FUNCTIONAL SERVICING REPORT

YORK ROAD RESIDENTIAL INFILL

1317 York Road
Niagara-on-the-Lake, ON

Prepared by: *Quartek Group Inc.*
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Rev.1 July 2025
Rev.2 Mar 2026
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Contents

Attachments

Drawing – Conceptual Site Servicing: 24086-CSS
Hydrant Flow Test

1.0 Introduction

This functional servicing report (FSR), prepared in support of the proposed Official Plan Amendment and Zoning By-Law Amendment for 1317 York Road, serves to demonstrate how servicing of the subject development can be appropriately achieved and to provide a basis for detailed engineering. This report will discuss the following key aspects of municipal design:

- Water Supply and Distribution
- Sanitary Sewerage
- Drainage and Site Grading
- Utility Servicing
- Servicing Locations

2.0 Background

The subject property is approximately 1718 m^2 (0.17 ha) in size and is located on the SE corner of the York Road and Tanbark Road intersection in Niagara-on-the-Lake – municipally referred to as 1317 York Road. The existing features on the site include a detached dwelling, granular driveway, concrete walkways, and grass/vegetated area. With the property being a corner lot, there is 49.4m of frontage along York Road and 41.1m along Tanbark Road. An aerial image showing the subject property is shown in Figure 1.

3.0 Development Proposal

The current proposal is to develop five (5) townhouse dwellings, in one (1) block, fronting Tanbark Road and one (1) detached dwelling which will front York Road.

Figure 1 – Aerial Image of Development Site
(Aerial image from Niagara Navigator)

4.0 Water Supply and Distribution

The Town of Niagara-on-the-Lake's water system is supplied by the DeCew Water Treatment Plant. The system is interconnected with the Niagara Falls water system. The supply area is divided into 11 pressure zones. Based on Niagara Region's *2021 Water and Wastewater Master Servicing Plan Update*, the existing peak hour minimum pressure at the development site ranges from 415-550 kpa (60-80 psi).

There is an existing 250mmØ PVC watermain located in Tanbark Road, and an existing 200mmØ PVC watermain located in York Road, along the west and north limits (respectively) of the subject property. There is a Regional 400mmØ ductile iron watermain on York Road as well.

The property is currently serviced with one (1) 19mmØ copper water service, connected to the 200mmØ York Road watermain, but the location of this service is unknown. This existing water service is to be properly decommissioned at the main.

Water supply for the townhouse block will be taken from the 250mmØ Tanbark Road watermain. A 25mmØ Type 'K' soft copper water connection will be installed for each unit, as well as for the single detached dwelling. For the single detached dwelling, water supply will be taken from the 200mmØ York Road watermain.

The existing fire hydrant on the NE corner of the York Road and Tanbark Road intersection will provide adequate fire protection for this development based on the following: the hose-path distance to farthest principal entrance (i.e. the front door of the southernmost unit) would be significantly less than 90 m, so the OBC maximum distance of 45 m from hydrant to truck and 45 m from truck to principal entrance would be satisfied.

The fire demand flow rate for the block of townhouses (Units A-E) is computed at 7,000 L/min (117 L/s or 1854 USgpm) per the Fire Underwriter's Survey, using worst-case assumption of all-combustible construction. The NFPA colour code for the existing hydrant is blue, meaning it can deliver a flow rate of 1500 USgpm (95 L/s) or greater. Furthermore, the Region's 2016 Water and Wasterwater Master Servicing Plan states that the existing hydrant's available fire flow is in the range of 250 L/s or greater.

A flow test was performed on the existing hydrant in question by Niagara Regional Fire Protection Inc. on April 2, 2026 (attached to this report). The extrapolated flow rate at 20 psi residual pressure is 2524 USgpm (159 L/s). Therefore, the required fire demand flow rate (117 L/s) falls below the available flow rate (159 L/s); the existing hydrant appears adequate to service this development.

