NOTICE OF CHANGE

MIL-HDBK-1025/1
NOTICE 3
30 June 1994

MILITARY HANDBOOK

PIERS AND WHARVES

TO ALL HOLDERS OF MIL-HDBK-1025/1:

1. THE FOLLOWING PAGES OF MIL-HDBK-1025/1 HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
vii	30 June 1994	vii	30 October 1987
viii	30 June 1994	viii	30 October 1987
viii-a	30 June 1994	New Page	
13	30 June 1994	13	30 October 1987
14	30 June 1994	14	30 October 1987
25	30 June 1994	25	30 October 1987
25a	30 June 1994	New Page	
26	30 June 1994	26	30 October 1987
191	30 June 1994	191	28 February 1992

2. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-HDBK-1025/1 will verify that page changes and additions indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the military handbook is completely revised or cancelled.

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PREPARING ACTIVITY
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PROJECT NO.
FACR-1126

AMSC N/A

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PIERS AND WHARVES

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2.2.3.2 Mobile Crane Operation. Piers and wharves are subject to frequent usage by truck-mounted mobile cranes forklifts, and straddle carriers for servicing the ships. This weight-handling equipment requires maneuvering and turnaround space on the deck for effective operation. If possible the deck space should be planned to allow mobile cranes to be backed up perpendicular to the bullrail. This permits the maximum load/reach combination.

2.2.3.3 Crane Tracks. Rail-mounted cranes are often needed for ship fleet loadout in outfitting/refit and repair facilities. Width requirements depend on equipment selected. A rail gage of 40 ft is standard for new cranes, except at container terminals or where it is necessary to conform to gages of existing tracks. When cranes are furnished, the distance from the waterside cranerail to the edge of the pier or wharf should be adequate to provide clearance for bollards, cleats, capstans, pits housing outlets for ship services, crane power conductors, and other equipment. Where aircraft carriers or other ship types with large deck overhangs are anticipated to be berthed, the cranerail should be located so that all parts of the crane will clear the deck overhang. For discussion of crane power conductors, see Naval Facilities Engineering Command NAVFAC DM-38.01, Weight Handling Equipment.

2.2.3.4 Railroad Tracks. For supply and ammunition piers and wharves, railroad service should be considered. Except where local conditions require otherwise, standard gage should be used for trackage. For standard gage and spacing between adjacent tracks, see Naval Facilities Engineering Command NAVFAC DM-5.06, Civil Engineering - Trackage. Width of piers and wharves should be adequate to allow passing of trains and forklift trucks (or other material-handling equipment). Allowances should also be made for stored cargo and other obstructions.

2.2.3.5 Trucks and Other Vehicles. A variety of service trucks and vehicles can be expected to use piers and wharves for moving personnel, cargo, containers, and supplies to and from the ships. The width provided must take into account operation and maneuvering of such vehicles. Turnaround areas should be provided.

2.2.3.6 Sheds and Buildings. Pier and wharf deck is usually too expensive an area for storage sheds, which should therefore be located on land to be cost-effective. However, small buildings to provide for berthing support and storage of equipment may sometimes need to be accommodated on deck.

2.2.3.7 Movable Containers and Trailers. During active berthing of ships, various containers of different sizes are temporarily or permanently located on pier deck to support the operations. These include shipyard tool boxes, garbage dumpsters, training trailers, and supply trucks. Adequate deck space should be available for locating and accessing these containers and trailers.

2.2.3.8 Fire Lane. For piers, provide a 15-foot-wide unobstructed fire lane independent of net operating width requirements. Locate and mark the lane near the longitudinal pier centerline. For wharves, provide a 15-foot-wide

unobstructed fire lane immediately adjacent to the operating area. These requirements should not be applied to small craft or yard craft piers.

2.2.3.9 Fuel-Handling Equipment. At specified berths, stationary fuel-handling equipment consisting of self-adjusting loading arms are often furnished to offload fuel products from tankers to onshore storage facilities. Pier or wharf width requirements depend on equipment selected and facilities furnished.

