ASCE QUAD CITIES SECTION

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2021 Board of Directors

Lock and Dam 15 Repairs

Join us on April 21, 2021 when Joshua Hendrix, from the United States Army Corps of Engineers, will present on repairs to Lock and Dam 15. Mr. Hendrix is a Project Manager with the United States Army Corps of Engineers. Mr. Hendrix attended Tennessee Technological University from 1975 to 1980. Mr. Hendrix obtained his Professional Engineers License in 2013.

Registration information will be sent via e-mail.

United States Army Corps of Engineers Mission

"To deliver vital public and military engineering services; partnering in peace and war to strengthen our nation's security, energize the economy and reduce risks from disasters.

United States Army Corps of Engineers Motto

Essayons - *"Let us try"*

United States Army Corps of Engineers Insignia

United States Army Corps of Engineers Fact

Did you know the USACE is the 5th largest supplier of electricity in the United States?

President's Message

The snow has melted, and spring bulbs are in full bloom. We're kicking off Spring with several great presentations and a tour Josh Hendrix (UASCE) will kick off our spring series with a presentation on the current Lock and Dam 15 repairs. Then in May, SAME invited us to check out USACE's new heavy lift crane (christened "The Quad Cities") and Engineers Without Borders will join us for a topic of their choice.

We are also partnering with Quad City Engineering and Science Council (QCESC) to help promote our events and increase ASCE's and QCESC's presence in the community. To that end, please check out QCESC's website (qcesc.org) follow QCESC on Facebook (QCESC), Twitter (@QCESC), and/or LinkedIn, and like/share articles, announcements, and upcoming events.

Don't forget: Please send us your ideas for upcoming presentations and/or tours.

Calendar and Upcoming Events

The Quad City Section leadership is working on a full slate of section meetings and tours to advance our members and the profession. The following Section calendar indicates activities currently in planning.

Date	Time	Topic	Speaker	Location
April 21, 2021	12 Noon to 1:00 PM	Repairs to Lock 15	USACE	Virtual
May 13, 2021	12 Noon to 1:00 PM	Joint Meeting with SAME: New Quad City heavy lifting cranes	SAME	To BE Announced
May 19, 2021	12 Noon to 1:00 PM	Engineers Without Borders – Topic of their choice	Engineers Without Borders	Virtual
June 16, 2021	12 Noon to 1:00 PM	QC Airport Taxiway Realignment	Crawford, Murphy, Tilly	Virtual
July 21, 2021	12 Noon to 1:00 PM	Engineering Ethics	NSPE	Virtual

We welcome volunteer speakers, engineering presentations, and project tour ideas. Contact any of our officers with your thoughts.

A Valve Selection Primer - Part 1

The Gate Valve and the Butterfly Valve

Gate Valves:

Gate valves are designed to be full-stop valves. This means that they are designed to be fully on or fully off. When the valve is in the off position, the flow is fully off. Attempting to throttle the flow with gate valve will result in damage to the valve in the long term. The damage will be caused by erosion or cavitation. Also, a partially closed / open gate valve results in the wedge or parallel plates being subjected to the water main pressure without full 360-degree support of the wedge by the wedge guides. Gate valves provide full bore (i.e. no reduction in the flow area through the valve) and allow the flow to pass through the valve without disrupting the flow pattern. Therefore, head loss through the valve is normally low.

Gate valves move the wedge (or plates) by a threaded stem. Thus, turning the stem to close the valve takes time. While closing the valve, the operator should be intentionally slow in closing the valve to prevent water hammer. But, closing the valve the threaded stem does help prevent any sudden closures. Sudden valve closures create water hammer that will damage the water distribution system.

Larger diameter gate valves are expensive. In addition, the force on the sealing wedge or plates, which is a function of the water system pressure and the area of the wedge / plates exposed to that pressure becomes significant as the valve size increases. The friction between the sealing wedge / plates and the seat increases, making it harder to turn the stem. To overcome this, the valve stem would have to be constructed with finer threads to increase the mechanical advantage in closing the valve. This results in a valve stem that may wear out quicker.

Gate valves located beneath grade are normally constructed with a non-rising stem. Thus, the elevation of the nut on the stem does not change. The rotation of the stem raises or lowers the sealing wedge. In above-grade applications, some operators prefer gate valves that have a rising stem. This allows the operator to assess at a quick glance whether the valve is open or closed.

