R 634

Technical Report

POLAR CAMP IMPROVEMENTS—STRUCTURAL, ARCHITECTURAL, AND UTILITY ACCESSORIES FOR THE JAMESWAY SHELTER

July 1969

Sponsored by

NAVAL FACILITIES ENGINEERING COMMAND

NAVAL CIVIL ENGINEERING LABORATORY

Port Hueneme, California

32

POLAR CAMP IMPROVEMENTS—STRUCTURAL, ARCHITECTURAL, AND UTILITY ACCESSORIES FOR THE JAMESWAY SHELTER

Technical Report R-634

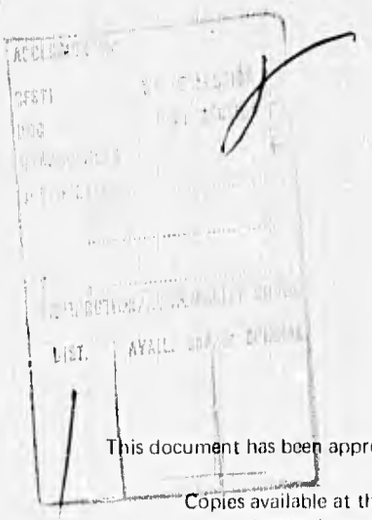
Y-F015-23-01-008

by

F. W. Brier

ABSTRACT

The basic Jamesway shelter has been used for over a decade in polar regions. It possesses characteristics which make it a logical selection for polar use; however, it also has limitations which restrict its usage and decrease its efficiency. Accessories have been developed by NCEL to alleviate the structural, architectural, and utility limitations of the basic Jamesway. Prototypes of the accessories were fabricated or procured by the Laboratory and subsequently tested. Evaluation indicated that they are applicable to polar use and augment the general usefulness of the Jamesway shelter during long- and short-term occupancy. It is recommended that the accessories presented in this report be added to the Advanced-Base Function Component System and be used, when appropriate, for effective application of the Jamesway shelter.



BLANK PAGE

CONTENTS

INTRODUCTION

In polar regions where work forces are isolated for long periods, warm and comfortable quarters for rest and relaxation are essential to good morale. Good morale is fundamental for efficient and effective productivity when work forces are not motivated by exploration and high adventure.

Warm, comfortable quarters are difficult to obtain in operations of 1 year or less because of rapid erection and air mobility requirements. Erection and outfitting time is especially critical for short-life, pioneer or temporary polar camps. Unnecessary time spent on camp construction requires manpower that should be accomplishing the operational mission. In addition, camp maintenance should be kept at a minimum in order to utilize the manpower for the mission. The high cost of support personnel in polar regions easily justified the expense of camp systems minimizing manpower.

Since its introduction to polar use, the Army Quartermaster Corps Tent, commonly known as the Jamesway, has been used for quarters, messing, galley, utilities, and other shelter needs. Several years of use have proven the Jamesway to be comfortable and adaptable. This in-service period, however, has also revealed certain limitations in the shelter. To improve the Jamesway and eliminate its major limitations, the Naval Civil Engineering Laboratory (NCEL) developed a series of structural, architectural, and utility accessories. This technical report summaries these accessories.

BASIC JAMESWAY

Description

The nonrigid prefabricated Jamesway consists of interlocking plywood floor units and wooden half-round arches covered with 1-inch-thick fiberglass-insulated blankets acting as walls and ceiling. The basic building unit is 16 feet wide by 16 feet long by 8 feet high (Figure 1). The Jamesway can be expanded to any length by the addition of 4-foot intermediate sections: two floor units, one arch, and one blanket.

Figure 1. Basic Jamesway with vestibule.

The basic Jamesway is equipped with two entries, one at the center of each endwall. All windows and openings are located on the endwalls: one window on each side of the door and an opening above each door. To reduce heat loss and protect the entry, a vestibule may be attached to each end of the building.

The Jamesway is detailed in Army Quartermaster Corps Drawings No. 5-4-181 through 5-4-188. Procurement data is available in Military Specification MIL-T-10168E.

Limitations

The basic Jamesway has proven to be a useful and reliable shelter for polar use; however, continual usage of the shelter has revealed the following limitations:

Structural. The building does not have an adequate floor or foundation system.

Architectural.

1. The low profile of the arch ribs does not provide sufficient headroom along the sides of the building for optimum space utilization.
2. The doors, placed at the center of the endwalls, limit the flexibility of interior arrangement and camp layout.
3. The vestibules, which require a 90-degree turn before entering the building, limit the size of admitted items after the building is erected.
4. The endwall windows do not utilize the round-the-clock daylight in lounges, offices and mess halls.
5. The building has no provision for interior partitions.
6. The plywood floor units do not provide an aesthetically pleasing floor surface.

Utility.

1. The electrical system is inadequate.
2. The basic building does not include head facilities or a water-supply system.
3. The heating system is inadequate.
4. The endwall utility openings limit the flexibility of interior arrangement.
5. The building does not have adequate air circulation.

GENERAL CRITERIA FOR JAMESWAY ACCESSORIES

Design and construction procedures in polar regions differ distinctly from those for temperate climates due to the remote location, adverse climate, and economic factors. Based on experience, the following general criteria[1] were established for designing the Jamesway accessories listed in Table 1:

Table 1. Jamesway Accessories

Accessory	Y&D Drawing No.	Installation Cost for a 64-Foot Jamesway ($)	Erection Time (man-hours)	Shipping Weight (lb)
Structural accessories				
Skid foundation	993764 and 993765	4,500*	20	4,960
Reinforced floor	936916	96†	8	1,920
Architectural accessories				
Wall extension	996903 through 05	1,640†	8	1,460
Side-entry kit	936907 through 12	470†	4	330
End-entry kit	936913	165†	1	85
Picture window	993770	280‡	4	335
Building divider	936954	420‡	2	832
Curtain partitions	1085856	900‡	8	400
Floor covering	—	7.00/sq yd§	0.1/sq yd	20 lb/sq yd
Utility accessories				
Electrical distribution system	936906	500†	6	200
Dry head kit	936914	241†	1	82
Hot-water snowmelting system	993769 and 1085857	1,380†	42	1,093
Snowmelter loading chute	993767 and 993768	1,500‡	30	1,540
Water-storage tank	936915	252†	1	140
Force-air heating system	—	770†	48	520
Roof vent	936902	176†	2	5
Ceiling fans	—	240¶	3	30

* Based on 1965 Laboratory fabrication cost.

† Based on 1962 Laboratory fabrication cost.

‡ Based on 1964 Laboratory fabrication cost.

§ Based on 1968 procurement cost.

¶ Based on 1964 procurement cost.

