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Title 46 – Shipping

Chapter I – Coast Guard, Department of Homeland Security

Subchapter E – Load Lines

Part 45 Great Lakes Load Lines

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Load Line Certificate Form

PART 45—GREAT LAKES LOAD LINES

Authority: 46 U.S.C. 5104, 5108; Department of Homeland Security Delegation No. 0170.1.

Source: CGD 73-49R, 38 FR 12290, May 10, 1973, unless otherwise noted.

Subpart A—General

§ 45.1 Purpose.

This part prescribes requirements for assignment of freeboards, issuance of loadline certificates, and marking of loadlines for service on the Great Lakes of North America.

[CGD 73-49R, 38 FR 12290, May 10, 1973, as amended by USCG-1998-4442, 63 FR 52190, Sept. 30, 1998]

§ 45.3 Definitions.

As used in this part:

- (a) **Length (L)** means 96 percent of the total length on a waterline at 85 percent of the least moulded depth measured from the top of the keel or the length from the foreside of the stem to the axis of the rudder stock on that waterline, if that is greater. In ships designed with a rake of keel the waterline on which this length is measured must be parallel to the designed waterline.
- (b) **Perpendiculars** means the forward and after perpendiculars at the forward and after ends of the length (L). The forward perpendicular coincides with the foreside of the stem on the waterline on which the length is measured.
- (c) **Amidships** means the middle of the length (L).
- (d) **Breadth** unless expressly provided otherwise, means the maximum breadth of the ship, measured amidships to the moulded line of the frame in a ship with a metal shell and to the outer surface of the hull in a ship with a shell of any other material.
- (e) **Moulded Depth** means the vertical distance measured amidships from the top of the keel to the top of the freeboard deck beam at side except that—
 - (1) In vessels of other than metal construction, the distance is measured from the lower edge of the keel rabbet;

- (2) Where the form at the lower part of the midship section is of a hollow character, or where thick garboards are fitted, the distance is measured from the point where the line of the flat of the bottom continued inwards cuts the side of the keel;
 - (3) In ships having rounded gunwales, this distance is measured to the point of intersection of the moulded lines of the deck and side, the lines extending as though the gunwale were of angular design; and
 - (4) Where the freeboard deck is stepped and the raised part of the deck extends over the point at which the moulded depth is to be determined, the distance is measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part.
- (f) **Depth for Freeboard (D)** means—
- (1) Moulded depth amidships plus the thickness of the stringer plate with no allowance for sheathing; and
 - (2) In a vessel having a rounded gunwale with a radius greater than 4 percent of the breadth (B) or having topsides of unusual form, the depth for freeboard (D) of a vessel having a midship section with vertical topsides and with the same round of beam and area of topside section equal to that provided by the actual midship section.
- (g) **Freeboard** means the distance measured vertically downwards amidships from the upper edge of the deck line to the upper edge of the related load line.
- (h) **Freeboard Deck** means, normally, the uppermost complete deck exposed to weather and sea that has permanent means of closing all openings in the weather part thereof and below which all openings in the sides of the ship are fitted with permanent means of watertight closings except that—
- (1) In a ship having a discontinuous freeboard deck, the lowest line of the exposed deck and the continuation of that line parallel to the upper part of the deck is the freeboard deck.
 - (2) At the option of the owner and subject to the approval of the Commandant a lower deck may be designated as the freeboard deck, if it is a complete and permanent deck continuous in a fore and aft direction at least between the machinery space and peak bulkheads and continuous athwartships;
 - (3) When this lower deck is stepped the lowest line of the deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck.
- (i) **Superstructure** means a deck structure on the freeboard deck, extending from side to side of the ship or with the side plating not being inboard of the shell plating more than 4 percent of the breadth (B). A raised quarterdeck is a superstructure.
- (j) **Enclosed superstructure** means a superstructure with enclosing bulkheads.
- (k) **Height** of a superstructure means the least vertical height measured at side from the top of the superstructure deck beams to the top of the freeboard deck beams.
- (l) **Length of a superstructure (S)** means the mean length of the part of the superstructure which extends to the sides of the vessel and lies within the length (L).
- (m) **Flush deck ship** means a ship that has no superstructure on the freeboard deck.
- (n) **Weathertight** means that in any sea conditions water will not penetrate into the ship.

- (o) **Watertight** means designed to withstand a static head of water.
- (p) **Exposed positions** means exposed to weather and sea.
- (q) **Intact bulkhead** with respect to superstructure means a bulkhead with no openings.
- (r) **Steel** means steel and materials with which structures can be made equivalent to steel with respect to such parameters as yield strength, total deflection, flexural life, or resistance to galvanic or stress corrosion.

[CGD 73-49R, 38 FR 12290, May 10, 1973, as amended by USCG-2014-0688, 79 FR 58280, Sept. 29, 2014]

§ 45.5 Seasonal application of load lines.

For the purposes of the law and regulations prohibiting submergence of load lines (46 U.S.C. 88c; 46 CFR 42.07-10), the fresh water and salt water load lines marked under this part apply during the following seasons:

- (a) Summer load lines apply April 16 through April 30 and September 16 through September 30.
- (b) Except for hopper dredges operating at working freeboards in accordance with subpart C of part 44 of this chapter, the Assigning Authority may not allow for lesser freeboards.
- (c) Intermediate load lines apply October 1 through October 31 and April 1 through April 15.
- (d) Winter load lines apply November 1 through March 31.

§ 45.9 Seasonal application of load lines for vessels not marked under this part.

- (a) For the purposes of the law and regulations prohibiting submergence of load lines (46 U.S.C. 88c; 46 CFR 42.07-10) the marks assigned to vessels holding international load line certificates apply during the following seasons:
 - (1) Vessels assigned freeboards as new vessels under the International Load Line Convention, 1966—
 - (i) Winter—November 1 through March 31.
 - (ii) Summer—April 1 through April 30 and October 1 through October 31.
 - (iii) Tropical—May 1 through September 30;
 - (2) Vessels assigned freeboards as existing vessels under the International Load Line Convention, 1966—
 - (i) Winter—November 1 through March 31;
 - (ii) Summer—April 1 through April 30 and October 1 through October 31;
 - (iii) Tropical—September 16 through September 30;
 - (iv) Tropical Fresh—May 1 through September 15.
- (b) Except for hopper dredges operating at working freeboards in accordance with subpart C of part 44 of this chapter, the Assigning Authority may not allow for lesser freeboards.

[CGD 73-49R, 38 FR 12290, May 10, 1973, as amended by CGD 76-080, 54 FR 36977, Sept. 6, 1989]

§ 45.11 Issue of load line certificate.

- (a) A vessel 79 feet in length and more, and 150 gross tons or over, the keel of which is laid or which has reached a similar stage of construction after April 14, 1973, must meet the requirements of this part.
- (b) Except as prescribed in paragraph (a) of this section, any vessel that meets the requirements in subparts C and D of this part and the survey requirements in §§ 42.09-15 through 42.09-50 of this subchapter is entitled to assignment of freeboards and issue of a load line certificate under this part by the Commandant or his authorized representative.
- (c) A vessel, the keel of which was laid or was at a similar stage of construction before April 14, 1973, that meets the requirements of this part that were in effect before April 14, 1973, and the survey requirements in §§ 42.09-15 through 42.09-50 of this subchapter is entitled to the assignment of freeboards calculated under the provisions of this part in effect before April 14, 1973, and to a load line certificate issued under this part by the Commandant or his authorized representative.

§ 45.13 Form of certificate.

The form of a load line certificate issued under this part is specified in appendix A to this part.

§ 45.15 Exemptions.

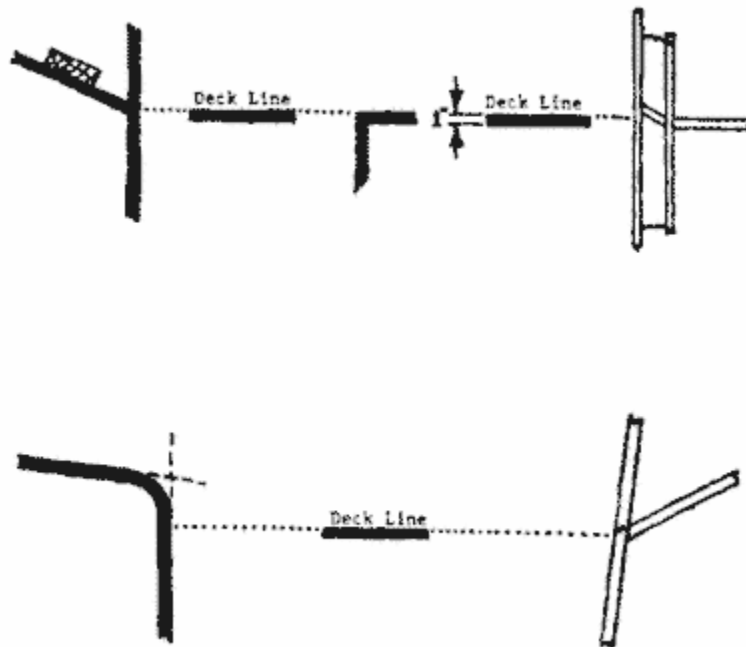
- (a) The Commandant may exempt a ship from any of the requirements in this part if the chairman of the board of Steamship Inspections, Department of Transport, Canada, and the Commandant agree that the sheltered nature or the condition of that voyage make it unreasonable or impracticable to apply requirements of this part.
- (b) The Commandant may exempt a vessel that embodies features of a novel kind from any of the requirements of this part if those requirements might seriously impede research into the development of such features and their incorporation in ships. Any such vessel must comply with the safety requirements that, in the opinion of the Commandant, are adequate for the service for which the vessel is intended and will insure the overall safety of the vessel. If the Commandant grants an exemption pursuant to this paragraph he communicates the details of the exemption and the reasons therefor to the chairman of the board of Steamship Inspections.
- (c) A vessel that is not normally engaged on voyages to which this part applies but that, in exceptional circumstances, is required to undertake a single such voyage between two specific ports may be exempted by the Commandant from any of the requirements of this part, if the ship complies with safety requirements that, in the opinion of the Commandant are adequate for the voyage that is to be undertaken by the vessel.
- (d) Unmanned dry cargo river barges carrying non-hazardous cargoes on certain routes on Lake Michigan may be exempted from load line requirements in accordance with the conditions specified in subpart E of this part.

[CGD 73-49R, 38 FR 12290, May 10, 1973, as amended by CGD 84-058, 50 FR 19533, May 9, 1985; USCG-1998-4623, 67 FR 19690, Apr. 23, 2002]

Subpart B—Load Line Marks

§ 45.31 Deck line.

- (a) Each vessel must be marked with a deck line on the outer surface of the shell on each side of the vessel with the upper edge of the line passing through the point where the upper surface of the freeboard deck intersects the outer surface of the shell or if the summer freeboard is correspondingly adjusted under § 45.57, the deck line may be placed above or below the freeboard deck. Figure 1 illustrates the deck line markings.
- (b) Each deck line must be at least 12-inches long and 1-inch wide.

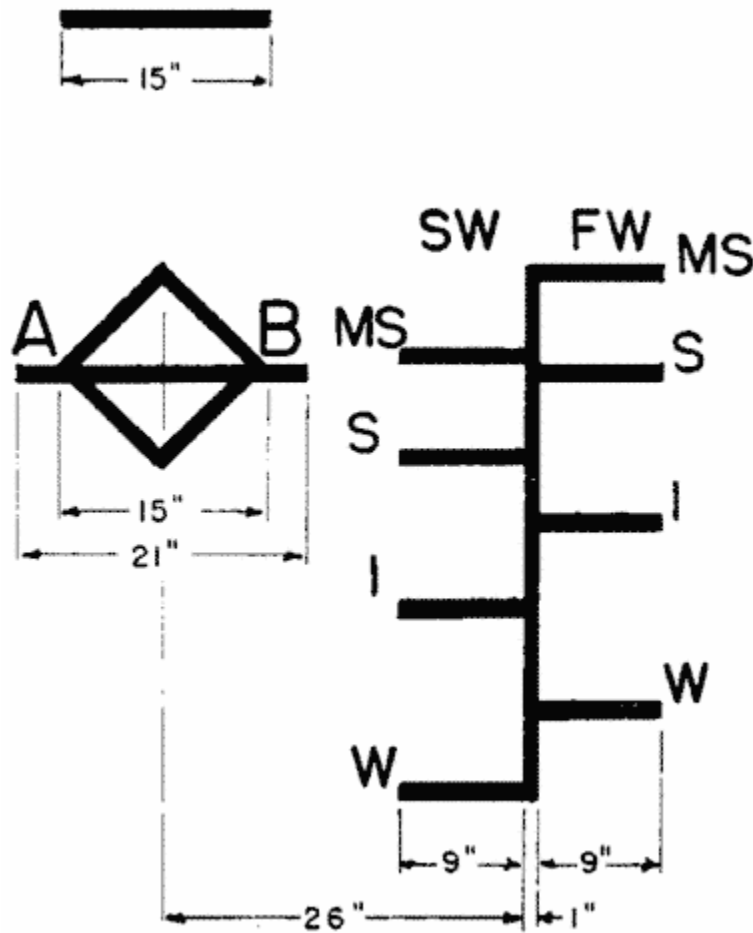


§ 45.33 Diamond.

- (a) Each vessel must be marked with the diamond mark described in figure 2 of § 45.35 amidships below the upper edge of the deck line on each side with the center of the loadline mark at a distance below the deck line equal to the summer freeboard assigned under this part.
- (b) The width of each line in the loadline mark must be 1 inch.

