

HISTORIC EVALUATION REPORT



MARINSHIP MACHINE SHOP (BUILDING 11)

Sausalito, California

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Prepared by

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Introduction

This Historic Evaluation Report (HER) was prepared by Knapp & VerPlanck Preservation Architects (KVP) for the Sausalito Community Development Department. The HER evaluates the potential historical and architectural significance of the Marinship Machine Shop (Building 11), a two-story, heavy-timber-frame, industrial building located within the southern portion of the former Marinship property in Sausalito, California.¹ The property is located at 25 Liberty Ship Way, on the northwest side of the street, just east of its intersection with Marinship Way (Assessor's Parcel No. 063-090-06) (**Figure 1**).² The irregularly shaped parcel is the rump of the original Marinship property conveyed by the W.A. Bechtel Corporation to the U.S. Army Corps of Engineers ca. 1946. The subject property is bounded by similar properties, many of which contain World War II-era structures. In addition to the Machine Shop, the property contains the Army Corps' Bay Model (Building 29) to the north and an unidentified World War II-era steel structure and a non-historic pier that juts out into Richardson's Bay to the east. Most of the subject parcel is paved. There is some landscaping to the east of the Machine shop and there are also some street trees along Marinship Way. The Machine Shop was conveyed by the General Services Administration (GSA) to the Veterans Administration (VA) in 2006. The VA proposes to demolish the structure and replace it with a smaller, two-story research clinic and a surface parking lot. It is the purpose of this report to determine whether the Machine Shop is eligible for listing in the National Register of Historic Places (National Register) and the California Register of Historical Resources (California Register).



Figure 1. Aerial photograph showing location of the Machine Shop/Building 11

Source: Marin Map: <http://mmgis.marinmap.org/dnn/Home/tabid/36/Default.aspx>

¹ Each of the former Marinship buildings have both a historic name and a building number. The numbers were apparently assigned by Bechtel Corporation and seem to correspond to the order in which the buildings were constructed. For consistency, we will use the building's name in this report.

² The streets and buildings in the Marinship property do not align with the cardinal points of the compass but for ease of reference KVP shall henceforward describe Building 11 as being located on the north side of Liberty Ship Way, with San Francisco Bay to the east, Building 29 (Bay Model) to the north, and Bridgeway to the west.

I. Current Historic Status

KVP searched federal, state, and local records to determine if the Machine Shop is identified in any official registers of historical resources. The specific registers consulted are listed below.

A. *Here Today*

Published in 1968 by the San Francisco Junior League, *Here Today: San Francisco's Architectural Heritage (Here Today)* was the first comprehensive cultural resource survey completed in the San Francisco Bay Area. In addition to San Francisco, the survey covered adjoining San Mateo and Marin counties. Prepared by volunteers, the survey provides a photograph and limited information on approximately 2,500 properties. The survey files are archived at the Koshland San Francisco History Center in the San Francisco Main Library.³ There is an entire section devoted to Sausalito in *Here Today*. However, the section covers mainly older Victorian and Edwardian-era buildings within the city's downtown and adjoining residential areas. It does not include any maritime properties aside from the former San Francisco Yacht Club on Bridgeway, and no World War II-era properties. The Marinship property is not mentioned anywhere in the survey.

B. *City of Sausalito Historical Inventory*

After becoming increasingly concerned over the loss of historic buildings, in 1976, the City of Sausalito adopted regulations to designate historically, architecturally, and culturally significant local landmarks and historic districts. In addition to establishing the Historic Landmarks Board (HLB) and creating the Downtown Historic Overlay Zoning District in 1981, the City established an inventory of specific properties that appeared to warrant recognition for their special historic, architectural, or aesthetic value. In order to qualify for inclusion on the inventory of "Noteworthy Structures, Arks, Landmark Buildings, National Register Buildings, Structures, Sites, and Objects," a resource must be at least 50 years of age and be demonstrated to be "significant to local, regional, state or national history."⁴ Properties in the Inventory fall within one of four categories: "Noteworthy," "Landmark," "Downtown Historic District," and "National Register of Historic Places." Prepared nearly 35 years ago, the Sausalito Inventory mainly comprises aesthetically prominent nineteenth and early twentieth-century dwellings, churches, civic buildings, and commercial buildings – most of which are located in the Downtown, Old Town, and New Town districts. Nonetheless, there are several industrial buildings associated with the city's shipbuilding industry, including Marinship Building No. 30 – the Mold Loft – which is designated as a "Noteworthy" structure.⁵

C. *California Historical Resources Information System*

Properties listed in the California Historical Resources Information System's (CHRIS) Historic Property Directory (HPD), or that are under review by the California Office of Historic Preservation (OHP), are assigned status codes of "1" to "7," establishing a baseline record of historical significance. Properties with a status code of "1" are listed in the California or National Register. Properties with a status code of "2" have been formally determined eligible for listing in the California or National Register. Properties with a status code of "3" or "4" appear to be eligible for either register through survey evaluation. Properties with a status code of "5" are typically locally significant or of contextual importance. Status codes of "6" indicate that the property has been found ineligible for listing in any register and a status code of "7" indicates that the property has not been evaluated. No part of the former Marinship property is listed in the HPD.⁶

³ San Francisco Planning Department, *San Francisco Preservation Bulletin No. 11: Historic Resource Surveys* (San Francisco: n.d.), 3.

⁴ City of Sausalito Zoning Code Section 10.46.050, <http://www.ci.sausalito.ca.us/Index.aspx?page=265>

⁵ City of Sausalito, *Noteworthy Structures and other Buildings that may have Historical Significance* (Sausalito Community Development Department, updated May 1999).

⁶ California Office of Historic Preservation, *Directory of Properties in the Historic Property Data File for Marin County* (Rohnert Park, CA: Northwest Information System, revised October 5, 2010).



Figure 2. Machine Shop; view toward north
Source: KVP Architects

II. Description

A. Site

The Machine Shop occupies a small portion of a large 564,706 square-foot parcel (including both land and water) in the southern portion of the former Marinship shipyard (**Figure 2**).⁷ To the north is Building 29, which now houses the Army Corps of Engineers' Bay Model, a small museum dedicated to the history of Marinship, as well as the Army Corps' Construction and Operations offices. To the east of the Machine Shop are a paved parking lot, a narrow unpaved driveway, and several small structures housing boat repair, rigging, painting, and other maritime businesses. To the west is a smaller commercial building containing a plumbing business; this property contains a World War II-era Marinship warehouse (Building 17 – Paint and Oil Shop). To the south of the Machine Shop is Liberty Ship Way, and on the opposite side of the street is the 30 Liberty Ship Way office park complex, which incorporates two heavily remodeled former Marinship buildings. The immediate site is enclosed within a chain-link fence topped by barbed wire. The site is mostly paved, although there is a planting strip lined with trees on the south side of the building, as well as a row of street trees along the eastern fence line.

B. General Description

Unlike the majority of the surviving Marinship-era buildings, the Machine Shop has not undergone extensive alterations. On the other hand, it has not been maintained for some time and consequently the structure appears to be in fair-to-poor condition. Although it appears to be three stories, the Machine Shop is a two-story industrial building containing approximately 27,400 square feet of interior space. The footprint measures 136' x 202' and it has a concrete slab foundation resting atop wood pilings. It is a heavy-timber-frame structure clad in painted plywood sheathing. The exterior walls, which are punctuated by groupings of double-hung wood windows on the first floor level and bands of wood ribbon win-

⁷ In the interest of consistency, this report uses the building's historic name "Machine Shop" instead of Building 11.

dows on the upper levels, have no extraneous ornament. The building is massed as two sections: the apparently three-story machine-shop, which is capped by an undulating barrel-vaulted roof, and the two-story, shed-roofed office wing to the south. KVP did not have authorization to access the interior of the building, so the description of the interior is based on observations from photographs provided by the Sausalito Community Development Department.

C. South Façade

As a utilitarian industrial building, the Machine Shop does not have a primary façade distinguished by enhanced ornamental detailing. However, the south façade, which faces Liberty Ship Way, contains the primary entrance to the building and it is also the most highly visible part of the building (**Figure 3**). Originally one-story high, the office wing was increased to two stories during the early days of World War II. The south façade is ten bays long, clad in painted plywood, and punctuated by an asymmetrical arrangement of double-hung wood windows, wood ribbon windows, and pedestrian entrances. A comparison of the existing building with the existing conditions drawings made by Richard Grambow in 1945 indicate that some changes were made to the south façade after the war to improve the building's functionality. In a few areas, double-hung windows took the place of the original ribbon windows, probably to enhance natural light and ventilation. However, the double-hung windows match those on other parts of the building and do not detract from the original design. In addition, there appears to have been a water tank mounted to the roof that was removed not long after the war.



Figure 3. South façade of the Machine Shop
Source: KVP Architects

Beginning at the left side of the south façade, the westernmost bay contains a group of four double-hung wood windows on the first floor level and a band of four ribbon windows on the second floor level. A boarded up pedestrian entrance is located on the right side of the bay. To the east, the second bay contains tripartite ribbon windows on the first and second floor levels. Continuing east, the third bay features a tripartite ribbon window on the first floor and an identical window on the second floor level, although this window is offset to the west. The fourth bay contains another pair of offset ribbon windows and the main entrance to the office wing. The entrance, which appears to be a postwar alteration, is recessed within an integral porch paneled in unpainted plywood and sheltered beneath a flat wood canopy canti-



Figure 4. Eastern third of south façade
Source: KVP Architects

levered out over a concrete walkway leading to the street. The porch is enclosed behind a steel security gate. Above the entrance is a four-light awning-sash window. The fifth bay features a tripartite ribbon window and a four-light awning sash window on the first floor level and a tripartite band of double-hung wood windows at the second floor level. After this point, the south façade becomes more regular in appearance (Figure 4). The sixth and seventh bays contain groups of four double-hung wood windows. The eighth bay features a tripartite ribbon window on the first floor level and a group of four double-hung windows on the second floor level. One boarded-up pedestrian door and one historic two-panel wood door

flank the ribbon window on the first floor. The ninth bay has groups of four double-hung windows on the first and second floor levels and the tenth bay has pairs of matching windows on both floors.

The entire south façade is clad in 4' x 8' plywood sheets painted a light gray color. The office wing is capped by an overhanging eave consisting of wood rafter ends concealed behind a wood fascia board painted tan. Metal ventilator pipes extend up along the walls through the soffit. Sheetmetal HVAC equipment is mounted to the roof of the office wing. A portion of the south wall of the machine shop proper is exposed to view above the office wing roof; it is clad in newer T-111 plywood that is incompatible with the rest of the smooth plywood exterior.

C. East Façade

The east façade of the Machine Shop comprises the machine shop, although the southernmost bay is the office wing. A comparison of the 1945 Grambow drawings and the existing building reveal very few postwar changes (Figure 5). The east façade is four bays wide; the southernmost bay consists of pairs of double-hung wood windows on the first and second floor levels. The next three bays are largely the same, consisting of large barrel-vaulted bays articulated by vehicular openings and double-hung windows at the first floor level and two bands of ribbon windows above (Figure 6). There are slight differences between the three machine shop bays; the southernmost features an additional pedestrian door to the left of the vehicular door and the vehicular door does not have sliding metal fire doors. Occupying the spandrel panels between the ribbon windows in the central bay of the machine shop are the words "MACHINE SHOP" painted in capitalized red letters in a 1940s-era font. The east façade terminates with a band of wood trim and metal flashing that outline the barrel vaulted roof.

D. North Façade

The north façade of the Machine Shop is also largely identical to what is shown on the 1945 Grambow drawings. In comparison with the south façade, the north façade is entirely symmetrical, with each of the ten bays consisting of groups of four double-hung wood windows on the first floor level and two bands of wood ribbon windows above (Figure 7). Each ribbon window comprises four, four-light windows that appear to be fixed in place, although some may be operable awning sash. The north façade is clad in 4' x 8' plywood sheets and terminates in a cornice consisting of the exposed 2" x 6" rafter ends linked together by recessed fascia boards. The north façade features several large ventilation ducts or flues.



Figure 5. East façade of the Machine Shop
Source: City of Sausalito Community Development Department



Figure 6. Detail of east façade
Source: KVP Consulting



Figure 7. North façade of the Machine Shop
Source: KVP Consulting

F. West Façade

The west façade of the Machine Shop is partially obscured by trees and adjoining buildings and therefore impossible to photograph in one section (**Figures 8 & 9**). The Grambow drawings indicate that it was originally the mirror image of the east façade. Since the decommissioning of Marinship in 1945-46, the west façade appears to have undergone several alterations, including the infilling of the three vehicular entrances that were once located here (probably after the property to the west was sold, cutting off vehicular access to the rear of the building) and the addition of a metal stair leading up to the second floor level of the office wing. Above the first floor level, the west façade appears unchanged, retaining all of its original plywood cladding, wood ribbon windows, and painted signage reading: "MACHINE SHOP."



Figure 8. West façade of the Machine Shop
Source: KVP Consulting



Figure 9. Detail of west façade
Source: KVP Consulting

G. Roof

The roof of the Machine Shop comprises three parallel barrel-vaulted sections corresponding to each of the three bays of the machine shop interior (**Figure 10**). The vaults are supported by large wood bow-string trusses that allow for 40' clear spans inside. The vaults are clad in redwood sheathing covered in asphalt "rolled" roofing materials. The asphalt roofing has failed or been removed in large areas and the interior of the building is now exposed to the elements.



Figure 10. Roof of the Machine Shop
Source: Bing.com

The office wing has a shed roof that appears to be covered in more recent built-up materials. The roof of the Machine Shop is punctuated by its original sheet metal ventilators and large wood-frame, wire-glass skylights located along the inner edge of the outer vaults and along both sides of the center vault.

H. Interior

As mentioned above, KVP did not survey the interior of the Machine Shop. It is private property and was off-limits. However, KVP did obtain interior photographs from the Sausalito Community Development Department. According to the original 1945 Grambow drawings the interior of the Machine Shop was divided (as it is today) into two sections: the machine shop proper and the two-story office wing. According to the plans, the machine shop itself was divided into three equal bays, as it remains today. The northernmost bay was labeled on the drawings as the "Operating Gear Bay." This bay contained a small office at the northeast corner and a fenced-in area defined by workbenches. These built-out spaces evidently no longer exist. Recent photographs indicate that the rest of the interior materials remain intact, including the concrete flooring, plywood exterior walls, plank demising walls, exposed heavy timber framing, overhead traveling crane, exposed bowstring trusses, 2" x 6" rafters and purlins, skylights, suspended incandescent light fixtures, and wood double-hung and fixed ribbon windows (**Figure 11**).



