

U.S. NAVAL BASE, PEARL HARBOR, INSTRUMENT SHOP &
ELECTRICAL SHOP LEAN-TO
(U.S. Naval Base, Pearl Harbor, Naval Shipyard, Facility Nos. 3A &
3B)
Avenue E, between Sixth & Seventh Streets
Pearl Harbor
Honolulu County
Hawaii

HABS HI-445

HI-445

HABS
HI-445

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, INSTRUMENT SHOP AND ELECTRICAL SHOP LEAN-TO (U.S. Naval Base, Pearl Harbor, Naval Shipyard) (Facility Nos. 3A and 3B)

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Location:

Avenue E between Sixth Street and Seventh Street
Buildings 3A and 3B abut one another
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.

Significance:

These shops are significant for their association with the build-up of the Naval Shipyard facilities in years prior to the U.S. entry into World War II, as well as the Navy's response to the December 7th attack. Facility 3A is also significant for being designed by the firm of noted industrial architect, Albert Kahn, and retains unique modern industrial features synonymous with his name. This facility exhibits the immediate security concerns of the Navy following the attack, as the steel sash windows were replaced soon after its completion with sidewalls of splinterproof reinforced concrete. Facility 3A and its extension Facility 3B represent the Navy's infrastructure planning for World War II, as well as emergency infrastructure reinforcement and expansion made in response to the Pearl Harbor attack.

Description:

Building 3A and 3B are documented together in this report because they were built just two years apart and they share a common structural wall. Both facilities were used for instrumentation and gyro shops. The following description will first describe Building 3A and then Building 3B.

Building 3A is a permanent, rectangular-shaped, one-story structure. It consists of concrete pier foundations and a concrete floor slab at grade, with concrete masonry unit exterior walls on three sides for splinter-proofing, steel structural framing, and a saw-tooth roof design. The west wall, which once was part of Building 3, is faced with modern-sectioned (trapezoidal-shaped pattern) corrugated metal panels. Note that the upper portion of the concrete masonry unit walls appear to be a modification of the Albert Kahn standard design of siding or steel sash windows. It is likely that, because of increased protection needs after the WWII Pearl Harbor attack, and for security needs of instrumentation, these walls were adapted early on. Another example is that of Facility 79, whose walls were modified to double-wall design for security after the Pearl Harbor attack. The building has an overall dimension of 162'-5" (eight bays) x 133'-4" (seven

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bays). A 1942 Battery Shop addition along the north side measures 162'-5" x 21'-6".

Building 3A has an open floor plan with steel columns along the perimeters of the building as well as on the interior. The columns on the north and south elevations are spaced at 20' intervals. Those on the east elevation are spaced at a 16'-8" interval with the exception of one missing column where the large sliding door is located. The west elevation abutting Building 3 (which has since been demolished) has only three columns along its face, at varying intervals. Within the interior space, six steel columns spaced in a grid pattern support the roof structure. The open floor plan allows for relatively unrestricted use of the space. Several rows of shelving hold various parts and materials. On the north side of the building is a room entitled "Battery Shop", which has a bridge crane that spans the width of the room. On the north wall, adjacent to the Battery Shop, are a machine room and a toilet facility.

The roof structure is comprised of exposed steel I-beams, rafters, and purlins that form the saw-tooth roof design with windows facing north. The roof design has three consecutive roof ridges and their valleys (looking like three right triangles lying on their hypotenuses) that run in the east-west orientation, with low-sloping roofs on both sides of the three roof forms. Wood tongue-and-groove sheathing covered with composition roofing material is attached to the long side of the roof slope, while the short side of the slope (light monitor) facing north is faced with translucent corrugated panels, bringing in non-glaring indirect north light into the space used for technical work. The gable ends are faced with corrugated metal panels. Rainwater is drained through two drainage pipes located at the ends of each of the valleys. These drains run along the interior and exit the building through the east and west walls. A parapet wall runs along the perimeter of the side roofs.

Most of the exterior doors and fenestration are original. The east elevation wall has an oversized metal mesh sliding door with a steel frame holding an exterior wood sliding door. The north elevation off the storage room addition has two overhead roll-up metal doors with an exterior chain-link rolling door. On the west elevation, there is a large roll-up door that leads to a narrow delivery lane. A metal swing fire exit door is located adjacent to the roll-up door. The south elevation abuts Building 3B, and a single metal sliding door is centrally located within this wall.

There are incandescent and fluorescent lights suspended from the roof beams and rafters throughout the structure. The floors are bare concrete. The structural columns and roof framing are exposed.

The building has undergone several modifications over the years. In 1943, Building 3B was added to the south side. In 1964, the third row

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of clerestory windows was modified, and, it appears that, later, the rest of the clerestory windows were also altered. The steel-sash windows of the monitor were replaced with corrugated vinyl translucent panels. In 1972, the interior of the Battery Shop addition (1942) was renovated. When Buildings 2, 2A, 3, and 28 were demolished in 1983, a long, thin portion of Building 3A, which was attached to the south side of Building 3, was also demolished at this time. This portion measured 161 feet by 34 feet in plan. Following this demolition, building 3A was repaired and the west wall was rebuilt. Recently, a small toilet facility located at the southwest corner of Building 3A was built.

Building 3B abuts the south side of Building 3A. It is a permanent, rectangular-shaped, one-story structure. It consists of concrete perimeter foundations and a concrete floor slab, with concrete masonry unit exterior walls on three sides, and a single-sloping lean-to roof design. It measures 168'-8" in length by 17'-8" in width, with the length extending beyond the edge of Building 3A on the west side for a distance of 6 feet.

Functionally, it housed supporting facilities for Building 3. The Electrical Shop Lean-to Addition held a storeroom, a salt vat room, and a women's toilet, locker, and shower room. A passageway connecting to Building 3 was located at the far east end of the building. In 1947, a large metal sliding door was installed at the east side of the concrete masonry unit wall which separates Building 3A from 3B. A 1982 plan shows that the women's toilet facilities had been removed and replaced with classrooms. The 1982 drawing planned for small toilet facilities for men and women to be located at the approximate middle of the building. These bathroom facility walls have been removed and, at present, the building has an open floor plan and is used as a staging area for test equipment. Presently, on the interior, there is only one interior partition; this wall separates a small office space from the larger space. The wall is a typical drywall partition that holds a small sliding window that looks out onto the larger space. A large air-conditioning duct, which runs down the length of the room, is suspended from the exposed roof rafters.

