
PROCEDURES MANUAL FOR DEVELOPERS

CHAPTER 8 – PRIVATE WATER AND SEWER CONSTRUCTION

This chapter applies to any developer who proposes to construct, reconstruct, or modify a public sewer, water main, or associated public infrastructure such as hydrants and catch basins; connect the proposed facility to an existing Pittsburgh Water and Sewer Authority (PWSA) system or facility, and transfer the ownership of the proposed facility to the PWSA. The following sections provide information on the requirements of the PWSA and of various departments of the City of Pittsburgh (City), Allegheny County (County), and the Commonwealth of Pennsylvania (Commonwealth).

All correspondence, related agreements and drawings can be mailed to the PWSA engineering office at the following address:

Pittsburgh Water and Sewer Authority
Penn Liberty Plaza I
1200 Penn Avenue
Pittsburgh, PA 15222
Attn: Engineering and Construction

8.1 General Requirements

Before the developer initiates the application process with the PWSA, there may be other steps involved depending on the type of development proposed. For example:

- The City Zoning Department should be contacted by the developer to obtain proper zoning approval(s).
- All subdivisions must be approved by the City and recorded at the County Recorder of Deeds.
- City of Pittsburgh Department of Public Works (DPW) should be contacted regarding street grading and/or paving regulations and/or elevations.
- Allegheny County Conservation District (ACCD) should be contacted regarding State Stormwater NPDES Permit regulations and Erosion and Sediment Pollution Control Plans.

Certain developments may require the submittal of the PWSA Water and Sewer Use Application (Application). Chapter 2 of this manual discusses when an Application is required and provides guidelines for preparing the DEP sewage facilities planning module and related attachments. If an Application is required, then the Application must be approved by the PWSA before the PWSA will review any construction drawings.

Prior to the commencement of any work on the project drawings, **the PWSA requires a pre-development meeting**. The following is a list of general requirements:

1. Meeting with the PWSA;
2. Approved Developer's Agreement;
3. Plan reviews and approvals for 30%, 60%, 90% and Final Design Drawings;
4. Project Cost Estimate;
5. Preparation/Submittal of required Performance bonds and/or certified Letter of Credit (L.O.C.);
6. Submittal of Escrow Check for the PWSA's Engineering and/or Field Inspection Fees;
7. Construction Material Submittals;
8. Submittal to the PWSA of a completed checklist, and approval of such checklist by the PWSA.
9. PWSA approved and signed construction plans, which shall serve as a permit.
10. Pre-Construction Meeting;
11. Construction Begins (72 Hour Notice for Inspector);
12. Submittal of Final Archival As-Builts/Record Information for Review and Approval by the PWSA;
13. Formal Board Acceptance of New Public Facilities; and
14. Warranty Bond (15% of Performance Bond for 18 Months).

PWSA encourages the private use of 'Green Infrastructure' such as the use of open channels or vegetated swales for the conveyance of stormwater, but according to current agreements/regulations will only accept the ownership and maintenance of conventional public sewers and waterlines as per separate agreement. PWSA requires all public facilities to be sized for the water service zone and/or sewer/water shed and built within public rights-of-way where feasible. Any public facilities constructed through private property must have all the proper recorded easements and any other site specific legal documentation, agreements, permits, etc. PWSA will review each project on a case by case basis and will only accept ownership for public facilities that are determined to be in the best interest of the authority.

Private shared infrastructure such as detention basins serving multiple properties will require recorded Maintenance Agreements and may also require easements, variances, and other documentation as described in greater detail below.

Past work not properly permitted and/or accepted via recorded agreement by the PWSA is the responsibility of the current property owner(s). This includes a wide range of structures ranging from unauthorized private sewer taps to storm culverts. Any past maintenance and/or repairs done to said private facilities by the PWSA for the sake of public health and safety does not imply ownership by the PWSA.

Common reasons why facilities may not be accepted by PWSA are as follows:

- The facilities only serve a single customer. In such a situation, the facilities would be considered private sewer lateral(s) or private water service line(s). Documentation must be provided to PWSA that the correct permits and variances are in place for these private structures/facilities. This may include encroachment permits for facilities in the right-of-way, variances from the City of Pittsburgh/ACHD, recorded easements/agreements for other properties crossed, and other requirements depending on the specific site.
- Newly constructed roads, in which the facilities are also constructed, and not accepted by the City of Pittsburgh. (Hence, will remain private.)
- Lack of inspection by the PWSA, as-built drawings, or other requested documentation to verify the proper construction of the proposed water and/or sewer facilities.
- Facilities that cross private property when it is not required by site conditions as interpreted by PWSA.
- Facilities that do not have all the required recorded legal agreements, easements and/or permits. It is the developer's responsibility to research and acquire at their expense all permits and/or recorded easements prior to dedication of public water and sewer facilities to PWSA.
- Facilities built do not match materials, methods, or general locations on approved plan. Any departures from approved plans must be approved in writing by PWSA.

If the proposed facilities constructed by the developer are located in a public street right-of-way and PWSA chooses not to accept said facilities, or if the proposed facilities constructed by the developer cross and serve multiple adjoining private lots, then the proposed utilities will be classified as private and ownership will not be accepted by the PWSA. The developer would be required to obtain a private sewer/water line variance from the ACHD and/or the City of Pittsburgh. The developer is also required to properly record with the City and the County Recorder of Deeds the ownership/maintenance agreement between all parties that share use of the private utilities. The PWSA will not permit the connection of the proposed facilities to existing PWSA public facilities if the maintenance agreement is not recorded. **Copies of the ACHD variance letter, recorded easement(s), and recorded maintenance agreement must be submitted to the PWSA.**

If the proposed development will involve earth movement the developer is required to contact ACCD and the City and acquire all necessary State and City permits. If the developer constructs streets that will be dedicated to the City, then the developer needs to coordinate with the City for the acceptance of said streets. PWSA will require confirmation from the City that the developer is entering into an agreement with the City for the public acceptance of the rights-of-way and cart-ways within the proposed

development. The developer is also required to review and comply with the City requirements for proper grading, paving, and curbing of said proposed public rights-of-way.

