

**HIS MAJESTY THE KING IN RIGHT  
OF THE PROVINCE OF ONTARIO,  
REPRESENTED BY THE MINISTER OF  
TRANSPORTATION FOR THE PROVINCE OF ONTARIO**

Attention: Christine Costa, Manager, Major Planning & Innovations Office - Ministry of Transportation

**Re: Technical Design Standard and Cost Sharing Principles Between the Region of Peel and Ontario Ministry of Transportation to Engineer and Construct Various Utility Relocations along the Proposed Highway 413**

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**Public Works**

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The Ontario Ministry of Transportation (the Ministry) is undertaking a significant project, known as Highway 413, which proposes a 52-kilometre new highway from Highway 400 to Highway 401/407 ETR. The proposed project within the Regional Municipality of Peel (the Region) is from Highway 50 to Highway 401/407 ETR.

For the project limits within the Region, there will be a multitude of water and wastewater infrastructure that will require protection, rehabilitation, relocation or replacement. In addition, and given the proposed highway crosses the urban boundary recently approved in the Region's Official Plan, numerous new water and wastewater infrastructure crossings are proposed to service new development in support of the Province's housing pledges as defined in Bill 23 - *More Homes Built Faster Act*, 2022. The Region requires the Ministry's consensus on establishing a set of principles for both a technical design standard and cost sharing principle in order to advance water and wastewater servicing plans.

**1) Technical Design Standard**

The Region is proposing the following design standard for the Highway 413 that would be applicable for the following scenarios:

- i. Existing Infrastructure
  - a. Water and Wastewater Infrastructure that requires relocation as a result of Highway 413 Infrastructure.
- ii. New Infrastructure
  - a. Water and Wastewater Infrastructure that will be designed, constructed and operational by the Region ahead of and/or during the Highway 413 project which is required as part of Bill 23 - *More Homes Built Faster Act*, 2022.

As illustrated within the Highway 413 Interactive Map ([EE CAN ON HWY 413 Virtual PIC Experience Builder PUBLIC \(arcgis.com\)](https://arcgis.com/webapp/viewer/index.html?appid=ee-can-on-hwy-413-virtual-pic-experience-builder-public)), the Region's infrastructure is proposed to be designed as follows:

- i. All water chambers and water appurtenances and all wastewater maintenance holes shall be located outside of the Ministry's Highway 413 Right-of-Way.
  - a. The Ministry's Highway 413 Right-of-Way (ROW) is identified as the land that includes the highway lanes and the transit way. Please see image below for reference:

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- i. The Ministry's Highway 413 ROW would be identified for any land between Letter "B" and Letter "D".



- ii. For all existing and/or new water infrastructure, which will be relocated or installed within the Ministry's Highway 413 ROW, the water infrastructure shall be designed, in conjunction with the Ministry's Corridor Management Office and Highway 413 Project Team, based on the following parameters:
  - a. Installed via trenchless technology in a two-pass system.
    - i. A two-pass system is defined as a tunnelling procedure that requires the installation of 2 independent systems which includes (1) Tunnel & Primary Tunnel Support and (2) Carrier Pipe.
    - ii. The installation of water infrastructure requires a two-pass system due to the Ministry's requirement of a steel liner as a protection system for all water infrastructure since water infrastructure are always pressurized; steel liner may be an independent system or embedded within a reinforced concrete jacking pipe (see below for further details).
  - b. Tunnel & Primary Tunnel Support (1<sup>st</sup> pass of the two-pass system):
    - i. Tunnel & Primary Tunnel Support is the short-term tunnel structural support:
      1. Prevent the native ground from collapsing once the ground has been removed/excavated by a tunnel machine;
    - ii. Tunnel & Primary Tunnel Support may consist of the following:
      1. Segmentally lined tunnel support (this system will require an ancillary steel liner for water infrastructure);
      2. Ribs and lagging (this system will require an ancillary steel liner for water infrastructure);

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3. Rock Bolts, Wire mesh and/or Shotcrete in a variety of configurations to suit ground conditions (this system will require an ancillary steel liner for water infrastructure);
  4. No support – primary tunnel support may be open where conditions and tunnel size permit; or
  5. Reinforced Concrete Jacking Pipe (this system does not require an ancillary steel liner as jacking pipe contains an internal steel liner).
- c. Carrier Pipe (Water Infrastructure) (2<sup>nd</sup> pass of the two-pass system):
- i. Polyvinyl Chloride (PVC); and/or
  - ii. CPP (AWWA C300/AWWA C301/AWWA C303).

