

U.S. NAVAL BASE, PEARL HARBOR, PREFABRICATED,  
SPLINTERPROOF PERSONNEL SHELTER  
(U.S. Naval Base, Pearl Harbor, Naval Shipyard, Facility No. S1133)  
Avenue C, near Seventh Street intersection, adjacent to Facility No.  
155  
Pearl Harbor  
Honolulu County  
Hawaii

HABS HI-460

HI-460

HABS

HI-460

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, PREFABRICATED, SPLINTERPROOF PERSONNEL SHELTER

(U.S. Naval Base, Pearl Harbor, Naval Shipyard)  
(Facility No. S1133)

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**Location:** Avenue C near Seventh Street intersection  
Adjacent to Facility 155, at its northeast corner  
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:** Facility S1133 is located within the Pearl Harbor National Historic Landmark. This air raid shelter is a distinctive building type that was constructed solely during the World War II period in direct response to the December 7, 1941 attack. This is the only extant example in the Shipyard of this once-numerous facility type. Facility S1133 is the last of a series of personnel shelters (Facilities S1130 to S1135) that were positioned around the perimeter of the historic Facility 155, the Shipfitter and Boiler Shop. This shelter is a supporting element to the Shipyard's historical context.

**Description:** The form of the building is an assemblage of arched, precast concrete sections. Casting impressions, from the wooden boards used in the forms, are visible in the concrete. There are fourteen sections, with the two flat end panels with offset doorways. The building measures approximately 70'-0" long x 13'-2" wide and 13'-0" tall. One square-topped ventilation stack rises about a foot above the roofline, which was most likely shorter than the high stacks used during World War II for protection from gas. A corrugated metal shed roof with a metal mesh enclosure for bikes was later added to the north side of the arch; the roof edge rests on one side of the concrete.

The foundation slab is a poured-in-place concrete slab that sits about 8" high off the surrounding ground plane. The rectangular-shaped slab extends slightly beyond the wall edges so that the few inches that remained after placement of the sections could be filled with a concrete mixture that was designed to allow future removal and relocation of the arch sections.

The standard parabolic arch section is 5'-0" in length and has four metal loops embedded in the top of the concrete arch for lifting. The straight canted walls curve into an arched roof, and the concrete sections do not require any additional structural framework. The foot of the walls is set

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into a trough in the thickened or upturned slab to provide additional strength. The structural drawing for buildings of this type (Fourteenth Naval District 1942e) shows the thickness of the arch at the crown was 14", but the walls are only 10" thick at the foot of the walls. Reinforcing steel was used in all the modular pieces. To move and place the sections, cranes and trailers with 8-ton capacities were required. The concrete sections are now unpainted but were commonly painted with tan and olive green paint schemes during World War II. The joints have been waterproofed with roofing mastic to seal the former mortar seams between the concrete sections.

The entryways are offset in the end panel and are rare remaining examples for this shelter type. At the primary access on the east end of the tunnel-like barrel vault form is a steel entry vestibule built with a steel door roughly 6' deep, 8' wide, and 7' high. The west end entry is connected to Facility 155 through a steel-wall, tunnel-like entryway that measures about 5'-wide. The doorway openings are 2'-6" x 6'-6", with metal-frame doors installed. The first bays on both sides of the structure are entry vestibules that have concrete walls with doorway-size openings between the entry section and the main part of the shelter. Originally they were to function as airlocks in case there was a gas attack. These end sections function as protected entryways; the doorways on the end walls and the section next to it are offset to prevent shrapnel or splinters from entering directly into the shelter. The end walls and two partition wall pieces are 8" thick. The vestibule wall openings measure 2'-4" x 6'-6", with a 6" high curb or threshold. There are no window openings in this building type, only roof vents. The original square ventilators extended as high as 16', presuming the gas was heavier than air.