A Stormwater Management Analysis and Design Report must be prepared by the developer as per the current City of Pittsburgh regulations and submitted to the Stormwater Management Officer at the Department of City Planning. ACCD and/or PA DEP must also be contacted regarding Stormwater NPDES Permit requirements. Contact information can be found in Chapter 2 of this Manual. When the report has been approved, the developer must request that the Stormwater Management Officer provide written confirmation of approval to the PWSA. The developer must also provide documentation of any necessary State, County and/or local permits.

Projects involving construction along rivers, streams, and other bodies of open water and/or involving flood plains, wetlands or saturated soils may require permitting from the United States Army Corps of Engineers (USACE). PWSA reserves the right to require documentation of the proper permits from the USACE.

8.2 Development Agreement

The Development Agreement (Agreement) must be executed by both the developer and PWSA before the construction drawings can have final approval. Review of the Agreement and construction drawings can occur simultaneously. A sample of the Development Agreement is provided in Appendix L. (Per request, the PWSA can supply a digital word document sample for editing.)

The Agreement will address the bonds required. The developer/owner must furnish the PWSA with a Performance Bond or an approved Certified Letter of Credit each in the amount equal to 100 percent of the total project construction cost as determined by the PWSA. The developer/owner shall also furnish PWSA with a Maintenance Bond for the warranty of all construction for a period of eighteen months from the date of the PWSA Board acceptance of the completed work. The Maintenance Bond shall be in an amount equal to 15 percent of the total construction cost. PWSA must be named as the only obligee on all bonds. Please note that the City may impose separate bonding requirements also.

The developer must prepare and submit a construction cost estimate to PWSA for review. The PWSA reserves the right to adjust the cost estimate as it deems necessary. The construction cost estimate will be used to determine the value of the Bonds. The Agreement will also address the fees to be paid by the developer to PWSA for review/processing of the construction drawings, shop drawing review, and construction inspection. **Fees shall be deposited in an escrow account or as directed by PWSA.** The Escrow amounts must be at a minimum of ten (10) percent of the Performance Bond/Letter of Credit and must be made payable to **the PWSA.**

Please be advised that the Escrow amount values will be drawn down as PWSA inspection/engineering costs are invoiced. If Escrow account is exhausted, all work will stop until an additional agreed amount is deposited in said account.

If monies are left over, these funds will be refunded back to the developer.

PWSA will provide a standard sample Agreement to the developer for review. The developer is encouraged to review the Agreement with his legal counsel so that the Agreement can be tailored to the specific project. Once the developer completes the editing of the document, the developer will submit the revised Agreement back to PWSA for review.

Where a property owner or developer constructs or causes to be constructed at the property owner or developer's expense any private extension of the water or sewer system(s) to be dedicated to and accepted for public use by the PWSA, upon request the PWSA shall provide for partial reimbursement to the property owner or developer if, within 10 years of the public infrastructure dedication, the owner of another property not in the development for which the extension was constructed connects a water service line or sewer lateral directly to the dedicated extension(s). Reimbursement shall be calculated and made as provided in 53 Pa. C.S. § 5607(d) (31).

8.3 Construction Plans

The preparation of construction plans will begin with a preliminary meeting between the developer and PWSA. The meeting will allow for the developer to become familiar with the PWSA requirements for said plans. Subsequent plan reviews will follow when the construction plans are at 30 percent, 60 percent, and 90 percent complete as well as a final review. The 30 percent progress review can be bypassed, if both parties agree, until the plans are 60 percent complete. The remaining reviews are mandatory. The developer should allow for a minimum of 30 working days for PWSA's review of each submittal of the construction plans. PWSA's review time will be contingent upon the project complexity, completeness and accuracy of the plans and the timeliness of each submittal.

The construction plans must contain the PWSA Title Block in the lower right-hand corner of each sheet. Each sheet may include the PWSA Approval Block to the left of the title block unless otherwise noted. Figure 8-1 depicts an example of the PWSA Title Block for Construction Plans whereas Figure 8-2 depicts an example of the PWSA Private Construction Approval Block.

**Figure 8-1
Sample PWSA Title Block for Construction Plans**

PROJECT No. _____		
PRIVATE SEWER CONTRACT		
THE PITTSBURGH WATER AND SEWER AUTHORITY		
SANITARY SEWER/STORM SEWER/WATERLINE (RE)CONSTRUCTION		
FIFTH AVENUE DARRAUGH STREET TO LOTHROP STREET*		
CITY OF PITTSBURGH ALLEGHENY COUNTY, PA		
SCALE: _____	SHEET _____	ACCESSION No. _____
DATE: _____	OF _____	CASE No. _____

*Display Title Block on drawings 6 inches wide by 4 inches tall.
Title block to provide a description of the project limits of work.

