



City of

# Saskatoon

## Public Works Operations Manual

### Standard Operating Procedures for Water and Sewer

#### WS-A412 Water Connection Repair

#### 1. Objective:

- 1.1. To repair the water connection in a timely and efficient manner, minimizing disruption in service to the customer.
- 1.2. To ensure the water connection repair meets current standards.

#### 2. Scope:

- 2.1. This procedure includes repairs of water connections (not complete replacements).

#### 3. Reference:

- 3.1. Saskatchewan Department of Labour – Occupational Health and Safety Regulations (1996)
  - i. Section 260 Excavation and Trenching
  - ii. Section 261(2) Temporary Protective Structures
  - iii. Section 87(4)(a, b) Personal Protective Equipment/General Responsibilities
  - iv. Section 259 Locating Underground Pipelines, etc.
  - v. Section 338 Asbestos Surfaces and 339 Ventilation Equipment
  - vi. Section 269(1)(a, b) Requirements Before Confined Space Is Entered
- 3.2. Traffic Control Manual
- 3.3. City of Saskatoon Policy number A04-011 (B)(4) - Safety Rules and Personal Protective Equipment
- 3.4. The Environmental Management and Protection Act (2002) and The Water Regulations (2002)
- 3.5. City of Saskatoon Standard Construction Specifications and Drawings Roadways, Water and Sewer, 2000 Edition
- 3.6. WS-A01 Water Quality SOP (Current Version)

#### 4. Outstanding Issues:

- 4.1. Completion of WS-A01 Water Quality SOP
- 4.2. Creation of an SOP for Backfilling
- 4.3. Creation of an SOP for Water Connection Replacement

#### 5. Approvals:

- 5.1. The Clearances and Locations Work Group will acquire approval for underground/overhead utility clearances prior to excavation.

## **6. Responsibilities:**

### **6.1. Supervisor IV**

- i. Ensures the Clearances and Locations Work Group acquire the clearances of all utilities at the repair site.
- ii. Performs a daily circle check on their assigned vehicle and logs results.
- iii. Locates and marks water and sewer lines.
- iv. Meets with other utility representatives at the repair site, as required.
- v. Notifies the public of a water outage in the case of a planned repair.
- vi. Requests the sign shop and/or the labourers install appropriate traffic control devices, when required.
- vii. Ensures appropriate traffic control devices are in place.
- viii. Confirms the de-energizing of any buried utilities and relays the information to the applicable staff, if required.
- ix. Coordinates and selects the equipment required to successfully complete the repair.
- x. Acquires materials for the repair.
- xi. Ensures that all shoring equipment is in proper working order and installation is in compliance with all regulations.
- xii. Deploys the crew of operators and labourers to the job site.
- xiii. Supervises all subordinate staff, while available to do so.
- xiv. Identifies water connection location and size of excavation.
- xv. Determines with the excavator/backhoe operator, the most suitable way to excavate.
- xvi. Ensures subordinate staff, are aware of, understand, and follow all safety rules and regulations.
- xvii. Ensures all utilities have been supported as required by their owner's specifications.
- xviii. Determines the length of pipe to be replaced.
- xix. Is aware of other construction/maintenance activities in the immediate vicinity of the repair site that may be affected by the repair activities.
- xx. Ensures proper cleaning, disinfection, flushing sampling and testing methods are adhered to, by monitoring and/or performing them.
- xxi. Ensures repair meets current standards and recommended practices.
- xxii. Ensures backfill standards are met.
- xxiii. Inspects work area to ensure it is clean, safe and tidy during and at completion of the repair.
- xxiv. Ensures that a plan of the closed valves is submitted to the Valve Supervisor.
- xxv. Ensures that all required forms and documentation are completed and submitted; at the end of the day the work is completed.

