Guidelines for working in close proximity to water infrastructure

EPCOR PROVIDING MORE

This guideline covers the requirements and activities for notifying, locating, and working in close proximity to the existing water distribution and transmission system, whether it is operating a valve, hydrant or facility installations aligned across or parallel to an EPCOR Water Services Inc. (EWSI) asset.

Valves and hydrants are to be operated only by EPCOR Water personnel unless prior approval has been granted by EWSI. All hydrant usage must comply with the requirements of the Hydrant Use Permit program. All opening/closing of valves must be witnessed by an EPCOR Inspector.

At no time is any contractor allowed to cut, connect or change EPCOR Water infrastructure without signed EPCOR approved drawings. This approval can be obtained through the Private Development process with a Municipal Servicing Agreement which is administered by the City of Edmonton or through EPCOR's New Water Distribution Mains Program.

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Section I

General Information

Requesting a Locate

Prior to any ground disturbance activities, contact Alberta One Call to locate all buried utilities:

- 1-800-242-3447
- www.albertaonecall.com

This is a FREE service. There may be charges if your schedule requires that locates be done outside of working hours (excluding Emergency Locate requests).

Alberta One call requires a **minimum of two full working days** for non-emergency locate requests. Allow for more time during the busy construction season.

Completed locates are valid for 14 days.

EWSI in Edmonton is a member of the consortium that uses the services of Alberta One Call for infrastructure locates.

Utilities that are not members of Alberta One Call must be contacted directly for locates.

Water System Infrastructure

Water mains can range in size from 20mm copper service lines to 1950mm transmission mains and can be a variety of materials such as: asbestos cement, polyvinyl chloride, concrete, steel, fiberglass, cast iron, copper, lead, or high density polyethylene.

Water infrastructure materials come in a variety of colours including grey, black, blue, white, yellow (jacketed) for pipes and red for valves and appurtenances.

All water main construction must be completed in accordance with approved design drawings and the City of Edmonton Design and Construction Standards – Volume 4. Only approved materials can be used on all water infrastructure projects. A copy of the standards and the approved material list can be found in Volume 4 on the City's website at www.edmonton.ca.

Water mains cannot be electrically traced and must be located based on as-built drawings.

Water infrastructure is typically dimensioned relative to property lines which can change over time and as such, the dimension may become unreliable.

Standard Clearances

Maintaining the required clearances between water infrastructure and other facilities minimizes the risk of damage to water infrastructure during construction.

Table 1 and Table 2 summarize the minimum vertical and horizontal clearances between water infrastructure and the proposed new facility.

Vertical Separation

Table 1: Minimum vertical separation *****

Water Facility	***Proposed New Facility***	***Minimum Clearance Distance****
Water main	Utility crossing **over** the water main	0.5m
Water main	Utility crossing **under** the water main	0.3m

Horizontal Separation

Table 2: Minimum horizontal separation *****

Water Facility	***Proposed New Facility***	***Minimum Clearance Distance****
Water main < 500 mm	Parallel shallow utility	1.8m (center to center)
Water main < 500 mm	Parallel deep utility	2.5m (center to center)
Water Main ≥ 500 mm	Any parallel shallow or deep utility	1.8m (center to center) + ½ the water main diameter
Valve Casing, Fitting and/or Thrust Block	Shallow utility crossing	1.0m (edge to edge)
Water Service, Hydrants, or Chambers	Parallel utility	1.8m (edge to edge)

* **Increased horizontal and vertical separation will be required for water mains made of materials that are more brittle, such as AC or FRP, or for proposed interactions with large duct banks, large diameter sewers, or high pressure pipelines.**

These requirements will be evaluated by EPCOR Water on a case by case basis and are dependent on:

