

**U.S. NAVAL BASE, PEARL HARBOR, LUBRICATING OIL
STORAGE BUILDING
(U.S. Naval Base, Pearl Harbor, Fleet and Industrial Supply Center)
(Facility No. 88)
Merry Point near North Road
Pearl Harbor
Honolulu County
Hawaii**

HABS No. HI-401

**HABS
HI-401**

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

**HISTORIC AMERICAN BUILDINGS SURVEY
National Park Service
U.S. Department of the Interior
Oakland, California**

HISTORIC AMERICAN BUILDINGS SURVEY

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- Location:** Merry Point, near North Road
Pearl Harbor Naval Base
City and County of Honolulu, Hawaii
- U.S.G.S. Pearl Harbor Quadrangle, Hawaii 1999
7.5 Minute Series (Topographic) (Scale – 1:24,000)
Universal Transverse Mercator Coordinates: 4.609740.2361460
- Present Owner:** U.S. Navy
- Present Occupants:** Fleet and Industrial Supply Center, Fuels Division
- Present Use:** Lubricant Storage (soon to become unused)
- Significance:** The building is significant because there is no other building with its form and function on the base, and because of its relationship to the history of the Naval Oil Reserve scandal in the 1920s. Its history is also tied to the other early fuel facilities at Pearl Harbor. Since its erection in 1924, it has housed the various types of lubricating oil needed for the maintenance of machinery on ships and in buildings throughout the Pearl Harbor Naval Base.

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Description:

General Architectural character: This building is a simple utilitarian structure. An interesting aspect of this structure was the construction process. The 56 25,000-gallon tanks, due to their size and weight, were set in place before the structure was built. The tanks on the first tier sit on concrete cradle supports; the second-tier tanks sit on metal cradles connected to a steel support system of posts and beams and cross-bracing. There is no finished floor below the tanks; the concrete cradle supports sit directly on the ground. After the two-tiered tank racks were completed and the drums were in place, the warehouse-like structure was constructed. The building is basic, with simple design elements. The steel truss shell is characterized by its box-like shape, low-pitched roof with skylights, symmetrical fenestration, and minimal detailing. The building has a warehouse appearance that corresponds to the minimal needs of housing oil tanks.

EXTERIOR

1. Overall Dimensions: This is a high-bay, one-story structure with a rectangular plan, 15 bays long by 3 bays wide. The original part of the building measures 218'-0" x 82'-0" and has a total gross area of 17,876 square feet. The building form has been determined by the tank layout. There are two long rows of 14 tanks, stacked in two tiers, with a central east-west aisle that has a trench for pipes and plumbing plus walkways for circulation. The long rows of tanks are also separated by a central bay running north-south. The four exterior doors indicate the location of these interior aisles. The building height from the finished floor level to the underside of the eaves measures 35'-8 1/2". The storage addition built in 1942 on the south side of the building, with a floor area measuring 59'-0" x 25'-0", spans the four bays nearest the western end. An undated addition, measuring about 15' x 25' in plan, abuts the east end of the 1942 storage addition. The drum-loading platform addition built in 1943 is directly to the east of the central south-side door. This addition's floor plan measures 28'-0" x 8'-0" and spans two bays. It is open-sided and covered with a sloped lean-to roof. The platform is elevated 3'-6" above ground level and is accessed by stairs on one side and a ramp on the other. The 1942 transformer enclosure, at the eastern end of the south side, measures 19'-8" x 12'-10" in plan.

2. Foundation: The steel structural columns are built on concrete footings. The perimeter footings support the concrete perimeter walls that rise about 5' above grade. The drawings show the concrete footings spaced every 14'-0" on center in the east-west direction, except for the center bay which has a span of 16'-0" on center. The concrete tank cradle supports, three per tank, one at each end and another in the center, are sandwiched between the footings. The concrete tank supports are 9" thick, and approximately 4' high at their highest point.

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3. Walls: The siding is corrugated transite (cement-asbestos) panels attached to the steel columns by U-shaped steel channels, above the concrete perimeter walls, which rise about 5' above grade.

4. Structural system, framing: The structural system is a steel post and beam framing system with cross-bracing and steel roof trusses.

5. Openings:

- a. **Doorways and doors:** There are four main doors on this building. They are located on the four axis points of the building, at the center of the east, west, north and south walls. The entrances on the east-west axis are double steel doors originally with multi-light sash in the upper two-thirds. The door openings measure 12'-1" in width by 14'-3" in height. The entrance doors on the north-south axis are single steel doors with multi-light sash in the upper half. Transoms above the doors and sidelights adjacent to them, originally were steel-sash windows, with fixed and pivoting sections. Fixed metal panels under the sidelights were the same height (approximately 5') as the adjoining perimeter concrete walls. The single doors measure approximately 3'-6" in width by 9' in height and the entire window and door assemblies on the north and south sides measure 12'-7" in width by 14'-8" in height. All doors swing out. Several doors have been partially or entirely covered with corrugated material, and most of the glass has been painted.
- b. **Windows and shutters:** Most of the fenestration for the building is located at the top portion of the north and south walls. Under the roof eaves, at every bay, centered between the structural columns, is a wire mesh and multi-light steel-sash assembly that measures 11'-0" wide x 8'-0" high. These provide natural light and ventilation to the interior. The wire mesh portion of the assembly is at the upper third. The bottom two-thirds consists of triplets of fixed nine-pane steel sash. Also, at the lower portion of the north and south walls, located at every other bay, centered between columns, are smaller steel window assemblies. These nine-light steel windows measure 4'-0" wide by 6'-0" high, with a six-light pivoting portion at the bottom two-thirds of the window. Most of these lower windows have painted glass or corrugated material covering them. On the east and west ends, above each double door opening, there is one window with triplet sash. In each sash there is a six-light pivoting section below a row of three fixed lights and above nine fixed lights. The dimensions of these two windows are approximately 11' wide by 10' high. The original panes are obscure wire glass, but about ten percent of the panes have been replaced over the years with a patterned wire glass which is more translucent.