### **6.2. Clearances and Locations Work Group**

- i. Acquires clearances for all utilities.
- ii. Locates and marks water and sewer lines.
- iii. Meets the other utility representatives at the repair site.
- iv. Notifies Railway Roadmasters (CN & CP) in advance of work progress near railroad corridors.
- v. Provides drawings of water and sewer line locations.
- vi. Coordinates the removal of some obstructions.
- vii. Initiates job numbers and location numbers.
- viii. Supplies the Supervisor IV with the required forms.
- ix. Updates manual and electronic records.

### **6.3. Labourers**

#### **6.3.1. Bottom Labourer**

- i. Erects appropriate traffic control devices as directed by the Supervisor IV.
- ii. Inspects the hydraulic shoring for leaks, pins, bent rails and general condition of pumps, fluid levels and hoses.

- iii. Complies with all safety rules and regulations.
- iv. Works unsupervised if required.
- v. Exposes (by hand) all the buried utilities including water and sewer lines (during excavation) after they have been marked.
- vi. Signals and directs the excavator/backhoe operator to the location of the buried water and sewer lines in the final phase of excavation.
- vii. Installs shoring as per manufacturers recommendations.
- viii. Observes the trench walls for cracking and/or movement of soil that could indicate potential for collapse.
- ix. Warns other bottom labourers of imminent danger and immediately summon their exit.
- x. Ensures tools and crew trailer are clean and in proper working order.
- xi. Disinfects tools, equipment and materials before use.
- xii. Exposes the water connection.
- xiii. Prepares the water connection for repair.
- xiv. Repairs the water connection.
- xv. Observes for leaks, following repair and re-pressurization.
- xvi. Installs a 12lb anode on copper connection pipe as required
- xvii. Mechanically compacts backfill material.
- xviii. Removes all unnecessary traffic control devices from the roadway prior to leaving the site.

**6.3.2. Top Labourer**

- i. Erects appropriate traffic control devices as directed by the Supervisor IV.
- ii. Inspects hydraulic shoring for leaks, pins, bent rails and general condition of pumps, fluid levels and hoses.
- iii. Complies with all safety rules and regulations.
- iv. Works unsupervised if required.
- v. Installs shoring as per manufacturers recommendations.
- vi. Ensures tools and crew trailer are clean and in proper working order.
- vii. Disinfects tools, equipment and materials before use.
- viii. Assembles the required repair materials.
- ix. Passes all required tools and material to bottom labourer.
- x. Observes trench walls for cracking and/or movement of soil that could indicate potential for collapse.
- xi. Warns bottom labourer of imminent danger and immediately summon their exit.
- xii. Energizes the water main.
- xiii. Operates the hydrant.
- xiv. Installs hydrant throttle valve.
- xv. Installs hydrant hose or diffuser and directs flows to the storm sewer system if possible.
- xvi. Directs the tandem axle truck operator to dump the backfill material.
- xvii. Cleans the area around the excavation.
- xviii. Removes all unnecessary traffic control devices from the roadway prior to leaving the site.

**6.4. Tandem Axle Truck Operator**

- i. Operates a tandem axle truck.
- ii. Performs daily circle checks before operating trucks and trailers and logs results.
- iii. Ensures a regular maintenance schedule is adhered to, including daily servicing.
- iv. Ensures trailers are clean and in proper working order.
- v. Works unsupervised if required.
- vi. Hauls the emergency water supply, shoring and crew trailers as required.
- vii. Ensures the emergency water supply trailer is taken to the worksite first and its heating system is turned on if required.
- viii. Notifies Central Dispatch of the location of the emergency water supply trailer.
- ix. Ensures the emergency water supply trailer is completely filled before storing.

- x. Hauls and loads material as required or directed by the Supervisor IV.
- xi. Ensures load counts are logged on the appropriate forms.
- xii. Assists with repair as directed by the Supervisor IV.

