Secretary of State
Certificate and Order for Filing

PERMANENT ADMINISTRATIVE RULES

I certify that the attached copies* are true, full and correct copies of the PERMANENT Rule(s) adopted on May 30, 2008 by the Water Resources Commission.

	Date prior to or same as filing date
Oregon Water Resources Department, Technical Services Division	OAR Chapter 690
Agency and Division	Administrative Rules Chapter Number

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to become effective July 1, 2008. Rulemaking Notice was published in the February 1, 2008 Oregon Bulletin.**
Date upon filing or later — Month and Year

RULE CAPTION

Special area standards for water supply well construction and maintenance.

Not more than 15 words that reasonably identifies the subject matter of the agency's intended action.

RULEMAKING ACTION

List each rule number separately (000-000-0000)

Secure approval of new rule numbers (Adopted or Renumbered rules) with the Administrative Rules Unit prior to filing.

ADOPT: OAR 690-215-0200

AMEND: OAR 690-200-0028; OAR 690-200-0050(3); OAR 690-210-0280; OAR 690-215-0060; OAR 690-215-0080
REPEAL: n/a
RENUMBER: n/a
AMEND & RENUMBER: n/a

Stat. Auth.: ORS 537.780, 536.027, 536.090

Other Auth.: ORS 537.505 through 537.795, 537.780(1)

Stats. Implemented: ORS

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JUN 27 2008
WATER RESOURCES DEPT.
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RULE SUMMARY

The Water Resources Commission (Commission) adopted rules that establish special area standards for water supply well construction and maintenance in the Eola Hills Ground Water Limited Area and Pete's Mountain Area. Specifically, the rules require that all wells within both areas have a minimum of ¾-inch dedicated measuring tube installed at the time of pump installation, pump repair or pump replacement to give the Department access necessary to gather essential water level data. Additionally, these standards require that all new and deepened water supply wells that develop water from basalt within the Eola Hills Ground Water Limited Area be constructed with casing and seal to within 100 feet of the bottom of the well. Additionally, in both areas new wells require a six inch diameter casing.

Ruben E. Ochoa	Ruben E. Ochoa	6/18/2008
Authorized Signer	Printed name	Date

With this original, file one photocopy of certificate, one paper copy of rules listed in Rulemaking Actions, and electronic copy of rules. **The Oregon Bulletin is published the 1st of each month and updates rules found in the OAR Compilation. For publication in Bulletin, rule and notice filings must be submitted by 5:00 pm on the 15th day of the preceding month unless this deadline falls on a weekend or legal holiday, when filings are accepted until 5:00 pm on the preceding workday. ARC 930-2005

OREGON WATER RESOURCES DEPARTMENT

DIVISION 210

Well Construction Standards

690-210-0005
Standards Apply to all Methods of Well Construction

(1) The following well construction standards apply to all methods of water supply well construction. The methods include, but are not limited to, drilling, driving, jetting, boring, and digging.

(2) Horizontal and Remediation wells shall be constructed under special standard approval only as described in OAR 690-200-0021.

(3) Additional standards will apply to some methods as specified in the following regulations.

Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented: ORS 536.090 & ORS 537.505 - ORS 537.795
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0216; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0030
Placement of Water Supply Wells

(1) No person shall construct a water supply well within 50 feet of any septic tank; 100 feet of a septic drainline or sewage disposal structure or facility; 50 feet of a closed sewage or storm drainage system (except those in or underneath a building); 50 feet of a confined animal feeding or holding area; 50 feet of any animal waste holding area such as a pond or lagoon; 100 feet of any sewage sludge disposal area; or 500 feet of a hazardous waste storage, disposal or treatment unit without written permission of the Director. Rain water gutter downspouts and drains are exempt from the above setback requirements. The constructor should consider whether greater distances are required for the protection of the ground water depending on the topography and local geology.

(2) A new water supply well may be constructed at the site of an abandoned septic tank or drain field one year after the septic tank or drain field is taken out of use. The abandoned septic tank shall be pumped by a DEQ licensed sewage disposal business to remove all contents. Following pumping, the tank shall be filled with reject sand, bar run gravel or other material approved by the on site sub-surface sewage permitting agent. The delivery line between the building and the tank shall be permanently capped or filled with cement grout. A water supply shall not be constructed through an abandoned septic tank or septic drain line. The new water supply well shall be located to meet other setbacks as directed in section (1) of this rule.

Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented: ORS 536.090 & ORS 537.505 - ORS 537.795
Hist.: WRD 3. f. & ef. 2-18-77; WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-060-0015; WRD 7-1988, f. & cert. ef. 6-29-88; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0060
Explosives
(1) If explosives are used in the construction of a water supply well, their use must be reported on the well report. The type and amount of explosive(s) used shall be reported.
(2) In no case shall explosives other than commercially developed gun perforators be detonated inside the well casing or liner pipe without written permission from the Director. The request shall include the type of explosive to be used, how it will be placed, and where it is to be placed. In no case shall an explosive charge be dropped down a well or used to sever installed well casing or liner pipe
Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented: ORS 536.090 & ORS 537.505 - ORS 537.795
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0066; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0065
Hydrofracturing
(1) If the water supply well is hydrofractured, the constructor shall so note on the well report. Information reported shall include methods and materials used, maximum pressure exerted on the formation, location of packers, initial and final static water level figures, as well as initial and final yield figures.
(2) In no case shall hydrofracturing allow commingling of waters within the well bore.
(3) The well shall not be hydrofractured within 20 feet of the bottom of the existing well casing.
(4) Clean sand or other materials (propping agents) approved by the Department may be injected into the well to hold the fractures open when the pressure is removed.
(5) All tools and propping agents shall be disinfected prior to placement into the well.
Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented:
Hist.: WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0070
Injection Wells
No water supply well subject to these rules shall be used for the injection of surface or ground waters, or chemically or thermally altered waters, unless the injection installation, well design, and receiving formations are approved by the Water Resources Department. For additional regulations on the use of wells for injection purposes, contact the Oregon Department of Environmental Quality.
Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-060-0030; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0100
Mineralized or Contaminated Groundwater
All formations which yield contaminated or mineralized water shall be adequately cased and sealed off to prevent contamination of the overlying or underlying water-bearing zones.

Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0056; WRD 7-1988, f. & cert. ef. 6-29-88; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0130

Sealing of Wells in Unconsolidated Formations Without Significant Clay Beds

Water supply wells drilled into unconsolidated water-bearing strata overlain by unconsolidated materials, such as sand, silt, or gravel, without significant clay beds, shall have a watertight, unperforated well casing extending to a minimum of eighteen feet below land surface. An upper oversize drillhole, four inches greater in diameter than the nominal diameter of the casing, shall be constructed to a minimum depth of 18 feet. To prevent caving, a temporary surface casing, at least 18 feet in length, shall be used throughout the construction of the annular seal space. The annular space between the permanent well casing and the upper, oversize drillhole shall be completely full of grout in accordance with OAR 690-210-0310 thru 690-210-0360 after the permanent well casing is set into final position. The temporary surface casing shall be removed from the well as the annular space is filled. (See Figure 210-1) [Figure not included, see ED. Note.][ED. NOTE: Figures referenced in this rule are available from the agency.]

Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0126; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0140

Sealing of Water Supply Wells in Unconsolidated Formations with Significant Clay Beds

Water supply wells drilled into water-bearing strata overlain by unconsolidated deposits of clay, or sand and gravel in which significant interbeds of clay are present, shall have a watertight, nonperforated, permanent well casing extending at least five feet into a clay or other impermeable stratum overlying the water-bearing zone. In all cases, an upper oversize drillhole, at least four inches greater in diameter than the nominal diameter of the permanent well casing shall be constructed to this same depth. In the event that the subsurface materials penetrated by the upper drillhole cave, or tend to cave, an outer, temporary surface casing shall be used to case out caving materials throughout the construction of the oversize drillhole. If the clay or other impermeable stratum is 13 feet or less below land surface, the watertight, nonperforated well casing and the upper, oversize drillhole shall extend to a minimum depth of 18 feet below land surface. If necessary to complete the well, the single, permanent well casing may be extended below the required sealing depth prior to sealing the well with grout. If preferred, a smaller diameter casing, liner, or well screen may be installed. The annular space between the permanent well casing and the upper, oversize drillhole shall be completely full of grout in accordance with OAR 690-210-0310 through 690-210-0360 after the permanent well casing is set into final position. The temporary surface casing shall be removed from the well as the annular space is filled. (See Figure 210-2.)

[ED. NOTE: Figure referenced in this rule are available from the agency.]

Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.79

Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79, Renumbered from 690-061-0131; WRD 8-1993, f. 12-14-93, cert. ef.1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0150
Sealing of Water Supply Wells in Consolidated Formations

(1) Water supply wells drilled into a water-bearing rock formation overlain by clay, silt, sand, gravel, or similar materials, shall be constructed in accordance with one of the following methods:

(a) Method 1 (Continuous Seal): An upper drillhole, four inches greater in diameter than the nominal diameter of the permanent well casing to be installed, shall extend from land surface to at least five feet into solid, uncreviced, consolidated rock overlying the water-bearing rock formation below a depth of 13 feet. Unperforated permanent well casing shall extend to this same depth. The annular space between the casing and the drillhole wall within the rock formation shall be filled with grout. The upper annular space between the casing and the drillhole wall shall be filled from land surface to at least five feet into an impermeable clay stratum below a depth of 13 feet. The annular space between the upper and lower sealing intervals shall be filled with an impermeable sealing material. If necessary to complete the well, a smaller diameter well casing, liner pipe, or well screen may be installed. If cement grout is placed by a suitable method from the bottom of the casing to land surface (Methods A, B, D, Appendix 3), the upper drillhole shall be at least two inches larger than the nominal diameter of the casing. (See Figure 210-3.);

(b) Method 2 (Step-Down Casing): An upper drillhole, four inches greater in diameter than the permanent well casing to be installed, shall extend from land surface to at least five feet into an impermeable clay stratum below a depth of 13 feet. Unperforated, permanent well casing shall extend to, and be driven into, solid, uncreviced, consolidated rock overlying the water-bearing rock formation. A lower drillhole, equal in diameter to the inside diameter of the upper permanent well casing, shall be constructed at least five feet into solid uncreviced rock overlying the water-bearing formation. A smaller diameter casing, at least two inches smaller in diameter than the diameter of the upper permanent well casing, shall extend at least five feet into the lower drillhole and at least eight feet into the upper permanent well casing. The annular space between the upper oversize drillhole and the permanent well casing, and the annular space between the smaller diameter lower casing and the lower drillhole, shall be completely filled with grout in accordance with OAR 690-210-0310 through 690-210-0360 after the permanent well casing and the lower casing are set into final position. (See Figure 210-4.);

(c) Method 3 (Under-Reaming): An upper drillhole, four inches greater in diameter than the permanent well casing to be installed, shall extend from land surface to at least five feet into an impermeable clay stratum below a depth of 13 feet. A lower drillhole, at least two inches greater in diameter than the diameter of the permanent well casing, shall be constructed at least five feet into solid, uncreviced, consolidated rock by under-reaming methods. Unperforated, permanent well casing shall extend to and be driven into solid, uncreviced, consolidated rock at the bottom of the under-reamed section following placement of the sealing material. The annular space between the upper oversize drillhole and the upper permanent well casing shall be filled with cement grout using Method C or bentonite. The annular space between the lower under-reamed drillhole wall and the permanent well casing, shall be completely filled with grout applied under

pressure in accordance with the appropriate Method A, B, or D, in Appendix 3. (See Figures 210-5 and 210-6.)
(2) In all cases, (Methods 1, 2, or 3, above), if materials penetrated by the upper oversize drillhole cave, or tend to cave, an outer temporary surface casing shall be used to case out all caving material throughout construction of the oversize drillhole. The temporary surface casing shall be withdrawn as the annular space is filled with grout.
[ED. NOTE: Figures and Appendix referenced are available from the agency.]
Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0136; WRD 7-1988, f. & cert. ef. 6-29-88; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef 11-15-01

690-210-0155
Additional Standards for Artesian Water Supply Wells
(1) Water supply wells penetrating into an artesian aquifer shall have an upper oversize drillhole four inches greater in diameter than the nominal diameter of the permanent well casing. Watertight unperforated casing shall extend and be sealed at least five feet into the confining formation immediately overlying the artesian water-bearing zone. In all cases, a minimum of 18 feet of casing and casing seal will be required. If cement grout is placed by a suitable method from the bottom of the casing (Methods A, B, and D, in Appendix 3 and Figure 210-5), the diameter of the upper drillhole shall be at least two inches larger than the nominal diameter of the casing. To complete the well, smaller diameter casing, perforated liner, or a well screen may be installed.
(2) When artesian pressures are encountered in the absence of a confining formation, casing and casing seal requirements shall be determined by the Director upon written application. In the alternative, the person constructing the well may construct the well in conformance with the minimum standards for artesian wells with a confining formation, set forth in section (1) of this rule.
(3) If an artesian water supply well flows at land surface, the well shall be equipped with a control valve and a watertight mechanical cap, threaded or welded, so that all flow of water from the well can be completely stopped.
(4) All flowing artesian wells shall be equipped with a pressure gauge placed on a dead-end line. A petcock valve shall be placed between the gauge and well casing. (See Figure 210-7)
(5) All flowing artesian water supply wells shall be tested for artesian shut-in pressure in pounds per square inch and rate of flow in cubic feet per second, or gallons per minute, under free discharge conditions. This data shall be reported on the well report.
[ED. NOTE: Figures & Appendixs referenced are available from the agency.]
Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0156, 690-061-0161, 690-061-0166, 690-061-0171 & 690-061-0176; Renumbered from 690-210-0120 by WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0160