**Figure 8-2
PWSA Private Construction Approval Block**

<u>THE PITTSBURGH WATER AND SEWER AUTHORITY</u>	
PWSA Project Reviewer certifies that he/she has reviewed the above noted document(s) in accordance with the Authority's established rules and regulations. Based on this review, approval is hereby recommended	<u>Date</u>
_____	_____
PWSA Project Reviewer	
<u>Approval</u>	<u>Date</u>
_____	_____
Deputy Director of Engineering	
_____	_____
Director of Engineering and Construction	
_____	_____
Executive Director	

Display Title Block on drawings 6 inches wide by 4 inches tall.

The following requirements shall apply to all construction plans.

- All plans shall be drawn on 24-inch x 36-inch sheets and shall include a North point preferably oriented to the top of the sheet.
- Sheet titles shall be used that provide basic project location information per sheet (e.g., Fifth Avenue, Darraugh Street to Lothrop Street).
- In the plan view, the street address shall be shown for each lot and the proposed and/or existing building footprint locations shall be outlined.
- All plan views and profiles must be tied to the City monumentation and precise (not temporary) City benchmark elevations as recorded at the City of Pittsburgh Department of Public Works, Survey Division.
- The plans must be drawn to scale; 20-scale is preferred but 30-, 40-, and 50-scale are acceptable (as directed).
- The plans shall depict plan views, profiles, and details, showing typical cross-sections as needed.
- On profiles existing and proposed final grades shall be identified. Distort the vertical scale. (Suggested: Horizontal 1" = 20', Vertical 1" = 10')
- The existing background features and proposed topography shall be shown 50 percent screened or half-toned with **all proposed new public sewer and waterline information shown in bold line weight and text.**
- A symbol legend will be provided to the developer to indicate the preferred symbols of PWSA or as directed (see Appendix I).
- Proposed pipe materials and pipe sizes shall be shown on all plan views (as directed).
- City rights-of-way and City boundaries shall be shown on plan views.
- Legal rights-of-way and property boundaries shall be identified.
- Next to each street name, the right-of-way width (i.e., Fifth Avenue 60-feet) and the type of street surface pavement shall be identified.
- All existing underground utilities and appurtenances (i.e., gas, telecommunication, etc.) shall be shown 50 percent screened or half-toned.
- Text over-writes must be eliminated. Do not crop text on match-lined drawings.

Where applicable to the type of development, the following specific requirements shall be followed.

- Proposed sanitary sewer, storm sewer, and waterline plan views must be shown on the same sheets and designed to accept the entire sewer shed and/or water service zone, not just the project limits.

- All new storm sewers and sanitary sewers must be constructed separately unless otherwise directed in writing. **No new construction of combined public sewers will be permitted in areas of new development or redevelopment previously served by existing combined sewers.** Provisions must be made for sewer separation where feasible and as directed by the PWSA. Normally, where proper flow capacities and self-cleaning velocities can be applied, the existing combined sewer will be designated for conversion to either a designated storm or a designated sanitary sewer (as determined by the PWSA) and a new sewer built for the other service (storm or sanitary). All such sewers shall be designed to serve the entire upstream watershed/sewer shed and to allow for future extension. The PWSA reserves the right to make final determination as to the size, type, and location(s) of all new or rehabilitated facilities.
- The location of the proposed sewer shall be stationed and typically dimensioned off the edge of the right-of-way or the centerline of the cart-way, if it coincides with the centerline of the right-of-way and/or survey base running line.
- The profile of the proposed sewer including elevations of all manholes and the percent slope of all piping. Elevations must be per City monumentation and City datum, unless otherwise directed by PWSA.
- The location of all proposed sanitary and storm sewer manholes and the wye connections must be shown for each lot by stationing.
- Sewer wye connections for the proposed lots shall be installed in the trunk sewers during construction. Wye connections shall be constructed at the 10 o'clock and 2 o'clock positions.
- Locations of valve boxes and meter pits for waterlines must also be shown by stationing.
 - Please note that the developer can construct a proposed public waterline without installing taps and customer service lines. However, if the developer desires to install the water taps, then they must be dry taps performed when the waterline is uncharged. After making the dry taps, the developer will also be required to install each customer service line from the tap to either a meter pit or the building to be serviced. Installation of all meter pits will be the responsibility of the developer. The PWSA must install all water meters and remote reading devices at the time of service installation. No unmetered taps and/or wild ends are permitted. Taps for vacant properties must be metered and billed in the name of the contractor/developer/owner.

The developer will prepare and include a plan view of the Recorded Plan of Lots, which shall include the deed book, volume, and page reference from the County Recorder of Deeds as well as signatures from the City Planning Commission as proof of said recording. A minimum 20-foot wide easement is required for all public sanitary sewers, storm sewers, and waterlines (24 inch diameter or less). Where feasible, utilities shall be constructed on a 5-foot offset from the

edge of the easement right-of-way line. Typically PWSA requires roughly one additional foot of easement for each inch of pipe diameter in excess of 24 inches. Other conditions such as depth are also factored in to the easement requirements. The exact easement width and location shall be determined by the direction of PWSA. The developer is required to obtain/pursue all easements. The developer must show recorded proof that all easements and/or encroachments exist in the records of the City and/or County Recorder of Deeds.

After PWSA reviews and approves the 90 percent complete construction plans, PWSA will instruct the developer to finalize plans. From the finalized plans, the developer will prepare and submit one set of 4 mil thick, double-matte, archival quality, permanent, reproducible Mylar drawings to PWSA for final approval. Each sheet of the Mylars shall be stamped, signed, and dated by a Professional Engineer registered in the Commonwealth. The Mylars will be reviewed by PWSA, and the developer will be contacted once the Mylars are approved. Once PWSA approves the Mylars, the developer shall also submit the construction plans in a PWSA-approved digital format.