1. Satisfactory operation in ambient temperatures of -65°F
2. Air transportable by C-130 aircraft
3. Simplicity of design
4. Simplicity of fabrication
5. Minimum maintenance requirements
6. Maximum use of Navy standard stock items or readily available commercial items
7. Fast and efficient erection
8. Minimum of alterations to basic building
9. Applicable to buildings 16 feet or longer

STRUCTURAL ACCESSORIES

The basic Jamesway structural system is adequate for climatic conditions such as wind and snow loads, but inadequate for loads resulting from mobility and heavy use. To satisfy these requirements, NCEL developed the following structural accessories for the Jamesway: the skid foundation and the heavy-duty floor units.

Skid Foundation

Camps on fields of drifting snow require frequent relocation or complete burial will eventually occur and abandonment will follow. At the present time, relocation of a Jamesway requires disassembling, transporting, and reassembling of the shelter. To reduce relocation time and effort, a mobile skid foundation was developed which permits rapid and economical relocation of the building.

The mobile foundation (Figure 2) is made up of 16-foot-long, 12-inch-high steel I-beam foundation sections positioned beneath the sidewalls of the building with open-web joists spanning the beams at 4-foot intervals.[1,2] Preliminary field tests indicated that rigid foundation sections up to 32 feet long are practical, but greater lengths require a hinged joint to reduce bending moments caused by cantilevering.

In-service tests of a 64-foot Jamesway, erected on a skid foundation, were conducted near McMurdo Station, Antarctica, in December 1966. The Jamesway, which was towed a distance of 1 mile, had a hinged joint at its

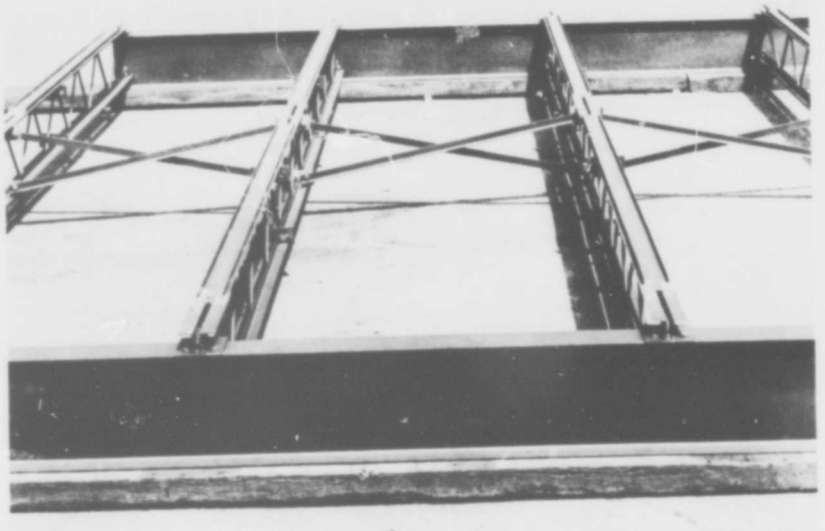


Figure 2. Mobile foundation with open-web joists.

center. The roof blanket, purlins, wall extensions, and floor sections over the hinged joint were removed before towing to permit proper end movement (Figure 3). During the towing test, the foundation system performed satisfactorily with only small deflections. A cost analysis of the foundation system revealed that one relocation saved 88% of the original foundation cost. Two relocations of a Jamesway would more than justify the use of a skid foundation.

Reinforced Floor Unit

The basic Jamesway floor units of plywood construction are not adequate for transmitting large concentrated loads, such as galley appliances, diesel generators, and other heavy equipment, to the foundation. Even though failure may not occur, large deflections result in excessive canting of the floor surface.

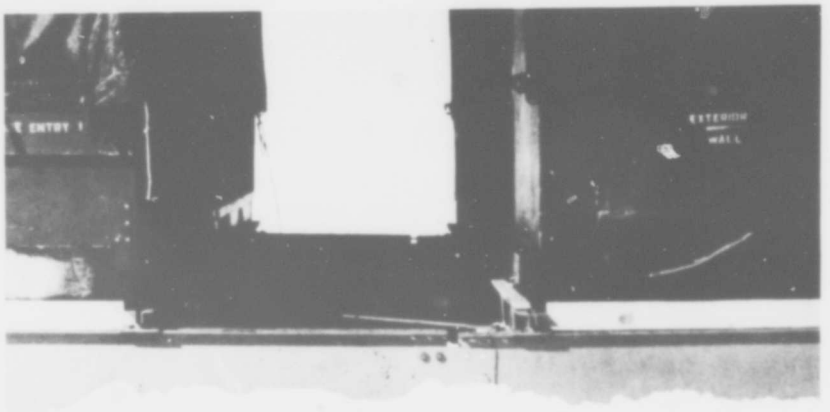


Figure 3. Jamesway with section removed over hinge joint.

To satisfy the need for a stronger floor, NCEL designed and tested a reinforced floor panel.[1] The reinforced floor panel is constructed by inserting six 2 x 6 timber joists transversely in the standard floor panel (Figure 4). The timber joists reduce panel deflections from 1.28 inches to 0.25 inches when a 1,000-pound concentrated load is applied at its center.

ARCHITECTURAL ACCESSORIES

Because of its many architectural limitations, the basic Jamesway lacks flexibility in usage. To increase its usability and improve living conditions, NCEL developed the following architectural accessories for the Jamesway: wall-extension kit, side-entry kit, end-entry kit, picture window, building divider, curtain partitions, and floor covering.

Wall-Extension Kit

One of the most objectionable characteristics of the basic Jamesway is the limited available space: the height along the sidewalls is restricted because of the circular arch-rib system. Insufficient ceiling height reduces usable floor space by approximately 15% and consequently decreases quartering capacity.

To alleviate this inherent limitation of the basic Jamesway, NCEL developed a wall-extension kit which raises the arch-rib ceiling 2 feet (Figure 5). This is achieved by using panels which rest directly on the floor, and connectors that allow mounting of the arch ribs on top of the panels.

The 2-foot-high extension panels, which are constructed of wood framing and 1/4-inch plywood skin, are 2-1/8 inches thick and 6 feet 6 inches or 8 feet long, depending on endwall or sidewall usage. The 8-foot-long sidewall panels allow the building to be expanded in multiples of 8 feet. All extension panels are filled with aluminum-foil-covered fiberglass blanket insulation 1-1/2 inches thick.[1]

The wall-extension panel kit was first tested at Thule, Greenland, in January 1961. No problems during erection or deficiencies during 3 months of use as a storage building were encountered. In October 1961 the prototype was shipped to McMurdo Station, Antarctica, where it was used as a quarters building for 4 months. Again no problems were encountered and the building proved to be weathertight and very comfortable.

