

## SECTION 1 - GENERAL DESIGN STANDARDS

### 1.1 General Requirements

#### 1.1.01 General

- A. The design of all utility systems and extensions or modifications thereto shall be performed under the direction of a registered professional engineer with a current registration in the Commonwealth of Virginia in accordance with Title 54, Chapter 3 of the Code of Virginia, 1950, as amended. Where applicable, design may be performed under the direction of a certified land surveyor in accordance with Sec. 54-17.1(3)(b) of the above cited code.
- B. All design shall conform to the Commonwealth of Virginia "Sewerage Regulations", the "Waterworks Regulations" and to the requirements of other State and Federal Agencies having jurisdiction.
- C. Additionally, all design shall conform to the requirements of New Kent County Utilities Department (hereinafter referred to as "Department"). Where the requirements of the State and Department, hereafter referred to as Department, are in conflict, the more restrictive requirements shall govern.
- D. All designs submitted to New Kent County shall include completed review checklist forms. These forms can be found in Volume 1, Section 5, Forms F-5 and F-6.
- E. As-built drawings shall be submitted in a compatible AutoCAD format and approved by the Department prior to release of bonds and prior to connection to the system.

#### 1.1.02 Engineering Report

- A. An engineering report shall be submitted to and approved by the Department before preparing drawings and specifications except for minor extensions as determined by the Department. The report shall contain an overall plan which shall incorporate all of the proposed construction together with a sufficient amount of the surrounding area in order to clearly outline the interrelationship of the two. Existing and proposed development shall be shown as well as existing and proposed utilities. Where phase development is contemplated, the extent of each phase shall be clearly delineated. Additional requirements shall be imposed as detailed in other divisions of these standards and as required by the Department.

#### 1.1.03 System Layout

- A. Layout map shall be prepared which delineates sewer shed area boundaries or pressure zone boundaries for sewer projects and water projects respectively. The map shall clearly define the areas pertinent to interim and ultimate development of

the area proposed to be served. The Layout Map shall show present and future development, proposed interim and future utilities as well as those existing utilities that will be affected by or have an effect on the proposed utilities.

#### 1.1.04 System Design

- A. An analysis shall be prepared that will tabulate the numbers of people served or proposed to be served as determined from the County's Land Use Plan, Planned Water or Sewer Service Area Maps, and/or existing Zoning. The tabulation shall be incremental areas for evaluation purposes.
- B. Minimum, average and maximum flows shall be developed for areas and sub-areas and tabulated in the report as deemed necessary or appropriate.
- C. The design shall address overall present and future flows and system capacities of existing and proposed utilities as they may be affected by or may affect the facilities involved and shall develop proposed water main and sewer line sizes as well as proposed sewer pump station capacities, well capacities, and tank volumes as needed.
- D. The design shall be based on ultimate development and shall present such factors as deemed necessary for a sound evaluation of the several factors used in development of the report.
- E. Where an alternate design is proposed that would incorporate interim or staged construction, the report shall develop the alternate design and shall present a thorough investigation and justification for consideration of the alternate.

### 1.2. Drawing Organization and Format

#### 1.2.01 Drawing Organization

- A. Drawings shall consist of the following types of sheets arranged in the order listed:
  - (1) Cover Sheet
  - (2) Index Sheet (Not less than 1" = 600' scale)
  - (3) Overall Utility Sheet (not less than 1" = 200', showing existing and proposed water and sewer utilities)
  - (4) Plan Sheets
  - (5) Plan and Profile Sheets
  - (6) Standard Sheets and Special Details

(7) Erosion and Sediment Control Details

- B. Projects consisting of only structures may not require plan and profile sheets and projects for construction of gravity sewers, force mains or water lines may not require the use of plan sheets except for special details.

1.2.02 Sheet Format

- A. All construction drawings shall be on sheets 24 inch x 36 inch.
- B. The cover sheet shall contain the Owner's name and project description in large, distinctive letters, a vicinity map with a minimum area of 144 square inch drawn where possible on a scale of 1 inch equals 2,000 feet to indicate the general vicinity of the contemplated construction, an index to the plan sheets and the signed stamp of the Owner or principal of the engineering firm.
- C. The Index Map shall be to a scale of not less than 1 inch equals 600 feet and shall show all proposed utility construction with ties to existing utilities. The lines of proposed construction together with proposed utility structures shall be indexed to the drawings to indicate the extent of coverage on each drawing, or, in the case of structures, to the group of drawings involved.
- D. The Overall Utility Sheet shall be to a scale of not less than 1 inch equals 200 feet and shall show all proposed water and sewer construction with ties to existing utilities. This sheet is intended to provide the Contractor and Owner an overall plan of the water and sewer system associated with the project.
- E. Where proposed sewer facilities tie to existing sewer facilities, the plans shall show an equality in elevations whenever elevations do not match those shown on record drawings of the Department. New Kent County Sewer elevations shall be designated as "N.K.S." and shall be for Department Information only.
- F. Plan sheets as well as Plan and Profile Sheets shall show horizontal, vertical and topographic data as outlined in Section 1.2. of these Standards.
- G. Drafting Conventions
  - (1) Follow the symbols shown on the Standard Symbols Sheet at the end of this Tab No. 1.  
  