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6. Roof:

- a. **Shape, covering:** The roof is a low-pitch (3/4 in 12) gable roof with wide overhanging eaves, supported by brackets on the north and south sides. It is covered with an asphalt and gravel roofing, over pre-cast concrete panels, which replaced the original gypsum roof panels in 1952. Down the roof ridge are skylights and ventilators that alternate at each bay.
- b. **Skylights:** Gabled skylight assemblies are located at the roof ridge, centered between columns, at every other bay. They measure 12'-0" in length x 9'-0" in width with a pitch of about 3.5 in 12.

INTERIOR

1. Floor Plans: There are two central aisles in the building, one running north-south and the other running east-west. The central bay that runs in the shorter north-south direction holds the pump room and compressor room for the oil tanks. On either side of each room are seven bays to the east and seven bays to the west, each bay holding two tiers of lubricating oil tanks. The only interior walls are those enclosing these rooms. Each room has a large metal sliding door between it and the central east-west bay. The trench running in the east-west central bay measures 6'-6" in width and approximately 2' in depth, and has side trenches about 3' wide to each tank tier.

2. Flooring: The finished floor is largely confined to two aisles along the central concrete trench. The trench, containing the piping, was useful for containment of potential oil spills. The aisles consist of alternating concrete slab sections and checkered metal plates across the side trenches. There are also some checkered metal plates crossing the main trench. The tanks sit on concrete cradle forms that are supported by concrete foundations but with no flooring between these, just the compacted dirt surface. There are metal catwalks along the second tier of tanks.

3. Wall and ceiling finish: The only interior walls are in the pump and compressor rooms, which use the same corrugated transite siding that is on the exterior and exposed on the interior. The ceiling is the underside of the pre-cast concrete panel roof structure, supported by steel rafters and trusses.

4. Hardware: The original door and window hardware appear to be intact.

5. Mechanical equipment:

- a. **Electrical:** There is new electrical transformer equipment near the southeast corner of the building.

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- b. Heating, air conditioning, ventilation: There are eight metal ventilators located at every other bay at the ridge of the roof.
- c. Piping: Numerous pipe systems connect to the tanks, compressor rooms, and pumping rooms. Each tank has a 2-1/2" and a 4" line that supplies and discharges the oils. These lines are connected to valves, compressors, and pumps that pump oil in and out of the tanks. The main lines run east-west in the concrete trench in the central bay.
- d. Lighting: Industrial-style incandescent luminaries, which light the ground-level tanks, are attached to the underside of the mezzanine catwalks above. The lights that illuminate the second tier of tanks are attached to the top side of the mezzanine catwalk system, shining upwards to illuminate the walk.

SITE

The structure was built on a mudstone ridge in the Merry Point peninsula, located between Merry Loch and Quarry Loch. The natural depth of the soil is very shallow at the ridge. However, most of this highly altered peninsula is composed of fill. The irregular shape of the peninsula was transformed into a triangle when the fueling wharfs (Fac. M 1 – M 4) were built in 1923. When the Lubricating Oil Building was erected, in 1924, it was the most prominent among the few buildings located at Merry Point. The other early buildings on the peninsula were an electrical substation, a small barracks building (Fac. 89), and two pump houses. The overall setting has changed, because most of the numerous fuel oil tanks that were built across North Road, as part of the same fuel facilities construction project in the early 1920s, have been demolished. Only five of the original riveted steel tanks in the upper tank farm remain. The immediate setting of the building on the peninsula has also changed considerably over the years. The area on the west side of the building, near the point of the peninsula, has changed the most. In 1920s and 1930s this area was largely clear of buildings, except for an oil purification plant (Fac. 96). In WWII, this area was filled with large storage buildings and a transit shed at the tip. All the WWII buildings on the west side of Facility 88 have been removed and replaced by a variety of other buildings in the last six decades. The south side of Facility 88 is the only vantage from which one can get a clear view of the building; there is a large open paved area here. A lava rock retaining wall and chain link fence are along this side of the building, at the edge of the parking lot. This lava rock wall connects to the concrete retaining wall just west of the building. A narrow dirt road leads from the parking area up to the chain link fence gate near the southeast corner of Facility 88. In 1940, three large cargo storehouses, Facilities 145, 146, and 147, were built on the north side of Facility 88 creating a virtual wall on that side of the building. A splinterproof air raid shelter (Fac. S 1154) was also constructed during

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WWII east of this building, on the south side of the mudstone ridge, but has since been demolished.

Historical Context: For an overview history of the early fuel facilities at Pearl Harbor, including information on the Naval Oil Reserve Scandal and its relationship to this facility, see HABS No. HI-389.

