

# 299 West Hunt Club Road, Ottawa

## RAIL SAFETY PROXIMITY STUDY

FOR  
PRITEC Management Inc.

July 24, 2025  
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### Issue and Revision Record

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## INTRODUCTION

Entuitive Corporation (“Entuitive”) has been retained by PRITEC Management Inc. (the ‘Owner’ or ‘Applicant’) to review the development proposal at 299 West Hunt Club Road, Ottawa, and assess the plans against the most recent guidelines for new development in proximity of an active heavy rail corridor.

It is our understanding that the Applicant is seeking to expand the existing automotive/light-industrial operations on the property, which exists as a car dealership today. The site is adjacent to Canadian National Railway’s (CN) Beachburg Subdivision rail corridor, a main line track that carries infrequent, low speed freight traffic through Ottawa and surrounding areas.

As part of our review, we have prepared a Rail Safety Report for the site, which is summarized herein. The intention of this report is to assess the risk profile of the adjacent rail corridor, determine the Site’s ability to provide the standard mitigation, and summarize the measures that are proposed for the new development within the context of the existing guidelines.

The scope of our review is limited to rail safety matters. Other relevant disciplines, including noise, vibration, stormwater management, and air quality, fall outside the scope of this review and, where required, are expected to be addressed by qualified professionals. Additionally, the proposed mitigation measures apply to the development lands and don’t extend to the safety of individuals or property beyond it or within the rail corridor.

## GUIDELINES AND METHODOLOGY

For this site, the applicable rail adjacent development requirements are those of CN Railway and the Municipality. This review has been prepared with reference to the following guidance documents:

- *Federation of Canadian Municipalities / Railway Association of Canada (FCM/RAC) Guidelines for New Development in Proximity to Railway Operations;*
- *CN Railway: Non-Residential Development Adjacent to the Railway Right-of-Way (Main Lines); and*
- *AECOM Development of Crash Wall Design Loads from Theoretical Train Impact*

### [FCM/RAC Proximity Guidelines \(2013\)](#)

The Guidelines for New Development in Proximity to Rail Operations (or ‘FCM/RAC Guidelines’) began as an initiative between the Federation of Canadian Municipalities and the Railway Association of Canada, to identify best practises and guidelines for new developments in proximity to railways, which present a unique set of risks and challenges.

The guidelines are intended to be used “to provide municipalities with the necessary tools to facilitate decision-making” and “address the variable nature in the delivery of mitigative measures for new developments in proximity to railway operations.” (Section 1, p.6).

Importantly, the guidelines also recognize, “when it comes to safety, all parties must be aware that there are inherent safety implications associated with new developments in proximity to a railway line, and that these implications can often be mitigated, but typically not entirely eliminated. The goal is to establish a common, standardized process, whereby potential impacts to safety in the context of development applications in proximity to rail corridors can be assessed.” (Section 1, p.6).

The FCM/RAC Guidelines set out requirements for:

- Life Safety: Impact from a derailed train, fire, smoke, projectiles and/or debris from an accident
- Comfort/Quality of Life: Noise, vibration, air quality

New developments along the rail corridor should be designed and built to provide reasonable protection to the development against rail activities and accidents. As such, the guidelines recommend mitigation measures be provided as a “package” to most effectively mitigate the risks associated with railway activities. The guidelines define this ‘package’ of measures simply as “Standard Mitigation” and “Alternative Mitigation”.

#### Standard Mitigation

The standard mitigation measures include minimum setbacks to sensitive and/or high occupancy uses, a minimum 1.83-metre-high security fence along the railway property line, an acoustic/noise barrier (height determined on a site-by-site basis) and, where applicable, a safety barrier in the form of an earthen berm, crash wall, or alternative barrier.

The FCM/RAC Guidelines also discuss a variety of additional risks related to new development including but not limited to stormwater management, air quality, noise, vibration, construction, and trespassing risks. These considerations are typically addressed through additional studies and controls, carried out by qualified professionals, and reviewed as part of a development application.

Table 1 below outlines the setbacks and safety barriers for sensitive and high occupancy uses. Notably, these mitigation measures consider the classification of the track and vary depending upon the nature of the line.

*Table 1: FCM/RAC Guidelines – Standard Mitigation*

Classification of Rail / Track	Setback	Standard Berm Height	Standard Berm Slope
Freight Rail Yard	300m	n/a	n/a
Principal Main Line	30m	2.5m above grade	Side slopes not steeper than $\leq 2.5:1$
Secondary Main Line	30m	2.0m above grade	Side slopes not steeper than $\leq 2.5:1$
Principal Branch Line	15m	2.0m above grade	Side slopes not steeper than $\leq 2.5:1$
Secondary Branch Line	15m	2.0m above grade	Side slopes not steeper than $\leq 2.5:1$
Spur Line	15m	No requirement	No requirement

Setback distances are typically measured from the mutual property line to ensure that the entire railway right-of-way is protected for potential rail expansion in the future (Section 3.3, pg.27).

Where the standard mitigation measures cannot be met, the FCM/RAC Guidelines recommend the use of the *Development Viability Assessment tool* to evaluate the suitability of a site for development, and to identify the appropriate mitigation measures based on the profile of the rail corridor. From the assessment, alternative mitigation is measured on its ability to provide an equivalent or higher level of protection as the standard measures would offer.

The Development Viability Assessment is meant to take into consideration details of the development lands, including topography, lot shape and configuration, current and future expansion plans setbacks from the railway, track geometry and alignment, rail corridor speeds, and other site-specific aspects of the local area that could affect the viability of the development.

The development viability assessment framework is illustrated in Figure 1 below.

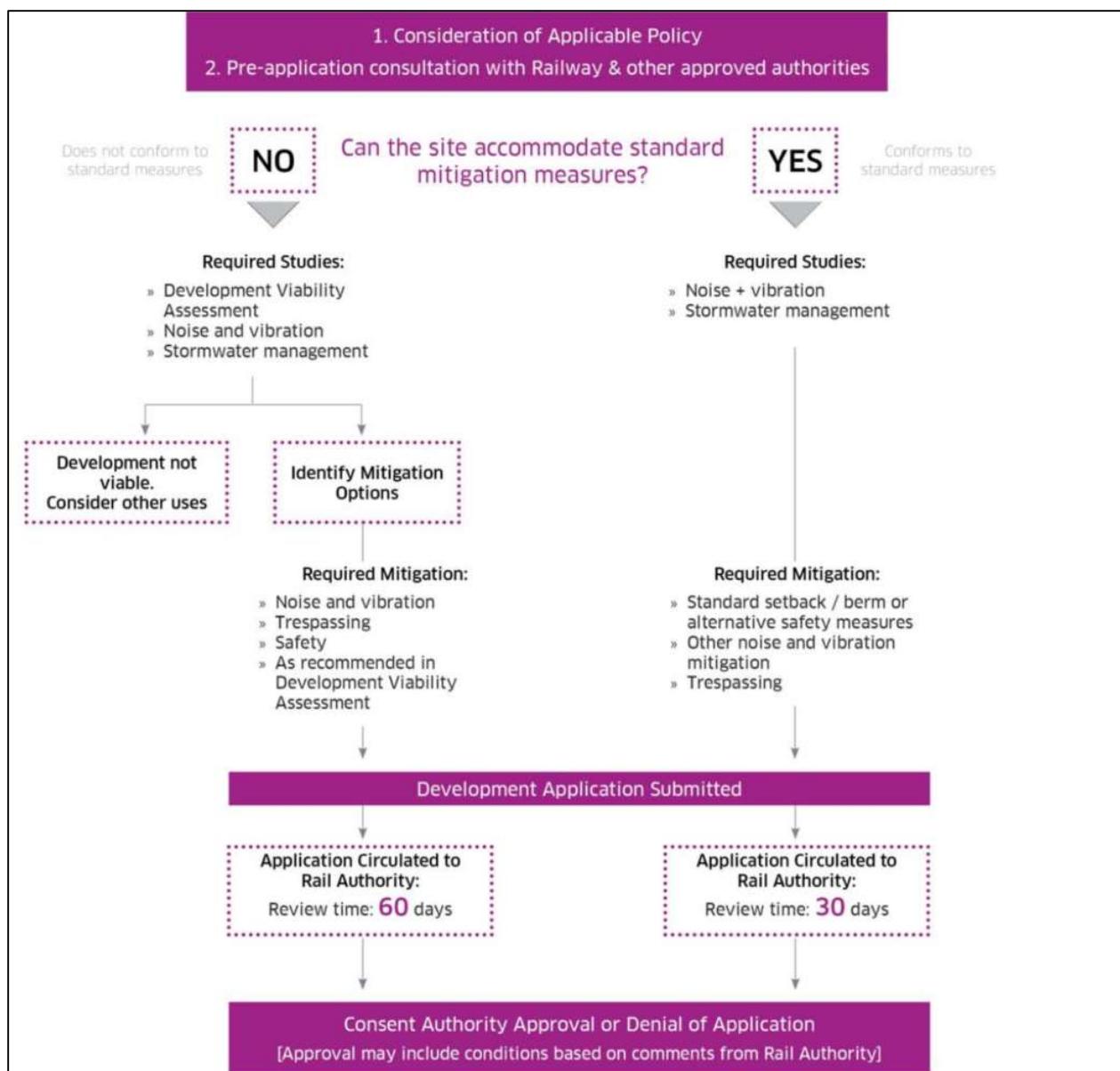


Figure 1: Development Viability Assessment Criteria

It is important to note that while the FCM/RAC Guidelines for New Development in Proximity to Railway Operations technically apply to all forms of development near railway infrastructure, their structure, language, and stated intent clearly emphasize residential development as the primary focus. The guidelines place a heightened emphasis on quality-of-life factors, such as noise, vibration, and air quality, as well as life safety risks, which are of particular concern in sensitive land uses like housing.

The introduction and subsequent sections of the guidelines highlight residential development, residential infill, and conversions from commercial/industrial to residential uses as the key scenarios for which these guidelines are intended. Section 1.3, for example, specifically emphasizes the applicability of the guidelines where a residential development is contemplated:

**[Intended Audience]**

"Municipal staff, as a tool to better understand the safety, vibration, noise, and other issues related to new development along railway corridors, and to more effectively evaluate and provide feedback on development proposals, particularly when they involve a residential component.

"Railways, to update their internal policies regarding development in proximity to railway corridors, particularly residential infill development and conversions, and to provide opportunities for collaboration with stakeholders."

Similarly, Section 2.0 and 2.1 reiterate that the most pressing concerns, such as noise exposure and trespassing risks, are most relevant when residential uses are introduced near active rail operations.

Accordingly, while the guidelines may still offer useful high-level best practices for industrial or commercial development, their most prescriptive mitigation measures are not positioned as mandatory for such land uses.

In practice, these measures have typically only mandatory by rail authorities when residential uses are proposed. As this proposal involves a commercial/industrial use rather than a sensitive residential use, it is reasonable to interpret the FCM/RAC Guidelines as informative rather than prescriptive in this case.

Further, as the rail corridor is owned by CN Railway, the '*CN Non-Residential Development Adjacent to the Railway Right-of-Way*' were also reviewed and considered as part of our assessment and are summarized below.

**CN Non-Residential Development Adjacent to the Railway Right-of-Way (Main Lines)**

The CN Non-Residential Development Adjacent to the Railway Right-of-Way (Main Lines) guidelines outline the recommended safety considerations for non-residential development in proximity to main line rail corridors. This document provides useful guidance for non-residential development that is absent from the FCM/RAC Guidelines.

