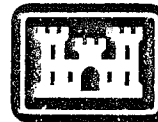
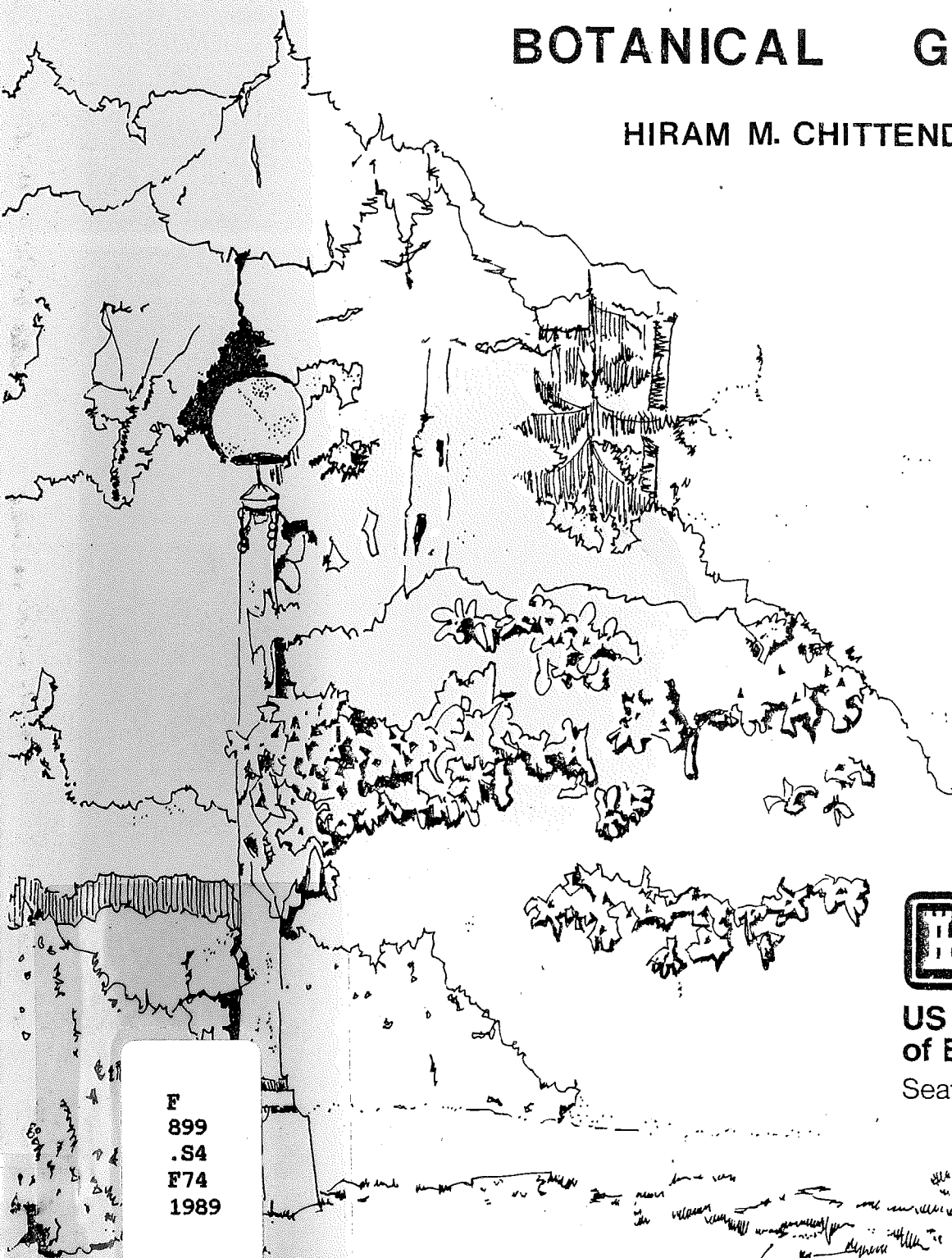




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HISTORIC GROUNDS REPORT THE CARL S. ENGLISH, JR. BOTANICAL GARDEN

HIRAM M. CHITTENDEN LOCKS



US Army Corps
of Engineers
Seattle District

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HISTORIC GROUNDS REPORT
THE CARL S. ENGLISH, JR. BOTANICAL GARDEN
AT THE HIRAM M. CHITTENDEN LOCKS
SEATTLE DISTRICT, CORPS OF ENGINEERS

PREPARED BY RENEE L. FREIER
NOVEMBER, 1989

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HISTORIC GROUNDS REPORT:
THE CARL S. ENGLISH, JR. BOTANICAL GARDEN
AT THE HIRAM M. CHITTENDEN LOCKS

SUMMARY

The character of the Carl S. English, Jr. Botanical Garden has evolved to its present state over the past 73 years. Essentially two aspects govern the historic significance of the garden: 1) the original layout and design and 2) the botanically significant plant collection. The original layout was designed by architect Carl F. Gould in 1915 with original plant and bed locations established at that time by an unknown landscape architect. The botanical significance of the garden began to be established in the early 1930's when Carl S. English, Jr., a well known horticulturist in the Pacific Northwest in his latter years, was hired as assistant gardener. English's most influential period began with his promotion to lead gardener in 1941 and by 1969 he had replaced approximately 80% of the original plant material with a wide array of rare or botanically interesting plant species.

Although the predominant style in which the grounds have been developed is the English Landscape Garden Style, the garden incorporates both formal and informal elements. The formal aspects originated in Gould's layout while the informal characteristics, although also evident in the original layout of the loop road, rolling topography and curving path, were primarily employed by Carl S. English, Jr. to develop the planting beds in later years. Recommendations to preserve the elements which make the garden

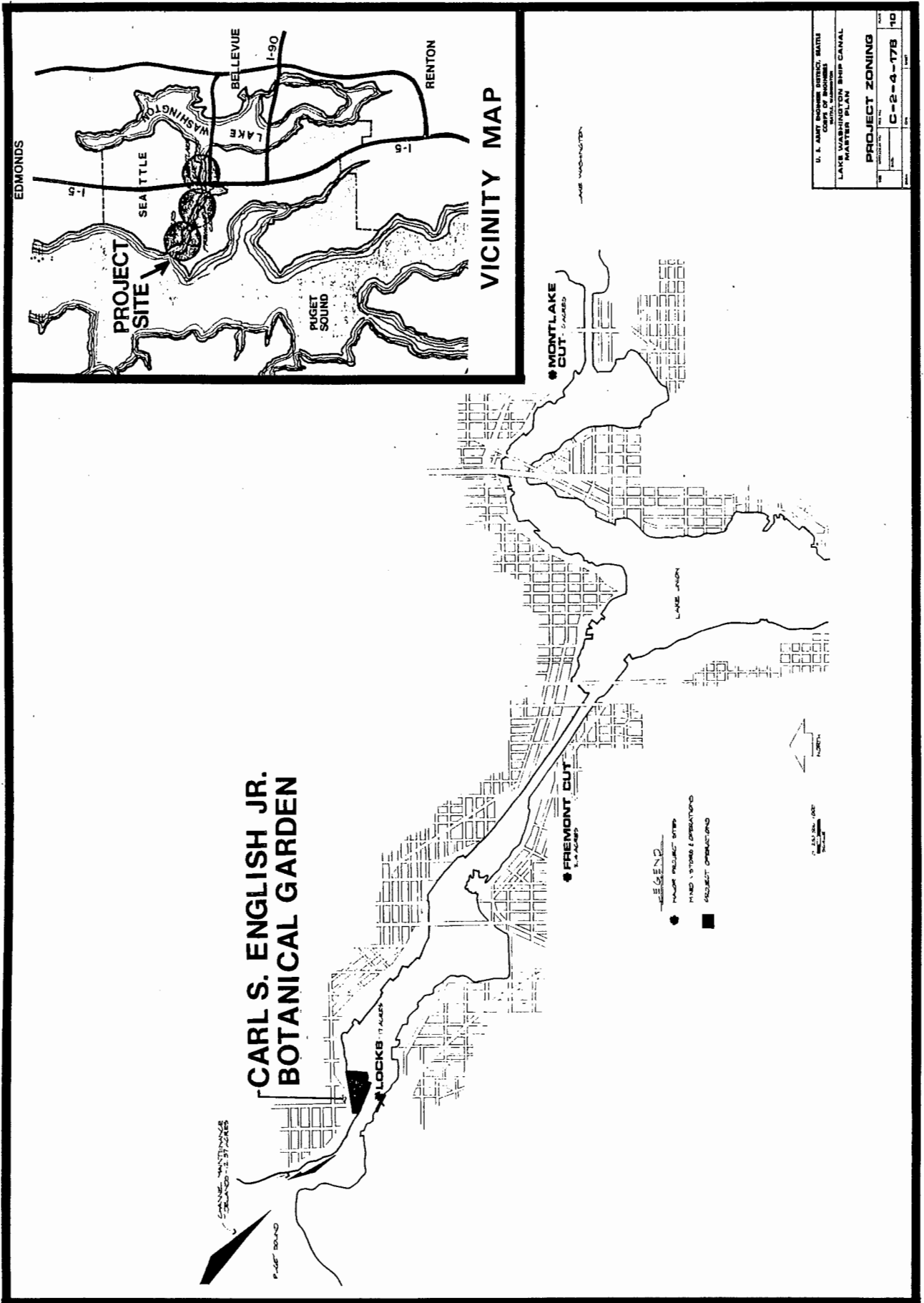
unique include preserving the original design layout, the open lawns, the lines of trees, the natural formation of the planting beds, and the botanical diversity.

1.0 INTRODUCTION AND STATEMENT OF PURPOSE

This report is concerned with the character and historic integrity of the landscape, known as the Carl S. English, Jr. Botanical Garden, which lies north of the Hiram M. Chittenden Locks. The locks, located in Seattle, Washington, span the freshwater of Salmon Bay as it flows out into Shilshole Bay and eventually into Puget Sound. The locks, spillway, fish ladder, buildings, grounds, and garden as well as the Montlake and Fremont cuts comprise the Lake Washington Ship Canal Project (LWSC); the whole of which was designated a historic district on December 14, 1978 (Map A).

In particular this report explores the significant elements and features and original layout of the Carl S. English, Jr. Botanical Garden. The garden comprises at least 7 of the 17 acre locks reservation* and is described in the Nomination Form for the National Register as a "luxuriant array of mature ornamental and specimen trees, shrubs, and bedding plants..." (Map B). In 1974 the garden was named after Carl S. English, Jr. who was gardener and later horticulturist at the project from 1931-1974. Carl S. English, Jr. was nationally recognized as one of the Northwest's leading horticulturists enriching the locks' grounds by planting trees, shrubs and herbs from the Pacific Northwest as well as many parts of the world. The objectives of this report are to describe

*Other sources designate the garden to be approximately seven acres but in this report the garden is seen to include a greater area (see Map B).



Map A. Project Location and Vicinity Map

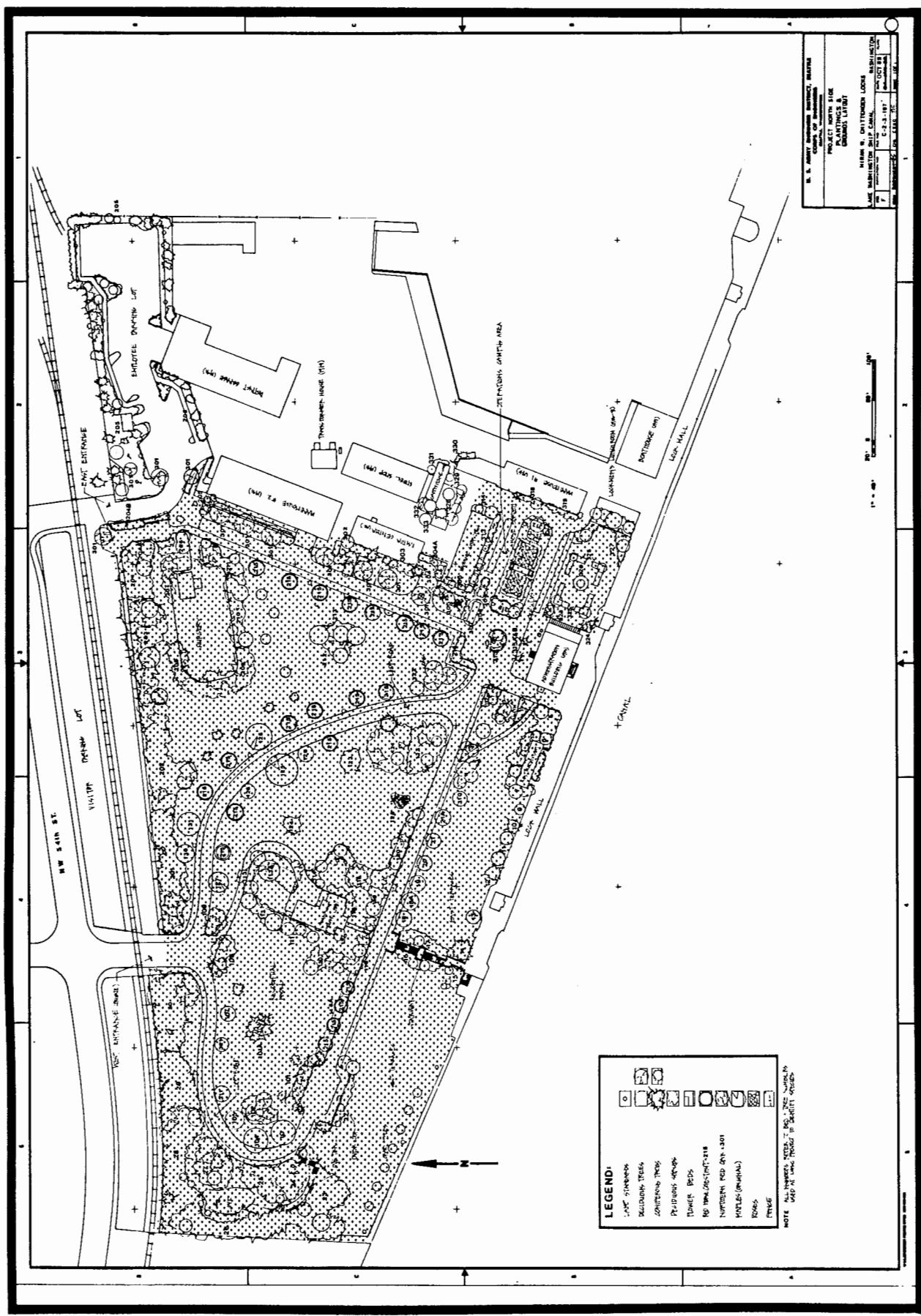
and analyze the elements which make up the historic character of the garden and the lock grounds and how this character could best be preserved.

This report is organized into four sections: 1) a methodology review, 2) a historic overview of the locks' landscape and botanical garden, 3) a site inventory and analysis in reference to the historic character of the landscape and its elements, and 4) recommendations as to how the historic character should be maintained.

2.0 METHODOLOGY

The preparation of this historic grounds report has been broken down into four tasks: 1) Historical Research; 2) Site Investigation; 3) Documentation of Significant Historic Landscape Features or Elements; and 4) Recommendations.

2.01 The methods used included a literature search and review of articles on file at the Lake Washington Ship Canal project and the University of Washington library. These articles included historic designations; early construction of lock grounds; Carl F. Gould, original project architect; the development and formation of the Carl S. English, Jr. Botanical Gardens; Carl S. English, Jr. (articles about and by him); and definition of the English Landscape style, the predominant style in which the gardens are designed. Carl S. English, Jr.'s data file was reviewed to gain



Map B. Areas of The Carl S. English, Jr. Botanical Garden

accurate information on dates of various events, his position at the locks, awards and honors given and letters received.

2.02 Historic photographs on file at the LWSC and at the University of Washington's Special Collections were viewed to make physical comparisons throughout time. These are used extensively within this report to review the information gathered from the other sources and in writing the garden descriptions. All photographs are referenced within the discussion and their reference numbers appear in parentheses.

2.03 Historic plans of the original layout and possible planting plans showing various stages of development were also used. Five plans/maps from 1915 (C-2-3-17), 1916 (C-2-3-25), 1918 (LWC-1), 1969 (LWC-520), and 1989 were used to compare with the photographs. The earliest maps from 1915, 1916, and 1918 are not complete and were all revised at some point. A completely accurate early planting plan could not be found.

2.04 Interviews with historians David Streatfield, professor of landscape architecture at the University of Washington, and Cathy Gilbert, landscape architect with the Cultural Resources Division of the National Park Service were conducted to gain general information and professional opinions on historic landscapes. Contact was made with Architect William Booth, who is currently writing a book about Carl F. Gould and is knowledgeable about

Gould's architectural style and practice in Seattle. Also contacted were local horticulturists, Arthur Kruckeburg and Brian Mulligan, those who worked with him, Walter L. Lyon and Bill Alguard, and Carl's sister, Grace Olback.

2.05 Site Inventory

Using a base map (C-2-3-198) and an existing conditions "historic tour" within a garden history report written in 1969 by University of Washington landscape architecture student, LoAnne Koykka, a site investigation was made with locks Horticulturist, Mike Fleming. Each bed and area of interest was reviewed as to significant changes which have taken place. This was repeated with Walter Lyon, Lead Gardener from 1974-1978 and assistant gardener under Carl S. English, Jr. from 1963-1974.

A number of site visits were made observing visitor use of the gardens and general conditions.

Current condition photographs were taken to document current conditions, uses and garden elements. These are explored individually and related to one or any combination of the following qualities which define historic integrity: historic location, design, setting, materials, workmanship, feeling, or association.

2.06 Site Evaluation

2.06.1 Although, in the nature of all landscapes, the lock grounds

have been evolving over the past 73 years, three time periods are used to compare the growth and significant changes which have occurred on this site. These are: 1) 1915-1940, 2) 1941-1974, and 3) 1975-present (1989).

The first of these three periods, 1915-1940, covers from the time the first layout of the site was designed by Architect Carl F. Gould and the first planting plan was devised to the year Carl S. English, Jr. became lead gardener.

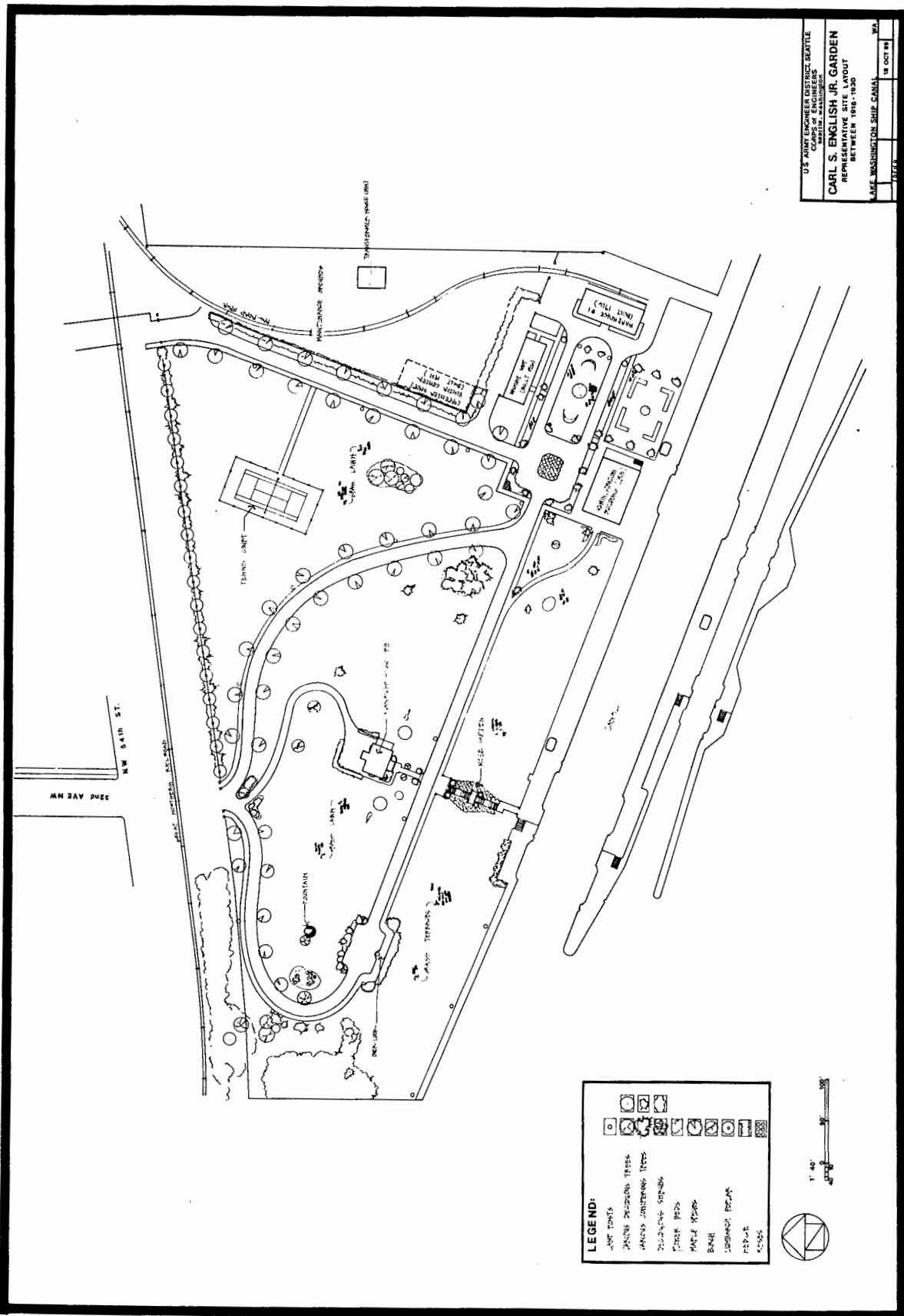
The second period, 1941-1974, covers the years during which English developed the garden to a level for which it became well known and admired.

The third period, 1974 to the present, covers the years after English's retirement when the grounds were maintained and further developed by gardener Walter Lyon (1974-1978) and horticulturist Mike Fleming (1978-1989).

2.06.2 Three maps (C-E) are used to illustrate the evolution of the garden and landscape. The first map (C) shows the original layout of the roads, sidewalks, planting beds and trees as best could be deciphered. This was generated by the author from three planting plans from 1915, 1916, and 1918 and from historic photographs dated between 1916 and 1930. This map is useful in illustrating original site layout and planting bed location. The

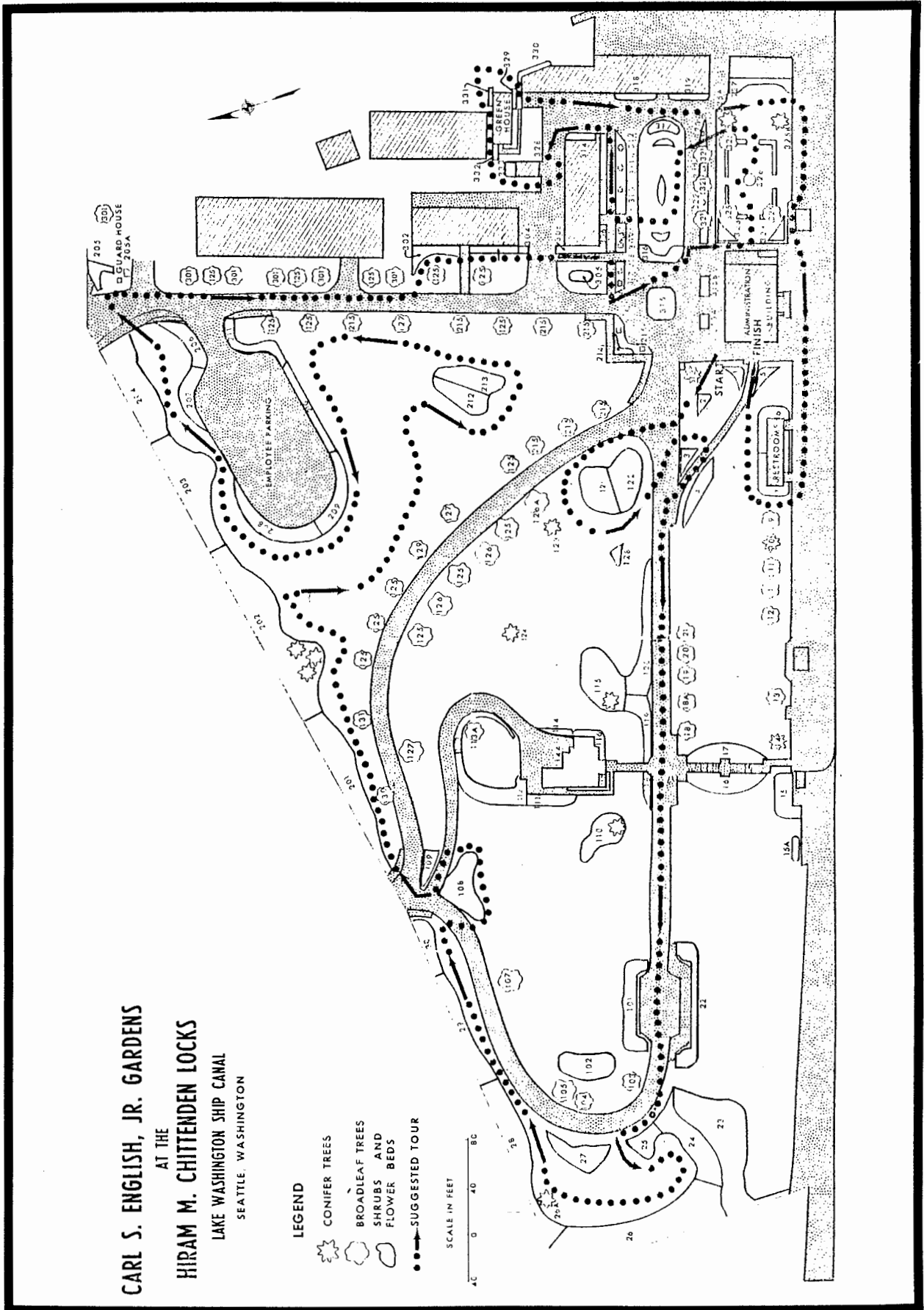
second map (D) was done by Carl S. English, Jr. in 1969 as part of a pamphlet for the XI International Botanical Congress which toured the locks in August 1969. This pamphlet, later published for general public use, describes the garden and includes a partial plant list organized by numbered beds. The third map (E) is an updated site plan showing existing 1989 conditions generated from a 1984 base map\planting plan (C-2-3-198).

