

SECTION 10.0 PIPE TRENCHES

10.01 Excavation and Preparation of Trench

The trench shall be excavated to the proper depth to permit installation of the pipe along the lines and grades shown on the Plans. The trench width at the top of the pipe shall be as narrow as possible, but will vary with the depth of the trench and the nature of the soil encountered, but in all cases shall be of sufficient width to permit the pipe to be laid and jointed and the backfill to be placed and compacted thoroughly. The trench width, at the top of the pipe, for pipe thirty-three (33) inches and smaller in inside diameter shall be equal to the outside diameter of the bell of the pipe plus sixteen (16) inches. Trench width, at the top of the pipe, for pipe larger than thirty-three (33) inches inside diameter shall be equal to the outside diameter of the bell of the pipe plus twenty-four (24) inches. If the Contractor varies from this requirement or if the specified trench widths cannot be maintained, an improved bedding for the installed condition shall be used as directed by the Engineer. PVC pipe shall be installed as per ASTM D 2321, and according to the manufacturer's recommendations. See Sections 8.15, 9.02, and, 9.10.

Class 'D' bedding shall have a flat bottom conforming to the grade to which the pipe is to be laid, unless otherwise approved in writing by the City Engineer. Where bell and spigot pipe is used, the contractor shall shape the trench bottom at the bell of the pipe to fit the shape of the bell of the pipe and to permit all the barrel portion of the pipe to be uniformly supported by the trench bottom.

The pipe shall be laid upon solid soil cut true and even, so that the barrel of the pipe shall be uniformly supported for its full length. A laying square and grade line shall be used to ensure a proper and uniform trench grade.

Any part of the trench excavated below grade shall be corrected with approved material and thoroughly compacted (95% std. proctor).

Where excavation is in solid rock, the rock shall be removed to a depth of at least six inches (6") below grade and shall be backfilled with earth, sand, gravel or other suitable material and compacted to the proper grade before the pipe is installed.

The developer/contractor shall be responsible for damage to adjoining structures whether shown on the plans or not shown on the plans. Special precaution shall be observed whenever blasting is required.

The contractor shall be responsible for the safe conduct of the work, which shall include the furnishing and placing of all sheeting, shoring and bracing required in trenching excavation.

All Bedding shall be designed and constructed for all applicable dead loads and HS-20 traffic loads according to latest revisions of ASTM C 12 for VCP, ASTM A 746 for DIP, ASTM D 2321 for PVC, and for RCP according to “The Concrete Pipe Association Design Manual” and ASTM C 76. All bedding material outside of the middle third pipe diameter shall be compacted to a minimum of 95% Standard Proctor density in order to ensure proper support of the pipe.

Class ‘C’ Bedding shall be as class ‘D’ except the bottom of the trench shall be rounded out to conform to the outside diameter of the pipe (approximately ½ ID in width) as per City Standard Detail 71B-5; alternately, the trench may be lined with fine granular material to a minimum of 1/6 ID as per NCDOT Standard Detail 300.01 for flexible pipe.

Class ‘B’ Bedding shall be as class ‘C’ except the bedding shall be increased to ¼ the ID of the pipe, and pipe shall be backfilled to the springline with granular material as per City Standard Detail 71B-5; or NCDOT Standard Detail 300.01 for rigid pipe.

10.02 Trench Stabilization

All portions of the project where lines are to be installed in low, wet areas or other areas where proper foundations cannot be provided, shall be stabilized by adding #57 washed stone in the trench bottom. The developer/contractor shall furnish and place the stone in the trench and shall shape and compact it to the proper grades and cross-section required by the plans. The minimum depth of stone shall vary according to the subgrade conditions, but shall, in no case, be less than six inches

10.03 Blasting

When blasting is required, the contractor shall secure all permits required. See Section 8.15 for further requirements.

10.04 Backfilling

The trench shall be backfilled with approved material in uniform layers of not more than six inches (6") and shall be thoroughly tamped.

As soon as practical after the pipe has been laid (but, in no case, later than twenty-four hours) the contractor shall begin the backfilling operation in six inch (6") layers. Extreme care shall be exercised in the backfilling and tamping operation to prevent damage to the pipe, the grade and alignment, or the joints.

All backfill material shall be approved by the City Engineer and shall be free of stones which are greater than four inches (4") in diameter. All backfill material within six inches (6") of surface of the pipe shall be free of all stones and sharp objects which might produce point loads upon the pipe.

All backfill material shall be compacted to a minimum of 95% Standard Proctor density regardless of material. In instances where compliance with compaction requirements is questionable as determined by the City Engineer, testing shall be provided by the contractor and a reputable licensed Geotechnical Engineer to verify compliance.

See Sections 8.17 and 5.05 for compaction test requirements.

When the pipe is located in streets, roads and driveways, the backfill shall be consolidated in such a manner as to provide an adequate foundation for street base and surfacing.

Provisions for surface drainage shall be made as required by the City Engineer to prevent washing out of the backfill material from the trench.

