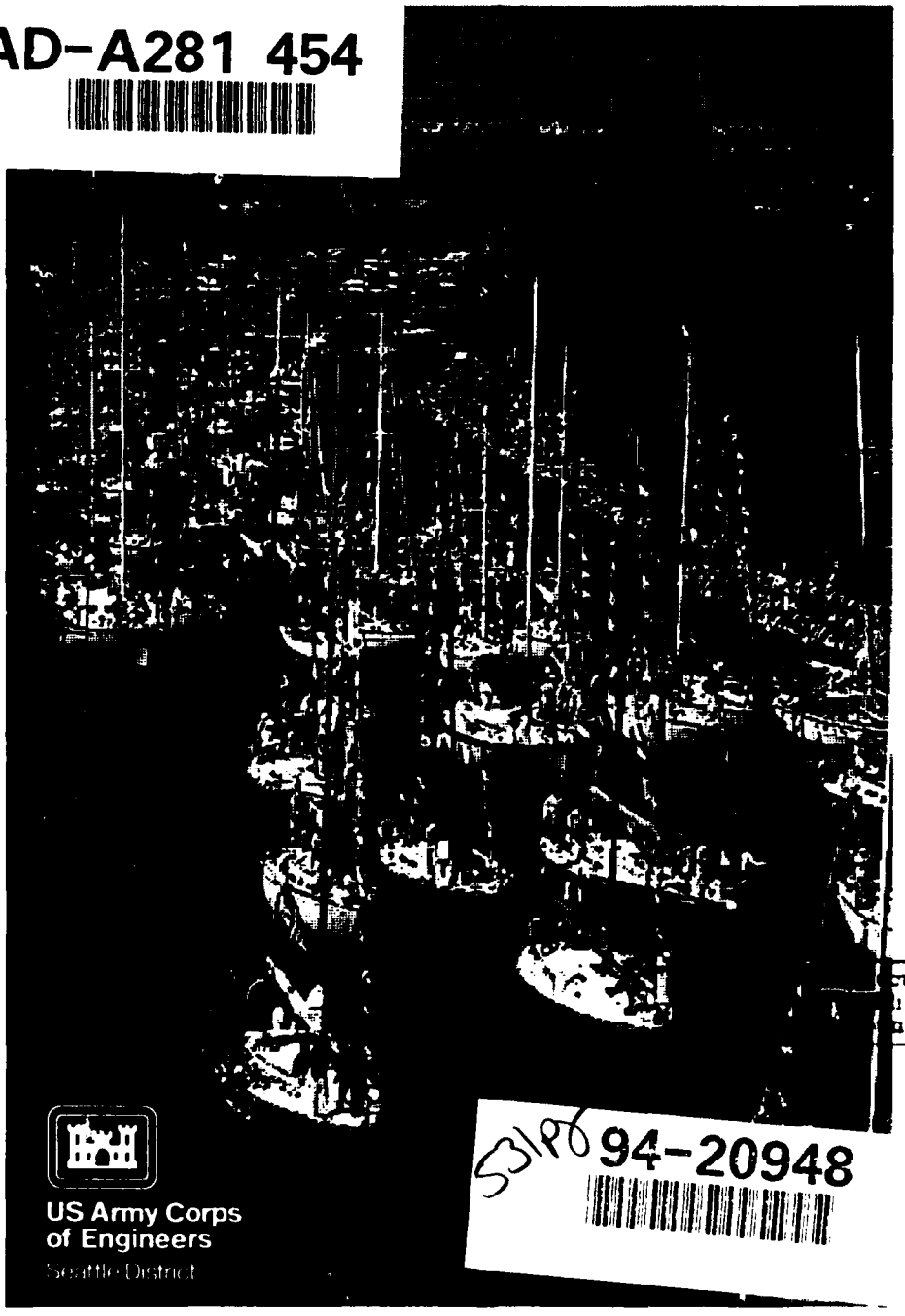
Master Plan (DM 9)

Lake Washington Ship Canal
Seattle, Washington



US Army Corps
of Engineers
Seattle District

February 1994

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This February 1994 Lake Washington Ship Canal Master Plan (Design Memorandum 9), has been prepared to guide the use and development of the natural and manmade resources at the project, which is administered by the Seattle District, US Army Corps of Engineers.

Project resource development and management actions are measured against a management framework which includes resource objectives and concise land management measures for individual project sites and features. The Master Plan will serve to increase resource management effectiveness and provide the basis for the preparation of follow-on operational management plans (OMP), prescribed by ER 1130-2-400, and feature design memorandums (FDM).

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CENPD-PE-ER (CENPS-EN-PL-PF/01 Feb 94) 1st End
Tyger/ss/(503) 326-3829
Subject: Lake Washington Ship Canal Project Master Plan

CDR, North Pacific Division, Corps of Engineers, P.O. Box 2870,
Portland, OR 97208-2870

02 MAY 1994

FOR CDR, Seattle District, ATTN: CENPS-EN-PL-PF

1. The subject Master Plan has been reviewed and is approved subject to the enclosed comments.

2. Upon completion, the additional information including the complete chain of correspondence, should be placed in the front of the document. Five completed master plans should then be forwarded to this office for our records. The contact person is Mr. John Tyger, CENPD-PE-ER, (503) 326-3829
FAX (503) 326-7328.

FOR THE COMMANDER:

W.E. Daugherty

Encl

DAVID A. GEIGER, P.E.
Acting Director of Planning &
Engineering

CF:
CENPD-CO
CENPD-RE

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CENPD Comments on
Lake Washington Ship Canal
Master Plan

1. The project data shown on paragraph 2-8 is considerably different than that shown in paragraph 2-9. The project acreage as well as the various land classification acreage are not clearly shown here or elsewhere in the report. Plates 6 through 9 show land classifications. This is the logical place to identify acreage by classification and site. Suggest this be accomplished.

2. Sections 5 through 11 discuss various land classifications. These sections do not relate this information to the classifications shown on plates 6 through 9. Without some relation to what areas are being described in these sections, the information is of little value.

Enclosure 1

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-2255

REPLY TO ATTENTION OF

CENPS-EN-PL-PF (1105-2-10c) 1 Feb 94

MEMORANDUM FOR Commander, North Pacific Division

SUBJECT: Lake Washington Ship Canal Project Master Plan

1. Submitted for your approval is the Project Master Plan prepared in accordance with ER 1130-2-435 (10 copies enclosed).

2. This document reflects Division and public review comments received during the review of the draft document. The District study team has worked closely with Messrs. John Tyger and Paul Peloquin of your staff in resolving Division review comments on the draft and near final documents.

3. If you would like to discuss this plan, I am available at (206) 764-3690.

1 Encl
as

for WALTER J. CUNNINGHAM
Colonel, Corps Of Engineers
Commanding

VALIDATION

The Lake Washington Ship Canal Project Master Plan, Design Memorandum 9, prepared by Engineering Division, has been coordinated with all pertinent elements of Seattle District, including Operations Division and Real Estate Division.

for PHILLIP M. O'DELL, P.E.
Chief, Engineering Division

BRIAN R. APPLEBURY, P.E.
Acting Chief, Operations Division

JOSEPH C. DUNCAN
Chief, Real Estate Division

ACKNOWLEDGEMENTS

Study Management and Coordination - Mr. Derek J. Chow
Landscape Architecture and Design - Ms. Pamela J. Yorozu
Natural Resources - Mr. Jeffrey White
Project Resources - Ms. Dawn A. Wiedmeier
Real Estate - Mr. Steve Hanson
Historical Significance - Mr. Horace H. Foxall, Jr.

The following Seattle District personnel are acknowledged for their contribution to the development of the Master Plan: Mr. John D. Welch, Mr. Steven D. Babcock, Mr. Thomas D. Murphy, Ms. Susan J. Evans, Mr. Kenneth D. Graybeal, Mr. Regge K. Egger, Mr. Jeffrey C. Laufle, Mr. Kenneth Brunner, Mr. Theodore M. Borchert, Mr. Michael E. Fleming, Mr. David G. Rice, Ms. Jennifer Morales, Mr. James R. Kluge, Ms. Kerri L. Swanson, and Ms. Bonnie J. Lambers.

The Master Plan was also developed in coordination with the following organizations: Ms. Carroll Smith, and Ms. Vicki T. Marsten of the Seattle Engineering Department; and Mr. Rolfe P. Kellor of the University of Washington.

EXECUTIVE SUMMARY

This February 1994 Lake Washington Ship Canal Master Plan, (Design Memorandum 9), has been prepared to guide the use and development of the natural and manmade resources at the project, which is administered by the Seattle District, U.S. Army Corps of Engineers.

Project resource development and management actions are measured against a management framework which includes resource objectives and concise land management measures for individual project sites and features. The Master Plan will serve to increase resource management effectiveness and provide the basis for the preparation of follow-on operational management plans (OMP), prescribed by ER 1130-2-400, and feature design memorandums (FDM).

The Lake Washington Ship Canal project consists of the Hiram M. Chittenden Locks (also known as the Government Locks and Ballard Locks), and the Fremont Cut and Montlake Cut navigation channels. Construction of the Locks was started by the U.S. Army Corps of Engineers in September 1911, with the small lock opened to traffic on July 30, 1916 and the large lock on August 3, 1916. The navigable channels between Salmon Bay and Lake Union (Fremont Cut) and between Lake Union and Lake Washington (Montlake Cut) were completed in 1916 and 1917, respectively.

The Locks provide a navigation passage between the saltwater of Puget Sound and the freshwater portion of the project at a mean elevation of 21 feet above sea level at Shilshole Bay. The project is located entirely within the city limits of Seattle, Washington. Lands adjoining the waterway have been developed for commercial, industrial, residential, park, and other public purposes, but shoreline use of the canal is predominantly related to the maritime industry.

Project lands were acquired in accordance with the authorizing documents for operation of the project for navigation. The Master Plan presents various project land classifications and gives specific recommendations for both short and long term development and resource management consistent with the authorized project purpose and the recent acceptance of the Lake Washington Ship Canal Project as a Historic District.

Project lands are classified into one of the following categories: Project Operations; Recreation; Environmental Sensitive Areas; Multiple Resource Management, Recreation - Low Density; Multiple Resource Management, Vegetative Management; and Easement Lands.

Overall resource objectives at the project are:

- To establish and maintain close, ongoing coordination with interested Federal, State and local agencies, and citizen groups and organizations in managing the natural and manmade resources and cultural features associated with the Lake Washington Ship Canal Project;

- To protect, preserve, and conserve the project's natural and manmade resources to ensure their continued availability for use and enjoyment by present and future generations;

- To preserve and rehabilitate the Hiram M. Chittenden Locks and Lake Washington Ship Canal Historic District consistent with the Secretary of the Interior Standards for Rehabilitation;

- To preserve, enhance and protect habitat on project land which is used by wildlife in the project area; and

- To broaden public understanding and appreciation of the role of the Corps in the development and administration of water resource projects, the purpose and operation of the Lake Washington Ship Canal Project, and the management of the project's natural and manmade resources and cultural features, through the use of interpretive programs and facilities

It is recommended that this Lake Washington Ship Canal Project Master Plan be adopted as a guide to the orderly use, development, and management of the natural and manmade resources of the Lake Washington Ship Canal Project.

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SECTION 1 - INTRODUCTION

1.1 PURPOSE

Master plans are required for Civil Works projects and other fee owned lands. The 1977 Master Plan (DM 5) was prepared under Engineer Regulation 1120-2-400. On December 30, 1987, ER 1130-2-435 set forth new requirements for project master plans. The Lake Washington Ship Canal Master Plan (Design Memorandum 9), hereafter referred to as the "Master Plan" will guide the use and development of the natural and manmade resources administered by the Seattle District, U.S. Army Corps of Engineers (hereafter, the Corps, or Seattle District). In accordance with ER 1130-2-435, the Master Plan guides the Corps responsibilities pursuant to Federal laws to preserve, conserve, restore, maintain, manage, and develop the project lands, waters, and associated resources. The Master Plan anticipates what could and should happen and is flexible to changing conditions. Design functions are handled in the feature design memorandums and in contract plans and specifications. Water Management and Operation and Maintenance works are handled in the LWSC Water Control Manual and O&M Plan. The Master Plan deals in concepts, not in details of design or administration. Detailed management and administrative functions are handled in the Operational Management Plan (OMP). Historic preservation activities, which effectively manage and protect the historic resources, are handled in the comprehensive Historic Properties Management Plan.

1.2 SCOPE

The Master Plan evaluates project resources to develop guidelines that provide for their best and highest use, development, and management. Evaluation is focused specifically on project lands administered by the Corps and includes consideration of operation, scenic, cultural, historic, recreational, and biological values. The primary goal of the Master Plan is to prescribe an overall land and water management plan, resource objectives, and associated design and management concepts. The Master Plan provides a guide for the best possible combination of responses to regional needs, resource capabilities and suitabilities, and expressed public interests and desires consistent with authorized project purposes, historic designation, and other institutional policies and directives. The Master Plan is based on a thorough understanding of the operation of the project and of project operations land and

facility requirements. Land classifications and resource management prescriptions are formulated to be in harmony with these requirements.

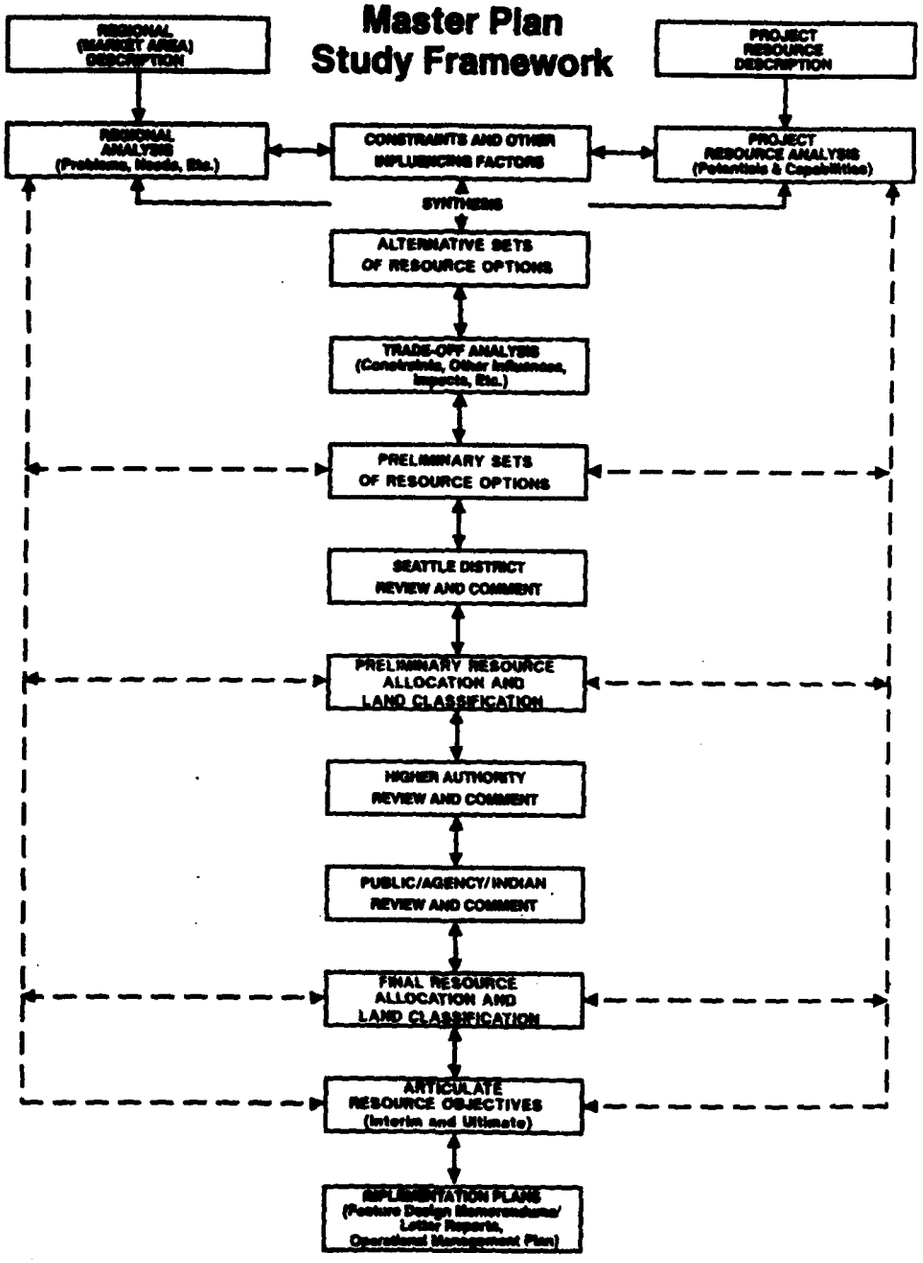
1.3 PLAN FORMULATION

The Master Plan has been formulated utilizing the study framework depicted in Figure 1-1. This plan formulation process was developed as a means to improve the quality and usefulness of the Corps' master plans and to reduce the long-term cost of the Corps' master planning program. Current master planning philosophy within the Corps is reflected in this plan formulation. Major outputs of the plan formulation process include the following:

- Specific Historic District requirements, as discussed in Section 3.
- Establishment of project-wide resource objectives in accordance with the intent of Engineer Regulation 1130-2-435, as discussed in Section 4.
- Assignment of land classification and restricted water use zones to project areas in accordance with the intent of ER 1130-2-435, as discussed in Section 4.
- Establishment of resource objectives for specific project sites for which land classification has been assigned, as discussed in Sections 5, 6, 7, 8, 9, and 10.
- Identification of land management measures which will contribute to achievement of site-specific resource objectives, as discussed in Sections 5, 6, 7, 8, 9, and 10.
- Identification of major constraints to future project resource use, development, and management, as discussed in Sections 5, 6, 7, 8, 9, and 10.
- Listing of proposed development and specification of general design criteria to be considered in subsequent design phases of plan implementation, as discussed in Section 11.
- Recommendations for subsequent aspects of planning for use, development, and management of project resources, as discussed in Section 12.

Figure 1-1

Master Plan Study Framework



1.4 RESOURCE OBJECTIVES

Resource objectives guide the future design, development and management of the resource base, natural and manmade, to obtain the greatest possible benefit through meeting the needs of the public and protecting and enhancing environmental quality. The resource objectives contained herein are clearly written statements specific to the Lake Washington Ship Canal Project that specify the attainable options for resource development and management. They are consistent with the project purposes, applicable Federal laws and directives, regional needs, resource capabilities and expressed public desires. These were formulated through study and analyses focusing on three broad components: regional needs, public desires, and resource capabilities and potentials. The purpose of establishing resource objectives is to facilitate preparation of master plans that reflect the best possible combination of these three components with regard to the use, development and management of project resources as illustrated in Figure 1-2.

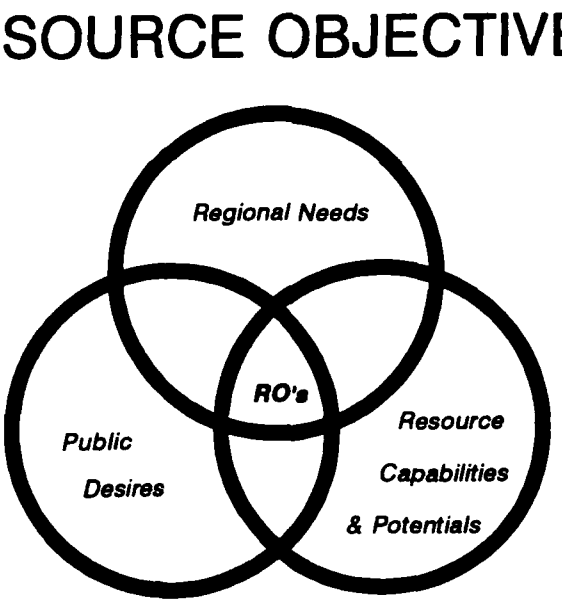


Figure 1-2

1.5 PROJECT-WIDE PROVISIONAL RESOURCE OBJECTIVES

1.5.1a Objective: To establish and maintain close, ongoing coordination with interested Federal, State and local agencies, and citizen groups and organizations in managing the natural and manmade resources and cultural features associated with the Lake Washington Ship Canal Project.

1.5.1b Rationale: Because it is prominently located in a large metropolitan area, the project is constantly in the public eye. Local community organizations and individuals have a high degree of interest in the project because they see the ship canal and locks as a community resource. The operation of the project and the one million-plus visitors attracted annually to the project have an impact on the community, maintaining a high degree of community awareness of, and interest in, how the Corps manages project resources. Numerous agencies and groups have proven invaluable by providing input to the Corps in decisions regarding the Carl S. English, Jr., Botanical Garden and in helping to establish Commodore Park, the Montlake Cut Waterside Trail and the Fremont Walkway. The Corps has a responsibility to maintain close coordination with, and to support the efforts of, Federal and State agencies in preserving, protecting and enhancing resident and anadromous fish populations in accordance with those agencies' goals and objectives. Close coordination should also be maintained with the city of Seattle and Burlington Northern Railroad to manage the public parking lot located adjacent to the north entryway along NW 54th Street.

1.5.2a Objective: To protect, preserve, and conserve the project's natural and manmade resources to ensure their continued availability for use and enjoyment by present and future generations.

1.5.2b Rationale: The Lake Washington Ship Canal project is a major tourist attraction in the Seattle, Washington area. Project lands and facilities provide a variety of opportunities for passive and active recreational activities in an urban setting. Intensive public use of project facilities is compatible with project operations, affording the public a unique opportunity to observe the locking of vessels through the two locks and the migration of anadromous fish through the fish ladder. Facilities and access along the Montlake Cut and Fremont Cut provide additional opportunity to observe and enjoy a wide range of activity associated with the operation of the project. The Carl S. English, Jr. Botanical Garden offers

an extensive and colorful selection of trees, shrubs, and herbaceous plants that have come from many lands.

1.5.3a Objective: To preserve and rehabilitate the Hiram M. Chittenden Locks and Lake Washington Ship Canal Historic District consistent with the Secretary of the Interior Standards for Rehabilitation.

1.5.3b Rationale: The Hiram M. Chittenden Locks and Lake Washington Ship Canal Historic District was entered in the National Register of Historic Places on December 14, 1978. Under the provisions of the National Historic Preservation Act of 1966, this property, which includes the locks and Carl S. English, Jr. Botanical Garden, Fremont Cut, and Montlake Cut, was determined to possess exceptional value in illustrating American history and culture. The group of original structures at the Locks were designed by Carl F. Gould and constitute a considerable historic resource. They survive today as a carefully designed and maintained complex of classically-styled concrete structures from a narrowly defined construction period. The Carl S. English, Jr. Botanical Garden and the landscaped setting of the area are an integral part of the Historic District. Their preservation is significant to the integrity of the district, as cited in the nomination report. It is in the public interest for the Corps to maintain the Historic District in full compliance with the intent of the National Historic Preservation Act. The Secretary of the Interior Standards for Rehabilitation are the sole regulatory basis for determining whether or not a rehabilitation work is consistent with the historic character of the structure or the district *in which* it is located. ER 1130-2-438, Historic Preservation Program, provides additional guidance relative to implementing historic preservation management objectives.

1.5.4a Objective (Primary): To preserve, enhance and protect habitat on project land which is used by wildlife in the project area.

1.5.4b Objective (Secondary): To cooperate with fish and wildlife agencies in controlling nuisance wildlife and plant species on project lands.

1.5.4c Rationale: The Locks, Montlake Cut, and Fremont Cut provide habitat and food for a variety of songbirds, waterfowl, small mammals, and reptiles. Vegetative management and public use can and should be compatible with management for desirable wildlife species. There is need, however, for management actions to control certain pest

species which are detrimental to project operations, vegetative management and public use and enjoyment of project facilities and resources.

1.5.5a Objective: To broaden public understanding and appreciation of the role of the Corps in the development and administration of water resource projects, the purpose and operation of the Lake Washington Ship Canal Project, and the management of the project's natural and manmade resources and cultural features, through the use of interpretive programs and facilities.

1.5.5b Rationale: An active interpretive services program is an important resources management tool that should be used to foster public understanding and appreciation for the historical, natural, recreational, and commercial values of the project, as well as the role of the Corps in developing and managing the Lake Washington Ship Canal Project.

SECTION 2 - PROJECT DESCRIPTION

2.1 PROJECT AUTHORIZATION

The possibility of connecting Puget Sound with Lake Union and Lake Washington was suggested as early as 1854 and was recommended for consideration by the War Department in 1871. Over ensuing years, a number of studies followed, eventually leading to the Rivers and Harbors Act of June 25, 1910. Under provisions of this act, the construction of a double-lock dam and accessory works at the entrance to Salmon Bay was authorized, together with authorization for the dredging of a channel from the locks to deep water in Puget Sound and a channel from the Locks to Lake Washington. Various legislative documents have authorized additional improvements since then. The Lake Washington Ship Canal Project consists of the Hiram M. Chittenden Locks (also known as the Government Locks or Ballard Locks), Fremont Cut, and Montlake Cut. Construction of the locks was started by the Corps in September 1911, with the small lock opened to traffic on July 30, 1916, and the large lock on August 3, 1916. The navigable channel between Salmon Bay and Lake Union (Fremont Cut) was completed in October 1916. The navigable channel between Lake Union and Lake Washington (Montlake Cut) was completed in May 1917. The Lake Washington Ship Canal Project was designated to the National Register of Historic Places in 1978. A more detailed legislative history is furnished by Exhibit A.

2.2 PROJECT PURPOSE

The purpose of the Lake Washington Ship Canal Project is to make use of the extensive freshwater bodies lying in and adjacent to Seattle. By providing an access between Puget Sound and Lakes Union and Washington, the project has contributed to the industrial, commercial, and recreational developments of the area. The project affords passage from salt water to fresh water, where saw logs can be stored free from rapid destruction by teredos (a marine worm), and commercial, naval, and leisure craft can be moored free from the destructive effects of corrosion, electrolysis, marine plant growth, barnacles and teredos. As a result, the area serves as homeport for large numbers of commercial fishing boats, and consequently, the project facilitates waterborne commerce to and from Alaska. The project also provides significant values in the regulation of lake levels, passage of anadromous fish to upstream spawning grounds, and public visitation.

2.3 PROJECT LOCATION

The 8-mile-long Lake Washington Ship Canal, connecting saltwater Puget Sound with the freshwater bodies of Salmon Bay, Lake Union, and Lake Washington, is located entirely within the city limits of Seattle, Washington. The inland waters cover an area of 25,000 acres with a shoreline of about 100 miles. Fresh water begins at the Hiram M. Chittenden Locks and the adjacent dam which control the water level in the lakes upstream. The ship canal continues from the Locks to Salmon Bay, Fremont Cut, Lake Union, Portage Bay, Montlake Cut, and Lake Washington's Union Bay, where it ends at Webster Point. See Plate 1 for project location and vicinity.

2.4 PRE-PROJECT HISTORY

Before construction of the Lake Washington Ship Canal, Lake Washington's seasonal level variation was 3 to 4 feet. The Sammamish River was navigable for its entire length and was used to transport coal and logs between Lakes Sammamish and Washington. Water discharged from the south end of Lake Washington joined with the Cedar River to form the Black River, which then flowed generally west to join the White River and further west to join the Duwamish River finally flowing into Elliott Bay. Lake Union's inflow was limited to springs, small streams, and runoff. Lake Union had no connection to Lake Washington. Salmon Bay was a saltwater tidal inlet.

2.5 PROJECT HISTORY

The earliest recommendation for a canal to connect Lake Washington with Puget Sound originated in 1854. Thomas Mercer, one of Seattle's earliest settlers, described the advantages of a canal in a speech at the July 4, 1854, picnic referring to a union of lakes and bays and so naming Lake Union and Union Bay. Ensuing years saw much talk of the possibility, but little action. Some efforts were attempted, most notably by Harvey Pike, another early settler who in 1869 took pick and shovel to the area between Lakes Washington and Union, hoping that a small ditch eventually would become a large channel by erosion.

In 1867, the project was reviewed by a board of engineers chaired by General Barton S. Alexander, touring the region. First Lieutenant T. H. Handbury of the Engineer Corps reported in favor of such a canal in 1871 on a reconnaissance of military engineering problems in the region. He included preliminary surveys of possible alternate routes in his

report. From that point forward sporadic attempts were made by local citizens to gain the support of the Department of the Army and Congress for construction of the canal. Private improvement companies were formed, foundered and dissolved. Meanwhile, the selection of a route -- whether northerly via Salmon Bay and Lake Union, or to the south via the mouth of the Duwamish River -- remained controversial.

During the same year of Handbury's reconnaissance, a civic group known as the Lake Washington Improvement Association was formed but accomplished nothing until 1880 when, headed by Judge Thomas Burke, it was incorporated with a capital budget of $50,000. The group hired a contractor to cut through the ridge between Lakes Washington and Union, but this effort ended in failure. Wa Chong, a Chinese contractor, was hired in 1885 and managed to cut a ditch deep and wide enough to float logs through.

In 1890 Congress made its first appropriation for the proposed commercial waterway in Seattle, and a survey was authorized to locate the most feasible route. The government survey report, dated December 15, 1891, considered five possibilities, of which the present general route beginning at Shilshole Bay was preferred as having the best alignment and potential for being the least costly. The city of Seattle and King County proceeded to acquire right-of-way while further investigations and reports on appropriate routings were made.

The involvement of the Corps in the project on a lasting basis is marked from the beginning of Major Hiram Chittenden's term as District Engineer. In 1906 Congress authorized the construction by private capital of a canal with a single timber lock at Salmon Bay proposed by local citizen James A. Moore. In a report on the Moore proposal dated December 1906, Major Chittenden itemized the government's interest in the matter. In essence, the government would be concerned with the commercial promise of a navigable waterway and would benefit indirectly from the lowering of the waters of Lake Washington. The latter would facilitate flood control and drainage of swamp lands. In his report, Major Chittenden also recommended significant changes in the nature and placement of the lock, advocating a double lock of more permanent masonry construction. If located at the narrows near the outlet of Salmon Bay, it would raise Salmon Bay out of tidal influence and lower Lake Washington waters to the level of the intervening body, Lake Union. Major Chittenden provided arguments which reversed the Army's prior negative findings on the feasibility of the project. The absence of tidal action would simplify cargo loading and unloading on the inland waters; Lake Union would offer a placid winter refuge for the fishing fleet, and fresh water would cleanse destructive teredos and barnacles from the hulls of ocean-going vessels

without the expense of dry-docking. Thus, the notion that the Federal government would assume primary responsibility for the undertaking was firmly implanted.

A detailed annual report on the proposed Lake Washington Ship Canal was filed by Major Chittenden in December 1907. Because the government-endorsed northerly route was attacked by Ballard lumber mill operators who did not wish to relinquish their tideland sites and by partisans of the southerly route through newly filled and platted tidelands along the Duwamish estuary, the canal routing controversy dragged on for several years. In September 1908, Chittenden left Seattle and was commissioned as a lieutenant colonel. He was succeeded by Major Charles W. Kutz as District Engineer (October 1908 - July 1911). The stalemate was eventually broken during Kutz's term. Reginald H. Thompson, the City Engineer who master-minded Seattle's grandest public improvement schemes, and the Chamber of Commerce were important advocates of Chittenden's initial recommendations. The cause was finally won in June 1910, when Congress appropriated $2,275,000 for construction according to specifications in the District Engineer's annual report of 1907.

The Locks project grounds were purchased from Ole S. Shillestad, a cabinet maker who had moved there in 1876. Design of the lock and spillway dam structures were accomplished in-house by the Seattle District. In September 1911, construction commenced under the direction of Colonel James B. Cavanaugh. In November 1911, ground was broken for the Locks. In February 1913 the first concrete was deposited in the forms. July 1916 marked the first closing of the completed locks gates and the filling of Salmon Bay. Lake Washington was lowered approximately 9 feet to the level of Lake Union by October 1916. This caused it to drain into Lake Union and reversed the flow of the lower end of the Cedar River, causing it to drain into Lake Washington. The Black River, with both its sources flowing in the other direction, no longer existed. With the completion of the Fremont Cut, Salmon Bay was raised to the height of Lake Union and became fresh water. In May 1917 the Montlake Cut between Lakes Union and Washington was opened in the near vicinity of the abandoned portage excavated by the Lake Washington Improvement Association. The entire project was dedicated with due ceremony on July 4, 1917, with congratulations from Theodore Roosevelt (President 1901 - 1908). Brigadier General Chittenden and numerous other officials were present. Overhead flew a plane built by the 1-year-old Boeing Company, while a parade of ships and boats, led by the 184-foot *Roosevelt*, the flagship of Commodore Robert E. Perry during his 1907 Arctic expedition, crossed through the locks.

At the time of the dedication the cost of the project was reported as $5,000,000. In addition to right-of-way acquisition costs, the city of Seattle bore the expense of building new bridges, sewer and water tunnels and regrading streets where necessary. The major costs were divided between the State of Washington and King County, for acquisition of rights-of-way and excavation and construction upstream from the locks, and the Federal government, which constructed the locks and accessory works.

Originally referred to as the "Government Locks" or "Ballard Locks", Congress officially honored Brigadier General Hiram M. Chittenden in 1956 by naming the Locks after him.

At the time they were built, the Locks were second in size only to those at the Panama Canal, but now are surpassed by several others in the United States. However, it is unlikely they are surpassed in the number of vessels handled.

The existing features of the project are shown on Plates 2, 3, 4, and 5.

2.6 SIGNIFICANT INDIVIDUALS.

2.6.1 Hiram M. Chittenden - Champion of the Lake Washington Ship Canal

Hiram M. Chittenden (1858 - 1917), a native of New York, graduated from West Point with high honors as a second lieutenant of engineers in 1884. Thereafter he completed a three year course in the Engineer School of Application, was made a first lieutenant, and was ordered to Omaha as engineer officer of the Department of the Platte. Thus embarked upon a lifetime career as an army engineer, he would soon gain recognition as a conservationist and historian. Chittenden first achieved national acclaim in 1897 for a massive report advocating Federal construction of irrigation dams which is said to have become the basis of the Newland Act of 1902. After serving in the Spanish-American War he returned to Yellowstone Park, where he took charge of completing the road system he earlier had helped lay out. In 1904 he was promoted to the rank of major and soon after was appointed to the Federal Commission to locate the boundaries of Yosemite Park. Chittenden was an early advocate of the concept of multiple-purpose resource use which is widely applied today. Among his substantial publication credits are *The Yellowstone National Park* (1895), *The History of Early Steamboat Navigation on the Missouri River* (1903), *The*

Life, Letters and Travels of Father Pierre Jean de Smet (1905), and, his monumental work, *The American Fur Trade of the Far West* (1902).

Among the projects which Chittenden directed during his active period as Seattle District Engineer, 1906-1908, next in importance to the Lake Washington Ship Canal was planning and construction of 14 miles of the 25-mile tourist road from the western boundary of Mount Rainier National Park to Camp of the Clouds. From his predecessor he inherited the on-going task of constructing fire control towers for the coastal artillery batteries at Forts Flagler, Casey, and Worden which comprised the defenses for Seattle and its harbor in Elliott Bay. After leaving Seattle, he was promoted to Lieutenant Colonel.

Throughout his later years Chittenden suffered from a debilitating paralysis (locomotor ataxia), but his astonishing capacity for work seldom flagged. By the middle of 1908, however, his condition had worsened to such an extent that he was forced to withdraw from normal duty as a lieutenant colonel. At the urging of several of his associates in the ship canal project, including City Engineer Reginald Thompson, Secretary of the Interior Richard Ballinger, a former Seattle Mayor, and others interceded on his behalf and succeeded in securing Chittenden's promotion to the rank of Brigadier General prior to his disability retirement on February 10, 1910. After his retirement, Chittenden continued to be active as a consulting engineer in the Seattle area. Despite his frail health, he continued to write (*War of Peace, Flood Control*, and a revised and expanded edition of his guidebook to Yellowstone National Park) and to take part in public life as president of the Seattle Port Commission (1911 - 1915). Chittenden wrote extensively for the journals of the American Society of Civil Engineers until his death in 1917. Congress officially honored Brigadier General Chittenden in 1956 by naming the Locks after him.

2.6.2 Architectural Firm of Bebb and Gould

Charles H. Bebb (1856 - 1942) and Carl F. Gould (1873 - 1939) were leaders of the architectural community in Seattle. Their selection to lay out and design the complex of concrete accessory buildings on the government reservation at the ship canal locks was fitting. The more than 10 initial buildings on the site have a range of refinement along classical lines, but they are solid and straightforward in a manner appropriate to their function and setting along the massive lock walls.

Bebb, a native of England, was educated at Kings College, London, and the University of Lausanne, Switzerland, where he studied engineering. He emigrated to the United States in 1880 and was first employed as a construction engineer by the Illinois Terra Cotta Company of Chicago. From 1885 to 1890 he served as supervisor of construction for the eminent architectural firm of Adler and Sullivan. Bebb was the first Washington architect to be elected a Fellow of the American Institute of Architects (AIA). He helped organize the Washington State Chapter of the AIA in 1894 and served several terms as its president. From 1911 to 1935 Bebb served as Consulting Architect for the State Capitol Group in Olympia.

Gould, a native of New York City, graduated from the Harvard School of Architecture in 1898 and thereafter spent four years (1899 - 1903) at the Ecole des Beaux Arts in Paris. On his return to the United States he was employed by the eminent New York architects McKim, Mean and White. Later, he became a member of the New York firm of Carpenter, Clair and Gould. He arrived in Seattle around the time of the Alaska-Yukon-Pacific Exposition of 1909, or shortly before. Gould too became active in the affairs of the Washington State Chapter of the American Institute of Architects.

In 1915, a year or two after Bebb and Gould commenced a long and fruitful partnership, the firm was given charge of the University of Washington Campus Plan. Gould helped found the University of Washington's School of Architecture and was the first chairman of the department. Among other noted works by Bebb and Gould in Seattle are the modernistic Seattle Art Museum (1932), the annex of the Rainier Club (1929), the U.S. Marine and Virginia Mason Hospitals, and the Olympic Hotel, designed in cooperation with the George B. Post Company of New York.

2.6.3 James B. Cavanaugh

James B. Cavanaugh (1869 - 1927) was born in Illinois shortly after the Civil War. Cavanaugh was appointed to the U.S. Military Academy from Washington, and graduated in 1892 at the head of his class. He was commissioned to the Corps as an additional 2nd lieutenant. Cavanaugh climbed the usual ladder of experience, holding commands in the United States, Philippines, France, and Germany. Cavanaugh held the position as Assistant to Chief of Engineers between October 10, 1907 to July 31, 1911, being commissioned as major on February 14, 1908.

As the Seattle District Engineer between August 1, 1911 and May 10, 1917 he oversaw the construction of the Lake Washington Ship Canal which at the time was second only in size to the Panama Canal. On March 12, 1915, he received his commission as lieutenant colonel. As described by Samuel H. Hedges, President of the Washington State Chamber of Commerce, Cavanaugh was "well-informed, honest, fearless, and, while he was of course at all times employed by the United States, he was entirely fair and judicial in his decisions rather than prejudiced in favor of the party who employed him." Cavanaugh's attributes were further described as an able engineer, with strength coupled with diplomacy. Dr. James M. Burnell, Cavanaugh's great-nephew, recalled that Cavanaugh declined a request by Mr. William Boeing to start an engineering company for him.

On March 12, 1917, he received his commission as Colonel. Upon leaving Seattle, Cavanaugh took the command of the 18th Engineers, Railway. Cavanaugh served again in the Office of Chief of Engineers between March 7, 1919, and April 29, 1919; as District Engineer in Florence Engineer District until July 31, 1919; and in 1st Portland Engineer District and as Division Engineer in the Northern Pacific Division between August 1, 1919, and August 1, 1922. Cavanaugh retired with the rank of colonel on December 1, 1922. Cavanaugh received the Distinguished Service Medal for services performed in France during World War 1. After retirement Cavanaugh worked for the Mesabi Mineral Association as executive officer. While wintering in Colorado in 1927 with his sister, Mrs. J. F. McIndoe, Cavanaugh passed away while recuperating from pneumonia.

2.6.4 Carl S. English, Jr.

Carl S. English, Jr. (1904 - 1976), as a boy developed interest in plants. At the age of 16 he built a greenhouse with his own funds. A high school course in botany inspired him to specialize in botany at the college level. In 1929 he graduated from the State College of Washington (now Washington State University) at Pullman with a BA degree in botany. Following graduation from college, English settled in Portland, Oregon, where he began a small seed and plant business. In 1931, English began working for the Corps as a gardener at the Locks. He took over as head gardener in 1940 and became the horticulturist in 1971. While at the Locks his part-time business increased substantially, offering some 1,500 kinds of plants and 1,000 kinds of seeds.

The garden at the Locks benefited from English's wide knowledge of plant materials containing trees and shrubs from all over the world.

The garden at the Locks became a botanical garden including many of English's personal contributions. Many of the plants had been grown from seeds obtained from botanical gardens throughout the world. English discovered, named and published two plants of the purslane family: *Talinum okanoganense* from the Okanogan Highlands of north-central Washington; and *Claytonia nivalis* from the Wenatchee Mountains of central Washington. Additionally, English produced at least two horticulturally worthy hybrids of mountain-dwellers: *Penstemon* X *Edithiae*; and *Lewisia howellii* X *Lewisia rupicola*. English received many awards including the Army's Meritorious Civilian Service Award in 1967, American Horticultural Society Professional Citation in 1971, and Hiram M. Chittenden Locks Garden named in honor of him in 1974. In 1976, at the age of 71, English died.

2.7 HISTORIC SIGNIFICANCE

The Lake Washington Ship Canal is significant to Seattle, the State of Washington and the nation as a major engineering achievement completed under government auspices which added more than 90 miles to the city's waterfront accessible to ocean-going vessels. Following decades of visionary planning and failed attempts, the project realized by the Corps in 1917 connected Puget Sound with a series of inland bodies free from tidal fluctuations and destructive marine life. The resulting freshwater harbor extending over some 25,000 acres combines with Seattle's saltwater harbor in Elliott Bay to provide navigational facilities rated among the finest of any port in the country.

The workable plan for the canal and locks was delineated and promoted by Major Hiram M. Chittenden, Seattle District Engineer between 1906 and 1908. The project endorsed by the Department of the Army and various alternative schemes were embraced by the business community with enthusiasm which reflected the spirit of Seattle in the early years of the century. Permitting ocean-going freighters and barges to load and unload near industrial sites developing on the shores of Lake Union and Lake Washington was felt to enhance the city's growing image as the transportation center of the Puget Sound region. The project was executed under the supervision of Colonel James B. Cavanaugh, Seattle District Engineer between 1911 and 1917, and Mr. Arthur W. Sargent, Assistant Engineer in charge of construction. Among local figures closely associated with the project were Charles H.

Bebb and Carl F. Gould, partners in a leading architectural firm which laid out the maintenance campus at the government reservation.

With its fixed dam double locks and right-of-way stretching nearly 8 miles, the Lake Washington Ship Canal for many years was generally regarded second in scope only to the multiple locks and 50-mile-long canal completed across the Isthmus of Panama by the U.S. Government between 1904 and 1914. While the size of Seattle's locks has since been superseded in the continental United States, it is unlikely any of the later locks handle more vessels in a given year. The facilities officially designated as the Hiram M. Chittenden Locks in 1956 are operated on a 24-hour basis. While naval and commercial craft, fishing boats and log rafts play a significant role in locks usage, pleasure craft, which have proliferated since the post-war years, now make up the bulk of traffic.

2.8 PROJECT SETTING

Oriented northwest to southeast, the locks and dam span the narrowest section of the Salmon Bay Waterway, where it is some 400 feet across, approximately a mile and a half east of the entrance to Shilshole Bay. When the locks and dam raised and stabilized its water level, Salmon Bay ultimately became a freshwater body and the harbor of a sizable fishing fleet. Lands adjoining the eight-mile-long ship canal waterway between Puget Sound and Lake Washington have been developed for commercial, industrial, residential, park, and other public purposes, but shoreline use of the canal is predominantly related to the maritime industry. As a consequence, boat ramps and marinas, piers, docks, wharves, marine repair shops and ship building yards are typical developments in the vicinity of the three separate parcels of the Lake Washington Ship Canal project. The first parcel (locks) embraces the locks and their guide piers, the spillway dam and fish ladder, and grounds owned in fee simple by the Corps. The second and third parcels, respectively, are limited to the Corps' fee-owned holding along the Fremont Cut and perpetual easement along the Montlake Cut.

The majority of the 16.2-acre government grounds accompanying the Locks lies on the north shore of the waterway, where maintenance and administrative facilities are arranged on a modified grid perpendicular to the waterway. The westerly portion of the reservation rises to an elevation of 45 feet, and sited atop this plateau is the Cavanaugh House, originally built in 1913 as the Lockskeeper residence, which serves as the residence of the District Engineer. In front of the house, a terraced embankment of dredged materials falls off toward the

water grade in 5-foot intervals. A paved walkway parallel with the waterway extends the length of the lawn-covered plateau, and at its westerly end is a viewing overlook with solid concrete railing. This secondary concourse is linked to a private gateway in the northwest corner of the reservation by curvilinear road segments which encompass the residential knoll. In this informally landscaped westerly section is a luxuriant array of mature ornamental and specimen trees, shrubs, and bedding plants introduced by gardener Carl S. English, Jr., and others in the 1940's.

The high ground of the reservation slopes off gradually on the east to level terrain. Here the maintenance campus is laid out along the main concourse, which is essentially on axis with the spillway dam. Included in this more-or-less formal complex of classically styled concrete structures designed by the eminent local architectural firm of Bebb and Gould are the administration building, which is the focal point, the machine shop, office and shop building, and mechanics shop. Each of these is clustered around a courtyard which opens onto the locks. Other initial structures, the gas and oil building, carpenter and blacksmith shops and transformer house, are sited to the north in the direction of the east gateway which serves as the visitors' entrance.

In the 1940's, a number of new structures, some of them temporary in nature, were added on the north and on the less public easterly margin of the maintenance core. Among the new structures are the boathouse, greenhouse, steel shop, and two large metal-clad warehouses, one of which currently serves as a district garage. The grounds are lighted by electroliers on tapered and chamfered concrete standards. However, the original single globe fixtures have been replaced with modern lamps. Public parking is provided outside reservation boundaries along the Burlington Northern Railway right-of-way. Reservation boundaries which are not contiguous with the waterway are lined with security fencing.

A rehabilitated fish ladder and underwater fish viewing room are located at the far end of the spillway dam, on the south shore of the waterway. Adjoining the westerly end of this segment of the reservation is city-owned Commodore Park, developed for day use purposes.

Lake Union is a comparatively small body covering an area of nearly 1.5 square miles. Further to the interior, Lake Washington has an area of about 39 square miles and depths that exceed 200 feet. The Fremont Cut, like the Salmon Bay Waterway which the Cut connects to Lake Union, is angled to the southeast. It generally follows the course of an old stream bed between the Fremont District on the north shore and the base of Queen Anne Hill on the

south. Taking its name from the former district, the channel is 5,800 feet in length and 100 feet wide, although the Corps' fee-owned right-of-way is 300 feet wide. The authorized depth of the channel is 30 feet. Concrete revetments on either side of the channel are bolstered by rip-rap. The low banks are lined with single rows of Lombardy poplars which have been described as "colonnades". Subsidiary landscaping of an informal nature was undertaken along the banks as a beautification project by the Seattle Garden Club in the 1950's.

The Montlake Cut follows a compass-oriented easterly course of 2,500 feet through a narrow neck of land between Lake Union's Portage Bay and Union Bay in Lake Washington. The channel takes its name from the residential district on the south shore. The Montlake District is connected to the University of Washington campus on the north shore via the Montlake Drawbridge, which crosses the canal at right angles near the center. The channel width is 100 feet, and is dredged to an authorized depth of 30 feet. The right-of-way controlled by the Corps is typically 350 feet wide. The tops of the concrete revetments are used as waterside walks; trails about midway up either steep embankment rise to a height of about 65 feet. On the south shore a recreational trail was developed by the Corps in cooperation with the Seattle Garden Club in 1970. It extends from West Montlake Park on the extreme west end of the cut to Horace McCurdy Park on the east end. The Washington Park Arboretum trail connects to the Corps trail at McCurdy Park and continues through and beyond the state owned marshes of Foster Island to Washington Park Arboretum. The ship canal channel in Union Bay has an authorized depth of 30 feet and a width of 200 feet.

2.9 PROJECT LANDS ADMINISTERED BY THE CORPS

Corps properties along Lake Washington Ship Canal consist of Hiram M. Chittenden Locks, Fremont Cut, and smaller noncontiguous properties downstream of the locks on Shilshole Bay tidelands. The Corps also has a real estate interest in the Montlake Cut consisting of a perpetual right-of-way granted by the State of Washington on March 16, 1907 (Revised Code of Washington 37.08.250). Corps properties do not contain any wetlands.

The Locks contain about 16.2 acres in fee ownership that consist of the locks, dam and spillway, fish ladder, project grounds containing buildings necessary for operation and maintenance of the locks, a world-renowned botanical garden, and a Class A Regional Visitor Center. The botanical garden, named after the primary horticulturist involved in its evolution, Carl S. English, Jr., consists of about 6.6 acres of grounds within the Locks' 16.2 acres.

The Fremont Cut is located between Salmon Bay and Lake Union. The cut is approximately 5,800 feet long and 300 feet wide. However, a combined total of approximately 3.3 acres is available for project visitor development, as only approximately 15 feet of land is available between the concrete revetment and the property line on each side of the cut. Moreover, because of industrial and commercial use of the shoreline adjacent to Corps property, only 3,500 feet of the Cut is available for public use.

The Montlake Cut is located in the eastern portion of Lake Washington Ship Canal between Portage Bay and Union Bay. The cut is approximately 2,500 feet long and 350 feet wide. (The original 500-foot-wide right-of-way was reduced to its current 350-foot width in 1965, when the United States conveyed its easement interest in the northern 150 feet to the State of Washington (University of Washington)). Narrow strips on each side of the waterway contain a total of approximately 9.2 acres. Corps development of these lands for project visitor use is permissible in the opinion of Corps counsel under the terms of the Corps' right-of-way interest.

In addition, the Corps retains title to two smaller parcels of land along the canal at Shilshole Bay totaling approximately 12.6 acres. A portion of this land has been outgranted by license to private business. See Exhibit B.

2.10 RELATED LANDS ADMINISTERED BY OTHERS

The Lake Washington Ship Canal extends from Puget Sound at Shilshole Bay through the highly urban-industrial-commercial areas of Salmon Bay and Lake Union to the park-like setting of Union Bay at the entrance to Lake Washington. Plantings, shrubbery, and trails along the Fremont and Montlake Cuts, established city parks on Lake Union, and scenic park-like lands under the administration of the University of Washington at Union Bay add to the public-use image of the canal.

Lands adjoining the entire length of the canal have been developed for industrial-commercial, residential, and public purposes. Shoreline use of the canal is related almost exclusively to the maritime industry, containing such things as piers, docks, wharves, dry docks, marine repair shops, shipbuilding yards, and other water-related uses. In addition, various dry and cold storage warehouses, steel fabricating and light manufacturing plants, office buildings, and miscellaneous facilities such as seaplane ramps, and restaurants are located in the area.

Some ocean-going freighters, barges, and container ships can load and off load near major Seattle industrial centers. Ornamental gardens, parks, and trails along the shoreline offer the public a variety of leisure-time activities in addition to the viewing opportunities offered at the Locks by the thousands of pleasure craft which use the ship canal.

The Locks are set amongst industrial, commercial, and residential developments in the Ballard community. The city of Seattle maintains Commodore Park, immediately adjacent to the fish ladder along the south shore, and parking lot (owned by Burlington Northern Railroad) immediately outside the Locks' main gate north of the property. The city has long range plans to extend the Burke-Gilman Pedestrian and Bicycle Trail through the parking area, outside the Locks, out to Shilshole Bay. This effort includes acquiring the railroad right-of-way.

Salmon Bay then became the harbor of a large fishing fleet, grouped mainly around the Seattle Fishermen's Terminal. Many marinas, repair shops, warehouses, sand and gravel plants, steel plants, lumber yards, and barge loading areas, in addition to oil bunkering and handling facilities, are located in this portion of the canal.

Salmon Bay is connected to Lake Union by the Fremont Cut, which originally was a small outlet stream from Lake Union. Along the north shore of the Fremont Cut, the city of Seattle has extended a portion of the Burke-Gilman Trail and maintains Fremont Canal Park adjacent to the Corps boundary. Some landscaping is also present. Along the south shore the city is planning a bike and pedestrian trail along the recently acquired railroad right-of-way adjacent to the Corps boundary. This project will include additional landscaping. An adjacent land owner, Fremont Dock Company and Quadrant Corporation have obtained easement interests from the Corps to construct an extension of the Burke-Gilman Trail along the north shore as part of their business park development project, Quadrant Lake Union Center.

Lake Union is near the center of Seattle and its shoreline accommodates ship repair and scrapping yards, marinas, a number of modern office buildings, and a variety of industrial plants. Public boat-launching ramps and docks for the National Oceanic and Atmospheric Administration, the Seattle Harbor Police, and other government agencies are located on the shoreline. Many houseboats are moored along the east shore and an extensive area, formerly a gas plant, has been converted into the city's Gas Works Park. Due to its central location,

plans for upgrading the entire Lake Union area are being considered by the city of Seattle. The water level of the lake was not changed by the construction of the ship canal.

The ship canal continues easterly through Portage Bay, which is an easterly adjunct of Lake Union. Portage Bay extends from Interstate 5 and the University Bridge on the west and connects to the Montlake Cut at its eastern extremity. The north shore is lined by University of Washington facilities (Fisheries Research Center, Oceanographic Laboratories) and by commercial enterprises, while the south shore has utilities for houseboat moorage and residential development. Two yacht clubs also are located along the southern shore. The southeastern portion of Portage Bay, near the yacht club and the Evergreen Point Floating Bridge, is a significant urban freshwater marsh and is the habitat of a considerable number of waterfowl.

Portage Bay is an arm of Lake Union and is connected to Union Bay, which is an arm of Lake Washington, by the Montlake Cut. The University of Washington has developed plans to extend the Burke-Gilman Trail, among other improvements, along the north shore on and adjacent to the government boundary.

The ship canal extends eastward through Union Bay and terminates at Webster Point, beyond which is the main body of Lake Washington and deep water. Union Bay has substantial areas of marshland and wildlife. The south side of Union Bay near the Arboretum and Evergreen Point Floating Bridge is very important urban freshwater marsh and has extensive wildlife. The arboretum is a large area open to the public, containing an authentic Japanese garden with trees and shrubs from all over the world. On the northeast shore of Union Bay in the vicinity of Webster Point, there are many expensive private residences with large and well-kept gardens. A portion of a large marshy area on the northwest shore, which is owned by the University of Washington, has been filled with dredge disposal material.

2.11 MAJOR CORPS OUTGRANTS

Residents along the south bank of the Montlake Cut have enjoyed an unobstructed view across the ship canal of the University of Washington campus. To improve their views and usage, residents over the years have constructed patios, flower gardens, and vehicle turnouts within the government boundary. The Corps has issued consents to residents allowing use of already constructed structures but limits any further development. Control of

these lands remain that of the government. Exhibit B lists current real estate leases, licenses, easements, permits, and consents.

2.12 ACCESS

The locks and ship canal are accessible to boat traffic from the Puget Sound (west) and from Lake Washington and Lake Union (east). Boarding or disembarking at the Locks is prohibited.

The Locks are, however, favorably located for access by public and private land transportation. The Locks are within easy walking distance of large population segments and have high accessibility by automobile. Main city arterials border both sides of the Locks while paved city streets and street ends are adjacent to Corps properties along Fremont Cut. The Montlake Cut can be accessed from the street system. The Museum of History and Industry, located on the east end of the south bank of the cut, has a large parking lot that the public uses to gain access to the Arboretum Trail. This, in turn, connects to the Corps' trail at the east end. Access on the west end of the south bank of the cut may be gained through the city of Seattle's West Montlake Park. Parking, however, is limited and confined to the street. The area along the south bank between the museum and the park is residential which for all practical purposes eliminates public entry to the cut. The north bank of the Montlake Cut is bordered completely by University of Washington property. Corps property along the north bank is accessible only by foot and bicycle traffic. Public access through the University of Washington along the north bank, or residential area along the south bank, may be gained from the stairway system on each side of the Montlake Bridge.

2.13 PROJECT OPERATION

The authorized construction of the ship canal project resulted in a lowering of the water level in Lake Washington to that of Portage Bay from a mean elevation of 29.8 feet to a mean elevation of 21.0 feet (Corps of Engineers datum).

The Locks provide a navigational passage between the freshwater portion of the project at a mean elevation of 21.0 feet, and Shilshole Bay, the level of which is determined by tidal action. Depending on the tide, the lift provided by the locks varies from 6 to 26 feet. The structure incorporates two locks, the larger of which is 825 feet long between the upper and lower miter gates and is 80 feet in width. This lock can be divided into two smaller

chambers by an intermediate miter gate. Ocean-going vessels up to 30-foot draft can be accommodated through the large lock. A saltwater barrier, hinge-mounted to the floor of the lock, is air-operated via push button controls located in the center control tower. The barrier is usually left in a raised position to reduce the intrusion of salt water into Salmon Bay, and beyond, but is lowered to permit passage of deep-draft vessels. Salt water which passes into Salmon Bay during lockages settles into a saltwater basin immediately upstream of the large lock. A saltwater drain conduit, with inlet at the bottom of the saltwater settling basin, returns the salt water by gravity through the dam and/or fish ladder.

The small lock, adjacent to and south of the large lock, has a chamber 150 feet long by 30 feet wide and is used by smaller vessels with drafts up to 16 feet. Floating mooring bitt on both the south and north walls limit the usable width to 28 feet.

The dam which forms the barrier between the small lock wall and the south shore is 235 feet long and has six 32-foot-wide spillway openings in which steel radial gates are installed. The six spillway gates are raised and lowered by individual electrically operated gate hoists. Maximum discharge capacity of the spillway at full gate opening is approximately 16,000 cubic feet per second.

A rehabilitated fish ladder and new fish viewing room were completed in 1976. This allows for upstream adult fish passage, research by fisheries resource managers, and visitors' observation of fish migration.

The Lake Washington Ship Canal Project is operated to provide optimum conditions for navigation between Puget Sound and the freshwater lakes and bays surrounding Seattle. The dam controls the outflow of fresh water from Lakes Union and Washington and maintains the upstream water level on a tightly controlled rule curve between elevation 20.00 feet and elevation 22.00 feet (Corps of Engineers datum).

The annual drawdown of the upstream water level begins in about October and the minimum level at elevation 20.00 feet is usually reached by December. The low water period is used for cleanup and dock repairs along the ship canal and Lake Washington. Beginning about mid-February, the water level is allowed to rise until it reaches elevation 21.85 feet which usually occurs by the end of April. Full pool, elevation 22.00 feet, is not reached until mid to late June.

Maintenance of a proper freshwater inflow-outflow balance is of great importance to prevent saltwater intrusion through the locks and to control the water level and water quality upstream. The present inflow regime appears to be satisfactory for maintenance of a proper water balance.

2.14 CLIMATE

The project area has a predominantly marine type climate featuring dry, pleasant summers and rather mild but rainy winters. There are several factors which combine to produce this type of climate: (1) its proximity to the Pacific Ocean; (2) its location in the path of the polar jet stream and a belt of prevailing westerly winds in the middle and upper atmosphere; (3) the surrounding terrain, particularly the Olympic and Cascade Mountain ranges; and (4) two massive air circulation systems over the north Pacific: the Pacific High and the Aleutian Low. These factors, or climatic controls, combine to allow four distinct seasons but eliminate the extreme weather events that are common for locations at this high a latitude.

Weather systems traversing the eastern Pacific accumulate massive amounts of moisture. These systems feed upon and travel along the polar jet stream which, during the winter, is generally aimed at the Pacific Northwest. As these systems reach the west coast they are strong and laden with moisture. However, the Olympic Mountains take the full brunt of these storms and weaken them before they reach the project area. To the east, the Cascade Mountains effectively block the invasion of extreme high and low temperatures from Continental air masses. The result is a more benign weather pattern than would normally be expected for a project as far north as Duluth, Minnesota, and the Gulf of St. Lawrence.

During summer the Pacific High holds sway. The general flow of air is from the northwest. Due to this warm, dry flow it is not unusual for two or three weeks to pass with only a trace of precipitation. A typical summer afternoon has temperatures in the upper 70's or low 80's. During the night temperatures normally fall into the 50's. Evaporation is high during the warm season with about 28 inches of water evaporating from April through September.

During autumn, as winter approaches and the North Pacific starts to tilt away from the sun, the Aleutian Low begins to bestir itself. It has been weak and almost non-existent, lurking in the far north all summer. Now it starts to nudge the Pacific High for dominance.

The High begins to weaken and retreat to the south. The general flow of the air changes and mainly comes to the project from the southwest. This results in a rainy season lasting from early October through mid-March. The clouds and frequent rains during this period are important factors in holding wintertime temperatures above the freezing marks for extended periods of time. The typical winter day has high readings in the 40's with nighttime temperatures in the 30's. Freezing temperatures are observed only 15 - 20 days a year at the project. Usually light snow will fall several times each winter totaling less than 10 inches a year at the project.

The frequent cloudy, drizzly days of winter have led to the myth that it rains all the time in the Seattle area. The fact is, the project receives only about 34 inches of rain a year. As a comparison, this is about ten inches less than what Houston, Texas receives. This 34 inches is, however, spread out over about 150 days of the year which is considerably more than for Houston and most other locations in the country.

Spring arrives early at the project and is characterized by slowly warming temperatures. The Pacific High begins its annual migration north as the Aleutian Low weakens and treks northward as well. The sun is a more frequent visitor as rainy days become rather scarce.

These climatic conditions stimulate vegetative growth to be quite lush and flowers to remain in bloom for an unusually long period. The growing season usually lasts from about late March until mid-November.

2.15 GEOLOGIC SETTING

The geologic story of the area is one of repeated glacial erosions and depositions. Glaciers advanced and retreated over the area at least four times, each glacier nearly eliminating the evidence of previous glaciers. A chronologic history of the actions of the last glacier to cover Seattle, about 14,000 years ago, is exhibited in the nearby bluffs of Discovery Park (formerly Fort Lawton).

One of the first effects of each glacial advance was to block the natural drainage of Puget Sound to the north, through the Strait of Juan de Fuca. This resulted in the formation of a lake which eventually rose to a level that allowed it to drain to the south. The lake initially received clays, silts, and fine sands from glacial outwash and coarser sands and

gravels from delta formations wherever streams or rivers entered the lake. The deposited material graded from coarse to fine with increasing distance from the source. As the glacier advanced, the lake was crowded southward and successively coarser material was deposited. As the glacier moved over the area, unsorted glacial till consisting of clay, silt, sand, gravel, and boulders were deposited. The underlying material was consolidated under the weight of the ice and eroded. As the glacier receded, the lake reformed and successively finer material was deposited until ice retreat again permitted drainage via the Strait of Juan de Fuca.

Throughout the area there are often several hundred feet of layers of stratified and unstratified glacial deposits. The glaciation created the major landforms around Seattle and produced the north-south running basins of Lake Sammamish and Lake Washington and the many north-south trending hills of the city. Puget Sound was deepened by the erosion.

2.16 VEGETATION

The vegetation of greatest interest at this project is found in the Carl S. English, Jr., Botanical Garden located at the Locks. Located to the north of the Locks, the garden forms a background and contrast to the mechanical workings.

When the Hiram M. Chittenden Locks were dedicated in 1917, the newly constructed lawns were dotted with just a few trees and shrubs donated by the city of Seattle. In 1927, Otto Humdahl, landscape architect, designed the formal flower beds east of the administration building. The formal beds, with the exception of a large rose garden which has been added, that were created are still in use today, featuring bulbs, annual, and perennial flowers throughout the spring and summer seasons. From 1931 to 1940, Carl S. English, Jr., held the position of assistant gardener at the Lake Washington Ship Canal project and began supplementing and even replacing the original plantings with hardier and more native materials. After becoming head gardener in 1940, Mr. English developed the extensive and diverse (over 500 species and 1,500 varieties) selection of trees, shrubs and herbaceous plants by collecting seeds and plants from botanical gardens and arboretums throughout the world as well as native settings of the Pacific Northwest. The naturalistic plant groupings, large shade trees and broad unbroken expanses of lawn are typical attributes of the English Landscape Style, in which the garden was developed. The garden provides year-round interest which, combined with the green spaciousness of the lawn areas, form a pleasurable setting for the Locks activity.

In recognition of the outstanding work he performed as horticulturist, the garden was named the Carl S. English, Jr., Ornamental Garden in a ceremony held on December 10, 1974. The garden was later renamed Carl S. English, Jr., Botanical Garden due to the scientific as well as visual significance of the garden to the Pacific Northwest.

The Chittenden Locks and Lake Washington Ship Canal were placed on the National Register as a Historic District in 1978. The Carl S. English, Jr., Botanical Garden is noted in the historic designation as an "area of significance," indicating that the garden is a valuable part of the project's historic district designation. The November 1989 Historic Grounds Report, prepared by Ms. Renee L. Freier, identifies the significant historical elements and features of the garden and documents the historical evolution of the garden from the original layout to current conditions.

A self-guided tour of the garden is described in a 1988 pamphlet entitled "Carl S. English, Jr., Botanical Garden", published by the Seattle District. A pamphlet titled "Carl S. English, Jr., Garden at the Hiram M. Chittenden Locks" was prepared by the Corps in 1976. This pamphlet, no longer available in print, contained a map of the garden and plant list originally developed by Mr. English in 1964 for the XI Botanical Congress. Mr. English died in 1976 at the age of 71. A memorial plaque was placed in the garden to honor his contributions in the field of horticulture both locally and nationally. A plant list for the garden was researched and compiled in 1982 by Ms. Kathy K. Mendelson, botanist, and Mr. Michael E. Fleming, current horticulturist at the Lake Washington Ship Canal Project. See Appendix A for plant list and current garden plant bed layout.

Vegetation on the south side of the Locks consists of trees, shrubs, and ground covers which were installed following construction of the fish ladder and adjacent Commodore Park between 1976 and 1978.

Areas that can be considered as habitat are terribly fragmented throughout the canal due to industrial and business developments. Although important, the existing habitat is extremely limited and in some cases of questionable value.

The Fremont Cut area is also landscaped. A colonnade of Lombardy poplars line the straight narrow channel of the Fremont Cut and separates the waterway from the adjacent urban land uses. Beneath the poplars are predominantly native grasses and shrubs, however non-native species such as scotch broom have become increasingly invasive. Along the south

shore the slopes vary from 2:1 and flatter and rise only a few feet above the concrete revetment. On the north shore the slopes are steeper (1½:1) rising as much as 12 feet above the concrete revetment.

Vegetation on both sides of the canal west of the Fremont Bridge consists of a mixture of native and exotic trees, shrubs, ground covers, and grasses. Tree species include European birch, big-leaf maple, flowering cherry, blieriana plum, and European mountain ash. Extensive public use along the canal has created openings between the trees exposing barren and compacted soils furthering potential for natural erosion. Ewing mini-park, a city of Seattle park located on the south shore under the cable tower, has the most extensive ornamental planting along the Fremont Cut. Tree and shrub planting, provided by the city of Seattle on the north shore due to extension of the Burke-Gilman Trail in 1992, will continue through 1993. Existing poplars are old and are reaching their lifespan. Young poplars were planted several years ago by the Corps in an attempt to replace the aging poplars, however, most did not survive.

The Montlake Cut is a narrower channel than the Fremont Cut and is characterized by steep side slopes, planted with a combination of ornamental English ivy, deciduous and evergreen trees and native shrubs and grasses. Trees primarily consist of native conifers, but a row of approximately 12 Lombardy poplars line the west end of the north shore.

2.17 FISH

Salmon, steelhead, and sea-run cutthroat trout capture the visitor's interest at the Locks because of the fish ladder underwater viewing room incorporated during the rehabilitation of the fish ladder facility in 1976. Salmon, steelhead, and cutthroat trout mature in salt water but must return to fresh water to reproduce. The Cedar River, Sammamish River system, and other streams feeding Lake Washington produce significant runs of salmon and steelhead each year. The largest run of salmon is that of the sockeye, which occurs in the summer; chinook and coho arrive starting in late summer and fall, respectively, while the peak steelhead run occurs in the winter. The fish ladder, on the south shore of the Locks, provides a favorable route around the dam and locks.

The Lake Washington system supports many species of resident fish. Since these species do not migrate past the locks, and are not generally seen by the visitor, they capture less visitor interest than salmon, steelhead, or cutthroat trout.

2.18 WILDLIFE

The Lake Washington Ship Canal offers the chance to see large numbers of fish and wildlife, varying with the seasons. The canal vicinity supports a rather large wildlife population, largely due to the interface between salt and fresh water at the locks and the relatively undisturbed vegetation on Magnolia Bluff and other steep hills adjacent to the canal.

It has been estimated by observers that of all the native small and aquatic animal species in Seattle, the greatest populations occur in the ship canal vicinity.

The Seattle Audubon Society has observed over 200 species of birds within the ship canal vicinity. The area is used by bird species both indigenous and in transit, with the latter group passing through the area in fall on their way to southern wintering grounds. A list, prepared by Mr. Ken Brunner, Corps Wildlife Biologist, of birds commonly found in the project area can be found in Appendix B.

The bird life is quite abundant and clearly visible, although total numbers and distributions are largely dependent on fish and plant life of the canal. Beginning in salt water and moving upstream, one will see a wide variety of species. Wading in the shallows of Shilshole Bay, great blue herons stalk small to medium size fish. Along the shorelines, sandpipers and other shorebirds poke into the sand for food. Out in the bay, loons, grebes, and ducks will float on the surface and dive for fish. At the Locks, the visitor will see gulls scavenging for a wide selection of food. Terns sit on wires and fly over the water, occasionally dropping to snatch fish from immediately below the spillway. Great blue herons and Canada geese are frequent visitors and nesters at the project; bald eagles fly over periodically. Upstream of the Locks, the canal supports a year-round population of mallards and American coots. Union Bay is an important wintering ground for thousands of ducks of many species. Flocks of wintering Canada geese occasionally include a few white fronted geese. Double crested cormorants perch in the poplars along the Fremont Cut while following a migrating food supply.

Visitors may even see muskrat and an occasional beaver from a boat in the Union Bay portion of the ship canal. Crayfish are abundant in shallow portions of Union Bay. California sea lions and otters have become quite common in Puget Sound.

2.19 HUNTING

Hunting is prohibited within the city limits.

2.20 FISHING

The Montlake and Fremont Cuts are open to the public for fishing, sanctioned under local, State, and Federal regulations. Because of the potential for conflict with navigation, fishing at the Locks is prohibited. The city of Seattle, however, provides fishing access from their Commodore Park Development approximately 600 feet downstream of the locks on the south shore.

2.21 ENDANGERED AND PROTECTED SPECIES

In accordance with Section 7 of the Endangered Species Act of 1973, the Corps will insure that any Corps' activities have taken into account impacts to federally listed or proposed threatened or endangered species.

The Corps will continue to support resource agencies and tribal management of fish and wildlife resources through the operation of the project.

In recent years California sea lions, protected under the Marine Mammal Protection Act, have preyed upon migrating salmon and steelhead at the Locks. It was estimated by the Washington Department of Wildlife that sea lions consume 60% or more of the wild steelhead whose numbers have been declining (it is documented that in 1993 less than 200 adult fish were observed). Consequently, considerable effort has been expended by State and Federal agencies to discourage sea lions, by the use of non-lethal methods, from taking fish at the Locks. This effort has resulted in little success.

