



CITY OF HAMILTON
PUBLIC WORKS DEPARTMENT
Engineering Services Division

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	October 31, 2016
SUBJECT/REPORT NO:	Eastern Sanitary Interceptor Sewer Repair (PW16097) (Wards 10 & 11)
WARD(S) AFFECTED:	Wards 10 & 11
PREPARED BY:	Erika Waite (905) 546-2424, Extension 6397
SUBMITTED BY:	Gary Moore, P. Eng Director, Engineering Services Public Works
SIGNATURE:	

RECOMMENDATION

- (a) That staff be directed to commence site preparation works for the rehabilitation of the Eastern Sanitary Interceptor Sewer on South Service Road at Fruitland Road in advance of proposed 2017 Capital Rates Budget approval in order to complete an urgent, weather-sensitive rehabilitation installation in January and February 2017 by Liqui-Force Services under existing contract C13-17-14;
- (b) That the costs accrued in connection to site preparation work referred to in Recommendation (a) of Report PW16097 be applied to account 5161761241 upon approval of the 2017 Capital Rates Budget, with a total project value of \$4,160,000.

EXECUTIVE SUMMARY

Damage sustained to the Eastern Sanitary Interceptor Sewer in the vicinity of 690 South Service Road was discovered in April 2014 when a robotic camera fell into a hole during a routine sewer compliance inspection.

Spot repairs, including installation of a new manhole, were completed in May 2016. In order to work within the interceptor sewer, temporary full by-pass was required to divert sewer flows above the surface, around the work location and back into the sewer at a downstream access point. During the by-pass, without flow within the pipe, it was discovered that the entire pipe surface below the normal flow line was eroded from the connection to approximately 50 meters west of Fruitland Road, a total of approximately 370 meters, due to the same flow conditions that caused the damage requiring the original repair. The downstream damage was not able to be seen in initial inspections due to the high flow within the sewer and as such was discovered during the repair work.

Damage to the sewer system includes:

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1. Along the invert (bottom) of the pipe from the connection in the vicinity of 690 South Service Rd and traversing 320 meters to Fruitland Road, the concrete has eroded to the reinforcing bars (rebar) along with corrosion of the rebar itself.
2. Complete erosion of the bottom of a manhole in the intersection of South Service Road and Fruitland Road and subsequent exposure and wash-out of the surrounding bedding material.
3. Approximately 50 meters of eroded concrete and corroded rebar below the flow line along South Service Road, downstream/west of Fruitland Road.

The Eastern Sanitary Interceptor Sewer is approximately 10 meters deep and within a truck route which reduces accessibility and feasibility of digging to replace pipe segments. Due to the type and location of the damage within the pipe, it is recommended that a full-structural Cured-In-Place Pipe (CIPP) repair be installed utilizing modified resin for additional chemical corrosion resistance. The damaged manhole at Fruitland Rd and South Service Rd will be repaired and lined with a spray-applied material. The funding for the repairs has been included in the 2017 Capital Rates Budget.

The high flows within the pipe and additional flows entering the interceptor at the Fruitland Rd manhole requires flow by-pass that will take approximately 3 months of site set-up time in order to minimize traffic disruption and accommodate work interruptions due to weather events. Flows within the sewer during weather events have been measured significantly higher than typical dry-weather flow; installation would be most effective and safest during the coldest time of the year when surface flows have a reduced impact on the flow within the pipe.

It is recommended that approval be given to commence site preparations in October 2016 for CIPP liner installation to commence January 23rd, 2017 with completion anticipated by the end of February 2017.

Costs accrued for site preparation work during 2016 would be applied to 5161761241 upon approval of the 2017 Capital Rates Budget.

Alternatives for Consideration – See Page 4

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: Funding for all works required for the rehabilitation work is proposed in the 2017 Capital Rates Budget, Project ID: 5161761241, for a total upset limit of \$4,160,000. Billing would not occur until the 2017 Capital Rates Budget is approved.

Recuperation of associated costs from a third-party is being reviewed in conjunction with Hamilton Water and Legal Services as allowed under the Sewer Use By-law.

Staffing: It would be beneficial to complete works during the winter due to Construction staff availability during the typical construction off-season.

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Legal: Coordination with Legal has been maintained since the discovery of the initial damage in 2014 through communications with Hamilton Water, Compliance and Regulations Section.

HISTORICAL BACKGROUND

Initial CCTV sewer inspection requested by Compliance and Regulations for sewer use by-law permitting was completed in April 2014 at 690 South Service Road. A large hole in the invert of the sewer was discovered when the camera unit fell into it.

Repairs to the sewer and installation of a manhole were completed in early 2016. During the repair work, while flow by-pass was in place, subsequent damage was observed from the lateral connection point to the downstream extent of the by-pass, towards Fruitland Road. The contractor was requested to continue inspection of the sewer so as to identify the extents of the damage beginning in the vicinity of 690 South Service Rd.

Damage was observed from 690 South Service Road, westerly to approximately 50 meters west of Fruitland Road, including substantial damage to the bottom of the manhole structure in the intersection of South Service Road and Fruitland Road.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

N/A

RELEVANT CONSULTATION

The following City Divisions have been consulted and are in agreement with the recommendations of this report:

- Hamilton Water, Compliance and Regulations, Environmental Enforcement
- Legal Services
- Finance and Corporate Services

ANALYSIS AND RATIONALE FOR RECOMMENDATION

Due to the success of rehabilitation activities after damage from similar manufacturing process effluents in other areas of the City of Hamilton, installation of CIPP to rectify damage to the sewer is the most cost and time effective solution within the required urgent repair time-frame.

Cured-In-Place Pipe (CIPP) rehabilitation was selected above open-cut replacement and Glass-Reinforced Panel (GRP) lining as the preferred repair option due to the expedient installation capability, minimal disruption to other assets, competitive cost, and availability through an existing contract, further reducing delays. Additionally, CIPP materials can be enhanced to provide resistance to more corrosive effluent than typical replacement pipe materials, which is an added benefit in industrial/manufacturing areas. GRP lining was reviewed but would cause additional delay in installation due to intercontinental product delivery and additional procurement timing.

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ALTERNATIVES FOR CONSIDERATION

Alternative 1: Do nothing, allow the pipe to fail in the near future and complete an emergency repair in an industrial area where manufacturing processes requiring discharge to the sewer would have to be stopped for an undetermined time-frame to allow for repairs to be made.

Alternative 2: Open-cut replacement of the pipe and manhole for the length of the damage as described herein, which is estimated at a minimum of \$4.0M and would take approximately six months, including road or lane closures and significant disruption to traffic at the intersection of South Service Road and Fruitland Rd. Additionally, time required for design, and coordination would add a minimum of two years prior to commencement of construction works.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Economic Prosperity and Growth

Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.

Clean and Green

Hamilton is environmentally sustainable with a healthy balance of natural and urban spaces.

Built Environment and Infrastructure

Hamilton is supported by state of the art infrastructure, transportation options, buildings and public spaces that create a dynamic City.

Our People and Performance

Hamiltonians have a high level of trust and confidence in their City government.

APPENDICES AND SCHEDULES ATTACHED

N/A