



MEMORANDUM

TO:

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FROM:

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PROJECT:

7406-04
10 West

DATE:

July 26, 2023

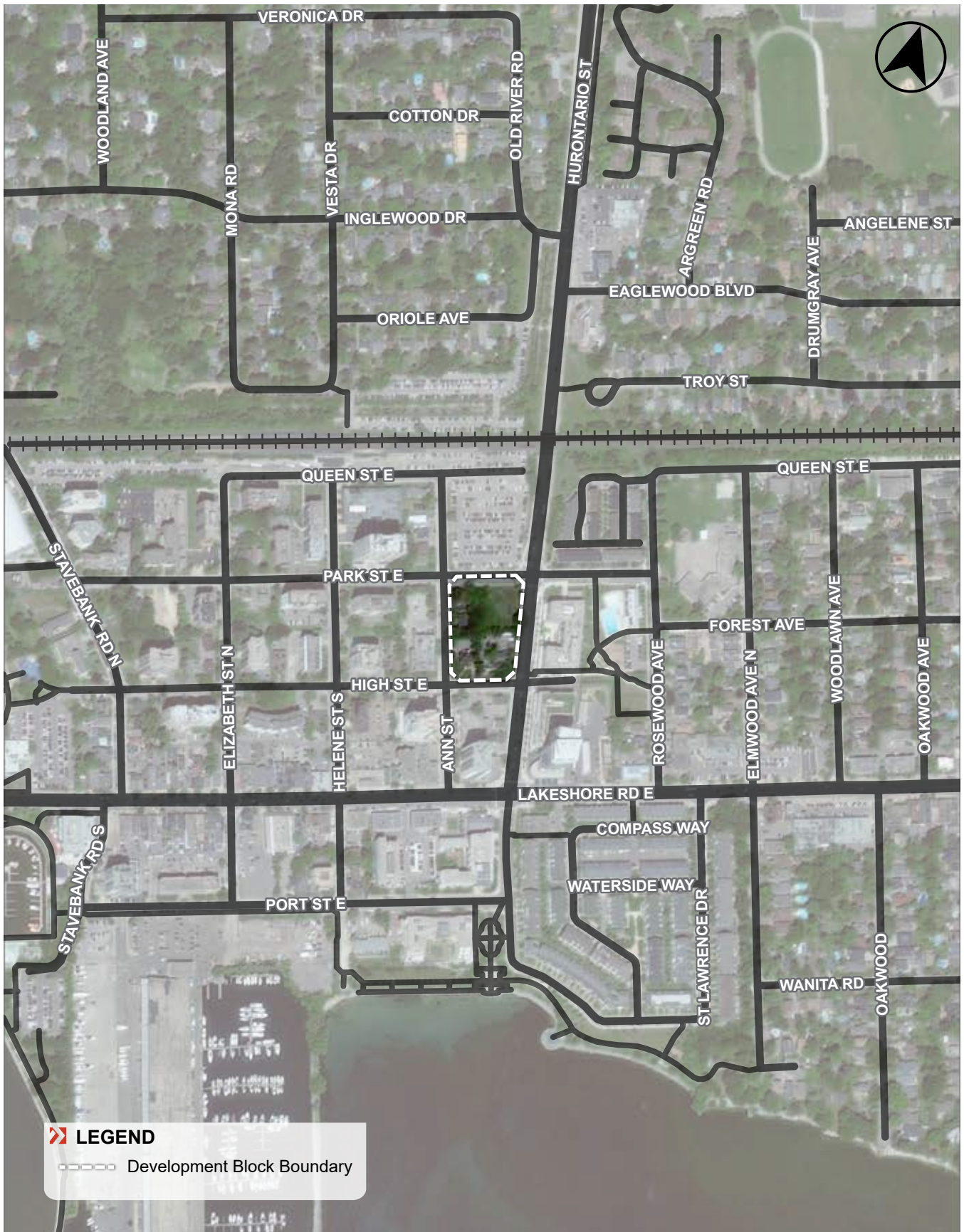
**RE: 17 AND 19 ANN STREET, 84 HIGH STREET AND 90 HIGH STREET LANDS – TRANSPORTATION CONSIDERATIONS
ADDENDUM**

1.0 INTRODUCTION

BA Group has been retained by 10 West GO GP Inc. to provide transportation advisory services in support of an Official Plan Amendment and Rezoning application to permit the redevelopment of the 17 and 19 Ann Street, 84 High Street and 90 High Street lands (herein referred to as “the site”) in the City of Mississauga. The site is 3,273.96 square metres in size and located approximately 150 metres from the Port Credit GO Station and less than 100 metres from the future Hurontario LRT stop at the northwest corner of Hurontario Street and Park Street East. The existing development block consists of two residential detached dwelling units on the northwestern portion of the site, 2,449.5 square metres of vacated City-owned lands on the northeastern portion of the block, and two heritage buildings (84 and 90 High Street) along the southern portion of the site. The site location is illustrated in **Figure 1**.

The proposed development includes a 26-storey tower which will be situated within the northwest corner of the site (municipal address of 17 and 19 Ann Street) and will contain 410 residential units and approximately 312 square metres of commercial space at grade. A total of 2,449 square metres of public parkland will be created through the redevelopment, including a 1,536 square metre park along Hurontario Street and a 913 square metre park oriented along High Street East. The site area also contains two existing structures, both of which will be retained at full build-out. These consist of six (6) residential units at 84 High Street and approximately 340 square metres of commercial GFA at 90 High Street. Reduced scale architectural plans are attached in **Appendix A**.

In December of 2021, BA Group submitted an Urban Transportation Considerations Study in support of a development proposal which at that time supported the provision of 283 parking spaces; including 233 resident spaces and 36 residential visitor spaces for the 10 West development, and 7 spaces reserved for each of the existing 84 and 90 High Street heritage buildings. Considering a proposal of [then] 359 residential units, resulting effective parking requirements of 0.64 spaces per unit and 0.10 spaces per unit were proposed for residential and visitor components, respectively.



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FIGURE 1 SITE LOCATION










Subsequently, in November 2022, BA Group submitted a Technical Memorandum which addressed agency comments, including those pertaining to the proposed parking requirements supported in our December 2021 Study. Most recently, through further discussions with City Staff pertaining to the parking supply, BA Group submitted an April 2023 Parking Letter in support of a 23-storey tower containing 365 residential units and approximately 312 square metres of commercial space at grade.

Considering the changes made to the proposed development (as reflected in our April 2023 Letter), this Memorandum has been prepared to update the full range of transportation details previously considered in our November 2022 Transportation Memorandum; namely, pertaining to parking and loading requirements, as well as discussion of capacity impacts at relevant study area intersections on Wilson Avenue.

1.1 The Proposed Development

As previously mentioned, the proposed consists of a 26-storey tower which will be situated within the northwest corner of the site (municipal address of 17 and 19 Ann Street) and will contain 410 residential units and approximately 312 square metres of commercial space at grade. Key elements of the development proposal are summarized in **Table 1**.

Table 1 Development Proposal Summary

		Use	Development Proposal	
10 West (Parcel A)		Proposed Residential Units	One-bedroom	291 units
			Two-bedroom	119 units
			Total	410 units
		Proposed Retail	312 m ² GFA	
	Vehicular, Bicycle and Loading Supply			
		370 parking spaces	Resident	296 spaces
			Non-Residential	74 spaces
	269 bicycle parking spaces	Long Term	246 spaces	
		Short Term	23 spaces	
	1 loading space	1 Formal and 1 Informal Loading Space		
84 High Street (Parcel D)		Existing Residential Building	6 units (to be retained)	
		Resident	5	
		Non-Residential	1	
90 High Street (Parcel E)		Existing Residential Building	To be converted to commercial / office uses (~340 m ² GFA)	
		Commercial	7	

Compared to the development programme considered in our April 2023 Letter, the current proposal will add an additional three storeys to the tower located at 17 and 19 Ann Street, comprising of 45 more residential units. An additional 51 bicycle spaces and 41 vehicular parking spaces are also provided therein, including 33 more residential spaces and 8 more visitor spaces to be contained within an additional underground parking level. The vehicular parking supply has been revised to

reflect a 10% reduction relative to By-law requirements as was proposed in our April 2023 Letter. All remaining site elements have remained unchanged.

1.2 Site Access

Vehicular access to the 10 West below-grade parking and at-grade loading facility is proposed within a consolidated driveway off of Ann Street. Pick-up, drop-off and front-door delivery activity for the building will be accommodated informally along Ann Street.

1.3 Parking

A 7-level below-grade parking garage is proposed within the 10 West residential development. A total of 385 parking spaces are proposed including 296 resident spaces and 74 residential visitor spaces for the 10 West development, 6 spaces reserved for the existing 84 High Street, and 7 spaces for the 90 High Street heritage buildings, and 2 spaces for car-share. As mentioned above, the aforementioned includes an additional parking level and 41 more vehicular parking spaces, including 33 more residential spaces and 8 more visitor spaces.

1.4 Loading

Two (2) loading spaces are proposed within a central consolidated loading facility, accessed from Ann Street, to accommodate the proposed 10 West retail and residential refuse, recycling and organic collection as well as delivery/moving activities. One (1) formal loading space, consistent with the requirements set out in the Mississauga Zoning By-law, and one (1) proposed smaller loading space (deficient by 1.0 m in length), that can accommodate a range of smaller delivery vehicles (i.e., step vans and cube vans). The proposed loading arrangement does not consider the retained heritage buildings at 84 and 90 High Street, as they do not form part of the proposed condominium and therefore will not share the loading spaces. Refuse / recycling collection for the existing 84 and 90 High Street buildings will continue to occur as curbside pickup.

1.5 Bicycle Parking

Short-term visitor bicycle parking for the 10 West development (residential and retail uses) will be provided at grade and long-term resident bicycle parking will be provided on the P1 level of the parking garage, accessed via the site driveway and parking ramp.

2.0 VEHICULAR PARKING ASSESSMENT

2.1 Proposed Parking Requirements

As previously mentioned, BA Group submitted an April 2023 Parking Letter in order to demonstrate the appropriateness of a proposed 10% reduction in By-Law parking requirements per the City of Mississauga's Parking Utilization Studies for Site Specific Applications Terms of Reference (attached in **Appendix B**). The following site-specific rates were proposed:

- Residents:
 - 1 Bedroom: 0.72 spaces / unit
 - 2 Bedroom: 0.72 spaces / unit
- Non-Residential (Residential Visitors + Ground Floor Commercial/Retail):
 - 0.18 spaces / unit

- Ancillary Uses (Includes: Retail Store, Service Establishment, Take-out Restaurant, Convenience Restaurant and Restaurant <220 m2):
 - None
- Office (90 High Street):
 - 2 spaces / 100 m2 GF
- Residential (84 High Street):
 - 1 Bedroom: 0.8 spaces / unit

Based on the foregoing, these parking rates have been applied to an updated development programme as summarized in **Table 2**. On this basis, the proposed parking requirement would therefore recommend the provision of 382 parking spaces, including 295 resident spaces and 74 residential visitor spaces for the 10 West development, 6 spaces reserved for the existing 84 High Street property (five resident and one visitor spaces), and 7 spaces for the 90 High Street property.

Table 2 Calculation of Proposed Parking Requirement

	Use	Units / GFA (m ²) ¹	Rate (Proposed Minimum) ²	Proposed Minimum Parking Requirement ³
10 West	Resident			
	Studio	0 units	0.72 spaces / unit	0 spaces
	1-Bedroom	291 units		209 spaces
	2-Bedroom	119 units		86 spaces
	3-Bedroom	0 units		0 spaces
	Resident Subtotal	410 units		295 spaces (0.72 spaces per unit)
	Non-Resident			
	Visitor	410 units	0.18 spaces / unit	74 spaces
	Retail	312 m ²	-	0 spaces
	Non-Resident Subtotal			74 spaces
Total			369 spaces	
84 High Street	Resident	6 units	0.8 spaces / unit	5 spaces
	Visitor		0.2 spaces / unit	1 space
90 High Street	Office	340 m ²	2.0 spaces / 100 m ² GFA ⁴	7 spaces

2.2 Proposed Parking Supply

The current concept plan illustrates the provision of 386 parking spaces including 296 resident spaces and 74 residential visitor spaces for the 10 West development, 6 spaces reserved for the existing 84 High Street property, and 7 spaces for the 90 High Street property. In addition, 2 car-share spaces will be provided in the P1 parking level. This proposed supply meets and slightly exceeds the minimum parking requirements of the proposed rates. It is noteworthy to mention that the proposed parking supply will be supported by a range of transportation demand management (TDM) measures, as were specified in our April 2023 Letter. These include:

- Provisioning of two (2) car share spaces located in the visitor section of the garage (in addition to the visitor spaces provided);
- Providing Presto Cards pre-loaded with a value of \$75.00 for each residential unit;
- Applicant’s committal to selling parking spaces unbundled from the purchase price of each residential unit; and,
- Provisioning of a Bike Repair Station on-site.

The above suite of TDM measures proposed for the project will support non-auto use and will accommodate the proposed 10% reduction in the resident parking supply requirement.

3.0 BICYCLE PARKING CONSIDERATIONS

3.1 Bicycle Parking Requirements

3.1.1 Transportation Demand Management Strategy and Implementation Plan Recommended Rates

As discussed in Section 1.0, BA Group submitted a Transportation Study in December of 2021 in support of the original proposal. At the time of that writing, there were no bicycle parking requirements in Zoning By-law 225-2007. However, the City of Mississauga’s Transportation Demand Management Strategy and Implementation Plan did recommend bicycle parking standards to be included in the city’s Zoning By-Law for new developments. Application of these rates to the current proposal of the 10 West development is summarized in **Table 3** and result in a bicycle parking requirement of 321 spaces (287 long-term and 34 short-term spaces).

Table 3 City of Mississauga Recommended Bicycle Parking Rates (10 West Development)

Land Use	Unit Type	Number of Units / GFA	Minimum Bicycle Parking Standard	Spaces Required
Residential	Short-term	410 units	0.08 spaces / unit	33 spaces
	Long-term		0.70 spaces / unit	287 spaces
Retail	Short-term	312 m ²	0.25 spaces / 100 sm GFA	1 space
	Long-term		0.10 spaces / 100 sm GFA	0 spaces
Total				321 spaces

3.1.2 By-Law Requirements

Bicycle parking requirements are now specified in the City’s Zoning By-law 225-2007. Application of by-law rates are summarized in **Table 4**.

Table 4 City of Mississauga By-law 225-007 Bicycle Parking Rates

Land Use	Class Type ¹	Number of Units / GFA	Minimum Bicycle Parking Standard	Spaces Required
Residential	Class A	410 units	0.60 spaces / unit	246
	Class B		The greater of 0.05 spaces per unit or 6.0 spaces	21
Retail ²	Class A	312 m ²	0.15 spaces / 100 sm GFA	1
	Class B		0.20 spaces / 100 sm GFA	1
84 High Street – Residential ³	Class A	6 units	N/A	-
	Class B		N/A	-
90 High Street – Office ³	Class A	340 m ²	N/A	-
	Class B		N/A	-
Total				269 spaces

Notes:

1. Class A means a bicycle parking space designed to provide long-term parking for employees or residents of the building. Bicycle Parking Space, Class B means a bicycle parking space designed to provide short-term transient parking for persons who are not residents or employees of the building.
2. GFA’s do not include vestibule areas.
3. Bicycle parking requirements are not applicable for residential uses under 20 units and non-residential units under 1,000 m² of GFA

Application of these rates to the proposed development results in a bicycle parking requirement of 269 spaces, of which 246 are long-term spaces (called “Class A” in the By-law) and 23 are short-term spaces (called “Class B” in the By-law). As noted, the exemptions in the By-law for residencies under 20 units and non-residential units under 1,000 m² of GFA means that there is no bicycle parking requirement for the 84 High Street and 90 High Street heritage properties.

3.2 Proposed Bicycle Parking Supply

The current concept plan for 10 West development illustrates the provision of 269 parking spaces including 246 long-term (resident) spaces and 23 short-term (visitor) spaces for the 10 West development. This proposed bicycle parking supply meets the Zoning By-law 225-2007 requirements. It is proposed to provide visitor bicycle parking spaces at-grade while long-term occupant spaces will be located in secure and weather-protected facilities within the P1 level of the parking garage. No bicycle parking is provided for the existing 84 High Street and 90 High Street heritage buildings.

4.0 LOADING CONSIDERATIONS

4.1 Zoning By-Law Loading Requirement

The City of Mississauga Zoning By-law 0225-2007 loading standards apply to the proposed development. **Table 5** summarizes the minimum loading requirements for the proposed development under the Zoning By-law. The application of the minimum Zoning By-law loading requirements requires a total of two (2) loading spaces to be provided to service the proposed 10 West development.

Table 5 City of Mississauga Zoning By-Law 0225-2007 Loading Requirements

Site Address	Use	Units / GFA (sq. m.)	Minimum Zoning By-Law Requirement	Number of Loading Spaces Required ¹
10 West	Residential	410 units	1 loading space for apartment dwelling containing > 30 units	1
	Retail	312 m ²	1 loading space for GFA greater than 250 sq. m. and less than 2350 sq. m.	1
10 West - Required Loading Spaces²				2
84 High Street	Residential	6 units	None Required (curbside pickup)	-
90 High Street	Office	340 m ²	None Required (curbside pickup)	-

Notes:

1. The City of Mississauga Zoning By-law requires loading spaces to have an “unobstructed rectangular area with a minimum width of 3.5 m and a minimum length of 9.0 m”. A clear height of 7.5m for a loading area is specified within the Region of Peel Waste Collection Design Standards Manual” (2007)
2. The City of Mississauga Zoning By-law does not including any provisions for shared loading arrangements.

4.2 Loading Supply & Facilities

Loading supply and facilities were discussed in detail in our December 2021 Transportation Study. As discussed, the site constraints make it unfeasible to accommodate the two (2) formal loading zones. It should be noted that if the retail floor area within the proposed 10 West development was less than 250 m² (current proposal is 62 m² above this threshold) no loading space would be required. Furthermore, the City of Mississauga Zoning By-law does not including any provisions for shared loading arrangements in mixed-use developments.

Nevertheless, two (2) loading spaces are proposed within a central, consolidated loading facility for the proposed 10 West development with vehicular access provided off of Ann Street. While the proposed loading supply meets the Zoning By-law requirement (2 spaces), one of the proposed spaces is deficient in length by 1 metre. The proposed loading facilities for the 10 West development are as follows:

- One (1) formal loading space, consistent with the requirements set out in the Mississauga Zoning By-law (3.5 m width and 9.0 m length); and
- One (1) proposed smaller loading space (3.5 m width and 8.0 m length), that can accommodate a range of smaller delivery vehicles (i.e. step vans and cube vans).

Given that the pick-up of refuse and recycling for the residential and retail uses would not occur at the same time, and that building maintenance workers would shuffle the bins on the day of collection, the proposed bin staging arrangement discussed in our December 2021 Transportation Study is acceptable given the site constraints. Moreover, the increase in residential units (51 in relation to said Study) will not change the loading requirements, or instigate a need to reconsider the loading arrangements previous determined.

Vehicle maneuvering Diagrams are attached in **Appendix C**.

5.0 TRAFFIC VOLUMES

5.1 Existing Traffic Volumes

Existing traffic volumes were last considered in Section 6.2 of our November 2022 Memorandum. For the purposes of this addendum, the same existing traffic volumes have been adopted as illustrated in **Figure 2**. It should be noted that existing traffic volumes used in our November 2022 Memorandum were based on modifications to, and/or difference counts used in our December 2021 Study. This was discussed in detail in Section 6.2 of our November 2022 Memorandum.

5.2 Background Traffic Volumes

Background traffic volumes were last considered in Section 6.3 of our November 2022 Memorandum. These consisted of both corridor volumes (following direction from the City of Mississauga) and background developments. For the purposes of this addendum, the same background traffic volumes have been adopted. Future background traffic volumes are reproduced in **Figure 3**.

5.3 Site Traffic Volumes

5.3.1 Site Trip Generation

Site-derived vehicle trip generation and assignment were last discussed in Section 8.3 of our December 2021 Transportation Study. Following this methodology, and considering the current development programme, site vehicle trips are summarized in **Table 6**.

Table 6 Site Trip Generation

Rate / Mode of Transport			AM Peak Hour			PM Peak Hour		
			In	Out	2-Way	In	Out	2-Way
Proposed Site Traffic	LUC 222 (Multi-Family Housing – High Rise) ¹	410 units ¹	0.09	0.19	0.27	0.19	0.14	0.33
	Number of Trips	410 units	35	75	110	75	55	130
	15% Volume Shift to Transit		-5	-10	-15	-15	-5	-20
	Net-New Site Vehicular Trip Generation		30	65	95	60	50	110

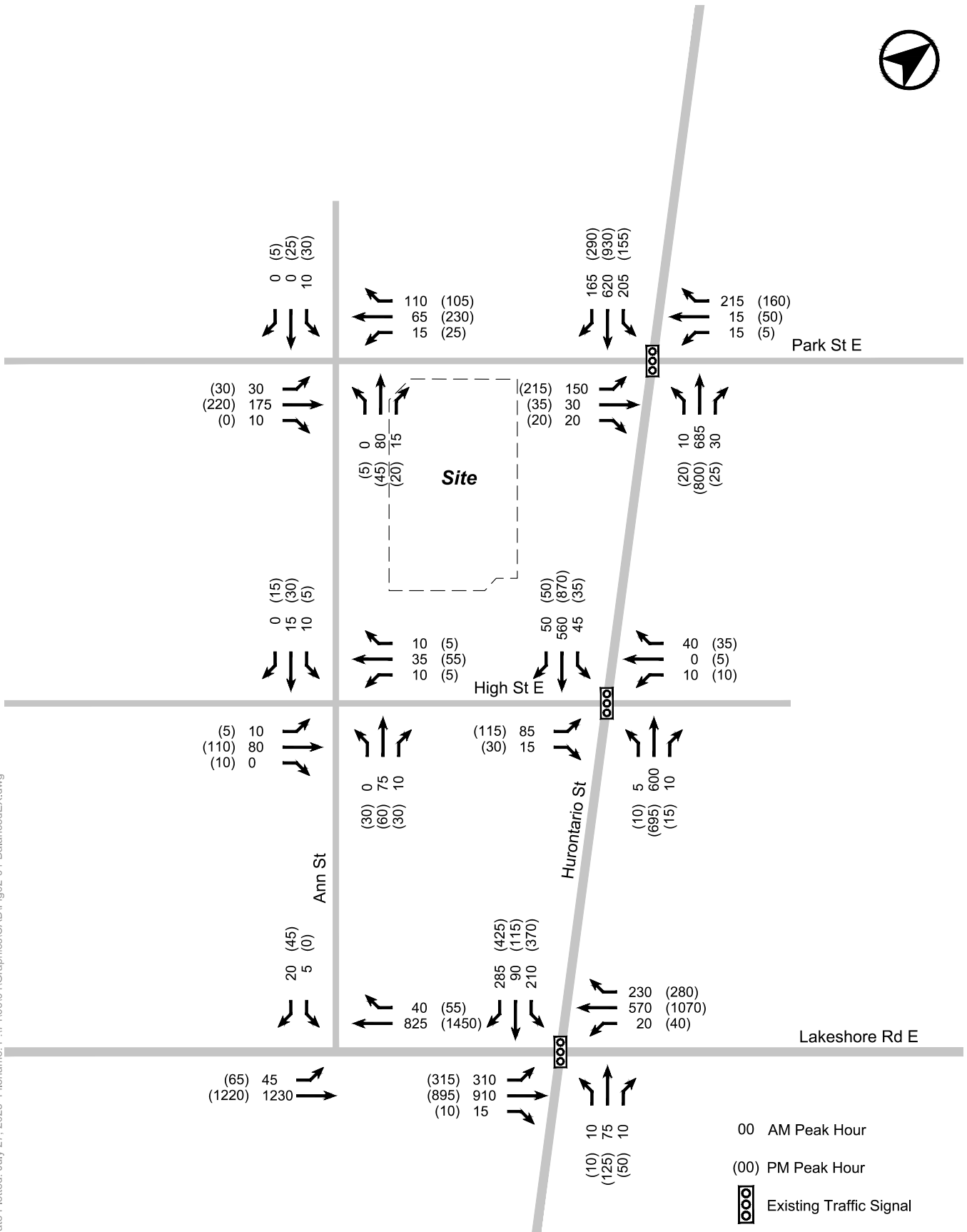
Notes:

1. Rounded to the nearest 5 vehicles / persons.
2. 15% of Driver mode share shifted to transit mode share.
3. Fitted Curve Equation Effective Rates - AM Peak: $T = 0.22(X)+18.85$, PM Peak: $T = 0.26(x)+23.12$

As can be seen in the Table, the site will generate on the order of approximately 95 and 110 two-way vehicle trips during the morning and afternoon peak hours, respectively.

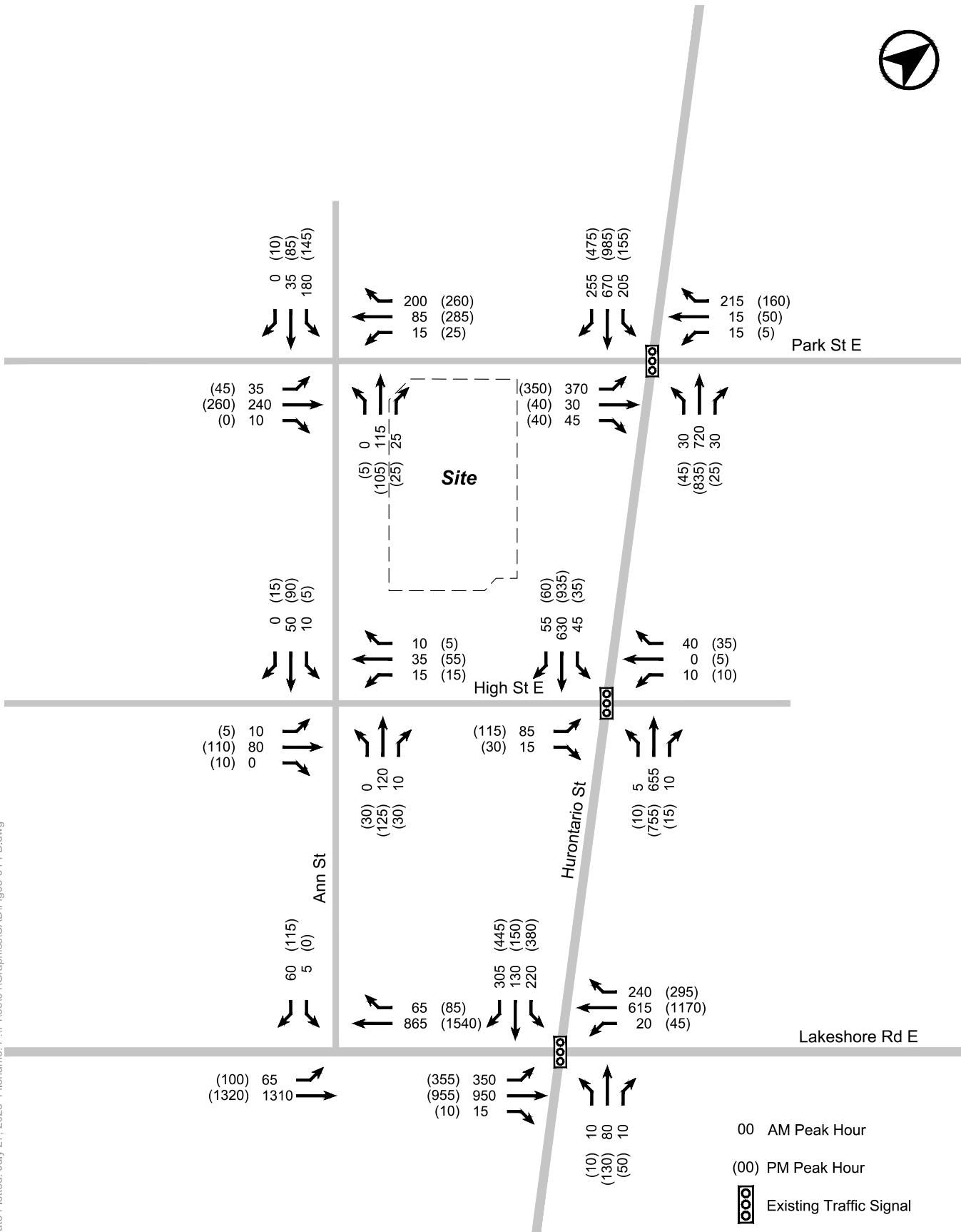
5.3.2 Site Traffic Distribution

Site traffic distribution assumptions were last considered in Section 8.3.2 of our November 2022 Memorandum. For the purposes of this addendum, the same distribution assumptions have been adopted. Site traffic volumes are illustrated in **Figure 4**.



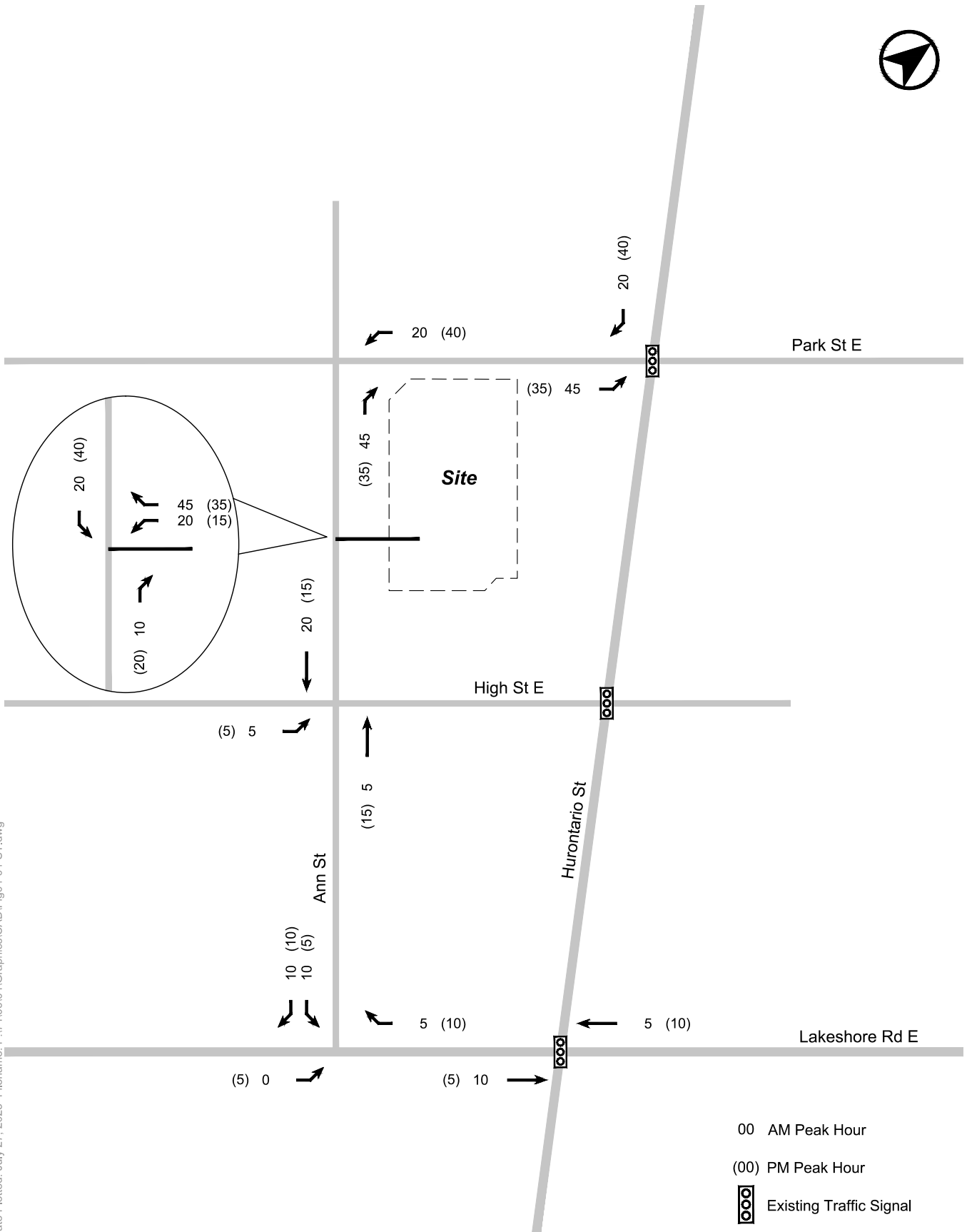
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FIGURE 2 EXISTING TRAFFIC VOLUMES



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FIGURE 3 FUTURE BACKGROUND TRAFFIC VOLUMES



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FIGURE 4 SITE TRAFFIC VOLUMES

5.4 Future Total Traffic Volumes

The future background traffic volumes in the weekday morning and afternoon peak hours were combined with the site traffic volumes to develop the future total traffic forecasts. The future total traffic volumes for the weekday morning and afternoon peak hours are illustrated in **Figure 5**.

6.0 CAPACITY ANALYSIS

Capacity analysis assumptions were discussed in Section 6.7.1 of our November 2022 Memorandum. Following this same approach, Synchro worksheets, including detailed input parameters and output results, are attached in **Appendix D**.

6.1 Analysis Parameters

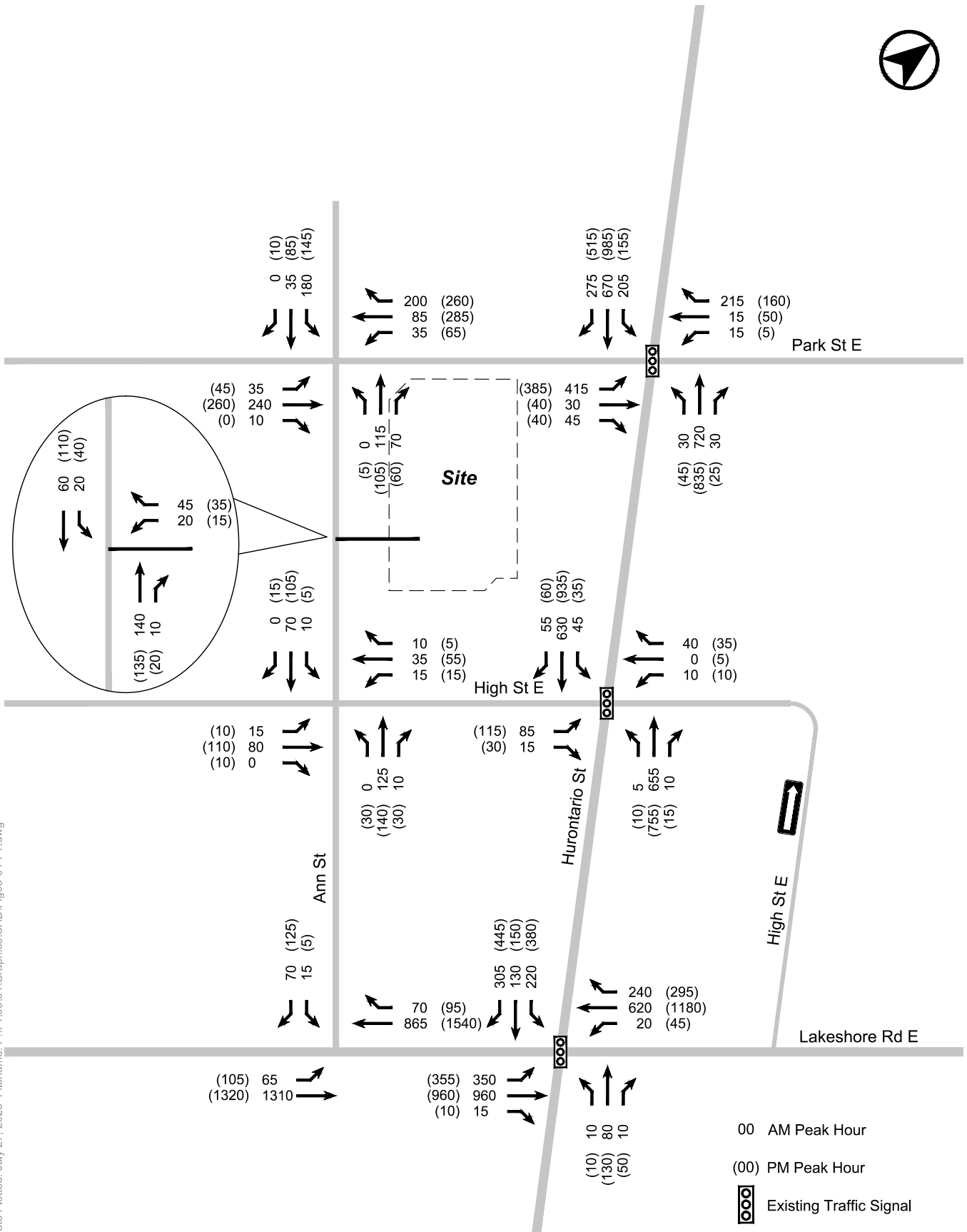
Analysis parameters were discussed in Section 6.7 of our November 2022 Memorandum. As mentioned, during the analysis of the afternoon peak hour existing conditions, default Synchro parameters produced unrealistically high v/c ratios for the eastbound left turn movement at the Lakeshore Road East / Hurontario Street – St. Lawrence Drive intersection (i.e., v/c ratios above 1.0). To better reflect existing conditions (i.e., an ‘at-capacity’ eastbound left turn movement that operates at, or just under, a v/c of 1.0), the ‘Left Turn Permitted Factor’ for this movement has been adjusted from a default of 1.32 to 1.9; resulting in a eastbound left turn v/c of 0.99. These adjustments reflect the reality of driver behaviour under near-capacity conditions. In addition, all ‘Lost Time Adjustment’ factors have been set to a value of zero for all signalized intersections.

6.2 Signalized Intersections

6.2.1 Hurontario Street – St. Lawrence Drive / Lakeshore Road

The Hurontario Street – St. Lawrence Drive / Lakeshore Road East intersection is a signalized intersection that currently operates with a cycle length of 140 seconds and 120 seconds during the morning and afternoon peak hours, respectively. Capacity analysis results are summarized in **Table 7**. Under existing traffic conditions, the intersection operates at an acceptable level of service during the weekday morning peak hour (overall v/c of 0.62), and under busy conditions during the afternoon peak hour period (overall v/c of 0.95). As discussed in Section 6.7.2., the eastbound left turn movement will operate at the limit of its theoretical capacity. Under future background traffic conditions, the signal timing plan was optimized during both peak hours resulting in operations improvements. The intersection will operate with a good level of service during the weekday morning peak hour (overall v/c of 0.70), and under busy yet acceptable conditions during the afternoon peak hour period (overall v/c of 0.98).

With the addition of site-related traffic under future 2027 traffic conditions, as the proposed development is fully developed, the intersection continues to operate under similar conditions during both the weekday morning and afternoon peak hours with overall v/c ratios of 0.70 and 0.98. Site related impacts on the intersection are negligible. Although the signal timing plan was optimized per the future per future total condition, no physical improvements are required or recommended to accommodate the proposed development.



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FIGURE 5 FUTURE TOTAL TRAFFIC VOLUMES

Table 7 Signalized Intersection Capacity Results – Hurontario Street / Lakeshore Road

Movement	Existing (2023)		Future Background (2028)		Future Total (2026)	
	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.54 (0.94)	A (D)	0.64 (0.95)	B (D)	0.64 (0.95)	B (D)
EBT	0.37 (0.48)	A (B)	0.39 (0.50)	B (B)	0.40 (0.51)	B (B)
EBR	0.01 (0.01)	A (B)	0.01 (0.01)	A (B)	0.01 (0.01)	A (B)
WBL	0.06 (0.18)	B (C)	0.07 (0.23)	B (C)	0.07 (0.23)	B (C)
WBT	0.29 (0.78)	B (D)	0.33 (0.89)	B (D)	0.34 (0.90)	B (D)
WBR	0.16 (0.26)	B (C)	0.16 (0.33)	B (C)	0.16 (0.33)	B (C)
NBL	0.04 (0.02)	D (C)	0.04 (0.02)	D (C)	0.04 (0.02)	D (C)
NBT	0.21 (0.25)	D (C)	0.22 (0.26)	D (C)	0.22 (0.26)	D (C)
SBL	0.81 (0.91)	E (E)	0.81 (0.97)	D (E)	0.81 (0.97)	D (E)
SBT	0.23 (0.17)	D (C)	0.31 (0.22)	C (C)	0.31 (0.22)	C (C)
SBR	0.21 (0.57)	F (C)	0.23 (0.48)	F (C)	0.23 (0.48)	F (C)
Overall	0.62 (0.95)	D (C)	0.70 (0.98)	C (D)	0.70 (0.98)	C (D)

Notes:

1. XX (XX): Weekday a.m. peak hour (Weekday p.m. peak hour).

6.2.2 Hurontario Street / High Street

The Hurontario Street / High Street intersection is a signalized intersection that currently operates with a cycle length of 140 seconds and 100 seconds during the morning and afternoon peak hours, respectively. Capacity analysis results are summarized in **Table 8**. Under existing traffic conditions, the intersection operates at an acceptable level of service during the weekday morning and afternoon peak hour periods, with overall v/c ratios of 0.28 and 0.40.

Under future background traffic conditions, with allowances of specific area developments and corridor growth, the intersection begins to operate at an acceptable level of service during the weekday morning and afternoon peak hours with overall v/c ratios of 0.31 and 0.42. With the addition of site-related traffic under future 2027 traffic conditions, as the proposed development is fully developed, the intersection continues to operate at an acceptable level of service during the weekday morning and afternoon peak hours with overall v/c ratios of 0.31 and 0.42. Site related impacts on the intersection are negligible. No improvements of any kind are required or recommended to accommodate the proposed development.