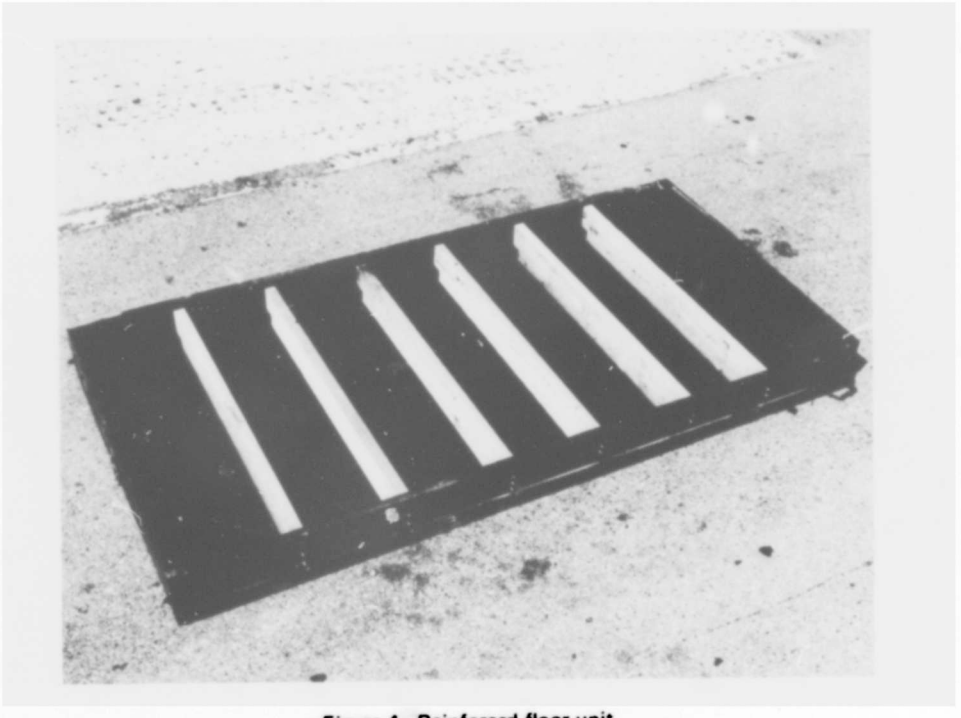


Figure 4. Reinforced floor unit.

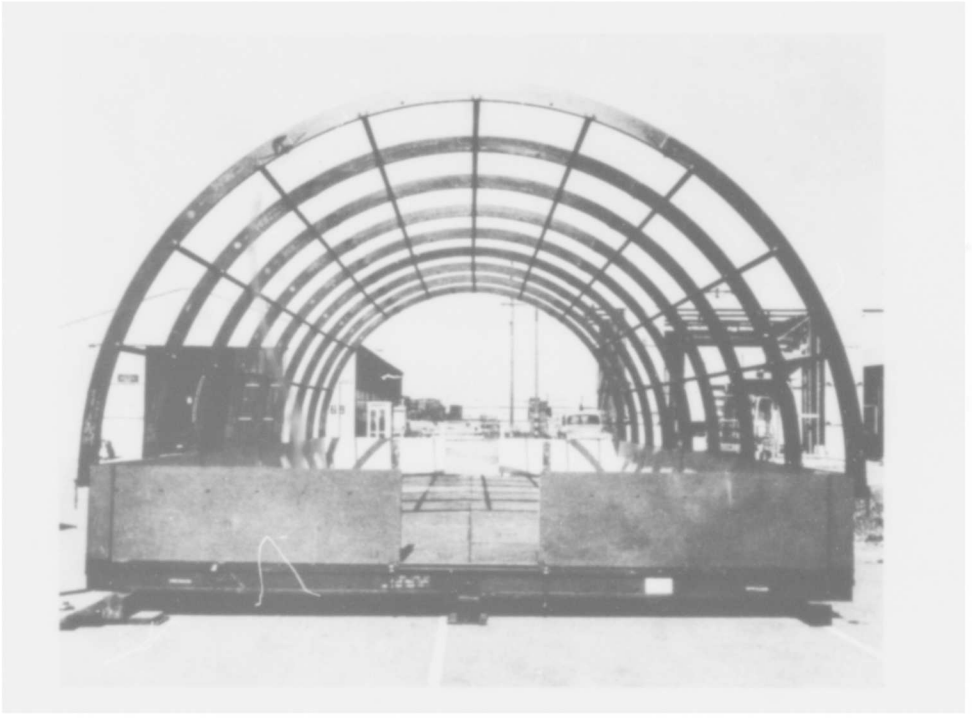


Figure 5. Jamesway equipped with wall extensions.

Entry Kits

The standard Jamesway has entrance doors only at the center of the endwalls. The door placement limits flexibility in usage and necessitates camp layouts providing access to the ends of all buildings. In addition, the standard Jamesway vestibule, with its 90-degree turn, restricts entry. To correct these inadequacies, two special entries were developed: one for sidewall and another for straight-through endwall usage.

Side-Entry Kit. To provide flexibility of door placement, a side-entry kit was developed. It is constructed of wood framing with a plywood skin, and is designed to fit between any two arch ribs.[1] The design is such that one roof blanket can be rolled back to provide room for the vestibule (Figure 6); this eliminates the necessity of cutting a blanket. For installation in the Jamesway fitted with wall extensions, a 4-foot-long wall-extension panel was designed to replace the normal 8-foot extension panel.

The side-entry vestibule is a plywood compartment 3 feet 10 inches wide, 2 feet 6-3/4 inches deep, and 6 feet 7-1/4 inches high. It sits on a Jamesway floor unit with its outer wall flush with the edge of the building.

