

U.S. NAVAL BASE, PEARL HARBOR, FORGE SHOP &
GALVANIZING SHOP
(U.S. Naval Base, Pearl Harbor, Naval Shipyard, Facility Nos. 5 &
5A)
Sixth Street between Avenues D & E
Pearl Harbor
Honolulu
Hawaii

HABS HI-484

HI-484

HABS

HI-484

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN BUILDINGS SURVEY
PACIFIC GREAT BASIN SUPPORT OFFICE
National Park Service
U.S. Department of the Interior
1111 Jackson Street
Oakland, CA 94607

HISTORIC AMERICAN BUILDINGS SURVEY

U.S. NAVAL BASE, PEARL HARBOR, FORGE SHOP & GALVANIZING SHOP (U.S. Naval Base, Pearl Harbor, Naval Shipyard) (Facility Nos. 5 and 5A)

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HABS No. HI-484
(NOTE 4)

Location: Sixth Street between Avenues D & E
Pearl Harbor Naval Base
City and County of Honolulu, Hawaii

This building falls within the UTM coordinates of the Pearl Harbor Naval Shipyard as defined in the location section of the overview report HABS No. HI-483. This building's UTM coordinates are: 04.607860.2361840.

Significance: These two facilities are part of an important grouping of historic buildings including Facilities 4(HABS HI-359), 4A(HABS HI-360), 8(HABS HI-446), 9(HABS HI-487), and 13(HABS HI-462) all located within the same block between Sixth and Seventh Street and Avenues D and E (See enlarged area map on p 7). This grouping is significant as a part of a core grouping of buildings in the initial base. Facility 5 was constructed in 1913 as part of the initial establishment of the naval base at Pearl Harbor. Facility 5A which abuts the south side of Facility 5 was completed in 1941 in association with the major expansion of Shipyard Shop facilities during World War II. Located within the Pearl Harbor National Historic Landmark, these two buildings are of a distinctive type and period of construction. Over the years these two buildings have provided forging, blacksmithing, heat treatment for strengthening and galvanizing services for the nearby dry docks.

Description: **Facility 5** is a single-story utilitarian structure with minimal detailing. Following the original plans, it was constructed as a permanent forge shop. Prior to WW II, Shop 23 used this facility. It has a rectangular floor plan and a mezzanine level. The original building dimensions were 240'-0" x 120'-0" with a height of 64'-8". It is of steel-frame construction with steel columns set on a foundation of concrete piers and H-bearing piles. Primary exterior material of the walls is corrugated metal panel with some additions of concrete. The structure is composed of a steel truss roof framing system, supported by steel columns bolted to concrete footings. The roof has a steel truss frame with riveted diagonal bracing. It has distinct tripartite roof system that consists of a central gable ridge monitor and two tiers of symmetrical flanking shed roofs below it. Off the north side of the building the shed roof extends at a slightly shallower slope to cover the lean-to addition. There is a gable roof at the east end of the structure that was added around 1972 during a building alteration for a heat treatment kiln. In 1938 the corrugated iron sheets that were

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originally installed on the roof were replaced with corrugated asbestos sheets. These too were later replaced. The present roofing material is corrugated metal panels.

Originally, the ground floor was enclosed by wire mesh attached to steel girts. A gradual enclosure of the steel structure was accomplished with corrugated metal sheets forming the bottom half of the wall and bands of window fenestration completing the top. Each window unit is typically composed of a 30-light steel sash with 21 fixed lights bordering a central 9-light pivoting sash. A band of these windows spans the length of the building just above the mezzanine level as well as at the west end. The number of lights per sash varies at the ground level. The clerestory windows at the roof monitor are a band of paired 27-light steel sash pivot windows at both the north and south side. Located under the eaves and above the windows are continuous strips of wire mesh screens that span the length of the building. The entry door at Sixth Avenue is a metal mesh gate. Metal, large-scale, roll-up doors are located on the east end.

The interior of the building has a warehouse appearance that corresponds to the functional space requirements for forging and blacksmithing. Photographs taken in 1938 show the flooring and surrounds of the southeast corridor of the building being prepared as a galvanizing plant. This service was moved to Facility 5A in 1942 and then to Facility 8. A mezzanine for workers' lockers and a break area that can be accessed by a central stairwell occupies the southwest corner of the building. Lavatory and locker room facilities are at the first floor beneath it and an enclosed office space is located at the northwest corner. This space was added around 1953 as a wing extension to both Facilities 5 and 5A.

The flooring of the building is concrete and macadam. Indentations in this floor allow for placement and stabilization of the parts, particularly propellers, on which work is completed. Tracks for bridge crane operation were added when the east addition was constructed. Ten sets of 12" steel columns form the structure of the interior space. These columns support cross beams to hold cranes. At present, 2 cranes with capacities of 10,000 pounds (c. 1913) and 2,000 pounds are placed near the west entrance for the transport of heavy equipment and metal work. Behind the 12" columns stand 15" structural columns. A large collection of forging equipment and machinery, both functional and non-functional abandoned, is arranged within the interior. This includes a functional, Southwark made, single-casting steel press (c. 1930), one non-functional steel press (c. 1960), mill-wheel grinders, kilns, vats for water-bath cooling, extensive shelving of tool and die patterns and a Tate-Jacobs furnace. The necessary hydraulic piping system for operations is present, though not all functional. Facility 5 is located within close proximity to the yard railroad track and air piping system.

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Most windows were installed after the original completion date of 1913. In 1941 a lean-to was added on the north side of the building. Drawings dating to 1972 show plans for the demolition of two structural bays at the east end of Facility 5 which were replaced with a new 38'-8" addition.

Facility 5A was constructed as a semi-permanent addition to Facility 5 in 1941. It is a one-story, utilitarian structure with a rectangular floor plan and minimal detailing. This open-air structure is situated on a concrete slab-on-grade foundation with concrete footings. It has a structural steel frame with diagonal bracing and a combination of corrugated metal, concrete, and expanded metal mesh enclosures at the exterior wall surfaces. The roof is an extremely low pitched gable (that appears to be almost flat) with composition roofing material on 1-5/8"-thick tongue-and-groove wood planks. The framework for the roof structure is composed of cantilevering steel purlins that rest on steel rafter beams. The eaves overhang 6'-1" on all sides and the roof is trimmed with metal gutters and flashing. There are no windows as the building is open on the east and west ends and under the north and south side eaves. Expanded wire mesh fences enclose the east and west ends of the building. Swinging gates of the same material provide access into Facility 5A from the exterior.

Aluminum light fixtures, added in 1972, hang from a wood ceiling. The concrete floor supports various galvanizing equipment, including one large and one small galvanizing kettle, tanks to contain muriatic acid, sulfuric acid and hydrofluoric acid and a 1,000-gallon water tank cooling vat. A riveted metal frame supports a functional overhead 10,000 pound capacity overhead bridge crane which traverses the west end of the building. The building was originally enclosed at the east and west ends with concrete and steel sash doors and windows. It is uncertain when these materials were removed from the structure.

The original dimensions of this building were 119'-4" x 38'-6" x 26'-0". Around 1953 two structural bays were added to the east end of the building and one bay was added to the west end. The building was extended a total of 58'-0" in length. In this same year the toilet and shower facilities originally housed at the west end of Facility 5A were moved to the new wing extension at the northwest junction of Facility 5 and 5A.

Historical Context:

Facility 5 was part of a core grouping of buildings in the initial base. When built it was located adjacent to another major shop building (Shipfitters and Boiler Makers Shop in Facility 4 –demolished in early 2000) and the original power plant (Facility 8). This steel forge shop was erected in 1913 in the same year as those two facilities as well as Facilities 9 (storehouse), 6 (foundry), and former Facilities 2 (Pipe and Plumbing Shop), and 3 (Machine Shop). The remainder of the neighboring facilities within the street block were erected in the years to follow (Fac. 13 – 1917), (Fac. 4A – 1941), and (Fac. 9A – 1953).

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It was built as a forging shop for the Navy where metal was heated before being shaped. Once shaped the metal was coated with zinc, better known as galvanizing, to prevent rust from forming. These were and have been particularly beneficial practices for ship parts, maintenance and repair. In 1941 when the Shipyard was going through a major expansion, Facility 5A was constructed in order to relocate the galvanizing services from Facility 5 to this new and adjacent location.

The lean-to on the north side (1941) and the gable roof addition at the east end (1972) of Facility 5 are two of the major additions to this building. Facility 5A was designed by well-known architect, Albert Kahn. Its flat roof and open frame highly contrasts with adjoining Facility 5 and makes it a distinct type of construction. The two-story bathroom and storage addition (c.1953) at the exterior corner junction of the west end of Facility 5 and the north wall of Facility 5A is a shared structure between the two buildings.

Facility 5 is currently used as a Forge and Propeller Shop and Facility 5A as a Forge and Heat Treat building.

For an overview of the Naval Shipyard see HABS No.HI-483.

Sources:

The original drawings for this building are on microfilm at NAVFACPAC Plan Files.

Historic photographs of Facility 5 are located at the National Archives II, Photo Collection, RG 71 CA; Box 171, 165, and 178. More recent photographs [1980] of both Facility 5 and 5A were found at the Fourteenth Naval District Photo Collection.

Almy, Capt. E.D., Cmdr. J.J. Manning, and Lt. Cmdr. Philip Lemler
1940 Letter Report dated 29 April 1940 to the Secretary of the Navy on Development of Fourteenth Naval District. In National Archives, San Bruno, RG 181, 14th ND, District Staff Hdqtrs., General Correspondence [Formerly Classified] 1936-1944, Box 1, Folder 1-1(1) Developments.

Contractors Pacific Naval Air Bases

n.d. *Technical Report and Project History, Contracts NOy-3550 and NOy 4173:* On microfilm at Pacific Division Naval Facilities Engineering Command Library.

n.d. Information from untitled source regarding field work started in July 1940 and terminated 31 Dec 1943, p. A-709.

Project Information:

Photo documentation and recordation of this facility by the Navy has been done in anticipation of future alterations or potential demolition of the structure. Photo documentation of historic facilities by the Navy assists in expediting planned undertakings by having the

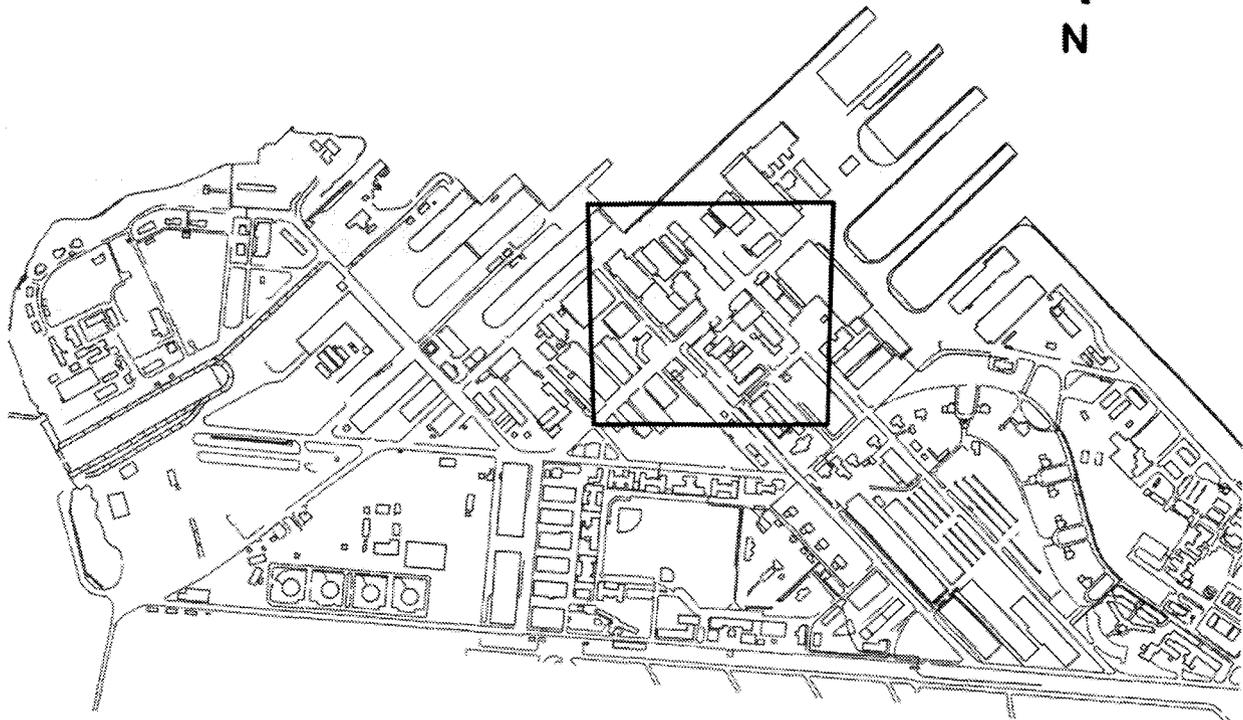
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documentation prepared prior to taking actions. Also, photo documentation assists the Navy in gaining more information about its historic facilities to assist in making proactive management decisions. This project is being supervised by Jeffrey Dodge A.I.A., Historical Architect NAVFAC Hawaii. The photographic documentation was undertaken by David Franzen, photographer. Delta Lightner and Joanmarie N. Orlowski, Architectural Historians, of Mason Architects, Inc. prepared the written documentation. The field work and research was conducted for this report between July 2001 and December 2001.

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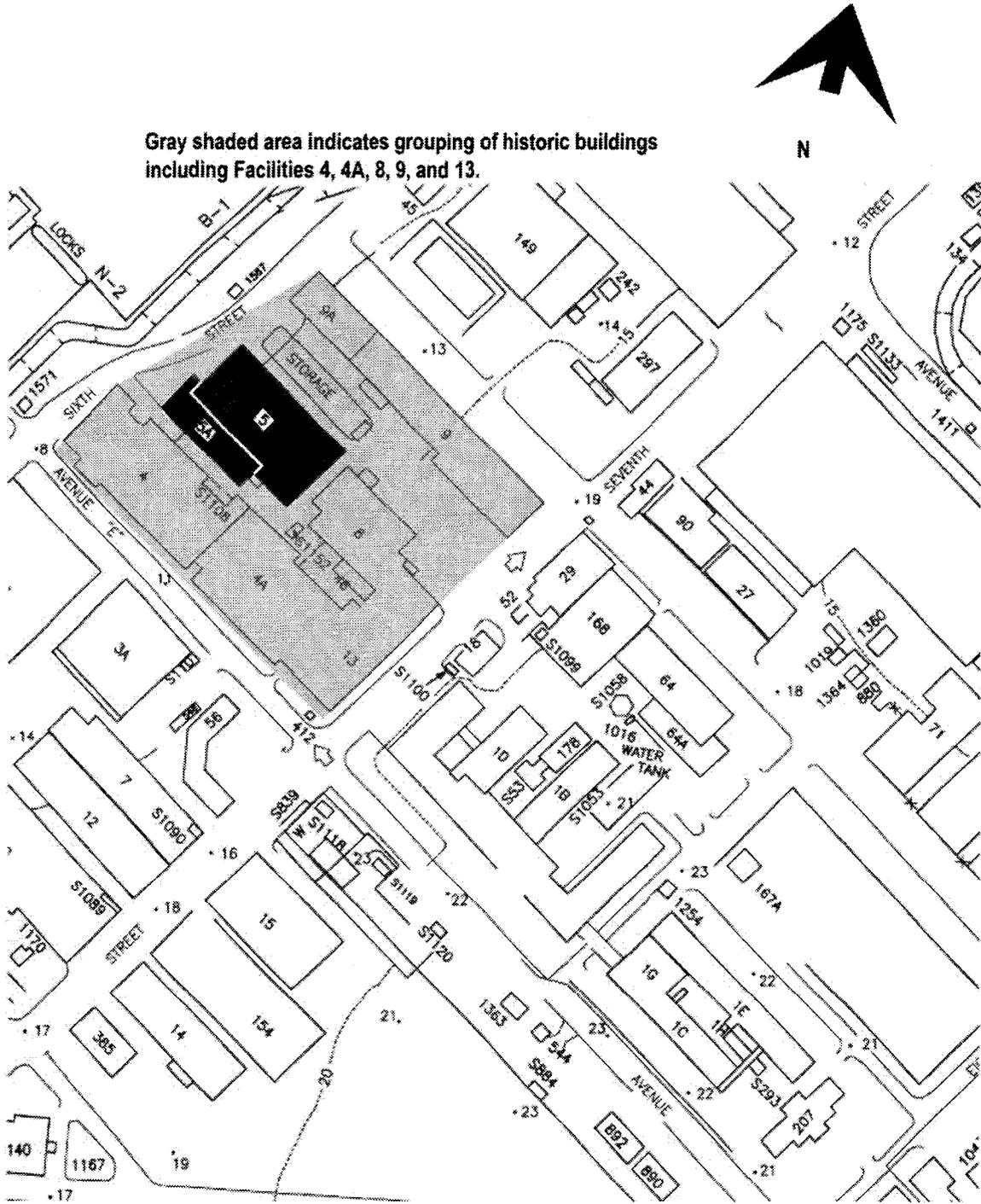
Shipyard Map

