

# Water Meter and Backflow Prevention Standards

## INFORMATION BULLETIN

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This information bulletin provides guidance on the design standards of water meters and backflow preventers. These devices are essential in ensuring reliable utility services, equitable billing for water consumption, and safeguarding our water supply and public health. Design standards also protect the safety of the City team that tests, inspects, maintains, and replaces these portions of the drinking water system.

The City requires that water system components meet service requirements for both customers and City operations staff by following the City's standard drawings and water design guidelines. Developer projects shall include the location and footprint of water meters and backflow preventers in the initial project submittal to the City, to facilitate and mitigate potential conflicts between the building design and necessary water connections. Projects shall follow these standards at the beginning of project design to protect the drinking water system and minimize conflicts later in the design process.

Projects designed to meet standards do not require a deviation form. Projects that do not comply with the City's standards must submit a deviation request form for consideration by the City. The deviation request will add review and processing time to the applicant, and approval is not guaranteed. Deviation requests will be considered on a case-by-case basis and must demonstrate why the project cannot comply with the standards due to a technical limitation that cannot reasonably be designed around to accommodate City water system standards and how the proposed non-standard design protects the drinking water system.

If a project involves unique site conditions or if you anticipate that deviations from the standard may be needed, it is recommended that you meet with DSD staff during the early stages of your project to help identify any potential issues.

## I. Water Meter and Backflow Prevention Standards

All new or redevelopment projects shall adhere to current City standards when designing and planning modifications to water connections. The following water meters and backflow preventer device standards apply to new development, redevelopment, and tenant improvement projects.

### A. Waters Meter and Backflow Preventer Requirements

The Development Services Department (DSD) determines the required meter sizes based on the completed [DS-16 "Water Meter Data Card."](#)

**PDF** The applicant tabulates plumbing fixtures based on the proposed development and calculates Total Fixture Units based on values from the current State of California Plumbing Code. The meter sizes are based on the calculated flow using the latest versions of industry-wide accepted standards published by the American Water Works Association (AWWA) Standards (C-700, C-701, and C-702). Installation of water meters shall adhere to City standards and applicable AWWA standards.

Above-ground installations of backflow preventer devices for water and fire services are mandated by the California Code of Regulations and California Department of Public Health requirements. Deviations requesting below-ground installations of backflow preventer devices will not be approved, per the California Code of Regulations and California Department of Public Health. Water meter and backflow preventer devices shall be designed and installed in accordance with the current City of San Diego standard drawings and Water Facility Design Guidelines.

### B. Water Meter and Backflow Preventer Standard Drawings

Meter/Service size	Service Type	Standard Drawing	Installation
Single 2" and smaller	Utilized for less than 3" service	SDW-149 – 2" Water Service Installation	Install below-grade inside of a meter box flush with the sidewalk and in the public Right-of-Way (ROW).
		SDW-150 – 1" Water Service Installation	Associated backflow preventer device shall be installed above ground per SDW-155.
		SDW-155 Backflow Preventer for ¾" to 2" Metered Service	Install above ground.
Dual 2" meter	Utilized for 3" service	SDW-114 – 2" Meter, Backflow Preventer and Meter Boxes <sup>(1)</sup>	Install each meter below grade inside an individual meter box flush with the sidewalk and in the public ROW.  An above grade backflow preventer is required for each meter.
¾" and larger meters	For projects with zero setback	SDW-141 - Backflow Preventers Wet Utility Room (WUR) Installation <sup>(1)</sup>	Install backflow preventer assemblies immediately within parcel limits in a manner accessible for inspection, repair, and use.  Applicants may use the San Diego Downtown Design Guidelines for development projects in the downtown area.
3" and larger meter	Utilized for service larger than 3", installed outside of building footprint	SDW-157 - Dual Above Ground Meter with Private Backflow Preventer <sup>(1)</sup>	Install above ground in a reinforced concrete slab and protective fence.  Install meter immediately within parcel limits, within a water easement, in a manner accessible for inspection, repair, and use.  Install backflow preventer assemblies immediately within parcel limits in a manner accessible for inspection, repair, and use.
4" and larger Fire Service	Fire Service and Backflow Preventer Assemblies <sup>(1)</sup>	SDW-105 - Backflow Preventer for 4" and Larger Fire Service <sup>(1)</sup>	Install backflow preventer above ground and immediately within parcel limits in a manner that allows access for inspection, repair, and use.  Install backflow preventer within a WUR, when the WUR is appropriate to be applied to the project.