The majority of the recommendations are consistent with the standard mitigation measures outlined in the FCM/RAC Guidelines, which are summarized above.

However, and most importantly, certain conditions for development are required while others are stated as being recommended. The conditions that are required include a 30-metre setback for vehicle access points (ie. driveways, laneways, etc.) from at-grade crossings, and trespass mitigation in the form of a 1.83-metre-high fence to address trespassing risks. The recommendations for a safety barrier and a setback are not a pre-condition of a approval and are determined by the Applicant on a site-by-site basis.

Notably, the non-residential uses referenced include, "Institutional, Commercial (office, retail, hotel, restaurants, shopping centres, warehouse retail outlets, and other places of public assembly) and recreational facilities (parks, outdoor assembly, sports areas)."

A copy of these guidelines is included in Appendix B – CN Guidelines.

## SITE CONTEXT

The site is an irregularly shaped lot bound by Hunt Club Road to the east, West Hunt Club Road to the south, an undeveloped land parcel to the west, and the CN Railway corridor to the north. These details are illustrated in Figure 2 below.



Figure 2: Context Plan

The adjacent CN rail corridor is comprised of 3 tracks, two active tracks and one inactive industrial track. The site is flat and generally at the same elevation as the nearby rail corridor. The site is located at Mile 6.7 of the corridor, approximately 1km west of the junction between the Beachburg Subdivision and the VIA Rail Smith's Falls Subdivision corridor.

Today, the site is used as a car dealership and automotive repair/service shop. Surface parking is observed on the site between the existing buildings and the rail corridor. The existing uses are illustrated in Figure 3 and Figure 4 below.



Figure 3: Existing Land Use (looking southwest from Hunt Club Road)



Figure 4: Existing Land Use at 299 West Hunt Club Road

In the future, once the development is complete, the existing buildings will remain and will continue to be used for the same purpose as they are today.

## RAIL CORRIDOR CONTEXT

The Beachburg Subdivision extends from Mile 0 in downtown Ottawa to (approximately) Mile 14 where it meets the Renfrew Subdivision (owned and operated by the Arnprior-Nepean Railway). The Beachburg Subdivision from Mile 0-6 is owned by VIA Rail, while CN Railway currently owns the corridor between Mile 6-14. The historical rail map, which highlights CN's ownership (in blue), is illustrated in Figure 5 below.

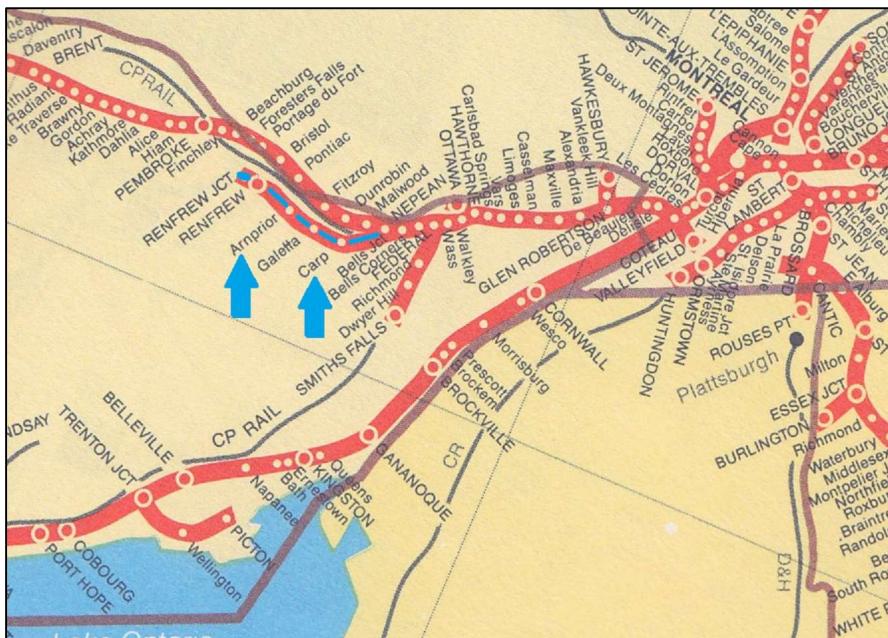


Figure 5: Beachburg Subdivision

### Current Railway Operations

The rail corridor adjacent to the site is comprised of three tracks, as follows:

- A single, active main line track
- A single, active siding track
- A single, inactive industrial siding track

The tracks run in an east-west direction and are straight in alignment alongside the site boundary.

An existing out-of-service industrial track is observed along the southern extent of the rail corridor, extending into the existing employment lands west of the site. Today, the industrial track is overgrown and does not appear to be in use at the time of writing.

Based on publicly available information, weekly train service operates through the corridor which serves industrial manufacturers further west, along the Renfrew Subdivision. The weekly service through the corridor typically involves trains with few cars and smaller loads. The scheduled CN freight service along the Beachburg Subdivision is pictured in Figure 6 below.



Figure 6: CN Railway - Beachburg Subdivision

The infrequent service and reduced train lengths contribute to an overall reduction in the risk profile of the rail corridor. Considering these operational details, the standard mitigation measures for mainline track may be overly onerous due to the infrequent nature of rail service, which more closely reflects operations typically associated with a spur track.

### Future Railway Operations

The Railway Association of Canada's *Rail Atlas of Canada*, included in Appendix A, identify the tracks alongside the subject property as tracks that will be discontinued as part of the Rail Authority's Three-Year Network Plan.

In 2018, CN reclassified the line to "Discontinuance", which the CN website defines as, "the interruption of railway service on a line that is no longer profitable to operate," which entails the removal of rail and ties "immediately after discontinuance."<sup>1</sup>

As of July 11, 2025, CN Railway released a revised Three-Year Network Plan, which confirms the plans to discontinue rail service through the corridor. The revised Network Plan is pictured in Figure 7 below, and included in Appendix A.

<sup>1</sup> CN Railway. 2025. *Network Efficiencies*. Accessed online at: <https://www.cn.ca/en/about-cn/network-efficiencies/>

CN Three-Year Rail Network Plan						
Canadian Network						
Revised July 11, 2025						
Province	Line	Milepost				
		From	To	Total	Status	
Ontario	Alexandria	12.00	72.40	60.40	Retain	
Ontario	Alexandria	72.40	76.30	3.90	Retain	
Ontario	Alexandria / Vankleek Spur	0.00	19.80	19.80	Retain	
Ontario	Alexandria / L'Orignal Spur	0.00	4.20	4.20	Retain	
Ontario	Alexandria / Walkley Line Spur	0.00	4.09	4.09	Retain	
Ontario	Alexandria / Walkley Line Spur	4.09	4.11	0.02	Retain	
Ontario	Alexandria / Walkley Line Spur	4.11	5.83	1.72	Retain	
Ontario	Bala	1.90	276.10	274.20	Retain	
Ontario	Beachburg	0.30	6.00	5.70	Discontinue	
Ontario	Beachburg	6.00	14.50	8.50	Discontinue	
Ontario	Caramat	0.00	243.80	243.80	Retain	
Ontario	CASO	19.50	30.52	11.02	Retain	

Figure 7: CN Railway Three-Year Network Plan (Revised July 2025)

Considering the plans to discontinue service along the rail corridor, the removal of track from the right-of-way, the potential for increased rail traffic or expansion of the corridor in the future is not likely.

Lastly, in 2021 the Ottawa City Council approved the purchase of the Beachburg Subdivision from north Kanata and Morris Island Conservation Area, a 35-kilometre corridor that could eventually be part of the city's long-term transportation needs<sup>2</sup>. The City of Ottawa-owned Beachburg Subdivision is located near Mile 14, further from the subject property, but does signal the long-term potential for rail operations within the corridor.

### Track Speeds

Track diagrams and train speeds are not typically available from the Rail Authority for spur line tracks. Further, no data is publicly available indicating the maximum operating speed along the Beachburg Subdivision spur line.

Correspondence between the Applicant and CN Railway indicated maximum freight speeds up to 25mph, which have been assumed for this study. This correspondence is included in Appendix A – Rail Corridor Details.

This is consistent with maximum operating speeds for freight traffic through urban areas. Notably, freight trains carrying hazardous goods or flammable materials are typically limited to a maximum speed of 25mph in urban areas. Similarly, freight movements in urban areas are restricted in extreme temperatures.

<sup>2</sup> Ottawa Citizen. 2021. *Council Briefs: Approvals for more photo radar, small biz tax break, rail corridor purchase*. Accessed online at: <https://ottawacitizen.com/news/local-news/council-briefs-approvals-for-more-photo-radar-small-biz-tax-break-rail-corridor-purchase>

Safety Record of the Rail Corridor

In order to better understand the risk profile of the rail corridor alongside the site, the historical accident data was reviewed to assess the frequency and types of accidents that occurred.

Table 2 below summarizes the data published by the Transportation Safety Board (TSB) for accidents recorded in the Beachburg Subdivision rail corridor between 1985 and 2025, within 3 miles of the site.

*Table 2: TSB data summary for rail incidents in proximity to subject site.*

Period Start	1985
Period End	2025
Subdivision / Rail Corridor	Beachburg Spur
Total Number of Events	17
Total Number of Incidents	5
Total Number of Accidents	12
<b>SUMMARY</b>	
CROSSING	1
DERAILMENT INVOLVING TRACK UNIT	1
DG LEAKER	3
EMPLOYEE	2
FIRE ON-BOARD R/S	2
MOVEMENT EXCEEDS LIMITS OF AUTHORITY	2
NON-MAIN-TRACK TRAIN DERAILMENT	6

Based on the accident data presented in the table above, the Beachburg Subdivision demonstrates a low risk profile. Of the accident data recorded, we note that:

- The only fatal accident involved a railway employee in 1987 – no notes or details of the accident are available.
- The three (3) incidents involving Dangerous Goods (DG LEAKER) all occurred in 1990 and have not occurred since
- No dangerous goods or hazardous materials were released in any of the recorded accidents/incidents
- The majority of derailments occurred east of the site where the junction with the Smith's Falls Subdivision is located, which would not be expected to impact the subject site, in the event of this occurring in the future.

While the historical accident data is not a predictor of future accidents, the limited accident history recorded within the rail corridor alongside the subject property suggests a lower-risk operating profile than a frequently used, higher speed mainline track.

## PROPOSED DEVELOPMENT

The development is proposed as 2-storey automotive service building that will be used to support the existing car dealership on the site today. The new building will be situated in the northwest corner of the site, where the surface parking is current located. The location of the new building and general layout of the site is illustrated in Figure 8 below (see Appendix D for higher resolution images and dimensions).