Lubricating Oil History

The reason this building was designed to hold 56 separate tanks of lubricating oil is because there was little industry standardization in the early twentieth century, and the numerous types of equipment in the buildings and ships at Pearl Harbor required many different lubricants. This building remains the central lubricant supply point for the base. However, this 1.4-million-gallon-capacity lubricating oil storage building will be replaced with a 60,000-gallon-capacity facility now under construction near Fac. S 582. Only a few types are now required, due to the establishment of industry standards and military specifications for lubricants.

Physical History of Facility

Date of erection: 1924

Architect: J.D. White Engineering Corporation, New York

Original and subsequent owners: U.S. Navy

Builder, contractor, suppliers: According to the steel manufacturer's shop drawings, dated 1923, the American Bridge Co. of Ambridge, PA, under order number E5273, supplied the structural steel. Pan American Petroleum and Transport Company built this structure and the other oil-related facilities at Pearl Harbor in the early 1920s.

Original Plans and construction: Six sheets of the original plans and construction drawings entitled "Additional Fuel Oil Storage, Lubricating Oil Storage Building" were found. The two earliest drawings, dated January and February 1923 only have the U.S. Navy Bureau of Yards and Docks on the title block. The four dated June 1923 indicate that J.D. White Engineering Corporation refined the design of the structure for the U.S. Navy Bureau of Yards and Docks. These drawings were approved by L.E. Gregory, Chief of the Bureau of Yards and Docks. The sheet dated January 1923 shows the building with a stucco exterior surface and a parapet roof with raised center sections on all four sides. The February 1923 sheet shows the building with corrugated metal siding and a gable roof with overhanging eaves. The June 1923 drawings are essentially the same design as the February one, except the building has "corr. asbestos" (transite) siding. The design changes

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were probably cost savings measures. The original cost of the building is not known. Except for a few small additions and alterations, Facility 88 still appears much as it did when originally built.

Alterations and Additions: In 1942, the plumbing and piping system for the tanks was revised and expanded and new catwalks added. Also in 1942, two additions were built on the south side -- a storage lean-to near the southwest corner and an unroofed transformer enclosure at the southeast corner. The latter has concrete walls 16" thick, presumably for lateral (but not overhead) protection from flying shrapnel in case of attack. In 1943 a wood-framed shed-roofed drum-loading platform was added near the center of the south side. About 1950, the building was electrically upgraded. The building was reroofed in 1952 and the original gypsum roof panels were replaced with pre-cast concrete panels. An undated alteration is the shed-roofed addition abutting the storage lean-to, with its shed roof at right angles to the shed roof on the 1942 storage addition. The electrical system was also upgraded sometime after 1950. Currently there is no electrical equipment within the 1942 transformer enclosure walls. New equipment was installed within new walls and fences, just outside the 1942 walls.

Sources:

Architectural Drawings

Six sheets of the original plans and construction drawings entitled "Additional Fuel Oil Storage, Lubricating Oil Storage Building" are in the files of the Fuels Superintendent at the Fleet and Industrial Supply Center. Also available here are the steel manufacturer's shop drawings, sheets 3-17, dated 1923 drawn by the American Bridge Co. of Ambridge, PA under order number E5273, as well as other additional sheets by the manufacturer. Drawings of the additions and revisions to Facility 88, dated 1941 and 1952, are located on microfiche cards in the Plan Files of the Naval Facilities Engineering Command, Pacific.

Early Views

Photographs of the Lubricating Oil Storage Building when it was built can be found at the National Archives in RG71CA, Box 161 in the "Lubricating Oil Bldg" folder. A 1927 aerial view of the building and its surrounding area is located at the USS Bowfin Museum.

Bibliography

Fourteenth Naval District

- 1929 "Map of the Yard and Adjacent Units Showing Developments to June 30, 1929" with notation "Plan Showing Outline and Location of Improvements Recommended in Annual

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Estimates for 1932, Submitted 1930." Drawing no. A-152.
From National Archives, courtesy Earth Tech.

1932 "Pearl Harbor, T.H., Showing Developments to June 30,
1932." Drawing no. 1-N1-110. From National Archives,
courtesy Earth Tech.

Likely Sources Not Yet Investigated:

National Archives II, Text and Cartographic sections, 8601 Adelphi
Road, College Park, Maryland 20740, ph. (301) 713-6625.

National Archives, Pacific Sierra Region, 1000 Commodore Drive, San
Bruno, California 94066, ph. (415) 876-9009.

Navy Historical Center, Washington Navy Yard, 805 Kidder Breese,
S.E., Washington, D.C. 20734, ph. (202) 433-4131.