1. Size and material of the water main.

2. Water main shutdown and customer impact assessment.

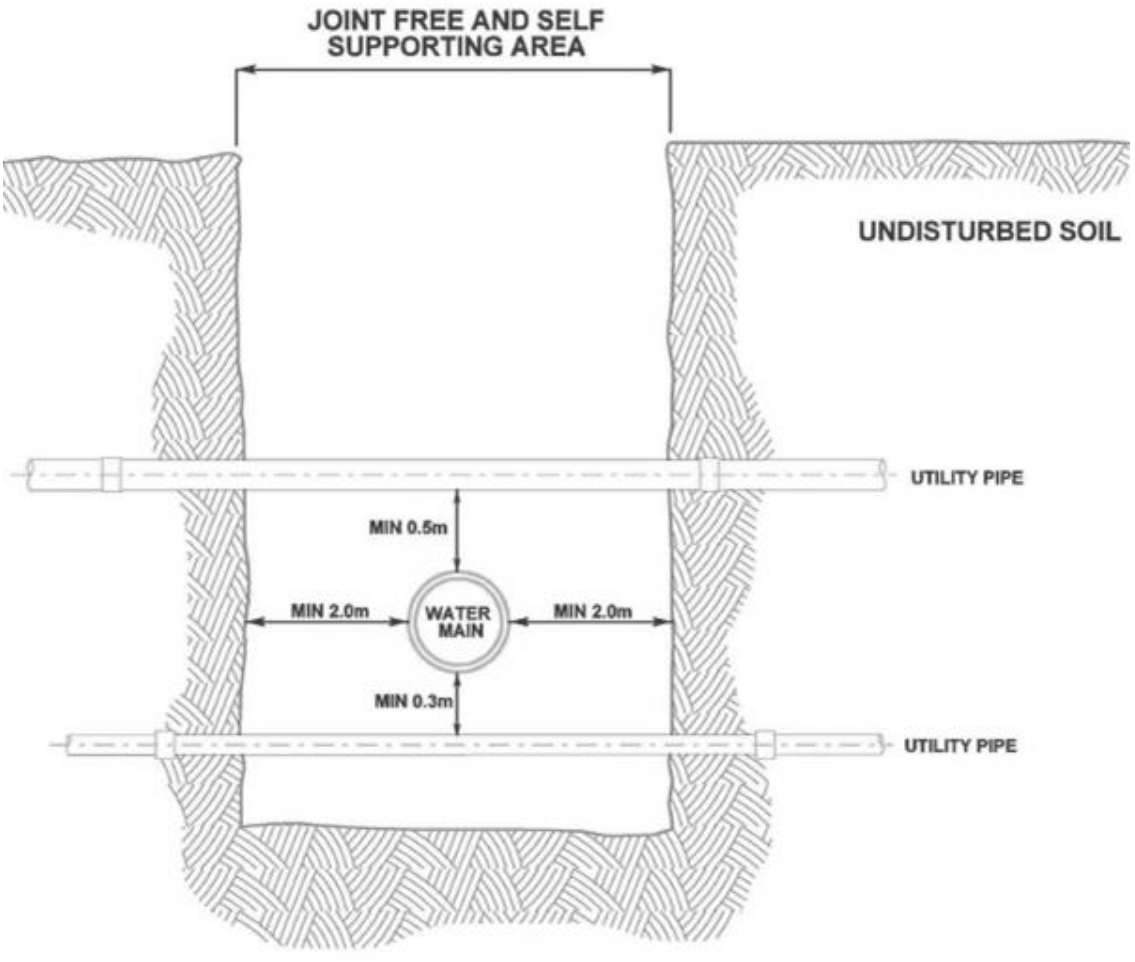
3. Future access to water infrastructure for maintenance/replacement.

4. Size and material of the proposed new facility.

5. Method of construction.

Proposed new facilities crossing over the water main should be self-supporting to enable future maintenance/replacement of the water main.

Proposed new facilities crossing over or under the water main should be joint-free within 2.0m of the water main, with joints centered on either side of the water main.



Material of Water Main

From our experience, here are some characteristics of the common types of water mains contractors may encounter in the field:

Asbestos Cement (AC)

- Very brittle
- Vulnerable to damage from vibrations and soil movement

Cast Iron (CI)

- Corrosion can increase brittleness of the pipe and vulnerability to damage from vibrations and soil movement

High Density Polyethylene (HDPE)

- High thermal coefficient of expansion and contraction so pipe exposed to temperature variations may shift out of alignment without proper restraint and support

Polyvinyl Chloride (PVC)

- Can become brittle when exposed to very cold temperatures and requires extra care in handling during cold weather

Steel (STL)

- Strong and generally self-supporting
- Care should be taken to avoid damage to the coatings
- Check pipe for external corrosion causing pitting and weakening of pipe wall

Concrete Cylinder Pipe (CCP)

- Susceptible to damage from vibrations and soil movement
- Requires a more complex repair if damaged

Fiberglass Pipe (FRP)

- Susceptible to damage from vibrations and soil movement
- Requires a more complex repair if damaged

Additional Notes

The majority of waterlines are installed at standard depths; however, there can be instances where the depth varies due to surrounding utilities and other structures. Some examples of deviations are:

Water mains can vary significantly in depth, ranging from 1.0m to 7.0m.

1. Larger transmission water mains can be shallower as they generally have enough flow to prevent freezing.

2. Smaller distribution water mains are generally installed deeper but can change elevation at vertical bends which may occur when crossing another deep utility.

3. Vertical bends can result in the water main being shallower or deeper than expected at specific locations.

Locations of water mains can be determined through surface features such as chamber lids, valve casings. However, these can be deceiving in situations where valves may be strapped to the branch of a tee instead of along a water main alignment.

Services valves can be located using services records. However, these records may not reflect any horizontal or vertical bends.

Thrust blocks are not located but are a critical part of the water system. They can be substantial in size and are cast at every reducer, tee, cross and bend to provide the necessary anchorage to withstand the stresses of a pressurized system.

Section II

Before You Dig

Valves

Valves play a critical role in controlling the water flow in the distribution system and are to be **operated by EPCOR Water personnel only, unless prior approval has been granted**. All valves 350mm and larger are to be operated only by EPCOR.

Prior to operating any distribution valves (smaller than 350mm), the contractor must consult with the EPCOR Inspector to check and verify the impacts to customers.

The EPCOR Inspector must also witness the operation of the valve and ensure that the valve status is updated in EPCOR's record system.

It is critical that all valves are returned to their normal operating status after construction is complete and that the record system reflects the current status at all times.

Valves left in the “non-normal” status can result in significant water quality issues, unplanned depressurizations (loss of pressure in the system) and customer outages.

