FUNCTIONAL SERVICING REPORT

524 York Road Phase 2

Niagara-on-the-Lake, Ontario

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QGI File: 13254

07 Feb 2025

524 York Road - Phase 2 Niagara-on-the-Lake, Ontario

FUNCTIONAL SERVICING REPORT

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Civil Drawing Package: SS-1 & G-1

Appendix

Site Plan, dated 27 Jan 2025



1.0 Introduction

This Functional Servicing Report (FSR) outlines how the subject development will be serviced in accordance with municipal requirements. The report addresses the following key aspects of municipal infrastructure:

- Water Supply and Distribution
- Sanitary Sewerage
- Roadway
- Utility Servicing
- Servicing Locations

Storm Drainage and Stormwater Management are addressed under separate cover.

2.0 Background

This development proposal represents the second and final phase of development for the subject property in the Glendale Industrial Area of Niagara-on-the-Lake. The subject land in this report is bounded by Regional Road 81 (York Road), Glendale Avenue, and Counsell Street.

Site Data

Address: Municipal No. 524 York Road

Roll Number: 262702001802450 Existing Site Use: Commercial

Property Area: 2.82 ha

The property currently has ±188m of frontage along Glendale Avenue, ±167m along York Road (RR № 81), and ±160m along Counsell Street.

Proposed servicing and grading drawings are attached to this report. References to building numbers in this report correspond to the current site plan in the appendix. An aerial map showing the subject property with aerial imagery from 2023 is found in Figure 1 on the following page.





Figure 1 – Aerial Map of Subject Property



3.0 Water Supply and Distribution

3.1 Existing Condition

Based on 2018 construction records, the property's water supply is sourced from the 300mm PVC municipal watermain on Townline Road. A 250mm diameter, 240m long DR-18 PVC water service connects to this municipal watermain and extends westerly adjacent to Firehall Station 5 at municipal № 350 Townline Road through vacant land owned by the proponent, within a 6.3m-wide easement.

Phase 1 included a dual-brand, six-storey hotel building comprising a 'Holiday Inn Express' and 'Staybridge Suites', totaling 174 guestrooms, plus a common area and swimming pool. Both hotels are fully sprinklered and meet the OBC definition of non-combustible construction type, as per the 2017 building permit. A single fire line enters the building's south limit whereas the domestic water connection enters the building on its west face, just north of the porte-cochère. The surrounding parking lot contains four site hydrants, with two positioned on the east and west sides, respectively.

A single 200mm diameter PVC stub and blow-off extends from Phase 1 into Phase 2 lands near the west entrance of Phase 2.

3.3 Proposed Works

Phase 2 proposes a 10-storey dual-brand hotel building, comprising a 'Fairfield' and 'TownePlace', totaling 207 guestrooms, in addition to a common area between hotels and swimming pool. The hotel building is proposed as fully sprinklered.

Two restaurants are proposed at the west limit of Phase 2, currently identified as 'A' and 'B', with floorplates of 220 and 336 sq.m, respectively. Each restaurant building is unsprinklered.

A single site hydrant is proposed within the southeast quadrant of the Phase 2 area, positioned within 45m of the hotel's fire department connection, as required by the OBC.

The hotel will have separate domestic and fire service connections, both entering the building's west face at the MEP (Mechanical, Electrical, and Plumbing) room. The domestic line will be metered within the MEP room, while the fire line will remain unmetered.

Each of the restaurants will be served by individual 50mm diameter services which will be Town-metered within each building.



3.3 Design Analysis

Anticipated fire demand flow for the existing and proposed buildings are presented in Table 3.1 and 3.2, 3.3, & 3.4, respectively. Anticipated rates are based on the Fire Underwriter's Survey (2020). The proposed hotel was presumed to be sprinklered, achieve a minimum 2-hour Fire Resistance Rating (FRR) on structural elements and have unprotected vertical openings, yielding a non-combustible construction coefficient of 0.8.

