

Water and Sewer Separation Standards

Nebraska Department of Health and Human Services
Title 179 Chapter 7 Update

March 2011
Spring Contractor's Meeting

Water and Sewer Separation Standards

- Separation standards for water mains when alignment parallels or crosses sewer utilities
- Historically “Ten State Standards” used for design and construction
- Health based standard



Water and Sewer Separation Standards



AMERICAN WATER



Pressure Surges as a Potential Contamination Route

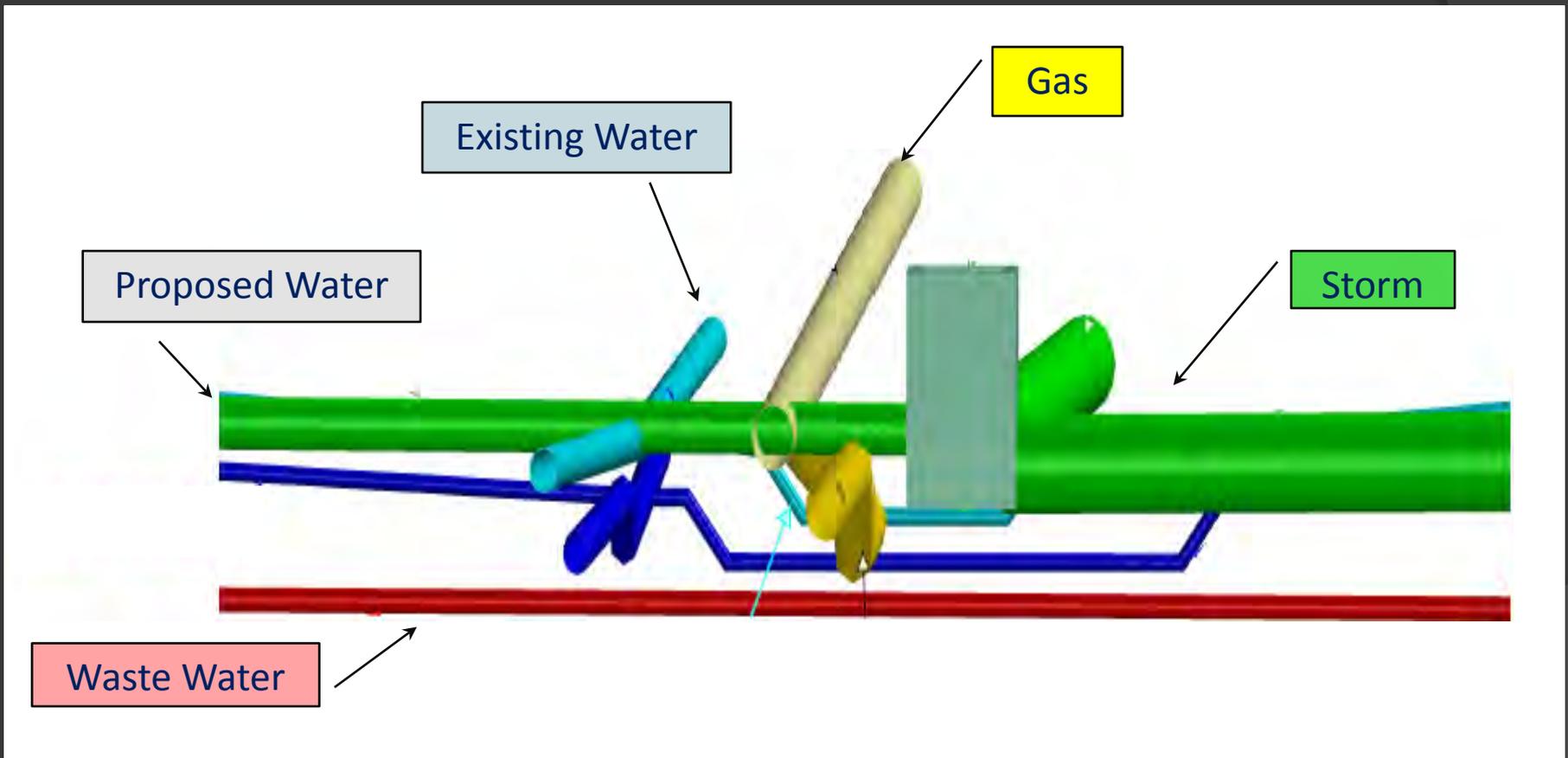
- Intrusion of outside water into the distribution system may potentially occur during periods of low or negative pressures if there is an opening in the pipe (e.g., a hole or crack) and the external head > internal head
- Studies (Karim et al. *JAWWA* 95(5): 134-146, 2003) have shown that soil and non-potable water surrounding distribution pipes can contain a variety of microbiological pathogens, including fecal indicators and culturable human viruses



