

HABS No. CA-1543H

MARE ISLAND NAVAL SHIPYARD, BATTERY TEST, OFFICE
AND STORAGE FACILITY (BUILDING 463A)
CALIFORNIA AND E STREET
VALLEJO
SOLANO COUNTY
CALIFORNIA

HABS
CAL
48-MARI,
1H-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

**Historic American Buildings Survey
National Park Service
Western Region
Department of the Interior
San Francisco, California 94107**

HISTORIC AMERICAN BUILDING SURVEY

HABS
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48-MARI,
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MARE ISLAND NAVAL SHIPYARD
BATTERY TEST, OFFICE AND
STORAGE FACILITY (BLDG. NO. 463A)

HABS NO. CA-1543H

Location: Easterly of the northeast corner of
California Avenue and "E" Street
Mare Island Naval Shipyard
Vallejo
Solano County
California

United States Geological Survey (USGS)
Mare Island Quadrangle (7.5)

Universal Transverse Mercator Coordinates:
10.563341.230 mE - 4218104.647 mN

Present Owner: Department of the Navy
Mare Island Naval Shipyard
Vallejo, California 94592-5100

Present Use: Originally constructed as a battery test, storage and office
facility to expand capabilities of the main battery shop
located in Building 461-now inactive

Statement of
Significance: Building 463A had a supporting role in the overhaul and
repair of ship and submarine batteries during World War II.

Prepared By: Mr. Steven R. Black
Title: Architect/General Engineer
Affiliation: Mare Island Naval, Staff Civil Engineer Department
Facilities Planning Division Code 913

PART I - HISTORICAL INFORMATION:

A. Physical History:

1. Date of Erection: Building 463A was built in 1937 to provide a facility to support expansion of the operations in Building 463. The construction period is established by review of shipyard records, a period facility map (June 1938) and the approval date of the earliest original construction drawing (May 7, 1936). The facility is located northeast of the intersection of California Avenue and "E" Street and to the north of "E" Street. Functions performed in Building 463A were related to other battery shop operations located in Buildings 461 and 463, built in 1932. The reader is referred to separate HABS documentation on Building 463 recorded as CA-1543G.

2. Architect: The design for the building was accomplished by the staff of the Public Works Department (PWD) of the Mare Island Navy Yard, later to become Mare Island Naval Shipyard, under the command of Captain C. A. Carlson (CEC, USN)-Public Works Officer from July 1934 to March 1938.

3. Original and Subsequent Owners: Building 463A was constructed as the result of Congressional appropriation on Federal land under cognizance of the Department of the Navy. Mare Island Naval Shipyard is recorded (July 12, 1978) as US Government property with the Office of the Solano County Recorder, Fairfield, California as Parcel No. 67-010-030 in Book 56594 of these records. Title and ownership of this building has rested with the Department of the Navy since originally constructed.

4. Building, Contractor(s) and Suppliers: Initial construction appears to have been accomplished by Shipyard Public Works Forces. This assumption is based on original construction drawings, which do not reference any contract or specification number, and a comment entered onto the original Property Record Card (No. 200182) stating "construction data not available (probably yard labor)". Materials for construction were typical of readily available materials within the area and were most likely procured from local suppliers. Steel framing was probably assembled by shipyard personnel as there would have been plenty of laborers skilled in steel construction and assembly. Construction materials are not exotic or unusual.

5. Original Plans and Construction: Photographs CA-1543H-8 through CA-1543H-12 show original construction details. Drawings showing original construction as well as subsequent modifications are on file at Mare Island Naval Shipyard, Staff Civil Engineer Office Plan Files.

6. Alterations and Additions: Few alterations have been done to this building, limited to minor changes to plumbing and electrical distribution systems. The only major alteration occurred in 1970 when the interior was changed to support battery shop laboratory/testing functions. This work included installation of new heating and ventilation equipment, installation of a suspended acoustic ceiling with integrated lighting, plumbing improvements and replacement of five wood double hung windows with aluminum frame double hung windows. Work was accomplished under Navy contract N62474-70-C-0518. Photographs CA-1543H-13 through CA-1543H-15 show details of this conversion.

