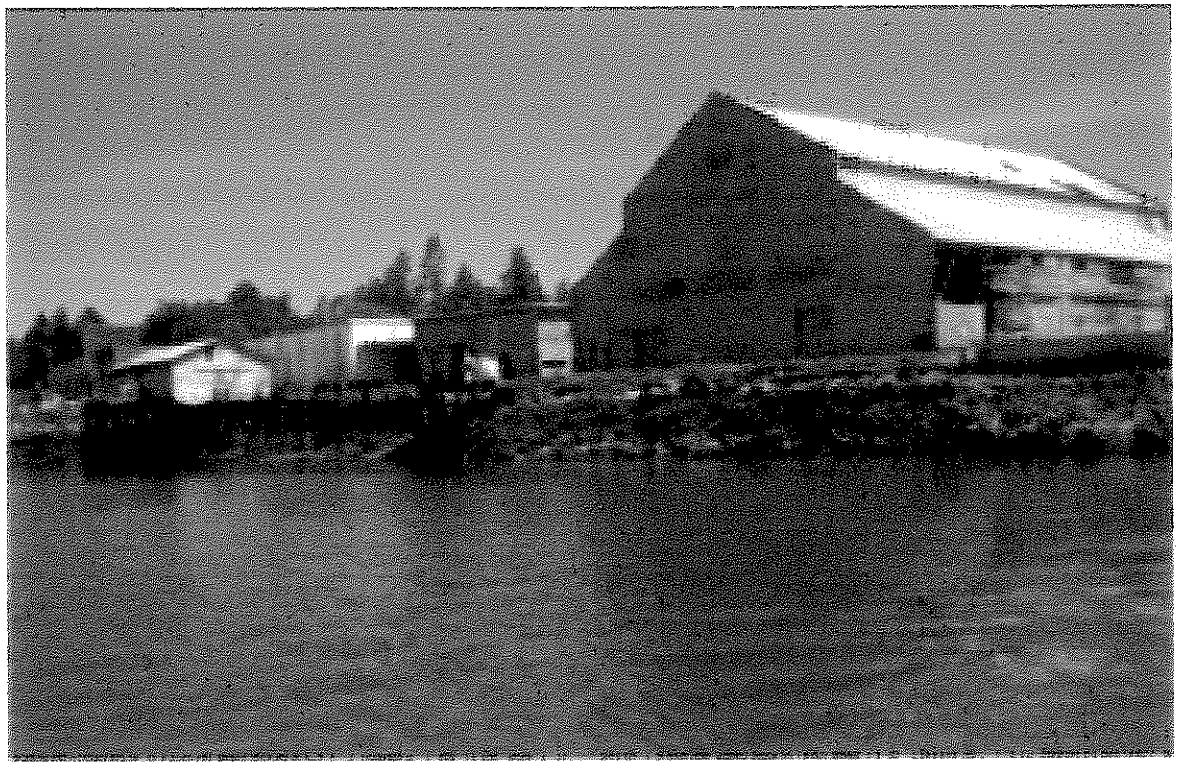
BIOLOGICAL EVALUATION

for

SHORELINE REDEVELOPMENT

LA CONNER WASHINGTON



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September 14, 2004

LA CONNER AND ASSOCIATES SHORELINE REDEVELOPMENT BIOLOGICAL EVALUATION

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APPENDICES

1.0 EXECUTIVE SUMMARY

La Conner Associates is proposing to redevelop a portion of the waterfront and land in the city of La Conner in Skagit County, Washington. The landward development will replace the existing industrial structures with mixed-use buildings. The waterfront development will provide public use of shoreline boardwalks, decks and café as well as moorage for pleasure vessels. The waterfront design will be consistent with current use and local zoning of the La Conner waterfront. The proposed Project will improve the existing nearshore habitat by:

- Removal of a failing bulkhead.
- Removal of approximately 49 creosote pilings.
- Removal of concrete slab ruble riprap.
- Placement of rock appropriate for attachment by macroalgae.
- Transplanting of existing eelgrass patch (approx. 12 stems).
- Reconfigure the shoreline to a more gentle slope.
- Creation of a salmon migration corridor.

This redevelopment project will also construct a floating dock moorage, shoreline boardwalk, and overwater decks around two existing overwater structures. A mitigation plan has been submitted and accepted by Washington State Department of Fish and Wildlife (WDFW) that will improve the nearshore habitat on-site to a measurable amount that offsets impacts of increasing the area of overwater structures.

Chinook salmon, bull trout and bald eagles may be present in the action area during the construction period. Mitigation and conservation measures have been selected to minimized impacts and the proposed Project may affect, but not likely to adversely affect these species.

Steller's sea lion, brown pelicans, marbled murrelets and leatherback sea turtles are not likely to be present in the Action Area at the time of construction and therefore, the proposed Project may affect, but not likely to adversely affect these species. Humpback whales are not known to occur within the San Juan Islands and the proposed Project will have no effect on this species.

The proposed action may adverse affect the Essential Fish Habitat for west coast groundfish, Pacific salmon and coastal pelagic species. Water quality may be degraded during the construction period of the proposed action. The potential impacts are expected to be temporary and will not likely persist after the construction period.

Following is a summary of the Effects Determination of this Biological Evaluation for the proposed La Conner Associates Project.

SPECIES	EFFECT	TAKE
Puget Sound Chinook Salmon	NLTAA*	None
Coastal/Puget Sound Bull Trout	NLTAA	None
Steller's Sea Lion	NLTAA	None
Humpback Whales	No Effect	None

Leatherback Sea Turtle	NLTAA	None
Bald Eagles	No Effect	None
Brown Pelican	NLTAA	None
Marbled Murrelets	NLTAA	None
Essential Fish Habitat	MAA	

1. Not Likely to Adversely Affect.
2. May Adversely Affect

2.0 DESCRIPTION OF PROJECT AND PROJECT AREA

2.1 Project Location

This project is located o Swinomish Channel in the City of La Conner, Skagit County, Washington (Section 36, Township 34 N Range 2 E) (Sheet 1, Appendix A)

2.2 Project Description

La Conner Associates is proposing to redevelop a portion of the waterfront and land in the city of La Conner in Skagit County, Washington. The Project is located between Commercial and Caledonia streets (Sheet 1, Appendix A). The landward development will replace the existing industrial structures with mixed-use buildings. The waterfront development will provide public use of shoreline boardwalks, decks and café as well as moorage for pleasure vessels. The waterfront design will be consistent with current use and local zoning of the La Conner waterfront. This Biological Evaluation (BE) addresses impacts that the proposed project may have on ESA listed species. A Mitigation Plan (Appendix C) addresses the improvement of nearshore habitat within the Project boundaries as mitigation for the construction of overwater structures. The waterfront redevelopment will improve aquatic habitat between the depths of -10 ft and +10 ft (all depths referred to in this BE are relative to Mean Lower Low Water). Improvements to this habitat will include:

- Removal of a failing bulkhead.
- Removal of approximately 49 creosote pilings.
- Removal of concrete slab ruble riprap.
- Placement of rock appropriate for attachment by macroalgae.
- Transplanting of existing eelgrass patch (approx. 12 stems).
- Reconfigure the shoreline to a more gentle slope.
- Creation of a salmon migration corridor.

This redevelopment will also construct a floating dock moorage, shoreline boardwalk, and overwater decks around two existing structures. Drawings of existing conditions and proposed redevelopment are attached as Appendix A. Redevelopment of the waterfront will be completed in four phases:

- Phase I: Reconfiguration of shoreline by removal of a failing bulkhead, creosote piles, and manmade material in the nearshore area. Placement of approximately 12 steel guide

piles for the floating dock, approximately 90 ACZA treated wood piles for support of the overwater decks and guide for the dock gangway.

- Phase II: Construction of nearshore habitat from -10 ft to +10 ft to provide a salmon migration corridor through the Project area. A mix of sediment sizes will be used to provide substrate for attached macroalgae and to promote epibenthic production.

- Phase III: Construction of deck structures, and placement of floating dock and gangway.

- Phase IV: Construction of boardwalk along the shoreline. All supporting members of boardwalk will be placed above the Mean High Water.

Phase I

Phase I will create a new shoreline landward of the existing shore by removing a failing bulkhead that is built of creosote treated timbers and piles and untreated wood that has deteriorated (Photos 3 and 4, Appendix B). A portion of the fill material behind the bulkhead will also be removed and replaced with appropriately sized quarry spalls (Sheet 8, Appendix A). As part of this phase, approximately 49 creosote piles will be removed from the nearshore environment. Piles that cannot be extracted will be cut or broken at the mudline and the stub left in place. The area will later be covered with clean material as part of Phase II and the pile stubs will therefore be buried below the proposed grade.

The existing "pump house" structure will be temporarily moved as part of the shoreline reconfiguration and replaced near its original location as part of Phase III. Approximately 14 ACZA treated wood piles will be used to support for pump house deck with 7 fender piles along the face of the deck. Approximately 60 ACZA treated wood piles will be used to support the "crab shack" deck and approximately 12 steel guide piles will be used for the floating dock (Sheet 3 Appendix A). Completion of Phase I will require approximately four weeks.

Phase II

Phase II will construct a fish migration corridor between the depths of -10 ft and +10 ft. A subtidal rock revetment will be placed along 80% of the length of the Project area at the existing -6 ft to -10 ft depth to raise the sea bed to -4 ft. Existing material may be used as partial fill after it has been crushed to appropriate size then over laid with 8 inch quarry spalls between -4 ft depth to +10 ft (Sheets 4-10, Appendix A). A layer of 2 – 4 inch railroad ballast will be used to fill the voids between quarry spalls. The slope of the finished sea floor will be consistent between -4 and +10 with an average slope of 2.6:1 (H:V). A small patch of eelgrass (*Z. marina*) will be transplanted from an existing location in the Project area into the constructed nearshore with appropriate sediment to avoid loss of eelgrass habitat and to provide a potential source for growth of an eelgrass bed within the Project area. Four clusters of large rock will be placed to provide additional substrate for attachment algae as well as visual aesthetics during low tide events. Sheet 4 (Appendix A) shows the proposed nearshore habitat plan. Completion of Phase II will require approximately two weeks.

Phase III

Phase III will complete the waterfront redevelopment of the La Conner Associates Project. The floating dock, gangway, and overwater decks will be constructed. ACZA treated wood will be used as decking and structural members. Railings will be constructed of both ACZA treated wood and metal. The existing overwater structures will be refurbished with like-kind or better material to retain the conformity with the contiguous historic district where possible. Creosote treated materials will not be used for refurbishing the overwater structures. The 10 ft wide floating dock will be constructed of ACZA treated timbers or concrete with encapsulated foam floatation (sheet 12, Appendix A). The floating dock will be positioned over the sea floor that is -10 ft or greater depth with the exception of 14 sq ft at the north end. This depth contour was selected to avoid impacts to the nearshore habitat and to prevent grounding of the dock and moored vessels.

2.3 Action Area

- Upland Action Area: 0.5-mile radius from Project Area during construction phase.
- In-water Action Area: 0.5-mile radius from Project Area during construction phase.

Construction of the Project will require the use of heavy equipment such as a backhoe, dump trucks, pile driver, barge and tugs. Noise from construction will be somewhat elevated above background levels and may be discernable for a distance of 0.5 miles. In-water work will consist piling removal, removal of ruble, placing fill, and pile driving. Work will be staged from both shore and from a barge. Fine sediment will be entrained into the Swinomish Channel during the construction period however, the sediment load is naturally high due to the input from the Skagit River and turbidity will not likely be above background levels beyond 0.5 mile from the construction site. Pile removal, pile driving, rubble removal and adding fill will require approximately six weeks; after this period turbidity will not be elevated by Project activities.

3.0 EXISTING ENVIRONMENTAL CONDITIONS

3.1 Marine Habitats

The nearshore habitat of the Project area is of poor value to salmon and their prey. The shoreline has been armored with broken concrete slabs that are poor attachment substrate for algae and epibenthic organisms that are important prey for salmon. Several derelict creosote piles are located on the site that continues to degrade the water quality in Swinomish Channel.

The waterfront of the Project area has had a variety of commercial uses including fuel transfer and unloading commercial crab harvest. Currently the crab shack is used for storage and the pump house is vacant. The pump house was part of a 1,475 sq ft overwater structure and the deck was removed at the request of the Washington State Department of Natural Resources (WDNR) in 1999 because of safety issues. Building moratoria and litigation have prevented replacement of this structure until 2003. The shoreline above +10 ft consists of a failing wood

bulkhead that in part, is constructed of creosote treated timbers and untreated logs placed lengthwise along the shore (Photos 1-6, Appendix B). Behind the timber bulkhead is fill from undetermined sources. A concrete bulkhead forms the shoreline under the crab shack and concrete apron to the north. Photographs 1-6 show the existing features of the shoreline in the Project area. Below +10 ft, the shore is armored with ruble composed of various man-made materials such as broken concrete slab and poured concrete pads mixed with quarry spalls. Below -5 ft the substrate was mixed with cobble, gravel, sand and silt.

An intermediate level eelgrass/macroalgae survey was conducted on October 2, 2003 (Appendix E). Macroalgae and one small patch of eelgrass were observed. *Fucus* and *Ulva* were the dominant algae with some *Laminaria* between -5 to -12 ft with coverage ranging from 5% to 40%. A small patch of eelgrass (*Z. marina*) with 12 turions was observed at -6.8 ft depth. Algae were observed where the substrate was suitable for attachment. The concrete slabs were generally suitable for turf algae such as *Fucus* and *Ulva* but not for *Laminaria* and other kelps.

WDFW has not documented spawning areas for herring, surf smelt or sand lance within one mile of the Project area. Surf smelt spawn in Martha Bay a pocket beach in Skagit Bay 1.3 miles from La Conner. These three fish species are important prey items for the Pacific salmon, west coast groundfish, and pelagic fish, and therefore an important component of fish habitat. These forage fish are also a prey item for marbled murrelet and Stellar's sea lion.

3.2 Terrestrial Habitats

The Project site was been developed with commercial buildings for several decades. These buildings have served a number of different enterprises such a fish processing and fish meal processing. Currently the buildings are vacant or used for storage. Very little natural habitat for terrestrial species is available on site. A few ornamental shrubs are available for passerine birds but there are no large trees that could be used by bald eagles for roosting or nesting. The closest bald eagle nest has been document 1.6 miles from the project site (WDFW 2004) and will not be impacted by the proposed Project.

4.0 SPECIES AND HABITAT FEATURES

4.1 Species Information

Federally listed species that may be affected by the proposed action within the La Conner area are listed below

SPECIES	STATUS
Puget Sound Chinook Salmon (*Oncorhynchus tshawytscha*)	Threatened
Coastal/Puget Sound Bull Trout (*Salvelinus confluentus*)	Threatened
Steller's Sea Lion	Endangered

(*Eumetopias jubatus*)	
Humpback Whales (*Megaptera novaeangliae*)	Endangered
Leatherback Sea Turtle (*Dermochelys coriacea*)	Endangered
Bald eagles (*Haliaeetus leucocephalus*)	Threatened
Brown Pelican (*Pelecanus occidentalis*)	Endangered
Marbled murrelets (*Brachyrhamphus marmoratus*)	Threatened

4.2 **Marine Species**

Puget Sound and associated waters support several species of anadromous salmon. These include chinook salmon (*Oncorhynchus tshawytscha*), chum salmon (*O. keta),* coho salmon (*O. kisutch),* pink salmon (*O. gorbuscha),* sockeye salmon (*O. nerka),* steelhead trout (*O. mykiss),* and sea-run cutthroat trout (*O. clarki clarki).* Two anadromous char species, bull trout (*Salvelinus confluentus*) and Dolly Varden (*S. malma)* are also found in the Strait of Georgia. Dolly Varden and bull trout are similar in appearance and are often mistaken for the other. While there is no suitable habitat for spawning in the Action Area, adult and juvenile salmonid species migrate and rear throughout Puget Sound and the Strait of Georgia. Salmonid species, as well as other marine species, use eelgrass meadows for foraging and cover. No specific surveys were conducted to determine use of chinook salmon or bull trout in the project vicinity. Rather, the assumption is that these fish may be present throughout the year in these locations.

Puget Sound Chinook Salmon

Puget Sound chinook salmon were listed as threatened under ESA (64FR 14308) on August 2, 1999. Spawning populations of chinook salmon are distributed along the Pacific Coast of North America from the Ventura River in southern California to Point Hope, Alaska, and in northeast Asia from the Anadyr River south to Hokkaido, Japan (Wydoski and Whitney, 1979). Chinook salmon can be found throughout the year in the inland waters of Washington State. Mature chinook salmon migrate through the Strait of Georgia to freshwater spawning tributaries on the mainland of the United States and Canada. Wild chinook salmon spawn in the mainstem of rivers or large tributaries at water from depths of a few inches to several feet, and in substrate ranging in size from small gravel to cobble. Fry emergence is dependent upon water temperature, but may begin as early as January. Chinook fry spawned in the mainstem move downstream soon after hatching, although rearing chinook may spend up to a year in the river before outmigrating to the Strait of Georgia during the winter and spring. Normally, chinook fry seek pools and other areas suitable for rearing as they move downstream. After a short period of acclimation to the marine environment, the juveniles begin to migrate throughout the Strait of Georgia on their way to the open ocean. During this immature "blackmouth" phase, chinook salmon may residualize in Puget Sound and the Strait of Georgia and spend up to two to three years in the area. Eventually, they return to their natal stream or river as mature adults to spawn.

Puget Sound Chinook Salmon Critical Habitat

Critical habitat for Puget Sound chinook salmon is currently under review by NOAA-fisheries.

Coastal/Puget Sound Bull Trout and Dolly Varden

Coastal/Puget Sound Bull trout were listed as threatened under the Endangered Species Act (64 FR 58909) on November 01, 1999. Washington State Dolly Varden was proposed for listing as threatened due to similarity of appearance to bull trout (66 FR 1628) on January 09, 2001.

Native char (including bull trout and Dolly Varden) are found in western North America and northeastern Asia from northern California to the Alaskan and Siberian shores of the Arctic Ocean and South to Japan and Korea. Inland populations occur in northern Nevada, Idaho, Montana, and Alberta. In Washington they occur in most major streams of the coastal drainage, Puget Sound, and the Columbia River, and in some large lakes such as Ross, Chester Morse, Wenatchee, and Chelan (Wydoski and Whitney 1979).

Bull trout closely resemble Dolly Varden and were long considered an inland form of that coastal anadromous trout until Cavender (1978) identified them as a distinct species. They were officially recognized as *Salvelinus confluentus* by the American Fisheries Society in 1980. It is currently believed that the coastal/Puget Sound population contains the only anadromous forms of bull trout in the coterminous United States. Native char prefer cold, unpolluted water, spring- and groundwater-influenced systems with loose gravel substrate, a low gradient, and bank cover for spawning. They are considered adults at about four years and spawn in late summer. Juvenile anadromous char move downriver in the spring, spend summer in the estuary, and winter back in the lower river. This temporal and spatial life history pattern generally limits the extent of their marine migrations.

In Washington State, bull trout and Dolly Varden are managed jointly because they co-exist, and have very similar life histories and habitat requirements (WDFW 2000). In 1997, a statewide inventory identified 80 stocks of bull trout/Dolly Varden; 22 of these stocks were found in the Puget Sound region (WDFW 1998). This salmonid stock inventory also states that no known populations of char are native to the Strait of Georgia. However, it is possible that a migrating individual may occasionally inhabit the Project Site.

Puget Sound/Strait of Georgia Coho Salmon

On July 25, 1995 (60 FR 38011), NMFS determined that listing was not warranted for the Puget Sound/Strait of Georgia coho salmon. However, the ESU is designated as a candidate for listing due to concerns over specific risk factors. The NOAA Technical Memorandum concluded that:

> "Although current population abundance is near historical levels and recent trends in overall population abundance have not been downward, there is substantial uncertainty relating to several of the risk factors considered. These risk factors include widespread and intensive artificial propagation, high harvest rates,

extensive habitat degradation, a recent dramatic decline in adult size, and unfavorable ocean conditions. Further consideration of this ESU is warranted to attempt to clarify some of these uncertainties."(Weitkamp *et al.* 1995)

Steller's Sea Lion

The Steller's sea lion occurs from the Channel Islands of southern California north to the Pribilof Islands of the Bering Sea and west to the Kamchatka Peninsula (Jameson and Peeters, 1988). The population in Washington State is relatively stable, although listed as threatened, while the Alaskan population is decreasing and listed as endangered. Breeding and pupping rookeries occur from May to August with adults and juveniles dispersing widely afterward.

The only known Steller's sea lion rookery in Washington occurs on the west coast of the Olympic Penninsula, although small groups are often seen foraging in Puget Sound. Small groups of most likely transient males are present in the San Juan Island Archipelago during at least a portion of the year (WDFW 1993).

Humpback Whale

During the summer, humpback whales in the North Pacific migrate and feed over the continental shelf and along the coasts of the Pacific Rim, from Point Conception, California, north to the Gulf of Alaska, Prince William Sound, and Kodiak Island. Humpback whales spend the winter in three separate wintering grounds: the coastal waters along Baja California and the mainland of Mexico, the main islands of Hawaii, and the islands south of Japan. Although humpback whales may occasionally enter Puget Sound, they are not known to occur within the San Juan Island Archipelago.

Leatherback Sea Turtle

Leatherback sea turtles are distributed throughout the oceans of the world and range from Alaska to Tierra Del Fuego in the Western Hemisphere. Pacific Ocean stocks generally nest on sandy, high energy beaches in the tropics and subtropics between November and January (USFWS, 1980). However, they may be found almost anywhere at anytime because of their tendency to undergo extensive migrations and their alternating-year reproductive cycle (Balazs, 1982). Leatherbacks prefer pelagic areas and are rarely seen above the 100-fathom contour except during nesting.

4.3 Wildlife Species

Bald Eagle

Bald eagles (*Haliaeetus leucocephalus*) are currently listed as threatened by the State of Washington and the U.S. Fish and Wildlife Service (USFWS). Recent increases in bald eagle populations resulted in the USFWS down listing the species from endangered to threatened in 1995. Bald eagles are present in the project area and project activity implications to bald eagle

utilization are addressed in the following paragraphs. The life history, habitat requirements, and limiting factors of bald eagles presented below are adapted from the Washington Department of Wildlife publication: Management Recommendations for Washington's Priority Habitats and Species (Rodick and Milner 1991).

Washington's resident bald eagles are intrinsic to large water bodies both east and west of the Cascade Mountains. Perch trees, including snags and dead crowned trees, are used during the day and often selected according to their proximity to the food source (Steenhof et al. 1980 in USFWS 1986) with taller trees being preferred. Bald eagles may use tidelands and open waters, in and adjacent to the project area, as foraging habitat.

Bald eagles typically nest in large, mature or old growth trees and use the same nest over successive years. In Washington, courtship and nest building activities typically begin in January and February. Egg-laying begins in March or early April, the eaglets hatch in mid-April or early May, and the eaglets fledge in mid-July. The closest known nest to the project is about 1.6 miles to the north of the Project area

Migrant eagles typically begin to arrive at their wintering grounds in late October (Anderson et al. 1986). Wintering bald eagles concentrate in areas of abundant food and minimal disturbance. Increased numbers of migratory eagles, often regionally specific, over-winter along Washington waterways. Primary wintering areas in western Washington include the Olympic Peninsula, the San Juan Islands, Puget Sound and its major tributary rivers, and Hood Canal.

Prey availability and temporal disturbance from human activities such as construction are probably the most important factors affecting bald eagle productivity and survival. Human activities near nest sites during the nesting season can disturb eagles leading to nest abandonment or reduced reproductive success (Anthony et al. 1982). Disturbance while feeding, particularly during winter, can cause eagles to expend more energy increasing their susceptibility to disease and poor health (Stalmaster 1987).

Anthony and Isaacs (1989) recommend that habitat alterations not occur within 1,300 feet of nests and that other disturbances should be time restricted within 2,600 feet of nests. Activities that may impact breeding and rearing eagle nests are not allowed within one-quarter mile or, one half mile by line of sight from January 1 through August 15 of any year.

Brown Pelican

The Brown pelican (*Pelecanus occidentalis*) was listed as an endangered species by the USFWS in 1970. Brown pelicans are uncommon summer residents of Washington's coastal marine waters and use these areas as post-breeding, dispersal habitat to forage and loaf (Sibley 2000). When located within dispersal habitat, this species remains within 20 miles of the shoreline taking advantage of local fishing conditions and opportunistically using available loafing habitat. Preferred prey items for this species are schooling marine fishes found near the surface including Pacific mackerel (*Scomber scombrus*), Pacific sardine (*Sardinops sagax*), and northern anchovy (*Engraulis mordax*), which comprise the majority of the brown pelican diet (USFWS 1995).

Roosting and loafing sites are also found along Washington coastal environments and include offshore rocks, islands, and sandbars and to a lesser extent jetties, pilings and other man-made features adjacent to protected marine habitats. Although this species does not breed in Washington State, offshore rock outcrops and islands constitute preferred breeding habitat, which occurs from the southern coast of California to well below the Mexican border; nest sites are generally found in either mangrove trees or are ground nests built from a variety of materials. Due to Washington State being near the northern edge of summer dispersal range for this species, no critical habitat for brown pelican has been designated within the Pacific Northwest (USFWS 1995). Despite sparse records for this species, brown pelicans have been recorded using both Grays Harbor and Willapa National Wildlife Refuge along the southwest edge of Washington State and have been documented as far north as Vancouver Island (USFWS 2003, Sibley 2000).

Current threats to brown pelican populations include the bioaccumulation of DDT and other organochlorine pesticides, human disturbance of nesting colonies, over fishing of primary prey items, oil spills and other contributors to large-scale species die-offs (USFWS 1995). Although an occasional individual may disperse to the Strait of Georgia area, brown pelicans are rarely expected to occur in any significant numbers within Washington marine waters. As such, it is very unlikely this species would be found in the Action Area and no brown pelicans were observed during the site visit.

Marbled Murrelet

Marbled murrelets (*Brachyramphus marmoratus*) were listed as threatened the USFWS in 1992 and are currently listed as threatened with Washington Department of Fish and Wildlife. Marbled murrelets are year-round residents on Washington marine waters. These birds forage in sheltered waterways and harbors generally within 1.2 miles of shore, selecting feeding areas that are closer than other alcid seabirds that forage in Washington waters (Rodrick and Milner 1991). Pacific Sand lance (*Ammodytes hexapterus)* is the primary prey species of marbled murrelets, constituting over 65% of their diet, especially during the breeding season (Burkett 1995). Other prey species include pacific herring *(Clupea harengus)*, seaperch *(Cymatogaster aggregata)*, euphausiids and other marine invertebrates (Burkett 1995).

Marbled murrelets nest in mature and old-growth forests within 60 miles of marine waters from Alaska to northern California. The breeding season extends from April 1 to September 15. Old-growth and mature forest stands appear to be important to and are visited by marbled murrelets year-round. These visits may be important in forming or maintaining pair bonds and for selecting nest sites (Marshall 1988). Forested nesting habitat characteristics have been identified in the Marbled Murrelet Survey Protocol (Ralph et. al. 1994, and Evans et. al. 2000) and adopted by the Forest Practices Board in 1997. There are no known marbled murrelet nest sites in the project vicinity (from WDFW Priority Habitats and Species Maps [Report date: March 27, 2000]), and no potential murrelet nesting habitat exists in or near the project area.

