

All water pumped or bailed from the trench or other excavation must be conveyed in an acceptable manner to a suitable point of discharge, i.e. a stream or ditch, where it shall not cause injury to public health, or public or private property, or to work under construction or previously completed or to the street surfaces, or to cause interference with the use of streets by the public.

4.1.2.10 Excavation Near Roads and Railroads

Special care must be exercised in trenching near roads and railroads to protect against collapsing of the roadbed structure. Each situation must be evaluated on account of varying soils. Where excavations encroaching at or near roads and/or railroads will be limited because of scheduled jack/bore methods required for installations under roads and/or railroads, the trench excavated shall be halted at least ten (10) feet from the pavement edge of a road, or more if soil conditions so indicate, and no nearer than twenty-five (25) feet from the centerline of the railroad track nearest the excavation as measured at 90 degrees (right angles) to the railroad.

4.1.2.11 Subsurface Obstructions

In excavating, backfilling and laying pipe care must be taken not to remove, disturb or injure any water, sewer, gas, electric, telephone, or other conduits or utilities without prior approval of the owner of the utility encountered, including private utilities.

If necessary in order to perform the intended work, the Contractor shall sling, shore up, and maintain such utilities in operation, and promptly repair any damage done to them. Before final acceptance of the work, all such utilities shall be made "equal to or better" than prior to construction.

It shall be the Contractor's responsibility to locate underground utilities. In event of damage to the utilities, the Contractor will promptly notify the utility owner (private or public) and must assume full responsibility therefor.

In event pipe or conduits providing service to adjoining buildings are broken, or damaged to some questionable degree of service, the Contractor shall immediately make repairs at his own expense, or be otherwise liable for repair costs incurred by others. The utility owner reserves the right to make repairs, caused by the Contractor, without prior notice. Removal or relocation of a utility encountered may be done upon prior approval by the utility owner given directly to the Contractor.

4.1.2.12 Embankments

Whenever the water main is to be installed in a fill area, the Water and Sewer Department will require the installation of ductile iron pipe.

4.1.2.13 Rock Excavation

Remove rock to 6 inches below grade of trench and build back trench bottom with suitable material tamped into place.

When necessary, blasting operations shall be conducted in strict accordance with all existing ordinances and regulations. Blasting shall be conducted by persons licensed to use explosives.

Where blasting is to be conducted along the right-of-way of a state claimed roadway, the Developer shall provide the Water and Sewer Department all necessary information to submit blasting permit applications to the Georgia Department of Transportation for approval. Blasting may be conducted only after this permit is received.

4.1.3 Inspection Before Laying of Pipe

Before any pipe is laid in the trench, the pipe shall be subject to inspection. Only first quality pipe with smooth surfaces (interior and exterior), free from cracks, flaws, blisters, etc., shall be used. Pipe contaminated with dirt deposits shall be cleaned prior to installation in the trench.

4.1.4 Pipe Installation

4.1.4.1 Handling

Pipe shall be carefully unloaded with a pipe unloader or crane.

4.1.4.2 Laying

Pipe shall be swept clean of trash or dirt before lowering into the trench. After the pipe has been cleaned it shall be lowered into the trench in such a manner that the pipe shall not be damaged. Each joint shall then be lined and brought to a uniform grade upon a solid trench bottom. Bell holes for couplings or bell shall be prepared with a minimum clearance of two inches. Pipe shall be laid in straight lines on uniform grades and shall not be deflected either vertically or horizontally in excess of that recommended by the manufacturer.

Before stopping work each day all open pipe ends shall be closed with a proper size plug. Protect pipe from floating.

4.1.4.3 Joining

4.1.4.3.1 Mechanical Joints

Clean spigot and bell of foreign material and apply a prepared lubricant solution before slipping gasket and gland over spigot end of pipe. Small side of gasket and lip of gland must face the socket. Paint gasket with lubricant solution and place spigot end of pipe securely home in socket. Push gasket evenly into position in socket, slide gland into position and tighten bolts with fingers.

Tighten bolts with a torque wrench to recommended tightness by tightening bottom bolt and then top bolt. Thereafter, all bolts shall be tightened in sequence of 180° apart until all bolts are within the range of torque recommended by the manufacturer. If effective sealing is not accomplished, disassemble and reassemble after thorough cleaning.

4.1.4.3.2 Slip Joints

Jointing shall be made with rubber gaskets and lubricant furnished by the manufacturer in strict accordance with the manufacturer's recommendations. Prepare field cut pipe by filing 1/8 inch 30° bevel on pipe end to avoid injuring gasket.

4.1.4.3.3 Threaded Pipe

Wire brush threads clean and apply an approved joint compound. Tighten until joint is snug and watertight.

4.1.4.3.4 Polyvinyl Chloride Pipe

Do not thread PVC pipe; when connections to existing threads are necessary, adaptors will be used. Use strap wrenches to couple threaded PVC pipe fittings and use lubricant recommended by pipe manufacturer.

Avoid excessive torque and do not score pipe. Use couplings furnished with pipe for fittings and install in strict accordance with the manufacturer's recommendations.

4.1.4.3.5 Polyethylene Pipe

Use brass or copper flare fittings.

4.1.4.3.6 Nestable Corrugated Steel Casing Pipe

Construct trench approximately 12 inches wider than the diameter of the pipe to be installed. Round bottom of trench to conform to the shape of the pipe. Remove large stones and other obstructions. Do not excavate more material than necessary. If excavation is made in unstable soil, place

a 12-inch layer of gravel in trench bottom. Assemble pipe casing in strict accordance with manufacturer's recommendations.

4.1.4.4 Connections to Existing Mains

Connections to existing mains shall be made at the locations shown on the plans or as directed by the Water and Sewer Department. No connections shall be made without first submitting the name and references of the Contractor performing the work for approval by the Water and Sewer Department. After Contractor approval, connections may be made forty-eight (48) hours after notice is given to the Water and Sewer Department.

When existing gate valves on the distribution system must be shut off in order to make connections, this work will be done by the Developer with approval of the Water and Sewer Department. Shut-offs will be made at such time as will be convenient to the greatest number of customers affected.

When an existing main has been cut or a plug removed for a connection, the work of making a connection shall proceed without interruption until complete.

Connections to existing mains shall be governed by all applicable provisions of these specifications. The Developer shall locate, excavate and cut the existing main, remove the section of old pipe, rework the trench, connect the new pipe with the old and set necessary specials and valves as shown on the approved plans. All necessary precautions shall be taken to brace valves and mains under pressure to prevent blow outs.

4.1.5 Backfilling

The trench shall be backfilled with loose native earth free of clods, large stones, debris, or other objectionable material.

In traffic areas, particularly roads and streets, parking lots and walkways, the full depth of backfill shall receive thorough tamping in 6 inch layers to a minimum of 95% standard proctor density. The Water and Sewer Department may request that soil compaction test be performed by an outside testing consultant. The developer will be responsible for payment to the testing consultant. Particular attention is directed to driveways and walkways, and areas subject to mail delivery where prompt backfilling is required to prevent inconvenience to the public.

In all areas of construction, the excavated material shall be cleared from the premises and the completed work left in a neat and acceptable condition. Included are such items as broken pavement and other matter not classified as earth.

Trenches and other excavated areas completed by the Contractor shall be kept in a good and safe condition during a one year maintenance period following acceptance by the Water and Sewer Department and regulatory agencies.

4.1.5.1 Time

Trenches shall be backfilled as soon as practical after laying and jointing the pipe. Provisions for traffic as specified under "Excavated Material" must be adhered to.

4.1.5.2 In Non-Traffic Areas

Carefully refill with suitable material in layers not exceeding 6 inches in thickness and thoroughly tamp with mechanical tamps to one foot above the top of the pipe. The remainder of the trench may be backfilled without tamping with the exception of areas around valves and fire hydrants which require tamping as specified under the installation of those items. The backfill shall be rounded over the trench to provide allowance for future backfill settlement.

4.1.6 Highway and Railroad Crossings

Install in strict accordance with railroad or State Highway requirements and all applicable provisions of the plans and specifications. See Detail 3-2.

Perform no work until satisfactory arrangements have been made with the State Highway Department or railroad.

Install casing pipe by jacking, boring or tunnelling in strict accordance with the requirements of the Georgia Department of Transportation and FHWA or railroad; diameter of the hole shall not exceed the outside diameter of the pipe.

Cement grout shall be pumped around pipe where voids were developed during the installation operation.

Casing pipe shall be steel as previously specified and joints shall be welded. Carrier pipe shall be ductile iron with mechanical joints as previously specified. Welds shall be filled arc weld type performed only by qualified welders, meeting American Welding Society, and American Institute of Steel Construction Standards. Welds shall be continuous, watertight, and develop a greater strength than the pipe.

Install on required grade. Inside and outside of welds shall have all rust, mill scale, flux flumes, oxides, grease and oil removed by chipping and wire brushing immediately before applying touch-up coating.

All weld areas and areas where coating has been scratched shall be recoated with coal tar material of same type and thickness as original coating. Outside shall be coated immediately after welding.

Carrier pipe will be pushed into casing on wooden skids to avoid damaging coating in casing.

Seal ends of casing in accordance with Georgia Department of Transportation or railroad requirements.

4.1.7 Uncased Bores for Driveways

Uncased bores for lines under paved driveways shall be in strict accordance with State Highway requirements and all applicable provisions of the plans and specifications.

Shore, brace and maintain all safety measures to avoid danger or damage.

4.1.8 Asphalt Concrete Paving Replacement (Where Open Cut is Allowed)

Materials and construction methods shall conform to the Georgia State Department of Transportation Standard Specifications, latest edition, and Detail 3-1 of these standards.

4.1.8.1 Removal

Existing pavement shall be sawed.

4.1.8.2 Excavation and Backfill

Excavation and backfill shall be in accordance with this Section.

4.1.8.3 Base

Base shall be 8 inches of "High Early Strength" concrete in accordance with Section 430 of the Georgia Standard Specifications for Construction of Roads and Bridges.

4.1.8.4 Pavement

Pavement shall be hot mix asphaltic concrete either Type "E" or "F", and shall be in accordance with Section 400 of the Georgia Standard Specifications for Construction of Roads and Bridges.

4.1.9 Valves and Fittings

Shall be placed every 500 L.F. or as shown on the approved plans or directed by the Water and Sewer Department. See Detail H₂O-0002. Valves shall be set plumb and on firm bearing. Valves 12 inches and larger installed on ductile iron pipe shall be complete with mechanical joint retainer glands. All valves and fittings shall be secured with a method of restraint approved by the Department. Valve boxes shall be set plumb and the top of the box brought to the surface of the ground or pavement.

4.1.9.1 Setting Valve Markers

Set vertically in ground with 36 inch projecting. Locate as directed by Water and Sewer Department.

4.1.9.2 Shut-Off Valves

Shut-off valves shall be placed 100' from edge of a stream or creek crossing on both sides or as directed by the Water & Sewer Department.

4.1.10 Plugging Dead Ends

All dead ends of pipes, tees, or crosses shall be plugged or capped. Installation of plugs or caps shall be as specified for similar pipe and fittings. A fire hydrant assembly shall be installed on the end of the pipe as directed by the Water and Sewer Department.

