

SECTION F

SHORELINE STRUCTURES

F1. Piers

F1.1 Piers that are used only for pedestrian access to gangways and floating docks should be designed to support a minimum ULL of 50#/ft². This is equivalent to the required loading for vehicle storage garages, fixed seating areas and offices, and is the same ULL required on gangways.

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F1.2 **Guard railings shall be provided on all piers which are more than 30 inches above grade.**

F1.2.1 **Height of the top rail of guard railings shall be not less than 42 inches, measured from the finished deck surface to the top of the top rail, except on fishing piers as addressed in F1.2.2.**

F1.2.2 Fishing is typically not allowed from piers within marinas because of potential conflicts between anglers and boaters, and local regulations that may prohibit fishing within marina basins. However, **on an accessible pier where fishing is allowed, 25 percent of the railing must have a maximum top rail height of 34 inches for anglers with disabilities fishing from benches, stools or wheelchairs.**

F1.3 **Openings in guard rails shall not permit the passage of a 4 inch diameter sphere.** This can be accomplished by use of intermediate rails, pickets and/or ornamental components.



Guard Rail w/Hand Rail Meets 4" Sphere Test

F1.4 A minimum design load of 20#/linear foot should be applied horizontally along the centerline of the top rail of all guardrails.

F1.5 Handrails must be provided where a pier is part of an accessible route, and must be not less than 34 nor more than 38 inches above the walking surface, measured to the top of the handrail. In cases where fishing is allowed, the top rail will be both a guardrail and a handrail throughout the 25 percent of the rail length that is lowered as per F1.2.2 above. These lowered sections of railing are to be dispersed throughout the length of the railing where fishing is permitted.

F2. Gangways

F2.1 From an emergency exit standpoint, it is desirable to have a minimum of two gangways serving a marina, or an individual section of a marina that is not accessible from other marina sections served by a gangway(s).



F2.2 Uniform Live Loads

100 #/ft² minimum ULL shall be used for gangway structural design.

50 #/ft² minimum shall be used for ULL transferred to floating docks.

F2.3 Loadings transferred from a gangway to a floating dock system include appropriate portions of both the gangway DL and ULL.



F2.4 Recommended minimum clear gangway width is 36 inches. Anything less is impractical in consideration of typical gangway traffic and transfer of goods, supplies and equipment.

F2.5 ***Minimum clear width of a gangway on an accessible route shall be 36 inches.*** This includes the clear width between handrails on each side of an accessible gangway.



36" Minimum Gangway Width

F2.6 Gangway Railings

F2.6.1 Guard Rails.

F2.6.1.1 Guard Rail Loadings.

50#/linear foot applied horizontally along centerline of top rail

200# LPL applied vertically at any point along length of any horizontal guard railing, including the top rail and any mid-rails

F2.6.1.2 Guard Rail Heights.

42 inches minimum height
45 inches maximum height

measured perpendicular from deck to top of top rail

F2.6.1.3 **Openings in guard rails shall not permit the passage of a 4 inch diameter sphere.** This can be accomplished by use of intermediate rails, pickets and/or ornamental components.

F2.6.2 Handrails.

F2.6.2.1 **Handrails shall be provided on both sides of all gangways.**

F2.6.2.2 Handrail Heights.

All heights are to be measured perpendicular to gangway deck.



Minimum Height:
34 inches

Maximum Heights:

35¼ inches on gangways not exceeding a 2½:1 slope

36 inches on gangways not exceeding a 3:1 slope

38 inches on gangways not exceeding a zero slope

F2.7 Gangway decks must have a durable non-skid surface to provide traction, especially when wet, and when gangways are at steeper slopes.



F2.8 The use of cleats on gangway decks to improve traction is generally to be avoided. However, where gangways remain at steep slopes for long periods of time, gangway cleats may be deemed necessary to develop improved traction.



Handrails on Both Sides of a Gangway



Steep Gangways at River Based Marina

F2.8.1 Gangway cleats should meet the following criteria:

- be attached perpendicular to the long axis of the gangway
- spaced on 12 to 16 inch centers
- maximum width of 1 inch
- maximum height of ½ inch
- if greater than ¼ inch high, all edges above ¼ inch to be beveled at 45°

F2.8.2 Gangway cleats shall not be used on accessible gangways.

F2.9 Maximum gangway slopes.

F2.9.1 On Coastal Waterways:

- 3:1 maximum slope @ 0.0 MLLW or above
- 2½:1 maximum slope below 0.0 MLLW



F2.9.2 On Inland Waterways:

- 3:1 maximum slope not less than 90% of the time
- 2½:1 maximum slope not more than 10% of the time



F2.9.3 Accessible Gangways on both Inland and Coastal Waterways:

- 1:12 maximum slope (see exceptions below)

F2.9.3.1 The following two exceptions (numbers 3 and 4) apply to accessible gangway slopes. They are two of the eight exceptions that apply to accessible gangways. See F2.15.8 for the complete list of gangway exceptions.

Exception 3.

If the total length of a gangway, or series of gangways, is at least 80 ft, the 1:12 maximum slope does not apply.

Exception 4.

In a marina with less than 25 boat slips, and the total length of a gangway, or series of gangways, is at least 30 ft, the 1:12 maximum slope does not apply.

F2.10 Toe plates provided at either the lower and/or upper ends of a gangway, provide a smooth transition between the gangway deck surface and shore or a marina dock.



