

**CITY OF SUMTER**  
**GUIDELINES FOR UTILITY, ROADWAY AND**  
**DRAINAGE CONSTRUCTION**

**Office of the City Engineer**

**April 9, 1999**

Authorization:

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Public Services Director

Authorization:

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## **SCOPE**

The following guidelines are intended to provide requirements for the design and construction of utilities which will come under the subsequent ownership and maintenance of the City of Sumter. By policy and ordinance, the City will not accept utilities, roadways and drainage systems installed on private property unless agreed to by the City Council and proper easements are executed. These criteria apply to service mains, roadways, parking lots and storm drainage on private property except where may be specially noted. Conformance with these guidelines does not relieve the developer, or his agents, from liability under other Regulations of the City of Sumter or other governmental agencies.

All utility and road work installed for eventual acceptance into the City of Sumter's maintenance and ownership must be executed by competent, licensed contractors, as licensed through the South Carolina Department of Labor, Licensing & Regulation.

## **FAMILIAR ABBREVIATIONS**

Abbreviations used repeatedly in the document are as follows:

<b>SCDHEC</b>	South Carolina Department of Health & Environmental Control
<b>SCDOT</b>	South Carolina Department of Transportation
<b>AWWA</b>	American Water Works Association
<b>LLR</b>	South Carolina Department of Labor, Licensing & Regulation

## CONTENTS

- I. Potable Water Mains**
  - a. General Design Requirements
  - b. Inspection Requirements
  - c. Record Drawings and Service Locations
  - d. Acceptance Documents Issued by the City Engineer
  
- II. Gravity Sewage Collection Systems**
  - a. General Design Criteria
  - b. Inspection Requirements
  - c. Record Drawings and Service Locations
  - d. Acceptance Documents Issued by the City Engineer
  
- III. Sewage Pumping Systems**
  - a. General Design Requirements
  - b. Inspection Requirements
  - c. Record Drawings and Operation Manuals
  - d. Acceptance Documents Issued by the City Engineer
  
- IV. Roadway Construction**
  - a. General Design Criteria
  - b. Inspection Requirements
  - c. Acceptance
  
- V. Drainage Facilities**
  - a. General Design Criteria
  - b. Record Drawings
  - c. Acceptance Documents Issued by the City Engineer
  
- VI. Commercial, Residential and Multiple Occupancy Utility Connections**
  - a. General
  - b. Residential Water and Sewer Services
  - c. Services to Multiple Family Dwellings
  
- VII. Easements, Deeds and Benchmarks**
  - a. General
  - b. Benchmarks
  
- VIII. Variances**
  - a. General

# **I. POTABLE WATER MAINS**

## **A. General Design Requirements**

### **1. Flow Tests**

Upon request, personnel of the City Engineer's office will conduct flow tests as near to the desired location as practical. The static pressure, residual pressure and its corresponding flowrate will be reported. Other information such as main size and configuration, time, date and duration of the test will also be supplied. Tests will be performed at the earliest convenience with the approval of the Public Services Director. No flow tests will be conducted by individuals other than City personnel unless accompanied by City personnel.

### **2. Main Sizing**

- a) The sizing of potable water mains for adequate supply and pressure shall be no less stringent than that called for by current SCDHEC regulations.
- b) Design shall reflect consideration to flushing the mains with minimal disturbance to normal service and provide consideration for optimized flushing paths without excessive head loss.
- c) No main may be designed smaller than a six-inch diameter where fire protection is to be provided. No mains shall be sized smaller than four-inch diameter unless they are hydraulically viable, less than five hundred feet in length and support the equivalent of five or less single family dwellings.

### **3. Valves, Hydrants and Main Configuration**

- a) Efforts shall be made to limit the use of dead-ended mains. Valves shall be supplied in such manner as to allow flushing as described in this section and maintenance sufficient to limit the number of services out of operation. Valves shall be located at most, 2,000 ft. apart and the boxes so arranged that they will not be damaged by traffic, using concrete traffic rings if necessary. Line valves, where possible, shall be located near hydrant leg valves.
- b) Fire hydrants shall provide 2 ½ inch hose connections and ¼ inch pump connection. They shall be located in residential areas so a hydrant is within 1,000 ft. or less of every residence. In commercial areas, hydrants shall be located to within 500 ft. or less from every building. These distances shall be measured along the street. Adverse turns at intersections may require placement of an additional hydrant.

