J A B L O N S K Y, A S T A N D P A R T N E R S
Consulting Engineers

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Preliminary Report: Crash Wall Protection at 338 & 338.5 Cumberland Avenue (Mile 55.1.-56.47 Hamilton s/d) City of Hamilton

Prepared For: Mr. Brandon Petter
3 Studebaker Place, Unit 1
Hamilton, ON L8L 0C8

Prepared By: Jablonsky, Ast & Partners
400-3 Concorde Gate
Toronto, Ontario
M3C-3N7

REGISTERED PROFESSIONAL ENGINEER
R. ASMAN
Mar. 1, 2022
PROVINCE OF ONTARIO

Date: March 1, 2022
Job No.:201XX

P.F. Ast, P.ENG D. Tari., P.ENG M. Shiu, P.ENG R. Asman, P.ENG
J.N. Vivian, P.ENG R.J. Watson, P.ENG C.J. Slama, P.ENG R. Martinez, P.ENG

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Scope and Context:

This report has been prepared to establish the various parameters involved when it comes to providing a crash wall to protect a proposed residential building from the detrimental consequences of an accidental derailment of trains traveling immediately adjacent to the property.
The proposed development consists of 3 storey residential town homes to be built off of Cumberland Avenue and sitting just north of the principle heavily traveled CP Rail line corridor. The centerline of the currently most northerly track is approximately 9 M to the south of the proposed crash barrier. The townhome of the development closest to the track is an additional 6 M back from the crash wall or about 15 M from the railway track. The final finished grade elevation at the crash wall will be about +/-100.60 M. CP-Rail will not permit any significant permanent structure on its property. It is our understanding that in lieu of providing an earthen berm, a crash wall is an acceptable alternative.

Crash Abatement Systems:

Based on previously reviewed literature on the subject of crash walls, we can report the following.
Although rare, a train derailment will result in a very massive moving object traveling offline and potentially colliding with a stationary object directly in its path. When these stationary objects are occupied buildings, they must be protected by constructing an earthen berm in front of the building or by constructing an expendable crash wall structure. These structures generally take the form of a reinforced concrete crash wall. The rationale is to provide a replaceable protective barrier that will minimize structural damage to the adjacent building. There are a number of important points associated with the design and construction of crash walls.
.
The construction costs of these walls are invariably high. The consequences of a train derailment are complex and not of an entirely predictable nature. Furthermore, there does not appear to be one single clearly defined approach to design of these protective structures.

We have found that there are presently several approaches regarding the design of these crash barriers among them a full dynamic approach utilizing impact theory whereby the momentum of a moving body at impact is equated to an impulse. This method, although the most realistic, has one major drawback and it is the difficulty in accurately establishing the incremental time span of the impact. A second problem with it is that this type of analysis generally assumes linear elastic behavior which is not strictly correct.
A more standard approach appears to be one which equates the momentum of a

moving body to the work done or energy absorbed in reducing the momentum of that moving body to zero. This is the method we have chosen to employ. We have received guidelines from AECOM Consultants in which information is provided with respect to train mass and direction at impact and to this point as well as estimated velocity. As well recommendations are made with respect to how much energy is absorbed through plastic deformation of the locomotives and rail cars.

Empirical Crash Wall Design:

There are several commonly used crash barrier systems and they come in various configurations. They all appear effective when it comes to providing crash protection to an adjacent building structure. We are rather fortunate that or building is not tight to the crash barrier and so can use the soil behind the barrier to absorb a substantial part of the impact

Wherever and whenever possible the preferred solution to a crash barrier system is to separate the crash wall from the structure to be protected and provide earth backfill behind the crash wall. This earth is a very effective, economical means of absorbing the energy of a moving train.

Wherever and whenever possible it is advisable to avoid connecting the crash barrier back to the structure it is intended to protect. It is best to provide a substantial gap between the crash wall and the adjacent structure, which in our case we are well able to do.

Often the most cost-effective crash barrier system consists of a continuous cantilevered or continuous counter-fort type reinforced concrete wall. These walls demonstrate a superior ability at engaging a substantial length of wall to resist the impact and at re-directing the train impact. As illustrated in Figure 1.
The commonly recommended height of a crash wall is one that is sufficiently high to not have the train roll over it or have parts, for example the roof of the boxcar, travel over it on impact. In the absence more detailed information this height should be, at minimum, at least 6 feet high and preferably at least 6 feet above the point at which the train impacts the crash barrier or about 9 feet. We propose using a wall 7'-0" (2.135 meters) high.

Interestingly, based on recorded experience, it appears to be preferable to construct the crash wall as close as possible to the tracks. This minimizes the amount of potential damage to the wall during impact by corralling the derailed train, however in our case this is not viable.

It is generally acknowledged that when the very low probability, high impact force event occurs the crash barrier will sustain significant damage to the point that it will be rendered unusable as a crash barrier and must be rebuilt.

Train Derailment Impact Criteria:

Aecon has published a guideline which we have incorporated into a spread sheet marked up to reflect the conditions relevant to our site on Cumberland Avenue. This is presented in Appendix A

Analysis of Proposed Crash Wall:

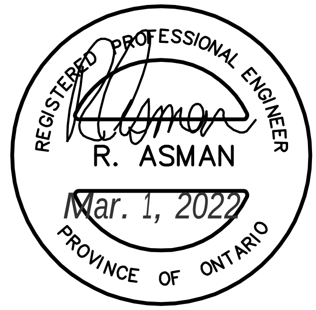
Reference Appendix "A"

This portion of the report deals with numerous conditions and a methodology associated with the determination of the appropriate equivalent static derailed train impact forces. Our approach has been to use Method 2, an energy balance approach. We have determined that the governing load condition involves an accordion type of rotational single passenger blow impact. Case 2 can be eliminated by virtue of the distance from the centerline of the nearest track to the crash wall being at the minimum about 8.7 meters. Load case 1 can be eliminated because the track speed of the freight train is 50mph and once it has derailed it will come to rest before hitting the wall.
The recommended impact angle is given as 3.5 degrees. This method of determining the impact force takes into consideration the braking effect the soil has on the speed of the derailed train as it burrows into the soil. It also accounts for the increase in the train speed should it move down significant embankment which is not our case.
In our analysis, equation (3) Passenger Train glancing blow results in an impact velocity of 26.7 m/s resulting in an estimated impact load of load of 1,846 KN. This load is significantly less than the load from an accordion type of impact which is 3,135 KN.

Preliminary Conclusions:

The crash wall has been will designed for an impact of 3,315 KN applied at a height of 1.8 meters above the base of the wall and with the wall absorbing the equivalent of 200 mm of deformation in the direction of the impact.

Report Prepared By: Robert Asman P.Eng.



Appendix A

Edited "Submission Guidelines for Crash Walls" July 2014 -AECOM

TRAIN SPEED RECOMMENDATIONS -CP RAIL

REGISTERED PROFESSIONAL ENGINEER
R. ASMAN
Mar. 1, 2022
PROVINCE OF ONTARIO

Submission Guidelines for Crash Walls

Jablonsky, Ast and Partners comments have been shown in blue.

Crash walls may be required for the protection of overhead structures, and in some cases the Railway may consider a crash wall as an alternative to an earthen berm for the protection of structures or facilities adjacent to the track. When proposing or designing such a structure, the following components should be in the submission. Where there is a discrepancy between the requirements here and those provided by the client Railway or AREMA, the more stringent shall govern.

1. Covering Letter

- Summary of items enclosed,
  Jablonsky, Ast and Partners will such a covering letter.
- Location and date of previous, approved, similar designs by this designer, if any,
  Jablonsky, Ast and Partners will such a covering letter
- Where the crash wall is proposed as an alternative to an earthen berm: alternative materials / configurations considered and benefits of this design,
  This has been covered in the report prepared by Jablonsky, Ast and Partners.
- A Location or Key Plan. This will be used to identify the mileage and subdivision, the classification of the rail line, and the maximum speed for freight and passenger rail traffic, all obtained from AECOM Canada for CP and CN-owned corridors or from GO Transit for GO-owned corridors.
  The location can be inferred from the site plan in Appendix "B" of this report.
- Name, phone, fax and e-mail address of your contact.