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Water and Sewer Separation Standards



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Revisions

- Formally adopts Recommended Standards for Water Works, 2007 Edition (Ten State Standards)
- Defines and clarifies deviations to separation standard in a new guidance document
- Recognizes storm sewers pose less risk than sanitary sewer
- Allows utilities to enter into a 3 year agreement in lieu of submitting plans and specifications for each project

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3-year Agreement Requirements

- NDHHS approval of standard plans and specifications
- Sizing of mains and appurtenances must not cause system pressure to go below 20 psi
- Distribution main projects must be in substantial compliance with “2007 Recommended Standards for Water Works”
- Project plans and specifications available to allow NDHHS staff to conduct a field inspection
- Annual list of projects incl. deviations to standards

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Record Keeping

- Project description, purpose, proposed materials, operating pressures, design flows
- Certification of project completion by engineer
- Record drawings
- Bacteriological testing results
- Pressure/leakage test results
- Documentation and justification for deviations from separation standards listed in 179 NAC 7-007.

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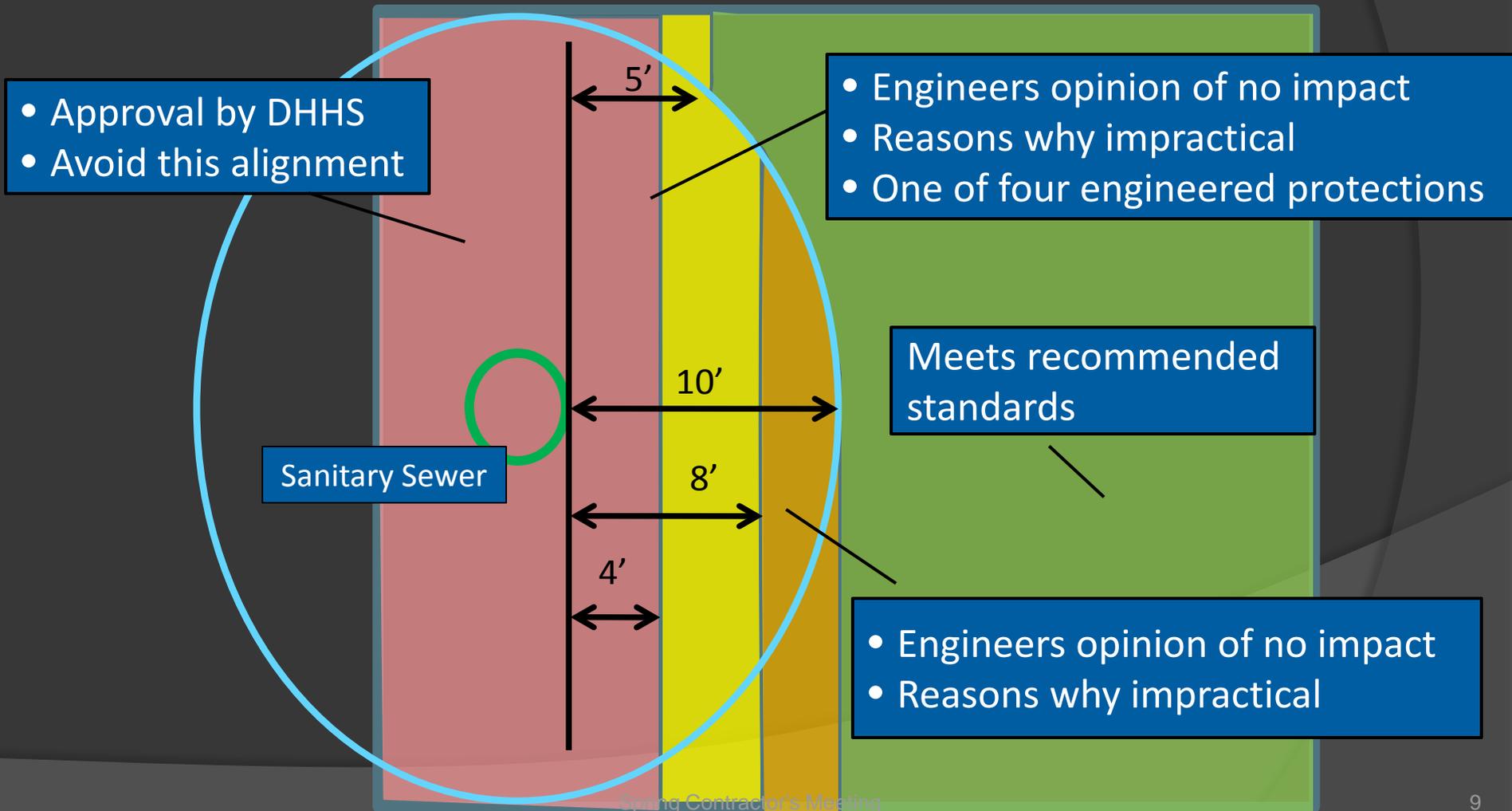
Separation Standards

