CITY OF MAPLE RIDGE

Operations Department (Waterworks)

Watermain Testing Procedures for Development and Capital Projects

Revision No.	Date	Description
0	March 26, 2019	Issued for Use
1	June 1, 2021	Issued for Use; updated per City Comment
2	May 5, 2023	Issued for Use; updated per City Comment

Watermain Testing Procedures for Development and Capital Projects

Contractor to provide the name of a qualified 3rd party testing agency and submit for review the water main testing plan prior to commencement of testing.

Plan to include procedures and locations of testing, disinfection, de-chlorination, flushing, discharge and sampling.

Day 1

- **Pressure test** – 200psi @ 2 hours for mains with working pressure less than 134psi
  - Test Pressure to be 1.5 x working pressure at the lowest elevation of the section for mains exceeding 134psi.
  - Check that all mainline valves & hydrants are accessible, functioning and open during the pressure testing. Ensure air valves, PRVs, etc. are installed properly.
  - Confirm hydrant use permit has been issued and that the backflow preventer device is certified.
  - MMCD 33 11 01 or AWWA C600 Allowable Loss calculation should be used.

- **Chlorinate** – No less than 25mg/L. Do not over chlorinate (over 100mg/L). Particularly over an extended period. High chlorination amounts longer than 1 day may affect the pipe. Ensure all laterals and services have been chlorinated at test points and at random points as necessary.

Day 2

- **Residuals** – Confirm chlorine still in the main after 24 hrs (no less than 10mg/L). City inspector to confirm at all test/sample points and at random points as necessary.

- **Flush** – Chlorine levels to be no more than the typical system residuals (MMCD 0.3mg/L).
    - A chlorine neutralizing agent shall be applied to the flushed water prior to discharging to storm sewers or watercourses. Where discharge directly to a watercourse is proposed, the Contractor shall engage a Qualified Environmental Professional (QEP) to prepare the flushing procedures and monitor the discharge as appropriate.
    - Discharge of chlorinated water into the sanitary sewer is not permitted unless prior authorization has been obtained.
    - The testing plan must specify a discharge location and consider impacts the discharge may cause to the environment or downstream infrastructure.

Day 3

- **1st Set of Samples** - (Minimum 16 hrs between flushing and 1st sample required.)
    - AWWA C651: Sample for every 366m. One at each end and at the end of each branch/lateral. A lateral/branch is defined as anything greater than one length of pipe).
        - Samples are to be taken from a ½" or ¾" test point.
        - Blow offs and hydrants do not represent optimum sampling conditions and should be avoided (AWWA C651 5.1.3 Sample Procedure).
    - City Inspector witnesses the sampling. Testing Agency delivers the samples to the lab.

Day 4

- **2nd Set of Samples** - (Minimum 24 hrs between 1st and 2nd sample required.)
    - Same sample locations as 1st set.
    - Flushing plan to address potential pressure loss in main during sampling.
    - City Inspector witnesses the sampling. Testing Agency delivers the samples to the lab.

***Trouble shooting, failed test results, etc. To be reviewed with inspector, Waterworks Superintendent, Engineer of Record (EOR) and/or Contract Administrator (CA) as required.** NOTE: Bacteriological tests older than 30 days will not be accepted by the City of Maple Ridge.*

Coordination of Tie-in with Waterworks

- Provide copy of the key plan, water drawing, and any conflicting utility drawings (Hydro, Gas, Communications). BCOne call may not have any newly installed infrastructure.
- Meet onsite as necessary with Waterworks and/or contractor to review site conditions, schedule, and any coordinated works with contractor.
- Email contractor and engineer (with cc to Waterworks) of proposed dates of scheduled tie-in.
- Submit water main test report (including documentation of procedures followed, locations of testing, disinfection, flushing, discharge and sampling), all test documents, signed and sealed (Hard copy to Waterworks Supervisor, and PDF to Waterworks Superintendent and supervisor)

Notes

- Hydrant use permit is required for filling and testing new water mains. Backflow preventer calibration certification to be provided prior to issuance of the hydrant use permit. **All other uses of hydrants are not permitted.**
- All underground works must be complete, including all necessary tests, prior to asphalt pavement being placed.
- All temporary mainline flushing blow-offs to be 100mm diameter. 50mm diameter blow-offs are acceptable at temporary secondary laterals. All permanent blow-offs to be to be 100mm diameter per CMR Standard Detail Drawing W8
- Watermain testing and sampling is to be completed by a qualified 3rd party testing agency (BCWWA member). Any testing and sampling to be completed by the contractor is to be witnessed full time by the Engineer of Record.
- Contractor shall submit the testing and flushing plan to the EOR or CA for review and approval prior to submitting to the City for acceptance.
- EOR or CA to sign and seal the watermain test report document and submit to City inspector prior to tie-in scheduling.

NEW WATERMAIN TEST RECORD

Location:

EoR (Development) **Contract Administrator (Capital):**

Project Number: Inspector:

Watermain Length:

Watermain Diameter & Material:

Number of Service Connections & Laterials:

Number of Hydrants:

PRESSURE TEST

Tester: *(print name)* Date:

Test pressure: 200 *psi* Duration of Test: _____ *min*

Allowable Leakage: _____ *L/Hr* Actual Leakage: _____ *L/hr*

Starting Pressure: _____ *psi* Ending Pressure: _____ *psi*

Start time: _____ am / pm End Time: _____ am / pm

Pressure test Inspected/Witnessed By:

DISINFECTION TEST

Chlorinated By: _____ (print name) Time: _____ Date: _____

Chlorine Applied: _____ (Mg/L) ** 25Mg/L minimum application for 24 hrs.*

Chlorine Residual: _____ (Mg/L) **10Mg/L minimum residual after 24 hrs.*

Date of Final Flush: _____ Time: _____ Date: _____

Disposal of Chlorinated Water (location): _____

Chlorine Neutralizing Chemical: (*Sodium or Calcuim Thiosulphate)* - _____

Chlorine Residuals Confirmed/Witnessed By:

VERIFICATION (Bacteriological)

1st Sample Temperature (C°): _____ Chlorine At Sample Time: _____ (Mg/L)

Sampled By: _____ (print name)

Date: _____ Time: _____ *Minimum 16 hrs between flushing and 1st sample required.

Testing Laboratory:

2nd Sample Temperature (C°): _____ Chlorine At Sample Time: _____ (Mg/L)

Sampled By: _____ (print name)

Date: _____ Time: _____ *Minimum 24 hrs between 1st and 2nd sample required.

Testing Laboratory: _____

Sampling Inspected/Witnessed By: _____

1) Bacteriological tests older than 30 days will not be accepted by the City of Maple Ridge and retesting will be required.

2) Discharge of chlorinated water into the sanitary sewer is to be avoided unless prior otherization has been received from the Municipal Engineer.

2) Prior to connection to the water distribution system, all new water mains shall be tested in accordance with MMCD 33 11 01 and AWWA C651 "Disinfecting Water Mains" plus any other government agencies (Metrovan, Provincial and Federal)

3) All testing, disinfection, and verification sampling of new water mains, for CMR Capital contracts, are to be inspected/witnessed by the Contract Administrator or the CA's authorized representative.

4) All testing, disinfection, and verification sampling of water mains for New Development to be inspected/witnessed by City of Maple Ridge Engineering Inspector.

5) Submit bacteriological test results with this completed form.

6) Obtain Hydrant Use Permit prior to commencing any testing.(Includes submittal of certified backflow prevention device document).

7) Attach Design Drawings.

Engineer's Seal

Signature: EoR(Development) / CA Representative (Capital)