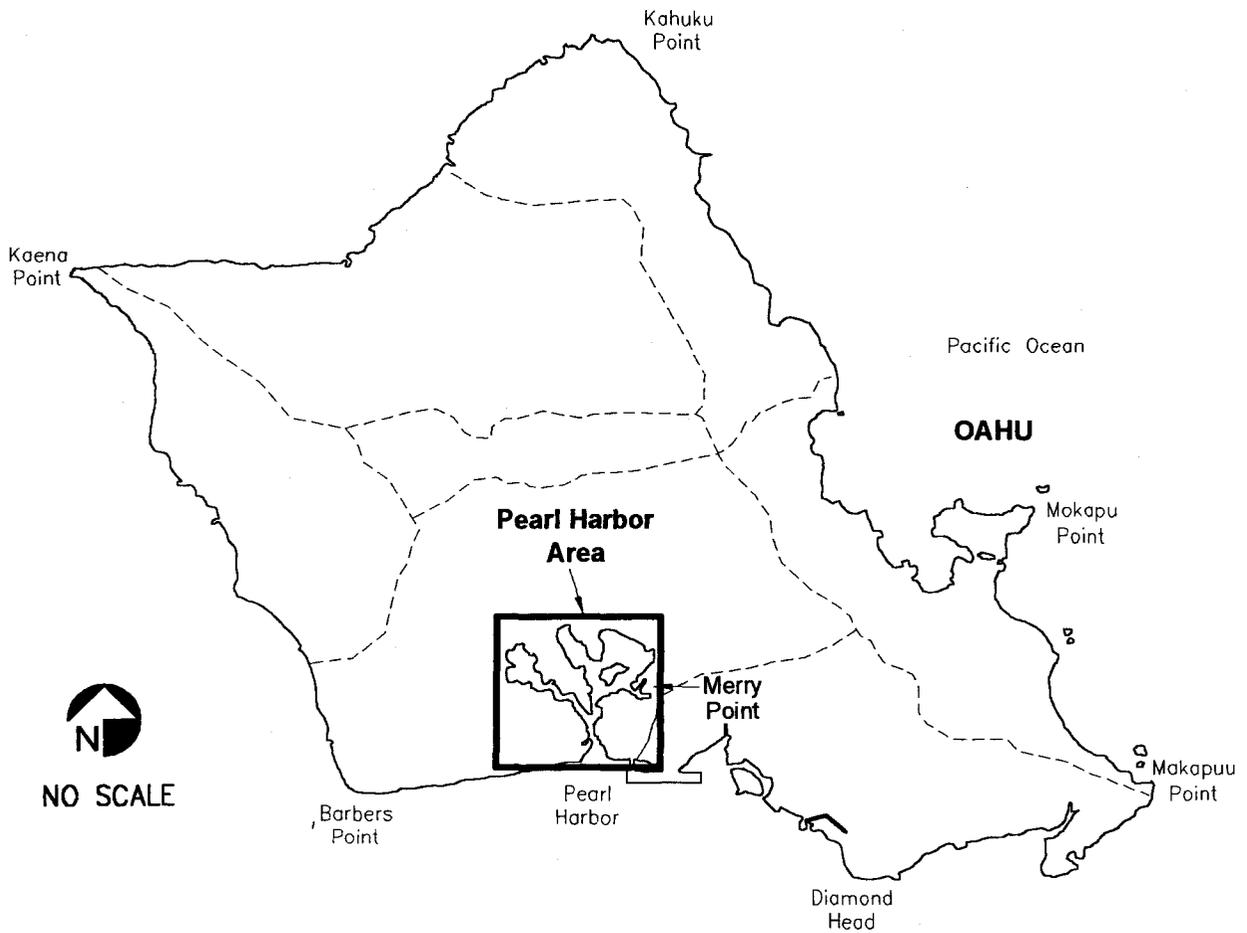
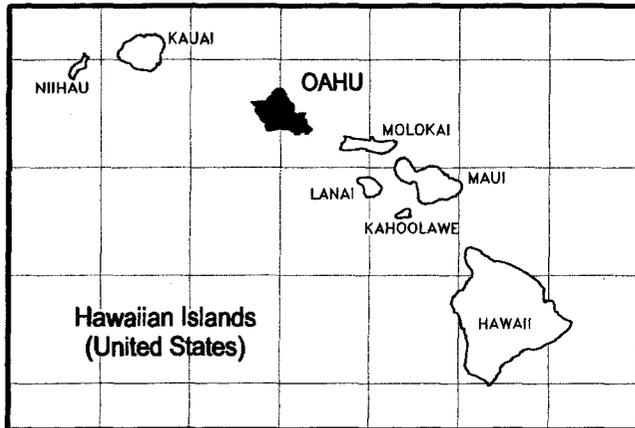
Port Hueneme NAVFAC Archives, 621 Pleasant Valley Road, Port
Hueneme, California 93043, ph. (805) 982-5563.

Project Information: Commander Navy Region (COMNAVREG) Hawaii has embarked on a program of documentation of historic properties within its area of responsibility, with the goal of recording historic information about each property type and establishing its context of significance. This information will assist COMNAVREG Hawaii in the appropriate management of the property, be it routine repair and maintenance for continuing use, rehabilitation for continuing use / adaptive reuse, or demolition. At this time, specific action that may affect this facility has not been determined. This report was prepared under a Historic Preservation Services contract (N62742-97-D-3502) awarded to AMEC Earth and Environmental, the prime contractor, by the U.S. Navy, Naval Facilities Engineering Command, Pacific. The contract was funded through the Cultural Resources Program of COMNAVREG Hawaii. The photographic documentation was undertaken by David Franzen, of Franzen Photography. Maps were made by Nestor Beltran of NAB Graphics. Lorraine Palumbo and Ann Yoklavich, Architectural Historians at Mason Architects did the field work, research, and draft of this report between 1999 and 2000. Ann Yoklavich finalized the report.

