Trainers Manual

A411

CITY OF SASKATOON

Water and Sewer Section

Curb Stop Replacement Trainers Manual

CITY OF SASKATOON

Curb Stop Replacement Trainers Manual

Table of Contents

Preparation for Training

Resources for Training:

i. A list of the staff requiring training.
ii. Familiarization with training manual.
iii. A meeting room.
iv. Copies of an "Uncontrolled" Procedure, Trainee Manual and Work Method Check List. An "Uncontrolled" document has the word Uncontrolled water marked across the page. There are copies of the uncontrolled documents in the trainer's tool kit. Package the Procedure, Trainee Manual, Work Method Check List and copies of all the forms together for each trainee.
v. Example copies of the following forms, for each trainee:
    - Water Service Disruption Report
    - Daily Work Report
    - Foreman's Job Report
    - Worksite – Safety Check Sheet
    - Weekend Material Data Sheet
    - Work Method Checklist
    - Aggregate Tracking Ticket
    - Advisory - Emergency Water Service Interruption (Door Hanger)
vi. Presentation and presentation equipment.
vii. The videos "Hard Hat Safety –Heads Up" and "Personal Protective Equipment". Both videos are located with the occupation health and safety superintendent at City Hall.
viii. A T.V. and V.C.R.
ix. Certificates of completion for each staff member.
x. Examples of all equipment and materials.
xi. Doughnuts and Coffee

Training Time Table

Session Number	Time	Activity	8:00am Start Time	8:30am Start Time
Session 1	15min	Introduction	8:00am	8:30am
Session 2	25min	Method and Techniques	8:15am	8:45am
	25min	Video, Personal Protective Equipment	8:40am	9:10am
	25min	Method and Techniques	9:05am	9:35am
	15min	Break	9:30am	10:00am
Session 3	90min	Finish Method and Techniques	9:45am	9:15am
	15min	Break	11:15am	11:45am
Session 4	45min	Review Equipment and Materials	11:30am	12:00am
	60min	Lunch	12:15pm	12:45pm
Session 5	25min	Video: Hard Hat Safety – Heads Up	1:15pm	1:45pm
	25min	Discussion	1:50pm	2:10pm
	15min	Break	2:15pm	2:45pm
Session 6	90min	Review Procedure and Forms	2:30pm	3:00 pm
		End of Day	4:00pm	4:30pm

Session 1

Session 1 is the introduction. Start by introducing yourself, your name your position how long you have been with the City of Saskatoon and anything else you deem applicable. After your introduction discuss what they will be trained on, and example is given below.

Introduction

The objective of this course is to train staff on replacing a curb stop in a timely, efficient manner while minimizing disruption in service to the customer and insuring the replacement meets current standards. Should substandard conditions of the peripheral infrastructure be identified, further renovations will be

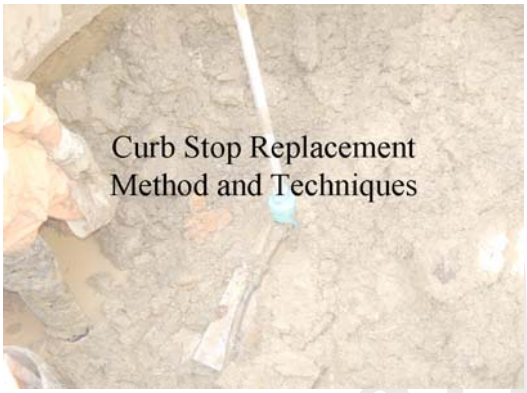
performed. (If you have already introduced yourself to the group of staff meny times, just give a brief explanation of the activity)

Session 2

Session 2 begins the slide presentation on the methods and techniques section of curb stop replacement. The trainee's manual will be handed out at the beginning of this session. The overhead transparencies or power point presentation will be used. Show the slide and read any notes in the trainer's copy of the presentation. Feel free to discuss the slide further, if required. Due to time restriction try to get through about half of the slides before the break.

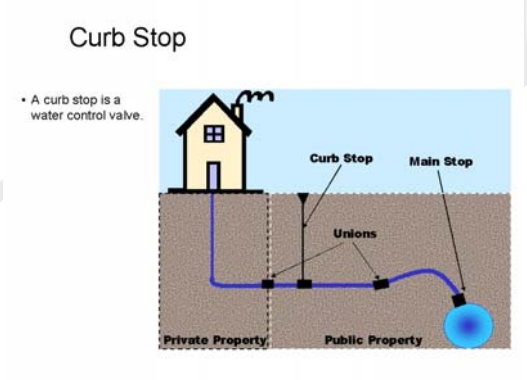
Methods and Techniques

Slide 1



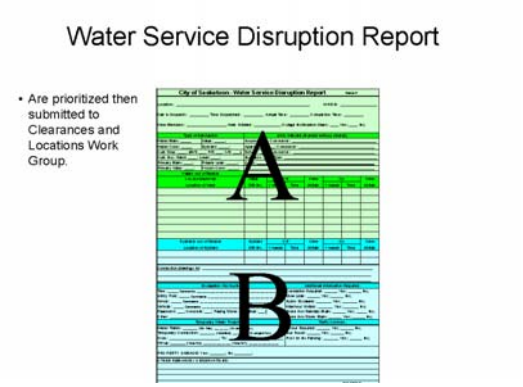
To prepare for this section familiarize yourself with the material. Hand out the trainee manuals prior to starting the presentation.

Slide 2



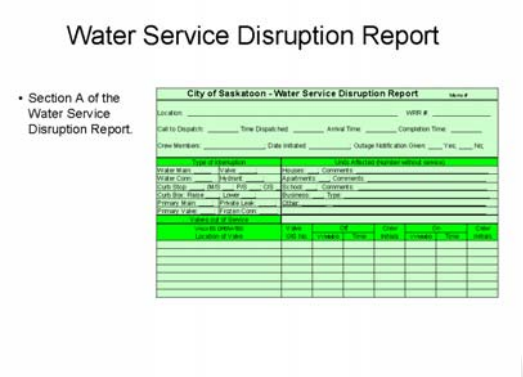
A curb stop is a water control valve, located on the property line of most private dwellings or commercial properties. Its purpose is to facilitate the isolation of water supply to the customer.

