Trillium Health Partners/ Mississauga Hospital: Noise and Vibration Impact Study

FINAL REPORT

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December 8, 2021: This report was originally prepared as part of a Zoning By-law Amendment and Official Plan Amendment application for the Mississauga Hospital site at 100 Queensway West and 2250 Hurontario Street, however it is understood to be submitted in support of a Site Plan Control Application (SPA) for the proposed hospital tower on the site. Additional detail with respect to the SPA scope will be included in a subsequent Noise and Vibration Impact Study as part of the SPA resubmission.

Limitations and Sign-off

This document entitled Trillium Health Partners/Mississauga Hospital: Noise and Vibration Impact Study was prepared by Stantec Consulting Ltd. ("Stantec") for the account of Trillium Health Partners (the "Client") to support the regulatory review process for its Zoning Bylaw Amendment and Official Plan Amendment (the "Application") for the THP Mississauga Hospital Broader Redevelopment Project (the "Project"). In connection therewith, this document may be reviewed and used by the City of Mississauga participating in the review process in the normal course of its duties. Except as set forth in the previous sentence, any reliance on this document by any other party or use of it for any other purpose is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The information and conclusions in the document are based on the conditions existing at the time the document was published and does not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by the Client or others, unless expressly stated otherwise in the document. Any use which another party makes of this document is the responsibility and risk of such party. Such party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other party as a result of decisions made or actions taken based on this document.

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Executive Summary

Stantec Consulting Ltd. was retained by Trillium Health Partners (THP) to prepare a noise and vibration impact study in support of a Stage 2 zoning by-law amendment and official plan amendment application for the THP Mississauga Hospital (M-site) located at 100 Queensway West and 2250 Hurontario Street, in Mississauga. The M-site proposal consists of a clinical podium (ambulatory, diagnostic and treatment areas) and a 24 storey tower containing inpatient units, at the southwest corner of Hurontario and Queensway West. The proposal also includes an expanded 8 storey parkade building.

Road traffic noise from Hurontario Street and Queensway West/East was identified as the most significant transportation noise source, with less noise contribution from the future Hurontario Light Rail Transit (HuLRT). The noise assessment results indicate that the proposed development is considered acoustically feasible if the design provisions summarized below are satisfied:

Elevated Outdoor Leaving Areas (Roof Terraces above the clinical podium) Noise Controls:

- No noise barrier is required.

Indoor noise controls:

- Air conditioning is mandatory for occupied areas of the clinical podium and inpatient tower.
- Upgraded exterior windows up to STC35 are expected for the inpatient tower, with a minimum STC45 exterior wall construction. This is based on the assumption that the ratios of floor to window/wall area are 50% and 50%.
- STC45 exterior wall construction can be met with common wall constructions, including spandrel.

Stationary Noise Controls:

- A future Traction Power Substation (TPSS) planned for the Hurontario Light Rail Transit (HuLRT) line was identified as the closest noise source not associated with the new hospital development. The predicted noise from the future TPSS is expected to not exceed applicable sound level limits if the sound power level is below 76 dBA with tonal sound character.
  - The location and design of the TPSS was based on data from Reference Concept Design Consolidated Noise Assessment Report – Hurontario Road" prepared by AECOM (date December 20, 2017) (AECOM noise report). The assessment should be updated at a later stage of the application process, because the HuLRT construction is currently in progress.
- Existing stationary noise sources servicing other buildings at M-Site should be currently in compliance with existing buildings at the hospital and are expected to be in compliance with the new hospital building.
- The impact of the future hospitals stationary noise sources should be assessed at a later stage of planning when detailed design information is available.

The noise impact assessment should be updated when detailed information including site plan, floor plan and architectural drawings are available.

The future HuLRT operation was identified to be the primary source of vibration. Vibration from the LRT is predicted to be imperceptible to human occupants. The predicted ground vibration from the LRT will be considered by the design team for potential impact to anticipated higher-sensitivity uses (e.g., diagnostic imaging).

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Abbreviations

BPN	Building Practice Note
EASR	Environmental Activity and Sector Registry
ECA	Environmental Compliance Approval
LRT	Light Rail Transit
MECP	Ministry of the Environment, Conservations and Parks
NEF	Noise Exposure Forecast
NPC	Noise Pollution Control
OBC	Ontario Building Code
OLA	Outdoor Leaving Area
ORNAMENT	Ontario Road Noise Analysis Method for Environment and Transportation
POW	Plane of Window
QEW	Queen Elizabeth Way
RMS	Root Mean Square
STC	Sound Transmission Class
THP	Trillium Health Partners
TPSS	Traction Power Substation

1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by Trillium Health Partners (THP) to prepare a noise and vibration impact study in support of the Stage 2 zoning by-law amendment and official plan amendment (ZBA/OPA) application for the THP Mississauga Hospital (M-site) redevelopment located at 100 Queensway West and 2250 Hurontario Street in Mississauga. The existing THP Mississauga hospital will be largely demolished, and a new hospital building will be constructed east of the existing hospital.

The purpose of this study is to determine the noise impact from future vehicular traffic on Hurontario Street and on Queensway West/East, as well as the vibration impact due to the future operation of Hurontario Light Rail Transit (HuLRT) on Hurontario Street.

This assessment was based on the Concept Site Plan (dated December 21, 2020) and M-Site Block Diagram (date December 18, 2020) prepared by Stantec.

The nearest future HuLRT track will be aligned 27 m from the east side of the proposed hospital building. A vibration impact assessment is required to be conducted according to the City of Mississauga Official Plan. Therefore, this vibration impact study was conducted in accordance with the “Guidelines for New Development in Proximity to Railway Operations” from Federation of Canadian Municipalities and the Railway Association of Canada (FCMRAC) (May 2013).

An assessment of aircraft traffic noise is not required because the proposed site is beyond the noise exposure forecast (NEF) 25 noise contours for local airports.

The closest stationary noise source is a future traction power substation (TPSS) associated with HuLRT, which is planned to be located approximately 13 m north of the proposed hospital building. A preliminary stationary noise impact prediction was completed, using publicly available data for the TPSS.

An aerial view of the project site is shown in Figure 1 (Appendix A).

2.0 SITE DESCRIPTION AND PLAN

The proposed THP M-site is located at the southwest corner of Queensway West and Hurontario Street in the City of Mississauga. The new hospital building is proposed to be a 24-storey tower consisting primarily of inpatient units, surgical units, and diagnostic units with mechanical on the 7th and 15th floors of the podium, as well as on the roof. The new hospital building is planned to be located at the southwest corner of Queensway and Hurontario Street, with an expanded 8-storey parkade building.

The new hospital is planned to have two elevated rooftop terraces on 10th floor above the podium, and a covered outdoor patio on grade at the north end of the proposed hospital. There are two accessible courtyards planned to be adjacent to the east and west side entrances.

The existing hospital, which is centrally located in hospital grounds, will be demolished except for the J-wing, and the space of the existing hospital is planned to be converted to soft landscaped green spaces. A copy of the site plan is attached in Appendix B.

The THP M-site is designated institutional (I-2) in the City of Mississauga Zoning By-law 0225-2007, and the site is bounded by a mix of residential, commercial, and office uses. Queen Elizabeth Way (QEW) is approximately 620 m south of the THP M-site, and a Canadian Pacific (CP) railway corridor, carrying both freight rail and GO Transit commuter rail, is approximately 1.6 km north of the THP M-site. A local zoning map sourced from the City of Mississauga is attached in Appendix C.

3.0 GUIDELINES AND CRITERIA

3.1 NOISE

The Ministry of the Environment, Conservation and Parks (MECP) publication Noise Pollution Control (NPC)-300, Part C for land use planning (MECP NPC-300, 2013), and the "General Guidelines for the Preparation of Acoustical Reports in the Region of Peel" (November 2012) (Peel Guideline) are used for this noise impact assessment.

The City of Mississauga Official Plan, Section 6.10, references MECP NPC-300 for stationary and transportation noise sources, with the same requirements as NPC-300. The City of Mississauga Noise By-Law 360-79 does not provide quantitative noise guidelines, focusing on prohibitions by time and place for potential noise nuisance activities such as property upkeep, construction and festivities. The Mississauga bylaw is currently under review for update; however, it is not currently anticipated to introduce any quantitative noise limits. In accordance with By-Law 360-79, the THP M-site is designated as a "Quiet Zone", and this includes surrounding residential areas adjacent to the THP M-site. A quiet zone is an area of the City of Mississauga where quiet is of particular importance, which does not affect the current noise and vibration study but should be considered during the construction phase of the proposed project.

3.1.1 Transportation Noise

Transportation (road and rail) noise criteria as set by the MECP NPC-300 and Peel Guideline are adapted for this assessment. Table 3.1 provides a summary of the applicable limits for transportation noise assessment.

Table 3.1 Noise Criteria for Transportation Noise

Type of Space	Time Period	Noise Criteria Leq (dBA)
Outdoor Living Areas (OLA)	Daytime - (07:00 - 23:00)	55 (road and rail)
Outdoor Plane of Window (POW)	Nighttime - (23:00 - 07:00)	50 (road and rail)
Indoor Living Area (i.e., Clinical Areas)	Any	45 (road and rail)
Indoor Sleeping Quarters (Bedrooms)	Nighttime - (23:00 - 07:00)	40 (road) / 35 (rail)

There is no specific definition of OLA in the City of Mississauga Official Plan and Peel Guideline. An OLA, however, is defined by MECP as an outdoor amenity area where the enjoyment of the outdoor environment is expected during the daytime period (07:00 to 23:00) for the occupants. For transportation noise, MECP NPC-300 defines an elevated OLA as:

- Readily accessible from the building (e.g., backyard, gardens, terraces or patios)
- Elevated terraces and balconies with minimum depth of 4 m
- Only OLA for the occupants

- Not enclosed
- For OLAs on grade, the assessment should be conducted 3 m from the subject façade, while for elevated OLAs, the assessment should be conducted at the middle of OLA

In accordance with the MECP NPC-300, the roof terraces at the proposed hospital are considered OLAs, while the outdoor spaces on grade are not considered OLAs.

3.1.2 Stationary Noise

MECP NPC-300 establishes criteria limits for noise from stationary sources for POW receptors. The sound level is expressed in terms of one-hour equivalent sound levels (L_{eq}, 1hr) at the receptor. The higher of the MECP exclusion limit and the lowest existing hourly background sound level (ambient) at any point of reception is used as the applicable criteria for stationary noise. Stantec has determined that the acoustic environment of the THP M-site is representative of an MECP Class 1 Area. The MECP defines a Class 1 area as an area with an acoustical environment typical of a major population centre, where the daytime and nighttime background sound level is dominated by the activities of people, usually road traffic, often referred to as “urban hum”.

In this analysis, the MECP exclusion limits were conservatively adopted for the plane of windows of potentially noise sensitive indoor uses at the new hospital building. The MECP Class 1 noise criteria limits outlined in NPC-300 are summarized in Table 3.2.

Table 3.2 MECP Noise Exclusion Limits-Stationary Noise Sources – Class 1 Area

Receiver Category	Time Period	L_{eq} (1hr) dBA
Plane of Window Receptor (Stationary Noise)	Day (07:00 - 19:00)	50
	Evening (19:00 – 23:00)	50
	Night (23:00 to 07:00)	45

3.1.3 Noise Control Requirements

In accordance with the provincial and regional guidelines, noise control measures will be required as a condition of the development application. These noise control measures are summarized in terms of outdoor noise controls and ventilation requirements in Table 3.3 and Table 3.4, respectively and are further explained below.

OLA Noise Control Measures: Acoustic walls are a typical mitigation measure for OLAs, which are sometimes referred to as noise barriers or fences. MECP NPC-300 requires the daytime noise level in the OLA must be attenuated to 60 dBA or less as described in Table 3.3.

The Peel Guideline specifies a sound level limit at OLA 55 dBA for daytime. The sound level limit may be exceeded by up to 5 dB when reductions less than 5 dB are not considered technically, economically, and administratively feasible. However, when designing noise barriers, the design criteria is 55 dBA, and the design should provide the maximum amount of attenuation that is aesthetically, technically, administratively, and economically practical.

Noise Warning Clause (NWC): Warning clauses are required on offers of purchase and sale agreements or lease/rental agreements if noise levels exceed applicable sound level limits to warn future building occupants. However, NWC's are only for advising purchasers or tenants of residential properties, not institutional uses.

Provision for Air Conditioning: Units with this requirement must be designed to allow future occupants to install central air conditioning which will provide alternative ventilation if windows must be closed to reduce interior noise levels. In general, a forced air ducted heating system suitably sized and designed to permit the future installation of a central air conditioning system by the occupant is required. It is anticipated that the hospital's occupied spaces will be supplied with a means of central air conditioning.

Central air conditioning: Central air conditioning is required where projected interior noise levels are more than 10 dB in excess of the noise level objectives, so that windows may be closed to provide effective noise attenuation.

Building components designed to achieve indoor sound level criteria: Special wall, window and door construction that exceeds Ontario Building Code (OBC) specifications may be required as determined by Sound Transmission Class (STC) if nighttime outdoor noise level at a sleeping quarter POW is greater than 60 dBA for transportation noise sources and/or 55 dBA for rail noise sources. The recommendations must comply with local regulations; it should be clearly stated how the recommendations differ from OBC requirements.

Table 3.3 Noise Control Requirements for Outdoor Living Areas (MECP NPC-300)

Predicted Outdoor Noise Level, L_{eq} (dBA)	**Required Noise Control Measures (Transportation Noise)**
Daytime (07:00 to 23:00)	
Less than 55	No barrier required
Greater than 55 and less than 60	Barrier (reduce to 55 dBA per Region of Peel)
Greater than 60	Barrier (reduce to 55 dBA) or barrier (reduce below 60 dBA only if achieving 55 dBA is not feasible)

Table 3.4 Plane of Window - Noise Control Ventilation Requirements (MECP NPC-300)

Predicted Outdoor Noise Level, L_{eq} (dBA)		Required Noise Control Measures (Transportation Noise)
Daytime (07:00 to 23:00)	**Nighttime (23:00 to 07:00)**	
Less than or equal to 55	Less than or equal to 50	No mitigation required
Greater than 55 and less than 65	Greater than 50 and less than 60	Provision for air conditioning (A/C)
Greater than 65	Greater than 60	Central A/C or other ventilation system installed prior to occupancy; Building component should be designed so that the indoor sound level meets the required sound level limits.

3.2 VIBRATION

Vibration criteria for the proposed new hospital building are developed from the review of multiple references. MOEE/TTC (1993) and Metrolinx Environmental Program and Assessments (EPA) (2019) recommend a maximum vertical vibration velocity of 0.1 mm/s (RMS) for LRT projects. The 0.1 mm/s (RMS) is considered as the vibration threshold of human perception.

For the proposed new hospital building, however, an additional vibration limit is considered because the vibration sensitive equipment (e.g., CT, and MRI) is planned to be located close to the LRT track on the second floor. Noise criteria for vibration sensitive equipment and general spaces adopted from ASHRAE (2007) are summarized in Table 3.5.

Table 3.5 Vibration Criteria

Type of Space	Description	Vibration Limit (mm/s, RMS)1
General Spaces	• Suitable in most instances for surgical suites • Inpatient areas • laboratory robots	0.10
MRI Rooms (Level 2)	• High-precision balances • Spectrophotometers • Magnetic resonance imagers (MRI)	0.013[2]

Notes:

1. The vibration assessment or measurement inside building structure (e.g., floor, foundation wall).
2. This criterion is a generic limit; the vibration criteria can be re-evaluated if application-specific documents become available at a later stage of design.

4.0 NOISE IMPACT ASSESSMENT

4.1 NOISE POINT OF RECEPTION

Noise Impacts are evaluated at physical locations defined as points-of-reception (POR). Seven PORs representing worst-case assessment locations, were considered for the noise impact assessment. The PORs represent worst-case noise impact scenario from Hurontario Street and on the east and Queensway West/East on the north. A summary of the PORs considered in this assessment is provided in Table 4.1 and shown in Figure 2.

From review of M-Site Block Diagram (dated December 18, 2020), OLAs on the 10th floor and outdoor POWs of inpatient units on 12th floor were considered as PORs for the noise impact assessment, as well as treatment areas with exterior facing windows on the 5th and 8th floors of the podium level. The height of the POR in each OLA was modelled as 1.5 m above the associated floor, and the setback distance from each road was determined based on the Concept Site Plan (dated December 21, 2020). The PORs should be reviewed when detailed architectural designs are available. The M-site Block Diagram is attached in Appendix D.

Table 4.1 Noise Point of Reception Summary

POR ID	Description	POR Height (m)
POR01	OLA (10th storey roof terrace on south-east), mainly exposed to Hurontario Street	1.5 m from roof level (54.5 m from the ground)
POR02	OLA (10th storey roof terrace on north-east), exposed to both Hurontario Street and Queensway	1.5 from roof level (54.5 m from the ground)
POR03	Inpatient unit on 12th floor (south-east), mainly exposed to Hurontario Street	63.5 m from the ground
POR04	Inpatient unit on 12th floor (north-east), Exposed to both Hurontario Street and Queensway	63.5 m from the ground
POR05	Inpatient unit on 12th floor (north), mainly exposed to Queensway	63.5 m from the ground
POR06	Critical Unit on 5th floor (north), mainly exposed to Queensway	23.5 m from the ground
POR07	NICU on 8th floor (north-east), exposed to both Hurontario Street and Queensway	45.5 m from the ground

4.2 NOISE ASSESSMENT METHODOLOGY

4.2.1 Transportation Noise Source – Road Traffic

Road traffic on Hurontario Street and Queensway West/East is the dominant road traffic noise source impacting on the proposed new hospital building. The ultimate road traffic volume for Queensway West was obtained from the Region of Peel. Additional road traffic data for Hurontario Street was obtained from "Reference Concept Design Consolidated Noise Assessment Report – Hurontario Road" prepared by AECOM (date December 20, 2017) (AECOM noise report). The road traffic volume with operation of HuLRT was considered for the road traffic volume on Hurontario Street. The Region of Peel provided ultimate traffic volumes for Hurontario Street, but the AECOM report provides future road traffic volumes on Hurontario that are higher than the ultimate volumes provided by the Region of Peel. Additionally, the volumes indicated in the AECOM report for Queensway East show lower volumes than Queensway West. Volumes from the AECOM report are used in this assessment for Hurontario Street, while the Region of Peel's ultimate road traffic volume for Queensway West was conservatively also applied for Queensway East.

The occasional movement of vehicles on roads within the hospital grounds is expected to be insignificant compared to external roads.

A summary of the road traffic volume used in the road traffic noise model is provided in Table 4.2. Traffic speed limit, traffic composition (% of automobiles, % of medium trucks, % of heavy trucks), and the daytime/nighttime traffic volume split are provided in the table.

Table 4.2 Road Traffic Volume Summary

Roadway	Speed Limit (Km/h)	Traffic Volume (Year 2031)					
		Daytime (07:00 to 23:00)			Nighttime (23:00 to 07:00)		
		Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
Queensway West and East[1]	60	92%			8%		
		28,684 (96.32%)	411 (1/38%)	712 (2.39%)	2,508 (96.76%)	47 (1.80%)	37 (1.44%)
Hurontario Street (NB)[2]	50	90%			10%		
		15,206	651	407	1,690	72	45
Hurontario Street (SB)[3]		13,414 (93%)	574 (4%)	359 (3%)	1,490 (93%)	64 (4%)	40 (3%)

Notes:

[1] Based on 24-hour ultimate traffic volume from the Region of Peel (Correspondence regarding traffic volume is in Appendix E).

[2] North-bound traffic volume with LRT operation based on AECOM (2017) noise report.

[3] South-bound traffic volume with LRT operation based on AECOM (2017) noise report.

The road traffic noise levels at the PORs were predicted according to the MECP NPC-300 guideline using STAMSON v5.04 noise modelling software which implements the Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT) (MECP, 1989). ORNAMENT is the MECP recommended road traffic noise prediction method.

STAMSON modelling was configured to account for the separation distance from each roadway and set to calculate road traffic noise levels over an acoustically reflective intermediate between the roadway and the PORs. The roads and intervening ground were considered as flat and conservatively modelled as a reflective surface.

4.2.2 Transportation Noise Source – Rail Traffic

For future LRT operation on Hurontario Street, the light rail vehicle (LRV) traffic volume was obtained from the AECOM noise and vibration reports. A summary of the LRV traffic volume used in the rail traffic noise model is provided in Table 4.3.

Table 4.3 LRV Traffic Volume Summary

Roadway	Speed Limit (Km/h)	Traffic Volume (Future HuLRT)	
		Daytime (07:00 to 23:00)	Nighttime (23:00 to 07:00)
Hurontario Street	50	292	66

The rail traffic noise levels at the PORs were predicted using the same methodology as used in the road traffic noise using STAMSON v5.04. The STAMSON modeling package has limitations incorporating vehicle length and track type for rail vehicles. For an accurate estimation of rail traffic noise, a Custom noise source was derived employing the prediction method from the United States Federal Transit Administration (FTA, 2018). The following parameters and assumptions were adopted from AECOM (2017) noise report for the development of the “Custom” noise source level:

- Length of LRV: 48 m
- Number of Cars: 4
- Track Type: Embedded track on grade
- Maximum LRV Passby Noise Level (Lmax): 75 dBA at 15 m with 65 km/h
- Source Height: 0.5 m

Calculation details (FTA and STAMSON) are in Appendix F.

Noise levels from crossovers and wheel squeal were not considered in this assessment since the track is not curved, and the 2017 AECOM report indicates no crossovers were planned near the project site.

The predicted rail noise levels were combined with the road traffic noise levels using STAMSON, then the results were compared against the applicable criteria.

4.2.3 Stationary Noise Source – External to Hospital

The closest stationary noise source that is not associated with the hospital is a future traction power substation (TPSS) associated with HuLRT which is planned to be located approximately 13 m north of the proposed hospital building.

From a desktop aerial review of the THP M-site and surrounding areas, stationary sources at other off-site uses are expected to be in compliance, because the existing long term care home within the footprint of the new hospital building shares a similar setback to existing offsite sources.

The stationary noise sources of the existing THP Mississauga hospital were not considered in this study because the existing facility's sources should already be in compliance with existing receptor points at the hospital itself and will be demolished (other than J-Wing) after the new hospital building is fully entered into service.

A preliminary description and noise source level of the future TPSS is obtained from the AECOM (2017) noise report. As described in the AECOM noise report the major noise sources contained in a TPSS are anticipated to be a transformer located inside an enclosure with HVAC units located on the roof of the enclosure. These noise sources are collectively referred to as the TPSS. The TPSS is expected to operate 24 hours a day and 7 days a week.

