

Section 2: Water Contract Drawings

Version 4.0



A. Drawing Size

1. Sheet – 24" x 36"
2. Inside Border 23" x 34" (1-1/2" from left, 1/2" from top, bottom, right) (See Appendix IIa [6])
3. Title Block – 5" x 9" located in lower right hand corner (See Appendix IIc [7]).

B. Drafting

1. Scales
 - a. Plan – 1" = 20' except as otherwise specifically approved.
 - b. On new construction, where 1" = 30' scale can reduce the number of sheets, it may be used, with the approval of the Water/Sewer Engineering Supervisor.
 - c. Cross Sections – 1/4" = 1'-0 or as otherwise appropriate
 - d. Profile (where required):
 - Horizontal: match plan
 - Vertical: 1" = 5'
2. Lettering
 - a. All text size, style and orientation shall conform to the examples shown in Appendix IIf [8] except the size of the call out for the proposed water main in the featured street shall be 0.24" and the style and orientation shall be as shown in Appendix IXa [9].
 - b. Title block information shall be as shown in Appendix IIc [10].
 - c. Existing utilities shall be indicated using upper and lower case lettering and shall be italicized. The word existing shall not be used.
 - d. Proposed work shall be indicated using nonitalic lettering in bold upper case letters.
 - e. The word proposed shall be used in the plan and cross sections to only call out the proposed water main and proposed sewer. It should not be used with any appurtenances (like manholes, collars or inlets) but the letters calling out the appurtenances should still be bold upper case. See the Sample Plans shown in Appendix IX [11].
 - f. All streets shall be kept clear of notes as much as possible. The name of the street shall be placed along the top of the sheet. No abbreviations shall be used on the street.
 - g. The words street, road, avenue, etc., should be spelled out on streets and abbreviated on intersecting streets.

- h. For Private Cost Contracts, the words “PRIVATE COST” in a 0.24” Arial font shall be placed above the title block.
- i. The words “AUTHORIZED BY ORDINANCE OF COUNCIL” (where applicable [12]) shall be 0.175”.
- j. The words “PRELIMINARY ASSESSMENT” (where applicable [13]) shall be 0.14”.
- k. Line weights and styles shall be as shown in Appendix IIe [14]

3. Symbols and Abbreviations

- a. Symbols and abbreviations shown in Appendix II [15] shall be used.
- b. Although no legend is shown on the water sheets, the symbols and abbreviations used shall be the same as on the sewer sheets as shown in Appendix IIj [16].
- c. Any other symbols and abbreviations shall be defined on the Contract Drawings.

4. Drawing Orientation

- a. The drawing should be generally oriented with the street on the sheet being oriented horizontally across the sheet, and north being oriented towards the top of the sheet (the north arrow should point towards the top of the page). In the rare instance that a street is exactly north – south the north arrow should point towards the right.
- b. When part of a joint water and sewer contract, the water drawing shall be oriented the same as the sewer drawing.

5. Cross Sections

- a. All water drawings shall contain a typical cross section. Drawings shall contain more than one cross section if the underground structures or utilities change substantially, such as under a bridge.
- b. On a joint water and sewer contract, the water cross sections shall match those of the sewer drawings.
- c. On a water only contract, all cross-sections on a given street shall be taken in the same direction.

C. Water Base Plan Information

1. City Plan Information

- a. Houseline distance, street (cartway and footway) and Right-of-way widths, name of street and state route number if it is a state highway (see Appendix Vi for a list of state highways and their accompanying state route numbers [17]).
- b. City Plan Elevations as well as existing surface of ground shall be shown on Assessable and Private Cost water projects.
 - i. An Assessable water project is one where there is no existing water main and the project is being funded by the City (See Section 2 D.2.c.1) [18]. A Private Cost water project is one where there is no existing water main and the project is being funded by a developer. It has no Assessment. For Private Cost Contracts, Developers should refer to the Private Cost Contract Requirements.
 - ii. Street Status – Legally open or not legally open; at grade or not at grade. Only label if not legally open or not at grade.
- c. Cartway and footway widths shall be dimensioned.

