

OREGON ADMINISTRATIVE RULES  
CHAPTER 690, DIVISION 61 — WATER RESOURCES DEPARTMENT

DIVISION 61

CONSTRUCTION OF WELLS

Drilled Wells (Cable Tool)

**Well Casing**

**690-61-005** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Well Casing**

**690-61-006** (1) All casing installed, other than plastic casing set forth in rule 690-61-031, shall be of steel, in new or like new condition, being free of pits or breaks, and shall meet minimum American Society of Testing Materials (ASTM A-120) specifications for line pipe, for the sizes as set out in Table 1.

(2) All casing having a diameter larger than twenty (20) inches shall have a wall thickness of at least .375 inch.

(3) Well casing installed in a well greater than a nominal diameter of ten (10) inches, having a wall thickness of .250 inch and meeting ASTM A-120 specifications must not exceed the following depth limitations (Diameter — Maximum Depth, respectively):

- (a) 12 inches — 250 feet;
- (b) 14 - 16 inches — 150 feet;
- (c) 18 - 20 inches — 100 feet.

(4) Steel casings of other ASTM specifications may be considered under the provisions of Special Standards (rule 690-60-040).

[Publications: The publication(s) referred to or incorporated by reference in this rule are available from the office of the Water Resources Department.]

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Casing Joints**

**690-61-010** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Liner Pipe**

**690-61-011** Liner pipe installed through caving formations, or for sealing out water of poor quality, and installed without driving, may be of lighter weight than specified by the table under rule 690-61-006. Such lightweight pipe shall have a wall thickness equal to or greater than a minimum wall thickness of .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, SDR 21 (Class 200), or SDR 26 (Class 160). Liner pipe installed in a well shall extend or telescope at least eight (8) 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 (8) feet into the adjacent larger diameter liner pipe. Liner pipe shall not be permanently fixed to a well casing below land surface except by the use of cement grout, packers, or similar sealing materials, placed in the annular space between the liner and well casing.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Sealing of Casing**

**690-61-015** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Casing Joints (Steel Casing)**

**690-61-016** All casing joints shall be welded or screw coupled and shall be watertight. 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 Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Sealing of Casing**

**690-61-020** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Temporary Casing**

**690-61-021** Temporary outer surface casing used in the construction of a well shall be withdrawn as sealing material is placed.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Sealing of Casing**

**690-61-025** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Casing Shoe**

**690-61-026** In all drilled wells, permanent well casing that is driven shall be equipped with a standard drive shoe at its lower end, welded or threaded onto the lower end of the string of casing. The shoe shall have a beveled cutting edge of metal forged, cast, or fabricated for this special purpose.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Mineralized Water**

**690-61-030** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Plastic Casing**

**690-61-031** All plastic casing shall be installed only in an oversized drillhole without driving. Such casing shall be of polymerized Vinyl Chloride (PVC), type 1120 or 1220, SDR 21 (Class 200) or SDR 26 (Class 160), meeting the standards of the "National Sanitation Foundation" and ASTM D-2241-73 and ASTM 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:

- (1) SDR = 21 — Maximum Depth = 150 feet.
- (2) SDR = 26 — Maximum Depth = 100 feet.

NOTE: Plastic casing is not acceptable for use in public, community municipal or public water supply wells. See reference to Health Division regulations in Appendix 1.

[Publications: The publication(s) referred to or incorporated by reference in this rule are available from the office of the Water Resources Department.]

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79



**OREGON ADMINISTRATIVE RULES**  
**CHAPTER 690, DIVISION 61 — WATER RESOURCES DEPARTMENT**

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**Polluted Water**

**690-61-035** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Casing Joints (Plastic Casing)**

**690-61-036** All casing joints shall be watertight. Either "bell" type or coupling hubs are approved. Hub couplings shall be of material meeting the specifications for plastic casings as stipulated in rule 690-61-031. 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 2).