#### 4. Materials and Workmanship

- a) Requirements for materials and workmanship in the construction of new water mains shall be no less stringent that required by SCDHEC. All PVC mains 4-inch diameter and larger shall ascribe to AWWA C900 and C905. Smaller PVC mains shall be pressure rated pipe, SDR 26 or better. All pipe shall be NSF approved for drinking water service. Only bell and spigot pipe with glands are required on each fitting. No glue joints will be accepted. Ductile iron, class 50 or better will be required where metallic pipe is indicated. No cast iron, galvanized, other metallic pipe or asbestos cement pipe will be accepted. All materials shall be compatible with the distribution of potable water. Valves shall be 125 pound class or better, AWWA approved. Hydrants shall be Mueller models, AWWA approved.
- b) The developer, through his contractor, is responsible for materials and workmanship for twenty-four months after the acceptance date.

#### 5. Preliminary Design Review

City Engineering personnel will review the prescribed features when designs are finalized through the Subdivision Review Committee, Technical Review Committee, or separately, to determine compliance with the requirements. Upon satisfactory review and provided existing mains are adjudged to be capable of their proper support, a letter will be sent to the design engineer stating that the City of Sumter's intent to serve water to the development and to own, operate and maintain the mains upon satisfactory completion of the project.

### B. Inspection Requirements

#### 1. Notification

- a) The City Engineer shall be notified when a new water main is to begin construction. Routine and random inspections will be made by his personnel to verify the satisfactory nature of construction.
- b) The City Engineer shall be notified in advance when the pressure testing of the new mains is to be conducted so personnel can be present. Test procedures shall be no less stringent than required by current AWWA standards.
- c) The presence of a City inspector during construction shall not relieve design engineer of his responsibilities as required by SCDHEC, LLR nor other agencies associated with the work.

### C. Record Drawings and Service Locations

Record drawings reflecting the constructed main layout shall be provided to the City Engineer in a reproducible medium and two blueprint copies. Service locations shall be indicated on the drawing so they can be accurately scaled for distance from property irons. Unless compelling reason can be demonstrated, service locations shall be near the center of the lot's street frontage. If service cannot be located, the City will make the taps at the developer's expense.

### D. Acceptance Document Issued by the City Engineer

#### 1. Documents Required of the Design Engineer

The Design Engineer, at the conclusion of the project, is responsible to product the following documents to the City Engineer:

- a) Record drawings as described in Section C.
- b) Copies of satisfactory bacteriological sample results in sufficient locations and frequency to demonstrate thorough disinfection. Two consecutive satisfactory samples, taken no less than 24 hours apart, are necessary with associated chlorine residuals recorded on the forms.
- c) Copy of the construction certification stating that the installation is in conformance with plans and specifications as approved by SCDHEC Bureau of Water.

#### 2. Acceptance for Ownership, Operation and Maintenance

Upon the satisfactory receipt and review of the documents in Paragraph 1, and with satisfactory inspection by Engineering personnel, a letter will be issued by the City Engineer to the design engineer notifying him that the new water mains are accepted by the City of Sumter for ownership, operation and maintenance.

### E. Failure of Compliance

Failure to comply with the review, notification inspection or submittal portions of this section will result in the refusal of the City of Sumter to assume responsibilities for the utilities as described.

## II. Gravity Sewage Collection Systems

### A. General Design Requirements

#### 1. Sizing and Grading of Gravity Sewer Mains

Gravity sewer mains shall be sized and assigned grades in accordance with SCDHEC requirements.

#### 2. Manholes

- a) Manholes shall be precast reinforced sections with a minimum of brickwork added to attain proper rim elevation. Brick manhole construction will only be considered where no other alternative is practical.
- b) Interior drop manholes will be acceptable provided sufficient space to accommodate maintenance tools and personnel is maintained. Interior drop manholes will be discouraged in new construction. Configuration will be according to the City's standard construction detail.
- c) Manholes may be placed more than 400 feet apart, but not more than 500 feet apart.