4.1.11 Concrete Blocking

All bends, tees, ends of mains, and crosses shall be blocked as indicated on the plans or as directed by the Water and Sewer Department. Blocking shall be 3,000 p.s.i. concrete placed between undisturbed soil and the fitting to be anchored. Blocking shall be so placed that the pipe and fitting joints are accessible.

4.1.12 Fire Hydrants

Shall be located and installed as shown on the plans or as directed by the Water and Sewer Department, but not greater than 500 feet apart for residential and 500 feet apart for commercial and industrial, and set plumb from 30 to 36 inches of hydrant exposed above the ground. Developer will furnish adjustable anchor couplings as required to maintain these dimensions. Hydrant extension kit will only be

allowed if approved by City of Hampton Water & Sewer Department prior to installation.

Foreign matter shall be removed from the interior of hydrants, stuffing boxes tightened and the valve operated to assure they are in working order before installation.

Eight (8) cubic feet of gravel shall be placed around base of hydrants to insure drainage. Tie rods or hydrant tees and anchor couplings shall be installed, and backfill shall be thoroughly tamped around hydrants. See Detail H2O-0001.

4.1.13 Services

4.1.13.1 Service Connections

Corporation stops and curb stops shall be used on all service connections. Connections to main lines shall require a double strap saddle. Use approved tapping machine to make all taps. See Detail TUP-0003.

4.1.13.2 Service Lines

Service line conduit and/or piping shall be installed at a minimum depth of 4 feet. Long side services installed in new subdivisions shall be installed by casing service lines in 2" conduit. Conduit may be installed under proposed streets either by open cut prior to curb and gutter installation, by mechanical boring from beyond back-of-curb to back-of-curb following curb installation, or by other acceptable means preapproved by Water and Sewer Department Engineer or designate. Service lines shall not be connected to fire hydrant leads.

4.1.13.3 Setting Meters and Meter Boxes

Meter boxes shall be located as directed by the Water and Sewer Department, (See Section 1.2.14.1) installed plumb and backfill thoroughly tamped. Meter and Stop will be installed in box as detailed on typical Detail No. TUP-0003. Developer shall replace any meter boxes damaged during construction.

4.1.13.4 Cross Connections

Cross connection to any other water supply, either by the Developer or an Individual, is not permitted.

4.1.14 Cleanup and Property Restoration

Upon completion of backfilling, all surplus earth, rock, damaged or broken pipe or other materials shall be moved and disposed of immediately by the Contractor. All streets, driveways, monuments, mailboxes or other private property damaged by the Contractor or Sub-Contractors shall be cleaned up and restored to their original condition as soon as possible.

4.1.15 Protection of the Work

The Developer will be responsible for the care of all work until final completion and acceptance, and will be required to make good at his own expense any damage or injury it may sustain for any cause.

4.2 Hydrostatic Testing

4.2.1 Expelled Air

Before applying the specified test pressure, all air shall be expelled from the pipe. If hydrants, blow-offs or air release valves are not available at the high elevations, the Contractor shall make the necessary taps at points of highest elevation before the test is made and insert plugs after the tests have been completed. Any cracked or defective pipe, fittings, valves, or hydrants discovered in consequence of this pressure test shall be removed and replaced with sound material and the test shall be repeated until satisfactory to the Water and Sewer Department.

4.2.2 Testing Required

After all piping has been placed, each section shall be tested by the Developer in the presence of the City Inspector and tests shall be continued until all leaks have been made tight to the satisfaction of the City Inspector. The Developer shall furnish all water pumps, gauges, bulkheads, and other materials necessary to conduct the test as herein required. Every precaution must be taken to valve off or otherwise protect control equipment in or attached to the pipe line to prevent damage or injury thereto. All piping shall be hydrostatically tested at a pressure of at least one and one-half times the rated pressure of the pipe for fifteen (15) minutes, then at the rated pressure of the pipe for two (2) hours.

4.2.3 Allowable Leakage Test

Following the initial fifteen (15) minute pressure test, the pressure loss shall be recorded and the pressure dropped to the rated pressure of the pipe for the additional two (2) hours. At the end of the two (2) hour period a leakage test shall be conducted as follows. The pipe being tested

shall be refilled, monitoring the amount of water required, until the original pressure rating is obtained. The maximum leakage allowed will be ten (10) gallons per inch diameter per mile per day.

4.2.4 Water for Testing

Prior to receiving water for hydrostatic testing, the Contractor shall notify the Water and Sewer Department that he desires water for testing and disinfection. A temporary fill line shall be extended from an existing active water main to the water main being filled. This line shall be equipped with a meter and a backflow prevention device as specified herein. The Water and Sewer Department shall provide an inspector to operate all active water valves and witness tests and disinfection procedures. The Developer or his Contractor shall not operate active water valves under any circumstances.

Water used in testing shall be paid for by the developer at the standard rate as established by the Water and Sewer Department. The amount shall be calculated by determining the capacities of the lines installed and being tested or as read from the meter on the temporary fill line.

4.3 Disinfection Of Water Lines

4.3.1 General

After piping has been satisfactorily installed, pressure tested and flushed, the Developer shall disinfect all potable water lines and equipment installed by him. Precaution should be taken in laying pipes, valves, and hydrants to keep them as clean as possible to minimize contamination. Water mains shall be disinfected by filling them with water and introducing a chlorine solution during the filling process to achieve 25 mg/l free chlorine throughout the main. Care should be taken in filling the mains so that the entrained air is drawn from the pipe at all high points so as to permit intimate contact of the disinfection agent with the entire inside surface of the pipe and appurtenances. The disinfection solution shall be allowed to remain in the lines for not less than twenty-four (24) hours. At the end of the 24 hour period, all portions of the main shall show a residual chlorine content of not less than 10 mg/l. The heavily chlorinated water shall be neutralized with an approved chemical or method prior to discharging from the water mains.

Disinfection of water lines and the disposal of heavily chlorinated water (following disinfection) must be accomplished in accordance with the latest edition of AWWA Standard C651.

4.3.2 Notification of Testing

The Water and Sewer Department shall be notified twenty-four (24) hours before filling lines for disinfection.

4.3.3 Amount of Disinfecting Agent Used

An acceptable method is by preparing a 1% solution with sodium hypochlorite or calcium hypochlorite. The required amount of chlorine to produce a 25 mg/l concentration in 100 feet of pipe is as follows:

<u>Pipe Diameter</u>	<u>100% Chlorine (lb.)</u>	<u>1% Chlorine Solutions (gal.)</u>
4	.013	0.16
6	.030	0.36
8	.054	0.65
10	.085	1.02
12	.120	1.44
16	.217	2.60

4.3.4 Residual Testing

After wasting the heavily chlorinated water and final flushing, water samples shall be taken from the water main and shall be tested for bacteriological quality at a state approved lab. Copies of written lab results must be submitted to the Water and Sewer Department prior to installation of any water meters.

4.4 Inspections and Acceptance

4.4.1 General

Before water can be used in a new system, the system must first receive final approval and acceptance from the City of Hampton Water and Sewer Department.

4.4.2 Inspection for Approval

Authorized representatives of the Water and Sewer Department shall have access to the work for inspection at any reasonable time. The final inspection of all improvements shall be held before conditional acceptance of the work and before the start of the one (1) year maintenance period. When all construction in accordance with these standards has been completed, the Developer shall request by letter a final inspection and acceptance from the Water and Sewer Department.

All permits and drawings will be examined at this time to insure that the work has been completed in accordance with the approved plans and these standards.

4.4.3 Stop Work Order

Any work not meeting the requirements of these standards or the approved plans shall be corrected by the Developer. At any time, throughout construction, should the work not be corrected after notification by the City, a stop work order shall be issued by the City.

4.4.4 Acceptance

After all improvements are complete, the Developer shall provide the City with a one (1) year maintenance agreement to provide for the cost of maintenance of the public improvements (water system or parts thereof). The Developer shall also issue the Water and Sewer Department a letter of conveyance, granting ownership of the completed water system to City of Hampton.

If failures occur, in the opinion of the City Engineer, to any public improvements (water systems), within a one year period from the date of the letter of acceptance, the Developer shall be notified in writing of the defects and shall be given a reasonable time to correct the problem; otherwise, it shall be deemed a breach of the Maintenance Agreement and the City shall have the right to make the necessary repairs, either by public contract, or using City equipment, and the Developer shall be liable for the full amount of the cost of the repairs.

5. SEWER SYSTEM CONSTRUCTION REQUIREMENTS

5.1 Trenching and Excavation

5.1.1 General

The following shall establish the general construction requirements for the installation of sewerage systems, installed, operated, and maintained in the service areas of the City of Hampton. It shall be understood that these standards reflect the minimum requirements necessary for final acceptance of the utility by the Water and Sewer Department.

1. It shall be the responsibility of the Developer to notify all utility companies prior to any excavation.
2. The Developer shall notify the City of Hampton Water and Sewer Department forty-eight (48) hours prior to beginning construction. This department may request a pre-construction conference with the Developer and his Contractor before beginning construction.
3. All construction shall be subject to inspection by authorized representatives of the Water and Sewer Department at any time, and at their request no dirt cover shall be placed on any portion of completed sewer system until it has been inspected and approved by the Water and Sewer Department Inspector.
4. It shall be the responsibility of the Developer to coordinate all construction and insure that these standards are adhered to. Any work not meeting these standards shall be corrected immediately by the Developer, after notification by the City Water and Sewer Department Representative. Should the work not be corrected after verbal notification, a written stop work order shall be issued by the Water and Sewer Department until the deficiencies have been corrected.

5.1.2 Trench Construction

5.1.2.1 Trench Description

Trench may be open cut from the ground surface where designated on the plans or approved by the Water and Sewer Department. Boring may be required to protect certain surface improvements and to satisfy requirements of the Georgia Department of Transportation and/or the railroad companies. Minimum width shall be the nominal diameter of the pipe plus twelve inches and minimum cover on pipe shall be 48 inches. Bottom of the trenches shall be hand dressed so that the pipe has even bearing

on solid undisturbed earth throughout its entire length between bell holes. Bell holes of sufficient size for making perfect joints shall be provided.

5.1.2.2 Alignment and Grades

Alignment and grade control stakes shall be provided by the Contractor in accordance with the approved plans. Bench Marks and other principal control points shall be furnished by the Developer.

True alignment shall be required. Gradient control shall be by laser beam. Alignment shall be as indicated on the approved plans. When an obstruction is encountered, make necessary changes in alignment or grade as approved by the Water and Sewer Department. See detail TUP-0001.

5.1.2.3 Excavation

Excavation shall consist of removing earthwork for the satisfactory placement of sewers and appurtenances. This includes vegetation, brush and debris, soil, rock, pavements, etc., for the intent and purpose of constructing the work to required lines and grades, including sheathing, bracing and dewatering of excavations, trench bed stabilization, and such other incidentals necessary to comply with plans and specifications.

All excavated material shall be placed on one side of the trench in a manner to prevent blockage of surface drainage patterns and traffic. It shall be so placed as to not endanger the work, allowing at all times free access to the trench, and all existing utilities publicly or privately owned, particularly fire hydrants.

