1983

Reuben Kachadoorian played a key role in the identification and geotechnical study of the Pillar Mountain landslide. He had a long and colorful career working on a wide variety of other projects in Alaska, including engineering studies of the Denali Highway, the Cape Lisburne area, and the Trans-Alaska Pipeline route. His 30 years of research in the state has done much to further the knowledge of Alaskan geology. At the time of his death, Kachadoorian was geologist-in-charge of the Branch of Alaskan Geology, U.S. Geological Survey, Menlo Park, California.

This professional report is dedicated to an outstanding scientist and an inspiring friend.

Randall G. Unalik
August 1, 1983

Cover photo: Unstable Pillar Mountain poses potential hazard to City of Kodiak (right foreground). Slope instability is indicated by scars and by material from former landslides. Abert Highway at base of mountain; photo shows former highway bisected by debris from major rockfalls in late 1971. St. Paul Harbor in foreground. (Photo courtesy of U.S. Geological Survey; file no. PG 78-33.)
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37. Apparent strain path of survey station 32. ............................................. 16
38. Apparent strain path of survey station 33. ............................................. 16
39. Apparent strain path of survey station 34. ............................................. 16
40. Apparent strain path of survey station 35. ............................................. 16

TABLE

Table 1. Calculated variances, in feet, of north-south (N), east-west (E), and vertical (V) components from the initial measurements of October 30-31, 1978, for each survey station. .................. 6

PLATE

Plate 1. Station positions, Pillar Mountain slide area, Kodiak, Alaska. .................. Envelope
SURVEY-MONITORING SYSTEM, PILLAR MOUNTAIN LANDSLIDE AREA,
KODIAK, ALASKA

By
Randall G. Updike

INTRODUCTION

For nearly two centuries, the community of Kodiak has prospered around Saint Paul Harbor, which is dominated by 1,270-ft-high Pillar Mountain located immediately to the northwest.

Site of a destructive tsunami generated by the Prince William Sound Earthquake of 1964, Saint Paul Harbor has been the focal point of commerce for Kodiak since 1792, when Alexander Baranov, manager of the Shelikhov (later Russian American) Company, selected the site as a fur-trading center because of "its good harbor and close vicinity to good building timber" (U.S. Bureau of Census, 1983, p. 74). The city now hosts a vigorous fishing economy.

Pillar Mountain borders Saint Paul Harbor and rises to a northeast-southwest trending ridge over 1,250 ft high (pl. 1). The steep, harbor-facing slope of the mountain has a long history of localized ground failure. Slope instability appears to have increased over the last 25 yr, due in part to excavation and construction at the mountain base.

Although Pillar Mountain was quarried for road and construction materials through the late 1960s, the Abert Highway (fig. 1) was moved from the lower slope to the base of Pillar Mountain in the late 1960s because of slope instability. In December 1971, major rockfall closed the highway.

At the time of this accelerated mass wasting, the Alaska Department of Highways (now the Department of Transportation and Public Facilities, or DOT) contracted R&M Consultants, Inc., of Anchorage, to establish and survey monuments on the mountain slope. R&M conducted these surveys in December 1971 (after the rockfall), July 1972, and October 1972.

In the fall of 1972, DOT installed two slope-indicator casings in drill holes on the intermediate and lower slopes of the mountain. With the acquired data, DOT contracted Dames and Moore, Inc., to conduct a geotechnical investigation of the slide area (Murphy, 1973).

In 1976, the slope-indicator casings were reoccupied and the monuments were resurveyed by the U.S. Geological Survey and DOT. Kachadoorian and Statler (1976)

reported that progressive slope movement had occurred since 1971-72 and that landslides on Pillar Mountain could range from small-scale failures typical of the mountain to a rapid rock slide large enough to cause a destructive sea wave in Saint Paul Harbor. Such a wave could inflict damages to Kodiak as severe as those of the tsunami from the 1964 earthquake. Consequently, the Director of the USGS, in a May 10, 1978, letter of advice, warned the Alaska State Geologist of the potential geologic hazard to Saint Paul Harbor and the city of Kodiak (Menard, 1978). Because of this, DGGS began monitoring Pillar Mountain in October 1978.

GEOLOGY OF PILLAR MOUNTAIN

Topography, rock types, and bedrock structure contribute significantly to the instability of Pillar Mountain. The glacially oversteepened slope rises more than 2:1 (horizontal to vertical) and in places reaches 1:2. Bedrock consists of interbedded phyllite and graywacke of the Kodiak Formation (Cretaceous), and both bedding and foliation dip steeply toward the northwest. Multiple joint sets penetrate the bedrock. At least two thrust faults strike east-northeast across the mountain slope, dipping to the northwest at angles that appear shallower than those of the bedding. Younger dip-slip faults, striking northeast and northwest, cut across the bedding and the thrust faults. No direct evidence for Holocene activity along these faults has been observed. Numerous surface lineaments that appear over much of the mountain slope strike nearly parallel to the bedding and joints. Fissuring parallels the trends defined by bedrock structure; some lineaments probably represent former fissures.

DGGS INVESTIGATIONS

On August 23 and 24, 1978, I accompanied State Geologist R.G. Schaff and M. Bukovansky (geotechnical engineer) and D. Jones (geotechnical engineer), both of Dames and Moore, Inc., on a helicopter and ground reconnaissance of the southeastern slopes of Pillar Mountain. We observed indications that the surface material of the slope was moving. Numerous ground fissures were evident between the top of the 1971 slide scar and the summit. Disruption of soil and vegetation and the

1DGGS, P.O. Box 772116, Eagle River, Alaska 99577.
Figure 1. Diagrammatic map showing relative location of base stations and reference points.
The abrupt angular configuration of the many open fissures (fig. 2) indicate that they are active. Soil infilling and revegetation suggest that some fissures have been stable for several years. The configuration of the fissures is dictated by separation of bedrock along bedding and joint planes.

The field party concluded that a toppling-type failure was occurring over most of the mountain slope and that it was caused by gravity-induced separations along closely spaced metamorphic-rock cleavage that dips into the mountainside at a steep angle. Water entering and reemerging along structural lineaments also appeared to contribute to slope failure.

The depth to which bedrock is affected by the failure process and the rate of surface movement could not be determined. The field party agreed that if toppling is a shallow phenomenon, there is far less concern for a catastrophic landslide than had been previously contemplated. However, we felt that the observable features (including recent rockfalls) and the survey data reported by the U.S. Geological Survey (Kachadoorian and Slater, 1978) were enough to warrant additional study.

In 1978 Schaff secured state funds to install and operate a new survey monitoring system (fig. 3). A registered surveyor in Kodiak, Roy Ecklund, was contracted to operate the system.

**INSTALLATION OF SYSTEM**

On October 4 and 5, 1978, Ecklund, J.R. Newgaard (DGGS), and I made several traverses of the mountainside and selected sites for monitoring the potential slide mass delineated by Kachadoorian and Slater (1978). Points were selected at the summit near open fissures and at locations (stations 1, 2, and 5) both east and west of the delineated slide zone (stations 14 and 22) (fig. 1). Three points (stations 25-27) were located directly above the slide scarp and another (station 33) was positioned in the southwestern bedrock face of the scarp.

Ecklund supervised the construction of permanent survey stations at the selected points (figs. 1 and 4). Climatic conditions—intense freeze-thaw cycles, high...
winds, occasional heavy snowfall—warranted unusual care in the installation of monuments. The stations consist of 5/8-in.-diam rebar, 24 in. long, set 20 in. into the ground, with at least 12 in. of the rod embedded in rock and reinforced with concrete (fig. 4). Before each set of readings was taken, the mountain was traversed and the integrity of each monument was confirmed.

Base stations were established across Saint Paul Harbor at Gull and near Islands (stations 'Gull' and 'Near 2'). Concrete pads at each base station were poured directly onto bedrock to support the tripod with theodolite. The stations were established by triangulation expansion from U.S. Coast and Geodetic Survey (USCGS) stations 'Fall-1967' and 'Harbor 1-1967' (fig. 1, pl. 1). The control figures consisted of one adjusted quadrilateral based on the zone 5 state plane inverse between the USCGS stations. Elevations of 'Gull' and 'Near 2' were established by reciprocal leveling from 'Fall-1967' with an N1-025 Zena automatic level (accuracy, ±0.025 ft/0.8 mi).

**SURVEY PROCEDURES**

The 'Gull' and 'Near 2' stations, 4,167.19 ft apart, form the base line of the survey network (fig. 5). During the initial survey, the state plane coordinates of the two stations were established (pl. 1). All measurements were made with 010 and 010A Zena theodolites (average

---

**Figure 4. Installation design, observation stations on Pillar Mountain.**
Figure 5. View from intermediate slope, Pillar Mountain, looking toward Near Island (left) and Gull Island (right), where base stations were located. Note survey station in foreground (center), Kodiak harbor headwater at extreme left.

directional error of ±1 sec, direct and reversed positions). Horizontal angles for the initial and subsequent survey sets were turned with station 'Fall-1967' as a backsight. Two survey sets were turned to each point by using the 'Near 2' and 'Gull' stations, and the mean of the two balanced sets was used to calculate the bearing-bearing intersection. Two sets of vertical angles were taken to each point from 'Gull' only, and the mean of the two balanced sets was used to establish the elevations of the point. No curvature or refraction correction was computed. Wind, tidal effects, low winter sun angle, and varied surface conditions (ice, snow, and rain) undoubtedly introduced some random or systematic errors for a given data set.