Photo 1 - Cavanaugh (Lock Keeper's) House, October 1913

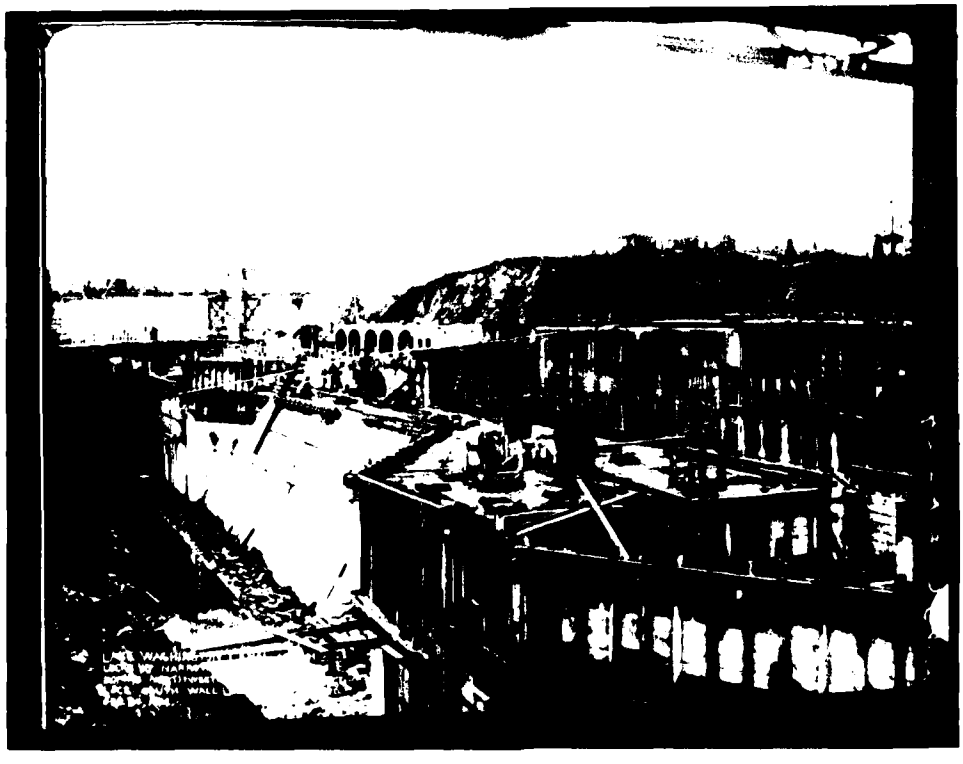


Photo 2 - Locks During Construction, February 1914

Photo 3 - Locks During Construction, April 1914

Photo 4 - Montlake (Portage) Cut, 1914

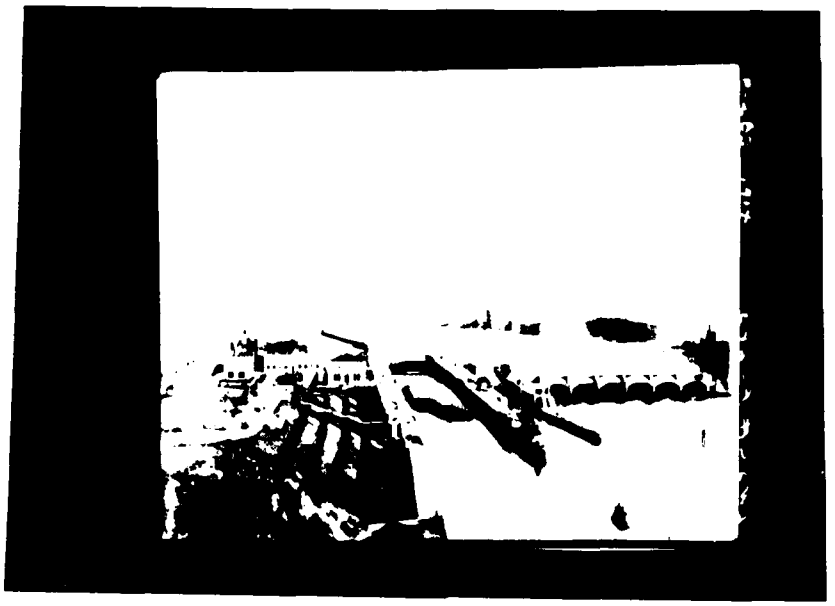


Photo 5 - Locks, 1914

Photo 6 - Administration Building, 1993

Photo 7 - Warehouse No. 1, 1993

Photo 8 - Machine Shop, 1993

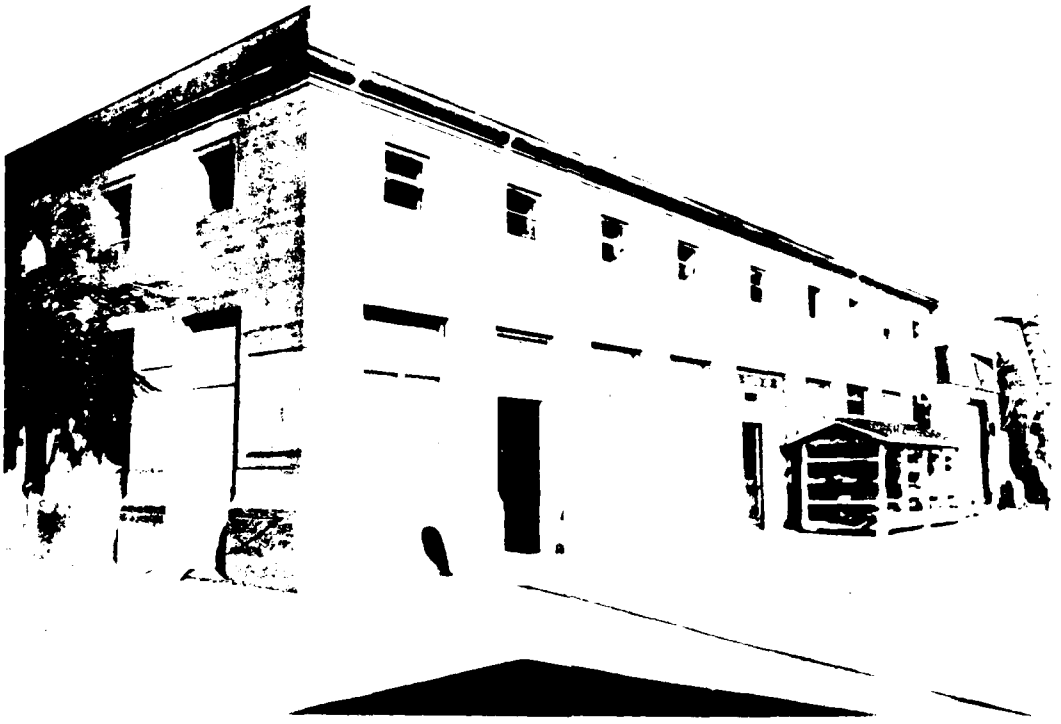


Photo 9 - Warehouse No. 2, 1993

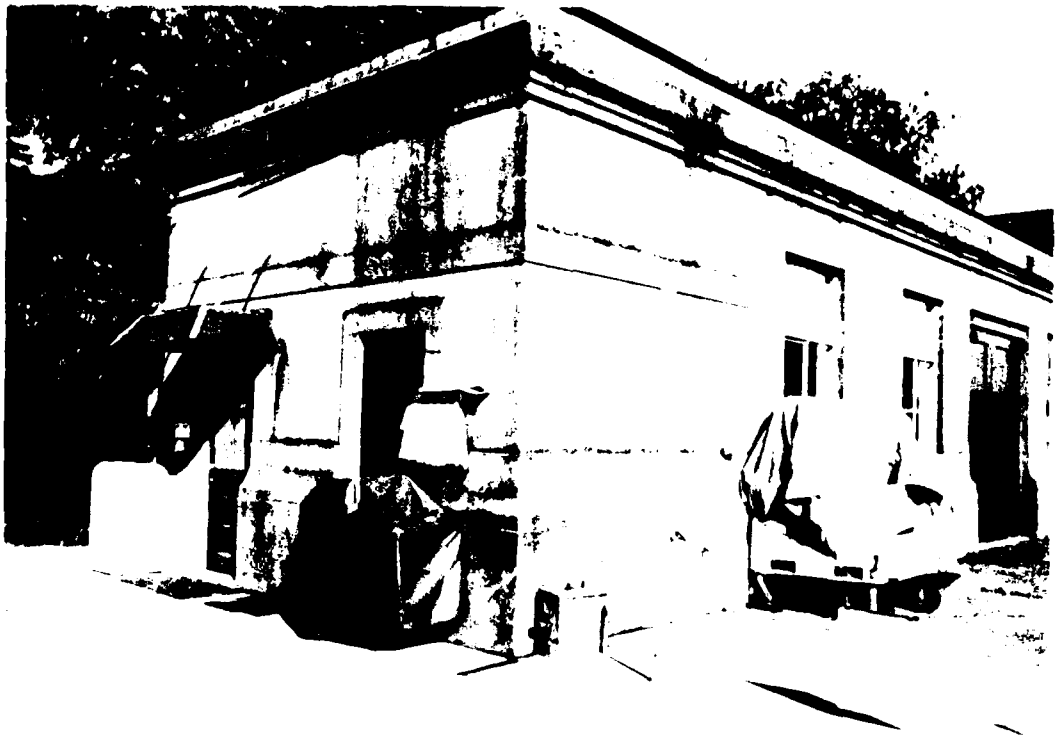


Photo 10 - Mechanic Shop, 1993

Photo 11 - Garden, 1993

Photo 12 - Promenade and Loop Road Intersection, 1993

LOCATION MAP

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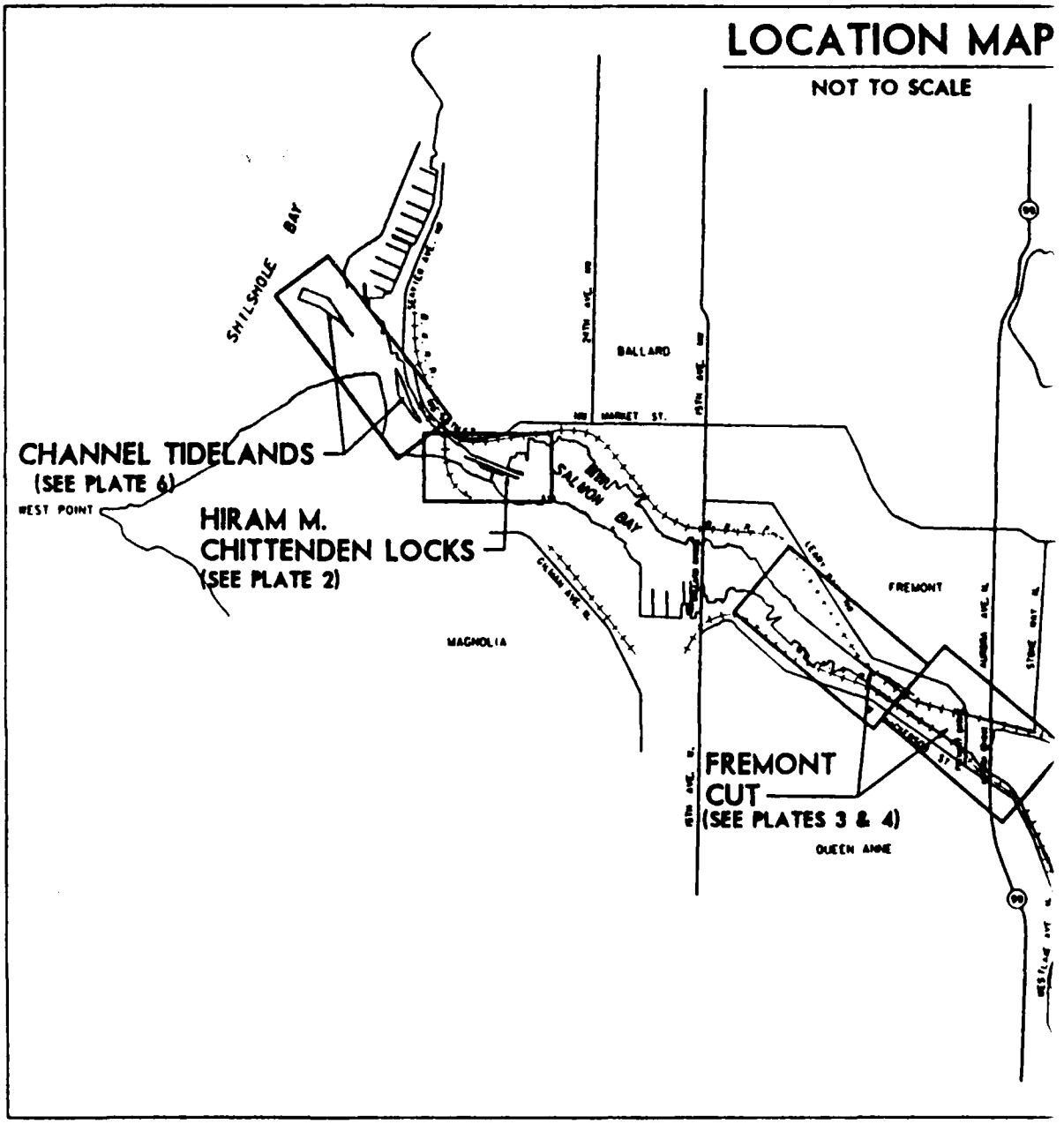

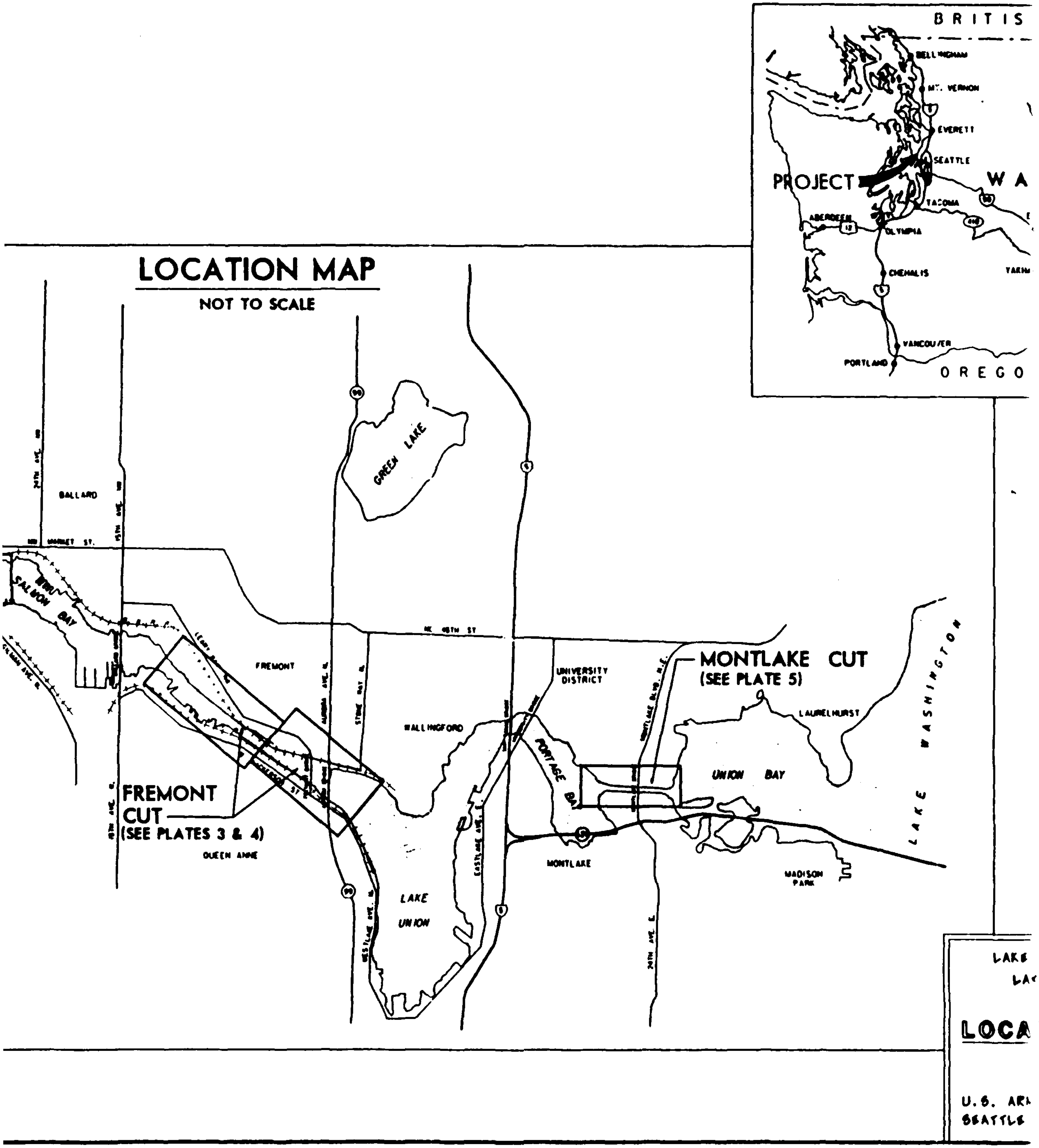

LOCATION MAP
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OLYMPIA
CHEHALIS
VANCOUVER
PORTLAND
OREGO
GREEN LAKE
BALLARD
SALMON BAY
FREMONT
UNIVERSITY DISTRICT
MONTLAKE CUT
(SEE PLATE 5)
LAURELHURST
LAKE WASHINGTON
WALLINGFORD
PORTAGE BAY
UNION BAY
FREMONT CUT
(SEE PLATES 3 & 4)
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MADISON PARK
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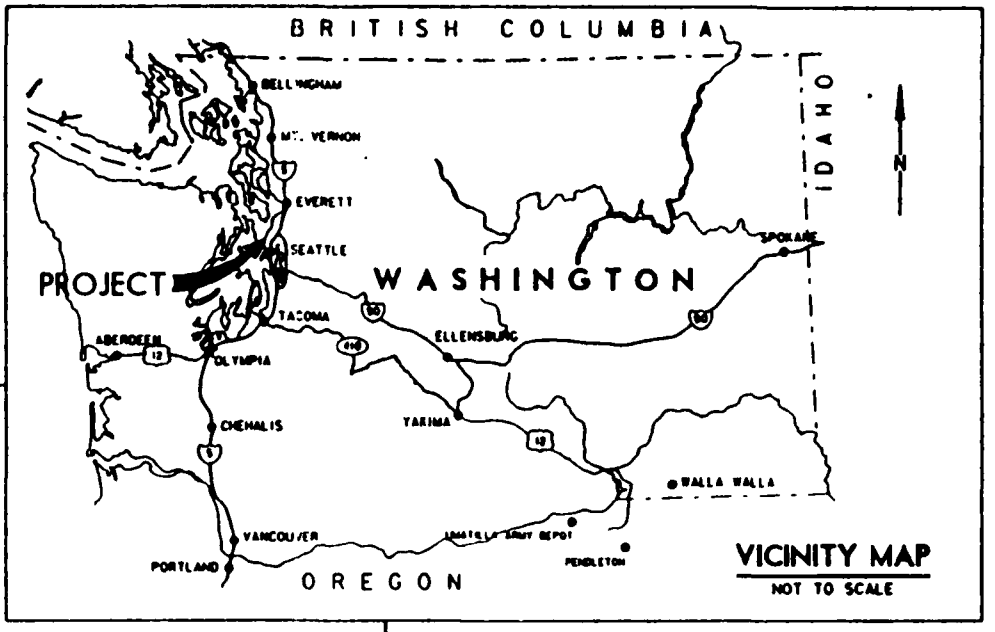
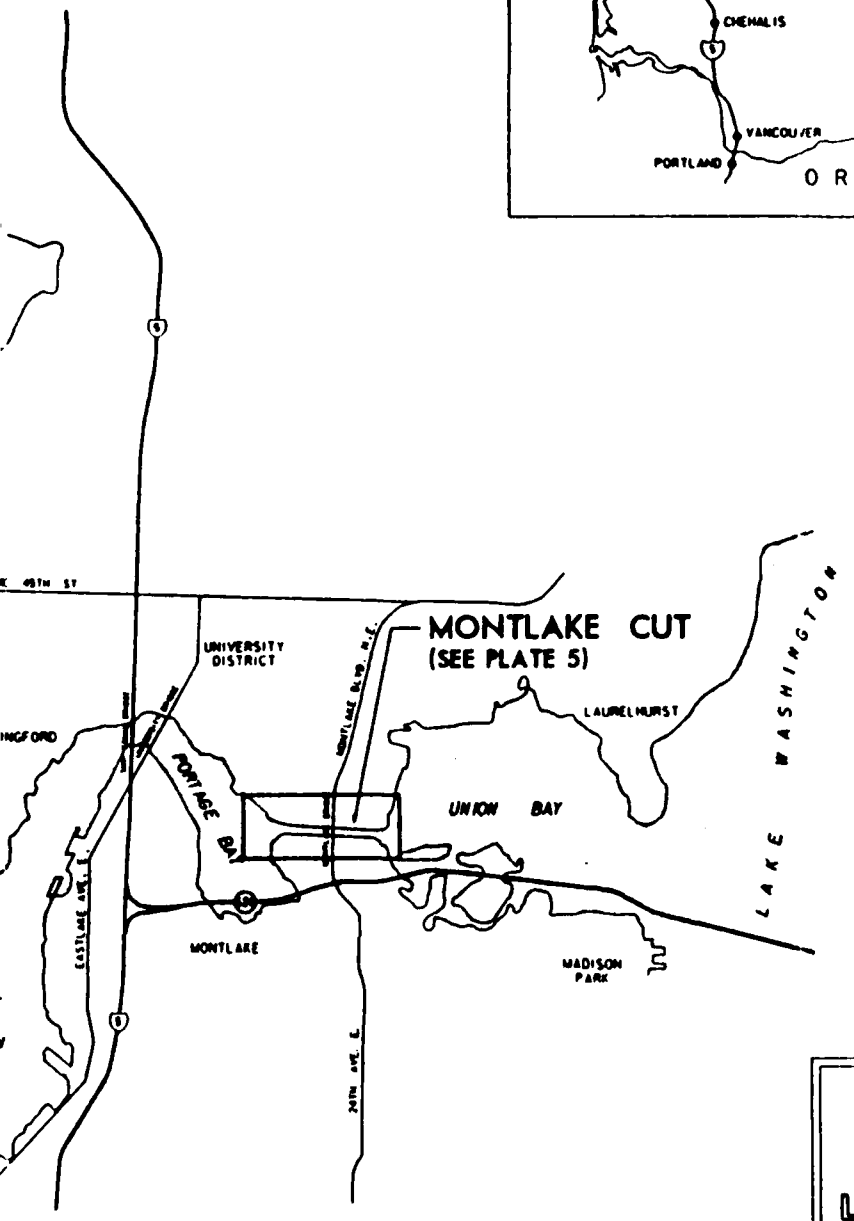


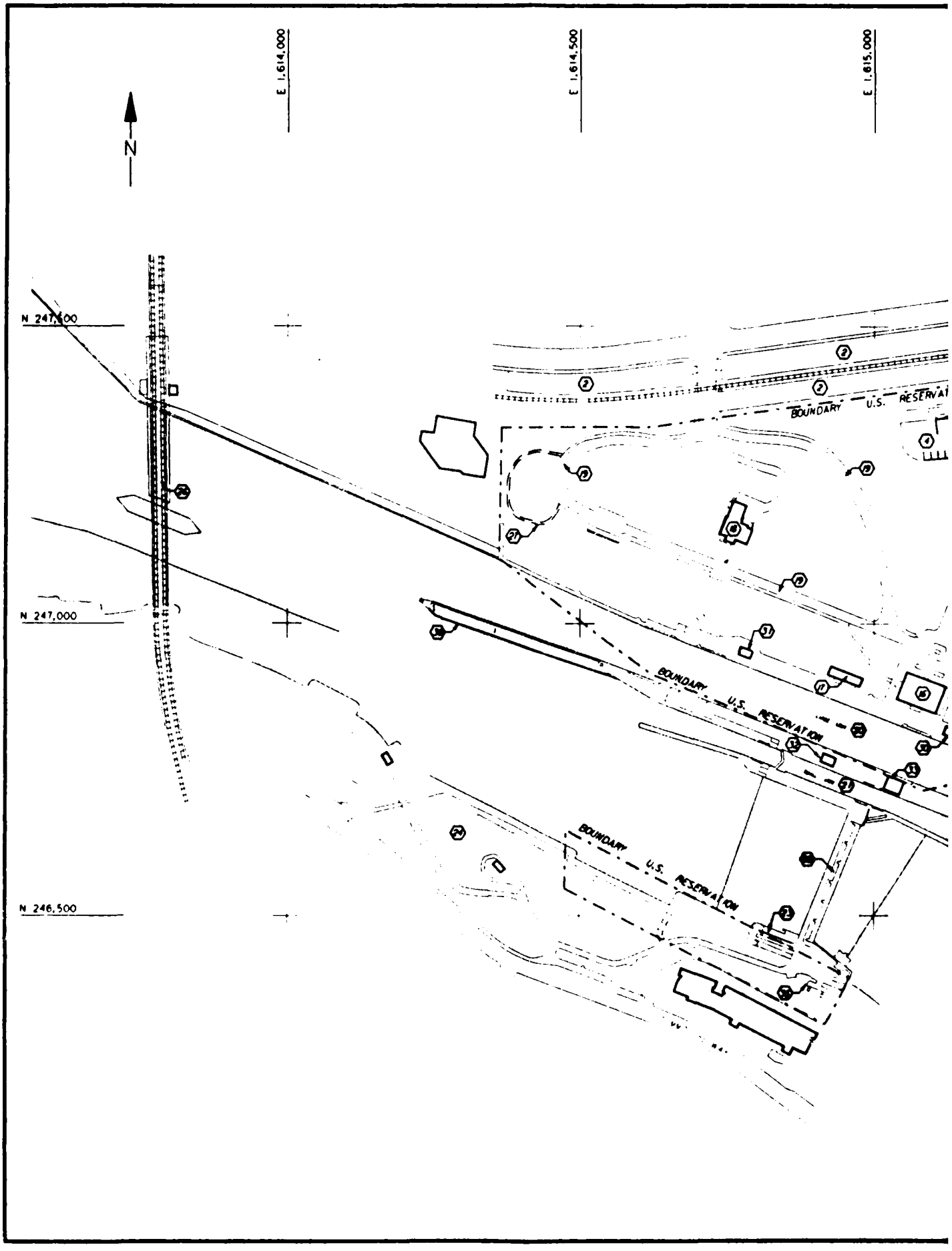


LAKE WASHINGTON SHIP CANAL MASTER PLAN
LAKE WASHINGTON SHIP CANAL PROJECT

LOCATION AND VICINITY MAP

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT

PLATE 1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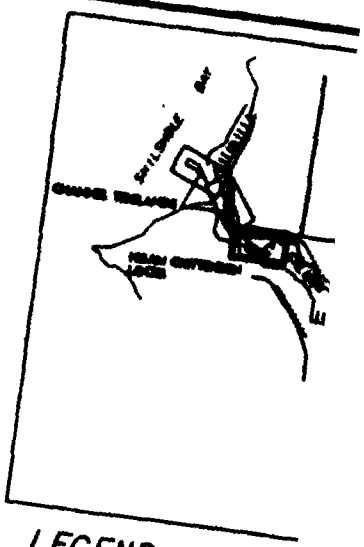

LEGEND

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2 PUBLIC PARKING-CITY
3 EMPLOYEE PARKING
4 NURSERY/STAGING ARE
5 PROMENADE
6 WAREHOUSE #2
7 DISTRICT GARAGE
8 EQUIPMENT STORAGE B
9 OPERATIONS AND MAIN
10 STEEL SHOP
11 VISITOR CENTER
12 MACHINE SHOP
13 GREENHOUSE
14 WAREHOUSE #1
15 BOATHOUSE
16 ADMINISTRATION BUILD
17 RESTROOM
18 CAVANAUGH HOUSE
19 LOOP ROAD
20 LARGE LOCK
21 SMALL LOCK
22 SPILLWAY
23 FISHLADDER
24 COMMODORE PARK
25 OILHOUSE
26 BURLINGTON NORTHERN
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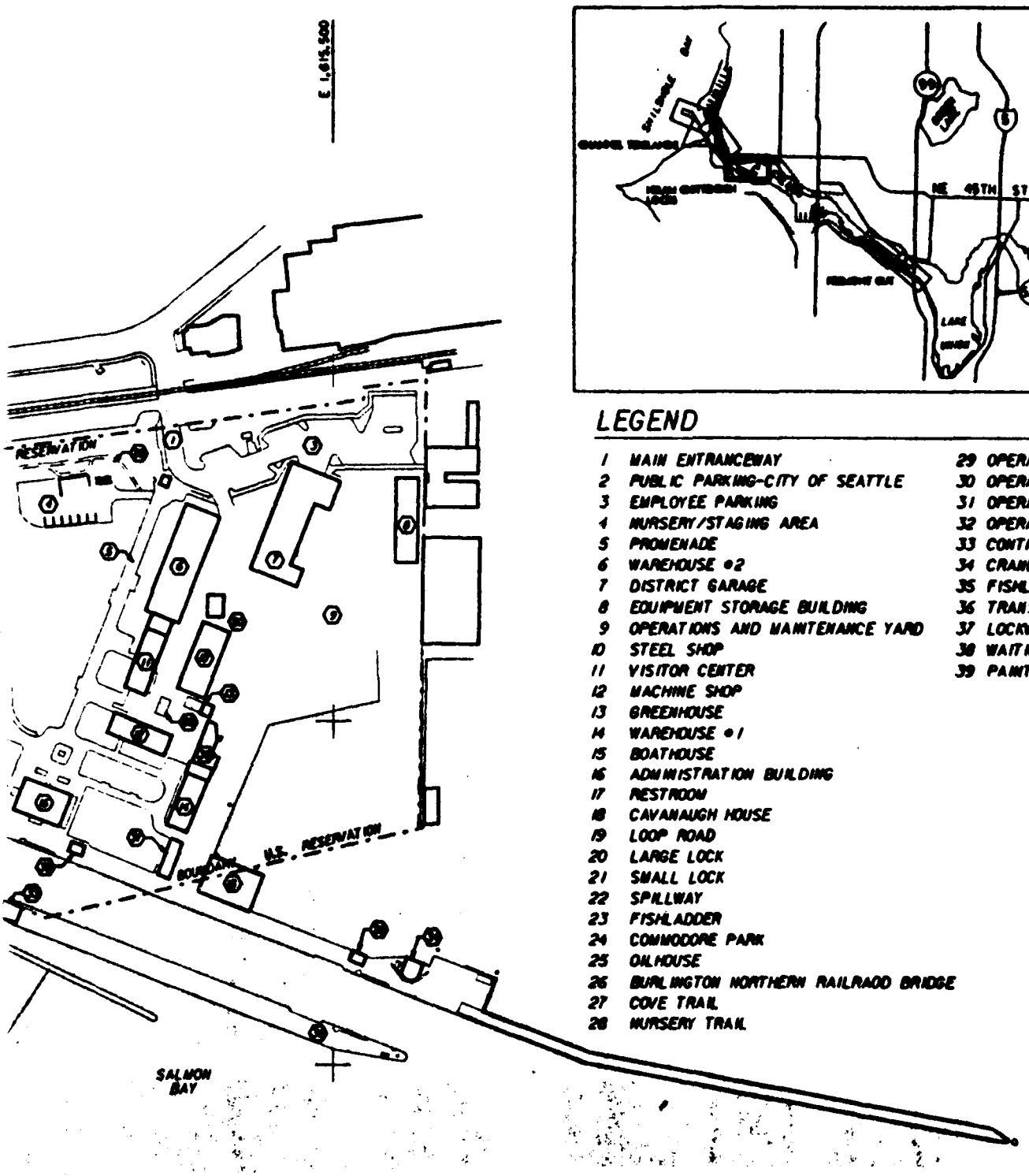

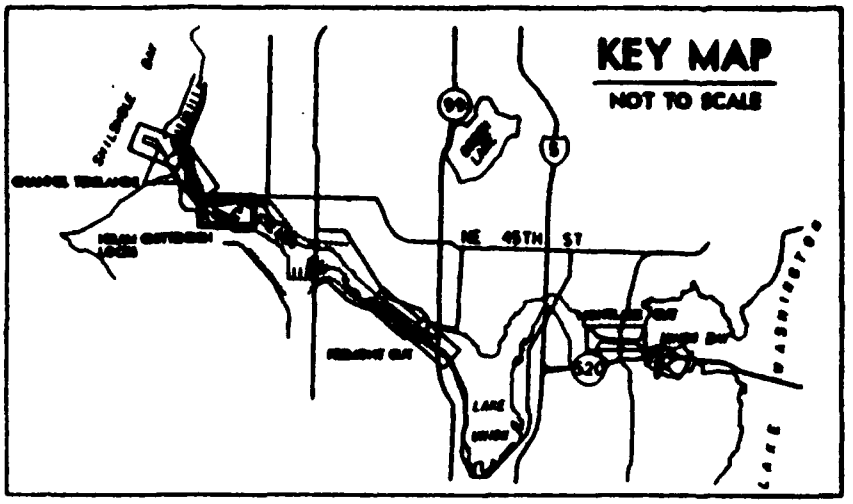

LEGEND

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8 EQUIPMENT STORAGE BUILDING
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14 WAREHOUSE #1
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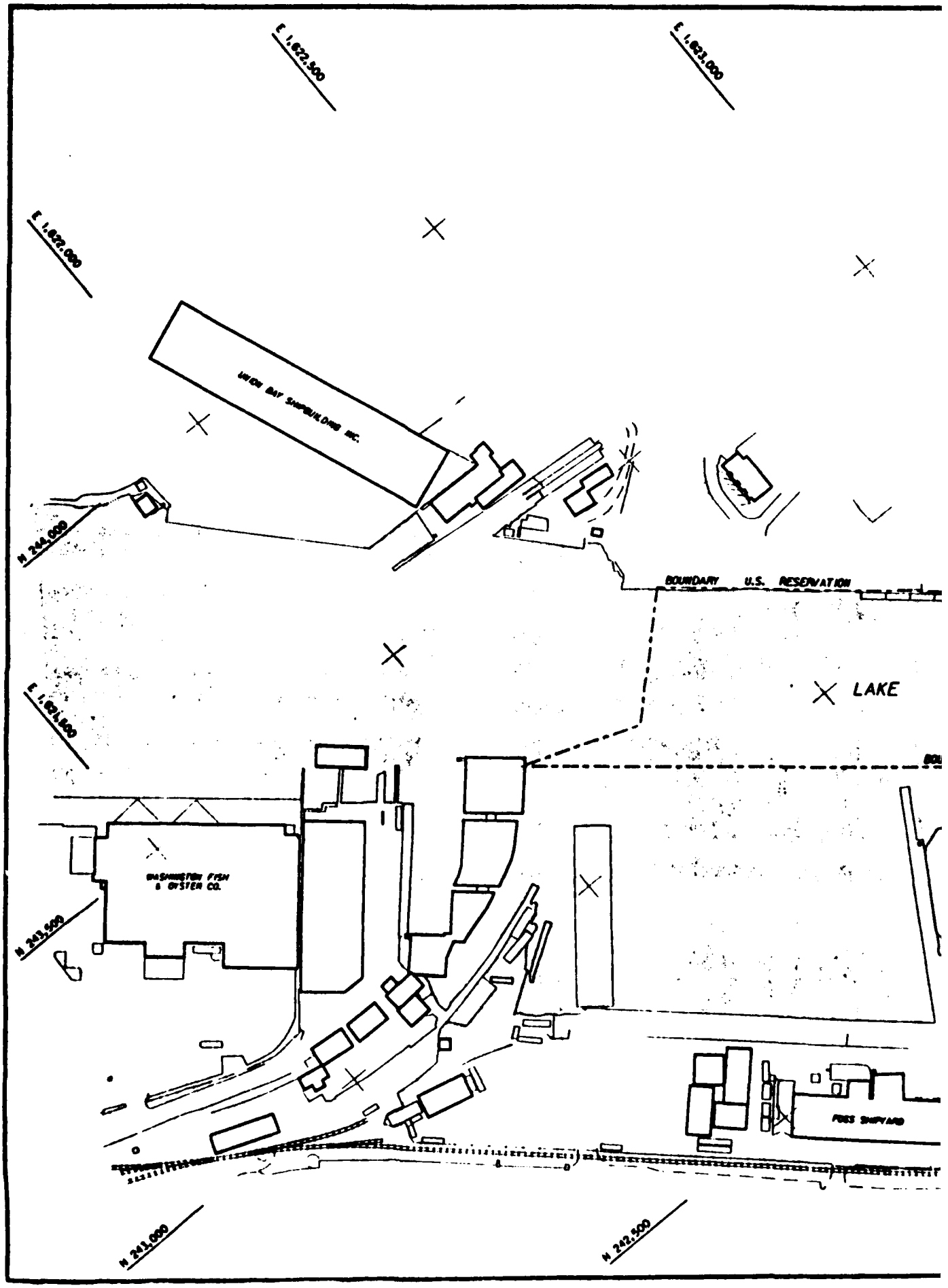
24 COMMODORE PARK
25 OILHOUSE
26 BURLINGTON NORTHERN RAILROAD BRIDGE
27 COVE TRAIL
28 NURSERY TRAIL
29 OPERATING HOUSE #1
30 OPERATING HOUSE #2
31 OPERATING HOUSE #3
32 OPERATING HOUSE #4
33 CONTROL TOWER
34 CRANE HOUSE
35 FISHLADDER RESTROOMS
36 TRANSFORMER HOUSE
37 LOCKWALL LUNCH/LOCKERROOM
38 WAITING PIERS
39 PAINT SHOP/STORAGE AREA

LAKE WASHINGTON SHIP CANAL MASTER PLAN
HIRAM M. CHITTENDEN LOCKS

EXISTING CONDITIONS

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT

PLATE 8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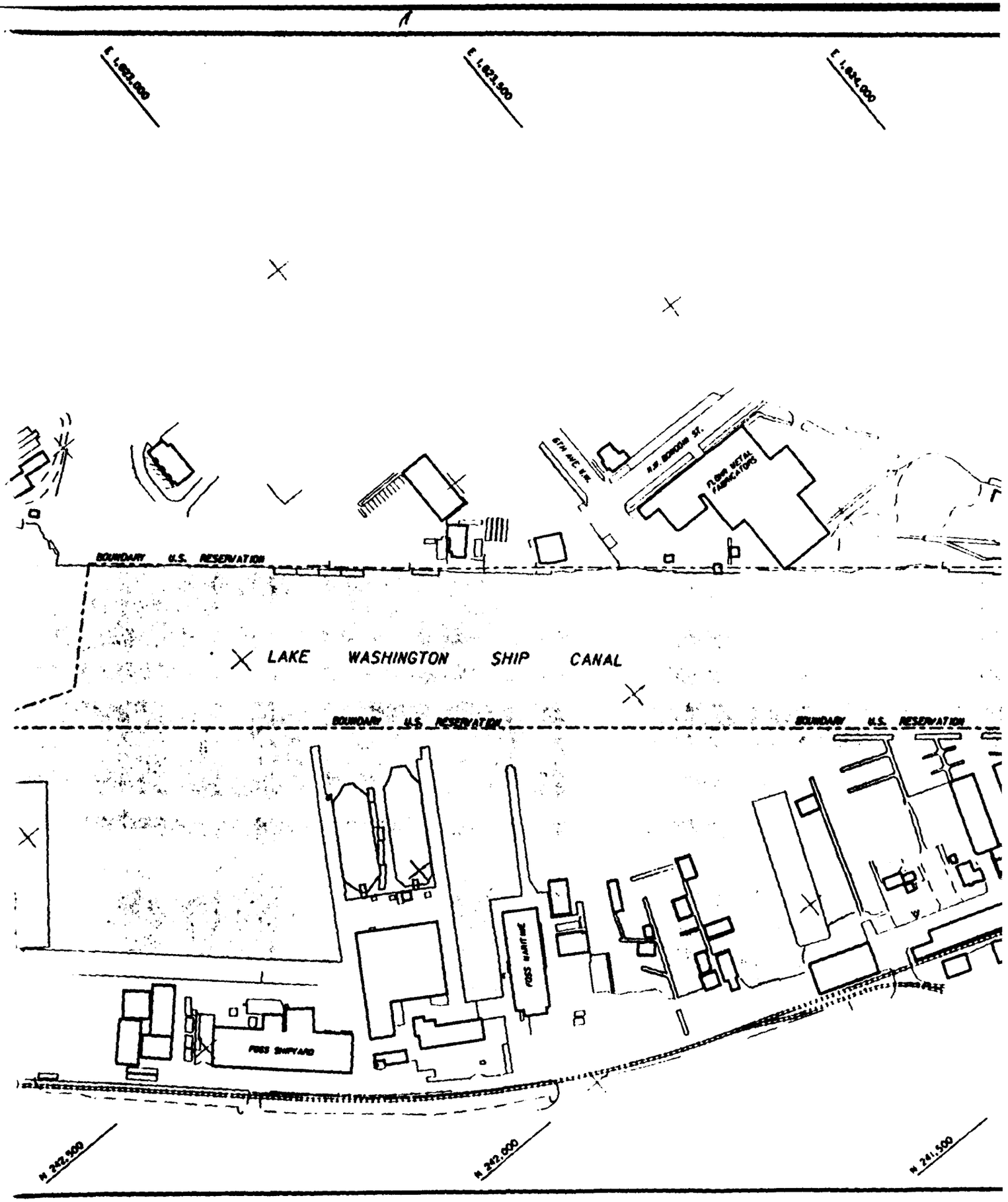
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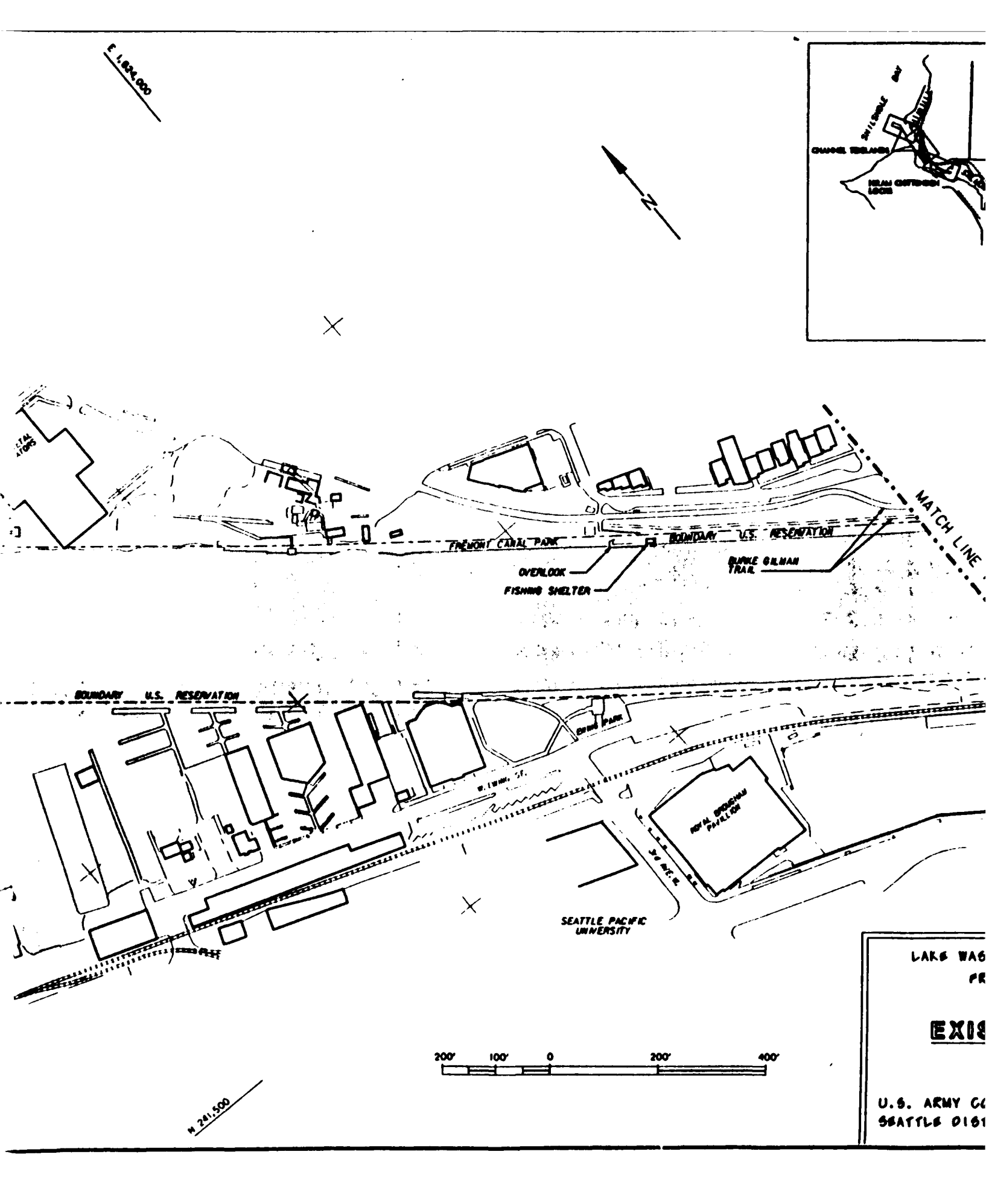

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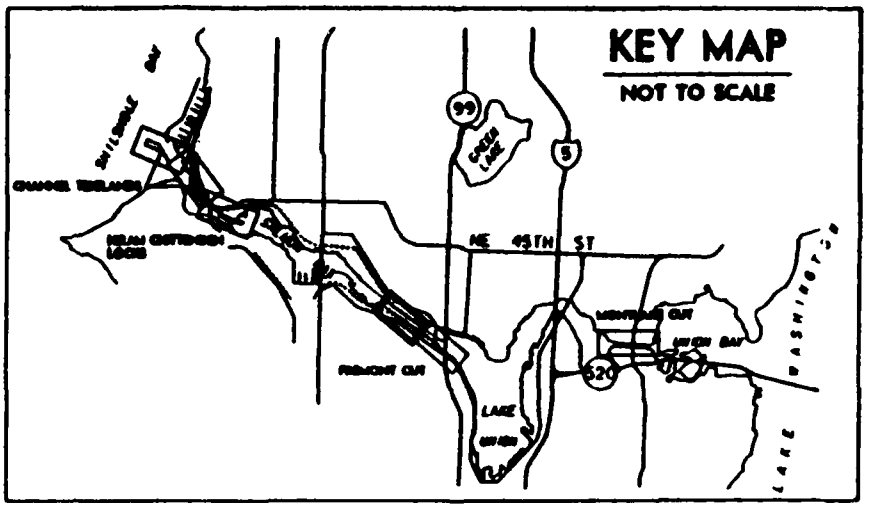

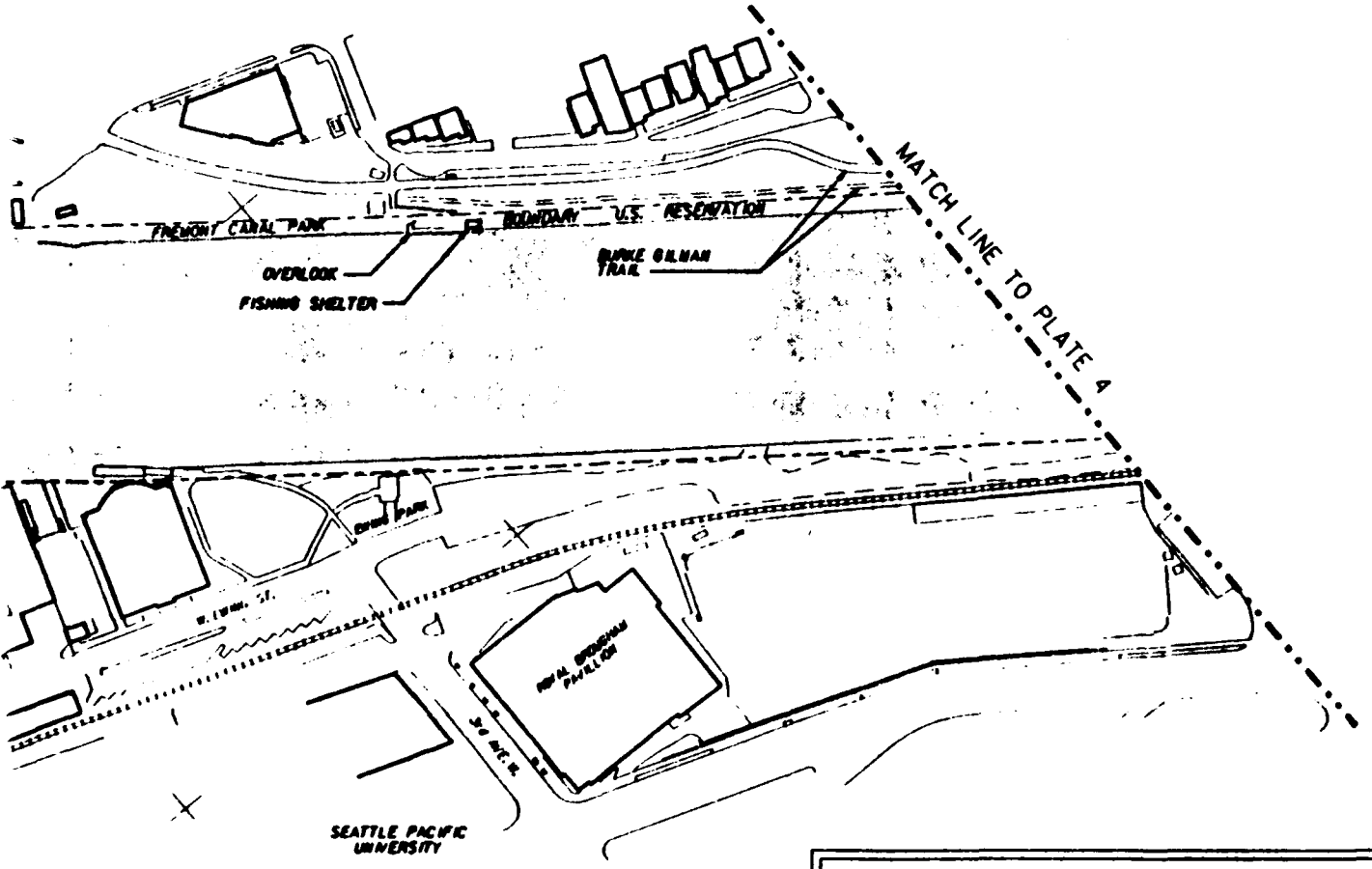

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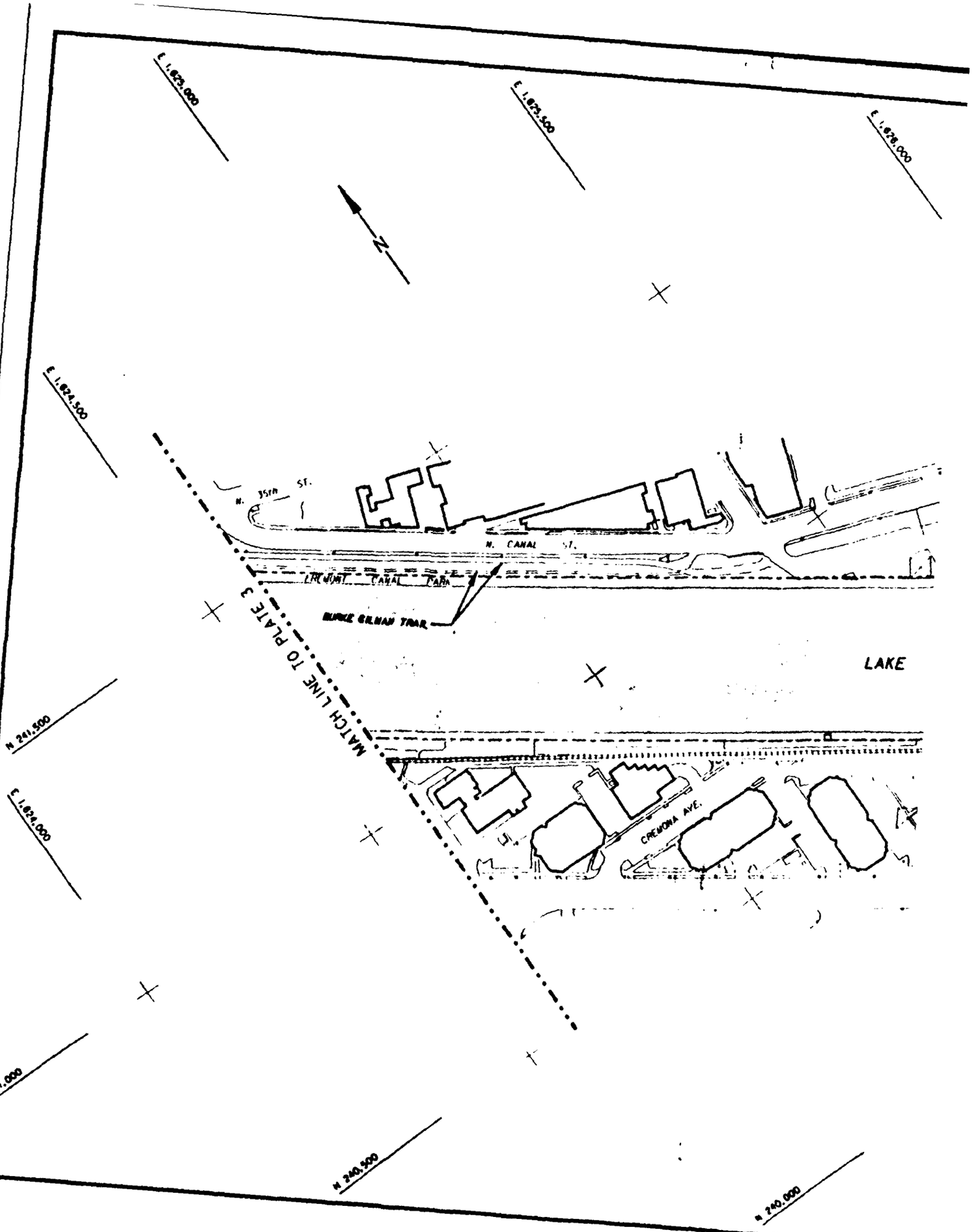
LAKE WASHINGTON SHIP CANAL MASTER PLAN
FREMONT CUT - WEST PORTION

EXISTING CONDITIONS

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT

PLATE 3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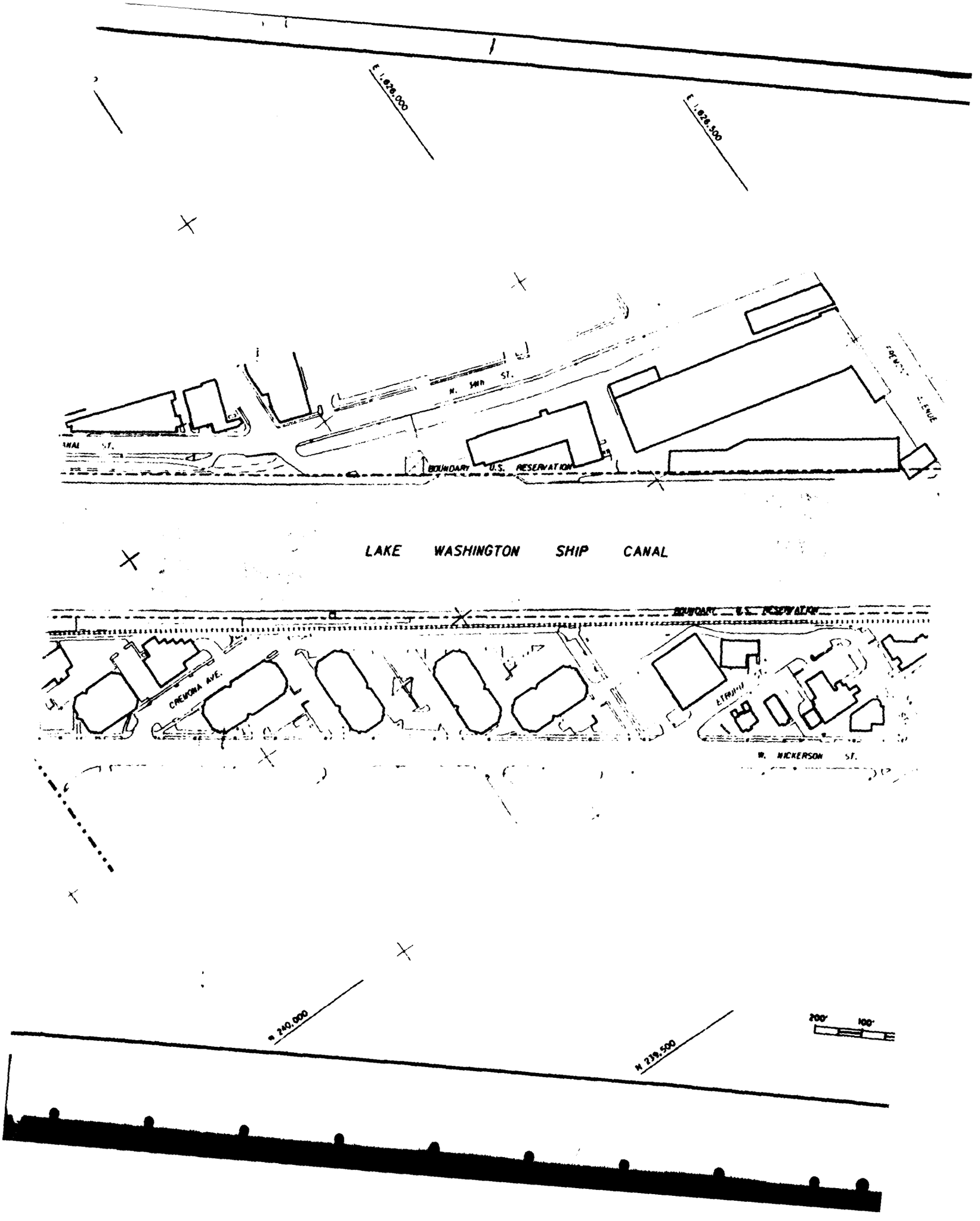
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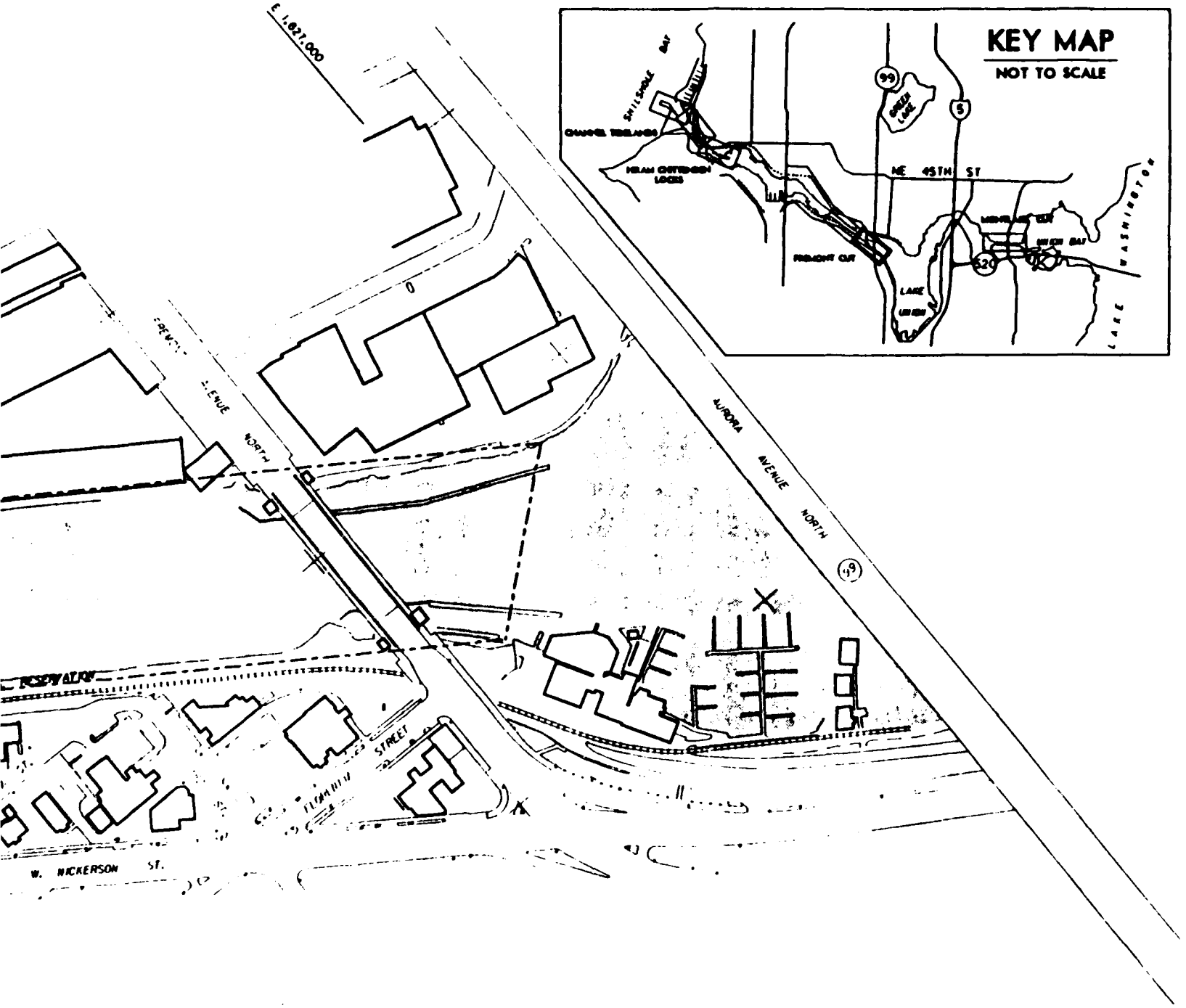

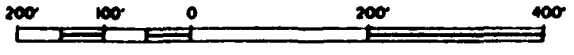

LAKE WASHINGTON SHIP CANAL MASTER PLAN
FREMONT CUT - EAST PORTION

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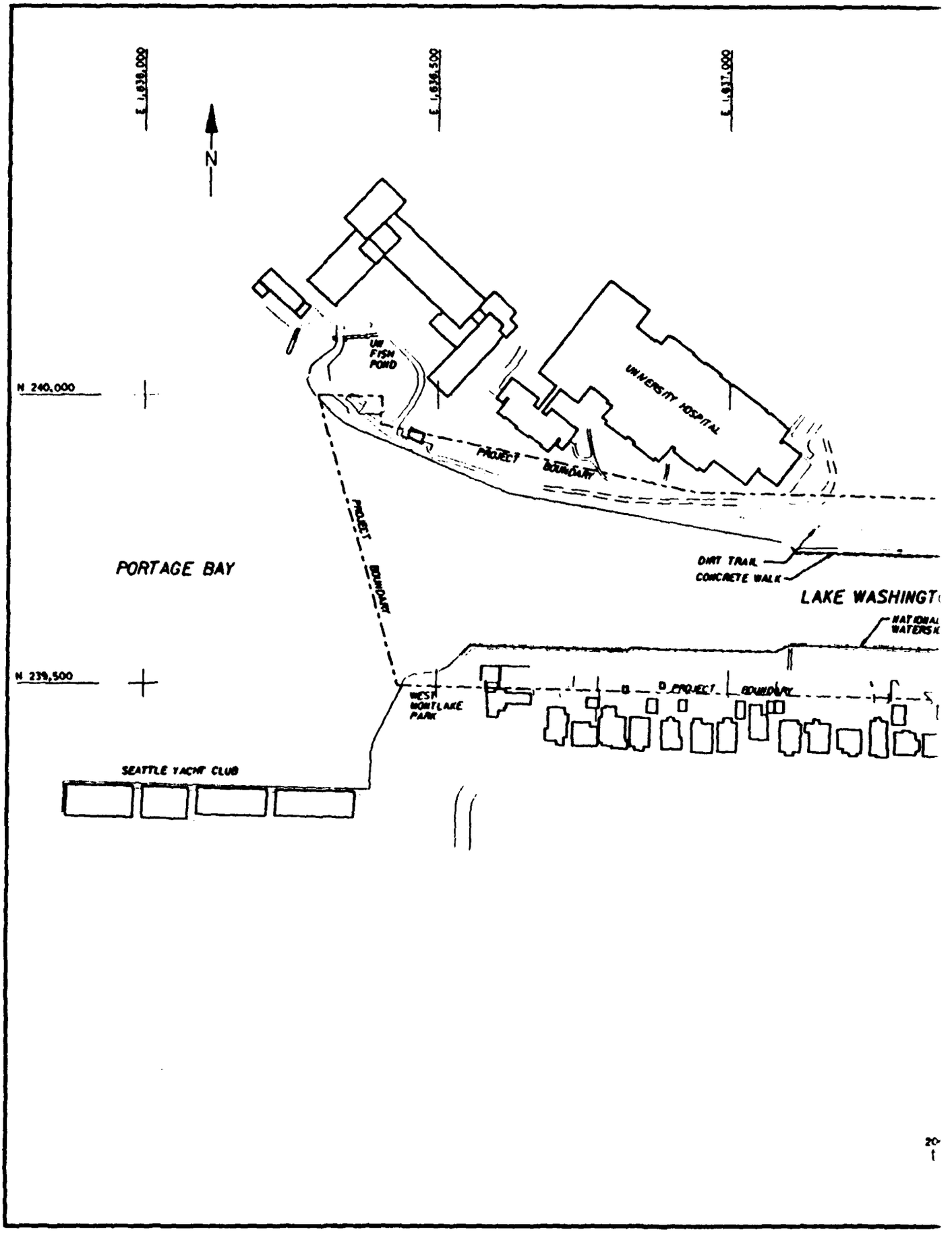
U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT

PLATE 4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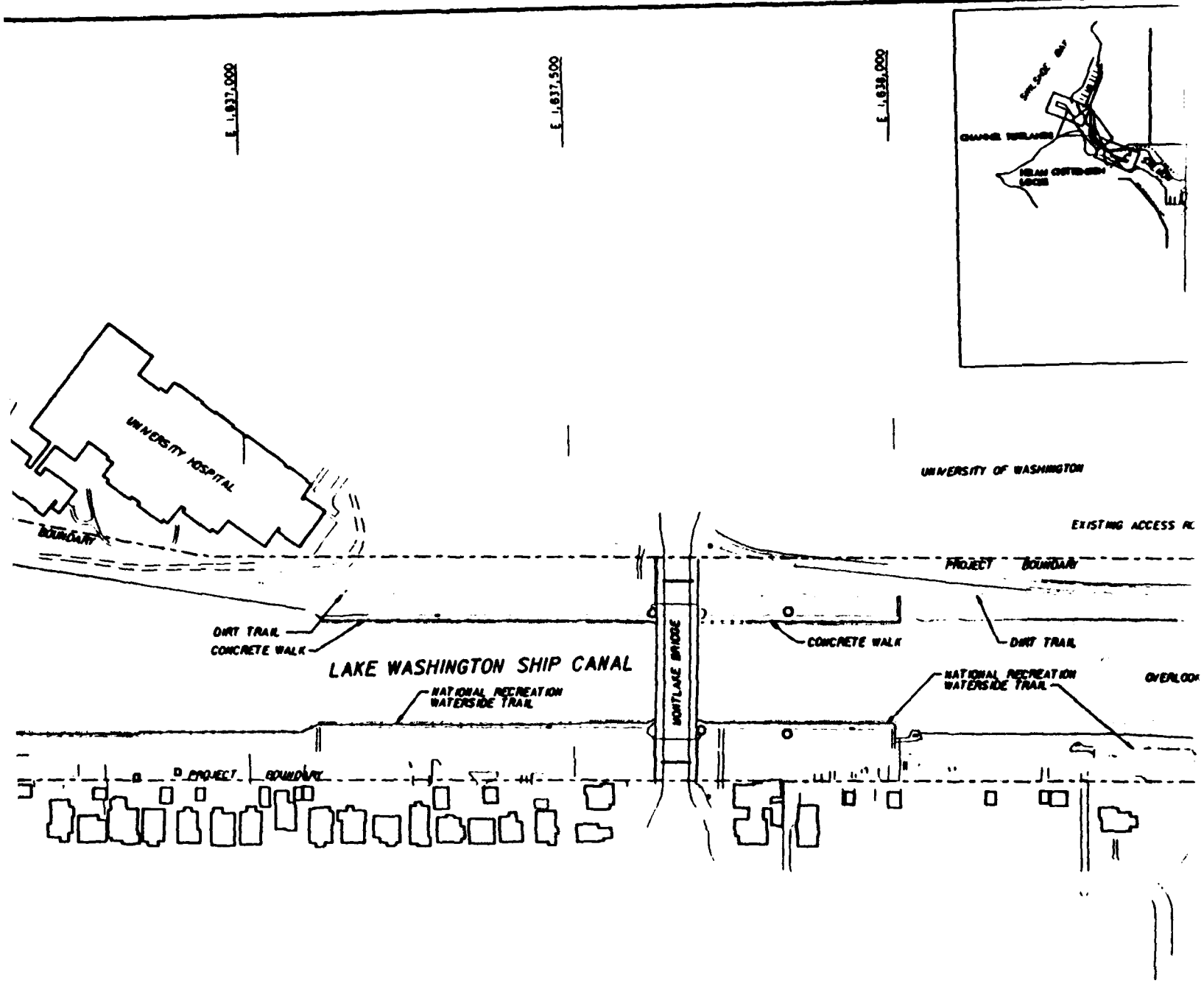

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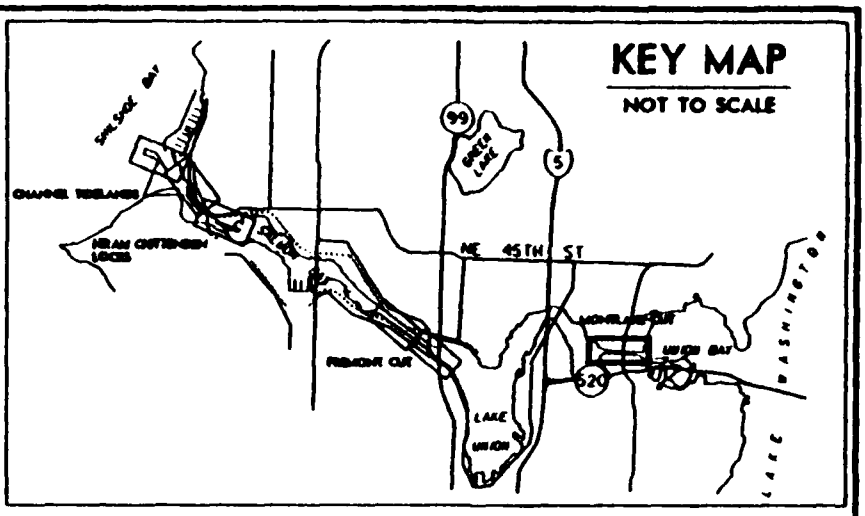

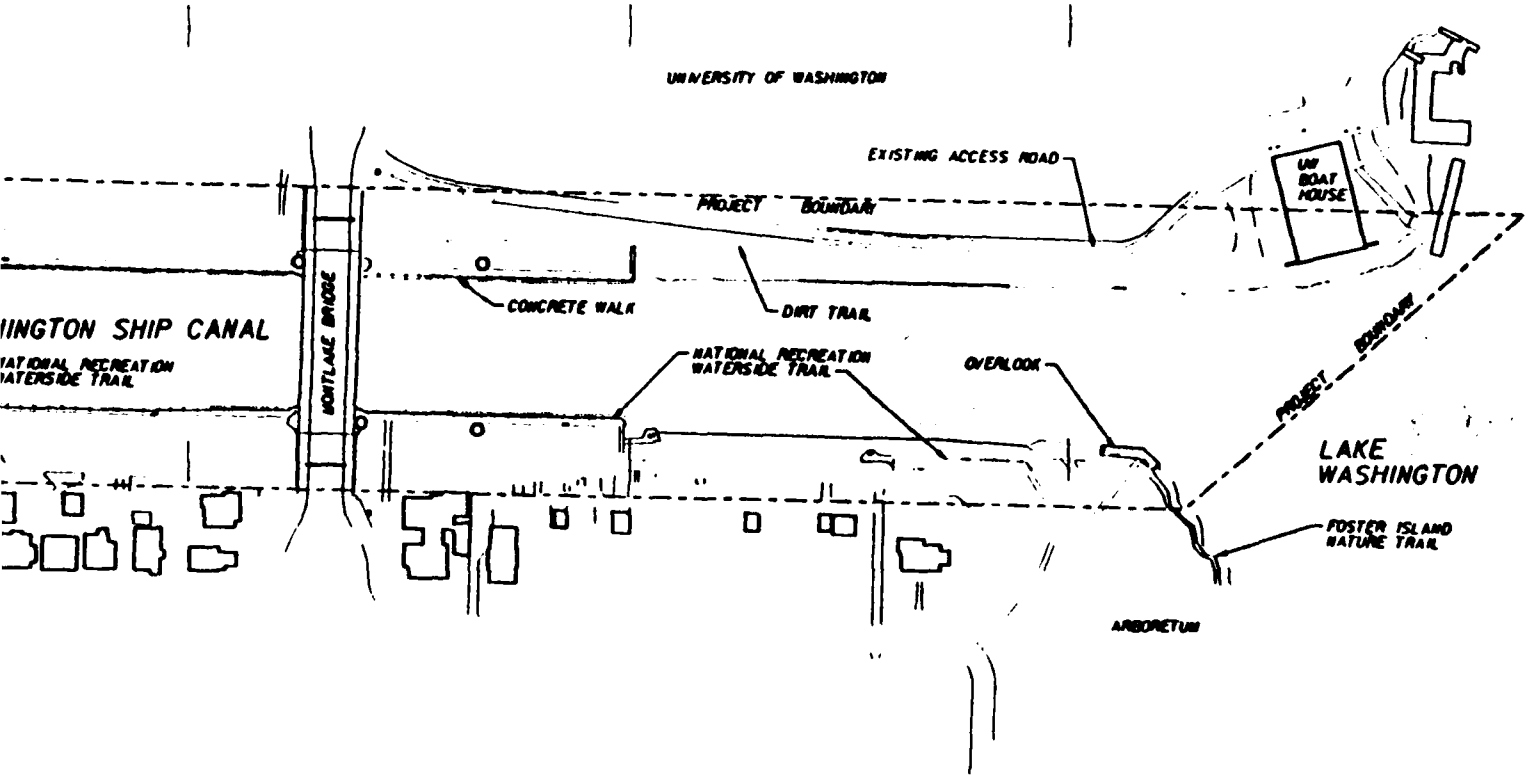

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LAKE WASHINGTON SHIP CANAL MASTER PLAN
MONTLAKE CUT

EXISTING CONDITIONS

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT

PLATE 5

SECTION 3 - FACTORS INFLUENCING RESOURCE USE, DEVELOPMENT, AND MANAGEMENT

3.1 GENERAL

A variety of social, economic, and institutional factors have been identified as influencing the selection and implementation of options for the future use, development, and management of project resources. These factors include socioeconomic characteristics, area of influence, project maritime traffic use, project visitation developments, recreation trends and needs, policy on new recreational developments, views of the public, and historic properties management.

3.2 HISTORIC PROPERTIES MANAGEMENT

The Lake Washington Ship Canal Historic District was nominated for inclusion on the National Register by the Washington State Historic Preservation Office on April 13, 1978; it was entered into the National Register by the Keeper of the National Register, Washington, DC on December 14, 1978. In order to preserve the integrity of the Lake Washington Ship Canal Historic District, significant elements, characteristics, or features of the district must be identified and maintained. Development must also be well planned and appropriately designed and constructed consistent with the Department of Interior Standards for Rehabilitation and in compliance with Section 106 of the National Historic Preservation Act 36 CFR Part 800 as determined by the State Historic Preservation Office. For complete documentation of the nomination and subsequent acceptance by the Advisory Council on Historic Preservation, see Appendix C.

The Historic District designation requires that the managing agency, in this case the Corps, protect and maintain the historic integrity of the district and the elements which make up that district. Integrity, according to the National Register criteria is defined by seven qualities: historic location; design; setting; materials; workmanship; feeling; and association, all of which the district property must possess. Prior to the implementation of any development or rehabilitation within the Historic District, consistent with the Secretary of Interior Standards, a determination of effect must be obtained from the State Historic Preservation Office, except for those items identified in the Programmatic Agreement (PA); see Appendix C.

