

**CHAPTER 1109**  
**Utility Design And Construction Standards**

<p>1109.01 General. 1109.02 Water supply. 1109.03 Fire protection. 1109.04 Sanitary sewers. 1109.05 Design criteria for sanitary sewers.</p>	<p>1109.06 Drainage and storm sewers. 1109.07 Electric, gas and telephone improvements. 1109.08 Oversize and off-site improvements.</p>
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**CROSS REFERENCES**

Sewer regulations - see S.U. & P.S. Ch. 935  
Water regulations - see S.U. & P.S. Ch. 939

**1109.01 GENERAL.**

A professional engineer, licensed in Ohio, shall design any plans for public water supply, storm water, and wastewater facilities.

**1109.02 WATER SUPPLY.**

(a) Where a public water supply is reasonably accessible or required because of groundwater pollution problems, the subdivision shall be provided with a complete water distribution system including a connection for each lot. All residential structures shall have curb stops (shut off valves) and boxes. No curb stops or meter pits shall be installed in concrete or asphalt. Appropriately spaced fire hydrants may be required by the Planning Commission. Public water distribution and public well systems shall meet the requirements of the Ohio Environmental Protection Agency, as cited in the Ohio Revised Code.

(b) When a public water main is accessible, the developer shall install adequate water facilities subject to the specifications of the Ohio Environmental Protection Agency, the City Utilities Department, and the County Health Department. Depending on the number of housing units, residential subdivisions shall be connected to an existing public or community water supply system if such service is available within the distances defined in Table 5-1.

TABLE 5-1 WATER SUPPLY EXTENSIONS	
SIZE OF DEVELOPMENT	DISTANCE
1 Unit	200 feet
2 Units	400 feet
3 Units	600 feet
4 Units	800 feet
5-16 Units	1,000 feet

### 1109.03 FIRE PROTECTION.

(a) Fire hydrants with two and one half (2-1/2) inch outlets and one (1) large pumping connection shall be provided by the subdivider in all subdivisions with adequate public water supplies.

(b) Hydrants shall be located between property lines and curbs with all outlets facing or parallel to the street. Hydrants shall be placed at the corners of all blocks and at midblock for blocks exceeding eight hundred (800) feet in length. Hydrants shall also be required at the entrance and end of all cul-de-sacs exceeding four hundred (400) feet in length.

(c) Hydrants shall be spaced to provide necessary fire flow. The average area per hydrant shall not exceed 120,000 square feet. In addition, hydrants shall be spaced so that each residence shall be within 400 feet of a hydrant.

(d) A hydrant shall be located at all low points and at all high points with adequate means of drainage provided.

(e) The type of hydrant and control valves and the location of the hydrant shall be approved by the Fire Chief and Public Works Director for the City.

(f) The minimum size of any water line serving any hydrant shall not be less than eight (8) inches in diameter and shall be on circulating water lines. The size and location of water lines shall be approved by the Public Works Director, the Fire Chief, or person responsible for the fire protection. No hydrant valves shall be installed in concrete sidewalks or driveway aprons (only in grass areas).

### 1109.04 SANITARY SEWERS.

(a) Where an adequate public sanitary sewer system is reasonably accessible in the determination of the Planning Commission, public sanitary sewers shall be installed to adequately serve all lots, including lateral connections to the public system. Public sewer system extensions shall meet the requirements of the Ohio Environmental Protection Agency, the Public Works Director. Combinations of sanitary sewers and storm sewers shall be prohibited.

(b) Depending on the number of housing units, residential subdivisions shall be connected to an existing public sanitary sewer system if public service is available within the distances defined in Table 5-2.

TABLE 5-2 SANITARY SEWER EXTENSIONS	
SIZE OF DEVELOPMENT	DISTANCE
1 Unit	200 feet
2 Units	400 feet
3 Units	600 feet
4 Units	800 feet
5-16 Units	1,000 feet

#### 1109.05 DESIGN CRITERIA FOR SANITARY SEWERS.

(a) These design criteria are not intended to cover extraordinary situations. Deviations will be allowed and may be required in those instances when considered justified by the Public Works Director and/or County Sanitary Engineer.

(b) Design Factors. Sewer capacities shall be adequate to handle the anticipated maximum hourly quantity of sewage and industrial waste together with an adequate allowance for infiltration and other extraneous flow. Sewers shall be designed for the total tributary area using the criteria in Table 5-3.

TABLE 5-3 DESIGN CRITERIA FOR SANITARY SEWERS	
DEVELOPMENT TYPE	FLOWS
1-family and 2-family dwellings	0.2 c.f.s./acre
1-2 story apartments	0.2 c.f.s./acre
3-6 story apartments	0.2 c.f.s./acre
Commercial-small store, offices	0.2 c.f.s./acre
Commercial-shopping centers	0.2 c.f.s./acre
High-rise	As directed by County Sanitary Engineer
Industrial	As directed by County Sanitary Engineer
<p>Note: These design factors shall apply to watersheds of 300 acres or less. Design Factors for watersheds larger than 300 acres and smaller than 1,000 acres shall be computed on the basis of a linear decrease from the applicable design factor for an area of 300 acres to the design factor of .01 c.f.s./acre for an area of 1,000 acres unless otherwise directed by the Public Works Director and/or the County Sanitary Engineer.</p>	

(c) Size. The diameter of sewers proposed shall not exceed the diameter of the existing or proposed outlet, whichever is applicable, and shall be no less than eight (8) inches.

(d) Minimum Slope. All sewers shall be designed to give mean velocities, when flowing full, of not less than 2.0 feet per second and not greater than 10.0 feet per second. All velocity and flow calculations shall be based on the Manning Formula using an "n" value of 0.013.

(e) Alignment. All sewers shall be laid with straight alignment between manholes, unless otherwise directed or approved by the Public Works Director.