Fire Hydrants

Fire hydrants primarily serve as an active fire protection appurtenance which enables Fire Rescue Services to access the municipal water supply to assist in extinguishing fires.

Hydrants also have valuable secondary uses such as: enable water main flushing to maintain the water quality, provide temporary water service to properties during water main shutdowns, or provide water for construction activities.

Hydrants can sometimes have a coloured disc attached to the side nozzle, which represent the following:

BLUE – hydrants that are being used by a Hydrant Use Permit holder. These blue discs should always be displayed when withdrawing water from hydrants.

GREEN – hydrants that are out of service due to EPCOR's construction projects or approved Private Development projects.

ORANGE – hydrants that are not functioning properly and/or are out of service.

WHITE – hydrants that cannot be used except in emergency situations by Fire Rescue Services. Operating these hydrants may cause negative effects to the water distribution system, environment or customers within the neighbourhood.

Any time a water main is isolated, even temporarily, green hydrant discs must be installed on all hydrants rendered out of service by the shut-down.

Once the water main is back in-service, the discs must be removed. Out of Service hydrants related to construction activities must be reported to EPCOR's Construction Inspector. Out of service hydrants for any other reason must be reported to Water Dispatch at 780-412-6800. EPCOR staff will update hydrant status information in EPCOR's record system.

Hydrants are to be operated only by EPCOR Water personnel unless prior approval has been granted.

To maintain the integrity and water quality of the distribution system, an individual who needs to obtain water from a fire hydrant must obtain a Hydrant Use Permit.

All Hydrant Use Permit holders must comply with EPCOR Water's Terms and Conditions.

Hydrant Use Permit

Applications for Hydrant Use Permits must be made in person at EPCOR Water's Montrose site:

12317 Mount Lawn Road
Edmonton, AB T5B 4J4
780-412-3003

To schedule an appointment, call from Monday to Friday, 8:00 am to 3:00 pm.

One meter is issued for each hydrant permit; however, a customer may have more than one permit.

The following equipment will be issued by EPCOR Water Services Inc.:

1 – Meter
1 – Flushing gate valve
1 – Blue disc (Permit Holder)
1 – 1.5m length of fire hose
1 – Hydrant wrench
1 – Backflow prevention device

Here is an example of a hydrant equipment setup. **Note that the meter must not be attached directly to the hydrant nozzle.**

Use arrows on meter and backflow preventer to ensure correct directional flow through these devices.

Hydrant Use Requirements

All hydrant users must operate fire hydrants in accordance with information provided in the current valid Hydrant Use Permit Information Package, in order to ensure operator and public safety; prevent damages to public/private property; and prevent damages to fire hydrants and other water infrastructure.

The customer must have a copy of the current valid hydrant permit and hydrant operating procedures with them at all times.

EPCOR Water Dispatch must be advised by calling 780-412-6800 before any hydrants are used to obtain water each day.

Hydrant permit holders must not operate any hydrant that has a disc of any colour installed on the hydrant nozzle, other than their own blue disc issued to them by EPCOR Water.

EPCOR Water Services Inc. reserves the right to refuse the use of any specific hydrant. **In addition, hydrants in the area bounded by 101 Ave – 109 Ave and 43 St – 84 St must not be used by hydrant permit holders.**

Some hydrants in the water distribution system require that water be pumped out of the barrel after use. These hydrants are not to be used during the winter months to prevent damage to the hydrant from freezing and to ensure that the hydrant remains operational for Fire Rescue Services.

Meter Readings - Required Monthly

Permit Holders must report the monthly meter reading by the 15th of each month by calling 780-412-3003 or by emailing readings to hydrantreadings@epcor.com.

Include the following information:

1. Company name
2. Hydrant meter number
3. Meter reading

Returning the Hydrant Use Equipment

Hydrant Use equipment must be returned **no later than December 15th** of the year in which it is issued.

The customer will be held responsible for lost or damaged equipment and hydrants, including damage by freezing.

Truck Fill Service

EPCOR Water operates six truck fill stations in Edmonton to provide high-quality drinking water to those who may not receive serviced water, including:

- Commercial water haulers
- Construction companies
- Acreage and business owners

To protect the water quality and ensure the bulk water dispensing system remains contaminant free, customers must provide their own clean connection hose. Water hauling containers should not be used for purposes other than potable water transportation.

A secure pre-paid account must be set up before accessing the bulk water stations. A customer can open an account from Monday through Friday, 8:00 am to 3:00 pm by calling 780-412-3003 or by visiting the Montrose site at 12317 Mount Lawn Rd. in Edmonton.

Once the account is open, the customer will receive a PIN to activate the dispensing device at truck fill stations. Fees will be charged in accordance with EPCOR Water's Terms and Conditions.

Truck-Fill Stations (Open 24/7/365)

1. Londonderry Reservoir
   74 St – 144 Ave
   3” hose connector

2. Evergreen / North East Edmonton
   501 – 167 Ave
   3” hose connector

3. West Edmonton
   13240 – 142 St
   3” hose connector

4. Davies Yard
   8729 – 58 Ave
   3” hose connector

5. Poundmaker
   #18, 10708 – 187 St
   3” & 4” hose connectors

6. Kaskitayo Reservoir
   1851 – 111 St
   3” & 4” hose connectors

Addition or Modification to Existing Water Infrastructure

Addition or modification to EPCOR Water's existing water infrastructure can be completed through a Servicing Agreement with the City of Edmonton or EPCOR's New Water Distribution Mains Program.