Building Name:	1317 York Road (NOTL) Townhouse Block	Quartek
Project #:	24086	
Total Effective Area (sq. m):		1104
Building Construction Coefficient:		1
Initial Fire Flow:		7000
Occupancy Adjustment:		-1050
Sprinkler Protection Adjustment:		0
Standard Water Supply Adjustment:		0
Supervised System Adjustments:		0
Community Level Automatic Sprinkler Protection of Area Adjustment		0
Fire Subdivision with Risk and/or Unprotected Openings Adjustment		0
Total Exposure Charge Adjustment		770
Total Fireflow with Adjustments - (Rounded to nearest 1000 L/min)		7000 L/min

Figure 2 – 2020 Fire Underwriter's Survey Calculation Parameters

5.0 Sanitary Sewerage

There is an existing 200mmØ PVC sanitary sewer located in Tanbark Road, and an existing 250mmØ PVC sanitary sewer located in York Road, along the west and north limits (respectively) of the subject property.

The property is currently serviced with one (1) 100mmØ PVC sanitary service, connected to the Tanbark Road sanitary sewer. This existing sanitary service is to be properly decommissioned.

Each new townhouse unit will be serviced through individual 135mmØ PVC sanitary laterals connected to the 200mmØ sanitary sewer in Tanbark Road. The single detached dwelling will also be serviced through a 135mmØ PVC sanitary lead, but it will be connected to the 250mmØ sanitary sewer in York Road.

Key design data for sanitary servicing are as follows:

Townhouse Units:

No. of Dwelling Units	5 units
Population Density	3.0 persons/unit
Total Design Population	15
Peaking Factor	Babbitt
Mean sewage flow	320 L/cap/day
Sewage shed area (total)	0.136 ha
Infiltration Rate	0.28 L/ha•s
Manning's 'n'	0.013

Average Sewage Flow for Units A-E: 320x15/(24x3600) = 0.056 L/s

Peaking Factor: $5/(15/1000)^{0.2}$ = 11.6 > 4.5, so use 4.5

I/I Flow: 0.28x0.136 = 0.038

Peak Sewage Flow: 0.056x4.5+0.038 = 0.29 L/s

From the above, we estimate the peak sewage flow at 0.29 L/s for townhouse Units A to E.

It is noted that the capacity of the receiving sewer, the 200mmØ sanitary sewer in Tanbark Road with a slope of ±0.49% based on Quartek's survey, is 23.0 L/s. This additional flow represents 1.3% of the sewer's capacity (assuming unsurcharged operation).

Single Detached Unit:

No. of Dwelling Units	1 unit
Population Density	3.0 persons/unit
Total Design Population	3
Peaking Factor	Babbitt
Mean sewage flow	320 L/cap/day
Sewage shed area (total)	0.035 ha
Infiltration Rate	0.28 L/ha•s
Manning's 'n'	0.013

Average Sewage for Unit: 320x3/(24x3600) = 0.011 L/s

Peaking Factor: $5/(3/1000)^{0.2}$ = 16.0 > 4.5, so use 4.5

I/I Flow: 0.28x0.035 = 0.010

Peak Sewage Flow: 0.011x4.5+0.010 = 0.06 L/s

From the above, we estimate the peak sewage flow at 0.06 L/s for the single detached unit.

It is noted that the capacity of the receiving sewer, the 250mmØ sanitary sewer in York Road with a slope of ±1.16% based on reference drawings supplied by the Town, is 64.0 L/s. This additional flow represents 0.09% of the sewer's capacity (assuming unsurcharged operation).

We expect that there will be no impediments to sanitary servicing for the development using currently existing municipal sewage works.

6.0 Drainage and Site Grading

The subject property's current drainage system is overland, with no pronounced/functioning swales, and much of the property is grass area. Topographical data shows the land has minimal slopes that aim towards both bounding roads, but the majority of the property drains northeast. Existing elevations of the property vary from ±122.30 to ±123.70. Stormwater eventually reaches the existing curb & gutter on either York or Tanbark Road, to ultimately be conveyed by the respective storm sewer. There is an existing 600mmØ concrete storm sewer located on the west side of Tanbark Road and a 300mmØ concrete storm sewer on the south side of York Road, east of the property.

The proposed site grading design will ensure positive drainage away from the buildings and neighbouring properties to the east and south. Side and rear yard swales will convey the majority of the site's runoff to on-site collection points.

