SECTION 13 MINIMUM TECHNICAL DESIGN STANDARDS - WATER

In addition to the technical design standards described below, the applicant shall also refer to the most current version of the New Jersey Administrative Code Title 7, Department of Environmental Protection, and Title 5, Residential Site Improvement Standards, to assure compliance with all necessary permit requirements.

13.1 Preliminary Plans

In the case of extensive or involved projects, or those for which deviations from these Rates, Rules and Regulations are anticipated, the preparation of a preliminary report and plan is advisable before detailed design proceeds; and it is recommended that the preliminary data be discussed with the Authority Engineer before final decisions are made. Formal comments will be made by the New Jersey Department of Environmental Protection on preliminary reports, if requested.

13.2 Applications for Approval

Applications for the approval of plans and specifications shall be submitted by a qualified professional engineer licensed to practice in New Jersey, on forms provided by the Department of Environmental Protection. Plans submitted by such an engineer shall bear his seal.

Applications are to be signed by the proper official (with title) of the public body, company or corporation; (or if signed by an authorized agent, shall be accompanied by a certified copy of the authorization).

13.3 Engineering Data to be Submitted to the Department of Environmental Protection

The following materials shall accompany the application for approval:

(a) An Engineer's Report as outlined subsequently.

(b) Maps, plans and specifications.

(c) Total estimated cost of the proposed project, including the cost of land and legal and engineering fees, and the cost of all applicable structures, even though they may not be subject to review.

13.4 Engineer's Report

The Engineer's Report shall, when pertinent, contain the following information:

(a) Description of existing waterworks as related to the proposed project.

(b) Data on present and future population served by the proposed project together with present and anticipated water requirements and the relationship of the proposed works to these factors. Estimates should be for a period of twenty-five (25) years.

(c) Information on the source of supply, to include the following data:

(1) If from a surface source; the dependable yield, characteristics of the quality of the water in relation to its treatability; information obtained as a result of a sanitary survey on the sources of pollution; and the existing or proposed measures to insure protection of the supply.

(2) If from an underground source; data on the geological strata expected to be penetrated and the effect that such strata may have on the quality of the water; available information on yield and water quality; test well findings (if any); sources of potential pollution within a minimum distance of five-hundred (500) feet or, in the case of adverse geological conditions such as creviced or fissured rock formations, from a larger area; and a general description of the construction features proposed to protect the source from pollution.

(d) A description of significant pumping equipment, giving capacity of units and general information on the arrangement of facilities, including the provision of standby power (if provided), control of operation and alarm systems.

(e) A summary of proposed treatment processes with data to establish that the proposed processes will produce adequate protection of the water so treated, together with sufficient information on the nature and dosage of any chemicals applied so as to provide the reviewer with a clear understanding of their operation. Normal capacity of each unit shall be given to show that the requirements of these Rates, Rules and Regulations are being met.

(f) The methods proposed for the treatment and disposal of sludge and filter backwash.

(g) Sanitary features of proposed storage, transmission and distribution works.

(h) That portion of the system to be built at the present time.

13.5 Maps

A map or maps in sufficient detail to aid in the examination and comprehension and the specific project covered by the application shall be embodied with, or accompany, the plans and specifications. All maps shall be drawn to a suitable scale, shall be properly titled, and the north point and datum shall be indicated. Topography shall be shown by elevations, contours or other suitable methods. Road, streams, municipal boundaries and other features shall be shown, including applicable data such as watersheds, reservoir locations, wells and well fields, water treatment plants, existing transmission and distribution mains, storage tanks, fire hydrants and potential sources of pollution such as sewers and sewage disposal units.

13.6 Plans

13.6.1 Details

Plans shall be drawn to standard scales on uniformly sized sheets. Each sheet shall contain necessary titles, scales, dates, owner's name and the general description of the project. The name of the Engineer and his seal shall be shown on each sheet.

The preferred size is a drawing having a height of twenty-four (24) inches and a length of about thirty-six (36) inches including suitable margins. Lettering should be sufficiently large to permit reduction, and all plans should have graphic scales.