Servicing Agreement with the City of Edmonton

The engineering design and construction of the water infrastructure may be completed under a Servicing Agreement through the City:

City of Edmonton
Development Coordination
Current Planning Service Centre
5th floor, 10250 - 101 Street
Edmonton, AB T5J 3P4
780-442-5311

The design of the water infrastructure must be completed at the cost of the applicant, subject to the review and approval of EPCOR Water, other utilities and City departments.

The construction drawings must be approved and stamped by a Professional Engineer.

In accordance with the terms of the servicing agreement, the construction, testing and commissioning of the water main may be undertaken by a contractor of the applicant's choice. **An EPCOR Water inspector must be present during water infrastructure construction, testing and commissioning.**

The Servicing Agreement outlines the responsibilities of the project proponent and the City of Edmonton, the scope of the project, warranty periods, and any fees or assessments the applicant is required to pay.

Additions and modifications to existing water infrastructure must adhere to the current version of the City of Edmonton Design and Construction Standards.

More information is also available on the City of Edmonton website.

EPCOR's New Water Distribution Mains Program

At the request of the Customer, and at the Customer's cost, the engineering design and construction of water infrastructure may be completed by EPCOR Water under the New Water Distribution Mains Program.

EPCOR Water will design, construct, test and commission the project.

The construction will be completed by an EPCOR crew or approved contractor.

Construction is weather dependent, and must occur between the months of May to October.

The customer is charged actual contractor costs plus corporate overhead and a design and engineering fee. If requested by EPCOR Water, the customer shall pay a portion or all of the estimated costs prior to the start of construction.

Once a design has been agreed upon and payments or deposits have been received, EPCOR Water will schedule the project based on available time and resources.

The New Water Distribution Mains Program is intended for minor modifications and projects with limited scope. EPCOR Water may refuse to complete a project under the New Water Program, at its discretion.

Concerns with respect to the location of water facilities shall be forwarded to EPCOR Water and will be dealt with on an individual basis.

At EPCOR Water's discretion, relocation of water facilities may be completed at the Customer's expense under the New Water Distribution Mains Program.

EPCOR Contact:
Tina Yanitski
780-412-3446
tyanitski@epcor.com

Crossing and Proximity Agreements

Any party proposing construction involving ground disturbance that crosses the boundary of lands containing EPCOR Water facilities is required to enter into a **Facility Crossing Agreement** with EWSI, prior to performing the ground disturbance.

Any party proposing construction involving ground disturbance to a depth exceeding 2.0m within 5.0m of the boundary of lands or Right-of-Way (ROW) containing EWSI facilities, is required to enter into a **Facility Proximity Agreement** with EWSI, prior to performing the ground disturbance. Additional information and requirements can be found in the City of Edmonton Bylaw 15816 (EPCOR Water Services and Wastewater Treatment).

The Crossing and Proximity Agreement process can take up to 4 weeks and will require the following:

1. Letter requesting Crossing or Proximity Agreement
    a. Company name and contact
    b. Location
    c. Method of construction
    d. Size and material of installation

2. Construction design drawing (Schedule B)

Crossing and Proximity Agreements can be requested through the EPCOR Water Land Admin group:

Roxanne McFarlane
780-412-3514

Rebecca Zadunayski
780-969-8781

Waterlandadmin@epcor.com

New Water Service or Abandonment Requests

New Water Service

All service connections must comply with the requirements of the City of Edmonton Design and Construction Standards.

Private service lines must comply with the requirements of the Alberta Safety Codes Act and the National Plumbing Code of Canada.

Abandoning an Inactive Water Service

Water services that are no longer required or have been inactive for greater than 6 months should be abandoned prior to excavation in the vicinity of the water service.

An inactive water service can cause significant damage to your property or excavation, if it fails unexpectedly.

Water service abandonments are provided by EPCOR at no charge to the developer/owner to eliminate the risks of contamination and potential property damage.

Application for Service Connection or Abandonment

A customer or a person acting as an agent for the customer may apply for a new service, or connection to an existing EPCOR Water service, or abandon an inactive service, through the City:

City of Edmonton, Drainage Services
Water and Sewer Servicing Section
5th Floor, Century Place
9803 – 102A Ave
Edmonton, AB T5J 3A3
780-496-5444

More information is also available on the City of Edmonton website.

Completion of water service abandonment may take up to 30 days from the date of application.

Hot Tap Permits and Procedures

A Hot Tap Permit must be completed for all live connections to existing water mains.

Contractors are required to present a written plan identifying necessary valve closures plus a contingency plan detailing steps to be taken in the event of problems occurring during the hot tap process.

The plan should show customers that will be affected by the work, which includes the contingency plan, and how service will be maintained to those customers.

Note that connections to existing water mains 450mm diameter or greater requires a Shutdown Permit. Coordinate with the EPCOR Inspector to obtain all required permits.

EPCOR Contact:
Michael Bohme
780-412-3652
mbohme@epcor.com

An EPCOR Inspector must be on-site to observe hot taps and to provide system support in the event of a failure.

