

## 6. ENGINEERS CHECKLIST FOR WATER AND SEWER PLANS

### 6.1 Title Page

- \_\_\_\_\_ A. Project Name
- \_\_\_\_\_ B. Engineer's or Class B Surveyor's Seal and Original Signature
- \_\_\_\_\_ C. Vicinity Sketch (complete in detail)
- \_\_\_\_\_ D. Title Block
- \_\_\_\_\_ E. GPIN Number and/or Tax Map and Parcel Number
- \_\_\_\_\_ F. Magisterial District
- \_\_\_\_\_ G. Name, Address, and Phone Number of Developer/Owner
- \_\_\_\_\_ H. Legend of sanitary sewer and water mains, other utilities and structures existing and proposed ground and pavement profile.

### 6.2 General

- \_\_\_\_\_ A. The plan includes an overall plan of the water and sewer layout, including any phasing of the development. A separate Utility Master Plan may be submitted to meet this requirement.
- \_\_\_\_\_ B. Engineer and/or Surveyor has notified all property owners prior to performing any offsite design and/or surveying work.
- \_\_\_\_\_ C. Table of Estimated Quantities (including breakdown of type of pipe).
- \_\_\_\_\_ D. All sheets in set bear an appropriate signed and dated seal.
- \_\_\_\_\_ E. Water and Sewer Notes (as a minimum, reference has been made to County Standard specifications and details).
- \_\_\_\_\_ F. Vertical scale is 1" = 5' or 1" = 10'; and horizontal scale is no greater than 1" = 50', unless otherwise approved by the Department of Public Utilities. A "bar" scale is shown on each sheet.
- \_\_\_\_\_ G. All water and sewer designs conform to the latest County, State and Federal regulations or standards.
- \_\_\_\_\_ H. Plan and Profile sheets are on 24" x 36" paper unless otherwise approved by the County.
- \_\_\_\_\_ I. Scale drawings are accurate to within +/- 2% for vertical and horizontal scales.

### 6.3 Plans

#### A. Utility Plans

- \_\_\_\_\_ 1. All water, sewer, road, and drainage structures are shown on one plan sheet.
- \_\_\_\_\_ 2. All plans include:
  - \_\_\_\_\_ a. Existing water and/or sewer lines are properly labeled with size and with horizontal and vertical distances referenced on the plan.
  - \_\_\_\_\_ b. At least two vertical bench marks are shown on the plan.
  - \_\_\_\_\_ c. Horizontal and vertical scale shown on each sheet (scale should be same on plan and profile).
  - \_\_\_\_\_ d. All existing easements are shown accurately and proposed utility easements are shown on plans. The existing easements reflect accurate recordation information.
  - \_\_\_\_\_ e. All existing and proposed storm sewer lines, gas, telephone, power, and other utility lines, which cross or run parallel to the sewer or water mains, are shown with horizontal and vertical separations given, where applicable.
  - \_\_\_\_\_ f. Adjacent road and drainage projects are shown as required.
  - \_\_\_\_\_ g. Consideration has been given to areas where roads and drainage structures may be lowered in the future.
  - \_\_\_\_\_ h. Road names, state route numbers, and right-of-way widths are shown.
  - \_\_\_\_\_ i. Plan and profile are drawn in the same direction. Stations shall ascend from left to right.
  - \_\_\_\_\_ j. Proposed water and/or sewer lines are shown with reference distances from right of way, boundary, buildings, other utility lines, etc.
  - \_\_\_\_\_ k. All property lines and property markers (stones, rods, pins, pipes, monuments, etc.) are shown.
  - \_\_\_\_\_ l. Location of existing houses, buildings, fences, wells and other structures are shown on plans. In lawn or kept areas, trees and shrubs in the easements are shown (size and type).
  - \_\_\_\_\_ m. All designs conform to the latest County and State erosion control and sedimentation rules, regulations, and ordinances. An erosion control and sedimentation plan must be approved by the County Department of Public Works.
  - \_\_\_\_\_ n. The engineer understands that he/she is responsible for

coordinating the utility design and construction work with other engineers where their projects connect or are affected by other projects.

