# Watermain Commissioning Plan

Project Name/Address: Enter

From – To / Description: Enter

City of Guelph Contract Number: Enter

Contractor Name: Enter

**3rd Party Commissioning (if applicable)**

Licensed Operator Name/Company: Enter

License number: Enter

This template provides a format to document the information required to support successful watermain commissioning in the City of Guelph. The completed template must be submitted to the contract administrator (Engineering P.M. or consultant) for approval.

The Plan should be submitted prior to watermain installation so that source requirements and sampling points are known which may avoid the need to change construction plans or re-excavate a main to install an intermediate sampling point.

If the project requires multiple commissioning stages, a Watermain Commissioning Plan must be completed for each stage.

A sketch of the site must be included separately from this template, indicating system layout with source, sampling locations, swab launch and exit clearly marked.

# Staging

The new water system will be pressure and leakage tested in one stage comprised of the following areas:

| Watermain Size | From | To |
| --- | --- | --- |
| (mm) | (street name) | (street name) |
| Choose | Enter | Enter |
| Choose | Enter | Enter |
| Choose | Enter | Enter |
| Choose | Enter | Enter |
| Choose | Enter | Enter |

*If multiple stages are required, a separate commissioning plan must be submitted for each stage. This section is not applicable for temporary servicing.*

# Sample Locations

Samples will be taken, using copper tails, from existing system facilities like service laterals and air relief valve fittings, or temporary service laterals, where necessary, on long runs. A sample from the source side of the new main is not required.

All services ≥100mm in diameter and all hydrant leads >6m in length, will be considered watermains and must be sampled accordingly.

| Sample Point Number  | Street Name | Station | Distance from Source or Previous Sample Location  | Type of Sample Port |
| --- | --- | --- | --- | --- |
| (1-01, 1-02 etc.) |  | (0+xxx) | (max. 370 m) | (blowoff/hydrant) |
| Enter | Enter | Enter | Enter | Enter |
| Enter | Enter | Enter | Enter | Enter |
| Enter | Enter | Enter | Enter | Enter |
| Enter | Enter | Enter | Enter | Enter |
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# Temporary Connection/Water Source

The watermain stage under test will be connected to the source as detailed below. The reduced pressure principle (RP) backflow preventer must be tested and certified on-site to prevent a possible reverse flow and contamination of the in-service source main.

|  |  |
| --- | --- |
| Street (name) | Enter |
| Location (Station 0+xxx) | Enter |
| Source Main Size (mm) | Choose |
| Number of Fill Lines | Enter |
| Fill Line Size (mm) | Choose |
| Flow Rate Per Line (L/sec) | Enter |
| Total Flow Rate of Feed (L/sec) | Enter |
| Back Flow Preventer Type | Choose |

# Swabbing

Swabbing will be done wet and 4 (four) swabs will pass through all new mains. Water will be added to the pipelines ahead of the swabs by adding water via the source connection. Swabs will be a minimum of 50mm larger than the diameter of the pipe. Swabs will travel at a velocity of 0.5-1.0m/s.

| Street Name | Launch Station | Pipe Size | Swab Size | Swab Velocity | Retrieval Location Station |
| --- | --- | --- | --- | --- | --- |
|  | (0+xxx) | (mm) | (mm) | (m/sec) | (0+xxx) |
| Enter | Enter | Choose | Choose | Enter | Enter |
| Enter | Enter | Choose | Choose | Enter | Enter |
| Enter | Enter | Choose | Choose | Enter | Enter |
| Enter | Enter | Choose | Choose | Enter | Enter |
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| Enter | Enter | Choose | Choose | Enter | Enter |
| Enter | Enter | Choose | Choose | Enter | Enter |

# Hydrostatic Testing/Leakage Calculation

As a minimum, the hydrostatic test pressure of 1035 kPa (150psi) will be applied to all points of the watermain within the test section, including high points.

| Point | Street Name | Station | Elevation | Pressure | Pipe Diameter | Length of Test Section |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | (0+xxx) | (m) | (kPa/psi) | (mm) | (m) |
| Test Pressure Application Point | Enter | Enter | Enter | Enter | Enter | Enter |
| High Elevation Point | Enter | Enter | Enter | Enter | Enter | Enter |
| Low Elevation Point | Enter | Enter | Enter | Enter | Enter | Enter |
| Leakage Calculation | Enter |

*This section is not applicable for temporary servicing. A visual inspection is required.*

# Disinfection and Testing

Sodium Hypochlorite must be provided in sealed containers with labels that demonstrate compliance with AWWA and NSF/ANSI/CAN 60 Standards.

Disinfection will be carried out in accordance with MECP’s Watermain Disinfection Procedure (as related to new watermain) and ANSI/AWWA Standard C651. Chlorine will be injected into the new main at the source end at a rate that will result in a free chlorine residual of between 50 and 100 mg/l (ppm) throughout the new pipeline.

After 24 hours, the maximum allowable decrease in concentration is 40%, to a maximum concentration decrease of 50 mg/L. If acceptable readings are found, then flushing (de‐chlorination) will commence. All chlorinated water will be neutralized to less than 0.2 mg/l free chlorine for discharge to a storm sewer or less than 0.05 mg/l free chlorine when there may be detrimental effects to the natural environment. All testing and sampling must be performed by a Certified Operator.

| Type of Chlorine | Rate of Water Flow | Rate of Chlorine Injection | Time to Chlorinate Test Section | Target Chlorine Residual | Neutralizing Agent |
| --- | --- | --- | --- | --- | --- |
| (Sodium Hypochlorite/NaOCl) | (L/sec) | (L/sec) | (min) | (mg/L) | (Sodium Thiosulphate) |
| Choose | Enter | Enter | Enter | Enter | Choose |

Results of bacteriological sample analysis will be reported to the Contractor by the contract administrator (Engineering P.M. or consultant).