In conjunction with the Secretary of Interior's Standards, specific Lake Washington Ship Canal Stewardship Standards have been developed for application in restoration and rehabilitation of the buildings at the Lake Washington Ship Canal Project. These standards are contained in Appendix E.

3.3 SOCIOECONOMIC CHARACTERISTICS

The economy of the Seattle area is dependent on many industries including aerospace equipment, ships, and trucks manufacturing; forest products industry ranging from the harvesting of saw logs to the manufacture of finished wood and pulp products; wholesale and retail trade; sea food distribution; tourism; commercial boating; and increasing pleasure boating industry; and most recently, computer software engineering.

3.4 AREA OF INFLUENCE

A 1975 visitor survey showed the primary market area for the project being within a 25-mile radius with 75 percent of project visitors residing in the Puget Sound region. Surveys conducted in 1985 and 1991/1992 cannot substantiate these findings. Newer survey formats interview only one person if in a group. Characteristically, this person is a local resident, many times bringing their visitors to the Locks. Survey formats do not question where each member in the group resides. Casual observations, however, indicate that the influence of the Lake Washington Ship Canal Project extends well beyond the Puget Sound region, attracting visitors from throughout Washington State as well as from other parts of North America, Europe, and Asia.

3.5 PROJECT MARITIME TRAFFIC USE

The original economic justification for the ship canal project was commercially-oriented marine traffic, but following World War II, increasing pleasure boat usage assumed an important role in the operation of the project. Table 3-1 shows the development of the marine traffic from 1985 to 1992. Past data shows an increase in pleasure boats using the Locks since the 1960's.

Table 3-1
Canal Use by Vessel Type, CY 1985 - 1992

CY	Vessel Traffic (tons)	No. of Pleasure Boats	No. of Commercial Boats
1985	1,843,781	60,325	16,990
1986	2,263,631	60,646	18,247
1987	1,994,381	67,083	17,273
1988	2,131,600	61,326	18,792
1989	2,406,720	60,706	17,578
1990	2,310,118	60,897	18,004
1991	1,935,876	59,256	15,625
1992	3,173,218[1]	51,805[2]	14,546[3]

Commercial usage of the Locks stabilized during the 1980's but is forecasted to decrease through the 1990's. Many of the industrial facilities that once lined the route of the ship canal are being forced to move to less costly areas in and out of the Puget Sound region.

[1] High tonnage attributed to transporting I-90 pontoons.

[2] Water conservation operations during drought conditions reduced the total number of lockages. Due to the increase in waiting time between lockages, the number of vessels locking through also decreased.

[3] Water conservation operations during drought conditions reduced the total number of lockages. Due to the increase in waiting time between lockages, the number of vessels locking through also decreased.

3.6 PROJECT VISITATION DEVELOPMENTS

3.6.1 Lake Washington Ship Canal

Visitation to the project which includes the Locks, Montlake Cut, and Fremont Cut, shows some decrease since fiscal year 1988 with no discernible pattern of increase or decrease in visitor hours (refer to Table 3-2). Data reflecting a decrease in visitors (Visits) may be the result of better reporting methods, such as the use of a computer program to calculate visitation rather than manual calculation, and better electronic equipment and placement for counting visitors. In 1987, projects were asked to calculate Visitor Days and Visitor Hours in addition to the Persons and Vehicles categories already being reported. Reporting of visitation changed from a calendar year basis to a fiscal year basis in 1988.

Table 3-2
ANNUAL VISITATION, FY 1988-1992

Fiscal Year	Visits[4]	Visitor Hours[5]
1988	1,137,600	2,203,200
1989	1,095,500	2,124,200
1990	1,030,500	1,999,000
1991	963,800	1,867,000
1992	996,100	1,928,900

[4] Visits is another term for number of people. Its definition according to the Waterways Experiment Station is, "one person recreating in one or more activities equals one visit."

[5] Visitor hours are calculated by multiplying the total number of people under Visits by the average number of hours spent on the project. The average number of hours spent on the project by all visitors is calculated from the survey data. One visitor hour equals one or more persons recreating in one or more activities for a total of 60 aggregate minutes.

Over a 13-year period, 1980-1992, visitation has slowly increased from a low of 603,300 visitors in calendar year 1981 to a high of 1,137,600 in fiscal year 1988.

By month, visitation was highest during May through September, with 65 percent of the visitors using the project during this time. The month of May usually experienced higher visitation than June due to opening of boating season in early May. Boats parade through the Locks enroute to Lakes Union and Washington and Puget Sound. July was normally the peak month, averaging 172,800 visitors during calendar years 1987-1992. August averaged 164,500 visitors during this same period. Monthly visitation rarely dropped below 24,000 which is in December, 32,000 being more the average.

3.6.2 Hiram M. Chittenden Locks, Carl S. English Jr., Botanical Garden, Fish Ladder

The area of the Locks provides a variety of environments for the public to enjoy. The locks themselves are unique in that they separate the freshwater lakes on the east side from the saltwater Puget Sound on the west side. On the north bank visitors enjoy the Carl S. English, Jr., Botanical Garden, expansive lawns for relaxing and viewing vessels locking through, a visitor center and gift shop, tours, historic buildings, and the locks themselves. Crossing over the locks and spillway dam to the south bank visitors can view the fish ladder or stroll along the shoreline in Commodore Park, managed by the city of Seattle Department of Parks and Recreation. Access to the Locks area is via both the north and south banks.

3.6.3 Montlake Cut

The Corps manages only the south bank of the Montlake Cut. The University of Washington manages the north bank. The south bank consists of a 0.38-mile-long gravel trail along the water starting from the Arboretum Trail on the east end, crossing under the Montlake Bridge, and westward to West Montlake Park, the latter being a popular area for fishing. Three wooden overlooks were constructed on the east end to beautify the area for visitors; a totem pole watches over the east end of the trail.

The Montlake Cut usually receives its primary use during the spring and summer months due to improving weather conditions and the increase in boats going

through the cut. The month of May normally experiences high visitation. The largest visitation day in May is for opening of boating season, which includes crew races. It is estimated that 30,000 visitors line both the north and south banks for this event.

In reviewing the 1991/1992 Pedestrian Visitation Survey data, activities included jogging, walking either individually or with dogs, bicycling, fishing, and picnicking. The survey techniques do not lend themselves to the conclusion that majority of the users reside within a 10-block radius despite the results. The data also does not decipher between users participating in multiple activities. It is likely that those walking their dogs are local residents. Joggers are also likely local residents or students from the University of Washington. Survey data did not confirm a high percentage of fishing probably due to the fact that surveyors were not in the area during normal fishing hours or surveying the appropriate meter. Activity uses are listed in Table 3-3.

Table 3-3
Activity Distribution in Percentages[6]

	Winter[7]	Spring	Summer	Fall
Residing within 10 blocks	23	21	13	5
Joggers	41	5	8	7
Walking	36	55	34	5
Bicycling	5	4	3	0
Picnicking	0	3	4	24[8]
Fishing	0	2	0	0

[6] Activity distribution for Montlake Cut is a rough estimate based on a manual review of the 1991\92 Pedestrian Visitation Survey. The survey had not yet been formally analyzed in 1993. Visitation statistics may only be 60 to 70 percent accurate due to limitations within the survey techniques.

[7] Winter visitation statistics cannot be considered valid. Less than 30 visitors were observed or surveyed.

[8] A high percentage of picnickers during the fall resulted from a single school group.

3.6.4 Fremont Cut

The Fremont Cut is going through a period of transition, from an underdeveloped, under-used industrial area to one of moderate commercial development. Visitation is expected to increase dramatically as the surrounding area is transformed from the former industrial type community to a more upscale office environment. Numerous offices have been and will be built adjacent to the Fremont Cut, on both the north and south banks, and all can be expected to contribute to an increase in visitation. This area has not had any type of pedestrian survey conducted. As the area develops, surveys will be scheduled to get a handle on use activity.

3.6.5 Overview and Summary

In general, the locks and the ship canal as a whole have demonstrated the ability to draw large volumes of visitors and can be expected to continue this trend. Water is a primary attractant and as shorelines in the region are consumed by private residences and businesses, visitors will continue to gravitate towards public water-resource areas, such as beaches and parks. Based on visitation figures for the city of Seattle, the Locks is the second most visited site in the city next to the Seattle Center, site of the 1962 World's Fair. Assuming no further development at the Locks, an average annual visitation of about 1.05 million visitors per year can be expected.

Corps personnel conducted a year-long Pedestrian Visitation Survey which began in the spring of 1991. Periodic surveys are required by ER 1130-2-430, Recreation Use Surveys, to update information on visitor composition and volume of use. Earlier surveys were conducted in 1975 and 1985. As of 1993, the 1991/1992 survey had not been analyzed. The Waterways Experiment Station is developing special instructions to analyze the data. Because the Lake Washington Ship Canal is primarily a pedestrian- and boat-only project, analysis cannot be conducted using the Visitation Estimation and Reporting System (VERS) which analyzes vehicle/passenger survey data. Analyzed data will provide a series of load factors for use in calculating visitation volumes for monthly reports. In addition, survey data will reveal the composition of visitors using the project, such as where they were from, how long

they were visiting the project, what activities they were engaged in, and any comments, complaints or recommendations they had for bettering a visitor's use of the project.

3.7 RECREATION TRENDS AND NEEDS

The Locks have been utilized by the public primarily as a sightseeing adventure.

At the Fremont Cut the Seattle Burke-Gilman Trail system has been extended and another local bicycle and pedestrian trail in place of the existing RR right-of-way is being planned.

At the Montlake Cut the University is proposing an extension of the Burke-Gilman Trail and the placement of campus art along the north bank.

3.8 POLICY ON NEW RECREATIONAL DEVELOPMENTS

The current policy of the Corps is to encourage non-Federal participation in the development and administration of existing Corps recreation areas. Current policy governing new recreation developments at completed projects stipulates that "development to meet increased demands for recreation facilities should be pursued with local funds, through lease agreements with local governments units, or other means. Operation, maintenance, and replacement costs are the responsibility of the local sponsor". However, where possible the Corps should participate in cost-shared projects with local interests. (Reference ER 1165-2-400, Recreation Planning, Development, and Management Policies, and related guidance for further discussion of Army policy on recreational development.)

3.9 VIEWS OF THE PUBLIC

Comprehensive planning recognizes the active participation and needs of all parties associated with public development. Coordination with Federal, State, and local agencies, private groups, and other organizations must be conducted on an ongoing basis in order to reach the development potential of a project. Just as project needs change with time so will specific development objectives. The Master Plan, to remain flexible enough to meet changing conditions and needs while still providing the necessary foundation for development,

must continue to perform as the vehicle through which future public and private views can be considered and acted upon.

Coordination meetings were conducted with the Seattle Engineering Department and University of Washington. Appendix D contains a list of public and private groups that were given the opportunity to review and comment on the draft Master Plan and includes copies of the letters received. Water management and fisheries resource management were areas that seem to be the focus of most of the comments. Addressing the issues surrounding these areas, however, are not within the scope of the Master Plan. Water management and fisheries resource management are more appropriately handled in the Lake Washington Ship Canal Project Water Control Manual and Operation Plans. Other comments pertaining to Lombardy poplars, ladders, and wildlife have resulted in changes to the document. Clarification was made on replacement of the aging Lombardy poplars. Comments pertaining to adjacent trail developments have been forwarded to the appropriate agency.

Comments received during the December 20, 1993 public meeting mainly focused on recreation issues. Corps responses to these comments are documented in the memo for record dated December 28, 1993 (see Appendix D for a copy).

SECTION 4 - LAND ALLOCATION, CLASSIFICATION, RESTRICTED WATER USE ZONES, AND HISTORIC PRESERVATION MANAGEMENT

4.1 GENERAL

The purpose of this section is to define and prescribe project land allocation, land classification, and restricted water use zones in accordance with ER 1130-2-435.

4.2 LAND ALLOCATION

Areas now owned in fee by the United States and controlled by the Corps normally are allocated to one of three categories: Project Operation, Recreation, or Fish and Wildlife. These allocations are based on the purpose for which they were acquired. At the Lake Washington Ship Canal Project, all lands were acquired for Project Operation. Project lands were acquired in accordance with the Rivers and Harbors Act of June 25, 1910 for construction and operation of the project for Project Operation (Navigation). Allocated land purpose takes precedence over any of the following classification categories.

4.3 LAND CLASSIFICATION

Allocated project lands are further classified to provide for development and resource management consistent with authorized project purposes. The classification process refines the land allocations to fully utilize project lands and considers public desires, legislative authority, regional and project specific resource requirements and suitability. Project lands are classified into one of the following categories, as shown on Plates 6, 7, 8, 9, and 10.

4.3.1 Project Operations

In many cases the majority of lands on Corps projects are classified under Project Operations. This classification category includes those lands required for the project structure, operations center, office, maintenance compound and other areas that are used solely for project operations. Additionally, this classification includes lands designated as private areas for the residence of the District Engineer. Visitor activities in residence areas are limited.

4.3.2 Recreation

Lands developed for intensive recreational activities by the visiting public, including developed recreation areas and areas for concession, resort, and quasi-public development.

4.3.3 Environmental Sensitive Areas

Lands of ecological significance. Public use is limited to those activities that do not conflict with preserving fish and wildlife habitat.

4.3.4 Multiple Resource Management

Lands managed for one or more of, but not limited to, these activities to the extent that they are compatible with the primary allocation.

(1) Recreation - Low Density. Low density recreation activities such as hiking, primitive camping, wildlife observation, hunting, or similar low density recreational activities.

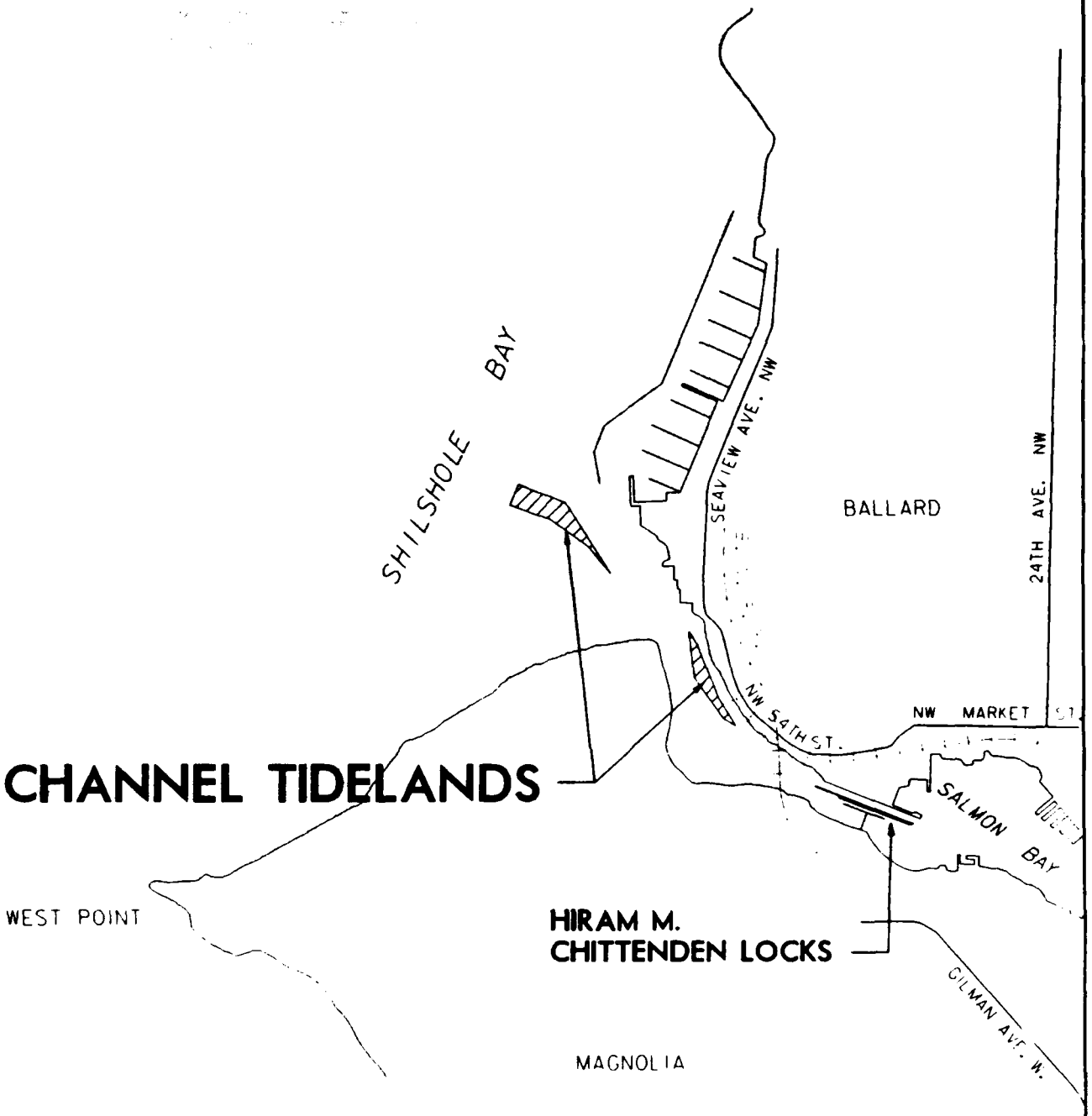
(2) Vegetative Management. Management activities for the protection and development of forest and vegetative cover.

4.3.5 Easement Lands

All lands for which the Corps holds an easement interest but not fee title. Planned use and management of easement lands will be in strict accordance with the terms and conditions of the easement estate acquired for the project.

4.4 RESTRICTED WATER USE ZONES

The Locks, Fremont Cut, and Montlake Cut are restricted water use zones. These zones are restricted to commercial and recreational navigation only. The city of Seattle is currently considering legislation prohibiting swimming in the ship canal. Fishing is allowed at the Fremont and Montlake Cuts.



LEGEND

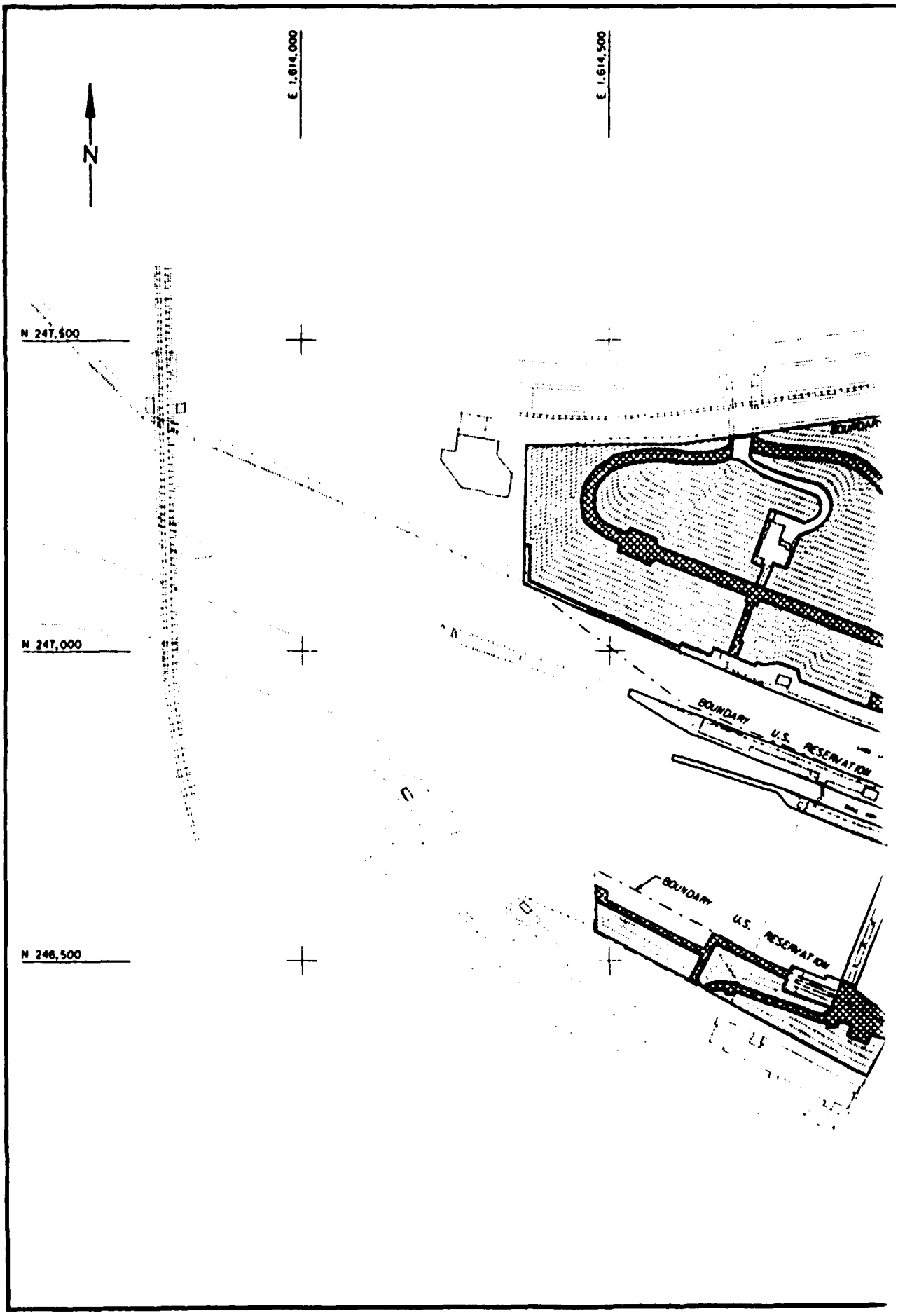
ENVIRONMENTAL SENSITIVE AREAS
(12.6 ACRES)

LAKE WASHINGTON SHIP CANAL MASTER PLAN
CHANNEL TIDELANDS

LAND CLASSIFICATION

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT

PLATE 6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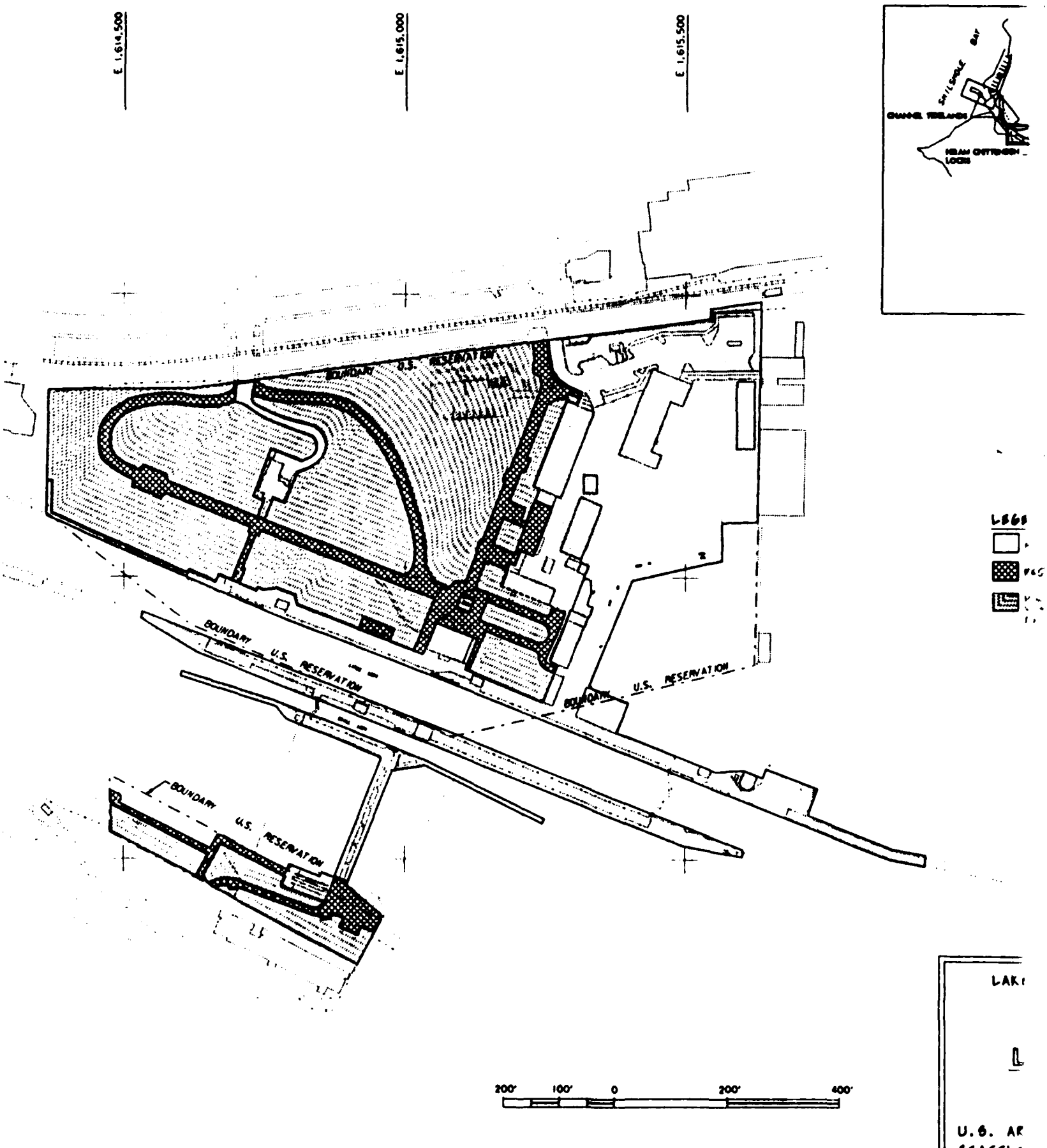
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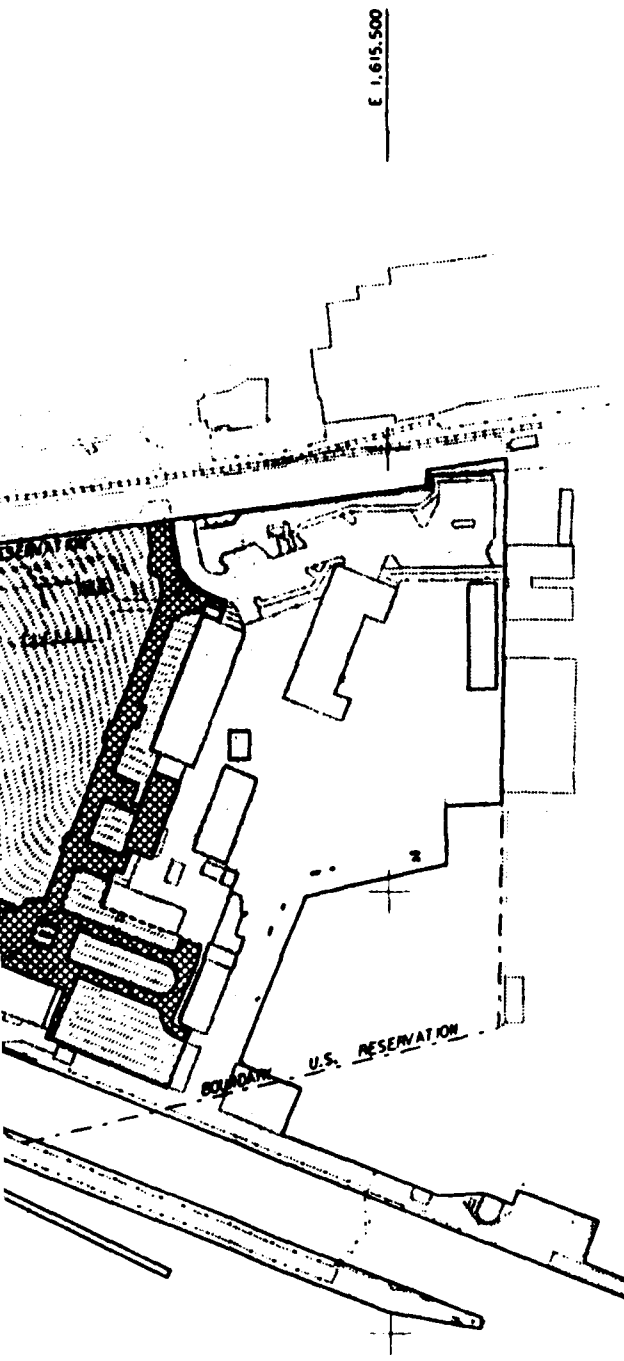
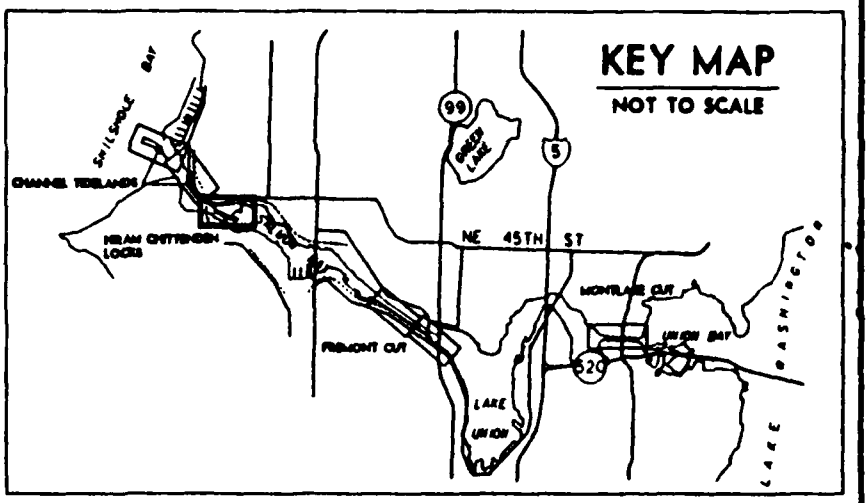




LEGEND

- PROJECT OPERATIONS (7.2 ACRES)
- RECREATION (1.7 ACRES)
- MULTIPLE RESOURCE MANAGEMENT: VEGETATIVE MANAGEMENT (7.3 ACRES)

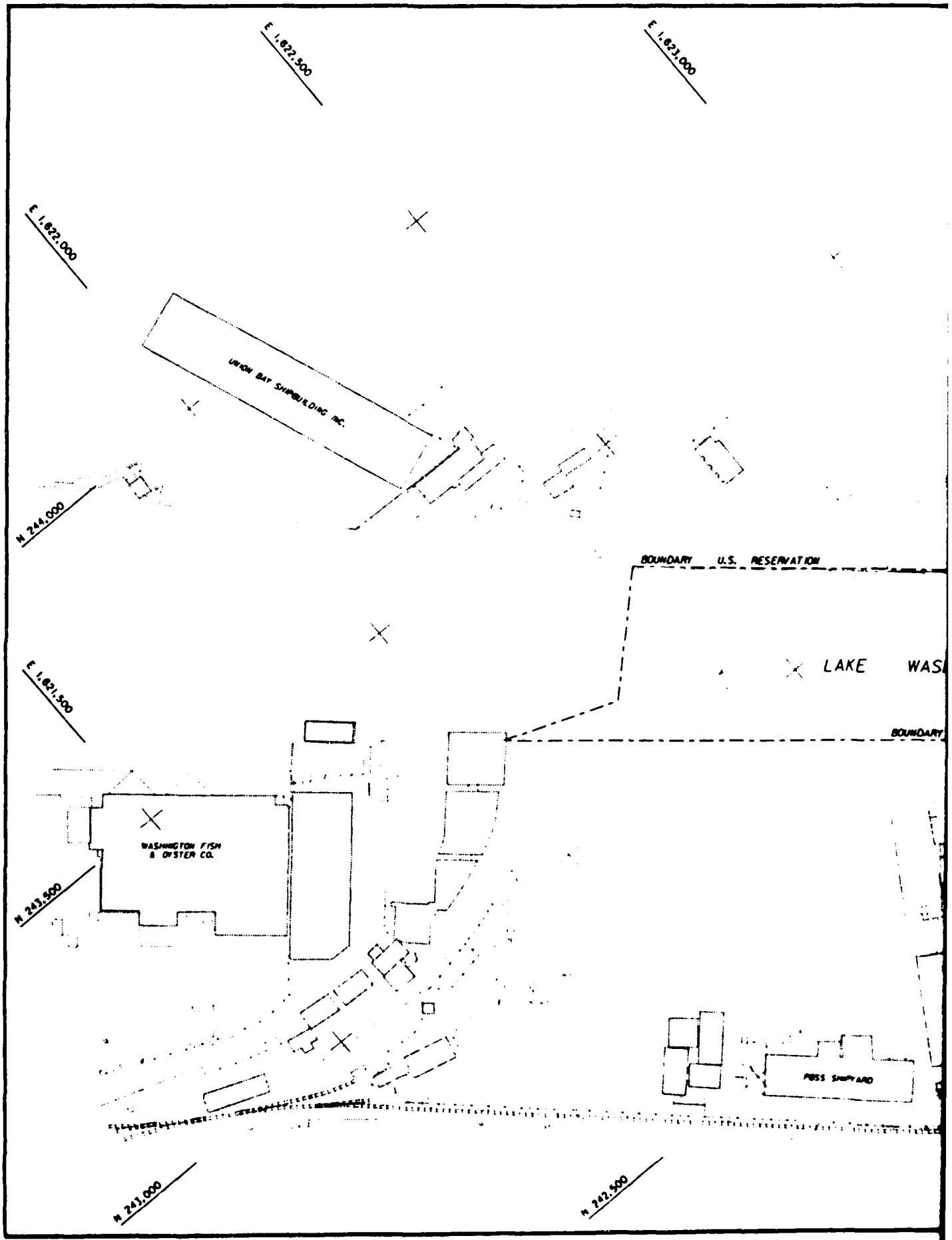
200' 100' 0 200' 400'

LAKE WASHINGTON SHIP CANAL MASTER PLAN
HIRAM M. CHITTENDEN LOCKS

LAND CLASSIFICATION

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT

PLATE 7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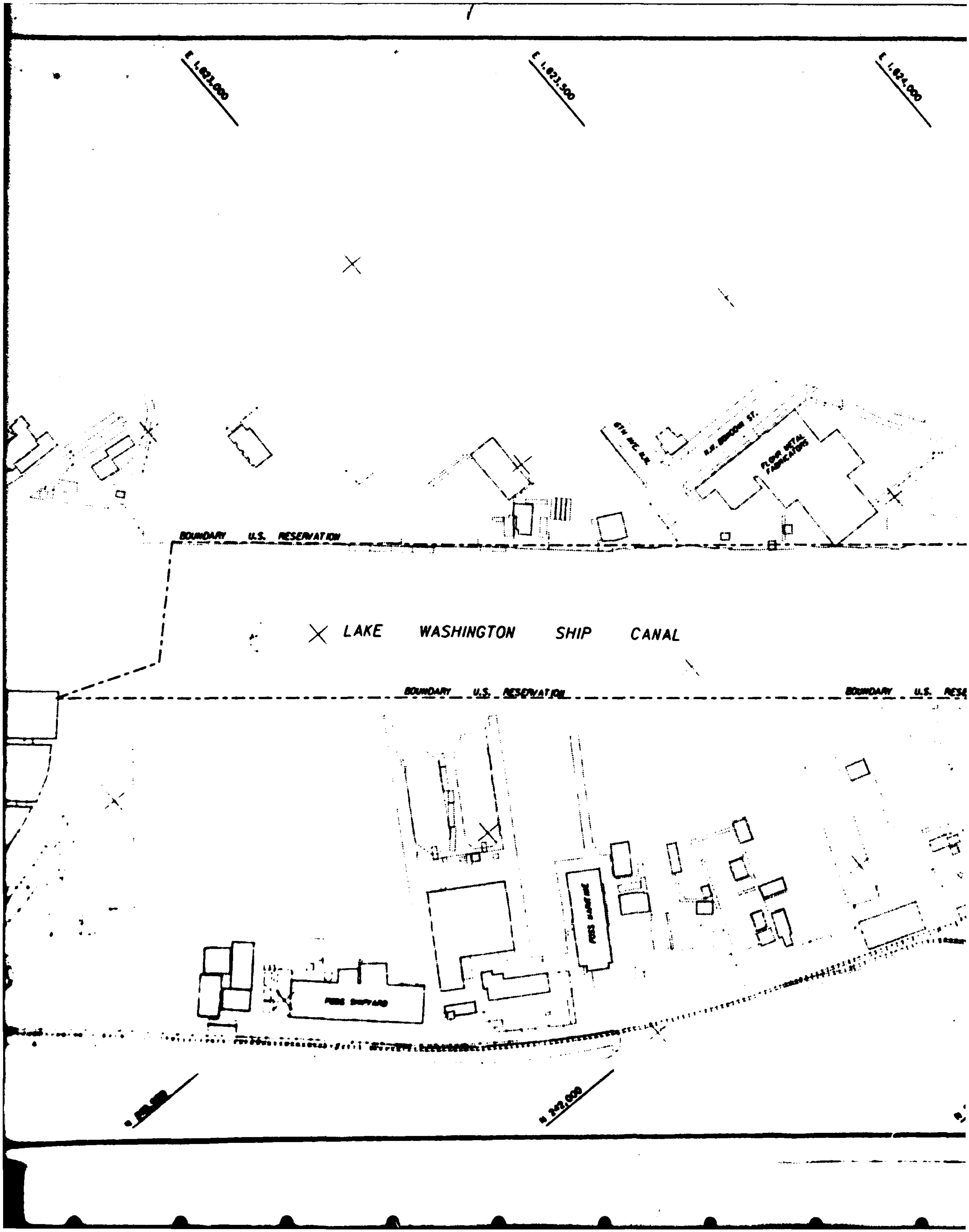
N 244,000
BOUNDARY U.S. RESERVATION
LAKE WAS
E 1,621,500
BOUNDARY
WASHINGTON FISH & OYSTER CO.
N 243,500
FOSS SHIPYARD
N 243,000
N 242,500



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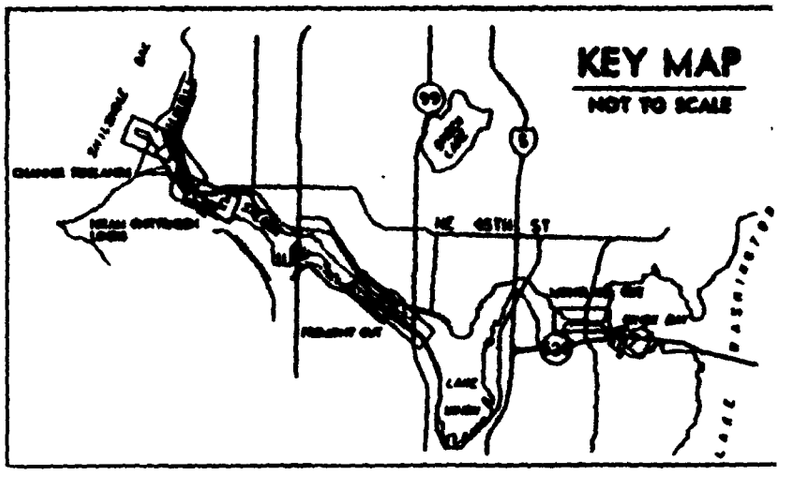
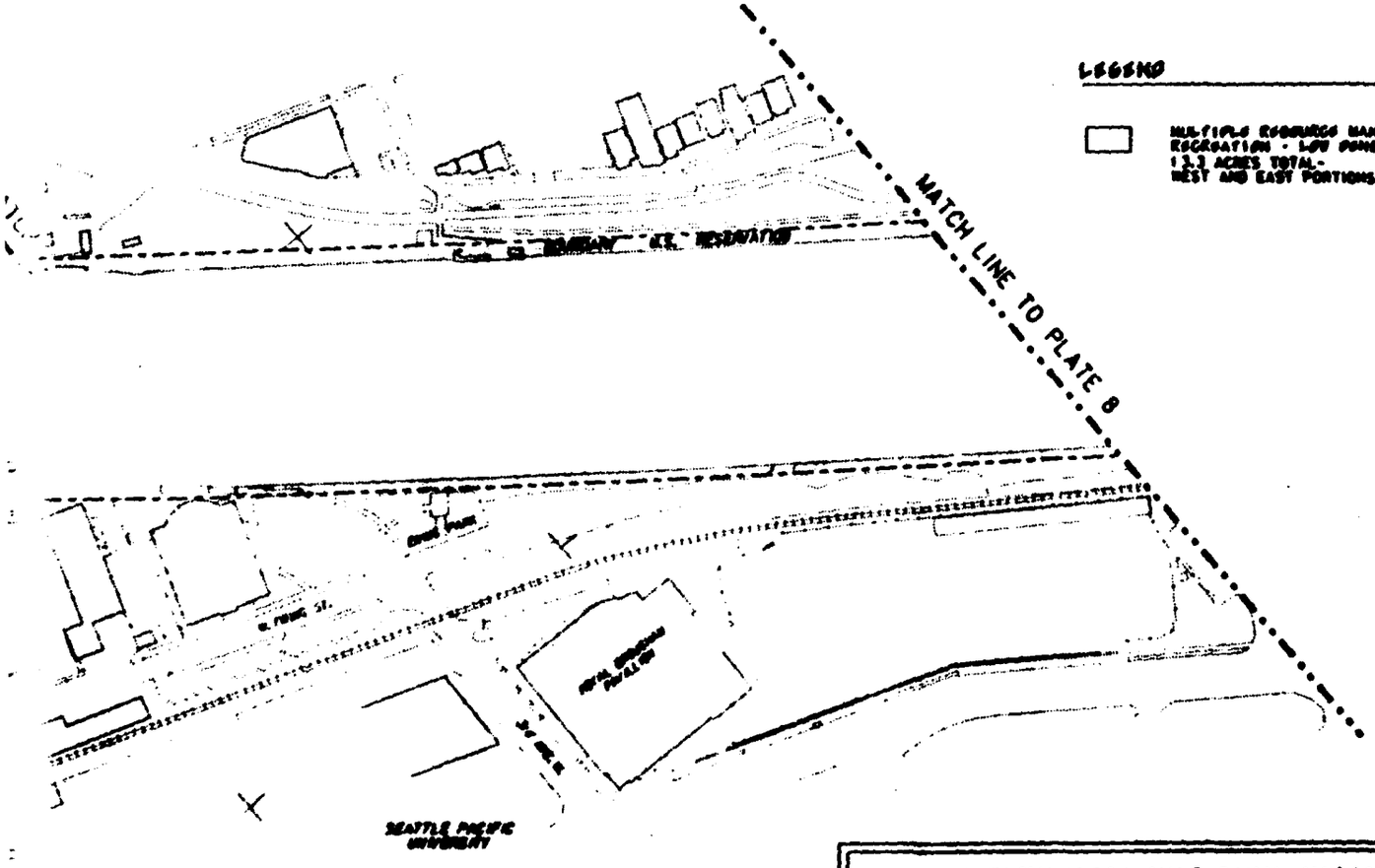
6TH AVE. N.W.
BOUNDARY U.S. RESERVATION
LAKE WASHINGTON SHIP CANAL
BOUNDARY U.S. RESERVATION
FOSS SHIPYARD
N 242,000


BOUNDARY U.S. RESERVATION
SEATTLE PACIFIC UNIVERSITY





LEGEND

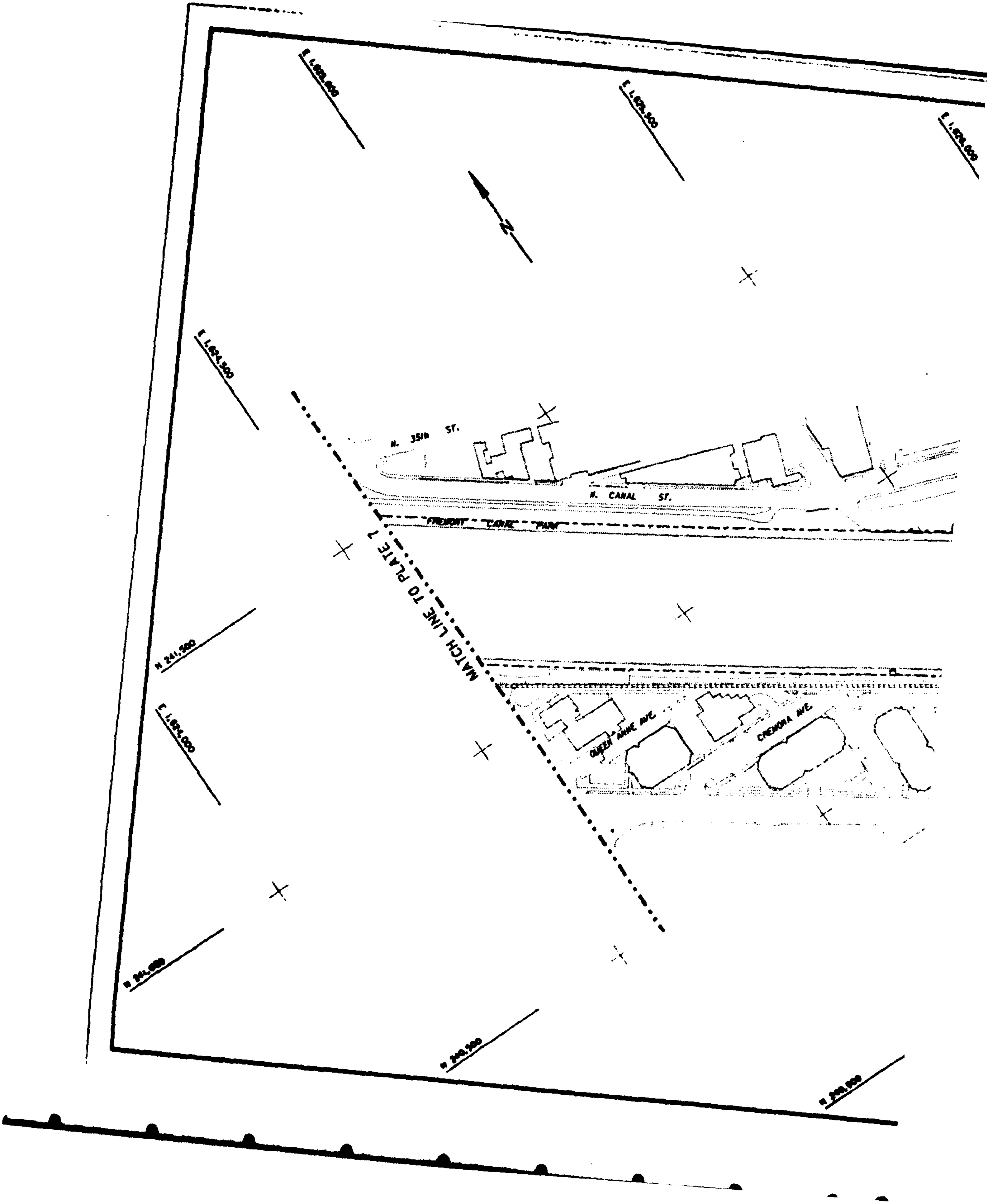
MULTIPLE RESOURCE MANAGEMENT: RECREATION - LOW DENSITY
13.2 ACRES TOTAL-
WEST AND EAST PORTIONS)

LAKE WASHINGTON SHIP CANAL MASTER PLAN
FREMONT CUT - EAST PORTION

LAND CLASSIFICATION

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT

PLATE 8



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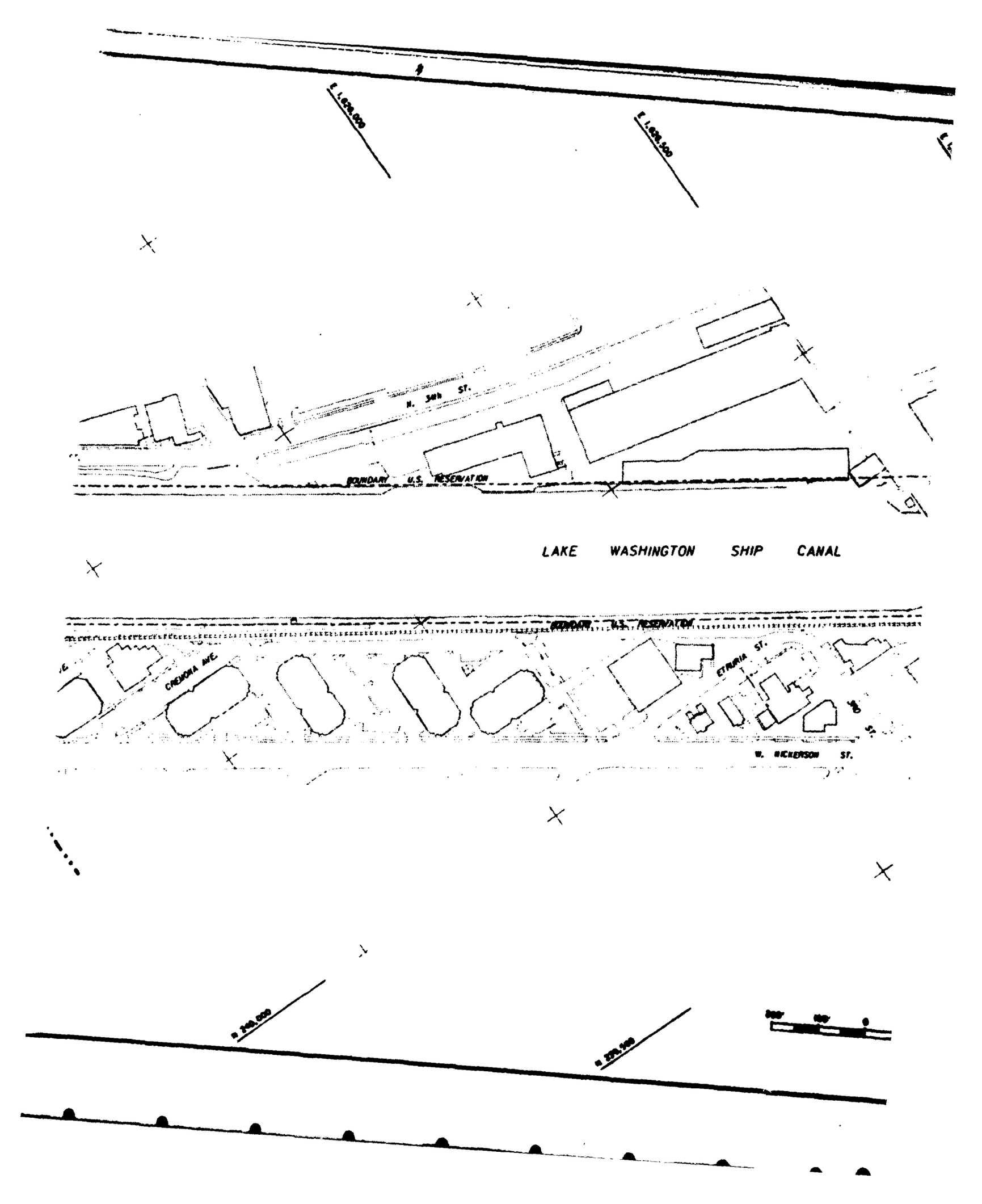
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LAKE WASHINGTON SHIP CANAL
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W. NICKERSON ST.
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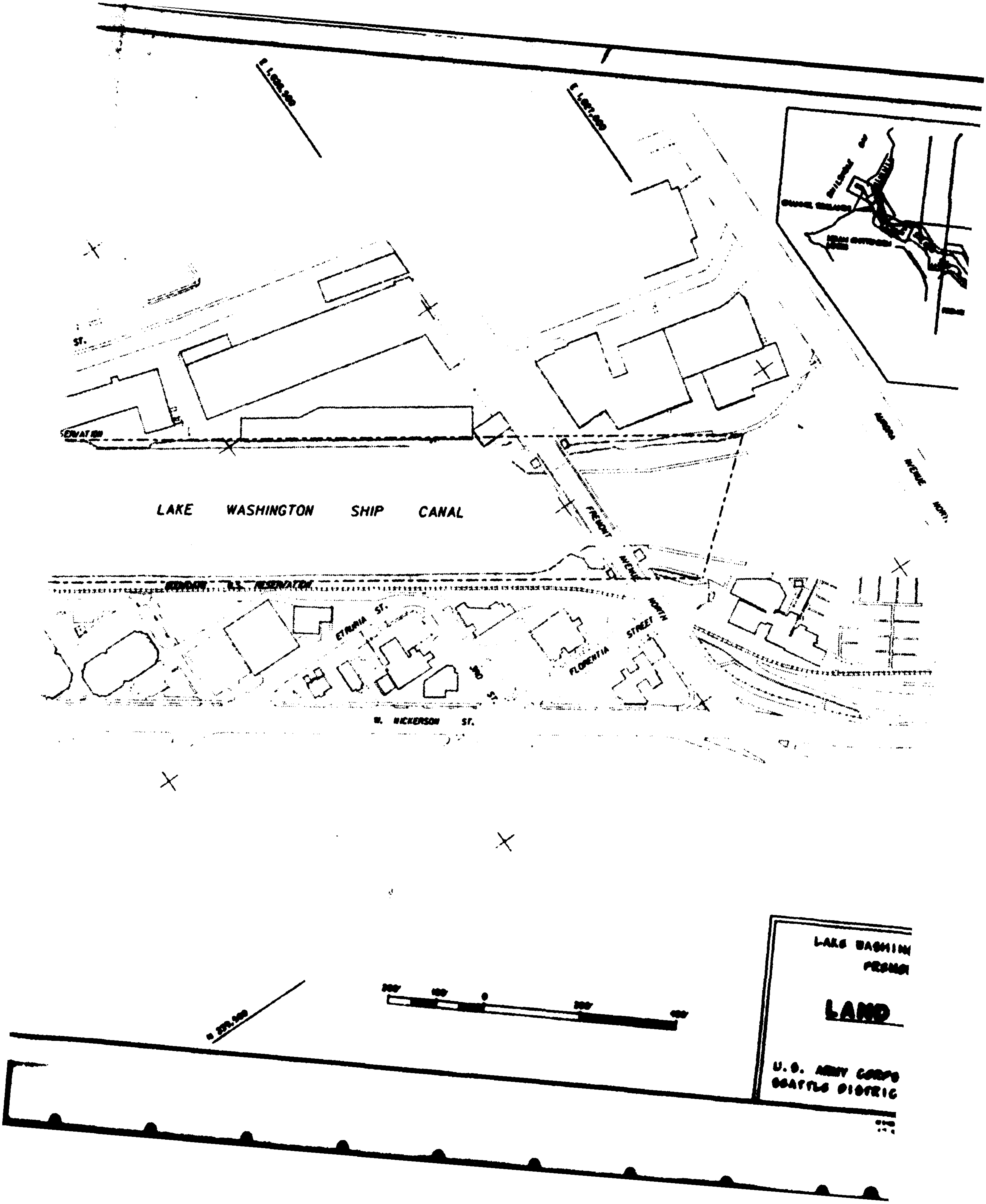
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STREET
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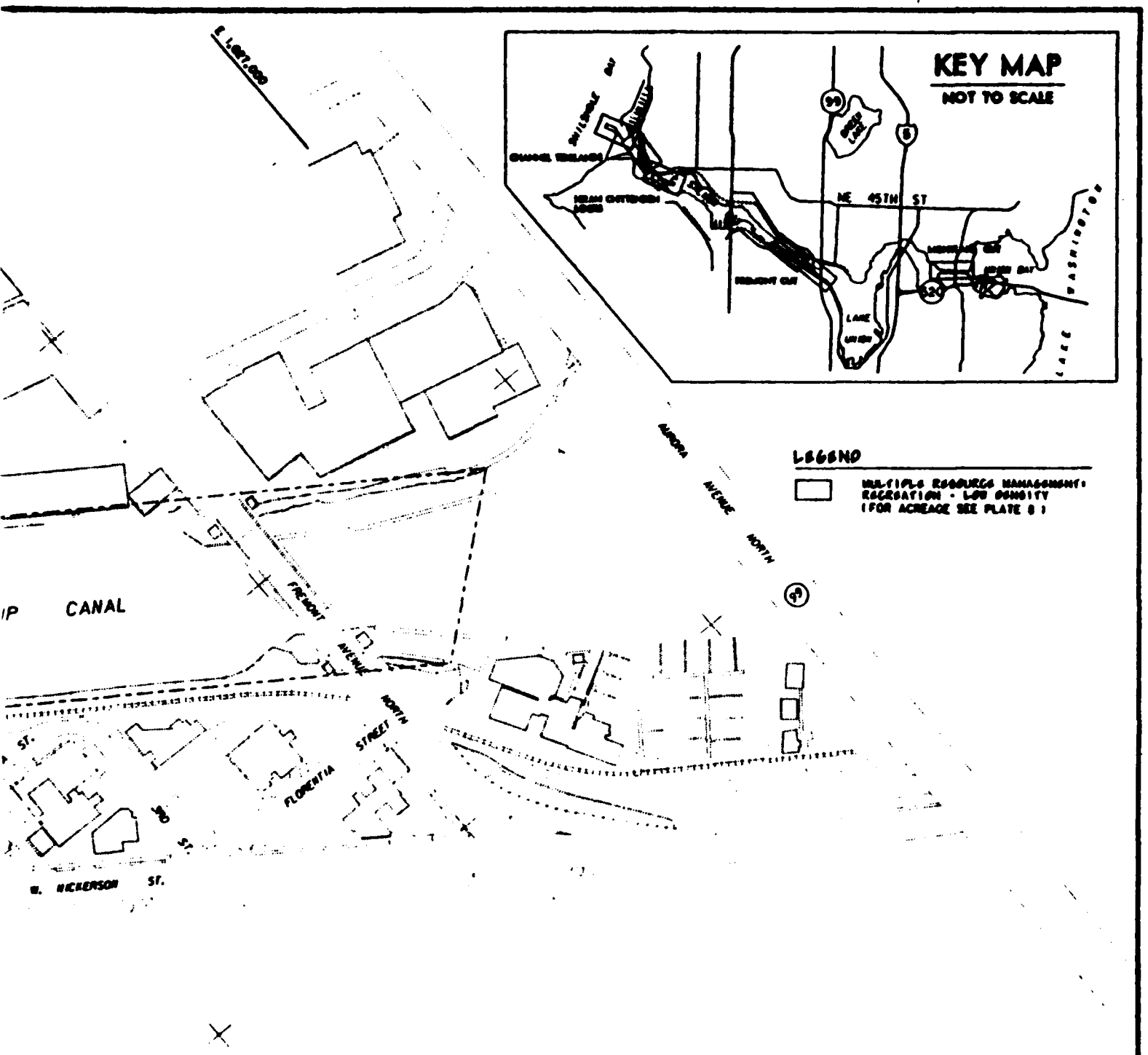
FREMONT
AVENUE
NORTH
LAND

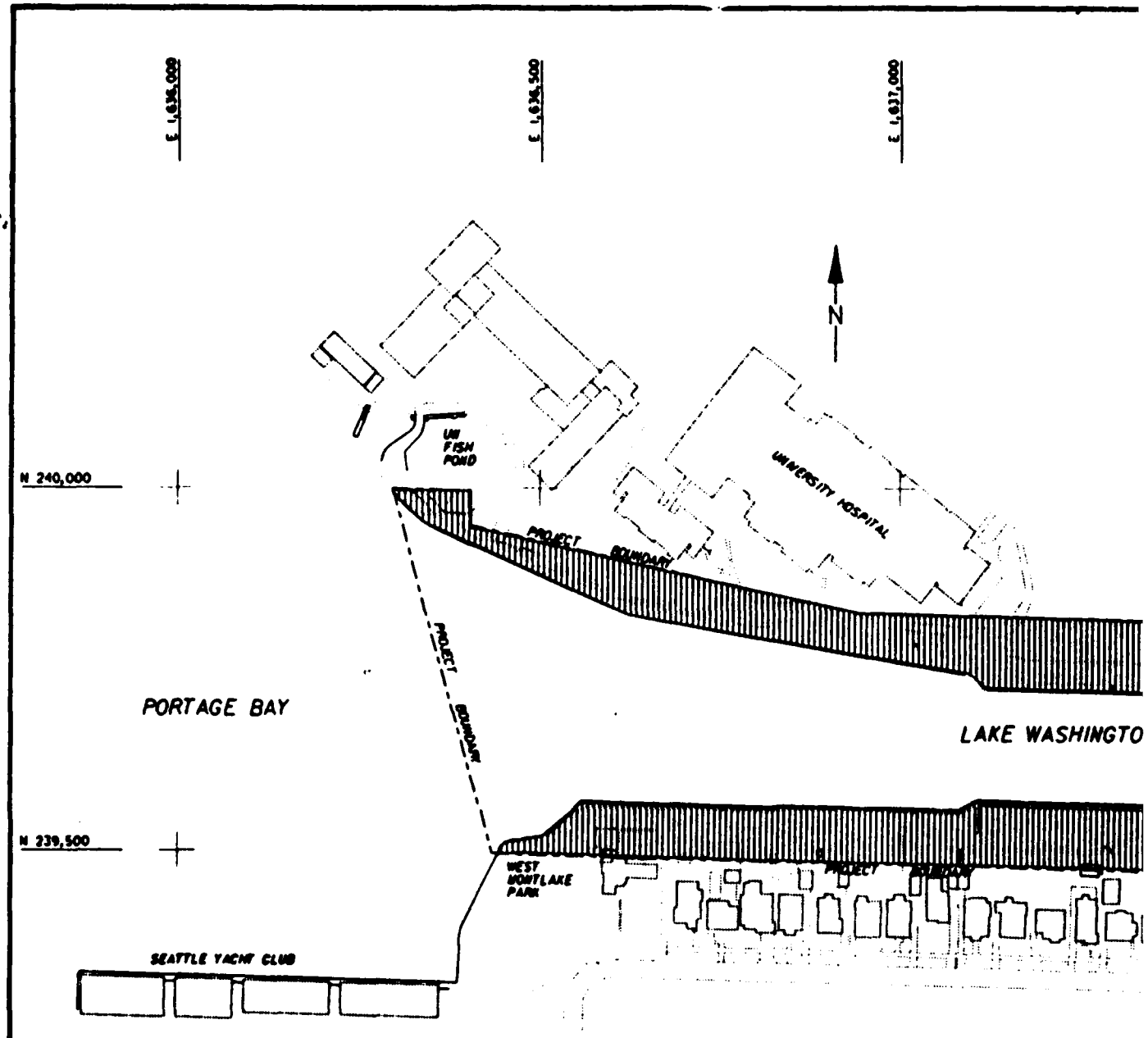


LAKE WASHINGTON SHIP CANAL MASTER PLAN
FREMONT CUT - EAST PORTION

LAND CLASSIFICATION

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT

PLATE 9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LAKE WASHINGTO
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WEST MONTLAKE PARK
PROJECT BOUNDARY
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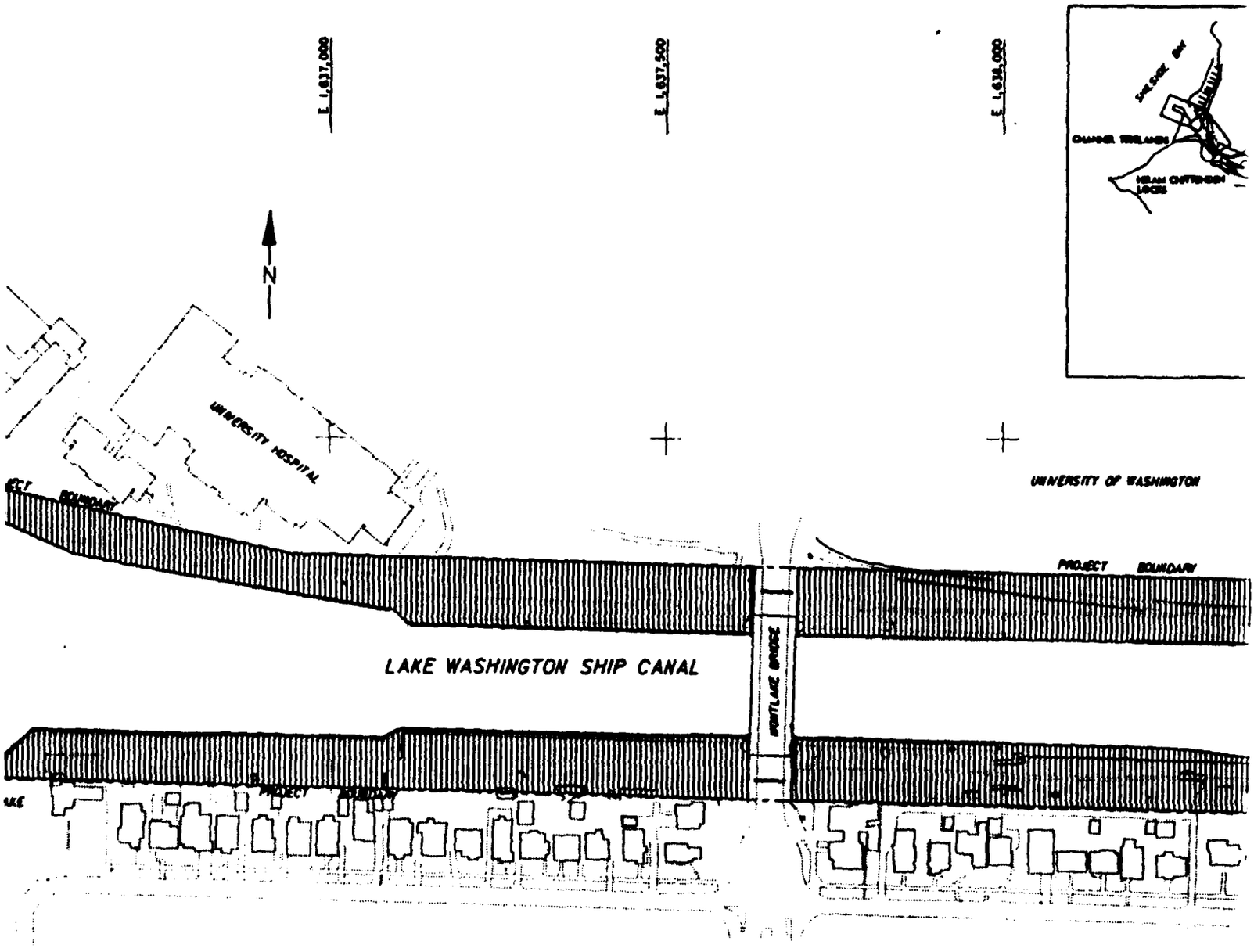

LEGEND

EASEMENT LANDS: MULTIPLE RESOURCE MANAGEMENT: RECREATION - LOW DENSITY (8.2 ACRES)

200' 100' 0 200' 400'

LAKE

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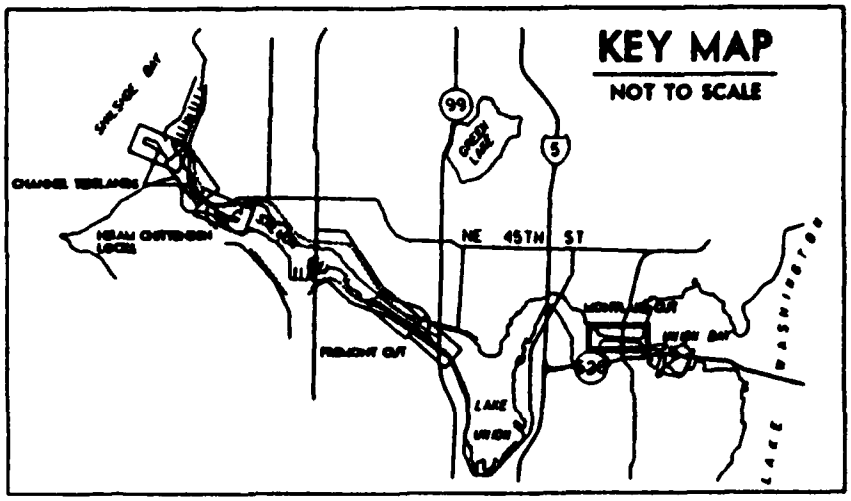
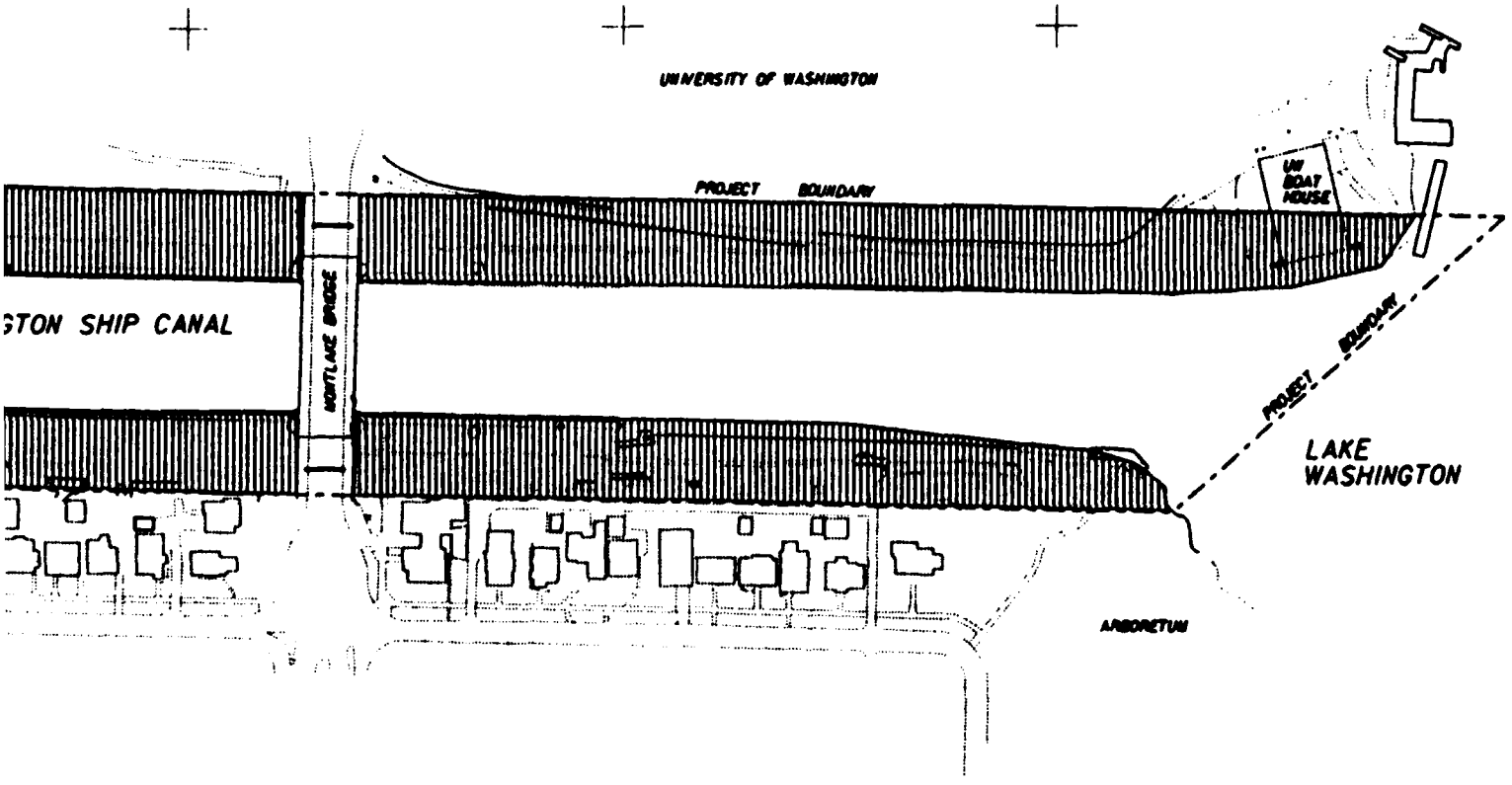




LEGEND

SANCTUARY LANDS: MULTIPLE RESOURCE MANAGEMENT: RECREATION - LOW DENSITY (19.2 ACRES)

200' 100' 0 200' 400'

LAKE WASHINGTON SHIP CANAL MASTER PLAN
MONTLAKE CUT

LAND CLASSIFICATION

U.S. ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT

PLATE 10

SECTION 5 - PROJECT OPERATIONS

5.1 GENERAL

Section 5 describes and analyzes lands and associated facilities and structures required for operation and maintenance and official residence in accordance with authorized project purposes. All such lands are classified Project Operations, as prescribed in Section 4, and include the locks and spillway dam, appurtenant structures, administration building, parking area, operations and maintenance area, and District Engineer's residence. (See Plate 7 for classification limits.)

5.2 LOCKS AND SPILLWAY DAM AND APPURTENANT STRUCTURES

5.2.1 Resource Objectives

(1) The primary objective is to continue to operate and maintain the locks, spillway dam, appurtenant structures, and residence in accordance with established and coordinated operating procedures and criteria.

(2) The secondary objective is to preserve the craftsman style used in the original construction of the locks, spillway dam, and accessory buildings.

5.2.2 Rationale

The Locks provide a navigation passage between the freshwater portion of the project at a mean elevation of 21 feet above sea level, and Shilshole Bay, the level of which is determined by tidal action. Depending on the tide, the lift provided by the locks varies from 6 to 26 feet. The spillway dam forms a 235-foot-long barrier between the small lock wall and the south shore and controls freshwater discharge to regulate the water surface elevation of the ship canal and Lakes Union and Washington. The original and new structures are listed in the Historic District designation (see Appendix C).

5.2.3 Land Management Measures

Develop programmatic agreement with the Advisory Council on Historic Preservation to rehabilitate the original structures, modify the control tower, and maintain in accordance with the Secretary of Interior's Standards and Guidelines for Rehabilitation (48 Federal Register 44716-42) and LWSC Stewardship Standards (see Appendix E).

5.2.4 Major Constraints

None.

5.2.5 Description

(1) The Locks and Spillway Dam, Guide Piers, and Waiting Piers were constructed in 1916. The design of these items was accomplished by the Seattle District. The large lock is 825 feet long and 80 feet wide. Separated by a concrete wall from the large locks, the small lock is 150 feet long and 30 feet wide. The spillway dam has six 32-foot-wide steel radial gates. Each gate is raised and lowered by individual electrically operated gate hoists. Waiting and guide piers are constructed of treated timbers.