Notes on a drawing for this type of shelter (Fourteenth Naval District 1942d) indicate that usually the interior doors at this location were solid and fitted with gaskets to make them gas proof. None of these gas-proof doors remain in the extant arch-type shelters at Pearl Harbor. The notes on the standard drawing for this shelter state that the solid, gas-proof doors were to be left open between uses, with the outer, screened-panel door secured, to allow airing-out of the shelter. All of the interior doors have been removed; only the end doors exist. The east end has an expanded metal mesh door and the west end has a steel-faced door.

Alterations to the building over the years have consisted mostly of removing the interior furnishings and equipment. The basic form and structure remains the same. The interior is used as a storage facility. There are shelves and drawers that line both sides of the arches. Down the center is a temporary steel plate walkway. Modern fluorescent fixtures are installed on the ceiling. There is one fan opening in the ceiling. The single square-topped ventilation stack rises a few inches above the roofline, while the drawing (Fourteenth Naval District 1942b)

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shows two tall air vents. There are three other small pipe vent openings over the former toilets. Very little remains in the interior, but in the drawing the main interior space, near the east end of the building had a men's and women's toilet area, each having two toilet stalls and a lavatory. The toilet stalls were made of wood frame construction using 2 x 3 wood studs. The toilet was a simple board seat with a bucket underneath. The other areas to the west side of the toilets were originally lined with simple wood slat benches. There is a concrete wall with a doorway-size opening near the center of the building, which divides the facility in two halves. It is uncertain whether or not this opening was originally sealed with a door.

The facility is in good condition. There is some water penetration between the seams, which has caused some staining of the walls, but in general, the condition of the concrete and the foundation is good. There is one major alteration to the shelter; the large bike shelter that is attached to the mauka side (north) of the structure. The roof of the bike shelter is attached to the length of the structure, near the top of the arch. On the south side of the structure, a smaller window air-handling unit platform from Facility 155 is connected to the top portion of the arch.

**Historical Context:** The erection of this building was in direct response to the December 7, 1941 attack. Further attacks by the Japanese were expected and similar facilities were constructed in numerous locations around the Naval Base and adjacent Navy housing areas. Many air raid shelters installed were of this same pre-cast concrete arch type. Almost all of the World War II air raid shelters have been removed in the years following the war, but some, like this one, were retained for storage or other uses. There are only a handful of buildings with variations on this form extant at Pearl Harbor that retain substantial integrity. The primary remaining facilities of this type are Facilities S 51 (Hale Moku), S 830 (Kuahua), S 946 (Submarine Base), Facility 4 (Bishops Point), S 380 and S 381 (West Loch), and Facility S 77 (Pearl City Peninsula). Two other structures with similar form are at Bishop Point, Facility 20 and an unnumbered facility next to it. The unnumbered one has just been placed on the foundations of another, larger building. Facility 20 is shown as a splinterproof armory on World War II drawings and maps (Fourteenth Naval District 1942f and 1942g). However, the foundations of Facility 20 do not appear original, and its doors have been altered. Facility 4 was actually built on the site of a "Type No. 3" air raid shelter, which had been erected in early 1942 (Fourteenth Naval District 1942a).

The air raid shelters were constructed by the Contractors Pacific Naval Air Bases, which was a group of construction firms. Contractors Pacific Naval Air Bases was awarded a large contract to work on new Navy air bases, which included additional facilities throughout Oahu. Directly

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after the Pearl Harbor attack, the work force was used for emergency work, such as splinterproof personnel shelters and first aid stations, as well as for salvage and repair work. During this time, very little work was done on contract projects.