#### 3. Materials and Workmanship

- a) Requirements for materials and workmanship in the construction of new sanitary sewer mains shall be no less stringent than required by SCDHEC. PVC, SDR35 or better, will be accepted for sewer main within the strength confines of the material as recommended by the manufacturer. No exposed pipe shall be thermoplastic material. Ductile iron, class 50 or better, shall be used where strength requirements dictate or cover and exposure conditions govern. Other materials such as reinforced concrete or smooth wall, high density polyethylene will be considered on a case by case basis and only where SCDHEC is in agreement with its use.
- b) The developer through his contractor shall be responsible for materials and workmanship twenty-four months after the acceptance date.
- c) All gravity sewer mains are to be bedded using appropriately sized stone.

#### 4. Preliminary Design Review

City Engineering personnel will review final designs through the Subdivision Review Committee, Technical Review Committee or separately, to determine compliance with the requirements. Upon satisfactory review and provided existing capacity in downstream mains and the wastewater treatment plant, a letter will be sent to the design engineer stating the City of Sumter's intent to accept and treat sewage from new development in the amount estimate by the engineer and to own, operate and maintain the mains upon satisfactory completion of the project.

#### B. Inspection Requirements

##### 1. Notification

- a) The City Engineer shall be notified when new sewer mains are to begin construction. Routine and random inspections will be made by Engineering personnel to verify the satisfactory nature of construction.
- b) The City Engineer shall be notified when the sewer mains are ready for final inspection. At that time, Engineering personnel will inspect those elements readily accessible. The City's video camera vehicle will then inspect the complete interior of the mains for defects in material or workmanship. The standard for infiltration will be no greater than that allowed by SCDHEC.
- c) The presence of a City inspector during construction shall not relieve the design engineer of his responsibilities as required by SCDHEC, LLR nor other agencies associated with the work.

#### C. Record Drawings and Service Locations

Record drawings reflecting the as-built main layout shall be provided to the City Engineer in a reproducible medium and two blueprint copies. Service locations shall be indicated on the drawing so they can be accurately scaled for distance from property irons. Unless compelling reason can be demonstrated, service locations shall be near the center of the street frontage. Manhole final rim and invert elevations shall be determined from established USGS monuments. Manhole locations shall be surveyed from known, fixed horizontal stations. Should service taps not be located, the City will make the taps at the developer's expense.



#### D. Acceptance Document Issued by the City Engineer

##### 1. Documents Required of the Design Engineer

The Design Engineer, at the conclusion of the project, is responsible for producing the following documents to the City Engineer:

- a) Record drawings as described in Section C.
- b) Copy of the construction certification stating that the installation is in conformance with the approved plans and specifications as approved by the SCDHEC.

##### 2. Acceptance for Ownership, Operation and Maintenance

Upon the satisfactory receipt and review of the documents in paragraph 1, and with satisfactory inspection by Engineering personnel, a letter will be issued by the City Engineer to the Design Engineer notifying him that the new mains are accepted by the City for ownership, operation & maintenance.

#### E. Failure of Compliance

Failure to comply with the review, notification inspection or submittal portions of this section will result in the refusal of the City of Sumter to assume responsibilities for the utilities as described.

### **III. Sewage Pumping Systems**

#### A. General Design Requirement

1. The design of a sewage pumping station shall be no less stringent than that required by SCDHEC. Each station shall be equipped with the following elements:
  - a) Sufficient yard spacing to maneuver full-size pickup truck to any point necessary to reach equipment for service. Sufficient space through gates and maneuvering room shall be allowed for a rodder/vactor truck to approach the wet well for solids extraction.
  - b) A yard light shall be provided on a pole in sufficient location to allow nighttime work. This light is to have its own separate switch for manual operation only.
  - c) The placement of the operating panel shall be at a location which will not require the operator to stand on or near a wet well access door.
  - d) Sufficient power cable shall be supplied to carry two times the rated amperage of the pumps.