Slide 3



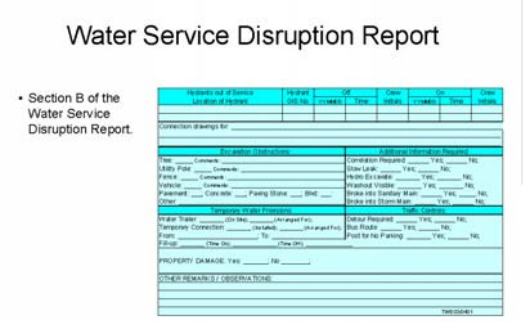
As the Water Service Disruption Reports appear, each request for repairs needs to be followed through.

Slide 4



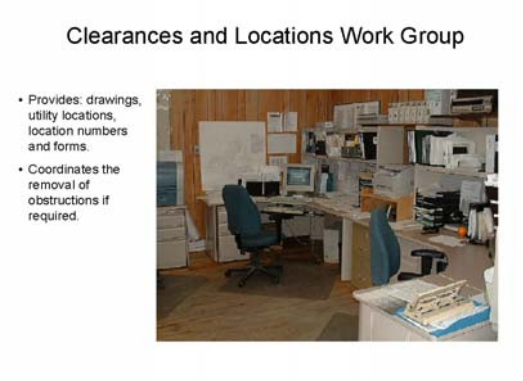
Section A of the Water Service Disruption Report. Contains the general data, the type of interruption, the units affected and all the valves out of service.

Slide 5



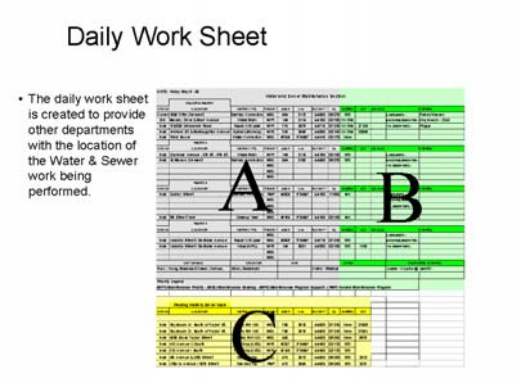
Section B of the Water Service Disruption Report contains hydrant, excavation, temporary water, traffic controls and any additional information.

Slide 6



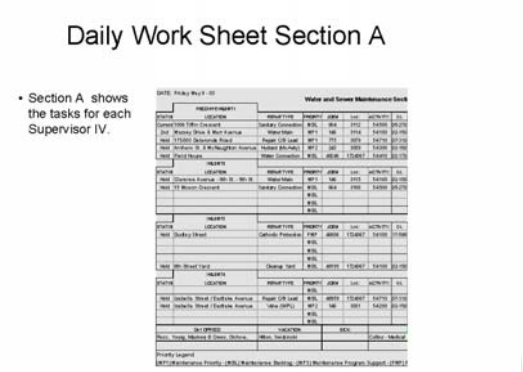
The Clearances and Locations Work Group will provide; drawings, utility locations, location numbers, and any required forms. If required the Clearances and Locations Work Group will coordinate the removal of objects obstruction the excavation like trees and utility poles.

Slide 7



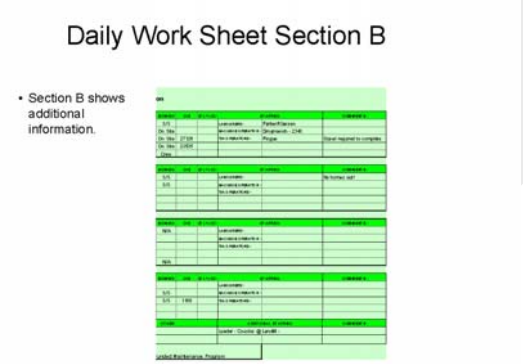
A daily work sheet is created to provide other departments with the location of the Water & Sewer work being performed that day.

Slide 8



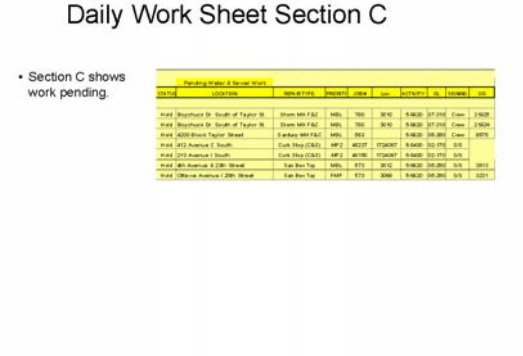
Section A shows the tasks for each Supervisor IV. In this view status, location, repair type, priority, GIS #, job #, location #, activity #, and GL # are shown. The staff not at work are listed at the bottom of section A.

Slide 9



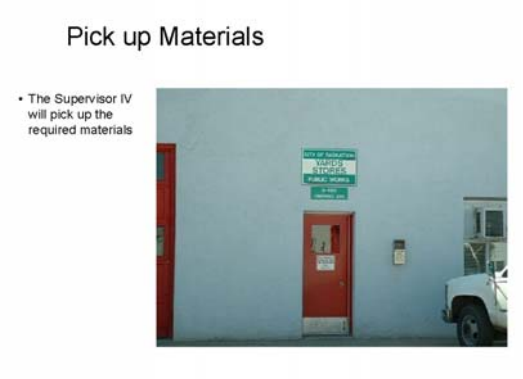
Section B shows additional information on signing, GIS#, utility locations, staffing and comments.

Slide 10



Section C shows pending work.