2. Information

- a. Consultant's name shall be shown on the base plan to the left of the title block stipulating who prepared the base plan and/or design. The base plan and/or design completion date shall be shown directly beneath the Consultant's name. For Consultant's projects the drawing shall be stamped by a registered Professional Engineer in the state of Pennsylvania. If only the base plan or design was prepared by the Consultant, the wording should reflect such.
- b. The words "AUTHORIZED BY ORDINANCE OF COUNCIL" shall be placed above the title block on base plans when the street has no City water main and one is being proposed.
- c. Except for private cost projects, the words "PRELIMINARY ASSESSMENT" shall be placed at the bottom center of each sheet, on base plans when the street has no water main and one is being proposed. For assessable projects, drawings shall be sent to the District Surveyor to obtain the preliminary assessment. See Section 6 D.12. [19] and Appendix VIb [20]
 - i. An Assessment is a charge to the property owner for the installation of a water main and/or sewer. It is based on the length of frontage with deductions for corner properties.
- d. Miscellaneous information that shall be provided on each plan drawing.
 - i. Ward number
 - ii. "One Call" Numbers
 - iii. Water Plate Number
 - iv. Highway District Number
 - v. Survey District Number
 - vi. Ordinance Date (if applicable [21])
 - vii. Preliminary Assessment (if applicable [22])
 - viii. GPIS Number

- e. The drawing's title block should always contain the date that the most recent changes were completed.
- f. The title block of each sheet shall indicate the limits of work represented on that particular sheet. In many cases this will not be the entire length of the project.
- g. On Water Only projects the title block shall read as follows:
 - i. For north-south streets the title block shall read from south to north.
 - ii. For east-west streets between two streets starting with a letter, the title block shall read from west to east (i.e. from A St. to B St.).
 - iii. For east – west streets between two numbered streets the title block shall read from east to west (i.e. from 2nd St. to 3rd St.). The anomaly is the title block for Front St. to 2nd St. which shall also read from east to west. Note: Even though the title block reads from east to west, the drawing will always be just the opposite (i.e. 3rd St. will be on the left side of the sheet and 2nd St. will be on the right side of the sheet). This is because north always has to be towards the top of the sheet.

- h. On Water and Sewer projects the title block on Water sheets shall follow the same direction as the Sewer sheets.

3. Plan View Information

a. Paving Information

- i. Existing footway, curb and roadway material shall be fully identified.
- ii. Driveway, tree wells and curb ramps shall be indicated.
- iii. Footways, if special pattern (particularly brick), shall be carefully identified.
- iv. Deteriorated footway shall be noted.

b. Traffic Information

- i. Direction of traffic along with parking information shall be shown on all streets including intersecting streets. Symbols used shall be as shown on the sample drawings in Appendix IX [23]. As shown in Appendix IIg [24] the number of operating lanes in each direction is represented by the number of arrows. Parking or no parking is written above or below the line indicating which side of the street has which.

c. Labeling

- i. Mains in streets within six (6) inches of City Plan grade or in Right-of-way shall have their depth specified ("cover").
- ii. Mains in new streets or in streets known to be not at confirmed grade, labeling of the proposed main shall be discussed with the Water/Sewer Engineering Supervisor.

d. Above Ground Features

- i. Steps, cellar doors, fire hydrants, parking meters, trees (including diameter), manhole covers, traffic signs and signals, utility poles, and all street furniture (phone booths, mailboxes, benches, etc.) shall be identified as shown in Appendix IIj [25].
- ii. Existing water curb stops, sewer vent boxes, and gas curb boxes shall also be identified as shown in Appendix IIj [26].

- iii. Property lines shall be indicated, along with sufficient street addresses to identify all properties. The address label shall be parallel to the street it is related to. The street name should be added to the address if it is not obvious (like on a parallel street or similar addresses on intersecting streets).
- iv. All lots not containing structures shall be so labeled (open lot, parking lot, etc.)
- v. Overhead bridges shall be shown and the elevation of the underside of the bridge shall be indicated on the base plan.
- vi. Match lines shall be shown on base plans when required as shown on the sample in Appendix II [27] and Appendix IX [28].
- vii. All street grades along the gutters shall be indicated. The direction of stormwater gutter flow shall be indicated by placing arrow heads on the curbs pointing in the downgrade direction as shown on the sample in Appendix IXa [29].

4. Misc. Field Information

- a. The final design and specifications are very dependent on the field investigation, and the information obtained from the field visit. The engineers and/or designers which visit the field location should pay special attention to the visible details of the block which may be useful in later making design decisions. Examples of such items are:
 - i. Condition of paving, signs of paving disruptions due to Water Department infrastructure failures, etc. This information will assist in establishing appropriate paving limits.
 - ii. Evidence of hydrant relocations or damaged or knocked over hydrants. This information will assist in locating new hydrants.
 - iii. Potential construction interferences such as low bridges, tree interference, overhead wires or structures, etc.
 - iv. Condition of homes, are any vacant or collapsing, etc.
 - v. These are a few examples of the type of information required to properly design a contract.