See *Stormwater Management Report* included under separate cover.

7.0 Utility Servicing

Utilities have been notified of the proposed development plan and have not expressed any challenges in servicing this development. The relocation of a Bell Canada copper splice pedestal is proposed as part of this project – Bell Canada has confirmed that the pedestal can be relocated ±1m south to avoid conflict with Unit 2's proposed driveway.

8.0 Service Locations

Please refer to the attached drawing which shows approximate locations of the existing municipal services along with the proposed services for the development.

Prepared by:

Tyler Crawford, C.E.T.
Civil Engineering Designer

Reviewed by:

Hank Klassen, P.Eng.
Senior Civil Engineer

GENERAL

1. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND EXISTING ELEVATIONS WHICH INCLUDE BUT ARE NOT LIMITED TO THE BENCHMARK ELEVATIONS, EXISTING SERVICE CONNECTIONS, AND EXISTING INVERTS. ANY INCONSISTENCIES AND OMISSIONS ON THIS DRAWING / DRAWING SET SHALL BE REPORTED TO THE ENGINEER FOR CLARIFICATION BEFORE COMMENCING THE WORK.

2. THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND ABOVE GROUND UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL CONFIRM THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

3. SURVEY EVIDENCE (MONUMENTS, IRON BARS, ETC.) SHALL NOT BE DISTURBED, DAMAGED, OR REMOVED.

4. COMPUTER DRAWING FILE CO-ORDINATES FOR THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION LAYOUT UNLESS SPECIFICALLY DIRECTED BY THE ENGINEER.

5. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT. THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE CONSTRUCTOR AS DEFINED IN THE ACT.

6. ALL CONSTRUCTION SIGNAGE SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR CANADA (MUTCDC) AND THE ONTARIO TRAFFIC MANUAL (OTM).

7. TOWN OF NIAGARA-ON-THE-LAKE STANDARD DRAWINGS AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) SHALL APPLY WHEREVER RELEVANT, WHETHER SPECIFICALLY REFERENCED OR NOT.

8. ALL WORK SHALL BE IN ACCORDANCE WITH THE RELEVANT SECTIONS OF THE ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS) AND DRAWINGS (OPSD), AND THE NIAGARA PENINSULA STANDARD CONTRACT DOCUMENT (NPSCD) UNLESS OTHERWISE NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS.

9. ALL MEASUREMENTS ARE IN METRES UNLESS OTHERWISE NOTED.

10. ALL GRANULAR MATERIAL SHALL BE COMPACTED TO 100% STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD) AND ALL NATIVE BACKFILL SHALL BE COMPACTED TO 95% SPMDD UNLESS OTHERWISE NOTED.

11. ALL AREAS DISTURBED BY THE CONTRACTOR DURING THE CONSTRUCTION OF THE WORKS HEREIN, SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER AS DETERMINED BY THE ENGINEER. ALL GRASS AND VEGETATION COVERED AREAS SHALL BE RESTORED BY PLACING TOPSOIL (MINIMUM 100mm) AND SOD TO ESTABLISH A GRASS COVER TO THE SATISFACTION OF THE TOWN, UNLESS NOTED OTHERWISE.

12. SOD SHALL BE IN ACCORDANCE WITH OPSS 803. PLACED TOPSOIL SHALL BE IN ACCORDANCE WITH OPSS 802 AND FREE OF ALL GRANULAR PARTICLES OR OTHER MATERIALS DELETERIOUS TO PLANT GROWTH.

EROSION AND SEDIMENT CONTROL

13. EROSION AND SEDIMENT CONTROL WORKS SHALL BE INSTALLED AS SHOWN ON DRAWING 24086-CSS. SILTATION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO THE START OF CONSTRUCTION AND MAINTAINED FOR THE DURATION.

14. SILT FENCE SHALL BE HEAVY-DUTY AS PER OPSD 219.130. GEOTEXTILE MATERIAL FOR ANY APPLICATION SHALL BE WOVEN WITH A WEAVE DENSITY OF 270R OR EQUIVALENT.

