




Birch Equities Limited
1196-1210 Yonge Street & 2-8 Birch Avenue, Toronto
Rail Safety Assessment

Issue and Revision Record				
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Rail Safety Assessment

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1. Executive Summary

Hatch Ltd. has been retained by Birch Equities Limited (the “Owner” or ‘Applicant’) to provide a Rail Safety Assessment for the development proposed at 1196-1210 Yonge Street & 2-8 Birch Avenue (the “Property” or “Site”), in support of the Zoning By-Law Amendment (ZBA) to permit a 15-storey mixed-use development.

The Site is located approximately 33 metres north of the Canadian Pacific (CP) North Toronto Subdivision. Notably, the Site is separated from the railway by existing developments, a small hydro station, as well as Birch Avenue and Yonge Street.

The site is rectangular-shaped and comprised of a series of adjacent properties that will be redeveloped. Figure 1-1 illustrates the Site Location below.

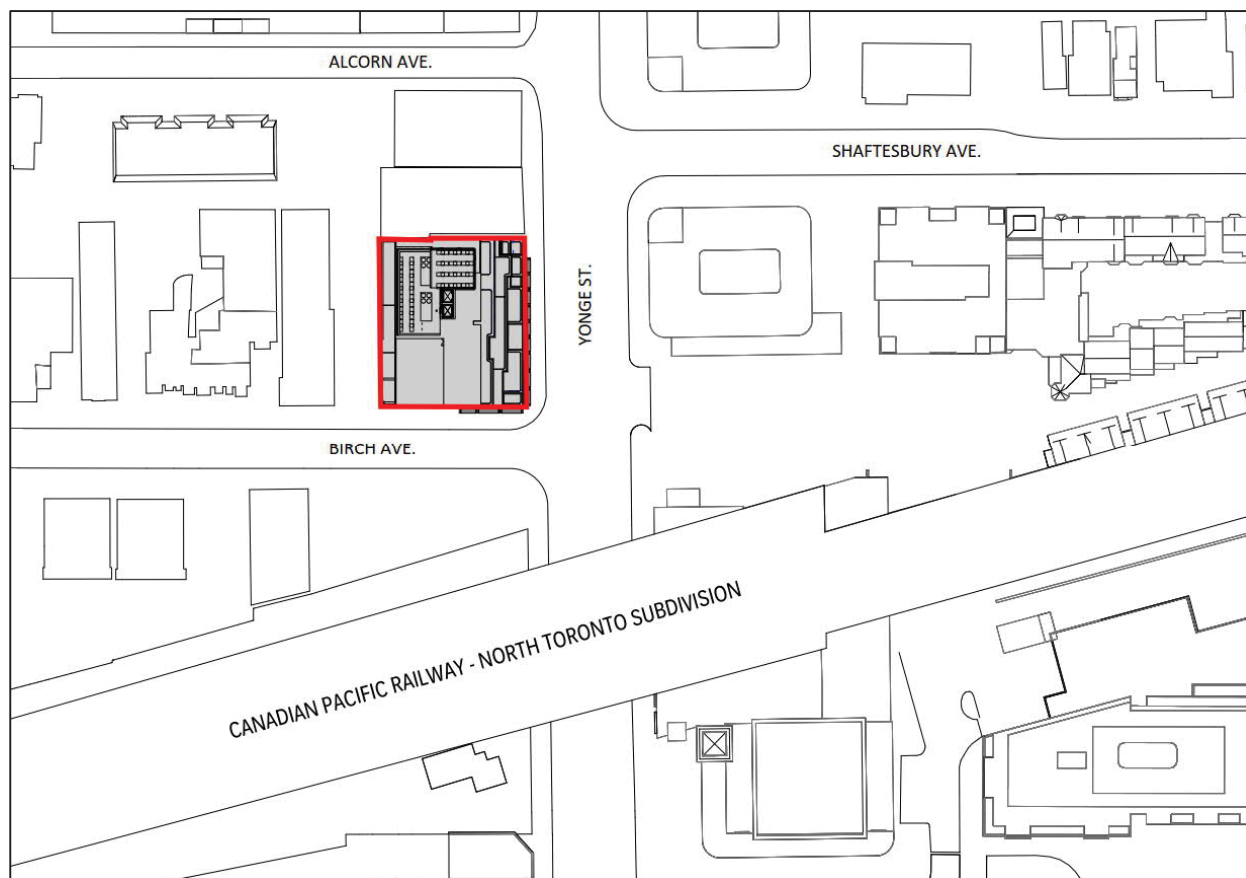


Figure 1-1: Site Location

The purpose of this report is to assess the risk profile of the nearby Canadian Pacific Railway-owned North Toronto Subdivision rail corridor, identify the risks to both people and property, and summarize the mitigation measures that are included as part of the new development.

This Rail Safety Assessment considers the recommendations within the Federation of Canadian Municipalities and Railway Association of Canada’s (FCM/RAC) *Guidelines for New Developments in Proximity to Railway Operations (2013)* as well as the City of Toronto’s *Land Use Study: Development in Proximity of Rail Operations (2019)*.

The FCM/RAC Guidelines for New Developments in Proximity to Railway Operations (2013) recommends, as a standard measure, a 30-metre setback, measured from the rail corridor property line and a 2.5-metre-high earthen berm to protect in the event of a derailment where principal mainline tracks are present. The City of Toronto Land Use Study recommends the same approach for new developments adjacent to mainline tracks.

At 1196-1210 Yonge Street & 2-8 Birch Avenue, the recommended setback is already achieved, due to the existing separation between the Site and rail corridor. The application of an earthen berm is considered impractical as the Site does not share a property line with the railway.

The guidelines indicate that in these circumstances, alternative mitigation measures may be considered where the site-specific conditions and rail-corridor conditions are such that the risks can be effectively mitigated to an equivalent level as the standard measure.

Given the low operating speeds within the rail corridor and the absence of high-speed passenger trains, the risk of a derailed train impacting the Property is considered very low.

This conclusion is partly informed by the Energy Balance Analysis (annexure or appendix??), which indicates that a derailed freight train would lose all momentum before reaching the Property boundary. Additionally, the Energy Balance Analysis indicates that a derailed train would have to be travelling nearly 50% higher than the maximum allowable speed to leave the extent of the rail corridor. Lastly, the grade separation of the rail corridor and Yonge Street results in a condition whereby a derailed train would be expected to fall onto the roadway below instead of travelling further towards the Property.

As such, a safety barrier is not proposed as part of the new development. Additional risks considered in this assessment include the possibility of risks as they relate to noise, vibration, and potential fire, explosion and/or flying debris that could occur in a derailment scenario.

Rail safety is a key objective for the new development. The risks to people and property must be identified, and as appropriate, mitigated. It is understood that rail-related risks cannot be completely eliminated. However, a package of mitigation measures is included in these development plans to protect against those risks.

2. Guidelines and Methodology

All new development proposals within proximity of the rail corridor(s) should consider the rail safety requirements set out by the City of Toronto Terms of Reference, as part of their development approval process, and relevant railway owners, i.e., Canadian Pacific Railway. Both the City of Toronto and Canadian Pacific Railway have independent criteria, based principally on the FCM/RAC Guidelines, both allowing for Site-specific approaches to determining appropriate rail safety requirements.

The guidelines reviewed in the preparation of this report include:

- FCM/RAC Guidelines for New Development in Proximity to Railway Operations (2013)
- City of Toronto – Land Use Study: Development in Proximity to Rail Operations (2019)
- AECOM Submission Guidelines for Crash Walls (July 29, 2014) and Development of Crash Wall Design Loads from Theoretical Train Impact
- CP Engineering Structures Design Standards – Protection of Structures Adjacent to Railroad Tracks (2016)

Note: CP applies the FCM/RAC Guidelines to new developments adjacent to their railways.

2.1 City of Toronto Land Use Study: Development in Proximity to Rail Operations (2019)

In 2019, the City of Toronto commissioned and published the Land Use Study: Development in Proximity to Railway Operations. The purpose of the study is, “to provide the City with recommendations specific to Toronto” as the City of Toronto is ultimately responsible for regulating land use and managing development proposed on sites that are in proximity to railway lands.

The rail safety guidelines have not been formally adopted by the municipality but largely mirror the FCM/RAC Guidelines.

2.1.1 City of Toronto Terms of Reference

The City of Toronto Terms of Reference indicate that where the risk mitigation measures vary from the City’s preferred approach (that includes a 30-metre setback combined with a 2.5-metre-high earthen berm) a technical report (and/or series of reports) shall be prepared and submitted to the municipality and rail operator.

The report should demonstrate the practical and/or technical reasons why the preferred safety and risk mitigation measures cannot be accommodated on the proposed development site. The report shall show how the proposed alternative measures reduce the risks to acceptable levels or eliminate it in its entirety.

A copy of the City’s Terms of References are included in Appendix A – References and Guidelines. The Land Use Study is available through the City of Toronto’s website.

2.2 Development Viability Assessment

The FCM/RAC Guidelines recommend the use of a ‘Development Viability Assessment’ to evaluate the rail corridor and Site conditions, to determine appropriate mitigation measures that offer an equivalent level of protection as the standard measure. Where the standard mitigation measures cannot practically or feasibly be accommodated, site-specific mitigation measures are recommended to address complex and often constrained land parcels.

The City of Toronto Land Use Study: Development in Proximity to Railway Operations also recognizes the Development Viability Assessment as a means of assessing a development site where the standard measures are not practical or feasible.

This Rail Safety Assessment has been prepared in accordance with the Development Viability Assessment criteria. The mitigation measures proposed herein account for the specific conditions within the rail corridor and on Site, to ensure that the intention of the guidelines is reflected in the proposed design.

3. Land Use and Proposed Development

The new development is proposed as a mixed-use building that includes residential with at-grade retail units along Yonge Street. The development concept is illustrated below in Figure 3-1.



Figure 3-1: Site Rendering (Southeast Elevation)

3.1 Site Conditions

The site is currently occupied by low-rise commercial and residential buildings, which will be demolished as part of the development. The current employment land uses are shown in Figure 3-1 below.



Figure 3-2: Existing land uses at 1196-1210 Yonge Street

The Property is approximately 33.2m from the edge of the rail bridge over Yonge Street. Further to the west, where the rail corridor property line changes direction, the development remained approximately 33.7m from the rail corridor property line. At all times, the recommended 30 metre separation distance is achieved.

The rail corridor is approximately 5 metres higher in elevation than the development lands. The closest track is recorded at an elevation of approximately 127.00. The centreline of the closest track is approximately 47.7m from the property line. These details are shown in Figure 3-3 below and Appendix F.

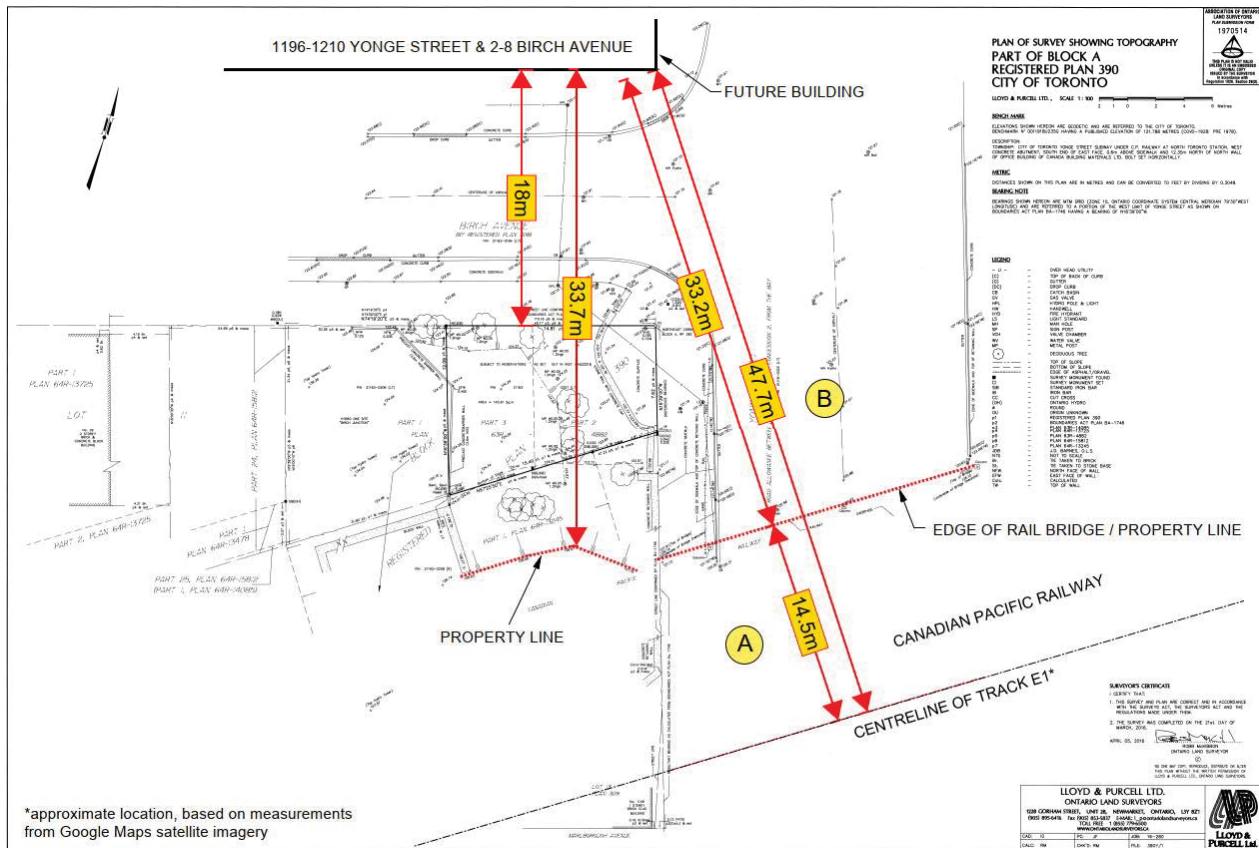


Figure 3-3: Property and track elevation

A small hydro station is located on the southwest corner of Yonge Street and Birch Avenue. Further west of the hydro station are various existing development including existing residential town homes, a daycare, a public school and a community park. These existing buildings (south of Birch Avenue, north of the rail corridor) provide considerable protection to the proposed development at 1196-1210 Yonge Street & 2-8 Birch Avenue.

The rail corridor is separated from the adjacent properties by a variety of fencing including standard chain link fences, retaining walls and noise barriers. As the Site does not share its boundaries with the rail corridor, no fencing is currently in place.

3.2 Proposed Development

The site is located at 1196-1210 Yonge Street & 2-8 Birch Avenue, at the northwest corner of the intersection of Yonge Street and Birch Avenue in the City of Toronto. The site is bound by Yonge Street to the east, Birch Avenue to the south, existing 1-3 storey commercial buildings, with low-rise residential development to the west, and existing 3-4 storey commercial buildings along Yonge Street, to the north.

The proposed development consists of a 15-storey mixed-use building with three levels of underground parking and ground-floor retail. The retail units will be located along the east side of the ground floor, fronting onto Yonge Street and Birch Avenue.

Residential suites will be located on Levels 3 to 14, with common indoor and outdoor amenity spaces at the Level 15 mechanical penthouse floor. The ground floor plan, shown below, is programmed entirely as non-sensitive, low occupancy space.

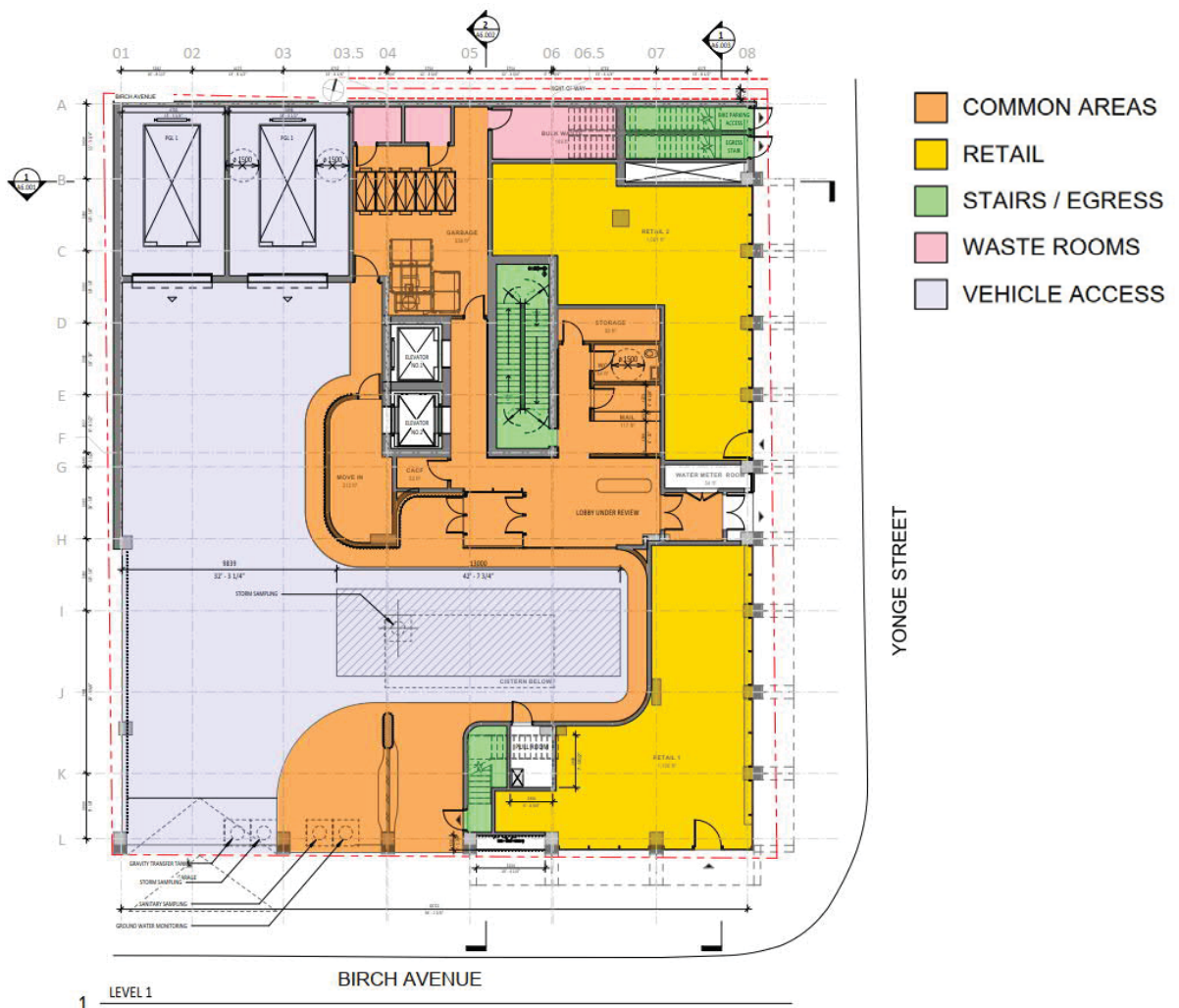


Figure 3-4: Ground Floor Layout

Parking, servicing, loading and vehicle maneuvering areas occupy a large area of the ground floor. The remaining space will consist of building common areas (lobbies, corridors, mail rooms, elevators, storage areas, etc.) and at-grade retail units.

The second-floor plan (also referred to as the 'Mezzanine') consists of lockers, bicycle parking, storage and additional common areas (such as corridors and exit stairwells). A portion of the mezzanine is open to the ground floor below. These uses are highlighted in Figure 3-5 below.

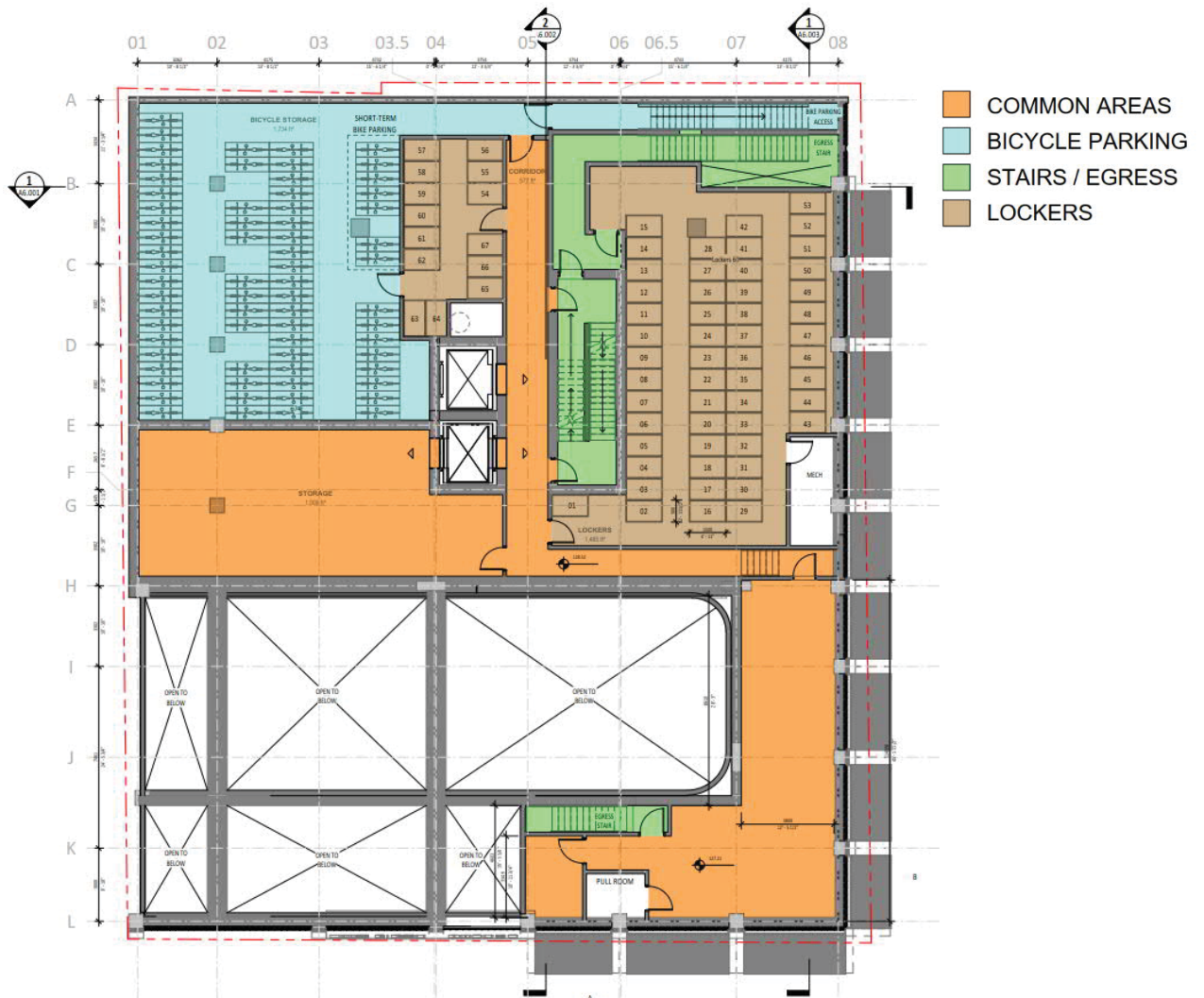


Figure 3-5: Second Floor/Mezzanine Layout

While the building is proposed beyond the recommended 30-metre setback area, the ground floor and mezzanine floors are programmed as non-sensitive, low occupancy uses. This is consistent with the recommendations in the guidelines, to locate the least sensitive uses closest to the rail corridor.