The maximum sound power allowed at the proposed TPSS location is estimated and provided in this report. This overall sound power level must be verified at a later stage of the design during the planning process. It is understood that HuLRT construction is currently underway, and changes from the earlier 2017 design may require co-ordination between HuLRT and THP of noise compliance / mitigation measures.

The stationary noise impact was conducted in accordance with the outdoor sound propagation prediction model: ISO 9613-2: Acoustics – Attenuation of Sound during Propagation Outdoors – Part 2: General Method of Calculation. This model includes geometrical divergence (distance attenuation), barrier effects, ground effects, atmospheric absorption, and topography. The model considers a downwind condition for the purpose of analysis (i.e., the wind direction is always oriented from each source location towards each POR location). The stationary noise source was modelled as a point source.

The planned location of the TPSS is shown in Figure 2 based on the location provided in the AECOM report.

4.2.4 Stationary Noise Source – Hospital to Off-Site

Noise impact assessment from the hospital noise sources (e.g., rooftop units) at off-site noise sensitive areas was not conducted in this study since the mechanical system details for the new hospital building are not yet sufficiently developed at this design stage.

The proposed new hospital building is planned to be located adjacent to residential zones across Hurontario Street. Therefore, a detailed stationary noise assessment is required before the equipment selections and detailed design of mechanical systems are finalized. It is expected that an application to the MECP for Environmental Compliance Approval (ECA) or Environmental Activity and Sector Registry (EASR) application will be required prior to the hospital becoming operational. The new hospital will need to be designed and built to ensure the MECP NPC-300 sound level limits are met at the surrounding noise sensitive areas.

4.3 NOISE ASSESSMENT RESULTS

4.3.1 Transportation Noise

Equivalent sound levels (L_{eq}) due to transportation (road and rail traffic) noise were predicted at PORs representing worst-case assessment locations. The predicted transportation noise impact levels at the PORs and applicable noise controls are summarized in Table 4.4. As shown in the table, the dominant transportation noise source is road traffic, and the noise from the LRT operation is insignificant compared to the road traffic noise. STAMSON calculations are attached as Appendix F.

Table 4.4 Summary of Predicted Transportation Noise Levels and Noise Control Measures

Point of Reception	Time Period Daytime (16hr) Nighttime (8 hr)	Predicted Noise Level without Mitigation (dBA)			Sound Level Limit (dBA)	Recommended Noise Mitigation Measures
		Road	Rail	Total		
POR01	Daytime (OLA)	48	39	49	55	No noise barrier required
POR02	Daytime (OLA)	50	39	50	55	No noise barrier required
POR03	Daytime (POW)	64	55	64	45	Provision for air conditioning (A/C), and forced air heating [1]
	Nighttime (POW)	57	51	58	40	
POR04	Daytime (POW)	66	55	66	45	Central A/C or other ventilation system installed prior to occupancy; and Building component should be designed so that the indoor sound levels are below the MECP criteria
	Nighttime (POW)	59	51	59	40	
POR05	Daytime (POW)	66	50	66	45	
	Nighttime (POW)	58	47	58	40	
POR06	Daytime (POW)	66	50	66	45	
	Nighttime (POW)	58	46	58	45	
POR07	Daytime (POW)	67	55	67	45	
	Nighttime (POW)	59	51	60	40	

Note:

[1] It is anticipated that occupied spaces throughout the building will be equipped with a central air system; the provision for A/C and forced air is considered the minimum acoustical requirement and will be satisfied if central A/C is provided.

4.3.2 Stationary Noise

The worst-case noise impact location would be the north side of the building. To comply with the MECP noise exclusion limit at night, the allowable maximum sound power level of TPSS unit should be designed to 76 dBA with a conservative 5 dB tonality penalty added to this sound power level as per MECP publication NPC-104. A tonal noise source is typically characterized as a hum or buzz and can be present in certain pieces of electrical infrastructure. The 2017 AECOM noise report does not indicate whether this TPSS was expected to be a tonal character source.

The 2017 AECOM noise report indicates an assumed sound power level of 83 dBA for the TPSS. At the time of the 2017 AECOM noise report, the closest noise receptor would have been the existing long term care home located within the footprint of the new hospital building. The 2017 AECOM noise report identified that the TPSS building walls and roof would include minimum 16-gauge thickness steel, or alternative providing greater noise attenuation, and had assumed sound data for the external HVAC units on the TPSS. Prior to operation of the TPSS, Metrolinx or its designated TPSS operator will be required to design the TPSS to comply with provincial noise limits for all existing or municipally-approved PORs.

It is understood that HuLRT construction is currently underway, and changes from the earlier 2017 design may require co-ordination between HuLRT and THP for a detailed noise compliance assessment and noise mitigation measures.

4.4 NOISE MITIGATION RECOMMENDATIONS

4.4.1 Outdoor Living Areas Noise Controls

For the elevated rooftop OLAs, no noise barriers are required as described in Table 4.4.

4.4.2 Indoor Noise Controls

As shown in Table 4.4, mandatory central air conditioning or other ventilation system should be installed to the inpatient units facing both roads, allowing the windows to stay closed.

In addition, the exterior components of the new hospital building should be designed so that the indoor sound levels do not exceed the noise criteria. The acoustical requirements of exterior building components (walls, windows) were determined using Building Practice Note 56 (BPN56), provided by the National Research Council of Canada.

Assuming the wall and window areas of sensitive rooms are both 50% of the associated floor area, windows up to STC35 are required, provided exterior walls are at least STC45. STC35 is considered typical for sealed insulating units, and STC45 can be met with common wall constructions, including spandrel panel.

This acoustic performance estimation of exterior component will need to be updated when the detailed design of the building becomes available at a later stage in the planning process.

4.4.3 Stationary Noise Controls

At the time of this assessment, details on mechanical design for the new hospital building are not available. However, noise controls will be considered during the ongoing design of the new hospital building. Measures such as appropriate siting, selection and provision of engineering controls like barriers and silencers are commonly applied for other buildings of similar use and scale and are considered feasible.

5.0 VIBRATION IMPACT ASSESSMENT

The proposed new hospital building is planned to be adjacent to the future HuLRT alignment. The setback distance of the new hospital building from the centre line of the closest LRT track (south-bound track) is approximately 27 m. The FTA Manual (2018) and the City of Mississauga Official Plan recommend a vibration impact study on the institutional buildings within 30 m or 75 m from the LRT track, respectively.

5.1 GROUND-BORNE VIBRATION METRICS

Vibration is an oscillatory motion that can be described in terms of the displacement, velocity, or acceleration. The velocity represents the instantaneous speed of a floor movement and acceleration is the rate of change of the speed. The response of humans, buildings, and equipment to vibration can be accurately described using either velocity or acceleration. Velocity is chosen in this report, for its closer relationship to sound.

For the response of humans and equipment, an averaged vibration amplitude is more appropriate because it takes time for the human body and equipment to respond to vibrational excitation. Root-Mean-Square (RMS) amplitude is typically used to access human and equipment responses to vibration. The RMS value is the square root of the average of the squared amplitude of a signal that can be described as a smoothed vibration amplitude for an average period. The average period of RMS is typically one second (FTA 2018).

5.2 VIBRATION POINTS OF RECEPTION

Vibration Impacts are evaluated at physical locations defined as vibration points-of-reception (VPOR). A summary of the VPORs considered in this assessment is provided in Table 5.1. Although several VPORs can be considered for the assessment, only the worst-case spaces are reported. The representative worst spaces are summarized in Table 5.1 and shown in Figure 2.

The VPORs are considered on the interior floor slab (Level 1 and Level 2). VPOR01 represents general spaces on the ground level (Level 1) close to the LRT track, and VPOR02 represents an MRI room on the 2nd Level.

Table 5.1 Point of Reception Summary

Façade	POR ID	Description
East	VPOR01	General spaces on Ground Level
East	VPOR02	MRI room on 2nd Level

5.3 VIBRATION ASSESSMENT METHODOLOGY

The Vibration Assessment Update Report – Hurontario LRT prepared by AECOM (December 20, 2017) does not identify the project site as a vibration sensitive receptor because the existing long term care home was not considered vibration sensitive.

In this vibration impact study, the operational vibration impact on the identified receptors was conducted in accordance with the General Vibration Assessment procedure proposed by FTA (2018) Manual. The soil's ability to transmit vibration is based on HuLRT information from AECOM (2017).

5.3.1 Method

The basic approach for the General Vibration Assessment is to utilize base curves that predict the overall ground-borne vibration as a function of distance from the source:

$$L_v = 85.88 - 1.06\log(d) - 2.32\log(d)^2 - 0.87\log(d)^3$$

where d = setback distance (ft) and Lv = vibration velocity level (dB, ref 1micro-inch/sec).

Adjustments to these curves are applied to account for factors such as vehicle speed, geologic conditions, building type, and receiver location within the building. The applied parameters are summarized in Table 5.2.

Table 5.2 Parameter for General Vibration Assessment

	Source/Path Factor	Hurontario LRV
Train Definition	Train Type	Light Rapid Transit
	Train Speed	50 km/h
	Stiff Suspension	No
	Resilient Wheels	No
	Worn Wheels	No
Rail Definition	Rail Type	Continuous Welded Rail
	Worn or Corrugated Track	No
	Special Track work	No
Path Definition	Efficient Propagation in Soil	Yes[1]
	Propagation in Rock Layer	No

Note:

[1] Soil propagation is based on information from the AECOM (2017) vibration report prepared for HuLRT. The vibration transmission is expected to be efficient.

5.4 VIBRATION IMPACT ASSESSMENT RESULTS

The predicted vibration impacts on the identified VPORs are summarized in Table 5.3. As described in the table, the vibration velocity within the building from HuLRT is predicted to be imperceptible. It is anticipated that the MRI and other diagnostic imaging rooms will require additional vibration mitigation due to the higher vibration sensitivity of these types of medical equipment; however, the predicted levels are low enough that vibration mitigation is considered feasible.

Table 5.3 Vibration Impact Assessment Results

VPOR	Description	Predicted Vibration (mm/s, RMS)	Criteria (mm/s, RMS)	Exceedance (Yes/No)
VPOR_01	General spaces on Ground Level	0.049	0.1	No
VPOR_02	MRI room on 2nd Level	0.039	0.013	Note

Note:

1. The predicted vibration levels in the MRI room are below the perceptible limit, but above the general vibration limit – the required design elements to achieve lowered vibration levels are considered feasible.

6.0 CONCLUSION

Stantec completed a noise and vibration impact assessment of the proposed new hospital (THP M-site) in support of the Stage 2 zoning by-law amendment and official plan amendment application.

Road traffic noise from Hurontario Street and Queensway West/East was identified as the most significant source of transportation noise, with less contribution from the future Hurontario Light Rail Transit (HuLRT). The noise assessment results indicate that the proposed development is considered acoustically feasible if the design provisions summarized below are satisfied:

Elevated Outdoor Leaving Areas (Roof Terraces above the clinical podium) Noise Controls:

- No noise barriers are required.

Indoor noise controls:

- Air conditioning is mandatory for occupied areas of the clinical podium and inpatient tower.
- Upgraded exterior windows up to STC35 are expected for inpatient and treatment spaces, with a minimum STC45 exterior wall construction. This is based on the assumption that the ratios of floor to window/wall area are 50% and 50%.
- STC45 exterior wall construction can be met with common wall constructions, including spandrel.

Stationary Noise Controls:

- A future Traction Power Substation (TPSS) planned for the Hurontario Light Rail Transit (HuLRT) line was identified as the closest stationary noise source in the vicinity of the Project, that is not associated with the hospital itself. Information on the design of the TPSS was based on Reference Concept Design Consolidated Noise Assessment Report – Hurontario Road" prepared by AECOM (date December 20, 2017) (AECOM noise report) and should be updated as the HuLRT construction is currently in progress.
- Existing stationary noise sources servicing other buildings at M-Site should be currently in compliance with existing buildings at the hospital and are expected to be in compliance with the new hospital building.
- The impact of the future hospitals stationary noise sources should be assessed at a later stage of planning when detailed design information is available.

The noise impact assessment should be updated, and sound transmission class (STC) rating values should be reviewed once detailed information including site plan, floor plan and architectural drawings are available.

Conclusion
May 14, 2021

The future HuLRT operation was identified to be the primary source of vibration. Vibration from the LRT is predicted to be imperceptible to human occupants. The predicted ground vibration from the LRT will be considered by the design team for potential impact to anticipated higher-sensitivity uses (e.g., diagnostic imaging).

The proposed project is considered feasible from the perspective of both noise and vibration impact.

Both noise and vibration impacts should be re-evaluated at a later stage of the approvals process, considering HuLRT project is currently underway and final design and construction may change from what was considered in the HuLRT noise and vibration studies this report is based on.

7.0 REFERENCES

AECOM Vibration Report (2017), Vibration Assessment Update Report – Hurontario LRT, Metrolinx.

AECOM Noise Report (2017), Reference Concept Design Consolidated Noise Assessment Report – Hurontario LRT, Metrolinx.

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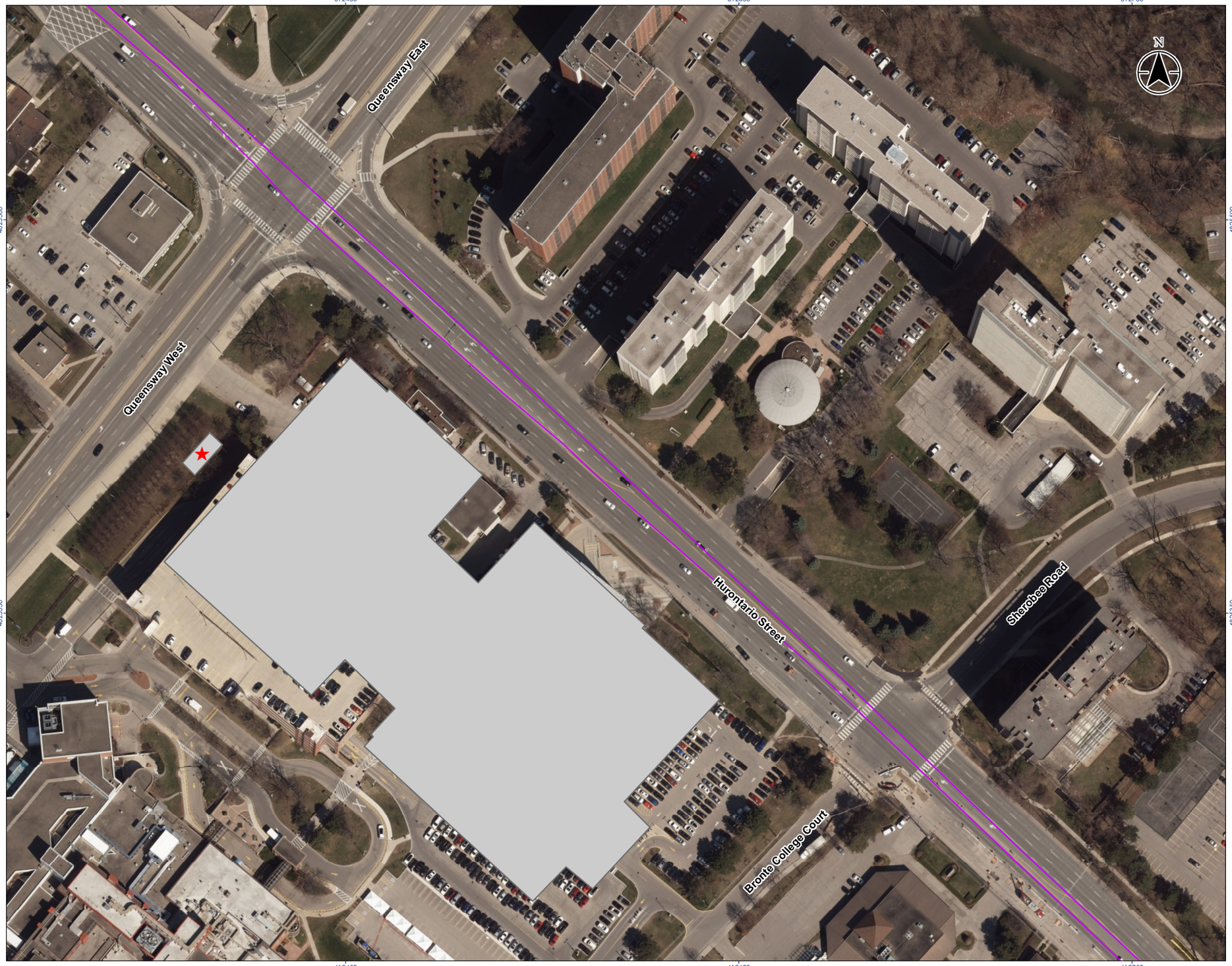
APPENDIX A
Figures



Stantec

Legend

- TPSS (future Hurontario LRT)
- Future Hurontario LRT
- Building

0 25 50 Metres

1:1,500 (At original document size of 11x17)

Notes

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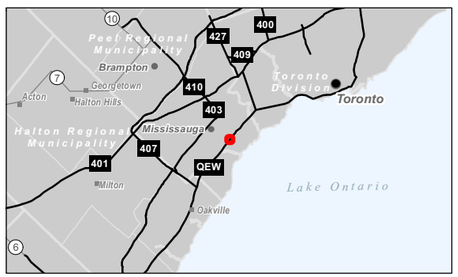


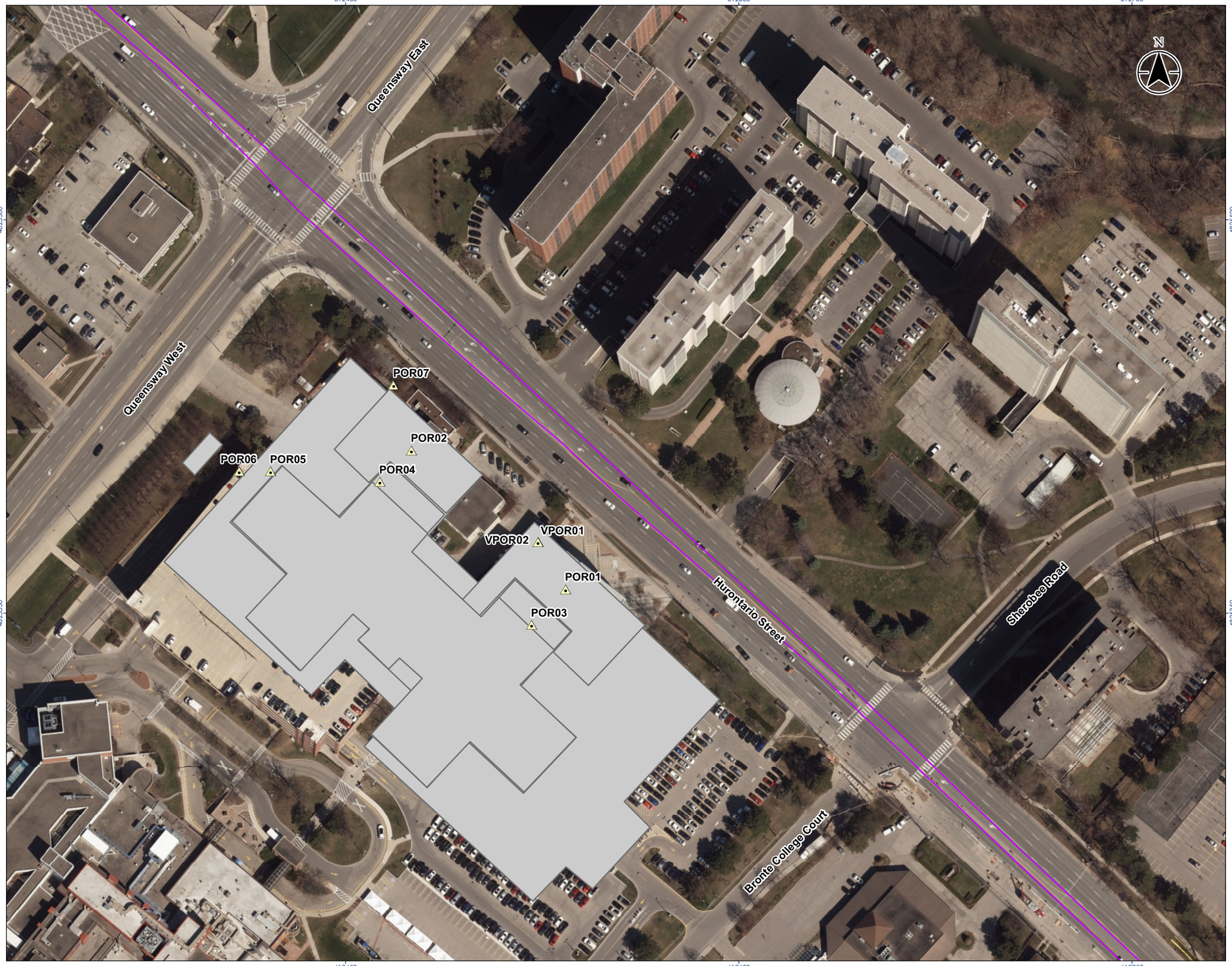
Project Location
Mississauga, ON

160940747 REVA
Prepared by SW on 2021-03-30
Technical Review by BCC on 2021-03-30
Independent Review by AC on 2021-03-30

Client/Project
TRILLIUM HEALTH PARTNERS
TRILLIUM HEALTH PARTNERS/MISSISSAUGA HOSPITAL: NOISE AND VIBRATION IMPACT STUDY

Figure No.
1

Title
Aerial View of Project Site



Stantec

Legend

- Noise Receptor
- Future Hurontario LRT
- Building

0 25 50 Metres

1:1,500 (At original document size of 11x17)

Notes

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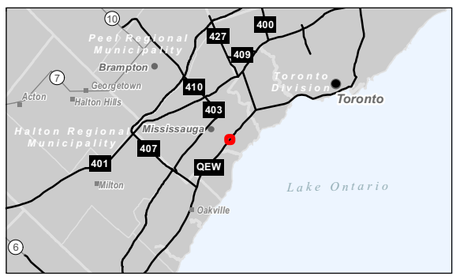

