

## **SECTION I - GENERAL INFORMATION**

### **1.01 Application of the Standard**

The Construction Specifications in this manual generally refer to work located in the street right-of-way, utility easements and/or storm drainage easements. It is not the intent of the manual to specify how general construction on private property shall be performed.

### **1.02 General Arrangement of Plans**

Water, sewer, grading, streets, and drainage plans are generally preferred on one consolidated plan. However, if information is cluttered, separate plans may be prepared if the other information is provided in a light line weight.

In general, all plans shall show:

1. scale(s)
2. date of issue
3. purpose of issue (i.e. for review only, for construction only, etc.)
4. north arrow
5. USGS elevations and benchmark(s)
6. existing streets, underground utilities (including lines, valves, manholes, etc.), structures, power poles, rights-of-way, easements, etc., labeled with an identification and size, i.e. "existing 8" water line", "Elm Road (SR 0001), 60' ROW, 30' pavement", "Duke Power R/W, 100"
7. creeks and drainage ways
8. flood plain
9. lot lines
10. vicinity map
11. preparer's seal

The nature and date of all revisions must be included on all revised pages.

### **1.03 Permits, Approvals and Encroachments**

The City shall review all plans prior to submittal to any other reviewing agency.

All approvals by all regulating authorities shall be obtained before any construction is started. The City shall incur no costs for plan approvals. Copies of all approvals, including all permits, maps, plans, and executed agreements shall be received by the City before construction begins.

Application for approval of water and sewer facilities by NC State Authorities shall be completed in the name of the City for public extensions and be submitted for signatures accompanied by all required documentation, plans and fees. Privately owned extensions should be submitted in the name of the owner/developer.

Other approvals must be obtained from (but not limited to) Rowan County (sedimentation and erosion control), NC Department of Transportation (right-of-way encroachment), railroads and utilities (right-of-way encroachment), and private property owners (right-of-way). All permanent rights-of-way shall be obtained in the name of the owner/developer and transferred to the City or in the City's name initially.

The City shall incur no expense for permitting or right-of-way procurement.

#### **1.04 Approval by the City**

Approval by the City shall be obtained by the following procedure:

1. Submit three (3) sets of plans with a letter requesting approval of the plans. One (1) set of reproducible plans shall be submitted upon final approval.
2. The City shall review the plans for conformance with the City's ordinances and standards and make appropriate comments. The City shall return plans with comments or stamp the reproducible plans upon final approval.
3. All approvals, easements and rights-of-way shall be obtained in accordance with Item 1.03 of this section.
4. Shop Drawings shall be submitted and approved prior to the start of construction.
5. A mandatory pre-construction conference shall be held prior to the start of construction. The pre-construction conference shall be attended by the City, owner/developer, engineer, and contractor. A minimum advance notice of 2 business days is required to schedule the conference. The Engineer shall bring a copy of the approved plans, permits, right-of-way encroachments, recorded easements, etc. The contractor shall bring a construction schedule, shop drawings, copy of insurance policy with the appropriate liability coverage (\$1,000,000 per occurrence) etc.
6. Utilities Management or City Engineer shall allow construction to begin when all permits have been received and all requirements of the appropriate Review Board(s) have been met.

#### **1.05 Construction Records and Inspections**

##### **Record Drawings**

Record drawings shall be prepared to reflect all changes made during construction. A field survey (by a Professional Land Surveyor) to locate all roads, structures, and new manholes, and to determine the inverts of new storm and sanitary sewer lines as well as location of all water lines, hydrants, bends and connection points shall be conducted by the owner/developer.

All elevations shall be tied to USGS benchmarks and a permanent easily accessible benchmark shall be established at the site and noted on the plans.

Record drawings shall show locations of all sewer laterals and water services referenced to fixed points so as to be easily located in the event that the markers are destroyed. Record drawings shall show the location of all drainage easements and utility rights-of-way. Drainage discharges shall be referenced to fixed points so as to be easily located. The method of location of these items shall be as directed by Utilities Management or City Engineer. The City will review the record drawings, if corrections are needed, the drawings will be returned to the Engineer for revisions. Record drawings shall consist of a complete set of corrected plans and be printed on mylar and a digital copy on the appropriate media.