- e) Number 57 stone shall be laid down at least 4 inches thick over the fenced area.
- f) All pumps are to operate at 230 volts, 3-phase, 60 hertz. Any other power designation will be considered only under compelling reasons.
- g) The City of Sumter will accept the following pump makes only:  
**ITT Flygt, Gorman Rupp or Barnes. No “or equal” pumps will even be considered.**
- h) No grinder pumps or grinder mechanisms preceding a pump station will be accepted for maintenance by the City.
- i) The valves serving the station shall be enclosed in a separate vault with a gravity drain back to the wet well.
- j) A quick connect pump connection shall be provided down stream of the valve vault and have its own shut-off valve.
- k) All bends shall be true pattern wyes, wye pattern tees or long radius elbows.
- l) All piping through the station to the quick connect fitting shall be ductile iron.
- m) The control panel shall be fitted with a separate 110 volt weather-proof exterior power receptacle and breaker.
- n) A spare impeller will be provided to the City.

## 2. Force Mains

Force Mains shall be equipped with the following features:

- a) Force mains may be constructed from AWWA C900 or from pressure rated pipe in bell and spigot configuration. In either case, attention must be given to wave effects and transient forces on the type of pipe selected. Where higher strength is needed or pipeline exposed, ductile iron pipe shall be supplied. Ductile iron fittings with mechanical joints will be used to join pipes. Retainer glands shall be supplied at the joints.
- b) The force main will be designed for a velocity of not less than 3 ft. per second.
- c) Air relief valves will be constructed as shown in the City of Sumter’s standard construction details and located as necessary to relieve the force main pressurization and vacuum.
- d) A reasonable transition from the force main discharge to the receiving gravity sewer must be provided.

## B. Inspection Requirements

### 1. Notification

- a) The City Engineer shall be notified when a new sewage pumping station begins construction. Routine and random inspections will be made by Engineering personnel to verify the satisfactory nature of construction.
- b) The City Engineer shall be notified when the new pump station is ready for electrical and warranty inspection, final inspection and force main pressure testing. At these times, Engineering personnel will inspect the system for compliance with the requirements of Section A and personnel of the Mechanical Maintenance Department and City Electrician will also provide inspection services. The force main is required to retain one hundred percent of the pressure rating of the pipe for 2 hours and must be witnessed by Engineering personnel.
- c) The presence of a City inspector during construction shall not relieve the design engineer of his responsibilities as required by SCDHEC, LLR nor other agencies associated with the work.

## C. Record Drawings, Operation Manuals and Warranty

Record drawings are required if any significant change in the pumping station on the force main alignment is made. The engineer must present all warranty information and operations manuals at that time. The developer through his contractor shall be responsible for materials and workmanship for twenty-four months after the acceptance date. The spare impeller must also be supplied.

## D. Documents Required of the Engineer

1. The Design Engineer, at the conclusion of the project, is responsible to produce the following documents to the City Engineer:
  - a) Record drawings and other items as described in Section C.
  - b) Copy of the construction certification stating that the installation is in conformance with the approved plans and specifications as approved by the SCDHEC.

## E. Acceptance Documents Issued by the City Engineer

Upon receipt of the documents in C and D and the spare impeller and satisfactory inspections by Engineering personnel, a letter will be issued by the City Engineer to the design engineer notifying him that the sewage pumping station is accepted by the City for ownership, operation and maintenance.

## IV. Roadway Construction

### A. General Design Criteria

#### 1. Rights of Way

Sufficient rights of way shall be provided to accommodate the roadway and necessary should width. Refer to Exhibit 17 of Article 8, Section E of the Ordinance.

#### 2. Roadway Construction

Roadways, curbs and gutters constructed to become part of the City's maintained streets shall meet the design standards of the SCDOT, Standard Specification for Highway Construction, 1986 edition, the Standard Drawings for Road Construction and subsequent sections of this document.

#### 3. Meeting Existing Pavement

Where new pavement meets existing paving, the transitions will be made smooth and even. Streets shall be so constructed that transitions from state roads to city streets are not noticeable.

