

**Proposed Flat with Shop and Services and Eating Place Uses “Commercial” and area shown as ‘Road’  
At 152-164 Wellington Street, Sheung Wan, Hong Kong  
S16 Planning Application**

**(Planning Application No: A/H3/449)**

**APPENDIX I**  
Revised Environmental Assessment

Prepared for

**Gallery Grove Limited**

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**Ramboll Hong Kong Limited**

**PROPOSED FLAT WITH SHOP AND SERVICES/EATING PLACES  
AT NOS. 152 – 164 WELLINGTON STREET IN SHEUNG WAN**

**ENVIRONMENTAL ASSESSMENT**

Date **June 2024**

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Signed

Project Reference **CHPWELTNE100**

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## 1. INTRODUCTION

### 1.1 Project Background

1.1.1 The purpose of this Section 16 application is to propose a composite redevelopment at 152-164 Wellington Street, Central. The Application Site is currently zoned as "Commercial" under the Approved Sai Ying Pun and Sheung Wan Outline Zoning Plan (OZP) No. S/H3/34.

1.1.2 Ramboll Hong Kong Limited is commissioned by the applicant to prepare an Environmental Assessment (EA) in support of the planning application. The EA report will assess the major environmental issues (i.e. environmental noise, air quality, construction phase environmental impact) of the Application Site and the surrounding area.

### 1.2 Application Site and its Environ

1.2.1 The Application Site has site area of about 612 m<sup>2</sup>. The Application Site is located at Central, bounded by Wellington Street on the northeast and Aberdeen Street on the northwest. Queen's Road Central is located further away to the northeast of the Application Site. The immediate surrounding developments are predominantly mixed-used, with commercial, residential, open space, and land uses for Government, Institution or Community (G/IC). **Figure 1.1** shows the location of the Application Site.

### 1.3 Proposed Development

1.3.1 The Proposed Development includes 1 residential tower with 25 residential storeys erected on a podium with 2 storeys of retail use and two storeys of clubhouse.

1.3.2 Under the Proposed Scheme, the plot ratio of residential use is proposed as 9.10 and with the total domestic GFA of about 5,569.2 m<sup>2</sup>. The building height of the residential tower is +119.9 mPD. A podium (with retail use and clubhouse) with +30.15 mPD is located underneath the proposed residential tower within the Application Site.

1.3.3 The Proposed Composite Redevelopment is tentatively completed in 2030. The population intake year for the proposed development will be no later than Year 2030.

### 1.4 Appraisal of Environmental Impact

#### Noise

1.4.1 The Application Site is bounded by roads on two sides. The potential road traffic noise impact has been assessed in this study. Direct noise mitigation measures have been recommended to minimise the potential road traffic noise impact.

1.4.2 The Application Site is located at the centre of Central and Sheung Wan commercial area. No active industrial operation can be observed. Major industrial noise impact would be due to fixed noisy facilities. Onsite survey has been conducted to understand the noise environment. Noisy facilities have been identified. Quantitative fixed noise impact assessment has been conducted to evaluate the potential fixed noise impact.

1.4.3 The development is not environmentally polluting in nature. Should there be any fixed noisy facilities (e.g. fan system, HVAC for retail, clubhouse) provided in future, it will be designed to follow the HKPSG requirement (i.e. acceptable noise level minus 5 decibels) to ensure that there is no adverse impact on any noise sensitive use in the surrounding.

### Air Quality

- 1.4.4 With respect to the potential vehicular emission impact, the Application Site is affected by open road emissions from nearby carriageways such as Wellington Street, Aberdeen Street, and carriageways further away.
- 1.4.5 Man Cheung Street portal and Connaught Road Central Underpass portal within 500m from the Application Site have been identified and corresponding emission should be accounted.
- 1.4.6 There is absence of chimney emission observed in the surrounding. However, several covered or open-area public transport interchanges (PTIs) within 500m from the Application Site have been identified. As observed, mechanical ventilation is provided at the covered PTIs. Moreover, the emission from buses at the open-area PTI would be released to atmosphere directly.
- 1.4.7 The helicopter and marine emission are also identified and included in the impact assessment.
- 1.4.8 A quantitative air quality impact assessment is prepared to address the potential air quality impact that would be generated from the aforementioned emissions.

## **1.5 Organisations of the Report**

- 1.5.1 This Environmental Assessment report contains the following chapters: -
- Chapter 2 to evaluate and assess potential road traffic noise impact on the Proposed Development at the Application Site, and propose practicable noise mitigation measures to attenuate the impact;
  - Chapter 3 to evaluate and assess potential fixed noise impact on the Proposed Development at the Application Site, and propose practicable noise mitigation measures to attenuate the impact;
  - Chapter 4 to evaluate the potential air quality impact on the Proposed Development at the Application Site, and propose practicable mitigation measures to attenuate the impact.



## 2. TRAFFIC NOISE IMPACT ASSESSMENT

### 2.1 Introduction

- 2.1.1 This road traffic noise impact assessment is prepared to address potential road traffic noise impact on the noise sensitive uses of the Proposed Development and to recommend mitigation measures where practicable to attenuate the impact.
- 2.1.2 The Proposed Development consists of residential, retail, , and other ancillary facilities such as clubhouse, transformer room and E&M rooms. The residential dwelling is noise sensitive in nature and will rely on opened window for ventilation purpose. All other uses are either non-noise sensitive in nature or do not rely on opened window for ventilation purpose.

### 2.2 Assessment Criteria

- 2.2.1 Noise standards are recommended in the Hong Kong Planning Standards and Guidelines (HKPSG) for planning against noise impact from sources such as road traffic, railway and aircraft.
- 2.2.2 Under the HKPSG, the criterion for road traffic noise impact for dwellings, is  $L_{10(1-hour)}$  70 dB(A). The criteria apply to habitable rooms which rely on openable windows for ventilation.

### 2.3 Assessment Methodology

- 2.3.1 In this assessment, the potential noise impact arising from nearby existing and future road carriageways on the Proposed Development has been assessed based on the proposed master layout plan (MLP).
- 2.3.2 It involved the prediction of future noise impacts on Noise Sensitive Receivers (NSRs) arising from traffic flows along existing and future road carriageways situated within or in the vicinity of the Application Site. Calculation of predicted road traffic noise were based on the worst case peak hour traffic flows projected within a 15-year period from the target completion and occupation date (Year 2030) of the proposed development.
- 2.3.3 For worst-case scenario evaluation, the assessment year was chosen to be year 2045, which has the maximum forecasted traffic flow within the 15-year period. The year 2045 traffic forecast data is prepared by project traffic consultant and attached in **Appendix 2-1. Confirmation from the Transport Department (TD) has been sought by the Project Traffic Consultant and provided in Appendix 2-1.**
- 2.3.4 The U.K. Department of Transport's procedure "Calculation of Road Traffic Noise" (CRTN) was used to predict the hourly  $L_{10(1-hour)}$  noise levels generated from road traffic at selected representative NSRs. Practicable environmental mitigation measures have been recommended, where necessary. The predicted noise levels were compared with the relevant HKPSG noise standards.
- 2.3.5 The road surfacing type of all carriageways within 300m assessment area of the Application Site is assumed impervious. Speed limit of 50 km/hr is assumed for all roads generally, except Central-Wanchai Bypass and Rumsey Street Flyover (Connaught Road Central Flyover) (80 km/hr).

### 2.4 Noise Sensitive Receivers

- 2.4.1 A number of Noise Sensitive Receivers (NSRs), which are likely to be subject to worst road traffic noise impact of the corresponding habitable rooms, were selected for the assessment. All assessment points were taken at 1.2 m above the floor and 1 m away from the façade of openable windows of rooms of sensitive use (living room, bedroom).

2.4.2 **Figure 2.1** illustrates the locations of the selected representative NSRs for road traffic noise impact assessment.

## 2.5 Assessment Result without Noise Mitigation Measures (Base Scenario)

2.5.1 The predicted road traffic noise levels on the selected representative NSRs based on the development scheme with no further direct noise mitigation measures has been assessed. **Appendix 2-2** shows the predicted road traffic noise level under peak traffic flow condition representing worst case scenario within 15 years from the completion of the proposed development.

2.5.2 According to the assessment result, the maximum noise level for AM peak scenario and PM peak scenario are 70dB(A) and 69dB(A) respectively. There is no exceedance of road traffic noise standards under AM and PM peak scenario. Therefore, no mitigation measure is required.

## 2.6 Conclusion

2.6.1 Road traffic noise impact assessment has been carried out for the proposed development. According to the Assessment result, no adverse road traffic noise impact on the Proposed Development is anticipated. No noise mitigation measure is required.

### 3. FIXED NOISE IMPACT ASSESSMENT

#### 3.1 Introduction

- 3.1.1 This fixed noise impact assessment is prepared to address potential fixed noise impact on the noise sensitive uses of the Proposed Development and to recommend mitigation measures where practicable to attenuate the impact.
- 3.1.2 The Proposed Development consists of residential, retail, and other ancillary facilities such as clubhouse, transformer room and E&M rooms. The residential dwelling is noise sensitive in nature and will rely on opened window for ventilation purpose. All other uses are either non-noise sensitive in nature or do not rely on opened window for ventilation purpose.

#### 3.2 Assessment Criteria

- 3.2.1 According to the Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (“IND-TM”) issued under the Noise Control Ordinance, the Proposed Development is situated in urban area. Connaught Road Central Flyover acts as an Influencing Factor (with daily flow over 30,000 veh according to the latest annual traffic census 2022). However, the Connaught Road Central Flyover is about 250m away from the development and blocked by the high-rise buildings.
- 3.2.2 Therefore, Area Sensitivity Rating “B” is adopted accordingly, which is not affected by the IF. Respectively standards during day & evening time and night time are  $Leq(30min)$  65dB(A) and 55 dB(A).

#### 3.3 Assessment Methodology

- 3.3.1 Assessment of noise impact arising from fixed noise sources has been based on standard acoustic principles and procedures given in the IND-TM. Noise impacts due to individual noise sources are calculated and logarithmically summed at each NSR to represent the overall impacts:

$$\sum PNL_i = \sum [SWL_i + C_{distance} + C_{barrier} + C_{impulse} + C_{tonality} + C_{barrier} + C_{facade}]$$

where

$PNL_i$	= Predicted noise level, i.e. the overall sound pressure level arising from individual noise sources after various corrections
$SWL_i$	= Derived sound power level of individual noise sources from measured noise levels
$C_{distance}$	= Correction for distance attenuation
$C_{barrier}$	= Correction (-10 dB(A)) for substantial shielding by building structure
$C_{impulse}$	= According to the nature of the identified noise sources in the surrounding, noise of impulsive nature is not expected. No correction is recommended
$C_{tonality}$	= Correction for tonality as in IND-TM, if applicable
$C_{facade}$	= Correction (+3 dB(A)) for façade reflection at receiver

#### 3.4 Identification of Fixed Noise Sources

3.4.1 Based on onsite survey along the periphery of the Application Site, no noticeable noise from any fixed noise sources can be identified. According to further review including referencing to aerial photos and photos taken in the surrounding with study area of 300m from site noise sources have been identified in the surrounding as tabulated below and shown in **Figure 3.1**.

**Table 3.1 Identified Fixed Noise Sources within the 300m Study Area**

Building	Type of Noise Sources	Height	Separation from Nearest Site Boundary
On Building <sup>^</sup>	Chiller (1 nos.) Cooling tower (1 nos.)	~120mPD	~10m
Queen's Road Centre <sup>^</sup>	Chiller (2 nos.)	~130mPD	~10m
Stag Building <sup>^</sup>	Chiller (2 nos.)	~59mPD	~10m
V Heun Building <sup>^</sup>	Chiller (3 nos.)	~87mPD	~45m
The L. place <sup>^</sup>	Chiller (4 nos.)	~50mPD	~50m
OCBC Wing Hang Tower <sup>^</sup>	Chiller (4 nos.)	~71mPD	~50m
The Wellington <sup>^</sup>	Cooling tower (2 nos.)	~131mPD	~50m
Yin Serviced Apartments	Chiller (2 nos.)	~96mPD	~60m
Butterfly on Wellington	Chiller (2 nos.)	~90mPD	~60m
Shing Lee Commercial Building <sup>^</sup>	Chiller (1 nos.)	~72mPD	~70m
Wing Hang Insurance Building <sup>^</sup>	Chiller (2 nos.)	~72mPD	~80m
ICBC Asia Building <sup>^</sup>	Chiller (2 nos.)	~65mPD	~90m
BOC Group Life Assurance Tower <sup>^</sup>	Chiller (2 nos.)	~73mPD	~130m
Amtel Building <sup>^</sup>	Chiller (2 nos.)	~71mPD	~150m
100QRC <sup>^</sup>	Chiller (3 nos.)	~130mPD	~150m
Tai Sang Bank Building <sup>^</sup>	Chiller (2 nos.)	~55mPD	~150m
Public Bank Centre <sup>^</sup>	Chiller (2 nos.)	~75mPD	~150m
Jade Centre <sup>^</sup>	Chiller (1 nos.)	~98mPD	~150m
Soho Square <sup>^</sup>	Chiller (2 nos.)	~106mPD	~170m
The Pemberton <sup>^</sup>	Cooling tower (3 nos.)	~82mPD	~170m
Golden Centre <sup>^</sup>	Chiller (3 nos.)	~110mPD	~170m
Hong Kong Trade Centre <sup>^</sup>	Chiller (3 nos.)	~77mPD	~180m
Regent Centre <sup>^</sup>	Chiller (2 nos.)	~92mPD	~180m
Pearl Oriental House <sup>^</sup>	Chiller (1 nos.)	~98mPD	~180m
Nan Fung Tower <sup>^</sup>	Chiller (6 nos.)	~30mPD	~180m
Nanyang Commercial Bank Building <sup>^</sup>	Chiller (3 nos.)	~56mPD	~190m
World Trust Tower <sup>^</sup>	Chiller (2 nos.)	~85mPD	~200m
H Queen's <sup>^</sup>	Cooling tower (3 nos.)	~120mPD	~200m
1 Lyndhurst Tower <sup>^</sup>	Chiller (2 nos.)	~101mPD	~200m
Infinitus Plaza <sup>^</sup>	Chiller (7 nos.) Cooling tower (2 nos.)	~34mPD (5 chillers) ~123mPD (2 chillers & 2 cooling tower)	~200m
CTG House <sup>^</sup>	Chiller (4 nos.)	~93mPD	~210m
Car Po Commercial Building <sup>^</sup>	Chiller (1 nos.)	~115mPD	~210m
H Code <sup>^</sup>	Chiller (8 nos.)	~120mPD	~210m
Kinwick Centre <sup>^</sup>	Chiller (3 nos.)	~131mPD	~210m

Beautiful Group Tower <sup>^</sup>	Chiller (2 nos.)	~83mPD	~220m
The Pottinger	Cooling tower (2 nos.)	~83mPD	~230m
Asia Standard Tower <sup>^</sup>	Cooling tower (4 nos.)	~78mPD	~240m
Hang Sang Bank Headquarters <sup>^</sup>	Chiller (3 nos.) Cooling tower (4 nos.)	~135mPD	~240m
Crawford House <sup>^</sup>	Cooling tower (2 nos.)	~83mPD	~250m
Bonham Circus <sup>^</sup>	Cooling tower (2 nos.)	~107mPD	~250m
299 QRC <sup>^</sup>	Chiller (3 nos.)	~79mPD	~270m
Strand 50 <sup>^</sup>	Chiller (3 nos.)	~96mPD	~270m
Harbour Building <sup>^</sup>	Chiller (1 nos.)	~96mPD	~290m

<sup>^</sup>No night time operation

- 3.4.2 Most identified noise sources are to the north to east of the Application Site, such as the L.place on the north side, V Huen Building on the northeast side and Butterfly on Wellington on the east side.
- 3.4.3 According to the site survey, most of the identified fixed noise sources are located at roof or inaccessible location. Direct noise measurement is not possible and relevant details of the identified noise sources are not available at this stage despite that request has been made to the operators of these potential noisy facilities (**Appendix 3-4**), while no reply is received yet. Besides, the respective owner or estate management have been approached to request for access for direct noise measurement or provision of noise data during the site survey. No access consent can be obtained from any of the parties. Since direct measurement is not practicable possible, the noise strength of the identified noise sources has been assumed based on equipment catalogue (if equipment model information is provided) or reference equipment catalogue model of similar scale. The reference equipment catalogue is shown in **Appendix 3-3**.

### 3.5 Noise Sensitive Receivers

- 3.5.1 A number of representative Noise Sensitive Receivers (NSRs), corresponding to habitable rooms which are likely to be subject to worst noise impact were selected for the assessment. All assessment points were taken at 1 m away from the façade of openable windows of rooms of sensitive use (living room, bedroom).

**Figure 3.2** illustrates the locations of the selected representative NSRs for road traffic noise impact assessment.

### 3.6 Assessment Result without Noise Mitigation Measures (Base Scenario)

- 3.6.1 **Appendix 3-1** shows the noise strength of identified noise sources and predicted noise level at the selected NSRs. **Appendix 3-2** illustrates the view of some selected NSRs to justify the shielding correction adopted. According to the assessment results, the predicted noise levels at all selected NSRs would comply with relevant standards without noise mitigation. No adverse fixed noise impact on the Proposed Development is anticipated.

### 3.7 Impact due to Future Fixed Noise Sources of the Proposed Development

- 3.7.1 The Proposed Development will inevitably contain noisy facilities such as ventilation system, fan system and HVAC (for clubhouse and retail uses). However, in this early planning stage, building services consultant/contractor has not been engaged and there is absence of any detail regarding potential noisy facilities. In all circumstances, the requirement under HKPSG is fully observed (i.e. acceptable noise level minus 5 decibels). In future detailed design of the project, same requirement will be imposed

so that the relevant noise standard will be met by various means such as selection of quiet equipment, use of shielding device, acoustic louvers, silencers, semi/full-enclosure. Upon availability of details of fixed noise sources, the assessment of fixed noise impact can be conducted with respect to the said planning approval condition. With abundance of direct noise mitigation measures to control and suppressed the generated noise level, no adverse noise impact due to operation of potentially noisy facilities of the Proposed Development is anticipated.

### **3.8 Conclusion**

- 3.8.1 According to the result of fixed noise impact assessment, no adverse fixed noise impact due to surrounding fixed noise sources on the Proposed Development is anticipated with the recommended noise mitigation is considered necessary.
- 3.8.2 This is in early planning stage of the study so that there is no detail of future fixed noise sources onsite available. With abundance of direct noise mitigation measures to control and suppressed the generated fixed noise level, no adverse noise impact due to operation of potentially noisy facilities of the Proposed Development is anticipated.

## 4. AIR QUALITY IMPACT ASSESSMENT

### 4.1 Introduction

4.1.1 This section predicts air quality pollutant concentration at the Proposed Development, informing the provision of air quality mitigation measures to ensure future residents are not exposed to adverse air quality impact. The assessment considers **emissions** from the traffic emissions from road networks, portal emissions, helicopter emission and marine emission within 500m of the site boundary. The air pollutants assessed are Nitrogen Dioxide (NO<sub>2</sub>), Sulphur Dioxide (SO<sub>2</sub>), Respirable Suspended Particulate (RSP) and Fine Suspended Particulate (FSP). Concentrations of these pollutants are predicted at air sensitive receivers (ASRs) within the Proposed Development through the use of quantitative computer modelling, and are compared with the relevant Air Quality Objectives (AQOs).

4.1.2 The assessment area of 500m from the Application Site is shown in **Figure 4.1**.

### 4.2 Assessment Criteria

4.2.1 The Hong Kong AQOs enacted on 1/1/2022 are listed in **Table 4.1** below.

**Table 4.1 Hong Kong Air Quality Objectives**

Pollutants	Average Time	Standard <sup>[i]</sup> (µg/m <sup>3</sup> )	No. of exceedances allowed
SO <sub>2</sub>	10-min	500	3
	24-Hour	50	3
RSP (PM <sub>10</sub> ) [ii]	24-Hour	100	9
	Annual	50	NA
FSP (PM <sub>2.5</sub> ) [iii]	24-Hour	50	35
	Annual	25	NA
NO <sub>2</sub>	1-Hour	200	18
	Annual	40	NA
Ozone (O <sub>3</sub> )	8-Hour	160	9
Carbon Monoxide (CO)	1-Hour	30,000	0
	8-Hour	10,000	0
Lead (Pb)	Annual	0.5	NA

Notes:

[i] All measurements of the concentration of gaseous air pollutants, i.e. sulphur dioxide, nitrogen dioxide, ozone and carbon monoxide, are to be adjusted to a reference temperature of 293 Kelvin and a reference pressure of 101.325 kilopascal.

[ii] Respirable suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 10 µm or less.

[iii] Fine suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 2.5 µm or less.

### 4.3 Existing Air Quality

4.3.1 The tentative year of completion of the Proposed Development is 2030. The year of 2030 hourly background concentrations of NO<sub>2</sub>, SO<sub>2</sub>, RSP and FSP from the **PATH v3.0 model** has been adopted for the purpose of this assessment. The data for Year 2030 was extracted from the *Pollutants in the Atmosphere and the Transport over Hong Kong-model version 3.0 (PATH v3.0)* developed and released by EPD in January 2024 (Grid 38, 29).

4.3.2 The five most recent years of air quality monitoring data, 2018 to 2022, from the Central/Western General Air Quality Monitoring Station (AQMS) are summarized in **Table 4.2**.

**Table 4.2 EPD Air Quality Monitoring Data in Central/Western AQMS and PATH v3.0 (Grid 38, 29) (Year 2030)**

Pollutant	Averaging time	Parameter	AQO ( $\mu\text{g}/\text{m}^3$ )	Concentration <sup>[1]</sup> ( $\mu\text{g}/\text{m}^3$ )					
				2018	2019	2020	2021	2022	PATH in Year 2030 (38, 29)
RSP (PM <sub>10</sub> )	24-hour	10 <sup>th</sup> highest	100	70	69	60	65	52	53
	Annual	Maximum	50	34	30	25	26	22	21
FSP (PM <sub>2.5</sub> )	24-hour	36 <sup>th</sup> highest	50	34	33	29	27	28	27
	Annual	Maximum	25	21	20	16	16	14	13
NO <sub>2</sub>	1-hour	19 <sup>th</sup> highest	200	159	153	128	149	142	88
	Annual	Maximum	40	39	37	32	33	30	19
SO <sub>2</sub>	10-minute	4 <sup>th</sup> highest	500	135	62	31	51	62	22
	24-hour	4 <sup>th</sup> highest	50	22	12	9	10	7	7
O <sub>3</sub>	8-hour	10 <sup>th</sup> highest	160	<b>164</b>	<b>191</b>	140	155	<b>197</b>	<b>169</b>

Notes:

[1] Bolded and underlined values exceed the relevant AQO.

#### 4.4 Construction Phase

##### Representative Air Sensitive Receivers

4.4.1 The major air quality impact of concern during the construction phase will be the potential fugitive dust emission. The Project is at the early planning stage, the construction works of the proposed development will be commenced in Year 2027. The major dust emission sources during the construction phase of the Proposed Development are expected to arise from construction activities during site formation stage such as:

- Demolition of the existing building blocks;
- Excavation resulting in exposed ground vulnerable to air erosion;
- Earth moving, loading and unloading of excavated material;
- Wind effect on material stockpiling; and
- Vehicle movements on haul roads and over the construction site.

4.4.2 There will be potential impacts from the criteria pollutants (e.g. nitrogen oxides (NO<sub>x</sub>), sulphur dioxide (SO<sub>2</sub>), and carbon monoxide (CO)). Emission from diesel trucks for the haulage of materials and construction plants will contain high percentage of smoke particulate and unburned hydrocarbons in comparison with petrol driven vehicles. The Application Site is of ~0.06 ha so that development scale is very low. There is no basement proposed so that deep excavation is not necessary. Estimated 3,000 m<sup>3</sup> of demolition waste will be generated. Assuming demolition work of 6 months, it will generate around 3 truckloads per day and 1/3 of truckload per hour. The anticipated number of construction plants that result from the construction works will not be excessive due to the site constraint of the site area. Therefore, significant impact on the existing air quality is not envisaged. Under Air Pollution Control (Non-road Mobile Machinery) Emission Regulation and Air Pollution Control (Fuel Restriction) Regulation, there is also adequate control for emission from on-site machinery and non-road



vehicles. In all circumstances, the contractor will be required to observe all relevant regulations and maintain all equipment in good condition to avoid any excessive emission.

- 4.4.3 There are ASRs located within 500m from the Proposed Development and considered as Air Sensitive Receivers (ASRs). **Figure 4.2** shows the separation distance between the Application Site and the nearby ASRs which are expected to be worst affected and also listed in **Table 4.3**. According to the observation during site survey, it is expected that the construction works of the nearby construction sites (such as the construction sites at 27-33 Gage Street, 1-13 Gage Street, 120 Wellington Street, 7-11 Jervois Street and 92 Wellington Street) will be completed/ almost completed (they are expected to be completed within 1 to 2 years). Therefore, it is anticipated that the construction works of these construction sites will be completed before the commencement of the construction works of the Proposed Development and cumulative air quality impact would not be expected. In addition, there are some construction sites identified which may be considered as concurrent projects. They are at 16-20 Gage Street, 118-120 Queen's Road Central, 9-19 Lyndhurst Terrace, 47-59 Staunton Street, 15-19 Hollywood Road, 7-13 Hillier Street, 64-66 Wellington Street, 94-98 Bonham Strand, 29 Des Voeux Road Central, 62E Robinson Road, and 3-6 Glenealy. It is anticipated that the construction works of these construction sites will be carried out concurrently with the construction works of the Proposed Development. However, as it is anticipated that mitigation measures for fugitive dust emission would be implemented at these construction sites to reduce the impact generated, adverse cumulative air quality impact would not be anticipated.

**Table 4.3 Representative Air Sensitive Receivers for Construction Phase**

ASR ID	ASR	Horizontal Distance to Subject Site
C01	166 Wellington Street	8m
C02	On Building	9m
C03	152 Queen's Road Central	12m
C04	99F Wellington Street	22m
C05	Kimley Commercial Building	26m
C06	150 Wellington Street	0m
C07	Wa On Lane Sitting-out Area	0m
C08	Tung Tze Terrace	5m
C09	Man Lee Building	12m
C10	Lan Kwai Fong Hotel	9m

#### Mitigation Measures for Fugitive Dust Emission

- 4.4.4 In all circumstances, fugitive dust emission arising from construction activities can be effectively suppressed by incorporating proper mitigation measures into work procedures through contractual clauses with reference to EPD's Recommended Pollution Control Clauses for Construction Contracts, where applicable, good site management, and close monitoring by the resident engineers. The contractor shall be required to follow the requirements of the Air Pollution Control (Construction Dust) Regulations. With the adaptation of good practices, it is expected that emission of construction dust can be kept at an acceptable level. Mitigation measures including but not limited to the followings with respect to superstructure construction of a building and hoarding should be implemented as appropriate:
- Plan site layout so that machinery and dust causing activities (e.g. haul roads and stockpiling areas) are located away from receptors as far as possible

- Electric power supply shall be provided to on-site machinery during the construction stage as far as possible to minimize the gaseous emissions. Construction plant and equipment will be connected to mains electricity supply use of diesel generators and diesel-powered equipment should be avoided as far as practicable to minimize air quality impact arising from the equipment
- In the case of the superstructure construction of a building
  - Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting shall be provided to enclose the scaffolding from the ground floor level of the building, or if a canopy is provided at the first floor level, from the first floor level, up to the highest level of the scaffolding;
  - Any skip hoist for material transport shall be totally enclosed by impervious sheeting; and
  - Any relevant requirements set out in Parts III and IV of Air Pollution Control (Construction Dust) Regulations shall be met.
- Except for road opening or resurfacing work, or for construction work carried out in a construction site that is completely paved or completely covered with hardcore
  - Vehicle washing facilities including a high pressure water jet shall be provided at every discernible or designated vehicle exit point;
  - The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point shall be paved with concrete, bituminous materials or hardcores;
  - Where a site boundary adjoins a road, street, service lane or other area accessible to the public and nearby ASR, hoarding of not less than 3 m high from ground level shall be provided along the entire length of that portion of the site boundary except for a site entrance or exit.

4.4.5 Other recommended dust mitigation measures are described below.

General Site Management

4.4.6 Appropriate working methods should be devised and arranged to minimise dust emissions and to ensure any installed control system and/or measures are operated and/or implemented in accordance with their design merits. No free falling of construction debris should be allowed, which should be let down by hoist or enclosed tunnel to the ground.

4.4.7 A high standard of housekeeping shall be maintained. Any piles of materials accumulated on or around the work areas shall be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas shall be carried out in a manner that does not generate fugitive dust emissions. Prior to cleaning, the materials should be handled properly to prevent fugitive dust emission. Any exposed earth shall be properly treated by compacting or hydro seeding, within 6 months after the last construction activity.

4.4.8 Frequent mist/ water spraying should be applied on dusty areas. The frequency of spraying will depend upon local conditions such as rainfall, temperature, wind speed and humidity. The amount of water spraying should be just enough to dampen the material without over-watering which could result in surface water runoff.

Vehicles and Unpaved Site Roads

4.4.9 Dust emission from unpaved roads comes predominantly from travelling of vehicles. Areas within the site where there are regular vehicle movements should have an

approved hard surface. Speed controls at an upper limit of 10km/hr should be imposed and their movements should be confined to designed roadways within the site. All dusty vehicle loads should have side and tail boards covered by tarpaulin extending at least 300mm over the edges of the side and tail boards. Wheel-wash troughs and hoses should be provided at exit points of the site.

#### Material Stockpiling and Handling

- 4.4.10 The amount of stockpiling should be minimised where possible. Construction material or debris should be covered and stored inside enclosed areas. Other control measures such as enclosed or semi-enclosed windboard should be used, where applicable, to minimise dust emission. Regular watering is needed at areas such as storage piles, where there could be potential dust emission.
- 4.4.11 With best management practice and mitigation measures properly implemented, potential air quality impact during construction of the project is not considered adverse.

### 4.5 Operational Phase

#### Representative Air Sensitive Receivers

- 4.5.1 Representative ASRs of the Proposed Development within the Project Area would be selected for the assessment of the air quality impacts arising from the surrounding air pollution sources during the operational phase.
- 4.5.2 The locations of the representative ASRs during operational phase are shown in **Figure 4.3** and summarized in **Table 4.4**.

**Table 4.4 Representative ASRs for Operational Phase**

ASR ID	Local Ground mPD	Flagpole Height, mAG	Assessment Height, mPD
A01 – A10	13.90	1.5 – 106.00	15.40 – 119.90

### 4.6 Air Quality Impact Assessment Methodology

#### Version of PATH

- 4.6.1 Hourly meteorology data for a full year is extracted from **PATH v3.0** provided by EPD (meteorological data **year 2019**, Grid 38, 29). Hourly mixing heights lower than **119m or higher 2009m are corrected to 119m or 2009m** respectively to align with the real meteorological data recorded by the Hong Kong Observatory (HKO) in **2019**. Hourly wind speeds lower than **0.5 m/s** (i.e. calm wind condition) are corrected to **0.5m/s**.
- 4.6.2 The hourly background concentrations of NO<sub>2</sub>, RSP and FSP in Year 2030 are extracted from **PATH v3.0** provided by EPD (Grid 38, 29) to predict the total air quality concentrations at ASRs.
- 4.6.3 Within the 4km radius area of the Application Site, one major point source, the Ocean Terminal with marine vessels, has been identified. Considering the presence of high-rise buildings in between the Proposed Development and the Ocean Terminal, there would be no direct impact from the Ocean Terminal on the identified ASRs for the Proposed Development. Therefore, the Ocean Terminal would not be included for the air modelling regarded as background emissions.

#### Computer Modelling for Industrial Air Quality

- 4.6.4 The dispersion of NO<sub>2</sub>, SO<sub>2</sub>, RSP and FSP were modelled using AERMOD software released by Lakes Environmental Software. The model is based on the principle of

Gaussian dispersion and is widely accepted by EPD and is used in this assessment to predict both concentration and deposition of pollutants from point and area sources

- 4.6.5 The albedo, Bowen ratio for the 10km x 10 km area, surface roughness for the 1km area, and the Surface File and Profile File to be used as input in AERMOD are downloaded and extracted from the AERMET tool in the Smart Air Modelling Platform v1.1 (SAMP v1.1) released by EPD in January 2024. The relevant information is provided in **Appendix 4-1**.

#### Source Description and Emission Inventory

- 4.6.6 Onsite surveys were conducted on 9 Aug 2023 (at 2:00 p.m.), 7 Nov 2023 (at 12:00 p.m.) and 13 Nov 2023 (at 3:00 p.m.) to verify the presence of chimneys. The area within 500m from the Application Site is zoned as Residential, Commercial (C), Open Space (O), Other Specific Uses (OU), Comprehensive Development Area (CDA) and Government, Institution or Community (G/IC). There is no area zoned "industrial" within 500m from the proposed development. Based on onsite surveys and desktop research, no active chimney was identified within 500m from the Application Site. Marine emissions, helicopters, open roads, portal and Public Transport Interchange/Bus Terminus have been assessed. **Table 4.5** shows a summary of the sources and the associated air pollutants of concern.

