

9. Connections to Existing or Proposed Water Pipelines.

a. Design of Connections to Existing Pipelines.

1) Limitation to connections to Existing Pipelines.

- a) Water Mains (12-inch and smaller) cannot connect to PCCP Transmission Mains 36-inch and larger, except in the following conditions; If the connection is to existing PCCP water main and the proposed service connection is looped to another water main that is not depended on existing PCCP water main.

2) Determine the pipe material and the alignment of the existing pipeline.

- a) Information that are available and items that are required to be developed.

- (1) WSSC "as-built" contract drawings are intended to show only the control reference ties to the horizontal appurtenances of the pipeline alignment, the type of pipe material used, and the Contractor's name. As-builts do not always show changes to the original design alignment (horizontal or vertical) that may have been made during the construction of the pipeline. The Designer must investigate using other methods described below and determine if any changes have been made to the original design of the existing pipeline, and adjust the design accordingly.
- (2) 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, as WSSC will not be responsible for this information.
- (3) Test pits are typically needed when the design requires the vertical and horizontal alignment to be accurately located. Perform test pits on the existing alignment so that the horizontal and vertical position can be accurately determined.
- (4) WSSC construction files may be requested by the Designer. The type of information that may be available in the contract files includes:
 - (a) WSSC Construction Inspector's field reports/notes.
 - (b) WSSC/Contractor written correspondence.
 - (c) Contractor's shop drawings, including lay schedules for PCCP, etc.

3) Connecting to existing pipelines other than DIP, CIP or PVC.

- a) Prestressed Concrete Cylinder Pipe (PCCP). Any connections between existing PCCP and new DIP will require special design including: Adapter (PCCP to DIP) see Part One, Section 7 (Allowable Fittings), Insulated Joint (typically flanged type) see Part One, Section 3 (Pipe and Fitting Joints), possible cathodic protection and special coatings see Part Three, Section 28 (Corrosion Control), and possible thrust restraint see Part Three, Section 27 (Thrust Restraint for Buried Piping). Verify the following for PCCP connections:

- (1) WSSC has installed Internal Acoustic fiber optic (AFO) Cables in most of the existing PCCP water pipelines. This cable is designed to monitor the existing condition of the PCCP pipeline.



- (a) Prior to connecting to existing PCCP pipelines, first verify with WSSC as to whether the pipeline has AFO Cables. If pipeline has AFO Cables, the cables must be removed and replaced by an approved WSSC contractor responsible for installing and monitoring the cable at no cost to WSSC.
- (2) Perform test pits to verify the actual horizontal/vertical alignment of the existing PCCP pipeline, location of the existing joint, and to determine if the existing joint is beveled or straight.
- (3) If the existing PCCP has restrained joints, indicate this on the drawings and design the proposed connection to account for the restrained thrust.
- b) Steel Pipe, Asbestos Cement Pipe (ACP), old pit-cast CIP with oversize OD's. When the existing pipe material is not DIP, CIP or PCCP provide a detailed design and specifications on how the connection will be constructed.
 - (1) When connecting to existing ACP, design the connection to remove only a short section of existing ACP pipe. Existing ACP section removed during the connection will remain in the trench, see Specifications.
- 4) Tapping existing pipelines requires test pits when certain physical features may prevent proper tapping of the existing pipe and when necessary to determine the alignment of the existing pipeline and the location of the existing pipe joints. For information on positioning a TS&V on DIP, CIP or PVC, see Part One, Section 7 (Allowable Fittings).
 - (1) Tapping PCCP water mains is not allowed; see Part One, Section 7 (Allowable Fittings).

b. Revising Designed Connections During Construction.

- 1) Connecting to an existing pipeline 12-inch and smaller in diameter. The vertical and horizontal alignment can usually be changed or revised during construction of the pipelines with little difficulty due to the amount of allowable joint deflection, which provides greater alignment flexibility.
- 2) Connecting to an existing pipeline 16-inch and larger in diameter. The vertical and horizontal alignment may require additional fittings, appurtenances and etc., to adjust alignment location during construction.
 - (a) If the vertical alignment requires revisions, the new alignment may create additional high or low points. In this case, additional blow-off connections or air release valves may be required.
 - (b) If the vertical and horizontal alignment both require revisions, the new alignment may result in pipeline joints having deflections exceeding the allowable, which would require additional bends and thrust restraints to be added.
 - (c) If the alignment requires changes during construction, the Designer will be responsible for the additional cost as determined by the WSSC.

c. Connection to Proposed or Future Pipelines.



- 1) Connecting to a pipeline to be built under another contract.
 - a) Coordinate design with connecting contracts.
 - b) When the pipeline under design will be extended, design the future alignment approximately two-hundred (200) feet from the end of the cap or plug, see requirements under Length of Profile, Part One, Section 11 (Vertical Alignment – Profiles).
 - c) If the new pipeline will depend on the construction of another pipeline for the supply of water, 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.

d. Labeling Existing Pipelines on the Drawings.

- 1) Existing pipeline material (DIP, CIP, PVC, PCCP, ACP, steel, etc.), thickness class, type, grade, etc. For PCCP, indicate the manufacturer's name and job number for the existing PCCP pipeline.
- 2) Existing WSSC contract number.
- 3) Special pipe corrosion protection, coatings, wrappings, joint bonding, etc.
- 4) Special thrust restraint, existing special thrust blocking and/or existing restrained joint types, locations and lengths, including valves restrained to tees.

e. Special Items.

- 1) Special items to be considered during the design of connections to existing pipelines include thrust pipe restraints, see Part Three, Section 27 (Thrust Restraint Design for Buried Piping) and pipe corrosion protection, see Part Three, Section 28 (Corrosion Control).
- 2) When shutdown of the existing water system is determined to be impossible, line stops can be designed to temporarily shut down the existing water pipeline. See Specifications for requirements and Part One, Section 22 (Specialty Valves). Special thrust pipe restraints will be required to restrain the line stop, see Part Three, Section 27 (Thrust Restraint Design for Buried Piping).

