
III. GENERAL ENGINEERING REQUIREMENTS

1. Purpose

- 1.1 The purpose of this chapter is to describe the engineering and procedural steps required by the City of Chattanooga from beginning to final acceptance of a sanitary sewer project. These criteria apply to the development of all facilities that discharge sanitary sewage as part of their normal operations. This would include but not be limited to subdivisions, trailer parks, apartments, resorts, schools, service stations, shopping centers, truck stops, motels, industrial waste systems, laundries, and car wash facilities.

2. Ownership

- 2.1 Wastewater collection and transport systems, including pumping stations and force mains, will not be approved for construction unless ownership and responsibility for operation of the completed system are transferred to and accepted by the City of Chattanooga. Under certain circumstances, an organization or a person may request approval for construction of wastewater collection and transport systems, provided the organization or person adopts and implements an acceptable long-term plan for ownership, operation, and maintenance of the system.

3. Permits

- 3.1 It is the owner's responsibility to obtain all necessary permits along streams or rivers, i.e., Corps of Engineers, TVA, or the Natural Resources Section of the Division of Water Pollution Control.

4. Requirement for Licensed Engineer

- 4.1 All engineering design reports, plans and specifications, and any other relevant technical information presented to the City of Chattanooga for approval must bear the stamp of a professional engineer licensed to practice in the State of Tennessee. The City Engineering Division cannot act as consulting engineers for owners, but assistance will be given insofar as possible in developing a suitable and economical project.

5. Existing Sanitary Sewer System Capacity

- 5.1 Construction of new sewer systems or extensions of existing systems will be allowed only when the downstream conveyance system and the receiving wastewater treatment facility are capable of adequately conveying or processing the added hydraulic and organic load.

6. Design Requirements

- 6.1 The goal of these design requirements is to promote the simplest system available that will meet the standards of the city while providing maximum ease of operation. While cost comparisons are important, long-term operability and reliability should be an overriding influence in design of sanitary sewer systems.
- 6.2 The design period should be 20 years unless growth of the area dictates other design parameters.

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- 6.3 As a minimum, the following items shall be considered in the design of the sanitary sewer system:
 - 6.3.1 Present and future water quality requirements;
 - 6.3.2 Local topography of the area being served by the sanitary sewer system;
 - 6.3.3 The immediate and downstream effects of industrial wastes that may be discharged into the new system;
 - 6.3.4 System capital costs;
 - 6.3.5 System operating and maintenance costs;
 - 6.3.6 Environmental impact on present and future adjacent land use.

7. Engineering Report

- 7.1 Every proposed addition to the sanitary sewer system of the City of Chattanooga shall be accompanied by an engineering report to explain the purpose of the proposed addition. The engineering report shall assemble basic information, present design criteria and assumptions, and offer conclusions and recommendations. The report must be sufficiently complete to facilitate further plan and specification development. The report shall identify and be consistent with all applicable areawide projects, drainage basins, service areas, comprehensive, and metropolitan area plans, e.g. 208 and 303(e) plans.
- 7.2 As a minimum, the engineering report shall include the following information:
 - 7.2.1 Purpose and need for the proposed project;
 - 7.2.2 Present and design population with the method of determination;
 - 7.2.3 Nature and extent of the area to be served, including immediate and probable future development;
 - 7.2.4 Description of the existing collection system, including general condition and known problems;
 - 7.2.5 Present basis of design, including reliable measurements or analysis of flow and wastewater constituents, and hydraulic, organic, and solids loadings attributed to residential, commercial, and industrial users;
 - 7.2.6 The 25-year and 100-year flood elevations and conditions;
 - 7.2.7 Sufficient soils and geologic data to evaluate site conditions, including borings for representative subsurface conditions when appropriate and identification of Karst feature;
- 7.3 The engineering report shall be submitted to the office of city engineer, and may be submitted alone or with the proposed construction plans and specifications. The city engineer will review and either approve or comment in writing on the report within 30 calendar days.

8. Plans and Specifications

- 8.1 All plans and specifications must be in accordance with the approved engineering report, and any changes must be approved in writing by the city engineer prior to construction. All plans and specifications for sanitary sewer systems shall show the following:
 - 8.1.1 The name, address, and phone number of the owner;
 - 8.1.2 The name, address, and phone number of the engineer;
 - 8.1.3 The seal and signature of the design engineer;
 - 8.1.4 The scale in feet;
 - 8.1.5 A north arrow;