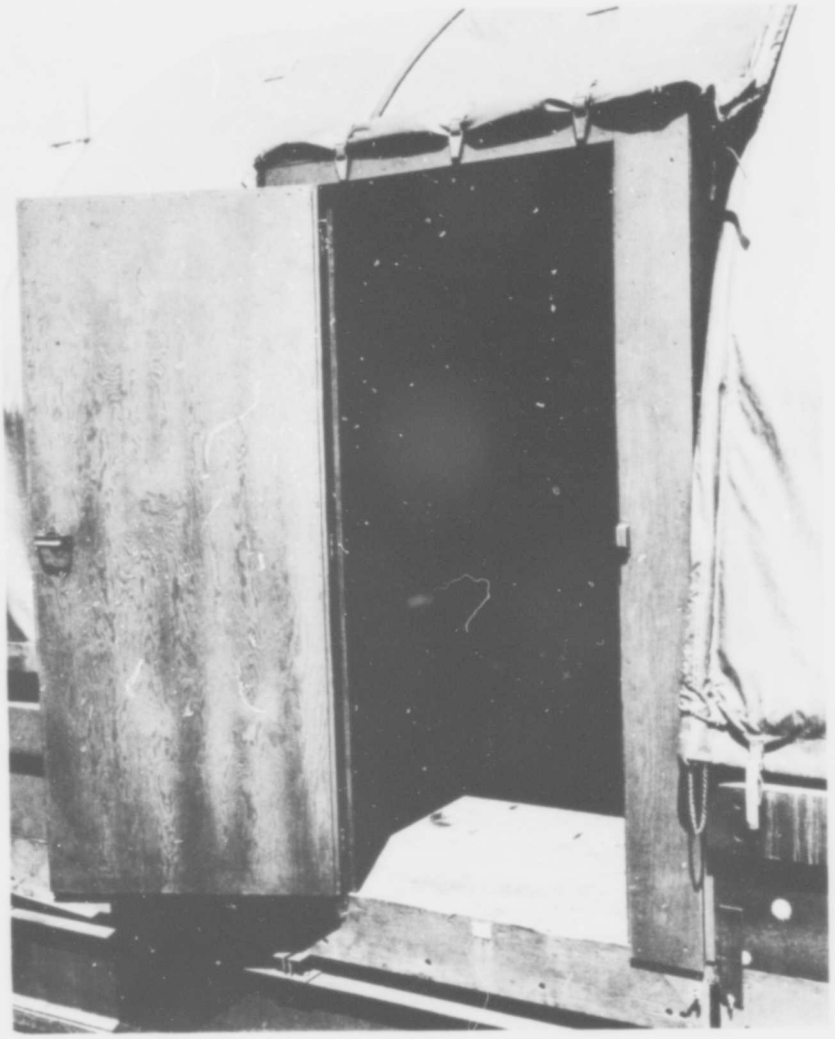


Figure 6. Side-entry vestibule.

Prefabricated side-entry vestibules have been used in NCEL Jamesways since October 1963. They have proven to be a useful and beneficial addition to the basic Jamesway.

End-Entry Kit. The 90-degree turn in the basic Jamesway vestibule limits the size and shape of objects entering the building through the endwall. To permit direct entry, a vestibule was developed with a straight-through door arrangement. This is accomplished by using a plywood door panel to replace the canvas wall in the basic Jamesway vestibule.[1]

The need for a modified endwall vestibule is neutralized where sidewall entry kits are used with their straight-through door design. However, since sidewall entry kits are not in wide use, modified endwall vestibules should be used to provide better accessibility and easier entry to the basic Jamesway.

Picture Window

Because of increased heat loss and problems of controlling light in sleeping quarters, the desirability of windows in polar shelters has always been a controversial issue. In locations such as lounges, offices and mess halls, however, windows would create a more aesthetically pleasing environment. For this reason, a 3 x 4-foot picture window (Figure 7) was developed which would fit between any two arch ribs along either sidewall of the Jamesway. The design is such that one roof blanket is rolled back to provide an opening for the window; this eliminates the necessity of cutting a blanket. The window is constructed using two sheets of 1/4-inch plate glass with silica gel between the two plates to prevent condensation.[3]

Two prototype picture windows were tested in February 1965 at the NCEL camp near McMurdo Station, Antarctica. The windows were installed quickly and easily with a minimum of tools, and they performed satisfactorily.

Building Divider

In polar camps, many buildings house two or more facilities. The basic Jamesway has no provision for building dividers to separate various facilities or to reduce noise transfer. For these reasons, a prefabricated building divider was developed.

The building divider is designed to be as soundproof as possible, fit under any arch rib, adjust to tolerances of Jamesway construction, and provide multiple variation in door placement.[4] The divider consists of one door and nine tongue-and-groove panels, two of which are interchangeable with the door (Figure 8). This allows three variations in door location. The 2-1/8-inch-thick wood-framed panels are covered with 1/4-inch-thick plywood skin and are filled with fiberglass insulation for soundproofing. The framing and plywood skin are combined in a configuration to form a tongue-and-groove interlocking system between panels.

Figure 7. Picture window for Jamesway.

Figure 8. Jamesway building divider.

A prototype building divider was shipped to McMurdo Station, Antarctica, in November 1964 for testing at the NCEL camp on the Ross Ice Shelf. Since then it has been used to separate many types of nonparallel activities. In each case, it has performed satisfactorily and has proved itself to be a valuable accessory for Jamesways.

Curtain Partitions

The basic Jamesway shelter has no interior partitions. In order to provide some degree of privacy for occupants living in isolated regions, curtains are sometimes used to divide the building into individual quarters (Figure 9). Curtains are easily installed and provide a visual screen while permitting circulation of air for heating the building.

Using knowledge obtained from two earlier designs,[5, 6, 7] NCEL developed a third design. This design uses 3/4-inch standard steel pipe, 1 x 1-1/2-inch steel tee, and turnbuckles attached to existing arch bolts to form a rigid, easily installed support system for fire-resistant cotton curtains.

Although curtain partitions do not furnish absolute privacy, they do provide a psychological and visual barrier which stimulates good morale during periods of isolation. Partitions are not essential for short-duration personnel, but they should be used in all quarters for long occupations.

Floor Covering

Experience in outfitting polar buildings and camps has shown that standard Navy floor coverings buckle and curl at the edges when used in polar regions. A survey of commercially available floor covering, directed toward finding a durable, easily installed covering which does not buckle under conditions prevalent in polar buildings, resulted in the testing of rubber tile (Figure 10).

Tests investigating the flexibility, warping, and thermal expansion of interlocking rubber tile were conducted in the NCEL cold chamber and at the NCEL camp on the Ross Ice Shelf.[8] The tests indicated that the interlocking tile is suitable for use in polar regions, and has the advantage of being fast and easy to install.

Based on 1964 cost, rubber floor tile is 38% more expensive than battleship linoleum, but the need for mastic is eliminated and maintenance cost is reduced. In addition, rubber floor tile is attractive in appearance, noiseless, durable, and easily cleaned.

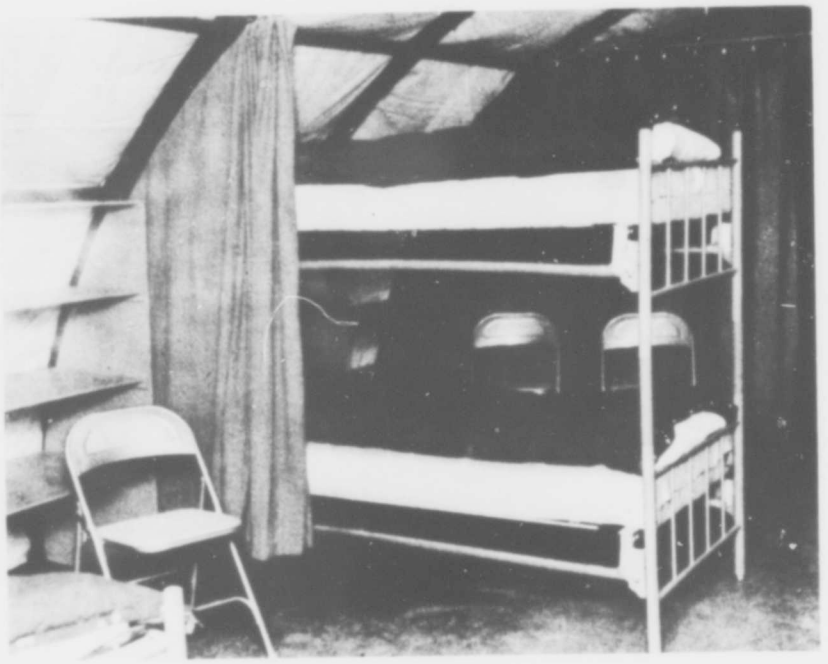


Figure 9. Curtain partitions for Jamesway.