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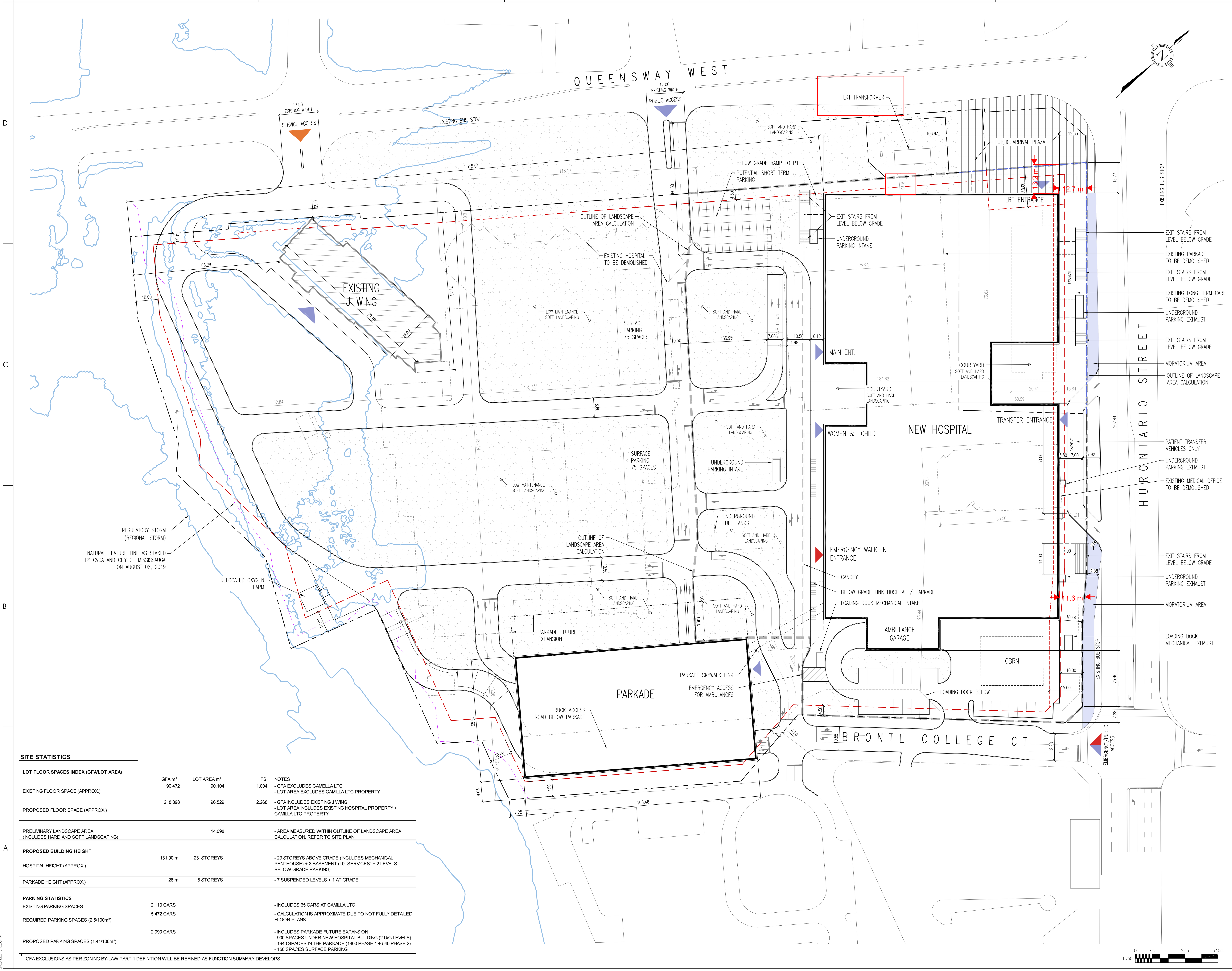
TRILLIUM HEALTH PARTNERS
TRILLIUM HEALTH PARTNERS/MISSISSAUGA HOSPITAL: NOISE AND VIBRATION IMPACT STUDY

Figure No.
2

Title
Point of Reception for Noise and Vibration Impact Assessment

APPENDIX B
Site Plan



SITE STATISTICS

LOT FLOOR SPACES INDEX (GFA/LOT AREA)	GFA m²	LOT AREA m²	FSI	NOTES
EXISTING FLOOR SPACE (APPROX.)	90,472	90,104	1.004	- GFA EXCLUDES CAMELLA LTC - LOT AREA EXCLUDES CAMILLA LTC PROPERTY
PROPOSED FLOOR SPACE (APPROX.)	218,898	96,529	2.268	- GFA INCLUDES EXISTING J WING - LOT AREA INCLUDES EXISTING HOSPITAL PROPERTY + CAMILLA LTC PROPERTY
PRELIMINARY LANDSCAPE AREA (INCLUDES HARD AND SOFT LANDSCAPING)		14,098		- AREA MEASURED WITHIN OUTLINE OF LANDSCAPE AREA CALCULATION. REFER TO SITE PLAN
PROPOSED BUILDING HEIGHT				
HOSPITAL HEIGHT (APPROX.)	131.00 m	23 STOREYS		- 23 STOREYS ABOVE GRADE (INCLUDES MECHANICAL PENTHOUSE) + 3 BASEMENT (L0 "SERVICES" + 2 LEVELS BELOW GRADE PARKING)
PARKADE HEIGHT (APPROX.)	28 m	8 STOREYS		- 7 SUSPENDED LEVELS + 1 AT GRADE
PARKING STATISTICS				
EXISTING PARKING SPACES	2,110 CARS			- INCLUDES 65 CARS AT CAMILLA LTC
REQUIRED PARKING SPACES (2.5/100m²)	5,472 CARS			- CALCULATION IS APPROXIMATE DUE TO NOT FULLY DETAILED FLOOR PLANS
PROPOSED PARKING SPACES (1.41/100m²)	2,990 CARS			- INCLUDES PARKADE FUTURE EXPANSION - 900 SPACES UNDER NEW HOSPITAL BUILDING (2 U/G LEVELS) - 1940 SPACES IN THE PARKADE (1400 PHASE 1 + 540 PHASE 2) - 150 SPACES SURFACE PARKING

* GFA EXCLUSIONS AS PER ZONING BY-LAW PART 1 DEFINITION WILL BE REFINED AS FUNCTION SUMMARY DEVELOPS

c:\users\ebasta\bim 360\stantec consulting\1400200191_thp_broader_redev_m_site\project files\e_isd\02_cad\01_site\thp_m-site site plan
2020.12.21 3:12:08 PM

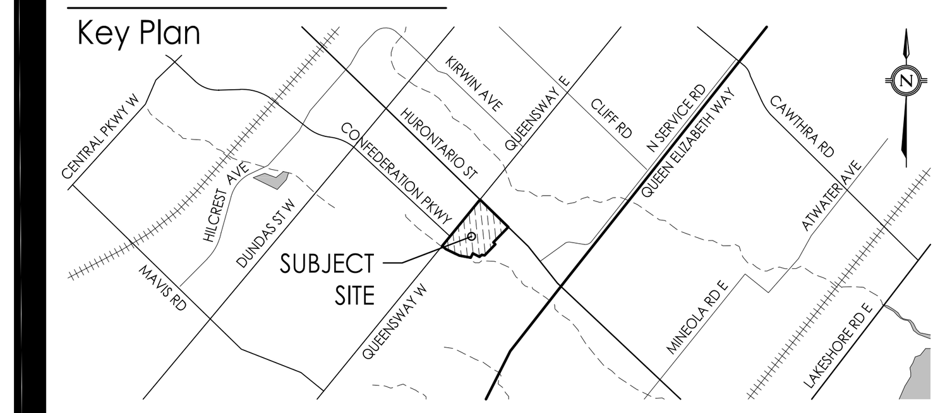
ORIGINAL SHEET - ARCH D

0 7.5 22.5 37.5m
1:750

Stantec

Stantec Architecture Ltd.
100-401 Wellington Street West
Toronto ON M5V 1E7
Tel: (416) 596-6666
www.stantec.com

Key Plan



Legend

- PROPERTY LINE
- CAMILLA LAND PROPERTY LINE
- MINIMUM SETBACK
- MAXIMUM SETBACK
- EXISTING BUILDING TO BE DEMOLISHED
- OUTLINE OF LANDSCAPED AREA CALCULATION
- LANDSCAPING
- MORATORIUM AREA

Notes

1. THE LOCATION OF ALL UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE LOCATION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
2. FOR BUILDING DETAILS REFER TO ARCHITECTURAL DRAWINGS.

Revision	By	Appd	YYYY.MM.DD

Issued	By	Appd	YYYY.MM.DD
2 STAGE 2 SUBMISSION	EB/BC	EC	2020.12.18
1 ISSUED FOR DARC	BC	EC	2020.10.30

File Name: THP_M-SITE SITE PLAN	EB/BC	EB/BC	EC/HS	2020.12.21
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

PRELIMINARY NOT FOR CONSTRUCTION

Not for permits, pricing or other official purposes. This document has not been completed or checked and is for general information or comment only.

Client/Project Logo

Trillium Health Partners

Client/Project
TRILLIUM HEALTH PARTNERS

PROPOSED DEVELOPMENT (M-SITE)
Mississauga, ON

Title

CONCEPT SITE PLAN

Project No. 1400 200191
Scale 1:750
Revision 0
Sheet of
Drawing No. **2.4.1B**

APPENDIX C
Zoning Map

Stantec

Legend

- LRT Track
- Building

Zone Description

- Convenience Commercial
- Development
- Greenlands - Natural Features
- Greenlands - Natural Hazards
- Institutional
- Neighbourhood Commercial
- Office
- Open Space - Community Park
- Residential - Apartments
- Residential - Detached Dwellings - Typical Lots
- Residential - Townhouse Dwellings
- Utility

0 50 100 Metres
1:3,000 (At original document size of 11x17)

Notes

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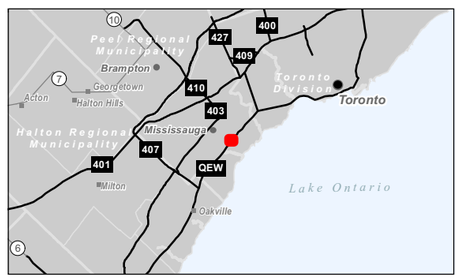
4. Zoning data from City of Mississauga. https://ext.maps.mississauga.ca/Html5Viewer/index.html?viewer=izbl.HTML5#



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Client/Project
TRILLIUM HEALTH PARTNERS
TRILLIUM HEALTH PARTNERS/MISSISSAUGA HOSPITAL: NOISE AND VIBRATION IMPACT STUDY

Figure No.
C1

Title
Zoning Map

APPENDIX D
M-Site Block Diagram

THP Area Analysis

			Functional Program 2021-01-14			Stage 2 Costing 2020-12-18					
Dept. incl 2031/32 increase	Dept. #	Dept. Name	FP CGSF (26/27)	FP CGSF Growth Areas (31/32)	Total FP CGSF	Designed CGSF (26/27)	Designed CGSF Growth Areas (31/32)	Total Designed CGSF	Designed CGSF Variance	Overall Variance (FP vs. Designed)	Comments
	01A	AMB SERV - MED SURG	39,720		39,720	38,461	-	38,461	(1,259)	-3%	
	01B	AMB SERV - WOMEN & CHILD	29,925		29,925	30,759	-	30,759	834	3%	
	02	MENTAL HEALTH AMB	10,140		10,140	10,338	-	10,338	198	2%	
*	03	CCU	126,905	10,005	136,910	127,843	10,005	137,848	938	1%	
	04	*MATERNAL NEWBORN*	106,715		106,715	*108,331*	-	*108,331*	1,616	2%	**
	05	*MED/SURG IPU*	507,575		507,575	*524,755*	-	*524,755*	17,180	3%	**
	06	*MENTAL HEALTH IPU*	93,810		93,810	*96,968*	-	*96,968*	3,158	3%	**
	07	*NICU*	45,690		45,690	*48,187*	-	*48,187*	2,497	5%	**
	08	PAEDIATRIC IPU	41,240		41,240	42,485	-	42,485	1,245	3%	
*	09	CARDIAC CATH & EP	47,535	6,470	54,005	47,654	6,470	54,124	119	0%	
	10	CARDIAC CLINICS & DIAGNOSTICS	17,745		17,745	*18,270*	-	*18,270*	525	3%	
*	11	DIAGNOSTIC IMAGING	62,285	420	62,705	62,898	420	63,318	613	1%	
	12	EMERGENCY DEPARTMENT	70,415		70,415	71,970	-	71,970	1,555	2%	
	13	ENDOSCOPY	17,850		17,850	18,128	-	18,128	278	2%	
*	14	RENAL INPATIENT (DIALYSIS)	7,710	155	7,865	7,869	155	8,024	159	2%	
	15	LAB MED & GENETICS	36,985		36,985	38,166	-	38,166	1,181	3%	
	16	PHARMACY	24,620		24,620	25,231	-	25,231	611	2%	
*	17	SURGICAL SERVICES	99,065	8,460	107,525	98,945	8,460	107,405	(120)	0%	
	18	CORPORATE ADMIN	47,185		47,185	47,208	-	47,208	23	0%	
	20	HUMAN RESOURCES	15,795		15,795	15,797	-	15,797	2	0%	
	21	INFORMATION SERVICES	34,935		34,935	34,964	-	34,964	29	0%	
	22	INTERPROF EDU. AND LEARN	32,260		32,260	32,252	-	32,252	(8)	0%	
	23	PROFESSIONAL PRACTICE	6,760		6,760	6,887	-	6,887	127	2%	
	24	PATIENT REGISTRATION	3,205		3,205	2,629	-	2,629	(576)	-18%	
	25	PUBLIC AREAS & AMENITY	20,975		20,975	20,821	-	20,821	(154)	-1%	
	25.1	RETAIL/WELLNESS CENTER	38,906		38,906	38,943	-	38,943	37	0%	
	26	RESEARCH & INNOVATION	10,440		10,440	10,447	-	10,447	7	0%	
	27	SPIRITUAL CARE	3,035		3,035	3,035	-	3,035	0	0%	
	28	STAFF + MED STAFF	11,300		11,300	11,236	-	11,236	(64)	-1%	
	29	VOLUNTEER RESOURCES	2,070		2,070	2,074	-	2,074	4	0%	
	30	BIOMEDICAL	7,875		7,875	7,889	-	7,889	14	0%	
	31	COMMAND CENTRE	10,625		10,625	10,669	-	10,669	44	0%	
	32	CORPORATE SERVICES	41,695		41,695	43,047	-	43,047	1,352	3%	
	33	FACILITIES	23,200		23,200	23,624	-	23,624	424	2%	
	34	MATERIALS MANAGEMENT	29,915		29,915	30,632	-	30,632	717	2%	
*	35	MDRD	21,080	1,715	22,795	21,039	1,715	22,754	(41)	0%	
	36	FOOD SERVICES	20,850		20,850	21,405	-	21,405	555	3%	
	37	SECURITY SERVICES, FIRE & LIFE SAFETY	2,210		2,210	2,210	-	2,210	-	0%	
	38	C-Site Laboratory Medicine	9,245		9,245	9,245	-	9,245	-	0%	
Totals	**without C-Site**		**1,770,246**	**27,225**	**1,797,471**	**1,804,066**	**27,225**	**1,831,291**	**33,820**		
		with C-Site	1,779,491		1,806,716	1,813,311		1,840,536			
		UNASSIGNED				***14,130.00***					***not included in CGSF calculations/ PDC to reduce/ eliminate in Stage3***

** *Component gross areas are in progress and have been tested at a block level of detail. The Inpatient areas are currently trending at a higher gross up than programmed and will require further detail analysis in the next stage. The figures noted reflect a 1.57 gross up compared to 1.55 programmed. Current requirements for accessibility, clinical practice, and FFE have not been fully vetted which may put further pressure on area but pending further study and analysis the PDC team believe the targets can be met.*

THP Area Analysis

Level	Circulation	Mechanical	Mech- Shafts	Electrical	Elevators/Stairs	IT	Parking	Unassigned	Total	Comments
EXIT TRANSFER	-	-	-	-	28,827	-	-	-	29,570	
Level 0	23,938	7,068	-	9,325	11,820	1,454	-		205,513	
Level 1	27,993	-	2,002	2,600	10,210	604	-		190,946	
Level 2	21,973	-	2,232	2,603	11,195	625	-		193,023	
Level 3	17,339	-	3,253	2,605	11,010	620	-		179,019	
Level 4	10,811	-	3,787	2,592	10,460	620	-		179,786	
Level 5	12,000	-	3,890	2,605	10,806	620	-		172,286	
Level 6	11,409	-	4,016	2,603	10,557	620	-		166,739	
Level 7 MECH	2,642	138,866	-	7,616	9,535	-	-		166,740	
Level 8	13,411	-	2,092	2,610	10,087	611	-		166,728	
Level 9	7,168	-	2,111	2,094	8,802	611	-		115,112	
Level 10	6,037	-	2,116	1,261	6,261	611	-		75,564	
Level 11	5,986	-	2,116	1,261	5,283	611	-		74,598	
Level 12	5,807	-	2,128	1,333	5,653	614	-		78,008	
Level 13	5,811	-	2,128	1,284	5,653	611	-		78,008	
Level 14	5,811	-	2,128	1,280	5,653	611	-		78,008	
Level 15 MECH	2,496	60,787	-	3,204	4,760	-	-		78,008	
Level 16	5,854	-	2,126	1,273	5,502	614	-		78,008	
Level 17	5,854	-	2,126	1,273	5,502	614	-		78,008	
Level 18	5,853	-	2,126	1,273	5,502	614	-		78,008	
Level 19	5,847	-	2,126	1,273	5,494	614	-		78,008	
Level 20	5,847	-	2,126	1,273	5,494	614	-		78,008	
Level 21	5,854	-	2,126	1,273	5,502	614	-		78,008	
Level 22	4,704	20,651	1,854	853	5,125	307	-		70,571	
Level 23 MECH	2,184	26,387	-	16,935	4,729	-	-		54,139	
P1	-	-	-	-	-	442	192,044		-	NOT INCLUDED IN CALCULATED BGSF
P2	-	-	-	-	-	-	192,265		-	NOT INCLUDED IN CALCULATED BGSF
Total	**222,629**	**253,760**	**48,609**	**72,304**	**180,593**	**13,878**	**384,308**	**14,130**	**2,820,408**	

AS PER PROGRAM		DESIGNED AREAS			
	FP CGSF		**Revit CGSF Total**	**Designed CGSF Variance (SF)**	**Designed CGSF Variance (%)**
	FP CGSF 2026/27	1,770,246	Revit CGSF 2026/27	1,804,066	
	FP CGSF Increase 2031/32	27,225	Shell 2031/32	27,225	
	FP CGSF Total 2031/32	**1,797,471**	**Revit CGSF Total**	**1,831,291**	33,820	1.9%
			Unassigned	***14,130.00***	

	BGSF Range (SF)	**FP BGSF**	**Revit BGSF**	**Designed BGSF Max Variance (SF)**	**Designed BGSF Variance (%)**
	BGSF Max (1.53 GF)	**2,750,131**	**2,820,408**	70,278	2.6%
	BGSF Min (1.48 GF)	2,710,311			

Assumed Plant/Circ/Core SF	**Designed REVIT Plant/Circ/Cores SF**	**Designed Façade**	**TOT Designed REVIT Plant/Circ/ Shell&Core SF**	**Designed Plant/Circ/ Shell&Core Variance**	**Designed Plant/Circ/ Shell&Core Variance (%)**
952,660	791,773	183,215	**974,987**	(769,445)	2.3%

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Stage 2 Submission — By: — Appd: — 2020.12.18

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Title

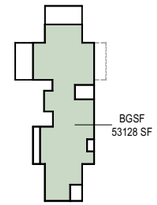
AREA ANALYSIS

Project No.
1400200191

Scale

Revision

Drawing No.
2.4.6.1-01



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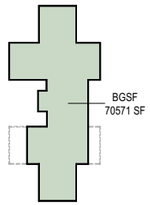

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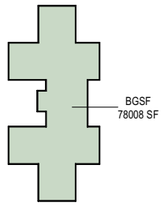

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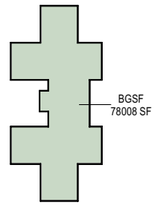

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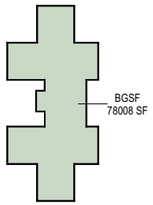

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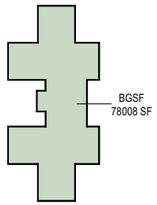

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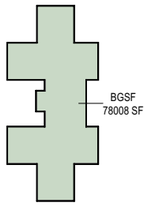

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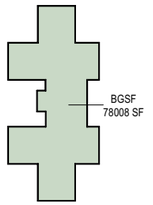

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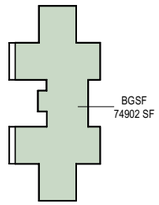

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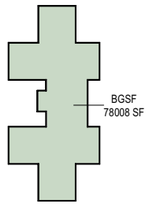

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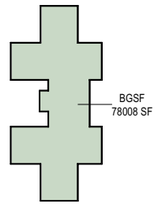

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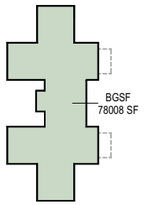

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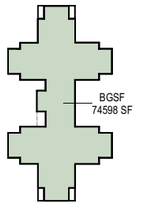

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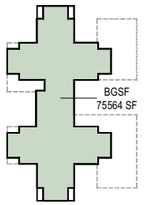

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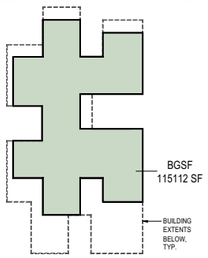

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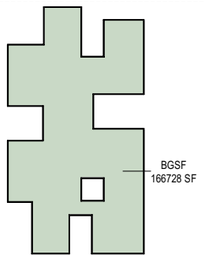

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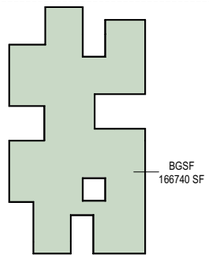

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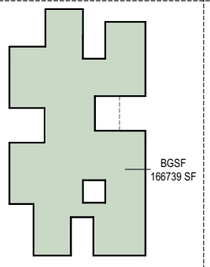

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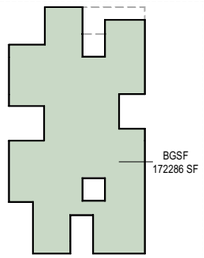

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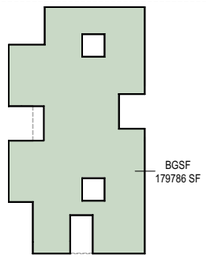

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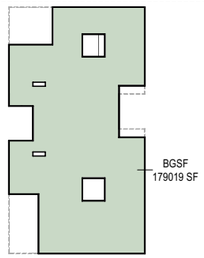

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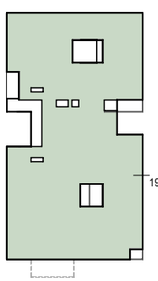

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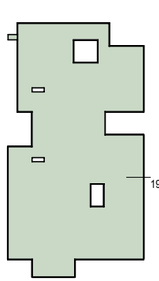

