APPENDIX E: SANITARY SEWER DESIGN GUIDANCE

E.1 – KDHE Sanitary Sewer Extension Permit with City Details
E.2 – KDHE Checklist for Sewer Extension Plan Review
E.3 – City of Lawrence Design Flow Example (Area Method)
STATE OF KANSAS  
DIVISION OF ENVIRONMENT  
APPLICATION FOR SEWER EXTENSION PERMIT

The applicant hereby requests a permit for extension of sanitary sewers in compliance with the requirements of K.S.A. 65-165 and K.S.A. 65-166. Plans and specifications submitted must comply with the Kansas Department of Health and Environment, Division of Environment, "Minimum Standards of Design for Water Pollution Control Facilities."

APPLICANT DATA

1. __________________________________________________________________________ 
   Name of Project (as it appears on plans)

2. __________________________________________________________________________ 
   Name of Applicant (Governmental Unit)

3. __________________________________________________________________________ 
   Kansas Water Pollution Control Permit Number for the Wastewater Treatment Facility which will treat the flow from this sewer extension.

4. __________________________________________________________________________ 
   Name the engineer or engineering firm responsible for inspection of this extension.

In making application for a sewer extension permit, I hereby certify that continuous engineering observation of the construction of the proposed improvement, including building connections, shall be provided in accordance with Kansas Department of Health and Environment Regulation 28-16-55.

Signature: _______________________________  
Authorized Official

Print Name:  City PM Name

Title:  City PM Title

Mailing Address:  City of Lawrence - MSO

P.O. Box 708

Lawrence, KS 66044

E-Mail Address:  City PM Email Address
DESIGN ENGINEER DATA

1. **PROJECT NAME**
   Name of Project (as it appears on plans)

2. Engineers estimate of construction cost **PROJECT COST**

3. What are the conditions and capacity of the existing sewer system downstream of this sewer extension?
   a. What is the present average daily flow at the wastewater treatment facility? 10.1 MGD __MGD
      CIRCLE YES OR NO
   b. Do the downstream sewer lines presently convey the peak flow without inducing backup into buildings or bypass to the environment? YES NO
   c. Can the downstream receiving sewers convey the additional peak design flow generated after completion of this sewer extension without backup into buildings or bypassing to the environment? YES NO
   d. If the answer to either of the above questions is NO, what steps are being taken to eliminate or prevent bypass or service line backup conditions?

   Attach additional pages if necessary.

4. What are the design flows for this sewer extension?
   (Include a copy of the calculations for flow and list the following values)
   Average daily ### ### MGD Peak ### ### MGD

5. If wastewater pumping facilities are included in the project, provide with this application the following: system curve, pump curve and total head calculations and planned control elevations i.e. pumps off, low level on, high level on, and alarm level.

The information contained above is accurate to the best of my knowledge.

Signature: ____________________________  Kansas Licensed Engineer
Print Name: __________________________
Address: ____________________________
E-Mail Address: ________________________
P.E. Stamp/Date/Signature
Checklist for Sewer Extension Plan Review

Project name: PROJECT NAME

City: Lawrence, Kansas

Project #: Project #

Date: DATE

Flow Check

Project ADF: ####_________ mgd/Current {A} Average Daily Flow at WWTP/F 10.1__________ {B} Design Flow @ WWTP/F: 12.5_________ mgd {C}

____ WWTF has capacity for added flow ( {A} + {B} < {C} )

____ WWTF has valid NPDES permit (effective date: 8/1/2019)

____ Flow to correct WWTP

Facility Short Name: Kansas River Wastewater Treatment Facility

NPDES KS0038644

Quick checks

____ Stamp & Seal on every plan sheet & cover sheet submitted OR a digital signature on cover sheet

____ Site map

____ North arrow and scale on every page necessary

____ Benchmarks stated

Stamps/Signatures/Officiality

____ Application is filled out correctly (i.e. correct NPDES number, signed in correct boxes)

____ PE Stamp on application

____ City Official signature on application

____ Appropriate specifications stated on transmittal letter, plans, or provided

Cross section/Pipe details

____ Easements/Right of ways

____ Connected to existing downstream sewer system

____ In/Out flow directions on manholes

____ In/Out flow elevations on manholes

____ Sanitary Sewer materials identified

____ Slope between each manhole is correct

____ Plan = profile MH

____ Cover depth > 30in (2.5ft)

____ Water/Sewer separation

____ Drop manholes

Misc.

____ Approved details on detail sheet

____ Access to manholes (opening >22in)

____ Cleanout distance not >150 ft from manhole

____ Collars on pipes

____ Trench plugs

____ Identify 100-year flood plain

____ Other: ____________________________________________

External Reviewer Signature: ______________________________

KDHE Reviewer Signature: ______________________________
Design Document Downloads

- City of Lawrence Flow Calculators and Templates
  - lawrenceks.org/mso/development/

Design Flow Example:

Develop the design sanitary sewer flow rate for a development with the following characteristics:

Land Use:

- 10 ac medium density residential
- 6 ac office/multi family
- 4 ac office/commercial

Solution:

Step 1: Input the land use acreages into column A of the Land Use sheet as shown.
Step 2: Input the density into column E of the Land Use sheet as shown.
Step 3: Input the bounding values from the Design Table for developed acreage in column B of the Design Flow sheet as shown.
Step 4: Read the design flow as calculated in column N of the Design Flow Sheet as shown.
## DEVELOPMENT LAND USE INPUT

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<th>Calculated Percent Zone as Decimal</th>
<th>Zone Type</th>
<th>Land Use Description</th>
<th>Input Density units/acre</th>
<th>Given Equivalent capita/unit</th>
<th>Calculated Equivalent capita/acre</th>
<th>Calculated Equivalent capita</th>
<th>Given Capita Usage gal/capita/day</th>
<th>Given Average WWP gal/acre/day</th>
<th>Given Infiltration gal/acre/day</th>
<th>Given Inflow Coeff K</th>
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