

SECTION 2.0 GENERAL PROVISIONS

2.01 Drawings

The developer shall be responsible for providing all drawings, plans and specifications as required by the UDO.

Detailed construction plans shall be submitted to the City Engineering Department for approval prior to the beginning of any construction per the UDO. Any changes from the approved plans must be resubmitted to the Engineering Department for reapproval.

Final "as built" drawings shall be submitted by the developer or his engineer upon completion of the construction per the UDO. The "as built" plans shall show the size, type and location of all sanitary sewer, storm sewer and water lines. In addition, these plans shall show the location of all fire hydrants, tees, valves, manholes, taps and other appurtenances to an accuracy of one-tenth of a foot. All references shall be tied to a fixed object such as a fire hydrant, power poles, *etc.*; water meters and sewer cleanouts shall be tied to the nearest adjacent property corner. Final "as built" plans shall be submitted and approved before any water or sewer line can be accepted for maintenance by the City. See Section 2.34 herein.

2.02 Permits and Regulations

The contractor and developer shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work. The contractor shall secure at his expense, any and all permits required by the performance of this work. If the contractor observes that the drawings and specifications are in conflict with Local, State or Federal laws and regulations, he shall promptly notify the engineer of record/developer. The developer shall then promptly notify the City Engineer in writing of any conflicts. Any necessary revisions to the plans shall be made by the developer and approved by the City Engineer.

City will allow the Contractor to use city water in the approved pursuit of construction under this contract with the City with out any charge therefore. The Contractor shall notify the Utility Department and the Engineer prior to any such usage. The Contractor shall supply all labor, equipment, and material necessary including but not limited to: city approved meter and a proper AWWA backflow prevention connection. The City will monitor this use, if in the sole opinion of the Engineer, the Contractor is abusing the use of this water usage the Engineer may cancel this approval and the Contractor shall supply his own water at no additional cost to the City. **Only City of Gastonia personnel shall operate existing valves; except in cases of emergency.**

2.03 Inspection of Work

The City Engineer or his designated representatives shall at all times have access to the work while it is in preparation or progress and the contractor and/or developer shall provide proper facilities for such access and for inspection.

The contractor shall give the City Engineer timely notice of its readiness for inspection. Inspections by the City Engineer shall be as prompt as possible.

If any work should be covered up without the approval or consent of the City Engineer, it must (if required by the City Engineer) be uncovered for examination at the contractor's or developer's expense.

See Section 2.34 for Television Inspection.

Any and all work not in conformance with these specifications and with City Standards shall be removed or corrected as directed by the City Engineer. The decision of the City Engineer shall be final.

2.04 Maintenance of Traffic

Where lines are to be installed in existing City maintained streets or highways, such streets or highways shall be kept open to public traffic at all times by contractor, unless permission to close these streets or highways is granted by the Traffic Engineer. In the event permission is granted to close certain streets or a portion thereof, the contractor shall notify the City Police Department, the City Fire Department and any other agency as to the time and location of such street closing as directed by the City Engineer.

Work in NCDOT roads may require additional measures.

Proper and sufficient barricades, lights, signing and other protective devices shall be required to be installed by the developer or contractor. All construction signs and the installation of same shall conform to the "Manual on Uniform Traffic Control Devices" as adopted by the American Association of State Highway and Transportation Officials (AASHTO). Additional signing shall be provided by the developer as directed by the Traffic Engineer.

2.05 Restriction of Load Limits

All improvements shall be protected from excessively heavy vehicle or earth loads. Any improvements which are broken, crushed, knocked from its proper alignment or otherwise damaged due to excessive loads, shall be replaced by the developer or contractor. Any existing cracks shall be pointed out to the inspector prior to the contractor beginning construction or he will be held liable for correction.

2.06 Use of Explosives

When the use of explosives is approved by the City of Gastonia Fire Marshall for the prosecution of the work, the contractor shall exercise the utmost care not to endanger life or property. The contractor shall be responsible for any and all damages resulting from the use of explosives.

