

TITLE 179 PUBLIC WATER SYSTEMS

CHAPTER 7 SITING, DESIGN AND CONSTRUCTION OF PUBLIC WATER SYSTEMS

7-001 SCOPE AND AUTHORITY: These regulations establish standards for the siting, design, and construction of public water systems and the associated fees. The authority is found in Neb. Rev. Stat. §§ 71-5301 to 71-5313.

7-001.01 Other Regulations: Persons designing and/or constructing water projects are advised that regulations and/or codes that are not enforced by the Department may exist and apply to the project, including but not limited to electrical codes, plumbing codes, building codes, wastewater regulations, and regulations issued and enforced by Natural Resources Districts, federal, state, county, or city authorities.

7-002 DEFINITIONS

Certification of Project Completion means documentation signed and dated by the engineer indicating that a project or portion of a project has been completed in accordance with the approved plans and specifications for placement into service.

Community public water supply distribution system means that part of the public water system including distribution mains, valves and hydrants that are under the ownership and/or legal control of the public water system owner.

Department means the Division of Public Health of the Department of Health and Human Services.

Director means the Director of Public Health of the Division of Public Health or his/her authorized representative.

Distribution main means a pipe through which water is delivered to a water service main.

Emergency condition means any event that causes the complete loss of water supply or loss of adequate pressure in the system.

Engineer means a professional engineer registered in the State of Nebraska.

Project means plans and specifications from a public water system that are submitted on one date for review and approval.

Major construction, extension, or alteration means those structural changes that affect the source of supply, treatment processes, or transmission of water to service areas, but does not include the extension of service mains within established service areas.

Non-community public water supply distribution system means that part of the public water system including the well discharge piping, all buried pipe and building plumbing that is under the ownership and/or legal control of the public water system owner.

Service main means the portion of a pipe from a distribution main to the user. Service main also means service pipe or service line.

Substantial conformance means that the siting, design, and construction of drinking water facilities will not adversely impact public health and/or the ability of a public water system to deliver safe drinking water on a continuous basis.

Transmission main means a pipe through which water is conveyed from a source of supply or storage to a point of storage, treatment, or the distribution system. Transmission mains may have individual service connections where there is no other economical or convenient system designed to provide service to individual customers.

Tremie pipe means a pipe or hose that carries grout or gravel pack to the placement depth.

7-003 SUBMISSION OF PLANS AND SPECIFICATIONS: Plans and specifications for all major construction, extension or alteration to public water systems must be prepared by an engineer and must be submitted to the Director for review and written approval prior to the beginning of construction, except as provided in 179 NAC 7-004. Upon approval of the plans and specifications the Director will issue a construction permit. A construction permit is valid for a period of two years from the date of issuance. If construction is not started within two years from the issuance of the permit, the owner and/or the engineer must request a time extension in writing prior to the expiration of the construction permit and the Director must approve it with an expiration date in order for it to continue to be valid.

7-003.01 The plans and specifications:

1. Must be presented in legible form and with a scale of one inch equal to not more than 100 feet on full size drawings to establish construction requirements and facilitate effective review, except that rural water or regional water systems that do not have firefighting capabilities may use a scale of one inch equal to not more than 500 feet;
2. Must be submitted by the engineer in triplicate (at least one copy should be in a reduced form of 11"X17" for use by Department staff in the field) and in sufficient time to permit 30 working days for review and comment or approval

and with time for the incorporation of changes if required. Systems having an engineer on staff may submit plans and specifications in duplicate;

3. May not be amended in a manner that alters the capacity, hydraulic conditions and operation of water system components; functioning of water treatment processes; or water quality before the Director has approved change orders directing such amendments;

7-003.02 Record drawings must be submitted to the Department within one year of the project placement into service date.