If there is more than one sheet, all shall be bound together and, in the case of transmission and distribution mains, an index map shall be supplied showing by number the area and districts covered by the various sheets.

13.6.2 Symbols

All topographical symbols and conventions used shall be clearly defined. Water transmission and distribution mains to be built at present or constructed later shall be shown by suitable conventions. Where applicable, existing sanitary sewers and combined sewers shall be shown by special designations.

13.6.3 Elevations and Dimensions

Surface elevations shall be shown of all important parts of the work, with sufficient dimensions to permit verification of the operation of the facility. U.S. Coast and Geodetic Survey Datum shall be stated. (Use NADA 83, NADA 88)

13.7 Specifications

Complete specifications shall be submitted covering the potable water facilities of the project. To conserve file space and to facilitate review of the data, sections dealing with general conditions of Contract and Notices to Bidders should be omitted.

13.8 Ground Water Supplies

13.8.1 Design

The following criteria shall be considered in designing a water supply system for a realty improvement:

(a) Availability of water from a public potable water supply within an economic distance from the realty improvement.

(b) Advisability of establishing a public potable water supply.

(c) A dependable source of water supply.

(d) Geology

(e) Potential and known sources of pollution.

(f) A balanced system of supply, pumping, treatment, distribution and storage facilities to meet the peak demand.

13.8.2 Alternate Design or Construction Features

Proposed design or construction features of a water supply differing from the provisions of these standards may be approved upon submission of evidence to the satisfaction of the Administrative Authority that public health or safety would not be affected adversely by such design or construction and such proposed design or construction features did not permit lower standards than those required herein.

13.8.3 Water Consumption

Water supply systems shall be designed to provide a minimum quantity of potable water as determined from the following table with a 50% increase in the quantity indicated by an asterisk (*) where laundry facilities are provided. Current average daily water demand information can be obtained in Section 7:10-12.6 of the New Jersey Administrative Code, as amended.

Gallons Per Person

Type of Establishment	Per Day
Cottages, seasonal occupancy	100
Single Family dwellings	100
Multiple family dwellings (Apartments)	75
Rooming Houses	50
Boarding Houses	75*
a. For each non-resident boarder	15
Hotels	50-75*
Motel or Tourist Cabin	50-75*
Mobile Home Park	100
Restaurants	
a. Sanitary Demand per Patron	5
b. Kitchen Demand per Patron	5
c. Kitchen and Sanitary Demand	10
Camps	
a. Barracks type	50*
b. Cottage type	40*
c. Day Camps (no meals served)	15
Day Schools	
a. No cafeteria or showers	10
b. With cafeteria and no showers	15
c. With cafeteria and showers	20
d. Cafeteria, showers & laboratories	25
Boarding Schools	100*
Day Workers: Office, Industrial, etc.	25
Hospitals (depending on type)	150-250
Institutions other than hospitals	75-125
Picnic Grounds	
a. Toilet only	10
b. Toilet and showers	15
Swimming pools and bathhouses	10
Clubhouses	
a. With resident members	60*
b. For each nonresident member	25
Self-service laundries	50 Gal./Wash

When more than one use will occur, the multiple use shall be considered in determining water quantity. Small industrial plants maintaining a cafeteria and/or showers; clubhouses or hotels maintaining swimming pools and/or laundries are typical examples of multiple uses.

At private camp grounds, not less than seventy-five (75) gallons per campsite per day shall be provided if privies are used. Where water- flushed toilets are used, at least one-hundred (100) gallons per campsite per day shall be provided. Where laundry facilities and individual sewer hook ups are used, at least one-hundred and fifty (150) gallons per campsite per day shall be provided.

13.8.4 Sources of Water

The source of water shall preferably be from the Authority's water distribution system unless the Applicant proves that this connection is not technically feasible.

13.8.5 Grading

Final grading shall provide adequate drainage of surface water away from the well and be of sufficient height to protect the sources of water supply from flooding.

13.8.6 Freezing

All parts of the water supply system shall be designed, located and constructed to protect against freezing.

13.8.7 Cross Connection

No (physical) cross connection shall be established between a water supply system serving a realty improvement and an approved public potable water supply unless approved in accordance with the provisions of N.J.S.A. 58:11-9.1 et seq.