The contractor shall notify each public utility company having structures in proximity to the site, of his intention to use explosives, and shall secure a blasting permit from the City Fire Department as may be necessary.

2.07 Used Materials, Prohibited

The use of materials which are second rate or which have been used previously is strictly prohibited. All materials shall be new, first quality materials and free from defects which would affect their strength, efficiency, appearance or structural quality. All materials shall be per the City Engineer's latest approved materials list or shall be specifically approved by the City Engineer.

Failure to remove or correct work which does not meet City Standards and Specifications shall be sufficient reason for the City to invalidate the contract, and to refuse to accept any or all lines included in the contract, or allow developer to connect to the City's existing water and sewer lines.

2.08 Surveys, Lines and Grades

The developer shall be responsible for establishing all lines and grades necessary for installation and inspection of this work. Cut-sheets shall be provided in accordance with Section 2.09 of these specifications for all sanitary sewer lines. For water lines, grade and alignment stakes shall be provided at a minimum interval of one hundred feet (100'). Where water lines are within street right-of-way and where the curb and gutter section has been installed, the back of the curb may be used in place of grade stakes.

2.09 Cut-Sheet

The developer shall be responsible for the preparation of all cut-sheets and the submission of these cut-sheets to the City Engineer. All cut-sheets shall be submitted to the City Engineer for his review and approval at least twenty-four (24) hours prior to their anticipated need for construction.

Cut-sheets shall bear the full name and title of the person responsible for their preparation and shall bear sufficient data and information to locate grade stakes in field. All stations and grades shown shall conform to those shown on the approved plans, except where changes have been approved in writing by the Public Works Director and Utilities Director. All cut-sheets submitted to the City Engineer shall be checked by the City before approval, however, the approval of cut-sheets which are in error shall in no way obligate the City to make field correction.

2.10 Location of Water and Sanitary Sewer Lines

Where water mains and sewer mains are laid parallel or approximately parallel, the minimum horizontal clearance between all sanitary sewer mains and any water distribution mains shall be ten (10) feet. Where a sanitary sewer line and water distribution line are within ten (10) feet horizontal clearance, the sewer line shall be below the water line and the minimum vertical clearance shall be eighteen (18) inches. Where water and sewer lines are laid in the same trench, they shall have a minimum vertical clearance of eighteen (18) inches with the water line at the higher elevation, on a bench of undisturbed earth.

Where water mains and sewer mains cross, the minimum vertical clearance shall be eighteen (18) inches with the water main at the higher elevation. However, where water mains will cross over a sewer main with less than eighteen (18) inches vertical separation, both the water and sewer mains must be constructed of ferrous materials with joints equivalent to water main standards for a distance of ten (10) feet on each side of the point of crossing as measured perpendicular to each line. See NCDEQ's "GRAVITY SEWER MINIMUM DESIGN CRITERIA" for testing requirements.

Whenever it is necessary for a water main to cross under a sewer, both the water main and the sewer shall be constructed of ferrous materials and with joints equivalent to water main standards for a distance of 10 feet on each side of the point of crossing as measured perpendicular to each line. A section of water main pipe shall be centered at the point of crossing.

Whenever it is necessary for a water main to cross under a storm sewer, there shall be at least twenty-four (24) inches of clearance. Where twenty-four (24) inches of clearance is not possible the waterline shall be constructed of ferrous material.

The location and nominal depth of all utilities within the street right-of-way shall conform to those shown on City Standard No. 71D-15C, 71D-15D. Utilities located outside the street right-of-way shall be centered on the public easement and shall conform to the following nominal depths of cover, where possible:

Water	-	36 inches (See Section 9.10)
Sanitary Sewer	-	72 inches

All sanitary sewer lines shall be located at least 100 feet from any public water supply well and 50 feet from any private water supply well, unless the sanitary sewer is constructed of DIP materials and joints that are equivalent to water main standards, in which case the sanitary sewer shall be at least 50 feet from the public water supply well and 25 feet from any private water supply well.