SEE ENLARGED MAP



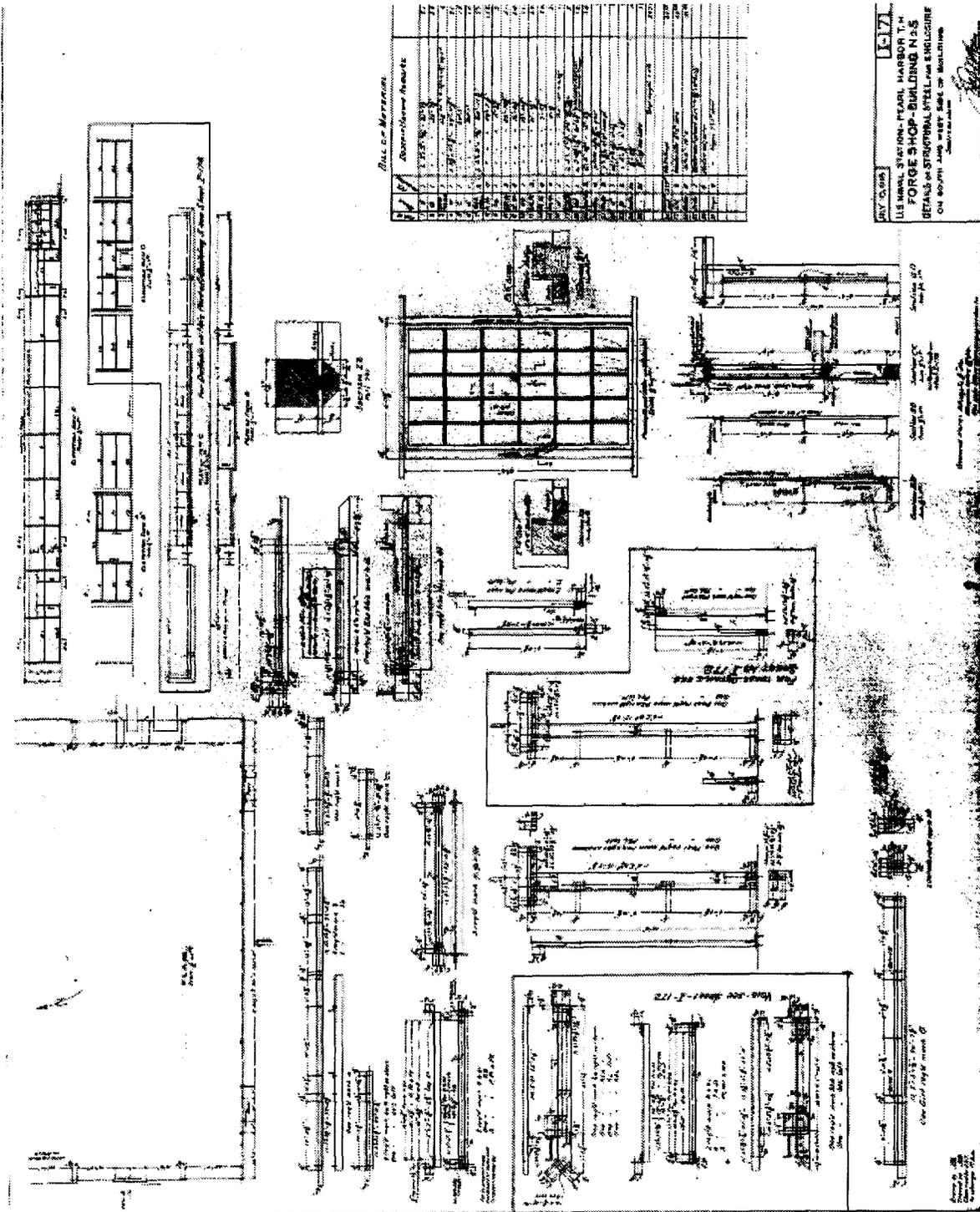
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Enlarged Area Map (reduced, not to scale)



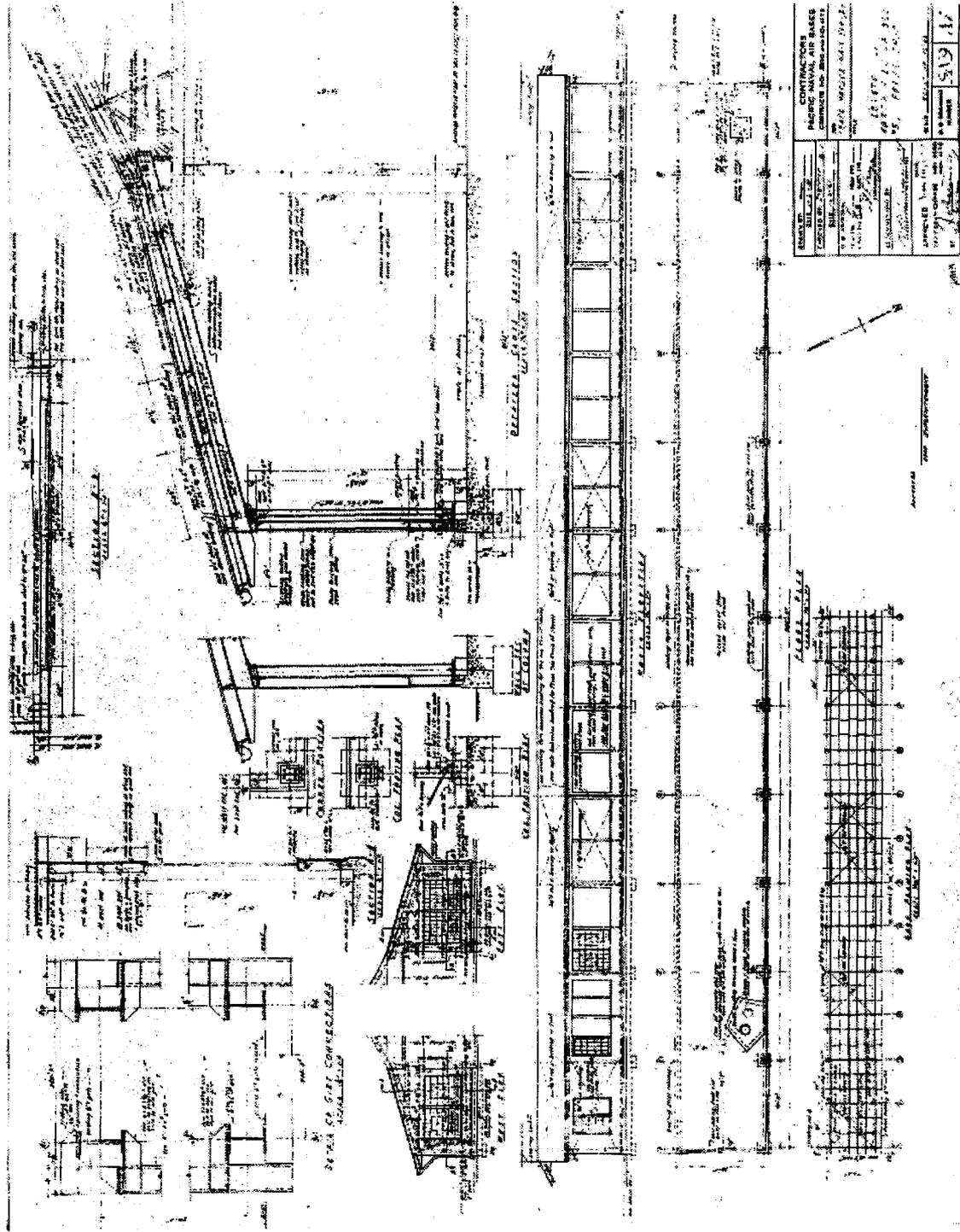
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Facility 5 – Details of Structural Steel for Enclosure
(Drawing No. I-171, dated 7/10/1918) (reduced, not to scale)