# Final Connections

# Less than or equal to 6m

Final connection <6m will be made in dry conditions, in the presence of a Water Services’ Certified Operator with a minimum of 48-hour notice given to the City.

All required pipe and fittings must be hand swabbed with a minimum 1% to maximum 5% solution of chlorine prior to installation.

| Location | Type of Connection | Gap to Connect | Connection Details |
| --- | --- | --- | --- |
| Station (0+xxx) | (cut-in tee or sleeve etc.) | (<6m) |  |
| Enter | Enter | Enter | Enter |
| Enter | Enter | Enter | Enter |
| Enter | Enter | Enter | Enter |
| Enter | Enter | Enter | Enter |

*This section is not applicable for temporary servicing.*

**Greater than 6m and less than 40m**

Connections greater than one pipe length (generally > 6 m) shall be undertaken in accordance with Section 4.10.2 of ANSI/AWWA Standard C651.

**Exception:** The procedure described below may be used at the discretion of the Operating Authority for the installation and disinfection of Connections greater than one pipe length and up to a total length of 40 m if the Connection:

1. Crosses a transportation corridor, the extended closure of which could result in significant community impacts (e.g., traffic congestion, loss of emergency vehicle access, safety concerns), or
2. Cannot be constructed to within one pipe length of the existing watermain due to the potential for destabilizing an existing thrust block.
* A Certified Operator is required to witness the installation of the Connection to the existing municipal infrastructure to ensure that sanitary construction practices are followed, and proper disinfection is performed.
* The Connection shall remain Isolated from the existing Drinking Water System, except while being flushed or sampled, until satisfactory results are received from two Microbiological Samples taken by a Certified Operator
* Where required by the Operating Authority, hydrostatic testing of the Connection shall not be undertaken against the isolating valve until satisfactory results from the Microbiological Samples referred to above are received. Drinking Water shall be used for hydrostatic testing.

**Are you requesting an exception to 4.10.2 of ANSI/AWWA Standard C651?** Choose

Reason for exception (including address/location): Enter

Type of Connection: Enter

Length of gap to connect: Enter

**Exception Approval (completed by Water Services)**

Exception approved: Choose

Water Services Representative Approval: Name

Date: Click or tap to enter a date.

*This section is not applicable for temporary servicing.*

# Site Diagram

Site diagram has been attached to this submission separately, indicating system layout with source, sampling locations, swab launch and exit clearly marked: [ ]

***\*Continue to next section (page 10) to indicate whether temporary dead ends will be created on existing and/or temporary watermains at this stage.***

# Review (Engineering)

Commissioning plan reviewed: Choose

Engineering/Building Representative Review: Name

Date: Click or tap to enter a date.

# Approval (completed by Water Services)

Commissioning plan approved: Choose

Water Services Representative Approval: Name

Date: Click or tap to enter a date.

This form provides a format to document the information required to support the maintenance of secondary disinfection residual at temporary dead ends created on existing and/or temporary watermains during capital construction activities.

This form is not applicable for final connections assuming there are no dead ends being left in the system. **APPLICABLE: Yes** [ ]  **(Proceed to section 1) No**[ ]  **(Submit now)**

Water Services is to complete sections 2, 3, and 4 and is responsible for maintaining the secondary disinfection residual at each site and completing the Temporary Dead End Flushing Results spreadsheet for each project.

# Notification

Project Name: Enter

Contract Number: Enter

Project Manager Name: Enter

Contractor Name: Enter

Inspector Name: Enter

Number of dead ends created (be sure to consider pressure boundaries): Enter

Date dead end(s) to be created: Enter

Expected length of closure: Enter

Have the area(s) been prepped for the regular discharge of water: Choose

| Location of Dead End\*to include temporary and existing watermains | Watermain Size (mm) | Material | Existing or Temporary Main | Size of Flushing Infrastructure | Type of Flushing Infrastructure |
| --- | --- | --- | --- | --- | --- |
| Enter | Choose | Choose | Choose | Choose | Choose |
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# Assessment (Water Services)

1. Determine number of services on dead end
	1. if zero, no flushing schedule is required
	2. if there are services, move to step 2
		1. if there is a sample station off the dead end, notify Treatment Supervisor
2. Site visit to measure the length of each dead end
3. Use the length of dead end and size of main, calculate the representative flushing volume
4. Complete the Temporary Dead End Assessment table below for each dead end associated with project

|  |
| --- |
| Temporary Dead End Assessment |
| Name of Operator(s) performing assessment:  |
| Date of assessment: |
| Location of Dead End | # of Services  | Requires flushing (Y/N) | Length of dead end | Flushing volume (m3) | Flushing Frequency | Flushing schedule created |
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# Flushing and sampling Records

Results are recorded in the Temporary Dead End Flushing Results spreadsheet located in the P drive folder for each project.

Appendix A of this document contains a printable template that may be used as a transitory document to record results in the field before transferring them to the spreadsheet.

# Project Completion

|  |
| --- |
| Dead end(s) reconnected: |
| Location of dead end | Date reconnected | Initials |
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Operator Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Completed records are to be filed in the relevant project folder on P drive***

# APPENDIX A

This page may be printed and used as a transitory document to record results in the field before transferring to the spreadsheet in each project folder on the P drive, which is considered the final record.

| Frequency: |
| --- |
| Datemm/dd/yyyy | Location of dead end | Calculated flush volume | Flushing Start Time | Time of sample | Volume Flushed(m3) | Residual  | Time Flushed (min) | Water LossM3 | Temp. Start/End | Operator (initials) |
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