

1.2 WATER AND SEWER PLANS

1.2.01 Drawing Organization

- A. Water and Sewer Plan Sets (Drawings) shall consist of the following sheets, as needed, arranged in order:
 - 1. Cover Sheet
 - 2. Overall Layout Sheet
 - 3. Utility Notes and Computation Sheets
 - 4. Utility Plan and Profile Sheets
 - 5. Detail Sheets
 - 6. Other sheets related to utilities design and construction of the project (as needed)

- B. General Requirements for Water and Sewer Plans
 - 1. Plans shall be prepared on 36-inch by 24-inch paper.
 - 2. Each sheet in the Plans shall include a suitable title block containing the name of the project, sheet title, sheet number, name of the county, the district in which the project is located, the date of the plans, revision dates and descriptions, and the name and design firm of the licensed professional who prepared the plans.
 - 3. Plans shall be produced in NAD 83 State Plane Coordinate System. Horizontal control shall be established by a minimum of two coordinate points.
 - 4. Vertical datum shall be NAVD88.
 - 5. A North Arrow shall be included on each plan view.
 - 6. A Graphic Scale shall be provided on each plan view.
 - 7. The scale shall be correctly depicted on all plans and profiles as well as other applicable sheets.
 - 8. The seal and signature of the Professional Engineer (the Design Engineer) who prepared the plans shall be on each plan set.

9. Adequate benchmarks shall be provided along the lines of construction and shown on all plan views.
10. All manholes, clean-outs, structures, pipes, hydrants, valves, meter boxes and other appurtenances must be georeferenced.
11. All manholes and structures shall be labeled with Northing and Easting coordinates.
12. Plans shall be prepared using computer aided drafting (CAD) in a black-line and grayscale format and in substantial accordance with the drafting conventions contained in these Standards and Specifications.

1.2.02 Format and Content Requirements

- A. Cover Sheet: A cover sheet shall be provided for all Water and Sewer Plans. If the Water and Sewer Plans are part of a set of plans prepared for a Plan of Development (POD) or Land Disturbance Plan (LDP), a separate cover sheet for utilities plans is not required.

At a minimum, the cover sheet shall contain the following items and information:

1. Project name in large, distinctive letters.
 2. Name, design firm, and contact information of the licensed professional engineer who prepared the plans.
 3. Owner's name and contact information.
 4. A vicinity map on a scale no larger than 1-inch equals 2,000 feet and with a sufficient level of detail to identify the area of the county in which the project is located, including nearby roads. The vicinity map shall include a north arrow and scale.
 5. An index listing all the sheets included in the plan set.
 6. The stamp of the design engineer or principal of the engineering firm which prepared the plans, with original signature.
 7. The name and credentials of the Responsible Land Disturber for the project.
 8. A detailed list of estimated quantities needed to construct the public utilities shown on the plans.
- B. Overall Layout Sheet: For Water and Sewer Plans containing multiple utility plan sheets, a single plan view sheet shall be provided at a scale no larger than 1" =

600', or as specifically permitted otherwise, to show all proposed water lines, sewer lines, and related facilities to be constructed with the project.

The overall layout sheet shall, at a minimum, contain the following items and information:

1. An index map of all utility plan sheets in the drawing set, showing the layout and extent of each utility plan sheet and the match lines between sheets.
 2. All proposed water and sewer utilities with line sizes and manhole numbers labeled.
 3. Existing water and sewer utilities on and adjacent to the project parcel(s), with clear labeling of line sizes and manhole numbers.
 4. All connections to existing water and sewer utilities.
 5. Existing roads, parcel lines, buildings, utilities, etc. in the project area, including parcel information for adjacent parcels.
 6. All existing and proposed easements, labeled with size and type. Instrument Number shall be provided for existing easements. If an Instrument Number is not available, then the Deed Book and Page Number may be used.
- C. Utility Notes and Computations Sheet: The utility notes and computation sheet shall include the following items and information. Multiple sheets may be used if needed:
1. DPU *Water and Sewer Utility Construction Notes* as contained in the latest revision of Form F-09.
 2. DPU *Linear Utility Project Erosion & Sediment Control and Stormwater Management Notes* as contained in the latest revision of Form F-14.
 3. All engineering calculations performed during the design of the water and sewer utilities for the project. This includes, but is not limited to the Sanitary Design Table (Form F-04), water system hydraulic analysis layout and results, restrained joint computations for pressure pipe, and Domestic Meter Sizing Form (Form F-07).
 4. A table of Northing and Easting coordinates, in NAD 83 coordinate system, for each sanitary manhole included on the plans.
- D. Water and Sewer Plan and Profile Sheets: Plan and profiles sheets shall be provided for all proposed water and sewer lines. Plan and profile shall be shown on the same sheet with plan view(s) in the upper portion of the sheet and

accompanying profile(s) presented below. Scale shall be Horizontal: 1" = 50' and Vertical: 1" = 5' unless specifically permitted otherwise. Plan views shall clearly show all proposed water lines, sewer lines, manholes, related appurtenances, and all associated labeling, highlighted or bold. Other items related to construction including, but not limited to, roads, rights of way and property lines, easements, setback lines, lot numbers, property owner information, building locations, driveways, curb and gutter, sidewalk, ditch-lines, storm sewer lines and structures, and grading, must be clearly shown, but shall be screened/grayscale to accentuate the water and sewer utilities. Stationing shall be along the centerline of the pipe and shall be complete and consistent in all views.