2.07 The information collected from all sources were combined to describe the evolution of each bed and area within the garden. These descriptions tour the garden giving the evolution of each bed and significant area.

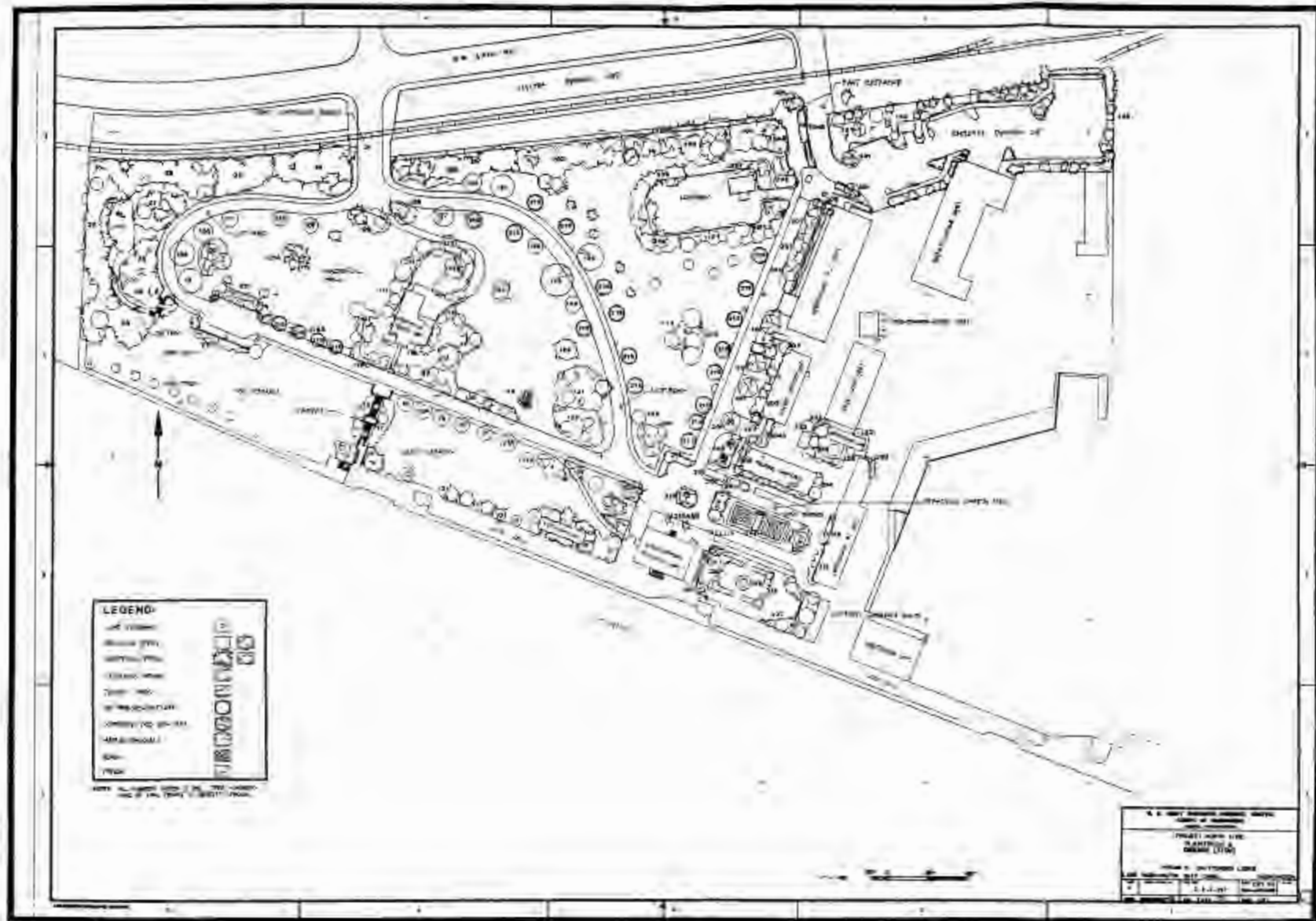


U.S. ARMY ENGINEER DISTRICT SEATTLE
 4000 UNIVERSITY AVENUE
 SEATTLE, WASHINGTON
CARL S. ENGLISH JR. GARDEN
 REPRESENTATIVE SITE LAYOUT
 BETWEEN 1915-1930
 LAKE WASHINGTON SHIP CANAL
 18 OCT 89
 WA

Map C. Carl S. English Botanical Garden Representative Site Layout Between 1915 - 1930



Map D. Carl S. English, Jr. Botanical Garden as Drawn by Carl S. English, Jr. for 1969 Botanical Conference



Map B. Current (1999) Garden Conditions

3.0 HISTORIC OVERVIEW OF LANDSCAPE

3.01 NATIONAL HISTORIC PRESERVATION ACT

Under the National Historic Preservation Act of 1966 (NHPA) and a revised Section 106 (1986) it is required that every Federal agency "take into account" how each of its undertakings could affect historic properties. The Lake Washington Ship Canal, as a Federally designated historic district, is one such historic property.

A "historic district" is one of several categories used by the U.S. Department of Interior to classify historic properties. The remaining categories include buildings, structures, sites, and objects. Although in the Nomination Form the Historic Preservation Specialist from the Office of Archaeology and Historic Preservation in Olympia, Washington, categorized the LWSC project only under historic "buildings" and "structures", the Department of Interior chose to enter the Project as a "district". Concerning historic districts, the National Register Bulletin No. 16 (U.S. Department of Interior, 1987) states:

"A district possesses a significant concentration, linkage or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development." (p. 41)

Within the Nomination Form "Areas of Significance" are also called out. The items which are marked include the district's architecture, commerce value, engineering, military significance,

political/governmental importance, transportation value, and, most pertinent to this report, the landscape architecture.

The historic district designation requires that the managing agency, in this case the U.S. Army Corps of Engineers, protects and maintains 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 historic property must possess. These qualities are referred to within this report to gain an understanding of the elements which comprise the Carl S. English, Jr. Botanical Garden.

Carl S. English, Jr., writing in 1972, stated that the garden was started in 1932, the year after he began working at the locks as an assistant gardener. This may be the case if the definition of the "garden" only includes the particular plants Carl English was instrumental in planting. Being that the garden is affected by more than the individual plants, for the purpose of this report the historic time frame of the garden is more inclusive. Elements which pre-date Carl English's employment, such as original layout, topography, and structures of the garden, are also considered when evaluating its historic integrity.

What follows is a historic overview of the locks' grounds presented

within a framework of the three time periods previously outlined.

3.02 EARLY SITE FORMATION - 1901-1940

3.02.1 Pre-Locks

Prior to the commencement of construction of the locks in November of 1911, the land north of the lock wall rose steeply, as high as 74 feet, in the northwest corner and fell off to 20 feet on the east side of the reservation. A topographic map from 1901 (**Map F**) shows site form and elevation. The reservation was, at least partially, forested in the native upland species typical of the Pacific Northwest - predominantly a mixture of Western Red Cedar, Douglas Fir, and Western Hemlock (Chrzastowski 1983). The reservation grounds were bought from Ole S. Schillestad, a cabinetmaker who had moved there in 1876. Four small structures can be seen in the 1901 topographical map indicating site some development.

3.02.2 Original Layout

During construction, the area comprising the north side of the lock canal was cleared, areas of the site were leveled by several feet, and the steep slope parallel to the waterway was filled and terraced with material dredged from the lock channel (English 1972).

Carl F. Gould

As stated in the Introduction, the original layout of the locks grounds, roads and walkways, and grading was designed by Carl F.

LAKE WASHINGTON CANAL
LOWER LOCK SITE
CONTOUR MAP OF U.S. CANAL RESERVATION
IN TOWNSHIP 25 N. R 3 E.

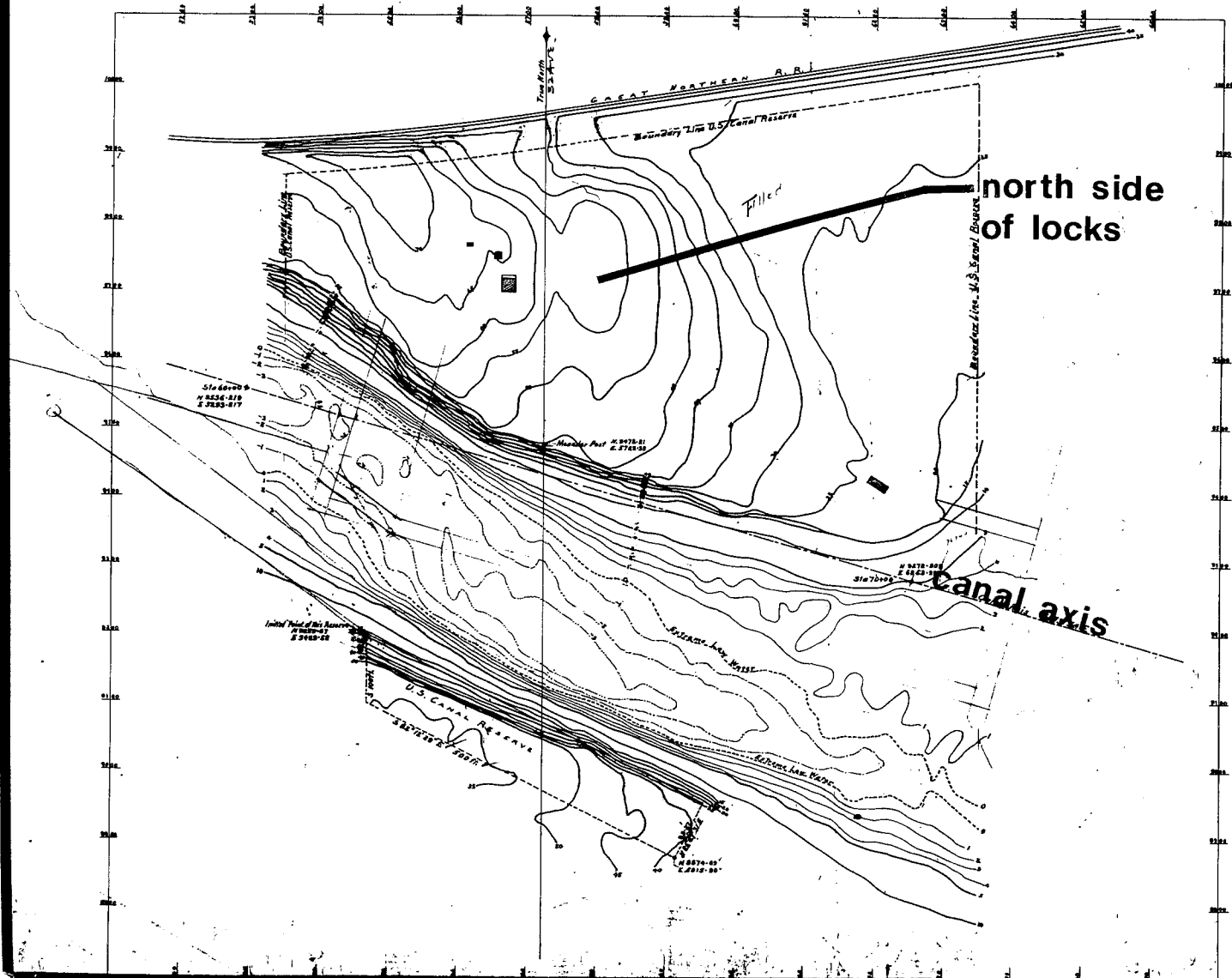
Compiled and reduced from similar Map of J. M. Clapp
Asst Engineer. File No. L. W. C. 41 of Nov 1901

Contours above the 5th Curve are 5' apart.
Contours below the 5th Curve are 1' apart.

Scale 100' = 1 inch

Elev 00 = Extreme Low Water.

Datum Extreme low tide.



Map F. Topographical Map of Locks Grounds (1901)

CADRE NO.
DRAWER NO.
ROLL NO.
NUMBER

Gould in 1915. Carl F. Gould (1873-1939) was educated at Harvard (B.A. 1898) and obtained his Master of Architecture at the Ecole des Beaux Arts in Paris (1899-1903), the predominant school of nineteenth century site and building design. In 1908, after working for such prominent eastern firms as McKim Mead and White and George C. Post, Gould moved to Seattle from New York City (Johnston, 1987). In 1914 he and the already well-established architect Charles H. Bebb formed the partnership of Bebb and Gould. The firm is recognized for the design of a number of well known Seattle buildings including the Seattle Art Museum in Volunteer Park, The U.S. Marine and Virginia Mason Hospitals, and the University of Washington's Henry Art Gallery and Suzzallo Library. Bebb and Gould were also hired by the University of Washington to make revisions to the campus plans originally laid out by prominent Landscape Architect Frederick Law Olmsted, Jr. and Charles Olmsted. In 1914 Gould helped found the University of Washington's School of Architecture where he acted as first chairman until 1926.

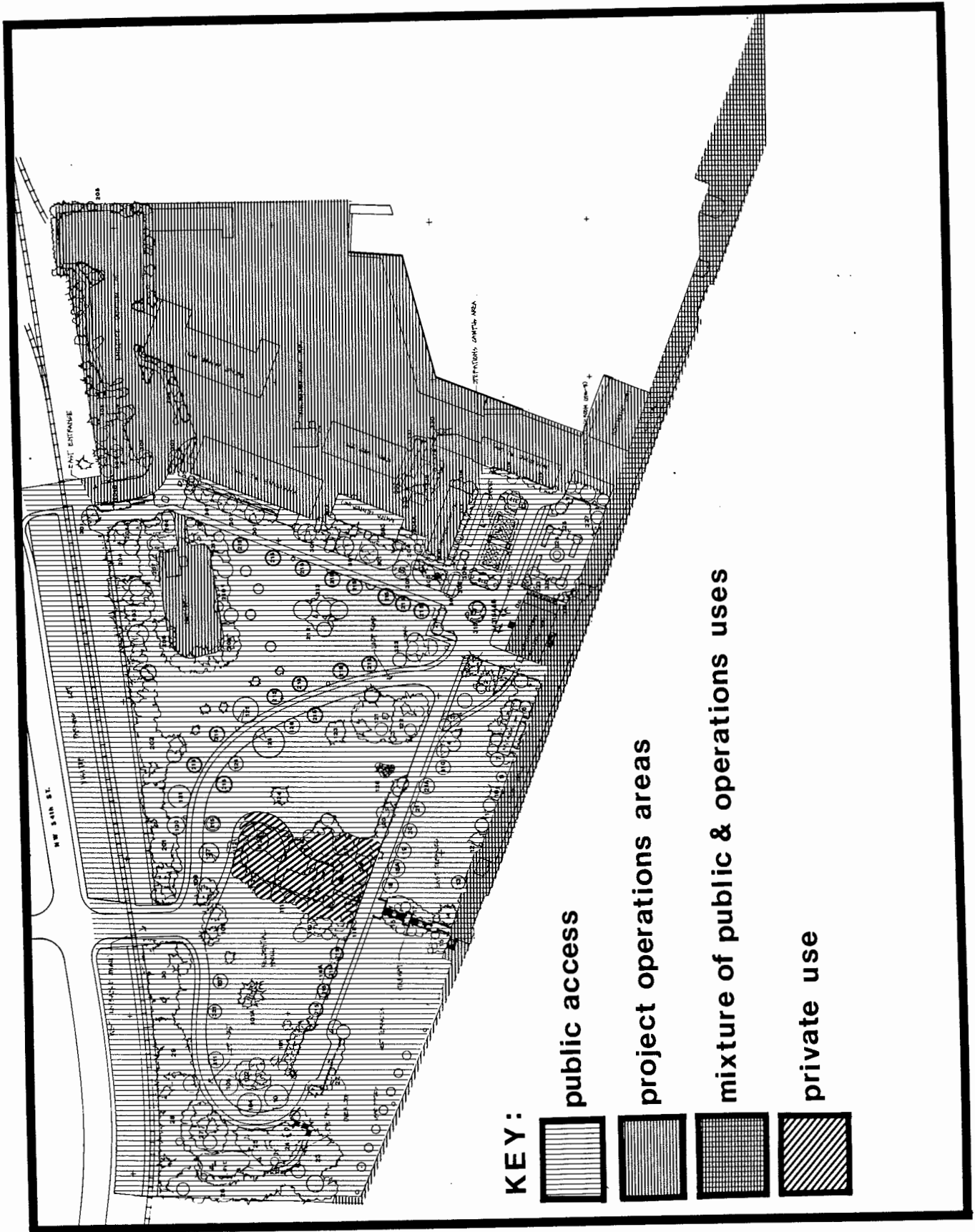
Gould's Site Plan

Today's design is very much of what the original layout of the locks grounds. The reservation was and is divided into areas of public and operational uses. The operations area includes a maintenance 'campus' which contain four original buildings (Administration Bldg., Machine Shop, Transformer House, and Warehouse #1), the lock wall running parallel to the channel, the locks and spillway, walkway to the fish ladder, four small

operation houses, and the fish ladder on the opposite side of the channel.

The public portions of the reservation lie mainly to the west of the operations area and include the sweeping lawns, roadways and paths leading around the grounds, portions of the lock wall, spillway walkway and fish ladder. A private residence, located atop the highest point in the open lawn, was originally built in 1913 for the lockskeeper but is now used by the Army Corps Seattle District Engineer. Access is restricted for privacy in the area immediately surrounding the house (Map G).

The layout of the roads, walkways, and topography was done in a manner which is a mixture of formal and more 'naturalistic' elements. At the time Gould attended the Ecole des Beaux Arts emphasis was being placed upon landscape design as well as architecture (personal communication, David Streatfield). A formal influence may be seen in the straight lines of the entry walkway/road, the south edge of the loop drive, the stairway which leads down from the private residence, and in the layout of the campus area directly surrounding the administration and maintenance buildings; all set on a grid parallel to the line of the lock wall. These, in turn, are softened by the curves of the loop road which circles to the north around the residential knoll, and by the rolling topography of the open lawns. These softer more 'naturalistic' features of the ground's layout were adopted by the



Map G. Public, Private, and Operations Use Areas

Beaux Arts School but have their origins in another tradition, the English Landscape Style. The English Style Landscape originated in 17th century England and reached continental Europe in the early 1800's and the U.S. by the late 1850's. This style is further discussed in Section 3.04.3.

The Original Planting Plan

A complete, accurate original planting plan could not be found. Three historic plans with varying degrees of vegetation drawn on were used to gain some idea of where trees, shrubs and flowers may have been used. These three plans (C-2-3-17, C-2-3-25, and LWC-1) are dated 1915, 1916, and 1918 respectively and are not reproduced here but may be found in the LWSC micro-film filing system.

The 1915 planting and road layout plan (C-2-3-17) by an unknown landscape architect (possibly within the firm of Bebb and Gould) contains a number of plants and beds. Some of the beds, unfortunately, do not appear to exist in the historic photographs. This plan has a hand written note stating "revised when built" which may pertain to the plants shown. The location of many of the beds and the use of maples lining the west leg of the loop road, though, are consistent with photographs and give a general sense of the first landscaping of the locks grounds.

The 1916 plan shows only the lines of maples and conifers used along the roadways but there are other planting beds which appear

in photographs. The 1918 plan is more accurate showing the location of shrubs, hedges and individual trees but does not specify the species. Planting beds shown in the 1915 and 1918 plans, as in the photographs, take a number of shapes ranging from crescents to ovals to amorphous forms.

An early 1916 photograph (photo 2) shows that less formal plantings were first put in directly around the newly completed Administration Building. These plantings apparently were removed shortly after the picture was taken and a more formal design was used. Historic photographs taken later in 1916 (photo 3, photo 1) show that only conifers were planted accenting corners, sidewalk crossings, and entry ways. Maples, donated by the Seattle Parks Department, were planted at even intervals lining both the east entry drive and the north portion of the loop road. The earliest photographs show a well planted bed in the location of 121/122. A rose bed existed in Bed 315 and single evergreen trees dotted corners at the locations of Beds 3 and 12 (photo 3). Photograph 1 shows that the locations of Beds 108, 109, 101 and 111 were part of the earliest planting design. A tennis court, used by lock employees, can be seen in the approximate location of the now existing nursery. This tennis court, though, was set parallel to the east entrance road, not at an angle as is the nursery. The tennis court was removed in 1928 and lawn was planted in its stead (see photo 7).

3.02.3 Early Maintenance and Plantings

A part-time gardener maintained the plantings and the lawns were cut by locks personnel from 1916-1920 (Koykka 1969). In 1920 the first full-time gardener, Henry S. McCarty, was hired. According to Carl English (in Koykka 1969) McCarty planted a line of Lombardy Poplars along the north border. (By the end of the 1960's all these poplars had been removed due to their extensive shallow root systems which were detrimental to the surrounding plants.)

From 1925-1941 Gustaf Julius Eckerstrom was lead gardener. Koykka states that the "formal beds" east of the Administration Building were designed by Landscape Architect Otto Holmdahl in 1927 while Eckerstrom was here. This may be incorrect as a December 1920 photograph (photo 6) shows an outline of the beds. These beds form the corners of a square with a circular bed in the center and were designed to represent an anchor (personal communication; Mike Fleming). See Map C, a plan generated from historical photographs dating between 1916-1930.

In 1931 Carl S. English, Jr. was hired as an assistant gardener. Photographs from the period while Eckerstrom acted as lead gardener show a well manicured landscape with clipped hedges, shrubs, and conical shaped conifers. Although English planted trees while acting as an assistant, many of which he propagated himself, the landscape character appears to have been maintained in a more formal manner. A comparison of two photographs, c.1929-30 and

1939, show additions of plant material, but the open spaciousness of the grounds and the use of well defined serpentine shaped flower beds and single evergreen species as accents at corners of buildings and paths predominated (see photographs 8, 11, 13, and 16).

3.03 CARL S. ENGLISH, JR.'S INFLUENCE - 1941-1974

3.03.1 1941 "Cut Off" Date

After Eckerstrom retired in 1941, Carl S. English, Jr. was promoted to lead gardener. Although English had already been at the Locks for ten years and his influence in helping to shape the garden began prior to his promotion to lead gardener, 1941 is used as a starting point for his most influential period. As lead gardener (1941-1961) and horticulturist (1969-1974), it is assumed that he had more control of how the grounds were maintained and developed. A comparison of a 1939 aerial photograph (photo 11) and one taken in 1963 (photo 28), 22 years after Carl S. English, Jr. became lead gardener, demonstrates significant changes in the variety and extent of planting material. Existing beds were expanded and, given the addition of the employee parking lot just west of the east entry in 1941 and the public rest rooms in 1947, a number of new planting beds were added (Beds 206-211, 6-8). Also, during the many years following Carl S. English's promotion to lead gardener the original plant material was aging and the opportunity arose to replace the more common plant species with experimental exotics.

Overall, photographs from the years following English's promotion (1941) show an evolution away from the use of annuals and flower beds toward a greater use of shrubs and trees. This can be seen in a comparison of Beds 119 and 120 during years between 1939 into the 1970's (see photographs 11, 28, and 13); the area west of the Administration Building where beds 1,2,5, and 12 now exist (photos 26 and 10); and along the stairway leading down from the Cavanaugh Residence (photos 9, 17, and 32,).

3.03.2 Carl S. English, Jr. - The Horticulturist

Carl S. English's contribution to the locks' garden is in the vast array of native and exotic plant species he introduced. Graduating from Washington State University in 1929 with a Bachelors of Science in Botany, Carl S. English, Jr. was foremost a horticulturist and botanist (see Appendix A for detailed information on Carl English's professional career). The majority of trees and shrubs in the garden were propagated by Carl himself. Koykka (1969) states that "since Mr. English joined the staff, 80% of the plant materials ha[ve] been replaced by him either to upgrade the quality of the plant or to work in plant materials more suited to the landscape situation." English's all consuming interest in botany took him into the alpine regions of the western states to collect seed for propagation. Essentially he used the locks grounds as an experimentation area. Plants he found to be successful at the locks he then made available to others through his international seed exchange.

Plant Sources

Carl S. English, Jr. had two primary sources for the plant material he introduced at the locks' garden: 1) native seed collection and 2) international exchange. His vacations with his wife, Edith Hardin English, also an accomplished horticulturist, were often spent hiking in mountainous regions of the Cascades, Olympics, Siskiyou, Blue Mountains, Mount Baker and Mount Hood in the Pacific Northwest as well as into the ranges of Montana, Utah, Wyoming, Idaho, Arizona, and Nevada. During these explorations the Englishes collected native seeds for experimentation at the locks, for their native plant nursery, and for exchanges.

Carl S. English's second source of plant material for the locks was through seed exchanges with various botanical gardens and arboreta around the world. These international exchanges offered seeds collected from plants native to their home countries. Thus many of the exotic species found at the locks were only one generation removed from their native countries (the Dawn Redwood for example). Unfortunately Carl S. English did not keep records specifying the direct source of specific plants used at the locks and therefore sources cannot be traced. Records at the University of Washington Arboretum do show, however, which species they received from Carl between the years 1936-1974 and may be useful in obtaining replacements for species no longer existing on site at the Locks (see Appendix B).