Water infrastructure will be a pressurized system during normal operating conditions. As a result, the casing/host pipe material will be designed to withstand the internal pressure of the water pipe with a minimum pressure rating of 150PSI.

- iii. For all existing and new wastewater infrastructure, which will be relocated or installed within the Ministry's Highway 413 ROW, the wastewater infrastructure shall be designed in conjunction with the Ministry's Corridor Management Office and Highway 413 Project Team, based on the following parameters:
- a. Installed via trenchless technology in a single-pass system containing only a carrier pipe (wastewater infrastructure).
    - i. A single-pass system is defined as a tunnelling procedure that requires the installation of 1 independent pipe system;
    - ii. The installation of wastewater infrastructure requires only a single-pass system since wastewater infrastructure are not pressurized (i.e. operate via gravity).
  - b. Carrier Pipe:
    - i. CPP (AWWA C300/AWWA C302);
    - ii. Polyvinyl Chloride (PVC); and/or
    - iii. Glass Fibre Reinforced Polymer.
- \*PVC material may be permitted as a Carrier Pipe if a two-pass system is installed.

Wastewater infrastructure will be low-pressure tested as part of the commissioning process (one-time event), however and during normal operating conditions, the wastewater infrastructure will be a gravity system. As a result, a single-pass system will be permitted; a steel liner is not required.

- iv. For all new water and wastewater infrastructure which will be installed within the Ministry's Highway 413 ROW and that will intersect with new Highway 413 overpass or underpass, the Region's Project Team will coordinate with the Highway 413 Project Team to acquire any and all available design information associated with crossing. To expedite the water and wastewater infrastructure required to support growth and meet the

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Province's housing pledges, the Region's Project Team will design and install all new water and wastewater infrastructure within the existing respective road's ROW. The Region is unable to pursue additional property acquisition to mitigate the conflict between the Highway 413 crossing infrastructure and the Region's proposed infrastructure. As a result, the Region's Project Team and the Highway 413 Project Team shall coordinate and endeavor to eliminate existing and future conflicts between any applicable foundation system(s) and the proposed water and wastewater infrastructure based on the following scenarios:

a. The Region's Infrastructure Constructed Before the future Highway 413

In the event that the Region's water and wastewater infrastructure is constructed before the future Highway 413 (in accordance with Section (ii)), the Region's infrastructure will be installed within existing road right of way limits and may cross directly underneath the future Highway 413 crossing structure(s) and the Highway 413 Project Team shall design the bridge structure foundations to avoid impacts to the Region's infrastructure without the need for future relocation. The Region will endeavor to reduce the potential future impact on crossing design, to the best of their ability, provide Highway 413 Project Team as-built records of the newly installed infrastructure and the project teams shall ensure that future impacts to water and wastewater service will be eliminated. Given the priorities included as part of this letter the Region and the MTO will commit to advance preliminary designs in the interest of permitting housing enabling infrastructure to be completed expeditiously.

b. The Region's Infrastructure Constructed During/After the future Highway 413

In the event that the Region's water and wastewater infrastructure is constructed during or after the future Highway 413 (in accordance with Section (ii)), the Region's infrastructure may cross directly underneath the future Highway 413 crossing structure(s) and the Region's Project Team shall design the Region's infrastructure to avoid impacts to the Highway 413 bridge structure foundations. The Highway 413 Project Team will endeavor to reduce the potential future impact on crossing design, to the best of their ability, provide the Region's Project Team as-built records of the newly installed bridge structure foundations and the project teams shall ensure that future impacts to water and wastewater service will be eliminated.

v. Priority Projects at the Region

The Region has identified (3) projects that are critical as these projects involve the installation of new water and wastewater infrastructure to

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service new development in support of the Province's housing pledges as defined in Bill 23 - *More Homes Built Faster Act*, 2022. The projects include:

- a. HWY 413 and Humber Station Road;
- b. HWY 413 and Heart Lake Road; and
- c. HWY 413 and Bovaird.