Where necessary, wood fencing or retainers shall be erected to retain the excavated material within narrow limits to prevent the obstruction of traffic and/or encroachment upon pavements or other areas restricted by property owners. Included shall be protection of hedges, walls, flower/rock gardens, shade trees, fruit trees, and vegetable gardens. Satisfactory provisions shall be made for travel on sidewalks, crosswalks, streets, railroads, bridges, private ways, railings, barriers, etc. All drains, gutters, culverts, and sewers for surface drainage shall be kept open, or if it is evident they must be temporarily closed then all requirements of the Owner must be met prior to such closing.

Excavated material shall not, in any case, be placed upon the pavement surfaces of public roads or streets, owned by the city, county or state, unless prior approval is given by the proper

authority having jurisdiction. In periods between dusk and daylight, and during inclement weather when visibility is limited, caution lights and barricades shall be placed at each end and along the excavated material. Each building, wall, fence, pile, bridge, railroad, sidewalk, driveway, tree, lawn, garden, or any other improvement encountered is to be properly protected from injury. In event of damage during the work, prompt repairs satisfactory to the Water and Sewer Department and the property owner shall be made by the Contractor.

Plans direct sections where jack and bore methods are required under certain pavements and/or railroads.

5.1.2.4 Trenching

Except as specified for jack/bore procedures under pavements and railroads, all excavation shall be made by open cut, unless otherwise authorized by the Water and Sewer Department. All work within right-of-way of railroads and state highways, shall be subject to an approval permit for construction (processed through the Owner), and all rules and regulations of those authorities shall be required. It shall be the responsibility of the developer to prepare the applications for the required permits.

Trenches shall be excavated to the grade shown of the plan and profile drawing. Where excessive excavation results, the Contractor shall construct special foundations or use special backfill methods. Overdepth excavation will be required to remove material unsuitable to support the pipe.

5.1.2.5 Sheathing and Bracing

When trench sides must be kept as nearly vertical as possible, it may be necessary to sheath, brace, or support trench sides.

When trench depth excavation exceeds five (5) feet, sheathing and bracing shall be required to protect the pipe crew from injury, irrespective of the visible judgement of soil conditions by the Contractor. In event the sheathing cannot be removed without injury to the sewer of adjoining structures, it shall be left in place or cut, and the upper part then removed. All trenching, sheathing, bracing, side sloping, etc., shall conform to the regulations of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA). Side sloping in accordance with OSHA regulations is acceptable where conditions permit. It shall be the responsibility of the Contractor to insure that all safety measures are met.

5.1.2.6 Stabilization and Bedding

In soft ground, quicksand, or in areas where soil conditions are such that pipe alignment, or grade is endangered, the trench shall be excavated below grade and then brought back to grade with stone stabilizer material. Stone stabilizer material shall be A.S.T.M. #57 crushed stone. Depth of stone shall be 6 inch min. or as directed by the Water and Sewer Department.

5.1.2.7 Bedding Classifications for Ductile Iron Pipe

Pipe shall be bedded in either Class B or Class C as specified by the Developer's design engineer. See Detail SS-0003.

Class B - The pipe shall be bedded with No. 57 stone bedding material placed on the trench bottom. The bedding shall have a minimum thickness beneath the pipe of 4 inches or one-eighth of the outside diameter of the pipe, whichever is greater, and shall extend up the side to the springline. Backfill from pipe horizontal centerline to a level not less than 12 inches above the top of the pipe shall be of the bedding material or carefully placed native soil, compacted. Initial backfill shall be finely divided material free of debris, organic material and stones.

Class C - The pipe shall be bedded in No. 57 stone bedding material placed on the trench bottom. Native soils may be used when approved by the Water and Sewer Department. The bedding shall have a minimum thickness beneath the pipe of 4 inches or one-eighth of the outside diameter of the pipe, whichever is greater, and shall extend up the sides of the pipe one-sixth of the outside diameter of the pipe. Initial backfill between the bedding and a plane 12 inches over the top of the pipe, shall be finely divided earth free from debris and stones, and shall be compacted.

Class D - is not allowed.

5.1.2.8 Bedding Requirements for Polyvinyl Chloride Pipe

PVC sewer shall be installed in a granular embedment material as specified herein and as shown on Detail 5-1. The embedment material shall be No. 57 stone. The bedding shall be placed to the top of the pipe in three (3) successive applications. First, a three (3) inch minimum foundation shall be placed to proper grade prior to pipe installation. Following pipe installation, the embedment material shall be carefully placed as haunching to no more than one third of the pipe diameter. The haunching shall be sliced underneath the pipe barrel with a shovel to ensure firm base and side support. Thirdly, the

embedment material shall be carefully placed to the top of the pipe.

Initial backfill consisting of suitable native soil shall be carefully placed and compacted to a minimum of 12 inches above the pipe. Initial backfill material shall consist of fine, loose earth containing adequate moisture for thorough compaction. The material shall be free of large stones, clods, vegetable matter, debris, and other objectionable material.

The remainder of the trench backfill shall be in accordance with the section "Backfilling."

5.1.2.9 Concrete Encasement

Concrete encasement, when required, shall completely surround the pipe and shall have a minimum thickness at any point of one-fourth of the inside diameter of the pipe or 4 inches, whichever is greater.

5.1.2.10 Rock Excavation

Remove rock to 6 inches below grade of trench and build back trench bottom with suitable material tamped into place.

When necessary, blasting operations shall be conducted in strict accordance with all existing ordinances and regulations. Blasting shall be conducted by persons licensed to use explosives.

Where blasting is to be conducted along the right-of-way of a state claimed roadway, the Developer shall provide the Water and Sewer Department all necessary information to submit blasting permit applications to the Georgia Department of Transportation for approval. Blasting may be conducted only after this permit is received.

5.1.2.11 Limit of Open Trench

The length of the trench to be opened or the area of surface to be disturbed and restored at any one time shall be limited to that which the Contractor can complete in one day's work, or less in event of apparent inclement weather, or not to exceed 100 feet.

It shall be the Contractor's responsibility to provide adequate barricades, warning signs, flagmen, flashing lights, etc., as necessary to safeguard the public. All trenches must be backfilled by the close of each work day.

5.1.2.12 Disposition of Water

Keep trenches free of water. The Contractor shall furnish all equipment and labor necessary to remove any water found or accumulated in the trench. Other excavation shall be kept clear of water while pipe is being laid or concrete or masonry is being placed. No pipe shall be laid in water and water must not be permitted to flow over or rise upon any masonry or pipe until the work has been accepted to prevent flow-in of silty water and thus prevent buildup of foreign matter in the pipe.

All water pumped or bailed from the trench or other excavation must be conveyed in an acceptable manner to a suitable point of discharge, i.e. a stream or ditch, where it shall not cause injury to public health, or public or private property, or to work under construction or previously completed or to the street surfaces, or to cause interference with the use of streets by the public.

5.1.2.13 Excavation Near Roads and Railroads

Special care must be exercised in trenching near roads and railroads to protect against collapsing of the roadbed structure. Each situation must be evaluated on account of varying soils. Where excavations encroaching at or near roads and/or railroads will be limited because of scheduled jack/bore methods required for installations under roads and/or railroads, the trench excavated shall be halted at least ten (10) feet from the pavement edge of a road, or more if soil conditions so indicate, and no nearer than twenty-five (25) feet from the centerline of the railroad track nearest the excavation as measured at 90 degrees (right angles) to the railroad.

5.1.2.14 Subsurface Obstructions

In excavating, backfilling and laying pipe care must be taken not to remove, disturb or injure any water, sewer, gas, electric, telephone, or other conduits or utilities without prior approval of the owner of the utility encountered, including private utilities.

If necessary in order to perform the intended work, the Contractor shall sling, shore up, and maintain such utilities in operation, and promptly repair any damage done to them. Before final acceptance of the work, all such utilities shall be made "equal to or better" than prior to construction.

It shall be the Contractor's responsibility to locate underground utilities. In event of damage to the utilities, the Contractor will promptly notify the utility owner (private or public) and must assume full responsibility therefor.

In event pipe or conduits providing service to adjoining buildings are broken, or damaged to some questionable degree of service, the Contractor shall immediately make repairs at his own expense, or be otherwise liable for repair costs incurred by others. The utility owner reserves the right to make repairs, caused by the Contractor, without prior notice. Removal or relocation of a utility encountered may be done upon prior approval by the utility owner given directly to the Contractor.

5.1.2.15 Embankments

Whenever the sewer is to be installed in a fill area or in cut with less than four (4) feet of cover (top of pipe to ground surface), the Water and Sewer Department will require the installation of ductile iron pipe.

5.1.3 Inspection Before Laying of Pipe

Before any pipe is laid in the trench, the pipe shall be subject to inspection. Only first quality pipe with smooth surfaces (interior and exterior), free from cracks, flaws, blisters, etc., shall be used.

5.1.4 Pipe Installation

Pipe installation shall be performed with bell ends upgrade without any break in alignment or grade between manholes. A thorough cleaning of all dirt, and foreign matter shall be made of bells and sockets before jointing. Pipe materials shall meet specifications contained elsewhere herein.

5.1.4.1 Handling

Pipe shall be carefully unloaded with a pipe unloader or crane.

5.1.4.2 Laying

Pipe shall be swept clean of trash or dirt before lowering into the trench. After the pipe has been cleaned it shall be lowered into the trench in such a manner that the pipe shall not be damaged. Each joint shall then be lined and brought to a uniform grade upon a solid trench bottom. Bell holes for couplings or bell shall be prepared with a minimum clearance of two inches. Pipe shall be laid in straight lines on uniform grades.

Before stopping work each day all open pipe ends shall be closed with a proper size plug. Protect pipe from floating.

5.1.4.3 Joining

5.1.4.3.1 Mechanical Joints

Clean spigot and bell of foreign material and apply a prepared lubricant solution before slipping gasket and gland over spigot end of pipe. Small side of gasket and lip of gland must face the socket. Paint gasket with lubricant solution and place spigot end of pipe securely home in socket. Push gasket evenly into position in socket, slide gland into position and tighten bolts with fingers.

Tighten bolts with a torque wrench to recommended tightness by tightening bottom bolt and then top bolt. Thereafter, all bolts shall be tightened in sequence of 180° apart until all bolts are within the range of torque recommended by the manufacturer. If effective sealing is not accomplished, disassemble and reassemble after thorough cleaning.

5.1.4.3.2 Slip Joints

Jointing shall be made with rubber gaskets and lubricant furnished by the manufacturer in strict accordance with the manufacturer's recommendations. Prepare field cut pipe by filing 1/8 inch 30° bevel on pipe end to avoid injuring gasket.

5.1.4.4 Nestable Corrugated Steel Casing Pipe

Construct trench approximately 12 inches wider than the diameter of the pipe to be installed. Round bottom of trench to conform to the shape of the pipe. Remove large stones and other obstructions. Do not excavate more material than necessary. If excavation is made in unstable soil, place a 12-inch layer of gravel in trench bottom. Assemble pipe casing in strict accordance with manufacturer's recommendations.

5.1.4.5 Connections to Existing Manholes

Connections to existing manholes shall be made at the locations shown on the plans as directed by the Water and Sewer Department. All connections shall be made in a neat and workmanlike manner to avoid damage to the existing structure. Core and boot suitable modification to the manhole bench shall be made to the satisfaction of the Water and Sewer Department.