(2) The Operating Houses, nos. 1, 2, 3, and 4 were constructed in 1914. Nos. 1 through 3 are on the north lock wall. No. 4 is situated on the middle lock wall. Each are single-story structures of reinforced concrete measuring approximately 14 x 21 feet containing rectilinear domed roofs, and wrap-around corner window bays with transom grilled. Operating house nos. 1, 2. and 3 were originally built to perform lock controls and are still operable; however, they have been functionally superseded by a central control tower.

(3) The Control Tower was constructed on the middle lock wall in 1969. It provides central controls for the small and large locks, and the spillway dam. The base of the tower covers a 19- x 24-foot area and is constructed of reinforced concrete. The observation level is a glass-enclosed steel-frame overhang.

(4) The Emergency Dam Hoist House was constructed in 1922. It is a single story structure of reinforced concrete measuring 20 x 20 feet exclusive of bayed south elevation, and contains emergency dam hoists and saltwater barrier air compressor. Its entablature and base construction is classical tradition which conforms to patterns established by the original group of accessory buildings.

5.2.6 Land Classification

Project Operations.

5.3 LOCK WALLS AND SPILLWAY DAM WALKWAY.

5.3.1 Resource Objectives

(1) The primary objective is to maintain safe access to the lock walls and facilities on both north and south shores of the Hiram M. Chittenden Locks.

(2) The secondary objective is to preserve the craftsman style used in the original construction of the locks and spillway dam.

5.3.2 Rationale

The locks and spillway dam are traversed by a pedestrian walkway which links the south shore, via the south entryway, to the main project grounds on the north shore. The lock walls and spillway dam walkway serve as a means to operate and maintain the facilities on both shores. The lock walls have become popular visitor attractions for viewing the workings of the locks and the passage of pleasure and commercial vessels. To a lesser extent, the spillway dam walkway also serves as a vantage point for visitors observing fish which mill around waiting to pass into Salmon Bay on their way upstream. These facilities are an important and unique recreational and interpretive opportunity available to the visiting public. These structures are listed in the Historic District designation.

5.3.3 Land Management Measures

Develop programmatic agreement with the Advisory Council on Historic Preservation to rehabilitate the original structures and maintain in accordance with the Secretary of Interior's Standards and Guidelines for Rehabilitation and LWSC Stewardship Standards.

5.3.4 Major Constraints

None.

5.3.5 Description

The lock walls and spillway dam walkway were constructed with the original structures. These provide the only access along the locks and dam.

5.3.6 Land Classification

Project Operations.

5.4 ADMINISTRATION BUILDING.

5.4.1 Resource Objectives

(1) The primary objective is to conduct administrative and clerical activities integral to operation of the Lake Washington Ship Canal project.

(2) The secondary objective is to preserve the second renaissance revival style architectural character used in the original construction.

(3) The tertiary objective is to encourage continued public access to the Administration Building lobby and to the basement as a means to foster appreciation of the unique second renaissance revival style architectural character and qualities of the building and of the purpose and operations of the dewatering pumps located in the basement.

5.4.2 Rationale

The Administration Building houses the offices of the Project Manager, Project Engineer, and chiefs of the Natural Resources and Administration sections, plus clerical offices. A public lobby is located on the first floor. Switchboards and lock dewatering pumps are located in the basement. Architectural plans and elevations for the building were prepared in 1914 by Carl F. Gould of the eminent local firm of Bebb and Gould. The building has been only superficially altered, mostly on the interior, and some restoration and upgrading has been accomplished over time, in accordance with the Secretary of the Interior's standards for rehabilitation is ongoing. The Administration Building is a significant part of the Historic District designation. It is appropriate that this building be accessible for limited public viewing while serving its primary operational purpose. Visitors are allowed, unescorted, to view the lobby. Interpretive signs explaining the purpose and operation of the dewatering pumps are currently displayed in the basement, and guided tours in past years have included the viewing of the pumps.

5.4.3 Land Management Measures

Develop programmatic agreement with the Advisory Council on Historic Preservation to rehabilitate the original structures and maintain in accordance with the Secretary of Interior's *Standards and Guidelines* for Rehabilitation and LWSC Stewardship Standards.

5.4.4 Major Constraints

None.

5.4.5 Description

The Administration Building was constructed between 1914 and 1915. The solitary initial multi-purpose public building is the focal point of the reservation. Its second renaissance revival style sits on a rectangular foundation area measuring 47 x 67 feet. It is a multi-story structure, including two upper stories and a basement, constructed of reinforced concrete with tile-clad hipped roof with central deck. The basement contains the pumping plant for dewatering the locks for annual repairs and

the original electrical distribution panel (which is intact but functionally superseded). The ground story has cross-axial corridors with central lobby space and principal offices in each corner. The lobby opens up to the second story gallery. It features an oval ceiling light of textured and colored glass, and terrazzo floor with geometric trim of Alaska and verde antique marble. Interior walls and ceilings, including coved cornices, are plaster-finished. Woodwork, including door and window trim, baseboards, pilasters, ogee wall panel moldings, and Ionic stave columns flanking the main entry vestibule, is varnished oak. The second story storerooms open onto the lobby.

Each exterior elevation has tripartite organization. Walls are topped with a decorative concrete parapet. Second story windows are covered with cast-iron grilles. Ground story arcuated windows and central pedimented doorways are in panels of concrete set off from the major wall surface by special texturing with a bush hammer. The main entry on the southwest, or waterway face, is recessed behind a two-story portal arch and surrounded by plate glass fronted by cast iron grilles. Surmounting either bulkhead of the concrete steps of this entrance are light globes mounted on fluted concrete drums with dolphin-supported bronze fittings. These are noteworthy because they are the only external lighting fixtures on the reservation which have remained wholly intact.

The building has been only superficially altered, mostly on the interior. The building's basement pumping plant is open to the public on guided tours.

5.4.6 Land Classification

Project Operations.

5.5 PARKING AREA

5.5.1 Resource Objective

Manage the parking area for weekday use by government employees and for overflow parking by evening and weekend project visitors.

5.5.2 Rationale

Parking area was created to reduce vehicular parking conflicts with operation activities in the Operation and Maintenance area. Parking spaces must be reserved for government employees during normal weekday duty hours. Parking by project visitors can only be accommodated during evening and weekend periods.

5.5.3 Land Management Measures

None.

5.5.4 Major Constraints

None.

5.5.5 Description

The employee parking area was constructed along with the North Entryway. The parking area provides approximately 50 spaces for government employee private vehicles during normal duty hours.

5.5.6 Land Classification

Project Operations.

5.6 OPERATIONS AND MAINTENANCE AREA.

5.6.1 Resource Objectives

(1) The primary objective is to conduct necessary operation and maintenance functions integral to the operation of the project.

(2) The secondary objective is to preserve the classical tradition conforming to the utilitarian style of the original group of accessory structures.

5.6.2 Rationale

The operations and maintenance area is required for project operations and maintenance purposes. This area includes industrial, warehouse, garage and related operational buildings and uses which are identified in the Historic District designation. The area will continue to be off limits to the general public.

5.6.3 Land Management Measures

Consolidate storage and remove unnecessary items from the area. Utilize area for operations activities. Ensure efficient use of paved areas for access and circulation of operations equipment. Encourage employees to park in the employee parking area to eliminate potential conflicts and safety hazards with operation activities. Develop programmatic agreement with the Advisory Council on Historic Preservation to rehabilitate the original structures and maintain in accordance with the Secretary of Interior's Standards and Guidelines for Rehabilitation and LWSC Stewardship Standards.

5.6.4 Major Constraints

None.

5.6.5 Description

(1) The Mechanics Shop was constructed in 1914. It is a single story reinforced concrete structure with a built-up roof and a foundation area measuring 18 x 56 feet. It features base mold, entablature and other details in the classical tradition conforming to the simple utilitarian style of the original group of accessory buildings. Currently this building is used as storage and project personnel locker room.

(2) The Transformer House was constructed in 1914. It is a single story reinforced concrete structure with a built-up roof and a foundation area measuring 25 x 33 feet. It contains electrical equipment. It is the only one of the original accessory buildings to have a compass orientation rather than conforming to the grid perpendicular to the waterway. The openings of the west facade are outlined with continuous plain moldings under segmental arch heads. It features entablature, belt

molds and base in the classical tradition conforming to the simple utilitarian style of the original group of accessory buildings. The central doorway is protected by a pedimented hood.

(3) The Warehouse No. 1 building was constructed in three parts. The Office and Shop building was completed in 1916; the 7 stall garage was completed in 1922. In 1945, the two structures were combined by covering the space between them to form the existing structure. The Warehouse is a two story reinforced concrete structure with a built-up roof and a foundation area measuring 36 x 80 feet. It features details in classical tradition conforming with the established pattern.

(4) The Machine Shop was constructed in 1916. It is a two story reinforced concrete structure with a built-up roof and a foundation area measuring 30 x 85 feet. It features entablature, belt molds and base in classical tradition conforming to the simple utilitarian style of the original group of accessory buildings.

(5) The Oil House was constructed in 1916 and expanded in the 1930's. It is a single story reinforced concrete structure with a built-up roof and a foundation area measuring 14 x 22 feet. Two 300-gallon fuel tanks remain abandoned in place. It features exterior details in classical tradition conforming to the simple utilitarian style of the original group of accessory buildings.

(6) The Steel Shop was constructed in 1941. Currently, it is used as the welding and plumbing shops, lunch and locker rooms, and offices for the chief of maintenance and yard crew foreman. It is a high ceiling single story metal-clad steel frame structure with a built-up roof and a foundation area measuring 40 x 102 feet.

(7) The Warehouse No. 2 building was constructed in 1941. It is a high ceiling single story metal-clad steel frame structure with a built-up roof and a foundation area measuring 50 x 160 feet. It is used as storage and office space and contains a second story loft.

(8) The District Vehicle Garage was constructed in 1941. It is a single story metal-clad steel frame structure with a built-up roof and a foundation area measuring 50 x 160 feet. It serves as the district garage and maintenance shop. The paint spray booth and wash rack are recent additions.

(9) The Boathouse was constructed in 1949. It is a wood frame structure with a foundation area measuring 55 x 79 feet. The exterior is finished in stucco and painted grey to achieve certain compatibility with neighboring concrete structures. It houses Corps vessels used in snagging and dredging operations. This area has also been used for mooring Seattle fire boats. In 1992 this area was used as mooring for historic vessels, to celebrate the 75th anniversary of the Locks. The Duwamish has been moored there on a temporary basis since at least 1986.

(10) The Greenhouse was constructed before 1941 and rebuilt in 1949. It is a single story wood frame structure with a double-pitched roof. It has a foundation area measuring 15 x 15 feet. The wood frame structure is adjoined by a 15 x 34 foot glass panel structure.

(11) The storage shed was constructed in the late 1980's. Its foundation area measures 25 x 125 feet. It is located adjacent to the east boundary and not highly visible. Its compass orientation does not conform with the majority of the maintenance complex.

(12) Portions of the operations and maintenance paved areas have been used for long-term stockpile of materials and equipment as well as employee parking.

5.6.6 Land Classification

Project Operations.

5.7 JAMES B. CAVANAUGH HOUSE AND GROUNDS

5.7.1 Resource Objectives

(1) The primary objective is to the preserve the original spirit of craftsman style bungalow construction typified by the James B. Cavanaugh House while maintaining the house as official residence of the District Engineer.

(2) The second objective is to maintain buffer planting which enhances privacy from the public.

5.7.2 Rationale

The James B. Cavanaugh House, constructed in 1913, was the first permanent building to be completed at the Locks. Originally the lockskeeper's house, the house was first used as official residence of the Seattle District Engineer in 1967. In a bronze plaque ceremony on December 10, 1974, the residence was dedicated in honor of Colonel James B. Cavanaugh. The building is an important example of the craftsman style bungalow construction and should be maintained near original design in keeping with its inclusion in the historic district. Buffer plantings maintain a physical and a psychological separation between public areas of the gardens and the immediate environment of the residence.

5.7.3 Land Management Measures

Develop programmatic agreement with the Advisory Council on Historic Preservation to rehabilitate the original structure, modify any new features, and maintain in accordance with the Secretary of Interior's Standards and Guidelines for Rehabilitation and LWSC Stewardship Standards.

5.7.4 Major Constraints

None.

5.7.5 Description

(1) James B. Cavanaugh House was constructed in 1913 as a residence for the Lockskeeper. It was the first permanent building completed on the reservation. Two sheets of drawings for the building among project records stored on the site are dated December 1912. Not prepared by local architect Carl F. Gould as once supposed, the plans evidently were the concept of C. A. D. Young, "Junior Engineer". A simple, rectangular construction with stuccoed hollow tile walls. Originally the structure measured 26 x 35 feet. Two stories with shingled gable roof and overhanging eaves with exposed rafters. Certain details apparently were derived from the craftsman style Bungalow. Its features are: cross-axial frontal gable; shed-roofed rear dormer; brick end chimneys with corbelled caps; porches have hipped roofs with shaped outriggers; and single and coupled double-hung sash windows with nine lights over one.

(2) In 1966 the interior was remodeled; partitioning was revised and one of the fireplaces was removed; and bathroom, bedroom, and carport were added. In the early 1970's, the "Backus" room was added. In 1984, the carport was made into a garage. In 1986, a bath was added in the basement and the kitchen was remodeled. Externally, the upgrading was discreet. Among the results were: roof cover of composition shingles; gutters and downspouts; conversion of front ground story windows to bay windows within original openings; and addition of a bedroom and carport to the rear pantry and stoop. In 1992 and 1993 slate roofing was reinstalled on the house.

(3) In 1967 the house was dedicated as the official residence of the Seattle District Engineer and renamed in honor of Colonel James B. Cavanaugh.

5.7.6 Land Classification

Project Operations.

5.8 FISH LADDER

5.8.1 Resource Objective

Manage and operate the fish ladder for migration of anadromous fish between Puget Sound and the rivers and streams within the Lake Washington basin.

5.8.2 Rationale

The fish ladder at the locks provides a favorable route around the dam and locks. The facility is managed and operated in cooperation with the Washington Departments of Fisheries and Wildlife, Muckleshoot Indian Tribe, and Suquamish Tribe.

5.8.3 Land Management Measures

None.

5.8.4 Major Constraints

None.

5.8.5 Description

Anadromous salmon, steelhead, and cutthroat trout utilize the Lake Washington Ship Canal as a migratory route between freshwater habitat, in the Lake Washington basin, and the ocean. Anadromous fish species passing through the canal include spring, summer, and fall chinook salmon, steelhead, sea-run cutthroat trout, coho salmon, and sockeye salmon. The fish ladder was originally constructed with the locks and dam as a means of providing upstream fish passage around the locks and dam. In 1976, the fish ladder was rehabilitated to meet current fish passage technology. Downstream fish passage is provided by the locks, spillway, and fish ladder. Upstream adult fish passage is provided by the locks and fish ladder. The fish ladder is also utilized to by fisheries resource managers for research. Water used to operate the fish ladder is primarily provided by the saltwater drain system and freshwater inlet of the fish ladder.

5.8.6 Land Classification

Project Operations.

SECTION 6 - RECREATION

6.1 GENERAL

Section 6 describes operations lands classified under the category of Recreation, and prescribes criteria for their future development and management. Project operations activities, for which lands were acquired, takes precedence over any land classification category. Recreational lands and facilities, as prescribed in Section 4, include the visitor center, north entry area, formal promenade, loop road, south entry area, and fish viewing gallery. (See Plate 7 for classification limits.)

6.2 VISITOR CENTER

6.2.1 Resource Objective

Preserve the classical architectural style conforming to the utilitarian style of the original group of accessory structures while maintaining Visitor Center programs to provide a multi-faceted interpretive services program, including exhibits, brochures, and guided and self-guided tours.

6.2.2 Rationale

The Visitor Center and interpretive services program are managed to provide interpretive exhibits and information for project visitors. The center features exhibits on the history and operation of the locks and ship canal and the role of the Corps in the Pacific Northwest and nation. The Visitor Center interprets project purposes and resources and enhances visitor understanding and appreciation of the Corps' various missions. Outside exhibits and the guided and self-guided tour programs also play an important role in interpreting the project to visitors. This structure is listed in the Historic District designation.

6.2.3 Land Management Measures

Develop programmatic agreement with the Advisory Council on Historic Preservation to rehabilitate the structure's exterior and maintain in accordance with the

Secretary of Interior's Standards and Guidelines for Rehabilitation and LWSC Stewardship Standards.

6.2.4 Major Constraints

None.

6.2.5 Description

The Visitor Center was originally constructed as the Carpenter and Blacksmith Shop Building in 1921. It is a two story reinforced concrete structure with a built-up roof and a foundation area measuring 31 x 91 feet. It features a classical entablature, belt molds and bases which conform to the pattern established by the original accessory buildings. Portions of the exterior have been altered. Current use includes exhibits, interpretive programs, and a bookstore. This facility includes restroom facilities for persons who are physically disabled. In 1993 areas and features that were remodeled included the facility's entrance, finishes, information desk, and theater. The interpretive features are in the process of being updated.

6.2.6 Land Classification

Recreation.

6.3 NORTH ENTRY AREA

6.3.1 Resource Objective

Maintain the north entryway area to maximize visitor access to and enjoyment of the locks, fish ladder, Carl S. English, Jr., Botanical Garden, and related project features. Vehicle access is restricted to necessary project maintenance and emergency vehicles only.

6.3.2 Rationale

The entryway is reserved for pedestrian use only. The gates separating the pedestrian thoroughfare and the service entry/employee parking lot will only be

opened for access by authorized maintenance and emergency vehicles. Periodically, ambulances use this entryway to respond to emergency calls.

6.3.3 Land Management Measures

None.

6.3.4 Major Constraints

None.

6.3.5 Description

The north entryway is the major portal for public access to the Hiram M. Chittenden Locks. Rehabilitation of the north entryway between 1979 and 1989 included paving, fencing, provided a new employee parking area, a guardhouse (similar to the Operating Houses; replaced the single story 7 x 7 foot wood frame Gatehouse originally constructed in 1949), and associated landscaping. The initial phase of construction was completed in 1982; phase II was completed in 1989. The entryway provides appropriate strong project identification and conveys the nature of the Locks as a unique and major public attraction offering a wide variety of interesting activities in a waterside park setting.

6.3.6 Land Classification

Recreation.

6.4 FORMAL PROMENADE

6.4.1 Resource Objective

Maintain the promenade as the thoroughfare between the main visitor features of the Locks, i.e. visitor center, botanical garden, administration building, and locks.

6.4.2 Rationale

The promenade is maintained to provide the visitor guided access through the historic district. This road is also used as access for maintenance and emergency vehicles.

6.4.3 Land Management Measures

None.

6.4.4 Major Constraints

None.

6.4.5 Description

The promenade consists of the tree-lined pedestrian "boulevard" which leads visitors from the North Entry directly to the Visitor Center, Administration Building, and the locks. The promenade and other formal walks that connect buildings within the campus-like grounds of the Locks were upgraded in 1989 as part of the Phase II Entryway Project. These circulation routes were part of the original layout by Bebb and Gould in which vehicular use of the project by the public was allowed. Due to the exclusion of public vehicles from the grounds and deteriorating pavements becoming a safety hazard, upgrading was required. The new design provided an 18-foot-wide concrete promenade with a trench drain running full length through the center. Exposed aggregate and broom finishes were used as contrasting patterns.

6.4.6 Land Classification

Recreation

6.5 LOOP ROAD

6.5.1 Resource Objective

The loop road provides access to the garden, west side overlook, and serves as an exercise trail. Its function and integrity must be preserved to support the use of the garden and project grounds.

6.5.2 Rationale

The loop road is maintained to provide the visitor a primary access route through the botanical garden and project areas. This route minimizes heavy traffic through unpaved portions of the garden. This road is also used as access for maintenance and emergency vehicles.

6.5.3 Land Management Measures

Replace the deteriorated concrete roadway surface with a matching paving material as the promenade. Maintain its current route through the botanical garden and around the residential knoll.

6.5.4 Major Constraints

None.

6.5.5 Description

The loop road is currently a combination of an 18-foot-wide concrete roadway, 6-inch concrete curbing, and 4-foot-wide concrete walk which extends west of the Administration Building to a viewing overlook with solid concrete railing and continues around the residential knoll tying back to the main promenade at the Administration Building. Both the roadway and the concrete walkway have deteriorated to the point where shifting concrete panels and broken paving cause safety hazards for pedestrians. The roadway is no longer required for vehicular traffic (as originally designed) other than maintenance and emergency vehicles.

6.5.6 Land Classification

Recreation.

6.6 SOUTH ENTRY AREA

6.6.1 Resource Objective

Maintain the south entryway for pedestrian, natural resource vehicles, and emergency vehicle access to the fish ladder and the locks.

6.6.2 Rationale

The south entry is the only access to the fish ladder, fish viewing gallery, and locks from the south.

6.6.3 Land Management Measures

Maintain landscape features consistent with Commodore Park features.

6.6.4 Major Constraints

None.

6.6.5 Description

The south entryway was designed and constructed in conjunction with rehabilitation of the fish ladder and development of Commodore Park during the mid-1970's. It provides controlled pedestrian access to the fish ladder, fish viewing gallery, and north project area from Commodore Way and Commodore Park. Periodically, ambulances use this entryway to respond to emergency calls in the vicinity of the fish ladder. A restroom is located along the bank. Project vehicles also utilize this entryway to maintain plantings in the area.

6.6.6 Land Classification

Recreation.

6.7 PUBLIC COMFORT STATION

6.7.1 Resource Objective

Provide public lavatory facilities.

6.7.2 Rationale

The Locks accommodates approximately 1 million visitors annually. This the primary public restroom facility at the Locks.

6.7.3 Land Management Measures

None.

6.7.4 Major Constraints

None.

6.7.5 Description

The public comfort station was constructed in 1947. It is a single story reinforced concrete construction measuring 14 x 58 feet and situated west of Administration Building overlooking the locks.

6.7.6 Land Classification

Recreation.

6.8 FISH VIEWING GALLERY

6.8.1 Resource Objective

Maintain the public viewing gallery and associated interpretive exhibits to enhance the visitor's understanding and appreciation of the fish migration and the purpose and function of the fish ladder. Fish migration past the Locks is one of the main visitor attractions at the project.

6.8.2 Rationale

Anadromous fish are an important ecological, cultural, and economic resource to the Pacific Northwest region. The public viewing gallery provides an educational opportunity for visitors from within and outside this region.

6.8.3 Land Management Measures

Upgrade the facility to the highest interpretative standards to maintain (fulfill) the Corps' interpretative mission.

6.8.4 Major Constraints

None.

6.8.5 Description

Anadromous salmon, steelhead, and cutthroat trout utilize the Lake Washington Ship Canal as a migratory route between freshwater habitat, in the Lake Washington basin, and the ocean. The fish ladder provides a favorable route around the locks and dam. The underwater fish viewing gallery was constructed in 1976 during the rehabilitation of the fish ladder. The gallery features six large lighted windows below water level and provides a unique opportunity for project visitors to view migrating fish while they are traversing the ladder. Various interpretive exhibits explaining the fish runs are located inside the gallery.

6.8.6 Land Classification

Recreation.

SECTION 7 - ENVIRONMENTAL SENSITIVE AREAS

7.1 GENERAL

Section 7 describes operations lands classified under the category of Environmental Sensitive Areas, and prescribes criteria for their future development and management. Project operations activities, for which lands were acquired, take precedence over any land classification category. Environmental Sensitive Areas lands, as prescribed in Section 4, include the Channel Tidelands made up of two parcels; the Seattle and Ballard Tidelands. (See Plate 6 for classification limits.)

7.2 CHANNEL TIDELANDS

7.2.1 Resource Objective

Preserve the habitat quality of the Seattle and Ballard Tidelands for fish and wildlife use.

7.2.2 Rationale

In an increasingly growing metropolitan area such as Seattle, it is quite unique to find such high quality fish and wildlife habitat. The ship canal, which links the Lake Washington system to Puget Sound, contains many valuable but declining fisheries resources. Additionally, Discovery Park supports sensitive bird species such as the bald eagle and great blue heron. In times of concern for environmental preservation, it is good stewardship to manage the tidelands so it remains productive to fish and wildlife. Although the locations are such that development of these lands is not expected, action should be taken to insure these lands are preserved in their most natural state. Public access is somewhat restricted due to the location of these lands; however, public access is gained for recreational uses such as fishing, sightseeing, and strolling. An easement has been granted at the Ballard Tideland to Ballard Bait Company.

7.2.3 Land Management Measures

Restrict activities that degrade fish and wildlife habitat qualities.

7.2.4 Major Constraints

None.

7.2.5 Description

The two parcels of channel tidelands, inter-tidal Seattle Tidelands and sub-tidal Ballard Tidelands, totalling 12.57 acres were acquired along with other project lands for navigation. During the summer of 1993, a team of Corps biologists and estuary experts inspected these lands and concluded that these are highly productive fish and wildlife habitats. The location of these lands are such that development and destruction of the habitat are not anticipated.

7.2.6 Land Classification

Environmental Sensitive Areas.

SECTION 8 - MULTIPLE RESOURCE MANAGEMENT: RECREATIONAL - LOW DENSITY

8.1 GENERAL

Section 8 describes operations lands classified under the category of multiple resource management: recreational - low density, and prescribes criteria for their future development and management. Project operations activities, for which lands were acquired, take precedence over any land classification category. Recreational - low density areas include the north and south shores of the Fremont Cut. (See Plates 8 and 9 for classification limits.)

8.2 FREMONT CUT (NORTH SHORE)

8.2.1 Resource Objectives

(1) The primary objective is to maintain and improve the historical colonnade created by the existing Lombardy poplars along the narrow canal while maintaining the cut for navigational purposes.

(2) The secondary objective is to maintain coordination with the city of Seattle, adjacent property owners, the Fremont community and other interested groups, organizations and individuals to accommodate and enhance public access to and use of the north shore.

(3) The third objective is to replace barren or overgrown areas with new landscaping.

8.2.2 Rationale

The north shore of the Fremont Cut is a narrow band of property open to public use and used frequently by fishermen, sightseers, walkers, and picnickers, and for general relaxation. The property provides visitors with a close view of the ship canal. The Lombardy poplars along the narrow canal have been described as a colonnade in the nomination for the National Register of Historic Places.

8.2.3 Land Management Measures

Develop a landscape renovation plan for the north shoreline which addresses maintaining existing poplars, amending and breaking up compacted soils as required, and replanting bare areas with low maintenance native shrubs and groundcovers for erosion control. Consideration should be given to plants that support wildlife, particularly birds, wherever possible. Provide irrigation to the area of maintenance of new plantings. This plan shall also coordinate the extension of the Burke-Gilman Trail, and associated landscaping, with the city of Seattle and other adjacent property owners. The plan shall be in accordance with the Secretary of Interior Standards and Guidelines for Treatment of Historic Landscapes and the Section 106 review process under the National Historic Preservation Act. Existing poplars shall be removed only if and when determined to be in a hazardous or unsafe condition or if the tree's removal will ensure a more healthful environment for adjacent poplar trees. Poplars which are removed shall be replaced in kind, with a Lombardy poplar (see Appendix F). The hazardous determination would be based on International Society of Arborculture (ISA) Hazard Tree Inventory and Analysis standards.

8.2.4 Major Constraints

The age and size of the poplars may make necessary replacements difficult and costly.

8.2.5 Description

The north shore of the Fremont Cut is approximately a 15-foot-wide strip of land behind the concrete revetment. It provides a buffer from adjacent development and is identified by the distinct row of poplars at the east end. The landscape consists of tree and shrub plantings, dominated by Lombardy poplars, and a walkway and overlook on the west end which were jointly developed in 1981 by the Corps and Seattle Department of Parks and Recreation (Seattle Parks Department). In 1992, the Seattle Parks Department further developed an extension of the Burke-Gilman Trail by providing separate bike and foot paths. The 43 plus poplars are spaced quite closely (12 to 15 feet apart) and are assumed to be reaching maturity. Some of the poplars are in a declining state of health with weakened top and side branches due to aging.

Currently, the Seattle Parks Department possesses a lease to maintain the landscape along the cut.

8.2.6 Land Classification

Multiple Resource Management: Recreational - Low Density.

8.3 FREMONT CUT (SOUTH SHORE)

8.3.1 Resource Objectives

(1) The primary objective is to maintain and improve the historical colonnade created by the existing Lombardy poplars along the narrow canal while maintaining the cut for navigational purposes.

(2) The secondary objective is to maintain coordination with the city of Seattle, adjacent property owners, the Queen Anne community and other interested groups, organizations and individuals to accommodate public access and use of the south shore of the ship canal.

(3) The third objective is to replace barren or overgrown areas with new landscaping.

8.3.2 Rationale

The south shore of the Fremont Cut is a narrow band of property open to public use and used frequently by fishermen, sightseers, walkers, and picnickers, and for general relaxation. The property provides visitors with a close view of the ship canal. The Lombardy poplars along the narrow canal have been described as a colonnade in the nomination for the National Register of Historic Places.

8.3.3 Land Management Measures

Develop a landscape renovation plan for the south shoreline which addresses maintaining existing poplars, amending compacted soils, and replanting bare areas with low maintenance native shrubs and groundcovers for erosion control. Consideration

should be given to plants that support wildlife, particularly birds, wherever possible. Provide irrigation to the area of maintenance of new plantings. This plan shall also identify public access to the shoreline and coordinate the construction of the city of Seattle planned pedestrian and bicycle trail between the Fremont Bridge and Ewing mini park. The plan shall be prepared in accordance with the Secretary of Interior Standards and Guidelines for Treatment of Historic Landscapes and the Section 106 review process under the National Historic Preservation Act. Existing poplars shall be removed only if and when determined to be in a hazardous or unsafe condition or if the tree's removal will ensure a more healthful environment for adjacent poplar trees. Poplars which are removed shall be replaced in kind, with a Lombardy poplar (see Appendix F). The hazardous determination would be based on International Society of Arborculture (ISA) Hazard Tree Inventory and Analysis standards.

8.3.4 Major Constraints

The age and size of the poplars may make necessary replacements difficult and costly.

8.3.5 Description

The south shore of the Fremont Cut is approximately a 15-foot-wide strip of land behind the concrete revetment. It provides a buffer from adjacent development and is identified by the distinct row of poplars. The landscape, dominated by the Lombardy poplars, contains various species of trees and shrubs. Some areas of the shoreline have heavy undergrowth while other areas have barren compacted soils with large surface roots poking through. The poplars are evenly spaced (25 to 30 feet apart) and based on size believed to be 75 to 80 years old. It is not known when or who initially planted the poplar colonnade.

8.3.6 Land Classification

Multiple Resource Management: Recreational - Low Density.

SECTION 9 - MULTIPLE RESOURCE MANAGEMENT: VEGETATIVE MANAGEMENT

9.1 GENERAL

Section 9 describes operations lands classified under the category of multiple resource management: vegetative management, and prescribes criteria for their future development and management. Project operations activities, for which lands were acquired, take precedence over any land classification category. Vegetative management areas include the Carl S. English, Jr., Botanical Garden and south entry way buffer zone. (See Plate 7 for classification limits.)

9.2 CARL S. ENGLISH, JR., BOTANICAL GARDEN

9.2.1 Resource Objective

Manage the Carl S. English, Jr., Botanical Garden to retain the garden style and heritage developed by Mr. English during his 43 years of stewardship at the Locks, and to preserve their significant aspects and how those aspects relate within the Hiram M. Chittenden Locks and Lake Washington Ship Canal Historic District.

9.2.2 Rationale

The Carl S. English, Jr., Botanical Garden forms a background and contrast to the mechanical workings of the locks. Lawn development and the planting of some trees was begun in 1916 with construction of the locks. Today, the garden contains approximately 500 species and 1,500 varieties of trees and shrubs from many parts of the world, as well as plants native to the northwest. The garden has received worldwide recognition and has been featured in national horticultural journals and magazines, as well as local publications. The structure of the grounds near the buildings was set by the local architectural firm of Bebb and Gould, and a formal English-style garden east of the Administration Building was designed by landscape architect Otto Humdahl in 1927. Carl S. English, Jr., began working for the Corps, providing care to the garden at the Locks, in 1931. From 1940 until he retired in 1974, Mr. English was the head of the garden staff and became nationally known as one of the Northwest's leading horticulturists.

In recognition of the outstanding work he performed as horticulturist, the garden was named in honor of Carl S. English, Jr., in a ceremony held on December 10, 1974. The bronze dedication plaque reads, "In honor of the man who devoted 43 years of Federal service to the development and care of this garden. He gathered an extensive collection of plants and seeds from around the world. His landscape arrangements provide visitors a variety of texture and color throughout the year." The style of the garden has its roots in the country estates of England. The estates are landscaped in the naturalistic tradition, which abandons the straight lines, symmetrical designs, and manicured flower beds seen in formal designs. Instead, the landscape draws inspiration from nature, with curving lines, scenic vistas, broad lawns or meadows, large shade trees, and thick shrub borders.

The heritage of the English informal style is seen in the Carl S. English, Jr., Botanical Garden, in the broad lawns edged with shade trees, banked with curving shrub borders, and made accessible by curvilinear roads and walks. These curvilinear roads and walks stem off of a very symmetrical access road and almost formal "courtyard" grouping of buildings. The trees, shrubs, and herbaceous plants are planted in aesthetically pleasing combinations that emphasize the textures and colors of foliage. In this garden, the individual specimens are important, but the collective beauty of the garden draws the visitor's first response. The garden is an asset to the Corps and the community as a display and for scientific study. Proper management will preserve the character and heritage of the garden for the enjoyment and inspiration of present and future generations.

9.2.3 Land Management Measures

Restore elements of the garden which are not consistent with style of the Carl S. English, Jr., Botanical Garden and as described on the National Register of Historic Places. Continue to introduce worthy specimens within the framework of the garden and label specimens for scientific study. Provide outdoor environmental education opportunities to the public as staff availability permits. Continue to encourage use of the garden by local community groups and schools for environmental education purposes. Preservation, restoration, and rehabilitation of the garden shall be consistent with the Secretary of Interior standards for treatment of Historic Landscapes.

9.2.4 Major Constraints

None.

9.2.5 Description

Since Carl English, Jr.'s development of the grounds from basic tree and shrub plantings to an elaborate botanical garden, managing the grounds became increasingly intensive. Attention has been required on the part of subsequent project gardeners and horticulturists to work with not only mass quantities of plant materials and their immense and varied cultural requirements but also poor soils and drainage throughout the site as well as an antiquated and inefficient underground irrigation system. As plant materials within the garden have matured, maintenance has continued to increase.

For about five years between 1985 and 1989 the grounds maintenance at the Locks, Fremont Cut and Montlake Cut was contracted. However, these annual contracts included primarily mowing lawns, weeding, and edging. Currently a professional horticulturist staff manage the vegetation at the Lake Washington Ship Canal project. The current use of the nursery staging and storage area, originally the location of the tennis court and later employee parking area, is supportive of vegetative management and is currently undergoing changes to become an interpretative plant propagation area.

The garden is accessed primarily by the use of the loop road. Small gravel paths at the west end of the garden and around the nursery area further enhances visitor enjoyment of the garden.

9.2.6 Land Classification

Multiple Resource Management: Vegetative Management.

9.3 SOUTH ENTRY WAY BUFFER ZONE

9.3.1 Resource Objectives

(1) The primary objective is to maintain and protect existing vegetative cover which provides a pleasing visual backdrop to the south entryway and fish ladder area.

(2) The secondary objective is to preserve and provide wildlife habitat for nongame wildlife species.

9.3.2 Rationale

The south entryway buffer zone was developed concurrent with construction of the south entryway and rehabilitation of the fish ladder. The landscape consists of plant materials which provide an attractive low maintenance backdrop to the south entryway and fish ladder. Vegetation is managed to partially screen adjacent apartments and condominiums. The landscaping also provides some habitat and food for songbirds which frequent the area. The area is steeply sloped and neither accessible for, nor conducive to, public use.

9.3.3 Land Management Measures

None.

9.3.4 Major Constraints

None.

9.3.5 Description

The south entryway buffer zone is landscaped with a variety of low growing trees, shrubs and herbaceous plants which provide an attractive low maintenance backdrop to the south entryway and fish ladder.

9.3.6 Land Classification

Multiple Resource Management: Vegetative Management.

SECTION 10 - EASEMENT LANDS

10.1 GENERAL

Section 10 describes operations lands classified under the category of easement lands. A perpetual easement was acquired from the State of Washington for the lands at the Montlake Cut for the primary purpose of navigational project operation. (See Plate 10 for classification limits.)

10.2 MONTLAKE CUT (NORTH SHORE)

10.2.1 Resource Objectives

(1) The primary objective is to maintain the existing indefinite term license granted to the University of Washington which allows the University to use, maintain, operate, and repair the University's in-place structures and to maintain landscaping within the ship canal right-of-way on the north side of the Montlake Cut, and maintain public access to the area while maintaining the area to support the navigational channel.

(2) Protect and maintain the historic resource of the original concrete embankments. Implement conservation methods which ensure retention and preservation of the terrain and significant landscape features.

10.2.2 Rationale

The Corps was granted a perpetual easement by the State of Washington on March 16, 1907 for the canal right-of-way through the Montlake area. The land is held in fee title by the State of Washington but is administered by the Corps. These project lands are required for operations and so allocated by the Corps. Public use of the land is supportive of and incidental to the original canal concept. The public's interest in access to the north shore of the Montlake Cut is best served by maintaining the present license granted to the University of Washington for development and management of public access facilities and landscaping. Vegetative management should be monitored by the Corps to ensure bank stability.

10.2.3 Land Management Measures

To enhance public safety, the Corps shall extend safety rails along length of the revetment on the west side of the Montlake Bridge. The University's school for the learning disabled is located here.

10.2.4 Major Constraints

None.

10.2.5 Description

The Montlake Cut is located in the eastern portion of Lake Washington Ship Canal. The Corps has a real estate interest in the Montlake Cut, for the purpose of project operations, consisting of a perpetual right-of-way granted by the State of Washington on March 16, 1907 (RCW 37.08.250). The cut is approximately 2,500 feet long and 350 feet wide. The north shore is a narrow strip along side the waterway. Corps development of these lands for project visitor use is permissible in the opinion of counsel under the terms of the Corps' right-of-way interest. In 1965 the Department of the Army granted the University of Washington an indefinite term license to use, maintain, operate, and repair the University's in-place structures and to landscape, beautify, and maintain lawns, trees, shrubbery, and other plantings within the canal right-of-way.

10.2.6 Land Classification

Easement Lands.

10.3 MONTLAKE CUT (SOUTH SHORE)

10.3.1 Resource Objectives

(1) The primary objective is to maintain and preserve the Montlake Cut Waterside Trail, associated features, and landscape plantings to ensure retention of its designation as a National Recreation Trail while maintaining the area to support the navigational channel.

(2) The secondary objective is to protect and maintain the historic resource of the original concrete embankments. Implement conservation methods which ensure retention and preservation of the terrain and significant landscape features.

10.3.2 Rationale

The Corps was granted a perpetual easement by the State of Washington on March 16, 1907 for the canal right-of-way through the Montlake area. The land is held in fee title by the State of Washington but is administered by the Corps. These project lands are required for operations and so allocated by the Corps. Public use of the land is supportive of and incidental to the original canal concept, and the Corps has sufficient real estate interest to allow expenditure of funds to develop and maintain public use facilities. The Montlake Cut Waterside Trail was designated a National Recreation Trail in 1971 and connects the University of Washington's Arboretum Waterfront Trail with the West Montlake Park on Portage Bay.

10.3.3 Land Management Measures

The Corps has issued letters of consent to adjacent land owners for the use of project easement land. This consent allows usage but prohibits further encroachments without proper approvals. Furthermore, it clarifies that the government has not relinquished it's rights to the lands. This is supported by the State of Washington.

10.3.4 Major Constraints

None.

10.3.5 Description

The Montlake Cut is located in the eastern portion of Lake Washington Ship Canal. The Corps has a real estate interest in the Montlake Cut, for the purpose of project operations, consisting of a perpetual right-of-way granted by the State of Washington on March 16, 1907 (RCW 37.08.250). The cut is approximately 2,500 feet long and 350 feet wide. The south shore is a narrow strip of land along side the waterway. Corps development of these lands for project visitor use is permissible in the opinion of Corps counsel under the terms of the Corps' right-of-way interest.

Residential property directly abuts the government boundary, in some cases, residential features encroach upon the government boundary.

10.3.6 Land Classification

Easement Lands.

SECTION 11 - PROPOSED DEVELOPMENT AND DESIGN CRITERIA

11.1 GENERAL

Policies and procedures for the planning, design, operation, and maintenance of facilities at Corps Civil Works projects are given in engineer manuals and regulations, including the following:

- ER 1110-2-400, Recreation Planning and Design Criteria
- ER 1110-2-400, Design of Recreation Sites, Areas, and Facilities
- ER 1110-2-102, Design Features to Make Buildings and Facilities Accessible to and Usable by the Physically Handicapped
- ER 1130-2-400, Management of Natural Resources and Outdoor Recreation of Civil Works Water Resources Projects
- ER 1130-2-438, Project Construction and Operation, Historic Preservation Program
- ER 1165-2-400, Recreation Planning, Development, and Management Policies
- AR 600-7, Non-discrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army.
- Uniform Federal Accessibility Standard (UFAS)

These and other publications guide the development of operations and visitor facilities in order to assure that they are of the highest quality while serving the health, safety, and enjoyment of project visitors.

Design principles and criteria particularly appropriate to the project are discussed in the following paragraphs.

11.2 PROPOSED DEVELOPMENT/DESIGN CRITERIA

Development should be sensitive to the natural character of the site and area. The landscape identity of each site and its physical elements should be fully appraised so that the most scenic areas will remain undisturbed, to be enjoyed in their most natural states. Facilities should be designed so as to blend with the existing vegetation and terrain characteristic to the project area. Only the most adaptable terrain will be used for siting of facilities, avoiding cuts and fills to the extent practicable. Physical development of facilities should also avoid impacts or conflicts to significant plant materials, cultural resource areas, and historic preservation area. Specific site considerations for visitor facilities are as follows:

11.2.1 Irrigation System

Upgrade or replace, as required, the existing irrigation system throughout the botanical garden for more efficient operation, maintenance, and water use based on project staffing, funding and water supply available. Components of the irrigation system including heads and valves shall be designed and installed discreetly into the plant beds in order to lessen visual impacts of an essentially modern or non-historical element. *Estimated cost for replacement of the irrigation system is* $100,000 at 1993 price levels.

11.2.2 Loop Road

Replace the deteriorated concrete roadway surface with a similar design and material as in the Phase II promenade upgrade. This will provide the visitor a safe and pleasant stroll through the Carl S. English, Jr., Botanical Garden. Estimated cost for replacement of the loop road is $50,000 at 1993 price levels.

11.2.3 Control Tower

Modify the Control Tower to match the style and character of the original structures.

11.2.4 Site Furnishings

Restore and rehabilitate site furnishings within the garden such as benches, fencing, trash receptacles, and light standards. The existing light standards along the lock walls are replacements to the original concrete standards designed by Bebb and Gould. Future work in accordance with the requirements of the Historic Management Plan should include restoration of the light standards to the style and character of the original items.

11.2.5 Locks Parking Area (City of Seattle)

Directly outside of the North Entry and along the north boundary line, the city of Seattle maintains a 120-vehicle public parking area on Burlington Northern Railroad (BNRR) property. Within the asphalt paved area the BNRR maintains an active track running east-west. Coordination with the city on maintenance and potential improvements to the public parking area must be maintained. Such coordination is necessary to ensure the area is retained as free public parking and to ensure that any maintenance or improvements to the parking area are consistent with current use of the entry area as the main visitor entrance. The Locks and historic district are highly utilized by the public, and the main entrance, with its initial visual impact on the visitor, along with the public parking lot, should be managed as a highly visually element which a visitor would feel is part of the Locks complex. Pursue a more effective city operation and maintenance of the parking lot or acquire railroad property in fee. Coordinate with any city of Seattle and BNRR maintenance and potential improvements to the public parking area outside the North Entry.

11.2.6 Fremont Cut Vegetative Management Plan

Develop a vegetative management plan for landscape maintenance at the Fremont Cut to guide Corps and property lessees' activities. The Lombardy poplars, which are at their life expectancy, shall be replaced in-kind on an as needed basis. Replacement of poplars shall be consistent with the Secretary of Interior guidelines for the treatment of Historic Landscapes.

11.2.7 Montlake Cut (Southside) Waterside Trail Surface

Replace the existing gravel surface of the southside Waterside Trail along the south shore of the Montlake Cut with a more stable and durable surface consistent with designation as a National Recreation Trail. Additionally, eliminate the dead end in the upper walkway near the bridge by connecting the upper and lower trails with a stairway.

11.2.8 Handrails at Montlake Cut (Northside)

The Corps shall extend safety handrails along concrete revetment on the north shore west from the Montlake Bridge to the end of the revetment. The current situation poses a visitor safety hazard, especially to the nearby University child development center. Estimated cost for installation of the safety handrails is $25,000 at 1993 price levels.

11.2.9 Nursery Area

Transform the nursery staging/garden maintenance area into a plant propagation and educational area as shown in Exhibit C. Estimated cost to convert the nursery area into a plant propagation and educational area is $25,000.

11.2.10 Operations and Maintenance Area at Boathouse

If the project is going to continue tours of historic vessels, a dock and pier area for mooring historic vessels should be established near the existing Boathouse. Public access to the vessels shall be limited.

11.2.11 Botanical Garden

Preserve, maintain, and restore the garden in the style set forth by Carl S. English, Jr. The following are recommended developments within the garden:

(1) Remove elements which are inconsistent with the Historic District and Secretary of Interior's Standards as described in the 1989 Historic Grounds Report.

(2) Continue to actively pursue replacement of historically significant plant materials, which have died or been removed, with in-kind species. Tree species should be replaced as soon as feasible due to their impact upon the visual and physical structure of the garden.

The following are ongoing activities recommended to continue:

(1) Preserve the botanical diversity of the garden by supplementing existing plant beds with new or experimental plant species which fit the character and style of the garden. Original sizes and shapes of plant beds shall be maintained to the extent possible and not necessarily expanded for these purposes.

(2) Maintain accurate records of plant material loss and replacement dates; collection, purchasing, or propagation of replacement plants; and routine vegetative management performed within the garden.

(3) Enhance visitor enjoyment and understanding of the garden by identifying and labeling major/significant plants within the garden. Tagging system shall be durable and readable, yet inexpensive to purchase, install, and maintain.

11.2.12 Site Furnishings

Additional or replacement site furniture/furnishings shall be consistent with the Secretary of Interior's Standards and LWSC Stewardship Standards. The predominant landscape materials (not including vegetation) found in the Locks reservation are concrete, rock, and wood, concrete being used in the original design and the wood structures added later.

11.2.13 Light Standards

Replace existing standards with near original design.

11.2.14 Facilities For Persons with Disabilities

To the extent practical, facilities will provide universal accessibility in accordance with the Americans with Disabilities Act (Public Law 101-336).

11.2.15 Fences

Perimeter fences shall either be of green vinyl coated chain link, 9 feet high, or wrought iron design matching the main entryway. Low fences or retaining walls within the Locks grounds shall either be of concrete, rockery, or wood.

11.2.16 Emergency Water Access at the Montlake and Fremont Cuts

Install ladders at the Cuts to allow emergency entry to and exit from the water.

SECTION 12 - CONCLUSIONS AND RECOMMENDATIONS

12.1 CONCLUSIONS

The Lake Washington Ship Canal Project Master Plan has been prepared to provide guidance to the preservation, conservation, restoration, maintenance, management, and development of project lands, waters, and associated resources. Project lands were acquired in accordance with the authorizing documents for operation of the project for navigation. The land classifications present specific recommendations for both short and long term development and resource management consistent with the authorized project purpose and the acceptance of the Lake Washington Ship Canal Project as a Historic District. Project resource development and management actions shall be measured against a management framework which includes resource objectives and concise land management measures for individual project sites and features. This Master Plan will serve to increase resource management effectiveness and provide the basis for the preparation of follow-up Operational Management Plans (OMP), prescribed by ER 1130-2-400, Feature Design Memorandums (FDM), and Historic Properties Management Plan.

12.2 RECOMMENDATIONS

Recommend that the Lake Washington Ship Canal Project Master Plan be adopted as a guide to the orderly use, development, and management of the natural and manmade resources of the Lake Washington Ship Canal Project administered by the Seattle District. The land classifications and resource objectives formalized by the Master Plan provide a balanced plan for sound resource use, development, and management consistent with authorized project purposes and historic resource preservation, and based on determination of highest and best use.

EXHIBIT A
LEGISLATIVE HISTORY

EXHIBIT A

The following Federal statutes provide for development and management of Federal water resource projects for various purposes according to the intent of Congress.

a. Public Law 534, 78th Congress, 22 December 1944. Section 4 of the Flood Control Act of 1944, as last amended in 1960 by Section 207 of Public Law 87-874, 87th Congress (76 Stat. 1195), provided authority for the Corps of Engineers to develop and maintain park and recreation facilities at water resource projects.

b. Public Law 85-624, 12 August 1958. The Fish and Wildlife Coordination Act provided for integration of fish and wildlife programs with Federal water resource developments.

c. Public Law 86-645, Enacted 14 July 1960. The River and Harbor Act of 1960 provides for management of industrial resources and allows sale of project lands to states, political subdivisions thereof, and port districts.

d. Public Law 86-717, 6 September 1960. The terms of this law provided for protection and improvement of forest lands at Corps of Engineers projects.

e. Public Law 89-72, 9 July 1965. The Federal Water Project Recreation Act required that full consideration be given to opportunities afforded by outdoor recreation and fish and wildlife resources. It further provided for non-Federal participation in land acquisition, development and management of those resources. Supplement No. 1 to S.D. 97, 87th Congress, 2nd Session, provided variable user-day values for recreation and fish and wildlife.

f. Public Law 89-80, 22 July 1965. Water Resources Planning Act is one of the most important and comprehensive acts affecting water resources conservation and development. It established the National Water Resources Council and provided for river basin commissions. The purpose of the act was to bring together the many diverse planning activities of Federal, state and local governments and other planning groups as applied to water resource development. It provided for implementation of the declared national policy to encourage the conservation, development, and utilization of water and related land resources of the United States on a comprehensive and coordinated basis. One of its more important provisions is for the preparation and review of comprehensive regional and river basin plans.

g. Public Law 87-88, 20 July 1961. The Federal Water Pollution Control Act amended the Federal Water Pollution Control Act of 1956 to provide for a more effective program of water pollution control and for other purposes by extending Federal authority and increasing construction grant authority.

h. Public Law 89-234. The Water Quality Act of 1965 further amended previous laws establishing the Federal Water Pollution Control Administration and transferred administration to the Department of the Interior.

i. Public Law 89-753. The Clean Water Restoration Act of 1970 provided more Federal money for building treatment facilities.

j. Public Law 91-224. The Water Quality Improvement Act of 1970 provided for establishment of effluent standards for sanitary waste discharges from all classes of watercraft, old and new. It provided penalties for vessel owners and manufacturers for failing to provide tighter control over pollution from their activities.

k. Public Law 91-190. The National Environmental Policy Act of 1969 declared a national environmental policy for protection and enhancement of the environment and established a Council on Environmental Quality.

l. Public Law 91-224. The Water Quality Improvement Act of 1970 directed compliance with the implementation of provisions of existing law by all Federal departments engaged in public works activities and provided a staff for the Council on Environmental Quality, established by Public Law 91-190.

m. Public Law 93-205, Enacted 28 December 1973. This law is cited as the Endangered Species Act of 1973, repealing the Endangered Species Act of 1969. It is applicable to the development and management of any endangered species of fish, wildlife, or plant in the project area. Proposed developments in the master plan allow for the protection of threatened species and species having a wide range of influence, such as migratory waterfowl and fish.

n. Public Law 89-665, Enacted in 1966. The National Historic Preservation Act of 1966 declared that the historical and cultural foundations of the nation should be preserved as a living past of our community life and development. It provides for Federal assistance to state and local governments, private organizations, and individuals in historic preservation.

o. Public Law 59-209, Enacted June 1906. Public Law 59-209, the Antiquities Act of 1906 (34 Stat. 225), 8 June 1906, provided for the preservation and protection of antiquities on public lands, including archeological remains and historic sites.

p. Executive Order 11593. Executive Order 11593, Protection and Enhancement of the Cultural Environment (36 - C.F.R. - 8921), 13 May 1971, extends the 1966 act by providing that projects on Federally-owned lands must be reviewed to assure protection and enhancement of the cultural environment.

The following paragraphs detail the legislative history of the Lake Washington Ship Canal Project from 1890-1920 via acts of Congress.

Examinations and Surveys

Sep. 19, 1890, River and Harbor Act:

"The Secretary of War is authorized and directed to appoint a board of three officers of the Corps of Engineers of the United States Army, whose duty it shall be to select and survey the most feasible location, and estimate the expense of construction of a ship-canal to connect the waters of Lakes Union, Washington, and Sammamish with Puget Sound; and the sum of $10,000, or as much thereof as may be necessary, is hereby appropriated for its expenses." (H.Ex.Dec.40,52d C., 1st; A.R.'92,p.2762.)

Improvement

Aug. 18, 1894, River and Harbor Act:

"For dredging Salmon Bay and the improvement of the waterway connecting the waters of Puget Sound, at Salmon Bay, with Lakes Union and Washington by enlarging the said waterway into a ship canal, with the necessary locks and appliances in connection therewith, $25,000: Provided, That no part of said amount shall be expended on the improvement of the waterway connecting the waters of Puget Sound with Lakes Union and Washington until the entire right-of-way and a release from all liability to adjacent property owners have been secured to the United States free of cost and to the satisfaction of the Secretary of War."

Survey, Location and Cadastral Map

Mar. 2, 1895, River and Harbor Act:

"That the Secretary of War be, and he is hereby, authorized and directed to expend, from the appropriation of $25,000 "For dredging Salmon Bay, and improvement of the waterway connecting the waters of Puget Sound, at Salmon Bay, with Lakes Union and Washington, by enlarging the said waterway into a ship canal, with the necessary locks and appliances in connection therewith," made by the "Act (of August 18, 1894) making appropriations for the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes," received by the President August 7th, 1894, the sum of $5,000 in making a definite survey and location of said improvement, and in preparing a cadastral map, showing each piece of property required to be deeded to the United States or from which a release is required, with its metes and bounds." (S.Doc.269,54th C.,1st; A.R.'96 p.2355) (Later special report,H.D.335,57th C.,1st; A.R. '02,p,2419)

Improvement

June. 3, 1896, River and Harbor Act:

"For dredging Salmon Bay and improvement of the waterway connecting the waters of Puget Sound with Lakes Union and Washington by enlarging the said waterway into a ship canal, with the necessary locks and appliances in connection therewith, $150,000: Provided, That no part of said amount shall be expended on the improvement of the waterway connecting the waters of Puget Sound with Lakes Union and Washington until the entire right-of-way and a release from all liability to adjacent property owners have been secured to the United States, free of cost and to the satisfaction of the Secretary of War; said canal to be constructed either by the Smiths Cove route or by the Shilshole Bay route in the discretion of the Secretary of War."

Improvement, Surveys, etc.

Jun. 13, 1902, River and Harbor Act:

"Improving waterway connecting Puget Sound with Lakes Union and Washington, Washington: Continuing improvement, $160,000: Provided, That this appropriation, together with the unexpended balance to the credit of said improvement, shall be expended in securing, by dredging, a low-water channel 10 feet in depth from Shilshole Bay through Salmon Bay to the wharves at Ballard: Provided further, That a board of engineers shall be appointed by the Secretary of War, who shall make such surveys, examinations and investigations as may be required to determine the feasibility and advisability of constructing a canal, with necessary locks and dams, connecting Puget Sound with Lakes Union and Washington of sufficient width and depth to accommodate the largest commercial and naval vessels, and said board shall prepare and report plans and estimates of the cost thereof. Said board shall also examine the route for a similar canal connecting Elliott Bay with Lakes Union and Washington, with a view to determine the feasibility of such route, and shall invite proposals from the Seattle and Lake Washington Waterway Company for the construction of a similar canal over said route connecting Elliott Bay with Lake Washington, and similar proposals for connecting Elliott Bay with Lake Union through Lake Washington, said proposals to specify the time for the completion of each project, and all rights and privileges to be reserved by said company. Said board shall also report upon the relative advantages of all proposed routes. Nothing herein shall be construed as the adoption of any project for the construction of a waterway connecting Puget Sound with Lakes Union and Washington. Said board shall make its reports as above provided for to the next session of Congress." (S.Doc.127,57th C,2d: A.R. '03,p.2340.) See also H.Com.Doc.18.61st C.,2d.

Improvement

Mar. 3, 1905, River and Harbor Act:

"Improving the waterway connecting Puget Sound with Lakes Union and Washington, Washington: Continuing improvement, $125,000: Provided, That this appropriation, together with the unexpended balance to the credit of said improvement, shall be expended in securing by dredging a deeper and wider low-water channel from Shilshole Bay through Salmon Bay to the wharves at Ballard. Nothing herein shall be construed as the adoption of any project for the construction of the waterway connecting Puget Sound with Lakes Union and Washington."

June 11, 1906 (Puget Sound-Lake Washington Waterway):

(An Act authorizing James A. Moore or his assigns to construct a canal along the Government right-of-way connecting the waters of Puget Sound with Lake Washington. See pp. 1179-1171 of R.&H.Laws for text.)

Mar. 2, 1907, River and Harbor Act:

"Improving the waterway connecting Puget Sound with Lakes Union and Washington, Washington: For maintenance of improvement, $10,000; and the Secretary of War may make a survey and estimate of cost of said waterway or canal with one lock, with a view to the construction of the same, in conjunction with the county authorities of King County or other agency, of sufficient size to accommodate the largest commercial or naval vessels afloat; or, if deemed more advisable, with a view to the construction of a canal of less dimensions, and to submit dimensions and estimate of cost of same, together with a report upon what portion of said work will be done or contribution to be made by said county or other agency. And the provisions of the Act approved June 11, 1906, authorizing James A. Moore, or his assigns, to construct a canal, with suitable timber lock, are hereby so modified as to permit the said James A. Moore or his assigns, subject to the conditions and stipulations of the Act, to excavate a channel 75 feet wide at the bottom and 25 feet deep at mean low water from deep water in Puget Sound at the mouth of Salmon Bay to deep water in Lake Washington, in lieu of constructing the canal and timber lock specified in the said Act, the location of the said channel and work of excavation to be subject to the directions of the Secretary of War, and the plans and order of work to be subject to his approval before beginning and when completed and accepted by the Secretary of War, the channel to be and remain a free public highway of the United States."
(H.Doc.953,60th,1st--Project Document.)

Feb. 6, 1909, Act extending time for constructing canal by James A. Moore:

"That, subject to all the other provisions contained in the Act of Congress entitled "An Act authorizing James A. Moore, or his

assigns, to construct a canal along the government right-of-way connecting the waters of Puget Sound with Lake Washington,"approved June 11, 1906, and contained in the modification of said Act made in the Act of Congress entitled "An Act making appropriations for the construction, repair, and preservations of certain public works on rivers and harbors, and for other purposes," approved March 2, 1907, the time limitation for the completion of the canal authorized by said Acts is hereby extended until June 11, 1912."

Jun. 25, 1910, River and Harbor Act:

"Puget Sound-Lake Washington Waterway: Continuing improvement by the construction of a double lock, with the necessary accessory works, to be located at "The Narrows," at the entrance to Salmon Bay, in accordance with the project set forth in House Document No. 953, 60th Congress, 1st session, $150,000; and the Secretary of War may enter into a contract or contracts for such material and work as may be necessary to complete said lock and accessory works, to be paid for as funds may be provided from time to time by law, not to exceed in the aggregate $2,275,000, including the amount herein appropriated: Provided, That before beginning said work, or making such contract or contracts, the Secretary of War shall be satisfied that King County, or some other local agency, will do the excavation in the waterway above the lock to the dimensions recommended in said project, and will also secure the United States from liability for any claims or damages on account of the grant made to James A. Moore or his assigns by the Act of Congress approved June 11, 1906, or on account of the lowering of the level of Lake Washington, raising the level of Salmon Bay, or any other alteration of the level of any part of said waterway."

"Improving waterway connecting Puget Sound with Lakes Union and Washington: For maintenance of improvement, $5,000."

Mar. 4, 1911, Sundry Civil Act:

"Puget Sound-Lake Washington Waterway: For continuing improvement by the construction of a double lock, with the necessary accessory works, $150,000."

Mar. 22, 1912, authorizing N.P.Ry. to cross right-of-way:

"That the Northern Pacific Railway Company, a corporation organized under the laws of Wisconsin, and having authority to construct, maintain, and operate a bridge and approaches thereto across the waterway connecting Puget Sound with Lakes Union and Washington at Seattle, in the State of Washington, at a point at or near the head of Salmon Bay, is hereby authorized to cross and occupy with said structure the right-of-way owned by the United States adjacent to and along said waterway, under such terms and conditions as the Secretary of War may deem equitable and fair to the public, in accordance with the provisions of the Act entitled "An Act to regulate the

construction of bridges over navigable waters, approved March 23 1906."

"Sec.2. That the right to alter, amend, or repeal this Act is hereby expressly reserved."

Aug. 24, 1912, Sundry Civil Act:

"Puget Sound-Lake Washington Waterway: For continuing improvement by the construction of a double lock, with the necessary accessory works, $500,000."

Mar. 4, 1913, River and Harbor Act:

"Improving waterway connecting Puget Sound with Lakes Union and Washington: For maintenance of completed works, $5,000: Provided, That of the amounts heretofore appropriated or authorized so much as shall be necessary may, in the discretion of the Secretary of War, be used for dredging in the channel below the lock to the depth recommended in House Document No. 953, 60th Congress, 1st session."

June 23, 1913, Sundry Civil Act:

"Puget Sound-Lake Washington Waterway: For continuing improvement by the construction of a double lock, with the necessary accessory works, $1,100,000."

Aug. 1, 1914, Sundry Civil Act:

"Puget Sound-Lake Washington Waterway: For continuing improvement by the construction of a double lock, with the necessary accessory works, in completion of contract authorization, $375,000."

Examination and Survey

Mar. 4, 1915, River and Harbor Act:

"Lake Washington Ship Canal, Washington."
(H.Doc.800,64th C.,1st: Recommended dredging 30' channel below locks and revetment.)

Improvement

Jul. 27, 1916, River and Harbor Act:

"Waterway connecting Puget Sound with Lakes Union and Washington, Washington: Continuing improvement, $348,000."

Aug. 8, 1917, River and Harbor Act:

"For improvement of Lake Washington Ship Canal in accordance with the report submitted in House Document No. 800, 64th Congress, 1st session, $200,000."

EXHIBIT B
REAL ESTATE LEASES, LICENSES, EASEMENTS, PERMITS, AND CONSENTS

EXHIBIT B

The following Real Estate leases, licenses, easements, permits, and consents have been granted to various public and private groups and individuals for use of Federal property at the Lake Washington Ship Canal and Hiram M. Chittenden Locks Project.

1. ENG 1, license to Pacific Northwest Bell Telephone Company to install and operate public telephones for an indefinite term.

2. DACW67-3-13-1, license to Washington Natural Gas Co. (Successor to Seattle Lighting Company) to construct a gas main tunnel under the Fremont Cut of the Lake Washington Ship Canal granted on 19 June 1913 for an indefinite period.

3. DACW67-2-17-1, easement to the city of Seattle for a 150 foot-wide right-of-way at Montlake Bridge and a right-of-way 70 feet wide east of Montlake Boulevard to construct and maintain a tunnel to carry water, sewer, gas, and other pipes and electric wires under the canal, granted on 2 May 1908 for an indefinite period. This document is actually a consent as the federal government only acquired easement interest for the Montlake Cut.

4. DACW67-2-27-1, easement to the city of Seattle for a right-of-way for a 9.5 foot diameter concrete-lined tunnel and a 54-inch steel pipeline at the Montlake Bridge, granted on 2 August 1926 for an indefinite period. This document is actually a consent as the federal government only acquired easement interest for the Montlake Cut.

5. DACW67-9-66-5, consent granted to the University of Washington on 20 July 1965 to use and maintain grantee's in-place structures & maintain grounds on the north side of the Montlake Cut for an indefinite period.

6. DACW67-3-71-90, license to the Municipality of Metropolitan Seattle (METRO) to use a parcel of land containing 0.06 acres along the south side of the Fremont Cut near 3rd Avenue Northwest for a Mini-Park. License term ends 21 February 1996.

7. DACW67-2-72-34, easement to city of Seattle to construct a storm drain outfall sewer at the Fremont Cut near 3rd Avenue Northwest, granted on 4 February 1972 for a 50-year term.

8. DACW67-2-72-35, easement to city of Seattle to construct a storm drain outfall sewer at the Fremont Cut near Phinney Avenue North, granted on 2 February 1972 for a 50-year term.

9. DACW67-2-73-20, easement to city of Seattle for a sanitary sewer at the Hiram M. Chittenden Locks granted on 7 September 1973 for a perpetual term.

10. DACW67-2-74-18, easement to Pacific Northwest Bell Telephone Company for an underground communications line duct facility at the Fremont Cut near 3rd Avenue Northwest, granted on 8 April 1974 for a 50-year term.

11. DACW67-1-78-12, lease granted to city of Seattle for use of 0.64 acres of land and water area for park purposes (Commodore Park) at the Hiram M. Chittenden Locks, granted on 27 September 1976 for a 50-year term.

12. DACW67-1-80-36, lease granted to city of Seattle for use on 0.69 acres of land and water area for park purposes (Canal Park) at the Fremont Cut, granted on 19 February 1980 for a 25-year term.

13. DACW67-2-80-45, easement granted to David & Sandra Sabey to install, operate, and maintain two 12" storm drain pipes at the Fremont Cut near Warren Avenue, granted on 27 June 1980 for a 50-year term.

14. DACW67-9-80-47, consent granted to Municipality of Metropolitan Seattle to construct, operate, and maintain submarine electrical bypass cable at the Montlake Cut, granted on 26 April 1980 for an indefinite term.

15. DACW67-2-82-22, easement granted to city of Seattle for a right-of-way for a power pole at the Fremont Cut, granted on 15 April 1982 for a 50-year term.

16. DACW67-2-83-8, easement granted to city of Seattle for a right-of-way for overhead and underground electric distribution facilities at the Hiram M. Chittenden Locks, granted on 23 December 1982 for a 25-year term.

17. DACW-1-84-15, lease granted to Municipality of Metropolitan Seattle to construct a dock and renovate a portion of bulkhead at the Fremont Cut. Lease term ends 31 May 1994.

18. DACW67-1-85-2, lease granted to Seattle Pacific University to install, operate and maintain a rowing and crew shell launching facility at the Fremont Cut. Lease term ends 31 May 94.

19. DACW67-2-85-4, easement granted to Jacobson Brothers, Inc. for a right-of-way for a driveway at the Hiram M. Chittenden Locks. Easement term ends 31 January 1995.

20. DACW67-9-86-3 , consent granted to city of Seattle for installation of a 21" storm sewer outfall at the southeast end on the Montlake Cut, granted on 20 April 1987 for an indefinite term.

21. DACW67-1-86-15, lease granted to Dan & Vera Relei for use of 0.07 acres of Government tidelands (Ballard Tidelands) for installation and operation of a dock for storing live fish bait. Lease term ends 29 January 1996.

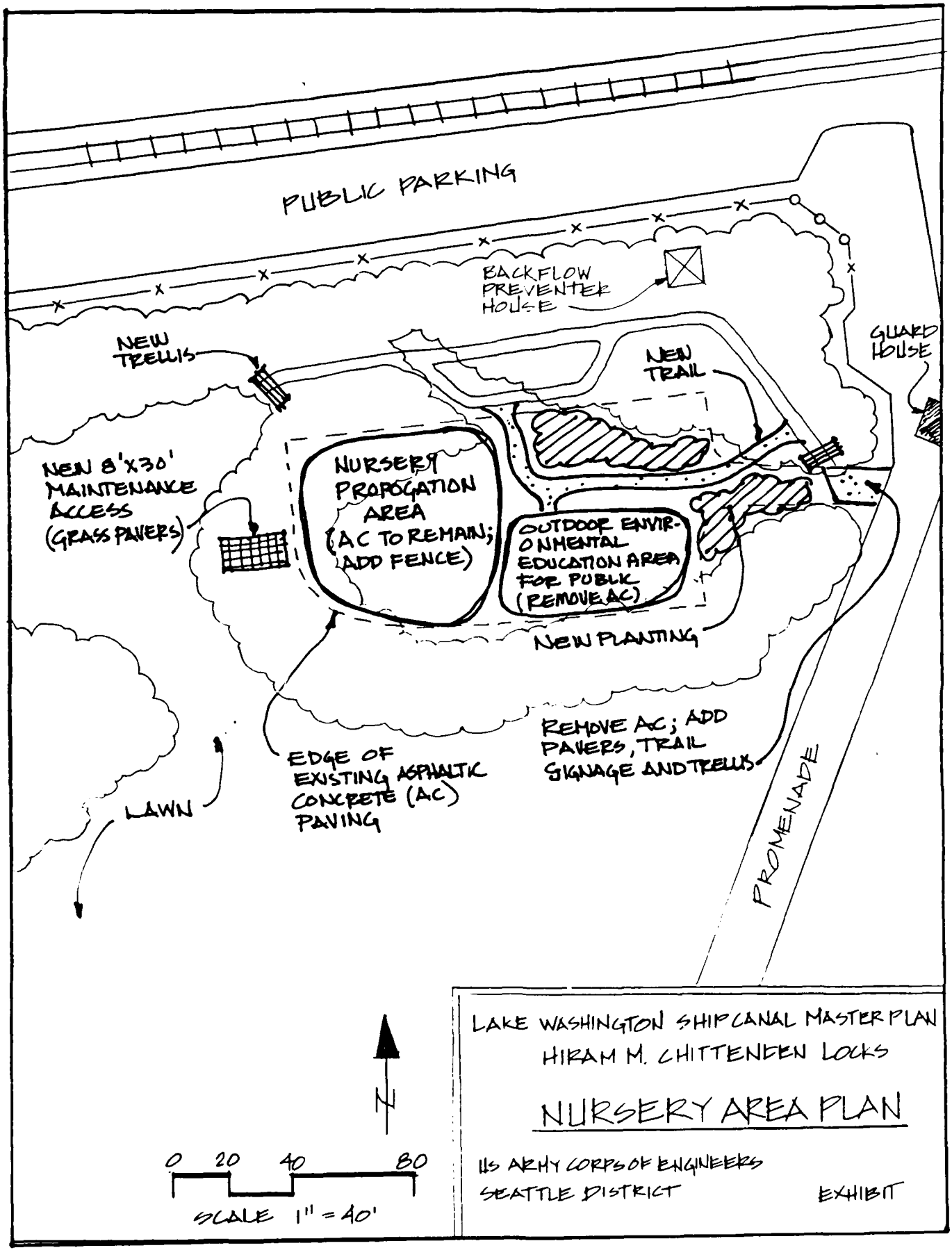
22. DACW67-1-89-1, lease granted to Lakeside Industries for Barge loading and unloading equipment at the Fremont Cut. The Lease ends 30 September 1993.

23. DACW67-2-90-94, easement granted to M&M Partnership for a right-of-way for a 12" storm sewer line at the Fremont Cut, granted for a 50-year term on 8 January 1990.

24. DACW67-2-91-29, easement granted to Fremont Dock Company/Quadrant Corporation for construction of a pedestrian trail (extension Burke-Gilman Trail System) with landscaping at the Fremont Cut, granted for a 50-year term on 14 September 1992.

25. DACW67-2-92-40, easement granted to Seattle Pacific University to construct a storm sewer outfall at the Fremont Cut, granted on 10 July 1992 for a 50-year term.