The Developer must submit a completed Private Development Checklist, found in Appendix M, for review by the PWSA. The PWSA will review the completed checklist, and if all requirements in the checklist are complete, the PWSA will approve and sign the plans for construction. The PWSA will notify the developer when the plans are available for pick up at the PWSA Permits Counter. The approved and signed plans shall serve as the Developer's permit for private construction of facilities to be dedicated to PWSA. The PWSA will not approve the plans until the Development Agreement has been approved by the PWSA Board of Directors and signed by the parties. The check list may be submitted concurrently with the mylars.

8.4 Notes Section

The developer shall include the applicable PWSA notes on one of the sheets of the construction plan set. The notes address general requirements such as the bonds the developer must obtain and working hours of the project. There are also specific notes for storm sewer, sanitary sewer, and waterline construction. The developer will be directed to select the appropriate notes from the list provided by PWSA (see Appendix J) and only include those applicable notes on the plans.

8.5 Specifications

8.5.1 Storm Sewers

All public storm sewers must be sized for the entire drainage area, both water and/or sewer shed not just the current project site and/or municipal boundaries. All changes in direction and grade of the storm sewer shall be accomplished at a manhole. Public inlets may not be used in lieu of manholes to change direction or grade. Inlets shall also be installed at every low point and/or intersection (before each crosswalk preferred) and at intervals determined by using Pennsylvania Department of Transportation (Penn DOT) Design Manual 2 but shall not exceed 300 feet. The location of each manhole and

inlet/catch basin shall be indicated by offset distance and survey running line stationing. The PWSA reserves the right to make final decisions at all catch basin and storm inlet locations.

Storm sewer pipe shall be reinforced concrete pipe (RCP) Class IV, or PWSA-approved equal.

All manholes must be precast concrete with poured-in-place concrete bases and/or precast bases as directed. In sewer manholes the crown of the incoming pipe should be matched at a minimum to the crown of the outgoing pipe if the outgoing pipe has a larger diameter than the incoming pipe.

PWSA encourages the private use of natural and/or nonstructural techniques such as vegetated swales or open air channels to control and direct stormwater in lieu of storm sewers where feasible.

PWSA does not and will not maintain or own any private storm retention tanks, basins, or culverts for stormwater control. PWSA facilities shall not be constructed on or under any of these private stormwater facilities. PWSA facilities must stand alone and not discharge into any of these types of private facilities without written approval from the PWSA and/or recorded agreement.

On the sewer line profiles the developer must show pipe material, strength class, the distance between storm manholes, grades, pipe lengths, pipe slopes, and pipe and manhole inverts. Pipe slopes should be rounded off to the nearest quarter-foot where feasible. Inlet elevations shall be displayed. Inlets on the near side of the profile shall be depicted in solid lines while inlets on the far side shall be shown in dashed lines (as directed). Each individual profile shall include a title that provides the names of related streets relevant to the profile shown. Profiles shall use a horizontal scale of 1 inch equals 20 or 30 feet and a vertical scale of 1 inch equals 10 feet (unless otherwise directed).

8.5.2 Sanitary Sewers

Sanitary sewer design shall be in accordance with the DEP Domestic Wastewater Facilities Manual and the Allegheny County Health Department regulations except where current PWSA requirements and/or specifications apply or supersede.

All turns and breaks in grade must be located at a manhole. Spacing between sanitary manholes shall not exceed 300 feet. The top of the manhole castings shall be constructed to established grades as determined by the City street grades. It is recommended that the sanitary sewers be constructed at a minimum of 2 feet below basement elevations to accommodate drainage from building basements. However, the depth of the sanitary sewers will be contingent upon location of the project. PWSA reserves the right to modify, raise or lower the depth of proposed sewers as it deems necessary. The sanitary sewers must be designed for a minimum **design velocity** under average daily flow conditions of 2 feet per second (fps) and preferably at a minimum grade of 2 percent.

The minimum size of all sanitary sewers shall be 8 inches in diameter or as directed. The required pipe materials are listed in Table 8-1.

**Table 8-1
Pipe Material Minimum Requirements for Sanitary Sewer Mains**

Pipe Diameter (inches)	Required Pipe Material
15 or less	Polyvinyl chloride (PVC) SDR 26, Vitrified clay pipe (VCP), Ductile iron pipe (DIP)
Greater than 15, up to and including 24	Vitrified clay pipe (VCP), Ductile iron pipe (DIP)
Greater than 24	Reinforced concrete pipe (RCP) with a special mix design. The special mix required by PWSA includes Type II cement and limestone aggregate, Class IV pipe.

Ductile iron pipe (DIP) and other pipe materials will be reviewed by PWSA and accepted on a case-by-case basis. **The PWSA reserves the right to make final decisions on all pipe sizes and materials used.**

All manholes must be precast concrete with poured-in-place concrete bases, pre-cast as directed. All castings must be approved gray iron. In the manholes the crown of the incoming pipe should be matched to the crown of the outgoing pipe if the outgoing pipe has a larger diameter.

On the profiles the developer must show the distance between sanitary manholes, centerlines, grades, pipe lengths, pipe slopes, and pipe and manhole inverts. Pipe slopes should be rounded off to the nearest quarter-foot where feasible. Basement elevations shall be displayed. Buildings on the near side of the profile shall be depicted in solid lines while buildings on the far side shall be shown in dashed lines. Each individual profile shall include a title that provides the names of streets relevant to the profile. Profiles shall use a horizontal scale of 1 inch equals 20 or 30 feet and a vertical scale of 1 inch equals 10 feet (unless otherwise directed).