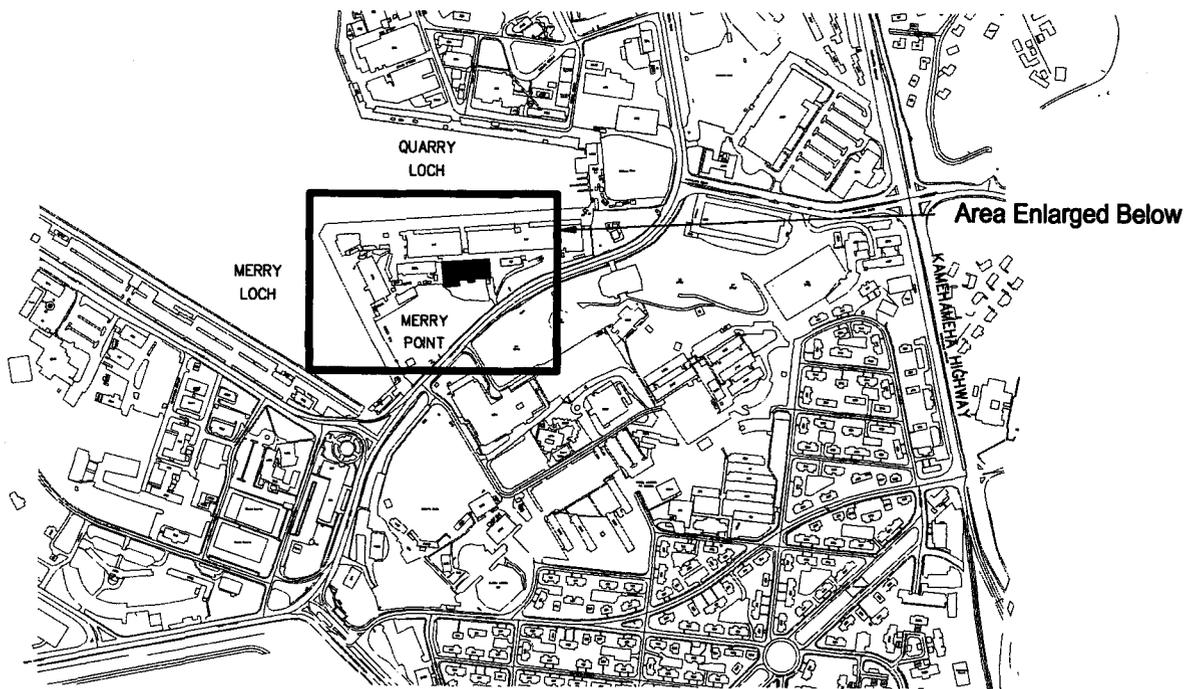
Prepared by: Lorraine Palumbo and Ann Yoklavich, Architectural Historians
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Date of Final Report: January 2004

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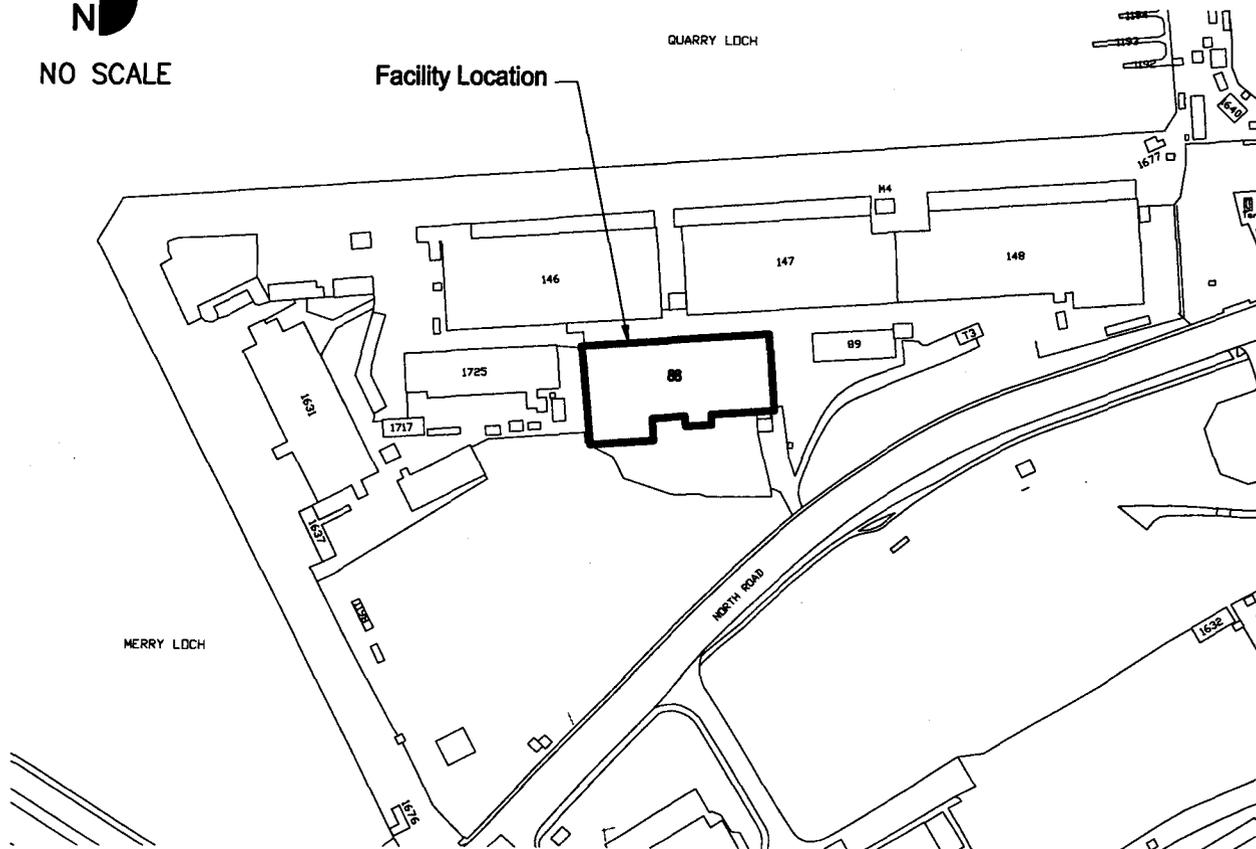