§ 45.35 Seasonal load lines.

Each vessel must have the summer (S), midsummer (MS), intermediate (I), and winter (W) loadlines for fresh water freeboards calculated under §§ 45.71 through 45.75 marked in accordance with § 45.39.



§ 45.37 Salt water load lines.

Each vessel that operates in the salt water of the St. Lawrence River must—

- (a) Be marked with the summer (S), midsummer (MS), intermediate (I) and winter (W) load line marks under § 45.77 for salt water; and
- (b) Be marked with the letters “FW” above the fresh water marks and the letters “SW” above the salt water marks as described in figure 2.

§ 45.39 Marking.

- (a) The diamond, lines, and letters must be painted in white or yellow on a dark ground or in black on a light ground and permanently marked on the sides of the vessel.
- (b) The upper edge of the line that passes through the center of the diamond must indicate summer freeboard assigned under § 45.53.
- (c) Unless otherwise authorized the seasonal load lines must be horizontal lines extending forward of, and at right angles to, a vertical line marked at a distance 26 inches forward of the vertical centerline of the diamond as described in figure 2.
- (d) The salt water load lines must be horizontal lines extending abaft the vertical line required by paragraph (b) of this section as described in figure 2.

- (e) The upper edge of each seasonal and salt water load line mark must indicate the minimum freeboard for that mark.
- (f) When two freeboards assigned under this part differ by 2 inches or less, the line for the lesser freeboard must be omitted and the line for the greater freeboard must be identified with the seasonal letters for both freeboards.
- (g) Seasonal freeboards that are limited by a summer freeboard assigned under § 45.53(c) must not be marked but the identifying letter must be marked adjacent to the summer mark.
- (h) The identity of the authority that assigns the freeboard must be indicated alongside the load line diamond above the horizontal line that passes through the center of the diamond with two initials approximately 4¹/₂ inches high and 3 inches wide.

Subpart C—Freeboards

§ 45.51 Types of ships.

- (a) For the purpose of this subpart, a type A vessel has—
 - (1) No cargo ports or similar sideshell openings below the freeboard deck;
 - (2) Only small freeboard deck openings fitted with watertight gasketed hatch covers of steel;
 - (3) No dimension of a freeboard deck cargo opening greater than 6 feet and the total area not exceeding 18 ft²; and
 - (4) No more than two freeboard deck cargo openings to a single cargo space.
- (b) For the purposes of this subpart a type B vessel is a vessel that does not meet the requirements in paragraph (a) of this section.

§ 45.53 Summer freeboard.

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

$$F \text{ (inches)} = 10.2 \times P_1 \times D$$

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 midsummer 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 ration 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:
 $H^s = [6.0 + (L/300)]$ 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 $0.6L$.
- (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

Length of Ship (feet)	Value of P
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
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

Length of Ship (feet)	Value of P
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

Length of Ship (feet)	Value of P
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
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

Length of Ship (feet)	Value of "A"
340	0.00006
350	0.00000

TABLE 12(3)
VALUES OF L/D₅

Length of Ship (feet)	Value of L/D ₅
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

Length of Ship (feet)	Value of L/D_5
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.

§ 45.65 Excess sheer limitations.

The decrease in freeboard allowed in § 45.63 is limited as follows:

SHEER CALCULATION—TABLE 4

Station	Actual ordinate	S. M.	Product
After Half:			
AP		1	
L/6-AP		3	
L/3-AP		3	
Midship		1	
Sum of Aft Products			
After Standard Sheer	$.2665L + 26.65^1$		
Difference: Sum-STD			_____ + Excess/-Deficiency
AFT Sheer: Diff ÷ 8			_____ Excess/Deficiency
Fwd. Half:			
FP		1	
L/6-FP		3	
L/3-FP		3	
Midships		1	
Sum of Fwd Products			
Fwd Standard Sheer	$.5330L + 53.30^1$		
Difference: Sum-STD			_____ + Excess/-Deficiency
FWD Sheer: Diff ÷ 8			_____ Excess/Deficiency

¹ L in Standard Sheer = L or 500 whichever is less.

SHEER SUMMATION

Aft Sheer± _____
 Fwd Sheer± _____
 Net Sheer± _____
 Mean: Net-2 _____ Excess/Deficiency

- (a) In vessels having no enclosed superstructure from 0.1 L abaft amidships to 0.1 L forward of amidships, no decrease is allowed.

- (b) In vessels having enclosed superstructures amidships less than 0.1 L before and abaft amidships, the decrease must be reduced by linear interpolation.
- (c) If excess sheer exists in the forward half, and the after half is at least 75 percent of standard sheer, the full decrease is allowed. If the after sheer is between 50 percent and 75 percent of standard sheer an intermediate decrease, determined by linear interpolation, is allowed for the excess sheer forward. If the after sheer is 50 percent of standard or less, no decrease is allowed for the excess sheer forward.
- (d) Where an enclosed poop or forecastle is of standard height with greater sheer than that of the freeboard deck, or is greater than standard height, an addition to the sheer of the freeboard deck may be made using the following formula:

$$S = vL' / 3L$$

Where

s = sheer credit, to be deducted from the deficiency or added to the excess of sheer.

v = difference between actual and standard height of superstructure at the end ordinate.

L' = mean enclosed length of poop or forecastle up to a maximum length of 0.5 L .

The superstructure deck must not be less than standard height above this curve at any point. This curve must be used in determining the sheer profile for forward and after halves of the vessel.

- (e) The maximum decreased for excess sheer must be no more than $1\frac{1}{2}$ inches per 100 feet of length.
- (f) Where the deck of an enclosed superstructure has at least the same sheer as the exposed freeboard deck, the sheer of the enclosed portion of the freeboard deck cannot be taken into account.

§ 45.67 Sheer measurement.

- (a) The sheer is measured from the freeboard deck at side to a line of reference drawn parallel to the keel through the sheer line at amidships;
- (b) In ships designed with a rake of keel or designed to trim by the stern, the sheer must be measured in reference to a line drawn through the sheer line at amidships parallel to the design load waterline.
- (c) In flush deck ships and in ships with detached superstructures, the sheer must be measured at the freeboard deck.
- (d) In ships with a step or break in the topsides, the sheer must be measured from the equivalent depth amidships.
- (e) In vessels with a superstructure of standard height that extends over the whole length of the freeboard deck, the sheer must be measured on the superstructure deck. Where the height of superstructure exceeds the standard, the least difference (Z) between the actual and standard heights must be added to each end ordinate. Similarly, the intermediate ordinates at distance of $\frac{1}{6}L$ and $\frac{1}{3}L$ from each perpendicular must be increased by 0.444 Z and 0.111 Z respectively.

§ 45.69 Correction for bow height.