- \_\_\_\_\_ o. Locations of special features (conc. encasement, rip-rap stabilization at creek crossings, clay dams, etc.) are shown on the plans. Details have been provided as appropriate or reference is made to standard details.
- \_\_\_\_\_ p. Detail drawings of all stream crossings and storm sewer outlets, with elevations of the stream bed and high (100 year flood elevation) and normal water elevations.
- \_\_\_\_\_ q. Proper labeling of subdivision (lot, block, street names, subdivision boundaries, etc.).
- \_\_\_\_\_ r. Adjacent property owner name(s) are shown on plans.
- \_\_\_\_\_ s. All fill and cut areas are shown within the area of existing and proposed sewer and/or water mains.
- \_\_\_\_\_ t. Necessary easement plats have been recorded. Deed book and page where easements are recorded is shown for each easement as appropriate.
- \_\_\_\_\_ u. Pavement replacement detail, boring detail, etc. are shown on all plans or reference is made to standard details.
- \_\_\_\_\_ v. Location and dimensions of all water and sewer service connections are shown.
- \_\_\_\_\_ w. Proposed, and original ground elevations are shown on profiles.
- \_\_\_\_\_ x. Municipal, subdivision and/or drainage area boundaries are shown.
- \_\_\_\_\_ y. North Arrow is reflected on all plan sheets.
- \_\_\_\_\_ z. Miss Utility notation is shown.
- \_\_\_\_\_ aa. Engineer understands that any changes made to the road, drainage, water and/or sewer design will require a submittal to the Utilities Department for review and approval of the revised water and sewer plans reflecting those changes.
- \_\_\_\_\_ bb. All revisions include an explanation either on the plans or by separate transmittal.
- \_\_\_\_\_ cc. Plans have been submitted to State Health Department and/or the Department of Environmental Quality for review and approval where applicable. A copy of transmittal letter is attached to plans when they are submitted for approval.
- \_\_\_\_\_ dd. If horizontal bore is required, bore location, length of bore, pit

location (average 10' x 40') are shown and shown in relation to all existing and/or proposed utilities on plan and profile.

\_\_\_\_\_ ee. Clay dams or other acceptable designs are shown at the appropriate locations to avoid water from creek and/or lake being diverted along pipe bedding.

\_\_\_\_\_ ff. Utility plans reflect those conditions as approved by the Planning Commission/Board of Supervisors.

\_\_\_\_\_ 3. Sanitary Sewer Plans

\_\_\_\_\_ a. All sanitary sewer plans are labeled with size, grade, length, and type & class of pipes (with backup calculations on the type & class pipe needed, where applicable).

\_\_\_\_\_ b. Manholes are labeled with top and invert elevations, and locations, size and inverts of drop stacks when a vertical drop exceeds 2 feet.

\_\_\_\_\_ c. Deflection angles at all manholes or bearings of all lines are shown on the plans.

\_\_\_\_\_ d. Minimum finished floor elevations and basement elevations are to be shown on plans, where applicable. If gravity sewer service cannot be provided to a lot it should be noted on the plans.

\_\_\_\_\_ e. A sewerage drainage area map with hydraulic analysis is included in plans.

\_\_\_\_\_ f. The engineer has field verified the inverts of existing manhole(s).

\_\_\_\_\_ g. All manholes are designed to an elevation above the 100 year flood plain elevation as set forth in the design standards, unless otherwise approved by the Utilities Department.

\_\_\_\_\_ j. Ground coverage over sewer pipe meets minimum criteria.

\_\_\_\_\_ k. Engineer has put a notation that a backwater valve is to be used where the building with a finished floor elevation of the building is below the top elevation of the nearest upgrade manhole from the building connection.