7-003.03 Review of Plans and Specifications: When review of the plans and specifications does not indicate substantial conformance to Neb. Rev. Stat. §§ 71-5301 to 71-5313 or regulations in Title 179 NAC 7, or if inadequate information is provided for a complete review, a comment letter will be issued by the Department to the engineer. The issues identified in the Department's comment letter must be addressed within 60 calendar days from the date of issuance of the comment letter unless the owner and/or the engineer request in writing and the Department approves an extension of time. If the engineer does not respond in writing to the Department's comment letter within 60 calendar days from the issuance of the comment letter, the Department will deny the construction permit for the project. When a project is denied for construction, new sets of plans and specifications, along with a review fee per Title 179 NAC 7-005, must be submitted for review and written approval prior to starting construction.

7-003.04 The Department may deny approval of plans and specifications for failure to comply with any of the provisions of Neb. Rev. Stat. §§ 71-5301 to 71-5313 or 179 NAC 7. The Department will inform the engineer and the public water system owner, in writing, of the factual basis for the denial and the statutory or regulatory provisions supporting the decision. The denial will become final 30 days after the mailing of the notice, unless the public water system owner, within the 30-day period, requests a hearing in writing. The hearing shall be conducted in accordance with the Nebraska Administrative Procedure Act and 184 NAC 1, the Department's Rules of Practice and Procedure for Administrative hearings.

7-004 PLANS AND SPECIFICATIONS -- REQUIRED/NOT REQUIRED

7-004.01 Plans and specifications must be submitted for the following types of projects:

1. All components of new public water systems and/or interconnection between public water systems;
2. New wells, new intake structures, relining of existing wells or replacement of one type of well pump with a different type of well pump;

3. Alterations that influence the capacity of existing wells or intake structures;
4. New treatment plants, modifications to existing treatment plants, and new or modifications to existing waste residual treatment at water treatment facilities;
5. Permanent installation of chemical feed equipment;
6. Storage facilities and repair to existing storage facilities, including interior lining, painting and/or coatings;
7. Pump stations;
8. Transmission mains; and
9. Construction of new distribution mains and replacement of existing distribution mains that are not exempted by 179 NAC 7-004.02 item 3.

7-004.02 Plans and specifications are not required for the following activities unless required by a state or federal funding source.

1. Installation of service mains,
2. Installation of service meters,
3. Replacement of existing distribution mains with pipes of a similar size (not to exceed one nominal size and not to exceed \$86,000 in project costs) and in a similar location; or
4. Minor repairs and maintenance which includes:
 - a. Repair of distribution or transmission mains,
 - b. Replacement of valves and fire hydrants,
 - c. Maintenance such as exterior painting, reconditioning or servicing of existing equipment,
 - d. Replacement of equipment such as chemical feeders, pumps or controls within 10% of the original approved capacity, and
 - e. Similar items with the approval of the Department.
5. For non-community systems, small water treatment units which are certified by NSF (National Sanitation Foundation), NAMA (National Automatic Merchandising Association), or other national organizations recognized by the Department and have a total capacity not to exceed 10 gpm may be installed if the Department is notified and provided with the proper certification information. The Department may require chlorination/disinfection depending on the type of water treatment unit provided.

7-004.03 Three-Year Review Program: The Department will not require the submission of plans and specifications for the construction of new distribution mains and replacement of existing distribution water mains (those not already exempted by 179 NAC 7-004.02 item 3) if a public water system enters into a three-year renewable review program agreement with the Department. The Department will enter into an initial three-year agreement with a system that pays the fee indicated in 179 NAC 7-005.02 and meets the following requirements. At the end of the initial three-year period, the agreement may be renewed. If at any time the system fails to meet any of the requirements, the Department may withdraw its approval.