- (a) The minimum summer freeboard of all manned vessels must be increased by the same amount in inches as any deficiency which may be shown by the following formulas:

(1) For vessels having a length of not less than 79 feet and not greater than 550 feet,
0.593 L (1.0-L/1640) inches—actual bow height

(2) For vessels having a length greater than 550 feet,
(341.6—0.227 L) inches—actual bow height

(b) Where the bow height is obtained by sheer, the sheer must extend for at least 15 percent of the length of the vessel measured from the forward perpendicular.

(c) Where the bow height is obtained by a superstructure, the superstructure must be enclosed and extend from the stem to a point at least 0.06 L abaft the forward perpendicular.

(d) Vessels which, to suit exceptional operational requirements, cannot meet the requirements of paragraph (c) of this section may be given special consideration by the Commandant.

(e) The bow height is defined as the vertical distance at the forward perpendicular between the waterline corresponding to the assigned summer freeboard at the designed trim and the top of the exposed deck at side.

§ 45.71 Midsummer freeboard.

The minimum midsummer freeboard (fms) in inches is obtained by the formula:

$$fms = f(s) - 0.3Ts$$

where:

f(s) = summer freeboard in inches

Ts = distance in feet between top of keel and the summer load line.

§ 45.73 Winter freeboard.

The minimum winter freeboard (fw) in inches is obtained by the formula:

$$fw = f(s) + T s (200)/L$$

where:

L = length L in feet but not less than 400 feet.

§ 45.75 Intermediate freeboard.

The minimum intermediate freeboard (f_i) in inches is obtained by the formula:

$$f_i = f(s) + T s(100)/L$$

where:

L = length L in feet but not less than 400 feet.

§ 45.77 Salt water freeboard.

- (a) The salt water addition in inches to freeboard applicable to each fresh water mark is obtained by the formula:

$$\text{Addition} = \Delta / 41T$$

where:

Δ = displacement in fresh water, in tons of 2,240 pounds, at the summer load waterline.

T = tons per inch immersion, of 2,240 pounds, in fresh water at the summer load waterline.

- (b) When the displacement at the summer load waterline cannot be certified, the addition in inches to the minimum freeboard in fresh water may be obtained by multiplying 0.25 by the summer draught in feet measured from the top of the keel to the center of the load line diamond.

Subpart D—Conditions of Assignment

§ 45.101 Purpose.

This subpart prescribes conditions that a vessel must meet to be eligible for assignment of a loadline under this part.

§ 45.103 Structural stress and stability.

- (a) The nature and stowage of the cargo, ballast, and other variable weights must be such as to make the vessel stable and avoid unacceptable structural stress.
- (b) The vessel must meet all applicable stability and subdivision requirements of this chapter.

§ 45.105 Information supplied to the master.

Unless otherwise authorized by the Commandant, the vessel must have onboard, in a form approved by the Commandant, sufficient information.

- (a) To enable the master to load and ballast the vessel in a manner that avoids unacceptable stresses in the vessel's structure; and
- (b) To guide the master as to the stability of the ship under varying conditions of service.

§ 45.107 Strength of hull.

The general structural strength of the hull must be sufficient for the draught corresponding to the freeboard assigned and must be approved by the Commandant. Ships built and maintained in conformity with the requirements of a classification society may be recognized by the Commandant as possessing adequate strength.

§ 45.109 Strength of superstructures and deckhouses.

Each superstructure or deckhouse used for accommodations of the crew must be approved by the Commandant or the approved assigning authority with regard to general strength and weathertightness. The Commandant may use the requirements of the assigning authority as a guide.

§ 45.111 Strength of bulkheads at ends of superstructures.

Bulkheads at ends of enclosed superstructures must have sufficient strength to withstand impact of boarding seas.

§ 45.113 Access openings in bulkheads at ends of enclosed superstructures.

- (a) Access openings in bulkheads at ends of enclosed superstructures must have doors of steel or material as strong as steel that are permanently attached to the bulkhead and framed, stiffened, and fitted so that the bulkhead and door are as strong as the bulkhead and weather tight when closed.
- (b) The means for securing the doors weathertight must be permanently attached to the doors or bulkheads and arranged so that the doors can be secured weathertight from both sides of the bulkhead.
- (c) Access openings in bulkheads at ends of enclosed superstructures must have sills that are at least 12 inches above the deck.

§ 45.115 Bulwarks and guardrails.

- (a) The exposed parts of freeboard and superstructures decks and deckhouses on the freeboard deck must have guardrails or bulwarks that are at least 36 inches high above the deck.
- (b) Guardrails must have at least three courses with no more than a 9-inch opening below the lowest course and no more than 15 inches between other courses. If the sheer strake projection is at least 8 inches above the deck, a guardrail may have two courses with no more than 15 inches between courses.
- (c) In way of trunks at least half the protection required by paragraph (a) of this section must be in the form of open rails.

§ 45.117 Freeing port area: General.

- (a) Where bulwarks on the weather portions of freeboard or superstructure decks form wells, the bulwarks must have the area prescribed in this section and §§ 45.119 and 45.121 for rapidly freeing and draining the decks of water.
- (b) Except as required in §§ 45.119 and 45.121 the minimum freeing port area in square feet on each side of the ship for each well on the freeboard deck and on the raised quarterdeck must be at least as great as A in the following formulas:
 - (1) Where the length of bulwark (l) in the well is 66 feet or less, $A = 7.6 + 0.115 (l)$
 - (2) Where (l) exceeds 66 feet, $A = 0.23 (l)$but (l) need in no case be taken as greater than $0.7L$.
- (c) In ships having erections on deck that are open at either or both ends, provision for freeing the space within such erections must be approved by the Commandant or the assigning authority.
- (d) The lower edges of the freeing ports must be as near the deck as practicable. Two-thirds of the freeing port area required must be provided in the half of the well nearest the lowest point of the sheer curve.

- (e) All freeing port openings in the bulwarks must be protected by rails or bars spaced approximately 9 inches. If shutters are fitted to freeing ports, ample clearance must be provided to prevent jamming. Hinges must have pins or bearings of noncorrodible material. If shutters are fitted with securing appliances, these appliances must be of approved construction.
- (f) The minimum freeing port area for each well on superstructure decks must be one-half of the area required by paragraph (b) of this section.

[CGD 73-49R, 38 FR 12290, May 10, 1973, as amended by USCG-2014-0688, 79 FR 58280, Sept. 29, 2014]

§ 45.119 Freeing port area: Changes from standard sheer.

The freeing port area required by § 45.117(b) must be multiplied by the factor in the following table 5 if the sheer differs from the standard sheer defined in § 45.63, table 4.

TABLE 5
FREEING PORT AREA: SHEER CORRECTION.