In addition to the items and information listed above, water and sewer plan and profile sheets shall meet the following requirements:

1. For waterlines (and other pressure pipes), complete callouts, stationing, size and type of all pipes, separation distances, valves, hydrants, bends, tees, service connections, and other fittings, along with all other information necessary for construction of the lines shall be clearly shown on the plan and profile views. Waterlines (and other pressure pipes) running parallel to streets may be profiled and stationed on the road profile. Separate profile sheets shall be provided for waterlines which run outside a right-of-way.
2. For gravity sewer lines, stationing, lengths, slopes, pipe size and material, pipe crossings, vertical separation distances, manholes, inverts, manhole top elevations, manhole labels, service connections and all other related information necessary for construction of the sanitary sewer lines shall be clearly shown on the sanitary sewer profiles. Sewer lines, manholes, pipes sizes, lengths and materials, horizontal separation distances, deflection angles, flow direction arrows, service laterals and cleanouts shall be clearly shown on the plan view. Manhole top elevations shall be provided on the profile view and shall be shown as spot-shots in the plan view. Separate profiles shall be provided for all gravity sewer lines.
3. All pipe crossings of both water and sewer lines shall be shown, stationed, and labeled in both plan and profile views. Minimum cover and minimum edge-to-edge vertical clearance shall be noted on the profile view.
4. All lot numbers, property lines, property owner information, easements and rights of way shall be clearly shown on water and sewer plan views.
5. All stream crossings, road crossings, bores and jacks, and crossings of other utilities by proposed water and/or sewer lines shall be clearly shown and labeled in both the plan and profile views for those lines.
6. The locations of Erosion and Sediment Control devices shall be shown on the plan view.

7. Plan and profile views shall be consistent from sheet to sheet across Match Lines.
 8. Drop manholes shall be labeled in both plan and profile views.
 9. Utility lines which are not to be owned by the county shall be clearly labeled "Private" in both plan and profile views.
 10. Grease traps and oil/water separators shall be shown in the plan view and shall be located by dimensioning from buildings, or other permanent structures. These shall be labeled "Private".
 11. All existing water and sanitary sewer facilities and easements within and immediately adjacent to the project shall be clearly shown and labeled on the plans. Ownership information for parcels adjacent to the project shall be provided on the plans. Existing facilities shall be shaded gray on the plans.
 12. Details of all proposed connections to existing water and sewer utilities shall be provided. These shall be clearly shown and labeled on the plan and profile views, with appropriate test-pit locations shown and labeled on the plan view.
 13. Profiles of existing water and sewer lines shall also be included if cover is to be increased or decreased over the lines, or if new connections are proposed to them.
 14. All information shall be consistent between plan and profile views.
- E. Detail Sheets: Separate sheet(s) shall be provided which include the appropriate Standard Details from these Standards and Specifications for the items, materials and construction associated with the project. Detail sheets shall also include any details of special items, materials and/or construction proposed as part of the project.
- F. Other Plan Sheets: Additional drawings and/or details required for construction of public water and sewer utilities associated with the project. Examples include: Demolition Plans for existing utilities to be abandoned or replaced, Bypass Pumping and/or Maintenance of Service Plans, Erosion and Sediment Control Plans and Details on projects for which the water and sewer plans are not part of a Plan of Development (POD), and plans for ancillary or adjacent construction which may affect the project.

1.2.03 Drafting Conventions and Drawing Standards

- A. All drawings shall be prepared using computer aided drafting (CAD).

- B. Symbols and abbreviations used on the plans shall be substantially as shown on Standard Detail (DES-01) and shall be consistent throughout the plan set. A Key/Legend to the symbols and abbreviations used on the Plans shall be included on the Notes and Computation Sheet.
- C. Existing facilities and other elements shall be shaded gray. New work shall be dark lines and of sufficient linewidth to easily distinguish new work from existing. Line widths should be varied between different items on the plans.
- D. The minimum text height shall be 0.10 inches for notes, general text, and dimensions. Plan, profiles, section, and detail labels shall be a minimum of 0.20 text height and of a heavier line weight.
- E. All plans submitted for review shall comply with the minimum format and quality control requirements of these Standards. Plans which do not substantially meet these criteria will not be accepted for review.
- F. Plans submitted for review shall be AutoCAD blackline and grayscale format.
- G. Drawings shall be clear and legible. Text shall be clearly legible with no overlap or interference with other text and shall be readable when drawings are reduced to half size.
- H. All drawings must be capable of producing legible second generation prints after being reduced to half size.
- I. The contrast of the printed material shall be high, with blank areas being as white as possible, and all information being as dark as practicable, while remaining clear and distinct.
- J. Shading shall not be used on the Plans if it will hide or obscure information when the drawing is photocopied or scanned.
- K. Screening and hatching shall be in accordance with conventionally accepted standards and shall not block text or other pertinent information.
- L. A digital version of the complete plan set shall be prepared by plotting AutoCAD plan sheets to a digital file. The digital file shall be submitted in addition to the specified number of paper plan sets. The file shall be .pdf or compatible and shall be clear and legible.

END OF SECTION 1.2