13.8.8 Priming

A pump which requires priming, other than the initial priming following installation, shall not be employed for any water supply system serving a realty improvement.

13.8.9 Disinfection

Upon completion of the installation of a water supply system or following repairs to its pumping equipment, it shall be flushed, disinfected with a chlorine solution, and thoroughly reflushed to remove all traces of chlorine in a manner acceptable to the Administrative Authority.

13.8.10 Duplicate Installations Required

In supplies derived entirely from ground water sources, duplicate wells and pumping equipment, or equivalent, shall be provided when average water demand exceeds twenty thousand (20,000) gallons per day or the number of services exceeds one-hundred (100).

An interconnection with another approved public water supply may be accepted in lieu of a duplicate installation.

13.8.11 Protection of Ground Water Sources

Sufficient land shall be acquired around wells, infiltration galleries, springs and similar sources of ground water developed for public water supply, as to satisfy the Department of Environmental Protection.

All land within a minimum of fifty (50) feet from a well shall be acquired by the owners of a public water supply system.

Any sewer or line carrying sanitary or industrial wastes which is within one-hundred (100) feet of a well shall be of steel, reinforced concrete, cast-iron or other suitable material; shall be properly protected, of completely watertight construction, and shall be tested for water tightness after installation.

No manholes or connections on a sanitary sewer system shall be permitted within one-hundred (100) feet of a well.

13.8.12 General Information Required

The Engineer's Report required in accordance with the provisions of Section 13.4 shall include the following information:

(a) General description of the construction of the ground water source.

(b) Test pumping report including maximum tested yield and drawdown.

(c) Capacity of pumping equipment installed and the control of its operation.

13.8.13 Information to be Shown on Map

The map or maps required in accordance with the provisions of Section 13.5 shall show the following information:

(a) Topography and the locations of existing, presently planned, and future planned ground water sources in the area under consideration. Each source shall be given an identifying number in chronological order of construction.

(b) Elevations of well-heads above a common datum plane and highest known flood elevations.

(c) Pollutional hazards (such as septic tank systems, sewers, barnyards and watercourses), are required.

13.8.14 Formation Log

The detailed plans and specifications shall be accompanied by a formation log showing the types and thickness' of formations penetrated by the well or, in the event this information is not available at the time of the application, it shall be submitted to the Department of Environmental Protection, when the well has been constructed and prior to the approval of the well as a source of water for public potable and domestic purposes.

13.8.15 Detailed Drawings

(a) A schematic drawing or drawings of the construction shall be included with as much detail as is practicable with the information available, and shall include:

(1) Length, size and locations of casings and screens.

(2) Method of sealing off shallow ground water from entering the well, including the sealing of the annular space between the drill hole and the outer casing and surface strata.

(3) Pumping unit, including prime and stand-by power sources.

(4) Plan and section of pump house or similar structure.

(5) Method of connecting the well or other ground water source with the distribution system.

(b) A detailed drawing or drawings shall be submitted for the following construction:

(1) Details of well head, including elevations of protective curbing, top of casing, pump house floor and surrounding grade.

(2) Method of sealing well head against surface pollutants.

(3) Provision and locations of well vents and the methods for their protection against the entry of contaminating matter.

(4) Well head piping details, showing provision and locations of check valves, surge or air-relief valves, gate valves, sampling tap, water level indicator, discharge pressure gauge and blow-off connection to permit pumping to waste.

13.8.16 Applicability of AWWA Standards for Wells

Subject to the provisions of this Section, minimum well construction standards shall equal applicable portions of the American Water Works Association Standard for Deep Wells (AWWA A100-66) or superseding standard.

13.9 Distribution Systems

13.9.1 Material to be Submitted

(a) For new water supply systems, a plan showing the distribution system shall be submitted with the other engineering data. This shall show locations, diameters and material of the pipes, and location of hydrants, blow offs, and main valves.

(b) Major extensions, additions, and improvements of transmission and distribution lines in excess of an estimated construction cost of $50,000 (total for all Sections), shall be submitted for review and approval. Routine extensions, additions and alterations need not be submitted.