- Recommended Standards for Water Works 2007 Edition
 - Horizontal: Minimum 10 feet from sewer or septic
 - Vertical: Minimum 18 inches from sewer
 - Reviewing Authority may allow deviations on a case by case basis
- NDHHS allows deviations to standards if impractical and if additional protocols are followed

See NDHHS: [Design and Installation Guide for Water Main and Sanitary/Storm Sewer Separations](#)

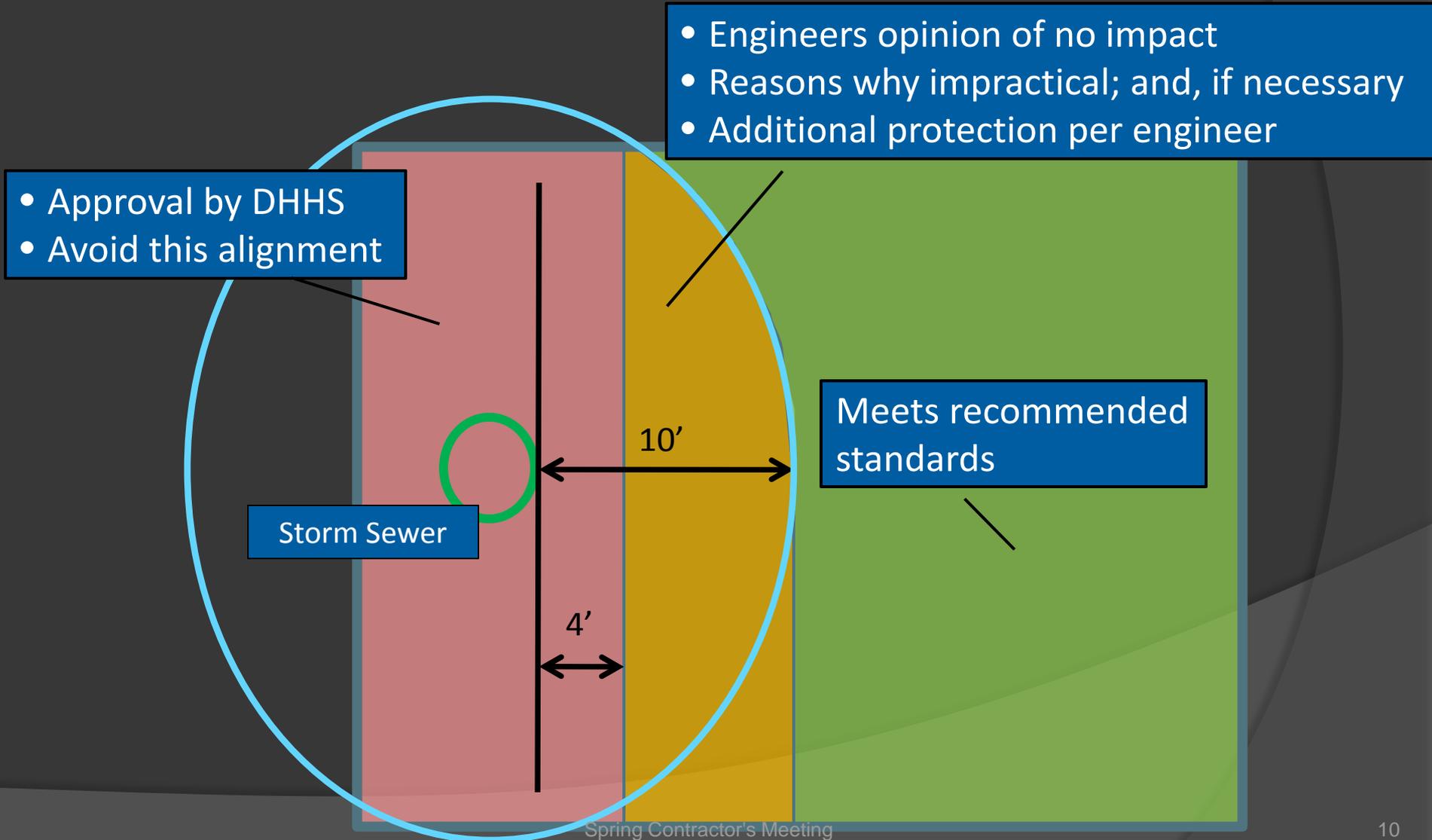
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Horizontal Separations for Sanitary Sewer



