

CITY OF NEWTON, KANSAS

DESIGN STANDARDS

FOR SANITARY SEWER IMPROVEMENTS

NOVEMBER 2025

THE CITY OF
NEWTON, KANSAS

STANDARD ENGINEERING DESIGN CRITERIA AND
GENERAL IMPROVEMENT POLICY

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GENERAL

Purpose

- A. The City of Newton is striving to provide uniformity in construction efforts involving public works. To accomplish this, it is important that initial design comply with established standards and specifications approved by the City. In addition to initial design, there are many construction activities that will be performed which will not require design and construction documents, which must also comply with uniform City standards. The following document will serve as the standard guideline for all sanitary sewer design.

Scope

- A. This document includes design criteria for sanitary sewer Systems. City standard specifications and standard details for waterlines must also be referenced and utilized for all work.

Variation from design criteria

- A. Variations will be permitted from the Standard Engineering Design Criteria and General Improvement Policy when a formal request is made to the City. The request will involve the following:
 - 1. List any and all variations being requested.
 - 2. Provide justification for each variation in writing. In the case of a detail, provide a sketch or an engineered drawing indicating the modification requested.
 - 3. Request a formal meeting with the City to discuss the suggested variation.
 - 4. Obtain in writing an approval of the modification.

Special circumstances may be encountered where a specific item is not included in the Standard Engineering Design Criteria and General Improvement Policy. If this occurs, a formal request shall be made to the City and shall meet the requirements as shown above for a variation.

Compliance with Applicable Statutory Requirements

- A. Compliance with all Federal, State and Local Laws will be required. Where permits are required by Federal, State and Local Agencies, the Project Owner will be required to complete all filing, pay all fees, and obtain an approved permit. All information including maps, plans, specifications, etc., required to obtain an approved permit shall be provided to the City. Traffic control for all projects shall be established and shall conform to the latest version Manual on Uniform Traffic Control (MUTCD).

Amendment to Standard Engineering Design Criteria

- A. Amendments to the Standard Engineering Design Criteria and General Improvement Policy will be approved by the City. The Amendments will be made available by the City for insertion into this document. It is the responsibility of the holder of this document to assure themselves that they have all the amendments or a current document.

General Development Plan or Plat

- A. Any development plan or proposed plat shall be submitted to the City with utilities and pavement generally located within the boundary of the plan or plat. For plats the utilities will be located within dedicated easements and rights-of-way. The general development plan or plat shall show preliminary elevations for all sanitary sewers, streets, and storm drainage conveyance systems. In addition, the project owner for a plat shall submit a four-corner lot grading plan indicating elevations at each corner for the subdivision that is being developed. The four corner lot grading plans will be placed on file with the City and will be reviewed during requests for building permits.

SANITARY SEWER DESIGN CRITERIA

General

- A. Design of water systems shall meet the Minimum Standards of Design for Water Pollution Control Facilities as established by the Kansas Department of Health and Environment (KDHE) and shall also meet the requirements of the City of Newton.
- B. Prior to submittal to KDHE, the designer shall provide the City with two sets of Office Copy plans for review and comment. Following Newton's review, the designer shall submit a sanitary sewer extension permit along with plans and supplemental specifications to KDHE and must obtain approval prior to the bid letting.

Sanitary Sewer Design

A. Sanitary Sewer Pipe Slopes

- 1. Minimum pipe slopes for sanitary sewers shall be utilized to maintain a minimum velocity of 2 ft/s of the wastewater. Minimum pipe slopes are listed below:

<u>Pipe Diameter (Inches)</u>	<u>Slope (%)</u>
8	0.40
10	0.25
12	0.20
15	0.15
18	0.12
21	0.10
24	0.08

A slope of 0.3% may be used with 8" PVC Pipe with prior approval by the City.

B. Manhole Drops

- 1. Manholes shall typically include a 0.1' pipe flowline drop for straight runs and a 0.2' pipe flowline drop for 90 degree turns. When changing pipe sizes at a manhole, the pipe tops should be set to match.

C. Sanitary Sewer Capacity

1. Per KDHE requirements, sanitary sewers shall be sized to carry the design flow when running 2/3 full for pipes 18" and smaller. Sanitary sewers shall be designed to carry all preexisting flows plus additional capacity for peak future flows plus an allowance for infiltration. Calculated flows from future residential developments should include population density per acre, with a projected domestic flow of 100 gallons per capita-day, with a minimum peaking factor of 3. Projections for commercial and industrial developments shall utilize KDHE flow assumptions of other known information about the future development flows.