In all cases, the horizontal and vertical location of all City sewer lines shall be designed and aligned in accordance to “GRAVITY SEWER MINIMUM DESIGN CRITERIA” as adopted by NCDEQ on February 12, 1996, or latest revision.

Some of the Minimum separations at the time of this printing are as follows:

a)	<i>any private or public water source, including any WS-I waters of Class I or Class II impounded reservoirs used as a source of drinking water</i>	<i>100 feet</i>
b)	<i>waters classified WS-II, WS-III, B, SA, ORW, HQW, or SB [from normal high water (or tide elevation)]</i>	<i>50 feet</i>
c)	<i>any other stream, lake or impoundment</i>	<i>10 feet</i>
d)	<i>any building foundation</i>	<i>5 feet</i>
e)	<i>any basement</i>	<i>10 feet</i>
f)	<i>top slope of embankment or cuts of 2 feet or more vertical height</i>	<i>10 feet</i>
g)	<i>interceptor drains</i>	<i>5 feet</i>
h)	<i>groundwater lowering and surface drainage ditches</i>	<i>10 feet</i>
i)	<i>any swimming pool</i>	<i>10 feet</i>
j)	<i>storm sewers</i>	<i>horizontal 10 feet vertical 24 inches</i>

Storm sewers and water supplies shall be protected by using the type pipe and testing methods in accordance with Section VI of the “Gravity Sewer Minimum Design Criteria” as adopted by NCDEQ on March, 2008 or latest revision.

The maximum sanitary sewer grade shall be 10%. Minimum pipe size shall be eight (8) inch diameter. Minimum slope for eight (8) inch pipe shall be 0.6%. Under no circumstances shall the design flow be less than two (2) feet per second at 2/3 full flow.

Specially designed and approved outside drop precast manholes with extra thick bases and an extended lip shall be utilized to dissipate any additional grade. The lip shall be designed to prevent the manhole from being dislocated.

2.11 Minimum Right-of-Way Widths

Where sewer or water lines are to be constructed on easements outside the street right-of-way, the minimum widths for these easements shall be:

30 feet for sanitary sewer lines and
20 feet for water distribution lines.

Additional right-of-way may be required where it is deemed necessary by the City Engineer.

2.12 Approved Materials

All materials covered by these specifications shall be those manufactured under the brand names specified in the City Engineer's Approved Material List for that type material or an alternate type which meets or exceeds the quality of the brand name. The use of an alternate type of material must be approved in writing by the City Engineer. See the Instructions to Bidders for additional information on approved equal process.

2.13 NSF Approval

All PVC water pipes shall bear the National Sanitation Foundation (NSF) seal of approval.

2.14 Materials, Appliances, Employees

Unless otherwise stipulated, the contractor shall provide and pay for all materials, labor, tools, equipment, light, power, transportation and other facilities necessary for the execution and completion of the work. See section 2.02 for use of City water.

Unless otherwise stipulated, all materials shall be new and both workmanship and materials shall be of a good quality. The contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

2.15 Protection of Work and Property

The contractor shall adequately protect adjacent property as provided by law and the contract documents. He shall provide and maintain all passage ways, guard fences, lights and other facilities for protection required by public authority or local conditions. In the event of negligent trespass, the contractor shall restore the area as directed by the City Engineer.

In an emergency affecting the safety of life or of the work or of adjoining property, the contractor or developer, without special instruction or authorization from the Engineer, is hereby permitted to act, at his discretion, to prevent such threatened loss or injury, and he shall so act, without appeal, if so instructed or authorized. Any compensation, claimed by the contractor on account of emergency work, shall be determined by agreement.

2.16 Inspection of Work

The Engineer and his representatives shall at all times have access to the work wherever it is in preparation or progress and the contractor shall provide proper facilities for such access and for inspection.

If any work should be covered up without approval or consent of the Engineer, it must (if required by the Engineer) be uncovered for examination at the contractor's expense.

2.17 Superintendence: Supervision

The contractor shall keep on his work during its progress a competent superintendent and any necessary assistants, all satisfactory to the City Engineer. The superintendent shall represent the contractor in his absence and all directions given to him shall be as binding as if given to the contractor. Important directions shall be confirmed in writing to the contractor. Other directions shall be so confirmed on written request in each case. The contractor shall give efficient supervision to the work, using his best skill and attention.