The anticipated peak flow demand for this site, accounting for both potable (domestic/commercial) and fire demand, is summarized in Table 3-5. Note that the criteria used to calculate water demand are provided in the lower half of the table. The peak demand scenario considered was 'maximum day flow + fire flow,' with the worst-case fire demand attributed to the proposed Restaurant 'B'. While the existing hotel building's peak fire flow demand is anticipated to be 5,000 L/min (83 L/s or 1,321 USgpm), demonstration of network transmission adequacy was part of the approval process in 2016-2017. Restaurant 'B's peak fire flow demand is anticipated to be 4,000 L/min (66.7 L/s or 1,056 USgpm), assuming no sprinklering, and normal construction coefficient of 1.0. Peak domestic draw is anticipated to be 17.8 L/s, therefore total anticipated peak flow demand for the Phase 2 site is 85 L/s.

The Niagara Region 2016 Water and Wastewater Master Servicing Plan Update notes that the Townline Road area shows 60-80psi peak hour system pressures for the 2016 period and 2041 forecast.

A simplified and conservative demonstration of network transmission adequacy is shown in Table 3.6. The combined potable demand for Phases 1 and 2, plus the greatest anticipated Phase 2 fire demand, is modelled as a single node located at the proposed hydrant in the southeast corner of Phase 2. At a flow rate of 85 L/s, the total dynamic head loss is estimated at 13.8 psi. Given that the 300mm municipal watermain on Townline maintains a minimum pressure of 60 psi, the proposed Phase 2 watermain network is expected to be sufficient.



Table 3.1 Fire Demand Existing Hotel Building

Building Name:	Ex. Ph. 1 Holiday Inn & Staybridge Suites Hotel	Quartek*
Project #:	13254	
Total Effective Area	a (sq. m):	3392.5
Building Construct	ion Coefficient:	0.8
Initial Fire Flow:		10000
Occupancy Adjusti	ment:	-1500
Sprinkler Protectio	n Adjustment:	-3000
Standard Water Su	-1000	
Supervised System	-1000	
Community Level A	0	
Fire Subdivision wit	h Risk and/or Unprotected	
Openings Adjustme	0	
Total Exposure Cha	1200	
	h Adjustments - (Rounded to rest 1000 L/min)	5000 L/min

Table 3.2 Fire Demand Proposed Hotel Building

Building Name:	Prop. Ph. 2 Fairfield & & TownePlace Hotel	Quartek
Project#:	13254	
Total Effective Area	a (sq. m):	2301
Building Construct	ion Coefficient:	0.8
Initial Fire Flow:		8000
Occupancy Adjust	ment:	-1200
Sprinkler Protectio	-2400	
Standard Water Su	-800	
Supervised System	-800	
Community Level A of Area Adjustment	0	
Fire Subdivision wit	_	
Openings Adjustm	0	
Total Exposure Cha	0	
Total Fireflow wit	3000 L/min	

Table 3.3 Fire Demand Prop. Restaurant 'A' Building

Building Name:	Prop. Ph. 2 Restaurant 'A'	Quartek*
Project #:	13254	
Total Effective Area	a (sq. m):	220
Building Construct	ion Coefficient:	1
Initial Fire Flow:		3000
Occupancy Adjusti	ment:	0
Sprinkler Protectio	n Adjustment:	0
Standard Water Su	0	
Supervised System	0	
Community Level A of Area Adjustment	0	
Fire Subdivision wit Openings Adjustme	0	
Total Exposure Cha	0	
Total Fireflow wit near	3000 L/min	

Table 3.3 Fire Demand Prop. Restaurant 'B' Building

Building Name:	Quartek		
Project #:	13254		
Total Effective Area	a (sq. m):	336	
Building Construct	ion Coefficient:	1	
Initial Fire Flow:		4000	
Occupancy Adjust	ment:	0	
Sprinkler Protectio	n Adjustment:	0	
Standard Water Su	0		
Supervised System	0		
Community Level A of Area Adjustment	0		
Fire Subdivision wit	th Risk and/or Unprotected		
Openings Adjustme	0		
Total Exposure Cha	0		
	h Adjustments - (Rounded to rest 1000 L/min)	4000 L/min	