SURVEY RESULTS

Eight sets of readings were made from October 30, 1978, to June 24, 1980, when the project was terminated. Appendix A shows the computed north-south and east-west bearing values (tied to the state plane coordinate system) and vertical elevations. Vertical elevations are not given for the readings of May 2-3, 1980, because surface refraction introduced significant errors (Ecklund, personal commun., 1980).

During the summer of 1979, K.W. Wong, a photogrammetric and geodetic engineer, was contracted by the City of Kodiak on the advice of the Pillar Mountain Landslide Geotechnical Committee to evaluate the data generated by this study and by previous surveying projects. Wong noted (and I agree) that two difficulties are inherent in the survey method (above) used by DCGS to gather data: “the method did not provide any redundancy in determining either the horizontal or vertical positions of the points during each survey”;

also, the instrumentation used had a low limit of distance-measuring accuracy.

Wong (1979, p. 11) felt that survey precision could be improved by more refined instrumentation. However, the levels of precision he suggested far exceeded the scope and funding of the project.

STATISTICAL INFERENCE FROM SURVEY DATA

To assess the survey data acquired (app. A) for actual movement of the points, a statistical analysis of the recorded numbers was made to minimize random or systematic errors in data acquisition. The following method, suggested by Wong (1979, p. 25), was used.

The earliest sets of measurements were made in a 5-wk period: October 30, November 14, and December 1, 1978. Assuming that the points did not move during this period and that any differences in coordinate readings were caused by survey errors, Wong calculated the root-mean-square error of the changes in coordinates as:

\[
\begin{align*}
\sigma_{\Delta N} &= \pm 0.05 \text{ ft} \\
\sigma_{\Delta E} &= \pm 0.08 \text{ ft} \\
\sigma_{\Delta h} &= \pm 0.06 \text{ ft} \\
\sigma_{\Delta R} &= \pm 0.09 \text{ ft}
\end{align*}
\]

Where \( \sigma_{\Delta N} \) represents changes in north coordinates, \( \sigma_{\Delta E} \) represents changes in east coordinates, \( \sigma_{\Delta h} \) is the change in elevation, and \( \sigma_{\Delta R} \) represents changes in the resultant vector of the three components.

Using the same assumptions on the three initial sets of readings, I also calculated the maximum mean-
Table 1. Calculated variances, in feet, of north-south ($\Delta N$), east-west ($\Delta E$), and vertical ($\Delta h$) components from the initial measurements of October 30-31, 1978, for each survey station.

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Potential error due to errors in the final report on this data.

The errors are taken from surface reflection.
expected random error, equal to ±3σ (third degree of deviation from the mean), which indicates that there is only a 0.2 percent chance that the actual random error exceeds the 3σ value. This calculation, reiterated for the three data sets, provides the following mean maximum error values:

\[
3σ_{AN} = ±0.16 \text{ ft} \\
3σ_{ΔE} = ±0.36 \text{ ft} \\
3σ_{Δh} = ±0.20 \text{ ft}
\]

These values are thus taken to represent the major, intermediate, and minor axes for the error ellipsoid at a survey point. Error levels for stations near the mountain summit are increased by the variation in sighting distance between points near the mountain summit and base, abrupt change in vertical angles being turned, increased refraction effect for altitudes, and angle of incident light.

Calculated variances from original coordinates for each survey station are given in feet in table 1. Negative values indicate changes in opposite direction; thus, -0.03 under 'N' denotes a movement of 0.03 ft to the south.

The apparent strain paths in the horizontal plane for each station are given in figures 6-40. The initial point is the origin for each graph; and each point on the plotted curve correlates—with one exception—with subsequent variances from the initial coordinates. (Variances for June 6, 1978, are consistently out of context with both earlier and later readings; these data are not plotted on the figures.) The calculated mean error ellipse for the entire station array is superimposed on figures 6-40, with axes established by the preceding calculations.

ALTERNATIVE METHODS

I considered two alternative methods for obtaining the error ellipses. The first would consider each point independent of the rest of the station array and base the error ellipse axes on the three initial (late-1978) sets of readings for that point. This method would be based on but three numbers (statistically weaker than using the entire station array) and would negate consideration of systematic errors inherent in the data set.

The second alternative would place stations in three groups on the basis of elevation—upper, intermediate, and lower—and then calculate the deviations therein. This method would presume that these groups of relative accuracy exist. However, it is far more probable that progressive variation with distance from the baseline is the case. Thus, neither alternative portrays the probable error at a given station as fully as does the method I actually used (see preceding section).

OBSERVATIONS

On the basis of the data acquired and the statistics calculated, the following observations can be made:

- The curves for stations at or near the summit are more eccentric than those for lower stations.
- Of the 25 stations, 24 show a deflection in coordinates from northwest to southeast between April 23, 1979, and May 2, 1980.
- For the last set of readings (June 23, 1980), 26 stations recorded a pronounced shift toward the east, often larger than all previous readings combined.
- Stations 3, 5, 6, and 9 had the most alpycal curves (figs. 8, 10, 11, and 14).
- Those stations positioned at locations not near fissures (figs. 5, 7, 10, 19, and 27) show curves similar to nearby stations.
- Those stations directly above the slide scar (figs. 30-32) showed no evidence of alpycal behavior.
- Station 3 (fig. 38), located in the rock face of the active slide area, showed no evidence of movement.

CONCLUSIONS

Three conclusions can be made. First, the data indicate that virtually no movement occurred from November 1978 to July 1980. Second, the statistical calculations and station graphs support the accuracy of the first three movements (late 1978) and thereby help establish a reliable data network for future research. Third, the inherent limitations of the survey method and the difficulties associated with climate and topography introduced errors in all readings. Introducing a correction factor to screen out these consistent errors is beyond the scope of this project. Therefore, before further readings are taken on the stations, I recommend that:

a) An electronic distance-measuring instrument be used with the 10 theodolite.
b) Redundancy be incorporated into the survey procedures. (This can be done by using the 'Near 2' base station and adding a third, possibly on Ushk Island; fig. 1.)
c) Control stations well outside the potential slide zone be established. (These should include points on the summit of Pillar Mountain, points on the mountain slope several tens of meters to the east and west, and stations in the highway and dock areas. Points at the White Alice site at the mountain summit should also be referenced.)

ACKNOWLEDGMENTS

This project was supported through a special appropriation from the State of Alaska to the Division of Geological and Geophysical Surveys. Roy Ecklund, Registered Land Surveyor, Kodiak, Alaska, conducted the survey of stations we established. I particularly ap-
preciate the careful technical reviews of this report by James Riehle of the U.S. Geological Survey (Anchorage), and Gail March of DGGS. Jay Newgaard, DGGS, Anchorage, assisted the author in the field. I also appreciate the various members of the DGGS Publications staff who participated in various phases of production:


Figure 6. Apparent strain path of survey station 1 in the horizontal plane.
REFERENCES CITED


Figure 7. Apparent strain path of survey station 2.

Figure 8. Apparent strain path of survey station 3.
Figure 9. Apparent strain path of survey station 4.

Figure 10. Apparent strain path of survey station 5.

Figure 11. Apparent strain path of survey station 6.

Figure 12. Apparent strain path of survey station 7.
Figure 13. Apparent strain path of survey station 8.

Figure 14. Apparent strain path of survey station 9.

Figure 15. Apparent strain path of survey station 10.

Figure 16. Apparent strain path of survey station 11.

Figure 17. Apparent strain path of survey station 12.
Figure 18. Apparent strain path of survey station 13.

Figure 19. Apparent strain path of survey station 14.

Figure 20. Apparent strain path of survey station 15.

Figure 21. Apparent strain path of survey station 16.

Figure 22. Apparent strain path of survey station 17.

Figure 23. Apparent strain path of survey station 18.
Figure 24. Apparent strain path of survey station 19.

Figure 25. Apparent strain path of survey station 20.

Figure 26. Apparent strain path of survey station 21.

Figure 27. Apparent strain path of survey station 22.

Figure 28. Apparent strain path of survey station 23.

Figure 29. Apparent strain path of survey station 24.
Figure 30. Apparent strain path of survey station 25.

Figure 31. Apparent strain path of survey station 25.

Figure 32. Apparent strain path of survey station 27.

Figure 33. Apparent strain path of survey station 28.

Figure 34. Apparent strain path of survey station 29.

Figure 35. Apparent strain path of survey station 30.
Figure 36. Apparent strain path of survey station 31.

Figure 37. Apparent strain path of survey station 32.