Slide 11

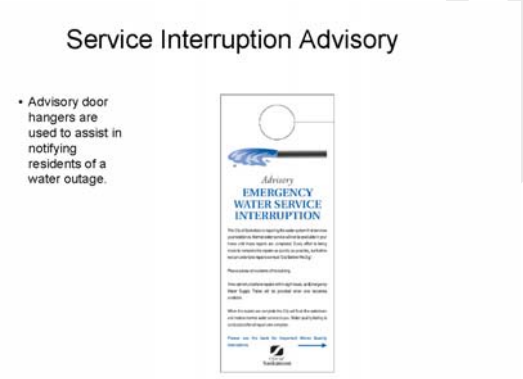


The Supervisor □ V will pick up all materials that can be transported with a ¾ ton truck from Public Works Stores. (For larger material a truck hoist or tandem truck will be used)

Slide 12

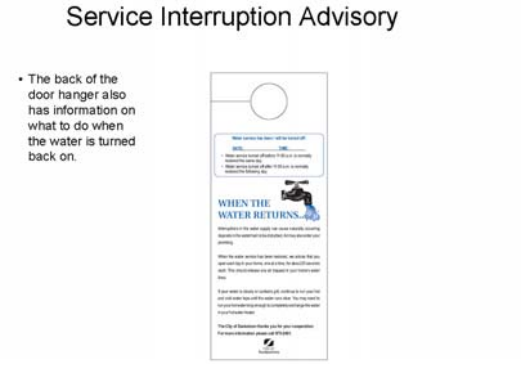
Representatives from utility companies can field locate their lines if required. All buried and overhead utilities shall be identified and marked prior to beginning an excavation. The Clearances and Locations Work Group representative or the Supervisor IV will mark the city owned utilities. Locations of the utilities will be a determining factor in performing the excavation.

Slide 13



Service interruption advisories will be distributed in the case of a water disruption more than 1 hr but less than 36hr. Each affected residence will receive a door hanger on the main entrance door as well as a verbal message.

Slide 14

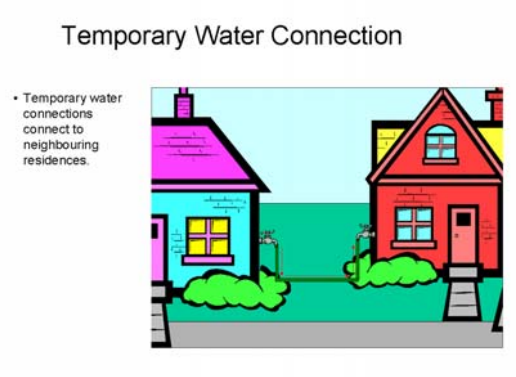


The date and time of the start of the water disruption must be written or stamped on the back of the hanger. Apartments require hangers on the main door only. Gated communities will require hangers on each residence if access is given to the community, if not hangers may be posted on the main entrances.

Slide 15

Emergency water supply trailers can be used to supply water to residents during a water outage. It is important to ensure the emergency water supply trailer is kept clean.

Slide 16



Temporary water connections are sometimes used to supply water when a curb stop is being replaced. Temporary hook ups can be installed from neighbouring properties or a hydrant.

Slide 17

Upon arrival at the work site, an appropriate location for the trailers will be determined in order to keep them clear of the excavation site.

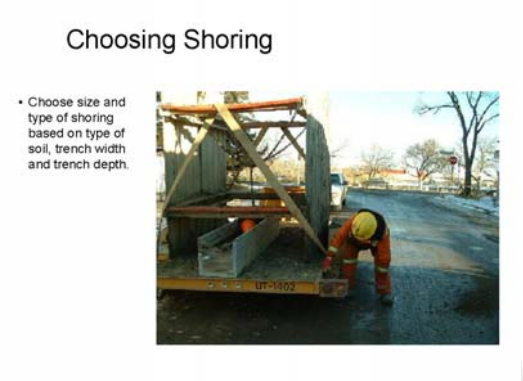
Slide 18

Every effort should be made to cut the asphalt or concrete with an earth saw (winter), quickie saw or asphalt saw (summer), prior to excavating.

Slide 19

Asphalt or concrete will be stripped, separated and hauled away to the designated reclamation site. Asphalt and concrete are to be recycled.

Slide 20



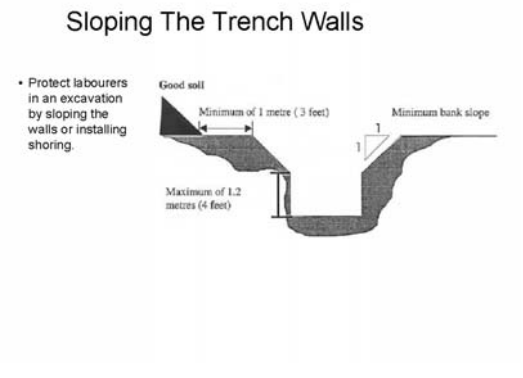
Excavator/backhoe and type of shoring will be chosen based on type of soil, and the width and depth of excavation/trench. The Supervisor IV will choose which equipment to be used.

Slide 21

It is not always possible to excavate on the opposite side of the sewer connection, but try to do so when ever possible.

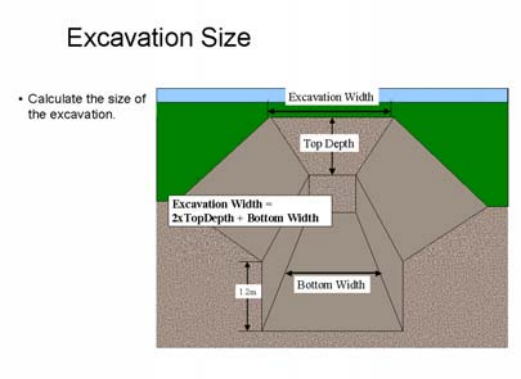
Note that the asphalt has not been cut with an asphalt saw.