EXHIBIT C
PROPOSED NURSERY AREA DEVELOPMENT



LAKE WASHINGTON SHIP CANAL MASTER PLAN
HIRAM M. CHITTENDEN LOCKS

NURSERY AREA PLAN

US ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT

EXHIBIT

APPENDIX A
PLANT LIST

APPENDIX A
PLANT LIST

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	ALNUS Betulaceae		
A10.1	A. cordata	Italian Alder	23B
	AMPELOPSIS Vitaceae		
A11.1	A. brevipedunculata var. marimowiczii	Blueberry Climber	330
	ANTIRRHINUM		
A12.1	A. majus	Snapdragon	2
	AQUILEGIA Ranunculaceae		
A13.1	A. caerulea	Columbine	306, 327
	ARALIA Araliaceae		
A14.1	A. californica	Elk Clover	108, 205A, 327
	ARBUTUS Ericaceae		
A15.1	A. menziesii	Madrone, Madrona	23B, 27, 208
A15.2	A. unedo	Strawberry Tree	17, 23A, 30, 112, 205, 208
A15.3	A. xalapensis var. arizonica	--	306
	ARCTOSTAPHYLLOS Ericaceae		
A16.1	Arctostaphyllos sp.	Manzanita	120
A16.2	A. X Media	--	119, 120
A16.3	A. nummularia	Ft. Bragg Manzanita	101
A16.4	A. uva-ursi	Kinnikinnik, Bearberry	16, 17, 120
	ARISTOLOCHIA Aristolochiaceae		
A17.1	A. californica	--	328
	ASIMINA Annonaceae		
A18.1	A. triloba	Pawpaw	203
	ASPARAGUS Liliaceae		
A19.1	Asparagus var.	Asparagus	330
	ASTILBE Saxifragaceae		
A20.1	A. crispa	--	120
A20.2	Astilbe sp.	Spirea	304
	AUCUBA Cornaceae		
A21.1	A. japonica	Japanese Aucuba	24
	AUSTROCEDRUS Cupressaceae		
A22.1	A. chilensis	Chilean Incense Cedar	30

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	BERBERIS Berberidaceae		
B1.1	B. darwinii	Darwin's Barberry	3, 5, 23, 24, 28. 30, 115, 116, 12. 201, 203, 205, 210, 211, 315A
B1.2	B. Julianae	Wintergreen Barberry	203, 210, 211, 304, 327
B1.3	B. verruculosa	Warty Barberry	211, 304, 304A
	BERGENIA Saxifragaceae		
B2.1	B. cordifolia	Heart Leaf Bergenia	17, 26, 209, 213, 318, 319, 327
	BETULA Betulaceae		
B3.1	B. nana	Arctic Birch	323
B3.2	B. pendula	European White Birch	23B, 113A
	BLECHNUM Polypodiaceae		
B4.1	B. spicant	Deer Fern	120
	BLETTILA Orchidaceae		
B5.1	B. striata	Ground Orchid	304, 323
	BUDDLEIA Loganiaceae		
B6.1	B. davidii	Butterfly Bush	23B, 29
	BUPLEURUM Umbelliferae		
B7.1	B. fruticosum	--	205A
	BUSARIA Pittosporaceae		
B8.1	B. spinosa	Box Thorn	17
	BUXUS Buxaceae		
B9.1	B. sempervirens	Boxwood	28, 29, 203, 204, 205

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	CALLISTEMON Myrtaceae		
C1.1	C. subulatus	Bottlebrush	8, 328, 331
	CALLUNA Ericaceae		
C2.1	C. vulgaris	Heather	101
	CALOCEDRUS Cupressaceae		
C3.1	C. decurrens	Incense Cedar	205
	CAMELLIA Theaceae		
C4.1	Camellia X Bow Bells	Camellia hybrid	304
C4.2	C. japonica	Camellia	3, 29, 30, 112, 117, 122, 204, 211, 302, 304
C4.2.1	C. japonica 'Auburn White'	--	114A
C4.2.2	C. japonica 'Candida'	--	110
C4.2.3	C. japonica 'Cuspidata'	--	304
C4.2.4	C. japonica 'Donckelardii Fulgens'		304
C4.2.5	C. japonica 'Finlandii'	--	304
C4.2.6	C. japonica 'J. C. Williams'	--	302
C4.2.7	C. japonica 'Jupiter'	--	304
C4.2.8	C. japonica 'Magnoliiflora'	--	327
C4.2.9	C. japonica 'Rose Bowl'	--	304
C4.2.10	C. japonica 'Tricolor Red'	--	327
C4.3	C. reticulata	--	8, 304, 318
C4.4	C. sasanqua	--	28, 29, 205, 205A, 208, 306
	CAMPANULA Campanulaceae		
C5.1	C. persiciflora	Bellflower	306
C5.2	C. rapunculoides	Creeping Bellflower	317, 327
	CARPENTARIA Saxifragaceae		
C6.1	C. californica	Bush Anemone	8
	CATALPA Bignoniaceae		
C7.1	C. bignonoides	Common Catalpa	203
	CEANOTHUS Rhamnaceae		
C8.1	C. griseus var. horizontalis	Carmel Creeper	330
C8.2	C. 'Millerton's White'	--	306
C8.3	C. prostratus	Mahala Mat	313
C8.4	C. sp.	--	17
C8.5	C. thyrsiflorus	Blueblossom	306
	CEDRUS Pinaceae		
C9.1	C. atlantica	Atlas Cedar	203
C9.2	C. deodara	Deodar Cedar	26, 28, 110, 115, 207, 209
C9.3	C. libani	Cedar-of-Lebanon	2

	CERATOSTIGMA Plumbaginaceae		
C10.1	C. plumbaginoides	--	306, 316
	CERCIDIPHYLLUM Cercidiphyllaceae		
C11.1	C. japonicum	Katsura Tree	204, 304A
	CERCOCARPUS Rosaceae		
C12.1	C. ledifolius	Mountain Mahogany	120
	CHAENOMELES Rosaceae		
C13.1	C. speciosa	Flowering Quince	24
	CHAMAECYPARIS Cupressaceae		
C14.1	C. nootkatensis	Alaska Yellow Cedar	211
C14.1.1	C. nootkatensis 'Pendula'	--	315A, 315B
C14.2	C. obtusa	Hinoki Cypress	317
C14.3	C. pisifera	Sawara Cypress	10, 124, 201
C14.3.1	C. pisifera 'Plumosa'	Plume Sawara Cypress	121,203
	CHAMAEDAPHNE Ericaceae		
C15.1	C. calyculata	--	3
	CHAMAEROPS Palmae		
C16.1	C. humilis	Fan Palm	8, 327, 330, 331
	CHIMONANTHUS Calycanthaceae		
C17.1	C. praecox	--	4, 6, 318, 327
	CHOISYA Rutaceae		
C18.1	C. arizonica	--	304
C18.2	C. ternata	Mexican Orange	5A, 23B, 26, 28, 30, 203, 209
	CHRYSANTHEMUM Compositae		
C19.1	C. X hortorum	Garden Mums	8, 316
C19.2	C. parthenium	Feverfew	327
	CISTUS Cistaceae		
C20.1	C. albidus	Rockrose	205
C20.2	C. X hybridus	--	2
C20.3	C. laurifolius	--	210, 328
C20.4	C. X 'Silver Pink'	--	315, 316
C20.5	C. villosus	--	118
	CLADRASTIS Leguminosae		
C21.1	C. lutea	Yellowwood	202
C21.2	C. sinensis	--	118A
	CLEMATIS Ranunculaceae		
C22.1	C. flammula	--	119
C22.2	C. heracleiflora var. Davidiana		8
C22.3	Clematis sp.	--	319

	CLETHRA Clethraceae		
C23.1	C. alnifolia	Summer-Sweet	201, 207
C23.2	C. barbinervis	--	327
	COLCHICUM Liliaceae		
C24.1	C. autumnale	Autumn Crocus	128, 204, 317, 318, 319, 326, 328
	CORNUS Cornaceae		
C25.1	C. capitata	--	314, 330
C25.2	C. florida	Eastern Dogwood	113
C25.3	C. kousa	Korea Dogwood	120, 118A, 207, 302
C25.3.1	C. kousa rubra	Pink Korea Dogwood	24
C25.4	C. mas	Cornelian Cherry	16, 122
C25.5	C. nuttallii	Western Dogwood	121, 203, 204, 205, 208, 209
	CORONILLA		
C26.1	C. emerus	Scorpion Senna	24, 201
	CORYLOPSIS Hamamelidaceae		
C27.1	C. sinensis	Winter Hazel	4, 30
C27.2	C. willmottiae	--	327
C27.3	C. tibetica	--	118A
	COTONEASTER Rosaceae		
C28.1	C. henryana	--	204, 209
C28.2	C. horizontalis	Rock Spray Cotoneaster	30, 101, 201, 204, 304
C28.3	C. lactea	--	28, 112, 201, 203, 204, 205, 207, 208, 209, 316, 318, 319
C28.4	Cotoneaster sp.	--	16
C28.5	C. wardii	--	205A
	CRATAGEUS Rosaceae		
C29.1	Cratageus sp.	Hawthorn	16
	CRINODENDRON Elaeocarpaceae		
C30.1	C. Patagua	--	313
	CROCOSMIA Iridaceae		
C31.1	C. X crocosmaeflora	Montebretia	4, 5, 202
	CROCUS Iridaceae		
C32.1	Crocus varieties	--	302
	CRYPTOMERIA Taxodiaceae		
C33.1	C. japonica	--	22

	CUNNINGHAMIA Taxodiaceae		
C34.1	C. lanceolata	China Fir	28
	CYCLAMEN Primulaceae		
C35.1	C. coum	--	302, 306
C35.2	C. europaeum	--	324
C35.3	C. neapolitanum	--	5, 302, 317, 323
C35.4	C. repandum alba	--	120
	CYRILLA Cyrillaceae		
C36.1	C. racemiflora	Leatherwood	4
	CYTISSUS Leguminosae		
C37.1.1	C. ardonia hybrid #1	Broom	120
C37.1.2	C. ardonia hybrid #2	Broom	120
C37.2	C. hirsutus	Broom	101

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	DABOECIA Ericaceae		
D1.1	D. cantabrica	Irish Heath	119, 120
	DANAE		
D2.1	D. racemosa	Alexandrian Laurel	304
	DAPHNE Thymelaeaceae		
D3.1	D. collina	--	211
D3.2	D. laureola	Spurge Laurel	24, 26, 211, 313, 316, 317, 318, 323, 328
D3.3	D. mezereum	February Daphne	2, 6, 26, 30, 203, 210, 305 and others
	DEUTZIA Saxifragaceae		
D4.1	D. gracilis	Slender Deutzia	24
D4.2	D. X kalmiiflora	--	201
	DIANTHUS Caryophyllaceae		
D5.1	Dianthus sp.	--	119, 120, 209, 315
	DIMORPHOTHECA Compositae		
D6.1	Dimorphotheca sp.	--	119, 316
	DRYAS Rosaceae		
D7.1	D. octapetala	Mountain Avens	5, 8, 315, 316

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	ELAEAGNUS Elaeagnaceae		
E1.1	E. multiflora	Cherry Elaeagnus	202
E1.2	E. pungens	Silverberry	119, 304A
	ENKIANTHUS Ericaceae		
E2.1	E. campanulatus	--	4, 5, 26, 27, 102, 118, 204, 315
E2.2	E. chinensis	--	118A
E2.3	E. perulatus	--	302
	ERICA Ericaceae		
E3.1.1	E. arborea alpina	Tree Heather	25
E3.2	E. carnea	Heather	102, 119, 209, 302, 304, 326
E3.3	E. lusitanica	Spanish Heather	108, 122
	ERODIUM Geraniaceae		
E4.1	E. manescari	Heron's Bill	315
	ERYNGIUM Umbelliferae		
E5.1	E. alpinum	Sea Holly	314, 315
E5.2	E. planum	--	316
E5.3	E. yuccifolium	--	4
	ESCALLONIA Saxifragaceae		
E6.1	E. rubra	--	3, 201, 330
	EUCALYPTUS		
E7.1	Eucalyptus sp.	Australian Gum	23B
	EUCRYPHIA Eucryphiaceae		
E8.1	E. glutinosa	--	5, 327
E8.2	E. X intermedia	--	304
	EURYA Theaceae		
E9.1	E. emarginata	--	115
E9.2	E. japonica	--	115, 118A
E9.2.1	E. japonica 'Winter Wine'	--	118A

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	FAGUS Fagaceae		
F1.1	F. grandifolia	American Beech	21
	FALLUGIA Rosaceae		
F2.1	F. paradoxa	Apache Plume	17, 120, 316
	X FATSHEDERA Araliaceae		
F3.1	F. Lizei	Aralia-Ivy	317
	FATSIA Araliaceae		
F4.1	F. japonica	Japanese Fatsia	317
	FICUS Moraceae		
F5.1	F. carica	Edible Fig	330
	FILIPENDULA Rosaceae		
F6.1	F. vulgaris	Dropwort	304
	FORSYTHIA Oleaceae		
F7.1	F. suspensa	Forsythia	23B, 201, 202, 302
	FRAGARIA Rosaceae		
F8.1	Fragaria sp.	Wild Strawberry	17, 120, 316
	FRANKLINIA Theaceae		
F9.1	F. alatamaha	Rare Franklinia	101
	FRAXINUS Oleaceae		
F10.1	F. ornus	Flowering Ash	15A, 30
	FUCHSIA Onagraceae		
F11.1	F. hybridus	Garden Fuchsia	201, 306, 315
F11.2	F. magellica var. globosa	Shrub Fuchsia	4, 24

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	GALANTHUS Amaryllidaceae		
G1.1	G. nivalis	Snow Drop	119
	GARRYA Garryaceae		
G2.1	G. elliptica	Silk Tassel Bush	16, 29, 30, 120, 201, 202, 203, 204, 330, 332
G2.2	G. Fremontia	--	120
	GAULTHERIA Ericaceae		
G3.1	G. Miqueliana	--	108
G3.2	G. procumbens	Wintergreen	304
G3.3	G. shallon	Salal	23B, 25, 27, 102, 120, 205, 208, 209, 213, 304, 327
	GENISTA Leguminosae		
G4.1	G. hispanica	Spanish Gorse	119
G4.2	G. lydia	--	316
G4.3	G. pilosa	--	2, 4, 119, 120
	GERANIUM Geraniaceae		
G5.1	Geranium sp.	Hardy Geranium	119
	GINKGO Ginkgoaceae		
G6.1	G. biloba	Maidenhair Tree	28, 122, 302

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	HALESIA Styracaceae		
H1.1	H. carolina	Silverbell Tree	4
	HAMAMELIS Hamamelidaceae		
H2.1	H. japonica	Japanese Witch Hazel	318, 320
H2.1.1	H. japonica var. rubra	--	26
H2.2	H. mollis	Chinese Witch Hazel	7, 122
	HEBE Scrophulariaceae		
H3.1	H. traversii	--	204
	HEDERA Araliaceae		
H4.1	H. helix	English Ivy	2, 23A, 23B, 120, 201, 202, 317
H4.1.1	H. helix variety	--	25, 119
	HELLEBORUS Ranunculaceae		
H5.1	H. niger	Christmas Rose	119, 120, 122, 203, 315, 317, 330
H5.2	H. orientalis	Lenten Rose	315, 327
	HEMEROCALLIS Liliaceae		
H6.1	H. hybrids	Daylilies	214
	HEPATICA Ranunculaceae		
H7.1	H. americana	Liverleaf	304
	HEUCHERA Saxifragaceae		
H8.1	H. sanguinea	Coral Bells	120
	HIBISCUS Malvaceae		
H9.1	H. syriacus	Rose of Sharon	26
	HOLODISCUS Rosaceae		
H10.1	H. discolor	Ocean Spray	23A, 27, 30
	HYDRANGEA Saxifragaceae		
H11.1	H. aspera 'Strigosa'	--	204
H11.2	H. paniculata	--	202
H11.3	H. quercifolia	--	5A, 201, 204, 211
H11.4	H. serrulata var. acuminata	--	323
	HYPERICUM Hypericaceae		
H12.1	H. androsacae	Tutsan	7, 15
H12.2	H. patulum	Tall St. John's Wort	4, 5, 7, 120, 314, 328

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	ILEX Aquifoliaceae		
I1.1	I. aquifolium	English Holly	7, 112, 201, 317, 319
I1.2	I. Buergeri	--	16
I1.3	I. crenata	Japanese Holly	119
I1.3.1	I. crenata convexa	Japanese Holly variety	205
I1.4	I. pedunculosa	--	119
I1.5	I. Pernyi	Perny's Holly	206, 207
	ILLICIUM Illiciaceae		
I2.1	I. anisatum	Star Anise	23A
	IRIS Iridaceae		
I3.1	Iris sp.	--	315
I3.2	I. aureonympha	Golden Nymph Iris	306
I3.3	I. Douglasiana	--	7, 17, 120, 205A, 208, 212
I3.4	I. foetidissima	Scarlet Seeded Iris	201
I4.1	I. tenax	Pacific Coast Iris	28

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	JASMINUM Oleaceae		
J1.1	J. humile	Jasmine	24, 122, 203, 204, 205A
J1.2	J. nudiflorum	Jasmine	4
	JUGLANS Juglandaceae		
J2.1	J. nigra	Black Walnut	327
	JUNIPERUS Cupressaceae		
J3.1	J. chinensis 'Columnaris'	--	117
J3.2	J. chinensis 'Sargentii'	--	16, 17

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	KALMIA Ericaceae		
K1.1	K. angustifolia	Sheep Laurel	120
K1.2	K. latifolia	Mountain Laurel	25, 102, 327
	KNIPHOFIA Liliaceae		
K2.1	K. Uvaria	Red Hot Poker	4
	KOELRUETARIA Sapindaceae		
K3.1	K. paniculata	Golden Rain Tree	122, 328
	KOLKWITZIA Caprifoliaceae		
K4.1	K. amabalis	Beauty Bush	30, 102

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	LABURNUM Leguminosae		
L1.1	L. anagyroides	Golden Chain Tree	23A, 24, 25, 29, 201
	LEDUM Ericaceae		
L2.1	L. glandulosum var. columbiana	--	5
L2.2	L. groenlandicum	Labrador Tea	108
	LEPTOSPERMUM Myrtaceae		
L3.1	L. scoparium prostratum	New Zealand Tea Tree	119, 120
	LEUCOTHOE Ericaceae		
L4.1	Leucothoe sp.	Fetterbush	119
L4.2	L. Davisiae	Sierra Laurel	108, 327
L4.3	L. Fontanesiana	Dog Hobble	27, 112, 209
	LIBERTIA Iridaceae		
L5.1	L. formosa	Libertia	17, 304, 306, 329
	LIGUSTRUM Oleaceae		
L6.1	L. vulgare	Common Privet	201, 203
	LILIUM Liliaceae		
L7.1	L. longiflorum	Trumpet Lily	304
	LIMNANTHES Limnanthaceae		
L8.1	L. douglasii	Meadow Foam	128, 305, 326
	LINARIA Scrophulariaceae		
L9.1	L. genistafolia dalmatica	Toadflax	27
L9.2	L. maroccana	Toadflax	323
	LIQUIDAMBAR Hamamelidaceae		
L10.1	L. Styraciflua	Sweet Gum	203, 213
	LIRIODENDRON Magnoliaceae		
L11.1	L. tulipifera	Tulip Tree	213
	LITHOCARPUS Fagaceae		
L12.1	L. edulis	--	17
L12.2	L. densiflorus	Tan Bark Oak	7, 22, 26, 102, 204
L12.2.1	L. densiflorus var. echinoides	--	8, 29
L12.2.2	L. densiflorus var. Protection	--	23B
L12.3	L. Henryi	--	110

	LITHODORA Boraginaceae		
L13.1	L. fiddusa	--	101
	LONICERA Caprifoliaceae		
L14.1	L. Heckrottii	Honeysuckle	319
	LYCHNIS Caryophyllaceae		
L15.1	L. coronaria	Rose Campion	28, 29
	LYSICHITON Araceae		
L16.1	L. americana	Skunk Cabbage	212

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	MAGNOLIA Magnoliaceae		
M1.1.1	M. acuminata var. cordata	Yellow Cucumber Tree	17
M1.2	M. cylindrica	--	17
M1.3	M. grandiflora	Evergreen Magnolia, Bull Bay	16, 318, 319, 306
M1.4	M. heptapeta	Yulan Magnolia	306
M1.5	M. Kobus	Kobus Magnolia	25, 105, 206
M1.5.1	M. Kobus 'K. Wada'	--	15
M1.6	M. liliflora	--	112
M1.6.1	M. liliflora 'Nigra'	--	29, 208
M1.7	M. mollicomata	--	205, 314
M1.8	M. salicifolia	--	16
M1.9.1	M. Sargentiana 'Robusta'	--	7
M1.10	M. Sieboldii	--	116, 315
M1.11.1	M. X Soulangiana 'Alba'	--	7
M1.11.2	M. X Soulangiana 'Rustica Rubra'	--	108
M1.12	Magnolia sp.	--	23A
M1.13	M. Sprengeri	--	16
M1.14	M. stellata	Star Magnolia	119, 201, 206, 326
M1.15	M. tripetala	Umbrella Tree	28
M1.16	M. X Veitchii	--	17, Nursery
M1.17	M. virginiana	Sweet Bay	327
M1.18	M. Watsonii	--	324
M1.19	M. Wilsonii	--	110
	X MAHOBERBERIS Berberidaceae		
M2.1	M. Miethkeana	--	202
	MAHONIA Berberidaceae		
M3.1	M. aquifolium	Tall Oregon Grape	4, 5, 17, 23B, 24, 29, 30, 115, 119, 120, 201, 203, 204 205, and others
M3.2.1	M. aquifolium 'Compacta'	--	Fish Ladder 2, Fish Ladder 3
M3.3	M. dictyota	--	5A
M3.4	M. haematocarpa	--	5A
M3.5	M. japonica	--	203
M3.6	M. nervosa	Low Oregon Grape	119, 302
M3.7	M. pumila	--	119, 120
	MALANTHEMUM Liliaceae		
M4.1	M. dilatatum	Beadruby	121, 122

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	NANDINA Berberidaceae		
N1.1	N. domestica	Heavenly Bamboo	116
	NARCISSUS Amaryllidaceae		
N2.1	N. asturiensis	Miniature Daffodil	108
N2.2	N. juncifolius	Daffodil	101
N2.3	N. 'Mt. Hood'	Daffodil	302
	NOTHOFAGUS Fagaceae		
N3.1	N. Dombeyi	--	210
N3.2	N. obliqua	--	201
	NYSSA Nyssaceae		
N4.1	N. sylvatica	Tupelo	107, 212, 213

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	OLEARIA Compositae		
01.1	O. albida	Tree Aster	23B
	OSMANTHUS Oleaceae		
02.1	O. armantus	--	205
02.2	O. Delavayi	--	116, 117, 118A, 202, 205
02.3	O. heterophyllus	Holly Olive	119
	X OSMAREA Oleaceae		
03.1	X O. Burkwoodii	--	119, 211
	OSMARONIA Rosaceae		
04.1	O cerasiformis	Indian Plum	331
	OSTEOSPERMUM Compositae		
05.1	O. Barberae	Cape Marigold	119, 316
	OXYDENDRUM Ericaceae		
06.1	O. arboreum	Sourwood	Fish Ladder 1, Fish Ladder 2

	PIERIS Ericaceae		
P14.1	P. floribunda	Andromeda	27, 30, 112, 120, 122, 207, 327
P14.2	P. formosa	--	108, 109, 118A, 302
P14.3	P. japonica	Japanese Lily of the Valley Bush	108, 110, 116, 11 118, 119, 122, 204, 207, 211, 317
P14.3.1	P. japonica var. crispa	--	8, 29, 201
P14.3.2	P. japonica 'Pygmaea'	Dwarf Lily of the Valley Bush	120
P14.4	P. taiwanensis	--	7
	PIMELIA Thymelaeaceae		
P15.1	P. prostrata	Riceflower	101
	PINUS Pinaceae		
P16.1	P. aristata	Bristlecone Pine	101
P16.2	P. Banksiana	Jack Pine	330
P16.3	P. Bungeana	Lace Bark Pine	16, 17
P16.4.1	P. contorta 'contorta'	Shore Pine	23B
P16.4.2	P. contorta 'latifolia'	Lodgepole Pine	203, 205
P16.5	P. densiflora	Japanese Red Pine	26, 27, 28, 108, 109, 306
P16.6	P. edulis	Pinyon Pine	101
P16.7	P. jeffreyi	Jeffrey's Pine	26, 28, 327
P16.8	P. lambertiana	Sugar Pine	205
P16.9	P. Mugo	Swiss Mountain Pine	118, 120
P16.9.1	P. Mugo 'mugo'	Dwarf Swiss Mountain Pine	120
P16.10	P. nigra	Austrian Black Pine	208, 302
P16.11.1	P. parviflora var. Glauca	Japanese White Pine	120
P16.12	P. patula	Mexican Pine	304
P16.13	P. pinea	Italian Stone Pine	23B
P16.14	P. radiata	Monterey Pine	23B
P16.15	P. Sabiniana	Digger Pine	23B, 201, 327
P16.16	P. Thunbergiana	Japanese Black Pine	323, 324
P16.17	P. uncinata	--	207
P16.18	P. Wallichiana	Himalayan White Pine	304
	PISTACIA Anacardiaceae		
P17.1	P. chinensis	Pistachio	205
	POLYSTICHUM Polypodiaceae		
P18.1	P. munitum	Sword Fern	throughout garden
P18.2	P. setiferum	Alaska Fern	6, 23, 25, 108, 112, 115, 121, 122, 302, 317, 327
	POTENTILLIA Rosaceae		
P19.1	P. fruticosa	Shrubby Cinquefoil	28

	PRIMULA Primulaceae		
P20.1	P. Auricula 'Fire King'	Auricula	120
P20.2	P. Juliae	Primrose	206
	PRUNUS Rosaceae		
P21.1	P. X blireiana	--	30
P21.2.1	P. cerasifera 'Atropurpurea'	Cherry Plum	28
P21.3	P. Laurocerasus	English Laurel	201, 203
P21.4.1	P. Mume 'Peggy Clark'	Japanese Apricot	8
P21.5	P. Persica	Flowering Peach	23
P21.6	P. Sargentii	Sargent Cherry	120
P21.7.1	P. serrulata 'Kofugen'	Japanese Flowering Cherry	211
P21.7.2	P. serrulata 'Kwanzan'	Japanese Flowering Cherry	209, 321
P21.7.3	P. serrulata 'Naden'	Japanese Flowering Cherry	317
P21.7.4	P. serrulata 'Shirotae'	Japanese Flowering Cherry	201, 204
P21.7.5	P. serrulata 'Shirofugen'	Japanese Flowering Cherry	104, 206, 211
P21.7.6	P. serrulata 'Shogetsu'	Japanese Flowering Cherry	26, 27, 112, 119, 209, 211
P21.7.7	P. serrulata 'Taizan-fukun'	Japanese Flowering Cherry	7, 23B, 325
P21.7.8	P. serrulata 'Takasago'	Japanese Flowering Cherry	120, 304
P21.7.9	P. serrulata 'Ukon'	Japanese Flowering Cherry	203, 207, 112
P21.8.1	P. subhirtella 'Autumnalis'	--	7
P21.8.2	P. subhirtella 'Momi-jugara'	--	309
P21.8.3	P. subhirtella 'Pendula'	Weeping Higan Cherry	112, 210
P21.8.4	P. subhirtella 'Yae-shidare-higan'	--	312
P21.8.5	P. subhirtella 'Whitcombii'	--	110
P21.9	P. yedoensis	Yoshino Cherry	313
P21.9.1	P. yedoensis 'Akebono'	--	112, 114
	PSEUDOLARIX Pinaceae		
P22.1	P. Kaempferi	Golden Larch	16
	PSEUDOTSUGA		
P23.2	P. menziesii	Douglas Fir	26, 29, 201, 203, 204
	PYRACANTHA Rosaceae		
P24.1	P. coccinea	Firethorn	205, 210
P24.2	P. crenatoserrata	Firethorn	210, 331
	PYRUS Rosaceae		
P25.1	P. Calleryana	Flowering Pear	23A

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	QUERCUS Fagaceae		
Q1.1	Q. agrifolia	Calif. Live Oak	24, 17
Q1.2	Q. canariensis	--	19
Q1.3	Q. cerris	--	18
Q1.4	Q. chrysolepis	Canyon Live Oak	210, 323, 1, 5, 29
Q1.5	Q. coccinea	Scarlet Oak	102, 30, 24, 23, 25
Q1.6	Q. glauca	Ring Cupped Oak	205, 3, 30
Q1.7	Q. hypoleucoides	Silverleaf Oak	8, 316
Q1.8	Q. ilex	Holly Oak	4, 307
Q1.9	Q. kelloggii	Calif. Black Oak	13
Q1.10	Q. mongolica	Mongolian Oak	20
Q1.11	Q. myrsinifolia	--	17
Q1.12	Q. palustris	Pin Oak	27, 112
Q1.13	Q. phillyraeoides	Ubame Oak	308, 108
Q1.14	Q. rubra	Red Oak	301, 215A, 205A
Q1.15	Q. rugosa	--	316, 324
Q1.16	Q. sadlerana	Sadler's Oak	101, 202, 303
Q1.17	Q. sp.	--	19
Q1.18	Q. suber	Cork Oak	210
Q1.19	Q. vaccinifolia	Huckleberry Oak	330, 205A, 314, 315, 17, 23B, Fish 1.
Q1.20	Q. wislizenii	Interior Live Oak	315, 112

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	RAPHIOLEPIS Rosaceae		
R1.1	R. umbellata	Yedda Hawthorne	Fish Ladder 3
	RHODODENDRON Ericaceae		
R2.1	R. adenopodum	--	108, 110
R2.2	R. 'Alice'	--	209
R2.3	R. amagianum	Amagi Azalea	23B
R2.4	R. arboreum	Tree Rhododendron	27
R2.5	R. X arbutifolium	--	121
R2.6	R. 'atlanticum'	Coast Azalea	17
R2.7	R. augustinii	--	120, 302
R2.7.1	R. augustinii 'Marine'	--	302
R2.7.2	R. augustinii 'Tower Court'	--	302
R2.8	R. 'Avril'	--	205
R2.9	R. 'Blue Tit'	--	6
R2.10	R. 'Brittania'	--	23A, 27, 108
R2.11	R. 'Broughtonii Aureum'	--	6
R2.12	R. Bureavii	--	302
R2.13	R. 'Butterfly'	--	5
R2.14	R. calophytum	--	23A
R2.15	R. cardiobasis	--	28, 202, 203, 208
R2.16	R. catawbiense	--	25
R2.17	R. caucasicum hybrid	Caucasian Rhod.	122
R2.18	R. cerasinum	--	108
R2.19	R. concinnum	--	102
R2.20	R. 'Cory Koster'	--	7
R2.21	R. chryseum 'Fabia'	--	327
R2.22	R. cuneatum	--	113, 208
R2.23	R. 'Cynthia'	--	6, 25
R2.24	R. Dalhousiae	--	23B
R2.25	R. davidsonianum	--	6, 112, 113
R2.26	R. 'Dawn's Delight'	--	327
R2.27	R. decorum	--	17, 25, 27, 113, 12 209
R2.28	R. desquamatum	--	108
R2.29	R. detonsum	--	122
R2.30	R. discolor	--	110
R2.31	R. 'Dormouse'	--	302
R2.32	R. 'Earl of Athlone'	--	114A
R2.33	R. 'Erubescens'	--	6

R2.34	R. 'Fabia'	--	327
R2.35	R. 'Faggetter's Favorite'	--	108
R2.36	R. Falconeri	--	23B
R2.37	R. Fortunei	--	28, 209
R2.38	R. 'Fragrantissimum'	--	211
R2.39	R. 'Game Chick'	--	109
R2.40	R. X Gandavense	Ghent Hybrid Azalea	108, 114, 205
R2.40.1	R. X Gandavense 'Altaclarense'	--	302
R2.41	R. 'Gill's Crimson'	--	109
R2.42	R. 'Gomer Waterer'	--	24, 26, 122
R.2.43	R. griersonianum hybrid	--	1, 7, 27
R2.44	R. gymnocarpum	--	23B
R2.45	R. hippophaeoides	--	5, 108
R2.46	R. Houlstonii	--	7
R2.47	R. 'Ihrig'	--	4
R2.48	R. impeditum	--	302
R2.49	R. indicum	--	2, 102, 116, 117, 119
R2.50	R. insigne	--	208
R2.51	R. Johnstoneanum	--	23B
R2.52	R. Keysii	--	118A
R.53	R. X Kosteranum	Molle Hybrid Azalea	25, 29, 102, 112, 116, 118, 120, 201, 203, 204, 206, 210, 212, 213
R2.54	R. leucapis	--	108
R2.55.1	R. loderi hybrid	--	108
R2.55.2	R. loderi 'Game Chick'	--	109
R2.55.3	R. loderi 'King George'	--	109, 302
R2.55.4	R. loderi 'Patience'	--	109
R2.56	R. X Luscombei	--	203
R2.57	R. X macrophyllum X occidentale	--	211
R2.58	R. X 'Maxwellii'	--	122, 302, 317
R2.59	R. minus hybrid	--	207
R2.60	R. 'Mrs. A. T. de la Mare'	--	15
R2.61	R. 'Mrs. C. B. van Ness'	--	27
R2.62	R. 'Mrs. C. W. Leak'	--	7
R2.63	R. 'Mrs. E. C. Sterling'	--	27
R2.64	R. 'Mrs. Furnival'	--	118

R2.65	R. 'Mrs. Mary Ashley'	--	1, 109
R2.66	R. mucronatum	--	5, 304
R2.66.1	R. mucronatum 'Amethystinum'	--	113
R2.67	R. mucronulatum	--	114
R2.68	R. X Nobleanum	--	26
R2.69	R. X obtusum	--	119
R2.69.1	R. X obtusum 'Hi No Crimson'	--	108, 119, 121
R2.69.2	R. X obtusum 'Hi No Digiri'	--	119
R2.69.3	R. X obtusum 'Hi No Mayo'	--	109
R2.70	R. occidentale	--	5, 120
R2.71	R. oreodoxa	--	23A
R2.72	R. 'Pinkie Pearce'	--	302
R2.73	R. polylepis	--	26
R2.74	R. ponticum	--	122
R2.74.1	R. ponticum 'Cheiranthifolium'	--	108
R2.74.2	R. ponticum hybrid	--	108
R2.75	R. 'Princess Elizabeth'	--	7
R2.76	R. pubescens	--	302
R2.77	R. 'Purple Splendor'	--	27
R2.78	R. racemosum	--	5, 6, 8, 116, 120, 122, 304, 306, 317, 327
R2.79	R. Racile	--	302
R2.80	R. ravum	--	27
R2.81	R. 'Rosa Mundi'	--	118, 121
R2.82	R. 'Ruby Bowman'	--	28
R2.83	R. 'Sappho'	--	119
R2.84	R. schlippenbachii	Royal Azalea	113, 121
R2.85	R. simsii hybrid	--	302
R2.86	R. smirnowii	--	108
R2.87	R. 'Sovenir of Slocock'	--	211
R2.88	R. sutchuenense	--	26
R2.89	R. tephropeplum	--	304
R2.90	R. tosaense	--	118A
R2.91	R. 'Unknown Warrior'	--	115
R2.92	R. Vaseyi	--	120
R2.93	R. vernicosum	--	108
R2.94	R. viriei	--	23B
R2.95	R. 'walloper'	--	113
R2.96	R. wardii hybrid	--	27
R2.97	R. 'Wilbar'	--	302
R2.98	R. williamsianum	--	114, 121, 304
R2.99	R. yakusimanum	--	205A
R2.100	R. yunnanense	--	25, 28, 112, 210, 211, 302, 327

	RHUS Anacardiaceae		
R3.1	R. typhina	Staghorn Sumac	201
	RIBES Saxifragaceae		
R4.1	R. sanguineum	Currant	6, 8, 24, 116, 201, 202, 204, 205A, 314, 317, 318, 319, 327, 333

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	SARCOCOCCA Buxaceae		
S1.1.1	S. Hookerana var. humilis	Sweet Box	302
S1.2.1	S. ruscifolia var. chiliensis	Fragrant Sweet Box	304
	SAXEGOTHAEA Podocarpaceae		
S2.1	S. conspicua	Prince Albert Yew	304
	SAXIFRAGA Saxifragaceae		
S3.1	S. Cotyledon	--	119
S3.2	S. umbrosa	London Pride	315
	SCABIOSA Dipsacaceae		
S4.1	S. ochroleuca	Pin Cushion Flower	313, 318
	SCIADOPITYS Taxodiaceae		
S5.1	S. verticillata	Japanese Umbrella Pine	302
	SENECIO Compositae		
S6.1	S. laxifolius	--	17
	SEQUOIA Taxodiaceae		
S7.1	S. sempervirens	Coast Redwood	122, 201. 203
	SEQUOIADENDRON Taxodiaceae		
S8.1	S. giganteum	Giant Sequoia	14, 201, 203, 204
	SIDALCEA Malvaceae		
S9.1	Sidalcea sp.	--	327
	SILENE Caryophyllaceae		
S10.1	S. Hookeri	Campion	16
	SINOFRANCHETIA Lardizabalaceae		
S11.1	S. chinensis	--	302
	SKIMMIA Rutaceae		
S12.1	S. japonica	Skimmia	7, 27, 108, 109, 121,122, 202, 203, 204, 206, 306, 317, 318, 319
	SMILAX Liliaceae		
S13.1	S. aspera var. maculata	Greenbier	330, 331
	SOPHORA Leguminosae		
S14.1	S. japonica	Japanese Pogoda Tree	204

	SORBUS Rosaceae		
S15.1	S. Aucuparia	European Mountain Ash	203
S15.2	S. esserteauiana	--	304A
S15.3	S. Folgneri	--	17, 26, 110'
S15.4	S. Prattii	--	26
	SPHAERALCEA Malvaceae		
S16.1	Sphaeralcea sp.	--	313
	SPIREA Rosaceae		
S17.1	S. X Vanhouttei	--	22
	STACHYURUS Stachyuraceae		
S18.1	S. praecox	--	16
	STEWARTIA Theaceae		
S19.1	S. monadelpha	--	211
S19.2	S. pseudocamellia	--	206, 211, 327
S19.3	S. rostrata	--	211
	STYRAX Styracaceae		
S20.1	S. japonica	Japanese Snowbell	28, 201, 208, 209, 210
S20.2	S. Obassia	Fragrant Snowbell	102, 211
S20.3	S. Wilsonii	--	16

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	TAXODIUM Taxodiaceae		
T1.1	T. distichum	Bald Cypress	212, 213
	TAXUS Taxaceae		
T2.1	T. baccata 'Repens'	Prostrate Yew	23B
T2.2	T. brevifolia	Western Yew	28, 202, 203, 209
	TETRACENTRON Tetracentraceae		
T3.1	T. sinense	--	23A
	THUJA Cupressaceae		
T4.1.1	T. occidentalis 'Aurea-variegata'	Variegated White Cedar	123
T4.1.2	T occidentalis 'Pyramidalis'	--	318, 319
T4.2	T. plicata	Western Red Cedar	23B, 24, 25, 26, 27, 29, 203, 204
	TILIA Tiliaceae		
T5.1	T. petiolaris	Basswood	103
	TRACHYCARPUS Palmae		
T6.1	T. fortunei	Windmill Palm	128, 305, 318, 330
	TROCHODENDRON Trochodendraceae		
T7.1	T. araliodes	Wheel Tree	205, 306
	TSUGA Pinaceae		
T8.1	T. canadensis	Canadian Hemlock	Fish Ladder 1, Fish Ladder 2
T8.2	T. heterophylla	Western Hemlock	26
T8.3	T mertensiana	Mountain Hemlock	24, 102, 118, 119, 208, Fish Ladder 1

TAG NUMBER	BOTANICAL NAME		COMMON NAME	LOCATION BED #
U1.1	UMBELLULARIA U. californica	Lauraceae	Oregon Myrtle	17, 21', 322

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	VACCINIUM Ericaceae		
V1.1	V. corymbosum	Highbush Blueberry	108
V1.2	V. ovatum	Evergreen Huckleberry	25, 27, 120
V1.3	V. parvifolium	Red Huckleberry	203, 212
	VANCOUVERIA Berberidaceae		
V2.1	V. hexandra	--	108, 119
	VERBASCUM Scrophulariaceae		
V3.1	Verbascum sp.	Mullein	2, 4
V3.2	V. Chaixii	Mullein	4, 315
V3.3	V. Thapsus	Common Mullein	31
	VIBURNUM Caprifoliaceae		
V4.1	V. X bodnantense	--	319
V4.2	V. cinnamomifolium	--	118
V4.3	V. Davidii	David's Viburnum	30, 118
V4.4	V. Lantana 'Mohican'	Wayfaring Tree	118
V4.5	V. Opulus	High Bush Cranberry	108, 210, 213
V4.6	V. plicatum tomentosum	Double File Viburnum	5A, 25
V4.7	V. rhytidophyllum	Leatherleaf Viburnum	112, 201
V4.8	V. tinus	Laurustinus	24, Fish Ladder 2
	VINCA Apocynaceae		
V5.1	V. minor	Periwinkle	Fish Ladder 2
	VIOLA Violaceae		
V6.1	Viola sp.	--	120
	VITIS Vitaceae		
V7.1	V. Coignetiae	Crimson Glory Vine	302
V7.2	V. vinifera var. 'Purpurea'	European Grape	205A, 30

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION: BED #
	WEIGELA Caprifoliaceae		
W1.1	Weigela sp.	--	203, 304
	WOODWARDIA Polypodiaceae		
W2.1	W. radicans	Chain Fern	304

TAG NUMBER	BOTANICAL NAME	COMMON NAME	LOCATION BED #
	YUCCA Agavaceae		
Yl.1	Y. gloriosa	Spanish Dagger	23A, 23B, 24, 29, 201

TAG NUMBER	BOTANICAL NAME		COMMON NAME	LOCATION BED #
	ZANTEDESCHIA	Araceae		
21.1	A. aethiopica		Calla Lily	15
	ZAUSCHNERIA			
22.1	Z. californica		California Hummingbird Flower	101

March 3, 1982

ADDENDUM #1 TO PLANT LISTING FOR CARL S. ENGLISH, JR., GARDENS AT THE HIRAM M. CHITTENDEN LOCKS, LAKE WASHINGTON SHIP CANAL. SEATTLE, WA.

Subj: Addition/deletion of items in the plant listing for the Gardens

1. Holders of plant listing for the Carl S. English, Jr., Gardens are requested to make changes to that listing as indicated below:

a. Tag Number A1: Add "A1.5 A. Grandis Grand Fir 202."

b. Tag Number A2: Add "A2.13 A. Griseum Paper Bark Maple 110."

c. Tag Number A8: Under Location Bed # add: "204A." for Tag Number A8.1.

d. Following Tag Number A22.1: Add "AMARYLLIS Amaryllidaceae
A23.1 A. Belladonna Belladona Lilly 6."

e. Following Tag Number A23.1: Add "ATHRYRIUM Polypodiaceae
A24.1 A. Filix 'femina' Lady Fern 110."

f. Following Tag Number A24.1: Add "ARUNCUS Rosaceae
A25.1 A. Sylvester -- 108."

g. Tag Number B1: Add "B1.4 B. thunbergii Japanese Barberry 202."

h. Tag Number B9.1: Add "306" under location bed.

i. Tag Number C1.1: Delete "8" under lonation bed.

j. Tag Number C4.3: Delete "8" under location bed.

k. Tag Number C4.4: Add: "304, 329" under location bed.

l. Tag Number C8.4: Change "C. sp." to read "C. veitchianus."

m. Tag Number C8.5: Change "306" to read "313" under location bed.

n. Tag Number C19.1: Delete "8" under location bed.

o. Tag Number C22.2: Change "8" to "Lath House" under location bed.

p. Tag Number C27.1: Delete "4" under location bed.

q. Tag Number C27: Add "C27.4 C. Pauciflora Buttercup winter hazel 16."

r. Tag Number C28.3: Delete "316" from location bed.

s. Tag Number C35.3: Add "329" under location bed.

March 5, 1982

Subj: Addition/deletion of items in the plant listing for the Gardens

t. Tag Number C37: Add "C37.3.1 C. Battandieri Atlas Broom 238."
Add "C37.4.1 C. X Praecox Moonlight Broom 202."
Add "C37.5.1 C. Nigricans Broom 119."

u. Following Tag Number C37: Add "CLAYTONIA Portulacaceae —
C38.1 C. Nivalis Spring Beauty 1."

v. Following Tag Number C38: Add "CALYCANTHUS Calycanthaceae
C39.1 C. Occidentalis Western Spice Bush 28."

w. Following Tag Number C39: Add"CORDYLINE Agavaceae
C40.1 C. Indivisa Dracaena 128."

x. Following Tag Number C40: Add "CORYLUS Betulaceae
C41.1 Corylus sp. -- 201.
C41.2 C. tibetica -- 118A."

y. Following Tag Number 41: Add: " CONVALLARIA Liliaceae
C42.1 C. Majalis Lily of the Valley 122."

z. Following Tag Number 42: Add: "CERCIS Leguminosae
C43.1 Cercis Siliquastrum Judas Tree 204."

aa. Following Tag Number 43: Add: "CALICARPA Verbenaceae
C44.1 C. Mollis -- 204A."

bb. Following Tag Number 44: Add: "CASTANOPIS Fagaceae
C45.1 C. Cuspidata var. sieboldii 204, 18."

cc. Following Tag Number 45: Add:"CAMASSIA Liliaceae
C46.1 C. Sp. Camas Lilly 120."

dd. Following Tag Number D7.1: Add: DIGITALIS Scrophularizceae
D9.1 D. Purpurea -- 2."

ee. Following Tag Number D8: Add: DAVIDIA Nyssaceae
D9.1 D. Involucrata Dove Tree 30."

ff. Following Tag Number D9: Add: DENDROMECON Papaveraceae
D10.1 D. Rigida Harfordi Island Bush Poppy 313."

gg. Following Tag Number E6.1 Add:
"E6.2 E. Macrantha X E. Pteroclodon var. Donald Brilliance 204A."

hh. Following Tag Number E9: Add: "ENDYMION Liliaceae
E10.1 E. Non-Scriptus -- 304."

ii. Following Tag Number E10: Add: "EPIMEDIUM Berberidaceae
E11.1 E. Pimedium Grandiflorum Biships Hat 25."

Subj: Addition/deletion of items in the plant listing for the Gardens

jj. Tag Number F10: Add: "F10.2 F. Sp. -- 201."

kk. Tag Number F11.2: Add "201" to Location Bed.

ll. Tag Number G4: Add: "G4.4 G. Tinctoria Dyer's green weed 120."

mm. Tag Number G4.3: Delete "2" from Location Bed.

nn. Tag Number H11.4: Change "H. serrulata var. acuminata" to read "H. serrulata serata var. acuminata."

oo. Tag Number H12.2: Delete "7" from Location Bed.

pp. Tag Number H12: Add: "H12.3 H. Calycinum -- 122."

qq. Following Tag Number H12: Add "HOSTA Liliaceae
H13.1 H. Ventriculosa Plantain Lilly 120."

rr. Tag Number I1.1: Delete "319."

ss. Tag Number I4.1: Change to read "I3.5."

tt. Tag Number I3: Add: I3.6 I. Laeuigata -- 212."

uu. Following Tag Number K4.1: Add "KERRIA Rosaceae
K5.1 Kerria Japonica 'pleniflora' Japanese Rose 202."

vv. Tag Number L1.1: Delete "24, 24" from Location Bed.

ww. Tag Number L12.2.1: Delete "8" from Location Bed, and enter "Lath House."

xx. Tag Number L12.2.2: Delete entire tag information. (No longer in garden.)

yy. Following Tag Number L16.1: Add: "LYONIA Ericaseae
L17.1 Lyonia ovaliflia var. elliptica 204A."

zz. Following Tag Number L171.: Add"LEWISIA Portulaceae
L18.1 L. Cotyledon Lewisia 120."

aaa. Tag Number M1.5: Change "M. Kobus" to read "M. Kobus var. borealis."

bbb. Tag Number M1: Add: M1.20 M. Macrophylla Bigleaf Magnolia 28."

ccc. Tag Number M1.3: Delete "306." in location bed.

ddd. Tag Number M3.1: Delete "4" and add:"302,304, 319, 329, 330" to location bed.

eee. Tag Number M3: Add: M3.8 M. Pinnata -- 30."

fff. Tag Number M8.1: Delete "2" from location bed.

ggg. Tag Number N3.1: Change Location Bed Number from"210"to "Front of Warehouse #2."

hhh. Tag Number 02.2: Add: "204A" to Location Bed.

iii. Tag Number P2.2: Add: "327" to Location Bed.

jjj. Tag Number P6.1: Add: "6" to Location Bed.

kkk. Tag Number P16: Add: "P16.19 P. Koraiensis Korean Pine 16." and "P16.20 P. Sylvestris Scot's Pine 16."

lll. Tag Number P21.7.7: Add "6" to Location Bed.

mmm. Tag Number P21.9: Add"P21.9.2 P. Sp. Japanese Flowering Cherry 17."

nnn. Following Tag Number P25.1: Add:"PAEONIA Paeoniaceae
P26.1 P. Emodia Peony 329" and
"P26.2 P. Lutea Peony 313."

ooo. Following Tag Number P26.2: Add"POLYONNTUM Liliaceae Soloman Seal
P27.1 P. Multiflorum -- 302."

ppp. Following Tag Number P27.1: Add: "PODOCARPUS Podocarpaceae P28.1
P. Alpinus -- 316" and "P28.2 P. Nivalis -- 316."

qqq. Following Tag Number P28.2: Add"PLATYCARYA Juglandaceae
P29.1 Platycarya Strobilacea -- 204A."

rrr. Following Tag Number Q1.20: Add: "Q1.21 Q. Prinus Chestnut Oak 122."

sss. Following Tag Number R1.1: Add: R1.2 R. Umbellata var. mertensii -- 204A."

ttt. Tag Number R2.47: Delete "4" under Location Bed.

uuu. Following Tag Number R2.100: Add: "R2.101 R. Manipurense -- 329" and "R2.102 R. Thomsonii(3) -- 11A."

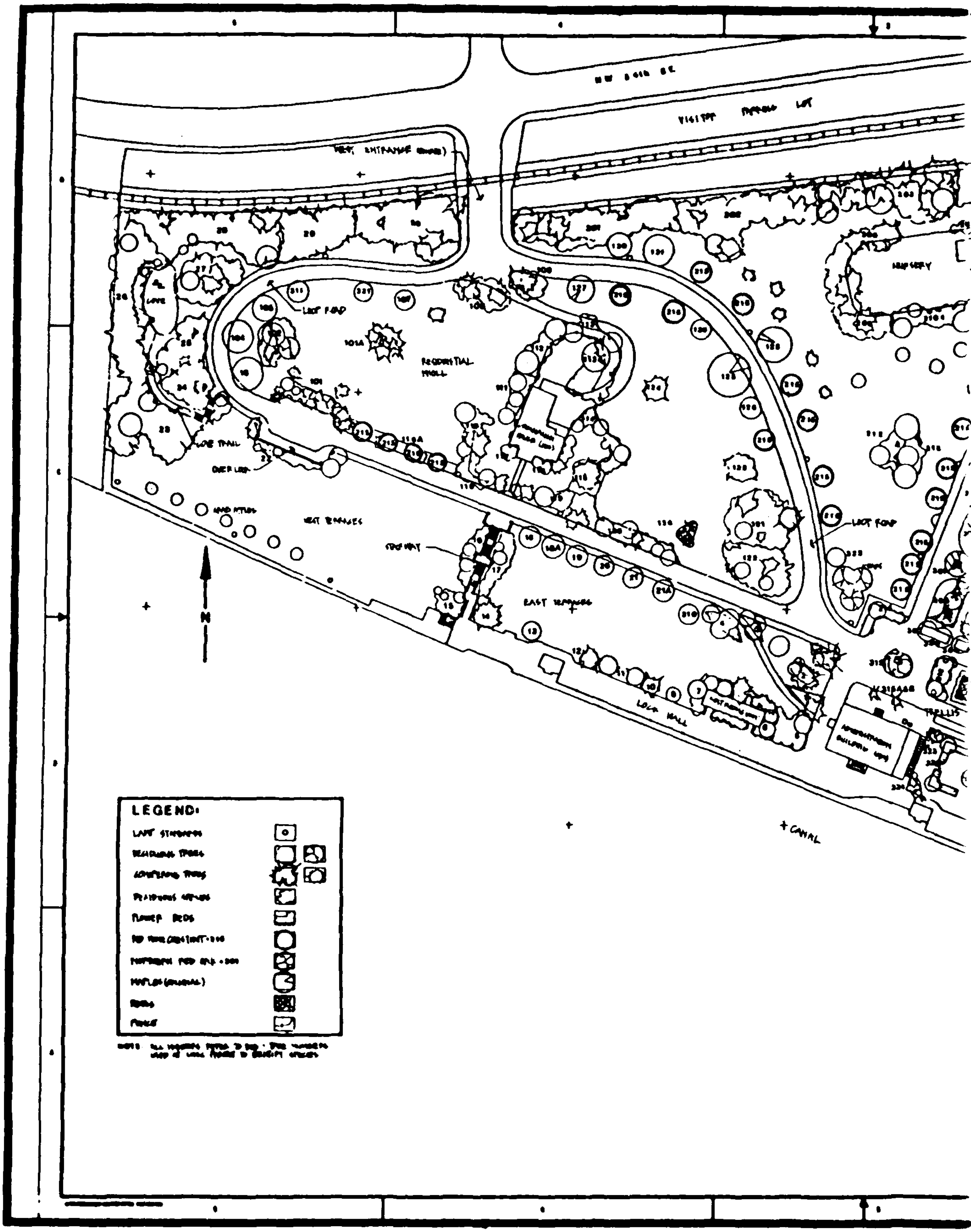
vvv. Tag Number R4.1: Delete: "6, 8" under Location Bed.

www. Following Tag Number R4.1: Add: "RUSCUS Liliaceae
R5.1 R. Aculeatus -- 329" and "R6.1 R. Moyesii -- 17." and
"R6.2 R. Sp. -- Rose 17."

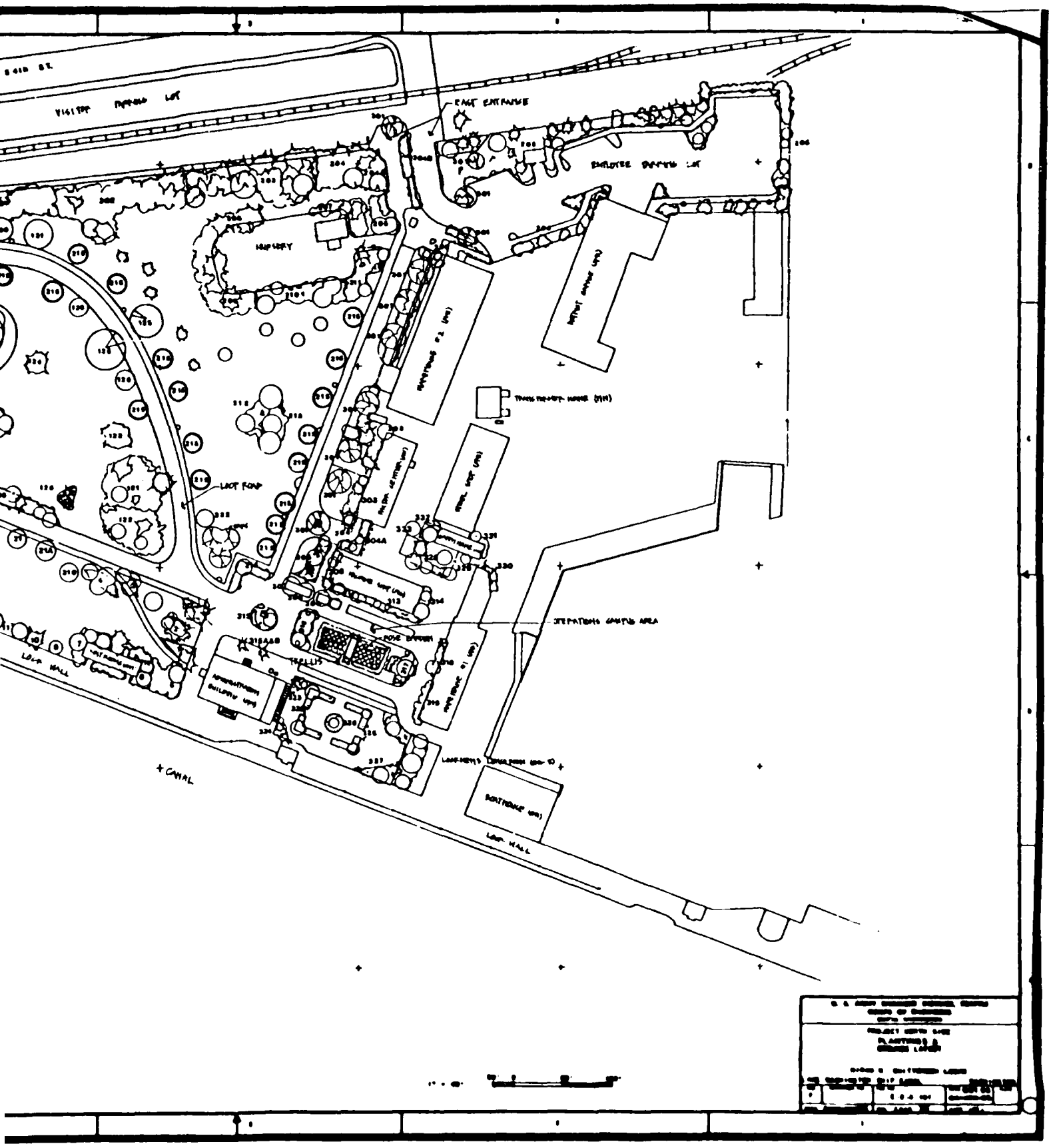
xxx. Following Tag Numb[illegible] Add"RUBUS Rosaceae
[illegible]. Hispidus Swamp Dewberry -- 316."

yyy. Following Tag Number S17.1: Add "S17.2 S. Japonica -- 204A."

zzz. Tag Number T4.1.2: Delete "318" from Bed Location.



LEGEND:
RESIDENTIAL
KNOLL
NURSERY
WEST TERRACE
EAST TERRACE
LOCK WALL
TRELLIS
CANAL


EAST ENTRANCE
EMPLOYEE PARKING LOT
LOCK ROAD
CANAL
LOCK WALL
LOCK WALL

APPENDIX B
LWSC PROJECT BIRD LIST

CHITTENDEN LOCKS BIRD LIST

SPECIES	ABUNDANCE/SEASON	HABITAT	LOCATION
Common Loon	CW	SW	S,D
Pacific Loon	UW	SW	S,D
Red-throated Loon	UW	SW	S,D
Western Grebe	CW	SW	S,L,D
Red-necked Grebe	UW	SW	S,D
Horned Grebe	UW	SW	S,L,D
Eared Grebe	RW	SW,FW	L
Pied-billed Grebe	UY	FW	L,U
Double-crested Cormorant	OW	FW,SW	S.U,D
Pelagic Cormorant	OW	SW	S,D
Great Blue Heron	OY	MF,F	S,U,D
Canada Goose	CY	M,PG	L,S,U,D
Mallard	CY	FW,M,SW	L,S,U,D
Gadwall	UY	FW,M,SW	L,S,U
Green-Winged Teal	CY	FW,M,MF	L,U
American Wigeon	CW	FW,M,SW	L,S,U
Ruddy Duck	CW	SW,FW	L,S,U,D
Tufted Duck	RW	FW	L
Scaup (Lesser & Greater)	CW	FW,SW	L,S,U,D
Surf Scoter	UW	SW	S,D
White-Winged Scoter	UW	SW	S,D
Common Goldeneye	CW	SW,FW	L,S,U,D
Barrow's Goldeneye	UW	SW,FW	L,S,D
Bufflehead	CW	FW,SW	L,S,U,D
Common Merganser	OW	FW	L,U
Red-breasted Merganser	UW	SW	L,S,D
Hooded Merganser	OW	FW	L,U
American Coot	CY	FW,SW,M	U,S
Killdeer	CY	PG,MF	L,U,D
Greater and Lesser Yellowlegs	CM	MF	U,S,D
Spotted Sandpiper	OS	GS	S,U,D
Dunlin	UW	MF	L,S,D
Sanderling	OW	MF,GS	S,D
Parasitic Jaeger	OM	SW	D
Glaucous-winged Gull	CY	SW,FW,MF	L,S,U,D
California Gull	CM	SW,FW,MF	L,S,U,D
Herring Gull	RY	SW,FW	L,S,D
Ring-billed Gull	UW	SW,FW	L,S,U,D
Mew Gull	CY	SW	L,S,D
Bonaparte's Gull	CW	SW	L,S,D
Common Tern	CM	SW	L,S,D
Arctic Tern	UM	SW	L,S,D
Pigeon Guillemot	UY	SW	
Rhinocerous Auklet	UW	SW	
Common Murre	RW	SW	
Bald Eagle	UY	F,MF,FW,SW	
Red-tailed Hawk	CY	F,SW	

Cooper's Hawk	UY	F,PG	D,L,U,S
Sharp-shinned Hawk	UY	F,PG,ST	D,L,U,S
Merlin	OY	F,PG	D,L,U,S
Rock Dove	CY	PG	L,D,S,U
Band tailed Pigeon	UY	F,PG	D,L,U,S
Common Nighthawk	OS	A,PG	L,U,S,D
Rufous Hummingbird	CS	PG,F,ST	D,L,U,S
Anna's Hummingbird	UY	PG,ST	D,L,S
Belted Kingfisher	CY	SW,FW	L,D,S,U
Northern Flicker	CY	F,ST,PG	L,D,S,U
Red-breasted Sapsucker	RY	F,PG	D,L
Downy Woodpecker	CY	F,ST,PG	L,D,S,U
Pacific Slope Flycatcher	CS	F,ST,PG	D,L,U
Western Wood Pewee	CS	F,ST,PG	D,L,U
Olive-sided Flycatcher	CS	F,ST,PG	D,L,U
V-G Swallow	CS	A,PG	L,U,S,D
Tree Swallow	CS	A,PG,F	L,U,S,D
Barn Swallow	CS	A,PG,MF	L,U,S,D
Cliff Swallow	CS	A,M,MF	U,L,S,D
Common Crow	CY	F,PG,ST	L,S,D,U
Northwestern Crow	CY	GS,MF,SW(A)	S,D,L
Steller's Jay	CY	PG,F,ST	L,D,U
Red-breasted Nuthatch	CY	F,ST	D,L
Black-capped Chickadee	CY	ST,PG,F	D,L,U
Chestnut-backed Chickadee	CY	F,ST,PG	D,L,U
Bushtit	CY	ST,F,PG	D,L,U
Brown Creeper	UY	F,PG	D,L
Winter Wren	CY	F,PG	D,L
Bewick's Wren	CY	PG,ST,F	D,L,U
American Robin	CY	PG,F,ST	L,D,U
Varied Thrush	UW	PG,ST,F	D,L
Hermit Thrush	UM	F,ST,PG	D,L,U
Swainson's Thrush	CS	F,ST,PG	D,L,U
Ruby-crowned Kinlet	CY	F,ST,PG	D,L,U
Golden-crowned Kinglet	CY	F,ST,PG	D,L,U
Cedar Waxwing	CY	F,ST,PG,M	D,L,U
European Starling	CY	PG	L,D,U
Orange-Crowned Warbler	CS	PG,ST,F	D,L,U
Yellow Warbler	CS	PG,ST,F,M	D,L,U
Black-Throated Gray Warbler	CM	F	D
Yellow-Rumped Warbler	CY	F,ST,PG	L,D,U
Wilson's Warbler	CS	F,ST,PG	L,D,U
Black-headed Grosbeak	US	F,ST,PG	D,L,U
Rufous-Sided Towhee	CY	ST,PG	D,L,U
Song Sparrow	CY	F,ST,PG	D,L,U
White-Crowned Sparrow	CY	F,ST,PG,G	D,L,U

Golden-Crowned Sparrow	UW	ST,PG	D,L,U
Savannah Sparrow	CS	G	U,S,D,L
Dark-Eyed Junco	CY	F,ST,PG	D,L,U
Red-winged Blackbird	CY	M,ST	U,D
Brown headed Cowbird	UY	F,ST,PG	D,L,U
Western Tanager	UY	F,ST,PG	D,L,U
Purple Finch	UY	F,ST,PG	D,L,U
House Finch	CY	F,ST,PG	L,D,U
Evening Grosbeak	CW	F,ST,PG	L,D,U
American Goldfinch	CY	ST,G	D,U
Pine Siskin	CY	F,ST,PG	D,U,L
House Sparrow	CY	PG,ST	L,D,U

Abundance/Season Codes

C Commonly seen
U Regularly seen
O Seen occasionly
R Rare sightings only

Y Year-round
W Winter residents (including spring and fall)
M Spring and fall only
S Summer residents (including spring and fall)

Habitat Codes

SW Salt Water
MF Mudflats
FW Fresh Water
M Marsh
F Forest
ST Shrubby Thickets
PG Parks and Gardens
GS Gravel Shore
A Aerial
G Grassland

Location Codes

L Locks, including Carl English Gardens
S Shilshole (SW)/Salmon Bays (FW)
D Discovery Park
U Union Bay (also Portage Bay and Lake Union)

Any additional species found at the Locks but not on this list should be reported to park rangers. If you believe the bird to be rare for Western Washington, you might also want to call the Seattle Audubon Society Rare Bird Hotline to leave a message: 526-8266.

NOTE: The abundance codes for birds on this list are strictly based on observations in the immediate vicinity of the Lake Washington Ship Canal and may be at variance to other checklists which reflect a wider distribution. For example, the American goldfinch, which is common throughout western Washington, is listed as uncommon, because the habitats in the vicinity of the ship canal are not ideal for goldfinches. Likewise, locations, such as Union Bay, do not necessarily include birds found in adjacent upland habitats such as the Montlake Fill and the Washington Park Arboretum, unless the species is regularly seen along the shore.

APPENDIX C
HISTORIC NOMINATION
AND ACCEPTANCE

Munsell/emy/3630
27 November 1978

1 DEC 1978

NPSEN-PL-LR (Undated) 2d Ind
SUBJECT: Hiram Chittenden Locks, Lake Washington Ship Canal, WA; Nomination to the National Register of Historic Places

DA, Seattle District, Corps of Engineers, Post Office Box C-3755, Seattle, Washington 98124

TO: Division Engineer, North Pacific, ATTN: NPDPL-LR

Attached as per your request are NPS's comments to the nomination of the subject property to the National Register of Historic Places (inclosure 2).

FOR THE DISTRICT ENGINEER:

SIDNEY KNUTSON, P.E.
Acting Chief Engineering Division

2 Incl
Added 1 incl
2. Cmts, 27 Nov 78

cc w/incl:
Munsell/Maas
Dice
Newman, RP
Swanson, Des Br
Bailey, Opns
ERS RP FILE (LWSC CR File)

DICE
NEWMAN
FARRAR
HOGAN
SWANSON
DERRICK
LATTA
PAO
OFC COUNSEL

SELLEVOLD/s/
ED PL FILE

NPDPL-ER (undated) 1st Ind
SUBJECT: Hiram Chittenden Locks, Lake Washington Ship Canal, WA;
Nomination to the National Register of Historic Places

DA, North Pacific Division, Corps of Engineers, P.O. Box 2870,
Portland, OR 97208 1 November 1978

TO: District Engineer, Seattle

1. The State of Washington has nominated the subject property to the National Register of Historic Places. Inclosed is a copy of the nomination assemblage.

2. In order that we may respond to OCE's suspense date of 30 November 1978, request you provide your views on the subject nomination to reach this office by COB 21 November 1978.

3. Return of inclosure is requested.

FOR THE DIVISION ENGINEER:

1 Incl
nc

D. E. OLSON
Chief, Planning Division

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314

REPLY TO ATTENTION OF:

DAEN-CWP-P

SUBJECT: Hiram Chittenden Locks, Lake Washington Ship Canal, WA; Nomination to the National Register of Historic Places

Division Engineer, North Pacific

1. Inclosed is a copy of the nomination of subject property to the National Register of Historic Places.

2. Please provide your views on this nomination to DAEN-CWP-P (Mr. Richard Leverty) by COB 30 November 1978.

3. Return of inclosure is requested.

FOR THE CHIEF OF ENGINEERS:

1 Incl
as

JOHN R. HILL, JR.
LTC, Corps of Engineers
Assistant Director of Civil Works, Pacific

FHR-8-226
June 1976

U. S. DEPARTMENT OF THE INTERIOR
HERITAGE CONSERVATION AND RECREATION SERVICE
WASHINGTON OFFICE

FOLLOW-UP SLIP

To: Mr. Richard Leverty
Chief
Plan Formulation and Evaluation Branch
Planning Division
Directorate of Civil Works
Corps of Engineers
Department of the Army
Washington, D. C. 20314

Date 12.18.78

A Copy of the Washington State nomination for the Chittenden Locks and Lake Washington Ship Canal Historic District is attached.

I find no record indicating that it was listed previously or found eligible for the Register. The Register does include, though, the W. T. Stevens, a steam-driven sternwheeler used within the historic district now being nominated.

We anticipate receiving your comments on the nomination within the next 45 days.

NOT TO BE FILED

Signature Marcella Sherfy
~~National Register of Historic Places~~

NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

RECEIVED APR 25 1978

DATE ENTERED

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC: Chittenden (Hiram M.) Locks and Related Features of the Lake Washington Ship Canal

AND/OR COMMON:

2 LOCATION

STREET & NUMBER: [illegible] NOT FOR PUBLICATION

CITY, TOWN: Seattle VICINITY OF

CONGRESSIONAL DISTRICT: 1st - Hon. Joel Pritchard

STATE: Washington CODE: 53 COUNTY: King CODE: 033

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
X DISTRICT	X PUBLIC	X OCCUPIED	AGRICULTURE	MUSEUM
X BUILDING(S)	PRIVATE	UNOCCUPIED	COMMERCIAL	PARK
X STRUCTURE	BOTH	WORK IN PROGRESS	EDUCATIONAL	PRIVATE RESIDENCE
SITE	PUBLIC ACQUISITION	ACCESSIBLE	ENTERTAINMENT	RELIGIOUS
OBJECT	IN PROCESS	YES: RESTRICTED	GOVERNMENT	SCIENTIFIC
	BEING CONSIDERED	X YES: UNRESTRICTED	INDUSTRIAL	X TRANSPORTATION
		NO	MILITARY	X OTHER: Recreation

4 OWNER OF PROPERTY

NAME: U. S. Army Corps of Engineers, Seattle District

STREET & NUMBER: North Pacific Division
4725 East Marginal Way South

CITY, TOWN: Seattle VICINITY OF

STATE: Washington 98134

Montlake Cut not owned by Corps but held in perpetual lease from State.

Director Herman L. Barnes
Dept. of General Administration
Olympia, Wash. 98504

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.: Real Estate Division, Seattle District, U. S. Army Corps of Engineers

STREET & NUMBER: 4725 East Marginal Way South

CITY, TOWN: Seattle

STATE: Washington 98134

6 REPRESENTATION IN EXISTING SURVEYS

TITLE: Inventory authorized by Executive Order 11593
"Protection and Enhancement of the Cultural Environment"

DATE: April 4, 1972 X FEDERAL STATE COUNTY LOCAL

DEPOSITORY FOR SURVEY RECORDS: Department of the Army, Office of the Chief of Engineers

CITY, TOWN: Washington

STATE: D.C. 20314

CONDITION		CHECK ONE	CHECK ONE
_EXCELLENT	_DETERIORATED	_UNALTERED	X ORIGINAL SITE
X GOOD	_RUINS	X ALTERED	_MOVED DATE_____
_FAIR	_UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

SUMMARY STATEMENT

By making a continuous waterway of man-made channels and inland bodies extending nearly eight miles between Puget Sound and Lake Washington, the Lake Washington Ship Canal opened up a vast fresh-water harbor to ocean-going vessels and thus complemented Seattle's deep-water port facilities in Elliott Bay. The project was conceived and planned over a period of years in cooperation with private enterprise and local government and was completed under auspices of the U. S. Army Corps of Engineers and dedicated in 1917. Its primary components are a fixed dam and double locks and a 17-acre reservation at Salmon Bay in the Ballard District; a channel slightly more than a mile long known as the Fremont Cut, which connects the Salmon Bay Waterway to Lake Union; and a half-mile long channel known as the Montlake Cut, which in turn joins Lake Union to Lake Washington. These engineering features have been little altered since their completion sixty years ago, except for repairs and a normal amount of upgrading, and they have remained under the jurisdiction of the Department of the Army. At the locks site, now officially designated the Hiram M. Chittenden Locks, approximately half of the structures supporting the operation of the locks have been added since the 1940s. However, the initial complex of ten or twelve concrete accessory buildings is intact. Moreover, for the most part, the Corps of Engineers Master Plan for the project provides for the preservation and enhancement of historical elements.

LEGAL DESCRIPTION

The Hiram M. Chittenden Locks of the Lake Washington Ship Canal are located in SE¼ Sec. 10, T.25N., R.3E. and in SW¼ Sec. 11, T.25N., R.3E., of the Willamette Meridian. The engineering feature straddles the Salmon Bay Waterway, and the accompanying government reservation is sited amidst the Ballard Tide Lands on the north shore and the Seattle Tide Lands on the south shore.

The Fremont Cut of the Lake Washington Ship Canal is located in NW¼, NE¼ and SE¼ Sec. 13, T.25N., R.3E., and in SW¼ Sec. 18, T.25N., R.4E., of the Willamette Meridian. The engineering feature traverses the Ross Addition and Denny and Hoyt's Addition to the Plat of Seattle.

The Montlake Cut of the Lake Washington Ship Canal is located in S½ Sec. 16, T,25N., R.4E. of the Willamette Meridian. The engineering feature is bordered by the University of Washington tract on the north shore and, on the south shore, by the Montlake Park Addition to the Plat of Seattle.

GENERAL CHARACTERISTICS OF THE SITE

The locks and dam are situated athwart the foot of Salmon Bay, originally a tidal inlet, which gives into Shilshole Bay north of Magnolia Head in Puget Sound. To the south of the headland, in Elliott Bay, lies Seattle's principal harbor. Oriented northwest to southeast, the locks and dam span the narrowest section of the Salmon Bay Waterway, where it is some 400 feet across, approximately a mile and a half east of the entrance to Shilshole Bay. When these features raised and stabilized its water level, Salmon Bay ultimately became a freshwater body and the harbor of a sizable fishing fleet. As is pointed out in the Lake Washington Ship Canal Master Plan, lands adjoining the eight-mile waterway between Puget Sound and Lake Washington have been developed for commercial,

industrial, residential, park and other public purposes, but shoreline use of the canal is predominantly related to the maritime industry. As a consequence, boat ramps and marinas; piers, docks and wharves; marine repair shops and shipbuilding yards are typical developments in the near vicinity of the three separate parcels proposed for nomination. The first parcel of 49 acres embraces the locks and their guide piers, the spillway dam and fish ladder, and grounds owned in fee simple by the U. S. Army Corps of Engineers. The second and third parcels of 38.5 and 20 acres, respectively, are limited to the Corps' fee-owned holdings along the Fremont and Montlake Cuts.

The preponderance of the 17-acre reservation which accompanies the locks lies on the north shore of the waterway, where maintenance and administrative facilities are arranged on a modified grid perpendicular to the waterway. The westerly portion of the reservation rises to an elevation of 45 feet, and sited atop this plateau is the Lock-keeper's House, which currently serves as the residence of the District Engineer. In front of the house, a terraced embankment of dredge spoils falls off toward water grade in 5-foot intervals. A paved concourse parallel with the waterway extends the length of the lawn-covered plateau, and at its westerly end is a viewing platform or overlook with solid concrete railing. This secondary concourse is linked to a private gateway in the northwest corner of the reservation by curvilinear road segments which encompass the residential knoll. In this informally landscaped westerly section of about seven acres is a luxuriant array of mature ornamental and specimen trees, shrubs and bedding plants introduced by grounds-keeper Carl S. English and others in the 1930s and 1940s.

The high ground of the reservation slopes off gradually on the east to level terrain about 20 feet in elevation. Here the maintenance campus is laid out along the main concourse, which is essentially on axis with the spillway dam. Included in this more-or-less formal complex of classically-styled concrete structures designed by the eminent local firm of Bebb and Gould are the administration building, which is the focal point, the machine shop, office and shop building, and mechanics shop. Each of these is clustered around a courtyard which opens onto the locks. Other initial structures, the gas and oil building, carpenter and blacksmith shops and transformer house, are sited to the north in the direction of the east gateway which serves as the visitors' entrance. In the 1940s a number of new structures, some of them temporary in nature, were added on the north and on the less public easterly margin of the maintenance core. Among the newer structures are the boathouse, greenhouse, steel shop, and two large metal-clad warehouses, one of which currently serves as a district garage. An employees' parking lot was developed inside the east entrance and was well screened by plantings. The Master Plan calls for its removal eventually. The grounds are lighted by electroliers on tapered and chamfered concrete standards. However, the original single globe fixtures have been replaced with modern lamps. Public parking is provided outside reservation boundaries along Burlington Northern Railway right-of-way. Reservation boundaries which are not contiguous with the waterway are lined with security fencing.

Little over an acre of the reservation is located at the far end of the spillway dam, on the south shore of the waterway, where a rehabilitated fish ladder and new underwater

fish viewing room were completed a year ago. Adjoining the westerly end of this segment of the reservation is city-owned land which is being developed for day-use park purposes. In turn, Commodore Park will be linked by trails to the city's Discovery Park, which occupies portions of the Fort Lawton Military Reservation on Magnolia Bluff.

Lake Union is a comparatively small body covering an area of nearly one and a half square miles. Further to the interior, Lake Washington, on the other hand, has an area of 39 square miles and depths that exceed 200 feet. The Fremont Cut, like the Salmon Bay Waterway which it connects to Lake Union, also is angled to the southeast. It follows, generally, the course of an old stream bed between the Fremont District on the north shore and the base of Queen Anne Hill on the south. Taking its name from the former district, the channel is 5800 feet in length and 100 feet wide, although the Corps of Engineers' fee-owned right-of-way is 300 feet wide. The authorized depth of the channel is 30 feet. Concrete revetments on either side of the channel are here and there bolstered by rip-rap. The low banks are lined with single rows of Lombardy poplars which have been aptly described as "colonnades" because they are nearly uninterrupted from the Northern Pacific Railway Bridge on the westerly end to the Fremont Drawbridge on the east. Subsidiary landscaping of an informal nature was undertaken along the banks as a beautification project by the Seattle Garden Club in the 1950s.

The Montlake Cut follows a compass-oriented easterly course of 2500 feet through a narrow neck of land between Lake Union's Portage Bay and Union Bay in Lake Washington. The channel takes its name from the residential district on the south shore. The Montlake District is connected to the University of Washington campus on the north shore via the Montlake Drawbridge, which crosses the canal at right angles near the center. The channel width is 100 feet, although the right-of-way controlled by the Corps of Engineers is typically 325 feet wide. It is dredged to an authorized depth of 30 feet. The tops of the concrete revetments are used as waterside walks, and there are trails also about midway up either steep embankment rising to a height of about 65 feet. On the south shore a recreational trail was recently improved and developed by the Corps of Engineers in cooperation with the Seattle Garden Club. It extends from West Montlake Park on the extreme w[illegible] end of the channel to Horace McCurdy Park on the east end, and it continues through and beyond the marches of Foster Island to Washington Park.

HIRAM M. CHITTENDEN LOCKS

Construction of the locks and dam was carried out within the protection of two independent coffer dams. The locks were constructed without piles on a bed of hard clay. Concrete work, generally held to have been of exceptionally durable quality, was composed of one part Portland cement, three parts sand, and six parts gravel. The concrete was mixed, lowered into the forms by bottom dump buckets, spread in layers and spaded, but no tamping was required. Particular care was taken to protect the concrete from the action of salt water during the curing process. Detailed descriptions of construction and operating methods are given in W. J. Barden and A. W. Sargent's 1926 paper published by the American Society of Civil Engineers, which is listed among the bibliographical references.

The following general description is quoted from Lake Washington Ship Canal Master Plan, Design Memorandum 5 (Seattle: Seattle District, U. S. Army Corps of Engineers, April 1976), Section 2, page 7, and Section 4, page 1.

The locks provide a navigation passage between the freshwater portion of the project, at a mean elevation of 21 feet above sea level, and Shilshole Bay, the level of which is determined by tidal action. Depending on the tide, the lift provided by the locks varies from 6 to 20 feet. The structure incorporates two locks, the larger of which is 825 feet long between the upper and lower miter gates, and is 80 feet in width. This lock can be divided into two smaller chambers by an intermediate miter gate. Ocean-going vessels, up to 30 foot draft, can be accommodated through this lock. A salt-water barrier, hinge-mounted to the floor of the lock, is air-operated via manual push-button controls located in the central control tower. The barrier is manually left in a raised position to reduce the intrusion of saltwater into Salmon Bay but is lowered to permit passage of deep-draft vessels. Saltwater which passes into Salmon Bay but is lowered to permit passage of deep-draft vessels. Saltwater which passes into Salmon Bay during lockage settles into a saltwater basin immediately upstream of the large lock. A saltwater drain conduit returns the saltwater by gravity to Shilshole Bay. The saltwater drain conduit inlet is at the bottom of the saltwater settling basin. Flow through the conduit is controlled by an electrically-operated sluice gate at the fishladder.

The small lock, adjacent to and south of the large lock, has a chamber 150 feet long by 30 feet wide, and is used by smaller vessels with drafts up to 16 feet. Floating mooring bitts on both the south and north walls limit the usable width to 28 feet.

The dam which forms the barrier between the small lock wall and the south shore is 235 feet long and has six 32 foot wide spillway openings in which steel radial gates are installed. The three spillway gates located near the south shore are raised and lowered by an electrically-operated, movable hoist, while the three spillway gates located near the locks are equipped with individual electrically-operated gate hoists. Maximum discharge capacity of the spillway at full gate opening is approximately 16,000 c.f.s. (Note: The three south gates are scheduled for automation, and the hoist house will have to be removed.)

A rehabilitated fish ladder on the south shore, complete with a fish viewing room, was recently opened to the public . . . The original fish ladder at the locks was constructed in 1917 . . . It *has been undergoing rehabilitation since 1973,* at which time the underwater fish viewing room, pedestrian ramps and rest room facilities were planned.

ACCESSORY STRUCTURES

1. Lockkeeper's House (1913). First permanent building completed on the reservation. Two sheets of drawings for the building among project records stored on the site are dated December 1912. Not prepared by local architect Carl F. Gould as once supposed, the plans evidently were the concept of C. A. D. Young, "Jun. Engineer". A simple, rectangular construction with stuccoed hollow tile walls. Originally measured 26 x 35 feet. Two

stories with shingled gable roof and overhanging eaves with exposed rafters. Certain details apparently derived from the Craftsman Bungalow. Cross-axial frontal gable; shed-roofed rear dormer. Brick end chimneys with corbelled caps. Porches have hipped roofs with shaped outriggers. Regular fenestration. Single and coupled double-hung sash windows with nine lights over one.

In 1966 the interior was remodeled; partitioning was revised and one of the fireplaces was removed. Externally, the upgrading was discreet. Among the results: new roof cover of composition shingles, conversion of front ground story windows to bay windows within original openings, addition of a bedroom and carport to the rear pantry and stoop. In 1967 the house was dedicated as the official residence of the Seattle District Engineer and renamed in honor of Colonel James B. Cavanaugh, U. S. Army Corps of Engineers District Engineer during the construction of the Lake Washington Ship Canal 1911-1917. The Master Plan calls for no further changes except possible additional buffer planting to increase privacy.

2. Administration Building (1914-1915). The solitary initial multi-purpose public building on the reservation and the focal point, it called for extraordinary design effort. Ten sheets of plans and elevations dated 1914 and prepared by Carl F. Gould of the eminent local firm of Bebb and Gould are among project records stored on the site. Rectangular plan measuring 47 x 67 feet. Reinforced concrete construction. Two stories and basement. Tile-clad hipped roof with central deck. Second Renaissance Revival Style. Basement contains the pumping plant for unwatering or emptying the locks for annual repairs and the original electrical distribution panel, which is intact but functionally superseded. Ground story has cross-axial corridors with central lobby space and principal offices in each corner. Lobby is open to second story gallery. Oval ceiling light of textures and colored glass. Terrazzo floor with geometric trim of Alaska and verde antique marble. Centered in lobby floor is a brass plaque in the form of the battlemented structure which serves as the logogram of the U. S. Army Corps of Engineers. Further federal iconography is found in the lobby entablature, which is decorated with shields, and in the wrought iron gallery railing, where cast iron American eagle emblems are centered in each section. Interior walls and ceilings, including coved cornices, are plaster-finished. Woodwork, including door and window trim, baseboards, pilasters, ogee wall panel moldings, and Ionic stave columns flanking the main entry vestibule, is varnished oak. Second story storerooms open onto the central gallery.

Each exterior elevation has tripartite organization. Walls are topped with a decorative concrete parapet. Second story windows are covered with cast-iron grilles. Ground story arcuated windows and central pedimented doorways are in panels of concrete set off from the major wall surface by special texturing with a bush hammer. The main entry on the southwest, or waterway face is recessed behind a two-story portal arch and surrounded by plate glass fronted by cast iron grilles. Surmounting either bulkhead of the concrete steps of this entrance are light globes mounted on fluted concrete drums with dolphin-supported bronze fittings. These are noteworthy because they are the only external lighting fixtures on the reservation which have remained wholly intact.

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The building has been only superficially altered, mostly on the interior. The Master Plan calls for some restoration and upgrading, including the replacement of window sash to match the original, cleaning and sealing masonry, and refinishing woodwork as required. While primary visitor-information functions will be shifted elsewhere, the building's basement pumping plant will be open to the public as an exhibit area. A basement stairway access from the exterior and additional interior lighting are among the few improvements planned.

3. Operating Houses, Nos. 1, 2, 3, and 4 (1914). Nos. 1 through 3 are on the north lock wall. No. 4 is situated on the middle lock wall. Single-story structures of reinforced concrete measuring 14 x 21 feet. Rectilinear domed roofs. Wrap-around corner window bays with transom grilles. Original purpose was to control locks. Functionally superseded by central Control Tower but still operable. Master Plan calls for retention and reconditioning.

4. Mechanics Shop (1914). Single story structure of reinforced concrete measuring 18 x 56 feet. Built up roof. Base mold, entablature and other details in the classical tradition conform to the simple utilitarian style of the original group of accessory buildings. Current use: storage and locker room.

5. Transformer House (1914). Single story structure of reinforced concrete measuring 25 x 33 feet. Built up roof. Contains transformers and emergency generator. The only one of the original accessory buildings to have a compass orientation rather than conforming to the grid perpendicular to the waterway. Openings of the west facade are outlined with continuous plain moldings under segmental arch heads. Entablature, belt molds and base in the classical tradition conform to the simple utilitarian style of the original group of accessory buildings. Pedimented hood over central doorway. Master Plan calls for minor restoration and cleaning.

6. Office and Shop Building (1916). Warehouse of the original group of accessory buildings. Reinforced concrete construction measuring 36 x 80 feet. Two stories. Built up roof. Details in classical tradition conform with established pattern. Later single story paint shop additions on north end doubled the building's length. Aluminum window sash has been substituted for original and is to be replaced.

7. Machine Shop (1916). Reinforced concrete construction measuring 30 x 85 feet. Two stories. Built up roof. Entablature, belt molds and base in classical tradition conform to the simple utilitarian style of the original group of accessory buildings. Aluminum window sash has been substituted for original and is to be replaced.

8. Gas and Oil Building (1916). Single story structure of reinforced concrete measuring 14 x 22 feet. Built up roof. Contains 600 and 315-gallon gasoline tanks. Exterior details in classical tradition conform to the simple utilitarian style of the original group of accessory buildings.

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9. Carpenter and Blacksmith Shops (1921). Reinforced concrete construction measuring 31 x 91 feet. Two stories. Built up roof. Entablature, belt molds and base in classical tradition conform to the pattern established by the original accessory buildings. This building appears to have replaced temporary frame structures on the site. Master Plan calls for interior renovation as a visitors' interpretive center, and nearly all improvements will be confined to the interior. However, the exterior will be cleaned and sealed and doors and window sash will be replaced along original lines.

10. Emergency Dam Hoist House (1922). Single story structure of reinforced concrete measuring 20 x 20 feet exclusive of bayed south elevation. Built up roof. Contains emergency dam hoists and saltwater barrier air compressor. Entablature and base in classical tradition conform to pattern established by the original group of accessory buildings. Minor restoration or reconditioning is planned.

11. Steel Shop (1941). Metal-clad steel frame construction measuring 40 x 102 feet. Built-up roof. Used for steel fabrication, locker room.

12. Warehouse No. 2 (1941). Metal-clad steel frame construction measuring 50 x 160 feet. Built-up roof. Used as storage and office space.

13. District Garage (1941). Metal-clad steel frame construction measuring 50 x 160 feet with 20 x 25 foot washrack addition on SE corner. Built up roof. District garage and maintenance shops.

14. Public Comfort Station (1947). Single story reinforced concrete construction measuring 14 x 58 feet. Master Plan proposes that built up roof be developed as viewing deck. Situated west of Administration Building overlooking locks.

15. Boathouse (1949). Wood frame construction measuring 55 x 79 feet. Exterior stuccoed and painted grey to achieve certain compatibility with neighboring structures of concrete. Houses steam-powered sternwheeler snagboat W. T. Preston and other vessels under Corps jurisdiction used in snagging and dredging operations.

16. Greenhouse (1949). Single story wood frame construction with double-pitched roof measuring 15 x 15 feet. Adjoining 15 x 34 foot glass panel structure.

17. Gatehouse (1949). Single story 7 x 7 foot wood frame structure at visitors' entrance. Master Plan calls for eventual removal and replacement with a new guard office to be coordinated with a re-designed entry way.

18. Open Storage Shed (1940s?). 25 x 125 feet. Adjacent to east boundary. Not highly visible. Compass orientation nonconforming with majority of maintenance complex.

19. Quonset Hut (1949). 36 x 60 feet. Located in NE corner of maintenance area. Not highly visible. Compass orientation nonfonforming with majority of maintenance complex.

Master Plan calls for removal to allow development of less visible parking area.

20. Control Tower (1969). On middle lock wall. 19 x 24 feet. Base, or ground story of reinforced concrete. Overhanging, glass-enclosed steel-grame observation story. Purpose is to centralize control of locks. Master Plan calls for retention as primary communications and navigation control structure. However, extensive modifications are contemplated to make its angular lines visually conformable with the early concrete buildings.

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BACKGROUND OF THE PROJECT

As is repeatedly pointed out, the notion of a navigable waterway joining Puget Sound to Lake Union and Lake Washington is nearly as old as settlement in the area. Seattle pioneer Thomas Mercer is credited with the first doumented public expression on the subject. In 1854, during a Fourth of July picnic, he cited the advantages of such a canal and, referring to the union of lakes and bays, he proposed names ultimately associated with the inland bodies.

The concept first received federal recognition in 1867 when a Board of Engineers for the Pacific Coast, headed by Lieutenant Colonel Barton S. Alexander, was charged with recommending a site for a naval station in Puget Sound waters. One location under consideration was the freshwater basin of Lake Washington, access to which would require the construction of a ship canal. From that point forward sporadic attempts were made by local citizens to gain the support of the Department of the Army and Congress for construction of the canal. Private improvement companies were formed, foundered and dissolved. Meanwhile, the selection of a route - whether northerly via Salmon Bay and Lake Union, or to the south via the mouth of the Duwamish River - remained controversial.

In 1890 Congress made its first appropriation for the proposed commercial waterway in Seattle, and a survey was authorized to locate the most feasible route. The government survey report, dated December 15, 1891, considered five possibilities, of which the present general route beginning at Shilshole Bay was preferred as having the best alignment and potential for being the least costly. The City of Seattle and King County proceeded to acquire right-of-way while further investigations and reports on appropriate routings were made.

The involvement of the U. S. Army Corps of Engineers in the project on a lasting basis is marked from the beginning of Major Hiram Chittenden's term as District Engineer. In 1906 Congress authorized the construction by private capital of a canal with a single timber lock at Salmon Bay proposed by local citizen James A. Moore. In a report on the Moore proposal dated December 1906, Chittenden itemized the government's interest in the matter. In essence, the government would be concerned with the commercial promise of a navigable waterway and would benefit indirectly from the lowering of the waters of Lake Washington. The latter would facilitate flood control and drainage of swamp lands. In his report Chittenden also recommended significant changes in the nature and placement of the lock, advocating a double lock of more permanent masonry construction. If located at the narrows near the outlet of Salmon Bay, it would raise Salmon Bay out of tidal influence and lower Lake Washington waters to the level of the intervening body, Lake Union. Chittenden provided arguments which reversed the Army's prior negative findings on the feasibility of the project. The absence of tidal action would simplify cargo loading and unloading on the inland waters; Lake Union would offer a placid winter refuge for the fishing fleet, and fresh water would cleanse destructive teredos and barnacles from the hulls of ocean-going vessels without the expense of dry-docking. Thus, the notion that the federal government would assume primary responsibility for the undertaking was firmly implanted.

The existing project was based on the detailed annual report on the proposed Lake Washington Canal filed by Chittenden in December 1907. Because the government-endorsed northerly route was attacked by Ballard lumber mill operators who did not wish to relinquish their tideland sites and by partisans of the southerly route through newly filled and platted tidelands along the Duwamish estuary, the canal routing controversy dragged on for several years. The stalemate was eventually broken, but not before Chittenden's forced retirement due to disability early in 1910. Reginald H. Thompson, the City Engineer who master-minded Seattle's grandest public improvement schemes, and the Chamber of Commerce were important advocates of Chittenden's initial recommendations. The cause was finally won in June 1910, when Congress appropriated $2,275,000 for construction according to specifications in the District Engineer's annual report of 1907.

Construction was commenced under the direction of a successor, Colonel James B. Cavanaugh, in September 1911. Ground was broken for the locks on November 10 of that year. In February 1913 the first concrete was deposited in the forms. The gates of the completed locks were closed July 12, 1916, and the filling of Salmon Bay began. Lake Washington was lowered to the level of Lake Union by October of that year. The Fremont Cut was opened between Salmon Bay and Lake Union in the same month. On May 8, 1917 the Montlake Cut between Lakes Union and Washington was opened in the near vicinity of the abandoned portage excavated by the Lake Washington Improvement Association. The entire project was dedicated with due ceremony on July 4, 1917, during which time the 184 foot Roosevelt, the flagship of Commodore Robert E. Perry's Arctic Expedition of 1907, led a parade of traffic through the locks.

At the time of the dedication the cost of the project was reported to have reached a total of $5,000,000. In addition to right-of-way acquisition costs, the City of Seattle bore the expense of building new bridges, sewer and water tunnels and regrading streets where necessary. The major costs were divided between the State of Washington and King County, for acquisition of right-of-way and excavation and construction upstream from the locks, and the federal government, which constructed the locks and accessory works.

HIRAM M. CHITTENDEN - CHAMPION OF THE LAKE WASHINGTON SHIP CANAL

Hiram M. Chittenden (1858-1917), a native of New York, was graduated from West Point with high honors as a second lieutenant of engineers in 1884. Thereafter he completed a three year course in the Engineer School of Application, was made a first lieutenant, and was ordered to Omaha as engineer officer of the Department of the Platte. Thus embarked upon a lifetime career as an army engineer, he would soon gain recognition as a conservationist and historian. Chittenden first achieved national acclaim in 1897 for a massive report advocating federal construction of irrigation dams which is said to have become the basis of the Newland Act of 1902. After serving in the Spanish-American War he was returned to Yellowstone Park, where he took charge of completing the road system he earlier had helped lay out. In 1904 he was promoted to the rank of major, and soon after was appointed to the federal commission to locate the boundaries of Yosemite Park. Chittenden was an early advocate of the concept of multiple-purpose

resource use which is widely applied today. Among his substantial publication credits are The Yellowstone National Park (1895), The History of Early Steamboat Navigation on the Missouri River (1903), The Life, Letters and Travels of Father Pierre Jean de Smet (1905), and, his monumental work, The American Fur Trade of the Far West (1902).

Among the projects which Chittenden directed during his active period as Seattle District Engineer, 1906-1908, next in importance to the Lake Washington Ship Canal was planning and construction of 14 miles of the 25 mile tourist road from the western boundary of Mount Rainier National Park to Camp of the Clouds. From his predecessor he inherited the on-going task of constructing fire control towers for the coastal artillery batteries at Forts Flagler, Casey and Worden which comprised the defenses for Seattle and its harbor in Elliott Bay.

Throughout his later years Chittenden suffered from a debilitating paralysis (locomotor ataxia), but his astonishing capacity for work seldom flagged. By the middle of 1908, however, his condition had worsened to such an extent that he was forced to withdraw from normal duty. At the urging of several of his associates in the Ship Canal project, including City Engineer Reginald Thompson, Secretary of the Interior Richard Ballinger, a former Seattle Mayor, and others interceded on his behalf and succeeded in securing Chittenden's promotion to the rank of brigadier-general prior to his disability retirement on February 10, 1910. Despite his frail health, Chittenden continued to write (War or Peace, Flood Control, and a revised and expanded edition of his guidebook to Yellowstone National Park) and to take part in public life as president of the Seattle Port Commission, 1911-1915.

A NOTE ON THE ARCHITECTURAL FIRM OF BEBB AND GOULD

Charles Herbert Bebb (1856-1942) and Carl F. Gould (1873-1939) were leaders of the architectural community in Seattle. Their selection to lay out and design the complex of concrete accessory buildings on the government reservation at the ship canal locks was fitting. The ten or more initial buildings on the site have a range of refinement along classical lines, but they are solid and straightforward in a manner appropriate to their function and setting along the massive lock walls.

Bebb, a native of England, was educated at Kings College, London, and the University of Lausanne, Switzerland, where he studied engineering. He emigrated to the United States in 1880 and was first employed as a construction engineer by the Illinois Terra Cotta Company of Chicago. From 1885 to 1890 he served as supervisor of construction for the eminent architectural firm of Adler and Sullivan. Bebb was the first Washington architect to be elected a Fellow of the American Institute of Architects. He helped organize the Washington State Chapter of the AIA in 1894 and served several terms as its president. From 1911 to 1935 Bebb served as Consulting Architect for the State Capitol Group in Olympia. In 1915, a year or two after he and Gould commenced a long and fruitful partnership, the firm was given charge of the University of Washington Campus Plan. Gould helped found the University of Washington's School of Architecture and was first chairman of the department.

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Gould, a native of New York City, was graduated from the Harvard School of Architecture in 1898 and thereafter spent four years (1899-1903) at the Ecole des Beaux Arts in Paris. On his return to the United States he was employed by the eminent New York architects McKim, Mead and White. Later, he became a member of the New York firm of Carpenter, Clair and Gould. He arrived in Seattle around the time of the Alaska-Yukon-Pacific Exposition of 1909, or shortly before. Gould too became active in the affairs of the Washington State Chapter of the AIA. Among other noted works by Bebb and Gould in Seattle are the Modernistic Seattle Art Museum (1932), the annex of the Rainier Club (1929), the U. S. Marine and Virginia Mason Hospitals, and the Olympic Hotel, designed in cooperation with the George B. Post Company of New York.

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plot plans of the project. For the most part, proposed developments are designed to preserve and promote public appreciation of the historical features.

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VERBAL BOUNDARY DESCRIPTION

Hiram M. Chittenden Locks

Beginning at a point on the SW corner Lot 1, Block 13 of Ballard Tide Lands; thence southeasterly along the southerly lot lines of Lots 1 through 5 of said Block 13 to the SE corner of Lot 5 of said Block; thence north to the southerly boundary of the Great Northern Railway* right-of-way; thence northeasterly along said railway right-of-way boundary to a point approximately 7 feet east of the projection north of the east lot line of Lot 2, Block 11, Ballard Tide Lands; thence north 17.5 feet to the southerly boundary of the Great Northern Railway right-of-way; thence northeasterly along said railway right-of-way boundary to the projection north of the east lot line of Lot 4, Block 11, Ballard Tide Lands; thence south along said projected line to the SE corner of Lot 4; thence east in a perpendicular direction along the U.S. Pierhead Line 1050 feet to the projection south of the west boundary of 26th Avenue N.W.; thence south across the Salmon Bay Waterway 750 feet to the State Harbor Line; thence west along the State Harbor Line and northwesterly along the north lot lines of Lots 1 through 4 of Block 7, Seattle Tide Lands to a point approximately 45 feet west of the projection north of the east boundary of 31st Avenue West; thence southwesterly in a line perpendicular to the Waterway 100 feet; thence northwesterly in a line parallel with the Waterway 535.88 feet; thence north approximately 105 feet to the U.S. Pierhead Line; thence northwesterly along said Pierhead Line to the projection south of the east boundary of 34th Avenue N.W.; thence north along said projected line approximately 350 feet across the Salmon Bay Waterway to the point of beginning.
*Burlington Northern Railway current owner

Fremont Cut Parcel

Beginning at a point on the northerly State Harbor Line of the Lake Washington Ship Canal approximately 25 feet southeast of the Northern Pacific Railway Bridge right-of-way (which point is the SW corner of Lot 8, Block 1, Seattle Tidelands); thence southeasterly along said State Harbor Line 5540 feet to a point approximately 280 feet southeasterly of the Fremont Bridge right-of-way; thence southwesterly 300 feet across the canal to a point on the southerly State Harbor Line which is approximately 105 feet southeasterly of the Fremont Bridge right-of-way; thence northwesterly along said State Harbor Line 5810 feet to a point 7.98 feet southeasterly of the NE corner of Lot 12, Block 13, Ross Addition; thence southeasterly in a line parallel with the northerly lot line of said Lot 12 approximately 200 feet; thence northeasterly 266.59 feet to the point of beginning.

Montlake Cut Parcel

Beginning at the SE corner of Block 18-A of the 2nd Supplement, Lake Union Shore Lands; thence south to a point 48.56 feet south of the north U.S. Bulkhead and Pierhead

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RECEIVED APR 25 1978
DATE ENTERED

Line of the Lake Washington Ship Canal; thence in a southeasterly direction 552.73 feet to a point 151.76 feet south of said U.S. Bulkhead and Pierhead Line; thence east along a line parallel with said U.S. Bulkhead and Pierhead Line 2069.44 feet; thence in a southwesterly direction approximately 485 feet across the canal to a point on the south boundary line of Section 16, T.25N., R.4E., W.M., approximately 240 feet east of the quarter corner of Section 16; thence west along said Section boundary line 2229.76 feet; thence in a northwesterly direction approximately 510 feet across the canal to a point on the north U.S. Bulkhead and Pierhead Line approximately 55 feet west of the point of beginning; thence east along said U.S. Bulkhead and Pierhead Line to the point of beginning.

UTM References

Hiram M. Chittenden Locks and Related Features of the Lake Washington Ship Canal.

Chittenden Locks:

A: 10/545560/5279340
B: 10/545840/5279150
C: 10/545840/5278920
D: 10/545385/5278910
E: 10/545080/5279090
F: 10/545080/5279300

Fremont Cut:

A: 10/547470/5278080
B: 10/547590/5278090
D: 10/549010/5277140

Montlake Cut:

A: 10/551930/5277230
B: 10/552720/5277180
C: 10/552640/5277090
D: 10/551960/5277090

PERIOD

_PREHISTORIC
_1400-1499
_1500-1599
_1600-1699
_1700-1799
_1800-1899
X1900-

AREAS OF SIGNIFICANCE -- CHECK AND J IFY BELOW

_ARCHEOLOGY-PREHISTORIC
_ARCHEOLOGY-HISTORIC
_AGRICULTURE
XARCHITECTURE
_ART
XCOMMERCE
_COMMUNICATIONS
_COMMUNITY PLANNING
_CONSERVATION
_ECONOMICS
_EDUCATION
XENGINEERING
_EXPLORATION/SETTLEMENT
_INDUSTRY
_INVENTION
XLANDSCAPE ARCHITECTURE
_LAW
_LITERATURE
XMILITARY
_MUSIC
_PHILOSOPHY
XPOLITICS/GOVERNMENT
_RELIGION
_SCIENCE
_SCULPTURE
_SOCIAL/HUMANITARIAN
_THEATER
XTRANSPORTATION
_OTHER (SPECIFY)

SPECIFIC DATES 1906-1917

BUILDER/ARCHITECT District Engineers: Hiram M. Chittenden (planning and promo... and James B. Cavanaugh (supervi... of construction). A. W. Sargent was Assistant Engineer in Charg... of Construction during the construction phase 1911-1917.

STATEMENT OF SIGNIFICANCE

SUMMARY STATEMENT

The Lake Washington Ship Canal is significant to Seattle, the state and the nation as a major engineering achievement completed under government auspices which added more than 90 miles to the city's waterfrontage accessible to ocean-going vessels. Following deca... of visionary planning and failed attempts along such lines, the project realized by the U. S. Army Corps of Engineers in 1917 connected Puget Sound with a series of inland bodies free from tidal fluctuations and destructive marine life. The resulting fresh-water harbor extending over some 25,000 acres combines with Seattle'as saltwater harbor in Elliott Bay to provide navigational facilities rated among the finest of any port in the country.

The workable plan for the canal and locks was delineated and promoted by Major Hiram M. Chittenden, Seattle District Engineer 1906-1908. Both the project endorsed by the Department of the Army and various alternative schemes were embraced by the business community with an enthusiasm which epitomized the booster spirit of Seattle in the earl... years of the century. That ocean-going freighters and barges could be permitted to loa... and unload near industrial sites developing on the shores of Lake Union and Lake Washin... ton was felt to enhance the city's growing image as the transportation center of the Puget Sound region and a break-of-bulk point for domestic, coastal and international trade. The project was executed under the supervision of Colonel James B. Cavanaugh, District Engineer 1911-1917, and Arthur W. Sargent, Assistant Engineer in charge of construction. Among local figures closely associated with the project were Charles Her... Bebb and Carl F. Gould, partners in a leading architectural firm which laid out the mai... tenance campus on the government reservation at the locks.

With its fixed dam and double locks and right-of-way stretching nearly eight miles, the Lake Washington Ship Canal for many years was generally regarded second in scope only to the multiple locks and 50-mile-long canal completed across the Isthmus of Panama by the U. S. government 1904-1914. While the size of Seattle's locks has since been supe... seded in the continental United States (on the Ohio and Mississippi River, for example few, if any, of the later locks are believed to handle more vessels in a given year. ... facilities officially designated the Hiram M. Chittenden Locks in 1956 are operated on... 24-hour daily basis. While naval and commercial craft, fishing boats and log rafts pl... a significant role in locks usage, pleasure craft, which have proliferated since the Post War years, now make up the bulk of traffic.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

Interview, February 9, 197~ Jim Newman, Environmental Planner, Seattle District, U.S. Army Corps of Engineers.
Interview, February 22, 1977: Robert Frey, Real Estate Division, Seattle District, U. S Army Corps of Engineers.
Lake Washington Ship Canal Master Plan, Design Memorandum 5 (Seattle: Seattle District, U. S. Army Corps of Engineers, April 1976). Includes summary history, early view and

(continued on attached sheet)

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY Locks, 49.09; Fremont Cut, 38.5; Montlake Cut, 20.3.
UTM REFERENCES Total acreage of three parcels: 107.89.

	ZONE	EASTING	NORTHING		ZONE	EASTING	NORTHING
A				B			
C				D			

VERBAL BOUNDARY DESCRIPTION

See attached sheet

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE
Elisabeth Walton Potter, Historic Preservation Specialist

ORGANIZATION
Office of Archaeology and Historic Preservation

DATE
March 1977

STREET & NUMBER
111 West 21st Avenue

TELEPHONE
(206) 753-4117

CITY OR TOWN
Olympia

STATE
Washington 98504

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL X STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665) hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE Jeanne McElroy

TITLE

DATE 4-13-78

FOR NPS USE ONLY
I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

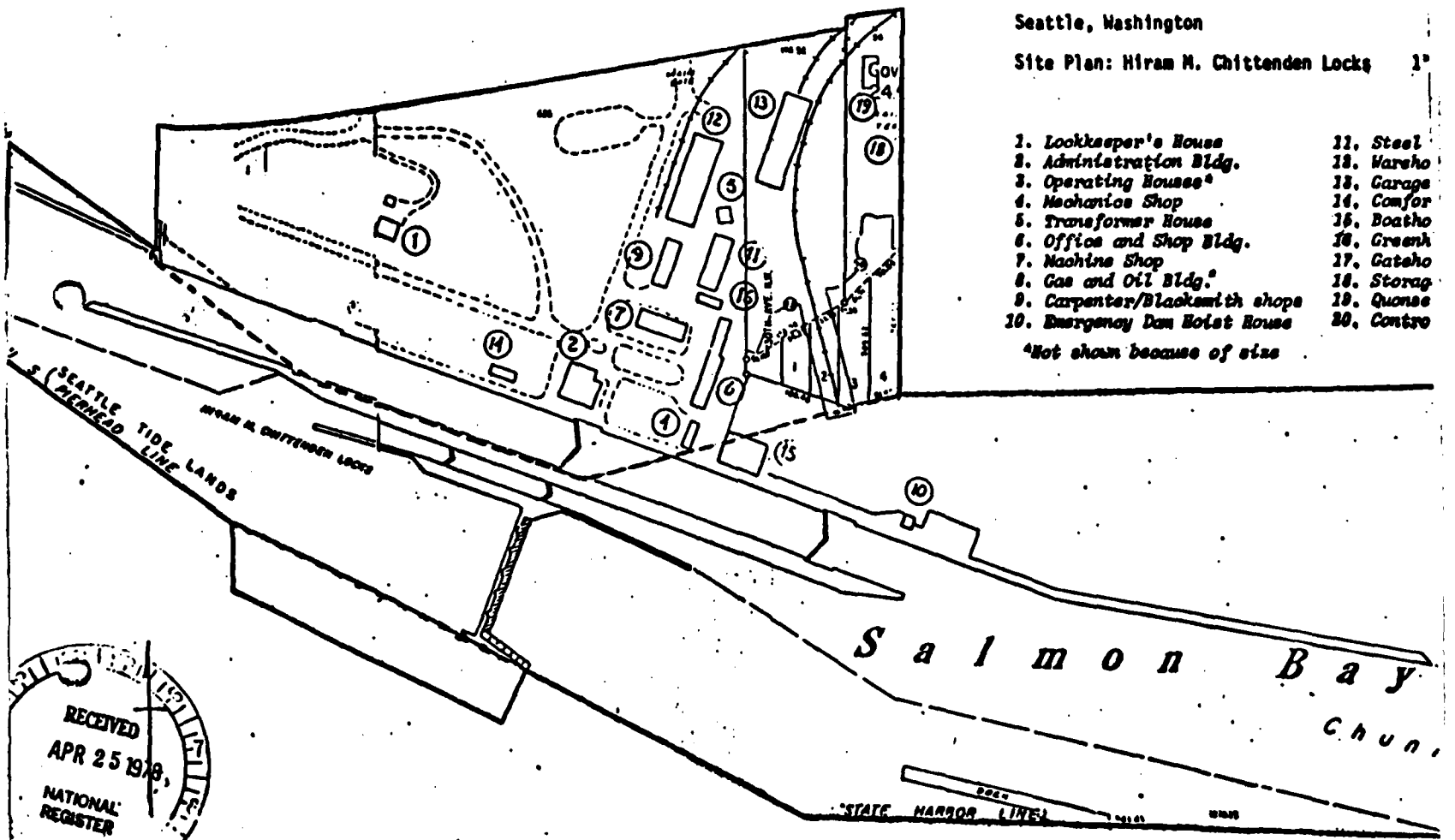
ATTEST: DATE

KEEPER OF THE NATIONAL REGISTER

Hiram M. Chittenden Locks and Related Feat
of the Lake Washington Ship Canal

Seattle, Washington

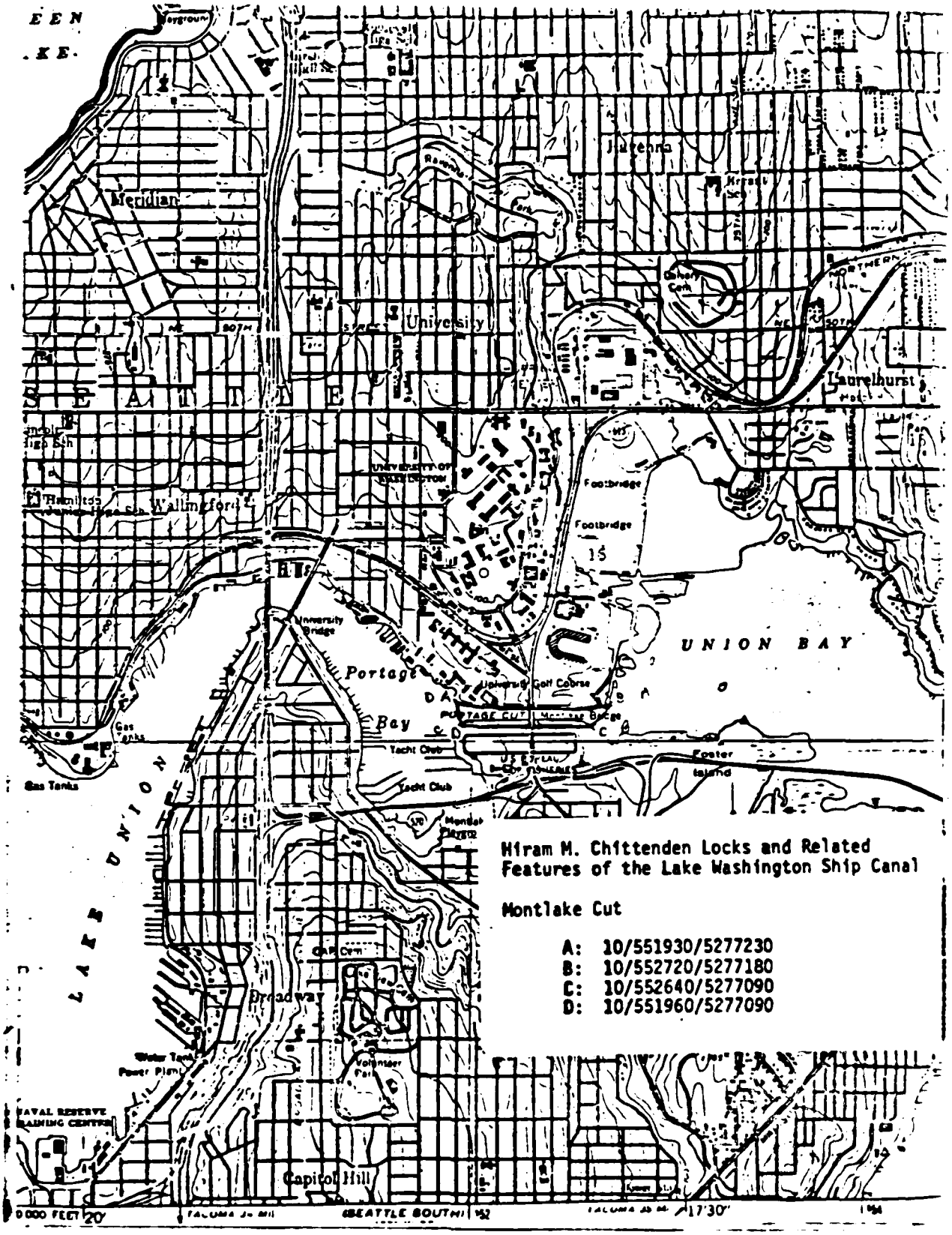
Site Plan: Hiram M. Chittenden Locks 1"



1. Lookkeeper's House
2. Administration Bldg.
3. Operating Houses*
4. Mechanics Shop
5. Transformer House
6. Office and Shop Bldg.
7. Machine Shop
8. Gas and Oil Bldg.*
9. Carpenter/Blacksmith shops
10. Emergency Dam Hoist House
11. Steel
12. Wareho
13. Garage
14. Comfor
15. Boatho
16. Greenh
17. Gateho
18. Storag
19. Quonse
20. Contro

*Not shown because of size

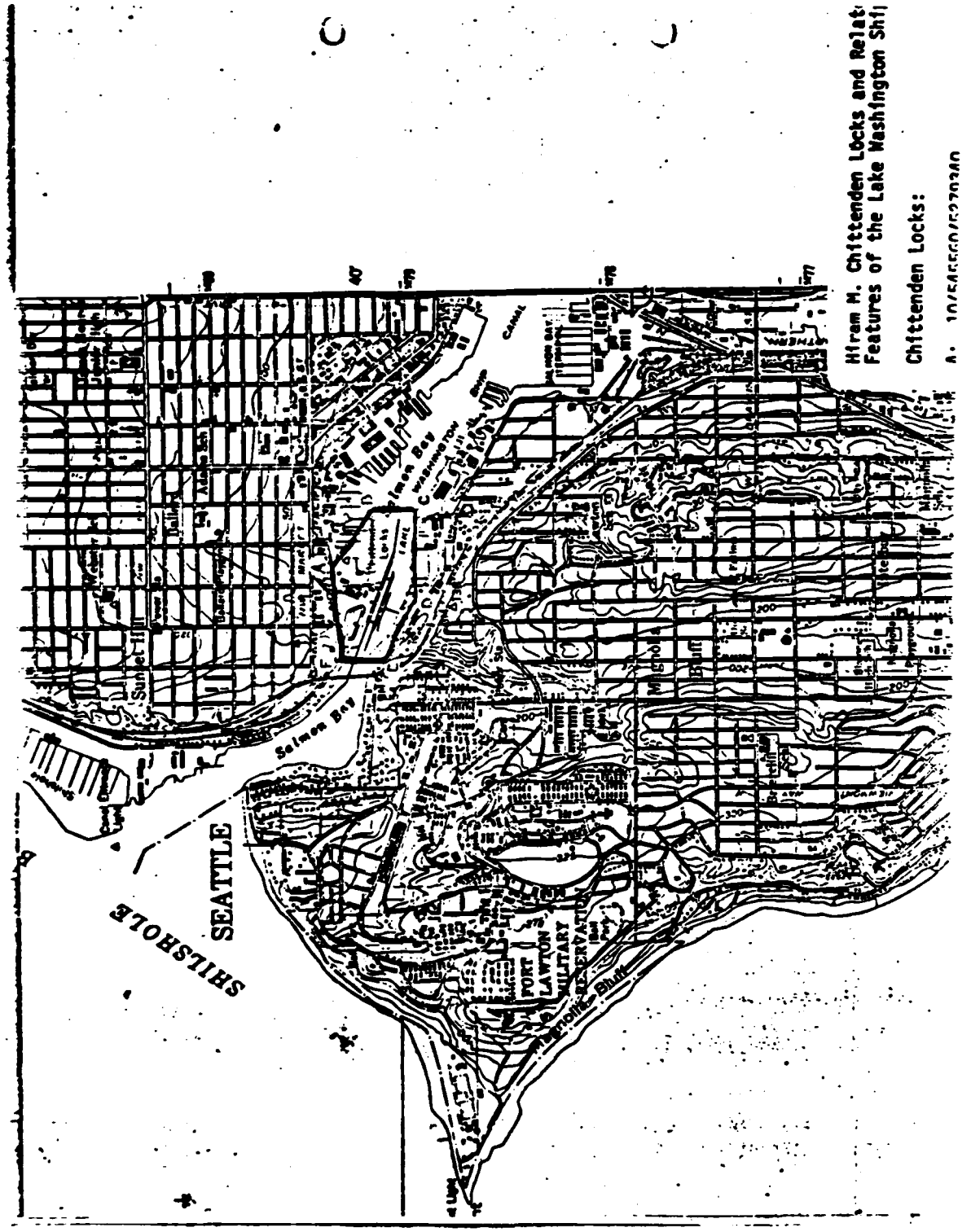
3.



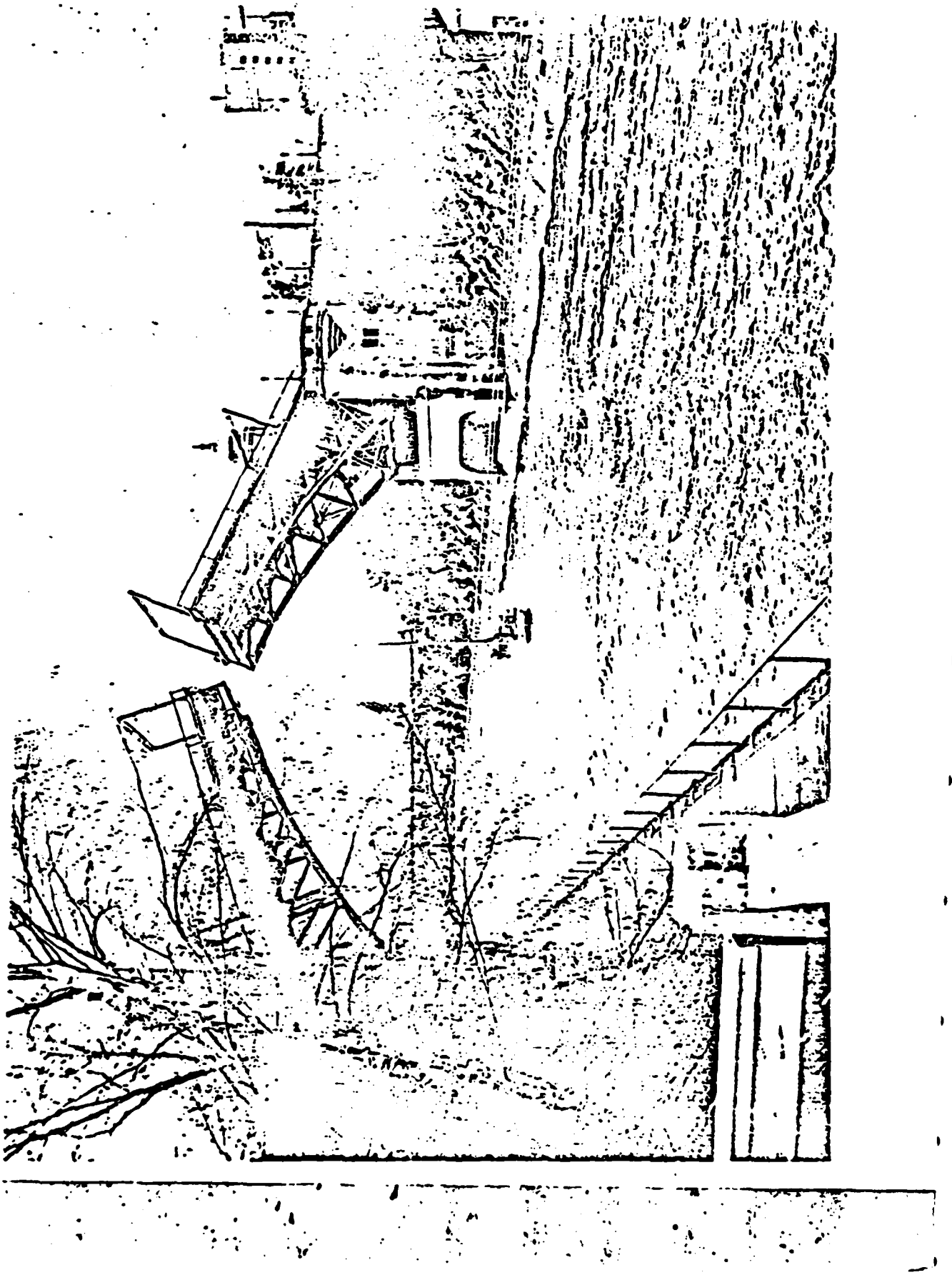
Hiram M. Chittenden Locks and Related Features of the Lake Washington Ship Canal

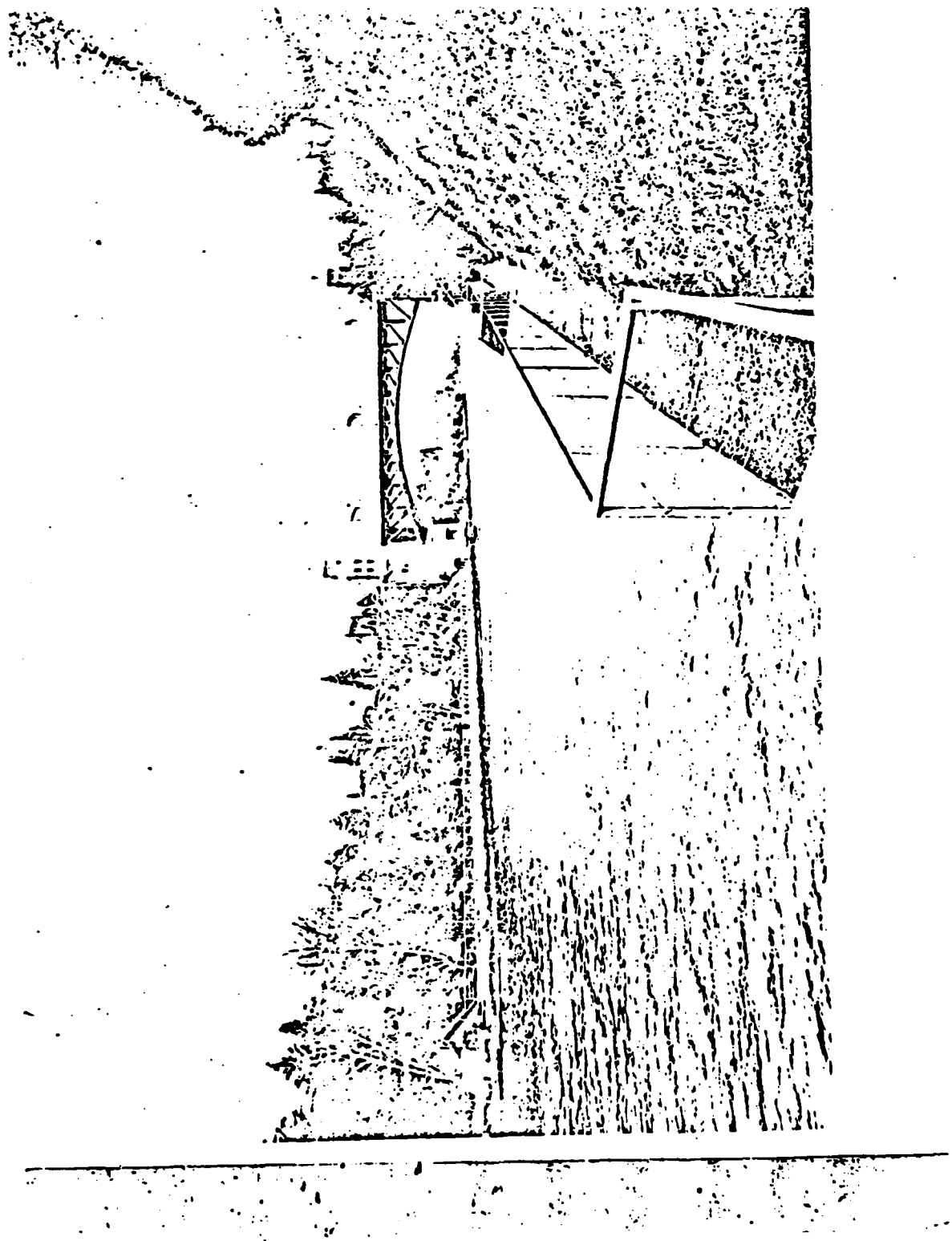
Montlake Cut

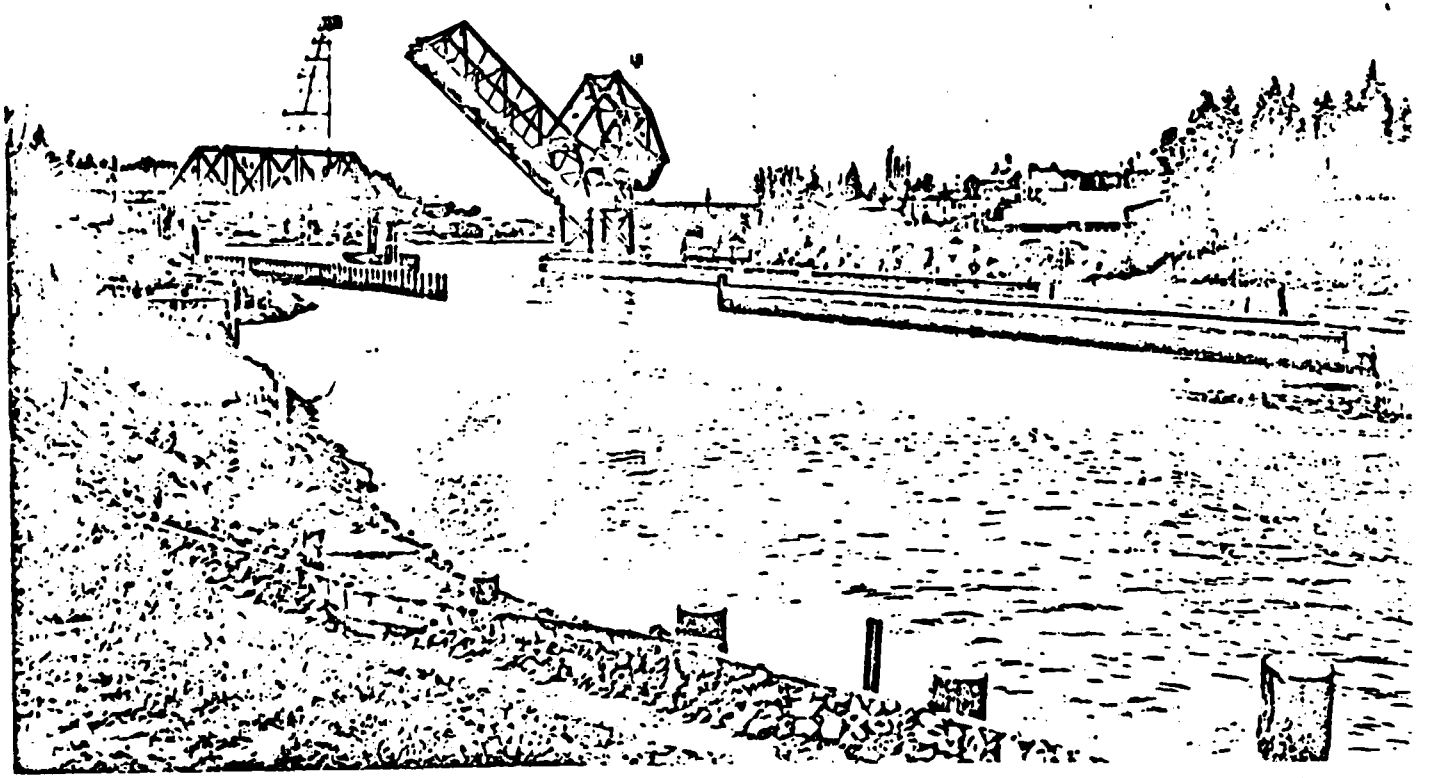
A: 10/551930/5277230
B: 10/552720/5277180
C: 10/552640/5277090
D: 10/551960/5277090

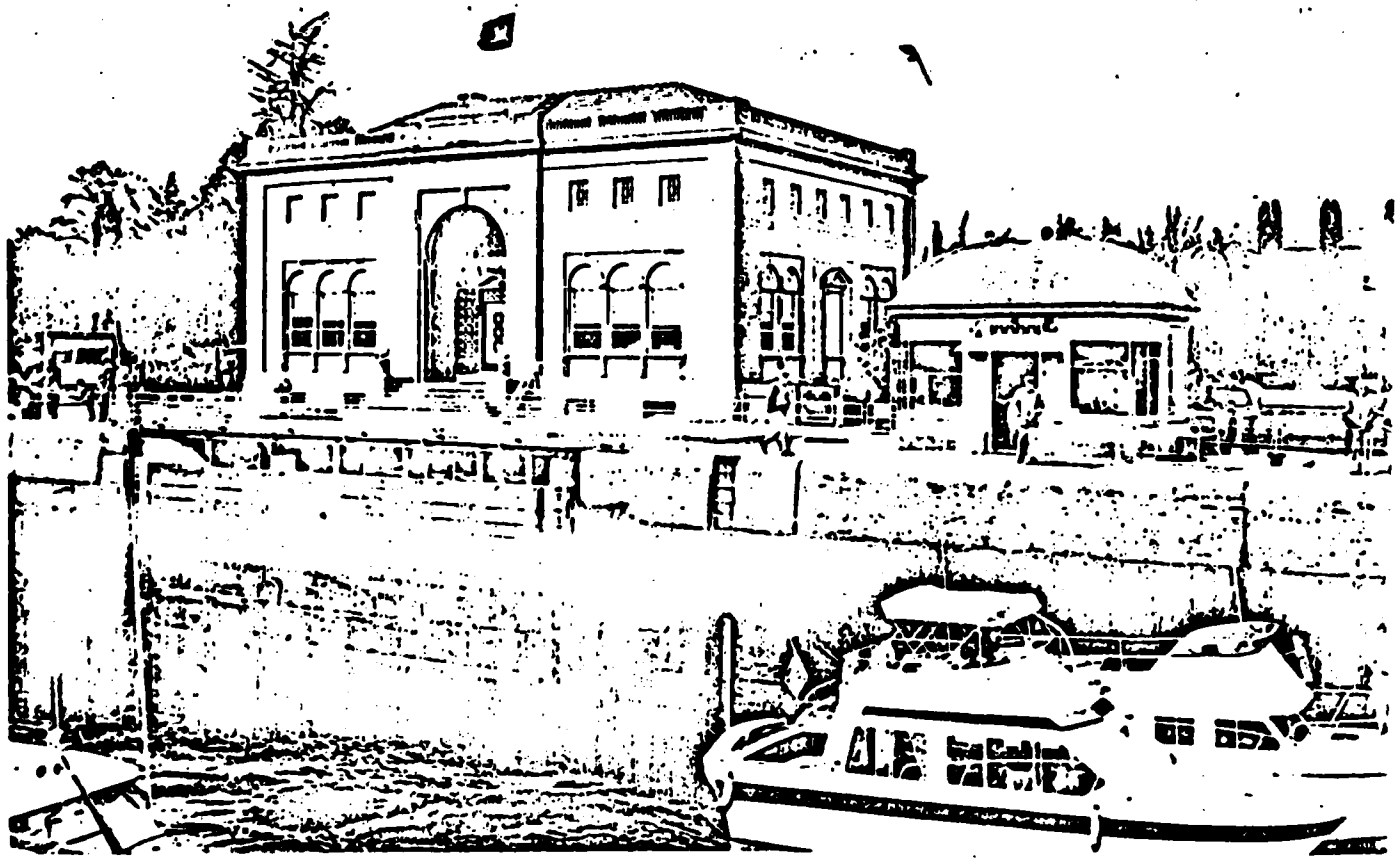


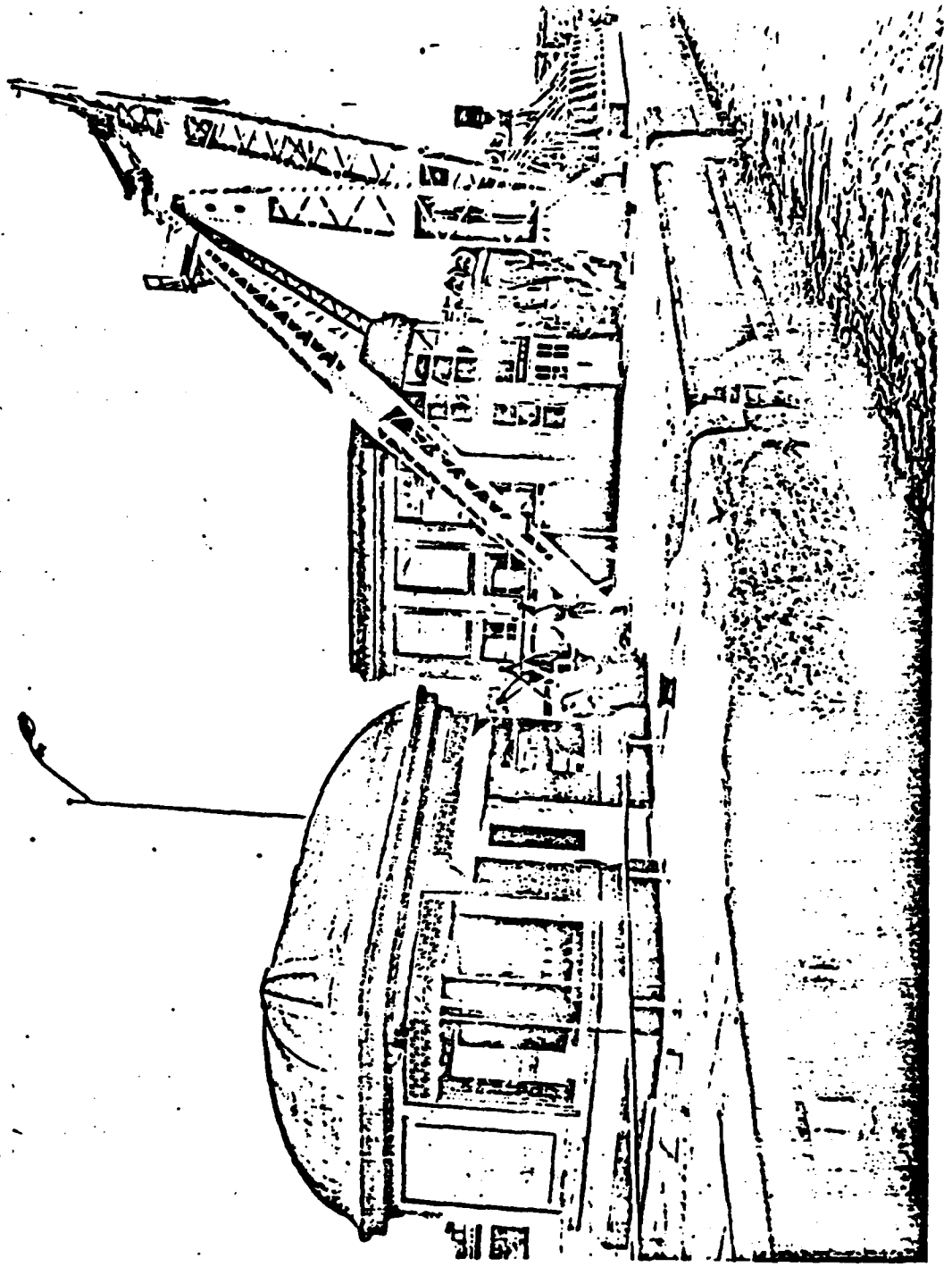
(2) In the first complete paragraph, it should be noted that the

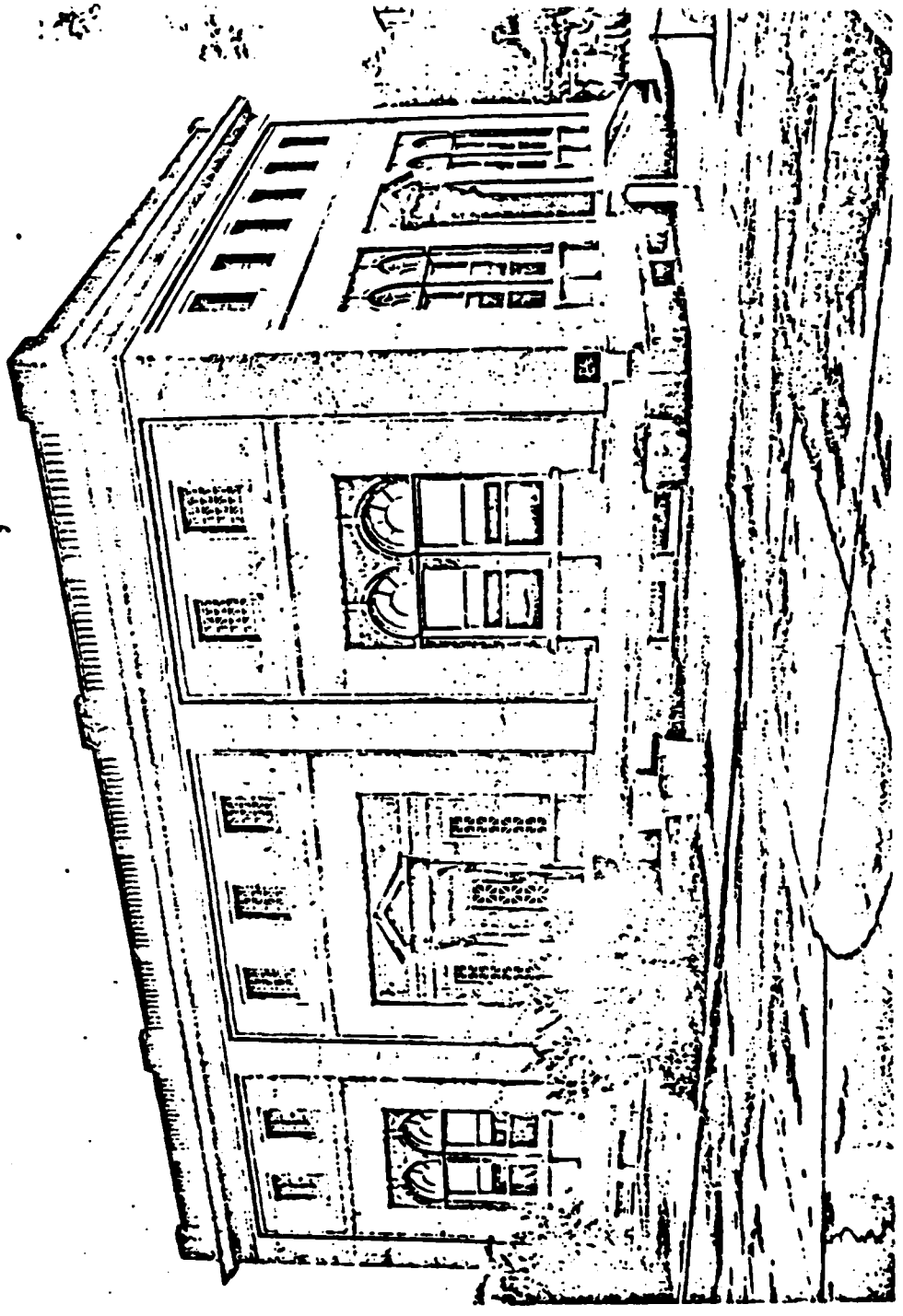


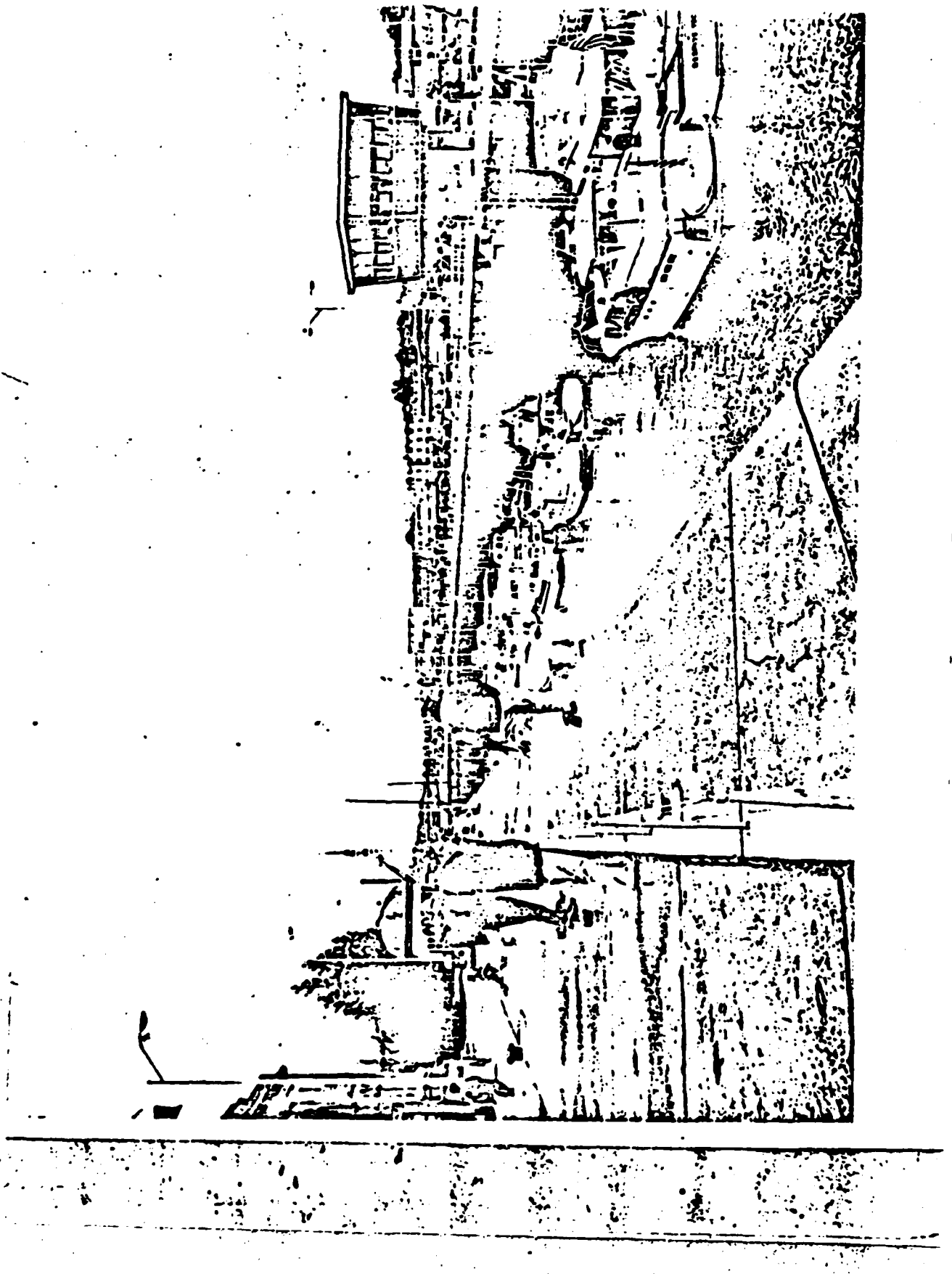


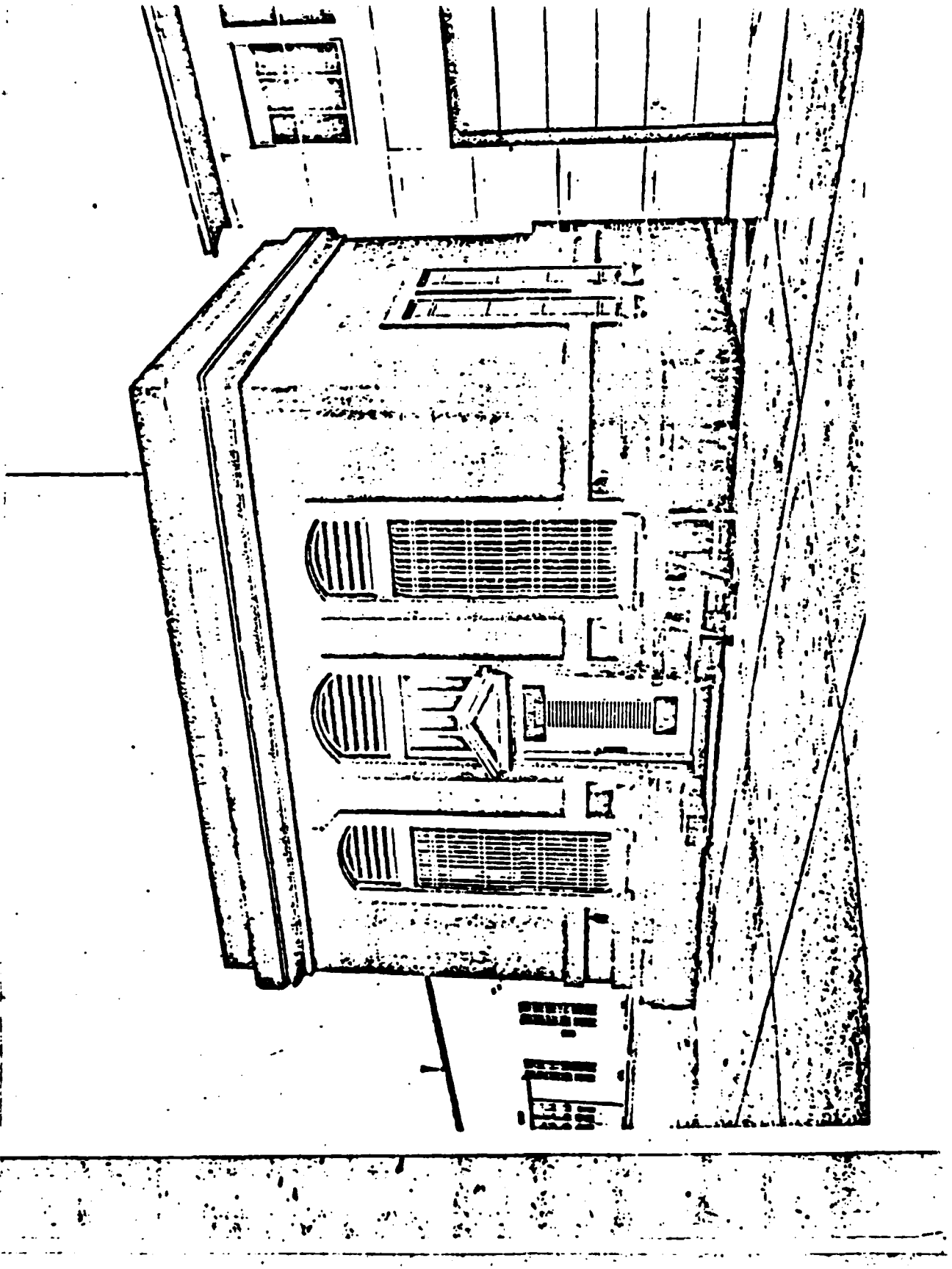


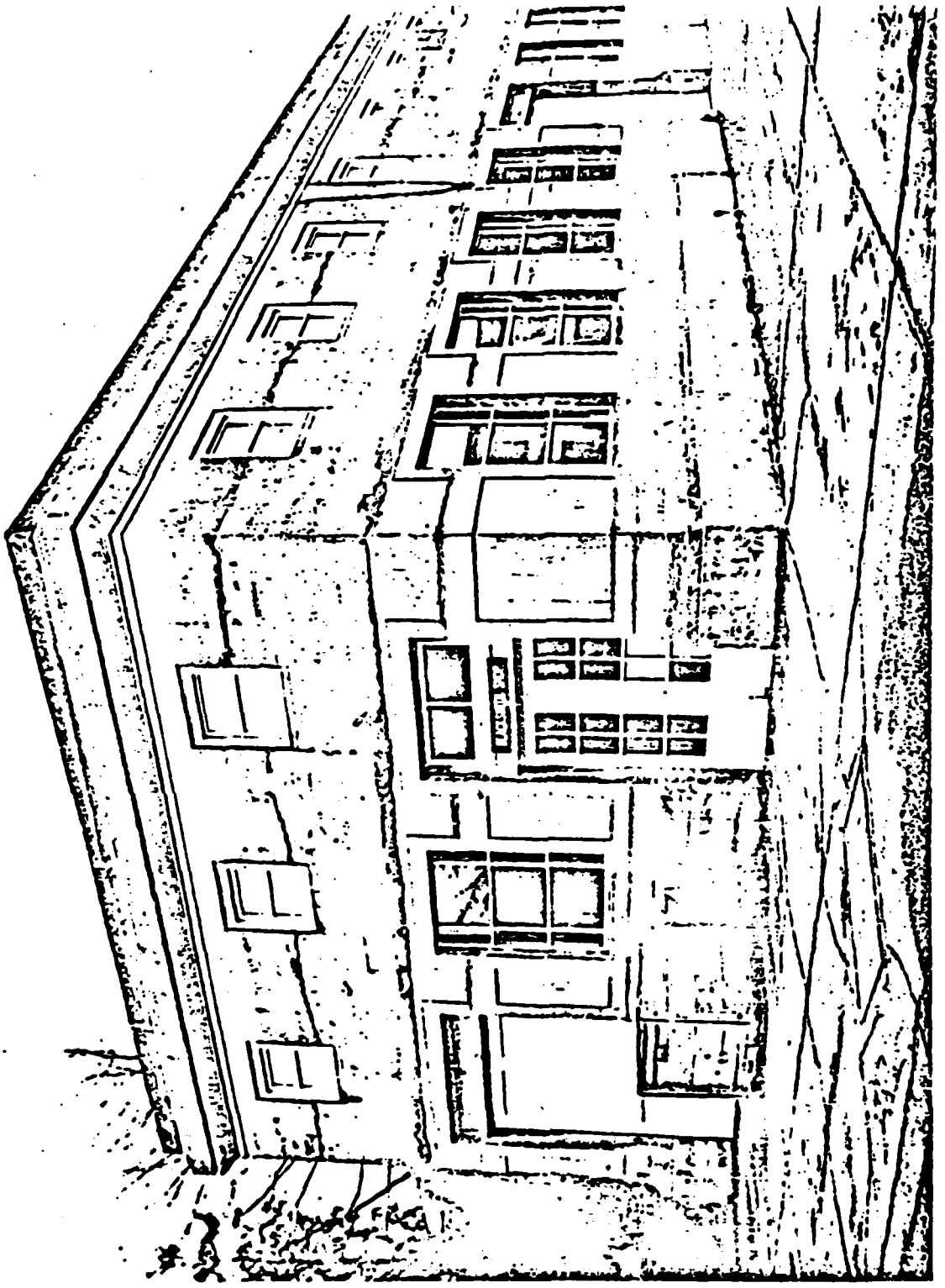


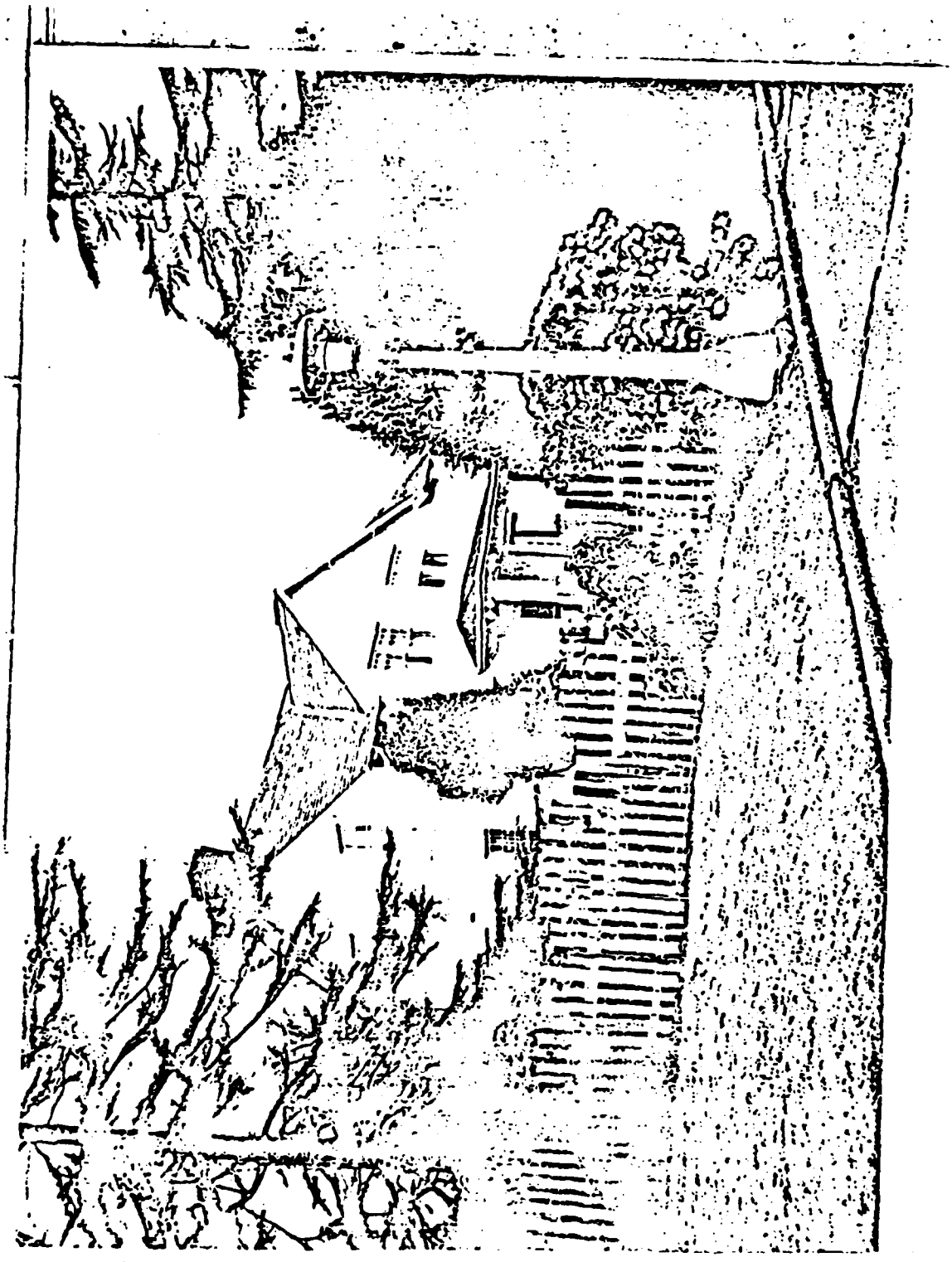












BUILDING ENTRANCE OBJECTIVES

27 November 1978

CORPS OF ENGINEERS
STAFF COMMENTS

Re: Review of the Hiram Chittenden Locks and Related Features of the Lake Washington Ship Canal Nomination to the National Register of Historic Places

1. General. Our careful evaluation indicates that the submittal form is substantially accurate as written. Minor inaccuracies and out-of-date information in several form item details exist, but should have little consequence in relation to the overall nomination. Detailed corrections and comments follow:

2. Corrections.

a. Form item 2, Location. The proper address for this property is 3015 NW. 54th Street, Seattle, Washington 98107.

b. Form item 3, Classification.

