

# **CITY OF NORTH VERNON WASTEWATER CONSTRUCTION SPECIFICATIONS**

## **Introduction**

Unless modified, deleted, replaced or otherwise changed, the latest published edition of the following documents shall be the accepted standard for materials and/or procedures for the construction, modification, alteration, or expansion of North Vernon's sewer system:

1. IDEM Laws and Regulations.
2. Recommended Standards for Sewage Works (Ten State Standards).

If a conflict shall exist between reference sources, the most restrictive requirement shall prevail. The Wastewater Superintendent shall provide interpretation, as requested.

Property owners, at their cost, are responsible for the maintenance and repair of the sewer lateral from their building sewer to the right-of-way or utility easement line. The City is responsible for the maintenance and repair of the sewer lateral from the right-of-way or easement line to the public sewer main including the sewer lateral fitting which connects the sewer lateral to the public sewer main.

All work performed within a public right-of-way or an utility easement shall be performed by a plumber licensed in the State of Indiana, a contractor under the direct supervision of the Wastewater Department or an employee of the Wastewater Department. All work performed on a sewer lateral from a building to the right-of-way or utility easement line shall be performed by a plumber licensed in the State of Indiana except as herein stated.

The owner of an owner occupied residence may perform work on the owner's sewer lateral outside of the public right-of-way or easement.

Anytime work is performed on a sewer lateral, a Sewer Permit is required for the purpose of documenting the work performed on the sewer lateral.

Plan approval by the City of North Vernon does not imply nor assure approval by IDEM. Plans are approved subject to the conditions of compliance with all applicable laws, rules, regulations and standards. The proposed project may be constructed only in accordance with the approved plans. There may be no deviation from the approved plans without the written approval of the City. Approval of the plans does not constitute an assurance that the proposed project will operate in compliance with all IDEM regulations.

Plans shall be submitted to IDEM for approval. The cost of submitting plans to IDEM and review by IDEM shall be paid by the Contractor. Construction shall not begin until such plans are approved by IDEM.

Due to Federal, State and City ordinances, all sewers connecting to the City of North Vernon's public sewer system shall comply with City of North Vernon standards.

***Determination of the Amount of Sewage***

**Average Flows**

The average flow of sanitary sewer shall be computed on the basis of 100 gallons per capita. The estimated flows listed are to be used only for the design of sewers and lift stations, and should not be used in the design of treatment plants.

<u>WASTEWATER SOURCE</u>	<u>ESTIMATED SEWAGE FLOW</u> (gallons per day)
Apartments	
One bedroom	200
Two bedrooms	300
Three bedrooms	350
Assembly Halls	
Per seat	2
Bowling Alleys (no food service)	
Per lane	75
Churches	
Small-per sanctuary seat	3-5
Large with kitchen-per sanctuary seat	5-7
Dance Halls	
Per person at maximum capacity	2
Factories	
No showers-per employee	20
With showers-per employee	35
Family Dwelling	
Per person	100

WASTEWATER SOURCEESTIMATED SEWAGE FLOW

(gallons per day)

Single Family	400
Food Service Operations	
Ordinary restaurant (not 24 hours) per seat	35
24 hour restaurant-per seat	50
Banquet rooms-per seat	5
Restaurant along freeway-per seat	70
Tavern (very little food service)-per seat	35
Curb service (drive-in)-per car space	50
Hospitals	
No resident personnel-per bed	200
Laundries	
Coin operated-per machine (standard size)	400
Motels	
Per Unit	100
Nursing and Rest Homes	
Per patient	100
Office Buildings (exclusive of cafeteria or Office) per employee per shift	20
Add for cafeteria (.5 per sq. ft.)	5
Playgrounds and Daytime Parks	
With toilet facility-per person	5
Schools	
Elementary (not including showers or Cafeteria-per pupil)	15
High and Junior High (not including Showers or cafeteria) per pupil	20
Add for showers-per pupil	5
Service Stations	
Per rest room	400

WASTEWATER SOURCE

ESTIMATED SEWAGE FLOW

(gallons per day)

Shopping Centers (without food service or Laundries)-per area of floor space

0.2/sq.ft.