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- 8.1.6 A location map;
 - 8.1.7 The date of submittal and any revision dates.
 - 8.2 The plans should be clear and legible and drawn to a scale which permits all necessary information to be shown plainly. Plan and profile sheets should be drawn on D size paper, 24 inches by 36 inches, and should use the standard format of the City of Chattanooga, which is shown as Figure III - 1, and can be downloaded at www.chattanooga.gov/pubworks/engineering/design/standards3-2001.pdf. Where practical, sanitary sewer lines shall be drawn with north to the top or to the left of the sheet. The plan view of the line shall be positioned directly above the profile view of the same line segment.
 - 8.3 The plans shall show the following information at a minimum:
 - 8.3.1 Profiles for sewer detail with a horizontal scale of not more than 100 feet to the inch and a vertical scale of not more than 10 feet to the inch. Plan views should be drawn to a corresponding horizontal scale;
 - 8.3.2 Locations of streets and sewers;
 - 8.3.3 Lines of ground surface, pipe type and size, manhole stationing, invert and surface elevation at each manhole, and grade of sewer between adjacent manholes;
 - 8.3.4 Manholes should be labeled on the plan and also on the profile correspondingly. Where there is any question of the sewer being sufficiently deep to allow access by any point of entry, the elevation and location of the point of entry shall be plotted on the profile of the sewer which is to provide service to the point of entry;
 - 8.3.5 Locations of all special features such as inverted siphons, concrete encasements, elevated sewers, check dams, and flow monitoring key manholes;
 - 8.3.6 Location of all existing structures below and above ground which might interfere with the proposed construction, including water mains, gas mains, storm drains, and telecommunications systems;
 - 8.3.7 Detail drawings of all stream crossings with elevations of the streambed and of normal and extreme high- and low-water levels to include 25- and 100- year floodplain;
 - 8.3.8 A topographic map with contours shown at 2-foot intervals, including trees over 4" caliper within 25 feet of centerline of the proposed sewer line.
 - 8.4 A general layout plan must be submitted for projects involving construction or substantial modification of pumping stations. The plan should show:
 - 8.4.1 The location of the pump station and the extent of the tributary area;
 - 8.4.2 A topographic map with contours shown at 2-foot intervals;
 - 8.4.3 The land use (commercial, residential, and agricultural) existing or proposed for the near future within a 500-foot radius of the pumping station. Existing buildings and their types within 100 feet of the pumping station property lines should be included;
 - 8.4.4 Elevation of groundwater at the site and maximum elevation of sewage in the collection system upon occasion of power failure;
 - 8.4.5 Test boring locations and test boring information;
 - 8.4.6 Plan and elevation views of the pump suction (from the wetwell) and discharge piping showing all isolation valves and gates.



CITY OF CHATTANOOGA
DEPARTMENT OF PUBLIC WORKS
PROJECT NAME

WILSON C. MACDONALD, ADMINISTRATOR

PHILIP H. LYNN, P.E., CITY ENGINEER

SEWER PLAN

SEWER PROFILE

SHEET TITLE

REV. DESCRIPTION DATE BY

SCALE

DRAWN

DESIGNED

CHECKED

APPROVED

ISSUED

STAMP

PROJECT NUMBER

DATE

SHEET OF

FILE NUMBER

Figure III - 1

9. Construction Specifications

- 9.1 Construction specifications supplement the plans by describing the intended project in additional detail relative to construction products and methods. The specifications shall conform to the city's standard specifications and shall include, but not be limited to, all construction information which is not shown on the drawings and is necessary to inform the contractor in detail of the design requirements relative to the quality of materials, workmanship and fabrication of the project, and the type, size, operating characteristics, and rating of equipment; machinery; valves, piping, and jointing of pipe; electrical apparatus, wiring, and meters; operating tools; construction materials; miscellaneous appurtenances; and testing for the completed systems.

10. Submittals

- 10.1 After written approval of the engineering report by the city engineer, the owner or his authorized representative shall submit five copies of complete construction plans and specifications of the proposed facilities to the city engineer for review and approval. Written approval must be received from the city engineer before construction can begin.
- 10.2 Each sheet of the plans shall be hand-dated with a copy of the seal and signature of the engineer. Only the title sheet and front cover of the specifications are required to be marked with original seal, signature, and date.
- 10.3 The city engineer will review and either approve or comment on the final plans and specifications within 30 calendar days. Three copies of plans and specifications will be retained by the city, with the remaining copies returned to the owner. One of the retained city copies will be forwarded to the Tennessee Department of Environmental and Conservation.
- 10.4 The City of Chattanooga requires that one stamped copy of the approved plans and specifications be on the construction site and available for inspection at all times during the construction process.

11. Revisions to Approved Plans

- 11.1 Any deviations from approved plans or specifications affecting capacity, flow, operation of units, or point of discharge shall be approved in writing by the city engineer prior to making any changes. Revisions to plans or specifications should be submitted at least 10 days in advance of any construction work which will be affected by such changes to permit sufficient time for review and approval. Minor structural revisions will be permitted during construction with the concurrence of the design engineer. As-built plans clearly showing all alterations shall be submitted to the city at the completion of the work.