2. Geotechnical Report - (2 copies)

- Soil properties used in design, and how determined,
  This will be provided by Lanterra, developer and builder.
- Borehole logs including location plan, if required to support these properties,
  This will be illustrated in the geo-technical report to be prepared for Lanterra
- Narrative report describing soil and ground water conditions, if required as above.
  This will be part of the geo-technical report to be prepared for Lanterra

3. Design of Crash Walls

- One of the following methods may be chosen, or an alternative design load may be selected and if it can be justified by the engineer responsible for the design. The simplified approach of Method 1 may be used in most cases. Method 2 may be used to optimize the design, or where factors such as distance from the track to the wall, track speeds, side slopes along the track, consequences of collision or others may justify a different load.

- **Method 1**: The wall may be designed for a minimum point load of 600 kip (2700 kN) applied horizontally and normal to the face at any point along the wall
  - The point load shall be applied at a height of 6 feet (1.8 m) *above the top of rail* for walls up to 25 feet (7.6 m) from the centerline of track, or a height of 6 feet (1.8 m) *above the groundline* for walls farther than 25 feet (7.6 m) from the centerline of track.

REGISTERED PROFESSIONAL ENGINEER
R. ASMAN
Mar. 1, 2022
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- This method may be applied where track speeds do not exceed 50 mph (80 km/hr) for freight or 70 mph (112 km/hr) for passenger trains; where speeds exceed these limits, Method 2 shall be used.

- **Method 2**: an energy balance approach considering collision by glancing blow and single car rotation may be used to determine the design load. The following four cases must be considered:

It is our intention to use this approach.

- Freight Train Load Case 1 - Glancing Blow: nine cars weighing 143 tons (129 700 kg) each, impacting the wall at an angle, θ_G. The angle of impact will be a function of track curvature, and for tangent track may be taken as 3.5 degrees.
  This load case is investigated.
- Freight Train Load Case 2 - Single Car Impact: single car weighing 143 tons (129 700 kg) impacting the wall as it undergoes rotation about its center. The angle of rotation at impact is:

$$\theta_f = \operatorname{asin}\left(\frac{d_{CL}}{8.5}\right) \quad [1]$$

= arcsin(8.7/8.5) = n/a radians (n/a°)

where d_{CL} is the distance from the crash wall to the centerline of track in m. The closest existing or future track is to be used. Where d_{CL} is greater than 8.5 m, this load case need not be considered.

Since the distance to the track centreline is 8.7 meters this load case is not considered.

- Passenger Train Load Case 3 - Glancing Blow: eight cars weighing 74 tons (67120 kg) each impacting the wall at an angle, θ_G. The angle of impact will be a function of track curvature, and for tangent track may be taken as 3.5 degrees.
  This load case is investigated.
- Passenger Train Load Case 4 - Single Car Impact: single car weighing 74 tons (67120 kg) impacting the wall as it undergoes rotation about its center. The angle of rotation at impact is:

$$\theta_f = asin\left(\frac{d_{CL}}{13}\right) \quad [2]$$

= arcsin(8.7/13) = 0.733 radians (42.0°)

Where d_{CL} is greater than 13 m, this load case need not be considered.

Since the distance to the track centreline is 8.7 meters this load case must be considered.

- The analysis should reflect the specified track speeds for passenger and/or freight trains applicable within the subject corridor.

- To assist in designing the structure for the above load cases, use:

  - For the glancing blow load cases, the speed of derailed equipment impacting the wall is reduced from the track speed, v_o, to

$$v_G = \sqrt{v_o^2 + 2a\left(\frac{d_{CL}-1.625}{\sin\theta_G}\right)} \text{ [m/s]} \quad [3]$$

$$V_G = \sqrt{V_o^2 + 2 \times (-2.45) \times \left(\frac{8.7 - 1.625}{0.061}\right)} =$$

This equation indicates that by the time the train has traveled the distance from the track center line to the face of the crash wall the train speed has been reduced somewhat.

Where d_{CL} is the distance from the crash wall to the centerline of track in m.

v_o is the track speed in m/s

V_o = 50 mph =22.35 m/sec *Freight Train*

$V_G = \sqrt{V_o^2 - 568}$ = 0.0 m/s

θ_G is the angle of impact

$\theta g = 3.5^0$ $\sin(\theta g) = 0.061$

V_o = 80 mph = 35.76 m/sec *Passenger Train*

$V_G = \sqrt{V_o^2 - 568}$ = 26.7 m/s

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Mar. 1, 2022
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a is the acceleration in m/s, calculated as $-9.8(.25 + G)$ = *-9.8(.25 + (-.0)) = -2.45 m/s*

G is the grade in decimal unit of the groundline in the direction of travel defined by the angle of impact relative to the centerline of track; calculated as $\frac{Groundline\ at\ wall - Base\ of\ Rail}{d_{CL}/\sin\theta_G}$. *G =* $\frac{100.60 - 100.60}{(8.7/0.061)}$ = *0*

- For the single car load cases, the speed of derailed equipment impacting the wall is

$$v_A = \frac{2.3\theta_f}{\sqrt{1-\cos\theta_f}}\left[\frac{m}{s}\right] for\ freight\ cars \quad v_A = \text{n/a} \tag{4}$$

$$v_A = \frac{2.9\theta_f}{\sqrt{1-\cos\theta_f}}\left[\frac{m}{s}\right] for\ passenger\ cars \quad v_A = \frac{2.9 \times 0.733}{\sqrt{1-\cos(0.733)}} = 8.28\ \text{m/s} \tag{5}$$

Where θ_f is the angle of impact, in radians, defined in [1] and [2].

- For energy dissipation, assume:
  - Contact with the wall stops all movement in the direction perpendicular to the wall, but not along its length
  - Plastic deformation of individual car due to direct impact is 1 foot (.3048 m) maximum,
  - Total compression of linkages and equipment of the 8 or 9 car consist is 10 feet (3.048 m) maximum,
  - Deflection of wall is considered negligible in equations [6] to [9]. Where the designer wishes to include it, those equations may be modified.
  - In lieu of more rigorous analysis, these energy balance equations may be used to determine the design load perpendicular to the wall. The design load acts along the given length of wall.
    - For the glancing blow load cases

$$F_G = \frac{\frac{1}{2}m(v_G \sin\theta_G)^2}{d_G + d_{Plast}} \tag{6}$$

$F_A = \frac{\frac{1}{2} \times 9 \times 129{,}700KG \times (0.0 \times 0.061)^2}{0.186 + 0.2}$ =0 KN -- ***Freight Does not Govern***

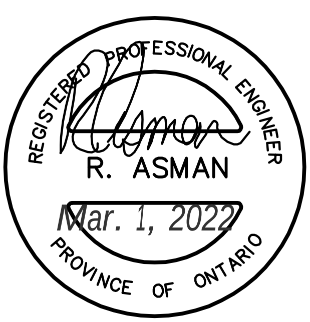
$F_A = \frac{\frac{1}{2} \times 8 \times 67{,}120KG \times (26.7 \times 0.061)^2}{0.186 + 0.2}$ = 1,845 KN - ***Passenger***

NOTE:This approach will require the wall to be capable of absorbing the equivalent of 200 MM of deflection

And the load is considered to act along the length l_G in m:

$\theta g = 3.5^0$ $\cos(\theta g) = 0.998$

$$l_G = \frac{3.048}{\cos\theta_G} \quad l_G = \frac{3.048}{0.998} = 3.054M \tag{7}$$



Where m is the mass of the derailed cars in kg.

v_G is the impact speed in m/s, defined in [3]