**Table 4.5 Summary of Emission Sources**

Sources	SO <sub>2</sub>	NO <sub>x</sub>	RSP	FSP
(i) Marine Vessels	✓	✓	✓	✓
(ii) Helicopter	✓	✓	✓	✓
(iii) Open Roads	x	✓	✓	✓
(iv) Public Transport Interchange/Bus Terminus	x	✓	✓	✓
(v) Portals	x	✓	✓	✓

#### **(i) Marine Vessels Emissions**

##### Sources within 500m area from Application Site

- 4.6.7 On-site survey was conducted in August 2023 to verify the presence of marine vessels. There are two existing marine activities within the 500m Assessment Area, including fast ferry services at the Hong Kong - Macau Ferry Terminal (HKMFT) and fire boat traffic movement at the Central Government Pier. Since the emission points of the fire boats while they are hotelling at the Central Government Pier and the manoeuvring of fire boats are out of the 500m Assessment Area, it would not be included in the modelling. The identified sources are shown in **Figure 4.4**.
- 4.6.8 With reference to "Study on Marine Vessels Emission Inventory – Final Report" by HKUST in February 2012, the total emissions from vessels can be calculated using the following equations:

$$\text{Total Emission}_{(\text{pollutant})} = \sum \text{Emission}_{(\text{pollutant, activity mode, equipment})}$$

$$\text{Emission}_{(\text{pollutant, activity mode, equipment})} = P \times FL \times T \times EF$$

where P is the installed power of equipment;  
FL is fractional load of equipment in a specific mode;

T is operation time-in-mode; and

EF is fractional load emission factor of equipment.

- 4.6.9 Emissions from ferries during arriving to/ departing from the berths will be modelled as evenly distributed point sources representing the segment they travel to and from the berths within the 500m assessment area. The routes are shown in **Figure 4.4**. All point sources will be modelled as fairway cruising mode as a conservative approach.
- 4.6.10 Emissions during staying at the berths will be modelled as single point source using hoteling mode.
- 4.6.11 Although request of information has been sent to the operators of Hong Kong Macau Ferry Terminal (correspondences sent to the operations are shown in **Appendix 4-20**), reply was not received from the operator and hence no information on the engine powers, engine load factors and time-in-modes was obtained from the operators. Therefore, the references will be made to "Study on Marine Vessels Emission Inventory – Final Report", which is considered as the best available information.
- 4.6.12 According to the ferry schedule at the HKMFT available at Marine Department's website, the visiting frequencies of different modes at each hour for more than a week in August 2023 are studied. As August is the summer holiday, more passengers taking the ferries would be expected. The frequency collected on 19 and 20 August 2023 (during weekends) was found to be the worst-case. According to the information available in 2018 Port of Hong Kong Statistical Tables, 2019 Port of Hong Kong Statistical Tables and 2020 Port of Hong Kong Statistical Tables issued by Marine Department, the number of cross-boundary ferries are decreasing. Therefore, adoption of above information is not expected to cause under-estimation for the calculation of emission rate. Since only a short distance of route for the arrival of the fast ferry would be within the 500m Assessment Area and the majority of the routes within the 500m Assessment Area would be for the departure of the fast ferry, the review of the visiting frequencies has been focused on the information of departure and presented in **Appendix 4-2**. According to the information of the departure, the maximum numbers of fast ferry departed in each hour between 0700 – 1900 and 1900 – 0100 are 4 and 2 for Berth No. 1 to Berth No. 4 respectively. Therefore, the numbers of fast ferry departed for each hour at 0700 – 1900 and 1900 – 0100 for Berth No. 1 to Berth No. 4 are assumed as 4 and 2 respectively. For the idling emissions of the fast ferry, 1 ferry is assumed at each berth for each hour at 0700 – 1900 and 1900 – 0100 at maximum based on the maximum number of fast ferry departed for each hour. The details of model inputs and the detailed information of the calculation of the emission rates of the fast ferry services are shown in **Appendix 4-3** and **Appendix 4-8**.

#### (ii) **Helicopter Emissions**

- 4.6.13 On-site survey was conducted in August 2023 to verify the presence of heliport facilities. There is a helipad of Hong Kong Macau Ferry Terminal within the 500m Assessment Area. Locations of the emission sources are shown in **Figure 4.6**. Although request of information has been sent to the operator of Hong Kong Macau Ferry Terminal (correspondences sent to the operations are shown in **Appendix 4-20**), reply was not received from the operator. According to the schedule of regular flight on the website of the helicopter service company, only 1 regular flight is scheduled per hour between 10:00 and 17:00 on Thursday to Monday at the heliport. And hence, there should be only 1 landing and taking off cycle per hour between 10:00 and 17:00 on Thursday to Monday for regular flight at the heliport. Besides, the frequency of the operation of the helicopter in the approved EIA report for Expansion of Heliport Facilities at Macau Ferry Terminal (Register No: AEIAR-095/2006) has been reviewed.

Since the frequency of the operation of the helicopter assumed in the approved EIA report is higher, a more conservative approach has been adopted for this assessment. Beside the frequency of the operation of the helicopter, the flight path and the emission height of the helicopter as assumed in the approved EIA report is also adopted for defining the emission sources of the helicopter. In addition, the information of the exhaust temperature, exit velocity and the exhaust diameter assumed in the approved EIA report for A Rooftop Helipad at the Proposed New Block of Queen Mary Hospital is referred and adopted in this assessment. The details of model inputs and the detailed information of the emission rates of helicopters are shown in **Appendix 4-5** and **Appendix 4-10**.

**(iii) Open Roads Emissions**

- 4.6.14 Air pollutant concentration at the Project Site due to the emission from the nearby road networks (vehicular tailpipe emissions) will be assessed. The emission factor of each road within 500m Assessment Area from the Project Site was calculated with the EMFAC-HK V4.3 issued by EPD. Based on the emission factor of each road, the air pollutant concentration at the Project Site will be modelled with **AERMOD**.

**(iv) Heavy Good Vehicle (HGV)/ Coach Parking, Public Transport Interchange/Bus Terminus**

- 4.6.15 Heavy good vehicle (HGV)/coach parking sites identified within 500m Assessment Area based on the on-site survey conducted in August 2023 and desktop research are the carparks of The Center, Cosco Tower, **Man Yee Building**, Shun Tak Centre, Rumsey Street Multi-storey Carpark and Hong Kong Station Carpark. **The location of the identified HGV/coach parking sites is shown in Figure 4.8 and the parking sites are located at distances ranging from approximately 140m to 400m from the Application Site.** As these parking sites are located relatively far from the Proposed Development, broad-brush approach has been adopted for applying starting emission for all vehicle types on the roads (ID L4H, L4I, L5A, L5B, L5C, L5D, L5E, L5F, L6B, L7C, L7D, L7E, L25B, L33A, L33B, L33C, L38B, L38C, L38D, L38E, L38F, L41A, L41E, L42C, L42D, L43D, L43E, L45B, L45C, L45E, L50A, L50B, L56A and L56B) with vehicles leaving from the carparks in order to assessing the impact. Besides, a road-side bus terminus at Man Kwong Street (near Central Government Pier) is identified. Since this bus terminus only served for 1 bus route and is located over 300m away from the boundary of the Proposed Development, a broad-brush approach has been adopted for applying starting emission for all vehicle types on the roads connected with the bus terminus (ID L39A, L39B and L39C) in order to assessing the impact.
- 4.6.16 Three Public Transport Interchanges (PTIs) are found within 500m Assessment Area of the Application Site – Central Exchange Square Terminus, Central (Rumsey Street) Terminus, and Hong Kong Station Public Transport Interchange. The location of the ventilation exhausts and openings/egress/ingress were identified during the site visits, and the emission information were provided by traffic consultant based on 24-hour site survey on a normal working day **in mid of September 2023**. The air pollutant concentration from the ventilation exhausts and openings/egress/ingress were modelled with AERMOD.
- 4.6.17 Emission from the PLBs/buses within Central Exchange Square Terminus and Hong Kong Station Public Transport Interchange would be exhausted via mechanical ventilation system of which the exhaust air louvres is located and ingress / egress / openings. Since the Central Exchange Square Terminus and Hong Kong Station Public Transport Interchange are located at a distance of ~350m from the Application Site, the potential impacts from PTIs are relatively minor. **Emissions from these two PTIs are assumed to be evenly distributed via each ingress / egress / openings / ventilation exhaust.**

- 4.6.18 Central (Rumsey Street) Terminus is an Open Area PTI. The emission from the buses within Central (Rumsey Street) Terminus would be released to the atmosphere directly.
- 4.6.19 Precise approach has been adopted to estimate the PTI and Bus Terminus emission. The start emissions, running exhaust emission and idling emissions associated with the PLBs/buses at the PTI and Bus Terminus within the assessment area (initial NO, initial NO<sub>2</sub>, FSP and RSP) were calculated based on the start emission and running exhaust emission factors predicted by EMFAC-HK model, cold idling emission factors from Calculation of Start Emissions in Air Quality Impact Assessment published by EPD, warm idling emission factors from Road Tunnels: Vehicle Emissions and Air Demand for Ventilation published by World Road Association and traffic data provided by the traffic consultant.
- 4.6.20 Calculations of emissions associated with the PTI and Bus Terminus were made reference to the Calculation of Start Emissions in Air Quality Impact Assessment published by EPD. Start emissions for diesel vehicles fitted with selective catalytic reduction (SCR) devices (i.e. FBSD and FBDD) and LPG vehicles were adjusted based on the idling emission and would be released over a total spread distance of 700m and 150m from where the start takes place, while running exhaust and idling emissions would be released on the spot. The locations of emission sources and the detailed calculation of the emissions are presented in **Appendix 4-6** and **Appendix 4-11**. The emission of the spread distance was modelled with AERMOD.

#### **(v) Portals Emissions**

- 4.6.21 Based on a desktop study, all portals within the study area have been identified. These include Man Cheung Street portal emission and Connaught Road Central Underpass portal emission. Locations of all portals are shown in **Figure 4.7**.
- 4.6.22 According to the Permanent International Association of Road Congress Report (PIARC, 1991), the pollutants were assumed to eject from the portal as a portal jet such that 2/3 of the total emissions was dispersed within the first 50m of the portal and the other 1/3 of the total emission within the second 50m.
- 4.6.23 The 24-hour emission factor for each tunnel in 2030 has been adopted in compiling the emission inventory of portals based on the details of sensitivity analysis of the emission inventories of the vehicular emission from open roads results mentioned in **Section 4.7.31**. The input parameters and the calculation of emission factors for portals and 24-hour emission factors for different tunnel sections by applying the minimum quarterly temperatures and relative humidity (RH) are given in **Appendix 4-7** and **Appendix 4-12**.

### **4.7 Methodology of EMFAC-HK Modelling**

#### Objective

- 4.7.1 The aim of conducting EMFAC Model is to calculate project-specific vehicle emission factor of criteria air pollutants (e.g. NO, NO<sub>2</sub>, FSP and RSP) arising from vehicular tailpipe emission on the road carriageways within 500m study area of the Proposed Development.
- 4.7.2 EPD's Smart Air Modelling Platform v1.1 (SAMP v1.1) which is embedded with EMFAC-HK Model version 4.3, is used to generate the model input files for modelling the emission from open road.

#### EMFAC-HK Model

- 4.7.3 The latest available EMFAC-HK Model version 4.3 dated 13 January 2021 (the EMFAC-HK Model) has been adopted.

Guideline and Document

4.7.4 Several guidelines and documents published by the EPD, which are available from the following EPD EMFAC-HK website (the EPD website), are referred for EMFAC-HK Model input:

- [http://www.epd.gov.hk/epd/english/environmentinhk/air/guide\\_ref/emfac-hk.html](http://www.epd.gov.hk/epd/english/environmentinhk/air/guide_ref/emfac-hk.html) (the EPD website)
- Guideline on Modelling Vehicle Emissions (Released in January 2021) (the EPD Guideline)
- 2018 Licensed Vehicle by Age and Technology Group Fractions (the EPD Document)

Traffic Data

4.7.5 Three sets traffic data predicted by the project traffic consultant, MVA Hong-Kong Limited, includes hourly traffic flows with a composition of 18 vehicle classes according to "Guideline on Modelling Vehicle Emissions" as shown in **Table 4.6** below. Traffic forecast is included in **Appendix 4-13**, which shows the hourly Vehicle Kilometer Travelled (VKT), and the hourly average speed (kph) of road carriageways respectively.

**Table 4.6 EMFAC-HK Vehicle Classes**

Vehicle Class Description	Fuel Type	Gross Vehicle Weight (tonnes)	Symbol 1 (in csv output file)	Symbol 2 (in bcd output file & traffic data)
Private Cars (PC)	ALL	ALL	PC	PC
Taxi	ALL	ALL	Taxi	Taxi
Light Goods Vehicles (<=2.5t)	ALL	<=2.5t	LGV<=2.5t	LGV3
Light Goods Vehicles (2.5-3.5t)	ALL	>2.5-3.5t	LGV2.5-3.5t	LGV4
Light Goods Vehicles (3.5-5.5t)	ALL	>3.5-5.5t	LGV>3.5t	LGV6
Medium & Heavy Goods Vehicles (5.5-15t)	ALL	>5.5-15t	HGV<=15t	HGV7
Medium & Heavy Goods Vehicles (15-24t)	ALL	>15-24t	HGV15-24t	HGV8
Public Light Buses	ALL	ALL	PLB	PLB
Private Light Buses (<=3.5t)	ALL	<=3.5t	PrLB<=3.5t	PV4
Private Light Buses (>3.5t)	ALL	>3.5t	PrLB>3.5t	PV5
Non-franchised Buses (<6.4t)	ALL	<=6.36t	NFB<=6.4t	NFB6
Non-franchised Buses (6.4-15t)	ALL	>6.36-15t	NFB6.4-15t	NFB7
Non-franchised Buses (15-24t)	ALL	>15-24t	NFB15-24t	NFB8
Single Deck Franchised Buses	ALL	ALL	FBSD	FBSD



Vehicle Class Description	Fuel Type	Gross Vehicle Weight (tonnes)	Symbol 1 (in csv output file)	Symbol 2 (in bcd output file & traffic data)
Double Deck Franchised Buses	ALL	ALL	FBDD	FBDD
Motor Cycles	ALL	ALL	MC	MC
Heavy Goods Vehicles (>24t)	ALL	>24t	HGV>24t	HGV9
Non-franchised Buses (>24t)	ALL	>24t	NFB>24t	NFB9

- 4.7.6 The estimated 18-class distribution as defined in EMFAC-HK was derived by sectoring the relevant classes in the Transport Department's Annual Traffic Census record or vehicle distribution obtained from manual traffic count surveys, in proportion to the recorded distribution in EPD document: "2018 Vehicle Licensed Number by Age and Technology Group Fractions".
- 4.7.7 All concerned roadways shall be characterized with speed limits. Average speeds of 24 hours were prepared for each road.
- 4.7.8 The established road traffic data, including traffic flow, 24-hour vehicle mix and 24-hour average speed was provided by the Project Traffic Consultant. Confirmation from the Transport Department (TD) has been sought and the reply from TD on the methodology adopted for the traffic forecast is provided in **Appendix 4-13**. It should be noted that the traffic forecasts for the assessment have been produced strictly in accordance with the methodology of the traffic forecast.

#### EMFAC-HK Input

##### *Geographical Area*

- 4.7.9 "Hong Kong" is selected as the Geographical Area.

##### *Calendar Year*

- 4.7.10 In order to determine the highest emission scenario and the worst assessment year, EMFAC-HK model runs have been carried out with emission factors and the predicted traffic forecast for 2030 (i.e. completion year), 2037 (i.e. seven years after completion year), and 2045 (i.e. fifteen years after completion year).

##### *Season or Month*

- 4.7.11 Per the EPD Guideline, "Annual" is selected in this study to evaluate the highest vehicle emission within the Model Year.

##### *Mode and Output*

- 4.7.12 EMFAC-HK Model is run in Emfac mode for calculating area fleet average emissions.

##### *Temperature and Humidity*

- 4.7.13 The information of temperature and relative humidity from PATH meteorological output in the corresponding grids was used in this assessment.
- 4.7.14 In accordance with a *Guideline of Use of Temperature and Relative Humidity Data for Vehicular Emission Factor Prediction* published by EPD in March 2021, the daily profile of lowest temperature and relative humidity data in each hour for each month available at SAMP v1.1 was applied for the calculation of emissions from open roads for both short-term (i.e. hourly or daily average) and long-term (i.e. annual average) air quality impact and the minimum quarterly temperatures and RHs were applied for the

calculation of emissions from PTIs and portals for both short-term and long-term air quality impact.

#### *Speeds*

- 4.7.15 The average speed data provided by the project traffic consultant for every hour of each road was used for the subsequent calculation. As mentioned in **Section 4.7.8**, the relevant correspondence of the endorsement by the TD is provided in **Appendix 4-13**.

#### *Exhaust / Evaporation Technology Fractions*

- 4.7.16 Vehicle classes are grouped with different exhaust and evaporation technology group indexes and technology fractions. Each technology group represents a distinct emission control technology. Default exhaust and evaporation technology fractions are adopted in this assessment.

#### *Population and Accrual Rate*

- 4.7.17 Default vehicle populations forecast and accrual rate in EMFAC-HK Model is adopted.

#### *Trips and VKT*

- 4.7.18 Default trips and VKT for HK total is adopted. Detailed emission factors were generated with respect to the combination of temperature, RH and speed for running exhaust emission, and combination of temperature and soak time for start emission.

#### Calculation of Emission Factors by EMFAC-HK Model Output

##### *Running Exhaust Emission Factor*

- 4.7.19 To represent the worst-case scenario, a maximum running exhaust fleet average emission factor (g/km) arising from all combinations of minimum temperature and relative humidity with respect to each combination of speed and vehicle class will be adopted for NO<sub>2</sub>, NO, RSP and FSP for every month of a year.
- 4.7.20 For each road, hourly composite running exhaust emission rate (NO<sub>2</sub>/NO/RSP/FSP) is determined by:

*Hourly composite running exhaust emission factor (NO<sub>2</sub>/NO/RSP/FSP) (g/veh-km)*

*=  $\sum$  [hourly running exhaust fleet average emission factor for each vehicle class x % composition of corresponding vehicle class]*

##### *Starting Emission Factor*

- 4.7.21 In general, no starting emission will be applied if the roads with double yellow line and the road classified as District Distributor, Primary Distributor, Trunk Road & Expressway. The roads (ID L7A, L7B, L7C, L9A, L9B, L9C, L10A, L53A, L53B and L56A) with on-street parking, no line or single yellow line are considered as with starting emission. As the information of the soak time is not available, the maximum starting emission (g/trip) among different soak times (from 5min to 720min) is adopted, which is considered as a more conservative approach. Starting emissions of all 18 vehicle classes are included in the calculation.
- 4.7.22 The number of trip is dependent on vehicle population. The default value of trip in the EMFAC-HK Model is the number of trips within HK given a defined vehicle population. Since there is no project-specific vehicle population data, it is proposed to estimate the number of trips within the study area with respect to the project-specific Vehicle Kilometers Travelled (VKT) given the assumption that the VKT is related to vehicle population.
- 4.7.23 It is assumed that there is no starting emission on Expressways (EX), Primary Distributor (PD) and District Distributor (DD) roads. The number of trips of these roads

is zero for all vehicle classes for all hour of the day. For the local and rural roads within the study area, the number of trips is estimated by scaling the number of trips for vehicle class within the entire HK using the ratio of VKT for local and rural roads within the study area to VKT for local and rural roads within the entire HK.

*Trip for local and rural roads within the study area*

$$= \text{Trip for local and rural roads within HKSAR} * \frac{\text{VKT for local and rural roads within the study area}}{\text{VKT for local and rural roads within HKSAR}}$$

*Note: For particular vehicle class and particular hour*

4.7.24 The same method was also adopted in the approved Liantang EIA. The estimation of % VKT for local and rural roads within HK is shown in **Appendix 4-14**.

4.7.25 In this assessment, the estimated VKT for local and rural roads with possible starting emission amounts to ~14.34% of total VKT according to the 2022 Traffic Census Data. Trip per VKT for local and rural road for each class is determined by:

$$\text{Trip/VKT (1/veh-km) for each vehicle class} = \text{HK total number of trips for each vehicle class} \div (\text{HK total VKT for each vehicle class} \times \% \text{ of daily vehicle-km for local and rural roads in Hong Kong}).$$

4.7.26 Based on the hourly **VKT data** from the project traffic consultant, the hourly total starting emission (gram) for each vehicle class along each road is determined by:

$$\text{Hourly total starting emission (g) for each vehicle class} = \text{starting emission rate for each vehicle class} \times \text{Trip/VKT for each vehicle class} \times \text{VKT for each vehicle class along each road}$$

4.7.27 The hourly total starting emission for each road is the sum of hourly total starting emission (gram/km) for each vehicle class along the same road. The hourly composite starting emission factor is calculated by dividing the value using the hourly traffic flow:

$$\text{Hourly total starting emission (g/km)} = \Sigma [\text{hourly total starting emission for each vehicle class}]$$

$$\text{Hourly composite starting emission factor (g/veh-km)} = \text{hourly total starting emission} \div \text{hourly total traffic flow}$$

#### Meteorological Data

4.7.28 Hourly meteorological data of Grid (38,29) for a full year is extracted from the PATH v3.0 released by EPD in January 2024. Hourly wind speeds lower than 0.5m/s (i.e. calm wind condition) are corrected to 0.5m/s. Hourly Pasquill stability classes are extracted from the PATH v3.0. Hourly mixing heights are capped between the minimum and maximum values measured at King's Park AWS (2019), i.e. 119m and 2009m.

#### Noise Barrier

4.7.29 Neither vertical nor cantilevered noise barriers are found within 500m from the Application Site according to the findings from onsite visits and confirmation from Highways Department. Therefore, no noise barriers are considered in the model assessment.

#### Road Elevation

4.7.30 4.8.64.8.5 The base elevation is the elevation of the ground surface underneath the road link in meter above Principal Datum (mPD). The height of the road surface above ground (in mAG) should be added to the release height.

Assessment Year

- 4.7.31 The air quality impact of the vehicular emissions is typically calculated based on the highest emission strength from the traffic forecast data within the first 15 years after the completion of the Proposed Development (i.e. between 2030 and 2045). The assessment year is selected to represent the highest emission scenario given the combination of vehicular emission factors and traffic flow for the same year. The worst assessment year has been determined based on the highest NO<sub>x</sub>, RSP and FSP emission scenario using the EMFAC-HK model. Sensitivity tests have been conducted to determine the worst-case scenario given the combination of vehicular emission factors and the projected traffic flow for the following selected years within 15 years after the completion of the Proposed Development. The representative years are 2030 (i.e. completion year), 2037 (i.e. seven years after completion year) and 2045 (fifteen years after completion year). Details of sensitivity analysis of the emission inventories of the vehicular emission from open roads is shown in **Appendix 4-14** and **Appendix 4-15**. Based on the results, the greatest total emission for NO<sub>x</sub>, RSP and FSP is in Year 2030, therefore, Year 2030 has been selected as the worst-case model year for the air quality.

**4.8 Post-processing of Modelling Results and Background Pollutant Contribution**

- 4.8.1 Pollutant dispersion from vehicular, marine, helicopter and PTI/Bus Terminus emissions have been simulated using the **AERMOD model**. Dispersion results and background pollutant contributions have been combined and post-processed for the different averaging periods required for comparison with the relevant AQOs.

NO<sub>x</sub> to NO<sub>2</sub> Conversion

- 4.8.2 The conversion of NO<sub>x</sub> to NO<sub>2</sub> is a result of a series of complex photochemical reactions and determines the prediction of near field impact of NO<sub>x</sub> emissions. To determine vehicular emission impacts, the emission factors of NO<sub>2</sub> are extracted from the results of the EMFAC-HK Model version 4.3 and the emission factors of NO are calculated from the emission factors of NO<sub>x</sub> and NO<sub>2</sub> for all motor vehicle types. For the emissions from ferries and helicopter, initial NO<sub>2</sub> to NO<sub>x</sub> ratio for is assumed as 20% with reference to the approved EIA report for Expansion of Heliport Facilities at Macau Ferry Terminal (Register No: AEIAR-095/2006).
- 4.8.3 For NO<sub>x</sub> in particular, an algorithm has been built-in to convert a portion of NO<sub>x</sub> predicted at ASRs into NO<sub>2</sub> using the Ozone Limiting Method (OLM) when they mix with the ambient O<sub>3</sub>. The OLM assumes a conversion process that is stoichiometrically limited by the ambient O<sub>3</sub> levels, and hence the latter can be used to predict the maximum convertible NO<sub>2</sub> from NO<sub>x</sub> for superimposing onto the initial "out-of-tailpipe / in-stack" NO<sub>2</sub> levels as the base level. OLM has been applied for the sum of the vehicular and industrial sources to compare with the available ozone for conversion to NO<sub>2</sub>.

$$[NO_2]_{Predicted} = [NO_2]_{initial} + \text{Min}([NO]_{initial} \text{ or } \frac{46}{48}[O_3]_{PATH})$$

Jenkin Method for Long-term Cumulative NO<sub>2</sub> Assessment

- 4.8.4 For the long-term cumulative NO<sub>2</sub> assessment (i.e. predictions of annual average NO<sub>2</sub> concentration), Jenkin Method was adopted for the conversion of cumulative annual average NO<sub>x</sub> to cumulative annual average NO<sub>2</sub> by using the functional form with reference to "Review of Methods for NO to NO<sub>2</sub> Conversion in Plumes at Short Ranges" published by Environment Agency of UK in 2007. The mentioned functional form is shown as below:

$$[NO_2] = \frac{([NO_x] + [O_x] + \frac{J}{k}) - \sqrt{([NO_x] + [O_x] + \frac{J}{k})^2 - 4 \times [NO_x] \times [O_x]}}{2}$$

where

[NO<sub>2</sub>] is Annual Average NO<sub>2</sub> Concentration;

[NO<sub>x</sub>] is Annual Average NO<sub>x</sub> Concentration;

[O<sub>x</sub>] is the Sum of Annual Average NO<sub>2</sub> Concentration and Annual Average O<sub>3</sub> Concentration (i.e. [O<sub>x</sub>] = [NO<sub>2</sub>] + [O<sub>3</sub>]);

J is the Photolysis Rate of NO<sub>2</sub>;

k is the Rate Coefficient for the Reaction between NO and O<sub>3</sub>.

- 4.8.5 The above functional form was used to analyse the annual average data obtained from EPD's air quality monitoring stations. The details for the data analysis and derivation of cumulative annual average NO<sub>x</sub> to NO<sub>2</sub> conversion equation using Jenkin Method for this assessment are shown in **Appendix 4-17**. The cumulative annual average NO<sub>x</sub> to NO<sub>2</sub> conversion equation for this assessment was calculated as below:

$$[NO_2]_p = \frac{([NO_x]_p + 92.6 + 14.44) - \sqrt{([NO_x]_p + 92.6 + 14.44)^2 - 4 \times [NO_x]_p \times 92.6}}{2}$$

#### Background Pollutant Contribution

- 4.8.6 The latest Pollutants in the Atmosphere and their Transport over Hong Kong model (PATH v3.0) released by EPD is used to estimate the background air quality. Since population intake year for the proposed development will be no later than Year 2030, PATH v3.0 for year 2030 of Grid (38,29) has been adopted as the background concentration.

### **4.9 Assessment Results**

- 4.9.1 The predicted air pollutant concentrations from the surrounding vehicular, marine, helicopter and Heavy Good Vehicle (HGV)/ Coach Parking, PTI/Bus Terminus emissions have been quantitatively assessed separately for NO<sub>2</sub>, RSP, FSP and SO<sub>2</sub>.
- 4.9.2 The predicted results of NO<sub>2</sub>, RSP, FSP and SO<sub>2</sub> at all predetermined ASRs are summarized in **Appendix 4-18**. Contour plots at G/F of the Application Site (assessment height: 13.9mPD) for NO<sub>2</sub>, RSP & FSP and the contour plot at worst-hit level for SO<sub>2</sub> are shown in **Appendix 4-19**.

#### NO<sub>2</sub>

- 4.9.3 The predicted results of the 19<sup>th</sup> highest 1-hour average and annual average NO<sub>2</sub> concentration at all identified ASR at selected levels are summarized in **Appendix 4-18**. The predicted results and the contour plots indicate that NO<sub>2</sub> concentrations at the Application Site would comply with the relevant AQOs. Therefore, no adverse air quality impact on the Application Site would be anticipated.

#### RSP

- 4.9.4 The predicted results of the 10<sup>th</sup> highest 24-hour and annual average RSP concentrations at ASR levels are summarized in **Appendix 4-18**. The predicted results and the contour plots indicate that RSP concentrations at the Application Site would comply with the relevant AQOs. Therefore, no adverse air quality impact on the Application Site would be anticipated.

### FSP

- 4.9.5 The predicted results of the 36<sup>th</sup> highest 24-hour and annual average FSP concentrations at ASR levels are summarized in **Appendix 4-18**. The predicted results and the contour plots indicate that FSP concentrations at the Application Site would comply with the relevant AQOs. Therefore, no adverse air quality impact on the Application Site would be anticipated.

### SO<sub>2</sub>

- 4.9.6 The predicted results of the 4<sup>th</sup> highest 10-minute average and 24-hour average SO<sub>2</sub> concentrations for all identified ASRs at selected levels are summarized in **Appendix 4-18**. The predicted results and the contour plots indicate that SO<sub>2</sub> concentrations at the Application Site would comply with the relevant AQOs. Therefore, no adverse air quality impact on the Application Site would be anticipated.

- 4.9.7 According to the predicted results of all of the identified ASRs, the predicted results indicate that the 1-hour average & annual average NO<sub>2</sub> concentration, 24-hour & annual average RSP concentration, 24-hour & annual average FSP concentration, and 10-minute average & 24-hour average SO<sub>2</sub> concentration would comply with the relevant AQOs. With the assumptions of worst-case scenario adopted for most of the emission sources, the relevant AQOs are well-met for the whole Application Site even in case of any minor adjustment in assumptions and floor height necessary.

## **4.10 Odour Impact Assessment**

- 4.10.1 Only the Gage Street Refuse Collection Point has been identified within 200m study area from the Application Site during the on-site survey conducted in Aug and Nov 2023, which is located at a distance of ~55m from the Application Site. According to the observation during the on-site survey, no odour impact was observed near the Gage Street Refuse Collection Point. Moreover, according to the Code of Practice on the Operation of Refuse Collection Vehicles (RCVs) issued by Environmental Protection Department, no waste should be left in the uncovered hopper of RCV. Waste should be properly compressed and stored inside the RCV. After collecting the waste at a waste collection point, the ground of the waste collection point should be properly cleaned to maintain environmental hygiene and the rear loading compartment should be properly covered to mitigate odour spread. Therefore, it is anticipated that no adverse odour impact would be arisen from the Gage Street Refuse Collection Point on the air sensitive receivers of the Application Site.

## **4.11 Conclusion**

- 4.11.1 Although the Gage Street Refuse Collection Point has been identified within 200m study area from the Application Site during the on-site survey, no odour impact was observed near the Gage Street Refuse Collection Point. Therefore, it is anticipated that no adverse odour impact would be arisen from the Gage Street Refuse Collection Point on the air sensitive receivers of the Application Site.
- 4.11.2 The predicted concentrations of assessment parameters (NO<sub>2</sub>, RSP and FSP and SO<sub>2</sub>) at all ASRs at the Application Site would comply with the relevant AQOs. Therefore, no adverse air quality impact on the Application Site would be anticipated. With the assumptions of worst-case scenario adopted for most of the emission sources, the relevant AQOs are well-met for the whole Application Site even in case of any minor adjustment in assumptions and floor height necessary.

## 5. CONCLUSION

- 5.1.1 The environmental noise, air quality, construction phase environmental impacts including risk of land contamination have been assessed in this report with respect to the Proposed Development at Application Site.

### Noise

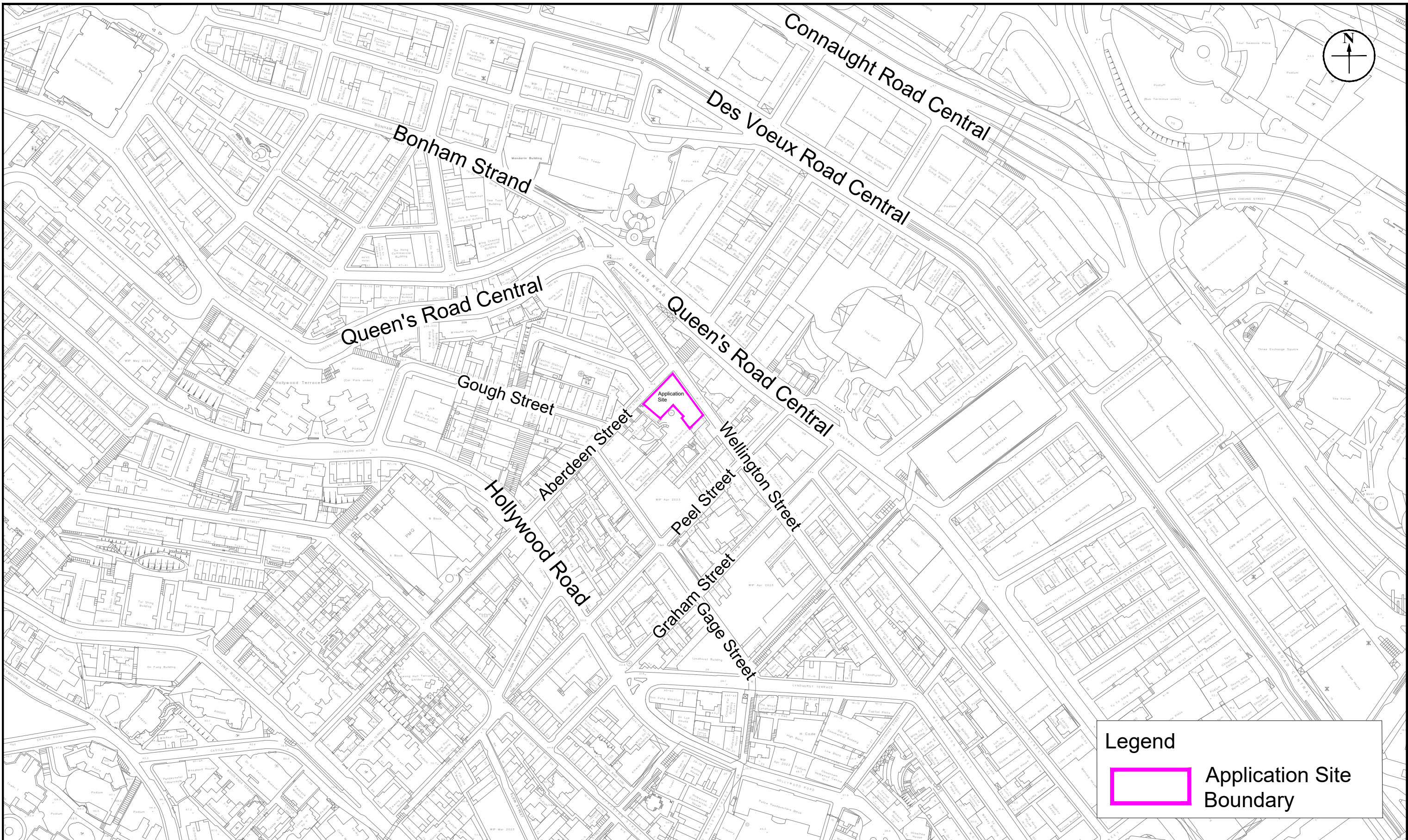
- 5.1.2 According to the result of road traffic noise impact assessment, no adverse road traffic noise impact due to surrounding roads on the Proposed Development is anticipated. No noise mitigation is considered necessary for the proposed development.
- 5.1.3 According to the result of fixed noise impact assessment, no adverse fixed noise impact due to surrounding fixed noise sources on the Proposed Development is anticipated. No noise mitigation is considered necessary.
- 5.1.4 This is in early planning stage of the study so that there is no detail of future fixed noise sources onsite available. Any fixed noisy facilities (e.g. fan system, HVAC for clubhouse) provided onsite in future will be designed to follow the HKPSG requirement (i.e. acceptable noise level minus 5 decibels) to ensure that there is no adverse impact on any noise sensitive use in the surrounding. Fixed noise impact assessment will be conducted with respect to noisy equipment onsite in later stage when relevant design information is available and will be submitted for the purpose to discharge relevant planning condition if this application is approved.