5. Utility information shall be given as follows:

- a. Each Utility shall be identified in the following order: Water, H.P.F.S., PECO, Sewer, Verizon, Gas, Streets-Traffic, SEPTA, Public Property-Communications, Public Property-Transit, Western Union, and Cable TV. See Section 6 [30] [31] and/or Appendix VI [32] for contact information, if required.
- b. Each utility shall be located from the face of the curb to the centerline of the utility as shown on the examples in Appendix IX [33].
- c. Show all existing water main valves and other utility manholes using the symbols shown in Appendix IIh [34].
- d. Indicate duct bank or pipe size as width x height except sewer which shall be height x width.
 - i. Brick sewers shall be labeled in feet and inches (e.g. 2'-6" x 1'-8")
 - ii. Manufactured pipe shall be labeled in inches (e.g. 36" RCP)

- iii. Box sewers, whether brick or reinforced concrete shall be labeled in feet and inches. The above nomenclature, if used consistently, assists in quick identification and approximate dating of the sewer.
- e. Each former utility (i.e. Keystone, City Transit, PTC) if so identified on manholes or the highway supervisor's drawing shall be indicated and identified by its current owner (i.e. Verizon, SEPTA). Each time a former utility is encountered it must be investigated individually. For example do not assume that PTC is SEPTA without confirmation from SEPTA.
- f. Cover for all utilities shall be indicated to the outside top of the conduit.
 - The cover to the top of the sewer is calculated by determining the depth to the invert bottom and subtracting the height and then subtracting the thickness of the crown. Unless the thickness of the crown of a brick sewer is shown on record plans, it shall be assumed to be 9". This should be done at each manhole. If the cover varies by less than 6", use the shallower cover. If the cover varies by more than 6" state the cover varies from min. to max.
- g. All information shall be correct at the point identified. If size changes, or if cover changes at a specific point, and if either is relevant to the design they shall be labeled as often as required.
- h. High voltage electrical conduits shall be separately labeled with voltage and boxed in.
- i. SEPTA and railroad tracks shall be shown as accurately as possible, but not dimensioned. Their status (active, inactive, paved over) shall be stated. Ties for railroad tracks shall be shown and ties for trolley tracks shall not be shown.
- j. Utility lines shall be drawn using the type of line shown in Appendix IIe [36].
- k. Existing sewer inlets shall be accurately shown using the symbols in Appendix IIk [37].
- l. Utilities other than water, sewer, and gas shall be shown as double line when their width is 42" or greater.
- m. Existing sewers with a width of 24" or over shall be shown as double line and include a center line for dimensioning. Existing sewers with a width of less than 24" shall be shown as single line, unless the sewer is brick or is part of a separate system. All existing brick sewers shall be shown as a double line. In a separate system, where the stormwater conduit is located directly over the sanitary sewer, the sanitary sewer shall be shown as a single dashed line, and the stormwater conduit shall always be shown as double line.
- n. All water mains and gas lines 24" or greater in diameter shall be shown as double line.
- o. Abandoned utilities shall be labeled "abandoned" except abandoned water mains, which shall not be drawn on the plans.

D. Proposed Water Main

1. Plan View (Contract Plans)
 - a. The proposed water mains shall be located and dimensioned from the centerline of the proposed water main to the nearest curb line.
 - b. All proposed valves and fittings shall be shown.
 - c. Match lines shall be shown on all Contract Plans where applicable.
2. Cross Section (Contract Plans)
 3. The proposed water main shall be shown in the correct location in the cross section. The proposed water main shall be dimensioned from the center line of the proposed main to the curb line and identified.
 4. Where there is a railroad bridge shown on the base plan, a cross section at the railroad bridge with underside elevations showing the proposed water main shall be shown. Bridge foundations shall also be shown.

E. Sample Drawing

1. Appendix IX [38] shows a sample water drawing which demonstrates the final look of the drawings. Take note of the general look and character of the drawing. Also notice the lettering style, line widths and scales. Additionally, see Appendix II [39] for “Drawing Size and Borders (Water),” “Title Block (Water Drawing),” “Symbols,” “Lettering,” “Line Styles,” and “Standard Notes for Water Sheets.”

Change Log

Version	Type	Change
4.0	Format	Indented ‘2.B.3.d. Drawing Orientation’ to the left to make it ‘2.B.4. Drawing Orientation’. For 2.C.5.f, indented all information regarding calculating sewer cover to the right to make it a subpoint.
4.0	Content	Changed text in section B. Lettering sub section 2.c. from “slanted” to “italicized”.
4.0	Content	Revised text from section B. Lettering sub section 2.d. to remove reference to slanted text.
4.0	Format	Manual converted from PDF to web content.