<sup>(1)</sup> Refer to [Information Bulletin 113](#) **PDF**: How to obtain approval for Cross-Connection Control.

## II. Request for Deviation from Standards

The applicant must demonstrate that the proposed non-standard installation: 1.) is necessary due to legitimate technical engineering limitations that prevent the site from being able to comply with the City standards during the initial design process; and 2.) that the proposed alternative will not pose health and safety risk to the water system. The request for a deviation from standards shall include a technical engineering-based justification, reasons why the deviation is required, and risk mitigation measures for non-standard utility services, water meters, and backflow preventer devices. The request shall demonstrate that the alternative design has addressed the following factors regarding the City public water system:

### A. Water Quality Assurance

Non-standard designs must meet water quality standards, prevent contamination, and comply with current state law. Applicants shall provide comprehensive plans to ensure the materials and installation methods do not compromise water quality.

### B. System Integrity

Water services, meters, and backflow preventer devices shall not compromise the overall integrity of the water supply system. Careful engineering and design shall be undertaken to ensure seamless integration and compatibility. Multiple in-line services shall not compromise the public water main or result in premature wear and tear of meters or backflow preventer devices.

### C. Hydraulic Analysis

Applicants shall abide by the water meter sizes determined by DSD (water meter data card) and the AWWA standards. Water services and meters shall be sized to adequately serve the project's peak demand, maintain accurate flow measurement, equalize flows to prevent premature wear and tear of the meters and ensure that services do not compromise the integrity of the public water main. Failure to appropriately plan for and size meters per these requirements at the onset of the project is not considered a technical engineering-related justification for a deviation.

### D. Constructability

If water meters and backflow preventer devices cannot be installed to meet the City's standards and guidelines due to site constraints, the applicant shall propose design alternatives for the installation to meet all applicable State and Federal requirements, including but not limited to California Plumbing Code (CPC) and Americans with Disabilities Act (ADA) compliance under the Federal requirements.

### E. Flood Mitigation

Water meters and backflow preventer devices shall be designed to prevent flooding in the event of water release during normal operation, system failures, and extreme weather conditions. Consideration shall be given to elevated installation or additional safeguards to prevent water damage or contamination.

### F. Access Controls

Access to meters and backflow preventer devices shall be restricted to authorized personnel only. Implementing robust access controls and security measures is essential to prevent unauthorized tampering or interference.

### G. Operational Needs

Designs of meters and backflow preventer devices must consider how City staff will access, inspect, maintain, and replace these assets post-construction. Adequate clearances and easements for persons and equipment must be provided.

## III. Deviation from Standards Procedure

All applicants shall design projects consistent with the City standards to ensure timely application processing and approval. Project timelines are not a technical engineering-related justification for a deviation request.

The location and footprint of water meters and backflow preventers shall be included in the initial submittal to the City to facilitate and mitigate potential conflicts between the building design and water service installations.

For projects proposing non-standard installation, submit the Deviation from Standard form to DSD for review and approval. Refer to [DS-266](#) **PDF** for the Deviation from Standards form. Processing of non-standard installations will add time to permit processing, will require additional technical information to be supplied to the City, and approval is not guaranteed. The procedure for requesting a deviation from standards includes the following:

### A. Permit Application

Submit a complete permit application to DSD, including all required documentation, such as engineering drawings, specifications, water/sewer study, water demand calculations, and any relevant test data. If standard installation is infeasible and a non-standard installation is proposed, the Deviation from Standards form shall be included with the first submittal to minimize delays to the project. Refer to Information Bulletin 166 for procedures to obtain a permit to install water, sewer or fire services.

The design shall consider space requirements for the required water meter size and associated backflow preventer devices for each service (domestic, fire, and irrigation). Utility connections and location shall be included in the preliminary design submittal to avoid redesign and impacts to other design characteristics (e.g., building footprint, density bonus, number of units, public space, aesthetics, etc.).