### Air Quality

- 5.1.5 The predicted concentrations of assessment parameters (NO<sub>2</sub>, RSP, FSP and SO<sub>2</sub>) at all ASRs of the Application Site are expected to be within the relevant AQOs. Therefore, no adverse air quality impact on the Proposed Development is anticipated. **With the assumptions of worst-case scenario adopted for most of the emission sources, the relevant AQOs are well-met for the whole Application Site even in case of any minor adjustment in assumptions and floor height necessary.**

## Figures





**Figure:** 1.1

**Title:** Locations of the Site and Its Environs

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

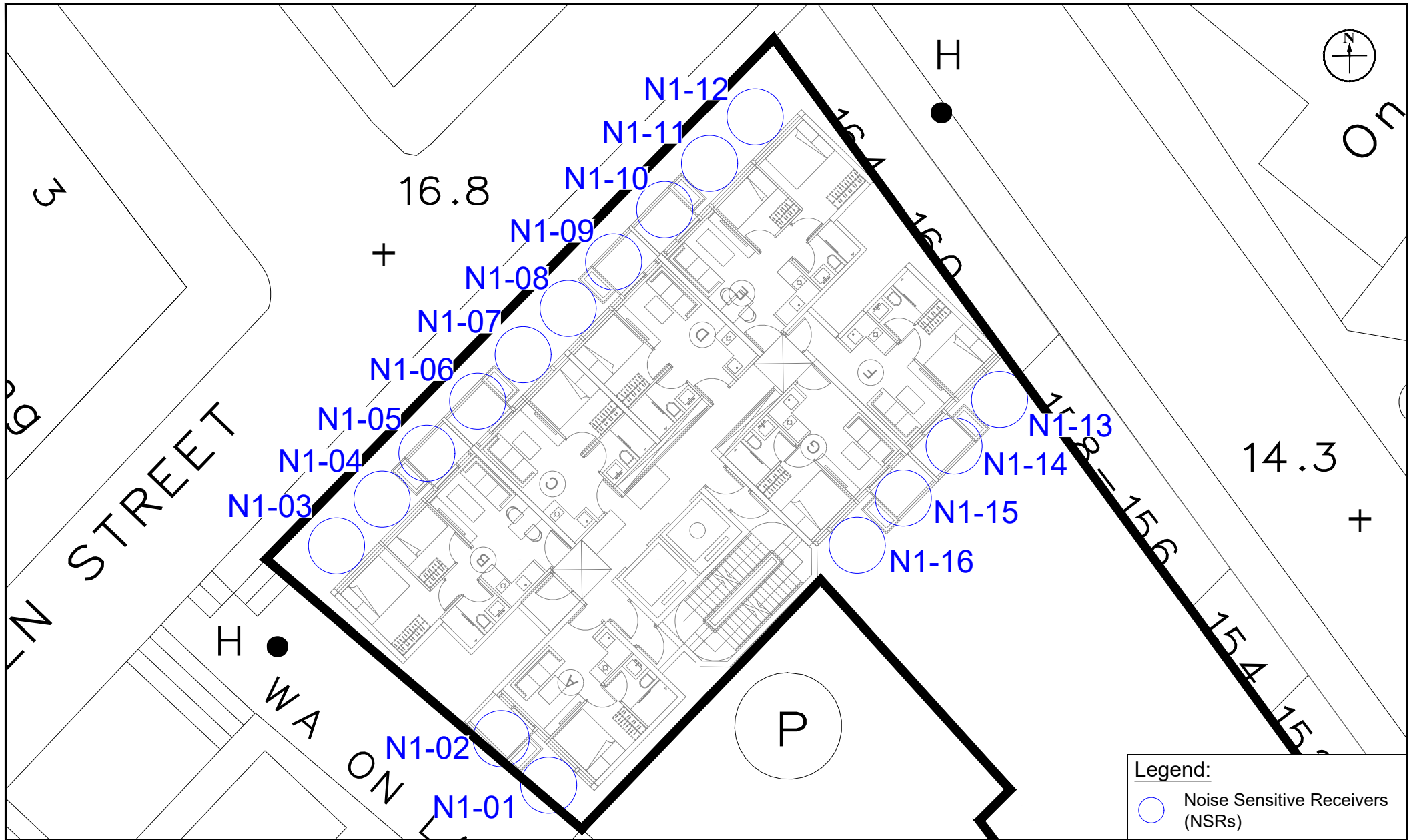
**RAMBOLL**

Drawn by: DC

Checked by: SL

Rev.: 1.1


Date: Feb 2024



**Figure:** 2.1

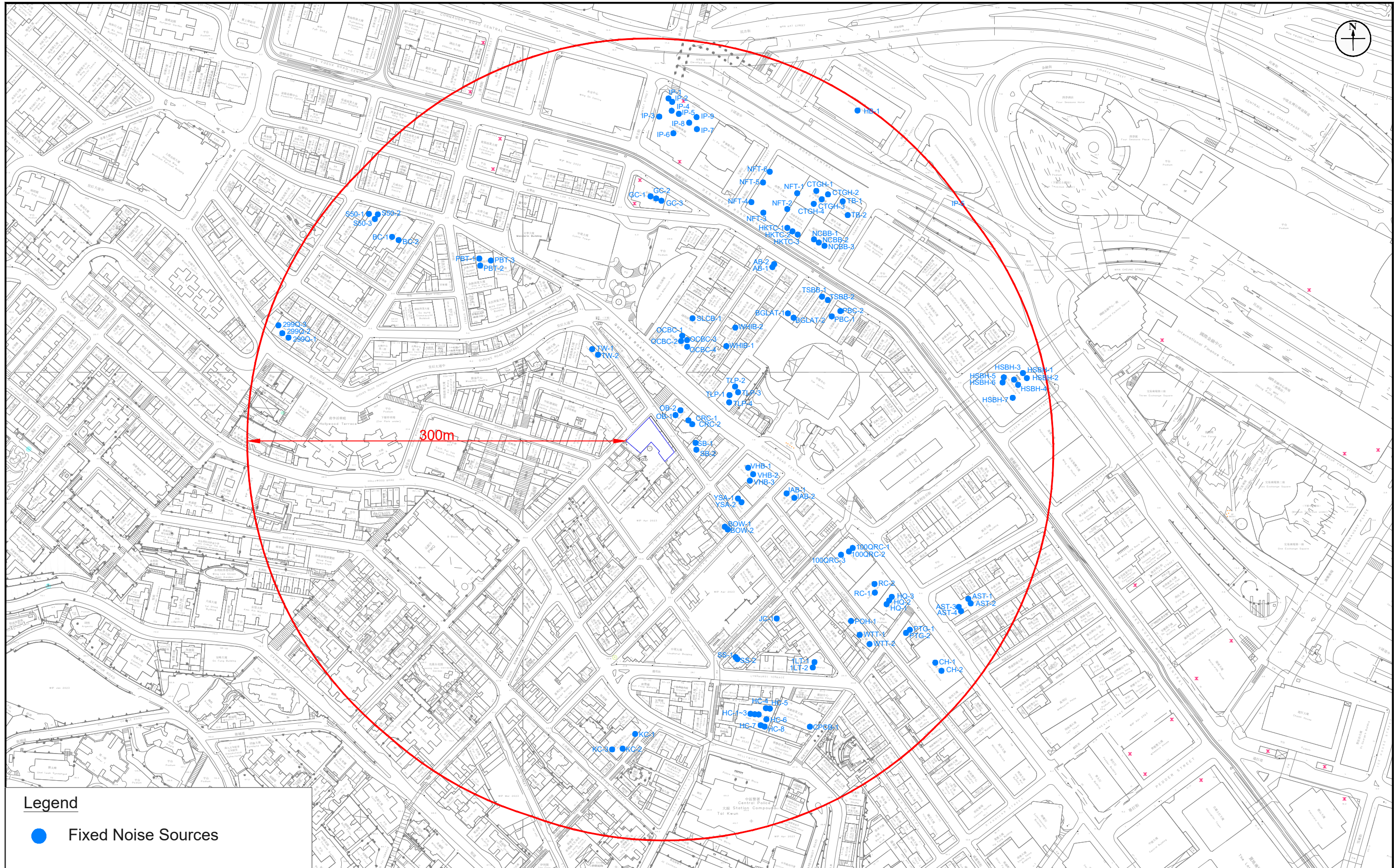
**Title:** Location of Representative Noise Sensitive Receivers for Road Traffic Noise Impact Assessment

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

<b>Legend:</b>	
	Noise Sensitive Receivers (NSRs)



Drawn by:	CM
Checked by:	CC
Rev.:	1.1
Date:	Feb 2024



**Legend**

● Fixed Noise Sources

**Figure:** 3.1

**Title:** Locations of Identified Fixed Noise Sources for Fixed Noise Impact Assessment

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

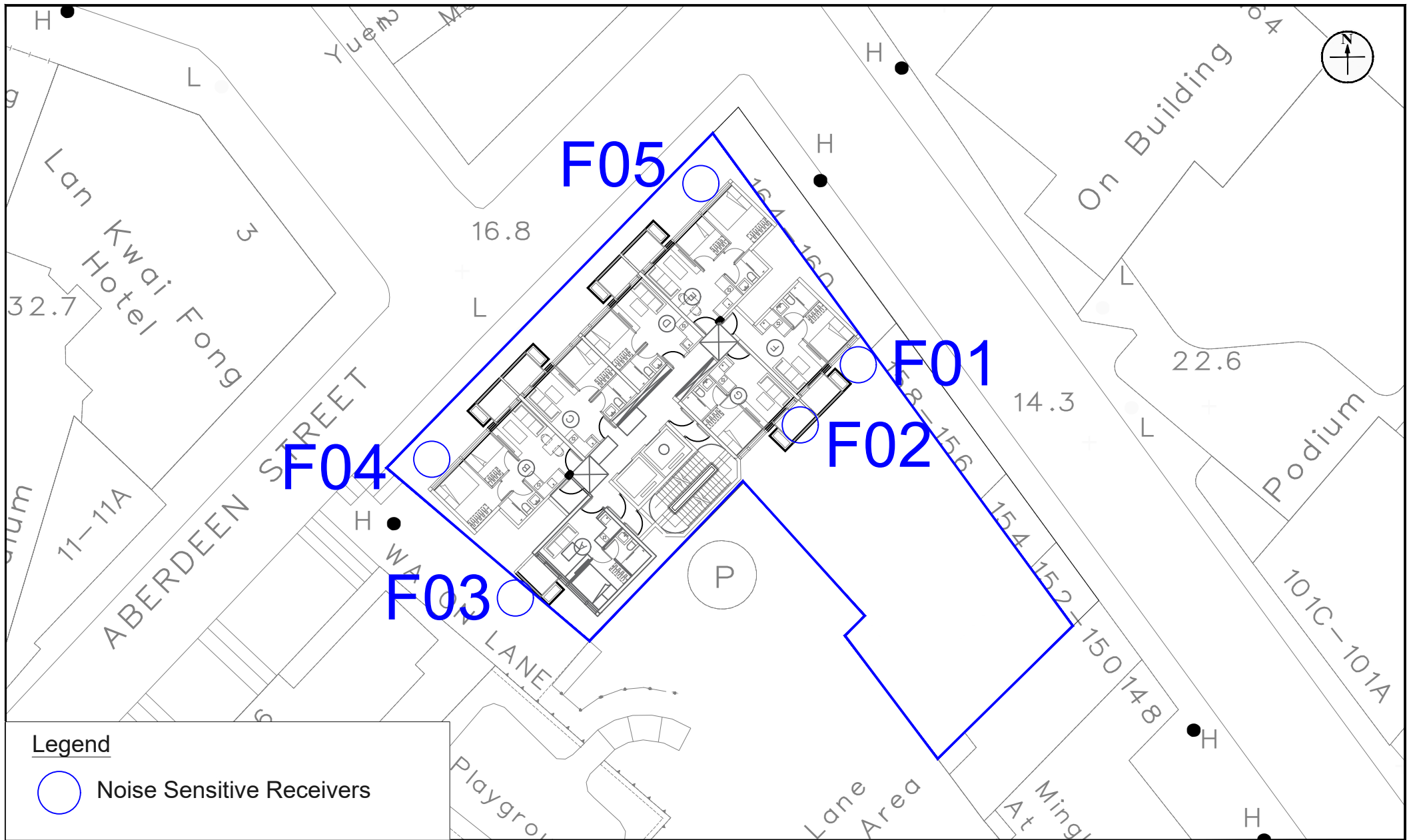
**RAMBOLL**

Drawn by: DC

Checked by: CC

Rev.: 1.1

Date: Feb 2024



**Legend**

○ Noise Sensitive Receivers

**Figure:** 3.2

**Title:** Locations of Representative Noise Sensitive Receivers for Fixed Noise Impact Assessment

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

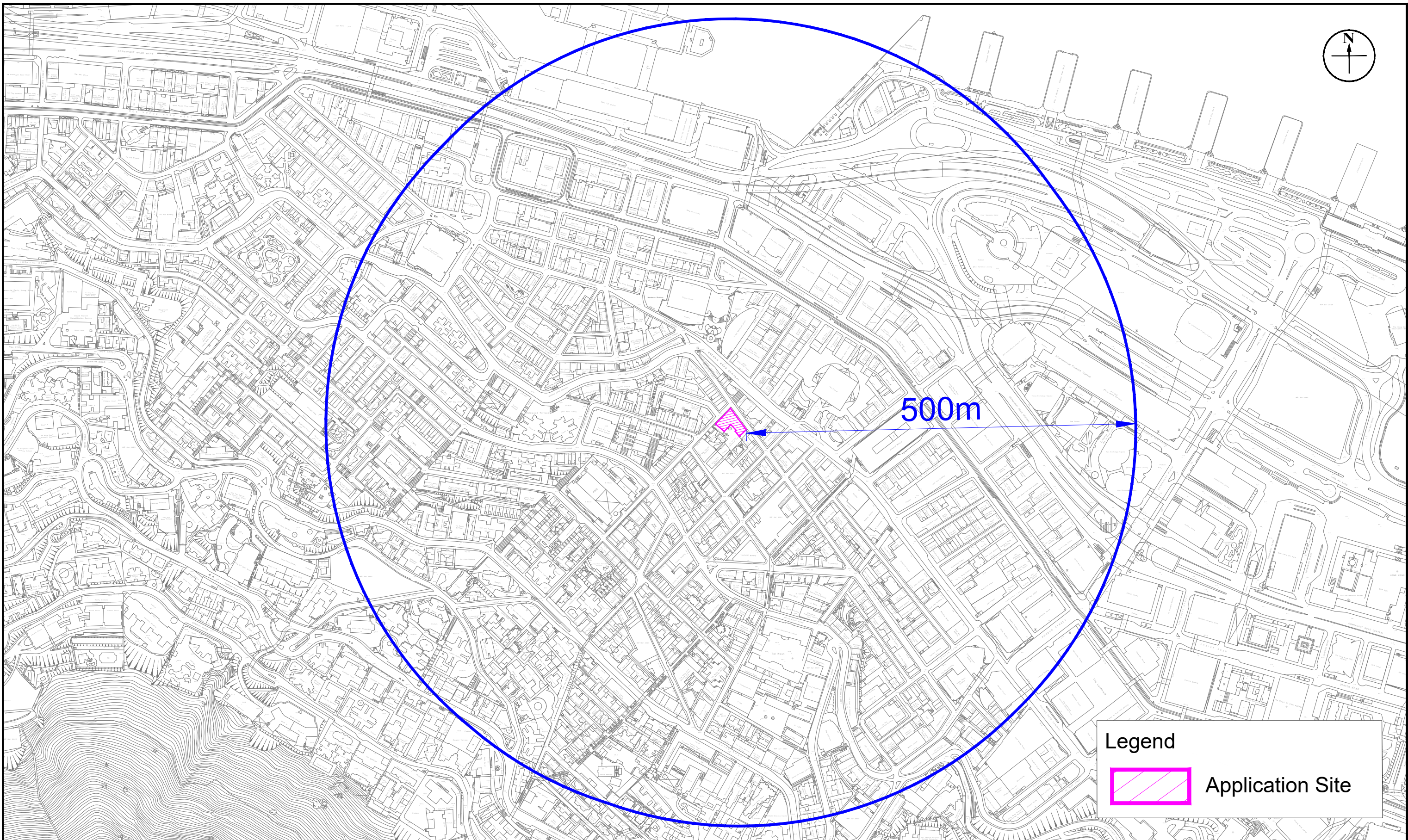
**RAMBOLL**

Drawn by: DC

Checked by: CC

Rev.: 1.1

Date: Feb 2024



**Figure:** 4.1

**Title:** Locations of the Site and Its Environs

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

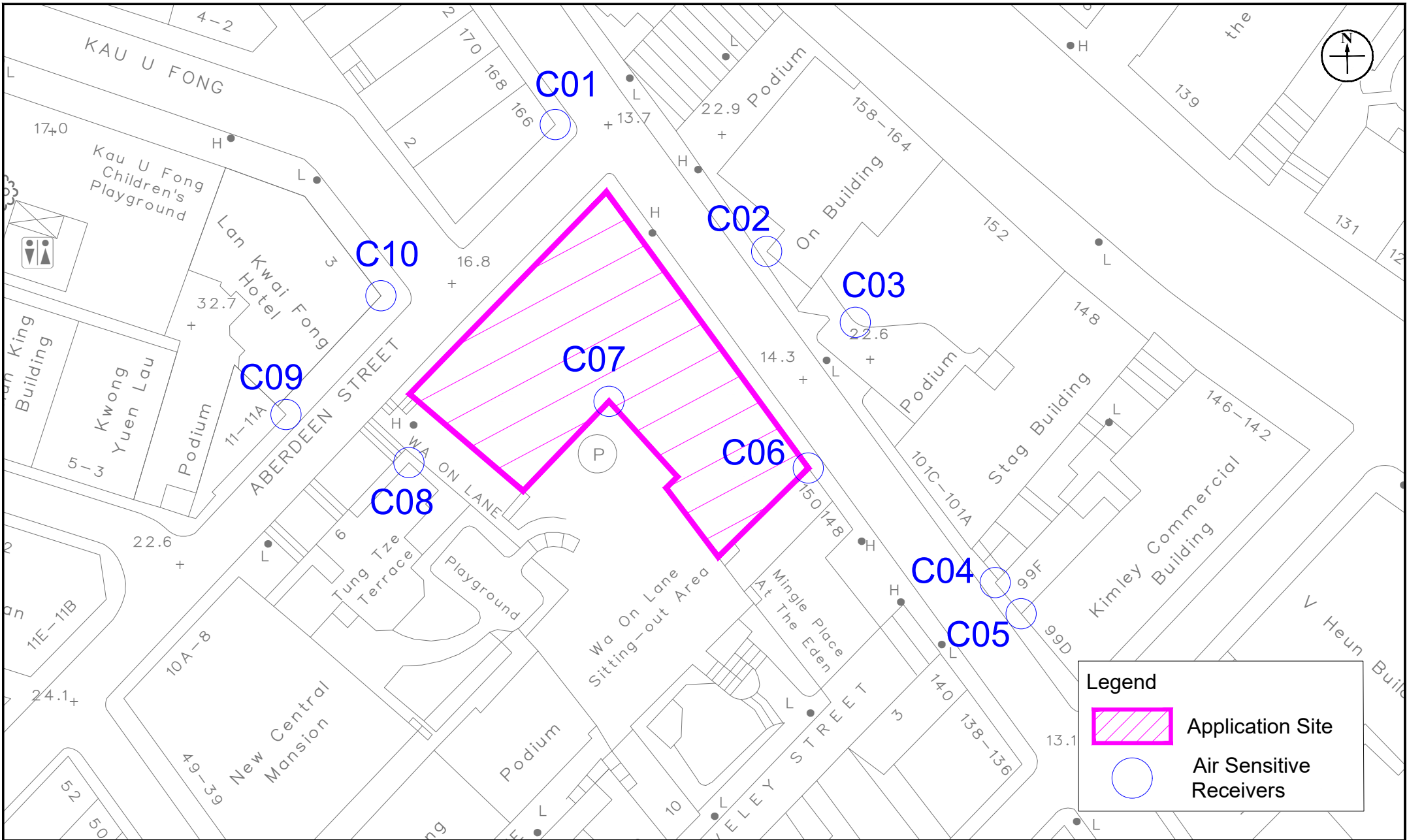
**RAMBOLL**

Drawn by: AW

Checked by: SL

Rev.: 1.1

Date: Feb 2024



**Figure:** 4.2

**Title:** Locations of Representative Air Sensitive Receivers during Construction Phase

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

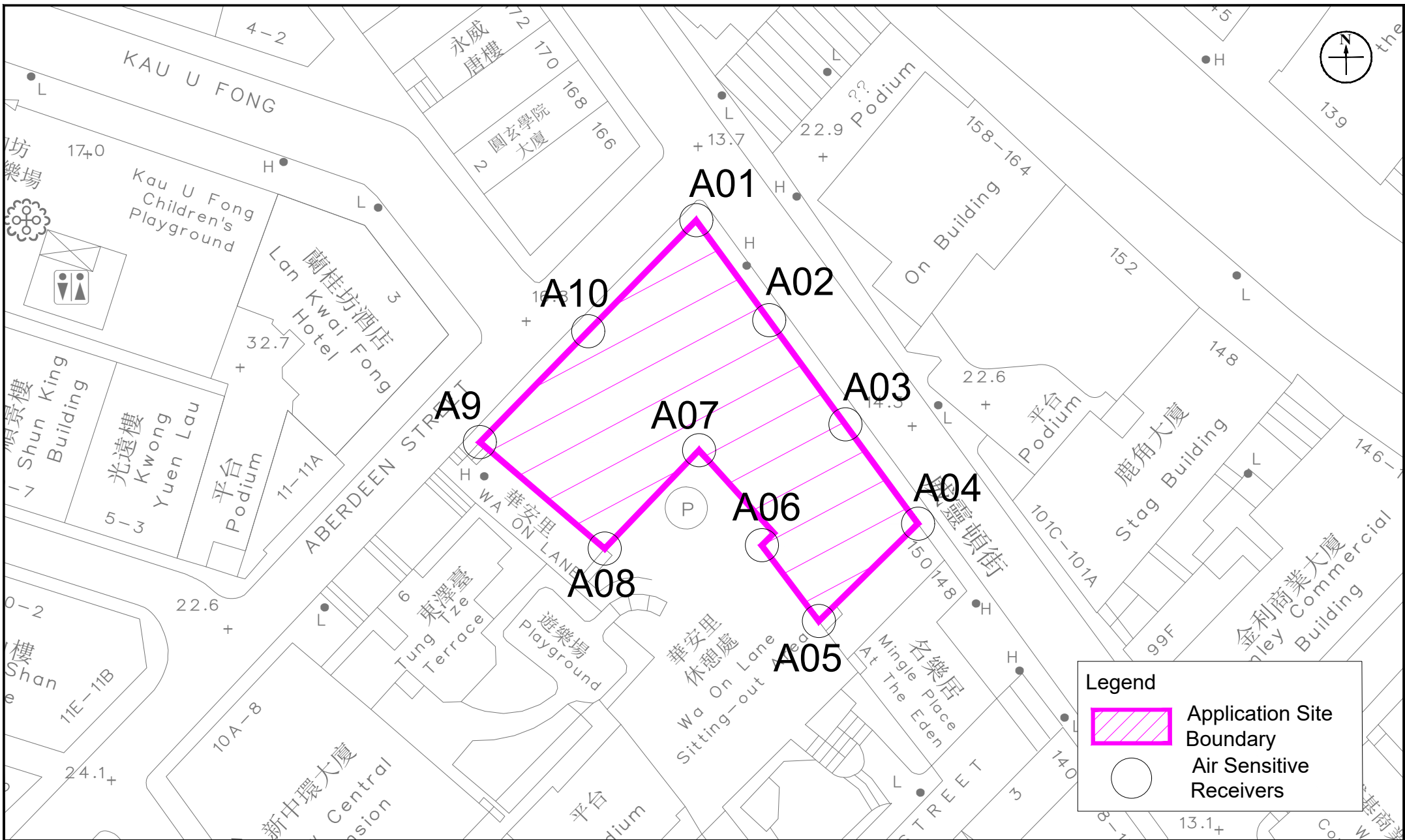
**RAMBOLL**

Drawn by: AW

Checked by: SL

Rev.: 1.1

Date: Feb 2024



**Figure:** 4.3

**Title:** Locations of Representative Air Sensitive Receivers during Operational Phase

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

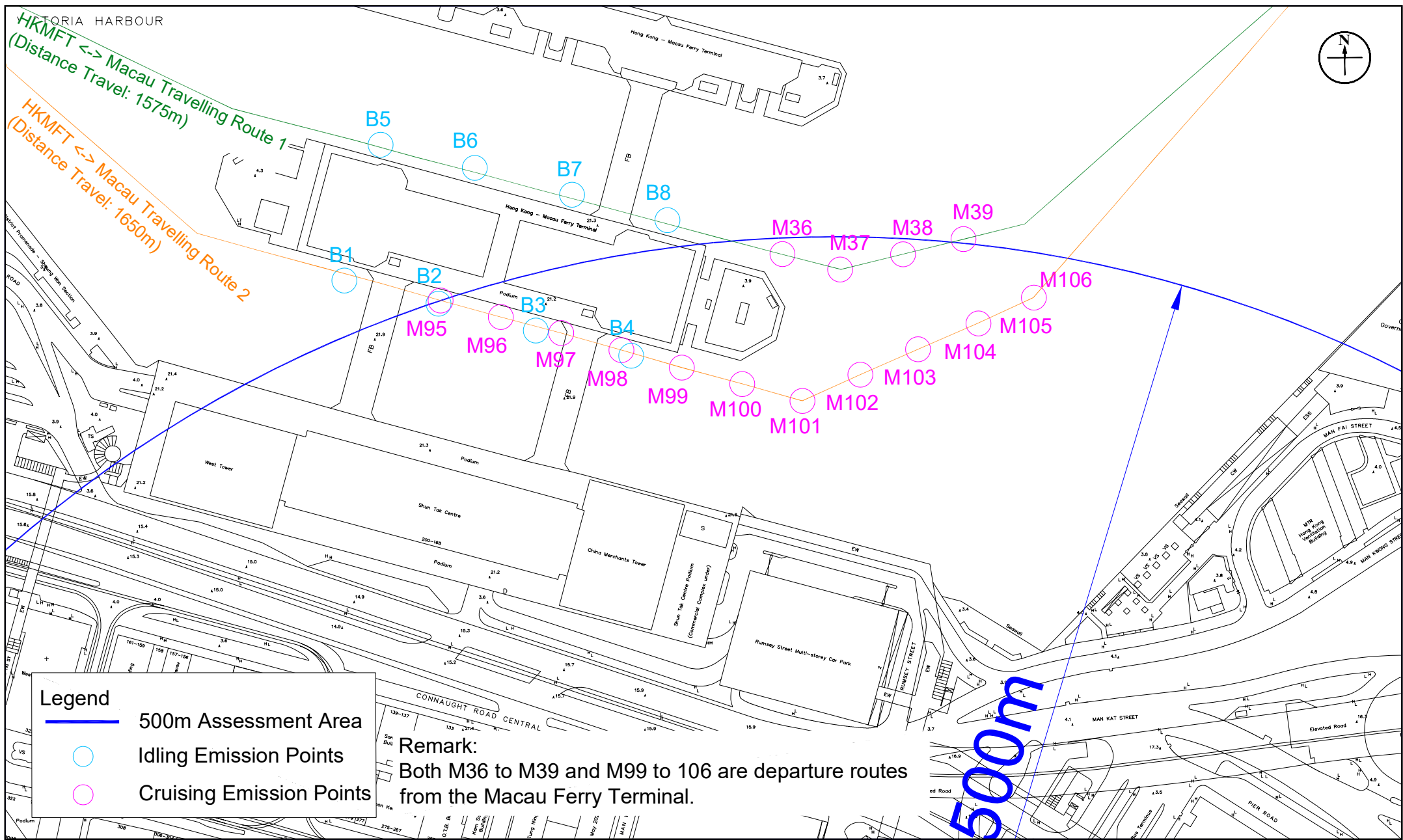
**RAMBOLL**

Drawn by: AW

Checked by: BF

Rev.: 1.1

Date: Feb 2024



**Figure: 4.4**

**Title:** Locations of Emissions from Marine Vessels at Hong Kong - Macau Ferry Terminal

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 - 164 Wellington Street in Sheung Wan