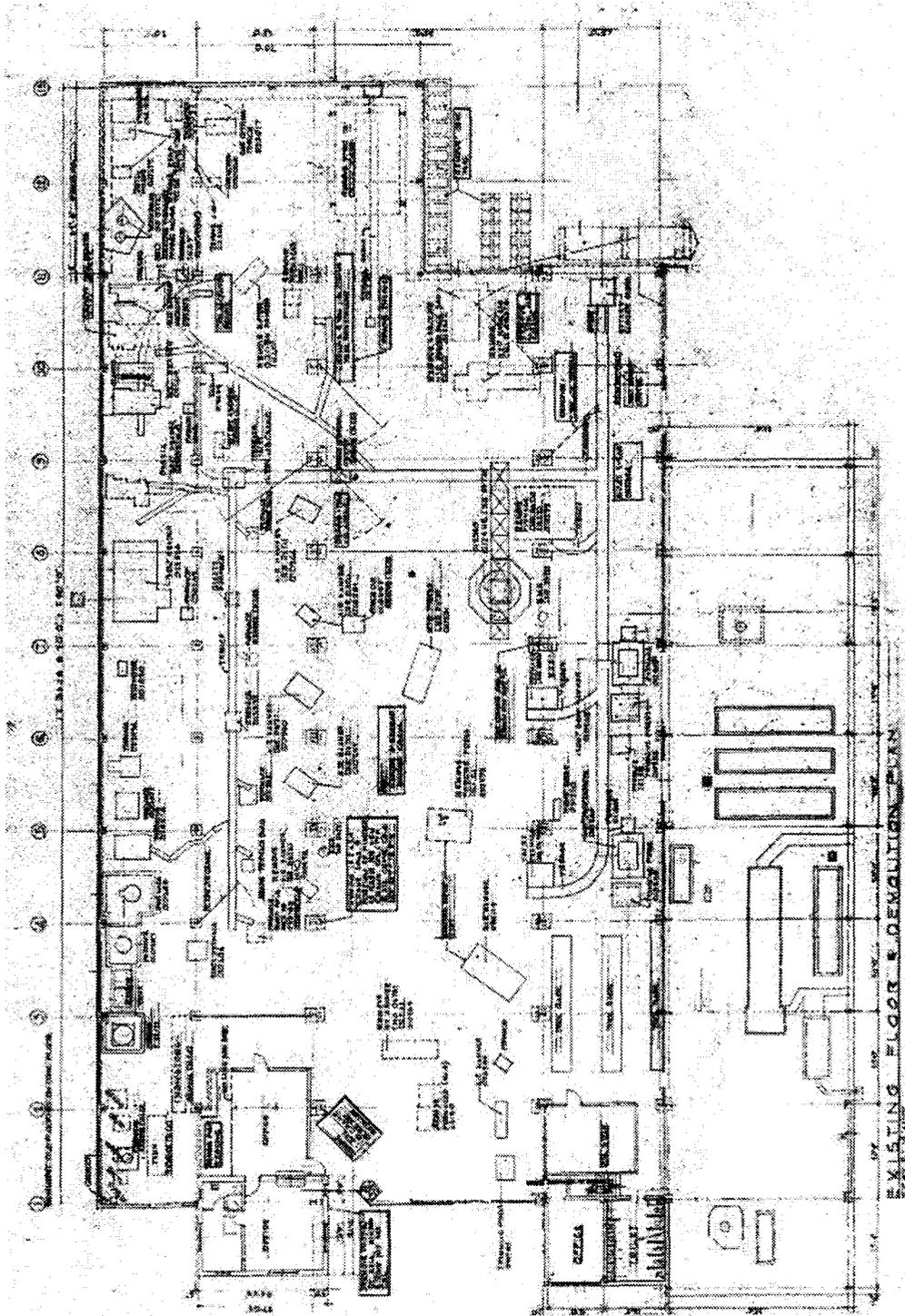
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Facility 5 – Lean-to Addition - Floor and Roof Framing Plans, Cross Section, Elevation, and Details (Drawing No. 652, dated 1/10/1940) (reduced, not to scale)