The structure of Building 3B is simple and straightforward. The roof is connected to the wall of Building 3A at the north side and overhangs the exterior wall for a distance of 1'-10" on the south side. Support members are through-bolted to the concrete masonry wall of Building 3A. A wood beam attached to the wood members is supported by wood posts that stand at equally spaced intervals along the length of the north side wall. The roof slopes from north to south and is supported by 2 x 10 wood rafters with cross-bridging that is sheathed with wood planking. The original roofing material was 90# mineral surfaced roofing. The original design necessitated the installation of roof vents and up until the building was renovated in later years, four

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large vents, which vented the women's locker room below, were located on the eastern half of the building.

The walls of Building 3B are concrete masonry unit blocks. However, the south wall was built up to the 7'-3" height and above that wood framed openings (1'-9" high) covered with insect screens lined the areas under the eaves, providing ventilation to the space. (These have since been removed and replaced with plywood boards and air-conditioning has been installed). Four of the five (with one door having been filled in) exterior doors on the south elevation have been replaced in recent years. The new doors are single, flush wood hinged doors along the south wall, with a pair of double swing doors at the east end of the south wall. These doors lead into a small office space located at the east corner of the structure. The door openings have been filled in to accommodate the size of the new doors. A row of three, one-over-one double-hung windows on the south wall has been replaced with aluminum-frame window sashes.

Historical Context:

Building 3A was designed by architect Albert Kahn. It was constructed in 1941 but was planned for construction in 1940, prior to the start of World War II, when the Navy was looking to expand their shop facilities. This facility was designed and constructed under the emergency Contract No. 1473.

According to a letter written by Captain Almy to the Secretary of the Navy in April 1940, the location of the new shop building had been under analysis. The letter states:

The Yard originally recommended that a new building be constructed in the area south of the Machine Shop (Building 67) and to the east of the new Power Plant. As planned by the yard, the building would have about 75,445 sq. ft. of floor area with suitable space for gyro, optical, and fire control work. The Department Shore Station Development Board approved this, subject to the feasibility of tying this building into the Machine Shop proper. It developed that this location would deny the Electric Shop area for expansion and would likewise restrict expansion of power plant activities, and handicap the installation of power services. As a result, it was agreed to build an annex to the present Electrical Shop (Building 3) to care for gyro, optical, and fire control work and to build an annex to the present Machine Shop (Building 67) for electrical-machine and other work.

Architect Albert Kahn of Detroit, Michigan designed many of the buildings at Naval bases in Hawaii and the Pacific (Contractors Pacific Naval Air Bases n.d.: A-338). He was "one of the country's foremost industrial designers, and had been chosen to prepare plans for the barracks, mess halls, and hangars that could be standardized for the

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various bases" (Woodbury 1946: 76). German-born, but raised in the United States, Kahn specialized in factory design and had several commissions from the Ford Motor Co. (Richards 1977: 163). His buildings were noted for their simplicity, efficiency, and use of natural light. The firm also became famous for the speed of its design process when a huge aircraft factory in Baltimore was completed, from design to construction in 81 days (Bucci 1993: 105). This simplicity of design and component construction with prefabricated parts was much needed and appreciated when Kahn's firm was awarded the contracts to design the new Navy bases in the Pacific and Atlantic.

Facility 3B was constructed in 1943, as an extension to Building 3 and 3A. It housed the supporting facilities for these shops, including a women's toilet and locker room, a salt vat room, and a storage room. The interior of Facility 3B has been modified over the years; however, the interior has remained relatively intact.

In 1983, several buildings were demolished to make room for the construction of a new Pipe Shop Facility, which is the present Facility 1456. Facilities 2, 2A, 3, 4, 4A, and 28 were demolished in total. Facility 3B was not affected at this time. Adjacent Facility 4 and 4A were demolished in 2000. Facility 4A was also a Kahn-designed industrial expansion facility built during the same emergency build-up period, but steel sash windows were allowed because less significant sheet metal work was done there.

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

Sources:

The original drawings for this building are on digitally scanned images or microfilm at Pacific Division, Naval Facilities Engineering Command (NAVFAC-EFD Pacific) Plan Files.

Almy, E.D., Captain, USN, Commander J.J. Manning, et al.

1940 Letter dated April 29, 1940 via the Commandant, 14th Naval District to the Secretary of the Navy regarding the Development of the Fourteenth Naval District – Report of Visit of Departmental Representatives. 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.

Bureau of Yards and Docks

1946 "Building the Navy's Bases in World War II, Vol. I and II," U.S. Government Printing Office.

Commander, Navy Region Hawaii

2000 Pearl Harbor Naval Complex, Cultural Resources Management Plan, Pearl Harbor, HI.

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Commander, Navy Region Hawaii
2002 Integrated Cultural Resources Management Plan, Pearl
Harbor Naval Complex, Pearl Harbor, HI.

HABS/HAER Documents

var. dates For those resources on the Navy database at the time the
CRMP (Contract No. NB62742-93-D-0502) was prepared,
the HABS/HAER numbers assigned have been included in
the electronic database as an additional field, as noted in
Appendices: Pearl Harbor Naval Complex Cultural
Resources Management Plan, 1998, p. A-6.

Nakahara, Kenneth.

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Historic Preservation Division Pearl Harbor Inventory Forms
Files.