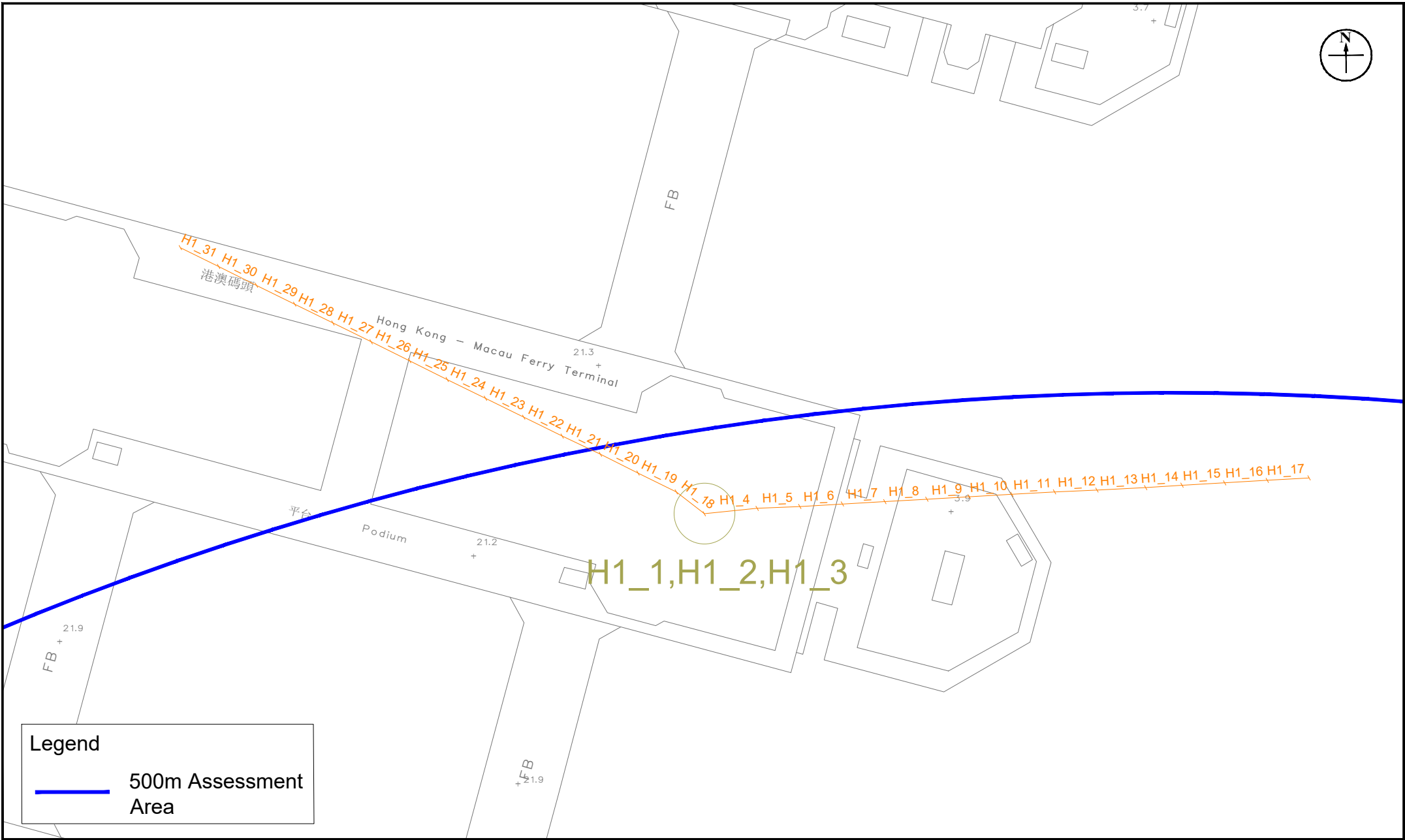
Drawn by: AW

Checked by: BF

Rev.: 1.2

Date: Jun 2024





**Legend**

 500m Assessment Area

**Figure:** 4.6

**Title:** Locations of Emissions from Helicopters

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

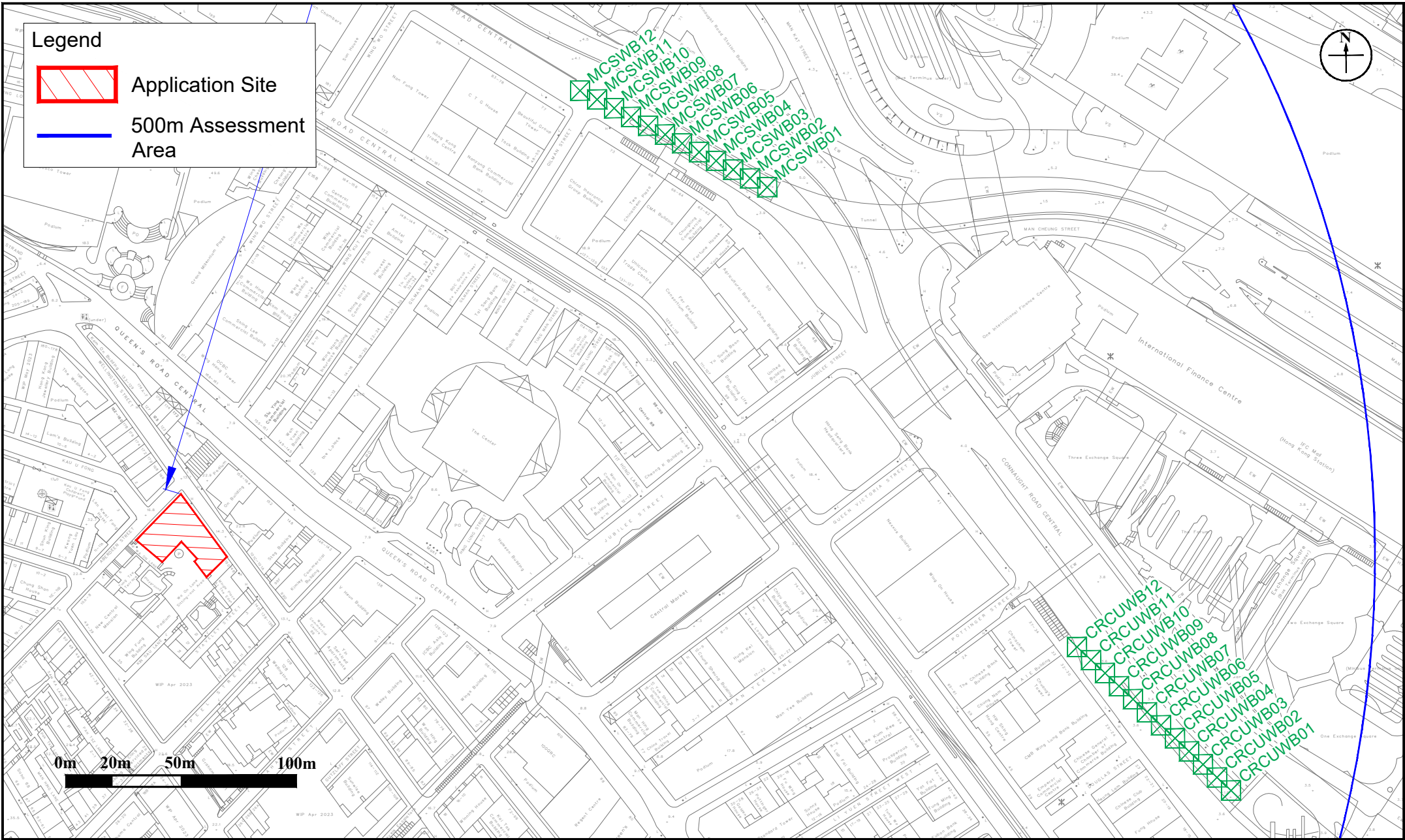


Drawn by: AW

Checked by: BF

Rev.: 1.1

Date: Feb 2024



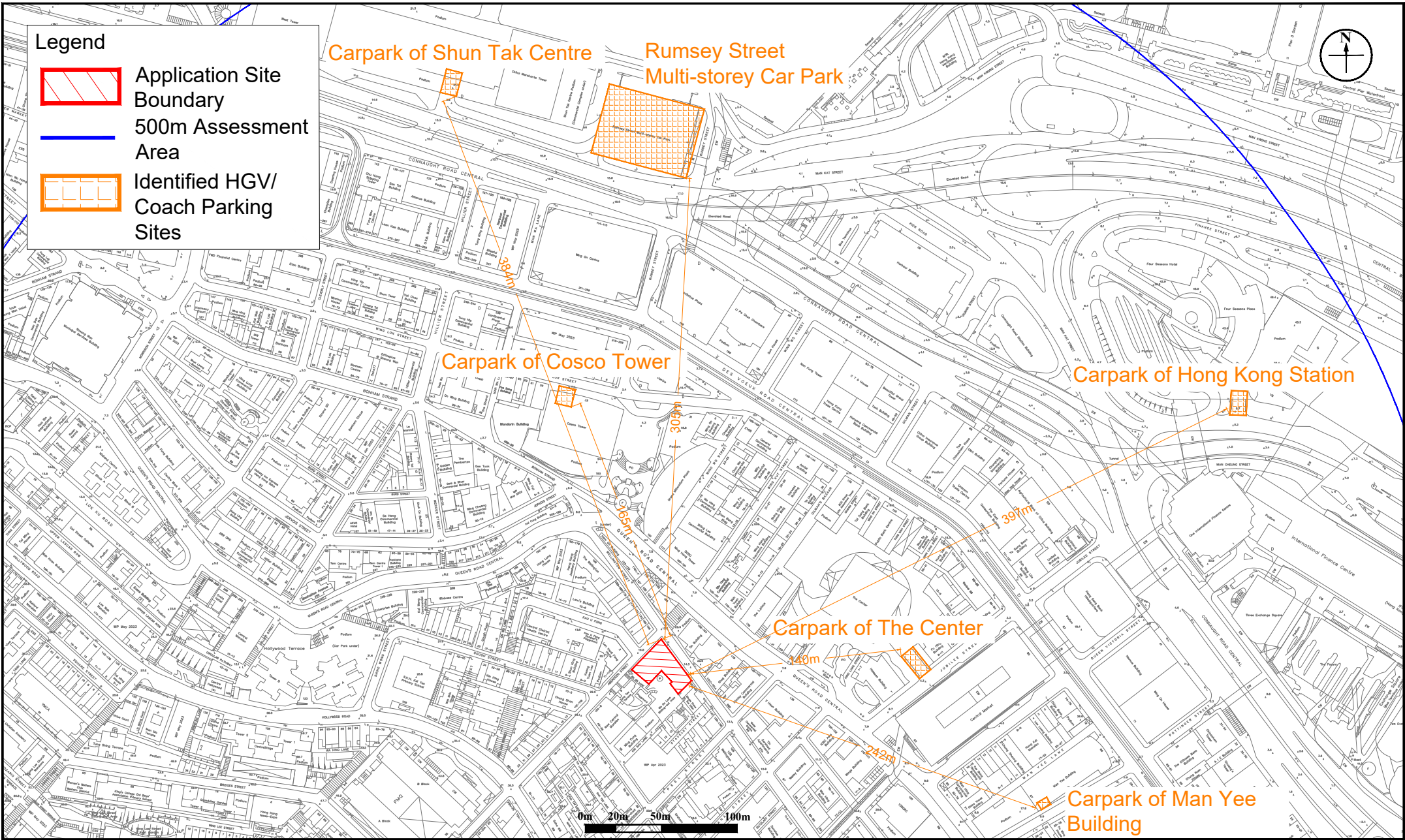
**Figure:** 4.7

**Title:** Locations of Emission Sources of Portals

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan



Drawn by:	AW
Checked by:	BF
Rev.:	1.1
Date:	Feb 2024



**Figure:** 4.8

**Title:** Locations of Identified Heavy Good Vehicle (HGV)/coach parking sites

**Project:** S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central

**RAMBOLL**

Drawn by: AW

Checked by: BF

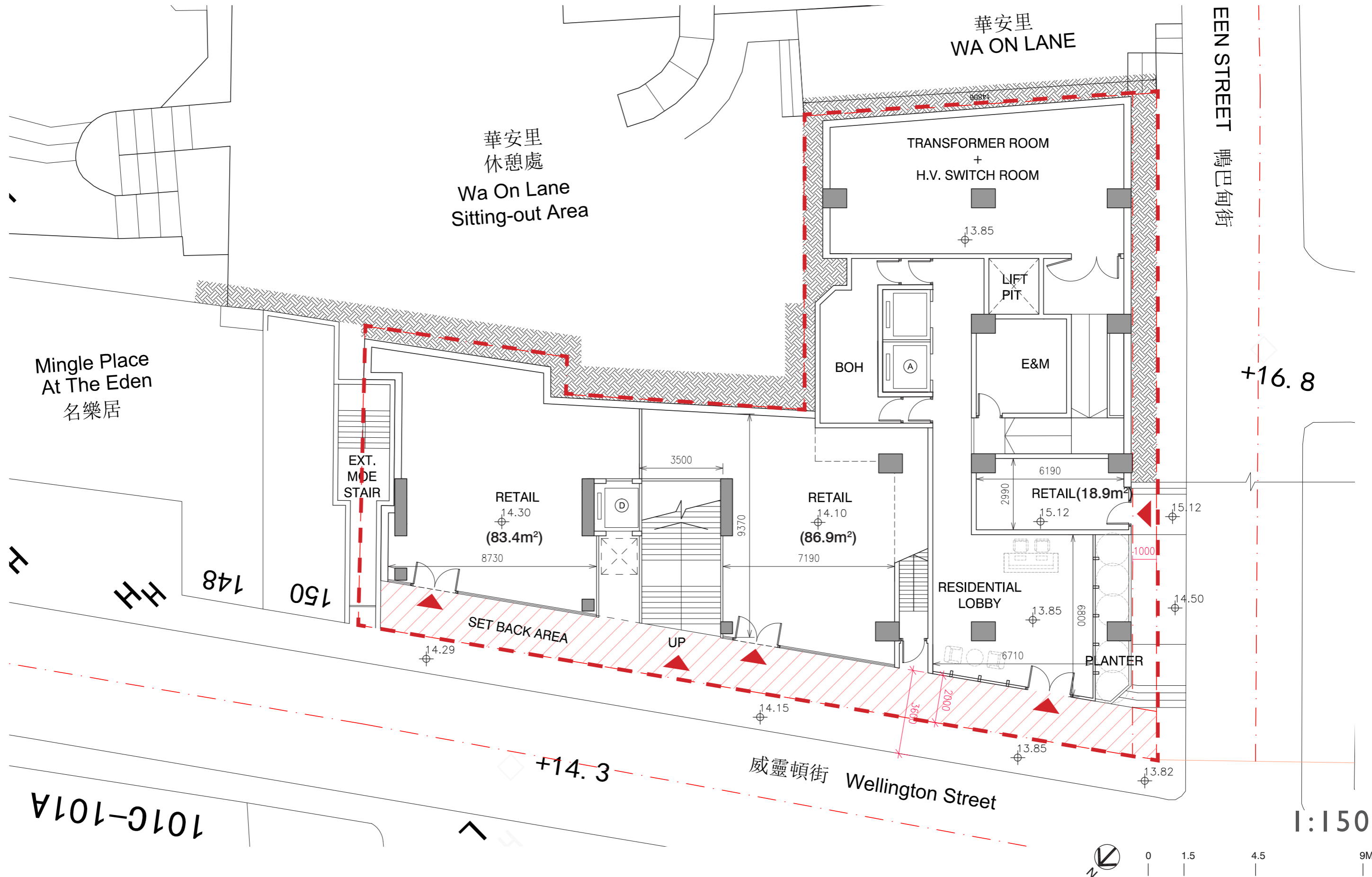
Rev.: 1.2

Date: Jun 2024

**Appendix 1-1    Layout and Floor Plans of the Proposed Development**

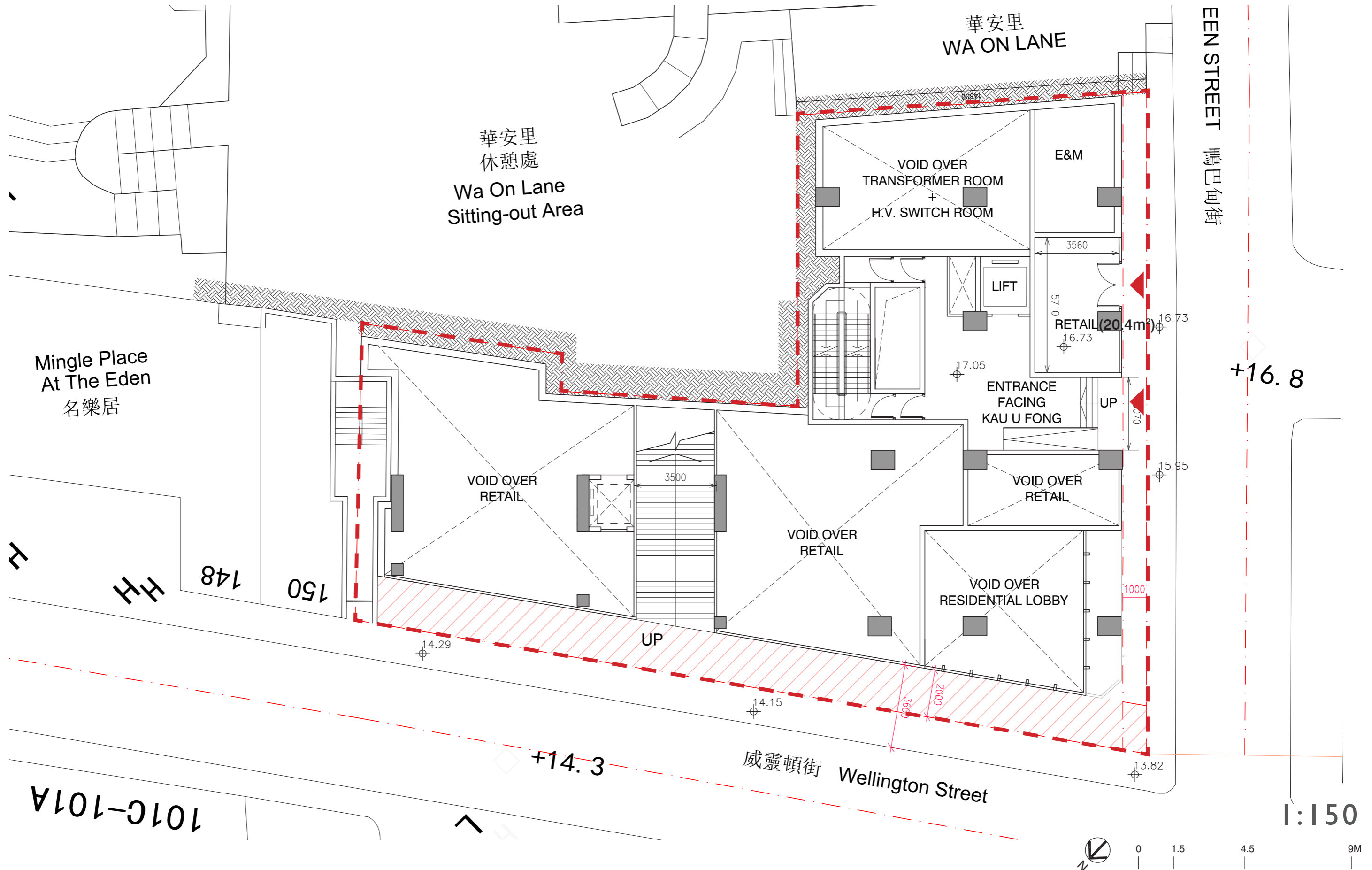
# PODIUM PLANS

GF



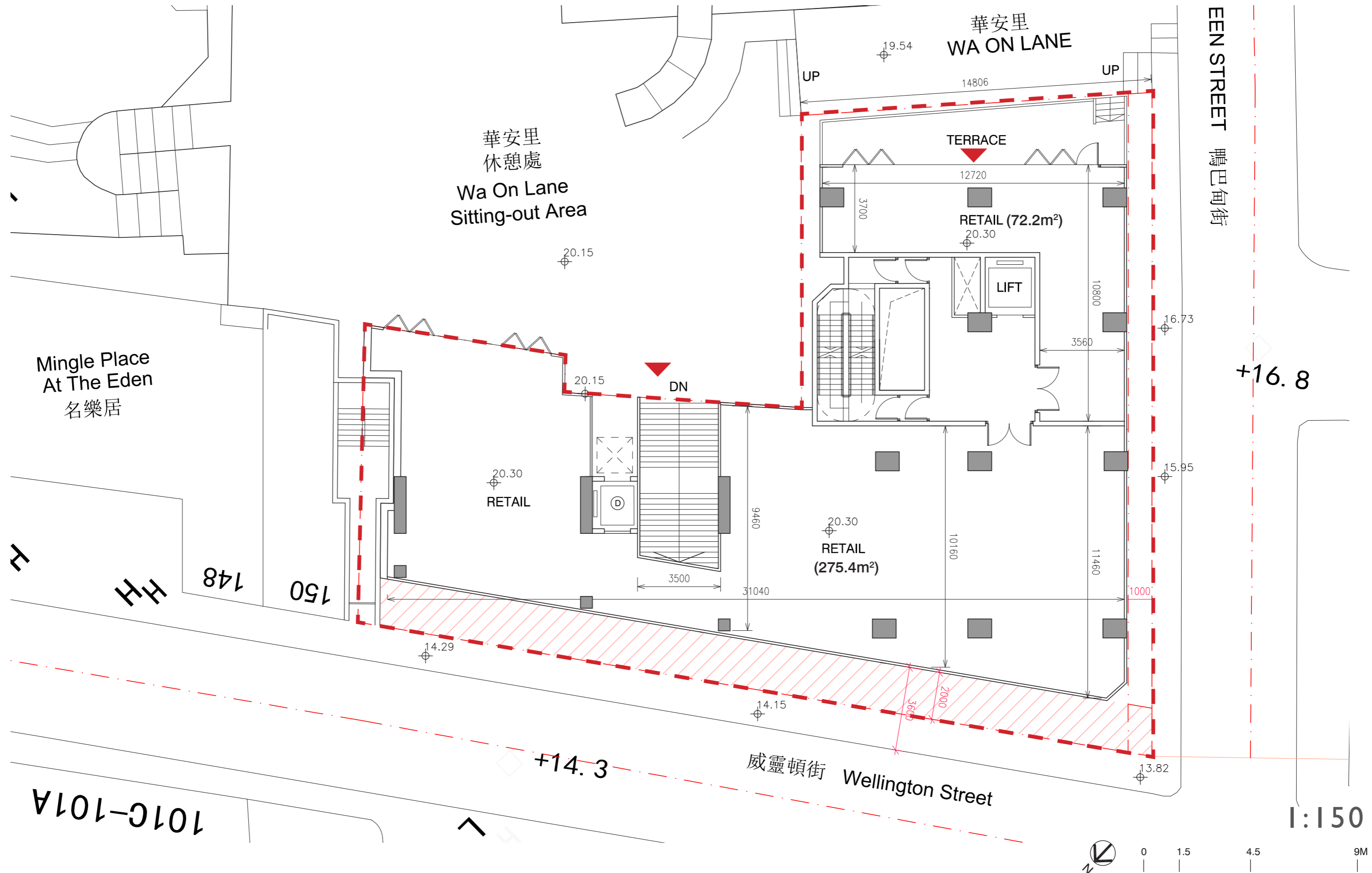
# PODIUM PLANS

MF



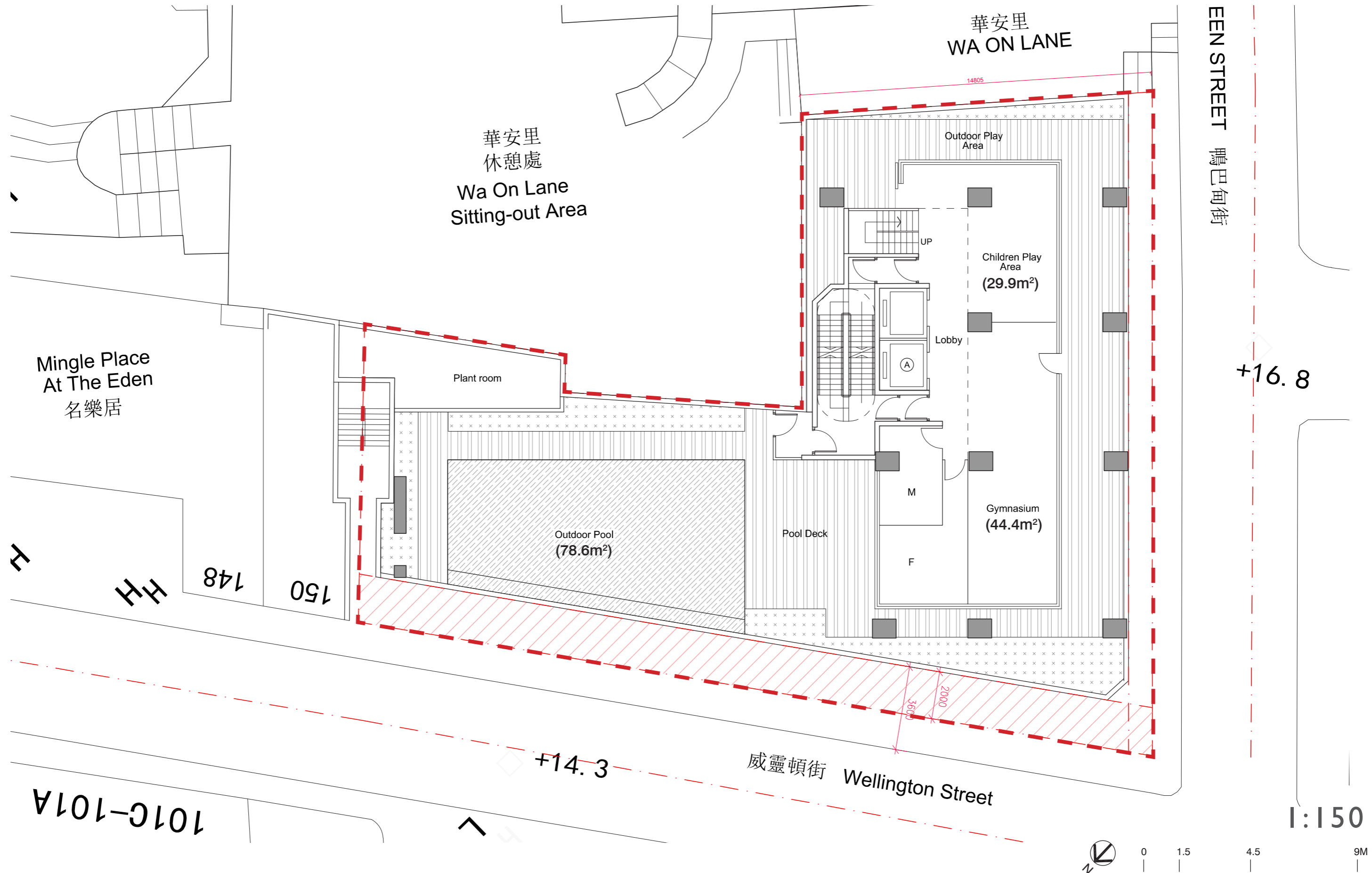
# PODIUM PLANS

IF



# PODIUM PLANS

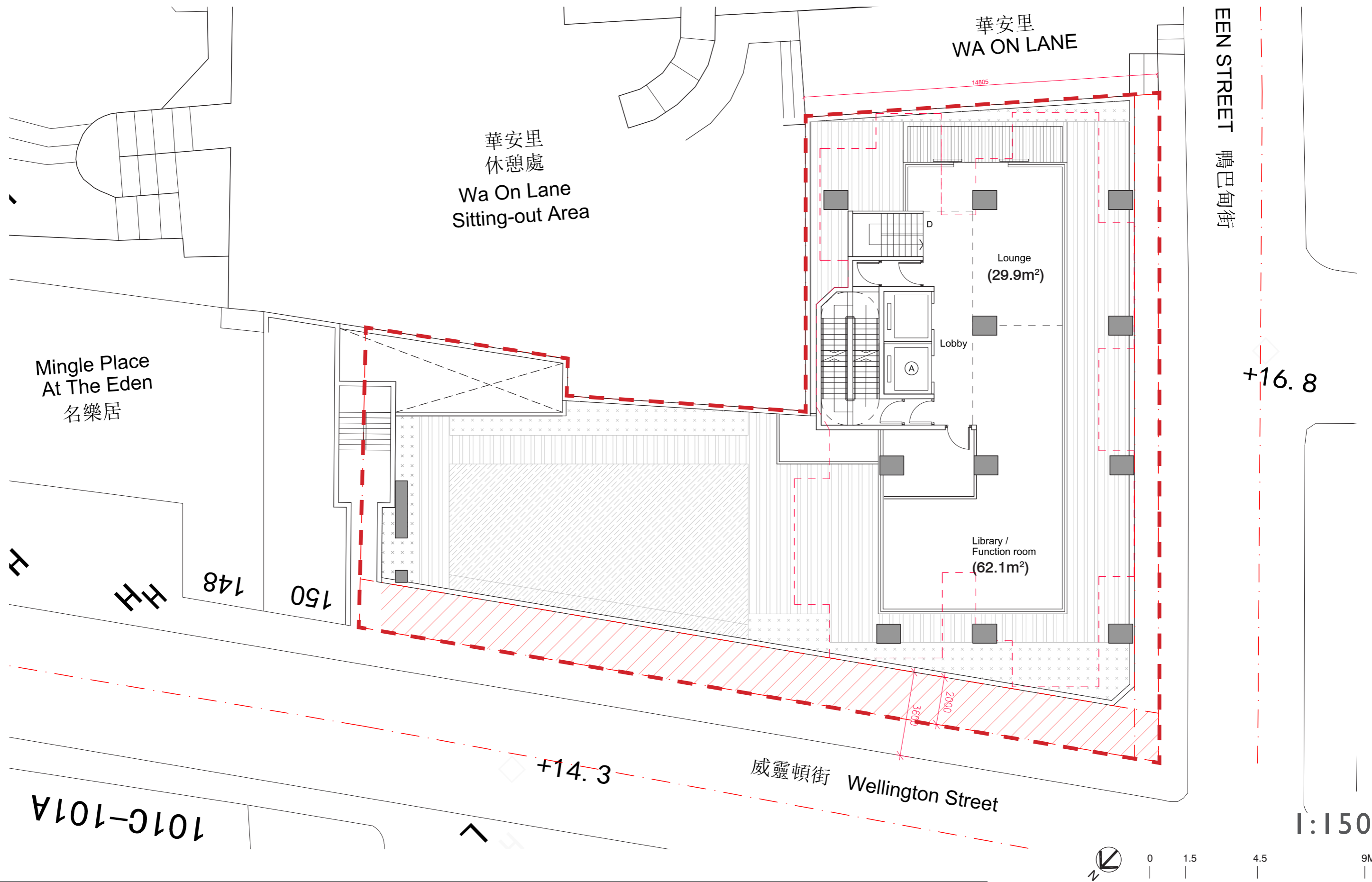
## 2F (CLUBHOUSE)





# PODIUM PLANS

## 3F (CLUBHOUSE)



EEN STREET 鴨巴甸街

華安里  
WA ON LANE

華安里  
休憩處  
Wa On Lane  
Sitting-out Area

Mingle Place  
At The Eden  
名樂居

威靈頓街 Wellington Street

101C-101A

+16.8

+14.3

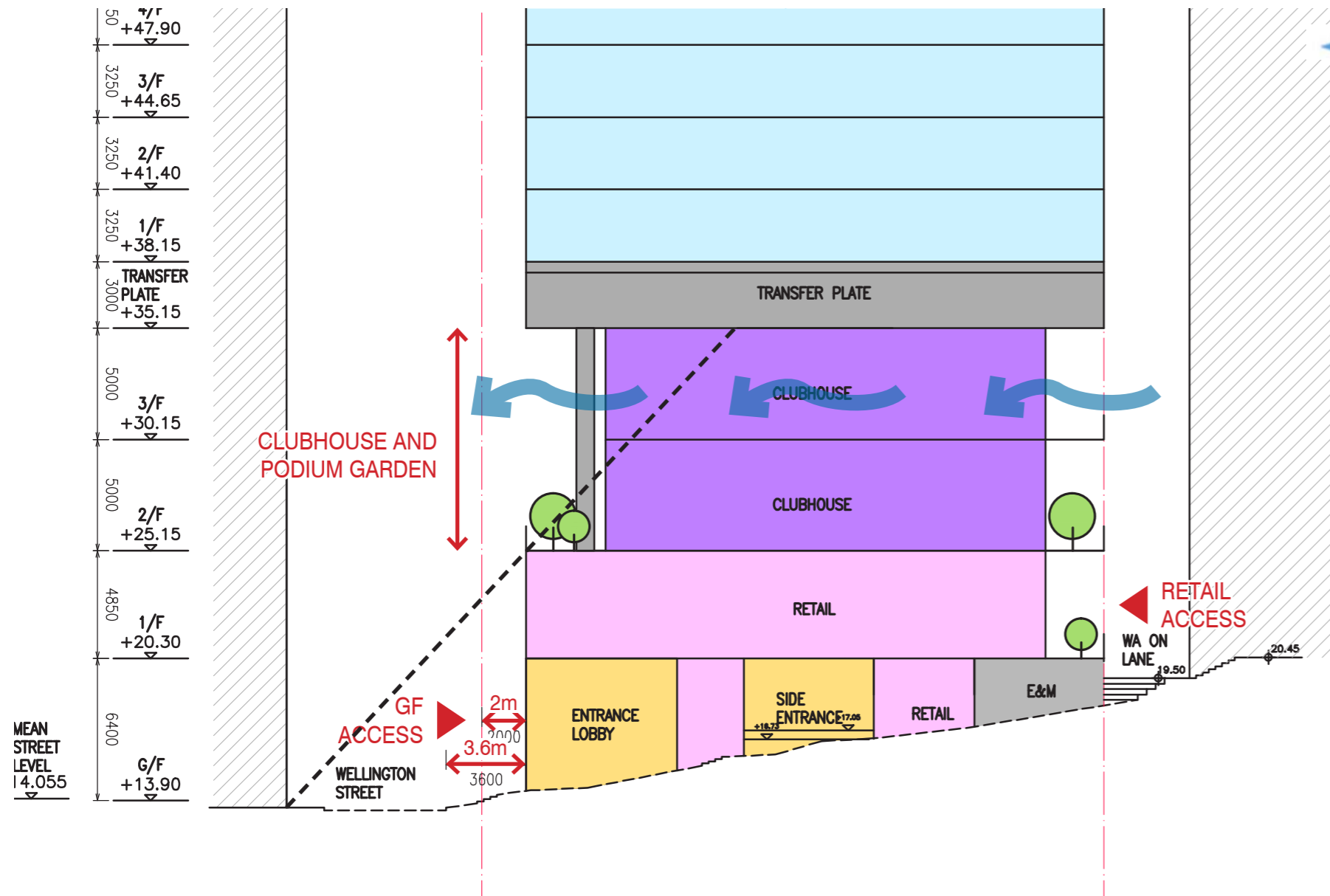
1:150



# PODIUM SECTION

## BUILDING SET BACK APP-152 COMPLIANT

Appendix C  
(PNAP APP-152)



Legend:  
 Greenery on communal podium garden

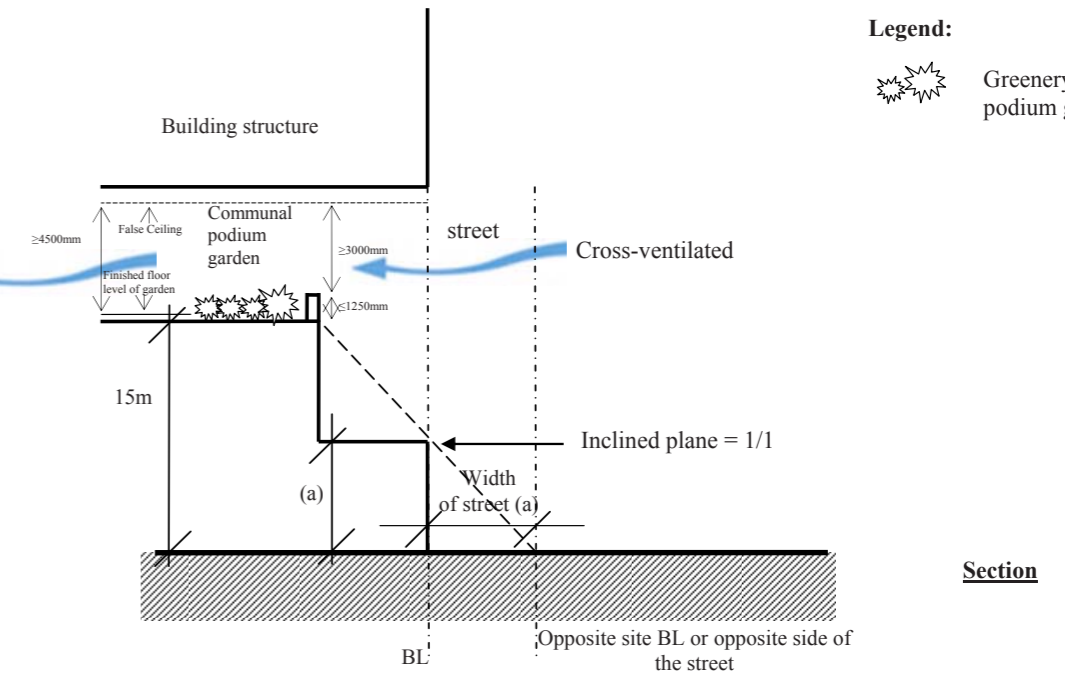


Fig. C3 Stepped building profile with communal podium garden as detailed in paragraph 7(b)