Figure 38. Apparent strain path of survey station 33.

Figure 39. Apparent strain path of survey station 34.

Figure 40. Apparent strain path of survey station 35.
November 14, 2002

City of Kodiak
Engineering Office
2410 Mill Bay Road
Kodiak, Alaska 99615

Attention: Mr. Howard Weston, City Engineer

RE: REPORT - PILLAR MOUNTAIN SLIDE RECONNAISSANCE

Dear Howard:

The City of Kodiak authorized Golder Associates to conduct a geologic reconnaissance of the Pillar Mountain slide area immediately south of the community. The purpose of the visit was to observe the current conditions at the slide prior to its being covered with snow and to assess any visible changes compared to the conditions described in the July 1982 Pillar Mountain Slope Stability Study, Final Project Report prepared for the City of Kodiak by R&M Consultants.

This 2002 reconnaissance was conducted by an engineering geologist and included the following:

- Review of the July 1982 Pillar Mountain Slope Stability Study
- Interpretation of aerial photographs
- Field traverses of the slide vicinity to observe evidence of recent movement (such as slides, fresh scarps, tension cracks, rockfall at base) and condition of any instrumentation
- Photograph pertinent slide features
- Observations of bedrock exposures

The Pillar Mountain Slide is active over an area approximately 1,200 ft high by 1,700 ft wide situated above West Rezanof Drive and the city docking facilities. The 1982 report documented the investigations and analyses to determine the type and magnitude of potential failure and suggested long term mitigative measures. The report states that a sudden catastrophic failure of the slide into St. Paul Harbor could send a damaging wave into the Kodiak waterfront similar in size to the 1964 seismic sea waves that devastated the city following the 1964 earthquake.

Slide History

The flanks of Pillar Mountain have been used as a source of borrow for decades. Prior to 1971, a bedrock exposure with active rockfall existed at the toe of the present slide area. This area was about
300 ft high and 1,400 ft long. In 1971 a quarry was developed along the abandoned (due to rock fall) highway at an elevation of approximately 125 ft. Approximately 300,000 yards of material was removed by the contractor when large amounts of rock debris began falling from a vertical guily in the slope. Over the next couple weeks an estimated 600,000 yds of rock fell from the slope. Extensive development of open transverse ground fractures were noted on the slope above the slide. Activity since 1971 has remained low with small showers of rock and occasional large blocks intermittently falling from the face of the bedrock exposure. At the time of the 1982 investigations, many of the upslope ground fractures were partially to completely filled with slope wash soils and were revegetated. However, some fractures still appeared open and fresh (R&M, 1982).

2002 Investigations

Aerial photographs were obtained from 1983 and 2001 and interpreted with a stereoscope in an effort to detect changes that had occurred over the 18 year interval. These photos are shown in Figures 1 and 2. Although there appeared to be some minor headward progression at the top of the active rockfall area, there were no obvious new areas of fresh ground cracking or deteriorating stability.

Field traverses of the slope were made on November 8, 2002 following interpretation of aerial photographs. The Kodiak area had near record rainfall in the preceding month. The reconnaissance routes extended from the highway to the top of Pillar Mountain and included a traverse along the top edge of the active rockfall area, as shown on Figure 2. The traverses were made to make a general inspection of the slope, closely inspect ground cracks to look for evidence of recent movement, and to observe the condition of the active rockfall area and talus slope. In addition, a plane was chartered for a low level flight to obtain oblique photographs.

The ground cracks mapped in 1982 are still visible on the upper slopes as shown in Figure 3 and 4. The small exposed bedrock zone, approximately 150 ft south west of the top of the slide (Figures 2 and 4), appeared to be little changed. The most prominent ground crack at the top of the active rockfall area is occupied by a large evergreen tree as shown in Figure 5. This tree is also visible in the 1983 and 2001 (Figures 1 and 2) on the southwest (left) side of the top of the active rockfall area. The downslope side of the crack forms a wide bench. The crack is heavily overgrown with vegetation and there is no obvious indication of recent movement. Other transverse cracks on the slope are similarly overgrown with no apparent sign of recent movement. The evergreen trees above the active rockfall area are nearly straight, suggesting little or no slope movement.

The bedrock at the top of the active rockfall area (Figures 5, 6, and 7) is very steep and fractured. It appears to be failing by ravelling rather than by more deep-seated movement. There are no apparent open transverse cracks or bulging in the bedrock in active rock fall area. The bedrock in lower portions of the active rock fall area appears to be fairly stable and slightly lower-angled than the bedrock above it (Figure 8). The talus at the toe of the slope has impacted the gabion wall along the highway and appears to be aggrading evenly for the entire length of the slide area (Figure 8). The talus is evenly distributed along the width of the slope, as shown in Figure 9, indicating that the rockfall from the upper slope is slowly ravelling at relatively constant rate rather than releasing in large masses.

Several of the monuments installed on the slope more than 20 years ago were encountered during the field traverses. However, the monuments installed at the very edge of the active rockfall area were not found, indicating that the top of the slide has progressed upslope several feet in the last two decades.
In summary, the slide continues to discharge rockfall in fairly random small releases rather than large catastrophic failures. Changes to the slide and upper slope since 1982 are relatively minor and generally limited to slow upward progression of the active rockfall area due to ravelling. Although there are numerous transverse ground cracks on the upper slopes, they are heavily overgrown and/or partially filled with soil and organics. There is no apparent evidence of significant ongoing deep-seated movement.

Thanks again for the opportunity to review this very interesting rock slide and prepare this report.

Please call us if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Robert G. Dugan, C.P.G.
Principal Engineering Geologist

Rupert G. Tart, Jr., P.E.
Principal Geotechnical Engineer

RGD/RGT/ljd.

Attachments:

- Figure 1 – 1983 Photo, Pillar Mountain Slide
- Figure 2 – 2001 Photo, Pillar Mountain Slide
- Figure 3 – Cracks on Upper Slope
- Figure 4 – Views Above Active Rockfall Zone
- Figure 5 – Views From Top of Slide
- Figure 6 – Top of Slide, Ground Cracks and Fractured Bedrock
- Figure 7 – Bedrock Exposures, Active Rockfall Zone
- Figure 8 – Middle and Lower Portions of Slide Runout Area
- Figure 9 – Upward View

Distribution: City of Kodiak – 3 copies
Aerial view of slope above slide, looking SW

Aerial view of slope above slide, looking NE

Figure 3

CRACKS ON UPPER SLOPE
Upper portion of slide, NE side

Exposed bedrock above SW side of slide area

Figure 4
VIEWS ABOVE ACTIVE ROCKFALL ZONE
3 ft deep ground crack at top of SW side of slide (with large evergreen tree)

View looking down the slide from the top of the scarp

Figure 5

VIEWS FROM TOP OF SLIDE

CITY OF KODIAK / PILLAR MOUNTAIN RECON / AK
5 ft deep crack at top of scarp (overgrown with alders)

View of bedrock face at top of slide

Figure 6

GROUND CRACKS & FRACTURED BEDROCK

CITY OF KODIAK / PILLAR MOUNTAIN RECON / AK

PHOTO DATE: November 8, 2002

PROJECT NO.: 023-5559.001  FILE: FIGURED.CDR  DATE: 11/12/02  DRAWN: JJS

Golder Associates
Active rockfall zone, SW side of slide

Active rockfall zone, NE side of slide

Figure 7
BEDROCK EXPOSURES
ACTIVE ROCKFALL ZONE

CITY OF KODIAK / PILLAR MOUNTAIN RECON / AK
Transition from fractured bedrock to talus

Gabion wall at toe of talus slope

Figure 8
MIDDLE AND LOWER PORTIONS OF SLIDE RUNOUT AREA

Golder Associates
Appendix G

Public Outreach
Public Meeting
Meeting Notes
Kodiak Waterfront Planning Project
February 24, 2010
6:30 – 8:00 p.m.
Kodiak Convention Center

The public meeting was held in an open house format with participants encouraged to attend at any time during the scheduled hours. A brief presentation about both projects, improvements to pedestrian facilities from Pier 2 to downtown and the City Waterfront Planning effort, were addressed. A short question and answer portion took place following the presentation. Staff was available throughout the night to discuss both projects and answer any questions.

Below are comments heard by staff throughout the evening.

**Pedestrian Facilities**

- Let’s not get too fancy with the sidewalk.
- There’s no reason to walk to Pier 2; how does it benefit the community?
- Cannery workers & cruise ship passengers walk along Shelikof Street; pedestrian use by runners along Shelikof; limited use.
- Andy Schroeder (Island Trails Network) said that a sidewalk would benefit the entire community; this area along Shelikof (behind the canneries) is the most active during the middle of the night; hundreds of people work at the cannery and walk or ride their bikes to work; people commute out to the Coast Guard base and use this route; it would be a year round amenity for Kodiak.
- “Complete the Street” motto: Include pedestrian amenities when a road is constructed.
- The sidewalk along Shelikof dead-ends into downtown (near the police station/restrooms) – continue it around the boat harbor so pedestrians can get to the other side.
- Horizon Lines – industrial use (user group); concerned about current state of Shelikof Street without incorporating cruise ship pedestrian traffic; a sidewalk will create too much traffic and their operations will not want more pedestrian traffic in this area; they recommend the sidewalk going up to Rezanof; they have 2500 containers per year moving in and out of these loading dock areas off Shelikof.