#### **6.5. Excavator/Backhoe Operator**

- i. Operates the excavator/backhoe.
- ii. Performs daily circle check before operating the excavator/backhoe and logs results.
- iii. Ensures a regular maintenance schedule is adhered to, including daily servicing.
- iv. Works unsupervised if required.
- v. Consults with and receives direction from the Supervisor IV on the critical steps of the excavation.
- vi. Ensures asphalt and granular material are separated from the sub-grade material to avoid contamination.
- vii. Responds to the direction of the labourer to avoid contacting buried utilities.
- viii. Assists with shoring installation.
- ix. Excavates around the water connection.
- x. Backfills excavation to meet current standards.
- xi. Ensures the final grade of the excavation is smooth and level.

#### **7. Inputs:**

- 7.1. Daily work instructions
- 7.2. Water Service Disruption Report
- 7.3. Drawings
- 7.4. All utility clearances

#### **8. Outputs:**

- 8.1. Repair of water connection
- 8.2. Completion details recorded in the Foreman's Report
- 8.3. Update of information for the inventory database

#### **9. Control Mechanisms:**

- 9.1. The Supervisor VI will discuss with the Supervisor IV the latest techniques or materials that may be introduced into this activity from other agencies.

#### **10. Procedure:**

- 10.1. The Clearances and Locations Work Group will acquire clearances for all utilities, (Gas, power, water, sewer, phone, cable, etc.) before the excavation begins.
- 10.2. The Clearances and Locations Work Group will provide the required location numbers, job numbers, drawings and forms to the Supervisor IV as well as organize the removal of some site obstructions i.e. trees and utility poles.
- 10.3. The Clearances and Locations Work Group will notify Railway Roadmasters (CN & CP) in advance of work progress near railroad corridors.
- 10.4. All vehicles must be circle checked and the results logged before use.
- 10.5. The Supervisor IV or the Clearances and Locations Work Group representative will mark the water and sewer lines and meet the other utility representatives at the repair site.
- 10.6. The Supervisor IV will request that the Sign Shop and/or the labourers install the required traffic control devices and ensure they are installed as per the *Traffic Control Manual*.
- 10.7. Every effort must be made to notify the public affected by a water outage prior to shutting down a water supply line.
- 10.8. The Supervisor IV will ensure that buried utilities have been de-energized, if required.

- 10.9. The Supervisor IV will coordinate, select and acquire all required equipment and materials and deploy their crew to the job site.
- 10.10. Before using the equipment the tandem axle truck and excavator/backhoe operators must perform circle checks, log results and ensure that the regular maintenance schedule for that equipment has been adhered to.
- 10.11. The tandem axle truck operator will ensure that the trailers are clean and in proper working order and the emergency water supply trailers are completely filled before storing.
- 10.12. The tandem axle truck operator will haul the emergency water supply, shoring and crew trailers - transporting the emergency water supply trailer first and turning on its heater if required.
- 10.13. The tandem axle truck operator notifies Central Dispatch of the location of the emergency water supply trailer.
- 10.14. The Supervisor IV will decide on the water connection repair location and size of excavation and discuss with the excavator/backhoe operator the best method for excavating.
- 10.15. All staff must wear the personal protective equipment required by both *Occupational Health and Safety Regulations (1996) Section 87(4)(a, b) Personal Protective Equipment/General Responsibilities* and *City of Saskatoon Policy number A04-011 (B)(4) - Safety Rules and Personal Protective Equipment*
- 10.16. Asphalt and/or concrete must be stripped, separated and hauled to a designated reclamation site.
- 10.17. Where possible, excavate parallel with the water connection. Consider the locations of other buried utilities.
- 10.18. Excavate the area around the water connection according to the *Occupational Health and Safety Regulations (1996) Section 260 Excavation and Trenching*
- 10.19. The labourers must locate and expose (shallow buried) underground utilities by hand.
- 10.20. The labourers shall communicate the location of all buried utilities to the excavator/backhoe operator. All staff must follow the *Occupational Health and Safety Regulations (1996) Section 259 Locating Underground Pipelines, etc.*
- 10.21. Support all buried utilities as required by their owner's specifications.
- 10.22. The labourers shall inspect shoring before use.
- 10.23. The Supervisor IV will confirm that the shoring is in proper working order and installation is in accordance with regulations.
- 10.24. Personnel must stay clear when lifting and lowering shoring and/or materials.
- 10.25. The shoring is installed with the assistance of the excavator/backhoe and the labourers in accordance with manufacturer's recommendations and the *Occupational Health and Safety Regulations (1996) Section 261(2) Temporary Protective Structures.*
- 10.26. Shoring must be placed in excavation in such a manner as not to disturb any buried utilities.
- 10.27. Shoring must be expanded to support trench walls, install endplates as required.
- 10.28. The access/egress ladder must be in place while persons are in the excavation *Occupational Health and Safety Regulations (1996) Section 269(1)(a, b) Requirements Before Confined Space Is Entered.*
- 10.29. Labourers shall observe the trench walls for signs of collapse throughout the repair.
- 10.30. If at any time a bottom labourer is in danger the other labourers must immediately summon their exit from the excavation.
- 10.31. The labourers will ensure the tools and crew trailer are clean and in proper working order.
- 10.32. The labourers will disinfect tools and equipment before use on the water connection repair as per *WS-A01 Water Quality SOP (Current Version).*
- 10.33. The water connection will be repaired according to the Trainee Manual.
- 10.34. Remove old service clamps or service saddles and/or main stops from the water main if you change the type of pipe material or they are leaking.
- 10.35. Install the new main stop into the new service clamp or service saddle.
- 10.36. Service clamps must be used on AC pipe.
- 10.37. The section of damaged water connection pipe must be replaced with copper pipe.
- 10.38. A union and polyethylene insert must be used to connect polyethylene and copper pipe.
- 10.39. Ensure new copper pipe is goose necked.
- 10.40. The Supervisor IV will ensure the repair meets current standards and recommended practices.

