

ATTACHMENT B

CHAPTER VIII. PIERS AND BULKHEADS

8.01 Application.

This chapter shall apply to all piers and bulkheads within the boundaries of El Lago, or attached to facilities within the city. All existing floating structures shall be brought into conformance with the requirements of this chapter. These provisions apply to piers and pontoon or raft type boats constructed in or on the water within the boundaries of El Lago, or adjoining waters.

Pier means any pier, wharf, structure, boat dock, boathouse, gangway or other platform or structure in or adjoining the water to which vessels may be moored, by which they may be boarded or on which persons may walk or sit.

Bulkhead is a retaining wall engineered to retain erosion of land and prevent the banks of a lake or other body of water from sloughing off.

8.02 Construction of piers.

All piers constructed of wood shall be constructed as follows:

(1) Piles: All wood piles shall be pressure treated with an approved preservative to meet the Uniform Building Code Standard 25-14-61. The minimum diameter of a pile shall be ~~four (4)~~six (6) inches. Piles shall be embedded at least ~~thirty (30)~~ forty-eight (48) inches in firm soil.

~~(2) Column action: All piles shall be braced with diagonal braces with not less than two-inch by four-inch lumber, pressure treated as above, bolted with at least one-half-inch galvanized bolts. Two (2) bents in any pier shall be connected with X braces.~~

(~~2~~3) Framing: Ledgers shall be at least two-inch by ~~eight~~six-inch nominal and shall be bolted with at least two (2) one-half-inch galvanized bolts. They shall be pressure treated as above.

(~~3~~4) Stringers: Stringers shall be at least two-inch by eight-inch nominal and pressure treated as above.

(~~4~~5) Decking: Deck must be not less than two (2) feet above high tide elevation. Nominal size of planks shall be not less than two-inch by eight-inch No. 2 grade, spaced at least one-half inch apart and nailed with 3-16d nails (galvanized) with three (3) nails to each bearing. No pier shall exceed seven (7) feet in width.

(~~5~~6) Lumber: All lumber mentioned in this standard shall be pressure treated against decay, ~~except the deck which may be untreated.~~

(~~6~~7) Protection: No pier may project so as to be closer to another property than that from which it projects as on any point on such pier. No pier may project more than one-third of the distance across

any body of water, inlet, bay, channel, stream or cove. No pier may be built closer than five (5) feet to an extended property line.

~~(78)~~ Superstructures: Piers may be provided with posts, railings and roofs, ~~but shall be without walls of any kind.~~

~~(89)~~ Inspections: All pier sites shall be inspected before a permit is issued. All completed piers shall be subject to a final inspection.

~~(10)~~ ~~Warning devices: Amber or yellow reflectors with three-inch minimum diameter lenses shall be placed on all piers and other surface installations. Reflectors shall be placed not more than eight (8) feet apart and shall be eighteen (18) inches above mean high tide. All piers more than fifty (50) feet in length shall be lighted with at least one hundred-watt lamps each ten (10) feet in excess of fifty (50) feet.~~

~~(911)~~ Designed load: Noncommercial piers shall be designed for at least fifty (50) pounds per square foot live load.

EXCEPTION: Boat launching ramps may be of concrete or such other material as may be approved by the building official.

8.03 Commercial pier construction.

All commercial piers constructed of wood shall be constructed as follows:

(1) Loads: assumed live loads shall be one hundred (100) pounds per square foot.

(2) Piles shall be wood and shall be pressure treated in accordance with **Uniform Building Code Standard No. 25-14-61**. Every pile shall conform to the specifications for Class A, B or C piles in the **Uniform Building Code Standard No. 15-16-61**.