Slide 22



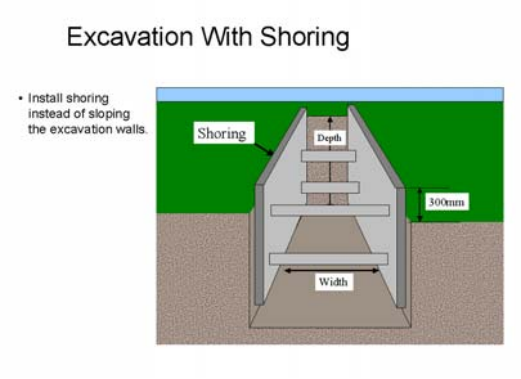
Protect labourers in an excavation by sloping the walls or installing shoring. A combination 1:1 (45 degree) slope and vertical face may be used, as long as the vertical face does not exceed 1.2m (4feet) and the overall depth of the excavation is not greater than 5m (15feet)

Slide 23



To calculate the size of the excavation if shoring is not used determine the depth required. The depth can be determined by measuring manhole depths, valve casings, valve chambers etc. Use the formula shown.

Slide 24

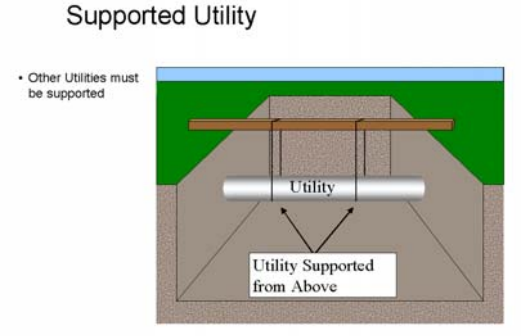


It is best practice to minimize the size of the excavation by installing shoring instead of sloping the excavation walls.

Slide 25

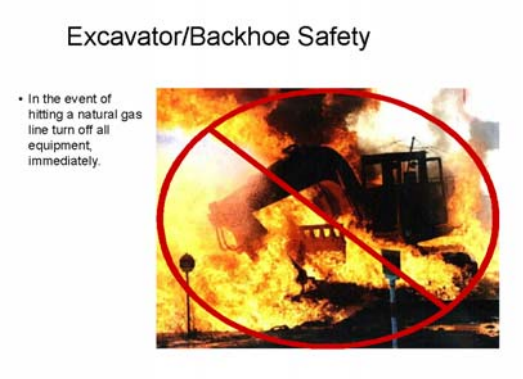
When locating a buried utility deeper than 1.2meters (4feet), shoring must be placed in excavation prior to worker probing for the utility. The feeling rod can be used from out side of the excavation.Underground services within 600mm (2feet) of the excavation must be exposed by hand or other approved systems (hydro excavation).

Slide 26



Buried utilities will be supported as required during excavation.

Slide 27



In the event that a natural gas line is hit, the machine must be immediately turned off as the engine may ignite the gas (especially in calm conditions). In this photo the excavator hit an underground propane line.

Slide 28

If the vehicle contacts overhead power lines do not exit the vehicle until told it is safe to do so by qualified personnel. If a fallen live wire lies across the vehicle or the equipment, stay in place until the utility owner arrives. Do not attempt to move fallen wires. Always assume that the wires are energized and potential for injury or fatality is present.

Slide 29

Do not go in between the excavator bucket and the truck being loaded. Do not stand under the bucket of the excavator/backhoe. Keep clear of the swing of the turntable and reach of the excavator/backhoe.

Slide 30

No worker will enter a trench greater than 1.2m (4feet) in depth, without the installation of a temporary protective structure.

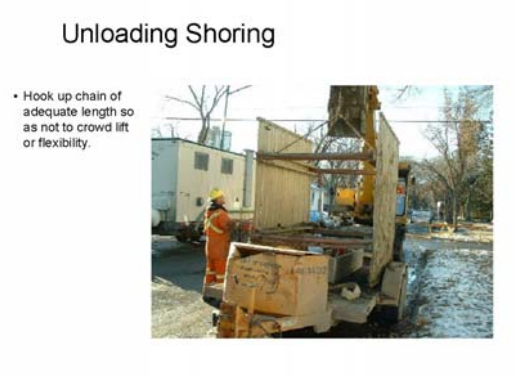
Stop Presentation

Show Video: Personal Protective Equipment (Safety Care Series)

Slide 31

Make sure shoring and trailer, are clean and in proper working order for transporting. Shoring trailers shall not be used to transport material unless designated for such use. Park trailer where there are no overhead lines or tree branches. Check for cracks on the shoring eyebolts and chains. Ensure that tie down straps are in good condition (Not frayed or torn).

Slide 32



Hook up chain appropriately so as not to crowd lift or flexibility. Keep the chain short when transporting the shoring from the trailer to the excavation, this prevents the shoring from swinging excessively.

Slide 33

Position the excavator/backhoe far enough back so the shoring can be lifted and lowered safely. Use tag lines wherever possible. Naturally frozen soil is not considered safe and therefore must be shored.

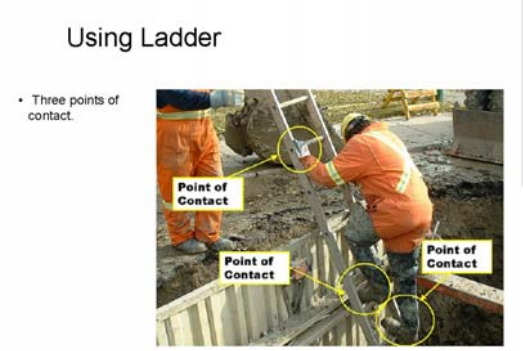
Slide 34

Once the shoring is in the excavation the side panels must be expanded hydraulically to be tight against the excavation walls. Endplates must be installed if the ends of the excavation are not sloped.

Slide 35

After shoring is in place, install and secure the ladder in the excavation. Labourers must wear all the required personal protective equipment.
All hand tools are lowered into the excavation using a bucket and rope. **Never** throw tools into the excavation.

Slide 36



Three points of contact must be kept on the ladder when in use.

