

**WATERMAIN COMMISSIONING PLAN**

**Watermain Tie-In (> 1 pipe length, <40 m)**

**1234 Elm St. Watermain Tie-in**

**PM: Wendy Waterman**

**XYZ Construction**

**123 Anystreet, Anytown, ON**

**(519) 672-1234**

**Site Contact: Johnny Whitehat**

**Site Contact Number: (226) 432-1234**

1. **PROJECT DESCRIPTION:**

**Project Area: 1234 Elm Street**

We will be installing the watermain listed below to the existing XXX mm Watermain on the South side of Elm St.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section ID** | **Main Size (mm)** | **Material** | **Length (m)** |
| 1 | 300 | PVC | 930  |
| 2 | 200  | PVC | 12  |
| 3 | 50 | PVC | 200 |

**\*Submit drawing of new watermain, including all sample locations, with this plan.**

1. **TAPPING OR TEEING:**

A City of St. Thomas Tapping Permit will be obtained prior to any tapping or tee installations. The watermain tapping will be completed by The City of St. Thomas Water Services. All equipment/material disinfection and tapping activities will be witnessed by a City of St. Thomas Water Operator.

All tapping equipment, fittings and valves being installed that will come into contact with drinking water will be disinfected with a minimum 1 % sodium hypochlorite solution immediately prior to use/installation.

1. **SELECTION OF PROCEDURE:**

The watermain will be commissioned utilizing the procedure selected below:

|  |  |
| --- | --- |
|  | **PROCEDURE A:** ABOVEGROUND SET-UP AND TESTING PRIOR TO CONNECTION |
| **X** | **PROCEDURE B:** HYPOCHLORITE SPRAY**NOTE: This procedure may only be used for a total length of up to 40 m AND under one of the following circumstances:****This procedure is being utilized because the watermain:**

|  |  |
| --- | --- |
| **X** | 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) |
|  | Cannot be constructed to within one pipe length of the existing watermain due to the potential for destabilizing an existing thrust block. |

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**“PROCEDURE A”**

1. **PIPE INSTALLATION**

The pipe required for the connection will be set up aboveground, disinfected and tested for bacteriological parameters prior to installation, as described below.

1. **DISINFECTION AND FLUSHING**

**Type of chlorine:** 12% Sodium Hypochlorite (NSF 60/61 certified)

**Rate of water flow:** 1.0 L/sec

**Rate of chlorine injection:** 0.05 L/min

**Time to chlorinate test section:** 10.8 minutes

In the presence of a City of St. Thomas Water Operator, chlorine will be injected into the watermain system at the source end, at a rate that will result in a free chlorine residual of greater than 50 mg/L at the far end of the section from the source water.

Following a minimum 24-hour rest period, a City of St. Thomas Water Operator will check the free residual at the same location and compare the residuals found to the initial residual, to confirm residuals are within the allowable decrease (Allowable decrease = 40% of initial free chlorine residual, to a maximum of 50 mg/L).

The disinfection process will be repeated, should free chlorine levels decrease more than 40% of the initial readings over the 24-hour test period.

1. **DISPOSAL OF CHLORINATED/SUPER-CHLORINATED WATER:**

**Neutralizing Agent:** Hydrogen Peroxide

**Application Method:** Injection

**Discharge Location:** Storm Sewer Catchbasin on SW corner of Ross and Wellington

Upon successful disinfection of the new watermain, the system will be flushed of all super-chlorinated water until such time as free chlorine residuals within the overland system are consistent with the St. Thomas Distribution Water System residuals in the area.

When disposing of chlorinated water and/or super-chlorinated water, all precautions will be taken to ensure water has been neutralized prior to reaching the natural environment.

During flushing activities to dispose of super-chlorinated water, monitoring will be undertaken continuously using a low-level chlorine test strip.

1. **BACTERIOLOGICAL TESTING:**

Following flushing of super-chlorinated water and recharging of the new watermain with water normal to the operation of the St. Thomas Water Distribution System, the new watermain will be allowed to rest for a minimum of 16 hours.

Following the 16-hour rest period, a City of St. Thomas Water Operator will collect a bacteriological sample(s) from the watermain where the water has travelled through the segment. The Operator will leave the sample tap running and return after a minimum of 15 minutes to collect a second sample.

The City of St. Thomas will submit the samples to an accredited laboratory for *E. Coli*, Total Coliform and Heterotrophic Plate Count analysis.

1. **PIPE TO REMAIN SEALED FOLLOWING TESTING:**

Between the time the satisfactory bacteriological sample results are received and the time that the connection piping is installed, the ends of the piping will be sealed with plastic wraps, watertight plugs, or caps.

1. **CONNECTION**

Following receipt of satisfactory bacteriological results and approval from the City of St. Thomas Project Manager, arrangements for final connection of the pre-disinfected pipe will be made to accommodate the pipe being connected to the active distribution system.

1. **HYDROSTATIC TESTING:**

**NOTE: HYDROSTATIC TESTING SHALL NOT BE COMPLETED AGAINST A VALVE CONNECTED TO THE EXISTING DISTRIBUTION SYSTEM.**

**PLEASE REQUEST ALTERNATIVE HYDROSTATIC TESTING PROTOCOL FROM THE CITY IF WATERMAIN INCLUDES POLYETHYLENE SECTIONS OF PIPING.**

Following the filling of the watermain, a period of 24 hours will be provided to allow for adsorption to take place prior to the initiation of hydrostatic testing.

