

PIPE SUPPORTED ON PIERS

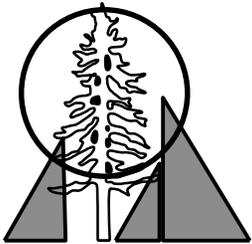
A. GENERAL: This section addresses the situation in which the sewer line must cross natural or man-made terrain features, with the pipe exposed above-ground, rather than crossing underground. The guidelines below refer to sewer lines in the City of Tega Cay's collection system, and may not apply to other aerial installations such as within treatment plants or other isolated facilities. The Engineer shall be responsible for all details associated with the design of pier-supported piping systems. All details related to a planned aerial crossing on piers shall be submitted the City's Utility Department with the preliminary plan submittal package.

B. MATERIALS:

- 1) Ductile iron pipe shall be used for all aerial crossings, the required wall thickness shall be specified by the Engineer.
- 2) The DIP joint configuration shall be as specified;
- 3) Fittings and appurtenances shall be as specified;
- 4) Long span pipe may be used to reduce the number of joints; this material shall be submitted to the City's Utility Department for approval.

C. DESIGN CONSIDERATIONS

- 1) The carrying capacity of the supports themselves,
- 2) The strength of the structure from which a pipe may be suspended
- 3) Unusual or additional loads not in the scope of this section. Such loading may include seismic, frequency or resonance of vibrations, wind, water current, and other special design considerations.
- 4) It is also necessary to ensure a minimum of lateral and vertical stability at the supports for aboveground piping. Deflected pipe joints can result in thrust forces of hydrostatic or hydrodynamic origin, and, if not laterally and vertically restrained, unbalanced forces may result in additional joint deflection and possible failure of the pipeline.
- 5) Thermal expansion of ductile iron pipelines supported above ground is not usually of concern in correctly designed and installed systems because of the nature of the push-on joint. A 120° F change in temperature results in expansion or contraction of a 20' length of ductile iron pipe of approximately 1/8". This is easily accommodated by correctly installed pipe and joints.
- 6) Occasionally, where support structures are expected to have significantly different behavior than the pipeline, special considerations for expansion, contraction, and supports may be necessary;
- 7) Supports should generally be positioned immediately behind the pipe bells. Supports should normally not be placed under spigots adjacent to bells, due to possible undesirable effects on joints.
- 8) Pipe supports should cradle the pipe in a saddle. This cradling, which should follow the contour of the pipe, minimizes stress concentrations at the supports. It is recommended that the saddle angle of the support be between 90° and 120°. Little or no benefit is gained by increasing the saddle angle more than 120°. With angles smaller than 90°, the maximum stress tends to increase rapidly with decreasing saddle angle.
- 9) Supports, piles, and/or foundations should be adequately designed from a structural and soil-engineering standpoint to safely handle any loads transferred from the pipe.
- 10) Refer to CONSTRUCTION DETAIL NO. 22. NOTE: The construction details provided in these Specifications are suggestions only and do not relieve the Design Engineer from the responsibility and obligation to consider all issues related to the proper design of all structures and systems and compliance with all applicable regulations and standards.



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REVISIONS

NO	DATE	DESCRIPTION

CITY OF TEGA CAY
LAND DEVELOPMENT
STANDARDS

PIPE SUPPORTED ON
PIERS NOTES

STD. NO	REV