Slide 37

Should excess amounts of water be observed in the trench, prepare sump and install a submersible pump.

Slide 38

All tools must be disinfected prior to use on a water connection repair, especially if they have been previously used on a sewer repair. Ensure that a proper disinfectant applicator is used.

Slide 39

Excess dirt on equipment should be cleaned with a wire brush and a rag prior to soaking with disinfectant. Soak items with disinfectant solution (Min 5% Sodium Hypo-chlorite solution), let soak for a minimum of 7 seconds. Scrub item with a clean rag then rinse clean with disinfectant solution. Let tools dry before use.

Slide 40

Session 3

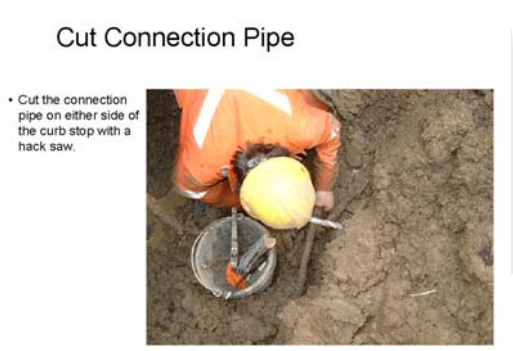
Session 3 completes the review of the methods and techniques section of the slide presentation. You should be able to finish reviewing the slides during this session. Try to leave a little time at the end for a question period. Do not go on to the resources required section of the presentation, this will be covered in the next session.

Method and Techniques

Slide 41

Enter excavation and remove dirt from the base of the curb stop and existing service to a length of approximately 2.5 feet on either side of curb stop.

Slide 42



With water off, cut pipe on either side of curb stop using hacksaw. Make sure to cut pipe far enough on either side so as to leave enough room to effect repair.

Slide 43

Lift existing lines up to prevent debris from entering domestic line. If further excavating is required, tie rags around ends of pipe to protect from debris while excavating.

Slide 44

Remove the failed curb stop, and spindle. If the existing pipe is damaged, the damaged section must also be removed.

Slide 45

If a pipe will be added to the existing connection then a union will be required to connect it. Place and tighten union on the existing pipe closest to the watermain.

Slide 46

If lead pipe is found it may have to be filed to accommodate lead to copper union.

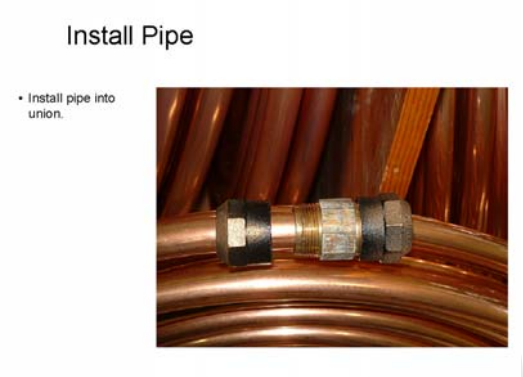
Slide 47

Cut the replacement copper pipe to a length that allows for the new spindle and casing to remain out of the finished sidewalk if practical and on City right of way.

Slide 48

Slide the union onto the existing pipe. To do this, unscrew the pressure fitting and slide onto the pipe. Insert union onto the pipe until it meets the "centring stop". Next slide the middle section of the union onto the pipe. Screw the pressure fitting back onto the middle section of the union.

Slide 49



Insert new copper pipe into the union, which is already on the existing pipe. Insert pipe into union until it meets the "centring stop"

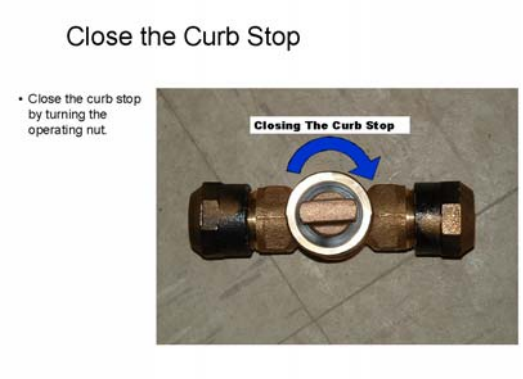
Slide 50

Tighten both ends of the union.

Slide 51

Install new curb stop on the copper pipe (installed in the previous step) and tighten. Ensure the pipe is inserted to the centre of the curb stop (on both sides).

Slide 52

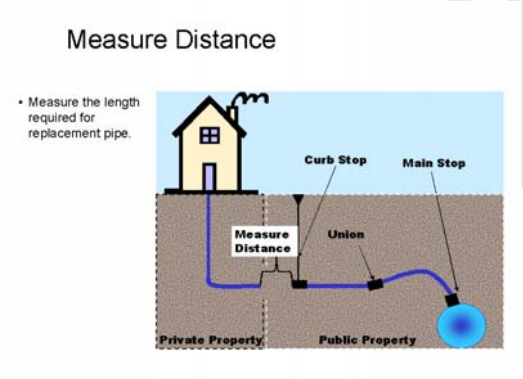


Turn curb stop off by turning the operating nut on the top. A crescent wrench can be used

Slide 53

Watermain can now be re-energized. This will minimize the water service disruption to other customers on the same water main as the connection that is being worked on.

Slide 54

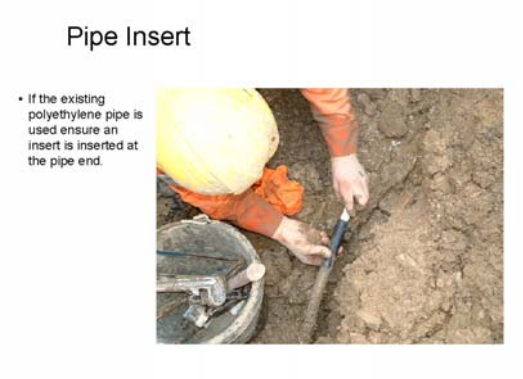


Measure remaining distance from curb stop to connection pipe on the "private property" side.