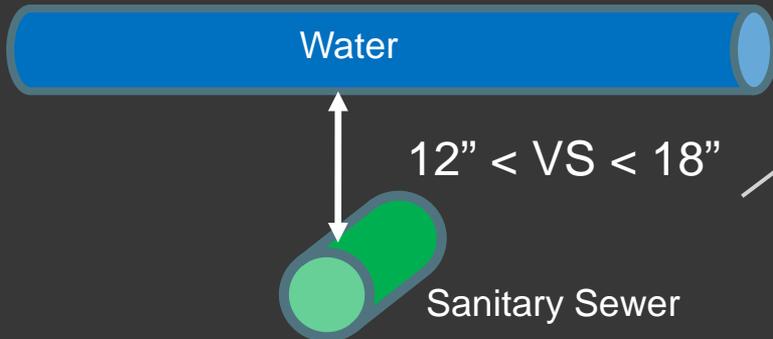
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Horizontal Separations for Storm Sewer

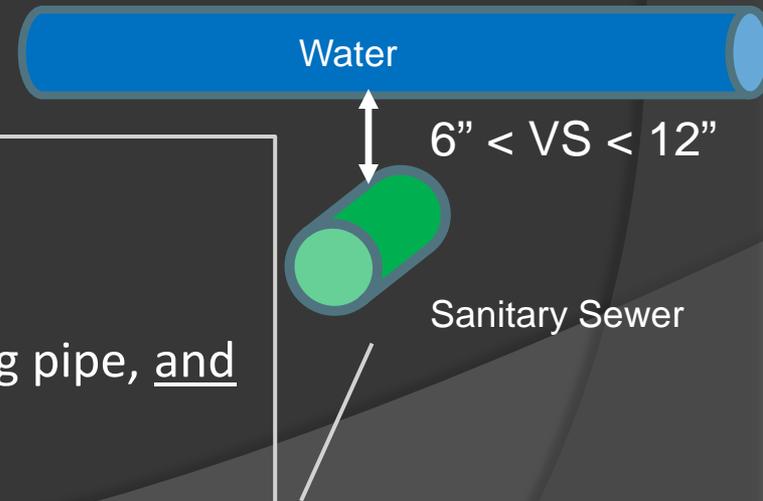


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Vertical Separations for Sanitary Sewer Below



- Engineers opinion of no impact
- Reasons why impractical
- Full length of pipe centered over Sanitary

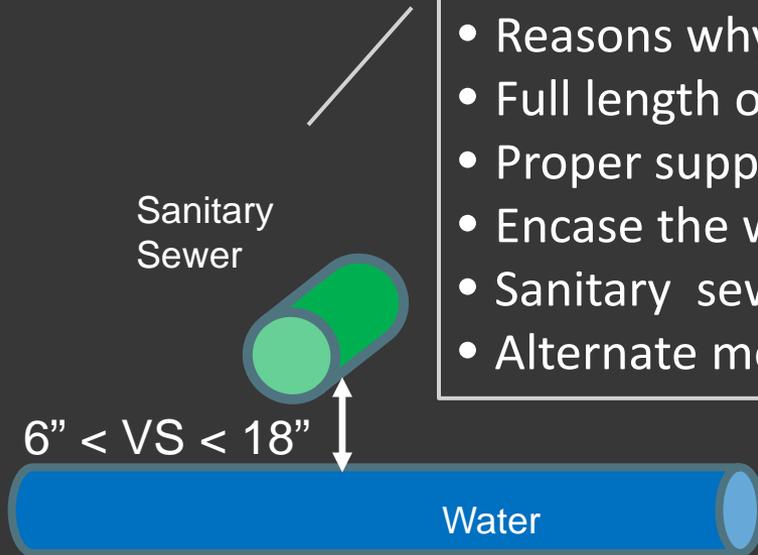


- Engineers opinion of no impact
- Reasons why impractical
- Full length of pipe centered over sanitary
- Proper support to prevent settlement and breaking pipe, and
- Encase the water main or sanitary sewer; or
- Sanitary sewer is water pipe rated at 150 psi; or
- Alternate method or protection approved by NDHHS

