FERRO
STRUCTURAL
ENGINEERING

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September 23, 2024 Our File 2478

Raymond Nicolini
InSite Construction Management Inc.
410-3120 Rutherford Road
Concord, ON, L4K 0B2
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Re: 8.5m H. Proposed Retaining Wall Feasibility Review
14 Station Road, Bolton, ON

In respect of the question as to whether an 8.5m H. Retaining Wall is feasible we offer the following comments.

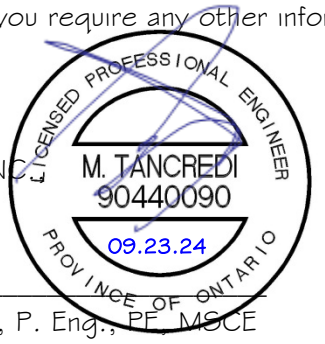
We have reviewed the following drawings by GM BluePlan dated November 2023, Project No. 423091:

a. Site Grading & Servicing Plan, Drawing No. 2 of 5.
b. Retaining Wall Plan, Retaining Wall Section A-A, Drawing No. 5 of 5.

We have completed a Feasibility Review of the proposed 8.5 m H. Retaining Wall. On the basis of our Review, the proposed 8.5 m H. Retaining Wall is indeed feasible, in our opinion. The proposed 8.5 m H. Retaining Wall requires no loss of the quantity of parking spaces currently proposed, and does not require 'tie-backs'. Please see Feasibility Design Report, attached, for preliminary retaining wall design and associated design assumptions.

Please let us know if you require any other information.

Respectfully,
FERROENG GROUP INC.



Per: Mike Tancredi, P. Eng., PE, MSCE

Attach.: Feasibility Design Report

Professional Engineers Ontario

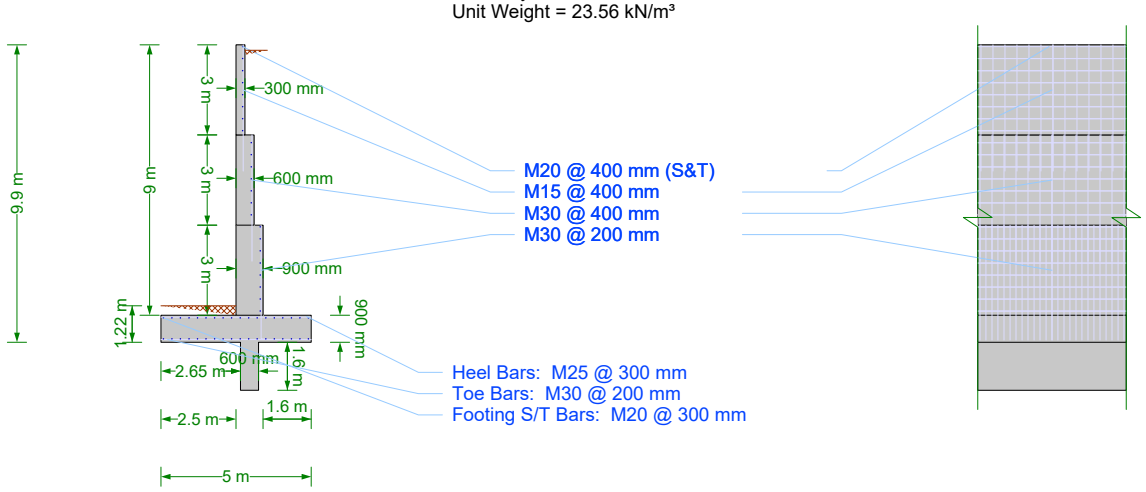
ONTARIO SOCIETY OF PROFESSIONAL ENGINEERS

Mike Tancredi, P. Eng, PE, MSC
FERROENG GROUP INC.