Potential threats to marbled murrelet populations include loss of old-growth forest, disturbance during nesting, nest predation, oil spills, entanglement in gill-nets, and disturbance during foraging (Ralph et al. 1995). The Interagency Marbled Murrelet Committee has issued

management guidelines that suggest gill-netting and oil development or transport be restricted where large concentrations of marbled murrelets occur (IMMC 1991). Marbled murrelets forage and winter in marine habitats around the San Juan Islands in relatively low densities with the highest numbers generally observed in fall (Speich and Wahl 1995). Although murrelets may use the project area for foraging, no marbled murrelets were observed during the site visit.

5.0 ESSENTIAL FISH HABITAT

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires Federal agencies to consult with NOAA Fisheries on activities that may adversely affect Essential Fish Habitat (EFH). The objective of this EFH assessment is to describe potential adverse effects to designated EFH for federally managed west coast groundfish, pacific salmon and coastal pelagic species. The EFH assessment describes conservation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the proposed action.

The proposed Project is located in Swinomish Channel that provides a corridor between Skagit Bay and Padilla Bay. For this EFH Assessment, it was assumed that the fish species listed as having essential habitat in Puget Sound would be applicable. Table 1 lists the species that have been identified with EFH in the Puget Sound (http:www.nwr.noaa.gov/1habcon/habweb/efh/puget_sound.pdf).

Table 1. Federally managed species and life stages identified with Essential Fish Habitat in Puget Sound. (http:www.nwr.noaa.gov/1habcon/habweb/efh/puget_sound.pdf) (?=uncertain)

SPECIES	ADULT	SPAWNING/ MATING	JUVENILE	LARVAE	EGGS/ PARTURITION
West Coast Groundfish					
Spiny dogfish	X	X	X		X
Big skate	X	X	X		X
California skate	X				
Longnose skate	X				X
Ratfish	X				X
Lingcod	X	X	X	X	X
Cabezon	X	X	X	?	X
Kelp greenling	X	X	X	X	X
Pacific cod	X	X	X	X	X
Pacific whiting (hake)	X		X		
Sablefish	X		X		
Black rockfish	X		X		
Bocaccio	X	?	X	X	
Brown rockfish	X	?	?	X	
Canary rockfish	?	?	X		
China rockfish	X		X		
Copper rockfish	X		X	?	
Darkblotched rockfish	X		X		
Greenstriped rockfish					
Pacific Ocean rockfish	X		X		
Quillback rockfish	X		X	?	
Redbanded rockfish	X				
Redstriped rockfish	?				
Rosethorn rockfish	X		X		

SPECIES	ADULT	SPAWNING/ MATING	JUVENILE	LARVAE	EGGS/ PARTURITION
Rosy rockfish	?				
Rougheye rockfish	X		?		
Sharpchin rockfish	X		?		
Shortspine thornyhead	X		X		
Splitnose rockfish	X		X		
Stripetail rockfish	X				
Tiger rockfish	X		X		
Vermilion rockfish	X	?	X		
Yelloweye rockfish	X	?			
Arrowtooth flounder	X	X	X		
Butter sole	X	X	X		
Curlfin sole	X				
Dover sole	X	X	X		
English sole	X	X	X	X	X
Flathead sole	X	X	X		
Pacific sanddab	X		X	X	X
Petrale sole	X		X		
Rex sole	X	X	X		X
Rock sole	X	X	X		
Sand sole	X	X	X		
Starry flounder	X	X	X	X	X
Pacific Salmonids					
Chinook salmon	X		X		
Coho salmon	X		X		
Puget Sound pink salmon	X		X		
Coastal Pelagic Species					
Northern anchovy	X	X	X	X	X
Pacific sardine	X				
Pacific mackerel	X				
Market squid	X				

EFH for west coast groundfish is defined as:

> "...the aquatic habitat necessary to allow for groundfish production to support long-term sustainable fisheries for groundfish and for groundfish contributions to a healthy ecosystem. Descriptions of groundfish EFH for each of the 83 species and their life stages result in more than 400 EFH identifications. When these EFHs are taken together, the groundfish EFH includes all waters from the mean higher high water line, and the upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon and California seaward to the boundary of the U.S. Exclusive Economic Zone (EEZ) (370.4 km offshore)."

EFH for pacific salmonids is defined as:

> "...those waters and substrate necessary for salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. To achieve that level of production, EFH includes all those streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon in Washington, Oregon, Idaho, and California. In the estuarine and marine areas, salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the EEZ offshore of Washington, Oregon, and

California north of Point Conception. Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the Pacific Fishery Management Council), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years).

EFH for coastal pelagic species is defined as:

"The east-west geographic boundary is all marine and estuarine waters from the shoreline along the coasts of California, Oregon, and Washington offshore to the limits of the EEZ and above the thermocline where sea surface temperatures range between 10°C to 26°C. The southern boundary of EFH is the US-Mexico maritime boundary. The northern boundary of the range of coastal pelagic finfish is more dynamic and variable due to the seasonal cooling of the sea surface temperature. The northern EFH boundary is, therefore, the position of the 10°C isotherm which varies both seasonally and annually."

6.0 ANALYSIS OF EFFECTS

6.1 Potential Impacts

Overwater structures

Overwater structures and their supporting members impact aquatic habitat by altering light regimes, wave energy, substrates and water quality. The structures can reduce the amount of light that penetrates the water and create shade directly underneath and to the sides of the structures. Light is a requirement for aquatic vegetation growth and production; aquatic vegetation will not grow where there is insufficient light. Aquatic vegetation provides structure and food base for the ecosystem and food webs. Habitat with aquatic vegetation is far more productive than bare sediment habitat and provides food items, refuge and spawning substrate for a number of species that are associated with ESA listed fish and wildlife. Floating docks and piles reduce the wave energy that controls the sediment in the nearshore habitat. Reduced wave energy decreases netshore drift, which transports sediment along the nearshore. Wave energy also controls the subtidal sediment characteristics and reduced wave energy may allow fine sediment to settle out of the water column and decrease the movement of detritus material from the subtidal habitat. Sediment around dock piles have been observed to have an increased component of shellhash that alters the sediment density near the overwater structure. Water quality issues associated overwater structures are generally associated with operation of watercraft such as vessel discharge, engine operation, fuel spillage, bottom paint sloughing, vessel maintenance and propwash. (Nightingale and Simentstad 2001).

Construction activities may also contribute to each of the issues discussed above. Barges may shade the aquatic vegetation, and propwash from construction vessels may alter the sediment and displace vegetation. Grounding of construction vessels may also displace vegetation and alter the sediment.

Overwater structures also present physical barriers to fish migration, prey resource production and availability, and altered predator-prey relationships. The potential of these impacts is relative to the size of the structures, density of piles, and the area of shade resulting from the structure. Juvenile salmonids avoid entering shaded habitats and have rarely been observed to pass under floating objects (Nightingale and Simentstad 2001).

Treated Wood

Wood preservative leaching from the piles also pose a risk to water quality and sediment contamination. Generally, two types of treatment are applied to wood products to reduce decomposition of the wood and increase the longevity of the structurally integrity: 1) organic treatment (oil base) with creosote, and 2) inorganic treatment (water base) with ammoniacal copper zinc arsenate (ACZA) and chromated copper arsenate (CCA type C). Creosote and pentachlorphenal treated wood is not allowed in freshwater lakes and pentachlorphenal is not used as a supplement to creosote treated wood in marine applications in Washington State. The water base treatments have less potential for environmental impacts than creosote and concentration of toxic copper is leached at a lower rate with CCA than ACZA. The leaching rate of zinc, chromium III and VI and arsenic V in both CCA and ACZA treated wood is less that the chronic water quality standards of Washington. The initial leaching rate of copper exceeds Washington water quality standards however; the leaching rate of both CCA and ACZA treated wood is greatly diminished within a matter of days after placement in the aquatic environment. The area of impact is small and limited to the vicinity of the structure and the potential for impact is greater in the sediment than in the water column due to the dilution rates of water currents. Few studies however, have found conclusive evidence of adverse biological impacts due to sediment contamination from treated wood (Poston 2001).

To minimize leaching, WDFW requires all piling and lumber treated with preservatives to be sufficiently cured before being placed in the water or sediments. WAC 220-110-270(9). (Conservation measure No.3 below)

Pile Removal and Pile Driving

Disturbance of sediment as a result of pile driving, pile removal and propwash may suspend sediments that have been contaminated from the treated timber piles or other sources. This may be a vector of reintroduction of contaminates into the ecosystem. Fish will likely be attracted to the construction site because of the suspension of benthic organisms (Nightingale and Simenstad 2001). Long-term accumulation of metals in sediment at the base of pilings placed in mud has not been reported and concentrations of polyaromatic hydrocarbons (PAH) in sediment have been found to decrease over a period of several years, possibly due to microbial activity (Poston 2001). In addition, bioaccumulation and biomagnification of PAH and metals (other than methyl mercury) do not occur and therefore, the risk of removal of pilings is not clear or well understood (Poston 2001). Turbidity however, may be temporarily elevated for the period of piling removal.

Pile driving can generate intense underwater Sound Pressure Levels (SPL) that have cause sever damage and mortality to fish (Longmuir and Lively 2001). The intensity of SPL produced by

pile driving is dependant on a number of factors including:

- Type and size of pile;
- Type and size of pile driving equipment;
- Firmness of substrate;
- Depth of water;

Wood and concrete piles produce lower SPL than hollow steel piles that appear to produce the most intense sound pressures when driven by a drop-hammer impact pile driver. Vibratory hammers produce sound pressures of lower intensity with rapid repetition over a period of several seconds to several minutes whereas as both the hydraulic and drop-hammer impact pile driving produces a very short intense sound pressure. Fish display avoidance response to the SPL associated with vibratory pile driving. Fish may respond to the first initial strikes of an impact hammer but then the response wanes and the fish remain within the area where potential harmful SPL may be experienced (NOAA Fisheries 2003).

The effort required to drive a pile is dependant on the size, type of pile and the firmness of the substrate that the pile is being driven into. Larger diameter displacement piles such as wood, concrete and closed-end steel piles require greater impact than piles with cutting ends such as open end steel pile or sheet pile. Firmer substrates are more resistant to penetration and also require greater impact than less consolidated sediment. The depth of water where the pile is being driven effects the attenuation of sound pressure and shallow water attenuates sound more rapidly (NOAA Fisheries 2003).

This Project proposes to place approximately 90 ACZA treated wood piles and 12 steel piles using a drop-hammer impact pile driver. Driving the wood piles will not likely produce SPL that are detrimental to fish however, driving the steel piles may produce SPL sufficient to cause harm. Conservation Measure No. 4 will be implemented to avoid risk of injury to ESA listed fish and the EFH of fisheries resources.

Excavation

Excavation within the intertidal zone has a number of effects on marine organisms and habitat including entrainment, behavior effects, resuspension of contaminants, increased turbidity, and noise. These effects are temporary and localized within the action area with the exception of contaminants. Resuspension can allow contaminants to reenter the food web and to become accumulated in organisms through biomagnification (Nightingale and Simenstad 2001b). Mobile species can avoid sediment plumes but sessile species that are attached to benthic habitat will be impacted by increased sediment load.

Analysis results reported by Washington State Department of Ecology (Ecology) (2003) for sediment samples collected in Swinomish Channel indicate that sediments are relatively clean. Three separate samples had chemicals that exceeded the Cleanup Screen Levels (WAC 173-204). A sample collected on August 31, 1988 had an exceedance of Bis (2-ethylhexyl) phthalate, a chemical used in plastic tubing to improve flexibility and possibly the laboratory source of contamination of the sediment sample. Sediment samples collected on June 1, 1994 had

concentration of two PAHs, fluoranthene and phenanthrene that exceeded the Cleanup Screen Levels. Analysis of additional collected samples from the same station and period did not result in exceedance levels of these or any other sediment chemicals. Both of these PAHs are likely constituents of creosote and are not uncommon in sediment samples.

6.2 Direct Effects:

Potential impacts to the aquatic habitat may include:

1. Temporary increased turbidity from a sediment plume related to removal of derelict piles and rubble;
2. Temporary impacts to water quality to due construction activities such as potential fuel, oil and hydraulic fluid spills;
3. Temporary disruption of bird forage and nesting activities due to construction noise;
4. Temporary disruption of fish forage and rearing behavior due to construction activities;
5. Temporary risk of injury to fish due to sound pressure produced by pile driving;
6. Shading of subtidal and intertidal areas;
7. Reduced wave action along shoreline.

Disturbance of sediment will occur during Phase I and II of the construction activity that is expected to be completed in six weeks. During this time derelict piles and concrete rubble will be removed, new piles will be installed and rock fill will be placed. After this work is completed, the seabed will not be disturbed and turbidity will return to background levels. Estuarine water is naturally turbid and the level of turbidity is variable depending on terrestrial sources, wind, waves and plankton production.

Discharges of petroleum products will not be allowed as required by the WDFW HPA and as listed below as a Conservation Measure No. 14.

Bottorff *et al.* (1987) monitored noise associated with the construction activities on the Orcas Island ferry terminal and found that construction noise, including pile driving, was no higher than background noise 0.25 to 0.5 miles from the work site. The closest bald eagle nest site to the proposed project is approximately 1.6 miles, thus project noise from construction will not be discernable from background noise and therefore will have no impact to behavior of bald eagle.

Shade from overwater structures is address in the mitigation plan attached as Appendix C and in Appendix D; Shade Study. Implementation of the mitigation plan will provide appropriate attachment substrate for marine vegetation so that the area of coverage will be increased by a ratio of 1.25:1.

6.3 Indirect Effects

A removed creosote piles and timbers will be disposed at an appropriate upland site and will not be allowed to enter the waters of Washington State as required by the WDFW HPA (Appendix F) and as outlined below in conservation measures.

7.0 CONSERVATION MEASURES

The following conservation measures have been incorporated into the project to protect and minimize the impact to the aquatic habitat.

1. Timing limitations – Tidal reference area 9 (Blaine)
   a) In-water work will only be allowed from **June 16** through **March 14** for the protection of migrating juvenile salmonids.
   b) Forage fish restrictions are not applicable
   c) Bald eagle restrictions are not applicable

2. All treated wood products will meet American Wood-Preservers' Associations standards for materials in Marine Construction (C18).

3. Western Wood-Preservers' Associations Best Management Practices (BMPs) amendment #1 will be followed for post-treatment process.

4. The following sound attenuation methods shall be required for the driving of steel piles with an impact hammer below the ordinary high water line:

   a. For steel piles 10 inches in diameter or less, a 6 inch thick wood block shall be installed between the piling and the impact hammer during pile driving operations of a bubble curtain shall be installed around the pile during pile driving operations.

   b. For steel piles greater than 10 inches in diameter, a bubble curtain shall be installed around the pile during pile driving operations.

5. All manmade debris on the beach shall be removed and disposed of upland such that it does not enter waters of the state.

6. The existing creosote treated timber piling, the existing failing timber bulkhead and the existing concrete/asphalt slab debris shall be removed from the beach and disposed of upland such that they do not re-enter such waters. Under no circumstances shall creosote treated piling or lumber be used for project construction.

7. Existing creosote piling that can not be extracted shall be cut or broken off at the mud line and covered with, at a minimum, 12 inches of clean substrate material as part of the Phase II construction of the near shore fish migration corridor.

8. Existing concrete slab materials removed from the beach may be crushed to appropriate size and used as partial fill for constructing the fish migration bench. Crushed concrete slab materials used shall be over laid with a layer of 8 inch quarry spalls and 2-4 inch railroad ballast of sufficient depth to prevent the re-emergence of the crushed concrete to the surface of the seabed.

9. rock for sub-tidal rock revetment element of fish migration bench and 4 rock cluster elements shall be composed of clean, angular material of a sufficient durability and sixe to prevent its being broken up or washed away by high water or wave action.

10. All natural habitat features on the beach larger than 12 inches in diameter, including trees, stumps, logs, and large rocks, shall be retained on the beach following construction. These habitat features may be moved during construction if necessary.

11. Project activities shall be conducted to minimize siltation of the beach area and seabed.

12. If fish kill occurs or fish are observed in distress, the project activity shall immediately cease and WDFW habitat program shall be notified immediately.

13. All debris or deleterious material resulting from construction shall be removed from the beach area and bed and prevented from entering waters of the state.

14. No petroleum products or other deleterious materials shall enter surface waters.

15. The contractor will have oil-absorbent materials on site to be used in the event of a petroleum product spill on the deck of construction vessels and if any sheen is observed in the water.

16. Project activities shall not degrade water quality to the detriment of fish life.

17. Mitigation: Unavoidable shading impacts associated with the overwater elements of the proposed project shall be mitigated as per the terms and conditions of the La Conner Associates Mitigation Plan for Shoreline Redevelopment dated July 28, 2004 attached as Appendix C.

8.0 DETERMINATION OF EFFECTS

8.1 Summary

The following table lists the summary of the effects analysis for federally listed ESA species.

SPECIES	EFFECT	TAKE
Puget Sound Chinook Salmon	NLAA[1]	None
Coastal/Puget Sound Bull Trout	NLAA	None
Steller's Sea Lion	NLAA	None
Humpback Whales	No Effect	None
Leatherback Sea Turtle	No Effect	None
Bald Eagles	NLAA	None
Brown Pelican	NLAA	None
Marbled Murrelets	NLAA	None
Essential Fish Habitat	MAA[2]	

3. Not Likely to Adversely Affect.
4. May Adversely Affect

"Take" Analysis

Construction of the La Conner Associates Project will not likely result in a "take" of any individuals, populations or critical habitat of the above ESA listed species. After completion of the project, no further action will be necessary and no cumulative effects are expected.

Interrelated and Interdependent Effects

Interrelated activities include vessel traffic in Swinomish Channel, Skagit Bay and Padilla Bay. The proposed marina may have an indirectly affect on the number of vessels operating on the waters of surrounding Swinomish Channel but the vessel traffic will likely increase due to the increased human population living and utilizing the area for transportation and recreation.

8.2 Marine Species

Puget Sound Chinook Salmon

The proposed action may affect, not likely to adversely affect Puget Sound chinook salmon or its critical habitat. Chinook salmon may utilize the Project Area for rearing, but there is no appropriate spawning habitat in the Action Area. The short-term presence of heavy equipment on the upper intertidal area and in-water work may have a temporary effect to any fish that may be present. The Project is not expected to have a long-term impact on habitat or fish resources that comprise the forage base for Puget Sound chinook salmon.

Coastal/Puget Sound Bull Trout

The proposed project may affect, not likely to adversely affect Coastal/Puget Sound bull trout. Juvenile native char are isolated from the proposed project because of their freshwater distribution. It is unlikely that adult bull trout or Dolly Varden will be found in the Project vicinity, although they may occasionally migrate through the Action Area.

Steller's Sea Lion

The proposed project may affect, not likely to adversely affect Steller's sea lions. Critical life-history phases such as breeding and pupping do not occur in this area. The project is not expected to impact fish resources and will therefore not impact the forage base of the Steller's sea lion.

Humpback Whale

The proposed project will have no effect on the humpback whale, because they are not known to occur within the San Juan Island Archipelago.

Leatherback Sea Turtle

The proposed project may affect, not likely to adversely affect leatherback sea turtles. It is very unlikely that leatherback sea turtles or its prey utilize the Project Area.

8.3 Wildlife Species

Bald Eagle

A bald eagle nest has been documented by WDFW (2004) approximately 1.6 miles from the project site, one mile outside of the Action Area. Bottorff et al. (1987) monitored noise associated with the construction activities on the Orcas Island Ferry Terminal and found that construction noise, including pile driving, were no higher than background noise 1/4 to 1/2 miles from the work site. Elevated noise during construction activities will not be discernable from background noise associated with boat and auto traffic and other current human activities in the Project vicinity.

Construction activities associated with the proposed project will have may affect, not likely to adversely affect individual bald eagles or populations in the project vicinity.

Brown Pelican

The Strait of Georgia is near the northern edge of summer dispersal range for this species, and no critical habitat for brown pelican has been designated within the Pacific Northwest (USFWS 1995). Brown pelicans have been recorded using both Grays Harbor and Willapa National Wildlife Refuge along the southwest edge of Washington State and have been documented as far north as Vancouver Island (USFWS 2003, Sibley 2000). Although an occasional individual may disperse to this area, brown pelicans are rarely expected to occur in any significant numbers within Washington marine waters. Therefore, it is very unlikely this species would be found in the Action Area and the proposed project may affect, but not likely to adversely affect individual or populations of brown pelican.

Marbled Murrelet

There are no known marbled murrelet nest sites in the project vicinity (WDFW 2003). Potential nesting habitat does not exist either in or near the project area. Foraging habitat may exist both in and near the Project area. Lands and waters adjacent to the Project area already have considerable human developments and associated activities, including private boat traffic, fisheries and other recreational endeavors. The Project is not expected to adversely impact prey resources or prey habitat for the marbled murrelet.

In conclusion, the construction activities associated with the proposed project may affect, but not likely to adversely affect individual marbled murrelets or populations in the project vicinity. No mitigation measures for marbled murrelets are currently proposed.

8.4 Essential Fish Habitat

The proposed action may adversely affect EFH for west coast groundfish, Pacific salmon and coastal pelagic species. Water quality may be degraded during the construction period of the proposed action. The potential impacts are expected to be temporary and will not likely persist after the construction period. Impacts resulting from the proposed action will be insignificant and/or discountable.

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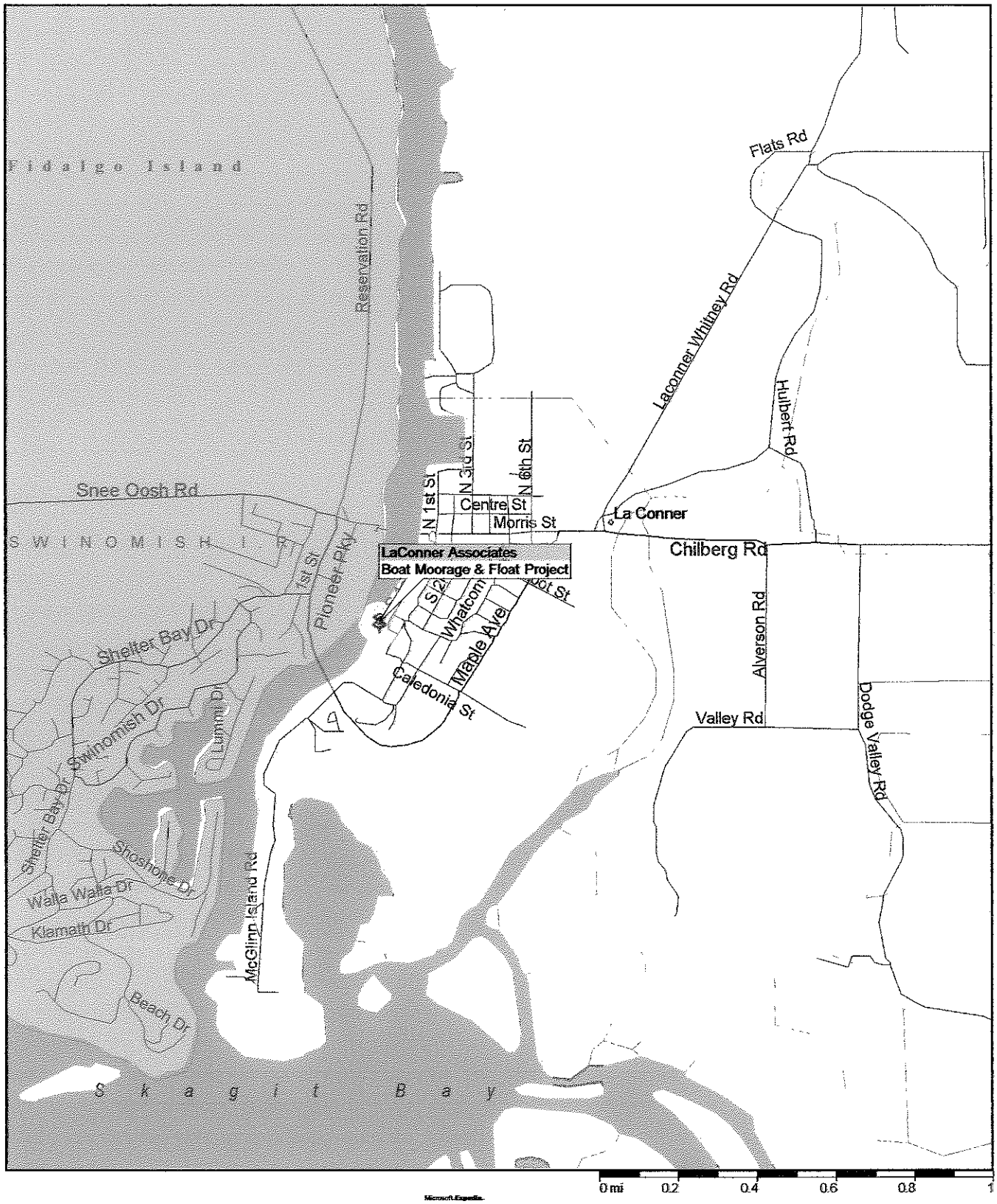
Appendix A

Project Drawings

VICINITY MAP

LA CONNER ASSOCIATES BOAT MOORAGE & FLOAT IMPROVEMENTS



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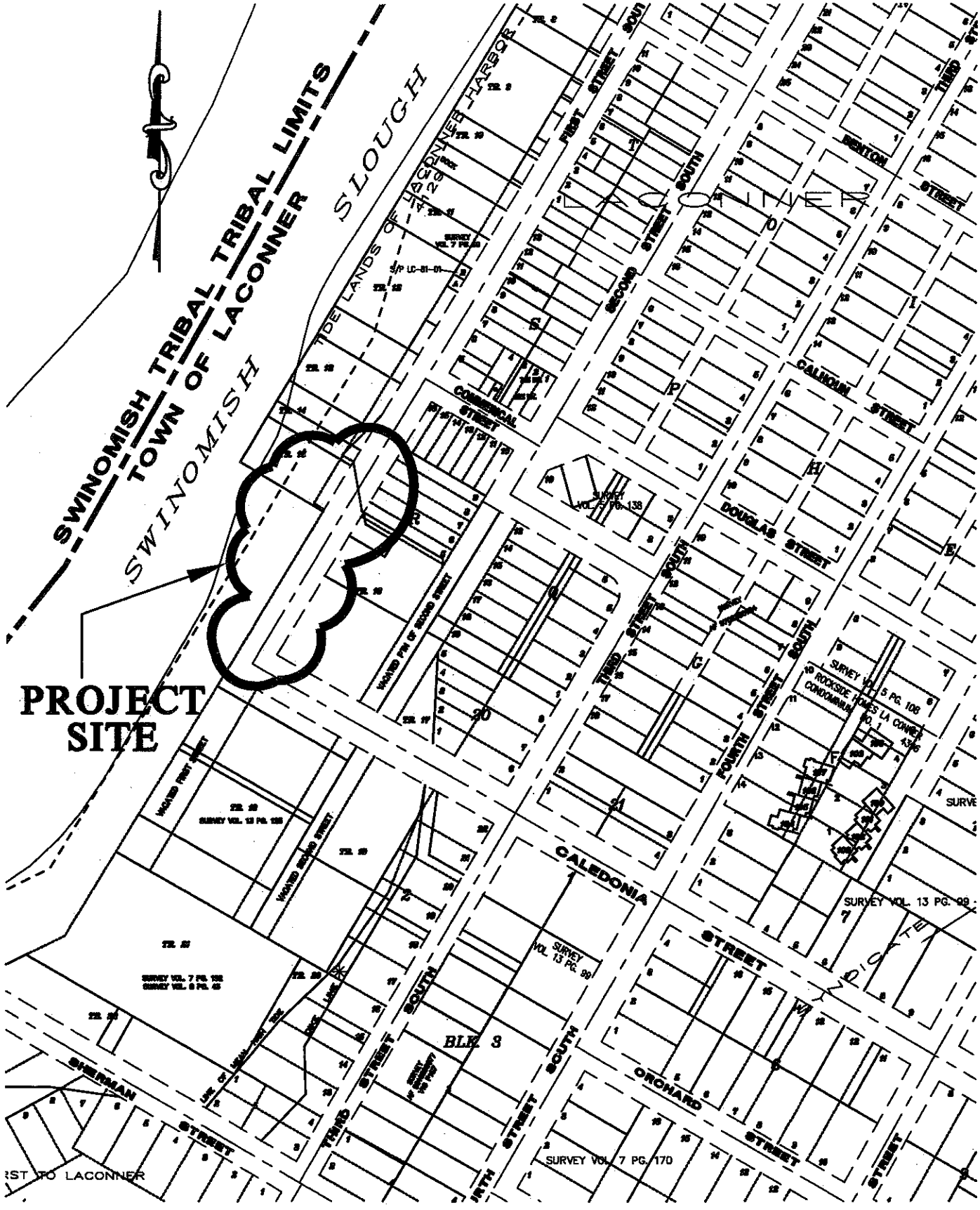