15. SILT FENCE INSTALLATION AND MAINTENANCE CONSIDERATIONS:

15.1. GEOTEXTILE MATERIAL SHALL BE STRETCHED TIGHT DURING INSTALLATION AND THE BOTTOM EDGE BURIED A MINIMUM OF 150mm WITH COMPACTION OF THE EXCAVATED BACKFILL.
15.2. CLEAR GRANULAR STONE PLACEMENT CAN BE USED IN FROZEN OR UNFROZEN CONDITIONS TO ASSIST IN FILTERING SEDIMENT LADEN WATERS.
15.3. SILT FENCE SHALL BE INSPECTED REGULARLY AND AFTER EVERY RAINFALL TO IDENTIFY FAILED SECTIONS. ANY FAILURE SHALL BE REPAIRED IMMEDIATELY.
15.4. WHEN SEDIMENT ACCUMULATES TO HALF THE HEIGHT OF THE GEOTEXTILE MATERIAL IT SHALL BE REMOVED AND DISPOSED OF IN A CONTROLLED AREA.
15.5. A SUPPLY OF SILT FENCE SHALL BE KEPT ON SITE TO PROVIDE FOR QUICK REPAIRS OR ADDITIONAL FENCING REQUIREMENTS.

16. GEOTEXTILE MATERIAL SHALL BE PLACED UNDER THE GRATES IN ALL CATCH BASINS TO TRAP SEDIMENT. SILT TRAPS SHALL BE CLEANED REGULARLY BY THE CONTRACTOR AND SHALL NOT BE REMOVED UNTIL PAVEMENT OPERATION IS COMPLETED AND ALL VEGETATED AREAS ARE STABILIZED.

ROADS AND EARTHWORKS

17. WHERE DISTURBED OR DAMAGED, REINSTATEMENT OF EXISTING ROADS MUST COMPLY WITH THE REQUIREMENTS OF THE ROAD AUTHORITY. PAVEMENT REINSTATEMENT MUST COMPLY WITH OPSD 509.010 AND OPSS 310 & 314. SERVICE TRENCHES ARE TO BE SAWCUT SQUARE PRIOR TO PAVING OPERATION. MINIMUM ASPHALT AND GRANULAR THICKNESS FOR ROADWAY REINSTATEMENT SHALL MATCH EXISTING CONDITIONS, OR THE SCHEDULE BELOW, WHICHEVER IS GREATER:

SURFACE COURSE	40mm	HL3-HS
BINDER COURSE	80mm	HL8-HS
GRANULAR BASE	450mm	GRAN. 'A'
TOTAL THICKNESS	570mm	

STORM SEWERS

18. CONSTRUCTION OF STORM SEWERS SHALL BE IN ACCORDANCE WITH TOWN STANDARDS & SPECIFICATIONS (LATEST EDITION) AND MINISTRY OF ENVIRONMENT (MOE) GUIDELINES (LATEST EDITION).

19. SINGLE CATCH BASINS SHALL BE IN ACCORDANCE WITH OPSD 705.010.

20. CATCH BASIN FRAME AND GRATES SHALL BE PER OPSD 400.020.

21. ALL STORM SEWERS AND CATCHBASIN LEADS SHALL BE EITHER CONCRETE, CLASS III PER CSA A257.1 & A257.2 WITH CLASS "B" BEDDING PER OPSD 802.030, OR, PVC SDR-35 PER CSA 182.1 & 182.2 WITH GRANULAR 'A' EMBEDMENT PER OPSD 802.010, UNLESS OTHERWISE NOTED.

22. ALL STORM LATERALS TO BE 100mmø DR-28 PVC LAID AT 2% SLOPE CONNECTED TO PROPOSED STORM DETENTION SYSTEM AND CAPPED & STAKED OUTSIDE OF PROPOSED FOUNDATION.

23. STORM SEWER BEDDING SHALL BE PER OPSD 802 SERIES, WITH GRANULAR 'A' COVER. ALL BEDDING AND COVER MATERIAL SHALL BE COMPACTED TO 100% SPMDD.