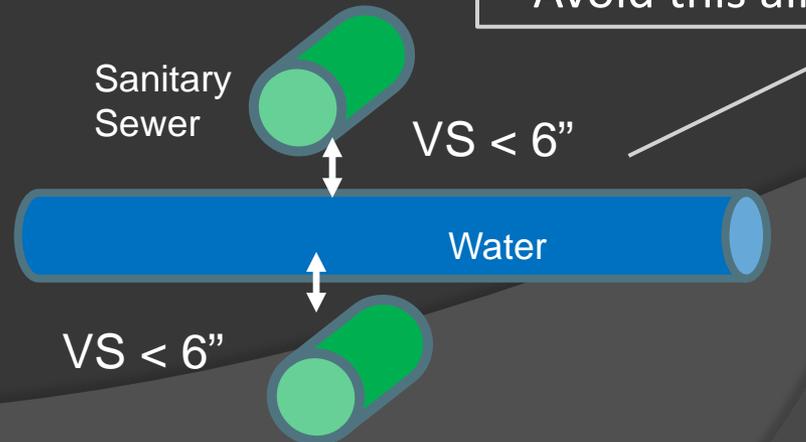
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Vertical Separations for Sanitary Sewer Above

- Engineers opinion of no impact
- Reasons why impractical
- Full length of pipe centered over sanitary
- Proper support to prevent settlement and breaking pipe, and
- Encase the water main or sanitary sewer; or
- Sanitary sewer is water pipe rated at 150 psi; or
- Alternate method or protection approved by NDHHS



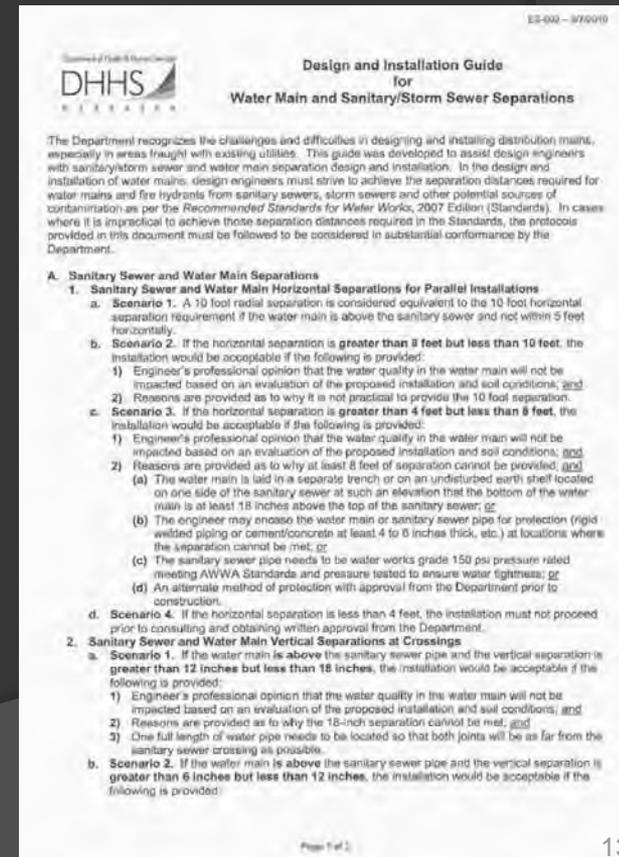
- Approval by DHHS
- Avoid this alignment



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Other Important Design and Installation Criteria

- More flexible separation standards for storm sewers
- Sanitary force main separations
- Fire hydrant drain separations



Water and Sewer Separation Standards

Public Works and Utilities Projects

- Consultants:
 - Use NDDHS Title 179 standards for design
 - Submit Project Deviation Log for designs and construction phase services
- Contractors:
 - Be knowledgeable of requirements
 - Report conflicts to project personnel for resolution and documentation
- Public Works and Utilities:
 - Document deviations and maintain records for NDHHS inspection
 - Submit annual list of projects and deviations to NDDHS

