1. Purpose

   The purpose of this chapter is to describe the general engineering and procedural steps required by the Hamilton County Water and Wastewater Treatment Authority (WWTA) from beginning to final acceptance of a sanitary sewer design 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

   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 WWTA. At its discretion, the WWTA can review laterals as shown on utility drawings for compliance with its rules and regulations; however, the WWTA will not approve the design of laterals will not accept ownership of laterals until designated by the Service Lateral Program. (SLP).

3. Permits

   3.1. It is the developer's responsibility to obtain and to comply with all necessary permits along streams or rivers, i.e., Corps of Engineers, Tennessee Valley Authority (TVA), or the Tennessee Department of Environment and Conservation (TDEC) Division of Water Pollution Control.

   3.2. It is the developer's responsibility to obtain and to comply with all necessary permits along Tennessee Department of Transportation's (TDOT) right-of-way.

4. Requirement for Licensed Engineer

   All engineering design reports, plans and specifications, and any other relevant technical information presented to the WWTA for approval must bear the stamp of a professional engineer licensed to practice in the State of Tennessee. The WWTA cannot act as consulting engineers for owners, but assistance will be given within reason in developing a suitable and economical project. The WWTA can act as a consulting engineer as directed by the 60/40 Program under Section VII of the WWTA Rules and Regulations.

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.

5.2. If the WWTA determines that there may not be enough capacity in the line, it is up to the engineer to show the downstream system has sufficient capacity.

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 WWTA and TDEC 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

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. How will the surrounding area(s) be served;
- 6.3.4. Does design conform to any master sewer plans;
- 6.3.5. The immediate and downstream effects of industrial wastes that may be discharged into the new system;
- 6.3.6. System capital costs;
- 6.3.7. System operating and maintenance costs;
- 6.3.8. Environmental impact on present and future adjacent land use.

7. Engineering Report

7.1. Every proposed addition to the sanitary sewer system of the WWTA shall be accompanied by an engineering report to explain the purpose of the proposed addition. The engineering report shall assemble basic information, flow calculations, present design criteria and assumptions, and offer conclusions and recommendations. The report must also include a discussion involving future development and how the designed system would support that future development. The report shall identify and be consistent with all applicable area wide projects, drainage basins, service areas, comprehensive, and master sewer area 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 WWTA Chief Engineer, and may be submitted alone or with the proposed construction plans and specifications. The Chief Engineer will review and either approve or comment in writing on the report within 30 calendar days of all documentation being submitted.

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 Chief Engineer and Executive Director 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;

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 WWTA. 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, gravity mains and laterals shall be named according to the standard WWTA nomenclature. The nomenclature can be found on the following website [http://www.hamiltontn.gov/wwta/].

8.3.5. Locations of all special features such as 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 and eventual maintenance, 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.

8.3.9. A general layout plan must be submitted for projects involving construction substantial modification of pumping stations. The plan should show:

8.3.9.1. The location of the pump station.

8.3.9.2. A topographic map with contours shown at 2-foot intervals;

8.3.9.3. 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;

8.3.9.4. Elevation of groundwater at the site and maximum elevation of sewage in the collection system upon occasion of power failure;

8.3.9.5. Test boring locations and test boring information;

8.3.9.6. Plan and elevation views of the pump suction (from the wetwell) and discharge piping showing

9. Construction Specifications

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 WWTA'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, adjoining 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 Chief Engineer, the owner or his authorized representative shall submit seven copies of complete construction plans and specifications of the proposed facilities to the Chief Engineer for review and approval. Written approval must be received from the Chief Engineer and Executive Director 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.

10.2.1. Only the title sheet and front cover of the specifications are required to be marked with original seal, signature, and date.

10.2.2. The Chief 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 WWTA, with the remaining copies returned to the owner. One of the retained WWTA copies will be forwarded to the Tennessee Department of Environmental and Conservation.

10.2.3. The WWTA 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

Any deviations from approved plans or specifications affecting capacity, flow, operation of units, or point of discharge shall be approved in writing by the Chief 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. Record Drawings clearly showing all alterations shall be submitted to the WWTA at the completion of the work