Whenever sewers must cross under water mains and other conduits, the sewer shall be laid at such an elevation that the top of the outer diameter of the sewer pipe is at least 18 inches below the bottom outer diameter invert of the said conduits. When the elevation of the sewer cannot be varied to meet the above requirements, the water main shall be relocated to provide this separation, for a distance of 10 feet extending on each side of the sewer.

8.5.3 Water Mains

Water mains shall be DIP, Class 52, cement-lined. Valves and water boxes shall be approved ductile iron.

Minimum depth for a water main is 4 feet from the finished grade to the crown of the outside diameter (O.D.) of the pipe. Minimum PWSA water main size is 8 inches in diameter, or as-determined by PWSA.

If the developer proposes to construct waterlines that will not be part of the PWSA service area and will be owned by another water authority, then the developer shall display 50 percent screen or half tone those waterlines on plans submitted to PWSA.

8.6 Hydrant Flow Test

If the developer proposes to construct a waterline that will connect to an existing PWSA water main, then the developer must perform a hydrant flow test prior to development of construction plans. The developer must apply for a hydrant permit in order to conduct the hydrant flow test. Applications must be made in person at the PWSA permit counter.

The applicant must select two flow hydrants and one pressure hydrant on the permit application. The PWSA will verify that the hydrant selections are appropriate. The applicant will complete Form HYD–Hydrant Permit and pay any associated fees to the PWSA before the test can take place. Form HYD also contains a table to record the results of the hydrant flow test.

The Operations Division of PWSA will operate all valves and hydrants during the flow tests. The applicant must conduct the tests using his own equipment and personnel. The pressure drop must be equal to or greater than 20 percent using the first choice flow hydrant. If the required pressure drop is not achieved, then the applicant is required to flow the second hydrant.

PWSA will not permit hydrant flow tests when the outside air temperature is below 40°F and falling. The outside air temperature must be at least 40°F and rising. When the outside air temperature is below 40°F, PWSA can authorize a hydrant flow test to be conducted only if additional safety measures are taken and permitted by the city. (i.e. salt truck, etc.) This is also dependent upon the availability of the PWSA crew to operate the hydrants. Due to an unforeseen circumstance or emergency, a hydrant flow test should be rescheduled when the outside air temperature is above 40°F.) Results from a hydrant flow test are valid for a period of one year from the date of the test. In certain areas with heavy development, PWSA may determine that the test results are valid for only six months from the date of the test.

All hydrant flow test data must be sealed by a Professional Engineer licensed in the Commonwealth of Pennsylvania.

A sample of Form HYD–Hydrant Permit can be found in Appendix D. The applicant must complete the Hydrant Flow Test Data (shown in Table 8-2) with the data from the test and additional information regarding the domestic and fire protection water demands. The completed data table shall be displayed on at least one sheet of the construction plan set. If the developer is also required to prepare water tap-in drawings (see Chapters 4 and 5), then the Hydrant Flow Test Data table must be displayed on each tap-in drawing as well.

8.7 Other Requirements

At any time during the construction plan reviews, the developer can submit catalog cut-sheets for all materials proposed for the development. The PWSA must review and approve the cut-sheets before construction can commence. PWSA review time is estimated at 15 to 30 days depending on the completeness and accuracy of the cut-sheets submittal.

The developer must provide PWSA with 72 hours advance notice before construction begins. A PWSA inspector must be present on site. Contact the PWSA Director of Engineering at (412) 255-8987 to request an inspector.

8.8 Tap-in Drawings

Tap-in drawings **are** required when the development includes **all** of the following:

- Development of lots,
- Construction of public storm sewer and/or sanitary sewer and/or waterline,
- Construction of building(s), and
- Construction of laterals and service lines from building(s) to the new sewer and/or waterlines.

**Table 8-2
Hydrant Flow Test Data**

<u>HYDRANT FLOW TEST DATA</u>		
(REQUIRED FOR TAPS LARGER THAN 1-INCH)		
Date of Test: _____/_____/_____	Hydrant Permit No.: _____	
Test Performed By: _____		
	FLOW HYDRANT	PRESSURE HYDRANT
Hydrant Number		
Location		
Static Pressure (psi)	XXXXXXXXXXXXXXXXXXXX	
Residual Pressure (psi)	XXXXXXXXXXXXXXXXXXXX	
Flow Observed (gpm)		XXXXXXXXXXXXXXXXXXXX
Fire Protection Demands:		
Sprinkler System Peak Demand	_____	gpm _____ psi
Inside Hose Demand	_____	gpm
Outside Hose Demand	_____	gpm
Domestic System Peak Demand	_____	gpm
Private Fire Hydrant Demands:	_____	gpm

On drawing display table at 6 inches wide by 5 inches tall.

Tap-in drawings **are not** required when the development is **limited to** the following:

- Development of lots, and
- Construction of public storm sewer and/or sanitary sewer and/or waterline.

Under the second scenario where the developer only develops the lots and constructs the PWSA facilities, the responsibility of applying for sewer and water taps falls on the future property owner whenever that owner decides to connect to the PWSA facilities.

If the development involves all items listed in the first scenario in this section, the tap-in drawings will be required if any of the following conditions are present:

8.8.1 Sewers

- Developments greater than a two-family residential unit (i.e., flow greater than 799 gallons per day) with new sanitary sewer or storm sewer tap(s).

8.8.2 Water

- Proposed taps into an existing PWSA waterline for development greater than a two-family residential unit (including all commercial, institutional, and industrial development).