The third-floor plan, shown in Figure 3-6 below, consists almost entirely of sensitive use residential units. The residential units on the third floor are designated 'Rental Replacement'. These units are all without balconies and are intended to replace the existing residential uses currently on the property.

The remaining space on the third floor consists of corridors, exit stairwells and elevators.

Floors 4-15 are planned similar to the third floor and will consist of residential units. Recessed balconies are planned for the majority of residential units. Upgraded window treatments will be provided, which are summarized in Section 6.1 and the Noise Impact Assessment, submitted under separate cover as part of the development application.

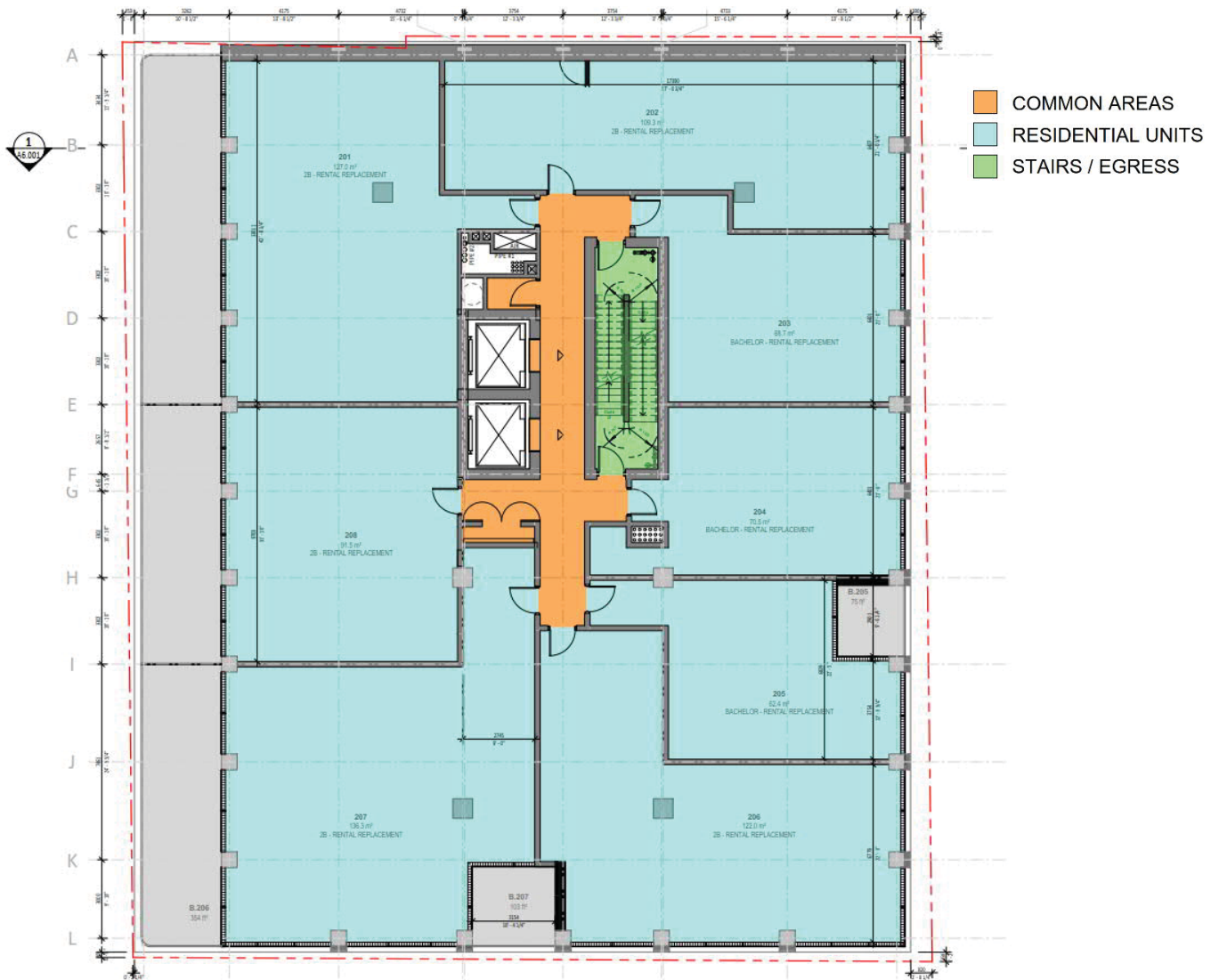


Figure 3-6: Third Floor Layout

The layout of the building is consistent with the intent of the guidelines. Many non-sensitive, low occupancy uses are planned closest to the rail corridor and the ground level. This includes parking and vehicle access, storage, servicing, waste, common areas and retail uses. The sensitive use residential units are planned on Floors 3-15, increasing the separation distance between the railway and the units.

The residential units on Floors 4-15 include recessed balconies and all units will include upgraded window treatments to ensure rail-borne noise from passing trains is effectively mitigated through appropriate building design and materials.

3.3 Rail Corridor Conditions and Details

3.3.1 Current Rail Corridor Operating Environment

The North Toronto Subdivision is a primary freight corridor for Canadian Pacific Railway (CP). Passenger train service does not operate through the corridor and no rights have been granted to either Metrolinx or VIA Rail to operate on this track.

The Site is located at approximately Mile 2.3 of the rail corridor, immediately west of Yonge Street. The rail corridor is currently comprised of two principal main line tracks. At this location, the maximum allowable speed for freight trains is 50mph. This speed applies to both east and westbound trains.

The track configuration is illustrated in Figure 3-6 below.

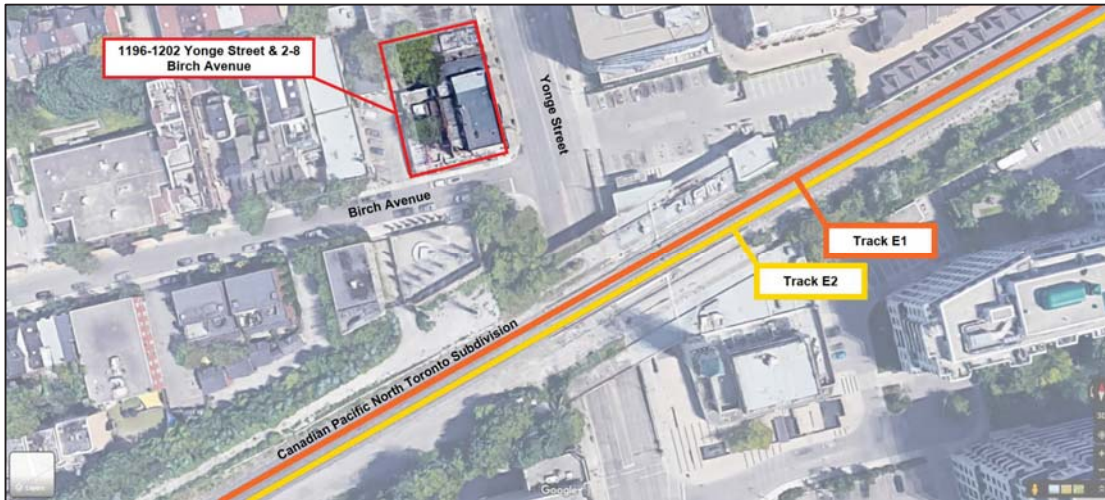


Figure 3-7: Satellite Aerial of Site Conditions along the North Toronto Subdivision

In the current condition, the closest track is approximately 47-metres from the property line. The tracks are straight in alignment. Two curves are observed on the tracks. One curve is located approximately 800m southwest of the Site, at Avenue Road. The other curve is located approximately 750m northeast of the Site, at Mount Pleasant Road. Both curves are approximately 1-2° and are not considered to pose a significant risk to either the railway operations or the future occupants at the Site.

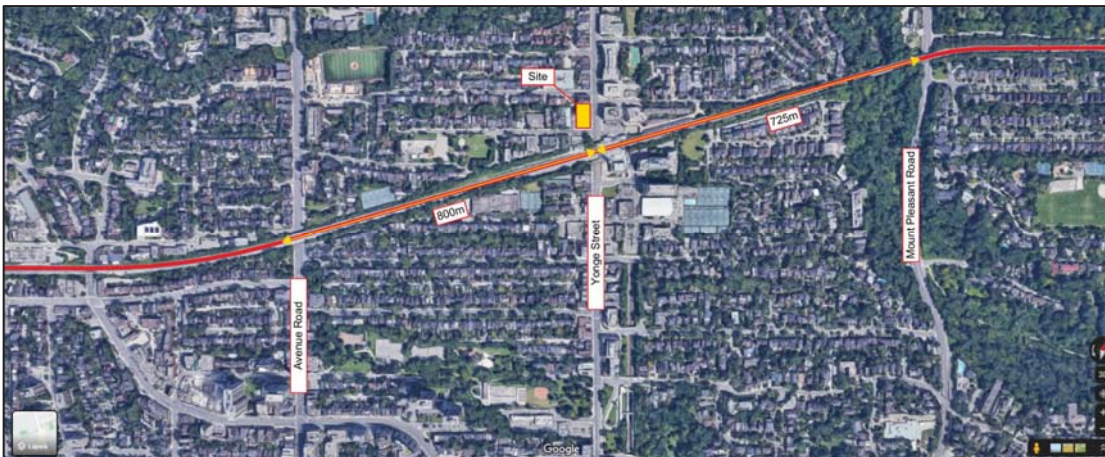


Figure 3-8: Track Alignment of North Toronto Subdivision

The City of Toronto rail adjacent development guidelines indicate a daily volume of 35-40 trains, each of which typically consists of approximately 125 cars. These details are included in Appendix E.

3.3.2 Track Expansion / Future Condition

Currently, track expansion within the rail corridor is not anticipated and there are no publicly available plans to modify or alter the current configuration of the tracks.

However, it is noted that the corridor has sufficient space for five tracks, and it is considered possible that tracks could be moved, or new tracks added to the corridor over the next 20 years, resulting in tracks closer to the Site. Based on the low speeds even if the rail corridor is expanded, the Site is not at risk of impact from a derailed train.

4. Risk Assessment

The following section provides an overview of the potential risks to people and property based on the adjacent rail operations.

4.1 Risk Profile by Operating Environment

The Transportation Safety Board (TSB) rail accident/incident data was reviewed as part of this application. The following accidents were recorded between Mile 0.0 and 6.0 on the Canadian Pacific Railway North Toronto Subdivision rail corridor between the years 2001 and 2021.

Table 4-1 below summarizes the accidents recorded by the TSB by subdivision and rail operator:

Table 4-1: TSB Reported Incidents

	CANADIAN PACIFIC RAILWAY
	NORTH TORONTO SUBDIVISION
TRESPASSER	20
MAIN-TRACK TRAIN DERAILMENT	3
NON MAIN-TRACK TRAIN DERAILMENT	1
MOVEMENT EXCEEDS LIMITS OF AUTHORITY	12
MAIN-TRACK TRAIN COLLISION	1
NON-MAIN-TRACK TRAIN COLLISION	1
DANGEROUS GOODS LEAKER	1
CROSSING	4
COLLISION INVOLVING TRACK UNIT	1
UNCONTROLLED MOVEMENT OF R/S	1
FIRE	1
TOTAL	46

After carefully reviewing the rail accident data there are four key items of note:

1. Of the 20 recorded trespassing events, 13 of these incidents resulted in a fatality.
2. Of the 4 recorded crossing incidents, a single event resulted in fatality. CP Railway and the Transportation Safety Board noted the following accident summary:

“CP freight train 102-09 struck and fatally injured a pedestrian on Bartlet Street public crossing equipped with flashing light signals, bell and gates. Local police, ambulance and CP officials responded.”
3. A single event recorded as “Dangerous Goods Leaker” was recorded in 2015. CP Railway and the Transportation Safety Board noted the following accident summary:

“During switching operations between tracks LT08 and LT10, CP crew on assignment T15-25, while coupling to stationary equipment on LT10, observed car UTLX 631178 (load of Sodium Hydroxide Solution) spill product from top hatch and downside of car. No injuries reported however, Conductor and Train master were exposed and had contact to product. Product was washed off. Amount unknown.”

No fatalities or injuries were recorded as a result of this incident.
4. A single event recorded as “Fire” was recorded in 2002. CP Railway and the Transportation Safety Board noted the following accident summary:

“CP train crew on 166-27 reported the 1st car from the head end, CP 428056, gondola was on fire. The fire department was called, and the fire extinguished without incident. CP officials responded and investigating.”

No fatalities or injuries were recorded as a result of this incident.

Site-specific factors that demonstrate a lower risk profile at the Site include:

- **Track Speeds** – the freight trains on these tracks run at 50mph. A potential derailment of a train running at that speed would not have enough energy to travel far enough to leave the bridge (theoretically). The train would have to be moving at approximately 72mph to leave the bridge (and fall to the street below). Theoretically, a train would have to be going at 129mph to reach the property line, and that is highly unlikely due to the track speeds limited to 50mph.
- **Track Alignment** - The tracks are straight in their alignment. Because the track is without any curvature, there is a lower risk of trains derailing adjacent to the site. Furthermore, there are no switches or crossovers near the Site, further lowering the possibility of a train derailment due to track infrastructure.

The combination of the discussed factors can be reasonably considered to improve the safety and hazard level on the development site that may arise from the railway operation.

4.2 Potential Derailment Scenarios and Impact

The risk assessment, illustrated in Table 4-2 below, has identified a total of eleven potential derailment scenarios posed by the North Toronto Subdivision rail corridor at the site.

Table 4-2: Risk Assessment at 1196-1210 Yonge Street & 2-8 Birch Avenue

Risk Assessment at 1196-120 Yonge Street & 2-8 Birch Avenue				
Hazard	Frequency	Severity	Residual Risk Level	Risk Classification
1. Main Line Derailment <i>Derailment of passenger train alongside the site boundary</i>	Passenger trains do not operate on the North Toronto Subdivision. A potential derailment of a passenger train on a Metrolinx-owned rail corridor is not anticipated to have any impact on the proposed development.			N/A
2. Train Travelling Faster than Zone Speed for Type of Train <i>Derailment of passenger train at speed greater than max. line speed</i>	Passenger trains do not operate on the North Toronto Subdivision. A potential derailment of a passenger train on a Metrolinx-owned rail corridor is not anticipated to have any impact on the proposed development.			N/A
3. Main Line Derailment <i>Derailment of freight train alongside the site boundary</i>	1	3	3	Acceptable
4. Train Travelling Faster than Zone Speed for Type of Train <i>Derailment of freight train at speed greater than max. line speed</i>	1	4	4	Acceptable
5. Main Line Derailment – Explosive <i>Derailment of freight train carrying flammable or hazardous materials</i>	1	5	5	Acceptable
6. Dangerous Goods Leak/Release <i>From a loaded freight train due to a failure of, or damage to the railcar carrying said goods</i>	1	3	3	Acceptable
7. Airborne Train Derailment <i>Top level of sea-can (double stack intermodal) freight car becomes airborne in a derailment</i>	1	3	3	Acceptable
8. Crew Member Incapacitated <i>Controller of the train loses consciousness or ability to use train controls while train is in motion</i>	1	3	3	Acceptable
9. Runaway Rolling Stock - Explosive <i>Unattended railcar(s) loaded with dangerous goods begin moving by gravity without an active prime mover</i>	1	4	4	Acceptable
10. Movement Exceeds Limits of Authority <i>Unauthorized movement by a train placing the train in a position that could be struck by another train</i>	2	2	4	Acceptable
11. Trespassing onto Railroad <i>Trespassing onto railroad by unauthorized member</i>	2	4	8	Tolerable

5. Mitigation Measures

The FCM/RAC Guidelines recommend a package of mitigation measures to address rail corridor proximity. These recommended mitigation measures are described below.

5.1 Setbacks

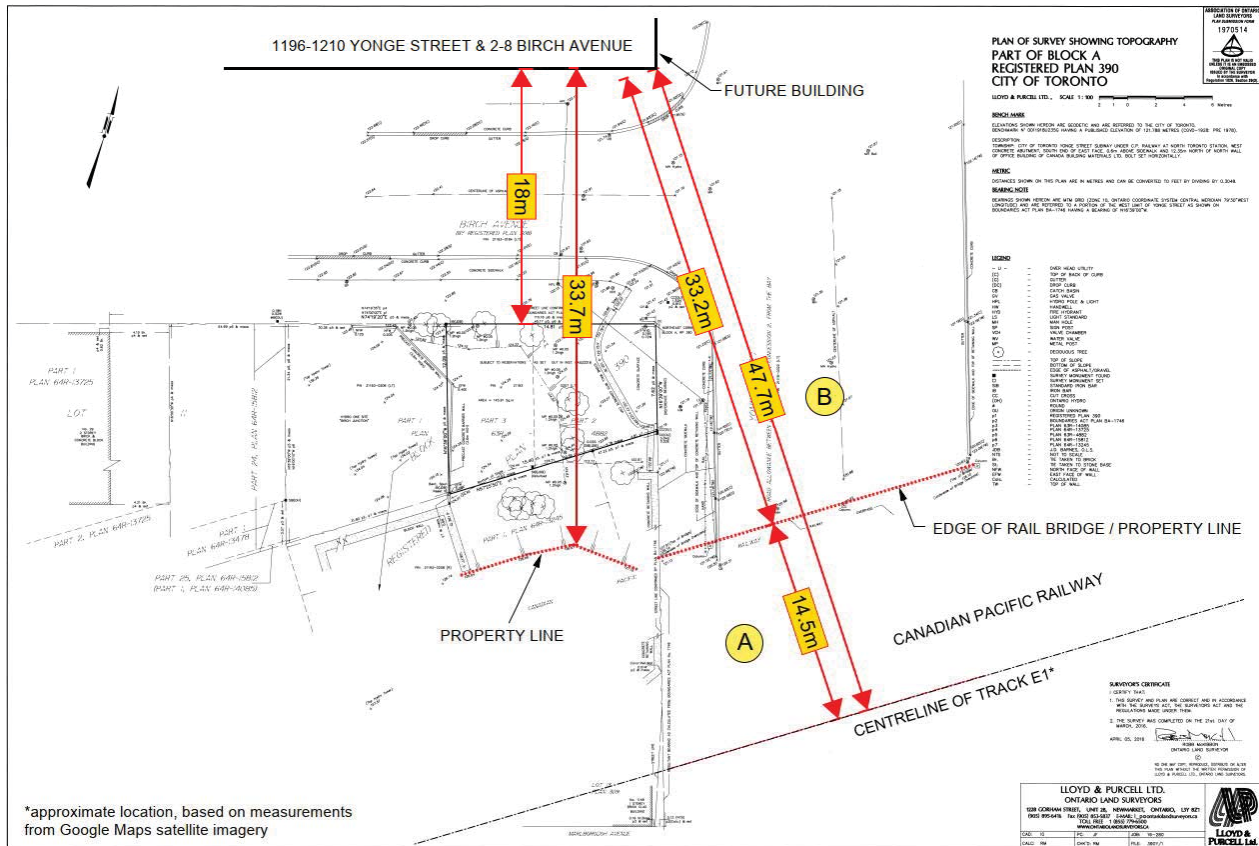
Setbacks between the rail corridor and any new development are a preferred mitigation measure to act as a physical buffer zone that allows occupants of the development to escape from the building in the event of a derailment. The FCM/RAC Guidelines indicate that a setback “contributes to mitigation against the potential impact of a railway incident as well as noise and vibration, through distance separation.” (pg.20)

Under typical circumstances, the setback is to be measured from the mutual property line, shared between the rail operator and subject property. However, in the case of 1196-1210 Yonge Street & 2-8 Birch Avenue, the development Site does not share a mutual boundary with the rail corridor.

Instead, as previously discussed, the Site shares a property line with two City of Toronto-owned public roads – Yonge Street and Birch Avenue. A small hydro field is also located along the northern boundary of the rail corridor, south of Birch Avenue, further separating the Site from the rail right-of-way.

The new will be horizontally setback approximately 33.2 metres from the existing rail corridor property line. This separation distance exceeds the standard setback recommended by the guidelines.

Furthermore, the closest active track is approximately 14.5 metres from the rail corridor property line, meaning that the closest active track to the future building is approximately 47.7 metres.



*approximate location, based on measurements from Google Maps satellite imagery

5.2 Safety Barrier

The FCM/RAC Guidelines recommend the use of safety barriers to absorb the energy impact of a derailed train, protect against the physical components of a derailment (in conjunction with the setback), and help mitigate rail-borne noise.

However, the Guidelines also acknowledge that “implementation of such measures is easiest to achieve for new greenfield development” and that “challenges may be encountered in the case of conversions or infill projects on small or constrained sites, and any implications related to the use of alternative mitigation measures need to be carefully evaluated.” (pg. 21).

At 1196-1210 Yonge Street, the application of the standard 2.5-metre-high earthen berm is considered impractical as the Site is adjacent to two public roads and does not share its property line with the railway.

The Energy Balance Analysis, included in Appendix C, indicated that a derailed freight train travelling at the maximum allowable speed limit of 50mph (80km/hr) would not have enough momentum to leave the rail corridor. Theoretically, the Energy Balance Analysis indicated that a train would have to be travelling at approximately 72mph to leave the rail corridor right-of-way.

Due to the grade separation of Yonge Street, which runs underneath the North Toronto Subdivision, a derailed train at Yonge Street would be expected to fall to the roadway below.

Lastly, the Energy Balance Analysis indicated that a train derailed train would have to be travelling at approximately 129mph to reach the development property line. A train derailing at this speed adjacent to this Site is considered unlikely as the train would likely derail prior to reaching this speed, since the track is not designed to accommodate trains travelling at that speed.

The risk of an impact by a derailed train is acceptably low, and the provision of the standard or alternative safety barriers is considered impractical for this development Site. As such, a safety barrier is not provided at 1196-1210 Yonge Street & 2-8 Birch Avenue.

5.3 Application of Sensitive and Non-Sensitive Uses

As previously discussed in Section 3.2, the proposed building design applies non-sensitive, low occupancy uses on the ground floor and mezzanine floors, closest to the rail corridor.