- 10.41. The top labourer will install the throttle valve and hose for hydrant flushing, and operate hydrant.
- 10.42. The water line shall be re-energized/filled.
- 10.43. The bottom labourer will observe the new repair for leaks.
- 10.44. Connect a 12 lb anode to copper water service lines, where the existing service lines are being reconnected into a non-metallic watermain.
- 10.45. The Supervisor IV will perform or monitor the performance of the water quality testing in accordance with *The Environmental Management and Protection Act (2002)* and *The Water Regulations (2002)*.
- 10.46. The top labourer will direct the tandem axle truck operator to dump the backfill material.
- 10.47. Backfill all buried utilities as required by their owner's specifications and confirm backfill specifications have been met.
- 10.48. The Supervisor IV ensures backfill material meets the requirements in the *City of Saskatoon Standard Construction Specifications and Drawings Roadways, Water and Sewer, 2000 Edition*
- 10.49. Soil and granular material must be compacted to a standard proctor density minimum of 98% and be free from frozen or substandard backfill material.
- 10.50. Non-shrink backfill must be used beneath concrete or paving stone sidewalks or driveways.
- 10.51. Pavement cut will be left down if instructed by the Asphalt Supervisor.
- 10.52. Final grade of all excavations must be smooth and level.
- 10.53. Driveways, road surfaces and sidewalks must be swept clean.
- 10.54. The Supervisor IV will inspect the site for cleanliness before leaving the site.
- 10.55. All unnecessary traffic control devices will be removed from the roadway prior to leaving the site.
- 10.56. The Supervisor IV will submit a plan of the closed valves to the Valve Supervisor.
- 10.57. The Supervisor IV will ensure that all the required forms and documentation are complete and submitted - at the end of the day the job is completed.
- 10.58. The Clearances and Locations Work Group will update the manual and electronic records.

## **11. Associated Forms:**

- 11.1. Water Service Disruption Report
- 11.2. Daily Work Report
- 11.3. Foreman's Job Report
- 11.4. Worksite – Safety Check Sheet
- 11.5. Standard Distribution System Flushing and Sampling Form
- 11.6. Weekend Material Data Sheet
- 11.7. Work Method Checklist
- 11.8. Aggregate Tracking Ticket
- 11.9. Emergency Water Service Interruption (Door Hanger)