24. MINIMUM CLEARANCE OF 200mm SHALL BE PROVIDED BETWEEN THE OUTSIDE OF THE PIPE BARRELS AT THE POINT OF PIPE CROSSING FOR SEWERS AND OTHER UTILITIES EXCEPT FOR WATERMAIN CROSSINGS WHEN THE MINIMUM CLEARANCE SHALL NOT BE LESS THAN 500mm. FOR WATERMAIN CROSSINGS WHERE A MINIMUM CLEARANCE OF 500mm CANNOT BE OBTAINED, THE CROSSING SHALL BE CONCRETE ENCASED.

SANITARY SEWERS

25. CONSTRUCTION OF SANITARY SEWERS SHALL BE IN ACCORDANCE WITH CITY STANDARDS & SPECIFICATIONS (LATEST EDITION) AND MINISTRY OF ENVIRONMENT (MOE) GUIDELINES (LATEST EDITION).

26. ALL SANITARY LATERALS TO BE 135mmø DR-28 PVC LAID AT 2% SLOPE AND CONNECTED TO EXISTING SEWER WITH APPROVED MANUFACTURED TEE AND CAPPED & STAKED NEAR THE STREETLINE. SANITARY SERVICE LATERALS SHALL BE CONSTRUCTED WITH A 100mmø PVC VERTICAL CLEANOUT CONNECTION AT THE PROPERTY LINE. ALL PROPOSED WYES AND BENDS SHALL BE OF 'SWEEP' OR 'LONG-RADIUS' TYPE.

27. ALL SANITARY LATERALS SHALL HAVE CLASS 'B' BEDDING PER OPSD 802.010, GRANULAR 'A' COVER MATERIAL AND SELECT NATIVE BACKFILL UNLESS OTHERWISE NOTED.

28. IN EXISTING ROADWAYS, SANITARY SEWER BEDDING SHALL BE AS PER OPSD 802 SERIES, WITH FULL GRANULAR 'A' COVER. ALL BEDDING AND COVER MATERIAL SHALL BE COMPACTED TO 100% SPMDD.