Competent person, Certification by OSHA, etc. :

Prior to beginning of construction, the Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall meet all OSHA requirements, including but not limited to, certification as a

Competent Person. This person shall be the Contractor's superintendent unless otherwise designated in writing by the Contractor to the City, and he shall be present at the job site during any and all construction activity.

2.18 Correction of Work Before Final Acceptance

The contractor shall promptly remove from the premises all materials condemned by the City Engineer as failing to conform to the Standard Specifications and/or Details, whether incorporated in the work or not, and the contractor shall promptly replace and re-execute his own work in accordance with the Standard Specifications and/or Details and without expense to the City and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.

2.19 Use of Completed Portions

The City shall have the right to take possession of and use any completed portions of the work, but such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the contract documents. If such prior use increases the cost of or delays the work, the contractor shall be entitled to such extra compensation, as the Engineer may determine.

2.20 Indemnity

The contractor shall indemnify and save harmless the City from and against all losses and all claims, demands, payments, suits, actions, recoveries and judgments of every nature and description brought or recovered against him, by reason of any act or omission of the said contractor, his agents or employees, in the execution of the work or in the guarding of it.

The contractor shall, , maintain and pay for such insurance, issued in the name of the City, as will protect the City from his contingent liability under this contract, and the City's right to enforce against the contractor any provision of this article shall be contingent upon the full compliance by the City with the terms of such insurance policy or policies, a copy of which shall be deposited with the City.

2.21 Workmen's Compensation Insurance Required

The contractor will be required to carry "Workmen's Compensation Insurance" on the men employed by him or his subcontractors on this work according to the North Carolina State Law and to furnish the City a certificate to that effect at the time of the delivery of the signed contract to the City.

2.22 Public Liability Insurance Required

The contractor shall be required to carry "Public Liability Insurance" to protect the contractor and the City against the result of injuries caused to persons to the extent that the liability insurance company's limit of liability, including completed operations coverage, of not less than for Bodily Injury \$ 3,000,000 each occurrence; Property Damage, \$ 3,000,000 on account of any one occurrence with an aggregate limit of not less than \$ 3,000,000. The Contractor shall present to the City a CERTIFICATE OF INSURANCE or other satisfactory written evidence of the fact that he has the above required insurance coverage.

2.23 Separate Contracts

The City reserves the right to let other contracts in connection with this work. The contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

If any part of the contractor's work depends for proper execution or results upon the work of any other contractor, the contractor shall inspect and promptly report to the City Engineer any defects in such work that render it unsuitable for such proper execution and results. His failure so to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of his work, except as to defects which may develop in the other contractor's work after the execution of his work.

To insure the proper execution of his subsequent work the contractor shall measure work already in place and shall at once report to the City Engineer any discrepancy between the executed work and the drawings.

2.24 Engineer's Status

The City Engineer shall have general authority to stop the work whenever such stoppage may be necessary to insure the proper execution of the work. He shall, also, have authority to reject all work and materials which do not conform to the Standard Specifications and Details, and to decide questions which arise in the execution of the work.

2.25 City Engineer's Decision

The City Engineer shall, within a reasonable time after their presentation to him, make decisions in writing on all claims of the City or the contractor and on all other matters relating to the execution and progress of the work or the interpretation of the plans.

All such decisions of the Engineer shall be final.

2.26 Lights, Barricades and Signs

The contractor shall provide, erect, and maintain all necessary barricades, suitable and sufficient amber lights and caution signals, provide a sufficient number of watchmen, and take all necessary precautions for the protection of the work and safety of the public. It is the duty and responsibility of the contractor to furnish and mount any necessary signs on suitable and approved NCDOT and/or MUTCD standards.

2.27 Sanitary Provisions

The contractor shall furnish for use of his force on the work, necessary toilet conveniences, secluded from public observation. They shall be kept in a clean and sanitary condition and comply with Local and State requirements and regulations. He shall commit no public nuisance.