Water and Sewer Separation Standards Public Works and Utilities GP&P Website

- Ten State Standards Project Deviation Log (PDF)
- Title 179, Chapter 7
- Design and Installation Guide for Water Mains and Sanitary/Storm Sewer Separations (PDF)

NDHHS TITLE 179-704.3 RECORDS (TEN STATE STANDARDS PROJECT DEVIATION LOG)			
PROJECT NAME:		PROJECT NUMBER:	E.O. NUMBER:
DESIGN PROJECT MANAGER:	COMPANY/DEPARTMENT:	CONSTRUCTION PROJECT MANAGER:	COMPANY/DEPARTMENT:
ENGINEER:	COMPANY/DEPARTMENT:	PROJECT OWNER:	801 LETING DATE:
PROJECT DESCRIPTION:			
PROJECT PURPOSE:			
PIPE SIZE (IN.):			
PIPE MATERIAL:			
OPERATING PRESSURE (PSI):			
DESIGN FLOW (GPM):			
BACTERIOLOGICAL TESTS (See Attached Documentation):			
PRESSURE TESTS (See Attached Documentation):			
AS-BUILT RECORDS/DRAWINGS (See Attached Documentation):			
SIGNATURE:		TITLE:	DATE:

EFFECTIVE DATE: APRIL 4, 2010

NEBRASKA DEPARTMENT OF HEALTH AND HUMAN SERVICES

179 NAC 7

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.

DESIGN AND INSTALLATION GUIDE FOR WATER MAIN AND SANITARY/STORM SEWER SEPARATIONS

The Department recognizes the challenges and difficulties in designing and installing distribution mains, especially in areas fraught with existing utilities. This guide was developed to assist design engineers with sanitary/storm sewer and water main separation design and installation. In the design and installation of water mains, design engineers must strive to achieve the separation distances required for water mains and the hydrants from sanitary sewers, storm sewers and other potential sources of contamination as set forth in the referenced Standards for Water Works, 2017 Edition (Standards). In cases where it is impractical to achieve those separation distances required in the Standards, the practices provided in this document must be followed to be considered in a mutual conference by the Department.

A. Sanitary Sewer and Water Main Separations

1. Sanitary Sewer and Water Main Horizontal Separations for Parallel Installations

a. Scenario 1. A 10-foot vertical separation is considered equivalent to the 10-foot horizontal separation requirement if the water main is above the sanitary sewer and not within 8 feet horizontally.

b. Scenario 2. If the horizontal separation is greater than 8 feet but less than 10 feet, the installation would be acceptable if the following is provided:

- Engineer's professional opinion that the water quality in the water main will not be impacted based on an evaluation of the proposed installation and soil conditions; and
- Reasons are provided as to why it is not practical to provide the 10-foot separation.

c. Scenario 3. If the horizontal separation is greater than 4 feet but less than 8 feet, the installation would be acceptable if the following is provided:

- Engineer's professional opinion that the water quality in the water main will not be impacted based on an evaluation of the proposed installation and soil conditions; and
- Reasons are provided as to why at least 8 feet of separation cannot be provided; and
 - The water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sanitary sewer at such an elevation that the bottom of the water main is at least 18 inches above the top of the sanitary sewer; or
 - The engineer may encase the water main or sanitary sewer pipe by protection (rigid welded piping or concrete/corrugated at least 4 to 8 inches thick, etc.) at locations where the separation cannot be met; or
 - The sanitary sewer pipe meets the water works grade 150 psi pressure rated meeting AWWA Standards and pressure tested to ensure water tightness; or
 - An alternate method of protection with approval from the Department prior to construction.

d. Scenario 4. If the horizontal separation is less than 4 feet, the installation must not proceed prior to consulting and obtaining written approval from the Department.

2. Sanitary Sewer and Water Main Vertical Separations at Crossings

a. Scenario 1. If the water main is above the sanitary sewer pipe and the vertical separation is greater than 12 inches but less than 18 inches, the installation would be acceptable if the following is provided:

- Engineer's professional opinion that the water quality in the water main will not be impacted based on an evaluation of the proposed installation and soil conditions; and
- Reasons are provided as to why the 18-inch separation cannot be met; and
- One full length of water pipe reaches to the access so that both joints will be far from the sanitary sewer crossing as possible.

b. Scenario 2. If the water main is above the sanitary sewer pipe and the vertical separation is greater than 6 inches but less than 12 inches, the installation would be acceptable if the following is provided:

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