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Explosives**

**690-61-040** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Top Terminal Height**

**690-61-041** The casing head or pitless unit of any well shall extend not less than twelve (12) inches above the finished ground surface or pumphouse floor, and not less than twelve (12) inches above the local surface runoff level. No casing shall be cut off below land surface except to install a basement offset or a pitless unit, or during permanent abandonment of a well. 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. The watertight casing of any well to be used for public or community use shall extend not less than twelve (12) inches above the finished land surface or pumphouse floor, and not less than twelve (12) inches above the regional flood level of record.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Chlorination of Water**

**690-61-045** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Casing Openings**

**690-61-046** 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 Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Well Test**

**690-61-050** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Pitless Well Adapters and Units**

**690-61-051** Surface seal requirements for well casing set forth herein shall also apply when a pitless adapter or unit is installed in a well and shall cover that sealing interval occupied by the pitless case from the point of casing connection to land surface. A cement grout seal shall not be required within the pitless unit sealing interval. The pitless adapter or unit, including the cap or cover, pitless case and other attachments, shall be designed and constructed to be watertight and prevent the entrance of contaminants into the well from surface or near-surface sources. Pitless units shall be vented to the atmosphere.

**NOTE:** Pitless well adapters or units are not acceptable for use on public, community, municipal or public utility water supply wells. (See references to Health Division regulation in Appendix 1, Part 11)

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Access Port**

**690-61-055** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Mineralized or Polluted Ground Water**

**690-61-056** All formations which yield polluted or highly mineralized water shall be adequately cased or cemented off so as to prevent pollution or contamination of the overlying or underlying water-bearing zones.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Perched Ground Water**

**690-61-059** Wells drawing from perched ground water will incorporate the drilling construction practices and facilities that will prevent the waste of this type of ground water.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Completion of Well**

**690-61-060** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Commingling of Waters**

**690-61-061** In no case shall wells be constructed to allow commingling or leakage of ground water from different ground-water bodies associated with different geological units. However, ground water entering from different depths in the same geological unit may be combined provided the waters are similar as to potentiometric head, temperature and mineral content.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Rotary Drilled and  
Gravel Packed Wells**

**Definition**

**690-61-065** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]



**OREGON ADMINISTRATIVE RULES**  
**CHAPTER 690, DIVISION 61 — WATER RESOURCES DEPARTMENT**

**Explosives**

**690-61-066** Explosives shall not be detonated inside the well casing or liner pipe except that commercially developed perforators may be used. 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 Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Well Casing**

**690-61-070** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Unattended Wells**

**690-61-071** All wells when unattended during construction shall be securely covered.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Sealing of Casing**

**690-61-075** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Organic Materials**

**690-61-076** Organic materials which foster or promote undesired organic growth shall not be employed in the construction of a water well. This includes but is not limited to brans, hulls, grains, starches and proteins.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Sealing of Casing**

**690-61-080** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Well Test**

**690-61-081** Every well shall be tested for yield and drawdown for a period of not less than one hour either by bailing, pumping or air testing. Any testing method that does not provide for drawdown measurements during testing is not an accurate or reliable test of yield.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Sealing of Casing**

**690-61-085** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Cement Grout**

**690-61-086** Only cement grout sealing material which meets the following requirements shall be used to construct the required casing seal in a water well:

(1) Cement Grout — 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 .075 ounce (1 level teaspoonful) per sack of dry cement. The powder shall not contain polishing agents. The addition of bentonite clay to a grout mixture is permissible but shall not in any case exceed five (5) percent by weight of dry cement. Sand shall not be added to grout seal mixtures. Calcium chloride may be added to a Portland cement grout to accelerate the set but shall not exceed two (2) pounds per sack of dry cement. High-alumina cement and Portland cement of any type shall not be mixed together for use in a water 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.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Chlorination of Gravel Pack**

**690-61-090** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Casing Centralizers**

**690-61-091** Well casing to be sealed into an oversize drillhole should be equipped with centering guides to ensure the proper centering of a casing. In all events, casings shall be centered in sealed interval. Guides should be of steel, at least one-fourth (1/4) inch in thickness, evenly spaced in groups of three (3) or four (4) in twenty (20) foot intervals or less. (See Figure 1)

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Mineralized or Polluted Water**

**690-61-095** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Methods of Placement of Cement Grout**

**690-61-096** Cement grout to be used as a sealing material in a well shall be placed or forced upward from the bottom of the space to be grouted and shall be placed in one continuous operation without significant interruption. (For acceptable methods of procedure, see Appendix 2.)