1. The system must submit two sets of standard specifications and standard drawings sealed, signed and dated by an engineer for approval by the Director. Changes of sanitary significance to the approved standard specifications and standard drawings must be submitted to the Director for review and written approval prior to implementation.
2. The sizing of the mains and appurtenances must not cause any part of the system pressure to go below 20 psi under normal operating conditions. All distribution main projects must be designed by an engineer and must be in substantial conformance to the "Recommended Standards for Water Works," 2007 Edition, which is hereby incorporated into these regulations by reference. It is available for viewing at the Department of Health and Human Services, Division of Public Health, 301 Centennial Mall South, Lincoln, NE 68509. It is available from Health Research Inc., Health Education Services Division, P.O. Box 7126, Albany, NY 12224, (518)439-7286, www.hes.org. Any distribution main project with estimated or actual costs that do not exceed \$86,000 do not need to be designed by an engineer, but must follow the standard specifications and standard drawings approved by the Department.
3. The Department may at any time request a system to provide a set of plans and specifications for a recently constructed water distribution main project to allow Department staff to conduct a field inspection.
4. The system must provide the Department with an annual list of all water distribution main projects that were placed in service during the previous calendar year by March 31 of each year. Those projects that deviated from the contamination separation standards in 179 NAC 7-007 must be noted.
5. In addition, the system must maintain the following records for each project and make them available to the Department on request:
 - a. A set of plans and specifications for each project, until replaced by record drawings which must be kept as long as the project is in service,
 - b. A project description indicating the purpose of the project, the proposed piping material design, operating pressure and design flows where applicable,
 - c. Copies of certification of project completion for each water distribution main project (by the engineer or owner, as applicable),
 - d. Copies of satisfactory bacteriological testing results and pressure/leakage tests, and
 - e. Documentation and justification for any deviation, for each project where applicable, from the contamination separation standards for water mains and fire hydrants listed in 179 NAC 7-007.

7-005 FEES

7-005.01 An initial fee for the review of plans and specifications for the types of projects for which plans and specifications are required in 179 NAC 7-004 must be submitted with each project in the amount of one hundred dollars plus 0.5% of the engineer's estimated cost for the project, alteration or improvement described in the documents to be reviewed but such total fee will not exceed \$7600 and:

7-005.01A Documentation of the contract or actual cost of the project must be provided to the Director by the engineer or owner of the system for the purpose of determining the final fee amount;

7-005.01B Payment of the final fee amount -- one hundred dollars plus 0.5% of the contract or actual cost of the project minus the initial fee paid -- must be made, except that amounts of \$25 or less need not be paid or refunded;

7-005.01C Failure to pay the final fee amount constitutes cause to deny or revoke the permit to operate the system.

7-005.02 For the review and approval of standard specifications and standard drawings, annual audit and field inspection for the three-year review program in 179 NAC 7-004.03, the following fees apply

Systems with a population greater than or equal to 100,000	\$1800/ year
Systems with a population greater than or equal to 10,000 but less than 100,000	\$ 900/ year
Systems with population greater than or equal to 3300 but less than 10,000	\$ 600/ year
Systems with a population less than 3300	\$ 300/ year

7-005.03 There is a fee of \$1000 in addition to the plan review fee if construction is begun or completed prior to obtaining approval from the Department unless the project was initiated or completed under emergency conditions.

7-006 SITING

7-006.01 All wells, treatment and storage facilities, and other appurtenances necessary for the continued operation of a public water system must be located:

1. To protect against damage or breakdown as a result of floods, fire, earthquakes, or other natural disasters to the greatest extent possible, and
2. To prevent contamination of the drinking water by existing sources of pollution to the greatest extent possible.

7-007 DESIGN STANDARDS

7-007.01 The Director will review plans and specifications for substantial conformance to the "Recommended Standards for Water Works", 2007 Edition and the requirements of Title 179 NAC 7. In the event of discrepancy, Title 179 NAC 7 will govern. The Department will consider approving designs that follow generally accepted engineering guidelines and standards published by national engineering societies, federal environmental agencies, public health boards, engineering textbooks used by accredited university engineering programs, documented successful installations or successful pilot/full scale testing.