Figure 11. Interior of north bay of the Machine Shop, looking west
Source: Sausalito Community Development Department

The north bay contains at least one free-standing structure, probably constructed by the Army Corps of Engineers ca. 1946. There are several sinks and kilns within the space, also probably installed ca. 1946 when the Army Corps converted the building into a materials testing laboratory. The north bay, as well as the rest of the machine shop, contains longitudinal steel bracing installed by the Army Corps ca. 1995. The center bay of the machine shop wing was originally very similar to the north bay. According to the original plans, it does not seem to have been devoted to any specialized use, although it too had (and continues to have) an overhead traveling crane used to lift and carry oversized machinery, materials, and finished products. The center bay features a concrete floor and demising walls clad in wood planks. The perimeter walls feature exposed framing and plywood. At least one original wood structure may survive toward the west end of the space. Several newer structures – probably built after 1946 when the Army Corps took over – exist along the south wall of the center bay. The center bay has undergone more substantial seismic lateral bracing (**Figure 12**).



Figure 12. Interior of the center bay of the Machine Shop, looking east
Source: Sausalito Community Development Department

The south bay of the machine shop section is labeled the “Finish Bay” on the 1945 plans. The plans indicate that this space contained a tool room, a welding booth, and a room containing finish materials. The south bay appears to have undergone more alterations than either of the other two bays, with a partition wall installed approximately halfway along the long axis of the space and a portion of its north wall removed so that it is now linked with the center bay. The south bay does not appear to retain its overhead traveling crane. Otherwise, many of its original features and materials remain, including its concrete flooring, exposed heavy timber framing, and exposed bowstring trusses (Figure 13).

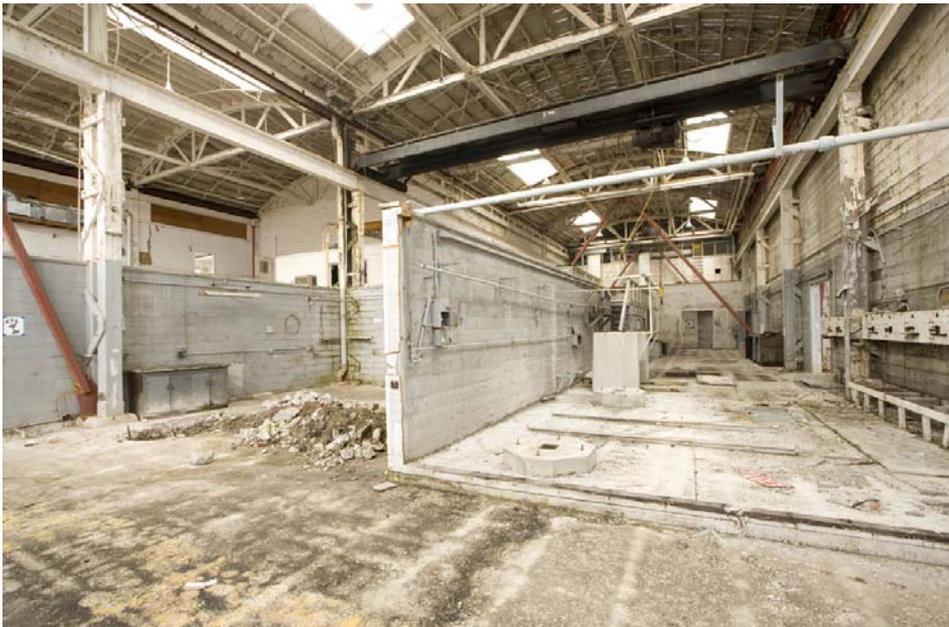


Figure 13. South (left) and center bay (right) of the Machine Shop, looking west
Source: Sausalito Community Development Department

According to the 1945 Grambow plans, the office wing contained offices, a boiler room, tool and die room, and men's toilet rooms and locker rooms. The second floor contained a lunch room and women's toilet room, locker room, and "quiet room." Because women comprised approximately one-quarter of Marinship's workforce at the height of production in 1943 and 1944, management found it necessary to provide them with their own spaces, and this appears to be why the second floor was added in late 1942 or early 1943. Although the office wing was clearly adapted for the use of the Army Corps after 1946, many of the original materials and features appear to be retained in place, including concrete flooring on the first floor and wood flooring on the second floor, wood-plank or plywood walls and ceilings, double-hung wood or fixed windows, and suspended fluorescent light fixtures (Figure 14).



Figure 14. Office interior of the Machine Shop, looking west
Source: Sausalito Community Development Department

1. Assessment of Physical Fabric

With the exception of the concrete floor and the metal overhead cranes, metal-clad fire doors, hardware, and plumbing and light fixtures, the Machine Shop is entirely constructed of wood. Wood-frame construction was traditionally not used for permanent shipyard structures. Instead, steel and masonry were used due to concerns over strength, durability, and resistance to fire. However, during World War II there were restrictions on the use of steel for most non-military projects – even war plants and shipyards. Wood was readily available and therefore not subject to these restrictions. Wood-frame buildings were also traditionally much quicker and easier to construct than steel-frame or concrete buildings and required less skilled labor. As buildings that were probably intended to be temporary – they only needed to last the duration of the war – wood-frame construction was probably seen as the best choice for nearly all the buildings at Marinship. The only buildings constructed of steel there were buildings that housed explosive or otherwise dangerous materials.

Although wood is one of the oldest building materials, the buildings at Marinship (including the Machine Shop) demonstrate some innovative applications of the material geared toward mass-production – particularly the glue-laminate trusses and plywood sheathing. Although laminated wood products go back centuries, the development of water-proof finishes and standardized sizes only happened in the United States in the 1930s, just in time for the Second World War when plywood was increasingly used to build barracks, aircraft, and landing craft. Plywood was inexpensive, durable, and much cheaper and easier

to use than traditional wood siding which had to be cut, milled, finished, and then nailed into place in relatively small sections. Another technological breakthrough used extensively at Marinship were laminated roof trusses. Introduced to the United States only in the 1930s, glue-laminated roof structures (“glulam”) were eagerly adopted by the U.S. military and other war industries because one did not need whole (and increasingly scarce) oversized timber components. Also, glulam components could be pre-fabricated off-site and shipped to wherever they were needed.

Despite its lightweight construction, the Machine Shop has survived for nearly 70 years with relatively few changes to its overall form, materials, and design. Designed as an industrial machine shop, all that was required of it were wide, clear-span spaces to accommodate large machinery with enough space to move, shape, and temporarily store large objects such as propeller shafts and other finely calibrated equipment handled by the machinists who worked in the building. In addition, there needed to be a way to transport large objects and machinery into and out of the building. For this reason, most maritime machine shops since the nineteenth century have featured high-capacity overhead traveling cranes capable of moving objects from trucks or railcars at the entrance of the building to practically any location inside (overhead cranes can move both longitudinally and laterally). Of subsidiary importance were non-production related spaces, such as offices, toilet rooms, break rooms, and locker rooms –spaces traditionally contained within shipyard machine shops. These could be accommodated either within mezzanines or freestanding structures built within the large machine shop bays or they could be placed in a separate wing as they are in the Marinship Machine Shop.

While it belonged to the Army Corps of Engineers, the Machine Shop was used as a soils and concrete testing laboratory, a purpose well-suited to a general-purpose industrial building with high ceilings, concrete floors and overhead cranes to move equipment about the building. While the Army Corps occupied the building, it provided some regular maintenance – enough to keep the roof on, the windows fixed, and the rain out. However, the building has been abandoned now for about 15 years. Its rolled roofing was removed by the VA in 2008, allowing rain into the building. In addition, many of its windows are broken and squatters have broken into the building many times, posing dangers to the building and to themselves. Without regular maintenance, the relatively lightweight structure will only continue to deteriorate.

III. Historic Context

This section provides an overview of Sausalito, a construction and ownership history of the Machine Shop, as well as pertinent information on the development of Marinship during the Second World War.

A. Sausalito

What is now Sausalito was historically the site of a Bay Miwok settlement known as *Liwanelowa*. The Bay Miwok who lived in this part of Marin County were part of a tribelet known as the *Huimen*. The first known European visitor to *Liwanelowa* was the Spaniard Don José de Cañizares, who arrived on the *San Carlos* on August 5, 1775. Cañizares reported friendly natives and abundant lumber, fresh water, and populations of deer, elk, bear, sea lions, and other animals. He also remarked on the suitability of the area for shipbuilding, with its large mature redwoods and sheltered deep-water cove just inside the Golden Gate. The following year, the Spanish crown established a military garrison at *El Presidio de San Francisco* (The Presidio), right across the Golden Gate from what is now Sausalito. Eventually the Spanish rounded up most of the Bay Miwok who lived at *Liwanelowa* and sent them to live at either *Misión San Francisco de Asís* or *Misión San Rafael de Arcangel*.⁸

One of the first non-indigenous inhabitants of Sausalito was an Englishman named William A. Richardson (1795-1856). Born in London, Richardson was a sailor. He learned enough Spanish in his travels along the coast of Latin America to communicate with the local *Californios* when he arrived in the San Francisco Bay aboard the British whaler *Orion* in 1822. Mexico had just won its independence from Spain and Richardson apparently liked the way of life in the remote frontier settlement. He jumped ship and within three years he had converted to Catholicism, become a naturalized Mexican citizen, and married Maria Antonia Martinez, the daughter of Don Ignacio Martinez, the *Commandante* of The Presidio. As a Mexican citizen, Richardson was eligible to petition the governor for land, and around 1837 he petitioned Governor Alvarado for a 20,000-acre *ranch* in the Marin Headlands. He called his new home *Rancho Saucelito* in recognition of a small grove of willows that grew around a fresh water spring. Richardson and his wife lived in an adobe located on what is today's Pine Street, near Caledonia Street. He built a wharf close by and used it to trade lumber, hides, and tallow from his ranch with Yankee traders. He also outfitted whalers who dropped anchor in San Francisco Bay and sold fresh water to the residents of the growing settlement of Yerba Buena (renamed San Francisco in 1847).⁹

The American conquest of the Southwest in 1847 put an end to the idyllic *ranch* culture of Mexican California. Many of the Anglo-American newcomers who flooded the territory during the Gold Rush proved contemptuous of Spanish and Mexican laws, quickly overrunning many of the *ranchos*. *Rancheros* were forced to legally defend title to their lands, a process that quite literally ruined many. By the 1860s, most of the *ranchos* in the San Francisco Bay Area had been broken up into smaller landholdings, including *Rancho Saucelito*, which had been gradually sold off to pay Richardson's legal bills. By the time of his death in 1856, Richardson's lawyer Samuel Throckmorton had gained control of most of the *ranch*.¹⁰

Seven years before his death, William Richardson had sold his last remaining 650 acres to another San Francisco lawyer named Charles T. Botts. With visions of a new metropolis on the north shore of the Golden Gate, Botts established a community he called "Old Saucelito" on the shore of Shelter Cove. None of his heady plans for building a competitor to San Francisco were realized, but the small settlement remained, eventually becoming known as "Old Town."¹¹

⁸ Bonnie J. Peterson, *Dawn of the World: Coast Miwok Myths* (San Rafael, CA: Marin Museum Society, 1976).

⁹ Jack Mason, *Early Marin* (Petaluma, CA: House of Printing, 1971), 26.

¹⁰ Margaret Badger, Phil Frank, et al, *Sausalito* (Charleston, SC: Arcadia Publishing, 2005), 10.

¹¹ *Ibid.*, 23.

nickname: "Monte Carlo of the West."¹⁴ Meanwhile, Downtown became a bastion of rail yard workers, fishermen, and other working-class people.

Conditions in late nineteenth-century Sausalito continued to define the community well into the early twentieth century. As the junction of the San Francisco Ferry and the North Pacific Coast Railroad (reorganized as the North Shore Railroad in 1902), Sausalito remained an important transit node for travelers journeying between San Francisco and points north. In 1903, the North Shore Railroad opened an electrified rail line to Mill Valley and San Anselmo, opening up interior sections of Marin County to weekenders and commuters. Growth in private automobile ownership did not lessen the importance of Sausalito, with new auto ferries springing up between San Francisco and downtown Sausalito. Hotels, saloons, and other attractions sprang up in the town to cater to weekend day trippers and others passing through the city.¹⁵ The opening of the Golden Gate Bridge in 1937 marked the beginning of the end of Sausalito's role as an important transit node. Passenger rail service ended in February 1941 and regular ferry service ended not much later, although the latter would temporarily resume during the Second World War.¹⁶

U.S. entry into the Second World War transformed Sausalito just as it was watching its importance as a transit center slip away. The opening of the Marinship yard north of New Town led to the doubling of the city's population as thousands of shipyard workers made their way to Sausalito to take high-paying jobs building Liberty Ships and tankers. The town would never be the same again.

B. Shipbuilding in the Bay Area during the 1940s

Although in 1940, the United States had not yet entered the Second World War, it was actively supporting Britain in its valiant stand against Nazi Germany and growing increasingly concerned over Japanese expansionism in Asia. In 1936, President Franklin D. Roosevelt and Congressional Democrats passed the Merchant Marine Act, part of which involved the creation of the U.S. Maritime Commission. The new commission's mandate was "to develop and maintain a merchant marine sufficient to carry a substantial portion of the water-borne export and import foreign commerce of the United States on the best-equipped, safest and most suitable type of vessels owned, operated and constructed by citizens of the United States, manned with a trained personnel and capable of serving as a naval and military auxiliary in time of war or national emergency."¹⁷ Seeking to avoid getting caught off-guard as it had during the First World War, one of the commission's first acts was to authorize a long-range construction program to build 50 vessels a year over the next ten years.¹⁸

By early 1941, President Roosevelt doubled the U.S. Maritime Commission's goal to 400 ships.¹⁹ Meanwhile, after suffering stunning losses at the hands of the German U-boat fleet, the British government commissioned 60 freighters to be constructed in American yards. Following a decades-long slump in shipbuilding, private American shipyards could not even begin to respond to the demand for new freighters commissioned by the American and British governments. In a bid to meet its goals, the Maritime Commission began actively encouraging private industry to construct and operate new modern shipyards by providing the upfront construction costs and guaranteeing a seemingly limitless number of commissions. One of the first to respond was construction magnate Henry J. Kaiser. A member of the influential Six Companies consortium – builders of Hoover, Grand Coulee, and Bonneville dams (in partnership with W.A. Bechtel Corporation and several others) – Henry J. Kaiser joined forces with Todd Shipyards in 1940 to found the Seattle-Tacoma Shipbuilding Corporation. The Maritime Commission

¹⁴ William Chapin et al, *Suburbs of San Francisco* (San Francisco: Chronicle Books, 1969), 130.