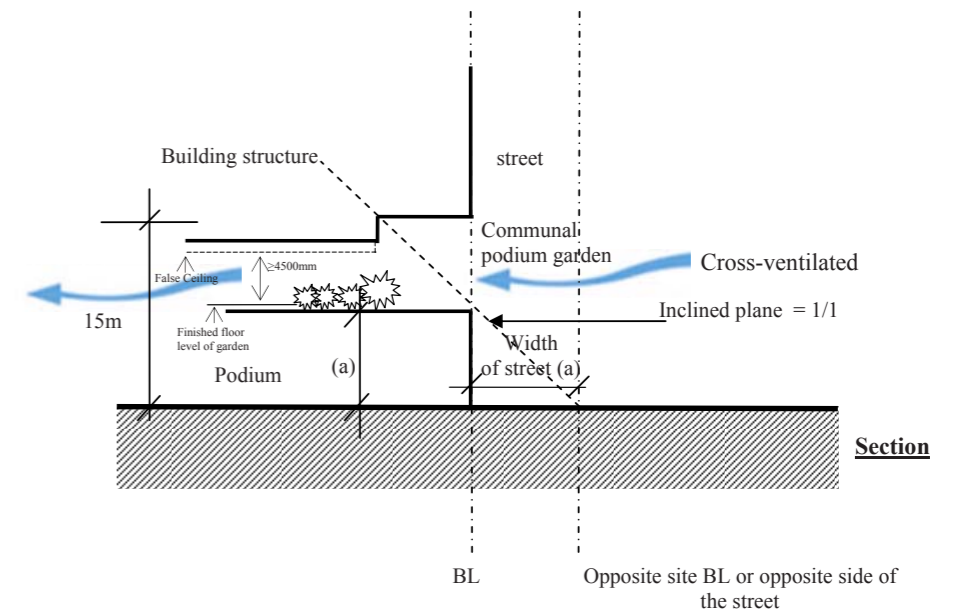




Fig. C4 Stepped building profile with communal podium garden as detailed in paragraph 7(b)

# TOWER TYPICAL PLAN

CLASS C SITE

 1 Bedroom (Open Kitchen)

 2 Bedroom (Open Kitchen)

**Site coverage**

244.61 sqm / 612 sqm  
= 40%

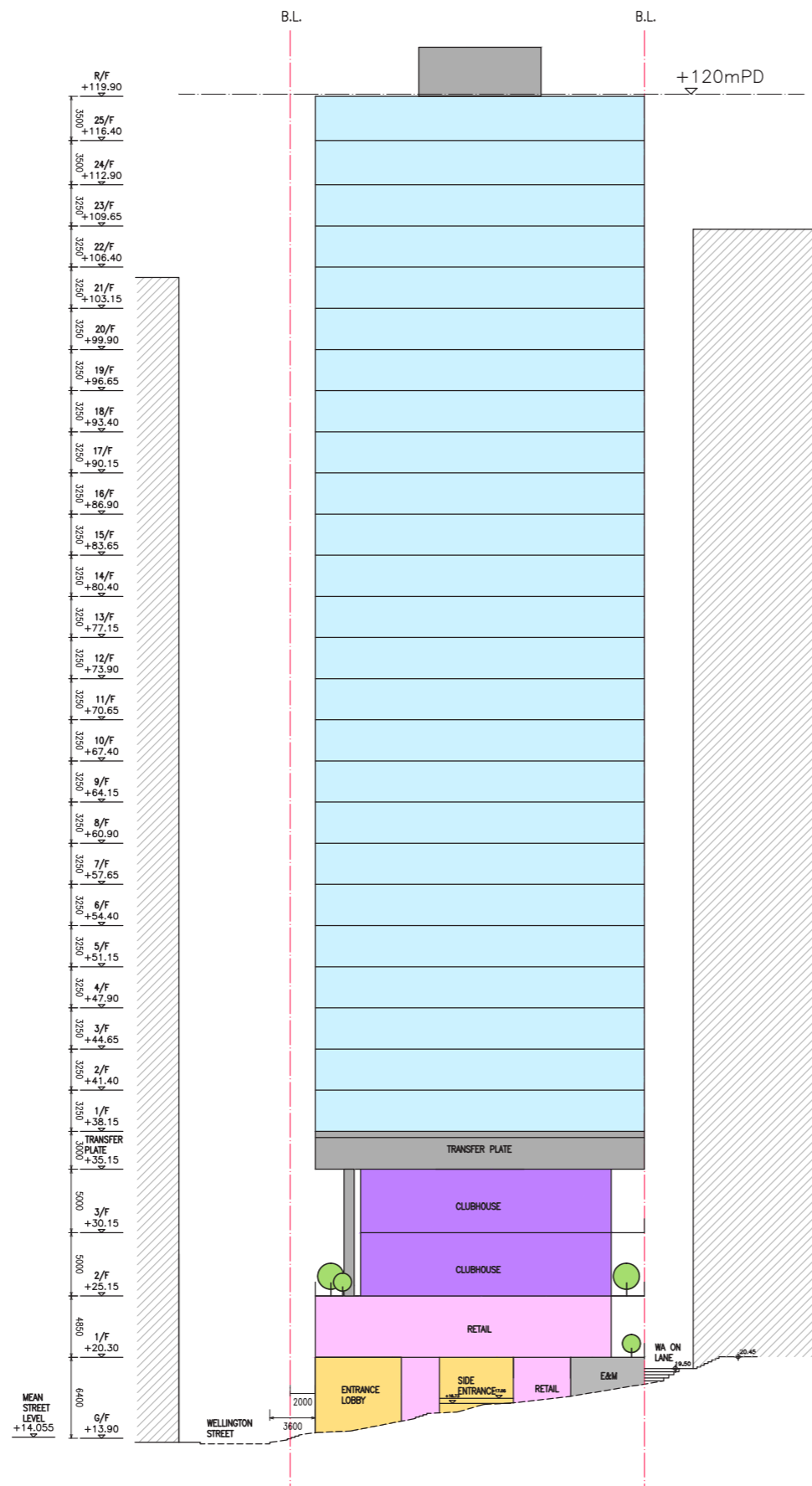
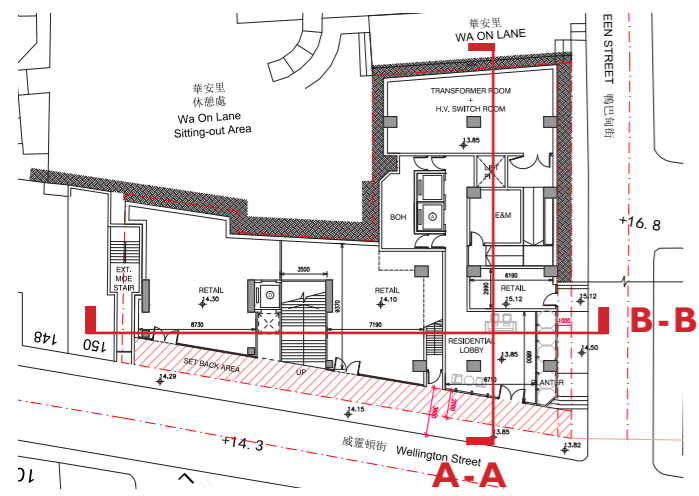
**Typical Floor Efficiency**

= 207.5 sqm SFA / 236.1 sqm GFA  
= 87.9%

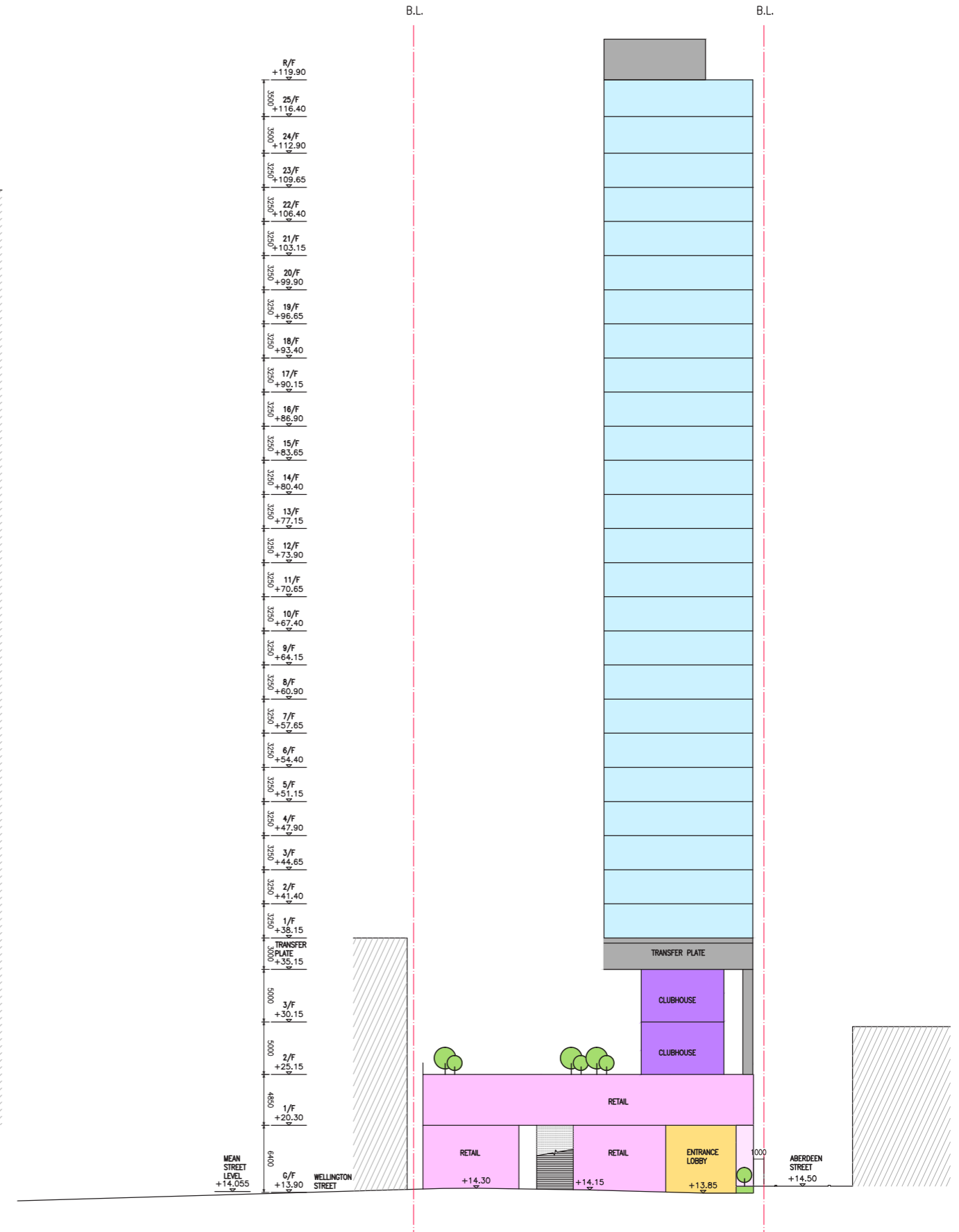


# SECTION

1:500



SECTION A-A



SECTION B-B

**Appendix 2-1 Year 2045 Traffic Forecast**

## Billy Fan

---

**From:** Alice Ping Wai LUK <pingwailuk@td.gov.hk>  
**Sent:** 04 June 2024 12:17  
**To:** MUI Ray  
**Cc:** Kit CHOW; cknwong@pland.gov.hk; hhcchan@pland.gov.hk  
**Subject:** RE: S16 Application for Proposed Development at No.152 -164 Wellington Street (Application No. A/H3/449) - TD's comments  
**Attachments:** RtoC Table.pdf; 20240603\_Revised Road Profile.pdf

Dear Ray,

I refer to your revised submission via e-mail @ 03/06/2024 06:24 PM and the R-to-C table submitted under FI3 of the captioned planning application as attached regarding Traffic Noise Impact Assessment (TNIA) and Air Quality Impact Assessment (AQIA):

We have no particular comment from the traffic engineering viewpoint on your proposed methodology for traffic forecasting for TNIA and AQIA presented under the captioned submission.

Regards,  
Alice LUK  
E/C&W2, Traffic Engineering (HK) Division  
Transport Department  
Tel: 2829 5426  
Fax: 2824 0399

From: MUI Ray <rmui@systra.com>  
To: "pingwailuk@td.gov.hk" <pingwailuk@td.gov.hk>  
Cc: "kitchow@td.gov.hk" <kitchow@td.gov.hk>, CHAN Rebecca <rchan@systra.com>, YAM Henry <hyam@systra.com>  
Date: 03/06/2024 06:24 PM  
Subject: RE: S16 Application for Proposed Development at No.152 -164 Wellington Street (Application No. A/H3/449) - TD's comments

---

Dear Alice,

As discussed this afternoon, please find attached the revised road type (yellow highlighted) as supplementary information of the FI submission for your kind reference. Thanks.

Best Regards,

**Ray Mui**  
Associate  
Tel: +852 2864 6480 (Direct Line) ?Gen: +852 2529 7037 ?Fax: +852 2527 8490



22nd Floor ?Genesis ? 33-35 Wong Chuk Hang Road ?Hong Kong  
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**From:** MUI Ray

**Sent:** Tuesday, May 28, 2024 12:14 PM

**To:** pingwailuk@td.gov.hk

**Cc:** kitchow@td.gov.hk; Fiona NG <[fiona.ng@couturehomes.hk](mailto:fiona.ng@couturehomes.hk)>; jacky@couturehomes.hk; Gladys Ng <[gladysng@ktaPlanning.com](mailto:gladysng@ktaPlanning.com)>; Calvin Chiu <[cchiu@ramboll.com](mailto:cchiu@ramboll.com)>; Billy Fan <[bfan@ramboll.com](mailto:bfan@ramboll.com)>; CHAN Rebecca <[rchan@systra.com](mailto:rchan@systra.com)>; YAM Henry <[hyam@systra.com](mailto:hyam@systra.com)>

**Subject:** RE: S16 Application for Proposed Development at No.152 -164 Wellington Street (Application No. A/H3/449) - TD's comments

Dear Alice,

Further to our tele-conversation yesterday, please find attached the updated road types (yellow highlighted) for Air Quality Impact Assessment (AQIA) as supplementary information of the FI submission for your kind reference.

Appreciated very much if endorsement of the methodology of traffic forecast for environmental assessment and no further comment on the TIA could be granted. Many thanks!

Best Regards,

**Ray Mui**

Associate

Tel: +852 2864 6480 (Direct Line) ?Gen: +852 2529 7037 ?Fax: +852 2527 8490



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**From:** MUI Ray

**Sent:** Wednesday, May 22, 2024 1:50 PM

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**Cc:** [kitchow@td.gov.hk](mailto:kitchow@td.gov.hk); Fiona NG <[fiona.ng@couturehomes.hk](mailto:fiona.ng@couturehomes.hk)>; [jacky@couturehomes.hk](mailto:jacky@couturehomes.hk); Gladys Ng <[gladysng@ktaPlanning.com](mailto:gladysng@ktaPlanning.com)>; CHAN Rebecca <[rchan@systra.com](mailto:rchan@systra.com)>; YAM Henry <[hyam@systra.com](mailto:hyam@systra.com)>

**Subject:** S16 Application for Proposed Development at No.152 -164 Wellington Street (Application No. A/H3/449) - TD's comments

Dear Alice,

Referring to our tele-conversation earlier this week regarding the captioned, FI submission including the traffic responses to TD's comments and Appendix II (revised TIA pages) were formally submitted to TPB via the letter from the Planning Consultant dated 14<sup>th</sup> May 2024 (cover letter attached).

In addition, as discussed, we would like to supplement the information of construction traffic as below for your kind consideration.

**Peak Hour Construction Traffic**

The peak hour construction traffic of the proposed development is preliminary estimated with reference to the construction traffic activities of similar construction site.

	<b>Preliminary Estimated Construction Traffic of the Proposed Development</b>
<b>Estimated Peak Daily construction traffic</b>	22 vehicles per day
<b>Working hours of construction traffic</b>	10 hours (8 am to 6 pm)
<b>Peak-hour construction traffic</b>	2.2 vehicles per hour (i.e about 6 pcu/hr)

It is revealed that the peak hour construction traffic volume is not significant and is also less than the development trip generations (Table 4.7 of the submitted TIA), it is considered the construction traffic impact to the adjacent road network due to the construction traffic is not significant.

Should you have any queries, please feel free to contact us. Thanks.

Best Regards,

**Ray Mui**

Associate

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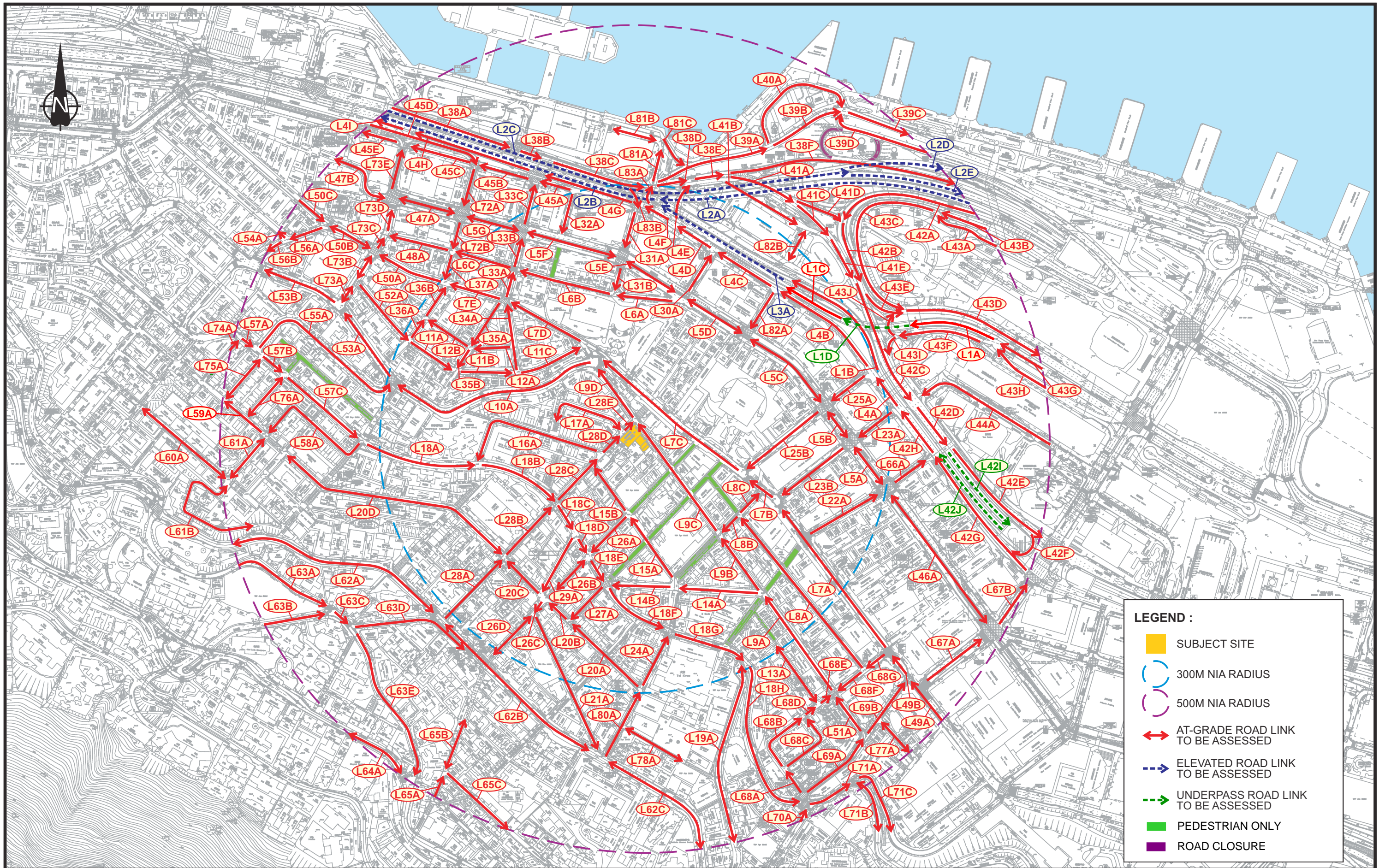
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**LEGEND :**

- SUBJECT SITE
- 300M NIA RADIUS
- 500M NIA RADIUS
- AT-GRADE ROAD LINK TO BE ASSESSED
- ELEVATED ROAD LINK TO BE ASSESSED
- UNDERPASS ROAD LINK TO BE ASSESSED
- PEDESTRIAN ONLY
- ROAD CLOSURE

-	-	-	Project Title
-	-	-	S16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL / COMMERCIAL DEVELOPMENT AT 152-164 WELLINGTON STREET, CENTRAL
Rev.	Description	Checked	Date
-	-	-	-

Drawing Title	
<b>INDEX PLAN OF IDENTIFIED ROAD LINK FOR NIA AND AQIA</b>	
Designed	YAM
Checked	KFM
Scale	NTS
Date	NOV 2023
Drawing No.	6.1
Rev.	-

SYSTRA		MVA	
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## S16 Planning Application for Proposed Residential / Commercial Development at 152-164 Wellington Street - Year 2045 Traffic Forecast for NIA

Index <sup>(1)</sup>	Road Section	Direction	2045 AM Peak		2045 PM Peak	
			Peak Hour Traffic Flow - Round up to nearest 10 (veh/hr)	HV% <sup>(2)</sup>	Peak Hour Traffic Flow - Round up to nearest 10 (veh/hr)	HV% <sup>(2)</sup>
			L1A	Man Cheung Street	One-way	730
L1B	Rumsey Street Flyover	One-way	2310	11%	2610	8%
L1C	Man Cheung Street	One-way	730	11%	1040	11%
L1D	Man Cheung Street	One-way	730	11%	1040	11%
L2A	Central-Wanchai Bypass	One-way	1330	9%	1380	6%
L2B	Rumsey Street Flyover	One-way	4070	10%	4670	8%
L2C	Rumsey Street Flyover	One-way	3810	13%	2850	7%
L3A	Rumsey Street Flyover	One-way	2750	11%	3300	8%
L4A	Connaught Road Central	One-way	3690	11%	3920	10%
L4B	Connaught Road Central	One-way	1210	14%	1040	13%
L4C	Connaught Road Central	One-way	1430	13%	1320	13%
L4D	Connaught Road Central	One-way	1680	18%	1650	14%
L4E	Man Kat Street	One-way	220	19%	220	6%
L4F	Connaught Road Central	One-way	1460	18%	1450	16%
L4G	Connaught Road Central	One-way	840	22%	760	20%
L5A	Des Voeux Road Central	Two-way	770	20%	790	14%
L5B	Des Voeux Road Central	Two-way	570	18%	620	18%
L5C	Des Voeux Road Central	Two-way	650	16%	690	18%
L5D	Des Voeux Road Central	Two-way	590	18%	640	19%
L5E	Des Voeux Road Central	Two-way	720	33%	760	27%
L5F	Des Voeux Road Central	Two-way	360	33%	460	19%
L5G	Des Voeux Road Central	Two-way	590	22%	640	18%
L6A	Wing Lok Street	One-way	50	0%	40	0%
L6B	Wing Lok Street	One-way	420	23%	330	6%
L6C	Wing Lok Street	One-way	310	6%	170	1%
L7A	Queen's Road Central	One-way	540	6%	550	5%
L7B	Queen's Road Central	One-way	550	13%	580	8%
L7C	Queen's Road Central	One-way	780	12%	850	9%
L7D	Bonham Strand	One-way	740	8%	840	3%
L7E	Bonham Strand	One-way	180	10%	150	6%
L8A	Stanley Street	One-way	70	22%	110	3%
L8B	Cochrane Street	One-way	20	19%	20	0%
L8C	Cochrane Street	One-way	60	22%	100	3%
L9A	Wellington Street	One-way	730	10%	1050	4%
L9B	Wellington Street	One-way	200	9%	360	4%
L9C	Wellington Street	One-way	220	9%	370	4%
L9D	Wellington Street	One-way	540	10%	790	4%
L10A	Queen's Road Central	One-way	570	16%	800	8%
L11A	Jervis Street	One-way	120	3%	90	4%
L11B	Jervis Street	One-way	180	3%	150	3%
L11C	Jervis Street	One-way	70	5%	60	4%
L12A	Burd Street	One-way	20	0%	30	0%
L12B	Burd Street	One-way	20	0%	30	0%
L13A	Wo On Lane	Two-way	20	29%	40	13%
L14A	Lyndhurst Terrace	One-way	430	10%	620	4%
L14B	Lyndhurst Terrace	One-way	340	12%	500	4%
L15A	Gage Street	One-way	220	8%	280	5%
L15B	Gage Street	One-way	130	9%	160	6%
L16A	Gough Street and Shing Wong Street	One-way	40	27%	80	6%
L17A	Kau U Fong	Two-way	40	26%	40	5%
L18A	Hollywood Road	One-way	420	12%	410	6%
L18B	Hollywood Road	One-way	450	13%	480	5%
L18C	Hollywood Road	One-way	450	10%	550	5%
L18D	Hollywood Road	One-way	450	10%	550	5%
L18E	Hollywood Road	One-way	460	10%	560	5%
L18F	Hollywood Road	One-way	630	11%	790	5%
L18G	Hollywood Road	One-way	740	11%	930	6%

L18H	Wyndham Street	One-way	720	11%	850	5%
L19A	Arbuthnot Road	Two-way	150	5%	210	5%
L20A	Staunton Street	One-way	90	18%	100	5%
L20B	Staunton Street	One-way	260	11%	330	3%
L20C	Staunton Street	One-way	170	13%	200	5%
L20D	Staunton Street and Bridges Street	Two-way	130	16%	140	1%
L21A	Elgin Street	One-way	100	8%	140	2%
L22A	Pottinger Street	One-way	310	13%	310	5%
L23A	Queen Victoria Street	One-way	340	20%	300	5%
L23B	Queen Victoria Street	One-way	180	8%	170	5%
L24A	Old Bailey Street	One-way	120	14%	150	11%
L25A	Jubilee Street	One-way	360	10%	440	11%
L25B	Jubilee Street	One-way	280	12%	370	9%
L26A	Peel Street	One-way	20	18%	20	0%
L26B	Peel Street	Two-way	20	0%	20	13%
L26C	Peel Street	One-way	100	8%	140	2%
L26D	Peel Street	Two-way	30	0%	20	27%
L27A	Graham Street	One-way	170	8%	270	3%
L28A	Aberdeen Street	One-way	130	4%	160	1%
L28B	Aberdeen Street	One-way	290	7%	370	2%
L28C	Aberdeen Street	One-way	360	13%	530	4%
L28D	Aberdeen Street	One-way	330	12%	460	4%
L28E	Aberdeen Street	One-way	340	12%	470	3%
L29A	Elgin Street	One-way	10	0%	10	33%
L30A	Wing Wo Street	One-way	120	5%	200	5%
L31A	Rumsey Street	One-way	630	23%	450	27%
L31B	Rumsey Street	One-way	260	8%	140	1%
L32A	Man Wa Lane	One-way	30	0%	80	3%
L33A	Hillier Street	One-way	170	7%	160	5%
L33B	Hillier Street	One-way	170	7%	160	5%
L33C	Hillier Street	One-way	850	10%	1000	8%
L34A	Mercer Street	One-way	120	5%	110	3%
L35A	Hillier Street	One-way	70	8%	70	0%
L35B	Hillier Street	One-way	140	6%	120	0%
L36A	Cleverly Street	One-way	40	22%	50	0%
L36B	Cleverly Street	One-way	50	15%	80	3%
L37A	Cleverly Street	One-way	280	7%	250	2%
L50A	Bonham Strand	One-way	490	8%	460	3%
L52A	Jervis Street	One-way	120	12%	140	9%
L53A	Queen's Road Central	One-way	760	15%	970	8%
L55A	Lok Ku Road	One-way	170	18%	180	4%
L80A	Old Bailey Street	One-way	200	15%	240	8%
L82A	Gilman Street	One-way	70	6%	70	8%
L82B	Gilman Street	Two-way	30	0%	30	0%
L83A	Connaught Road Central	One-way	460	14%	490	9%
L83B	Connaught Road Central	One-way	430	30%	240	35%

**Notes:**

1. Please refer to Figure 6.1 for index plan of assessed road sections.
2. Vehicles with an unladen weight of 1,525 kg or more are categorized as heavy vehicles (HV), which includes light/medium/heavy goods vehicles (LGV/MGV/HGV), container trucks, public light bus (PLB), non-franchised buses (NB), and franchised buses (FB)
3. Motorized Vehicle is prohibited from 0700 to 1900 in Elgin Street (L29A)

**Appendix 2-2 Results of Road Traffic Noise Impact Assessment (Base Case Scenario)**

**Predicted Road Traffic Noise (L10, dB(A)) at Selected Sensitive Receivers  
Base Case-AM Peak Flow**

**Tower 1**

Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15	N1-16	
1/F	39.4	61	62	69	69	69	69	69	69	69	69	69	69	65	63	61	58	
2/F	42.6	61	62	69	68	68	68	68	68	69	69	69	69	65	63	62	59	
3/F	45.9	61	61	68	68	68	68	68	68	68	68	68	69	64	63	62	60	
4/F	49.1	60	61	68	68	68	68	68	68	68	68	68	68	64	63	62	61	
5/F	52.4	60	61	67	67	67	67	67	67	68	68	68	68	64	62	61	61	
6/F	55.6	60	60	67	67	67	67	67	67	67	67	68	68	64	62	61	61	
7/F	58.9	59	60	67	67	67	67	67	67	67	67	67	68	63	62	61	61	
8/F	62.1	59	60	66	66	66	66	67	67	67	67	67	68	63	62	61	60	
9/F	65.4	59	60	66	66	66	66	66	66	67	67	67	67	63	61	61	60	
10/F	68.6	59	59	66	66	66	66	66	66	66	67	67	67	63	61	61	60	
11/F	71.9	58	59	66	66	66	66	66	66	66	66	67	67	62	61	60	60	
12/F	75.1	58	59	66	66	66	66	66	66	66	66	66	67	62	61	60	60	
13/F	78.4	58	59	65	65	65	65	65	66	66	66	66	67	62	60	60	60	
14/F	81.6	58	59	65	65	65	65	65	65	66	66	66	66	62	60	60	60	
15/F	84.9	58	58	65	65	65	65	65	65	66	66	66	66	62	60	60	59	
16/F	88.1	58	58	65	65	65	65	65	65	65	66	66	66	61	60	60	59	
17/F	91.4	58	58	65	65	65	65	65	65	65	66	66	66	61	60	59	59	
18/F	94.6	58	58	65	64	64	64	65	65	65	65	66	66	61	60	59	59	
19/F	97.9	58	58	64	64	64	64	65	65	65	65	66	66	61	59	59	59	
20/F	101.1	57	58	64	64	64	64	64	65	65	65	65	66	61	59	59	59	
21/F	104.4	57	58	64	64	64	64	64	65	65	65	65	66	61	59	59	59	
22/F	107.6	57	58	64	64	64	64	64	64	65	65	65	65	61	59	59	59	
23/F	110.9	58	58	64	64	64	64	64	64	65	65	65	65	61	59	59	58	
24/F	114.1	58	58	64	64	64	64	64	64	65	65	65	65	60	59	58	58	
25/F	117.6	58	58	64	64	64	64	64	64	65	65	65	65	60	59	58	58	
Max Noise Level		61	62	69	69	69	69	69	69	69	69	69	69	65	63	62	61	
Exceedance		0		0			0		0			0			0		0	

Total no. of Flats:	175
Total no. of Exceedance:	0
Compliance Level:	100%
Max. Noise Level:	69

Notes:

**71** Noise level exceed standard of 70 dB(A)

**Predicted Road Traffic Noise (L10, dB(A)) at Selected Sensitive Receivers  
Base Case-PM Peak Flow**

**Tower 1**

Floor	*mPD	N1-01	N1-02	N1-03	N1-04	N1-05	N1-06	N1-07	N1-08	N1-09	N1-10	N1-11	N1-12	N1-13	N1-14	N1-15	N1-16	
1/F	39.4	61	62	68	68	68	68	68	68	68	68	69	69	66	64	62	59	
2/F	42.6	60	61	68	68	68	68	68	68	68	68	68	69	65	64	62	60	
3/F	45.9	60	61	68	68	67	67	67	67	68	68	68	68	65	64	63	61	
4/F	49.1	60	61	67	67	67	67	67	67	67	68	68	68	65	63	63	62	
5/F	52.4	60	60	67	67	67	67	67	67	67	67	67	68	65	63	62	62	
6/F	55.6	59	60	67	67	66	66	66	67	67	67	67	68	64	63	62	62	
7/F	58.9	59	60	66	66	66	66	66	66	66	67	67	67	64	63	62	61	
8/F	62.1	59	59	66	66	66	66	66	66	66	66	67	67	64	62	62	61	
9/F	65.4	59	59	66	66	66	66	66	66	66	66	67	67	64	62	62	61	
10/F	68.6	58	59	65	65	65	65	65	66	66	66	66	67	63	62	61	61	
11/F	71.9	58	59	65	65	65	65	65	65	66	66	66	67	63	62	61	61	
12/F	75.1	58	59	65	65	65	65	65	65	65	66	66	66	63	62	61	61	
13/F	78.4	58	58	65	65	65	65	65	65	65	66	66	66	63	61	61	61	
14/F	81.6	58	58	65	65	65	65	65	65	65	65	66	66	63	61	61	60	
15/F	84.9	58	58	64	64	64	64	65	65	65	65	66	66	62	61	61	60	
16/F	88.1	58	58	64	64	64	64	64	65	65	65	65	66	62	61	60	60	
17/F	91.4	57	58	64	64	64	64	64	64	65	65	65	66	62	61	60	60	
18/F	94.6	57	58	64	64	64	64	64	64	65	65	65	66	62	60	60	60	
19/F	97.9	57	58	64	64	64	64	64	64	65	65	65	65	62	60	60	60	
20/F	101.1	57	57	64	64	64	64	64	64	64	65	65	65	62	60	60	60	
21/F	104.4	57	57	64	64	64	64	64	64	64	65	65	65	61	60	60	59	
22/F	107.6	57	57	63	63	64	64	64	64	64	65	65	65	61	60	60	59	
23/F	110.9	57	57	63	63	63	63	64	64	64	64	65	65	61	60	59	59	
24/F	114.1	57	57	63	63	63	63	64	64	64	64	65	65	61	60	59	59	
25/F	117.6	57	57	63	63	63	63	64	64	64	64	65	65	61	60	59	59	
Max Noise Level		61	62	68	68	68	68	68	68	68	68	69	69	66	64	63	62	
Exceedance		0		0			0		0			0			0		0	