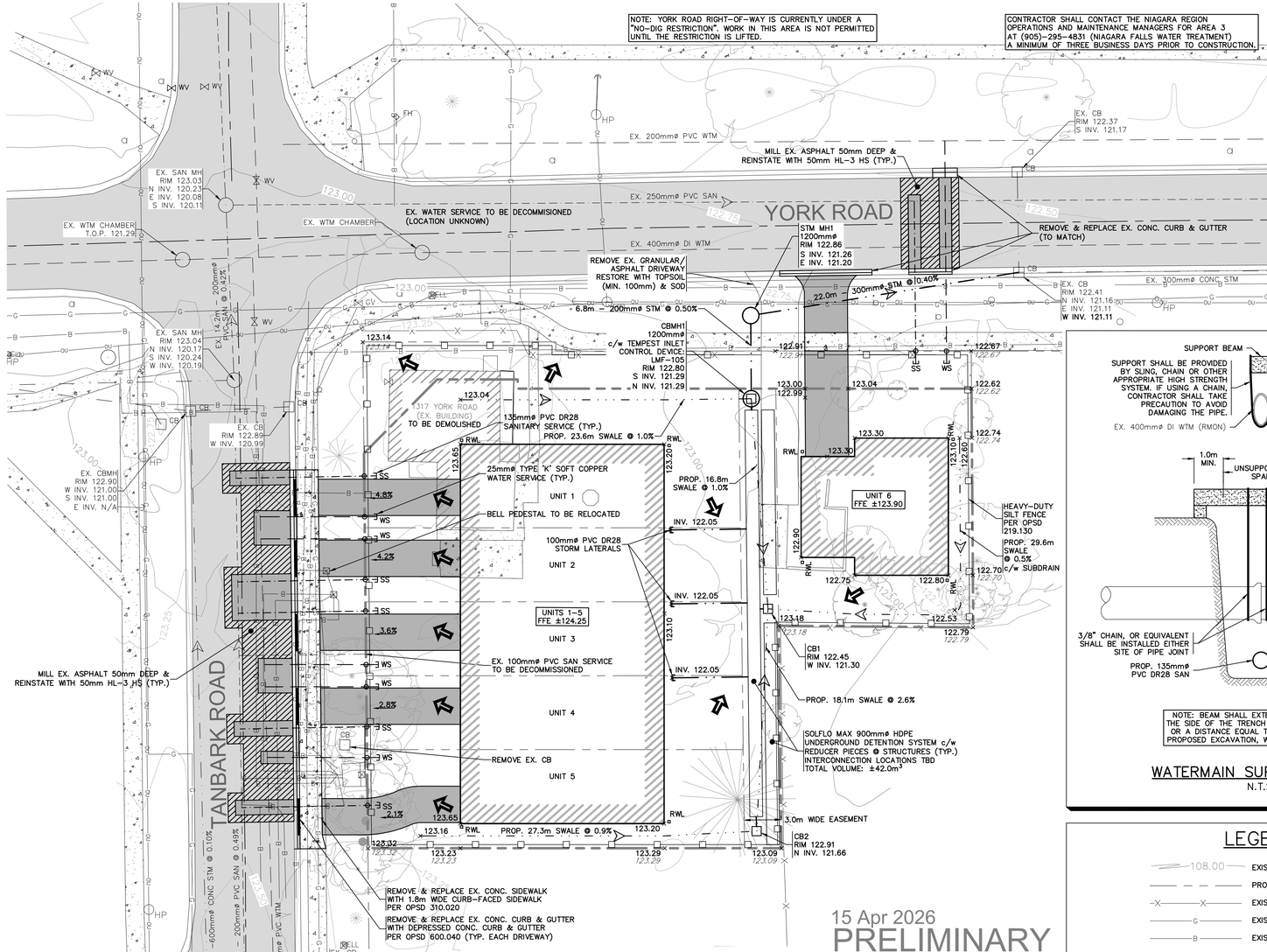
29. MINIMUM CLEARANCE OF 200mm SHALL BE PROVIDED BETWEEN THE OUTSIDE OF THE PIPE BARRELS AT THE POINT OF PIPE CROSSING FOR SEWERS AND OTHER UTILITIES EXCEPT FOR WATERMAIN CROSSINGS WHEN THE MINIMUM CLEARANCE SHALL NOT BE LESS THAN 500mm. FOR WATERMAIN CROSSINGS WHERE A MINIMUM CLEARANCE OF 500mm CANNOT BE OBTAINED, THE CROSSING SHALL BE CONCRETE ENCASED.

WATERMAIN

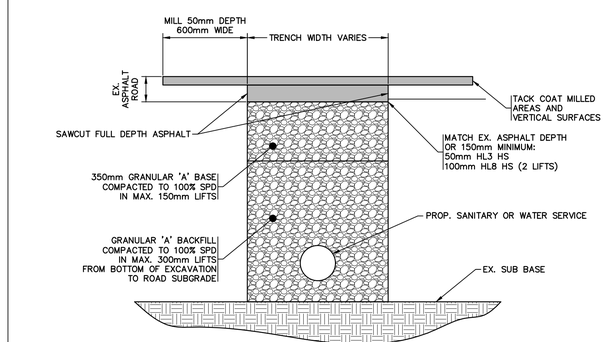
30. WATER SERVICES SHALL BE 25mmø TYPE 'K' SOFT COPPER AS PER OPSD 1104.010. ALL DOMESTIC WATER SERVICE CONNECTIONS SHALL HAVE MAINSTOPS (COMPRESSION TYPE FITTINGS) INSTALLED AT THE WATERMAIN EQUAL TO THE WATER SERVICE CONNECTION DIAMETER. CURB STOP AND VALVE BOX SHALL BE INSTALLED ON PROPERTY LINE. AT EACH SERVICE SADDLE WATERMAIN PIPE SHALL BE CORED BY A 19mmø "SHELL' OR 'CORE' CUTTER AS RECOMMENDED BY THE PIPE MANUFACTURER. A HOLESAW, TWIST DRILL, SPADE OR AUGERING BIT WILL NOT BE PERMITTED UNDER ANY CIRCUMSTANCE.

