Eliminating Vaults from Direct Bury Distribution Systems
IDEA Campus Conference – Distribution Workshop

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Overview

• Replacing vaults with pre-insulated direct bury pipe and valves
• Reconstruction of underground vaults
• Evolution of valves in a distribution network

• Eliminates the high cost of underground concrete structure repairs.
• Reduce annual maintenance cost of vault electrical systems, sump pumps, freeze protection and dehumidifiers.
• Removes the risk of exposure to confined space of an underground vault.
• Concrete underground structures are susceptible to the effects of road salt and ground water.
Expansion Vault Removal Project
Expansion Vault Removal Project
Expansion Chamber Removal Project
Expansion Chamber Removal Project
Expansion Vault Removal Project
Expansion Vault Removal Project
Ready for insulation
Air Vent Vault Removal
Air Vent Vault Removal
Air Vent Vault Removal
Air Vent Vault Removal
Air Vent Vault Removal
Air Vent Vault Removal

Air Release
Air Vent Vault Removal
Air Vent Vault Removal
Benefits of Pre-Insulated Direct Bury Pipe and Valves

• Significant advancement in field joint kits – shrinkable sleeve. Resistant to ground water intrusion.
• Polyurethane foam insulation reduces heat loss, improves system efficiency.
• Impact resistant polyethylene outer pipe jacket.
• Pre-insulated pipe is watertight, resistant to road salt and other chemicals found in soil.
Mainline Vault Reconstruction

• Mainline vaults are major intersecting pipeline arteries in the distribution network.
• Mainline vaults allow for multiple configurations of the distribution network.
• These vaults contain large diameter piping, isolation valves, air vents, drains, bypass piping, communication networks, connections to leak detection systems.
• Reconstruction projects are budgeted annually.
• Not suitable for direct bury applications.
Mainline Vault Reconstruction
Not suitable for direct bury applications
Vault Reconstruction Project
Lid Removals
Vault Reconstruction Project
Vault Reconstruction Project
Insulation removed. Wall repairs in progress. Plug and butterfly valves
Vault Reconstruction Project

Concrete forms for wall repairs.
Vault Reconstruction Project

Wall repairs complete.
Vault Reconstruction Project

Phase 1. Pipe and valve replacement.
Vault Reconstruction Project
Phase 2. Pipe and valve replacement.
Vault Reconstruction Project

More pipe and valve replacement
Vault Reconstruction Project

More pipe and valve replacement.
Vault Reconstruction Project

Insulation in progress. Closed cell high performance insulation (polyisocyanurate)
Vault Reconstruction Project

Final insulation.
Vault Reconstruction Project

Cover installation.
Vault Reconstruction Project

Cover installation.
Vault Reconstruction Project

Waterproofing and manhole covers. Street restoration. Project complete.
Valves for Distribution Mainline Vaults
Types of Valves in the Distribution Network
1983 - 2019

Lubricated Plug Valve  Butterfly Valve  Ball Valve
Lubricated Plug Valves

• Installed in the distribution network in the 1980’s
• Gear operator replacement parts no longer available.
• Grease port failures caused operational issues.
• Valves became difficult to operate.
• Valve replacement projects began in 2005.
Butterfly Valves

- Installed in the distribution network in the 1990’s.
- Low maintenance and excellent operational performance.
- Lower up front cost compared to ball valves.
- Disc in the center of the valve creates higher pressure drop.
- Valve leak by issues due to disc and/or seat wear.
Ball Valves

- Quality constructed ball valves.
- Superior operational performance.
- Lower pressure drop.
- 40+ year service life.
- Higher upfront cost.
- Ball valves are 20% of the overall project costs.
Questions?

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