13.9.2 Capacity and Size of Mains

(a) Design capacity of water mains shall be such as to provide a minimum residual pressure of twenty pounds per square inch (20 psi), at peak day demand plus fire flow.

(b) The minimum diameter of all distribution mains shall be six (6) inches. In any case, any pipe intended to supply fire hydrants shall have a minimum diameter of six (6) inches. All mains having more than one (1) fire hydrant shall be a minimum of eight (8) inches.

13.9.3 General Design Requirements

(a) So far as is practicable, distribution mains shall be laid in the loop system to eliminate dead ends. Dead ends, if unavoidable, shall have a fire hydrant, flushing hydrant or blow off for flushing purposes.

(b) All distribution mains shall be provided with sufficient earth (four feet minimum), or other suitable cover to prevent freezing.

(c) Water services and plumbing shall conform to the relevant local and/or State plumbing codes.

(d) The specifications shall include provisions for the adequate disinfection of all new distribution mains prior to being placed into service.

(e) Water mains and sewers generally shall be separated by a horizontal distance of ten (10) feet. If such lateral separation is not possible, the water and sewer pipes shall be in separate trenches, with the sewer at least eighteen (18) inches below the bottom of the water main. At crossings of sewers and water mains, the sewer shall be at least eighteen (18) inches below the bottom of the water main. Where this is not possible, the sewer shall be constructed of cast iron pipe with mechanical or slip-on joints, or hot- poured lead joints, for a distance of at least ten (10) feet on either side of the crossing.

13.9.4 Water Body Crossings

(a) Surface water crossings, both over and under water, present special problems which should be discussed before final plans are prepared.

(b) Sampling taps and valves will be provided at each end of a water body crossing to facilitate sanitary control.

13.9.5 Maintenance of Adequate Protection

(a) Chambers or pits containing gate valves, air-relief valves, blow offs, meters or similar appurtenances to a distribution system shall be suitably drained and shall not be connected directly to any storm sewer or sanitary sewer.

(b) No blow offs, air-relief valve, flushing device or hydrant drain shall be directly connected to a storm sewer or sanitary sewer.

(c) The open end of an air-relief pipe shall be extended from the manhole or enclosing chamber to a point at least one (1) foot above the ground, and shall be provided with a down facing elbow and insect screen.

(d) Except as permitted under the provisions of Chapter 47, P.L. 1966 (N.J.S.A. 58:11-9.1 et. seq.) there shall be no physical connection between the distribution system and any unapproved source of water. No steam condensate, or cooling water from engine jackets or other heat-exchange devices, shall be returned to the potable water supply.

13.10 Distribution Storage

13.10.1 General

(a) Storage for finished water shall be provided as an integral part of each water supply system.

(b) The location, size, type and elevation of the equalization reservoir, standpipe or elevated tank shall be such as to meet the distribution system pressure requirements contained in Section 13.9.

(c) Unless a smaller capacity can be justified by the provision of standby power, alternate sources of supply, adequate booster pumps or inter-connections, storage facilities serving the system by gravity shall be equivalent to approximately one day's water requirements.

(d) In any system serving more than fifty (50) customers, hydropneumatic tanks will not be considered as providing adequate storage.

(e) Clear wells, whether designed as separate structures or as part of the filter structure, shall meet the requirements for below grade reservoirs, as issued by the New Jersey Department of Environmental Protection.

(f) Finished water shall not be stored adjacent to an untreated water compartment when only a single wall separates the two.

(g) Each reservoir and tank shall be equipped with overflow and low level warnings or alarms.

(h) There shall be means available to determine water level elevations in each distribution storage unit.

(i) Facilities shall be so designed as to permit dewatering for cleaning and maintenance without interrupting service. Direct connection to a storm sewer or sanitary sewer will not be permitted.

13.10.2 Protection and Safety

(a) All equalization reservoirs, standpipes and elevated tanks shall be protected against unauthorized access and vandalism. Fencing, locks and other necessary safeguards shall be provided.

(b) Due regard, in the design of an elevated facility, must be given to the personal safety of the employees.