

5. General Horizontal Alignment.

a. General.

- 1) The Designer has the responsibility to point out where various factors of good planning and design are in conflict with the following guidelines and the requirements of other agencies. The alignment must be the best overall design. Failure to point out conflicts at an early stage in the design may result in delays and possibly costly changes.
- 2) If the design follows the guidelines in this manual, the design will most likely result in a plan that can be carried through to completion without delay.

b. Considerations.

- 1) Identify and locate all existing and proposed facilities prior to selecting the alignment of the sewer.
- 2) Consider the guidance in Part Three, Section 19 (Geotechnical Considerations for Pipeline Alignments), when selecting the horizontal alignment.

c. Location.

- 1) Wherever possible, sewers shall be located in a public or existing right of way.
- 2) Where practical, design the pipeline seven (7) feet from the centerline of the street and on the side with the lower ground at the houses.
- 3) Typically, design the sewer pipeline on the lower elevation side of the street, except when the number of lots or houses makes it cost effective to locate the sewer on the high elevation side of the street.
- 4) All sewer infrastructure shall be located within the road/WSSC right of way with adequate access to allow for routine inspection and maintenance. The placement of sewer infrastructure in the rear/back yard of the owner's property shall be the least preferred design and will be reviewed and approved on a case by case basis.
- 5) The pipeline alignment within existing areas (streets or roads) should avoid construction in high traffic volume roads or road closings.
- 6) In existing areas (streets or roads) the alignment of the pipeline should try to avoid the removal of trees or landscaped areas.
- 7) The pipeline alignment should be extended past the limits of the proposed road improvements so that future pipeline extensions maybe constructed without the need to cut the pavement.
- 8) Sewer pipelines are to be located to minimize disruption to environmental features. By necessity, sewers are located along drainage courses, where streams, wetlands, tree protection, etc., are likely to restrict the location of the pipeline. Take into account all permit restrictions and existing environmental features and avoid disturbance when possible.



- 9) For additional horizontal alignment information, see Part Two, Section 4 (Fittings), Section 6 (Curved Horizontal Alignments), Section 7 (Relocating Sewer Pipelines), Section 10 (Tunnels or Casing Pipes) and Section 11 (Design of Structures).

d. Labeling New Pipelines and Structures in Plan.

- 1) Label all pipe sizes, pipe material/class, direction of flow, appurtenances and fittings on plans.
- 2) Label manhole/structure in plan, give number, location and type of all structures, see Setting Frame and Covers under Part Two, Section 11 (Design of Structures). Start the numbering of the new manholes with the lowest number being the lowest point in the design and increase up grade from there.

e. Sewage Flow Tabulation Table.

- 1) Show Sewage Flow Tabulation Table on the first sheet. Include in this table, the number of units being served by this contract, type of units (existing, proposed, and/or future) and the sewage flow.

f. Connections to Existing Sewer Pipelines and Manholes.

1) Extending existing sewer pipeline.

- a) If the existing sewer pipeline material is one of WSSC's currently allowed materials (see Part Two, Section 3 (Selection of Pipe Materials- Gravity Sewers), specify the same pipe material and maintain the same horizontal and vertical alignment as the existing sewer pipeline.
- b) Provide a note on the drawings stating "Connect and extend to existing <give existing pipe size and existing pipe material> sewer and maintain the same horizontal and vertical alignment".
- c) If the existing sewer pipe material is not one of the WSSC's allowable pipe materials listed under Part Two, Section 3 (Selection of Pipe Materials - Gravity Sewers) and/or the horizontal or vertical alignment requires a change in direction, design the connection using a built-over manhole, see "Connecting to an existing sewer pipeline with a manhole" in this section and Part Two, Section 19 (Manholes Built Over Existing Sewers).

2) Connecting to an existing sewer pipeline with a manhole.

- a) For design requirements see, Part Two, Section 19 (Manholes Built Over Existing Sewers).
- b) Provide a note on the drawings stating "Build manhole over existing sewer". Also reference Standard Details S/2.0 and S/2.1 or S/2.2 for manhole design and S/3.01 for the manhole connection.

3) Connecting to an existing manhole.

- a) For design requirements, see Determining Manhole Diameters under Part Two, Section 14 (Pipe to Manhole Geometry).
- b) Provide a note on the drawings stating "Connect to existing manhole". Also reference Standard Detail S/3.01 for the manhole connection.



- 4) Asbestos Cement Pipe (ACP). When connecting to existing ACP pipelines, provide a detailed design and specifications on how this connection will be made. Refer to the Specifications and ASTM C966 for information on design and installation of ACP.

g. Determining Existing Pipe and Manhole Material.

- 1) Information that is available and items that are required to be developed.
 - a) WSSC "as-built" contract drawings are intended to show only the control reference ties to the horizontal location of the manholes, the type of pipe and manhole material used and the Contractor's name. Typically, as-builts do not always show changes to the original designed alignment (horizontal or vertical), that may have been made during the construction of the pipeline. The Designer must investigate and determine if any changes have been made to the original design, and adjust the design accordingly.
 - b) Field surveys must follow the requirements set by WSSC. Perform all surveys required to design the alignment. Any survey information that is provided by WSSC from previous contracts, etc., must be verified and WSSC will not be responsible for this information.
 - c) Test pits are needed when the design requires the vertical and horizontal alignment to be accurately located. Request and perform test pits on the existing alignment so that the horizontal and vertical position can be accurately determined.
 - d) WSSC construction files can be requested from WSSC and the type of information that may be available in the contract files includes:
 - (1) WSSC Construction Inspector's field reports/notes.
 - (2) WSSC/Contractors written correspondence
 - (3) Contractor's shop drawings.

h. Labeling Existing Pipelines and Manholes in Plan.

- 1) Existing pipeline material; PVC, PVC AWWA C900/905, RCP, DIP, ACP, CISP, etc., and thickness class, type, grade, etc.
- 2) Existing WSSC contract number.

i. Labeling Existing Structures in Plan.

- 1) Indicate the existing manhole number, typical to new manhole numbering and labeling, as shown in Labeling Manholes on the Drawings under Part Two, Section 11 (Design of Structures), except above the line, note "Ex. MH", and below the line, include the manhole number.
- 2) Indicate the existing manhole material (precast, cast in place or brick) and contract number when designing the connection to the existing manhole. See requirements under Labeling Manholes on the Drawings, under Part Two, Section 12 (Type of Manholes).



j. Connection to Proposed or Future Pipelines.

- 1) If the new pipeline will depend on the construction of another pipeline for handling the flow of sewage, include a "Dependency Note" on the drawings. Indicate in the note that the new pipeline cannot be placed in service until another contract is in service; provide contract numbers of the depending pipeline.