OR

- Proposed taps into an existing PWSA waterline for all customer service taps larger than 1 inch.

OR

- Fire service taps on the water main are proposed because fire suppression system(s) is (are) required by the City of Pittsburgh.

Tap-in drawings for storm sewers, sanitary sewers, and waterlines can be submitted at any time but cannot be approved until the private construction drawings have been approved by PWSA. Please refer to Chapters 3A, 3B, 4, and 5 of this manual for instructions on preparing sewer tap-in drawings and water tap-in drawings.

PITTSBURGH WATER AND SEWER AUTHORITY

Notes for Private Construction Plans

General Notes

1. All work done and materials furnished under this contract shall be in accordance with the Pittsburgh Water and Sewer Authority (PWSA), and the City of Pittsburgh current general contract conditions standard specifications for the materials and construction dated November 1938, with supplements thereto and revisions thereof, using current updated PWSA specifications and standards for construction unless otherwise noted.
2. The developer/owner must furnish the PWSA with a performance bond (or approved equal) and a labor and material payment bond, each in an amount equal to 100 percent of the total project construction cost as determined by PWSA. The developer/owner shall also furnish the PWSA with a maintenance bond for the warranty of all construction for a period of 18 months from the date of the PWSA's acceptance of the completed work and board approval. The maintenance bond shall be in an amount equal to 15 percent of the cost of the work. The PWSA alone shall be named as an obligee on all bonds.
3. The developer/owner or his contractor shall obtain all building permits, plumbing permits, construction and/or street opening permits required by the City of Pittsburgh, County of Allegheny and the Commonwealth of Pennsylvania and/or any local surrounding municipalities as needed.
4. All construction materials must be submitted in a timely manner for review and approved by the PWSA department of engineering and construction prior to the start of construction. Submittal information shall include a list of materials and their source of supply as well as manufacturer's descriptive catalog data, drawings, charts, tables, etc. Necessary to substantiate compliance with the PWSA specification requirements.

List of materials and source thereof, together with work schedule, must be submitted and approved by the PWSA department of engineering and construction before construction is started.

Prior to the start of construction, the developer/owner or his contractor shall submit a schedule of the work to be performed for review by the PWSA's department of engineering and construction.

5. Contractor shall submit detailed shop drawings in accordance with the PWSA on uniform size sheets no smaller than 24 inches by 36 inches for review and approval. Also submit drawings in DGN or DWG format on electronic media acceptable to the PWSA.
6. The preconstruction meeting shall be set by PWSA. Afterwards, the developer/owner or his contractor shall notify the PWSA department of engineering and construction no less than 72 hours in advance of the start of construction.
7. The developer/owner's contractor shall not perform any work during the night, on weekends, or on PWSA holidays, unless ordered to do so by the PWSA's director, or at the request of the contractor with the approval of the director. When the contractor is given permission to work during these periods, he shall reimburse the PWSA for all PWSA's representative's labor and expenses associated with inspection of the work.
8. Unless otherwise directed use precise City benchmark(s): Show on plans precise City B.M. No(s). _____ - and elevation(s) _____ (also note standard City description and location(s)).
9. Saw-cut all existing public and/or private sidewalk(s) and street pavement(s) (as directed).
10. The contractor shall apply a City approved scaling deterrent to all finished concrete pavement surfaces and sidewalks in accordance with current City specifications or as shown on the contract plans (if directed).
11. The contractor shall be responsible for cleaning all castings, water boxes, catch basins, storm inlets, and manholes after construction and/or paving is completed including any private casting surfaces (if directed).
12. Material required to replace unsuitable material for stabilization for sub- grade(s) shall be City/PWSA approved backfill material. The composition and method of compaction shall conform to current City of Pittsburgh specifications for sub-base treatment.
13. All old material removed under this contract and not to be reused shall become the property of the contractor and must be promptly removed from the site.
14. A complete and accurate photographic archival hard copy four mill thick double matted mylar drawing (24 x 36) noting as-built record information marked in red ink, including

all completed as built record information as to location, elevation, and stationing with offsets of sewer and/or water lines, catch basins, wye branch connections, gate valves, fittings, hydrants, stations, grades, etc. This required information must be furnished to the PWSA at the completion of the contract. The contractor shall submit one set of as built/record drawings showing the proposed PWSA facilities to be dedicated as constructed, including all deviations from both the approved project contract drawings and any related approved shop drawings. All as-built drawings shall be prepared on uniform size sheets as noted above not less than 24 inches by 36 inches and submitted within two weeks after final PWSA inspection and final testing of the system, plus include an approved electronic media copy compatible to the PWSA electronic filing systems. Said as-built information must be certified by an engineer licensed in Pennsylvania, or if directed measured up by a surveyor licensed in the Commonwealth of Pennsylvania.

Until the above described as built/record drawings are received and approved by the PWSA and final acceptance letter is written by the PWSA Director of Engineering and Construction, PWSA will not accept the newly built facilities to be dedicated a public infrastructure. The private developer/contractor will remain responsible for the privately constructed facilities, including all maintenance and/or repairs until PWSA's final acceptance of said facilities. Any required repairs and/or maintenance PWSA does to the new facilities in the interest of the general public prior to acceptance will be back charged to the private developer/contractor and/or reimbursement pursued. If acceptable as built information is not received within sixty days time after completion of the new project, PWSA reserves the right to create the required as built/record information and invoice the private developer/contractor and/or pursue reimbursement via their existing bond(s).

