

**WAC 173-160-201 What are the casing and liner requirements? (1)**

Proper casing must be installed in all water supply wells.

(2) The casing shall withstand typical forces which act upon it during and after installation. It shall be resistant to the corrosive effects of the surrounding formations, earth, and water and shall be impervious to any contaminants encountered.

(3) All plastic casing or liner pipe used in potable water supply wells must be manufactured to conform to National Sanitation Foundation (NSF) Standard 14-84, or the most recent revision.

(4) Unless prior approval is obtained from the department, well casings and liner pipes must be made of either steel or plastic.

(5) Liner pipe must be of sufficient strength to withstand breakage or collapse when the well is pumped and meet ASTM potable water standards.

(6) When installed, liner pipe shall extend or telescope at least two feet into the lower end of the well casing. If more than one string of liner pipe is installed, each string shall extend or telescope at least eight feet into the adjacent larger diameter liner pipe.

(7) Liner pipe may not be permanently fixed to a well casing below land surface.

(8) Minimum specifications for steel casing and steel liner pipe for water wells are shown in Table 1.

TABLE 1  
Minimum Specifications for Steel Casing and  
Steel Liner Pipe

NOMINAL SIZE (inches)	OUTSIDE DIAMETER (inches)	WALL THICKNESS (inches)	WEIGHT PER FOOT (pounds)	TEST SECTION OUTSIDE DIAMETER (inches)
1.25	1.660	0.140	2.27	0.500
1.5	1.900	0.145	2.72	0.750
2.0	2.375	0.154	3.65	1.000
2.5	2.875	0.203	5.79	1.500
3.0	3.500	0.216	7.58	2.000
3.5	4.000	0.226	9.11	2.500
4.0	4.500	0.237	10.79	3.000
5.0	5.563	0.258	14.62	3.500
6.0	6.625	0.250	17.02	4.000
8.0	8.625	0.250	22.36	6.000
10	10.750	0.250	28.04	8.000
12	12.750	0.250	33.38	10.000
14	14.000	0.312	45.61	11.000
16	16.000	0.375	57.52	14.000
18	18.000	0.375	70.59	16.000
20	20.000	0.375	78.60	18.000
24	24.000	0.375	94.62	20.000
30	30.000	0.375	118.65	24.000

(9) Steel casing larger than thirty inches shall have a minimum wall thickness of 0.375 inches.

(10) Minimum specifications for plastic casing and plastic liner pipe for water wells are shown in Table 2.

TABLE 2  
Minimum Specifications for Plastic Casing  
and Plastic Liner Pipe

NOMINAL CASING DIAMETER (inches)	MINIMUM THICKNESS (inches)	SDR
2.0	0.133	21
2.5	0.137	21
3.0	0.167	21
3.5	0.190	21
4.0	0.214	21
4.5	0.236	21
5.0	0.265	21
6.0	0.316	21
8.0	0.410	21
10	0.511	21
12	0.606	21

(11) Steel casing and steel liner: All steel casing and steel liner must be new or, in like new condition, and be structurally sound.

(a) Casing or liner that has been exposed to a contaminant shall not be used in well construction unless the contamination can be entirely removed.

(b) When casing or liner lengths are joined together, they must be connected by watertight weld or screw coupled joints.

(i) Welded joints must be at least as thick as the wall thickness of the well casing and be fully penetrating.

(ii) All steel well casing or liner shall meet or exceed the minimum American Society for Testing and Materials (ASTM) A-53 A or B specification for steel pipe.

(12) Plastic casing and plastic liner: Plastic, fiberglass, PVC, SR, ABS, CPVC or other type of nonmetallic well casing or liner must be manufactured and installed to conform with ANSI/ASTM F 480-81, or the most recent revision.

(a) SDR is calculated by dividing the outside diameter of the pipe by the wall thickness.

(b) SDR 21 is the minimum requirement (Class 200); higher pressure rated pipe may be used.

(c) All plastic casing must be installed only in an oversized drill hole without driving. The oversized hole must be a diameter of at least four inches larger than the outside diameter of the plastic casing or coupling hubs, whichever is larger. Plastic casing and liner must be of sufficient strength to withstand breakage or collapse when installed and while the well is pumped. Plastic casing and liner must meet ASTM potable water standards.

(d) All plastic casing or liner must be new or, in like new condition and clearly marked by the manufacturer showing nominal size, class, type of plastic material, SDR, ASTM designation, and have a NSF seal of approval for use in potable water supplies.

(e) Casing or liner that has been exposed to a contaminant shall not be used in well construction unless the contaminant is entirely removed.

(f) Plastic casing or liner joints must be watertight.

(i) Either "bell" type, threaded joints, or coupling hubs are approved.

(ii) Hub couplings must be of materials meeting the specifications for plastic casings as stipulated in subsection (2) of this section.

(iii) If joints are secured with solvent cement, it must be done in accordance with manufacturer's directions.

(13) Concrete curbing: The concrete used to make curbing must consist of clean, hard and durable aggregate with not less than five sacks (ninety-four pounds per sack) of portland cement per cubic yard of concrete.

(a) The maximum diameter of aggregate particles may not exceed 1 1/2 inches, but in any case may not exceed 1/5 the minimum width of the casing thickness.

(b) The ratio of coarse aggregate to fine aggregate (passing No. 4 U.S. Standard Sieve) must be approximately 1 1/2 to 1 by volume, but in any case, may not exceed 2 to 1 nor be less than 1 to 2.

(14) The curbing shall be at least six inches thick and free of voids. The walls shall be poured in one continuous operation.

(15) When concrete tile is used to line a well, the combined total wall thickness and seal shall be a minimum of six inches.

[Statutory Authority: Chapter 18.104 RCW. WSR 09-01-125 (Order 08-10), § 173-160-201, filed 12/19/08, effective 1/19/09; WSR 06-23-121 (Order 06-08), § 173-160-201, filed 11/21/06, effective 12/22/06; WSR 98-18-104 (Order 98-17), § 173-160-201, filed 9/2/98, effective 10/3/98. Statutory Authority: Chapter 18.104 RCW and RCW 43.21A.080. WSR 98-08-032 (Order 97-08), § 173-160-201, filed 3/23/98, effective 4/23/98.]