θ_G is the angle of impact

NOTE: Since the train speeds exceed 80 mph for passenger trains it is not an option to use the prescribed impact force of 2700 KN for the design of the crash wall.

d_G is the deformation of the consist in the direction of the applied force, and $d_G = 3.048 \sin\theta_G$, in m d_G = 3.048 sin(3.5°) = 0.186

- For the single car impact

  F_A = n/a

  $$F_A = \frac{\frac{1}{2}m(v_A\cos\theta_f)^2}{d_A} \qquad [8]$$

  $F_A = \frac{\frac{1}{2} \times 67{,}120\text{KG} \times (8.28 \times \cos(0.733))^2}{0.3048 \times \cos(0.733)+0.2}$ = 3,135 KN

  Anticipated wall plastic movement and deflection

  Single car Passenger Train Governs with impact load of 3,135KN

  And the load is considered to act along the length l_A in m:

  $$l_A = \frac{.3048}{\sin\theta_f} \qquad [9]$$

  $= \frac{0.3048}{0.669}$ = 0.456 m

  Where m is the mass of the derailed cars in kg.

  v_A is the impact speed in m/s, defined in [4] or [5]

  θ_f is the angle of rotation at impact defined in [1] or [2]

  d_A is the deformation of the consist in the direction of the applied force, and $d_A = .3048\cos\theta_f$, in m d_A = n/a (Freight)
  d_A = 0.3048 cos(0.733) = 0.227 (Passenger)

  Where the influence areas of two sequential cars in an accordion style of derailment overlap, the wall must be designed for the simultaneous impact of both cars.

- Regardless of the method selected, the following guidelines must be followed:

  - The minimum thickness for walls up to 25 feet (7.6 m) from the centerline of track shall be 2'-6" (.760 m); minimum thickness for walls farther than 25 feet (7.6 m) from the centerline of track shall be 18 inches (.45 m).

    The proposed crash wall is to be 450 mm thick.

  - Crash walls less than 12 feet (3.6 m) from the centerline of track shall be a minimum of 12 feet (3.6 m) above the top of rail. Crash walls between 12 feet (3.6 m) and 25 feet (7.6 m) from the centerline of track shall be a minimum of 7 feet (2.135 m) *above the top of rail* . Crash walls greater than 25 feet (7.6 m) from the centerline of track shall be a minimum of 7 feet (2135 m) ***above the adjacent groundline.***

    The proposed crash wall needs to be a minimum of 2.135 meters above top of rail.

  - The face of the crash wall shall be smooth and continuous, and shall extend a minimum of 6 inches (0.15 m) beyond the face of the structure (such as a building column or bridge pier) parallel to the track.

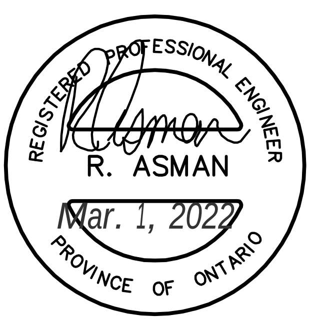
    The proposed crash wall is intended to be smooth and continuous.

  - The design must incorporate horizontal and vertical continuity to distribute the loads from the derailed train.

    The proposed crash wall reinforcing will provide horizontal and vertical continuity.

  - The wall must be of solid, heavy construction, and separate precast blocks or stones will not be permitted.

    The proposed crash wall be of reinforced concrete construction.



4. Drawings - (2 hard copies as well as .pdf format)

- Site plan clearly showing property line, location of wall structure, centerline and elevation of nearest rail track,
  This is illustrated in sketches SK-1 and SK-2.
- Layout and structural details of proposed structure, including all material notes and specs and construction procedures/phasing. All drawings signed and sealed by a professional engineer registered in the province having jurisdiction at the project location.
  This is illustrated in sketch SK-2.
- Extent and treatment of any temporary excavations on railway property.
  For this project there will not be any shoring on railway property.

5. Cheque

- A cheque payable to AECOM will be required for the cost of this review. Please contact AECOM for current pricing. Cost will take into consideration number of submissions, site visits, meetings, and alternative or unusually complex designs.
  This the scope of the developer and builder.

6. Post-Construction Certificate - (1 copy)

- Engineer's certificate of completion describing actual construction, and certifying that the structure was built as per approved drawings,
  Jablonsky, Ast and Partners will provide such a document.
- Copy of as-built drawings, as part of the engineer's certification of completion.
  Jablonsky, Ast and Partners will include such a document.

Access to Railway Operating Rights-of-Way

Permits **MUST** be obtained before entering into any Railway Operating right-of-way.

Some or all of the following may also be required: - proper railway flagging protection, cable locates, liability insurance, release of liability, safety training.

AECOM Canada Ltd. will provide guidance as to the proper process to be followed in this regard. Fees will be established based on the nature and extent of the work being proposed.

Communication for Submissions

All correspondence during the review process should be directed to AECOM Canada Ltd.

Upon completion of our review, a confidential report on our findings will be made to the railway company, who will subsequently contact the applicant.

The applicant will be notified when the report has been submitted to the railway.

Liability and Responsibility

The review will be undertaken with the understanding that neither the railway nor AECOM Canada Ltd. shall have any responsibility nor liability whatsoever for the design or adequacy of the crash wall, notwithstanding that any plans or specifications may have been reviewed by the railway nor AECOM Canada Ltd. No such review shall be deemed to limit the applicant's full responsibility for the design and construction adequacy of the works.

AECOM Canada Ltd.

Mississauga, Ont.

July 2005 Revised July 29, 2014

Robert Asman

From: Brandon Petter <bpetter@urbansolutions.info>
Sent: June 25, 2021 9:43 AM
To: Robert Asman
Cc: Matt Johnston
Subject: RE: FC-21-016 - 338 & 338.5 Cumberland Ave., Hamilton

Sounds great Robert, thanks for the update!

Enjoy your weekend,

Brandon Petter, BA (Hons), MPlan
Planner

T (905) 546-1087 | **C** (905) 546-6682
3 Studebaker Place, Unit 1, Hamilton, ON L8L 0C8

From: Robert Asman <rasman@astint.on.ca>
Sent: June 25, 2021 9:41 AM
To: Brandon Petter <bpetter@urbansolutions.info>
Cc: Matt Johnston <mjohnston@urbansolutions.info>
Subject: RE: FC-21-016 - 338 & 338.5 Cumberland Ave., Hamilton

Good morning Brandon, yes we can provide a fee proposal for this work. We can send it to you by Monday.

Robert Asman
Partner

JABLONSKY, AST AND PARTNERS
Consulting Engineers

3 Concorde Gate, 4th Floor
Toronto, ON M3C 3N7
rasman@astint.on.ca
416-447-7405 x 115

From: Brandon Petter <bpetter@urbansolutions.info>
Sent: June 25, 2021 8:58 AM
To: Robert Asman <rasman@astint.on.ca>
Cc: Matt Johnston <mjohnston@urbansolutions.info>
Subject: RE: FC-21-016 - 338 & 338.5 Cumberland Ave., Hamilton

Morning Robert,

Just following up on the email below. Let me know if you are still able to provide a proposal for the work noted below.

Thanks,

Brandon Petter, BA (Hons), MPlan
Planner

T (905) 546-1087 | **C** (905) 546-6682
3 Studebaker Place, Unit 1, Hamilton, ON L8L 0C8

From: Brandon Petter
Sent: June 15, 2021 1:54 PM
To: Robert Asman <rasman@astint.on.ca>
Cc: Matt Johnston <mjohnston@urbansolutions.info>
Subject: RE: FC-21-016 - 338 & 338.5 Cumberland Ave., Hamilton

Good Afternoon Robert,

After receiving further correspondence with CP it appears that were are to go following the understanding that the Crash Wall Report needs to be designed in relation to a Principal Main Line which has high speeds frequently exceeding 80 km/h (Appendix B below). Since that is the case, would you be able to put together a proposal with these requirements in mind?