Ann Yoklavich

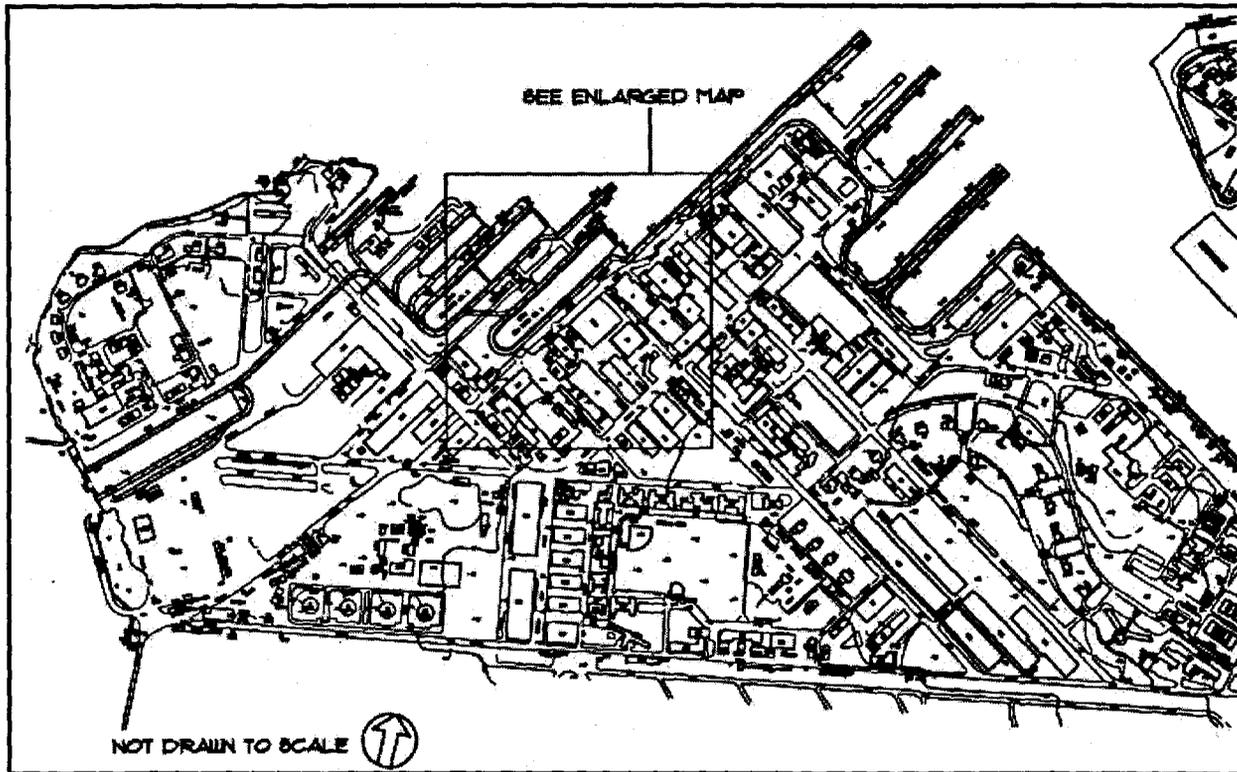
2000 U.S. Naval Base, Pearl Harbor, Overview Report, World War
II Splinterproof Buildings. Historic American Building Survey
documentation. Submitted to and accepted by the National
Park Service as HABS No. HI-390. Prepared by Mason
Architect and Franzen Photography, for the U.S. Navy,
Pacific Division, Naval Facilities Engineering Command.

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
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., Historic
Preservation Specialist at the Pacific Division, Naval Facilities
Engineering Command (NAVFAC EFD Pacific). The photographic
documentation was undertaken by David Franzen, photographer.
Lorraine M. Palumbo, Ph.D. Architectural Historian, of Mason
Architects, Inc. prepared the written documentation. The fieldwork
and research was conducted for this report between July 2001 and
December 2001.

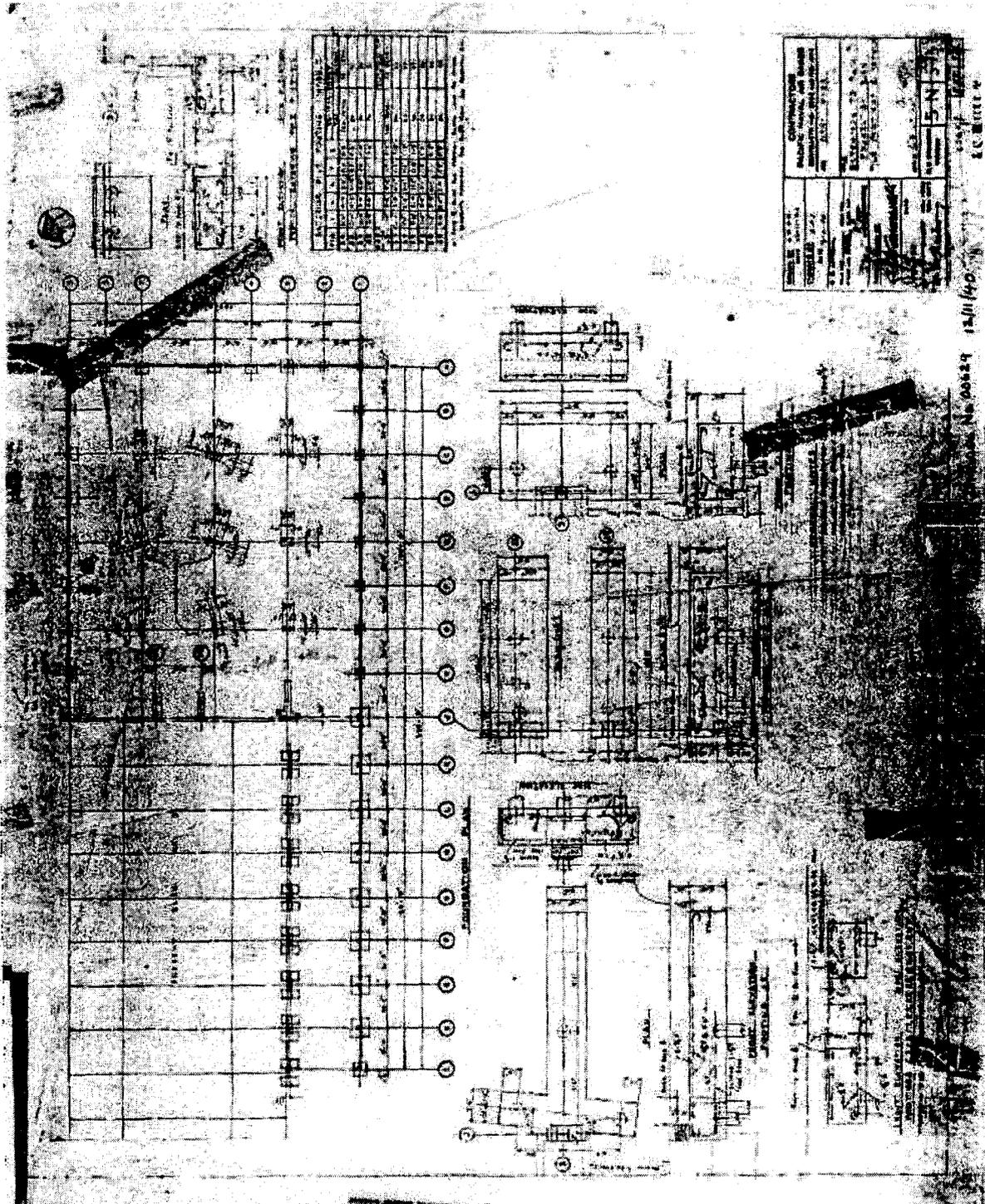
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Shipyard Map