### **Inspection**

Construction inspection shall be as described in Section IV of this manual. Care shall be taken to notify the proper authority in sufficient time to inspect and/or witness all phases of construction and testing as required. The owner/developer shall see that adequate inspection is provided at the job site to ensure all installation is done in accordance with the approved plans and these standards and specifications and to allow certification(s) as required.

Construction inspection by a registered professional engineer or a representative of the Engineer's office, under the Engineer's supervision, is required. The Engineer must submit a statement acceptable to State Agencies and the City of Salisbury, reflecting that the water and/or sewer system was constructed in accordance with the approved plans and specifications and submit a copy of his inspection log. The Engineer must also submit a statement certifying the streets and storm drainage have been constructed in substantial conformance with City Specifications and the approved plans.

A City of Salisbury Utilities Inspector will spot check the construction on all permitted projects both public and private (private water lines when these lines provide any type of fire protection and on all sewer lines). Concurrent attendance by the Utilities Inspector and the Engineer or engineer's representative is required for all water and sewer testing.

### **Final Inspection**

A final Inspection shall be conducted upon completion of all construction and testing. The purpose of the final inspection is to verify that all construction and materials meets the requirements of the approved plans and City of Salisbury standards and specifications. Concurrent attendance by the contractor, Utilities Inspector and the Engineer or engineer's representative is required. During the final inspection the Engineer or engineer's representative shall make a "punch list" containing engineer's and City's comments. Each section of sewer line shall be visually inspected ("lamped" by the Engineer or his representative) or CCTV inspected. All lot corners are to be located and staked prior to final inspection.

### **Test Results**

Tests of all type shall routinely be prepared at no cost to the City. The City shall receive copies of all tests which do not meet standard specifications. The Contractor shall be responsible for reviewing and retaining all test reports.

Prior to acceptance of the completed job, the Contractor shall submit a notarized statement certifying that all test reports were acceptable and/or all unacceptable materials have been replaced.

#### **1.06 Guarantee of the Work**

The work shall be guaranteed by the owner/developer for a period of one year from acceptance by the City. The guarantee shall cover all materials and workmanship. Any defective work or materials shall be repaired or replaced at no expense to the City. The owner/developer shall submit a one-year warranty document to the City of Salisbury prior to final acceptance of the project.

#### **1.07 Acceptance of Facilities by the City**

The City shall accept new facilities upon completion of the following:

1. All construction is complete, all tests are satisfactory, a final inspection has been held, and all punch list items have been addressed (release by Utilities Inspector).
2. Plan originals with "record drawings" revisions are received.
3. Engineer's certifications of water, sewer, drainage, and streets are received, and necessary certifications are submitted to the State and the City of Salisbury.
4. Contractor's certification of tests has been received.
5. The Owner/Developer's statement of one-year guarantee has been received.
6. All permanent easements, rights-of-way, and permits are properly recorded and filed.
7. Any releases required by Utilities Management and/or City Engineer have been made (including easement/property issues).
8. Evidence of final payments to suppliers and sub-contractors (for public designed utilities & utilities to be taken over by the City of Salisbury):
  - a. Contractor's Affidavit of Payment and Debts and Claims.
  - b. Contractor's Affidavit of Release of Liens.
  - c. Evidence that all claims have been settled.

#### **1.08 Variance Procedure**

Requests for variances from the Standard City requirements shall be reviewed on a case by case manner as follows:

1. The party requesting the variance shall discuss the issue with the appropriate City Staff members. Staff will determine if additional engineering studies, special agreements and/or

additional documentation is needed to support the variance request. Staff will also determine which of the following variance procedures shall apply.

2. If the variance relates to an issue such as development density, street classification, location of intersections, access, or other items which are easily demonstrated before engineering plans are developed, the requesting party shall submit the variance request in conjunction with the preliminary plat review. Staff will forward the variance request and a staff recommendation to the Planning Board for consideration. The variance shall be clearly identified on the preliminary plat and, if approved by the Planning Board, shall be considered an acceptable concept.
3. If the variance relates to an issue which becomes apparent only after engineering plans have been developed, the requesting party shall submit the variance request in conjunction with the engineering plan review. Staff will forward the request and a staff recommendation to City Council for consideration. Engineering plans will not be approved until all variance requests have been approved by Council or the design meets standard City requirements.