Slide 55

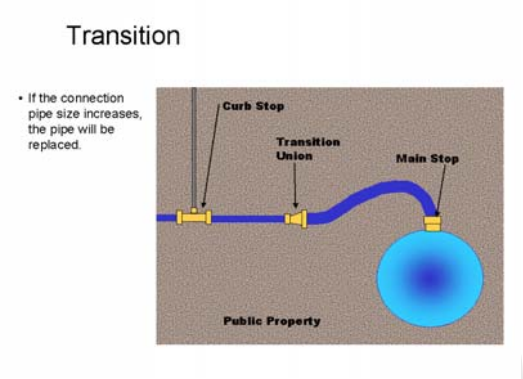
If required, install new copper pipe into curb stop on the "private property" side. If the existing pipe will reach to the curb stop, it should be used.

Slide 56



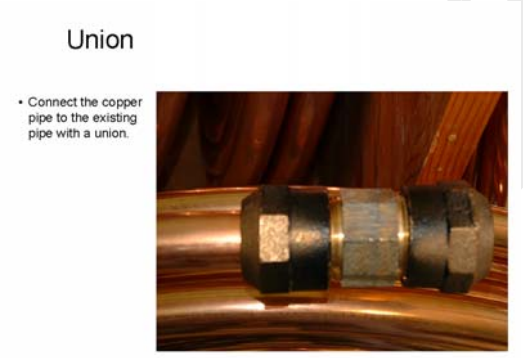
If polyethylene pipe is used ensure all connections have inserts.

Slide 57



If the connection pipe increases in size on the public property side, the pipe must be replaced. The larger pipe size will be used. Further excavating may be required.

Slide 58



If copper pipe is added, a union will need to be installed to connect it to the existing pipe. Once the copper pipe is connected to the existing pipe, connect it to the curb stop.

Slide 59

Check and tighten all fittings. Two pipe wrenches can be used to tighten the fittings.

Slide 60

All fittings must be supported with pressure treated wood blocks.

Slide 61

Open curb stop to energize water connection and check all fittings leaks. Notify customer(s) prior to re-energizing the water connection.

Slide 62

Install the spindle on top of the curb stop.

Slide 63

Install casing overtop of the spindle.

Slide 64

Install and compact backfill material around base of casing to allow it to stand on its own.

Slide 65

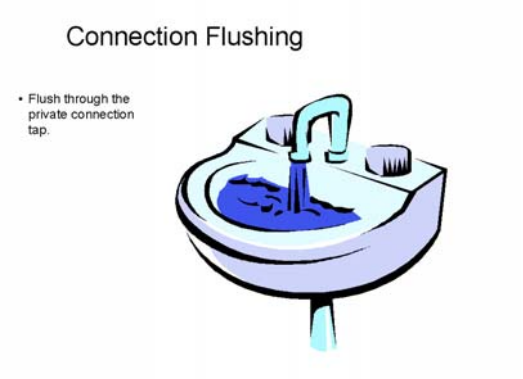
Adjust height of curb stop casing top section as required. The casing top section must be set to finished grade.

Slide 66

Connect the magnet to the curb stop casing. The magnet will make it easier to locate the curb stop with metal locators after backfilling.

Slide 67

Slide 68

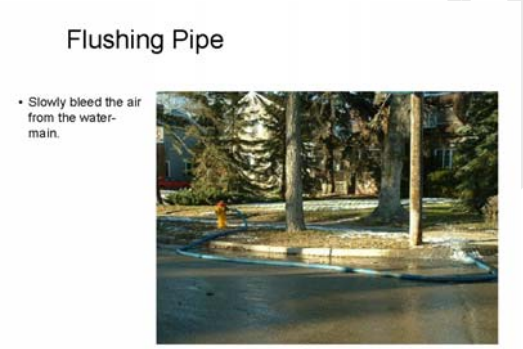


The water connection will be flushed through a private tap for approximately 5min. If it is believed that the watermain has been contaminated the main will be flushed though the appropriate hydrant.

Slide 69

Disinfect throttle valve and hydrant port with disinfectant solution. Attach throttle valve and hose onto hydrant. Ensure throttle valve is open and run hose to the storm manhole or catch basin; alternately a diffuser can be used.

Slide 70



Open the valve upstream of the repair to flush the main past the repair. Air will be expelled from the water main while it fills with water. Open the valve slowly. (Opening it too fast can create water hammer, which can damage the water main.)

Slide 71

Test for turbidity and chlorine. Flush the hydrant until turbidity and chlorine levels have been met. Take a water sample from the hydrant with the water sample jar. Deliver water sample to the water treatment plant for bacteriological testing. Follow the procedures in the water quality SOP.

Slide 72

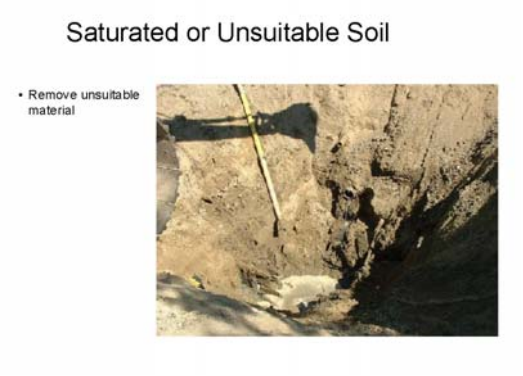
All hand tools and ladder are removed from excavation after the replacement is complete. Never throw tools out of excavation. Clean tools prior to storing.

Slide 73

Shoring is removed from excavation by the Excavator/Backhoe and placed on the trailer. Ensure shoring equipment and the trailer are cleaned, serviced, repaired or replaced and are ready for the next job. End plates must be stored in proper place on the trailer.

Slide 74

Slide 75



If soil conditions at base of excavation are unstable, remove unsuitable material and replace with crushed rock and/or granular material.