Line weight for existing facilities shall be no heavier than 0.021 inch.
  - (2) Standard Symbols - Proposed Facilities  
  
Symbols shall be as shown above except that solid lines shall be used for

pipes; line weight shall be no lighter than 0.026 inches and no heavier than 0.035 inches.

(3) Drafting Standards for Good Reproduction

Letters will be no smaller than 1/8 inch and care will be exercised to keep the lettering open so that it will be legible in the event drawings are reduced to half size. All drawings must be capable of producing legible second generation prints after being reduced to half size.

H. Additional Information

- (1) Drawings for minor utility extensions shall include estimated materials quantities and current Department standard notes.
- (2) Horizontal scale in Plan and Profile Sheets shall be no smaller than 1 inch equals 50 feet and shall be in State Plane Coordinates.
- (3) Vertical profile scale shall be no smaller than 1 inch equals 10 feet.
- (4) All existing and proposed underground utilities shall be shown in plan and profile.
- (5) Bench Marks shall be set no more than 500 feet apart along the lines of construction outside the limits of construction. Datum for elevation shown shall be in State Plane Coordinates referenced to Mean Sea Level.

**1.3. Easement Requirements**

1.3.01 All sewer and water lines to be under the jurisdiction of New Kent County shall be located either in public right of way or easements.

- A. Private owners developing water and sewer facilities which will be under the control of New Kent County shall prepare plats and convey easements to New Kent County.
- B. Water and sewer facilities prepared for New Kent County shall be prepared for all construction outside of public right of way.

1.3.02 Permanent easements shall be a minimum of 20 feet in width with consideration for wider easements where more than one facility may occupy an easement, or where, because of line size or access requirements, wider easements are desirable. The department reserves the right to require wider easements on a case-by-case basis. Easements shall generally be centered on the utility line unless the Engineer can demonstrate that this is impractical.

1.3.03 Construction easements shall be acquired for all County contracts. Developers constructing facilities are not required to have construction easements where work is on the developer's

property. Construction easements shall provide a minimum working width of 50 feet, including the 20 foot permanent easement. Generally it is desirable to provide more construction easement on one side than the other. This allows room for construction traffic and material storage.

- 1.3.04 Easement plats shall be on sheets (8½ inch x 14 inch), (11 inch x 17 inch), (17 inch x 28 inch), or (24 inch x 36 inch). Where longer easements are required, multiple sheets may be utilized.

A center line for the easement shall be shown together with the limits of both the proposed permanent and construction easement widths referenced to the center line of the easement. Bearings and distances shall be shown on the center line of the easement and on the right-of-way or property lines where they intersect the center line. Distances shall be shown from fixed points on both the center line and the property lines to the intersection of the two. Bearings, distances and closures shall be to the degree of accuracy of 1 in 8,000 except that approximations will be permitted where it is considered impractical to delineate existing property lines. The body of the plat shall show the name of the property owner and the Deed or Will Book reference for the source of title. The names of all adjacent property owners and a north arrow shall also be shown. Street names or highway route numbers shall also be shown where applicable.

- 1.3.05 No other utility lines, storm sewers, or other appurtenances shall be laid parallel or nearly so, within any permanent water/sewer easement. Such facilities may cross permanent water/sewer easements as nearly perpendicular as possible.

## **1.4. Review Procedure**

### **1.4.01 General**

- A. The engineer shall be responsible for obtaining the review and necessary approvals of all drawings and specifications by applicable County, State and Federal agencies having jurisdiction. Copies of such approvals shall be submitted to the County at the time of final review by the County.
- B. The engineer shall be responsible for obtaining the “Certificate to construct” from both VDH and VDEQ prior to the commencement of construction for utility system extensions.

### **1.4.02 Department Review**

- A. Two sets of plans shall be submitted with the current Review Checklist for Water and Sewer Plans (Form F-5) and Information Sheet to the Department for review. If they are found acceptable, the engineer shall submit a third set and all three shall be marked "Approved" by the Department.
- B. When addressing previous comments, the engineer shall provide a list of prior

comments and below each comment, explain how each has been addresses. Changes requested after plans are approved shall be submitted to the Department with two copies for review with the changes highlighted or "bubbled" on the plans that clearly outline the changes. The Department reserves the right to require full sets for resubmittal if it deems that they are necessary for its review.

END OF SECTION