7-007.02 Chemical Feed Systems: All chemical feeders must have primary and secondary interconnect control devices to prevent overfeeding. Where applicable, chemical feeders must be electrically interconnected with the well or service pump and must also be provided with secondary control devices as a means of reducing the possibility of overfeed. An exception to this may be made for systems that have warning devices and are staffed 24 hours a day, 7 days a week.

7-007.03 Wells/Groundwater Source(s)

1. Every well, infiltration line or spring serving or intended to provide water for a public water system, to the greatest extent possible, shall be located, constructed, or modified in such a manner that neither underground nor surface contamination by any biological, chemical or radioactive substance or by the physical property of any substance from any cesspool, privy, septic tank, sub-surface tile system, sewer, drain, pit below ground surface, abandoned or decommissioned well, animal or avian wastes, or any other possible source of pollution can adversely affect such water supply. The minimum recommended horizontal distances in feet separating the well, infiltration gallery or spring from potential sources of contamination are as described in the following table. The Department will consider location, of wells and springs at closer proximity than the minimum distances below. Approval for such location may be given when circumstances require such location, but only if, in the opinion of the Director, the engineer demonstrates that such location will not constitute a pollution hazard to the supply. The examples are not meant to be all inclusive. When locating a ground water source, the owner of a public water system shall consider all potential sources of contamination and anything which may affect the ability of the source to produce an adequate supply of safe water on a continuous basis. When surface runoff or underground movement from potential sources of contamination may adversely affect the quality of water from such supplies, the distance separating these potential sources of contamination and the well, infiltration gallery, or spring should be greater than that listed in the following schedule.

CATEGORY	DISTANCE Feet
Water Well	1,000
Sewage Lagoon	1,000
Land application of municipal/industrial waste material	1,000
Feedlot or Feedlot Runoff	1,000
Underground disposal system (septic system, cesspool, etc.)	500
Corral	500
Pit Toilet/Vault Toilet	500
Wastewater Holding Tanks	500
Sanitary Landfill/Dump	500
Chemical or Petroleum Product Storage	500
Sewage Treatment Plant	500
Sewage Wet Well	500
Sanitary Sewer Connection	100
Sanitary Sewer Manhole	100
Sanitary Sewer Line	50

NOTE: If the distance requirements in 179 NAC 13 Attachment 2 are not met, the well is subject to testing to determine if it is ground water under the direct influence of surface water. If a well meets that definition, it is treated as a surface water source subject to all the requirements of the rules regarding surface water.

2. A test hole is required for all proposed well sites or the engineer must provide similar information that would have been provided by the test hole.
3. The annular space must be grouted (cement based grout) to a minimum depth of 10 feet below the ground surface. If a pitless unit is to be installed, the upper limit of the cement based grout must be one foot below the field connection of the adapter. Crushed or chip bentonite must be installed from the top of the designed gravel pack to the base of the cement based grout. In order to accomplish this, the annular space must be 4 to 12 inches larger than the nominal casing size. Pouring into a dry annular space is preferred. Placement of the bentonite into the annular space must be done in a manner which ensures that bridging does not occur. Prior to using this material, it must be sieved over a 1/4 inch mesh screen to remove fines which may have accumulated in the bag during shipment. Any alternate annular space grouting/sealing proposed must be justified by the engineer with supporting documents.
4. The following information must be submitted with the plans and specifications, addenda thereto, or prior to construction:
 - a. Test hole driller's logs and reports or similar information.