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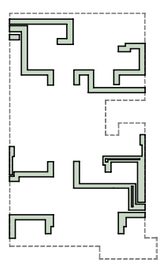

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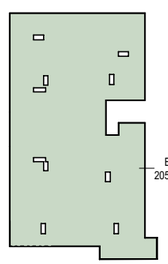

LEVEL 0
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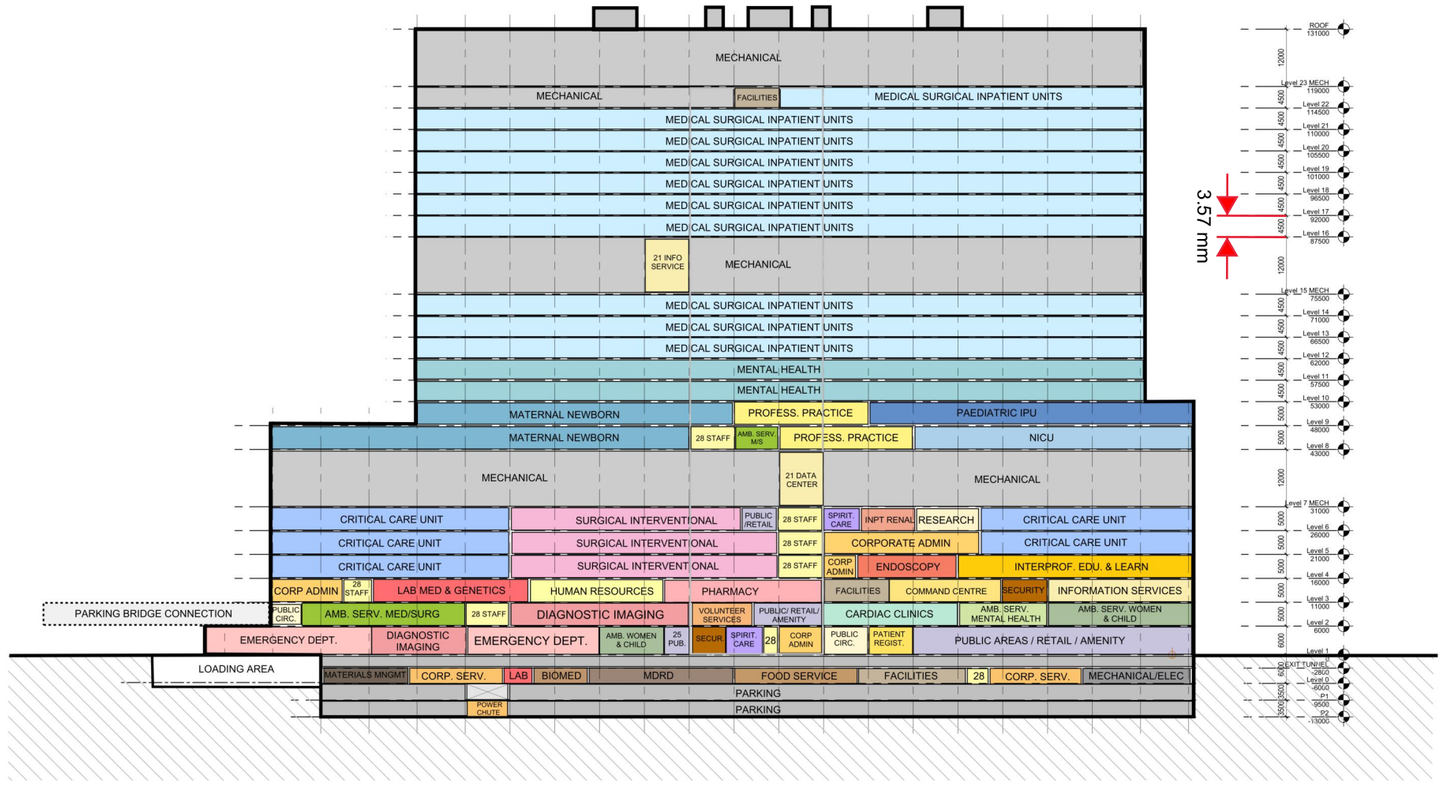
Title
KEY PLANS

Project No.
1400200191

Scale
1 : 2000

Revision

Drawing No.
2.4.6.1-02



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Title

STACKING DIAGRAM

Project No. 1402200191

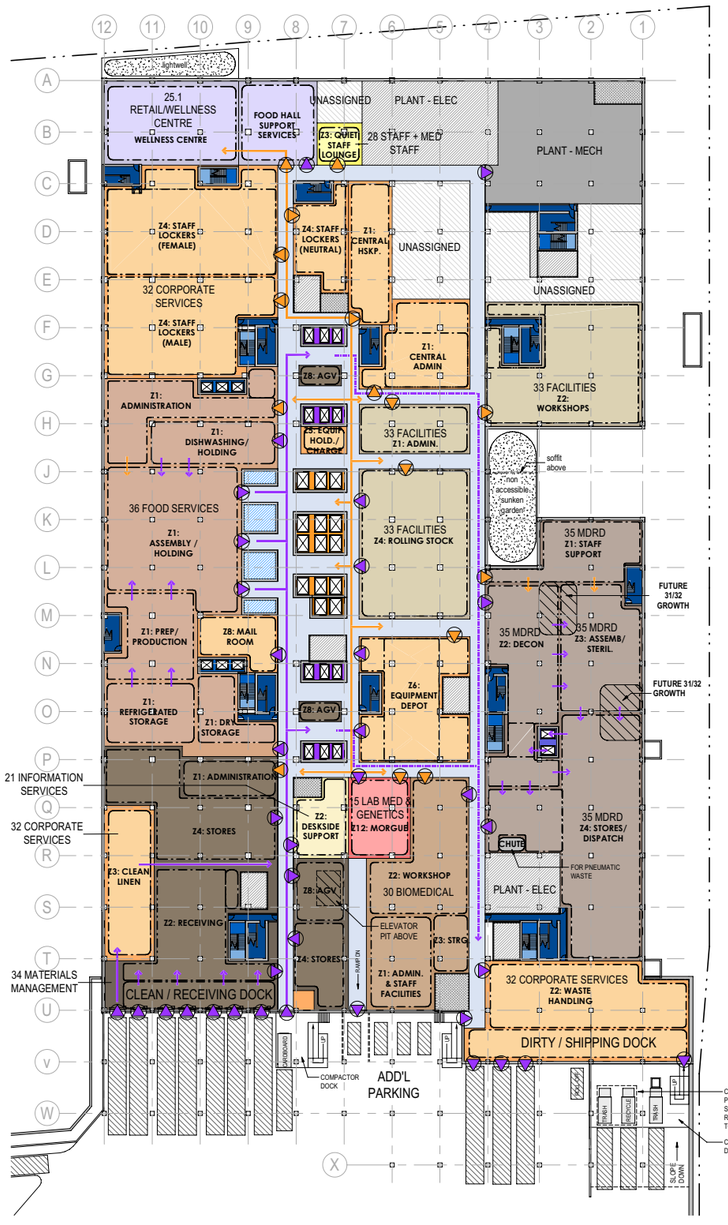
Scale

Revision

Drawing No. **2.4.6.1-03**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 15 LAB MED & GENETICS
- 21 INFORMATION SERVICES
- 25.1 RETAIL/WELLNESS CENTRE
- 28 STAFF + MED STAFF
- 30 BIOMEDICAL
- 32 CORPORATE SERVICES
- 33 FACILITIES
- 34 MATERIALS MANAGEMENT
- 35 MDRD
- 36 FOOD SERVICES
- CIRCULATION PAT/STAFF
- ELEVATOR LABOUR/ DELIVERY
- ELEVATOR PARKING
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC - OVERRUN
- ELEVATOR SERVICE
- ELEVATOR SERVICE - MDR
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH
- STAIRS
- STAIRS PARKING
- UNASSIGNED

0 5 10 20 30 40 50

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LEVEL 0 DEPARTMENTAL ZONE STUDY

Project No.
1400200191

Scale
As indicated

Revision

Drawing No.
2.4.6.2-00

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
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- ENTRANCE - PUBLIC
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- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
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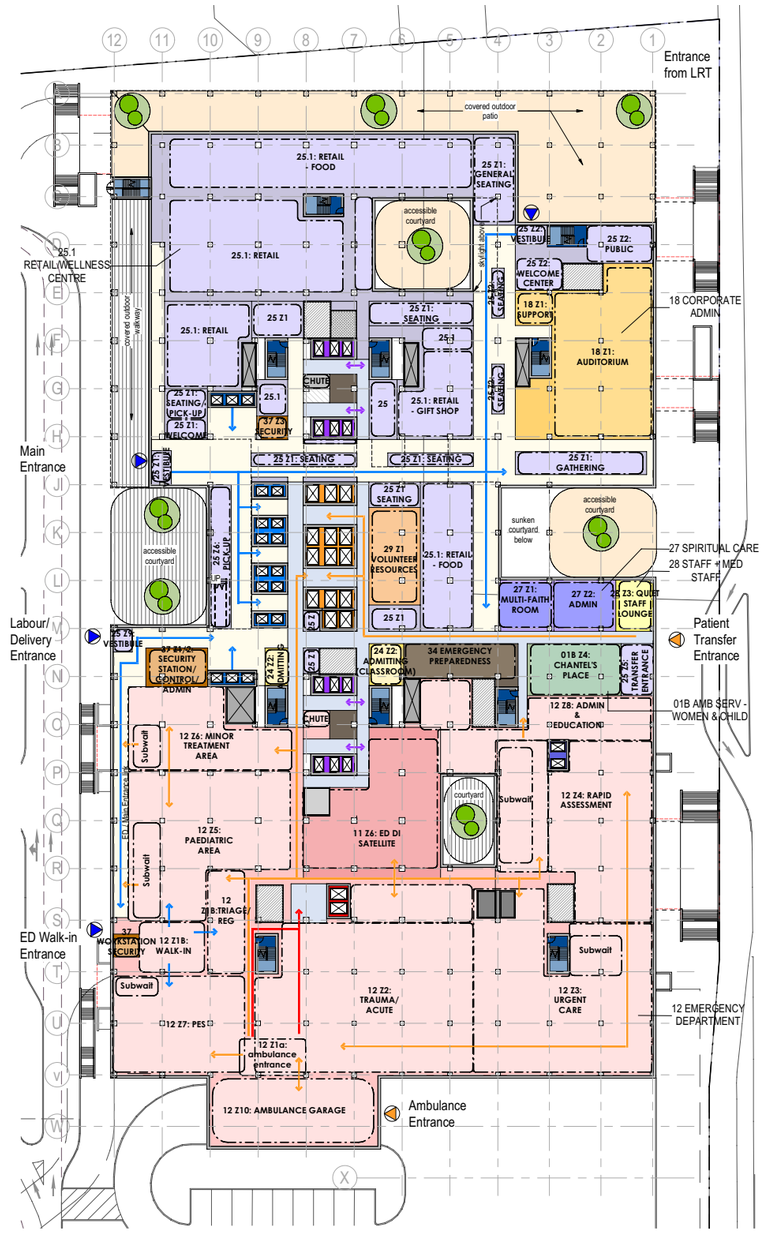
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 01B AMB SERV - WOMEN & CHILD
- 11 DIAGNOSTIC IMAGING
- 12 EMERGENCY DEPARTMENT
- 18 CORPORATE ADMIN
- 24 PATIENT REGISTRATION
- 25 PUBLIC AREAS, RETAIL & AMENITY
- 25.1 RETAIL/WELLNESS CENTRE
- 27 SPIRITUAL CARE
- 28 STAFF + MED STAFF
- 29 VOLUNTEER RESOURCES
- 34 MATERIALS MANAGEMENT
- 37 SECURITY SERVICES, FIRE & LIFE SAFETY
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR LABOUR/ DELIVERY
- ELEVATOR PARKING
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- ELEVATOR SERVICE - MDR
- ELEVATOR TRAUMA
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS
- UNASSIGNED

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Title

LEVEL 1 DEPARTMENTAL ZONE STUDY

Project No. 1400200191

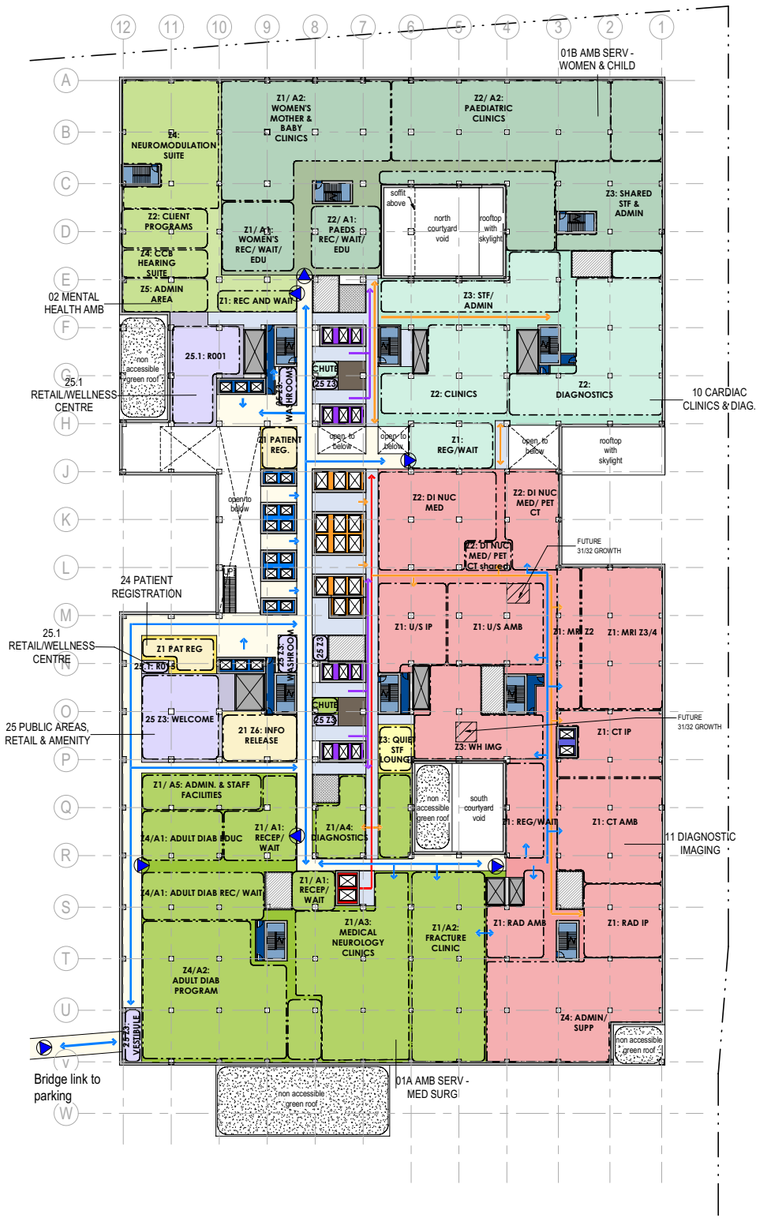
Scale As indicated

Revision

Drawing No. **2.4.6.2-01**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 01A AMB SERV - MED SURG
- 01B AMB SERV - WOMEN & CHILD
- 02 MENTAL HEALTH AMB
- 10 CARDIAC CLINICS & DIAG.
- 11 DIAGNOSTIC IMAGING
- 21 INFORMATION SERVICES
- 24 PATIENT REGISTRATION
- 25 PUBLIC AREAS, RETAIL & AMENITY
- 25.1 RETAIL/WELLNESS CENTRE
- 28 STAFF + MED STAFF
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR LABOUR/ DELIVERY
- ELEVATOR PARKING
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- ELEVATOR SERVICE - MDR
- ELEVATOR TRAUMA
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS

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Title

LEVEL 2 DEPARTMENTAL ZONE STUDY

Project No. 1400200191

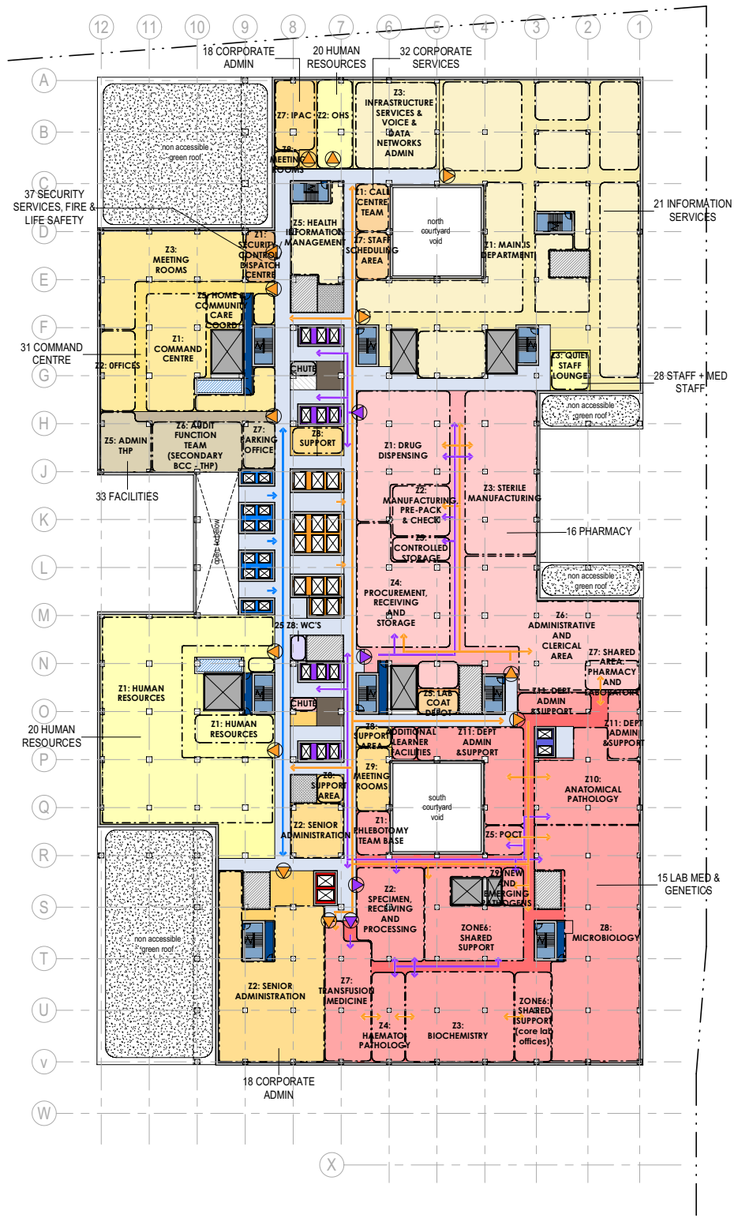
Scale As indicated

Revision

Drawing No. **2.4.6.2-02**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 15 LAB MED & GENETICS
- 16 PHARMACY
- 18 CORPORATE ADMIN
- 20 HUMAN RESOURCES
- 21 INFORMATION SERVICES
- 25 PUBLIC AREAS, RETAIL & AMENITY
- 28 STAFF + MED STAFF
- 31 COMMAND CENTRE
- 32 CORPORATE SERVICES
- 33 FACILITIES
- 34 MATERIALS MANAGEMENT
- 37 SECURITY SERVICES, FIRE & LIFE SAFETY
- CIRCULATION PAT/STAFF
- ELEVATOR LABOUR/ DELIVERY
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR PUBLIC - PARKING - OVERRUN
- ELEVATOR SERVICE
- ELEVATOR SERVICE - MDR
- ELEVATOR TRAUMA
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS
- UNASSIGNED

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Stage 2 Submission			2020.12.18

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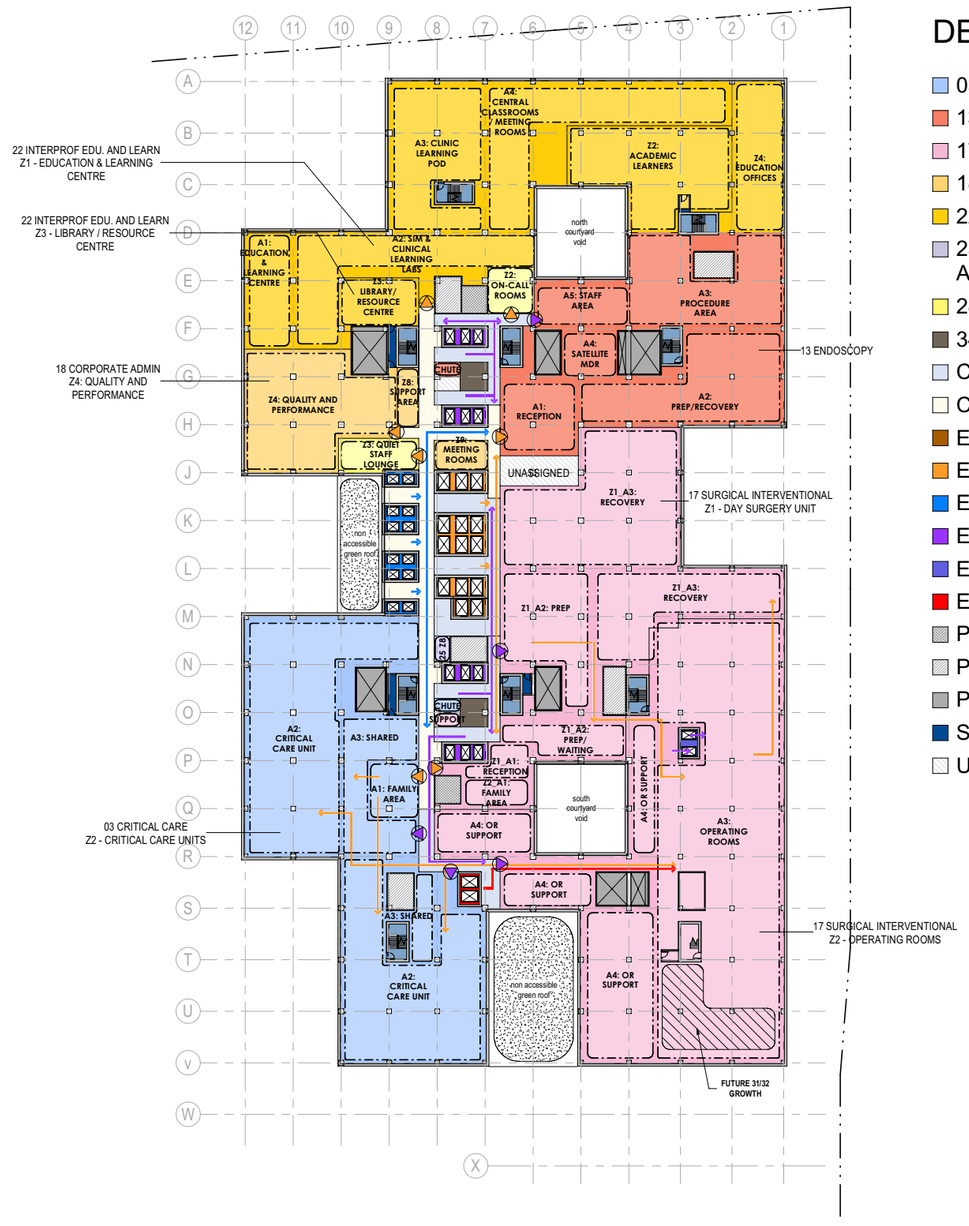
LEVEL 3 DEPARTMENTAL ZONE STUDY