Table 3.5 Water Demand Criteria and Analysis

524 York Rd. Niagara-on-the-Lake Building Ex. Ph.1 StayBridge Suites Ex. Ph.1 Holiday Inn Express	Gross Area m² n/a	Rooms	Seats	Bed						igned by:	J. Prinzen
Building Ex. Ph.1 StayBridge Suites	Area m² n/a	Rooms	Seats	Red						•	-
Ex. Ph.1 StayBridge Suites	Area m² n/a	Rooms	Seats	Red							
Ex. Ph.1 StayBridge Suites	Area m² n/a	Rooms	Seats	Red		COIVIN	/IERCIAL D	EMAND	FIRE DE	MAND	
• =	n/a			Spaces	Units	Daily Demand	Max. Day Demand	Max. Hour Demand	FUS 2 Anal		Comments
• =	-					m^3	L/s	L/s	(L/min)	(L/sec)	
Ex. Ph.1 Holiday Inn Express	/-	70	-	168	-	42.0	1.75	2.63			
	n/a	100	-	240	-	60.0	2.50	3.75	5,000	83.3	
Ex. Ph.1 Hotel Common Area†	n/a	-	-	-	-	n/a	3.30	4.95			
Sumline	-	-	-	-	-	-	7.55	11.33			
Prop. Ph.2 Fairfield	n/a	108	-	259	-	64.8	2.70	4.05			
Prop. Ph.2 Fairfield	n/a	99	-	238	-	59.4	2.48	3.71	3,000	50.0	
Prop. Ph.2 Hotel Common Area††	n/a	-	-	-	-	n/a	3.60	5.40			
Prop. Ph.2 Restaurant 'A'	220	-	110	-	-	13.8	0.57	0.86	3,000	50.0	
Prop. Ph.2 Restaurant 'B'	336	-	168	-	-	21.0	0.88	1.31	4,000	66.7	
Sumline	-	-	-	-	-	-	10.22	15.33			
Phase 2 Max Hour =	26.7	' L/s									
Phase 2 Max Day + Fire =	84.4	L/s									
Assumptions:	2	occupie	d bed-sp	oaces per	room (i	ndustry sta	tistic - conse	ervative)			
	55%	of resta	urant flo	oorplate f	or seati	ng patrons					
	1.1	m² per r	estaura	nt patron	(OBC, T	able 3.1.17	'.1)				
	250	L/bedsp	ace den	nand (OB	C, Table	8.2.1.3.B S	ewage)				
	200	L/bedsp	ace, cor	mmercial	laundry	(OBC, dedu	ictive metho	d Table 8.2.1.	3.B Sewage	e)	
	40	L/persor	n, swimi	ming and	bathing	facilities (C	BC, Table 8.	2.1.3.B Sewag	ge) *assum	e 1 persoi	ၫ/sq.m.
	5,000	L/1,000r	n² shop	ping dema	and (MC	DECC Design	n Guideline I	OWS Table 3-2)		
	2,500	L/machi	ne, gues	st laundry	(OBC, T	able 8.2.1.	3.A Sewage)				
	60	L/seat, p	aper se	rvice rest	aurant	(OBC, Table	8.2.1.3.B S	ewage)			
	125	L/seat, r	on-24h	r restaura	nt (OBO	C, Table 8.2	.1.3.B Sewa	ge)			
Peaking Factors:											
r caiming i actors.	3.6	Max Day	/ Peakir	g Factor (MOECC	Design Gui	ideline DWS	Table 3-3)			
	5.4			•		•		S Table 3-3)			
						-					

