

SECTION IV

DESIGN CRITERIA FOR WASTEWATER PROJECTS

GENERAL

The following are the minimum standard Design Criteria that must be met for all wastewater main improvements in order to meet the requirements of 30 TAC Chapter 317, Sections 317.1 through 317.3, the City of Fort Worth Ordinance #7234 (Subdivision Ordinance), and the City of Fort Worth Policy for the Installation of Community Facilities, also to be approved for incorporation into the Fort Worth Wastewater Collection System.

WASTEWATER MAINS AND LATERALS

1. BASIC PRELIMINARY INFORMATION

- A. Determine the total area within the natural drainage limits to be served by the proposed mains/laterals using information below:
 - (1) Topographic or contour maps,
 - (2) Field surveys,
 - (3) Highway drainage information,
 - (4) As builds,
 - (5) Other suitable material

- B. Estimate the current and/or future population load to be served by the main/lateral. In no case it shall be less than the population obtained by multiplying the gross area under "A" above, by **18 people per acre**. However, this minimum population shall not be employed in place of sound information relating to a particular area in question indicating a higher population than the minimum.

- C. Prepare a preliminary map of the area to be served by the main, both present and future, on which shall be shown:
 - (1) Limits of the drainage area,
 - (2) All subdivisions, recorded or not
 - (3) All known proposed subdivisions, preliminary plats or concept plans,
 - (4) Location of all water and drainage ways both natural and man-made,
 - (5) Tentative location of proposed main, showing probable point of

- connection to existing wastewater system. (A check should be made at this time to establish whether or not, “front foot” charges, or other similar charges are applicable for connection to the existing wastewater main),
- (6) All existing state, county, and city highways, roads, streets, and right-of-way dedicated for public use and any proposed (see master thoroughfare plan) street,
 - (7) Property lines and utility easement lines of all tracts in the vicinity of the main location with present owners shown.

2. PRELIMINARY DESIGN PROCEDURE

- A. Make a preliminary survey of the tentative main location, along with such alternate locations as this field survey might indicate as desirable. This survey includes:
- (1) Baseline surveys showing relation between property corners and proposed wastewater main centerline. This information shall be in sufficient detail to properly locate the proposed main on the preliminary map and to determine the number of properties involved for securing the necessary right-of-way and easements.
 - (2) Profile survey showing:
 - (a) Field-determined elevation of any existing manhole invert, stub, or wastewater main to which the proposed wastewater lines is to connect.
 - (b) Elevation of the ground at centerline of the proposed main at each stations, half station and/or ground break.
 - (c) Elevation of ground, 100 feet left and right of centerline at each station.
 - (d) Elevation at any draw, creek, depression, pond, lake or water course within any portion of the centerline at intervals not to exceed 10 feet, with proper reference made as to location with respect to centerline.
 - (e) As appropriate elevation of service stub out of each existing house or building to be served directly by the main. In case service stub is not available, finish floor or basement elevation should be shown at the front and back of the house. In any event, care should be taken to properly

locate the existing house and points of elevation taken with relation to centerline.

- B. Prepare preliminary plan and profile drawing for the mains showing the information obtained from the preliminary survey.
- (1) Station 0+00 of the proposed main shall be equated to the interceptor main stations at the point of connection (usually a manhole). The exception would be the continuation of an existing main, in which stationing would continue from the point of connection to the existing main. In no case should the engineer renumber or rename any existing main or lateral number and stationing.
 - (2) The plot of the main on the profile sheet shall be from left to right, beginning at Station 0+00 (lowest flow line elevation), and progressing right in increasing stations to the highest flow line elevation.
- C. Analyze the data obtained previously and the result from the wastewater collection system hydraulic modeling effort. Determine the points where each increment of load will be added to the proposed main and prepare a tabulation showing the estimated magnitude of the population load under ultimate conditions at each of those points, showing both the incremental and cumulative load. For pipe size 10-inch and above show on the profile of each segment of wastewater main the capacity required and the capacity provided in million gallons per day.
- D. Adjust preliminary grade on the profile, keeping in mind that this grade should be sufficiently deep to accept not only the normal direct connections, but in general, the top of the proposed main should be:
- (1) Not less than two feet below the bottom of such drainage course being paralleled;
 - (2) Far enough below the bottom of such drainage course to permit a 4-inch service line to pass under the drainage course with one foot of cover, approach the proposed main on at least a 1.00% grade, and match top of pipe with the proposed main at the point of connection; or
 - (3) Not less than five feet below the finished grade of the street in which it is to be located.
- E. Determine the limiting or latest gradient between each point of load increment

- F. Recheck all steps in the PRELIMINARY DESIGN PROCEDURE to be sure that the location and grade selected for the proposed main as the end result of this procedure are to be the best possible combinations obtainable under governing circumstances.

WASTEWATER LIFT STATIONS AND FORCE MAINS (Revised 9/01/01)

The Fort Worth Water Department will determine the proposed capacity and future expansion capacity. The lift station will also have remote monitoring capability as required by the Water Pollution Division of the Fort Worth Water Department.

Wastewater force mains will be sized to meet the ultimate capacity of the lift station. The force main material will be a pressure grade pipe acceptable to the Fort Worth Water Department.

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September 1, 2001

All Holders of Fort Worth
"Policy and Procedure for
Processing Water and Wastewater
Projects for Design and Construction"
Effective April 1999.

RE: Section IV.2 "Design Criteria for Wastewater Projects – Wastewater Lift Stations
and Force Mains"

The City of Fort Worth Water Department has updated and clarified the design guidelines to be used for the design and installation of wastewater lift stations within the City of Fort Worth. This new document entitled, "Design Guidelines for Wastewater Lift Stations", shall be viewed as supplemental to the "Policy and Procedure for Processing Water and Wastewater Projects for Design and Construction".

A copy of the "Design Guidelines for Wastewater Lift Stations" is available at the Water Department, free of charge.

Sincerely,

S. Frank Crumb, P.E.
Assistant Director, Planning and Engineering

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