

165 DREDGING

Original dredging such as channel and turning basin dredging not directly related to the specific construction of a facility, is planned under Basic Category 165. Dredging performed primarily to provide fill shall be coded under Basic Category 932, Site Improvement. Dredging directly related to the specific construction of an item shall bear the same code as the item. Do not use this category code for inventory purposes.

165 10 DREDGING (CY)

Dredging is planned to provide operating channels, maneuvering area, anchorages and moving basins for ships. Generally, harbor-area depths vary. Certain areas are set aside for the use of small craft and other areas for the use of larger ships. Depth requirements for channels differ from those at anchorages and berths. No matter which area is under consideration, provisions of adequate depth and all anticipated water levels is essential. A tabulation of some of the characteristics of auxiliary and combatant vessels as well as service craft is given in Table 151-10. Where harbor design requires critical clearances for a particular vessel type or condition, specific verification by NAVSEA Ship Logistics Manager is required.

Anchorage and Berthing Depth are identical for any specific type vessel. The minimum required depth for an undamaged vessel is estimated by adding 4 feet to the maximum navigational draft for the type of vessel indicated in Table 151-10. However, in all instances, the required minimum berthing depth for all undamaged aircraft carriers, battleships and fast combat support ships is 50.0 feet. The minimum required depth for floating dry-docks is determined by adding 2 feet to the maximum navigational draft for this type of vessel indicated in Table 151-10.

Channel Depths for fully operational channels protected from direct storm-wave attack are determined by using a ratio of channel depth to navigational draft. The optimum ratio of the largest vessel should be 1.3 for vessels speeds of less than 7 knots and 1.5 for vessels speeds in excess of 7 to 8 knots. At these ratios, the bottom effects on vessel handling become negligible. In many instances, these desired depths are not attainable. For general design minimum used in preliminary harbor planning, but subject to subsequent detailed analysis, use the approximation indicated as follows:

Vessel Type	Channel Depth
CV, AOE & BB	45
CG	36
Destroyers, submarines and auxiliary ships	Maximum navigational draft plus 5
Small craft	12 to 15

Channel Widths for interior channels protected from open sea water and strong coast currents are determined by the dimensions shown in Figure 165-10 where B = beam of vessel.

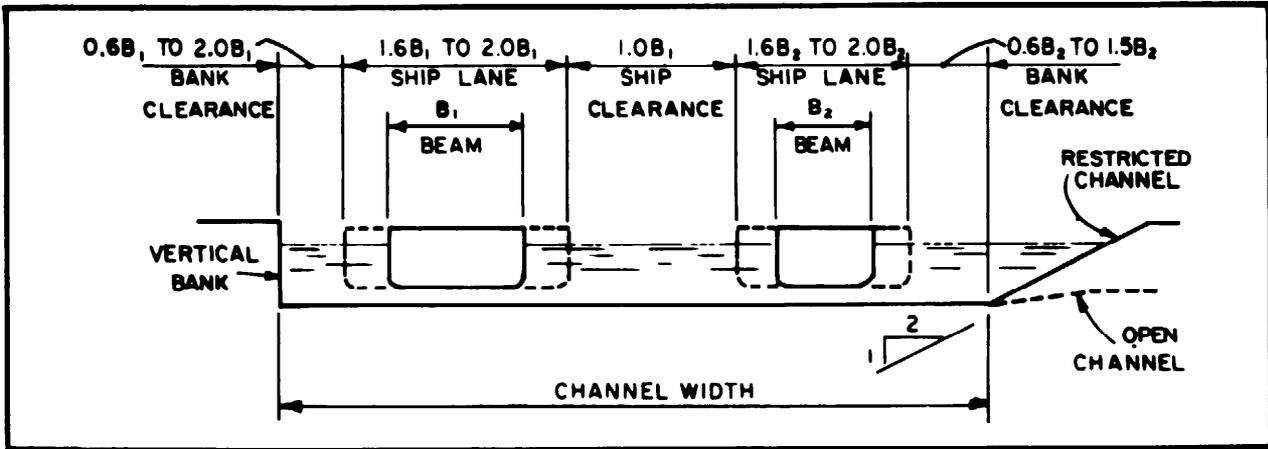


FIGURE 165-10
Dimensioning Protected Interior Channels

(1) Ship-Lane Widths. Where good operating conditions (that is, a maximum ship speed of 10 knots, currents less than 3 knots, good visibility, and wind less than 15 knots) exist, the following ship-lane widths should be used:

<u>Vessel Maneuvering characteristics</u>	<u>Lane Width as a Multiple of Beam</u>
Excellent--CG and DD	1.6
Good--FFG, CV, AOE, BB, and LSD 36	1.8
Poor--Submarines, Tenders, AE, and AS	2.0

(2) Ship Clearance. Ship clearance is normally assumed to be equal to the beam at waterline of the largest vessel. Where a channel is to be frequently used by aircraft carriers having large overhanging decks, increase the clearance between ship lanes to maximum vessel breadth.

(3) Bank Clearance. Vessels traveling in restricted waterways experience hydrodynamic suction from the banks. This is offset by rudder-angle adjustment.

In addition to rudder-angle and vessel-handling criteria, overall vessel safety must be considered in determining bank-clearance distance. In an open channel, the markings of the channel limits may not be as fully defined as in a restricted channel. This can be compounded in times of poor visibility. Similarly, where there exists a high damage probability for grounding, as in the case of an underwater rock ledge, additional bank-clearance margins should be considered. Extra allowance should also be made where the channel is subject to siltation from the side slopes. Under conditions such as those mentioned above, the minimum desired bank clearance for design purposes should be equal to the beam of the largest vessel frequenting the harbor. For open channels with steeper than 1-on-3 side slopes, this minimum clearance should be 1.2 times the beam.

Anchorage and Turning Basins. Naval Activities planned for locations abutting sheltered waters of large extent but inadequate overall depth frequently require, in addition to the dredged channel access, area of sufficient size and depth for use as anchorages or turning basins. These areas in the bays or estuaries of coastal waters should be selected initially to acquire the advantages of natural channels which, in the case of anchorages, may connect widely separated but acceptable areas. Turning basins at the inboard end of dredged channels should be shaped and dimensioned with due consideration for the orientation of the wharves and for the size and turning characteristics of the ships to be accommodated. At marginal wharves, sufficient deep water must be left beyond the ends of the wharves for maneuvering from the wharf to the basin.

For a detail analysis of design requirements affecting this category code see NAVFAC DM 25 and DM 26 Series for additional information.