†Based on 6M + 6F public use washrooms, 1 Unisex, 1 Universal, 58 + 3*5 = 73 FU flush valve toilets + 14*2 Sink FU = 101 FU total \rightarrow 53 USgpm or 3.3 L/s ††Based on 8M + 8F public use washrooms, 1 Unisex, 1 Universal, 58 + 5*5 = 83 FU flush valve toilets + 18*2 Sink FU = 119 FU total \rightarrow 57 USgpm or 3.6 L/s



Table 3.6 Water Supply Pressure Analysis

		1	NΑ	TER SUPPLY P	PRESSURE A	NALY	SIS		
Vrancor Hospitality Phase 2 07-Feb-2025									
524 York Road, Niag	ara-on-the-	Lake							
				Frictional He	adloss Ana	alysis			
	Total De	emand Flow:		0.085	m ³ /s				
Pipe Description	Size (mØ)	Length (m)		Flowrate (m ³ /s)	Velocity (m/s) (C value	H-W Headloss (m)	Headloss (psi)
External Service	0.250	255		0.085	1.73		110	4.01	5.71
Ph.1 East Side	0.200	187	ОР	0.041	1.30		110	2.24	3.20
Ph.1 West Side	0.200	162	2	0.044	1.41		110	2.24	3.20
Phase 2	0.250	154		0.085	1.73		110	2.42	3.45
							Σ	8.68	12.4
	Static Headloss Analysis								
Proposed Ph.2 Hydrant 117.5 masl									
	Townline Rd. Hydrant 116.5 masl								

Δ

1.0

1.4

Hazen-Williams Formula

 $P_d = 6.05 \, q^{1.85} / (c^{1.85} \, d_h^{4.8655}) \times 10^5$

where

 P_d = pressure drop (bars/m pipe)

c = design coefficient determined for the type of pipe or tube

the higher the factor, the smoother the pipe or tube

q = flow rate (litre per minute)

 d_h = inside hydraulic diameter (mm)

Hazen-Williams							
C-Values*	Pipe Size						
100	150mm						
110	200-250mm						
120	300-600mm						
130	Over 600mm						

*from MOE Design Guidelines 2008

m

psi



4.0 Sanitary Sewerage

4.1 Existing Condition

Based on 2018 construction records, a 250mm diameter sanitary lateral was provisioned on Phase 2 lands during the construction on Phase 1. No municipal sanitary sewer exists on York Rd., Glendale Ave., or Counsell St. The site is serviced from the 525mm diameter municipal sewer on Townline Road, through a 6.3m-wide easement, parallel to the site's watermain.

The elevation of the 250mm diameter sewer on site is governed by the outlet elevation on Townline Road. Minimal pipe slopes appear to have been utilized such that the on-site network cannot be made lower.

4.2 Proposed Works

The existing 250 mm diameter PVC sanitary stubs at MH10A will be extended easterly and westerly to service the proposed Phase 2 buildings. Since no basements are proposed, all sanitary wastewater can be conveyed by gravity, excepting pool and elevator pit floor drains.

4.3 Design Analysis

Vrancor Hospitality Phase 2			WAS	TEWAT	ER GEN	NERATIO	ON ANALYSIS	7-Feb-25
524 York Rd.								Designed by: J. Prinzen
Niagara-on-the-Lake						COMM	IERCIAL	Checked by:
						DEM	IAND	
	Gross	Dooms	Cooto	Bed	Units	Daily	Peak	
Building	Area	Rooms	Seats	Spaces	Units	Flow	Flow	
	m^2					m^3	L/s	
Ex. Ph.1 StayBridge Suites	n/a	70	-	168	-	37.8	1.58	
Ex. Ph.1 Holiday Inn Express	n/a	100	-	240	-	54.0	2.25	
Ex. Ph.1 Hotel Common Area†	n/a	-	-	-	-	n/a	3.30	
Sumline	-	-	-	-	-	91.8	7.13	
Prop. Ph.2 Fairfield	n/a	108	-	259	-	58.3	2.43	
Prop. Ph.2 Fairfield	n/a	99	-	238	-	53.5	2.23	
Prop. Ph.2 Hotel Common Area††	n/a	-	-	-	-	n/a	3.60	
Prop. Ph.2 Restaurant 'A'	220	-	110	-	-	13.8	0.57	
Prop. Ph.2 Restaurant 'B'	336	-	168	-	-	21.0	0.88	
Sumline	-	-	-	-	-	146.5	9.71	
Phase 2 Peak Flow =	16.8	L/s						
Assumptions:	2.4	occupied bed-spaces per room (industry statistic - conservative)						
	55%	5% of restaurant floorplate for seating patrons						