(1) Subitem Accessible. The appropriate category should be "Yes: restricted" rather than "Yes: unrestricted." There are specific hazard areas from which the public is excluded.

(2) Subitem Present Use. The category "commercial" with the modifier "navigation" placed in parenthesis should be marked. The category "government" should also be checked. Finally, the listing "Private residence" should be modified to read "Federal residence" and marked.

c. Form item 4, Owner of Property. The street number of the Seattle District, Corps of Engineers should be "4735" rather than "4725." In addition, the mailing address of the Seattle District should also be included: Post Office Box C-3755, Seattle, Washington 98124.

d. Form item 5, Location of Legal Description. As in c above, the indicated street number should be changed to "4735" from "4725."

e. Form item 7, Description, page 2.

(1) The sentence beginning on line 5 "The first parcel of 49 acres..." and ending with "...U.S. Army Corps of Engineers." should have added in parenthesis (30 acres fee owned and 19 acres Navigational Servitude).

Encl 2

(2) In the first complete paragraph, it should be noted that the lock keeper's house, which currently serves as the residence of the District Engineer, has been designated as the Cavanaugh House.

(3) At the conclusion of the first complete paragraph, it should be mentioned that the 7-acre landscaped area is officially named the Carl S. English, Jr., Gardens.

(4) In the second complete paragraph, the sentence "The Master Plan calls for its removal eventually." should be continued "... and construction of a new parking lot within the northeast portion of the grounds."

f. Form item 7, Description, page 3.

(1) In line 1 "...fish viewing room were completed a year ago." the phrase "a year ago" should be changed to "June 1976."

(2) In the sentence following (1) above the phrase "...land which is being developed..." should have the term "being" deleted since the development is now completed.

g. Form item 7, Description, page 4. The final sentence in paragraph 4 which begins "The three south gates..." should be changed to read "The three south gates were automated, and the hoist house was removed in August 1978."

h. Form item 7, Description, page 6. Paragraph number 6 should have the following sentence added: "This building has been used as the Blacksmith and Carpenter Shop since 17 November 1977."

i. Form item 7, Description, page 7.

(1) Paragraph number 9, final sentence, should be altered to: "However, the exterior walls will be cleaned and sealed. Window sashes have been replaced along original lines and a new entry way was provided with new doors."

(2) Paragraph 9 should be concluded with the following sentence: "This building was converted for use as a Visitor Center on 17 November 1977."

3. Comment. There is no objection to this nomination of this project to the National Register of Historic Places. However, due to continued pressure to increase efficiency and reduce operating cost and staff, certain modifications will be required from time to time. This work will be coordinated as required, but it may not in all cases be possible to completely retain the historic element.

United States Department of the Interior

HERITAGE CONSERVATION AND RECREATION SERVICE

WASHINGTON, D.C. 20240

IN REPLY REFER TO:

H32-880

Re: Executive Order 11593

Dear Federal Representative:

We are pleased to advise you that the property owned by your agency and listed on the enclosed sheet has been entered in the National Register in compliance with Executive Order 11593.

Sincerely yours,

Charles A. Herrington

Charles A. Herrington
Chief, Branch of Registration
National Register

Enclosure

ENTRIES IN THE NATIONAL REGISTER

STATE WASHINGTON

Date Entered 4 1978

Name	Location
Chittenden Locks and Lake Washington Ship Canal Historic District	Seattle King County

Also Notified

Honorable Warren G. Magnuson
Honorable Henry M. Jackson
Honorable Joel Pritchard

State Historic Preservation Officer
Mr. Louis R. Guzzo
111 West 21st. Avenue
KL-11
Olympia, Washington 98504

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-2255

REPLY TO ATTENTION OF

Design Branch

Ms. Mary Thompson
Department of Community Development
Office of Archeology and Historic Preservation
111 - 21st Avenue Southwest, KL-11
Olympia, Washington 98504-8343

Dear Ms. Thompson:

Enclosed for your signature is a final copy of the Programmatic Agreement (PA) for the Lake Washington Ship Canal Project which is listed on the National Register of Historic Places. This PA will satisfy the Corps of Engineers Section 106 and Section 110 responsibilities pursuant to 36 CFR Part 800.13 for any undertaking that may adversely affect this National Register District. Also enclosed per your request is a copy of Engineering Regulation (ER) 1130-2-438, Historic Preservation Program which provides policy guidance for Corps of Engineers Civil Work projects.

We have incorporated your comments and the comments for the Advisory Council on Historic Preservation in the final copy. We will provide you with a copy of the Lake Washington Ship Canal Master Plan (Appendix A) when it is finalized.

If there are technical questions concerning this request, please contact Mr. Horace H. Foxall at (206) 764-3614.

Sincerely,

Walter J. Cunningham
Colonel, Corps of Engineers
District Engineer

Enclosures

cc w/encl 1:
Chow/CENPS-EN-PL-PF
Northup/Rice/CENPS-PL-ER
Johnson/CENPS-DB
Hacker/CENPS-PL-CP
Borchert/CENPS-OP-PO-LW
Hewes/CENPS-OP-PO
Henson/CENPS-OC

FOXALL/EN-DB-AC
NAKAMOTO/EN-DB-AC
LARKIN/EN-DB
JOHNSON/EN-DB
MOSHIER/EN-DB
AUSTIN-HALL/EN
O'DELL/EN
APPLEBURY/OP
CUNNINGHAM/DE
EN-DB FILE

PROGRAMMATIC AGREEMENT
AMONG THE U.S. ARMY CORPS OF ENGINEERS,
THE WASHINGTON STATE HISTORIC PRESERVATION OFFICE,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING IMPLEMENTATION OF
THE LAKE WASHINGTON SHIP CANAL PROJECT

WHEREAS, the Seattle District, U.S. Army Corps of Engineers proposes to administer the Lake Washington Ship Canal Project authorized by the River and Harbors Act of June 25, 1910; and

WHEREAS, the Lake Washington Ship Canal Project has been listed on the National Register of Historic Places as an historic district on December 18, 1978. and

WHEREAS, the Seattle District, U.S. Army Corps of Engineers has determined that the Lake Washington Ship Canal Project may have an effect upon properties included on the National Register of Historic Places and has consulted with Washington State Historic Preservation Office (Washington SHPO) and the Advisory Council on Historic Preservation (Council) pursuant to Section 800.13 of the regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act (NHPA); (16 U.S.C. 470), and Section 110(a.1) of the same (16 U.S.C 470h-2) and

WHEREAS, the Seattle District, U.S. Army Corps of Engineers, the Washington SHPO and the Council agree that it is advisable to accomplish the development and execution of the Programmatic Agreement in accordance with 36 CFR 800.13 and ER 1130-2-438, and

NOW, WHEREFORE, the Seattle District, U.S. Army Corps of Engineers, the Washington SHPO and the Council agree that Lake Washington Ship Canal Project shall be administered in accordance with the following stipulations to satisfy the Seattle District, U.S. Army Corps of Engineers Section 106 responsibility for all individual aspects of the project and meets the Section 110 requirement for stewardship standards.

Stipulations

The Seattle District, U.S. Army Corps of Engineers will ensure that the following measures are carried out:

I. Treatment of Properties and Review of Undertakings

a. The Seattle District, U.S. Army Corps of Engineers shall ensure that the Washington SHPO has the opportunity to review and approve any proposed undertaking, except those listed in Stipulation II, before any rehabilitation or construction begins. The Washington SHPO will review and comment on plans for the undertaking within 30 days, provided that all the information is complete. If the Washington SHPO does not comment within 30 days, it will be presumed that it concurs with the proposal.

b. Rehabilitation. All of the contributing properties of the historic district will be rehabilitated in accordance with the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings, (U.S. Department of the Interior, National Park Service) and the Lake Washington Ship Canal Stewardship Standards adopted as part of the Project Master Plan, attached hereto as Appendix A & B.

c. Except for those undertakings that consist solely of actions exempt from review under Stipulation II, a plan for each rehabilitation project, including architectural specifications and drawings will be provided to the Washington SHPO for review and concurrence before the project begins.

d. The U.S. Army Corps of Engineers will program funds through normal budgetary channels. Should appropriation in any given year be insufficient the agreement shall not be voided, but all parties to the agreement will vigorously support appropriations sufficient to continue the plans.

II. Undertaking That Do Not Require Review

The following types of undertakings shall be considered to have no effect on historic properties and may proceed without further review.

a. Sidewalk replacement or repair.

b. Roadway replacement or repair.

c. Maintenance of existing landscaping and Carl S. English, Jr, Botanical Gardens.

d. Interior rehabilitation of Operating Houses, Warehouses, Shop Buildings, Control Tower, Visitor Center, Boathouse and Cavanaugh House.

e. Maintenance of the existing Large and Small Locks and Spillway Dam, Guide Piers, and Waiting Piers.

f. Maintenance of the existing fish ladder.

g. Maintenance and minor in-kind repair or replacement of the existing concrete walls and landscape colonnade at the Fremont Cut.

h. Maintenance and minor in-kind repair or replacement of the existing concrete walls at the Montlake Cut.

i. Maintenance and minor in-kind repair or replacement of building or site features, elements, or materials within the historic district.

j. Repair and replacement of existing utility lines and poles in their present configuration and alignments.

III. Qualification of Personnel

a. The Seattle District, U.S. Army Corps of Engineers shall ensure that all architectural plans and specifications carried out pursuant to this agreement are carried out by or under the direct guidance and supervision of a person or persons meeting the minimum Secretary of the Interior's Professional Qualifications Standards.

b. The Seattle District, U.S. Army Corps of Engineers shall ensure that all Maintenance and minor in-kind repair or replacement of building features carried out pursuant to this agreement will be performed by the Lake Washington ship canal project staff under the direct supervision of a person or persons meeting at a minimum the Office of Personnel Management (OPM), Job Qualification Standards for Trades and Labor Occupations - Handbook X-118C.

c. The Seattle District, U.S. Army Corps of Engineers shall ensure that all landscape work, site maintenance and in-kind replacement of site features at the Carl S. English, Jr, Botanical Gardens, Fremont Cut and Montlake Cut will be carried out pursuant to this agreement under the direct guidance and supervision of a person or persons meeting the minimum Office of Personnel Management (OPM), Job Qualification Standards for Trades and Labor Occupations - Handbook X-118C, with appropriate expertise in horticulture and gardening.

IV. Historic Property Management Plan

a. Within three years from the date of this agreement, the Seattle District, U.S. Army Corps of Engineers will develop and implement a Historic Property Management Plan (HPMP) for the Lake Washington Ship Canal Project in accordance with the standards and guidelines attached as Appendix C. The Seattle District, U.S. Army Corps of Engineers will ensure that the HPMP is developed in consultation with the Washington SHPO and the Council before implementation.

b. When the HPMP is complete in draft form, the Seattle District, U.S. Army Corps of Engineers will provide copies of the draft to the Washington SHPO and the Council for review and acceptance. Disagreements or questions about the draft HPMP will be resolved through consultation among the parties.

c. Upon acceptance of the HPMP by the Washington SHPO and the Council, the Seattle District, U.S. Army Corps of Engineers will finalize and implement it in lieu of compliance with 36 CFR 800.4 through 800.6.

d. The Seattle District, U.S. Army Corps of Engineers will prepare a report annually on the implementation of the HPMP, and

provide this report to the Washington SHPO and Council for review, comment, and consultation as needed.

V. Future Discovery

a. In the future, if artifacts from Native American or European settlements, or deposits associated with the construction of the canal, are discovered on the project site, the Seattle District, U.S. Army Corps of Engineers will comply with all Section 106 requirements and enter into consultation with the Washington SHPO and the Council.

b. If Native American graves are discovered at the project site, the Washington SHPO will be notified and the provisions of the Native Americans Grave Protection and Repatriation Act (NAGPRA) will be carried out.

VI. Dispute resolution

Should the Washington SHPO and the Council object within 30 days to any actions proposed pursuant to this agreement, the Seattle District, U.S. Army Corps of Engineers, shall consult with the objecting party to resolve the objection. If the Seattle District, U.S. Army Corps of Engineers, determines that objection cannot be resolved the Seattle District, U.S. Army Corps of Engineers shall forward all documentation relevant to the dispute to the Council. Within 30 days after receipt of all pertinent documentation, the Council will either:

a. provide the Seattle District, U.S. Army Corps of Engineers with recommendations, which the Seattle District, Corps of Engineers will take into account in reaching a final decision regarding the dispute; or

b. notify the Seattle District, U.S. Army Corps of Engineers that it will comment pursuant to 36 CFR 800.6(b), and proceed to comment. Any Council comment provided in response to such a request will be taken into account by the Seattle District, Corps of Engineers in accordance with 36 CFR 800.6(c)(2) with reference to the subject of the dispute.

Any recommendation or comment provided by the Council will be understood to pertain only to the subject of the dispute; the Seattle District, U.S. Army Corps of Engineers responsibility to carry out all actions under this agreement that are not the subjects of the dispute will remain unchanged.

VII. Monitoring

The Washington SHPO and the Council may monitor activities carried out pursuant to this Programmatic Agreement, and Section 110 of the NHPA and the Council will review such activities if so requested.

The Seattle District, U.S. Army Corps of Engineers will cooperate with the Washington SHPO and the Council in carrying out their monitoring and review responsibilities.

VIII. Amendments

Any party to this Programmatic Agreement may request that it be amended, whereupon the parties will consult in accordance with 36 CFR 800.13 to consider such amendment.

IX. Termination

Any party to this Programmatic Agreement may terminate it by providing thirty (30) days notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendment or other actions that would avoid termination. In the event of termination, the Seattle District, U.S. Army Corps of Engineers will comply with 36 CFR 800.4 through 800.6 with regard to individual undertakings covered by this Programmatic Agreement.

X. Noncompliance with Agreement

In the event the Seattle District, U.S. Army Corps of Engineers does not carry out the terms of this Programmatic Agreement, the Seattle District, U.S. Army Corps of Engineers will comply with 36 CFR 800.4 through 800.6 with regard to individual undertakings covered by this Programmatic Agreement.

Execution and Implementation of this Programmatic Agreement evidences that the Seattle District, U.S. Army Corps of Engineers has satisfied its Section 106 responsibilities for all individual undertaking of the program and meets the requirements for program stewardship standards.

SEATTLE DISTRICT, U.S. ARMY CORPS OF ENGINEERS

By:_____ Date:_____
Colonel Walter J. Cunningham, Commander

WASHINGTON STATE HISTORIC PRESERVATION OFFICE

By:_____ Date:_____
Mary M. Thompson, State Historic Preservation Officer

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By:_____ Date:_____
Robert D. Bush, Executive Director

APPENDIX B

Lake Washington Ship Canal
Stewardship Standards

GENERAL

The Stewardship Standards have been developed for application in the restoration and rehabilitation of the buildings at the Lake Washington Ship Canal. These Standards will be applied and used in conjunction with and in supplement to the Secretary of Interior's Standards for Rehabilitation of Historic Buildings and guidelines for treatment of Historic Landscapes. In some instances the Stewardship Standards are more specific than the Secretary of the Interior's Standards in addressing what is appropriate for the buildings, structures or site features, in these instances the Stewardship Standards should take precedence.

The LWSC stewardship standards stress the importance of the repair, replacement, and rehabilitation of architecturally significant building structural or site elements, while recognizing the need to accommodate current operation and fiscal responsibilities. In some instances, exterior and interior alterations to buildings may be needed to assure their continued use, but it is most important that such alterations do not radically change, obscure, or destroy original character-defining spaces, materials, and finishes. The LWSC standards identify certain of the origina. character-defining attributes, and offer guidance as to their maintenance and rehabilitation.

SITE OBJECTIVES

Preserve the relationship between buildings, landscape elements and open space.

Retain site elements which are important in defining the overall character of the historic district. Retain and maintain structures, furnishings and objects that remain from the period of significance.

Remove and replace as required furnishings and objects that were placed in the landscape after the period of significance and which do not contribute to the overall character of the historic district. For example light fixtures, fences, benches, and trash receptacles.

Accommodate required parking including access for the physically disabled without intrusion to the buildings or significant areas.

Screen parking from public view areas to reduce its impact on the historic district.

Acquire furnishings and objects which are similar to these that existed, in the landscape during the period of significance. New furnishings and objects should match the original in size, materials, finishes and placement into the site design.

EXTERIOR OBJECTIVES

Maintain concrete elements which are important in defining the overall historic character of each building. Remove and replace concrete that is inconsistent with the original concrete in color, texture and workmanship.

Analyze existing concrete so that a compatible mix can be made for repairs. New concrete should match the old in color, texture and workmanship.

Masonry surfaces shall be protected and maintained close to the original design. When repair is no longer practical, replacement of elements will be done to match the original. Repair chimneys to match original designs.

Metal elements which contribute to the architectural character of the buildings should be retained and preserved. Also, retain and preserve the type of finish, historic color, size, and shape.

Copper and bronze should not be painted or coated. Other metals should be painted to protect them from the elements.

Retain, rather than replace, architectural metal elements when repair of the element and limited replacement of deteriorated or missing parts can be accomplished.

Reinstall copper gutters to match the original design where a replacement material now exists.

WOOD OBJECTIVES

Interior and exterior wood elements that are important in defining the overall historic character of the building should be retained and preserved. Original cornices and brackets, architraves, door surrounds, pediments, newels, bannisters, railings, moldings, casings, etc., wood elements should remain as original fabric with repairs. Replace only if the original cannot be repaired. Replace elements that were once a part of the original fabric and are now missing.

Retain historic finishes to preserve the historic character of the exterior. Repaint wood only as needed with materials that are appropriate to the historic district.

Remove paint buildup from woodwork, sand, prime, and repaint; reglaze windows and doors as required. Caulk as required.

Repairs shall match the original woodwork in design, size and shape.

DOOR AND WINDOW OBJECTIVES

Doors and windows together with their trim define the historic character of the buildings and therefore shall be retained and preserved. Remove non-original doors and windows that compromise the integrity of the original and replace with units to match the original or that is standard for adjacent structures. Retain, repair, and maintain historic hardware where it exists. Replace hardware to match the original in size, shape and configuration.

Maintain the operating condition of doors and windows. Locate weatherstripping to facilitate operation.

Maintain the historic appearances of windows and doors and their frames though retention of designs, materials, finishes and colors including the configuration of sashes and muntins, depth of reveals, molding profiles, and the reflectivity and color of the glazing.

Energy conservation will be achieved by appropriate insulation or other appropriate methods that do not radically change, damage or destroy character-defining features.

Maintain integrity of caulking and sealants at doors and windows.

ROOFING OBJECTIVES

Retain character-defining roof shapes and roofing materials, rather than introducing incompatible designs or improper installation techniques. Retain the configuration of existing roofs without the addition of new elements that diminish the historic character.

Roofing material shall be appropriate to the style and period of the buildings. Retain original sound historic clay tile and slate roofing materials and architectural metal.

All repairs shall match the original design and materials.

BUILDING ENTRANCE OBJECTIVES

Retain historic entrances and porches which are character defining elements of the building. Significant elements include doors, entablaters, columns, brackets, rails, and stairs.

Provide barrier-free access where necessary through removable or portable, rather than permanent, ramps. Do not remove historic steps, but rather, ramp above them. Locate barrier-free access so as to minimize visual intrusion and impact on the structure.

INTERIOR OBJECTIVES

Retain and preserve interior elements and finishes that are important in defining the overall historic character of the buildings. These elements include but are not limited to columns, cornices, chair rails, baseboards, fireplaces and mantels, light fixtures, hardware, flooring, plaster and may include plumbing fixtures.

Public spaces such as entrance spaces, and entrance halls are important in defining the overall historic character of the building. Size, configuration, and proportion of these spaces should be maintained. Where alterations have occurred they should be removed to restore the plan to the original design.

Maintain character-defining interior spaces by not cutting through floors, lowering ceilings, or removing walls.

Reuse decorative material or elements that were removed during rehabilitation work including wall and baseboard trim, door moulding, paneled doors, and wainscoting.

Remove excessive paint build-up from character defining elements with due regard to disposition of hazardous materials. Prime and repaint from approved palette of colors.

Maintain the finishes or colors of historic woodwork. For example, do not paint a previously varnished wood element, or strip historically painted wood surfaces to bare wood to create a "natural look".

New materials that obscure or damage character-defining interior elements shall not be installed. Likewise, paint, plaster, or other finishes on historically finished surfaces shall not be removed in an effort to create a new appearance.

Remove, clean, lacquer, and reinstall original hardware. Return original doors to designated openings.

HVAC OBJECTIVES

Remove all asbestos from heating and water lines.

Install mechanical systems and service equipment when required, that causes minimal alteration to the building's floor plan and the principal exterior elevations, and the least damage to historic building materials and volume of principal rooms. Remove intrusive ductwork from principal rooms and provide alternate sources of supply.

Install mechanical systems and service equipment so that character-defining structural or interior elements are not radically changed, damaged, or destroyed.

Exterior walls shall not be cut for installation of HVAC units. Remove units that have been cut through exterior walls.

ELECTRICAL OBJECTIVES

Provide underground supply of power, phone and cable. Rewire buildings to new service entries. Internally wire for cable and phone, removing existing conduits and wiring from exterior. Conceal all exposed conduits and ensure adequacy of outlets. Replace missing character-defining light fixtures with those appropriate to the character of the original exterior and interior. Where possible, replicate existing original fixtures or introduce fixtures appropriate to the period.

STRUCTURAL OBJECTIVES

Correct any structural deficiencies before rehabilitation or restoration.

CAVANAUGH HOUSE OBJECTIVES

These additional Cavanaugh House standards will identify certain character-defining attributes, and offer guidance as to house maintenance and rehabilitation.

Public spaces such as entrance halls, parlors, and dining rooms that are important in defining the overall historic character of the house. Size, configuration and proportion of these spaces should be maintained. Where alterations have occurred they should be removed to restore the plan to the original design.

Sand wooden floors only when it is absolutely necessary, rather than at the change of occupancy.

Maintain character-defining interior elements and finishes throughout the house.

APPENDIX C

HISTORIC PROPERTY MANAGEMENT PLAN STANDARDS AND GUIDELINES

The Historic Property Management Plan (HPMP) for the Seattle District, U.S. Army Corps of Engineers - Lake Washington Ship Canal Project shall be prepared in accordance with the following standards and guidelines.

1. The HPMP will be prepared by or under the direct guidance and supervision of an individual who meets, or individuals who meet, at a minimum, the Professional Qualifications Standards for historic architecture, landscape architecture, and archeology in the Secretary of the Interior's Professional Qualifications Standards. (48 FR 44738-9).

2. The HPMP will be prepared with reference to Secretary of the Interior's Standards and Guidelines for Preservation Planning (48 FR 44716-20); the Section 110 Guidelines (53 FR 4727-20) and U.S. Army Corps of Engineers, Engineering Regulation (ER) 1130-2-438.

3. The essential purpose of the HPMP will be to establish processes for integrating the preservation and use of historic properties with the mission and programs of the Seattle District, U.S. Army Corps of Engineers in a manner appropriate to the nature of the historic properties involved, the nature of the Lake Washington Ship Canal Project and the nature of the Seattle District, U.S. Army Corps of Engineers mission, programs, and planning processes.

4. In order to facilitate such integration, the HPMP, including all maps and graphics, will be made consistent with the CADD systems used by the Seattle District, U.S. Army Corps of Engineers.

5. The HPMP will include the following:

a. Foreword. The foreword shall explain the basis upon which the HPMP is being prepared.

b. Introduction. The introduction shall explain the organization and use of the various sections of the HPMP.

c. Overview. This element of the HPMP will synthesize available data on the history, architecture, architectural history, and landscape architecture of the Lake Washington Ship Canal Project and its surrounding area, to provide a context in which to evaluate and consider alternative treatment strategies for different classes of historic properties. The overview shall include, but not be limited to information on the Lake Washington Ship Canal Project and its historical site patterns, architecture of the facilities and landscape design of the Carl S. English, Jr. Botanical Gardens, Fremont Cut and Montlake Cut.

d. Inventory. This element of the HPMP will include descriptions of all properties within the Lake Washington Ship Canal Project that are known or thought to meet the National Register criteria (36 CFR 60.4). This documentation will include the National Register nomination form for the historic district and photographs.

e. Management System. The element of the HPMP will establish procedures for the management of historic properties within the Lake Washington Ship Canal Project, including but not limited to:

i. procedures for promoting the use of historic properties for agency purposes or the purposes of others, in a manner that does not cause significant damage to or deterioration of such properties;

ii. procedures for the maintenance of historic buildings, and site properties with prioritized building-by-building recommendations and rehabilitation;

iii. procedures for the avoidance or mitigation of adverse effects on historic properties, incorporating the review procedures set forth in this Programmatic Agreement;

iv. procedures of consultation with relevant parties during the implementation of the HPMP.

APPENDIX D
PUBLIC COMMENTS

LAKE WASHINGTON SHIP CANAL PROJECT
MASTER PLAN

List of Public and Private Groups

Federal
US Fish and Wildlife Service
National Park Service
National Marine Fisheries Service
NOAA, Pacific Marine Center
US Environmental Protection Agency

State
Washington Department of Natural Resources
Washington Parks and Recreation Commission
Washington Department of Fisheries
Washington Department of Ecology, Water Quality Section
Office of the Governor
Washington Department of Wildlife
Washington Department of Commerce and Trade Development
University of Washington, Grounds Maintenance Facilities Dept
Washington State Historic Preservation Office

County
King County Parks and Recreation

City
City of Seattle, Planning Department
City of Seattle, Water Department
City of Seattle, Parks and Recreation Department
City of Seattle, Engineering Department

Tribe
Muckleshoot Indian Tribe

LAKE WASHINGTON SHIP CANAL PROJECT MASTER PLAN - cont'd
List of Public and Private Groups

Groups and Individuals
Fremont Public Association
Burlington Northern Railroad, Inc.
Audubon Society
Magnolia Community Club
Ballard District Council
Ballard Neighborhood Service Center
Ballard Chamber of Commerce
Museum of History and Industry
Consolidated Restraurants, Inc.
Jacobson Brothers, Inc.
Seattle Pacific College, University Relations
Montlake Community Club
Fremont Business Association
Seattle Garden Club
Ms. Benella Caminiti
Mr. Douglas Woods
Ms. Joann Lysak
Fremont Chamber of Commerce
Lake Union Association
North Seattle Industrial Association
Norwegian Commercial Club
Seattle Marine Business Coalition
Ballard Historic Society
Quadrant
Seattle Pacific Credit Union

LWSCMP/PUBLIST.DOC

STATE OF WASHINGTON
DEPARTMENT OF FISHERIES
Post Office Box 43135 • Olympia, Washington 98504-3135 • (206) 902-2200 • SCAN 902-2200 • TDD 902-2207

August 6, 1993

Department of the Army
Seattle District, Corps of Engineers
ATTENTION: Derek Chow, Study Manager
Post Office Box 3755
Seattle, Washington 98124-2255

SUBJECT: Draft Lake Washington Ship Canal Master Plan, Tributary to Puget Sound, King County, WRIA 08.0028

Dear Mr. Chow:

Washington Department of Fisheries (WDF) has reviewed the above-referenced document and submits the following comments.

WDF appreciates the opportunity to review the conceptual draft document. WDF hopes that through continued open communications with the Army Corps of Engineers we can continue to improve upon the functioning of the Chittenden Locks to freely and effectively pass the anadromous fish which migrate through the locks. Our department does have a concern with flow management, i.e., that the saltwater return has been extended over the years and has an unscreened intake which appears to be somewhat of a revolving door for adult migrants. Thus, WDF hopes to be involved in any future design modifications which might correct this problem.

On page 2-28, WDF would like to see included an acknowledgement that the Lake Washington **system** includes Lake Sammamish and the Sammamish River and their tributaries. These constitute a significant portion of the drainage area and are important producers of anadromous fish which pass through the Locks and Ship Canal.

If you have any questions or need additional information, please contact Larry Fisher, WDF Regional Habitat Manager, at (206) 392-9159.

We appreciate your cooperation in our efforts to protect, perpetuate, and manage the fish resources of the state of Washington.

Sincerely,

Donald Haring
for Millard S. Deusen
Regional Supervisor, Freshwater Permits
Habitat Management Division

cc: Gary Sprague, WDF

QUADRANT
A Weyerhaeuser Company

QUADRANT LAKE UNION CENTER
659 North 34th Street
Seattle, Washington 98103

July 20, 1993

Mr. Derek Chow
Study Manager, Planning Branch
Department of the Army
Seattle District Corps of Engineers
P.O. Box 3755
Seattle, WA 98124-2255

Dear Mr. Chow:

RE: DRAFT LAKE WASHINGTON SHIP CANAL PROJECT MASTER PLAN

My comments on Section 8.2 Fremont Cut (North Shore)of the above referenced draft plan follow.

Quadrant and Fremont Dock Company have a long term easement agreement with the Army Corps (No DACW67-2-91-29) dated September 14,1992 to construct, maintain and landscape an extension of the Burke Gilman Trail along the north shore of the Fremont Cut in an area which generally extends from Phinney Avenue North to Aurora Avenue. Because of the easement, Quadrant is very interested in Army Corps policies which affect the easement area. I am disappointed that Quadrant was not included on your distribution list for the Draft Master Plan and I ask that you include us on all future mailings relating to the Plan.

Quadrant agrees that the Lombardy poplars are in a declining state of health and that the root surfaces protruding above the ground are a hazard to both people and adjacent buildings. When Quadrant developed its landscape plan for the easement area, the landscape architect was concerned about the health of the trees so we are glad that you plan on replacing them with a substitute. What tree will be substituted and will the substitution occur all at one time or gradually as individual tree health warrants?

As trees are replaced we want to be sure that their removal does not damage our adjacent existing buildings. What provisions will be made to insure the continued stability of our existing Quadrant Lake Union Center buildings during tree replacement?

Finally, how will you coordinate the tree replacement with our Corps approved landscape plan and Burke Gilman trail extension for Phase I of the new buildings at Quadrant Lake Union Center (Phinney Avenue North to Evanston)? Quadrant will construct the Burke Gilman Trail extension on the north shore of the Fremont Cut as currently permitted by the City of Seattle. Since we have a Corps approved landscape and construction plan and since we are fully permitted by the City of Seattle we do not expect the new Corps Master Plan to create any changes for us. Is this your understanding as well?

I look forward to your response to these questions. I can be reached at 547-7400.

Sincerely,

Barbara Chilcote

Barbara Chilcote
Senior Development Manager

cc: Suzie Burke, Fremont Dock Co.

AUG 11 1993

Seattle Water Department

Robert P. Groncznack, Superintendent
Norman B. Rice, Mayor

August 9, 1993

Mr. Derek Chow, Study Manager
Planning Branch
Department of the Army
Seattle District, Corps of Engineers
P.O. Box 3755
Seattle, WA 98124-2255

Dear Mr. Chow,

Thank you for the opportunity to review the "Draft Lake Washington Ship Canal Project Master Plan". Staff members of the Seattle Water Department have reviewed the plan and offer the following comments for your consideration.

1. Add provisions to the plan that will allow for the development and installation of sonic fish counting devices for enumerating adult salmon should this be deemed advisable at some point in the future.

2. Add provisions that will allow development and installation of a smolt enumeration device at some point along the ship canal.

3. Consider the addition of a waterfront site to house facilities associated with the implementation of a Lake Washington Basin Salmonid Recovery Program should such an initiative be implemented in the near future.

Thank you again for the opportunity to review the document. If you have any questions please call me at 684-4608.

Sincerely,

NANCY DAVIDSON,
Water Resources Manager

RML 1/shipcom

AUG 11 1993

Seattle
Engineering Department

Gary Zarker, Director
Norman B. Rice, Mayor

August 9, 1993

Mr. Derek Chow, Study Manager
Department of the Army
Seattle District, Corps of Engineers
PO Box 3755
Seattle, WA 98124-2255

Dear Mr. Chow,

The City of Seattle established the Lake Union and Ship Canal Water Quality Management Program to reduce or eliminate sources of pollution, especially nonpoint sources, to Lake Union and the Ship Canal. Various departments in the City of Seattle in cooperation with the Department of Ecology, Metro, Department of Natural Resources, and the Puget Sound Air Pollution Control Authority, remain involved with education and outreach activities, inspections of businesses and water quality sampling efforts in the Lake Union watershed.

We appreciate the opportunity to comment on the Army Corps of Engineers' Master Plan for the waters between Puget Sound and Lakes Union and Washington. Our primary concern is that although the recommendations (p. 13-1) state "...that the Lake Washington Ship Canal Project Master Plan be adopted as a guide to the orderly use, development, and management of the natural and manmade resources of the Lake Washington Ship Canal Project administered by the Seattle District, U.S. Army Corps of Engineers", the Plan does not address water quality or shoreline habitat and does not adequately address the affects of saltwater intrusion on aquatic life in the waters of Lake Union and the Ship Canal.

Section 3 discussed factors influencing resource use, development, and management. They included historic properties management, recreation, fish, and wildlife, etc. but did not mention water quality. The quality of waters in Lake Union and the Ship Canal directly affect the quality of recreation and the existence of fish and wildlife.

Section 2.13 mentions the maintenance of a proper freshwater inflow-outflow balance to prevent saltwater intrusion through the locks. Are there studies to document that a proper water balance is being achieved year-round and that aquatic species are not being adversely affected?

Section 9 discussed Wildlife Management but did not consider management of wildlife species, only water passage. There was no discussion on the future management of sea lions.

Section 10 discusses vegetative management but only as it applies to the botanical gardens. Is this the extent of the resources administered by the Corps? What about mitigation, maintenance and enhancement of natural riparian habitat?

If you have any questions regarding our comments or our activities in the Lake Union and Ship Canal area, please feel free to contact me at 684-7597.

Sincerely,

Jennie S. Goldberg
Senior Environmental Analyst
Seattle Drainage and Wastewater Utility

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
911 NE 11th Avenue - Room 620
PORTLAND, OREGON 97232
503/230-5400 FAX 503/230-5435

AUG 1 1 1993

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Mr. Derek Chow, Study Manager
Planning Branch
Seattle District, Corps of Engineers
P.O. Box 3755
Seattle, WA 98124-2255

RE: Draft, Lake Washington Ship Canal Project Master Plan

Dear Mr. Chow:

National Marine Fisheries Service (NMFS) appreciates the opportunity to review the draft Master Plan for the Lake Washington Ship Canal Project. We have the following comments for your consideration.

Historically, the Lake Washington Basin has produced significant runs of anadromous salmonids supporting important recreational and commercial fisheries within the basin and marine waters. However, in recent years there has been a serious decline in anadromous fish production within the basin. In particular, spawning escapements of sockeye salmon and steelhead trout are far below escapement goals. Spawning escapements of coho and chinook salmon are also declining. In response to this problem, efforts are underway to determine the reasons for these declines and to implement programs to help restore populations of anadromous salmonids. These efforts will require a comprehensive approach and long-term commitment of resources from a variety of state, local, and federal agencies, and tribal interests.

As you are aware, NMFS has been working closely the past few years with other fishery agencies, the tribes, and the Corps, in a cooperative effort to identify problems and possible solutions regarding adult steelhead passage at the Hiram Chittenden Locks. Although this effort was primarily focused on steelhead passage in relation to the serious sea lion predation at the locks, the overall issue of fish passage for all anadromous species has now become of paramount concern. Some of the fish passage concerns identified in the past include delay caused by varying salinities and attraction flows, loss of fish ladder flow in the diffuser supply wells, adult fish fallback, and impacts to juvenile fish due to abrupt pressure and salinity changes. Ensuring that the best possible upstream and downstream fish passage conditions exist at the locks for all anadromous species must necessarily be a key component of an overall restoration strategy for the Lake Washington Basin.

It is our understanding that the primary goal of the Master Plan is to prescribe an overall land and water management plan, resource objectives, and associated design and management concepts for the Lake Washington Ship Canal that lays the groundwork for future implementation plans (Sections 1.2, SCOPE, and 1.3, PLAN FORMULATION). Therefore, NMFS feels that it is essential for the Master Plan to thoroughly address concerns with fish passage at the locks. This could be accomplished by expanding the specific wildlife resource objective on page 9-1, Section 9 - "Multiple Resource Management: Wildlife Management General", to include specific consideration of information needs and opportunities to provide the best possible upstream and downstream fish passage conditions at the Hiram Chittenden Locks. Including this objective in the Master Plan can serve to improve resource management effectiveness and provide the basis for preparation of future operational management plans that specifically address fish passage improvements at the locks.

Sincerely,

Merritt E. Tuttle
Division Chief

cc: WDW (Engman)
WDF (Sprague)
MIT (Coccoli)
SWD (Little)

rec'd

AUG 26 1993

Seattle
Department of
Parks and Recreation

Holly Miller, Superintendent
Norman B. Rice, Mayor

August 23, 1993

Derek Chow, Study Manager
Planning Branch
Department of the Army
Seattle District Corps of Engineers
P.O. Box 3755
Seattle, Washington 98124-2255

Dear Mr. Chow:

The Seattle Department of Parks and Recreation has reviewed the July 1993 Draft Master Plan (DM 9) for the Lake Washington Ship canal. We apologize for the lateness of our comments.

We appreciate reference to the City of Seattle facilities and in particular our Department's facilities which border the Ship Canal. Given the number of such facilities, we believe it is extremely important that we retain a close working relationship with your agency. From our Commodore Park at the Hiram M. Chittendon Locks to trails along both sides of the Fremont Cut, numerous existing and proposed small and larger parks in Lake Union and Portage Bay as well as our Arboretum at the eastern end of the Montlake Cut, we share a rich number of resources to be enjoyed by the public on the water and from the shoreline. We believe it is vital to the public interest that we continue working closely with you on future development and management of these resources.

We are especially interested in the Plan's landscaping proposals. For example, the existing poplars have long been an identifying feature of the Fremont Cut. We would appreciate the opportunity to participate in public discussions concerning replacement of these trees.

We are also interested in proposals affecting recreational boating on the Ship Canal. We received a copy of Benella Caminiti's comments to you regarding the lack of ladders along certain walled portions of the Ship Canal. We believe Ms. Caminiti's proposal is worthy of consideration.

You may be aware that there have previously been proposals at the State level to undertake a wildlife management plan for Union Bay. While we have received no recent information concerning these proposals, your agency would obviously be an interested party to such planning.

One omission we observed is that on several of the plates Fremont Canal Park, just east of Flohr Metal Fabricators, is not labelled. This should be corrected for future reference.

We further appreciate that you have noted some of the changes which this Department and the Seattle Engineering Department are involved with, particularly the trail development on the north and south sides of the Fremont Cut area. There are also a number of shoreline projects on the Ship Canal from our Shoreline Park Improvement Fund (SPIF) process which have recently approved for implementation by our elected officials. Rick Nishi (684-7047) was in charge of this process and can brief you concerning specific proposals. If you received any pertinent comments on such developments through the review of your draft Plan, please let us know.

Thank you for the opportunity to comment. As noted, we would appreciate notification and involvement with future details of design and management, particularly those which may affect our properties.

Sincerely,

Holly Miller

Holly Miller
Superintendent

HM:fhy

cc: Cyril Juanitas, Assistant to the Mayor
Tom Tierney, Intergovernmental Relations
Gary Lawrence, Director, Planning Department
Rick Krochalis, Director, Construction and Land Use

MUCKLESHOOT INDIAN TRIBE

FISHERIES DEPARTMENT

August 9, 1993

Mr. Derek Chow, Study Manager
Planning Branch
Department of the Army
Seattle District, Corps of Engineers
PO Box 3755
Seattle, Washington 98124-2255

re: Comments on the Ship Canal Master Plan

Dear Mr. Chow,

The Lake Washington Ship Canal plays an important role in the treaty rights and livelihood of the Muckleshoot Indian Tribe (MIT). We appreciate the chance to review the US Army Corps Master Plan for this site. In addition we would like to commend the staff at the Chittenden Locks for their cooperation with MIT in the annual sockeye salmon enumeration research. Gathering this crucial information has been simplified considerably through the helpfulness of the Corps employees at the locks.

However, having reviewed the draft Master Plan for the Lake Washington Ship Canal, the Tribe has concluded that the Corps has virtually ignored hundreds of thousands of fish and dozens of commercial fishermen utilizing this area. MIT ceded their homeland (the Lake Washington, Green River, and Upper Puyallup River basins) in the 1850s in return for a right to a share of the fisheries resources. These resources have been systematically degraded or eliminated. The single worst event in the fisheries of the Cedar River and Lake Washington systems is arguably the creation of the Chittenden locks. It is inconceivable that the fish resources of the Ship Canal are summarized in only one paragraph. It would be advantageous to replace all the time and effort that went into the four pages of Corps biographies with research on fish and wildlife.

There are several omissions in the draft Master Plan that the Tribe would like to address, past present and future.

The Master Plan should address the past effects of the locks and Ship Canal construction on fisheries resources. These include:

The hydrological manipulations involved in the Ship Canal construction (including lowering Lake Washington and redirecting the Cedar River into the lake) eliminated the wetlands at the Black River delta, The Black River itself, the historic Cedar River delta, the Lake Washington outfall, the Lake Washington tributary deltas and the Salmon Bay estuary.

39015 172nd Avenue S.E. • Auburn, Washington 98002 • (206) 931-0652 • FAX (206) 931-0752

By eliminating the water contribution from the Lake Washington and Cedar River systems, the construction severely degraded the wetlands in the Duwamish estuary and increased the migration time for Green River salmon smolts.

There were several decades of locks operations with a fish ladder so poorly designed that only the most athletic fish could traverse it.

Changing the entrance and exit to an anadromous system without any contingency plan for the biota of the lake or river severely impacted many of the fish species found there. Eighty years later, the longfin smelt still haven't found their way out and are one of only two landlocked populations in the world. Up to 27 million of these smelt exist in the lake. They can have a profound effect on the lake's clarity and ecology, and directly influence the success of salmon species. Cedar River chum salmon didn't migrate well through a lake system and a run that used to produce hundreds of thousands of individuals per year is now extinct

The Master Plan should identify present problems with the locks that may require changes in infrastructure or use. These problems include:

Dumping fresh-water osmoregulating outmigrant salmon immediately into salt water at the locks without the benefit of any brackish transition zone.

A poorly designed fish ladder that confuses returning adult salmonids, increasing predation by sea lions.

Intermittent failure of the freshwater attraction valve in the ladder system delaying migration through the ladder by returning adults, and exposing the fish to predators for a longer period.

A poorly designed fish ladder and dam that increases seagull predation on smolts.

An almost total lack of natural habitat along the shores of the ship canal. There are few wetlands west of the Arboretum, and almost no in-channel structure besides pilings.

The Master Plan should identify future changes in infrastructure or public use of the locks necessary to correct current problems with these facilities.

Since the Tribe expects to receive a copy of the Operational Management Plan in the near future, those operation requirements affecting fish will be more thoroughly discussed in that review. However, given the fact that many of these operational changes will alter the facilities discussed in the Master Plan, we feel their inclusion here is warranted. Therefore, the following items will be considered in the Master Plan.

Modify the fish ladder so that the entrance is more obvious to returning adult salmon and steelhead, thereby decreasing sea lion predation. This will be especially important when or if Lake Washington steelhead (and possibly sockeye) are listed under the Endangered Species Act in the near future. This contradicts Section 9.2.6 of the Master Plan (General Wildlife Management), which states of 'no major constraints' on the fish ladder and viewing gallery.

Put an alarm and backup system on the freshwater attraction valve so that any mechanical failure is detected before all the sea lions are full.

Consider doubling the fresh water through the fish ladder so that it becomes the primary mode of travel for both outmigrant and returning fish. Saltwater from the settling basin mixes with freshwater in the ladder to provide a brackish water transition to Puget Sound. This is thought to be better on the juvenile out-migrating fish than dumping them directly into saltwater in the locks.

Where possible, engineer wetlands off the mouth of the fish ladder for outmigrants to use while adjusting to salt water and hiding from predators.

Where possible, bench the banks of the Ship Canal and plant with native riparian vegetation. The Tribe disagrees with the phrase in the Master Plan that "The vegetation of greatest interest at this project is found in the Carl S. English, Jr., Botanical Garden located at the locks". The Tribe's vegetation of greatest interest would be the natural vegetation that is noticeably absent.

Consider imposing a fee on boats using the lock facilities. The funds collected could be used to facilitate studies of the anadromous fish utilizing the Ship Canal.

Install predator netting over the fish ladder and dam to minimize seagull predation. In the Wildlife section of the Master Plan, it states, "At the locks, the visitor will see gulls scavenging for a wide selection of food. Terns sit on wires and fly over the water, occassionally dropping to snatch fish from immediately below the spillway". The fact that these fish are predated upon below the spillway is indicative of a problem with fish passage through the facility. As such, this mortality is the Corp's responsiblity.

The Master Plan document presents the following problems which need to be addressed:

Section 2.2 of the Master Plan (Project Purpose) states "The project also provides significant values in the ... passage of anadromous fish". This is a debatable point, and one that requires validation. The Master Plan documents ship passage through the locks over time (Table 3.1), but not fish. The Fish section of the Lake Washington/Cedar River watersheds should include a compilation of the historical scientific and anecdotal information on fish use of the locks by year since their completion for at least the following species: steelhead and cutthroat trout, chinook, coho, and sockeye salmon. This should be compared to estimated fish runs in the Black and Cedar Rivers before the locks were built. In addition, the Plan should include annual catch estimates for the commercial species (chinook, coho, sockeye, steelhead).

Section 2.20 of the Master Plan (Fishing) makes no mention of the several large scale commercial fisheries in the Ship Canal. The Muckleshoot Tribe has fished in that area since long before the Chittenden locks were first discussed. They have continued to fish there every year that there are sufficient returning adults to support a fishery. In addition non-Indian commercial fisheries are present in the summer months for crayfish.

Section 2.21 of the Master Plan (Protected Species) does not consider future problems. Mentioning sea lions, eagles, and blue herons, the paragraph ignores the impending listings of Lake Washington steelhead, sockeye salmon and bull trout under the Endangered Species Act. Nor does it mention that under the second phase of US *vs.* Washington (the Boldt Decision), federal agencies (and others) are required to maintain salmon runs through maintaining species habitat.

Section 3.3 of the Master Plan (Socioeconomic Characteristics) fails to mention that the Lake Washington fishery has accounted for two-thirds of Tribal income in some years.

Section 5.2.3 of the Master Plan (Resource Objectives for the Locks and Spillway Dam) should include the objective of not interfering in fish passage.

In Section 13.2 (Recommendations) the Tribe objects to the sentence "The land classifications and resource objectives formalized by the Master Plan provide a balanced plan for sound resource use, development, and management consistent with authorized project purposes and historic resource preservation, and based on determination of highest and best use". The Tribe

feels that the Corps has ignored the natural resources of the area except to the extent that they play some role in recreation.

In order to maintain the salmon runs that are the mainstay of the Muckleshoot economy, and were promised in perpetuity in return for ceding the Lake Washington basin, the US Army Corps of Engineers must consider these runs in the Master Plan for the Ship Canal.

Thank you,

Eric Warner
Fisheries Mitigation Specialist

cc:

Colonel Cunningham	COE
Jeff Laufle	COE
Ken Brunner	COE
Karen Northup	COE
Steven Foster	COE
Tim Brodurtha	USFWS
Gary Sprague	WDF
Gary Engman	WDW

received

AUG 9 1993

COMMENTS ON DRAFT MASTER PLAN (DM 9)

LAKE WASHINGTON SHIP CANAL

SEATTLE, WASHINGTON

JULY 1993

Phone (206)283-1052

Benella Caminiti
2919 Mayfair Ave, North
Seattle WA 98109

August 3, 1993

COMMENTS - PAGES 1 - 9

ILLUSTRATIVE PHOTOGRAPHS

# 1 - 3	Composition of the dump material on south bank, to be dumped
4 - 5	Volume material pushed over side of bank at multiple sites.
6 - 7	Extent of current dump material waiting pushing to bank side, July 29, additive to that already pushed over # 7 pile at different site than # 6
8 - 9	"View" from triangular park bench of dense mats of overgrown bushes, bindweed (morning glory), and height of trees planted years ago to replace removed poplars. (Eastern ship canal.
10	Dump material over side bank to bulkhead, and post that carried "no swimming, no diving" sign, now removed by ? .
11 - 12	"The Wall" - and concrete platform attached: # 11 is view to east and # 12 to west.
13	Summer re-growth of sucker sprouts from poplars, pruned away in spring, 1993.
14	View to South Ship Canal, from Fremont side. Small trees bordering shore near Seattle Pacific Univ., replacements of poplars removed years ago.
15 -16	Same, View to Scuth Ship Canal, from Fremont side. Small trees east of colonnade, those planted to replace colonnade of poplars in that location. Fremont and Aurora bridges beyond.
17	Foliage of the remaining south bank colonnade trees
18	View from the Fremont Bridge: looking west.

NEWSPAPER ARTICLES

As noted on Page 1, Re Water Conservation at the Locks

2.13 PROJECT OPERATION: Search for WATER CONSERVATION STATEMENTS

pages 2.22-2.23 Text conclusion is "The present inflow regime appears to be satisfactory for maintenance of a proper water balance." **

This is indicative that no further methods or projects will be in effect for water conservation - FRESH water.

Newspaper articles to be noted on LOCKS fresh water consumption are: From the Seattle Times -

1. April 29, 1992, page A-10. Don't be in a hurry at the locks this summer. Don Hannula, editorial columnist. Enclosed

2. May 14, 1992, page A-13. The thirsty locks rarely gulp down municipal water. Larry Merkle, Corps of Engineers, Seattle District, Chief, Hydrology & Hydraulics. Enclosed

3. August 1, 1993, B-1, B-3. More water-tight times ahead for area. Dick Lilly, Staff reporter.

Mr. Hannula remarks on volume of fresh water consumed by locks on a single July day at peak [illegible] of pleasure boating season, 314 million gallons. He remarks on past studies of locks water use, concluding that "The problem has been studied to death."

Mr Merkle responds on federal governments claims of superior right to natural flow for navigation, denies that locks use diminishes municipal and industrial supply.

Mr. Lilly's long review on water supply to region notes that another plan is due to be completed in three to five years to reach agreement between all concerned parties/agencies/tribes/Corps, etc. Further, "Other projects -- rehabilitation of Ballard Locks so they will use less water, reducing the demand for flow on the Cedar River --".

Common knowledge is that regardless of periodic drought situations, demand for fresh water will be significantly increased in near future. The state Growth Management Act requires that local governments make provisions for this growth, which can not be done without reference to water supply for municipal and industrial needs.

The day is past when the state's fishery resources can be sacrificed to interests of green lawns, owners of pleasure boats, houseboats, and lake-side home owner's view.

** This comment implies that no further attention will be given to fresh water conservation, a disgraceful situation in view of regional needs.

THE PLAN MUST BE REVISED TO REPORT THE ENTIRETY OF THE CORPS RESPONSIBILITY FOR WATER CONSERVATION AT THE LOCKS, THE MAXIMUM, APPLICABLE TO:

1. Prevention of saltwater intrusion, depletion of regional fresh water for casual recreational boating, and

2. Means and projects the Corps will undertake to cooperate with state and

local governments for municipal and industrial needs of near-future and thereafter time, and Growth Management Act, and

3. The need to permit instream levels of fresh waters to be constantly improved to provide healthy environment/habitat for state and national fishery resources, both recreational and commercial, and other dependent wildlife.

So important an issue <u>can</u> <u>not</u> be dismissed with a few nondescript sentences.

NATIONAL REGISTER NOMINATION FORM ITEM # 7, page 3

Has application been made to the NPS, Dept of Interior, for removal of the Lombardy poplars ?

The poplars are the dominating feature of the landscape, except for the two easternbridges, Fremont and Aurora above .

No time frame is shown for tree removal, and replacement with trees of equivalent height or significance. The candidates for replacement are generally common in Seattle (except for the Dawn redwoods) and nowhere else in the City is there an equivalent stand or colonnade, nor one so familiar to city residents - not even in the Washington Park Arboretum.

MASTER PLAN 1.1

"Purpose:" Here I expected to locate mention of the TIME FRAME for accomplishment of the projects and plans. NONE was located here or elsewhere.
Last prior Master Plan was issued 1977, sixteen years ago. Is there a particular time period for Master Plan issuance ?

What examination has been made, and by whom, to determine if projects specified in 1977 Master Plan have been completed or abandoned ?

<u>NEED FOR PUBLIC SAFETY</u> - FEATURE IGNORED BY CORPS

Master Plan No mention

Along the entire length of the Ship Canal bulkheads, Fremont/Queen Anne, and Montlake cuts, there are no ladders installed by which anyone could climb from the waters to land, or from the rip-rap to land.

The heighth of these bulkhead walls makes them impossible to climb, except in case of young and vigorous males. I experienced this problem when walking with my adult male Irish setter who decided to drop onto the rip-rap in pursuit of a rat that was moving there and could not then climb up: neither could I get up after dropping to rip-rap to give him a boost, until rescued by a passer-by.

Sufficient numbers of kayakers and canoists use the cut that ladders should be installed in case of their needs.

THE CORPS' ANTIPATHY TO COLONNADE OF LOMBARDY POPLARS AND INTENT TO DESTROY THEM

MASTER PLAN WORKSHOP BROCHURE 1973, Page 5.(4)

It must be noted that tree-topping is a means of condemning any tree to death. On page 5 we find an historical note on this practise being maintained, and fraudulent claim to support the practise:

HISTORY

"Landscaping - It was recommended that the poplar tree planting theme for the Cut be dropped. Due to the height of these trees, aerodynamic disturbances sometimes occur in the canal. This in turn creates havoc with sailboats, and is a serious safety problem.

(emphasis added)

We know of no reported accidents or complaints stemming from this phenomera. However, we will maintain a program of tree-topping along the Cut to minimize this potential hazard."

Given that all sailboats passing through the Cut do so under some form of power other than sails, and the "potential hazard" has no basis in fact, record or complaint, the arguments then given for tree destruction were specious.

MASTER PLAN 1993 8.3.1 & 8.2.1

With arguments equally specious, North and South sides shores poplar colonnade destruction is again emphasized. Statement is that "The poplars are in a declining state of health with weakened tops and side branches."

The earlier arguments about it being a threat to safety of navigation do not now appear.

HISTORIC PLACES, NATIONAL REGISTER, NOMINATION FORM Item # 7, Page 3 1978

In this document the Fremont Cut poplars colonnade is described as:

"nearly uninterrupted from the Northern Pacific Railway Bridge on the westerly end to the Fremont Drawbridge on the East. " (emphasis added)

APPENDIX B

Thus it seems that in the past 15 years a "nearly uninterrupted" colonnade has been reduced to a mere 35 trees, with a long strip of short birches and miscellaneous trees on either side for considerable lengths, east and west.

PHOTOS: # 14-16

THis is a sorry remnant of trees that were existing when nomination was made, and that scene which I remember.

MASTER PLAN 1993

HEALTH OF TREES; Other than the mere statement that "the poplars are in a declining state" NO EVIDENCE has been presented to support this claim. No report from an independent certified arborist or plant pathologist appears.

APPENDIX B

Here we find a long list of "acceptable" substitute trees - including such absurdities as the Metasequoia - dawn redwood ! And a variety of trees that either reach maturity as low growing or have long time to maturity.

SEE PHOTOS # 8 - 9.

What would become of any VISUAL PUBLIC ACCESS to waters ? Its not recognized as a necessary feature. Over time and maturity of "acceptable trees" the result would be exactly as shown in photos 8 & 9.

MASTER PLAN 12.2.6 — THE STRONGEST EVIDENCE FOR THE HEALTH AND SAFETY OF THE TREES IS THAT FROM THE STORM OF THE INAUGURAL DAY, 1993. (rebutting statement of 12.2.6.)
While trees all over the city, including city parks, were falling in great numbers, or having large branches ripped from trunks NOT ONE of these poplar fell or had any broken branches. This, despite that the winds thru the Canal were exceedingly strong, as they frequently are. The only sign of storm damage were twigs and smaller stem parts on the ground.

South side — This was the situation on the South Side where I walked the day following the storm.

Photos 17-18 — Physical evidence is shown by the evident health, abundance of foliage, strong color of foliage, and intact bark structure of the trunks.
For six years during the 1950-1960's I was the librarian at research and development establishments of major agricultural chemical manufacturers. This work required my knowledge of botany, chemistry, entomology helminthology, acarology, microbiology.
But it is even now superfluous to determine that those trees are in good condition, despite their admitted age.

ARE we to condemn to death any aged living creature or plant on spurious claims ?

Is the tree destruction program simply a make-work project to justify jobs and costly contracts ?

PLEASE PROVIDE — Dates and any other records for the removal of the poplars that existed on the eastern and western sides of the existing colonnade. What reason was given for their removal and the substitution of other species?

FUTILITY OF CORPS 1993'MAINTENANCE' EFFORTS

PHOTO # 13

Master Plan 12.2.6 — On the first effort in memory of there being any "pruning or maintenance" efforts for the plantings on the South Fremont Cut, crews of Corps came this 1993 spring season to cut out growth of sucker branches that sprout from the base and trunks of the Lombardy poplar trees.

It is now the first week of August and the sucker sprouts are almost as dense again as they were prior to this wasted effort and costs.

FUTILITY OF CORPS EARLIER "REPLANTING" OF LOMBARDY POPLARS

page 1-28 — Possibly 5 years ago there were circa 10 sapling poplars (presume Lombardy) plante in this area. In the following year spring only a few greened out. Some were later vandalized, and to date there seem to be only two surviving, not very tall.

First paragraph — What inspections were made of growth of these planted trees ? Any inquiry of contractors for payment or replacement of those which failed to grow or sprout ?

WILDLIFE - CORMORANTS AND CANADA GEESE - AND POPLAR TREES

MASTER PLAN 2.18, page 2-29.

ERROR

"Flocks of wintering Canada geese --- " and "Canada geese are frequent visitors --"

These geese are permanent residents, present thru all months of the year.

"Cormorants use the poplars at the Fremont Cut".

This statement reveals the paucity of knowledge the Plan preparers have of these birds, or how they use the Lombardy poplars.

They are, I believe, Western Crested Cormorants: Thru all the eight months of the year or so, when the trees are not in full leaf, "residents" by virture of use of the trees for roosting from late afternoon until mid-morning, or winter daylight.

In January I have counted circa 400, roosting on the VERY OUTERMOST and HIGHEST BRANCHES OF THE SOUTH BANK TREES. *

THE DO NOT USE ANY OTHER TREES IN THE VICINTY; roosing sites are always on the branches overhanging the waters. *

They are large birds, individually conspicuous, and a wonderful spectacle in a city environment.

They spead out in use of the trees, with groups of 4 or 5 and some of 20 individuals per tree.

DESTRUCTION OF THE TREES WILL RESULT IN LOSS OF THESE BIRDS IN THE ENVIRONMENT/HABITAT THEY HAVE USED FOR LONG YEARS PAST, AND OUR LOSS in enjoyment of their presence.

Must a bird be endangered before there is any control of the destruction of its habitat ?

Illustration Enclosed

WILL WE BE OBLIGED TO ERECT POLES FOR THEM, AS HAS BEEN DONE IN WISCONSIN TO PROVIDE SUBSTITUTE ROOSTING SITES ? WOULD THEY USE SUCH POLE SITES ?

Exhibit A (b)

Public Law 85-624. Fish & Wildlife Coordination Act.

Has the U.S. Fish & Wildlife Service (Olympia) received a copy of the Master Plan ? Are they now informed of the value of the Cormorants to the City, or the possibility of their being driven away by loss of roost habitat ? Clearly they could not be.

There is no listing of Master Plan recipients by which to learn if F&WS has a copy.

* Contradiction to claim at 8.2.1 of "weakened side branches": Weakened side branches would not support the weight of the two or three heavy birds resting and roosting on them.

OUF CORMORANTS HAVE REAL TREES IN WHICH TO ROOST !!

WILL SUCH POST HABITATS BE PROVIDED TO SUBSTITUTE FOR LOMBARDY POPLARS ?

Nesting platforms for cormorants have been built in Wisconsin using P R funds

PAGE Land Classification; multiple resource management - LOW DENSITY

8.3.2 My response is more fully explained in the enclosed REQUEST FOR DENIAL of a shoreline permit for installation of a "transportation corridor" on the present Burlington Northern right-of-way, to serve bicycle use, both for commuters and recreation.

Such use as the City contemplates can not be termed "low density" despite that this is not defined further in the plan.

The $2.3 million now admitted for cost of the project would be spent in part on area adjacent to Corps property on South Side and in part on extension to and slightly beyond the Ballard Bridge.

NO MENTION OF USE OF THIS ADJACENT PROPERTY FOR HIGH INTENSITY (70%) USE - BIKING appears in Master Plan.

8.2.4 NO MENTION IS GIVEN AS TO HOW THIS USE WOULD IMPACT THE EXISTANT LOW INTENSITY USES LISTED AS "RATIONALE", or CAUSE THEIR DECLINE.

8.3.5 HOW HAS THE CORPS STAFF "COORDINATED WITH CITY"FOR BIKE TRAIL DESIGN ? IS IT SATISFACTORY WITH THE CORPS THAT ANOTHER NOTORIOUS "GREEN LAKE PATH" should be developed here ?

8.3.3 (2) How is is possible to "maintain coordination with the City --- the Queen Anne Community -- etc," when the existence of the MASTER PLAN has heretofore been concealed from examination of almost all listed parties ? (noted in cover letter)

THE DUMP GROUND ON BANKS OF SHIP CANAL, SOUTH SIDE , CORPS PROPERTY

PHOTOS # 1-7 Thru the month of July 1993 masses of loose dirt, sand,sticks, and rocks have been piled in stacks all along the bank, generally near the poplar trees. Sequentially the stacks have been pushed along the bank, layered over the rough grass cover existing.

It is not composted material, nor is it from an area of the Ship Canal that I know. The loosely packed Maple leaves, pine cones, plastic scraps make an unsightly mess on the bank, held back now only by a few grass scraps at land edge of the bulkhead.

Much of it will be in the SHIP CANAL waters with fall and winter rains, and, as it is now, blown about the air. By no means is this a "compost" to enrich the soil.

Whose idea was it, and why, to use this length of the Canal as a dump site ? What is the source of this trash ?

PHOTOS 6 and 7 show piles ready July 29th to be pushed over the bankside.

The practise should be stopped immediately; that which is not removable should be lightly ploughed into existing surface soil.

8.3.5 Nothing in the MASTER PLAN remarks on this offense, unless this is the example of "breaking-up compacted soils".

TOTALITY OF NEGLECT OF AESTHETICS OF WATER VIEWS

PHOTOGRAPHS # 8 - 9

Remarks in Cover Letter

ACCESS to WATERS - by either physical or visual means is a primary purpose of the State Shorelines Management Act and the City derivative, the Shoreline Master Program.

On the easterly portion of the Fremont Cut visual access is denied by the long-continued failure of the Corps to prune or clear the masses of overgrowth of bushes and vines on the property.

Photograph # 8 shows a piece of the park bench and obscuring of any view from that small park - on private property with a perpetual easement to the city for park use. This was gained as mitigation for development and street vacation to owners of office buildings westerly.

Trees are an attractive frame for sight of waters. But this obscuring of waters totally is unacceptable.

8.3.5 Land Management Measures. What is meant by "This plan shall also identify control of public access to the waters edge ---? "

Is fishing to be prohibited ?

Is swimming to be prohibited ?

4.5. Restricted Water Use Zones.

"The City is currently considering legislation prohbiting swimming in the ship canal."

Swimming is a public recreational right of navigation, and there is no legitimate reason for prohbiting its pleasures. From both the north and south bulkheads swimming close to shore has taken place - almost all by teen-agers - for as long as I can remember. It is a customary place of recreation. No accident has ever been reported or recorded.

In a City surrounded by water, opportunity for public access and swimming hardly exists, except by use in few and distant beach parks.

Must it be necessary to own a pleasure boat or commercial vessel to use and enjoy the waters? Are these waters to be prohibited to swimmers ?

photograph # 10.

Last year two steel framed posts were planted in the banks of the South ship canal by unknown party or agency. In past weeks the signs have been torn away, leaving posts standing. Signs said "NO SWIMMING, NO DIVING". Is it the City or Corps intention that swimmers should become law-breakers or scofflaws ? That will result if the City or Corps pursues any intent to deny a recreation that has been in existence for the near-30 years I've seen it happen, and envied the swimmers.

Except for these posted signs there has been NO public notice to inform anyone of this contemplated prohibition. It has been a tolerated practise, never interfered with by the City Police who are routinely in the area.

FREMONT CUT - THE CONCRETE WALL - South Ship Canal

MASTER PLAN -

NO MENTION

Left from the time that a concrete brick making plant existed and bricks were stored on the concrete surface and near the wall is THE WALL.

PHOTOS # 11 & 12

There are no remarks in the Master Plan to show the wall's existence or the kind of plantings over-growth that now grows between it and the bulkhead, obscuring views.

Is the wall to be left in place ? It is now straight and unbroken , except in one place - deliberately done.
The mounds of trash' shown in the photos have recently been scraped from surface of the concrete and piled in place.
These consist of soils and plants accumulated thru years and previously unattended or removed.

8.3.1

Note that the concrete surface is practically intact . There has not been any breakup from poplar roots. Yet one of the excuses for future destruction of the poplar trees is that "LARGE SURFACE ROOTS CAUSE TRIPPING HAZARDS."

TRIPPING OF PEDESTRIANS or strollers results from the existence of CORPS OF ENGINEERS BOUNDARY MARKERS which are hidden in the rough grasses.

SHIP CANAL WATER QUALITY DETERIORATION

EXHIBIT B

RE: Items numbered 7, 8, 9, 13, 20-21, 23, 25

WATER POLLUTION EASEMENTS GRANTED

These numbers refer to easements for 50 year or indefinite term to install storm sewer outfall, drain pipes, lines, sanitary sewer into waters of Ship Canal.