2.28 Public Convenience and Safety

The contractor at all times shall conduct the work in such a manner as to insure the least obstruction to traffic practicable. The convenience of the general public and of the residents along and adjacent to the street shall be provided for in a satisfactory manner, consistent with the operation and local conditions. Fire hydrants on or adjacent to the street shall be kept accessible to the fire

apparatus at all times, and no material shall be placed within fifteen (15) feet of any such hydrant. All sidewalks, gutters, sewer inlets, and portions of streets adjoining the roadway under construction shall not be obstructed more than is absolutely necessary. Preliminary cleaning up shall follow closely behind the backfilling and tamping operation, normally on the same day as the original disturbance but within a maximum of seven (7) days.

2.29 Final Cleaning Up

Upon completion of the work, and before acceptance shall be made, the contractor shall clean and remove from the roadway, sidewalks, planting strips, lawns, and all adjacent property, all surplus and discarded materials and rubbish, restore in an acceptable manner all property, both public and private, which has been damaged during the prosecution of the work, and shall leave the whole in a neat and presentable condition.

2.30 Acceptance

When the contractor has completed the work, in an acceptable manner, in accordance these specifications, the City Engineer shall make final inspection of the project, and upon completion of all necessary repairs, renewals and maintenance as herein specified shall certify in writing as to said completion.

2.31 Seeding, Mulch, and Tack

This item shall include all labor, equipment, and materials necessary to guarantee a full stand of permanent grass through the first growing season following its planting. All lime, fertilizer, seed, mulch and other materials provided shall be included in the bid unit price per 1000 square feet (MSF) of area seeded and mulched.

All disturbed areas shall be seeded, mulched, and tacked no later than thirty (30) days after the land disturbing activity started **for grading contracts and seven (7) days for all water, sanitary sewer, and storm drainage installation projects. Also, see sections 8.01 and 9.01.**

(a) Preparation of Site

All areas to be seeded shall be graded and shaped before applying seed. All loose rock, roots and other objects which would obstruct the establishment and maintenance of the vegetation shall be removed. In areas adjacent to or part of residential yards, the surface shall be hand-raked to remove all objectionable materials.

(b) Lime and Fertilizer

Ground Agricultural Lime shall be uniformly applied at the following rates:

Clay and clay loams	-	135 lbs./1000 S.F. (MSF)
Sandy loams, loams and silt loam	-	90 lbs./1000 S.F. (MSF)
Loamy sands, sands	-	50 lbs./1000 S.F. (MSF)

Fertilizer shall be uniformly applied at a rate of 18 to 23 lbs. per 1000 square feet. Fertilizer shall be 10-10-10, for Grass Legume mixtures use 5-10-10.

Apply Lime and fertilizer evenly and incorporate into the top 4-6 inches of soil by disking or other suitable means. Operate machinery on contour. When using a hydroseeder, apply lime and fertilizer to rough, loose surface. All lime and fertilizer shall meet all specifications of the North Carolina Department of Agriculture.

In lieu of the above rates of application, the contractor may apply lime and fertilizer at a rate specified in an approved soil test. Such soil tests shall be at the expense of the contractor and must be approved by the City Engineer.

All lime and fertilizer shall meet the specifications of the North Carolina Department of Agriculture.

(c) Seeding

All seed used shall be certified seed and shall meet the purity, germination and presence of prohibited weed standards of the North Carolina Department of Agriculture and each bag of seed used shall be “certified” to be in compliance to these standards.

Seeds shall be Bermuda Grass, Fescue or other type as approved by the City Engineer , but in all cases, shall be compatible with the surrounding yards and grassed areas. Where a seeded area is part of or adjoining a residential yard, the contractor shall determine the type of coverage in the yard and shall use a seed mixture to give a similar coverage in the seeded area.

Rates for applying seeds and seasonal limitations shall be as specified Section 6.1 of the “Erosion and Sediment Control Planning and Design Manual”, as published by the NC Department of Environment, Health, and Natural Resources (hereafter referred to as the Sediment Guide).