The Englishes' Private Nursery

At their private residence in Ballard, the Englishes maintained a one-acre nursery with experimental plots and a small greenhouse. An in-depth description of their personal garden and nursery can be found in an article by William Dress (1957) and will not be repeated here. The seed business the Englishes ran in their spare time was begun in 1931 when they first moved to Seattle. By 1957 they offered about 1500 kinds of plants and about 1000 kinds of seeds (Dress 1957).

Carl English's extensive work in horticulture earned him many honors and awards, both as a part of his job for the Army Corps of Engineers at the Chittenden Locks and within the horticultural community. In 1967 he received the Meritorious Civilian Service Award (1941-1967), the highest award granted by the Chief Engineer of the U.S. Army and in 1971 he received the American Horticultural Society Professional Citation. (See Appendix A for a complete list of awards and honors Carl S. English received during his career.) A quote by Frances Robertson in the University of Washington Arboretum Bulletin (1977) well describes Carl S. English's contributions to the horticulture community:

The value of Carl S. English's life could be summarized by re-counting the awards and honors which he received, but if we stopped there we would miss the kindness, the multiplicity of interests and the friendliness which enriched the lives of those who were privileged to know him.. You and I will remember gratefully his willingness

to help identify plants for those less botanically knowledgeable than he, his desire to share his horticultural experience, his insatiable curiosity about plants the world over and his ability to observe them closely in order to understand their cultural needs.....

The Northwest has been fortunate in having had an international ambassador of horticultural good will in the unassuming and unselfish person of Carl S. English, Jr.

Carl S. English's Planting Design Philosophy

In an article written by Carl English in 1972 for American Horticulturist, entitled "The Gardens at the Hiram M. Chittenden Locks in Seattle, he makes these comments which point toward his planting design philosophy. These are:

"An effort is made to have something of interest at all times of the year beginning with the winter-blooming shrubs, then the spring abundance of bloom of both trees and shrubs, followed by the summer bloom of the annuals and the late-blooming trees and shrubs, and closing with soothing colors of the autumn leaves."

"At the locks garden real effort has been put forth throughout the years to....continually acquir[e] new kinds of plants to try out and dispers[e] the choicer ones."

"Hopes of developing a garden that not only would be a joyous sight to see but also a garden worthy of serious

study."

The use of atypical seedlings is another design element English used in the garden. Mendelson (1986) hypothesizes this may have been done because "in horticulture the atypical form is sometimes considered more pleasing and will often show the greatest variability in flower form and color."

Also, English's maintenance practice of allowing a tree or shrub to grow with minimal pruning, if any, is another design/maintenance devise he followed. Plants which had been kept symmetrically clipped were allowed to "grow naturally" under English's supervision. Thickly vegetated planting beds acted as screens along borders. Tall shrubs and trees were used behind lower understory and grounds covers creating a layered effect. Aesthetically speaking, English planted with a variety of textures, overlapping and blending the different levels and layers of vegetation and creating visibly impervious screens. The great variety of species used throughout the garden and within each bed allowed for a mixture of different foliage textures creating a "tapestry of foliage" not always possible when fewer plant types are used.

The predominant landscape style in which the garden was developed over the years and the style which Carl S. English appears to have adopted, is known as the English Landscape Style. Because the

style in which the garden was developed is important to the historic character of the entire grounds, a discussion follows.

3.03.3 The English Landscape Garden Style

The English Landscape style, known by a number of different names such as the Gardenesque School of Landscape, the English Landscape Tradition, or the Naturalistic style, originated in the landscape design of 18th century English country estates and later in 19th century public park design. Factors typically cited as having influenced this landscape style include a revolt against the then predominant formal topiary gardens of England, Romanticism as manifested in poetic writings and the landscape paintings of Claude Lorrain or Salvator Rosa, and the love of nature (idealized and stylized as it was).

The English Landscape style, popularized in England by Lancelot "Capability" Brown (1716-1783), "abandon[ed] the straight lines, symmetrical designs, and manicured flower beds seen in formal designs. Instead the landscape [drew] inspiration from nature with curving lines, scenic vistas, broad lawns or meadows, large shade trees and thick shrub borders" (Mendelson 1986). The concept of "nature" this style drew from was that which is gentle and pastoral; "that of the English lowlands with flowing curves of landscape and river" (Turner 1986 p33). Highly acclaimed English Landscape Gardener, Gertrude Jekyll (1843-1932) referred to this style as the "free school" and explained that "...it teaches us to

form and respect large quiet spaces of lawn, unbroken by flower beds or any encumbrance; it teaches the simple grouping of noble types of hardy vegetation, whether their beauty be that of flowers or foliage or general aspect..." (in Turner 1986, p34). In the early 1800's this style was often adopted by botanical enthusiasts to display their plants and trees to the best advantage.

The English Landscape style was brought to the United States in the mid to late 1800's by Landscape Architect Frederick Law Olmsted. Olmsted is well known for his design, in partnership with Architect Calver Vaux, for New York City's Central Park (1858) and Brooklyn's Prospect Park (1866-67), and for the chain of parks and parkways in the City of Boston (1870's-80's). Olmsted recognized and adopted the English Landscape style's "new type of spatial form with curving boundaries of untrimmed vegetation...floored by the undulant surface of the land..." (Newton 1971, p220). This tradition was brought to Seattle by Olmsted's two sons, Frederick Law Olmsted, Jr. and Charles Olmsted. The Olmsted Brothers are known in Seattle for their designs for the Alaska-Yukon-Pacific Exposition (later developed into the University of Washington campus), Volunteer Park, the University of Washington Arboretum, and a number of curving boulevards which connect these and other parks throughout the city.

3.03.4 The English Landscape Style as Reflected in the Carl S. English, Jr., Botanical Garden

With the predominant landscape design style well introduced to Seattle through the Olmsted Brothers, it is understandable that the Lock's garden was developed in this popular manner. The Arnold Arboretum, part of Boston's chain of parks, and the University of Washington Arboretum, although both much larger than the Carl S. English Garden, more than likely acted as precedent, influencing the fashion of garden developed at the Locks.

From the discussion above, particular words or phrases can be singled out which describe the English Landscape Style. Table A does this and indicates areas which illustrate these attributes in the Carl S. English, Jr. Garden.

TABLE A. Attributes of the English Landscape Style and Its Application to The Carl S. English, Jr. Botanical Garden.

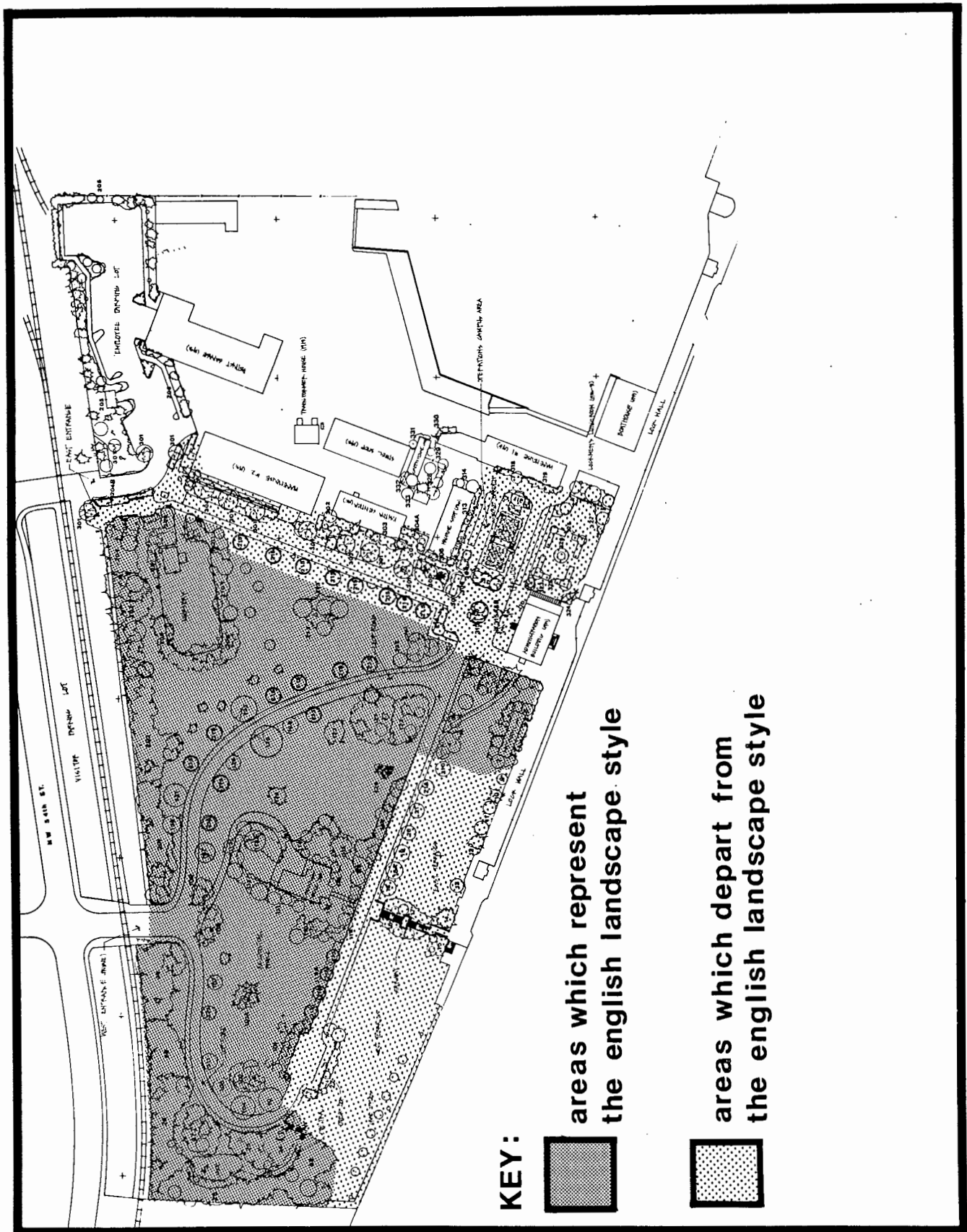
<u>Landscape Attribute</u>	<u>Areas within Garden Representing Attribute</u>
sinuous and flowing lines and boundaries	beds along north property line; curvelinear road and walkway
asymmetry	entry walk - open lawn to west, enclosed by buildings to east; most planting beds
informal edges	Cove; amorphous shaped planting beds; untrimmed vegetative borders
scenic vistas	overlook; view across open lawns
broad, unbroken lawns/meadows	open lawns
large shade trees	throughout site
thick shrub borders	alcove good example; all along north property line; corners
grouping of trees	Beds 212/213; 121/122; 206-211
idealized nature	entire site
gentle topography in upper areas	loop road leading around knoll;
untrimmed vegetation	most of planting beds
undulant surface	topography of upper areas of site as originally laid out by C.F. Gould

As can be seen from the above table, much of the landscape design of the garden does represent the English Landscape style; some attributes of which were present in the original layout by Gould

(e.g., curving roads and walks, undulating topography). There are instances, however, in which the design of the garden does depart from this style. This can be seen in the formal flower beds to the east of the Administration Building and the straight lines of the entrance walk, the drive parallel to and above the lock wall, and the terraced slopes. Straight lines, though, are not completely foreign to parks designed predominantly in the English Landscape style. For example, the "Mall" in New York City's Central Park, one of this country's first parks designed in the English Landscape style, is a straight walk which cuts diagonally through the south east section of that park. However, the landscape character of the Carl S. English, Jr. Garden, as a whole, does reflect the English Landscape style described above and measures to preserve this character should be considered (**Map H**).

3.04 CURRENT GARDEN/GROUNDS DEVELOPMENT - 1974-1989

In 1974, after 43 years of service to the botanical development of the garden, Carl S. English retired from the U.S. Army Corps of Engineers' Lake Washington Ship Canal Project. Walter L. Lyon, who began working at the locks in 1963 as an assistant gardener, was promoted to lead gardener and took charge of the garden until 1978. During the time in which he acted as lead gardener Lyon maintained the garden in a manner similar to Carl English. Having worked with English for over 10 years, Mr. Lyon was very sympathetic to English's maintenance practices.



Map H. Areas Representing the English Landscape Garden Style in the Carl S. English, Jr. Botanical Garden

Since 1978 to the present Michael Fleming has been the project's lead gardener (promoted to horticulturist in 1981). Mike Fleming, with an associate degree in horticulture from Edmonds Community College (1973), was employed as assistant gardener in 1974 after Lyon was promoted to lead gardener. Walter Lyon retired in 1978 and Fleming was promoted to lead gardener at that time. John Martin has been Fleming's assistant since 1980.

3.04.1 Sources of Change to the Garden

Since Carl English retired, changes to the character of the garden have taken place essentially under the direction of three forces; 1) the natural maturation and mortality of plant material, 2) incremental changes in maintenance and development by the lead gardener/horticulturists, and 3) redesigns done at the U.S. Army Corps of Engineers Seattle District Office. These sources of change are discussed generally below with a few specific examples used to illustrate points. More specific significant changes which have taken place are listed in bed by bed and area by area in Appendix B.

As is natural, aging, disease, and cold weather have led to the death of some plant material which was planted by Carl S. English, Jr. Due to overcrowding by mature plants some vegetation has been removed. It is recognized that many of the trees and shrubs were planted too close together (personal communication Fleming, Kruckeburg). Where possible, plants are transplanted to areas

which are more conducive to healthy growth. In the mid 1980's Fleming began a program to re-establish many of the species which have been lost. To guide plant replacement Fleming uses the list of plants Carl English compiled in 1969 for the XI Botanical Congress (U.S. Army Corps of Engineers 1974). Cuttings or seeds are collected from plants under stress so that an attempt to replace these plants with the same genetic material can be made.

The second source of alteration to the garden is the incremental changes the lead gardener/horticulturists have made over the past 15 years since Carl S. English retired. Planting beds have been enlarged, new ones have been added, and new individual trees planted. In the four years Walter Lyon acted as lead gardener few dramatic changes occurred. As stated above, Lyon maintained the garden in much the same manner Carl English had. A few new plants were planted but for the most part the garden remained the same. A greater number of changes have occurred in the eleven years following Lyon's retirement.

The need to accommodate the increased number of visitors to the project and many more years of plant growth and death have influenced new garden development. The most evident changes which have taken place under the direction of Mike Fleming have been: 1) the addition of the "cove trail", a small loop trail at the west end of the reservation added in 1981 (photo 35), 2) the addition in 1988 of a rose garden in the administration/operations campus

area (photo 36), 3) a greater variety and use of colorful annuals in the beds east of the Administration Building (compare photo 37 to 34), and 4) the recent addition of 8 individually spaced trees in the open lawn just west of the entry walk. These changes are discussed in greater detail in Appendix B.

In addition to these direct physical changes certain maintenance procedures Carl English employed to protect plants and beds from public use are no longer practiced. English was less than tolerant of general public use of the garden and did not allow picnicking or active play on the lawns. Concrete posts with cable strung between them or wooden fences were placed around beds, along both sides of the stairway leading down from the Cavanaugh House, and along the top of the terraced hillside running parallel with the road (photographs 11, 13, 17, and 33). Water sprinklers were turned on in the open lawns to discourage use. English saw the primary (only) role of the garden as a botanical display, not as a park and least of all as a playground.

Today, although the primary role of much of the locks grounds is still seen as a garden, greater tolerance of the grounds for uses other than botanical appreciation is afforded. Fences for the most part have been removed from within the garden. Part of a wood picket fence exists in bed 118 (photo 33) and a wooden fence is located behind the Cavanaugh Residence. Fleming removed the concrete and cable barriers from all of the planting beds but then

replaced one around Bed 212/213 due to extensive compaction.

The third source of change to the lock grounds since 1974 has come from the designers associated with the Seattle District Office of the U.S. Army Corps of Engineers (the District Office). In 1977 the Carpenter Shop was converted into the Visitor Center. An entry plaza including two concrete benches, concrete planters, a "Visitor Center" sign, and a re-configured planting Bed 302 designed by District Office personnel were built at this time. At the south Visitor Center exit, Bed 304A with a chain link fence and gate were added to guide visitors back onto the main walkway and away from the maintenance area.

Under the direction of the 1977 Master Plan structural changes to the grounds have or are scheduled to take place. Phase I to the entryway re-development was completed in 1980 and included a new design for the front (north east) entrance and a new employee parking lot. The design for this was done by the Seattle Landscape Architecture firm of Carothers and Associates. The existing iron gate and fence with concrete posts (photo 30) were removed and replaced by a new gate and fence system of two separate entrances; one for pedestrians and the other leading east into the employee parking lot. Three wood and steel benches were added and the sidewalk widened. Unlike most of the plant material found on the lock grounds, the plants used were specified by the landscape architecture firm and purchased for this improvement. Some of the

plants chosen are repeated in massings of single species (e.g., Beds 204A and 204B). This design technique is not consistent with the prevailing style of single specimen plants as found in most beds within the garden. (See points 1 and 15a-c in Section 5.0)

4.0 SITE ANALYSIS

The site analysis which follows documents the garden as it appears in its present 1989 state (Map E). Following the general site analysis, are bed by bed and area by area descriptions which incorporate both historic and present day features.

4.01 SITE DESCRIPTION

4.01.1 Context

Two Seattle communities lie on either side of the Hiram M. Chittenden Locks; Ballard to the north and Magnolia to the south. Shilshole Bay lies to the west and the highly urbanized and industrialized areas of Salmon Bay and Lake Union to the east. The majority of the seventeen acre locks reservation, including the garden, lies along the north side of the waterway. To the south, opposite the garden, lie the fish ladder operated by the U.S. Army Corps of Engineers and the city-operated Commodore Park. A visitor parking lot runs parallel to and the length of the north boundary line of the reservation. The City of Seattle leases this land from the owner, Burlington Northern Railroad. Northwest 54th Street, an east-west arterial street and the main access route to the locks, is located north of the parking lot.

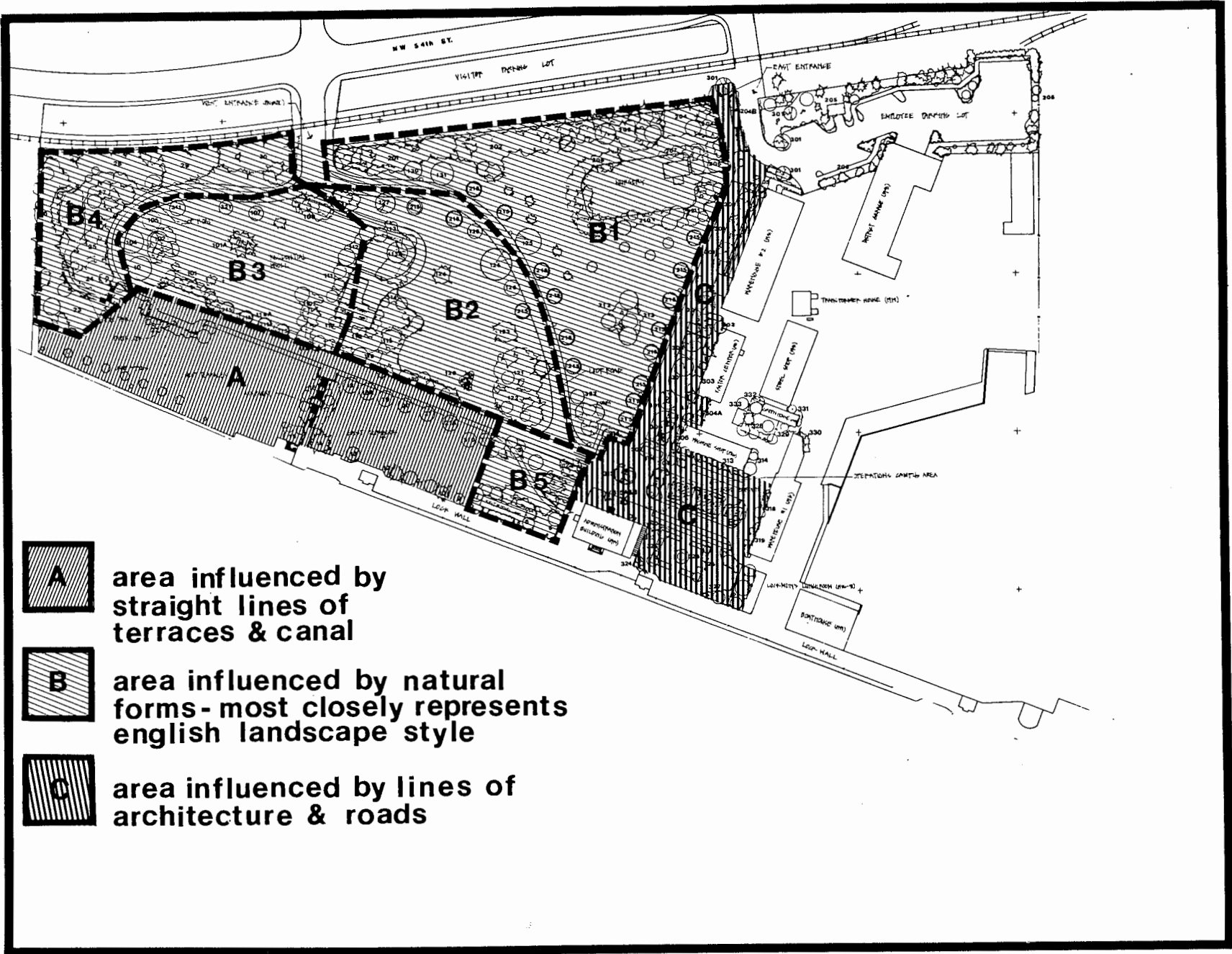
4.01.2. Organization of Spaces

The locks grounds can be divided into areas of public, operations, and private use as depicted in Map G of Section 3.02. The discussion which follows and Appendix B are concerned with the public use areas north of the lock wall, the portion of the garden surrounding the Cavanaugh House, and the vegetation surrounding the greenhouse and certain maintenance buildings.

The public and operations areas are basically divided by the entrance walkway into east and west portions of the grounds. Fourteen of the seventeen structures used for operational purposes are located east of this entryway. These structures and surrounding roadways are arranged on a modified grid perpendicular to the waterway. West of the walkway the grounds are dominated by the garden with its open lawns, specimen trees and shrubs, and the roadway\walkway encircling the well hidden Cavanaugh House and residential knoll.

Map B in Section 1.0 illustrates the areas with which this report is primarily concerned; the area considered the garden. For the purposes of describing the garden and its organization of spaces, the western portion of the grounds are further divided into three main areas (A-C) as illustrated in **Map I**.

Map I. Organization of Spaces in the Garden



A area influenced by straight lines of terraces & canal



B area influenced by natural forms - most closely represents english landscape style



C area influenced by lines of architecture & roads

Area A

Area A runs adjacent to and parallel with the lock wall and waterway. The five foot terraces characterize this area (photo 38). The straight lines of the lock wall are repeated in the terraces, the lines of trees found both at the top and bottom of the terraces, and in the road and walkway at the top of the slopes. This area is steep with an elevation gain of over 35 feet at the western (steepest) end. The steepness and terraces taper off toward the east end.

A concrete stairway bisects the slope dividing the terraces into east and west sections. The stairway has five landings including both the top and the bottom landings. The top landing (9 x 25 feet) is edged by a concrete curb 6-12 inches high, changing with the height variation of the surrounding topography, and 17 inches wide. This curb extends the whole length of the stairway on both sides. A metal hand-rail painted green runs the entire length of the steps (photo 39). This was added in the early 1980's. Located eight and ten steps down from the top landing, two rock retaining walls approximately one foot in height, hold back soil and vegetation. The middle landing features two original concrete benches. Vegetation on both sides of the stairway (beds 16 and 17) includes a thick array of ground cover and mature trees and extends 8-10 feet from the steps. At the bottom of the stairway the eight foot wide sidewalk jogs eastward around a steep thickly vegetated bank (Bed 15) and then continues 25 feet or more where it meets the

lock wall. A path, leading to the western half of the terraced slope, has been worn to the west of the bottom landing.

The concrete overlook is 17 x 77 feet. The solid concrete wall is 2 to 3 feet high from the sidewalk level and 3 to 8 feet high from the slope below. The wall is cut into a step-like pattern toward the top and the corners of both the wall and the curb separating the sidewalk from the road do not meet directly but jog out forming an interesting edge (photo 40). A single backless concrete and wood bench sits at the center of the overlook sidewalk. Vegetation surrounding the overlook (Bed 22) is low in the front maintaining views south to the water. Visibility is blocked at both ends by tall trees within Bed 22 and by the trees in Beds 16 and 17 surrounding the stairway.

Seven crabapple trees line the bottom of the western terraced area and mixed species line both the top and the bottom of the terraces in the eastern portion.

Area B

Area B is the largest of the three areas delineated here and, due to its size has been further divided into five sub-areas (1-5). On the whole, this larger area, which best represents the English Landscape Style, is characterized by open lawns, curvilinear roads and pathways, and naturalistic borders and beds of vegetation (photos 41 & 42).

Sub-area B1 is to the west of the entrance walk. This area is relatively flat with depressed areas which collect water (around Beds 212/213). A thickly vegetated border along the north property line and surrounding the nursery define the area to the north. Specimen trees line the walkways surrounding this area. Beds 212/213 combine to make one large thickly vegetated island in the center of the lawn. In anticipation of a proposed path leading across the lawn, eight individually spaced trees were planted in 1989 in the open lawn in between Beds 212/213 and the nursery. The lawn leads around to the north of the nursery but, due to canopy growth, the grass has died and access has been cut off by shrubs and a new bench placed in front of Bed 204A. This area is further discussed in Section 5.03 under Recommendations.