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Vicinity Map

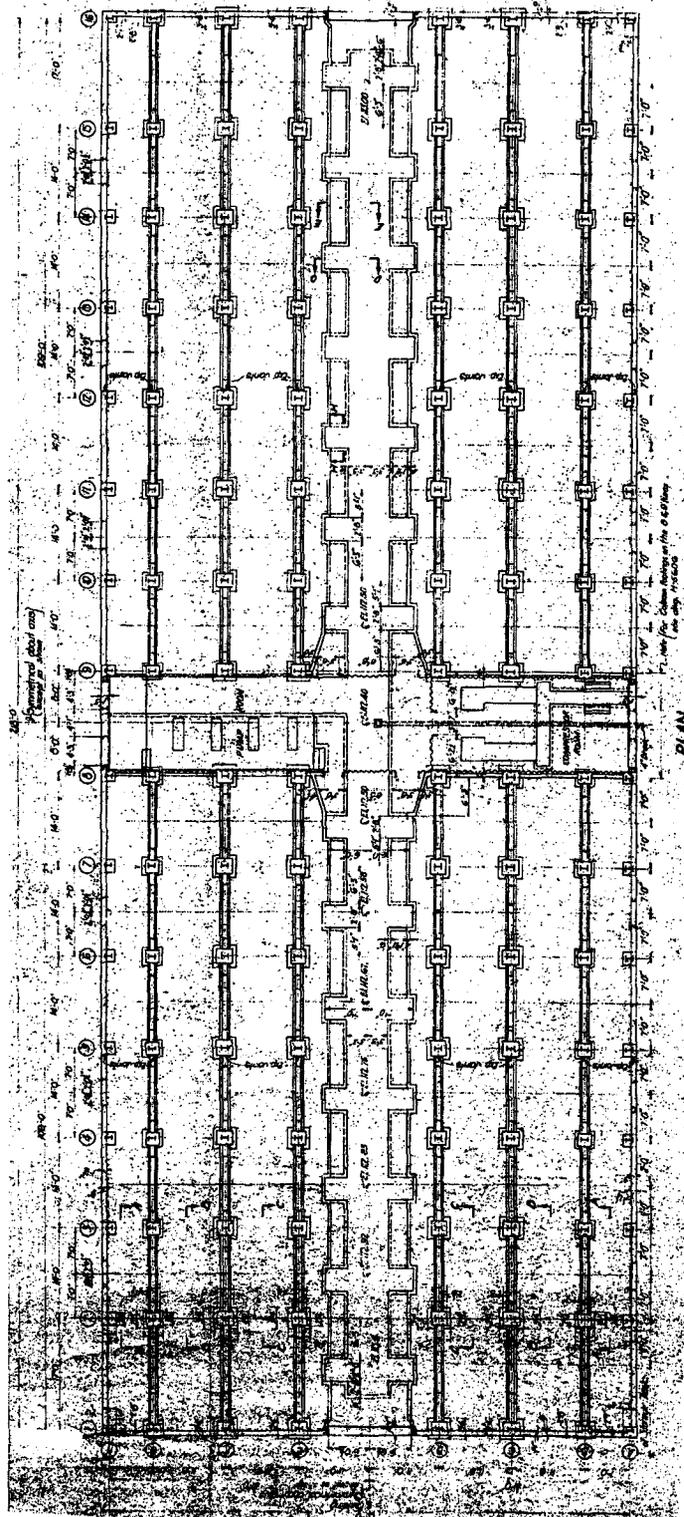

NO SCALE



Site Map

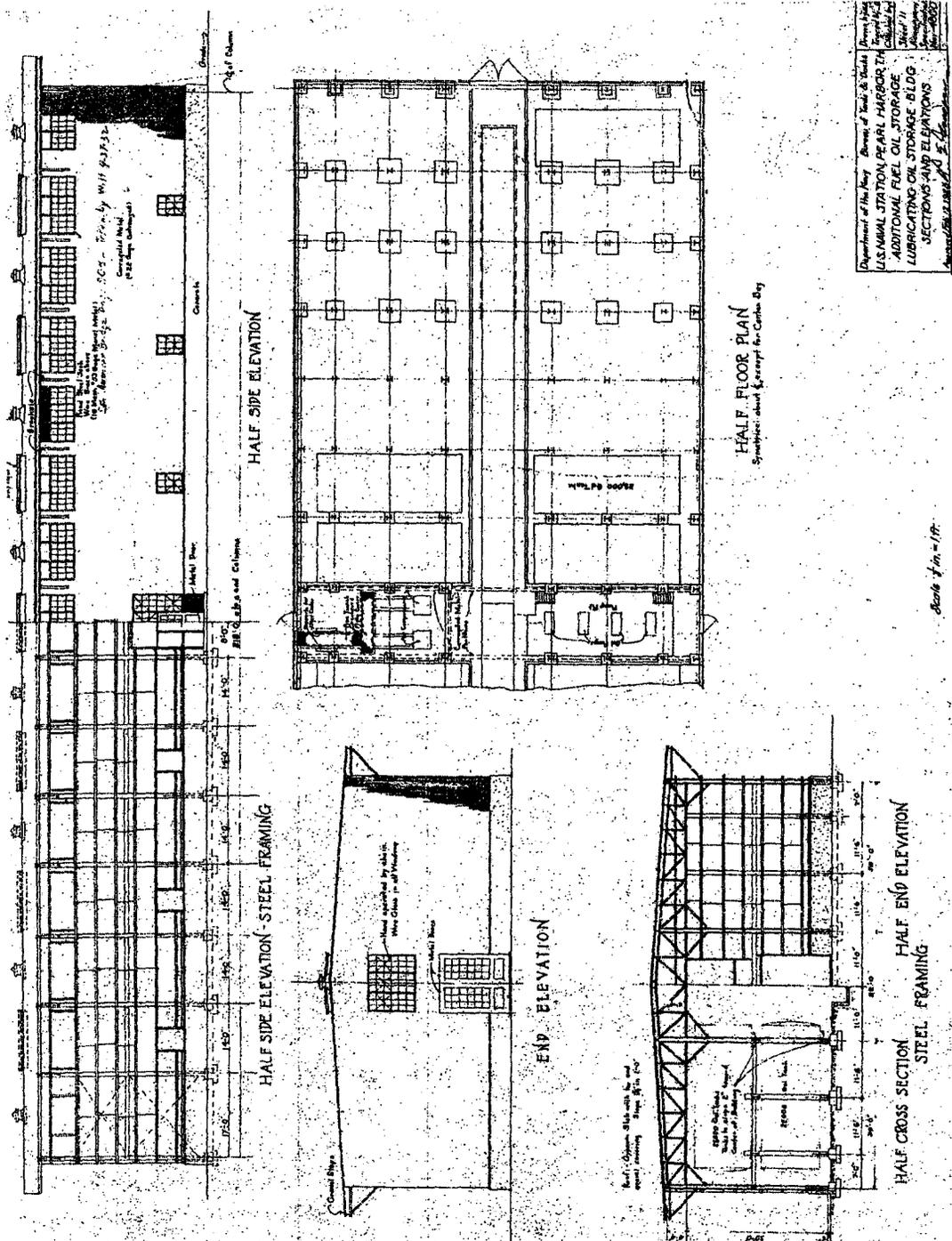
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1923 Foundation Plan (portion of Drawing no. 99083)



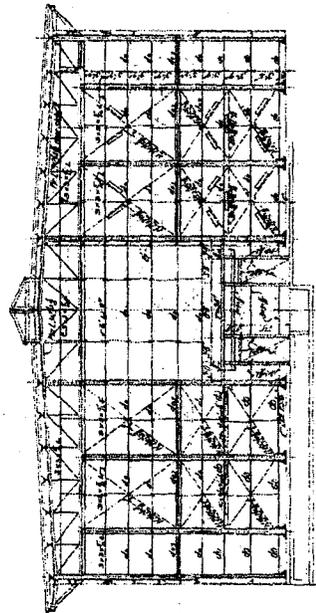