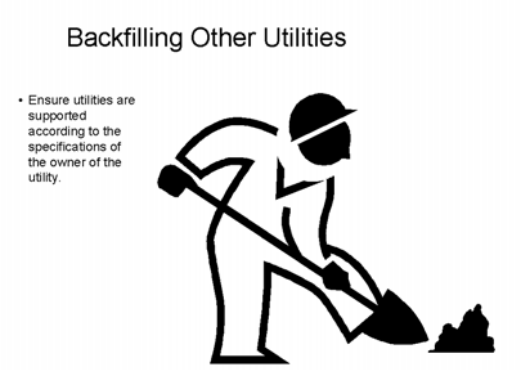
Slide 76

Cover services connection and mains with 150mm (6inches) of granular material and compact. Use spoil material if suitable. If not bring in clean backfill material.

Slide 77

Non-shrink backfill shall be used beneath (concrete or paving stone), sidewalks or driveways. Leave non-shrink backfill a minimum of 300mm (12inches) below grade.

Slide 78

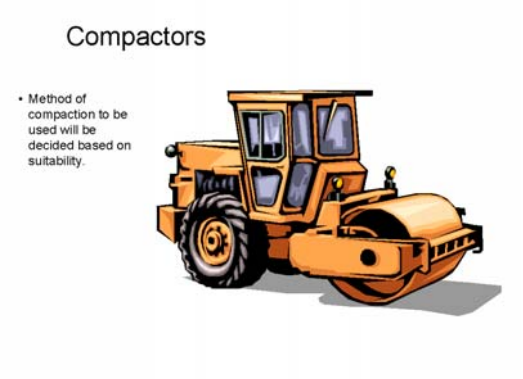


Ensure utilities are backfilled according to the specifications of the owner of the utility. A representative from the utility may be required to inspect and approve the bedding.

Slide 79

Backfill material should be free from loam [fertile material] sod, boulders, foreign material and frozen lumps.

Slide 80



There are many different types of equipment used for compacting. The equipment commonly used by the City of Saskatoon is given in the next slides.

Slide 81

Hydraulic tamper [excavator attachment] cannot be used directly above pipe or service without adequate cover. Use with 150mm (6inches) lifts.

Slide 82

Walk behind vibratory compactor can be used around mains, connections and manhole barrels etc. Backfill shall be placed in 150mm (6inches) lifts.

Slide 83

Handheld plate tampers are to be used for compacting in the pipe zone, around manholes etc. Backfill shall be placed in 150mm (6inches) lifts.

Slide 84

Bucket tamping is not an approved method of compacting.

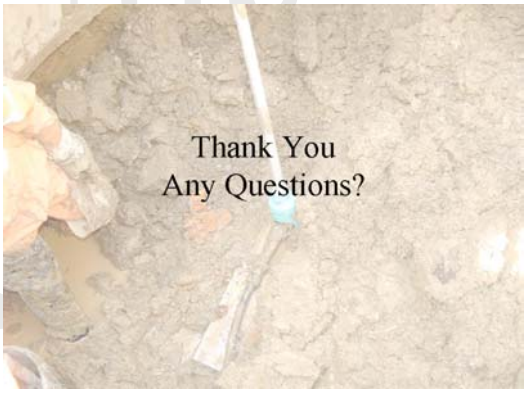
Slide 85

Before leaving the site all unnecessary traffic control devices will be removed, as per traffic control manual.

Slide 86

Others will perform site restoration.

Slide 87



Session 4

Session 4 reviews the last section of the slide presentation on resources required. Get the examples of the equipment out and ready to pass around. When discussing each piece of equipment have it passed around. It is easiest to have all the equipment laid out on a table in the same order as the slides. You should be able to finish reviewing the slides during this session. Try to leave a little time at the end for a question period.

Resources Required

Slide 1		To prepare for this section familiarize yourself with the equipment and material.
Slide 2		The number or staff required may vary depending on the size of the job.
Slide 3		There is one Supervisor IV.

Slide 4		Two labourers are required, one will work out of the excavation (top labourer) and one will work in the excavation (bottom labourer). Occasionally the working Supervisor IV will fulfill the role of top or bottom labourer and both labourers will be in the excavation.
Slide 5		One backhoe/excavator operator will be required.
Slide 6		Two tandem axle truck operators may be required.
Slide 7		Occasionally a loader operator is required.

Slide 8

Get the box of example equipment (if included) ready to pass around.

Pass each tool out when you come to that slide.

Slide 9

Feeling Rod

The feeling rod is used for finding buried utilities.

Slide 10

Tunnelling Shovel

The tunneling shovel is used for digging around the pipe.

Slide 11

Shovel

The shovel is used for digging.

Slide 12

Broom

The broom is used for site clean up.

Slide 13

Sledge Hammer

The sledgehammer can be used for knocking the support block into place.

Slide 14

Pick Axe

The pickaxe is used to break up hard soil.

Slide 15

Valve Key

The valve key is used to open and close valves.

Slide 16	Disinfectant Sprayer 	The disinfectant sprayer is used to spray disinfectant solution on contaminated tools and equipment.
Slide 17	Emergency Water Supply Trailer 	The emergency water supply trailer is used to supply water to customers.
Slide 18	Crew Trailer 	The crew trailers are used for storage and as a mobile office.
Slide 19	Excavator/Backhoe 	The excavator/backhoe is used to excavate, but it can also be used to lift heavy equipment like shoring.

Slide 20	Shoring & Trailer 	Shoring is used in excavation to protect workers from the excavation collapsing.
Slide 21	Truck 	The trucks are used to haul material and tow trailers.
Slide 22	Front End Loader 	The front-end loader is used to load trucks with backfilling materials.
Slide 23	Hydrant Key 	The hydrant key is used to open and close hydrants.

Slide 24	Hydrant Hose 	The hydrant hose can be used for hydrant flushing or pumping out the excavation.
Slide 25	Diffuser 	The hydrant diffuser is used to lessen the discharge from the hydrant.
Slide 26	Hydraulic Tamper 	Hydraulic tamper is a attachment for the excavator. It is used to compact the soil.
Slide 27	Vibratory Compactor 	Vibratory compactors are compactors used for small areas.