2.2.3.10 Phased Maintenance Activities (PMA). At some naval stations, PMA performed at berthing piers will be of significant magnitude. Requirements for space and pier dimensions due to PMA should be considered for these piers. For additional information, see Naval Civil Engineering Laboratory NCEL TM-5, Advanced Pier Concepts, Users Data Package. The four levels of PMA and their estimated space requirements are as follows and as detailed in Table 3.

a) Intermediate Maintenance Availability (IMA). IMA consists of removal and repair of shipboard equipment performed by Shore Intermediate Maintenance Activity (SIMA) personnel or tender forces, with a duration of approximately 30 days. Gross deck requirements range from 2000 to 3000 ft^2 with work area dimensions varying from 30 x 65 ft to 30 x 100 ft.

b) Planned Restricted Availability (PRA). PRA consists of limited repairs of shipboard equipment and systems by contract forces under Supervisor of Shipbuilding and Repairs (SUPSHIP) control, with a duration of 30 to 60 days. Gross deck area requirements are about 10,800 ft^2 (35 x 310 ft) of command and storage area could be on the lower level.

c) Selected Restricted Availability (SRA). SRA consists of expanded repairs and/or minor ship alterations to shipboard equipment and systems by SUPSHIP contract forces, with a duration of approximately 60 days. Gross deck area requirements are about 18,000 ft^2 (35 x 515 ft). On a double-deck pier with adequate clearance, about 5000 ft^2 of command and operational area could be on the lower level.

d) Regular Overhaul (ROH). ROH consists of major repairs and ship alterations to shipboard equipment and systems by SUPSHIP contract forces, with a duration of six to eight months. Gross deck area requirements are about 23,000 ft^2 (35 x 660 ft). In addition, there would be a requirement for turnaround areas on deck and warehousing off the pier or wharf. On a double-deck pier, up to 8000 ft^2 of command and operational area could be on the lower level.

2.4.4 Roadway Deck Elevation. The requirements for pier and wharf deck elevation are also applicable to the approaches. Where the adjacent land is higher or lower than pier or wharf, the approach can be sloped up or down to serve as a transition ramp. For approaches longer than 100 ft, the slope should be limited to 6 percent.

2.4.5 Number of Approaches

2.4.5.1 One Approach. For fueling and degaussing/deperming facilities, at least one single-lane approach structure should be provided, unless the facility is built as an island wharf or pier with access by watercraft.

2.4.5.2 Two Approaches

a) Where volumes of vehicular movements are large, at least two approaches should be provided to ensure continuous uninterrupted traffic flows from pier or wharf to shore. At multiple-berth facilities, approach structures at least every 500 ft should be considered.

b) Where the width of the pier or wharf is not sufficient to permit turning of vehicles, two approaches should be provided. Thus, vehicular traffic may enter and leave the facility without having to turn around. Generally, as it is easier for a truck in tight quarters to negotiate a left turn, traffic patterns should be designed to favor left turns.

2.4.5.3 Railroad Access. Where railroad access is planned, a separate approach is not necessary. However, a separate walkway should be considered.