¹⁵ Margaret Badger, Phil Frank, et al, *Sausalito* (Charleston, SC: Arcadia Publishing, 2005), 23.

¹⁶ *Ibid.*, 48.

¹⁷ Wayne Bonnett, *Build Ships!* (Sausalito, CA: Windgate Press, 1999), 24.

¹⁸ *Ibid.*

¹⁹ Charles Wollenberg, *Marinship at War: Shipbuilding and Social Change in Wartime Sausalito* (Berkeley: Western Heritage Press, 1990), 19.

promptly awarded the new company a commission to build five C-1 freighters. Around the same time, the Kaiser-Todd partnership won a contract to build 30 freighters for the British government.²⁰

Unable to build all these ships in Seattle, Kaiser began looking for an ideal location for a new state-of-the-art yard elsewhere on the West Coast. He found it in the mudflats of Richmond, California, a small industrial community located across the bay from San Francisco. Kaiser constructed Richmond Yard No. 1 and laid the keel for the first British freighter in April 1941. Impressed with the speed with which Kaiser had built this yard, the Maritime Commission requested that he build a second yard at Richmond expressly for Liberty Ships. Kaiser Richmond Yard No. 2 would be ready by September of that year (**Figure 16**).²¹



Figure 16. Kaiser Yards 1 & 2, Richmond
Source: Richmond Public Library

The Liberty Ship, famously nicknamed the “Ugly Duckling” by President Roosevelt, was arguably the most important American weapon in the fight against Nazi Germany (**Figure 17**). Based on the design of the common 10,000-lb British tramp steamer (the type ordered from Kaiser in 1940), the Liberty Ship was modified to U.S. specifications. Known officially as the EC2-S-C1, the Liberty Ship was designed for carrying virtually any cargo and it featured a simple layout for ease of construction, durability, maximum cargo capacity, and speed. Its hull was perfect for all-welded sub-assemblies by virtue of being mainly slab-sided with compound curves only at the bow and stern. The superstructure consisted of one main boxy deckhouse and standardized masts and booms. Over 2,700 Liberty Ships were built in the U.S. during the war, and around 450 of those were built in the San Francisco Bay Area.²²

The U.S. Maritime Commission believed that the San Francisco Bay Area was an ideal location for shipbuilding, mainly because of its location on the Pacific Ocean (away from the Atlantic, which was patrolled by German U-boats), its narrow harbor entrance that could be protected from submarine, surface, and air attack; and its long tradition of shipbuilding, coupled with its large workforce of well-trained ship-

²⁰ Wayne Bonnett, *Build Ships!* (Sausalito, CA: Windgate Press, 1999), 32.

²¹ *Ibid.*, 128.

²² *Ibid.*, 46-7.

wrights, shipfitters, boilermakers, and affiliated tradesmen. Prior to the war, the San Francisco Bay Area had several major shipyards, including Bethlehem Shipbuilding Company's San Francisco and Alameda Yards, the U.S. Navy's Mare Island Naval Shipyard in Vallejo, the Hunters Point Dry Docks (later Hunters Point Naval Shipyard) in San Francisco, Moore Shipbuilding in Oakland, Western Pipe & Steel Company's South San Francisco yard, and dozens of smaller yards along the Oakland-Alameda Estuary, San Francisco's India Basin, and as far inland as Stockton. Other western cities saw major shipbuilding activity during the war, including Los Angeles/Long Beach, Portland, and Seattle/Tacoma, but none approached the scale of the San Francisco Bay Area. Between 1939 and 1946, Bay Area shipyards launched some 1,400 vessels of various types, not counting the hundreds (if not thousands) of landing craft built by area yards. Liberty Ships constructed by Kaiser and Marinship were by far the most numerous. Most major warships, including aircraft carriers, battleships, and heavy cruisers were built in eastern yards. Western yards built destroyers (Bethlehem's San Francisco Yard) and submarines (Mare Island).²³

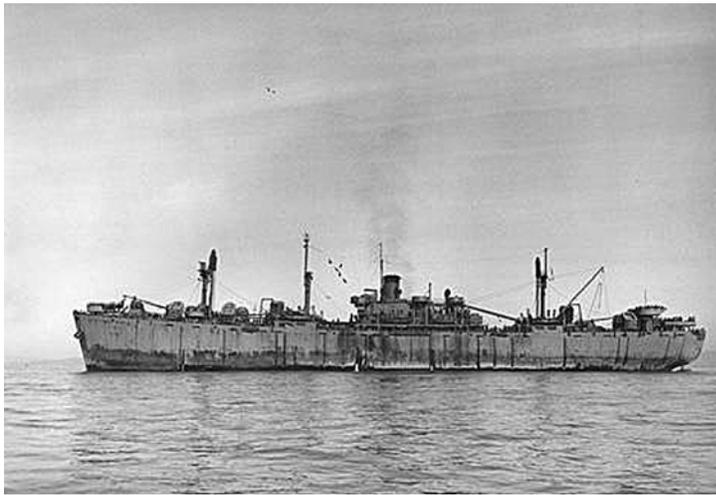


Figure 17. *SS Carlos Carrillo* – Liberty Ship
Source: http://wapedia.mobi/en/Liberty_ship

By 1941, the Maritime Commission's shipbuilding program had yielded over one million tons of shipping capacity, nearly tripling its 1939 figure. Nonetheless, the combined output of American and British yards still did not equal the tonnage lost to German U-boats that year. This factor, combined with the Japanese attacks on Pearl Harbor and other Pacific island bases, compelled President Roosevelt to up the quota for 1942 from one to five million tons. To meet this goal, more yards would be necessary. In January 1942, Admiral Emory S. Land of the Maritime Commission requested Henry Kaiser to build a third yard at Richmond to build C-4 troop transports. Two months later, on March 2, 1942, Admiral Land wired

Kenneth Bechtel at the headquarters of the W. A. Bechtel Corporation in San Francisco to request that he establish a shipyard in the San Francisco Bay Region to build Liberty Ships.²⁴

C. *W.A. Bechtel Corporation*

W.A. Bechtel Corporation (Bechtel) leapt at the opportunity to expand (as Kaiser had done) into shipbuilding. Founded in 1925 by W.A. "Dad" Bechtel as the W.A. Bechtel Corporation, the company, like Henry J. Kaiser, had gotten its start building roads in California. In 1931, Kaiser and Bechtel formed a consortium of construction companies to bid on public works projects in the West – in particular the Bureau of Reclamation's planned dam on the Colorado River. The consortium consisted of eight companies, but at the suggestion of Felix Kahn of MacDonald & Kahn, the consortium whimsically called itself "Six Companies," in reference to the famous benevolent societies of San Francisco's Chinatown. The Six Companies won the contract to build Hoover Dam with the low bid of \$49 million. This project catapulted Kaiser, Bechtel, and the other members of the consortium into the top rank of western construction companies.²⁵

²³ Wayne Bonnett, *Build Ships!* (Sausalito, CA: Windgate Press, 1999), 154.

²⁴ Charles Wollenberg, *Marinship at War: Shipbuilding and Social Change in Wartime Sausalito* (Berkeley: Western Heritage Press, 1990), 3.

²⁵ *Ibid.*, 8.

Dad Bechtel died unexpectedly on a trip to the Soviet Union in 1933. His son Steve Bechtel stepped into the position of authority, also sitting on the four-man executive committee of the Six Companies – chaired by Henry Kaiser. In 1937, Bechtel formed a sister company in Los Angeles called the Bechtel-McCone Company. Initially this firm specialized in building refineries, such as the Standard Oil Refinery in Richmond. Soon Bechtel-McCone moved into shipbuilding, building the California Ship Company (Calship) in Los Angeles in 1941.²⁶ At its peak, Calship employed 40,000 people and built 467 vessels during its four-and-a-half year run. Together, Calship and Marinship made Bechtel America's third-largest ship-builder after Kaiser and Bethlehem Steel.²⁷

D. Design and Construction of Marinship

Less than 24 hours after receiving the cable from Admiral Land, the Bechtel brothers selected Richardson's Bay in Sausalito as the site for their new state-of-the-art shipyard. They chose this particular site because it was mostly level and undeveloped and had access to deep water close to the Golden Gate. Just as important, it had excellent rail access thanks to the Northwestern Pacific Railroad and the Redwood Highway (U.S. 101), both of which ran through the site. A week after the cable, Kenneth Bechtel and other company executives traveled to Washington, D.C. with a detailed proposal. On March 10, 1942 – just ten days following Admiral Land's request – Bechtel signed a contract with the Maritime Commission to build and operate the proposed facility and build 34 ships by the end of 1943.²⁸

The proposed 210-acre site was not entirely vacant. Although most of it was partially submerged tideland property belonging to the Northwestern Pacific Railroad Company, the site also contained several industrial operations and a small community of about 30 residential property owners living atop a tree-clad promontory called Pine Hill. Initially the site did not include Pine Hill; this site was only incorporated into the site after Bechtel officials decided that it was necessary to facilitate an uninterrupted flow of materials and subassemblies through the site. In March 1942, the United States government initiated condemnation proceedings against the local landowners, forcing the residents of Pine Hill to leave their homes. They were only given two weeks to get out, although some were able to move their houses.²⁹

The drafting and engineering work on the proposed shipyard in Sausalito was handled in-house by Bechtel engineering staff. Quarters were made available for them in the Mills Building in downtown San Francisco. 50 persons were employed to do the design work, including several brought up from the company's Los Angeles office. The men worked seven day weeks from eight in the morning until ten at night.³⁰ A rendering created by Bechtel's engineering and drafting staff shows the appearance of the planned shipyard, which with a few exceptions, was largely built as depicted (**Figure 18**).

Bechtel staff designed the most efficient shipyard built in the Bay Area during the Second World War. Although not as large or as well-known as Kaiser's yards in nearby Richmond, the Marinship complex was better designed to reduce inefficiencies and speed up production. Freely borrowing from the assembly line techniques long used by auto manufacturers, Marinship's engineers designed what was known as a "turning flow" yard. By the early 1940s shipyard design tended to fall into either the "straight-line" or "turning flow" categories. In the straight-line mode, raw materials entered the site at one point (usually by railroad or truck) and then proceeded down a straight "assembly line" through various sorting, cutting, and preassembly stages until meeting the shipways at the water's edge. Here, the resulting subassemblies were assembled into a ship and launched. The straight-line approach was oriented perpendicular to the water and therefore required a lot of space. If a site did not have that much depth (like

²⁶ Charles Wollenberg, *Marinship at War: Shipbuilding and Social Change in Wartime Sausalito* (Berkeley: Western Heritage Press, 1990), 9.

²⁷ *Ibid.*, 10.

²⁸ Richard Finnie, *Marinship: the History of a Wartime Shipyard* (San Francisco: Marinship, 1947), 1-4.

²⁹ Charles Wollenberg, *Marinship at War: Shipbuilding and Social Change in Wartime Sausalito* (Berkeley: Western Heritage Press, 1990), 1.

³⁰ Richard Finnie, *Marinship: the History of a Wartime Shipyard* (San Francisco: Marinship, 1947), 14.

Marinship), the turning flow process was used. This mode worked the same as straight-line flow except that the assembly line operated parallel to the water until the subassembly process was completed. At this point the “flow” made a ninety-degree turn where it met the shipways. At the shipways, the subassemblies assembled, the ship launched, and towed to the outfitting docks for completion.³¹



Figure 18. Rendering of proposed cargo vessel shipyard in Sausalito (Machine Shop on far left)
Source: W.A. Bechtel Corporation

With limited space between Richardson’s Bay and the highway and rail lines that bounded the site to the west, Marinship would become a textbook “turning flow” yard.³² As designed by Bechtel’s engineers, the yard was split into four main zones: administration, subassembly, assembly, and outfitting (**Figure 19**). Administration was to be located in the north, near the primary rail and highway entrances to the yard. Raw materials, including thousands of steel plates for hulls, deckhouses, as well as pre-manufactured engines, shafts, propellers, rudders, and other machinery and equipment procured from other locations, would enter the 210-acre site here, where rail sidings provided direct access from the main line of the Northwestern Pacific Railroad. There were also access drives directly off Highway 101. Here, the incoming materials would be sorted and stored prior to production.

Just south of the administration zone was the subassembly zone. Here, the raw steel plates would be burned (cut) in the Plate Shop (Building 20) before being sent southward to the Subassembly Shop (Building 25) where the various plates would be welded together into subassemblies. The Mold Loft/Yard Office (Building 30), where full-sized drawings and templates for each part were made, was to be located just east of these two shops for easy communication and oversight.

Just south of the subassembly zone was to be the assembly area. Upon completion of the subassemblies (deck houses, stern and bow assemblies, bulkheads, etc.), they would be transported by truck, crane, or rail to the staging area to the west of the shipways. High-capacity, self-propelled “whirley” cranes operating along tracks on the shipways would then transport the completed subassemblies to the particular hull where they were needed and there workers would weld them into place. Preassemblies meant that only about 100 individual pieces were assembled on each shipway prior to launch.

Although to a casual observer, a ship was complete following launching, there were typically several more weeks of outfitting prior to testing and delivery. Limiting the amount of time in the assembly zone meant that more hulls could pass through the ways in a shorter amount of time. Upon the rough comple-

³¹ Wayne Bonnett, *Build Ships!* (Sausalito, CA: Windgate Press, 1999), 50.

³² A much more extensive description of the work flow of Marinship will be included in the Historic Context Statement being prepared by KVP as part of the upcoming Marinship survey.

tion of the vessel, it would be towed to the outfitting zone south of the assembly zone. Here, an entirely separate section of the shipyard would produce, sort, machine, and install all of the smaller parts of a ship, including electrical, plumbing, navigation instruments, weaponry, insulation, ventilation, joinery, flooring and decking, etc. Buildings that were to serve the outfitting zone included the Outfitting Docks (Structure 14), the Outfitting Shops (Building 15), the Subcontractors' Building (Building 26), the Main Warehouse (Building 29), the Machine Shop (Building 11), the Paint and Oils Warehouse (Building 17), the General Shops (Building 10), and the Blacksmiths' Shop (Building 4). For the most part, these buildings were laid out directly opposite the Outfitting Docks, allowing for individual items to be easily transported to the docks as they were needed.