Swimming Pool (average with hot shower) Per swimmer

10

Theaters Movie-per seat

5

Trailer Parks (mobile home parks) Per trailer space

300

**Peak Flows**

Sanitary sewers shall be designed on a peak flow basis using a peak factor of four (4) times the total calculated average daily wastewater flow for lateral sewers, and a peak factor of 2.5 for sub-mains and trunk sewers. Pumps and force mains should be designed to carry the peak flow of all the sewers that discharge into the lift station. The peak flow for area which do not have a 24-hour run-off period shall be calculated as follows:

$$\text{Peak Factor} \times \frac{(\text{Calculated Wastewater Flow} \times 24 \text{ hours})}{\text{Run-off period (In Hours)}} = \text{_____ gpd}$$

Peak Factor = 4.0 for Sewer mains  
Peak Factor = 2.5 for Trunk Sewers

ENTITY

RUN-OFF PERIOD

Municipality	24 hours
Factories	Length of Shift
Subdivisions (over 250 homes)	24 hours
Subdivisions (under 250 homes)	16 hours
Hospitals	12 – 24 hours
Schools	8 hours
Restaurants	16 hours
Mobile Home Parks	12 hours
Motels	4 hours

(Use of other run-off periods must be documented.)

## **Infiltration**

An allowance of 15% of the daily peak sanitary flows shall be added to the above peak sanitary flows to establish daily infiltration levels to the treatment plant's drainage basin.

## **DETAILS OF DESIGN AND CONSTRUCTION**

### **Minimum Size**

All public sanitary sewers conveying raw sewage shall be at least eight (8) inches in diameter.

### **Depth**

Sewers shall be deep enough to prevent freezing and to receive sewage from basements and cellars.

### **Location**

Public sewer mains shall be installed in public right-of-way or upon approval, in public utility easement. A sewer maintenance area shall be provided by the formula:

$$(2.5 \times \text{depth of sewer line}) + \text{ten (10) feet}$$

This sewer maintenance area shall be no less than twenty (20) feet and shall be totally within the public right-of-way or public utility easement. It shall be evenly divided on both sides of the sewer line.

### **Flow Velocity**

All sanitary sewers shall be designed to give a mean velocity of at least 2.0 feet per second, when flowing full; this is based on Manning's formula using an "n" factor of 0.013 in design. Use of other "n" values will be considered if shown justifiable on the basis of extensive field data. When velocities greater than fifteen (15) feet per second are expected, provisions should be made to protect against displacement and erosion of the pipe.

### **Minimum Allowable Slope**

The minimum allowable slope shall be that which results in a velocity of at least two (2) feet per second when the sewer pipe flows at  $\frac{3}{4}$  of full depth. Sewers 24 inches or less shall be laid with uniform slope and straight alignment between manholes. The line and grade alignment shall be checked with laser instrument whenever possible: use of batter boards is also acceptable.

<u>Sewer Size</u>	<u>Min. Slope to Obtain 2.0 FPS Velocity (ft./100 ft.) (n-0.013)</u>	<u>Approx. Capacity Minimum Slope (GPD)</u>	<u>Approx. Capacity Minimum Slope (CFS)</u>
8"	0.40	520,000	0.80
10"	0.28	750,000	1.16
12"	0.22	1,100,000	1.70
15"	0.15	1,680,000	2.60
18"	0.12	2,330,000	3.60

### **Steep Slopes**

If plans are submitted for approval with a slope less than the minimum, the consulting engineer must show justification for the recommendation.

Sewers on 15% slope or greater shall be anchored with concrete anchors spaced as follows:

- a. Not over 36 feet center to center on grades 20% to 35%.
- b. Not over 24 feet center to center on grades 35% to 50%.
- c. Not over 16 feet center to center on grades 50% and over.

### **Changes in Pipe Size**

When a smaller sewer discharges into a larger one, the invert of the larger sewer must be lowered sufficiently to maintain the same energy gradient. An approximate method to accomplish this is to place the 0.8 depth point of both sewers at the same elevation.

When a larger sewer discharges into a smaller one, the invert of the smaller sewer should not be raised to maintain the same energy gradient.

### **CONNECTIONS**

Roof drains, foundation drains and all other clean water connections to the sanitary sewer system are prohibited. The following shall appear on sanitary sewer plans and construction plans submitted to the City and IDEM for review:

**“No buildings shall be connected to a sewer lateral until the building is under roof. Roof drains, foundation drains, foundation sump pumps and all other clean water Connections are prohibited to the sanitary sewer system.”**