

WATER MAIN LINE STOPPING



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DEPARTMENT OF PUBLIC WORKS & PARKS
ENVIRONMENTAL SERVICES DIVISION

Overview

- Water Main Break – August 2011
- Valve Repair Options
- Line Stop Process
- Line Stop Project
- Lessons Learned

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Water Main Break – August 2011



Summary

- Retaining Wall adjacent to Bowring Park damaged during Hurricane Igor
- Temporary Repairs made with Armour Stone
- Contractor hired to replace damaged section of retaining wall
- 400mm Water Main located under wall footing

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Water Main Break – August 2011



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Water Main Break – August 2011



- Water Main Break occurred on August 31, 2011 at 1:45 pm
- Isolation Attempt #1
 - 2 Main Line Valves
 - 3 - 4 Secondary Valves
- Isolation Attempt #2
 - 2 Main Line Valves
 - 6 - 8 Secondary Valves

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Water Main Break – August 2011



- Isolation Attempt #3
 - 4 Main Line Valves
 - 50-60 Secondary Valves
- Water Main Repair
 - Water Main Break was never completely isolated
 - Repair completed with water still flowing – approx. 1/4" pipe
 - Repair completed Sept. 2

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Water Main Break – August 2011



- Water Main Repair
 - Water Main Break occurred on 400mm transmission main
 - Two 400mm Valves discovered to be inoperable
- Damaged Valves need to be Repaired or Replaced
 - Valves originally installed in 1954

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Valve Repair Options

Options Reviewed to Repair / Replace 400mm Valves

1. Repair Valve

- Given age of valve decided better to replace valve
- Option Eliminated

2. Replace Valve

- Could not isolate water main for water main break
- Therefore how could isolate water main to install new valves?
- Option Eliminated

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Valve Repair Options

Options Reviewed to Repair or Replace 400mm Valves

3. Insertion Valve

- At the time of evaluation – none of the manufacturers could perform a 400mm valve insertion
- Option Eliminated



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Valve Repair Options

Options Reviewed to Repair or Replace 400mm Valves

4.Line Stop

- Specialized equipment and personal required
- Option Selected as only alternative available



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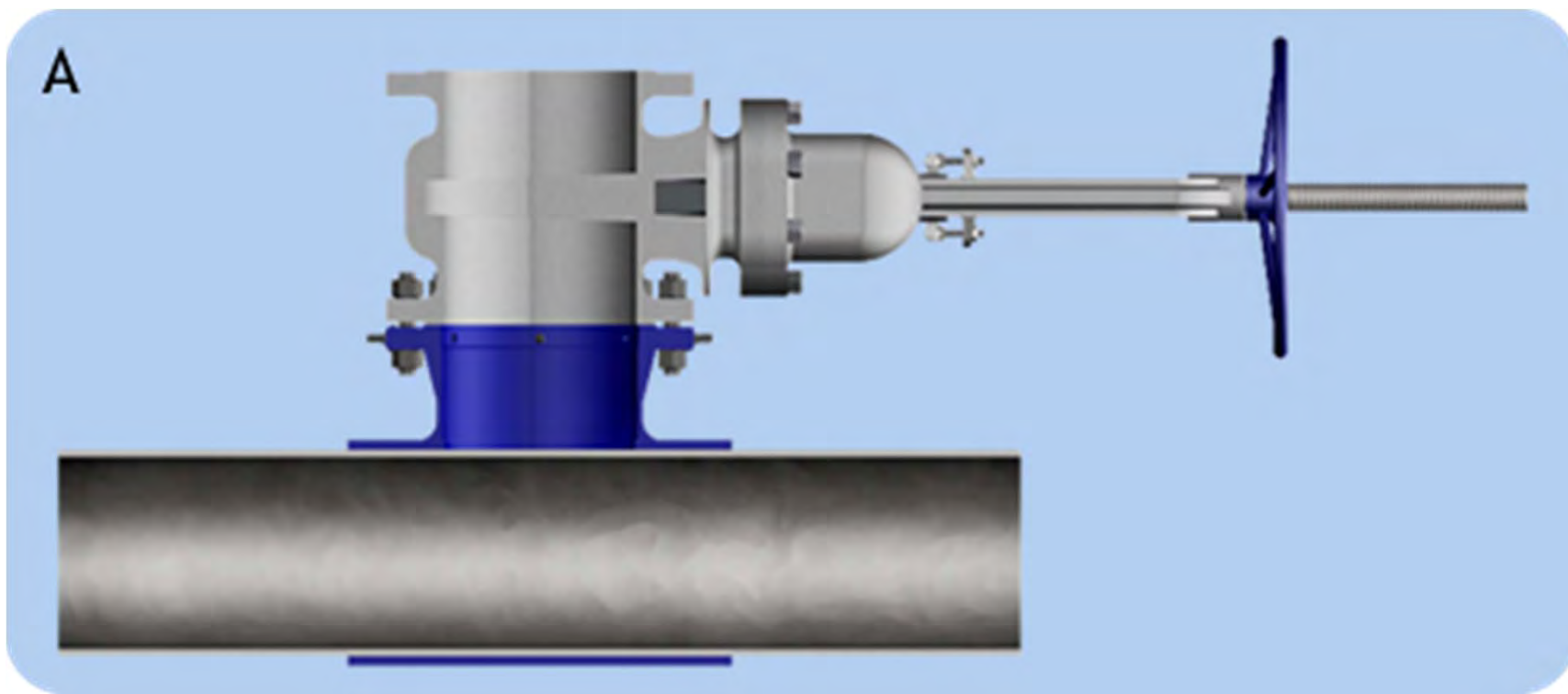
Line Stop Process