What inquiries or demands were made upon applicants that they demonstrate inability to connect this combined flow to existing municipal system whereby it would flow to the West Point Sewage Treatment Plant ?
What evaluation was made of alternate disposal options prior to granting easements ?
What permit applications, other than for the easements, were made and granted, by what agencies, before an increased burden of pollutants fouled the waters of a migratory fish water passageway and habitat of resident fish and invertebrates.?

What agency monitors the pollution burden of these storm sewer outfalls ?

Don't be in a hurry at the locks this summer

Don Hannula
Times editorial columnist

THERE'S a good likelihood that boaters will be cussing Hiram M. Chittenden this summer. Seattle's water shortage probably will mean a slowdown at the Ballard locks that bear his name.

The locks are the city's biggest fresh-water gulper. On a typical summer day, they suck about 200 million gallons of water from Lake Union and Lake Washington to allow boats to go through and keep salt water out of the lakes.

That's not drinking water. But to keep the two lakes at a minimum level set by federal law, it's water from the key river source that feeds city taps.

Facing what could be its worst water shortage ever, the Seattle Water Department is pushing voluntary conservation and planning mandatory measures.

Normal summer use for Seattle and the suburban customers it supplies is about 245 million gallons a day. On a typical July day, the locks named after an early-day Army Corps of Engineers district chief use 314 million gallons of lake water to move boats and flush salt water that rushes in from Puget Sound.

The elevator-type locks make 44 boat lifts on an average July day. Annually, there are almost 80,000 boat passages through the locks that separate Puget Sound and Lake Union.

For years, the Corps of Engineers has been studying ways to reduce the amount of water used. There have been improvements, but no major breakthroughs. The last year-long study was completed in March and is under review in the Corps district office in Portland. It deals with improved operations or physical modifications of the locks to use less water.

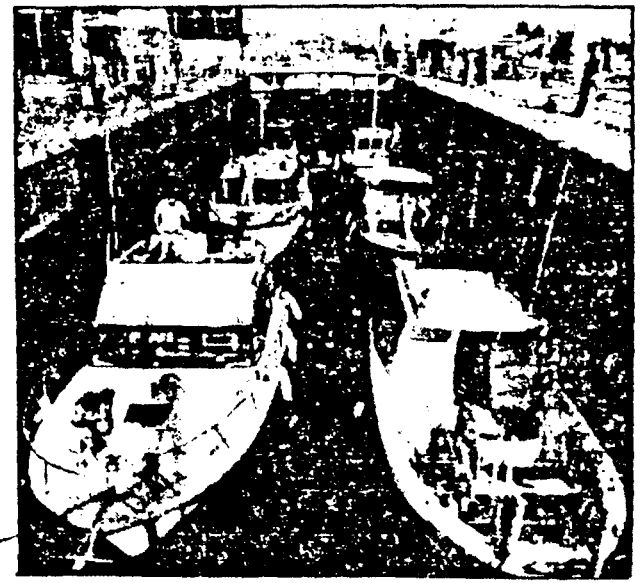
The problem has been studied to death.

It is complicated because it involves the Corps, the city and fisheries interests, including tribes. Fish need adequate water flows in the Cedar River as well as proper passage conditions at the locks. Competing with the fish for water are washing machines, showers, thirsty lawns ... and boaters.

The Corps and the city have an agreement to cooperate on water use. If push comes to shove, the Corps maintains federal law gives it a superior right to maintain navigation and keep the adjacent lakes at a required level.

In past droughts, the city has asked the Corps to reduce its water usage in the worst months of summer by reducing its lifts. That means waiting time for boaters.

City Water Department officials say a similar request probably will be made this year – unless there's an unexpected onslaught of rain.



Seattle Times file

The locks are used a lot – and use a lot of water.

"It's reasonable to expect there could be fewer lockages," said Larry Merkle, chief hydrologist for the Corps in Seattle.

While the city is putting out fliers seeking voluntary conservation, the Corps has done its equivalent: a press release asking boaters to be willing to wait to save water and cut their number of trips if possible.

Lake Washington's required water level is based on the level of Lake Union in 1916 when the locks were opened – about 20 feet. Under federal law, it can vary more than a foot above or below that. When the water gets too low, phones start ringing from houseboat owners with cracking water or sewer pipes or commercial yards that can't get boats in and out.

Merkle says better methods of monitoring salinity in Lake Union have come from past studies, along with improved flushing of salt water with less fresh water.

But in drought years like this, fewer lifts remain the only quick fix. The two locks – a large one and a small one – operate 24 hours a day. Often their loads are too light – only a few boats – to justify the water used. But, when the water is needed most in the summer, the boat demand is the greatest.

That's why boaters better start working on their patience now. Come August, they could face some big-time thumb-twiddling.

And the studies of using less water at the locks go on. Maybe there will be an unrelenting rain before they are finished, and they won't be needed.

■ Don Hannula's column appears Wednesday on The Times editorial page.

The thirsty locks rarely gulp down municipal water

Larry Merkle
Special to The Times

THE Hiram M. Chittenden Locks use a large volume of fresh water; however, conservation at the locks this year will add little or nothing to the Seattle area municipal and industrial (M&I) water supply. Conservation at the locks is useful to avert damage associated with abnormally low lake level and to prevent saltwater intrusion into Lake Washington.

The water used to operate the locks originates in the Cedar and Sammamish rivers and various other tributaries in the Lake Washington drainage basin. During the spring, some of this water is stored in the 2-foot operating range of Lake Washington to enhance conditions for navigation and recreation and for later use at the locks.

The Seattle metropolitan area's principal water supply is the Cedar River. Currently and throughout the preceding months, water supplied from the Cedar River to meet instream flow requirements, principally to support fishery needs, has exceeded the flow levels required to operate the locks. Therefore, all the water used at the locks this year is either water from the Sammamish River and other unregulated tributaries or Cedar River water required to meet instream flow (fishery) requirements. Stated another way, the locks make beneficial use of water that would be passing into Puget Sound even if the locks did not exist.

The city of Seattle is presently negotiating with the State of Washington and the Muckleshoot Indian Tribe to refine instream flow requirements for fishery needs. With the existing water supply system and so long as Cedar River instream flows for other purposes exceed requirements for the locks project, conservation measures at the locks will not increase the water supply available for municipal and industrial usage.

The potential for conflict between lock usage and municipal and industrial supply does exist. In any case where Cedar River flows are less than those required at the locks, the federal government claims a superior right to natural flow for navigation requirements. Also, a conflict would arise if the Sammamish River or other tributary in the Lake Washington basin were to be tapped for water supply.

Is there any value then to conserving water at the locks? The answer is an unequivocal "yes." In drought years, the locks' requirements can exceed water available from unregulated tributaries and the Corps' legal entitlement to Cedar River water. In that case the level of Lake Washington will drop below the normal 2-foot operating range and cause economic damage to marine industries, recreation and houseboats around Lakes Union and Washington.

Also, as lockages are made, dense saltwater passes upstream through the locks and would contaminate Lake Washington in some dry years if not flushed back into Puget Sound. Conservation measures reduce damage associated with low lake level and increase the water available for prevention of saltwater intrusion into Lake Washington.

In recent years, the Corps has improved its plans and facilities for operation in drought to include many water-saving measures. For example, new seals have been installed on the spillway gates to prevent leakage, and revised operation procedures have been developed to reduce the amount of water required to limit saltwater intrusion upstream of the locks. Studies indicate other operational and structural changes at the locks could further reduce water requirements.

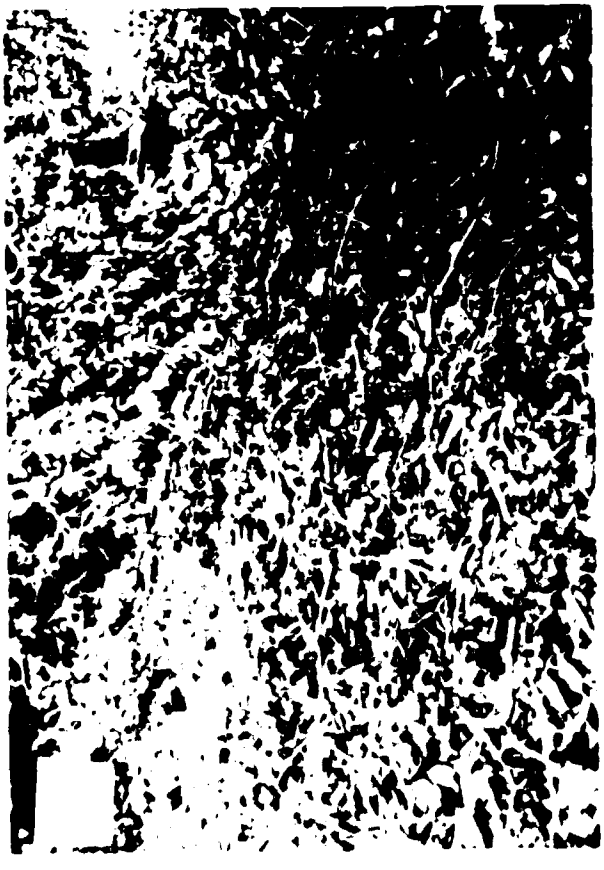
The Corps is currently assessing whether or not the benefits associated with those water savings will exceed the costs. This assessment is linked to the negotiations on Cedar River instream flow requirements. If the negotiated instream flow levels exceed flow requirement for the locks, the value of water saved is greatly diminished because it will not result in increased Cedar River water being available for municipal and industrial diversion.

To summarize, the Hiram M. Chittenden Locks project does use large quantities of water. However, so far this year and the vast majority of the time, lock usage does not diminish the quantity of water available for municipal and industrial supply, although the potential for conflict does exist.

The Corps is acutely aware of the need to conserve the water resource and has already taken actions to conserve water and has contingency plans to conserve more. In addition, we are prepared to pursue significant operational and structural changes that have potential to increase municipal and industrial supply and reduce damage associated with low lake levels and saltwater intrusion if the benefits are commensurate with the costs.

■ Larry Merkle is Chief, Hydrology & Hydraulics, U.S. Army Corps of Engineers, Seattle District.

S. Times May 14, '92 A-13



 Seattle Post Intelligencer July 9, 1983 F-12

OVERCROWDING

Vigorous activities should be banned from water's edge

Thanks for the July 4 editorial on the unsatisfactory Green Lake plan. Why the parks department director can't bite the bullet and rule out vigorous sports activities on the path is beyond understanding. Cyclists, joggers and rollerbladers are not interested in enjoyment of the park. Rather, they seek personal physical conditioning to the hazard of all others.

To compound the problem, the parks and engineering departments have learned nothing from the longstanding situation. Designs are now drawn to reproduce the conflict and congestion hazards in another location.

Even before Burlington Northern railroad has given up ownership of its property on the Queen Anne side of the Ship Canal, those city departments have applied for a shoreline permit to develop a 13-foot-wide path, not separated for most of the 1.5 miles from the Fremont to the Ballard bridges. Cyclists get 8 feet and pedestrians 5 feet, with a painted line between. Official predictions are that 70 percent of use would be by cyclists.

The shoreline master program (city ordinance and state law) has been ignored in the process. It has as primary goal the encouragement of water-dependent uses and increase of public access for purpose of viewing and using the waters. Here it makes "personal transportation services" a prohibited use. A bike path is such a prohibited service. Nonwater-dependent public facilities are a prohibited use. Again, a bike trail is not water-dependent. No examination of alternate and legal bike path possibilities has been made.

As long as anyone can remember, that narrow strip of land has been used for quiet, passive enjoyment, for strolling, picnics, watching ships and boats, by teen-agers swimming from the bank, watching and feeding birds, fishing and simply looking at the water.

P-I

Short-term solutions to crowding at Green Lake include repainting signs, changing the location of concession stands and repaving the pedestrian path.

City plans should not be made that violate shoreline law, exceed carrying capacity of the land, prejudice survival of industry and cost $1.5 million to do so.

Benella Caminiti
Seattle

Now $1.3 M

5-14-93

Green Lake conflicts

It should not have to take a body blow to Seattle's parks superintendent before something is done about the congestion at Green Lake.

Parks Superintendent Holly Miller recently fell afoul of a speeding rollerblader while she was jogging at Green Lake. Her story is remarkable only in that the sportsman in question landed a balled fist into her stomach when she asked him to slow down.

These days, an outing around Green Lake is all too likely to mean unwilling participation in a contact sport.

Green Lake's perimeter pathway is too crowded with too many people doing too many different things: walking, jogging, biking, skating, skateboarding, all on the same narrow strip of asphalt. That is too dangerous.

Something has to give here.

One suggestion is to limit specific activities to certain days of the week. Other options are to widen the path and truly separate wheeled visitors from those who are walking or running, or to ban wheeled visitors from the path entirely.

The outer rim of the park surrounding the lake already has a path that could be upgraded for cyclists, rollerbladers and skaters. The $76,000 the park department proposes to spend "studying" the options could better be used to lay a little asphalt along the path on the perimeter of the park.

also in Times editorial

TOO CROWDED

City should build cycling and skating path at Green Lake

Editor, The Times:

Bicyclists and skaters have made the walking path around Green Lake unsafe for pedestrians. In recent months, I have witnessed three accidents.

Early in the evening a few days ago, a most serious accident occurred in which a young man was struck by another man on roller blades who was speeding and skating on the wrong side of the path.

The victim was thrown off the path and into the lake 4 1/2 feet below the level of the path. As he hit the water, his upper back area hit a large piece of concrete. He screamed first with pain and then with fright when he found he could no longer voluntarily move his lower extremities. He had sustained either permanent or temporary damage to his spinal cord causing a paralysis of his lower extremities. An ambulance rushed this victim to a hospital.

In another recent accident, my wife one night was knocked over by a young man riding a bike. He was biking much faster than the speed limit (10 mph), he was on the wrong side of the path, and he was going in the wrong direction. His fourth illegal action was biking at night without a light.

Some of the danger on the path comes from the fact that very few people follow the rules. Pedestrians are supposed to stay in the inner part of the path and ambulate in the clockwise direction.

Individuals on bicycles or skates are supposed to stay on the outer part of the path and move in a counter-clockwise direction. Too often, bicyclists and skaters break all three rules at the same time by bicycling on the wrong side of the path, traveling in the wrong direction, and at excessive speeds.

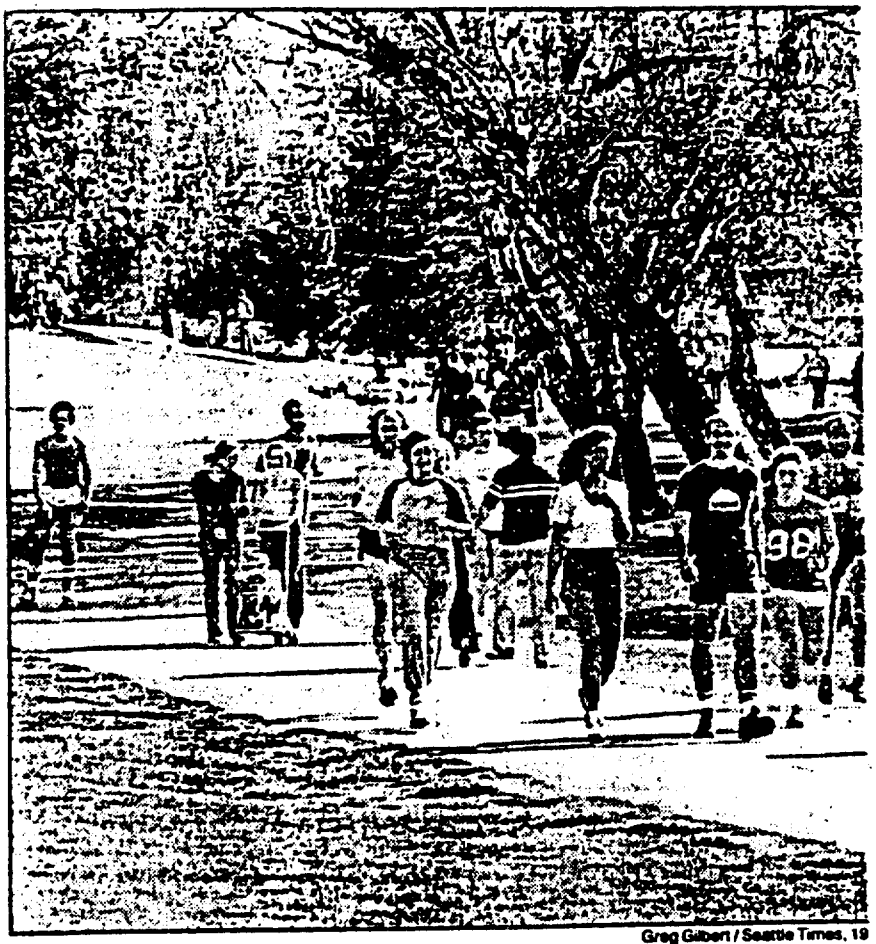
A most remarkable sign of the disregard of the posted traffic rules were the two Seattle police officers in uniform who were seen patrolling the path. Not only were they biking on the inner and wrong side of the path, they were also going in the wrong direction (clockwise)!

The only practical way to prevent accidents is to eliminate the use of the path for bicyclists and skaters. A different and separate pathway should be constructed solely for them.

The present path is too narrow to accommodate safely the large number of pedestrians, skaters and bicyclists who are attempting to use it.

The current situation is especially dangerous for vulnerable individuals such as the disabled, the very young and the elderly. Many people are not able to dodge out of the way of speeding cyclists and skaters. Unless the present dangerous situation is corrected, there will undoubtedly be more accidents.

— Theo. L. Dorpat, M.D., Seattle



Greg Gilbert / Seattle Times, 19

Skaters, joggers and strollers share the path around Green Lake with bicyclist

Keep bikes off highways

Bicyclists on public highways impede traffic. They cause accidents and many near-accidents, regularly putting car drivers in a position of peril.

They do not generally (in many cases physically cannot) practice safe driving rules of the road. Bicyclists are not required to demonstrate proof of competency and become licensed.

They are not required to carry liability insurance to protect the driving public they may cause injury to. They contribute not one iota to the cost and maintenance of public highways through user fees. A of the above is not only tolerated b encouraged because bicycling is consi ered the politically correct thing to do.

No other nonmotorized vehicles scooters, wagons, etc. – are allowed c the highways. Only an idiot would e courage the mixing of two such opposi modes of transportation as motorize and nonmotorized vehicles on the sam path at the same time.

Keep the bicyclists off the paths bui and paid for by motorists. Let th bicyclists pay for their own paths and for one, promise not to drive on them.

— Nick Shultz, Seattl

GREEN LAKE COLLISION

Speeding in-line skaters should be banned from Seattle's public parks

Editor, The Times:

Pedestrians at Green Lake, protect yourselves! In-line skaters may be dangerous to your health.

On Feb. 10, my friend and I were doing our usual Green Lake walk. A fast skater was noticed at the east side of the lake. A comment was then made in regard to his intense speed.

Approximately 20 minutes later, I was knocked down by this same racer. He was wearing elbow pads, knee pads and a helmet. I, as a walker, walking in the assigned lane, had NO protection. This 6-foot, 4-inch, 30ish skater, who was racing, changed lanes and collided head-on into me. He could have chosen the dirt on one side or the grass on the other side. Instead, he chose to speed between two walkers.

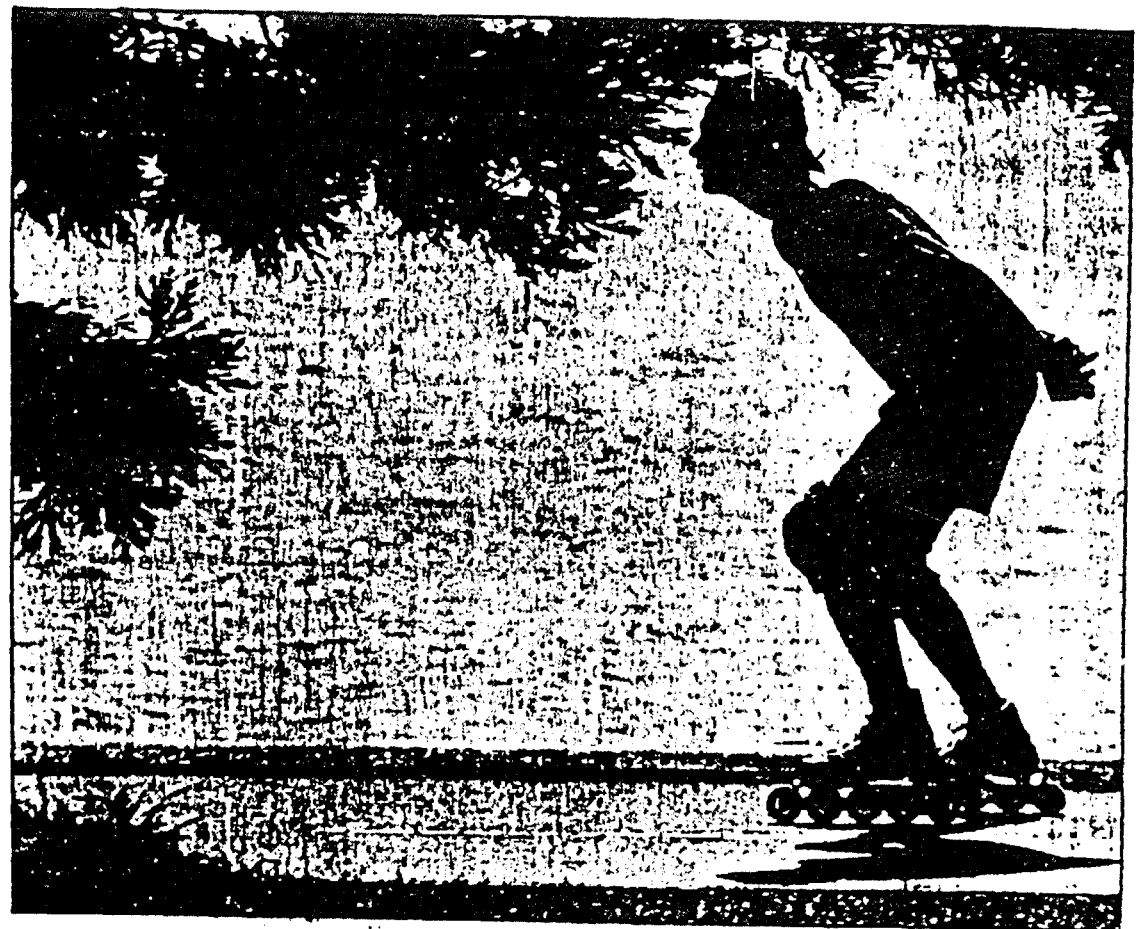
Needless to say, this aggressive person never apologized, never assisted me up from the sidewalk and never inquired about any possible injuries.

That evening was spent in an emergency room. Consultations were given and X-rays taken. All hospital personnel commented on the increased accidents caused by in-line skaters.

I was fortunate! First of all, all my teeth were intact. My right eye was swollen shut, my face was swollen and scratched, my forehead had a huge bump, both my arms were stiff and sore, my hands had cuts and abrasions, and my left wrist was immobilized due to the possibility of a hairline fracture.

I was forced to miss two days of work due to medical procedures administered to my face.

It has now been over two weeks since I was accosted by this skater. My face still remains discolored from all the bruising, the headaches have ceased, the aches and pains have subsided and my left wrist is better.



Benjamin Benschneider / Seattle Times, 1990

An in-line skater glides along the path around Green Lake in Seattle.

Now my concern is for the youngsters, the youth and the elderly who stroll around that lake. No one will be safe as long as in-line skaters are allowed to continue.

It is my wish that in-line skaters be banned from public parks for the sake of innocent walkers.

— Ellen Johanson, Seattle

South Slide

A moment of peace and wonder

ROBERT DE GIULIO/P-I

At another time in history, it might have been a band of intrepid explorers navigating some unknown, uncharted canal leading into dark waters, or an Indian canoe gliding swiftly down a river toward the tribal village. Quiet and solitude and wonder remain in urban Seattle, though few images contrast man and nature as vividly as a small sailboat moving alone between the majestic trees on the banks of the Lake Washington Ship Canal.

Plan to help folks navigate paths at Green Lake

by Helen E. Jung
Times staff reporter

You may need a traffic cop these days to navigate the paths at Green Lake, which seem to have become the scene of one big moving violation.

Skaters weave between bikers, who veer around joggers, who plow by strollers. And the pedestrians? They're busy dodging everyone.

Nine accidents at Green Lake were reported to the Seattle Parks and Recreation Department in 1992 – an increase of five over the previous year. Others have been reported in newspaper articles and letters. Many more are not reported at all, parks officials said.

To quell the war between the wheelers and the walkers, the Parks Department has outlined a two-part plan that was approved yesterday by the City Council's parks committee.

First, the department will identify short-term options, – mainly scheduling restrictions and other nonconstruction methods – to help prevent accidents this summer.

The second part calls for forming a committee to identify long-term solutions that may include capital expenditures such as paving pathways.

The process is estimated to cost $24,000.

Times 6-4-3

Rec'd 1-6-93
12:15 p.m.
Robert Lee
DCLU

Seattle Shorelines Coalition

JUNE 30, 1993

c/o 4207 BAGLEY AVENUE NORTH, SEATTLE, WASHINGTON 98103 632-6076

Ms Carol Proud, Permit Examiner
Department of Construction & Land Use of
Seattle WA 710 Second Ave, Suite 700
Seattle, WA 98104 - 1703

PERMIT APPLICATION # 9302336

by Seattle Engineering Dept &
Dept of Parks & Recreation

REQUEST DENIAL OF PERMIT FOR BIKE TRAIL, SHIP CANAL, SOUTH SIDE

Dear Ms Proud,

The Coalition requests denial of this Shoreline development permit on the basis of its multiple violations of the Shoreline Master Program (SMP), the implementation guidelines, the Land Use Code, and SEPA. Further, it presents particular threats to public safety and unique problems related to the SMP which have not been considered. Explanations are here listed, and on following pages.

Despite being incidentally noted as a "pedestrian/bicycle path" the formal name of the project is "BIKE TRAIL", even recognized as such in newspaper account title (Queen Anne News front page headline, May 19, enclosed). Use by pedestrians is tertiary at best.

Coalition Board members have NO aversion to bike paths or biking in the areas suitable for their use or installation; the property on this area which the City expects to acquire is NOT suitable for biking use, and the assorted other high-speed sports as roller skating, roller-blading, skateboarding which would result.

We especially direct your attention to the SMP 23.60.606 G & .848 G which states that PUBLIC FACILITIES WHICH ARE NON-WATER-DEPENDENT ARE A PROHIBITED (US/UI) USE. A bike trail is non-water-dependent, non-water-related. Public access to shorelines IS permitted use for purpose of views of waters. BIKING IS NOT WATER DEPENDENT: on the contrary, it poses particular hazard where bikers are viewing waters while engaged in that sport.

Despite that Queen Anne District of this City has bodies of water on three sides (Lake Union, Elliott Bay, Ship Canal), almost NONE of it has any public access. The shores are dedicated by major railroad lines, multiple industrial and maritime uses, residential (house boat & house barges), restaurents, office buildings, boat sales yards, boat repair yards, boat storage yards (often covered), various retail stores, etc.

Only the SHIP CANAL in the project area, and only a portion of the First Phase Easterly of 3rd Ave West offers any area for public access with unobstructed sight of water. In the implementation of the State Shoreline Management Act, of which the SMP is state law, the public's opportunity to enjoy the physical and aesthetic qualities of the shorelines is a high priority.

Purpose of the permit application is given as "to establish the use for future construction of a 13 ft wide pedestrian/bicycle path along the south side of the Lake Washington Ship Canal from 11th Ave West to the Fremont Bridge." The total distance of this FIRST PHASE is about 1.5 miles. For greater majority of length there is NO SEPARATION of bikers from pedestrians We will remark especially on that portion of the path from 3rd Ave West to the Fremont Bridge. The Shoreline overlay zoning is URBAN STABLE for the width area 200 feet from the water. Here the U.S. Corps of Engineers has a bulkhead in the bank, owning 15 feet distance property from the water; On this there are 35 large Lombardy poplar trees, which utilize that 15 feet of bank, as well as a variety of other trees and overgrown shrubs and bushes in easterly portion. Pedestrian use of the Corps property is impossible.

1, VIOLATION OF SMP AND IMPLEMENTATION GUIDELINES: DESIGN INCOMPATIBLE

URBAN STABLE

SMP 23.60.606 B-11 — Personal transportation services are a prohibited use. A Bike Trail is a personal transportation service, hence prohibited.

SMP 23.60.606 G — Non-water-dependent public facilities are prohibited use. Bike trail is not water dependent.

SMP 23.60.002 B-2, 3, 4. — Purposes & Policies:
2. Encourage water-dependent uses:
3. Provide for maximum public use and enjoyment of the shorelines of the City: and
4. Preserve, enhance and increase views of the water and access to the water.*

*In this regard the Bike path will inhibit access. Pedestrians will be obliged to cross the bike path to gain access, an impediment to comfortable and safe access.

Generally, under the present design, all aspects of .002 will be derogated.

SMP 23.60.152 F — General Development: All shoreline developments and uses shall utilize permeable surfacing where practicable to minimize water accumulation and runoff. (emphasis add

50% of the 30 ft right-of-way to be obtained from the railway would be impervious asphalt to provide for bike path.
Despite that the Engineering Dept has remarked upon it in their papers, this is excessive and unnecessary amoun of impermeable surface.

SMP 23.60.066 A-1 & B-1 — Requirements for a permit include examination as to whether a search has been made for reasonable or feasible alternative to shoreline use. There is NO SHOWING by the applicant that alternatives have been sought or examined for bike path, despite that there are such. Bike paths are feasible on Nickerson St, or its sidewalks, since sidewalk biking is permitted. Nickerson street is a 6 lane arterial, with two of the lanes used for parking . Dexter Ave North is example of alternative design possible for bike path.

1. VIOLATIONS OF SMP - continued

SMP 23.60.160 & 23.60.934		We recognize that .160 permits a bikeway as a form of "REGULATED PUBLIC ACCESS. However, this can not be claime for public facilities. "Regulated" as defined at .934 means "provision to the public by an owner, by easement, covenant or similar agreement. (i.e. by private property owner)
SMP 23.60.152	H	This paragraph requires developments and uses to "avoid disturbance, minimize adverse impacts and protect fish and wildlife habitat conservation areas. There is a moderately large population of Canada geese and various species of ducks resident on the Ship Canal her They are especially numerous in the Seattle Pacific University portion (SPU). Habitually, they walk from the shoreside to Wallace Field where they feed and rest. To do so they cross the railroad tracks by walking in flocks. Presently pedestrians halt to allow their passage. Given the speed of bicylists,the liklihood exists for bike-bird collisions, with hazard for each. Alternatively, if the birds are frightened by bikes they will be forced to fly. This amounts to harassment of animals, a violation also of the City Park Code.
SEPA ENVIRONMENTAL CHECKLIST Page 6 Needs Correction		(5) Animals. It may be appropriate here to note that the Checklist is defective by failure of noting a most conspicuous BIRD POPULATION which uses the Ship Canal and the Lombardy poplar trees thru eight months of the year. CORMORANTS in a colony of 400 birds approx. roost in the trees from October to May, settling in the late afternoon. Since the trees are deciduous these large birds are individually conspicuous, providing a uniquely close view of them, and a spectacle rarely seen in any urban area. They will not (do not) use any other species of tree. Nor do they use North Canal Side trees - ever.
IMPLEMENTATION GUIDELINES TO RESOLUTION 27618 OF SMP	F-3	Water-depedent recreation: "Recreation on waterfront lots including public parks should either depend on the use of water or relate to the enjoyment of views of the water." A bike path is a transportation means which does not depend on use or enjoyment of water. A bicyclist viewing water is a safety hazard to him/herself and others. Biking requires that one watch the path, other bikers, and nearby pedestrians to avoid collisions.

2. DEROGATION OF LONG-ESTABLISHED USE AND NATURE OF A RARE PROPERTY

For at least 30 years this Ship Canal area has been used as a pedestrian pathway, serving passive recreation. It was such in 1964 when there was a cement-block- making factory and a lumber yard there, long-since gone. Burlington Northern has tolerated such use of its property.

Such quiet uses would be overwhelmed by the 70% bicyclist use predicted by

2. Continued.

representative of the Engineering Dept. The quiet and safety long enjoyed would be lost to wheeled vehicles of various types as dominating.

The situation on Green Lake would be replicated. As long ago as the 1970's the conflicts of multiple uses were noted by the Park Dept and the "solution" which was no solution has been subject of a very many letters to the Editor regarding the accidents and general unpleasantness resulting.

Again, the Parks & Recreation Dept has "decided on some short-term solutions to ease over-crowded and dangerous conditions on the path around Green Lake - (Seattle Times, June 26, 93).

The Post Intelligencer cartoon of recent week offers one solution to this problem of multiple uses where the shoreline geography makes these competing uses irrational. (enclosed)

3. PREMATURITY OF THE PERMIT APPLICATION: LAND USE CODE 23.76.010 A.

The City does not own the property for which the SMP permit and federal grant funds are requested. The Burlington Northern Railway Co. has NOT abandoned and NO DATE is known when it may do so.
Can an SMP permit be granted where there is NO ownership ?

The Land Use Code is not clear on this issue. Please provide the statute, ordinance or regulation which would allow a municipality to obtain permits for establishing a use on privately owned property.

We believe that the motive for the urgency is a function of processing the paper work to qualify for federal grant of $1 million through Intermodal Surface Transportation Efficiency Act (ISTEA) grant. Design work has to be completed by this fall to qualify.

Thus, the niceties of property ownership and conflict with SMP provisions came to be overlooked or ignored.

4. FEDERAL ISTEA GRANT IS EXCESSIVE: <u>TRIPLES</u> COSTS PRESENTED TO VOTERS FOR OPEN SPACE BONDS ON PROJECT.

Present cost for PHASE I only is shown as $1,500,000. In May of 1989 acquisition and development costs were shown as a total of $676,000. ($380,000 & 296,000) (page enclosed) (For phases I & II)

No statement has been made to why the costs increased or if private property other than the Burlington Northern's will need to be purchased. The public assumption is that the BN property in a 30 ft strip will be free . What other BN property must be acquired by purchased is not known or shown to the public.

Without having read the text of the ISTEA grant provisions we can not know the extent to which these are provided for strictly RECREATIONAL USES, as the primary function of a project. The grant must have expectation that the project will serve as a COMMUTER BIKEWAY, which of course has no relation to water-dependency.
WAS THE FEDERAL DEPT OF TRANSPORTATION INFORMED OF REQUIREMENTS OF SMP ?

4. Continued. Were this project for recreational use application for grants could have been made to a variety of State or Federal agencies responsible for outdoor recreation, not to the Federal DOT.

We understand that this monetary costs question (4.) is outside the range of the Shoreline Master Program. However this is the only location where it can logically be raised in relation to the SMP.

We believe that the Project in Phases is a COMMUTER BIKEWAY and as such violates the policies and regulations of the Shcreline Management Act as well as the local program, the Master Program. It violates voters intent in passage of Open Space Bond Issue.

5. RAILBANKING (GRANDFATHERING) OF RAILROAD EQUALS RETENTION OF UPLANDS AND WATERFRONT DESIGNATIONS IN SHORELINE AND PROBLEMS THEREOF NOT ADDRESSED

SMP 23.60.924 L. Definitions of LOT, WATERFRONT and LOT, UPLAND

SMP 23,60.608 Permitted uses on UPLAND LOTS IN THE URBAN STABLE ENVIRONMENT

We understand the Rails-to-Trails legislation and various federal courts'decision which have upheld the need to retain railway rights-of-way (transportation corridors) for the indefinite future. We know of the Congressional acts which provoked the courts'decisions. The goal has been to protect any future need for these rail lines while allowing public uses in the interim.

Legally, in our belief, the fundamental nature of the railroad right-of-way would continue to exist, regardless of uses that might be developed in the interim. However ghostly it would be, the railroad right-of-way would be sufficient to retain the split of the shoreline into the "UPLANDS" and the "WATERFRONT" divisions, and standards for each with permitted and prohibited uses would continue to apply. No real "vacation" of RR would have taken place.

The UPLANDS designation provides for much greater scale of development* and use types. This makes it much more valuable to the private owners, hence more costly to purchase should that be necessary for the Ship Canal project.

One possibility is that the Seattle Pacific University could then build a new campus building on WALLACE FIELD, the only remaining "open space" on the uplands in that area. Almost all of the rest of the distance from the Fremont Bridge to 3rd Ave West is the site of 3 or 4 story office buildings. Another building would increase the shadows - darkness and cold - that now prevails thru much of the year. When SPUniversity locates area for regulation size soccer field Wallace Field will be superfluous to its needs. The Map enclosed titled "WALLACE FIELD DEVELOPMENT PLAN" may aid in understanding the situation. Further explanation is in the Letter to Editor of Queen Anne News of Oct. 4, 1991,the Coalition's successful work to prevent intended soccer field expansion and loss of future public park area.

The uplands/waterfront and higher costs for purchase if needed of uplands property, nor indeed, the Shorelines Program as it applies to all facets of Phase I and Phase II has not been addressed or studied by the applicant City Departments. Clarification and examination must be done prior to any permit granted.

* As 100% lot coverage in both US and UI (urban industrial) zones (and on BOTH Waterfront and Uplands lots in U.I. zone.

INDUSTRIAL NEEDS/NECESSITIES

6. SHORELAND FROM 3rd AVE WEST TO 11th AVE WEST of PHASE ONE and all of PHASE II CARRIES SMP OVERLAY ZONING OF UI, THE URBAN INDUSTRIAL .

SMP 23.60.840 H and 23.60.848 G : Each carries the same provision as that which we met with Urban Stable, that "Public facilities" must be water-dependent or water-related.

We repeat that a Bike Trail is neither, hence prohibited by .848 G.

SMP 23.60.932 "P" defines a "PUBLIC FACILITY" as "a facility owned, operated or franchised by a unit of general or special purpose government for public purpose."

Attachment A to Resolution 27618, Implementation Guidelines A.3, SHORELINE USES remarks on Page 6. :

The Ship Canal from Chittenden Locks to the Fremont Bridge - "to retain and encourage the important role that the Ship Canal plays in state, regional and local fisheries by reserving the Ship Canal primarily for water-dependent and water-related uses."

This is a simplistic and limited version of the maritime uses that the UI area is meant to protect. The Foss Maritime Company, for instance, is located here, is as old as the state (1889), serves mainly Alaska with tug and barge service, and sends these to jobs around the world, operating the largest and most modern fleet of tugs on the West Coast. Foss's operation in the Westerly area of Phase I are major feature of Ewing Street, MANY BLOCKS IN LENGTH.

Foss has a large number of employees who work in shifts. Parking lots are on Foss property. It is likely that recreational bikers will use Foss lots on which to park cars, load and unload their bikes, creating further congestion and hazard.@ Foss is served by its own fleet of vehicles, and needs a great number of truck deliveries per day. All will be severely impacted by volumes of bikers - who frequently expect all cars and trucks to be able to stop for their passage.

The City has, by its own actions, driven commercial maritime businesses from Lake Union. These businesses relocated to other cities or went out of business. The City has, additionally, permitted squatter residential house barges to invade UI Canal & UM*zones by converting their illegal status to "legal" by amendment of the Master Program in past year. (* Urban maritime , Lake Union)

The Phase I and II lengths of the Ship Canal offer another great advantage to maritime industrial uses. Here they can operate efficiently and economically on their own property, escaping the costly demands for use of Port of Seattle property.

Those actions of the City which are deleterious to function of these businesses - as a Bike Path - will damage the City's economic viability, at a time and in the future when it is most in difficulty.

A simple pedestrian path (here sidewalks do not now exist) would provide reasonable public access without this impact. Only a very few strollers ever walk west of 3rd ave West now ; should they use this UI area in future they are better able to stop and allow ease of truck crossing.

@ On-street parking hardly exists here; what there is would block access to businesses if used. Seattle Pacific University students' parking dominates all on-street parking westerly and on Nickerson Street.

The representative of the Engineering Dept agreed that wholly pedestrian use is feasible. (Meeting of Queen Anne Community Council Land Use Review Committee, June 24, 93.)

WE AGREE and here list our reasons.

PEDESTRIAN USE ONLY WOULD:

1. Comply with law, esp Shoreline Master Program, while Bike Trail does not.

2. Protect and preserve a rare and valuable shoreline park in Queen Anne district where parks of any kind are exceedingly scarce, while permitting use and enjoyment for all City residents & all age persons.

3. Preserve the quiet, passive nature of the shoreline from high-speed and high degree of athletic sport activity where it does not and has not existed.

4. Promote public safety, the avoidance of collisions and hazard which now occur and exist where biker/pedestrian mixed use projects have been developed on inadequate land base.

5. Promote outdoor recreation: See Report & Recommendations to the President of the United States; President's Commission on Americans Outdoors. December 1986. Table 2, page 26.

   Rank Order of Adult Participation 1 or more times Past Year: Of 32 forms <u>Walking for pleasure</u> ranks highest of all forms of outdoor recreation:

   with 84% of those interviewd participating sometimes/often/very often.

   "Natural beauty is the most important criteria in choosing park & recreation areas -- " (page 24.)

6. Be more economical to develop: no need for asphalt surfaces, avoid standing water problems, avoid possible necessity to purchase private property. Could probably be developed with OPEN SPACE BONDS ONI

7. Be developed more expeditiously, sooner usable over current use.

8. Keep interference with maritime business and industry minimal or reasonable level, west of 3rd ave West .

9. Satisfy Rail-to-Trail statutes, should the need exist.

The Seattle Shorelines Coalition is a City-wide organization comprised of individuals, community representatives, and marine business members. This offers assurance that our objections and proposed alternative do not rise from NIMBYISM.

We ask your careful examination of our concerns and denial of present SMP application. Thank you and please advise us of your decision.

Very truly yours,

Benella Caminiti

Ms Benella Caminiti for
Coalition Board of Trustees

CC: Mr. Rod Mack, DOE

Attached pages - six.

ATTACHMENT 2.

SEATTLE POST INTELLIGENCER June 25, 1993, page F2

Short-term solutions for Green Lake

By Eric Houston
P-I Reporter

Responding to a flood of complaints that the path circling Green Lake has become unsafe, the Seattle Parks Board yesterday approved steps aimed at easing congestion.

Six recommendations – which include repainting signs and improving a separate jogging-path surface – were developed after a public hearing earlier this week.

"The problems out there are created largely by overcrowding," said Tom Byers, a consultant for the Seattle Parks and Recreation Department.

Byers said the six recommendations are short-term solutions designed to improve safety this summer along the scenic path that is a favorite spot for bicyclists, skaters, joggers and walkers.

Byers said the long-term plan calls for building separate lanes for pedestrians and park users on skates or bicycles.

Parks Superintendent Holly Miller said she will implement the recommendations as soon as possible.

The recommendations approved by the Parks Board include:

- Clarifying the existing "courtesy code" and related signage to show that pedestrians can travel both ways on the inner path.
- Upgrading the surface of the jogging path and repainting lines that divide the path.
- Changing the location of concession stands to reduce congestion on the path.
- Expanding the city's Saturday and Sunday bicycle program to make portions of the streets throughout the city available for recreation.
- Setting a speed limit on the path.

SEATTLE TIMES. JUNE 26, 1993, Page A-10

Solutions for Green Lake path

BY HELEN E. JUNG
Seattle Times staff reporter

The Seattle Parks and Recreation Department has decided on some short-term solutions to ease overcrowded and dangerous conditions on the path around Green Lake, but don't expect to see them any time soon.

Some may take more than a month to implement. Among them:

- Clarifying the courtesy code of path use – that pedestrians can walk in either direction on their own side, while wheeled users must travel in one direction.
- Posting more signs with clearer symbols and fewer words that outline the rules.
- Repainting the center line that divides the pedestrian lane from the biking and skating lane.
- Improving the gravel path closest to the lake, which many joggers use.
- Moving concession stands to ease congestion.
- Expanding the Bicycle Saturday and Sunday program, which limits city roads specifically to bikers.
- Seeking an ordinance to establish a path speed limit that can be enforced by police patrolling the path.

In addition, a Parks Department task force will study long-term options.

ATTACHMENT 3

Post-Intelligencer

The voice of the Northwest since 1863

June 26, 1993

Publisher: Virgil Fassio
Executive Editor: J.D. Alexander
Editorial Page Editor: Charles J. Dunsire
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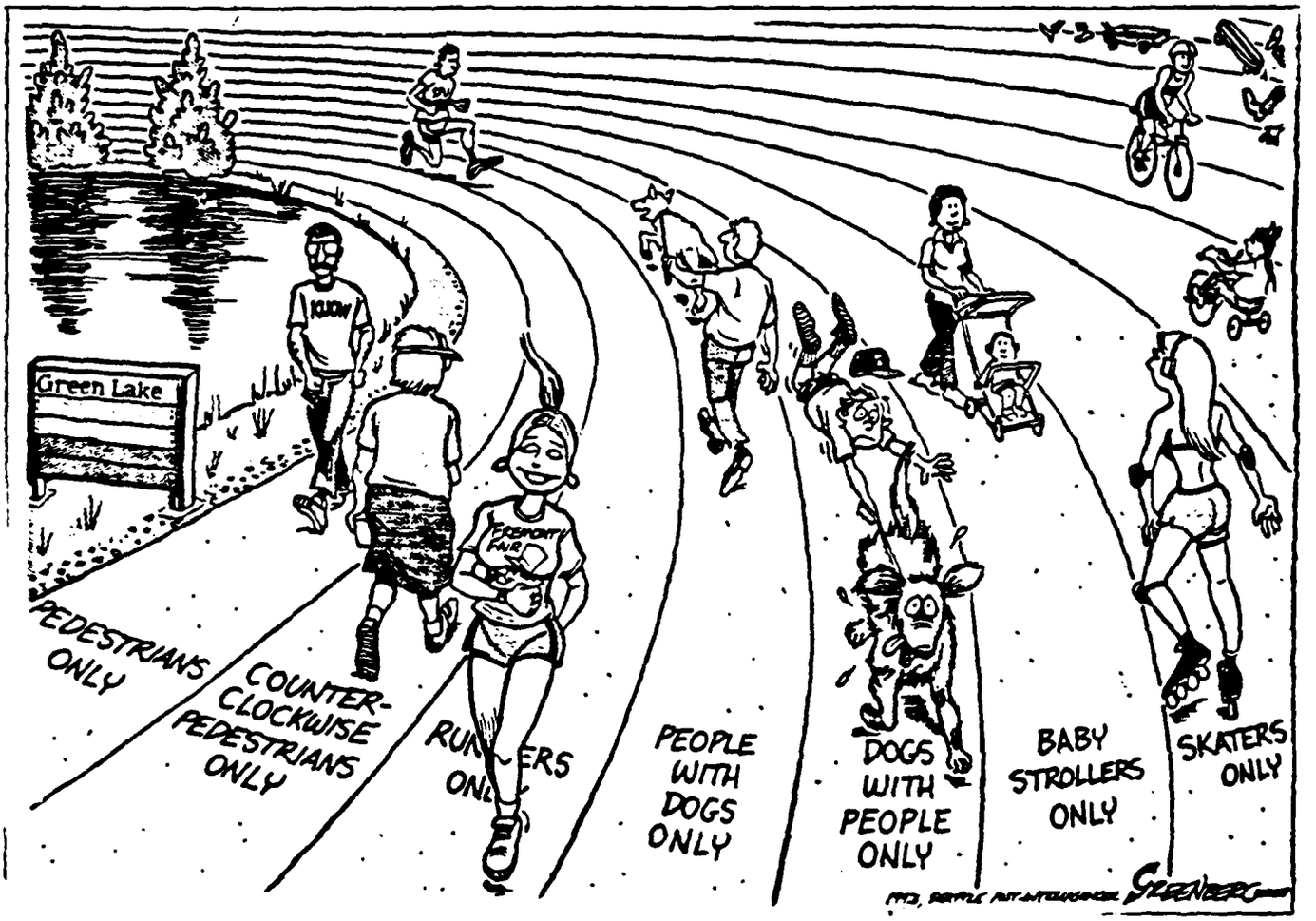


Source Seattle Dept Parks + Recreation

Coalition Attachment 4.

T R A I L S
Draft Open Space - Recommendation
May 31, 1989

ASSUMPTIONS

- Trail section is part of a regional system that connects to the county.
- Trail section can be built within five years.
- Trail section will receive substantial use.
- Trail section is not internal to a park.
- Trail section provides direct access to water or connects public access points.

	Acquisition Cost	Development Cost
Burke-Gilman Extension		
Gas Works Park (Densmore Ave N) to 2nd Ave NW.		$ 1,244,800.
2nd Ave NW to NW 45th St.	$ 39,000.	$ 770,800.
Burke-Gilman (completion of acquisition to Golden Gardens).	$ 520,000.	
Lake Union/Ship Canal		
Fisherman's Terminal to Nickerson (13th Ave W to 21st Ave W).	$ 70,500.	$ 557,300.
Fremont Bridge to Ballard Bridge (completion of acquisition).	$ 380,000.	
~~Dexter (Halladay to Westlake)~~		~~$ 386,800.~~ *
SE Lake Union, Fairview to W Galer St.		$ 259,100.
Fremont Bridge to 3rd Ave W (south side of canal).		$ 296,000.
Interbay		
Elliot Bay Park to W Galer St.		$ 368,700.
~~Gilman (30th Ave W to Thorndyke Ave W)~~		~~$ 109,200.~~ *
Duwamish		
Harbor Ave Link (SW Florida to 26th Ave SW)		$ 925,500.
Catholic Hill Link		$ 138,900.
Dakota Public Access Spar (to Port Public Access Park).	$ 36,000.	$ 12,000.
Duwamish Trail (SW Bronson Way to SW Michigan St).		$ 150,000.
SUB-TOTALS	$ 1,045,500.	$ 4,723,100.
TOTALS		$ 5,768,600.

TOTAL MILES 8.3

* These projects will be accomplished with other transportation improvement funds over the next ~~three~~ 5 years. Any savings accomplished in the listed projects may be applied to these projects.

ATTACHMENT 5

A1

Letters to the editor

Regrettable

Thank you for the editorial of September 25 endorsing the need of a shoreline public park on the Queen Anne ship canal. As you noted, Burlington Northern has announced its intent to vacate its right-of-way and *The Seattle Times* reported (September 24, C-3) that the Seattle City Council approved of its purchase for an amount of $710,000 for park development.

It is truly regrettable that Dr. Curtis Martin, new CEO of Seattle Pacific University, should wish a second look by the community and the powers-that-be for soccer field expansion.

He has not been properly advised as to the pertinent land-use code, the Seattle Shorelines Master Program (SSMP) which made the university's proposed use in error from its beginning. But then the city Department of Construction and Land Use and the city Hearing Examiner also chose to ignore or amputate it. It was left to the Seattle Shorelines Coalition to bring the illegalities of the proposed use to the attention of the city council.

Since the details have not been given to the public heretofore, they can now be explained. The SSMP is not merely city zoning, it is STATE LAW, the city's development of the Shorelines Management Act. The 200-foot boundary line of the act runs diagonally across the center of the existing soccer field, and all this falls into the SSMP designation of being an "urban stable" environment.

Another division of the 200-foot dimension is made by the railway right-of-way, with that which is waterward being termed a "waterfront" area. One need only look at the SSMP, Section 23.60.606-H to find that non-water-dependent institutional uses are prohibited on waterfront lots in the urban stable environment.

There is yet another proviso in the definition of a "lot, waterfront" at 23.60.924 - L. It states: "Vacation or relocation of a legal right of way after March 17, 1977, shall convert a lot which was an upland lot (such as that one-half of the soccer field) because of the existence of such right-of-way into a waterfront lot."

In opposing the expansion of the soccer field, the coalition was content that it should be grandfathered in as a non-conforming use, despite being now in a waterfront lot and prohibited use when B.N. vacated its property. The coalition agreed to retention of the soccer field's existing boundary.

The coalition is well aware that attempts will be made to change the city's ordinance. The threat to do so was made at the Hearing Examiner hearing when the provisions of the SSMP were first brought forth. The university must know that such a change would demand approval by the State Department of Ecology and, if necessary, by the State Shorelines Hearings Board and courts.

This year is the 20th anniversary of the Shorelines Management Act and it will be celebrated by a symposium on December 13 and 14 in Everett. Thanks to the vigilance of the Seattle Shorelines Coalition members, we will now be able to celebrate it with a beautiful new park on the ship canal, which will enhance Seattle Pacific University and the waterfront for everyone.

Benella Caminiti
Queen Anne

Letters policy

Letters to the editor should be limited to 250 words in length, typed and double spaced. Please include a phone number (for verification, not for publication). Send letters to: Editor, 225 West Galer St., Seattle 98119.

seattle SHORELINE MASTER PROGRAM DEFINITIONS

RE UPLANDS AND WATERFRONT LOTS

23.60.924 "L."

"Lot, waterfront" means a lot any portion of which is offshore of or abuts upon the ordinary high water mark or mean high water mark and any other lot or parcel partially or entirely within the Shoreline District which is not separated as of March 17, 1977, from the water by a street, arterial, highway, railroad right-of-way, or government-owned or controlled property which prevents access to and use of the water. Vacation or relocation of a legal right-of-way after March 17, 1977, shall convert a lot which was an upland lot because of the existence of such right-of-way into a waterfront lot.

For purposes of determining the appropriate use and development standards applicable to developments in railroad or street rights-of-way, the railroad or street right-of-way shall be considered to be a waterfront lot unless separated from the water by another railroad or street right-of-way.

(Ord. 113466 § 2(part), 1987.)

"Lot, upland" means a lot wholly or partly within the shoreline district which is separated as of March 17, 1977, from the water by a street, arterial, highway, railroad right-of-way or government-controlled property which prevents access to and use of the water.

"Lot, upland through" an upland lot wholly or partly within the Shoreline District which extends between a street, highway, or arterial right-of-way on the upland side and a street, highway, arterial, railway right-of-way, or government-controlled property on the waterfront side.

P.I. July 4 1993 page E-2

The Green Lake plan

The Seattle Parks Board's temporary solutions to ease the crowding on the paved path around Green Lake are just that — temporary.

It is a good idea to clarify the courtesy code that supposedly governs use of the path and to repaint the fading lines that divide it. So is improved signage to remind pedestrians they may travel in both directions on the inner section of the path.

Setting a speed limit — if it's enforced — and changing locations of concession stands may also help, as will expansion of the Sunday bicycle program to make more city streets available for cyclists.

But nothing short of building a new path is going to solve the safety problem at Green Lake.

That is the only way to separate pedestrians and runners from people who enjoy the lake on wheels. As matters now stand, traveling the pathway around Green Lake is a frustrating, frazzling experience for everyone who wants to use it, rather than a pleasant one.

So we're heartened to learn that the board's long-term plan calls for building separate lanes.

The sooner the better.

Times

BEWARE BICYCLISTS 7.19.91

Pedestrians aren't safe on paths at Green Lake

Editor, The Times:

From head to toe, I ache! It's difficult to move. On a recent evening I was injured at Green Lake. I was walking in the pedestrian lane when a young woman on a bicycle crashed into me from behind. The impact sent me sailing into the air.

I landed on my back, my head slammed onto the pavement. Stunned, I lay there while onlookers asked if someone should call 911. I was able to get up. Bruised, with a huge lump on my head, I drove home and called a friend to take me to the hospital. I was lucky. Although it hurts to move, even to laugh, I will recover.

Pedestrians are not safe at Green Lake. Bicyclists ride wherever they please, often racing and swerving around walkers. Many runners and roller skaters forcefully bump into walkers.

That evening I was concerned about the number of bikes on the path. Although I have a bicycle, I would never ride at Green Lake. What fun is it to ride in a crowd? That evening, I saw elderly folks out for a stroll, people in wheelchairs, children playing, babies in carriages, young people enjoying the warm evening. None of them was safe.

Businesses that rent bicycles and skates may object to restrictions. Organized running groups may consider recreational walkers a nuisance.

Will the bicyclists, skaters and runners continue to present obstacles and dangers to walkers? Will it take a tragic death before measures are taken to assure the safety and well-being of all?

The Seattle Parks Department must consider the dangers at Green Lake and take action now.

– Jean Lidin, Seattle

Times file

The paths of bicyclists and pedestrians don't always run smoothly at Green Lake Park.

SEATTLE PACIFIC CREDIT UNION
Serving the Christian family since 1967

2 Nickerson Street
Suite 102
Seattle, WA 98109
(206) 282-7201

AUG 30 1993

August 27, 1993

Derek Chow
(EN-PL PF)
US Army Corps of Engineers
4735 East Marginal Way South
Seattle, WA 98134-2385

Dear Mr. Chow:

I just learned some very disturbing news: the Army Corps of Engineers intends to chop down all of the poplar trees that line the ship canal. Our office is on the canal side of the Violett Building and we have become very fond of viewing the trees daily. I enjoy walking along the canal and seeing the eagles perched in the top of the poplar trees in the fall.

The trees are the most charming feature of the canal. Why must they all be cut down? I would agree that a diseased and dying tree should be selectively cut. However it should not be necessary to murder all of the trees.

Is the Army Corps of Engineers willing to purchase shades for the windows of our office if the trees are cut? In the early spring, my staff frequently get headaches from the glare off the water until the leaves come out on our poplar trees. Many neighboring offices would probably have similar concerns.

I would be glad to discuss this matter further. I can be reached at 282-7201.

Thank you for your thoughtful consideration of the content of this letter.

Sincerely,

Susan Siverson

Susan Siverson
President

CENPS-EN-PL-PF (1105-2-10c) 28 Dec 93

MEMORANDUM FOR Record

SUBJECT: 20 Dec 93 Public Meeting, Lake Washington Ship Canal Project Master Plan

1. On 20 Dec 93 the LWSC Master Plan public meeting was conducted at the Ballard Community Center from 1700 to 1815 hours. Enclosure 1 is the list of attendees. Representatives of the Seattle District were Dawn Wiedmeier (LWSC Project Office), Jeff White (Natural Resources Section), Pam Yorozu (Civil Design Section), Horace Foxall (Architectural Section), Steve Hanson (Real Estate Management and Disposal Branch), John Welch (LWSC Project Office), and Derek Chow (Plan Formulation Section).

2. The purpose of the public meeting was to present the content of the master plan (see enclosure 2 for agenda). In addition to the items listed on the agenda, the following questions and comments were discussed:

a. In 1978 the Lake Washington Ship Canal Project was placed on the National Register of Historic Places. Historic district requirements place strict standards on project rehabilitation. Much of the necessary rehabilitation work is complete. The control tower, constructed prior to acceptance on the National Register of Historic Places, will be modified aesthetically to match other lock structures.

b. Can the Corps do something about Hiram's at the Locks patrons using the public parking lot? (Question asked prior to the meeting.) Response: Under the current arrangement between the BNRR and city, the Corps can not prohibit Hiram's patrons from parking in the public parking lot. The public parking lot property is owned by the BNRR and leased to the City of Seattle. It is, however, a desire of the Corps to either obtain the property in fee or take on the management of the parking lot as reflected in the Master Plan's proposed development section.

c. Can the walkways over the lock gates be widened to accommodate wheeled (bicycle, stroller, wheelchair, etc.) traffic in both directions? Response: Widening of the walkways has been evaluated and it was determined that widening the walkways is not possible without impacting lock operations. There is no available space in the locks that could accommodate a widened walkway; any widening of the walkways would encroach into the locks. Additionally, portions of a widened walkway protruding over the lock walls would pose hazards for project personnel. The stringent historic district requirements also place constraints on our ability to modify historic structures. The American Disabilities Act (ADA) standards require modification of facilities only to the extent practical but require an acceptable alternative.

d. Swimming should be allowed in the canal. Swimming can be considered a form of navigation. Can the areas under the Fremont Bridge (protected by timber piles) be developed for swimming or as a wildlife sanctuary? Response: Swimming in the canal is prohibited by city ordinance and possibility US Coast Guard rules. Swimming activities in the canal places persons' lives at risk with commercial and recreational boat traffic. It is not feasible to develop swimming areas within the canal. National standards for swimmer safety require large protected areas not afforded by the narrow canal. The purpose of the canal is navigation. In this case, swimming is not a form of navigation. The area under the bridge has limited wildlife use, largely due to the location of the canal in a highly urbanized area.

e. Fees should be collected for lockages. Response: (This comment was partially addressed by a gentleman in the audience.) Currently the law prohibits collecting fees for lockages. We anticipate political resistance to passing a law requiring fees for lockages. Problems arise in determining a fair and equitable fee for the numerous types of boats and boating activities.

2 Encls

DEREK J. CHOW
Study Manager
764-3620

CENPS-OP-PO (White)
CENPS-OP-PO-LW (Welch/Wiedmeier/Borchert)
CENPS-RE-MD (Hanson)
CENPS-EN-DB-CD (Yorozu)
CENPS-EN-DB-AC (Foxall)
CENPS-PA (Graesser/Arbios)
LWSC MP Study File

LWSCMP/PUBMTG.MEM

APPENDIX E
LWSC STEWARDSHIP STANDARDS

APPENDIX E

Lake Washington Ship Canal
Stewardship Standards

GENERAL

The Stewardship Standards have been developed for application in the restoration and rehabilitation of the buildings at the Lake Washington Ship Canal. These Standards will be applied and used in conjunction with and in supplement to the Secretary of Interior's Standards for Rehabilitation of Historic Buildings and guidelines for treatment of Historic Landscapes. In some instances the Stewardship Standards are more specific than the Secretary of the Interior's Standards in addressing what is appropriate for the buildings, structures or site features, in these instances the Stewardship Standards should take precedence.

The LWSC stewardship standards stress the importance of the repair, replacement, and rehabilitation of architecturally significant building structural or site elements, while recognizing the need to accommodate current operation and fiscal responsibilities. In some instances, exterior and interior alterations to buildings may be needed to assure their continued use, but it is most important that such alterations do not radically change, obscure, or destroy original character-defining spaces, materials, and finishes. The LWSC standards identify certain of the original character-defining attributes, and offer guidance as to their maintenance and rehabilitation.

SITE OBJECTIVES

Preserve the relationship between buildings, landscape elements and open space.

Retain site elements which are important in defining the overall character of the historic district. Retain and maintain structures, furnishings and objects that remain from the period of significance.

Remove and replace as required furnishings and objects that were placed in the landscape after the period of significance and which do not contribute to the overall character of the historic district. For example light fixtures, fences, benches, and trash receptacles.

Accommodate required parking including access for the physically disabled without intrusion to the buildings or significant areas.

Screen parking from public view areas to reduce its impact on the historic district.

Acquire furnishings and objects which are similar to these that existed, in the landscape during the period of significance. New furnishings and objects should match the original in size, materials, finishes and placement into the site design.

EXTERIOR OBJECTIVES

Maintain concrete elements which are important in defining the overall historic character of each building. Remove and replace concrete that is inconsistent with the original concrete in color, texture and workmanship.

Analyze existing concrete so that a compatible mix can be made for repairs. New concrete should match the old in color, texture and workmanship.

Masonry surfaces shall be protected and maintained close to the original design. When repair is no longer practical, replacement of elements will be done to match the original. Repair chimneys to match original designs.

Metal elements which contribute to the architectural character of the buildings should be retained and preserved. Also, retain and preserve the type of finish, historic color, size, and shape.

Copper and bronze should not be painted or coated. Other metals should be painted to protect them from the elements.

Retain, rather than replace, architectural metal elements when repair of the element and limited replacement of deteriorated or missing parts can be accomplished.

Reinstall copper gutters to match the original design where a replacement material now exists.

WOOD OBJECTIVES

Interior and exterior wood elements that are important in defining the overall historic character of the building should be retained and preserved. Original cornices and brackets, architraves, door surrounds, pediments, newels, bannisters, railings, moldings, casings, etc., wood elements should remain as original fabric with repairs. Replace only if the original cannot be repaired. Replace elements that were once a part of the original fabric and are now missing.

Retain historic finishes to preserve the historic character of the exterior. Repaint wood only as needed with materials that are appropriate to the historic district.

Remove paint buildup from woodwork, sand, prime, and repaint; reglaze windows and doors as required. Caulk as required.

Repairs shall match the original woodwork in design, size and shape.

DOOR AND WINDOW OBJECTIVES

Doors and windows together with their trim define the historic character of the buildings and therefore shall be retained and preserved. Remove non-original doors and windows that compromise the integrity of the original and replace with units to match the original or that is standard for adjacent structures. Retain, repair, and maintain historic hardware where it exists. Replace hardware to match the original in size, shape and configuration.

Maintain the operating condition of doors and windows. Locate weatherstripping to facilitate operation.

Maintain the historic appearances of windows and doors and their frames though retention of designs, materials, finishes and colors including the configuration of sashes and muntins, depth of reveals, molding profiles, and the reflectivity and color of the glazing.

Energy conservation will be achieved by appropriate insulation or other appropriate methods that do not radically change, damage or destroy character-defining features.

Maintain integrity of caulking and sealants at doors and windows.

ROOFING OBJECTIVES

Retain character-defining roof shapes and roofing materials, rather than introducing incompatible designs or improper installation techniques. Retain the configuration of existing roofs without the addition of new elements that diminish the historic character.

Roofing material shall be appropriate to the style and period of the buildings. Retain original sound historic clay tile and slate roofing materials and architectural metal.

All repairs shall match the original design and materials.

BUILDING ENTRANCE OBJECTIVES

Retain historic entrances and porches which are character defining elements of the building. Significant elements include doors, entablaters, columns, brackets, rails, and stairs.

Provide barrier-free access where necessary through removable or portable, rather than permanent, ramps. Do not remove historic steps, but rather, ramp above them. Locate barrier-free access so as to minimize visual intrusion and impact on the structure.

INTERIOR OBJECTIVES

Retain and preserve interior elements and finishes that are important in defining the overall historic character of the buildings. These elements include but are not limited to columns, cornices, chair rails, baseboards, fireplaces and mantels, light fixtures, hardware, flooring, plaster and may include plumbing fixtures.

Public spaces such as entrance spaces, and entrance halls are important in defining the overall historic character of the building. Size, configuration, and proportion of these spaces should be maintained. Where alterations have occurred they should be removed to restore the plan to the original design.

Maintain character-defining interior spaces by not cutting through floors, lowering ceilings, or removing walls.

Reuse decorative material or elements that were removed during rehabilitation work including wall and baseboard trim, door moulding, paneled doors, and wainscoting.

Remove excessive paint build-up from character defining elements with due regard to disposition of hazardous materials. Prime and repaint from approved palette of colors.

Maintain the finishes or colors of historic woodwork. For example, do not paint a previously varnished wood element, or strip historically painted wood surfaces to bare wood to create a "natural look".

New materials that obscure or damage character-defining interior elements shall not be installed. Likewise, paint, plaster, or other finishes on historically finished surfaces shall not be removed in an effort to create a new appearance.

Remove, clean, lacquer, and reinstall original hardware. Return original doors to designated openings.

HVAC OBJECTIVES

Remove all asbestos from heating and water lines.

Install mechanical systems and service equipment when required, that causes minimal alteration to the building's floor plan and the principal exterior elevations, and the least damage to historic building materials and volume of principal rooms. Remove intrusive ductwork from principal rooms and provide alternate sources of supply.

Install mechanical systems and service equipment so that character-defining structural or interior elements are not radically changed, damaged, or destroyed.

Exterior walls shall not be cut for installation of HVAC units. Remove units that have been cut through exterior walls.

ELECTRICAL OBJECTIVES

Provide underground supply of power, phone and cable. Rewire buildings to new service entries. Internally wire for cable and phone, removing existing conduits and wiring from exterior. Conceal all exposed conduits and ensure adequacy of outlets. Replace missing character-defining light fixtures with those appropriate to the character of the original exterior and interior. Where possible, replicate existing original fixtures or introduce fixtures appropriate to the period.

STRUCTURAL OBJECTIVES

Correct any structural deficiencies before rehabilitation or restoration.

CAVANAUGH HOUSE OBJECTIVES

These additional Cavanaugh House standards will identify certain character-defining attributes, and offer guidance as to house maintenance and rehabilitation.

Public spaces such as entrance halls, parlors, and dining rooms that are important in defining the overall historic character of the house. Size, configuration and proportion of these spaces should be maintained. Where alterations have occurred they should be removed to restore the plan to the original design.

Sand wooden floors only when it is absolutely necessary, rather than at the change of occupancy.

Maintain character-defining interior elements and finishes throughout the house.

APPENDIX F
ACCEPTABLE SUBSTITUTES FOR POPLARS

11/4/93
PY/MF

FREMONT CUT/ LWSC CANAL TREES

CRITERIA--*Characteristics similar to existing poplars

1) Deciduous*
2) Columnar growth- height 50'-90'*
3) Yellow fall color*
4) Fast growth*
5) Inconspicuous flowers*
6) Deep-rooting
7) Tolerant of poor soil conditions
8) Drought-resistant
9) Strong wood with age (long-lived)
10) Locally available

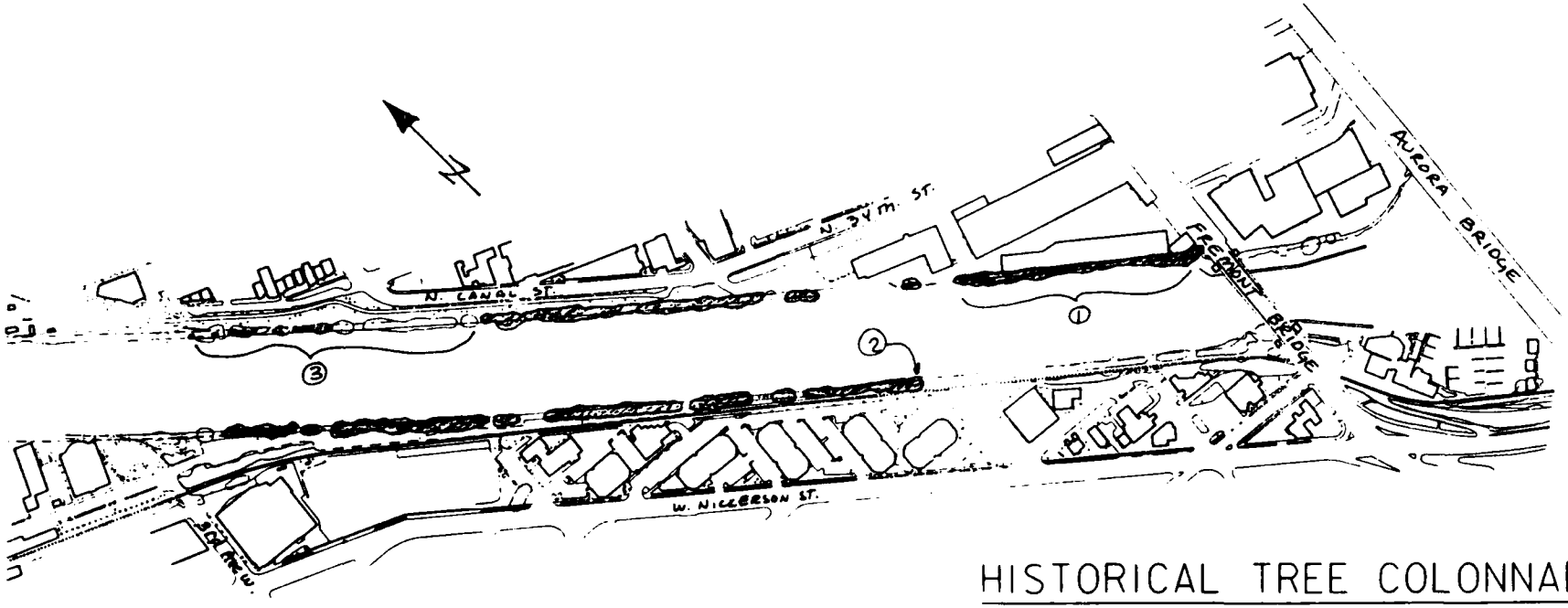
ACCEPTABLE SUBSTITUTES FOR EXISTING POPLARS

Botanical Name	Common Name
Populus nigra c.v. 'Italica'	Lombardy Poplar
Populus nigra c.v. 'Thevestina'	Ghost Poplar

ACCEPTABLE TREES FOR PLANTING ALONG CANAL

Botanical Name	Common Name
Acer nigrum 'Green Column'	Green Column Maple
Acer platanoides var. 'Columnare' 'Parkway'	Columnar Norway Maple
Acer rubrum var. 'Armstrong' 'Bowhall' 'Scarlet Sentinel' 'Karpic' 'Doric'	Columnar Red Maple
Acer saccharum var. 'Arrowhead' 'Newton Sentry' 'Seneca Chief'	Columnar Sugar Maple
Acer macrophylla 'Seattle Sentinel'	Columnar Bigleaf Maple
Acer grosseri	Maple
Calocedrus decurrens	Incense Cedar
Carpinus betulus 'Fastigiata'	European Hornbeam

Carpinus caroliniana	American Hornbeam
Cercidiphyllum japonicum	Katsura
Cladrastis lutea	Yellow Wood
Cornus kousa	Kousa Dogwood
Fagus sylvatica 'dawyckii'	Pyramidal Beech
Ginkgo biloba 'sentry'	Ginkgo
Liquidambar styraciflua	Sweet Gum
Liriodendron tulipifera 'Arnold'	Arnold Tulip Poplar
Metasequoia glyptostroboides	Dawn Redwood
Nothofagus antactica 'Puget Piller'	-
Nyssa sylvatica	Sour Gum
Populus alba 'Pyramidal'	Bolleana Poplar
Populus nigra c.v. 'Thevestina'	Lombardy Poplar
Populus tremuloides 'Erecta'	Quaking Aspen
Populus tremula 'Erecta'	Swedish Poplar
Quercus robur 'Fastigiata'	Upright English Oak
Stewartia pseudocamellia	Japanese Stewartia
Taxodium distichum	Bald Cypress



LEGEND

- EXISTING TREE COLONNADE (POPLARS)
- (1) EXISTING POPLARS SPACED 12'-15' APART
- (2) ONE POPLAR TO BE REMOVED
- (3) EXTEND POPLAR PLANTINGS

HISTORICAL TREE COLONNADE

FREMONT CUT (NO SCALE)

LAKE WASHINGTON SHIP CANAL
SEATTLE, WASHINGTON