Slide 28

Handheld Plate Tamper

Handheld plate tampers are compactors also used to compact small areas.

Slide 29

Turbidity meter

Turbidity is a measurement of particles in the water sample.

The more particles in the water, the higher the turbidity.

Slide 30

Chlorine Tester

The chlorine tester is used to test how much chlorine is in the water after the main has been disinfected and flushed.

Slide 31

Asphalt Saw

The asphalt saw is used to cut asphalt on concrete.

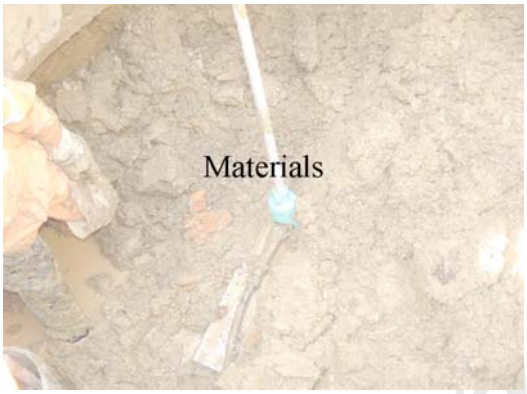
Slide 32	Crescent Wrench 	The crescent wrench can be used to tighten all fittings, and to open and close the curb stop.
Slide 33	Copper Pipe Cutters 	The copper pipe cutter is used to cut copper pipe.
Slide 34	Hacksaw 	The hacksaw is used to cut the polyethylene pipe.
Slide 35	Gravel Rake 	The gravel rake is used to level the backfill material.

Slide 36

Pipe Wrench

The pipe wrench is used to tighten all fittings.

Slide 37



To prepare for the next section get the box of example materials ready to pass around.

Slide 38

Curb Stop

The curb stop is the valve to a private water connection.

Slide 39

Curb Stop Spindle and Casing

The spindle is an extension on the valve to allow it to be opened and closed from the surface. The curb stop casing protects the spindle.

Slide 40	Copper Pipe 	Copper pipe is used by the City on water connections.
Slide 41	Brass Union 	The brass union is used to connect copper and/or polyethylene pipe.
Slide 42	Transition Union 	Transition unions are used to connect pipe with different outside diameters, like lead and copper pipes.
Slide 43	Magnet 	The magnet is used to assist in locating the curb stop after it has been backfilled.

Slide 44

The polyethylene pipe insert is used to prevent "kinking"of the polyethylene pipe at the curb stops or unions.

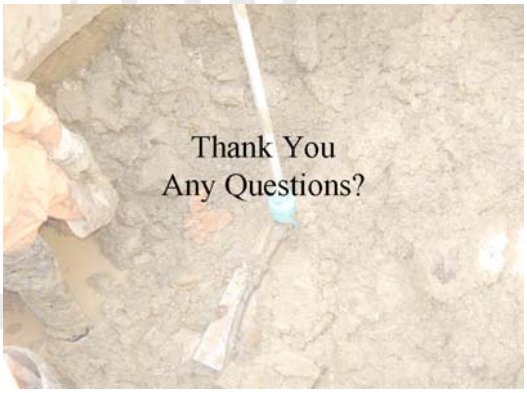
Slide 45

Clean rags are used to clean the pipe.

Slide 46

The treated wooden blocks are used to support unions and the curb stop.

Slide 47



Session 5

Session 5 will include a work exercise and discussion. For an exercise, show a video and then discuss.

Show the Video Hard Hat Safety – Heads Up.

After the video discuss the importance of wearing a hard hat. Ask the staff if they had any near misses and discuss them.

Session 6

Session 6 will review the procedure and all the required forms. Start by handing out the procedure and review it. Hand out all the required forms, then review each. A general overview of the procedure and each form is given below.

Procedure introduction

The procedure is a document that focuses: the roles and responsibilities of the required persons, for a specific task and the critical steps of the task.

Procedures are used primarily during training for a task, and then mainly as a reference document. Procedures should be auditable by either inspection during the process or by review of an audit trail upon completion of the process. Procedures are not intended to be used while the task is being preformed.

Water Service Disruption Report

This form is used to initiate maintenance. It has replaced the sewer and water maintenance memo. It is given to the locations department.

Daily Work Report

This is a list of all the work being performed or to be performed and who is performing the work. This form comes from the supervisor VI and goes out to all the supervisors IV and departments involved in a task.

Foreman's job report

This report details the work that has been completed. It is given to the supervisor IV with the worksite safety check sheet, by the locations department.

Worksite – Safety Check Sheet

This report lists all the safety requirements that must be met. It is handed out with the Forman's job report.

Standard Distribution System Flushing and Sampling Form

This is for tasks that require water quality testing. This form is taken with the water sample to the water treatment plant for testing.

Deep excavation notification form

This form is filled out for excavations deeper than 5 meters. The form is sent to Sask, labour and Charlie Cairns from Corporate Services - Employee Services.

Weekend Material Data Sheet

This form is filled out on the weekend when supplies are taken from central or engineering stores. The form is given to stores.

Confined Space Entry Inspection Form

This form is filled out when staff enters a confined space, such as manholes and valve chambers. The form should be given to the supervisor.

Work Method checklist

This form is taken to the job site and the critical steps are checked off as they are completed. The purpose of this form is to ensure none of the important steps are forgotten and to understand how each crew performs each task.

Advisory - Emergency Water Service Interruption (Door Hanger)

These hangers are to be distributed in instances where water service will be disrupted for more than one hour but less than 36 hours. These hangers will be given in conjunction with the conversation or left in the event that there is no one on hand to speak to. Using either the stamps in the kit or an ink pen, mark the date and time on the top of the back of the advisory. Each home in the affected area should receive one door hanger on the doorknob of the main entry into the home or another visible access into the building.