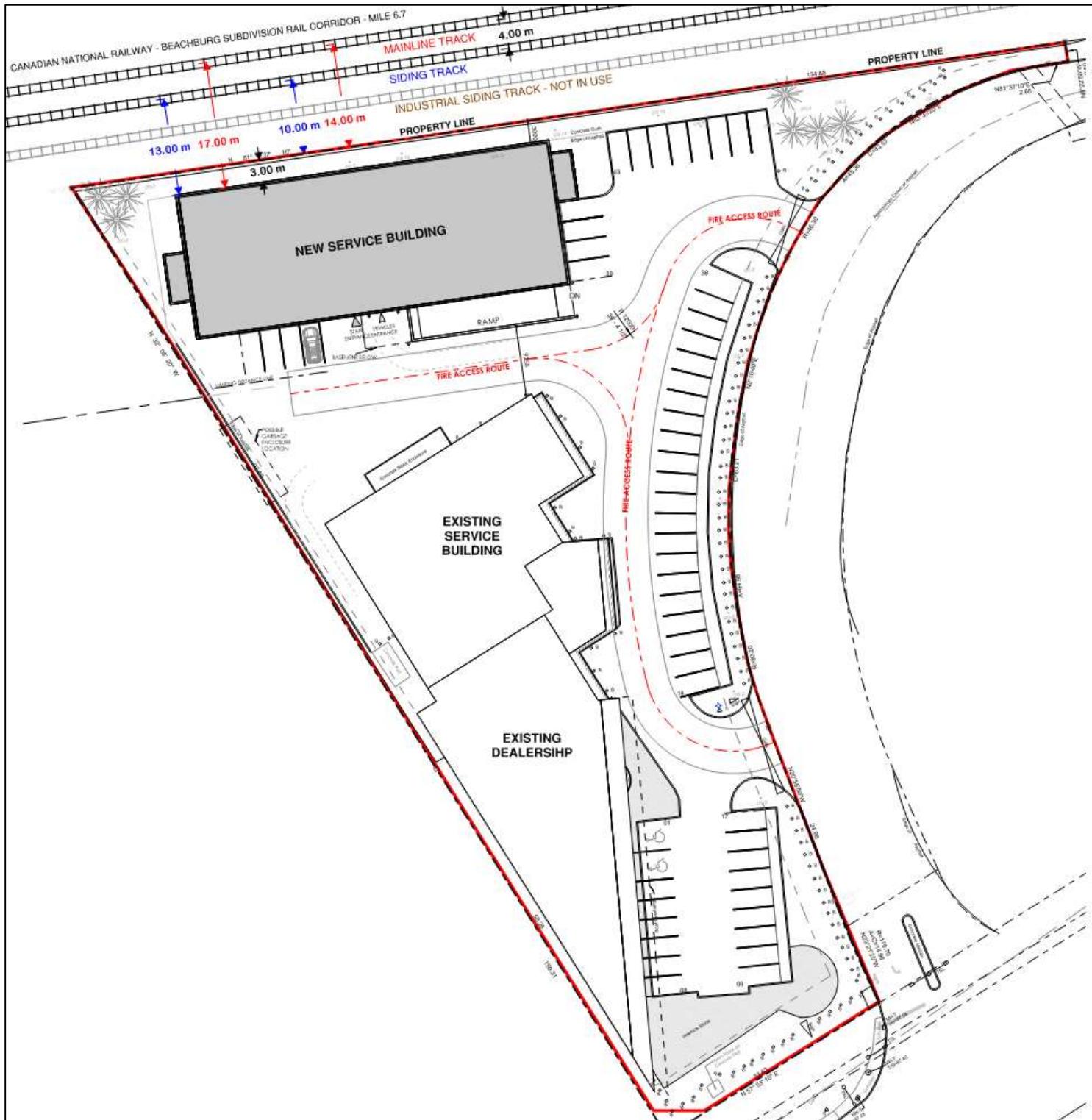


Figure 8: 299 West Hunt Club Road - Site Plan

The new building will be setback approximately 3m from the northern property line. In the current condition, the closest active track (a siding) is approximately 10m from the property line, while the main line track is approximately 14m from the property line. These details are illustrated in Figure 8 above and Appendix D.

The Ground Floor Plan is shown in Figure 9 below. The Ground Floor features 14 detailing bays for vehicles, a single office along the southern extent of the building, a car elevator along the northern extent of the building, and a ramp to allow access to the underground from the exterior of the building.

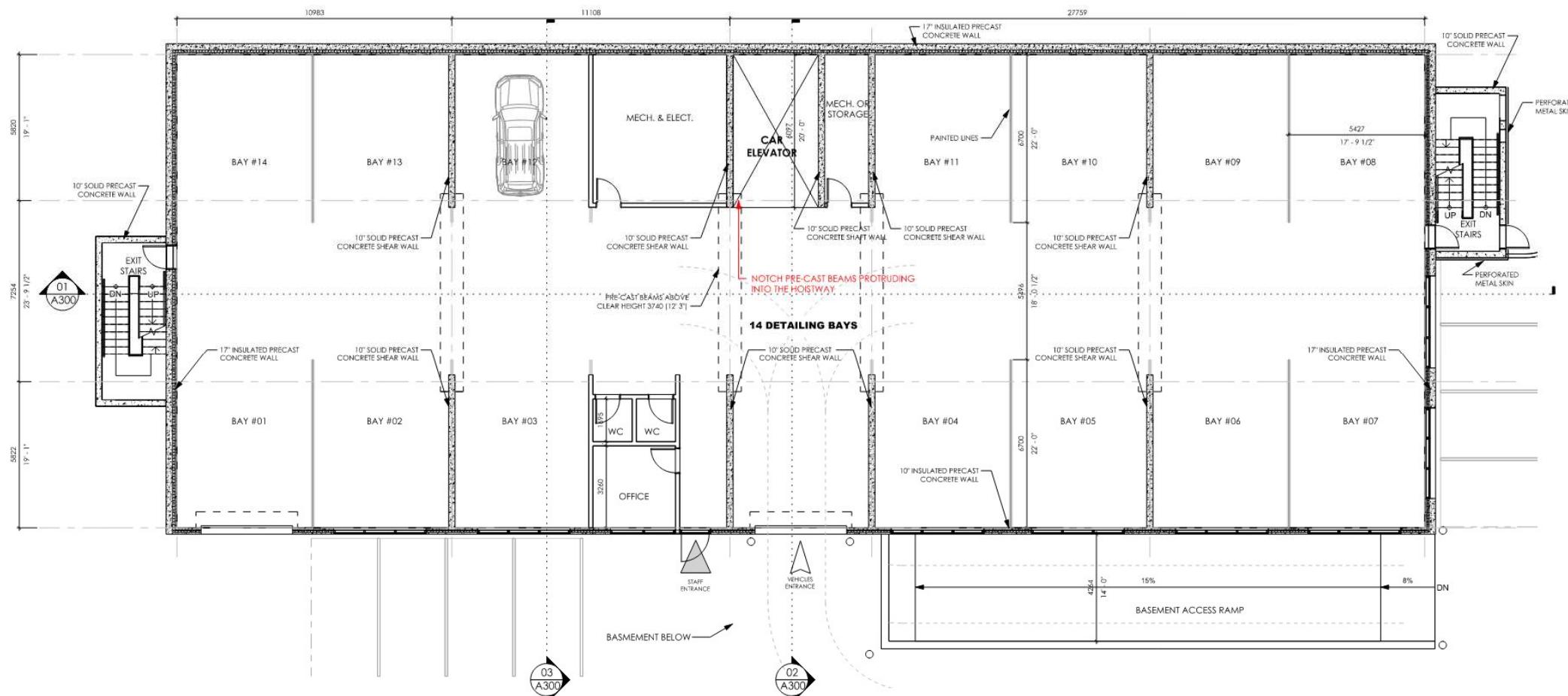


Figure 9: Ground Floor Plan at 299 West Hunt Club Road.

A single level of below grade parking is proposed for the development. The proposed P1 Level is pictured in Figure 10 below. Due to the proximity of the excavation to the rail corridor property line, excavation and shoring activities will need to be coordinated with CN Railway to ensure the rail corridor is protected during construction.

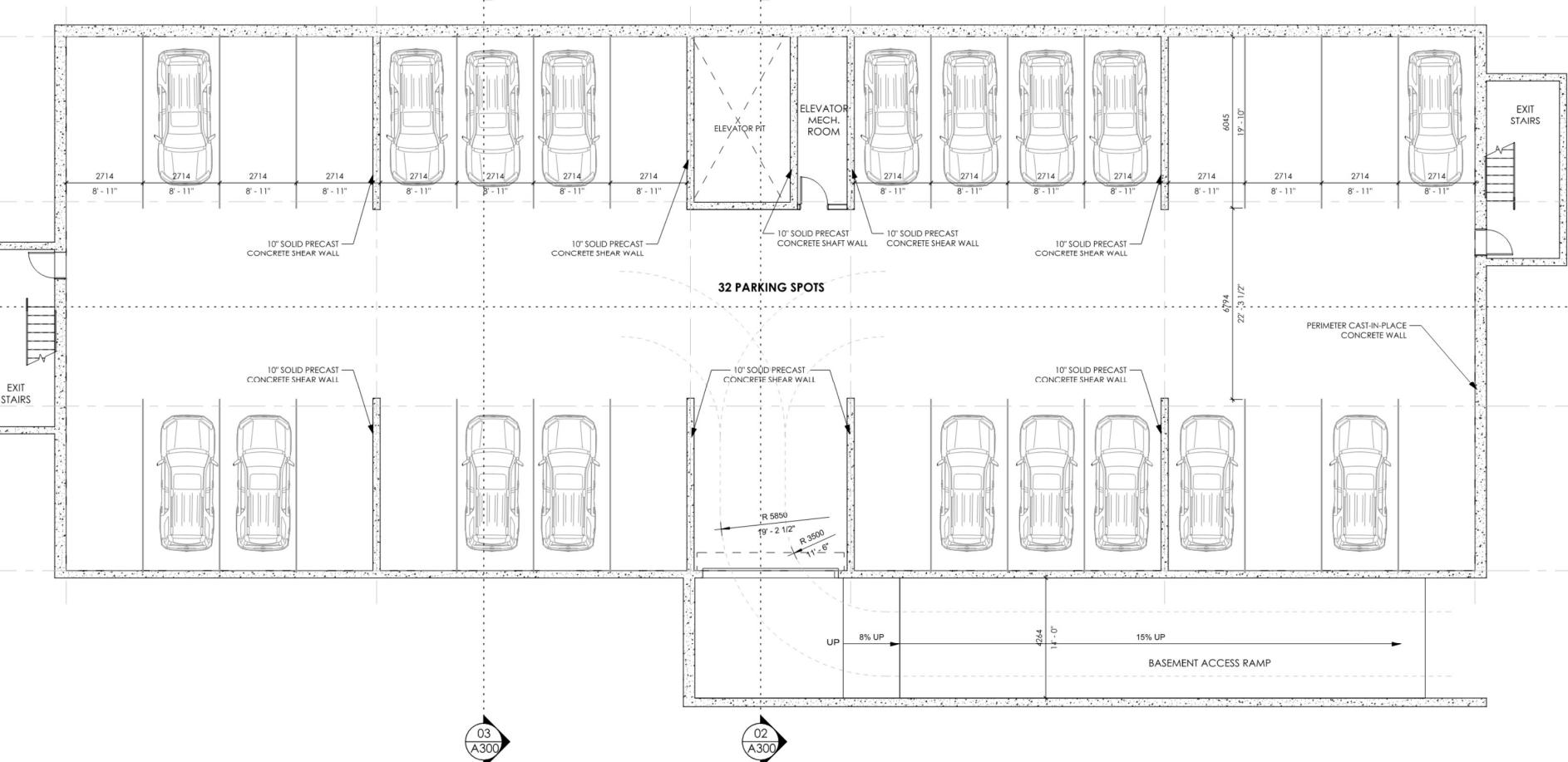


Figure 10: P1 Level at 299 West Hunt Club Road

The preliminary architectural plans for the site are included in Appendix D.

## TRAIN DERAILMENT ANALYSIS

Using the methodology outlined in the AECOM Development of Crash Wall Design Loads from Theoretical Train Impact (or 'AECOM Guidelines'), an Energy Balance Analysis was conducted to understand the outcome of a train derailment under specific scenarios (or 'Load Cases').