PWSA reserves the right to terminate and/or disconnect all private lines as determined by PWSA.

Sewer Line Notes

1. Buried main line pipe sewer(s) identification marker materials shall be an approved electronically locatable brightly colored plastic tape displaying the printed notation "sewer". Tape shall be laid between backfilling lifts over the pipe, not less than two feet above the pipe or less than two feet below finished grade surface. In no event shall the tape be more than four feet below finished surface.
2. All manholes to be PWSA approved pre-cast concrete manholes as per ASTM designation C478 with poured-in-place cement concrete bases and/or PWSA approved

precast bases as determined by PWSA. This includes reinforced concrete box manholes and/or brick manholes as directed by PWSA.

3. Sanitary manholes shall be exterior coated with PWSA approved emulsified bituminous coating as per ASTM designation D1227 or approved equal.
4. All standard house wyes to be minimum 4 inch diameter for sanitary sewers or minimum 6 inch diameter for storm or combination sewers unless otherwise noted.
5. Install the PWSA cast iron manhole castings as follows: frame No. 26, cover No. 25v (unless otherwise noted).
6. PWSA pipe sewer 15" diameter and smaller (unless otherwise directed) may be polyvinyl chloride (PVC), ASTM designation 3034, SDR-26 or for type PS46 ASTM designation D1784 (or PWSA approved equal). The pipe and fittings shall have integral wall bell and spigot joints with rubber ring joints. The pipe stiffness shall be in accordance with ASTM designation D2412; flexible elastomeric seals: ASTM designation D3212; seal material: ASTM designation F477. Standard installation of said sewer pipe shall be in compliance with ASTM designation D2321 and/or the PWSA current specifications.
7. All vitrified clay pipe sewer(s), (typically used for conveying sanitary or combination flows) including wye connections, shall be extra strength V.C. pipe (ASTM designation C700) compression joints for vitrified clay, bell and spigot shall conform to ASTM designation C425.
8. The reinforced concrete pipe sewer(s) shall conform to ASTM designation C76 with the following requirements:
 - A. All PWSA pipe sewers shall be minimum Class IV style, wall "B".
 - B. The pipe shall have a maximum absorption of 5.5% density and shall be less than 155 pounds per cubic foot using limestone aggregate and type II cement (unless otherwise directed).
 - C. Pipe shall be furnished in minimum 8-foot lengths and marked with manufactured date and pipe class.

- D. For sanitary and combined sewers, the contractor (if directed) will substitute type II cement with limestone aggregate in place of coal tar epoxy coating of interior surface of pipe.
 - E. All special radius R. C. pipe must be marked at the top exterior (crown) of each section to ensure proper alignment.
 - F. Joint assemblies shall be so formed and accurately manufactured that when the pipes are drawn together the pipe shall form a continuous watertight conduit with a smooth and uniform interior surface. The rubber gasket shall be the sole element of the joint depended upon to provide a watertight seal conforming to ASTM designation C443 and manufacturers recommendation for installation.
 - G. Pipe will be subject to rejection because of failure to conform to any of the above specification requirements.
9. Ductile iron pipe sewer and mechanical joint ductile iron fittings: shall be push-on joint ductile iron pipe with mechanical joint ductile iron fittings. Pipe and fittings to be used under this contract shall be in accordance with following specifications.
- A. Centrifugally cast – ductile iron pipe lined with a PWSA approved polymer lining (unless otherwise directed): AWWA/ANSI – C151/A21.51.
 - B. Interior lining PWSA approved ceramic epoxy coating consisting of an amine-cured novalac epoxy containing a minimum of 20% ceramic quartz pigment by volume or cement mortar lining for ductile iron and gray iron pipe and fittings as noted for water: AWWA/ANSI – C104/A21.4.
 - C. Use Mechanical joint ductile iron fittings: AWWA/ANSI – C110/A21.10. (as directed)
 - D. Rubber gasket joints for ductile iron and gray iron pressure sewer pipe and related fittings: as per AWWA/ANSI – C111/A21.11. Thickness design for ductile iron pipe AWWA/ANSI – C150/A21.50.
 - E. All ductile iron pipe shall be minimum class 52.
 - F. Ductile iron transition couplings and repair couplings.

- 1) Material description – couplings furnished under this contract shall be at least equal to or exceed the following and shall conform with the requirements hereinafter given
 - a. Center ring: ductile cast iron meeting or exceeding the latest revision of ASTM A-536.
 - b. Gaskets: natural or synthetic rubber compounded for potable water service.
 - c. End rings: ductile cast iron meeting or exceeding the latest revision of ASTM designation A-536.
 - d. Bolts and nuts: high strength steel track head, natural course roll thread with heavy hex nuts electro- galvanized with di-chromate seal.

10. Infiltration and/or exfiltration test shall be conducted by the contractor under inspection of the PWSA, in accordance with the recommendations of the national clay pipe institute. Any sewer failing to meet these requirements shall be properly corrected and reconstructed. Infiltration and exfiltration amounts shall be limited to 200 gallons per inch diameter of pipe per mile per day. (0.001 gallon/inch/diameter/hour/foot).

11. All newly constructed public sewers on the project must be televised by the contractor as directed and a video copy complete with data sheets compatible with PWSA record systems and approved by PWSA before final project acceptance. A seventy two (72) hour advance notice shall be given to the PWSA representative who will witness said video inspection and the area must be accessible for TV equipment including vehicles. In order for inspection to occur, all existing and proposed manholes to remain shall be constructed and brought up to the top of finished grade.