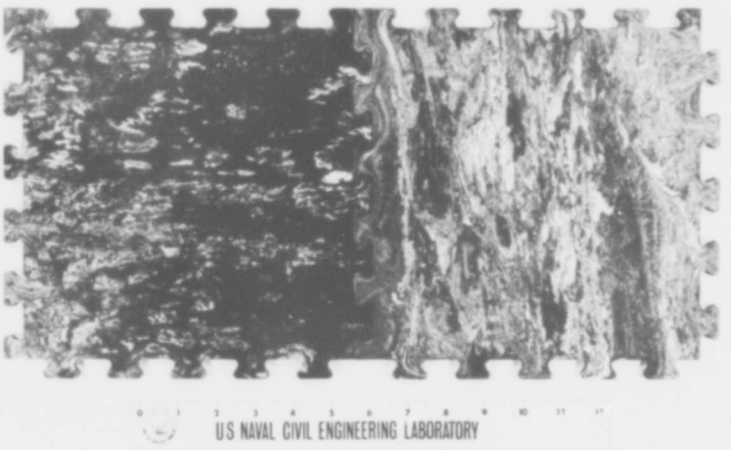


Figure 10. Interlocking rubber tile for use as floor covering.

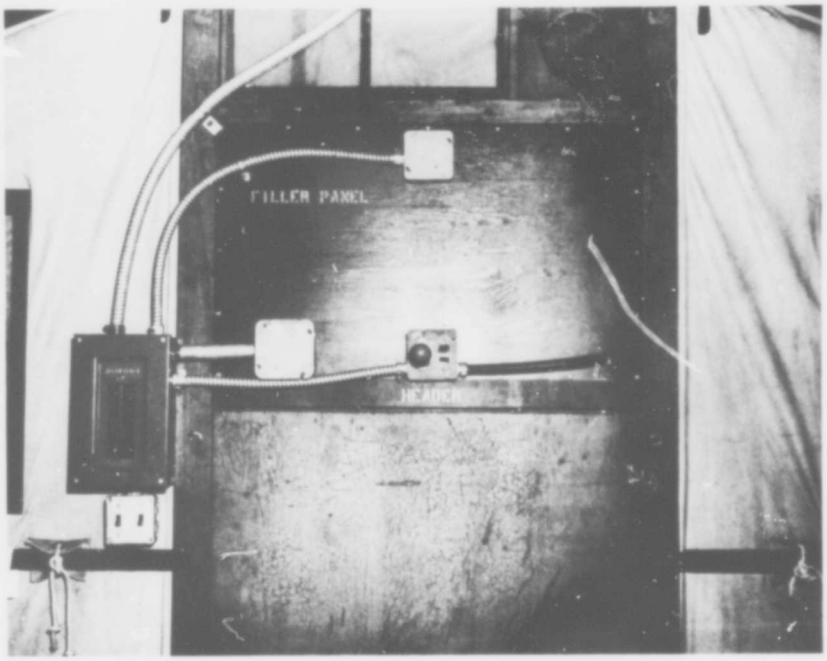


Figure 11. Distribution panel and overhead wiring for Jamesway electrical system.

UTILITY ACCESSORIES

The basic Jamesway has no provisions for utilities to meet the day-to-day needs of its occupants. To satisfy the need for electrical, sanitary, water and heating systems, NCEL developed the following utility accessories: electrical distribution system, dry head kit, hot-water snow-melting system, snowmelter loading chute, water-storage tank, heating system, roof vent, and ceiling fans.

Electrical Distribution System

The basic Jamesway electrical system does not provide any utility outlets, and its lighting capacity is marginal. To enrich living conditions and increase efficiency, NCEL designed a 2-circuit electrical distribution system for 32-, 48-, and 64-foot Jamesways; one circuit supplies duplex outlets spaced 8 feet apart along both sidewalls, and the other supplies all overhead, exit, and vestibule lights[1,9] (Figure 11).

The electrical distribution system has been used by NCEL in Antarctica for five austral summer seasons. It has proven to be a versatile and convenient accessory in shops, quarters, and office Jamesways.

Dry Head Kit

In polar regions where temperatures are extremely low, the complications of having a sewage-disposal line outside the building led to the use of a dry-type toilet. The toilet had to be simple to erect and operate, and conveniently located, yet removed from the building proper. The Jamesway side-entry vestibule provides a compartment with the capacity to house a toilet and the characteristics to accommodate the design requirements. Consequently, a dry-type toilet was designed to fit into this vestibule.

The dry head is designed to keep odors from escaping into the building proper, yet provide access for periodical removal of waste (Figure 12). To eliminate odors, the access door and cover are sealed with 1/8- by 3/4-inch felt gaskets; a pail with disposable plastic bags is used for collecting and disposing of the waste.[1,9]

Hot-Water Snowmelting System

An adequate water supply is a major factor in the establishment of polar camps. Potable water from freshwater lakes and distilled seawater have been used where possible, but location restrictions necessitate the use of melted snow for water supply at inland stations and camps. A variety of snowmelter designs have been used in polar regions. In most instances, these melters have been inefficient and complex in operation.

In an effort to develop a more efficient and less complex snowmelter, NCEL designed a hot-water snowmelting system (Figure 13) containing filters for odor and taste control. It used the excess capacity of the camp water heater as the heat source to produce potable water at the rate of 100 gph.[10]

The hot-water system was used by NCEL during DF-65 summer season. It is a fast and efficient melter and has the advantage of employing standard parts which are easily assembled and operated. The hot-water snowmelter developed by NCEL is designed for direct application in Jamesway shelters.

Figure 12. Access door for the dry head kit.