Ratio of sums of actual sheer ord./std. sheer ord. Greater than:	Multiplier for area required by § 45.117(b)
1.0	1.0
1.0	1.00
0.9	1.05
0.8	1.10
0.7	1.15
0.6	1.20
0.5	1.25
0.4	1.30
0.3	1.35
0.2	1.40
0.1	1.45
No sheer	1.50

§ 45.121 Freeing port area: Changes for trunks and side coamings.

If a vessel has a trunk and does not meet the requirements of § 45.61 or has continuous or substantially continuous hatchway side coamings between detached superstructures, the minimum area of the freeing port openings must be obtained from the following table:

Breadth of hatchway or trunk in relation to the breadth of ship	Area of freeing ports in relation to the total area of the bulwarks (percent)
40 percent or less	20
75 percent or more	10

The area of freeing ports at intermediate breadths must be obtained by linear interpolation.

§ 45.123 Freeing port area: Changes for bulwark height.

- (a) For the purposes of freeing port area only, bulwark height is considered standard at 24 in for ships 240 ft in length and less; and 48 in for ships 480 ft in length or greater. The standard bulwark height for ships of intermediate length is obtained by direct interpolation.
- (b) If the bulwark is more than standard height, the area required by § 45.117 must be increased by 0.04 square feet per foot (ft²/ft) of length of well for each foot difference in height.
- (c) For ships greater than 480 ft in length that have an average bulwark height less than 3 ft, the area required by § 45.117 may be decreased by 0.04 ft²/ft of length for each foot difference in height.

§ 45.125 Crew passageways.

The vessel must have means for protection of the crew from boarding seas such as life lines, gangways, and underdeck passages to facilitate passing between their quarters and machinery spaces and other spaces essential to the operation of the ship.

§ 45.127 Position of structures, openings, and fittings.

For the purposes of this part—

- (a) **Position 1** means in an exposed position on—
 - (1) The freeboard deck or a raised quarter deck;
 - (2) A superstructure deck or a trunk deck and forward of a point $\frac{1}{4}L$ from the forward perpendicular; or
 - (3) A trunk deck whose height is less than H_s .
- (b) **Position 2** means—
 - (1) On a superstructure deck aft of a point $\frac{1}{4}L$ abaft the forward perpendicular; or
 - (2) On a superstructure and trunk combination, that is H_s or more in height, aft of a point $\frac{1}{4}L$ abaft the forward perpendicular.

§ 45.129 Hull fittings: General.

Hull fittings must be securely mounted in the hull so as to avoid increases in hull stresses and must be protected from local damage caused by movement of equipment or cargo.

§ 45.131 Ventilators.

- (a) Ventilators passing through superstructures other than enclosed superstructures must have coamings of steel or equivalent material at the freeboard deck.
- (b) Ventilators in position 1 must have coamings at least 30 in. above the deck and ventilators in position 2 must have coamings at least 24 in. above the deck. The Commandant or the assigning authority may also require coamings in other exposed positions.
- (c) Ventilators in position 1 or 2 to spaces below freeboard decks or decks of enclosed superstructures or trunks must have coamings of steel permanently connected to the deck and any ventilator coaming that is more than 36 in. high must be specially supported.
- (d) Except as provided in paragraph (e) of this section ventilator openings must have weathertight closing appliances that are permanently attached or, where approved by the Commandant or the assigning authority conveniently stowed near the ventilators to which they are to be fitted.
- (e) Ventilators in position 1, the coamings of which extend to more than 12.5 ft above the deck, and in position 2, the coamings of which extend to more than 6 ft above the deck, need not have closing appliances unless specifically required by the Commandant.

§ 45.133 Air pipes.

- (a) Where an air pipe to any tank extends above the freeboard or superstructure deck—
 - (1) The exposed part of the air pipe must be made of steel and of sufficient thickness to avoid breaking from impact of boarding seas.
 - (2) The air pipe must have a permanently attached means of closing its opening; and
 - (3) The height from the deck to any point where water may obtain access below deck must be at least 30 in above the freeboard deck, 24 in above raised quarter decks, and 12 in above other superstructure decks.
- (b) If the height required in paragraph (a) of this section interferes with working the ship, the Commandant may approve a lower height after considering the closing arrangements.

§ 45.135 Hull openings at or below freeboard deck.

Closures for hull openings at or below the freeboard deck must be as strong as the structure to which they are attached and must be watertight.

§ 45.137 Cargo ports.

- (a) Unless otherwise authorized by the Commandant, the lower edge of any opening for cargo, personnel, machinery access, or similar opening in the side of a ship must be above a line that is drawn parallel to the freeboard deck at side and has as its lowest point the upper edge of the uppermost loadline.
- (b) The number of cargo ports in the sides of a ship must be—

- (1) No more than the minimum necessary for working the ship; and
- (2) Approved by the Commandant.

§ 45.139 Side scuttles.

- (a) The sill of each side scuttle must be above a line that is drawn parallel to the freeboard deck at side having its lowest point 2.5 percent of the breadth or 20 in above the summer load waterline, whichever is higher.
- (b) Except as provided for in paragraph (c) of this section, each side scuttle to a space below the freeboard deck, or to a space within an enclosed superstructure, must have a hinged inside deadlight which is designed so that it can be secured watertight over the side scuttle.
- (c) A side scuttle of a superstructure end bulkhead door, companionway door, or deckhouse door may have a portable inside deadlight which is designed so that it can be:
 - (1) Secured watertight over the side scuttle; and
 - (2) Stowed inside the superstructure, companionway, or deckhouse when not in use, in a readily accessible location on or adjacent to the door.

[CGD 73-49R, 38 FR 12290, May 10, 1973, as amended by CCGD 80-116, 46 FR 56788, Nov. 19, 1981]

§ 45.141 Manholes and flush scuttles.

Manholes and flush scuttles in position 1 or 2 or within any superstructure other than an enclosed superstructure must have permanently attached covers, unless the cover is secured by closely spaced bolts around its entire perimeter.

§ 45.143 Hull openings above freeboard deck.

Closures for openings above the freeboard deck must be as strong as the structure to which they are attached and must be weathertight.

§ 45.145 Hatchway covers.

- (a) Hatchways in position 1 and 2 must have weathertight hatch covers with gaskets and clamping devices.
- (b) The maximum ultimate strength of the hatchway cover material must be at least 4.25 times the maximum stress in the structure calculated with the following assumed loads:
 - (1) For ships 350 ft or more in length, at least 250 lb/ft² in position 1 and 200 lb/ft² in position 2.
 - (2) For ships less than 350 ft in length, at least AL in the following formula:
 - (i) Position 1:
$$AL = 200 + C$$

where $C = 50(L-79)/271$
 - (ii) Position 2:
$$AI = 150 + C$$

- (c) Hatchway covers must be so designed as to limit the deflection to not more than 0.0028 times the span under the loads described in paragraph (b) of this section and the thickness of mild steel plating forming the tops of covers must be at least 1 percent of the spacing of stiffeners or 0.24 in, whichever is greater.