Project No. 1400200191 — Scale As indicated

Revision — Drawing No. **2.4.6.2-03**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 03 CRITICAL CARE
- 13 ENDOSCOPY
- 17 SURGICAL INTERVENTIONAL
- 18 CORPORATE ADMIN
- 22 INTERPROF EDU. AND LEARN
- 25 PUBLIC AREAS, RETAIL & AMENITY
- 28 STAFF + MED STAFF
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR LABOUR/ DELIVERY
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- ELEVATOR SERVICE - MDR
- ELEVATOR TRAUMA
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS
- UNASSIGNED

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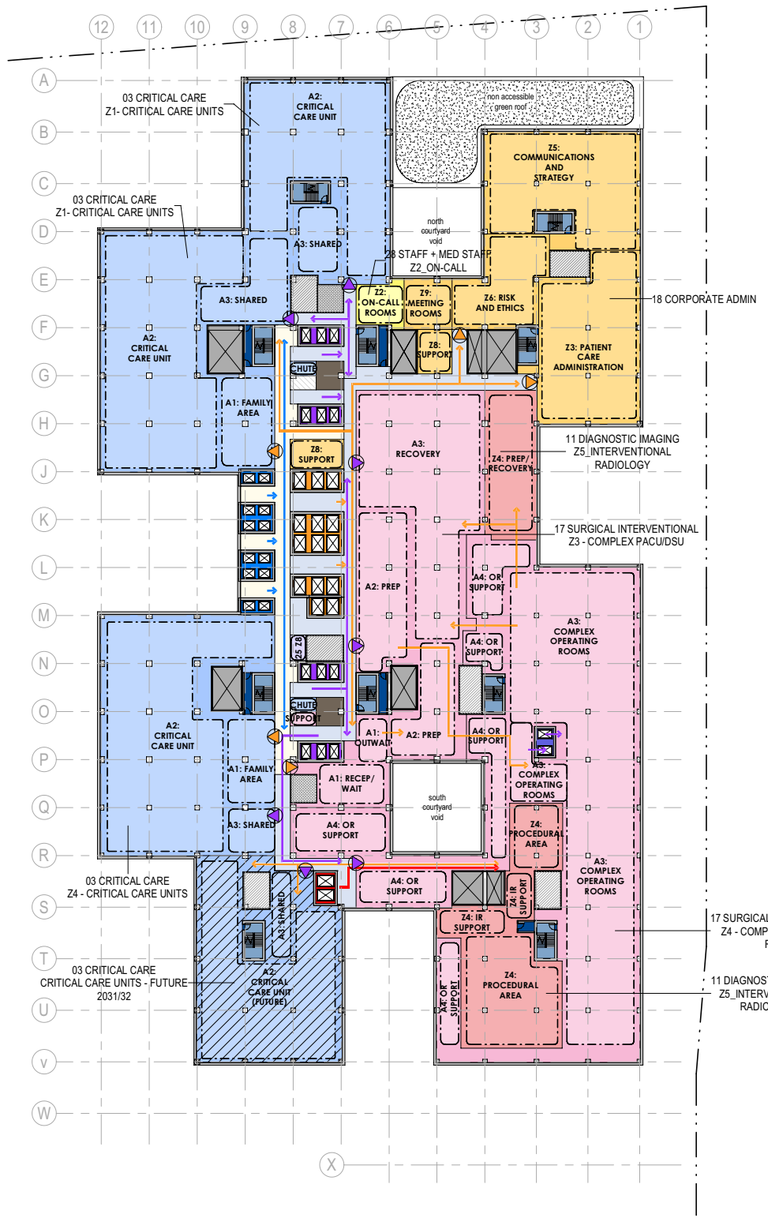
LEVEL 4 DEPARTMENTAL ZONE STUDY

Project No.	Scale
1400200191	As indicated
Revision	Drawing No.
	2.4.6.2-04

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 03 CRITICAL CARE
- 11 DIAGNOSTIC IMAGING
- 17 SURGICAL INTERVENTIONAL
- 18 CORPORATE ADMIN
- 25 PUBLIC AREAS, RETAIL & AMENITY
- 28 STAFF + MED STAFF
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR LABOUR/ DELIVERY
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- ELEVATOR SERVICE - MDR
- ELEVATOR TRAUMA
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS
- UNASSIGNED

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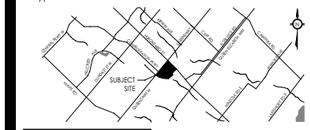

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Stage 2 Submission			2020.12.18

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LEVEL 5 DEPARTMENTAL ZONE STUDY

Project No. 1400200191

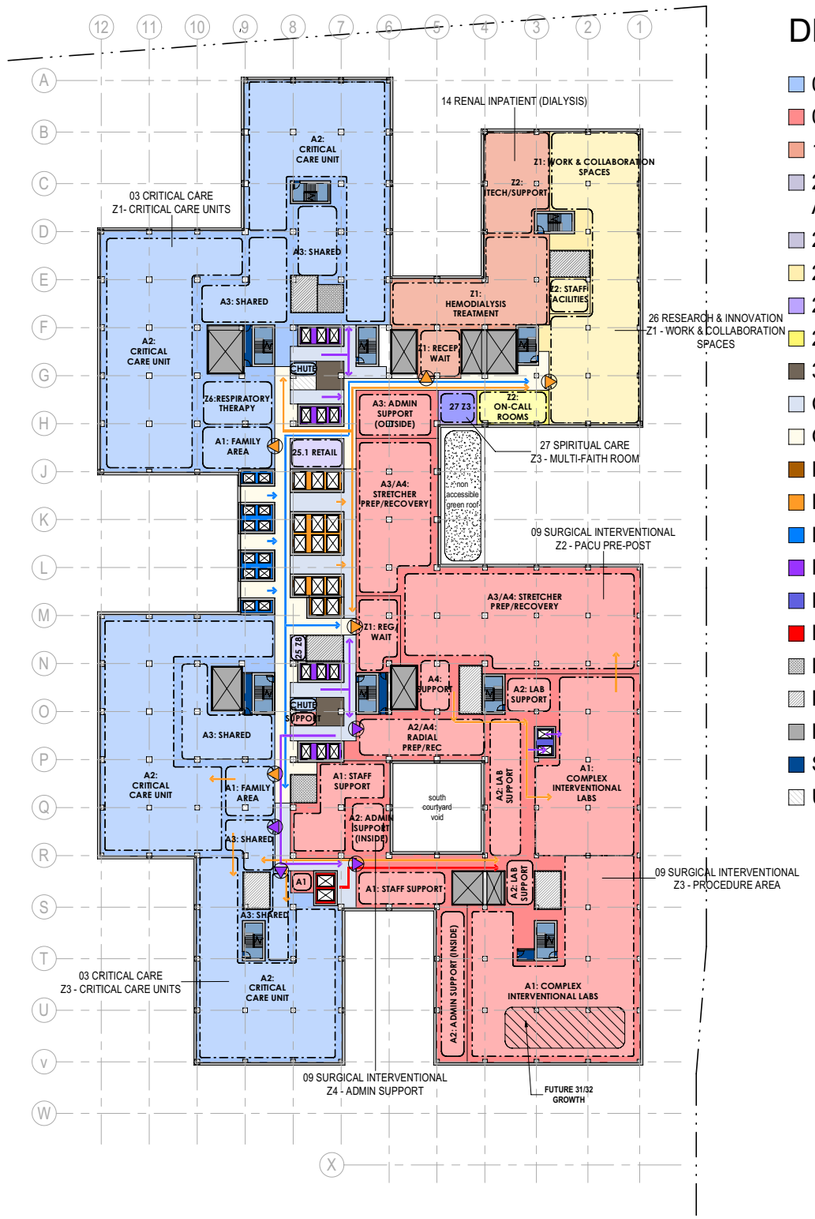
Scale As indicated

Revision

Drawing No. **2.4.6.2-05**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 03 CRITICAL CARE
- 09 SURGICAL INTERVENTIONAL
- 14 RENAL INPATIENT (DIALYSIS)
- 25 PUBLIC AREAS, RETAIL & AMENITY
- 25.1 RETAIL/WELLNESS CENTRE
- 26 RESEARCH & INNOVATION
- 27 SPIRITUAL CARE
- 28 STAFF + MED STAFF
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR LABOUR/ DELIVERY
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- ELEVATOR SERVICE - MDR
- ELEVATOR TRAUMA
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS
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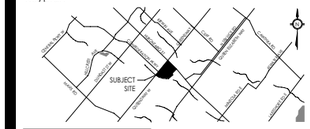

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LEVEL 6 DEPARTMENTAL ZONE STUDY

Project No. 1400200191

Scale As indicated

Revision

Drawing No. **2.4.6.2-06**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
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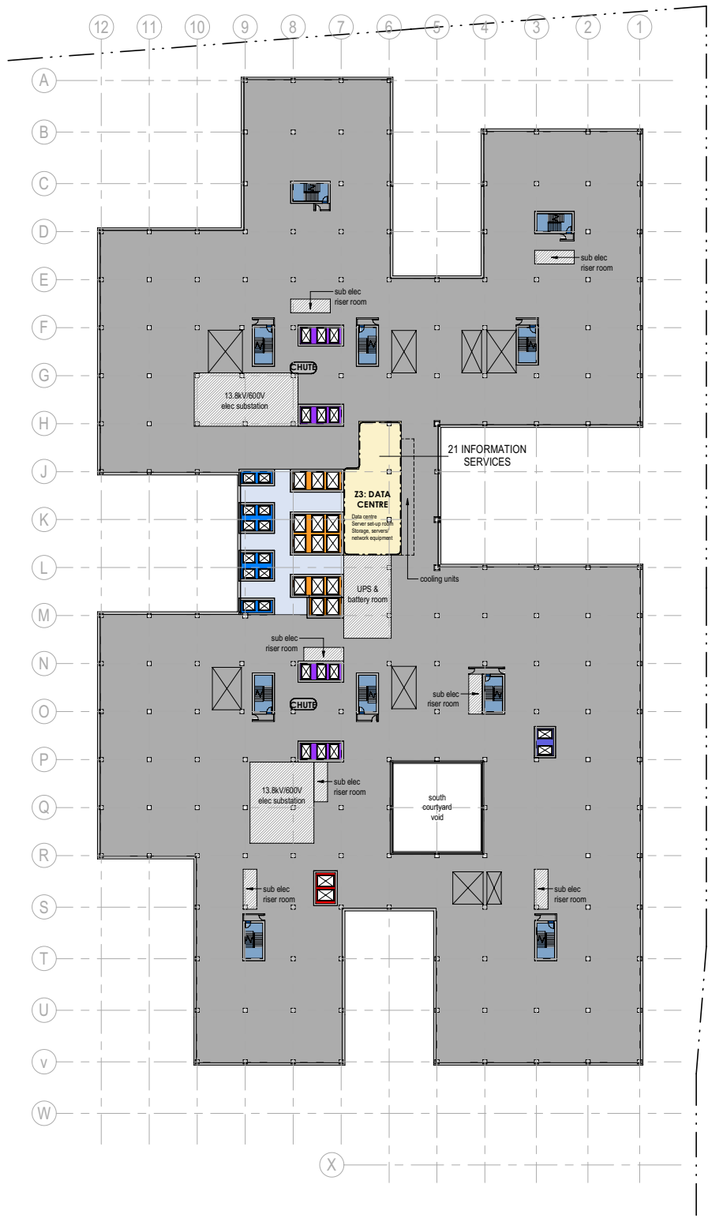
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 21 INFORMATION SERVICES
- CIRCULATION PAT/STAFF
- ELEVATOR LABOUR/ DELIVERY
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- ELEVATOR SERVICE - MDR
- ELEVATOR TRAUMA
- PLANT - ELEC
- PLANT - MECH
- STAIRS

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LEVEL 7 DEPARTMENTAL ZONE STUDY

Project No. 1400200191

Scale As indicated

Revision

Drawing No. **2.4.6.2-07**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
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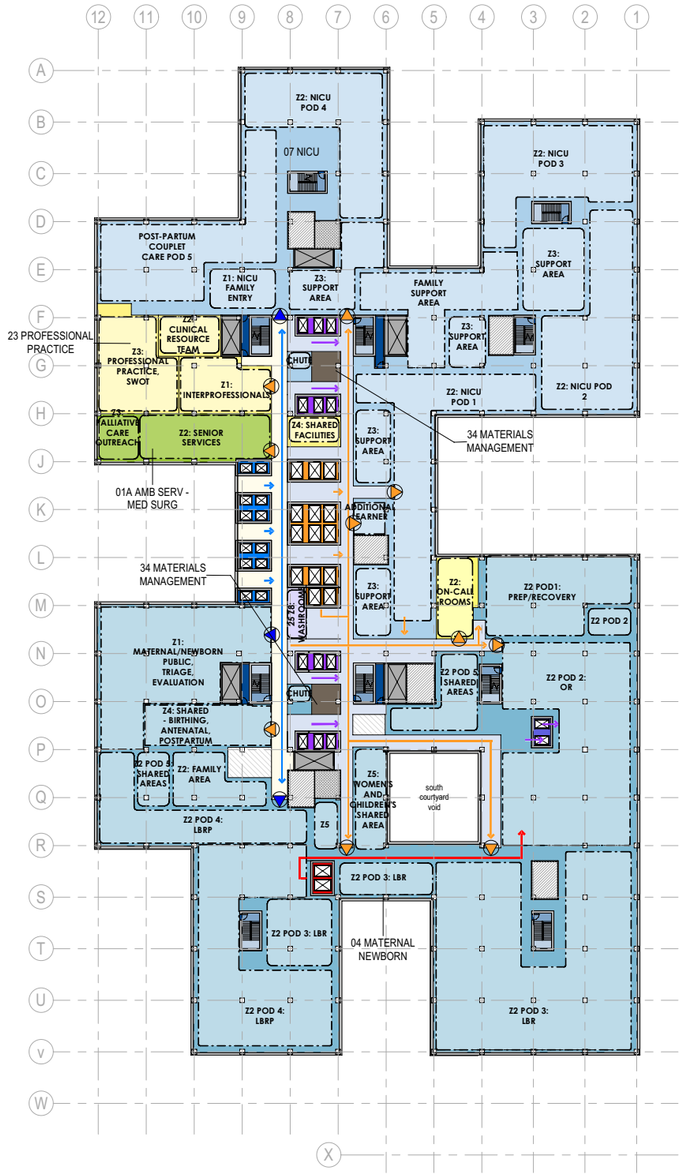
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 01A AMB SERV - MED SURG
- 04 MATERNAL NEWBORN
- 07 NICU
- 23 PROFESSIONAL PRACTICE
- 25 PUBLIC AREAS, RETAIL & AMENITY
- 28 STAFF + MED STAFF
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR LABOUR/ DELIVERY
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- ELEVATOR SERVICE - MDR
- ELEVATOR TRAUMA
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS
- UNASSIGNED

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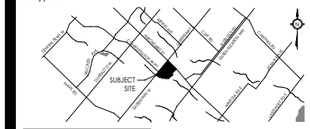

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Stage 2 Submission				2020.12.18
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LEVEL 8 DEPARTMENTAL ZONE STUDY

Project No. 1400200191

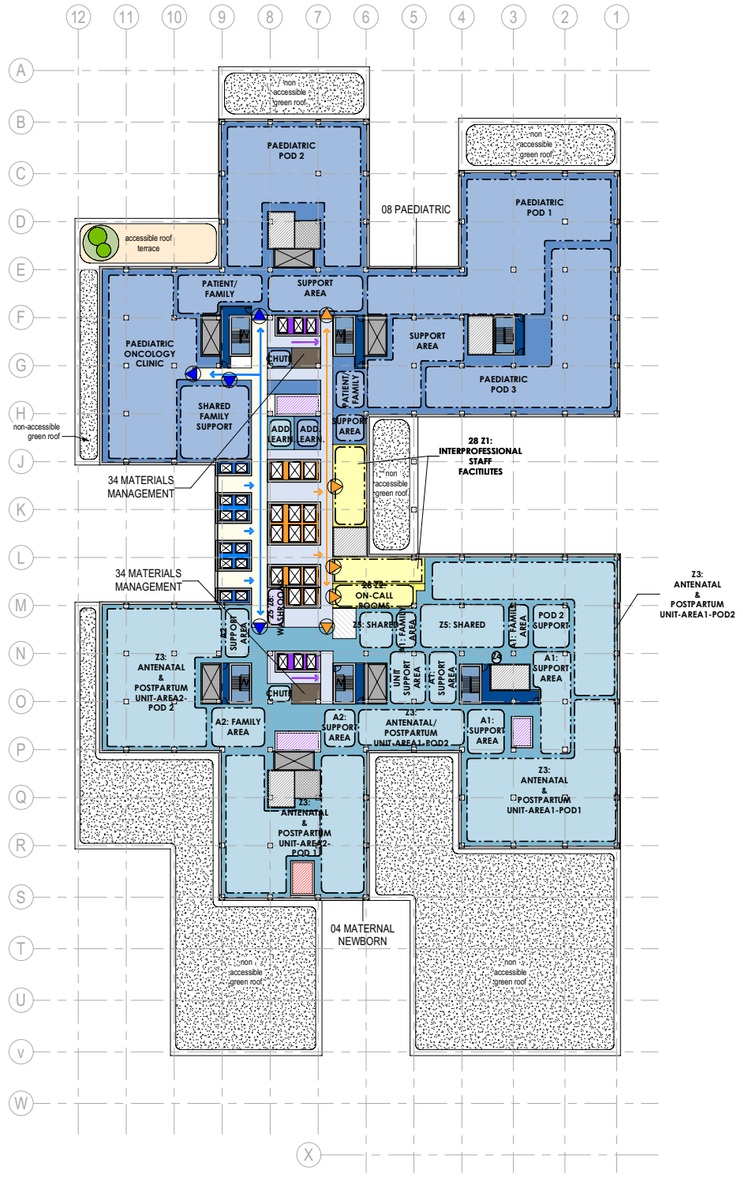
Scale As indicated

Revision

Drawing No. **2.4.6.2-08**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 04 MATERNAL NEWBORN
- 08 PAEDIATRIC
- 25 PUBLIC AREAS, RETAIL & AMENITY
- 28 STAFF + MED STAFF
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR LABOUR/ DELIVERY
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- ELEVATOR SERVICE - OVERRUN
- ELEVATOR TRAUMA - OVERRUN
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS
- UNASSIGNED

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LEVEL 9 DEPARTMENTAL ZONE STUDY

Project No. 1400200191

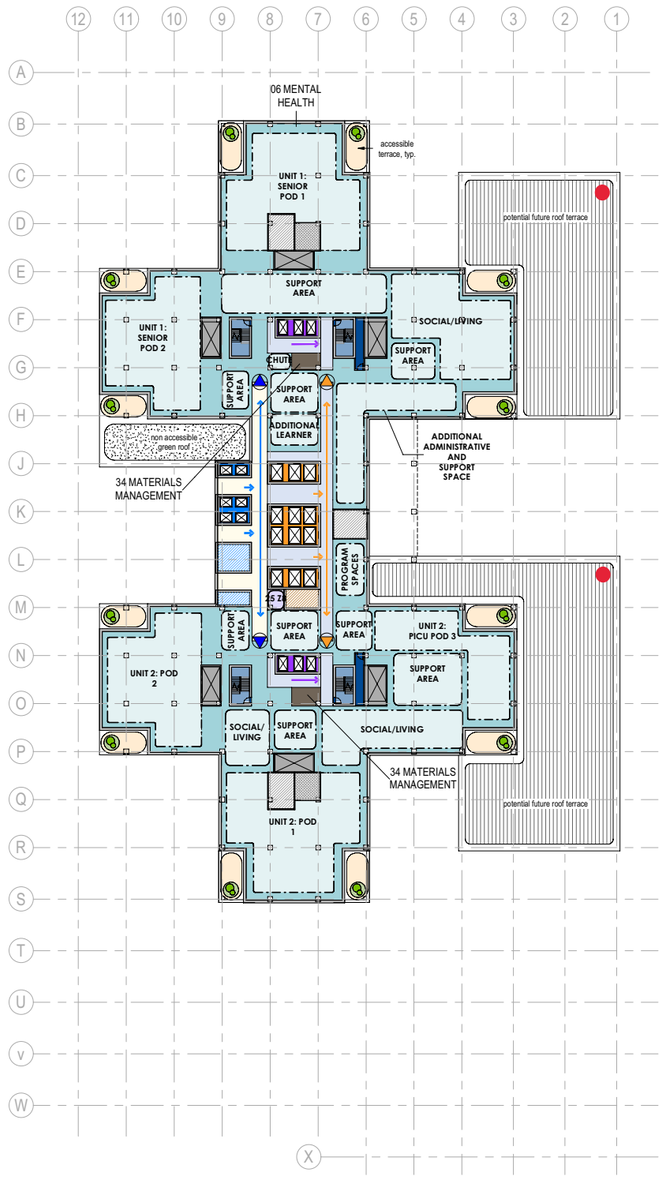
Scale As indicated

Revision

Drawing No. **2.4.6.2-09**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 06 MENTAL HEALTH
- 25 PUBLIC AREAS, RETAIL & AMENITY
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR LABOUR/ DELIVERY - OVERRUN
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR PUBLIC - OVERRUN
- ELEVATOR SERVICE
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS

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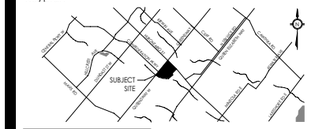

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	Dwn.	Dsgn.	Chkd.	10/07/20 YYYY.MM.DD

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LEVEL 10 DEPARTMENTAL ZONE STUDY