Seed type and seeding rate shall be as specified in the approved erosion control permit.

The contractor shall guarantee a full stand of permanent grass (100% coverage of disturbed area) through the first 12 months following its planting.

(d) Mulch

Mulch shall be applied for temporary erosion control and to protect the seed and fertilizer from the natural elements. The type, application rate and specifications shall be as given in Section 6.1 of the Erosion and Sediment Control Planning and Design Manual.

Mulch - dry, unchopped, unweathered small grain straw or hay free of seeds of competing plants - Spread at the rate of 1 1/2 - 2 bales per 1000 sf (MSF), depending upon the site and season. Evenly spread mulch over the area by hand or mechanical equipment. Apply mulch uniformly so that about 25% of the ground surface is visible.

Seeding and mulch are to be anchored by uniformly spraying emulsified or liquid asphalt on all areas where seeding is required. The rate of application shall be as specified in Section 6.1 of the Sediment Guide.

Emulsified Asphalt (Tack) - Apply uniformly 7.0 gallons per 1000 sf (MSF) of *rapid setting* (RS-1, CRS-1, RS-2, or CRS-2), *medium setting* (MS-1, MS-2, or CMS-2); *slow setting* (SS-1 or CSS-1). Rapid setting (RS or CRS) is formulated for curing in less than 24 hours even during periods of high humidity. Best for spring and fall.

Medium setting (MS or CMS) is formulated for curing within 24 to 48 hours.

Slow setting (SS or CSS) is formulated for use during hot, dry weather with 48 hours or more curing time.

Note - In areas of playing children or pedestrian traffic, asphalt application could cause problems of "tracking in" on rugs; damage shoes, clothing, etc. Use types RS or CRS to minimize problem.

Payment for mulch shall be included in the bid unit price per 1000 square feet (MSF) for seeding and mulching.

Unless otherwise stated in the Special Provisions, erosion control for this contract shall include the provisions that all disturbed areas shall be seeded and mulched no later than thirty (30) days after the land disturbing activity started.

2.32 Existing Underground Utilities

It will be necessary for the contractor to explore and excavate to determine the location of existing underground structures and/or utilities. Existing utilities as shown on the construction plans are for reference only. The City will not be responsible for inaccuracies in utility locations shown on said plans.

Prior to any underground installations/construction, the contractor shall contact all utility companies which have filed documents of ownership of underground utilities with the Register of Deeds office as required by law, as indicated on the plan or as evident on the construction site. The contractor shall give notice to said utilities of not less than two days, nor more than ten days prior to commencing excavation operations.

It shall be the responsibility of the contractor to investigate all underground utility locations far enough in advance so as not to delay his construction operations.

The contractor shall exercise care and caution when excavating in the vicinity of known utilities (including poles). If so requested by the utility company or agency, the contractor shall have representatives of said utility company or agency present during periods of construction which in close proximity of existing utility lines.

The contractor shall be responsible for any and all associated cost of supervision, assistance supplied, relocation performed, and damages said utilities may incur which can be attributed to work pursuant to this contract.

2.33 Materials Manufacture and Testing

All materials shall be manufactured and tested within the United States of America.

The City Engineer may as his discretion, require evidence as necessary relating to the origin of manufacture and testing and may disapprove the use of said materials if found contrary to this specification.

2.34 Record Drawings (As-Builts)

The Contractor will maintain a set of Record Drawings for the project which will include the changes made in materials, equipment, locations, and dimensions of the work. Each month, or as otherwise agreed, the Contractor shall submit to the City of Gastonia a current listing and description of each change incorporated into the work since the proceeding submittal.

In addition, the Contractor shall maintain a record of exact location of buried utilities encountered and any below grade structures. Reference items to definitive reference point locations such as found property corners, entrances to buildings, existing structure lines, fire hydrants, and related fixed structures. Include such information as location, elevation, coverage supports and additional pertinent replacement servicing or adjacent construction around any buried facility. When the work is complete, the Contractor shall submit a final Construction Record Drawing of all pipe systems in the project including both project items and pre-existing items. The drawings shall identify the complete location, elevation, and description of piping systems. The pipe systems shall be related to identified structures and appurtenances, with a minimum of two (2) dimensions to each individual item in the plan view. (See Typical Drawing).