Additional Standards for Filter Pack Wells with Surface Casing

If a permanent surface casing is installed in the construction of a filter pack well, a watertight, welded, steel plate at least 3/16 of an inch in thickness shall be installed between the inner production casing and the outer surface casing at the well head. A watertight fill port with threaded cap may be installed for the purpose of placing additional filter pack material in the well. (See Figure 210-8.)

[ED. NOTE: Figures referenced in this rule are available from the agency.]

Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795

Stats. Implemented:

Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0141; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0170

Additional Standards for Filter Pack Wells without Surface Casing

If a permanent surface casing is not installed in the construction of a filter pack well, and filler tubes are to be used, an oversize well bore having a nominal diameter of at least eight inches greater than the nominal diameter of the permanent well casing shall be constructed. If filler tubes are not to be used, an oversize well bore having a nominal diameter of at least four inches greater than the nominal diameter of the permanent well casing shall be constructed. A suitable plug shall be installed in the annular space between the filter pack material and the grout seal. A watertight fill pipe with threaded cap may be installed for the purpose of placing additional filter pack material in the well. The outside diameter of the fill pipe shall not exceed one-half the thickness of the grout seal surrounding the permanent well casing and shall be centered in the annular space. (See Figure 210-9.)

[ED. NOTE: Figure referenced in this rule are available from the agency.]

Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795

Stats. Implemented:

Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0146; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0180

Additional Standards for Driven or Jetted Wells

All drive point wells or jetted wells shall have nonperforated, watertight casing meeting the minimum specifications shown in Table 210-1 and extending a minimum distance of 18 feet below land surface. Drive casing greater than 3-1/2 inches shall comply with the minimum specifications in OAR 690-210-0190. An upper drillhole at least four inches greater in nominal diameter than the permanent casing shall extend at least 18 feet below land surface. The annular space shall be filled with grout. If temporary casing is used during construction, it must be removed during placement of the grout. (See Figure 210-10.)

[ED. NOTE: Tables and Figures referenced are available from the agency.]

Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795

Stats. Implemented:

Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0186 & 690-061-0191; WRD 7-1988, f. & cert. ef. 6-29-88; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0190
Steel Casing
(1) All steel casing installed shall be in new or like new condition, being free of pits or breaks, and shall meet or exceed the minimum American Society for Testing Materials (ASTM A-53A or B) specifications for steel pipe, for the sizes as set out in Table 210-2.
(2) All steel casing having a diameter larger than 20 inches shall have a wall thickness of at least 0.375 inch.
(3) Steel casing installed in a well greater than a nominal diameter of ten inches, having a wall thickness of 0.250 inch and meeting or exceeding ASTM A-53 A or B specifications must not exceed the following depth limitations (Diameter - Maximum Depth, respectively):
(a) 12 inches -- 500 feet;
(b) 14 -- 16 inches -- 250 feet;
(c) 18 -- 20 inches -- 100 feet.
(4) Steel casings of other ASTM specifications shall not be used without written permission of the Director. A written request to use casing of other specifications shall be submitted to the Director. This request shall include a description of the casing specifications and the reason for its use.
[ED. NOTE: Tables & Publications referenced are available from the agency.]
Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0006; WRD 7-1988, f. & cert. ef. 6-29-88; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0200
Steel Casing Joints
All steel casing joints shall be welded or thread coupled and shall be water tight. If welded casing joints are used, the weld shall be a full penetrating weld at least equal in thickness to the wall thickness of the casing. Welded casing joints shall have a tensile strength equal to or greater than that of the casing.
Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0016; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0210
Plastic Casing
(1) Plastic casing shall not be driven and may only be installed in an oversized drillhole.
(2) Plastic casing may only be installed after drilling has been completed. No drilling is allowed inside plastic casing.
(3) Such casing shall be of polymerized vinyl chloride (PVC), type 1120 or 1220, SDR 21 (Class 200) or SDR 26 (Class 160) or greater wall thickness, meeting the standards of the "National

Sanitation Foundation" and the specifications of ASTM F-480 or ASTMD-2241-73 and D-1784-69. The well casing must be clearly marked by the manufacturer showing: nominal size, type plastic material, Standard Dimension Ratio (SDR), ASTM designation, and National Sanitation Foundation seal of certified approval. The maximum depth to which this plastic casing may safely resist collapsing forces is a function of the "Standard Dimension Ratio" (SDR), i.e., the ratio of the outside diameter to the casing wall thickness. The maximum depths have been computed for readily available SDR and are cited as:
(a) SDR = 21 -- Maximum Depth = 150 feet;
(b) SDR = 26 -- Maximum Depth = 100 feet.
(4) If PVC casing is to be used, it shall be protected from physical and ultraviolet light damage using one of the following methods:
(a) By use of an upper protective steel casing meeting the requirements of OAR 690-210-0190. The protective steel casing shall be a minimum of 2" larger in diameter than the PVC casing and shall overlap the PVC casing. The protective steel casing shall extend at least six inches above the top of the plastic well casing and shall be sealed at least four feet into the ground within the annular seal and shall be fitted with a lid; or
(b) By use of a wellhead bunker. The bunker shall be made of concrete, hard plastic, fiberglass, wood or other structurally sound material that will protect the casing from both physical damage and ultraviolet light damage. The bunker shall completely surround the well and be fitted with a lid. The bunker shall be constructed so that access to the wellhead is maintained; or
(c) By other appropriate methods as approved in advance by the Water Resources Department.
(5) Pitless adaptors or units are not recommended in conjunction with PVC casing. If a pitless adaptor or unit is to be used, the constructor should take care that the weight of the pump and pump column do not exceed the strength of the casing.
[Publications: Publications referenced are available from the agency.]
Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0031; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0220
Plastic Casing Joints
All plastic casing joints shall be watertight. Either "bell" type, threaded, or coupling hubs are approved. Hub couplings shall be of material meeting the specifications for plastic casings as set forth in OAR 690-210-0210. Joints shall be made by solvent cement in accordance with manufacturer's directions. Newly assembled joints require careful handling until the initial set has taken place, which varies with the temperature and the pipe size. The recommended initial set times are from manufacturer's recommendations (See Table 210-3).
[ED. NOTE: Tables referenced are available from the agency.]
Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0036; WRD 7-1988, f. & cert. ef. 6-29-88; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0230
Inner Casing
Inner casing installed into a well must meet the minimum requirements of well casing (OAR 690-210-0190). The space between the two well casings shall be sealed so as to prevent the movement of water between the two casings. Inner casing installed in a well shall extend or telescope at least eight feet into the lower end of the well casing. The inner casing must be centered and must be a minimum of one inch smaller in diameter than the outer casing if an under reaming method system is used. If other methods are used, the inner casing must be a minimum of two inches smaller in diameter than the outer casing. The grout must be placed in a positive manner in accordance with method A, B, D, or E (see Appendix 3).
[ED. NOTE: Appendix referenced is available from the agency.]
Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-02310; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94

690-210-0240
Casing Shall be Centered
In all instances, casings shall be centered in sealed intervals. Casing centralizers may be used to ensure centering. When sealing a well by Method E, casing centralizers shall be used. (See Figure 210-11, 1986)
[ED. NOTE: Figures referenced are available from the agency.]
Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented:
Hist.: WRD 13-1986, f. 10-7-86, ef. 11-1-86; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0250
Top Terminal Height
(1) The casing head or pitless unit of any well shall extend a minimum of 12 inches above the finished ground surface or pumphouse floor, and a minimum of 12 inches above the local surface runoff level. The ground surface immediately surrounding the top of the well casing or pitless unit should be graded so as to drain surface water away from the well. Without permission of the Director, no casing shall be cut off below land surface except to install a pitless unit or during permanent abandonment of a well.
(2) Application to the Director to reduce the top terminal height of casing shall include:
(a) A description of physical characteristics of the well site which make the requested change necessary; and
(b) A description of additional steps to be taken over and above the minimum standards in these rules which will assure adequate protection of the ground water resource.
(3) The Director may approve a reduction of the top terminal height of the casing only upon a determination that the additional precautions to be taken and specific physical characteristics of the site would prevent contamination of the ground water resource.

Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0041; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0260
Openings in the Casing
There shall be no opening in the casing wall between the top of the casing and the bottom of the required casing seal except for pitless adapters, measurement access ports, and grout nipples installed in conformance with these standards. In no case shall holes be cut in the casing wall for the purpose of lifting or lowering casing into the well bore unless such holes are properly welded closed and watertight prior to placement into the well bore.
Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0046

690-210-0270
Pitless Well Adapters and Units
Surface seal requirements for well casing set forth herein shall also apply when a pitless adapter or unit is installed in a well. The seal shall cover that interval occupied by the pitless case from the point of casing connection to land surface. A cement grout seal shall not be allowed within the pitless unit or pitless adaptor sealing interval. The pitless adapter or unit sealing interval shall be sealed with unhydrated bentonite as described in OAR 690-210-0330 and 690-210-0340. The pitless adapter or unit, including the cap or cover, pitless case and other attachments, shall be designed and constructed to be watertight to prevent the entrance of contaminants into the well from surface or near-surface sources. Pitless units shall be vented to the atmosphere. Refer to OAR 690-210-0210 if the pitless adaptor or unit is to be used in conjunction with PVC casing.
NOTE: Prior to installing pitless well adapters or units on public, community, municipal, or public utility water supply wells, contact the Department of Human Resources. (See references to Health Division regulation in Appendix 1.)
[ED. NOTE: The Appendix referenced is available from the agency.]
Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-051; WRD 7-1988, f. & cert. ef. 6-29-88; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0280
Access Ports, *Dedicated Measuring Tubes* and Airlines
All water supply wells shall be equipped with a usable access port with a minimum diameter of 1/2 inch[. ~~*In addition, an airline with a pressure gauge adequate to determine*~~] **for the purpose of determining** the water level in the well at any time [~~*may be installed*~~]. [~~*If an airline is installed, it*~~] **Dedicated measuring tubes are recommended to be installed on all wells at the time of pump installation. Where required, dedicated measuring tubes shall be a minimum of ¾-inch schedule 40 PVC extending to the top of the pump (See Dedicated Measuring**

Tube Diagram and Specifications in Figure 200-5). An airline is not a substitute for a required dedicated measuring tube and, if installed, must enter the well in a location other than the access port. [~~*Unless it is located inside the well casing, the*~~] **A[*a*]**ccess ports**, dedicated measuring tubes** or airlines shall be capped and be a minimum of twelve inches above finished ground surface or pumphouse floor **(See Figure 210-12) (See Figure 200-5). The access port, airline and dedicated measuring tube on all water supply wells required by OAR 690-210-0280 shall be maintained in a condition that will prevent contamination of the ground water, and shall remain unobstructed and be maintained by the landowner so that the water level can be determined at any time.** [~~*If the well constructor does not install a pump in the well, the landowner will be required to provide the access port. (See Figure 210-12.)*~~]
[ED. NOTE: Figures referenced are available from the agency.]
Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented:
Hist.: WRD 13-1986, f. 10-7-86, ef. 11-1-86; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01; WRD May-2008, f. & cert. ef. 7-01-08

690-210-0290
Liner Pipe
Liner pipe installed through caving formations and installed without driving, may be of lighter weight than specified by Table 210-2 under OAR 690-210-0190. Such lightweight pipe shall have a wall thickness equal to or greater than 0.188 inch. All liner pipe shall be of steel, in new or like new condition, being free of pits or breaks; or shall be of polymerized vinyl chloride (PVC) type 1220 or 1120 and SDR 26 (Class 160) or greater wall thickness. Liner pipe installed in a well shall extend or telescope at least eight feet into the lower end of the well casing. In the event that 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. Liner pipe shall be removable. Liner pipe may be welded or hooked onto the permanent well casing but shall not be permanently fixed to a well casing or borehole wall using packers or grout which would prohibit the liner's removal. (See Inner Casing, OAR 690-210-0230.)
Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0011; WRD 7-1988, f. & cert. ef. 6-29-88; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0300
Drill Cuttings or Chips
In no case shall drill cuttings or drill chips be used or allowed to fill, partially fill, or fall into the required sealing interval of a well during the construction or the completion of a well.
Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-61-110