As designed, Marinship would also contain many buildings that were not directly involved with the production process, including administration, training and workforce development, emergency care, canteens, and transportation infrastructure. Marinship designers made sure that all were all located away from the main production line so as to not take up valuable space or cause congestion within critical parts of the yard. The Administration Building (Building 3) was to be located directly opposite the main entrance to the yard. Located on the opposite side of Highway 101 was to be a complex of buildings dedicated to training new hires (Buildings 27 and 28), salvage operations (Buildings 6 and 21), and the Cafeteria (Building 8). Various storage facilities, garages, and other non-production related facilities would be located at the far southern and northeastern parts of the yard. There was also to be a clinic (Building 19) near the ways to take care of any injured workers. Just to the north of the ways, the engineers designed a ferry slip to transport workers to the yard from San Francisco. Canteens serving cold lunches and coffee were to be interspersed throughout the yard.

Even before the engineers had completed their drawings, site work was underway. Soil tests revealed that bedrock was closest to the surface at the central portion of the shipyard site, so it was decided to place the shipways at this point. All structures, including the ways, were built atop beds of pilings that were driven through the mud and fill until they hit bedrock. Areas of the yard that did not have pilings – particularly in the northern part of the site – continually settled.³³

Bechtel broke ground on the yard on March 28, 1942 (**Figure 20**). In early April 1942, Pine Hill had been blasted away and the 838,763 cubic yards of debris used to fill the tidal marshes between Highway 101 (now Bridgeway) and the former railroad embankment. Suction dredges were used to deposit mud and silt from the bay floor onto the site. In addition, these dredges were used to clear a deep water channel out to San Francisco Bay and the Golden Gate. More than 25,000 pilings were used to stabilize the fill and to form a solid foundation for the yard and its dozens of buildings, ways, and structures. After the filling was done, plumbers installed a network of oxygen, compressed air, and acetylene lines throughout the site. Electricians also installed an 11,000-volt electrical cable to power the yard. Highway 101 and the Northwestern Pacific rail line were also relocated to follow the western boundary of the shipyard.³⁴

³³ Richard Finnie, *Marinship: the History of a Wartime Shipyard* (San Francisco: Marinship, 1947), 15.

³⁴ *Ibid.*, 11-22.

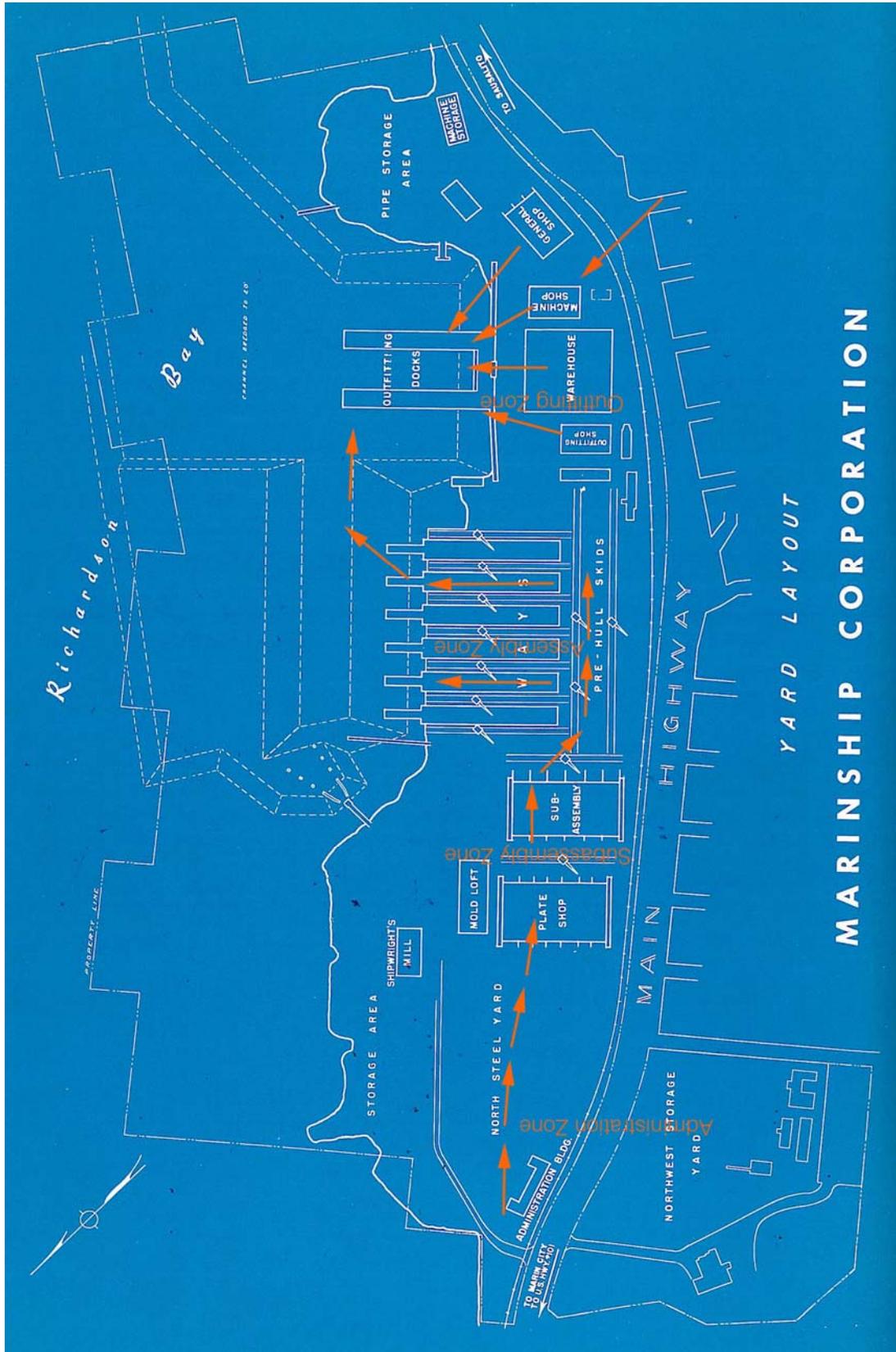


Figure 19. Site Plan of Marinship yard, with arrows depicting workflow and major zones
Source: Richard Finnie, *Marinship: The History of a Wartime Shipyard*
Annotated by KVP Architects



Figure 20. Marinship site being graded and filled, spring 1942
Source: Richard Finnie, *Marinship: The History of a Wartime Shipyard*

Following the completion of site work and infrastructure, work began on more than 30 buildings, six shipways, two outfitting docks, and thousands of feet of track for rail spurs and movable cranes. The first major building constructed was the Administration Building (Building 3). Begun in April 1942, it was completed by June 17, 1942. The 122,000-square-foot Outfitting Warehouse (Building 29) was completed next on July 28. The 107,000-square-foot Mold Loft (Building 30) was completed next, on August 23, 1942. Also completed during this time were the six shipways, seven gantry cranes, 7,360 feet of crane ways, two outfitting docks with a connecting dock and ramps, and a ferry slip for transporting workers to and from San Francisco.³⁵ By the end of 1942, the yard was essentially complete and employing 19,000 workers.³⁶

³⁵ Richard Finnie, *Marinship: the History of a Wartime Shipyard* (San Francisco: Marinship, 1947), 18.

³⁶ Charles Wollenberg, *Marinship at War: Shipbuilding and Social Change in Wartime Sausalito* (Berkeley: Western Heritage Press, 1990), 4.

E. Construction of the Machine Shop

The Machine Shop was the sixth building constructed in the new yard. The driving of the piles beneath the building began on June 20 and was completed nine days later. W.A. Bechtel Corporation's Construction Division laid the concrete foundation and footings from June 24-30, 1942. Erection of the building began on July 4 and was completed on August 8, 1942. Construction of a second floor office addition began on October 30 and was completed March 22, 1943. Although by no means the largest shipyard structure, the Machine Shop contained 27,400 square feet when completed, making it the sixth-largest structure. The building's vaulted bowstring-truss roofs resembled many of the larger industrial buildings on the site, including the Yard Office and Mold Loft (Building 30), Warehouse (Building 29), General Shop (Building 10), and the Outfitting Shop (Building 15).³⁷

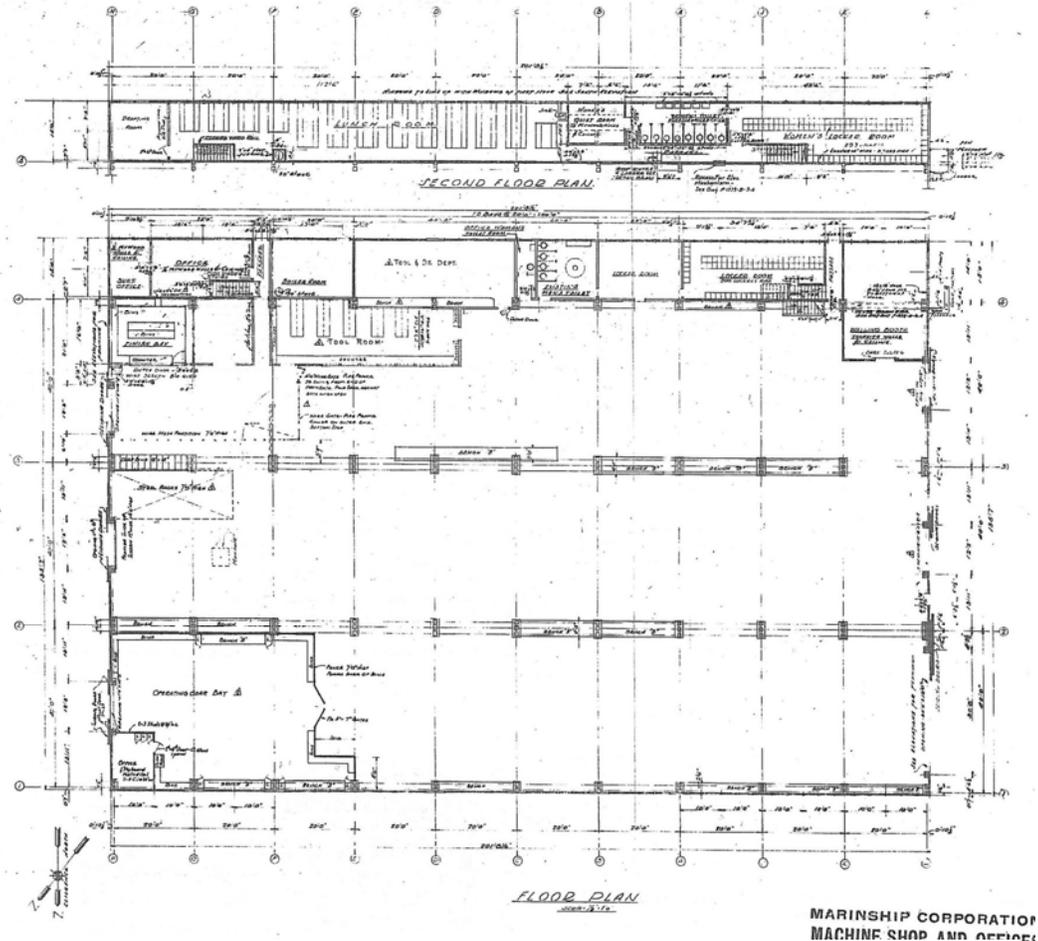


Figure 21. Machine Shop floor plans

Source: Richard Grambow, *Marinship at the Close of the Yard*

The completed Machine Shop measured 136' x 201' in plan and accommodated 27,400 square feet of floor area (Figure 21). As described in Chapter III above, the Machine Shop consisted of two major sections: the machine shop proper and the office wing. The machine shop consisted of three equal bays measuring 40' wide (north-south) by 201' long (east-west). Not very much information is provided on the plans regarding the specific use of each section of the machine shop. However, as a machine shop, it was most likely intended to be a flexible space with wide free spans and high ceiling heights whereby machinery and materials could be moved to where they were needed for particular jobs. On the other hand, the much smaller office wing, which measured only 15' x 201' in plan, was divided up into specific

³⁷ Richard Finnie, *Marinship: the History of a Wartime Shipyard* (San Francisco: Marinship, 1947), 20.

uses identified on the historic plans, including general offices, a tool room, and men's locker room and toilet room on the first floor, and a large lunch room and women's locker room, toilet room, and quiet room on the second floor. The second floor does not appear on the original 1942 rendering but it does appear on the 1945 Grambow drawings, indicating that it was added when it became necessary to accommodate larger numbers of female employees.