Feel free to give me a call if you wish to discuss the proposal further.

The following table is a general sample classification of rail line types. Proponents are advised to consult with the relevant railway to obtain information on the classification, traffic volume, and traffic speed, of the railway lines in proximity to any proposed development. Contact information for railways is available from the Proximity Project's website (see **APPENDIX G**).

SAMPLE RAIL CLASSIFICATION SYSTEM* (*TO BE CONFIRMED BY RELEVANT RAILWAY)

Main Line *(typically separated into "Principal" and "Secondary" Main Line)*	• Volume generally exceeds 5 trains per day • High speeds, frequently exceeding 80 km/h • Crossings, gradients, etc. may increase normal railway noise and vibration
Branch Line	• Volume generally has less than 5 trains per day • Slower speeds usually limited to 50 km/h • Trains of light to moderate weight
Spur Line	• Unscheduled traffic on demand basis only • Slower speeds limited to 24 km/h • Short trains of light weight

Thanks,

Brandon Petter, BA (Hons), MPlan
Planner

T (905) 546-1087 | **C** (905) 546-6682
3 Studebaker Place, Unit 1, Hamilton, ON L8L 0C8

From: Brandon Petter
Sent: May 18, 2021 2:15 PM
To: Robert Asman <rasman@astint.on.ca>
Cc: Matt Johnston <mjohnston@urbansolutions.info>
Subject: RE: FC-21-016 - 338 & 338.5 Cumberland Ave., Hamilton

Afternoon Robert,

I have reached out to them regarding your email below. I will advise once I get a response.

Thanks,

Brandon Petter, BA (Hons), MPlan
Planner

T (905) 546-1087 | **C** (905) 546-6682
3 Studebaker Place, Unit 1, Hamilton, ON L8L 0C8

From: Robert Asman <rasman@astint.on.ca>
Sent: May 17, 2021 3:56 PM
To: Brandon Petter <bpetter@urbansolutions.info>
Cc: Matt Johnston <mjohnston@urbansolutions.info>
Subject: RE: FC-21-016 - 338 & 338.5 Cumberland Ave., Hamilton

Hi Brandon, so they would like us to design for freight trains travelling at 50 mph. Can you please confirm that this will meet their requirements?

Robert Asman
Partner

JABLONSKY, AST AND PARTNERS
Consulting Engineers

3 Concorde Gate, 4th Floor
Toronto, ON M3C 3N7
rasman@astint.on.ca
416-447-7405 x 115

From: Brandon Petter <bpetter@urbansolutions.info>
Sent: May 17, 2021 2:35 PM
To: Robert Asman <rasman@astint.on.ca>

Cc: Matt Johnston <mjohnston@urbansolutions.info>
Subject: FW: FC-21-016 - 338 & 338.5 Cumberland Ave., Hamilton

Afternoon Robert,

Looks like I spoke to soon! Please see the email below regarding the train speeds.

Thanks,

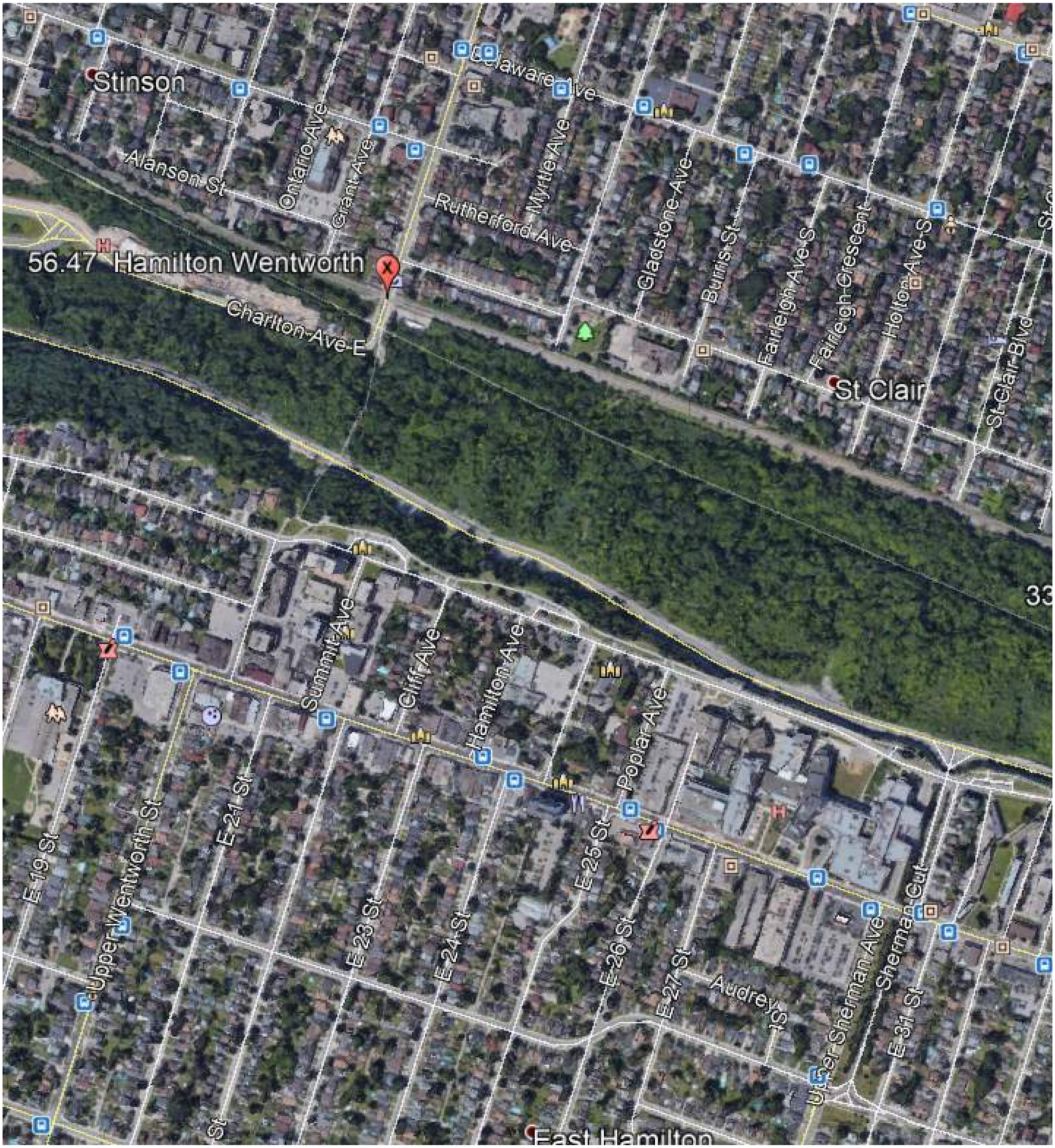
Brandon Petter, BA (Hons), MPlan
Planner

T (905) 546-1087 | **C** (905) 546-6682
3 Studebaker Place, Unit 1, Hamilton, ON L8L 0C8

From: CP Proximity-Ontario <CP_Proximity-Ontario@cpr.ca>
Sent: May 17, 2021 2:32 PM
To: Brandon Petter <bpetter@urbansolutions.info>
Cc: Kehler, Mark <Mark.Kehler@hamilton.ca>; Matt Johnston <mjohnston@urbansolutions.info>
Subject: RE: FC-21-016 - 338 & 338.5 Cumberland Ave., Hamilton

Hi Brandon,

My apologies for the delayed follow-up on this. I have found out that the maximum train speed between mile posts 55.1 – 56.47 on the Hamilton sub is 20 MPH, even though it is classified as principal main line track. I would use the maximum speed in the Proximity Guide based on track classification (principal main line) as current track speed could increase in future if rail operations determine a need for it.


