SECTION 5.6
BLOWOFFS

5.6.1 PURPOSE

The purpose of this section is to provide information regarding the use, sizing, location, alignment and design of blowoff assemblies for use with potable and recycled water pipelines.

5.6.2 STANDARD TERMS AND DEFINITIONS

Wherever technical terms occur in these guidelines or in related documents, the intent and meaning shall be interpreted as described in Standard Terms and Definitions.

The following terms and definitions as found in this section shall have the following meaning:

BO: Blowoff Assemblies

5.6.3 GENERAL

It is the responsibility of the user of these documents to make reference to and/or utilize industry standards not otherwise directly referenced within this document. The Engineer of Work may not deviate from the criteria presented in this section without prior written approval of the District's Engineer.

5.6.4 GUIDELINE

A. Requirements: A Blowoff (BO) assembly is used to flush out accumulated sediments at low spots and dead-ends of pipelines and for draining pipelines for repairs, maintenance, and inspection.

B. Drainage: BO discharge shall be directed away from the pipeline into a nearby storm drain or other non-erodible surface drainage channel. Discharge of water across the road surface is not permitted. When the discharge of a blowoff discharges to an erodible surface, consideration should then be given for the installation of an energy dissipater or an additional erosion control measure in accordance with Section 4.6.

   The downstream receiving system (including erosion potential) should be evaluated as to its suitability to accept the maximum flow from all affecting BO's. However, the Design Engineer should be aware that certain mitigating conditions mandated by the Regional Water Quality Control Board and the City of jurisdiction apply to the discharge of treated potable water into storm drains and natural drainage courses, and should consider those conditions when evaluating the downstream receiving system in accordance with Section 4.6.

C. Sizing: Each pipeline is to be evaluated individually for the need of BO assemblies depending on the size of pipeline, the distance between the blowoffs, the distance between line valves and locations of air valves to ensure the time required to drain each pipeline section is between two (2) to four (4) hours. If minimum time requirements cannot be met than additional BO's may be required. Faster drain times than those mentioned above may be required by the District Engineer.

   1. Minimum sizes shall be as follows (Note, the Engineer of Work shall consider the minimum velocity requirements of twenty-five feet per second (25fps) at

dead-end of mains per California Department of Health Services Article 5, Section 64642):

A. Two inch (2") BO assemblies shall be installed on pipelines for temporary use or as otherwise directed by the District Engineer.

B. Four inch (4") BO assemblies shall be installed on pipeline sizes sixteen inches (16") and smaller.

C. Six inch (6") BO assemblies shall be installed on pipeline sizes twenty inches (20") and larger.

2. Use the following formula to determine the proper blowoff size based on the drainage time specified above.

$$Q = Cd \times A\sqrt{2g \times H}$$

Q = Blowoff discharge rate (cfs)
Cd = Discharge coefficient (0.60)
A = Area of blowoff orifice (ft^2)
g = Acceleration of gravity ($32ft/sec^2$)
H = Pressure head at outlet (ft).

Assume one half (1/2) of elevation difference between end of pipe & blowoff.

The time required to drain the pipe is calculated by dividing the volume of water in the pipeline segment to be drained by the calculated flow ("Q") through the blowoff. Set the value of "Q" such that pipeline will drain within specified above and solve for "A". Note that the value of "Q" may be limited by the volume of water that can be dechlorinated and/or conveyed to an adequate drainage system. The District Engineer shall determine the upper limit of "Q" if any.

D. Locations:

1. For mains sixteen inches (16") and smaller: The locations of BO's are generally determined by the topography of the pipeline system and, accordingly, should be installed at low points of the pipeline. BO's shall also be placed at end of mains such as cul-de-sacs.

The outlets of fire hydrants can also perform the functions of a BO. Because a fire hydrant also provides local fire protection, the use of a fire hydrant in lieu of a BO is recommended.

In areas were space is limited, usually alley streets, a combination Air Vac and Blowoff assembly shall be used per Standard Drawing W-10.

2. For mains larger than sixteen inches (16"): Along with being installed at low points, BO's are also installed on the high side of closed valves if the closure of the valve creates a localized low point.

3. BO's should also be placed up-slope of a permanently/normally closed valve separating two different pressure zones or interconnections.

E. Appurtenances: The pressure class for all piping, valves, and fittings shall be equal to or greater than the pressure class of the water main. BO appurtenances will be required in

accordance with Standard Specification 15074, Standard Drawings W-9 through W-11 and the Approved Materials List.

F. Installation: BO's are to be installed above finish grade outside travel ways where likelihood of damage from traffic is least possible, yet within the road right of way or District easement in accordance with Standard Specification Section 15074 and Standard Drawings W-2 accordingly.

5.6.5 NOTATIONS ON PLANS

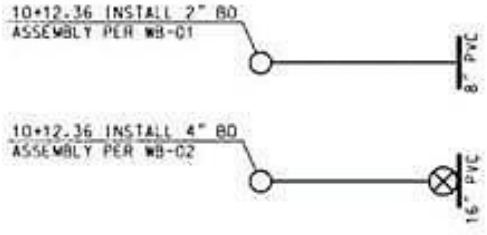
BO's shall be shown in the plan view portion of the sheet(s) only and shall include, but not be limited to, the following minimum information:

A. Standard symbols, stationing and plan callout notes shall be in accordance with Section 1.1.

B. BO's shall be shown with the following information:

- Stationing of the BO at the connection to the pipeline.
- Size of BO.
- Refer to Figure 1 below.

Figure 1
Blowoff Assembly Plan Callouts



5.6.6 MATERIAL SELECTION

BO and appurtenant components to be used with the installation of water systems shall be in accordance with Standard Specification Section 15074 and the Approved Materials List.

5.6.7 REFERENCE

Should the reader have any suggestions or questions concerning the material in this section, contact the District Engineer.

The publications listed below form a part of this section to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said publications unless otherwise called for. The following list of publications, as directly referenced within the body of this document, has been provided for the users convenience. It is the responsibility of the user of these documents to make reference to and/or utilize industry standards not otherwise directly referenced within this document.

1. Valley Center Municipal Water District Standards:

    A. Design Guidelines

i. Section 1.1, Drafting Guidelines

B. Standard Drawings

i. W-2, W-9 and W-11

C. Approved Materials List for Water Facilities

D. Technical Specifications

i. Section 15074, Blowoff Assemblies

2. California Department of Health Services Article 5, Section 64642

END OF SECTION