Ravnik & Associates, Inc.
CIVIL ENGINEERING & LAND-USE PLANNING
108 E. GILKEY ROAD
BURLINGTON, WA. 98233
PH: (360) 707-2048 FAX: (360) 707-2216

SHEET DESCRIPTION:

BOAT MOORAGE & FLOAT FACILTY FOR LA CONNER ASSOCIATES VICINITY MAP

SCALE: 1" = 200'
DRAWN BY: D. SVEUM
JOB NO. 97018A
DATE: 08/11/04

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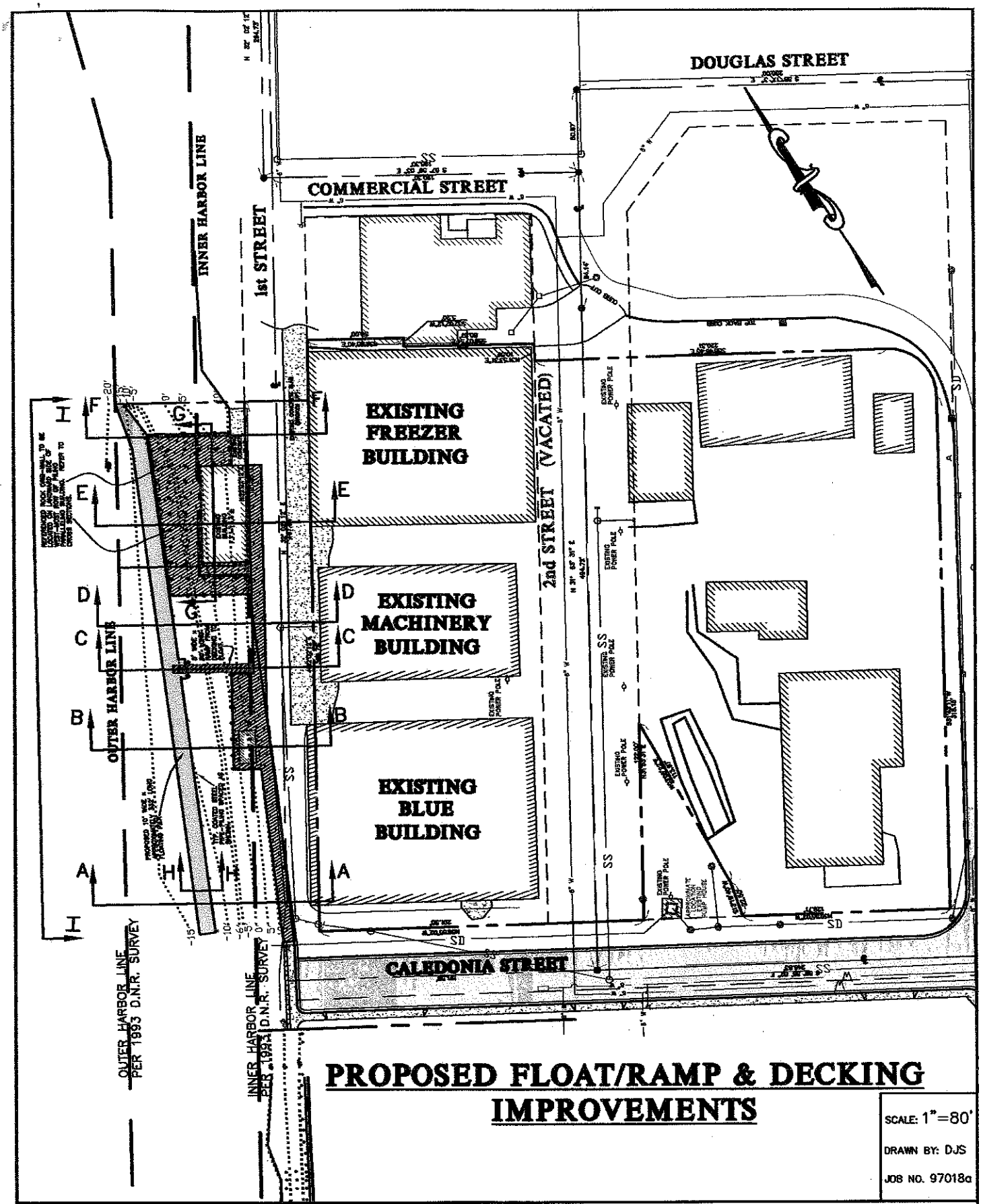


PROPOSED FLOAT/RAMP & DECKING IMPROVEMENTS

SCALE: 1"=80'

DRAWN BY: DJS

JOB NO. 97018a

Ravnik & Associates, Inc.

CIVIL ENGINEERING & LAND-USE PLANNING

108 E. GILKEY ROAD/P.O. BOX 361
BURLINGTON, WA 98233
PH: (360) 707-2048 FAX: (360) 707-2216

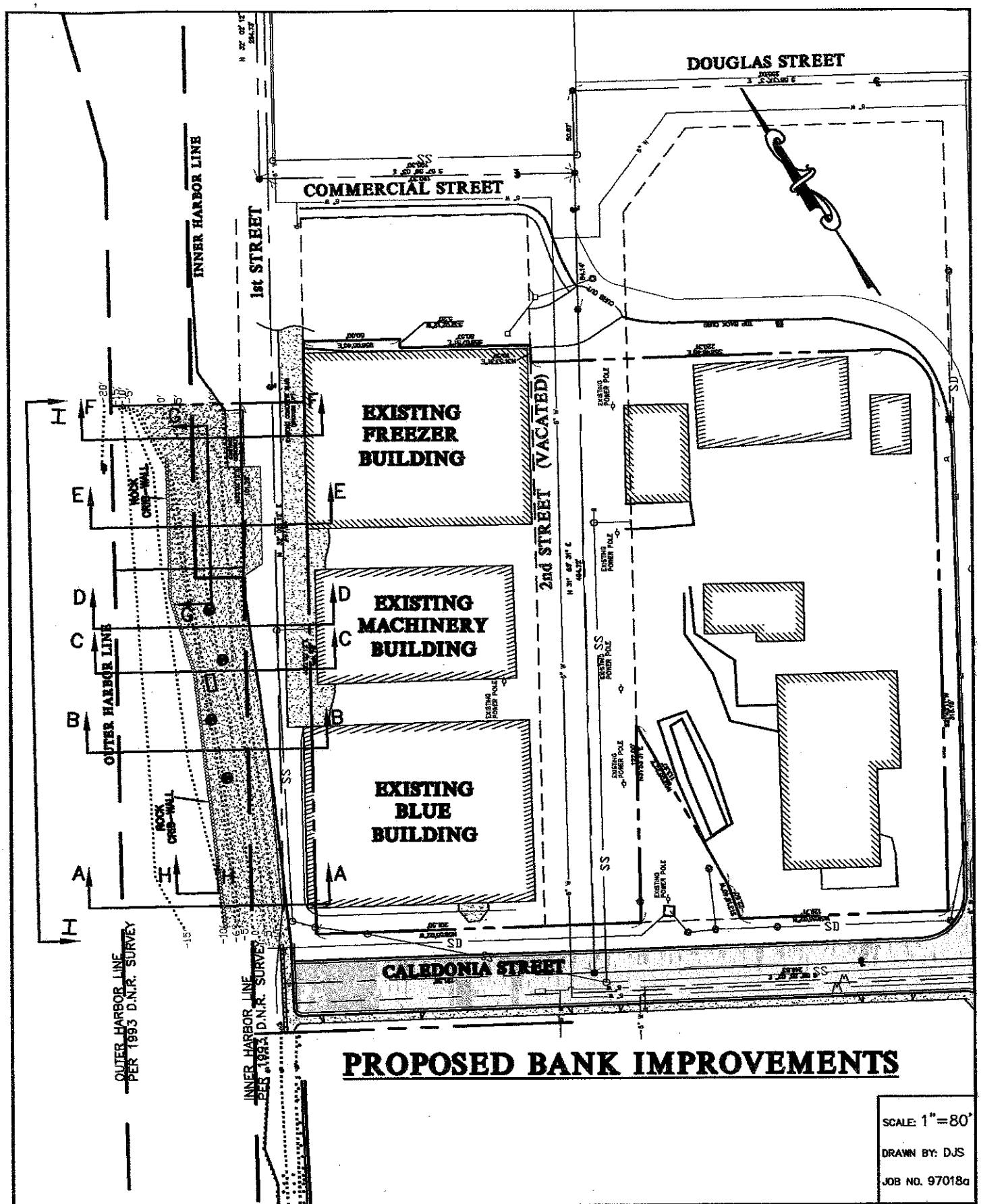
PROPOSED: Boat Moorage Float Facility **REFERENCE:** XXXX

PURPOSE: Support Waterfront Activities for Adjoining Commercial – Residential Zoned Areas

APPLICATION BY: LaConner Associates **in** Swinomish Channel, at LaConner, WA

SHEET 1 **OF** 12

DATE: 07/22/04



PROPOSED BANK IMPROVEMENTS

SCALE: 1"=80'
DRAWN BY: DJS
JOB NO. 97018a

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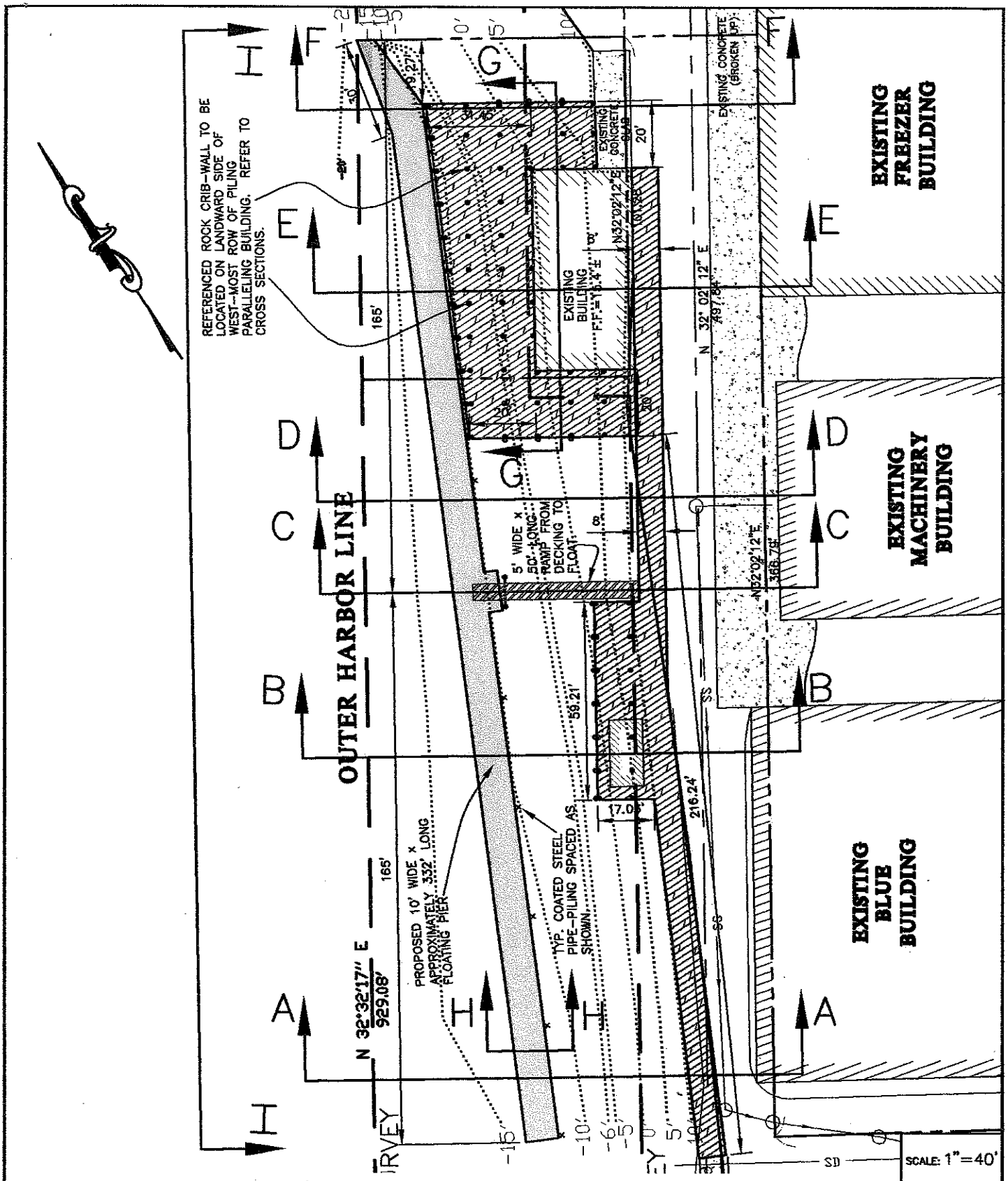
PROPOSED: Boat Moorage Float Facility **REFERENCE:** XXXX
PURPOSE: Support Waterfront Activities for Adjoining Commercial – Residential Zoned Areas
APPLICATION BY: LaConner Associates In Swinomish Channel, at LaConner, WA
SHEET 2 OF 12 **DATE:** 07/22/04



PROPOSED FLOAT/RAMP & DECKING DIMENSION PLAN

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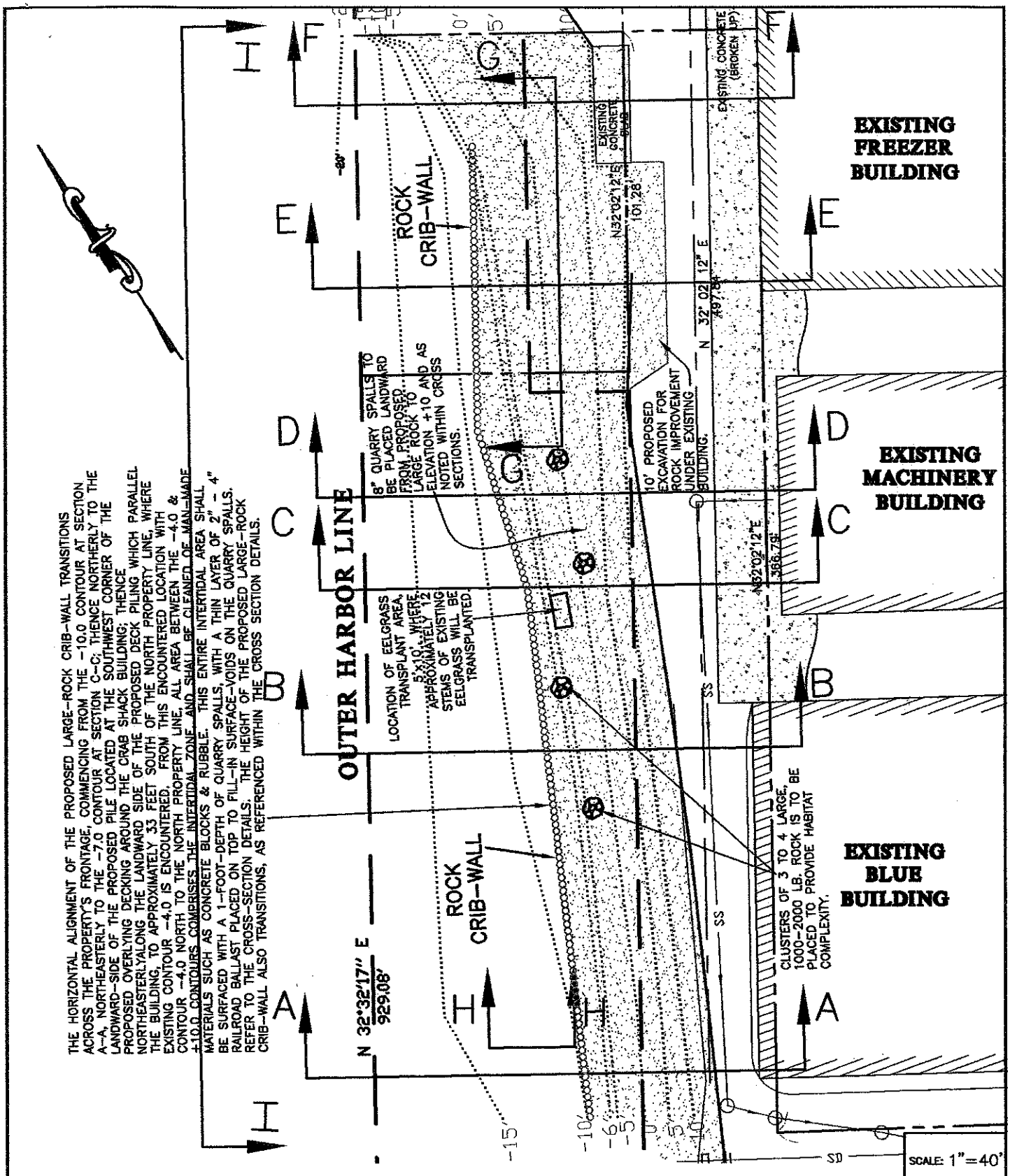
PURPOSE: Support Waterfront Activities for Adjoining Commercial – Residential Zoned Areas
APPLICATION BY: LaConner Associates **In** Swinomish Channel, at LaConner, WA

DATE: 07/22/04



THE HORIZONTAL ALIGNMENT OF THE PROPOSED LARGE-ROCK CRIB-WALL TRANSITIONS ACROSS THE PROPERTY'S FRONTAGE, COMMENCING FROM THE -10.0 CONTOUR AT SECTION A-A, NORTHEASTERLY TO THE -7.0 CONTOUR AT SECTION C-C; THENCE NORTHERLY TO THE LANDWARD-SIDE OF THE PROPOSED PILE LOCATED AT THE SOUTHWEST CORNER OF THE PROPOSED OVERLYING DECKING AROUND THE CRAB SHACK BUILDING; THENCE NORTHEASTERLY ALONG THE LANDWARD SIDE OF THE PROPOSED DECK PILING WHICH PARALLEL THE BUILDING, TO APPROXIMATELY 33 FEET SOUTH OF THE NORTH PROPERTY LINE, WHERE EXISTING CONTOUR -4.0 IS ENCOUNTERED. FROM THIS ENCOUNTERED LOCATION WITH CONTOUR -4.0 NORTH TO THE NORTH PROPERTY LINE, ALL AREA BETWEEN THE -4.0 & +10.0 CONTOURS COMPRISES THE INTERTIDAL ZONE AND SHALL BE CLEANED OF MAN-MADE MATERIALS SUCH AS CONCRETE BLOCKS & RUBBLE. THIS ENTIRE INTERTIDAL AREA SHALL BE SURFACED WITH A 1-FOOT-DEPTH OF QUARRY SPALLS, WITH A THIN LAYER OF 2" - 4" RAILROAD BALLAST PLACED ON TOP TO FILL-IN SURFACE-VOIDS ON THE QUARRY SPALLS. REFER TO THE CROSS-SECTION DETAILS. THE HEIGHT OF THE PROPOSED LARGE-ROCK CRIB-WALL ALSO TRANSITIONS, AS REFERENCED WITHIN THE CROSS SECTION DETAILS.

SCALE: 1"=40'
DRAWN BY: DJS
JOB NO. 97018a

BANK IMPROVEMENT DIMENSION PLAN

Ravnik & Associates, Inc.
CIVIL ENGINEERING & LAND-USE PLANNING
108 E. GILKEY ROAD/P.O. BOX 361
BURLINGTON, WA 98233
PH: (360) 707-2048 FAX: (360) 707-2216

PROPOSED: Boat Moorage Float Facility **REFERENCE:** XXXX
PURPOSE: Support Waterfront Activities for Adjoining Commercial -- Residential Zoned Areas
APPLICATION BY: LaConner Associates In Swinomish Channel, at LaConner, WA

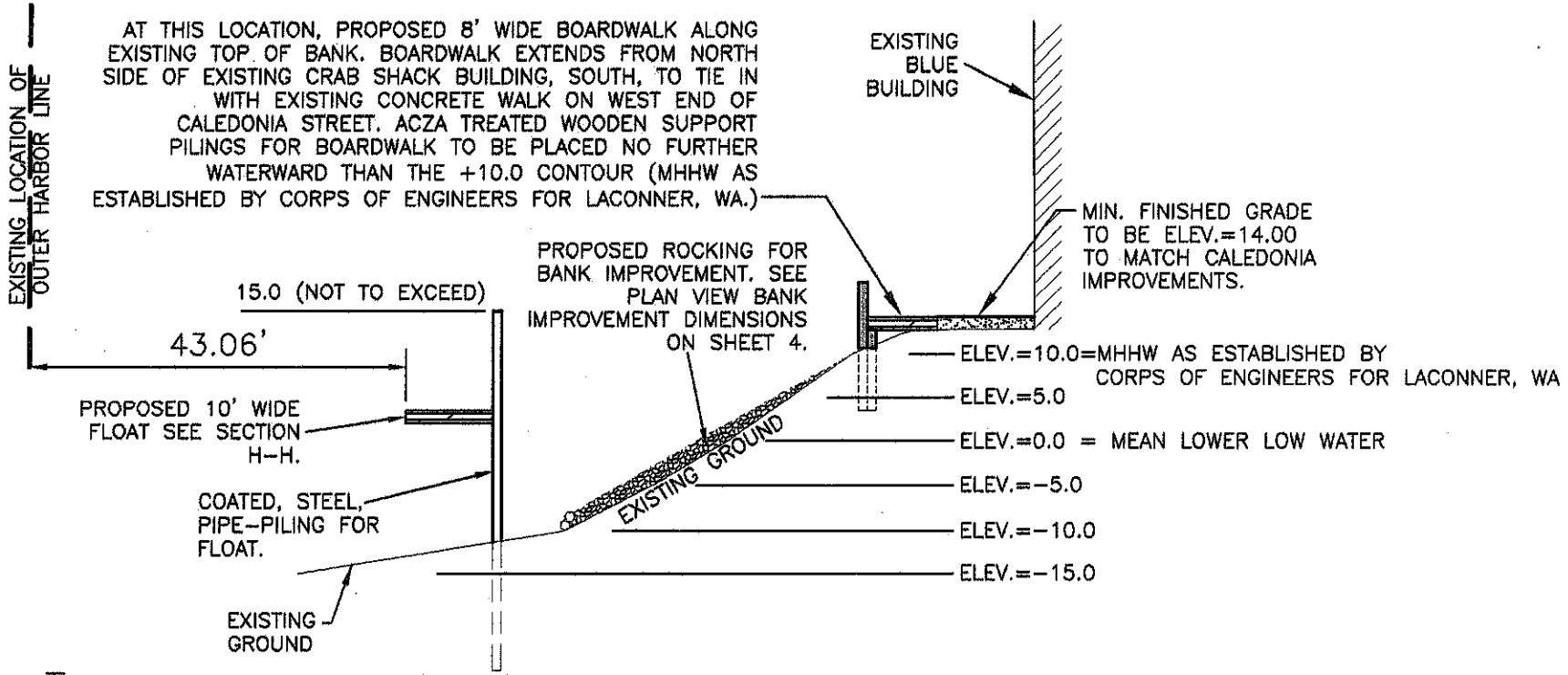
DATE: 07/22/04

Ravnik & Associates, Inc.
CIVIL ENGINEERING & LAND-USE PLANNING
105 E. GILKEY ROAD/P.O. BOX 361
BURLINGTON, WA. 98233
PH: (360) 707-2048 FAX: (360) 707-2256

PROPOSED: Boat Moorage Float Facility **REFERENCE:** XXXX
PURPOSE: Support Waterfront Activities for Adjoining Commercial – Residential Zoned Areas
APPLICATION BY: LaConner Associates **In** Swinomish Channel, at LaConner, WA
DATE: 07/22/04
SHEET 5 OF 12

EXISTING OUTER HARBOR LINE

AT THIS LOCATION, PROPOSED 8' WIDE BOARDWALK ALONG EXISTING TOP OF BANK. BOARDWALK EXTENDS FROM NORTH SIDE OF EXISTING CRAB SHACK BUILDING, SOUTH, TO TIE IN WITH EXISTING CONCRETE WALK ON WEST END OF CALEDONIA STREET. ACZA TREATED WOODEN SUPPORT PILINGS FOR BOARDWALK TO BE PLACED NO FURTHER WATERWARD THAN THE +10.0 CONTOUR (MHHW AS ESTABLISHED BY CORPS OF ENGINEERS FOR LACONNER, WA.)



BANK IMPROVEMENTS:
* NO DREDGING IS PROPOSED FOR THIS IMPROVEMENT.

AT APPROXIMATE ELEVATION –10.0, LARGE, 1000–2000 LB. ROCK IS TO BE KEYED AND PLACED ON A 1.5:1 SLOPE TO APPROXIMATE ELEVATION –8.0. QUARRY SPALLS TO BE PLACED ON EVEN SLOPE FROM –8.0 TO +10.0. THIN LAYER OF 2"–4" RAILROAD BALLAST TO BE APPLIED TO FILL IN SURFACE VOIDS. SOUTH END OF LARGE ROCK AND QUARRY SPALLS TO TRANSITION INTO THE EXISTING QUARRY SPALL EMBANKMENT AT THE WESTERLY MOST END OF CALEDONIA STREET.