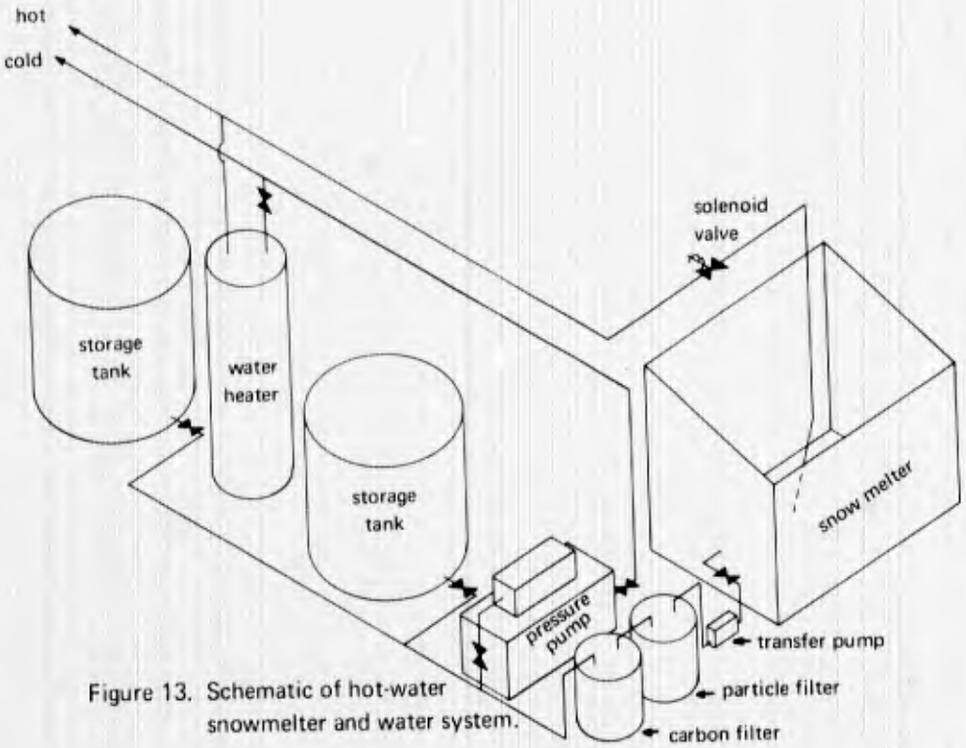


Figure 13. Schematic of hot-water snowmelter and water system.

Snowmelter Loading Chute

For maximum efficiency and minimum manpower requirements, scoop-equipped traxcavators are used to supply snow for snowmelter systems. When at all possible, the snow is deposited directly in the melting tank, eliminating hand shoveling. At facilities where melter tanks are located inside buildings, access openings must be provided.

To provide an access opening to the melter tank in the NCEL hot-water snowmelting system, a 6-foot-wide loading chute (Figure 14) was developed; it permits two yards of snow to be deposited at one time directly in the melter tank through the endwall of a Jamesway. A suitable 2-yard snow scoop for use with this snowmelter loading chute is detailed in Y&D Drawing No. 993769.

Water-Storage Tank

The complexity and expense of providing a permanent water distribution system in polar regions make the use of such a system impractical for short-duration polar operations. At temporary camps, water must be distributed periodically from the point of production to various points

Figure 14. Snowmelter loading chute after 1 year of use.

by means of a temporary system, such as a hose. This requires elevated water-storage tanks at the usage points which will provide a gravity-type distribution system within the buildings.

For Jamesway use, a 190-gallon water-storage tank with a support assembly (Figure 15) was designed and tested by NCEL. The tank is made of 1/8-inch aluminum plate, and the support assembly which holds the tank 6 feet 7 inches above the floor is made from aluminum angle and plate.[1, 9]

Forced-Air Heating System

Properly heated and vented buildings are essential for indoor comfort in polar regions. To improve indoor environmental conditions and comfort, NCEL developed a forced-air heating system with distribution ducts and diffusers.

The heat source for the system is a 134,000-Btuh oil-fired, forced-air furnace equipped with a stainless-steel combustion chamber, fresh-air intake, and squirrel-cage blower. Galvanized ducts 10 inches in diameter are used to distribute hot air to adjustable diffusers.

During field tests in two 64-foot Jamesways at the NCEL camp near McMurdo Station, the forced-air heating system greatly reduced the thermal gradient and improved environmental conditions.

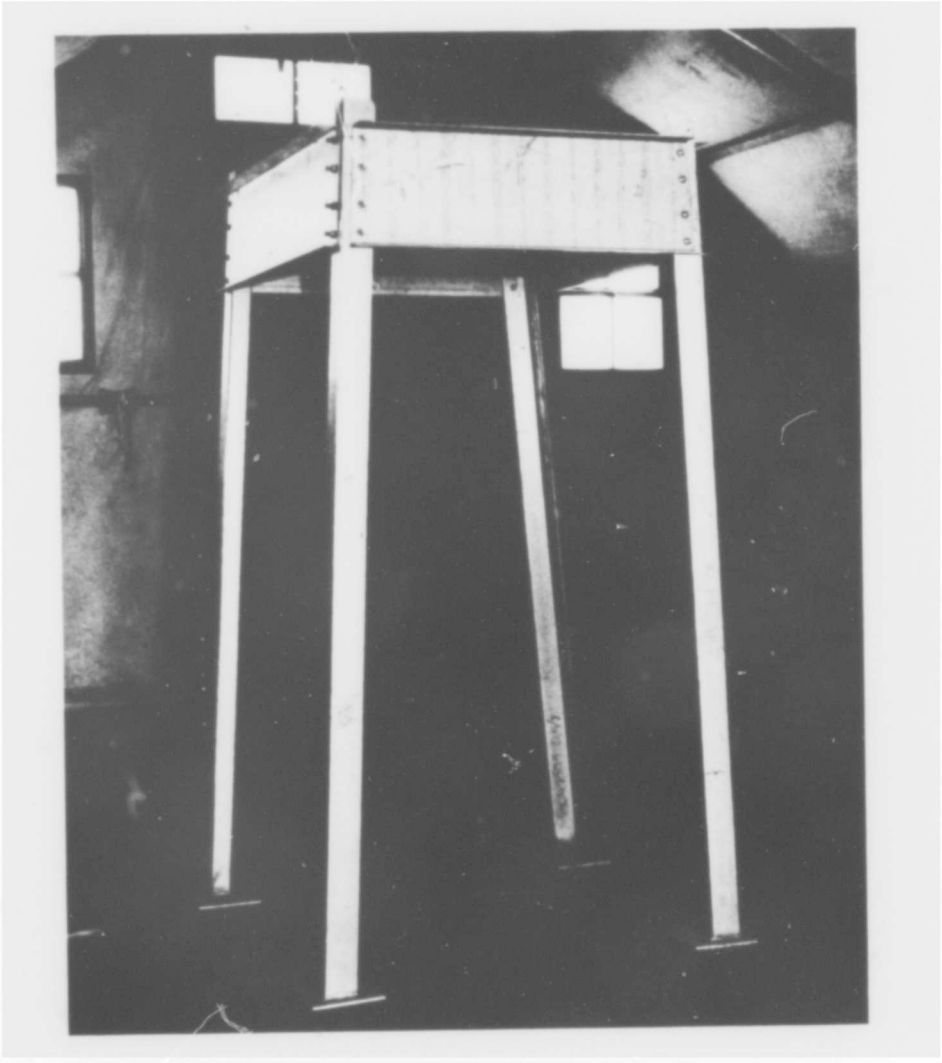


Figure 15. Support for elevated water-storage tank.