The foundation of the Machine Shop was concrete on wood pilings, and the floor was a concrete slab with an allowable floor load of 300 lbs per square foot. Like most of the buildings at Marinship, The Machine Shop is a heavy timber-frame structure clad in plywood with a bowstring-truss roof. Its interior consisted of three bays and an office wing. Each of the bays of the machine shop wing contained overhead traveling cranes, including one three-ton and three 10-ton bridge cranes and four jib cranes. The building was heated with overhead blower units.³⁸

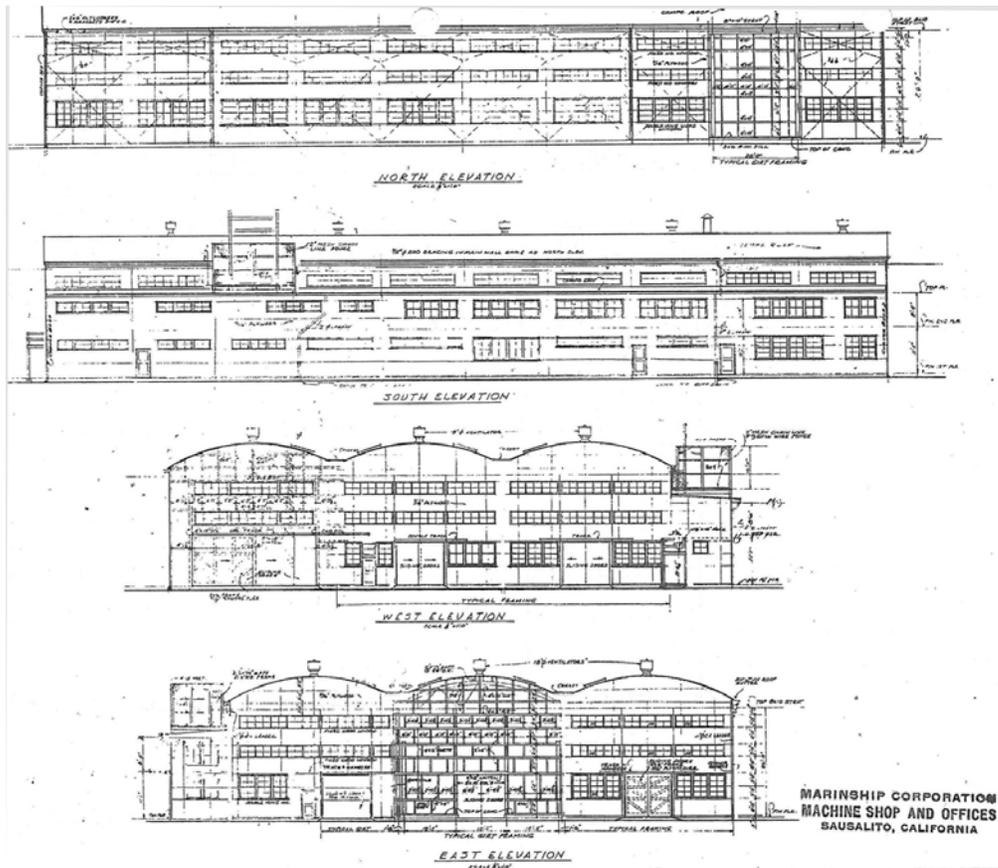


Figure 22. Machine Shop elevations
Source: Richard Grambow, *Marinship at the Close of the Yard*

Like many of the other larger buildings and structures at Marinship, the Machine Shop was clad in plywood sheets, at the time a revolutionary building material that allowed buildings to be erected much quicker, cheaper, and easier than traditional wood cladding materials. Although not explicitly designed in any particular architectural style, the modernist principle of “form following function” was rigorously adhered to in the design of the Machine Shop and other Marinship buildings. The interior plan, combined with its mass-produced building materials and pre-fabricated architectural elements dictated the appearance of the building(s). Although there are no decorative elements, the vaulted roof forms and

³⁸ Richard Grambow, *Marinship at the Close of the Yard* (Sausalito, CA: 1946).

ribbon windows do hint at the then-popular Streamline Moderne style, a style that explicitly celebrated the machine aesthetic (**Figure 22**).

The Machine Shop was one of the more important buildings at the new yard. It was under the jurisdiction of the yard's Machinery Section, which was responsible for handling the outfitting of each ship's engine, boiler, rudder, shaft, and other machinery. The Machine Shop operated with three shifts of machinists working every day of the week. Unlike much of the shipyard, which relied in large part on unskilled and semi-skilled workers, the Machine Shop was mainly staffed by trained machinists, many of whom had previous experience in prewar shipyards. The work was difficult and required extensive experience operating the complicated and expensive machinery used to produce parts with precise tolerances, such as propeller shafts and other mechanical systems. Other parts manufactured or modified in the Machine Shop included tail shafts, line shafts, all types of bearings, stern tubes and liners, coupling bolts, stern frames, rudders, fitted bolts and chocks, as well as taper pins and other hardware.³⁹ A photograph from the 1945 Grambow study shows the interior of the Machine Shop with the machinery in use (**Figure 23**).



Figure 23. Machine Shop interior, ca. 1945
Source: Richard Grambow, *Marinship at the Close of the Yard*

The machinists operated many specialized tools, including dies, cutters, and jigs. Machine Shop staff members were also charged with repairing broken machinery from throughout the yard, work that often required fabricating new parts from scratch.⁴⁰ A photograph in Richard Finnie's *Marinship: the History of a Wartime Shipyard* illustrates a scene taken in the Machine Shop (**Figure 24**). The work process involved the receipt of a shop order form from administration staff. The shop order form included the materials to be used or the parts to be repaired, the time required to complete the job, the date of the order and the date the part was to be completed, a sketch or plan, hull number, and a charge for the work for accounting purposes. Once the part was completed, it was routed to its proper department via courier.⁴¹

³⁹ Richard Finnie, *Marinship: the History of a Wartime Shipyard* (San Francisco: Marinship, 1947), 322.

⁴⁰ *Ibid.*

⁴¹ *Ibid.*

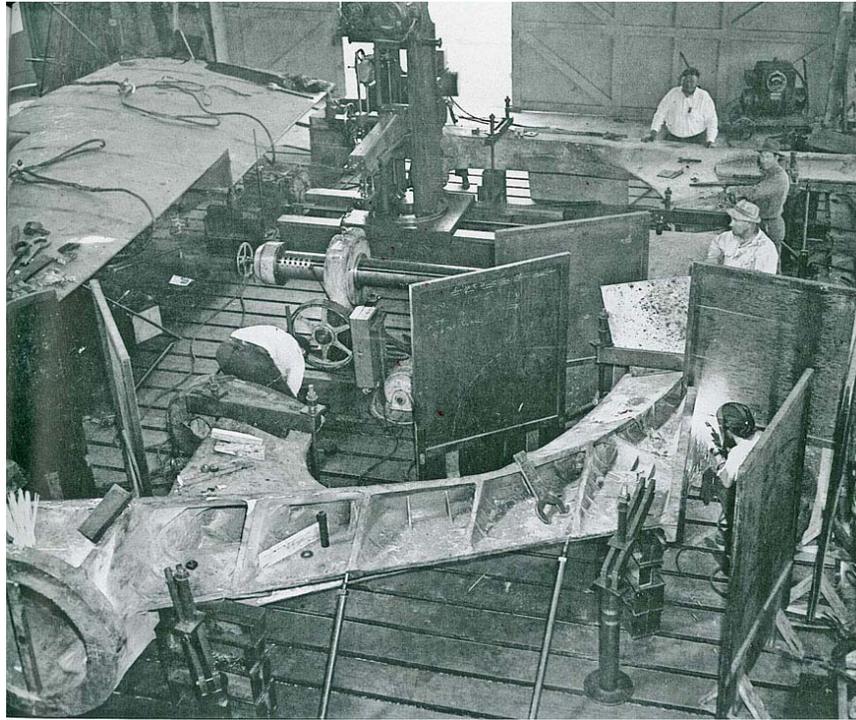


Figure 24. Interior of Machine Shop from Richard Finnie, *Marinship: The History of a Wartime Shipyard*

Original caption reads: "STERN FRAME. In the Machine Shop tail shafts, bearings, stern tubes and liners, coupling bolts and chocks, all had to be machine-finished and hand-spotted to within thousandths of an inch"

F. Concise History of the Marinship Yard: 1942-45⁴²

Kenneth Bechtel was put in ultimate charge of the new Marinship facility. The general manager was William Waste; he had been the manager of Calship before coming to Sausalito. Other management figures at Marinship also had experience in other Bechtel and Six Companies ventures, including construction manager Ted Panton and chief engineer Bruce Vernon.⁴³ At first Marinship was administered as the "Marin Shipbuilding Division of the W.A. Bechtel Company." It was a joint venture that also included Six Companies partners Bechtel-McCone, J.H. Pomeroy and Co., Raymond Concrete Pile, MacDonald & Kahn, and Morrison-Knudsen. The partners primarily participated in the construction of the yard, but all continued to share in the profits from shipbuilding. In the fall of 1942, Marinship became a separate corporation, with W.A. Bechtel & Co. and Bechtel-McCone each owning one-third of the total 4,500 shares and Kenneth Bechtel owning 500 more, meaning that the Bechtel Group owned three-quarters of the stock. The rest of the shares were apportioned among the junior partners. The Board of Directors included Kenneth Bechtel (president) and Steve Bechtel and John McCone (vice-presidents). Other board members included B.M. Eubanks, William Waste, and Robert Digges. Representatives of the partner companies were represented as well.⁴⁴

The yard, originally called the W.A. Bechtel Co., Marin Shipbuilding Division, was soon renamed Marinship, in keeping with the company's other shipyard Calship in Los Angeles. Before the yard was even 50

⁴² A more extensive account of the history of the development and operation of Marinship can be found in the Historic Context Statement prepared by KVP Architects as part of the survey of the former Marinship Property.

⁴³ Charles Wollenberg, *Marinship at War: Shipbuilding and Social Change in Wartime Sausalito* (Berkeley: Western Heritage Press, 1990), 14.

⁴⁴ *Ibid.*, 15.

percent complete, the first keels were laid on June 27, 1942. Initially, to save time, the steel for the first six ships was prefabricated at Calship and then shipped north to Sausalito for assembly.⁴⁵

Marinship was the first of the six post-Pearl Harbor Emergency yards to approach completion. Consequently, in the spring of 1942 Captain Vickery of the Maritime Commission asked Marinship to produce Liberty Ships with “all possible speed.”⁴⁶ Marinship launched its first Liberty, the *William H. Richardson*, 51 days ahead of schedule and delivered it in just 126 days, nearly half the average time of other Bay Area yards (**Figure 25**). Although the Maritime Commission had requested only three Liberty Ships by the end of 1942, Marinship built five. Even though Marinship did receive some help from Calship, the yard’s production was impressive, especially given that the yard itself remained under construction.⁴⁷

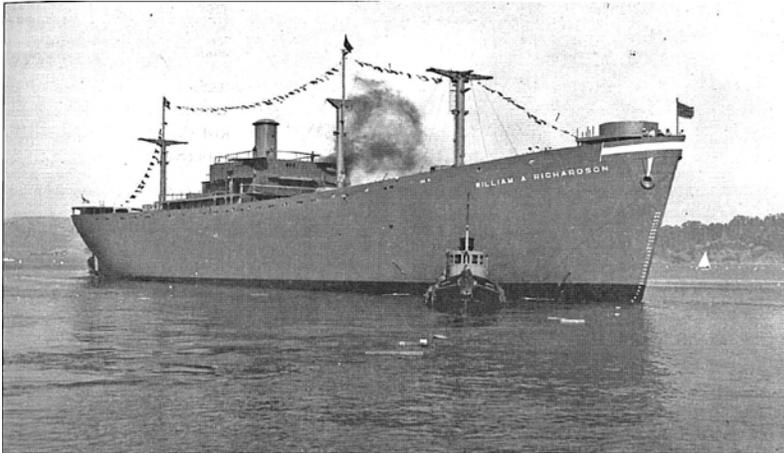


Figure 25. *William A Richardson* on Richardson's Bay just after launching on September 26, 1942

Source: Nicholas A. Veronico, *World War II Shipyards by the Bay*

After Marinship delivered 15 Liberty Ships, the U.S. Maritime Commission decided that the other Bay Area shipyards could handle this segment and asked Marinship to build T-2 merchant tankers and oilers for the Navy. The conversion over to T-2 tankers presented a great deal of problems for Marinship. Unlike the Liberty Ships which were built using extensive subassemblies, the T-2s were specialized vessels that required many more individual assemblies and thousands of extra welds, as well as 16 miles of internal piping connecting each of the oil tanks.⁴⁸ Increasing the challenge was the fact that some

of the tankers were to be built as oilers according to separate Navy specifications. In addition to having to retool the yard and extend the shipways, the resulting losses in efficiency inherent in building one type of ship caused Marinship to fall behind schedule on T2 production, completing only 11 in 1943 – half of the quota assigned by the Maritime Commission.⁴⁹

Exacerbating Marinship’s early production problems was that management had been experimenting with a new low-inventory production system that did not allow for the accumulation of any significant inventory of materials or subassemblies. This innovative strategy – the predecessor to today’s “just-in-time” inventory logistics – depended on a very efficient procurement department experienced with managing the supply chain. On-time delivery of necessary supplies, materials, and parts was essential if this

⁴⁵ Wayne Bonnett, *Build Ships!* (Sausalito, CA: Windgate Press, 1999), 35.

⁴⁶ Richard Finnie, *Marinship: the History of a Wartime Shipyard* (San Francisco: Marinship, 1947), 193.

⁴⁷ Liberty Ships built at Marinship were all named after Californians prominent in the state’s history. Tankers were named for California missions and later, California oil fields. Charles Wollenberg, *Marinship at War: Shipbuilding and Social Change in Wartime Sausalito* (Berkeley: Western Heritage Press, 1990), 32.

⁴⁸ Charles Wollenberg, *Marinship at War: Shipbuilding and Social Change in Wartime Sausalito* (Berkeley: Western Heritage Press, 1990), 32.

⁴⁹ *Ibid.*, 36.

method was going to work but unfortunately Marinship management was initially not up to the task. Their failure resulted in production delays, idled labor, and increasing tensions between labor and management and black and white workers.⁵⁰

By 1944, management had resolved the procurement and supply chain issues, a significant feat given that most of the yard's steel plating, machinery, and other supplies had to be shipped to Sausalito from factories and steel mills on the East Coast or in the Midwest. In a bid to further accelerate the yard's efficiency, Management instituted several new policies, including switching production from seven to six days a week, allowing maintenance and repair work to occur on the seventh day so that these tasks would not impede production.