REFER TO SHEET 1 OF 12 FOR LOCATION OF TYPICAL SECTION A–A

THE HORIZONTAL ALIGNMENT OF THE PROPOSED LARGE–ROCK CRIB–WALL TRANSITIONS ACROSS THE PROPERTY'S FRONTAGE, COMMENCING FROM THE –10.0 CONTOUR AT SECTION A–A, NORTHEASTERLY TO THE –7.0 CONTOUR AT SECTION C–C; THENCE NORTHERLY TO THE LANDWARD–SIDE OF THE PROPOSED PILE LOCATED AT THE SOUTHWEST CORNER OF THE PROPOSED OVERLYING DECKING AROUND THE CRAB SHACK BUILDING; THENCE NORTHEASTERLYALONG THE LANDWARD SIDE OF THE PROPOSED DECK PILING WHICH PARALLEL THE BUILDING, TO APPROXIMATELY 33 FEET SOUTH OF THE NORTH PROPERTY LINE, WHERE EXISTING CONTOUR –4.0 IS ENCOUNTERED. FROM THIS ENCOUNTERED LOCATION WITH CONTOUR –4.0 NORTH TO THE NORTH PROPERTY LINE, ALL AREA BETWEEN THE –4.0 & +10.0 CONTOURS COMPRISES THE INTERTIDAL ZONE, AND SHALL BE CLEANED OF MAN–MADE MATERIALS SUCH AS CONCRETE BLOCKS & RUBBLE. THIS ENTIRE INTERTIDAL AREA SHALL BE SURFACED WITH A 1–FOOT–DEPTH OF QUARRY SPALLS, WITH A THIN LAYER OF 2" – 4" RAILROAD BALLAST PLACED ON TOP TO FILL–IN SURFACE–VOIDS ON THE QUARRY SPALLS. REFER TO THE CROSS–SECTION DETAILS. THE HEIGHT OF THE PROPOSED LARGE–ROCK CRIB–WALL ALSO TRANSITIONS, AS REFERENCED WITHIN THE CROSS SECTION DETAILS.

SCALE: 1"=20'
DRAWN BY: DJS
JOB NO. 97018a

BANK IMPROVEMENT SECTION A-A

SCALE: 1"=20'

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CIVIL ENGINEERING & LAND-USE PLANNING
105 E. GILKEY ROAD/P.O. BOX 361
BURLINGTON, WA. 98233
PH: (360) 707-2048 FAX: (360) 707-2216

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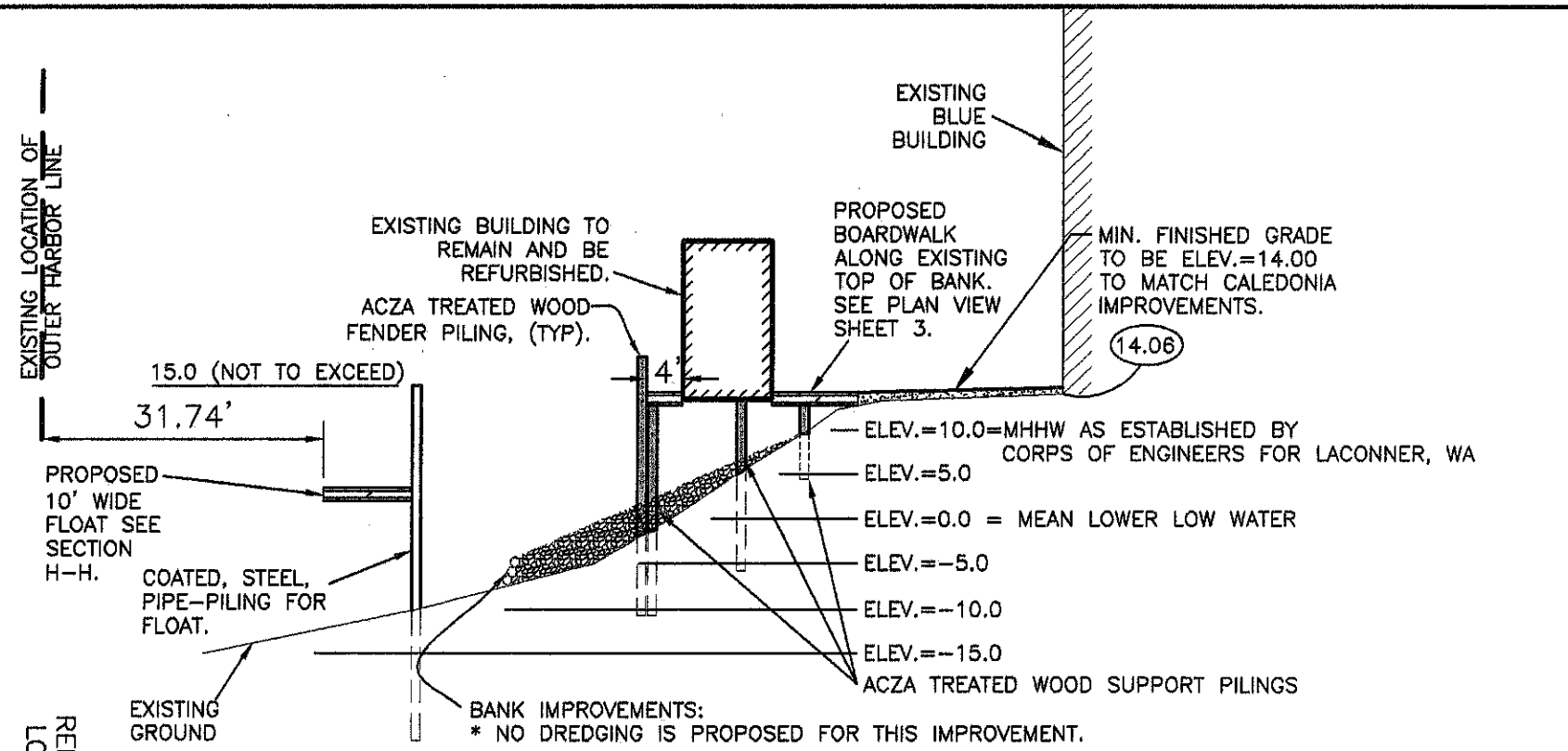
APPLICATION BY: LaConner Associates **in** Swinomish Channel, at LaConner, WA
DATE: 07/22/04
SHEET 6 OF 12



AS PER THE HORIZONTAL ALIGNMENT DEPICTED ON SHEET 4, NEAR APPROXIMATE ELEVATION –7.5, LARGE, 1000–2000 LB. ROCK IS TO BE KEYED AND PLACED ON A 1.5:1 SLOPE TO APPROXIMATE ELEVATION –4.0. QUARRY SPALLS TO BE PLACED ON EVEN SLOPE FROM –4.0 TO +10.0. THIN LAYER OF 2"–4" RAILROAD BALLAST TO BE APPLIED TO FILL IN SURFACE VOIDS.

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REFER TO SHEET 1 OF 12 FOR LOCATION OF TYPICAL SECTION B–B

SCALE: 1"=20'
DRAWN BY: DJS
JOB NO. 97018a

BANK IMPROVEMENT SECTION B-B

SCALE: 1"=20'

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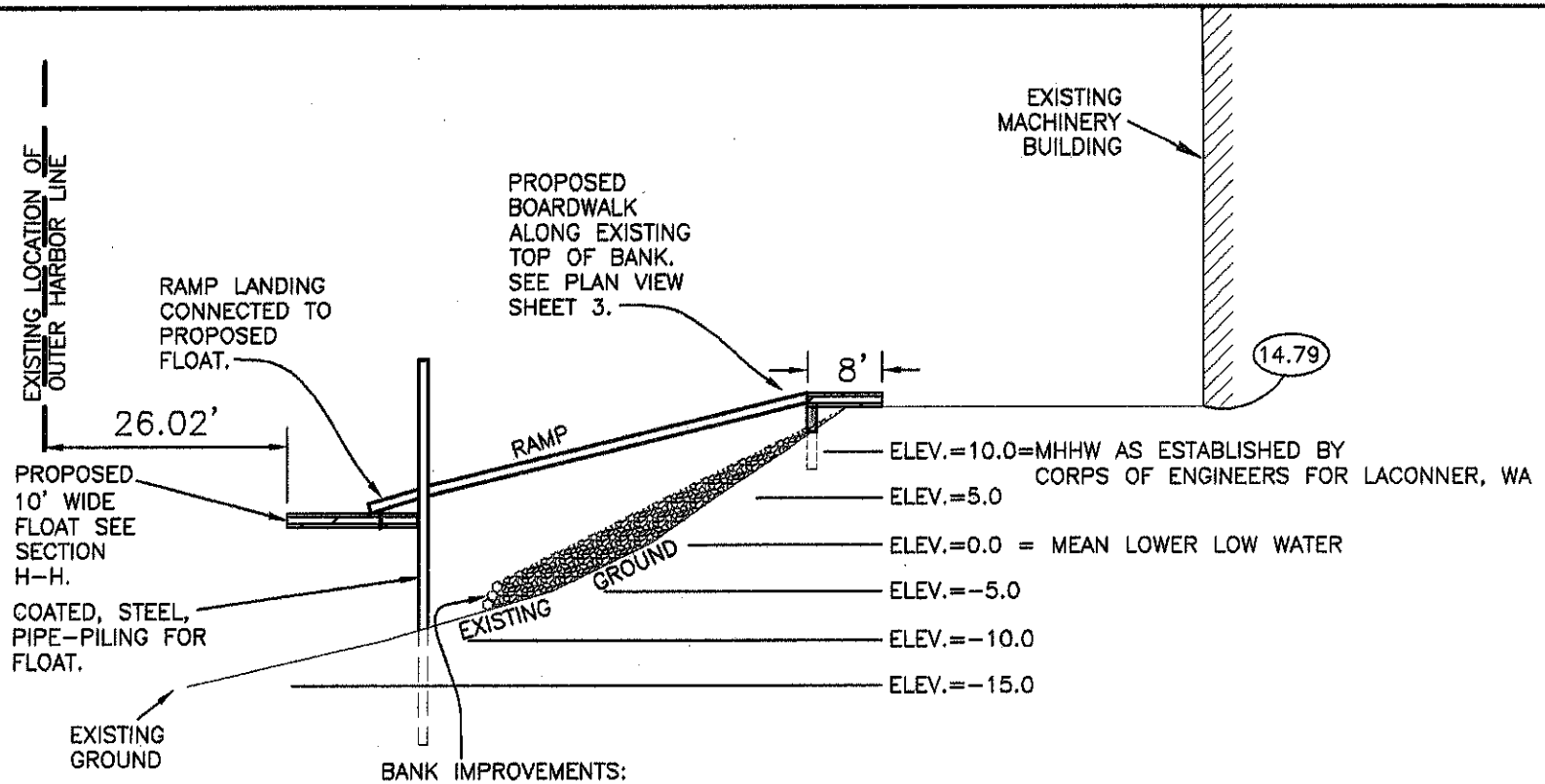
CIVIL ENGINEERING & LAND-USE PLANNING
108 E. GILKEY ROAD/P.O. BOX 361
BURLINGTON, WA. 98233
PH: (360) 707-2044 FAX: (360) 707-2216

PROPOSED: Boat Moorage Float Facility **REFERENCE:** XXXX
PURPOSE: Support Waterfront Activities for Adjoining Commercial – Residential Zoned Areas
APPLICATION BY: LaConner Associates **in** Swinomish Channel, at LaConner, WA
DATE: 07/22/04
SHEET 7 OF 12



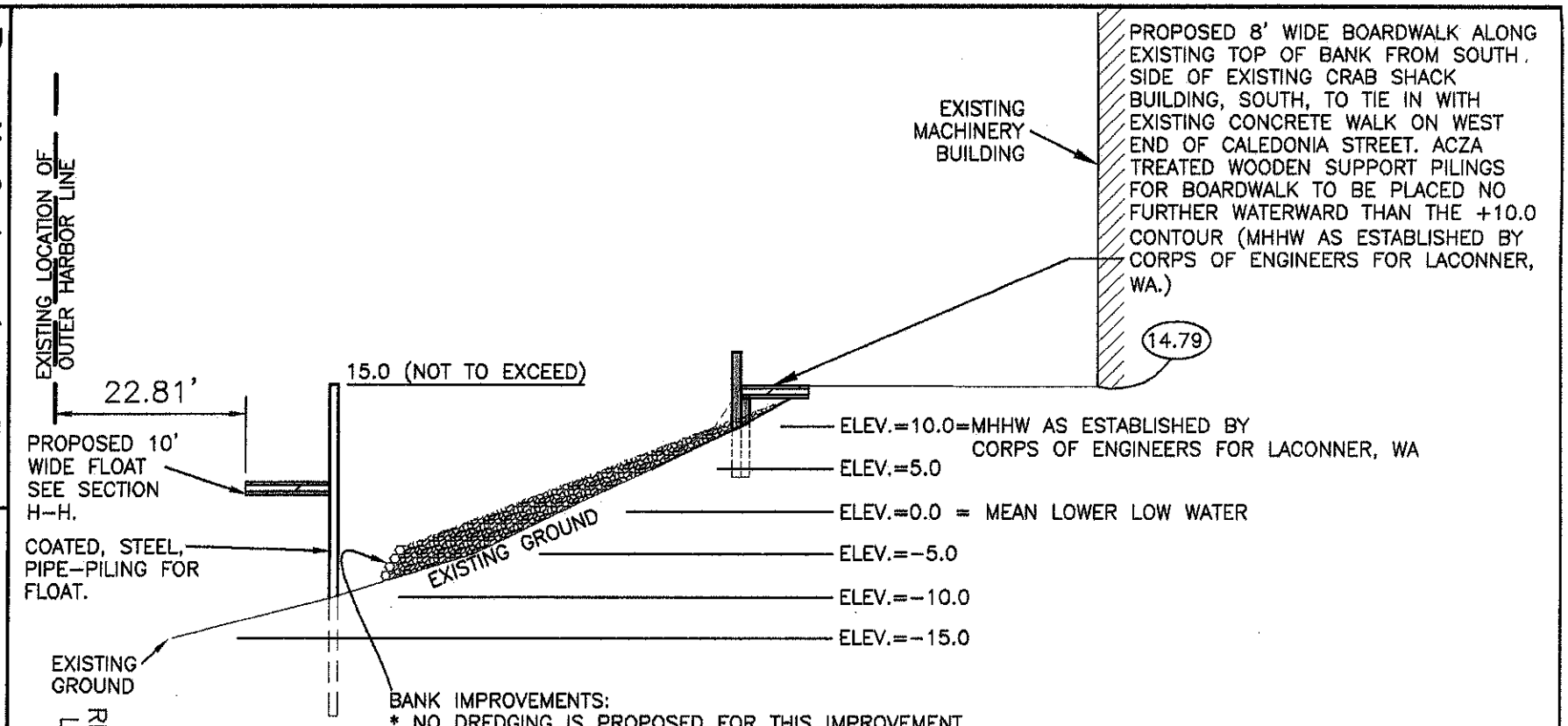
THE HORIZONTAL ALIGNMENT OF THE PROPOSED LARGE–ROCK CRIB–WALL TRANSITIONS ACROSS THE PROPERTY'S FRONTAGE, COMMENCING FROM THE –10.0 CONTOUR AT SECTION A–A, NORTHEASTERLY TO THE –7.0 CONTOUR AT SECTION C–C; THENCE NORTHERLY TO THE LANDWARD–SIDE OF THE PROPOSED PILE LOCATED AT THE SOUTHWEST CORNER OF THE PROPOSED OVERLYING DECKING AROUND THE CRAB SHACK BUILDING; THENCE NORTHEASTERLYALONG THE LANDWARD SIDE OF THE PROPOSED DECK PILING WHICH PARALLEL THE BUILDING, TO APPROXIMATELY 33 FEET SOUTH OF THE NORTH PROPERTY LINE, WHERE EXISTING CONTOUR –4.0 IS ENCOUNTERED. FROM THIS ENCOUNTERED LOCATION WITH CONTOUR –4.0 NORTH TO THE NORTH PROPERTY LINE, ALL AREA BETWEEN THE –4.0 & +10.0 CONTOURS COMPRISES THE INTERTIDAL ZONE, AND SHALL BE CLEANED OF MAN–MADE MATERIALS SUCH AS CONCRETE BLOCKS & RUBBLE. THIS ENTIRE INTERTIDAL AREA SHALL BE SURFACED WITH A 1–FOOT–DEPTH OF QUARRY SPALLS, WITH A THIN LAYER OF 2" – 4" RAILROAD BALLAST PLACED ON TOP TO FILL–IN SURFACE–VOIDS ON THE QUARRY SPALLS. REFER TO THE CROSS–SECTION DETAILS. THE HEIGHT OF THE PROPOSED LARGE–ROCK CRIB–WALL ALSO TRANSITIONS, AS REFERENCED WITHIN THE CROSS SECTION DETAILS.

REFER TO SHEET 1 OF 12 FOR LOCATION OF TYPICAL SECTION C–C

SCALE: 1"=20'
DRAWN BY: DJS
JOB NO. 97018a

BANK IMPROVEMENT SECTION C-C

SCALE: 1"=20'



AS PER THE HORIZONTAL ALIGNMENT DEPICTED ON SHEET 4, NEAR APPROXIMATE ELEVATION -9, LARGE, 1000-2000 LB. ROCK IS TO BE KEYED AND PLACED ON A 1.5:1 SLOPE TO APPROXIMATE ELEVATION -4.0. QUARRY SPALLS TO BE PLACED ON EVEN SLOPE FROM -4.0 TO TOP OF BANK. THIN LAYER OF 2"-4" RAILROAD BALLAST TO BE APPLIED TO FILL IN SURFACE VOIDS.

THE HORIZONTAL ALIGNMENT OF THE PROPOSED LARGE-ROCK CRIB-WALL TRANSITIONS ACROSS THE PROPERTY'S FRONTAGE, COMMENCING FROM THE -10.0 CONTOUR AT SECTION A-A, NORTHEASTERLY TO THE -7.0 CONTOUR AT SECTION C-C; THENCE NORTHERLY TO THE LANDWARD-SIDE OF THE PROPOSED PILE LOCATED AT THE SOUTHWEST CORNER OF THE PROPOSED OVERLYING DECKING AROUND THE CRAB SHACK BUILDING; THENCE NORTHEASTERLYALONG THE LANDWARD SIDE OF THE PROPOSED DECK PILING WHICH PARALLEL THE BUILDING, TO APPROXIMATELY 33 FEET SOUTH OF THE NORTH PROPERTY LINE, WHERE EXISTING CONTOUR -4.0 IS ENCOUNTERED. FROM THIS ENCOUNTERED LOCATION WITH CONTOUR -4.0 NORTH TO THE NORTH PROPERTY LINE, ALL AREA BETWEEN THE -4.0 & +10.0 CONTOURS COMPRISES THE INTERTIDAL ZONE, AND SHALL BE CLEANED OF MAN-MADE MATERIALS SUCH AS CONCRETE BLOCKS & RUBBLE. THIS ENTIRE INTERTIDAL AREA SHALL BE SURFACED WITH A 1-FOOT-DEPTH OF QUARRY SPALLS, WITH A THIN LAYER OF 2" - 4" RAILROAD BALLAST PLACED ON TOP TO FILL-IN SURFACE-VOIDS ON THE QUARRY SPALLS. REFER TO THE CROSS-SECTION DETAILS. THE HEIGHT OF THE PROPOSED LARGE-ROCK CRIB-WALL ALSO TRANSITIONS, AS REFERENCED WITHIN THE CROSS SECTION DETAILS.

BANK IMPROVEMENT SECTION D-D

SCALE: 1"=20'

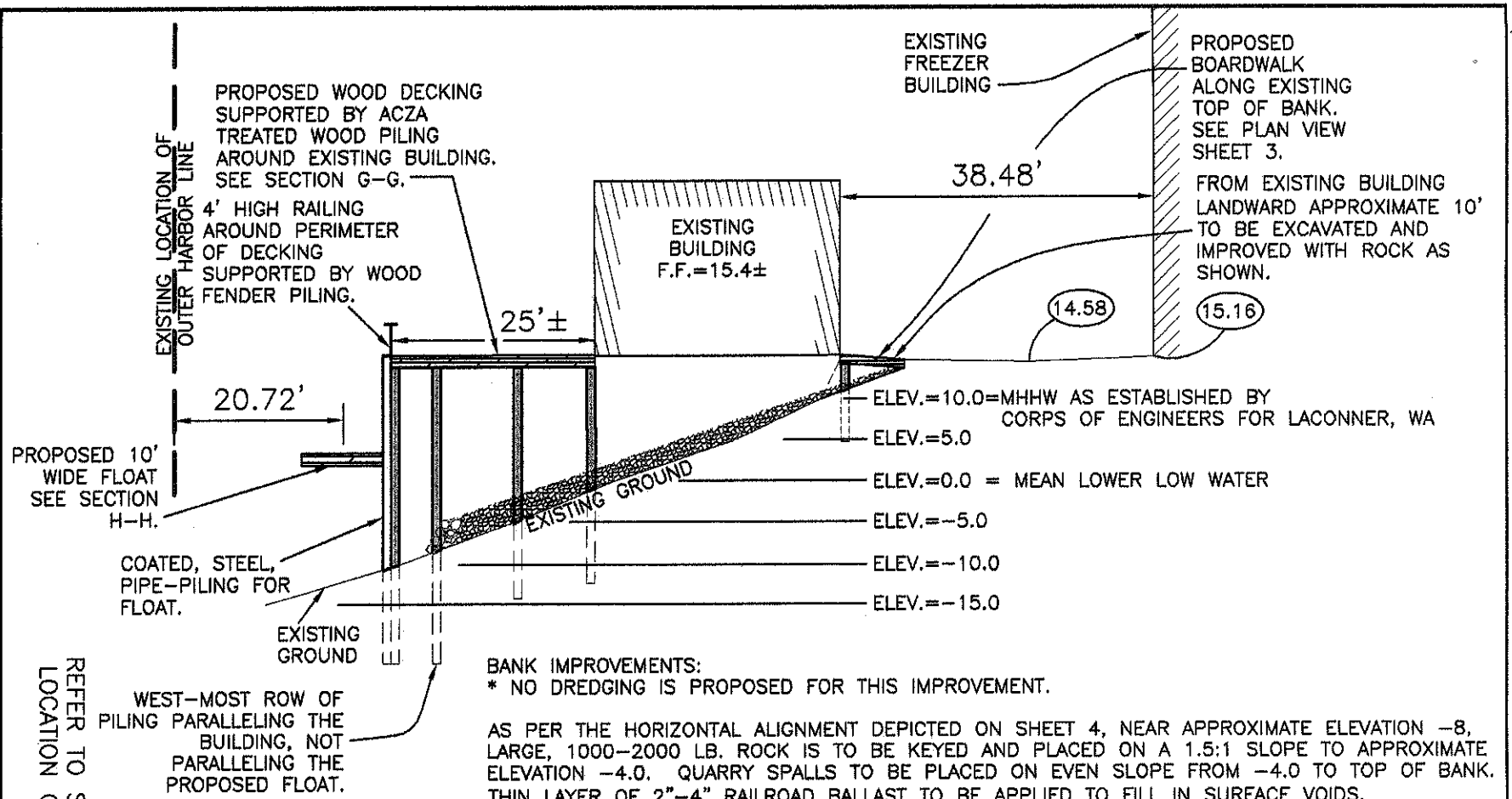
REFER TO SHEET 1 OF 12 FOR LOCATION OF TYPICAL SECTION D-D

SCALE: 1"=20'
DRAWN BY: DJS
JOB NO. 97018a

Ravnik & Associates, Inc.
CIVIL ENGINEERING & LAND-USE PLANNING
108 E. GILKEY ROAD/P.O. BOX 361
BURLINGTON, WA. 98233
PH: (360) 707-2048 FAX: (360) 707-2216

PROPOSED: Boat Moorage Float Facility **REFERENCE:** XXXX
PURPOSE: Support Waterfront Activities for Adjoining Commercial - Residential Zoned Areas
APPLICATION BY: LaConner Associates **In** Swinomish Channel, at LaConner, WA
DATE: 07/22/04

SHEET 8 OF 12



REFER TO SHEET 1 OF 12 FOR LOCATION OF TYPICAL SECTION E–E

BANK IMPROVEMENTS:
* NO DREDGING IS PROPOSED FOR THIS IMPROVEMENT.

AS PER THE HORIZONTAL ALIGNMENT DEPICTED ON SHEET 4, NEAR APPROXIMATE ELEVATION –8, LARGE, 1000–2000 LB. ROCK IS TO BE KEYED AND PLACED ON A 1.5:1 SLOPE TO APPROXIMATE ELEVATION –4.0. QUARRY SPALLS TO BE PLACED ON EVEN SLOPE FROM –4.0 TO TOP OF BANK. THIN LAYER OF 2"–4" RAILROAD BALLAST TO BE APPLIED TO FILL IN SURFACE VOIDS.

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BANK IMPROVEMENT SECTION E-E

SCALE: 1"=20'

Ravnik & Associates, Inc.
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198 E. GILKEY ROAD/P.O. BOX 348
BURLINGTON, WA 98233
PH: (360) 707-2048 FAX: (360) 707-2236

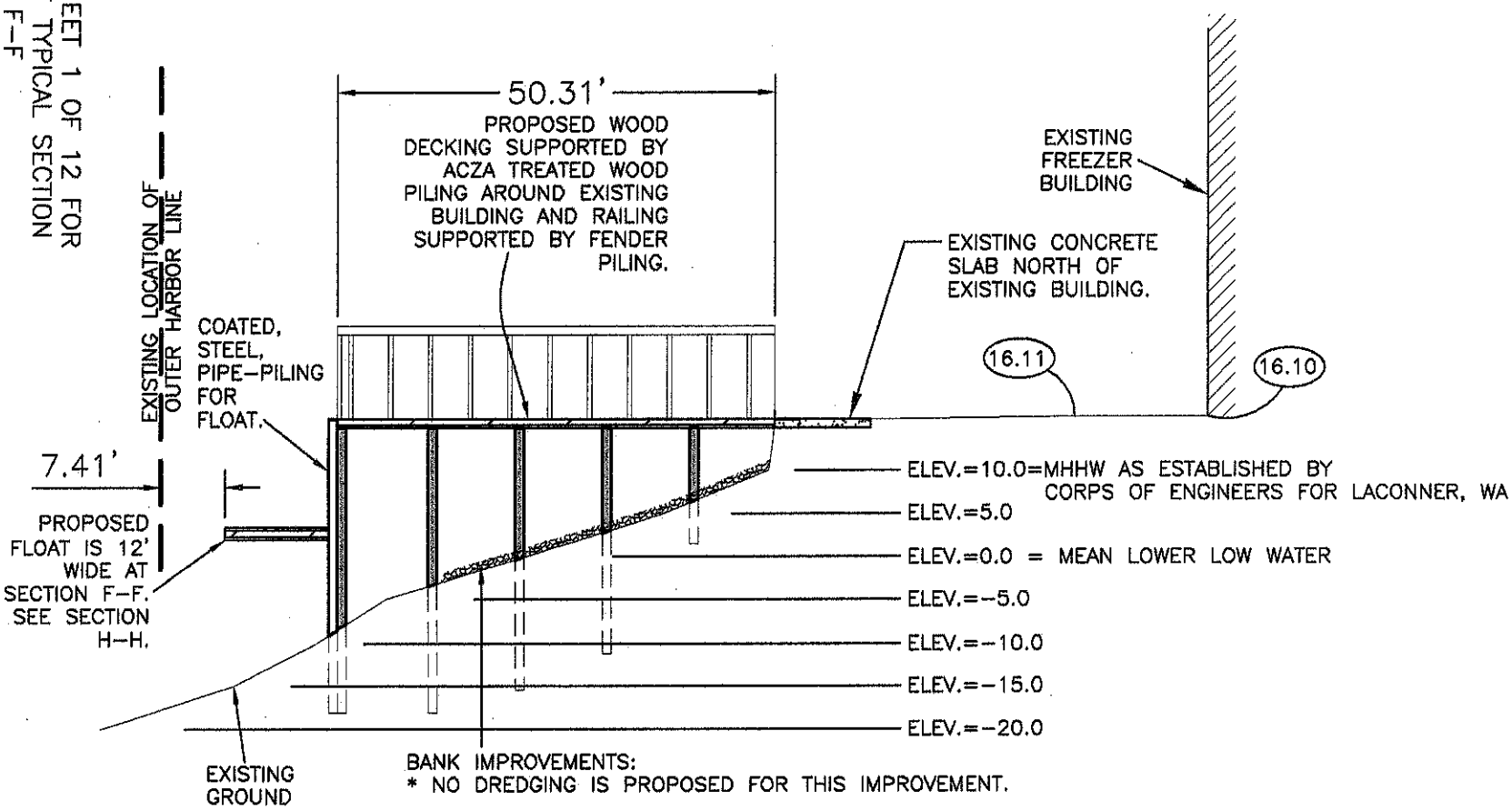
PROPOSED: Boat Moorage Float Facility **REFERENCE:** XXXX
PURPOSE: Support Waterfront Activities for Adjoining Commercial – Residential Zoned Areas
APPLICATION BY: LaConner Associates In Swinomish Channel, at LaConner, WA
DATE: 07/22/04
SHEET 9 OF 12

SCALE: 1"=20'
DRAWN BY: DJS
JOB NO. 97018g

Ravnik & Associates, Inc.
CIVIL ENGINEERING & LAND-USE PLANNING
198 E. GILKEY ROAD/P.O. BOX 361
BURLINGTON, WA 98233
PH: (360) 707-2848 FAX: (360) 707-2216

PROPOSED: Boat Moorage Float Facility **REFERENCE:** XXXX
PURPOSE: Support Waterfront Activities for Adjoining Commercial – Residential Zoned Areas
APPLICATION BY: LaConner Associates In Swinomish Channel, at LaConner, WA
DATE: 07/22/04
SHEET 10 OF 12

REFER TO SHEET 1 OF 12 FOR LOCATION OF TYPICAL SECTION F–F



MAN MADE MATERIAL SUCH AS CONCRETE SLABS WILL BE REMOVED FROM THE INTERTIDAL ZONE FROM –4 FT TO +10 FT AND REPLACED WITH APPROXIMATELY 1' DEPTH OF QUARRY SPALLS WITH RAILROAD BALLAST TO FILL VOIDS. THESE IMPROVEMENTS EXTEND TO NORTH PROPERTY LINE.