(3) No material other than treated wood shall be used in commercial pier construction. ~~(See Tables 62A and 62B.)~~

(4) Wave action: Wave action on piers shall be computed by the following formula: $P = 125 \times h \times h (\tan \text{ angle})$ in which the point of application is assumed to be at $3/8 h$ and $P =$ wave pressure, in pounds per linear foot of wave or per square foot of pier area at $3/8 H$; $H =$ height of wave in feet (minimum for h shall be four (4) feet), angle = maximum angle between centerline of pier and wave front (minimum angle, fifteen (15) degrees).

~~(5) Standard minimum retention of preservation in pressure treated piles and timbers for marine construction shall be in accordance with the requirements in Tables 62A and 62B.~~

~~(56)~~ Fasteners: All metal fasteners shall be either rust proof alloys, stainless or hot dipped galvanized steel.

~~(67)~~ Design requirements: ~~All~~ Commercial piers, upon request by the Building Official, shall be designed by and bear the seal of a professional engineer registered with the State of Texas.

(78) The requirements of paragraphs (67), (78), (89)-(10) and (911) under section 8.02 shall apply to commercial piers.

8.04 Floating piers and other structures.

All floating piers, rafts, houseboats and other structures in use on Clear Lake and other bodies of water in El Lago, shall conform to the following specifications:

- (1) Flotation: Flotation shall be by barrels, drums, tanks, or pontoons. They shall be sealed. They may be formed by marine plywood, fiberglass or metal. All of the foregoing floats constructed with ferrous metals shall be covered with a marine rust-resistant coating. Provided, canoes, rowboats, sailboats, and other boats having a single hull shall be excepted from these provisions.
- (2) Fasteners: All barrels, drums, tanks or pontoons used as floats shall be secured in place by means of steel straps, bolts, welds or other fasteners of similar strength and permanency. All fasteners including bolts, nails and screws used in the float shall be coated with rust-resistant marine coatings. No strap shall be less than 16 U.S. Gauge in the least dimension.
- (3) Steel framing: Framing may be of steel. All steel frame members shall meet the requirements of the building code of the City of El Lago. All steel and fasteners shall be covered with a marine rust-resistant coating or galvanized.
- (4) Wood framing: Framing may be of wood. All timber shall be either of redwood, cypress or pressure treated against decay. The least dimension of a beam or girder shall be four (4) inches nominal and the depth shall not be less than eight (8) inches nominal. The least dimension of a joint shall be two (2) inches nominal in width and the depth shall be not less than six (6) inches nominal. Joists shall have solid black bridging four (4) feet on centers. Joists shall be spaced not more than eighteen (18) inches on centers.
- (5) Flooring: Flooring shall be at least two (2) inches nominal thickness and shall be either cypress, redwood or any other wood which has been pressure treated against decay.

EXCEPTION: Marine or exterior grade plywood three-quarter-inch minimum may be used for flooring if meeting the requirements of the building code of the City of El Lago.

- (6) Fasteners: All fasteners shall be galvanized or coated with a rust-resistant marine material.
- (7) Rooms, cabins, houses and roofs above the platform level shall meet requirements of the building code of the City of El Lago.

8.05 Bulkhead construction.

All bulkheads shall be constructed of wood, steel or concrete. No bulkhead shall be constructed where it will displace waters on lakes or streams. All private bulkheads shall be constructed on private property. This chapter shall not prohibit the City of El Lago from constructing or causing to be constructed

retaining walls or bulkheads where in the opinion of the building official a hazard to life, limb or property exists, or where the polluting of the waters is in evidence.

(1) Wood bulkhead: All wood piles shall be pressure treated with an approved preservative to meet Uniform Building Code Standard 25-14-16. The minimum diameter of a pile shall be six~~five~~-inch tops. Piles shall be embedded a minimum of five (5) feet into firm soil ~~and shall have concrete placed around the pile in such a manner as to prevent movement when set~~. No pile shall extend above the ground more than thirty (30) inches. No pile shall be positioned farther apart than six (6) feet center to center.