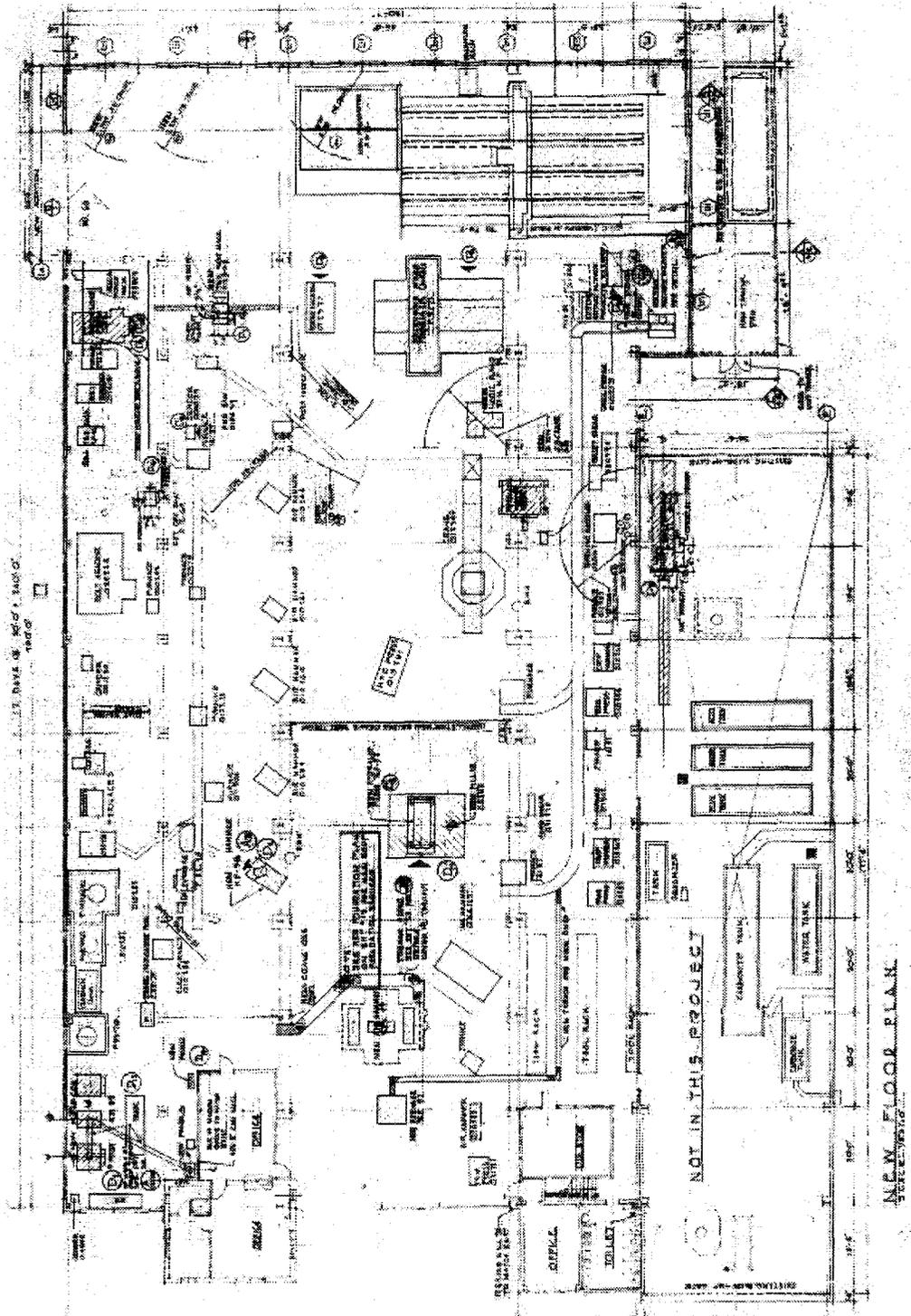
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Facility 5 – Existing Floor and Demolition Plan
(Drawing No. 7003055, dated 9/7/1972) (reduced, not to scale)



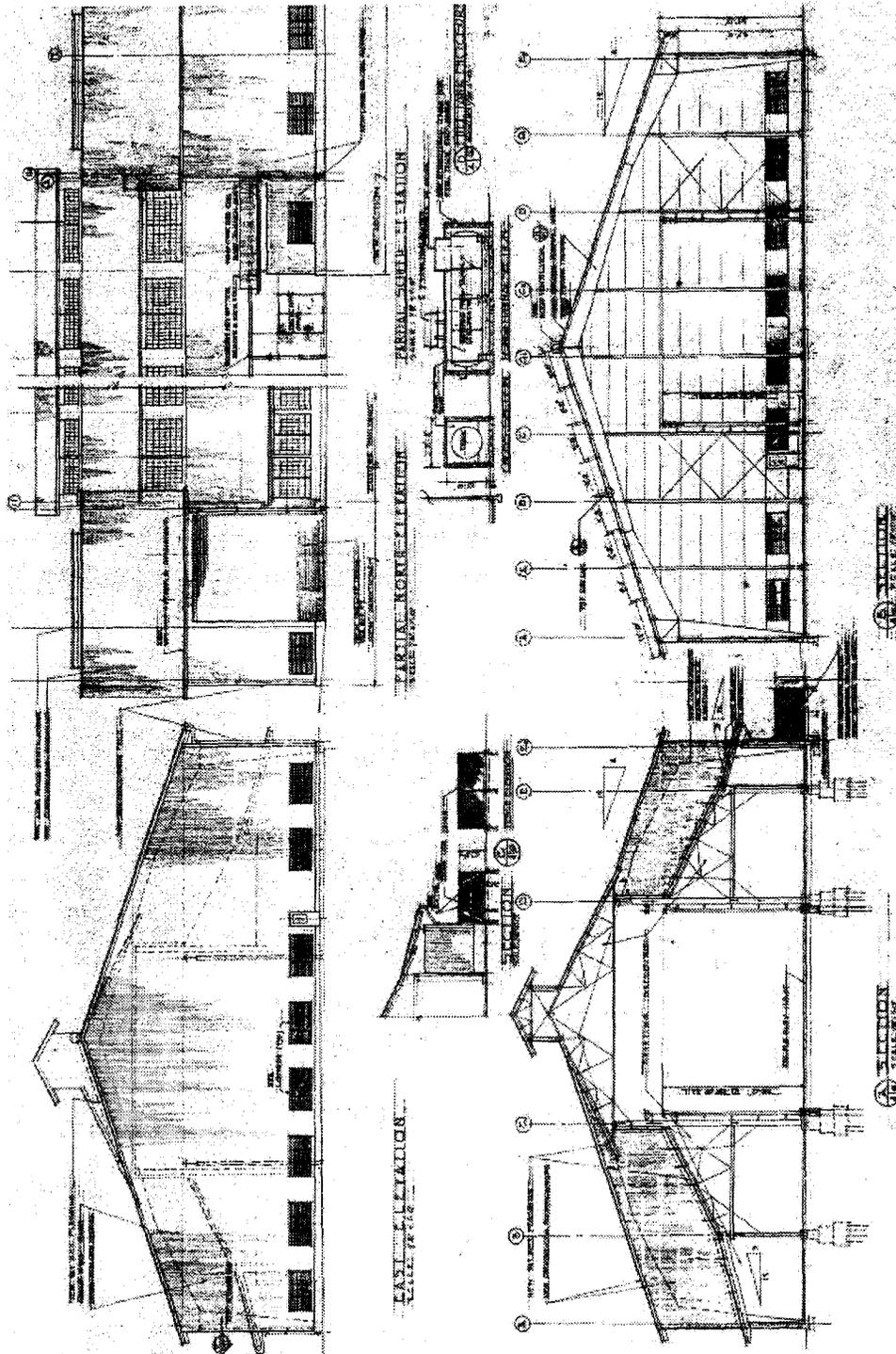
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Facility 5 – New Floor Plan (Drawing No. 7003056, dated 9/7/1972) (reduced, not to scale)