31. CONNECTIONS TO EXISTING TOWN WATERMAINS SHALL BE BY TOWN FORCES UNLESS AUTHORIZED OTHERWISE.

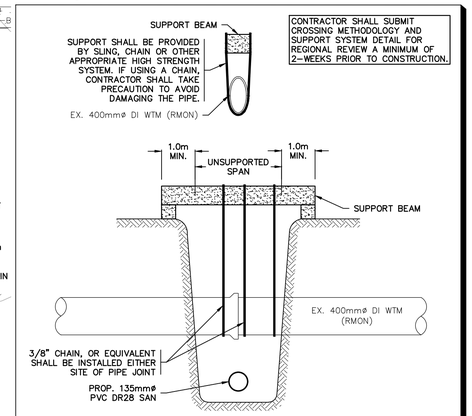
32. MINIMUM DEPTH OF COVER OVER WATERMAIN AND SERVICES SHALL BE 1.7m FROM THE TOP OF PIPE TO THE FINISHED GROUND ELEVATION.



15 Apr 2026
PRELIMINARY



TYPICAL DETAIL FOR ROAD CUT TRENCH RESTORATION
N.T.S.



NOTE: BEAM SHALL EXTEND TO 1.0m BEYOND THE SIDE OF THE TRENCH ON UNDISTURBED SOIL OR A DISTANCE EQUAL TO THE DEPTH OF THE PROPOSED EXCAVATION, WHICHEVER IS GREATER.

WATERMAIN SUPPORT DETAIL
N.T.S.

LEGEND

- 108.00 — EXISTING GROUND CONTOUR
- PROPERTY LINE
- -X-X- EXISTING FENCE
- -G- EXISTING GAS
- -B- EXISTING BELL
- -OU-OU- EXISTING OVERHEAD UTILITIES
- PROPOSED SILT FENCE
- 93.28 / 93.28 — PROPOSED GROUND ELEVATION / EXISTING GROUND ELEVATION
- PROPOSED BUILDING
- EXISTING BUILDING
- EXISTING ASPHALT
- PROPOSED ASPHALT
- EXISTING CONCRETE
- EXISTING WATERMAIN
- EXISTING SANITARY SEWER
- EXISTING CULVERT
- EXISTING DITCH
- WS — PROPOSED WATER SERVICE
- SS — PROPOSED SANITARY SERVICE & CLEAN OUT
- PROPOSED STORM SEWER
- PROPOSED SWALE
- CB — EXISTING CATCHBASIN
- EXISTING MAINTENANCE HOLE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- POST-DEVELOPMENT FLOW DIRECTION

issue	issued for	date	init.
C	OPA/ZBA RESUBMISSION	15 APR 2026	TC
B	OPA/ZBA RESUBMISSION	03 MAR 2026	TC
A	OPA/ZBA APPLICATION	10 JULY 2025	TC

seal

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project title

YORK ROAD RESIDENTIAL INFILL

1317 YORK ROAD, NIAGARA-ON-THE-LAKE

drawing title

CONCEPTUAL SITE SERVICING

drawn by	designed by
TC	TC
scale	date
1:200	10 JULY 2025
job number	issue
24086	C

drawing number

24086-CSS

NIAGARA REGIONAL FIRE PROTECTION INC.

Flow Test Location: 1317 York Rd.

Static Pressure (Psi)		**Pitot Reading 1**	47	**# of Outlets Flowed 1**	1
	69	**Outlet Size 1**	2.5	**# of Outlets Flowed 2**	2
Residual Pressure 1 (Psi)		**Pitot Reading 2**	25	**# of Outlets Flowed 3**	2
	59	**Outlet Size 2**	2.5	**Graph Data:**	
Residual Pressure 2 (Psi)		**Pitot Reading 3**	25	**Pressure Values (y-axis)**	**Flow Values (x-axis)**
	46	**Outlet Size 3**	2.5	69	0
Residual Pressure 3 (Psi)		**Flow 1 Calculated**		59	1150
	46		1150.3	46	1678
Extrapolated to 20psi residual 2524 GPM		**Flow 2 Calculated**		46	1678
Color code Blue			1677.9	**Date & Time of Test :**	**April 2/2026**
Coefficient value		**Flow 3 Calculated**			**1:00pm**
	0.9		1677.9	**Performed by:**	Derek & Ryan

Water Graph