Sub-area B2 rises quickly up to the east half of the residential knoll. A variety of trees line the curved roadway and the open grass lawn is bordered by the plants in Beds 120-123 to the south and to the west by Beds 113-115 which help to hide the Cavanaugh House from public view. The thickness of surrounding vegetation, which blocks views, and the steep slope on the north-east side, which well defines the edge of the space, gives this area a sense of seclusion. The view northeast from the slope looks back toward the expanse of the open lawn of sub-area B1.

West of the Cavanaugh House is sub-area B3 which is, in

description, similar to section B2. The terrain levels out here and the area is slightly larger making the lawn area appear more open than on the other side. Beds 101 and 118A border along the straight portion of the loop road creating a barrier between the south edge of the lawn and the road. These beds cut off circulation across the lawn in a north-south direction. Three clumps of trees and three individual specimens are scattered in the open lawn, concentrated primarily toward the edges of the lawn. Beds 110-112 hide the Cavanaugh House from view on this side.

The "Cove", a small opening within a thickly wooded area at the far west end of the reservation, is sub-area B4. A patch of grass lying at the center of the opening is edged by a wide gravel trail on the east and south sides. Three entrance points access this area: the cove trail from the south, a middle gravel surfaced entrance point, and a north entry which appears very much like a driveway. An original solid concrete bench, similar to those found on the stairway in Area A, is located at the center of the middle entrance. The cove trail leads out from the south end of the cove down 5 railroad tie and gravel steps set at slight angles to each other in order to make a turn toward the east. The gravel trail is edged by wood boards and a concrete post and cable rail marks the south side. Rough concrete chunks are used as a retaining wall at one point along the trail. The short trail takes the visitor down into the wooded hillside and up a tie and wood railing stairway back to the main loop road (photo 35).

Sub-area B5 is a small area just west of the Administration Building. This area is included in Area B rather than Area A, to which it is physically connected, due to a similarity in appearance and its irregularity in bed form. This area contains a short curving sidewalk and 7 small beds. The public rest rooms are well hidden from the north by surrounding beds 6 and 7. The lawn of this section opens up and leads into the terraces of Area A.

Area C

Area C of the garden includes the entrance walkway and the administration/operations campus area; the "campus" being the area east and north-east of the Administration Building. Area C is a mixture of formal and informal aspects. The formality of this area reflects the surrounding architecture and roadway system. The entrance walk is lined on the east side by 7 oaks and by 9 evenly spaced Scarlet Horse Chestnuts on the west. A clipped laurel hedge reinforces this line of the walk and shields Warehouse #2 from public view. This line though, is interrupted by a break in the hedge and by the visitor center plaza and bed 305 where a more naturalistic plant massing is used.

Trees, 8 cherries, 2 oaks, and single *Umbellularia californica* (Oregon myrtle) and *Magnolia*, are also used to line the operations campus sidewalks. The flowers of both the rose bed and the beds directly east of the Administration Building contribute to this

) formality. The rose garden is rectangular shaped, edged in by a low boxwood hedge and a line of marigolds along a bisecting grass-concrete path. Two wood trellises are located along the path. The formal layout of the set of flower beds directly east of the Administration Building (Beds 325 and 326) is made up of four rectilinear corner beds surrounding a circular center bed. These are filled with a diverse array of colorful annuals and some perennials (photo 37). Informal foundation beds, planted sometime in the 1940's, are used against Warehouse #1, the Machine Shop, and the Lockmen's lunchroom; the latter to such an extent that the structure is barely visible from the west. The irregular, overgrown nature of these beds and those found at the ends of the flower beds (316, 317, 323, 324, and 327) take the edge off of the formality of the rest of the area, giving it a less manicured appearance.

4.01.3 Uses

) Public use of the grounds was historically and is today primarily passive recreation (e.g. observation of the locks, fish ladder, and maritime traffic). The heaviest use areas are along the entrance walk, the lock walls and gates which access the fish ladder, the terraces, and the flower beds east of the Administration Building. Historically, access through the site could be made by car and the roads were open to automobile traffic and parking. Today, the roads are used by pedestrians. In the future, with the completion of Phase II of the entryway redevelopment, all vehicle, except for

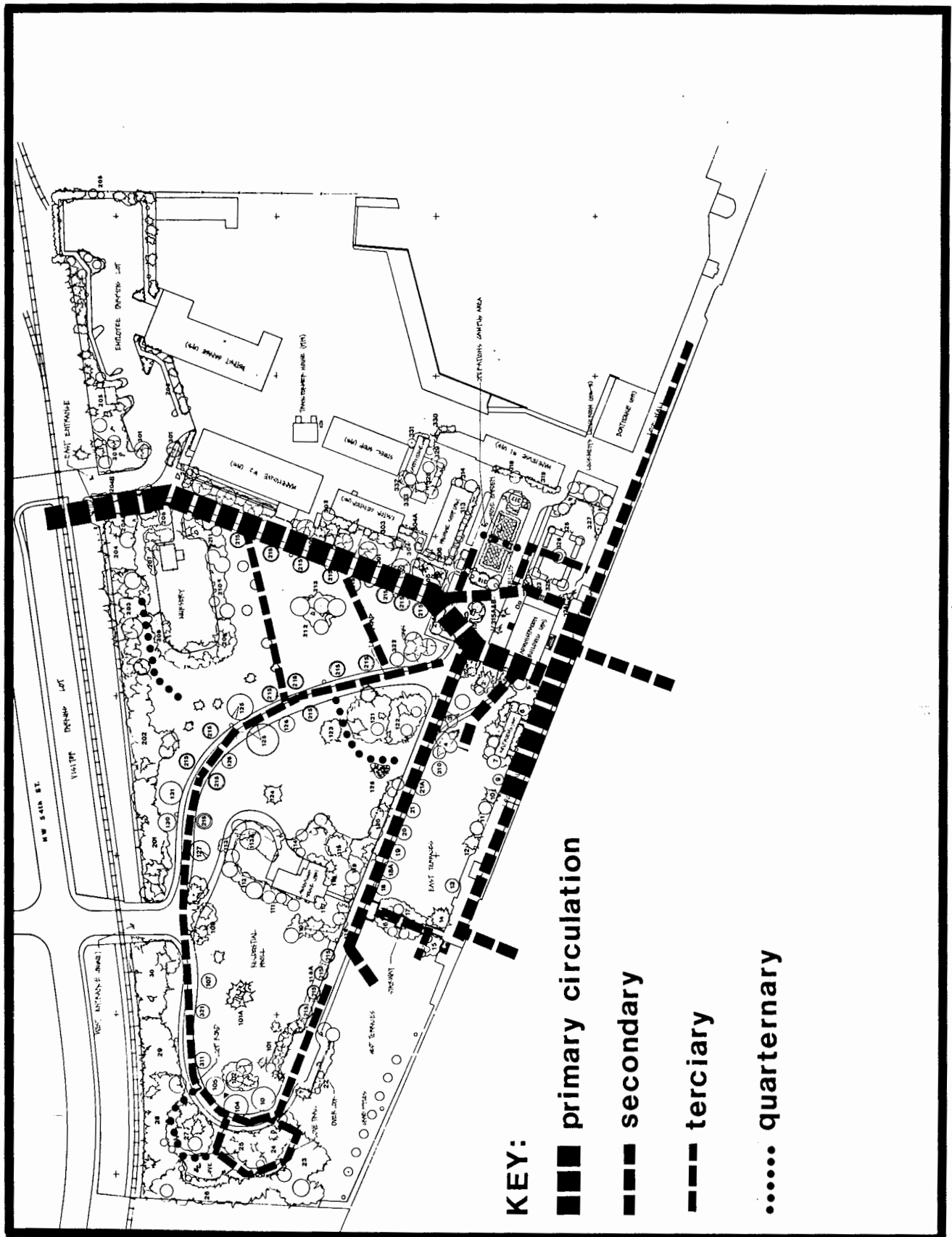
emergency vehicles, will be routed through the maintenance area east of the main entrance walkway.

Picnicking takes place most often on the terraces, but picnickers can be found in the open lawn of Area B1. According to the 1977 Master Plan only 4-10% of the locks' visitors come to observe the garden. According to the Master Plan (1977) ten percent is considered to be the garden's limit of use without detrimental effects.

4.01.4 Site Circulation

Map J shows generalized levels of circulation traffic through the site. As stated above, circulation within the reservation was historically open to automobiles. The north west entrance was used by the public and cars parked along the loop road. Given this, visitors were most likely spread throughout the grounds more than is found today where the visitors are concentrated along the north east entrance walk and lock wall. Today primary visitor circulation through the grounds is in a north-south direction from the visitor

parking lot through the north east entrance gate and plaza, down the entrance walk (with approximately 15% of the visitors stopping at the Visitors Center), past the Administration Building on the west side, and to the lock wall. The flower beds may attract some visitors to pass on the east side of the Administration Building



Map J. Pedestrian Circulation within the Garden

but the large majority of visitors use the west side; a more visually direct route.

Secondary circulation through the site takes the visitor into the garden area west of the entry walk. Use of the straight portion of the loop roadway above the terraces is more frequent than the leg which curves around to the north. This straight portion of the road has good views back to the water and affords access to the popular terraces. The little spur trail in area B5 west of the Administration Building is also used for access to the terraces.

Tertiary and "quaternary" circulation routes are within the core of the garden. The north leg of the loop road and the stairway in Area A receive some foot traffic as do the cove trail, and part of the open lawns to a lesser degree. Traffic across the lawns is heaviest up and down the terraces (the east side more than the west) and across Area B1 west of the entrance walk when the visitor's destination is the terraces or other areas of the garden.

4.01.5 Views

Primary views of the canal are best from the lock wall, from the west side of terraced slopes and from the concrete overlook above the terraces. From historic photographs it appears that views to the water were more prevalent from other areas of the reservation but due to thick vegetative growth these views no longer exist. This is especially true from the stairway where Bed 15 blocks views

) to the water.

Secondary views are across the lawns to other areas of the garden. Once past the nursery driveway, the view of the garden across Area B1 opens up, giving the visitor his/her first impression of the garden and the extent to which it fills the grounds. Maintaining this openness is important to the historic design and feeling of this area of the garden. The cove trail stairway landing has a viewing spot which looks out from within the wooded hillside across the western side of the terraces toward the water.

4.01.6 Materials

The predominant landscape materials (not including vegetation) found on the lock's reservation are concrete, rock and wood; concrete being used in the original design and the wood structures added later.

Concrete is a significant historic material used extensively throughout the grounds. The original sidewalks, roadways, benches, entrance gate pillars, lamp posts, stairway and the lookout plaza are all constructed in this material. These features are consistent with the original concrete project buildings and lock wall. Low barriers used to protect beds and over-used grassed areas were also constructed with concrete post.

Small rocks are a consistent material used throughout the history

of the garden. Uses include: low (6"-16") retaining walls along the stairway, as a rockery (Beds 118-120), individually placed within various beds, and edging Bed 315 in front of the Administration Building.

A fence added in 1938 along the north project border was first barbed wire and in 1941 chain link. This fence, though, was/is screened by thick vegetation and not visible from within the reservation. Wood was used to build lath fences behind the Cavanaugh House and in Beds 118-120. Logs, found floating in the bay, were used to line beds surrounding the employee parking lot (now the nursery) and around Bed 205.

Trail edging materials do not have a precedent within the garden. Trails were not historically built as English was able to grow grass in the areas which now pose a problem.

4.01.7 Patterns

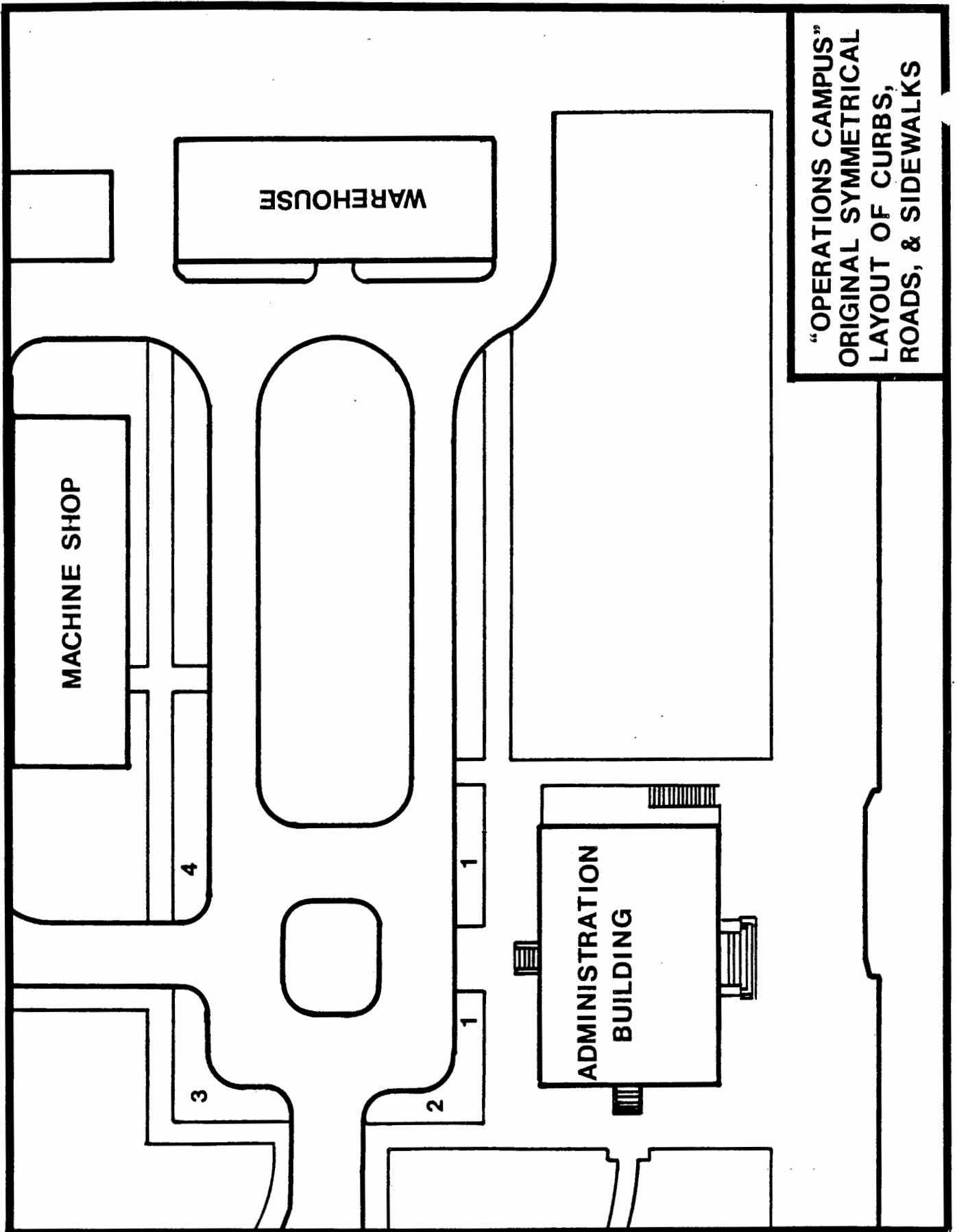
The patterns found within the garden are primarily in the concrete work and in the placement of trees. The overlook retaining wall expresses the quality of the design detail and workmanship given to the initial design of the architecture and landscape structures. The wall is cut into a three step pattern toward the top (photo 40). This pattern is slightly modified and repeated in the exterior base trim of the Administration Building and the Operation Houses. The corners of the stairway landings and the pedestals for

the original entrance gate pillars also exhibit a variation of this stepping pattern.

The aggregate concrete sidewalks, raised from the roadways by a 4" curb, are laid out in uneven squares ranging in size between 2'9" x 3' and 3' x 4'. This pattern is repeated throughout the site.

The symmetrical layout of the curbs and sidewalks in front of the Administration Building and in the operations campus area is important to the overall historic character of the lock grounds. Essentially the original layout of this area formed a pattern of sidewalks and curb cuts which lined up with one another (see Map K). In 1943 the sidewalk west of the Administration Building was widened for emergency access vehicles (area 2 on map). This process eliminated a grass strip and the curb which was aligned with the curb directly north (area 3 on map). At some point, possibly at the same time as in area 2, the grass strips directly north of the Administration Building (area 1) were removed, leaving only two small square spaces for Beds 315 A & B. The two north corners (areas 3 and 4) are still aligned and give a sense of the original intentions. (see Specific Recommendations in Section 5.0)

The even placement of trees along the roadways and sidewalks is another repeated landscape pattern found on the site. Trees are located between 20 and 40 feet on center and, given the number of trees drawn on early plans, may have been closer originally. The



**"OPERATIONS CAMPUS"
ORIGINAL SYMMETRICAL
LAYOUT OF CURBS,
ROADS, & SIDEWALKS**

Map K. "Operations Campus" Area Showing Original Symmetrical Layout of Curbs and Sidewalks. (from 1920 map LWC290)

lines of cherries (etc.) which were recently removed (October 1989) in the operations campus area also reflected this pattern.

4.01.8 Landscape Structures/Furniture

Landscape structures and furniture on the site include benches, retaining walls, rockeries, stairways, sidewalks, street lamps, gates, trellises, fences, and trash receptacles. As stated in the materials discussion many of the structures found in the garden are constructed in concrete. The original backless benches were entirely made of concrete. Later designs feature wood seats and backs (possibly from the 1940's) and the most recent benches

(1980's) are made of wood seats only. The three benches found at the northeast entrance deviate from the typical use of concrete and are made of wood with steel arm rests and legs. These are inconsistent with the garden's historic character.

The quality of workmanship and detailed design found in the construction of the overlook retaining wall, concrete stairway and landings, gate posts, and lamp posts are important to the overall character of the garden. (See discussion under Patterns)

Current structural additions to the grounds includes the cove stairway (1981) and the rose garden trellises (1988). The materials used for the cove trail (railroad ties, gravel, chunks of

rough concrete, and wood decking) are for the most part inconsistent with what is historically found on the site. The use of concrete post and cable barriers along the edge of the trail, though, was found on the site from the 1930's forward. By the fact that the trail can not be seen from other areas of the garden, its visual impact on the historic integrity of the garden is minimal.

The trellis in the rose garden is not typical of the structures found in the garden. Although the wood used in the trellises' construction is consistent with the wood fences erected by Eckerstrom and English, free standing garden furniture such as this are not found in any historic photographs. (See point 19b, Section 5.03)

4.02 DESIGN TRENDS

Table B on the following page summarizes the design trends outlined in the preceding analysis and which are described to greater detail in Appendix B (Bed and Area Description). As stated in the "Historic Overview of the Landscape", 1941 is the approximate date used for analyzing the different periods of garden development (see Section 3.01 for explanation). Point 8a in Table B uses pre-1930's rather than 1941 because Carl English began introducing different species to the garden prior to his promotion to lead gardener in 1941.

Table B demonstrates that changes to the garden have proceeded from a more formal, regular treatment of plantings, as seen in the

Table B. Design Trends observed in the layout and planting beds throughout time.

- Trends From 1915-Present
- 1 Lines of deciduous trees with no understory along all roads and walks.
- 2 Sporadic singular trees in open lawn - often evergreen
- 3 Large open lawns with borders of vegetation
- 4 Terraces left open - no vegetation planted on terraces other than next to steps and at top and bottom.
- 5a Pre-1941 (approx.)
Regular - serpentine, round, oval shaped beds of flowers
- 5b Post-1941 (approx.)
Amorphous shaped beds of mixed deciduous and coniferous woody plants.
- 6a Pre-1941 (approx.)
Singular coniferous trees accenting corners of buildings, entryway and sidewalks.
- 6b Post-1941 (approx.)
Greater mix of informal foundation plants around buildings
- 7a Pre-1941 (very approximate)
Symmetrical plantings predominate
- 7b Post-1941 (approx.)
Asymmetrical plantings predominate
- 8a Pre-1930's (approx.)
High use of common conifers and maples
- 8b Post-1941 (approx.)
High use of rhododendrons, oaks and botanical rare or interesting species - very diverse
- 9 Original design-Materials
Use of concrete features and furniture
- 10 Later additions by Carl English-Materials
Use of materials available at little cost e.g., wood fences, post and cable barriers, rock

original layout and in additions made by Eckerstrom, to one which is irregular and more "natural", as first cultivated under English. The location of individual beds essentially remained the same but the plant material changed significantly. Elements of both of these periods are instrumental in expressing the unique character of the garden and are worth preserving. Recommendations as to the specific treatment of the garden plant material and layout follow in Section 5.0.

5.0 RECOMMENDATIONS

Within the Site Analysis (Section 4.0) and Appendix B, individual landscape elements, uses, and conditions are discussed which relate to the historic character of the garden. The recommendations which follow progress from general recommendations for the site as a whole to specific ideas which will aid in the restoration or maintenance of the character of individual areas.

5.01 GENERAL RECOMMENDATIONS

Policy

1. As ten percent is considered to be the garden's limit of use without detrimental effects (Master Plan, 1977), encouraging increased visitor use of the garden is not recommended. Accomodating those visitors who seek the unique experience of a botanical garden is necessary though, and improvements to existing features may be necessary.

Design

2. New trails should not be added where trails did not previously exist.
3. Protect overused areas with cable and concrete post barriers on an as need and temporary basis.

4. When identifying plant species with markers, place the markers close to the sidewalk or place stepping stones in the bed to prevent people from walking in the beds.
5. Maintain as much grass as is possible. In problem areas reinforce grass with grass-crete or grass rings as is used successfully in the rose garden.
6. Maintain diversity and interest of plant species. Do not plant like species together in large clumps. Continue to use the garden for botanical experimentation.
7. Maintain open grass areas.
8. Maintain lines of individual trees where lines exist or existed as seen in historic photographs. Do not fill-in with understory between trees.
9. Allow vegetation to take as natural a form as possible (exception: laurel hedge on the east side of the entrance walk).
10. Maintain undulating lines along borders.
11. Maintain variety of textures, colors, and flower forms.
12. Plant beds with multiple layers of different vegetation.
13. Use exposed aggregate concrete (first choice), rock, or wood (second choices) for new structures such as steps, posts, trash receptacles, benches, and retaining walls.

5.02 SPECIFIC AREAS

14. Treatment of the Cove
 - a. Maintain open grass as much as possible. Do not allow further encroachment of gravel trail. Use grass-crete or grass rings along edges of the lawn to protect.
 - b. The Cove's railroad tie and gravel steps and the chunks of concrete retaining wall are inconsistent with historic material, design, and workmanship. Rocks, as found in Beds 118-120 and 16 & 17 could be used to retain soil.
 - c. Maintain concrete post and cable barriers.
 - d. Trail edging should be as unobtrusive as possible. Fleming has been using railroad ties which, as long as they are sunk into the ground exposing only 3'-4' of the wood, should work well. Although trail edging material

has no historic precedent, English used logs to line the employee parking lot (the present nursery) and logs were also found in Bed 205.

15. Treatment to Area Between North Property Line and Nursery
 - a. Improve the circulation behind north of the nursery. This area was originally open allowing access to the entrance walk. The grass which grew there has been over-shadowed. Although it is not feasible to replace the grass, the ground should be treated with soft, natural surface materials (eg. weathered wood chips), re-establishing its secondary or tertiary use.
 - b. Plant material, especially understory, should be enhanced to create thicker borders and provide screening between the trail and property line fence and between the trail and the nursery.
 - c. A wood lath fence, similar to those found around the Cavanaugh House, should be used to shield views into the nursery.
16. The visitor worn trail at the bottom of the stairway (bottom of Bed 16) should be reinforced with grass-crete or grass rings.
17. Bed 15 is overgrown and blocks views of the canal from the stairway. Soil erosion and water seepage are also problems with this bed. Plant material from a portion of this bed (east half) could be transplanted and lower vegetation planted to improve views to the canal from the stairway. A rockery similar to that found in Beds 118 and 119 and a series of smaller terraces could help stabilize the slope.
18. The Northeast Entrance Plaza
 - a. Bed 204A behind the single bench and Bed 205 opposite the bench should contain more diverse textures of foliage and layers of vegetation.
 - b. Replace existing benches with concrete benches.
 - c. The area behind the two benches (Bed 205) should be more typical of the lush planting beds found elsewhere on the site. Different layers, colors and textures of woody vegetation should be planted to draw visitors to the sign.
 - d. Do not use "Park Hours" sign at the front gate if the intent to view the reservation grounds is as a garden.
19. Remove the eight recently planted single trees in sub-area B1 where anticipated trail was planned. (see 21)

20. If a trail is found to be absolutely necessary to draw visitors across sub-area B1 into the garden, locate it along Beds 210 and 209. This will 1) prevent visually bisecting the open lawn and 2) get people closer to the beds.
21. The strong visual lines and patterns created by the original sidewalk layout in the campus area contribute to the historic character of the site and it is recommended that they be retained and re-established (see Map K in 4.01). Given that the endeavor to improve the entrance conditions is being undertaken with Phase II of the Entry Redevelopment, effort to restore the original symmetry of the area north of the Administration Building, rather than reduce it further, should be considered.

First, it is suggested that the existing sidewalk locations which are scheduled to be removed during the Phase II construction should be retained. A new exposed aggregate concrete surface, such as called out in the new design of the center gutter in the road/walkway, could be used to re-surface these sidewalks. Second, re-establish the appearance of the symmetrical layout discussed on "Patterns" in Section 4.01.7. This could be done through the use of different pavement patterns. Without actually reconstructing the curb and grass strip in area 2 (see Map K), different pavement types could reflect the original curved curb and the grass strip.