The drawings for this building were approved on October 10, 1942 (Fourteenth Naval District 1942b and 1942c). It was designed from standardized drawings and drawn by the Public Works Department of the Fourteenth Naval District at Naval Station, Pearl Harbor. This single sheet of drawings is entitled 'Navy Housing Precast Reinforced Concrete Shelter Arch Type, Air Raid Shelter'. These were standardized plans, which were used for the construction of several of these types of structures. Thirteen variations of the air raid shelter design are shown in that drawing. The variations are largely in the length of the building and in the number of toilets and sinks to be installed. The legend on Fourteenth Naval District Drawing No. OA-N4-586 reads:

Design Construction and Location

*Field conditions applicable in the following paragraph shall be determined and approved by the officer in charge.*

1. Shelters are intended to be constructed by excavating for the floor 1' to 4' below natural grade, depending on ground and drainage conditions. The excavated material is later used for backfill against the sloping sides of the shelter. The foundation slab is poured in place. All other concrete work to be precast in a central casting yard. Crane and trailer capacity of 8 tons will be required to handle and transport the sections.
2. In target areas and locations of high personnel concentration the shelters are equipped with a suitable number of toilets, wash basins, drinking fountains, and auxiliary electric power plant equipment. Water closets are used where a sewer line is conveniently adjacent.
3. Ventilation is accomplished by drawing the air in through the vent stacks and exhausting it through the doorways and vent openings over the toilets. With reversible fan this operation may be reversed to utilize natural convection up the stacks provided no gas is present. Interior doors are gasket fitted to render them gas proof. Between uses the outer screen doors are secured and the interior solid doors left open to allow airing-out of the shelter.
4. The indicated shelter capacities on shelter layout plans [e.g., Fourteenth Naval District Drawing No. OA-N4-1189] refer to normal and /maximum capacity. Normal capacity is the number of persons that can be continuously accommodated during a prolonged attack of up to 12

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hours duration. In case of failure of the power supply to ventilating fans, the time limit for this capacity will be reduced to 1/2 hour. The maximum capacity indicated refers to the number of persons that can be accommodated during short or intermittent attacks not exceeding 1/2 hour in duration. Operation of ventilating equipment must be fully and continuously maintained in shelters housing the maximum number of occupants.

5. Additional and heavier diagonal steel around doorway openings is required to prevent damage due to rough handling. The space between foundation curb wall and arch sections is to be filled with a lean concrete mix (1-4-5) [*i.e., 1 part cement to 4 parts sand and 5 parts aggregate*] to facilitate future removal of arch sections for reuse elsewhere.

**SUPPLEMENTARY NOTES**

6. Chemical toilets consist of wooden hinged toilet seats provided with empty 5-gallon paint container. A 1-gallon can of disinfectant is to be provided for each toilet.
7. Auxiliary gasoline driven, 1 kW manual start, electric power plant is located on the floor of the shelter vestibule opposite the entrance doorway. A 2" wooden barricade 18" high between the vestibule end walls serves as splinter protection for the engine. When wired as an auxiliary to power supplied from outside sources, the power change-over is to be effected by the use of a single pole double throw tumbler switch.
8. To conserve critical materials, wiring shown on plans is to be reduced to a minimum. A single pole fused safety switch will serve as service entrance and light control switch. All lights and fans are to be placed on a common 2-wire circuit. Wiring #14 type R wires supported by a single line of split knobs.

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

**Sources:**

The Fourteenth Naval District Drawing Number is OA-N4-586 and located on digitally scanned images or microfilm at Pacific Division, Naval Facilities Engineering Command Plan File room.

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.

Contractors Pacific Naval Air Bases  
n.d. Technical Report and Project History, Contracts NOy-3550 and NOy-4173, Pacific Naval Air Bases, Chapter VIII – Bishop Point. Microfiche of report at Pacific Division Naval Facilities Engineering Command Library.

**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.

**Pearl Harbor Naval Shipyard**

1992 Historic Preservation Documentation Program, photocopied document dated 15DEC92 including Appendix B Historic Inventory.

**Yoklavich, Ann**

1995 Naval Air Station Barbers Point, Air Raid Shelter, Facility 87, HABS No. HI-279-D. Prepared for Pacific Division Naval Facilities Engineering Command.

**Yoklavich, Ann**

2000 HABS No. HI-390. U.S. Naval Base, Pearl Harbor, World War II Splinterproof Shelters, Overview Report. Prepared for Pacific Division Naval Facilities Engineering Command.