5.1.5 Backfilling

Backfill material above the pipe embedment shall consist of native earth, free from large stones, clods, debris or other objectionable material.

In traffic areas, particularly roads and streets, parking lots and walkways, the full backfill shall receive thorough tamping in 6 inch layers to a minimum of 95% standard proctor density. The Water and Sewer Department may request that soil compaction test be performed by an outside testing consultant. The developer will be responsible for payment to the testing consultant. Particular attention is directed to driveways and walkways, and areas subject to mail delivery where prompt backfilling is required to prevent inconvenience to the public.

In all areas of construction, the excavated material shall be cleared from the premises and the completed work left in a neat and acceptable condition. Included are such items as broken pavement and other matter not classified as earth.

Trenches and other excavated areas completed by the Contractor shall be kept in a good and safe condition during a one year maintenance period following acceptance by the Water and Sewer Department and regulatory agencies.

5.1.5.1 Time

Trenches shall be backfilled as soon as practical after laying and jointing the pipe. Provisions for traffic as specified under "Trench Excavation" must be adhered to.

5.1.5.2 In Non-Traffic Areas

Initial backfill shall be placed carefully with suitable material in layers not exceeding 6 inches in thickness and thoroughly compacted with mechanical tamps to one foot above the top of the pipe. The remainder of the trench may be backfilled without compaction. The backfill shall be rounded over the trench to provide allowance for future backfill settlement.

5.1.6 Highway and Railroad Crossings

Install in strict accordance with railroad or State Highway requirements and all applicable provisions of the plans and specifications.

Perform no work until satisfactory arrangements have been made with the State Highway Department or railroad.

Install casing pipe by jacking, boring or tunnelling in strict accordance with the requirements of the Georgia Department of Transportation and FHWA or railroad; diameter of the hole shall not exceed the outside diameter of the pipe.

Cement grout shall be pumped around pipe where voids were developed during the installation operation.

Casing pipe shall be steel as previously specified and joints shall be welded. Carrier pipe shall be ductile iron with mechanical joints as previously specified. Welds shall be filled arc weld type performed only by qualified welders, meeting American Welding Society, and American Institute of Steel Construction Standards. Welds shall be continuous, watertight, and develop a greater strength than the pipe.

Install on required grade. Inside and outside of welds shall have all rust, mill scale, flux flumes, oxides, grease and oil removed by chipping and wire brushing immediately before applying touch-up coating.

All weld areas and areas where coating has been scratched shall be recoated with coal tar material of same type and thickness as original coating. Outside shall be coated immediately after welding.

Carrier pipe will be pushed into casing on wooden skids to avoid damaging coating in casing.

Seal ends of casing in accordance with Georgia Department of Transportation or railroad requirements.

5.1.7 Asphalt Concrete Paving Replacement (Where Open Cut is Allowed)

Materials and construction methods shall conform to the Georgia State Department of Transportation Standard Specifications, latest edition, and Detail 3-1.

5.1.7.1 Removal

Existing pavement shall be sawed.

5.1.7.2 Excavation and Backfill

Excavation and backfill shall be in accordance with this Section.

5.1.7.3 Base

Base shall be 8 inches of "High Early Strength" concrete in accordance with Section 430 of the Georgia Standard Specifications for Construction of Roads and Bridges.

5.1.7.4 Pavement

Pavement shall be hot mix asphaltic concrete either Type "E" or "F", and shall be in accordance with Section 400 of the Georgia Standard Specifications for Construction of Roads and Bridges.

5.1.8 Manhole Installation

Manhole shall be installed at intervals not exceeding 350 L.F. or as shown on the approved plans. Excavation for manholes shall be sufficient to provide six (6) inches of clearance between the outer surface of the manhole and the soil, or timber sheathing if required. All manholes shall be provided with steps placed sixteen (16) inches center to center and properly aligned.

5.1.9 Service Lines

A sewer service line shall be provided for every existing or proposed lot or building. Services shall extend to the property line of the lot being served and normally be located within ten (10) feet of the lower corner of the lot. The depth of the lines shall be no less than two (2) feet.

5.1.10 Sewage Pump Stations

Sewage pump stations shall be installed at locations as indicated on the approved plans.

5.2 Gravity Sewer Testing

5.2.1 General

When requested by the City of Hampton Water and Sewer Department, the Contractor shall test the integrity of the installed sewer line by one or more of the following: low pressure air test; a measurement of infiltration; mandrel test, and velocity test. These tests shall be performed upon such lines selected by the Water and Sewer Department.

5.2.2 Low Pressure Air Tests

5.2.2.1 Safety

The Contractor shall have the responsibility to ensure that all air plugs are installed and braced to prevent blowouts. Pressurizing equipment shall include a regulator or relief valve to avoid overpressurizing and damaging an otherwise acceptable line. No one shall be allowed in the manholes during testing.

5.2.2.2 Preparation of the Test Line

Secure the plugs in all pipe outlets, including stoppers in laterals, to resist the test pressure. Clean out all debris in the pipe. At the option of the contractor, the interior pipe surface may be wet by flushing the line in order to produce more consistent test results.

5.2.2.3 Procedure

The Contractor shall slowly introduce low pressure air into the sealed line until the internal air pressure reaches four (4) psig. The air supply shall then be throttled to maintain the four (4) psig internal pressure for at least two (2) minutes to permit the temperature of the entering air to equalize with the temperature of the pipe wall. When temperatures have equalized and the pressure stabilized, the air hose from the air supply shall be shut off. The pressure shall then be decreased to no less than 3.5 psig. At a reading of 3.5 psig, or any convenient pressure reading between 3.5 and 4.0 psig, timing shall begin with a stop watch. If the time shown in the table below for the designated pipe size and length elapses before the air pressure drops one (1) psig, the section undergoing the test has passed and shall be presumed to be free of defective joints.

5.2.2.4 Calculation of Test Time

<u>Pipe Diameter</u>	<u>Specified Time For Lengths Shown</u>				
	<u>Minimum Time</u>	<u>100 Ft.</u>	<u>200 Ft.</u>	<u>300 Ft.</u>	<u>400 Ft.</u>
8"	3:47	3:47	3:47	3:48	5:04
10"	4:43	4:43	4:43	5:56	7:54
12"	5:40	5:40	5:42	8:33	11:22

5.2.2.5 Groundwater Conditions

Groundwater should be taken into consideration and calculated for. Add one (1) p.s.i. for every 2.3 ft. of groundwater above the pipe.

5.2.2.6 Retest of Test Section

Any section of line in which a loss of more than 1.0 p.s.i.g. is encountered during the period of test may be retested at the option of the contractor. Failure of a test section of a line shall require location and grouting or other repair or replacement of the source of excessive air loss. The Water and Sewer Department shall approve the method to be used prior to any repair or replacement.

5.2.3 Measurement of Infiltration

The contractor shall furnish an adequate number of plugs of the proper size and acceptable weirs to measure infiltration into the system.

Infiltration greater than 100 gallons per inch diameter of pipe per mile of sewer per day will not be accepted. Any visible or audible leak must be dug up and repaired unless it is found to be in a joint and the Water and Sewer Department has authorized it to be repaired by chemical grouting. Any increase in flow between two adjacent manholes must be corrected.

Measurements of flow shall be performed on any lines with a visible flow of water.

5.2.4 Mandrel Test

At the request of the Water and Sewer Department a Mandrel Test shall be performed on PVC sewer pipe to test for maximum allowable deflection. The mandrel shall be sized to test a 7.5% deflection. The mandrel diameter shall be 7.5% less than the average reference internal diameter. Minimum diameters of mandrels to be used are as follows: 8" = 7.33"; 10" = 9.16"; 12" = 10.90". The following procedure is recommended:

1. Completely flush the line making sure the pipe is clean of any mud or trash that would hinder the passage of the mandrel.
2. During the final flushing of the line, attach a floating block or ball to the end of the mandrel pull rope and float the rope through the line. (A nylon ski rope is recommended.)
3. After the rope is threaded through line, connect the pull rope to the mandrel and place the mandrel in the entrance of the pipe.
4. Connect a second rope to the back of the mandrel. This will enable the mandrel to be retrieved if excessive deflection is encountered.
5. Remove all the slack in the pull rope by gently pulling the rope at the far manhole. After the slack has been removed, place a tape marker on the rope close to the pipe opening where the mandrel will exit. If mandrel encounters excessive deflection, the marker will provide a means of measuring the travel distance of the mandrel so that the deflected area can be located.
6. Draw mandrel through the sewer line.
7. An increasing resistance to pull is an indication of excessive deflection. If this occurs, measure the distance from beginning marker on rope to manhole. Locate section and replace bedding or pipe if visual examination reveals damage.
8. Retest.

5.2.5 Velocity Test

On lines installed at minimum grade or at any time the City of Hampton Water and Sewer Department suspects that a problem with flow will occur a velocity test of the suspect section may be requested.

The contractor shall add sufficient water at a point upstream of the suspect section. After flow has reached a steady rate, dye or some type of floating object such as a ping pong ball, or fishing float will be passed through the line. The float will be timed as it passes through the section. Any line in which a velocity of two (2) feet per second cannot be obtained, will not be accepted.

5.2.6. Televising of Lines

All gravity lines shall be televised after construction of the line. Any gravity line installed within a roadway shall be televised after installation of road subbase prior to paving. A copy of the televised line shall be provided on VHS Format including a written transcription record.

5.3 Force Mains

5.3.1 Hydrostatic Test

Force mains shall be hydrostatically tested after the pipe has been laid and backfilled between joints. Each section of pipe shall be subjected by hydrostatic gauge pressure at the rated pressure of the pipe for two (2) hours. Each section of pipe shall be slowly filled with water and brought to the specified test pressure, based on the elevation of the lowest point of the line or lowest point of the section under test, and corrected to the elevation of the test gauge. The pressure shall be applied by means of a gasoline driven test pump connected to the pipe in a manner satisfactory to the Water and Sewer Department. The contractor shall make arrangements for metering the amount of water used during the test. The contractor shall backfill all pipe and provide all thrust blocking before hydrostatic testing. It shall be the contractor's responsibility to locate and repair any and all leaks that are found. The Water and Sewer Department may direct the contractor to leave certain joints and connections uncovered until testing has been completed. All exposed pipe, fittings, valves, and joints will be carefully examined during the open trench test. Any cracked or defective pipe, fittings, or valves discovered in consequence of this pressure test shall be removed and replaced, and the test shall be repeated until satisfactory.

5.3.2 Leakage Test

In conjunction with the hydrostatic test, a leakage test shall be conducted at the rated pressure of the pipe. This leakage test will be conducted for two (2) hours and the maximum leakage allowed will be ten (10) gallons per inch diameter per mile per day.

5.4 Inspections And Acceptance

5.4.1 General

Before sewage is introduced into a new system, the system must first receive final approval and acceptance from the City of Hampton Water and Sewer Department.

