City of
Moose Jaw

COMMUNICATION # CC-2020-0268

TITLE: **2021 WW-17 Cast Iron Water Main Replacement Program**

TO: **Special City Council**

FROM: **Department of Engineering Services**

DATE: **November 4, 2020**

PUBLIC: **PUBLIC DOCUMENT**

RECOMMENDATION

THAT Communication # CC-2020-0268 regarding the 2021 WW-17 Cast Iron Water Main Replacement Program be received and filed.

EXECUTIVE SUMMARY

To provide City Council with the background and information on the Cast Iron Water Main Replacement Program to support a decision on the scope of future phases of this important program.

BACKGROUND

In 2015, the City of Moose Jaw received City Council's approval to undertake the implementation of replacement of the cast iron pipes within the City. The replacement of water mains under this Capital Project focused on the replacement of cast iron pipes in the most deteriorated condition. (Attachment i – 2015 Cast Iron Program Charter Report Final)

The City of Moose Jaw operates 274 kilometers of underground water distribution infrastructure of varying ages. Approximately 84 kilometers of the system is currently cast iron. The composition of this infrastructure varies based on the year of installation, and is largely comprised of Cast Iron, Ductile Iron, Asbestos-Cement, and PVC. (Attachment ii - 2020 Cast Iron Map)

The Department of Engineering Services maintains a record of the water main infrastructure in the City. The failures are recorded and analyzed to determine the most cost-effective program. In completing the analysis, the break history, pipe age, pipe material, condition of pavement, as well as condition of the sanitary sewer infrastructure are evaluated.

Over time, the Cast Iron Replacement Project will eliminate water mains of this material from our system. Many of these pipes have exceeded their service lives and their break frequencies are high. The replacement of these lines will result in increased flow, improved water quality, and reliability. This is a high priority project given the current high frequency of water breaks in the system.

DISCUSSION:

Program Review

The below information is a high-level review of annual project costs and total meters replaced, producing a unit cost per meter representative of the entire annual program.

Program Year	Meters replaced	Cost (Millions)	Program Unit Cost ($/m)
2016	2,420	$4.997	$2,064
2017	2,260	$4.991	$2,208
2018	3,250	$6.835	$2,103
2019	1,760	$4.340	$2,465
2020	2,800	$6.059	$2,163

In general, the scope of this program includes:

- Water main replacement
- Hydrant and valve replacement
- Water and sewer sanitary services
- Associated surface works including road structure and asphalt replacement, sidewalk replacement, and landscaping as required.

Associated infrastructure has also been included in this program, with a varying scope when reviewing in each year:

- Catch basin and catch basin leads
- Storm and sanitary manholes
- Replacement of deficient sidewalks
- Road repair type and extent

Each program also incorporates engaging home and business owners to have their private side water and sanitary services replaced in coordination with replacement of the water main serving their property. This allows the City and property owners to leverage a qualified contractor in replacement of associated aged infrastructure, include lead water services, and no-corrode sanitary services. This work is paid by the City, with agreement signed between the contractor and owner. The owner then pays the City, with the option to make full payment, or add to their taxes. This money is then added back into the water utility. While the money is regained under the general utility, it is money expended under the Cast Iron program which is used for the coordination and inclusion of private service replacements. This generally accounts for 10% to 20% of a given cast iron construction contract.

It should be noted that 2021 will mark the second year of the design and construction oversight being managed internally by City resources. In 2020, advantages were seen in the internal delivery of this process, with greater adaptability to address unforeseen issues, and more direct support provided by staff from Public Works. Valuable insight and understanding were gained in 2020, allowing for an informed and appropriate project scope, which is outlined below.

1. Full water main replacement, associated infrastructure, private service engagement, and full road asphalt overlays.
    a. This is consistent with the mandate laid out by City Council in 2015.

2. Surface Works
    a. Alternative solutions such as increased milling, asphalt removals, or overlay depths to be evaluated and applied as required.
    b. Complete road re-build if required. This additional work will be funded from TR1 Paved Roadways.
    c. Sidewalks replaced as a result of service connections.
    d. Deficient sidewalks and paraplegic ramps replaced based on sidewalk condition assessment as well as visual inspection.
    e. Landscaping completed as required.

3. Storm Sewers
    a. Catch basins replaced based on inspection.
    b. Storm manholes replaced based on inspection.
    c. Corrugated steel pipe catch basin leads replaced as required.
    d. Storm main replacement or rehabilitation evaluated and included if required, funded from SS1 Storm Sewers.

4. Sanitary Sewers
    a. Sanitary manholes replaced based on inspection.
    b. Sanitary main replacement or rehabilitation evaluated and included if required, funded from S1 Sanitary Sewers.

The above scope has been applied to an anticipated block, with unit costs applied from the 2020 contract. The expected cost per program meter is between $2,200 to $2,600 per meter. When compared to a budget of $6,600,000, 2,500 meters to 3,000 meters of cast iron water main replacement can be accomplished.

STRATEGIC PLAN

This report supports the City's goal of being fiscally responsible under the Strategic Goal of Fiscal Management and Accountability.

FINANCIAL IMPLICATIONS

The annual anticipated budget is outlined below:

WW-17 Cast Iron Water Main Replacement Project

Financial	2021	2022	2023	2024	2025
Capital	6,600,000	7,100,000	7,600,000	7,600,000	7,600,000

The annual break history is as follows:

2016 – 85
2017 – 116
2018 – 97
2019 – 109
2020 – 43

It is anticipated that beginning in 2022, savings in operations due to reduced breaks in the system will be available for the Cast Iron Water Main Replacement program as the net savings will be directed to addressing the backlog of repairs.

OTHER CONSIDERATIONS/IMPLICATIONS

There are no other recommendations, policy, privacy implications, official community plan implementation strategies or other considerations.

PRESENTATION

Mr. Bevan Harlton, Director of Engineering Services, will be available to present an overview of this report.

ATTACHMENTS

i. 2015 Program Charter Report Final
ii. 2020 Cast Iron Map

REPORT APPROVAL

Written by: Bevan Harlton, Director of Engineering Services
Reviewed by: Brian Acker, Director of Financial Services
Reviewed by: Tracy Wittke, Assistant City Clerk
Approved by: Jim Puffalt, City Manager
Approved by: Fraser Tolmie, Mayor

To be completed by the Clerk's Department only.

Presented to Regular Council or Executive Committee on _____.

No. _____ Resolution No. _____

Report Approval Details

Document Title:	2021 WW-17 Cast Iron Water Main Replacement Program - CC-2020-0268.docx
Attachments:	- i 2015 Cast Iron Program Charter Report Final.pdf - ii 2020 Cast Iron Map.pdf
Final Approval Date:	Nov 26, 2020

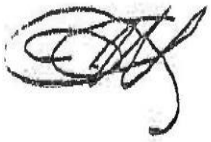
This report and all of its attachments were approved and signed as outlined below:

Bevan Harlton

No Signature found

Brian Acker

Tracy Wittke



Jim Puffalt

Fraser Tolmie