§ 45.147 Hatchway coamings.

- (a) Except where the Commandant determines that the safety of the vessel will not be impaired in any sea condition, each hatchway must have a coaming that is at least—
 - (1) 18 inches in position 1; and
 - (2) 12 inches in position 2.
- (b) Each hatchway coaming required by this section must be made of steel or equivalent material.
- (c) The height of these coamings may be reduced or omitted if the Commandant is satisfied that safety of the ship is not thereby impaired in any sea conditions.

§ 45.149 Machinery space openings.

- (a) Machinery space openings in position 1 or 2 must be framed and enclosed by steel casings, and where the casings are not protected by other structures that meet the requirements of § 45.109, their strength must be approved by the Commandant or the assigning authority.
- (b) Access openings in casings required by paragraph (a) of this section must have doors complying with the requirements of § 45.113. Other openings in such casings shall be fitted with equivalent covers, permanently attached.
- (c) Except as provided in paragraph (d) of this section, coamings of any funnel or machinery space ventilator that must be kept open for the essential operations of the ship must—
 - (1) In position 1, extend at least 12.5 ft above the deck; and
 - (2) In position 2, extend at least 6 ft above the deck.
- (d) The Commandant may approve a lesser height for protected coamings.
- (e) Coamings of any fiddley or skylight over a machinery space opening in the freeboard or superstructure deck or the top of a deckhouse on the freeboard deck, must have covers of steel permanently attached and capable of being secured weathertight.

§ 45.151 Other openings.

Each opening other than hatchways, machinery space openings, manholes, or flush scuttles—

- (a) In freeboard decks, must be protected by an enclosed superstructure or by a deckhouse or companionway that is equal in strength and weathertightness to an enclosed superstructure; or
- (b) In exposed superstructure decks or in the top of a deckhouse on freeboard decks that gives access to a space below the freeboard deck or a space within an enclosed superstructure, must be protected by a deckhouse or companionway.

§ 45.153 Through-hull piping: General.

- (a) All through-hull pipes required by this subpart must be made of steel or material equivalent to the hull in strength and fatigue resistance.

- (b) All valves used as shell fittings and all shell fittings on which such valves are mounted must be made of steel, or bronze or other ductile material approved by the Commandant.

§ 45.155 Inlets and discharge piping: Valves.

- (a) Except as provided in paragraphs (d) and (e) of this section each pipe that discharges overboard through the hull of the ship must have—
 - (1) An automatic nonreturn valve with a positive means for closing; or
 - (2) Two automatic nonreturn valves with the inboard valve accessible for examination in service.
- (b) The means for operating a valve described by paragraph (a)(1) of this section must be readily accessible and have indicators that show when the valve is not closed.
- (c) If the pipe discharges from a space that is not manned or does not have continuous bilge water monitoring, a valve described in paragraph (a)(1) of this section must be operable above the freeboard deck.
- (d) Each pipe that discharges from a space within an enclosed superstructure or deckhouse may have at least one accessible automatic nonreturn valve if the space is regularly visited by the crew.
- (e) Through-hull piping systems in machinery spaces may have valves with positive means for closing at the shell if the controls are readily accessible and have indicators showing when the valves are not closed (nonreturn valves are not required).

§ 45.157 Scuppers and gravity drains.

Scuppers and gravity deck drains from spaces above the freeboard deck that penetrate the shell below a line 24" or .05B above the summer loadline, whichever is greater, must have an automatic nonreturn valve. This valve may be omitted if the piping is of thickness not less than extra heavy pipe.

§ 45.159 Special conditions of assignment for type A vessels.

The lower freeboards allowed for type A vessels allow water on deck for greater percentages of time. Therefore the following additional requirements must be met to qualify for type A freeboards:

- (a) Machinery casings must be protected by an enclosed superstructure or deckhouse unless intact bulkheads are used on all sides on the freeboard deck.
- (b) Exposed machinery casings may be fitted with weathertight doors providing they lead to a space or passageway as strong as an enclosed superstructure from which a second interior weathertight door is provided for access to the engine room.
- (c) Hatchways on the exposed freeboard or forecastle decks must be provided with watertight covers of steel.
- (d) Unless a separate fore and aft access is provided below the freeboard deck, a permanent fore and aft gangway must be fitted at the superstructure deck level between poop and all other deckhouses used in the essential operation of the vessel.
- (e) Type "A" vessels must be fitted with open rails for at least half the length of the exposed parts of the weather deck. Where superstructures are connected by trunks, open rails must be fitted for the whole length of the exposed parts of the freeboard deck.

Subpart E—Unmanned River Barges on Lake Michigan Routes

Source: USCG-1998-4623, 67 FR 19690, Apr. 23, 2002, unless otherwise noted.

§ 45.171 Purpose.

- (a) This subpart establishes a special load line regime under which certain unmanned, river-service, dry-cargo barges may be exempted from the normal Great Lakes load line requirements while operating on certain Lake Michigan routes. Depending upon the route, the barge may only need a limited service domestic voyage load line, or may be conditionally exempted from load line assignment.
- (b) Except as provided in this subpart, barges operating on Lake Michigan must have either an international load line assignment issued in accordance with the International Convention on Load Lines, 1966, as amended, or a Great Lakes load line assignment issued in accordance with the requirements of this part.
- (c) The requirements of this subpart are summarized in table [45.171](#):

**Table 45.171:
Load Line Requirements for Dry Cargo River Barges
Operating on Lake Michigan**

	Voyages between Calumet Harbor, IL and:			
	Burns Harbor, IN	Milwaukee, WI	St. Joseph, MI	Muskegon, MI
1) Load line requirement	Conditionally exempted from load line assignment (must meet requirements below)		"Limited service domestic voyage" load line	
2) Where to register/apply	Exempted barges must be registered with the USCG Marine Safety Unit 555A Plainfield Road, Willowbrook, IL 60527 Fax: (630) 986-2120		Apply for load line to ABS Americas 16855 Northchase Dr. Houston, TX 77060	
3) Eligible barges	Dry cargo river barges Built and maintained in accordance with ABS River Rules Length-to-depth ratio less than 22 All weathertight and watertight closures are in proper working condition			
	No age limitation	Not more than 10 years old	No age limitation	
4) Freeboard requirement	All barges: freeboard must be at least 24 inches (610 mm) Open hopper barges: coaming height + freeboard must be at least 54 inches (1,372 mm)			
5) Tow limitations	Barges must be unmanned Not more than 5 nautical miles from shore			
	No limit on number of barges	Not more than 3 barges per tow		
6) Cargo limitations	Dry cargoes only. Liquid cargoes, even in drums or tank containers, are prohibited No hazardous materials. HazMats are defined in 46 CFR part 148 and 49 CFR chapter 1, subchapter C			
7) Weather limitations Voyage may not begin; or if these conditions arise during transit, voyage must be discontinued and tow must proceed to shelter.	"Fair weather" only	Ice conditions: adverse conditions that imperil tow or access to shelter Waves: 4 feet (1.2 m)		
		Sustained winds: 16 kts from NE, E, SE 21 kts from N, NW, W, SW, S		Sustained winds: 16 kts from N, NW, W, SW 21 kts from NE, E, SE, S
8) Pre-departure preps:	Required -- as specified in § 45.191			
9) Towboat requirements	Sufficient to handle tow, but at least--			
	(a) Power:	Sufficient to handle tow	1,000 HP	1,500 HP
	(b) Communication system:	Recommended -- § 45.195(a)	Recommended -- § 45.195(a)	Required -- § 45.195(a)
	(c) Cutting gear:	Recommended -- § 45.195(b)	Recommended -- § 45.195(b)	Required -- § 45.195(b)
	(d) Operational plan:	Recommended -- § 45.197	Recommended -- § 45.197	Required -- § 45.197