At some point after 1975, most probably about the time the building started being used by various maintenance contractors, interior partitions were constructed to subdivide the interior into a series of offices and storage rooms. Construction was of metal framing with gypsum wall board on each side. The laboratory furnishings and hoods/ducting were removed prior to this work, and the only remains of the lab are the false ceiling and lighting.

In 1989, exterior acid storage tanks were built to the east of the building. These are related to the overall battery shop operation by function only and are addressed in the section of this report titled "outbuildings".

B. Historical Context: Mare Island Naval Shipyard was established in 1854 by then Commodore David Glasgow Farragut as the United States Navy Yard, Mare Island. This was the first Navy shipyard established on the west coast by a still young nation. Throughout the decades thereafter, the Mare Island Naval Complex has been intimately connected with military history, development of industrial design, ship construction, repair and conversion and with the lives of men and women significant in U. S. History. With its establishment, Mare Island Naval Shipyard symbolized both the culmination of U.S. expansionist desires to obtain and hold California as well as to protect and extend its political and economic interests throughout the Pacific region. During the War Between The States, Mare Island was able to maintain the small Navy fleet on the west coast needed to patrol the Isthmus of Panama and San Francisco Bay where the threat existed that Confederate raiders might seize the

ships carrying gold to finance the war effort of the North. During the Spanish-American War, Mare Island was the base that repaired ships of the Asiatic Squadron and became the refuge for the sick and wounded sailors from battles in the Philippines. During World War I, the base served as a training base for Marines and Medical Corpsmen who did meritorious service the Europe. During World War II and later years, the shipyard built a large number of ships, submarines and landing craft as well as repairing and overhauling ships and submarines of the U.S. Navy and its allies.

In the century and a half of its existence, Mare Island has built 513 vessels, beginning with the Saginaw in 1859, and repaired/overhauled thousands more. Mare Island built the Civil War monitor Monadnock, the collier Jupiter (later to become the Navy's first aircraft carrier Langley), dozens of destroyers, escort and amphibious craft, submarine tenders, tankers and submarines. Large capital ships constructed here included the heavy cruisers San Francisco and Chicago and the battleship California, the only Navy battleship built on the west coast. And finally, beginning in 1954, Mare Island Naval Shipyard entered the atomic age by beginning the construction and overhaul of nuclear powered ships and submarines, thus completing the evolution of propulsive power from canvas to coal, from diesel oil to the atom.

The construction of Building 463A occurred at the time that the United States was well into expanding it's navy from a "treaty fleet" to one capable of becoming a "fighting fleet". During this time, Mare Island Naval Shipyard had received authorization to begin construction of several naval warships and submarines. Building 463A was originally built to provide for expanding the functions of Building 463, that of mixing acids and other chemicals used in the repair and refurbishment of submarine propulsion batteries. Reference is made on the facility Property Record Card that in 1978, the building was used as a radio repair shop (berthed ships). This function and battery shop functions would have been within the same overall shop structure of the shipyard, so it is likely that this building could have been used for a variety of battery shop repair work. While currently not listed on the National Register of Historic Places nor located within any listed historic district of the Shipyard, it is felt that the facility housed functions that were significant to the repair of submarine batteries during World War II, thereby contributing to critical submarine operations of the United States Navy during this period that were instrumental in disrupting logistic support of Japanese forces in the Pacific theater. During World War II, submarines constructed and repaired at Mare Island sank a total of 252 enemy ships totaling 988,357 tons.