Table 8 Signalized Intersection Capacity Results – Hurontario Street / High Street East

Movement	Existing (2023)		Future Background (2028)		Future Total (2028)	
	V/C	LOS	V/C	LOS	V/C	LOS
EBTLR	0.59 (0.62)	E (D)	0.59 (0.62)	E (D)	0.59 (0.62)	E (D)
WBTLR	0.09 (0.09)	E (D)	0.09 (0.09)	E (D)	0.09 (0.09)	E (D)
NBL	0.01 (0.02)	A (A)	0.01 (0.03)	A (A)	0.01 (0.03)	A (A)
NBTR	0.24 (0.27)	A (A)	0.26 (0.30)	A (A)	0.26 (0.30)	A (A)
SBL	0.08 (0.07)	A (B)	0.08 (0.08)	A (A)	0.08 (0.08)	A (A)
SBTR	0.24 (0.35)	A (B)	0.27 (0.38)	A (B)	0.27 (0.38)	A (B)
Overall	0.28 (0.40)	A (B)	0.31 (0.42)	A (B)	0.31 (0.42)	A (B)

Notes:

1. XX (XX): Weekday a.m. peak hour (Weekday p.m. peak hour).

6.2.3 Hurontario Street / Park Street East

The Hurontario Street / Park Street East intersection is a signalized intersection that currently operates with a cycle length of 140 seconds and 100 seconds during the morning and afternoon peak hours, respectively. Capacity analysis results are summarized in **Table 9**.

Under existing traffic conditions, the intersection operates at an acceptable level of service during the weekday morning and afternoon peak hour periods, with overall v/c ratios of 0.51 and 0.58. Under future conditions, the signal was optimized to accommodate for overall corridor growth and area background development allowances. A protected-permissive left turn was added to the eastbound left movements. The overall cycle length was unchanged. Under future background traffic conditions, with allowances of specific area developments and corridor growth, the intersection begins to operate at an acceptable level of service during the weekday morning and afternoon peak hours with overall v/c ratios of 0.75 and 0.90. With the addition of site-related traffic under future 2027 traffic conditions, as the proposed development is fully developed, the intersection continues to operate at an acceptable level of service during the weekday morning and afternoon peak hours with overall v/c ratios of 0.79 and 0.95. Site related impacts on the intersection are minimal. Under future total conditions, the signal timing plan was optimized given the addition of a protected phase for the eastbound left turn movement during the morning peak hour.

Table 9 Signalized Intersection Capacity Results – Hurontario Street / Park Street East

Movement	Existing (2021)		Future Background (2026) ²		Future Total (2026) ²	
	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.56 (0.60)	D (D)	0.72 (0.97)	C (E)	0.80 (1.07)	D (F)
EBTR	0.07 (0.07)	D (C)	0.07 (0.09)	C (C)	0.07 (0.09)	C (C)
WBL	0.04 (0.01)	C (C)	0.04 (0.01)	D (C)	0.05 (0.01)	D (C)
WBTR	0.18 (0.19)	D (C)	0.18 (0.19)	D (C)	0.18 (0.19)	D (C)
NBL	0.03 (0.09)	B (C)	0.19 (0.54)	D (D)	0.20 (0.60)	D (E)
NBTR	0.44 (0.59)	C (C)	0.74 (0.61)	D (C)	0.74 (0.61)	D (C)
SBL	0.48 (0.45)	B (B)	0.70 (0.47)	D (B)	0.70 (0.47)	D (B)
SBT	0.31 (0.50)	B (B)	-- (--)	-- (--)	-- (--)	-- (--)
SBR	0.11 (0.24)	B (B)	-- (--)	-- (--)	-- (--)	-- (--)
SBTR	-- (--)	-- (--)	0.64 (0.80)	C (C)	0.65 (0.82)	C (C)
Overall	0.51 (0.58)	C (C)	0.75 (0.90)	D (C)	0.79 (0.95)	D (C)

Notes:

1. XX (XX): Weekday a.m. peak hour (Weekday p.m. peak hour).
2. Protected-permissive left turn added to eastbound left movements.

6.2.4 Overall Assessment of Signalized Intersections

Based on the foregoing, the net-new site traffic volumes can be appropriately accommodated at the network signalized intersections with the Hurontario LRT through signal timing adjustments and without the need for geometric improvements.

6.2.5 Unsignalized Intersections

The summarized results of the intersection traffic operations analyses undertaken the unsignalized intersections are summarized in **Table 10**.

Table 10 Unsignalized Intersection Capacity Results

Movement	Existing (2021)		Future Background (2026)		Future Total (2026)	
	Delay	V/C	Delay	V/C	Delay	V/C
Anne Street / Lakeshore Road¹						
EBL	10.1 (14.1)	B (C)	10.5 (16.1)	B (C)	10.6 (16.4)	B (C)
SBLR	16.6 (10.2)	B (B)	14.4 (10.8)	B (B)	21.2 (27.1)	C (D)
Ann Street / High Street East³						
EBLTR	8.2 (8.1)	B (B)	8.5 (8.6)	A (A)	8.6 (8.8)	A (A)
WBLTR	7.8 (7.8)	A (A)	8.1 (8.3)	A (A)	8.1 (8.5)	A (A)
NBLTR	8.7 (8.6)	A (A)	9.3 (9.7)	A (B)	9.5 (10.0)	A (B)
SBLTR	8.1 (7.6)	A (A)	8.1 (8.3)	A (A)	8.1 (8.5)	A (A)
Ann Street / Park Street East³						
EBLTR	9.2 (10.2)	B (B)	13.0 (15.9)	B (C)	13.7 (17.2)	B (C)
WBLT	7.6 (9.9)	A (A)	9.3 (15.7)	A (B)	10.0 (19.8)	A (C)
WBR	6.7 (6.8)	A (A)	9.4 (11.2)	A (A)	9.7 (11.8)	A (A)
NBLTR	9.2 (9.1)	A (A)	11.5 (12.4)	B (B)	12.2 (13.4)	B (B)
SBLTR	8.2 (9.0)	A (A)	12.1 (14.7)	B (B)	12.6 (15.6)	B (C)
Ann Street / Proposed Site Driveway²						
WBLR	-- (--)	-- (--)	-- (--)	-- (--)	9.6 (9.7)	A (A)
SBLT	-- (--)	-- (--)	-- (--)	-- (--)	2.0 (2.2)	A (A)

Notes:

1. One-way stop control.
2. Two-way stop control.
3. All-way stop control
4. XX (XX): Weekday a.m. peak hour (Weekday p.m. peak hour).

Based on the unsignalized analysis, all unsignalized intersections will operate at acceptable levels of service (LOS C or better) under all scenario conditions. Traffic associated with the proposed development can therefore be appropriately accommodated.

6.2.6 Queueing Analysis

A queueing analyses has been undertaken at all study area intersections. Queueing results at the Hurontario Street – St. Lawrence Drive / Lakeshore Road East, Hurontario Street / High Street, and Hurontario Street / Park Street intersections are summarized in **Table 11**. As can be seen in the Table, average queue lengths are well tolerated during both peak hours. An exception occurs at the westbound right turn movement at the Hurontario Street – St. Lawrence Drive / Lakeshore Road East intersection and southbound left turn at the Hurontario Street / Park Street intersection. In both instances, queue lengths will exceed the storage capacity by no more than 1-2 vehicles, and will not interfere with the operation of upstream intersections. Notwithstanding the instances in which the 95th percentile queue is forecast to exceed available storage capacity, queueing at these movements is not impacted by the proposed development, and queue growth is a function of development in the surrounding area.

Table 11 Queuing Analysis Summary

Lane Group	Existing (2021)		Future Background (2026)		Future Total (2026)		Storage Length
	50th Percentile Queue	95th Percentile Queue	50th Percentile Queue	95th Percentile Queue	50th Percentile Queue	95th Percentile Queue	
Hurontario Street / Lakeshore Road East							
EBL	39.2 (43.1)	44.5 (44.4)	41.1 (43.3)	44.4 (44.4)	41.3 (43.5)	44.4 (44.3)	130
EBT	50.4 (65.4)	60.2 (65.2)	53.3 (56.8)	64.9 (66.6)	55.2 (53.6)	65.6 (61.1)	-
EBR	2.9 (15.8)	16.6 (15.8)	2.2 (1.1)	15.9 (4.9)	1.2 (0.2)	6.0 (2.2)	90
WBL	6.1 (54)	13.8 (54)	2.9 (23.5)	9.7 (78.6)	6.3 (51.8)	15.4 (137.4)	130
WBT	49.9 (129.5)	78.1 (129.5)	60.5 (136)	90.9 (214.4)	64.3 (247.8)	99.3 (272.3)	-
WBR	22.6 (88.4)	50.4 (67.5)	19.7 (52.3)	42.8 (67.5)	26.8 (62.8)	62.4 (67.5)	60
NBL	3.7 (6.5)	15.4 (6.5)	2.6 (1.1)	8.9 (5.1)	0.7 (3.4)	4.3 (15.3)	30
NBTR	13.8 (41.8)	28.6 (41.8)	16.4 (26.3)	32.6 (53.7)	14.6 (28.4)	33.7 (50.4)	-
SBL	33.2 (43.7)	38.4 (38.4)	28.7 (35)	37.3 (37.3)	28.1 (31.8)	37.2 (37.3)	35
SBT	67.4 (102.6)	101.5 (102.6)	55.1 (99.6)	101 (102.3)	64 (81.3)	102.9 (102.3)	-
SBR	28.8 (46.4)	37.5 (37.5)	22.5 (33.7)	37.5 (37.5)	24.5 (30.9)	37.5 (37.5)	90
Hurontario Street / High Street East							
EBLTR	22.4 (30.7)	22.4 (30.7)	20.6 (26.8)	46.1 (52.8)	24.3 (27.4)	49.4 (54.9)	-
WBLTR	7.1 (8.2)	7.1 (8.2)	10.8 (14.1)	19.2 (27)	9.8 (10.1)	21.1 (22.1)	-
NBL	0.9 (3.1)	0.9 (3.1)	0.8 (3)	4.8 (15)	0.7 (2.9)	4.0 (10.7)	30
NBT	14.8 (18.7)	14.8 (18.7)	20.7 (20.3)	48.3 (42.7)	24.9 (21.6)	52.5 (38.7)	-
NBTR	17.4 (24.1)	17.4 (24.1)	17.5 (23.1)	39.5 (42.8)	25.7 (25.3)	53.1 (43.1)	30
SBL	15.1 (12.7)	15.1 (12.7)	12.1 (7.1)	32.5 (28)	12.5 (13.6)	35.7 (37.3)	-
Hurontario Street / Park Street							
EBL	24.7 (26.8)	32.3 (32.3)	30.3 (30.4)	32.3 (32.3)	27 (31.5)	32.4 (32.4)	55
EBTR	16.9 (24.7)	49.2 (62)	53.4 (54)	77.6 (77.7)	44.7 (66.3)	79 (77.6)	-
WBL	2.0 (0.7)	8.4 (4.4)	2.4 (1.2)	9.7 (5.6)	4.6 (1.6)	18.5 (6.7)	60
WBTR	29.1 (24.6)	61.9 (42.1)	26.9 (23.5)	56.9 (45.9)	39.2 (54.6)	78.4 (89.2)	-
NBL	1.1 (2.1)	6.3 (8)	16.1 (12.2)	37.3 (29.6)	17.6 (18.8)	37.3 (37.4)	35
NBT	44.9 (33.5)	68.8 (59.5)	72.7 (41.7)	97.5 (63.3)	70 (46.1)	100.3 (85.8)	0
NBTR	49.3 (35.1)	79.2 (63.4)	76.1 (46)	99.4 (71.8)	72.8 (48.9)	100.9 (86.1)	-
SBL	29.1 (29.7)	37.3 (37.4)	49.3 (47.5)	67.5 (67.5)	50.4 (45.2)	67.3 (67.5)	30
SBT	65.5 (215.1)	100.4 (220.4)	127.2 (217.3)	198.3 (224.1)	160 (216.2)	228.9 (223.8)	-

Notes:

1. All values are in meters

7.0 SUMMARY OF FINDINGS

BA Group has been retained by 10 West GO GP Inc. to provide transportation advisory services in support of an Official Plan Amendment and Rezoning application to permit the redevelopment of the 17 and 19 Ann Street, 84 High Street and 90 High Street lands (herein referred to as “the site”) in the City of Mississauga. The proposed development has been updated to include a 26-storey tower which situated within the northwest corner of the site (municipal address of 17 and 19 Ann Street) and will contain 410 residential units and approximately 312 square metres of commercial space at grade. The site area also contains two existing structures, both of which will be retained at full build-out. These consist of six (6) residential units at 84 High Street and approximately 340 square metres of commercial GFA at 90 High Street.

Vehicular Parking

1. The proposed parking supply for the site reflects a 10% reduction relative to By-law requirements, consistent with our April 2023 proposal (Letter) to the City of Mississauga.
2. The current concept plan illustrates the provision of 386 parking spaces including 296 resident spaces and 74 residential visitor spaces for the 10 West development, 6 spaces reserved for the existing 84 High Street property, and 7 spaces for the 90 High Street property. In addition, 2 car-share spaces will be provided in the P1 parking level.
3. The proposed parking supply meets the proposed requirements, and will be supported by a range of transportation demand management (TDM) measures. These included:
 - a. Provisioning of two (2) car share spaces located in the visitor section of the garage (in addition to the visitor spaces provided);
 - b. Providing Presto Cards pre-loaded with a value of \$75.00 for each residential unit;
 - c. Applicant’s committal to selling parking spaces unbundled from the purchase price of each residential unit; and,
 - d. Provisioning of a Bike Repair Station on-site.

Bicycle Parking

4. Bicycle parking requirements are specified in the City’s Zoning By-law 225-2007. Application of these rates to the proposed development results in a bicycle parking requirement of 269 spaces, of which 246 are long-term spaces (called “Class A” in the By-law) and 23 are short-term spaces (called “Class B” in the By-law).
5. The current concept plan for 10 West development illustrates the provision of 269 parking spaces including 246 long-term (resident) spaces and 23 short-term (visitor) spaces for the 10 West development. This proposed bicycle parking supply meets the Zoning By-law 225-2007 requirements.
6. It is proposed to provide visitor bicycle parking spaces at-grade while long-term occupant spaces will be located in secure and weather-protected facilities within the P1 level of the parking garage.
7. No bicycle parking is provided for the existing 84 High Street and 90 High Street heritage buildings.

Loading Considerations

8. The application of the minimum City of Mississauga Zoning By-law 0225-2007 loading requirements requires a total of two (2) loading spaces to be provided to service the proposed 10 West development. It should be noted that if the retail floor area within the proposed 10 West development was less than 250 m² (current proposal is 62 m² above this threshold) no loading space would be required.

9. Site constraints make it unfeasible to accommodate the two (2) formal loading zones. Furthermore, the City of Mississauga Zoning By-law does not include any provisions for shared loading arrangements in mixed-use developments.
10. Two (2) loading spaces are proposed within a central, consolidated loading facility for the proposed 10 West development with vehicular access provided off of Ann Street. While the proposed loading supply meets the Zoning By-law requirement, one of the proposed spaces is deficient in length by 1 metre. The proposed loading facilities for the 10 West development are as follows:
 - a. One (1) formal loading space, consistent with the requirements set out in the Mississauga Zoning By-law (3.5 m width and 9.0 m length); and
 - b. One (1) proposed smaller loading space (3.5 m width and 8.0 m length), that can accommodate a range of smaller delivery vehicles (i.e. step vans and cube vans).
11. Given that the pick-up of refuse and recycling for the residential and retail uses would not occur at the same time, and that building maintenance workers would shuffle the bins on the day of collection, the proposed bin staging arrangement is acceptable given the site constraints.

Capacity Analysis

12. Under existing conditions, all study area intersections operate within capacity, although the Hurontario Street – St. Lawrence Drive / Lakeshore Road East intersection will operate under busy conditions during the afternoon peak hour.
13. Under future conditions (future background and future total), study area intersections will continue to operate under the same conditions.
14. Site traffic impacts are noted to be negligible, and no physical improvements are required or recommended to accommodate the proposed development. However, signal timing modifications are proposed as follows:
 - a. At the Hurontario Street / Park Street East intersection, a protected phase was added for the eastbound left turn movement during the morning peak hour.
 - b. At the Hurontario Street – St. Lawrence Drive / Lakeshore Road East intersection, the signal timing plan was optimized per the future per future total conditions.

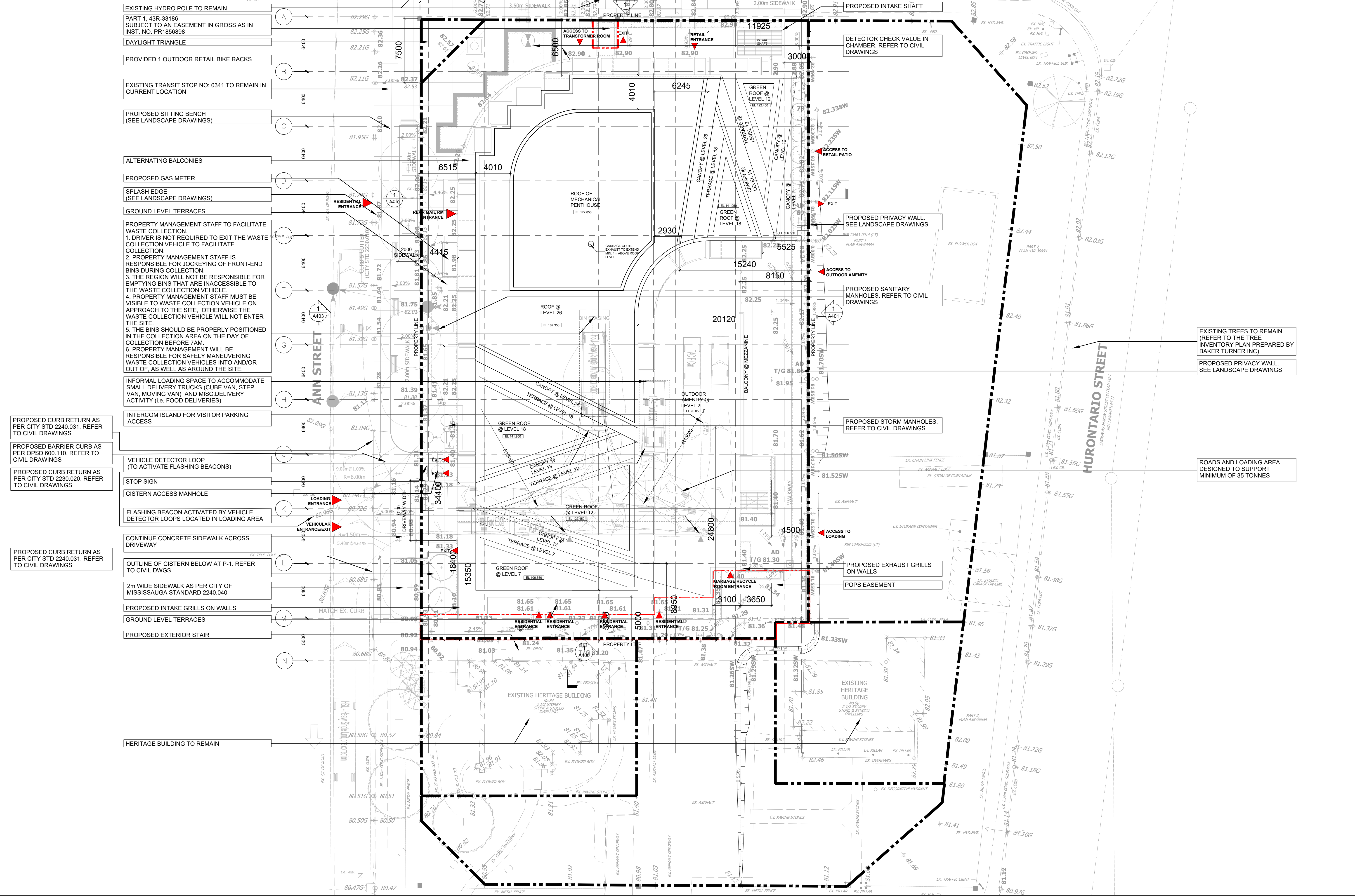
Queueing Study

15. Average queue lengths at all study intersections are well tolerated during both peak hours. An exception occurs at the westbound right turn movement at the Hurontario Street – St. Lawrence Drive / Lakeshore Road East intersection and southbound left turn at the Hurontario Street / Park Street intersection. In both instances, queue lengths will exceed the storage capacity by no more than 1-2 vehicles, and will not interfere with the operation of upstream intersections. Notwithstanding the instances in which the 95th percentile queue is forecast to exceed available storage capacity, queueing at these movements is not impacted by the proposed development, and queue growth is a function of development in the surrounding area.

In conclusion, the revised proposal can be accommodated from a transportation perspective.

Appendix A Reduced Architectural Plans

LENGTH NO.	BEGIN ELEV.	END ELEV.	LENGTH	(L1+L2)/2XL
1	82.25	81.55	23,365.00	1,921,771.25
2	82.25	81.55	7,455.00	610,564.50
3	81.55	82.25	5,920.00	481,680.80
4	82.25	82.90	9,790.00	799,989.85
5	82.25	82.90	79,144.00	6,509,594.00
6	82.25	82.90	5,770.00	476,457.75
7	82.90	82.75	6,565.00	543,746.13
8	82.75	82.90	21,025.00	1,741,395.63
9	82.90	82.90	7,805.00	647,034.50
10	82.75	82.90	29,005.00	2,395,087.88
TOTAL:			195,844.00	16,127,322.28
			EG:	82.35



- EXISTING HYDRO POLE TO REMAIN
- PART 1, 43R-33186 SUBJECT TO AN EASEMENT IN GROSS AS IN INST. NO. PR1856898
- DAYLIGHT TRIANGLE
- PROVIDED 1 OUTDOOR RETAIL BIKE RACKS
- EXISTING TRANSIT STOP NO. 0341 TO REMAIN IN CURRENT LOCATION
- PROPOSED SITTING BENCH (SEE LANDSCAPE DRAWINGS)
- ALTERNATING BALCONIES
- PROPOSED GAS METER
- SPLASH EDGE (SEE LANDSCAPE DRAWINGS)
- GROUND LEVEL TERRACES
- PROPERTY MANAGEMENT STAFF TO FACILITATE WASTE COLLECTION. 1. DRIVER IS NOT REQUIRED TO EXIT THE WASTE COLLECTION VEHICLE TO FACILITATE COLLECTION. 2. PROPERTY MANAGEMENT STAFF IS RESPONSIBLE FOR JOCKEYING OF FRONT-END BINS DURING COLLECTION. 3. THE REGION WILL NOT BE RESPONSIBLE FOR EMPTYING BINS THAT ARE INACCESSIBLE TO THE WASTE COLLECTION VEHICLE. 4. PROPERTY MANAGEMENT STAFF MUST BE VISIBLE TO WASTE COLLECTION VEHICLE ON APPROACH TO THE SITE, OTHERWISE THE WASTE COLLECTION VEHICLE WILL NOT ENTER THE SITE. 5. THE BINS SHOULD BE PROPERLY POSITIONED IN THE COLLECTION AREA ON THE DAY OF COLLECTION BEFORE 7AM. 6. PROPERTY MANAGEMENT WILL BE RESPONSIBLE FOR SAFELY MANEUVERING WASTE COLLECTION VEHICLES INTO AND/OR OUT OF, AS WELL AS AROUND THE SITE.
- INFORMAL LOADING SPACE TO ACCOMMODATE SMALL DELIVERY TRUCKS (CUBE VAN, STEP VAN, MOVING VAN) AND MISC. DELIVERY ACTIVITY (i.e. FOOD DELIVERIES)
- INTERCOM ISLAND FOR VISITOR PARKING ACCESS
- VEHICLE DETECTOR LOOP (TO ACTIVATE FLASHING BEACONS)
- STOP SIGN
- CISTERN ACCESS MANHOLE
- FLASHING BEACON ACTIVATED BY VEHICLE DETECTOR LOOPS LOCATED IN LOADING AREA
- CONTINUE CONCRETE SIDEWALK ACROSS DRIVEWAY
- OUTLINE OF CISTERN BELOW AT P-1. REFER TO CIVIL DWGS
- 2m WIDE SIDEWALK AS PER CITY OF MISSISSAUGA STANDARD 2240.040
- PROPOSED INTAKE GRILLS ON WALLS
- GROUND LEVEL TERRACES
- PROPOSED EXTERIOR STAIR
- HERITAGE BUILDING TO REMAIN

- PROPOSED CURB RETURN AS PER CITY STD 2240.031. REFER TO CIVIL DRAWINGS
- PROPOSED BARRIER CURB AS PER OPD 600.110. REFER TO CIVIL DRAWINGS
- PROPOSED CURB RETURN AS PER CITY STD 2230.020. REFER TO CIVIL DRAWINGS
- PROPOSED CURB RETURN AS PER CITY STD 2240.031. REFER TO CIVIL DRAWINGS

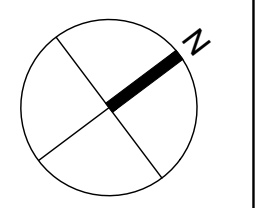
- EXISTING TREES TO REMAIN (REFER TO THE TREE INVENTORY PLAN PREPARED BY BAKER TURNER INC)
- PROPOSED PRIVACY WALL. SEE LANDSCAPE DRAWINGS
- ROADS AND LOADING AREA DESIGNED TO SUPPORT MINIMUM OF 35 TONNES

No.	Revisions	Date
03	ISSUED FOR CLIENT REVIEW	04 JUL 2023
02	RE-ISSUED FOR OPA / REZONING	28 OCT 2022
01	ISSUED FOR OPA / REZONING	17 DEC 2021

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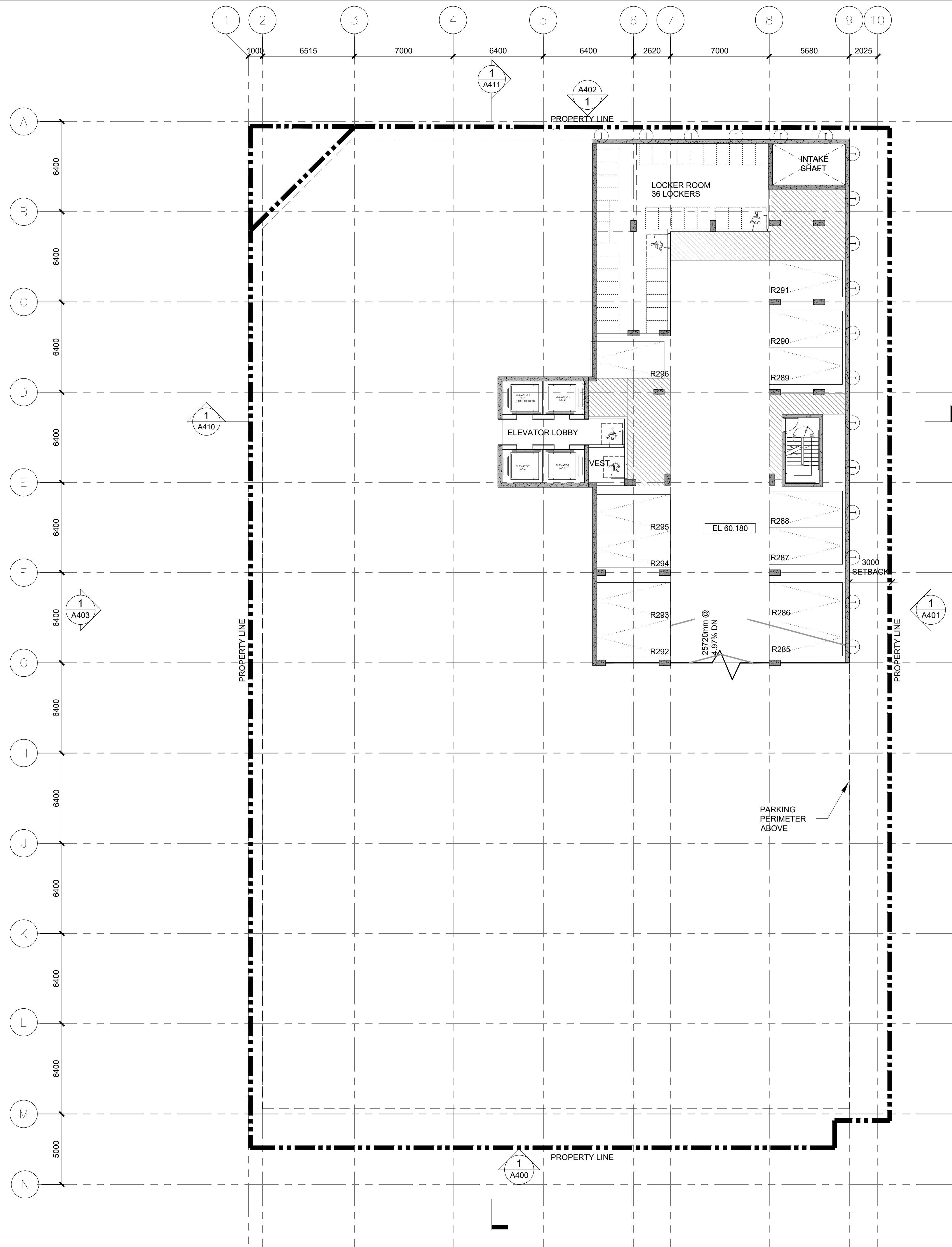
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 APP NO. OZ/OPA 23-11



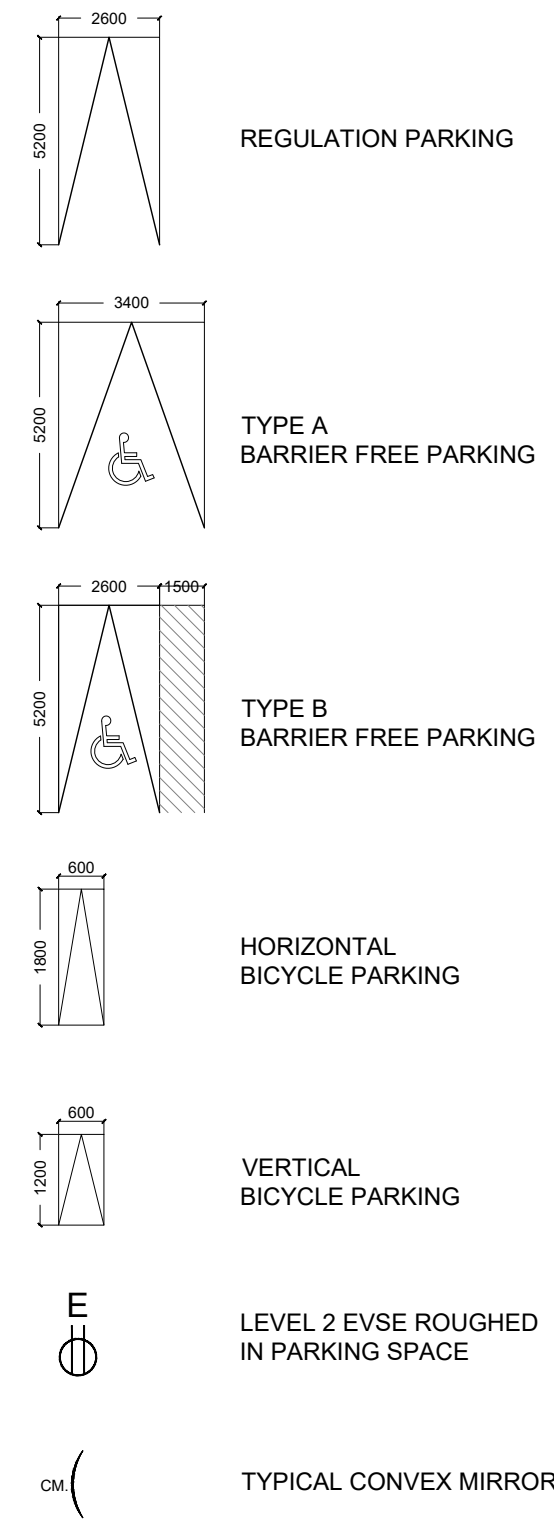
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Checked	Date
DL, CY	24 OCT 2022

SITE PLAN

Project No.	Drawing No.
21-182	A104



PARKING LEGEND



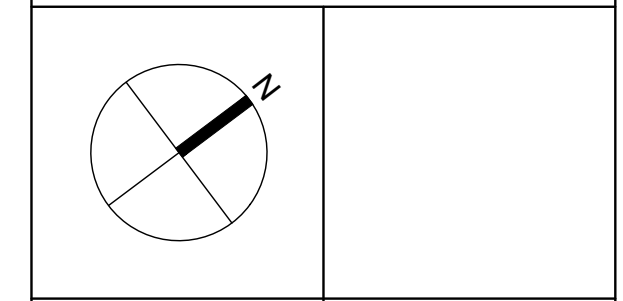
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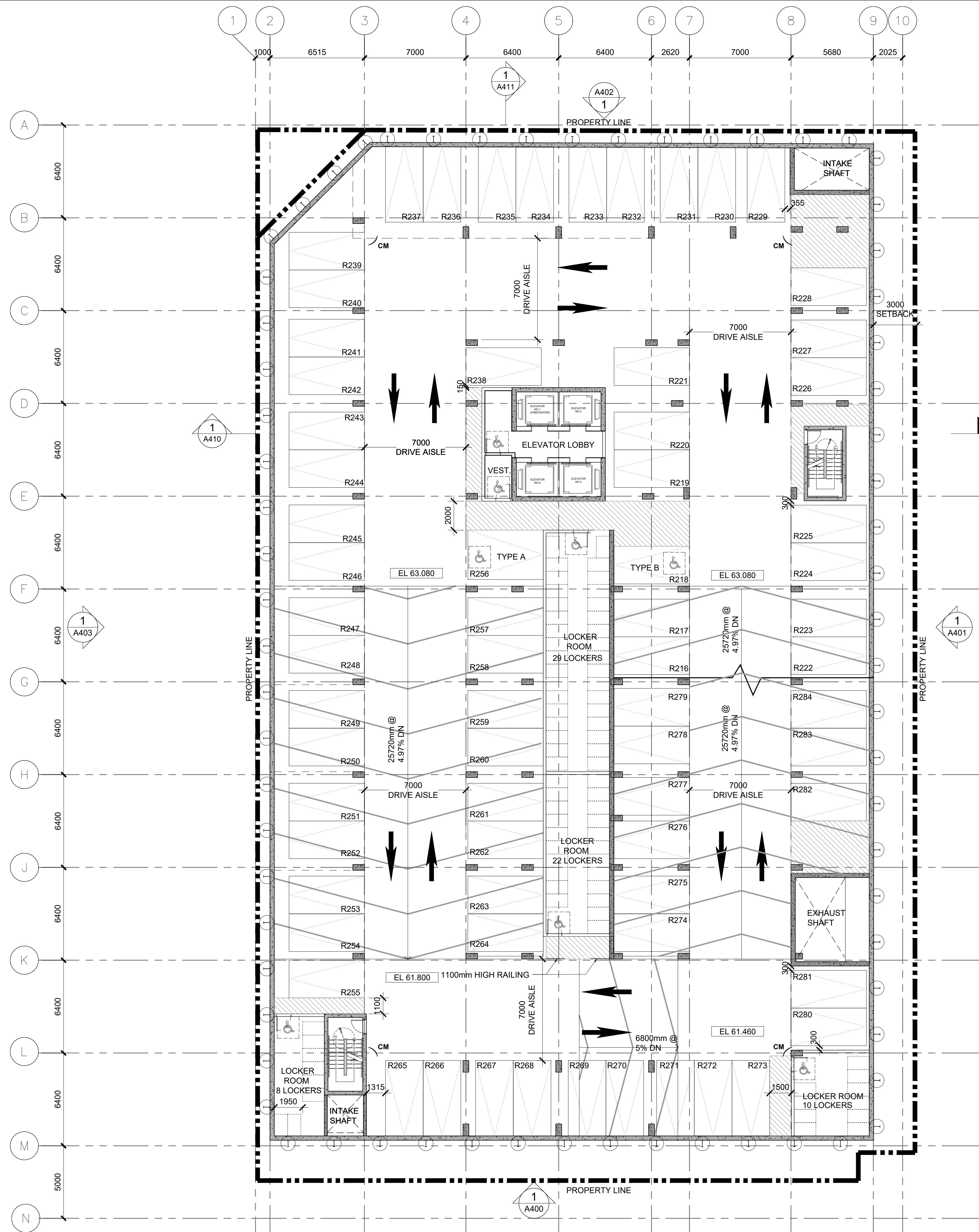
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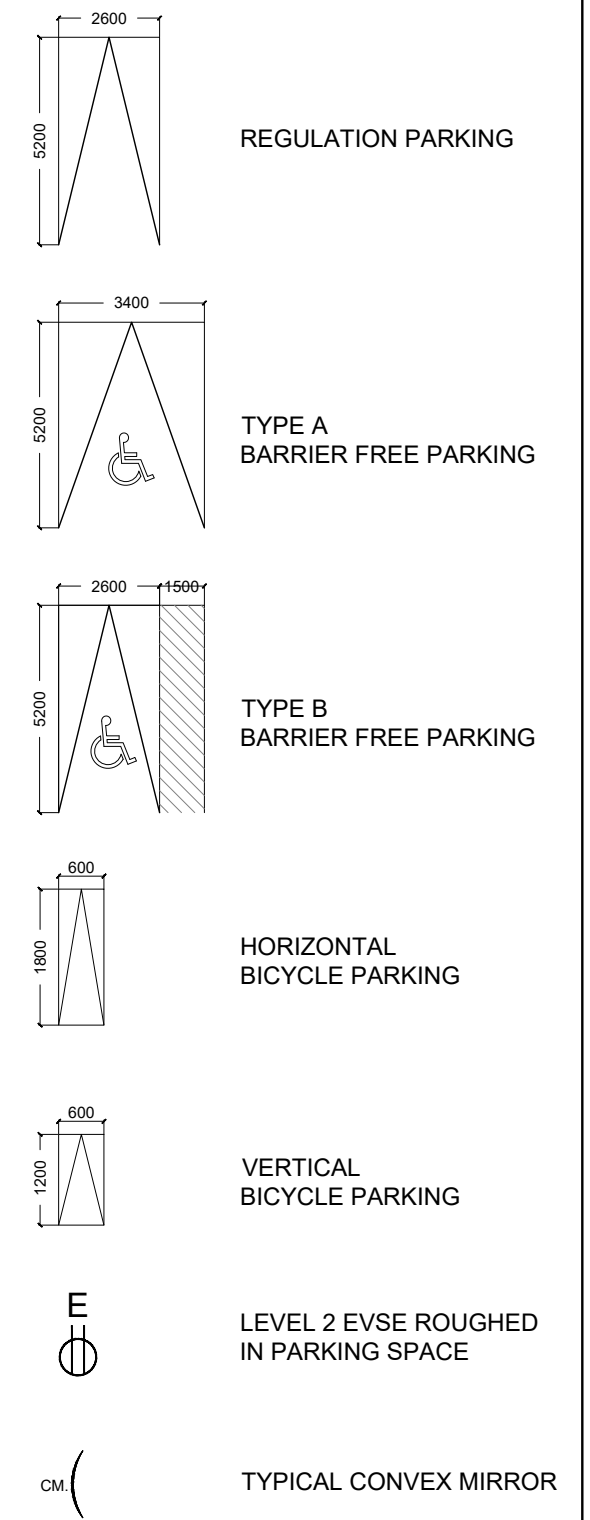
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Title
P7 PARKING LEVEL