22. Bed 118A contains four Scarlet Horse Chestnuts (#215) in an even line with spotty understory shrubs planted below. This area could be developed in one of two manners. Either the understory could be removed and grass replanted underneath the line of trees or the layers of understory could be planted to a more dense condition as found in Beds 119 and 120 and along the north property line of the project. The first of these two recommendations is preferred in order to maintain a sense of openness in this area.
23. Rose Garden
- a. Two rose beds previously existed on the project site prior to the one which was planted in 1988 by Mike Fleming. The original rose beds were located in Beds 15 and 17 on either side of the stairway leading down the terraced slope and in Bed 315 in front of the Administration Building. Therefore, the existence of the rose garden is not inconsistent with the garden's history and should remain.
 - b. The two trellises are inconsistent with garden furniture found historically on the grounds and should be removed.

6.0 PHOTOGRAPHS TO ACCOMPANY REPORT AND APPENDIX B

- Note 1: The photographs which follow are in chronological order from early 1916 to 1989.
- Note 2: The bed numbers, areas, structures, etc. written within brackets [] under each photograph refer to the bed, structure etc. discussed within the body of the report which cite the particular photo.
- Note 3: The numbers within parenthesis () refer to the number given the particular photograph within the LWSC numbering system.
- Note 4: All photographs from 1989 (#35-42) were taken by Renee L. Freier.



PHOTO 1: Early 1916. Shows lock reservation looking east. [1, 2, 3, 101, 108, 109, 206-211, Cove, tennis court]. (no LWSC number)

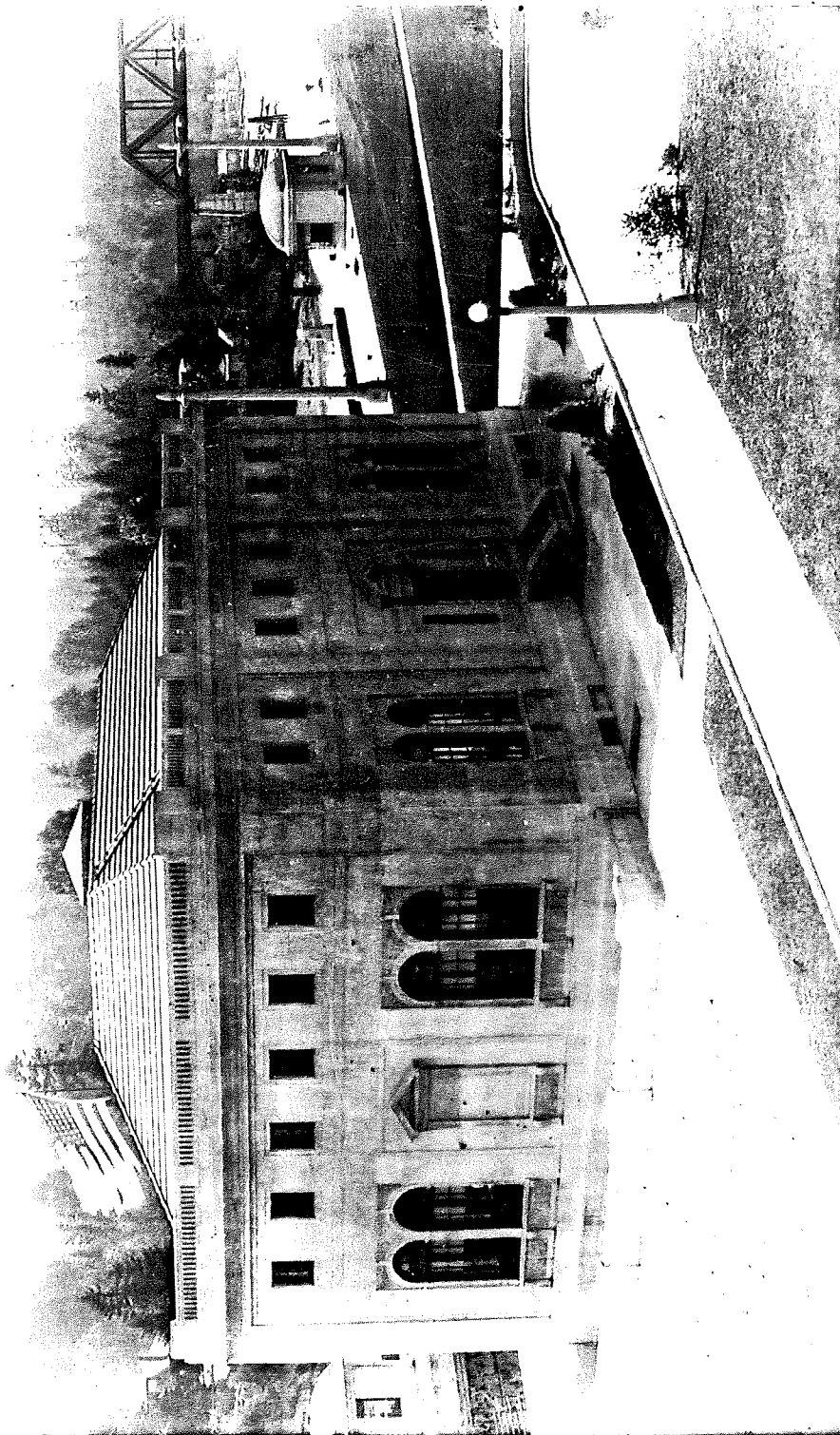


PHOTO 2: Early 1916. Slightly later than photo 1. The north and east side of the Administration Bldg. is seen here. The beds seen here were removed shortly after this picture was taken and a more formal landscape design was used - see photo 3. [12, 315 A & B, 316] (P-107)

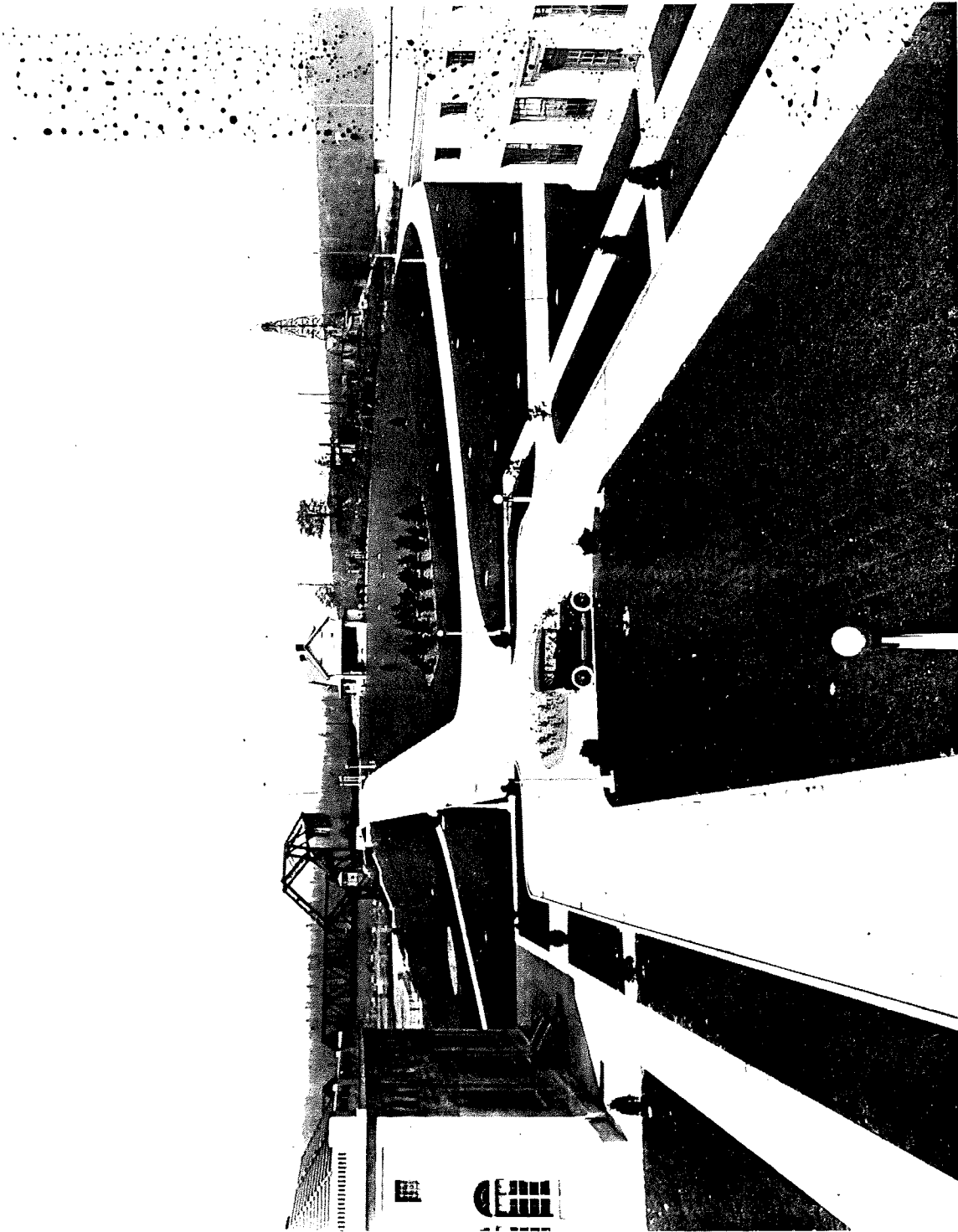


PHOTO 3: 1916. Reservation grounds looking west. Compare with photo 2. The shrubs in Beds 315 A & B, 316, and 12 no longer exist. More beds are visible here, including a round flower bed just beyond the diagonal curving sidewalk on the west side of the Administration Bldg. [4, 12, 121/122, 123, 124, 125, 201-204, 214, 306, 309, 315, 315 A & B, 316, the new rose garden location]. (P-110)



PHOTO 4: Summer 1920. The locks grounds looking north from the south side of the canal. [3, 20, 128, 305, 313, 325 A & B, the hedge along the entrance walk, the Cavanaugh House, and tennis court]. (P-59)

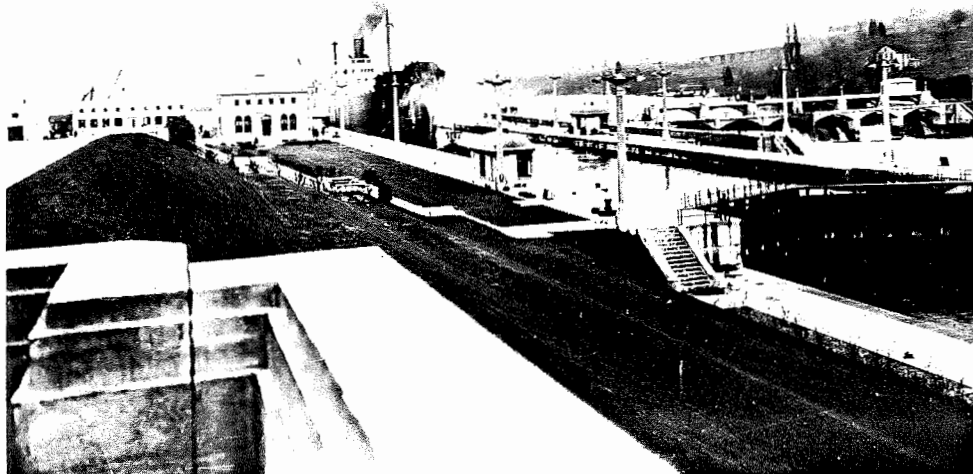


PHOTO 5: Winter 1921. Unobstructed view from overlook looking south east. [5, 15A, 16, 17] (P-53)



PHOTO 6: Locks grounds looking north from south side of canal. Outlines of Beds 325 and 326 can be seen in the right hand side of the photo showing that these beds were designed earlier than other garden history reports have stated. This photograph is mis-dated Dec. 1920. The size of specific trees and existence of Beds 325/326 date this sometime in late 1920's. (P-56)



PHOTO 7: 1928. View of reservation from west end looking east. [2, 15A, 16, 17, 22, 23, 101A, 102, 105, 108, 109, 110, 111, 113, 316, 317, 318, 319, front of Cavanaugh House]. (no LWSC number found)

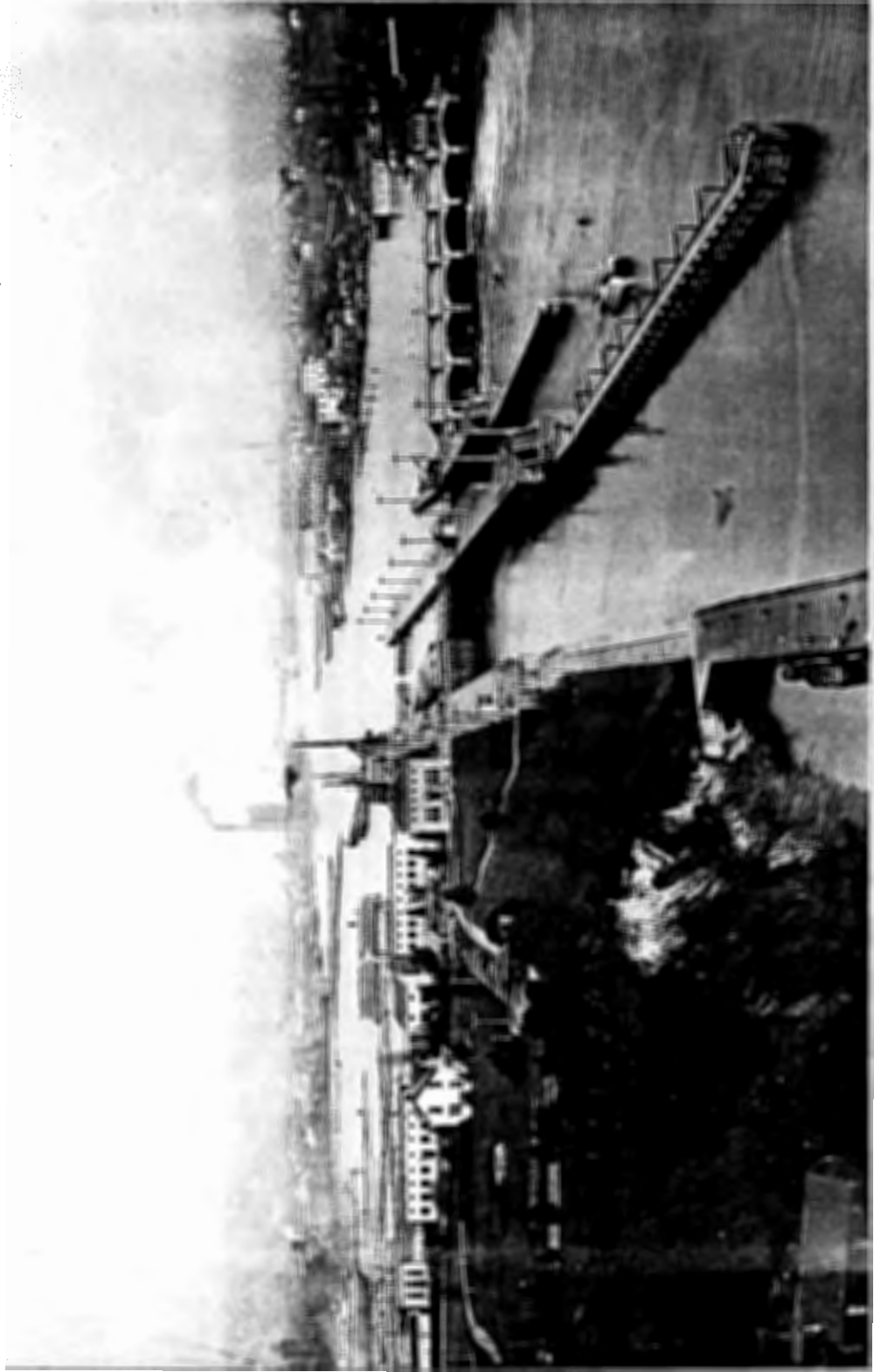


PHOTO 8: 1929-1930. View of reservation from the west end looking east. [1, 2, 5, 101, 101A, 110, 111, 114, 303, 315, 316, 317, 318, 319, 322, cove, fountain, rose garden area-crescents, line of maples on loop road]. (no LWSC number)

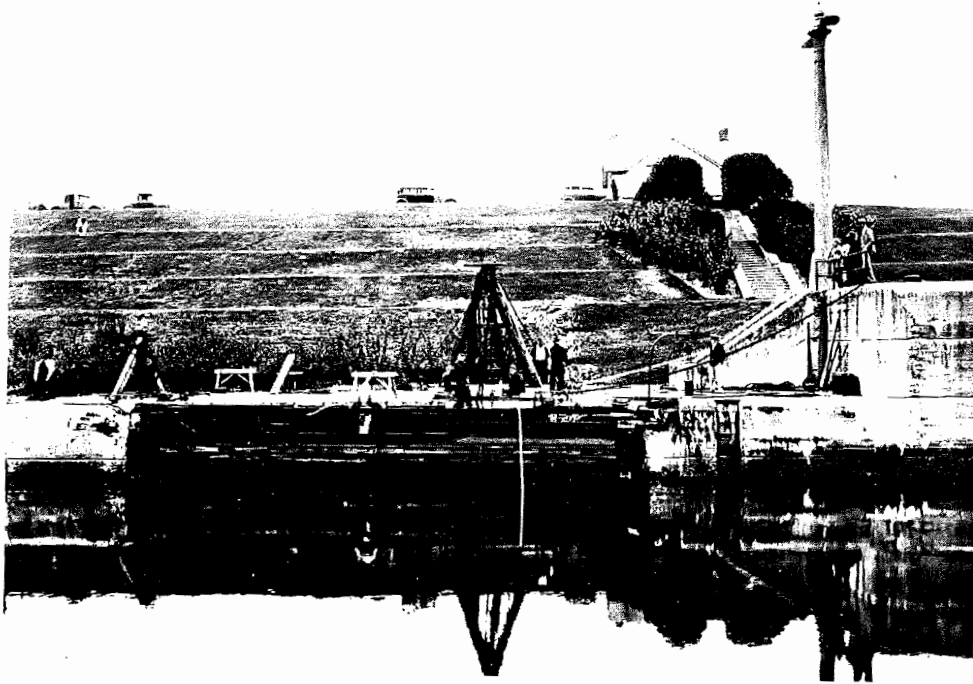


PHOTO 9: 1931. Terraced area as seen from canal. Cavanaugh House seen in background. See photo 12 for later development of beds. [15A, 16, 17]. (P-31)



PHOTO 10: 1937. View north to Administration Building from spillway. [1, 2, 5, 12, 323, 324, 325, line of poplars in background, roped off lawn]. (P-2)

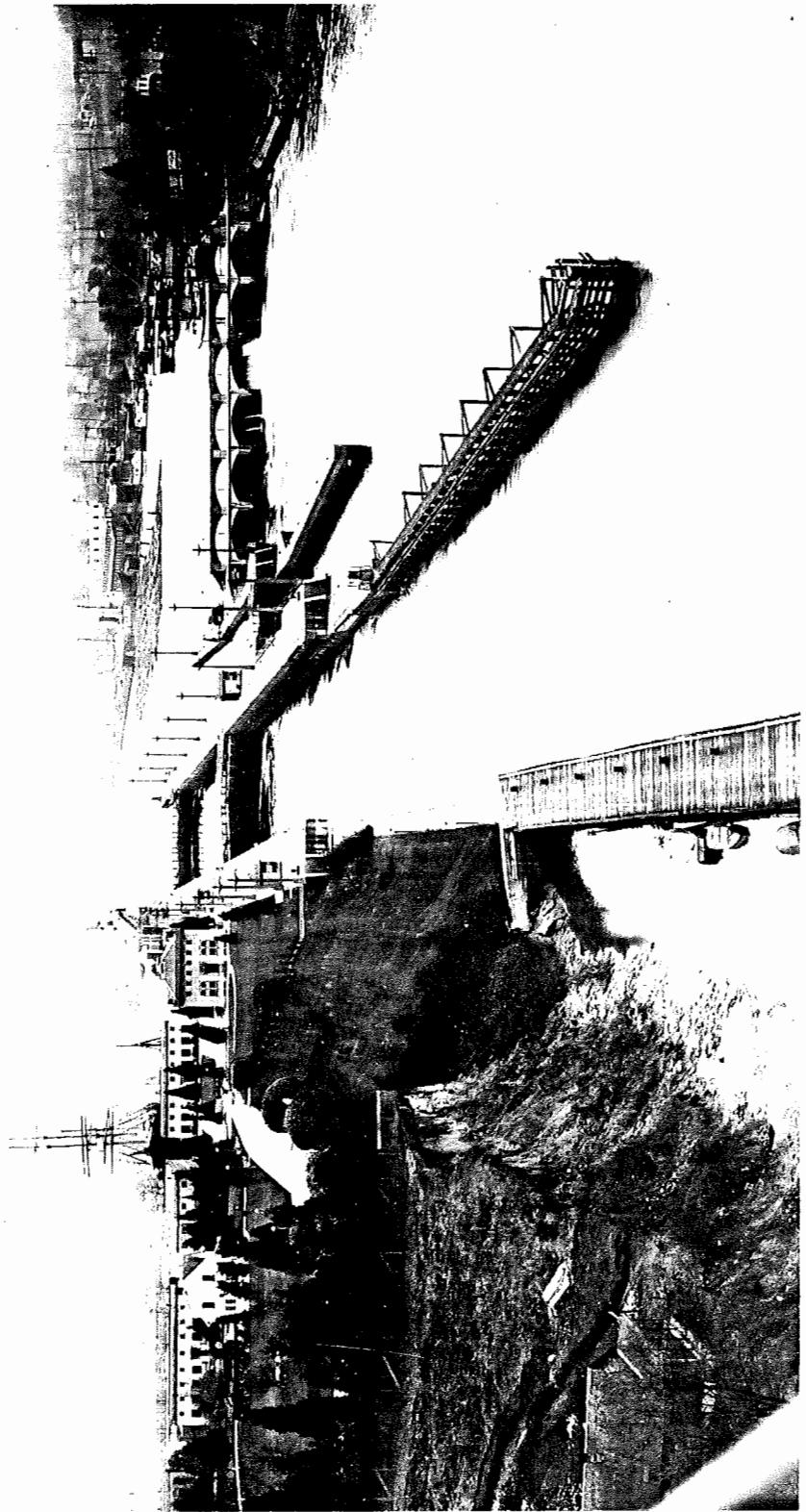


PHOTO 11: 1939. Reservation seen from west end looking east. Grounds and beds are formal and neatly manicured. [101, 110, 118-120, 303, fence along top of terraces, fountain]. (P-1)

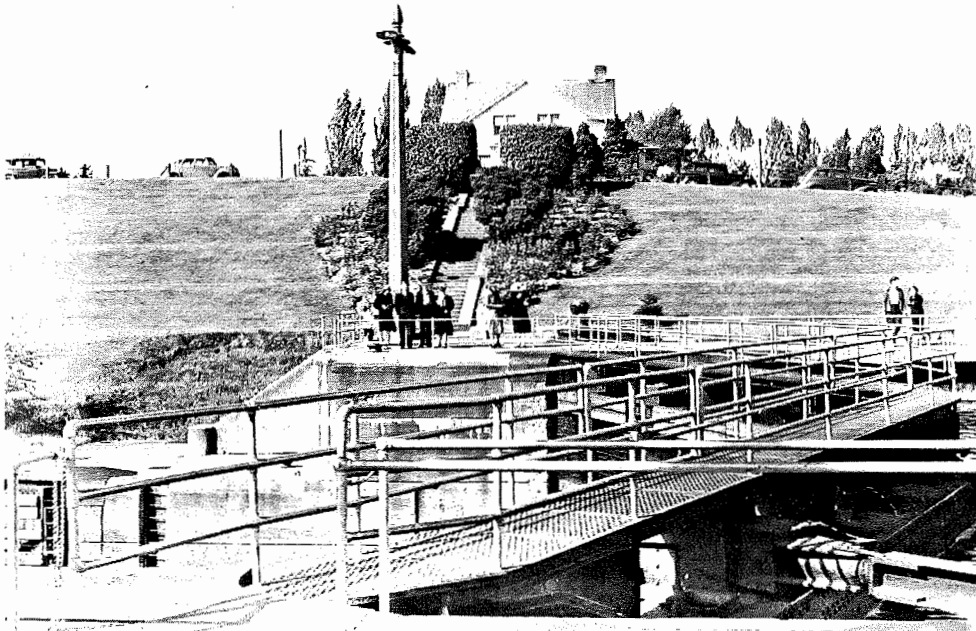


PHOTO 12: 1940. Terraced area as seen from locks. [15, 16, 17]
(P-64)



PHOTO 13: 1940. View of reservation from east end looking west.
[2, 3, 4, 316, rose garden area, front of Admin. Bldg.]. (P- 60)



PHOTO 14: 1941. View of greenhouse. (LWSC 80)



PHOTO 15: 1941. Warehouse #2 as seen across the lawn of sub-area B1. [125, original maples, clipped hedge]. (LWSC 90)



PHOTO 16: 1941. Aerial view of central and east end of reservation grounds. The orderly and formal placement of plant material, especially in the operations campus area, can be seen here. [4, 110, 115, 201-204, 215, 323, 324, 325, 325 A & B, 326]. (LWSC 69)



PHOTO 17: 1947. View west from the top of the Admin. Bldg. Construction of rest rooms. [4, 16, 17, corner of Bed 5, barrier at top of terraces]. (LWSC 513)