BANK IMPROVEMENT SECTION F-F

SCALE: 1"=20'

SCALE: 1"=20'
DRAWN BY: DJS
JOB NO. 97018a

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CIVIL ENGINEERING & LAND-USE PLANNING
105 E. GILKEY ROAD/P.O. BOX 361
BURLINGTON, WA 98233
PH: (360) 707-2048 FAX: (360) 707-2216

PROPOSED: Boat Moorage Float Facility **REFERENCE:** XXXX
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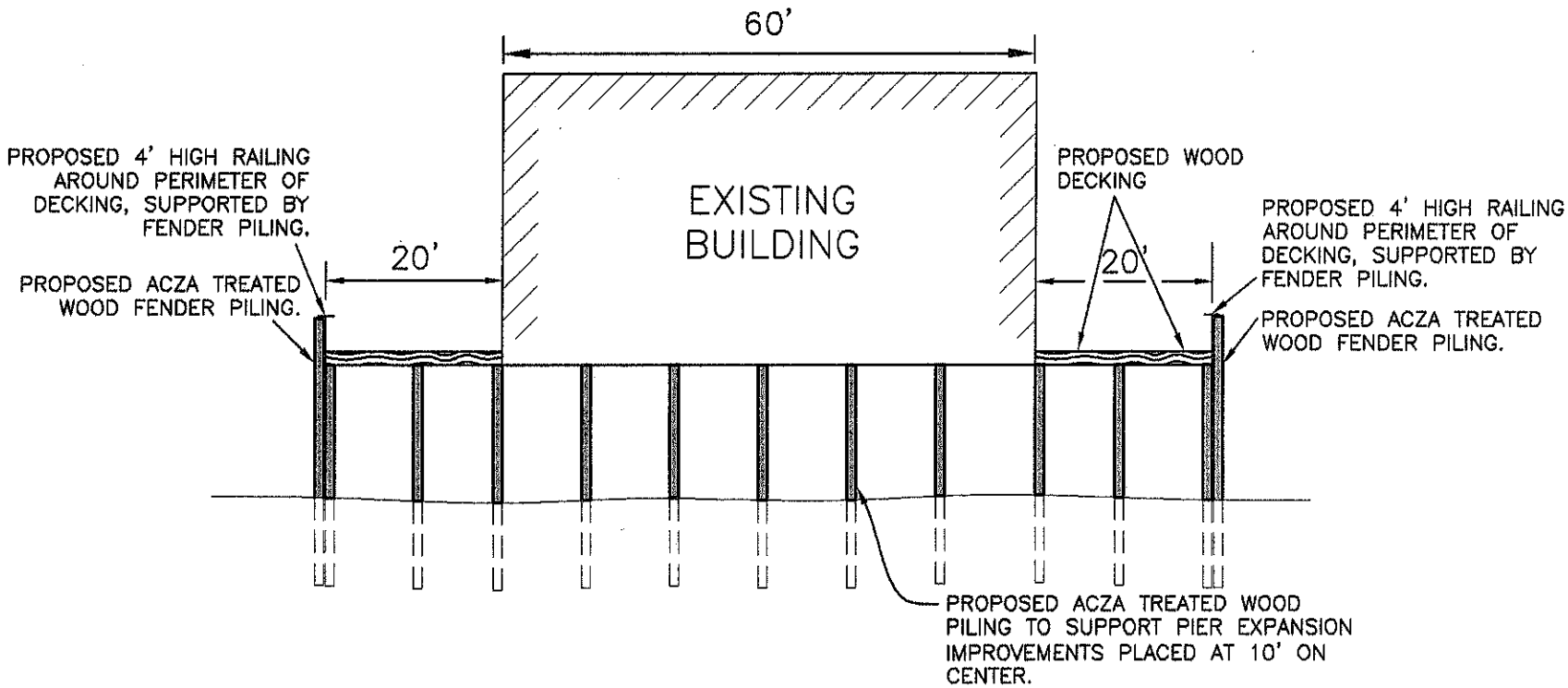
APPLICATION BY: LaConner Associates **In** Swinomish Channel, at LaConner, WA
DATE: 07/22/04

SHEET 11 OF 12

SCALE: 1"=20'
DRAWN BY: DJS
JOB NO. 97018a

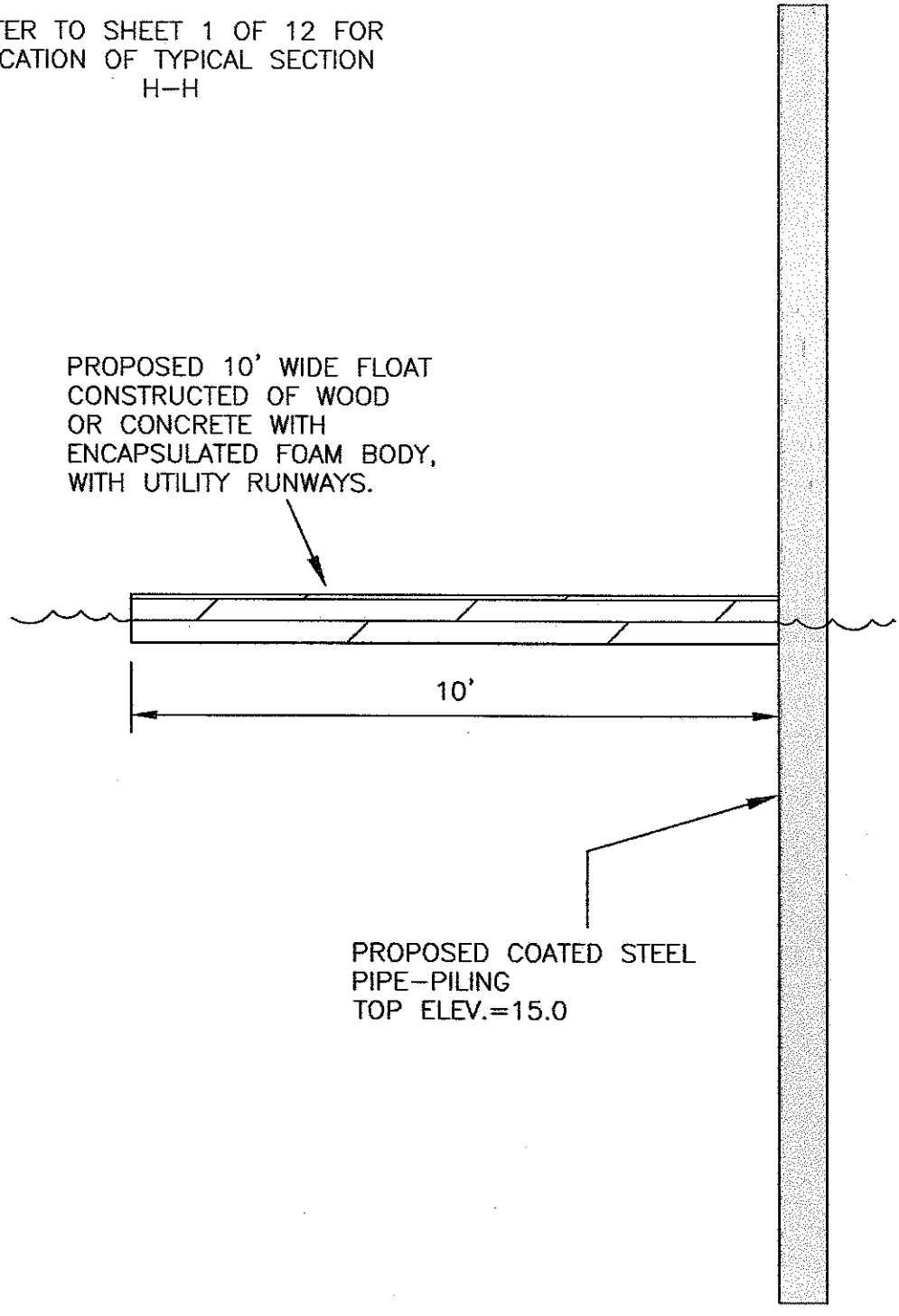
REFER TO SHEET 1 OF 12
FOR LOCATION OF TYPICAL
SECTION G–G



EXISTING OVER-WATER BUILDING WITH DECKING IMPROVEMENTS SECTION G-G

SCALE: 1"=20'

REFER TO SHEET 1 OF 12 FOR LOCATION OF TYPICAL SECTION H–H



TYPICAL FLOAT & PILING CROSS SECTION H-H

NOT TO SCALE

SCALE: NTS
DRAWN BY: DJS
JOB NO. 97018a

Ravnik & Associates, Inc.
CIVIL ENGINEERING & LAND-USE PLANNING
108 E. GILKEY ROAD/P.O. BOX 361
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PH: (360) 707-2048 FAX: (360) 707-2216

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APPLICATION BY: LaConner Associates **In** Swinomish Channel, at LaConner, WA
SHEET 12 **OF** 12 **DATE:** 07/22/04

Appendix B

Photographs of Project Area

Photo 1. Project area overview taken during an extreme low tide event on June 4, 2004.
Photo 2. View of Project area from southern boundary showing failing bulkhead and concrete slab riprap.
Photo 3. Failing bulkhead near center of Project area.
Photo 4. Existing nearshore habitat at base of bulkhead near cross section D-D (Sheet 8; Appendix A).
Photo 5. Concrete slab riprap at south portion of Project area from pumphouse
Photo 6. Concrete slab riprap at north portion of Project area showing crab shack area.

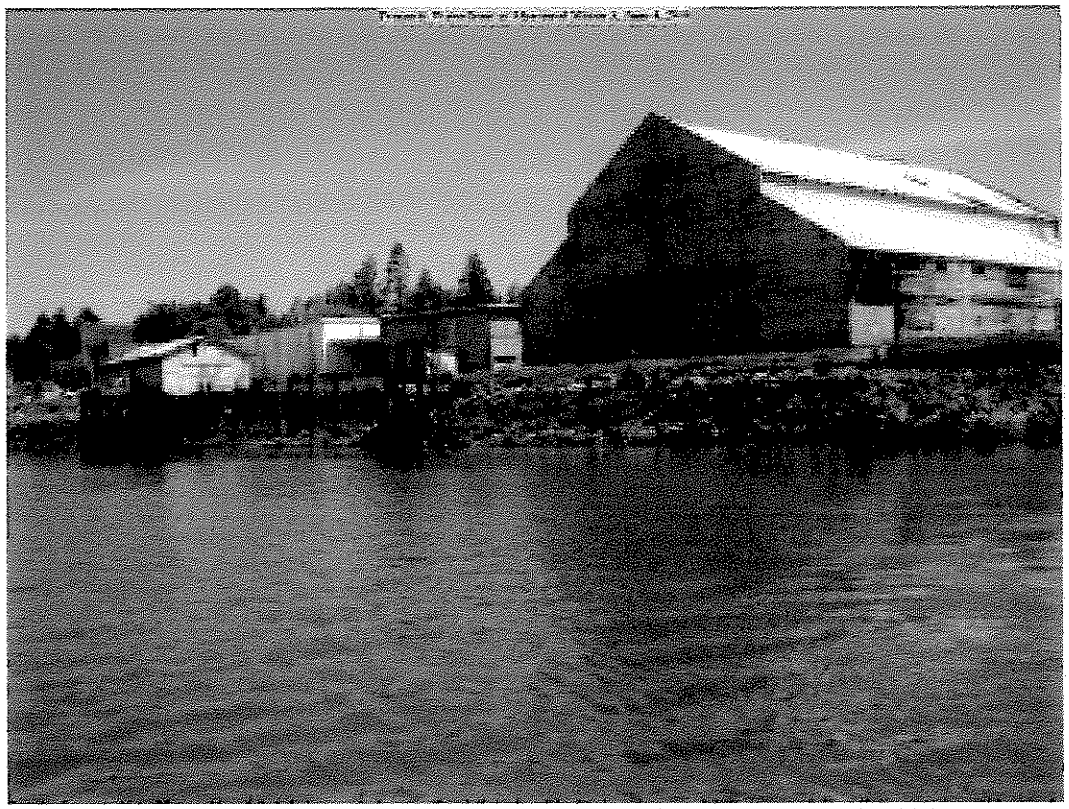

Photo 1. Project area overview taken during an extreme low tide event on June 4, 2004.

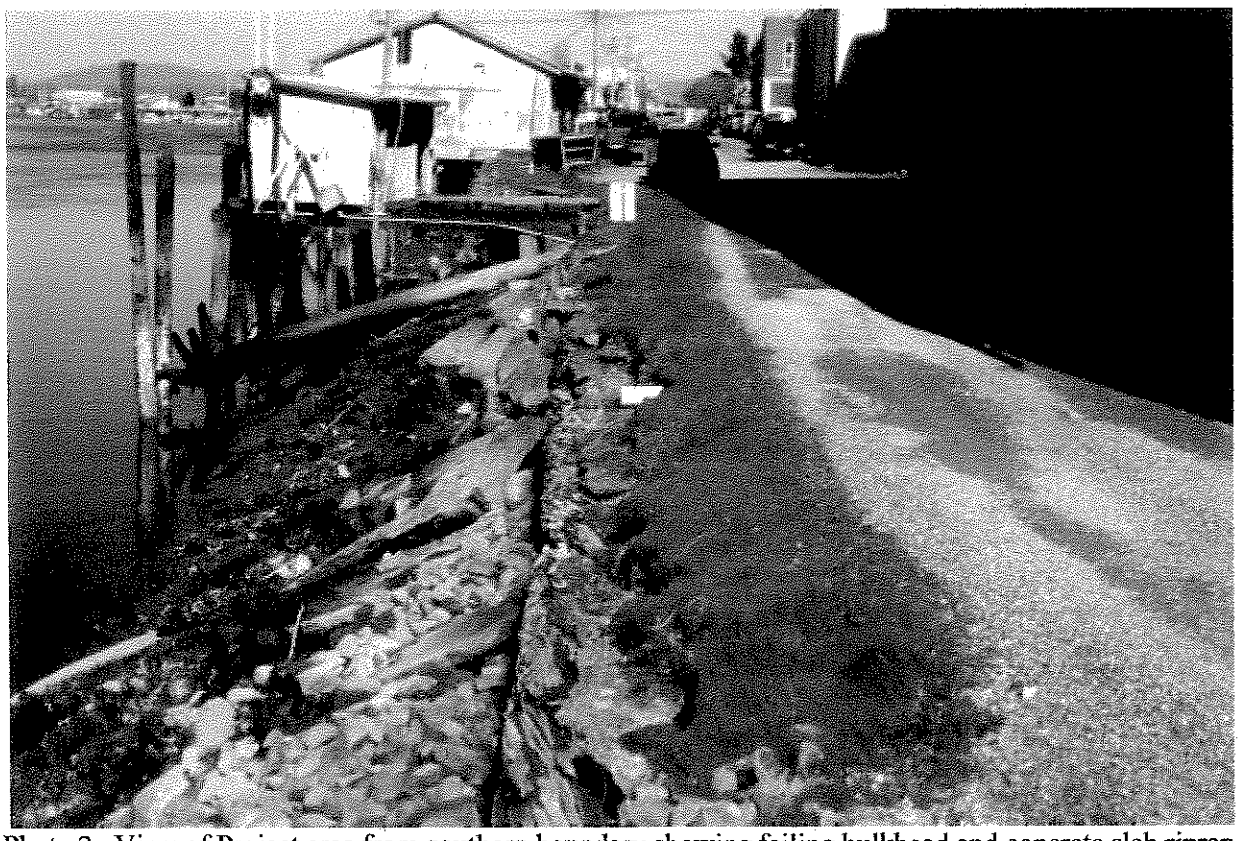

Photo 2. View of Project area from southern boundary showing failing bulkhead and concrete slab riprap.

Photo 3. Failing bulkhead near center of Project area.

Photo 4. Existing nearshore habitat at base of bulkhead near cross section D-D (Sheet 8; Appendix A).

Photo 5. Concrete slab riprap at south portion of Project area from pumphouse.

Photo 6. Concrete slab riprap at north portion of Project area showing crab shack area.

Appendix C

Mitigation Plan

LA CONNER ASSOCIATES MITIGATION PLAN

I. PROJECT DESCRIPTION

La Conner Associates is proposing to redevelop a portion of the waterfront and land in the city of La Conner in Skagit County, Washington. The Project is located between Commercial and Caledonia streets (Sheet 1, Appendix A). The landward development will replace the existing industrial structures with mixed-use buildings. The waterfront development will provide public use of shoreline boardwalks, decks and café as well as moorage for pleasure vessels. The waterfront design will be consistent with current use and local zoning of the La Conner waterfront. This Mitigation Plan addresses the improvement of nearshore habitat within the Project boundaries as mitigation for the construction of overwater structures. The waterfront redevelopment will improve aquatic habitat between the depths of -10 ft and +10 ft (all depths referred to in this plan are relative to Mean Lower Low Water). Improvements to this habitat will include:

- Removal of a failing bulkhead.
- Removal of 49 creosote pilings.
- Removal of concrete slab ruble riprap.
- Placement of rock appropriate for attachment by macroalgae.
- Transplanting of existing eelgrass patch (approx. 12 stems).
- Reconfigure the shoreline to a more gentle slope.
- Creation of a salmon migration corridor.

This redevelopment will also construct a floating dock moorage, shoreline boardwalk, and overwater decks around two existing structures. Drawings of existing conditions and proposed redevelopment are attached as Appendix A. Redevelopment of the waterfront will be completed in four phases:

- Phase I: Reconfiguration of shoreline by removal of a failing bulkhead, creosote piles, and manmade material in the nearshore area. Placement of approximately 12 steel guide piles for the floating dock, approximately 90 ACZA treated wood pile for support of the overwater decks and guide for the dock gangway.

- Phase II: Construction of nearshore habitat from -10 ft to +10 ft to provide a salmon migration corridor through the Project area. A mix of sediment sizes will be used to provide substrate for attached macroalgae and to promote epibenthic production.

- Phase III: Construction of deck structures, and placement of floating dock and gangway.

- Phase IV: Construction of boardwalk along the shoreline. All supporting members of boardwalk will be placed above the Mean High Water.

Phase I

Phase I will create a new shoreline landward of the existing shore by removing a failing bulkhead that is built of creosote treated timbers and piles and untreated wood that has deteriorated (Appendix B, Photos 3 and 4). A portion of the fill material behind the bulkhead will also be removed and replaced with appropriately sized quarry spalls (Sheet 8, Appendix A). As part of this phase, approximately 49 creosote piles will be removed from the nearshore environment. Piles that cannot be extracted will be cut or broken at the mudline and the stub left in place. The area will later be covered with clean material as part of Phase II and the pile stubs will therefore be buried below the proposed grade.

The existing "pump house" structure will be temporarily moved as part of the shoreline reconfiguration and replaced near its original location as part of Phase III. Approximately 14 ACZA treated wood piles will be used to support for pump house deck with 7 fender piles along the face of the deck. Approximately 60 ACZA treated wood piles will be used to support the "crab shack" deck and approximately 12 steel guide piles will be used for the floating dock (Sheet 3 Appendix A). Completion of Phase I will require approximately four weeks.

Phase II

Phase II will construct a fish migration corridor between the depths of -10 ft and +10 ft. A subtidal rock revetment will be placed along 80% of the length of the Project area at the existing -6 ft to -10 ft depth to raise the sea bed to -4 ft. Existing material may be used as partial fill after it has been crushed to appropriate size then over laid with 8 inch quarry spalls between -4 ft depth to +10 ft (Sheets 4-10, Appendix A). A layer of 2 – 4 inch railroad ballast will be used to fill the voids between quarry spalls. The slope of the finished sea floor will be consistent between -4 and +10 with an average slope of 2.6:1 (H:V). A small patch of eelgrass (*Z. marina*) will be transplanted from an existing location in the Project area into the constructed nearshore with appropriate sediment to avoid loss of eelgrass habitat and to provide a potential source for growth of an eelgrass bed within the Project area. Four clusters of large rock will be placed to provide additional substrate for attachment algae as well as visual aesthetics during low tide events. Sheet 4 (Appendix A) shows the proposed nearshore habitat plan. Completion of Phase II will require approximately two weeks.

Phase III

Phase III will complete the waterfront redevelopment of the La Conner Associates Project. The floating dock, gangway, and overwater decks will be constructed. ACZA treated wood will be used as decking and structural members. Railings will be constructed of both ACZA treated wood and metal. The existing overwater structures will be refurbished with like-kind or better material to retain the conformity with the contiguous historic district where possible. Creosote treated materials will <u>not</u> be used for refurbishing the overwater structures. The 10 ft wide floating docks will be constructed of ACZA treated timbers or concrete with encapsulated foam floatation (sheet 12, Appendix A). The floating dock will be positioned over the sea floor that is -10 ft or greater depth with the exception of 14 sq ft at the north end. This depth contour was selected to avoid impacts to the nearshore habitat and to prevent grounding of the dock.

II. EXISTING MARINE HABITAT CONDITIONS

The nearshore habitat of the Project area is of poor value to salmon and their prey. The shoreline has been armored with broken concrete slabs that are poor attachment substrate for algae and epibenthic organisms that are important prey for salmon. Several derelict creosote piles are located on the site that continues to degrade the water quality in Swinomish Channel.

The waterfront of the Project area has had a variety of commercial uses including fuel transfer and unloading commercial crab harvest. Currently the crab shack is used for storage and the pump house is vacant. The pump house was part of a 1,475 sq ft overwater structure and the deck was removed at the request of the Washington State Department of Natural Resources (WDNR) in 1999 because of safety issues. Building moratoria and litigation have prevented replacement of this structure until 2003. The shoreline above +10 ft consists of a failing wood bulkhead that in part, is constructed of creosote treated timbers and untreated logs placed lengthwise along the shore (Appendix B, Photos 1-6). Behind the timber bulkhead is fill from undetermined sources. A concrete bulkhead forms the shoreline under the crab shack and concrete apron to the north. Photographs 1-6 (Appendix B) show the existing features of the shoreline in the Project area. Below +10 ft, the shore is armored with ruble composed of various man-made materials such as broken concrete slab and poured concrete pads mixed with quarry spalls. Below -5 ft the substrate was mixed with cobble, gravel, sand and silt.

An intermediate level eelgrass/macroalgae survey was conducted on October 2, 2003. Macroalgae and one small patch of eelgrass was observed. *Fucus* and *Ulva* were the dominant algae with some *Laminaria* between -5 to -12 ft with coverage ranging from 5% to 40%. A small patch of eelgrass (*Z. marina*) with 12 turions was observed at -6.8 ft depth. Algae was observed where the substrate was suitable for attachment. The concrete slabs were generally suitable for turf algae such as *Fucus* and *Ulva* but not for *Laminaria* and other kelps.

III. MITIGATION PLAN

The La Conner Associates Project will increase the existing area of overwater structures between -10 ft and + 10 ft by approximately 4,195 sq ft. With the inclusion of the pump house deck as a previously existing structure, the overwater structure area will be increased by 2,720 sq ft. The Project will also place as many as 100 steel and ACZA treated wood piles to support these structures. To mitigate for potential impacts this plan has been developed to address three key components of the nearshore habitat in Swinomish Channel. These components are:

- Salmon migration corridor between tidal elevations of -10 ft and +10 ft.
- Macroalgae coverage within the Project Area.
- Epibenthic productivity of prey items for salmon and forage fish.

This mitigation plan is intended to provide no less than a 1.25:1 replacement of these nearshore habitat components within the boundaries of the Project area. To accomplish this objective, the following mitigation goals will be achieved:

- Increase of habitat area between the tidal elevations of -10 ft and +10 ft.
- Provide improved substrate and increased area for attached macroalgae.
- Provide improved habitat substrate for epibenthic organisms.

Existing Conditions

The quality of habitat in the Project area is poor for salmon migration and epibenthic productivity with moderate to poor value for macroalgae cover. The steep slope and concrete slabs in the intertidal and subtidal zone is the primary factor contributing to the low value. The concrete surface is poor substrate for algae attachment and is oriented to the waves from boat traffic through Swinomish Channel. To evaluate the existing habitat conditions, the area and habitat value was quantified within six areas and at four tidal strata of the Project site (Figure 1). The six areas were defined by the cross section views of the attached drawings (Sheet 1-4, Appendix A). Area 1 lays between Sections AA and Sections BB, Area 2 lays between Section BB and Section CC and so forth (Figure 1). Macroalgae coverage was estimated by averaging the percentage of coverage observed within the tidal strata as reported in the macroalgae/eelgrass survey and applying the average to the square foot area. Table 1 summarizes the area and macroalgae cover for each tidal stratum with existing conditions.

Table 1. Area and macroalgae cover for each tidal stratum with existing condition within Project boundary.

Criteria	Tidal Strata (ft MLLW)				Total Area (ft^2)
	-10 to -4	-4 to 0	0 to +4	+4 to +10	
Area (ft^2)	5,942.0	2,985.6	3,066.0	3481.5	15,475.1
Macroalgae Cover (ft^2)	802.2	289.6	321.9	372.5	1,786.2

Epibenthic productivity was not assessed in the pre-project surveys, however based on existing substrate and vegetative conditions we believe that the quality of epibenthic habitat is poor.