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1923 Half Floor Plan, Section, and Elevations (Drawing no. 98312)

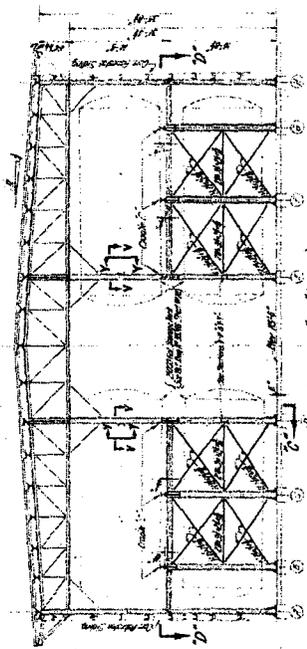


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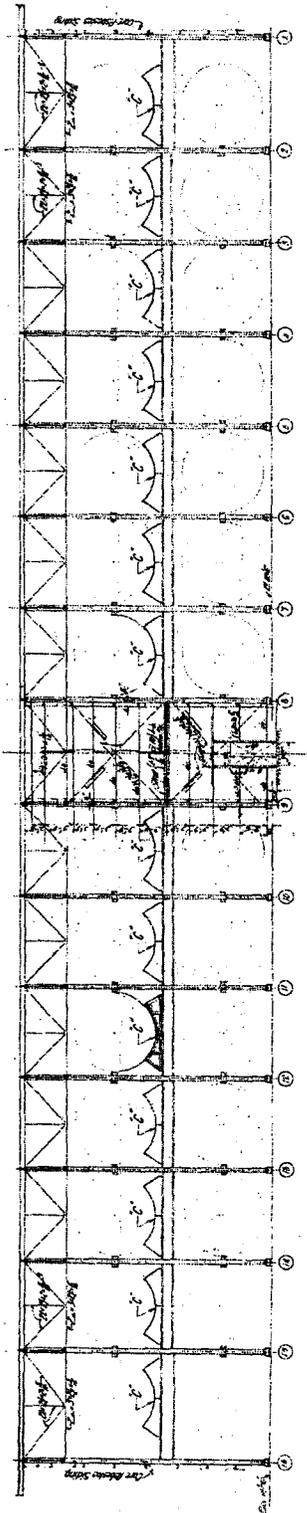
1923 Steelwork Plan and Sections (Drawing no. 99080)