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Explosives, Chlorination, Well Test, and Access Port**

**690-61-100** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Resumption of Construction Following Placement of Cement Grout**

**690-61-101** The time of the final set of the cement grout mixture varies greatly in accordance with cement-water ratio and temperature. Cement grout emplaced in a well for sealing purposes should not be disturbed in any way until the final set of the cement grout mixture. Performance of all cement grout seals shall be the responsibility of the water well contractor and drilling machine operator. *Recommended* periods of time of 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.



**OREGON ADMINISTRATIVE RULES**  
**CHAPTER 690, DIVISION 61 — WATER RESOURCES DEPARTMENT**

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Completion of Well**

**690-61-105** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Movement of Casing After Grouting**

**690-61-106** 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 Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Special Additional Standards  
for Artesian Wells**

**Definition**

**690-61-110** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Drill Cuttings or Chips**

**690-61-111** In no case shall drill cuttings and 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 Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Casing, Casing Joints, Explosives, and Chlorination**

**690-61-115** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Disinfection**

**690-61-116** Every new, altered, or reconditioned water well including pumping equipment, sand, or gravel used in filter pack wells and a well casing standing above the water table, shall be thoroughly hosed or sluiced with water, and shall be disinfected with a solution containing at least fifty (50) parts per million chlorine before being placed in the well. All water introduced into a well during construction shall be clean and potable. 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 upon completion of the well's construction. Following the completion of a well, and again after the pumping equipment has been installed, a 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 twenty-five (25) parts per million throughout the well after a period of twenty-four (24) hours. (See Chart Recommendations for Disinfection of Water Wells, Appendix 1.)

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Sealing of Casing**

**690-61-120** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Completion of Wells**

**690-61-121** A water well contractor, drilling machine operator, or landowner constructing his own well shall not remove the drilling machine from a well site unless the drilling machine is immediately replaced by another drilling machine in operating condition prior to:

(1) Completion of the well in compliance with rules 690-61-006 through 690-61-241 and a watertight seal, threaded or welded cap placed on the well in accordance with rule 690-63-005; or

(2) Completion of the well in compliance with rules 690-61-006 through 690-61-241 and a pump installed; or

(3) Abandonment of the well in compliance with rules 690-63-005 through 690-63-045.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Control Valves**

**690-61-125** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Drilled Wells**

**Sealing of Wells in Unconsolidated Formations Without Significant Clay Beds**

**690-61-126** Wells drilled into unconsolidated water-bearing strata overlain by unconsolidated materials, such as sand, silt, or sand and gravel, without significant clay beds, shall have a watertight, unperforated well casing extending at least five (5) feet below the top of the water table. If the water table is thirteen (13) feet or less below land surface, a watertight, unperforated, permanent well casing shall extend to a minimum depth of eighteen (18) feet. An upper oversize drillhole, four (4) inches great in diameter than the nominal diameter of the casing, shall be constructed to a minimum depth of eighteen (18) feet. To prevent caving, a temporary surface casing, at least eighteen (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 temporary surface casing or drillhole wall shall be completely filled and sealed from a depth of at least eighteen (18) feet to land surface with cement grout in accordance with rules 690-61-086 through 690-61-111 after the permanent well casing is set into its final position. The temporary surface casing shall be removed as the annular space is filled with cement grout. (See Figure 3)

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Elimination of Leakage**

**690-61-130** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Sealing of Wells in Unconsolidated Formations With Significant Clay Beds**

**690-61-131** 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, unperforated, permanent well casing extending at least five (5) feet into a clay or other impermeable stratum overlying the water-bearing zone. In all cases, an upper oversize drillhole, at least four (4) 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 oversized drillhole. If the clay or other impermeable stratum is thirteen (13) feet or less below land surface, the watertight, unperforated well casing and the upper, oversized drillhole shall extend to a minimum depth of eighteen (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 cement grout. If preferred, a smaller diameter casing, perforated liner, or well screen may be installed. The annular space between the permanent well casing and the upper, oversized drillhole shall be completely filled with cement grout in accordance with rules 690-61-086 through 690-61-111 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 4)

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

#### Pressure Gauge

**690-61-135** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

#### Sealing of Wells in Consolidated Formations

**690-61-136** (1) Wells drilled into a water-bearing rock formation overlain by clay, sand, or gravel, or similar materials, shall be constructed in accordance with one of the following methods:

(a) Method 1 — An upper drillhole, four (4) 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 (5) feet into sound, uncreviced, consolidated rock below a depth of thirteen (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 cement grout. The upper annular space between the casing and the drillhole wall shall be filled from land surface to at least five (5) feet into an impermeable clay stratum below a depth of thirteen (13) feet. The annular space between the upper and lower required cement grout sealing intervals shall be filled with an impermeable sealing material or cement grout. (See Figure 5) 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 pump from the bottom of the casing (Methods A, B, D, Appendix 2), the upper drillhole diameter may be only two (2) inches larger than the nominal diameter of the casing. (See Figure 5)

(b) Method 2 — An upper drillhole, four (4) inches greater in diameter than the permanent well casing to be installed, shall extend from land surface to at least five (5) feet into an impermeable clay stratum below a depth of thirteen (13) feet. Unperforated, permanent well casing shall extend to and shall be driven into sound, 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 (5) feet into sound uncreviced rock overlying the water-bearing formation. A smaller diameter casing or liner pipe, at least two (2) inches smaller in diameter than the diameter of the upper permanent well casing, shall extend at least five (5) feet into the lower drillhole and at least eight (8) feet into the overlying permanent well casing. The annular space between the upper oversized drillhole and the permanent well casing, and the annular space between the smaller diameter lower casing or liner pipe and the lower drillhole, shall be completely filled with cement grout in accordance with rules 690-61-086 through 690-61-111 after the permanent well casing and the lower casing or liner pipe are set into final position. (See Figure 6)

(c) Method 3 — An upper drillhole, four (4) inches greater in diameter than the permanent well casing to be installed, shall extend from land surface to at least five (5) feet into an impermeable clay stratum below a depth of thirteen (13) feet. Unperforated, permanent well casing shall extend to and shall be driven into sound, uncreviced, consolidated rock overlying the water-bearing formation. A lower drillhole, at least two (2) inches greater in diameter than the diameter of the upper permanent well casing, shall be constructed at least five (5) feet into sound, uncreviced, consolidated rock by under-reaming methods. The upper permanent well casing shall be lowered to the full depth of the lower oversized drillhole. The annular space between the upper oversized drillhole and the upper permanent well casing, and the annular space between the lower under-reamed drillhole and the permanent well casing, shall be completely filled with cement grout applied under pressure in accordance with the appropriate Methods A, B, C, or D, in Appendix 2. (See Figure 2 and 7)

(2) In all cases, (Methods 1, 2, or 3 above), should materials penetrated by the upper oversized drillhole cave, or tend to cave, an outer temporary surface casing shall be used to case out all caving material throughout construction of the oversized drillhole. The temporary surface casing shall be withdrawn as the annular space is filled with cement grout.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

#### Completion of Well

**690-61-140** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

#### Filter Pack Wells

##### Sealing of Filter Pack Wells with Surface Casing

**690-61-141** If a permanent surface or outer casing is installed in the construction of a filter pack well, a well bore having a nominal diameter of at least four (4) inches greater than the nominal diameter of the permanent surface casing shall extend from land surface to at least five (5) feet into a clay or other impermeable formation overlying the water-bearing zone. Unperforated watertight casing shall extend to this same depth and the annular space between the well bore and the surface casing shall be filled with cement grout. If the clay or other impermeable formation is at or near land surface, a minimum of eighteen (18) feet of unperforated casing shall be installed. A watertight, welded, steel plate at least three-sixteenths (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 pipe with threaded cap may be installed for the purpose of placing additional filter pack material in the well. (See Figure 8)

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

##### Drive Pipe

**690-61-145** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

##### Sealing of Filter Pack Wells Without Surface Casing

**690-61-146** If a permanent surface or outer casing is not installed in the construction of a filter pack well, a well bore having a nominal diameter of at least eight (8) inches greater than the nominal diameter of the permanent well casing shall extend from land surface to at least five (5) feet into a clay or



**OREGON ADMINISTRATIVE RULES**  
**CHAPTER 690, DIVISION 61 — WATER RESOURCES DEPARTMENT**

other impermeable formation overlying the water-bearing zone. Unperforated watertight casing shall extend to this same depth and the annular space between the well bore and the permanent casing shall be completely filled with cement grout. If the clay or other impermeable formation is at or near land surface, the upper oversize drillhole and unperforated, permanent well casing shall extend to a minimum depth of eighteen (18) feet below land surface. A suitable packer shall be installed in the annular space between the filter pack material and the cement 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 cement grout seal surrounding the permanent well casing. (See Figure 9)