Mare Island Naval Shipyard has a long history associated with the repair, overhaul and construction of US Navy submarines. The first vessels that could actually be called submarines stationed at Mare Island were the USS Grampus and USS Pike, arriving in 1904. These vessels were very small, measuring 60 feet in length with a beam of only 11 feet. Submerged operations were limited to only 2 hours and crew members were required to sign a will prior to their first dive. Propulsion was by means of gasoline internal combustion engines; while submerged, a small 70 horsepower electric motor run by 60 interconnected batteries was used to propel the small craft. Crew members were actually referred to as "divers" rather than submariners. Mare Island's long association with the Navy's submarine fleet was thus started and was later expanded as construction of submarines began with the launching of the first submarine built at Mare Island. The USS Nautilus (hull number V-6), not to be confused with the first nuclear powered submarine, was launched at Mare Island on March 15, 1930. She measured 371 feet in length and displaced 3,960 tons submerged. d Building 463A was constructed at a time when Mare Island was expanding its industrial capacity to support submarine operations on the west coast. Over ninety years of support to the Navy's submarine fleet will end with the closure of Mare Island Naval Shipyard in April of 1996 and demolition of such buildings as Building 463A is completed.

A submarine battery is essentially a self-contained galvanic cell whereby electrical energy is produced by means of the electrochemical action (ion transfer) between internal liquids and materials. Classes of submarines that were in operation prior to and during World War II were primarily powered by diesel-fueled engines, which required the submarines to operate on the surface in order to vent off exhaust gases. However, once submerged, primary propulsion power was provided by large banks of interconnected batteries which also provided power for instrumentation, ventilation and other systems aboard the submarine. The amount of time a submarine could operate submerged was limited to the extent of the charged condition of the batteries as well as available oxygen for the crew and numerous other factors. The fact that a submarine could operate for long periods of time submerged made for its success as a military weapon. While operating on the surface, the batteries would normally be recharged; however, as with liquid cell batteries of today, a point is reached where the battery must be drained of internal fluids, casings cleaned out and overhauled, plates replaced, and new battery fluids added.

After World War II, later classes of submarines continued to operate with similar means of propulsion until the advent of nuclear powered reactor plants to provide for primary propulsion. Batteries are still employed as part of the

secondary power system for nuclear powered submarines in conjunction with a shipboard emergency diesel generator.

Based upon an article that appeared in the shipyard newspaper (the "Grapevine") for February 1963, the shipyard was assigned the lead role as a battery test evaluation facility for the entire Navy after closure of the facility in Corona, California. All sorts of batteries, including submarine batteries, were the subject of the various tests and quality assurance procedures undertaken. In a May 1963 issue of the "Grapevine", the new facility had been placed into operation in Building 461, the main battery shop. As these functions expanded in scope, it is logical that additional test stations became a necessity. Since batteries release hydrogen gas as a by-product of the electrochemical action, these stations would have required individual ventilation and exhaust systems. The laboratory conversion done in 1970, as shown in photographs CA-1543H-13 through CA-1543H-15, was most likely a result of meeting this need. It has been related by various battery shop personnel that this function continued for approximately 5 years, terminating approximately in 1975. Since then, the building has been used for various base support functions, the most recent being storage for the elevator maintenance contractor.

PART II - ARCHITECTURAL SURVEY:

A. General Statement: Building 463A is a single story rectangular building, measuring approximately 64 feet in the east-west direction and 30 feet in the north-south direction. The long dimension is divided into four equal bays of 16 feet each. The building is located on the north side of E Street and east of California Avenue.

1. Architectural Character: The basic architectural character of the building may be characterized as reflective of the Greek or Classical Revival Style. As part of the larger battery shop complex, it is considered as being of minor significance. Several smaller industrial buildings built within the main industrial area of the shipyard prior to this building also reflect this design approach, and it is felt that the basic design for Building 463A was an attempt to carry on the style of the older, historic buildings on the yard.

2. Condition of Fabric: The general condition of this structure is considered good. Only minor foundation damage is noted on the south elevation. Demolition and site cleanup have been scheduled as part of site remediation measures ongoing at Mare Island at the time of this report.

B. Description of Exterior:

1. Overall Dimensions: Building 463 measures approximately 64 feet by 30 feet in plan, with the long dimension running in the east-west direction parallel to "E" Street. The height of the building is approximately 19 feet measured from existing grade to the top of the cornice.