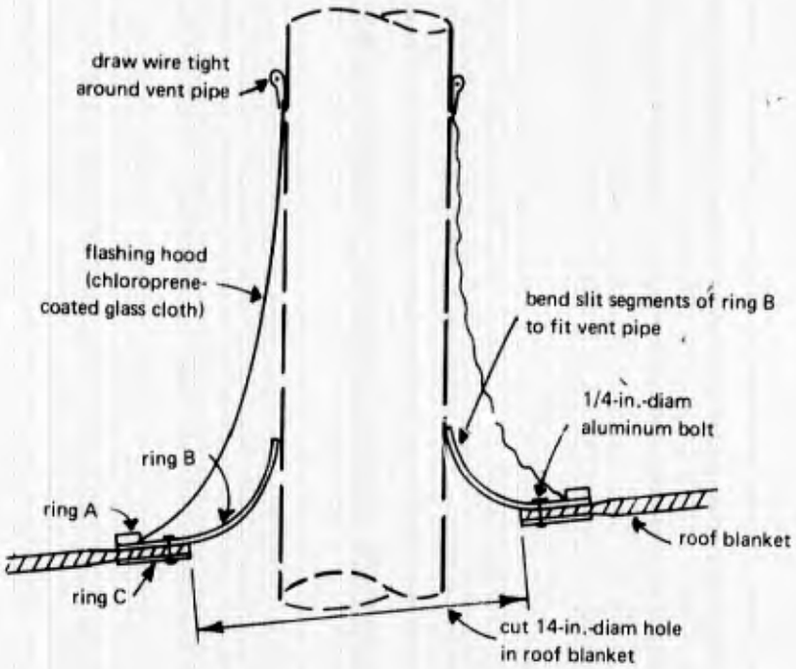


Figure 16. Section through the special roof vent.

Roof Vent

Placement of appliances such as furnaces, cooking ranges and water heaters is limited in the basic Jamesway because only two vents are provided, one above each door.

To provide greater versatility in placement of appliances, NCEL designed a weathertight roof vent which could be installed at any point in the roof of the Jamesway. The roof vent uses two aluminum rings to bind the cut edge of the roof blanket and one ring to hold the vent pipe in position at the center of the blanket opening (Figure 16). A flashing hood of chloroprene-coated glass cloth with a draw wire makes a weathertight closure around the pipe.[1, 9] Roof vents used at the NCEL camp near McMurdo Station have proven to be inexpensive, easy to install, and provide unlimited opening positions.

Ceiling Fans

The thermal gradient normally encountered in buildings results from densification of cold air. In polar regions where buildings sit directly on permafrost or snow, the thermal gradient is greatly magnified; temperatures

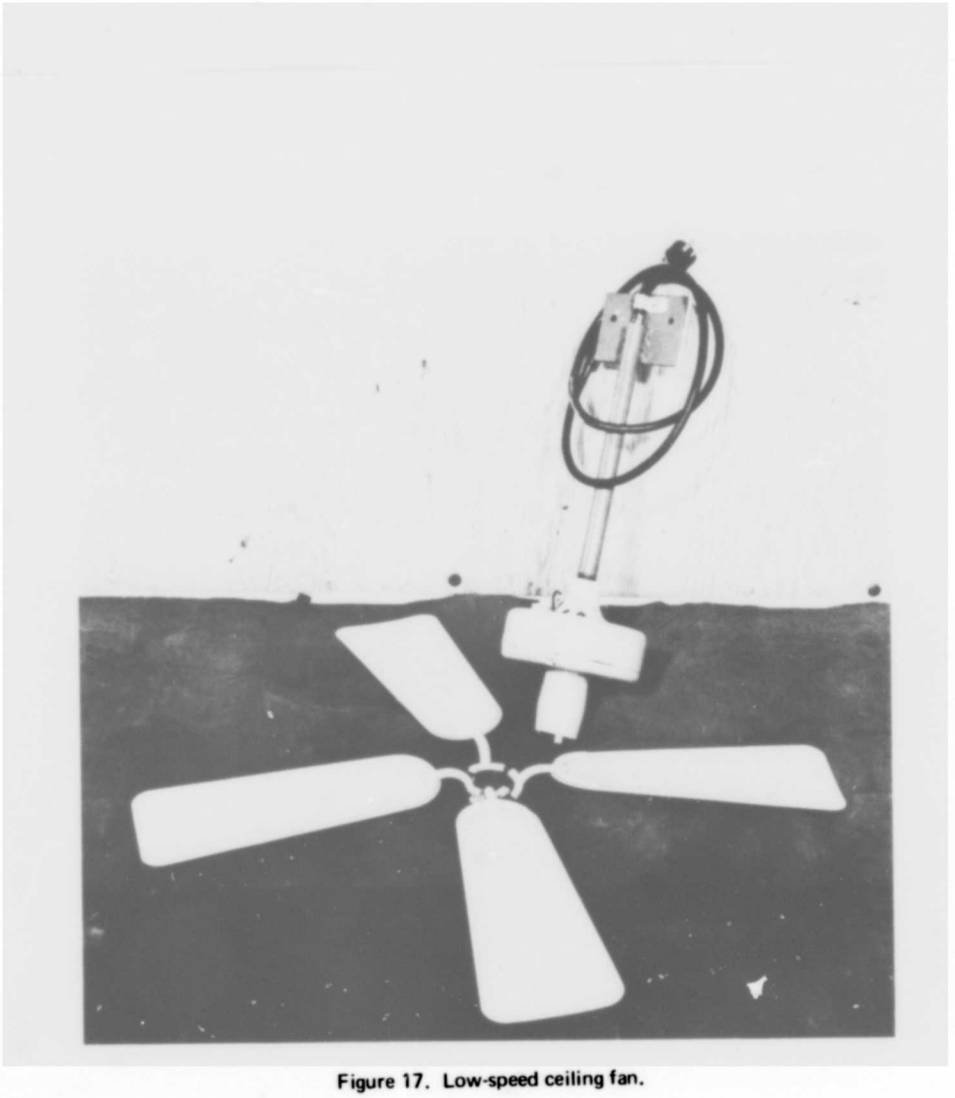


Figure 17. Low-speed ceiling fan.

ranging from 0 degrees at the floor to 80 degrees at the ceiling are common. To alleviate this condition and provide uniform temperatures by increased air circulation within polar buildings, a 4-bladed ceiling fan (Figure 17) was tested by NCEL.