- Community member noted that they walk the street (Shelikof) at night and that they live in downtown; they asked Horizon representative if a one lane road with a light would work.

  Rick Kniaziowski (Horizon) said that it sounded possible to Horizon to have a one lane road with a light at each end; the maneuvering of trucks costs time and money; loading dock bays were designed for 30’ long trucks and they are using 40’ long trucks (industry standard is to use trucks over 50’ long); he thought one-way traffic could be feasible.

- The crew from the cruise ships uses the nearby businesses; they look for the shortest route into town – they use Shelikof; local residents also use this route along Shelikof.

- Maneuverability of trucks needs to be considered when designing the sidewalk.

- There is a danger in encouraging pedestrians to go into this industrial area; higher use by pedestrians will occur if this sidewalk is built. It does not make sense to put an inviting sidewalk in an industrial area.

- Pedestrians will have to wait during cannery operations; if nice sidewalk – pedestrians will think they can go without looking for trucks backing up; there will be a need for signage to warn pedestrians about truck traffic and industrial operations along Shelikof; Rezanof may be safer.

- Speed zone – Rezanof Drive is a state road; messy, not pleasant to walk; everyone will take the Shelikof route because it is flat and the shortest route; older people won’t take Rezanof because of the steep incline and longer route. Rezanof may not be the best place for a sidewalk. It has a steep incline, is a busy street, and is a splash zone during rain events.

- Development of parking should be the responsibility of the industry or property owner; city should help enhance parking areas; land across from Western Alaska could hold 20-30 more cars; who owns the land? If cleaned up, it could help with parking issues.

- Tourists – ski lift/chair lift could be used for cruise ship passengers to transport them downtown – bird’s eye view of canneries.
Transient workers – some with bicycles use this industrial area; incorporate a trolley style shuttle for tourists.

They (cruise ship passengers) don’t want to be on a bus; but if it’s raining they would use the shuttle/trolley. Tourists are impatient and may not want to wait for a bus/trolley to make the rotation.

We need to get feedback from the cruise ship industry – on amount of passengers and frequency of boats into Kodiak.

Angled parking should be considered along Shelikof.

Parking is an important component of this plan (Pier 2 to Downtown Sidewalk).

Janet Buckingham (Kodiak Convention and Visitors Bureau) – cruise ship passengers will not use Rezanof from Pier 2; they want the quickest route (along Shelikof) – flattest route; they want to see “Kodiak” – the real Alaska; not go into jewelry shops and t-shirt shops; develop Shelikof with more parking and a sidewalk; Pier 2 could use a shelter (toilet/map/wayfinding); the Spit could use a shelter for community activities, such as a Saturday Market or Farmers Market.

User groups – get data/surveys from the cruise ship industry; how many people use the area; hard data about people using the facilities; local cannery workers – bunkhouses on Shelikof; safe place to walk; cannery users are one of the main user groups.

The more pedestrian friendly the community is the better.

**Waterfront Planning**

Recreation boating needs should be addressed.

Need proper planning for Waterfront Plan – corridor along Dog (Salmon) Bay Road; accelerate gravel extraction operation.

Tustumena – the ferry parks downtown; create a Visitor Center (VC) at the Harbormaster building – used by Tusty visitors; harbor tours; do not create a VC at Pier 2. A VC may be best at Pier I, or wherever the Tustumena docks in the future.

Many supported a shelter/structure for pedestrians at Pier 2 which would allow protection from outdoor elements, as well as a telephone and restrooms.

A structure on the spit of St. Paul Harbor is needed – possibly a covered farmer’s market.
- Dock No. 1 needs to be replaced with a new one like the tiered down dock in Cordova.

- Bathrooms and showers are needed at the top of all ramps in the harbors.

- A parking lot is needed at the south end of Near Island.

- Public Cold Storage needed; Ice Supply – a local company.

- Lack of sidewalk on Shelikof is a good example of why we need upfront planning for Near Island.
## Comment Summary

<table>
<thead>
<tr>
<th>Overall Site Layout</th>
<th>Response to Comment</th>
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<tr>
<td>Include section and recommendations on City-owned property that Dave Hilti is interested in.</td>
<td>Waterfront planning will include this.</td>
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<tr>
<td>Not much support from PHAB for Dave Hill’s plan - buy the south side of the Spit from the City and develop. The PHAB would like to leave the south side of the area as is, as it gets used heavily in current condition.</td>
<td>See above. Will be considered.</td>
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<th>Use of Waterfront</th>
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<tr>
<td>The waterfront is used for watching wildlife, having picnics and watching fishing boats coming into and going out of the harbor.</td>
<td>Presented concepts will aim to address and enhance all of these activities.</td>
</tr>
<tr>
<td>Commercial fishing, picnics, having a place to sit and eat with a view, and exercise by walking the docks are all uses of the City waterfront.</td>
<td>See above.</td>
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<tr>
<td>Waterfront serves both commercial and recreational purposes.</td>
<td>See above.</td>
</tr>
<tr>
<td>Waterfront is used for work, pleasure, to walk downtown, and to conduct business.</td>
<td>See above.</td>
</tr>
<tr>
<td>Commercial fishing operations.</td>
<td>See above.</td>
</tr>
<tr>
<td>Drinking coffee, showing visitors around, some boating</td>
<td>See above.</td>
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<tr>
<td>Include approximate cost to perform geological study on Pillar Mountain slide slope.</td>
<td>ROM cost estimates and projected schedules will be part of the draft report.</td>
</tr>
<tr>
<td>For the draft report, ROM cost estimates need to be developed, as well as a schedule for the concepts.</td>
<td>Acknowledged. ROM cost estimates and projected schedules will be part of the draft report.</td>
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<tr>
<td>Provide a price for updated study for the Pillar Mountain scree slope.</td>
<td>See above.</td>
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<th>Schedule</th>
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<td>Provide schedule for proposed improvements. Discuss when construction would need to begin.</td>
<td>Will include schedule estimates with costs.</td>
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<tr>
<th>Waterfront Improvements</th>
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<tr>
<td>Improvements that could be made should include moorage for ships such as the Oscar Dyson and other vessels that could be homeported in Kodiak.</td>
<td>The Oscar Dyson is homeported at Pier II.</td>
</tr>
<tr>
<td>Improvements to benefit the most would be parking between the Harbor dock and Island Seafood - between the dock and the harbor office.</td>
<td>The bulkhead and additional parking will be proposed along Shelikof Street to serve St. Paul Harbor.</td>
</tr>
<tr>
<td>Accommodate the Kodiak Maritime Museum plans. It is the perfect accent to town.</td>
<td>The Kodiak Maritime Museum is not in the scope of this project; however, wayfinding signage could be included in the sidewalk work which would incorporate the museum into the City plan.</td>
</tr>
<tr>
<td>The useless dock in front of the Harbomaster Building needs to be able to bring the boom truck on it. Fix it. A covered area (work area) for gear at Oscar’s Dock would be beneficial. Fix it.</td>
<td>Concepts will include major renovation or replacement of one or both Dock 1 and Dock 2.</td>
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### Waterfront Amenities

<table>
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<th>Comment Summary</th>
<th>Response to Comment</th>
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<tr>
<td>Bathrooms and showers are needed at the top of all ramps in the harbors.</td>
<td>Acknowledged. Concepts will recommend these amenities to some extent.</td>
</tr>
<tr>
<td>Public cold storage/ice supply is needed.</td>
<td>Concepts will present options for a cold storage facility.</td>
</tr>
<tr>
<td>A public ice house, public crane and public cold storage is needed.</td>
<td>Public cranes will be considered with concepts at Multi-Use Dock facilities.</td>
</tr>
<tr>
<td>A public crane and picnic tables would be nice. A cold storage facility would benefit many people.</td>
<td>See above.</td>
</tr>
<tr>
<td>Parking, laundry facilities, city dock restrooms and more ladders available are all amenities the waterfront needs more of.</td>
<td>Acknowledged. Concepts will recommend these amenities to some extent. See above. See above. Concepts will recommend these amenities to some extent.</td>
</tr>
<tr>
<td>Public telephones and bathrooms are needed. A place to get out of the weather would be beneficial. Map of places to go.</td>
<td>See above.</td>
</tr>
<tr>
<td>Showers for crew, move the bathrooms for the Harbormaster’s Building, and eliminate the drunk tank.</td>
<td>See above.</td>
</tr>
<tr>
<td>The park east of Fuller Boatyard has been ignored. The PHAB has asked that we look at an addition of possible amenities (benches, etc.).</td>
<td>Concepts will recommend these amenities to some extent.</td>
</tr>
<tr>
<td>The PHAB supports a provision of amenities such as showers, laundry and ice, although the feasibility of providing this publicly is somewhat in question. Potential costs/location need to be looked into so any decisions regarding location can be made.</td>
<td>Acknowledged. Will include recommendations on potential locations and cost estimates for requested amenities.</td>
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### Future Land Use

#### Downtown

- **If the ferry docks downtown, create a visitor center at the Harbormaster building.**  
  Comment noted.