of restaurant floorplate for seating patrons 1.1 m² per restaurant patron (OBC, Table 3.1.17.1) 225 L/bedspace demand (MECP, Design Guidelines for Sewage Works (2008), Table 5.3) 5,000 L/1,000m² shopping demand (MOECC Design Guideline DWS Table 3-2) L/seat, paper service restaurant (OBC, Table 8.2.1.3.B Sewage) 125 L/seat, non-24hr restaurant (OBC, Table 8.2.1.3.B Sewage) Peaking Factors: 3.6 Commercial Sewage Peak Factor, (MECP, Design Guidelines for Sewage Works (2008))

†Based on 6M + 6F public use washrooms, 1 Unisex, 1 Universal, 58 + 3*5 = 73 FU flush valve toilets + 14*2 Sink FU = 101 FU total → 53 USgpm or 3.3 L/s ††Based on 8M + 8F public use washrooms, 1 Unisex, 1 Universal, 58 + 5*5 = 83 FU flush valve toilets + 18*2 Sink FU = 119 FU total → 57 USgpm or 3.6 L/s



The current development plan estimates 16.8 L/s peak generation rate on site. Wet weather inflow is calculated based on 0.286 L/s/ha and a site area of 2.83 ha yields 0.81 L/s, for a total site outflow of 17.6 L/s.

The receiving sewer is a 525 mm diameter PVC municipal sanitary sewer with a 0.33% slope, providing an unsurcharged capacity of 247 L/s. The anticipated sanitary wastewater flow from Phases 1 and 2 could utilize approximately 7.1% of the sewer's gravity conveyance capacity.

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

5.0 Drainage and Stormwater Management

Please see SWM Report prepared by Quartek Group Inc. under separate cover.

6.0 Parking and Roadways

Where required for fire access routes, roadways will be 6m wide with 12m centreline, consistent with Ontario Building Code requirements.

The pavement design will follow the recommendations of the geotechnical consultant. Heavy-duty pavement will be specified for fire routes and garbage/loading areas, while light-duty pavement will be used in all other areas.

Concrete barrier curb, 150mm height, is generally proposed within the new development complying with OPSD 600.110.

7.0 Utilities

Hydro, Gas, Cogeco, and Bell services are located on Phase 1 lands. No impediments to extension are anticipated.

8.0 Service Locations

Please refer to attached drawings for proposed and existing municipal services.

Prepared by:

John Prinzen, EIT, Dipl. M.E.T., B.Eng.