In a 64-foot Jamesway, three 36-inch-diameter fans running at 235 rpm were effective in reducing the thermal gradient to a satisfactory range when used in conjunction with a forced-air heating system. Higher fan speeds were also tested, but drafts were disagreeable to personnel living in the building.

APPLICATION

Accessories for the Jamesway shelter presented in this report provide all essential services for personnel living in polar regions and alleviate major structural, architectural and utility limitations of the basic Jamesway. Some modifications or additions may be required to meet specific site conditions or operational requirements for a specific mission.

For short-term occupancy (30 to 60 days) at new construction sites or emergency shelters at established stations where simplicity and function are paramount, accessories such as picture windows, curtain partitions, and forced-air heating may be omitted. For long-term occupancy (4 to 12 months) at outlying work centers or seasonal outposts where maximum comfort and high productivity are paramount, most of the accessories presented in this report are needed to satisfy psychological, economical, and usability conditions.

In the past, Jamesways were used almost exclusively for pioneer and temporary camps at isolated polar locations because of their portability characteristics. Recent technological and logistical advancements have resulted in increased use of prefabricated knockdown shelters and preassembled vans for such camps. This change has reduced, but not eliminated, the requirement for Jamesways shelters. They are still needed to house quarters, offices, shops and supplies for construction camps at new sites, emergency shelters and temporary outlying work centers at existing stations, and remote small-party camps.

Jamesway shelters are still used extensively in Antarctica. Many of the accessories presented in the report have been adopted by the Naval Support Forces, Antarctica, and others are being considered for use. These include:

1. Skid foundations for Jamesways used as airfield terminals, generator shelters, and similar facilities
2. Picture windows for Jamesway offices and shops
3. Building dividers for multipurpose Jamesways
4. Curtain partitions for airfield quarters
5. Forced-air heating systems in Jamesways used for long-term occupancy
6. Roof vents for Jamesways containing heating systems.

CONCLUSIONS

1. Accessories presented in this report improve versatility, efficiency, comfort, erectability and portability of the Jamesway shelter.

2. Since Jamesway shelters will continue to be used at polar advanced bases in the forseeable future, these accessories should be readily available to permit more effective application of the Jamesway.

RECOMMENDATION

It is recommended that the Jamesway shelter accessories presented in this report be added to the Advanced-Base Function Component System.

REFERENCES

1. Naval Civil Engineering Laboratory. Technical Report R-241: Pioneer polar structures—Accessories for the Jamesway shelter, by G. E. Sherwood. Port Hueneme, Calif., May 1963. (AD 409581)

2. ——. Technical Report R-538: Pioneer polar structures—Mobile foundation for Jamesways up to 64 feet long, by G. E. Sherwood. Port Hueneme, Calif., July 1967. (AD 656587)

3. ——. Technical Report R-384: Pioneer polar structures—Jamesway picture window, by G. E. Sherwood. Port Hueneme, Calif., May 1965. (AD 616984)

4. ——. Technical Report R-383: Pioneer polar structures—Jamesway building divider, by G. E. Sherwood. Port Hueneme, Calif., May 1965. (AD 615520)

5. ——. Technical Note N-422: Erection of quarters building for pioneer polar camp, by R. W. Hansen, C. R. Hoffman, and E. H. Moser. Port Hueneme, Calif., Sept. 1961. (AD 266579)

6. ——. Technical Note N-771: Improvements to polar camps—Use of a 64-foot Jamesway, by G. E. Sherwood. Port Hueneme, Calif., Sept. 1965. (AD 623010)

7. ——. Technical Note N-804: Improvements for polar camps—Jamesway ceiling hanger bracket and curtain rods, by G. E. Sherwood. Port Hueneme, Calif., Mar. 1966.

8. ——. Technical Note N-612: Review of furnishings for polar camps, by G. E. Sherwood. Port Hueneme, Calif., June 1964. (AD 601893)

9. ——. Technical Note N-482: Pioneer polar structures—Specifications for Jamesway shelter accessories, by G. E. Sherwood. Port Hueneme, Calif., Apr. 1963. OUO (AD 404663)

10. ——. Technical Report R-441: Polar camp improvements—Water system using a hot-water snow melter, by C. R. Hoffman and G. E. Sherwood. Port Hueneme, Calif., Mar. 1966. (AD 631322)

Unclassified
Security Classification

DOCUMENT CONTROL DATA - R & D

Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified

1. ORIGINATING ACTIVITY (Corporate author) Naval Civil Engineering Laboratory Port Hueneme, California 93041	2a. REPORT SECURITY CLASSIFICATION Unclassified 2b. GROUP

3. REPORT TITLE

POLAR CAMP IMPROVEMENTS—STRUCTURAL, ARCHITECTURAL, AND UTILITY ACCESSORIES FOR THE JAMESWAY SHELTER

4. DESCRIPTIVE NOTES (*Type of report and inclusive dates*)

Not final; July 1964—June 1968

5. AUTHOR(S) (*First name, middle initial, last name*)

F. W. Brier

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
July 1969	26	10

8a. CONTRACT OR GRANT NO	9a. ORIGINATOR'S REPORT NUMBER(S) TR-634
b. PROJECT NO Y-F015-23-01-008	
c.	9b. OTHER REPORT NO(S) (*Any other numbers that may be assigned this report*)
d.	

10. DISTRIBUTION STATEMENT

This document has been approved for public release and sale; its distribution is unlimited.

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
	Naval Facilities Engineering Command Washington, D. C.

13. ABSTRACT

The basic Jamesway shelter has been used for over a decade in polar regions. It possesses characteristics which make it a logical selection for polar use; however, it also has limitations which restrict its usage and decrease its efficiency. Accessories have been developed by NCEL to alleviate the structural, architectural, and utility limitations of the basic Jamesway. Prototypes of the accessories were fabricated or procured by the Laboratory and subsequently tested. Evaluation indicated that they are applicable to polar use and augment the general usefulness of the Jamesway shelter during long- and short-term occupancy. It is recommended that the accessories presented in this report be added to the Advanced Base Function Component System and be used, when appropriate, for effective application of the Jamesway shelter.

DD FORM 1 NOV 65 1473 (PAGE 1)

S/N 0101-807-6801

Unclassified
Security Classification

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Polar						
Jamesway shelter						
Mobile skid foundation						
Reinforced floor unit						
Wall-extension kit						
Side-entry kit						
End-entry kit						
Picture window						
Building divider						
Curtain partitions						
Floor coverings						
Electrical distribution system						
Dry head kit						
Hot-water snowmelting system						
Snowmelter loading chute						
Water-storage tank						
Forced-air heating system						
Roof vent						
Ceiling fans						