- **Discuss that parcels 35, 37 and 39 are for sale (verify this is true) and discuss value.**  
  We will look into this as a part of the study.

- **Lot 94 is also likely coming up for sale and could provide a multi-use dock with a public crane and ice house.**  
  See above.

- **Lots 35, 37 and 39 (west of St. Paul breakwater) may be coming up for sale and the PHAB wondered if this could be taken advantage of. In general, the PHAB recommends the City plan on procuring more property as it becomes available. The PHAB would like to maintain public access to the waterway.**  
  These considerations will be taken into account in the concept study.

#### Near Island

- **Lack of sidewalk on Shelikof is a good example of why we need upfront planning for Near Island.**  
  Comment noted.

- **We hope the planning process includes waterfront on Near Island in the plan. This is the ideal time to do so as development is proceeding there.**  
  Near Island waterfront will be included in the study.

- **Uski Island, north of Near Island, should be considered to be reserved as a possible bird sanctuary.**  
  Uski Island could be set aside for recreation. There is also interest in developing both Uski and Gull Islands. This will be considered in the study.
<table>
<thead>
<tr>
<th>Comment Summary</th>
<th>Response to Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>The 1976 and 1988 Near Island Comprehensive Plans are good plans and were adopted by both the Assembly and the City Council. It designates industrial, commercial, and research zoning districts. This plan is what lead to the research buildings, the bridge, the harbor, and the float plane basin. It accommodates the needs of the community, but the city must expedite removal of material on City land in the industrial zone adjacent to the boat lift to allow space for any fishery support businesses to open.</td>
<td>Need to find opportunities for use of quarry materials (for example: filled bulkheads) in order to encourage further development of the quarry.</td>
</tr>
<tr>
<td>Uski Island, north of Near Island, should become an area where people can see off their loved ones when they leave for fishing expeditions.</td>
<td>Development would require connecting Uski Island with Near Island with a bridge and other future developments. This will be considered in the study.</td>
</tr>
<tr>
<td>We would like to support development of a walking trail around Near Island.</td>
<td>Concepts for enhanced recreation on Near Island will be considered.</td>
</tr>
<tr>
<td>Provide recommendations for parcel 139.</td>
<td>We will look into this as a part of the study.</td>
</tr>
<tr>
<td>The PHAB would like plans to eventually use Uski and Gull Islands for development. For Near Island, primarily reference previous development plan studies.</td>
<td>Boat yard development is underway for Near Island. Use of Uski Island and Gull Island will require bridges to provide land access to any development. This will be considered in the study.</td>
</tr>
<tr>
<td>Examine possible uses for the spot on Near Island where DOT&amp;PF was looking to put the ferry dock.</td>
<td>We feel this area has great development potential with good upland access and deep water potential for multi-use applications. This will be considered in the study.</td>
</tr>
<tr>
<td><strong>Gibson Cove</strong></td>
<td></td>
</tr>
<tr>
<td>There is not strong support for doing anything at Gibson Cove, but looking into land ownership and what would be required to develop should be completed.</td>
<td>Acknowledged. Ownership issues will be investigated.</td>
</tr>
<tr>
<td><strong>St. Paul Harbor</strong></td>
<td></td>
</tr>
<tr>
<td>A structure on the spit of St. Paul Harbor is needed - possibly a covered farmer's market.</td>
<td>Future use of Oscar's Spit area needs to be evaluated. Input has indicated that this area gets used heavily in its current condition and use.</td>
</tr>
<tr>
<td><strong>St. Herman Harbor</strong></td>
<td></td>
</tr>
<tr>
<td>The dock at St. Herman Harbor needs to be included in the Waterfront Study - high priority. A drive-down float should also be included, although this is potentially longer-term.</td>
<td>This would be an excellent opportunity to use material from the quarry to build a filled bulkhead dock. Conceptual plans for a Drive Down Float in St. Herman Harbor have been generated.</td>
</tr>
<tr>
<td><strong>Pier II</strong></td>
<td></td>
</tr>
<tr>
<td>Do not create a visitor center at Pier II.</td>
<td>Comment noted.</td>
</tr>
<tr>
<td>Support for a shelter/structure for pedestrians at Pier II - which would allow protection from outdoor elements.</td>
<td>See above. This will be considered in the study.</td>
</tr>
<tr>
<td>Support for a telephones and restrooms at Pier II.</td>
<td>This will be considered in the study.</td>
</tr>
<tr>
<td><strong>Pier I</strong></td>
<td></td>
</tr>
<tr>
<td>Examine the possibility of swapping properties with Petro Star for the Transient Float. This would allow combined space with Pier I for an extension.</td>
<td>Comment noted.</td>
</tr>
<tr>
<td><strong>Pier III</strong></td>
<td></td>
</tr>
</tbody>
</table>

Page 3 of 5
## Comment Summary

<table>
<thead>
<tr>
<th>Pier III is among PHAB's priorities.</th>
<th>Acknowledged. Pier III reconstruction is high priority.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Docks</td>
<td></td>
</tr>
<tr>
<td>Improving usability of Dock's 1 and 2 and the boat yard lift are a priority for the PHAB.</td>
<td>Acknowledged. Rehabilitation/replacement of Dock's 1 and 2 are a high priority. Finding uses for quarry materials to allow expansion of boat yard is a priority.</td>
</tr>
<tr>
<td>Look at improving capacity/usability at Dock 1 - this is likely a future replacement.</td>
<td>Planning will include Dock 1 repairs or replacement.</td>
</tr>
<tr>
<td>Oscar's Dock provides the best means for long term maintenance activities. In addition to improving operations/capacity, expansion in either direction should be looked at.</td>
<td>Planning will include Dock 2 repairs, replacement and expansion options.</td>
</tr>
<tr>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Should the City consider purchasing property for sale? What type of waterfront property should the City be looking for? How would it be used?</td>
<td>This will be considered in the study and mentioned in the report.</td>
</tr>
<tr>
<td>Additional Comments</td>
<td></td>
</tr>
<tr>
<td>Additional Comments - Fish Processors</td>
<td></td>
</tr>
<tr>
<td>Additional Comments - Parking</td>
<td></td>
</tr>
<tr>
<td>A parking lot is needed at the south end of Near Island.</td>
<td>This will be considered in the study.</td>
</tr>
<tr>
<td>Keep long-term parking in some form.</td>
<td>Acknowledged. Some additional parking will be included in planning. Designation as long term versus short term is a City issue. Comment will be forwarded to the appropriate City staff.</td>
</tr>
<tr>
<td>Extend parking area from Shelikof ramp to Breakwater Drive down/up dock for unloading. 3-tier dock to use for all tides.</td>
<td>Additional parking area and bulkhead will be proposed for St. Paul Harbor, along Shelikof Street. Drive Down Float, planned for St. Herman Harbor would serve well for use through all tides.</td>
</tr>
<tr>
<td>The parking along Shelikof Street is taken up now by all the store owners or people going to their store. Three-fourths of the time when you need to down to your boat, you end up driving around looking for some place to park, especially if it’s from 8 a.m. to 6 p.m. any day but Sunday.</td>
<td>Additional parking and bulkhead will be proposed along Shelikof Street to serve St. Paul Harbor.</td>
</tr>
<tr>
<td>Every boat in the harbor that pays for a stall should have 2 stickers (or at least 1)</td>
<td>Suggestion noted, but this is out of the scope of the project. This comment will be forwarded to appropriate City staff.</td>
</tr>
<tr>
<td>I use the downtown Harbor Parking for business, and I find it extremely useful. It is very convenient to be able to haul all my gear to the boat and park at a reasonable distance. Good parking is part of the whole package of why I choose Kodiak over other choices.</td>
<td>Acknowledged. Reduction in the number of parking spaces is not part of the overall plan.</td>
</tr>
<tr>
<td>Additional parking at St. Paul Harbor (west of the ramp) is a priority for the PHAB.</td>
<td>Additional parking and bulkhead will be proposed along Shelikof Street to serve St. Paul Harbor.</td>
</tr>
<tr>
<td>Comment Summary</td>
<td>Response to Comment</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------</td>
</tr>
<tr>
<td><strong>Additional Comments - Tourism</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Additional Comments - Recreation</strong></td>
<td></td>
</tr>
<tr>
<td>Trail connecting Dog Bay Harbor to the Northern Near Island Trail Network (one trail known as Channel Trail).</td>
<td>This will be considered in the study.</td>
</tr>
<tr>
<td>A public access to connect Dog Salmon Bay Road to a future trail could be along a platted alley between the KANA/Koniag Building and the proposed Kodiak Island Housing Authority.</td>
<td>See above.</td>
</tr>
<tr>
<td>Recreation boating needs should be addressed.</td>
<td>See above.</td>
</tr>
<tr>
<td><strong>Additional Comments - Tustumena</strong></td>
<td></td>
</tr>
<tr>
<td>A visitor center may be best at Pier I, or wherever the Tustumena docks in the future.</td>
<td>Comment noted.</td>
</tr>
<tr>
<td><strong>Additional Comments - Other</strong></td>
<td></td>
</tr>
<tr>
<td>Need proper planning for Waterfront Plan - corridor along Dog (Salmon) Bay Road; accelerate gravel extraction operation.</td>
<td>Acknowledged. Plans should include expansion of quarry operations on Near Island, develop uses for quarry materials, St. Herman Harbor parking, separation between Boat Yard users and St. Herman Harbor users, etc.</td>
</tr>
<tr>
<td>Dock number one needs to be replaced with a new one like the tiered down dock in Cordova.</td>
<td>This will be considered in the study.</td>
</tr>
<tr>
<td>Facilities such as a public ice house, public crane and public cold storage have received negative input from the local canneries.</td>
<td>Comment noted.</td>
</tr>
<tr>
<td>For the Pillar Mountain scree slope, the hazard and restrictions need to be defined.</td>
<td>Acknowledged. Further evaluation will be part of planning effort.</td>
</tr>
</tbody>
</table>
Appendix H