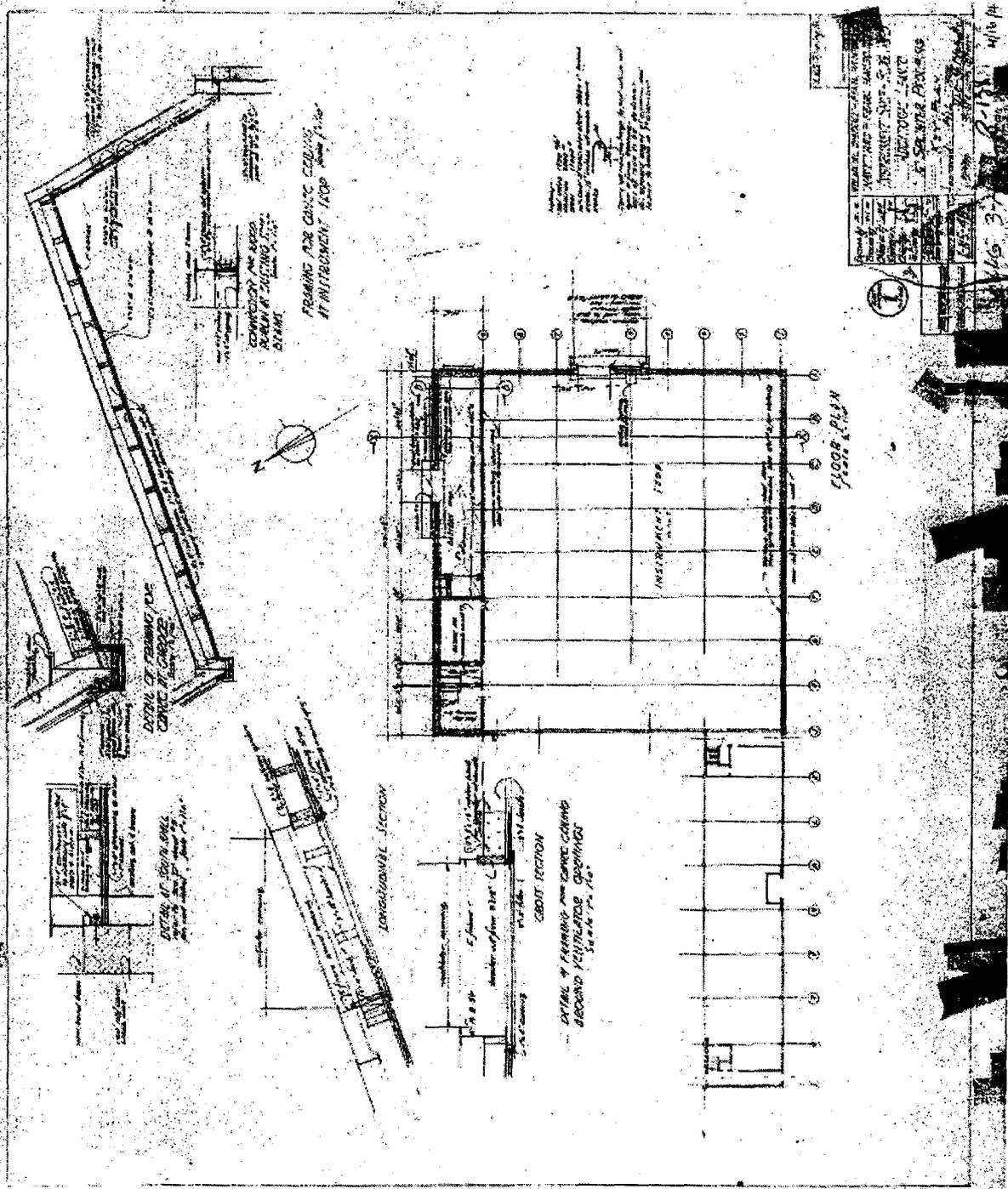
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Facility 3A Instrument Shop, Foundation Plan and Pile Footings and Details
(Drawing No. 00629, dated 12/11/1940) (reduced, not to scale)



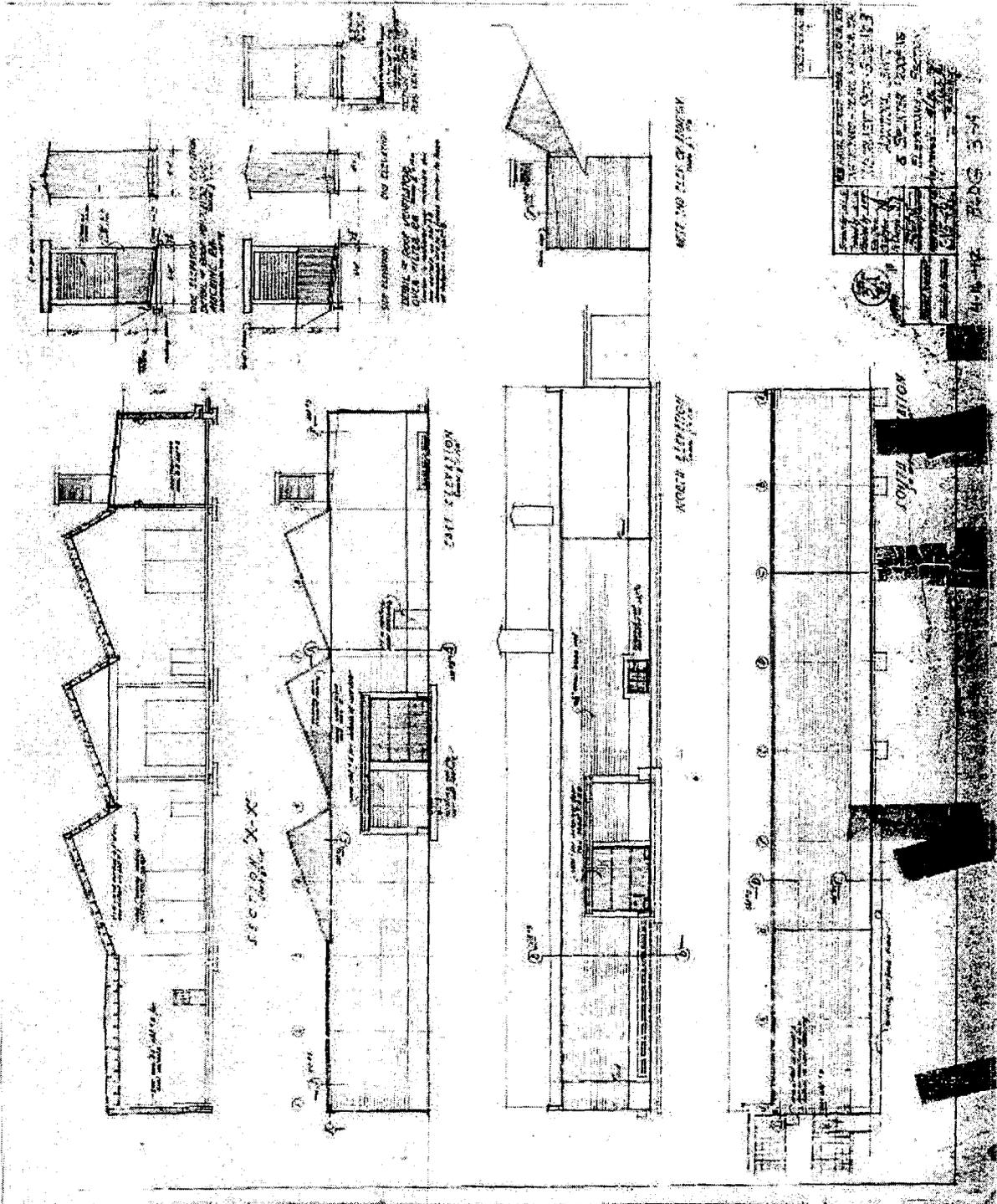
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**Facility 3A Instrument Shop, Floor Plan and Roofing Details
(Drawing No. I-N5-489, dated 4/16/1942) (reduced, not to scale)**



