Western Design Competition – Labatt Trunk Sanitary Sewer Realignment

Project Description:

The Labatt Trunk Sewer is a large 900mm diameter concrete gravity sanitary sewer. It is a critical section of London’s sanitary system because it transports sanitary flows from homes to the Greenway Treatment Plant. Figure 1 shows the approximate drainage area that flows through the Trunk Sewer. Originally constructed in 1935, the Labatt Trunk Sewer is now nearing the end of its designed service life. If a section of the sewer infrastructure were to fail, access to the sewer would be difficult, repairs would be costly and potential risk for residential backups and flooding would increase.

Today, the existing sewer alignment lays across private lands - Labatt Brewery lands and London Hydro lands (Figure 2). It is located along the South branch of the Thames River and was constructed with a meandering alignment beside the river to avoid deep construction depths. The trunk sewer crosses the river West of Richmond Street which creates a small waterfall affecting recreational activities such as canoeing and it also restricts fish passage. This crossing is known as ‘Hunt’s Weir’ (Figure 3). An ideal sewer realignment design would not interfere with the river and it should also consider the costs associated with construction and future maintenance.
The City of London’s Infrastructure Renewal Program is responsible for replacing existing infrastructure that is nearing or has passed its intended design life. The new infrastructure will have an updated design that meets today’s current design standards and regulations. The new infrastructure design should ensure that post-construction conditions are the same or better than pre-construction conditions. The challenge with renewal projects is that communities evolve over time and build on top of and around the original subsurface infrastructure. Commonly encountered design and construction challenges involve foundation stability of neighboring properties, designing to meet new capacity needs and ensuring there is enough space within the road allowance to accommodate upsized sewers with the existing subsurface utilities and services. Figure 4 shows an example of a roadway cross-section with congested subsurface infrastructure that is common for retrofit infrastructure renewal projects.

The City must maintain the structural integrity of all infrastructure while keeping in mind the social and financial impacts of construction staging and traffic rerouting. A preliminary review of the surrounding project area was completed to assess the installation year of the sanitary sewer system as shown in Figure 5. It is in the City’s best interest to reconstruct older streets rather than reconstructing newly paved roads. New sewers are designed in accordance to the City of London’s Design Specifications and Requirements Manual.
The City is looking for the optimal sewer realignment design for the portion of the sewer highlighted below in Figure 6. The proposed system should begin at the upstream end of Hunt’s weir and reconnect at the downstream intersection of Horton and Ridout. Specific tie in locations and construction staging can be proposed based on the proposed sewer design.

**Figure 6 Portion of Labatt Trunk Sewer to be realigned**

**Project Objectives:**

- Propose a feasible and constructible sewer realignment and specify the upstream and downstream connection points.
  - Identify necessary grades, inverts and potential conflicts - keep in mind that cost of construction increases as excavation depth increases.
  - Ensure that the proposed sewer can fit in the available space underground along with the other sewers, watermain and utilities.
  - Some drainage area analysis and design sheet calculations can be undertaken to help identify suitable pipe sizes for the new proposed pipe.
- Eliminate Hunt’s Weir and other river crossings where feasible to eliminate recreational and ecological restrictions of the Thames River.
- Justify the design by considering: overall cost, maintenance access, constructability, construction staging, traffic control, etc.

**Resources:**

- Existing Sanitary Sewer System – GIS File
- London Complete Streets Design Manual - Online
- City of London’s Design Specifications and Requirements Manual – Online
- Standard Contract Documents for Municipal Construction – Online