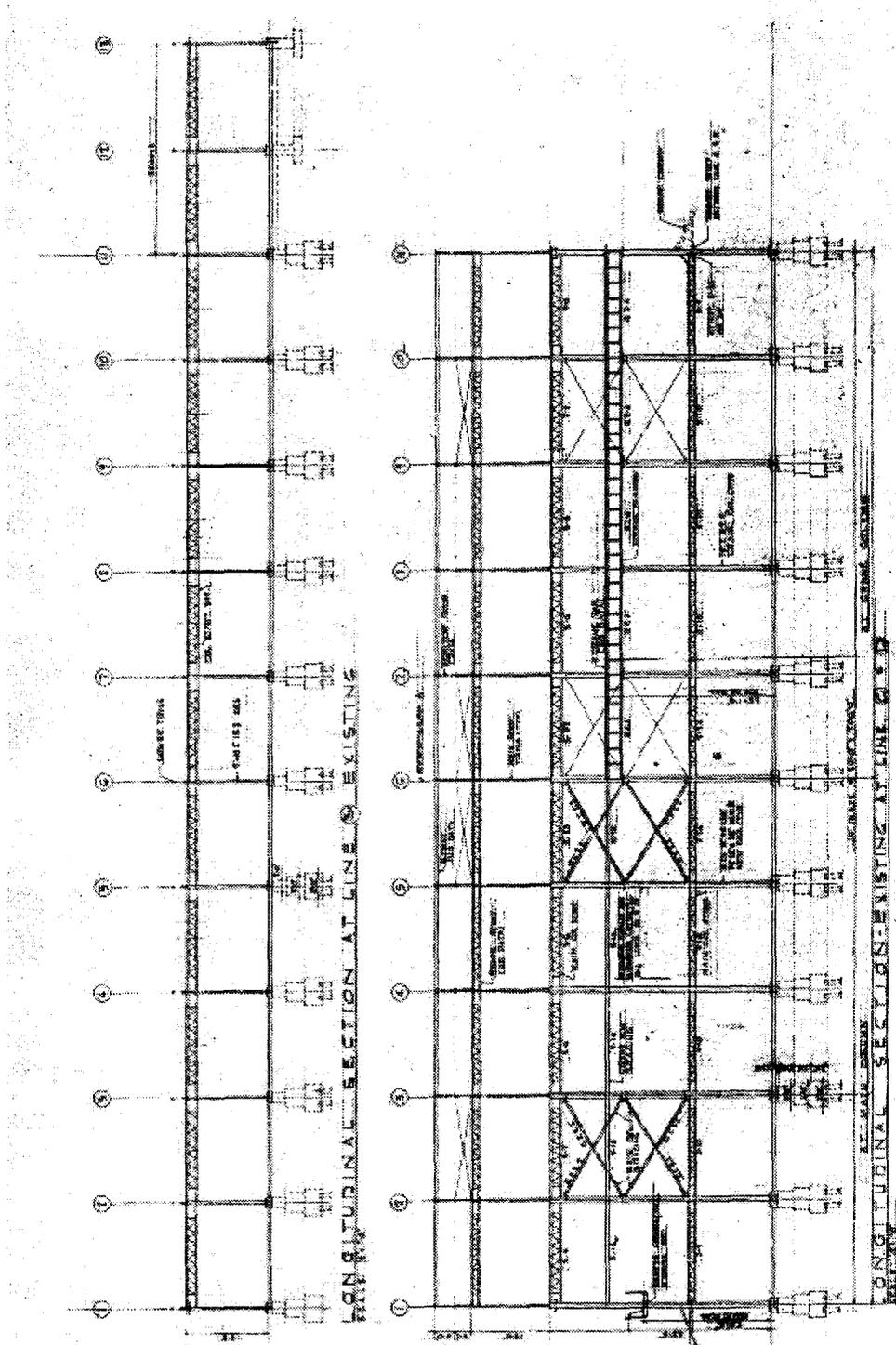
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Facility 5 – Exterior Elevations and Section (Drawing No. 7003058, dated 9/7/1972)
(reduced, not to scale)