SECTION 'A-A'



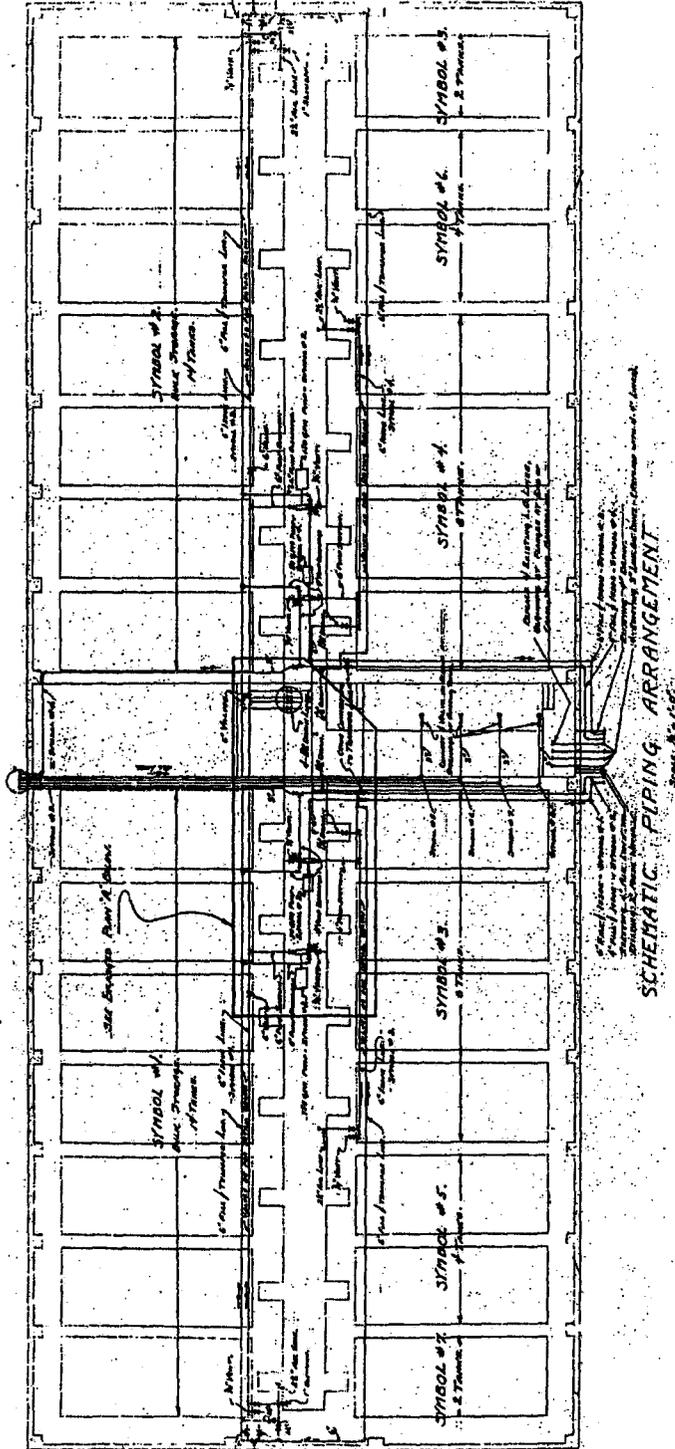
SECTION 'B-B' (Typical)



LONGITUDINAL SECTION 'C-C'

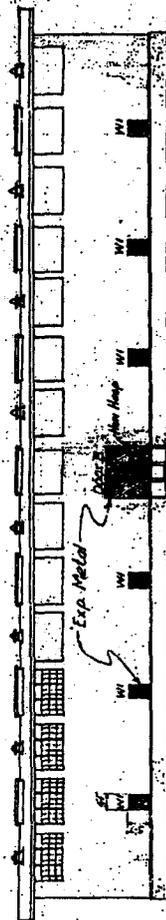
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1942 Plan (portion of Drawing no. N-N24-321)



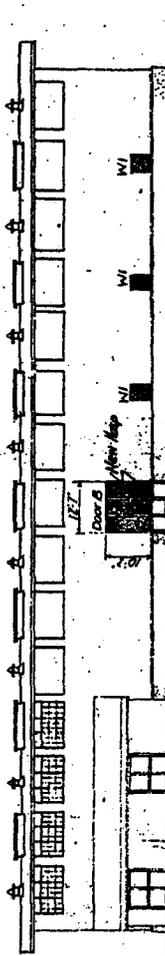
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1942 Elevations (portion of Drawing no. N-N24-350)

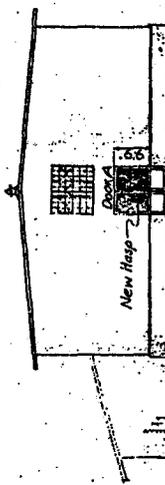


NORTH ELEVATION
Scale: 1/8"=1'-0"

*NOTE: Window Dimensions
 shown are size of main
 opening.*



SOUTH ELEVATION
Scale: 1/8"=1'-0"



EAST ELEVATION
WEST ELEVATION SIMILAR
Scale: 1/8"=1'-0"

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1942 Details of Additions to Transfer System Piping (Drawing no. N-N24-322)

