

where P_1 is defined in §45.55 and D is the depth for freeboard in feet.

(b) Except as required in paragraph (c) of this section, the minimum freeboard in summer for a type B vessel is F in the formula modified by the corrections in this subpart:

$$F \text{ (inches)} = 12 \times P_1 \times D$$

where P_1 is defined by §45.55 and D is the depth for freeboard in feet.

(c) Seasonal freeboards assigned under §§45.71 through 45.75 must be calculated on the basis of the summer freeboard calculated under paragraph (a) or (b) of this section.

(d) If a minimum freeboard is required for a vessel under this part which is greater than that required by paragraph (a) or (b) of this section because of scantling or subdivision requirements, the summer freeboard and the seasonal freeboards assigned under this subpart must be no less than that minimum freeboard, except the mid-summer seasonal freeboard may be calculated on the basis of the summer freeboard assigned under this paragraph.

(e) If a greater than the calculated minimum freeboard is requested by the applicant for the load line certificate, that greater freeboard may be assigned as the summer freeboard and—

(1) The intermediate and winter seasonal freeboards assigned must be calculated under paragraph (a) or (b) of this section; and

(2) The midsummer seasonal freeboard must be calculated on the basis of the summer freeboard assigned under this paragraph.

§ 45.55 Freeboard coefficient.

(a) For ships less than 350 feet in length (L), the freeboard coefficient is P_1 in the formula:

$$P_1 = P + A[(L/D) - (L/D_s)]$$

where P is a factor, which is a function of the length from table 1 and “ A ” is a coefficient, which is a function of length (L), from table 2; L/D is the ratio of the length (L) to the depth for freeboard (D); L/D_s is the ratio of the length (L) to a standard depth (D_s) from table 3.

D is not to be used as less than that which will give a ratio of L to D that is:

(a) More than 15 when $L=400$ feet or less, or

(b) More than 21 when $L=700$ feet or more, with the ratio for intermediate lengths being calculated proportionately.

(b) For ships 350 feet or more in length (L), the coefficient “ A ” is zero and the formula is:

$$P_1 = P$$

where P is a factor, which is a function of length from table (1).

§ 45.57 Correction: Position of deckline.

(a) Where the depth to the upper edge of the deckline is greater or less than D , the difference between the depths must be added to or deducted from the freeboard.

(b) When the Commandant or the approved assigning authority approves a location for the deckline that is above or below the freeboard deck, the minimum summer freeboard must be corrected by—

(1) Adding the difference between the depth and D if the depth is greater than D ; and

(2) Subtracting the difference between the depth and D , if the depth is less than D .

(c) Except for the adjustment allowed in paragraph (b) of this section, no freeboard of less than 2 in. may be assigned.

§ 45.58 Correction: Short superstructure.

The minimum freeboard in summer for a type B vessel that is 79 ft. or more but less than 500 ft. in length and has enclosed superstructures with an effective length of 25 percent or less of the length of the vessel must be increased by—

$$0.03 (500 - L) (0.25 - E/L) \text{ inches}$$

where:

(L)=length of vessel in feet;

(E)=effective length of superstructure in feet as defined in §45.59.

§ 45.59 Definitions for superstructure corrections.

For the purpose of §§45.58 through 45.61—

(a) The standard height of a superstructure (H^s) other than a raised quarter deck and the standard height of a trunk (H^t) is determined by the formula:

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$$H^S = [6.0 + (L/300)] \text{ ft}$$

(b) The length of superstructure (*S*) is the length of those parts of the superstructure which extends to the sides of the vessel and that lie within the length (*L*).

(c) The effective length (*E*) of a trunk is its length in the ratio of its mean breadth to *B*.

(d) The effective length (*E*) of an enclosed superstructure of standard height or greater is its length "*S*".

(e) Where the height of an enclosed superstructure or trunk is less than the standard height (*H_s*), the effective length (*E*) is its length reduced in the ratio of its height to *H_s*.

(f) The effective length (*E*) of a raised quarter deck of $\frac{2}{3}$ *H_s* or greater that has no openings in the front bulkhead is its length up to a maximum of 0.6*L*.

(g) The effective length (*E*) of a raised quarter deck of less than $\frac{2}{3}$ *H_s* or that does not have an intact front bulkhead is its length reduced by the ratio of its height to *H_s*.