\_\_\_\_\_ h. A NOTE stating that the Contractor must field verify the inverts of all existing manholes, gas lines, other utility lines prior to the start of construction.

\_\_\_\_\_ i. All “%” slopes are divisible by 4 to the nearest hundredth, where possible.

\_\_\_\_\_ j. All pipe between manholes are of like material and class.

- \_\_\_\_\_ k. All temporary and/or permanent silt basins or BMP facilities are shown and the sewer lines and manholes have been designed around these structures.
- \_\_\_\_\_ l. All existing sewer laterals are shown on the plans, with station, length and depth, as depicted on the as-built plans.
- \_\_\_\_\_ m. All sewer lines are designed with the entry into the manhole by the proposed sewer lines at an angle of 90° or greater to the downstream line, unless an exception is given.
- \_\_\_\_\_ n. Whenever connecting a sewer lateral to an existing sewer line, engineer has put on the plans the proper notation that “the Contractor must use a mechanical hole cutter when tapping the existing sewer line and that an approved saddle or Inserta-Tee shall be used” and the appropriate lots affected by this have been identified in the note.
- \_\_\_\_\_ o. Where new manholes are proposed over existing lines, distance from the new manhole to the two existing manholes is shown; inverts of the manhole and each existing manhole are shown; slope of existing line from new manhole to upstream and downstream existing manholes is shown.
- \_\_\_\_\_ p. Where future extensions are necessary, these lines are reflected on the plan.
- \_\_\_\_\_ q. Monitoring manholes are required for new facilities currently regulated by local or federal industrial waste pretreatment laws. Examples of these commercial facilities include restaurants, carwashes, auto repair shops, and laundromats to name a few. A private monitoring manhole shall be provided to facilitate random sampling.

\_\_\_\_\_ 4. Water Plans

- \_\_\_\_\_ a. Plans show all fittings, fire hydrants, and valves including sizes. Each appurtenance is properly labeled in plan view and profile.
- \_\_\_\_\_ b. All conflicts with storm sewers and other utility lines are shown with appropriate design changes shown.
- \_\_\_\_\_ c. A minimum of eighteen (18) inches of vertical clearance has been designed and obtained at all crossings of other utilities, or as specified by other utility agencies, or otherwise approved by the Utilities Department.
- \_\_\_\_\_ d. All water mains have a minimum of 3.5 feet of cover.
- \_\_\_\_\_ e. Fire hydrants and air relief valves are shown on plans and profile.
- \_\_\_\_\_ f. Hydrants or blow-off valves are designed at major low places in the line where possible and air release valves are designed at the high points.

- \_\_\_\_\_g. Flushing hydrants or hydrants are designed at the end of all lines in cul-de-sacs.
- \_\_\_\_\_h. All water services are shown.
- \_\_\_\_\_i. Plans show all connections to the existing mains, etc.
- \_\_\_\_\_j. Engineer has designed water system in accordance with available pressures and has provided fire flow and pressure calculations.
- \_\_\_\_\_k. Pipe sizes noted on plans.
- \_\_\_\_\_l. Ditch lines are shown on the plan and depth of ditch(s) are shown on the profile at the fire hydrant locations and service lines, where necessary.
- \_\_\_\_\_m. Water main stubs for future extensions are designed to be installed beyond the edge of pavement.
- \_\_\_\_\_n. Location of water meter boxes are shown outside of non-vehicular traveled areas. Where it is not possible to locate the boxes out of the driveways, and/or vehicular traveled area, a cast iron box is specified.
- \_\_\_\_\_o. For water main tie-ins, the engineer has shown the valve to be used for cut off during the tie-in. Where tapping the main line verses cuttings in a tee is applicable, the engineer has evaluated which method will be used as outlined in the County's Design Standards.
- \_\_\_\_\_p. Knockdown meter box shall not be located within any travel areas.