#### 4. Material and Construction

- a) Rough grading and mucking shall remove all undesirable materials from the area. Should insufficient satisfactory cut material exist to fill excavated areas, suitable sand clay shall be furnished to restore grade.
- b) The stability of the sub-base shall be demonstrated by proof rolling prior to installation of improved base. Proof rolling of the improved base material must also demonstrate its stability prior to application of surface course.
- c) Pavement shall be executed using one of the following three methods:
  1. An 8-inch macadam base course followed by 2 inches of asphalt concrete surface course, compacted.
  2. A 6-inch macadam base course followed by 2 inches of asphalt concrete binder course, then to be followed by 1 ½ inches of asphalt concrete surface course, compacted. It is intended that the 1 ½ asphalt concrete surface course will be applied only after 75% of housing construction is complete. Phased projects will be treated as a separate project for each phase.

3. Base and surface courses as designed and sealed by a licensed Geo-Technical Engineer following soil and compaction tests on the proposed right-of-way. The design should be for a pavement requiring minimum work/repair for 20 years. The City Engineer will review the engineered pavement design and make the final determination of its acceptability. In no case shall any design be accepted with less than 6" macadam base course followed by 1 ½ ' of asphalt concrete surface.

d) Prior to construction, the roadway system shall be reviewed by the City Transportation Coordinator to judge compliance with geometric design and traffic flow criteria. The City Engineer's office will consult in these matters when requested.

e) Inspection Requirements: The City Engineer shall be notified when construction begins. Random, routine inspections will be made by Engineering personnel during construction. Engineering personnel shall be notified in advance of proof roll stability tests and no tests shall be accepted without witness by such personnel.

**Unsatisfactory construction in any phase shall be grounds for removal and replacement of the material in place to the City's satisfaction.**

#### 5. Seeding to Prevent Erosion

All developing areas adjacent to new roadways shall be seeded to prevent erosion of soils onto the roadway. Silt fences will be required where grassing is not sufficient or timely to prevent erosion. Should erosion occur, the developer will be responsible to remove the siltation.

#### 6. Sidewalks

Sidewalks shall be required as given in Section 8, Exhibit 17, of the Ordinance. Sidewalks shall be no less than 4-inches thick and 4 ½ feet wide. Where sidewalks cross driveways, the thickness shall be increased to 6-inches. Provisions shall be made for handicapped access to the sidewalks and be barrier free at intersections. Sidewalks shall be composed of concrete or sand cement with a 28 day compressive strength of 3500 psi or better. Subgrade below the sidewalk shall be properly prepared for construction.

#### 7. Special Structures

Special Structures shall be reviewed on a case by case basis. No roadway or roadside structure shall interfere with the orderly and safe progression of traffic.

## 8. Islands with Signs and Special Adornments

Islands constructed to act as planters or entryway adornments will not be maintained by the City. Such structures shall remain the responsibility of the developer or homeowner's association for maintenance. Any subsequent damage to road surfaces by plantings in these islands shall be the responsibility of others for repair.

## 9. Tree Proximity

Trees shall not be planted in close proximity to road surfaces. Shoulders shall be kept clear of trees unless additional right of way is provided for their growth without interference with utilities placed in the roadway shoulders.

## B. Acceptance of Roadways by the City of Sumter

Upon satisfactory inspection of roadway construction and receipt of any title changes, deeds or easements for the roadway, Engineering personnel will provide to the Public Services Director a recommendation for acceptance subsequently to be presented to the City Council. The Council acts thereupon to accept the roadway system for operation and maintenance, at its pleasure. The developer shall comply with the bonding requirements of the Ordinance, Section 7,d.8, upon acceptance.

## **V. Drainage Facilities**

### A. General Design Criteria

#### 1. Design Methods

The design and sizing of storm drainage shall be according to the Rational Method, where applicable. Other analysis methods will be accepted upon satisfactory scrutiny by the City Engineer. Storm drainage should be based on the 25-year storm event specific to the area of Sumter.