TABLE 12(1)
TABLES OF P VALUES

Length of Ship (feet)	Value of P
80	0.1100
90	0.1136
100	0.1172
110	0.1208
120	0.1244
130	0.1281
140	0.1318
150	0.1355
160	0.1393
170	0.1430
180	0.1468
190	0.1506
200	0.1545
210	0.1583
220	0.1622
230	0.1661
240	0.1700
250	0.1740
260	0.1780
270	0.1820
280	0.1860
290	0.1900
300	0.1941
310	0.1982
320	0.2023
330	0.2065
340	0.2106
350	0.2148
360	0.2190
370	0.2233
380	0.2275
390	0.2318
400	0.2361
410	0.2400
420	0.2437

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TABLE 12(1)—Continued
TABLES OF P VALUES

Length of Ship (feet)	Value of P
430	0.2472
440	0.2506
450	0.2537
460	0.2567
470	0.2595
480	0.2621
490	0.2645
500	0.2667
510	0.2688
520	0.2706
530	0.2723
540	0.2738
550	0.2751
560	0.2762
570	0.2772
580	0.2779
590	0.2785
600	0.2788
610	0.2790
620	0.2790
630	0.2789
640	0.2785
650	0.2779
660	0.2772
670	0.2768
680	0.2760
690	0.2751
700	0.2740
710	0.2728
720	0.2715
730	0.2700
740	0.2684
750	0.2667
760	0.2648
770	0.2628
780	0.2607
790	0.2584
800	0.2560
810	0.2532
820	0.2504
830	0.2476
840	0.2448
850	0.2420
860	0.2392
870	0.2364
880	0.2336
890	0.2308
900	0.2280
910	0.2252
920	0.2224
930	0.2196
940	0.2168
950	0.2140
960	0.2112
970	0.2084
980	0.2056
990	0.2028
1000	0.2000

TABLE 12(2)
VALUES OF "A" FOR USE IN THE EXPRESSION
 $P_1 = P + "A" (L/D - L/D_s)$

Length of Ship (feet)	Value of "A"
80	0.00864
90	0.00806
100	0.00750
110	0.00696

TABLE 12(2)—Continued
VALUES OF "A" FOR USE IN THE EXPRESSION
 $P_1 = P + "A" (L/D - L/D_s)$

Length of Ship (feet)	Value of "A"
120	0.00644
130	0.00594
140	0.00546
150	0.00500
160	0.00456
170	0.00414
180	0.00374
190	0.00336
200	0.00300
210	0.00266
220	0.00234
230	0.00204
240	0.00176
250	0.00150
260	0.00126
270	0.00104
280	0.00084
290	0.00066
300	0.00050
310	0.00036
320	0.00024
330	0.00014
340	0.00006
350	0.00000

TABLE 12(3)
VALUES OF L/D_s

Length of Ship (feet)	Value of L/D _s
80	6.50000
90	6.76563
100	7.03125
110	7.29688
120	7.56250
130	7.82813
140	8.09375
150	8.35938
160	8.62500
170	8.89063
180	9.19625
190	9.42188
200	9.68750
210	9.95313
220	10.21875
230	10.48438
240	10.75000
250	11.01563
260	11.28125
270	11.54688
280	11.81250
290	12.07813
300	12.34375
310	12.60938
320	12.87500
330	13.14063
340	13.40625
350	13.67188
360	13.93750
370	14.20313
380	14.46875
390	14.73438
400	15.00000

- (h) Superstructures which are not enclosed have no effective length.
- (i) When a lower deck is designated as the freeboard deck, that part of the

hull which extends above the freeboard deck is treated as a superstructure so far as concerns the application of the conditions of assignment and the calculation of freeboard.

(j) A bridge or poop is enclosed only when access is provided whereby the crew may reach accommodations, machinery, or other working spaces inside the superstructure by alternative means that are available at all times when bulkhead openings are closed.

§ 45.61 Correction for superstructures and trunks.

(a) Where the effective length E of superstructures and trunks that meet the requirements of subpart D of this part is $1.0L$, the minimum summer freeboard may be corrected by subtracting $\frac{1}{2}H_s$.

(b) Where the effective length of superstructures and trunks is less than $1.0L$ the minimum summer freeboard may be corrected by subtracting a percentage of one-half of the standard superstructure height (H_s) determined by the formula:

$$\text{Percentage} = (E/2L) (1 + E/L) \times 100$$

(c) To be eligible for the correction a trunk must—

- (1) Be at least as strong and as stiff as a superstructure;
- (2) Have no opening in the freeboard deck in way of the trunk, except small access openings;
- (3) Have hatchway coamings and covers that meet §§ 45.143 through 45.147;
- (4) Provide a permanent working platform fore and aft with guardrails;
- (5) Provide fore and aft access between detached trunks and superstructures by permanent gangways;
- (6) Be at least 60 percent of the breadth of the ship in way of the trunk; and
- (7) Be at least $0.6 L$ in length, if no superstructure, is provided.

§ 45.63 Correction for sheer.

(a) The minimum summer freeboard must be increased by the deficiency, or may be decreased by the excess as limited by § 45.65, of sheer calculated from table 4, multiplied by:

$$0.75 - (S/2L)$$

where S is the total length of enclosed superstructures. Trunks are not included.