12. Contractor will be directed to conduct PWSA approved air vacuum testing on all sewers and manholes as per current PWSA specifications as per ASTM designation C828.

13. Contractor will be directed to perform deflection testing on all flexible plastic pipe sewers or as deemed necessary by PWSA for other materials. The mandrel testing shall be performed in the presence of a PWSA inspector using a deflectometer, calibrated television, or properly sized “go, no-go” mandrels. Maximum deflection accepted by PWSA shall be 5 percent of pipe diameter.

Water Line Notes

1. Buried mainline pipe identification markers shall be approved electronically locatable brightly colored plastic tape displaying the printed notation “water”. Tape shall be laid between backfilling lifts over the pipe, not less than two feet above the pipe or less than two feet below finished ground surface. In no event shall the tape be more than four feet below finished surface.
2. Gate valve – affidavit of compliance: the contractor shall obtain from the manufacturer of the valves an affidavit stating that the valves and all the materials used in its construction conform to the applicable requirements of the PWSA and AWWA current standard and supplementary specifications and that all test specified therein have been performed and met.
3. All new PWSA water mains shall be wrapped with approved polyethylene wrap. Polyethylene wrap using virgin polyethylene material conforming to the requirements of the ANSI/ASTM designation D1248. The minimum nominal thickness shall be 8 mils thick.
4. Curb boxes – round curb boxes shall be PWSA approved of the M.E.G. type constructed of cast iron. Standard gate box lid shall have two notch openings with the word “water” stamped or cast into it. Lid diameter to match box. Gate box extensions are not to be used for new construction. A maximum of three extension rings can be used per gate box.
5. All salvageable existing water line materials and appurtenances (i.e. castings, pipe, valves, fire hydrants, meters, etc.) Removed during the course of construction by the contractor shall be removed, undamaged, and delivered to the PWSA brilliant yard. All other damaged and/or unusable water line materials and related appurtenances shall be disposed of by the contractor at the discretion of and to the satisfaction of the PWSA.
6. All pipe valves and fittings shall be mechanical joint and shall be constructed so that the deflection per joint does not exceed 85% of maximum permissible.
7. All fittings and/or bends shall have concrete thrust blocking placed in accordance with the PWSA specifications/standards. Provide ductile iron retaining glands on all bends greater than 10 degrees including the required thrust blocking.

8. Thrust block concrete shall be City of Pittsburgh class “P” 4000# cement concrete as per the City of Pittsburgh specifications. A minimum of one foot of compacted backfill shall be placed above all thrust blocking prior to activating the water lines.

9. Ductile iron pipe and mechanical joint ductile iron fittings: all water lines shall be push-on joint ductile iron pipe with mechanical joint ductile iron fittings. Pipe and fittings to be used under this contract shall be in accordance with following specifications.
 - A. Centrifugally cast – ductile iron pipe: AWWA/ANSI – C151/A21.51.

 - B. Cement mortar lining for ductile iron and gray iron pipe and fittings for water lines: as per AWWA/ANSI – C104/A21.4.

 - C. Mechanical joint ductile iron fittings: AWWA/ANSI – C110/A21.10.

 - D. Rubber gasket joints for ductile iron and gray iron pressure pipe and fittings: AWWA/ANSI – C111/A21.11. Thickness design for ductile iron pipe AWWA/ANSI – C150/A21.50.

 - E. All ductile iron pipe shall be minimum class 52.

 - F. Ductile iron transition couplings and repair couplings
 - 1) Material description – couplings furnished under this contract shall be at least equal to or exceed the following and shall conform with the requirements hereinafter given
 - a. Center ring: ductile cast iron meeting or exceeding the latest revision of ASTM designation A-536.

 - b. Gaskets: natural or synthetic rubber compounded for potable water service.

 - c. End rings: ductile cast iron meeting or exceeding the latest revision of ASTM designation A-536.

 - d. Bolts and nuts: high strength steel track head, natural course roll thread with heavy hex nuts electro- galvanized with di-chromate seal.

- G. Glands for assembling mechanical joint fittings shall be restraining glands, consisting of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of AWWA/ANSI C-110/A21.10. The devices shall have a working pressure rating of 350 psi for 3-16 inch and 250 psi for 18-48 inch. Ratings are for water pressure and must include a minimum safety factor of 2 to 1 in all sizes. Gland body, wedges and wedge actuating components shall be cast from grade 65-45-12 ductile iron material in accordance with ASTM designation A536. Ductile iron gripping wedges shall be heat treated within a range of 370 to 470 BHN. Mechanical joint restraint for ductile iron pipe shall be Megalug series 1100 as manufactured by EBAA Iron, Inc. or approved equal.
10. The PWSA must be notified a minimum of 72 hours in advance of the time when the contractor proposes to connect the proposed waterlines to the existing water mains so that the PWSA operations division may arrange for the operation of the necessary valve shuts. **Only the PWSA personnel may operate public PWSA valves.**
 11. All new water and fire service mains shall be tested hydraulically at not less than 200 PSI pressure for not less than two hours, or 50 psi in excess of the maximum static pressure when the maximum static pressure is in excess of 150 PSI.
 12. All proposed connections to existing water mains shall be conducted during the time of least demand for water, unless otherwise directed.
 13. Sterilization: following the testing of any potable water mains, the main shall be thoroughly flushed and sterilized.
 14. Sterilization shall be in accordance with AWWA C-651-86 (revision of AWWA C-601-81), AWWA standard for disinfecting water mains.
 15. The contractor is responsible to ensure against leakage of the sterilizing solution into the existing public system and for properly disposing of the sterilizing solution.