[USCG-1998-4623, 67 FR 19690, Apr. 23, 2002, as amended at 75 FR 70601, Nov. 18, 2010; 75 FR 78928, Dec. 17, 2010; 76 FR 32326, June 6, 2011]

§ 45.173 Eligible barges.

Only barges meeting the following requirements are eligible for the special load line regime under this subpart:

- (a) Unmanned, river service, dry-cargo barges;
- (b) Barges that have been designed and built to at least the minimum scantlings of the American Bureau of Shipping River Rules which were in effect at the time of construction;
- (c) Barges with a length-to-depth ratio less than 22;
- (d) Barges on the Milwaukee route must not be more than 10 years old; and

- (e) All weathertight and watertight closures (dogs, gaskets, covers, etc.) must be in proper working condition.

[USCG-1998-4623, 67 FR 19690, Apr. 23, 2002, as amended at 75 FR 70603, Nov. 18, 2010]

§ 45.175 Applicable routes.

This subpart applies to the following routes, including intermediate ports, on Lake Michigan, between Calumet Harbor, IL, and—

- (a) Milwaukee, WI (the “Milwaukee route”);
- (b) Burns Harbor, IN (the “Burns Harbor route”);
- (c) St. Joseph, MI (the “St. Joseph route”); and
- (d) Muskegon, MI (the “Muskegon route”).

[USCG-1998-4623, 75 FR 70604, Nov. 18, 2010]

§ 45.177 Freeboard requirements.

- (a) All barges must have a minimum freeboard of 24 inches (610 mm).
- (b) Additionally, open hopper barges must have a combined freeboard plus cargo box coaming height of at least 54 inches (1,372 mm).

§ 45.179 Cargo limitations.

- (a) Only dry cargoes may be carried. Liquid cargoes, even in drums or tank containers, may not be carried.
- (b) Hazardous materials, as defined in part 148 of this chapter and 49 CFR chapter 1, subchapter C, may not be carried.

§ 45.181 Load line exemption requirements for the Burns Harbor and Milwaukee routes.

Barges operating on the Burns Harbor and Milwaukee routes may be conditionally exempted from load line assignment provided that the following requirements are met:

- (a) **Registration.** Before the barge's first voyage onto Lake Michigan, the owner or operator must register the barge in writing with the Commanding Officer, Marine Safety Unit Chicago, 555A Plainfield Road, Willowbrook, IL, 60527. The registration may be faxed to MSU Chicago in advance at (630) 986-2120, with the original following by mail. The registration may be in any form, but must be signed by the owner or operator. No load line exemption certificate will be returned. However, the registration will be kept on file.
- (b) The registration must include the following information:
 - (1) Barge name and official documentation number;
 - (2) Owner and operator (points-of-contact, company addresses and telephone numbers);
 - (3) Service route (Milwaukee and/or Burns Harbor);
 - (4) Design type (covered/uncovered hopper, deck, etc.);
 - (5) External dimensions;

- (6) Types of cargo; and
- (7) Place built and original delivery date.
- (c) The registration must include a statement certifying that:
 - (1) The barge has been designed and built to at least the minimum scantlings of the ABS River Rules which were in effect at the time of construction; and
 - (2) The owner or operator agrees to maintain the barge in serviceable condition and comply with the applicable provisions of 46 CFR part 45, subpart E.
- (d) **Expiration.** Registration is valid only until the earliest of the following events:
 - (1) The tenth anniversary of the delivery date (for barges on the Milwaukee route),
 - (2) The barge no longer is fit for this service (due to damage), or
 - (3) The barge changes ownership or operators (registration is not transferable to new owners or operators; the barge must be re-registered if it is to continue in Lake Michigan service).
- (e) **Notification.** The owner or operator of an exempted barge must notify the OCMI of the transfer of ownership or change of operator, withdrawal from Lake Michigan service (due to damage, age, or other circumstances), or other disposition of the barge.

[USCG-1998-4623, 67 FR 19690, Apr. 23, 2002, as amended by USCG-2006-25556, 72 FR 36330, July 2, 2007; 75 FR 70604, Nov. 18, 2010]

§ 45.183 Load line requirements for the St. Joseph and Muskegon routes.

- (a) **Load line certificate.**
 - (1) The load line issued under this subpart must be a limited-service, domestic-voyage load line.
 - (2) Except as provided under paragraph (b)(2)(vi) of this section, the term of the certificate is 5 years.
 - (3) The load line certificate is valid for the St. Joseph and Muskegon routes, and intermediate ports. However, operators must comply with the route-specific requirements on the certificate.
 - (4) The freeboard assignment, operational limitations, and towboat requirements of this subpart must appear on the certificate.
- (b) **Conditions of assignment.**
 - (1) An initial load line survey under § 42.09-25 of this chapter and subsequent annual surveys under § 42.09-40 of this chapter are required.
 - (2) At the request of the barge owner, the initial load line survey may be conducted with the barge afloat if the following conditions are met:
 - (i) The barge is less than 10 years old;
 - (ii) The draft during the survey does not exceed 15 inches (380 millimeters);
 - (iii) The barge is empty and thoroughly cleaned of all debris, excessive rust, scale, mud, and water. All internal structure must be accessible for inspection;

- (iv) Gaugings are taken to the extent necessary to verify that the scantlings are in accordance with approved drawings;
- (v) The hull plating (bottom and sides) and stiffeners below the light waterline are closely examined internally. If the surveyor determines that sufficient cause exists, the surveyor may require that the barge be drydocked or hauled out and further external examination conducted; and
- (vi) The initial load line certificate is to be issued for a term of 5 years or until the barge reaches 10 years of age, whichever occurs first. Once this certificate expires, the barge must be drydocked or hauled out and fully examined internally and externally.

[USCG-1998-4623, 67 FR 19690, Apr. 23, 2002, as amended at 75 FR 70604, Nov. 18, 2010]

§ 45.185 Tow limitations.