### B. Screening

DSD will review the deviation request for completeness and whether the proposed deviation warrants the request. Projects adhering to City standards (i.e. not requiring a deviation) do not require additional PUD review and concurrence unless a water and sewer study or comprehensive hydraulic modeling is required.

### C. Deviation from Standard Review

DSD will review the request and supporting documents (e.g., plans, plats, etc.) to ensure that the proposed methods and alternatives effectively mitigate the identified risks and maintain safety, quality, and performance standards acceptable to the City, and comply with state law. The review process includes collaboration between DSD and PUD staff to thoroughly assess the proposed non-standard components.

The following provides more detail on the information required as part of the deviation request:

- Justification
  - Identify the City standards from which the deviation is proposed.
  - Describe the engineering-based technical reason why the project cannot comply with the City standards.
  - Describe in detail the proposed solution and how it deviates from the standard(s).
  - Include a justification of why the deviation is required and how the proposed design protects the City's drinking water system.
- Alternative Design Analysis
  - Provide an analysis that includes the factors listed in Section II (a through g) and demonstrates how the design mitigates potential risks to the drinking water system
- Verification and Engineer of Records Sign-Off
  - The proposed deviation and supporting documentation shall be prepared and signed off by the Project's Engineer of Record (EOR).

### D. Deviation/Permit Issuance

Upon review and acceptance of the deviation request package, the City Engineer will sign the Deviation from Standard Form. DSD will continue processing the applicable permits necessary for the project.

### E. Inspection and Final Acceptance

Once construction begins for a project, DSD will inspect the construction project to ensure adherence to approved plans, with the following exceptions:

- water meters
- backflow preventers
- underground water system piping
- water system appurtenances
- wet utility rooms

## IV. Additional Information

All submittals impacting water system assets shall be addressed to DSD to facilitate and streamline the plan review process. Where the deviation from the standard is approved, the applicant and EOR are not relieved of the design responsibilities.

It is important to note that each deviation request will be reviewed and considered on its own merits based on the proposed alternative and project-specific variables. Approval of a deviation request does not imply preapproval for similar requests on other projects.

### A. Optional Project and/or Deviation Preliminary Review

Applicants have the option of applying for a Preliminary Review prior to formal project submittal to DSD for required permits and reviews. The Preliminary Review is a voluntary service that allows applicants to ask project-specific questions to assist with determining project design and feasibility. A Preliminary Review is not a comprehensive plan review. It is not intended to replace services provided by design professionals (architects, engineers, land use attorneys, code consultants, etc.). It is designed to answer specific project questions only and not design approval. Therefore, it will not be possible for staff to grant acceptance of your water and/or sewer deviation request(s) through the Preliminary Review. However, it can be used to assist with project planning and creating a more complete plan set when you formally submit. It is critical that you submit any necessary plans and studies that are needed for staff to answer your questions. Please see [Information Bulletin 513](#) for more information on the Preliminary Review process.

### B. Optional Water Meter Data Card Preliminary Review

Applicants have the option of applying for a Single Discipline Preliminary Review with the DSD-Combined Review discipline to obtain staff review of their draft [Water Meter Data Card \(DS-16\)](#) **PDF** prior to formal project submittal. This can assist with determining the required water meter size so that the project can be designed appropriately and avoid deviation requests and associated review delays. When submitting for a Preliminary Review, please provide all information requested on the Water Meter Data Card and select "DSD-Combined" as the reviewer, so that staff can provide an accurate response. Please see [Information Bulletin 513](#) for more information on the Preliminary Review process.

## References

- Water Meter Data Card, [DS-16](#) **PDF**
- General Application, [DS-3032](#) **PDF**
- Irrigation Meter Checklist, [DS-5852](#) **PDF**
- Deviation from Standards, [DS-266](#) **PDF**
- American Waterworks Association ([AWWA](#)) standards C-700, C-701 and C-702
- [2021 San Diego Standard Drawings](#)
- [2021 Water Facility Design Guidelines](#) **PDF**
- City Council Resolution (R-307143) [San Diego Downtown Design Guidelines](#)
- [Information Bulletin 113](#) **PDF**, "How to Obtain Approval for Cross-Connection Control"
- [Information Bulletin 166](#), "Water, Sewer or Fire Service"
- [Water and Sewer Fees](#) **PDF**