While the development is located beyond the 30-metre setback, consideration has been given to ensure that the sensitive use residential units achieve the greatest possible separation from the rail corridor right of way.

5.4 Warning Clauses

A warning clause will be registered on title to inform future building occupants of the nearby railway operations and the potential impacts and/or disruptions that may occur to the ongoing operating activities.

5.5 Ventilation

In addition to upgrade STC-rated windows to address external sources of noise, indoor ventilation will be installed as part of the new development to ensure that windows and doors may remain closed. This will limit the encroachment of odours, emissions and/or sounds that may be generated by the CP freight activities nearby.

6. Additional Risks and Considerations

While the focus of this study is on rail safety, particularly as it relates to derailment protection, there are additional risks to both the people and property typically associated with railway operations.

The following risks must also be considered and mitigated appropriately, to ensure land use compatibility between the proposed development and the railway.

6.1 Noise Impacts

The Site Owner has retained Valcoustics Canada Ltd for to prepare the Noise Impact Statement for the development proposed at 1196-1210 Yonge Street.

As summarized in the Noise Impact Statement:

“The indoor sound level limits can be achieved by using appropriate construction for exterior walls, windows, and doors. In determining the worst-case architectural requirements for the residential units, exterior wall and window areas were assumed to be 20% and 80% respectively, of the associated floor area for each façade of the building.

To meet the indoor sound level guidelines upgraded exterior walls meeting an STC rating of 60 and exterior windows meeting an STC rating of 44 are required for south facing bedrooms with windows along a single façade. Furthermore, if corner bedrooms are provided with windows along multiple facades, the STC rating would increase up to 2 points (i.e., STC 46 windows with STC 60 exterior walls).”

The Valcoustics Canada Ltd report will be submitted as part of the development application under separate cover.

6.2 Railway Vibration

The Site Owner has retained Valcoustics Canada Ltd to prepare the Vibration Assessment for the development proposed at 1196-1210 Yonge Street.

The primary concerns are levels of vibration that could affect the structural integrity of the development and concerns of annoyance / disturbances to the future occupants.

The vibration assessment concluded that, “the residential suites and the non-residential portions of the building are expected to be below the vibration guideline limits. Therefore, vibration mitigation is not mandatory for this site. However, as the site will provide high-end residential units, vibration isolation should be considered as part of the design to reduce the potential for vibration-induced noise and any small vibrations within the building.”

The Valcoustics Canada Ltd report will be submitted as part of the development application under separate cover.

6.3 Stormwater Management and Drainage

The discharge of stormwater from a development, during or after construction can potentially impact the rail infrastructure. Additionally, a new development may affect existing watercourses and change run-off behaviour.

A Stormwater Management Report is recommended to be prepared by a qualified engineer to ensure the proposed development does not adversely affect the local environment, including the rail corridor.

A separate report will be submitted as part of the development application.

Specific to this site, it is important to note that Yonge Street is graded favorably to any overflows as it descends below the rail corridor. Any overflow impact to the rail corridor is highly unlikely.

6.4 Trespassing

The FCM/RAC Guidelines states, “by far, the greatest number of annual fatalities resulting from railway accidents involves trespassers or vehicle occupants or pedestrians being struck at crossings. As a result, trespassing is at least as great, if not a greater safety concern than is derailment.”

As the Site does not share its mutual property line with the rail corridor, trespassing mitigation measures are not included in the submission package. Trespassing is a very real risk, however, the Property Owner does not have the ability to implement any measures to protect against this risk.

In the current condition, the rail corridor is separated from the neighbouring properties by a chain link fence.

6.5 Cranes and Aerial Operations

The use of cranes is common practice in construction, particularly where multi-storey developments are planned. Cranes and other equipment can move into or across the airspace above rail corridors and may pose as a safety concern if the operation of this equipment is not carefully managed.

Cranes, concrete pumps, and other equipment must not be used in the airspace over the rail corridor without approval from the rail authority. Loads should not pass over overhead wiring or transmission lines located within the corridor at any time.

It is unlikely that any crane movements will require the air space above the rail corridor at the Site.

However, it is recommended that the contractor responsible for construction confirm whether aerial movements within the rail corridor are required and coordinate with Canadian Pacific Railway as necessary to determine minimum clearances and permitting.

7. Conclusions and Recommendations

This Rail Safety Assessment has been prepared in accordance with the FCM/RAC Guidelines, City of Toronto Land Use Study: Development in Proximity to Rail Operations and considers CP’s engineering design standards.

The Assessment also recognizes the application of the standard mitigation measures is not practical for this development Site. As such, alternative measures are proposed that are considered appropriate for the Site in the context of the adjacent railway.

The risks associated with railway operations have been identified through the risk assessment.

Life safety risks related to a train derailment are considered very low. The application of a 33-metre setback provides a physical buffer between the rail corridor and the closest planned use.

Additional studies are recommended to ensure risks associated with vibration, noise and stormwater management are appropriately mitigated.

When the recommended mitigation measures contained herein are applied at the development site, the necessary criteria for new developments in proximity to active rail corridors will be satisfied.

8. Appendices

Appendix A – Guidelines and References

Appendix B – Architectural Plans

Appendix C – Energy Balance Analysis

Appendix D – Rail Corridor Details

Appendix E – Site Survey

Appendix F – Risk Assessment

8.1 Appendix A – Guidelines and References

1. FCM/RAC Guidelines for New Development in Proximity to Railway Operations (May 2013)
<https://www.proximityissues.ca/>
2. City of Toronto – Land Use Study: Development in Proximity to Rail Operations (March 2019)
<https://www.toronto.ca/wp-content/uploads/2019/05/960c-City-Planning-Final-Report-City-Wide-Land-Use-Study-Development-in-Proximity-to-Rail-Operations-Phase-2-March-21-2019.pdf>
3. Transportation Safety Board – Occurrence Database
<http://www.tsb.gc.ca/eng/stats/rail/data-5.asp>
4. AREMA Manual for Railway Engineering. American Railway Engineering and Maintenance-of-Way Association. 2017. *Concrete Structures and Foundations*.
5. CP Engineering Structures Design Standards – Protection of Structures Adjacent to Railroad Tracks (April 2016)
6. AECOM Submission Guidelines for Crash Walls (July 29, 2014)
7. Development of Crash Wall Design Loads from Theoretical Train Impact by Gaylene Layden, P.Eng, Bridge Engineer AECOM (2014)

8.2 Appendix B – Architectural Plans

1196-1210 YONGE ST.

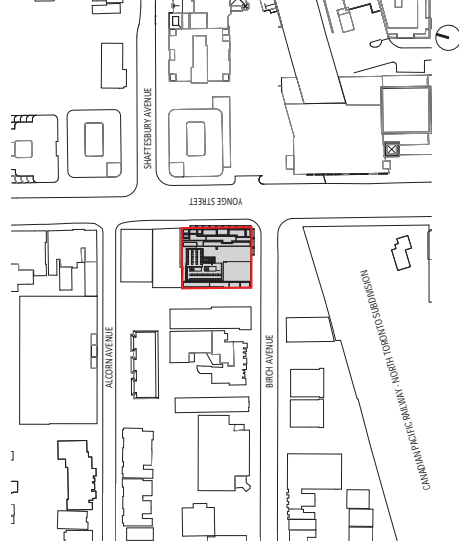
Pre-Application Meeting



DRAWING LIST

NO.	DESCRIPTION	DATE	BY	CHKD.
1	COVER SHEET			
2	GENERAL NOTES			
3	CONTEXT PLAN			
4	LANDSCAPE ARCHITECT			
5	SOIL & ENVIRONMENTAL			
6	TRANSPORTATION			
7	CIVIL ENGINEERING			
8	M&E ENGINEERING			
9	STRUCTURAL ENGINEERING			
10	ARCHITECT			
11	HERITAGE & CONSERVATION			
12	NOISE & VIBRATION			
13	ENERGY STRATEGY			
14	SHORING			
15	CONSTRUCTION			
16	UTILITY			
17	FOUNDATION			
18	MECHANICAL			
19	ELECTRICAL			
20	PLUMBING			
21	HAZARDOUS WASTE			
22	ENVIRONMENTAL IMPACT STATEMENT			
23	TRAVEL IMPACT STATEMENT			
24	WATER MANAGEMENT PLAN			
25	WIND ANALYSIS			
26	ACoustic ANALYSIS			
27	ENVIRONMENTAL MONITORING PLAN			
28	CONSTRUCTION MONITORING PLAN			
29	CONSTRUCTION PHASE PLAN			
30	CONSTRUCTION SAFETY PLAN			
31	CONSTRUCTION QUALITY CONTROL PLAN			
32	CONSTRUCTION SCHEDULING			
33	CONSTRUCTION LOG			
34	CONSTRUCTION REPORT			
35	CONSTRUCTION CLOSEOUT			
36	CONSTRUCTION AS-BUILT			
37	CONSTRUCTION RECORD			
38	CONSTRUCTION ARCHIVE			
39	CONSTRUCTION BACKUP			
40	CONSTRUCTION RECOVERY			
41	CONSTRUCTION RESTORATION			
42	CONSTRUCTION REPAIR			
43	CONSTRUCTION MAINTENANCE			
44	CONSTRUCTION INSPECTION			
45	CONSTRUCTION TESTING			
46	CONSTRUCTION ANALYSIS			
47	CONSTRUCTION EVALUATION			
48	CONSTRUCTION REPORTING			
49	CONSTRUCTION COMMUNICATION			
50	CONSTRUCTION DOCUMENTATION			
51	CONSTRUCTION RECORDING			
52	CONSTRUCTION PHOTOGRAPHY			
53	CONSTRUCTION VIDEOGRAPHY			
54	CONSTRUCTION AUDIOGRAPHY			
55	CONSTRUCTION THERMOGRAPHY			
56	CONSTRUCTION RADIATION			
57	CONSTRUCTION ULTRASOUND			
58	CONSTRUCTION X-RAY			
59	CONSTRUCTION CT-SCAN			
60	CONSTRUCTION MRI			
61	CONSTRUCTION PET-SCAN			
62	CONSTRUCTION SPECTROSCOPY			
63	CONSTRUCTION MASS SPECTROMETRY			
64	CONSTRUCTION CHROMATOGRAPHY			
65	CONSTRUCTION ELECTROPHORESIS			
66	CONSTRUCTION GEL ELECTROPHORESIS			
67	CONSTRUCTION POLYMERASE CHAIN REACTION			
68	CONSTRUCTION DNA MICROARRAY			
69	CONSTRUCTION PROTEOMICS			
70	CONSTRUCTION METABOLOMICS			
71	CONSTRUCTION LIPIDOMICS			
72	CONSTRUCTION GYROMICS			
73	CONSTRUCTION METABOLIC FLUX ANALYSIS			
74	CONSTRUCTION METABOLIC NETWORK ANALYSIS			
75	CONSTRUCTION METABOLIC PATHWAY ANALYSIS			
76	CONSTRUCTION METABOLIC SIGNATURE ANALYSIS			
77	CONSTRUCTION METABOLIC PROFILING			
78	CONSTRUCTION METABOLIC FINGERPRINTING			
79	CONSTRUCTION METABOLIC BIOMARKER DISCOVERY			
80	CONSTRUCTION METABOLIC BIOMARKER VALIDATION			
81	CONSTRUCTION METABOLIC BIOMARKER QUANTIFICATION			
82	CONSTRUCTION METABOLIC BIOMARKER CHARACTERIZATION			
83	CONSTRUCTION METABOLIC BIOMARKER CLASSIFICATION			
84	CONSTRUCTION METABOLIC BIOMARKER CLUSTERING			
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CONTEXT PLAN



DRAFT

KPMB
1196-1210 YONGE ST.
TORONTO, ONT. M5S 1A2
416-977-5104

1196-1210 YONGE ST.

SCALE: 1:1000
DATE: 2012-07-27
DRAWING NO.: 2012-07-27
COVER SHEET

OWNER AND CONSULTANT LIST

OWNER AND CONSULTANT LIST

DEVELOPER	ARCHITECT	STRUCTURAL ENGINEERING	M&E ENGINEERING	CIVIL ENGINEERING	TRANSPORTATION	LANDSCAPE ARCHITECT	SOIL & ENVIRONMENTAL	HERITAGE & CONSERVATION	NOISE & VIBRATION	ENERGY STRATEGY	SHORING
Woodcliffe Landmark Properties 1133 Yonge St., Suite 601 Toronto, ON M4T 2Y7 T: 416-361-5000	KPMB Architects 351 King St. East, Suite 1200 Toronto, ON M5A 0L6 T: 416-977-5104	Blackwell 134 Peter St., Suite 1301 Toronto, ON M5V 2H2 T: 416-593-5300	Lam & Associates Ltd. 160 Applewood Crescent, Unit 25 Concord, ON L4K 4H2 T: 905-660-7670	EXP 1595 Clark Blvd. Brampton, ON L6T 4V1 T: 905-793-9800	LEA Consulting Ltd. 625 Cochrane Dr., 9th Floor Markham, ON L3R 9R9 T: 905-470-0015	The Planning Partnership 1255 Bay St., Suite 500 Markham, ON M3R 2A9 T: 416-975-1556	Terraprobe Inc. 11 Indrell Lane Brampton, ON L6T 3Y3 T: 905-796-2650	Hunter & Associates Ltd. 1133 Yonge St., 3rd Floor Toronto, ON M4T 1W1 T: 416-444-8095	Isherwood Geotechnical Engineers 3100 Ridgeway Dr., #3 Mississauga, ON L5L 5W5 T: 905-820-3480	Purpose Building 119 Spadina Ave., Suite 600 Toronto, ON M5V 2L1 T: 416-613-9113	Isherwood Geotechnical Engineers 3100 Ridgeway Dr., #3 Mississauga, ON L5L 5W5 T: 905-820-3480

A0.000

GENERAL NOTES:
 1. The drawings shall be in accordance with the Ontario Building Code and all applicable laws and regulations.
 2. The drawings shall be in accordance with the Ontario Building Code and all applicable laws and regulations.
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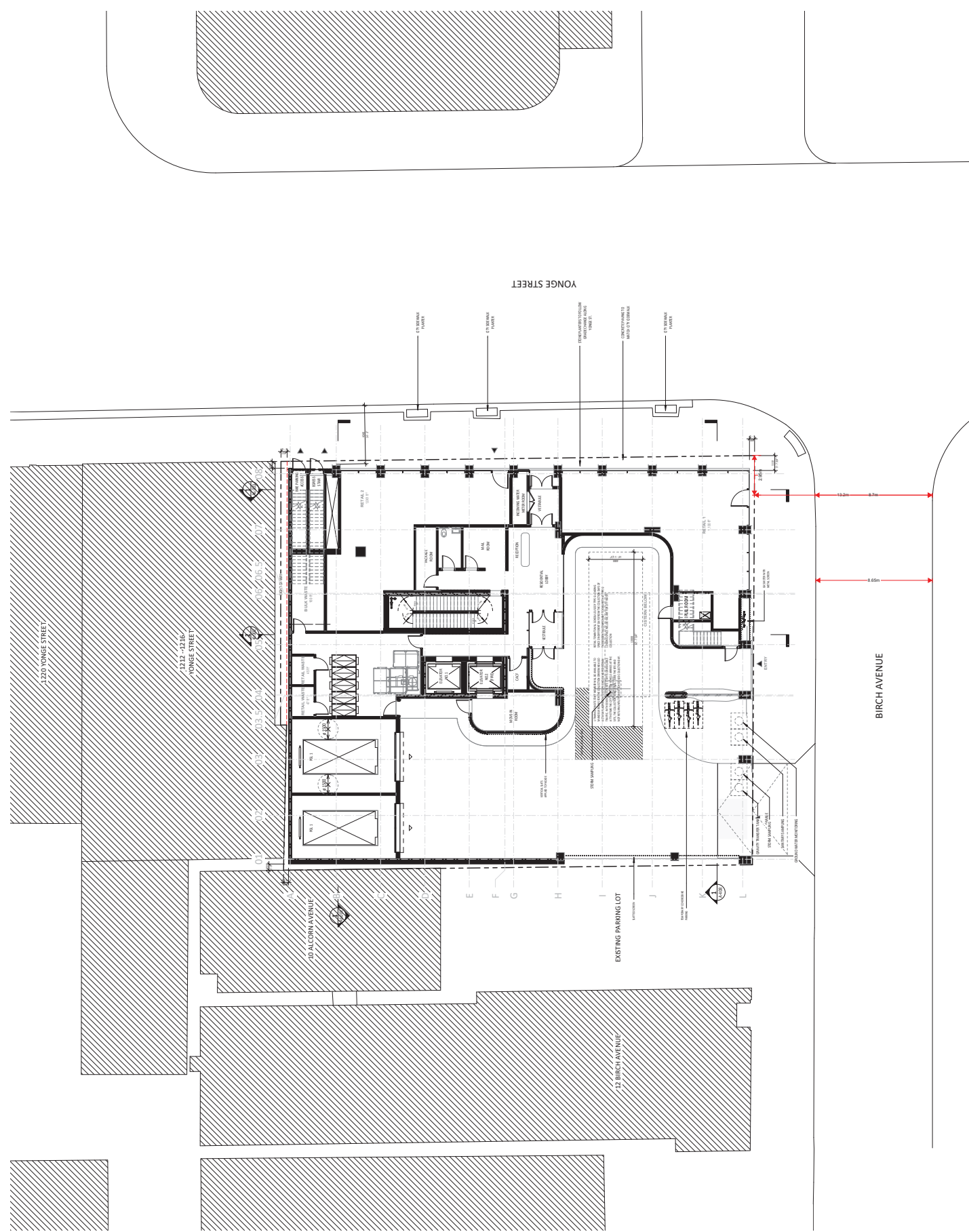
KPMB
 1200 YONGE ST. TORONTO, ON M6H 1L2
 416-977-1156

1885-210 YONGE ST.

SCALE:
 1:100
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 1/8" = 1'-0"

SITE PLAN

A1.002



YONGE STREET

BIRCH AVENUE

1220 YONGE STREET

1212-1216 YONGE STREET

10 ALCON AVE

EXISTING PARKING LOT

12 BIRCH AVENUE

All content is for informational purposes only. This document is not a contract and should not be used as such. It is intended to provide a general overview of the project and is subject to change without notice. The information contained herein is confidential and should not be distributed to third parties without the express written consent of the Architect. The Architect shall not be responsible for any errors or omissions in this document. The Architect shall not be responsible for any damages, including consequential damages, arising from the use of this document. The Architect shall not be responsible for any delays or interruptions of the project.

GENERAL NOTES:

1. The project is located at the intersection of Shaftesbury Ave and Yonge St. The site is bounded by Shaftesbury Ave to the north, Yonge St to the east, and Alcorn Ave to the south.
2. The project is a multi-story residential building with a total height of 15 stories. The building will be constructed in accordance with the City of Toronto's Building Code.
3. The project will include a mix of residential units, including studios, one-bedroom units, and two-bedroom units. The units will be distributed throughout the building to provide a variety of living options.
4. The project will include a ground-floor retail space, which will be used for a variety of purposes, including a cafe, a boutique, or a small office space.
5. The project will include a parking garage with 100 parking spaces. The parking garage will be located below ground level and will be accessible via a ramp from the street.
6. The project will include a landscaped plaza area, which will be used for outdoor seating, walking, and recreation. The plaza will be located on the east side of the building, adjacent to Yonge St.

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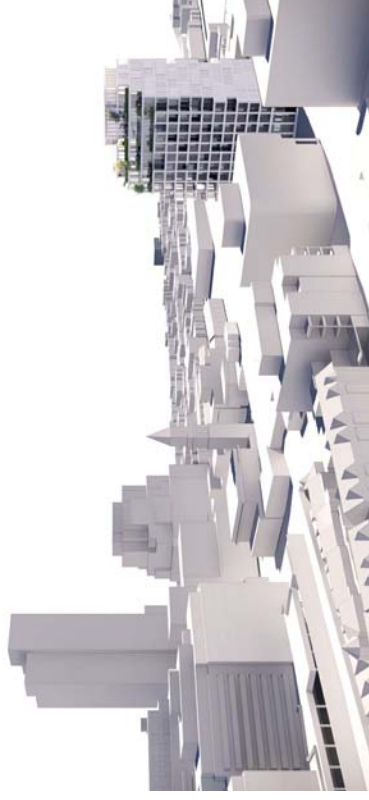
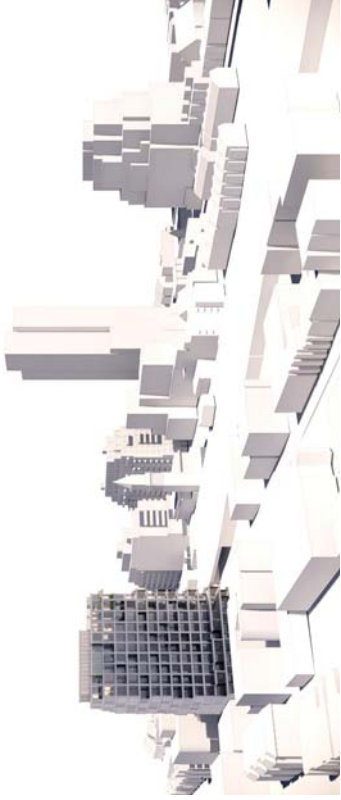
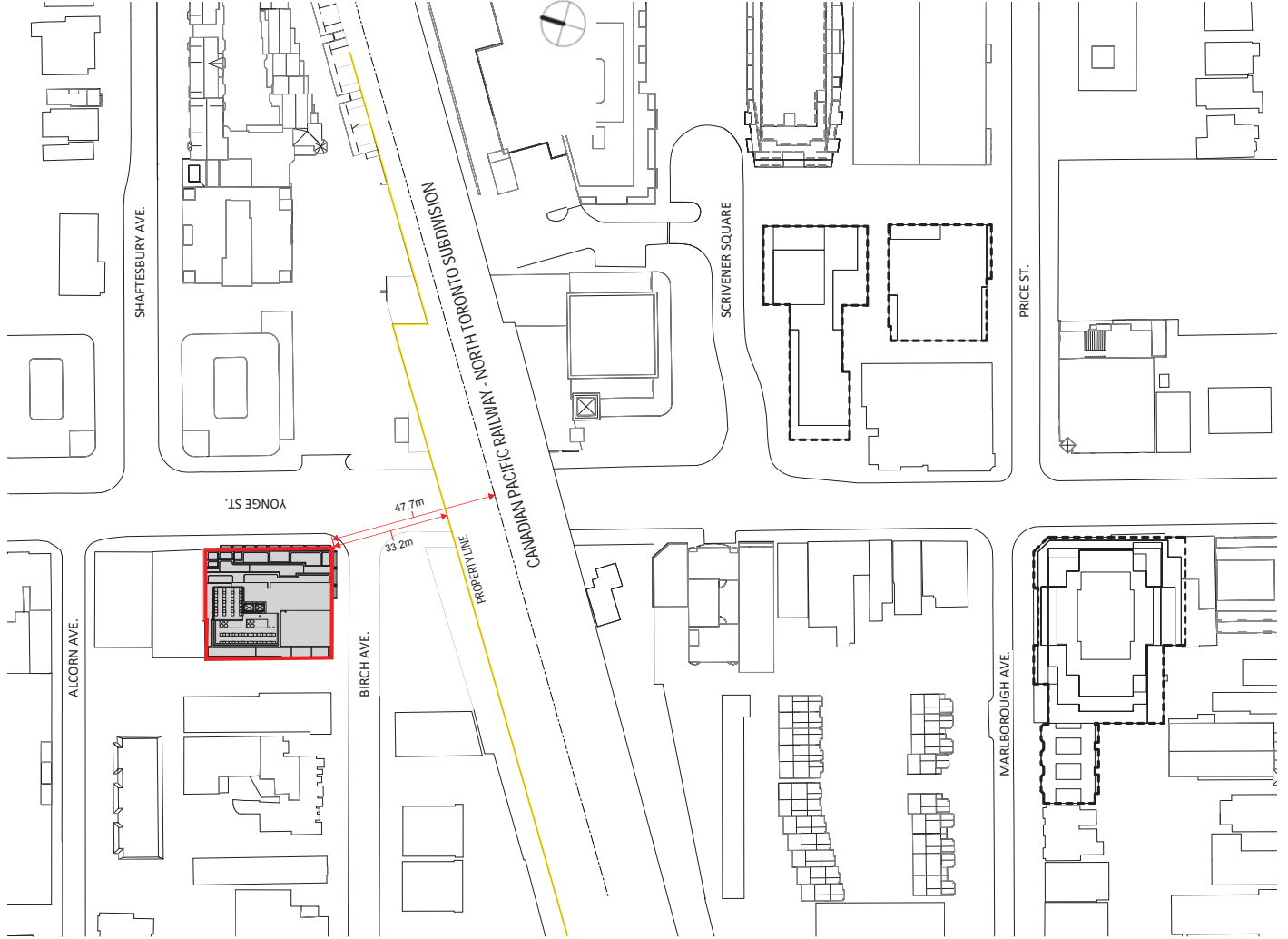
KPMB
 100 KING ST. W. SUITE 200
 TORONTO, ONT. M5X 1C5
 416-593-1100

1886-1210 YONGE ST.