- What is a Line Stop?
 - A method to temporarily shut off the flow (water, oil, gas, steam, etc.) of an in-service pipe system.
 - A hot tap is performed on the pipe system and a temporary plug is inserted into the pipe.
 - Once the work is complete, the plug is removed and the opening is sealed with a blind flange.

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Line Stop Process

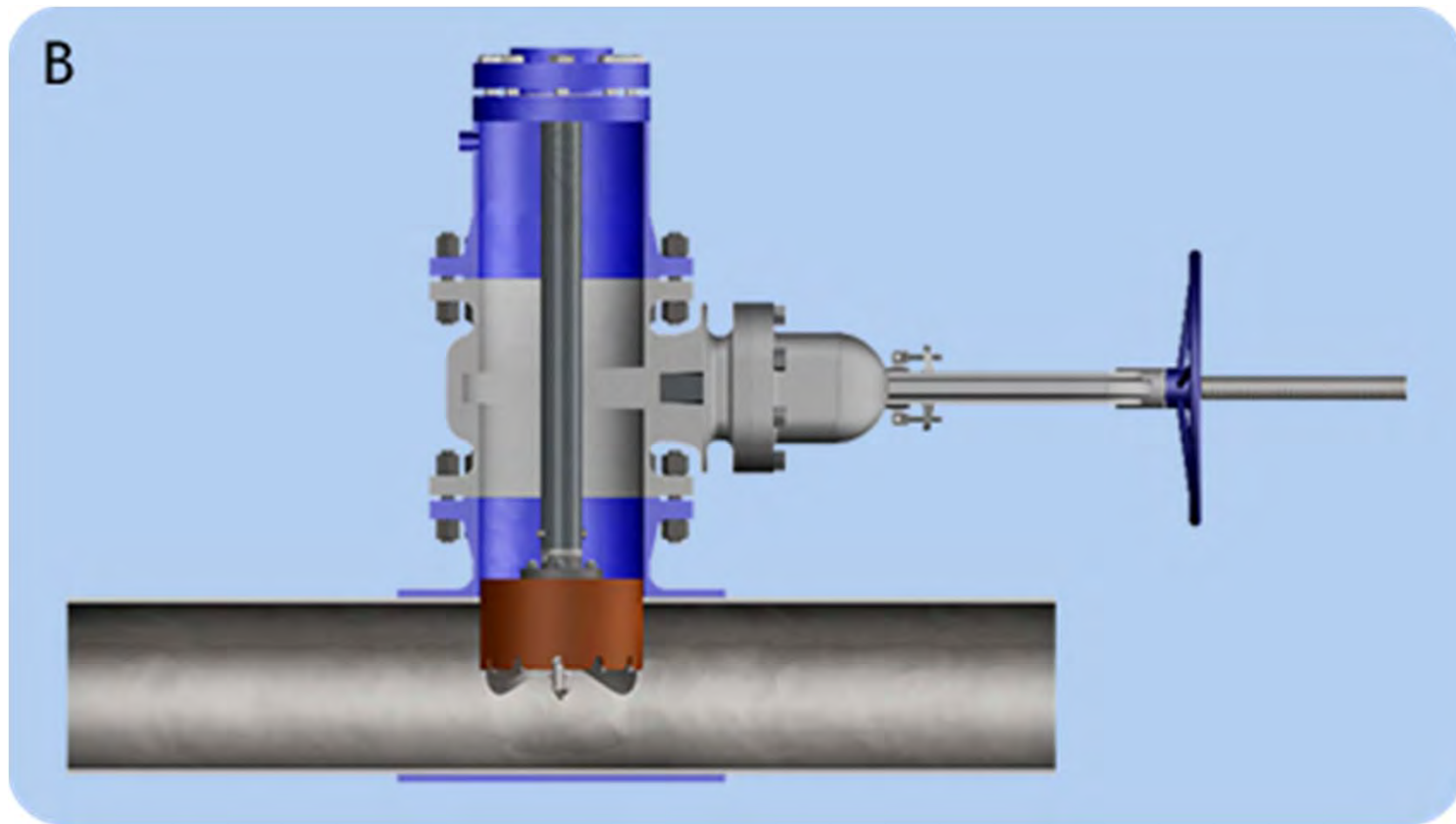


Step 1 - Install Tapping Sleeve and Valve

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Line Stop Process