#### **1.09 Erosion and Sedimentation Control**

All work shall be done in accordance with and subject to the limitations of Rowan County and State rules and regulations for erosion and sediment control.

It shall be the responsibility of the owner/developer to obtain approval of a sedimentation and erosion control plan from Rowan County. Additional information as to required format and plan content is available from Rowan County Environmental Services, 402 North Main Street, Salisbury, North Carolina, 28144, telephone (704) 216-8588.

Erosion control measures shall be provided to prevent any erosion or sedimentation problems that might affect any existing utility lines or structures during construction.

## **MATERIALS**

### **1.10 Clean Backfill**

Clean backfill material shall contain no man-made or organic material or clay pockets and shall be free of rocks, clods, or other materials larger than 2-inches in nominal diameter. Materials from on-site excavations may be used for clean backfill provided they meet the specified requirements and contain optimum moisture content for proper compaction. Water saturated material shall not be used as clean material. If sufficient on-site clean backfill material is not available, acceptable material from an off-site borrow area shall be secured.

### **1.11 Backfill**

Backfill shall be free of all organic materials and shall not contain any rocks larger than 4 inches in diameter, or be in a water saturated condition.

### **1.12 Crushed Stone or Screened Gravel**

Crushed stone or screened gravel shall meet the requirements of the North Carolina Department of Transportation Standard Specifications - latest revision.

Crushed stone or screened gravel shall conform to standard size No. 5. Any rock, run-of-bank sand or gravel excavated on-site which meets this gradation may be used. Specifically the stone shall meet the following gradation:

<u>Sieve Size</u>	<u>Percentage Dry Weight Passing Designated Sieve Size</u>
1-1/2 inch	100
1 inch	90-100
3/4 inch	20-55
1/2 inch	0-10
3/8 inch	0-5
No. 200	0-0.6

### 1.13 Pipe Bedding

All material used for pipe bedding shall conform to North Carolina Department of Transportation Standard Specification latest revision for standard size 67 material. Any rock, run-of-bank sand, or gravel excavated on site which meets the following gradation may be used.

<u>Sieve Size</u>	<u>Percentage Dry Weight Passing Designated Sieve Size</u>
1-inch	100
3/4-inch	90-100
3/8-inch	20-55
No. 4	0-10
No. 8	0-5
No. 200	0-0.6

### 1.14 Riprap

The stone for riprap shall consist of field stone or rough unhewn quarry stone. The stone shall be sound, tough, dense, and resistant to the action of air and water. The riprap shall be of the size required for proper erosion control and shall meet the standards for NCDOT Class 1 riprap, Class 2 riprap, Class A erosion stone or Class B erosion stone. Class 1 stone shall vary in weight from 5 to 200 pounds. At least 30 percent of the total weight of the riprap shall be in individual pieces weighing a minimum of 60 pounds each. Not more than 10 percent of the total weight of the riprap may be in individual pieces weighing less than 15 pounds each. Class 2 stone shall vary in weight from 25 to 250 pounds with at least 60% of the total weight of the riprap and shall be individual pieces weighing a minimum of 100 pounds. Not more than 5% of the total weight of the riprap may be individual pieces weighing less than 50 pounds each. Class A erosion stone shall range in size from 2"-6". Class B stone shall range from 5"-15".

During placing, the stone shall be graded so that the smaller stones are uniformly distributed through the mass. The stone may be placed by mechanical methods, augmented by hand placing where necessary. The placed riprap shall form a properly graded, dense, neat layer of stone. The channel shall be undercut to allow for the following depths of riprap.

Class I -	2'
Class II -	2.5'
Class A -	1'
Class B -	2'

## 1.15 Portland Cement Concrete

### **Portland Cement**

Portland cement shall meet the requirements of AASHTO M85 for portland cement Types I, II and III, except the maximum fineness requirements of AASHTO M85 do not apply to cement used in precast concrete products.

Air-entraining portland cement shall not be used.

Different types of cement shall not be mixed nor used alternately.

Cement shall be protected from contamination or damage during handling and storage. Cement which is damaged, partially set, lumped or caked shall not be used.