SCALE: 1:200
 DATE: 2024-07-12
 SHEET: A1.003

Context Plan



ALL CONCEPTS OF THE ARCHITECTURE SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECTURAL BOARD OF THE CITY OF TORONTO. THIS DRAWING IS NOT TO BE USED FOR ANY OTHER PROJECT OR FOR ANY OTHER PURPOSE WITHOUT THE WRITTEN PERMISSION OF THE ARCHITECT.

GENERAL NOTES:

1. THE ARCHITECT HAS CONDUCTED VISUAL GENERAL VERIFICATION OF THE PROPOSED CONSTRUCTION AND HAS FOUND IT TO BE IN ACCORDANCE WITH THE CITY OF TORONTO'S ZONING BY-LAW AND THE CITY OF TORONTO'S BUILDING CODE.
2. THE ARCHITECT HAS CONDUCTED VISUAL GENERAL VERIFICATION OF THE PROPOSED CONSTRUCTION AND HAS FOUND IT TO BE IN ACCORDANCE WITH THE CITY OF TORONTO'S ZONING BY-LAW AND THE CITY OF TORONTO'S BUILDING CODE.
3. THE ARCHITECT HAS CONDUCTED VISUAL GENERAL VERIFICATION OF THE PROPOSED CONSTRUCTION AND HAS FOUND IT TO BE IN ACCORDANCE WITH THE CITY OF TORONTO'S ZONING BY-LAW AND THE CITY OF TORONTO'S BUILDING CODE.
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5. THE ARCHITECT HAS CONDUCTED VISUAL GENERAL VERIFICATION OF THE PROPOSED CONSTRUCTION AND HAS FOUND IT TO BE IN ACCORDANCE WITH THE CITY OF TORONTO'S ZONING BY-LAW AND THE CITY OF TORONTO'S BUILDING CODE.
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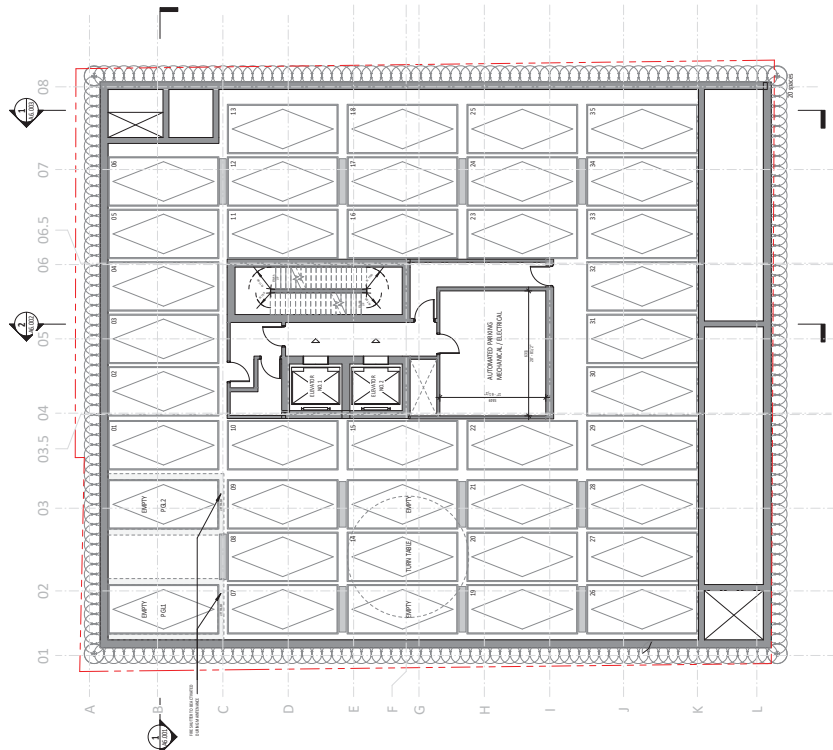
KPMB
 ARCHITECTS
 1000 SHEPPARD AVENUE EAST
 SUITE 200
 TORONTO, ONTARIO M2X 1L2
 416-491-1100

1886-1210 YONGE ST.

DWG# P3 PARKING PLAN
 SCALE: 1:100
 PROJECT NO.: 2022-01

P3 PARKING PLAN

A2.001



2 P3 PARKING PLAN

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GENERAL NOTES:
 1. THE ARCHITECTURE AND ENGINEERING FIRM SHALL BE RESPONSIBLE FOR THE DESIGN OF THE BUILDING AND THE PARKING PLAN. THE CLIENT SHALL BE RESPONSIBLE FOR THE DESIGN OF THE LANDSCAPE AND THE UTILITY SERVICES.
 2. THE ARCHITECTURE AND ENGINEERING FIRM SHALL BE RESPONSIBLE FOR THE DESIGN OF THE BUILDING AND THE PARKING PLAN. THE CLIENT SHALL BE RESPONSIBLE FOR THE DESIGN OF THE LANDSCAPE AND THE UTILITY SERVICES.
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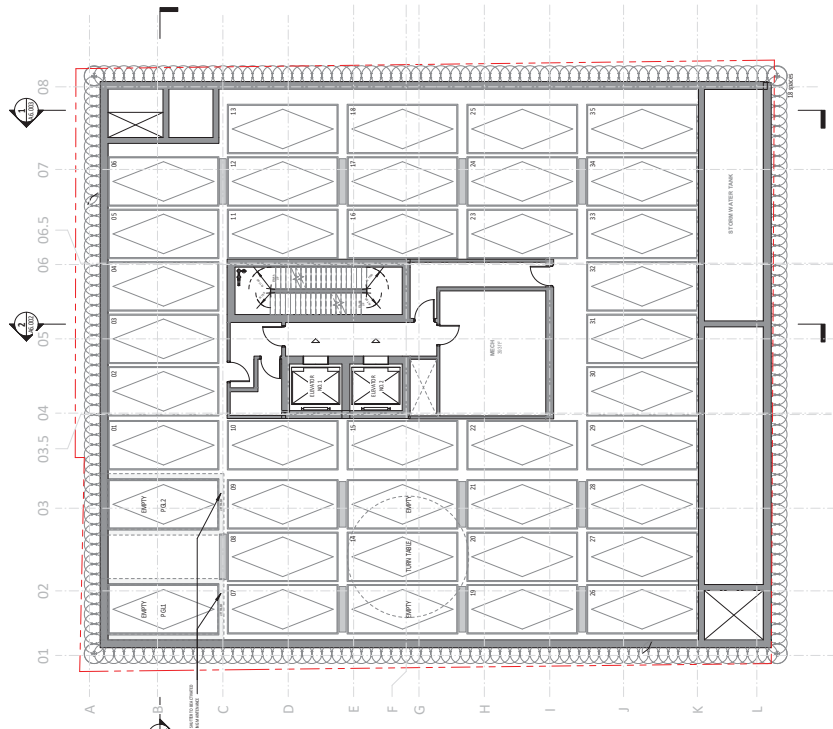
KPMB
 ARCHITECTURE
 1000 YONGE ST. TORONTO, ONT. M4W 1Y2
 416-924-1124

1885-1210 YONGE ST.
 PLAN AND P2 PARKING PLAN

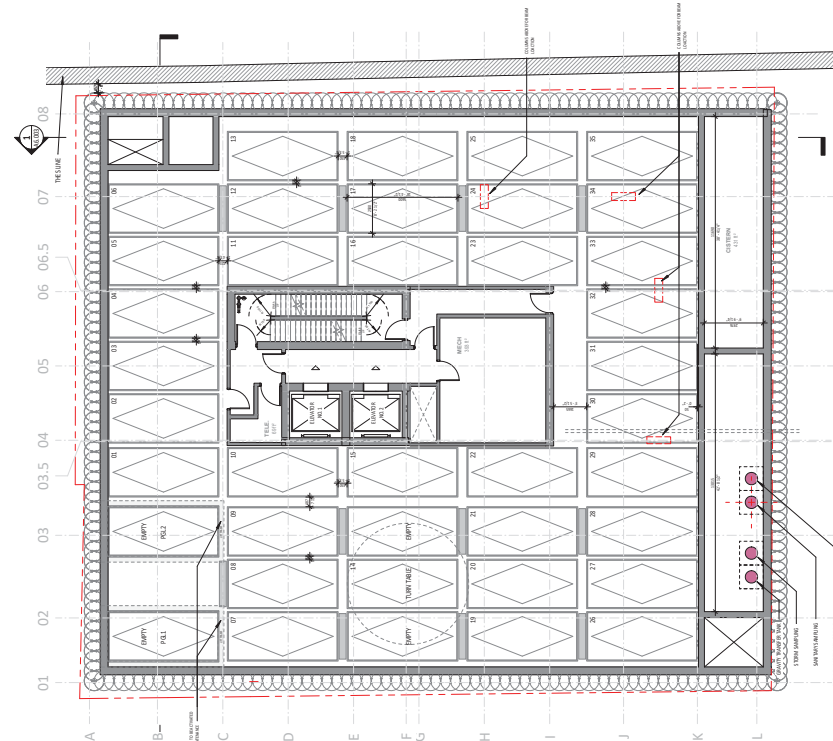
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PLAN AND P2 PARKING PLAN

A2.002



P2 PARKING PLAN



P1 PARKING PLAN

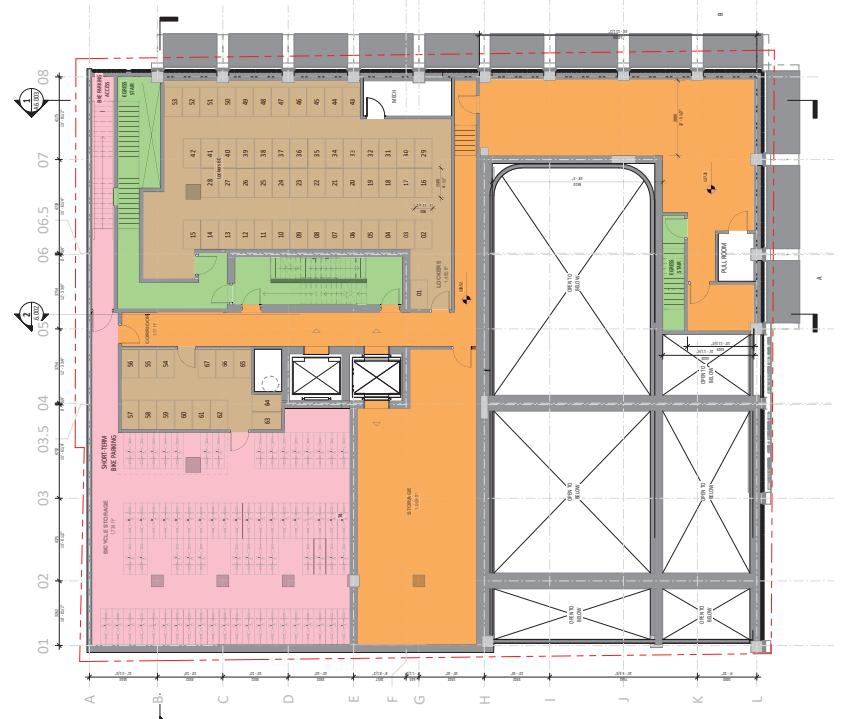
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- COMMON AREAS
- RETAIL
- STAIRS / EGRESS
- WASTE ROOMS
- VEHICLE ACCESS



1 LEVEL 1 BIRCH AVENUE

- COMMON AREAS
- RETAIL
- STAIRS / EGRESS
- WASTE ROOMS
- VEHICLE ACCESS



2 MEZZANINE LEVEL

DRAFT

KPMB
 1000 BIRCH AVENUE, SUITE 100
 VANCOUVER, BC V6C 3E8
 TEL: 604.681.1111
 WWW.KPMB.ARC

1886-1210 YONGE ST.

SCALE: 1:100
 DATE: 2022-07-27
 DRAWING NO: 2022-07-27

GROUND PLAN AND MEZZANINE

A2.003

ACCEPTED FOR THE ARCHITECT'S REVIEW AND APPROVAL OF THE ARCHITECT'S DESIGN AND CONSTRUCTION OF THE PROJECT. THIS DRAWING IS NOT TO BE USED FOR ANY OTHER PURPOSES WITHOUT THE WRITTEN CONSENT OF THE ARCHITECT.

GENERAL NOTES:

1. THE ARCHITECT'S DESIGN IS BASED ON THE INFORMATION PROVIDED BY THE CLIENT AND THE CONSULTANT. THE ARCHITECT IS NOT RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED.
2. THE ARCHITECT'S DESIGN IS SUBJECT TO THE APPROVAL OF THE LOCAL AUTHORITY AND THE CONSULTANT. THE ARCHITECT IS NOT RESPONSIBLE FOR THE ACCURACY OF THE APPROVALS.
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DRAFT

KPMB
 1000 SHEPPARD AV. E. SUITE 100
 SCARBOROUGH, ONTARIO M1S 1T2
 416-291-1506

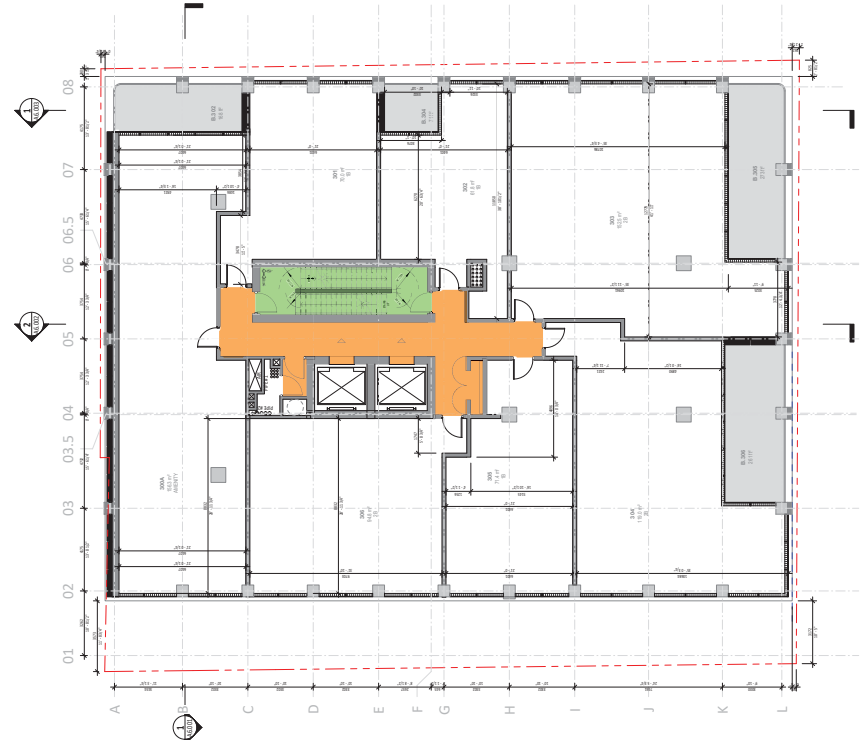
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 DRAWN BY: [Name]

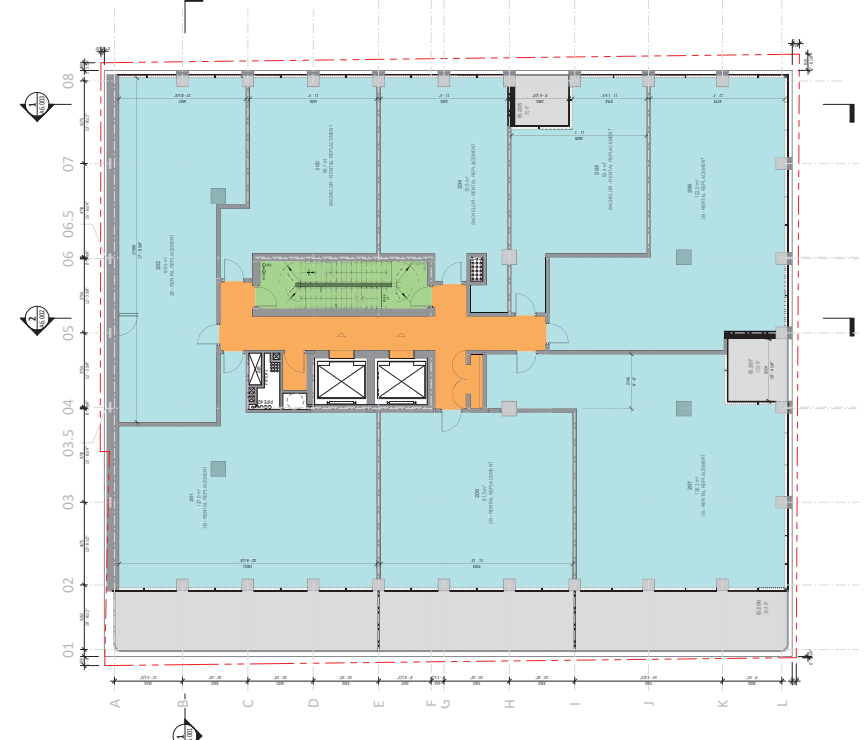
LEVEL 3 AND LEVEL 4

A2.004

- COMMON AREAS
- RESIDENTIAL UNITS
- STAIRS / EGRESS



2 LEVEL 4



1 LEVEL 3

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF VANCOUVER BUILDING BY-LAW (2024) AND THE BC BUILDING ACT (2024). THIS DRAWING IS THE PROPERTY OF KPMB AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF KPMB.

GENERAL NOTES:

1. The contractor shall verify all dimensions and locations of existing conditions before commencing work.
2. The contractor shall ensure that all work is completed in accordance with the approved plans and specifications.
3. The contractor shall maintain access to all existing services and structures throughout the project.
4. The contractor shall be responsible for obtaining all necessary permits and approvals from the relevant authorities.
5. The contractor shall ensure that all work is completed in a timely and efficient manner.
6. The contractor shall be responsible for the safety of all workers and the public during the construction process.

DRAFT

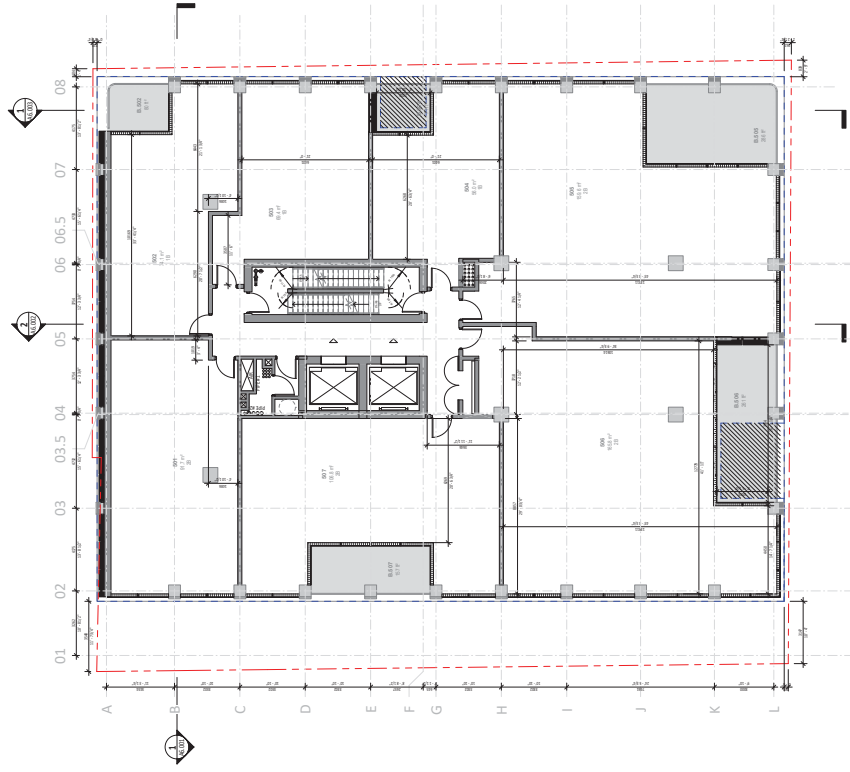
KPMB
 2000 VANCOUVER STREET
 VANCOUVER, BC V6J 1A2
 TEL: 604.681.1111
 WWW.KPMB.COM

1886-1210 YONGE ST.