While the AECOM Guidelines are typically used for the design of crash walls, they do note:

*The glancing blow calculations can also predict whether the train is expected to stop its forward momentum prior to reaching the proposed crash wall location, taking into account and the slope of the ground away from the track.*

The analysis completed includes assumes freight trains operating at a maximum speed of 25mph. As passenger rail traffic is not operational, they were not considered as part of the analysis. The existing centreline distance of 13m was evaluated and a difference in elevation of 0m was assumed between the rail corridor and the subject site.

For this analysis, a derailment angle of 3.5° was used. As an additional factor of safety, we considered the more extreme derailment scenario that applies a 10° departure angle, which is consistent with the FCM/RAC Guidelines.

The results are summarized in Table 3 below and included in Appendix C.

*Table 3: Summary of Train Derailment Load Cases from Existing Track E1*

Load Case	Scenario	Impact Force (3.5°)	Impact Force (10°)
1	Freight Train Multi-Car Glancing Blow	0 kN	0 kN
2	Freight Train Single Car Direct Impact	0 kN	0 kN
3	Passenger Train Multi-Car Glancing Blow	N/A	N/A
4	Passenger Train Single Car Direct Impact	N/A	N/A

Based on the analysis above, a train travelling at the (assumed) maximum allowable speed of 25mph is shown to lose all momentum prior to reaching the subject property line under any of the applicable load cases in both the 3.5-degree or 10-degree derailment scenarios. Notably, when a higher speed of 35mph is used, or a track closer to the property line is assumed, the results of the energy balance analysis remain the same. A derailed train would lose momentum before reaching the extent of the rail corridor.

While the AECOM Guidelines were not developed to exclusively determine the stopping distance of a derailed train, the conclusion we can draw from this analysis is that if a crash wall were proposed, there would be no theoretical impact for the wall to be designed for.

In both scenarios, the conclusion is the same. A derailed train would lose momentum before an impact is observed. The Train Derailment Analysis indicates that the risk of derailment at the site is acceptably low. The supporting calculations are included in Appendix C – Train Derailment Analysis.

## MITIGATION MEASURES

The FCM/RAC Proximity Guidelines recommend a package of mitigation measures to address the risks associated with heavy rail operations.

### Setbacks

Setbacks between the rail corridor and a new development are a recommended mitigation measure to:

- Allow a derailed train enough room to come to a complete stop.
- Allow for dissipation of rail-oriented emissions, noise, and vibration through distance separation
- Allow occupants of a building to escape in the event of a derailment.

In the case of 299 West Hunt Club Road, the setbacks established are indicated as follows:

- **Setback from the Property Line to Face of Building: 3.0 metres**
- **Setback from the Centreline of Track E1 to Face of Building: ~13.0 metres**

The sections in Figure 11 below illustrate the setbacks from the property line to the face of the building and the relationship of the development to the adjacent railway lands. The full plans are also included in Appendix D.

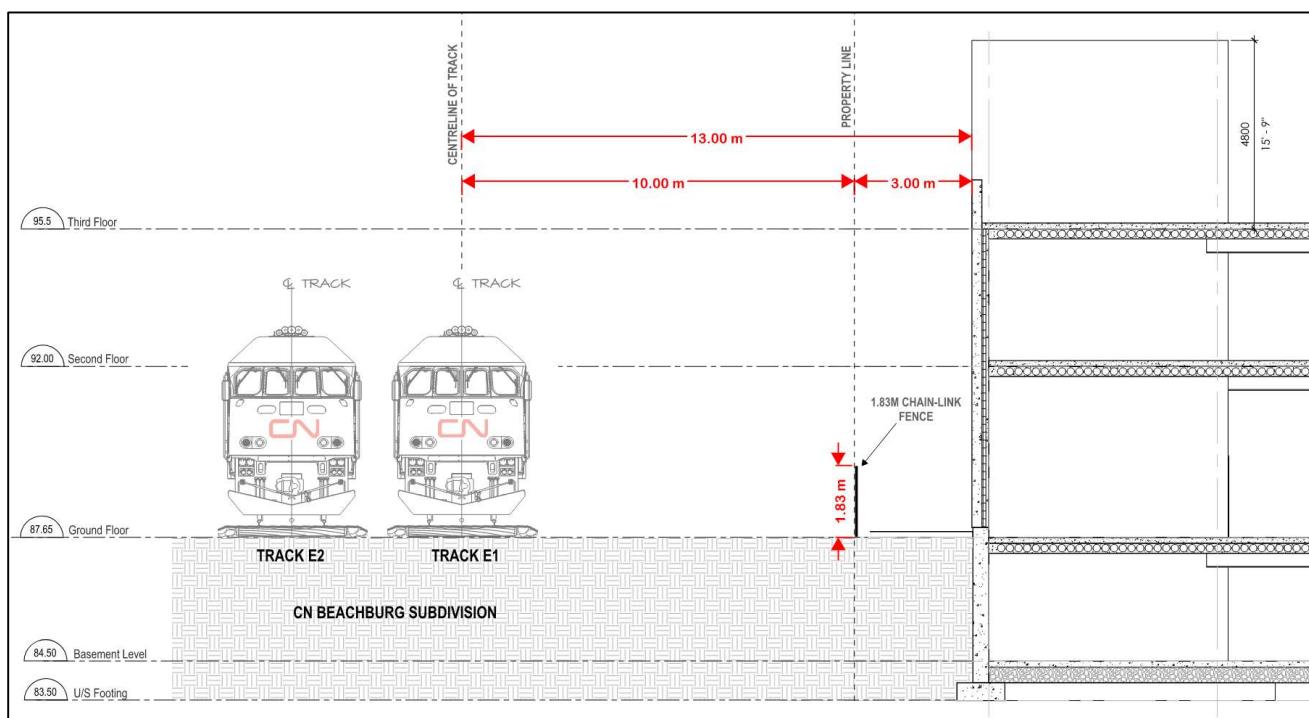


Figure 11: Section View - Building I - Relationship to Railway Lands

A minimum horizontal setback of 3.0m is achieved, measured from the rail corridor property line to the face of the building. This will allow for routine maintenance activities to occur without having to access the rail corridor to carry out these activities.

Although the FCM/RAC Guidelines recommend greater setbacks for certain land use types, they are not a regulatory requirement. Given the proposed light-industrial employment use, the setbacks described above are considered appropriate and consistent with the applicable guidance.

### Safety Barrier

In accordance with the FCM/RAC Guidelines, a safety barrier is recommended for developments adjacent to a principal mainline track. However, as the proposed development is a non-residential, non-sensitive land use, the installation of a barrier is considered a best practice rather than a mandatory requirement or condition of approval.

The likelihood of occupants being affected by the adjacent railway is low. This is primarily due to the limited use of the corridor, the short length and infrequent scheduling of trains, resulting in minimal exposure, and the light industrial function of the building. Given the nature of the operations anticipated within the building, occupants are expected to be accustomed to levels of noise, vibration, and odour that exceed those typically generated by the railway.

Considering these factors, a safety barrier is not proposed for the subject development.

### Trespassing

The FCM/RAC Guidelines assert that trespassing represents, 'by far, the greatest number of annual fatalities resulting from railway accidents.' In addition to posing significant safety risks, trespassing can lead to vandalism, damage to railway infrastructure, and disruption of rail operations.

Accordingly, new residential and non-residential developments adjacent to rail corridors are expected to include measures that deter unauthorized public access.

In the current condition, a chain link fence separates the property from the rail corridor. The current fencing meets the minimum height requirements for new developments with direct exposure to the railway and no additional fencing is required. Once the development is completed, the fence shall be left in a state of good repair. If any fence panels are damaged during construction the fence panels will be replaced. This approach is consistent with new developments in proximity of rail corridors, where trespassing mitigation is already in place.

Given the light-industrial and non-sensitive nature of the proposed development, along with its typically low occupancy and the infrequent use of the adjacent rail line, the existing 1.83-metre-high fence is considered sufficient. No further or enhanced trespass mitigation measures are proposed or deemed necessary for this site.

## ADDITIONAL RISK AND CONSIDERATIONS

### Construction

Any construction considerations will be dealt with separately with the Construction Manager's and Contractor's input. Additional permits such as Crane Swing Agreements and Flagging Permits may be required at the discretion of the Rail Authority.

These details, including those relating to shoring, excavation, ground and potential track monitoring, and all construction-related considerations will be addressed once the concept design is completed.

## CONCLUSION

Upon completion of our review, we conclude that the proposed development is consistent with the applicable guidelines for new development in proximity to rail operations. Importantly, as a light-industrial employment use, the land use type is generally considered to be non-sensitive and low-occupancy in nature.

The proposed expansion of the existing dealership - to allow for an additional automobile service building - falls under the 'non-residential development' category, which stipulate that the provision of the standard setback and safety barrier are recommended, but not required.

Considering the infrequent use of the rail corridor and the smaller train loads that have been recorded along this section of track, standard setbacks and a safety barrier are not proposed for the property. The derailment scenarios (or 'Load Cases') outlined in the AECOM Guidelines suggest that a derailed train would lose momentum prior to leaving the right-of-way, in the unlikely event of a derailment. As train movements are limited to 1-2 per week in the current condition, the risk of derailment alongside the subject property is considered to be exceptionally low.

Other impacts to the development from rail including noise, vibration and air quality, are not considered in this report and are typically assessed by independent specialists. Due to the light-industrial nature of the development, these studies are to be provided at the direction of the Municipality. We defer to the findings of those reports to appropriately address any concerns, if any, that may be present.

This summarizes our review of the proposed development plans in the context of the rail adjacent development guidelines. Should you have any further questions or comments, please contact our team.