ROM Project Cost Estimates
## Pier III - Option A
### Platform Dock
(2,100 ft Long)

## City of Kodiak Waterfront Master Plan
**ROM PROJECT COST ESTIMATES**

---DRAFT---

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>SITE MOBILIZATION AND DEMOBILIZATION</strong></td>
<td>LS All Req'd</td>
<td>$6,400,000</td>
<td>$6,400,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mob &amp; Demob</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><strong>DEMOLITION</strong></td>
<td>LS All Req'd</td>
<td>$1,500,000</td>
<td>$1,500,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Demo and Dispose all</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><strong>PLATFORM DOCK ~250,000 SF</strong></td>
<td>EA</td>
<td>150</td>
<td>$25,000</td>
<td>$3,800,000</td>
</tr>
<tr>
<td></td>
<td>Furnish &amp; Install 42&quot;x0.5&quot;t. Steel Pipe Pile for Crane Rails (100' avg length, partial galv)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Furnish &amp; Install 20&quot;x0.5&quot;t. Steel Pipe Pile (100' avg length, partial galv)</td>
<td>EA</td>
<td>690</td>
<td>$20,000</td>
<td>$13,800,000</td>
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<tr>
<td></td>
<td>Steel Caps (735 lbs per foot steel box girders, including installation)</td>
<td>LF</td>
<td>14,700</td>
<td>$600</td>
<td>$8,800,000</td>
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<tr>
<td></td>
<td>Precast Concrete Panels &amp; Cast-In-Place (installed)</td>
<td>SF</td>
<td>250,000</td>
<td>$70</td>
<td>$17,500,000</td>
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<tr>
<td></td>
<td>Crane Rail Beam</td>
<td>LF</td>
<td>1,500</td>
<td>$730</td>
<td>$1,100,000</td>
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<tr>
<td></td>
<td>Bollards, Etc.</td>
<td>LF</td>
<td>2,100</td>
<td>$50</td>
<td>$100,000</td>
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<tr>
<td></td>
<td>Fender Panels</td>
<td>EA</td>
<td>34</td>
<td>$100,000</td>
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</tr>
<tr>
<td></td>
<td>Armor Rock</td>
<td>CY</td>
<td>21,000</td>
<td>$60</td>
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<tr>
<td></td>
<td><strong>PLATFORM DOCK SUBTOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td>$49,800,000</td>
</tr>
<tr>
<td>4</td>
<td><strong>UPLAND IMPROVEMENTS (excludes Platform Dock area)</strong></td>
<td>SF</td>
<td>400,000</td>
<td>$5</td>
<td>$2,000,000</td>
</tr>
<tr>
<td></td>
<td>Regrading, Drainage, Paving, Roadwork, Etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td><strong>MISCELLANEOUS</strong></td>
<td>LS All Req'd</td>
<td>$3,000,000</td>
<td>$3,000,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Utilities, Lighting, Etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td><strong>CONSTRUCTION CONTINGENCY</strong></td>
<td>LS All Req'd</td>
<td>$12,500,000</td>
<td>$12,500,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>For items 1 through 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td><strong>PLANNING, PERMITTING, DESIGN AND IMPLEMENTATION COSTS</strong></td>
<td>LS All Req'd</td>
<td>$3,100,000</td>
<td>$3,100,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engineering Design (approx. 5% Construction Cost)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Surveying (Topographic/Bathymetric &amp; Land Survey)</td>
<td>LS All Req'd</td>
<td>$100,000</td>
<td>$100,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Geotechnical Investigation (deep water boring, test pile program, sampling, etc.)</td>
<td>LS All Req'd</td>
<td>$500,000</td>
<td>$500,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Permitting (Time and Materials based estimate)</td>
<td>LS All Req'd</td>
<td>$100,000</td>
<td>$100,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction Admin and On-site Observation (approx. 5% Const. Cost)</td>
<td>LS All Req'd</td>
<td>$3,100,000</td>
<td>$3,100,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>PLANNING, PERMITTING, DESIGN, AND IMPLEMENTATION SUBTOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td>$6,900,000</td>
</tr>
</tbody>
</table>

### KODIAK - WATERFRONT MASTER PLAN - ROM PROJECT COST - PIER III OPTION A - Platform Dock = $82,100,000
# Pier III - Option A

**Sheetpile Bulkhead**

(2,100 ft Long)

---DRAFT---

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>SITE MOBILIZATION AND DEMOBILIZATION</strong></td>
<td>LS All Req'd</td>
<td>$4,200,000</td>
<td>$4,200,000</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><strong>DEMOLITION</strong></td>
<td>LS All Req'd</td>
<td>$1,500,000</td>
<td>$1,500,000</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><strong>SHEETPILE BULKHEAD ~2,300 LF</strong></td>
<td>TON</td>
<td>8,500</td>
<td>$1,500</td>
<td>$12,800,000</td>
</tr>
<tr>
<td></td>
<td>Purchase Sheetpiles</td>
<td>CY</td>
<td>340,000</td>
<td>$20</td>
<td>$6,800,000</td>
</tr>
<tr>
<td></td>
<td>Steel Cap and Mooring Bollards</td>
<td>CY</td>
<td>34</td>
<td>$100,000</td>
<td>$3,400,000</td>
</tr>
<tr>
<td>4</td>
<td><strong>UPLAND CRANE RAIL SYSTEM ~ 1,500 LF</strong></td>
<td>EA</td>
<td>150</td>
<td>$20,000</td>
<td>$3,000,000</td>
</tr>
<tr>
<td></td>
<td>Furnish &amp; Install 42&quot;x0.5&quot; Steel Pipe Pile for Crane Rails (80' length, bare)</td>
<td>CY</td>
<td>2,200</td>
<td>$500</td>
<td>$1,100,000</td>
</tr>
<tr>
<td>5</td>
<td><strong>UPLAND IMPROVEMENTS</strong></td>
<td>SF</td>
<td>650,000</td>
<td>$5</td>
<td>$3,300,000</td>
</tr>
<tr>
<td>6</td>
<td><strong>MISCELLANEOUS</strong></td>
<td>LS All Req'd</td>
<td>$3,000,000</td>
<td>$3,000,000</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td><strong>CONSTRUCTION CONTINGENCY</strong></td>
<td>LS All Req'd</td>
<td>$9,100,000</td>
<td>$9,100,000</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td><strong>PLANNING, PERMITTING, DESIGN AND IMPLEMENTATION COSTS</strong></td>
<td>LS All Req'd</td>
<td>$2,300,000</td>
<td>$2,300,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engineering Design (approx. 5% Construction Cost)</td>
<td>LS All Req'd</td>
<td>$100,000</td>
<td>$100,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Surveying (Topographic/Bathymetric &amp; Land Survey)</td>
<td>LS All Req'd</td>
<td>$500,000</td>
<td>$500,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Geotechnical Investigation (deep water boring, test pile program, sampling, etc.)</td>
<td>LS All Req'd</td>
<td>$100,000</td>
<td>$100,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Permitting (Time and Materials based estimate)</td>
<td>LS All Req'd</td>
<td>$2,300,000</td>
<td>$2,300,000</td>
<td></td>
</tr>
</tbody>
</table>

**SUBTOTAL CONSTRUCTION COST = $45,700,000**

**CONSTRUCTION CONTINGENCY SUBTOTAL = $9,100,000**

**PLANNING, PERMITTING, DESIGN, AND IMPLEMENTATION SUBTOTAL = $5,300,000**

**KODIAK - WATERFRONT MASTER PLAN - ROM PROJECT COST - PIER III OPTION A - Sheetpile Bulkhead = $60,100,000**
## City of Kodiak
### Waterfront Master Plan
### ROM PROJECT COST ESTIMATES