Back seating on the sealing wedge / plates allows the valve stem to be replaced while the valve remains under pressure.

Some of the accessories for below grade gate valves include a pad that inserts between the valve and valve box. This helps protect the valve from direct blows that the valve box body may experience on the surface. Valve boxes can also have a debris cap. This prevents debris from entering the valve box. Debris that enters the valve box becomes situated around the valve nut. If enough debris gets into the valve box, this affects the operation of the nut.

It is critical that below grade gate valves be installed vertically so that the valve wrench will fit perfectly onto the valve nut. Misalignment of the valve nut requires the valve to be reassembled.

Gate valves are not always recommended for slurries of large particles or flows that contain debris. Materials in the flow can have prevent full sealing of the valve. And slurries can abrade the valve guides, seats, and wedge. Particularly if the wedge is a soft material. However, the movement of the wedge does provide a wiping mechanism to remove debris from the sealing wedge. If properly specified, the gate valve can be an important valve for flow with other materials suspended in the flow regime.

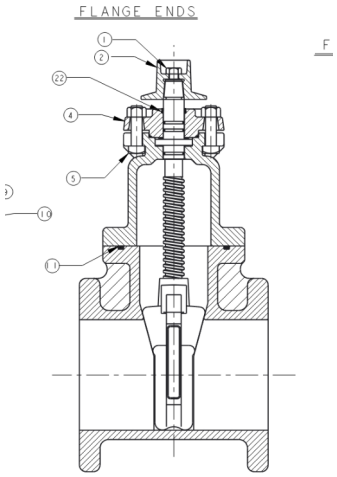

Figure No. 1: Resilient wedge gate valve

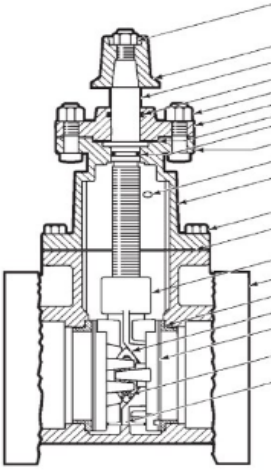

Figure No. 2: Double disc plate gate valve

Butterfly Valves:

Butterfly valves are a disc placed permanently in the flow regime. The valve normally turns 90 degrees between being fully opened and fully closed.

Because butterfly valves have half of the disc being closed against the water system pressure and half of the disc being closed by the water system pressure, for large diameter valves, they are generally easier to close. Because they do not utilize the system pressure to fully seat, when first developed these valved did allow for some leakage. But advances in materials have allowed these valves to seat id they are closed tightly.

Butterfly valves have some throttling capacity. This capacity starts to kick in when the valve is open in the range from 15 degrees to about 70 degrees. However, in this range, high velocities can cause the disc to vibrate and damage due to cavitation is always a possibility. And sometimes, while the disc itself may not vibrant, turbulence introduced by the disc may cause other system components to vibrate. Replacement or repair of the stem on this valve usually requires the system to be depressurized.

Because the disc is always in the flow regime, butterfly valves foul easily in slurries and flows that have stringy debris. Also, because the disc is always in the flow regime, the head loss associated with butterfly valves is greater than that of gate valves.

The disc can be turned directly or be geared so that there some mechanical advantage when closing the valve. Closing this valve must be performed intentionally slowly to avoid water hammer. Because of the closing mechanism, the stem on this valve, generally is almost always a non-rising stem. Because it these valves have a non-rising stem, valve controls that have circular hands should have markings on the handles to help operators quickly identify if the valve is open or closed. Some valves have levers for operating controls. In this case, it is easy to determine if the valve is open or closed.

It is critical that below grade butterfly valves be installed vertically so that the valve wrench will fit perfectly onto the valve nut. Misalignment of the valve nut requires the valve to be reassembled.

When the valve is in the open position, the disc actually extends beyond the valve body and into the adjacent pipes. Therefore, these valves cannot be installed immediately adjacent to other fittings.

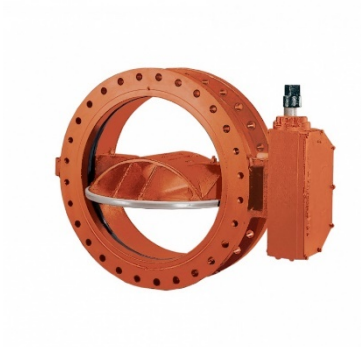

Figure No. :Typical butterfly valve