Proposed Conditions

To quantify the improvements in habitat quality and quantity, the area, and macroalgae coverage was estimated at the same tidal strata as described above. An adjustment of macroalgae coverage was applied to estimate the impacts of shade within the tidal stratum in each area. The macroalgae coverage of the proposed Project area was conservatively estimated based on the results of the eelgrass/macroalgae survey and professional judgment. Maximum macroalgae coverage in areas with direct sunlight throughout the day was estimated at 20% this compares with the maximum coverage observed during the intermediate eelgrass/macroalgae survey of 40%. In areas that were partially shaded during the day the macroalgae coverage was reduced by 25% to 50% and coverage in areas that received no direct sunlight was reduced by 60% to 75%. Macroalgae is very adaptable to low light levels. Markager and Sand-Jensen (1992) found that many algae have a minimum requirement of less than 1% of the surface irradiance. Areas that receive only indirect light will likely support some growth of algae. The coverage in these areas was estimated at 5%. The average cover of macroalgae over the proposed Project site is 13.4%. Figure 2 shows the habitat areas with proposed mitigation macroalgae coverage and shade area. Table 2 lists the estimated habitat area and macroalgae cover of the proposed Project area for

each stratum. A comparison of the gain or loss of area and habitat within each tidal stratum is listed in Table 3.

Table 2. Area, and macroalgae cover for each tidal stratum with proposed mitigation condition within Project boundary.

Criteria	Tidal Strata (ft MLLW)				Total Area (ft^2)
	-10 to –4	-4 to 0	0 to +4	+4 to +10	
Area (ft^2)	3,611.0	3,245.5	3,663.5	5,363.5	15,883.5
Macroalgae Cover (ft^2)	573.9	471.2	494.7	696.0	2,235.8

Table 3. Comparison of gain or (loss) of area, epibenthic productivity and macroalgae at each tidal stratum between proposed and existing conditions.

Criteria	Tidal Strata (ft MLLW)				Total Gain (ft^2)
	-10 to –4	-4 to 0	0 to +4	+4 to +10	
Area (ft^2)	(2,331.0)	259.9	597.5	1,882.0	408.4
Macroalgae Cover (ft^2)	(228.2)	181.6	172.8	323.4	449.6

Shade

A two dimensional shade model was used to estimate the area of shade created by the proposed structures at noon, 2 pm, and 4 pm on the equinox (March 20, 2004) and the solstice (June 20, 2004). The area that was shaded for any period of both days (Figure 3) was included in the total shade area estimates. Structures with a footprint over water less than -10 ft were modeled. The floating dock is in water greater than -10 ft with the exception of 14 sq ft at the north end of the dock. This small area was not included in the model because of its small size and general overlap with shade from the fixed dock. The greatest increase in shade is in the tidal strata between 0 to +4 ft primarily under the crab shack deck (Table 4.). A summary of the methods and results of the shade model is attached. Table 4 lists the area of existing and proposed structures in each tidal stratum.

Table 4. Estimated shade area for existing and proposed overwater structures.

Criteria	Tidal Strata (ft MLLW)				Total (ft^2)
	-10 to -4	-4 to 0	0 to +4	+4 to +10	
Existing shade area[1] (ft^2)	676.0	870.0	639.0	2,491.5	4,676.5
Proposed shade area (ft^2)	1,127.5	1,320.0	2,223.5	2,657.0	7,328.0
Increase of shade area (ft^2)	451.5	450.0	1,584.5	165.5	2,651.5

1. Not including historic pump house deck.

Sediment Size

A variety of sediment will be used within the Project Area. The subtidal revetment will be constructed of large angular rock (1,000 – 2,000 lb) keyed into the seafloor. This revetment will raise the seafloor and nearshore habitat into the desired tidal elevation for a salmon migration corridor through the Project area. This rock will also provide suitable attachment substrate for macroalgae. Where needed, fill will be placed to raise the sea floor to the appropriate elevation. Subsurface fill will consist in part of the manmade material that is currently in place. This material will first be removed and crushed to appropriate size before returning it into the Project

area. The finished grade will consist of 8-inch quarry spalls with a thin layer of 2-4 inch railroad ballast applied over the top to fill in surface voids. This material is also appropriate for macroalgae attachment and the smaller rock will provide more surface area for epiphyte attachment and epibenthic productivity. A 5 ft by 10 ft area will be prepared with fine sediment for transplanting a small patch of eelgrass that was observed during the eelgrass/macroalgae survey.

Salmon Migration Corridor

The proposed Mitigation Plan will provide a continuous migration corridor along the nearshore habitat in the Project area. Juvenile salmon show a preference for migrating along the shoreline in shallow depths (Williams and Thom 2001). The proposed Project will improve the nearshore habitat by creating an even slope between -4 ft and +10 ft so that as the tide raises and falls a consistent shallow depth is available continuous through the Project shoreline.

Epibenthic Productivity

The value of epibenthic productivity will be improved by a ratio of at least 1.25:1. A number of studies have found that epibenthic zooplankton have a greater density in vegetated habitat compared to bare mud or rock. Simenstad et al. (1980) found that the density of epibenthic zooplankton was greater in vegetated habitat compared to bare substrate in the same site ranging from 1.25:1 to 6.8:1. Thom et al. (1988) compared vegetated habitats with non-vegetated mudflats in Drayton Harbor and found a greater density of epibenthic zooplankton in the vegetated areas at a ratio of 8:1. Though information of epibenthic productivity of concrete slab substrate is lacking, it is assumed to be of poor quality. The surface area of the concrete slaps is planar and offers a homogenous habitat whereas the angular rock will provide a more diverse habitat with larger surface area and interstitial space between the rocks that will likely promote a more diverse epibenthic community. The concrete slabs also inhibit the benthic infauna community as well and the quarry spalls will provide space for the infauna organisms (R. Buckley, per comm). Mitigation projects for the Elliott Bay marina found that the density of epibenthic fauna were substantially higher in the areas with cobble and aggregate (4 – 8 inch average diameter) than sand-dominated substrate (Jones & Stokes 1993).

The proposed Project will replace the existing concrete slab rubble with 2 – 4 inch angular rock and 8 inch quarry spalls that will provide more valuable substrate for epibenthic fauna. This project will greatly improve the quality of substrate for macroalgae attachment, epibenthic zooplankton and benthic infauna. As a surrogate for the measurement of epibenthic productivity, we propose to use the coverage of macroalgae. If the constructed Project results in an increase of macroalgae coverage of at least 1.25:1, then we will assume that there is also an equal increase of epibenthic productivity.

Performance Standards

This mitigation plan will be considered successful and complete after post-construction monitoring has documented a net gain of:

- Nearshore habitat area between -10 ft and +10 ft.
- Macroalgae cover at a ratio of at least 1.25:1.

Minimum values of these habitat components that will be achieved by this mitigation plan are listed in Table 5. Macroalgae cover will be used as a surrogate for epibentic value; if there is no net-loss of macroalgae cover then it will be assumed that there is no net-loss of epibenthic value. The existing patch of eelgrass will be transplanted into a prepared bed in the Project area. The observed eelgrass patch consisted of 12 turions and because of the low number of plants, success or failure of transplanted eelgrass will not be included as a standard for mitigation success.

Table 5. Performance standards for the La Conner Associates nearshore redevelopment project.

Criteria	Total Area (ft^2)
Habitat Area (ft^2)	Greater than 15,475.1
Macroalgae Cover (ft^2)	2,235.8

IV. MONITORING

The success of this mitigation plan will be measured using the WDFW Post-project guidelines outlined below. The objectives of monitoring are:

1. Document the area where existing material has been removed and replaced with clean appropriate sized material.
2. Document coverage of macroalgae within the Project Area.

Methods

Transects will be selected perpendicular from shore at 20 ft intervals or less beginning at the southern property boundary and corresponding with the Sections shown in the Attached Project drawings. Transects will be marked with semi permanent markers (rebar) at +10 ft, and at MLLW. The +10 ft station will be considered station zero and data will be collected beginning at station 1 ft and at every ten ft along the transect to and including -10 ft depth. At least one station on each transect will be located in each of the four tidal strata of -10 ft to -4 ft, -4 ft to MLLW, MLLW to +4 ft and +4 ft to +10 ft. Observations will be recorded at each station for:

- Depth;
- Time;
- Substrate size;
- Macroalgae species, dominant and subdominant;
- Percent cover within 1 square meter;
- Presence or absence of eelgrass in transplant area and throughout the Project area;
- Incidental observations of fauna, e.g. fish and shellfish;

The survey of the intertidal area above MLLW will be conducted during a low tide event and conditions of the mitigation area and key features will be documented with photographs. Below MLLW the transect will be surveyed by divers recording the same information listed above.

Schedule

The first monitoring study will be conducted within the first growing season of (June 1 to October 1) after completion of the nearshore mitigation Project. If the macroalgae coverage objectives of the mitigation plan are not met within the first year a second monitoring study will be completed in the second year during the growing season and if the objective is not met after the second year, a third monitoring study will be completed.

If the mitigation area objective is not met in the first year, or macroalgae coverage objective is not met on the third year, a mitigation contingency plan will be implemented.

Data Analysis

Collected field data will be summarized for each transect and each tidal strata and presented in a final report to WDFW within 30 days of the monitoring survey. The data tables will provide:

- Transect and station;
- Tidal strata;
- Substrate size;
- Macroalgae species, dominant and subdominant;
- Percent coverage within 1 square meter;
- Observations of eelgrass, and incidental fauna.

V. CONTINGENCY PLAN

The success of this mitigation plan is dependent on two criteria:

1. A net gain of habitat area between –10 ft and +10 ft, and;
2. A net gain of macroalgae coverage of at least 1.25:1 within the Project area.

If in the first monitoring study, the mitigation area between -10 ft and +10 ft is determined to be less than existing pre-project area, then a plan to either increase the mitigation area on-site, or off-site mitigation will be developed in consultation with the WDFW Area Habitat Biologist.

If after the third monitoring study the macroalgae coverage objective is not met, then a plan to increase macroalgae attachment substrate on-site will be developed in consultation with the WDFW Area Habitat Biologist.

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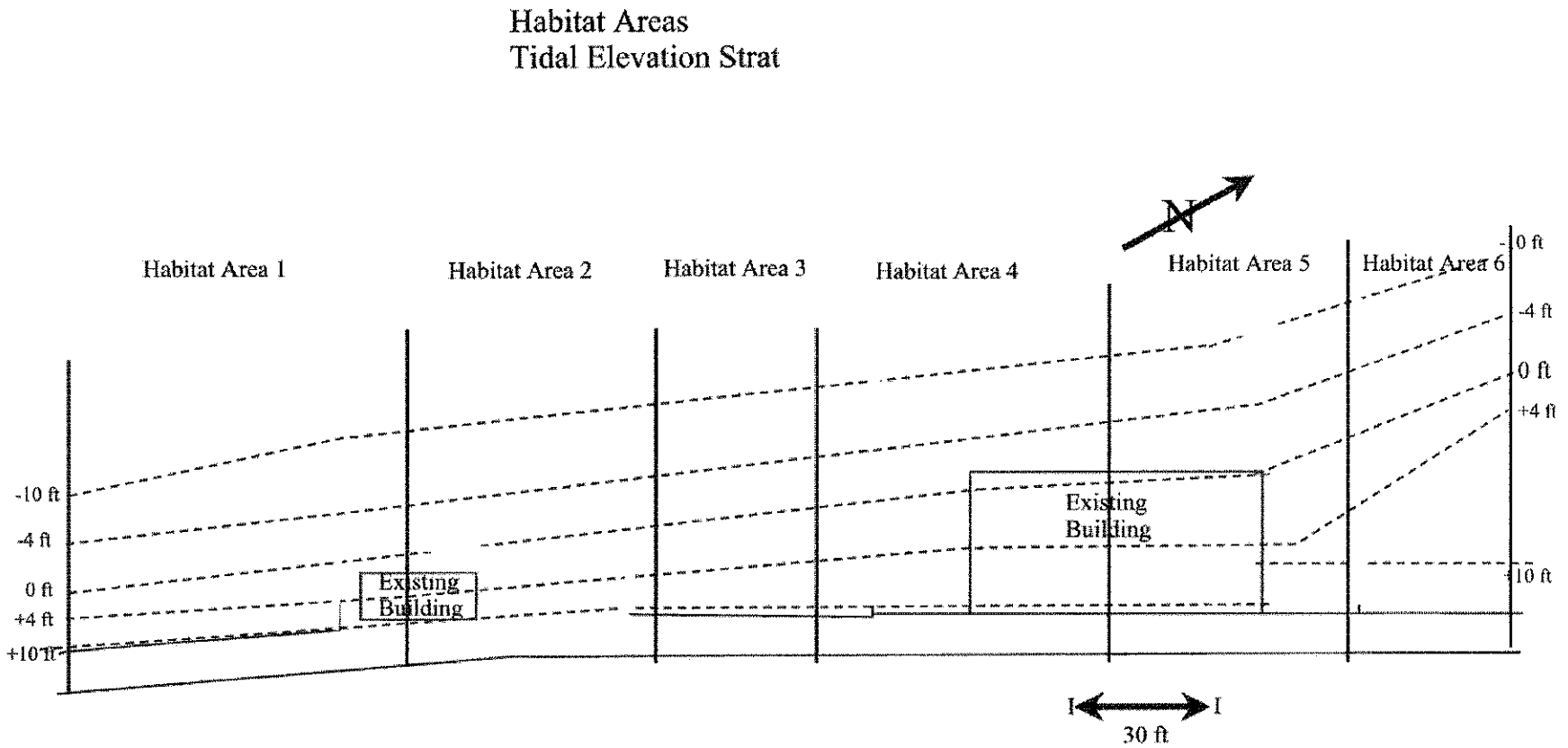

Figure 1. Project area with existing structures showing habitat areas and tidal elevation strata.

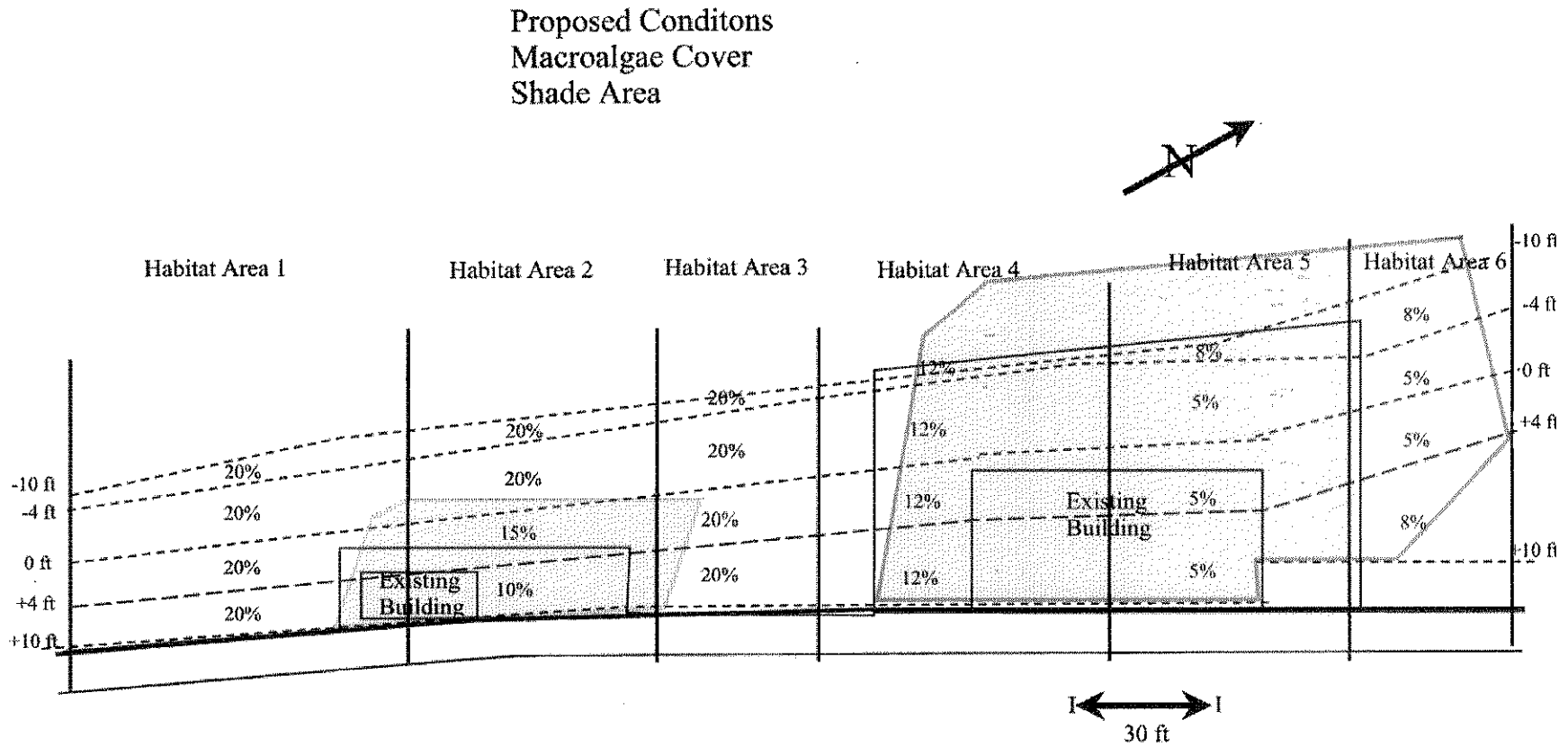

Figure 2. Project area with proposed conditions of macroalgae cover and maximum shade area.

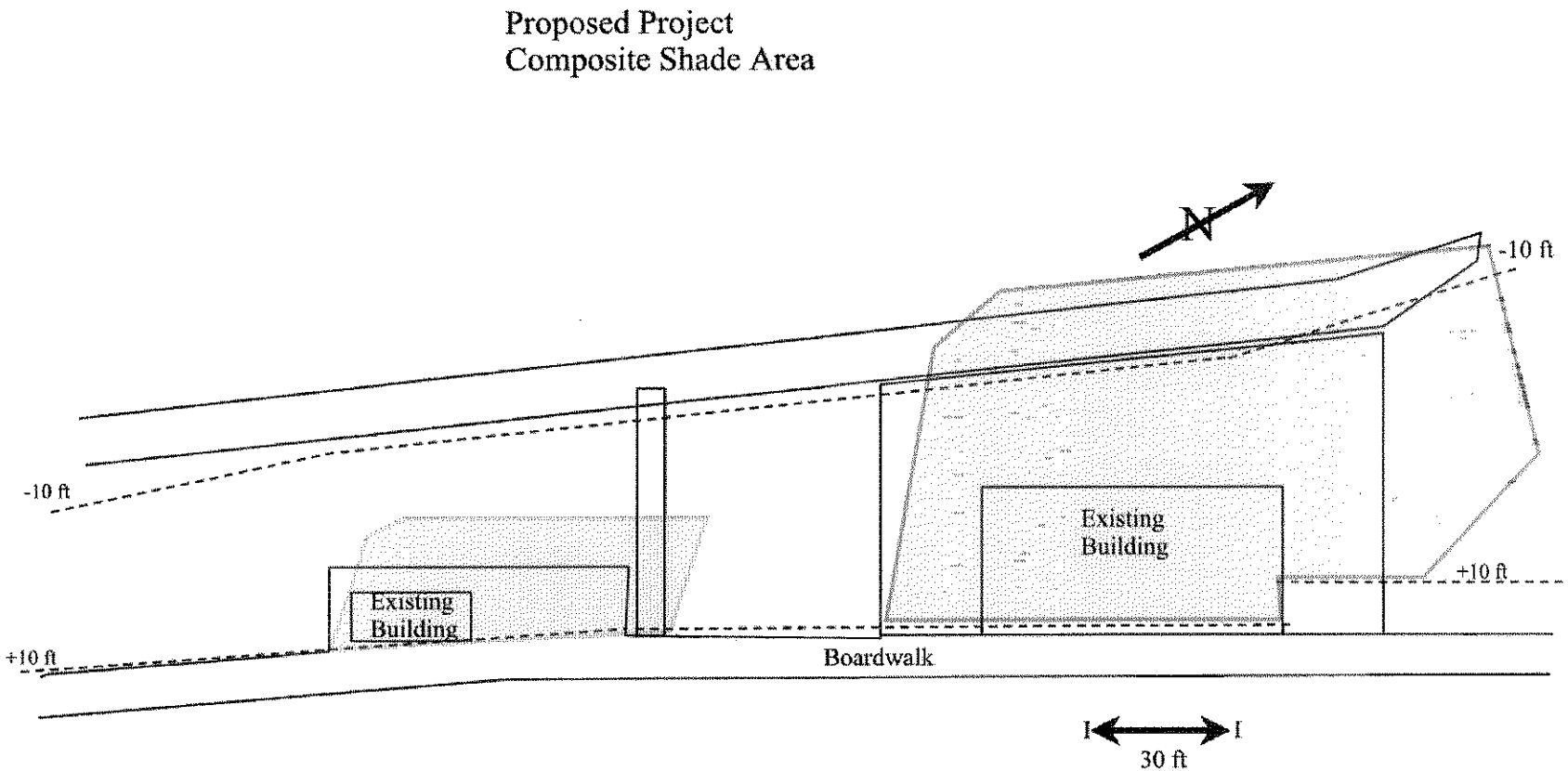

Figure 3. Project area with proposed overwater structures and maximum shade area.

Appendix D

Shade Model

LA CONNER ASSOCIATES
NEARSHORE REDEVELOPMENT

SHADE STUDY

Introduction

Overwater structures and their supporting members impact aquatic habitat by altering light regimes, wave energy, substrates and water quality. The structures can reduce the amount of light that penetrates the water and create shade directly underneath and to the sides of the structures. Light is a requirement for aquatic vegetation growth and production; aquatic vegetation will not grow where there is insufficient light. Aquatic vegetation provides structure and food base for the ecosystem and food webs. Habitat with aquatic vegetation is far more productive than bare sediment habitat and provides food items, refuge and spawning substrate for a number of species that are associated with ESA listed fish and wildlife. Floating docks and piles reduce the wave energy that controls the sediment in the nearshore habitat. (Nightingale and Simentstad 2001).

To estimate the area of shade that would impact the nearshore due to the overwater structures proposed for the La Conner Associates Project, a two-dimensional shade model was completed. The Project includes a floating dock and two fixed overwater decks (Sheets 1-12, Appendix A). The floating dock is positioned at depth greater than -10 ft relative to Mean Lower Low Water (MLLW, all depths referred to in this document are relative to MLLW) with the exception of 14 sq ft at the north end of the project. The crab shack deck is the larger of the two decks with an area of approximately 5,340 sq ft and will be located from the shoreline out to -10 ft depth. The smaller deck is associated with the existing pump house. A deck that was part of the pump house dock that was removed at the request of Washington State Department of Natural Resources (WDNR) in 1999. The area of the pump house deck was approximately 1,475 sq ft that extended from +10 waterward to MLLW. The area of this previously existing deck was not included in the shade study.

The orientation to the Project area and the faces of the decks are to the northwest. Sunlight does not fall directly onto the nearshore area of the project until after noon on both March 20, the equinox, and June 20 the solstice (Table 1 and Figure 1). For this study, the shade area was estimated at noon, 2pm and 4pm on both March 20 and June 20. The area where shade was persistent and direct sunlight would not strike the nearshore habitat was used to discount macroalgae cover and epibenthic value. Macroalgae cover was reduced by 20% in areas that were partially shaded during the day.

Methods

The angle of sunlight can be broken into two components:

1. Sun Azimuth: The position of the sun relative to north.
2. Sun Altitude: The angle of the sunlight above the horizontal surface of the earth.

Table 1 lists the values of these two components at intervals during the spring equinox and summer solstice. The fall equinox would have values equivalent to the spring equinox.

Table 1. Sun altitude and azimuth for various times on the spring equinox and summer solstice.

March 20, 2004	10 am	noon	1:37 pm[3]	2 pm	4 pm
Sun Altitude[1]	33.3°	41.6°	38.7°	36.9°	22.1°
Sun Azimuth[2]	137.5°	174.2°	205.9°	212.8°	243.1°
June 20, 2004	10 am	Noon	1:02 pm[4]	2 pm	4 pm
Sun Altitude	54.0°	62.9°	63.2°	57.1°	38.9°
Sun Azimuth	122.1°	173.7°	205.6°	230.3°	262.0°

1. Sun Altitude is measured vertically in degrees above the horizon.
2. Sun Azimuth is measured in degrees from true north.
3. Time when sunlight is parallel to Project area shoreline on March 20.
4. Time when sunlight is parallel to Project area shoreline on June 20.

Figure 1 shows the azimuth angles of the sun relative to the proposed dock structures and Figure 2 shows the altitude angles and distance under the overwater structures that the light would penetrate at +10, +4, MLLW, -4 and -10 ft. The distance that the sunlight would penetrate at a given depth was plotted on the azimuth angles at a given time from the deck corners to determine the approximate edge of the shade area. The shade areas are shown on Figures 3-8.

Figure 9 shows the composite of all shade areas and represents the maximum shade area.

Results

Table 2 lists the area of shade from the proposed project for each tidal stratum considered for this project. The gangway will be 5 ft wide and constructed of grating that will allow light to penetrate. The shade area from the gangway will likely reduce the growth of macroalgae. Figures 3-8 show the shade area relative to the proposed structures and Table 2 lists the area of shade for each tidal stratum for both the existing and proposed structures. Figure 9 shows the composite shade area of each day and time that represents the maximum shade area.

Table 2.