- Notify the EPCOR Inspector a **minimum of 72 hours prior** to the proposed connection to review the action plan and to schedule a hot tap inspection date and time.

- If boundary valves need to be checked by EPCOR to ensure that they are operable, notify the EPCOR Inspector a **minimum of one week prior** to the proposed connection.

Hot Tap Procedure

1. Locate boundary valve, clear casings of obstructions (dirt, ice, snow, asphalt). Ensure valve nut is accessible and valve is operable.

2. The boundary valves must be identified and recognized by the Tapping Contractor.

3. Never have more than one boundary valve open at one time unless directed to do so by EPCOR Water. **The EPCOR Inspector must witness the operation of all valves and report valve status changes to Dispatch immediately**.

4. The Tapping Sleeve (TVS) must be installed a minimum of 600mm away from any pipe joint.
   - Installation of TVS's should follow good water works practices including swabbing at the tapping location and the tapping sleeve with 1% chlorine bleach prior to assembling the TVS.
   - Significant care should be taken to ensure no dirt or debris enters the water main during the installation.

5. Support for the tapping sleeve and thrust blocks should be provided as per the City of Edmonton Design and Construction Standards.

Lost Coupon During a Hot Tap

Should the coupon be lost during the hot tap, immediately call Water Dispatch and supply them with your name, the reason you are calling and the Boundary Valve numbers.

1. Go to the Boundary Valves and close them. If this cannot be accomplished, notify Water Dispatch that immediate aid is required.

2. Immediately notify customers of the situation and that they will be temporarily out of water.

3. Flow from a hydrant to release pressure.

4. Open the TVS valve and retrieve the coupon.

5. Flush the section of main that was isolated using the hydrant and having only one boundary valve open at a time.

6. Take water samples. Bacteriological samples must be taken by the EPCOR Inspector if the water main has been depressurized.

7. Keep only one boundary valve open to maintain service until the water sample test results pass.

8. EPCOR will require a copy of the incident report and investigation from the contractor.

Crossing Inspection and Isolation Requests

For crossing inspection requests, contact an EPCOR Inspector a minimum of 72 hours prior to the crossing to schedule for an inspection. **EPCOR Water does not charge for inspection time for crossings or isolations.**

If the work cannot be done safely around a live water main, the contractor can request the water main be isolated to accommodate construction. EPCOR Water requires the following timelines:

- 2 weeks minimum notice for non-emergency work that does not impact customers

- 4 weeks minimum notice if temporary water hookup must be provided to customers

The contractor will be responsible for all costs related to water main isolations and temporary water hookup, including the cost of any new valve installations which may be required to isolate water mains.

EPCOR Contact:
Michael Bohme
780-412-3652
mbohme@epcor.com

Water Infrastructure Relocation Requests

If relocation of a water main, valve, or hydrant is necessary to accommodate a new building, driveway, sidewalk or utility, EPCOR Water requires the following timelines:

- 2 months minimum notice for non-critical distribution facilities (those facilities 300mm and smaller, not supplying water to non-interruptible customers, i.e.: hospitals)

- 4 months minimum notice for non-critical transmission facilities (those facilities 350mm and larger, not supplying water to non-interruptible customers, i.e.: hospitals)

- large diameter transmission mains or reservoir feeds may require up to 1 year notice due to limited opportunity to coordinate such work planned with facility shutdown

Vertical offsets can only be installed on distribution mains 350mm and smaller.

The contractor will be responsible for all costs related to water infrastructure relocations.

EPCOR Contact:
Tina Yanitski
780-412-3446
tyanitski@epcor.com

Water Service Interruptions

All planned water main shutdowns or service interruptions require notification and may require temporary water supply in accordance with Table 3.

In emergency situations that require an unplanned shutdown, notification and approximate outage duration must be provided to each customer affected within 1 hour after shutdown. Provide temporary water supply in accordance with Table 3.

Table 3: Water Service Interruptions

Length of Shutdown or Interruption	***Notification to Affected Customers***	***Temporary Water Supply***
Less than 8 hours	24 hours in advance	Not required
Greater than 8 hours	5 days in advance	Required
Emergency (Unplanned)	within 1 hour of shutdown	Required if greater than 20 hours

Anytime a water main is isolated, even temporarily, green hydrant discs must be installed on all hydrants rendered out of service by the shutdown.

Once the water main is back in service, the discs must be removed. Out of service hydrants must be reported to the EPCOR Inspector to ensure that the hydrant status is updated in EPCOR's record system and notification can be provided to Fire Rescue Services.

The times and durations for all water service interruptions are subject to EPCOR's approval.

Shutdown Less Than 8 Hours

If the interruption is less than 8 hours and includes services to customers, a temporary shutdown may be possible. This is subject to the shutdown not affecting critical customers or customers dependent on water for their business needs.

All temporary shutdowns require a minimum of 24 hour written notice to customers affected by the service interruption, except in emergency situations. Planned shutdowns not meeting the 24 hour notification requirement will not be permitted.

A notification letter must be delivered to each customer affected by the temporary shutdown.

Whenever possible, shutdowns should be scheduled to minimize impact on adjacent customers.

- For residential customers, shutdowns are typically scheduled during the week (Monday to Friday) and should not commence prior to 8:00 am or extend past 5:00 pm.