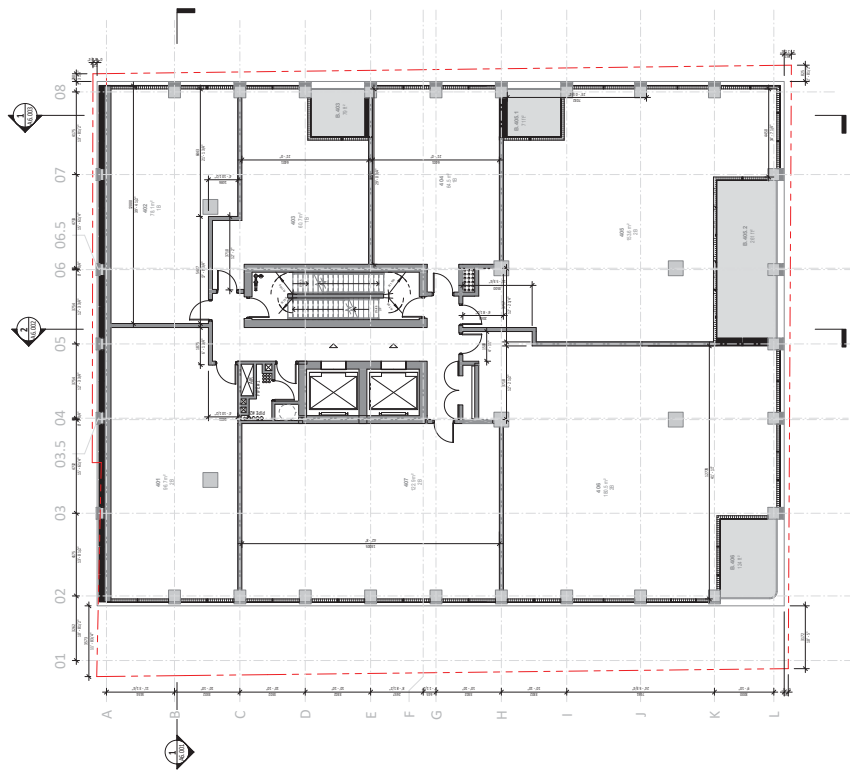
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 DATE: 2024-10-27
 DRAWING NO: 2024-27

LEVEL 5 AND LEVEL 6

A2.005



2 LEVEL 6



1 LEVEL 5

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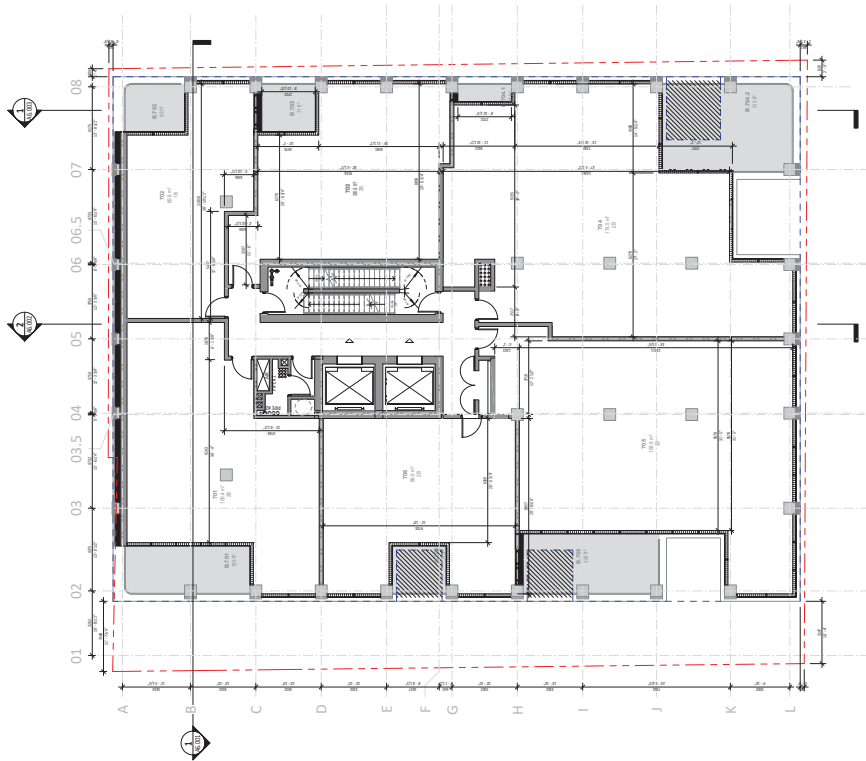
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KPMB
KIMBERLY PROFFER BUILDERS LTD.

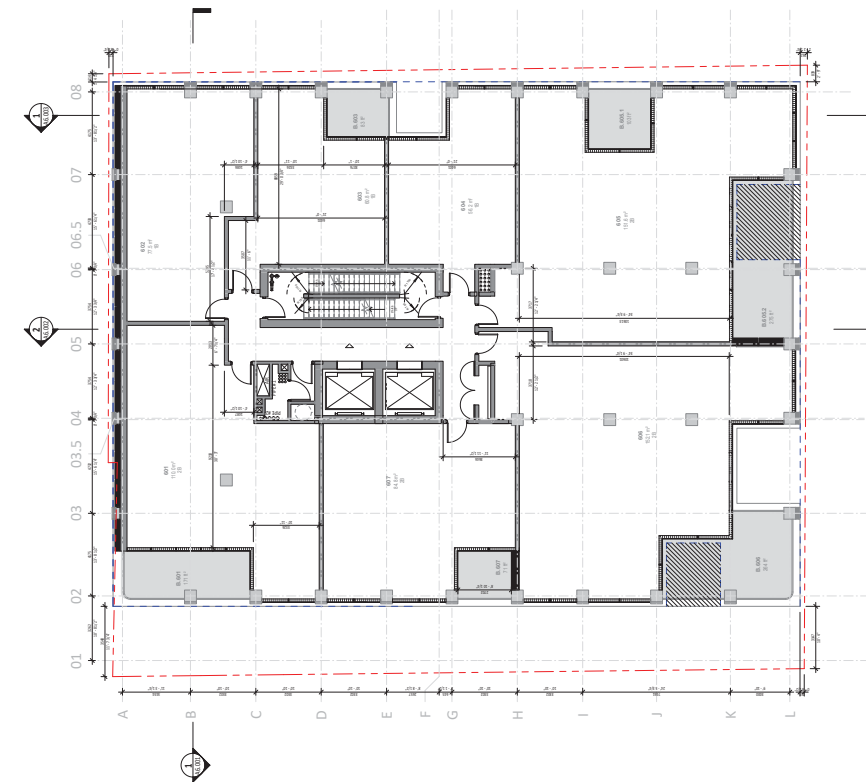
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LEVEL 7 AND LEVEL 8

A2.006



LEVEL 7



LEVEL 8

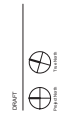
ALL CONCEPTS OF THE ARCHITECTURE SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECTURAL BOARD OF THE CITY OF TORONTO. THE ARCHITECT SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE ARCHITECTURAL BOARD OF THE CITY OF TORONTO. THE ARCHITECT SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE ARCHITECTURAL BOARD OF THE CITY OF TORONTO.

1. The architect shall be responsible for obtaining all necessary permits and approvals from the Architectural Board of the City of Toronto.
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6. The architect shall be responsible for obtaining all necessary permits and approvals from the Architectural Board of the City of Toronto.

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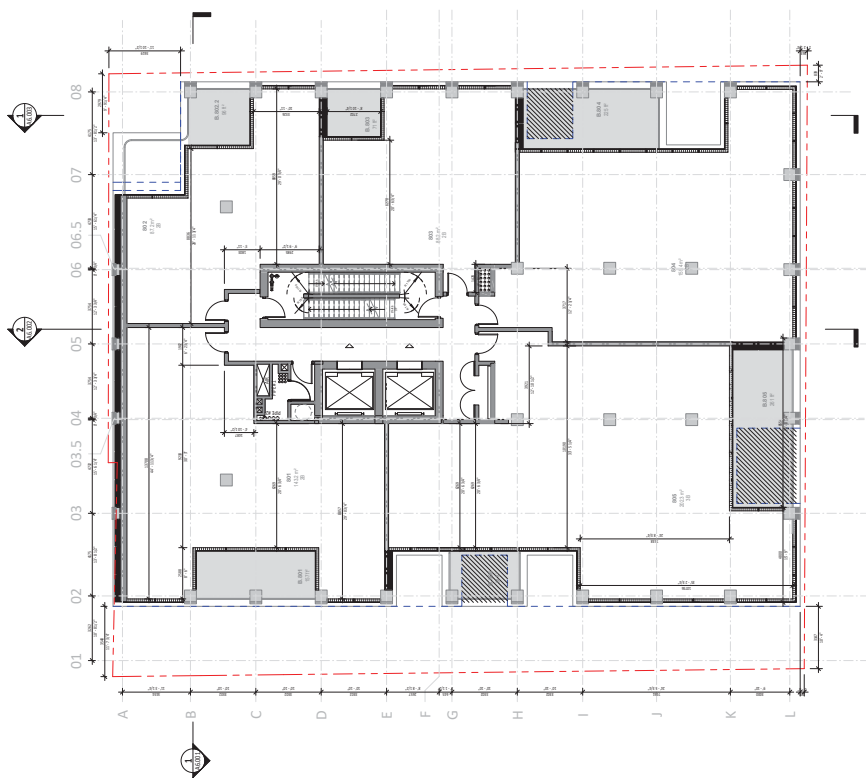
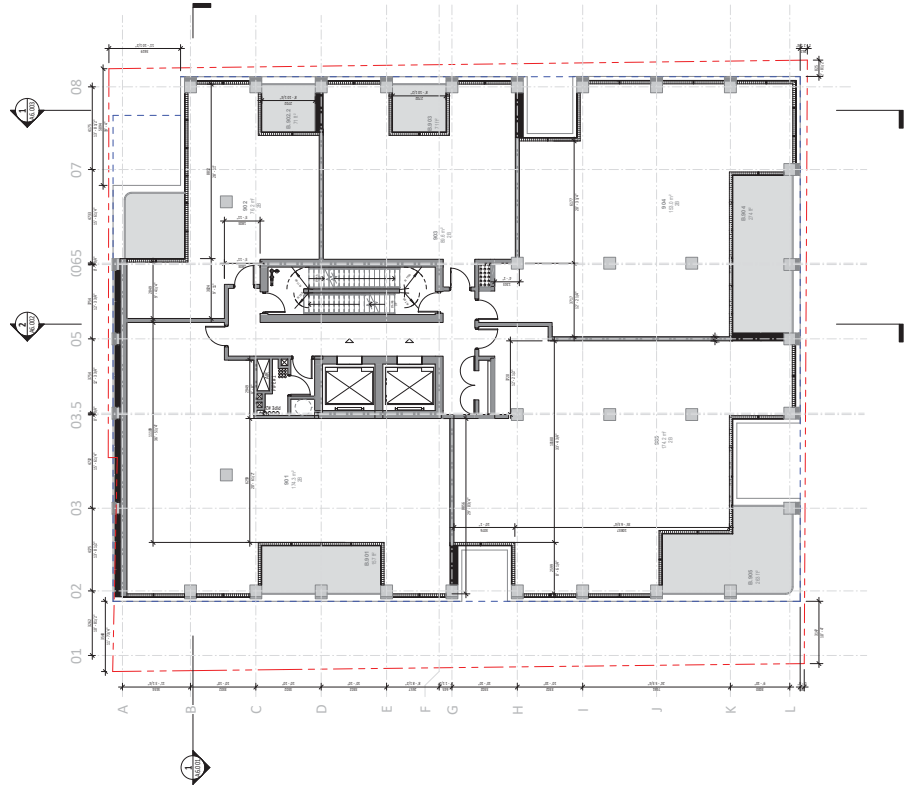
KPMB
 ARCHITECTS
 1000 SHEPPARD AVENUE EAST, SUITE 100
 SCARBOROUGH, ONTARIO M1S 1T2
 416-291-1506

1986-210 YONGE ST.
 TORONTO, ONTARIO



SCALE: 1/8" = 1'-0"
 1/4" = 3'-0"
 1/2" = 6'-0"
 1" = 12'-0"
LEVEL 9 AND LEVEL 10

A2.007



1 LEVEL 9

2 LEVEL 10

ALL CONCEPTS OF THE ARCHITECTURE
 SHALL BE SUBJECT TO THE APPROVAL AND
 REVIEW OF THE ARCHITECTURAL BOARD
 OF THE CITY OF TORONTO. THE ARCHITECT
 SHALL BE RESPONSIBLE FOR OBTAINING
 ALL NECESSARY PERMITS AND
 APPROVALS FROM THE CITY OF TORONTO
 AND THE PROVINCE OF ONTARIO.
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 AND THE PROVINCE OF ONTARIO.

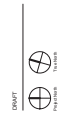
1. The architect shall be responsible for obtaining all necessary permits and approvals from the City of Toronto and the Province of Ontario.
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6. The architect shall be responsible for obtaining all necessary permits and approvals from the City of Toronto and the Province of Ontario.

GENERAL NOTES:
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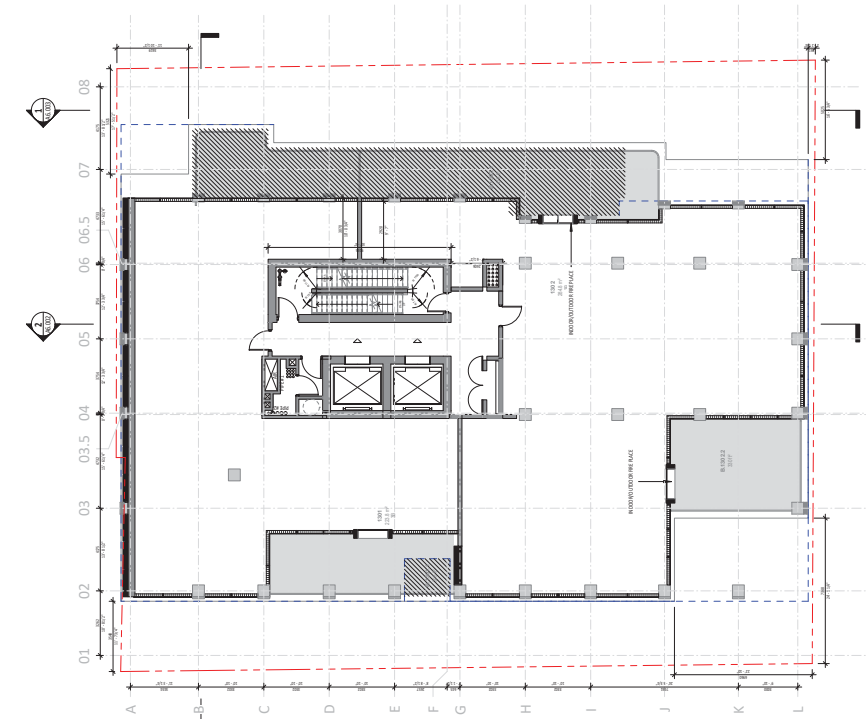
KPMB
 ARCHITECTS
 1000 SHEPPARD AVENUE EAST
 SUITE 100
 TORONTO, ONTARIO M2P 1L2
 416-491-1100

1885-1210 YONGE ST.
 LEVEL 13 AND LEVEL 14

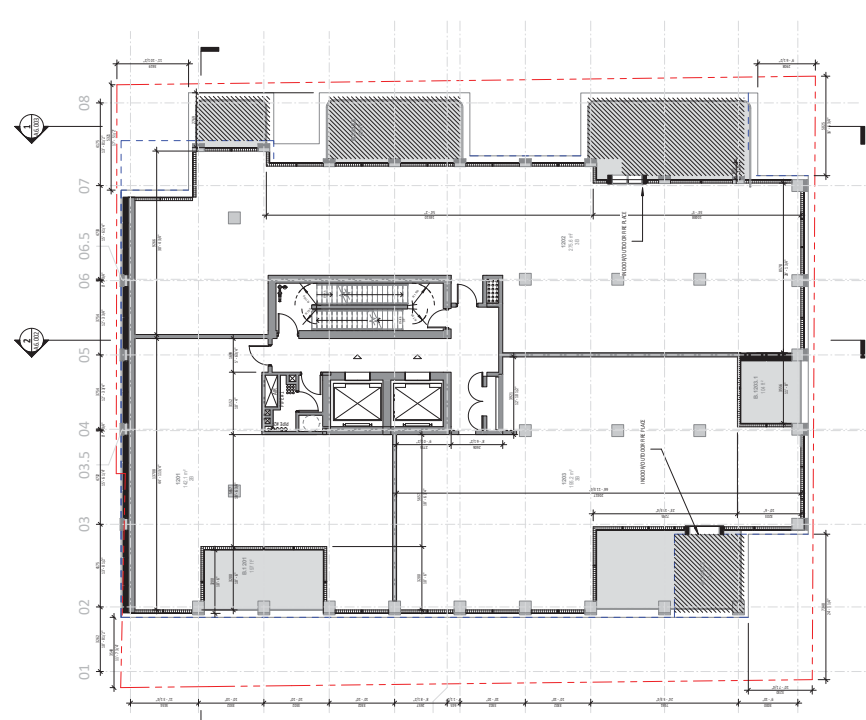


SCALE: 1:100
 DATE: 2023-07-27
 DRAWING NO.: 2023-07-27

A2.009



LEVEL 13



LEVEL 14

ACCEPTED FOR THE ARCHITECTURE AND ENGINEERING PROFESSIONAL REGULATORY BOARD OF THE PROVINCE OF ONTARIO. THIS DRAWING IS NOT VALID FOR ANY OTHER JURISDICTION. THE ARCHITECTURE AND ENGINEERING PROFESSIONAL REGULATORY BOARD OF THE PROVINCE OF ONTARIO IS NOT RESPONSIBLE FOR THE CONTENTS OF THIS DRAWING.

GENERAL NOTES:

1. The architect's design is based on the information provided by the client and is subject to change without notice.
2. The architect is not responsible for the accuracy of the information provided by the client.
3. The architect is not responsible for the accuracy of the information provided by the client.
4. The architect is not responsible for the accuracy of the information provided by the client.
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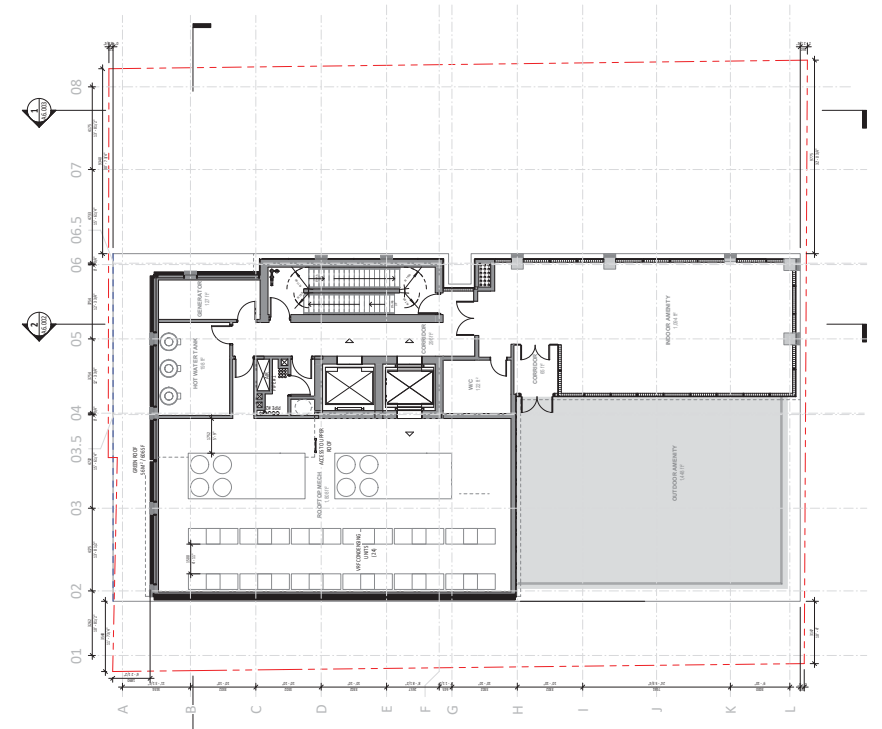
DRAFT

KPMB
 ARCHITECTS
 2000 KENNEDY ROAD, SUITE 101
 MARKHAM, ONTARIO L3R 9W7
 TEL: 416-479-4600
 FAX: 416-479-4601
 WWW.KPMB.AE.COM

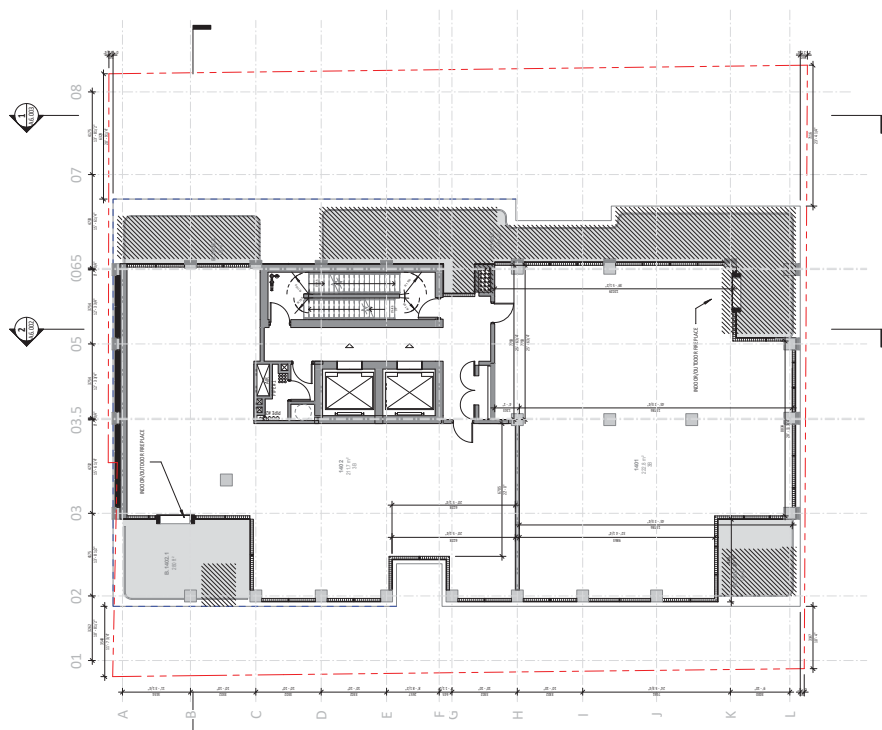
1985-210 YONGE ST.

SCALE: 1/8" = 1'-0"
 1/4" = 1'-0"
 1/2" = 1'-0"
 3/4" = 1'-0"
 1" = 1'-0"
LEVEL IS AND LEVEL
16' / M.P.H.