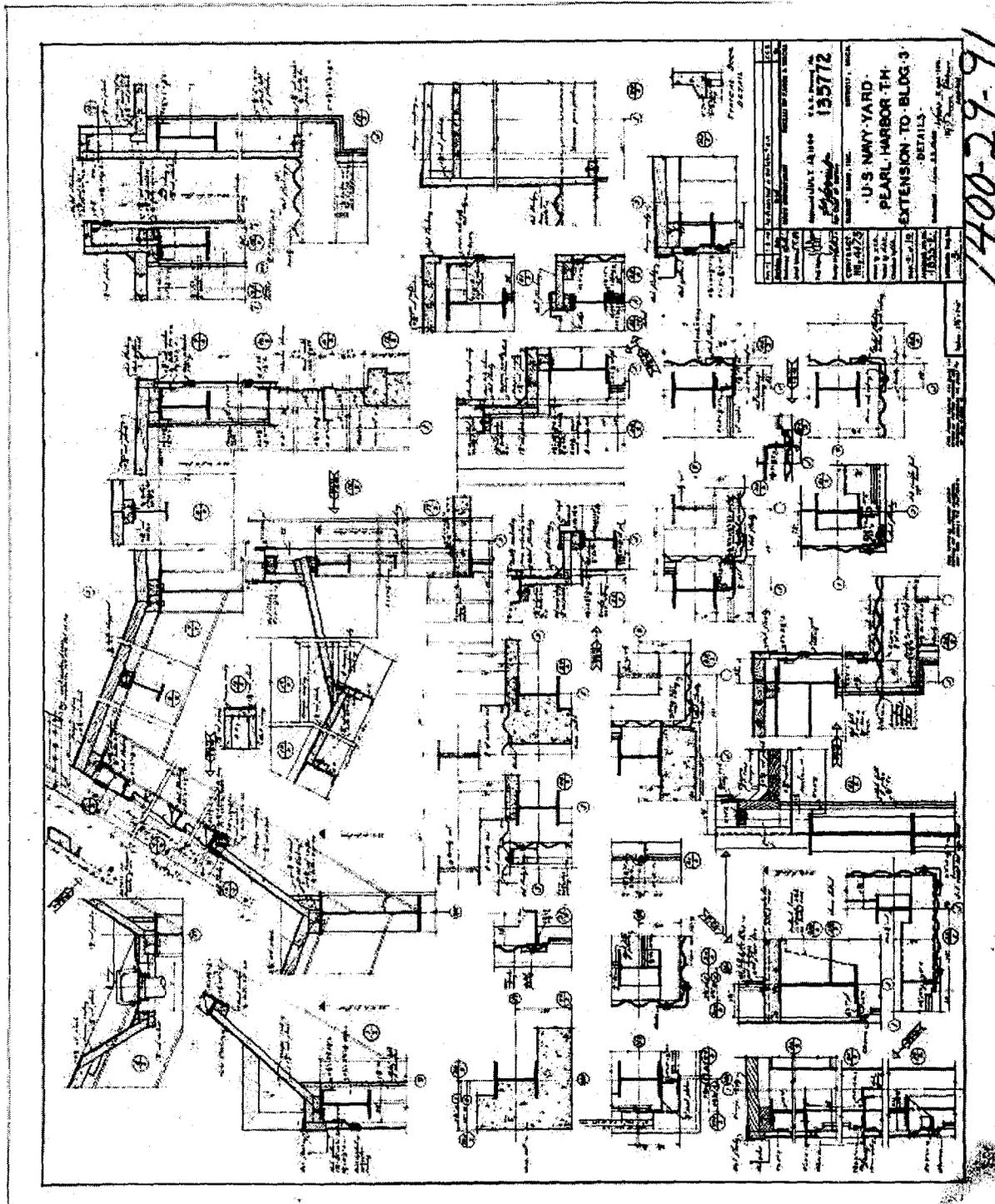
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Facility 3A Instrument Shop, Elevations and Sections
(Drawing No. I-N5-491, dated 4/16/1942) (reduced, not to scale)