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Well Casing Joints, and Mineralized or Polluted Water**

**690-61-150** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Special Additional Standards  
For Artesian Wells**

**Elimination of Leakage**

**690-61-151** All artesian wells shall be completed with the seals, packers, and casings that are necessary to eliminate sub-surface and/or surface leakage.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Sealing of Casing**

**690-61-155** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Commingleing of Water**

**690-61-156** In no case shall the casing in an artesian well be perforated or the well constructed in a manner that will allow the commingleing of water from an artesian zone with other water-bearing zones representing different groundwater bodies. All artesian wells shall be adequately cased and sealed into the confining stratum. Surface or subsurface leakage leading to a water loss or decay of artesian pressures will not be allowed.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Casing**

**690-61-160** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Control Valves**

**690-61-161** If a well flows at land surface, the well shall be equipped with a watertight mechanical cap, threaded or welded, and a control valve, so that all flow of water from the well can be completely stopped.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Chlorination**

**690-61-165** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Pressure Gauge**

**690-61-166** All flowing artesian wells shall be equipped with a pressure gauge and a petcock valve between the gauge and well casing so that the artesian head can be determined at any time. (See Figure 1)

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Mineralized or Polluted Water**

**690-61-170** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Well Test**

**690-61-171** All flowing artesian 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 log.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Sealing of Casing**

**690-61-175** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Construction of Artesian Wells**

**690-61-176** Wells penetrating into an artesian aquifer shall have an upper drillhole four (4) inches greater in diameter than the nominal diameter of the permanent well casing extending at least five (5) feet into the confining formation immediately overlying the artesian water-bearing zone. Unperforated, watertight casing shall extend to this same depth. If the confining formation is at or near land surface, the upper oversize drillhole and watertight casing shall extend to a minimum depth of eighteen (18) feet. The unperforated, permanent well casing shall be grouted into the confining stratum with cement grout. If cement grout is placed by a suitable pump from the bottom of the casing (Methods A, B, and D, in Appendix 2, See Figure 2), the diameter of the upper drillhole may be only two (2) inches larger than the nominal diameter of the casing. If necessary to complete the well, a smaller diameter casing, a perforated liner, or a well screen may be installed. (See Figure 10) In all cases, a sufficient amount of cement grout shall be placed in the well to rise a minimum of thirty (30) feet above the lower end of the well casing or to land surface. The upper annular space shall be completely filled with cement grout from land surface to a depth at least five (5) feet into a clay or other impermeable formation below a depth of thirteen (13) feet. The remainder of the annular space between the upper annular seal and the lower cement grout seal above the artesian zone shall be filled with either an impermeable sealing material or cement grout.

In wells which encounter artesian pressures in the absence of a confining formation, the foregoing requirements of rule 690-61-176 are not applicable and may be altered by receiving written approval by the Director in accordance with Special Standards rule 690-60-040.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Surface Curbing**

**690-61-180** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]



### Thermal Well Standards

**Construction of Thermal or Hot Water Wells**  
**690-61-181** [WRD 9-1978, f. 12-12-78, ef. 1-1-79;  
Repealed by WRD 12-1982,  
f. & ef. 12-14-82]

**Surface Curbing**  
**690-61-185** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

### Driven or Jetted Wells

**Drive Pipe**  
**690-61-186** (1) All drive point wells or jetted wells shall be constructed with drive pipe meeting the minimum specifications as set out in Table 3.

(2) Drive pipe greater than three and one-half (3-1/2) inches shall comply with the minimum specifications given in rule 690-61-006.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Surface Curbing**  
**690-61-190** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Construction of Driven or Jetted Wells**  
**690-61-191** All drive point wells or jetted wells shall have unperforated, watertight pipe extending a minimum distance of eighteen (18) feet below land surface. An upper drillhole at least four (4) inches greater in nominal diameter than the permanent production pipe shall extend at least eighteen (18) feet below land surface. The annular space shall be filled with cement grout after the pipe is set into final position. (See Figure 11)

NOTE: Wells constructed by the above driving or jetting methods may not produce water of suitable quality for use as public, community, municipal or public utility supplies. (See Appendix 1, Part II)

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Well Seal**  
**690-61-195** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

### Dug Wells

**Construction of Dug Wells**  
**690-61-196** All dug wells greater than twelve (12) feet in depth shall be constructed with a watertight surface curbing extending from a minimum of twelve (12) inches above land surface to a depth of eighteen (18) feet below land surface, or to within three (3) feet of the bottom of the well in the case of wells ranging from twelve (12) to twenty-one (21) feet in depth. Open wells, sometimes called sumps, which exceed ten (10) feet in average diameter are exempt from these construction requirements, but are subject to all the requirements covering

the use of the ground water and protection of the quality of the ground water.