Project No. 21-182	Drawing No. A200
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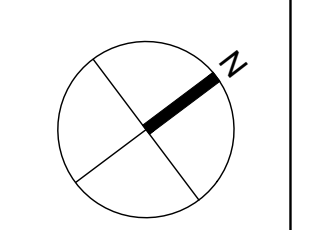
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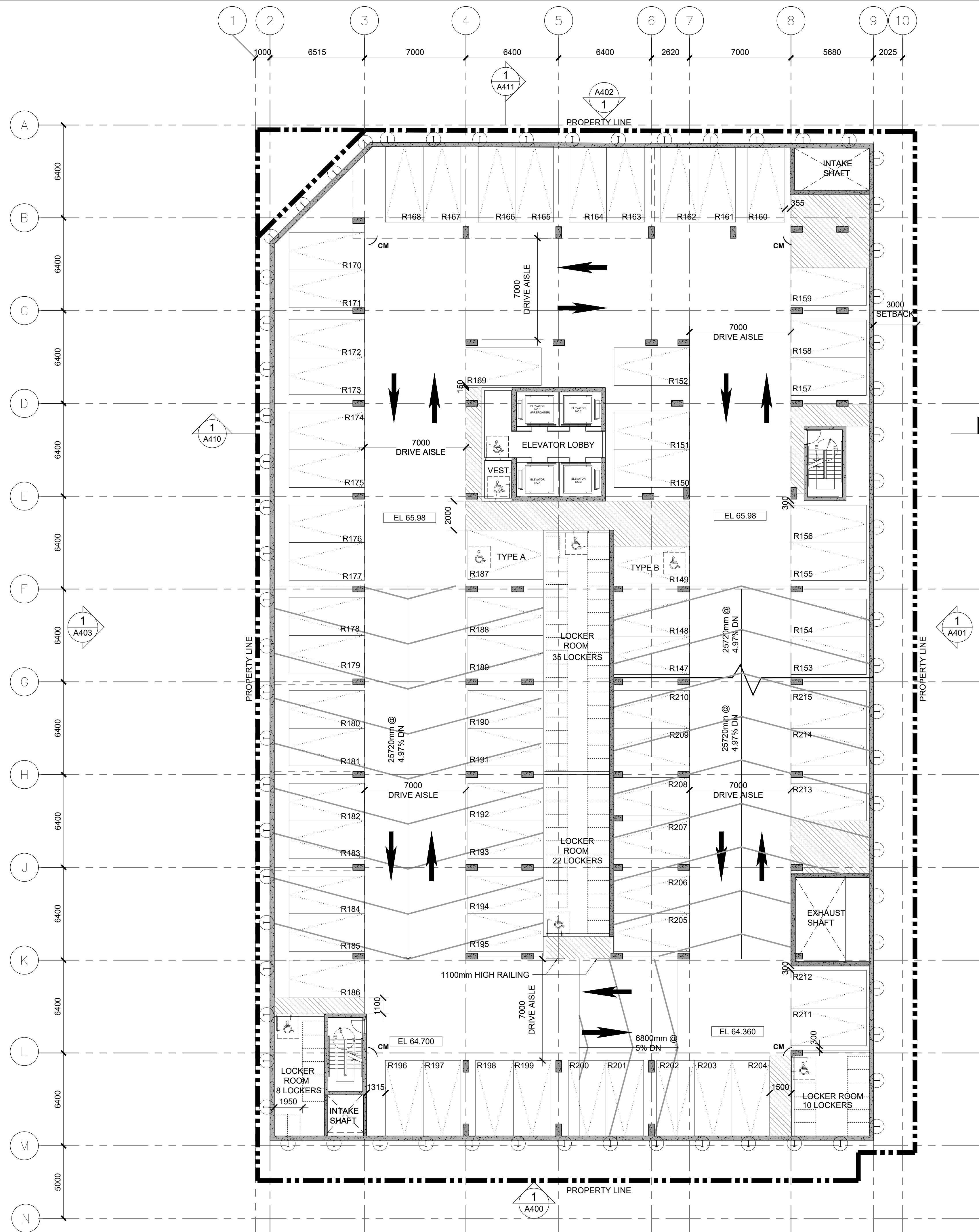
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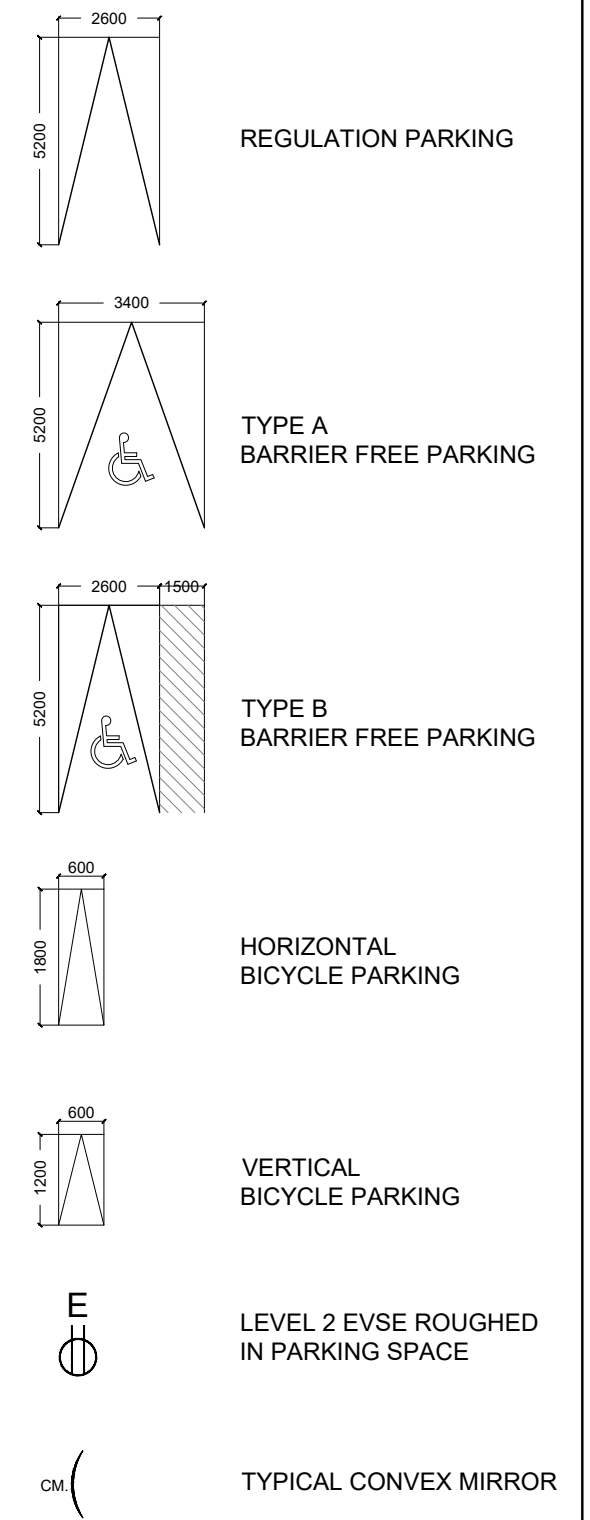
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Title
P6 PARKING LEVEL

Project No. 21-182	Drawing No. A201
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PARKING LEGEND



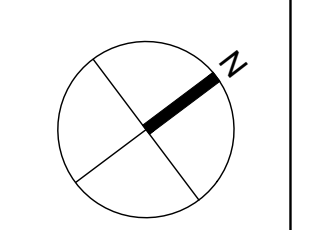
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02	RE-ISSUED FOR OPA / REZONING	28 OCT 2022
01	ISSUED FOR OPA / REZONING	17 DEC 2021
No.	Revisions	Date

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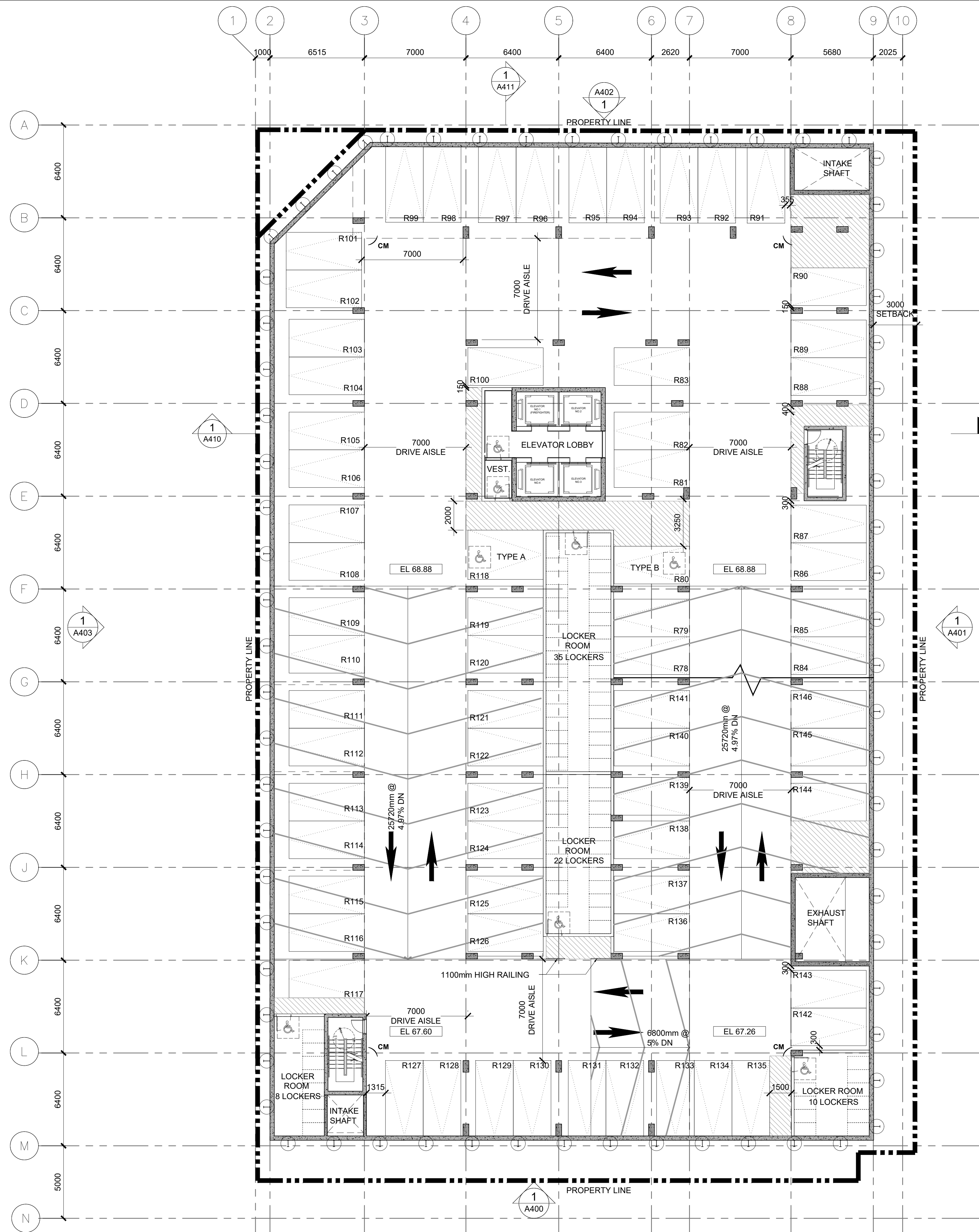
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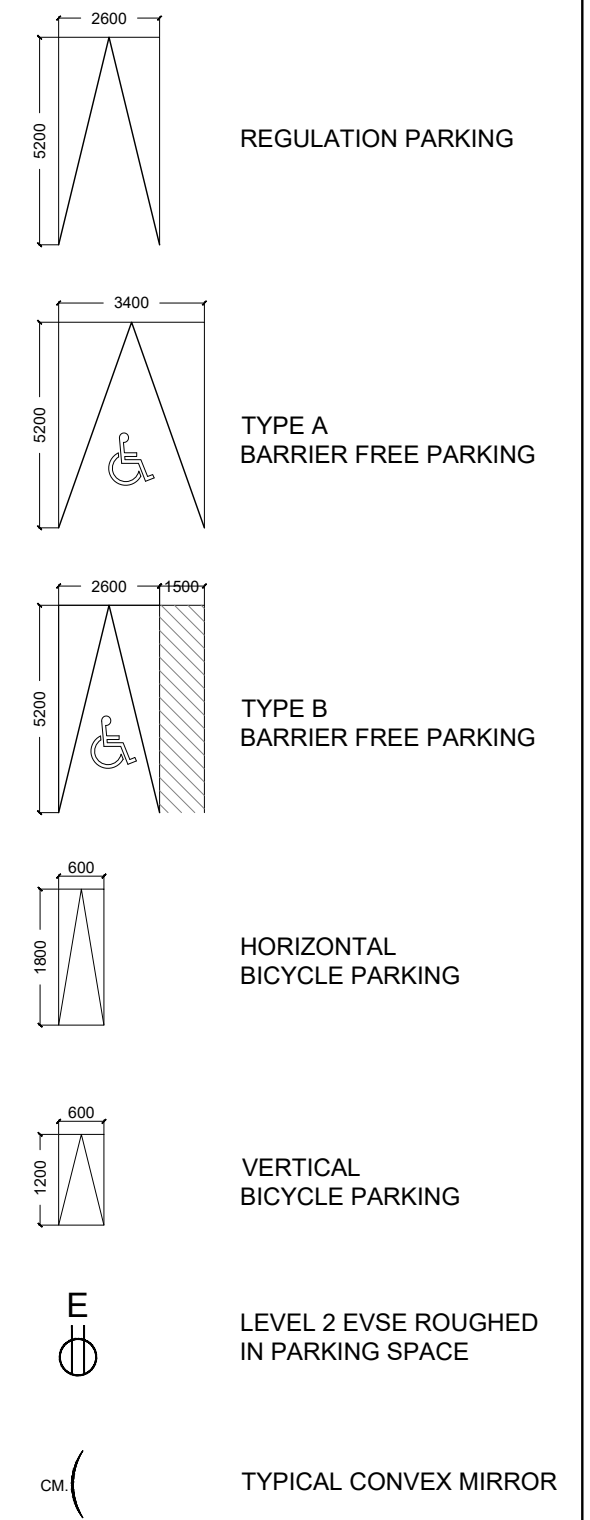
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Title
P5 PARKING LEVEL

Project No. 21-182	Drawing No. A202
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PARKING LEGEND



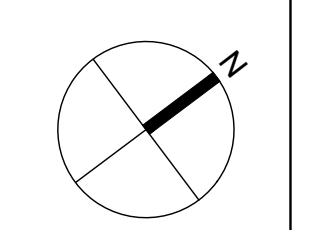
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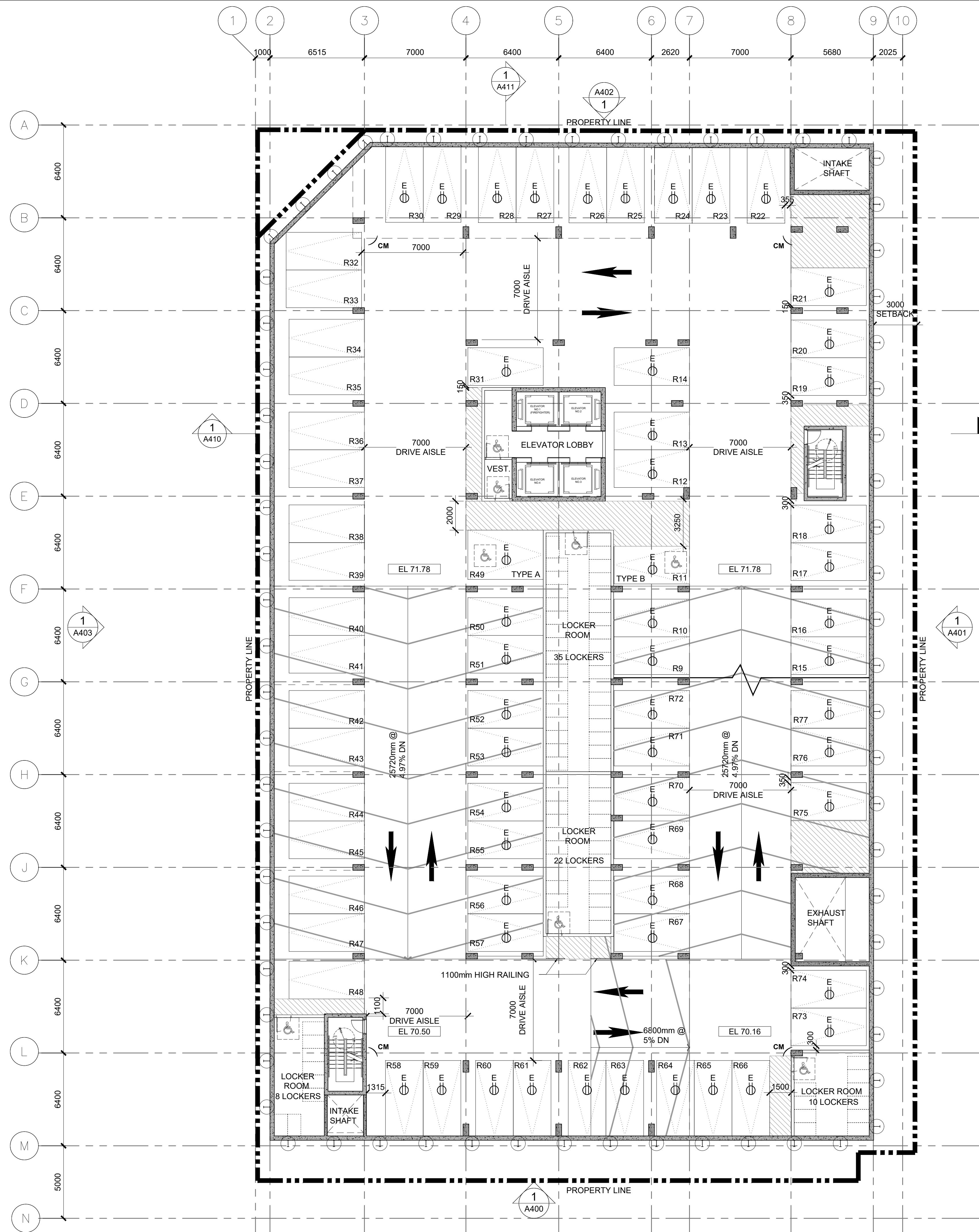
10 WEST GO
 MISSISSAUGA, ONTARIO
 APP No. 02/OPA 22-3 W1



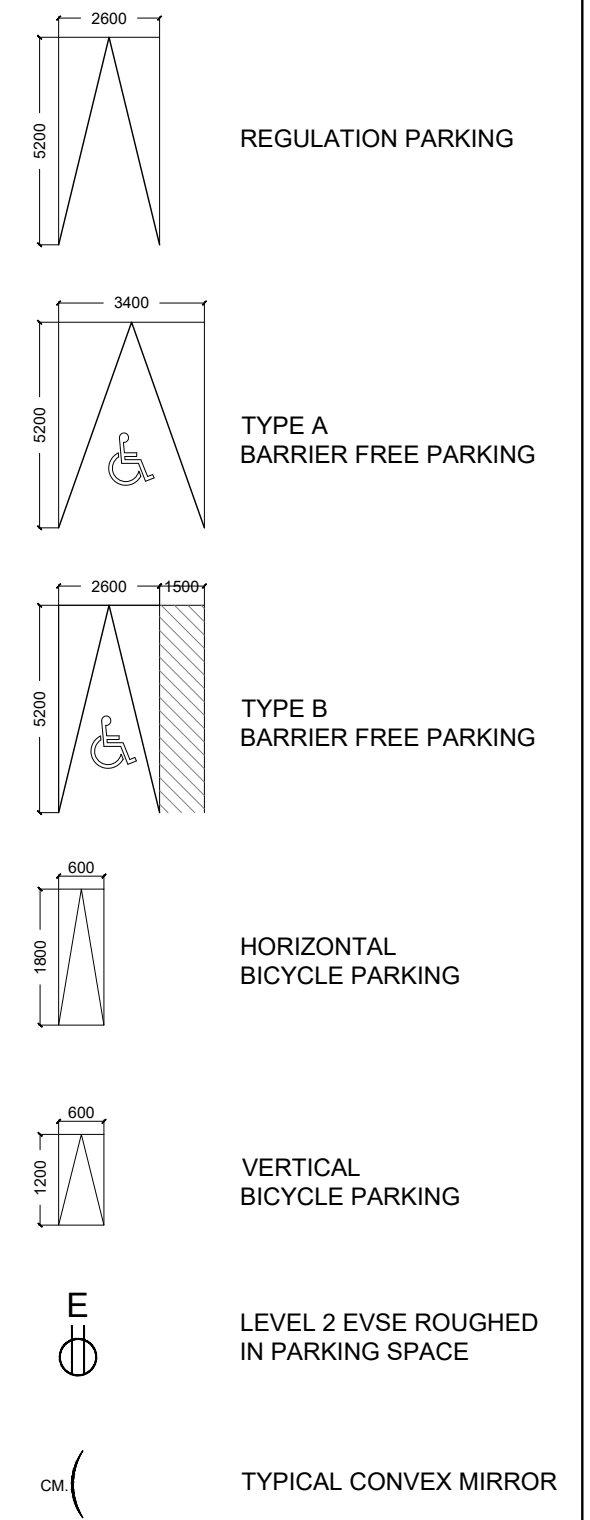
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Checked DL, CY	Date 24 OCT 2022

Title
P4 PARKING LEVEL

Project No. 21-182	Drawing No. A203
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PARKING LEGEND



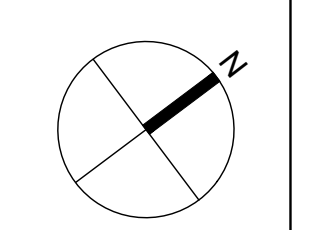
No.	Revisions	Date
03	ISSUED FOR CLIENT REVIEW	04 JUL 2023
02	RE-ISSUED FOR OPA / REZONING	28 OCT 2022
01	ISSUED FOR OPA / REZONING	17 DEC 2021

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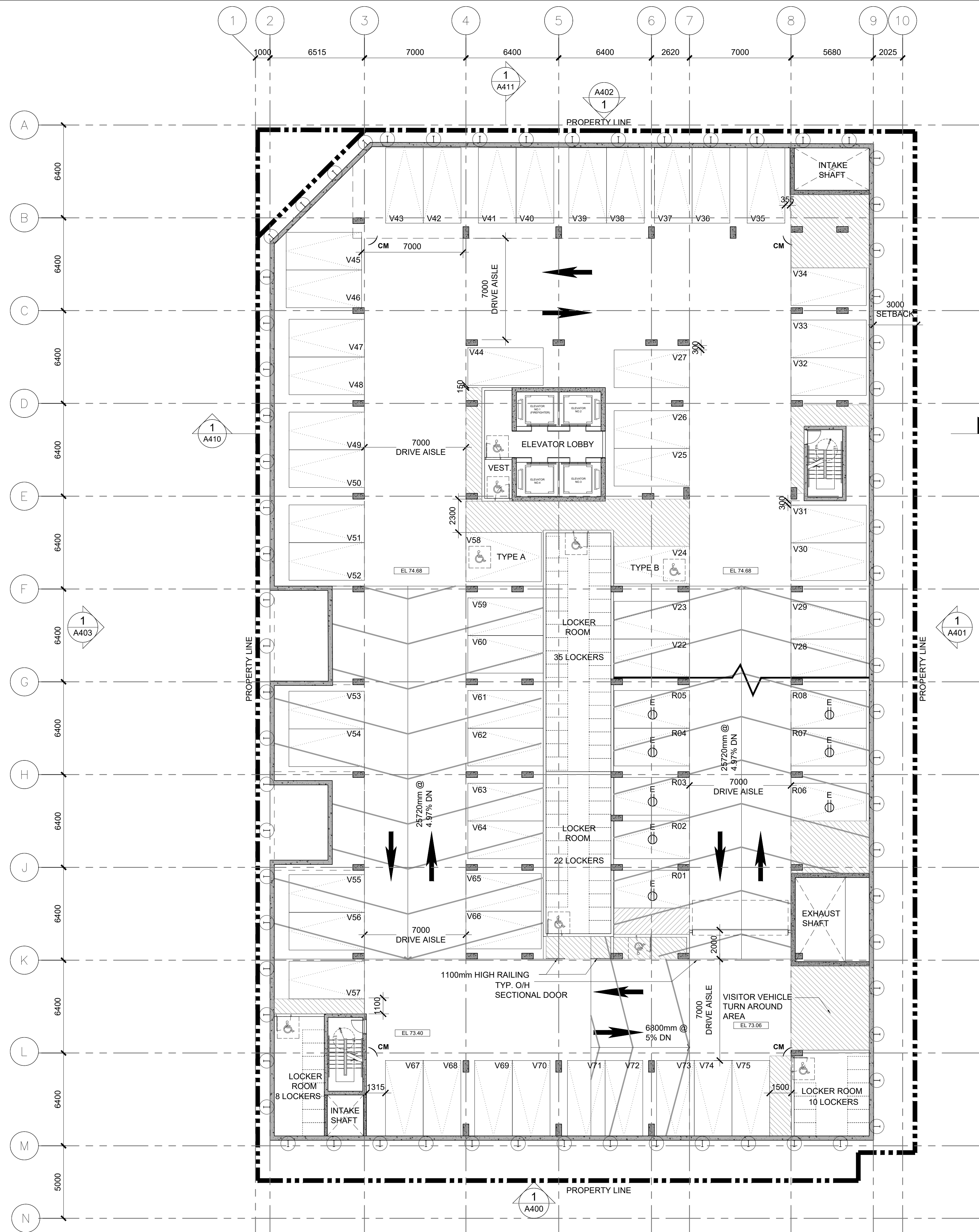
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 APP No. 02/OPA 22-3 W1



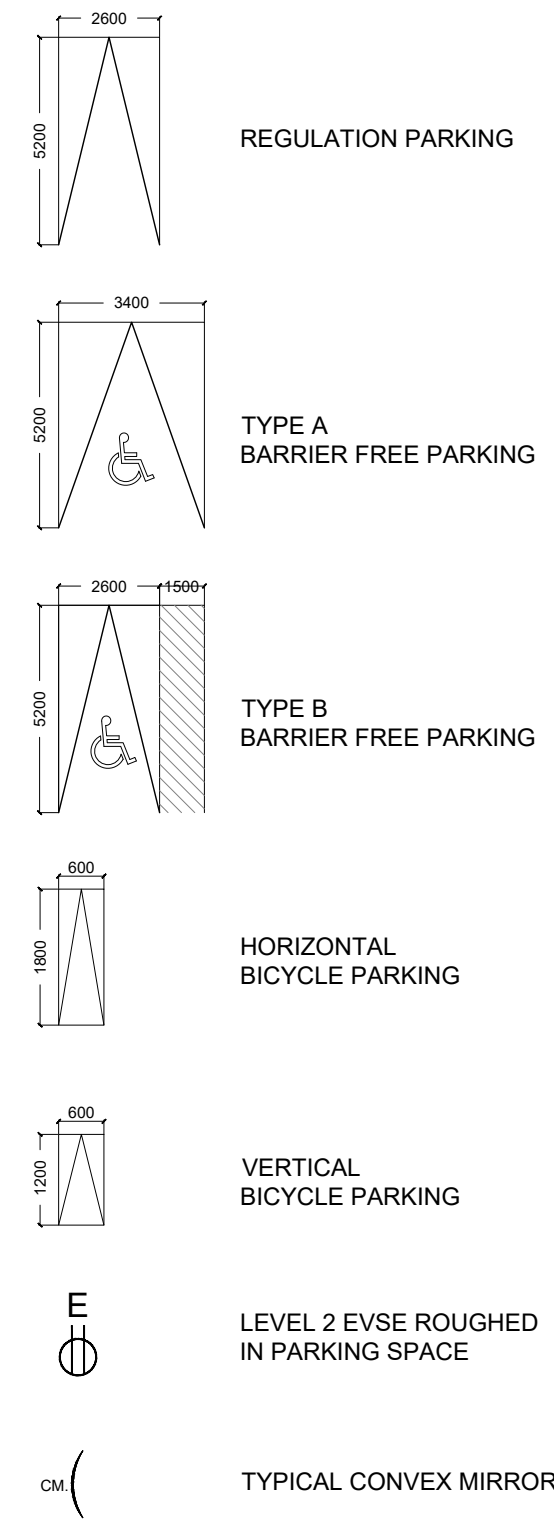
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Checked: DL, CY	Date: 24 OCT 2022

Title:
P3 PARKING LEVEL

Project No. 21-182	Drawing No. A204
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PARKING LEGEND



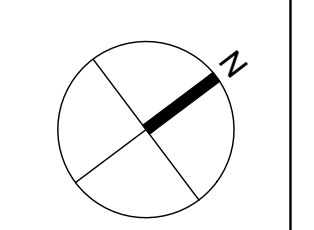
No.	Revisions	Date
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01	ISSUED FOR OPA / REZONING	17 DEC 2021

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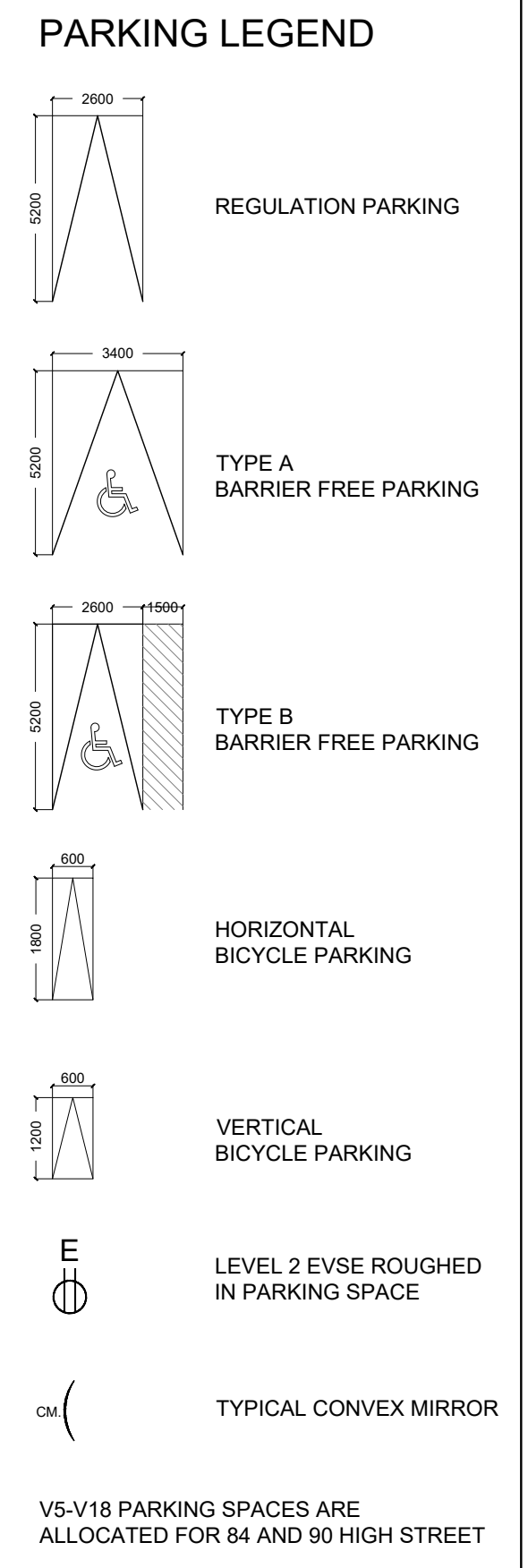
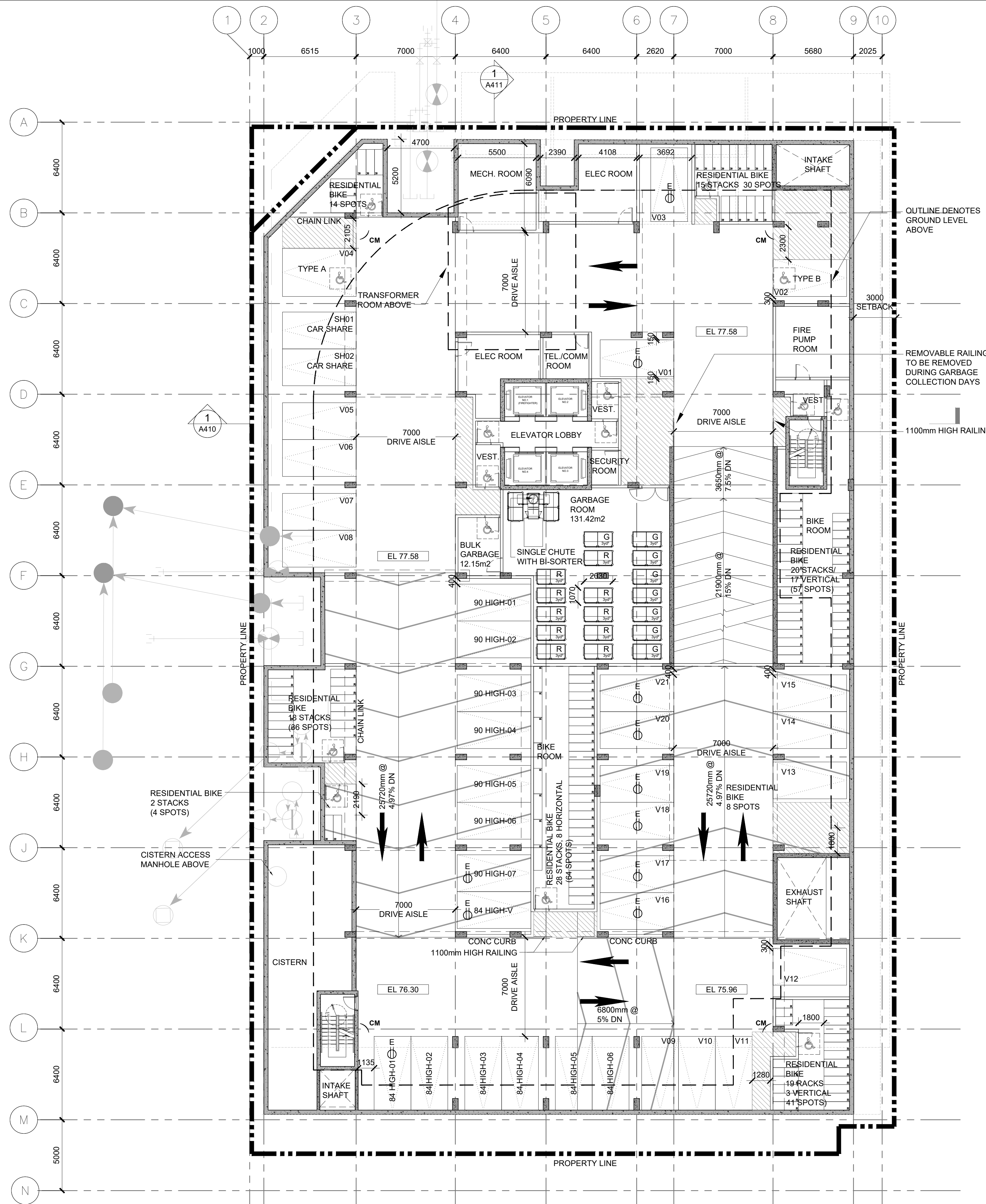
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 APP. NO. 02/OPA 22-3 W1



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Checked DL, CY	Date 24 OCT 2022

Title
P2 PARKING LEVEL

Project No. 21-182	Drawing No. A205
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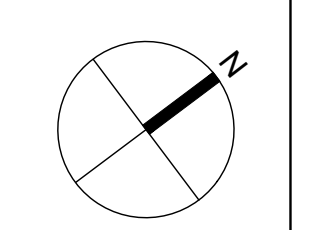
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Checked DL, CY	Date 24 OCT 2022

Title
P1 PARKING LEVEL

Project No. 21-182	Drawing No. A206
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Appendix B Parking Justification Letter

April 20th, 2023

Mark Mueller, Transportation Planner
Municipal Parking, City of Mississauga
3185 Mavis Rd
Mississauga, ON L5C 1T7
Phone: (905) 615 3200, ext. 5896

RE: 17 and 19 Ann Street, 84 High Street and 90 High Street lands – Parking Justification Letter

Dear Mark:

BA Group has been retained by 10 West GO GP Inc. to provide transportation advisory services in support of an Official Plan Amendment and Rezoning application to permit the redevelopment of the 17 and 19 Ann Street, 84 High Street and 90 High Street lands (herein referred to as “the site”) in the City of Mississauga. The site is 3,273.96 square metres in size and located approximately 150 metres from the Port Credit GO Station and less than 100 metres from the future Hurontario LRT stop at the northwest corner of Hurontario Street and Park Street East. The existing development block consists of two residential detached dwelling units on the northwestern portion of the site, 2,449.5 square metres of vacated City-owned lands on the northeastern portion of the block, and two heritage buildings (84 and 90 High Street) along the southern portion of the site.

The proposed development includes a 23-storey tower which will be situated within the northwest corner of the site (municipal address of 17 and 19 Ann Street) and will contain 363 residential units and approximately 312 square metres of commercial space at grade. A total of 2,449 square metres of public parkland will be created through the redevelopment, including a 1,536 square metre park along Hurontario Street and a 913 square metre park oriented along High Street East. The site area also contains two existing structures, both of which will be retained at full build-out. These consist of six (6) residential units at 84 High Street and approximately 340 square metres of commercial GFA at 90 High Street.

Background

In December of 2021, BA Group submitted an Urban Transportation Considerations Study in support of a development proposal which at that time supported the provision of 283 parking spaces; including 233 resident spaces and 36 residential visitor spaces for the 10 West development, and 7 spaces reserved for each of the existing 84 and 90 High Street heritage buildings¹. Considering a proposal of [then] 359 residential units, resulting effective parking requirements of 0.64 spaces per unit and 0.10 spaces per unit were proposed for residential and visitor components, respectively.

¹ Residential Parking Rate: (1 Bedroom: 0.57 spaces / unit, 2 Bedroom: 0.73 spaces / unit)

Subsequently, in November 2022, BA Group submitted a Technical Memorandum which addressed agency comments, including those pertaining to the proposed parking requirements supported in our December 2021 Study. A subsequent site parking requirement and parking rationale was proposed to consist of 319 parking spaces, including 250 resident spaces and 56 residential visitor spaces for the 10 West development, 6 spaces reserved for the existing 84 High Street property, and 7 spaces for the 90 High Street property². Considering the current proposal of 363 residential units, resulting effective parking requirements of 0.68 spaces per unit and 0.15 spaces per unit were proposed for residential and visitor components, respectively.

Most recently, through further discussions with City Staff pertaining to the parking supply, 10 West GO GP Inc. is proposing to further amend the site parking requirements. The proposed parking supply for residents and visitors has been increased such that the requirements are within 10% of the City's base Zoning requirements. The following updated site-specific requirements are proposed:

- **Residents:**
 - 1 Bedroom: 0.72 spaces / unit
 - 2 Bedroom: 0.72 spaces / unit
- **Non-Residential (Residential Visitors + Ground Floor Commercial/Retail):**
 - 0.18 spaces / unit
- **Ancillary Uses** (Includes: Retail Store, Service Establishment, Take-out Restaurant, Convenience Restaurant and Restaurant <220 m²):
 - None
- **Office (90 High Street):**
 - 2 spaces / 100 m² GF
- **Residential (84 High Street):**
 - 1 Bedroom: 0.8 spaces / unit

Based on the foregoing, application of these parking rates have been applied to an updated development programme (architectural plans are attached in **Appendix A**), which proposes 365 residential units and approximately 312 square metres of commercial space at grade. On this basis, the proposed parking requirement would therefore recommend the provision of 329 parking spaces, including 263 resident spaces and 66 residential visitor spaces for the 10 West development, 6 spaces reserved for the existing 84 High Street property (five resident and one visitor spaces), and 7 spaces for the 90 High Street property.

² Residential Parking Rate: (1 Bedroom: 0.68 spaces / unit, 2 Bedroom: 0.68 spaces / unit)

TABLE 1 CALCULATION OF PROPOSED PARKING REQUIREMENT

	Use	Units / GFA (m ²) ¹	Rate (Proposed Minimum) ²	Proposed Minimum Parking Requirement ³
10 West	Resident			
	Studio	0 units	0.72 spaces / unit	0 spaces
	1-Bedroom	261 units		188 spaces
	2-Bedroom	104 units		75 spaces
	3-Bedroom	0 units		0 spaces
	Resident Subtotal	365 units		263 spaces (0.72 spaces per unit)
	Non-Resident			
	Visitor	365 units	0.18 spaces / unit	66 spaces
	Retail	312 m ²	-	0 spaces
	Non-Resident Subtotal			66 spaces
Total			329 spaces	
84 High Street	Resident	6 units	0.8 spaces / unit	5 spaces
	Visitor		0.2 spaces / unit	1 space
90 High Street	Office	340 m ²	2.0 spaces / 100 m ² GFA ⁴	7 spaces
Total Site Requirement				342 spaces

Notes:

- Proposed supply is based on the site stats provided by CORE Architects, dated October 19 2022.
- The floor area for the existing 90 High Street heritage building is approximate.

Purpose

Per correspondence received from the City of Mississauga (dated March 20th, 2023) that relate to the parking proposed for the site, City staff note that “[for] the proposed parking rates...for the 363 residential units within the tower, shared visitor parking, and replacement parking for 84 and 90 High Street.....the overall parking at the site will be 36 parking spaces or 10% deficient from the existing City of Mississauga Zoning By-Law 0225-2007, as amended, for Parking Precinct 1 (By-law 0117-2022, June 8, 2022)”.

With this in mind, this Letter provides a proposed parking justification to demonstrate the appropriateness of the proposed 10% reduction in By-Law parking requirements per the City of Mississauga’s *Parking Utilization Studies for Site Specific Applications Terms of Reference*.



Parking Justification

Resident Parking

As discussed in our November 2022 Memorandum, adoption of the proposed resident parking requirements are appropriate based upon the following considerations:

- The subject Site is in close proximity to significant existing and planned transit services that provide non-automobile dependent travel connections across the City;
- Recent reduced residential parking approvals trends;
- A review of parking demands observed / recorded by BA Group at other residential condominiums in comparable areas; and,
- A series of Transportation Demand Management measures proposed to be incorporated in the development to support the use of non-automobile travel modes;

The Site has a Very Favourable Transit Supportive Site Context that is Supportive of Reduced Resident Parking and Consistent with Transportation Planning Principles:

It is noted that the site is situated in a favorable, non-auto mobility context, being located in close proximity to the Port Credit GO Station and well served by a number of frequent bus routes that provide transit connections to various regional and local rapid transit lines. Moreover, the Hurontario-Main Light Rail Transit (The Hurontario LRT) is expected to be opened by 2024 and is proposed to include a stop at the Port Credit GO Station, located approximately 100 metres from the site. The implementation of the Hurontario LRT is expected to significantly impact the transportation characteristics within the vicinity of the LRT corridor and the City of Mississauga at large. Due to the LRT's connections to several GO Stations and employment hubs along the span of the corridor, the *Hurontario LRT Benefits Case Analysis* forecasts that the future transit mode share along the Hurontario – Main corridor will be increased from 24% to 49% with the introduction of the LRT. The proximity of the site to the future LRT station would also suggest that the proposed 10 West development should have a parking supply that supports transit; one that is equal to or lower than prevailing market demand.

There are Precedents for Parking Reductions in Port Credit that have Achieved Greater than 10% Reduction in Resident Parking Requirement:

A similar conclusion was determined by the City of Mississauga Committee of Adjustment (CoA) panel (decided on March 25th, 2021) in relation to the proposed development located at 28 Ann Street (a property of Edenshaw Developments Limited) in the Port Credit neighborhood of Mississauga (File: A413.20). The CoA approved a minor variance to allow reduced parking requirements on the subject property to the effect of:

- 0.57 parking spaces per one bedroom unit whereas By-law 0225-2007, as amended, which requires a minimum of 0.75 parking spaces per one-bedroom unit in that instance; and
- 0.73 parking spaces per two-bedroom unit whereas By-law 0225-2007, as amended, which requires a minimum of 0.90 parking spaces per two-bedroom unit in that instance.

It is noted that the proposed 10 West site is located diagonally opposite the approved 28 Ann Street development (the sites are located on the northwest and southeast corners of the Park Street and Ann Street intersections) and are therefore set within the same transportation and community context (i.e., amenities, on-



street parking supply, walkability, household vehicle ownership). Nevertheless, the CoA substantiated the applicant's claim (i.e. 'Edenshaw') on the basis of applicable parking rates for a comparable development at 39 Newcastle Street in Etobicoke, Toronto (subject to the securement and implementation of TDM measures). This proposed development (File: 16 198950 WET 06 OZ) is located immediately to the north of the Mimico GO Station, which is serviced by the Lakeshore West GO Line (as is the 10 West site). A February 2020 decision of the Local Planning Appeal Tribunal (LPAT) approved a parking provision of 589 vehicular parking spaces, of which 444 spaces are meant for residents and 105 spaces for visitors. Considering the proposed 833 total residential units, this would represent a parking rate of 0.53 spaces/unit and 0.13 spaces/unit for residential and visitor components, respectively.