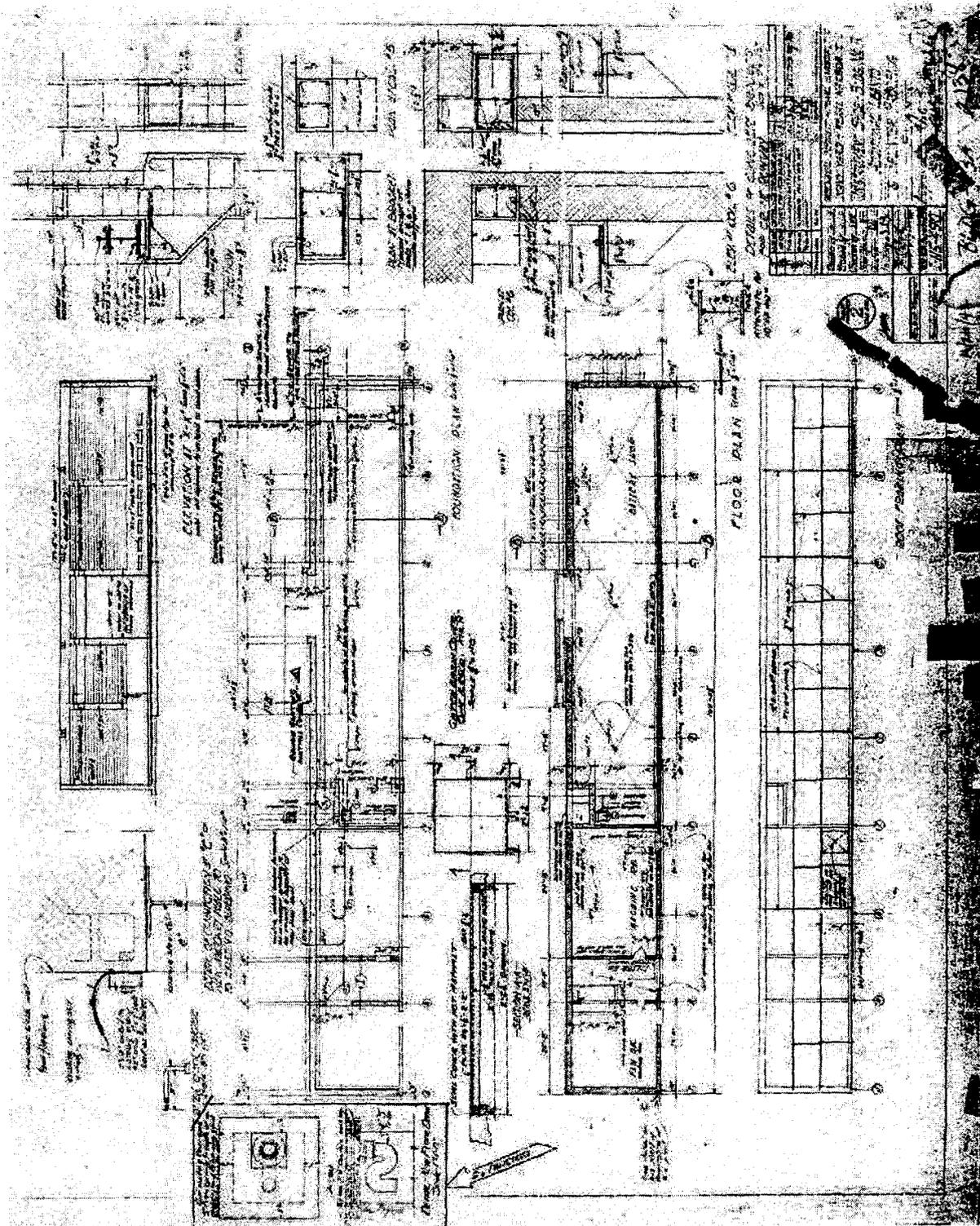
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Facility 3A Instrument Shop, Roof Details
(Drawing No. NOy-4173, dated 7/8/1940) (reduced, not to scale)



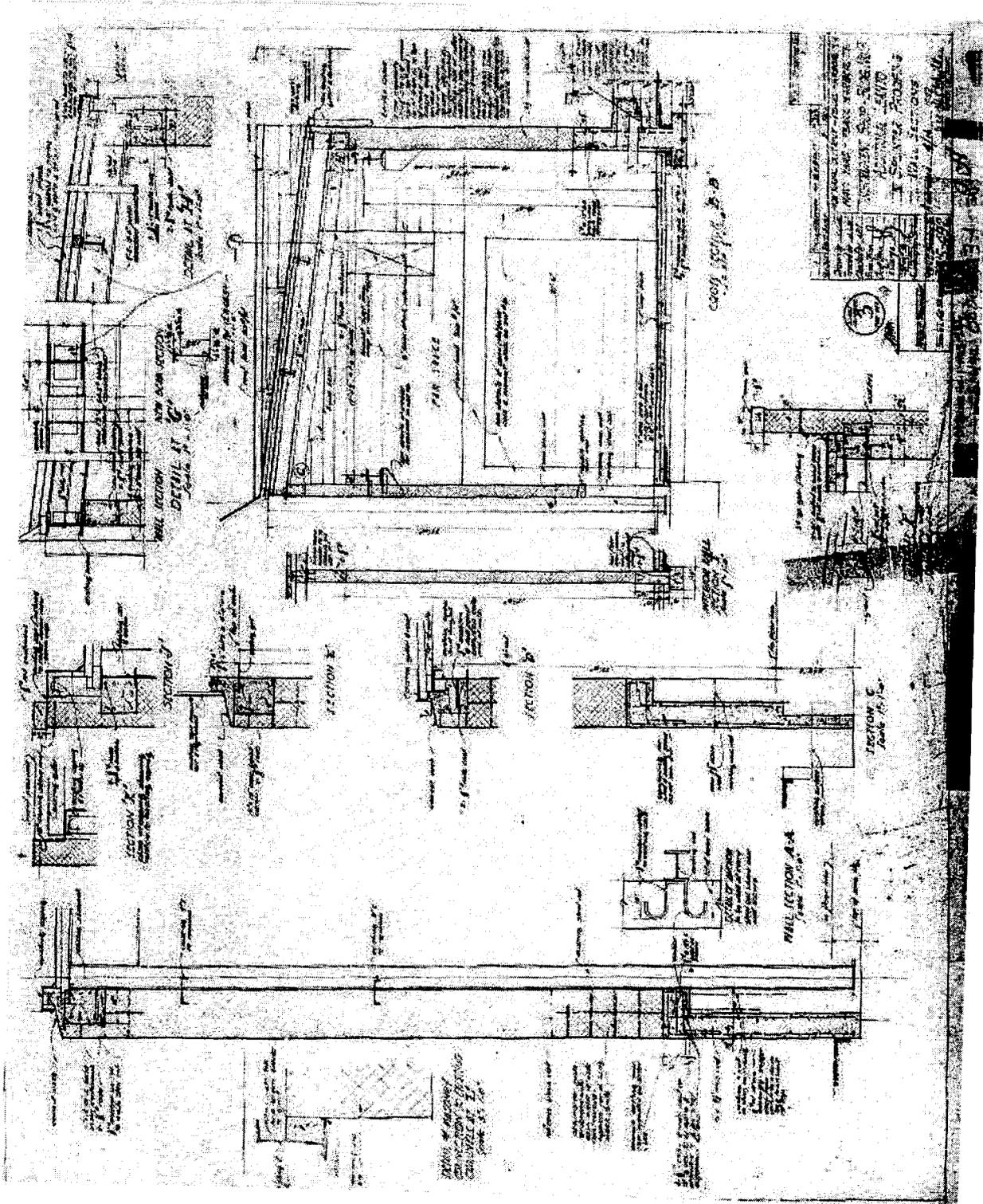
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Facility 3A Instrument Shop, Battery Shop and Mechanical Room Plan
(Drawing No. I-N5-490, dated 5/16/1942) (reduced, not to scale)