10.05 Pavement Cuts

The contractor shall exercise care in making pavement cuts, in order to inflict the least amount of damage possible to the present pavement. **Straight and even saw cuts shall be utilized when making any and all pavement cuts.** Any alternate means to saw cuts shall be approved by the City Engineer. See Section 9.10 for screening dust requirements.

The contractor shall bear the expense of replacing the pavement to its original condition. Upon written application by the developer or contractor, the City may repair the damaged area and bill the applicant the full expense of this repair.

It shall be the responsibility of the contractor to maintain proper safety and warning devices and to detour traffic as deemed necessary by the City Engineer.

Asphalt and Concrete Removal/Replacement

The Contractor shall cut, remove and restore all paved surfaces encountered under this Contract, unless indicated otherwise on the Project Plans.

Driveway cuts shall be restored as specified in the Specifications Section 5.20. Concrete driveways cut within the street right-of-way shall be restored with a minimum of 6" depth. Street cuts shall be resorted as indicated on Standard Detail 71D-26 (NCDOT streets/Major Arteries), and 26a (City residential streets) **latest revisions**; unless specified otherwise on the Project Plans. Concrete street cuts shall be restored to meet existing conditions, but in no case less than 6" depth. No pavement cut shall remain open over any night time period.

All traveled surfaces shall be restored within a practical time frame as otherwise approved by the City Engineer.

On Water Lines where the project plans indicate concrete or asphalt driveways and streets are to be crossed, disturbed, or traversed the contractor shall install the pipe by dry bore and jack method without an encasement pipe (except when an encasement pipe is indicated on the plans or the Proposal), see Special Provisions Section 9.19. The City will not allow concrete/asphalt drives or streets to be crossed by open cut for water lines, except where the contractor by his efforts has demonstrated that open cut is the only way to complete the construction. Any open cuts approved by the City shall be restored with asphalt/concrete the same day as the disturbance began.

On Sewer Lines where the Project Plans indicate concrete or asphalt driveways and streets are to be cut and restored, the Contractor at his option may install the pipe by dry bore and jack method without an encasement pipe, see Section 8.21. Any open cuts approved by the City shall be restored with asphalt/concrete the same day as the disturbance began.

The Contractor will be required to attain written approval from the City Engineer to maintain any pavement cut with stone for a period longer than two weeks.

All crushed, washed, or other stone supplied under this Contract shall comply with the City of Gastonia "Standard Specifications", including, but not limited to, Section 3.0 thereof. This item shall include all material, labor, and equipment necessary to place, compact, and condition the stone as indicated on the plans, Proposal, and Specifications (mentioned above or as directed by the City Engineer).

Contractors shall secure permit from Construction Inspections as per City Policy.

10.06 Concrete Paving

All concrete for use in patching concrete pavements or sidewalks shall be Class "A", 3000 psi concrete. Concrete street pavement shall be replaced in accordance with the detailed plans and in accordance with City Standards for concrete paving and repaving.

Whenever it may become necessary to break a section of concrete sidewalk, the entire section shall be removed and replaced.

10.07 Concrete Base

The concrete to be used as base course shall be Class "A", 3000 psi concrete and shall be placed in accordance with the detailed plans and in accordance with City Standards for concrete paving or repaving.

10.08 Asphalt Cement Paving

All asphalt surface paving shall be replaced in accordance to the City of Gastonia Paving Specifications and Standard Details, any Details included in the City's Project Plans shall take precedence.

The patch shall include the entire width of the trench plus twelve inches (12") each side of the trench and shall be constructed of Type S(f)-9.5 asphalt wearing surface, of Type I-19.0 binder asphalt base and of coarse aggregate base course, as shown in the City of Gastonia Standard Detail 71D-26, 71D-26a, or as directed by the City Engineer.

Plant mix asphalt shall be of a mix approved by the City Engineer.

10.09 Stone Base

All stone for stone base shall be ABC stone and shall be no less than six inches (6") in thickness after compaction. See Standard Detail 71D-26a, any Details included in the City's Project Plans shall take precedence.

All stone materials shall be from a quarry approved by the City Engineer.

10.10 Piers

See Section 8.20 for Pier/Piles/Concrete Supports

Piers shall be designed and located just behind the joint of a standard 18' length of ductile iron pipe. Piers shall be as shown on the approved plans and as approved by the City Engineer. For stream crossing a standard 18' or 20' length of ductile iron pipe shall be centered on the creek and all pier spacing shall be set accordingly. Special approval is required for longer creek clear spans.

All piers supporting sanitary sewer and water distribution pipe and all miscellaneous masonry for trench blocking shall be of Class "A", 3000 psi concrete. Brick and other materials shall be as specified elsewhere in these specifications.

All piers shall be constructed where shown on the plans or as directed by the City Engineer and in accordance with City Standard No. 71B-14, 71B-15, 71B-16.

For Repair of Old Brick Piers (not allowed on new construction)

Concrete Grade "A" building brick of a minimum size of two and one quarter inches (2-1/4") by three and three quarter inches (3-3/4") by seven and five-eighths inches (7-5/8") shall be used for brick piers. Brick shall conform to ASTM Standard Specification #C-55-37 or latest subsequent revision.