690-210-0310
Cement Grout
When using cement grout as the sealing material in a well, it must meet the following requirements:
(1) Cement grout used to seal a well shall be composed of a uniformly mixed slurry of Portland cement or High Early Strength Type III Portland cement and potable water, or High-alumina cement and potable water, mixed in the following proportions (Type of Cement -- Gallons of Water Per Sack of Dry Cement, respectively):
(a) Portland Cement -- 4-1/2 to 6;
(b) High Early Strength Type III Portland Cement -- 5-1/2 to 6-1/2;
(c) High-alumina Cement -- 4-1/2 to 6.
(2) Additives to increase fluidity, reduce shrinkage, or control time of set may be used in a cement grout mixture. Expanding agents such as aluminum powder may be used at a rate not exceeding 0.075 ounce (one level teaspoonful) per sack of dry cement. The powder shall not contain polishing agents. The addition of bentonite clay to a cement grout mixture is permissible but shall not in any case exceed five percent (5%) by weight of dry cement. Calcium chloride may be added to a Portland cement grout to accelerate the set but shall not exceed two pounds per sack of dry cement. High-alumina cement and Portland cement of any type shall not be mixed together for use in a well.
(3) Cement types other than those set forth herein shall not be used as a sealing material in a well except upon written approval of the Director of the Water Resources Department.
(4) In no case shall sand or aggregate be added to cement grout seal mixtures.
Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0086; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0315
Concrete
Concrete for use in the construction of a dug well, or for filling the annular space or well bore of a well, shall consist of clean, hard, and durable aggregate, and not less than five sacks of Portland cement per cubic yard of concrete. Concrete will be allowed only when the oversize drill hole is a minimum of eight inches larger in diameter than the well casing used in construction of the well. The maximum diameter of aggregate particles shall not exceed 1-1/2 inches, but, in any case, shall not exceed 1/5 or 20 percent of the minimum width of the space to be filled. The ratio of coarse aggregate to fine aggregate (Passing No. 4, U.S. Standard Sieve) shall be approximately 1-1/2 to 1 by volume, but, in any case, shall not exceed 2 to 1 nor be less than 1 to 2.
Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0211; WRD 7-1988, f. & cert. ef. 6-29-88, Renumbered from 690-0210-0430

690-210-0320
Methods of Placement of Cement Grout or Concrete
Cement grout or concrete used as a sealing material in a well shall be placed or forced upward

from the bottom to completely fill the annular space to be grouted and shall be placed in one continuous operation without significant interruption. If temporary outer surface casing is used in the construction of the well, it shall be withdrawn as the grout or concrete is placed. (For acceptable methods of placement, see Appendix 3 and Figure 210-5, 1986.)
[ED. NOTE: Figures and Appendix referenced are available from the agency.]

Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0021 & 690-061-0096; WRD 7-1988, f. & cert. ef. 6-29-88; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0330
Unhydrated Bentonite
Unhydrated bentonite used in construction of casing seals for water supply wells shall be specifically designed for sealing wells and be within industry tolerances for dry western sodium bentonite. Bentonite shall be free of polymers that promote bacterial growth. Placement of the bentonite shall conform to the manufacturers specifications and result in a seal that is free of voids or bridges. Powdered bentonite and bentonite grout or slurry shall not be used as an annular seal material.
Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented:
Hist.: WRD 12-1985, f. 12-6-85, ef. 12-7-85; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0087; WRD 7-1988, f. & cert. ef. 6-29-88; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0340
Method of Placement of Unhydrated Bentonite
(1) An upper oversize drillhole, four inches greater than the nominal inside diameter of the permanent well casing, shall be constructed to a minimum depth of 18 feet. The use of unhydrated bentonite as a surface casing seal shall not be allowed below 50 feet from land surface. In the event that the subsurface materials penetrated by the oversize drillhole cave, or tend to cave, an outer temporary surface casing shall be used to case out the caving materials throughout construction of the oversize drillhole. The temporary surface casing shall be removed before completion of the well.
(2) In the event water is present or encountered during the construction of the oversize drillhole, only bentonite chips manufactured to be greater than 1/4 inch or tablets shall be allowed in the sealing interval. A maximum of 25 feet of water may be present within the sealing interval. Granular bentonite may be used if the annular space is dry.
(3) Placement of bentonite shall conform to the manufacturer's specifications and result in a seal that is free of voids or bridges.
(4) After placement of the permanent casing, the annular space shall be filled to land surface with bentonite. The annular space shall be kept full while drilling or driving casing. A sounding or tamping tool shall be used in the sealing interval during pouring to measure fill rate and to break up possible bridges or cake formations. Care shall be taken to minimize the introduction of bentonite dust into the sealing interval.

(5) Pour rate shall be three minutes or slower per 50 pound sack in the water-filled portion of the annulus.

Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented:
Hist.: WRD 12-1985, f. 12-6-85, ef. 12-7-85; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0097; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0350

Resumption of Construction Following Placement of Cement Grout

The time needed for the final set of a cement grout mixture varies greatly in accordance with cement-water ratio and temperature. When cement grout is used to seal a well, construction should not resume until after the final set of the cement grout mixture. Performance of all cement grout seals shall be the responsibility of the person responsible for the construction of the well. Under no circumstances shall construction resume within six hours of the placement of the cement grout seal. Recommended periods of time for the final set are:

(1) If Portland Cement is used -- 72 hours;

(2) If High Early Strength Type III Portland Cement is used - 48 hours;

(3) If High-alumina Cement is used -- 6 hours.

Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0101; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0360

Movement of Casing after Cement Grouting

In no case shall the permanent well casing be moved or driven following the placement and initial set of the cement grout.

Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0106

690-210-0370

Well Test

Upon completion, every well shall be tested for yield and drawdown either by bailing, pumping, or air testing for a period of not less than one hour. Any testing method that does not provide for drawdown measurements during testing is not an accurate or reliable test of yield.

Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0081; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0380

Disinfection of a Well

Prior to or after being placed in the well, pumping equipment, sand, gravel and well casing shall be thoroughly hosed or sluiced with water, and shall be disinfected with a solution containing at

least 50 parts per million chlorine. All water introduced into a well during construction shall be clean and potable. Upon completion, the well and its equipment, including the interior of the well casing, shall be thoroughly swabbed and cleaned to remove all of the oil, grease, and foreign substances. The well and its equipment shall be disinfected by thoroughly agitating and mixing in the well a solution containing enough chlorine to leave a residual of 25 parts per million throughout the well after a period of 24 hours. Disinfection should also occur following the installation of pumping equipment. (See Chart Recommendations for Disinfection of Wells, Appendix 2.)

NOTE: Other public agencies may have jurisdiction over the discharge of chlorine in certain areas. The constructor should contact the Oregon Department of Environmental Quality or the appropriate city public works department for further information.

[ED. NOTE: The Appendix referenced is available from the agency.]

Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795

Stats. Implemented:

Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0116; WRD 7-1988, f. & cert. ef. 6-29-88; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0390

Completion of Wells

A well constructor or permitted landowner constructing their own well shall not remove the drilling machine from a well site, unless it is immediately replaced by another drilling machine in operating condition prior to completion or abandonment of the water supply well in compliance with OAR 690-210-0005 through 690-220-0140.

Stat. Auth.: ORS 536.090 & ORS 537.505 - ORS 537.795

Stats. Implemented:

Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0121; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0400

Construction of Dug Wells

Dug wells that are between 12 feet in depth and 21 feet in depth shall be constructed with a watertight surface curbing extending from a minimum of 12 inches above land surface to within three feet of the bottom of the well. Dug wells greater than 21 feet in depth shall be constructed with a watertight surface curbing that extends from a minimum of 12 inches above land surface to a depth of at least 18 feet below land surface. Open wells, sometimes called sumps, which exceed ten feet in average diameter are exempt from these construction requirements, but are subject to all the requirements covering the use of ground water. (water right application).

Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540

Stats. Implemented:

Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0196; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0410

Buried Slab Construction

In a buried slab type well, the slab shall be at least 18 feet below land surface and shall be at least

three inches in thickness. The slab shall be reinforced to withstand all stresses. The slab shall be sealed with cement grout at least one foot thick, and the well bore backfilled with grout or concrete in accordance with OAR 690-210-0300 through 690-210-0360 and OAR 690-210-0430. (See Figure 210-13.)
[ED. NOTE: Figures referenced are available from the agency.]

Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0206; WRD 7-2001, f. & cert. ef. 11-15-01

690-210-0420
Surface Curbing
(1) The surface curbing required in OAR 690-210-0400 shall be of concrete, concrete tile, or steel. If concrete is used, the concrete wall thickness shall not be less than six inches. In the case of buried slab type wells, well casing meeting the minimum specifications given in OAR 690-210-0190 through OAR 690-210-0220 shall be used. (See Figure 210-13.)
(2) If precast concrete tile or steel casing is used for the surface curbing, the well diameter to the bottom of the surface curbing shall be eight inches greater than the outside diameter of the tile or steel, and the annular space shall be completely filled with grout or concrete in accordance with OAR 690-210-0310 and OAR 690-210-0315. (See Figure 210-13, 1986.)
[ED. NOTE: Figure referenced are available from the agency.]
Stat. Auth.: ORS 183, ORS 536, ORS 537 & ORS 540
Stats. Implemented:
Hist.: WRD 9-1978, f. 12-12-78, ef. 1-1-79; WRD 13-1986, f. 10-7-86, ef. 11-1-86, Renumbered from 690-061-0201; WRD 7-2001, f. & cert. ef. 11-15-01