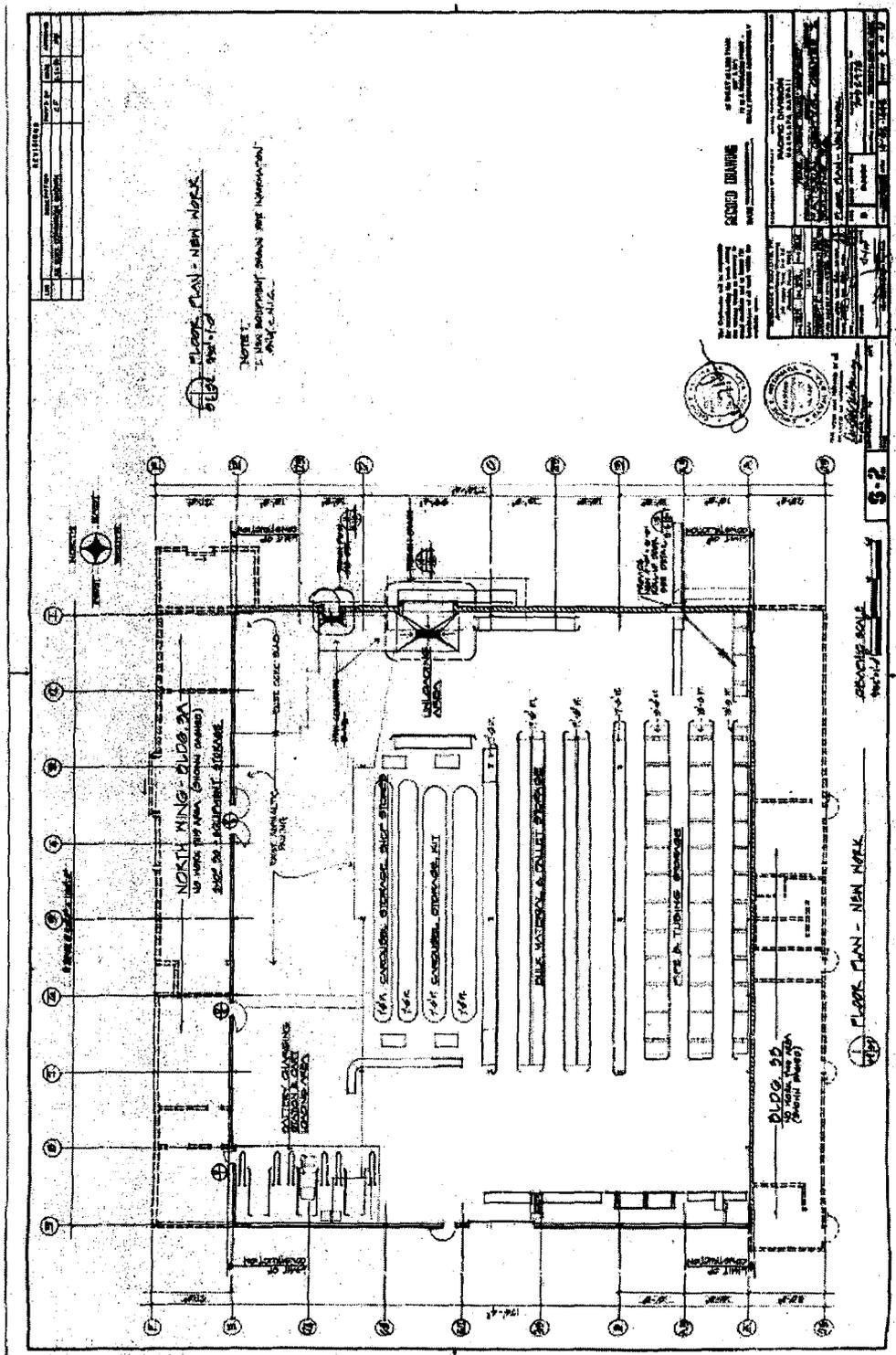
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Facility 3A Instrument Shop, Battery Shop and Mechanical Room Wall Sections
(Drawing No. I-N05-492, dated 5/16/1942) (reduced, not to scale)