- For business, institutional, or industrial customers, shutdowns should be scheduled further in advance (48 hours minimum) and in coordination with the customers to minimize any impacts on operations.

If, due to unforeseen circumstances, a temporary interruption will exceed 8 hours in duration, the contractor must re-notify all impacted customers and provide temporary water (water bottles) if required by any customers.

Transmission mains cannot be shutdown and re-commissioned within 8 hours if the line must be drained as it requires a significant amount of time to drain and refill.

Shutdown Greater Than 8 Hours

If the shutdown is greater than 8 hours and includes services, then temporary pressurized water supply is required.

Temporary water can only be supplied when the expected temperatures are above $0^{o}C$ unless alternative provisions to prevent freezing of the temporary water supply system are enacted.

A notification letter must be delivered to each customer affected by the shutdown. All temporary water supply systems must meet current EPCOR Standards.

For the protection of our customers and the water distribution system, temporary water supply can only be set up through EPCOR or an EPCOR Approved Contractor.

For temporary water supply system information, including pricing, contact:

Adam Halla
780-412-3372
ahalla@epcor.com

Transmission Main Shutdowns

All planned transmission main shutdowns require a Shutdown Permit and all boundary valves to be checked and confirmed prior to construction.

Transmission main shutdowns may require several hours to complete and it may take as long as two weeks for a crew to perform the shutdown during busy periods.

Transmission main shutdowns must be performed by EPCOR Personnel only.

To apply for a Transmission Main Shutdown Permit, contact:

Kyle Shaw
780-412-7693
kshaw@epcor.com

Notification Letters

Notification letters must be delivered to each customer affected by the water service interruption. A copy of the letter and a date/time of delivery must be provided to the EPCOR Inspector.

The notification letter must include the following:

1. Explanation of the work.
2. By whom and for whom (i.e. Contractor for Utility).
3. Explanation of why a water service interruption is required.
4. An estimated duration of the shutdown or interruption, including dates and times, when appropriate.
5. A 24 hour contact number for the contractor.

Section III

During Excavation

External Causes of Water Main Failures

Water pressures in the water distribution system can range from 280 kPa to 1000 kPa. At an average pressure, a break on a 300mm water main can fill a 1m x 2m x 3m trench in 7 seconds. Thus, a water main failure can cause a lot of damage very quickly and pose significant risk to workers in excavations.

Some common causes of water main breaks by external factors include:

1. Direct damage of water mains and water infrastructure during excavation and backfilling.
2. Disturbance of horizontal or vertical support to water mains.
3. Ground settlement or movement caused by excavation work.

Precautions to Prevent Damage

Always hand-dig or hydrovac to expose water infrastructure when crossing or when encroaching within 1.0m on either side of the locate field mark.

Do not assume the depth of the water system since the depth can vary significantly between 1.0m to 7.0m.

- Test holes must be hand dug or hydrovacced to expose the top of the pipe prior to crossing.

If the work is adjacent to a water main, check and maintain horizontal clearances, not only from the water main but also from the thrust blocks. Do not undermine the water main and cause settlement of the ground adjacent to or below the water main.

Do not disturb or expose any thrust blocks without prior consultation and agreement with EPCOR Water. Disturbing or exposing any thrust block without providing proper support may result in movement and detachment of pipe joints and unexpected release of water from the water distribution system.

Do not assume that depressurized mains or services have been formally abandoned. They may be connected to the pressurized water distribution system and are just isolated by a closed valve.

- Pulling or removing an isolated water main or service may result in damage to existing services.

- Pulling or hitting an isolated service (or service rod / stem) may result in the main stop breaking off, the service pulling out of the main stop, or the service valve being damaged.

- In some cases, the water main may be providing support to a live valve. Removing this water main may result in the detachment of the piping and valve.

If there is a potential conflict between planned work and an EPCOR Water facility, notify EPCOR Water so that we can work with you to help reduce the risk of damage. Potential options include:

- Partially or fully closing some of the valves can help reduce the shut down time if a failure does occur. It can also reduce the magnitude of the flow in the event of a failure. However, unless all valves are closed and the pressure is relieved, the water main will still be fully pressurized.

- We may be able to isolate and drain a portion of the main to reduce the impact of a failure.

Valves that are inaccessible to EPCOR in the event of an emergency can significantly delay isolation of the failed facility and increase the risk of property damage and safety hazards to workers and the public.

- Do not block access to boundary valves with construction fencing, sheds, or materials.

- Valves should not be buried under a stockpile of excavated materials, and casings should be protected from entry of construction debris.

Ensure valves are exposed, raised to grade, and cleared of debris as soon as possible after paving.

Failure to expose valves may result in financial charges from EPCOR (to expose the valves) or liability in the event a water main cannot be isolated during an emergency that results in property damage.

- Only approved materials must be used to raise valves. Adjustment rings are not approved for raising valves.
- Casing inserts (available from EPCOR at our McCauley location at 8720 – 106A Ave) are an exception to be used for valve casing adjustment only when a valve casing is jammed and cannot be adjusted enough to accommodate paving.
- **One paved over valve can result in 4 to 8 extra valves that need to be closed to complete isolation of a section of water main.**

Do not block access to fire hydrants with construction fencing, sheds, or excavated materials. Hydrants need to be accessible for the Fire Rescue Services in order to provide fire protection coverage.

