

ABSTRACT – VICTORIA BRICK STORM DRAIN – GRP REHABILITATION AT ROSS BAY CEMETERY

TITLE: PRESERVING VICTORIA'S HISTORY – GRP REHABILITATION OF BRICK DRAIN UNDER ROSS BAY CEMETERY

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The City of Victoria (BC, Canada) has an inventory of brick storm drains dating back to the 1860s. Located in some of the oldest neighbourhoods in Victoria and often following old creek systems, the pipes comprise complex non-circular arch and egg cross-sections with some having been converted from sanitary sewers to storm drains as urbanization has occurred. Today the brick network comprises a relatively small portion of the total City's drains but remains critical nonetheless.

Many of the pipes are now located under developed streets with prized trees, under houses and, in one case, under a cemetery containing graves of cherished figures from the City's history. As a result, collapse is not an option and trenchless rehabilitation is the only acceptable method of preserving the brick system and providing continued services to the public.

AECOM has been working with the City since 2009 to collect CCTV data; review pipe condition and expected life of the non-circular shapes; ranking of pipe condition to establish a prioritized program for replacement; and creating a replacement program that recognizes the City's' available annual funding.

The current year's program was larger than average to address several extra-large arch segments nearing failure through a combination of CIPP and GRP rehabilitation. One section under Ross Bay Cemetery, comprising a 1585mm wide by 990mm high brick arch was determined to be only replaceable using segmental GRP panels. It consists of two separate segments that each involve a combination of vertical drops and horizontal deflections with no available access from the graveyard surface.

The use of GRP helped balance the objectives of minimizing construction footprint with the ability to adopt a conservative structural design approach without compromising economics. The design investigated a range of applied loads models and the use of both bonded and un-bonded lining products in an effort to develop an optimum structural section without compromising constructability of a very complex section with even more complex access logistics.

This presentation will review the brick program, discuss the condition assessments, and strategies around design and tendering the 2016 program, as well as the logistics of construction for the GRP lining of the Ross Bay Cemetery drain.