Senior Civil Designer

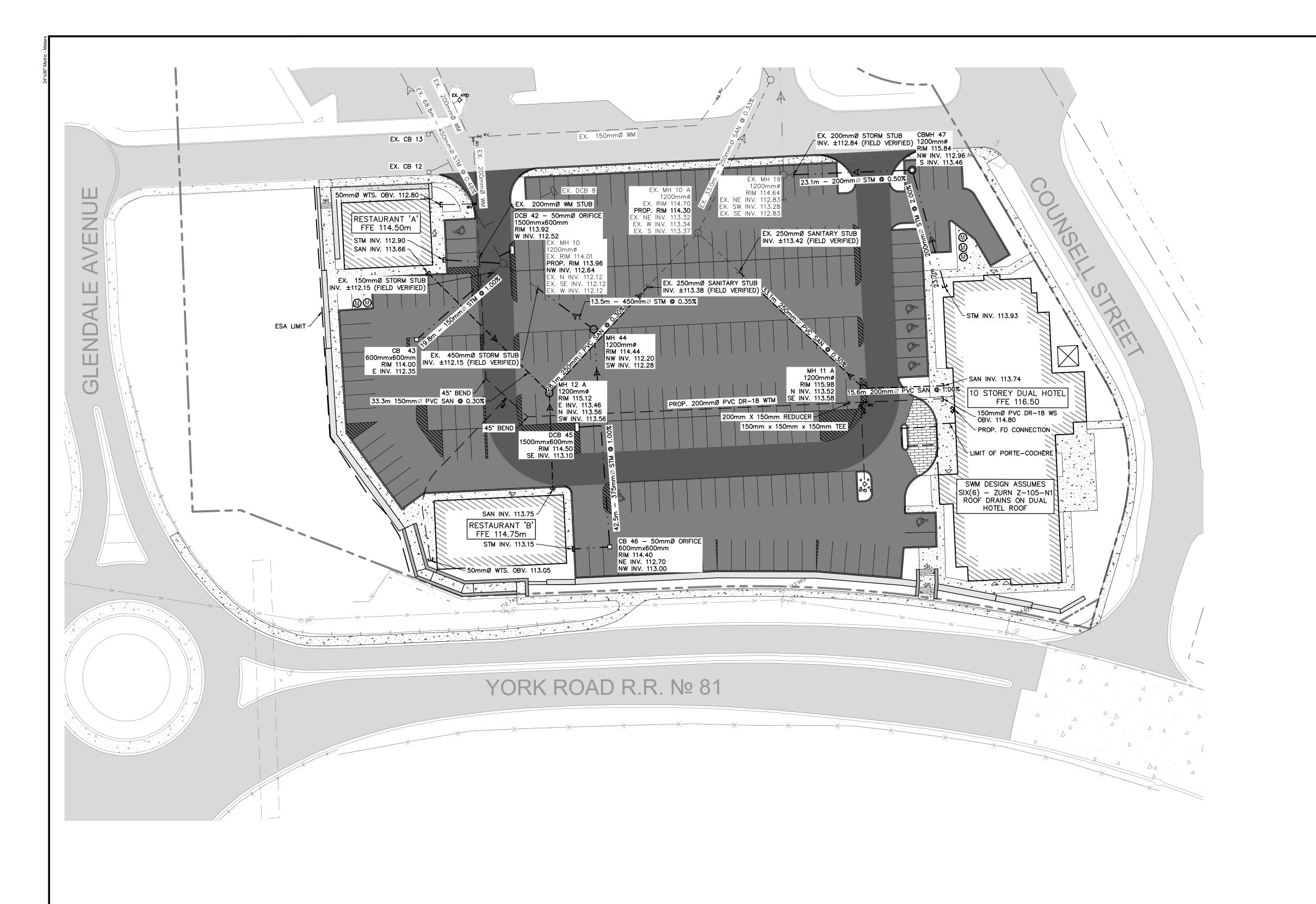
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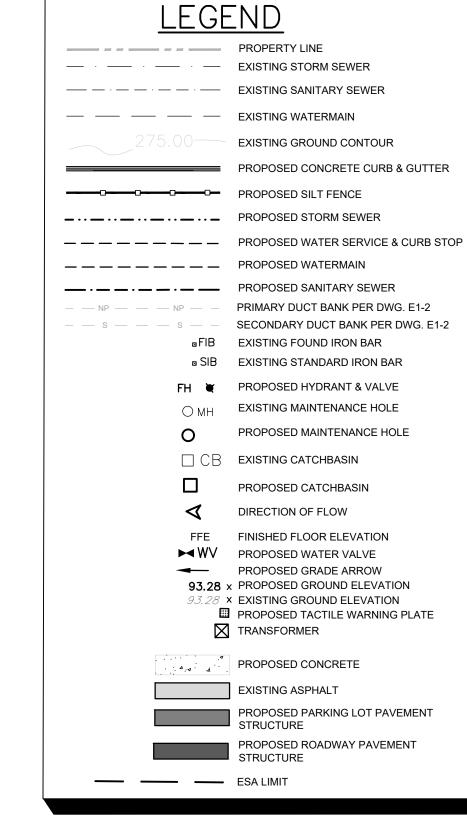
Hank Klassen, P.Eng. Senior Civil Engineer