## APPENDICES

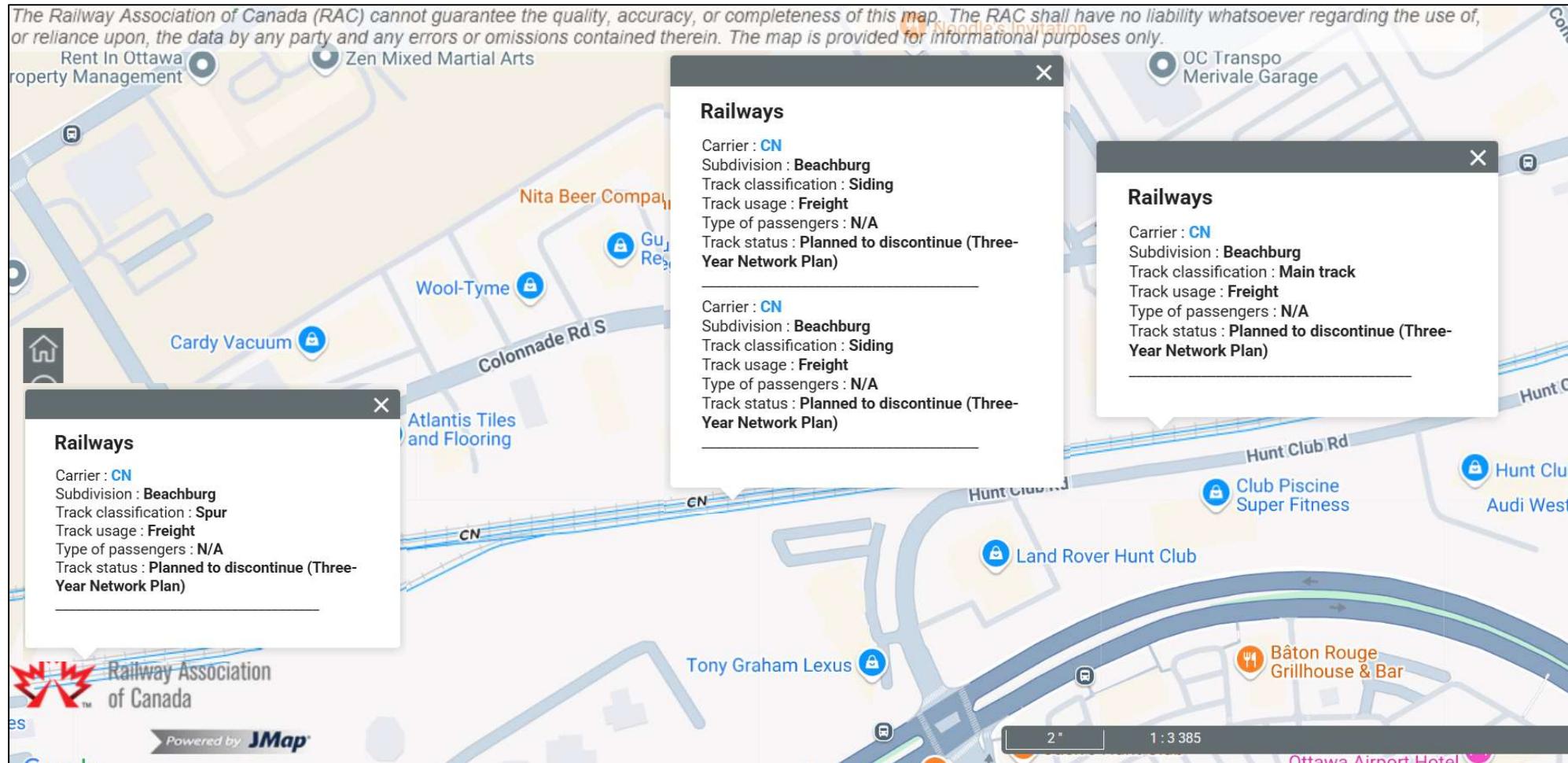
Appendix A – Rail Corridor Details

Appendix B – CN Guidelines

Appendix C – Train Derailment Calculations

Appendix C – Architectural Plans, Survey

**APPENDIX A – RAIL CORRIDOR DETAILS**



Railway Association of Canada Track Classification

# CN Three-Year Rail Network Plan



## Canadian Network

Revised July 11, 2025

Province	Line	Milepost			
		From	To	Total	Status
Ontario	Alexandria	12.00	72.40	60.40	Retain
Ontario	Alexandria	72.40	76.30	3.90	Retain
Ontario	Alexandria / Vankleek Spur	0.00	19.80	19.80	Retain
Ontario	Alexandria / L'Orignal Spur	0.00	4.20	4.20	Retain
Ontario	Alexandria / Walkley Line Spur	0.00	4.09	4.09	Retain
Ontario	Alexandria / Walkley Line Spur	4.09	4.11	0.02	Retain
Ontario	Alexandria / Walkley Line Spur	4.11	5.83	1.72	Retain
Ontario	Bala	1.90	276.10	274.20	Retain
Ontario	Beachburg	0.30	6.00	5.70	Discontinue
Ontario	Beachburg	6.00	14.50	8.50	Discontinue
Ontario	Caramat	0.00	243.80	243.80	Retain
Ontario	CASO	19.50	30.52	11.02	Retain
Ontario	CASO	218.20	228.10	9.90	Retain
Ontario	Cayuga	87.27	89.70	2.43	Discontinue
Ontario	Cayuga	114.60	119.00	4.40	Retain
Ontario	Chatham	7.10	63.90	56.80	Retain
Ontario	Dundas	0.00	78.20	78.20	Retain
Ontario	Fort Frances	0.00	143.70	143.70	Retain
Ontario	Grimsby	0.47	43.70	43.23	Retain
Ontario	Guelph	29.98	30.80	0.82	Retain
Ontario	Guelph	63.40	118.80	55.40	Retain
Ontario	Guelph	118.80	119.90	1.10	Retain
Ontario	Halton	0.00	49.50	49.50	Retain
Ontario	Kashabowie	0.00	141.40	141.40	Retain
Ontario	Kinghorn	0.00	1.70	1.70	Retain
Ontario	Kinghorn	193.22	195.60	2.38	Retain
Ontario	Kinghorn	197.50	197.70	0.20	Retain
Ontario	Kingston	40.00	332.60	292.60	Retain
Ontario	M & O	82.50	83.50	1.00	Discontinue
Ontario	Manistique	492.00	493.30	1.30	Retain

**APPENDIX B – CN GUIDELINES**

## NON-RESIDENTIAL DEVELOPMENT ADJACENT TO THE RAILWAY RIGHT-OF-WAY (Main Lines)

CN recommends the following protective measures for non-residential uses adjacent Main Lines (note some are requirements):

- A minimum 30 metre building setback, from the railway right-of-way, in conjunction with a 2.5 metre high earthen berm or 2.0 metres for a secondary main line, is recommended for institutional, commercial (ie. office, retail, hotel, restaurants, shopping centres, warehouse retail outlets, and other places of public assembly) and recreational facilities (i.e. parks, outdoor assembly, sports area).
- A minimum 15 metre building setback, from the railway right-of-way, is recommended for heavy industrial, warehouse, manufacturing and repair use (i.e. factories, workshops, automobile repair and service shops).
- A minimum 30 metre setback is **required** for vehicular property access points from at-grade railway crossings. If not feasible, restricted directional access designed to prevent traffic congestion from fouling the crossing may be a suitable alternative.
- A chain link fence of minimum 1.83 metre height is **required** to be installed and maintained along the mutual property line. With respect to schools and other community facilities, parks and trails, CN has experienced trespass problems with these uses located adjacent to the railway right-of-way and therefore increased safety/security measures must be considered along the mutual property line, beyond the minimum 1.83 m high chain link fence.
- Any proposed alterations to the existing drainage pattern affecting Railway property **require** prior concurrence from the Railway and be substantiated by a drainage report to the satisfaction of the Railway.
- While CN has no noise and vibration guidelines that are applicable to non-residential uses, it is recommended the proponent assess whether railway noise and vibration could adversely impact the future use being contemplated (hotel, laboratory, precision manufacturing). It may be desirable to retain a qualified acoustic consultant to undertake an analysis of noise and vibration, and make recommendations for mitigation to reduce the potential for any adverse impact on future use of the property.
- For sensitive land uses such as schools, daycares, hotels etc, the application of CN's residential development criteria is **required**.
- There are no applicable noise, vibration and safety measures for unoccupied buildings, but chain link fencing, access and drainage requirements would still apply.

**APPENDIX C – TRAIN DERAILMENT CALCULATIONS**

## IMPACT FORCES (10 DEGREE ANGLE OF IMPACT)

The design forces for glancing blow load cases were calculated using the equation below.

$$F_G = \frac{\frac{1}{2}m(v_G \sin \theta_G)^2}{d_G} \quad (\text{metric}) \quad [14M]$$

The design forces for the single car load cases were calculated using the equation below.

$$F_A = \frac{\frac{1}{2}m(v_A \cos \theta_f)^2}{32.17d_A} \quad [15]$$

All calculations were performed with a distance between the centreline of the closest track and the face of the building  $d_{CL}$ , of 13m. The resulting values are summarized in the sections below.

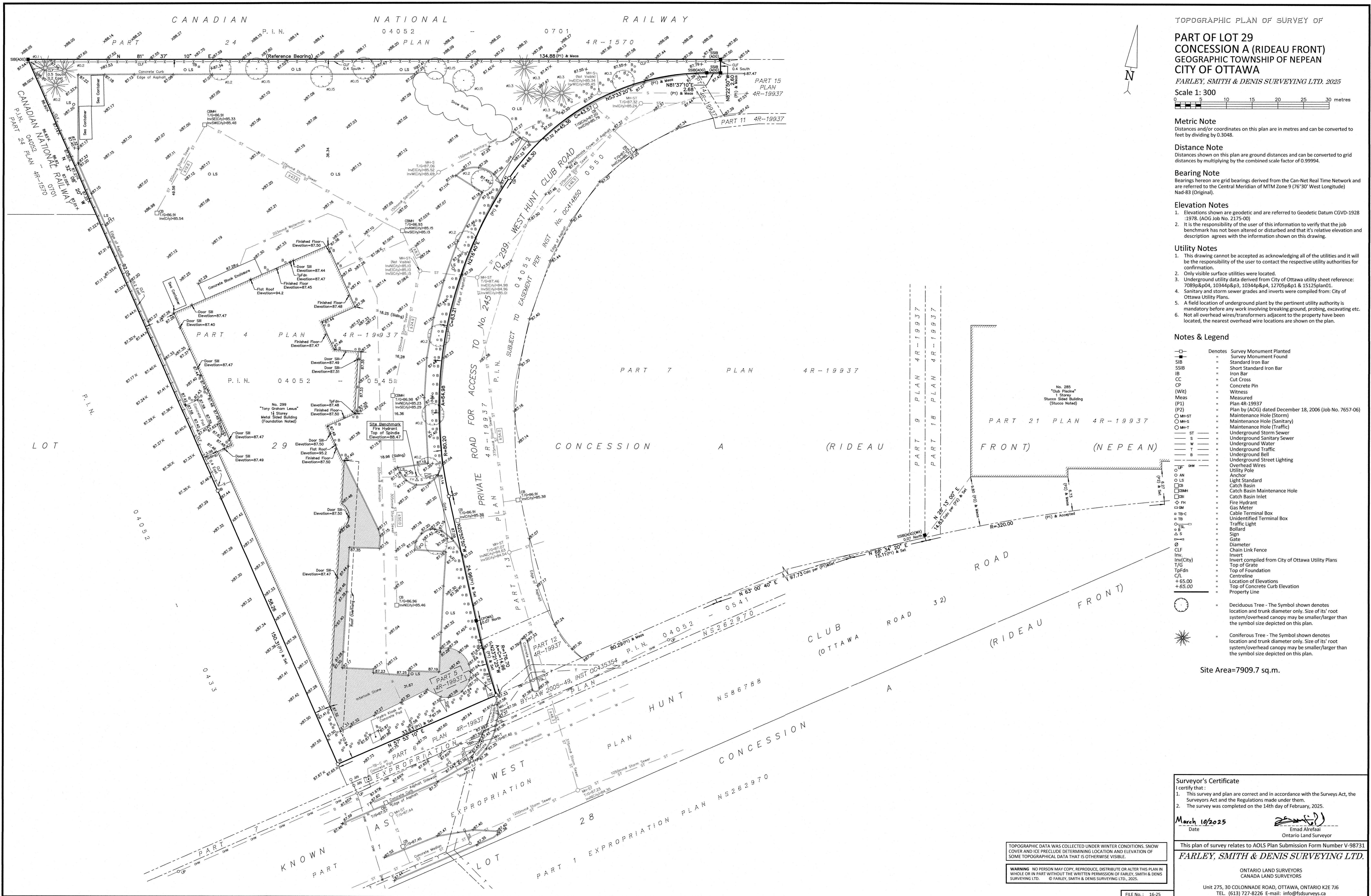
## LOAD CASE 1: GLANCING BLOW – MULTI-CAR FREIGHT