Stinson
Delaware Ave
Alanson St
Ontario Ave
Grant Ave
Rutherford Ave
Myrtle Ave
Gladstone Ave
Burris St
Fairleigh Ave S
Fairleigh Crescent
Holton Ave S
St Clair Blvd
56.47 Hamilton Wentworth
Charlton Ave E
St Clair
Summit Ave
Cliff Ave
Hamilton Ave
Poplar Ave
E 19 St
Upper Wentworth St
E 21 St
E 23 St
E 24 St
E 25 St
E 26 St
E 27 St
Audrey St
Upper Sherman Ave
Sherman Cut
E 31 St
East Hamilton

Thank you,

Crystal Watts
Analyst Real Estate
7550 Ogden Dale Road SE, Building 1
Calgary AB T2C 4X9

From: Brandon Petter <bpetter@urbansolutions.info>
Sent: May 3, 2021 2:54 PM
To: CP Proximity-Ontario <CP_Proximity-Ontario@cpr.ca>
Cc: Kehler, Mark <Mark.Kehler@hamilton.ca>; Matt Johnston <mjohnston@urbansolutions.info>
Subject: RE: FC-21-016 - 338 & 338.5 Cumberland Ave., Hamilton

This email did not originate from Canadian Pacific. Please exercise caution with any links or attachments.

Good Afternoon Crystal,

Thank you for the quick response, its much appreciated. My only concern is that, generally, we need to submit a residential crash wall report to AECOM as part of the Zoning By-law/Site Plan Approval process and they will require us to provide them with a letter (or memo) from the CP in which the governing train speeds are indicated.

Is there any way in which we could get the train speeds with that in mind? Would there be any other process to formally request that information? Appendix B of the Proximity Issues document provides sample rail classification and provides various speeds depending on the type of line. Can you confirm that the Rail line is a Main line (principal or secondary), Branch line, or spur line? If we can get confirmation then at least we can have some speeds to work our report off of.

Thank you again for your time.

Talk soon,

Brandon Petter, BA (Hons), MPlan
Planner

T (905) 546-1087 | **C** (905) 546-6682
3 Studebaker Place, Unit 1, Hamilton, ON L8L 0C8

From: CP Proximity-Ontario <CP_Proximity-Ontario@cpr.ca>
Sent: May 3, 2021 11:05 AM
To: Brandon Petter <bpetter@urbansolutions.info>
Cc: Kehler, Mark <Mark.Kehler@hamilton.ca>; Matt Johnston <mjohnston@urbansolutions.info>
Subject: RE: FC-21-016 - 338 & 338.5 Cumberland Ave., Hamilton

Good Morning Brandon,

Thank you for reaching out to CP Real Estate with regards to the development proposal at 338 & 338.5 Cumberland Avenue, in proximity to CP's Hamilton subdivision & yard. Please note that our CP Real Estate Team has changed its position regarding the sharing of its proprietary & confidential information and will no longer be providing rail data or yard specs to third parties. Further, rail traffic data is merely a snapshot in time, and traffic volumes are subject to fluctuation as a function of market demand. CP has at times provided traffic data to developers and consultants in the past. Unfortunately, CP found this practice was inconsistent, and in some cases, developers were using the data to justify the avoidance of important noise and vibration mitigation measures. We appreciate that this is a change to what was previously provided by our group. Across our network, CP freight trains operate 24/7 and schedules/volumes are subject to change.

Information that I am able to share would be that current operations at this yard include regular freight trains travelling through the yard, 24 hours a day, 7 days a week. In addition, there are servicing tracks at this location and trains would be moving in and out of the area. This location also handles regular yard operations including (but not limited to) switching and shunting of trains, material storage, and material delivery. With these operations, engines are constantly idling and the operations are continuous, loud and cause a lot of vibration. Rail traffic volume on any part of our North American network is a function of market demand. Traffic volumes fluctuate regularly as market demand for goods and commodities shifts or as export patterns change and does not have a set schedule. Any development near railway infrastructure should assume the potential for frequent train activity at any time of the day or night, on any day of the year. There is also the possibility of increasing our operations in future, including adding or moving track or any other railway related use.

CP's approach to development in the vicinity of rail operations is encapsulated by the recommended guidelines developed through collaboration between the Railway Association of Canada and the Federation of Canadian Municipalities. Those guidelines are available online at: http://www.proximityissues.ca/. The safety and welfare of residents can be adversely affected by rail operations and CP is not in favour of residential uses that are not compatible with rail operations.

Should the captioned development proposal receive approval, CP respectfully requests that the recommended guidelines be followed.

Thank you,

Crystal Watts
Analyst Real Estate
7550 Ogden Dale Road SE, Building 1
Calgary AB T2C 4X9

From: Brandon Petter <bpetter@urbansolutions.info>
Sent: May 3, 2021 7:00 AM
To: CP Proximity-Ontario <CP_Proximity-Ontario@cpr.ca>
Cc: Kehler, Mark <Mark.Kehler@hamilton.ca>; Matt Johnston <mjohnston@urbansolutions.info>
Subject: FC-21-016 - 338 & 338.5 Cumberland Ave., Hamilton

Good Morning,

I hope you are well. I contacting you in regards to the attached comments that were provided on February 23, 2021 for FC-21-016 – 338 & 338.5 Cumberland Ave., Hamilton, Ontario which is attached. In working towards a Zoning By-law Amendment submission to the City of Hamilton I was hoping you could provide the following information regarding the rail line which is in proximity to our site.

- Train Speeds
  - Commercial and Passenger
  - Are the trains coming to a complete stop prior to the subject lands?
- Operations of switching and shunting of trains
  - What material is being stored and delivered?
- Frequency of trains/activity
  - I understand you stated freight trains regularly travel through the yard, 24 hours a day, 7 days a week but is there a schedule set for these trains?
- Any other useful information in regards to the rail line and operations within proximity to the site

Thank you in advance for you time, if you wish to discuss the project or subject lands further please do not hesitate to reach out to myself or Matt Johnston (copied).

Talk soon,

Brandon Petter, BA (Hons), MPlan
Planner

URBAN SOLUTIONS
PLANNING & LAND DEVELOPMENT

T (905) 546-1087 | **C** (905) 546-6682

3 Studebaker Place, Unit 1, Hamilton, ON L8L 0C8

------------------------------ IMPORTANT NOTICE - AVIS IMPORTANT ------------------------------ Computer viruses can be transmitted via email. Recipient should check this email and any attachments for the presence of viruses. Sender and sender company accept no liability for any damage caused by any virus transmitted by this email. This email transmission and any accompanying attachments contain confidential information intended only for the use of the individual or entity named above. Any dissemination, distribution, copying or action taken in reliance on the contents of this email by anyone other than the intended recipient is strictly prohibited. If you have received this email in error please immediately delete it and notify sender at the above email address. Le courrier electronique peut etre porteur de virus informatiques. Le destinataire doit donc passer le present courriel et les pieces qui y sont jointes au detecteur de

Appendix B

(Plans)