- b. All sieve analysis and calculations used in gravel pack and screen design. This information must be submitted prior to the placement of the screen and gravel pack.
5. The well casing must be at least two nominal sizes larger than the bowl size of the pump.
6. Well casing lengths must be joined by a watertight method appropriate to the material used so that the resulting joint will have the same structural integrity as the casing itself.
7. Cement-based grout must be placed by tremie pouring. The tremie pipe must be kept full continuously from the start to finish of the grouting procedure, with the discharge end of the tremie pipe being continuously submerged just below the surface of the grout until the zone to be grouted is completely filled.
8. The filter pack grain size must be determined by taking the 70% retained grain size of the finest formation to be filtered and multiplying it by 4, 5, or 6. This is the 70% retained grain size of the filter material to be used. The uniformity coefficient (the size of sieve that retains 40% of the sample divided by the size that retains 90%) must not be greater than 2.5. The gradation of the filter material must form a smooth and gradual size distribution curve when plotted. The screen aperture openings must be of such size as to retain between 85% and 100% of the filter material. The total open area of the screen must be such that the entrance velocity of water at the design condition does not exceed 0.1 feet per second (fps) with 50% of the screen open area blocked off.
9. The length of filter pack must extend a distance of 2-1/2 times the maximum diameter of the well above the screen and below the screen, unless terminating in bedrock or clay.
10. The filter pack must be placed with a tremie pipe by washing or pumping the filter material in with water as a slurry.
11. The sand content must be determined from averaging the results of at least 5 samples collected over the course of the constant rate pump testing. The average of the sand content from these test results must not exceed two parts per million (ppm).

7-008 WATER QUALITY

7-008.01 Test Well: Water quality samples (except for asbestos, dioxin and endotoxin) must be collected from a test well to demonstrate that it will meet the requirements of Title

179 prior to construction of the production well. The Department may forgo this requirement if the following conditions are met:

1. The public water system's design engineer provides justification as to why the above requirement would not be necessary and the basis for making that determination, and
2. The system owner sends a letter to the Department requesting approval of the project without the water quality information. The letter must include a statement that the owner is aware that if the water quality from the production well does not comply with the water quality requirements of Title 179, the well may not be allowed to be placed into service.

7-008.02 Production Well: Water quality information must be obtained from the production well to demonstrate that it will meet the requirements of Title 179 prior to placement into service.

7-009 CONSTRUCTION: All major construction, extensions or alterations, except projects subject to the three-year review program in 179 NAC 7-004.03 must be completed in accordance with approved plans and specifications or approved change orders and must comply with the following requirements:

1. No part of a public water system falling within the definition of major construction may be placed in service prior to certification of project completion by the engineer, a final inspection by the department, and issuance of approval by the Director with the exception of water distribution main and interior tank coating projects. The Director may allow placement of these projects into service when requested by the owner and/or the engineer if the request is accompanied with a certification of project completion by the engineer and copies of satisfactory bacteriological testing results.
2. Any part of a public water system falling within the definition of major construction found not to be constructed in substantial conformance to approved plans and specifications or change orders, or for which plans and specifications were not approved, must not be placed in service until such time as the Director determines the construction to be in substantial conformance to the standards in 179 NAC 7-007.
3. If a public water system begins or completes any major construction, extension or alteration as defined in 179 NAC 7-002, prior to obtaining written approval from the Department, the system may be subject to an administrative penalty for the violation of Title 179 NAC 7-003. In addition, the system must do the following:

- a. Submit a copy of the project plans and specifications prepared by an engineer (as-built or as-recorded where applicable) to the Department for review and written approval,
- b. Submit the plan review fee in 179 NAC 7-005.01.
- c. Submit an additional review fee of \$1000 unless the project was completed under emergency conditions.
- d. Correct any portion of the construction found not be constructed in accordance with the requirements of Title 179 NAC 7.

7-010 DISTINCTIONS APPLIED TO NON-COMMUNITY WATER SYSTEMS

7-010.01 By first providing written notification to the Department, the owner of a non-community water system may accomplish siting, design, and construction in accordance with Title 178 NAC 12, Water Well Construction, Pump Installation, and Water Well Decommissioning Standards if the project involves a well:

1. With a capacity of less than 100 gallons per minute (gpm), associated bladder tank and piping in a water system with a total system capacity not exceeding 200 gpm, and
2. With the top of its well screen greater than 50 feet from the original ground surface, and
3. That is greater than 200 feet from a surface water source.

7-010.02 All other non-community water system projects meeting the definition of major construction, extension, or alteration must be accomplished in accordance with Title 179 NAC 7.