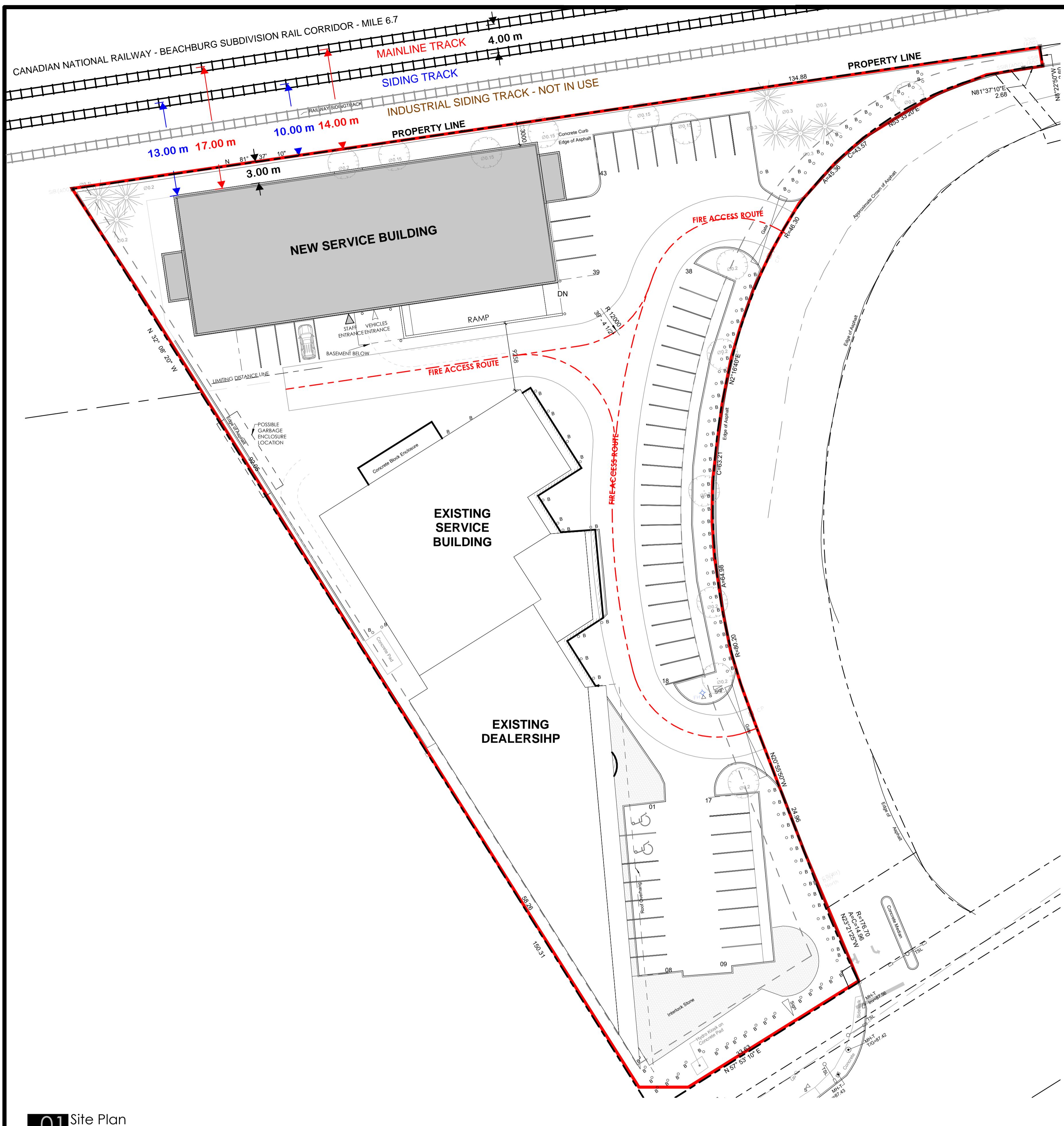
Description	Variable	Value
Resistance	$R$	0.25
Grade	$G$	0
Groundline at wall		0
Base of rail		0
Angle of impact (degrees)	$\theta_G$	10
Distance from the centreline of the track (dCL)	$d_{CL}$	13
Track speed (mph)	$v_o$	25
Track speed (km/hr)	$v_o$	40.2336
Track speed (m/s)	$v_o$	11.18
Velocity of train at impact (m/s)	$v_G$	0
Velocity of train at impact (km/hr)		0
Velocity of train at impact (mph)		0
Impact force (kN)	$F_G$	0
Length to stop (m)	$L$	25.49
Length of the wall along which the impact force should act (m)	$l_G$	3.10

## LOAD CASE 2: DIRECT IMPACT – SINGLE-CAR FREIGHT

Description	Variable	Value
Resistance	$R$	0.25
Distance from the centreline of the track (dCL)	$d_{CL}$	13
Track speed (mph)		25
Track speed (km/hr)		40.2336
Angle of rotation at impact (radians)	$\theta_f$	0
Impact speed (m/s)	$v_A$	0
Impact speed (km/hr)		0
Impact speed (mph)		0
Impact force (kN)	$F_A$	0
Length of the wall along which the impact force should act	$l$	0

**APPENDIX D – ARCHITECTURAL PLANS, SURVEY, GRADING PLAN**

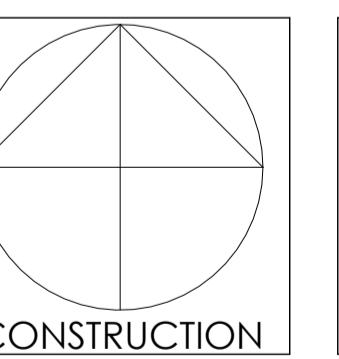




# 01 Site Plan

SCALE: 1 : 300

NOTES: TRACK  
CENTRELINE DISTANCES  
ARE APPROXIMATE,  
BASED UPON SATELLITE  
IMAGERY AND MAY VARY  
BY  $\pm 0.5$  METRES





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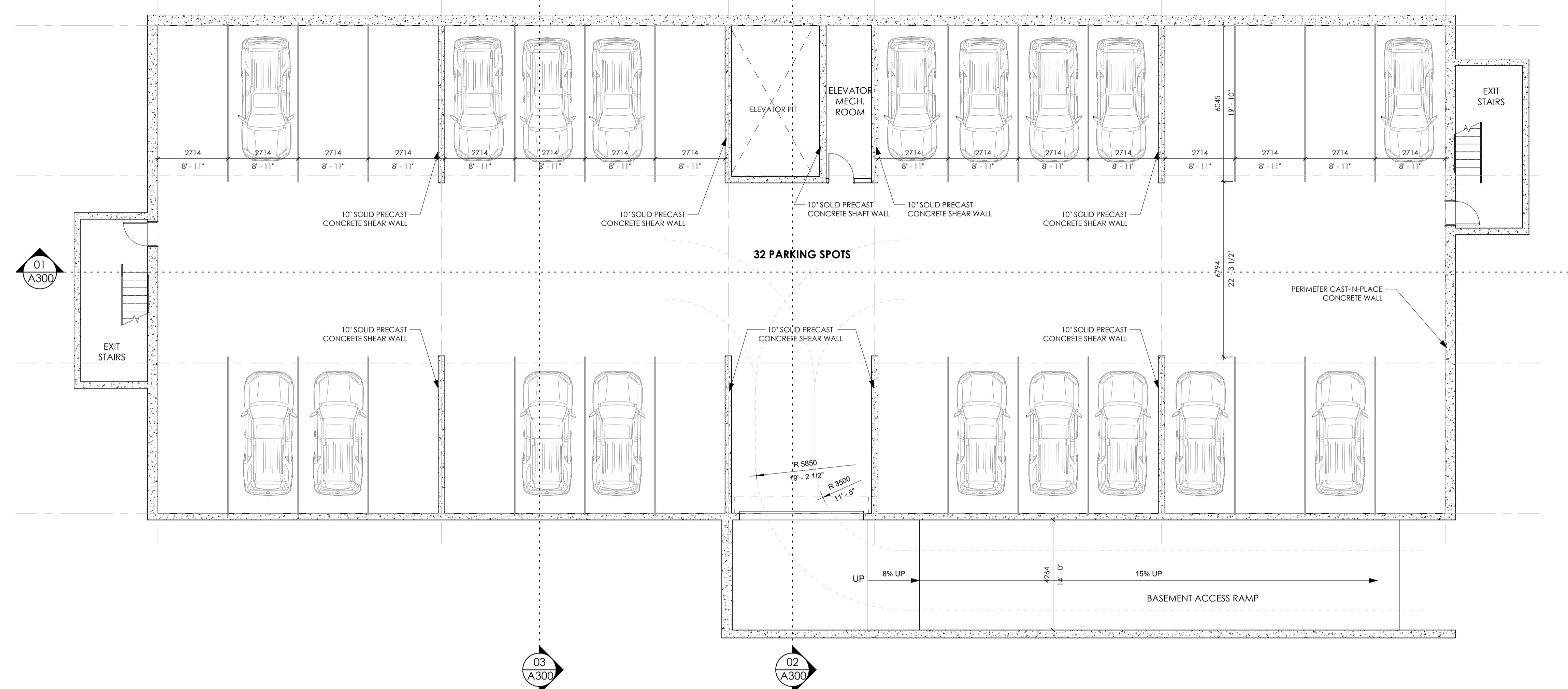
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GARAGE**  
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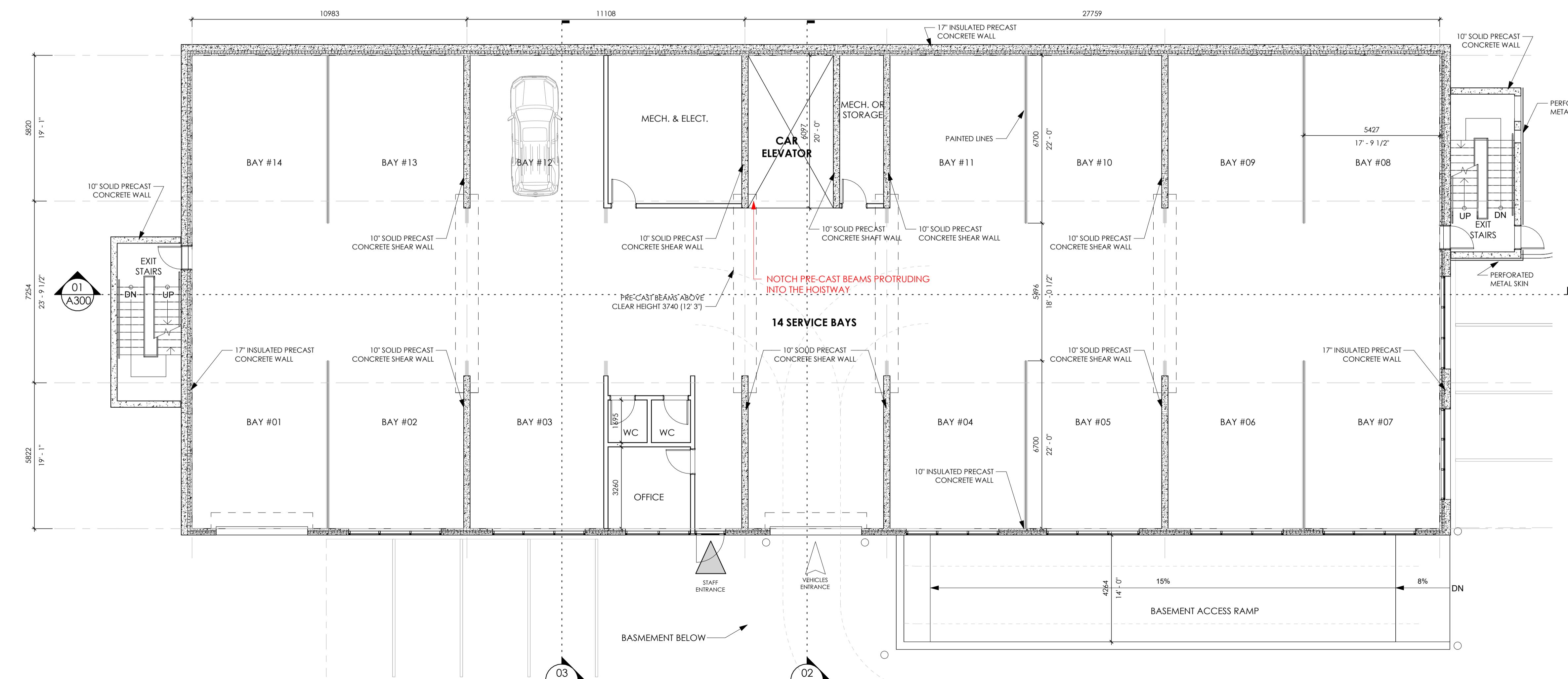
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SIGNED BY:	Designer
AWN BY:	Author
RT DATE:	Issue Date
ALE:	1 : 300
JECT NO.	Project Number
A001	