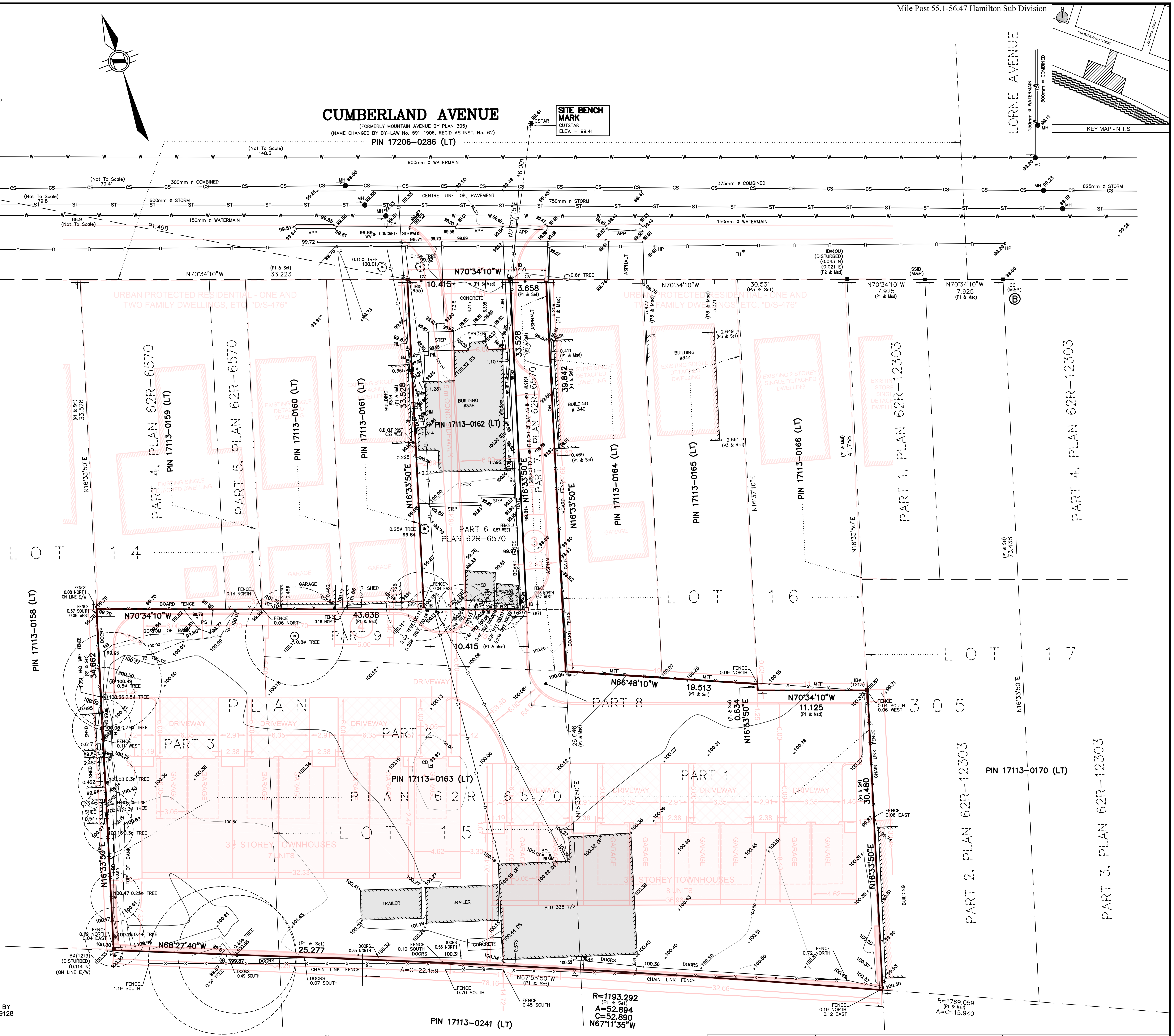
Crash Wall Layout and Extent:

Mile Post 55.1-56.47 Hamilton Sub Division

TOPOGRAPHIC SURVEY
OF PART OF
LOTS 14, 15 & 16
REGISTERED PLAN 305
IN THE
CITY OF HAMILTON

SCALE 1:200 METRIC

S.D. McLAREN, O.L.S. – 2021



LEGEND:

□	DENOTES	MONUMENT SET
■	"	MONUMENT FOUND
IB	"	IRON BAR
IBø	"	ROUND IRON BAR
PB	"	PLASTIC BAR
CC	"	CUT CROSS
SIB	"	STANDARD IRON BAR
SSIB	"	SHORT STANDARD IRON BAR
655	"	J.T. PETERS, O.L.S.
824	"	A.T. McLAREN, O.L.S.
1213	"	J.D. PETERS, O.L.S.
M&P	"	MACKAY MACKAY &B PETERS
OU	"	ORIGIN UNKNOWN
WIT	"	WITNESS
Msd	"	MEASURED
P1	"	PLAN 62R-6570
P2	"	PLAN 62R-12303
P3	"	PLAN BY A.T. McLAREN, O.L.S. DATED AUGUST 15, 1984, FILE 20106
PWF	"	POST & WIRE FENCE
CLF	"	CHAIN LINK FENCE
BF	"	BOARD FENCE
MTF	"	METAL FENCE
HM	"	HYDRO METER
GM	"	GAS METER
AC	"	AIR CONDITIONER
BOL	"	BOLLARD
PIL	"	PILLAR
DS	"	DOOR SILL
GF	"	GARAGE FLOOR
GV	"	GAS VALVE
MH	"	MANHOLE
CB	"	CATCH BASIN
FH	"	FIRE HYDRANT
PS	"	PATIO STONE
HP	"	HYDRO POLE
U	"	OVERHEAD UTILITIES
OH	"	OVERHANG
ø	"	DIAMETER
//	"	NOT TO SCALE

BENCHMARK:

MONUMENT 0011963U3498

ADELAIDE HOODLESS SCHOOL ON THE NORTHWEST CORNER OF MAPLEWOOD AVENUE AND SPRINGER AVENUE, ONE BLOCK SOUTH OF MAIN STREET (HIGHWAY NO. 8), 2.9 KM EAST OF THE POST OFFICE, TABLET IN THE SOUTH CONCRETE FOUNDATION WALL OF THE MOST SOUTHEASTERLY OR NEWEST PORTION OF SCHOOL, 1.21 M WEST OF THE SOUTHEAST CORNER AND 12 CM BELOW RED BRICK SIDING.

ELEVATION: 94.135 metres CGVD–1928:1978

NOTE:

UNDERGROUND SERVICE AND UTILITY LOCATIONS WERE LOCATED BY CITY OF HAMILTON DRAWING No. Z–3 WW (SHEET 19 OF 23)

UNDERGROUND SERVICE AND UTILITY LOCATIONS MUST BE VERIFIED PRIOR TO CONSTRUCTION

INVERTS MUST BE VERIFIED PRIOR TO CONSTRUCTION

BEARING NOTE:

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0)

NOTE:

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999699128

INTEGRATION DATA

OBSERVED REFERENCE POINTS (ORP's): UTM ZONE 17, NAD83 (CSRS) (2010.0). COORDINATES TO URBAN ACCURACY PER SEC. 14(2) OF O.REG. 216/10

POINT ID	NORTHING	EASTING
ORP Ⓐ	4788441.845	594267.386
ORP Ⓑ	4788375.328	594403.250

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

METRIC NOTE:

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

SURVEYOR'S CERTIFICATE:

I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM
2. THE SURVEY WAS COMPLETED ON THE 28th DAY OF JULY, 2021