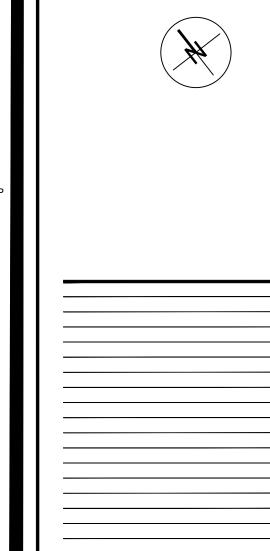
FUNCTIONAL SERVICING REPORT











A COORDINATION

issued for

Do not scale drawings. Report any discrepancies to Quartek Group Inc.

19FEB2025 CJM

07JAN2025 CJM

date

Drawings must be sealed by the Architect and / or Engineer prior to the use for any building permit applications and / or government approval. Seals must be signed by the Architect and / or Engineer before drawings are used for any construction.

All construction to be in accordance with the current Ontario Building Code and all applicable Ontario regulations.

All drawings and related documents remain the property of Quartek Group Inc., all drawings are protected under copyright and under



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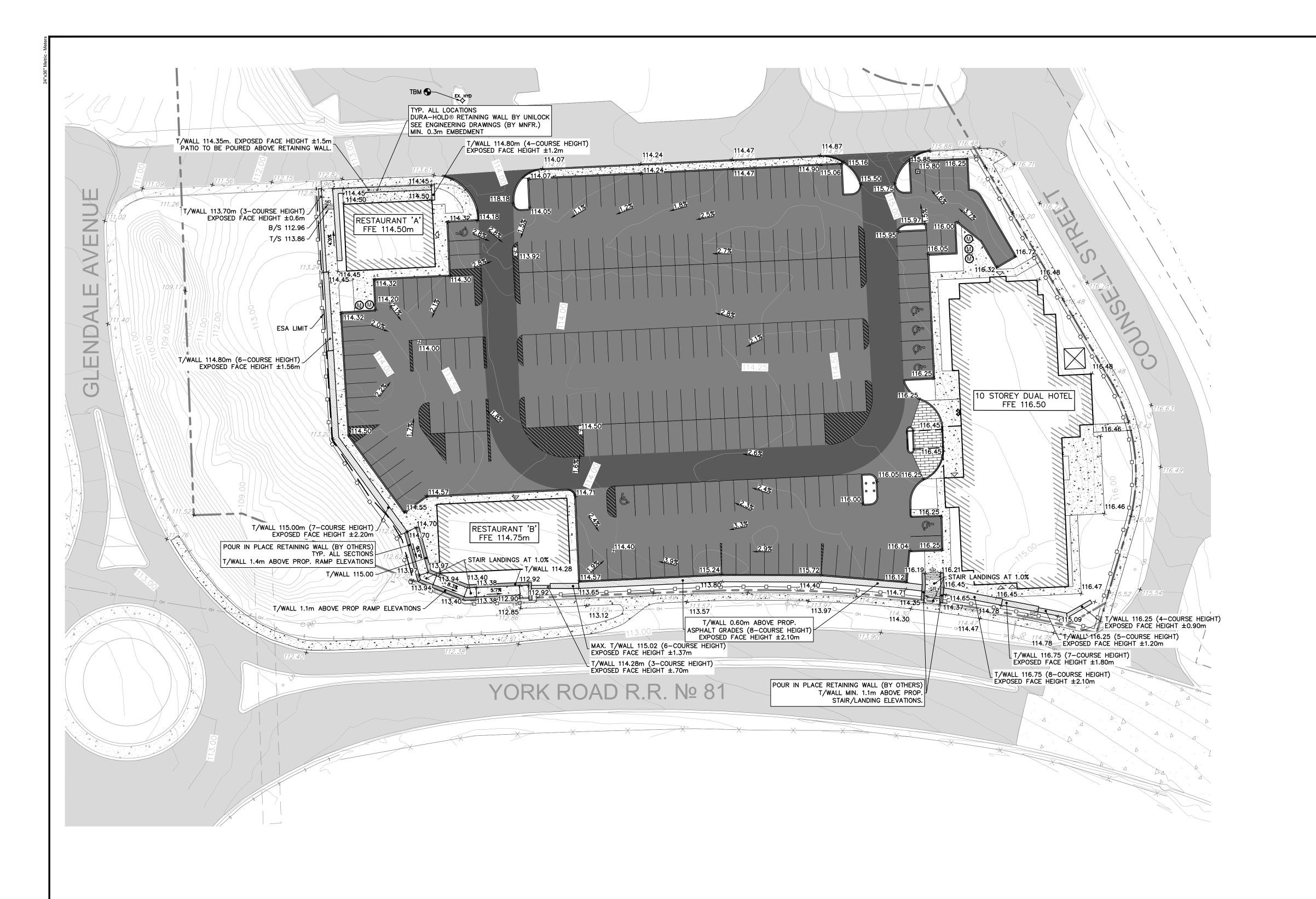
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524 YORK ROAD PHASE 2