A001



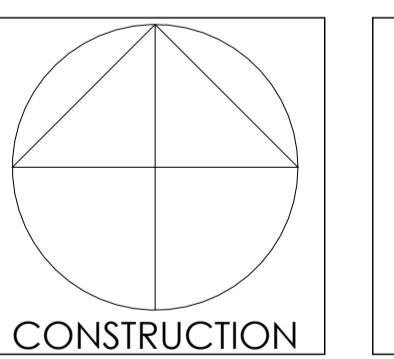
# 01 BASEMENT LEVEL

SCALE: 1 : 100



## 02 GROUND FLOOR

SCALE: 1 : 100





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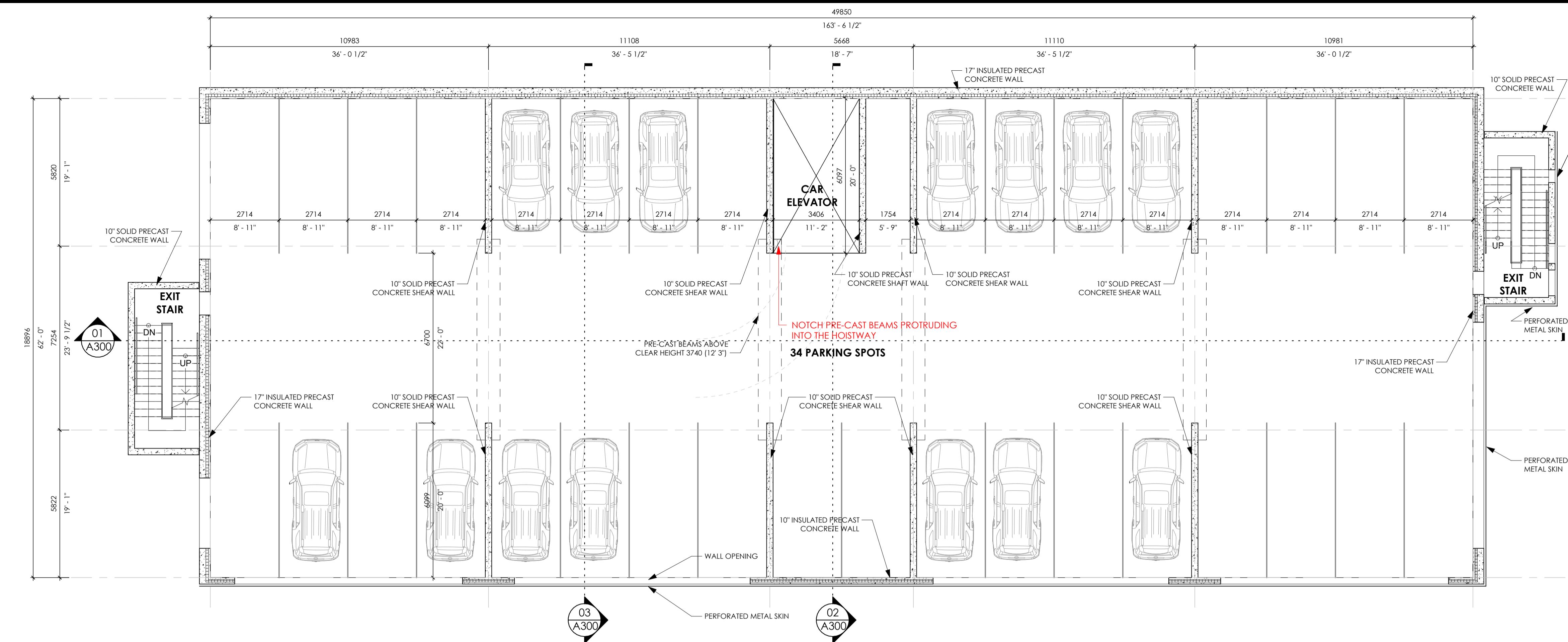
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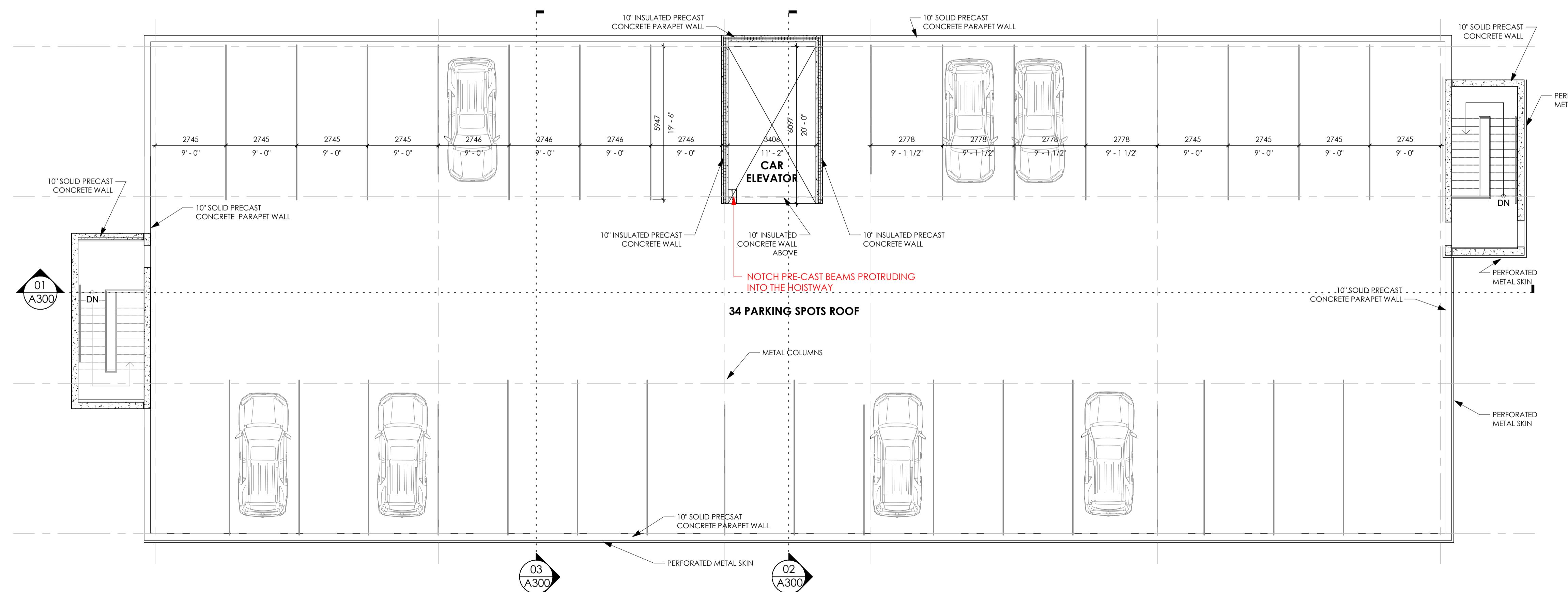
DRAWING TITLE:  
BASEMENT AND GROUND FLOOR PLANS

DESIGNED BY: Designer  
DRAWN BY: Author  
START DATE: Issue Date  
SCALE: 1 : 100  
PROJECT NO. Project Number

# A101



# 01 SECOND FLOOR PLAN

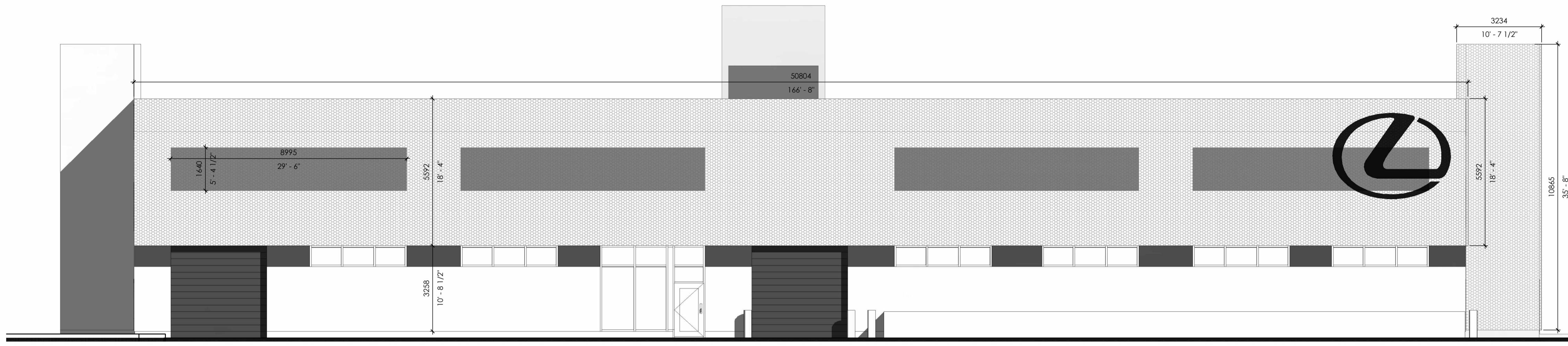


## 02 ROOF PLAN

DESIGNED BY: Designer  
DRAWN BY: Author  
START DATE: Issue Date  
SCALE: 1 : 100  
PROJECT NO. Project Number