2. Foundation: The building is supported by 27 wood piles located at approximately 8 foot centers along the north and south elevations and along the east-west centerline and terminating in 4 foot square pile caps. The 4 1/2 inch reinforced concrete floor slab is elevated above grade (El. 114) approximately 4 feet creating a crawl space below. The floor is supported by 12 inch wide by 18 inch deep reinforced concrete beams supported off the pile caps by short columns 12 inch by 12 inch in section. The floor-to-column interface transitions by a small haunch. A 6 inch thick reinforced concrete curtain wall encloses the area from below the floor slab to the elevation equivalent to the top of the pile caps. Ventilation and access to the crawl space under the slab is provided by two steel expanded metal grills each on the north and south elevation curtain walls. The floor slab was covered by a 3/4 inch cement topping. Reinforced concrete stairs and platforms provide access into the building at both the west and south elevations.

3. Walls: The exterior walls of the building are made of 8 inch thick reinforced concrete, covered on the exterior side by stucco (cement plaster). The cornice and window sills are formed integral with the concrete wall pour and the stucco coating extends over both. This gives the window sills the appearance of granite block sills, a detail found in red brick masonry buildings built on the complex in the latter part of the 19th century. The cornice is continuous around all four elevations.

Interior partitions are of metal stud framing with lath/plaster covering.

4. Structural System/Framing: Six 6 inch by 6 inch "H" columns, located along the north and south elevations at the quarter points of the long dimension (east-west) support the roof structure comprised of 7 1/2 wide by 18 inch deep beams. Spanning between these beams and the beams and end walls are 5 1/4 by 10 purlins spaced in four equal spacings along the short dimension. All steel framing is of riveted or bolted construction.

5. Porches, Stoops, Balconies, Bulkheads: As mentioned above, two elevated platforms with access stairs provide ingress/egress to the facility.

6. Chimneys: None

7. Openings:

a. Doorways and Doors: One set of double doors is located on the south elevation at mid-point of the wall measuring 3 foot by 7 foot, giving a total width of the opening of 6 feet. A single personnel access door is located on the west wall and measures 3 foot-6 inches by 7 foot. Originally these doors were solid core wood with 2x3 upper lites in each leaf. The single door is topped by a 3x2 lite transom. The double door is topped by a 6x2 lite transom. The head of the transoms align with the head of the windows located in each elevation. The single door was replaced with a hollow core metal door (no date).

b. Windows and Shutters: Original windows were wood framed, double hung windows, each section divided into 3x2 lites. Three windows on the south elevation and two on the west elevation have been replaced with single pane double hung aluminum frame windows.

8. Roof:

a. Shape, Covering: The roof of this building is a gable roof of fairly flat pitch, approximately 1 inch in rise for each 12 inches in run. The ridge runs in the long (east-west) dimension. The roof deck is of 3 1/2 inch reinforced concrete construction with a 3-ply built-up roof covering. Of note is that the elevation drawings show the bottom of the cornice on the gable (east-west) ends as being level horizontal with the top of the wall; as constructed, the cornice actually follows the slope of the roof at the gable ends. Copper gutters and downspouts are located on the north and south elevations. Two ventilation hoods are still present on the ridge.

b. Cornice, Eaves: The cornice is formed integral with the concrete wall pour and is shown in photograph CA-1543H-9.

c. Dormers, Cupolas, Towers: None

C. Description of Interior:

1. Floor Plans: The basic floor plan of the building is rectangular with the long dimension running in the east-west direction. The first bay at the west end has been subdivided into a small office, restroom and storage room. Three additional rooms were added in the latter 1970's.

2. Stairways: Exterior concrete stairways have been previously described.

3. Flooring: Original flooring was a 3/4 inch cement topping. The laboratory conversion done in 1970 included installation of a vinyl asbestos tile floor covering over the entire floor.

4. Walls and Ceiling Finish: Original interior finish consisted of exposed concrete wall and ceiling surfaces and exposed steel framing. The laboratory conversion included installation of a standard suspended acoustic ceiling /lighting system on a 2 foot by 4 foot grid, which still remains.