Manhole and Sanitary Sewer Locations

- A. Sanitary sewer shall not run longitudinally under street pavement unless approved by the City Engineer.
- B. Offset distances for sanitary sewer from property lines shall typically be 5'. Sanitary sewers shall typically be located on the south and west portions of utility easements.

Protection of Water Supplies

- A. Separation of waterline and sanitary sewers (and other sources of contamination) shall be per the requirements noted in the Standards Specifications per KDHE requirements.

Easement Requirements

- A. All sanitary sewers shall be constructed in easements. The minimum width of the easement is 20 feet, whether it is a utility easement or a sanitary sewer easement. Easements shall be obtained for sanitary sewer construction. Access to manholes shall be evaluated and any additional required easements shall be obtained for maintenance purposes. Utility easements shall be graded as part of the sanitary sewer construction. The easement grades shall be established based on an approved drainage plan.

Sanitary Sewer Service Connections

- A. No sewer services shall cross under street pavement unless approved by the City Engineer.
- B. Sanitary sewer service connections shall be provided for all lots that are to be serviced. Service connections will include either a 4" or 6" stub from a manhole, or an 8" x 4" or 8" x 6" in-line or saddle tee/wye. If a service connection is greater than 12' deep, (measured from finished ground to flow line of the lateral) riser pipe shall be extended to 8' below proposed grade.
- C. If one or two residential lots are required to be serviced and no future extension of the sewer is necessary, the lots may be serviced with an 8" x 4" in-line wye with an 8" cleanout assembly constructed on the end of the line. A cleanout may be provided only if the total length to the nearest downstream manhole is less than 150 feet.

Force Main Construction

- A. High points shall be minimized in the profile of sanitary sewer force mains. Provisions shall be made in the design to remove air from high points in the main force.

Wastewater Pump Stations

- A. Pump design shall include a minimum of two pumps, each with the capacity to handle the projected peak flows from the service area. All pump stations shall include a backup power source which typically includes the use of a natural gas-powered generator. Submersible pumps are the preferred type of lift station. The designer shall obtain approval from the City for the best pump station type based on design considerations. A reinforced concrete slab and access drive shall be included in design.
- B. Pump Sizing
 - 1. Each pump shall be sized to accommodate projected peak flows from the service area. Detention items for the sewage shall be determined for initial flows into the pump station. If the detention times warrant the use of smaller pumps, provisions shall be made to utilize variable frequency drives (vfds) or increase the capacity of the pumps by changing out the impellers and/or motors for future peak flows.
- C. Wet Well
 - 1. The wet well shall be sized to accommodate the peak flows from the service area. A precast manhole may be used as a wet well. The wet well shall be coated with a specialized coating per the Standard Specifications for manholes. Buoyancy of the wet well shall be calculated and additional thickness added to the wet well base as warranted. A screened stainless steel vent pipe shall be included at the top of the wet well. Bottom of wet well invert shall be sloped at 60° slope.
- D. Controls
 - 1. A submersible transducer shall be furnished for level of operation. Float controls shall be provided for the alarm conditions. The levels shall be as follows:
 - a. Low level “alarm”
 - b. Pump “off”
 - c. Lead Pump “on”
 - d. Lag Pump “on”
 - e. High level “alarm”

Alarm conditions shall be indicated through the use of emergency lights and horn located at the pump station site. Cellular communication shall also be included in the design to transmit alarm conditions.

Erosion Control

- A. All projects shall incorporate the use of best management practices to reduce erosion on the project and eliminate discharges of pollutants from the project site. Erosion control measures shall include the use of silt fences and temporary seeding and mulching. Temporary seeding shall include the use of rye grass and shall be applied within 14 days after the area was disturbed unless permanent seeding is performed within this time frame. All applicable requirements for the NPDES storm water pollution prevention shall be met. This may include a pollution prevention plan being prepared and submitted to the Kansas Department of Health and Environment if the disturbed construction area excess the requirements.

GIS Files

- A. Consultant shall provide a GIS file of the proposed infrastructure (MHs, pipe, etc.) that the City can utilize to update their GIS database.