5.4.2 Inspection for Approval

Authorized representatives of the Water and Sewer Department shall have access to the work for inspection at any reasonable time. The final inspection of all improvements shall be held before conditional acceptance of the work and before the start of the one (1) year maintenance period. When all construction in accordance with these standards has been completed, the Developer shall request by letter a final inspection and acceptance of the system from the Water and Sewer Department.

All permits and drawings will be examined at this time to insure that the work has been completed in accordance with the approved plans and these standards.

5.4.3 Stop Work Order

Any work not meeting the requirements of these standards or the approved plans shall be corrected by the Developer. At any time, throughout construction, should the work not be corrected after notification by the City, a stop work order shall be issued by the City.

5.4.4 Acceptance

After all improvements are complete, the Developer shall provide the City with a one (1) year maintenance agreement to provide for the cost of maintenance of the public improvements (sewer system or parts thereof). The Developer shall also issue the Water and Sewer Department a letter of conveyance, granting ownership of the completed sewer system to City of Hampton.

If failures occur, in the opinion of the City Engineer, to any public improvements (sewer systems), within a one year period from the date of the letter of acceptance, the Developer shall be notified in writing of the defects and shall be given a reasonable time to correct the problem; otherwise, it shall be

deemed a breach of the Maintenance Agreement and the City shall have the right to make the necessary repairs, either by public contract, or using City equipment, and the Developer shall be liable for the full amount of the cost of the repairs.

APPENDIX A

GUIDELINE FOR APPROVAL AND ACCEPTANCE

I. PRELIMINARY REVIEW

A. Developer

1. Meets with Water and Sewer Department to discuss system and obtain standards.
2. Submits two (2) copies of preliminary plans with checklist (Form H-101) for review.

B. Water and Sewer Department

1. Reviews plans to check for compliance with Development Standards.
2. Marks plan deficiencies along with checklist.
3. Meets with Developer to discuss changes necessary for approval.
4. Returns marked up plans to the Developer so that necessary changes may be made and plans resubmitted for final review.

II. PLAN SUBMITTAL

A. Developer

1. Pays review fees to the Water and Sewer Department.
2. Obtains state approval from the Georgia Department of Natural Resources, Environmental Protection Division if necessary.
3. Corrects plans as indicated on marked up plans.
4. Submits three (3) copies of revised plans to Water and Sewer Department for construction approval.
5. Provides completed D.O.T. permit application to the Water and Sewer Department for submittal.
6. Obtains necessary easements and permits for construction.

B. Water and Sewer Department

1. Reviews final plans to determine if all corrections have been made as marked on preliminary plans.
2. Approves plans for construction and returns one (1) set of plans to Developer.
3. If corrections were not made as marked on the originally reviewed plans, an additional \$25.00 fee may be assessed before the plans are resubmitted for a third review.

III. CONSTRUCTION PHASE

A. Developer

1. Secures the services of a competent Contractor to perform the construction on the project.
2. Submits name and references of the Contractor to Water and Sewer Department for approval. (Form H-102)
3. Upon Contractor approval, begins construction.
4. Notifies Water and Sewer Department forty-eight (48) hours prior to any construction.

B. Water and Sewer Department

1. Periodically inspects construction for concurrence with the Development Standards.
2. Witnesses all testing.

IV. POST CONSTRUCTION ACCEPTANCE

A. Developer

1. Submits one (1) set of reproducible mylar As-Built plans to the Water and Sewer Department and three (3) sets of prints.
 - a. Industrial and commercial developments: Submit one (1) set of reproducible mylar (24" x 36") civil site plan and details along with all applicable backflow prevention assembly inspection reports and test forms prior to activation of water service. Construction water may be provided on a temporary basis through a properly protected outlet.
2. Submits a letter to City of Hampton Water & Sewer Department requesting acceptance of water and/or sewer system along with 3 sets of as-built plans and provides Water and Sewer Department with a one (1) year Maintenance Agreement upon acceptance of System to be dated on first day of a water or sewer tap issuance. (Form H-103)
3. Deeds any necessary property and easements to City of Hampton. (Form H-104)

B. Water and Sewer Department

1. Water and Sewer Department performs final inspection.
2. No service shall be provided to developing lots until all utilities proposed for the development have been installed and final approval has been made.
3. If the final inspection reveals deficiencies that need correcting, a reinspection will be required. If the corrections noted are not addressed prior to the reinspection, a \$50.00 reinspection fee may be assessed prior to the other reinspections and acceptance.
4. Issues a letter of acceptance contingent upon Developer issuing Letter of Credit or guarantee for one (1) year maintenance agreement to begin on date of the first water or sewer tap issuance.

APPENDIX B

CITY OF HAMPTON

CHECKLIST SHOWING REVISIONS REQUIRED FOR APPROVAL BY W&S DEPARTMENT

SUBDIVISION OR DEVELOPMENT _____ PHASE _____

I. WATER LINES *** WATER MAIN LOCATION TO BE ON NORTH AND WEST SIDE WHEN POSSIBLE.

- | | |
|--|--------------------------------|
| _____ ORIGINAL STAMP & SIGNATURE OF STATE-APPROVED ENGINEER | _____ LOCATION MAP |
| _____ LIST OWNER/DEVELOPER-ADDRESS & PHONE NO. | _____ 24-HOUR CONTACT |
| _____ LEGEND, IF NEEDED | _____ SCALE |
| _____ SIZE OF LINES | _____ NORTH ARROW |
| _____ CONTOURS OR PERTINENT ELEVATIONS | _____ RIGHT OF WAY |
| _____ OVERALL LAYOUT OF SUBDIVISION OR DEVELOPMENT | _____ EASEMENTS |
| _____ LINE FOOTAGE/TYPE PIPE/NO. OF FIRE HYDRANTS | _____ GATE VALVE LOCATIONS |
| _____ STEEL CASING (List Size) | _____ STREAM BUFFER |
| _____ NO. OF LOTS OR DEVELOPMENT UNITS | _____ SEPARATE SHEET FOR WATER |
| _____ FIRE HYDRANT SPACING (500' Apart) | |
| _____ DETAIL SHEET (a) STREET CROSSING (b) CREEK CROSSING (c) FIRE HYDRANT (d) CONCRETE BLOCKING (e) FH CUL DE SAC DETAIL (f) SERVICE CONDUIT DETAIL | |
| _____ FIRE FLOW EVALUATION | _____ SERVICE CONDUITS |

II. SANITARY SEWER LINES

- | | |
|---|--|
| _____ ORIGINAL STAMPED BY STATE REGISTERED ENGINEER | _____ STREAM BUFFER |
| _____ LIST OWNER/DEVELOPER-ADDRESS & PHONE NO. | _____ SIZE OF LINES |
| _____ CLASS AND TYPE OF PIPE | _____ 24-HOUR CONTACT |
| _____ DISTANCE BETWEEN MANHOLES | _____ PLAN & PROFILE SHEETS |
| _____ SERVICE LINES | _____ GRADES (MINIMUM .50) |
| _____ LOCATION MAP | _____ OVERALL PLAN SHEET FOR SEWER |
| _____ LEGEND AND SCALE | _____ NO. OF LOTS OR DEVELOPMENT UNITS |

II. SANITARY SEWER LINES

____ LINE FOOTAGE/TYPE PIPE/NO. MANHOLES _____ NORTH ARROW

____ SEPARATE SHEET FOR SEWER LAYOUT/CONTOURS OR PERTINENT ELEVATIONS

____ DETAIL SHEET (a) BEDDING DETAIL CLASS (b) MANHOLE DETAIL-OUTSIDE DROP-INVERT (CONST. SOLID CONCRETE OR PRECAST W/RUBBER BOOTS AT OPENINGS) (c) STUB OUT DETAIL (d) SHALLOW MANHOLE DETAIL* (e) CREEK CROSSING* (f) JACK & BORE DETAIL* (g) CLEANOUT DETAIL*
NOTE: EROSION/SEDIM. CONTROL DETAILS APPROVED BY COUNTY REQUIRED.

*If applicable.

____ NO LANDFILL AREAS INVOLVED

____ EXISTING SEWERAGE CAPACITY

III. FOR ALL PROJECTS

IF LOCATED IN WATERSHED PROTECTION AREA, ARE ORDINANCE PROVISIONS COMPLIED WITH? _____
COUNTY APPROVALS OF EROSION AND SEDIMENTATION CONTROL PLANS AND DETAILS ARE REQUIRED.

...RETURN RED-LINES AND MARK-UP SHEETS WITH REVISED PLANS FOR FINAL APPROVAL...

...DEVELOPER'S ENGINEER MUST SUBMIT TO HCWSA DRAWING FOR DOT PERMIT IF REQUIRED...

IV. FINAL APPROVAL

____ FOUR (4) SETS OF FINAL APPROVED DRAWINGS W/DETAIL SHEETS

____ DOT PERMIT BY DEVELOPER'S ENGINEER

____ LETTER FROM COMMUNITY DEVELOPMENT OR COPY OF GRADING PERMIT

____ LAND LOT AND DISTRICT

ALL ITEMS MARKED MUST BE RECEIVED BY WEDNESDAY _____, AT 5:00 P.M. FOR PLACEMENT ON AGENDA FOR CONSIDERATION BY THE BOARD OF HCWA AT THE REGULAR MEETING ON TUESDAY, _____.

PLEASE NOTE: ONE SET (1) OF FINAL APPROVED DRAWINGS MUST BE KEPT ON THE JOB SITE AT ALL TIMES. FAILURE TO HAVE APPROVED PLANS ON THE JOB SITE WILL CAUSE WORK STOPPAGE. DEVELOPER OR HIS ENGINEER SHALL BE RESPONSIBLE FOR "AS BUILTS" ON FIELD CHANGES OF APPROVED DRAWINGS.

ENGINEER REVIEW CERTIFICATION: INITIAL REVIEW _____ FINAL REVIEW _____

GEORGIA PROFESSIONAL ENGINEER DATE

GEORGIA PROFESSIONAL ENGINEER DATE

(Title)

SIGNATURE OF REPRESENTATIVE

NAME OF CONTRACTOR

DATE: _____

YOU MUST ATTACH COPY OF INSURANCE CERTIFICATE

BONDING CAPACITY

MAXIMUM COVERAGE: _____

TYPES OF COVERAGE:

NAME OF INSURANCE COMPANY:

HENRY COUNTY BUSINESS LICENSE NUMBER:

STATE UTILITY CONTRACTOR LICENSE NUMBER:

LIST ON SEPARATE SHEET ALL MAJOR EQUIPMENT OWNED BY YOUR COMPANY

REFERENCES: (List the last three projects you have completed, including name and telephone number of developer and engineer)

NAME & TITLE OF KEY PERSONNEL AND YEARS OF EXPERIENCE IN WATER AND SEWER:

() CORPORATION () PARTNERSHIP () INDIVIDUAL DATE ORGANIZED: _____

ADDRESS: _____ PHONE: _____

NAME OF COMPANY:

TYPE OF WORK: () WATER LINE INSTALLATION () SEWER LINE INSTALLATION

REQUIREMENTS FOR PLACEMENT ON APPROVED CONTRACTORS LIST

**APPENDIX D
(Sample One (1) Year Letter of Credit)
(Maintenance Guarantee)**

BANK LETTERHEAD

Date

**Mr. Tom Eason, Superintendent
City of Hampton Water & Sewer Department
20 E. Main Street, South
Hampton, Georgia 30228**

Re: (Project Number and/or Name of Development)

Dear Mr. Eason:

We hereby establish an irrevocable letter of credit in favor of the City of Hampton Water & Sewer Department on behalf of (insert the name of the party dedicating water or sewer lines and appurtenances thereto to the Department) in the amount of ten (10%) percent of the cost of labor and material for water and sewer lines installed. This letter of credit will expire 365 days from the date hereof.