Pipe Joints

Pipe joints are usually the weak link of any pipe installation.

If a pipe joint has been exposed and is not properly supported or anchored, the joints may become detached, resulting in a water main failure.

Joint failures can occur as the result of settlement or heaving, or excessive loading.

Deep Excavations

Deep excavations can cause ground movement that may result in fracture of the water main or cause it to pull out of the pipe joint, bend, or coupling.

The extent of ground movement depends on the type of retaining wall, bracing system, construction method, soil condition, and ground water table.

Because the water mains are pressurized, they can fail sideways due to a blow-out caused by a lack of soil support or bracing. Even small movement of shoring (including H piles) or gaps between shoring can compromise the soil supporting the water mains enough to cause a failure.

Any party that proposes construction involving ground disturbance to a depth exceeding 2.0m within 5.0m of the boundary of lands or Right-of-Way (ROW) containing EWSI facilities, is required to enter into a **Facility Proximity Agreement** with EWSI, prior to performing the ground disturbance.

Contact EPCOR Water for recommendations regarding your deep excavation near water infrastructure.

Temporary Support System

If a utility crossing will undermine the water main, a temporary support structure will be required to prevent sagging, or detachment resulting in water main failure during excavation and backfilling.

The material, size, and length of water main that will be undermined are the factors which will determine whether a temporary support system is required.

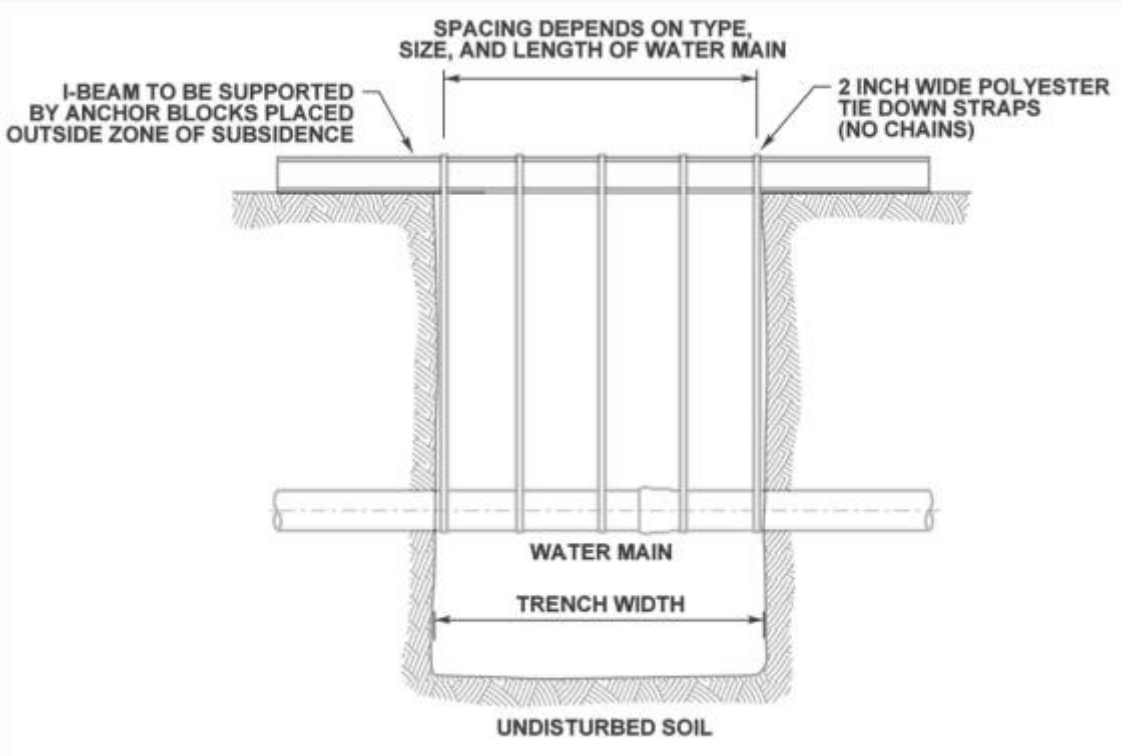
If the undermining will be significant, the following is recommended:

1. Water main should be plugged and removed for the work or

2. Water main is isolated and an engineered support system must be put in place

Note that even if a water main has been isolated, the dead weight of the pipe and water will still need support if the undermining is significant or a joint has been exposed.

An example of a temporary support system is shown on the next page. The spacing of the straps would depend on the size, material, and length of the exposed water main.



Ensure both sides of a joint are supported.

No chains can be used to support the water main.

A proper support system must be designed by a Professional Engineer.

Backfilling

To prevent ground settlement adjacent to or below existing water mains, the excavation must be backfilled with suitable material in compacted layers.

Backfill must be free of rocks, foreign material, and frozen earth.

Ensure that there is proper support in the area of the haunches of the pipe. The haunch area is the portion of the pipe from the bottom of the pipe to the horizontal centerline. Support of this area is most important in limiting pipe deflection in flexible pipe materials.

