

# **LARGE DIAMETER VALVES AND THE DISTRIBUTION SYSTEM**

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1. This presentation will cover the features and benefits of three different types of valves used in water works distribution systems. These valves are butterfly valves, metal seated gate valves, and resilient seated gate valves. These are the most commonly used valves in distribution service. Due to the complexity and low quantity usage in the distribution system, check valves will not be considered here.

2. Proper selection of large diameter valves is not as simple as it may seem. There are many variables to consider when choosing the right valve for the application. I will attempt to evaluate each consideration such as line size, pressure, performance, frequency of operation, line cleaning, ease of operation, and cost and look at the pros and cons of each type valve.

## 2.1 Line Size:

In some applications the flow restriction and pumping cost can vary greatly due to line size and valve type.

## 2.2 Pressure Rating:

The pressure rating of the valves used plays an important role and the rating varies with valve type

## 2.3 Frequency of Operation:

Operation of line valves is important to assure long term reliability and to minimize internal tuberculation build-up in the valves. frequency of operation also affects the life of some valves.

## 2.4 Reliability:

Reliability of any distribution system component is important.

Reliability in system valves can be enhanced by design and internal coating.

## 2.5 Ease of Maintenance:

Ease of maintenance and repair play an important role in the long-term cost of the system.

## 2.6 Space Requirements:

Smaller and lighter weight valves have a distinct advantage where space and handling is limited.

## 2.7 Buried Service:

Valves installed underground require that consideration be given to routine maintenance.

## 2.8 Shallow Bury:

The physical size and height of large diameter valves must be considered shallow trench depths are used. Smaller valves such as butterfly valves or horizontally installed gate valves may be required.

## 2.9 Valve Orientation:

Some types of valves require special orientation if they are installed immediately downstream of a pump or 90 degree bend.

#### 2.10 Line Cleaning:

Cleaning or "pigging" distribution system lines in some cases is an important consideration. Valve selection is critical if line "pigging" is to be used.

#### 2.11 Ease of Operation;

Operating torques are sometimes a factor in valve selection. Torques can vary greatly with valve design.

#### 2.12 Maintenance Frequency:

Routine maintenance becomes an important issue if valves are buried or installed where access is limited.

#### 2.13 Initial and Long Term Cost:

Cost is always an important factor, but initial cost may not be the controlling factor. Long term cost over the life of the valve could prove to be the deciding factor in valve selection.

### 3. Submittal Review:

One of the most important parts of building a distribution system is the selection and submittal review of the components used in the system, including valves. The valves must meet the performance requirements of the project and provide some measure of safety factor above minimum requirements to compensate for variations. Standards should be reviewed and used as applicable for product performance and quality. Always remember to deal with reliable suppliers with long term experience and trust your consulting engineer for guidance.

If you have any questions, please contact [Dr. C.Vipulanandan](#)

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