5. Openings: Previously described.

6. Decorative Features and Trim: None of significance.

7. Hardware: None of significance.

8. Mechanical/Electrical Equipment:

a. Heating, Air Conditioning, Ventilation: Heating is provided by unit steam heaters. The ventilation system installed as part of the lab conversion is no longer in place. Any ventilation now provided would be by natural means through open windows and doors.

b. Lighting: The original construction drawings show that the original lighting fixtures installed consisted of industrial grade 300 watt incandescent fixtures. This was replaced with installation of the suspended acoustic ceiling.

c. Plumbing: Original construction included water and drain services for the restroom. The laboratory conversion included installation of steam unit heaters and small industrial ventilation hoods and exhaust systems.

9. Original Furnishings: None of significance.

D. Site:

1. General Siting and Orientation: The orientation of Building 463A places the long centerline axis in a generally east-west orientation. This building

sits to the north of the main battery shop, Building 461, directly across "E" Street.

2. Historic Landscape Design: The site does not include any landscaping elements considered historically significant.

3. Outbuildings: Two acid storage tanks, one for sulfuric acid and one for sodium hydroxide, were built to the east of this building in 1963. The larger sulfuric acid tank is made of fiberglass; the other tank is of steel. Adjacent to these tanks to the south are two in-ground acid cooling vats. The functions of these tanks and adjacent vats is related to that of the main battery shop. Most recently, waste electrolyte would be pumped to this area, treated and neutralized, and then dumped into the shipyard sanitary system for disposal. In the mid-1970's, this disposal system was connected into the new shipyard industrial waste collection and treatment system. Photographs CA-1543H-5 through CA-1543H-7 show the basic structure for this installation (Facility No. 987). No drawings were found for the tanks.

PART III - SOURCES OF INFORMATION:

A. Architectural Drawings: The photographic documentation included as part of this survey report includes photocopies of record drawings for Building 463A, including original construction drawings and subsequent drawings showing alterations and modifications. All drawings are currently on file in the Plan Files vault of the Staff Civil Engineer, Mare Island Naval Shipyard.

B. Historic Views: Research of shipyard Photo Lab records and Historian's records found no direct historical views of this building. Several aerial photos of the island have been made over the years; however, no details of this building can be seen and therefore have not been included in this report.

C. Interviews:

1. A brief interview with Ms. Sue Lemmon, Shipyard Historian, on August 29, 1994 was held to determine the availability of historical documents and photo records. Issues of the "Grapevine" referenced herein are located in the historian's office.

2. Discussions with Photo Lab staff and a search of photo records was made to locate historical photos of the structure and site.

3. A brief interview with Mr. James Delorey of the Battery Shop staff concerning past use of the building was made 8 September 1994.

D. Bibliography:

1. Primary and Unpublished Sources: None

2. Secondary and Published Sources:

a. "Side-wheelers to Nuclear Power-A Pictorial Essay Covering 123 Years At The Mare Island Naval Shipyard" (1977); Sue Lemmon and E. D. Wichels; published by Leeward Publications, Inc.; Library Of Congress Catalog No. 77-90050.

b. "SSN688 Class Submarine Overhaul Support Manual" (1978); published by the Newport News Shipbuilding Company.

c. "A Long Line of Ships, Mare Island's Century of Naval Activity in California" (1954); Arnold A. Lott, LCDR, USN (Retired); published by the George Banta Publishing Company.

E. Likely Sources Not Yet Investigated: None recommended.

F. Supplemental Materials: None included.

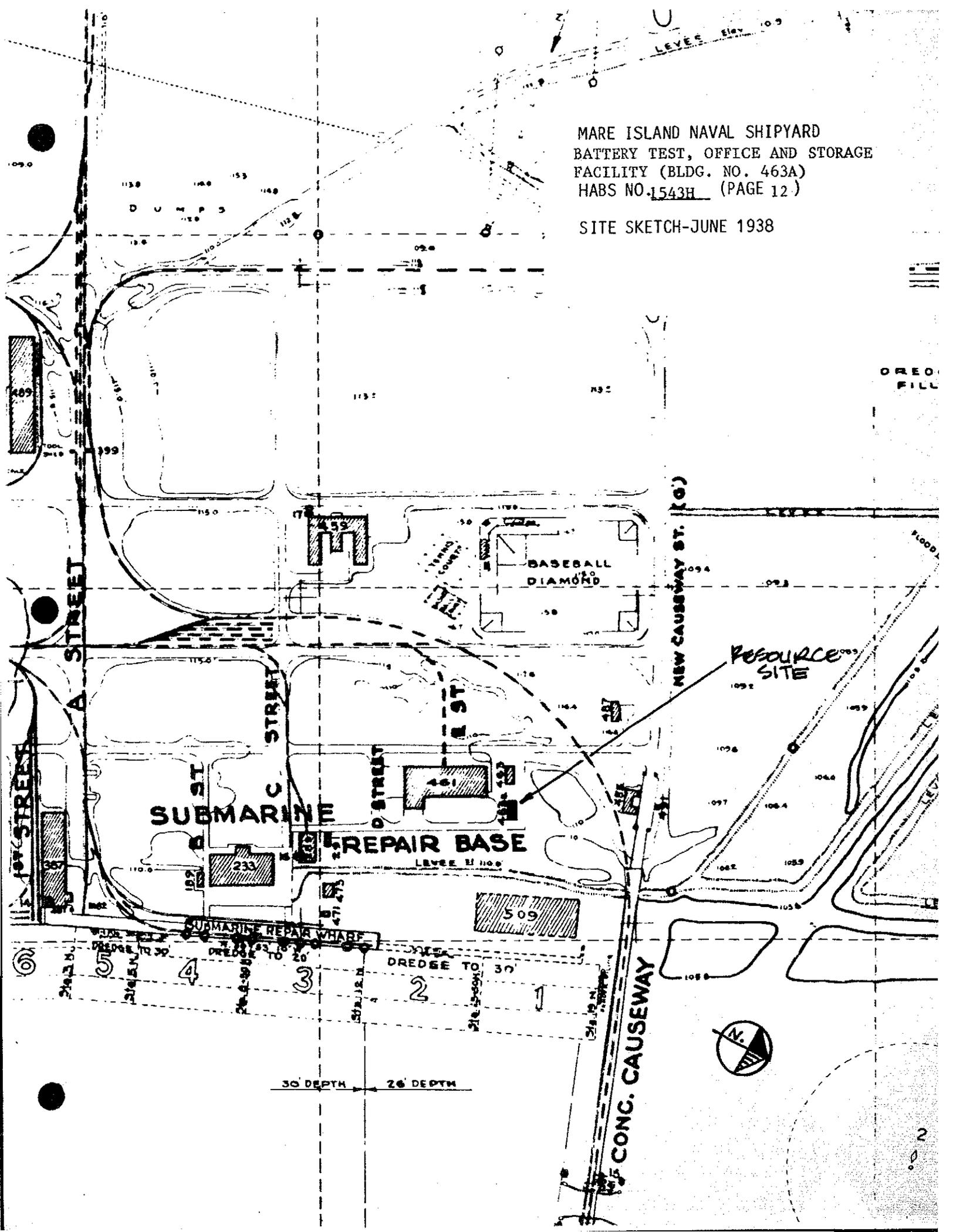
PART IV - PROJECT INFORMATION:

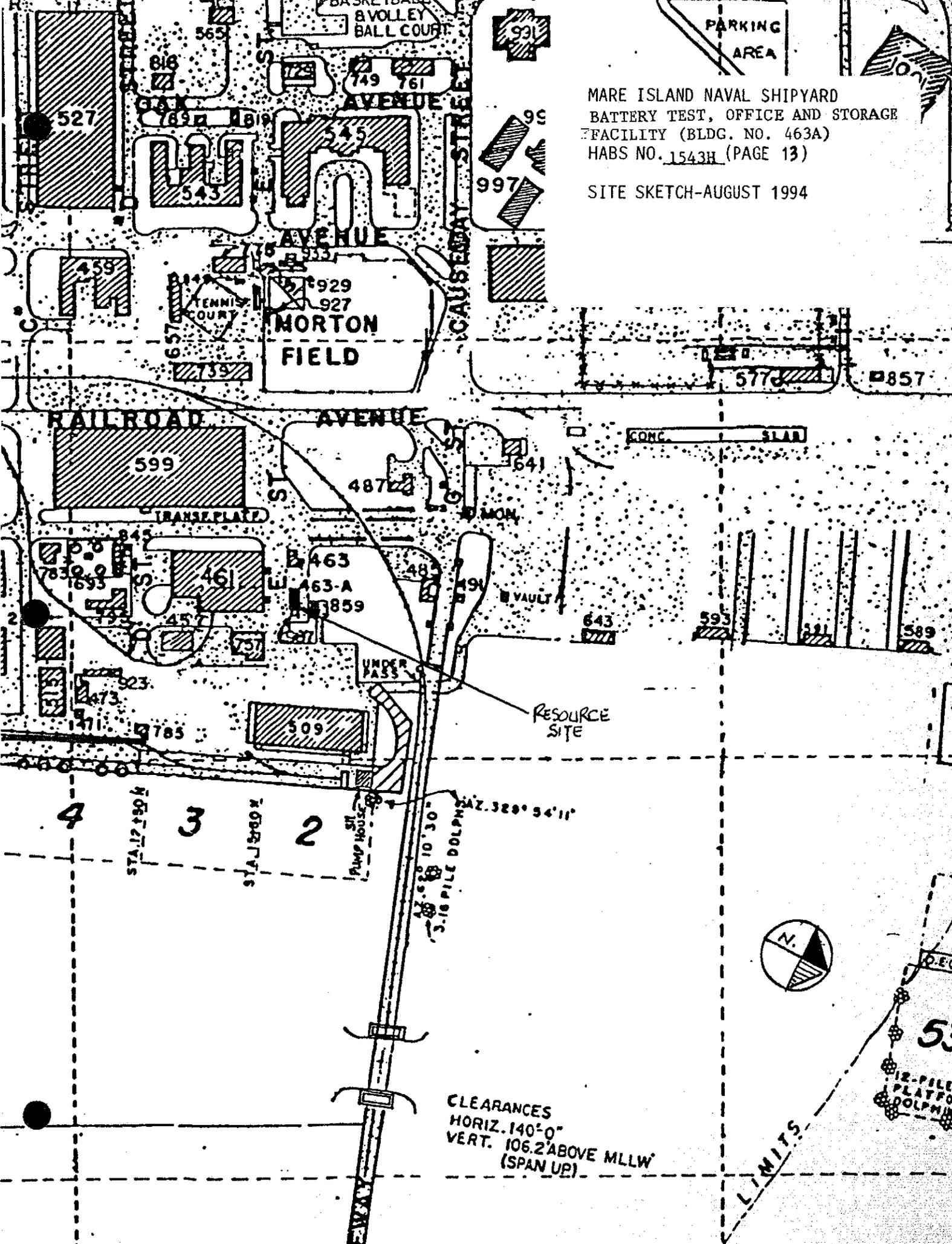
Building 463A is scheduled for demolition to support environmental restoration and clean up of chemically contaminated soils in the immediate area of the site, resulting from the repair and overhaul of submarine batteries.

This survey and documentation has been prepared to comply with mitigation requirements established by a Memorandum of Understanding between the United States Navy, the California State Historic Preservation Officer and the Advisory Council on Historic Preservation executed in 1994.

MARE ISLAND NAVAL SHIPYARD
BATTERY TEST, OFFICE AND STORAGE
FACILITY (BLDG. NO. 463A)
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SITE SKETCH-JUNE 1938





MARE ISLAND NAVAL SHIPYARD
 BATTERY TEST, OFFICE AND STORAGE
 FACILITY (BLDG. NO. 463A)
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SITE SKETCH-AUGUST 1994

CLEARANCES
 HORIZ. 140'-0"
 VERT. 106.2' ABOVE MLLW
 (SPAN UP)

LIMITS

12-PILE
 PLATFORM
 DOLPHIN