NOTE: Wells constructed by the above methods may not produce water of suitable quality for use as public community, municipal or public utility supplies. (See Appendix 1, Part II)

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Mineralized or Polluted Water**  
**690-61-200** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Surface Curbing**  
**690-61-201** The surface curbing required in rule 690-61-196 shall be of concrete, concrete tile, or steel. If concrete is used, the concrete wall thickness shall not be less than six (6) inches. In case of buried slab type well, well casing meeting the minimum specifications given in rule 690-61-006 through rule 690-61-031 shall be used. (See Figure 12)

If precast concrete tile or steel casing are used for the surface curbing, the well diameter to the bottom of the surface curbing shall be eight (8) inches greater than the outside diameter of the tile or steel, and the annular space shall be completely filled with concrete. (See Figure 12)

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Rules for Rotary or Dug Wells Apply to Bored Wells**  
**690-61-205** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Buried Slab Construction**  
**690-61-206** In a buried slab type well, the slab shall be at least eighteen (18) feet below land surface and shall be at least three (3) inches in thickness. The slab shall be reinforced to withstand all stresses. The slab shall be sealed with cement grout at least one (1) foot thick, and the well bore backfilled with cement grout or concrete. (See Figure 12)

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Casing**  
**690-61-210** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Concrete**  
**690-61-211** 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 (5) sacks of Portland cement per cubic yard of concrete. The maximum diameter of aggregate particles shall not exceed one and one-half (1-1/2) inches, but, in any case, shall not exceed one-fifth (1/5) or twenty (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 one and one-half (1-1/2) to one (1) by volume, but, in any case, shall not exceed two (2) to one (1) nor be less than one (1) to two (2).

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**OREGON ADMINISTRATIVE RULES**  
**CHAPTER 690, DIVISION 61 — WATER RESOURCES DEPARTMENT**

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**Sealing of Casing**

**690-61-215** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Bored Wells**

**Rules for Drilled Wells, Filter Pack Wells, or Dug Wells Apply to Bored Wells**

**690-61-216** Rules 690-61-006 through 690-61-136; 690-61-141 through 690-61-146; and 690-61-196 through 690-61-211 apply to all bored wells.

**NOTE:** Wells constructed by the above boring methods may not produce water of suitable quality for use as public, community, municipal or public utility supplies. (See Appendix 1, Part II)

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Inner Casing**

**690-61-220** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Deepening or Repair of Wells**

**Casing**

**690-61-221** All casing or liner pipe used in the repair or deepening of wells shall meet the minimum standards in rules 690-61-006 through 690-61-046.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Artesian Well**

**690-61-225** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Sealing of Casing**

**690-61-226** If in the repair of a drilled well the old casing is withdrawn, the well shall be recased in accordance with the rules set forth in rules 690-61-006 through 690-61-146.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Drilling in a Dug Well**

**690-61-230** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Inner Casing**

**690-61-231** If an inner casing is installed to prevent leakage of undesirable water into a well, the space between the two well casings shall be pressure grouted with cement grout so as to prevent the movement of water between the two casings.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Unusual Conditions**

**690-61-235** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Artesian Well**

**690-61-236** If upon deepening of an existing well, an artesian zone is encountered, the well shall be cased and completed as set forth in rules 690-61-151 through 690-61-176.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79

**Special Standards**

**690-61-240** [WRD 3, f. & ef. 2-18-77;  
Repealed by WRD 9-1978,  
f. 12-12-78, ef. 1-1-79]

**Drilling in a Dug Well**

**690-61-241** In no case shall a dug well be deepened by drilling methods.

Stat. Auth.: ORS Ch. 537  
Hist: WRD 9-1978, f. 12-12-78, ef. 1-1-79