SEWER SIZE (inches)	MINIMUM SLOPE (feet per 100 feet)
8	0.60
10	0.44
12	0.36
15	0.28
18	0.24
21	0.20
24	0.16

(f) Manholes. Manholes shall be installed at the end of each line; at all changes in grade, size, or alignment; at all intersections; and at distances not greater than 400 feet for sewers 15 inches and smaller, and 500 feet for sewers 18 inches in diameter and larger. The difference in elevation between any incoming sewer and the manhole invert shall not exceed 12 inches except where required to match crowns. The use of drop manholes will require approval by the Public Works Director.

(g) Sewerage Location. Sanitary sewers shall be located within street or alley rights-of-way unless topography dictates otherwise. When located in easements on private property, there shall be access to all manholes. A manhole shall be provided at each street or alley crossing. End lines shall be extended to provide access from street or alley right-of-way when possible.

#### 1109.06 DRAINAGE AND STORM SEWERS.

All storm drainage design shall be planned and executed so as to preserve natural topographic features and vegetative cover, to minimize change to existing topography, and to preserve natural drainage systems.

- (a) Where an adequate public storm sewer is available at the plat boundary, the subdivider shall construct a storm sewer system and connect with such storm sewer line. If such a storm sewer system is not accessible, natural drainage channels with easements of adequate width shall be provided as determined by the City Engineer. Storm drainage from lots, including drain tile around basements, shall not be permitted to discharge into any sanitary sewer facility, but shall connect to an adequate drainage outlet.
- (b) The subdivider shall construct all necessary facilities including underground pipe, inlets, catch basins, or open drainage ditches, as determined by the City Engineer, to provide for the adequate disposal of subsurface and surface water and maintenance of natural drainage courses. The best available technology shall be used to minimize off-site storm water runoff, increase on-site filtration, encourage natural filtration functions, simulate natural drainage systems, and minimize off-site discharge of pollutants to ground and surface water. Best available technology may include measures such as retention basins, recharge trenches, porous paving and piping, contour terraces, and swales. Storm water management shall follow the standards established in Hamilton County's Rules and Regulations governing the construction, operation and maintenance of the Hamilton County Storm Water Drainage System.
- (c) When necessary, outlet ditches of closed sewers of an approved type and size shall be required as part of the construction. If same is across private property, rights-of-way or easements shall be obtained by the subdivider or developer for the construction and future maintenance. These rights-of-way or easements shall be shown on the construction plans. Whenever possible, post-development drainage patterns shall be the same as predevelopment drainage patterns. The design of streets and grading shall be such that run-off from roofs, driveways and other impervious surfaces will be collected in ditches and/or gutters in short runs three hundred (300) feet to four hundred (400) feet in length. The runoff shall then be diverted from the surface, if not already underground, into storm sewers or a natural water course. Streets shall be located away from water courses unless storm sewers are to be installed. The channel downstream of the subdivision shall be improved adequately by the developer to convey the storm runoff from the subdivision and across the adjacent property owner so that damages from erosion are minimized.
- (d) The subdivider shall guard against the creation or continuation of swampy areas or stagnant pools, unless they are a component of a designed wetlands open space. The Planning Commission may require fill, swale and/or channel improvements in order to forestall such problems.
- (e) Adequate measures for the protection of open and closed drainage channels shall be provided. Maintenance easement widths shall be determined by the Public Works Director. The velocity flow on an open ditch shall not exceed four (4) feet per second in soil ditches or six (6) feet per second in turf gutters. Paved gutters will be required if velocities of flow are greater than those specified or if it is otherwise likely that destructive erosion will result. Drainage ditches shall not be permitted to discharge into any sanitary sewer facility.
- (f) No water course shall be altered in such a way as to change the amount or direction of flow; no fill, building or structures shall be situated in natural water courses unless provision is made for the flow of water in a manner satisfactory to the City Engineer.

**1109.07 ELECTRIC, GAS, AND TELEPHONE IMPROVEMENTS.**

(a) Electric and telephone service shall be provided within each subdivision. Gas service may be required where reasonably accessible. Whenever such facilities are reasonably accessible and available, they may be required to be installed within the area prior to the approval of the final plat. Telephone, electric, and street lighting wires, conduits, and cables shall be constructed underground except in cases where the Public Works Director and/or the County Engineer determines that topographic, bedrock, or underground water conditions would result in excessive costs to the subdivider.

(b) Overhead utility lines, where permitted, shall be located at the rear of all lots unless the City Engineer, upon the recommendation of utility company, provides reasons that justify the location of easements at another location. The width of the easement per lot shall be not less than ten (10) feet and the total easement width shall be not less than twenty (20) feet.

(c) Whenever a sanitary sewer line and electric and/or telephone line are each placed underground in the same utility easement, the total easement width shall be not less than twenty (20) feet.

(d) Whenever a major gas transmission line is on or adjacent to property proposed to be subdivided, adequate measures shall be taken to insure that all buildable sites are at a minimum safe distance from the transmission line easement, as recommended by the gas transmission company and the Public Utilities Commission of Ohio.

**1109.08 OVERSIZE AND OFF-SITE IMPROVEMENTS.**

(a) The City Council, with advice provided by the Planning Commission, may require that utilities, pavements, and other land improvements for the proposed subdivision be designed oversized, and/or with extensions provided, to serve nearby land which is an integral part of the neighborhood service or drainage area as determined by the Public Works Director.

(b) The subdivider shall be required to pay for all oversize improvements that pertain to sanitary sewers and waterlines and storm drainage requirements inherent to the plat and shall be required to pay for oversized sanitary sewer and/or water line improvements where such oversizing has been required for conformance with the sanitary sewer and water comprehensive plan of the City.