Total no. of Flats:	175
Total no. of Exceedance:	0
Compliance Level:	100%
Max. Noise Level:	69

Notes:

**71** Noise level exceed standard of 70 dB(A)

**Appendix 3-1 Detailed Fixed Noise Impact Assessment**



Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario  
Day/Evening Time

F01

NSR Coordinate: x = 833858.0 y = 816151.2 z = 59.0

Source ID	Description	Industrial Noise Source Coordinate:			SPL	Ref dist.	SWL	Slant distance from source to NSR (m)	Distance	Façade	Barrier	Tonality	Impulsiv e	ANL
		x	y	z										
OB-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833870.8	816166.0	121.8	--	--	86.0	65.8	-44.4	3.0	-10.0	3.0	0.0	37.6
OB-2	Cooling Tower (Ref - ryowo: FC/LN 200)	833874.7	816169.8	121.8	64.0	3.8	83.6	67.6	-44.6	3.0	-10.0	3.0	0.0	35.0
CRC-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833881.0	816161.9	131.1	--	--	92.0	76.4	-45.7	3.0	-10.0	3.0	0.0	42.3
CRC-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833884.0	816158.8	131.1	--	--	92.0	77.0	-45.7	3.0	-10.0	3.0	0.0	42.3
SB-1	Chiller (Ref - Daikin: EWAD-F-XR 500)	833886.6	816144.1	60.0	--	--	89.0	29.5	-37.4	3.0	0.0	3.0	0.0	57.6
SB-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833887.3	816138.6	60.0	--	--	85.0	31.9	-38.1	3.0	0.0	3.0	0.0	52.9
VHB-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833928.3	816124.3	88.4	--	--	86.0	80.8	-46.1	3.0	0.0	3.0	0.0	45.9
VHB-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833932.2	816119.2	88.4	--	--	86.0	86.0	-46.7	3.0	0.0	3.0	0.0	45.3
VHB-3	Chiller (Ref - Daikin: EWAD-D-SX 490)	833929.6	816114.1	88.4	--	--	86.0	85.8	-46.7	3.0	0.0	3.0	0.0	45.3
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	89.0	-47.0	3.0	0.0	3.0	0.0	43.0
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	92.6	-47.3	3.0	0.0	3.0	0.0	42.7
TLP-1	Chiller (Ref - Daikin: EWAD-C-SR C14)	833913.6	816181.9	51.8	--	--	95.0	63.9	-44.1	3.0	0.0	3.0	0.0	56.9
TLP-2	Chiller (Ref - Daikin: EWAD-F-XR 330)	833918.0	816188.6	51.8	--	--	87.0	71.1	-45.0	3.0	0.0	3.0	0.0	48.0
TLP-3	Chiller (Ref - Daikin: EWAD-C-SR C14)	833920.3	816184.2	51.8	--	--	95.0	70.9	-45.0	3.0	0.0	3.0	0.0	56.0
TLP-4	Chiller (Ref - Daikin: EWAD-F-XR 330)	833913.2	816176.1	51.8	--	--	87.0	61.0	-43.7	3.0	0.0	3.0	0.0	49.3
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	95.6	-47.6	3.0	0.0	3.0	0.0	43.4
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	98.6	-47.9	3.0	0.0	3.0	0.0	43.1
WHIB-1	Chiller (Ref - Daikin: EWAD-CFXR 870)	833911.1	816220.6	73.0	--	--	92.0	88.5	-46.9	3.0	0.0	3.0	0.0	51.1
WHIB-2	Chiller (Ref - Daikin: EWAD-CFXR 870)	833918.3	816235.3	73.0	--	--	92.0	104.4	-48.4	3.0	0.0	3.0	0.0	49.6
OCBC-1	Chiller (Ref - Daikin: EWAQ-G-XR 080)	833876.3	816229.0	72.2	--	--	80.0	81.0	-46.2	3.0	0.0	3.0	0.0	39.8
OCBC-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833875.0	816224.7	72.2	--	--	85.0	76.6	-45.7	3.0	0.0	3.0	0.0	45.3
OCBC-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833880.2	816225.5	72.2	--	--	85.0	78.7	-45.9	3.0	0.0	3.0	0.0	45.1
OCBC-4	Chiller (Ref - Daikin: EWAD-D-SX 410)	833880.2	816220.3	72.2	--	--	85.0	73.8	-45.4	3.0	0.0	3.0	0.0	45.6
SLCB-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833884.3	816242.7	73.1	--	--	92.0	96.2	-47.7	3.0	0.0	3.0	0.0	50.3
AB-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833947.6	816283.2	72.3	--	--	85.0	160.1	-52.1	3.0	0.0	3.0	0.0	38.9
AB-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833949.1	816285.4	72.3	--	--	85.0	162.7	-52.2	3.0	0.0	3.0	0.0	38.8
HKTC-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833959.3	816314.2	78.4	--	--	85.0	192.9	-53.7	3.0	0.0	3.0	0.0	37.3
HKTC-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833963.4	816311.4	78.4	--	--	85.0	192.7	-53.7	3.0	0.0	3.0	0.0	37.3
HKTC-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833967.6	816308.9	78.4	--	--	85.0	193.0	-53.7	3.0	0.0	3.0	0.0	37.3
NCBB-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833980.6	816305.2	57.4	--	--	92.0	196.8	-53.9	3.0	0.0	3.0	0.0	44.1
NCBB-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833984.4	816302.9	57.4	--	--	92.0	197.5	-53.9	3.0	0.0	3.0	0.0	44.1
NCBB-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833988.8	816300.1	57.4	--	--	92.0	198.2	-53.9	3.0	0.0	3.0	0.0	44.1
CTGH-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833982.3	816343.5	94.0	--	--	92.0	231.6	-55.3	3.0	0.0	3.0	0.0	42.7
CTGH-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833991.6	816340.8	94.0	--	--	92.0	234.6	-55.4	3.0	0.0	3.0	0.0	42.6
CTGH-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833986.4	816336.9	94.0	--	--	92.0	228.5	-55.2	3.0	0.0	3.0	0.0	42.8
CTGH-4	Chiller (Ref - Daikin: EWAD-D-SX 410)	833980.3	816333.3	94.0	--	--	85.0	222.1	-54.9	3.0	0.0	3.0	0.0	36.1
TB-1	Chiller (Ref - Daikin: EWAD-CFXR 820)	834003.4	816335.1	84.3	--	--	92.0	235.8	-55.5	3.0	0.0	3.0	0.0	42.5
TB-2	Chiller (Ref - Daikin: EWAD-CFXR 820)	834007.2	816324.2	84.3	--	--	92.0	229.8	-55.2	3.0	0.0	3.0	0.0	42.8
IAB-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833958.7	816104.1	66.6	--	--	86.0	111.4	-48.9	3.0	0.0	3.0	0.0	43.1
IAB-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833964.8	816100.4	66.6	--	--	86.0	118.5	-49.5	3.0	0.0	3.0	0.0	42.5
100QRC-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	834011.1	816060.8	129.5	--	--	95.0	191.3	-53.6	3.0	-10.0	3.0	0.0	37.4
100QRC-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	834008.1	816058.1	129.5	--	--	95.0	190.2	-53.6	3.0	-10.0	3.0	0.0	37.4
100QRC-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	834001.8	816055.5	129.5	--	--	92.0	186.6	-53.4	3.0	-10.0	3.0	0.0	34.6
RC-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	834028.6	816025.5	91.7	--	--	95.0	214.4	-54.6	3.0	0.0	3.0	0.0	46.4
RC-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	834028.3	816032.4	91.7	--	--	95.0	210.2	-54.5	3.0	0.0	3.0	0.0	46.5
HQ-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834037.9	816016.4	120.2	64.0	3.8	83.6	233.0	-55.3	3.0	-10.0	3.0	0.0	24.3
HQ-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834039.9	816019.3	120.2	64.0	3.8	83.6	232.9	-55.3	3.0	-10.0	3.0	0.0	24.3
HQ-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834042.0	816022.2	120.2	64.0	3.8	83.6	232.9	-55.3	3.0	-10.0	3.0	0.0	24.3
CH-1	Cooling Tower (Ref - ryowo: FC/LN 400)	834076.4	815970.1	75.6	66.0	5.4	88.7	284.2	-57.1	3.0	0.0	3.0	0.0	37.6
CH-2	Cooling Tower (Ref - ryowo: FC/LN 400)	834081.3	815963.7	75.6	66.0	5.4	88.7	292.1	-57.3	3.0	0.0	3.0	0.0	37.3
POH-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	834009.7	816003.1	97.7	--	--	84.0	215.5	-54.7	3.0	0.0	3.0	0.0	35.3
WTT-1	Chiller (Ref - Daikin: EWAD-CFXR 870)	834016.5	815992.1	85.4	--	--	92.0	226.1	-55.1	3.0	0.0	3.0	0.0	42.9
WTT-2	Chiller (Ref - Daikin: EWAD-CFXR 870)	834024.3	815984.9	85.4	--	--	92.0	236.7	-55.5	3.0	0.0	3.0	0.0	42.5
AST-1	Chiller (Ref - Daikin: EWAD-CFXR C10)	834102.6	816020.6	78.0	--	--	94.0	277.9	-56.9	3.0	0.0	3.0	0.0	43.1
AST-2	Chiller (Ref - Daikin: EWAD-CFXR C10)	834104.5	816017.0	78.0	--	--	94.0	281.3	-57.0	3.0	0.0	3.0	0.0	43.0
AST-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	834095.0	816014.2	78.0	--	--	85.0	274.4	-56.8	3.0	0.0	3.0	0.0	34.2
AST-4	Chiller (Ref - Daikin: EWAD-D-SX 410)	834096.8	816010.9	78.0	--	--	85.0	277.6	-56.9	3.0	0.0	3.0	0.0	34.1
BGLAT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.9	816246.5	16.5	--	--	92.0	145.8	-51.3	3.0	0.0	3.0	0.0	46.7
BGLAT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833964.4	816243.1	16.5	--	--	92.0	146.9	-51.3	3.0	0.0	3.0	0.0	46.7
TSBB-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833986.9	816259.8	56.3	--	--	86.0	168.6	-52.5	3.0	0.0	3.0	0.0	39.5
TSBB-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833991.5	816257.1	56.3	--	--	86.0	170.4	-52.6	3.0	0.0	3.0	0.0	39.4
PBC-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833994.6	816244.2	76.6	--	--	85.0	166.2	-52.4	3.0	0.0	3.0	0.0	38.6
PBC-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	834001.4	816248.4	76.6	--	--	85.0	174.1	-52.8	3.0	0.0	3.0	0.0	38.2
JC-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833950.9	816005.0	99.6	--	--	92.0	177.9	-53.0	3.0	0.0	3.0	0.0	45.0
ILT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833980.8	815970.5	102.3	--	--	92.0	222.7	-55.0	3.0	0.0	3.0	0.0	43.0
ILT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833979.5	815966.3	102.3	--	--	92.0	225.4	-55.1	3.0	0.0	3.0	0.0	42.9
SS-1	Chiller (Ref - Daikin: EWAQ-G-XR 090)	833918.4	815974.4	107.3	--	--	82.0	193.0	-53.7	3.0	-10.0	3.0	0.0	24.3
SS-2	Chiller (Ref - Daikin: EWAQ-G-XR 090)	833919.8	815972.9	107.3	--	--	82.0	194.8	-53.8	3.0	-10.0	3.0	0.0	24.2
CPCB-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833977.2	815919.4	116.3	--	--	85.0	266.9	-56.5	3.0	0.0	3.0	0.0	34.5
HC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833930.1	815929.6	121.7	--	--	86.0	241.3	-55.7	3.0	-10.0	3.0	0.0	26.3
HC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833933.6	815929.3	121.7	--	--	86.0	242.7	-55.7	3.0	-10.0	3.0	0.0	26.3
HC-3	Chiller (Ref - Daikin: EWAD-D-SX 490)	833936.6	815929.1	121.7	--	--	86.0	243.8	-55.7	3.0	-10.0	3.0	0.0	26.3
HC-4	Chiller (Ref - Daikin: EWAD-D-SX 490)	833942.4	815934.1	121.7	--	--	86.0	241.2	-55.6	3.0	-10.0	3.0	0.0	26.4
HC-5	Chiller (Ref - Daikin: EWAD-D-SX 490)	833945.5	815933.8	121.7	--	--	86.0	242.6	-55.7	3.0	-10.0	3.0	0.0	26.3
HC-6	Chiller (Ref - Daikin: EWAD-D-SX 490)	833942.8	815925.3	121.7	--	--	86.0	249.3	-55.9	3.0	-10.0	3.0	0.0	26.1
HC-7	Chiller (Ref - Daikin: EWAD-D-SX 490)	833938.2	815920.5	121.7	--	--	86.0	252.2	-56.0	3.0	-10.0	3.0	0.0	26.0
HC-8	Chiller (Ref - Daikin: EWAD-D-SX 490)	833941.3	815919.5	121.7	--	--	86.0	254.1	-56.1	3.0	-10.0	3.0	0.0	25.9
KC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833838.9	815913.7	132.0	--	--	95.0	249.2	-55.9	3.0	-10.0	3.0	0.0	35.1
KC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833828.9	815902.1	132.0	--	--	95.0	261.2	-56.3	3.0	-10.0	3.0	0.0	34.7
KC-3	Chiller (Ref - Daikin: EWAD-D-SX 490)	833820.6	815901.4	132.0	--	--	86.0	262.9	-56.4	3.0	-10.0	3.0		

299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	304.0	-57.7	3.0	-10.0	3.0	0.0	30.3	
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	309.6	-57.8	3.0	-10.0	3.0	0.0	23.2	
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	314.3	-57.9	3.0	-10.0	3.0	0.0	30.1	
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	200.0	-54.0	3.0	-10.0	3.0	0.0	34.0	
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	196.1	-53.8	3.0	-10.0	3.0	0.0	34.2	
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	192.9	-53.7	3.0	-10.0	3.0	0.0	27.3	
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	267.3	-56.5	3.0	-10.0	3.0	0.0	25.5	
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	261.8	-56.4	3.0	-10.0	3.0	0.0	25.6	
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	290.9	-57.3	3.0	-10.0	3.0	0.0	30.7	
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	285.2	-57.1	3.0	-10.0	3.0	0.0	30.9	
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	284.8	-57.1	3.0	-10.0	3.0	0.0	30.9	
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	301.9	-57.6	3.0	-10.0	3.0	0.0	22.0	
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	304.3	-57.7	3.0	-10.0	3.0	0.0	22.0	
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	294.5	-57.4	3.0	-10.0	3.0	0.0	22.3	
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	296.9	-57.5	3.0	-10.0	3.0	0.0	22.2	
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	286.9	-57.2	3.0	-10.0	3.0	0.0	30.8	
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	285.5	-57.1	3.0	-10.0	3.0	0.0	33.9	
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	291.7	-57.3	3.0	-10.0	3.0	0.0	33.7	
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	221.5	-54.9	3.0	-10.0	3.0	0.0	33.1	
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	206.8	-54.3	3.0	-10.0	3.0	0.0	33.7	
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	195.6	-53.8	3.0	-10.0	3.0	0.0	34.2	
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	199.5	-54.0	3.0	-10.0	3.0	0.0	34.0	
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	217.3	-54.7	3.0	-10.0	3.0	0.0	33.3	
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	227.0	-55.1	3.0	-10.0	3.0	0.0	32.9	
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	266.8	-56.5	3.0	-10.0	3.0	0.0	34.5	
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	264.2	-56.4	3.0	-10.0	3.0	0.0	34.6	
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	252.3	-56.0	3.0	-10.0	3.0	0.0	35.0	
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	257.1	-56.2	3.0	-10.0	3.0	0.0	34.8	
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	254.9	-56.1	3.0	-10.0	3.0	0.0	34.9	
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	246.7	-55.8	3.0	-10.0	3.0	0.0	35.2	
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	251.4	-56.0	3.0	-10.0	3.0	0.0	35.0	
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	255.6	-56.1	3.0	-10.0	3.0	0.0	28.5	
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	260.5	-56.3	3.0	-10.0	3.0	0.0	28.3	
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	195.4	-53.8	3.0	-10.0	3.0	0.0	37.2	
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	193.7	-53.7	3.0	-10.0	3.0	0.0	37.3	
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	191.9	-53.7	3.0	-10.0	3.0	0.0	34.3	
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	302.7	-57.6	3.0	0.0	3.0	0.0	40.4	
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	253.3	-56.1	3.0	0.0	3.0	0.0	33.6	
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	252.4	-56.0	3.0	0.0	3.0	0.0	33.6	
												<b>Noise standard:</b>	<b>65</b>	<b>Overall</b>	<b>65</b>

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F01

NSR Coordinate:

x = 833858.0

y = 816151.2

z = 59.0

Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	89.0	-47.0	3.0	0.0	3.0	0.0	43.0
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	92.6	-47.3	3.0	0.0	3.0	0.0	42.7
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	95.6	-47.6	3.0	0.0	3.0	0.0	43.4
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	98.6	-47.9	3.0	0.0	3.0	0.0	43.1
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	253.3	-56.1	3.0	0.0	3.0	0.0	33.6
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	252.4	-56.0	3.0	0.0	3.0	0.0	33.6
<b>Noise standard:</b>											<b>55</b>	<b>Overall</b>	<b>49</b>	

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario  
Day/Evening Time

F01

NSR Coordinate: x = 833858.0 y = 816151.2 z = 88.1

Source ID	Description	Industrial Noise Source Coordinate:			SPL	Ref dist.	SWL	Slant distance from source to NSR (m)	Distance	Façade	Barrier	Tonality	Impulsiv e	ANL
		x	y	z										
OB-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833870.8	816166.0	121.8	--	--	86.0	39.0	-39.8	3.0	-10.0	3.0	0.0	42.2
OB-2	Cooling Tower (Ref - ryowo: FC/LN 200)	833874.7	816169.8	121.8	64.0	3.8	83.6	42.0	-40.5	3.0	-10.0	3.0	0.0	39.2
CRC-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833881.0	816161.9	131.1	--	--	92.0	49.9	-42.0	3.0	-10.0	3.0	0.0	46.0
CRC-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833884.0	816158.8	131.1	--	--	92.0	50.8	-42.1	3.0	-10.0	3.0	0.0	45.9
SB-1	Chiller (Ref - Daikin: EWAD-F-XR 500)	833886.6	816144.1	60.0	--	--	89.0	40.7	-40.2	3.0	0.0	3.0	0.0	54.8
SB-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833887.3	816138.6	60.0	--	--	85.0	42.5	-40.6	3.0	0.0	3.0	0.0	50.4
VHB-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833928.3	816124.3	88.4	--	--	86.0	75.3	-45.5	3.0	0.0	3.0	0.0	46.5
VHB-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833932.2	816119.2	88.4	--	--	86.0	80.8	-46.1	3.0	0.0	3.0	0.0	45.9
VHB-3	Chiller (Ref - Daikin: EWAD-D-SX 490)	833929.6	816114.1	88.4	--	--	86.0	80.6	-46.1	3.0	0.0	3.0	0.0	45.9
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	81.0	-46.2	3.0	0.0	3.0	0.0	43.8
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	85.0	-46.6	3.0	0.0	3.0	0.0	43.4
TLP-1	Chiller (Ref - Daikin: EWAD-C-SR C14)	833913.6	816181.9	51.8	--	--	95.0	73.2	-45.3	3.0	0.0	3.0	0.0	55.7
TLP-2	Chiller (Ref - Daikin: EWAD-F-XR 330)	833918.0	816188.6	51.8	--	--	87.0	79.5	-46.0	3.0	0.0	3.0	0.0	47.0
TLP-3	Chiller (Ref - Daikin: EWAD-C-SR C14)	833920.3	816184.2	51.8	--	--	95.0	79.3	-46.0	3.0	0.0	3.0	0.0	55.0
TLP-4	Chiller (Ref - Daikin: EWAD-F-XR 330)	833913.2	816176.1	51.8	--	--	87.0	70.6	-45.0	3.0	0.0	3.0	0.0	48.0
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	90.0	-47.1	3.0	0.0	3.0	0.0	43.9
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	93.2	-47.4	3.0	0.0	3.0	0.0	43.6
WHIB-1	Chiller (Ref - Daikin: EWAD-CFXR 870)	833911.1	816220.6	73.0	--	--	92.0	88.7	-47.0	3.0	0.0	3.0	0.0	51.0
WHIB-2	Chiller (Ref - Daikin: EWAD-CFXR 870)	833918.3	816235.3	73.0	--	--	92.0	104.6	-48.4	3.0	0.0	3.0	0.0	49.6
OCBC-1	Chiller (Ref - Daikin: EWAQ-G-XR 080)	833876.3	816229.0	72.2	--	--	80.0	81.5	-46.2	3.0	0.0	3.0	0.0	39.8
OCBC-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833875.0	816224.7	72.2	--	--	85.0	77.1	-45.7	3.0	0.0	3.0	0.0	45.3
OCBC-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833880.2	816225.5	72.2	--	--	85.0	79.2	-46.0	3.0	0.0	3.0	0.0	45.0
OCBC-4	Chiller (Ref - Daikin: EWAD-D-SX 410)	833880.2	816220.3	72.2	--	--	85.0	74.3	-45.4	3.0	0.0	3.0	0.0	45.6
SLCB-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833884.3	816242.7	73.1	--	--	92.0	96.4	-47.7	3.0	0.0	3.0	0.0	50.3
AB-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833947.6	816283.2	72.3	--	--	85.0	160.3	-52.1	3.0	0.0	3.0	0.0	38.9
AB-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833949.1	816285.4	72.3	--	--	85.0	163.0	-52.2	3.0	0.0	3.0	0.0	38.8
HKTC-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833959.3	816314.2	78.4	--	--	85.0	192.2	-53.7	3.0	0.0	3.0	0.0	37.3
HKTC-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833963.4	816311.4	78.4	--	--	85.0	192.0	-53.7	3.0	0.0	3.0	0.0	37.3
HKTC-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833967.6	816308.9	78.4	--	--	85.0	192.3	-53.7	3.0	0.0	3.0	0.0	37.3
NCBB-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833980.6	816305.2	57.4	--	--	92.0	199.2	-54.0	3.0	0.0	3.0	0.0	44.0
NCBB-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833984.4	816302.9	57.4	--	--	92.0	199.8	-54.0	3.0	0.0	3.0	0.0	44.0
NCBB-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833988.8	816300.1	57.4	--	--	92.0	200.6	-54.0	3.0	0.0	3.0	0.0	44.0
CTGH-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833982.3	816343.5	94.0	--	--	92.0	229.1	-55.2	3.0	0.0	3.0	0.0	42.8
CTGH-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833991.6	816340.8	94.0	--	--	92.0	232.0	-55.3	3.0	0.0	3.0	0.0	42.7
CTGH-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833986.4	816336.9	94.0	--	--	92.0	225.8	-55.1	3.0	0.0	3.0	0.0	42.9
CTGH-4	Chiller (Ref - Daikin: EWAD-D-SX 410)	833980.3	816333.3	94.0	--	--	85.0	219.4	-54.8	3.0	0.0	3.0	0.0	36.2
TB-1	Chiller (Ref - Daikin: EWAD-CFXR 820)	834003.4	816335.1	84.3	--	--	92.0	234.5	-55.4	3.0	0.0	3.0	0.0	42.6
TB-2	Chiller (Ref - Daikin: EWAD-CFXR 820)	834007.2	816324.2	84.3	--	--	92.0	228.5	-55.2	3.0	0.0	3.0	0.0	42.8
IAB-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833958.7	816104.1	66.6	--	--	86.0	113.2	-49.1	3.0	0.0	3.0	0.0	42.9
IAB-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833964.8	816100.4	66.6	--	--	86.0	120.2	-49.6	3.0	0.0	3.0	0.0	42.4
100QRC-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	834011.1	816060.8	129.5	--	--	95.0	182.6	-53.2	3.0	-10.0	3.0	0.0	37.8
100QRC-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	834008.1	816058.1	129.5	--	--	95.0	181.4	-53.2	3.0	-10.0	3.0	0.0	37.8
100QRC-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	834001.8	816055.5	129.5	--	--	92.0	177.6	-53.0	3.0	-10.0	3.0	0.0	35.0
RC-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	834028.6	816025.5	91.7	--	--	95.0	211.9	-54.5	3.0	0.0	3.0	0.0	46.5
RC-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	834028.3	816032.4	91.7	--	--	95.0	207.7	-54.3	3.0	0.0	3.0	0.0	46.7
HQ-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834037.9	816016.4	120.2	64.0	3.8	83.6	227.1	-55.1	3.0	-10.0	3.0	0.0	24.5
HQ-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834039.9	816019.3	120.2	64.0	3.8	83.6	227.0	-55.1	3.0	-10.0	3.0	0.0	24.5
HQ-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834042.0	816022.2	120.2	64.0	3.8	83.6	227.0	-55.1	3.0	-10.0	3.0	0.0	24.5
CH-1	Cooling Tower (Ref - ryowo: FC/LN 400)	834076.4	815970.1	75.6	66.0	5.4	88.7	284.0	-57.1	3.0	0.0	3.0	0.0	37.6
CH-2	Cooling Tower (Ref - ryowo: FC/LN 400)	834081.3	815963.7	75.6	66.0	5.4	88.7	291.8	-57.3	3.0	0.0	3.0	0.0	37.4
POH-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	834009.7	816003.1	97.7	--	--	84.0	212.2	-54.5	3.0	0.0	3.0	0.0	35.5
WTT-1	Chiller (Ref - Daikin: EWAD-CFXR 870)	834016.5	815992.1	85.4	--	--	92.0	224.6	-55.0	3.0	0.0	3.0	0.0	43.0
WTT-2	Chiller (Ref - Daikin: EWAD-CFXR 870)	834024.3	815984.9	85.4	--	--	92.0	235.2	-55.4	3.0	0.0	3.0	0.0	42.6
AST-1	Chiller (Ref - Daikin: EWAD-CFXR C10)	834102.6	816020.6	78.0	--	--	94.0	277.5	-56.9	3.0	0.0	3.0	0.0	43.1
AST-2	Chiller (Ref - Daikin: EWAD-CFXR C10)	834104.5	816017.0	78.0	--	--	94.0	280.8	-57.0	3.0	0.0	3.0	0.0	43.0
AST-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	834095.0	816014.2	78.0	--	--	85.0	273.9	-56.8	3.0	0.0	3.0	0.0	34.2
AST-4	Chiller (Ref - Daikin: EWAD-D-SX 410)	834096.8	816010.9	78.0	--	--	85.0	277.1	-56.9	3.0	0.0	3.0	0.0	34.1
BGLAT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.9	816246.5	16.5	--	--	92.0	156.8	-51.9	3.0	0.0	3.0	0.0	46.1
BGLAT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833964.4	816243.1	16.5	--	--	92.0	157.8	-52.0	3.0	0.0	3.0	0.0	46.0
TSBB-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833986.9	816259.8	56.3	--	--	86.0	171.5	-52.7	3.0	0.0	3.0	0.0	39.3
TSBB-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833991.5	816257.1	56.3	--	--	86.0	173.3	-52.8	3.0	0.0	3.0	0.0	39.2
PBC-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833994.6	816244.2	76.6	--	--	85.0	165.7	-52.4	3.0	0.0	3.0	0.0	38.6
PBC-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	834001.4	816248.4	76.6	--	--	85.0	173.6	-52.8	3.0	0.0	3.0	0.0	38.2
JC-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833950.9	816005.0	99.6	--	--	92.0	173.6	-52.8	3.0	0.0	3.0	0.0	45.2
ILT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833980.8	815970.5	102.3	--	--	92.0	218.9	-54.8	3.0	0.0	3.0	0.0	43.2
ILT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833979.5	815966.3	102.3	--	--	92.0	221.7	-54.9	3.0	0.0	3.0	0.0	43.1
SS-1	Chiller (Ref - Daikin: EWAQ-G-XR 090)	833918.4	815974.4	107.3	--	--	82.0	187.8	-53.5	3.0	-10.0	3.0	0.0	24.5
SS-2	Chiller (Ref - Daikin: EWAQ-G-XR 090)	833919.8	815972.9	107.3	--	--	82.0	189.7	-53.6	3.0	-10.0	3.0	0.0	24.4
CPCB-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833977.2	815919.4	116.3	--	--	85.0	262.2	-56.4	3.0	0.0	3.0	0.0	34.6
HC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833930.1	815929.6	121.7	--	--	86.0	235.4	-55.4	3.0	-10.0	3.0	0.0	26.6
HC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833933.6	815929.3	121.7	--	--	86.0	236.8	-55.5	3.0	-10.0	3.0	0.0	26.5
HC-3	Chiller (Ref - Daikin: EWAD-D-SX 490)	833936.6	815929.1	121.7	--	--	86.0	238.0	-55.5	3.0	-10.0	3.0	0.0	26.5
HC-4	Chiller (Ref - Daikin: EWAD-D-SX 490)	833942.4	815934.1	121.7	--	--	86.0	235.3	-55.4	3.0	-10.0	3.0	0.0	26.6
HC-5	Chiller (Ref - Daikin: EWAD-D-SX 490)	833945.5	815933.8	121.7	--	--	86.0	236.7	-55.5	3.0	-10.0	3.0	0.0	26.5
HC-6	Chiller (Ref - Daikin: EWAD-D-SX 490)	833942.8	815925.3	121.7	--	--	86.0	243.6	-55.7	3.0	-10.0	3.0	0.0	26.3
HC-7	Chiller (Ref - Daikin: EWAD-D-SX 490)	833938.2	815920.5	121.7	--	--	86.0	246.5	-55.8	3.0	-10.0	3.0	0.0	26.2
HC-8	Chiller (Ref - Daikin: EWAD-D-SX 490)	833941.3	815919.5	121.7	--	--	86.0	248.5	-55.9	3.0	-10.0	3.0	0.0	26.1
KC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833838.9	815913.7	132.0	--	--	95.0	242.3	-55.7	3.0	-10.0	3.0	0.0	35.3
KC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833828.9	815902.1	132.0	--	--	95.0	254.6	-56.1	3.0	-10.0	3.0	0.0	34.9
KC-3	Chiller (Ref - Daikin: EWAD-D-SX 490)	833820.6	815901.4	132.0	--	--	86.0	256.4	-56.2	3.0	-10.0	3.0		

299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	303.3	-57.6	3.0	-10.0	3.0	0.0	30.4
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	308.9	-57.8	3.0	-10.0	3.0	0.0	23.2
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	313.6	-57.9	3.0	-10.0	3.0	0.0	30.1
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	198.5	-54.0	3.0	-10.0	3.0	0.0	34.0
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	194.6	-53.8	3.0	-10.0	3.0	0.0	34.2
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	191.3	-53.6	3.0	-10.0	3.0	0.0	27.4
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	263.5	-56.4	3.0	-10.0	3.0	0.0	25.6
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	257.9	-56.2	3.0	-10.0	3.0	0.0	25.8
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	288.5	-57.2	3.0	-10.0	3.0	0.0	30.8
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	282.7	-57.0	3.0	-10.0	3.0	0.0	31.0
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	282.3	-57.0	3.0	-10.0	3.0	0.0	31.0
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	295.8	-57.4	3.0	-10.0	3.0	0.0	22.2
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	298.2	-57.5	3.0	-10.0	3.0	0.0	22.2
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	288.2	-57.2	3.0	-10.0	3.0	0.0	22.5
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	290.7	-57.3	3.0	-10.0	3.0	0.0	22.4
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	280.5	-57.0	3.0	-10.0	3.0	0.0	31.0
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	279.0	-56.9	3.0	-10.0	3.0	0.0	34.1
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	285.3	-57.1	3.0	-10.0	3.0	0.0	33.9
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	227.1	-55.1	3.0	-10.0	3.0	0.0	32.9
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	212.8	-54.6	3.0	-10.0	3.0	0.0	33.4
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	202.0	-54.1	3.0	-10.0	3.0	0.0	33.9
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	205.7	-54.3	3.0	-10.0	3.0	0.0	33.7
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	223.0	-55.0	3.0	-10.0	3.0	0.0	33.0
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	232.5	-55.3	3.0	-10.0	3.0	0.0	32.7
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	271.1	-56.7	3.0	-10.0	3.0	0.0	34.3
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	268.5	-56.6	3.0	-10.0	3.0	0.0	34.4
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	256.9	-56.2	3.0	-10.0	3.0	0.0	34.8
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	261.5	-56.4	3.0	-10.0	3.0	0.0	34.6
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	259.4	-56.3	3.0	-10.0	3.0	0.0	34.7
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	240.8	-55.6	3.0	-10.0	3.0	0.0	35.4
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	245.6	-55.8	3.0	-10.0	3.0	0.0	35.2
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	249.8	-56.0	3.0	-10.0	3.0	0.0	28.7
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	254.9	-56.1	3.0	-10.0	3.0	0.0	28.5
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	189.6	-53.6	3.0	-10.0	3.0	0.0	37.4
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	187.8	-53.5	3.0	-10.0	3.0	0.0	37.5
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	186.0	-53.4	3.0	-10.0	3.0	0.0	34.6
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	300.4	-57.6	3.0	0.0	3.0	0.0	40.4
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	251.8	-56.0	3.0	0.0	3.0	0.0	33.6
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	250.9	-56.0	3.0	0.0	3.0	0.0	33.7
											<b>Noise standard:</b>	<b>65</b>	<b>Overall</b>	<b>64</b>