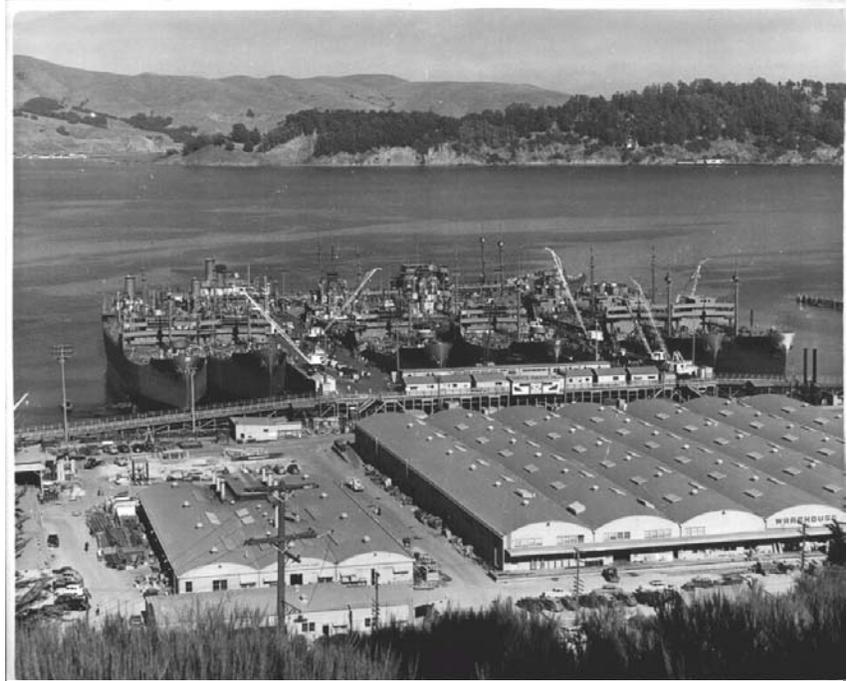


Figure 26. Multiple tankers and oilers at the Outfitting Docks, ca. 1944
Source: Sausalito Community Development Department

Management also learned how to more efficiently deploy labor. The switchover to tankers significantly complicated the outfitting stage. As mentioned, the tankers were much more complicated vessels than the Liberty Ships and consequently Marinship decided to assign more staff to the Outfitting Department, removing a major bottleneck in the post-launch production process (Figure 26). In addition, the management created “flying squads” of workers who were especially good at a particular task, moving them from way to way to finish important tasks.⁵¹

Marinship's workforce, which numbered almost 22,000 at its highpoint, was recruited from all over the Bay Area, California, and eventually the entire United States, including large contingents from Texas, Louisiana, Arkansas, Oklahoma, Iowa, Minnesota, and Missouri. The workforce included large numbers of draft-exempted senior citizens and women and minorities. Many were white and Native American Dustbowl refugees from the Southwest – the famous “Okies” of John Steinbeck's *Grapes of Wrath* – as well as thousands of African-Americans seeking to escape the strictures of the Jim Crow South. By 1944, Marinship was so desperate for workers that it began paying relocation costs for every worker who would agree to relocate to California. Marinship was the most integrated shipyard on the West Coast; African-Americans made up 10% of the workforce and women 25%.⁵²

Once recruited and relocated, workers had to be processed and issued a draft deferment (if an age-eligible male). Because nearly 90 percent of the new workers had never worked in a shipyard before,

⁵⁰ Charles Wollenberg, *Marinship at War: Shipbuilding and Social Change in Wartime Sausalito* (Berkeley: Western Heritage Press, 1990), 36.

⁵¹ *Ibid.*, 37.

⁵² *Ibid.*, 42.

nearly all had to be trained. Welders were in biggest demand and welder trainees trained for about three weeks before receiving certification as journeymen welders. Training was provided at the Training Shop (Building 28) and also at local high schools, colleges, and other facilities.⁵³ Workers who demonstrated their capabilities rose quickly through the ranks, often becoming leadermen or gang bosses in mere months.

Except for African-Americans, all workers were covered by collective bargaining agreements and were represented by a union.⁵⁴ Unions included the Teamsters, Building Service Workers, Electrical Workers, Printing Specialists, Technical Engineers, and Machinists. Most yard workers were represented by metal trades unions such as the Metal Trades Department of the AFL.⁵⁵ They were also covered by a Master Agreement between the unions and the Pacific Coast shipbuilders that had been brokered by the Roosevelt Administration. The Master Agreement governed wages (\$1.20 per hour for journeymen), bonuses for swing and graveyard work, and overtime for any work over 40 hours a week. In addition, the agreement maintained a closed shop and established Joint Labor-Management committees. In 1944, a day-shift journeyman earned around \$270 per month and a graveyard worker with overtime could earn \$365 per month.⁵⁶ These wages were quite good, especially for minorities and women who had traditionally been excluded from industrial work, as well as for the “Okies” and other poor whites who had slogged through the Depression working as migrant agricultural laborers.

Although labor disputes did occur occasionally, as well as recurring tensions between white and black workers, morale remained good at Marinship throughout the war. The Employee Relations department was founded to build morale, and they did so with talent shows, painting exhibits, fishing derbies, sports tournaments, and performances by famous entertainers like Bing Crosby and Marian Anderson. The department also issued the *Marin-er* monthly from June 1942 onward. The 9 x 12, three-color glossy was initially edited by Marin County journalist Fred Drexler. It contained photo essays, news, gossip, and a column by General Manager Bill Waste. Workers produced their own newsletter called *The Stinger*, a muckraking publication edited by yard employee John Connolly. *The Stinger* was soon co-opted and printed as part of the *Marin-er*.

Although most workers lived in San Francisco, others lived in Sausalito and in surrounding communities. At first many lived in rented quarters, such as empty rooms in residents' houses, trailers, tents, and sometimes converted agricultural buildings. To ease the pressure on Sausalito in particular, the National Housing Authority, in cooperation with Bechtel, began constructing a war defense workers' housing project called Marin City in June 1942. By the end of 1943, nearly 6,000 people lived in the 1,500 units located north of Marinship.⁵⁷

Good morale and changes in management strategy paid off and by early 1944, Marinship was building a tanker every 10 days. A photograph taken ca. 1944 shows all six ways occupied by either a tanker or an oiler under construction (**Figure 27**). In April 1945, Marinship delivered the *Ellwood Hills* in a record-breaking time of 59 days. Two months later, it produced the *Huntington Hills* in just 33 days – 28 days on the ways and five days at the outfitting docks. By the spring of 1944, improvements in efficiency meant that Marinship was building T-2 tankers at a faster rate than other shipyards.⁵⁸ During the three-and-a-half years of its existence, Marinship built 93 major vessels (not counting barges and launches), includ-

⁵³ Charles Wollenberg, *Marinship at War: Shipbuilding and Social Change in Wartime Sausalito* (Berkeley: Western Heritage Press, 1990), 46.

⁵⁴ Initially African-Americans were not allowed to join the main shipyard workers' unions, instead being forced to join auxiliary locals that did not have the right to vote.

⁵⁵ Charles Wollenberg, *Marinship at War: Shipbuilding and Social Change in Wartime Sausalito* (Berkeley: Western Heritage Press, 1990), 41.

⁵⁶ *Ibid.*, 56.

⁵⁷ *Ibid.*, 52.

⁵⁸ *Ibid.*, 37.

ing 15 Liberty Ships and 78 T-2 tankers. The yard also repaired 23 vessels and was in the process of building barges for the invasion of the Japanese mainland when the Japanese surrender came.⁵⁹

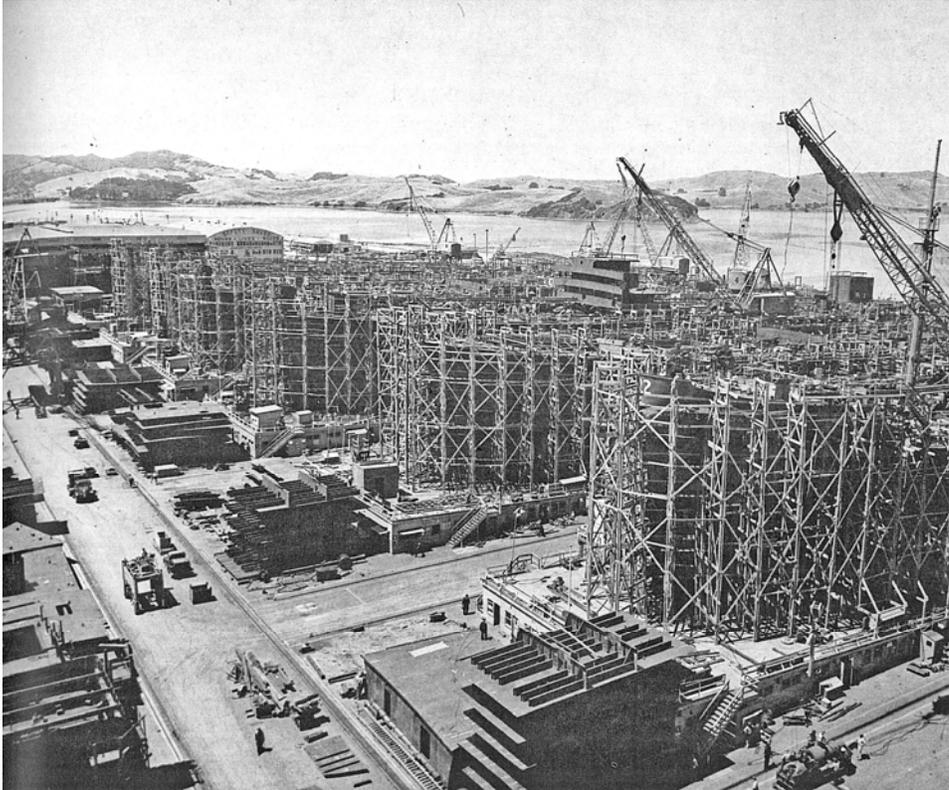


Figure 27. Tankers on the ways, ca. 1944

Source: Source: Richard Finnie, *Marinship: The History of a Wartime Shipyard*

As the war wound down in Europe and as invasion of the Japanese homeland appeared likely, the U.S. Maritime Commission requested Marinship to build a special “mini-shipyard” to construct dozens of 104’ invasion barges for transporting vehicles and other equipment required in a land invasion.⁶⁰ The obliteration of Hiroshima and Nagasaki in August 1945 by nuclear attack put an end to Japanese resistance and on September 2, 1945, the Japanese government surrendered to the United States and its allies on board the *U.S.S. Missouri* in Tokyo harbor.

Up until the day of the Japanese surrender Marinship was building tankers as quickly as it could. It built its last tanker, the *Mission San Francisco*, on September 8, 1945 (**Figure 28**). Initially contracted by the Maritime Commission to build 100 ships, Marinship built 93 – the final seven were cancelled following the Japanese surrender. Only one Marinship vessel – the Liberty Ship *Sebastian Cermeno* – was lost to enemy action.⁶¹ Although many had hoped that the yard would remain open after the war – and management frequently hinted that it would – Marinship was unceremoniously closed in 1946.

Marinship had been very profitable to Bechtel and its partners. Because the Maritime Commission owned the yards, paid all capital costs, and purchased major machinery and supplies, Bechtel had almost nothing at risk. During postwar congressional hearings it was estimated that Marinship received total pre-tax profits of \$11,871,394 on Commission contracts of \$280,941,573. In three-and-a-half years,

⁵⁹ Charles Wollenberg, *Marinship at War: Shipbuilding and Social Change in Wartime Sausalito* (Berkeley: Western Heritage Press, 1990), 5.

⁶⁰ Wayne Bonnett, *Build Ships!* (Sausalito, CA: Windgate Press, 1999), 148.

⁶¹ *Ibid.*, 35.

Bechtel and its partners earned more than a 2,000 percent return on their original investment of \$500,000.⁶²

In the final analysis, Marinship was a very important shipyard that set the standard for efficiency in shipbuilding. It was also responsible for tremendous social changes in Sausalito and Marin County. In comparison with other inner Bay Area counties, Marin County had remained an overwhelmingly rural bastion up until the war. Marinship resulted in the doubling of Sausalito's population (then the largest city in Marin County) and the creation of a large enclave of blue collar workers – (mostly in the shipyard workers' community of Marin City) that had not existed before the war. Author Charles Wollenberg described the yard: "Marinship was thus a military-industrial comet, briefly lighting up the Bay Area economic skyline. The yard was smaller and less publicized than Henry Kaiser's Richmond complex, but Marinship was in many ways the most technologically innovative and efficient of all the Bay Area's shipbuilding plants. At Marin, the application of mass production techniques to ship construction may have reached its highest stage of development."⁶³

G. Postwar Period

As mentioned above, Marinship gradually shut down after the Japanese surrender. Although many workers had hoped that the yard would remain open – after all it had given many long-excluded social groups good, well-paying jobs – this was not to be. Although the yard had some residual work retrofitting wartime vessels for peacetime uses, there was no demand for new merchant vessels when there were so many surplus vessels decommissioned from active wartime use. Most of the other post-Pearl Harbor Emergency shipyards in the Bay Area and elsewhere also closed after the war, leaving shipbuilding and repair to established pre-war yards such as Bethlehem Shipbuilding's San Francisco Yard or the Navy's Mare Island and Hunters Point Naval shipyards.

On May 16, 1946, the Maritime Commission conveyed the decommissioned Marinship yard to the U.S. Army Corps of Engineers, which needed a large base on San Francisco Bay from which to complete its local construction and conservation projects – both locally and in the entire South Pacific region.⁶⁴ The U.S. Army Corps did not need the entire shipyard, and in 1949, the Corps subdivided it and sold off over 56 acres, retaining only 11 acres in the former outfitting zone, including one of the Outfitting Docks, the Outfitting Shops (Building 15), the Outfitting Warehouse (Building 29), and the Machine Shop (Building 11).⁶⁵ The 1950 Sanborn maps indicate that the rest of the yard had been sold off to various building

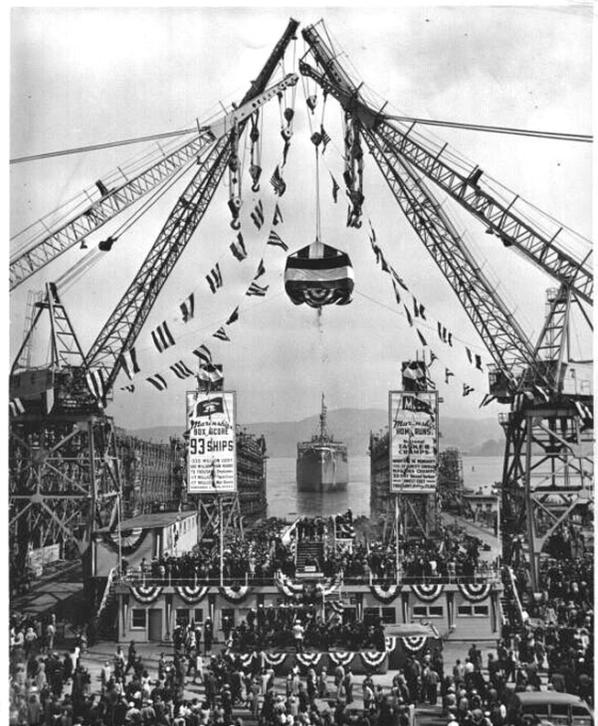


Figure 28. Launching of the *Mission San Francisco*, September 8, 1945

Source: Sausalito Community Development Department

⁶² Charles Wollenberg, *Marinship at War: Shipbuilding and Social Change in Wartime Sausalito* (Berkeley: Western Heritage Press, 1990), 36.

⁶³ *Ibid.*, 6.

⁶⁴ Richard Finnie, *Marinship: the History of a Wartime Shipyard* (San Francisco: Marinship, 1947), 371.

⁶⁵ Telephone conversation with Chris Gallagher, Manager of the San Francisco Bay Model, U.S. Army Corps of Engineers, March 14, 2011).

contractors, manufacturers, and smaller boat yards, with the massive Plate and Subassembly Shops demolished and replaced by smaller structures serving these various businesses (Figure 29).

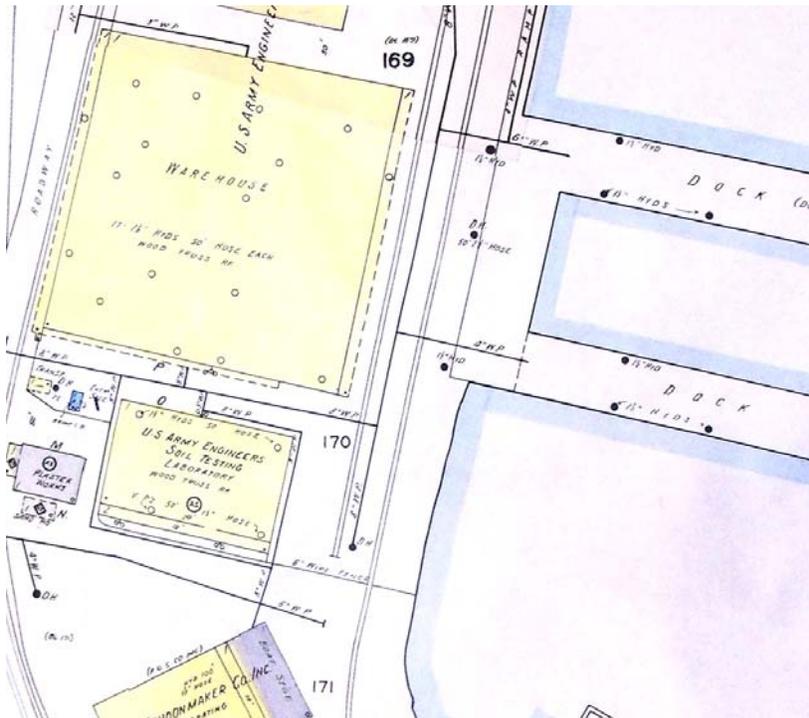


Figure 29. 1950 Sanborn Map showing Machine Shop and Warehouse

Source: Sausalito Historical Society

The Army Corps made some changes to their property, including demolishing and rebuilding the Outfitting Docks out of concrete and converting their three buildings to new uses. The new uses did not at first result in major changes to any of the three buildings, which functioned well as general-purpose industrial buildings. The agency eventually assigned the Outfitting Shops (Building 15) to the Navigation Department, which was responsible for dredging and removing hazards in San Francisco Bay and surrounding navigable waterways. In 1949, this building was increased in height by one story. The former Outfitting Warehouse (Building 29) was used as general-purpose warehouse. Meanwhile, the Army Corps converted the former Machine Shop (Building 11) into a laboratory for testing clay, soil, and concrete materials commonly used in dam and levee construction. The Corps constructed kilns throughout the machine shop section of the building where materials would be subjected to different temperatures to assess their efficacy and performance in various conditions. Other testing methods were used, including compaction. Laboratory spaces were set up in the former office wing to conduct chemical analyses of various soil and concrete types.⁶⁶

The Corps constructed kilns throughout the machine shop section of the building where materials would be subjected to different temperatures to assess their efficacy and performance in various conditions. Other testing methods were used, including compaction. Laboratory spaces were set up in the former office wing to conduct chemical analyses of various soil and concrete types.⁶⁶

In 1956, the Army Corps of Engineers began building a three-dimensional model of San Francisco Bay in response to a proposal to dam San Francisco Bay below the San Francisco-Oakland Bay Bridge and San Pablo Bay north of the Richmond-San Rafael Bridge to create two huge freshwater reservoirs. The Army Corps wanted to test the viability of the project before it was built and the only way to do it in the era before computer modeling was to create a massive, three-dimensional hydraulic model. The Bay Model revealed that the proposed reservoirs would not work due to the shallowness of both San Francisco and San Pablo bays. Its usefulness proven, the Bay Model was put to use testing the real-world effects of dredging and filling projects, as well as oil spills in various parts of the bay. Between 1966 and 1969, the Army Corps expanded the Bay Model to include Suisun Bay and the Sacramento/San Joaquin Delta.⁶⁷

⁶⁶ Telephone conversation with Chris Gallagher, Manager of the San Francisco Bay Model, U.S. Army Corps of Engineers, March 14, 2011).

⁶⁷ Ibid.

Ever since the Bay Model was constructed in 1956-59, it has been housed in the large Outfitting Warehouse next door to the Machine Shop. The building's tremendous footprint, measuring 122,500 square feet, was ideal for housing the 1.5-acre model, as well as the Construction and Operations departments of the Army Corps of Engineers' South Pacific Division office. With growing general interest in the Bay Model, the Army Corps opened it to the public. In 1980, the Army Corps decided to adopt a more proactive stance toward tourism and built a visitor center at each of its divisions. The visitor center for the South Pacific Division was constructed at the former Outfitting Warehouse, next to the former Machine Shop. An additional structural bay was added to the east side of the building to accommodate a museum, bookstore, and offices. In addition, a new toilet room structure, amphitheater, and landscaping were constructed east of the building. As part of the project, the exteriors of Buildings 15 and 29 were reclad in stucco to give them a uniform appearance.

Because it did not have a public function, the former Machine Shop (Building 11) was left largely unchanged by the Army Corps of Engineers. At some point after 1946 the exterior walls were clad in asbestos ("Transite") shingles and the vehicular entrances along the west side were paneled over in plywood. Building 11 continued in its use as a materials testing laboratory until 1996. Sometime in the early 1990s, the Army Corps installed steel moment frames within the interior of the building, probably in the wake of the 1989 Loma Prieta Earthquake. In 1996, the Army Corps decided that it did not need the building anymore and declared it surplus property. GSA handled the sale, which was not finalized until 2006 when the Veterans Administration (VA) took over the property. Initially the VA intended to remodel the building, and indeed it got as far as removing the asbestos shingles and roofing materials. In 2009, the VA decided to demolish the building instead and build a smaller facility on the site.

V. Evaluation of Historic Status

A. *National Register of Historic Places*

KVP evaluated the Marinship Machine Shop (Building 11) to determine if it appeared eligible for listing in the National Register of Historic Places (National Register). The National Register of Historic Places is the nation's most comprehensive inventory of historic resources. The National Register is administered by the National Park Service and includes buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level. Typically, resources over fifty years of age may be eligible for listing in the National Register if they meet any of the four significance criteria *and* if they retain sufficient historic integrity. However, resources under fifty years of age can be determined eligible if it can be demonstrated that they are of "exceptional importance," or if they are contributors to a potential historic district. National Register criteria are defined in depth in *National Register Bulletin Number 15: How to Apply the National Register Criteria for Evaluation*. There are four basic criteria under which a structure, site, building, district, or object can be considered eligible for listing in the National Register. These criteria are:

Criterion A (Event): Properties associated with events that have made a significant contribution to the broad patterns of our history;

Criterion B (Person): Properties associated with the lives of persons significant in our past;

Criterion C (Design/Construction): Properties that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant distinguishable entity whose components lack individual distinction; and

Criterion D (Information Potential): Properties that have yielded, or may be likely to yield, information important in prehistory or history.

A resource can be considered significant on a national, state, or local level to American history, architecture, archaeology, engineering, and culture.

B. *California Register of Historical Resources*

KVP also evaluated the Marinship Machine Shop for eligibility in the California Register of Historical Resources (California Register). The California Register is an authoritative guide to significant architectural, archaeological, and historical resources in the State of California. Resources can be listed in the California Register through a number of methods. State Historical Landmarks and National Register-eligible properties (both listed and formal determinations of eligibility) are automatically listed. Properties can also be nominated to the California Register by local governments, private organizations, or citizens. These include properties identified in historical resource surveys with Status Codes of 1 to 5 and resources designated as local landmarks or listed by city or county ordinance. The evaluation criteria used by the California Register for determining eligibility are closely based on those developed by the National Park Service for the National Register of Historic Places (National Register). In order to be eligible for listing in the California Register a property must be demonstrated to be significant under one or more of the following criteria:

Criterion 1 (Event): Resources that are associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

Criterion 2 (Person): Resources that are associated with the lives of persons important to local, California, or national history.

Criterion 3 (Design/Construction): Resources that embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of a master, or possess high artistic values.

Criterion 4 (Information Potential): Resources or sites that have yielded or have the potential to yield information important to the prehistory or history of the local area, California or the nation.

A resource can be considered significant on a national, state, or local level to American history, architecture, archaeology, engineering, and culture.

C. Evaluation

As is clear from the criteria for both registers, the National Register and the California Register are both closely related. Indeed, the California Register was consciously based the National Register. Because the two registers essentially use the same criteria, we evaluated the Marinship Machine Shop under National Register Criteria with the understanding that a property determined eligible for listing in the National Register Criteria automatically qualifies for listing in the California Register. The main difference between the registers is that the California Register uses a slightly more lenient approach to integrity and also the fifty-year threshold for eligibility is not as rigorously applied. Although the California Register recognizes properties with national significance, the focus of the California Register are properties significant within the local and state contexts that may not rise to the level of national significance. This is the reason why properties determined eligible for listing in the National Register are automatically listed in the California Register but not the other way around.

Criterion A (Events)

If its components retained integrity, the entire former Marinship yard in Sausalito would appear eligible for listing in the National Register under Criterion A (also California Register Criterion 1) for its association with the expansion of "Homefront" industries in the Bay Area during the Second World War. Evaluated under the National Park Service's "World War II and the American Home Front, National Historic Landmark Theme Study," it appears that most surviving property types associated with the Homefront industries – in particular shipbuilding – may qualify for listing in the National Register. Shipbuilding was the Bay Area's most important contribution to the war effort on the "Homefront." To expedite the construction of much-needed freighters and tankers, the U.S. Maritime Commission sponsored six "Emergency" shipyards in the Bay Area, including Henry J. Kaiser's Richmond Yards 1-4, Barrett & Hilp's Belair Shipyard in South San Francisco, and W.A. Bechtel Corporation's Marinship in Sausalito. Together these yards (in combination with the existing Bay Area yards) built approximately 1,400 vessels between 1939 and 1946. During World War II, the San Francisco Bay Area was the largest shipbuilding complex in the world, and it has never been surpassed. Its freighters and tankers were critical to victory in the European Theater and played an important role in the island hopping expeditions of the Pacific Theater.

After the War, the Bay Area's colossal shipbuilding complex gradually disintegrated. With thousands of surplus vessels available, there was no need for the extra capacity and the Emergency yards were all closed by the end of 1946. Little remains of these yards. The vast Richmond yards were demolished after the war, with only a handful of buildings and docks surviving at Kaiser Yard No. 3. Only the outlines of the Belair graving docks survive in the tidelands of South San Francisco.

Most of the historic pre-war yards closed between the late 1950s and the mid-1990s, casualties of more efficient overseas shipyards and the post-Cold War "Peace Dividend." Although Bethlehem Shipbuilding Company's San Francisco Yard survives, most of the World War II-era structures were demolished. Only

the power house at Bethlehem's Alameda yard survives and it is a pre-World War II building. Moore Dry Dock closed in the 1960s and the entire yard was cleared to make way for Port expansion in Oakland. Mare Island Naval Shipyard closed in 1996. Most of it survives but its future is uncertain as it is being redeveloped with suburban-style tract housing. Although it closed in 1971 most of the Hunters Point Naval Shipyard survives, including many World War II-era structures. Probably the most intact of the World War II-era yards, nearly all of Hunters Point Naval Shipyard will soon be demolished to make way for new residential and mixed-use development.

In contrast to other historic Bay Area shipyards (and all of the post-Pearl Harbor Emergency yards) more than half of Marinship's original buildings and ways survive. However, since it was decommissioned and transferred to the Army Corps of Engineers in 1946, the former shipyard was incrementally converted into an unofficial industrial park. The large, open-span World War II-era shipyard buildings are readily adaptable for a full range of light industrial, warehousing, office, and craft/art uses. However, all were built quickly using lightweight materials, necessitating frequent maintenance or extensive remodeling to make them suitable for higher-end office space. Recognizable by their vaulted bowstring-truss roofs, most Marinship buildings have been otherwise extensively altered on their exterior, including recladding in stucco, new aluminum windows and doors, and the building-out the interiors with multiple floors of office space.

The former Marinship Machine Shop appears *individually* eligible for listing under Criterion A (Events) as a rare property type associated with what was arguably the most important event in the history of the United States during the twentieth century – World War II, in particular the American Homefront. The building played a critical role in the outfitting of the Liberty Ships and tankers produced by the yard, vessels that were critical to the Allied war effort and that assured eventual victory. There appear to be no other extant World War II-era maritime machine shops left in the Bay Area that retain this degree of significance or integrity. Building 11 is also the Marinship building that retains the highest degree of integrity. The period of significance is 1942-1946, beginning with the building's construction and ending with the year that Marinship was decommissioned.

Criterion B (Persons)

The former Machine Shop appears ineligible for listing in the National Register under Criterion B (or California Register Criterion 2). There are no individual owners of the building that appear to be important to local, California, or national history.

Criterion C (Design/Construction)

The former Machine Shop appears eligible for listing in the National Register under Criterion C (also California Register Criterion 3) as a building that embodies the distinctive characteristics of a type, period, and method of construction – in this case, a utilitarian machine shop constructed by the W.A. Bechtel Corporation as part of Marinship, one of six Emergency shipyards commissioned by the U.S. Maritime Commission in the San Francisco Bay Area. Although not as well-known today as the world-famous Kaiser yards in Richmond, Marinship was the most efficiently designed shipyard in the Bay Area and an excellent embodiment of the "turning-flow" technique.⁶⁸ The yard was largely built within six months, on filled ground occupying what had been the mudflats of Richardson's Bay. In order to construct over 30 buildings in a short period of time, industrial materials and modular building components were combined assembly-line fashion, much as the Liberty Ships and tankers would be assembled in the upcoming years.