Criteria	Tidal Strata (ft MLLW)				Total (ft^2)
	-10 to -4	-4 to 0	0 to +4	+4 to +10	
Existing shade area[1] (ft^2)	676.0	870.0	639.0	2,491.5	4,676.5
Proposed shade area (ft^2)	1,127.5	1,320.0	2,223.5	2,657.0	7,328.0
Increase of shade area (ft^2)	451.5	450.0	1,584.5	165.5	2,651.5

1. Not including historic pump house deck.

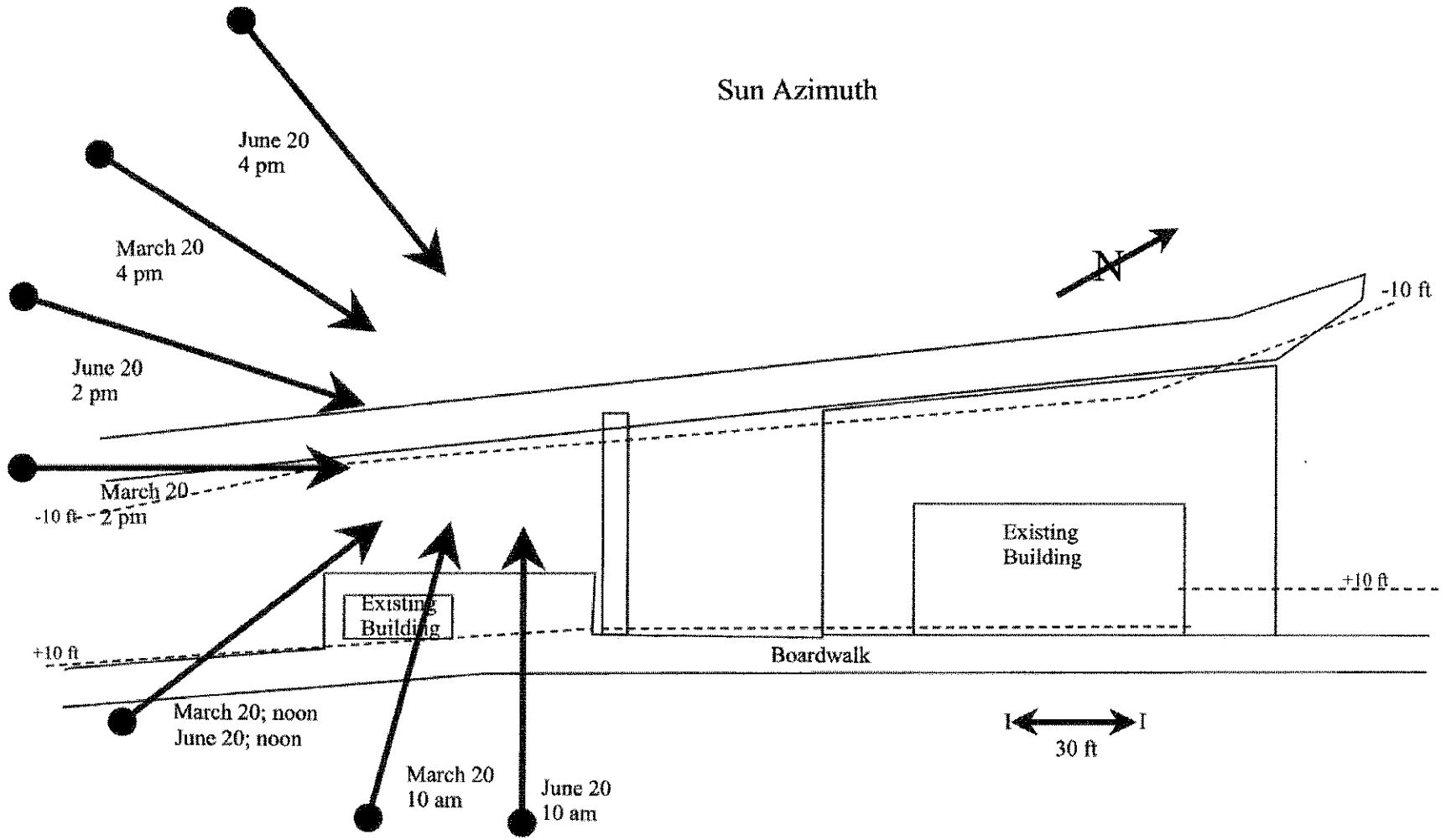

Figure 1. Sun azimuth for selected times on spring equinox, March 20, 2004 and the summer solstice on June 20, 2004.

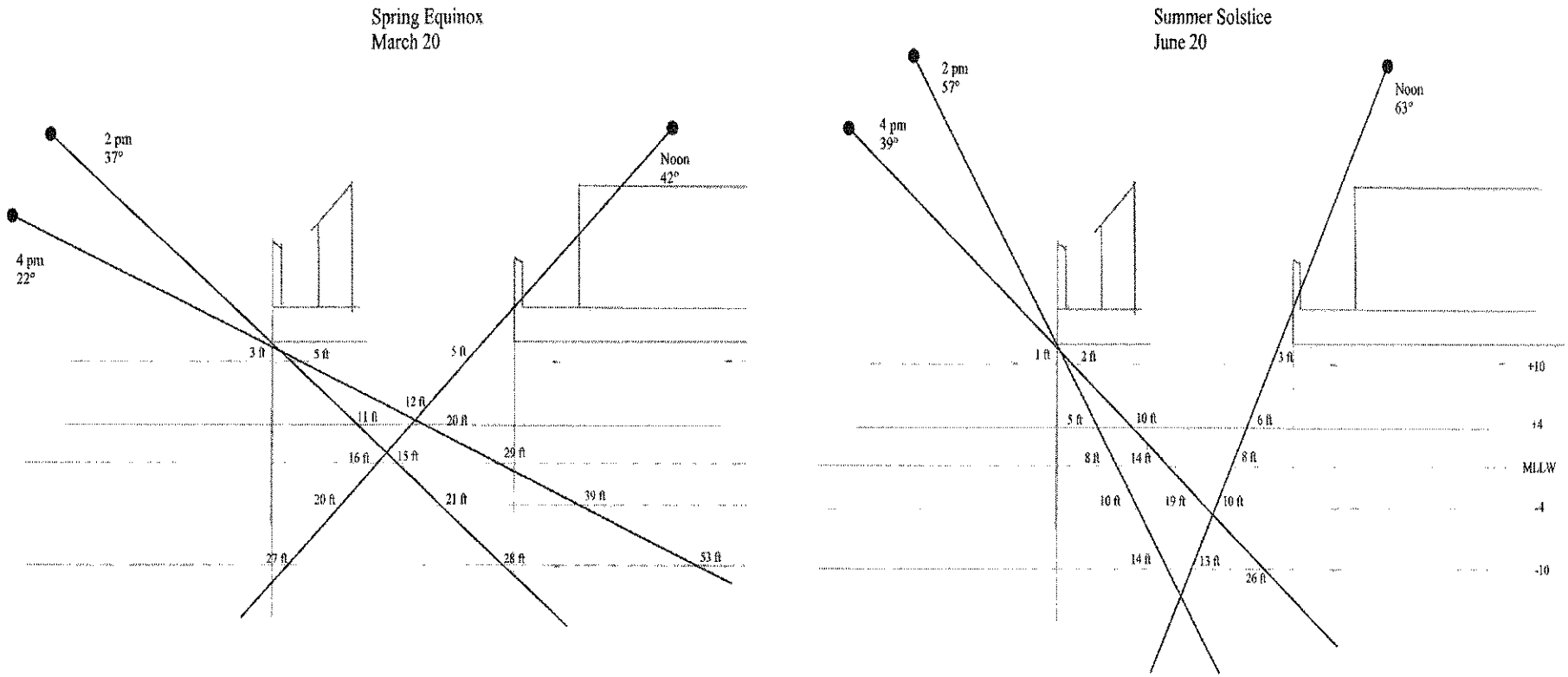

Figure 2. Sun altitude for selected times on spring equinox, March 20, 2004 and the summer solstice on June 20, 2004.

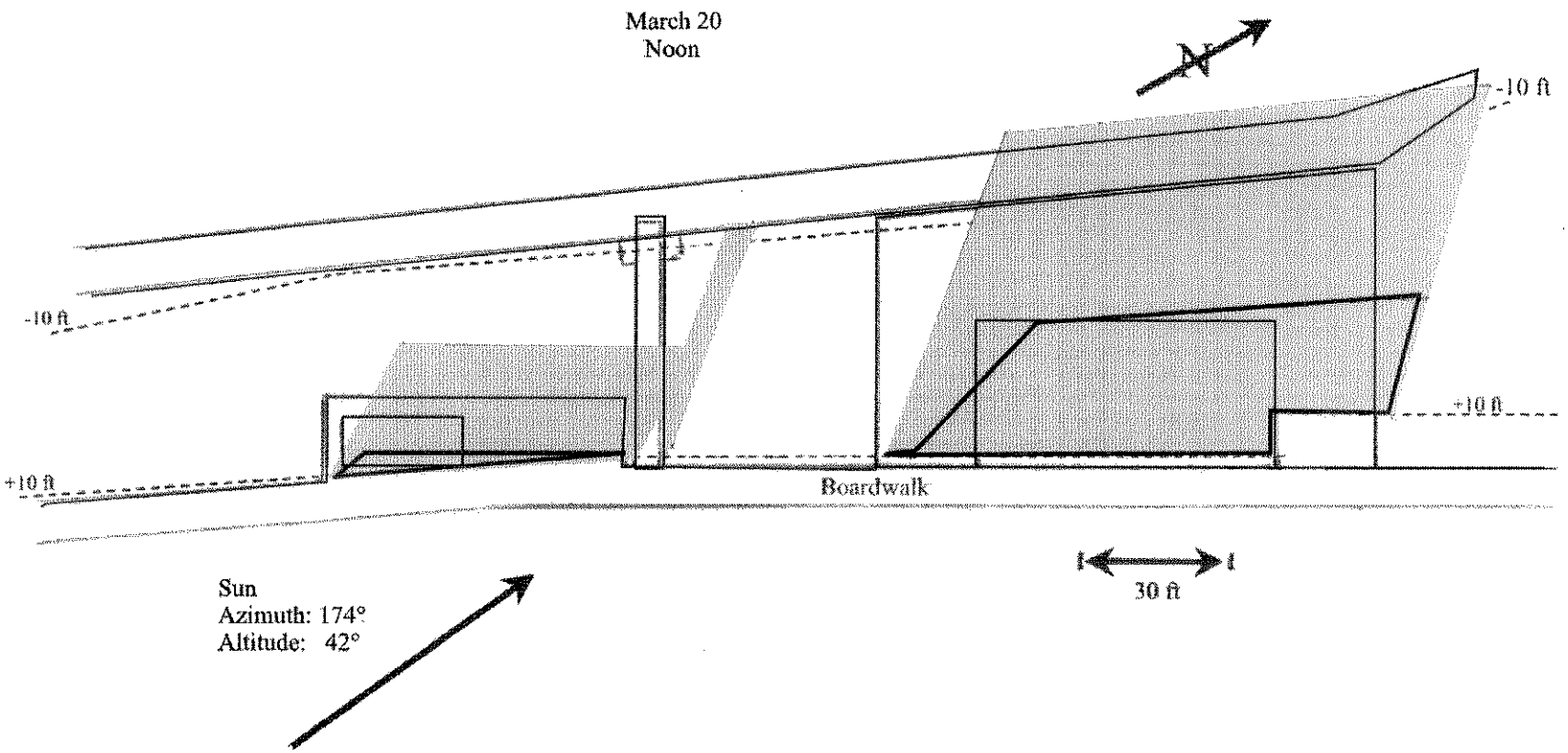

Figure 3. Results of shade model for noon on March 20, 2004. Partial shaded area is shown in grey and persistent shade area is shown outlined.

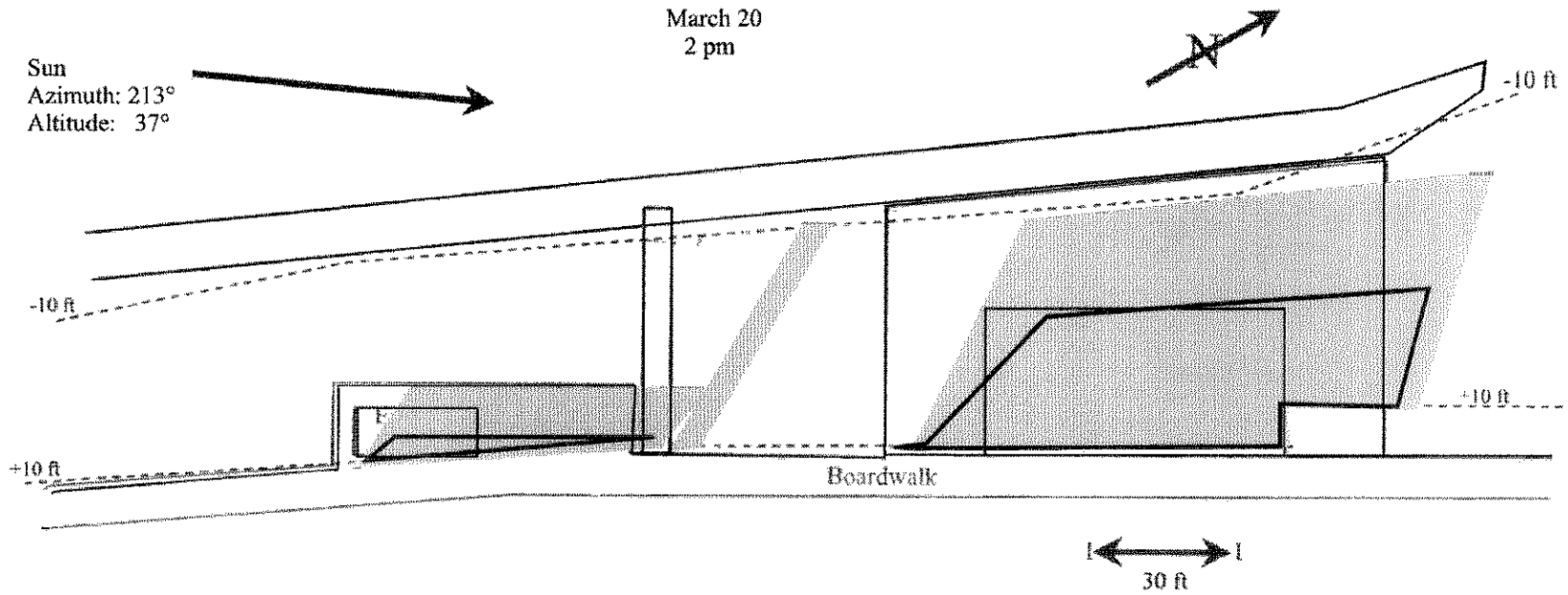

Figure 4. Results of shade model for 2 pm on March 20, 2004. Partial shaded area is shown in grey and persistent shade area is shown outlined.

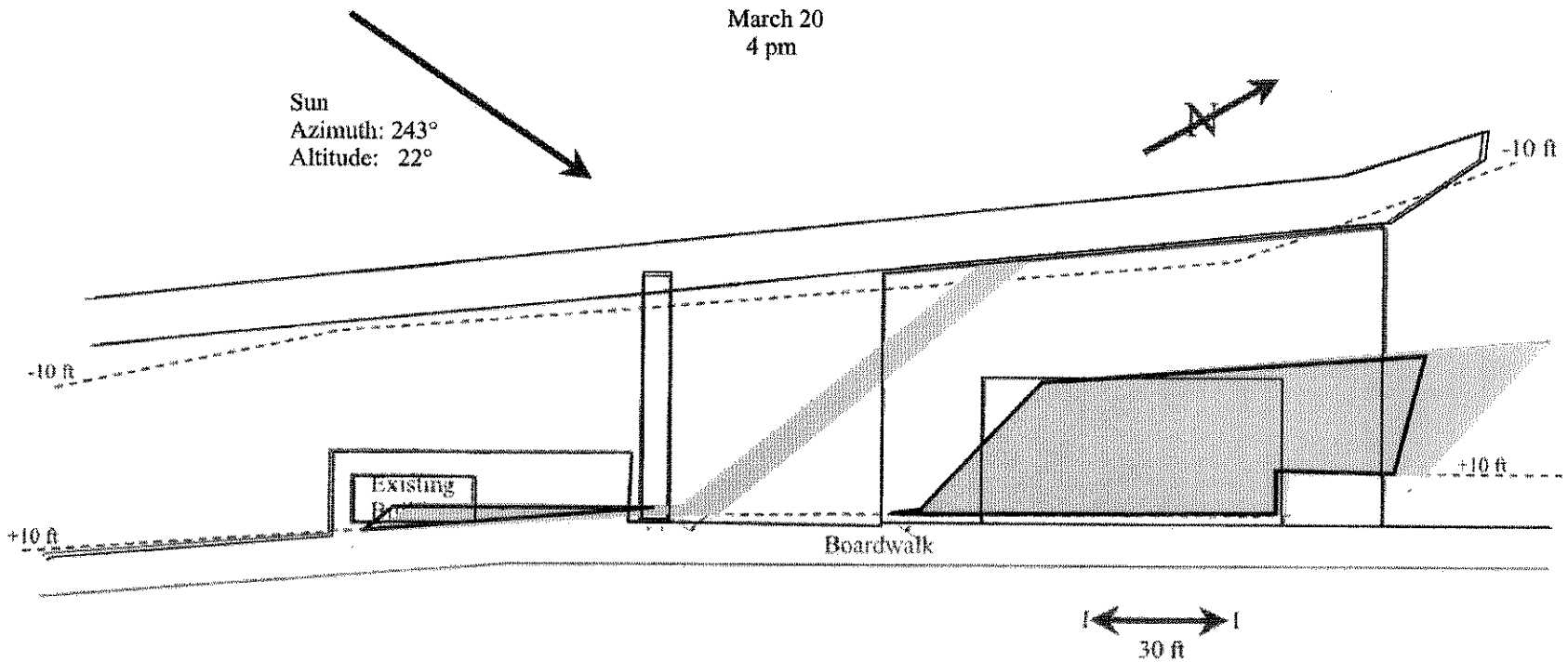

Figure 5. Results of shade model for 4 pm on March 20, 2004. Partial shaded area is shown in grey and persistent shade area is shown outlined.

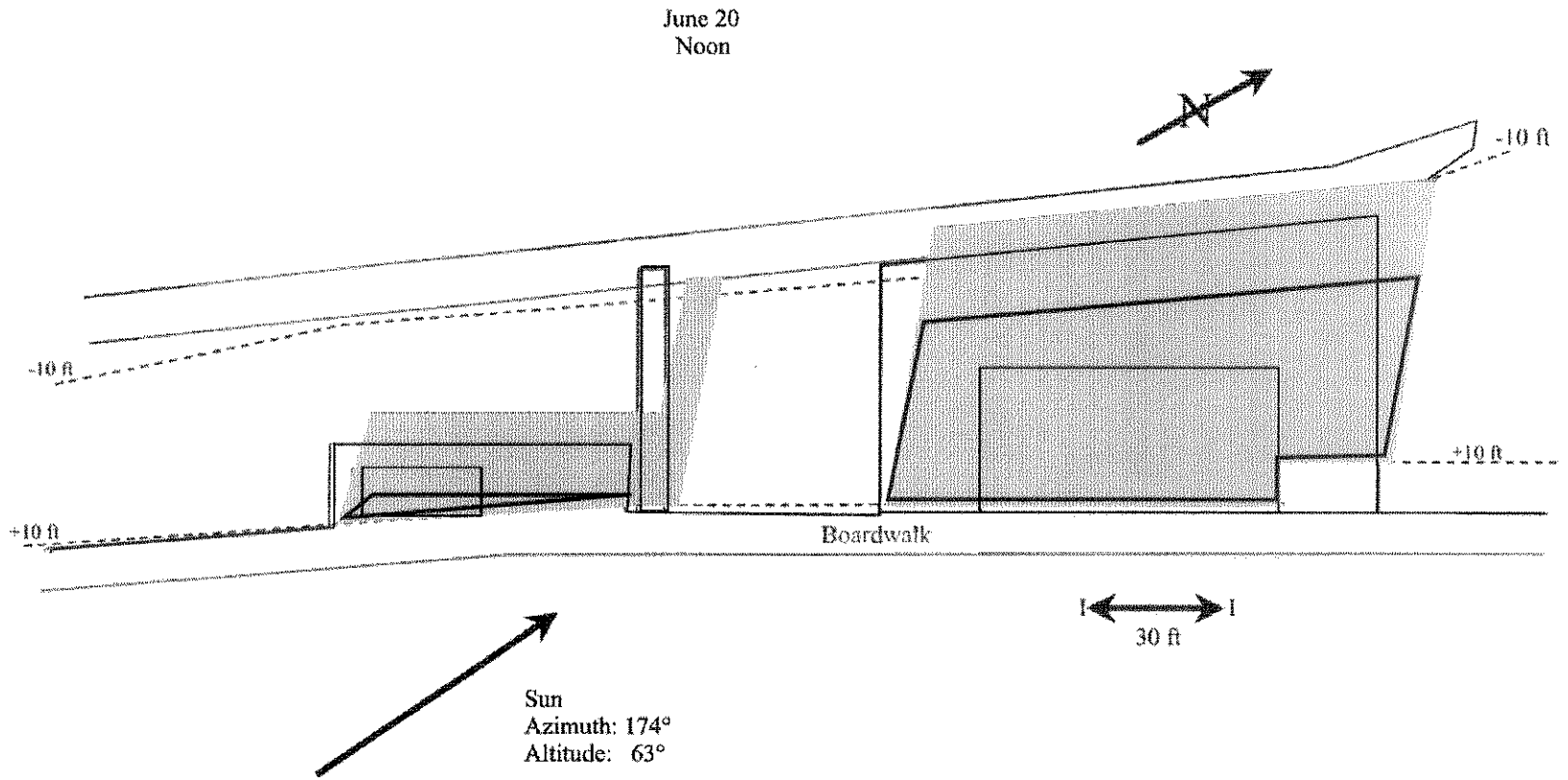

Figure 6. Results of shade model for noon on June 20, 2004. Partial shaded area is shown in grey and persistent shade area is shown outlined.

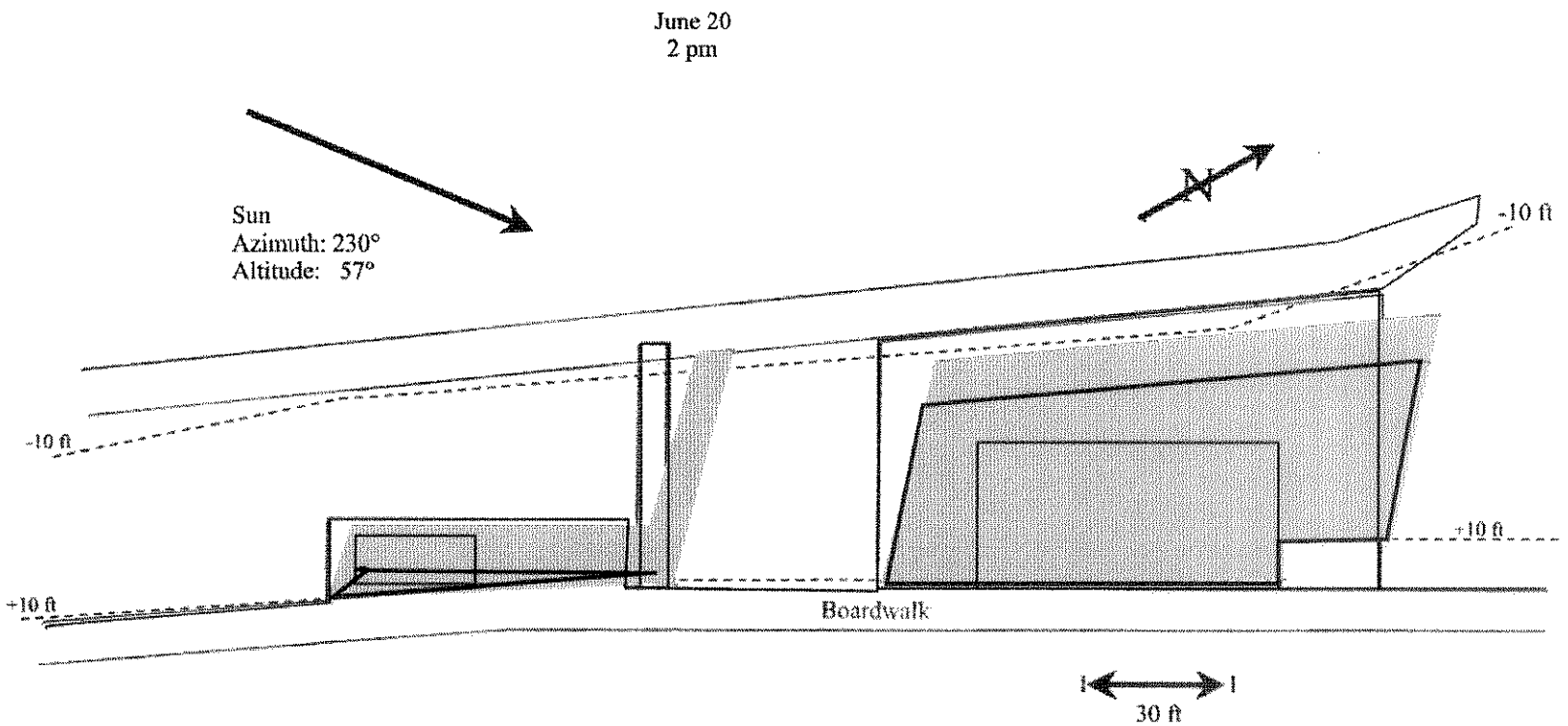

Figure 7. Results of shade model for 2 pm on June 20, 2004. Partial shaded area is shown in grey and persistent shade area is shown outlined.

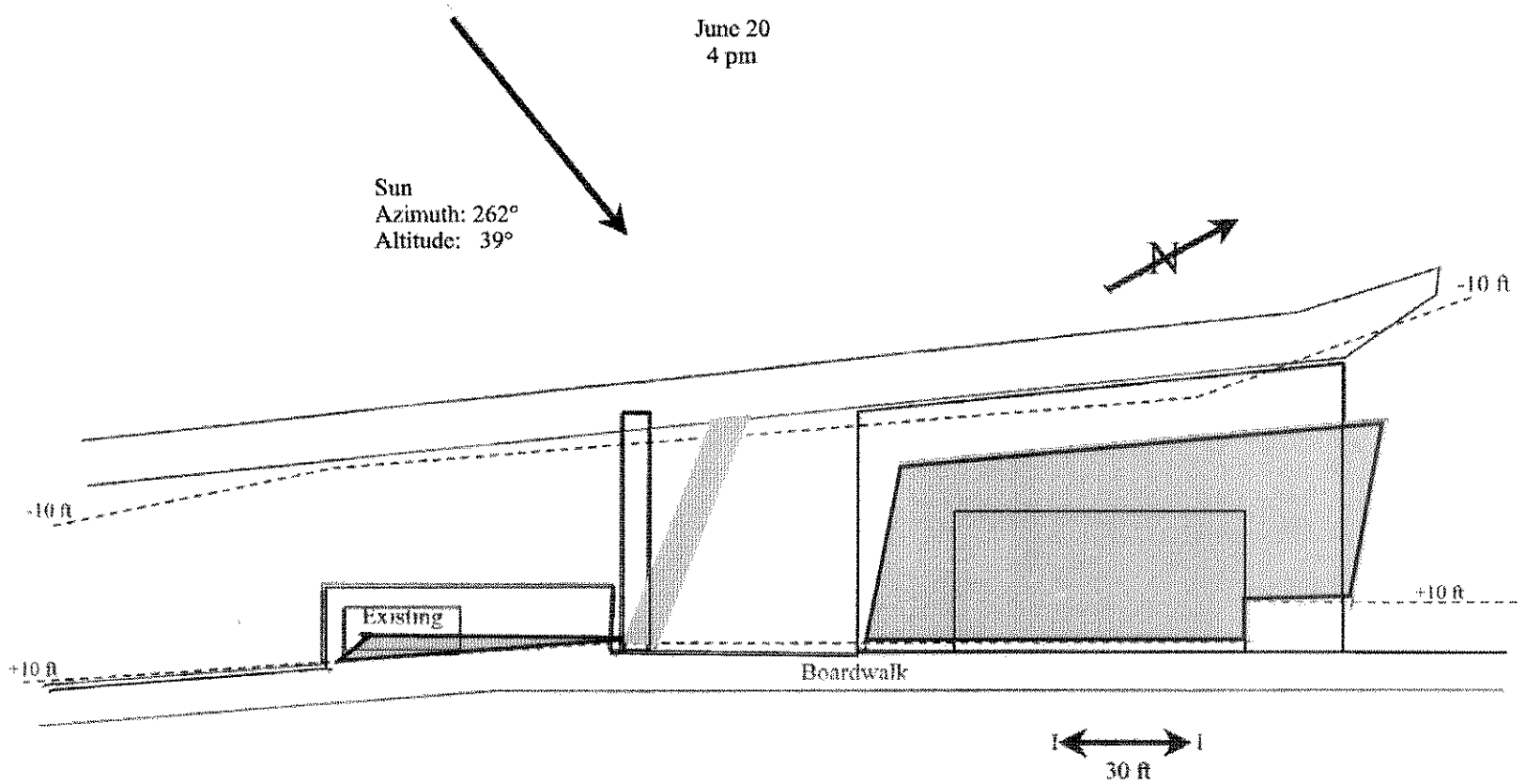

Figure 8. Results of shade model for 4 pm on June 20, 2004. Partial shaded area is shown in grey and persistent shade area is shown outlined.