#### 2. Required Elements and Materials

- a) Sufficient drainage inlets, in size, type and number, must be supplied to sufficiently remove stormwater. Water shall be conveyed by piping composed of SCDOT certified reinforced concrete. Smooth walled polyethylene pipe may be used where storm drains proceed off the roadway.
- b) All gravity drainage pipes shall be bedded with appropriately sized stone.

c) All roadway crossings and inlet basins must be composed of reinforced concrete or concrete and brick masonry. Inlet boxes shall be equipped with flush mount manhole lids.

d) Blind boxes are to be avoided unless absolutely critical to the design.

e) All piping shall be installed using a bedding class commensurate with the soil conditions. Where any piping is provided with less than one foot of cover under travel ways, special construction techniques must be devised and receive the City Engineer's approval prior to installation. No metallic piping shall be used unless expressly permitted through the City Engineer.

f) Discharge points for drainage pipes shall not promote erosion. Headwalls or one man rip rap with geofabric underlayment are required to stabilize soils at terminus of storm drain piping.

### 3. Open Ditches

Open Ditches will not be allowed for construction. Only if compelling reason is shown for an open ditch to be necessary will its installation be considered.

### B. Inspection

The City Engineer shall be notified when construction begins. Routine random inspections will be made by Engineering personnel to verify the satisfactory nature of construction. When complete, a final inspection shall be performed on all readily observable component. The City video camera vehicle will inspect the interior of the piping for quality of material and workmanship. The developer through his contractor shall be responsible for materials and workmanship for twenty-four months after the acceptance date.

### C. Record Drawings

Record drawings of the drainage system shall be supplied to the City Engineer with one reproducible copy and two blueprinted copies. Rim and invert elevations shall be determined from established USGS monuments and horizontal layout shall be determined from an established monument.

### D. Acceptance Documents Issued by the City Engineer

Upon receipt of the required documents and satisfactory inspection by Engineering personnel, the City Engineer will issue a statement accepting the drainage system for ownership, operation and maintenance. The City of Sumter will not take for ownership or be responsible for the upkeep of any stormwater sedimentation impoundments.

## **VI. Commercial, Residential and Multiple Occupancy Utility Connections**

### **A. General**

Service connections to domestic customers will be evaluated by the City Engineer as pertain to taps inside and outside the City of Sumter where water service does not exceed two inches and sewer service does not exceed 4 inches. Services larger will be referred to the Assistant Public Services Director for evaluation of pricing.

### **B. Services to Multiple Family Dwellings**

Where multiple family dwellings or commercial buildings for multiple occupancy are constructed, each unit within the structure shall have a separate water service, unless the building contains rental units and is intended for service through a master meter. A common sewer may serve the overall structure but shall not be smaller than six-inch diameter.

### **C. Single Family Dwellings and Single Occupancy Commercial**

1. Sewer services shall be equipped with a cleanout at the property line which will terminate six inches below grade. A one foot piece of steel reinforcing rod shall be placed near the cleanout so it may be readily found by metal detectors. Water services shall be placed in reasonable proximity to the sewer service to simplify location. The physical location of the services are to be near the middle of the street frontage.
2. All water services shall be equipped with appropriate backflow preventers. The customer is obliged to provide the device where water services are two inches or greater.

## **VII. Easements, Deeds and Benchmarks**

### **A. General**

In all cases, easements or deeds to the City of Sumter shall be prepared and recorded granting the right to enter onto lands where utilities are installed for purpose of maintenance or future construction where such lands are not in public rights of way.

Typical easement widths shall be:   0 to 6 ft. cut - 20 ft. easement  
  6 and greater - 30 ft. easement

As part of the acceptance process, all easements or deeds required for the project shall be submitted with previously described documents.



## B. Benchmarks

A benchmark shall be permanently established in the subdivision in a location usable to all utility designers, surveyors and contractors. This benchmark will be used throughout construction regardless of any phasing of the project. It shall be established from USGS markers of known elevation. The benchmark's exact location and nature will be indicated on all site and utility plans.

## **VIII. Provision for Variances**

Should an individual be unable to meet the requirements of this document, a request for variance to the particular section in question may be requested. Requests will be addressed to the Sumter City-County Planning Commission which will make the informed decision regarding the merit of a variance request as provided for in the Ordinance.