The purpose of this letter of credit is to guarantee payment of any labor or material incurred by the Department in repairing or maintaining the water or sewer lines and appurtenances thereto that have been constructed at the above stated location.

You may draw upon this letter of credit to the amount set forth above upon presentment at the bank of the following:

- 1. A bill for the labor and/or materials incurred by the Authority for the repair or maintenance of said facilities;**
- 2. Your draft or drafts at sight on this bank for the amount of the bill;**
- 3. A copy of this letter of credit.**

This letter of credit shall be non-assignable and non-transferable and the proceeds shall be non-assignable and non-transferrable.

This letter of credit shall be governed by the laws of the State of Georgia. We hereby agree with you that the drafts drawn under and in compliance with this letter of credit shall be duly honored upon due presentment to this bank.

Sincerely,

**City of Hampton
Form H-103**

APPENDIX E

DEED OF CONVEYANCE AND EASEMENT

STATE OF GEORGIA, HENRY COUNTY, CITY OF HAMPTON

CONSIDERATION OF THE SUM OF ONE DOLLAR AND OTHER CONSIDERATIONS to them paid, Grantors,

of the County of Henry to hereby give and convey unto City of Hampton, Georgia, political subdivision of the State of Georgia, its successors and assigns, a tract or parcel of land, which is described as follows:

All that tract or parcel of land lying and being in Land Lot(s) _____, _____ District, Henry County, Georgia, in a subdivision known as _____ and along the roads rights-of-way located in said subdivision.

A free, permanent and uninterrupted easement, use, liberty and privilege of a right-of-way for twenty (20) feet in width, in, on, under and through the property of the undersigned, for the purpose of laying, maintaining and operating a line of water or sewer pipe or pipes, including all appurtenant structures, as a part of the water or sewerage system of said Authority, and for the consideration aforesaid, the undersigned hereby agrees that said Authority, through its agents, may lay such additional lines of water or sewer pipe or pipes in, on, under and through said property, and the said pipe or pipes maybe of such size and may be laid at such depth as may be determined by the Authority or its agents, and the undersigned hereby expressly agrees that said Authority shall have a construction and maintenance easement o such minimum working width (not to exceed and additional twenty (20) feet) as is reasonably necessary for the prope installation and maintenance of such water or sewer line or lines; and the undersigned further agrees that said Authority, its successors and assigns, shall have the right- of-way granted, together with the right of ingress and egress to and from the same to the extent necessary to install, inspect, repair, keep up, replace, maintain and operate said line.

This Deed is also made for the purpose of conveying all of Grantor's right, title and interest in and to any water or sewer lines or appurtenances thereto located on the above-described property. The Grantor and Grantee agree that the fair market value of the property and water or sewer lines and appurtenances thereto being conveyed by this Deed is \$ _____.

TO HAVE AND TO HOLD said land and appurtenances unto said City of Hampton, Georgia, its successors, executors, administrators, and assigns, in fee simple.

Grantors warrant the title to said land against the lawful claims of all persons.

IN WITNESS WHEREOF, Grantor(s) have hereunto set its hand(s) and affixed its seal this _____ day of _____, 19_____.

Signed, sealed and delivered in the presence of: _____ (L.S.)

Unofficial Witness _____ (L.S.)

Notary Public _____ (L.S.)

My Commission Expires: _____ (L.S.)

City of Hampton Form H-104

APPENDIX F
CITY OF HAMPTON
WATER & SEWER PLAN REVIEW

FEE SCHEDULE

Minimum Plan Review Fee (0-10 Lots)	\$125.00
10 - 24 Lots	\$150.00
25 - 49 Lots	\$175.00
50 + Lots	\$175.00 plus \$2.00 per lot over 49
Plan Re-review	\$ 25.00
Easement Filing Fee	\$ 25.00 per easement

INSPECTION FEE SCHEDULE

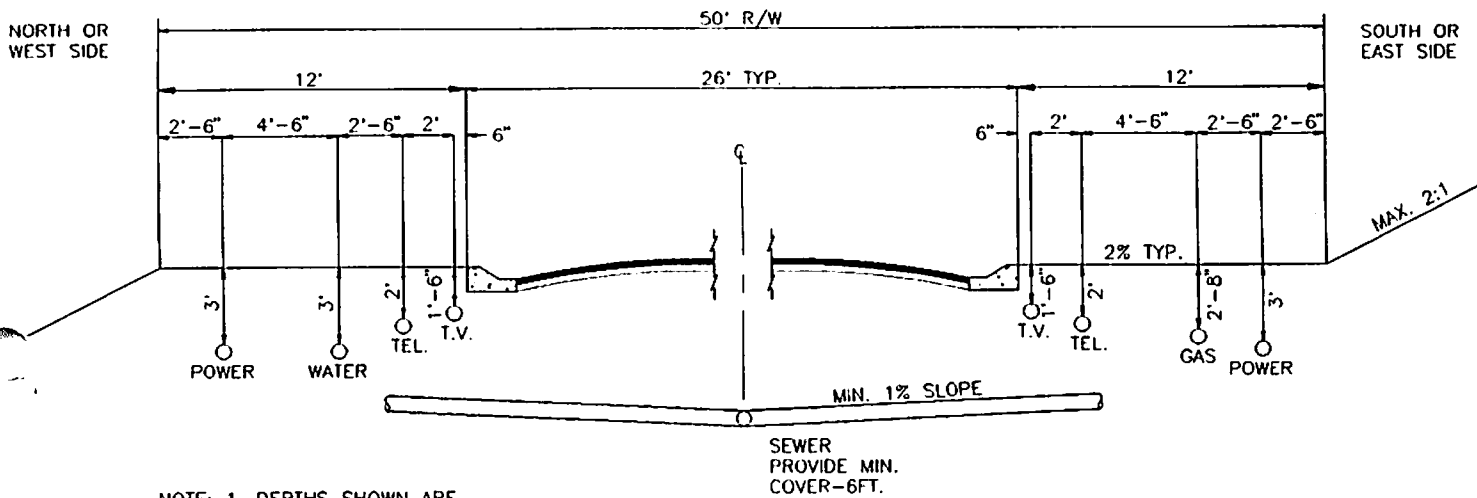
Water and Sewer Lines

1st Re-Inspection	\$25.00
2nd and Additional Re-Inspection	\$50.00

APPENDIX G
TYPICAL DETAILS

<u>Standard Detail #</u>	<u>Description</u>	<u>Page #</u>
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STANDARD DETAIL TUP-0001 CITY OF HAMPTON WATER AND SEWER DEPARTMENT



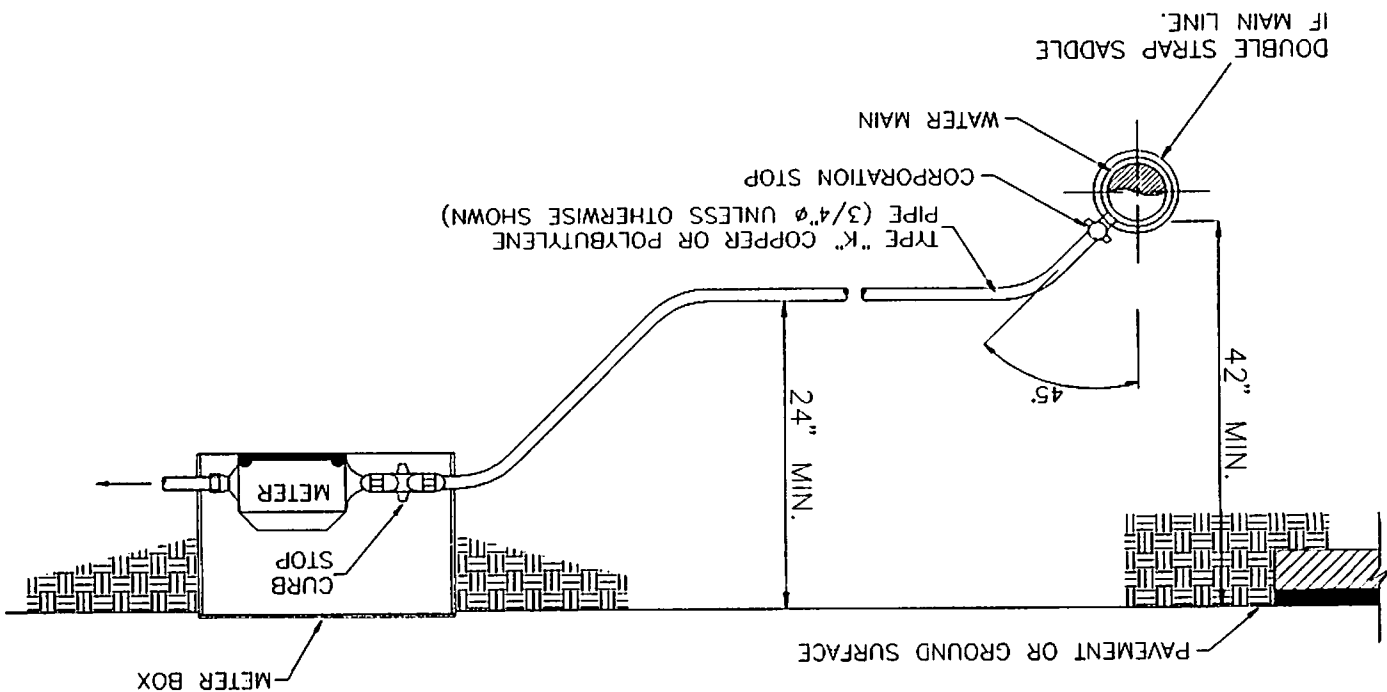
- NOTE: 1. DEPTHS SHOWN ARE MINIMUMS AND ARE TO BE TAKEN FROM TOP OF CURB ELEVATION.
2. WHEN UTILITY CONDUIT IS REQUIRED, CONDUIT SHALL BE OF SIZE AND DEPTH APPROPRIATE FOR THAT UTILITY, AND INSTALLED AT A MIN. 24" DEPTH

TYPICAL UTILITY PLACEMENT

N.T.S.

RESIDENTIAL SERVICE CONNECTION

N.T.S.