Proposed 8.5 m H. Retaining Wall, 14 Station Rd., Bolton

Design Detail

Concrete f'c = 35 MPa
Rebar Fy = 413.7 MPa
Unit Weight = 23.56 kN/m³



Check Summary

Ratio	Check	Provided	Required	Combination
----- Stability Checks -----				
✓ 0.728	Overturning	2.06	1.50	1.0D + 1.0H
✓ 0.994	Sliding	1.51	1.50	1.0D + 1.0H
✓ 0.853	Bearing Pressure	225 kPa	191.8 kPa	1.0D + 1.0H
✓ 0.804	Bearing Eccentricity	0.67 m	0.83 m	1.0D + 1.0H
----- Toe Checks -----				
✓ 0.869	Shear	372.7 kN/m	323.8 kN/m	1.4D + 1.5H
✓ 0.626	Moment	957.9 kN·m/m	599.9 kN·m/m	1.4D + 1.5H
✓ 0.000	Min Steel	89.31 mm²	0 mm²	1.4D + 1.5H
✓ 0.311	Development	242.4 cm	75.47 cm	1.4D + 1.5H
✓ 0.600	S&T Max Spacing	300 mm	500 mm	1.4D + 1.5H
✓ 0.890	S&T Min Steel	20.22 cm²/m	18 cm²/m	1.4D + 1.5H
----- Heel Checks -----				
✓ 0.942	Shear	380 kN/m	357.8 kN/m	1.4D + 1.5H
✓ 0.741	Moment	386.2 kN·m/m	286.3 kN·m/m	1.4D + 1.5H
✓ 0.000	Min Steel	42.61 mm²	0 mm²	1.4D + 1.5H
✓ 0.250	Development	334.9 cm	83.68 cm	1.4D + 1.5H
✓ 0.600	S&T Max Spacing	300 mm	500 mm	1.4D + 1.5H
✓ 0.890	S&T Min Steel	20.22 cm²/m	18 cm²/m	1.4D + 1.5H
----- Stem Checks -----				
✓ 0.908	Moment	989.3 kN·m/m	898 kN·m/m	1.4D + 1.5H
✓ 0.617	c/d Limit	0.3877	0.6285	1.4D + 1.5H
✓ 0.805	Shear	379.4 kN/m	305.5 kN/m	1.4D + 1.5H
✓ 0.683	Min Steel	17.58 cm²/m	12 cm²/m	1.4D + 1.5H
✓ 0.404	Base Development	82.38 cm	33.29 cm	1.4D + 1.5H
✓ 0.931	Lap Splice Length	120 cm	111.8 cm	1.4D + 1.5H
✓ 0.000	Lap Splice Spacing	0 mm	0 mm	1.4D + 1.5H
✓ 0.791	Horz Min Steel	7.58 cm²/m	6 cm²/m	1.4D + 1.5H
✓ 0.800	Horz Bar Spacing	400 mm	500 mm	1.4D + 1.5H

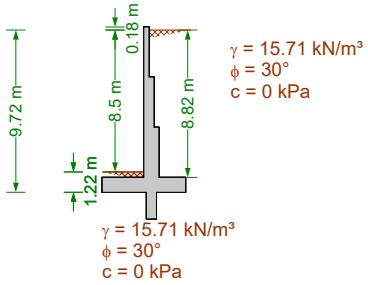
Criteria

Use basic criteria from common proje...	No
Building Code	CSA A23.3-04
Concrete Load Combs	Canadian CBC-05
Masonry Load Combs	ASCE 7-16 (ASD)
Stability Load Combs	IBC Retaining Wall St...
Apply Sds Factor to Seismic Combin...	No
Restrained Against Sliding	No
Neglect Bearing At Heel	Yes
Use Vert. Comp. for OT	No
Use Vert. Comp. for Sliding	No
Use Vert. Comp. for Bearing	Yes
Use Surcharge for Sliding & OT	Yes
Use Surcharge for Bearing	Yes
Neglect Soil Over Toe	No
Neglect Backfill Wt. for Coulomb	No
Factor Soil Weight As Dead	Yes
Use Passive Force for OT	Yes
Assume Pressure To Top	Yes
Extend Backfill Pressure To Key Bott...	No
Use Toe Passive Pressure for Bearing	No
Required F.S. for OT	1.50
Required F.S. for Sliding	1.50
Has Different Safety Factors for Seis...	No
Allowable Bearing Pressure	225 kPa
Req'd Bearing Location	Middle third
Wall Friction Angle	25°
Friction Coefficent	0.35
Soil Reaction Modulus	27146 kN/m³

Loads

Loading Options/Assumptions

➔ Passive pressure neglects top 0 m of soil.



Load Combinations

Canadian CBC-05

1.4D + 1.5H
0.9D + 1.5H
1.25D + 1.5H
1.0D + 1.5H
1.4D
0.9D
1.25D
1.0D