Ensure that all backfill cannot be washed away or subside and can provide a permanent support and prevent stress to the water infrastructure.

Firm bedding and embedment is essential to ensure the integrity of the water main.

Backfilling a Hydrovac Hole

Ensure the haunches of the water main are filled with fillcrete up to the springline of the main.

- *For areas not under pavement*, fill sand up to the original ground surface, leaving room for surface restoration, such as landscaping.

- *For areas under pavement*, fill sand up to 1.0m below the subgrade and then fillcrete to the subgrade.

Backfilling a Trench

Where the water main is undermined, and it is reasonable to do so, place fillcrete under the water main to the springline.

- *For areas not under pavement*, fill sand in compacted layers of 150mm thick up to the original ground surface.

- *For areas under pavement*, fill sand in compacted layers of 150mm thick up to 1.0m below the subgrade and then fillcrete to the subgrade.

Another option is to backfill under the pipe with clay or sand to a level that can be properly compacted.

- Then, fill the space beneath the pipe with sandbags compacted with side compact bars under the main.

- *For areas not under pavement*, fill sand in compacted layers of 150mm thick up to the original ground surface.

- *For areas under pavement*, fill sand in compacted layers of 150mm thick up to 1.0m below the subgrade and then fillcrete to the subgrade.

Water Sampling

Bacteriological samples must be taken after every temporary shut-down if the water main has been depressurized (i.e. any time a water main is isolated and drained or the pressure is reduced to zero).

It is critical that proper disinfection and sampling procedures are followed to ensure samples are not accidentally contaminated.

1. If an EPCOR crew performs the re-commissioning, a member of the crew will take the required sampling.

2. If an EPCOR Inspector witnesses the shutdown and re-commissioning, then the EPCOR representative is responsible for collection of the water sample.

Section IV

Emergency Procedures and Contact Information

Emergency Procedures

EPCOR Water Dispatch
24 Hour Emergencies
780-412-6800

If any water infrastructure has been damaged or disturbed:

1. Ensure trench has been cleared of all people.
2. If possible, close boundary valves to minimize the damage.
3. Immediately contact Water Dispatch to report the incident and let them know which valves have been closed. You will be required to provide the following information:
    - Contractor contact name and information.
    - What was damaged (infrastructure type and size)
    - Location of damage

- **Is a valve crew required onsite to isolate the damaged water facility? Let Dispatch know that immediate assistance is required**
- Any customers impacted

4. Dispatch will send an EPCOR Inspector to assess additional impacts to the system.

Never bury the damaged water infrastructure no matter how minor the damage may appear. Let an EPCOR Inspector assess the situation and minimize any potential damage.

The contractor should not attempt to repair the damage to the water infrastructure since this may jeopardize the integrity, water quality, and safety of the distribution system.

Only EPCOR or an EPCOR approved contractor may complete repairs on damaged water infrastructure, unless prior approval has been granted by EPCOR.

The contractor will be responsible for all costs associated with the response and repair of the damaged water infrastructure.

Contact Information

To report damages to water infrastructure, water related emergencies, water quality concerns, or vandalism or misuse of fire hydrants or other water infrastructure:

- Water Dispatch
  780-412-6800 (24 hours a day)

Hydrant flow test, water main isolations, or hot tap and crossing inspection requests:

- Michael Bohme
  780-412-3652
  mbohme@epcor.com

Transmission main shutdown permits:

- Kyle Shaw
  780-412-7693
  kshaw@epcor.com

Temporary water supply requests:

- Adam Halla
  780-412-3372
  ahalla@epcor.com

Hydrant use permit or truck fill service applications:

- Bulk Water Service
  Montrose Water Works
  12317 Mount Lawn Road
  Edmonton, AB T5B 4J4
  780-412-3003

  Hydrant Use Permit meter readings
  hydrantreadings@epcor.com

Proximity or crossing agreement requests:

- Roxanne McFarlane 780-412-3514 or
  Rebecca Zadunayski 780-969-8781
  Waterlandadmin@epcor.com

Addition or modification to existing water infrastructure requests:

- Tina Yanitski
  780-412-3446
  tyanitski@epcor.com

Valve Casing Inserts:

- McCauley Water Works
  8720 –106A Avenue
  Edmonton, AB T5H 0S3
  24 Hour Dispatch: (780) 412-6800

Servicing agreement requests:

- City of Edmonton, Development Coordination
  Current Planning Service Centre
  5th Floor, 10250 – 101 Street
  Edmonton, AB T5J 3P4
  780-442-5311

Water services – new or abandonment requests:

- City of Edmonton, Drainage Services
  Water and Sewer Servicing Section
  5th Floor, Century Place
  9803 – 102A Ave
  Edmonton, AB T5J 3A3
  780-496-5444

Colour Codes for Marking Buried Facilities

Type of Facility/Indicator	Colour
Proposed Excavation Limit	White
Temporary Survey Markings	Pink
Electric Power Lines, Cable Conduit & Lighting Cables	Red
Gas, Oil, Petroleum & Gaseous Materials	Yellow
Telephone, Cable TV, Alarm, Communication & Signal Lines	Orange
Potable Water	Blue
Sanitary Sewers, Storm Sewers & Drain lines	Green
Reclaimed Water, Irrigation & Slurry Lines	Purple

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