Since these Regional projects will be ahead of the Highway 413 project, Regional water and wastewater assets will need to be installed ahead of the Highway 413 infrastructure to enable housing development. As a result, the Ministry and the Region shall cohesively coordinate their individual projects as a priority, in order to ensure neither Agency's infrastructure is compromised nor requires any form of re-work/re-location where possible. The Region proposes that each Agency share all relevant and most up-to-date plan and profiles drawings, and in parallel, advance geotechnical investigations to aid in designing the respective infrastructure.

Additionally, while the Region has identified the highest priority projects, the Region will collectively work and identify the next list of projects that will garner attention and require collaboration between the Region and the Ministry. At this time, these projects include:

- a. HWY 413 & Mississauga Road re: Region of Peel's West Caledon Elevated Tank;
- b. HWY 410 extension at Speirrs Giffen Avenue/ Abbotside Way
- c. HWY 413 & Mayfield Road (Infrastructure Replacement)
- d. HWY 413 & Coleraine Drive (Infrastructure Replacement)
- e. HWY 413 & The Gore Road;
- f. Balance of South Caledon & West Brampton Crossings.

This criterion was established on the basis that the Region and the Ministry's Corridor Management Office have previously agreed to implement the above design standards for the Ministry's Highway 401 widening project from Regional Road 25 to Credit River. Further, the design standards were then incorporated into the Ministry's Queen Elizabeth Way Improvements from East of Cawthra Road to West of Etobicoke Creek (MTO Contract 2021-2127) and Queen Elizabeth Way and the Credit River Bridge from west of Mississauga Road to west of Hurontario Street.

## 2) Cost Sharing Principle

Similar to the Technical Design Standards, the Region and the Ministry have drafted, developed and executed the following cost sharing principles that were implemented within:

- a. Highway 401 from Regional Road 25 to Credit River; and
- b. Queen Elizabeth Way and the Credit River Bridge from west of Mississauga Road to west of Hurontario Street.

The Cost Share Calculation is based on useful life expectancy values and remaining useful life; the percentages would then be applied to any scope involving existing water and/or wastewater infrastructure due to the Highway 413 project.

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### Cost share calculation = Remaining Useful Life / Estimated Service Life

Where,

#### Estimated Service Life:

1. Water – Ductile Iron = 55yrs useful life
2. Water - Concrete (<600mm) = 65yrs useful life
3. Water - Concrete (>=600mm) = 75yrs useful life
4. Water - PVC = 75yrs useful life
5. Wastewater - PVC = 75yrs useful life
6. Wastewater – Concrete = 75yrs useful life

\*The Region and the Ministry's Design and Contract Standards Office have agreed to the following useful life values for water and wastewater infrastructure in October 2019.

#### Remaining Useful Life = Estimated Service Life – Age of Asset

Where,

Age of Asset = Current date – Install date

#### By way of example:

In 2024, the Region will need to relocate a 750mm concrete watermain that was installed in 2000. The total cost of relocation will be \$1,000,000.

### Cost share calculation = Remaining Useful Life / Estimated Service Life

Estimated Service Life = 75yrs

Install date = 2000

Current date = 2024

Age of Asset = 2024 - 2000 = 24

Remaining Useful Life = 75 - 24 = 51yrs

Cost share calculation =  $51/75 = 0.68$  or 68%

#### Allocation to each agency:

- 1) The Ministry = 0.68 or 68%
  1. 68% of \$1,000,000 = \$680,000
- 2) The Region = 0.32 or 32%
  1. 32% of \$1,000,000 = \$320,000

Therefore, the Region and the Ministry will contribute based on the cost share percentages calculated which will subsequently be applied to the total cost of the scope for the respective water and wastewater infrastructure.

Sincerely,

**Anthony Parente, P.Eng.**

General Manager – Water/Wastewater  
Public Works, Region of Peel