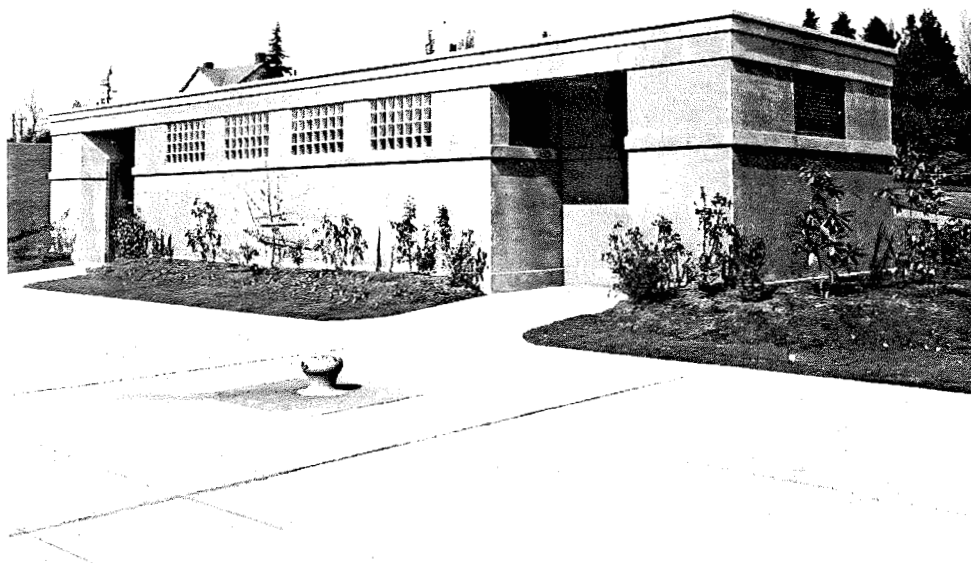


PHOTO 18: 1948. Completed rest rooms with newly planted Beds 6-8. [6-8]. (LWSC 592)

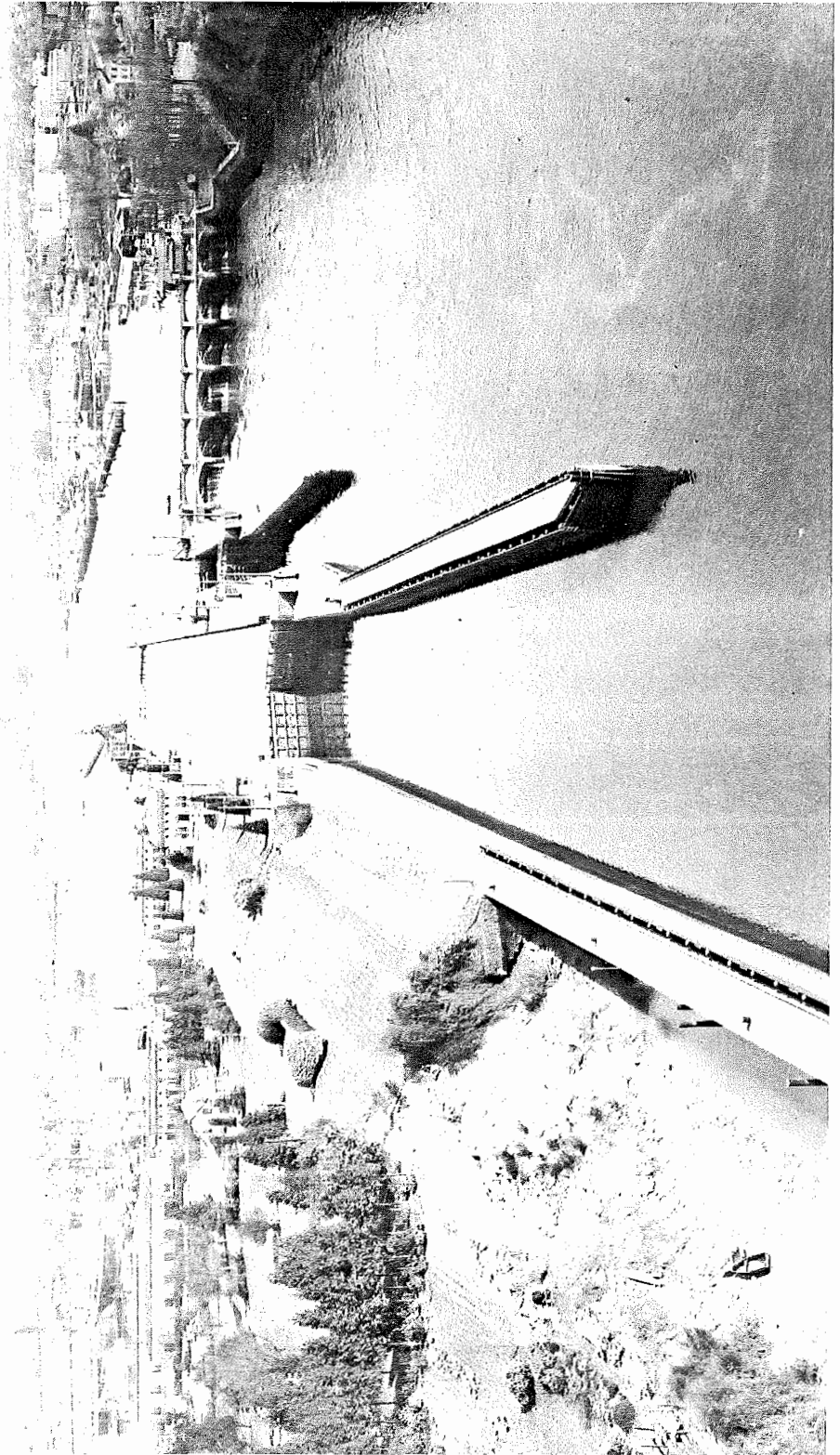


PHOTO 19: 1948. View east from west end. Still shows some formal influence. [1, 2, 3, 4, 15A, 112, 113, barriers above terraces].
(LWSC 588)

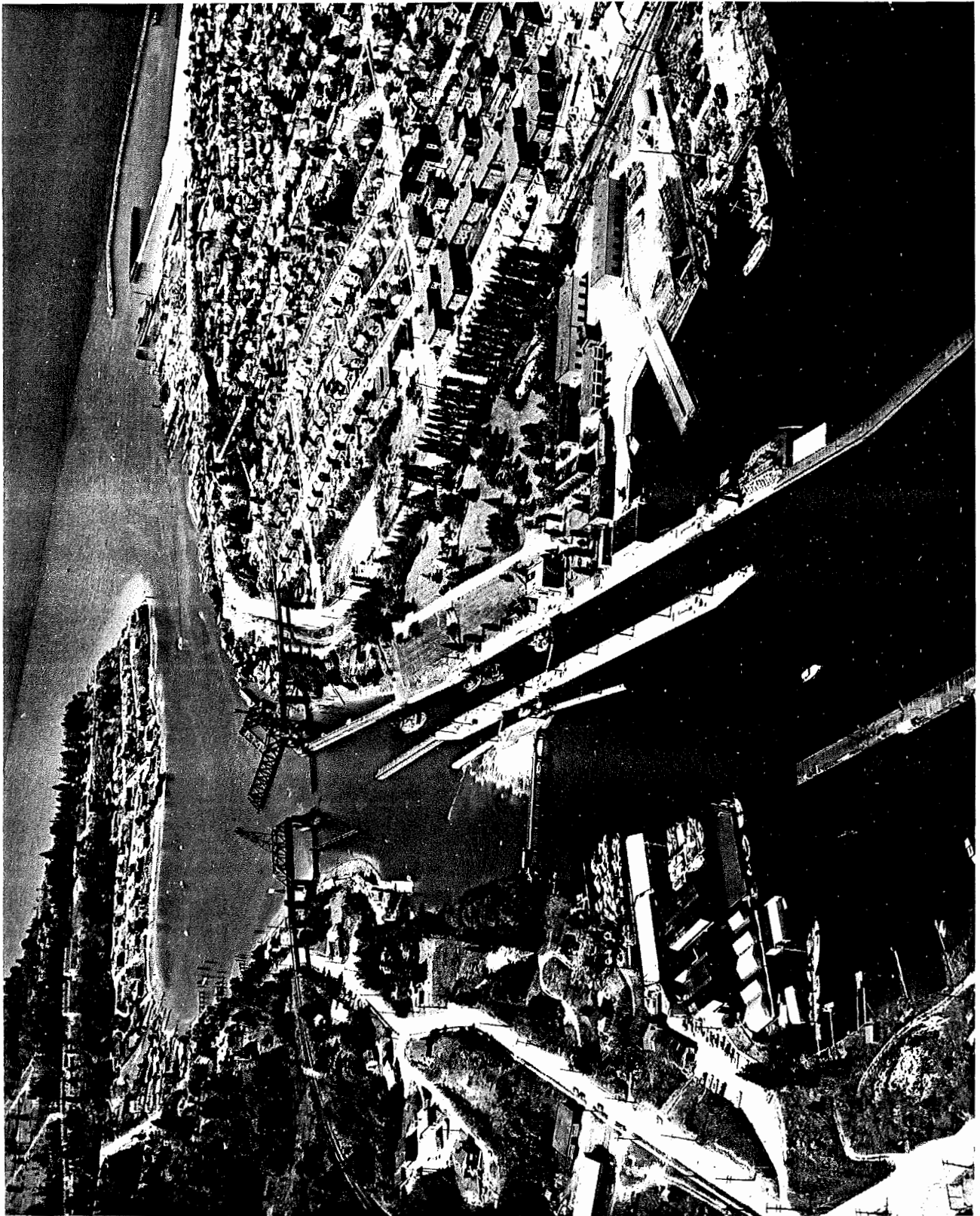


PHOTO 20: June 1958. Aerial of reservation from the east. [105, 107, 201-204, 306, 313, 323/324]. (LWSC 864)



PHOTO 21: 1956. Front of Administration Building and lockmen's uniforms. Compare to photo 22 [315, 315 A & B]. (LWSC 800)



PHOTO 22: 1959. Bed 315 and Lake Washington Ship Canal and Locks sign without shingled roof. (LWSC 895)



PHOTO 23: January 1962. Aerial view of the central and west end of the locks grounds. The symmetrical flower beds on either side of the Cavanaugh House can be seen here. [101, 102, 110, 115, cove, north west leg of the loop road].

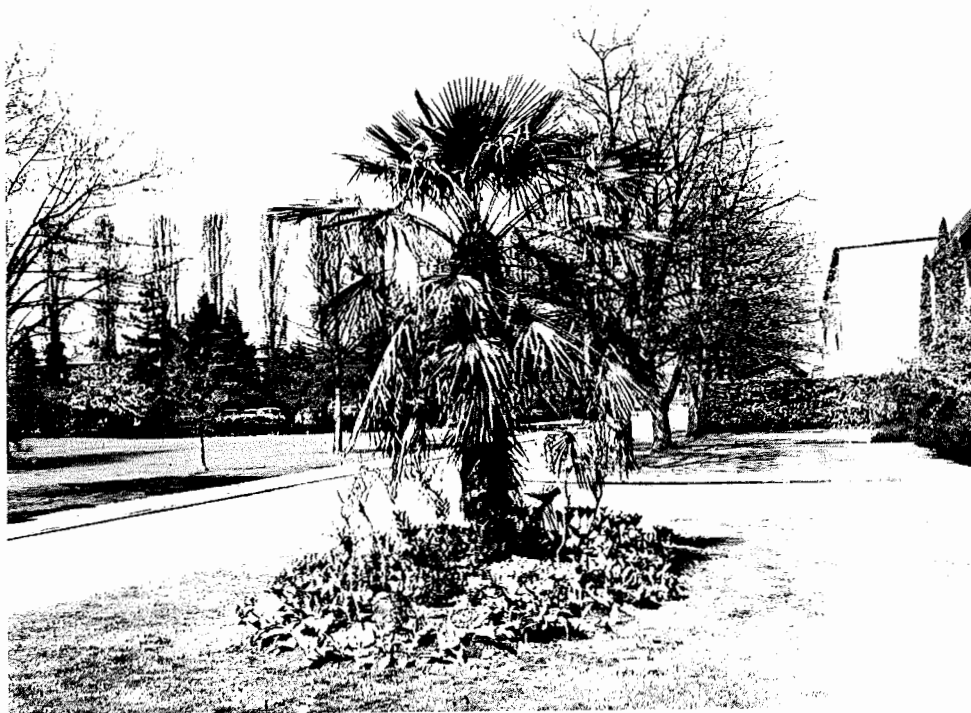


PHOTO 24: April 1962. View of Japanese Palm in Bed 305. The bed is considerably smaller than is found in 1989. (LWSC 948)



PHOTO 25: 1962. Operations campus area showing crescent shaped beds where rose garden now exists. [312, 316, 321, 323]. (LWSC 953)



PHOTO 26: 1962. View east toward sub-area B5 and operations campus area from terraces. [1, 3, 4, 5, 12, 121/122, 309]. (LWSC 951)



PHOTO 27: 1962. View east across crescent beds toward Warehouse #1 in operations campus area. [317, 318, 319, rose garden area]. (LWSC 952)

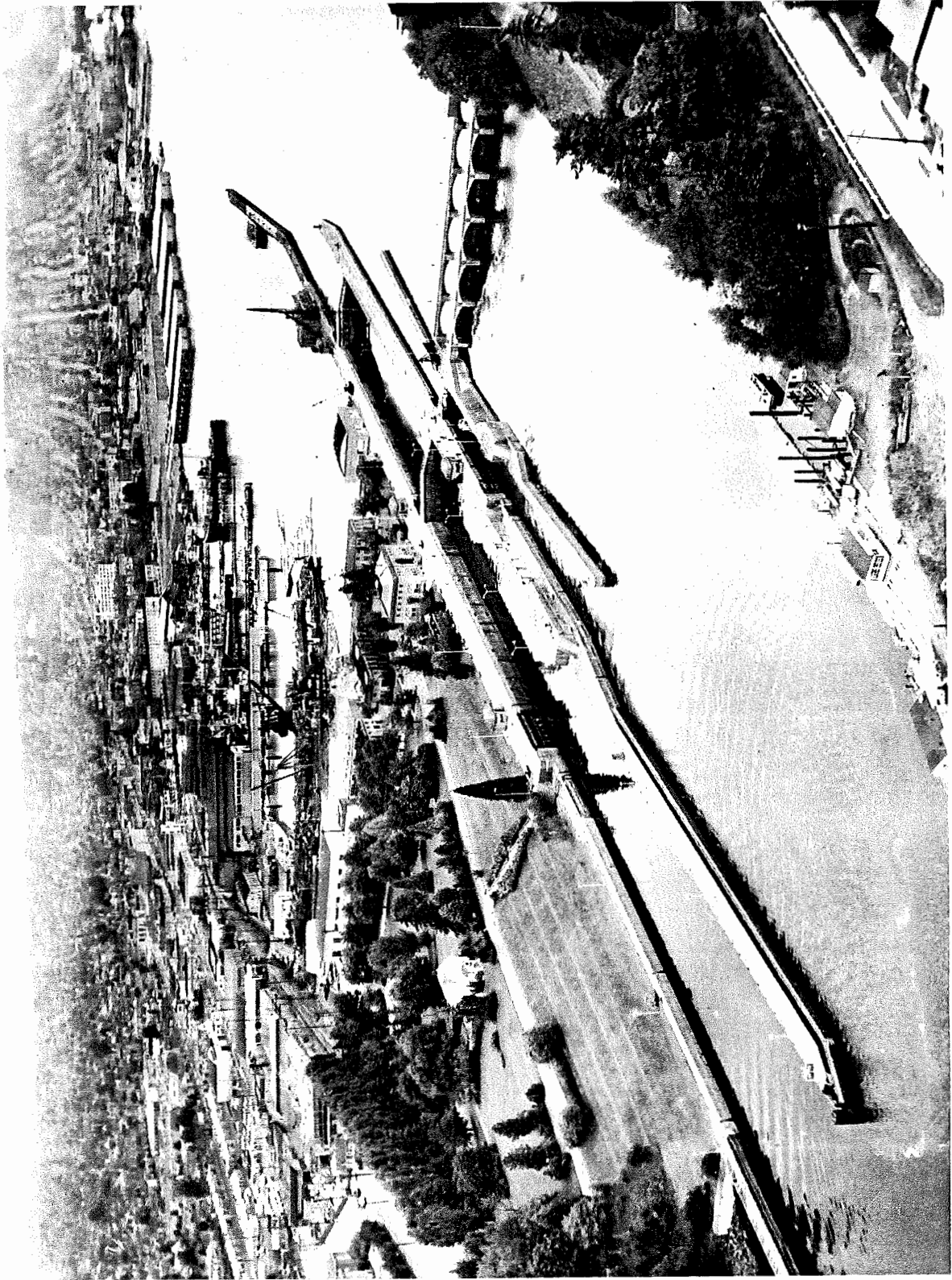


PHOTO 28: 1963. Aerial view of reservation looking north east.
[13, 14, 28]. (LWSC 1015)



PHOTO 29: 1967. Front view of Cavanaugh House. [116, 117].
(LWSC 1117)



PHOTO 30: Year unknown. The original north east entrance gate.



PHOTO 31: 1969. View north along entrance walk from the top of the Administration Bldg. [214, 305, 315]. (LWSC 1353)



PHOTO 32: View west over terraces and along straight leg of the loop road. Diversity in Beds 16 and 17 can be seen at this point. (LWSC 1354)



PHOTO 33: 1971. View of rockery in front of Cavanaugh House. Wood lath fence is visible here. [119/120]. (LWSC 1614)

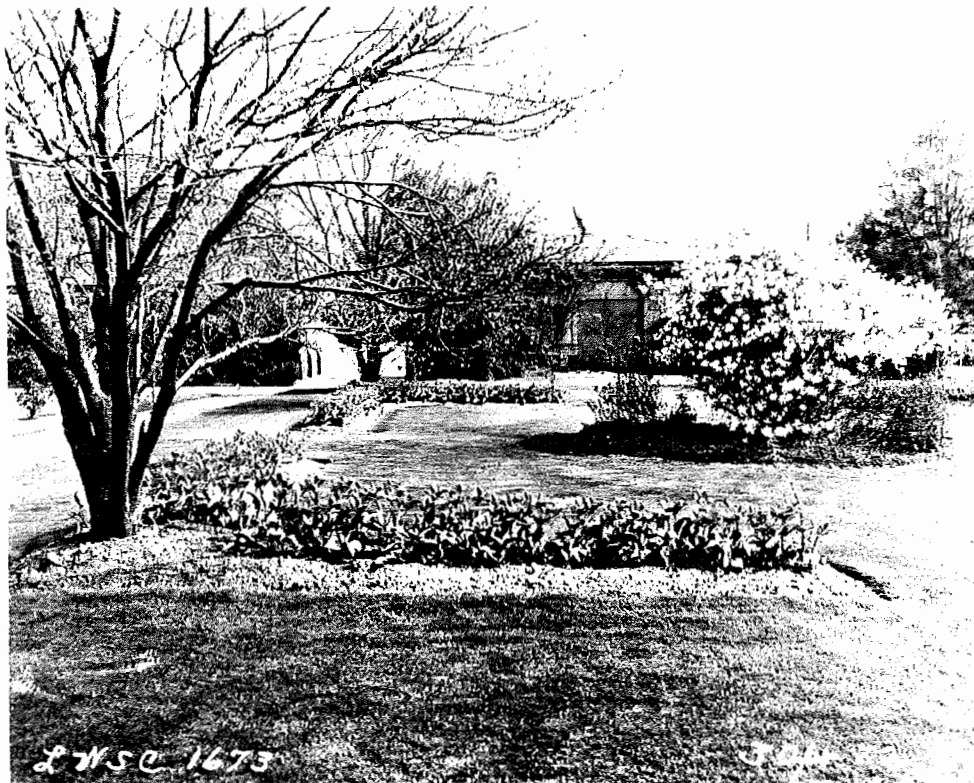


PHOTO 34: 1972. Flower beds east of the Administration Building. Compare with photo 37 from 1989. [325, 326]. (LWSC 1673)

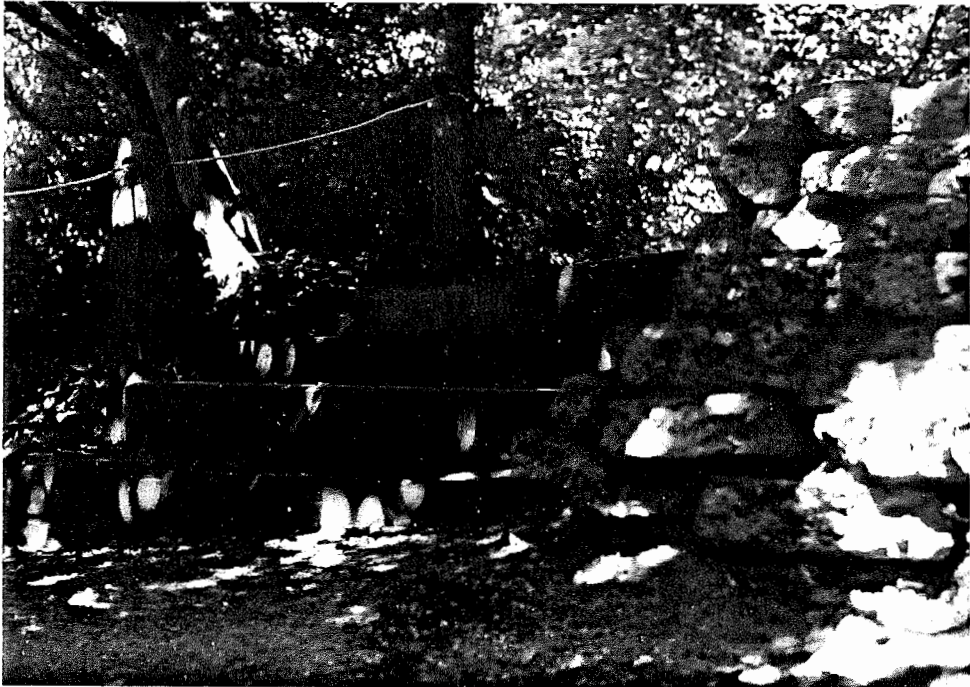


PHOTO 35: 1989. Along the cove trail looking east toward the deck stairway leading back to loop road. Notice concrete and cable barriers.



PHOTO 36: 1989. Rose garden added in place of crescent beds in operations campus area. Looking west toward Bed 316 and two wood lath trellises built by maintenance personnel.

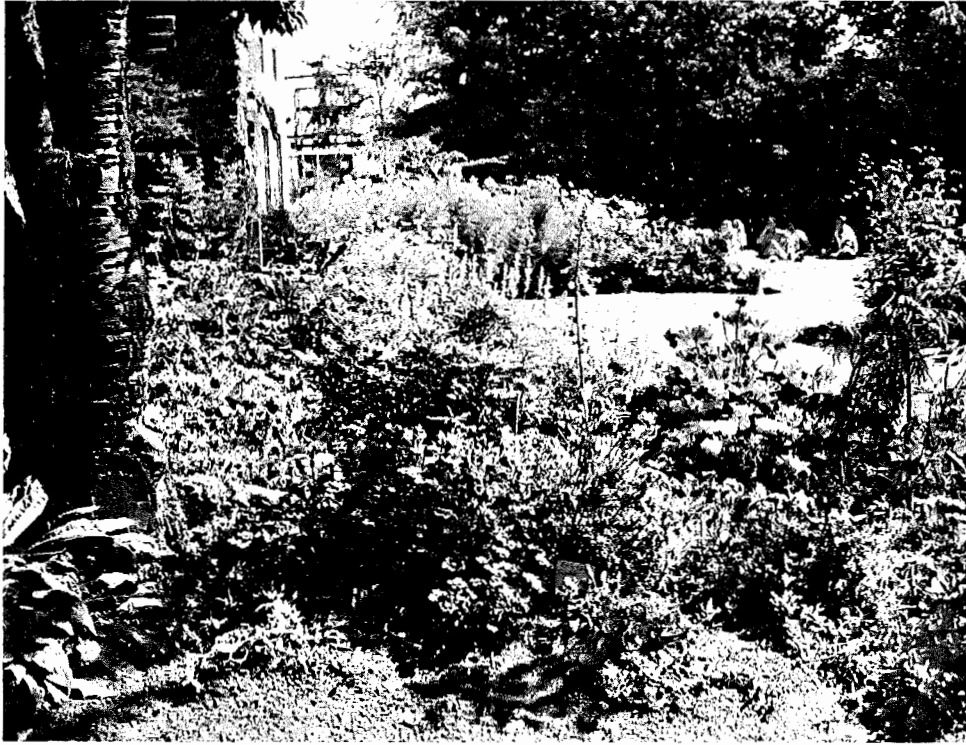


PHOTO 37: 1989. Array of flowers used in planting Beds 325/326. Compare with photo 34.

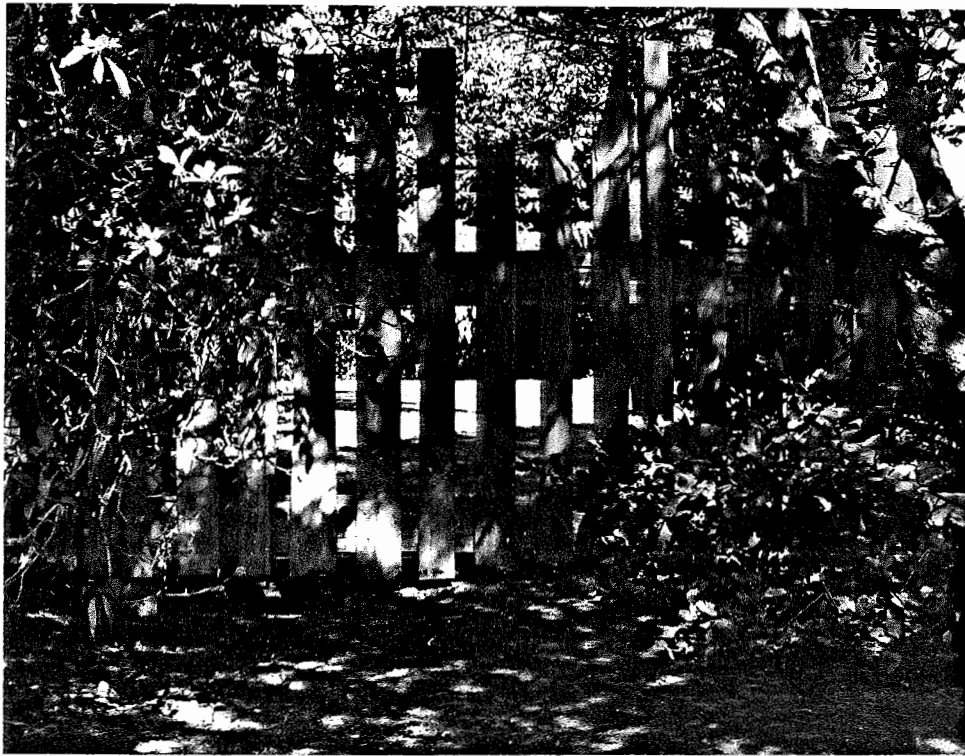


PHOTO 38: 1989. West half of terraces in Area A. Line of crab apples can be seen at the bottom of the slope.