The Final Record drawings shall be submitted by the Contractor/Developer's Engineer prior to acceptance . The Engineer of record for the project shall sign, seal, and date the as-built drawings.

Television Inspection

The Contractor shall provide color video inspection services on new sewer lines and/or existing City maintained sewer lines.

Inspection of sewer lines shall be performed by experienced personnel trained in locating breaks, obstacles, and service connections by closed circuit television. The interior of the line shall be carefully inspected to determine the location of any conditions which may indicate current or future problems or non-compliance to the contract documents. Any such conditions shall be noted and corrected at the contractor expense.

The television camera used for the inspection shall be one specifically designed and constructed for such inspection. Lighting for the camera shall be to allow a clear, color picture of the entire periphery of the pipe. The camera shall be capable of a 3600 viewing area. A backup camera shall be available on the project site. The camera shall be operable in 100% humidity conditions. The camera, television monitor, and other components of the video system shall be capable of producing color picture quality to the satisfaction of the Engineer.

The project name, location, date, manhole numbers, size and type pipe, and other information specific to the line segment being inspected shall be visibly displayed on the video viewing screen for a minimum of 10 seconds, prior to camera entry into the manhole.

Upon entry into the manhole, the surfaces of the manhole shall be videotaped and potential defects noted. Prior to entering the sewer line, conditions of the manhole/pipe connection shall be videotaped and potential defects noted.

When existing sewer flow depth, as measured in the first manhole upstream of the sewer segment being televised, exceeds 20% of the sewer line pipe diameter, the Contractor shall implement wastewater flow control methods, including but not limited to bypass pumping.

The rate of travel shall not exceed 30 feet per minute. At each line defect or service connection, the camera shall come to a complete stop and the subject panned. The footage meter count shall be clearly visible.

Printed television inspection logs shall be recorded by the Contractor clearly showing the distance from an adjacent manhole to discernable features such as broken or cracked pipe, defective joints, service laterals, and in existing lines presence of scale corrosion, grease buildup, storm sewer connections, and any other unusual conditions. A copy of the inspection logs shall be provided to the Engineer by the Contractor.

The Contractor shall provide color videotape recordings of all the subject lines, the recordings shall provide a visual record of problem areas of the lines before and after any rehabilitation. The recording shall include, at a minimum, a display of the footage meter and a display of the manhole segment number being televised. Where appropriate, comments should be included by electronic display.

The Contractor shall carry out his operations in strict accordance with all OSHA and manufacturer's safety requirements. Particular attention is drawn to those safety requirements involving entering confined spaces.

Cleaning shall be the responsibility of the contractor. Any hang-ups shall be the responsibility of the Contractor, the contractor shall remove the camera and repair any damage to the sewer line.

Digital As-Builts

When a project is designed by a developer and/or a consultant, digital as-builts will be required in addition to regular filmed hard copies. The digital submittals shall be as required by the City Engineer to closely match the City's GIS system. A policy generally indicating the City's needs is available and will be kept current to allow ease of addition of the systems so designed into the City's GIS system. The layering system is of importance so the importing of this information shall be as effortless as is possible, therefore early coordination during the design process is imperative.

2.35 **Abandonment, Shutdown of Existing Operations of Utilities, Tie-ins, Rodding/Blocking Verification**

Continuous operation of the City's existing utility systems are of critical importance.

Only City personnel shall operate any valves and controls on the City's existing utility systems.

All materials and equipment (including emergency equipment) necessary to expedite the tie-in shall be on hand prior to the shutdown of existing services or utilities.

The Contractor shall be responsible for notification of each property Owner (Customer) prior to disruption of service, except in the event of an emergency situation. The Contractor shall coordinate his activities with any non-City owned utility.

Refer to Section 8.22 and 9.18 for additional requirements.