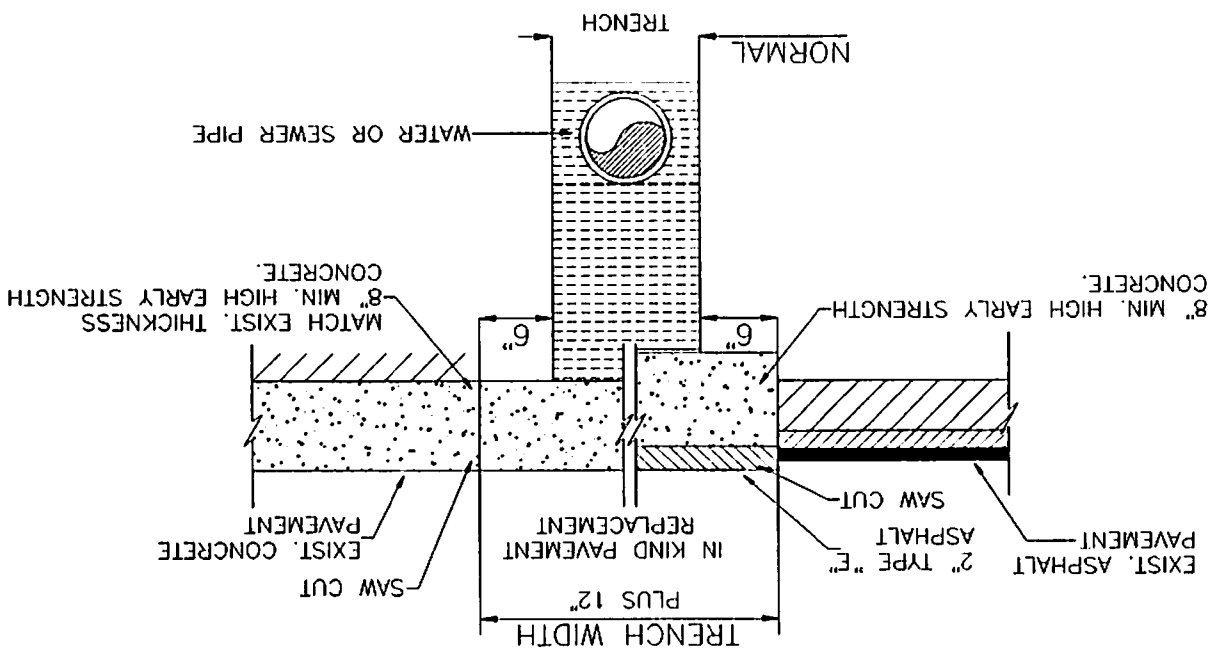


STANDARD DETAIL TUP-0003
CITY OF HAMPTON
WATER AND SEWER DEPARTMENT

TYPICAL PAVEMENT CUT

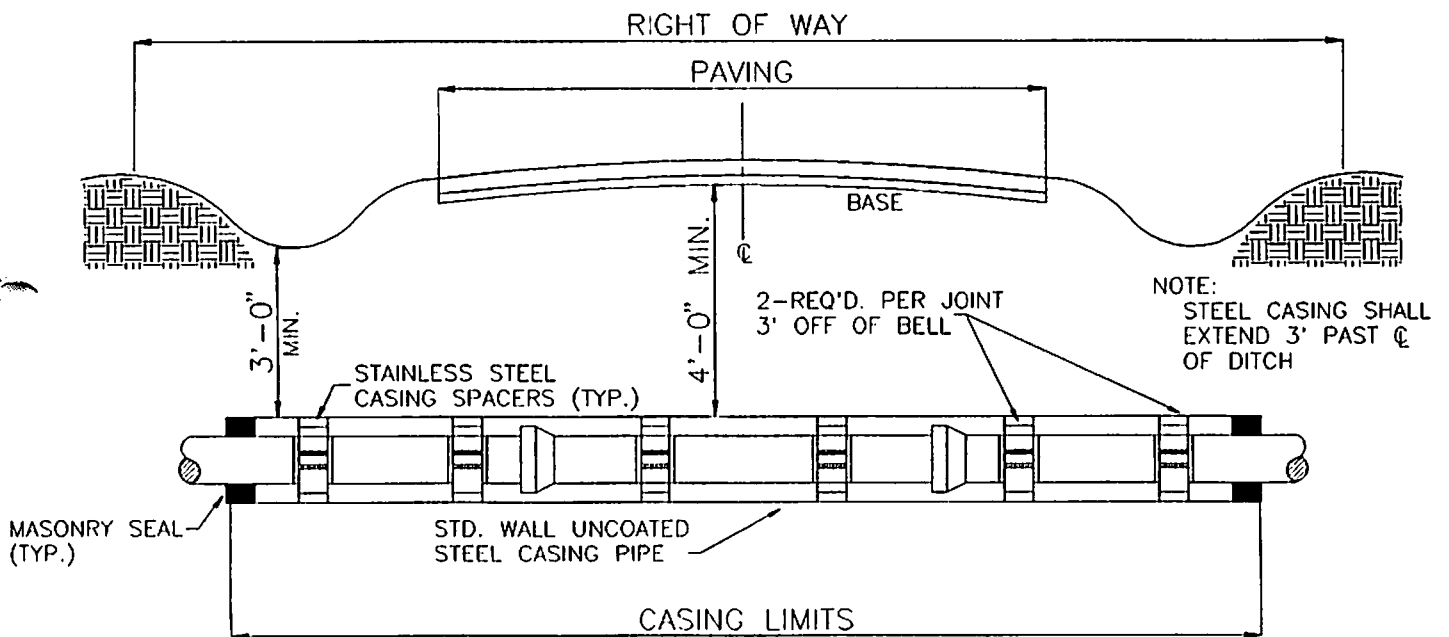
N.T.S.

NOTE: TRENCH TO BE BACKFILLED IN MAXIMUM 8" (LOOSE)
 LIFTS AND THOROUGHLY COMPACTED TO NOT LESS THAN
 95% STANDARD PROCTOR DENSITY AT OPTIMUM MOISTURE
 BY METHODS SATISFACTORY TO ENGINEER.



STANDARD DETAIL 3-1
 CITY OF HAMPTON
 WATER AND SEWER DEPARTMENT

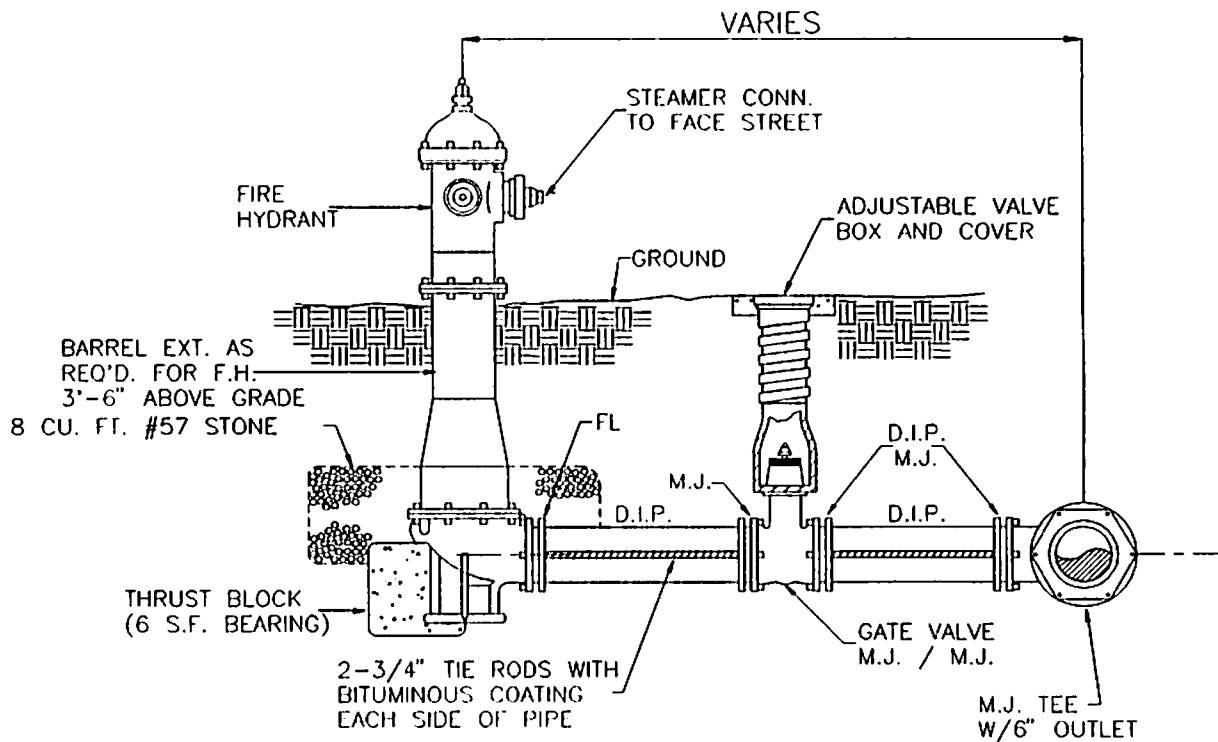
STANDARD DETAIL 3-2
CITY OF HAMPTON
WATER AND SEWER DEPARTMENT



TYPICAL HIGHWAY CROSSING

N.T.S.

STANDARD DETAIL H20-0001 CITY OF HAMPTON WATER AND SEWER DEPARTMENT

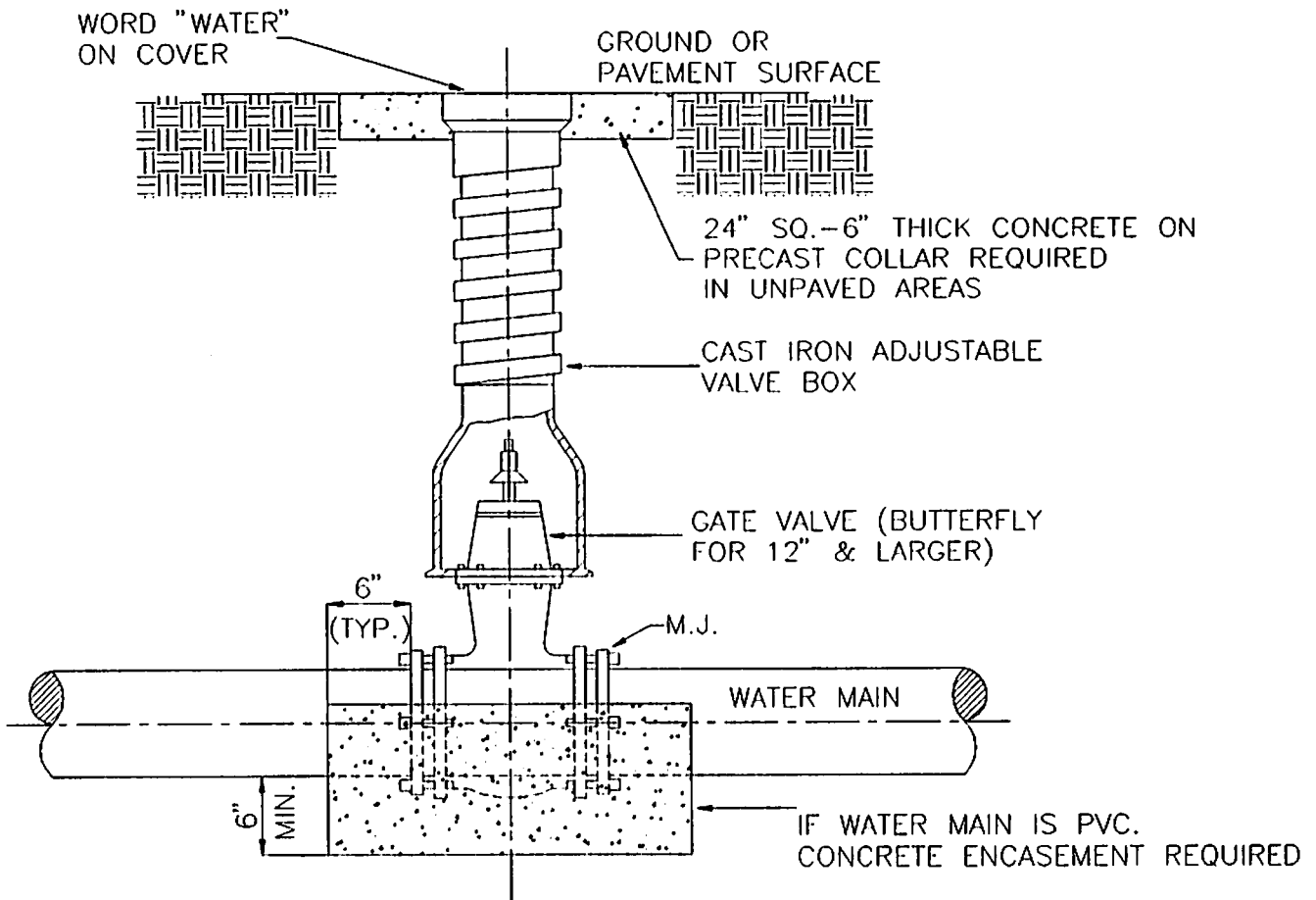


PROFILE - RODDED LEADER

FIRE HYDRANT INSTALLATION

N.T.S.