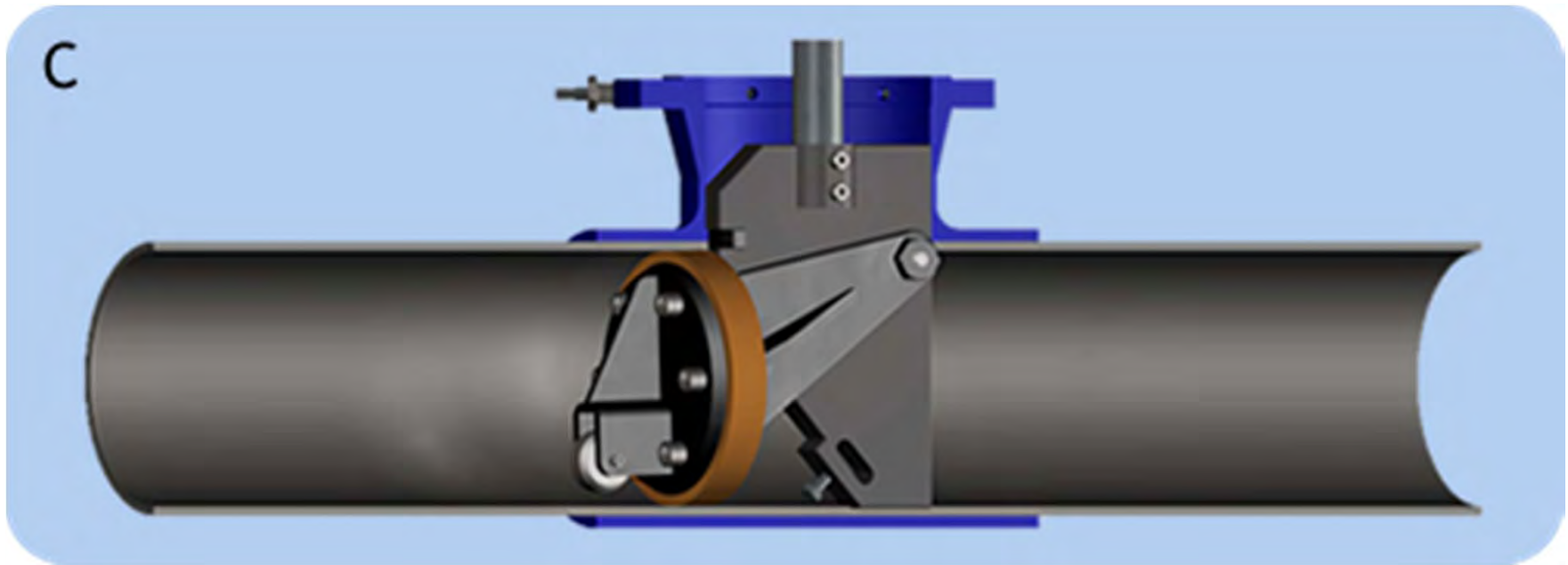


Step 2 – Install Drill and Tap Main

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Line Stop Process

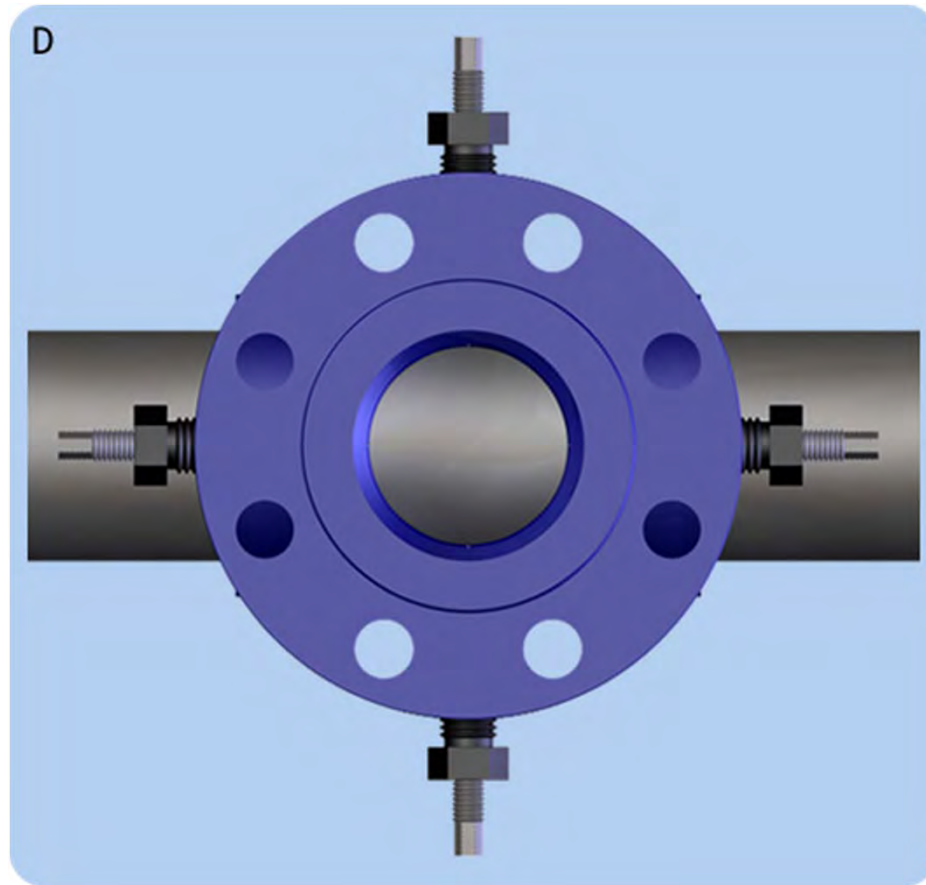


Step 3 – Install Temporary Plug

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Line Stop Process



Step 4 – Plug Removed & Blind Flange Installed

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Line Stop Project



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Line Stop Project



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Line Stop Project



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Lessons Learned

Line Stop Method was successful

- Would consider using again

Planning is Critical

- prior to the start of the job there was months of planning

1. Design
2. Pre-Construction
3. Construction

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Lessons Learned

Planning – Design

- Research and understand construction methods
- Select line stop locations
- Select valve locations
- Measure Pipe OD
- Obtain Pipe Sample - Coupon