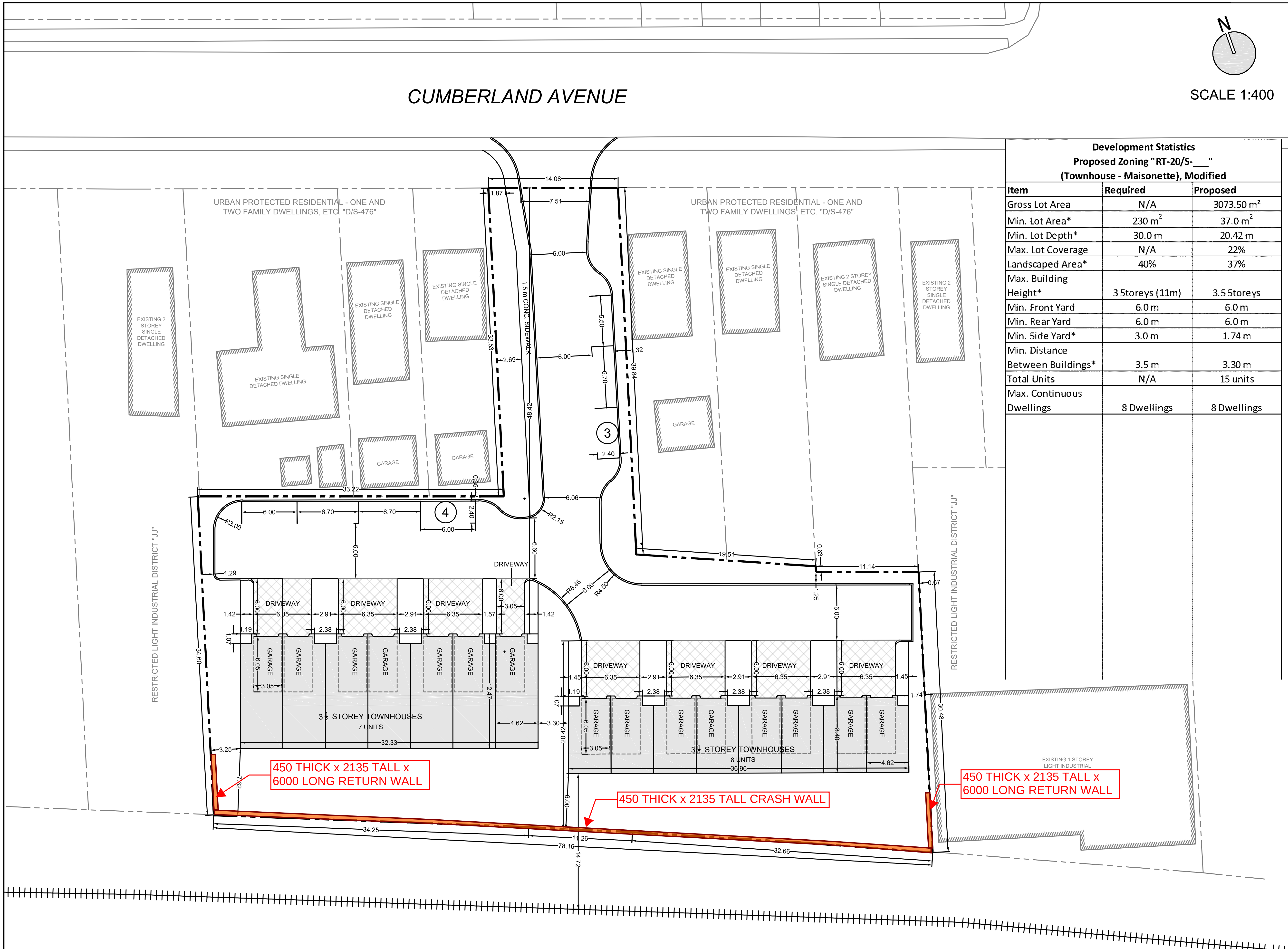
AUGUST 12, 2021
DATE

S. DAN McLAREN, O.L.S.

A.T. McLaren Limited
LEGAL AND ENGINEERING SURVEYS
69 JOHN STREET SOUTH, SUITE 230
HAMILTON, ONTARIO, L8N 2B9
PHONE (905) 527-8559 FAX (905) 527-0032

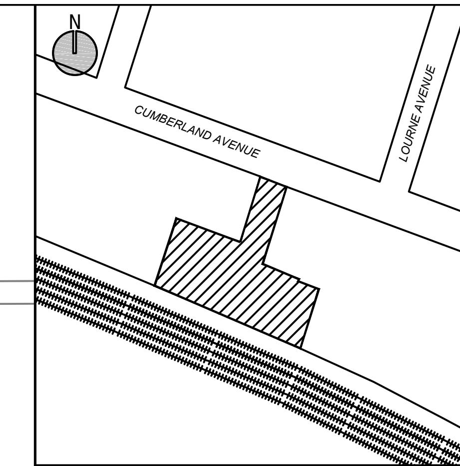
Drawn	Checked	Crew Chief	Scale	Dwg.No. 36744
JB	RBM	SM	1:200	

Mile Post 55.1-56.47 Hamilton Sub Division



Development Statistics
Proposed Zoning "RT-20/S-___"
(Townhouse - Maisonette), Modified

Item	Required	Proposed
Gross Lot Area	N/A	3073.50 m²
Min. Lot Area*	230 m²	37.0 m²
Min. Lot Depth*	30.0 m	20.42 m
Max. Lot Coverage	N/A	22%
Landscaped Area*	40%	37%
Max. Building Height*	3 Storeys (11m)	3.5 Storeys
Min. Front Yard	6.0 m	6.0 m
Min. Rear Yard	6.0 m	6.0 m
Min. Side Yard*	3.0 m	1.74 m
Min. Distance Between Buildings*	3.5 m	3.30 m
Total Units	N/A	15 units
Max. Continuous Dwellings	8 Dwellings	8 Dwellings



KEY MAP - N.T.S.

SCALE 1:400
METRES
0 5 10 15 20

LEGEND:
- SUBJECT LANDS
- EXISTING BUILDING
- PROPOSED BUILDING

NOT FOR CONSTRUCTION
ISSUED FOR REVIEW & COMMENTS ONLY

NOTES:
ALL DIMENSIONS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

DESIGN BY: S. FURLONG	CHECKED BY: M. JOHNSTON
DRAWN BY: S. FURLONG	DATE: SEPTEMBER 1, 2021

URBAN SOLUTIONS
PLANNING & LAND DEVELOPMENT
3 STUDEBAKER PLACE, UNIT 1
HAMILTON, ON L8L 0C8
905-546-1087 - urbansolutions.info

PROJECT:
338 & 338 ½ CUMBERLAND AVENUE
CITY OF HAMILTON

CLIENT:
2115616 ONTARIO INC.