STANDARD DETAIL H20-0002
CITY OF HAMPTON
WATER AND SEWER DEPARTMENT

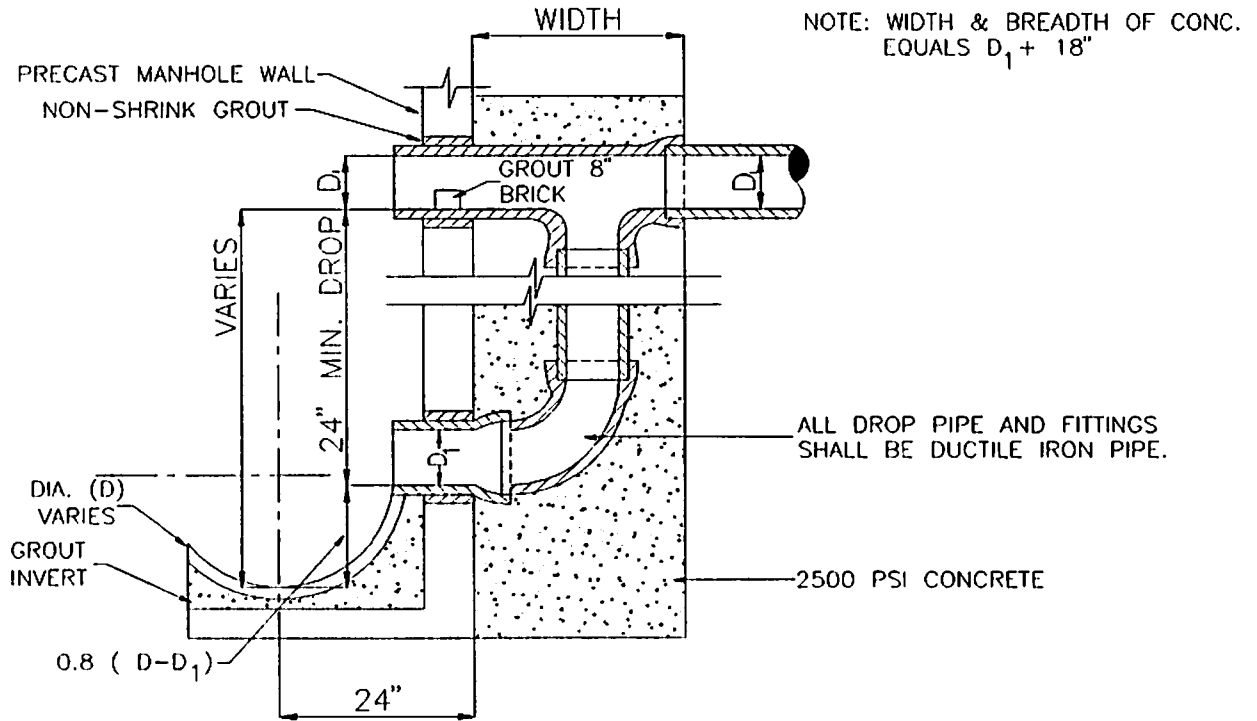


NOTE:
WHERE VALVE MARKERS ARE REQUIRED, INSTALL PRECAST REINFORCED
CONCRETE SQUARE POST, MINIMUM 4" SQUARE AND 6 FEET LONG,
ENGRAVED WITH WORD "VALVE" IN 2" HIGH LETTERING.

TYPICAL VALVE INSTALLATION

N.T.S.

STANDARD DETAIL SS-0002 CITY OF HAMPTON WATER AND SEWER DEPARTMENT



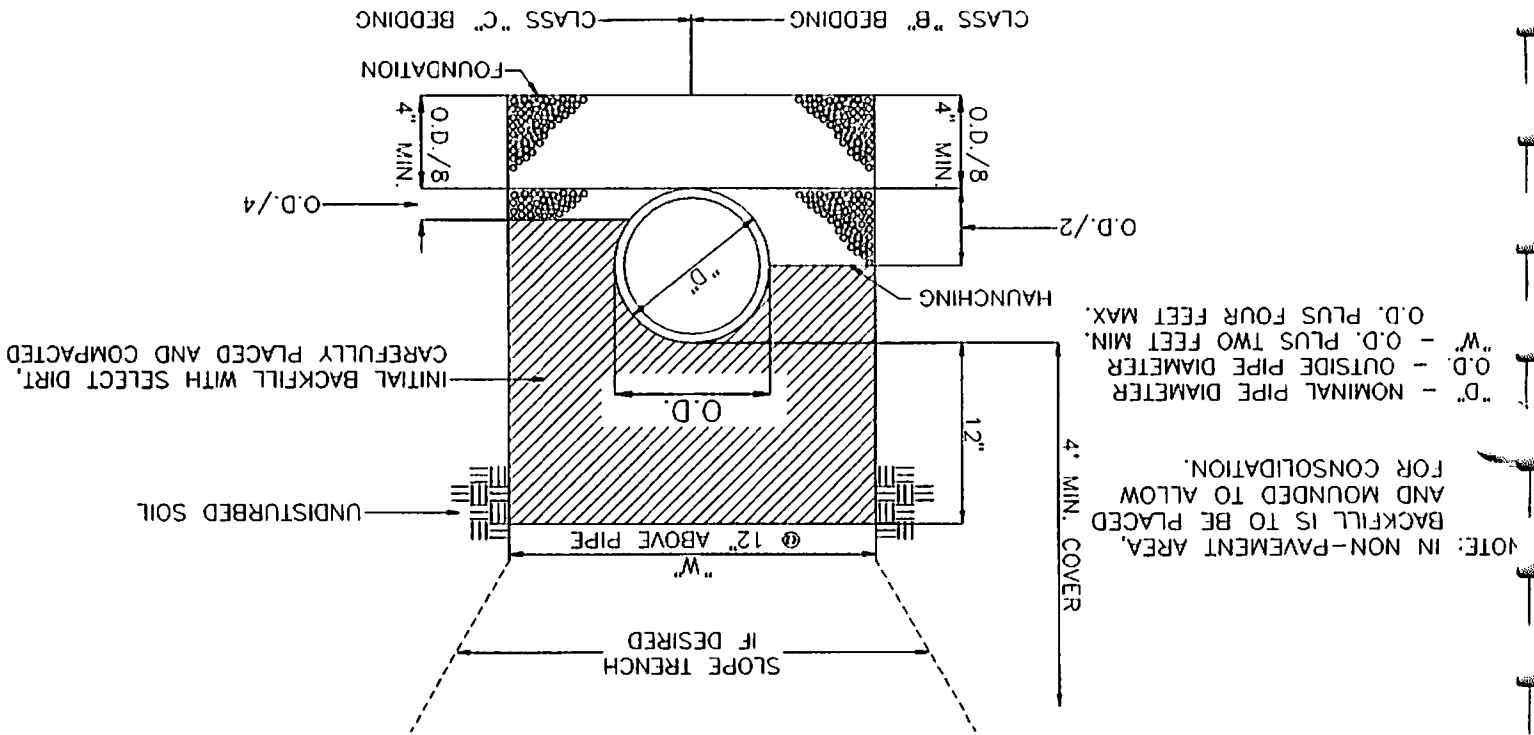
OUTSIDE DROP MANHOLE

N.T.S.

STANDARD DETAIL SS-0003
 CITY OF HAMPTON
 WATER AND SEWER DEPARTMENT

SEWER PIPE BEDDING

CLASS B AND C
 N.T.S.



AN ORDINANCE

WATER AND SEWER DEVELOPMENT STANDARDS

CITY OF HAMPTON, GEORGIA

AN ORDINANCE TO ADOPT DEVELOPMENT STANDARDS FOR WATER AND SEWERAGE SYSTEMS, CITY OF HAMPTON, GEORGIA DATED May, 1996 TO PROVIDE FOR AN EFFECTIVE DATE FOR THIS ORDINANCE; TO PROVIDE THAT THE CITY MAY WITHHOLD THE ISSUANCE OF BUILDING PERMITS AND/OR PERMITS FOR OCCUPANCY OR USE TO WHICH THIS ORDINANCE APPLIES; TO REPEAL CONFLICTING ORDINANCES, AND FOR OTHER PURPOSES.

WHEREAS, the City of Hampton has recommended the adoption of Development Standards for the construction of Water and Sewerage Systems in the incorporated areas of City of Hampton, Georgia.

NOW, THEREFORE be it ordained by the authority of the City of Hampton as follows:

1. That Development Standards for Design and Installation of Water and Sewerage Systems be adopted as of June 11, 1996. These standards shall apply to all non-governmental Water and Sewerage Systems constructed in the service areas of City of Hampton, Georgia.

2. That this Ordinance shall be in force and effect from and after the date of its approval by the City of Hampton.

3. That City of Hampton may withhold the issuance of any building permit and/or occupancy or use permit in any subdivision, development or improvement to which this Ordinance applies, until there is compliance with the regulations and specifications contained in said Development Standards for Water and Sewerage Systems.

4. That a copy of this Ordinance, including Development Standards for Water and Sewerage Systems to be filed with the permanent records of the minutes of the City of Hampton and that it may be inspected by any interested party during regular office hours, at the City of Hampton, Georgia.


5. That violation of this Ordinance shall be punished in accordance with OCGA § 36-32-1 et seq.; OCGA § 36-35-6; and the City Charter.

6. That all Ordinances, or parts thereof, in conflict with this Ordinance are hereby repealed.

MOTION MADE AND SECONDED, PASSED AND ADOPTED THIS 11TH day of JUNE, 1996.

1st. Reading : May 14, 1996

2nd. Reading : June 11, 1996



Tommy Smith, Mayor

APPROVED:




City Clerk