### **Fine Aggregate**

Fine aggregate shall consist of natural or manufactured sand having clean, durable, hard, uncoated particles, free from dirt, wood, paper, fiber and all other foreign material.

Natural sand shall meet the gradation requirements for No. 25 fine aggregate. Manufactured sand shall meet requirements for standard size 2MS.

<u>Sieve Size</u>	<u>% Total Weight Passing</u>	
	<u>2S</u>	<u>2MS</u>
3/8"	100	100
#4	95-100	95-100
#8	80-100	84-100
#16	45-95	45-95
#30	25-75	25-75
#50	8-30	8-35
#100	0.5-10	0.5-20
#200	0-3	0-8

### **Coarse Aggregate**

Coarse aggregate shall consist of crushed stone, crushed or uncrushed gravel or other inert materials of similar characteristics, washed to remove clay, loam and dust. The aggregate shall be free from dirt, wood, paper, fiber and all other foreign materials.

Coarse aggregate shall meet requirements of standard size no. 67 or no. 57. Standard size no. 78M shall be used in concrete for machine placed curb, gutter and paved ditch.

For aggregate gradations, see specification Section II, Item 5.0, "Stone and Aggregate".

## Water

Water used for mixing concrete shall be clear, potable, and free of deleterious substances.

## Concrete Mix Design

### REQUIREMENTS FOR CONCRETE

Class of Conc.	Minimum Compressive Strength at 28 days,  Lbs. Per Sq. Inch	*Maximum Water-Cement Ratio				*Consistency, Max. Slump Inches		Maximum Cement Content Pounds Per Cu. Yd.	
		Air-entrained Concrete		Non-Air-entrained Concrete		Vibrated	Non- Vibrated	Vibrated	Non- Vibrated
		Rounded Aggregate	Angular Aggregate	Rounded Aggregate	Angular Aggregate				
AA	4500	.381	.426	-	-	3	-	639	-
A	3000	.488	.532	.550	.594	3	4	564	602
B	2500	.488	.567	.559	.630	2.5	4	508	545
CMB	3500	.427	.470	-	-	3	-	639	-

## Depositing

Concrete shall not be used if it cannot be placed within ninety (90) minutes of the dispatch time. Concrete shall be deposited in such a manner so as to prevent contamination by foreign material and segregation due to rehandling or flowing. Segregated concrete and/or concrete consisting of foreign material shall not be used. Depositing shall not be done when temperature has not exceeded 35 degrees Fahrenheit and rising by 10:00 A.M. Concreting shall cease when the descending air temperature in the shade falls below 40 degrees Fahrenheit. It shall not resume until the ascending air temperature rises to 35 degrees Fahrenheit. All concrete shall be kept from freezing. Frozen concrete shall be replaced. Free fall shall not exceed 3 feet in any case.

## Forms

Forms may be made of wood, plywood, metal, or any other suitable material. Forms shall be mortar tight, of material strong enough to resist noticeable deflection or bulging between supports, and the interior dimensions of the forms shall be such that the finished concrete shall be of the proper form and dimensions. The design of the forms shall take into account the effect of vibration of concrete as it is placed and also the rate of speed at which the forms will be filled.

Mechanical vibrators, of an approved type, and continuous spading and/or rodding of concrete shall be used to produce proper contact of concrete with forms and reinforcing steel in piers and with forms and pipe in monolithic inverts insuring a compact, dense and impervious artificial stone of uniform texture.

## **Curing**

All concrete shall be cured by one of the following methods:

- (a) Forms left in place for a period of seven (7) days. Exposed concrete shall be moist cured.
- (b) Moist curing performed when forms are removed before seven (7) days. All construction joints shall be moist cured.
- (c) Curing compound used immediately after forms are removed and all surface water has disappeared.

## **Finishing**

The structure shall have a uniform and textured surface. All form marks exposed to view shall be rubbed off with a stone.

## **Testing**

Concrete shall be tested in accordance with Section IV of this manual.

## **Acceptance of Concrete**

The City Engineer or Utilities Management may require as many additional tests as deemed necessary to insure the concrete acceptability. The cost of the tests shall be at no expense to the City.