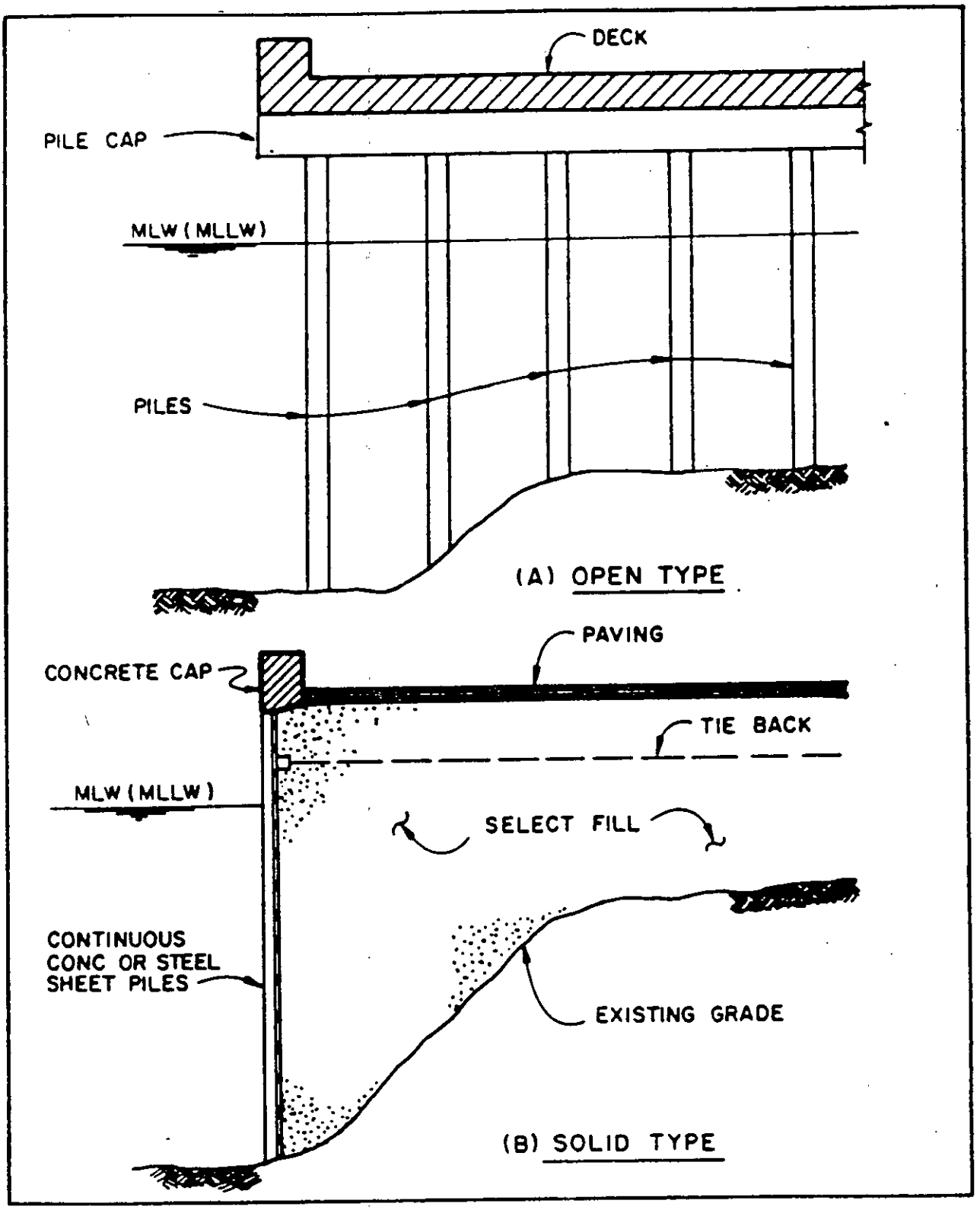
2.4.6 Turning Room. At the intersection of approach and piers and wharves, fillets or additional deck area should be provided at corners to allow for ease in executing turns. Where a one-lane approach roadway is provided as the only access, the pier or wharf should have sufficient turnaround space on the facility so that outgoing vehicles do not have to back out along the approach.

2.4.7 Safety Barriers. On all approaches, provide safety barriers adequate for the type of traffic using the facility (pedestrian, vehicular, and/or rail). However, safety barriers should not be provided in areas where mission operations, such as ship or small-craft berthing, are performed. Rail-only approaches do not normally require safety barriers. Traffic and pedestrian barrier design shall conform to AASHTO Guide Specifications for Bridge Railings and AASHTO Bridge Guide and Manual Interim Specifications.

2.5 Structural Types

2.5.1 General. The three major structural types for piers and wharves are open, solid, and floating. Open-type piers and wharves are pile-supported platform structures which allow water to flow underneath. Figure 8(A) illustrates the open type. Solid type uses a retaining structure

such as anchored sheet pile walls or quaywalls, behind which a fill is placed to form the working surface. Solid type will prevent streamflow underneath. Figure 8(B) illustrates the solid structural type. Floating type is a pontoon structure that is anchored to the seabed through spud piles or tension lines and connected to the shore by bridges or ramps. The top of the pontoon can be utilized as the working deck, as shown in Figure 9(A), or a separate column-supported working deck can be constructed on top of the pontoon, as shown in Figure 9(B). Floating structures by definition are not affected by tidal fluctuations, but they do interrupt the streamflow to some extent.



AMERICAN BUREAU OF SHIPPING (ABS)

Rules for Building and Classing Offshore Installations - Part 1 Structures

(Unless otherwise indicated, copies are available from American Bureau of Shipping (ABS), New York, NY 10006.)

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

Guide Specifications for Bridge Railings

Bridge Guide and Manual Specifications

(Unless otherwise indicated, copies are available from American Association of State Highway and Transportation Officials, 444 N. Capitol Street, N.W., Washington, DC 20001.)

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PROJECT NO.
FACR-1126