- (a) Barges must not be manned.
- (b) No more than a total of three barges per tow may operate on the Milwaukee, St. Joseph, and Muskegon routes. A mixed tow of load-lined and exempted barges is still limited to three barges on those routes.
- (c) Tows must not be more than 5 nautical miles from shore.

[USCG-1998-4623, 67 FR 19690, Apr. 23, 2002, as amended at 75 FR 70604, Nov. 18, 2010]

§ 45.187 Weather limitations.

- (a) Tows on the Burns Harbor route must operate during fair weather conditions only.
- (b) The weather limits (ice conditions, wave height, and sustained winds) for the Milwaukee, St. Joseph, and Muskegon routes are specified in § 45.171, table 45.171.
- (c) If weather conditions are expected to exceed these limits at any time during the voyage, the tow must not leave harbor or, if already underway, must proceed to the nearest appropriate harbor of safe refuge.

[USCG-1998-4623, 76 FR 32327, June 6, 2011]

§ 45.191 Pre-departure requirements.

Before beginning each voyage, the towing vessel master must conduct the following:

- (a) **Weather forecast.** Determine the marine weather forecast along the planned route, and contact the dock operator at the destination port to get an update on local weather conditions.
- (b) **Inspection.** Inspect each barge of the tow to ensure that they meet the following requirements:
 - (1) A valid load line certificate, if required, is on board;
 - (2) The barge is not loaded deeper than permitted;
 - (3) The deck and side shell plating are free of visible holes, fractures, or serious indentations, as well as damage that would be considered in excess of normal wear;
 - (4) The cargo box side and end coamings are watertight;

- (5) All hatch and manhole dogs are in working condition, and all covers are closed and secured watertight;
 - (6) All voids are free of excess water; and
 - (7) Precautions have been taken to prevent shifting of cargo.
- (c) **Verifications.** On voyages north of St. Joseph, the towing vessel master must contact a mooring/docking facility in St. Joseph, Holland, Grand Haven, and Muskegon to verify that sufficient space is available to accommodate the tow. The tow cannot venture onto Lake Michigan without confirmed space available.
- (d) **Log entries.** Before getting underway, the towing vessel master must note in the logbook that the pre-departure barge inspections, verification of mooring/docking space availability, and weather forecast checks were performed, and record the freeboards of each barge.

[USCG-1998-4623, 67 FR 19690, Apr. 23, 2002, as amended at 75 FR 70604, Nov. 18, 2010; 75 FR 78928, Dec. 17, 2010; 76 FR 32327, June 6, 2011]

§ 45.193 Towboat power requirements.

The towing vessel must meet the following requirements:

- (a) **General.** The towing vessel must have adequate horsepower (HP) to handle the tow, but not less than the amount specified for the routes below.
- (b) **Milwaukee and St. Joseph routes:** a minimum of 1,000 HP.
- (c) **Muskegon route:** a minimum of 1,500 HP.

[USCG-1998-4623, 67 FR 19690, Apr. 23, 2002, as amended at 75 FR 70604, Nov. 18, 2010]

§ 45.195 Additional equipment requirements for the Muskegon route.

Towboats on the Muskegon route must meet these additional equipment requirements:

- (a) **Communication equipment.** Two independent voice communication systems in operable condition, such as Very High Frequency (VHF) radio, radiotelephone, or cellular phone. At least two persons aboard the vessel must be capable of using the communication systems.
- (b) **Cutting gear.** Equipment that can quickly cut the towline at the towing vessel. The cutting gear must be in operable condition and appropriate for the type of towline being used, such as wire, polypropylene, or nylon. At least two persons aboard the vessel must be capable of using the cutting gear.

§ 45.197 Operational plan requirements for the Muskegon route.

Towing vessels on the Muskegon route must have on board an operational plan that is available for ready reference by the master. The plan must include the following:

- (a) The cargo limitations, the general operational requirements, and the special operational requirements of this subpart.
- (b) A list of mooring and docking facilities (with phone numbers) in St. Joseph, Holland, Grand Haven, and Muskegon, that can accommodate the tow.

- (c) A list of towing firms (with phone numbers) that have the capability to render assistance to the tow, if required.
- (d) Guidelines for possible emergency situations, such as barge handling under adverse weather conditions, and other emergency procedures.

[USCG-1998-4623, 67 FR 19690, Apr. 23, 2002, as amended at 75 FR 70604, Nov. 18, 2010]

Appendix A to Part 45—Load Line Certificate Form

great lakes load line certificate

No. _____

Issued under the authority of the Commandant, U.S. Coast Guard, United States of America, under the provisions of the Act of August 27, 1935, as amended to establish load lines on the Great Lakes of North America and the Load Line regulations in force on _____, 19____, By _____, duly authorized by the Commandant to issue said load line certificate.

Ship _____

Certificate No. _____

Official No _____

Length (LBP) _____

Gross tonnage _____

Port of registry _____

Type of Ship:

TYPE "A"

TYPE "B"

TYPE "B" with increased freeboard

FREEBOARD FROM DECK LINE

Midsummer

MS

Summer	S
Intermediate	I
Winter	W

load line

Upper edge of line through center of diamond	above S
	below S
	below S

Increase for salt water for all freeboards ____ inches.

The upper edge of the deck line from which these freeboards are measured is ____ inches above or below the top of the _____ deck at side.

This is to certify that this ship has been surveyed and the freeboards and load lines shown above have been found to be correctly marked upon the vessel in manner and location as provided by the load line regulations of the Commandant, U.S. Coast Guard, applicable to the Great Lakes.

This certificate^[1] remains in force until _____. Issued at _____ on the _____ day of _____, 19____. (Here follows the signature, seal, if any, and the name of the authority issuing the certificate.)

notes

- (1) In accordance with the Great Lakes Load Line Regulations the diamond and lines must be permanently marked. The "MS" loadline shall be assigned only to those particular vessels that qualify under the regulations.
- (2) The "SW" marks need only be assigned to Great Lakes vessels loading in salt water of the St. Lawrence River west of a straight line from Cap de Rosiers to West Point Anticosti Island, and west of a line along longitude 63 degrees west from Anticosti Island to the north shore of the St. Lawrence River. In such cases these limits shall be indicated on the certificate.
- (3) The load line assignment given by this certificate necessarily assumes that the nature and stowage of cargo, ballast, etc., are such as to secure sufficient stability for the vessel. Accordingly, it is the owner's responsibility to furnish the Master of the vessel with stability information and instructions when this is necessary to maintenance of sufficient stability.

(On the reverse side of the load line certificate, or on a separate sheet, attached and forming part of the certificate, provision is to be made for annual inspection and renewal endorsements.)

^[1] Upon the expiration of the certificate, renewal must be obtained as provided by the Great Lakes Load Line Regulations and the certificate so endorsed.