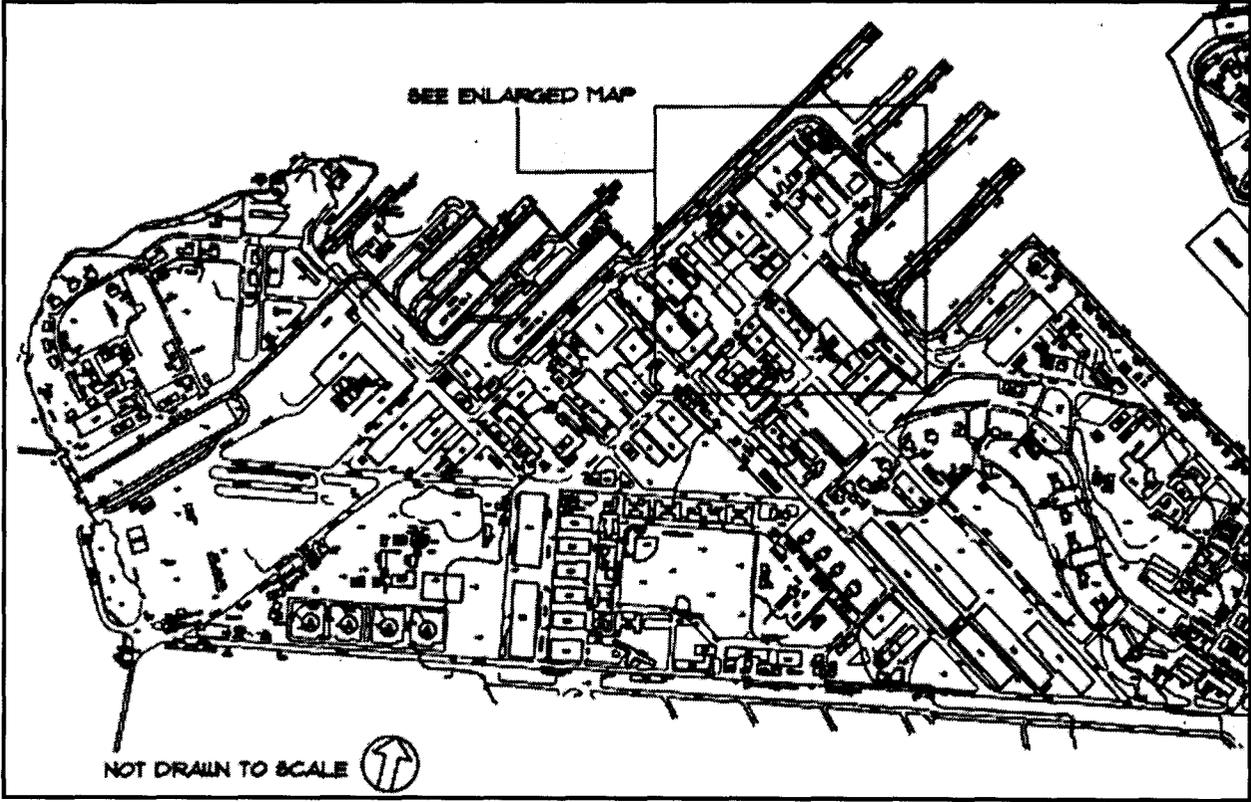
**Project Information:** Photo documentation and recordation of this facility by the Navy has been done in anticipation of potential demolition of the structure. Photo documentation of historic facilities by the Navy assists in expediting planned undertakings by having the documentation prepared prior 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, Architectural Historian, of Mason Architects, Inc. prepared

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the written documentation. The field work and research was conducted for this report between July 2001 and December 2001.