A2.010



2 M.P.H.



1 LEVEL 15

ALL CONCEPTS OF THE ARCHITECTURE AND ENGINEERING DESIGN SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECTURAL BOARD OF THE CITY OF TORONTO. THE ARCHITECT SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE ARCHITECTURAL BOARD OF THE CITY OF TORONTO.

GENERAL NOTES:

1. THE ARCHITECT HAS CONDUCTED VISUAL GENERAL VERIFICATION OF THE EXISTING CONDITIONS AND HAS NOT CONDUCTED A DETAILED SURVEY OF THE EXISTING CONDITIONS.
2. THE ARCHITECT HAS CONDUCTED VISUAL GENERAL VERIFICATION OF THE EXISTING CONDITIONS AND HAS NOT CONDUCTED A DETAILED SURVEY OF THE EXISTING CONDITIONS.
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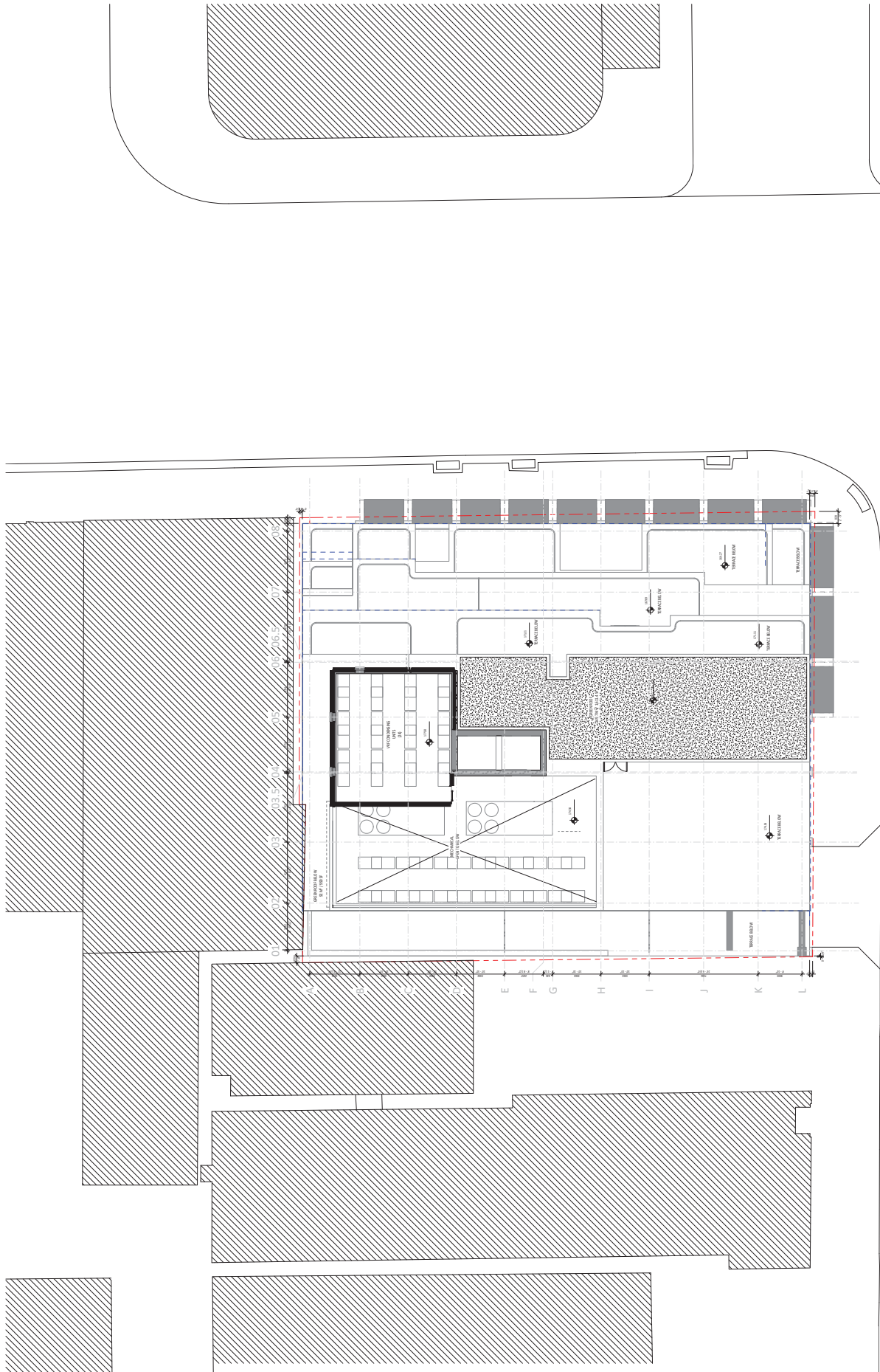
KPMB
 ARCHITECTS
 1000 SHEPPARD AV. E. SUITE 102
 SCARBOROUGH, ONT. M1S 1T2
 416-291-1100

PROJECT:
1885-210 YONGE ST.

SHEET:
1
 OF
1

SCALE:
 1:100
 DATE:
 2022-07-27

ROOF PLAN



1 SITE / ROOF PLAN

A2.011

ACCEPTED FOR THE ARCHITECTURE
 PROFESSIONAL REGULATORY BOARD OF
 ONTARIO (ARPO) ON BEHALF OF THE
 ARCHITECTS OF ONTARIO (A.O.)
 THIS DRAWING IS VALID FOR THE ARCHITECTURE
 PROFESSIONAL REGULATORY BOARD OF ONTARIO
 AS LONG AS THE ARCHITECT'S REGISTRATION NUMBER
 IS NOTIFIED TO THE BOARD OF ARCHITECTS OF ONTARIO

GENERAL NOTES:
 1. THE ARCHITECT'S DESIGN SHALL BE THE
 BASIS FOR THE CONTRACTOR'S OBLIGATION TO
 CONSTRUCT THE WORK IN ACCORDANCE WITH
 THE CONTRACT DOCUMENTS AND THE
 REQUIREMENTS OF THE CITY OF TORONTO
 2. THE ARCHITECT'S DESIGN SHALL BE THE
 BASIS FOR THE CONTRACTOR'S OBLIGATION TO
 CONSTRUCT THE WORK IN ACCORDANCE WITH
 THE CONTRACT DOCUMENTS AND THE
 REQUIREMENTS OF THE CITY OF TORONTO
 3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR
 OBTAINING ALL NECESSARY PERMITS AND
 APPROVALS FROM THE CITY OF TORONTO
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 OBTAINING ALL NECESSARY PERMITS AND
 APPROVALS FROM THE CITY OF TORONTO



1 SOUTH ELEVATION

2 WEST ELEVATION

APMB
 ARCHITECTURAL PROFESSIONAL REGULATORY BOARD OF ONTARIO
 400 WEST GERRARD ST. E. TORONTO, ONT. M4M 1B7
 416-977-5156

1886-110 YONGE ST.



SCALE: 1/8" = 1'-0"
 1/4" = 3'-0"
 1/2" = 6'-0"

**SOUTH & WEST
 ELEVATIONS**

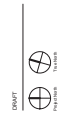
A5.001

ALL RIGHTS RESERVED. NO PART OF THIS DOCUMENT MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT THE WRITTEN PERMISSION OF THE ARCHITECT. THIS DRAWING IS THE PROPERTY OF THE ARCHITECT AND IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREON. ANY REUSE OR MODIFICATION OF THIS DRAWING WITHOUT THE WRITTEN PERMISSION OF THE ARCHITECT IS STRICTLY PROHIBITED. THE ARCHITECT ASSUMES NO LIABILITY FOR ANY ERRORS OR OMISSIONS IN THIS DRAWING. THE ARCHITECT'S RESPONSIBILITY IS LIMITED TO THE DESIGN AND CONSTRUCTION OF THE BUILDING AS SHOWN ON THIS DRAWING. THE ARCHITECT DOES NOT WARRANT THE ACCURACY OF ANY INFORMATION PROVIDED BY OTHERS. THE ARCHITECT'S DESIGN IS BASED ON THE INFORMATION PROVIDED BY THE CLIENT AND THE ARCHITECT ASSUMES NO LIABILITY FOR ANY ERRORS OR OMISSIONS IN THIS INFORMATION. THE ARCHITECT'S DESIGN IS BASED ON THE INFORMATION PROVIDED BY THE CLIENT AND THE ARCHITECT ASSUMES NO LIABILITY FOR ANY ERRORS OR OMISSIONS IN THIS INFORMATION. THE ARCHITECT'S DESIGN IS BASED ON THE INFORMATION PROVIDED BY THE CLIENT AND THE ARCHITECT ASSUMES NO LIABILITY FOR ANY ERRORS OR OMISSIONS IN THIS INFORMATION.

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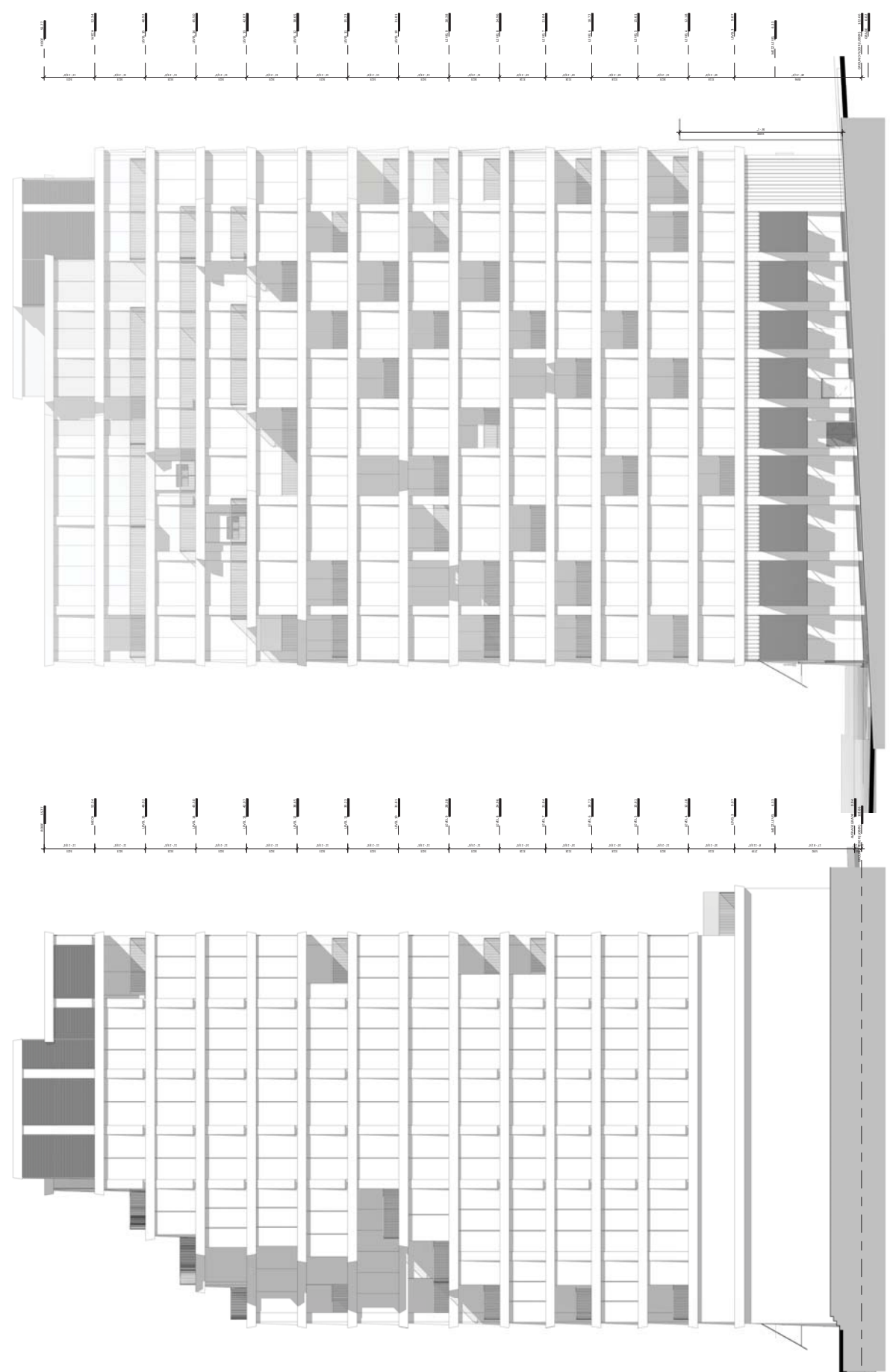
KPMB
 ARCHITECTS
 1000 BAYVIEW AVE. SUITE 100
 SCARBOROUGH, ONTARIO M1B 2Y1
 416-291-1100

1895-1210 YONGE ST.
 TORONTO, ONTARIO



SCALE: 1/8" = 1'-0"
 REFERENCE: 2022-23
NORTH & EAST ELEVATIONS

A5.002



2 EAST ELEVATION

1 NORTH ELEVATION

ALL CONCEPTS OF THE ARCHITECTURE SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT AND THE APPROVAL OF THE CITY OF VANCOUVER. THE ARCHITECT SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF VANCOUVER. THE ARCHITECT SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF VANCOUVER.

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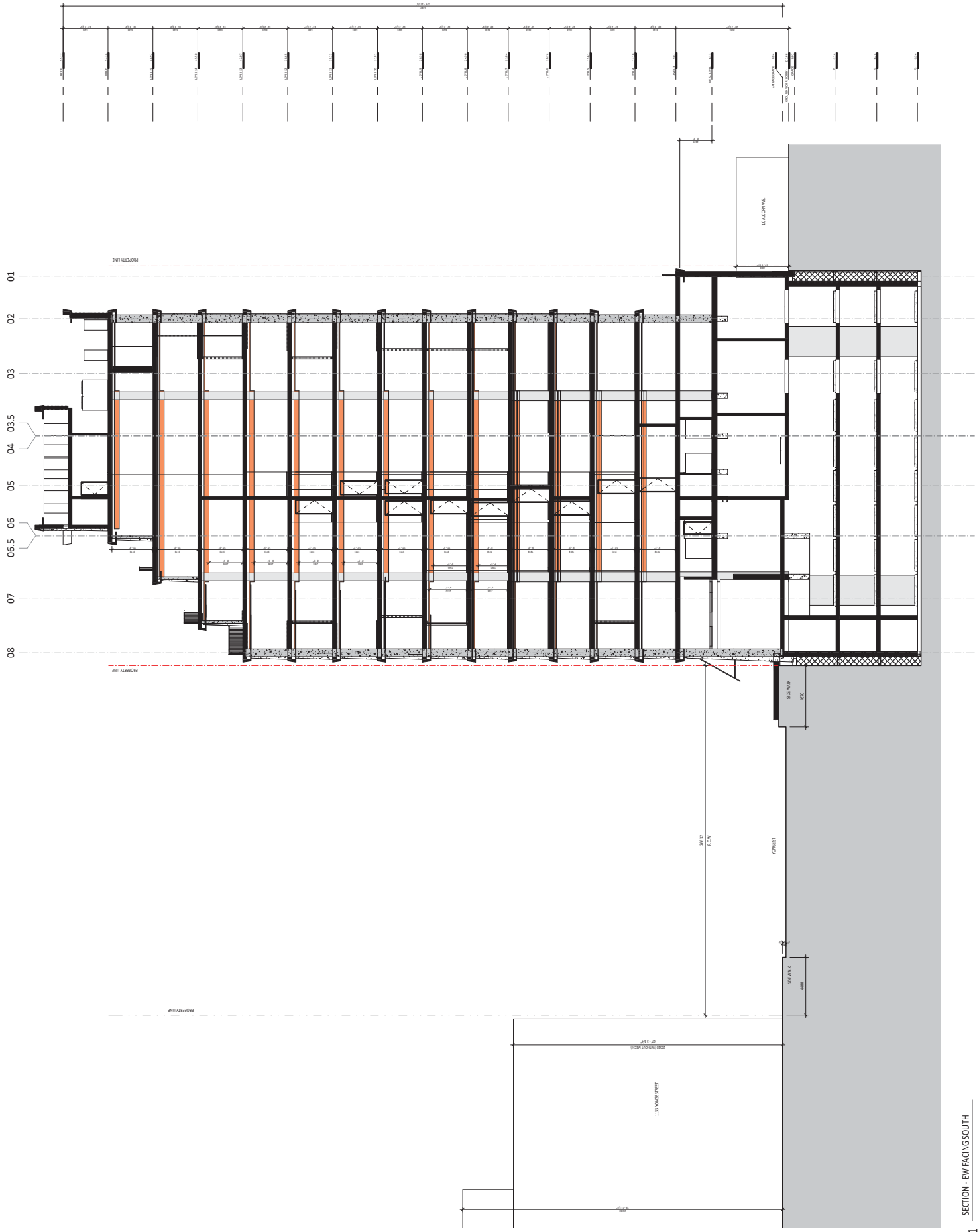
KPMB
 ARCHITECTS
 1000 WEST 10TH AVENUE, SUITE 100
 VANCOUVER, BC V6H 1T5
 TEL: 604-681-1111
 WWW.KPMB.AA

1885-1210 YONGE ST.
 VANCOUVER, BC

SHEET: A6.001
 SCALE: 1/8" = 1'-0"
 DATE: 2023-07-27

BUILDING SECTIONS
 NORTH
 SOUTH

A6.001



SECTION - EW FACING SOUTH

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE BUILDING ACT AND THE BUILDING REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPLICABLE AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPLICABLE AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPLICABLE AUTHORITIES.

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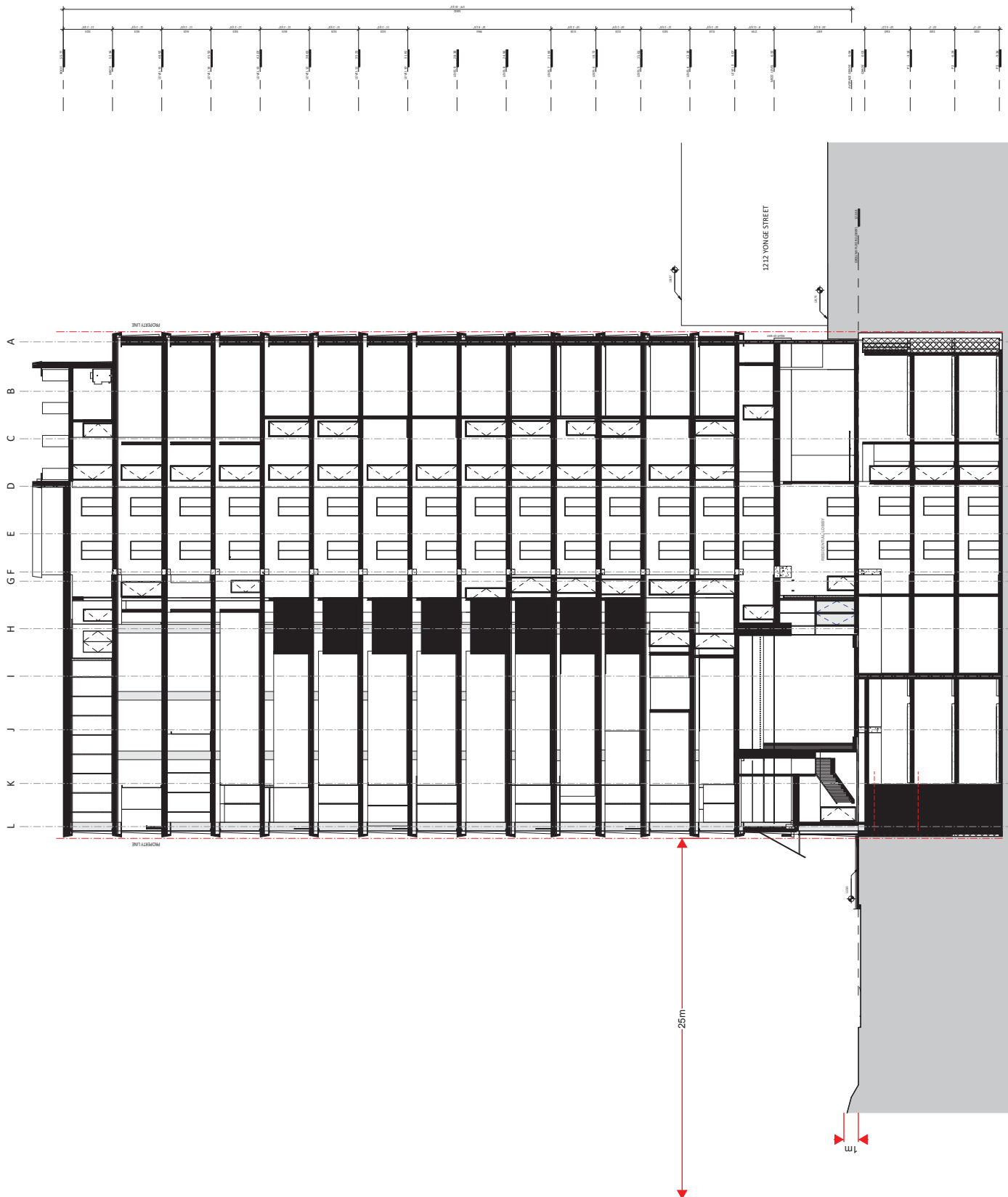
KPMB
 ARCHITECTS
 1000 SHEPPARD AVENUE EAST, SUITE 100
 SCARBOROUGH, ONTARIO M1S 1W4
 416-291-1100

PROJECT: 1886-1210 YONGE ST.
 DRAWING NO.: 2024-01

DWG#: 2024-01
 DATE: 2024-01-15
 SCALE: 1:100
 SHEET NO.: A6.002
 TOTAL SHEETS: 2024-01

BUILDING SECTIONS

A6.002



2 SECTION - NS FACING WEST

GENERAL NOTES:

1. This drawing is a preliminary architectural drawing and is not to be used for construction purposes.
2. The architect and contractor shall be responsible for the coordination of all trades and disciplines.
3. The contractor shall be responsible for the coordination of all trades and disciplines.
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KPMB
 ARCHITECTS
 1000 SHEPPARD AV. EAST, SUITE 100
 SCARBOROUGH, ONTARIO M1S 1T2
 416-491-1100

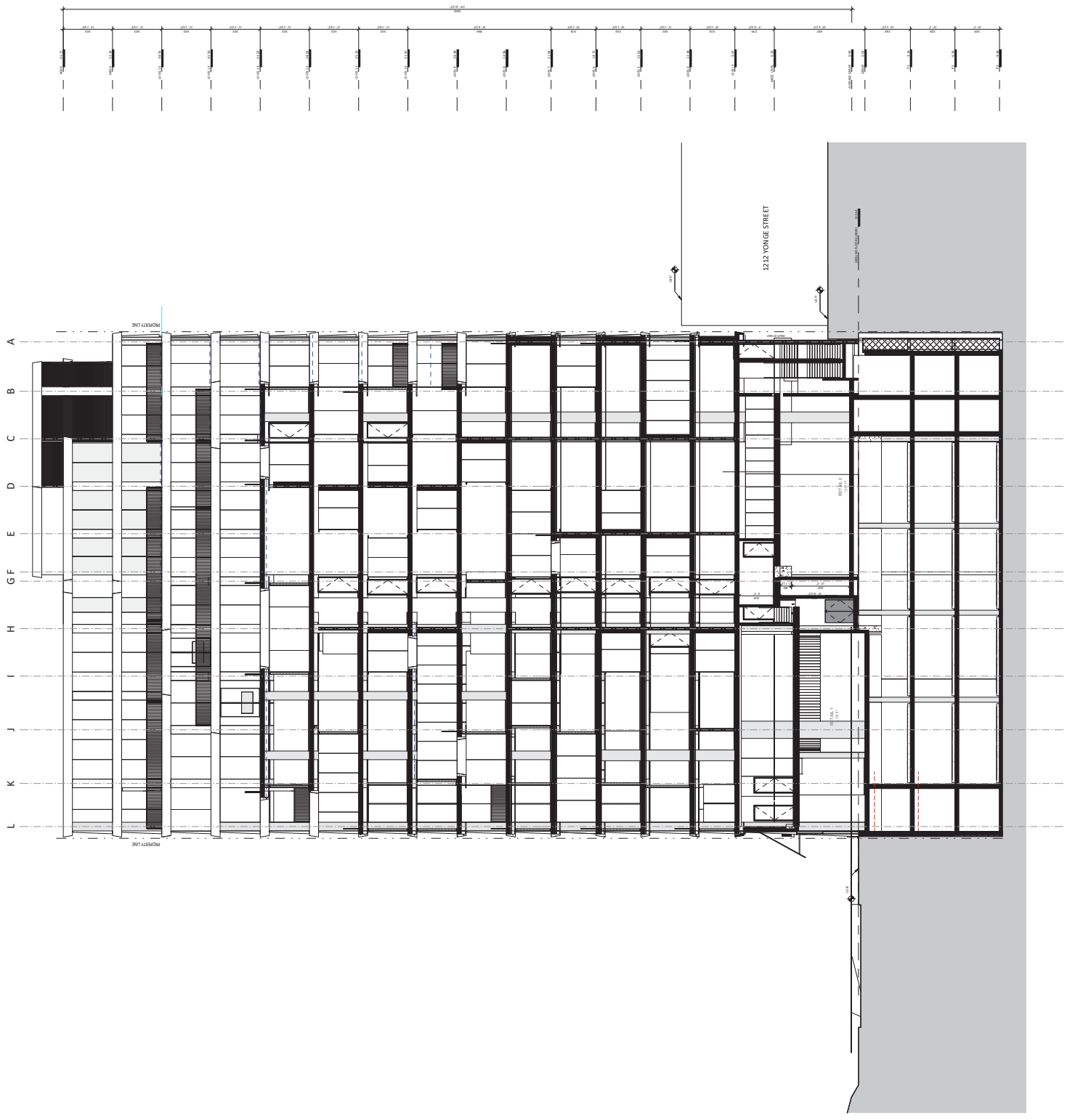
1886-1210 YONGE ST.