F2.10.1 The maximum toe plate slope is 3:1 under any in-service conditions or water levels. This applies to gangway toe plates on both coastal and inland waterways.

Toe Plate on Non-Accessible Gangway, or **Transition Plate** on Accessible Gangway

F2.11 Transition plates shall not under any circumstances exceed a slope of 1:12.

F2.12 Where the lower end of a gangway is supported on the deck of a marginal walkway or a main walkway, additional walkway width may be necessary to prevent

encroachment into the minimum clear widths of such walkways. The additional walkway width, if necessary, can be provided by a floating landing platform secured to the edge of the walkway. Care must be taken to maintain freeboard and cross slope requirements.



Floating Landing Platform for Gangway

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F2.13 Gangway utility connections require careful design, installation and maintenance. Gangways function as utility bridges across the land/water interface, providing a flexible link between shoreside and dockside utility lines as follows:

- electrical power
- telephone
- cable TV
- sewage lift-station
- potable water supply
- fire suppression
- fuel
- oil collection/discharge

F2.14 Accessible Gangways

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F2.14.1 An accessible gangway is an element of an accessible route that links floating docks with walkways, piers, bulkheads, parking areas, buildings, and other accessible marina service and activity centers.

F2.14.2 An accessible gangway connects a fixed pier or abutment on shore to a floating dock or other floating structure in a marina, excluding gangways that connect to vessels (ferries, commercial ships, livery boats, charter boats, vessels for hire, common carriers, etc.).

F2.14.3 Newly designed, or newly constructed and altered marina facilities, including gangways, are required to comply with federal and state accessibility guidelines which apply to each newly designed or newly constructed marina facility.

F2.14.4 Altered marina facilities must conform to federal and state accessibility guidelines.

F2.14.4.1 An “alteration” consists of any change in a primary function that adds new services or features. Examples would be the addition of electrical outlets on berths not previously so equipped, the provision of new berths of a different length or particular characteristic, or the provision of a totally new feature such as a fueling station, pumpout facility, boat rental service, etc. Routine maintenance work such as the replacement of decking and other components does not constitute an alteration.

F2.14.5 Existing marina facilities not being altered are not affected by new federal guidelines for recreational boating facilities published in 2002, and updated and edited in 2004.

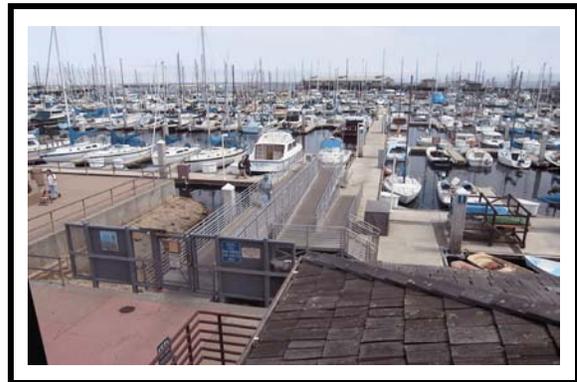
F2.14.6 Where an existing gangway (or a series of gangways that constitutes a single gangway system) is replaced or altered, an increase in the length of the gangway(s) is not required unless alterations are made to an area containing a primary marina function.



F2.14.7 Where there is a change in a primary function, and the cost of lengthening an existing gangway is considered to be disproportionate to the cost of overall alterations, the gangway does not have to be lengthened.



F2.14.8 By reference, an accessible gangway must comply with certain requirements for an accessible ramp, including location, width, passing space, head room, surface textures, slope, changes in levels, doors, egress and areas of rescue assistance. Since a variable slope gangway is significantly different in nature from a fixed slope ramp, eight (8) exceptions were provided in federal guidelines published in 2002, the first seven of which were carried over into revised guidelines published in 2004. See Appendix B for a side-by-side comparison of ADAAG Section 15.2 (published in 2002) and ADA-ABA Sections 1003 and 235 (published in 2004). The ADA-ABA guidelines are presently under review by the Federal Department of Justice.



Security Gate, Gangway and Switchback Ramps

Exception 1.

Where an existing gangway or series of gangways is replaced or altered, an increase in the length of the gangway is not required to comply with 15.2.2 unless required by 4.1.6(2).

Exception 2.

The maximum rise of 30 inches for a ramp does not apply to an accessible gangway.

Exception 3.

Where the total length of the gangway or series of gangways serving as part of a required accessible route is at least 80 feet, the 1:12 maximum slope for ramps specified in ADAAG 4.8.2 shall not apply to the gangway(s).

Exception 4.

In facilities containing fewer than 25 boat slips and where the total length of the gangway or series of gangways serving as part of a required accessible route is at least 30 feet, the 1:12 maximum slope for ramps specified in ADAAG 4.8.2 shall not apply to the gangway(s).

Exception 5.

Where gangways connect to transition plates, landings at each end of ramps specified by 4.8.4 shall not be required at the ends of accessible gangways.

Exception 6.

Where gangways and transition plates connect and are required to have handrails, handrail extensions specified for ramps in 4.8.5 shall not be required on gangways. Where handrail extensions are provided on gangways or transition plates, such extensions are not required to be parallel with the gangway or transition plate surface.

Exception 7.

The cross slope of gangways, transition plates, and floating piers that are part of an accessible route shall be 1:50 maximum measured in the static position.

Exception 8.

Limited-Use/Limited-Application elevators or platform lifts complying with ADAAG 4.11 shall be permitted in lieu of gangways complying with 4.3.