524 YORK ROAD, NIAGARA ON THE LAKE

SITE SERVICING

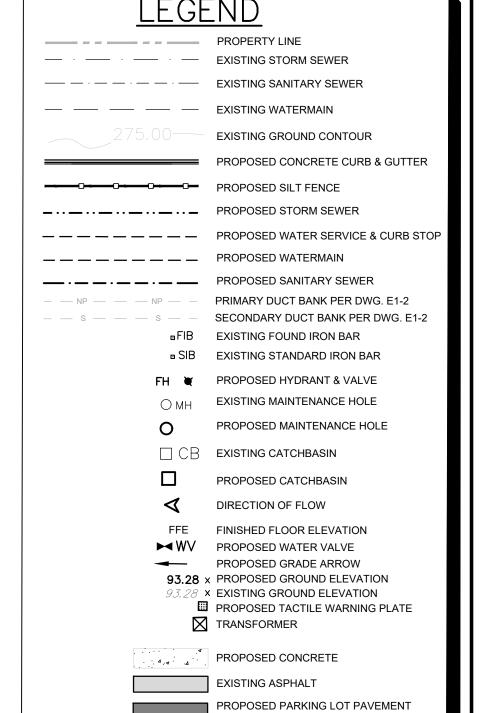
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JM	CJM/JRP						
	date						
1:400 (24x36)	07 Feb 2025						
ımber	issue						
13254	В						
ng number							
SS-2							



TEMPORARY BENCHMARK

TOP OF OPERATING NUT OF FIRE HYDRANT. LOCATED WITHIN CURB ISLAND NEAR ENTRANCE OFF GLENDALE.

(AS SURVEYED 2024) ELEVATION = 114.91 UTM (ZONE 17, NAD83 CSRS 2010 EPOCH) N: 4,780,327.381m E: 649,508.381m



STRUCTURE

STRUCTURE

PROPOSED ROADWAY PAVEMENT

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524 YORK ROAD PHASE 2

524 YORK ROAD, NIAGARA ON THE LAKE

GRADING

designed by
CJM/JRP
date
07 Feb 2025
issue
Α
G-2

plotted by: jmcleod on Feb 07, 2025 - 4:09pm

524 York Road Phase 2

Niagara-on-the-Lake, Ontario

APPENDIX

Site Plan