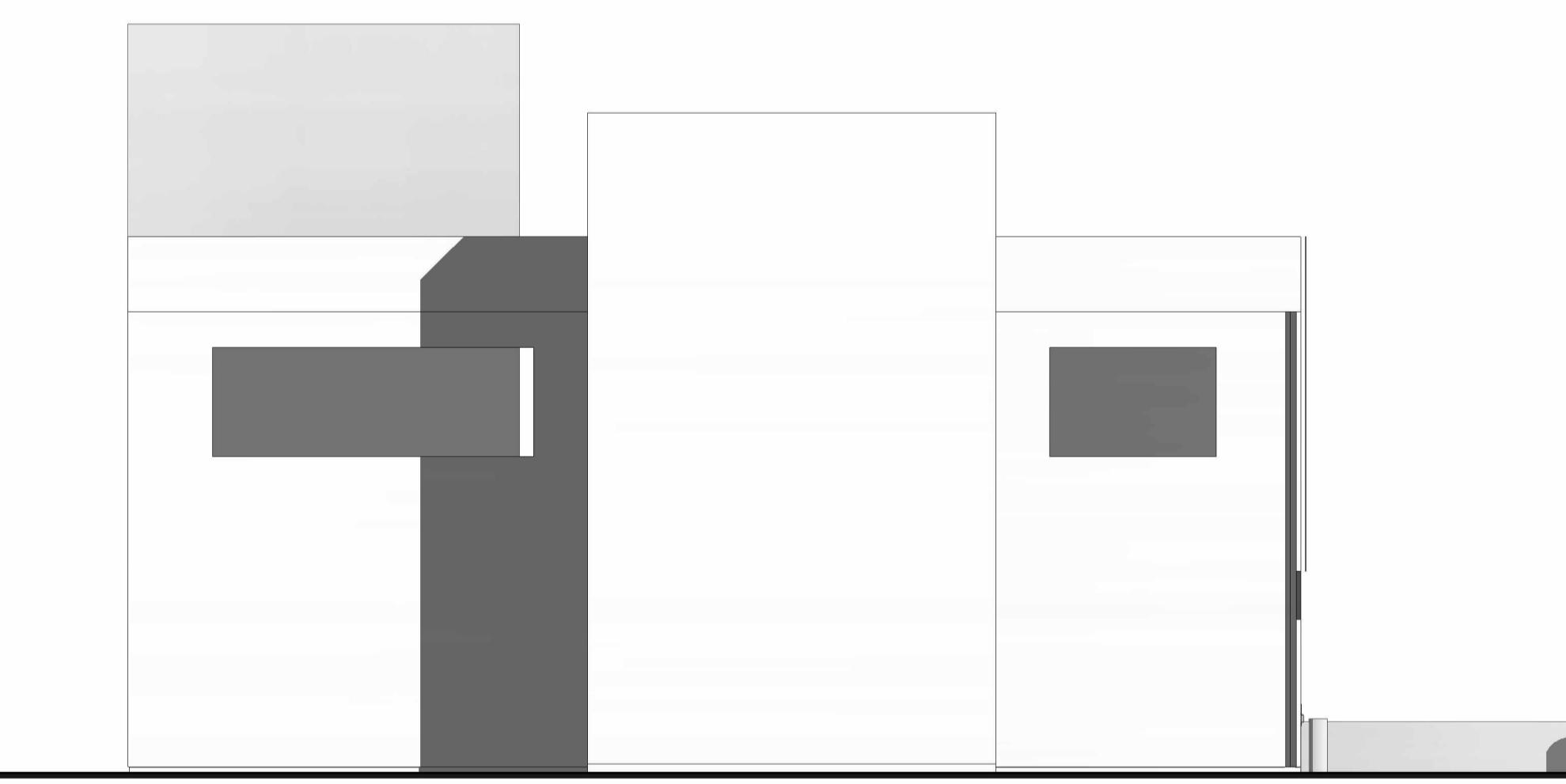
**A102**

A102

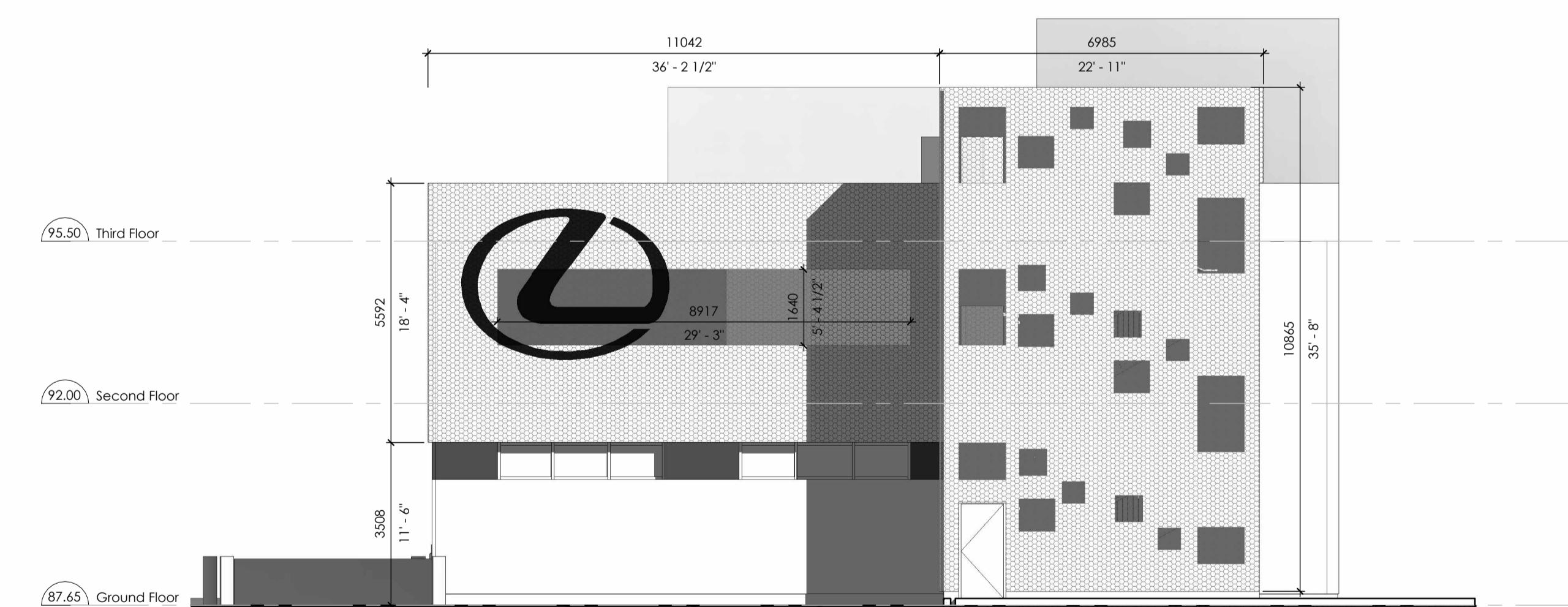


# 01 SOUTH ELEVATION

SCALE: 1 : 100



## 02 WEST ELEVATION



## 03 EAST ELEVATION

## CONSTRUCTION



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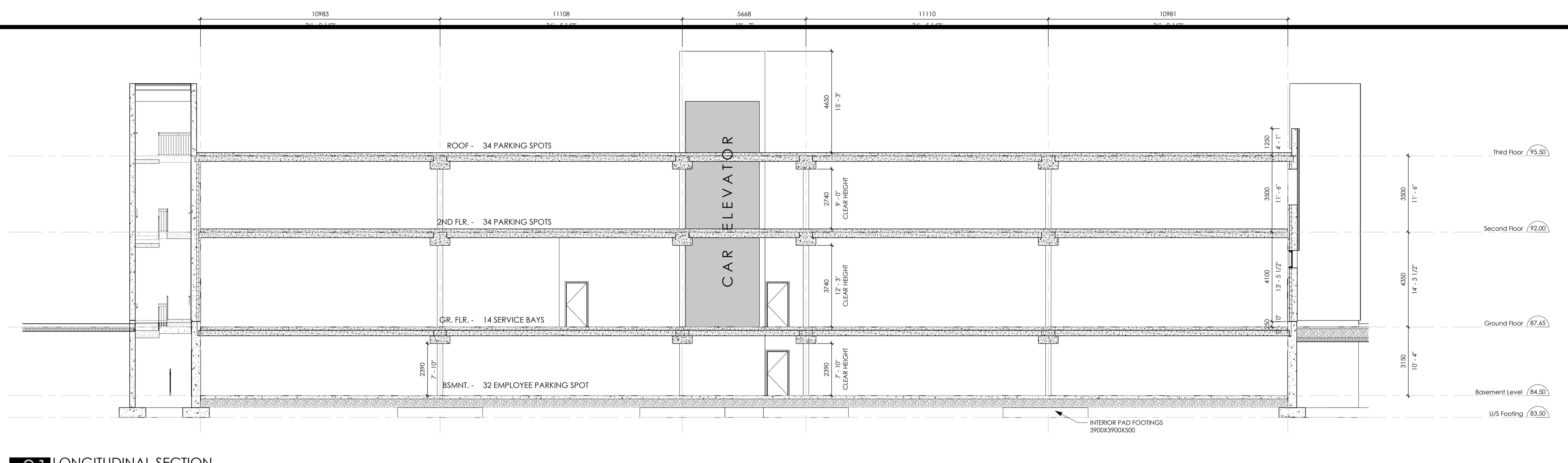
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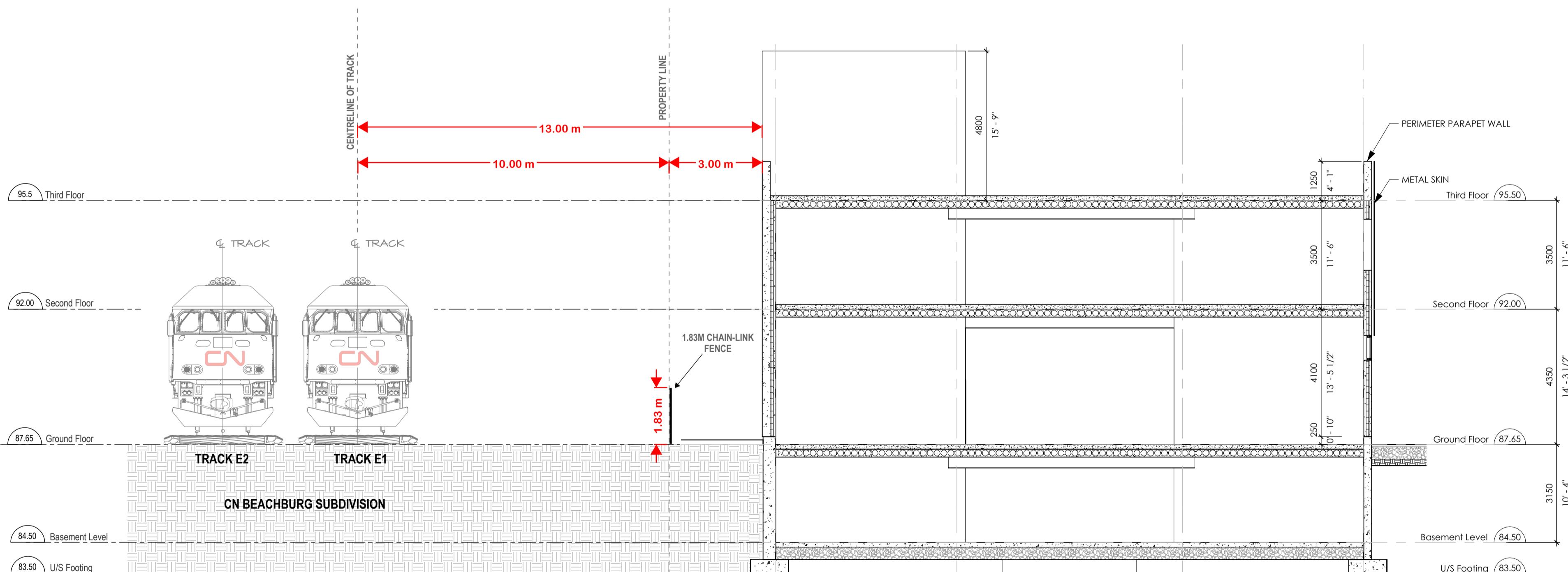
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DRAWN BY: Author  
START DATE: Issue Date  
SCALE: 1 : 100  
PROJECT NO. Project Number

A200



# 01 LONGITUDINAL SECTION



## 03 CROSS SECTION - GENERAL

CONSTRUCTION





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