---DRAFT---

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SITE MOBILIZATION AND DEMOBILIZATION</td>
<td>LS All Req'd</td>
<td>$2,000,000</td>
<td>$2,000,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mob &amp; Demob</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SITE MOBILIZATION AND DEMOBILIZATION SUBTOTAL = $2,000,000

| 2    | DEMOLITION | LS All Req'd | $1,500,000 | $1,500,000 | |
|      | Demo and Dispose all |        |          |            |        |

DEMOLITION SUBTOTAL = $1,500,000

| 3    | PLATFORM DOCK ~48,000 SF | EA | 55 | $30,000 | $1,700,000 |
|      | Furnish & Install 42"x0.5" Steel Pipe Pile for Crane Rails (100' avg length, partial galv) | | | | |
|      | Furnish & Install 20"x0.5" Steel Pipe Pile (100' avg length, partial galv) | EA | 150 | $22,000 | $3,300,000 |
|      | Steel Caps (735 lbs per foot steel box girders, including installation) | LF | 3,000 | $600 | $1,800,000 |
|      | Precast Concrete Panels & Cast-In-Place (installed) | SF | 48,000 | $70 | $3,400,000 |
|      | Crane Rail Beam | LF | 550 | $730 | $400,000 |
|      | Bollards, Etc. | LF | 600 | $50 | $30,000 |
|      | Fender Panels | EA | 11 | $100,000 | $1,100,000 |
|      | Armor Rock | CY | 15,000 | $60 | $900,000 |

PLATFORM DOCK SUBTOTAL = $12,630,000

| 4    | SHEETPILE BULKHEAD ~600 LF | TON | 1,200 | $1,500 | $1,800,000 |
|      | Purchase Sheetpiles | | | | |
|      | Install Sheetpiles | | | | |
|      | Structural Fill (from Near Island Quarry) | CY | 50,000 | $20 | $1,000,000 |

SHEETPILE BULKHEAD SUBTOTAL = $3,500,000

| 5    | DOLPHINS ~4 total | EA | 12 | $25,000 | $300,000 |
|      | Furnish & Install 30"x0.5" Steel Pipe Pile (100' avg length, partial galv) | | | | |
|      | Steel Dolphin Cap | EA | 4 | $50,000 | $200,000 |
|      | Fender Panels (including pin piles) | EA | 4 | $100,000 | $400,000 |

DOLPHIN SUBTOTAL = $900,000

| 6    | UPLAND IMPROVEMENTS (excludes Platform Dock area) | SF | 200,000 | $5 | $1,000,000 |
|      | Regrading, Drainage, Paving, Roadwork, Etc. | | | | |

UPLAND IMPROVEMENTS SUBTOTAL = $1,000,000

| 7    | MISCELLANEOUS | LS All Req'd | $1,000,000 | $1,000,000 | |
|      | Utilities, Lighting, Etc. | | | | |

MISCELLANEOUS SUBTOTAL = $1,000,000

| 8    | CONSTRUCTION CONTINGENCY | LS All Req'd | $4,500,000 | $4,500,000 | |
|      | For items 1 through 7 | | | | |

CONSTRUCTION CONTINGENCY SUBTOTAL = $4,500,000

| 9    | PLANNING, PERMITTING, DESIGN AND IMPLEMENTATION COSTS | LS All Req'd | $1,100,000 | $1,100,000 | |
|      | Engineering Design (approx. 5% Construction Cost) | | | | |
|      | Surveying (Topographic/Bathymetric & Land Survey) | LS All Req'd | $75,000 | |
|      | Geotechnical Investigation (deep water boring, test pile program, sampling, etc.) | LS All Req'd | $300,000 | |
|      | Permitting (Time and Materials based estimate) | LS All Req'd | $75,000 | |
|      | Construction Admin and On-site Observation (approx. 5% Const. Cost) | LS All Req'd | $1,100,000 | |

PLANNING, PERMITTING, DESIGN, AND IMPLEMENTATION SUBTOTAL = $2,650,000

KODIAK - WATERFRONT MASTER PLAN - ROM PROJECT COST - PIER III OPTION B - Platform Dock = $29,700,000
# Pier III - Option B

## Sheetpile Bulkhead

(600 ft Long)

---DRAFT---

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Amount</th>
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<td>1</td>
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<tr>
<td>3</td>
<td>SHEETPILE BULKHEAD ~700 LF</td>
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<td>3,000</td>
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<td></td>
<td></td>
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<tr>
<td>4</td>
<td>UPLAND CRANE RAIL SYSTEM ~ 550 LF</td>
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<td>CY</td>
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<td>DOLPHINS ~4 total</td>
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<tr>
<td>6</td>
<td>UPLAND IMPROVEMENTS</td>
<td>SF</td>
<td>-</td>
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<td>7</td>
<td>MISCELLANEOUS</td>
<td>LS</td>
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</table>

**SUBTOTAL CONSTRUCTION COST =** $13,550,000

7 CONSTRUCTION CONTINGENCY

For items 1 through 7

| LS | All Req'd | $2,700,000 | $2,700,000 |

**CONSTRUCTION CONTINGENCY SUBTOTAL =** $2,700,000

8 PLANNING, PERMITTING, DESIGN AND IMPLEMENTATION COSTS

| LS | All Req'd | $700,000 |
| LS | All Req'd | $75,000  |
| LS | All Req'd | $200,000 |
| LS | All Req'd | $75,000  |
| LS | All Req'd | $700,000 |

**PLANNING, PERMITTING, DESIGN, AND IMPLEMENTATION SUBTOTAL =** $1,750,000

**KODIAK - WATERFRONT MASTER PLAN - ROM PROJECT COST - PIER III OPTION B - MINIMAL =** $18,000,000
### Boatyard Development

#### City of Kodiak

**Waterfront Master Plan**

**ROM PROJECT COST ESTIMATES**

---DRAFT---

<table>
<thead>
<tr>
<th>Item</th>
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<th>Unit</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Amount</th>
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<tr>
<td>1</td>
<td>SITE MOBILIZATION AND DEMOBILIZATION</td>
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<td>$1,300,000</td>
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<tr>
<td></td>
<td>Mob &amp; Demob (approx. 10% of items 2, 4, 5, 6 and 7 only)</td>
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<tr>
<td></td>
<td>Demolition, as req'd (general)</td>
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<td></td>
<td>Drill, Blast, Grade and Sort</td>
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<td>QUARRY EXPANSION SUBTOTAL =</td>
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<td>$13,700,000</td>
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<td>WORK DOCK ~60'x150'</td>
<td>EA</td>
<td>50</td>
<td>$9,000</td>
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<tr>
<td></td>
<td>Furnish 24&quot;x0.5&quot;t Steel Pipe Pile (100' length, galv)</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Install Pipe Piles (drive to bearing or socket, as req'd)</td>
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<tr>
<td></td>
<td>Steel Caps (735 lbs per foot steel box girders, including installation)</td>
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<td>Precast Concrete Panels &amp; Cast-In-Place (installed)</td>
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<td>Bollards, Etc.</td>
<td>LF</td>
<td>150</td>
<td>$50</td>
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<td>Demolish Boat Lift Dolphins</td>
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<td>Furnish and Assemble Timber Floats (Drive Down, Mainwalk and Finger Floats)</td>
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<td></td>
<td>Furnish Steel Pipe Piles (assume 36&quot;x0.5&quot;t, 120' long, galv)</td>
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<td></td>
<td>Install Pipe Piles (socket all)</td>
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<tr>
<td></td>
<td>Transfer Bridge and Approach Pier</td>
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<td>Float Utilities</td>
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<td>Regrading, Drainage, Roadwork, Etc.</td>
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<tr>
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<td>UPLAND IMPROVEMENTS SUBTOTAL =</td>
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<td>$1,500,000</td>
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<tr>
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<td>MISCELLANEOUS</td>
<td>LS</td>
<td>All Req'd</td>
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<tr>
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<td>Utilities, Lighting, Etc.</td>
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<td>MISCELLANEOUS SUBTOTAL =</td>
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<td></td>
<td>$100,000</td>
<td>$100,000</td>
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</tbody>
</table>

**SUBTOTAL CONSTRUCTION COST = $28,180,000**

| 8 | CONSTRUCTION CONTINGENCY | LS | All Req'd | $2,640,000 | $2,640,000 |
|   | Construction Contingencies (approx. 20% of items 2, 4, 5, 6 and 7 only) | |          |            |         |