(2) Wood wall: Horizontal members shall be at least two~~three~~-inch by six~~eight~~-inch nominal lumber. Cracks between planks shall not be greater than one-eighth inch. All members shall be attached to wood pile with not less than two (2) 20d common galvanized nails or one (1) ~~one-half~~three-quarter-inch galvanized bolt. The bulkhead sheeting shall be a minimum two-inch by ten-inch center match (tongue and groove). All wood shall be treated as in Paragraph 1.

(3) Concrete bulkhead: All concrete bulkheads shall be of at least four and one-half (4 1/2) sack mix and test a minimum of two thousand five hundred (2,500) pounds per square inch at twenty-eight (28) days. The minimum depth shall be not less than thirty-six (36) inches to firm soil and shall not extend above grade more than thirty (30) inches. The width of such concrete shall be a minimum of ten (10) inches below ground and at least six (6) inches above grade. There shall not be less than No. #4 reinforcing steel rods placed eighteen (18) inches vertically and eighteen (18) inches horizontally. All intersecting steel shall be securely tied or welded to ensure positioning in foundation.

~~(4) — Reinforcing: There shall not be less than No. #4 reinforcing steel rods placed eighteen (18) inches vertically and eighteen (18) inches horizontally. All intersecting steel shall be securely tied or welded to ensure positioning in foundation.~~

~~(4)~~ Steel sheet pile bulkhead: Steel shall meet standard of A.S.T.M. A-245. All steel piles shall be of not less than 12 gauge. The depth of crimp shall be not less than one and one-half (1 1/2) inches and the width of such crimp shall be not less than three and one-half (3 1/2) inches. All piles shall have not less than one (1) inch crimped interlocks along both vertical sides. Finished pile width shall be not less than twelve (12) inches. Piles shall be driven not less than four (4) feet into firm soil and shall not extend more than thirty (30) inches above grade. A form fitting driving head or sheet driver shall be used to prevent pile damage. Plastic bulkhead material should be no less than one-half inch (1/2) thick, requires a minimum of one (1) 6-inch by 6-inch whaler and must be tied back every 6 feet.

(5) Tiebacks: All bulkhead pilings should be anchored to dead men a minimum of (10) ten feet off the bulkhead with a minimum of three-quarter inch steel rods. All steel rods should be coated with rust resistant marine coatings within four (4) feet of the bulkhead.

(6) Inspection: All proposed bulkhead sites shall be inspected before a permit may be issued. A final inspection shall be made on each bulkhead constructed.

(7) Maintenance: All bulkheads shall be subject to periodic inspection. Whenever any bulkhead requires maintenance for safety, sanitation or any other reason determined by the building official, a notice shall be served on the owner, lessor, lessee or any other person determined to be responsible and such notice shall require that within ten (10) days after receipt that all stated conditions be corrected.

(8) Treatment Levels: All pilings and rough milled lumber should be 2.5 CCA. All lumber for decking, stringers, cross stringers and other structural members should be a minimum of .4 ACQ.

~~Table 62A Substructure Members in Water~~

~~TABLE INSET:~~

Type of Member	Creosote	Creosote Coaltar Solution
Lbs. Per Cubic Foot		
Bench caps, plumbposts, bracing, cribbing, sheet piles fenders, chocks, etc.		
Southern yellow pine.....	12.0	12.0
Douglas fir.....	10.0	10.0
Gum.....	10.0	10.0
Red oak.....	10.0	10.0

~~Table 62B~~

~~TABLE INSET:~~

Type of Member	Creosote	50-50	Creosote
Petroleum	Chromated	Zinc	Chloride
Mixture*	Tanailth	Wolman	Salts
Lbs. Per Cubic Foot			
Caps, stringers, subfloor, decking, chocks and decking			
Southern yellow pine.....	12.0	14.0	1.0 0.5
Douglas fir.....	10.0	12.0	1.0 0.5
Gum.....	10.0	12.0	1.0 0.5

~~* Materials treated with these compounds must be painted.~~