Observed Parking Demands for Sites in Comparable Transportation Contexts Show a 10% Reduction is Appropriate:

A further query of the City of Toronto Development Proposal portal will also reveal an OPA & Rezoning application for a proposed residential condominium development located at 10 Audley Street (File: 16 168925 WET 06 OZ), immediately adjacent to aforementioned 39 Newcastle Street development and the Mimico GO Station. This application is proposed with a provision of 1,049 vehicular parking spaces, of which 912 spaces are meant for residents and 182 spaces for visitors. Considering the proposed 1,824 total residential units, this would represent an even more ambitious parking rate of 0.50 spaces/unit and 0.10 spaces/unit for residential and visitor components, respectively. As of this writing, this application is pending final review. Elsewhere in Etobicoke, observed residential condominium parking demands are known to be consistent with "Precinct 1" residential condominium parking rates as specified in [recently amended] City of Mississauga Zoning By-Law 0225-2007 (i.e., 0.80 spaces per unit). For example, in October 2016, BA Group undertook overnight traffic surveys on two different weekdays at a residential condominium located at 2 & 6 Eva Road in the West Mall neighborhood of Etobicoke (survey data attached in **Appendix B**). Observed parking demands were on the order of 0.82-0.83 occupied spaces per unit, which is generally comparable to By-Law rates controlling the 10 West site. To this effect, it is notable to contrast the respective transit contexts at this location and the 10 West site; with the former being located over two (2) kilometres from the nearest GO Station and access to higher order transit (the Kipling TTC Station at the same location). By comparison, it has been previously noted that the 10 West site is located in the immediate vicinity of a GO Station and will also be within convenient walking distance of a future Hurontario LRT stop.

The Site Parking Demand Will be Decreased through the Provision of TDM Measures on the Site:

To further defray demand for auto trip making activity at the proposed development at the 10 West site, a Transportation Demand Management (TDM) program is proposed that will incentivize and facilitate non-auto site-related trip making. This is proposed to consist of:

- Provisioning of two (2) car share spaces located in the visitor section of the garage (in addition to the visitor spaces provided);
- Providing Presto Cards pre-loaded with a value of \$75.00 for each residential unit;
- Applicant's committal to selling parking spaces unbundled from the purchase price of each residential unit; and,
- Provisioning of a Bike Repair Station on-site.

The above suite of TDM measures proposed for the project will support non-auto use and will accommodate the proposed 10% reduction in the resident parking supply requirement.

Visitor Parking

As discussed in our December 2021 Transportation Study and November 2022 Memorandum, adoption of the proposed visitor parking requirements is considered to be appropriate based upon the following considerations:

- Consistency with the recently approved parking rates for the neighbouring residential development at 78 Park Street East and 22 – 28 Ann Street and other reduced visitor parking supply ratio approvals with less proximate access to a GO Station; and
- Consistency with observed visitor parking characteristics for residential condominiums in Port Credit.

Observed Parking Demands for Sites in Comparable Transportation Contexts Show a 10% Reduction is Appropriate and is Consistent with Recent Approvals in Port Credit:

As with resident parking, visitor parking standards in areas with high levels of transit accessibility have been approved at rates well below even the recently amended Zoning By-law 0225-2007, which includes the previously mentioned development at 28 Ann Street. This permission follows a trend of such approvals for developments within the GTHA located in vicinity of GO Transit Stations, even those with less favorable holistic transit contexts than the 10 West site. These are summarized in **Table 2**.

TABLE 2 RESIDENTIAL VISITOR DEVELOPMENTS WITH APPROVED PARKING REDUCTIONS

Address	Proximity to Transit	Municipality	Resident Standard Applied	Permission Through
Approvals with comparable access to High Order Transit				
78 Park Street East and 22 – 28 Ann Street	~80 m from Port Credit GO Station	Mississauga (Port Credit)	0.10 spaces / unit	CoA Decision – A413.20 & Site Specific Zoning By-law 0054-2020
Approvals with less proximate access to High Order Transit				
1496 Bayly Street	- 575m from Pickering GO Station	Pickering	0.15 spaces / unit	Site Specific Zoning By-law 7810/21
600 James Street North	~900 m from West Harbour GO Station	Hamilton	0 spaces / unit *visitors will rely on area public parking	LPAT Case No. PL190517 Site Specific Zoning By-law 21-053-LPAT
70 Mississauga Road South	~1.2km from Port Credit GO Station	Mississauga	0.15 spaces / unit	LPAT Case No. PL18019

Existing Visitor Parking Characteristics at Residential Condominiums in Port Credit Currently Reflect Reductions in Demand Exceeding the Proposed 10%:

In additions to past approvals history, it is known that existing residential condominium developments in Port Credit have visitor parking demand ratios below requirements proposed for the 10 West site. For example, in September-October 2022, BA Group undertook traffic surveys on four different weekend days at five (5) residential condominiums located in Port Credit as detailed in our November 2022 Memorandum and



summarized in **Table 3** (survey data attached in **Appendix C**). Observed visitor parking demands were on the order of 0.12 occupied spaces per unit, which is significantly less than the residential visitor parking requirement proposed for the 10 West site and the By-Law rates controlling the site.

TABLE 3 BA GROUP DIRECTED VISITOR PARKING PROXY SURVEY RESULTS

Proxy Sites	49 Queen Street E	1 Hurontario Street	6-8 Ann Street	66 High Street E	15 Elizabeth Street N
	Observed Maximum Parking Rate (Spaces / Unit)¹				
Friday, September 23, 2022	0.08	0.11	0.11	0.15	0.11
Saturday, September 24, 2022	0.08	0.14	0.14	0.15	0.09
Friday, September 30, 2022	0.13	0.08	0.10	0.10	0.11
Saturday October 1, 2022	0.13	0.09	0.15	0.15	0.11

Notes:

1. Parking surveys were conducted on Fridays from 6:00 PM to 11:00 PM, and on Saturdays from 12:00 PM to 8:00 PM. Table values represent absolute maximum observed parking rates over survey periods.

Summary & Conclusion

Per discussions with City staff, the parking supply for the 10 West site has been suitably increased. The proposed site-specific requirements are now 10% deficient in relation to City of Mississauga Zoning By-Law 0225-2007 requirements. This Letter satisfies the requirement for a “Letter of Justification” per the City’s *“Parking Utilization Studies for Site Specific Applications Terms of Reference”* and demonstrates the validity of the proposed parking supply.

Based on BA Group's analysis, the proposed site-specific rates parking rates of 0.72 spaces per unit for residents, and 0.18 spaces per unit for visitors are appropriate because: 1.) the site context is very transit oriented and supportive of reduced auto trends; 2.) there are relevant parking approvals in Port Credit and other comparable areas that have approved similar and even further reduced rates; 3.) the proposed requirements accommodate parking demands observed at others sites with comparable contexts; and, 4.) the site will be supported by a suite of TDM measures.

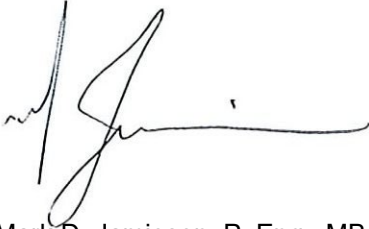
On this basis the proposed site-specific parking requirements, which are 10% less than the City's in force By-Law requirements, are appropriate.



Sincerely,
BA Consulting Group Ltd.



George J. Poulos, P. Eng.
Transportation Engineer



Mark D. Jamieson, P. Eng., MBA
Principal and CEO



Appendix A Architectural Plans





10 WEST GO

RE-ISSUED FOR OPA & REZONING SUBMISSION
 1 MAY 2023
 APP NO: OZ/OPA 22-3 W1

03	RE-ISSUED FOR OPA / REZONING	01 MAY 2023
02	RE-ISSUED FOR OPA / REZONING	28 OCT 2022
01	ISSUED FOR OPA / REZONING	17 DEC 2021

No. Revisions Date

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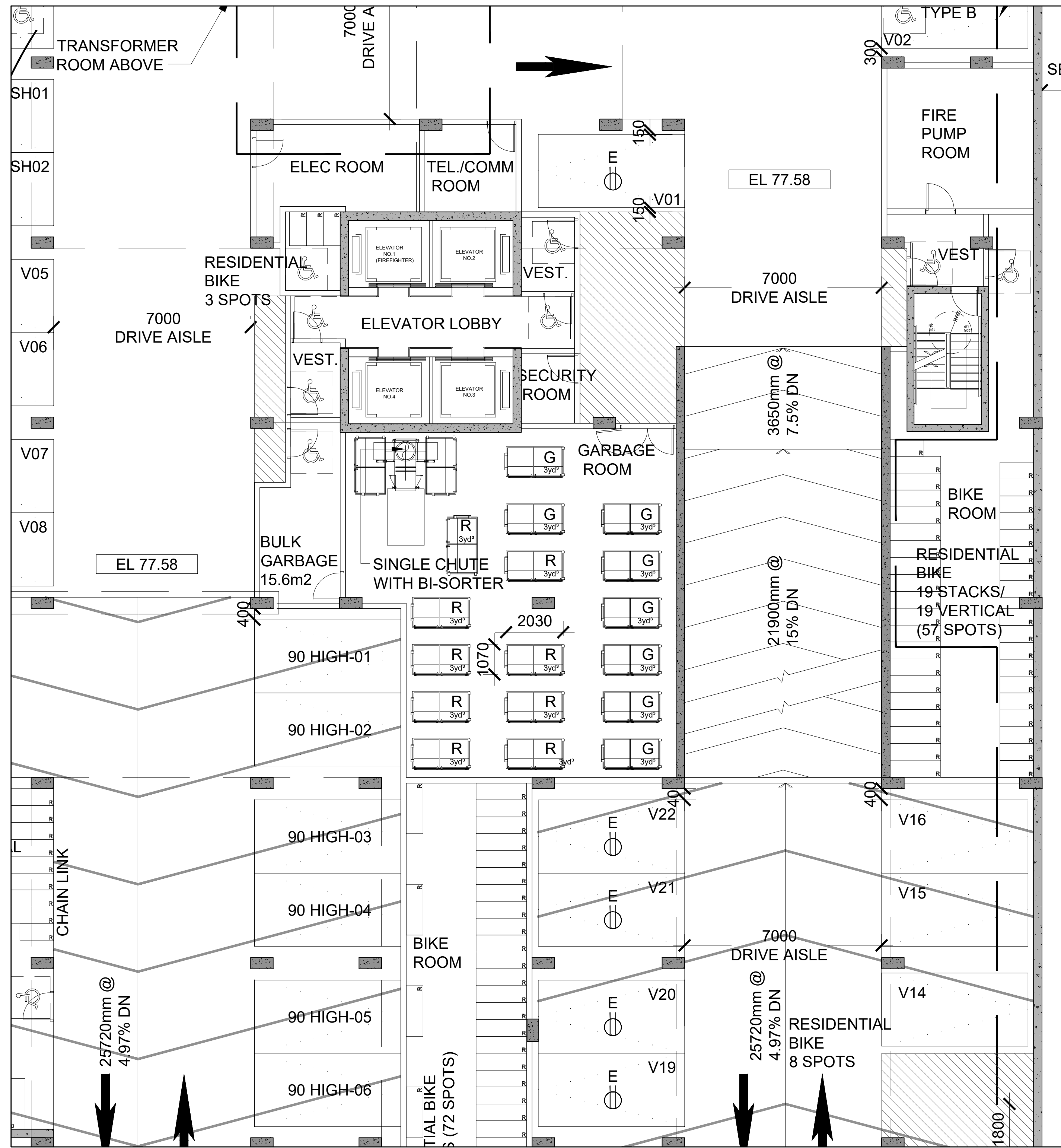
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 MISSISSAUGA, ONTARIO
 APP NO: OZ/OPA 22-3 W1

Drawn	Scale
DL, CY	NTS
Checked	Date
DL, CY	24 OCT 2022

TITLE

Project No.	Drawing No.
21-182	A001



4 GARBAGE ROOM
A100a 1:100

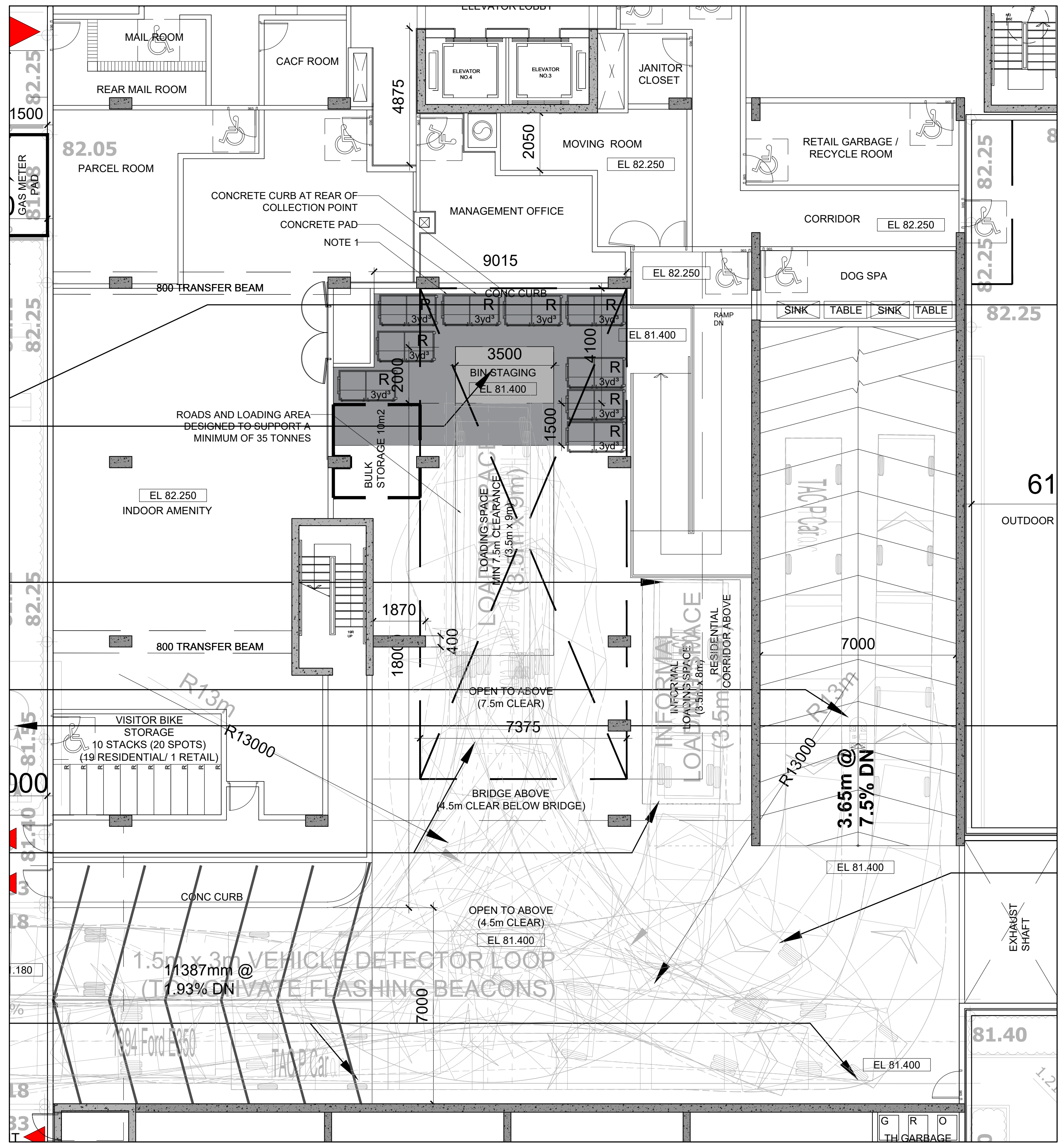
Multi-Residential Complexes and Stacked Townhouses

Type of Bin	3 yd ³ (units/bin)	4 yd ³ (units/bin)	6 yd ³ (units/bin)
Compacted Garbage	54	72	N/A
Non-compacted Garbage	18	24	36
Recyclable Materials	45	60	90

Note: Multi-Residential Complexes and Stacked Townhouses proposing less than 60 Dwelling Units will receive one Recycling Cart for every 7 Dwelling Units.

- NOTE 1:
PROPERTY MANAGEMENT STAFF TO FACILITATE WASTE COLLECTION
I. DRIVER IS NOT REQUIRED TO EXIT THE WASTE COLLECTION VEHICLE TO FACILITATE COLLECTION;
II. PROPERTY MANAGEMENT STAFF IS RESPONSIBLE FOR JOCKEYING OF FRONT-END BINS DURING COLLECTION;
III. THE REGION WILL NOT BE RESPONSIBLE FOR EMPTYING BINS THAT ARE INACCESSIBLE TO THE WASTE COLLECTION VEHICLE; AND
IV. PROPERTY MANAGEMENT STAFF MUST BE VISIBLE TO WASTE COLLECTION VEHICLE ON APPROACH TO THE SITE, OTHERWISE THE WASTE COLLECTION VEHICLE WILL NOT ENTER THE SITE.
- ROAD AND LOADING AREA DESIGNED TO SUPPORT MINIMUM OF 35 TONNES

3 WASTE MANAGEMENT REQUIREMENTS
A100a 1:100



2 STAGING AREA
A100a 1:100

AS PER REGION OF PEEL WASTE COLLECTION DESIGN STANDARDS

REQUIRED	PROVIDED
SOLID WASTE MANAGEMENT PLAN REQUIRED: 1 GARBAGE BIN(3yd ³) IS REQUIRED FOR EACH 54 UNITS AND 1 RECYCLING BIN(3yd ³) IS REQUIRED FOR EACH 45 UNITS.	SOLID WASTE MANAGEMENT PLAN PROVIDED: WASTE STORAGE ROOM SIZE PROVIDED AS FOLLOWS:
TOTAL # OF UNITS = 365 365/ 54 = 7x3yd ³ BINS (GARBAGE) 365/ 45 = 9x3yd ³ BINS(RECYCLE)	SPACE TO ALLOW FOR GARBAGE STORAGE: 7x3yd ³ BINS(GARBAGE) & 9x3yd ³ BINS(RECYCLE) = 131.30m ²
	SPACE FOR BULK STORAGE =15.65m ²
	TOTAL RESIDENTIAL WASTE STORAGE AREA PROVIDED: 146.95m ²

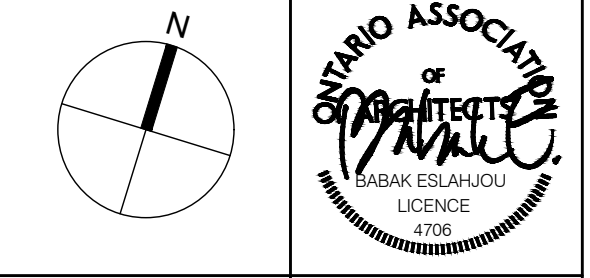
1 WASTE MANAGEMENT STATISTICS
A100a 1:100

No.	Revisions	Date
03	RE-ISSUED FOR OPA / REZONING	01 MAY 2023
02	RE-ISSUED FOR OPA / REZONING	28 OCT 2022
01	ISSUED FOR OPA / REZONING	17 DEC 2021

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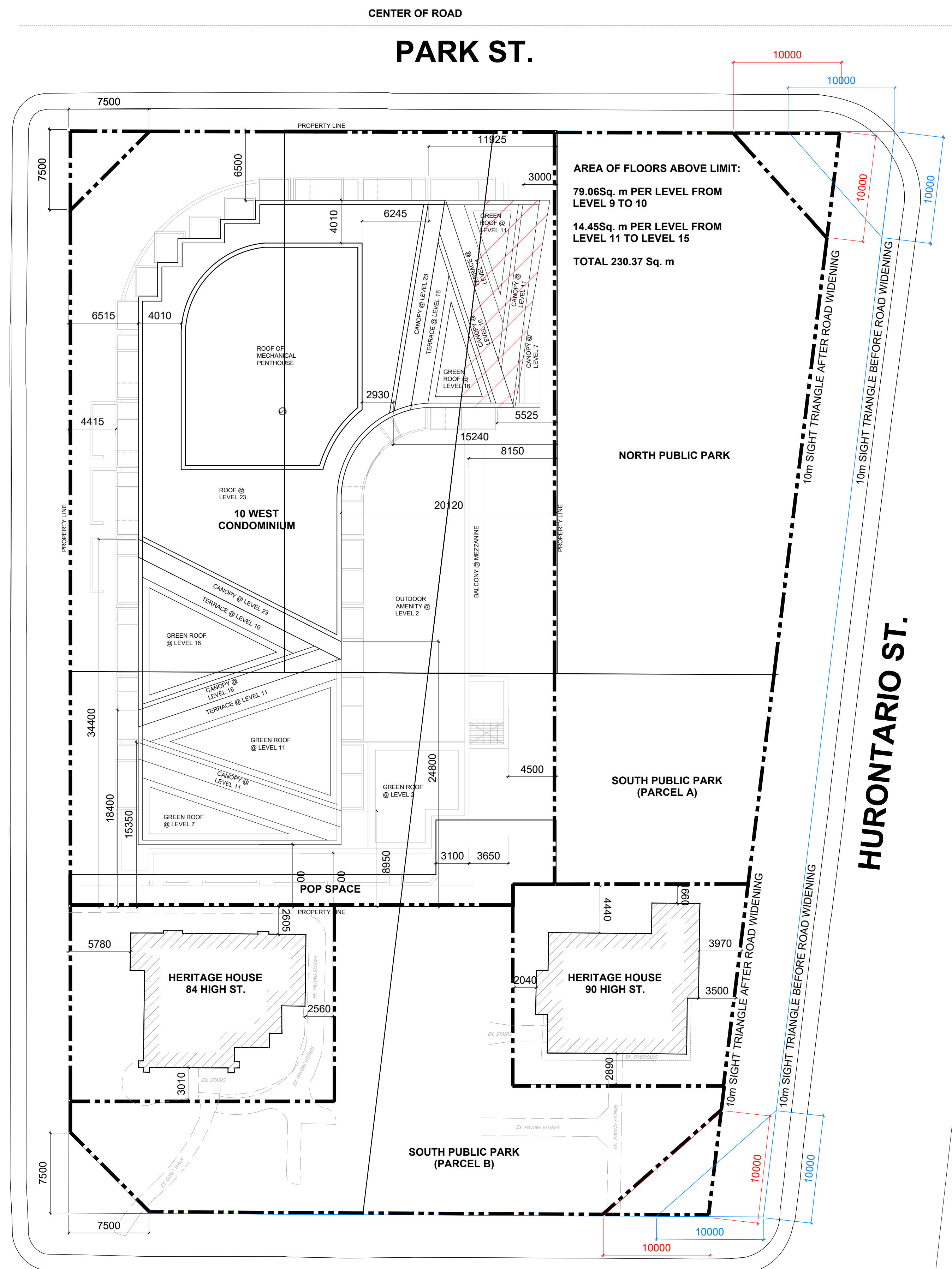


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Checked	Date
DL, CY	24 OCT 2022

RESIDENTIAL SOLID WASTE MANAGEMENT

Project No.	Drawing No.
21-182	A100a

PARCEL	AREAS (M2)
10 WEST CONDOMINIUM	3282.72
POPS SPACE	187.04
NORTH PUBLIC PARK (LANDS TO BE RETAINED BY CITY)	1152.49 (EXCLUDE 10mX10m DAYLIGHT TRIANGLE)
SOUTH PUBLIC PARK (PARCEL A)	383.96
SOUTH PUBLIC PARK (PARCEL B) (LANDS TO BE TRANSFERRED TO CITY)	913.09 (EXCLUDE 10mX10m/ 7.5mX7.5m DAYLIGHT TRIANGLE)
TOTAL CITY PARK	2,449.55



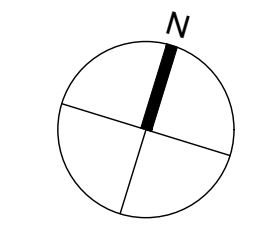
03	RE-ISSUED FOR OPA / REZONING	01 MAY 2023
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01	ISSUED FOR OPA / REZONING	17 DEC 2021
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APP NO: OZ/OPA 23-3-W1



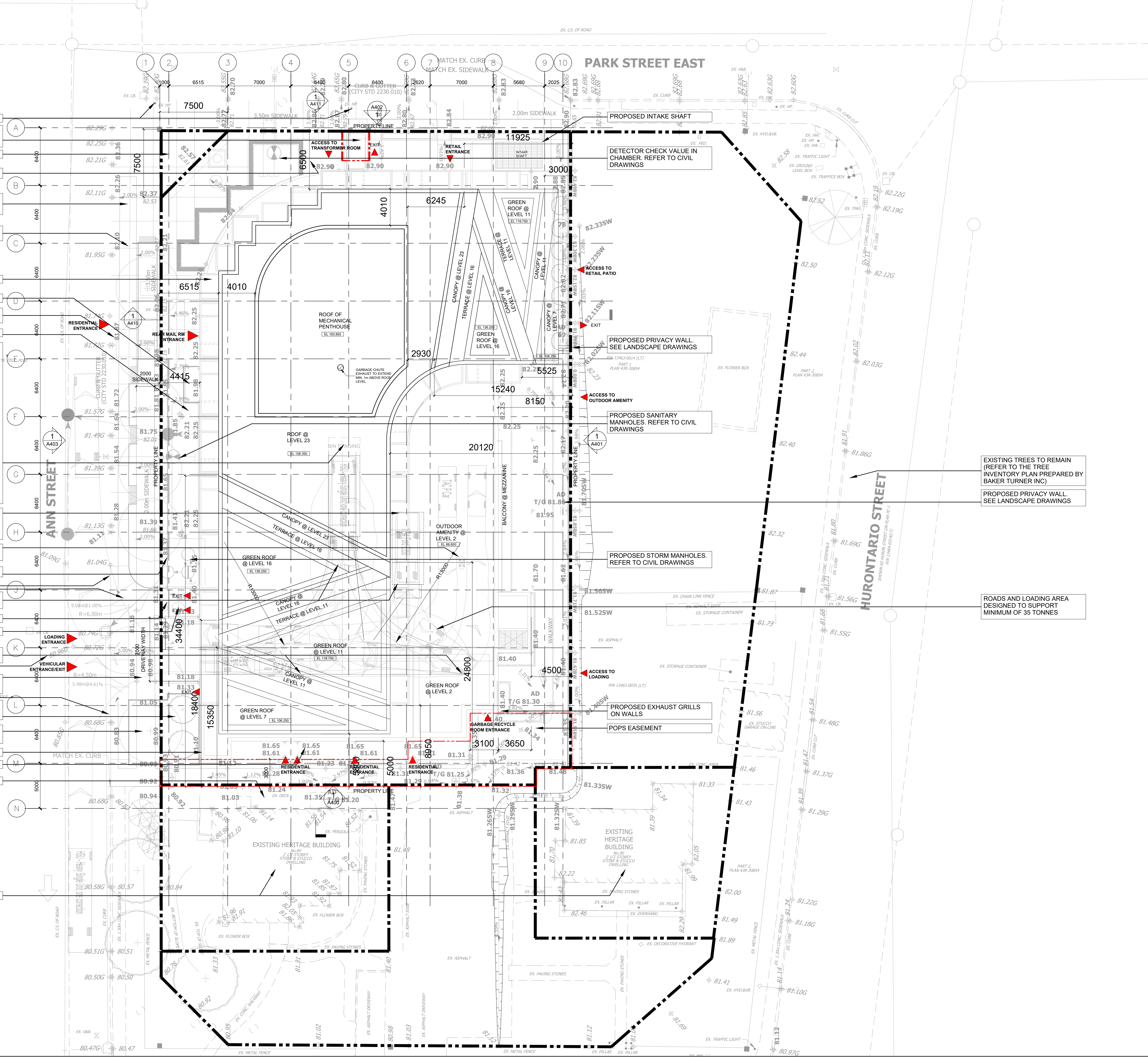
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Checked DL, CY	Date 24 OCT 2022

Title
PARCEL PLAN

Project No. 21-182	Drawing No. A103
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LENGTH NO.	BEGIN ELEV.	END ELEV.	LENGTH	(L1+L2)/2XL
1	82.25	81.25	23,365.00	1,921,771.25
2	82.25	81.55	7,455.00	610,564.50
3	81.55	81.18	5,920.00	481,680.80
4	81.18	82.25	9,790.00	799,989.85
5	82.25	82.25	79,144.00	6,509,594.00
6	82.25	82.90	5,770.00	476,457.75
7	82.90	82.75	6,565.00	543,746.13
8	82.75	82.90	21,025.00	1,741,395.63
9	82.90	82.90	7,805.00	647,034.50
10	82.75	82.90	29,005.00	2,395,087.88
TOTAL:			195,844.00	16,127,322.28
EG:				82.35

- EXISTING HYDRO POLE TO REMAIN
- PART 1, 43R-33186 SUBJECT TO AN EASEMENT IN GROSS AS IN INST. NO. PR1856898
- DAYLIGHT TRIANGLE
- PROVIDED 1 OUTDOOR RETAIL BIKE RACKS
- EXISTING TRANSIT STOP NO. 0341 TO REMAIN IN CURRENT LOCATION
- PROPOSED SITTING BENCH (SEE LANDSCAPE DRAWINGS)
- ALTERNATING BALCONIES
- PROPOSED GAS METER
- SPLASH EDGE (SEE LANDSCAPE DRAWINGS)
- GROUND LEVEL TERRACES
- PROPERTY MANAGEMENT STAFF TO FACILITATE WASTE COLLECTION.
 1. DRIVER IS NOT REQUIRED TO EXIT THE WASTE COLLECTION VEHICLE TO FACILITATE COLLECTION.
 2. PROPERTY MANAGEMENT STAFF IS RESPONSIBLE FOR JOCKEYING OF FRONT-END BINS DURING COLLECTION.
 3. THE REGION WILL NOT BE RESPONSIBLE FOR EMPTYING BINS THAT ARE INACCESSIBLE TO THE WASTE COLLECTION VEHICLE.
 4. PROPERTY MANAGEMENT STAFF MUST BE VISIBLE TO WASTE COLLECTION VEHICLE ON APPROACH TO THE SITE, OTHERWISE THE WASTE COLLECTION VEHICLE WILL NOT ENTER THE SITE.
 5. THE BINS SHOULD BE PROPERLY POSITIONED IN THE COLLECTION AREA ON THE DAY OF COLLECTION BEFORE 7AM.
 6. PROPERTY MANAGEMENT WILL BE RESPONSIBLE FOR SAFELY MANEUVERING WASTE COLLECTION VEHICLES INTO AND/OR OUT OF, AS WELL AS AROUND THE SITE.
- INFORMAL LOADING SPACE TO ACCOMMODATE SMALL DELIVERY TRUCKS (CUBE VAN, STEP VAN, MOVING VAN) AND MISC. DELIVERY ACTIVITY (i.e. FOOD DELIVERIES)
- INTERCOM ISLAND FOR VISITOR PARKING ACCESS
- PROVIDED 6 OUTDOOR VISITOR BIKE RACKS
- VEHICLE DETECTOR LOOP (TO ACTIVATE FLASHING BEACONS)
- STOP SIGN
- CISTERN ACCESS MANHOLE
- FLASHING BEACON ACTIVATED BY VEHICLE DETECTOR LOOPS LOCATED IN LOADING AREA
- CONTINUE CONCRETE SIDEWALK ACROSS DRIVEWAY
- OUTLINE OF CISTERN BELOW AT P-1. REFER TO CIVIL DWGS
- 2m WIDE SIDEWALK AS PER CITY OF MISSISSAUGA STANDARD 2240.040
- PROPOSED INTAKE GRILLS ON WALLS
- GROUND LEVEL TERRACES
- PROPOSED EXTERIOR STAIR
- HERITAGE BUILDING TO REMAIN



EXISTING TREES TO REMAIN (REFER TO THE TREE INVENTORY PLAN PREPARED BY BAKER TURNER INC)

PROPOSED PRIVACY WALL. SEE LANDSCAPE DRAWINGS

ROADS AND LOADING AREA DESIGNED TO SUPPORT MINIMUM OF 35 TONNES

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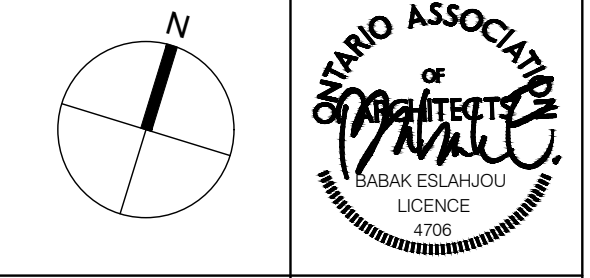
No. Revisions Date

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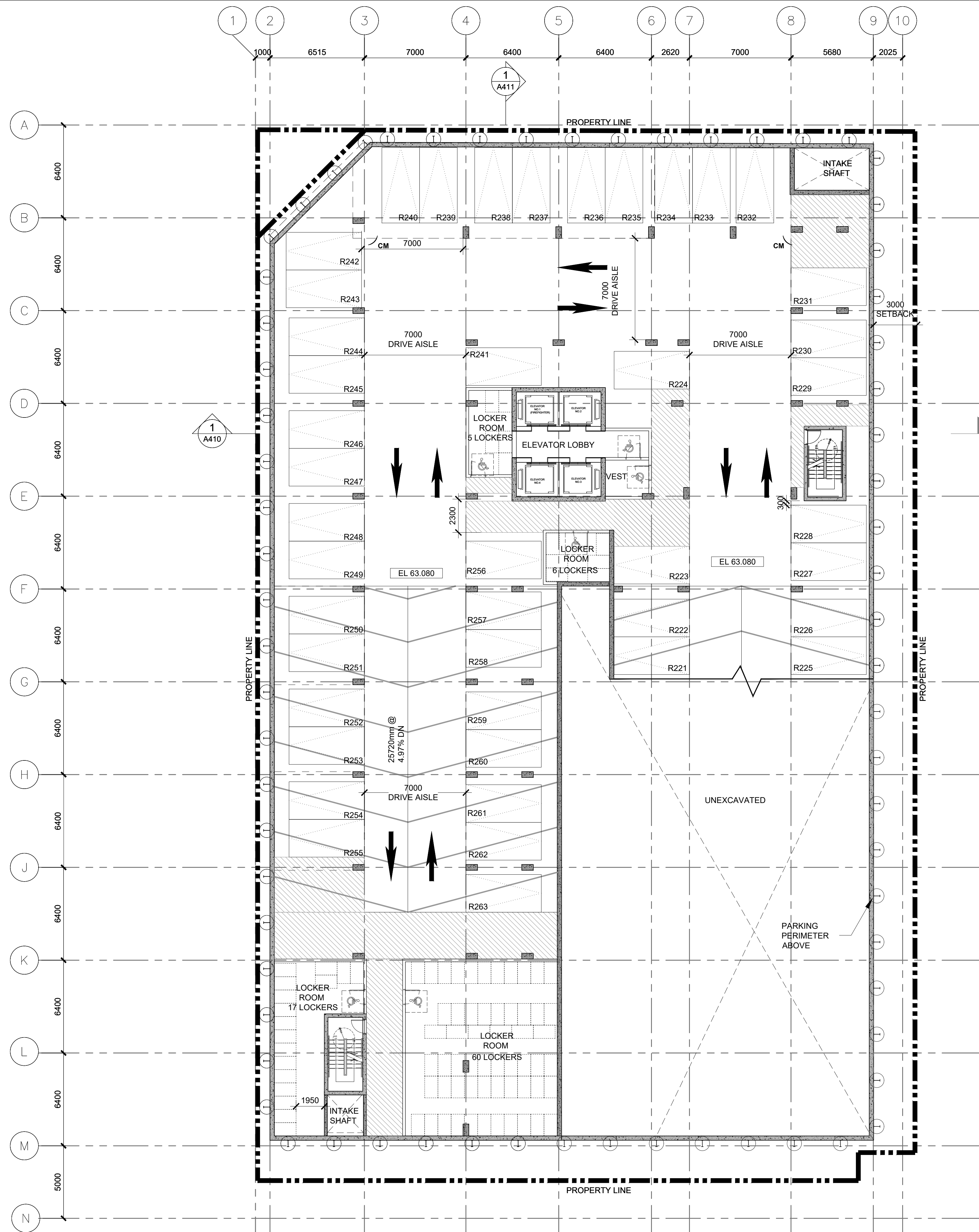
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 APP NO. OZ/OPA 23 21 W 1



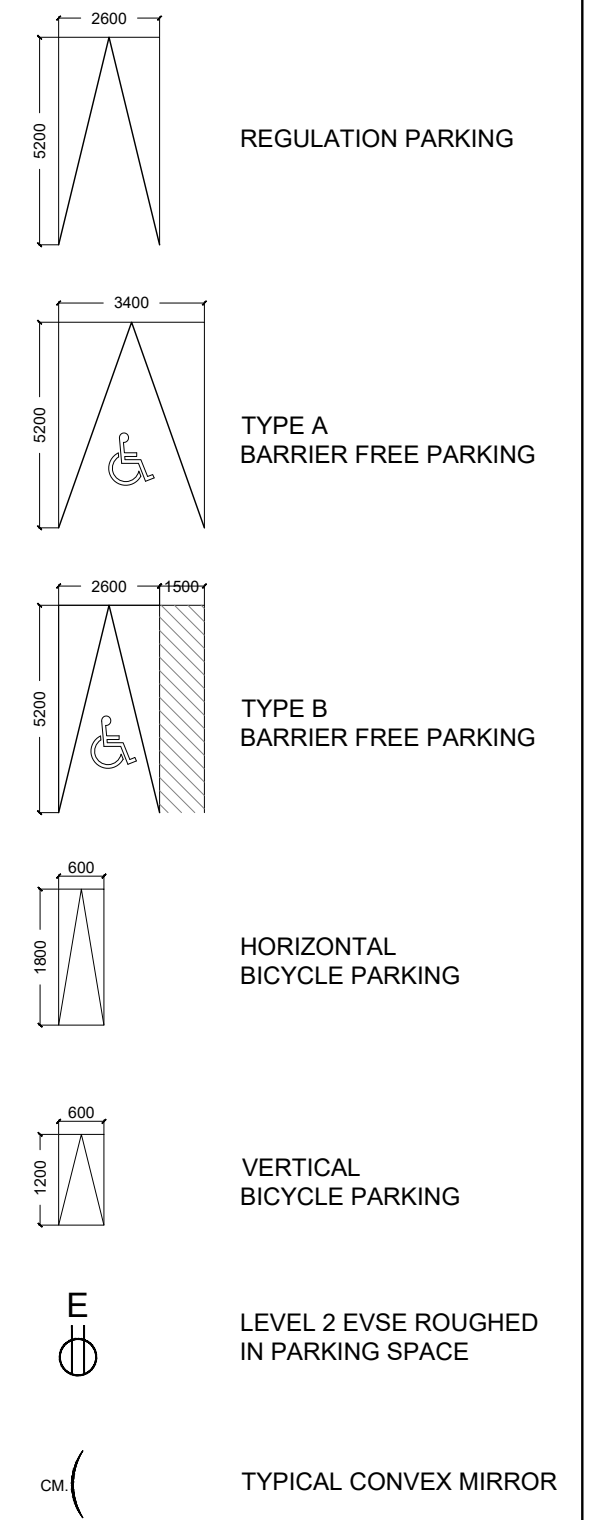
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Checked	DL, CY	Date	24 OCT 2022

Title: **SITE PLAN**

Project No.	21-182	Drawing No.	A104
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PARKING LEGEND



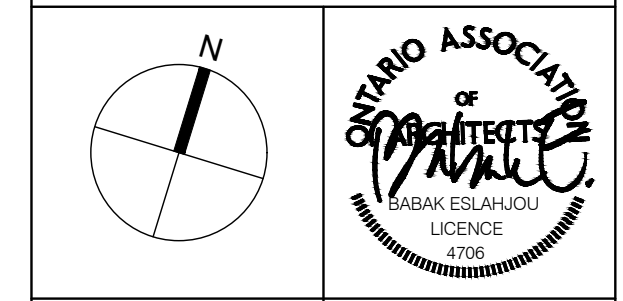
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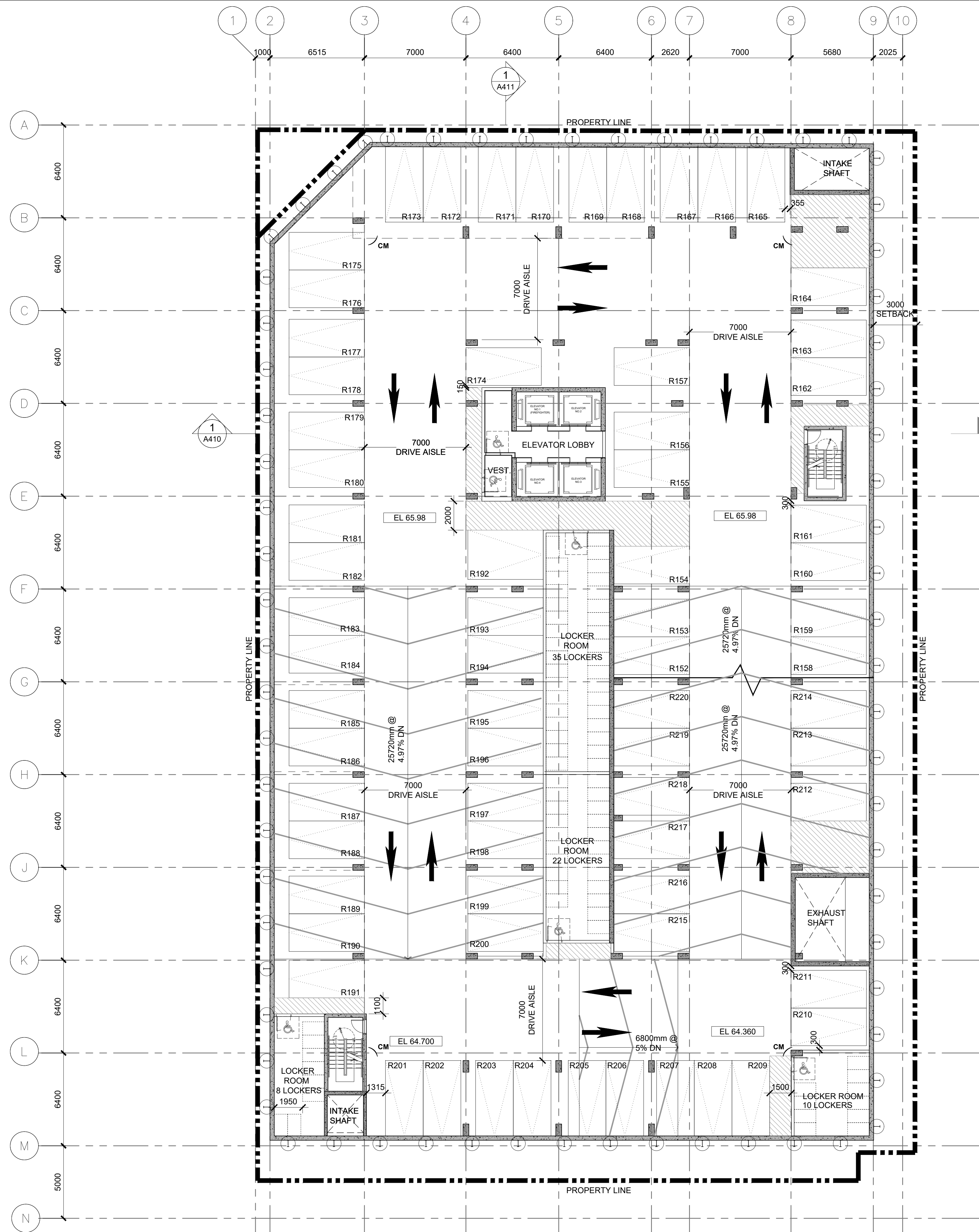
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 APP NO: OZ/OPA 23-3-W1



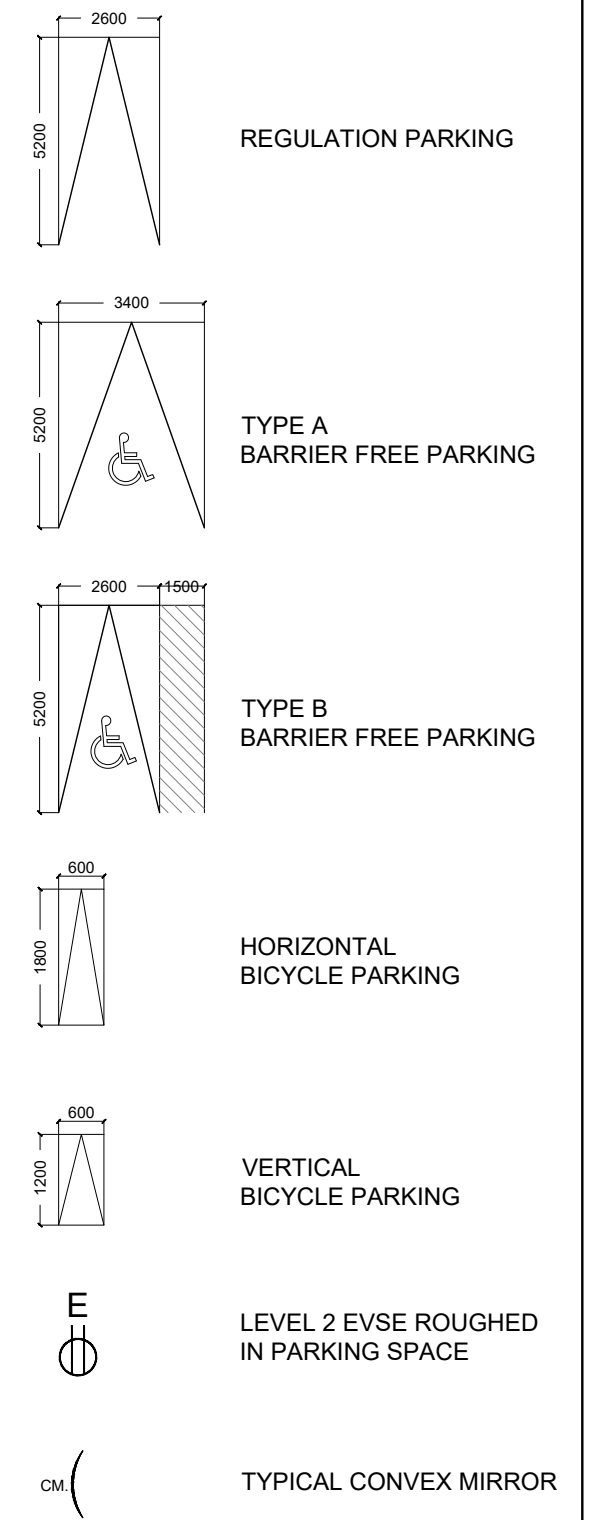
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Checked DL, CY	Date 24 OCT 2022

Title
P6 PARKING LEVEL

Project No. 21-182	Drawing No. A200
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PARKING LEGEND



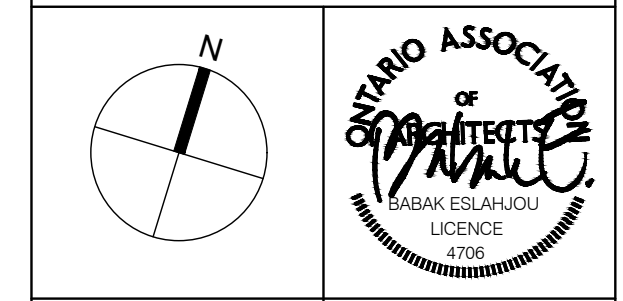
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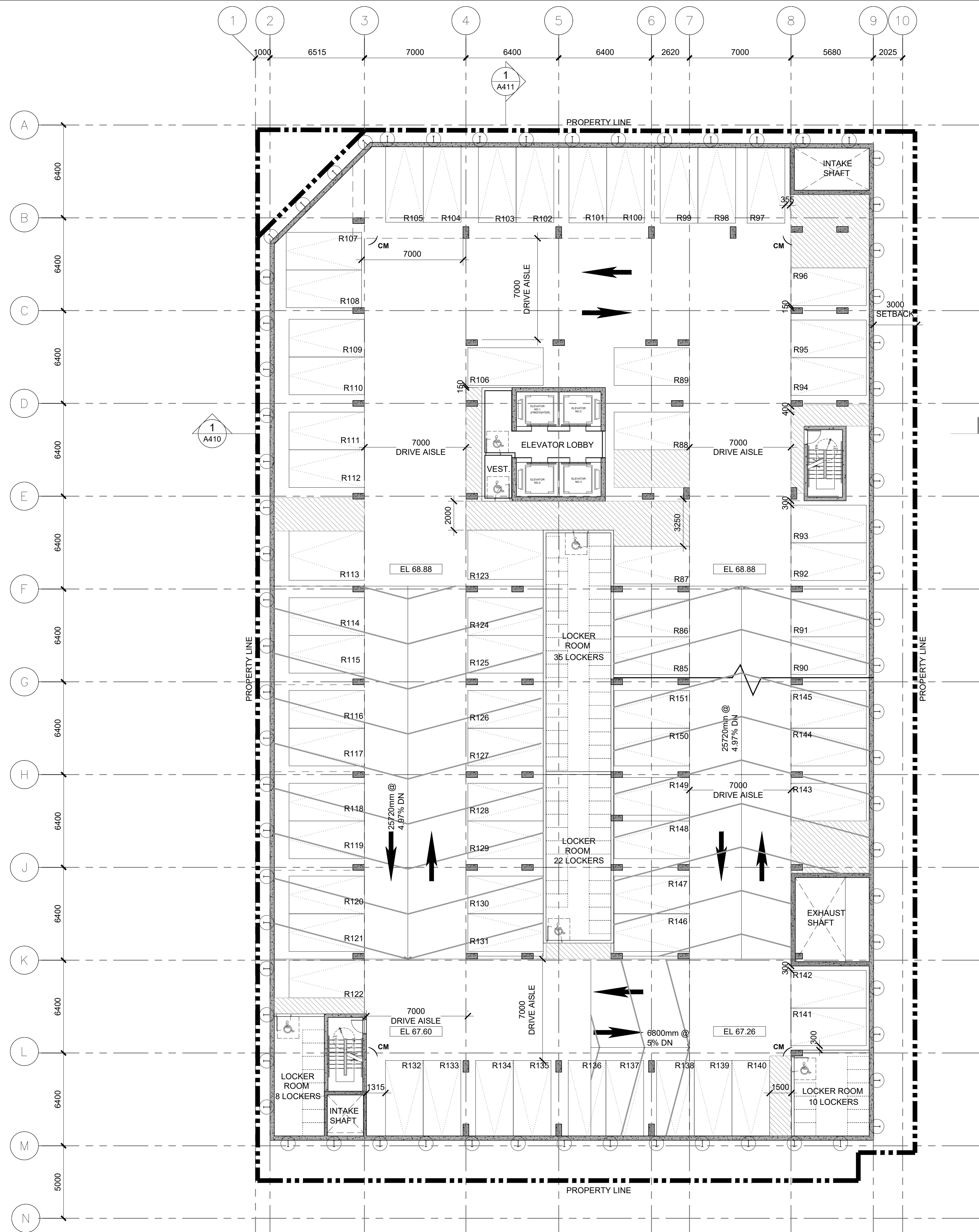
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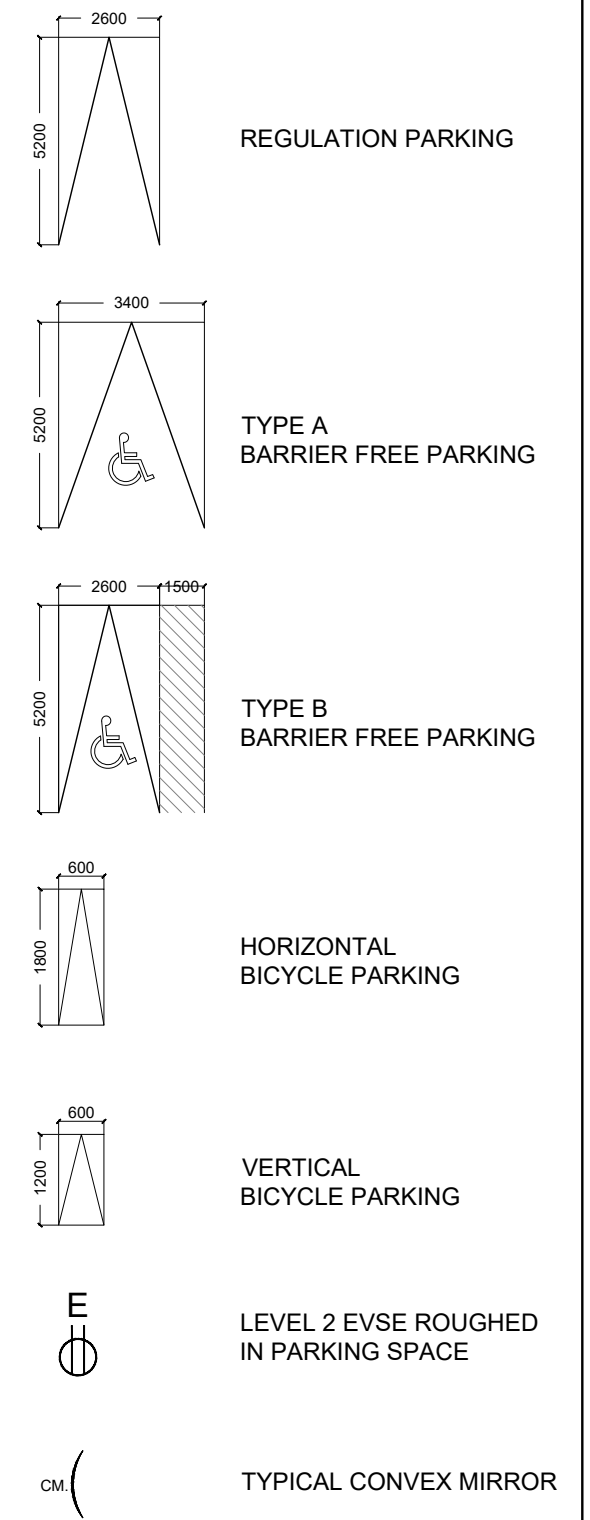
Drawn SK	Scale 1:150
Checked DL, CY	Date 24 OCT 2022

Title
P5 PARKING LEVEL

Project No. 21-182	Drawing No. A201
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PARKING LEGEND



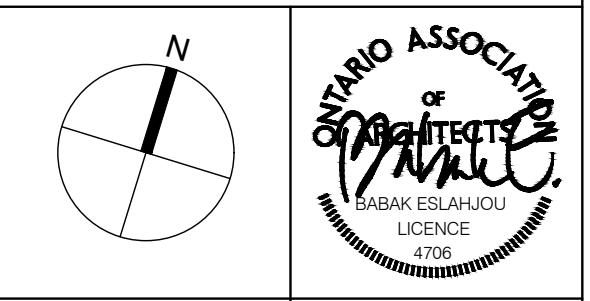
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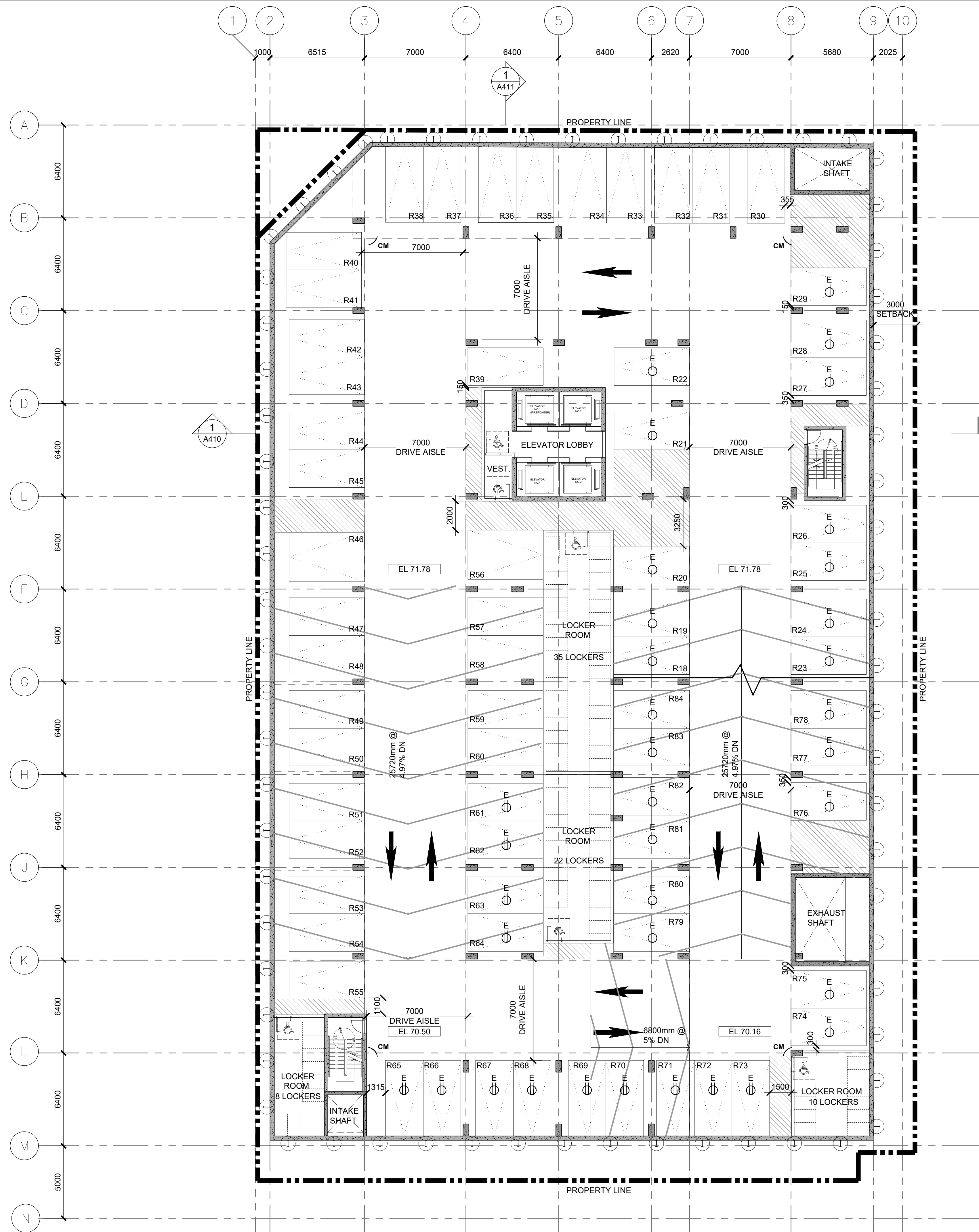
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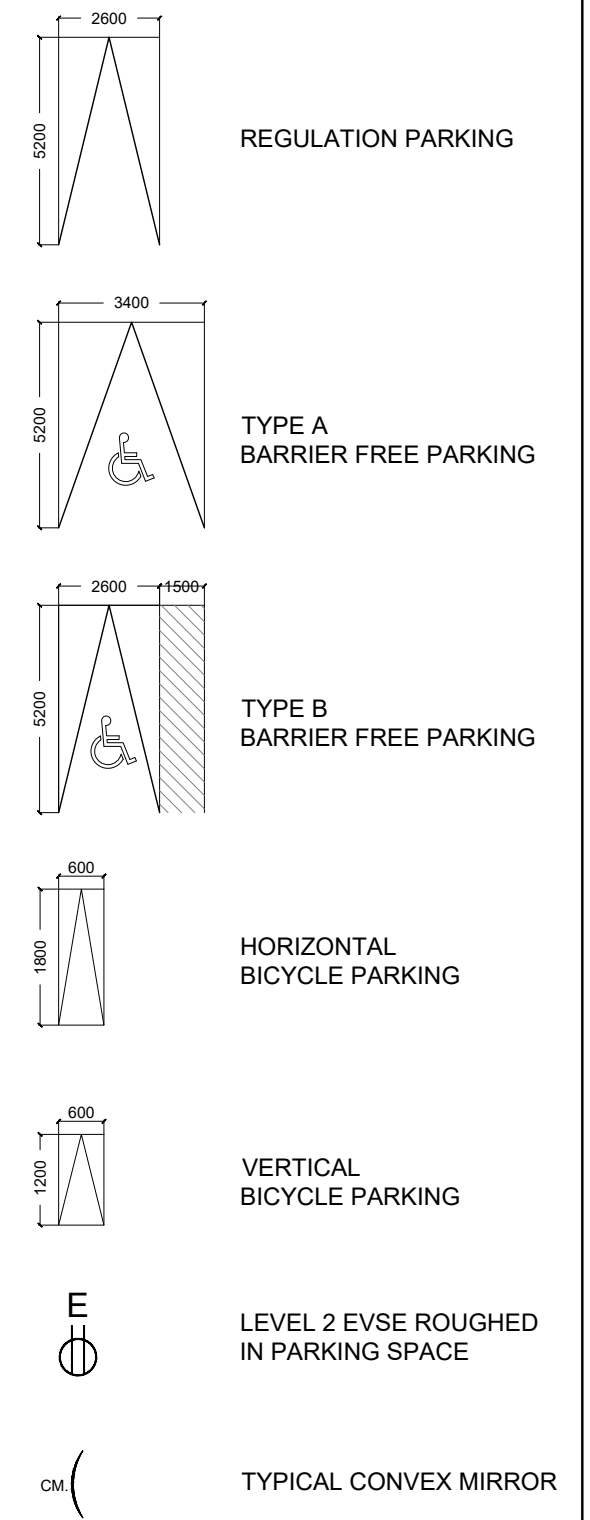
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Checked DL, CY	Date 24 OCT 2022

Title
P4 PARKING LEVEL

Project No. 21-182	Drawing No. A202
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PARKING LEGEND



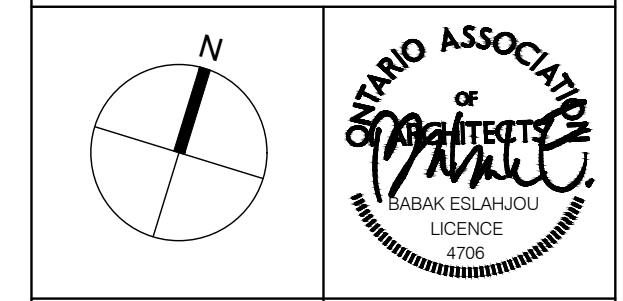
No.	Revisions	Date
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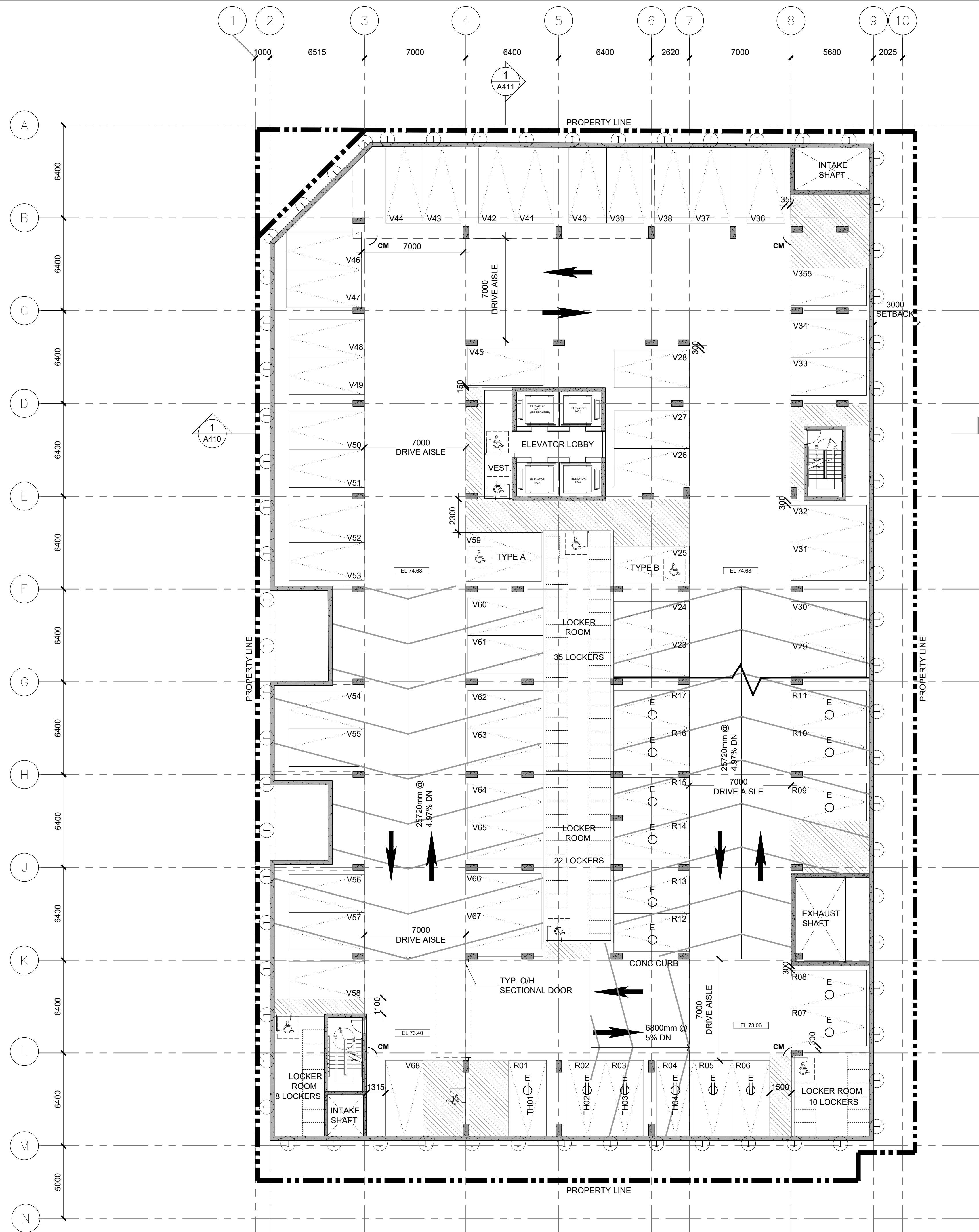
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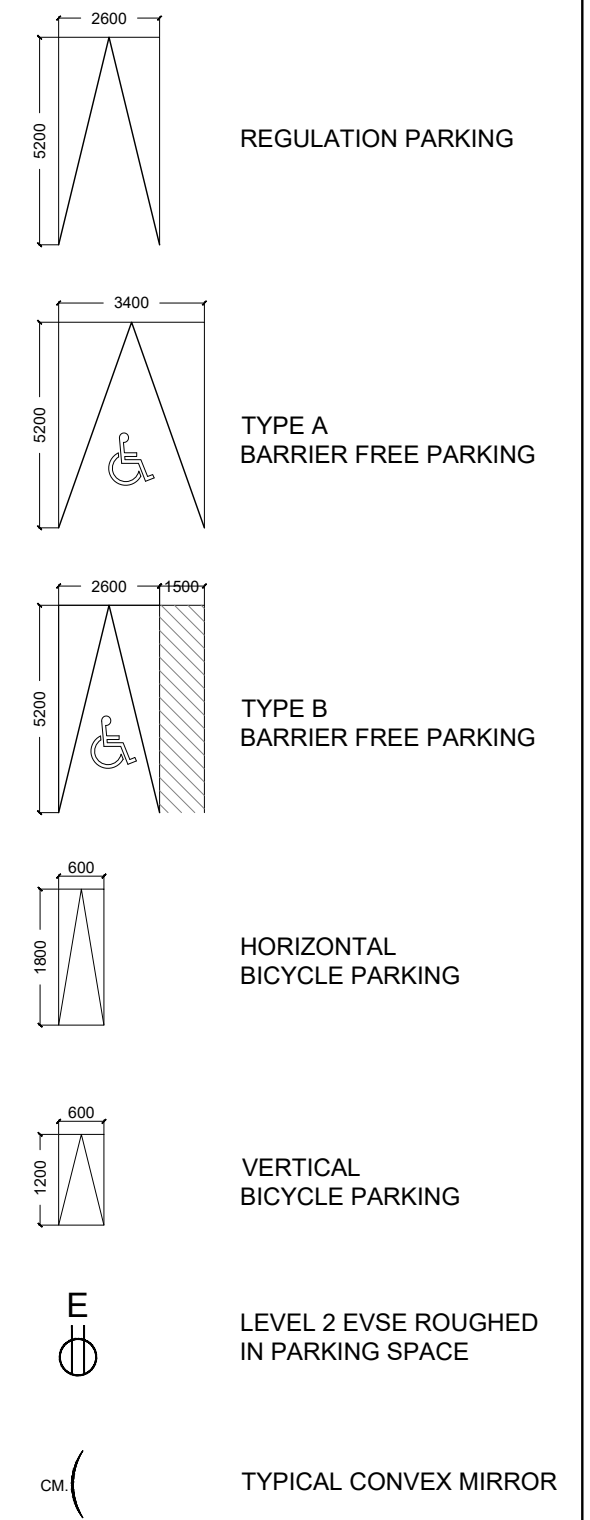
Drawn SK	Scale 1:150
Checked DL, CY	Date 24 OCT 2022

Title
P3 PARKING LEVEL

Project No. 21-182	Drawing No. A203
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PARKING LEGEND



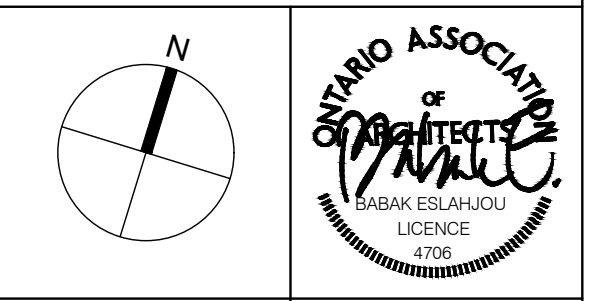
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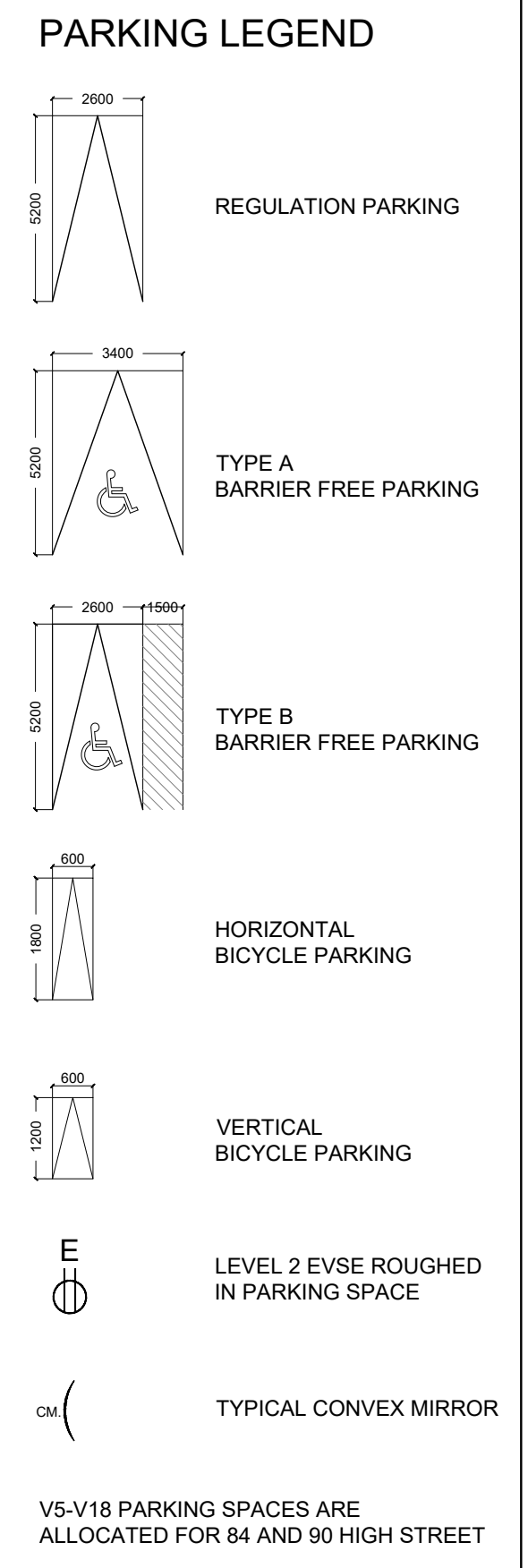
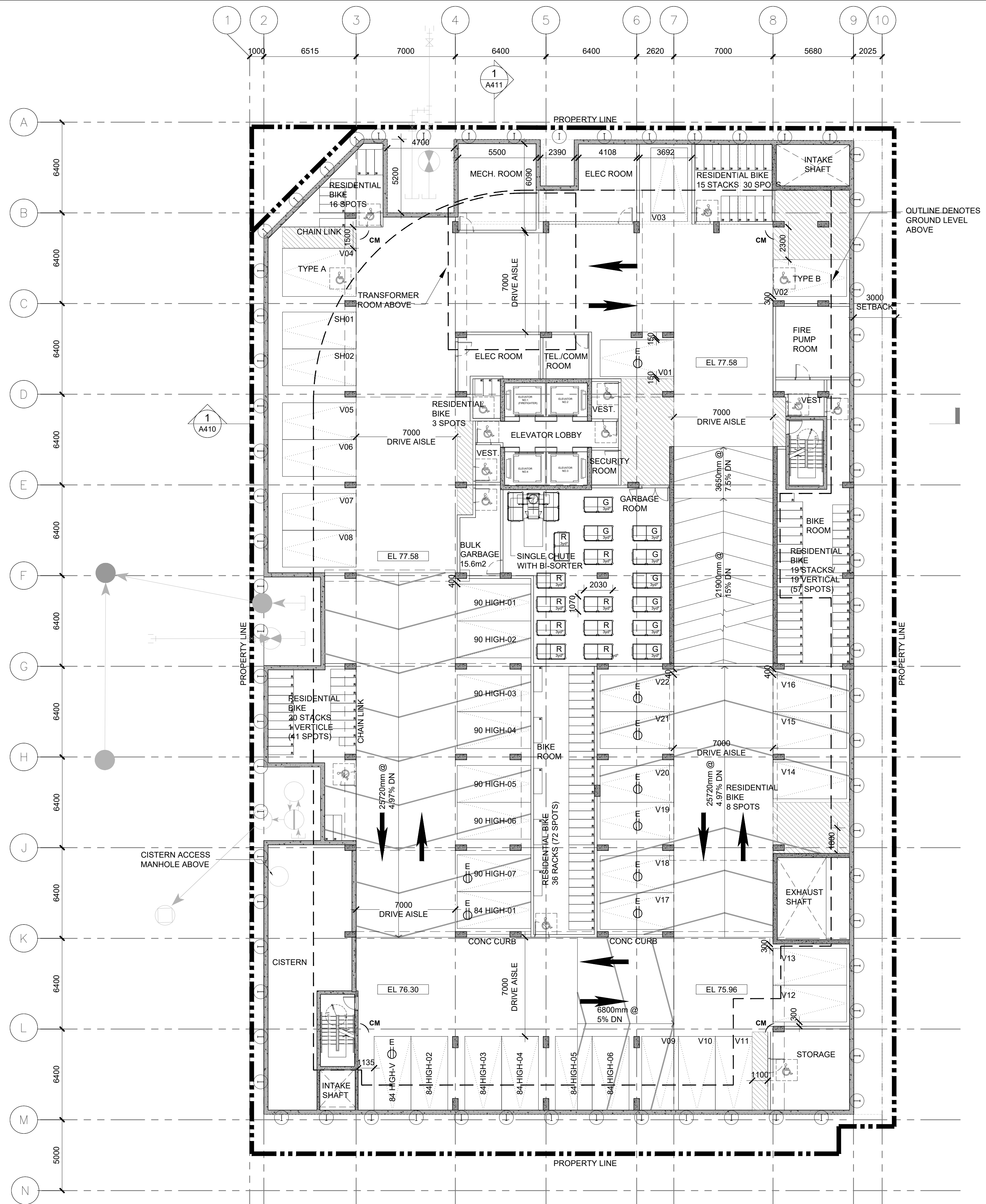
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 APP NO. OZ/OPA 23-1 W1



Drawn SK	Scale 1:150
Checked DL, CY	Date 24 OCT 2022

Title
P2 PARKING LEVEL

Project No. 21-182	Drawing No. A204
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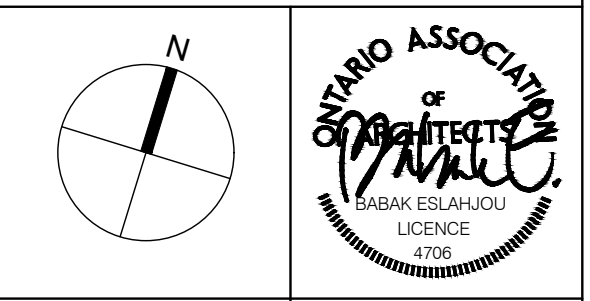
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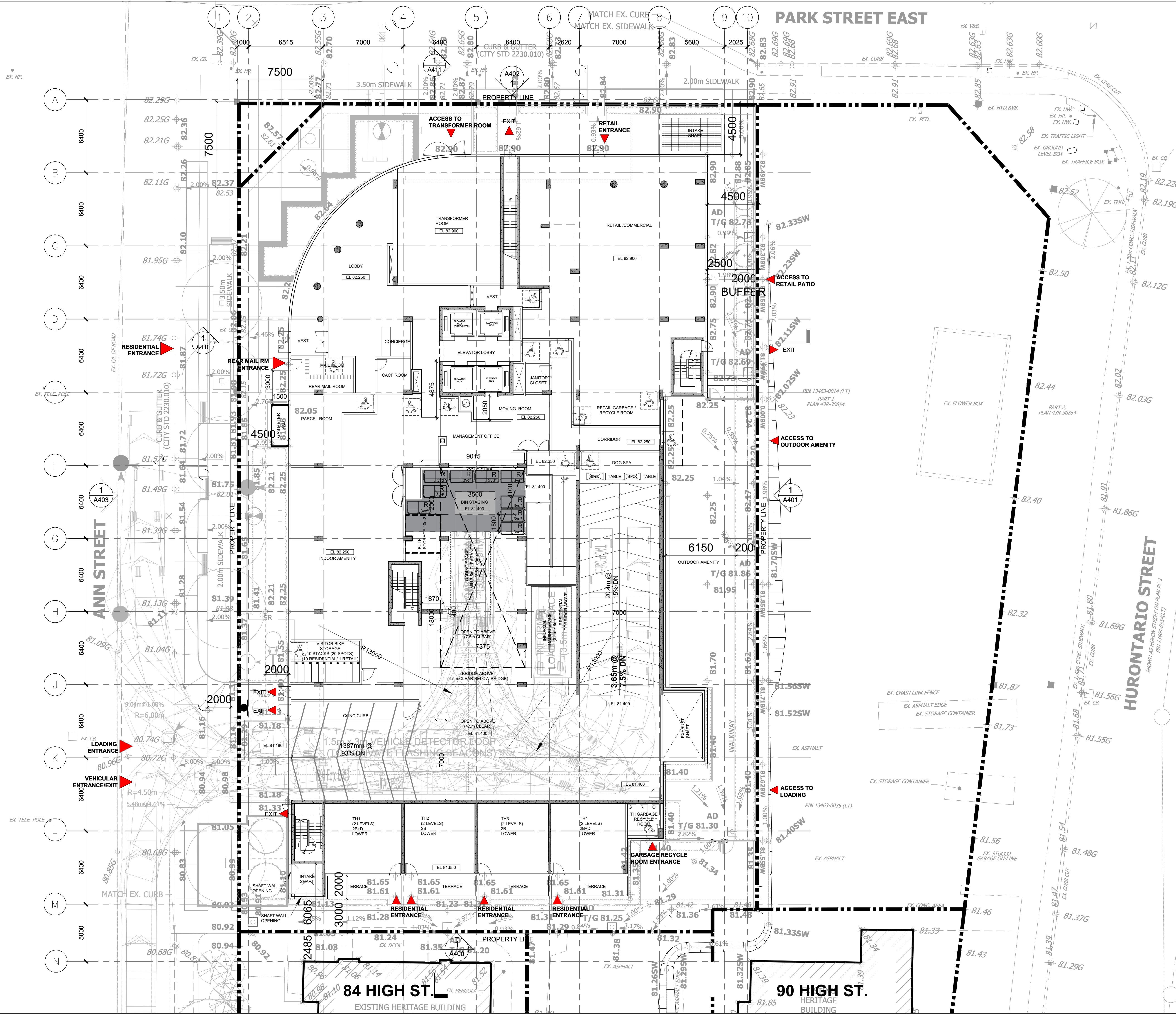
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 APP NO: OZ/OPA 23-1-W1



Drawn SK	Scale 1:150
Checked DL, CY	Date 24 OCT 2022

Title
P1 PARKING LEVEL

Project No. 21-182	Drawing No. A205
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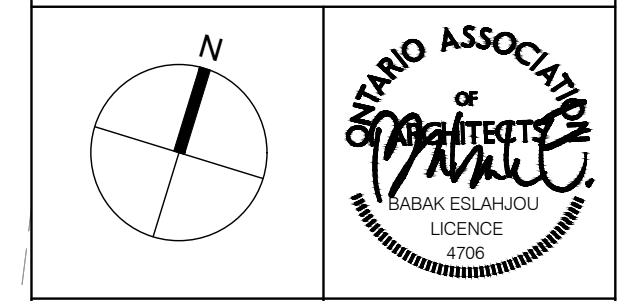
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Drawn	SK, MS	Scale	1:150
Checked	DL, CY	Date	24 OCT 2022

Title
GROUND LEVEL

Project No.	21-182	Drawing No.	A206
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Appendix B Overnight Residential Parking Proxy Data



Project: Eva Road
Project No: 5757-87
Location: 2 & 6 Eva Road
Date: Thursday October 20, 2016 & Tuesday October 26, 2016
Number Units 556

2AM Parking Summary

	Residents								Visitors			
	2 Eva Rd				6 Eva Rd				2 & 6 Eva Rd			
	Level 1	Level 2	Level 3	Total	Level 2	Level 3	Level 4	Total	Surface	UG Grade	Level 1	Total
Supply	60	112	116	288	76	84	123	283	6	69	42	117
Thurs Oct 20	49	93	87	229	62	69	100	231	1	32	12	45
Tues Oct 26	48	90	89	227	60	72	105	237	0	27	10	37

Project: Eva Road
 Project No: 5757-87
 Location: 2 & 6 Eva Road
 Date: Thursday October 20, 2016 & Tuesday October 26, 2016

Surface Visitor Parking

Stall No.	Thurs	Tues
V1		
V2	1	
V3		
V4		
V5		
V6		
Total	1	0

Underground Visitor Parking

Stall No.	Thurs	Tues
V1		
V2	1	1
V3	1	1
V4	1	1
V5	1	1
V6	1	1
V7	1	
V8		1
V9	1	1
V10		
V11		
V12	1	1
V13		1
V14	1	1
V15	1	1
V16	1	
V17	1	
V18		
V19		
V20	1	1
V21	1	1
V22	1	
V23		
V24	1	1
V25		1
V26	1	
V27	1	
V28	1	1
V29	1	1
V30		
V31	1	1
V32		
V33	1	1
V34		1
V35		
V36	1	
V37		
V38		
V39	1	
V40	1	1
V41		
V42	1	
V43	1	1
V44		
V45		
V46		
V47		
V48		
V49		
V50		
V51		
V52		
V53		
V54	1	1
V55	1	1
V56		
V57		
V58	1	1
V59		
V60		
V61		
V62		
V63		
V64		
V65		
V66		1
V67	1	
V68		
V69	1	1
Total	32	27

Level 1 Visitor Parking

Stall No.	Thurs	Tues
V1	1	1
V2		
V3		
V4		
V5	1	1
V6	1	1
V7	1	1
V8	1	
V9		
V10		
V11		1
V12	1	1
V13		
V14		
V15	1	1
V16		
V17		
V18	1	
V19	1	1
V20		
V21	1	1
V22		
V23		
V24		
V25		
V26		
V27		
V28		
V29	1	
V30		
V31		
V32		
V33		
V34		
V35		
V36		
V37		
V38		
V39		
V40		
V41	1	1
V42		
Total	12	10

Appendix C Port Credit Visitor Parking Proxy Survey Data

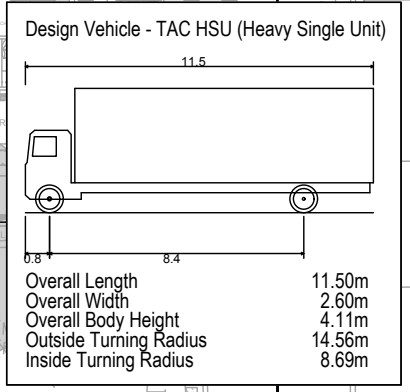
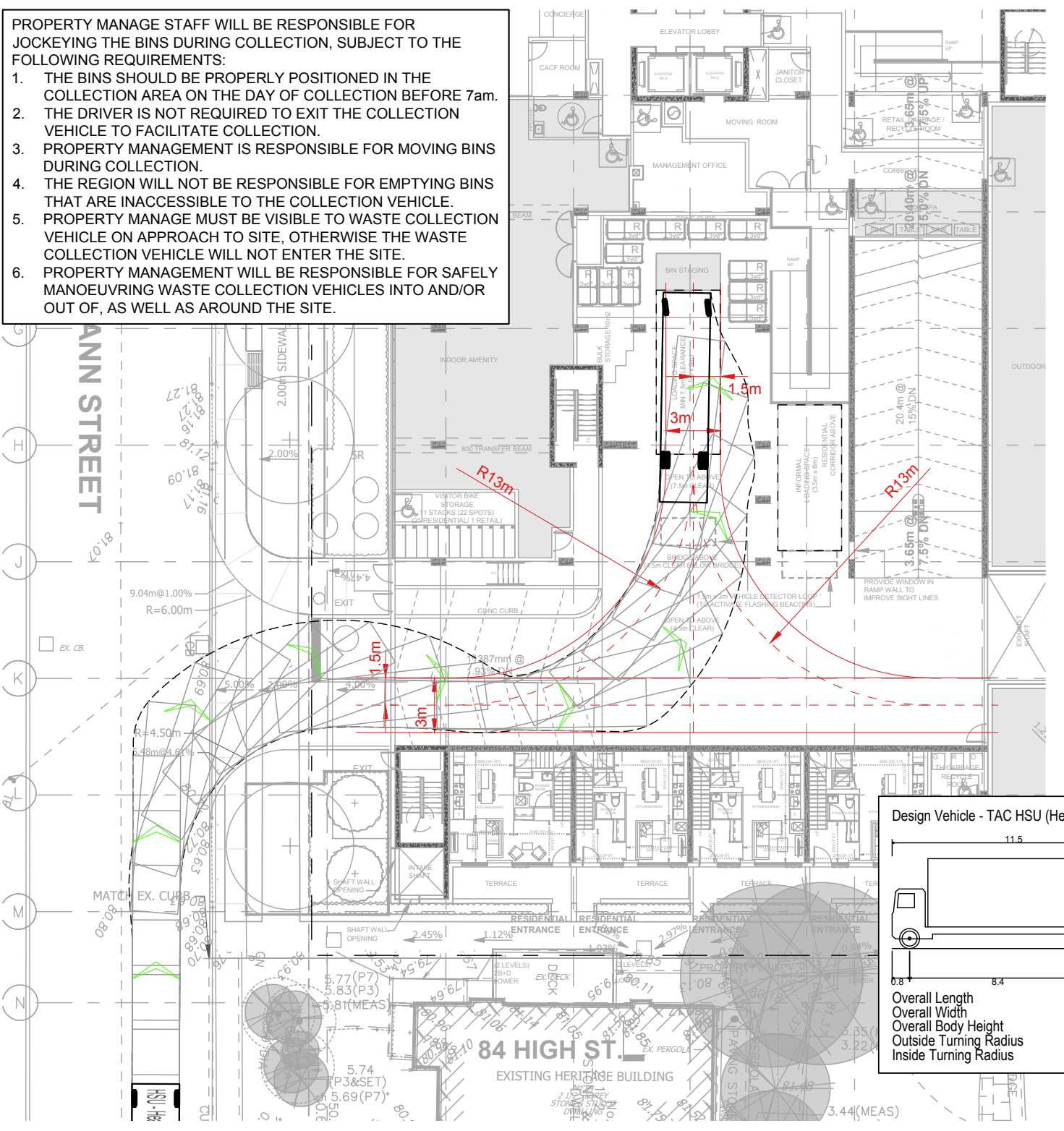


Appendix C Vehicle Maneuvering Diagrams

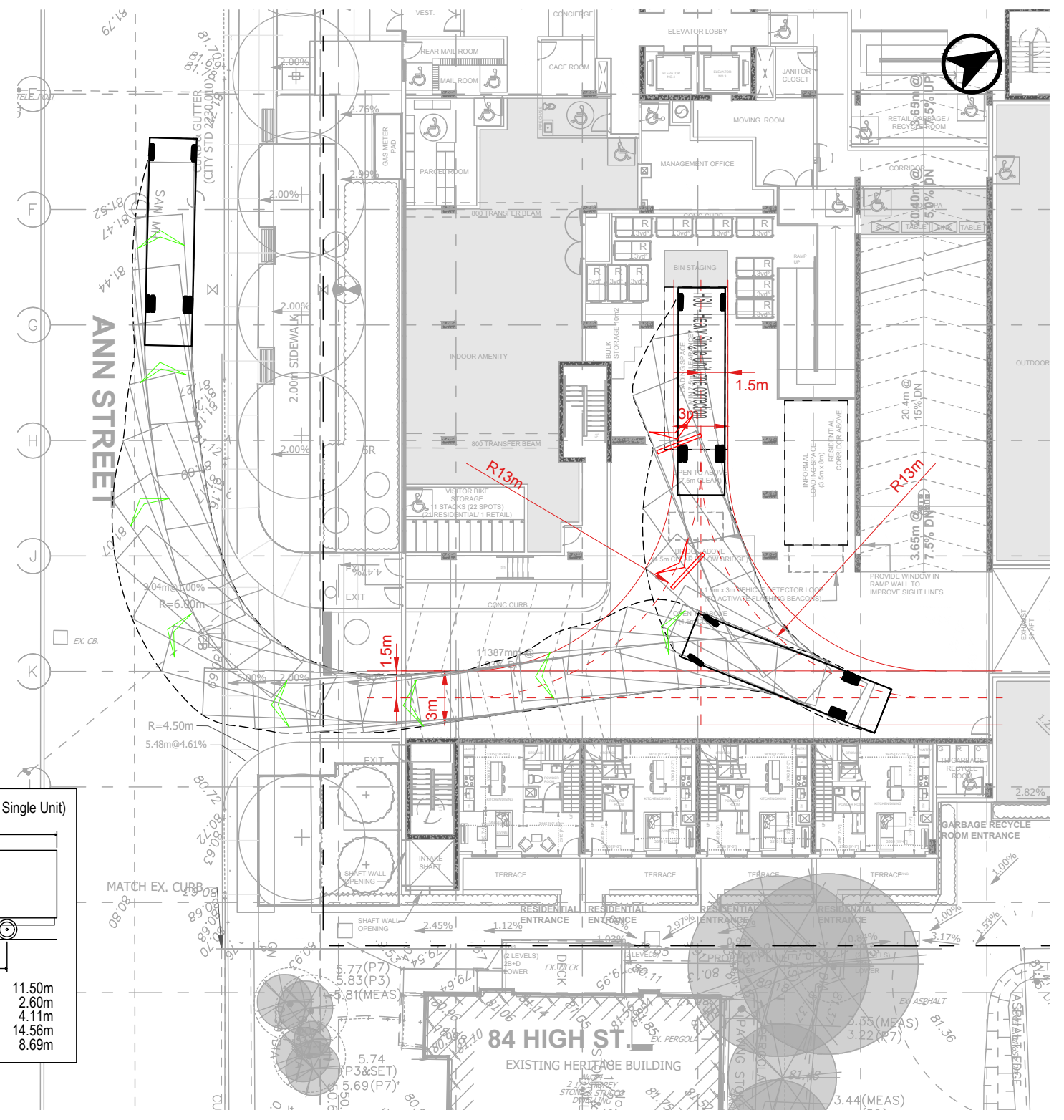
INBOUND

PROPERTY MANAGE STAFF WILL BE RESPONSIBLE FOR JOCKEYING THE BINS DURING COLLECTION, SUBJECT TO THE FOLLOWING REQUIREMENTS:

1. THE BINS SHOULD BE PROPERLY POSITIONED IN THE COLLECTION AREA ON THE DAY OF COLLECTION BEFORE 7am.
2. THE DRIVER IS NOT REQUIRED TO EXIT THE COLLECTION VEHICLE TO FACILITATE COLLECTION.
3. PROPERTY MANAGEMENT IS RESPONSIBLE FOR MOVING BINS DURING COLLECTION.
4. THE REGION WILL NOT BE RESPONSIBLE FOR EMPTYING BINS THAT ARE INACCESSIBLE TO THE COLLECTION VEHICLE.
5. PROPERTY MANAGE MUST BE VISIBLE TO WASTE COLLECTION VEHICLE ON APPROACH TO SITE, OTHERWISE THE WASTE COLLECTION VEHICLE WILL NOT ENTER THE SITE.
6. PROPERTY MANAGEMENT WILL BE RESPONSIBLE FOR SAFELY MANOEUVRING WASTE COLLECTION VEHICLES INTO AND/OR OUT OF, AS WELL AS AROUND THE SITE.



OUTBOUND

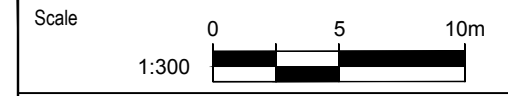


Date Plotted: July 26, 2023. Filename: J:\17406-04\BA\SPR\2023\Rev 14 - Jul 25 2023\ba-SPR-Rev14-7406-04.dwg



10 West - Site Plan Review Refuse Proxy Design Vehicle (Heavy Single Unit Truck - HSU) Inbound / Outbound Manoeuvres

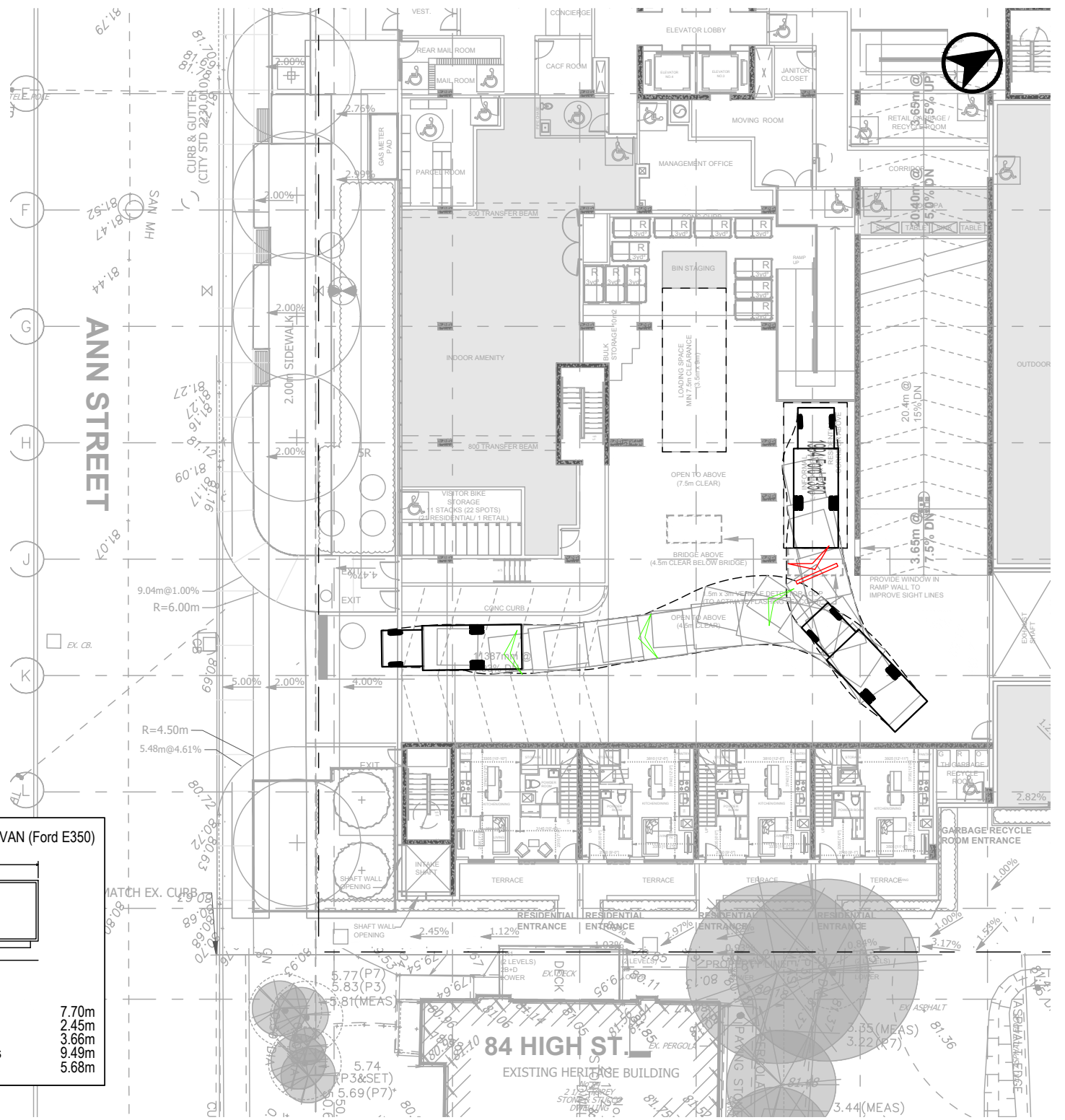
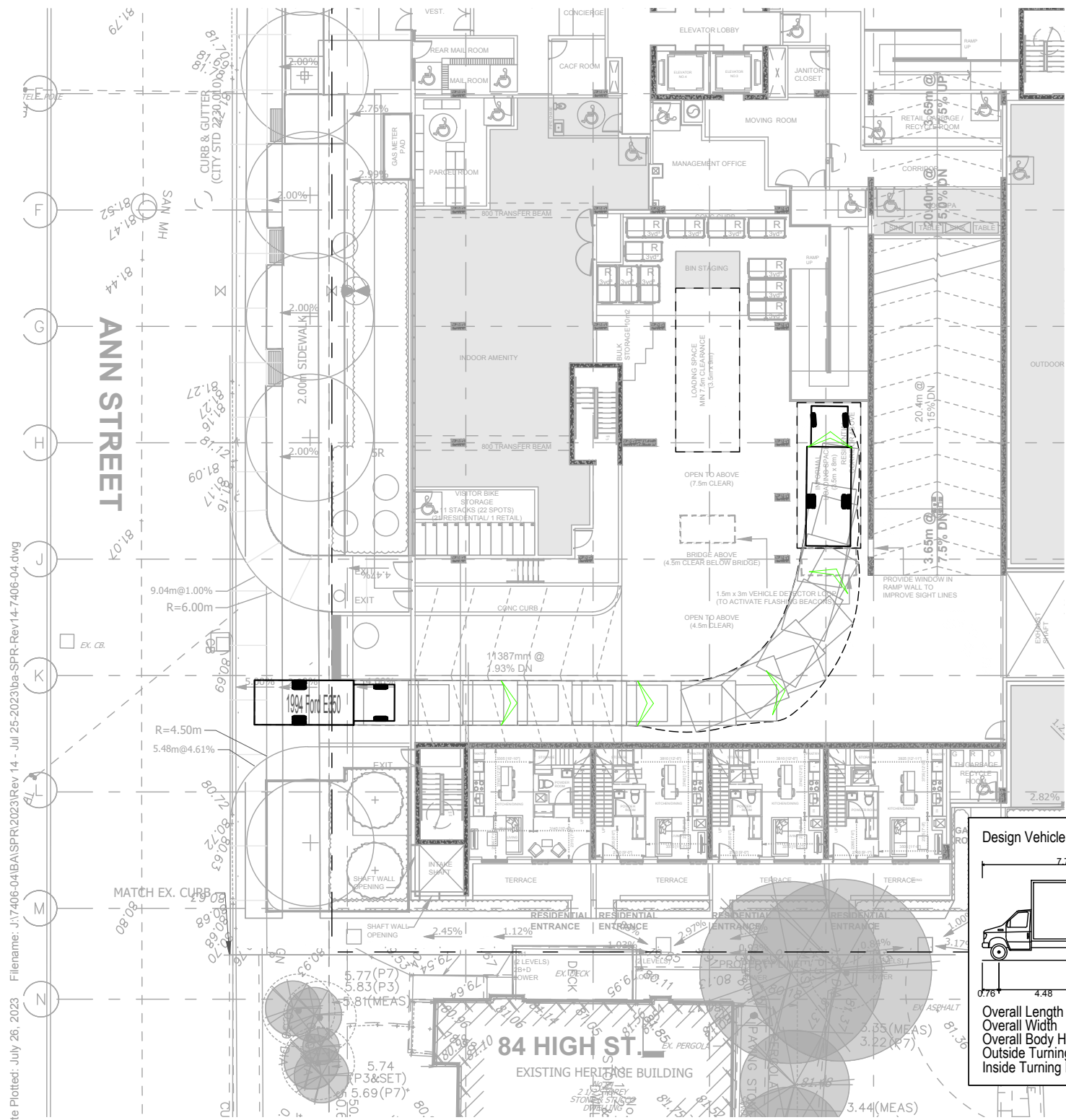
Project: 10 West
Project No. 7406-04
Date: October 1, 2021
Revised: July 25, 2023



Drawing No. **VMD-1**

INBOUND

OUTBOUND



Design Vehicle - CUBEVAN (Ford E350)

Overall Length	7.70m
Overall Width	2.45m
Overall Body Height	3.66m
Outside Turning Radius	9.49m
Inside Turning Radius	5.68m

Date Plotted: July 26, 2023. Filename: J:\17406-04\BA\SPR\2023\Rev 14 - Jul 25-2023\ba-spr-Rev14-7406-04.dwg

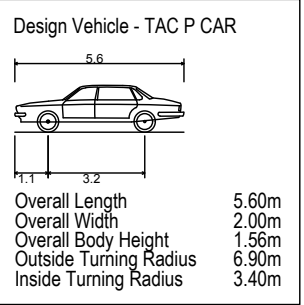
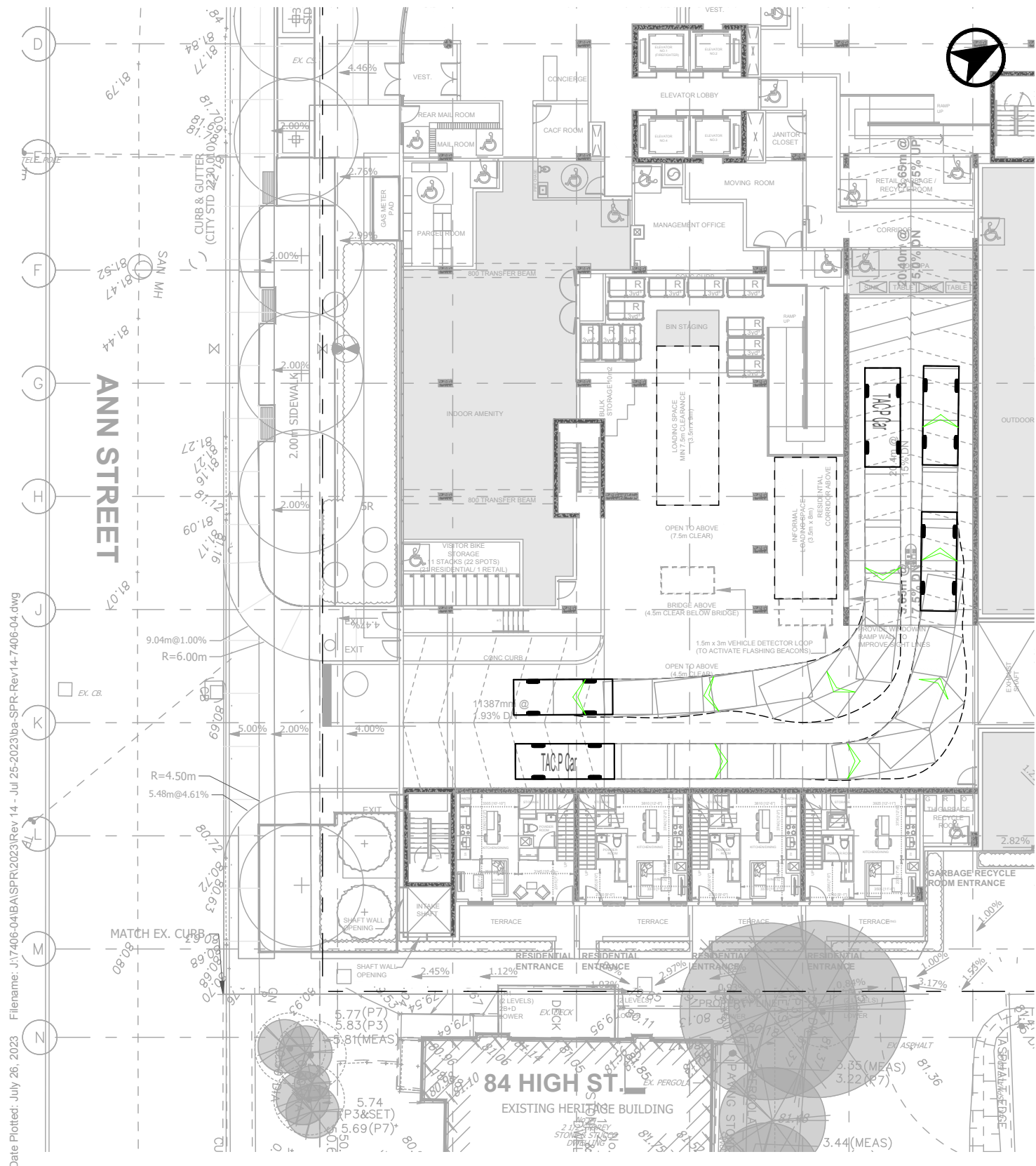


10 West - Site Plan Review Small Delivery Truck Design Vehicle Inbound / Outbound Manoeuvres

Project: 10 West
Project No. 7406-04
Date: October 1, 2021
Revised: July 25, 2023



Drawing No. **VMD-2**

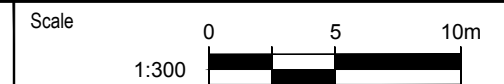


Date Plotted: July 26, 2023 File: J:\17406-04\BA\SPR\2023\Rev 14 - Jul 25-2023\ba-SPR-Rev14-7406-04.dwg



10 West - Site Plan Review
 Passenger Car Design Vehicle
 Inbound / Outbound Manoeuvres

Project: 10 West
 Project No. 7406-04
 Date: October 1, 2021
 Revised: July 25, 2023



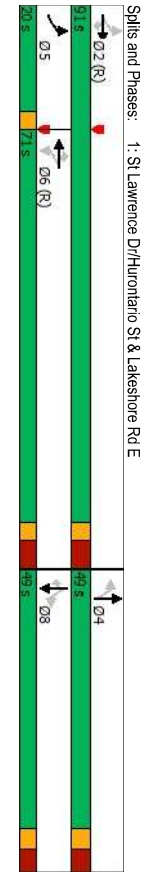
Drawing No. **VMD-3**

Appendix D Detailed Synchro Calculation Sheets

Queues
1: St Lawrence Dr/Hurontario St & Lakeshore Rd E Existing AM Peak Hour Period

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	310	910	15	20	570	230	10	75	210	90	285
Future Volume (vph)	310	910	15	20	570	230	10	75	210	90	285
Lane Group Flow (vph)	310	910	15	20	570	230	10	85	210	90	285
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	5	2	2	6	6	6	4	4	8	8	8
Detector Phases	2	2	2	6	6	6	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	46.5	46.5	46.0	46.0	45.0	45.0	45.0	45.0	45.0	45.0
Total Split (s)	20.0	91.0	91.0	71.0	71.0	49.0	49.0	49.0	49.0	49.0	49.0
Total Split (%)	14.3%	65.0%	65.0%	50.7%	50.7%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.53	0.37	0.01	0.06	0.29	0.25	0.04	0.22	0.81	0.23	0.56
Control Delay	11.3	10.5	1.1	20.2	19.0	3.4	39.7	42.1	73.2	43.8	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.3
Total Delay	11.3	10.5	1.1	20.2	19.0	3.4	39.7	42.1	73.4	43.8	28.0
Queue Length 50th (m)	28.1	53.5	0.0	2.5	43.8	0.0	2.4	19.5	62.2	23.6	35.2
Queue Length 95th (m)	53.4	83.5	1.2	9.2	74.8	16.0	6.9	32.0	92.2	42.8	67.7
Internal Link Dist (m)		43.4		254.1		90.8		102.6			
Turn Bay Length (m)	130.0	90.0	130.0	327	195.4	60.0	30.0	31.0	31.0	30.0	30.0
Base Capacity (vph)	608	2461	1050	327	1954	922	381	548	374	576	603
Starvation Cap Reductn	0	0	0	0	0	0	0	0	12	0	56
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.37	0.01	0.06	0.29	0.25	0.03	0.16	0.58	0.16	0.52

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 11 (8%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated



HCM Signalized Intersection Capacity Analysis
1: St Lawrence Dr/Hurontario St & Lakeshore Rd E Existing AM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	310	910	15	20	570	230	10	75	210	90	285
Future Volume (vph)	310	910	15	20	570	230	10	75	210	90	285
Ideal Flow (vph/ft)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost Time (s)	3.0	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	1.00	1.00	0.95	1.00	1.00	0.94	1.00	1.00	1.00	1.00	0.95
Frbp. ped/bikes	0.99	1.00	1.00	0.99	1.00	1.00	0.97	1.00	0.99	1.00	1.00
Frbp. ped/bikes	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85
Flt. Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1628	3579	1514	1770	3476	1462	1721	1819	1691	1921	1345
Flt. Permitted	0.40	1.00	1.00	0.31	1.00	1.00	0.70	1.00	0.70	1.00	1.00
Satd. Flow (perm)	677	3579	1514	584	3476	1462	1270	1819	1249	1921	1345
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	310	910	15	20	570	230	10	75	210	90	285
RTOR Reduction (vph)	0	0	5	0	102	0	4	0	0	0	226
Lane Group Flow (vph)	310	910	10	20	570	128	10	81	210	90	285
Confl. Peds. (#/hr)	35	15	15	15	35	30	5	5	5	5	30
Confl. Bikes (#/hr)											
Heavy Vehicles (%)	9%	2%	0%	0%	5%	3%	0%	4%	0%	0%	13%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	5	2	2	6	6	6	4	4	8	8	8
Permitted Phases	2	2	2	6	6	6	4	4	8	8	8
Actuated Green, G (s)	96.3	96.3	96.3	78.0	78.0	78.0	29.2	29.2	29.2	29.2	29.2
Effective Green, G (s)	96.3	96.3	96.3	78.0	78.0	78.0	29.2	29.2	29.2	29.2	29.2
Actualized G/C Ratio	0.69	0.69	0.69	0.56	0.56	0.56	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	3.0	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	569	2461	1041	325	1936	814	264	379	260	400	280
v/s Ratio Prot	0.006	0.25	0.01	0.03	0.09	0.09	0.01	0.04	0.04	0.05	0.04
v/s Ratio Perm	0.54	0.37	0.01	0.06	0.29	0.16	0.04	0.21	0.81	0.23	0.21
v/c Ratio	0.54	0.37	0.01	0.06	0.29	0.16	0.04	0.21	0.81	0.23	0.21
Uniform Delay, d1	8.8	9.1	6.9	14.2	16.4	15.0	44.2	45.9	62.7	46.0	45.9
Progression Delay, d2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.97	5.29
Incremental Delay, d2	1.1	0.4	0.4	0.4	0.4	0.4	0.1	0.3	16.4	0.3	0.4
Delay (s)	9.9	9.6	6.9	14.6	16.8	15.5	44.3	46.2	68.1	45.1	243.2
Level of Service	A	A	A	B	B	B	D	D	E	D	F
Approach Delay (s)	9.6	A	A	B	B	B	D	D	E	D	F
Approach LOS	A	A	A	B	B	B	D	D	E	D	F

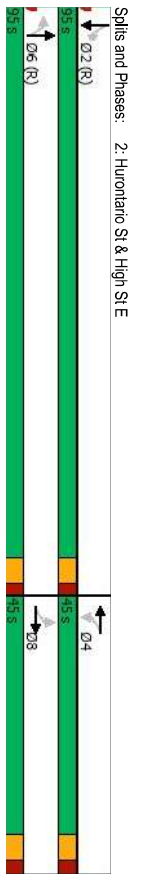
Intersection Summary
HCM 2000 Control Delay: 42.9 HCM 2000 Level of Service: D
HCM 2000 Volume to Capacity ratio: 0.62
Actuated Cycle Length (s): 140.0
Intersection Capacity Utilization: 86.4%
Analysis Period (min): 15
ICU Level of Service: E

Queues
2- Hurontario St & High St E

Existing AM Peak Hour Period

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	85	0	10	0	5	600	45	560
Traffic Volume (vph)	85	0	10	0	5	600	45	560
Future Volume (vph)	85	0	10	0	5	600	45	560
Lane Group Flow (vph)	0	100	0	50	5	610	45	610
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8	8	4	4	6	6	2	2
Detector Phases	8	8	4	4	6	6	2	2
Switch Phase	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Initial (s)	28.5	28.5	28.5	28.5	22.0	22.0	22.0	22.0
Minimum Split (s)	45.0	45.0	45.0	45.0	95.0	95.0	95.0	95.0
Total Split (%)	32.1%	32.1%	32.1%	32.1%	67.9%	67.9%	67.9%	67.9%
Total Spill (%)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Yellow Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0
Total Lost Time (s)	None	None	None	None	C-Min	C-Min	C-Min	C-Min
Recall Mode	None	None	None	None	0.26	0.01	0.24	0.08
v/c Ratio	0.65	0.65	23.0	2.6	4.1	0.6	0.2	0.24
Control Delay	63.4	0.0	0.0	0.0	0.3	0.0	0.2	0.2
Queue Delay	63.4	23.0	2.6	4.3	0.6	0.9	0.2	0.2
Total Delay	21.8	2.7	0.4	28.3	0.1	0.5	0.6	0.6
Queue Length 50th (m)	40.0	14.9	m0.5	25.7	0.3	0.6	0.6	0.6
Queue Length 95th (m)	58.2	28.1	102.6	94.7	30.0	30.0	30.0	30.0
Internal Link Dist (m)	353	424	628	2513	587	2552	1015	1015
Base Capacity (vph)	0	0	0	1173	0	86	0	0
Starvation Cap Reductn	0	1	0	86	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0.28	0.12	0.01	0.46	0.08	0.40	0.40	0.40
Reduced v/c Ratio								

Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 55 (39%), Referenced to phase 2:SBLT and 6:NBLT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.



HCM Signalized Intersection Capacity Analysis
2- Hurontario St & High St E

Existing AM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	85	0	15	10	0	40	5	600	10	45	560	50
Traffic Volume (vph)	85	0	15	10	0	40	5	600	10	45	560	50
Future Volume (vph)	85	0	15	10	0	40	5	600	10	45	560	50
Ideal Flow (vph/pl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.99	1.00	0.98	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frpb, ped/bikes	0.99	1.00	0.99	1.00	0.99	1.00	0.99	1.00	0.99	1.00	0.99	1.00
Flt	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Flt Protected	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Satd. Flow (prot)	1491	1521	1521	1768	3138	1652	3184	1652	3184	1652	3184	1652
Flt Permitted	0.79	0.42	0.94	0.42	1.00	0.42	1.00	0.42	1.00	0.42	1.00	0.42
Satd. Flow (perm)	1223	1440	783	3138	732	3184	732	3184	732	3184	732	3184
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	85	0	15	10	0	40	5	600	10	45	560	50
RTOR Reduction (vph)	0	20	0	36	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	80	0	0	14	0	5	610	0	45	607	0
Cont. Peds. (#/hr)	5	0%	0%	27%	0%	5%	0%	16%	11%	6%	13%	11%
Heavy Vehicles (%)	23%	0%	0%	27%	0%	5%	0%	16%	11%	6%	13%	11%
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA
Protected Phases	8	8	4	4	6	6	2	2	2	2	2	2
Permitted Phases	8	8	4	4	6	6	2	2	2	2	2	2
Actuated Green, G (s)	15.4	15.4	15.4	112.1	112.1	112.1	112.1	112.1	112.1	112.1	112.1	112.1
Effective Green, g (s)	15.4	15.4	15.4	112.1	112.1	112.1	112.1	112.1	112.1	112.1	112.1	112.1
Actuated G/C Ratio	0.11	0.11	0.11	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Clearance Time (s)	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Gp Cap (vph)	134	158	626	2512	586	2549	1019	1019	1019	1019	1019	1019
v/s Ratio Prot	0.07	0.09	0.09	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
v/s Ratio Perm	0.59	0.59	0.09	0.09	0.01	0.24	0.08	0.24	0.08	0.24	0.08	0.24
Uniform Delay, d1	59.3	58.0	2.8	3.0	3.5	3.0	3.4	3.0	3.4	3.0	3.4	3.0
Progression Factor	1.00	1.00	1.00	0.61	0.99	0.09	0.15	0.09	0.15	0.09	0.15	0.09
Incremental Delay, d2	6.9	6.9	0.3	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Delay (s)	66.2	66.2	56.3	1.7	3.6	0.5	0.7	0.5	0.7	0.5	0.7	0.5
Level of Service	E	E	E	A	A	A	A	A	A	A	A	A
Approach Delay (s)	66.2	66.2	56.3	1.7	3.6	0.5	0.7	0.5	0.7	0.5	0.7	0.5
Approach LOS	E	E	E	A	A	A	A	A	A	A	A	A

Queues
3- Hurontario St & Park St E Existing AM Peak Hour Period

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	150	30	15	15	10	685	205	620	165
Traffic Volume (vph)	150	30	15	15	10	685	205	620	165
Future Volume (vph)	150	30	15	15	10	685	205	620	165
Lane Group Flow (vph)	150	50	15	230	10	715	205	620	165
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA	Perm
Protected Phases	8	8	4	4	6	6	5	2	2
Detector Phases	8	8	4	4	6	6	5	2	2
Switch Phase	8.0	8.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0
Minimum Initial (s)	38.0	38.0	38.0	38.0	33.0	33.0	8.0	33.0	33.0
Minimum Split (s)	49.0	49.0	49.0	49.0	66.0	66.0	25.0	91.0	91.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	47.1%	47.1%	17.9%	65.0%	65.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag					Lag	Lag	Lead	Lead	
Lead-Lag Optimizer?					Yes	Yes	Yes	Yes	
Recall Mode	Max	Max	Max	Max	Max	Max	None	C-Min	C-Min
v/c Ratio	0.56	0.10	0.04	0.38	0.03	0.44	0.46	0.31	0.17
Control Delay	50.6	23.9	35.2	7.8	17.1	23.0	14.6	14.3	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0
Total Delay	50.6	23.9	35.2	7.8	17.1	23.7	14.6	14.3	2.5
Queue Length 50th (m)	36.8	6.3	3.1	3.1	1.3	80.6	23.8	44.7	1.1
Queue Length 95th (m)	62.1	16.7	8.9	24.0	3.7	95.7	36.0	56.4	10.6
Internal Link Dist (m)		73.3		75.8		94.7		197.8	
Turn Bay Length (m)	25.0	25.0	400	599	382	1624	523	1972	983
Base Capacity (vph)	289	524	400	599	382	1624	523	1972	983
Starvation Cap Reductn	0	0	0	0	0	553	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.10	0.04	0.38	0.03	0.67	0.39	0.31	0.17
Intersection Summary									
Cycle Length: 140									
Actuated Cycle Length: 140									
Offset: 97 (69%), Referenced to phase 2:SBTL, Start of Green									
Natural Cycle: 80									
Control Type: Actuated-Coordinated									



10 West
BA Group

Synchro 11 Report
EXAM.sjn

HCM Signalized Intersection Capacity Analysis
3- Hurontario St & Park St E Existing AM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	150	30	20	15	15	215	10	685	30	205	620	165
Traffic Volume (vph)	150	30	20	15	15	215	10	685	30	205	620	165
Future Volume (vph)	150	30	20	15	15	215	10	685	30	205	620	165
Ideal Flow (vph/pl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	3.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.95	1.00	0.95	1.00	1.00
Frbp. ped/bikes	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	0.99	1.00	1.00	0.98	1.00	0.98	1.00	0.99	1.00	1.00	1.00	0.85
Frbp. ped/bikes	1.00	0.94	1.00	1.00	0.86	1.00	0.99	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1685	1701	1751	1497	1497	1785	3320	1713	3288	1536	1713	3288
Flt Permitted	0.51	1.00	0.72	1.00	0.42	1.00	0.30	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	900	1701	1335	1497	783	3320	542	3288	1536	1335	1497	1536
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	150	30	20	15	15	215	10	685	30	205	620	165
RTOR Reduction (vph)	0	14	0	0	151	0	0	2	0	0	62	62
Lane Group Flow (vph)	150	36	0	15	80	0	10	713	0	205	620	103
Cont. Peds. (#/hr)	10	15	15	15	10	10	10	10	10	10	10	10
Heavy Vehicles (%)	5%	4%	6%	0%	18%	7%	0%	9%	10%	4%	11%	4%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA	Perm
Protected Phases	8	8	4	4	6	6	5	2	2			
Permitted Phases	8	8	4	4	6	6	5	2	2			
Actuated Green, G (s)	42.0	42.0	42.0	42.0	68.4	68.4	84.0	84.0	84.0	84.0	84.0	84.0
Effective Green, g (s)	42.0	42.0	42.0	42.0	68.4	68.4	84.0	84.0	84.0	84.0	84.0	84.0
Actuated G/C Ratio	0.30	0.30	0.30	0.30	0.49	0.49	0.60	0.60	0.60	0.60	0.60	0.60
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	3.0	7.0	3.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Gp Cap (vph)	270	510	400	449	382	1622	430	1972	921	430	1972	921
v/s Ratio Prot	0.02	0.02	0.05	0.05	0.01	0.21	0.04	0.19	0.07	0.04	0.19	0.07
v/s Ratio Perm	0.17	0.07	0.01	0.01	0.18	0.03	0.44	0.31	0.11	0.24	0.31	0.11
Uniform Delay, d1	41.2	35.0	34.7	36.2	18.5	23.3	13.9	13.8	12.0	13.9	13.8	12.0
Progression Factor	1.00	1.00	1.00	1.00	0.84	0.93	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.0	0.3	0.2	0.9	0.1	0.9	0.8	0.4	0.2	0.8	0.4	0.2
Delay (s)	49.2	35.3	34.9	37.1	15.8	22.5	14.7	14.2	12.3	14.7	14.2	12.3
Level of Service	D	D	C	D	B	C	B	B	B	B	B	B
Approach Delay (s)	45.7		36.9		22.5		14.0		14.0			
Approach LOS	D		D		C		B		B			
Intersection Summary												
HCM 2000 Control Delay	22.4											
HCM 2000 Volume to Capacity ratio	0.51											
Actuated Cycle Length (s)	140.0											
Intersection Capacity Utilization	88.0%											
Analysis Period (min)	15											
e Critical Lane Group												

10 West
BA Group

Synchro 11 Report
EXAM.sjn

HCM Unsignalized Intersection Capacity Analysis

Existing AM Peak Hour Period

4: Lakeshore Rd E & Ann St

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	45	1230	825	40	5	20
Future Volume (veh/h)	45	1230	825	40	5	20
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	45	1230	825	40	5	20
Pedestrians					20	
Lane Width (m)					3.5	
Walking Speed (m/s)					1.2	
Percent Blockage					2	
Right turn flare (Veh)						
Median storage (veh)		None				
Upstream signal (m)			67			
PX, platoon unblocked	0.92			0.92	0.92	
VC, conflicting volume	885			1570	452	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	689			1438	217	
IC, single (s)	4.4			6.8	7.0	
IC, 2 stage (s)						
FF (s)	2.3			3.5	3.3	
p0 queue free %	94			95	97	
CM capacity (veh/h)	748			107	704	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	45	615	615	550	315	25
Volume Left	45	0	0	0	0	5
Volume Right	0	0	0	0	40	20
CSH	748	1700	1700	1700	1700	333
Volume to Capacity	0.06	0.36	0.32	0.19	0.08	
Queue Length 95th (m)	1.5	0.0	0.0	0.0	0.0	1.9
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	16.7
Lane LOS	B					C
Approach Delay (s)	0.4			0.0		16.7
Approach LOS						C
Intersection Summary						
Average Delay	0.4					
Intersection Capacity Utilization	44.0%					
ICU Level of Service	15					
Analysis Period (min)	15					
	A					

HCM Unsignalized Intersection Capacity Analysis

Existing AM Peak Hour Period

5: Ann St & High St E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔	↔		↔	↔		↔	↔
Sign Control		Stop	Stop		Stop	Stop		Stop	Stop		Stop	Stop
Traffic Volume (vph)	10	80	0	10	35	10	0	75	10	10	15	0
Future Volume (vph)	10	80	0	10	35	10	0	75	10	10	15	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	80	0	10	35	10	0	75	10	10	15	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	90	55	85	25								
Volume Left (vph)	10	10	0	10								
Volume Right (vph)	0	10	10	0								
Head (s)	0.34	0.15	0.74	0.53								
Departure Headway (s)	4.6	4.4	5.0	4.9								
Degree Utilization, x	0.11	0.07	0.12	0.03								
Capacity (veh/h)	760	784	691	699								
Control Delay (s)	8.2	7.8	8.7	8.1								
Approach Delay (s)	8.2	7.8	8.7	8.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay	8.3											
Level of Service	A											
Intersection Capacity Utilization	22.8%											
ICU Level of Service	15											
Analysis Period (min)	15											
	A											

HCM Unsignalized Intersection Capacity Analysis

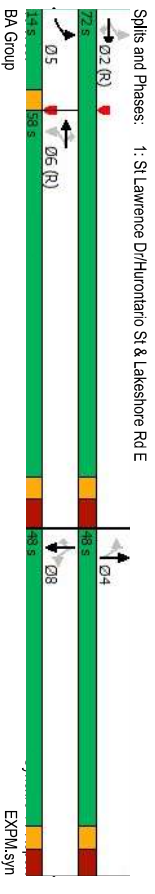
Existing AM Peak Hour Period

Queues

Existing PM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		Stop		Stop		Stop		Stop		Stop		Stop
Traffic Volume (vph)	30	175	10	15	65	110	0	80	15	10	0	0
Future Volume (vph)	30	175	10	15	65	110	0	80	15	10	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow rate (vph)	30	175	10	15	65	110	0	80	15	10	0	0
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total (vph)	215	80	110	95	10							
Volume Left (vph)	30	15	0	0	0							
Volume Right (vph)	10	0	110	15	0							
Head (s)	0.01	0.16	-0.70	0.54	0.20							
Departure Headway (s)	4.5	5.1	4.3	5.4	5.2							
Degree Utilization, x	0.27	0.11	0.13	0.14	0.01							
Capacity (veh/h)	776	675	811	628	632							
Control Delay (s)	9.2	7.6	6.7	9.2	8.2							
Approach Delay (s)	9.2	7.1		9.2	8.2							
Approach LOS	A	A		A	A							
Intersection Summary												
Delay	8.4											
Level of Service	A											
Intersection Capacity Utilization	35.3%											
ICU Level of Service	A											
Analysis Period (min)	15											

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
Lane Configurations		Stop		Stop		Stop		Stop		Stop		
Traffic Volume (vph)	315	895	10	40	1070	280	10	125	370	115	425	
Future Volume (vph)	315	895	10	40	1070	280	10	125	370	115	425	
Lane Group Flow (vph)	315	895	10	40	1070	280	10	125	370	115	425	
Turn Type	pr+pl	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases	5	2		6	6	6	6	4	8	8	8	
Permitted Phases	2	2	2	6	6	6	6	4	4	8	8	
Detector Phases	5	2	2	6	6	6	6	4	4	8	8	
Switch Phase												
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	8.0	46.0	46.0	46.0	46.0	46.0	46.0	45.0	45.0	45.0	45.0	
Total Split (s)	14.0	72.0	72.0	58.0	58.0	58.0	48.0	48.0	48.0	48.0	48.0	
Total Spilt (%)	11.7%	60.0%	60.0%	48.3%	48.3%	48.3%	40.0%	40.0%	40.0%	40.0%	40.0%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	0.0	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	
v/c Ratio	0.91	0.48	0.01	0.18	0.78	0.41	0.02	0.27	0.91	0.17	0.66	
Control Delay	50.1	19.4	0.0	26.2	37.1	7.9	25.4	25.6	64.0	27.1	20.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.8	0.0	2.2	
Total Delay	50.1	19.4	0.0	26.2	37.1	7.9	25.4	25.6	80.7	27.1	23.0	
Queue Length 50th (m)	~48.3	77.7	0.0	6.7	123.9	9.9	1.5	25.5	81.1	18.2	40.4	
Queue Length 95th (m)	#92.2	85.9	0.0	14.4	138.5	28.6	5.7	46.6	#151.2	34.4	83.8	
Internal Link Dist (m)		43.4		254.1				90.8		102.6		
Turn Bay Length (m)	130.0	90.0	130.0	60.0	30.0	31.0	30.0				30.0	
Base Capacity (vph)	347	1947	807	246	1520	739	444	672	416	696	653	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	46	0	118	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.91	0.46	0.01	0.16	0.70	0.38	0.02	0.26	1.00	0.17	0.79	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 70 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 100												
Control Type: Actuated-Coordinated												
~ Volume exceeds capacity, queue is theoretically infinite.												
Queue shown is maximum after two cycles.												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												



HCM Signalized Intersection Capacity Analysis
1: St Lawrence Dr/Hurontario St & Lakeshore Rd E

Existing PM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	315	895	10	40	1070	280	10	125	50	370	115	425
Traffic Volume (vph)	315	895	10	40	1070	280	10	125	50	370	115	425
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vph/pl)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Lane Width	3.0	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0
Total Lost time (s)	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.93	1.00	0.99	1.00	1.00	0.94	1.00
Frbp. ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00	0.95	1.00	0.96	1.00	1.00	0.85
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1665	3579	1453	1750	3614	1456	1704	1822	1738	1921	1424	1424
Flt Permitted	0.20	1.00	1.00	0.32	1.00	0.68	1.00	0.63	1.00	1.00	1.00	1.00
Satd. Flow (perm)	347	3579	1453	586	3614	1456	1225	1822	1147	1921	1424	1424
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	315	895	10	40	1070	280	10	125	50	370	115	425
RTOR Reduction (vph)	0	0	5	0	136	0	12	0	0	0	138	0
Lane Group Flow (vph)	315	895	5	40	1070	144	10	163	50	370	115	287
Confl. Peds. (#/hr)	55	5	5	5	55	50	20	20	20	20	50	50
Confl. Bikes (#/hr)	7%	2%	0%	0%	1%	2%	0%	0%	0%	1%	0%	5%
Heavy Vehicles (%)	7%	2%	0%	0%	1%	2%	0%	0%	0%	1%	0%	5%
Turn Type	pm+pr	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	5	2	6	6	6	4	4	8	8	8	8	8
Permitted Phases	2	2	2	6	6	6	4	4	8	8	8	8
Actuated Green, G (s)	62.8	62.8	62.8	45.7	45.7	45.7	42.7	42.7	42.7	42.7	42.7	42.7
Effective Green, G (s)	62.8	62.8	62.8	45.7	45.7	45.7	42.7	42.7	42.7	42.7	42.7	42.7
Actuated G/C Ratio	0.52	0.52	0.52	0.38	0.38	0.38	0.36	0.36	0.36	0.36	0.36	0.36
Clearance Time (s)	3.0	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	336	1873	760	223	1376	554	435	648	408	883	506	506
v/s Ratio Prot	60.11	0.25	0.00	0.07	0.30	0.10	0.01	0.09	0.32	0.17	0.06	0.20
v/s Ratio Perm	0.94	0.48	0.01	0.18	0.78	0.26	0.02	0.25	0.91	0.17	0.57	0.20
v/c Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay, d1	16.8	18.2	13.7	24.7	32.7	25.5	23.1	27.4	36.8	26.5	31.2	31.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	32.9	0.9	0.0	1.8	4.4	1.1	0.0	0.2	23.2	0.1	1.5	1.5
Delay (s)	49.7	19.1	13.7	26.4	37.1	26.7	25.1	27.6	60.0	26.6	32.6	32.6
Level of Service	D	B	B	C	D	C	C	C	E	C	C	C
Approach Delay (s)	26.9			34.7			27.4		43.0			
Approach LOS	C			C			C		D			
Intersection Summary												
HCM 2000 Control Delay	33.8			HCM 2000 Level of Service	C							
HCM 2000 Volume to Capacity ratio	0.95											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)	17.5							
Intersection Capacity Utilization	107.8%			ICU Level of Service	G							
Analysis Period (min)	15											
c Critical Lane Group												

Queues
2: Hurontario St & High St E

Existing PM Peak Hour Period

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	115	0	10	5	10	695	35	870
Traffic Volume (vph)	115	0	10	5	10	695	35	870
Future Volume (vph)	0	0	10	5	10	695	35	870
Lane Group Flow (vph)	0	145	0	50	10	710	35	920
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8	8	4	4	6	6	2	2
Permitted Phases	8	8	4	4	6	6	2	2
Detector Phase	8	8	4	4	6	6	2	2
Switch Phase	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Initial (s)	28.5	28.5	28.5	28.5	22.0	22.0	22.0	22.0
Minimum Split (s)	32.0	32.0	32.0	32.0	68.0	68.0	68.0	68.0
Total Split (%)	32.0%	32.0%	32.0%	32.0%	68.0%	68.0%	68.0%	68.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0
Lead-Lag Optimizer?	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
Recall Mode	None	None	None	0.20	0.02	0.27	0.07	0.35
v/c Ratio	0.67	18.2	5.2	5.2	5.2	15.1	18.7	18.7
Control Delay	0.4	0.1	0.0	0.4	0.4	0.0	2.2	2.2
Queue Delay	46.0	18.2	5.2	5.6	15.1	20.9	21.9	21.9
Queue Length 50th (m)	21.9	2.7	0.5	2.1	5.3	92.9	40.0	40.0
Queue Length 95th (m)	40.0	12.5	2.4	37.1	100.3	100.3	58.2	58.2
Internal Link Dist (m)	58.2	28.1	102.6	30.0	30.0	94.7	30.0	30.0
Turn Bay Length (m)	366	416	403	286	474	2604	41	41
Base Capacity (vph)	0	0	0	1287	0	1496	41	41
Saturation Cap Reductn	41	46	0	117	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0.45	0.14	0.02	0.55	0.07	0.83	0	0
Reduced v/c Ratio								
Intersection Summary								
Cycle Length: 100								
Actuated Cycle Length: 100								
Offset: 9 (9%), Referenced to phase 2SRTL and 6NBT, Start of Green								
Natural Cycle: 55								
Control Type: Actuated-Coordinated								
m Volume for 95th percentile queue is metered by upstream signal.								
Splits and Phases: 2: Hurontario St & High St E								
0.2 (R)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.6 (R)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
0.8 (R)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

HCM Signalized Intersection Capacity Analysis

Existing PM Peak Hour Period

3: Hurontario St & Park St E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	215	35	20	5	50	160	20	800	25	155	930	290	
Traffic Volume (vph)	215	35	20	5	50	160	20	800	25	155	930	290	
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Ideal Flow (vphpl)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	
Lane Width	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	
Lane Util. Factor	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.94	1.00	
Frbp. ped/cycles	0.99	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95	1.00	1.00	0.89	1.00	1.00	1.00	1.00	1.00	0.85	1.00	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	0.95	1.00	1.00	1.00	
Satd. Flow (prot)	1749	1762	1753	1635	1635	3489	1728	3510	1475	1475	1475	1475	
Flt Permitted	0.59	0.72	1.00	0.31	1.00	0.22	1.00	0.22	1.00	1.00	1.00	1.00	
Satd. Flow (perm)	1089	1762	1331	1635	571	3489	405	3510	1475	1475	1475	1475	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	215	35	20	5	50	160	20	800	25	155	930	290	
RTOR Reduction (vph)	0	13	0	0	107	0	0	2	0	0	102	102	
Lane Group Flow (vph)	215	42	0	5	103	0	20	823	0	155	930	188	
Confl. Peds. (#/hr)	15	20	20	20	15	20	35	35	35	35	20	20	
Heavy Vehicles (%)	1%	3%	0%	0%	2%	2%	0%	4%	0%	3%	4%	2%	
Turn Type	Perm	NA	Perm	NA	Perm	NA	NA	NA	NA	pm+pl	NA	Perm	
Protected Phases	8	8	4	4	6	6	6	6	6	5	2	2	
Actuated Green, G (s)	33.0	33.0	33.0	33.0	40.2	40.2	53.0	53.0	53.0	53.0	53.0	53.0	
Effective Green, g (s)	33.0	33.0	33.0	33.0	40.2	40.2	53.0	53.0	53.0	53.0	53.0	53.0	
Actuated G/C Ratio	0.33	0.33	0.33	0.33	0.40	0.40	0.53	0.53	0.53	0.53	0.53	0.53	
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Gap Cap (vph)	359	581	439	539	229	1402	344	1860	781	1860	781	781	
v/s Ratio Prot	0.02	0.06	0.06	0.04	0.24	0.24	0.04	0.26	0.13	0.26	0.13	0.13	
v/s Ratio Perm	0.20	0.07	0.07	0.01	0.19	0.09	0.59	0.45	0.50	0.24	0.24	0.24	
v/c Ratio	0.60	0.07	0.07	0.01	0.19	0.09	0.59	0.45	0.50	0.24	0.24	0.24	
Uniform Delay, d1	28.0	23.0	22.5	24.0	18.5	23.4	13.6	15.0	12.7	15.0	12.7	12.7	
Progression Factor	1.00	1.00	1.00	1.00	1.28	1.09	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.2	0.2	0.0	0.8	0.7	1.8	0.9	1.0	0.7	1.0	0.7	0.7	
Delay (s)	35.2	23.2	22.6	24.7	24.5	27.2	14.6	16.0	13.4	16.0	13.4	13.4	
Level of Service	D	C	C	C	C	C	B	B	B	B	B	B	
Approach Delay (s)	32.7	24.7	24.7	27.1	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	
Approach LOS	C	C	C	C	B	B	B	B	B	B	B	B	
Intersection Summary													
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service					C						
HCM 2000 Volume to Capacity ratio	0.58												
Actuated Cycle Length (s)	100.0	Sum of lost time (s)					17.0						
Intersection Capacity Utilization	93.5%	ICU Level of Service					F						
Analysis Period (min)	15												
c Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis

Existing PM Peak Hour Period

4: Lakeshore Rd E & Ann St

Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	65	1220	1450	55	0	45	
Traffic Volume (veh/h)	65	1220	1450	55	0	45	
Future Volume (veh/h)	Free	Free	Free	Stop	0%	0%	
Sign Control	0%	0%	0%	0%	0%	0%	
Grade	1.00	1.00	1.00	1.00	1.00	1.00	
Peak Hour Factor	65	1220	1450	55	0	45	
Hourly flow rate (vph)	1.00	1.00	1.00	1.00	1.00	1.00	
Pedestrians	30						
Lane Width (m)	3.5						
Walking Speed (m/s)	1.2						
Percent Blockage	2						
Right turn flare (veh)	None						
Median storage (veh)	None						
Upstream signal (m)	67						
pX, platoon unblocked	0.74						
vC, conflicting volume	1535						
WC1, stage 1 conf vol							
WC2, stage 2 conf vol							
vCU, unblocked vol	1010						
IC, single (s)	4.2						
IC, 2 stage (s)	2.3						
FF (s)	86						
p0 queue free %	469						
CM capacity (veh/h)							
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	
Volume Total	65	610	610	967	538	45	
Volume Left	0	0	0	0	0	0	
Volume Right	0	0	0	0	55	45	
SSH	469	1700	1700	1700	1700	784	
Volume to Capacity	0.14	0.36	0.36	0.57	0.32	0.06	
Queue Length 95th (m)	3.8	0.0	0.0	0.0	0.0	1.5	
Control Delay (s)	13.9	0.0	0.0	0.0	0.0	9.9	
Lane LOS	B	A					
Approach Delay (s)	0.7	9.9					
Approach LOS		A					
Intersection Summary							
Average Delay	0.5	58.9%					B
Intersection Capacity Utilization	58.9%	ICU Level of Service					B
Analysis Period (min)	15						

HCM Unsignalized Intersection Capacity Analysis

Existing PM Peak Hour Period

5: Ann St & High St E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		Stop			Stop			Stop			Stop	
Sign Control												
Traffic Volume (vph)	5	110	10	5	55	5	30	60	30	5	30	15
Future Volume (vph)	5	110	10	5	55	5	30	60	30	5	30	15
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow rate (vph)	5	110	10	5	55	5	30	60	30	5	30	15
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	125	65	120	50								
Volume Left (vph)	5	5	30	5								
Volume Right (vph)	10	5	30	15								
Head (s)	-0.04	-0.03	0.29	-0.16								
Departure Headway (s)	4.3	4.4	4.7	4.3								
Degree Utilization, x	0.15	0.08	0.16	0.06								
Capacity (veh/h)	794	767	733	779								
Control Delay (s)	8.1	7.8	8.6	7.6								
Approach Delay (s)	8.1	7.8	8.6	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay	8.1											
Level of Service	A											
Intersection Capacity Utilization	29.3%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

Existing PM Peak Hour Period

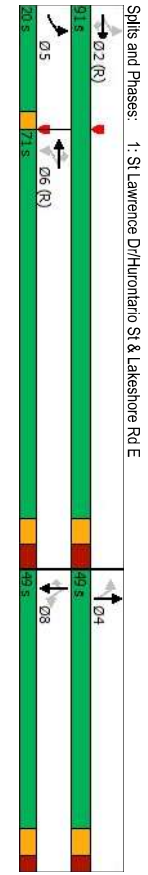
6: Ann St & Park St E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		Stop			Stop			Stop			Stop	
Sign Control												
Traffic Volume (vph)	30	220	0	25	230	105	5	45	20	30	25	5
Future Volume (vph)	30	220	0	25	230	105	5	45	20	30	25	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow rate (vph)	30	220	0	25	230	105	5	45	20	30	25	5
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total (vph)	250	255	105	70	60							
Volume Left (vph)	30	25	0	5	30							
Volume Right (vph)	0	0	105	20	5							
Head (s)	0.02	0.05	-0.70	0.04	0.05							
Departure Headway (s)	4.8	5.1	4.4	5.4	5.5							
Degree Utilization, x	0.33	0.36	0.13	0.11	0.09							
Capacity (veh/h)	727	677	790	597	588							
Control Delay (s)	10.2	9.9	6.8	9.1	9.0							
Approach Delay (s)	10.2	9.0	6.8	9.1	9.0							
Approach LOS	B	A	A	A	A							
Intersection Summary												
Delay	9.4											
Level of Service	A											
Intersection Capacity Utilization	47.7%											
ICU Level of Service	A											
Analysis Period (min)	15											

Queues
1: St Lawrence Dr/Hurontario St & Lakeshore Rd E
Future Background AM Peak Hour Period

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	350	950	15	20	615	240	10	80	220	130	305
Traffic Volume (vph)	350	950	15	20	615	240	10	80	220	130	305
Future Volume (vph)	350	950	15	20	615	240	10	80	220	130	305
Lane Group Flow (vph)	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Turn Type	5	2	2	6	6	6	4	4	8	8	8
Protected Phases	2	2	2	6	6	6	4	4	8	8	8
Detector Phases	5	2	2	6	6	6	4	4	8	8	8
Switch Phase	7.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Initial (s)	10.0	46.0	46.0	46.0	46.0	46.0	45.0	45.0	45.0	45.0	45.0
Traffic Volume (vph)	20.0	91.0	91.0	71.0	71.0	71.0	49.0	49.0	49.0	49.0	49.0
Total Split (%)	14.3%	65.0%	65.0%	50.7%	50.7%	50.7%	35.0%	35.0%	35.0%	35.0%	35.0%
Total Spill (%)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Yellow Time (s)	0.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	3.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0
Total Lost Time (s)	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None
v/c Ratio	0.62	0.39	0.01	0.07	0.33	0.27	0.04	0.23	0.81	0.31	0.57
Control Delay	13.7	11.6	1.3	23.2	21.9	3.9	38.6	41.3	51.7	24.3	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.4
Total Delay	13.7	11.6	1.3	23.2	21.9	3.9	38.6	41.3	52.1	24.3	13.3
Queue Length 50th (m)	34.0	59.5	0.0	2.7	51.3	0.0	2.8	20.6	62.1	25.8	50.9
Queue Length 95th (m)	64.2	92.6	1.3	10.0	88.2	17.5	6.8	32.8	95.5	50.9	82.4
Internal Link Dist (m)	43.4			254.1			90.8		102.6		
Turn Bay Length (m)	130.0	90.0	130.0	1886	902	349	549	373	576	617	30.0
Base Capacity (vph)	585	2414	1030	304	1886	902	349	549	373	576	617
Starvation Cap Reductn	0	0	0	0	0	0	0	0	20	0	68
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.39	0.01	0.07	0.33	0.27	0.03	0.27	0.62	0.23	0.56

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 11 (8%) Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated



HCM Signalized Intersection Capacity Analysis
1: St Lawrence Dr/Hurontario St & Lakeshore Rd E
Future Background AM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	350	950	15	20	615	240	10	80	220	130	305
Traffic Volume (vph)	350	950	15	20	615	240	10	80	220	130	305
Future Volume (vph)	350	950	15	20	615	240	10	80	220	130	305
Ideal Flow (vph/ln)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	1.00	1.00	0.95	1.00	1.00	0.94	1.00	1.00	1.00	1.00	0.95
Frbp. ped/bikes	0.99	1.00	1.00	0.99	1.00	1.00	0.97	1.00	0.99	1.00	1.00
Frbp. ped/bikes	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85
Flt. Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1629	3579	1514	1771	3476	1462	1731	1821	1691	1921	1345
Flt. Permitted	0.37	1.00	1.00	0.30	1.00	1.00	0.64	1.00	0.70	1.00	1.00
Satd. Flow (perm)	631	3579	1514	561	3476	1462	1166	1821	1243	1921	1345
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	350	950	15	20	615	240	10	80	220	130	305
RTOR Reduction (vph)	0	0	5	0	113	0	4	0	239	0	239
Lane Group Flow (vph)	350	950	10	20	615	127	10	86	220	130	66
Confl. Peds. (#/hr)	35	15	15	15	35	30	5	5	5	5	30
Confl. Bikes (#/hr)	5	5	5	5	10	10	5	5	5	5	30
Heavy Vehicles (%)	9%	2%	0%	0%	5%	3%	0%	4%	0%	0%	13%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	5	2	2	6	6	6	4	4	8	8	8
Permitted Phases	2	2	2	6	6	6	4	4	8	8	8
Actuated Green, G (s)	94.5	94.5	94.5	74.2	74.2	74.2	30.5	30.5	30.5	30.5	30.5
Effective Green, G (s)	94.5	94.5	94.5	74.2	74.2	74.2	30.5	30.5	30.5	30.5	30.5
Actuated G/C Ratio	0.68	0.68	0.68	0.53	0.53	0.53	0.22	0.22	0.22	0.22	0.22
Clearance Time (s)	3.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	549	2415	1021	297	1842	774	254	386	270	418	293
v/s Ratio Prot	0.008	0.27	0.01	0.04	0.09	0.09	0.01	0.05	0.18	0.07	0.05
v/s Ratio Perm	0.64	0.39	0.01	0.07	0.33	0.16	0.04	0.22	0.81	0.31	0.23
Uniform Delay, d1	10.0	10.1	7.4	16.0	18.8	16.9	43.2	45.0	52.1	45.9	45.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00
Incremental Delay, d2	2.4	0.5	0.4	0.4	0.5	0.5	0.1	0.3	16.6	0.4	0.4
Delay (s)	12.5	10.5	7.5	16.5	19.3	17.4	43.3	45.2	46.9	23.8	93.6
Level of Service	B	B	A	B	B	B	D	D	D	C	F
Approach Delay (s)	11.0			18.7			45.0		64.1		
Approach LOS	B			B			D		E		

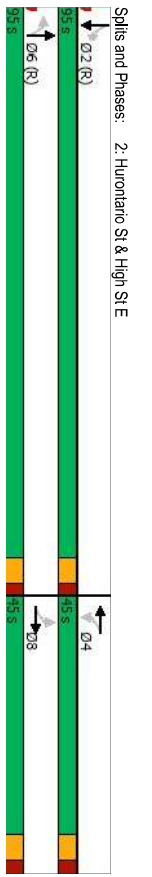
Intersection Summary
HCM 2000 Control Delay: 26.3 HCM 2000 Level of Service: C
HCM 2000 Volume to Capacity ratio: 0.70
Actuated Cycle Length (s): 140.0
Intersection Capacity Utilization: 89.2%
Analysis Period (min): 15
ICU Level of Service: E
Critical Lane Group: c

Queues
2: Hurontario St & High St E

Future Background AM Peak Hour Period

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	85	0	10	0	5	655	45	630
Traffic Volume (vph)	85	0	10	0	5	655	45	630
Future Volume (vph)	85	0	10	0	5	655	45	630
Lane Group Flow (vph)	0	100	0	50	5	665	45	665
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8	8	4	4	6	6	2	2
Detector Phases	8	8	4	4	6	6	2	2
Switch Phase	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Initial (s)	28.5	28.5	28.5	28.5	22.0	22.0	22.0	22.0
Minimum Split (s)	45.0	45.0	45.0	45.0	95.0	95.0	95.0	95.0
Total Split (%)	32.1%	32.1%	32.1%	32.1%	67.9%	67.9%	67.9%	67.9%
Total Split (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Yellow Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0
Total Lost Time (s)	None	None	None	None	C-Min	C-Min	C-Min	C-Min
Recall Mode	None	None	None	None	0.26	0.26	0.08	0.27
v/c Ratio	0.65	0.65	23.0	2.0	3.7	1.2	1.0	1.0
Control Delay	63.4	0.0	0.0	0.0	0.3	0.0	0.2	0.2
Queue Delay	63.4	23.0	2.0	4.0	1.2	1.2	1.2	1.2
Total Delay	21.8	2.7	0.3	32.1	0.5	3.2	3.2	3.2
Queue Length 50th (m)	40.0	14.9	14.4	m0.4	11.0	5.4	5.4	5.4
Queue Length 95th (m)	58.2	28.1	102.6	94.7	30.0	30.0	30.0	30.0
Internal Link Dist (m)	353	424	579	2513	554	2552	2552	2552
Base Capacity (vph)	0	0	0	1159	0	932	932	932
Starvation Cap Reductn	3	7	0	564	0	62	62	62
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0.29	0.12	0.01	0.49	0.08	0.42	0.42	0.42
Reduced v/c Ratio								

Intersection Summary
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 55 (39%), Referenced to phase 2:SBLT and 6:NBLT, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.



HCM Signalized Intersection Capacity Analysis
2: Hurontario St & High St E

Future Background AM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	85	0	15	10	0	40	5	655	10	45	630	55
Traffic Volume (vph)	85	0	15	10	0	40	5	655	10	45	630	55
Future Volume (vph)	85	0	15	10	0	40	5	665	10	45	630	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.99	0.98	0.98	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Frbp. ped/bikes	0.99	0.99	1.00	0.99	1.00	0.99	1.00	0.99	1.00	1.00	0.99	1.00
Frbp. ped/bikes	0.98	0.98	0.99	0.98	1.00	0.99	1.00	0.99	1.00	0.99	1.00	0.99
Flt	0.96	0.96	0.99	0.99	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1491	1521	1521	1770	3139	1655	3185	3185	3185	1655	3185	3185
Flt Permitted	0.79	0.79	0.94	0.94	0.39	1.00	0.40	1.00	0.40	1.00	0.40	1.00
Satd. Flow (perm)	1223	1223	1440	1440	723	3139	691	3185	691	3185	3185	3185
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	85	0	15	10	0	40	5	655	10	45	630	55
RTOR Reduction (vph)	0	20	0	0	36	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	80	0	0	14	0	5	665	0	45	682	0
Cont. Ped. (#/hr)	5	0%	0%	27%	0%	5%	0%	16%	11%	6%	13%	11%
Heavy Vehicles (%)	23%	0%	0%	27%	0%	5%	0%	16%	11%	6%	13%	11%
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA
Protected Phases	8	8	4	4	4	4	6	6	6	2	2	2
Actuated Green, G (s)	15.4	15.4	15.4	112.1	112.1	112.1	112.1	112.1	112.1	112.1	112.1	112.1
Effective Green, g (s)	15.4	15.4	15.4	112.1	112.1	112.1	112.1	112.1	112.1	112.1	112.1	112.1
Actuated G/C Ratio	0.11	0.11	0.11	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Clearance Time (s)	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Gp Cap (vph)	134	158	158	578	2513	553	2550	2550	2550	553	2550	2550
Lane Gp Cap (vph) Prot	134	158	158	578	2513	553	2550	2550	2550	553	2550	2550
v/s Ratio Perm	0.07	0.07	0.01	0.01	0.01	0.01	0.07	0.07	0.07	0.07	0.07	0.07
v/c Ratio	0.59	0.59	0.09	0.09	0.01	0.26	0.08	0.27	0.08	0.27	0.08	0.27
Uniform Delay, d1	59.3	59.3	58.0	2.8	3.5	3.0	3.0	3.5	3.0	3.5	3.0	3.5
Progression Factor	1.00	1.00	1.00	0.50	0.86	0.23	0.20	0.23	0.20	0.23	0.20	0.23
Incremental Delay, d2	6.9	6.9	0.3	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Delay (s)	66.2	66.2	56.3	1.4	3.3	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Level of Service	E	E	E	A	A	A	A	A	A	A	A	A
Approach Delay (s)	66.2	66.2	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3
Approach LOS	E	E	E	E	E	E	E	E	E	E	E	E

Intersection Summary
 HCM 2000 Control Delay: 7.9
 HCM 2000 Volume to Capacity ratio: 0.31
 Actuated Cycle Length (s): 140.0
 Intersection Capacity Utilization: 54.6%
 Analysis Period (min): 15
 e Critical Lane Group

Queues
3: Hurontario St & Park St E

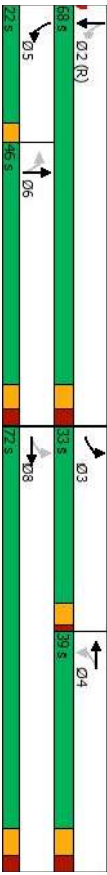
Future Background AM Peak Hour Period

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	370	30	15	15	30	720	205	670
Traffic Volume (vph)	370	30	15	15	30	720	205	670
Future Volume (vph)	370	30	15	15	30	720	205	670
Lane Group Flow (vph)	370	75	15	230	30	750	205	925
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases	3	8	8	4	4	6	5	2
Permitted Phases	8	8	4	4	6	6	5	2
Detector Phases	3	8	4	4	6	6	5	2
Switch Phase								
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	8.0	5.0	8.0
Traffic Volume (vph)	9.5	38.0	38.0	38.0	33.0	33.0	8.0	33.0
Minimum Split (s)	33.0	7.20	39.0	39.0	46.0	46.0	22.0	68.0
Total Split (%)	23.6%	51.4%	27.9%	27.9%	32.9%	32.9%	15.7%	48.6%
Total Split (s)	3.5	4.0	4.0	4.0	4.0	4.0	3.0	4.0
Yellow Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	4.5	7.0	7.0	7.0	7.0	7.0	3.0	7.0
Total Lost Time (s)								
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	Max	Max	Max	None	C-Min
v/c Ratio	0.70	0.10	0.04	0.42	0.19	0.74	0.68	0.85
Control Delay	32.1	10.1	42.2	9.5	41.3	48.7	34.8	31.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0
Total Delay	32.1	10.1	42.2	9.5	41.3	54.7	34.8	31.8
Queue Length 50th (m)	69.9	4.7	3.3	3.3	6.5	100.3	35.7	104.4
Queue Length 95th (m)	98.0	14.1	9.9	27.0	17.2	136.1	54.0	128.4
Internal Link Dist (m)		73.3		75.8		94.7		197.8
Turn Bay Length (m)	25.0		25.0		30.0		60.0	
Base Capacity (vph)	554	780	335	544	160	1014	339	1426
Starvation Cap Reductn	0	0	0	0	0	210	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.10	0.04	0.42	0.19	0.93	0.60	0.85

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2SRTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 3: Hurontario St & Park St E



HCM Signalized Intersection Capacity Analysis
3: Hurontario St & Park St E

Future Background AM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	370	30	45	15	15	215	30	720	30	205	670	255
Traffic Volume (vph)	370	30	45	15	15	215	30	720	30	205	670	255
Future Volume (vph)	370	30	45	15	15	215	30	720	30	205	670	255
Ideal Flow (vph/pl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost Time (s)	4.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	3.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.95	1.00	0.95	1.00	0.95
Frpb, ped/bikes	1.00	0.98	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	0.91	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.96	1.00	0.96
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1695	1630	1752	1497	1785	3321	1715	3208				
Flt Permitted	0.42	1.00	0.71	1.00	0.28	1.00	0.18	1.00				
Satd. Flow (perm)	752	1630	1306	1497	526	3321	324	3208				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	370	30	45	15	15	215	30	720	30	205	670	255
RTOR Reduction (vph)	0	24	0	0	160	0	0	2	0	28	0	0
Lane Group Flow (vph)	370	51	0	15	70	0	30	748	0	205	897	0
Confl. Peds. (#/hr)	10	15	15	15	10	10	10	10	10	10	10	10
Heavy Vehicles (%)	5%	4%	6%	0%	18%	7%	0%	9%	10%	4%	11%	4%
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA	NA	NA
Protected Phases	3	8			4		6		2			
Permitted Phases	8	8			4		6		5			
Actuated Green, G (s)	65.0	68.0	36.0	36.0	42.7	42.7	61.0	61.0				
Effective Green, g (s)	65.0	65.0	36.0	36.0	42.7	42.7	61.0	61.0				
Actuated G/C Ratio	0.46	0.46	0.26	0.26	0.31	0.31	0.44	0.44				
Clearance Time (s)	4.5	7.0	7.0	7.0	7.0	7.0	3.0	7.0				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Lane Gp Cap (vph)	514	756	335	384	160	1012	293	1397				
v/s Ratio Prot	60.13	0.03		0.05		0.23		60.08				
v/s Ratio Perm	60.21			0.01		0.06		60.23				
Uniform Delay, d1	0.72	0.07	0.04	0.18	0.19	0.74	0.70	0.64				
Progression Factor	26.6	20.7	39.1	40.5	35.9	43.7	28.1	30.9				
Incremental Delay, d2	1.00	1.00	1.00	1.00	0.99	0.99	1.00	1.00				
Delay (s)	4.8	0.2	0.3	1.0	2.5	4.7	7.1	2.3				
Level of Service	C	C	D	D	D	D	D	D				
Approach Delay (s)	29.6			41.4		47.5		33.6				
Approach LOS	C			D		D		C				

Intersection Summary

HCM 2000 Control Delay	37.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		
e Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

4: Lakeshore Rd E & Ann St

Future Background AM Peak Hour Period

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	65	1310	865	65	5	60
Future Volume (veh/h)	65	1310	865	65	5	60
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	65	1310	865	65	5	60
Pedestrians					20	
Lane Width (m)					3.5	
Walking Speed (m/s)					1.2	
Percent Blockage					2	
Right turn flare (Veh)						
Median Type		None		None		
Median storage (veh)						
Upstream signal (m)			67			
PX, platoon unblocked	0.90			0.90	0.90	
VC, conflicting volume	950			1702	485	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	724			1559	207	
IC, single (s)		4.4			6.8	7.0
IC, 2 stage (s)						
FF (s)		2.3			3.5	3.3
p0 queue free %		91			94	91
CM capacity (veh/h)		714			85	702
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	65	655	655	577	353	65
Volume Left	65	0	0	0	0	5
Volume Right	0	0	0	0	65	60
CSH	714	1700	1700	1700	1700	450
Volume to Capacity	0.09	0.39	0.39	0.34	0.21	0.14
Queue Length 95th (m)	2.4	0.0	0.0	0.0	0.0	4.0
Control Delay (s)	10.5	0.0	0.0	0.0	0.0	14.4
Lane LOS	B					B
Approach Delay (s)		0.5		0.0		14.4
Approach LOS						B
Intersection Summary						
Average Delay	0.7					
Intersection Capacity Utilization	46.9%					
ICU Level of Service	15					
Analysis Period (min)	15					
	A					

HCM Unsignalized Intersection Capacity Analysis

5: Ann St & High St E

Future Background AM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Volume (vph)	10	80	0	15	35	10	0	120	10	10	50	0
Future Volume (vph)	10	80	0	15	35	10	0	120	10	10	50	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	80	0	15	35	10	0	120	10	10	50	0
Direction, Lane #	EB 1	WB 1	NB 1	WB 1	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume Total (vph)	90	60	130	60	10	10	0	0	0	0	0	0
Volume Left (vph)	10	15	0	0	0	0	0	0	0	0	0	0
Volume Right (vph)	0	10	10	0	0	0	0	0	0	0	0	0
Head (s)	0.34	0.15	0.80	0.22								
Departure Headway (s)	4.8	4.7	5.2	4.7								
Degree Utilization, x	0.12	0.08	0.19	0.08								
Capacity (veh/h)	715	726	674	730								
Control Delay (s)	8.5	8.1	9.3	8.1								
Approach Delay (s)	8.5	8.1	9.3	8.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay	8.7											
Level of Service	A											
Intersection Capacity Utilization	26.5%											
ICU Level of Service	15											
Analysis Period (min)	15											
	A											

HCM Unsignalized Intersection Capacity Analysis

6: Ann St & Park St E

Future Background AM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		Stop		Stop		Stop		Stop		Stop		Stop
Traffic Volume (vph)	35	240	10	15	85	200	0	115	25	180	35	0
Future Volume (vph)	35	240	10	15	85	200	0	115	25	180	35	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow rate (vph)	35	240	10	15	85	200	0	115	25	180	35	0
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total (vph)	285	100	200	140	215							
Volume Left (vph)	35	15	0	0	180							
Volume Right (vph)	10	0	200	25	0							
Head (s)	0.02	0.15	-0.70	0.51	0.17							
Departure Headway (s)	5.6	6.2	5.3	6.4	5.9							
Degree Utilization, x	0.44	0.17	0.30	0.25	0.35							
Capacity (veh/h)	602	543	629	499	558							
Control Delay (s)	13.0	9.3	9.4	11.5	12.1							
Approach Delay (s)	13.0	9.3		11.3	12.1							
Approach LOS	B	A		B	B							
Intersection Summary												
Delay	11.4											
Level of Service	B											
Intersection Capacity Utilization	52.5%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

8: Ann St & Site Driveway

Future Background AM Peak Hour Period

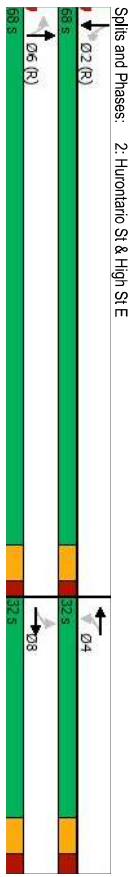
Movement	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	0	0	140	0	0	60	
Future Volume (veh/h)	0	0	140	0	0	60	
Sign Control	Stop	0%	Free	0%	Free	0%	
Grade	0%	0%	0%	0%	0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly flow rate (vph)	0	0	140	0	0	60	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median storage (veh)			None			None	
Upstream signal (m)							
PX, platoon unblocked							
WC, conflicting volume	200	140				140	
WC1, stage 1 conf vol							
WC2, stage 2 conf vol							
VCU, unblocked vol	200	140				140	
IC, single (s)	6.4	6.2				4.1	
IC, 2 stage (s)							
FF (s)	3.5	3.3				2.2	
p0 queue free %	100	100				100	
CM capacity (veh/h)	793	913				1456	
Direction, Lane #	WB 1	NB 1	SB 1				
Volume Total	0	140	60				
Volume Left	0	0	0				
Volume Right	0	0	0				
SSH	1700	1700	1456				
Volume to Capacity	0.08	0.08	0.00				
Queue Length 95th (m)	0.0	0.0	0.0				
Control Delay (s)	0.0	0.0	0.0				
Lane LOS	A	A					
Approach Delay (s)	0.0	0.0	0.0				
Approach LOS	A						
Intersection Summary							
Average Delay	0.0						
Intersection Capacity Utilization	10.7%						
ICU Level of Service	A						
Analysis Period (min)	15						

Queues
2- Hurontario St & High St E

Future Background PM Peak Hour Period

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	115	0	10	5	10	755	35	935
Traffic Volume (vph)	115	0	10	5	10	755	35	935
Future Volume (vph)	115	0	10	5	10	755	35	935
Lane Group Flow (vph)	0	145	0	50	10	770	35	985
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8	8	4	4	6	6	2	2
Detector Phases	8	8	4	4	6	6	2	2
Switch Phase	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Initial (s)	28.5	28.5	28.5	28.5	22.0	22.0	22.0	22.0
Minimum Split (s)	32.0	32.0	32.0	32.0	68.0	68.0	68.0	68.0
Total Split (%)	32.0%	32.0%	32.0%	32.0%	68.0%	68.0%	68.0%	68.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag								
Lead-Lag Optimizer?	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
v/c Ratio	0.67	0.20	0.03	0.30	0.08	0.38		
Control Delay	45.6	18.2	5.2	5.3	11.2	15.0		
Queue Delay	0.3	0.0	0.0	0.5	0.0	4.0		
Total Delay	45.9	18.2	5.2	5.8	11.2	19.0		
Queue Length 50th (m)	21.9	2.7	0.5	23.3	3.9	97.2		
Queue Length 95th (m)	40.0	4.0	2.4	40.7	109.0			
Internal Link Dist (m)	58.2	28.1	102.6		94.7			
Turn Bay Length (m)			30.0		30.0			
Base Capacity (vph)	366	416	369	287	444	2602		
Starvation Cap Reductn	0	0	1258	0	1499	0		
Spillback Cap Reductn	33	38	0	169	0	0		
Storage Cap Reductn	0	0	0	0	0	0		
Reduced v/c Ratio	0.44	0.13	0.03	0.58	0.08	0.90		

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 9 (9%), Referenced to phase 2SRTL and 6NBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.



HCM Signalized Intersection Capacity Analysis
2- Hurontario St & High St E

Future Background PM Peak Hour Period

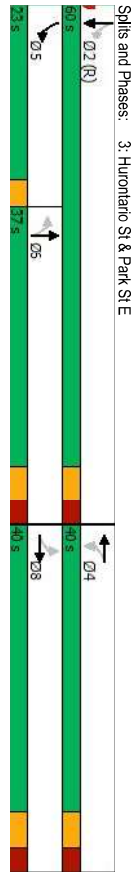
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	115	0	30	10	5	35	10	755	15	35	935	60
Traffic Volume (vph)	115	0	30	10	5	35	10	755	15	35	935	60
Future Volume (vph)	115	0	30	10	5	35	10	755	15	35	935	60
Ideal Flow (vph/pl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.99	0.98	1.00	0.98	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Frbp. ped/bikes	0.98	0.98	1.00	0.99	1.00	0.99	1.00	0.95	1.00	0.95	1.00	1.00
Frbp. ped/bikes	0.97	0.97	0.91	0.91	1.00	1.00	1.00	0.99	1.00	0.99	1.00	0.99
Flt	0.96	0.96	0.99	0.99	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1749	1630	1630	1773	3524	1629	3540	1629	3540	1629	3540	3540
Flt Permitted	0.93	0.27	1.00	0.35	1.00	0.35	1.00	0.93	0.27	1.00	0.35	1.00
Satd. Flow (perm)	1340	1535	502	3524	603	3540	603	1340	1535	502	3524	3540
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	115	0	30	10	5	35	10	755	15	35	935	60
RTOR Reduction (vph)	0	28	0	0	30	0	0	1	0	3	0	0
Lane Group Flow (vph)	0	117	0	0	20	0	10	769	0	35	992	0
Conf. Ped. (#/hr)	15	15	15	15	15	15	10	50	50	50	10	10
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	3%	0%	4%	2%	0%	0%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8	8	4	4	6	6	2	2	2	2	2	2
Actuated Green, G (s)	14.1	14.1	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4
Effective Green, g (s)	14.1	14.1	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4
Actuated G/C Ratio	0.14	0.14	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Clearance Time (s)	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Gp Cap (vph)	188	216	368	2598	442	2598	442	2598	442	2598	442	2598
v/s Ratio Prot	0.09	0.01	0.02	0.02	0.02	0.06	0.06	0.06	0.06	0.06	0.06	0.06
v/s Ratio Perm	0.62	0.09	0.09	0.03	0.30	0.08	0.38	0.38	0.38	0.38	0.38	0.38
Uniform Delay, d1	40.4	37.4	3.6	4.5	3.8	4.9	3.8	4.9	3.8	4.9	3.8	4.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	0.2	0.1	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3
Delay (s)	46.7	37.6	3.7	4.8	4.0	5.2	4.0	5.2	4.0	5.2	4.0	5.2
Level of Service	D	D	A	A	A	B	A	B	A	B	A	B
Approach Delay (s)	46.7	37.6	3.7	4.8	4.0	5.2	4.0	5.2	4.0	5.2	4.0	5.2
Approach LOS	D	D	A	A	A	B	A	B	A	B	A	B

Queues
3: Hurontario St & Park St E

Future Background PM Peak Hour Period

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	350	40	5	50	45	835	155	985
Traffic Volume (vph)	350	40	5	50	45	835	155	985
Future Volume (vph)	350	40	5	50	45	835	155	985
Lane Group Flow (vph)	350	80	5	210	45	880	155	1480
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases	8	8	4	4	6	6	5	2
Detector Phases	8	8	4	4	6	6	5	2
Switch Phase	8.0	8.0	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Initial (s)	38.0	38.0	38.0	38.0	33.0	33.0	8.0	33.0
Minimum Split (s)	40.0	40.0	40.0	40.0	37.0	37.0	23.0	60.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	37.0%	37.0%	23.0%	60.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	3.0	7.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	Max	Max	Max	Max	Max	Max	None	C-Min
v/c Ratio	0.97	0.13	0.01	0.33	0.54	0.61	0.45	0.81
Control Delay	76.6	13.9	22.8	8.6	57.5	29.5	14.5	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	2.2	0.0	6.2
Total Delay	76.6	14.0	22.8	8.6	57.5	31.7	14.5	28.1
Queue Length 50th (m)	70.0	5.6	0.7	7.0	5.7	57.1	14.0	113.6
Queue Length 95th (m)	#129.1	16.1	3.3	24.0	#27.2	111.4	24.0	145.6
Internal Link Dist (m)		73.3		75.8		94.7		197.8
Turn Bay Length (m)	25.0	25.0	25.0	30.0	30.0	60.0		
Base Capacity (vph)	359	595	429	646	83	1404	484	1805
Starvation Cap Reductn	0	0	0	0	0	390	0	0
Spillback Cap Reductn	0	27	0	0	0	0	0	289
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.14	0.01	0.33	0.54	0.85	0.32	0.97

Intersection Summary
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 19 (19%), Referenced to phase 2:SBLT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



HCM Signalized Intersection Capacity Analysis
 3: Hurontario St & Park St E

Future Background PM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	350	40	40	5	50	160	45	835	25	155	985	475
Traffic Volume (vph)	350	40	40	5	50	160	45	835	25	155	985	475
Future Volume (vph)	350	40	40	5	50	160	45	835	25	155	985	475
Ideal Flow (vph/pl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.7	3.5	3.5
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.95	1.00	0.95	1.00	0.98
Frpb, ped/bikes	1.00	0.98	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flt	0.99	1.00	1.00	0.98	1.00	0.99	1.00	1.00	1.00	1.00	0.95	1.00
Flt Protected	1.00	0.93	1.00	1.00	0.89	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	1.00
Flt Permitted	1749	1724	1754	1754	1635	1635	1779	3490	1729	3296	1729	3296
Satd. Flow (perm)	0.59	1.00	1.00	0.70	1.00	0.11	1.00	0.21	1.00	0.21	1.00	1.00
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	350	40	40	5	50	160	45	835	25	155	985	475
RTOR Reduction (vph)	0	27	0	0	107	0	0	2	0	58	0	0
Lane Group Flow (vph)	350	53	20	5	103	0	45	888	0	155	1402	0
Confl. Peds. (#/hr)	15	20	20	15	20	15	20	35	35	35	20	20
Heavy Vehicles (%)	1%	3%	0%	0%	2%	2%	0%	4%	0%	3%	4%	2%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	NA	pm+pt	NA	NA
Protected Phases	8	8	4	4	6	6	5	2				
Permitted Phases	8	8	4	4	6	6	5	2				
Actuated Green, G (s)	33.0	33.0	33.0	33.0	40.2	40.2	33.0	53.0	53.0	33.0	53.0	53.0
Effective Green, g (s)	33.0	33.0	33.0	33.0	40.2	40.2	33.0	53.0	53.0	33.0	53.0	53.0
Actuated G/C Ratio	0.33	0.33	0.33	0.33	0.40	0.40	0.33	0.53	0.53	0.33	0.53	0.53
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	3.0	7.0	3.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Gp Cap (vph)	359	568	429	539	84	1402	331	1746	331	1746	331	1746
v/s Ratio Prot	0.03	0.03	0.06	0.06	0.21	0.25	0.05	0.43	0.05	0.43	0.05	0.43
v/s Ratio Perm	0.32	0.09	0.00	0.01	0.19	0.54	0.61	0.47	0.80	0.20	0.80	0.80
Uniform Delay, d1	33.1	23.2	22.5	24.0	22.8	23.7	13.9	19.2	19.2	13.9	19.2	19.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.24	1.13	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	41.6	0.3	0.0	0.8	21.7	1.9	1.0	4.0	4.0	1.0	4.0	4.0
Delay (s)	74.7	23.5	22.6	24.7	49.9	28.8	14.9	23.2	23.2	14.9	23.2	23.2
Level of Service	E	C	C	C	D	B	C	C	C	B	C	C
Approach Delay (s)	65.2		24.7		29.8		22.4		22.4		22.4	
Approach LOS	E		C		C		C		C		C	

Intersection Summary
 HCM 2000 Control Delay: 30.5
 HCM 2000 Level of Service: C
 HCM 2000 Volume to Capacity ratio: 0.90
 Actuated Cycle Length (s): 100.0
 Intersection Capacity Utilization: 118.3%
 ICU Level of Service: H
 Analysis Period (min): 15
 Critical Lane Group: e

HCM Unsignalized Intersection Capacity Analysis

4: Lakeshore Rd E & Ann St

Future Background PM Peak Hour Period

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	100	1320	1540	85	0	115
Future Volume (veh/h)	100	1320	1540	85	0	115
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	100	1320	1540	85	0	115
Pedestrians					30	
Lane Width (m)					3.5	
Walking Speed (m/s)					1.2	
Percent Blockage					2	
Right turn flare (Veh)						
Median Type		None				
Median storage (veh)						
Upstream signal (m)			67			
PX, platoon unblocked					0.69	0.69
VC, conflicting volume					2472	842
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol		1054			2237	0
IC, single (s)		4.2			6.8	6.9
IC, 2 stage (s)						
FF (s)		2.3			3.5	3.3
p0 queue free %		76			100	84
CM capacity (veh/h)		423			19	736
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	100	660	660	1027	598	115
Volume Left	100	0	0	0	0	0
Volume Right	0	0	0	0	85	115
CSH	423	1700	1700	1700	1700	736
Volume to Capacity	0.24	0.39	0.39	0.60	0.35	0.16
Queue Length 95th (m)	7.3	0.0	0.0	0.0	0.0	4.4
Control Delay (s)	16.1	0.0	0.0	0.0	0.0	10.8
Lane LOS	C					B
Approach Delay (s)	1.1			0.0		10.8
Approach LOS						B
Intersection Summary						
Average Delay	0.9					
Intersection Capacity Utilization	68.1%					
ICU Level of Service	C					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

5: Ann St & High St E

Future Background PM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Volume (vph)	5	110	10	15	55	5	30	125	30	5	90	15
Future Volume (vph)	5	110	10	15	55	5	30	125	30	5	90	15
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	110	10	15	55	5	30	125	30	5	90	15
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	125	75	185	110								
Volume Left (vph)	5	15	30	5								
Volume Right (vph)	10	5	30	15								
Head (s)	-0.04	0.00	0.46	-0.07								
Departure Headway (s)	4.7	4.8	5.0	4.6								
Degree Utilization, x	0.16	0.10	0.26	0.14								
Capacity (veh/h)	711	691	690	739								
Control Delay (s)	8.6	8.3	9.7	8.3								
Approach Delay (s)	8.6	8.3	9.7	8.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay	8.9											
Level of Service	A											
Intersection Capacity Utilization	35.1%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
 6: Ann St & Park St E

Future Background PM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		Stop		Stop		Stop	Stop	Stop		Stop		Stop
Traffic Volume (vph)	45	260	0	25	285	260	5	105	25	145	85	10
Future Volume (vph)	45	260	0	25	285	260	5	105	25	145	85	10
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow rate (vph)	45	260	0	25	285	260	5	105	25	145	85	10
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total (vph)	305	310	260	135	240							
Volume Left (vph)	45	25	0	5	145							
Volume Right (vph)	0	0	260	25	10							
Head (s)	0.03	0.04	-0.70	0.13	0.10							
Departure Headway (s)	6.2	6.4	5.6	6.9	6.6							
Degree Utilization, x	0.53	0.55	0.41	0.26	0.44							
Capacity (veh/h)	545	544	615	450	501							
Control Delay (s)	15.9	15.7	11.2	12.4	14.7							
Approach Delay (s)	15.9	13.7		12.4	14.7							
Approach LOS	C	B		B	B							
Intersection Summary												
Delay	14.3											
Level of Service	B											
Intersection Capacity Utilization	68.9%											
ICU Level of Service	C											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
 8: Ann St & Site Driveway

Future Background PM Peak Hour Period

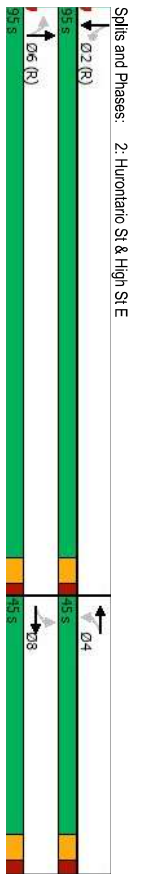
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			Stop			Stop
Traffic Volume (veh/h)	0	0	135	0	0	110
Future Volume (veh/h)	0	0	135	0	0	110
Sign Control	Stop	0%	Free	0%	0%	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	135	0	0	110
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right Turn Flare (Veh)			None			None
Median storage (veh)						
Upstream signal (m)						
PX, platoon unblocked						
WC, conflicting volume	245	135				135
WC1, stage 1 conf vol						
WC2, stage 2 conf vol						
VCU, unblocked vol	245	135				135
IC, single (s)	6.4	6.2				4.1
IC, 2 stage (s)						
FF (s)	3.5	3.3				2.2
p0 queue free %	100	100				100
CM capacity (veh/h)	748	919				1462
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	135	110			
Volume Left	0	0	0			
Volume Right	0	0	0			
SSH	1700	1700	1462			
Volume to Capacity	0.06	0.08	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A	A	A			
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	10.4%					
ICU Level of Service	A					
Analysis Period (min)	15					

Queues
2: Hurontario St & High St E

Future Total AM Peak Hour Period

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	85	0	10	0	5	655	45	630
Traffic Volume (vph)	85	0	10	0	5	655	45	630
Future Volume (vph)	85	0	10	0	5	655	45	630
Lane Group Flow (vph)	0	100	0	50	5	665	45	665
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8	8	4	4	6	6	2	2
Detector Phases	8	8	4	4	6	6	2	2
Switch Phase	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	28.5	28.5	28.5	28.5	22.0	22.0	22.0	22.0
Minimum Split (%)	45.0	45.0	45.0	45.0	95.0	95.0	95.0	95.0
Total Split (%)	32.1%	32.1%	32.1%	32.1%	67.9%	67.9%	67.9%	67.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0
Lead-Lag								
Lead-Lag Optimizer?	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
Recall Mode	None	None	None	0.26	0.01	0.26	0.08	0.27
v/c Ratio	0.65	0.65	0.26	2.0	2.0	3.6	1.2	1.0
Control Delay	63.4	63.4	23.0	2.0	3.9	1.2	0.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.2
Total Delay	63.4	63.4	23.0	2.0	3.9	1.2	1.2	1.2
Queue Length 50th (m)	21.8	21.8	2.7	0.3	32.0	0.5	3.3	3.3
Queue Length 95th (m)	40.0	40.0	14.9	m0.4	13.6	m0.9	5.5	5.5
Internal Link Dist (m)	58.2	58.2	28.1	102.6	94.7			
Turn Bay Length (m)			30.0	30.0	30.0			
Base Capacity (vph)	353	353	424	579	2513	554	2552	2552
Starvation Cap Reductn	0	0	0	1159	0	992		
Spillback Cap Reductn	3	3	7	0	564	0	62	62
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.29	0.12	0.01	0.49	0.08	0.43	0.43

Intersection Summary
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 55 (39%), Referenced to phase 2:SBTL and 6:NBLT, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 m Volume for 95th percentile queue is metered by upstream signal.



HCM Signalized Intersection Capacity Analysis
2: Hurontario St & High St E

Future Total AM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	85	0	15	10	0	40	5	655	10	45	630	55
Traffic Volume (vph)	85	0	15	10	0	40	5	655	10	45	630	55
Future Volume (vph)	85	0	15	10	0	40	5	655	10	45	630	55
Ideal Flow (vph/pl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	0.98	0.98	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	0.99	0.99	1.00	1.00	0.99	1.00	0.99	1.00	0.99	1.00	1.00	0.99
Flt	0.98	0.98	0.99	0.99	1.00	1.00	0.99	1.00	0.99	1.00	0.99	0.99
Flt Protected	0.96	0.96	0.99	0.99	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)	1491	1491	1521	1521	1770	1770	1655	185	1655	185	185	185
Flt Permitted	0.79	0.79	0.94	0.94	0.39	1.00	0.40	1.00	0.40	1.00	1.00	0.40
Satd. Flow (perm)	1223	1223	1440	1440	723	3139	691	3185	691	3185	3185	3185
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	85	0	15	10	0	40	5	655	10	45	630	55
RTOR Reduction (vph)	0	20	0	0	36	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	80	0	0	14	0	5	665	0	45	682	0
Cont. Peds. (#/hr)	5	5	5	5	5	5	5	5	10	10	10	5
Heavy Vehicles (%)	23%	0%	0%	27%	0%	5%	0%	16%	11%	6%	13%	11%
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA
Protected Phases	8	8	4	4	4	4	6	6	6	2	2	2
Permitted Phases	8	8	4	4	4	4	6	6	6	2	2	2
Actuated Green, G (s)	15.4	15.4	15.4	15.4	112.1	112.1	112.1	112.1	112.1	112.1	112.1	112.1
Effective Green, g (s)	15.4	15.4	15.4	15.4	112.1	112.1	112.1	112.1	112.1	112.1	112.1	112.1
Actuated G/C Ratio	0.11	0.11	0.11	0.11	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Clearance Time (s)	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Gp Cap (vph)	134	134	158	158	578	2513	553	2550	553	2550	2550	553
v/s Ratio Prot							0.21					0.21
v/s Ratio Perm	0.07	0.07	0.01	0.01	0.01	0.01	0.07	0.01	0.07	0.01	0.07	0.07
v/c Ratio	0.59	0.59	0.09	0.09	0.01	0.26	0.08	0.27	0.08	0.27	0.27	0.27
Uniform Delay, d1	59.3	59.3	58.0	58.0	2.8	3.5	3.0	3.5	3.0	3.5	3.5	3.5
Progression Factor	1.00	1.00	1.00	1.00	0.50	0.85	0.23	0.21	0.23	0.21	0.21	0.21
Incremental Delay, d2	6.9	6.9	0.3	0.3	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Delay (s)	66.2	66.2	58.3	58.3	1.4	3.2	0.9	0.9	0.9	0.9	0.9	0.9
Level of Service	E	E	E	E	A	A	A	A	A	A	A	A
Approach Delay (s)	66.2	66.2	58.3	58.3	1.4	3.2	0.9	0.9	0.9	0.9	0.9	0.9
Approach LOS	E	E	E	E	A	A	A	A	A	A	A	A

Queues

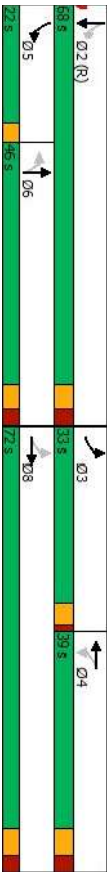
Future Total AM Peak Hour Period

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	415	30	15	15	30	720	205	670
Future Volume (vph)	415	30	15	15	30	720	205	670
Lane Group Flow (vph)	415	75	15	230	30	750	205	945
Turn Type	pm+pl	NA	Perm	NA	Perm	NA	pm+pl	NA
Protected Phases	3	8	8	4	4	6	5	2
Detector Phases	8	8	4	4	6	6	5	2
Switch Phase								
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	9.5	38.0	38.0	38.0	33.0	33.0	8.0	33.0
Total Split (%)	33.0	72.0	39.0	39.0	46.0	46.0	22.0	68.0
Total Split (%)	23.6%	51.4%	27.9%	27.9%	32.9%	32.9%	15.7%	48.6%
Yellow Time (s)	3.5	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	7.0	7.0	7.0	7.0	7.0	3.0	7.0
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	Max	Max	Max	None	C-Min
v/c Ratio	0.78	0.10	0.05	0.43	0.20	0.74	0.68	0.66
Control Delay	36.6	10.1	42.7	9.7	41.8	48.8	34.8	32.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0
Total Delay	36.6	10.1	42.7	9.7	41.8	54.8	34.8	32.0
Queue Length 50th (m)	81.2	4.7	3.4	3.4	6.5	100.3	35.7	107.1
Queue Length 95th (m)	113.0	14.1	9.9	27.0	17.3	136.1	54.0	131.5
Internal Link Dist (m)		73.3		75.8		94.7		197.8
Turn Bay Length (m)	25.0		25.0		30.0		60.0	
Base Capacity (vph)	548	780	320	529	153	1014	339	1426
Starvation Cap Reductn	0	0	0	0	0	210	0	0
Spillover Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.10	0.05	0.43	0.20	0.93	0.60	0.66

Intersection Summary

Cycle Length: 140	Actuated Cycle Length: 140	Natural Cycle: 90
Offset: 0 (0%), Referenced to phase 2SRTL, Start of Green		
Control Type: Actuated-Coordinated		

Splits and Phases: 3- Hurontario St & Park St E



HCM Signalized Intersection Capacity Analysis

Future Total AM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	415	30	45	15	15	215	30	720	30	205	670	275
Future Volume (vph)	415	30	45	15	15	215	30	720	30	205	670	275
Ideal Flow (vph/pl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost Time (s)	4.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	3.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Frbp. ped/bikes	1.00	0.98	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	0.99	1.00	0.96	1.00
Frbp. ped/bikes	1.00	0.91	1.00	1.00	0.86	1.00	1.00	0.99	1.00	0.96	1.00	0.96
Flt. Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1695	1630	1752	1497	1752	1497	1785	3321	1715	3204	1715	3204
Flt. Permitted	0.41	1.00	0.71	1.00	0.27	1.00	0.18	1.00	0.18	1.00	0.18	1.00
Satd. Flow (perm)	730	1630	1306	1497	504	3321	324	3204				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	415	30	45	15	15	215	30	720	30	205	670	275
RTOR Reduction (vph)	0	24	0	0	162	0	0	2	0	0	32	0
Lane Group Flow (vph)	415	51	0	15	68	0	30	748	0	205	913	0
Cont. Ped. (#/hr)	10	15	15	15	10	10	10	10	10	10	10	10
Heavy Vehicles (%)	5%	4%	6%	0%	18%	7%	0%	9%	10%	4%	11%	4%
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA	NA	NA
Protected Phases	3	8		4			6		5		2	
Permitted Phases	8			4			6		2			
Actuated Green, G (s)	65.0	68.0	34.3	34.3	42.7	42.7	61.0	61.0	61.0	61.0	61.0	61.0
Effective Green, g (s)	65.0	65.0	34.3	34.3	42.7	42.7	61.0	61.0	61.0	61.0	61.0	61.0
Actuated G/C Ratio	0.46	0.46	0.24	0.24	0.31	0.31	0.44	0.44	0.44	0.44	0.44	0.44
Clearance Time (s)	4.5	7.0	7.0	7.0	7.0	7.0	3.0	7.0	3.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Gp Cap (vph)	519	756	319	366	153	1012	293	1396				
v/s Ratio Prot	60.15	0.03		0.05		0.23		60.08		0.29		
v/s Ratio Perm	60.22		0.01		0.06		60.23		0.29			
Uniform Delay, d1	0.80	0.07	0.05	0.18	0.20	0.74	0.70	0.65				
Progression Factor	27.6	20.7	40.4	41.8	36.0	43.7	28.1	31.2				
Incremental Delay, d2	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00				
Delay (s)	8.4	0.2	0.3	1.1	2.8	4.7	7.1	2.4				
Level of Service	D	C	D	D	D	D	D	D				
Approach Delay (s)	33.7		42.8		47.6		33.9					
Approach LOS	C		D		D		C					

Intersection Summary

HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	104.1%	ICU Level of Service	G
Analysis Period (min)	15		
e Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

4: Lakeshore Rd E & Ann St

Future Total AM Peak Hour Period

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	65	1310	865	70	15	70
Future Volume (veh/h)	65	1310	865	70	15	70
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	65	1310	865	70	15	70
Pedestrians				20		
Lane Width (m)				3.5		
Walking Speed (m/s)				1.2		
Percent Blockage				2		
Right turn flare (Veh)						
Median Type		None				
Median storage (veh)						
Upstream signal (m)			67			
PX, platoon unblocked	0.90			0.90	0.90	
VC, conflicting volume	955			1705	488	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	727			1560	207	
IC, single (s)	4.4			6.8	7.0	
IC, 2 stage (s)						
FF (s)	2.3			3.5	3.3	
p0 queue free %	91			82	90	
CM capacity (veh/h)	711			84	702	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	65	655	655	577	358	85
Volume Left	65	0	0	0	0	15
Volume Right	0	0	0	0	70	70
CSH	711	1700	1700	1700	1700	306
Volume to Capacity	0.09	0.39	0.39	0.34	0.21	0.28
Queue Length 95th (m)	2.4	0.0	0.0	0.0	0.0	8.9
Control Delay (s)	10.6	0.0	0.0	0.0	0.0	21.2
Lane LOS	B					C
Approach Delay (s)		0.5			0.0	21.2
Approach LOS						C
Intersection Summary						
Average Delay	1.0					
Intersection Capacity Utilization	48.0%					
ICU Level of Service	15					
Analysis Period (min)	15					
	A					

HCM Unsignalized Intersection Capacity Analysis

5: Ann St & High St E

Future Total AM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Volume (vph)	15	80	0	15	35	10	0	125	10	10	70	0
Future Volume (vph)	15	80	0	15	35	10	0	125	10	10	70	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	80	0	15	35	10	0	125	10	10	70	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	95	60	135	80								
Volume Left (vph)	15	15	0	10								
Volume Right (vph)	0	10	10	0								
Head (s)	0.35	0.15	0.81	0.17								
Departure Headway (s)	4.9	4.7	5.2	4.6								
Degree Utilization, x	0.13	0.08	0.19	0.10								
Capacity (veh/h)	692	712	667	734								
Control Delay (s)	8.6	8.1	9.5	8.2								
Approach Delay (s)	8.6	8.1	9.5	8.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay	8.7											
Level of Service	A											
Intersection Capacity Utilization	26.6%											
ICU Level of Service	15											
Analysis Period (min)	15											
	A											

HCM Unsignalized Intersection Capacity Analysis

6: Ann St & Park St E



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		Stop		Stop		Stop		Stop		Stop		Stop
Traffic Volume (vph)	35	240	10	35	85	200	0	115	70	180	35	0
Future Volume (vph)	35	240	10	35	85	200	0	115	70	180	35	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	240	10	35	85	200	0	115	70	180	35	0
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total (vph)	285	120	200	185	215							
Volume Left (vph)	35	35	0	0	180							
Volume Right (vph)	10	0	200	70	0							
Head (s)	0.02	0.21	-0.70	0.24	0.17							
Departure Headway (s)	5.8	6.4	5.5	6.2	6.1							
Degree Utilization, x	0.46	0.21	0.31	0.32	0.37							
Capacity (veh/h)	577	521	605	515	535							
Control Delay (s)	13.7	10.0	9.7	12.2	12.6							
Approach Delay (s)	13.7	9.8		12.2	12.6							
Approach LOS	B	A		B	B							
Intersection Summary												
Delay	11.9											
Level of Service	B											
Intersection Capacity Utilization	54.9%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

8: Ann St & Site Driveway



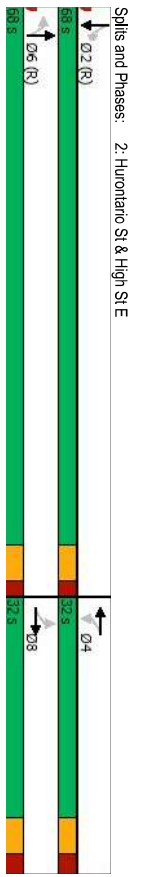
Movement	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	20	45	140	10	20	60	60
Future Volume (veh/h)	20	45	140	10	20	60	60
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	45	140	10	20	60	60
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right Turn Flare (Veh)							
Median storage (veh)			None				None
Upstream signal (m)							
PX, platoon unblocked							
VC, conflicting volume		245	145			150	
WC1, stage 1 conf vol							
WC2, stage 2 conf vol		245	145			150	
VC, unblocked vol							
IC, single (s)		6.4	6.2			4.1	
IC, 2 stage (s)							
FF (s)		3.5	3.3			2.2	
p0 queue free %		97	95			99	
CM capacity (veh/h)		737	908			1444	
Direction, Lane #	WB 1	NB 1	SB 1				
Volume Total	65	150	80				
Volume Left	20	0	20				
Volume Right	45	10	0				
SSH	847	1700	1444				
Volume to Capacity	0.08	0.09	0.01				
Queue Length 95th (m)	2.0	0.0	0.3				
Control Delay (s)	9.6	0.0	2.0				
Lane LOS	A	A	A				
Approach Delay (s)	9.6	0.0	2.0				
Approach LOS	A		A				
Intersection Summary							
Average Delay	2.6						
Intersection Capacity Utilization	26.1%						
ICU Level of Service	A						
Analysis Period (min)	15						

Queues
2- Hurontario St & High St E

Future Total PM Peak-Hour Period

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	115	0	10	5	10	755	35	935
Traffic Volume (vph)	115	0	10	5	10	755	35	935
Future Volume (vph)	115	0	10	5	10	755	35	935
Lane Group Flow (vph)	0	145	0	50	10	770	35	995
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8	8	4	4	6	6	2	2
Detector Phases	8	8	4	4	6	6	2	2
Switch Phase	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Initial (s)	28.5	28.5	28.5	28.5	22.0	22.0	22.0	22.0
Minimum Split (s)	32.0	32.0	32.0	32.0	68.0	68.0	68.0	68.0
Total Split (%)	32.0%	32.0%	32.0%	32.0%	68.0%	68.0%	68.0%	68.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag								
Lead-Lag Optimizer?	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
v/c Ratio	0.67	0.20	0.03	0.30	0.08	0.38		
Control Delay	45.6	18.2	5.2	5.3	10.8	14.6		
Queue Delay	0.3	0.0	0.0	0.5	0.0	4.0		
Total Delay	45.9	18.2	5.2	5.8	10.8	18.6		
Queue Length 50th (m)	21.9	2.7	0.5	2.3	3.8	96.3		
Queue Length 95th (m)	40.0	4.0	2.4	4.0	10.9	109.1		
Internal Link Dist (m)	58.2	28.1	102.6	30.0	94.7			
Turn Bay Length (m)	366	416	369	287	444	2602		
Base Capacity (vph)	0	0	1258	0	1499	0		
Starvation Cap Reductn	33	38	0	169	0	0		
Spillback Cap Reductn	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0		
Reduced v/c Ratio	0.44	0.13	0.03	0.58	0.08	0.90		

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 9 (9%), Referenced to phase 2SRTL and 6NBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.



HCM Signalized Intersection Capacity Analysis
2- Hurontario St & High St E

Future Total PM Peak-Hour Period

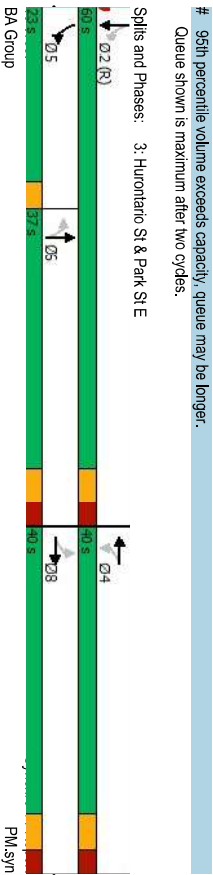
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	115	0	30	10	5	35	10	755	15	35	935	60
Traffic Volume (vph)	115	0	30	10	5	35	10	755	15	35	935	60
Future Volume (vph)	115	0	30	10	5	35	10	755	15	35	935	60
Ideal Flow (vph/pl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.99	0.98	1.00	0.98	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frbp. ped/bikes	0.98	0.98	1.00	0.99	1.00	0.99	1.00	0.95	1.00	0.95	1.00	0.95
Frbp. ped/bikes	0.97	0.97	0.91	0.91	1.00	1.00	1.00	0.99	1.00	0.99	1.00	0.99
Flt	0.96	0.96	0.99	0.99	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1749	1630	1630	1773	3524	1629	3540	1629	3540	1629	3540	3540
Flt Permitted	0.93	0.74	0.93	0.27	1.00	0.35	1.00	0.35	1.00	0.35	1.00	0.35
Satd. Flow (perm)	1340	1535	502	3524	603	3540						
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	115	0	30	10	5	35	10	755	15	35	935	60
RTOR Reduction (vph)	0	28	0	0	30	0	0	1	0	3	0	0
Lane Group Flow (vph)	0	117	0	0	20	0	10	769	0	35	992	0
Conf. Ped. (#/hr)	15	15	15	15	15	15	10	50	50	50	10	10
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	3%	0%	4%	2%	0%	0%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8	8	4	4	6	6	2	2	2	2	2	2
Actuated Green, G (s)	14.1	14.1	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4
Effective Green, g (s)	14.1	14.1	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4
Actuated G/C Ratio	0.14	0.14	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Clearance Time (s)	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Gp Cap (vph)	188	216	368	2598	442	2598	442	2598	442	2598	442	2598
v/s Ratio Prot	0.09	0.01	0.02	0.02	0.02	0.06	0.06	0.06	0.06	0.06	0.06	0.06
v/s Ratio Perm	0.62	0.09	0.09	0.03	0.30	0.38	0.38	0.38	0.38	0.38	0.38	0.38
Uniform Delay, d1	40.4	37.4	3.6	4.5	3.8	4.9	3.8	4.9	3.8	4.9	3.8	4.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	0.2	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Delay (s)	46.7	37.6	3.7	4.8	4.1	5.1	4.1	5.1	4.1	5.1	4.1	5.1
Level of Service	D	D	A	A	A	B	B	B	B	B	B	B
Approach Delay (s)	46.7	37.6	3.6	4.8	4.1	5.1	4.1	5.1	4.1	5.1	4.1	5.1
Approach LOS	D	D	A	A	A	B	B	B	B	B	B	B
Intersection Summary												
HCM 2000 Control Delay	12.9											
HCM 2000 Volume to Capacity ratio	0.42											
Actuated Cycle Length (s)	100.0											
Intersection Capacity Utilization	55.9%											
Analysis Period (min)	15											
e Critical Lane Group												

Queues
3- Hurontario St & Park St E

Future Total PM Peak Hour Period

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	385	40	5	50	45	835	155	955
Future Volume (vph)	385	40	5	50	45	835	155	955
Lane Group Flow (vph)	385	80	5	210	45	880	155	1500
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases			8		4		6	5
Permitted Phases	8	8	4	4	4	6	6	2
Detector Phases								
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	38.0	38.0	38.0	38.0	33.0	33.0	8.0	33.0
Total Split (%)	40.0	40.0	40.0	40.0	37.0	37.0	23.0	60.0
Total Spilt (%)	40.0%	40.0%	40.0%	40.0%	37.0%	37.0%	23.0%	60.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	3.0	7.0
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimizer?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	Max	None	C-Min
v/c Ratio	1.07	0.13	0.01	0.33	0.60	0.61	0.45	0.83
Control Delay	102.3	13.9	22.8	8.6	67.0	29.5	14.5	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	2.2	0.0	7.1
Total Delay	102.3	14.0	22.8	8.6	67.0	31.7	14.5	29.8
Queue Length 50th (m)	-87.7	5.6	0.7	7.0	5.7	57.1	14.0	117.9
Queue Length 95th (m)	#145.8	16.1	3.3	24.0	#29.0	111.4	24.0	151.6
Internal Link Dist (m)	73.3			75.8		94.7		197.8
Turn Bay Length (m)	25.0			25.0		30.0		60.0
Base Capacity (vph)	359	595	429	646	75	1404	484	1807
Starvation Cap Reductn	0	0	0	0	0	390	0	0
Spillback Cap Reductn	0	27	0	0	0	0	0	274
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.14	0.01	0.33	0.60	0.85	0.32	0.98

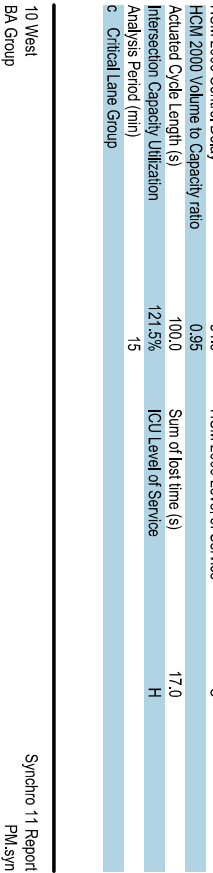
Intersection Summary
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 19 (19%), Referenced to phase 2:SBLT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



HCM Signalized Intersection Capacity Analysis
3- Hurontario St & Park St E

Future Total PM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	385	40	40	5	50	160	45	835	25	155	985	515
Future Volume (vph)	385	40	40	5	50	160	45	835	25	155	985	515
Ideal Flow (vph/pl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	3.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	0.98	1.00
Fpb, ped/bikes	0.99	1.00		1.00	0.98		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.89		1.00	1.00		1.00	0.95	1.00
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1749	1724		1754	1635		1779	3490		1729	3285	1729
Flt Permitted	0.59	1.00		0.70	1.00		0.10	1.00		0.21	1.00	1.00
Satd. Flow (perm)	1089	1724		1302	1635		188	3490		376	3285	3285
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	385	40	40	5	50	160	45	835	25	155	985	515
RTOR Reduction (vph)	0	27	0	0	107	0	0	2	0	0	68	0
Lane Group Flow (vph)	385	53	20	5	103	0	45	888	0	155	1432	0
Confl. Peds. (#/hr)	15			20			15	20		35	35	20
Heavy Vehicles (%)	1%	3%	0%	0%	2%	2%	0%	4%	0%	3%	4%	2%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases												
Permitted Phases	8	8		4			6			5	2	
Actuated Green, G (s)	33.0	33.0		33.0	33.0		40.2	40.2		53.0	53.0	33.0
Effective Green, g (s)	33.0	33.0		33.0	33.0		40.2	40.2		53.0	53.0	33.0
Actuated G/C Ratio	0.33	0.33		0.33	0.33		0.40	0.40		0.53	0.53	0.33
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		3.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Gp Cap (vph)	359	568		429	539		75	1402		331	1741	1741
v/s Ratio Prot		0.03			0.06			0.25			0.05	0.44
v/s Ratio Perm	0.035			0.00			0.24			0.20		
Uniform Delay, d1	1.07	0.09		0.01	0.19		0.60	0.61		0.47	0.82	0.20
Progression Factor	33.5	23.2		22.5	24.0		23.6	23.7		13.9	19.6	19.6
Incremental Delay, d2	1.00	1.00		1.00	1.00		1.23	1.13		1.00	1.00	1.00
Delay (s)	88.1	0.3		0.0	0.8		29.9	1.9		1.0	4.5	4.5
Level of Service	F	C		C	C		E	C		B	C	C
Approach Delay (s)		88.2			24.7			30.3			23.3	
Approach LOS		F			C			C			C	



HCM Unsignalized Intersection Capacity Analysis

4: Lakeshore Rd E & Ann St

Future Total PM Peak Hour Period

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	105	1320	1540	95	5	125
Future Volume (veh/h)	105	1320	1540	95	5	125
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	105	1320	1540	95	5	125
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (Veh)						
Median storage (veh)		None				
Upstream signal (m)			67			
PX, platoon unblocked					0.69	0.69
VC, conflicting volume					2488	848
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol					2257	0
IC, single (s)					6.8	6.9
IC, 2 stage (s)						
FF (s)		2.3			3.5	3.3
p0 queue free %		75			72	83
CM capacity (veh/h)		418			18	734
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	105	680	660	1027	608	130
Volume Left	105	0	0	0	0	5
Volume Right	0	0	0	0	95	125
CSH	418	1700	1700	1700	1700	290
Volume to Capacity	0.25	0.39	0.39	0.60	0.36	0.45
Queue Length 95th (m)	7.8	0.0	0.0	0.0	0.0	17.5
Control Delay (s)	16.5	0.0	0.0	0.0	0.0	27.1
Lane LOS	C					D
Approach Delay (s)	1.2			0.0		27.1
Approach LOS						D
Intersection Summary						
Average Delay	1.6					
Intersection Capacity Utilization	69.6%					
ICU Level of Service	C					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

5: Ann St & High St E

Future Total PM Peak Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Volume (vph)	10	110	10	15	55	5	30	140	30	5	105	15
Future Volume (vph)	10	110	10	15	55	5	30	140	30	5	105	15
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	110	10	15	55	5	30	140	30	5	105	15
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	130	75	200	125								
Volume Left (vph)	10	15	30	5								
Volume Right (vph)	10	5	30	15								
Head (s)	-0.03	0.00	0.49	-0.06								
Departure Headway (s)	4.8	4.9	5.1	4.6								
Degree Utilization, x	0.17	0.10	0.28	0.16								
Capacity (veh/h)	694	674	691	730								
Control Delay (s)	8.8	8.5	10.0	8.5								
Approach Delay (s)	8.8	8.5	10.0	8.5								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay	9.1											
Level of Service	A											
Intersection Capacity Utilization	34.8%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

6: Ann St & Park St E

Future Total PM Peak-Hour Period

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	45	260	0	65	285	260	5	105	60	145	85	10
Future Volume (vph)	45	260	0	65	285	260	5	105	60	145	85	10
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow rate (vph)	45	260	0	65	285	260	5	105	60	145	85	10
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total (vph)	305	350	260	170	240							
Volume Left (vph)	45	65	0	5	145							
Volume Right (vph)	0	0	260	60	10							
Head (s)	0.03	0.09	-0.70	-0.02	0.10							
Departure Headway (s)	6.5	6.8	5.8	7.0	6.9							
Degree Utilization, x	0.35	0.65	0.42	0.33	0.46							
Capacity (veh/h)	521	526	596	451	479							
Control Delay (s)	17.2	19.8	11.8	13.4	15.6							
Approach Delay (s)	17.2	16.4		13.4	15.6							
Approach LOS	C	C		B	C							
Intersection Summary												
Delay	16.0											
Level of Service	C											
Intersection Capacity Utilization	72.6%											
ICU Level of Service	C											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

8: Ann St & Site Driveway

Future Total PM Peak-Hour Period

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	35	135	20	40	110
Future Volume (veh/h)	15	35	135	20	40	110
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	35	135	20	40	110
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right Turn Flare (Veh)			None			None
Median storage (veh)						
Upstream signal (m)						
PX, platoon unblocked						
VC, conflicting volume	335	145				155
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	335	145				155
IC, single (s)	6.4	6.2				4.1
IC, 2 stage (s)						
FF (s)	3.5	3.3				2.2
p0 queue free %	98	96				97
CM capacity (veh/h)	646	908				1438
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	50	155	150			
Volume Left	15	0	40			
Volume Right	35	20	0			
SSH	809	1700	1438			
Volume to Capacity	0.06	0.09	0.03			
Queue Length 95th (m)	1.6	0.0	0.7			
Control Delay (s)	9.7	0.0	2.2			
Lane LOS	A	A	A			
Approach Delay (s)	9.7	0.0	2.2			
Approach LOS	A		A			
Intersection Summary						
Average Delay	2.3					
Intersection Capacity Utilization	29.7%					
ICU Level of Service	A					
Analysis Period (min)	15					