Project No.	Scale
1400200191	As indicated
Revision	Drawing No.
	2.4.6.2-10

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
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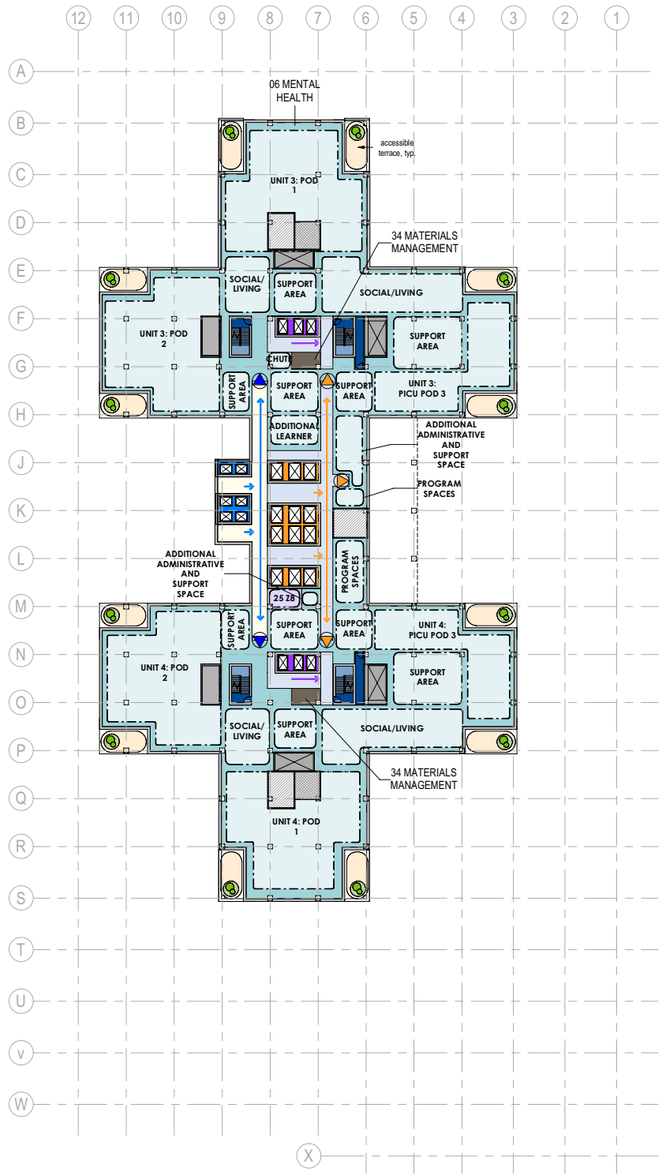
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 06 MENTAL HEALTH
- 25 PUBLIC AREAS, RETAIL & AMENITY
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS

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LEVEL 11 DEPARTMENTAL ZONE STUDY

Project No. 1400200191

Scale As indicated

Revision

Drawing No. **2.4.6.2-11**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
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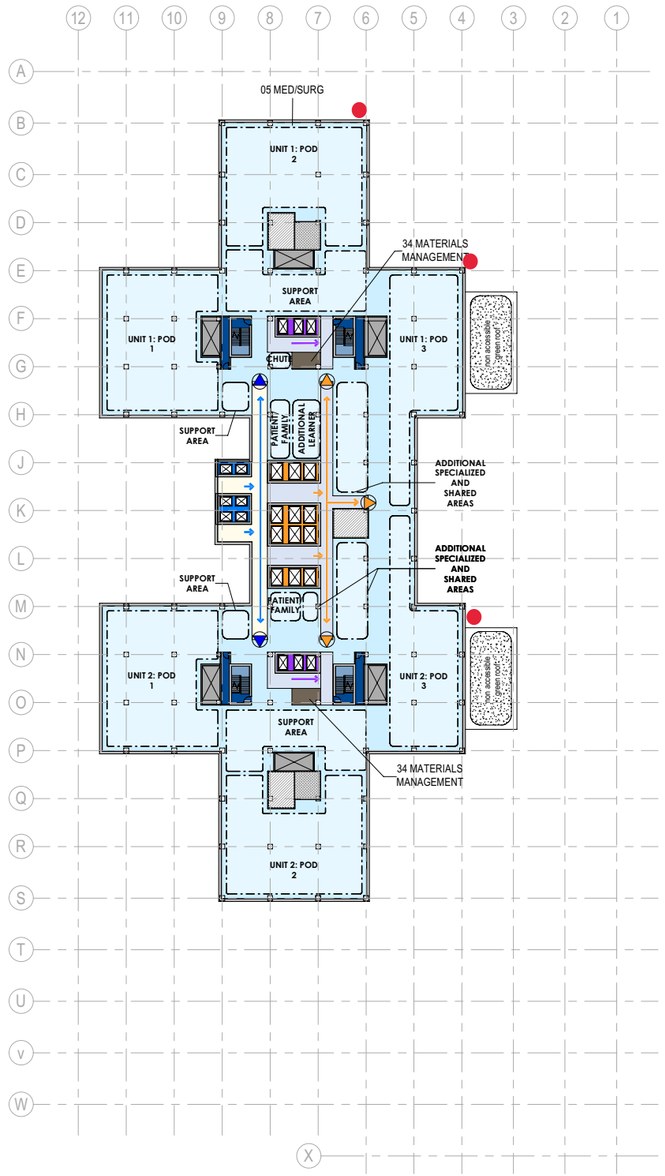
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 05 MED/SURG
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS

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LEVEL 12 DEPARTMENTAL ZONE STUDY

Project No. 1400200191

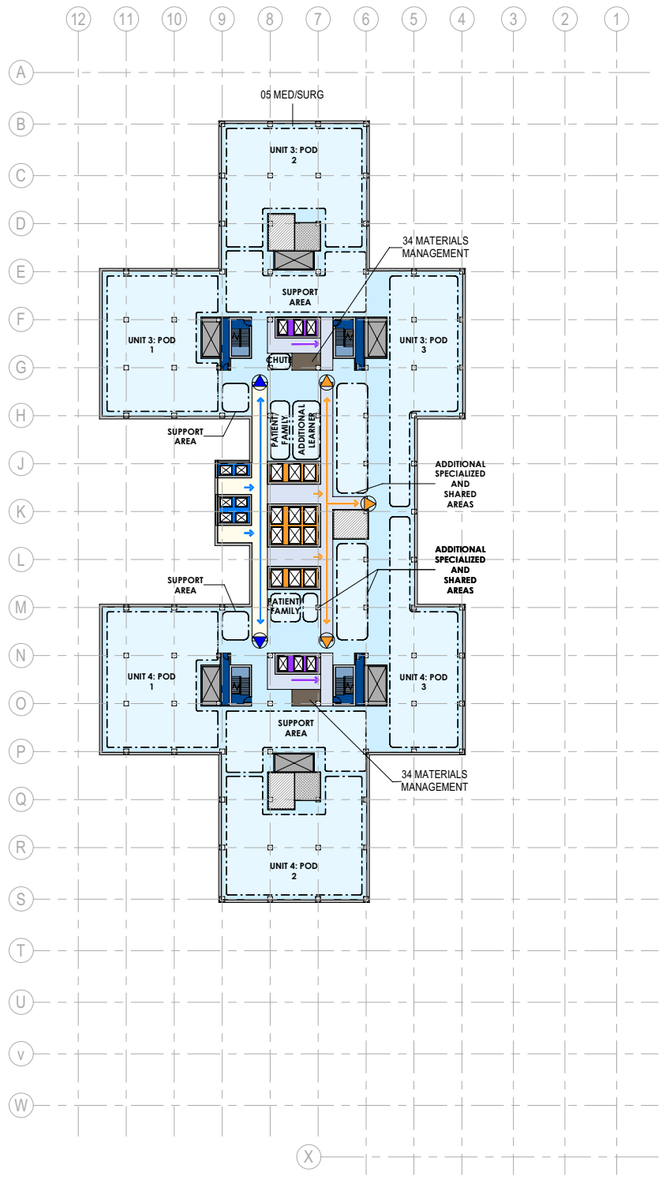
Scale As indicated

Revision

Drawing No. **2.4.6.2-12**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 05 MED/SURG
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS

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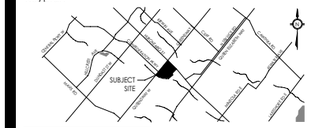

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Stage 2 Submission				2020.12.18
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LEVEL 13 DEPARTMENTAL ZONE STUDY

Project No. 1400200191

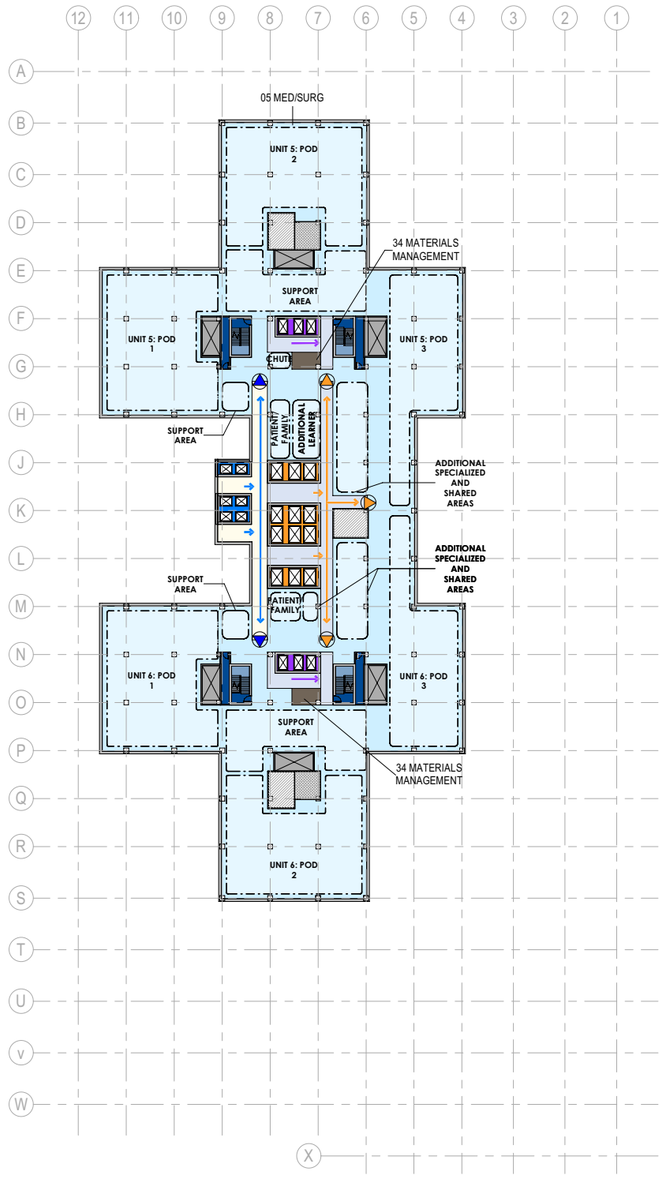
Scale As indicated

Revision

Drawing No. **2.4.6.2-13**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 05 MED/SURG
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS

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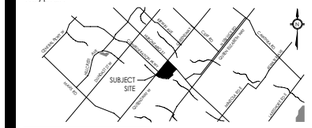

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Notes

Stage 2 Submission				2020.12.18
Issued/Revision		By	Appd	YYYY.MM.DD
File Name: N/A	Author Dwn.	Designer Dsgn.	Checker Chkd.	12/06/20 YYYY.MM.DD

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Title

LEVEL 14 DEPARTMENTAL ZONE STUDY

Project No. 1400200191

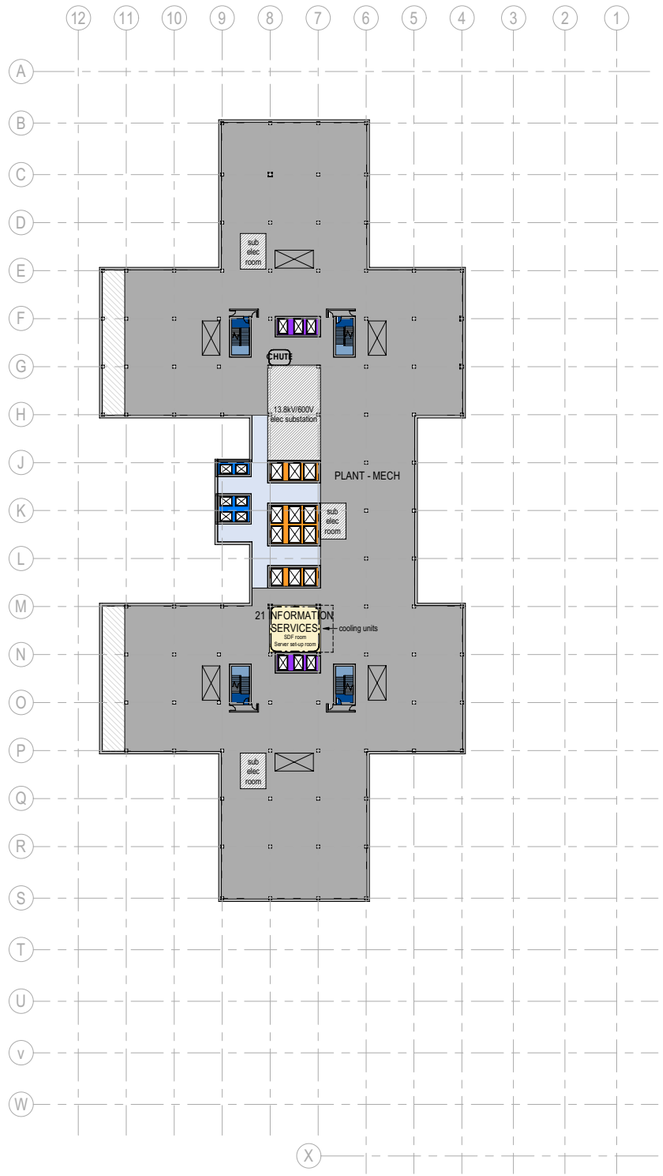
Scale As indicated

Revision

Drawing No. **2.4.6.2-14**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 21 INFORMATION SERVICES
- CIRCULATION PAT/STAFF
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- PLANT - ELEC
- PLANT - MECH
- STAIRS
- UNASSIGNED

0 5 10 20 30 40 50

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Issued/Revision	By	Appd	
Stage 2 Submission			2020.12.18 YYYY.MM.DD

File Name: N/A — Author Dwn. — Designer Dsgn. — Checker Chkd. — 12/06/20 YYYY.MM.DD

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Title

LEVEL 15 DEPARTMENTAL ZONE STUDY

Project No. 1400200191

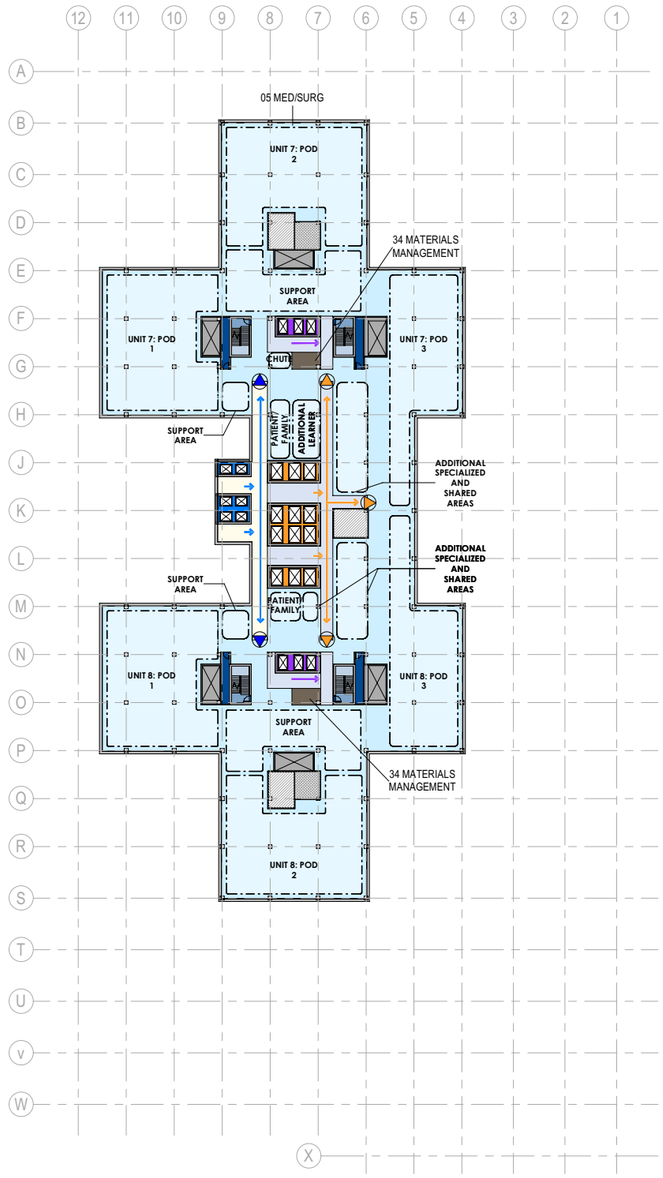
Scale As indicated

Revision

Drawing No. **2.4.6.2-15**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 05 MED/SURG
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS

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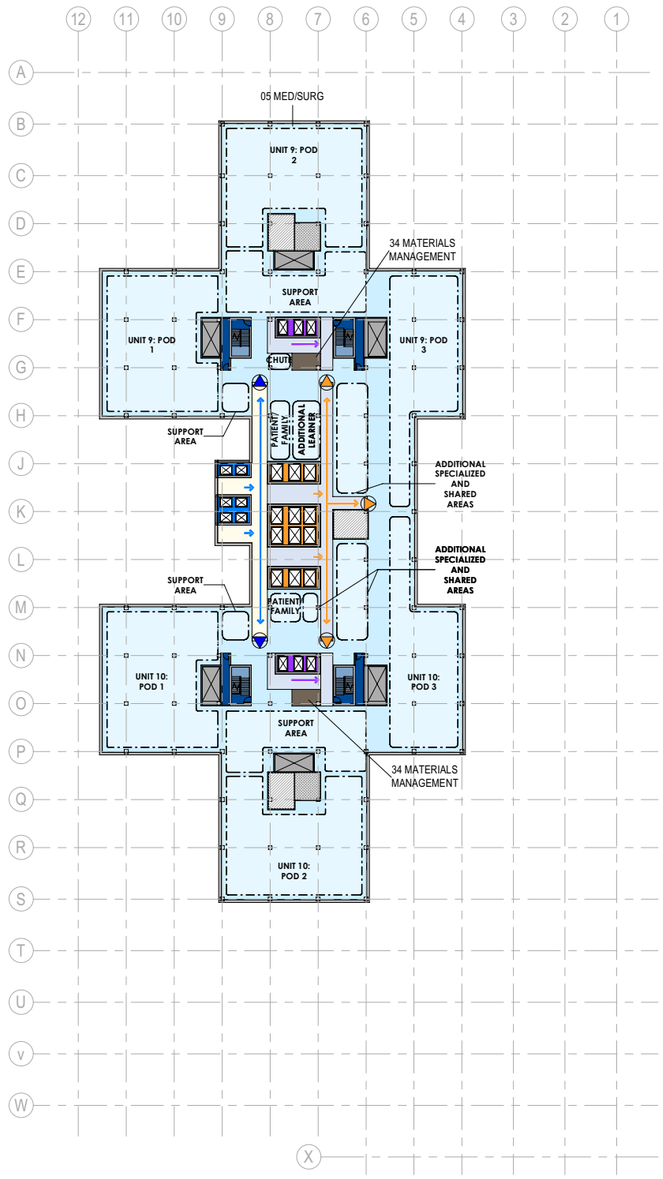
Title

LEVEL 16 DEPARTMENTAL ZONE STUDY

Project No.	Scale
1400200191	As indicated
Revision	Drawing No.
	2.4.6.2-16

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 05 MED/SURG
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS

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Title

LEVEL 17 DEPARTMENTAL ZONE STUDY

Project No.
1400200191

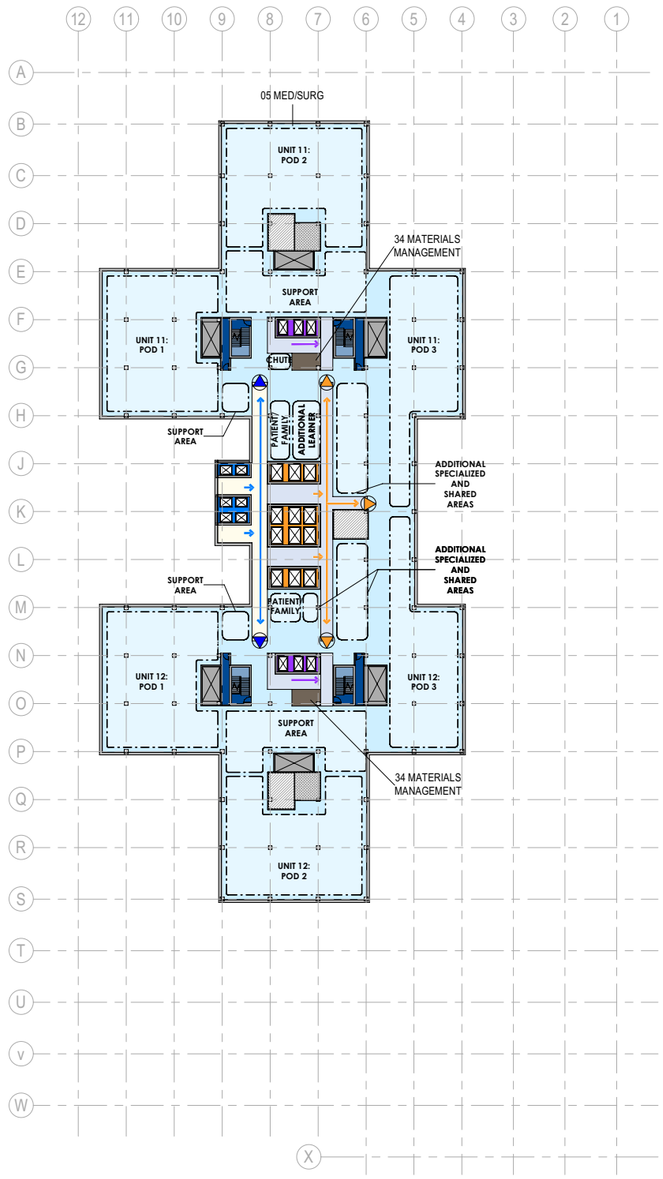
Scale
As indicated

Revision

Drawing No.
2.4.6.2-17

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 05 MED/SURG
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS

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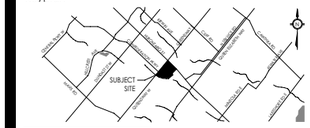

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Notes

Stage 2 Submission				2020.12.18
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LEVEL 18 DEPARTMENTAL ZONE STUDY