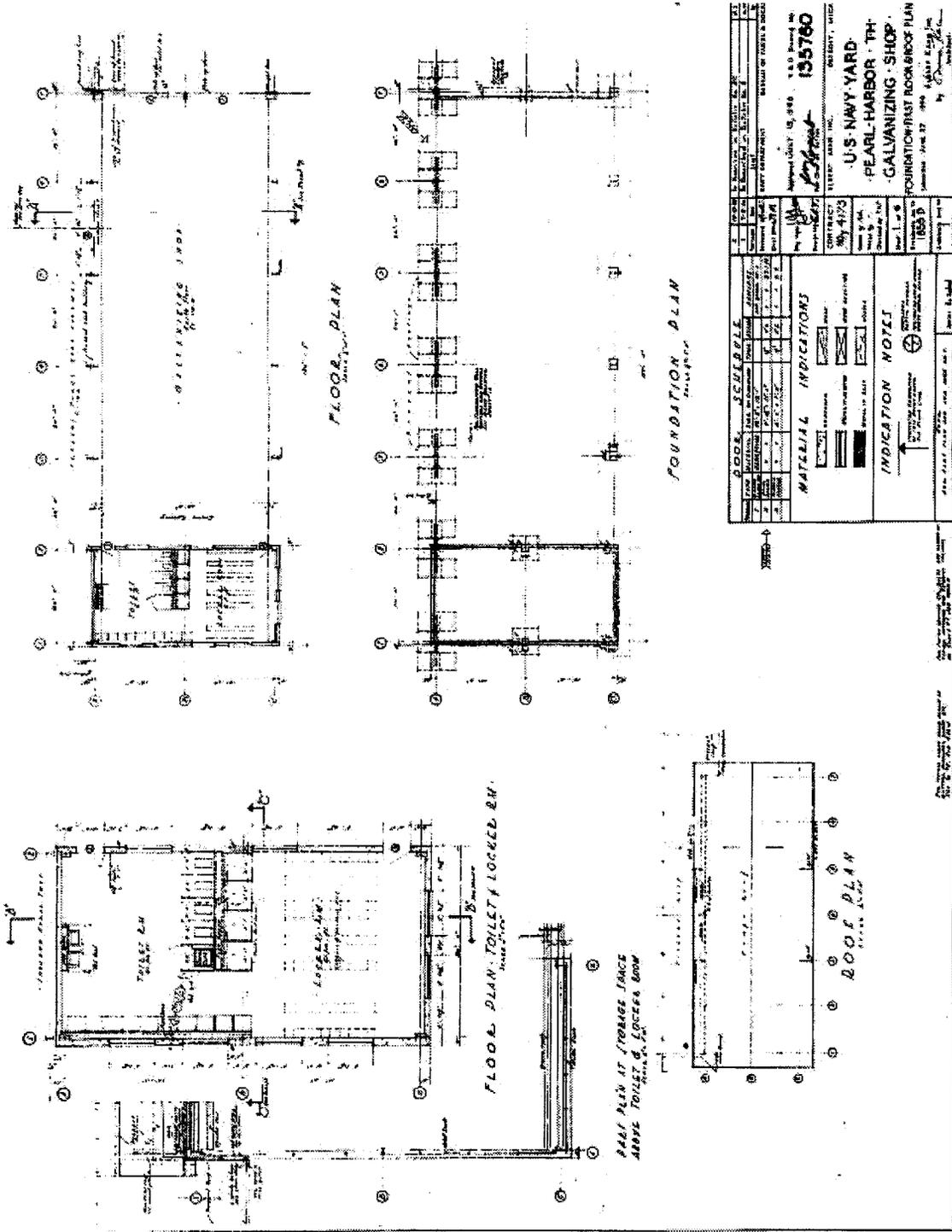
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Facility 5 – Longitudinal Section (Drawing No. 7003063, dated 9/7/1972) (reduced, not to scale)



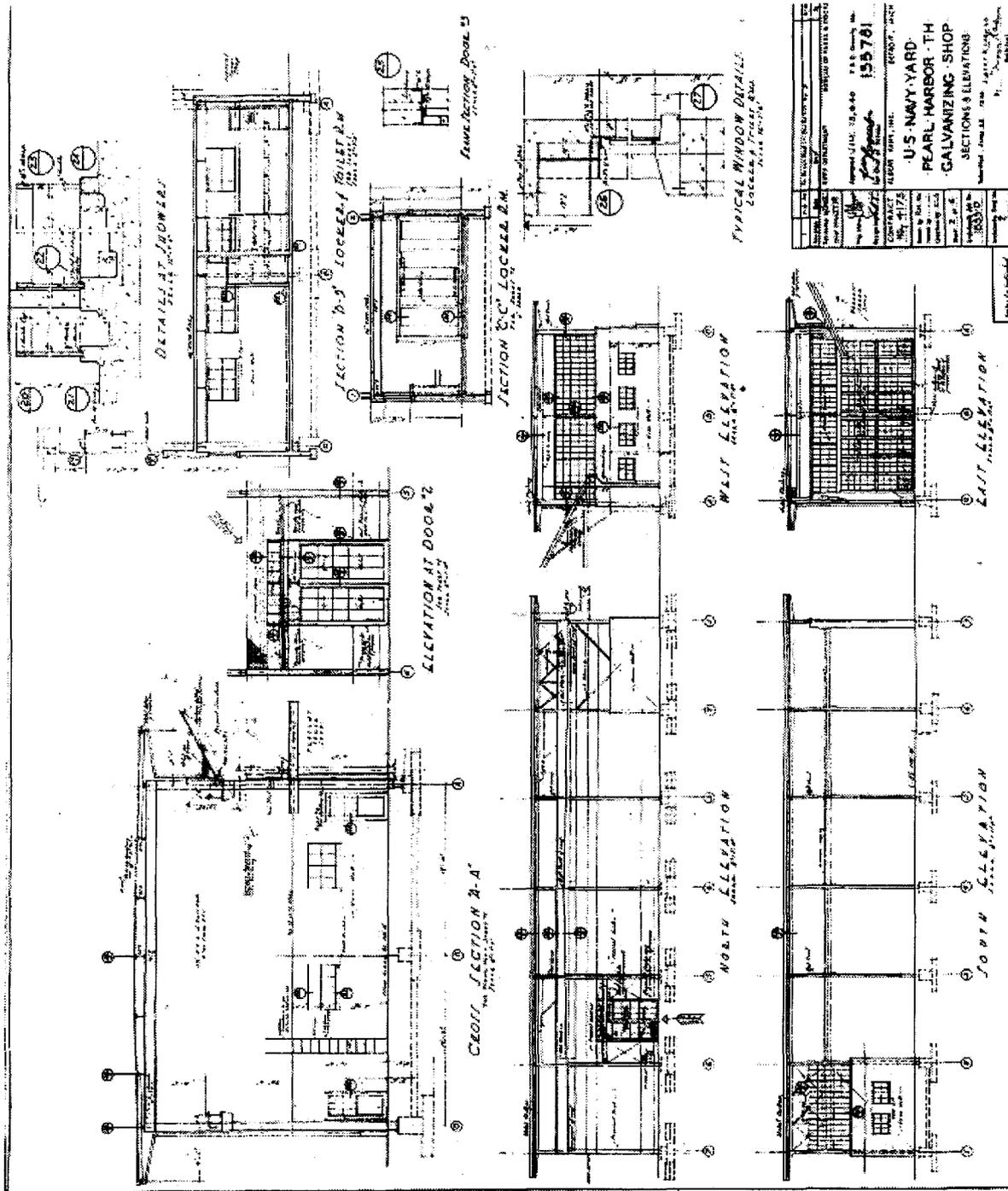
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Facility 5A – Foundation, First Floor, and Roof Plans
 (Drawing No. 135780, dated 7/13/1940) (reduced, not to scale)



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Facility 5A – Sections and Elevations (Drawing No. 135781, dated 7/13/1940)
 (reduced, not to scale)



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Facility 5A – Architectural Plans and Details (Drawing No. 551724, dated 2/26/1953)
(reduced, not to scale)