The hydrostatic test will be conducted under the supervision of a City of St. Thomas Water Operator.

A pressure pump equipped with a pressure gauge will be connected to the riser at STA 0+000.

The pressure pump will then be started and operated until the pressure in the watermain reaches 1035 kPa (150 psi). When the desired test start pressure is obtained, the City of St. Thomas Water Operator will record the test start time and pressure (150 psi).

The pressurized watermain will be left untouched for a period of 1 hour. When the 1 hour test period is complete, the Water Operator will record the test end time and test end pressure on the gauge. The pressure pump will be used to return the watermain to the 150 psi test pressure. The Water Operator will then bleed off and measure the volume of water removed in order to return the pressure to the test end pressure.

The volume bled off will be compared to the allowable leakage, as calculated below. If the measured leakage DOES NOT exceed the allowable leakage, the test result is deemed satisfactory. If the measured leakage exceeds the allowable leakage, all leaks will be located and repaired and the test section will be retested until a satisfactory result is obtained.

**Calculation of Allowable Leakage:**

The allowable leakage is 0.041 litres per millimetre of pipe diameter per kilometre of pipe for the 1-hour test period.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section ID** | **Main Size (mm)** | **Material** | **Length (m)** |
| 1 | 300 | PVC | 930  |
| 2 | 200  | PVC | 12  |
| 3 | 50 | PVC | 200 |

**Section 1:** Allowable Leakage1 = 0.041 L/mm diam/km/hour

 = 0.041 \* 300 mm \* 0.93 km

 = 11.44 L

**Section 2:** Allowable Leakage2= 0.041 L/mm diam/km/test period

 = 0.041 \* 200mm \* 0.012km

 = 0.0984 L

**Section 3:** Allowable Leakage3 = 0.041 L/mm diam/km/test period

 = 0.041 \* 50mm \* 0.2 km

 = 0.41 L

**Total Allowable Leakage** = Allowable Leakage1 + Allowable Leakage2 + Allowable Leakage3

 = 11.44L + 0.0984L + 0.41L

 = 11.95 L

**“PROCEDURE B”**

1. **DISINFECTION, INSTALLATION AND FLUSHING**

**Type of chlorine:** 12% Sodium Hypochlorite (NSF 60/61 certified)

In the presence of a City of St. Thomas Water Operator, a minimum 1% NSF 60/61 certified sodium hypochlorite solution will be used to hand swab the watermain sections aboveground, or in the excavation, immediately prior to installation.

Upon successful installation of the new watermain, the system will be flushed of all super-chlorinated water, as outlined in the section below, until such time as free chlorine residuals within the system are consistent with the St. Thomas Distribution Water System residuals in the area.

1. **MAINTAIN ISOLATION**

Once installed, isolation will be maintained from Existing St. watermain, except when flushing or sampling until satisfactory microbiological results are received from 2 samples, as described below.

1. **BACTERIOLOGICAL TESTING:**

Following flushing of super-chlorinated water and recharging of the new watermain with water normal to the operation of the St. Thomas Water Distribution System, the new watermain will be allowed to rest for a minimum of 16 hours.

Following the 16-hour rest period, a City of St. Thomas Water Operator will collect bacteriological samples from the sample locations indicated on the drawing provided and listed below. The Operator will leave the sample tap running and return after a minimum of 15 minutes to collect a second sample from each sample location.

 **HYDROSTATIC TESTING:**

**PLEASE REQUEST ALTERNATIVE HYDROSTATIC TESTING PROTOCOL FROM THE CITY IF WATERMAIN INCLUDES POLYETHYLENE SECTIONS OF PIPING.**

Following receipt of satisfactory bacteriological results and approval from the City of St. Thomas Project Manager, arrangements for hydrostatic testing will be made. Hydrostatic testing will take place as described below:

Following the filling of the watermain, a period of 24 hours will be provided to allow for adsorption to take place prior to the initiation of hydrostatic testing.

The hydrostatic test will be conducted under the supervision of a City of St. Thomas Water Operator.

A pressure pump equipped with a pressure gauge will be connected to the riser at STA 0+000.

The pressure pump will then be started and operated until the pressure in the watermain reaches 1035 kPa (150 psi). When the desired test start pressure is obtained, the City of St. Thomas Water Operator will record the test start time and pressure (150 psi).

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**Section 2:** Allowable Leakage2= 0.041 L/mm diam/km/test period

 = 0.041 \* 200mm \* 0.012km

 = 0.0984 L

**Section 3:** Allowable Leakage3 = 0.041 L/mm diam/km/test period

 = 0.041 \* 50mm \* 0.2 km

 = 0.41 L

**Total Allowable Leakage** = Allowable Leakage1 + Allowable Leakage2 + Allowable Leakage3

 = 11.44L + 0.0984L + 0.41L

 = 11.95 L

**Submitted by:**

Name:

Company:

Date:

Signature

**City of St. Thomas Plan Approval:**

Name:

Date:

Signature: