Review of Eastern Avenue TOC Noise Vibration Considerations

Ontario Line Technical Advisor

Toronto, Ontario March 2023

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Sign-Off Sheet

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Appendix A. Eastern Avenue TOC Design Documents

Appendix B. Rail Traffic Information



1 Introduction

Stantec, as part of OLTA, has reviewed the massing drawings for the proposed 356 Eastern Avenue transit-oriented community (TOC). The drawings and associated impacts have been considered with respect to the following:

- Compliance with provincial regulations from a land use planning perspective.
- Recommendations made in the publicly released environmental impact assessment report (EIAR) for the Ontario Line (OL).

The purpose of this report is:

- A) to determine if noise and vibration impacts of the Ontario Line (OL) on the proposed future TOC comply with the provincial limits from a land use planning perspective and to recommend receptor-based mitigation measures and/or upgrades needed in the design at the planning approval stage; and
- B) to review potential OL noise and vibration impacts due to the addition of this TOC (a new point of reception) and to review would this assessment would meet the same project requirements included in the noise and vibration impact assessment report appended to the EIAR (OLTA, Noise and Vibration Impact Assessment Report, April 2022).

Each of these perspectives on the potential impacts with regards to the TOC are discussed separately in Sections 3 and 4 of this report.

2 Documents Considered in Assessment

The following documents and drawings were provided and reviewed for the purposes of this assessment:

- Eastern Avenue TOC Massing Drawings prepared by SvN and dated October 7, 2022 (Attachment A), specifically, the files named as: 10206938-TD010-LKSRE-EAST_HARBOUR-2022.10.07D-PROGRESS SET.pdf
- The final Ontario Line Environmental Impact Assessment Report (EIAR)¹, April 2022
- The final OLTA Noise and Vibration Impact Assessment Report (NVIAR)², April 2022, appended to the EIAR
- The Ministry of Environment, Conservation and Parks (MECP) NPC-300 noise guideline: Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning Publication NPC-300, August 2013

¹ Publicly available at Full Report - Environmental Impact Assessment Report | Metrolinx Engage

² Publicly available at Noise and Vibration Impact Assessment Report (metrolinxengage.com)



- International Organization for Standardization (ISO), ISO 9613-2. Attenuation of sound during propagation outdoors – Part 2: General method of calculation. Geneva, Switzerland, 2017
- Federal Transit Administration (US FTA), U.S. Department of Transportation, Transit Noise and Vibration Impact Assessment Manual, September 2018

The assessment considers the drawings provided at the time of preparing this report and considers the analysis included in the final noise and vibration impact assessment report as of April 2022 (OLTA, NVIAR). The discussion within this report is limited to the information available at the time of preparing this report.

3 Impact of Ontario Line Project on the Eastern Avenue TOC

The Eastern Avenue TOC is a proposed new land development that would be adjacent to the proposed OL Infrastructure. This section of the report will discuss the potential noise and vibration impacts that the OL project may have on the proposed TOC development and TOC's compliance with the applicable provincial limits from a land use planning perspective.

OL tracks and other Joint Corridor tracks, which include tracks for both GO and VIA trains, are at the grade level and are exposed to the proposed TOC at this location. No stationary noise sources at Leslieville or East Harbour Station are identified that could potentially impact Eastern Avenue TOC at this time. Therefore, this review is focused only airborne-noise from the train passbys and train idling at the station, and vibration impact from the train passbys. The assessment includes consideration for OL and GO/VIA train operation.

3.1 Noise Criteria for TOC

To assess noise impacts from adjacent rail noise sources on the Eastern TOC (at the Plane of Window (POW) and for indoor noise levels), the Ministry of Environment, Conservation and Parks (MECP) NPC-300 noise guideline (Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning Publication NPC-300, August 2013) is considered as the appropriate guideline for this discussion.

As per NPC-300, the Eastern TOC is required to meet the indoor sound level limits for transportation noise and the daytime outdoor sound level limit for designated Outdoor Living Areas (OLAs). These limits are shown in Table 3-1.



Type of Space	Leq,16hr (dBA) 07:00 – 23:00	Leq,8hr (dBA) 23:00 – 07:00	Notes
Living/dining ²	40	40	Indoor noise limit
Sleeping quarters ²	40	35	Indoor noise limit
Outdoor living area ³	55	n/a	Outdoor noise limit Applies to common outdoor living areas associated with high-rise multi-unit buildings. Does not apply to balconies and elevated terraces less than 4m deep that are not enclosed.
Living/dining/sleeping ⁴	60	55	Outdoor "design limit" above which building components to achieve indoor limit must be specified

Table 3-1. Sound Level Limits for Transportation Noise (Rail)¹

Table notes:

1. Road traffic limits are excluded as it is not assessed in this assessment is focused on rail noise impact only.

- 2. NPC-300 Table C-2
- 3. NPC-300 Table C-1
- 4. NPC-300 Section 7.2.3

Section 7.2.3 of the MECP NPC-300 recommends that rail noise control measures be included if the nighttime sound level outside the bedroom or living/dining room windows exceeds 55 dBA or the daytime sound level outside the bedroom or living/dining area windows exceeds 60 dBA. Building components including windows, walls and doors, where applicable, need to be designed so that the indoor sound levels comply with the sound level limits (Table 3-1). Therefore, acoustical performance of the building components (windows, doors and walls) will be evaluated when predicted outdoor sound levels exceed the limit. The 60/55 dBA day/night "design limit" has been adopted for the Eastern Avenue TOC noise impact assessment at Plane of Window receptor locations.

In addition, MECP NPC-300 specifies that the exterior walls of the first row of dwellings next to railway tracks are to be built to a minimum of brick veneer or masonry equivalent construction, from the foundation to the rafters when the rail traffic $L_{eq (24-hour)}$, estimated at a location of a nighttime receptor, is greater than 60 dBA, and when the first row of dwellings is within 100 metres (m) of the tracks.

3.2 Analysis of TOC Noise Levels

The main transportation noise sources impacting the proposed Eastern Avenue TOC are rail noise from the existing GO/VIA rail corridor and the future OL alignment, and road noise from Eastern Avenue and Don Valley Parkway. The current assessment includes rail noise impact from the OL trains (i.e., train passbys and idling trains at East Harbour Station) and from the existing GO/VIA rail traffic to determine the overall noise levels at the TOC façades. This report does not consider road noise since the focus of this assessment is to evaluate the potential



impact between the OL Project and the TOC. However, Eastern Avenue and Don Valley Parkway road noise should be included in future land use planning assessments for the Eastern Avenue TOC.

Noise impacts from these transportation sources were predicted using the CADNA/A noise model, which implements the ISO 9613-2 standard and US FTA algorithm for rail noise. The modelling uses the following assumptions:

- Simplified massing of TOC building with smooth façades (sound reflective).
- Balconies on the South Elevation and East Elevation treated as sound reflective with sound diffraction around external edges.
- A composite ground absorption factor in the range of 0.2-0.7 is considered for the Project (G = 0.20 representing hard paving and G = 0.7 for the corridor, parks and other adjacent areas).
- Current grading included for the elevated rail corridor and areas immediately adjacent to the rail corridor.
- Optimized noise barriers as designed by Hatch (Hatch, November 2021; April 2022) are included in the model.
- Train volumes for the Ontario Line as indicated in EIAR are included in the noise model.
- Train volumes for the Joint Corridor (GO/VIA and Freight) as indicated in EIAR Appendix Q (AECOM Noise and Vibration Operations Report: Ontario Line - Lakeshore East Joint Corridor, AECOM, 2021).

Train volumes considered this review are summarized in Appendix B.

The worst-impacted facades and locations were chosen for receptors in the noise model. Plane of Window receptors were then modelled for Levels 2-4 on the South Elevation, and Levels 4-9 on the East Elevation for the representative windows, doors to balconies and open terrace. One OLA receptor was modelled for the Level 10 outdoor amenity area, at a height of 1.5 m above the floor level.

A total of sixteen (16) representative POW receptors on building facades and one (1) OLA receptor were chosen for this assessment. Table 3-2 provides results for the modelled receptors.



Table 3-2. Rail Noise Assessment Results

Receptor ID	Assessed Receptor	Noise Criteria (dBA)		Noise Impact with Joint Corridor			
	(Elevation, Level, Section Lines1)			Predicted Outdoor Noise Levels (dBA)		Exceedance (dB)	
		Day (Leq16hr)	Night (Leq8hr)	Day (Leq16hr)	Night (Leq8hr)	Day	Night
R01	South, L2, Lines 9 to 10	60	55	68	63	8	8
R02	South, L3, Lines 9 to 10	60	55	69	63	9	8
R03	South, L4, Lines 10 to 11	60	55	68	63	8	8
R04	East 1, L4, Lines 11 to 12	60	55	70	65	10	10
R05	East 2, L4, Lines 15 to 16	60	55	70	65	10	10
R06	South, L5, Lines 9 to 10	60	55	68	63	8	8
R07	East 1, L5, Lines 11 to 12	60	55	70	65	10	10
R08	East 2, L5, Line 16	60	55	70	65	10	10
R09	East 1, L6, Lines 11 to 12	60	55	70	65	10	10
R10	East 2, L6, Lines 15 to 16	60	55	70	65	10	10
R11	East 1, L7, Lines 11 to 12	60	55	70	64	10	9
R12	East 2, L7, Line 16	60	55	70	65	10	10
R13	East 1, L8, Lines 11 to 12	60	55	70	65	10	10
R14	East 2, L8, Lines 15 to 16	60	55	70	65	10	10
R15	East 1, L9, Lines 11 to 12	60	55	70	64	10	9
R16	East 2, L9, Line 15	60	55	70	64	10	9



Receptor	Assessed Receptor	Noise Criteria (dBA)		Noise Impact with Joint Corridor			
	(Elevation, Level, Section Lines1)			Predicted Outdoor Noise Levels (dBA)		Exceedance (dB)	
		Day (Leq16hr)	Night (Leq8hr)	Day (Leq16hr)	Night (Leq8hr)	Day	Night
R17	South, L10 outdoor amenity, Line 11	55	N/A	70	N/A	15	N/A

Table note:

1. Section lines from drawings 310T203A, 310T204A, 310T205A, 310T206A, 310T207A, 310T208A, 310T209A, 310T210A, and 310T211A

3.3 Discussion of Noise Results Related to TOC

The predicted noise levels from the rail noise sources show that sound levels at some POW receptors and the OLA receptor are expected to exceed the 60/55 dBA (day/night) "design noise limits" in Table 3-1, such that:

- Outdoor Noise levels from the Joint Corridor (combined OL and other trains):
 - Exceed by 8-10 dB at all POW receptors (façades facing the corridor southeast)
 - Exceed by 15 dB at the Level 10 OLA receptor during daytime
- A review of the units on both ends of the TOC building (e.g., southwest, west, northeast, and north) also was completed. Sound levels at those locations were exceeded by:
 - Up to 7 dB on the south side
 - Up to 6 dB on the north side

As per the guideline (MECP NPC-300), the acoustical performances of building components (windows, doors and walls) are evaluated, to achieve the indoor noise limit of 40/35 dBA (day/night).

For the building facades, the MECP requires the exterior walls, doors and windows to be designed to meet the indoor noise criteria. Based on the predicted outdoor sound levels on the TOC facades, preliminary window glazing and balcony door performance requirements were estimated to meet the indoor limits. As per the NPC-300 guideline, it is also required that the exterior walls of the TOC to be built to a minimum of brick veneer or masonry equivalent construction. Therefore, a brick veneer wall was considered for exterior to estimate the minimum Sound Transmission Class (STC) rating requirements for the windows and doors.

Based on the outdoor noise modelling results and the brick veneer or masonry equivalent construction required for the exterior wall, STC as high as 38 is required for windows and 35 is required for doors to the balconies. An example of a window construction to achieve STC-38 is a sealed window frame with 1/4" laminated interior glass, 1/2" air gap and 1/4" standard exterior



glass, or similar. An example of a glazed patio double-door construction to achieve STC-35 is $\frac{1}{4}$ " standard glass, $\frac{1}{2}$ " air gap and $\frac{1}{4}$ " standard glass, with acoustic door seals, or similar.

Additionally, a 2 m high parapet wall is required for the common amenity area on the Level 10 to mitigate sound levels during its daytime use. This mitigation can bring down sound levels as low as 56 dBA which is acceptable with an appropriate noise warning clause.

The following noise warning clauses may be required, depending on the sound level after noise mitigation, to include in the agreements of Offers of Purchase and Sale, lease/rental agreements and condominium declarations:

- TYPE A: "Purchasers/tenants are advised that sound levels due to increasing road, rail and/or air traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the MECP."
- TYPE B: "Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road, rail and/or air traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the MECP."
- TYPE C: "This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the MECP."
- TYPE D: "This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the MECP."

3.4 Vibration Criteria for TOC

The Eastern Avenue TOC is a new land development adjacent to the OL Project. To assess vibration impacts from the rail transportation sources to the Eastern TOC, the guidelines described in the US FTA Manual (2018) are considered for rail vibration impact assessment:

Type of Receptor	Ground-borne Vibration (GBV) - Limit ¹	Ground-borne Noise (GBN) - Limit ¹
Residence	0.1 mm/s (72 VdB)	35 dBA
Institutional/Commercial (Office)	0.14 mm/s (75 VdB)	40 dBA

Table 3-3. Applied Criteria for Operational Vibration Assessment

Table note:

¹ VdB is reference to 1 micro-in/s; velocity is in RMS; dBA is reference to 20 micro-Pa.



3.5 Vibration Analysis of OL on TOC

The assessment was conducted in accordance with the US FTA Manual (2018) with the adjustment factors and assumptions as summarized in Table 3-4. For the assessment of operational vibration, the analysis methodology described in the US FTA Manual has been used along with assumptions and mitigation recommendations included in the Noise and Vibration Impact Assessment Report (2022) for the train operations. This assessment assumes inefficient soil propagation due to separation of TOC building from the track support with retaining wall.

	Source/Path Factor	Parameters and Assumptions
Train Definition	Train Type	LRT
	Train Speed ¹	80 km/h
	Stiff Suspension	No
	Resilient Wheels	No
	Worn Wheels	No
Rail Definition	Rail Type	Continuous Welded Rail
	Worn or Corrugated Track	No
	Special Trackwork	No
Path Definition	Efficient Propagation in Soil	No
	Propagation in Rock Layer	No
	Coupling Loss	Yes
GBN Conversion	Dominant Frequency	Low (< 30 Hz)

Table 3-4. Rail Vibration Model Inputs and Assumptions

Table note:

1. The maximum OL train speed is considered assuming before and after revenue service operation. This is considered the worst-case (conservative) operation scenario based on the pre- and post-hour service deployment in which the train may not stop at the station

Rail operational activities are not expected to generate the vibration exceeding limits of the GBV and GBN at the residential and office spaces of the Eastern Avenue TOC without any vibration mitigation measures as described in the Noise and Vibration Impact Assessment Report (2022) on the track at the East Harbour station.

Assessment of potential GBV and GBN at the residential floor (Level 1 Mezzanine and Level 2) and office floor (Level 1) for Eastern Avenue TOC is based on the information provided. Table 3-5 presents the predicted results for GBV and GBN. The analysis predicted indoor GBV and GBN meet the criteria in Table 3-3.



Assessment Position	GBV Criteria (mm/sec)	GBN Criteria (dBA, ref. 20µ- Pa)	Predicted Indoor GBV (mm/sec)	Predicted Indoor GBN (dBA, ref. 20μ-Pa)
Level 1 - Mezzanine	0.1	35	0.040	14
Level 2 - Residence	0.1	35	0.035	13
Level 1 – Office	0.14	40	0.045	15

Table 3-5. Rail Vibration Assessment Results

3.6 Noise and Vibration Recommendation for Eastern Avenue TOC

OLTA has completed a review of the potential Eastern Avenue TOC noise and vibration impacts from the OL project, as summarized below.

- The Eastern Avenue TOC is expected to experience higher sound level than the MECP limit of 60/55 dBA (daytime/nighttime) for outside the bedroom or living/dining room windows from rail impacts alone. As a result, building components (windows, doors and walls) were evaluated to demonstrate how the indoor noise limit of 40/35 dBA (daytime/nighttime) can be achieved.
 - Due to proximity to the Joint Corridor and high sound levels on the building façade, the exterior walls of the TOC should be constructed of brick veneer, masonry, or equivalent construction.
 - Based on the outdoor façade noise levels and the expected exterior wall construction (brick veneer or masonry equivalent construction), STC as high as 38 is required for windows and 35 is required for doors to the balconies along the façade facing corridor. For the facades that experience lower noise levels (e.g., north, and south facades) require windows and doors with lower STCs than these.
- 2. The Level 10 outdoor amenity is expected to exceed the MECP limit for OLAs of 55 dBA for daytime. The exceedance is predicted to be related to Joint Corridor rail traffic rather than OL traffic alone. A 2 m high parapet wall is required for the Level 10 common amenity area to mitigate sound levels. This mitigation can reduce sound levels as low as 56 dBA which is acceptable with proper noise warning clause.
- 3. Noise warning clauses may be required for the units that experience high sound levels and they should be included in the agreements of Offers of Purchase and Sale, lease/rental agreements.
- 4. This assessment does not consider road traffic noise, rather it focussed on rail noise and assumes that road noise is less significant than noise impacts from rail. However, OLTA acknowledges that the NPC-300 guideline does combine both rail and road noise in the assessment. Combined rail noise and road noise should be considered when a detailed acoustic assessment of the site is conducted in the future, as part of the design of walls and windows.



5. Predicted GBV and GBN levels are expected to meet the criteria at the Eastern Avenue TOC. No additional mitigation is required.

This assessment of TOC land use planning rail noise impacts is provided as a preliminary consideration of impacts and expected design and mitigation requirements. OLTA expects that the TOC shall retain their own independent acoustic consultant to complete a noise impact study for the TOC as part of permit application, to consider all impacts (including final road and rail information) to the TOC at that time.

4 Impact of Eastern Avenue TOC as an Additional Receptor on EIAR Requirements

The Eastern Avenue TOC has the potential, as an additional receptor, to impact the requirements as outlined in the Noise and Vibration Impact Assessment Report (OLTA, April 2022). However, this assessment does not seek to modify these requirements. Instead, it reviews whether this assessment would meet the same requirements appended to the EIAR (OLTA, Noise and Vibration Impact Assessment Report, April 2022).

The proposed Eastern Avenue TOC is at a similar setback distance from the OL Project for the other nearby receptors (i.e. existing residential receptors) assessed in the EIAR Noise and Vibration Impact Assessment Report (OLTA, April 2022). The Eastern Avenue TOC does not introduce a new receptor type with more stringent noise limits than existing dwellings. Therefore, the proposed TOC or its location is not expected to impact the requirements outlined in the NVIAR report. The OL is expected to comply with its operational noise and vibration criteria with the introduction of the proposed Eastern Avenue TOC.

Construction of the Eastern Avenue TOC is expected to occur after the completion of East Harbour Station and the Ontario Line. Therefore, the potential noise and vibration impacts during construction of OL elements is not a concern and not reviewed in this report.

5 Closing

Stantec, as part of OLTA, has reviewed the massing drawings for the Eastern Avenue TOC. The drawings and associated impacts have been considered with respect to compliance with provincial regulations from a land use planning perspective as well as with respect to the recommendations made in the publicly released EIAR for the OL Project.



Appendix A. Eastern Avenue TOC Design Documents

ONTARIO LINE

INTEGRATED TRANSIT ORIENTED COMMUNITY

356 & 364 EASTERN AVENUE, 12 & 18 SAULTER ST (TBC) TORONTO, ON M4M 1B8

DRAWING NUMBER	DRAWING NAME
	
310T000A	COVER
310T001A	CONTEXT MASSING
310T002A	NOTES AND LEGENDS
310T003A	PROJECT STATISTICS
310T004A	CONTEXT PLAN
310T005A	ROOF SITE PLAN
310T006A	GROUND FLOOR SITE PLAN
310T007A	LANDSCAPE PLAN
310T102A	LEVEL B1
310T201A	LEVEL 1
310T202A	LEVEL 1 MEZZ
310T203A	LEVEL 2
310T204A	LEVEL 3
310T205A	LEVEL 4
310T206A	LEVEL 5
310T207A	LEVEL 6
310T208A	LEVEL 7
310T209A	LEVEL 8
310T210A	LEVEL 9
310T211A	LEVEL 10
310T212A	LEVEL 11
310T213A	LEVEL 12 - MECHANICAL PENTHOUSE
310T214A	LEVEL 13 - ROOF
310T400A	ELEVATIONS
310T401A	ELEVATIONS
310T500A	SECTIONS
310T501A	SECTIONS
310T502A	SECTIONS
310T600A	SHADOW STUDY - MARCH
310T602A	SHADOW STUDY - JUNE
310T603A	SHADOW STUDY - SEPTEMBER
310T604A	SHADOW STUDY - DECEMBER







DRAFT -ARCHITECTURE AND LANDSCAPE SET -REZONING

NOT FOR CONSTRUCTION - NOT FOR ESTIMATING OR BIDDING - TRANSIT STATION AREAS BY OTHERS ARE SHOWN FOR REFERENCE AND ARE NOT PART OF THIS APPLICATION

3B	TWO BEDROOM SUITE	VERTICAL 1800 1 / / / / / / / / / / / / / / / / / /
APPROX	APPROXIMATE	
ARCH	ARCHITECTURAL	BICYCLE PARKING
BC	BUILDING CODE	
BLDG	BUILDING	
вон	BACK OF HOUSE SERVICE AREA	
CACF	CENTRAL ALARM AND CONTROL FACILITY	
DED	DEDUCTION	
DIM	DIMENSION	
DWG	DRAWING	
EA	EXHAUST AIR	
ECR	ELEVATOR CONTROL ROOM	
ELEC	ELECTRICAL	
ELEV	ELEVATOR	
EMR		
ESC		
GCA	GROSS CONSTRUCTION AREA	
GFA	GROSS FLOOR AREA	GARBAGE AND RECYCLING TRI-SORTER
ITOC	INTEGRATED TRANSIT ORIENTED COMMUNITY	
LT	LONG TERM	
М	METRE	
MAIL	RESIDENTIAL MAIL ROOM	
MECH	MECHANICAL	
MECH PH	MECHANICAL PENTHOUSE	
NON-RES WASTE	NON-RESIDENTIAL WASTE ROOM	
NTS	NOT TO SCALE	PARKING
OAI	OUTSIDE AIR INTAKE	
OBC	ONTARIO BUILDING CODE	
OL	ONTARIO LINE	
RCD	REFERENCE CONCEPT DESIGN	ELEVATION
ROOF MECH	ROOF AREA FOR MECHANICAL EQUIPMENT	
ROW	RIGHT OF WAY	X X-X FLOOR LEVEL AND HEIGHT REFERENCE
RSA		
SPS	STAIR PRESSURIZATION SHAFT	X - GRID REFERENCE AND GRID LINE
STUDIO		
SWM ROOF	PERMEABLE ROOF FOR STORM	
TELECOM	WATER MANAGEMENT TELECOMMUNICATIONS ROOM	
TGS	TORONTO GREEN STANDARD	X WALL SECTION
TOFR	TOP OF FINISHED ROOF	
TOS	TOP OF SLAB	
ТҮР	TYPICAL	
 ISSUANCE		
	DRAFT - ARC	CHITECTURE AND

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TRANSIT STATION BY OTHERS

GRAVEL ROOF

PERMEABLE ROOF PAVERS

GREEN ROOF/ AMENITY GREEN ROOF

OL PAVING

SIDEWALK PAVING

ROAD

GRASS

EXISTING LANDSCAPING

FURNISHING ZONE PAVING

LANEWAY

PLANTERS

TITLE

ITOC EAST HARBOUR | EAST HARBOUR NOTES AND LEGENDS

PROJECT STATISTICS

MUNICIPAL ADDRESS: 356 EASTERN AVE., TORONTO, ON, M4M 1B8 BUILDING HEIGHT: 35.0 m (11 STOREYS)

BUILDING STATISTICS

AREAS	%	m ²
SITE AREA (EXISTING)		3514
SITE AREA (CONVEYANCE)		0
SITE AREA		3514
GCA ABOVE GRADE (TOC)		14836
GCA BELOW GRADE (TOC)		2883
GFA TOTAL (TOC)		12276
GFA RESIDENTIAL (TOC)	92%	11351
GFA NON-RESIDENTIAL (TOC)	8%	925
GFA RETAIL (TOC)	8%	925
FSL(TOC)		3 5

	0.0
GFA TRANSIT ABOVE GRADE (SUBJECT OF A DIFFERENT APPLICATION)	0
FSI (TOC + TRANSIT)	3.5

UNIT DISTRIBUTION AND AMENITY AREAS

UNIT TYPE	AREA m ²	REQUIRED	PROPOSED
STUDIO	27-34	NO REQ	0%
1B	46-72	NO REQ	70%
2B	73-88	15%	15%
3B	89-110	10%	12%
TOWNHOUSE	81-108	NO REQ	3%
AMENITY AREAS		REQUIRED m ²	PROPOSED m ²
INTERIOR AMENITY (RES)		284	345
EXTERIOR AMENITY (RES)		284	288
TOTAL AMENITY (RES)		568	633
EXTERIOR AMENITY (NON-RES)		NO REQ	0

GREEN ROOF AND STORMWATER MANAGEMENT

HARBOUR

D010-Lk

310T003

No.

SHEET

ROOF AREAS	m ²
TOTAL ROOF AREA	1973
RESIDENTIAL PRIVATE TERRACES	539
ROOFTOP EXTERIOR AMENITY	288
RENEWABLE ENERGY DEVICES	0
TOWER AREA LESS THAN 750 m2	0
TOTAL TGS EXCLUSIONS	827
TGS AVAILABLE ROOF	1146
GREEN ROOF	494
PERMEABLE LANDSCAPE	0
PERMEABLE ROOFSCAPE	827

TGS TIER 2 V3	REQUIRED %	PROPOSED ^o
GREEN ROOF	40%	439

ISSUANCE

DRAFT - ARCHITECTURE AND LANDSCAPE SET - REZONING

TOTAL

PARKING			
VEHICLE PARKING	RATIO	REQUIRED	PROPOSED
RESIDENTIAL STUDIO	0.30	0	
RESIDENTIAL 1B	0.50	50	
RESIDENTIAL 2B	0.80	17	
RESIDENTIAL 3B	1.00	17	
RESIDENTIAL TOWNHOUSE	1.00	4	
RESIDENTIAL VISITOR	0.10	15	
RESIDENTIAL TOTAL		103	30
RETAIL	1.00	10	
NON-RESIDENTIAL TOTAL		10	5
VEHICLE PARKING TOTAL		103	35

BICYCLE PARKING

BICYCLE PARKING TGS TIER 4 V3	RATIO	REQUIRED	PROPOSED
RESIDENTIAL LONG TERM	0.9 / UNIT	128	132
RESIDENTIAL SHORT TERM	0.1 / UNIT	15	16
RETAIL LONG TERM	0.2 / 100m²	2	8
RETAIL SHORT TERM	3 + 0.3 / 100m²	6	6
TRANSIT LONG TERM		0	0
TRANSIT SHORT TERM		0	0
BICYCLE PARKING TOTAL		151	162

OCCUPANT LOADS

OCCUPANT LOAD	PEOPLE
OCCUPANT LOAD RESIDENTIAL	386
OCCUPANT LOAD RETAIL	0
OCCUPANT LOAD OFFICE	0
TOTALS	386

LOADING AND WASTE COLLECTION

LOADING AREAS	REQUIRED	PROPOSED
TYPE C RESIDENTIAL	0	0
TYPE G RESIDENTIAL	1	1
TYPE A NON-RESIDENTIAL	0	0
TYPE B NON-RESIDENTIAL	1	1
TYPE C NON-RESIDENTIAL	0	0
WASTE COLLECTION AREAS	REQUIRED m ²	PROPOSED m ²
RESIDENTIAL WASTE ROOM	49	50
RESIDENTIAL BULK WASTE ROOM	10	10
NON-RESIDENTIAL WASTE ROOM		0
TOTAL WASTE COLLECTION AREA		60

FLOOR AREAS (TOC)

LEVEL	GCA	GFA DED	NRES GFA	RES GFA	RSA	0B	1B	2B	3B	TH	UNITS
LEVEL B1	2883	2852	8	24	24	0	0	0	0	0	0
LEVEL 01	1775	203	607	964	240	0	0	0	0	4	4
MEZZ	896	56	309	531	466	0	1	0	1	0	2
LEVEL 02	1890	496	0	1394	1237	0	12	3	3	0	18
LEVEL 03	1934	290	0	1644	1482	0	10	5	3	0	18
LEVEL 04	1190	42	0	1148	991	0	13	2	2	0	17
LEVEL 05	1321	173	0	1148	991	0	13	2	2	0	17
LEVEL 06	1125	110	0	1015	863	0	11	2	2	0	15
LEVEL 07	1170	159	0	1011	861	0	11	2	2	0	15
LEVEL 08	1043	121	0	922	778	0	13	2	0	0	15
LEVEL 09	1095	172	0	922	778	0	10	2	1	0	13
LEVEL 10	648	353	0	295	226	0	4	0	0	0	4
LEVEL 11	458	125	0	334	292	0	2	1	1	0	4
LEVEL 12	274	274	0	0	0	0	0	0	0	0	0
TOTALS	17702	5426	925	11351	9227	0	100	21	17	4	142

ONTARIO LINE

TITLE

ITOC EAST HARBOUR | EAST HARBOUR PROJECT STATISTICS

Plot Date: 2022-10-07 1:35:55 PM

		(M)	40 463 40 40 2450			
		L	4850 4900		//WATER 0 m ²	
		(J)	31210		600 60	
			4500 2500		LECOM 6.4 m ²	
		(H)	0 5747	FAN ROOM	FAN 30 FAN / /	
			1440- 500- 1000- 005- 1440-			4 5 000 1900 - -

			28 80.3 m ²	4900 TERRACE 22.7 m ² 3B 102.9 m ² 1B 55.2 m ² 4900	
ISSUANCE					

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		N	4203			
				11320	1000	5800
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			J	3 11040 1	
		(G)			
		(H)	12587	 	
		\bigcirc	1400		
	4	(J) -	2300	·	
	(3107401A) 2	(К)			
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			3600		53.7 m ²
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H D010-LM Б

2 EAST ELEVATION 310T400A1:250

Plot Date: 2022-10-07 1:40:27 PM ONTARIO LINE TITLE ITOC Infrastructure Ontario EAST HARBOUR | EAST HARBOUR ELEVATIONS DRAWING NUMBER 310T400A SCALE 1 : 250

		(126.15) LEVEL 14 (123.15) LEVEL 13
		118.45 LEVEL 12
		(114.85) LEVEL 11
		(111.25) LEVEL 10
		(107.65) LEVEL 09
		104.65\LEVEL 08
		101.05 LEVEL 07
		(<u>98.05</u>) <u>LEVEL</u> 06
		94.45 \ LEVEL 05
		87.85 LEVEL 03
		84.85 LEVEL 02
		81.80 LEVEL 01 MEZZ
		(78.75) LEVEL 01
		(74.78) LEVEL B1
		1 CROSS 310T500A1:350
ISSUANCE	DRAFT - ARCHITECTURE AND LANDSCAPE SET - REZONING	S

CTION AT TOC & JOINT RAIL CORRIDOR

TITLE

ONTARIO LINE

ITOC EAST HARBOUR | EAST HARBOUR SECTIONS

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		(126.15) LEVEL 14	STREE						
		4700							
		(118.45) LEVEL 12	AT						
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		(111.25) LEVEL 10	РКОР						
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84.85 LEVEL 02 900 <td< td=""><td><u>84.85 LEVEL 02</u> <u>98.80 LEVEL 01 MEZZ</u> <u>98.80 LEVEL 01</u> <u>98.80 </u></td><td>87.85 LEVEL 03</td><td></td><td></td><td></td><td>K</td><td>K</td><td></td><td>K</td></td<>	<u>84.85 LEVEL 02</u> <u>98.80 LEVEL 01 MEZZ</u> <u>98.80 LEVEL 01</u> <u>98.80 </u>	87.85 LEVEL 03				K	K		K
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	78.75 LEVEL 01 0 78.75 LEVEL 01 0 74.78 LEVEL B1 0 1 SECTION 3107501A 1 : 250	81.80 LEVEL 01 MEZZ	[[
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	1 SECTION 310T501/A1:250	74.78 LEVEL B1							
	310T501A1:250		SECTION						
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B SECTION 310T501A1 : 250

		3.15 LEVEL 13	'
		4700	4700
		3.45 LEVEL 12	<u>~</u> 8
	(114	4.85 LEVEL 11	
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	74	0266 1.78 LEVEL B1	3970
		SECTION 502A1:250	
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ONTARIO LINE

ITOC EAST HARBOUR | EAST HARBOUR SECTIONS Plot Date: 2022-10-07 1:41:07 PM

TITLE

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LEGEND

NEW SHADOWS EXISTING SHADOWS

ISSUANCE

DRAFT - ARCHITECTURE AND LANDSCAPE SET - REZONING

5 310T60(No. SHEET

MARCH 21, 2022 - 11:18

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JUNE 21, 2022 - 9:18

JUNE 21, 2022 - 10:18

JUNE 21, 2022 - 15:18

JUNE 21, 2022 - 14:18

LEGEND

NEW SHADOWS EXISTING SHADOWS

ISSUANCE

DRAFT - ARCHITECTURE AND LANDSCAPE SET - REZONING

5 310T60 No. SHEET

JUNE 21, 2022 - 11:18

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SEPTEMBER 21, 2022 - 9:18

SEPTEMBER 21, 2022 - 10:18

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LEGEND

NEW SHADOWS

EXISTING SHADOWS

ISSUANCE

DRAFT - ARCHITECTURE AND LANDSCAPE SET - REZONING

. О 310T No. SHEET

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LEGEND

NEW SHADOWS EXISTING SHADOWS

ISSUANCE

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Appendix B. Rail Traffic Information

LSE OnCorr Tracks

			East Harbol	to Dantor	tn - Compir	ied l'able		
	Track 1 (Local)	Track 2 (Express)	Track 3 ((Express)	Track 4	(Local)
	Day	Night	Day	Night	Day	Night	Day	Night
D1L6 (rev and non rev)	5	-	21	5	19	3	5	-
D2L12 (rev and non rev)	1	-	31	5	37	3	2	-
E1L6 (rev and non rev)	46	6	1	0	1	-	47	9
E2L12 (rev and non rev)	18	7	1	0	1	-	19	4
Freight	0	0	3	1	4	0	0	0
Via	0	0	16	1	18	0	0	0
D1L6 STF	6	-	1	-	1	-	6	-
E1L6 STF	129	29	2	2	4	-	128	32
E2L12 STF	-	1	3	2	5	-	-	-
			East Har	bor to US -	Combined	Table		
	Track 1 (Local)	Track 2 (Express)	Track 3 ((Express)	Track 4	(Local)
	Day	Night	Day	Night	Day	Night	Day	Night
D1L6 (rev and non rev)	5	-	21	5	19	3	5	-
D2L12 (rev and non rev)	1	-	31	5	37	3	2	-
E1L6 (rev and non rev)	46	6	1	0	1	-	47	9
E2L12 (rev and non rev)	18	7	1	0	1	-	19	4
Freight	0	0	3	1	4	0	0	0
Via	0	0	16	1	18	0	0	0
D1L6 STF	6	-	1	-	1	-	6	-
E1L6 STF	129	29	2	2	4	-	128	32
E2L12 STF	-	1	3	2	5	-	-	-

Station	Pouto	D1l	.6	D2L12		E1L6		E2L12	
Station	Route	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
REVENUE									
	GO Eastbound Revenue Local	5	-	2	-	47	9	19	4
	GO Eastbound Revenue Express 1	9	2	15	1	-	-	-	-
Dapforth to East Harbour	GO Eastbound Revenue Express 2	2	-	11	1	-	-	-	-
Danior (11 to East harbour	GO Westbound Revenue Local	5	-	1	-	46	6	18	7
	GO Westbound Revenue Express 1	14	1	9	4	-	-	-	-
	GO Westbound Revenue Express 2	2	-	10	1	-	-	-	-
	GO Eastbound Revenue Local	5	-	2	-	47	9	19	4
	GO Eastbound Revenue Express 1	9	2	15	1	-	-	-	-
Fast Harbour to Union	GO Eastbound Revenue Express 2	2	-	11	1	-	-	-	-
East harbour to onion	GO Westbound Revenue Local	5	-	1	-	46	6	18	7
	GO Westbound Revenue Express 1	14	1	9	4	-	-	-	-
	GO Westbound Revenue Express 2	2	-	10	1	-	-	-	-
Whithy PME to Upion Station	GO Eastbound Non-Revenue	1	1	-	-	-	-	-	-
	GO Westbound Non-Revenue	1	4	-	-	-	-	-	-
Midland Layover to Union	GO Eastbound Non-Revenue	1	-	7	-	-	-	-	-
Station	GO Westbound Non-Revenue	-	-	6	-	-	-	-	-
Dop Yord to Union Station	GO Eastbound Non-Revenue	6	-	4	1	1	-	1	-
Don faid to onion station	GO Westbound Non-Revenue	4	-	6	-	1	-	1	-
	GO Northbound Local	6	-	-	-	128	32	-	-
Dapforth to East Harbour	GO Northbound Express	1	-	-	-	4	-	5	-
Danior (11 to East Hai boul	GO Southbound Local	6	-	-	-	129	29	-	1
	GO Southbound Express	1	-	-	-	2	2	3	2

Richmond Hill Future Tracks

Track 1 (V	VB/SB)	Track 2 (EB/NB)		
Day	Night	Day	Night	
7	3	11	-	
11	1	12	-	
-	-	-	-	

Station	Douto	D1L6		D2L12		E2L12		
Station	Koute	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	
REVENUE								
Oriole to Union	GO Southbound	7	3	8	1	-	-	
	GO Northbound	11	-	9	-	-	-	
NON-REVENUE								
Belleville Don Branch Layover to	GO Southbound	-	-	3	-	-	-	
Union	GO Northbound	-	-	3	-	-	-	

D1L6 rev+non rev D2L12 rev+non rev E2L12 rev+non rev

Ontario Line Volumes

Name of Period	Period		Trains per Hour	No. Hours in	No. Trains per Period	
	Start	End	2060-2080 Data	Periou	2060-2080 Data	
Weekday 1	6:00	7:00	18	1	18	Night
Weekday 2	7:00	10:00	40	3	120	Day
Weekday 3	10:00	15:00	24	5	120	Day
Weekday 4	15:00	19:00	40	4	160	Day
Weekday 5	19:00	22:00	24	3	72	Day
Weekday 6	22:00	0:00	24	2	48	1/2 Day, 1/2 Night
Weekday 7	0:00	1:30	18	1.5	27	Night
			TOTAL		565	
			Day	07:00 to 23:00	<u>496</u>	
			Night	23:00 to 07:00	<u>69</u>	

Note: Trains per period are per track (i.e. in each direction on the corridor).