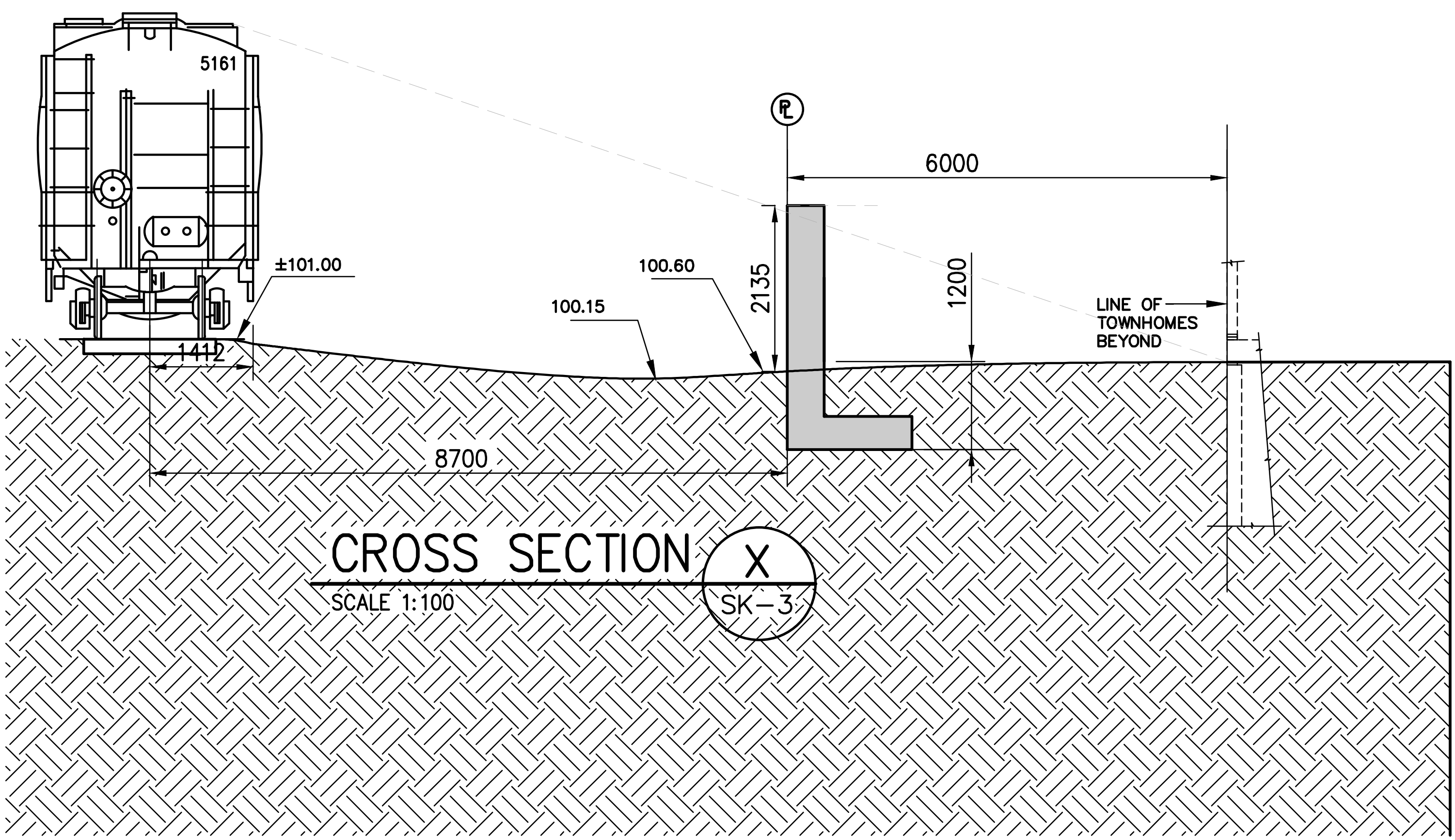
TITLE:
CONCEPT PLAN

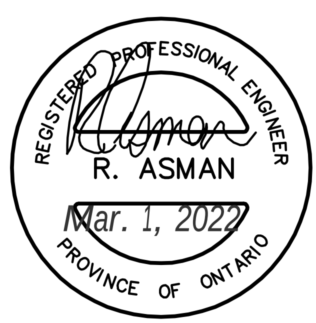
U/S FILE NUMBER:	SHEET NUMBER:
349-20	1


338 Cumberland
Mile Post 55.1-56.47 Hamilton Sub Division
CUMBERLAND AVENUE
338 Cumberland Ave
URBAN PROTECTED RESIDENTIAL - ONE AND TWO FAMILY DWELLINGS, ETC. "D/S-476"
3½ STOREY STACKED TOWNHOUSES
12 UNITS
3½ STOREY STACKED TOWNHOUSES
10 UNITS
1.5 METRE SIDEWALK
RESTRICTED LIGHT INDUSTRIAL DISTRICT "JJ"
EXISTING 1 STOREY LIGHT INDUSTRIAL
KEY MAP - N.T.S.
CUMBERLAND AVENUE
LOURIE AVENUE
Google Earth
© 2021 Google
40 m

Appendix C

(Cross Sections)





SCALE:

ISSUED FOR		
NO.	DATE	DESCRIPTION
1	MAR 1/22	FOR REVIEW

PROJECT TITLE

338 CUMBERLAND AVE.

HAMILTON ONTARIO

DRAWING TITLE

CRASH BARRIER SECTION

DRAWING NO. SK-1

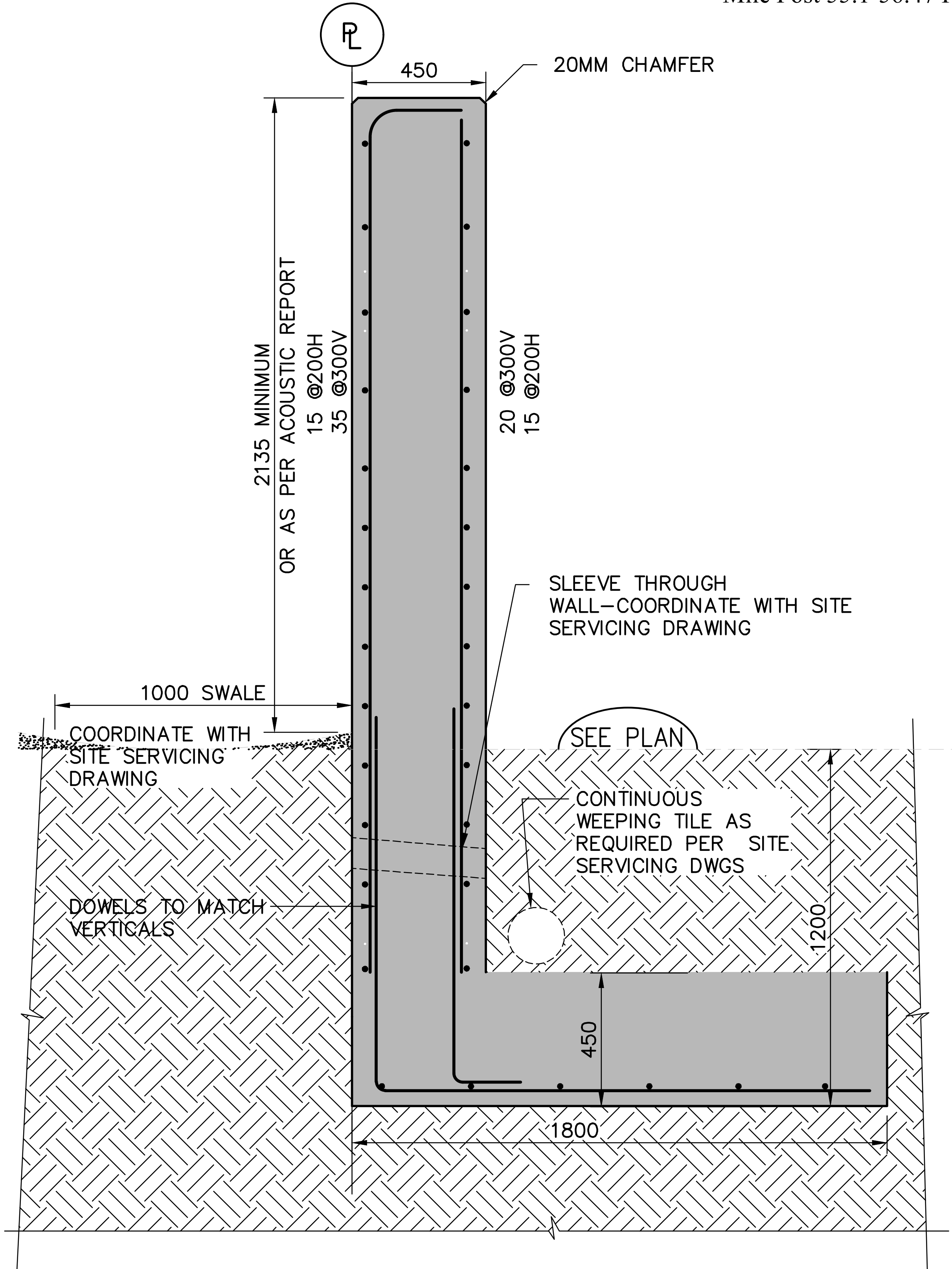
JABLONSKY, AST & PARTNERS

Structural Engineers

Toronto, Ont.

JOB NO. : 99014

Mile Post 55.1-56.47 Hamilton Sub Division



SECTION 1 / –

SCALE 1:20

REGISTERED PROFESSIONAL ENGINEER
R. ASMAN
Mar. 1, 2022
PROVINCE OF ONTARIO

SCALE: ______

ISSUED FOR		
NO.	DATE	DESCRIPTION
1	MAR 1/22	FOR REVIEW

PROJECT TITLE

338 CUMBERLAND AVE.

HAMILTON ONTARIO

DRAWING TITLE

CRASH BARRIER SECTION

DRAWING NO. SK–1

JABLONSKY,AST & PARTNERS

Structural Engineers

Toronto, Ont.

JOB NO. : 99014

Appendix D

(Tables and Miscellaneous Sketches)