**CONSTRUCTION CONTINGENCY SUBTOTAL = $2,640,000**

| 9 | PLANNING, PERMITTING, DESIGN AND IMPLEMENTATION COSTS | LS | All Req'd | $720,000 | $720,000 |
|   | Engineering Design (approx. 5% Construction Cost, minus quarrying) | |          |            |         |
|   | Surveying (Topographic/Bathymetric & Land Survey) | LS | All Req'd | $10,000 | $10,000 |
|   | Geotechnical Investigation (deep water boring, test pile program, sampling, etc.) | LS | All Req'd | $70,000 | $70,000 |
|   | Permitting (Time and Materials based estimate) | LS | All Req'd | $10,000 | $10,000 |
|   | Construction Admin and On-site Observation (approx. 5% Const. Cost, minus quarrying) | LS | All Req'd | $720,000 | $720,000 |

**PLANNING, PERMITTING, DESIGN, AND IMPLEMENTATION SUBTOTAL = $1,530,000**

**KODIAK - WATERFRONT MASTER PLAN - ROM PROJECT COST - BOATYARD DEVELOPMENT = $32,400,000**

**LOWER BOUND - WORK DOCK ONLY = $2,800,000**

**UPPER BOUND - ALL ABOVE + $2,700,000 FOR ON-SITE BUILDINGS (currently assumed to be developed privately) = $35,100,000**
# St. Herman Harbor Floats

## Phase 1 - L Floats

### City of Kodiak

**Waterfront Master Plan**

**ROM PROJECT COST ESTIMATES**

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<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Amount</th>
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<td>1</td>
<td>SITE MOBILIZATION AND DEMOBILIZATION</td>
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<td>SITE MOBILIZATION AND DEMOBILIZATION SUBTOTAL</td>
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<td>LS All Req'd</td>
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<tr>
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<tr>
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<tr>
<td></td>
<td>Furnish Steel Pipe Piles (assume 24&quot;x0.5&quot;, 100' long, galv)</td>
<td>EA</td>
<td>50</td>
<td>$10,000</td>
<td>$500,000</td>
</tr>
<tr>
<td></td>
<td>Install Pipe Piles (Socket all)</td>
<td>EA</td>
<td>50</td>
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<td>$1,250,000</td>
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<td>Furnish and Install Float Utilities</td>
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<td>FLOAT UTILITIES SUBTOTAL</td>
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<td>Utilities, Lighting, Etc.</td>
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<td>PLANNING, PERMITTING, DESIGN AND IMPLEMENTATION COSTS</td>
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<tr>
<td></td>
<td>Engineering Design (approx. 6% Construction Cost)</td>
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<tr>
<td></td>
<td>Surveying (Topographic/Bathymetric &amp; Land Survey)</td>
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<td>$30,000</td>
<td>$30,000</td>
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<tr>
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<td>Geotechnical Investigation (deep water boring, test pile program, sampling, etc.)</td>
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<td>Permitting (Time and Materials based estimate)</td>
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<td>Construction Admin and On-site Observation (approx. 6% Const. Cost)</td>
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**KODIAK - WATERFRONT MASTER PLAN - ROM PROJECT COST - ST. HERMAN HARBOR - PHASE 1 = $5,200,000**
### St. Herman Harbor Floats

**Phase 2 - K and Q Floats**

**Waterfront Master Plan**

**ROM PROJECT COST ESTIMATES**

---DRAFT---

<table>
<thead>
<tr>
<th>Item</th>
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<th>Unit</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Amount</th>
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<td>2</td>
<td>DEMOLITION</td>
<td>LS</td>
<td>All Req'd</td>
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<td>$300,000</td>
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<tr>
<td></td>
<td>Demo and Dispose all</td>
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<tr>
<td>3</td>
<td>NEW FLOATS AND PILES</td>
<td>SF</td>
<td>24,100</td>
<td>$75</td>
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<td>Furnish Steel Pipe Piles (assume 24&quot;x0.5&quot;, 100' long, galv)</td>
<td>EA</td>
<td>70</td>
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<td>Install Pipe Piles (Socket all)</td>
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<td>70</td>
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<td>6</td>
<td>CONSTRUCTION CONTINGENCY</td>
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<td>7</td>
<td>PLANNING, PERMITTING, DESIGN AND IMPLEMENTATION COSTS</td>
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<td>Engineering Design (approx. 6% Construction Cost)</td>
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<td>Surveying (Topographic/Bathymetric &amp; Land Survey)</td>
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<tr>
<td></td>
<td>Geotechnical Investigation (deep water boring, test pile program, sampling, etc.)</td>
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<tr>
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<td>Permitting (Time and Materials based estimate)</td>
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<tr>
<td></td>
<td>Construction Admin and On-site Observation (approx. 6% Const. Cost)</td>
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**SUBTOTAL CONSTRUCTION COST = $5,690,000**

**KODIAK - WATERFRONT MASTER PLAN - ROM PROJECT COST - ST. HERMAN HARBOR - PHASE 2 = $7,600,000**
### St. Herman Harbor Floats
**City of Kodiak**
**Waterfront Master Plan**
**ROM PROJECT COST ESTIMATES**

---DRAFT---

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Amount</th>
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<td>1</td>
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**SUBTOTAL CONSTRUCTION COST = $3,130,000**

**CONSTRUCTION CONTINGENCY SUBTOTAL = $600,000**

**PLANNING, PERMITTING, DESIGN, AND IMPLEMENTATION SUBTOTAL = $540,000**

---

**KODIAK - WATERFRONT MASTER PLAN - ROM PROJECT COST - ST. HERMAN HARBOR - PHASE 3 = $4,300,000**

---
### St. Herman Harbor Floats

**City of Kodiak**  
**Waterfront Master Plan**  
**ROM PROJECT COST ESTIMATES**

---DRAFT---

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<tr>
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<td>Demo and Dispose all</td>
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<td>Furnish Steel Pipe Piles (assume 16&quot;x0.5&quot;, 80' long, galv)</td>
<td>EA</td>
<td>100</td>
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<td>Surveying (Topographic/Bathymetric &amp; Land Survey)</td>
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<tr>
<td></td>
<td>Geotechnical Investigation (deep water boring, test pile program, sampling, etc.)</td>
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<td></td>
<td>Permitting (Time and Materials based estimate)</td>
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<tr>
<td></td>
<td>Construction Admin and On-site Observation (approx. 6% Const. Cost)</td>
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**KODIAK - WATERFRONT MASTER PLAN - ROM PROJECT COST - ST. HERMAN HARBOR - PHASE 4** = **$8,300,000**
## St. Paul Harbor Improvements - Option A

### City of Kodiak

#### Waterfront Master Plan

ROM PROJECT COST ESTIMATES

---DRAFT---

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<th>Item</th>
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<td>Demolish portions of dock for pile driving and to replace, as needed</td>
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<td>$150,000</td>
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<td>Furnish and Install New Steel Pipe Piles (est. 12.75&quot;x0.5&quot;t, avg 60' long, galv)</td>
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<tr>
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<td>Demolish portions of dock, as needed</td>
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<td>Replace Rotten Superstructure, Deck, Bullrails</td>
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<td>$90,000</td>
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<tr>
<td></td>
<td>Cast In Place Curb and Sidewalk</td>
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<tr>
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<td>Guardrails (350')</td>
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<td>$3</td>
<td>$30,000</td>
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<td>$50,000</td>
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<td>$300,000</td>
<td>$300,000</td>
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<tr>
<td></td>
<td>Utilities, Lighting, Etc.</td>
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<td>$300,000</td>
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<td>8</td>
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<td>$230,000</td>
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<tr>
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<td>Geotechnical Investigation (boring, test pile program, sampling, etc.)</td>
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**SUBTOTAL CONSTRUCTION COST = $1,520,000**

**KODIAK - WATERFRONT MASTER PLAN - ROM PROJECT COST - ST. PAUL HARBOR OPTION A = $2,100,000**
## St. Paul Harbor Improvements - Option B
(Replace Dock 1 and Oscar's)

**City of Kodiak**
**Waterfront Master Plan**
**ROM PROJECT COST ESTIMATES**

---DRAFT---

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
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<th>Quantity</th>
<th>Unit Price</th>
<th>Amount</th>
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<td>Geotextile and Timber Bulkhead (20' tall x 350' long)</td>
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<td>Guardrails (350')</td>
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<td>$3</td>
<td>$30,000</td>
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**SUBTOTAL CONSTRUCTION COST = $4,280,000**

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<td>Engineering Design (approx. 6% Construction Cost)</td>
<td>LS All Req'd</td>
<td>$10,000</td>
<td>$10,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Surveying (Topographic/Bathymetric &amp; Land Survey)</td>
<td>LS All Req'd</td>
<td>$50,000</td>
<td>$50,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Geotechnical Investigation (boring, test pile program, sampling, etc.)</td>
<td>LS All Req'd</td>
<td>$10,000</td>
<td>$10,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Permitting (Time and Materials based estimate)</td>
<td>LS All Req'd</td>
<td>$260,000</td>
<td>$260,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction Admin and On-site Observation (approx. 6% Const. Cost)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PLANNING, PERMITTING, DESIGN, AND IMPLEMENTATION SUBTOTAL = $590,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**KODIAK - WATERFRONT MASTER PLAN - ROM PROJECT COST - ST. PAUL HARBOR OPTION B = $5,700,000**