PHOTO 39: 1989. Stairway and landings bisecting Area A. Beds 16 and 17 lie on either side. Handrail can be seen running down the center.



PHOTO 40: 1989. West edge of the Overlook in Area A. The retaining wall and curb patterns can be seen here.



PHOTO 41: 1989. Sub-area B1 open area contrasting with thickly vegetated border around nursery. Beds 209 and 210 can be seen in the background.



PHOTO 42: 1989. Curvilinear road in Area B.

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APPENDIX A - CARL S. ENGLISH, JR. - PROFESSIONAL INFORMATIONPERSONAL

Born: 10/22/4 Camas, Washington
 Married: 1929 to Botanist Edith Hardin
 Retired: 6/28/74
 Died: 8/11/76 71 years old

EDUCATION

B.S. Botany 1929
 Washington State University
 Pullman, Washington

WORK EXPERIENCE

<u>Position</u>	<u>Date</u>
Army Corps of Engineers 1931-1974 Lake Washington Ship Canal Seattle, Washington	
Horticulturist Full charge of grounds at locks-propagating plants, charge of greenhouse, planting new flowers, upkeep of lawns, shrubbery etc.	1969-1974
Grounds Maintenance Worker (Lead Gardener) see job description above	1941-1969
Assistant Gardener Assisting with maintenance of grounds at locks.	1931-1940
Self-employed - plant and seed business Portland, Oregon and Seattle, Washington With Edith H. English co-owned native plant and seed supply business. Propagated and collected native plants of the Pacific Northwest. In 1957 offered 1000 seeds and 1500 plant species.	1929-1976
Landscape Gardening and General Nursery Work Portland, Oregon	1920- 1931

HONORS AND AWARDS

Hiram M. Chittenden Lock's Gardens named in honor 1974
 American Horticultural Society Professional Citation 1971
 Outstanding Male Civil Servant of Military Agencies 1969
 Outstanding Performance Rating 1968-1969
 Employee of the Year Award 1969
 Meritorious Civilian Service Award (1941-1967) 1967
 (highest civilian award granted by Chief

Engineer U.S. Army)	
American Rock Garden Society Annual Award	1966
Sustained Superior Performance Award	1963
Special Act or Service Award	1959

PUBLICATIONS

English, Carl S., Jr. 1974. "Carl S. English, Jr. Gardens at the Hiram M. Chittenden Locks Lake Washington Ship Canal" (brochure) U.S. Army Corps of Engineers, Seattle District: December 1974.

English, Carl S., Jr. 1972. "The Garden at the Hiram M. Chittenden Locks in Seattle" in American Horticulturist.

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English, Carl S., Jr. 1944. "Rhododendrons for the Rock Garden" in Arboretum bulletin, a journal of general horticulture information, University of Washington Arboretum Foundation. December 1944. pp11-13.

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RESEARCH

Discovered: Talinum okanoganense
Lewisia rupicola
Claytonia nivalis

Developed: Synthyrius reniformis 'Regina'
(cultivars) Dodecatheon panciflorum 'Red Wings'
Iris Douglasiana 'pegasus' and 'chamois'

Introduced: Penstemon x Edithae
Lewisia Hoellii x L. rupicola

MEMBERSHIPS AND AFFILIATIONS

The American Horticultural Society
American Rock Garden Society, Northwest Unit
Men's Garden Clubs of America, Seattle Unit
Alpine Garden Society (Great Britain)
Scottish Rock Garden Club (Scotland)
Fellow in the Royal Horticultural Society (England and Scotland)

APPENDIX B - BED AND AREA DESCRIPTIONS**Historic and Present Conditions**

The bed and area descriptions which follow were compiled through four main sources. First, a historic report of the garden by University of Washington Landscape Architecture student, Loanne Koykka (1969), was used to gather some information. In the preparation of her paper Koykka walked the grounds with Carl English. Some of her information is inconsistent with observations made from historic photographs, though, and efforts are made to correct these when possible.

Second, the grounds were inventoried with lead Horticulturist Mike Fleming and the current and future changes to each bed and area were discussed.

Third, historic photographs were used extensively to review the information gathered from the other sources and in writing the descriptions which follow. These photographs are referenced within the discussion and their reference numbers appear in parentheses.

Fourth, five maps from 1915 (C-2-3-17), 1916 (C-2-3-25), 1918 (LWC-1), 1969 (LWC-520), and 1989 were used to compare with the photographs. The earliest maps from 1915, 1916, and 1918 are not complete and had all been revised at some point. A completely accurate early planting plan could not be found.

Although individual plants are mentioned in this tour of the history and present condition of each individual planting bed, this is not a complete plant list. Due to lack of records, the origin of many of the plants is not known. A most current list of plants in the garden is found in Appendix C.

BED

- 1 Bed 1 shows up in the 1918 map as a group of shrubs. A 1916 photograph (photo 1) shows 2-3 evergreen trees in this location. Photographs from 1929 -1932 and 1937 (photos 8, 10) no longer show these trees but a serpentine shaped flower bed is located in their place. Koykka states that this bed "was originally landscaped before Mr. English came" but the plantings were less complex. The walk-way between the Administration Building was widened in 1943 and the landscaping redone. A 1962 photograph (photo 26) shows a well defined crescent shaped bed. Today the plant material in this and surrounding beds is much larger, casting shadows and leading to the death of much of the grass lawn which once surrounded them. Since 1974 some plant material has been moved to Bed 327 due to its large size.

- 2 As with Bed 1, the 1916 photograph (photo 1) shows a tree in the location of this bed. This single deciduous tree shows up in late 1920's photographs (photos 7, 8) as well. The now existing cedar of Lebanon was planted as a very small tree in this location in 1934. A photograph from 1937 (photo 10) shows a small Cedar of Lebanon surrounded by a low shrub. By 1940 the bed appears to have developed to include a variety of understory plants (photo 13). Since 1974 little change has occurred to this bed other than winter loss.
- 3 The 1915 revised planting plan calls out an azalea bed here. This was not implemented but 1916 and 1920 photographs (photos 1, 4) show a single evergreen tree at this corner. The 1918 planting plan shows a clump of shrubs in this location but expansion beyond the single tree does not appear until 1940 photographs (13). Since 1974 this bed has lost five plants but little has changed concerning its triangular shape.
- 4 This elongated triangular bed can be seen in photographs after 1939 (photo 13). An oval shaped flower bed and a single evergreen appear in the area south and west of Bed 4 in a 1916 photograph (photo 3) but this do not appear in photographs after 1929. A 1947 photograph (17) shows an irregular "E" shaped to the bed. Other than some plant loss, this bed is essentially the same now as it was when English left.
- 5 Bed 5 is an original bed location although its shape has changed over the years. This bed and Bed 1 were serpentine shaped flower beds as shown in 1929-32 and 1937 photographs (photos 8, 10). A 1962 photograph (photo 26) and English's map show shrubs and trees in a crescent shaped bed surrounded by grass to the east, south and west. The sidewalk borders the north edge. The lawn was removed due to grading and drainage problems after a new sidewalk and curb were added along the lock wall in the mid 1970's. A number of new plants were added to south-east corner of the bed changing its shape and eliminating access between the bed and the rest rooms.
- 6-8 These beds were added in 1948 after the rest rooms were built (photo 19). The drinking fountain was put in then also. The plant content in Bed 8 has changed almost completely due to overcrowding but the form of the bed has not changed. Plant loss in Beds 6 and 7 has been due to

water leakage from pipes under the rest rooms. Bed 7 on the west end of the rest rooms has changed very little in the past 15 years.

- 9 The *Acer grosseri* (maple) appears in photographs from 1967 forward.
- 10 The *Chamaecyparis pisifera* (Sawara Cypress) was moved here in 1944-5 from the "formal beds" as Koykka states. It is assumed the formal beds are the flower beds east of the Administration Building.
- 11 These two *Aesculus indica* (Indian Buckeye) show up in photographs from 1967.
- 12 This bed was not planted until the 1960's although two evergreen trees accenting the corner appear in 1916 photographs (photo 3). By 1937 these trees no longer existed and the corner remained open around the lamp post until sometime after 1963 (photo 10). The *Metasequoia glyptostroboides* (Dawn Redwood) seeds were obtained and cultivated in 1948, and the tree was planted in this location in the 1960's. The understory plants are not called out in the 1968 map done by English but were added at some point before 1974. Fleming later added more understory (the *Aralia californica* and *Peltaphyllum peltatum*).
- 13 The *Quercus Kelloggii* (Black Oak) shows up in 1963 photographs (photo 28).
- 14 The *Sequoiadendron giganteum* (Giant Sequoia) was planted in 1933 and was only four feet high at the time. By 1968 it is sixty or more feet tall.
- 15 This area was originally a grass slope. A 1940 photograph (photo 12) shows that this area may have had drainage problems as it appears not to be mowed while the grass around it is. The bed was first established by 1954 and by the mid 1960's the bed covered the area well (photo 28). Since 1974 no change to the plant material other than growth has taken place. English used a fence which extended down from the stairway to discourage people from climbing through the beds. This fence was removed by Fleming but may need to be replaced. The steepness of the bank, soil compaction, and a drainage seep make this a problem area.

15A 1920 and 1930's photographs (photos 7, 9) show a hedge-like clump of deciduous shrubs in the location which borders a part of the wall sidewalk. A 1948 photograph (photo 18) shows that this rectangular bed was removed. Carl English's 1969 list of plants lists *Fraxinus ornus* (flowering ash) as the sole plant in this location. This tree was killed by contractors' heavy equipment in the mid 1980's. It is unknown as to the origins of the *Liquidambar formosa* next to 15A location which is presently doing very poorly.

Crab-
apples

The un-numbered line of crab trees at the bottom of the western terraced area were planted by Walt Lyon in the early 1970's while English was still acting as lead horticulturist. Originally he planted nine trees. Seven still exist. Prior to planting the crab apples this area was grass with no plantings.

16/
17

Originally rose beds were planted on either side of the stairway. The top and middle landings were punctuated by clipped evergreen shrubs (photos 9, 12). A variety of trees and shrubs other than roses were added by English beginning in 1950. A wood fence ran the length of both sides of the stairway to protect the beds from people cutting through them. These were removed in the late 1970's by Fleming. In 1989 the plant material is essentially the same as when English left the locks. Two *Pinus sylvestris* which stood on either side of the top landing were removed in the mid 1970's due to over growth of area. Now compaction is large problem.

Hill
side

The terracing is part of Gould's original layout. These terraces were created from the dredge material taken from the canal. The terraces are approximately 5 feet deep and range in height and steepness from one end to the other; the west end being the steepest. Some slippage has taken place over the years. This can be seen in cracks in the stairway which bisects the terraces. In 1950-51 the west end of the hillside eroded and Beds 23 and 24 were planted to aid in erosion control. Other than the lines of trees planted at the top and bottom after 1960 and the beds surrounding the stairway, the grass lawns of the terraces have traditionally been left wide open.

While Eckerstrom and later English were lead gardeners, cable and concrete post barriers were used along the top of

the hillside terracing on both sides of the stairway to prevent public access (photo 13). These barriers were removed in the mid 1970's and the terraced areas were opened to use.

- 22 The location of this bed is part of the original plan and appears in all photographs from 1920 onward (photo 4). Koykka states that original laurels which were kept symmetrically clipped were later allowed to "grow naturally" under English's maintenance. These laurels were removed sometime after 1969 and were replaced with trees; *Lithocarpus densiflorus* on the east side and *Cryptomeria japonica* on the west.

Over-look

A full description of the overlook is given within the body of this paper (see Site Analysis p*).

- 23 This area was originally terraced, but due to the washing of water from the locks, the hillside eroded and this bed and part of Bed 24 were planted in 1950-1. The cove trail was added in 1981 by Fleming. A more in-depth description is given within the body of this paper (see Site Analysis Section 4.0).

Cove

The 1918 planting plan shows this area planted with a large clump of "shrubs". An early 1916 (photo 1) shows that this area was completely cleared before the new vegetation was planted. A late 1920's, early 1930's photograph (8) shows a lawn encircled by a mix of trees and shrubs. In 1968 Koykka states concerning Beds 25-27 that the area was basically landscaped in the same manner as it was when English arrived in 1931 - "The cedars were present when Mr. Eckerstrom came. The bamboo also. Mr. English put the shrubbery in in 1944."

A barricade of concrete posts with a cable running between the posts, like those found along the top of the terraces, was used around beds in the cove area in 1967. These were removed by Fleming and reused along the cove trail to direct flow along the cove trail and steps. The steps were added by Fleming in 1981.

Overstorey growth has made grass maintenance difficult and the lawn, which once filled most of the space in the cove, has diminished in size. Wider planting beds and a gravel trail along the south and east parts of the cove have been used to replace the lawn.

28-
30

The border from the west driveway entrance to the north west corner of the reservation was originally undefined (photo 7). In 1938 a barbed wire fence was placed along the property line. In 1941 a chain link fence replaced the barb wire, moving the border inward 20-25 feet. Lawn covered the ground between the sidewalk and the vegetative border. This lawn has been replaced with low shrubs (laurel in front of bed 30) in many places along the north border.

Hill The hilltop area contains the Cavanaugh House. Prior to construction of the reservation this area was 5 to 15 feet higher in places; various areas were leveled off and others were filled in with dredge material from the canal. The dredge material was deposited from the north border southward leaving glacial till, sand, silt and clay with 6"-10" of soil on top.

101 Bed 101 shows up in earliest photographs from 1916 onward (photo 1). Photographs from 1928, 1929-32 and 1939 (photos 7, 8, 11) show a symmetrical bed of rounded evergreen shrubs, conical coniferous trees, and flowers. By the 1950's and later a variety of deciduous shrubs were planted but the symmetrical tall coniferous trees still dominate the character of the bed at this time (photo 23). The rock work in this bed was done by English and Walt Lyon. Original conifers were still present in 1968, but most of the plant material was redone in a less symmetrical manner in the mid 1970's under Lyon. The *Pinus aristatas* and *yucca gloriosas*, part of English's additions, still exist in the bed.

101A This bed, a mixture of thirteen coniferous trees, was added by Fleming in 1986 as a temporary holding area for some of the trees (some are to remain). A 1923-28 photograph (7) shows 4-5 small crabapple-type trees in the approximate location of this bed. In 1928 one or two trees remained and Eckerstrom added a stone fountain (2.5' high by 10' across) in this location (photo 8). This fountain had a shallow basin and was designed to spill over as it had no drainage system. In 1942 or 43 the cement and piping gave out and English, thinking it inappropriate, removed it.

102 An oval shaped flower bed can be seen in early photographs (7) in the approximate location of bed 102. By 1958 a well established bed of tall trees can be seen so planting must have begun years before. A thicker under story of rhododendrons and azaleas grew here in the 1960's-70's (personal communications, Walter Lyon 1989) but has now

thinned out (23).

- 103 The basswood was planted in the 1930's.
- 104 The cherry may have been grafted by Walter Lyon in the 60's or early 70's.
- 105 This *Magnolia kobus*, var. *borealis* was most likely planted by English. Along the north west leg of the loop road. A 1928 photograph (7) shows what appears to be a row of single species trees along the east side of the northwest leg of the loop road. Trees may have been planted on both sides of the road but the west side of the road is obscured by vegetation in the early photographs which are available. These trees may have been maples, as were found along the north east leg of the loop road. By 1958 (photo 20) these deciduous trees, some of which appear to be different from the original line, were well grown-in, especially at the curve in the road. An early 1960's photograph (23) shows seven trees along the east side of the road; the now existing basswood, 103, magnolia, 104, and possibly the tupelo, 107, were part of this line of trees. By 1969, the year English drew up the map, only four trees (all different) in a line are called out along this segment of the road. All four exist today.
- 107 This single *Nyssa sylvatica* (tupelo) may have been part of the line of trees along the loop road seen in the 1958 aerial (photo 20). Its location along the edge of the road is typical of what is seen in historic photographs for this area.
- 107A *Abies concolor* (White fir) was added in 1986.
- 108 This bed appears in earliest photographs (1) of the area and was called out in the 1915 plan (that plan was not fully implemented). Flowers were planted in this bed originally, but by 1928 the bed was larger and contained trees and shrubs (photo 7). Koykka states, "Mr. Eckerstrom planted what he thought were Mugo pine in 1927-8, but they proved to be Japanese red pine. Mr. English planted the shrubbery in 1943-4." The rocks were placed either by Eckerstrom or English or both, as in beds 118-120. The bed has changed very little since English was horticulturist at the locks.

- 109 As with Bed 108 this bed appears in the earliest photographs of the grounds (photo 1). The development of this bed with the addition of trees and shrubs took place at the same time as bed 108.

West

Entrance

The west entrance to the reservation was originally given little landscape treatment (photo 1). The lamp standards were added in 1920 and the gates were possibly added in 1938. A 1944 photograph (LWSC 314; not shown in report) shows a laurel hedge planted on the outside of the boundary to the reservation.

- 110 This bed has taken a number of different shapes and contained a variety of different types of plant material. A 1928 photograph (7) shows a clump of tall annual flowers with some sort of supports. A photograph taken sometime in the fall or winter between 1929 and 1930 (photo 8) shows the outline of a serpentine bed in this location. A 1941 aerial (photo 16) shows that the shape of the bed (a circle with a tail) is identical to another bed (115) on the opposite side of the Cavanaugh House. These two beds are similar in size, shape, and planting material (low shrubs and flowers). A *Cedrus deodara* (deodar cedar) appears on both sides of the house just south of the beds (110 and 115). Both of the cedars appear in photographs after 1939 (Koykka states that the one on the east side of the house was planted in 1936) and they eventually became a part of beds 110 and 115 when these bed expanded. Due to the addition of more plant material both beds lose their distinctive serpentine shape, becoming asymmetrical and visually unrelated by the late 1960's. In 1976-77 bed 110 was expanded at both ends to connect with beds 118 and 111 creating more privacy for the residents of the Cavanaugh House.

Near

- 110 Koykka states, "there were sycamores here, but they became too unruly and were removed in 1945-6 and 1966". These may be seen planted on either side of the front yard closed to Beds 110 and 115 in photograph 8.

Next

to west

side of

- house A clipped *Escallonia langleyensis* (? or *rubra*) hedge ran along the side of the house. The hedge was removed in the 1970's and a new under story was added below the trees. A *pyracantha* was planted directly against the house before 1925 but was replaced by *Lyon* in the mid 1970's with

espaliered apples. The clematis was planted in the mid 1980's.

- 111 A clipped laurel hedge was used to block the side and back end of the Cavanaugh House from view and access (photo 7, 8). This hedge was removed in 1941 by English and a variety of trees and shrubs replaced it.
- 112 This bed was added by English in the early 1940's before the winter of 1942. The bed did not originally connect with bed 111 but left a wide gap between the beds (photo 18). In the early 1950's the bed was expanded to completely enclose the Cavanaugh House backyard. In 1984 three *Abies lasiocarpa* (subalpine firs) died and were removed.
- 113 Bed 113, planted by English, is a continuation of Bed 112. Two *Betula pendula* (European birch), one of which still exists (Bed 113A), appear in early photographs (7) but Bed 113, which curves around behind them, was not established until the mid to late 1940's (photo 18). A wood picket fence runs behind this and Bed 112. Vegetation has changed little since English retired.
- 114 A clipped laurel hedge, like the one which was found in Bed 111, ran along the east side of the back of the house (photo 8). This was removed in 1941 and primarily rhododendrons and azaleas were planted in its place. In the mid 1980's a deck was added to the north-east corner of the house and Bed 114 was moved farther out away from the house. The shape of this bed was changed and enlarged, connecting it to Bed 115 and creating an enclosed, more private side yard for the residents.
- 115 This bed appears in photographs as one of two beds symmetrically placed on either side of the residence (see Bed 110 discussion) (photo 23). The shape of this bed grew into an amorphous form which eventually encompassed the deodar cedar, planted in 1936. In early 1980's this bed was expanded north to connect with bed 114. The deodar cedar has been limbed up and new under story added since 1980's. *Albesia julibrissen* (silk tree), from National Arboretum, was added in the mid 1980's.

Drive
way

The curving driveway is a part of the original layout and was widened in mid 1970's by the maintenance crew.

Front
of
house

The landscape character of the front of the Cavanaugh House has changed over the years from wide open and visible to secluded and private; compare photographs 8 and 7 to present conditions. These nineteen twenties and thirties photographs show two symmetrical coniferous trees on either side of the three steps leading to the front porch. A circular flower bed sits on the west side of the walk. This bed no longer appears in photos after 1941. The beds directly in front of the house (Beds 116 and 117), as shown in late 1960's photographs (29), contain a diverse collection of shrubs of varying textures and leaf size. The plant material has changed little since the early 1970's. An iron front gate and handrail were added to the three steps which lead up to the front walk in 1984.

118/119/

120 These beds were put in as a rock garden in 1932 by Eckerstrom and English (photo 11). Prior to their development, the area was lawn with the two aforementioned coniferous trees accenting the sides of the steps leading to the Cavanaugh House. These beds had a wooden lath fence running behind (photo 33). In 1989 Bed 118 still has a portion of this fence.

118A Fleming added this bed in 1981. It is an extension of bed 118 and acts as a border along the straight leg of the loop to prevent people from cutting across the residential knoll lawn. The bed is sparse with little under story. Four evenly spaced *Aesculus X carnea 'Briotii'* (Scarlet Horse Chestnuts) were moved from Bed 16 along the stairway (most likely grafted by English in 1951, see 215) and transplanted into this bed in 1981. Prior to 1981 this area was always open lawn.

121/

122 These two beds appear as one large thick grouping of trees and under story plants. A 1916 photograph (3) shows this to be an original bed of primarily coniferous trees. English added plant material over the years and the beds have subsequently grown to dominate the whole corner.

123 The *Thuja occidentalis* var. *aureo-variegata* (*Arbor-vitae*) is present in a photograph from 1916 (photo 3).

- 124 The *Chamaecyparis pisifera* (Cypress) shows up as part of the earlier plantings of 1916 (photo 3).
- 125 The *Acer platanoides* (Norway Maples) are two of possibly three remaining original maples planted along the loop and entrance roads. Evenly spaced lines of maples were called out on both the 1915 and 1918 planting plans and show up in the earliest 1916 and later photographs (3, 7, 15, and 16). Photographs show between 20 and 25 maples along the loop road and between 20 and 25 on both sides of the east entrance walk. By 1969 eleven of these maples were left along the road and walkways.
- 126 Two *Aesculus californica* (California buckeye) sit on the west side of the north-east leg of the loop road. Although no information or reference is made to them in the Koykka paper, these were most likely planted by English to replace maples.
- 127 *Acer pseudoplatanus* (Sycamore Maple) is most likely another original maple.
- 128 A conical shaped coniferous tree appears in earlier photographs in the approximate location of this bed (photo 4). The seven *Trachycarpus fortunei* (Fan Palm), the hardiest of palms, were planted in 1949. All seven of those originally planted still exist in 1989.
- 129 This maple was listed in the 1969 map and list of plants as an *Acer Macrophyllum* (Big Leaf Maple) but has been found to be an *Acer platanoides* (125). This is most likely an original maple.
- 130/
131 Two cherries were most likely planted by Carl English to replace original maples.
- 201-
204 The 1916 photographs (3) shows shrubs (or small trees) lining the boundary. Koykka states that McCarty, the first full time gardener at the locks, planted a line of Lombardy poplars in the 1920's. These poplars were donated by the Seattle Parks Department and dominated this border until the middle to late sixties when English began removing them (photos 16, 20). Their extensive shallow root system

damaged surrounding shrubs. The uneven nature of these beds began prior to the removal of the straight poplars. The 1941 aerial photograph (16) shows an undulating border containing a number of tall well established conifers and thick shrubbery. Since 1978 at least 25 full grown Douglas Fir or Cedar have been removed due to death and overcrowding.

203/

204 These beds have grown to such a degree that the grass which use to exist between them and the beds along the nursery (206/207) has been shaded out. Originally access to the entrance sidewalk could be had between beds 204 and 206 (see 1969 map) but this was cut off by bed growth and the addition of bed 204A.

204A This bed was added when the west entrance was re-designed in the early 1980's. This bed is uncharacteristic of the rest of the beds in the garden in that it contains a massing of a single plant species (*Berberis verruculosa*) rather than a variety of species as is typical.

204B This bed, like 204A above, was added during the 1980 reconstruction of the entrance and is uncharacteristic of the rest of the garden in the use of primarily one species in the bed.

Employee

Parking

The employee parking lot was added as part of entryway re-development in 1980. The plants were specified by the landscape architecture firm Carothers Associates.