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F01

NSR Coordinate:

x = 833858.0

y = 816151.2

z = 88.1

Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	81.0	-46.2	3.0	0.0	3.0	0.0	43.8
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	85.0	-46.6	3.0	0.0	3.0	0.0	43.4
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	90.0	-47.1	3.0	0.0	3.0	0.0	43.9
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	93.2	-47.4	3.0	0.0	3.0	0.0	43.6
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	251.8	-56.0	3.0	0.0	3.0	0.0	33.6
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	250.9	-56.0	3.0	0.0	3.0	0.0	33.7
<b>Noise standard:</b>											<b>55</b>	<b>Overall</b>	<b>50</b>	

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario  
Day/Evening Time

F01

NSR Coordinate: x = 833858.0 y = 816151.2 z = 117.6

Source ID	Description	Industrial Noise Source Coordinate:			SPL	Ref dist.	SWL	Slant distance from source to NSR (m)	Distance	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsiv e Corr.	ANL
		x	y	z										
OB-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833870.8	816166.0	121.8	--	--	86.0	20.0	-34.0	3.0	-10.0	3.0	0.0	48.0
OB-2	Cooling Tower (Ref - ryowo: FC/LN 200)	833874.7	816169.8	121.8	64.0	3.8	83.6	25.3	-36.1	3.0	-10.0	3.0	0.0	43.6
CRC-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833881.0	816161.9	131.1	--	--	92.0	28.7	-37.2	3.0	-10.0	3.0	0.0	50.8
CRC-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833884.0	816158.8	131.1	--	--	92.0	30.3	-37.6	3.0	-10.0	3.0	0.0	50.4
SB-1	Chiller (Ref - Daikin: EWAD-F-XR 500)	833886.6	816144.1	60.0	--	--	89.0	64.7	-44.2	3.0	0.0	3.0	0.0	50.8
SB-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833887.3	816138.6	60.0	--	--	85.0	65.8	-44.4	3.0	0.0	3.0	0.0	46.6
VHB-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833928.3	816124.3	88.4	--	--	86.0	80.7	-46.1	3.0	0.0	3.0	0.0	45.9
VHB-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833932.2	816119.2	88.4	--	--	86.0	85.9	-46.7	3.0	0.0	3.0	0.0	45.3
VHB-3	Chiller (Ref - Daikin: EWAD-D-SX 490)	833929.6	816114.1	88.4	--	--	86.0	85.8	-46.7	3.0	0.0	3.0	0.0	45.3
YSA-1	Chiller (Ref - Daikin: EWAD-CFXR 210)	833920.2	816100.0	96.8	--	--	84.0	83.2	-46.4	3.0	0.0	3.0	0.0	43.6
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	87.1	-46.8	3.0	0.0	3.0	0.0	43.2
TLP-1	Chiller (Ref - Daikin: EWAD-C-SR C14)	833913.6	816181.9	51.8	--	--	95.0	91.5	-47.2	3.0	0.0	3.0	0.0	53.8
TLP-2	Chiller (Ref - Daikin: EWAD-F-XR 330)	833918.0	816188.6	51.8	--	--	87.0	96.6	-47.7	3.0	0.0	3.0	0.0	45.3
TLP-3	Chiller (Ref - Daikin: EWAD-C-SR C14)	833920.3	816184.2	51.8	--	--	95.0	96.4	-47.7	3.0	0.0	3.0	0.0	53.3
TLP-4	Chiller (Ref - Daikin: EWAD-F-XR 330)	833913.2	816176.1	51.8	--	--	87.0	89.4	-47.0	3.0	0.0	3.0	0.0	46.0
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	93.7	-47.4	3.0	0.0	3.0	0.0	43.6
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	96.7	-47.7	3.0	0.0	3.0	0.0	43.3
WHIB-1	Chiller (Ref - Daikin: EWAD-CFXR 870)	833911.1	816220.6	73.0	--	--	92.0	98.1	-47.8	3.0	0.0	3.0	0.0	50.2
WHIB-2	Chiller (Ref - Daikin: EWAD-CFXR 870)	833918.3	816235.3	73.0	--	--	92.0	112.7	-49.0	3.0	0.0	3.0	0.0	49.0
OCBC-1	Chiller (Ref - Daikin: EWAQ-G-XR 080)	833876.3	816229.0	72.2	--	--	80.0	91.9	-47.3	3.0	0.0	3.0	0.0	38.7
OCBC-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833875.0	816224.7	72.2	--	--	85.0	88.0	-46.9	3.0	0.0	3.0	0.0	44.1
OCBC-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833880.2	816225.5	72.2	--	--	85.0	89.9	-47.1	3.0	0.0	3.0	0.0	43.9
OCBC-4	Chiller (Ref - Daikin: EWAD-D-SX 410)	833880.2	816220.3	72.2	--	--	85.0	85.6	-46.7	3.0	0.0	3.0	0.0	44.3
SLCB-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833884.3	816242.7	73.1	--	--	92.0	105.1	-48.4	3.0	0.0	3.0	0.0	49.6
AB-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833947.6	816283.2	72.3	--	--	85.0	165.8	-52.4	3.0	0.0	3.0	0.0	38.6
AB-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833949.1	816285.4	72.3	--	--	85.0	168.4	-52.5	3.0	0.0	3.0	0.0	38.5
HKTC-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833959.3	816314.2	78.4	--	--	85.0	195.9	-53.8	3.0	0.0	3.0	0.0	37.2
HKTC-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833963.4	816311.4	78.4	--	--	85.0	195.7	-53.8	3.0	0.0	3.0	0.0	37.2
HKTC-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833967.6	816308.9	78.4	--	--	85.0	196.0	-53.8	3.0	0.0	3.0	0.0	37.2
NCBB-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833980.6	816305.2	57.4	--	--	92.0	205.8	-54.3	3.0	0.0	3.0	0.0	43.7
NCBB-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833984.4	816309.9	57.4	--	--	92.0	206.4	-54.3	3.0	0.0	3.0	0.0	43.7
NCBB-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833988.8	816300.1	57.4	--	--	92.0	207.1	-54.3	3.0	0.0	3.0	0.0	43.7
CTGH-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833982.3	816343.5	94.0	--	--	92.0	230.2	-55.2	3.0	0.0	3.0	0.0	42.8
CTGH-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833991.6	816340.8	94.0	--	--	92.0	233.1	-55.4	3.0	0.0	3.0	0.0	42.6
CTGH-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833986.4	816336.9	94.0	--	--	92.0	227.0	-55.1	3.0	0.0	3.0	0.0	42.9
CTGH-4	Chiller (Ref - Daikin: EWAD-D-SX 410)	833980.3	816333.3	94.0	--	--	85.0	220.6	-54.9	3.0	0.0	3.0	0.0	36.1
TB-1	Chiller (Ref - Daikin: EWAD-CFXR 820)	834003.4	816335.1	84.3	--	--	92.0	236.8	-55.5	3.0	0.0	3.0	0.0	42.5
TB-2	Chiller (Ref - Daikin: EWAD-CFXR 820)	834007.2	816324.2	84.3	--	--	92.0	230.9	-55.3	3.0	0.0	3.0	0.0	42.7
IAB-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833958.7	816104.1	66.6	--	--	86.0	122.3	-49.7	3.0	0.0	3.0	0.0	42.3
IAB-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833964.8	816100.4	66.6	--	--	86.0	128.8	-50.2	3.0	0.0	3.0	0.0	41.8
100QRC-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	834011.1	816060.8	129.5	--	--	95.0	178.2	-53.0	3.0	-10.0	3.0	0.0	38.0
100QRC-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	834008.1	816058.1	129.5	--	--	95.0	177.0	-53.0	3.0	-10.0	3.0	0.0	38.0
100QRC-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	834001.8	816055.5	129.5	--	--	92.0	173.1	-52.8	3.0	-10.0	3.0	0.0	35.2
RC-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	834028.6	816025.5	91.7	--	--	95.0	213.5	-54.6	3.0	0.0	3.0	0.0	46.4
RC-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	834028.3	816032.4	91.7	--	--	95.0	209.3	-54.4	3.0	0.0	3.0	0.0	46.6
HQ-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834037.9	816016.4	120.2	64.0	3.8	83.6	224.8	-55.0	3.0	-10.0	3.0	0.0	24.6
HQ-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834039.9	816019.3	120.2	64.0	3.8	83.6	224.7	-55.0	3.0	-10.0	3.0	0.0	24.6
HQ-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834042.0	816022.2	120.2	64.0	3.8	83.6	224.7	-55.0	3.0	-10.0	3.0	0.0	24.6
CH-1	Cooling Tower (Ref - ryowo: FC/LN 400)	834076.4	815970.1	75.6	66.0	5.4	88.7	286.8	-57.2	3.0	0.0	3.0	0.0	37.5
CH-2	Cooling Tower (Ref - ryowo: FC/LN 400)	834081.3	815963.7	75.6	66.0	5.4	88.7	294.6	-57.4	3.0	0.0	3.0	0.0	37.3
POH-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	834009.7	816003.1	97.7	--	--	84.0	212.9	-54.6	3.0	0.0	3.0	0.0	35.4
WTT-1	Chiller (Ref - Daikin: EWAD-CFXR 870)	834016.5	815992.1	85.4	--	--	92.0	226.9	-55.1	3.0	0.0	3.0	0.0	42.9
WTT-2	Chiller (Ref - Daikin: EWAD-CFXR 870)	834024.3	815984.9	85.4	--	--	92.0	237.4	-55.5	3.0	0.0	3.0	0.0	42.5
AST-1	Chiller (Ref - Daikin: EWAD-CFXR C10)	834102.6	816020.6	78.0	--	--	94.0	280.1	-56.9	3.0	0.0	3.0	0.0	43.1
AST-2	Chiller (Ref - Daikin: EWAD-CFXR C10)	834104.5	816017.0	78.0	--	--	94.0	283.4	-57.0	3.0	0.0	3.0	0.0	43.0
AST-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	834095.0	816014.2	78.0	--	--	85.0	276.6	-56.8	3.0	0.0	3.0	0.0	34.2
AST-4	Chiller (Ref - Daikin: EWAD-D-SX 410)	834096.8	816010.9	78.0	--	--	85.0	279.8	-56.9	3.0	0.0	3.0	0.0	34.1
BGLAT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.9	816246.5	16.5	--	--	92.0	172.3	-52.7	3.0	0.0	3.0	0.0	45.3
BGLAT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833964.4	816243.1	16.5	--	--	92.0	173.2	-52.8	3.0	0.0	3.0	0.0	45.2
TSBB-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833986.9	816259.8	56.3	--	--	86.0	179.4	-53.1	3.0	0.0	3.0	0.0	38.9
TSBB-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833991.5	816257.1	56.3	--	--	86.0	181.1	-53.2	3.0	0.0	3.0	0.0	38.8
PBC-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833994.6	816244.2	76.6	--	--	85.0	170.3	-52.6	3.0	0.0	3.0	0.0	38.4
PBC-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	834001.4	816248.4	76.6	--	--	85.0	178.0	-53.0	3.0	0.0	3.0	0.0	38.0
JC-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833950.9	816005.0	99.6	--	--	92.0	174.2	-52.8	3.0	0.0	3.0	0.0	45.2
ILT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833980.8	815970.5	102.3	--	--	92.0	219.0	-54.8	3.0	0.0	3.0	0.0	43.2
ILT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833979.5	815966.3	102.3	--	--	92.0	221.8	-54.9	3.0	0.0	3.0	0.0	43.1
SS-1	Chiller (Ref - Daikin: EWAQ-G-XR 090)	833918.4	815974.4	107.3	--	--	82.0	187.1	-53.4	3.0	-10.0	3.0	0.0	24.6
SS-2	Chiller (Ref - Daikin: EWAQ-G-XR 090)	833919.8	815972.9	107.3	--	--	82.0	189.0	-53.5	3.0	-10.0	3.0	0.0	24.5
CPCB-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833977.2	815919.4	116.3	--	--	85.0	260.7	-56.3	3.0	0.0	3.0	0.0	34.7
HC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833930.1	815929.6	121.7	--	--	86.0	233.1	-55.3	3.0	-10.0	3.0	0.0	26.7
HC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833933.6	815929.3	121.7	--	--	86.0	234.5	-55.4	3.0	-10.0	3.0	0.0	26.6
HC-3	Chiller (Ref - Daikin: EWAD-D-SX 490)	833936.6	815929.1	121.7	--	--	86.0	235.6	-55.4	3.0	-10.0	3.0	0.0	26.6
HC-4	Chiller (Ref - Daikin: EWAD-D-SX 490)	833942.4	815934.1	121.7	--	--	86.0	233.0	-55.3	3.0	-10.0	3.0	0.0	26.7
HC-5	Chiller (Ref - Daikin: EWAD-D-SX 490)	833945.5	815933.8	121.7	--	--	86.0	234.4	-55.4	3.0	-10.0	3.0	0.0	26.6
HC-6	Chiller (Ref - Daikin: EWAD-D-SX 490)	833942.8	815925.3	121.7	--	--	86.0	241.3	-55.7	3.0	-10.0	3.0	0.0	26.3
HC-7	Chiller (Ref - Daikin: EWAD-D-SX 490)	833938.2	815920.5	121.7	--	--	86.0	244.3	-55.8	3.0	-10.0	3.0	0.0	26.2
HC-8	Chiller (Ref - Daikin: EWAD-D-SX 490)	833941.3	815919.5	121.7	--	--	86.0	246.3	-55.8	3.0	-10.0	3.0	0.0	26.2
KC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833838.9	815913.7	132.0	--	--	95.0	238.7	-55.6	3.0	-10.0	3.0	0.0	35.4
KC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833828.9	815902.1	132.0	--	--	95.0	251.2	-56.0	3.0	-10.0	3.0	0.0	35.0
KC-3	Chiller (Ref - Daikin: EWAD-D-SX 490)	833820.6	815901.4	132.0	--	--	86.0	253.0	-56.1	3.0	-10.0			

299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	305.4	-57.7	3.0	-10.0	3.0	0.0	30.3	
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	311.0	-57.9	3.0	-10.0	3.0	0.0	23.1	
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	315.6	-58.0	3.0	-10.0	3.0	0.0	30.0	
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	201.3	-54.1	3.0	-10.0	3.0	0.0	33.9	
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	197.5	-53.9	3.0	-10.0	3.0	0.0	34.1	
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	194.3	-53.8	3.0	-10.0	3.0	0.0	27.2	
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	262.9	-56.4	3.0	-10.0	3.0	0.0	25.6	
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	257.3	-56.2	3.0	-10.0	3.0	0.0	25.8	
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	289.0	-57.2	3.0	-10.0	3.0	0.0	30.8	
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	283.2	-57.0	3.0	-10.0	3.0	0.0	31.0	
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	282.8	-57.0	3.0	-10.0	3.0	0.0	31.0	
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	292.5	-57.3	3.0	-10.0	3.0	0.0	22.3	
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	294.9	-57.4	3.0	-10.0	3.0	0.0	22.3	
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	284.8	-57.1	3.0	-10.0	3.0	0.0	22.6	
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	287.3	-57.2	3.0	-10.0	3.0	0.0	22.5	
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	277.0	-56.8	3.0	-10.0	3.0	0.0	31.2	
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	275.4	-56.8	3.0	-10.0	3.0	0.0	34.2	
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	281.9	-57.0	3.0	-10.0	3.0	0.0	34.0	
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	236.4	-55.5	3.0	-10.0	3.0	0.0	32.5	
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	222.7	-55.0	3.0	-10.0	3.0	0.0	33.0	
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	212.4	-54.5	3.0	-10.0	3.0	0.0	33.5	
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	215.9	-54.7	3.0	-10.0	3.0	0.0	33.3	
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	232.4	-55.3	3.0	-10.0	3.0	0.0	32.7	
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	241.5	-55.7	3.0	-10.0	3.0	0.0	32.3	
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	278.4	-56.9	3.0	-10.0	3.0	0.0	34.1	
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	276.0	-56.8	3.0	-10.0	3.0	0.0	34.2	
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	264.7	-56.5	3.0	-10.0	3.0	0.0	34.5	
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	269.2	-56.6	3.0	-10.0	3.0	0.0	34.4	
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	267.1	-56.5	3.0	-10.0	3.0	0.0	34.5	
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	238.2	-55.5	3.0	-10.0	3.0	0.0	35.5	
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	243.1	-55.7	3.0	-10.0	3.0	0.0	35.3	
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	247.4	-55.9	3.0	-10.0	3.0	0.0	28.8	
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	252.5	-56.0	3.0	-10.0	3.0	0.0	28.6	
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	188.2	-53.5	3.0	-10.0	3.0	0.0	37.5	
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	186.4	-53.4	3.0	-10.0	3.0	0.0	37.6	
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	184.6	-53.3	3.0	-10.0	3.0	0.0	34.7	
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	300.9	-57.6	3.0	0.0	3.0	0.0	40.4	
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	253.6	-56.1	3.0	0.0	3.0	0.0	33.6	
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	252.7	-56.1	3.0	0.0	3.0	0.0	33.6	
												<b>Noise standard:</b>	<b>65</b>	<b>Overall</b>	<b>64</b>



Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F01

NSR Coordinate:

x = 833858.0

y = 816151.2

z = 117.6

Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	83.2	-46.4	3.0	0.0	3.0	0.0	43.6
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	87.1	-46.8	3.0	0.0	3.0	0.0	43.2
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	93.7	-47.4	3.0	0.0	3.0	0.0	43.6
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	96.7	-47.7	3.0	0.0	3.0	0.0	43.3
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	253.6	-56.1	3.0	0.0	3.0	0.0	33.6
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	252.7	-56.1	3.0	0.0	3.0	0.0	33.6
											<b>Noise standard:</b>	<b>55</b>	<b>Overall</b>	<b>50</b>



299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	301.7	-57.6	3.0	-10.0	3.0	0.0	30.4
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	307.3	-57.8	3.0	-10.0	3.0	0.0	23.2
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	312.0	-57.9	3.0	-10.0	3.0	0.0	30.1
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	199.9	-54.0	3.0	-10.0	3.0	0.0	34.0
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	196.0	-53.8	3.0	-10.0	3.0	0.0	34.2
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	193.0	-53.7	3.0	-10.0	3.0	0.0	27.3
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	266.7	-56.5	3.0	-10.0	3.0	0.0	25.5
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	261.1	-56.3	3.0	-10.0	3.0	0.0	25.7
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	290.3	-57.3	3.0	-10.0	3.0	0.0	30.7
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	284.7	-57.1	3.0	-10.0	3.0	0.0	30.9
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	284.2	-57.1	3.0	-10.0	3.0	0.0	30.9
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	305.6	-57.7	3.0	-10.0	3.0	0.0	21.9
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	307.9	-57.8	3.0	-10.0	3.0	0.0	21.9
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	298.1	-57.5	3.0	-10.0	3.0	0.0	22.2
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	300.6	-57.6	3.0	-10.0	3.0	0.0	22.1
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	290.6	-57.3	3.0	-10.0	3.0	0.0	30.7
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	289.1	-57.2	3.0	-10.0	3.0	0.0	33.8
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	295.2	-57.4	3.0	-10.0	3.0	0.0	33.6
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	226.0	-55.1	3.0	-10.0	3.0	0.0	32.9
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	211.2	-54.5	3.0	-10.0	3.0	0.0	33.5
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	200.0	-54.0	3.0	-10.0	3.0	0.0	34.0
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	203.7	-54.2	3.0	-10.0	3.0	0.0	33.8
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	221.5	-54.9	3.0	-10.0	3.0	0.0	33.1
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	231.3	-55.3	3.0	-10.0	3.0	0.0	32.7
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	270.2	-56.6	3.0	-10.0	3.0	0.0	34.4
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	267.6	-56.6	3.0	-10.0	3.0	0.0	34.4
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	255.6	-56.2	3.0	-10.0	3.0	0.0	34.8
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	260.5	-56.3	3.0	-10.0	3.0	0.0	34.7
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	258.4	-56.2	3.0	-10.0	3.0	0.0	34.8
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	250.0	-56.0	3.0	-10.0	3.0	0.0	35.0
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	255.0	-56.1	3.0	-10.0	3.0	0.0	34.9
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	259.1	-56.3	3.0	-10.0	3.0	0.0	28.4
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	264.1	-56.4	3.0	-10.0	3.0	0.0	28.2
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	198.5	-54.0	3.0	-10.0	3.0	0.0	37.0
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	196.8	-53.9	3.0	-10.0	3.0	0.0	37.1
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	195.1	-53.8	3.0	-10.0	3.0	0.0	34.2
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	307.2	-57.7	3.0	0.0	3.0	0.0	40.3
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	253.9	-56.1	3.0	0.0	3.0	0.0	33.6
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	253.0	-56.1	3.0	0.0	3.0	0.0	33.6
											<b>Noise standard:</b>	<b>65</b>	<b>Overall</b>	<b>64</b>

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F02

NSR Coordinate:

x = 833854.7

y = 816147.9

z = 59.0

Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	89.5	-47.0	3.0	0.0	3.0	0.0	43.0
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	93.1	-47.4	3.0	0.0	3.0	0.0	42.6
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	95.0	-47.6	3.0	0.0	3.0	0.0	43.4
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	98.0	-47.8	3.0	0.0	3.0	0.0	43.2
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	253.9	-56.1	3.0	0.0	3.0	0.0	33.6
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	253.0	-56.1	3.0	0.0	3.0	0.0	33.6
<b>Noise standard:</b>											<b>55</b>	<b>Overall</b>	<b>49</b>	



299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	301.0	-57.6	3.0	-10.0	3.0	0.0	30.4	
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	306.6	-57.7	3.0	-10.0	3.0	0.0	23.3	
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	311.3	-57.9	3.0	-10.0	3.0	0.0	30.1	
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	198.5	-54.0	3.0	-10.0	3.0	0.0	34.0	
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	194.5	-53.8	3.0	-10.0	3.0	0.0	34.2	
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	191.5	-53.6	3.0	-10.0	3.0	0.0	27.4	
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	262.9	-56.4	3.0	-10.0	3.0	0.0	25.6	
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	257.2	-56.2	3.0	-10.0	3.0	0.0	25.8	
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	287.9	-57.2	3.0	-10.0	3.0	0.0	30.8	
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	282.2	-57.0	3.0	-10.0	3.0	0.0	31.0	
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	281.7	-57.0	3.0	-10.0	3.0	0.0	31.0	
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	299.6	-57.5	3.0	-10.0	3.0	0.0	22.1	
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	301.9	-57.6	3.0	-10.0	3.0	0.0	22.0	
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	291.9	-57.3	3.0	-10.0	3.0	0.0	22.3	
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	294.4	-57.4	3.0	-10.0	3.0	0.0	22.3	
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	284.2	-57.1	3.0	-10.0	3.0	0.0	30.9	
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	282.7	-57.0	3.0	-10.0	3.0	0.0	34.0	
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	288.9	-57.2	3.0	-10.0	3.0	0.0	33.8	
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	231.5	-55.3	3.0	-10.0	3.0	0.0	32.7	
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	217.1	-54.7	3.0	-10.0	3.0	0.0	33.3	
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	206.2	-54.3	3.0	-10.0	3.0	0.0	33.7	
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	209.9	-54.4	3.0	-10.0	3.0	0.0	33.6	
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	227.2	-55.1	3.0	-10.0	3.0	0.0	32.9	
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	236.7	-55.5	3.0	-10.0	3.0	0.0	32.5	
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	274.4	-56.8	3.0	-10.0	3.0	0.0	34.2	
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	271.9	-56.7	3.0	-10.0	3.0	0.0	34.3	
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	260.1	-56.3	3.0	-10.0	3.0	0.0	34.7	
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	264.9	-56.5	3.0	-10.0	3.0	0.0	34.5	
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	262.8	-56.4	3.0	-10.0	3.0	0.0	34.6	
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	244.2	-55.8	3.0	-10.0	3.0	0.0	35.2	
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	249.2	-55.9	3.0	-10.0	3.0	0.0	35.1	
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	253.4	-56.1	3.0	-10.0	3.0	0.0	28.6	
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	258.5	-56.3	3.0	-10.0	3.0	0.0	28.4	
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	192.8	-53.7	3.0	-10.0	3.0	0.0	37.3	
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	191.1	-53.6	3.0	-10.0	3.0	0.0	37.4	
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	189.4	-53.5	3.0	-10.0	3.0	0.0	34.5	
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	304.9	-57.7	3.0	0.0	3.0	0.0	40.3	
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	252.4	-56.0	3.0	0.0	3.0	0.0	33.6	
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	251.4	-56.0	3.0	0.0	3.0	0.0	33.6	
												<b>Noise standard:</b>	<b>65</b>	<b>Overall</b>	<b>64</b>

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F02

NSR Coordinate:

x = 833854.7

y = 816147.9

z = 88.1

Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	81.6	-46.2	3.0	0.0	3.0	0.0	43.8
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	85.6	-46.6	3.0	0.0	3.0	0.0	43.4
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	89.4	-47.0	3.0	0.0	3.0	0.0	44.0
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	92.5	-47.3	3.0	0.0	3.0	0.0	43.7
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	252.4	-56.0	3.0	0.0	3.0	0.0	33.6
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	251.4	-56.0	3.0	0.0	3.0	0.0	33.6
<b>Noise standard:</b>											<b>55</b>	<b>Overall</b>	<b>50</b>	





299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	303.1	-57.6	3.0	-10.0	3.0	0.0	30.4	
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	308.7	-57.8	3.0	-10.0	3.0	0.0	23.2	
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	313.4	-57.9	3.0	-10.0	3.0	0.0	30.1	
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	201.3	-54.1	3.0	-10.0	3.0	0.0	33.9	
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	197.4	-53.9	3.0	-10.0	3.0	0.0	34.1	
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	194.4	-53.8	3.0	-10.0	3.0	0.0	27.2	
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	262.3	-56.4	3.0	-10.0	3.0	0.0	25.6	
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	256.6	-56.2	3.0	-10.0	3.0	0.0	25.8	
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	288.4	-57.2	3.0	-10.0	3.0	0.0	30.8	
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	282.7	-57.0	3.0	-10.0	3.0	0.0	31.0	
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	282.2	-57.0	3.0	-10.0	3.0	0.0	31.0	
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	296.3	-57.4	3.0	-10.0	3.0	0.0	22.2	
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	298.7	-57.5	3.0	-10.0	3.0	0.0	22.1	
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	288.5	-57.2	3.0	-10.0	3.0	0.0	22.4	
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	291.1	-57.3	3.0	-10.0	3.0	0.0	22.4	
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	280.8	-57.0	3.0	-10.0	3.0	0.0	31.0	
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	279.2	-56.9	3.0	-10.0	3.0	0.0	34.1	
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	285.5	-57.1	3.0	-10.0	3.0	0.0	33.9	
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	240.6	-55.6	3.0	-10.0	3.0	0.0	32.4	
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	226.8	-55.1	3.0	-10.0	3.0	0.0	32.9	
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	216.4	-54.7	3.0	-10.0	3.0	0.0	33.3	
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	219.9	-54.8	3.0	-10.0	3.0	0.0	33.2	
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	236.5	-55.5	3.0	-10.0	3.0	0.0	32.5	
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	245.6	-55.8	3.0	-10.0	3.0	0.0	32.2	
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	281.7	-57.0	3.0	-10.0	3.0	0.0	34.0	
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	279.3	-56.9	3.0	-10.0	3.0	0.0	34.1	
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	267.8	-56.6	3.0	-10.0	3.0	0.0	34.4	
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	272.5	-56.7	3.0	-10.0	3.0	0.0	34.3	
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	270.4	-56.6	3.0	-10.0	3.0	0.0	34.4	
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	241.7	-55.7	3.0	-10.0	3.0	0.0	35.3	
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	246.8	-55.8	3.0	-10.0	3.0	0.0	35.2	
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	251.0	-56.0	3.0	-10.0	3.0	0.0	28.7	
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	256.2	-56.2	3.0	-10.0	3.0	0.0	28.5	
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	191.4	-53.6	3.0	-10.0	3.0	0.0	37.4	
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	189.7	-53.6	3.0	-10.0	3.0	0.0	37.4	
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	188.0	-53.5	3.0	-10.0	3.0	0.0	34.5	
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	305.4	-57.7	3.0	0.0	3.0	0.0	40.3	
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	254.2	-56.1	3.0	0.0	3.0	0.0	33.5	
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	253.3	-56.1	3.0	0.0	3.0	0.0	33.6	
											<b>Noise standard:</b>		<b>65</b>	<b>Overall</b>	<b>63</b>

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F02

NSR Coordinate:

x = 833854.7

y = 816147.9

z = 117.6

Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	83.8	-46.5	3.0	0.0	3.0	0.0	43.5
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	87.6	-46.9	3.0	0.0	3.0	0.0	43.1
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	93.1	-47.4	3.0	0.0	3.0	0.0	43.6
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	96.1	-47.7	3.0	0.0	3.0	0.0	43.3
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	254.2	-56.1	3.0	0.0	3.0	0.0	33.5
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	253.3	-56.1	3.0	0.0	3.0	0.0	33.6
<b>Noise standard:</b>											<b>55</b>	<b>Overall</b>	<b>50</b>	



299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	289.3	-57.2	3.0	0.0	3.0	0.0	40.8	
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	295.0	-57.4	3.0	0.0	3.0	0.0	33.6	
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	300.0	-57.5	3.0	0.0	3.0	0.0	40.5	
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	196.6	-53.9	3.0	0.0	3.0	0.0	44.1	
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	192.4	-53.7	3.0	0.0	3.0	0.0	44.3	
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	190.2	-53.6	3.0	0.0	3.0	0.0	37.4	
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	260.7	-56.3	3.0	0.0	3.0	0.0	35.7	
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	255.2	-56.1	3.0	0.0	3.0	0.0	35.9	
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	284.4	-57.1	3.0	0.0	3.0	0.0	40.9	
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	279.1	-56.9	3.0	0.0	3.0	0.0	41.1	
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	278.3	-56.9	3.0	0.0	3.0	0.0	41.1	
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	322.4	-58.2	3.0	-10.0	3.0	0.0	21.5	
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	324.6	-58.2	3.0	-10.0	3.0	0.0	21.4	
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	314.8	-58.0	3.0	-10.0	3.0	0.0	21.7	
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	317.1	-58.0	3.0	-10.0	3.0	0.0	21.6	
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	307.3	-57.8	3.0	-10.0	3.0	0.0	30.2	
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	305.7	-57.7	3.0	-10.0	3.0	0.0	33.3	
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	311.5	-57.9	3.0	-10.0	3.0	0.0	33.1	
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	242.2	-55.7	3.0	-10.0	3.0	0.0	32.3	
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	227.5	-55.1	3.0	-10.0	3.0	0.0	32.9	
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	215.6	-54.7	3.0	-10.0	3.0	0.0	33.3	
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	218.7	-54.8	3.0	-10.0	3.0	0.0	33.2	
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	236.7	-55.5	3.0	-10.0	3.0	0.0	32.5	
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	246.4	-55.8	3.0	-10.0	3.0	0.0	32.2	
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	280.8	-57.0	3.0	-10.0	3.0	0.0	34.0	
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	278.4	-56.9	3.0	-10.0	3.0	0.0	34.1	
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	265.9	-56.5	3.0	-10.0	3.0	0.0	34.5	
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	271.3	-56.7	3.0	-10.0	3.0	0.0	34.3	
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	269.5	-56.6	3.0	-10.0	3.0	0.0	34.4	
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	260.7	-56.3	3.0	-10.0	3.0	0.0	34.7	
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	266.6	-56.5	3.0	-10.0	3.0	0.0	34.5	
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	270.4	-56.6	3.0	-10.0	3.0	0.0	28.0	
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	275.7	-56.8	3.0	-10.0	3.0	0.0	27.8	
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	208.1	-54.4	3.0	-10.0	3.0	0.0	36.6	
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	206.8	-54.3	3.0	-10.0	3.0	0.0	36.7	
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	205.4	-54.3	3.0	-10.0	3.0	0.0	33.7	
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	323.6	-58.2	3.0	-10.0	3.0	0.0	29.8	
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	261.3	-56.3	3.0	-10.0	3.0	0.0	23.3	
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	260.1	-56.3	3.0	-10.0	3.0	0.0	23.3	
												<b>Noise standard:</b>	<b>65</b>	<b>Overall</b>	<b>59</b>

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F03

NSR Coordinate:

x = 833838.9

y = 816138.3

z = 59.0

Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	97.5	-47.8	3.0	0.0	3.0	0.0	42.2
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	101.0	-48.1	3.0	0.0	3.0	0.0	41.9
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	98.8	-47.9	3.0	0.0	3.0	0.0	43.1
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	101.8	-48.2	3.0	0.0	3.0	0.0	42.8
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	261.3	-56.3	3.0	-10.0	3.0	0.0	23.3
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	260.1	-56.3	3.0	-10.0	3.0	0.0	23.3
											<b>Noise standard:</b>	<b>55</b>	<b>Overall</b>	<b>49</b>