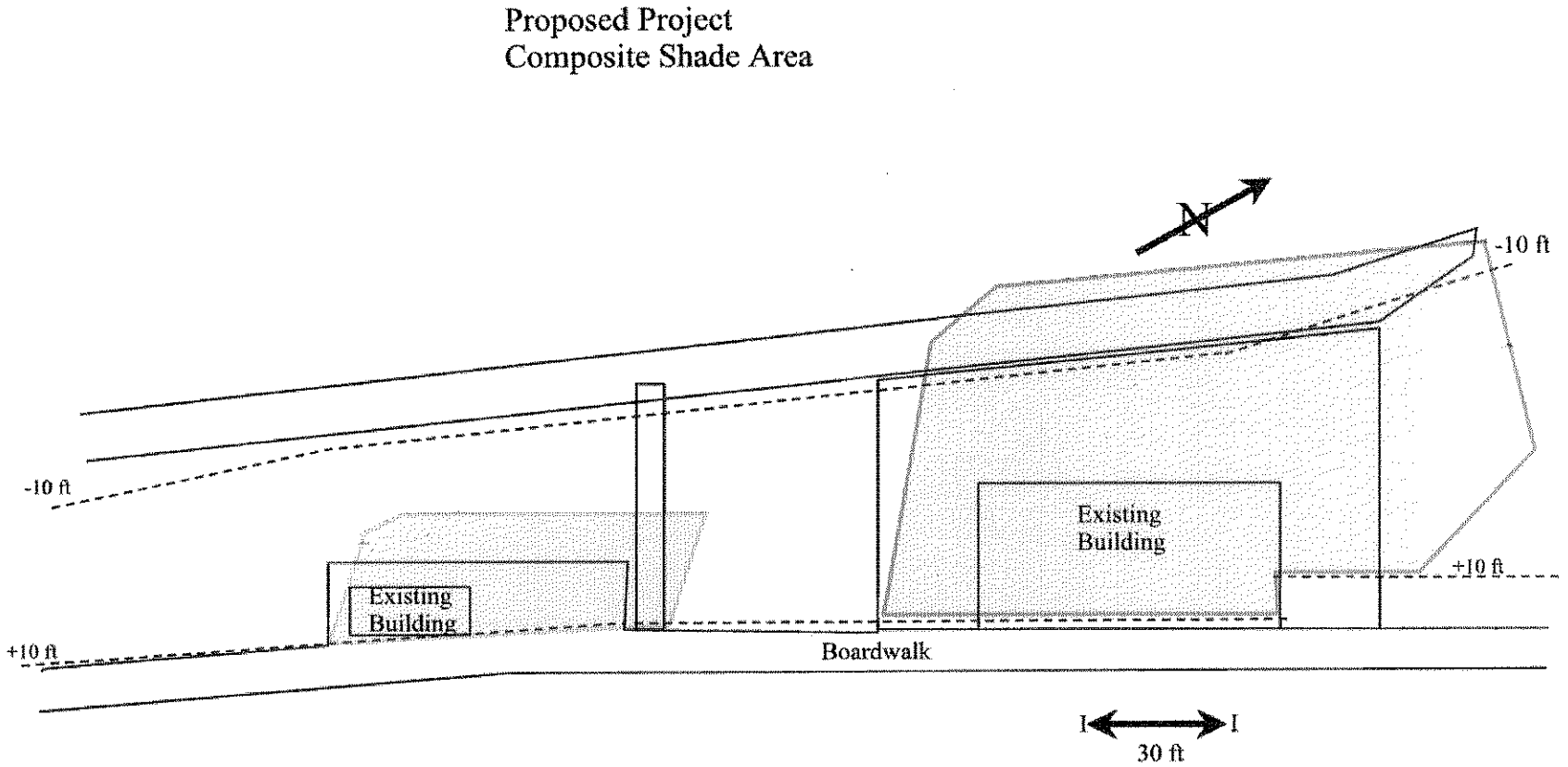

Figure 9. Composite of all shade areas showing the maximum area receiving shade during any day between the spring and fall equinox. The gangway ramp will be 5 ft wide and constructed of grating that will allow light penetration.

Appendix E

Intermediate Eelgrass Survey

Intermediate Eelgrass and Macroalgae Survey
La Conner Associates Project

Introduction

At the request of La Conner Associates, an intermediate eelgrass and macroalgae survey was conduct on October 2, 2003 by Fairbanks Environmental Services, Inc. A small patch of eelgrass was observed on Transect 6 and the macroalgae community was generally sparse to moderate with coverage ranging from 2% to 40%. Gravel was the dominant substrate, which provides poor attachment for macroalgae. *Fucus* and *Ulva* were the dominant algae from between +9 ft and –2 ft relative to Mean Lower Low Water (MLLW). *Laminaria* was the dominant alga from about –5 ft to –12 ft MLLW.

Methods

This survey followed the guidelines for an intermediate eelgrass and macroalgae survey developed by the Washington State Department of Fish and Wildlife. Ten transects were selected within the project area that were perpendicular to the shoreline. The transects were set at 40 ft intervals with Transect-1 at the center of Caledonia Street (Figure 1). The transects began at approximately +9 ft MLLW and extended out into Swinomish Channel for a distance of 80 ft. A 200 ft tape measure was used as a transect line with zero set at the water's edge. A diver swam perpendicular to shore on the surface to 80 ft, checked his position prior to descending and then recorded observations at 20 ft intervals as he swam along the bottom toward the shore. Observation of time, depth, substrate, and vegetation were recorded along each transect. All depths were converted relative to MLLW based on predicted tidal elevations for Swinomish Channel at La Conner.

Results

Macroalgae was present in the project area with sparse to moderate density. Close to shore, in depths from +9 to –2 ft MLLW *Fucus* and *Ulva* with 5% to 20% coverage was observed on the rip rap material that consisted of quarry spalls and concrete rubble (Appendix B; Photos 1 and 2). On Transects 9 and 10, the density of *Fucus* and *Ulva* was higher with coverage of 30% - 40%. From –2 to –10 ft MLLW the riprap was mixed with gravel and below –10 MLLW the substrate was gravel. *Laminaria* was observed from –5 to –15 ft MLLW with 2% – 25% coverage. A small patch of eelgrass (*Zostera marina*) with 10 turions was observed 40 ft from shore on Transect 6 at the depth of –6.8 ft MLLW. The results of this survey are listed on Tables 1-10.

Discussion

The macroalgae community is generally sparse to moderate and was found where there was appropriate attachment substrate. The proposed dock will impact an area equal to the surface area of the dock of the *Laminaria* community and part of the *Fucus* and *Ulva* community (Figure 1). The proposed dock will also impact the small patch of eelgrass. The results of this survey are consistent with a survey conducted by Marine Environmental Services on December 17, 1997.

Table 1. Diver's observations on Transect 1, centerline of Caldonia Avenue.

Station (ft)	Depth (MLLW)	Substrate	Species	% Cover	Comments
0	8.6	Boulder, cobble		0	Quarry spalls
20	-1.4	Boulder, cobble	*Fucus*	15	Rip rap
40	-8.4	Gravel	*Laminaria, micro*	10	
60	-10.4	Gravel	*Laminaria*	10	
80	-15.4	Gravel	*Laminaria*	2	

Table 2. Diver's observations on Transect 2, 40 ft north of Transcect 1.

Station (ft)	Depth (MLLW)	Substrate	Species	% Cover	Comments
0	8.5	Cobble	*Fucus*	5	Quarry spalls,
20	1.5	Cobble	*Fucus*	20	Broken concrete slab
40	-7.5	Cobble, gravel	*Laminaria, micro*	15	
60	-10.5	Gravel	*Laminaria*	2	
80	-16.5	Gravel	*Micro**	2	

Micro describes small red algae such as *Microcladia, Plocamium, Euthora, Odenthalia and Polysiphonisa.*

Table 3. Diver's observations on Transect 3, 40 ft north of Transcect 2.

Station (ft)	Depth (MLLW)	Substrate	Species	% Cover	Comments
0	8.4	Rip rap	*Fucus*	10	Broken concrete slab
20	-0.6	Boulder, cobble	*Fucus, Ulva*	15	
40	-7.6	Cobble, gravel	*Laminaria*	15	
60	-11.6	Gravel	*Laminaria*	5	
80	-16.6	Gravel	*Micro*	2	

Table 4. Diver's observations on Transect 4, 40 ft north of Transcect 3.

Station (ft)	Depth (MLLW)	Substrate	Species	% Cover	Comments
0	8.3	Rip rap	*Enteromorhpa*	20	Broken concrete slab
20	-1.7	Boulder, cobble	*Ulva*	8	Snails
40	-8.7	Cobble, gravel	*Laminaria*	10	
60	-12.7	Gravel	*Laminaria*	2	
80	-16.7	Gravel		0	

Table 5. Diver's observations on Transect 5, 40 ft north of Transcect 4.

Station (ft)	Depth (MLLW)	Substrate	Species	% Cover	Comments
0	8.2	Boulder, cobble		0	Broken concrete slab
20	-1.8	Boulder, cobble	*Ulva, Fucus*	10	
40	-9.8	Cobble, gravel	*Laminaria, micro*	5	
60	-13.8	Gravel, sand	*Laminaria*	2	
80	-16.8	Gravel, sand		0	

Table 6. Diver's observations on Transect 6, 40 ft north of Transcect 5.

Station (ft)	Depth (MLLW)	Substrate	Species	% Cover	Comments
0	8.2	Rip rap	*Fucus*	20	Broken concrete slab
20	-0.8	Gravel, cobble	*Fucus*	5	
40	-6.8	Gravel	*Laminaria, micro*	15	10 turions of Z. marina
60	-10.8	Gravel	*Laminaria*	5	
80	-16.8	Gravel		0	

Table 7. Diver's observations on Transect 7, 40 ft north of Transcect 6.

Station (ft)	Depth (MLLW)	Substrate	Species	% Cover	Comments
0	8.1	Rip rap	*Fucus*	20	Broken concrete slab
20	-0.9	Cobble, gravel	*Fucus*	5	
40	-6.9	Gravel	*Laminaria*	25	
60	-11.9	Gravel	*Laminaria*	2	
80	-15.9	Gravel	*Laminaria*	2	

Table 8. Diver's observations on Transect 8, 40 ft north of Transcect 7.

Station (ft)	Depth (MLLW)	Substrate	Species	% Cover	Comments
0	8	Rip rap	*Fucus, Ulva*	20	Broken concrete slab
20	0	Cobble, gravel		0	
40	-7	Gravel	*Laminaria, micro*	10	Many shiner perch
60	-12	Gravel	*Laminaria*	5	Garbage
80	-17	Gravel	*Micro*	2	

Table 9. Diver's observations on Transect 9, 40 ft north of Transcect 8.

Station (ft)	Depth (MLLW)	Substrate	Species	% Cover	Comments
0	7.9	Rip rap	*Fucus, Ulva*	30	Broken concrete slab
20	1.9	Cobble, gravel	*Micro*	2	
40	-6.1	Cobble, gravel	*Laminaria, micro*	20	
60	-14.1	Cobble, gravel	*Laminaria*	5	
80	-18.1	Gravel	*Micro*	2	

Table 10. Diver's observations on Transect 10, 40 ft north of Transcect 9.

Station (ft)	Depth (MLLW)	Substrate	Species	% Cover	Comments
0	7.8	Rip rap	*Fucus, Ulva*	40	Broken concrete slab
20	1.8	Rip rap	*Ulva*	20	
40	-8.2	Cobble, gravel	*Laminaria, micro*	10	Crab
60	-16.2	Gravel	*Micro*	5	
80	-18.2	Gravel	*Micro*	2	

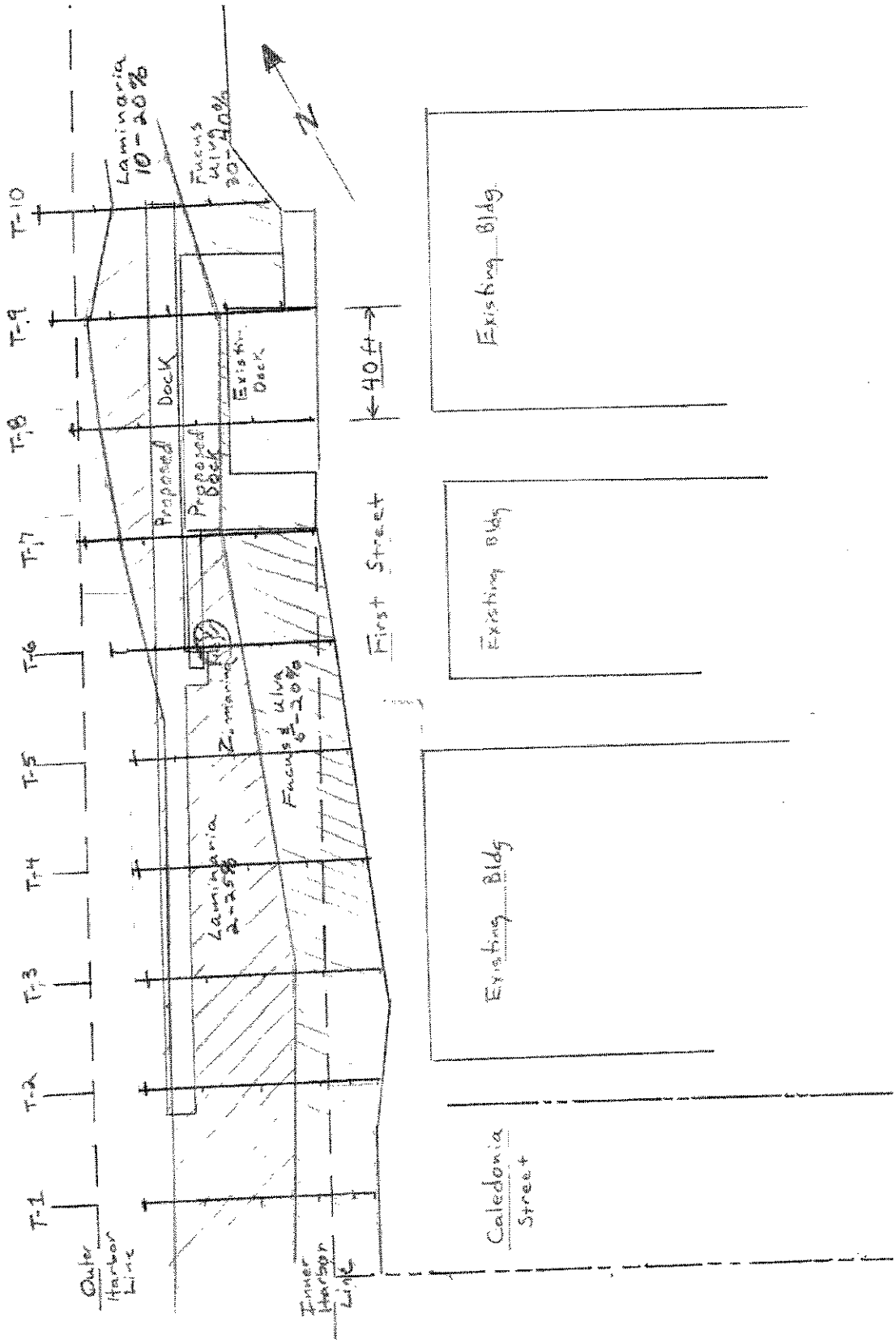

Figure 1. Location of transects, macroalgae community and eelgrass observed on October 2, 2003.

Appendix F

Washington State Department of Fish and Wildlife
Hydraulic Project Approval

HYDRAULIC PROJECT APPROVAL

RCW 77.55.100 - appeal pursuant to Chapter 34.05 RCW

State of Washington
Department of Fish and Wildlife
Region 4 Office
16018 Mill Creek Boulevard
Mill Creek, Washington 98012

DATE OF ISSUE: August 23, 2004 **LOG NUMBER:** ST-E7697-01

PERMITTEE	AUTHORIZED AGENT OR CONTRACTOR
LaConner Associates LLC Attention: Vaughn Jolley Post Office Box 1155 LaConner, Washington 98257 (360) 466-2672	Fairbanks Environmental Services, Inc. ATTENTION: Chris Fairbanks 914 12th Street Bellingham, Washington 98225 (360) 647-1744

PROJECT DESCRIPTION: Moorage Floats, Over Water Decks and Near Shore Habitat Enhancement New Permanent Fixed Marine Floating Suspended above water On bed Manmade Composites Natural Earth RipRap Over Water Structures =<2000 to 9999 Square feet

PROJECT LOCATION: South 1st Street, LaConner 48.3887N 122.4993W

#	WRIA	WATER BODY	TRIBUTARY TO	1/4 SEC.	SEC.	TOWNSHIP	RANGE	COUNTY
1	03.9700	Swinomish Channel	Skagit Bay		36	34 North	02 East	Skagit

NOTE: This Hydraulic Project Approval pertains only to the provisions of the Washington State Fisheries and Wildlife Codes. It is the permittee's responsibility to apply for and obtain any additional authorization from other public agencies (local, state and/or federal) that may be necessary for this project.

PROVISIONS

1. **TIMING LIMITATIONS:** The project may begin **immediately** and shall be completed by **December 31, 2006,** provided:

   a. Work below the ordinary high water line shall not occur from **March 15** through **June 14** of any year for the protection of migrating juvenile salmonids.

2. NOTIFICATION REQUIREMENT: The permittee or contractor shall notify the Area Habitat Biologist (AHB) listed below of the project start date. Notification shall be received by the AHB prior to the start of construction activities.

3. This project is approved as illustrated in your application and project plans dated July 22, 2004 subject to the following provisions.

4. All manmade debris on the beach shall be removed and disposed of upland such that it does not enter waters of the state.

5. The existing creosote treated timber piling, the existing failing timber bulkhead and the existing concrete/asphalt slab debris shall be removed from the beach and disposed of upland such that they do not re-enter such waters.

6. Existing creosote piling that can not be extracted shall be cut or broken off at the mud line and covered with, at a minimum, 12 inches of clean substrate material as part of the Phase II construction of the near shore fish migration corridor.

7. New piling shall be concrete, steel and/or ACZA treated timber piling.

8. Under no circumstances shall creosote treated piling or lumber be used for project construction.

9. All piling and lumber treated with preservatives shall be sufficiently cured to minimize leaching into the water or bed.

10. The following sound attenuation methods shall be required for the driving of steel piles with an impact hammer below the ordinary high water line

    a. For steel piles, 10 inches in diameter or less, a 6 inch thick wood block shall be installed between the piling and the impact hammer during pile driving operations or a bubble curtain shall be installed around the pile during pile driving operations.

    b. For steel piles greater than 10 inches in diameter, a bubble curtain shall be installed around the pile during pile driving operations.

11. The moorage float, ramp, over water decks and shoreline boardwalk shall be constructed as illustrated in your project plans dated July 22, 2004. Under no circumstances shall the moorage float, ramp, over water decks and shoreline boardwalk be constructed different from that illustrated in your project plans dated July 22, 2004 without prior WDFW approval.

12. The supports for the shoreline boardwalk shall be located landward of the Mean High Water elevation (+9.15).

13. No portion of the float system shall ground.

14. Floatation for the float system shall be fully enclosed and contained to prevent the breakup or loss of the floatation material into the water.

15. The fish migration bench shall be constructed as illustrated in your July 22, 2004 plans.

16. Rock for the sub-tidal rock revetment element of fish migration bench and the 4 rock cluster elements shall be composed of clean, angular material of a sufficient durability and size to prevent its being broken up or washed away by high water or wave action.

17. Existing concrete slab materials removed from the beach per provision 5 above, may be crushed to appropriate size and used as partial fill for constructing the fish migration bench. Crushed concrete slap materials used for the fish migration bench construction shall be over laid with a layer of 8 inch quarry spalls and 2-4 inch railroad ballast of sufficient depth to prevent the re-emergence of the crushed concrete materials to the surface.

18. The average surface slope of the fish migration bench between bed elevations -4.0 to +10.0 (MLLW = 0.00) shall be 2.6:1 (H:V).

19. The existing patch of eelgrass (Zostera marina) shall be transplanted into a location in the constructed near shore fish migration bench where suitable substrate to support eelgrass survival has been established.

20. Project activities shall be conducted to minimize siltation of the beach area and bed.

21. If a fish kill occurs or fish are observed in distress, the project activity shall immediately cease and WDFW Habitat Program shall be notified immediately.

22. All debris or deleterious material resulting from construction shall be removed from the beach area and bed and prevented from entering waters of the state.

23. No petroleum products or other deleterious materials shall enter surface waters.

24. Project activities shall not degrade water quality to the detriment of fish life.

MITIGATION:

25. The unavoidable shading impacts associated with the over water elements of the proposed project shall be mitigated per the terms and conditions specified in your LaConner Associates Mitigation Plan for the Shoreline Redevelopment dated July 28, 2004 and authored by Chris Fairbanks.

26. The mitigation elements shall be monitored per the terms and conditions specified in your LaConner Associates Mitigation Plan for the Shoreline Redevelopment dated July 28, 2004 and authored by Chris Fairbanks.

27. Mitigation contingency shall be implemented per the terms and conditions specified in your LaConner Associates Mitigation Plan for the Shoreline Redevelopment dated July 28, 2004 and authored by Chris Fairbanks.

SEPA: DNS by City of LaConner final on November 1, 2000.

APPLICATION ACCEPTED: August 6, 2004 **ENFORCEMENT OFFICER:** Downes [P1]

Brian Williams (360) 466-4345
Area Habitat Biologist Ext. 250

Brian Williams

for Director
WDFW

GENERAL PROVISIONS

This Hydraulic Project Approval (HPA) pertains only to the provisions of the Fisheries Code (RCW 77.55 - formerly RCW 75.20). Additional authorization from other public agencies may be necessary for this project.

This HPA shall be available on the job site at all times and all its provisions followed by the permittee and operator(s) performing the work.

This HPA does not authorize trespass.

DATE OF ISSUE: August 23, 2004 **LOG NUMBER:** ST-E7697-01

The person(s) to whom this HPA is issued may be held liable for any loss or damage to fish life or fish habitat which results from failure to comply with the provisions of this HPA.

Failure to comply with the provisions of this Hydraulic Project Approval could result in a civil penalty of up to one hundred dollars per day or a gross misdemeanor charge, possibly punishable by fine and/or imprisonment.

All HPAs issued pursuant to RCW 77.55.100 or 77.55.200 are subject to additional restrictions, conditions or revocation if the Department of Fish and Wildlife determines that new biological or physical information indicates the need for such action. The permittee has the right pursuant to Chapter 34.04 RCW to appeal such decisions. All HPAs issued pursuant to RCW 77.55.110 may be modified by the Department of Fish and Wildlife due to changed conditions after consultation with the permittee: PROVIDED HOWEVER, that such modifications shall be subject to appeal to the Hydraulic Appeals Board established in RCW 77.55.170.

APPEALS - GENERAL INFORMATION

IF YOU WISH TO APPEAL A DENIAL OF OR CONDITIONS PROVIDED IN A HYDRAULIC PROJECT APPROVAL, THERE ARE INFORMAL AND FORMAL APPEAL PROCESSES AVAILABLE.

A. INFORMAL APPEALS (WAC 220-110-340) OF DEPARTMENT ACTIONS TAKEN PURSUANT TO RCW 77.55.100, 77.55.110, 77.55.140, 77.55.190, 77.55.200, and 77.55.290:
A person who is aggrieved or adversely affected by the following Department actions may request an informal review of:
(A) The denial or issuance of a HPA, or the conditions or provisions made part of a HPA; or
(B) An order imposing civil penalties.
It is recommended that an aggrieved party contact the Area Habitat Biologist and discuss the concerns. Most problems are resolved at this level, but if not, you may elevate your concerns to his/her supervisor. A request for an INFORMAL REVIEW shall be in WRITING to the Department of Fish and Wildlife, 600 Capitol Way North, Olympia, Washington 98501-1091 and shall be RECEIVED by the Department within 30-days of the denial or issuance of a HPA or receipt of an order imposing civil penalties. The 30-day time requirement may be stayed by the Department if negotiations are occurring between the aggrieved party and the Area Habitat Biologist and/or his/her supervisor. The Habitat Protection Services Division Manager or his/her designee shall conduct a review and recommend a decision to the Director or its designee. If you are not satisfied with the results of this informal appeal, a formal appeal may be filed.

B. FORMAL APPEALS (WAC 220-110-350) OF DEPARTMENT ACTIONS TAKEN PURSUANT TO RCW 77.55.100 OR 77.55.140:
A person who is aggrieved or adversely affected by the following Department actions may request an formal review of:
(A) The denial or issuance of a HPA, or the conditions or provisions made part of a HPA;
(B) An order imposing civil penalties; or
(C) Any other "agency action" for which an adjudicative proceeding is required under the Administrative Procedure Act, Chapter 34.05 RCW.
A request for a FORMAL APPEAL shall be in WRITING to the Department of Fish and Wildlife, 600 Capitol Way North, Olympia, Washington 98501-1091, shall be plainly labeled as "REQUEST FOR FORMAL APPEAL" and shall be RECEIVED DURING OFFICE HOURS by the Department within 30-days of the Department action that is being challenged. The time period for requesting a formal appeal is suspended during consideration of a timely

informal appeal. If there has been an informal appeal, the deadline for requesting a formal appeal shall be within 30-days of the date of the Department's written decision in response to the informal appeal.

C. FORMAL APPEALS OF DEPARTMENT ACTIONS TAKEN PURSUANT TO RCW 77.55.110, 77.55.200, 77.55.230, or 77.55.290:
A person who is aggrieved or adversely affected by the denial or issuance of a HPA, or the conditions or provisions made part of a HPA may request a formal appeal. The request for FORMAL APPEAL shall be in WRITING to the Hydraulic Appeals Board per WAC 259-04 at Environmental Hearings Office, 4224 Sixth Avenue SE, Building Two - Rowe Six, Lacey, Washington 98504; telephone 360/459-6327.

D. FORMAL APPEALS OF DEPARTMENT ACTIONS TAKEN PURSUANT TO CHAPTER 393, LAWS OF 2003:
A person who is aggrieved or adversely affected by the denial or issuance of a HPA, or the conditions or provisions made part of a HPA may request a formal appeal. The FORMAL APPEAL shall be in accordance with the provisions of Chapter 393. The request for FORMAL APPEAL shall be in WRITING to the Environmental and Land Use Hearings Board.

E. FAILURE TO APPEAL WITHIN THE REQUIRED TIME PERIODS RESULTS IN FORFEITURE OF ALL APPEAL RIGHTS. IF THERE IS NO TIMELY REQUEST FOR AN APPEAL, THE DEPARTMENT ACTION SHALL BE FINAL AND UNAPPEALABLE.