DATE:
 2024.01.15

SCALE:
 1/8" = 1'-0"

BUILDING SECTIONS

A6.003



SECTION - NS FACING WEST RETAIL

8.3 Appendix C – Energy Balance Analysis

Energy Balance Analysis – 1196-1210 Yonge Street & 2-8 Birch Avenue

Memo

November 4, 2021

To: Birch Equities Limited

From: Jamie Kennedy

cc: David Anders
Behrang Dadfar

1.0 Introduction

The Energy Balance contained herein was prepared to assess theoretical derailment scenarios to inform the risk assessment as part of a new development application to permit a mixed-use residential development at 1196-1210 Yonge Street & 2-8 Birch Avenue (the 'Site'). The Site is located at Mile 2.20 of the Canadian Pacific Railway-owned North Toronto Subdivision rail corridor on the northwest corner of Yonge Street and Birch Avenue. Using Method 2, the 'Energy Balance' approach from the AECOM Crash Wall Guidance, the theoretical impact from nearby railway operations was evaluated.

The North Toronto Subdivision is comprised of 2 principal mainline tracks, with a maximum allowable speed of 50mph (80km/hr) for freight rail service. Passenger rail service is not scheduled or run through this rail corridor.

Importantly, the Site does not share a property line with the rail corridor. The Site is separated from the rail right-of-way by two public roads: Yonge Street and Birch Avenue. The rail corridor is elevated above the development lands and travels on a rail bridge over Yonge Street. The closest existing track is approximately 14.5m from the edge of the rail bridge, shown in Figure 1 .

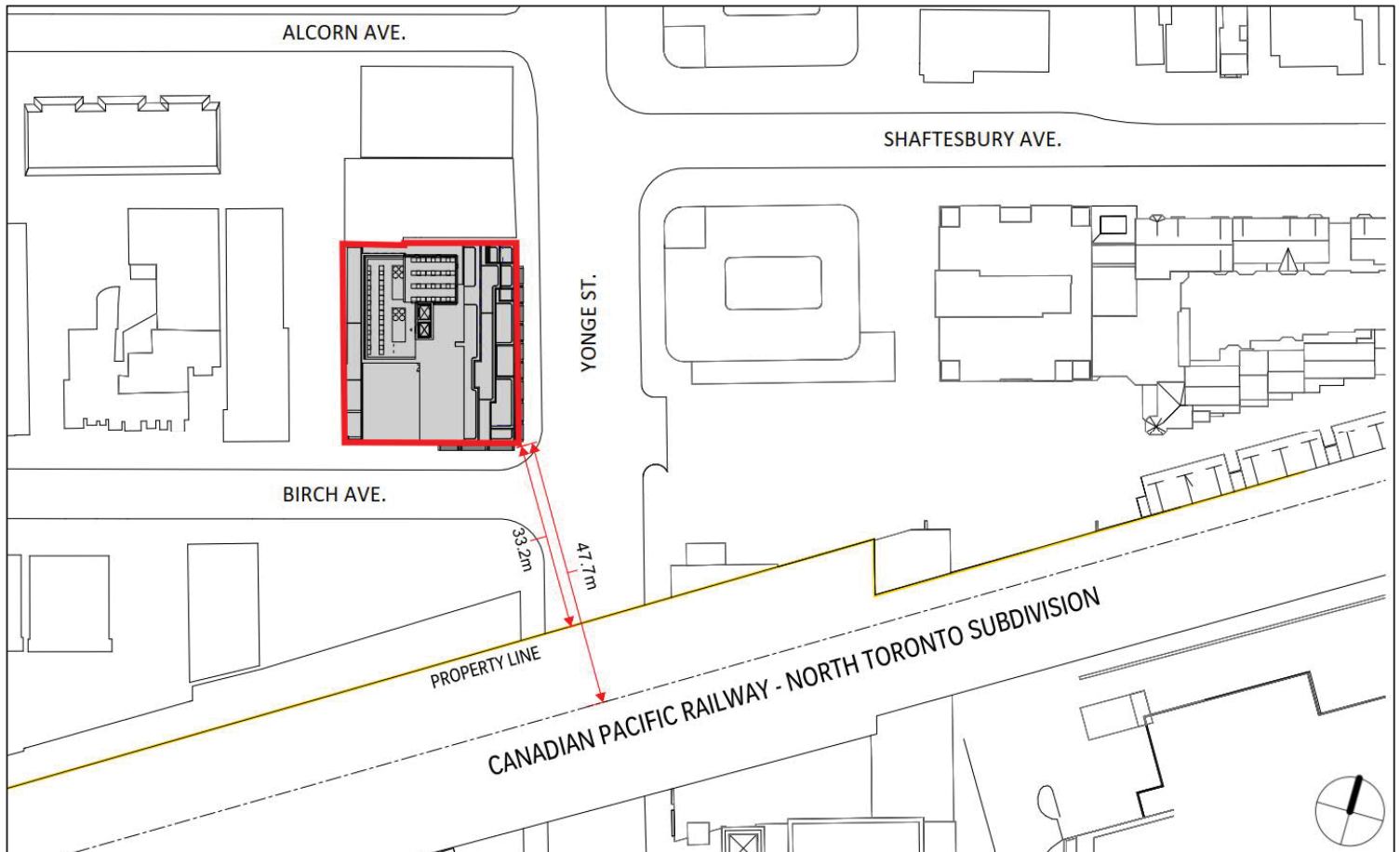


Figure 1: Site Location

2.0 Rail Corridor Details

Below are the approximate distances between the centreline of the closest track and the property line of the development, which is approximately 47.7 metres. The distance between the centreline of the closest track and the edge of the rail bridge is also highlighted, which is shown to be 14.5 metres.

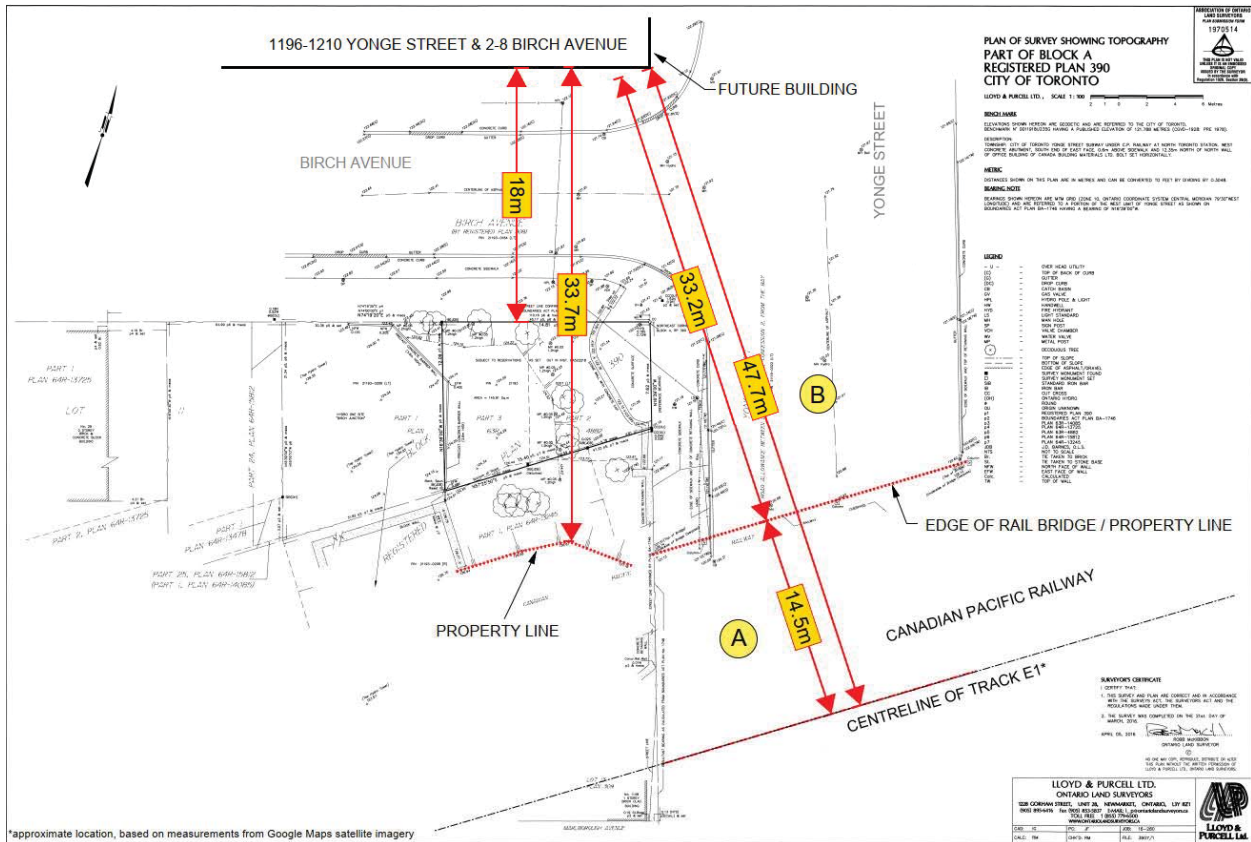


Figure 2: Rail Corridor Setbacks

Three specific measurements were considered in the analysis which correspond with Figure 2.

Table 1: Distances considered in Energy Balance Analysis

ID	Track No.	Distance to Centreline of Track (m)
A	Distance to Edge of Rail Bridge	14.50
B	Distance from Track to Property Line	47.70

As discussed above, the maximum design speed for the rail corridor is 50mph. Passenger service is not offered by CP Railway and is not scheduled to run through this corridor in the future.

3.0 Assumptions

- All calculations and figures are reported in S.I units.
- The current calculations herein rely on freight train information as outlined in industry standards and guidelines, including AREMA and the AECOM guide for crash wall design.
- The AECOM guidelines recommends not considering load cases where the distance from centre lines of track are greater than 8.5 m for single car freight impacts (Load case 2).
- The roll-over of locomotives and passenger cars is a possible occurrence in the existing condition due to the grades involved depending on their centre of gravity. This has not been considered in the energy simulations.
- The acceleration does not take into account air resistance, and thus the actual deceleration is likely be greater that what is stated.

4.0 Methodology

In determining the kinetic energy from a derailed train, the following reference documents are used to develop the approach:

- “FCM/RAC” - Guidelines for New Development in Proximity to Railway Operations (May 2013) – 1 method
The Federation of Canada Municipalities and the Railway Association of Canada
- “AECOM” - Submission Guidelines for Crash Walls (July 29, 2014), the “Guideline”. – 2 methods
“Development of Crash Wall Design Loads from Theoretical Train Impact”, by Gaylene Layden

In these guidelines, the energy balance approach is used to determine the impact load to use when designing the crash wall. Two scenarios of “Glancing Blow”, where the train hits the wall at an angle, and “Direct Impact”, where the train hits the wall head on, have been considered. These scenarios are shown in Figures 3 and 4.

Figure 3: Direct Impact¹

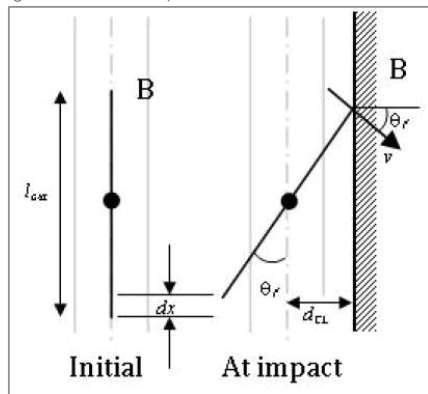
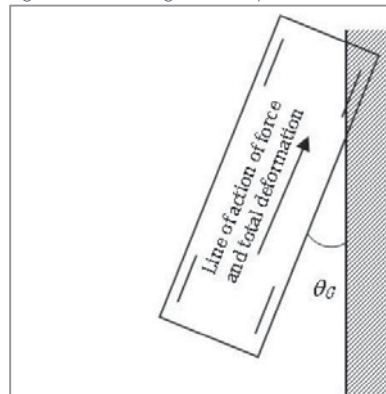


Figure 4: Glancing Blow Impact²



The FCM/RAC guidelines represent a more extreme scenario using heavier trains/cars and not accounting for the reduction in velocity of derailed train as it travels along a surface. Table 1 provides a brief summary of these guidelines.

The AECOM guidelines apply an energy balance approach that considers a collision by glancing blow and single car rotation to determine the design load for a wall at a distance d_{cl} from the centerline of track in feet (m). The four cases to be considered are:

- 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.
- 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. Where d_{cl} is greater than 28 feet (8.5 m), this load case need not be considered.

Table 2 – Guidelines and Methodology

Load Cases	FCM/RAC Guidelines (2013)	AECOM – Method 2 - “Energy Balance” (2014)
Load Case 1 – Glancing Blow, Freight		
Train Details:	3 x locomotives weighing 200,000 kg each + 6 x cars weighing 143,000 kg each	9 x cars, weighing 129,700 kg each
Angle of Impact (θ_g):	10°	3.5° (suggested)
Load Case 2 – Direct Impact, Freight		
Train Details:	1 x car weighing 143,000 kg	1 x car, weighing 129,700 kg
Angle of Impact (θ_c):	90°	Defined by $\theta_F = \text{asin}\left(\frac{d_{cl}}{8.5}\right)$ based on the d_{cl} of each track (m)

¹ Development of Crash Wall Design Loads from Theoretical Train Impact by Gaylene Layden, AECOM (2014)

² Development of Crash Wall Design Loads from Theoretical Train Impact by Gaylene Layden, AECOM (2014)

5.0 Energy Balance Analysis Results

The distance from the centreline of the closest track, based on the current track alignment, to the edge of the rail bridge and to the property line was assessed. The force of highest magnitude from each of the load cases is indicated and helps to inform the recommended rail safety mitigation measure(s) that are appropriate for the development.

Note, only freight trains were included in the analysis, as there is no passenger train traffic on this corridor.

Table 3: Summary of Energy Balance Results with the Existing Speed

Parameter	Method 2	
	Point A (Edge of Rail Bridge)	Point B (Edge of Property Line)
Distance from centreline of track	14.5m	47.7m
Rail Corridor Speed	80 km/h (50 mph)	80 km/h (50 mph)
Impact Force (kN) (AECOM guidelines)	N/A No Impact	N/A No Impact
Critical Velocity for Impact	114 km/h (71 mph) (Freight Car, Load Case 1 – Glancing Blow)	215 km/h (134 mph) (Freight Car, Load Case 1 – Glancing Blow)

6.0 Conclusion

The energy balance calculations have been performed as per the recommended methodology outline in the AECOM/AREMA guidelines. This analysis follows the prescribed Method 2 of AECOM's Crash Wall Design Guidelines to determine the maximum amount of energy dissipated under each derailment scenario. The analysis showed that there is no impact with the current configuration and speed.

The Energy Balance indicates that a derailed train would lose momentum before leaving the rail corridor right-of-way. In order for a train to leave the extent of the right-of-way, it would have to derail at a speed of approximately 71mph (114km/h), nearly 50% higher than the current maximum track design speed.

In order for a train to leave the right-of-way and reach the property line of the development, it would have to derail at a speed of approximately 134mph (215km/h), more than 2.5 times the maximum allowable speed limit within the rail corridor. Freight train speeds are federally regulated and limited to 50mph (80km/h) through urban areas. It is considered extremely unlikely that a freight train would be able to reach this speed.

Therefore, with the assumptions of this study, the proposed development at 1196-1210 Yonge Street & 2-8 Birch Avenue is not likely to be at risk of an impact from a derailed freight train with a maximum speed of 50mp/h (80k/h).

7.0 References

1. FCM/RAC Guidelines for New Development in Proximity to Railway Operations (May 2013)
<https://www.proximityissues.ca/>
2. AECOM Submission Guidelines for Crash Walls (July 29, 2014)
3. Development of Crash Wall Design Loads from Theoretical Train Impact by Gaylene Layden, AECOM (2014)
4. AREMA Manual for Railway Engineering. American Railway Engineering and Maintenance-of-Way Association. 2017. Concrete Structures and Foundations.
5. CP Engineering Structures Design Standards – Protection of Structures Adjacent to Railroad Tracks (April 2016)

8.4 Appendix D – Rail Corridor Details

East Division Time Table No 12, Module 10 North Toronto Subdivision – Effective at 0001 October 14, 2015

Train Standby Channel	Point to Train Tower Code	RTC Call-in Channel and RTC Call-in Code	RTC Authorities Channel	Emergency Call-in Code	Utility Channel and RTC Call-in Code	Utility Tower Code	Maintenance of Way Channel	Miles from Leaside	WESTWARD ↓	NORTH TORONTO SUBDIVISION (Subdivision No 6531) TrAM Area 1		EASTWARD ↑	Main Track(s)	Method of Control	TGBO / DOB Limits	Siding Capacity in Feet Signalled Siding	Station Number
										STATIONS							
CP 4 67-67	232	CP 9 21-67 *21#	60-60	911	CP 14 15-71 *21#	242	CP 13 71-71	0.0		LEASIDE	X	2	CTC +	DOB			3178
								3.4		HOWLAND	X						
								5.2		Interlocked Railway Crossing							
								5.5		OSLER Jct MacTier Sub	X						
								5.9		WEST TORONTO Jct Galt and MacTier Subs	X						

NORTH TORONTO SUBDIVISION FOOTNOTES

0.0 RADIO

- 0.1 Zone Code (Z) is 2.
- 0.2 To call Engineering Service Reliability, dial *21106# on CP 14 (15-71).

2.0 EQUIPMENT RESTRICTIONS

- 2.1 **Crane and Auxiliary**
— 414216 to 414232: 30 MPH on bridge mile 5.15.

3.0 DANGEROUS COMMODITIES

- 3.1 Key trains and all movements handling one or more full carloads, containerloads or trailerloads of SPECIAL dangerous commodities, unless a lower speed is otherwise prescribed, must not exceed 25 MPH between mile 0.0 and mile 5.9.

Loaded cars (not applicable to residue cars) containing other dangerous goods, unless a lower speed is otherwise prescribed, must not exceed 35 MPH between mile 0.0 and mile 5.9.

4.0 SPEEDS

4.1	Westward Movements			Eastward Movements
	MPH	Mile		MPH
	50	0.0	to 5.2	50
	35	5.2	to 5.9	35

4.2 Speed Restrictions, Extreme Temperatures

In the application of GOI Section 5, item 29.0, if the ambient temperature (degrees Celsius):

Rises to or above	Between Miles	Track	MPH
32	0.0 and 5.9	All Main	40
Drops to or below	Between Miles	Track	MPH
- 35	Entire Subdivision	All Main	35

5.0 TGBO / DOB LIMITS

- 5.1 DOB applicable on all main tracks between Leaside and West Toronto.

6.0 CENTRALIZED TRAFFIC CONTROL

- 6.1 CTC Rules apply between signals 2063-1 and 2063-2 at Leaside and signals 59N and 59S at West Toronto.

9.0 PUBLIC CROSSINGS AT GRADE

- 9.1 Whistle signal T&E 7.4(e) is prohibited at all public crossings at grade.
- 9.2 **Mile 4.62, Bartlett Avenue**
— Westward trains over 3000 feet in length must not pass signal 45-1 or 45-2 unless it displays an aspect less restrictive than Clear to Stop.
— Engine bell T&E 7.3 prohibited.
- 9.3 **Mile 5.7, Osler Avenue**
Engine bell T&E 7.3 prohibited.

NORTH TORONTO SUBDIVISION FOOTNOTES

10.0 INTERLOCKINGS

10.1 Davenport , mile 5.26 (CN Davenport)

Remotely-controlled interlocked railway crossing at grade with CN (mile 4.6 Newmarket Subdivision).
Controlled by CP RTC.