Under Criterion C, the former Machine Shop is an excellent and well-preserved example of an inexpensively constructed industrial building erected during World War II. Designed without any ornament, the

⁶⁸ Indeed, no mention of Marinship is made in the Introductory page to the National Park Service's "World War II in the San Francisco Bay Area" website: <http://www.nps.gov/history/nr/travel/www.llbayarea/intro.htm>

Machine Shop was built almost entirely of plywood in order to simplify its construction, as well as to avoid the use of steel and other rationed building materials. The building's design makes use of several modular and mass-produced industrial building materials and prefabricated products that became widespread during the war, including glulam bowstring trusses and standardized 4' x 8' plywood sheets. The wood double-hung and ribbon windows were also standard off-the-shelf materials. All of it could be quickly and easily assembled without highly skilled labor.

The Machine Shop was part of the yard's Outfitting Zone, where the final installation of machinery, furnishings, masts, weapons, bunks and other fittings occurred following the vessel's launch. Like nearly all shipyard machine shops, the Marinship Machine Shop was designed first and foremost as a place to shelter the work processes that went on inside – mostly highly skilled parts fabrication and repair. The interior's high, open-span work spaces made the most of natural light and ventilation. Heavy materials and machinery were moved around by the overhead traveling and jib cranes that operated in each bay. The office wing contained offices, a lunch room, and toilet and locker rooms for both male and female employees. Although not explicitly designed in any architectural style, the gently curving profile of the barrel-vaulted roof as well as the horizontal ribbon windows, recall the Streamline Moderne style popular during the 1940s. Otherwise, the building is a testament to the oft-repeated architectural dictum: "Form follows function."

Criterion D (Information Potential)

Examination of the former Machine Shop for eligibility under National Register Criterion D (or California Register Criterion 4) is beyond the scope of this report.

B. Integrity

Out of all of the remaining World War II-era Marinship buildings, the Machine Shop retains the most of its original design and materials. As opposed to nearly all of the other Marinship-era buildings that have been reclad in more permanent exterior materials, the exterior of the Machine Shop is still clad in its original painted plywood sheathing. The plywood was protected behind asbestos shingles for around 60 years, but its removal several years ago revealed the exterior as it would have appeared when it was constructed in 1942, including the large hand-painted signs on the east and west façades. Other exterior elements that remain intact include the double-hung wood windows and wood ribbon windows, the two metal-clad barn doors on the east façade, and several of the wood-panel pedestrian doors along the south façade. The only major changes to the exterior of the Machine Shop after World War II include the removal of what appeared to have been a water tank from the roof of the office wing, the infilling of three vehicular openings along the west façade (probably after 1949 when the property was subdivided and there was no longer vehicular access to the west side of the building), the addition of an exterior steel stair on the west façade at an unknown date, and the recladding of a small portion of the south façade (above the office wing) in T-111 siding ca. 2006.

Although the interior was inaccessible and therefore not surveyed as part of this report, comparing the drawings made as part of Richard Grambow's (Chief Engineer and Naval Architect of Marinship) report: *Marinship at the Close of the Yard in 1945*, reveals that very few alterations have occurred within the north bay of the machine shop interior. The concrete flooring, exposed wood wall framing, bowstring trusses, wood-plank interior walls, and overhead traveling crane remain intact. The center bay has undergone more alterations, including the addition of several structures containing kilns and other equipment used by the Army Corps, although these alterations are additive in nature and do not detract from the overall open volume of the center bay. The southern bay has been more heavily altered, including the removal of half of its north interior wall and the enclosure of its western section. The office wing appears to retain much of its original fabric on the first floor level.

One final point that should be discussed here in regard to integrity is that it refers to the intactness of a building's design not necessarily its physical condition. Although a conditions assessment of the build-

ing was not conducted as part of this report, it is obvious that the building faces many problems related to prolonged neglect/deferred maintenance, including a failing roof, broken and missing windows, deteriorating plywood siding, etcetera. Structurally speaking, the building may be in salvageable condition; its post and beam frame are of large enough dimensions that they are probably physically intact. In addition, the building underwent a seismic upgrade in the 1990s. We could not observe the foundation or any subsoil conditions.

VI. Conclusion

Constructed in 1942 according to the design of W.A. Bechtel Corporation's Engineering and Drafting Department, the Machine Shop is one of approximately 30 buildings constructed as part of the Marinship yard, one of six "Emergency" shipyards commissioned by the U.S. Maritime Commission in the Bay Area to build merchant vessels for the war effort. Designed in a utilitarian mode and constructed of lightweight wood construction, the Machine Shop was intended, like the rest of the shipyard, to be erected as quickly and easily as possible to serve a temporary need. The building makes use of several modular building materials that came of age during the Second World War, including glue-laminated bowstring roof trusses and standardized 4' x 8' plywood sheets used to clad the exterior. Aside from the overhead traveling cranes and the hardware and machinery, the Machine Shop was almost entirely wood, sparing structural steel for the war effort. Although entirely utilitarian, the curved profile of the roof vaults and the ribbon windows echo the Streamline Moderne style popular in the 1940s. Designed as a machine shop and used for this purpose during the war, its large open bays, concrete flooring, and overhead cranes were effectively adapted for its postwar use as a soils testing laboratory for U.S. Army Corps of Engineers, a function that characterized the building's postwar history for nearly 50 years. The Machine Shop appears eligible for listing in the National Register under Criteria A (Events) and C (Design/Construction) as a well-preserved (if physically deteriorated) industrial building from the important – if little-known – Marinship facility. Under Criterion A, the building is significant for its central role in the outfitting of the Liberty Ships and T-2 tankers constructed at Marinship between 1942 and 1945, vessels that were instrumental in Allied victory. Under Criterion C, the Machine Shop embodies the characteristics of a type, period, and method of construction as a rare and intact World War II-era shipyard building constructed of wood using time and labor-saving materials and techniques.

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X. Appendix *DPR 523 A & B Forms*

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 3S, 3CS

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 4 *Resource name(s) or number (assigned by recorder) Building 11

P1. Other Identifier Marinship Machine Shop
*P2. Location: Not for Publication Unrestricted

*a. County: Marin and P2b and P2c or P2d. Attach a Location Map as necessary.

*b. USGS 7.5' Quad: San Francisco North Date: 1999

*c. Address: 25 Liberty Ship Way City: Sausalito Zip: 94965

d. UTM: (Give more than one of large and/or linear resources) Zone _____; _____mE/ _____mN

e. Other Locational Data: Assessor's Parcel Number: 063-100-11

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Building 11 is located on the northwest side of Liberty Ship Way, just north of Marinship Way in Sausalito. It is a two-story, wood post-and-beam, industrial building clad in plywood sheathing and capped by an undulating bowstring truss roof. The building has a two-story, shed-roofed office wing along the southeast elevation. The redwood-sheathed roof of the machine shop is punctuated by sheet metal ventilators and large wood-frame, wire-glass skylights. The primary facade faces southeast and comprises the office wing. It is ten bays long, clad in painted plywood, and punctuated by an asymmetrical arrangement of double-hung wood windows, wood ribbon windows, and pedestrian entrances. The office wing is capped by an overhanging eave consisting of wood rafter ends concealed behind a wood fascia board. A portion of the south wall of the machine shop proper is exposed to view above the office wing roof; it is clad in newer T-111 plywood. The northeast facade mostly comprises the machine shop. It is four bays wide; the southernmost bay consists of pairs of double-hung wood windows on the first and second floor levels of the office wing. The next three bays are largely the same, consisting of large barrel-vaulted bays articulated by vehicular openings and double-hung windows at the first floor level and two bands of ribbon windows above. Occupying the spandrel panels between the ribbon windows in the central bay of the machine shop are the words "MACHINE SHOP" painted in capitalized red letters. The northeast facade terminates with a band of wood trim and metal flashing that outline the barrel vaulted roof. (continued)

*P3b. Resource Attributes: (list attributes and codes) HP8. Industrial building

P4. Resources Present: Building Structure Object Site District Element of District Other

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)



*P5b. Photo (view, date, accession #)
View toward west, April 6, 2011. 100_1470

*P6. Date Constructed/Age and Sources
 Historic Prehistoric Both
1942, Marinship: The History of a Wartime Shipyard

*P7. Owner and Address:
United States Of America
2479 E Bayshore Rd.
Palo Alto, Ca 94303

*P8. Recorded by
Knapp & VerPlanck Architects
235 Montgomery St., Ste. 747
San Francisco, CA 94104

*P9. Date Recorded:
April 22, 2011

*P10. Survey Type: (Describe)
Intensive

*P11. Report Citation: (Cite survey report and other sources, or enter "none") Finnie, Richard. *Marinship: The History of a Wartime Shipyard*. San Francisco: 1947.

*Attachments BSOR Photograph Record Continuation Sheet
 Archaeological Record NONE Location Map Other...
 Artifact Record District Record Linear Feature Record

BUILDING, STRUCTURE, AND OBJECT RECORD

*NRHP Status Code 3S, 3CS

Page 2 of 4 *Resource Name or # (Assigned by recorder) Building 11

B1. Historic Name Marinship Machine Shop

B2. Common Name Building 11

B3. Original Use Industrial B4. Present Use: Vacant

* B5. Architectural Style Utilitarian

***B6. Construction History**

Building 11 was constructed between June and August 1942. A second floor accommodating women's facilities was added in 1943. The building was seismically upgraded in the early 1990s.

*B7. Moved? No Yes Date? _____ Original Location: _____

***B8. Related Features**

B9a. Architect Bechtel Engineering Department b. Builder MacDonald & Kahn

*B10. Significance: Theme World War II Homefront Area: Marinship, Sausalito

Period of Significance 1942-1945 Property Type Industrial Applicable Criteria 1 & 3

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity)

Building 11, the Machine Shop, was constructed early on in the life of Marinship. The pilings were set and the foundation poured by June 30. The building was initially completed August 8, 1942. Less than a month later, a second-floor addition to the office wing was begun to accommodate women workers. This addition was completed in early 1943. As originally outfitted, the large 27,400 s.f. building contained one three-ton crane, three 10-ton bridge cranes, and four jib cranes. The building also had truck loading docks. The Machine Shop was under the directly of the Outfitting Department - Machinery Section - and was under the direct administration of Albert Webb, Yard Superintendent. In contrast to many of the Marinship departments, which employed mostly unskilled laborers, the Machine Shop employed many previously trained and highly skilled machinists. (continued)

B11. Additional Resource Attributes: (List attributes and codes) HP8. Industrial building

*B12. References: Finnie, Richard. *Marinship: The History of a Wartime Shipyard*. San Francisco: 1947.
Grambow, Richard. *Marinship at the Close of the Yard*. Sausalito, CA: 1945. □
Wollenberg, Charles. *Marinship at War: Shipbuilding and Social Change in Wartime Sausalito*. Berkeley: Western Heritage Press, 1990.

(Sketch Map with north arrow required.)

B13. Remarks

*B14. Evaluator Christopher VerPlanck

*Date of Evaluation April 22, 2011



(This space reserved for official comments)

CONTINUATION SHEET

Page 3 of 4

Resource Name or # (Assigned by Recorder) Building 11

*Recorded by: Knapp & VerPlanck Architects

Date April 22, 2011

Continuation Update

P3a: Description (continued)

The northwest façade is entirely symmetrical, with each of the ten bays consisting of groups of four double-hung wood windows on the first floor level and two bands of wood ribbon windows above. The northwest façade is clad in 4' x 8' plywood sheets and terminates in a cornice consisting of the exposed 2" x 6" rafter ends linked together by recessed fascia boards. The first floor of the southwest façade has three infilled vehicular entrances and a metal stair leading up to the second floor level of the office wing. Above the first floor level, the west façade has plywood cladding, wood ribbon windows, and painted signage reading: "MACHINE SHOP." Alterations include increasing the office wing to two-stories in 1943, removal of a water tank at an unknown date, and a seismic upgrade in the early 1990s. The rest of the property is mostly paved, although there is a narrow band of landscaping and several street trees along Liberty Ship Way. Building 11 appears to be in poor condition.

B10: Significance (continued)

The Machine Shop operated three shifts a day, seven days a week, and turned out all types of machinery and equipment, including tail and line shafts, bearings, stern tubes and liners, coupling bolts and chocks, and anything that required precise tolerances within thousandths of an inch. After Marinship was decommissioned in 1945 and conveyed to the U.S. Army Corps of Engineers, the Army Corps sold off most of the former yard, keeping only a core section comprising Buildings 11, 29, and 15 and the Outfitting Docks. The Army Corps converted Building 11 into a soil testing laboratory to test various dam and levee building techniques. The building required little in the way of alteration for this new use, although the Army Corps clad the plywood exterior in asbestos shingles and made some changes to the interior of the three large industrial bays. In the early 1990s, the Army Corps completed a seismic retrofit of the Machine Shop. In 1996, the Army Corps decided it did not need the building anymore and declared it surplus property. The Veterans Administration (VA) took it over in 2006. Initially intending to rehabilitate the building, the VA stripped the roofing materials and the asbestos shingles from the exterior. In 2009, the VA decided to demolish the building.

Integrity:

Building 11 has undergone few major alterations aside from the removal of a water tank from the roof and the infilling of several vehicular entrances on the southwest elevation when the property was subdivided. The exterior was covered in asbestos shingles for some time but these were removed a couple of years ago. The building has not been moved, so that it retains integrity of location. Neither the design nor the materials or examples of workmanship have been changed either. The setting appears largely intact. Of all buildings that remain of the old Marinship yard, Building 11 most evocatively expresses the appearance of the facility in World War II, retaining integrity of feeling and association. In summary, Building 11 retains integrity of location, design, setting, materials, workmanship, feeling, and association.

Evaluation:

Building 11, the former Marinship Machine Shop, appears individually eligible for listing in the California Register under Criteria 1 (Events) and 3 (Design/Construction) and likely in the National Register under the corresponding Criteria A and C. The building is one of six surviving major industrial buildings and warehouses that survive from the World War II era in the former Marinship yard. The building is part of what was the Outfitting Department, the most intact part of the yard. The building appears eligible under Criterion 1 and A as a building that is closely associated with the production of Liberty Ships and tankers during World War II. It is also significant under Criterion 3 and C as an intact and well-preserved and increasingly rare example of an industrial building built for one of the "Emergency Yards" constructed in the San Francisco Bay Area after Pearl Harbor. The building is also a good example of lightweight and inexpensive (probably temporary) construction making use of standardized materials and building techniques and very little steel or other rationed materials.

Page 4 of 4 Resource Name or # (Assigned by Recorder) Building 11
*Recorded by: Knapp & VerPlanck Architects Date April 22, 2011
 Continuation Update



Northwest elevation, 100_1480



Portion of southwest elevation, 100_1527



Southeast elevation, 100_1470



Northeast elevation, 100_1481