205 This bed may have contained a laurel hedge prior to re-landscaping in 1965 to its present condition. One cedar planted by Eckerstrom outside the entrance in 1932 still exists in 1989. The 1980 redesign of the entrance and parking lot addition was done in such a manner as to preserve the plantings in this bed. This bed number is now (1989) used to define the beds which surround the whole employee parking lot.

206-

211 From 1916 through 1928 a tennis court was located in an area close to these beds (photo 1). From 1928 until 1941 this area was open lawn. The beds were added by English in 1941 when an employee parking lot (the nursery area since 1980) was paved. The beds were landscaped with purchased shrubbery (one of the very few purchases made by English). A plaque honoring Carl S.

English, Jr. was placed next to Bed 211 in 1974. This plaque is due to be moved to Bed 305.

212/

213 These beds appear as one large grouping of trees, shrubs and ground cover. The present shape of the bed is original, put in before 1925. Over the years the plant material has been changed to take advantage of the wetter conditions found in this location. Hydrophilic plants, such as Bald Cypress, Sweet-gum, and Tupelo, were planted by English and can still be found the bed in 1989.

214 This is an original bed appearing in a 1916 photograph (3) as a small corner bed. The location and size of this bed remained relatively constant until sometime after 1969 when it was expanded to include the entire corner area under the two Horse Chestnuts. Over use by pedestrians walking across the bed and shade from the trees has resulted in a hard packed dirt surface with exposed tree roots. The entrance re-development plan is to change the shape of the curb which defines the shape this bed. The plant material is also to be removed with this re-development.

215 The *Aesculus X carnea* 'Briotii' (Scarlet Horse Chestnuts) were grafted and planted in 1951 (this also includes those found in other beds on the site). Eight Horse Chestnuts are evenly spaced along the west side of the entrance walkway. Over a number years these and the oaks, 301, which line the east side of the walkway were planted by English and Lyon and Fleming to replace the maples originally found along the entrance walkway (photos 15, 16). By the late 1970's the maples along the entrance walk were completely replaced by the Horse Chestnuts. Two more Horse Chestnuts sit at the corner over-shading bed 214. Originally two cedars were located at those locations (photo 13). These two Horse Chestnuts are to be moved in October of 1989 during the re-development of the entrance road and walkway.

Nine more Horse Chestnut trees line the east leg of the loop road interspersed between other species. And four Horse Chestnuts were transplanted from Bed 16 along the stairway to Bed 118A in 1981.

301 Eleven *Quercus rubra* ("borealis" is used by English), Northern Red Oak, are found on the site, seven of which line the east side of the entrance walk. Five of the eleven oaks were planted by English - four of which are found growing up from

within the laurel hedge and the fifth is in the employee parking lot. The remaining six oaks were planted in the mid 70's and in the early 80's.

Hedge

The *Prunus laurocerasus* (Laurel) hedge which runs the length of Warehouse #2 existed prior to the warehouse itself and appears in photographs as early as 1920 (photo 4). A hedge ran along the length of the entry road behind the row of maples separating the maintenance yard from the public access areas (photos 7, 15). The hedge turned a corner to the east behind the Machine Shop (photo 4). This portion of the hedge was removed when the Carpenter Shop (now the Visitor Center) was built in 1921. A new hedge was apparently planted in front of the north half of the west wall of the Carpenter Shop but this was removed in 1964 and a variety of shrubs, donated by a personal friend of Carl English as a memorial, were planted as Bed 302.

- 302 See "Hedge" above. In 1977 an entrance plaza was designed for the new Visitor Center. This design expanded and rerouted the sidewalk and eliminated part of this bed.
- 303 As with most all the buildings on the locks grounds, the original landscape treatment of the front of the Visitor Center/Carpenter Shop was minimal (photo 8). Although the Carpenter Shop was built in 1921, any sort of landscaping does not appear in the historic photographs until the late 1930's (photo 11). The soil in this bed was screened in the winter of 1966 to remove hunks of concrete remaining from the construction of the building. The Camellias were donated by the University of Washington Arboretum in 1966 and the Mexican pines were put in in 1967.
- 304A This bed was added as part of the Visitor Center conversion in 1977 to block access to maintenance area from visitor center exit.
- 305 A 1920 photograph (4) shows a small flower bed in the location of this bed. The larger of the three *Trachycarpus Fortunei* (Fan Palm), started from seed around 1933, was first planted near the residence but then moved to this location in 1957. The 1974 reprinted brochure of the garden features this bed with tulips growing underneath. Nineteen sixty-two photographs (24) show this bed was smaller and more regular in shape - (an oval) than it is today. Grass surrounded the bed on all sides.

Today the bed plantings have grown to meet the sidewalk on the east, north and south sides and the shape of the bed is an irregular serpentine form.

- 306 It appears from early photographs (3) that two conical shaped coniferous trees were used to accent the west end of the Machine Shop building. The bed along with the other foundation beds, was most likely created by English in the forties or fifties to hold the large number of experimental plant material he collected.
- 307 The *Quercus illex* (Holly Oak) was planted in 1959 and was severely injured in the winter of 1969.
- 308 The *Quercus phillyraeoides* (Evergreen Oak) was planted in 1959. Heavy soil compaction shading has led to the loss of grass under this and the holly oak.
- 309 This strip of grass between the sidewalk and curb originally contained two conical coniferous trees on either side of the short sidewalk leading to the machine shop (in the approximate location of trees 309 and 310) (photo 3). A third conifer was planted at the east end of the grass strip in the location of tree 312 but does not appear in photos after 1939. By the late 1950's three crabapple and/or cherry trees can be seen in aerial photographs and by 1962 five trees were planted along this strip (photo 26). In the fall of 1989 the three east end trees were removed for the entryway redevelopment project. (Two of these were transplanted to other areas of the project).
- 306 & 313/
- 314 A 1920 photograph (4) shows a low hedge planted in the location of Bed 313 but this was removed at some point before 1930 when it no longer appears in photographs (8). Although Koykka states that Beds 313 and 314 were put in during the 1930's, vegetation up against the south wall of the Machine Shop does not appear in the photographs until the late 1940's (photo 18). An evenly spaced line of 10 *Arborvitae* was planted in Beds 306 and 313; each tree planted between two windows. By 1958 (photo 20) an understory of plants can be seen under the *Arborvitae* but the *Arborvitae* dominate these beds until they were removed in the mid 1970's.

315 This island bed was originally planted as a rose bed (photo 3). English removed the roses in the mid 1950 (Koykka writes 1954 but photograph 21 from March 1956 still shows exposed soil and rose bush stumps as though they had recently been cut). Rocks, which first appear in late 1920's photographs (8), lined the edge of the bed. These rocks are now placed randomly within the bed, creating sills for vegetation to spill over and to hold soil back. A diverse mixture of ground covers, flowers, shrubbery and small trees have characterized this bed since the early 1960's (1596). The Seattle Fuschia Society began maintaining the bed in April 1989 and at that time existing fuscias were removed from the bed and placed in bed 327. A lush array of smaller fuscias and flowering ground covers were replanted. A *Quercus chrysolepis* was moved from this bed in October 1989 and transplanted to an area near Bed 101.

The shingled-roofed sign displaying the Army Corps of Engineer logo and stating "Visitors Welcome; Hiram M. Chittenden Lock and Lake Washington Ship Canal" has changed wording order and has not always had the roof structure. The sign first appears in a 1956 photograph (21) and was most likely put in at that time. The sign's roof appears in late 1960's photographs (31).

315

A&B

These two small bed on either side of the Administration Building entrance were originally planted with single conifers which eventually overgrew their location (photos 21, 3). In 1960 these conifers were removed and the beds were planted with a variety of tall and low growing shrubs. Bed 315B included *Penstemon Edithae*, a hybrid of penstemon hybridized by Carl English and named after his wife, Edith Hardin English. In 1980 Fleming removed the overgrown beds and replaced them with an Alaskan Yellow Cedar in each. These tall, curious looking conifers recall the earlier trees found in these beds but also speak to the horticultural diversity and interest found in the rest of the lock's botanical garden.

North side of
the Admin.

Bldg. A 1916 photograph (3) shows that the area in front of the Administration Building contained a strip of grass similar to the area just east of the building. Four conifers lined up directly in front of the north side of the building (two of which were in the location of Beds 315A and 315B mentioned above) (photo 13). The grass strip turned the corner echoing the opposite side of the road (around Bed 214). Around 1947 the sidewalk was widened on the west side of the Admin. Bldg. for emergency vehicular access thus eliminating the grass strip, two tall coniferous trees and the original symmetry of spaces and plant material which existed in front of the Administration Building.

316/

317 The two beds at the ends of the maintenance area median strip originally contained two conical shaped conifers each. Koykka states that the trees in bed 316 were cedars and cypress (*Chamaecyparis obtusa*) were found in bed 317. The trees at one end were not aligned with the trees at the other. Rather the two cypress at the east end were aligned with the door to Warehouse #1 and were closer together than the two cedars. The cedars (Bed 316) were aligned with the two conifers found at the corners of the road on the other side of Bed 315 (photos 3, 13, 7). By the early 1960's the two trees at each end contained beds of under story. In 1965 English replaced the cedars with a number of oaks. The cypresses in bed 317 blew over in the early 1980's and a mix of deciduous trees and shrubs, planted by English, dominate this end bed.

Rose
Garden

The area between Beds 316 and 317 has contained a variety of planting bed configurations through time. An earlier photograph (3) shows a small bed toward the center of the area and in late 1920's photographs (7) one sees a line of deciduous shrubs down the center of this median strip. By the late 1920's or early 1930's a round flower bed in the center of the grass with two crescent shaped beds on either end of the lawn appears (photos 8, 13, 16). English planted these beds with tulips and changed the circular bed's shape to more of an oval form (photo 25). In 1988 Fleming replaced the open grass and three flower beds with a rose garden. The approximately 200 rose bushes are bordered by a low hedge of *Ilex crenata* and *Buxus sempervirens*. Two wood trellises were also built at that time.

318/

319 A 1928 photograph (7) shows shrubs along the base of Warehouse #1 but these may have been removed the following years as the vegetation does not appear in a photograph dated between 1929 and 1930 (photo 8). According to Koykka the foundation beds in front of the warehouse were planted in 1935-36 and, other than the addition of more diverse plants by English through the years, have remained relatively the same since then. Nine to ten *Arborvitae*, as were found in front of the Machine Shop, lined the front of Warehouse #1 (photo 27). These may have all been put in at the same time as the other *Arborvitae* - mid 1940's.

321 Two of three *Prunus serrulata* "Kwanzan" (Japanese flowering

cherries) were grafted by English in 1941. The third younger cherry was planted to replace a like tree in 1987. These three trees were transplanted from along the maintenance campus walkway in October 1989 to prevent damage during roadway reconstruction. One was moved to Bed 101; another was planted along north-west leg of the loop road; and the third placed in front of Bed 202.

322 Originally the grass strip on which these trees are located contained a conifer at either end (photo 8). Two *Umbellularia californica* (Oregon Myrtle) were planted by English (most likely in the early 1960's) in between the row of Japanese Flowering Cherries (321). One of these myrtles exists in 1989 and the other was replaced by a magnolia in 1987. These were transplanted during the reconstruction of the roadway in October 1989. The Oregon Myrtle was moved to the corner location along the loop road across the road from Beds 121/122.

323\

324 The location of these two triangular shaped beds originally contained a single conifer each and a third single conifer existed between these two (photo 16). Between 1948 and 1958 the two end conifers were removed and the triangular shaped beds were planted with a grouping of pines and deciduous trees (photo 20). The middle conifer remained until the early 1960's. Other than growth, these two beds have essentially remained the same since the 1970's.

325/

326 Koykka states that the "formal beds" were design by Landscape Architect Otto Holmdahl in 1927 while Eckerstrom was here. The design of these beds include four corner beds surrounding a circular bed in the center (Bed 326). A conifer dotted the corners of each of the surrounding beds and a large deciduous shrub sat in the center. By 1941 (photo 16) these conifers were removed but English later planted flowering cherries (*Prunus serrulata* Taizan-fukun) in the same locations. Two of these cherries still exist in 1989 and two were replaced in like in 1989. A *Magnolia stellata* (Starry Magnolia), planted by English, was found in Bed 326 but was removed and replaced in kind in 1987. The perennial and annual flower beds, which were more formal using a limited plant pallet of geraniums, elysium, and ageratum prior to 1987, are now more diverse with a number of more colorful annual flowers (photo 34)

325A

This location originally contained a conical shaped coniferous tree (photo 4). This tree and two others, one of which was

located in place of 325B and one of which was located between these two, formed a line of three trees mirroring the three trees mentioned in the discussion of Bed 323 and 324 (photo 16). At some point, most likely in the 1940's, English planted a *Pinus Jeffreyi* (Jeffrey's Pine). This tree was damaged by contractors and removed in 1983 or '84.

325B

This location originally contained a conical shaped conifer (see 325A above). [One of these trees may have been the *Chamaecypris psifera* (Tree 10) moved from these beds in 1944-45.] As with 325A this tree was replaced by English at some point in the mid 1940's and replaced with a *Pinus sabiniana*. This pine blew over in a wind storm in 1985. At this time, in 1989, no tree exists in this location.

Pavement near the locks area was repaved around 1942-3 and again in late 1970's.

- 327 This bed was installed sometime after the Mechanic Shop (Lockmen's lunchroom) was built between 1936 and 1941. The size of this bed has increased since the 1969 map of the garden was drawn. The west corners of the bed have been extended further west, encompassing trees 325A and B. The plant material in this bed has grown to such a degree that the Lockmen's lunchroom is no longer visible.
- 328 The nursery area was established in 1937-8. The fence was put in then, and soil was hauled in. Many plants grown from seed in the greenhouse are moved here for a time before being planted in the gardens.
- 329-
- 333 Landscaping around the greenhouse was put in at different times since 1943 and is essentially the same as it was when English retired.

Green
house

The greenhouse was put in with a wooden frame around 1933-4 (photo 14). It was rebuilt with an aluminum frame in 1953. The greenhouse is heated by a gas furnace in the adjacent building. English did much of his experimenting with the seed he obtained through the seed exchanges. Many of the plants on the grounds had their origins in the greenhouse, and spent up to five years there or in the nursery before

being planted. English also cultivated indoor plants for the offices. Today the greenhouse is used for cultivation of replacement plants.

APPENDIX C - PEOPLE CONTACTED (August - October 1989)

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Arthur Kruckeburg, Chairman of the Dept. of Botany
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(knew Carl English)
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Walter L. Lyon
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Kathy Mendelson, Horticulturist
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APPENDIX D - PLANT LIST
from August 1981 and March 1982

Researched and compiled by
Kathy K. Mendelson, Botanist
in collaboration with
Michael E. Fleming Horticulturist

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

<u>TAG NUMBER</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>LOCATION BED #</u>
B1.1	BERBERIS Berberidaceae B. darwinii	Darwin's Barberry	3, 5, 23, 24, 28, 30, 115, 116, 121, 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
B2.1	BERGENIA Saxifragaceae B. cordifolia	Heart Leaf Bergenia	17, 26, 209, 213, 318, 319, 327
B3.1	BETULA Betulaceae B. nana	Arctic Birch	323
B3.2	B. pendula	European White Birch	23B, 113A
B4.1	BLECHNUM Polypodiaceae B. spicant	Deer Fern	120
B5.1	BLETTILA Orchidaceae B. striata	Ground Orchid	304, 323
B6.1	BUDDLEIA Loganiaceae B. davidii	Butterfly Bush	23B, 29
B7.1	BUPLEURUM Umbelliferae B. fruticosum	--	205A
B8.1	BUSARIA Pittosporaceae B. spinosa	Box Thorn	17
B9.1	BUXUS Buxaceae B. sempervirens	Boxwood	28, 29, 203, 204, 205

<u>TAG</u> <u>NUMBER</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>LOCATION</u> <u>BED #</u>
C1.1	CALLISTEMON Myrtaceae C. subulatus	Bottlebrush	8, 328, 331
C2.1	CALLUNA Ericaceae C. vulgaris	Heather	101
C3.1	CALOCEDRUS Cupressaceae C. decurrens	Incense Cedar	205
C4.1	CAMELLIA Theaceae 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
C5.1	CAMPANULA Campanulaceae C. persiciflora	Bellflower	306
C5.2	C. rapunculoides	Creeping Bellflower	317, 327
C6.1	CARPENTARIA Saxifragaceae C. californica	Bush Anemone	8
C7.1	CATALPA Bignoniaceae C. bignonioides	Common Catalpa	203
C8.1	CEANOTHUS Rhamnaceae 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. thyrsoiflorus	Blueblossom	306
C9.1	CEDRUS Pinaceae 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

C10.1	CERATOSTIGMA C. plumbaginoides	Plumbaginaceae --	306, 316
C11.1	CERCIDIPHYLLUM C. japonicum	Cercidiphyllaceae Katsura Tree	204, 304A
C12.1	CERCOCARPUS C. ledifolius	Rosaceae Mountain Mahogany	120
C13.1	CHAENOMELES C. speciosa	Rosaceae Flowering Quince	24
C14.1	CHAMAECYPARIS C. nootkatensis	Cupressaceae 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
C15.1	CHAMAEDAPHNE C. calyculata	Ericaceae --	3
C16.1	CHAMAEROPS C. humilis	Palmae Fan Palm	8, 327, 330, 331
C17.1	CHIMONANTHUS C. praecox	Calycanthaceae --	4, 6, 318, 327
C18.1	CHOISYA C. arizonica	Rutaceae --	304
C18.2	C. ternata	Mexican Orange	5A, 23B, 26, 28, 30, 203, 209
C19.1	CHRYSANTHEMUM C. X hortorum	Compositae Garden Mums	8, 316
C19.2	C. parthenium	Feverfew	327
C20.1	CISTUS C. albidus	Cistaceae 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
C21.1	CLADRASTIS C. lutea	Leguminosae Yellowwood	202
C21.2	C. sinensis	--	118A
C22.1	CLEMATIS C. flammula	Ranunculaceae --	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

<u>TAG NUMBER</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>LOCATION BED #</u>
D1.1	DABOECIA Ericaceae D. cantabrica	Irish Heath	119, 120
D2.1	DANAE D. racemosa	Alexandrian Laurel	304
D3.1	DAPHNE Thymelaeaceae 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
D4.1	DEUTZIA Saxifragaceae D. gracilis	Slender Deutzia	24
D4.2	D. X kalmiflora	--	201
D5.1	DIANTHUS Caryophyllaceae Dianthus sp.	--	119, 120, 209, 315
D6.1	DIMORPHOTHECA Compositae Dimorphotheca sp.	--	119, 316
D7.1	DRYAS Rosaceae D. octapetala	Mountain Avens	5, 8, 315, 316

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

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

<u>TAG NUMBER</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>LOCATION BED #</u>
G1.1	GALANTHUS Amaryllidaceae G. nivalis	Snow Drop	119
G2.1	GARRYA Garryaceae G. elliptica	Silk Tassel Bush	16, 29, 30, 120, 201, 202, 203, 204, 330, 332
G2.2	G. Fremontia	--	120
G3.1	GAULTHERIA Ericaceae 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
G4.1	GENISTA Leguminosae G. hispanica	Spanish Gorse	119
G4.2	G. lydia	--	316
G4.3	G. pilosa	--	2, 4, 119, 120
G5.1	GERANIUM Geraniaceae Geranium sp.	Hardy Geranium	119
G6.1	GINKGO Ginkgoaceae G. biloba	Maidenhair Tree	28, 122, 302

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

<u>TAC</u> <u>NUMBER</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>LOCATION</u> <u>BED #</u>
	ILEX Aquifoliaceae		
11.1	I. aquifolium	English Holly	7, 112, 201, 317, 319
11.2	I. Buergeri	--	16
11.3	I. crenata	Japanese Holly	119
11.3.1	I. crenata convexa	Japanese Holly variety	205
11.4	I. pedunculosa	--	119
11.5	I. Pernyi	Perny's Holly	206, 207
	ILLICIAM Illiciaceae		
12.1	I. anisatum	Star Anise	23A
	IRIS Iridaceae		
13.1	Iris sp.	--	315
13.2	I. aureonympha	Golden Nymph Iris	306
13.3	I. Douglasiana	--	7, 17, 120, 205A, 208, 212
13.4	I. foetidissima	Scarlet Seeded Iris	201
14.1	I. tenax	Pacific Coast Iris	28

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

<u>TAG</u> <u>NUMBER</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>LOCATION</u> <u>BED #</u>
	KALMLA 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. amabilis	Beauty Bush	30, 102

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

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

<u>TAG NUMBER</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>LOCATION BED #</u>
	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 Soulangeriana 'Alba'	--	7
M1.11.2	M. X Soulangeriana '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

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

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

<u>TAG</u> <u>NUMBER</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>LOCATION</u> <u>BED #</u>
P1.1	PARROTIA Hamamelidaceae P. Jacquemontiana	--	305
P2.1	PARTHENOCISSUS Vitaceae P. inserta	--	128
P2.2	P. tricuspidata	Boston Ivy	8, 24, 318, 319
P3.1	PAULOWNIA Bignoniaceae P. tomentosa	Empress Tree	23B, 122
P4.1	PELTIPHYLLUM Saxifragaceae P. peltatum	Umbrella Plant	15, 213
P5.1	PENSTEMON Scrophulariaceae Penstemon sp.	Beardtongue	101, 315, 316
P6.1	PERNETTYA Ericaceae P. mucronata	--	108, 119, 120, 213
P7.1	PETTERIA Leguminosae P. ramentacea	--	211
P8.1	PHILADELPHUS Saxifragaceae P. Lewisii	Mock Orange	202
P9.1	PHILLYREA Oleaceae P. decora	--	203, 211, 304A
P10.1	PHOTINIA Rosaceae P. X Fraseri	--	28, 119, 205A
P10.2	P. serrulata	--	26, 210
P10.3	P. villosa	--	208
P11.1	PHYLLOSTACHYS Graminae P. aurea	Bamboo	23B, 24, 26, 212, 213
P12.1	PHYTOLACCA Phytolaccaceae P. americana	Poke Berry	324
P13.1	PICEA Pinaceae P. abies	Norway Spruce	205

	PIERIS	Ericaceae		
P14.1	P. floribunda		Andromeda	27, 30, 112, 120, 122, 207, 327
P14.2	P. formosa		--	108, 109, 118A, 307
P14.3	P. japonica		Japanese Lily of the Valley Bush	108, 110, 116, 117, 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

<u>TAG NUMBER</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>LOCATION BED #</u>
Q1.1	QUERCUS Fagaceae 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

<u>TAG</u> <u>NUMBER</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>LOCATION</u> <u>BED #</u>
	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, 122
R2.28	R. desquamatum	--	209 108
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 'Altaclarensis'	--	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

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

<u>TAG</u> <u>NUMBER</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>LOCATION</u> <u>BED #</u>
	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
	SEQUOIA DENDRON 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

<u>TAG NUMBER</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>LOCATION BED #</u>
T1.1	TAXODIUM Taxodiaceae T. distichum	Bald Cypress	212, 213
T2.1	TAXUS Taxaceae T. baccata 'Repens'	Prostrate Yew	23B
T2.2	T. brevifolia	Western Yew	28, 202, 203, 209
T3.1	TETRACENTRON Tetracentraceae T. sinense	--	23A
T4.1.1	THUJA Cupressaceae 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
T5.1	TILIA Tiliaceae T. petiolaris	Basswood	103
T6.1	TRACHYCARPUS Palmae T. fortunei	Windmill Palm	128, 305, 318, 330
T7.1	TROCHODENDRON Trochodendraceae T. araliodes	Wheel Tree	205, 306
T8.1	TSUGA Pinaceae 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

<u>TAG NUMBER</u>	<u>BOTANICAL NAME</u>		<u>COMMON NAME</u>	<u>LOCATION BED #</u>
U1.1	UMBELLULARIA U. californica	Lauraceae	Oregon Myrtle	17, 211, 322

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<u>TAG</u> <u>NUMBER</u>	<u>BOTANICAL NAME</u>	<u>COMMON NAME</u>	<u>LOCATION</u> <u>BED #</u>
	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, 305

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

TAX
NUMBER

BOTANICAL NAME

COMMON NAME

LOCATION
BED #

Y1.1

YUCCA Agavaceae
Y. gloriosa

Spanish Dagger

23A, 23B, 24, 29,
201

<u>TAG</u> <u>NUMBER</u>	<u>BOTANICAL NAME</u>		<u>COMMON NAME</u>	<u>LOCATION</u> <u>BED #</u>
21.1	ZANTEDESCHIA A. aethiopica	Araceae	Calla Lily	15
22.1	ZANSCHERIA 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 Belladonna Lilly 6."
- e. Following Tag Number A23.1: Add "ATHYRIUM 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 location 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.

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, 10."
- cc. Following Tag Number 45: Add:"CAMASSIA Liliaceae
 C46.1 C. Sp. Camas Lilly 120."
- dd. Following Tag Number D7.1: Add: DIGITALIS Scrophularizceae
 D8.1 D. Purpurea -- 2."
- ee. Following Tag Number D8: Add: DAVIDIA Nyssaceae
 D9.1 D. Involucrata Dove Tree 30."
- ff. Following Tag Number D9: Add: DENDROMECOM Papaveraceae
 D10.1 D. Rigida Harfordi Island Bush Poppy 313."
- gg. Following Tag Number E6.1 Add:
 "E6.2 E. Macrantha X E. Pterocladon 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 Bishops 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 "13.5."
- tt. Tag Number I3: Add: 13.6 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 Ericaceae
L17.1 Lyonia ovalifolia var. elliptica 204A."
- zz. Following Tag Number L171.: Add "LEWISIA Portulacaceae
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. Manipurensis -- 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 Number ~~R4.1~~ Add "RUBUS Rosaceae R. 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.

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Freier, Renee L.

Historic grounds report

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