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Lessons Learned

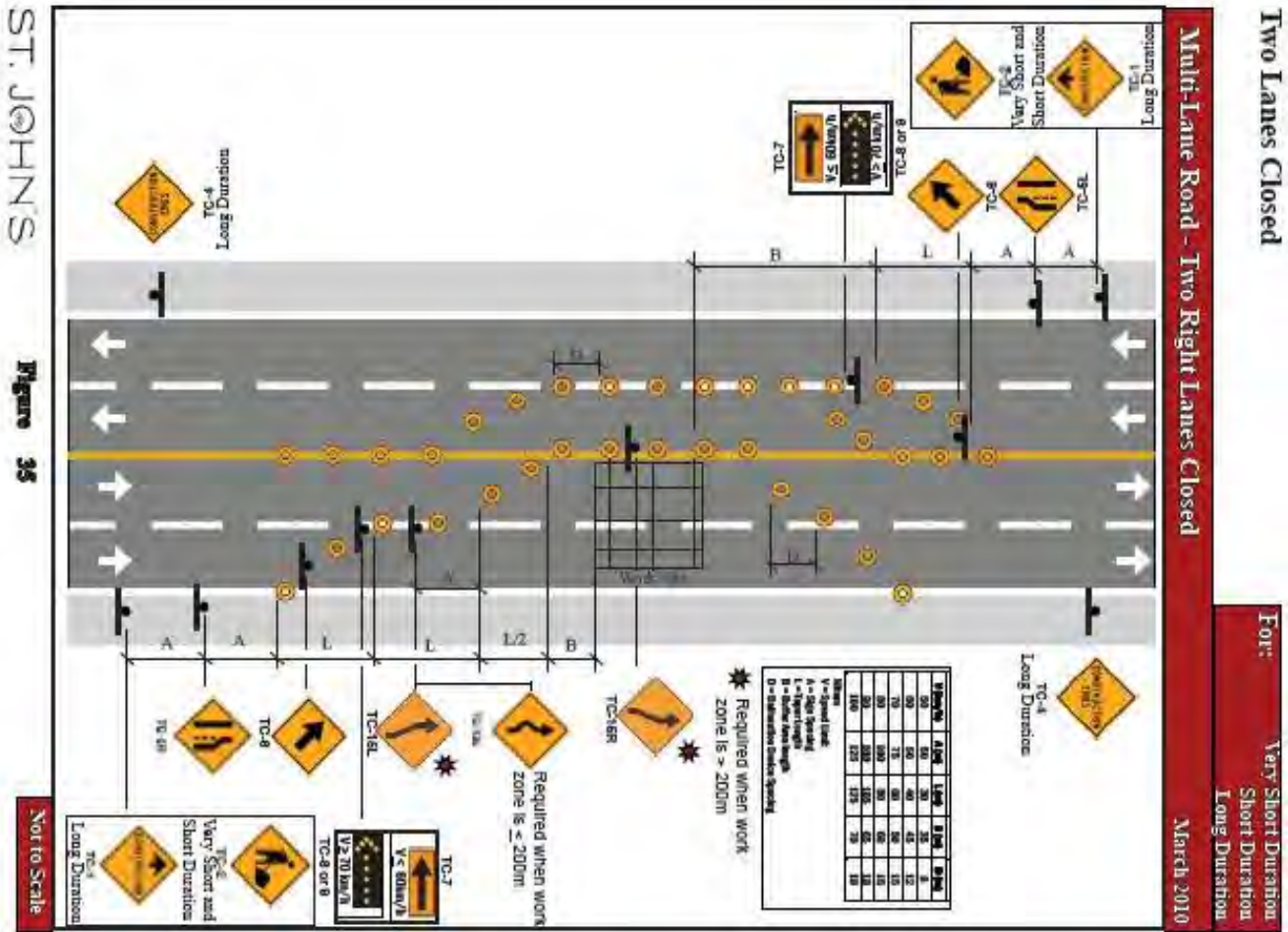
Planning – Pre-Construction

- Determine Critical Customers
- Develop water outage plan, including affected area and isolation valves
- Locate, clean and check all required valves
- Develop list of required materials and order if necessary
- Prepare Traffic Plan

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Lessons Learned



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Lessons Learned

Planning – Construction

- Prepare Water Interruption Notices – Notify Residents
- Conduct Pre-Job Meeting with Contractor(s)
- Know what is expected from all parties involved
- Pre-Fabricate as much as possible
- Ensure all required materials are on-site

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A panoramic view of St. John's, Newfoundland, at night. The city lights are reflected in the harbor water. The sky is a deep blue, and the city lights are a mix of warm yellow and cool white. The harbor is filled with boats and buildings, and the city extends up a hillside in the background.

Thank You

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