Project No.
1400200191

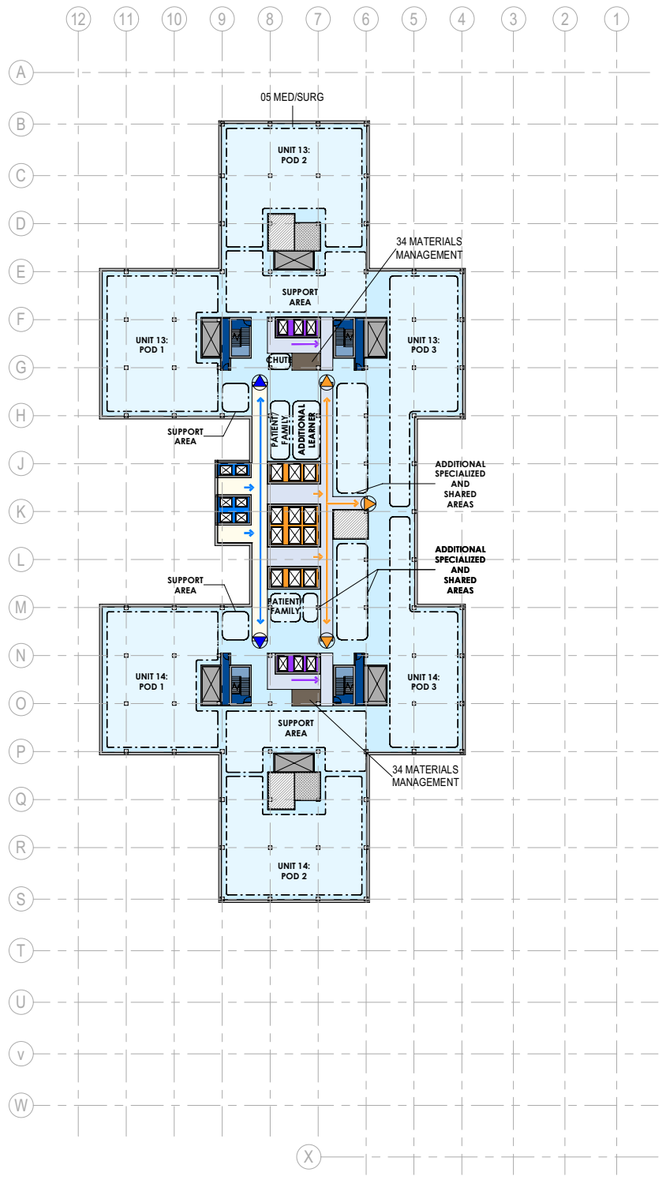
Scale
As indicated

Revision

Drawing No.
2.4.6.2-18

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 05 MED/SURG
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS

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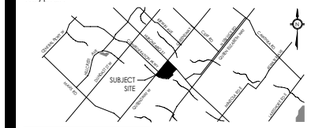

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Notes

Stage 2 Submission				2020.12.18
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LEVEL 19 DEPARTMENTAL ZONE STUDY

Project No. 1400200191

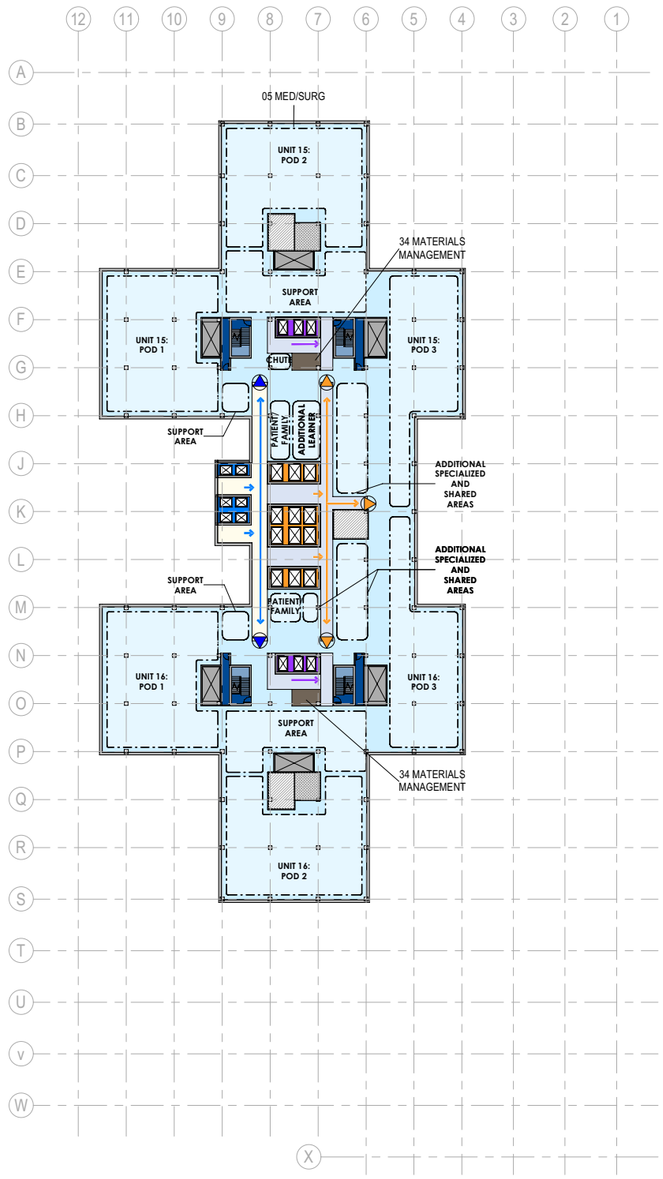
Scale As indicated

Revision

Drawing No. **2.4.6.2-19**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 05 MED/SURG
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS

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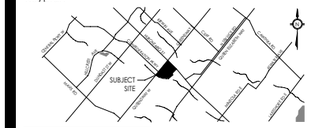
Keyplan



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Notes

Stage 2 Submission				2020.12.18
Issued/Revision		By	Appd	YYYY.MM.DD
File Name: N/A	Author Dwn.	Designer Dsgn.	Checker Chkd.	12/06/20 YYYY.MM.DD

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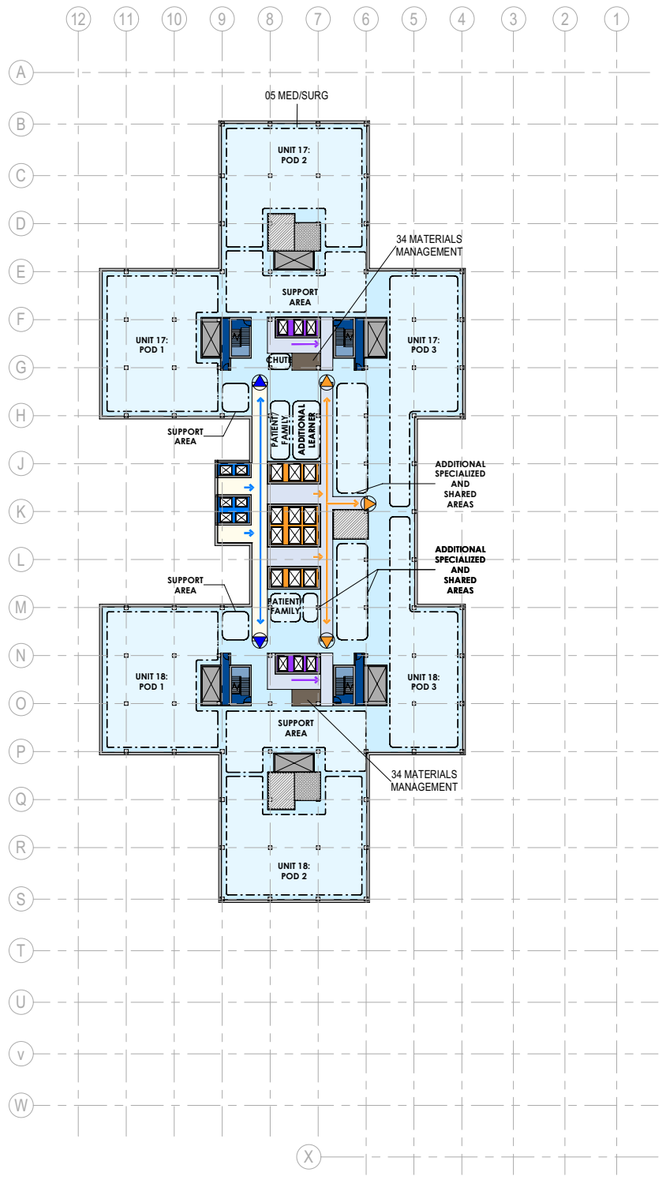
Title

LEVEL 20 DEPARTMENTAL ZONE STUDY

Project No.	Scale
1400200191	As indicated
Revision	Drawing No.
	2.4.6.2-20

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 05 MED/SURG
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH SHAFT
- STAIRS

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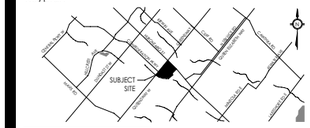

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LEVEL 21 DEPARTMENTAL ZONE STUDY

Project No.
1400200191

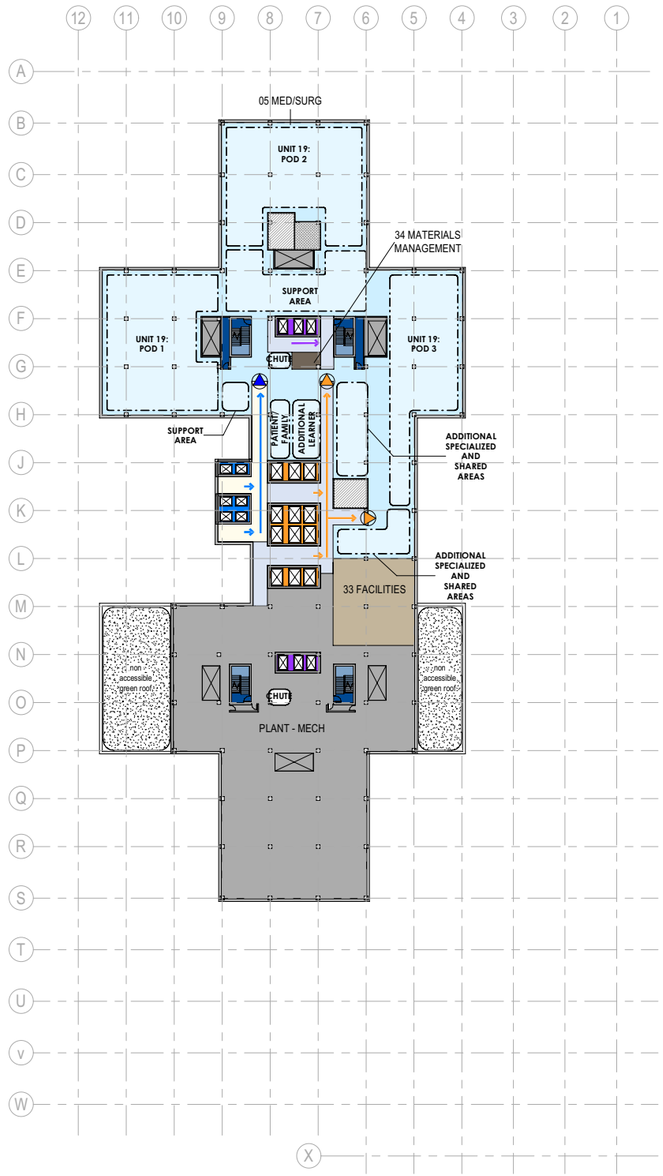
Scale
As indicated

Revision

Drawing No.
2.4.6.2-21

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- 05 MED/SURG
- 33 FACILITIES
- 34 MATERIALS MANAGEMENT
- CIRCULATION PAT/STAFF
- CIRCULATION PUBLIC
- ELEVATOR PAT/STAFF
- ELEVATOR PUBLIC
- ELEVATOR SERVICE
- PLANT - COMMS
- PLANT - ELEC
- PLANT - MECH
- PLANT - MECH SHAFT
- STAIRS

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Issued/Revision	By	Appd	
Stage 2 Submission			2020.12.18

File Name: N/A — Author Dwn. — Designer Dsgn. — Checker Chkd. — 12/06/20 YYYY.MM.DD

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Client/Project

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Title

LEVEL 22 DEPARTMENTAL ZONE STUDY

Project No. 1400200191

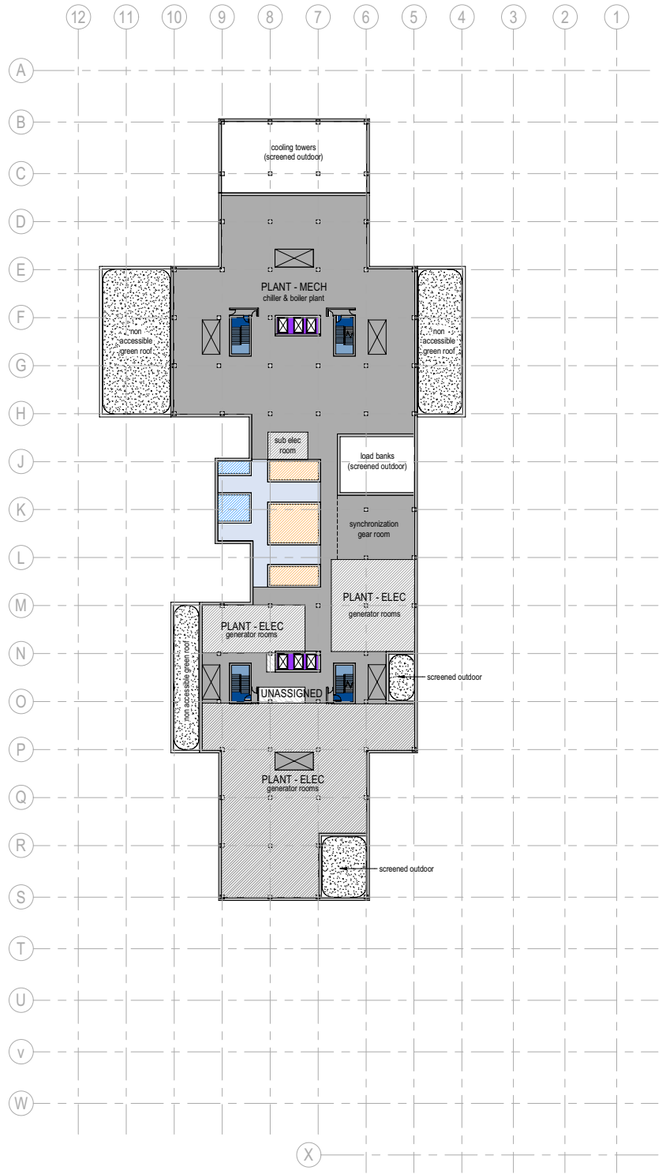
Scale As indicated

Revision

Drawing No. **2.4.6.2-22**

DEPARTMENTAL ZONE LEGEND

- PROGRAMMED OUTDOOR SPACE
- NON ACCESSIBLE GREEN SPACE/ROOF
- PROPOSED GREEN SPACE/ADD. ALT
- ENTRANCE - PUBLIC
- ENTRANCE - PATIENT/STAFF
- ENTRANCE - SERVICE
- FLOW LINE - PUBLIC
- FLOW LINE - PATIENT/STAFF
- FLOW LINE - SERVICE
- FLOW LINE - TRAUMA



DEPARTMENTS

- CIRCULATION PAT/STAFF
- ELEVATOR PAT/STAFF - OVERRUN
- ELEVATOR PUBLIC - OVERRUN
- ELEVATOR SERVICE
- PLANT - ELEC
- PLANT - MECH
- STAIRS
- UNASSIGNED

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Keyplan

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Notes

Issued/Revision	By	Appd	
Stage 2 Submission			2020.12.18

File Name: N/A	Author	Designer	Checker	
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			12/06/20	YYYY.MM.DD

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Client/Project

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Title

LEVEL 23 DEPARTMENTAL ZONE STUDY

Project No.	Scale
1400200191	As indicated
Revision	Drawing No.
	2.4.6.2-23

APPENDIX E
Traffic Data (Queensway West)

Date: March 4, 2021
From: Deborah Hunt-Kansal, Stantec
Re: Traffic Data Request – Queensway W. (0.3 km West of Highway 10 (Hurontario Street))

Deborah,
As per your request, we are providing the following 2019 traffic data:

	Existing	Ultimate
24 Hour Traffic Volume	31,176	32,400
# of Lanes	4	4
Day/Night Split	92/8	92/8
Day Trucks (% of Total Volume)	1.38% Medium 2.39% Heavy	1.38% Medium 2.39% Heavy
Night Trucks (% of Total Volume)	1.80% Medium 1.44% Heavy	1.80% Medium 1.44% Heavy
Right-of-Way Width	36 metres	
Posted Speed Limit	60 km/h	

Please note:

1. The current volume is not the Annual Average Daily Traffic, but the averaged raw volumes over three data collection days. If you need the Annual Average Traffic Volume, please visit the Peel Open Data website below: http://opendata.peelregion.ca/data-categories/transportation/traffic-count-stations.aspx
2. The ultimate volume is the planned volume during a level of service 'D' where a 2 second vehicle headway and a volume to capacity ratio of 0.9 is assumed. Traffic signals and hourly variations in traffic are also incorporated into the ultimate volume.

If you require further assistance, please contact me at robert.jay@peelregion.ca.

Regards,

Robbie Jay
Transportation Planner, Transportation System Planning
Transportation Division, Public Works Services, Region of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton, ON L6T 4B9
W: (905) 791-7800 x6456
E: robert.jay@peelregion.ca

Date: March 4, 2021
From: Deborah Hunt-Kansal, Stantec
Re: Growth Rates Data Request – Queensway W. west of Hurontario Street

Deborah,
Here are the estimated CAGR values for Queensway W. west of Hurontario Street:

2016 – 2021	2021 – 2031
0.5%	0.5%

These growth rates are estimated based on multiple sources including Peel Travel Demand forecasting model, ATR and land use/forecasts data. Please note that this area may be further affected by future growth (after 2031 and beyond). Please use your professional judgement when using these values.

If you require further assistance, please contact me at robert.jay@peelregion.ca.

Regards,

Robbie Jay
Transportation Planner, Transportation System Planning
Transportation Division, Public Works Services, Region of Peel
10 Peel Centre Drive, Suite B, 4th Floor
Brampton, ON L6T 4B9
W: (905) 791-7800 x6456
E: robert.jay@peelregion.ca

APPENDIX F
Transportation Noise Calculation

Custom Source Calculation

LRV Specification

Parameter	SI unit	Imperial unit
Lmax	75 dBA	75 dBA
Distance	15 m	50 ft
Speed	65 km/h	40 mph
Length	48 m	160 ft
# of cars	4	4
C_consist =-10log(# of cars)		-6.0 dB
C_emission =-30log(Speed/50)		2.9 dB
alpha = arctan(Length/2Distance)		1.0 rad
Adj (Embedded track on grade)		3.0 dB

Sound Exposure Level

SEL_ref 75.6 dBA
= Lmax+10log(Length/50)+10log(Distance/50)-10log[2alpha+sin(2alpha)]+C_consisit+C_emission+3.3
(Ref. FTA Table F-1)

1-hr Leq using FTA Manual

Leq (1hr) 47.1 <-- this level is used for calculation of "Custon" noise source level for STAMSON
=SEL_ref+10log(# of cars)+20log(Speed/50)+10log(average hourly volume)-35.6+Adj

STAMSON Custom Source

Reference Level	**78.5**	dBA
Source height	0.5	m

STAMSON 5.0 NORMAL REPORT Date: 15-03-2021 16:00:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: lrt.te Time Period: 1 hours
Description: Sound Level Calculation Matching with FTA Method

RT/Custom data, segment # 1: Hurontario
---
1 - Custom (78.5 dBA):
Traffic volume : 1 veh/TimePeriod
Speed : 65 km/h

Data for Segment # 1: Hurontario

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Hurontario

Source height = 0.50 m

RT/Custom (0.00 + 47.13 + 0.00) = 47.13 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	47.13	0.00	0.00	0.00	0.00	0.00	47.13

Segment Leq : 47.13 dBA

Total Leq All Segments: 47.13 dBA

TOTAL Leq FROM ALL SOURCES: 47.13

STAMSON 5.0 NORMAL REPORT Date: 30-03-2021 12:00:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por01_m.te Time Period: Day/Night 16/8 hours
Description: POR01 - OLA (Daytime Only)

Road data, segment # 1: HurontarioSB (day/night)

Car traffic volume : 13414/1490 veh/TimePeriod
Medium truck volume : 574/64 veh/TimePeriod
Heavy truck volume : 359/40 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: HurontarioSB (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 34.00 / 34.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 0.00 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 53.00 m
Barrier elevation : 53.00 m
Reference angle : 0.00

Road data, segment # 2: HurontarioNB (day/night)

Car traffic volume : 15206/1690 veh/TimePeriod
Medium truck volume : 651/72 veh/TimePeriod
Heavy truck volume : 407/45 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: HurontarioNB (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 52.00 / 52.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg

Barrier height : 0.00 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 53.00 m
Barrier elevation : 53.00 m
Reference angle : 0.00

Results segment # 1: HurontarioSB (day)

Source height = 1.26 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.26 ! 1.50 ! -14.16 ! 38.84

ROAD (0.00 + 45.52 + 0.00) = 45.52 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 66.52 0.00 -3.55 0.00 0.00 0.00 -17.45 45.52

Segment Leq : 45.52 dBA

Results segment # 2: HurontarioNB (day)

Source height = 1.26 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.26 ! 1.50 ! -8.74 ! 44.26

ROAD (0.00 + 45.43 + 0.00) = 45.43 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 67.07 0.00 -5.40 0.00 0.00 0.00 -16.24 45.43

Segment Leq : 45.43 dBA

Total Leq All Segments: 48.49 dBA

Results segment # 1: HurontarioSB (night)

Source height = 1.26 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.26	1.50	-14.16	38.84

ROAD (0.00 + 38.99 + 0.00) = 38.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.00	0.00	-3.55	0.00	0.00	0.00	-17.45	38.99

Segment Leq : 38.99 dBA

Results segment # 2: HurontarioNB (night)

Source height = 1.26 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.26	1.50	-8.74	44.26

ROAD (0.00 + 38.88 + 0.00) = 38.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.52	0.00	-5.40	0.00	0.00	0.00	-16.24	38.88

Segment Leq : 38.88 dBA

Total Leq All Segments: 41.95 dBA

RT/Custom data, segment # 1: Hurontario (day/night)

1 - Custom (78.5 dBA):
Traffic volume : 292/66 veh/TimePeriod
Speed : 50 km/h

Data for Segment # 1: Hurontario (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)

Receiver source distance : 43.00 / 43.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 0.00 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 53.00 m
Barrier elevation : 53.00 m
Reference angle : 0.00

Results segment # 1: Hurontario (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
0.50 ! 1.50 ! -11.06 ! 41.94

RT/Custom (0.00 + 39.38 + 0.00) = 39.38 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 60.88 -4.57 0.00 0.00 0.00 -16.93 39.38

Segment Leq : 39.38 dBA

Total Leq All Segments: 39.38 dBA

Results segment # 1: Hurontario (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
0.50 ! 1.50 ! -11.06 ! 41.94

RT/Custom (0.00 + 35.93 + 0.00) = 35.93 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 57.44 -4.57 0.00 0.00 0.00 -16.93 35.93

Segment Leq : 35.93 dBA

Total Leq All Segments: 35.93 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 48.99
(NIGHT): 42.92

STAMSON 5.0 NORMAL REPORT Date: 30-03-2021 11:47:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por02_m.te Time Period: Day/Night 16/8 hours
Description: POR02 - OLA (Daytime Only)

Road data, segment # 1: HurontarioSB (day/night)

Car traffic volume : 13414/1490 veh/TimePeriod
Medium truck volume : 574/64 veh/TimePeriod
Heavy truck volume : 359/40 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: HurontarioSB (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 33.00 / 42.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 0.00 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 53.00 m
Barrier elevation : 53.00 m
Reference angle : 0.00

Road data, segment # 2: HurontarioNB (day/night)

Car traffic volume : 15206/1690 veh/TimePeriod
Medium truck volume : 651/72 veh/TimePeriod
Heavy truck volume : 407/45 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: HurontarioNB (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 53.00 / 53.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg

Barrier height : 0.00 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 53.00 m
Barrier elevation : 53.00 m
Reference angle : 0.00

Road data, segment # 3: QueensWay (day/night)

Car traffic volume : 28684/2508 veh/TimePeriod
Medium truck volume : 411/47 veh/TimePeriod
Heavy truck volume : 712/37 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: QueensWay (day/night)

Angle1 Angle2 : -75.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -75.00 deg Angle2 : 90.00 deg
Barrier height : 0.00 m
Barrier receiver distance : 21.00 / 21.00 m
Source elevation : 0.00 m
Receiver elevation : 53.00 m
Barrier elevation : 53.00 m
Reference angle : 0.00

Results segment # 1: HurontarioSB (day)

Source height = 1.26 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)

1.26 ! 1.50 ! -14.63 ! 38.37

ROAD (0.00 + 45.59 + 0.00) = 45.59 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 66.52 0.00 -3.42 0.00 0.00 0.00 -17.51 45.59

Segment Leq : 45.59 dBA

Results segment # 2: HurontarioNB (day)

Source height = 1.26 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.26 ! 1.50 ! -8.55 ! 44.45

ROAD (0.00 + 45.42 + 0.00) = 45.42 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 67.07 0.00 -5.48 0.00 0.00 0.00 -16.16 45.42

Segment Leq : 45.42 dBA

Results segment # 3: QueensWay (day)

Source height = 1.24 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.24 ! 1.50 ! -9.68 ! 43.32

ROAD (0.00 + 44.92 + 0.00) = 44.92 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-75 90 0.00 70.68 0.00 -8.24 -0.38 0.00 0.00 -17.15 44.92

Segment Leq : 44.92 dBA

Total Leq All Segments: 50.09 dBA

Results segment # 1: HurontarioSB (night)

Source height = 1.26 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of

Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)

1.26 ! 1.50 ! -11.18 ! 41.82

ROAD (0.00 + 38.57 + 0.00) = 38.57 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 60.00 0.00 -4.47 0.00 0.00 0.00 -16.96 38.57

Segment Leq : 38.57 dBA

Results segment # 2: HurontarioNB (night)

Source height = 1.26 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)

1.26 ! 1.50 ! -8.55 ! 44.45

ROAD (0.00 + 38.88 + 0.00) = 38.88 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 60.52 0.00 -5.48 0.00 0.00 0.00 -16.16 38.88

Segment Leq : 38.88 dBA

Results segment # 3: QueensWay (night)

Source height = 1.09 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)

1.09 ! 1.50 ! -9.72 ! 43.28

ROAD (0.00 + 36.47 + 0.00) = 36.47 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-75 90 0.00 62.25 0.00 -8.24 -0.38 0.00 0.00 -17.16 36.47

Segment Leq : 36.47 dBA

Total Leq All Segments: 42.87 dBA

RT/Custom data, segment # 1: Hurontario (day/night)
---
1 - Custom (78.5 dBA):
Traffic volume : 292/66 veh/TimePeriod
Speed : 50 km/h

Data for Segment # 1: Hurontario (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 44.00 / 44.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 0.00 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 53.00 m
Barrier elevation : 53.00 m
Reference angle : 0.00

Results segment # 1: Hurontario (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)

0.50 ! 1.50 ! -10.77 ! 42.23

RT/Custom (0.00 + 39.35 + 0.00) = 39.35 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 60.88 -4.67 0.00 0.00 0.00 -16.86 39.35

Segment Leq : 39.35 dBA

Total Leq All Segments: 39.35 dBA

Results segment # 1: Hurontario (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	1.50	-10.77	42.23

RT/Custom (0.00 + 35.90 + 0.00) = 35.90 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	57.44	-4.67	0.00	0.00	0.00	-16.86	35.90

Segment Leq : 35.90 dBA

Total Leq All Segments: 35.90 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 50.44
(NIGHT): 43.66

STAMSON 5.0 NORMAL REPORT Date: 30-03-2021 12:04:14
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por03_m.te Time Period: Day/Night 16/8 hours
Description: POR03 - POW - Inpatient

Road data, segment # 1: HurontarioSB (day/night)

Car traffic volume : 13414/1490 veh/TimePeriod
Medium truck volume : 574/64 veh/TimePeriod
Heavy truck volume : 359/40 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: HurontarioSB (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 53.00 / 52.00 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 62.00 m
Reference angle : 0.00

Road data, segment # 2: HurontarioNB (day/night)

Car traffic volume : 15206/1690 veh/TimePeriod
Medium truck volume : 651/72 veh/TimePeriod
Heavy truck volume : 407/45 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: HurontarioNB (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 72.00 / 72.00 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 62.00 m
Reference angle : 0.00

Results segment # 1: HurontarioSB (day)

Source height = 1.26 m

ROAD (0.00 + 61.04 + 0.00) = 61.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	66.52	0.00	-5.48	0.00	0.00	0.00	0.00	61.04

Segment Leq : 61.04 dBA

Results segment # 2: HurontarioNB (day)

Source height = 1.26 m

ROAD (0.00 + 60.26 + 0.00) = 60.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.07	0.00	-6.81	0.00	0.00	0.00	0.00	60.26

Segment Leq : 60.26 dBA

Total Leq All Segments: 63.68 dBA

Results segment # 1: HurontarioSB (night)

Source height = 1.26 m

ROAD (0.00 + 54.60 + 0.00) = 54.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.00	0.00	-5.40	0.00	0.00	0.00	0.00	54.60

Segment Leq : 54.60 dBA

Results segment # 2: HurontarioNB (night)

Source height = 1.26 m

ROAD (0.00 + 53.71 + 0.00) = 53.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.52	0.00	-6.81	0.00	0.00	0.00	0.00	53.71

Segment Leq : 53.71 dBA

Total Leq All Segments: 57.19 dBA

RT/Custom data, segment # 1: Hurontario (day/night)
---
1 - Custom (78.5 dBA):
Traffic volume : 292/66 veh/TimePeriod
Speed : 50 km/h

Data for Segment # 1: Hurontario (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 62.50 / 62.50 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 62.00 m
Reference angle : 0.00

Results segment # 1: Hurontario (day)

Source height = 0.50 m

RT/Custom (0.00 + 54.69 + 0.00) = 54.69 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.88	-6.20	0.00	0.00	0.00	0.00	54.69

Segment Leq : 54.69 dBA

Total Leq All Segments: 54.69 dBA

Results segment # 1: Hurontario (night)

Source height = 0.50 m

RT/Custom (0.00 + 51.24 + 0.00) = 51.24 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	57.44	-6.20	0.00	0.00	0.00	0.00	51.24

Segment Leq : 51.24 dBA

Total Leq All Segments: 51.24 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.19
(NIGHT): 58.17

STAMSON 5.0 NORMAL REPORT Date: 30-03-2021 12:05:45
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por04_m.te Time Period: Day/Night 16/8 hours
Description: POR04 - POW - Inpatient

Road data, segment # 1: HurontarioSB (day/night)

Car traffic volume : 13414/1490 veh/TimePeriod
Medium truck volume : 574/64 veh/TimePeriod
Heavy truck volume : 359/40 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: HurontarioSB (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 52.00 / 52.00 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 62.00 m
Reference angle : 0.00

Road data, segment # 2: HurontarioNB (day/night)

Car traffic volume : 15206/1690 veh/TimePeriod
Medium truck volume : 651/72 veh/TimePeriod
Heavy truck volume : 407/45 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: HurontarioNB (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 71.00 / 71.00 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 62.00 m
Reference angle : 0.00

Road data, segment # 3: QueensWay (day/night)

Car traffic volume : 28684/2508 veh/TimePeriod
Medium truck volume : 411/47 veh/TimePeriod
Heavy truck volume : 712/37 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: QueensWay (day/night)

Angle1 Angle2 : -36.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 97.50 / 97.50 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 62.00 m
Reference angle : 0.00

Results segment # 1: HurontarioSB (day)

Source height = 1.26 m

ROAD (0.00 + 61.13 + 0.00) = 61.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	66.52	0.00	-5.40	0.00	0.00	0.00	0.00	61.13

Segment Leq : 61.13 dBA

Results segment # 2: HurontarioNB (day)

Source height = 1.26 m

ROAD (0.00 + 60.32 + 0.00) = 60.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.07	0.00	-6.75	0.00	0.00	0.00	0.00	60.32

Segment Leq : 60.32 dBA

Results segment # 3: QueensWay (day)

Source height = 1.24 m

ROAD (0.00 + 61.00 + 0.00) = 61.00 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
  -36   90   0.00 70.68   0.00 -8.13 -1.55   0.00   0.00   0.00 61.00

Segment Leq : 61.00 dBA

Total Leq All Segments: 65.60 dBA

Results segment # 1: HurontarioSB (night)

Source height = 1.26 m

ROAD (0.00 + 54.60 + 0.00) = 54.60 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
  -90   90   0.00 60.00   0.00 -5.40   0.00   0.00   0.00   0.00 54.60

Segment Leq : 54.60 dBA

Results segment # 2: HurontarioNB (night)

Source height = 1.26 m

ROAD (0.00 + 53.77 + 0.00) = 53.77 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
  -90   90   0.00 60.52   0.00 -6.75   0.00   0.00   0.00   0.00 53.77

Segment Leq : 53.77 dBA

Results segment # 3: QueensWay (night)

Source height = 1.09 m

ROAD (0.00 + 52.57 + 0.00) = 52.57 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
  -36   90   0.00 62.25   0.00 -8.13 -1.55   0.00   0.00   0.00 52.57

Segment Leq : 52.57 dBA

Total Leq All Segments: 58.50 dBA

RT/Custom data, segment # 1: Hurontario (day/night)
---
1 - Custom (78.5 dBA):
Traffic volume : 292/66 veh/TimePeriod
Speed : 50 km/h

Data for Segment # 1: Hurontario (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 60.00 / 60.00 m
Receiver height : 1.50 / 63.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 62.00 m
Reference angle : 0.00

Results segment # 1: Hurontario (day)

Source height = 0.50 m

RT/Custom (0.00 + 54.86 + 0.00) = 54.86 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.88	-6.02	0.00	0.00	0.00	0.00	54.86

Segment Leq : 54.86 dBA

Total Leq All Segments: 54.86 dBA

Results segment # 1: Hurontario (night)

Source height = 0.50 m

RT/Custom (0.00 + 51.42 + 0.00) = 51.42 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	57.44	-6.02	0.00	0.00	0.00	0.00	51.42

Segment Leq : 51.42 dBA

Total Leq All Segments: 51.42 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.95
(NIGHT): 59.27

STAMSON 5.0 NORMAL REPORT Date: 30-03-2021 12:06:49
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por05_m.te Time Period: Day/Night 16/8 hours
Description: POR05 - POW - Inpatient

Road data, segment # 1: HurontarioSB (day/night)

Car traffic volume : 13414/1490 veh/TimePeriod
Medium truck volume : 574/64 veh/TimePeriod
Heavy truck volume : 359/40 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: HurontarioSB (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 76.00 / 76.00 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 62.00 m
Reference angle : 0.00

Road data, segment # 2: HurontarioNB (day/night)

Car traffic volume : 15206/1690 veh/TimePeriod
Medium truck volume : 651/72 veh/TimePeriod
Heavy truck volume : 407/45 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: HurontarioNB (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 96.00 / 96.00 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 62.00 m
Reference angle : 0.00

Road data, segment # 3: QueensWay (day/night)

Car traffic volume : 28684/2508 veh/TimePeriod
Medium truck volume : 411/47 veh/TimePeriod
Heavy truck volume : 712/37 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: QueensWay (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 62.50 / 62.50 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 62.00 m
Reference angle : 0.00

Results segment # 1: HurontarioSB (day)

Source height = 1.26 m

ROAD (0.00 + 56.47 + 0.00) = 56.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	66.52	0.00	-7.05	-3.01	0.00	0.00	0.00	56.47

Segment Leq : 56.47 dBA

Results segment # 2: HurontarioNB (day)

Source height = 1.26 m

ROAD (0.00 + 56.00 + 0.00) = 56.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	67.07	0.00	-8.06	-3.01	0.00	0.00	0.00	56.00

Segment Leq : 56.00 dBA

Results segment # 3: QueensWay (day)

Source height = 1.24 m

ROAD (0.00 + 64.48 + 0.00) = 64.48 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
  -90   90   0.00 70.68   0.00 -6.20   0.00   0.00   0.00   0.00 64.48

Segment Leq : 64.48 dBA

Total Leq All Segments: 65.62 dBA

Results segment # 1: HurontarioSB (night)

Source height = 1.26 m

ROAD (0.00 + 49.94 + 0.00) = 49.94 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
  -90   0   0.00 60.00   0.00 -7.05 -3.01   0.00   0.00   0.00 49.94

Segment Leq : 49.94 dBA

Results segment # 2: HurontarioNB (night)

Source height = 1.26 m

ROAD (0.00 + 49.45 + 0.00) = 49.45 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
  -90   0   0.00 60.52   0.00 -8.06 -3.01   0.00   0.00   0.00 49.45

Segment Leq : 49.45 dBA

Results segment # 3: QueensWay (night)

Source height = 1.09 m

ROAD (0.00 + 56.05 + 0.00) = 56.05 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
  -90   90   0.00 62.25   0.00 -6.20   0.00   0.00   0.00   0.00 56.05

Segment Leq : 56.05 dBA

Total Leq All Segments: 57.70 dBA

RT/Custom data, segment # 1: Hurontario (day/night)
---
1 - Custom (78.5 dBA):
Traffic volume : 292/66 veh/TimePeriod
Speed : 50 km/h

Data for Segment # 1: Hurontario (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 85.00 / 85.00 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 62.00 m
Reference angle : 0.00

Results segment # 1: Hurontario (day)

Source height = 0.50 m

RT/Custom (0.00 + 50.34 + 0.00) = 50.34 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	60.88	-7.53	-3.01	0.00	0.00	0.00	50.34

Segment Leq : 50.34 dBA

Total Leq All Segments: 50.34 dBA

Results segment # 1: Hurontario (night)

Source height = 0.50 m

RT/Custom (0.00 + 46.89 + 0.00) = 46.89 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	57.44	-7.53	-3.01	0.00	0.00	0.00	46.89

Segment Leq : 46.89 dBA

Total Leq All Segments: 46.89 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.75
(NIGHT): 58.05

STAMSON 5.0 NORMAL REPORT Date: 30-03-2021 12:24:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por06_m.te Time Period: Day/Night 16/8 hours
Description: POR06 - POW - Critical Unit

Road data, segment # 1: HurontarioSB (day/night)

Car traffic volume : 13414/1490 veh/TimePeriod
Medium truck volume : 574/64 veh/TimePeriod
Heavy truck volume : 359/40 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: HurontarioSB (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 84.00 / 84.00 m
Receiver height : 23.50 / 23.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: HurontarioNB (day/night)

Car traffic volume : 15206/1690 veh/TimePeriod
Medium truck volume : 651/72 veh/TimePeriod
Heavy truck volume : 407/45 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: HurontarioNB (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 104.00 / 104.00 m
Receiver height : 23.50 / 23.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: QueensWay (day/night)

Car traffic volume : 28684/2508 veh/TimePeriod
Medium truck volume : 411/47 veh/TimePeriod

Heavy truck volume : 712/37 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: QueensWay (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 56.00 / 56.00 m
Receiver height : 23.50 / 23.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: HurontarioSB (day)

Source height = 1.26 m

ROAD (0.00 + 56.03 + 0.00) = 56.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	66.52	0.00	-7.48	-3.01	0.00	0.00	0.00	56.03

Segment Leq : 56.03 dBA

Results segment # 2: HurontarioNB (day)

Source height = 1.26 m

ROAD (0.00 + 55.65 + 0.00) = 55.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	67.07	0.00	-8.41	-3.01	0.00	0.00	0.00	55.65

Segment Leq : 55.65 dBA

Results segment # 3: QueensWay (day)

Source height = 1.24 m

ROAD (0.00 + 64.96 + 0.00) = 64.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	70.68	0.00	-5.72	0.00	0.00	0.00	0.00	64.96

Segment Leq : 64.96 dBA

Total Leq All Segments: 65.91 dBA

Results segment # 1: HurontarioSB (night)

Source height = 1.26 m

ROAD (0.00 + 49.51 + 0.00) = 49.51 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	60.00	0.00	-7.48	-3.01	0.00	0.00	0.00	49.51

Segment Leq : 49.51 dBA

Results segment # 2: HurontarioNB (night)

Source height = 1.26 m

ROAD (0.00 + 49.10 + 0.00) = 49.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	60.52	0.00	-8.41	-3.01	0.00	0.00	0.00	49.10

Segment Leq : 49.10 dBA

Results segment # 3: QueensWay (night)

Source height = 1.09 m

ROAD (0.00 + 56.53 + 0.00) = 56.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.25	0.00	-5.72	0.00	0.00	0.00	0.00	56.53

Segment Leq : 56.53 dBA

Total Leq All Segments: 57.93 dBA

RT/Custom data, segment # 1: Hurontario (day/night)
---
1 - Custom (78.5 dBA):

Traffic volume : 292/66 veh/TimePeriod
Speed : 50 km/h

Data for Segment # 1: Hurontario (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 94.00 / 94.00 m
Receiver height : 23.50 / 23.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Hurontario (day)

Source height = 0.50 m

RT/Custom (0.00 + 49.90 + 0.00) = 49.90 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	60.88	-7.97	-3.01	0.00	0.00	0.00	49.90

Segment Leq : 49.90 dBA

Total Leq All Segments: 49.90 dBA

Results segment # 1: Hurontario (night)

Source height = 0.50 m

RT/Custom (0.00 + 46.46 + 0.00) = 46.46 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	57.44	-7.97	-3.01	0.00	0.00	0.00	46.46

Segment Leq : 46.46 dBA

Total Leq All Segments: 46.46 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.02
(NIGHT): 58.23

STAMSON 5.0 NORMAL REPORT Date: 30-03-2021 12:19:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por07_m.te Time Period: Day/Night 16/8 hours
Description: POR07 - POW - NICU

Road data, segment # 1: HurontarioSB (day/night)

Car traffic volume : 13414/1490 veh/TimePeriod
Medium truck volume : 574/64 veh/TimePeriod
Heavy truck volume : 359/40 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: HurontarioSB (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 22.00 / 22.00 m
Receiver height : 45.50 / 45.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: HurontarioNB (day/night)

Car traffic volume : 15206/1690 veh/TimePeriod
Medium truck volume : 651/72 veh/TimePeriod
Heavy truck volume : 407/45 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: HurontarioNB (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 42.00 / 42.00 m
Receiver height : 45.50 / 45.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: QueensWay (day/night)

Car traffic volume : 28684/2508 veh/TimePeriod
Medium truck volume : 411/47 veh/TimePeriod

Heavy truck volume : 712/37 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: QueensWay (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 80.00 / 80.00 m
Receiver height : 45.50 / 45.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: HurontarioSB (day)

Source height = 1.26 m

ROAD (0.00 + 61.85 + 0.00) = 61.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	66.52	0.00	-1.66	-3.01	0.00	0.00	0.00	61.85

Segment Leq : 61.85 dBA

Results segment # 2: HurontarioNB (day)

Source height = 1.26 m

ROAD (0.00 + 59.59 + 0.00) = 59.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	67.07	0.00	-4.47	-3.01	0.00	0.00	0.00	59.59

Segment Leq : 59.59 dBA

Results segment # 3: QueensWay (day)

Source height = 1.24 m

ROAD (0.00 + 63.41 + 0.00) = 63.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	70.68	0.00	-7.27	0.00	0.00	0.00	0.00	63.41

Segment Leq : 63.41 dBA

Total Leq All Segments: 66.66 dBA

Results segment # 1: HurontarioSB (night)

Source height = 1.26 m

ROAD (0.00 + 55.33 + 0.00) = 55.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	60.00	0.00	-1.66	-3.01	0.00	0.00	0.00	55.33

Segment Leq : 55.33 dBA

Results segment # 2: HurontarioNB (night)

Source height = 1.26 m

ROAD (0.00 + 53.04 + 0.00) = 53.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	60.52	0.00	-4.47	-3.01	0.00	0.00	0.00	53.04

Segment Leq : 53.04 dBA

Results segment # 3: QueensWay (night)

Source height = 1.09 m

ROAD (0.00 + 54.98 + 0.00) = 54.98 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	62.25	0.00	-7.27	0.00	0.00	0.00	0.00	54.98

Segment Leq : 54.98 dBA

Total Leq All Segments: 59.33 dBA

RT/Custom data, segment # 1: Hurontario (day/night)
---
1 - Custom (78.5 dBA):

Traffic volume : 292/66 veh/TimePeriod
Speed : 50 km/h

Data for Segment # 1: Hurontario (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 31.00 / 31.00 m
Receiver height : 45.50 / 45.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Hurontario (day)

Source height = 0.50 m

RT/Custom (0.00 + 54.72 + 0.00) = 54.72 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	60.88	-3.15	-3.01	0.00	0.00	0.00	54.72

Segment Leq : 54.72 dBA

Total Leq All Segments: 54.72 dBA

Results segment # 1: Hurontario (night)

Source height = 0.50 m

RT/Custom (0.00 + 51.27 + 0.00) = 51.27 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	57.44	-3.15	-3.01	0.00	0.00	0.00	51.27

Segment Leq : 51.27 dBA

Total Leq All Segments: 51.27 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.93
(NIGHT): 59.96