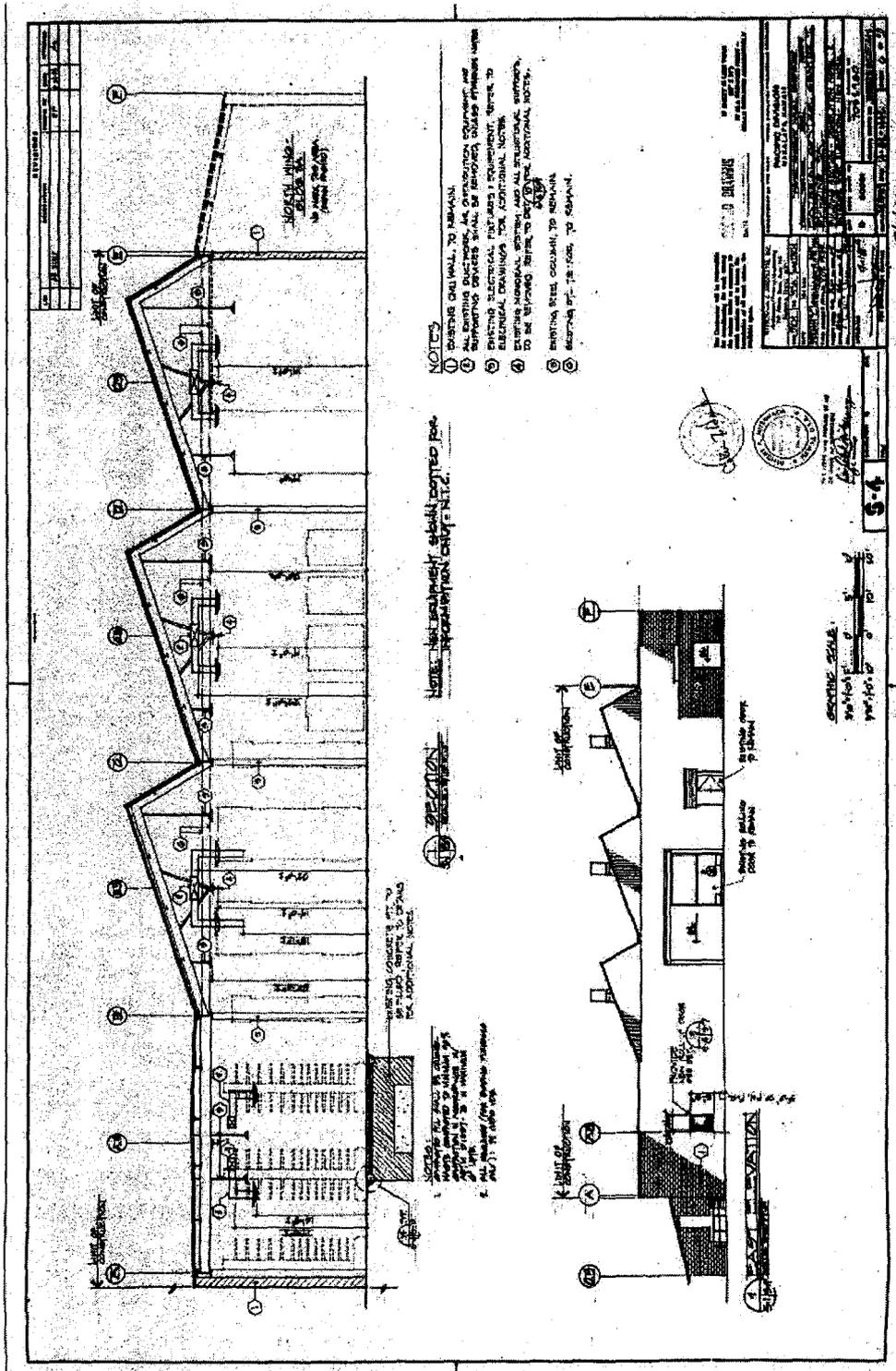
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**Facility 3A, Revised Floor Plan
 (Drawing No. 7052978, dated 5/11/1984) (reduced, not to scale)**



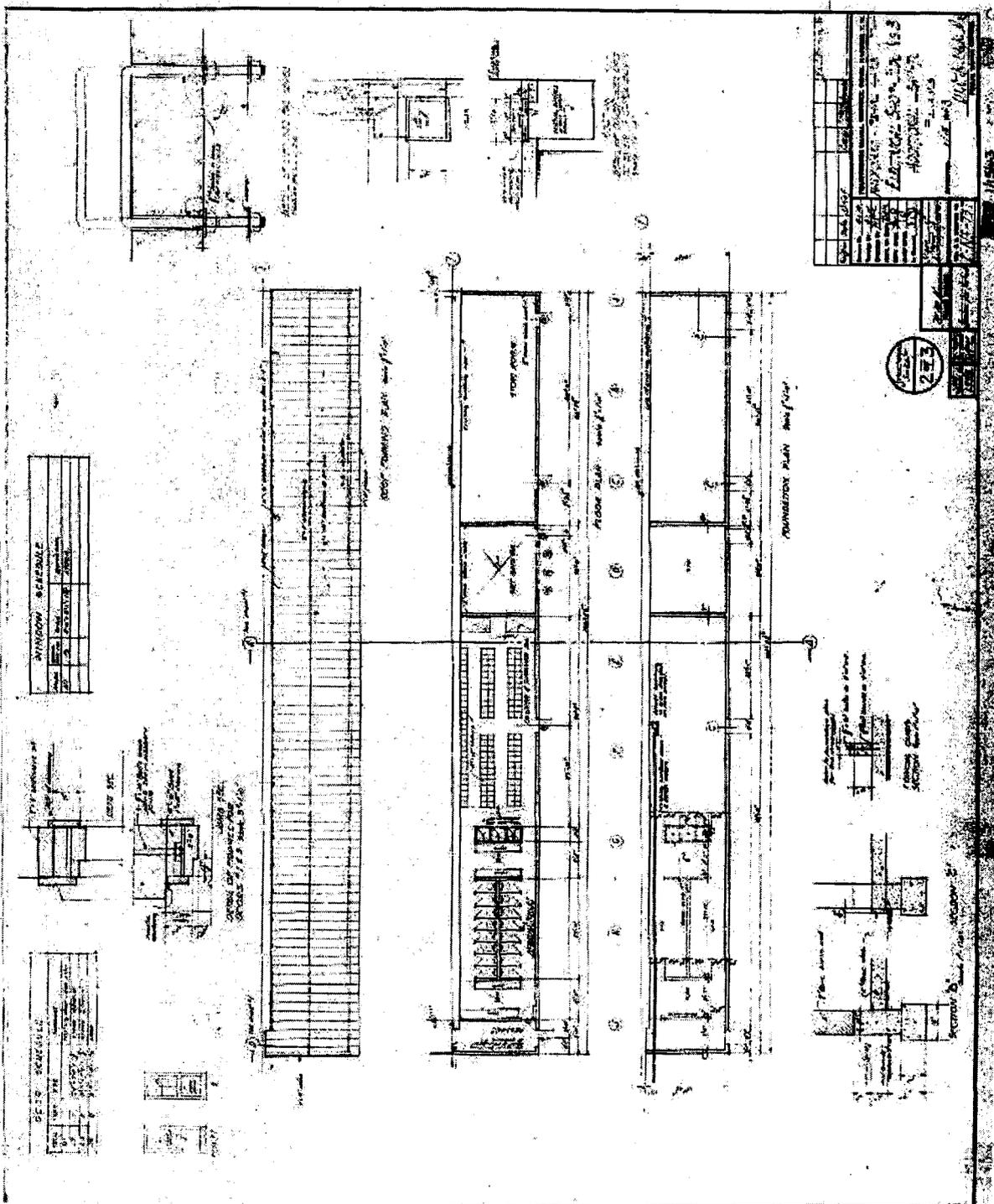
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**Facility 3A, Demolition Work and New Work, Cross Section and East Elevation
(Drawing No. 7052980, dated 5/11/1984) (reduced, not to scale)**



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**Facility 3B Electrical Shop Additional Lean-to, Foundation, Floor Plan and Roof Framing
 (Drawing No. I-N5-737, dated 1/15/1943) (reduced, not to scale)**



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Facility 3B Electrical Shop Additional Lean-to, Elevations and Detail
(Drawing No. I-N5-736, dated 6/2/1943) (reduced, not to scale)