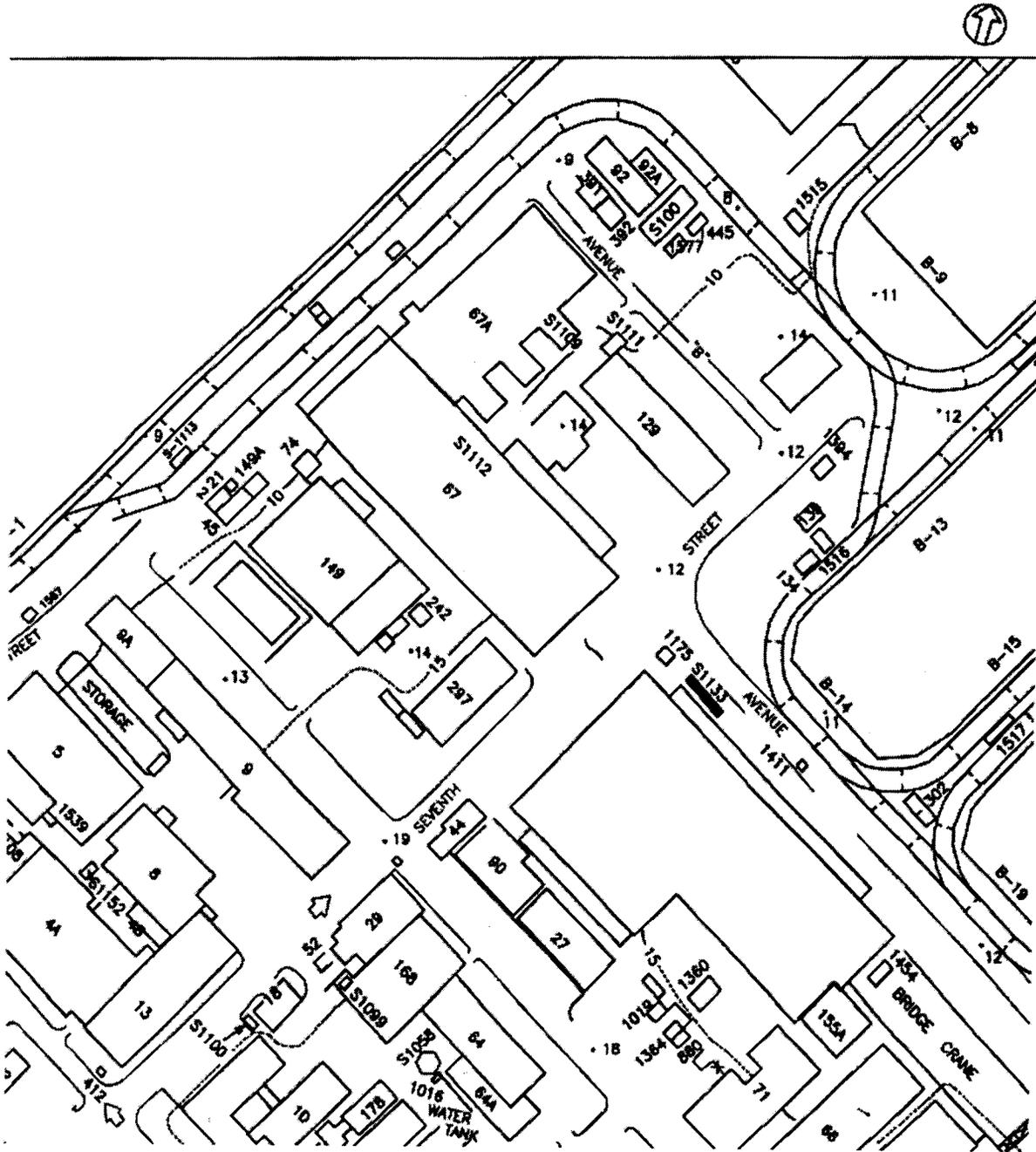
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Shipyard Map



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Enlarged Area Map (reduced, not to scale)



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**Navy Housing, Precast Reinforced Concrete Arch Type Air Raid Shelter  
Plans, Elevations, and Sections (Drawing No. OA-N4-586, dated 10/10/1942) (reduced, not  
to scale)**