Governing signals on CP for:

- westward movements, signals 53-1, 53-2
- eastward movements, signals 54-1,54-2.

Governing signals on CN for:

- northward movements, 45
- southward movements, 46.

Authority required for	Refer to
A movement to pass governing signal indicating STOP	T&E 18.10
Track Unit operating as a train	T&E 8.4
Track Unit	ENG 6.6
Track Work	ENG 6.7 *

In the application of T&E 18.10, T&E 17.7 does not apply on CP tracks.

* TOP may be issued between identifiable locations, or may specify “all tracks Davenport Interlocking” when necessary to provide protection on multiple routes.

11.0 GENERAL FOOTNOTES

11.1 To avoid annoyance to public, when necessary to stop at the following signals, try to stop by the location indicated. “Don’t Hold” = avoid stopping at that location if possible.

Direction	Signal Number	Track	Location
Eastward	58-1 & 58-2	Both	Don't Hold
	54-1 & 54-2	Both	Don't Hold
	46-1 & 46-2	Both	Don't Hold
	34-1 & 34-2	Both	50 feet west of Bathurst Street
	16-1 & 16-2	Both	Don't Hold
	02-1	South	Don't Hold
Westward	02-2	North	50 feet west of signal
	15-2 & 15-1	Both	Don't Hold
	33-2 & 33-1	Both	250 feet east of signal
	45-2 & 45-1	Both	100 feet east of signal
	53-2 & 53-1	Both	800 feet east of signal
	57-2 & 57-1	Both	Don't Hold
	59N & 59S	Both	Don't Hold

12.0 SPURS AND OTHER TRACKS

12.1 Leaside Yard

- A. In the application of T&E 14.8(a), movements may leave non-main track switches lined and locked in either position.
- B. Maximum speed 5 MPH on track T107.

12.2 Dimensional Traffic

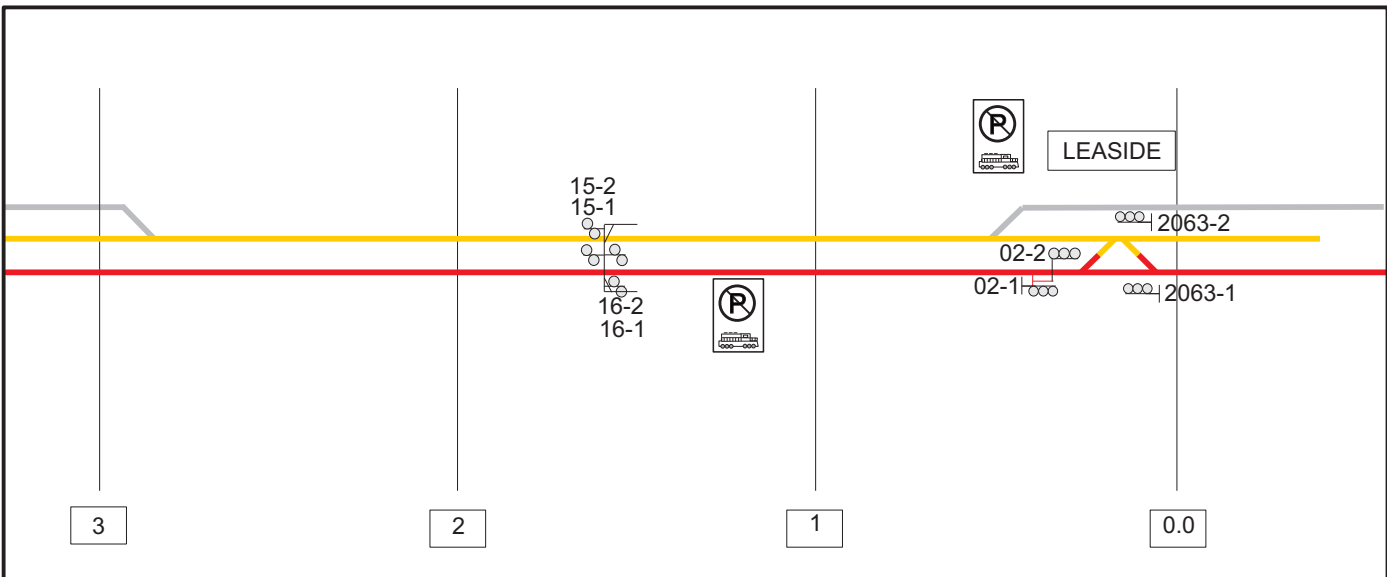
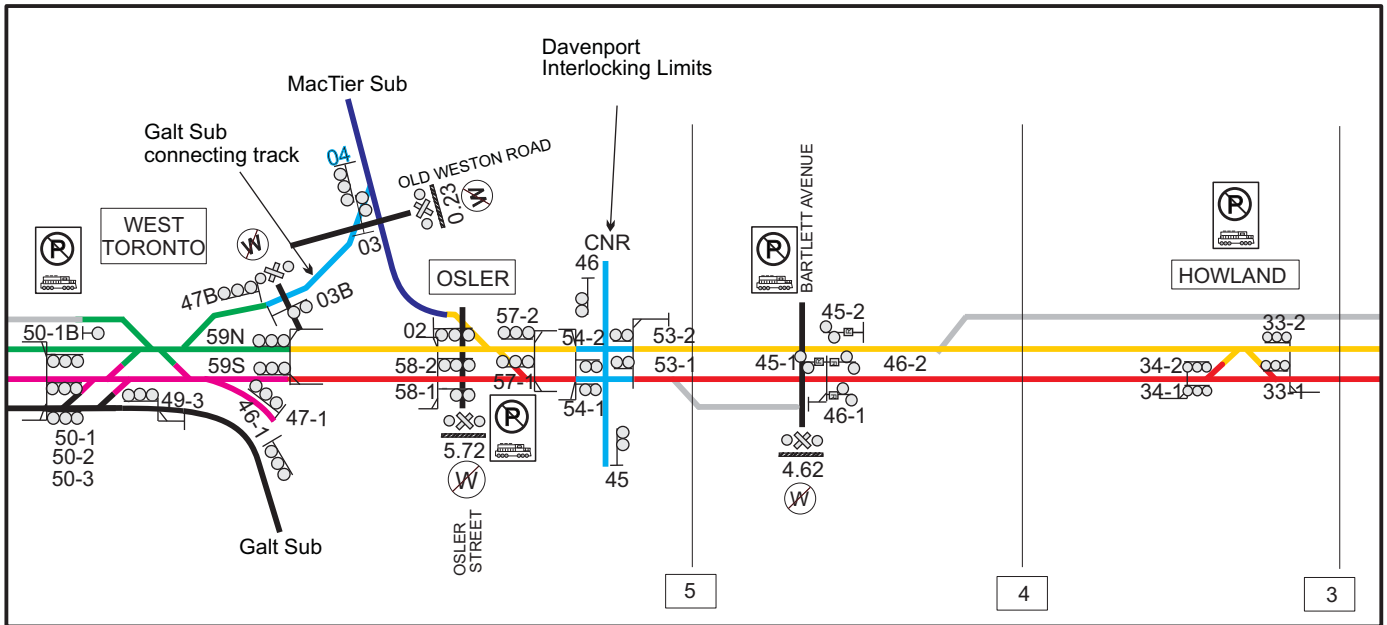
- A. Track P66 - account less than standard track centres, dimensional traffic must be protected as prescribed by GOI Section 10, Item 4.3, CHART #1.
- B. Track P6 & P8 - account greater than standard track centres, dimensional traffic not exceeding W-09, placed east of Locomotive “No Parking Sign” mile 4.87 but not within 200 feet of the east end of P6 at mile 4.64 will not conflict with movements operating on the south main track within these limits.
- C. Dimensional traffic must not be placed on track P6 west of mile 4.87 or within 200 feet of the east end of P6 without authority of the RTC, who must then afford standard prescribed dimensional traffic protection for main track movements on the south track.

12.3 Avoiding Annoyance to Public - P6 & P8

Unless unavoidable:

- cars placed in tracks P6 and P8 must not be left between Locomotive “No Parking Signs” erected at mile 5.1 and at mile 4.87 North Toronto Subdivision.
- trains lifting at P6 or P8 must also ensure that no part of their train is left standing within these limits.

North Toronto Sub (West Toronto to Leaside)

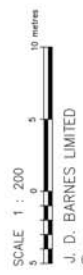


8.5 Appendix E – Site Survey

COMPILATION OF THE SURVEY DATA:
 This plan is a compilation of the survey data for the lots shown hereon. It is not a new survey and does not constitute a new survey. The original survey data is available for inspection at the office of the Surveyor General of Ontario, Toronto, Ontario.

GENERAL NOTES:
 1. The plan is compiled from the original survey data and is subject to the same conditions and restrictions as the original survey data.
 2. The plan is compiled from the original survey data and is subject to the same conditions and restrictions as the original survey data.
 3. The plan is compiled from the original survey data and is subject to the same conditions and restrictions as the original survey data.
 4. The plan is compiled from the original survey data and is subject to the same conditions and restrictions as the original survey data.
 5. The plan is compiled from the original survey data and is subject to the same conditions and restrictions as the original survey data.
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 7. The plan is compiled from the original survey data and is subject to the same conditions and restrictions as the original survey data.
 8. The plan is compiled from the original survey data and is subject to the same conditions and restrictions as the original survey data.
 9. The plan is compiled from the original survey data and is subject to the same conditions and restrictions as the original survey data.
 10. The plan is compiled from the original survey data and is subject to the same conditions and restrictions as the original survey data.

COMPILED PLAN SHOWING TOPOGRAPHY OF
PART OF LOTS 1 AND 2,
REGISTERED PLAN 308 YORKVILLE
CITY OF TORONTO



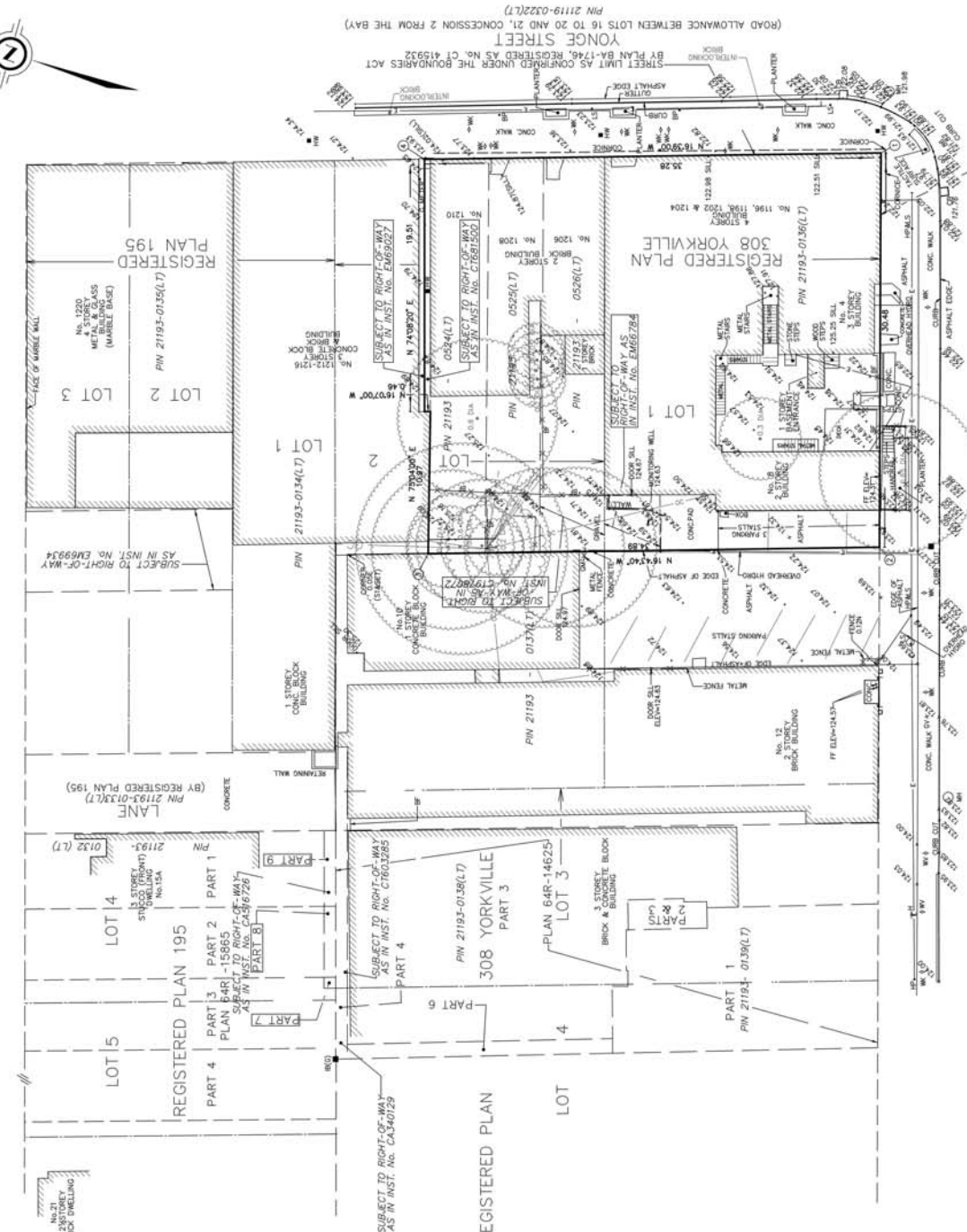
NOTES:
 DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRIC METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

BEARINGS AND DISTANCES:
 BEARINGS ARE GRID AND ARE REFERRED TO THE WESTERLY LIMIT OF LOT 160, HAVING A BEARING OF N 10°30'00" W IN ACCORDANCE WITH ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND PLAN BA-1746.

TOPOGRAPHY:
 TOPOGRAPHY IS SHOWN BY CONTOUR LINES AND SPOTS. SPOTS ARE PUBLISHED ELEVATIONS OF 122.897 METRES.

LEGEND

- CB DENOTES SINGLE CATCH-BASIN
- + GV DENOTES GAS VALVE
- HM DENOTES HYDRO MANHOLE
- MH DENOTES MANHOLE
- TMH DENOTES TELEPHONE MANHOLE
- BOL DENOTES BOLLARD
- HP DENOTES HYDRO POLE
- LS DENOTES LIGHT STANDARD
- PLR DENOTES PULLER
- P DENOTES POST
- S DENOTES SIGN
- SBN DENOTES TELEPHONE PEDESTAL
- FED DENOTES FIRE HYDRANT
- H DENOTES WATER KEY
- WK DENOTES WATER VALVE
- WV DENOTES HYDRO HAND WELL
- HW DENOTES HYDRO WELL
- MB DENOTES MAIL BOX
- TP DENOTES TELEPHONE POLE
- BF DENOTES BOARD FENCE
- M DENOTES METER
- MW DENOTES MANHOLE



THE FIELD WORK WAS COMPLETED ON AUGUST 30, 2019.

J.D. BARNES SURVIVING
 MAPPING
 LAND INFORMATION LIMITED
 41 BURNHAMTHORPE ST. EAST, SUITE 101, TORONTO, ON M6A 3R5
 T: (416) 368-3337 F: (416) 368-5388 www.jdbarnes.com

SCALE: 1:200
 DATE: 2019-08-30
 PROJECT: 19-001-001

DRAWN BY: MPT/AS/BCE
 CHECKED BY: CDB/JW/7908
 REFERENCE NO.: 105-22-368-04
 FILE: B:\19-001-001\Drawings\19-001-001.dwg
 9/17/19

PLAN OF SURVEY SHOWING TOPOGRAPHY
PART OF BLOCK A
REGISTERED PLAN 390
CITY OF TORONTO
LLOYD & PURCELL LTD.

SCALE 1:300
METRES

YONGE STREET

FUTURE BUILDING

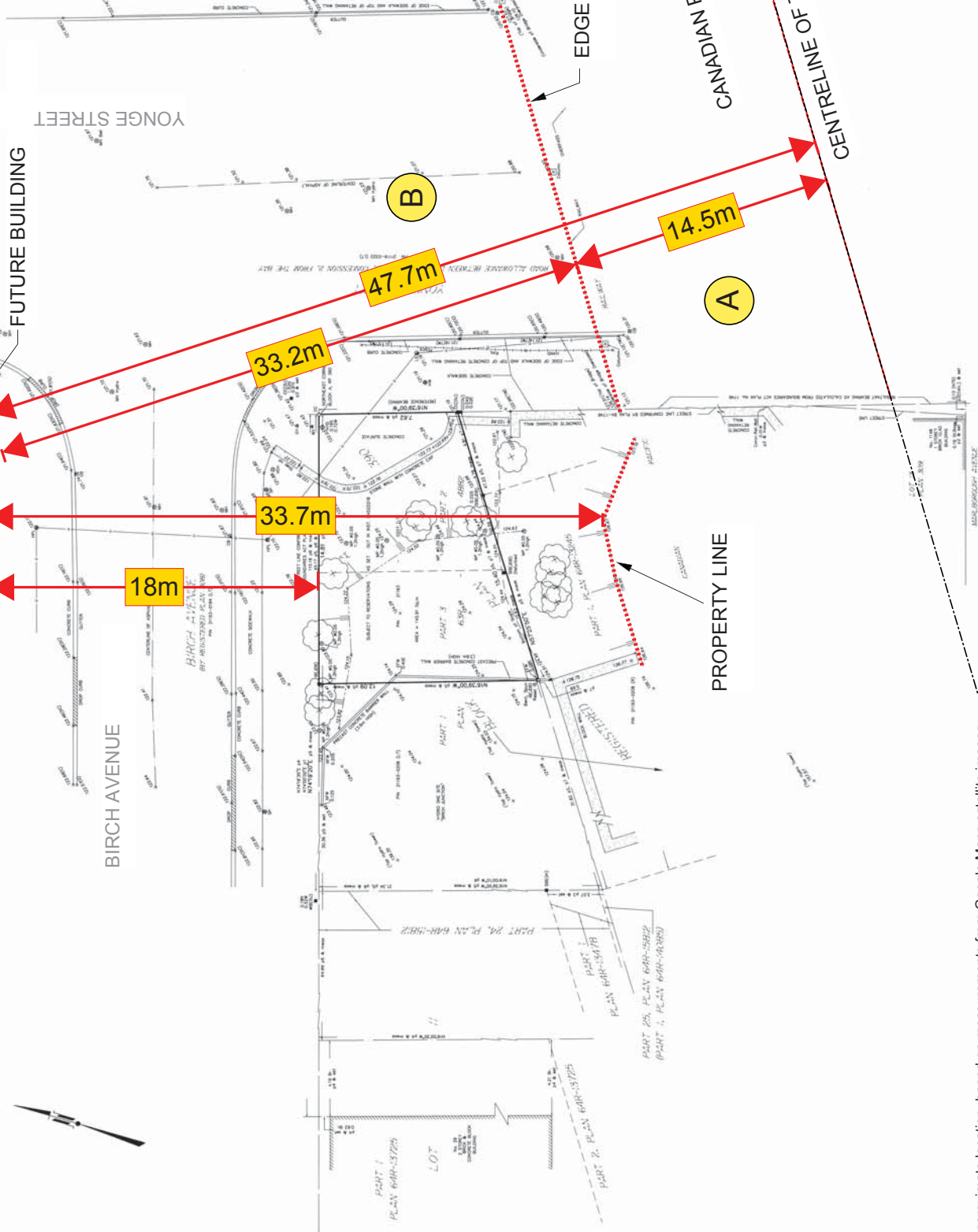
1196-1210 YONGE STREET & 2-8 BIRCH AVENUE

BIRCH AVENUE

EDGE OF RAIL BRIDGE / PROPERTY LINE

CANADIAN PACIFIC RAILWAY
CENTRELINE OF TRACKS

PROPERTY LINE



SURVEYOR'S CERTIFICATE
I CERTIFY THAT:
1. THE SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEY ACT AND REGULATIONS AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 21st DAY OF MARCH, 2018.
APRIL 05, 2018
LLOYD & PURCELL LTD.
REGISTERED PROFESSIONAL SURVEYORS

LLOYD & PURCELL LTD.
ONTARIO LAND SURVEYORS
1208 CORKHAM STREET, UNIT 201, NEWMARKET, ONTARIO, L3Y 6Z1
9050 895-6476 Fax: 9050 895-6477
WWW.LLOYDANDPURCELL.COM

*approximate location, based on measurements from Google Maps satellite imagery

8.6 Appendix F – Risk Assessment

Risk Assessment Matrix Framework

TSB Class:	Class 1		Class 2		Class 3		Class 4		Class 5	
	Catastrophic		Critical		Serious		Marginal		Negligible	
Frequent	5	25	20	15	10	5	2	1		
Probable	4	20	16	12	8	4				
Occasional	3	15	12	9	6	3				
Remote	2	10	8	6	4	2				
Improbable	1	5	4	3	2	1				

Risk Scoring for Each Instance

Frequency x Severity	Risk Category	Mitigation Strategy
Low	1 to 5	Broadly Acceptable Risk is acceptable. No further mitigation required.
Medium	6 to 10	Tolerable Risk is considered tolerable if agreed that the risk is reduced to a level considered as low as reasonably practicable.
High	11 to 25	Intolerable Risk shall be eliminated/reduced.

Frequency Criteria

Rating	Qualitative Interpretation
1	Unlikely to occur, but possible. It can be assumed the event is unlikely to occur.
2	Likely to occur sometime in the rail system lifecycle. It can reasonably be expected to occur several times.
3	Likely to occur several times. The event can be expected to occur several times.
4	Will occur several times. The event can be expected to occur frequently.
5	The event will be continually experienced

*** Assessment based on TSB data recorded since 2000.

Definition of Safety Hazard Severity Criteria

Hazard Rating	Consequence to Personnel or General Public	Consequence to the Environment
Negligible	1 Non-reportable injury	None
Marginal	2 Single minor injury	Reversible minor environmental impact
Serious	3 Single permanent partial or temporary total disabling injury; Multiple minor injuries.	Reversible moderate environmental impact
Critical	4 Single fatality; Single instances of permanent total disability; Multiple instances of permanent partial or temporary total disabling injuries.	Reversible significant environmental impact
Catastrophic	5 Multiple fatalities; Multiple instances of permanent total disability	Irreversible significant environmental impact

Going-in Assumptions and Conditions

- 1) The history of main line derailments has been considered as a part of this risk assessment.
- 2) Freight traffic is expected to continue at the current rate in the future.
- 3) Hazardous and flammable materials will continue to be scheduled and transported through this corridor.
- 4) Passenger trains do not operate through the corridor
- 5) Should any trains carrying dangerous goods operate on this line, such a train would operate at reduced mainline speeds, as outlined by CP's timetable for this corridor; speeds would be reduced to 35mph
- 6) The following assessment is based on accidents/incidents reported by the TSB between 2001 to 2021