299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	288.6	-57.2	3.0	0.0	3.0	0.0	40.8	
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	294.3	-57.4	3.0	0.0	3.0	0.0	33.6	
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	299.3	-57.5	3.0	0.0	3.0	0.0	40.5	
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	195.1	-53.8	3.0	0.0	3.0	0.0	44.2	
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	190.8	-53.6	3.0	0.0	3.0	0.0	44.4	
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	188.7	-53.5	3.0	0.0	3.0	0.0	37.5	
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	256.7	-56.2	3.0	0.0	3.0	0.0	35.8	
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	251.2	-56.0	3.0	0.0	3.0	0.0	36.0	
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	281.9	-57.0	3.0	0.0	3.0	0.0	41.0	
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	276.5	-56.8	3.0	0.0	3.0	0.0	41.2	
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	275.7	-56.8	3.0	0.0	3.0	0.0	41.2	
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	316.7	-58.0	3.0	-10.0	3.0	0.0	21.6	
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	318.9	-58.1	3.0	-10.0	3.0	0.0	21.6	
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	308.9	-57.8	3.0	-10.0	3.0	0.0	21.8	
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	311.3	-57.9	3.0	-10.0	3.0	0.0	21.8	
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	301.3	-57.6	3.0	-10.0	3.0	0.0	30.4	
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	299.7	-57.5	3.0	-10.0	3.0	0.0	33.5	
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	305.6	-57.7	3.0	-10.0	3.0	0.0	33.3	
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	247.4	-55.9	3.0	-10.0	3.0	0.0	32.1	
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	233.0	-55.3	3.0	-10.0	3.0	0.0	32.7	
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	221.4	-54.9	3.0	-10.0	3.0	0.0	33.1	
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	224.4	-55.0	3.0	-10.0	3.0	0.0	33.0	
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	241.9	-55.7	3.0	-10.0	3.0	0.0	32.3	
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	251.5	-56.0	3.0	-10.0	3.0	0.0	32.0	
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	284.8	-57.1	3.0	-10.0	3.0	0.0	33.9	
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	282.5	-57.0	3.0	-10.0	3.0	0.0	34.0	
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	270.2	-56.6	3.0	-10.0	3.0	0.0	34.4	
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	275.5	-56.8	3.0	-10.0	3.0	0.0	34.2	
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	273.7	-56.7	3.0	-10.0	3.0	0.0	34.3	
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	255.1	-56.1	3.0	-10.0	3.0	0.0	34.9	
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	261.1	-56.3	3.0	-10.0	3.0	0.0	34.7	
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	265.0	-56.5	3.0	-10.0	3.0	0.0	28.2	
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	270.4	-56.6	3.0	-10.0	3.0	0.0	28.0	
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	202.7	-54.1	3.0	-10.0	3.0	0.0	36.9	
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	201.3	-54.1	3.0	-10.0	3.0	0.0	36.9	
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	199.9	-54.0	3.0	-10.0	3.0	0.0	34.0	
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	321.5	-58.1	3.0	-10.0	3.0	0.0	29.9	
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	259.8	-56.3	3.0	-10.0	3.0	0.0	23.4	
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	258.6	-56.3	3.0	-10.0	3.0	0.0	23.4	
												<b>Noise standard:</b>	<b>65</b>	<b>Overall</b>	<b>59</b>

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F03

NSR Coordinate:

x = 833838.9

y = 816138.3

z = 88.1

Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	90.3	-47.1	3.0	0.0	3.0	0.0	42.9
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	94.1	-47.5	3.0	0.0	3.0	0.0	42.5
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	93.4	-47.4	3.0	0.0	3.0	0.0	43.6
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	96.6	-47.7	3.0	0.0	3.0	0.0	43.3
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	259.8	-56.3	3.0	-10.0	3.0	0.0	23.4
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	258.6	-56.3	3.0	-10.0	3.0	0.0	23.4
											<b>Noise standard:</b>	<b>55</b>	<b>Overall</b>	<b>49</b>





299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	290.8	-57.3	3.0	0.0	3.0	0.0	40.7	
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	296.5	-57.4	3.0	0.0	3.0	0.0	33.6	
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	301.4	-57.6	3.0	0.0	3.0	0.0	40.4	
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	198.0	-53.9	3.0	0.0	3.0	0.0	44.1	
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	193.8	-53.7	3.0	0.0	3.0	0.0	44.3	
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	191.6	-53.6	3.0	0.0	3.0	0.0	37.4	
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	256.1	-56.2	3.0	0.0	3.0	0.0	35.8	
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	250.6	-56.0	3.0	0.0	3.0	0.0	36.0	
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	282.4	-57.0	3.0	0.0	3.0	0.0	41.0	
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	277.0	-56.8	3.0	0.0	3.0	0.0	41.2	
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	276.2	-56.8	3.0	0.0	3.0	0.0	41.2	
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	313.6	-57.9	3.0	-10.0	3.0	0.0	21.7	
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	315.8	-58.0	3.0	-10.0	3.0	0.0	21.7	
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	305.7	-57.7	3.0	-10.0	3.0	0.0	21.9	
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	308.1	-57.8	3.0	-10.0	3.0	0.0	21.9	
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	298.0	-57.5	3.0	-10.0	3.0	0.0	30.5	
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	296.4	-57.4	3.0	-10.0	3.0	0.0	33.6	
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	302.3	-57.6	3.0	-10.0	3.0	0.0	33.4	
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	255.9	-56.2	3.0	-10.0	3.0	0.0	31.8	
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	242.0	-55.7	3.0	-10.0	3.0	0.0	32.3	
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	230.9	-55.3	3.0	-10.0	3.0	0.0	32.7	
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	233.8	-55.4	3.0	-10.0	3.0	0.0	32.6	
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	250.7	-56.0	3.0	-10.0	3.0	0.0	32.0	
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	259.9	-56.3	3.0	-10.0	3.0	0.0	31.7	
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	291.9	-57.3	3.0	-10.0	3.0	0.0	33.7	
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	289.6	-57.2	3.0	-10.0	3.0	0.0	33.8	
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	277.6	-56.9	3.0	-10.0	3.0	0.0	34.1	
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	282.8	-57.0	3.0	-10.0	3.0	0.0	34.0	
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	281.1	-57.0	3.0	-10.0	3.0	0.0	34.0	
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	252.7	-56.1	3.0	-10.0	3.0	0.0	34.9	
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	258.8	-56.3	3.0	-10.0	3.0	0.0	34.7	
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	262.7	-56.4	3.0	-10.0	3.0	0.0	28.3	
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	268.1	-56.6	3.0	-10.0	3.0	0.0	28.1	
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	201.4	-54.1	3.0	-10.0	3.0	0.0	36.9	
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	200.0	-54.0	3.0	-10.0	3.0	0.0	37.0	
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	198.6	-54.0	3.0	-10.0	3.0	0.0	34.0	
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	322.0	-58.2	3.0	-10.0	3.0	0.0	29.8	
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	261.6	-56.4	3.0	-10.0	3.0	0.0	23.3	
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	260.4	-56.3	3.0	-10.0	3.0	0.0	23.3	
												<b>Noise standard:</b>	<b>65</b>	<b>Overall</b>	<b>59</b>

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F03

NSR Coordinate:

x = 833838.9

y = 816138.3

z = 117.6

Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	92.2	-47.3	3.0	0.0	3.0	0.0	42.7
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	95.9	-47.6	3.0	0.0	3.0	0.0	42.4
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	97.0	-47.7	3.0	0.0	3.0	0.0	43.3
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	100.0	-48.0	3.0	0.0	3.0	0.0	43.0
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	261.6	-56.4	3.0	-10.0	3.0	0.0	23.3
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	260.4	-56.3	3.0	-10.0	3.0	0.0	23.3
											<b>Noise standard:</b>	<b>55</b>	<b>Overall</b>	<b>49</b>



299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	282.7	-57.0	3.0	0.0	3.0	0.0	41.0
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	288.3	-57.2	3.0	0.0	3.0	0.0	33.8
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	293.2	-57.3	3.0	0.0	3.0	0.0	40.7
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	187.8	-53.5	3.0	0.0	3.0	0.0	44.5
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	183.6	-53.3	3.0	0.0	3.0	0.0	44.7
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	181.4	-53.2	3.0	0.0	3.0	0.0	37.8
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	252.3	-56.0	3.0	0.0	3.0	0.0	36.0
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	246.8	-55.8	3.0	0.0	3.0	0.0	36.2
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	275.9	-56.8	3.0	0.0	3.0	0.0	41.2
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	270.6	-56.6	3.0	0.0	3.0	0.0	41.4
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	269.8	-56.6	3.0	0.0	3.0	0.0	41.4
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	325.4	-58.2	3.0	-10.0	3.0	0.0	21.4
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	327.8	-58.3	3.0	-10.0	3.0	0.0	21.3
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	317.9	-58.0	3.0	-10.0	3.0	0.0	21.6
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	320.4	-58.1	3.0	-10.0	3.0	0.0	21.5
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	310.3	-57.8	3.0	-10.0	3.0	0.0	30.2
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	308.8	-57.8	3.0	-10.0	3.0	0.0	33.2
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	315.0	-58.0	3.0	-10.0	3.0	0.0	33.0
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	238.3	-55.5	3.0	0.0	3.0	0.0	42.5
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	223.6	-55.0	3.0	0.0	3.0	0.0	43.0
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	211.2	-54.5	3.0	0.0	3.0	0.0	43.5
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	213.9	-54.6	3.0	0.0	3.0	0.0	43.4
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	231.8	-55.3	3.0	0.0	3.0	0.0	42.7
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	241.7	-55.7	3.0	0.0	3.0	0.0	42.3
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	273.6	-56.7	3.0	-10.0	3.0	0.0	34.3
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	271.3	-56.7	3.0	-10.0	3.0	0.0	34.3
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	258.6	-56.3	3.0	-10.0	3.0	0.0	34.7
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	264.2	-56.4	3.0	-10.0	3.0	0.0	34.6
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	262.5	-56.4	3.0	-10.0	3.0	0.0	34.6
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	253.9	-56.1	3.0	-10.0	3.0	0.0	34.9
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	260.2	-56.3	3.0	-10.0	3.0	0.0	34.7
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	263.8	-56.4	3.0	-10.0	3.0	0.0	28.2
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	269.2	-56.6	3.0	-10.0	3.0	0.0	28.1
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	201.0	-54.1	3.0	0.0	3.0	0.0	46.9
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	199.8	-54.0	3.0	0.0	3.0	0.0	47.0
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	198.5	-54.0	3.0	0.0	3.0	0.0	44.0
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	319.9	-58.1	3.0	0.0	3.0	0.0	39.9
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	269.3	-56.6	3.0	-10.0	3.0	0.0	23.0
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	268.2	-56.6	3.0	-10.0	3.0	0.0	23.1
											<b>Noise standard:</b>	<b>65</b>	<b>Overall</b>	<b>61</b>

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F04

NSR Coordinate:

x = 833834.3

y = 816146.0

z = 59.0

Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	104.5	-48.4	3.0	-10.0	3.0	0.0	31.6
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	108.1	-48.7	3.0	-10.0	3.0	0.0	31.3
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	106.9	-48.6	3.0	-10.0	3.0	0.0	32.4
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	109.9	-48.8	3.0	-10.0	3.0	0.0	32.2
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	269.3	-56.6	3.0	-10.0	3.0	0.0	23.0
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	268.2	-56.6	3.0	-10.0	3.0	0.0	23.1
<b>Noise standard:</b>											<b>55</b>	<b>Overall</b>	<b>38</b>	



299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	281.9	-57.0	3.0	0.0	3.0	0.0	41.0	
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	287.6	-57.2	3.0	0.0	3.0	0.0	33.8	
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	292.4	-57.3	3.0	0.0	3.0	0.0	40.7	
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	186.2	-53.4	3.0	0.0	3.0	0.0	44.6	
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	182.0	-53.2	3.0	0.0	3.0	0.0	44.8	
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	179.8	-53.1	3.0	0.0	3.0	0.0	37.9	
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	248.3	-55.9	3.0	0.0	3.0	0.0	36.1	
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	242.7	-55.7	3.0	0.0	3.0	0.0	36.3	
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	273.4	-56.7	3.0	0.0	3.0	0.0	41.3	
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	267.9	-56.6	3.0	0.0	3.0	0.0	41.4	
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	267.2	-56.5	3.0	0.0	3.0	0.0	41.5	
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	319.8	-58.1	3.0	-10.0	3.0	0.0	21.5	
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	322.1	-58.2	3.0	-10.0	3.0	0.0	21.5	
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	312.1	-57.9	3.0	-10.0	3.0	0.0	21.8	
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	314.6	-58.0	3.0	-10.0	3.0	0.0	21.7	
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	304.4	-57.7	3.0	-10.0	3.0	0.0	30.3	
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	302.9	-57.6	3.0	-10.0	3.0	0.0	33.4	
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	309.1	-57.8	3.0	-10.0	3.0	0.0	33.2	
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	243.6	-55.7	3.0	0.0	3.0	0.0	42.3	
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	229.2	-55.2	3.0	0.0	3.0	0.0	42.8	
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	217.1	-54.7	3.0	0.0	3.0	0.0	43.3	
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	219.7	-54.8	3.0	0.0	3.0	0.0	43.2	
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	237.3	-55.5	3.0	0.0	3.0	0.0	42.5	
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	246.9	-55.8	3.0	0.0	3.0	0.0	42.2	
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	277.8	-56.9	3.0	-10.0	3.0	0.0	34.1	
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	275.5	-56.8	3.0	-10.0	3.0	0.0	34.2	
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	263.0	-56.4	3.0	-10.0	3.0	0.0	34.6	
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	268.6	-56.6	3.0	-10.0	3.0	0.0	34.4	
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	266.9	-56.5	3.0	-10.0	3.0	0.0	34.5	
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	248.1	-55.9	3.0	-10.0	3.0	0.0	35.1	
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	254.6	-56.1	3.0	-10.0	3.0	0.0	34.9	
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	258.2	-56.2	3.0	-10.0	3.0	0.0	28.4	
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	263.8	-56.4	3.0	-10.0	3.0	0.0	28.2	
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	195.4	-53.8	3.0	0.0	3.0	0.0	47.2	
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	194.1	-53.8	3.0	0.0	3.0	0.0	47.2	
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	192.9	-53.7	3.0	0.0	3.0	0.0	44.3	
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	317.7	-58.0	3.0	0.0	3.0	0.0	40.0	
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	267.9	-56.6	3.0	-10.0	3.0	0.0	23.1	
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	266.7	-56.5	3.0	-10.0	3.0	0.0	23.1	
												<b>Noise standard:</b>	<b>65</b>	<b>Overall</b>	<b>61</b>



Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F04

NSR Coordinate:

x = 833834.3

y = 816146.0

z = 88.1

Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	97.8	-47.8	3.0	-10.0	3.0	0.0	32.2
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	101.7	-48.1	3.0	-10.0	3.0	0.0	31.9
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	101.9	-48.2	3.0	-10.0	3.0	0.0	32.8
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	105.1	-48.4	3.0	-10.0	3.0	0.0	32.6
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	267.9	-56.6	3.0	-10.0	3.0	0.0	23.1
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	266.7	-56.5	3.0	-10.0	3.0	0.0	23.1
<b>Noise standard:</b>											<b>55</b>	<b>Overall</b>	<b>39</b>	



299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	284.2	-57.1	3.0	0.0	3.0	0.0	40.9	
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	289.8	-57.2	3.0	0.0	3.0	0.0	33.8	
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	294.7	-57.4	3.0	0.0	3.0	0.0	40.6	
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	189.2	-53.5	3.0	0.0	3.0	0.0	44.5	
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	185.1	-53.3	3.0	0.0	3.0	0.0	44.7	
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	182.9	-53.2	3.0	0.0	3.0	0.0	37.8	
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	247.6	-55.9	3.0	0.0	3.0	0.0	36.1	
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	242.0	-55.7	3.0	0.0	3.0	0.0	36.3	
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	273.9	-56.8	3.0	0.0	3.0	0.0	41.2	
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	268.5	-56.6	3.0	0.0	3.0	0.0	41.4	
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	267.7	-56.6	3.0	0.0	3.0	0.0	41.4	
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	316.7	-58.0	3.0	-10.0	3.0	0.0	21.6	
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	319.1	-58.1	3.0	-10.0	3.0	0.0	21.6	
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	308.9	-57.8	3.0	-10.0	3.0	0.0	21.8	
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	311.5	-57.9	3.0	-10.0	3.0	0.0	21.8	
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	301.1	-57.6	3.0	-10.0	3.0	0.0	30.4	
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	299.6	-57.5	3.0	-10.0	3.0	0.0	33.5	
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	305.9	-57.7	3.0	-10.0	3.0	0.0	33.3	
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	252.3	-56.0	3.0	0.0	3.0	0.0	42.0	
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	238.4	-55.5	3.0	0.0	3.0	0.0	42.5	
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	226.8	-55.1	3.0	0.0	3.0	0.0	42.9	
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	229.3	-55.2	3.0	0.0	3.0	0.0	42.8	
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	246.1	-55.8	3.0	0.0	3.0	0.0	42.2	
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	255.4	-56.1	3.0	0.0	3.0	0.0	41.9	
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	285.0	-57.1	3.0	-10.0	3.0	0.0	33.9	
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	282.8	-57.0	3.0	-10.0	3.0	0.0	34.0	
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	270.6	-56.6	3.0	-10.0	3.0	0.0	34.4	
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	276.0	-56.8	3.0	-10.0	3.0	0.0	34.2	
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	274.4	-56.8	3.0	-10.0	3.0	0.0	34.2	
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	245.7	-55.8	3.0	-10.0	3.0	0.0	35.2	
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	252.2	-56.0	3.0	-10.0	3.0	0.0	35.0	
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	255.9	-56.2	3.0	-10.0	3.0	0.0	28.5	
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	261.5	-56.3	3.0	-10.0	3.0	0.0	28.3	
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	194.0	-53.8	3.0	0.0	3.0	0.0	47.2	
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	192.8	-53.7	3.0	0.0	3.0	0.0	47.3	
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	191.5	-53.6	3.0	0.0	3.0	0.0	44.4	
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	318.2	-58.1	3.0	0.0	3.0	0.0	39.9	
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	269.6	-56.6	3.0	-10.0	3.0	0.0	23.0	
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	268.5	-56.6	3.0	-10.0	3.0	0.0	23.1	
												<b>Noise standard:</b>	<b>65</b>	<b>Overall</b>	<b>60</b>

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F04

NSR Coordinate:

x = 833834.3

y = 816146.0

z = 117.6

Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	99.6	-48.0	3.0	-10.0	3.0	0.0	32.0
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	103.4	-48.3	3.0	-10.0	3.0	0.0	31.7
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	105.2	-48.4	3.0	-10.0	3.0	0.0	32.6
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	108.3	-48.7	3.0	-10.0	3.0	0.0	32.3
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	269.6	-56.6	3.0	-10.0	3.0	0.0	23.0
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	268.5	-56.6	3.0	-10.0	3.0	0.0	23.1
<b>Noise standard:</b>											<b>55</b>	<b>Overall</b>	<b>38</b>	



299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	293.1	-57.3	3.0	0.0	3.0	0.0	40.7	
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	298.6	-57.5	3.0	0.0	3.0	0.0	33.5	
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	303.1	-57.6	3.0	0.0	3.0	0.0	40.4	
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	186.7	-53.4	3.0	0.0	3.0	0.0	44.6	
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	182.9	-53.2	3.0	0.0	3.0	0.0	44.8	
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	179.6	-53.1	3.0	0.0	3.0	0.0	37.9	
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	254.5	-56.1	3.0	0.0	3.0	0.0	35.9	
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	248.9	-55.9	3.0	0.0	3.0	0.0	36.1	
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	278.0	-56.9	3.0	0.0	3.0	0.0	41.1	
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	272.2	-56.7	3.0	0.0	3.0	0.0	41.3	
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	271.9	-56.7	3.0	0.0	3.0	0.0	41.3	
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	308.9	-57.8	3.0	-10.0	3.0	0.0	21.8	
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	311.4	-57.9	3.0	-10.0	3.0	0.0	21.8	
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	301.6	-57.6	3.0	-10.0	3.0	0.0	22.1	
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	304.3	-57.7	3.0	-10.0	3.0	0.0	22.0	
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	293.9	-57.4	3.0	-10.0	3.0	0.0	30.6	
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	292.6	-57.3	3.0	-10.0	3.0	0.0	33.7	
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	299.3	-57.5	3.0	-10.0	3.0	0.0	33.5	
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	217.5	-54.7	3.0	0.0	3.0	0.0	43.3	
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	202.8	-54.1	3.0	0.0	3.0	0.0	43.9	
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	190.7	-53.6	3.0	0.0	3.0	0.0	44.4	
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	193.8	-53.7	3.0	0.0	3.0	0.0	44.3	
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	211.7	-54.5	3.0	0.0	3.0	0.0	43.5	
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	221.5	-54.9	3.0	0.0	3.0	0.0	43.1	
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	257.1	-56.2	3.0	-10.0	3.0	0.0	34.8	
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	254.7	-56.1	3.0	-10.0	3.0	0.0	34.9	
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	242.5	-55.7	3.0	-10.0	3.0	0.0	35.3	
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	247.6	-55.9	3.0	-10.0	3.0	0.0	35.1	
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	245.6	-55.8	3.0	-10.0	3.0	0.0	35.2	
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	237.5	-55.5	3.0	-10.0	3.0	0.0	35.5	
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	243.0	-55.7	3.0	-10.0	3.0	0.0	35.3	
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	246.8	-55.8	3.0	-10.0	3.0	0.0	28.8	
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	252.0	-56.0	3.0	-10.0	3.0	0.0	28.6	
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	185.6	-53.4	3.0	0.0	3.0	0.0	47.6	
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	184.1	-53.3	3.0	0.0	3.0	0.0	47.7	
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	182.5	-53.2	3.0	0.0	3.0	0.0	44.8	
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	299.0	-57.5	3.0	0.0	3.0	0.0	40.5	
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	266.4	-56.5	3.0	-10.0	3.0	0.0	23.1	
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	265.6	-56.5	3.0	-10.0	3.0	0.0	23.2	
												<b>Noise standard:</b>	<b>65</b>	<b>Overall</b>	<b>64</b>

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F05

NSR Coordinate:

x = 833849.2

y = 816161.3

z = 59.0

Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	101.1	-48.1	3.0	-10.0	3.0	0.0	31.9
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	104.9	-48.4	3.0	-10.0	3.0	0.0	31.6
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	108.3	-48.7	3.0	-10.0	3.0	0.0	32.3
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	111.3	-48.9	3.0	-10.0	3.0	0.0	32.1
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	266.4	-56.5	3.0	-10.0	3.0	0.0	23.1
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	265.6	-56.5	3.0	-10.0	3.0	0.0	23.2
<b>Noise standard:</b>											<b>55</b>	<b>Overall</b>	<b>38</b>	





299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	292.4	-57.3	3.0	0.0	3.0	0.0	40.7	
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	297.9	-57.5	3.0	0.0	3.0	0.0	33.5	
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	302.4	-57.6	3.0	0.0	3.0	0.0	40.4	
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	185.1	-53.4	3.0	0.0	3.0	0.0	44.6	
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	181.3	-53.2	3.0	0.0	3.0	0.0	44.8	
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	178.0	-53.0	3.0	0.0	3.0	0.0	38.0	
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	250.5	-56.0	3.0	0.0	3.0	0.0	36.0	
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	244.8	-55.8	3.0	0.0	3.0	0.0	36.2	
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	275.4	-56.8	3.0	0.0	3.0	0.0	41.2	
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	269.6	-56.6	3.0	0.0	3.0	0.0	41.4	
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	269.2	-56.6	3.0	0.0	3.0	0.0	41.4	
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	303.0	-57.6	3.0	-10.0	3.0	0.0	22.0	
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	305.5	-57.7	3.0	-10.0	3.0	0.0	21.9	
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	295.5	-57.4	3.0	-10.0	3.0	0.0	22.2	
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	298.2	-57.5	3.0	-10.0	3.0	0.0	22.2	
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	287.7	-57.2	3.0	-10.0	3.0	0.0	30.8	
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	286.3	-57.1	3.0	-10.0	3.0	0.0	33.9	
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	293.2	-57.3	3.0	-10.0	3.0	0.0	33.7	
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	223.3	-55.0	3.0	0.0	3.0	0.0	43.0	
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	208.9	-54.4	3.0	0.0	3.0	0.0	43.6	
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	197.2	-53.9	3.0	0.0	3.0	0.0	44.1	
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	200.2	-54.0	3.0	0.0	3.0	0.0	44.0	
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	217.6	-54.8	3.0	0.0	3.0	0.0	43.2	
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	227.1	-55.1	3.0	0.0	3.0	0.0	42.9	
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	261.6	-56.4	3.0	-10.0	3.0	0.0	34.6	
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	259.1	-56.3	3.0	-10.0	3.0	0.0	34.7	
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	247.2	-55.9	3.0	-10.0	3.0	0.0	35.1	
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	252.2	-56.0	3.0	-10.0	3.0	0.0	35.0	
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	250.2	-56.0	3.0	-10.0	3.0	0.0	35.0	
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	231.4	-55.3	3.0	-10.0	3.0	0.0	35.7	
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	236.9	-55.5	3.0	-10.0	3.0	0.0	35.5	
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	240.9	-55.6	3.0	-10.0	3.0	0.0	29.0	
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	246.2	-55.8	3.0	-10.0	3.0	0.0	28.8	
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	179.5	-53.1	3.0	0.0	3.0	0.0	47.9	
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	177.9	-53.0	3.0	0.0	3.0	0.0	48.0	
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	176.3	-52.9	3.0	0.0	3.0	0.0	45.1	
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	296.6	-57.4	3.0	0.0	3.0	0.0	40.6	
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	264.9	-56.5	3.0	-10.0	3.0	0.0	23.2	
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	264.1	-56.4	3.0	-10.0	3.0	0.0	23.2	
												<b>Noise standard:</b>	<b>65</b>	<b>Overall</b>	<b>63</b>

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F05

NSR Coordinate:

x = 833849.2

y = 816161.3

z = 88.1

Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	94.2	-47.5	3.0	-10.0	3.0	0.0	32.5
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	98.2	-47.8	3.0	-10.0	3.0	0.0	32.2
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	103.4	-48.3	3.0	-10.0	3.0	0.0	32.7
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	106.5	-48.5	3.0	-10.0	3.0	0.0	32.5
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	264.9	-56.5	3.0	-10.0	3.0	0.0	23.2
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	264.1	-56.4	3.0	-10.0	3.0	0.0	23.2
<b>Noise standard:</b>											<b>55</b>	<b>Overall</b>	<b>39</b>	



299Q-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833564.5	816227.4	80.9	--	--	92.0	294.6	-57.4	3.0	0.0	3.0	0.0	40.6	
299Q-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833559.6	816230.8	80.9	--	--	85.0	300.1	-57.5	3.0	0.0	3.0	0.0	33.5	
299Q-3	Chiller (Ref - Daikin: EWAD-CFXR 600)	833556.5	816237.1	80.9	--	--	92.0	304.6	-57.7	3.0	0.0	3.0	0.0	40.3	
PBT-1	Chiller (Ref - Daikin: EWAD-CFXR 600)	833715.7	816289.5	83.6	--	--	92.0	188.2	-53.5	3.0	0.0	3.0	0.0	44.5	
PBT-2	Chiller (Ref - Daikin: EWAD-CFXR 600)	833716.2	816284.4	83.6	--	--	92.0	184.4	-53.3	3.0	0.0	3.0	0.0	44.7	
PBT-3	Chiller (Ref - Daikin: EWAD-D-SX 410)	833724.7	816288.4	83.6	--	--	85.0	181.1	-53.2	3.0	0.0	3.0	0.0	37.8	
BC-1	Chiller (Ref - Daikin: EWAD-D-SX 490)	833646.5	816307.1	108.3	--	--	86.0	249.9	-56.0	3.0	0.0	3.0	0.0	36.0	
BC-2	Chiller (Ref - Daikin: EWAD-D-SX 490)	833651.7	816304.6	108.3	--	--	86.0	244.2	-55.8	3.0	0.0	3.0	0.0	36.2	
S50-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833628.2	816325.3	98.0	--	--	92.0	275.9	-56.8	3.0	0.0	3.0	0.0	41.2	
S50-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833635.2	816325.0	98.0	--	--	92.0	270.1	-56.6	3.0	0.0	3.0	0.0	41.4	
S50-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833632.9	816321.3	98.0	--	--	92.0	269.8	-56.6	3.0	0.0	3.0	0.0	41.4	
HSBH-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834145.9	816199.3	136.2	64.0	3.8	83.6	299.7	-57.5	3.0	-10.0	3.0	0.0	22.1	
HSBH-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834149.0	816195.3	136.2	64.0	3.8	83.6	302.3	-57.6	3.0	-10.0	3.0	0.0	22.0	
HSBH-3	Cooling Tower (Ref - ryowo: FC/LN 200)	834138.9	816194.1	136.2	64.0	3.8	83.6	292.1	-57.3	3.0	-10.0	3.0	0.0	22.3	
HSBH-4	Cooling Tower (Ref - ryowo: FC/LN 200)	834142.1	816190.0	136.2	64.0	3.8	83.6	294.9	-57.4	3.0	-10.0	3.0	0.0	22.3	
HSBH-5	Chiller (Ref - Daikin: EWAD-CFXR 600)	834130.7	816195.9	136.2	--	--	92.0	284.2	-57.1	3.0	-10.0	3.0	0.0	30.9	
HSBH-6	Chiller (Ref - Daikin: EWAD-CFXR C15)	834129.8	816191.8	136.2	--	--	95.0	282.9	-57.0	3.0	-10.0	3.0	0.0	34.0	
HSBH-7	Chiller (Ref - Daikin: EWAD-CFXR C15)	834137.8	816179.8	136.2	--	--	95.0	289.8	-57.2	3.0	-10.0	3.0	0.0	33.8	
NFT-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	833967.2	816341.7	30.0	--	--	92.0	232.7	-55.3	3.0	0.0	3.0	0.0	42.7	
NFT-2	Chiller (Ref - Daikin: EWAD-CFXR 740)	833959.3	816329.1	30.0	--	--	92.0	219.0	-54.8	3.0	0.0	3.0	0.0	43.2	
NFT-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.5	816326.2	30.0	--	--	92.0	207.8	-54.4	3.0	0.0	3.0	0.0	43.6	
NFT-4	Chiller (Ref - Daikin: EWAD-CFXR 740)	833930.9	816334.6	30.0	--	--	92.0	210.7	-54.5	3.0	0.0	3.0	0.0	43.5	
NFT-5	Chiller (Ref - Daikin: EWAD-CFXR 740)	833940.2	816350.2	30.0	--	--	92.0	227.2	-55.1	3.0	0.0	3.0	0.0	42.9	
NFT-6	Chiller (Ref - Daikin: EWAD-CFXR 740)	833945.5	816358.6	30.0	--	--	92.0	236.4	-55.5	3.0	0.0	3.0	0.0	42.5	
IP-1	Chiller (Ref - Daikin: EWAD-CFXR C15)	833865.3	816416.7	34.0	--	--	95.0	269.2	-56.6	3.0	-10.0	3.0	0.0	34.4	
IP-2	Chiller (Ref - Daikin: EWAD-CFXR C15)	833868.3	816414.0	34.0	--	--	95.0	266.9	-56.5	3.0	-10.0	3.0	0.0	34.5	
IP-3	Chiller (Ref - Daikin: EWAD-CFXR C15)	833858.1	816402.3	34.0	--	--	95.0	255.2	-56.1	3.0	-10.0	3.0	0.0	34.9	
IP-4	Chiller (Ref - Daikin: EWAD-CFXR C15)	833867.9	816406.9	34.0	--	--	95.0	260.1	-56.3	3.0	-10.0	3.0	0.0	34.7	
IP-5	Chiller (Ref - Daikin: EWAD-CFXR C15)	833873.5	816404.4	34.0	--	--	95.0	258.2	-56.2	3.0	-10.0	3.0	0.0	34.8	
IP-6	Chiller (Ref - Daikin: EWAD-C-XR C16)	833869.2	816389.1	123.3	--	--	95.0	228.7	-55.2	3.0	-10.0	3.0	0.0	35.8	
IP-7	Chiller (Ref - Daikin: EWAD-C-XR C16)	833887.8	816392.4	123.3	--	--	95.0	234.4	-55.4	3.0	-10.0	3.0	0.0	35.6	
IP-8	Cooling Tower (Ref - ryowo: FC/LN 400)	833881.7	816397.4	123.3	66.0	5.4	88.7	238.4	-55.5	3.0	-10.0	3.0	0.0	29.1	
IP-9	Cooling Tower (Ref - ryowo: FC/LN 400)	833887.6	816401.9	123.3	66.0	5.4	88.7	243.7	-55.7	3.0	-10.0	3.0	0.0	28.9	
GC-1	Chiller (Ref - Daikin: EWAD-C-XR C16)	833851.1	816339.2	111.8	--	--	95.0	178.0	-53.0	3.0	0.0	3.0	0.0	48.0	
GC-2	Chiller (Ref - Daikin: EWAD-C-XR C16)	833855.6	816337.5	111.8	--	--	95.0	176.4	-52.9	3.0	0.0	3.0	0.0	48.1	
GC-3	Chiller (Ref - Daikin: EWAD-CFXR 740)	833859.7	816335.7	111.8	--	--	92.0	174.8	-52.9	3.0	0.0	3.0	0.0	45.1	
HB-1	Chiller (Ref - Daikin: EWAD-CFXR 740)	834015.0	816407.1	97.5	--	--	92.0	297.2	-57.5	3.0	0.0	3.0	0.0	40.5	
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	266.7	-56.5	3.0	-10.0	3.0	0.0	23.1	
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	265.8	-56.5	3.0	-10.0	3.0	0.0	23.2	
												<b>Noise standard:</b>	<b>65</b>	<b>Overall</b>	<b>63</b>

Predicted Noise Level for Fixed Noise Impact Assessment - Base Case Scenario

Night Time

F05

NSR Coordinate:

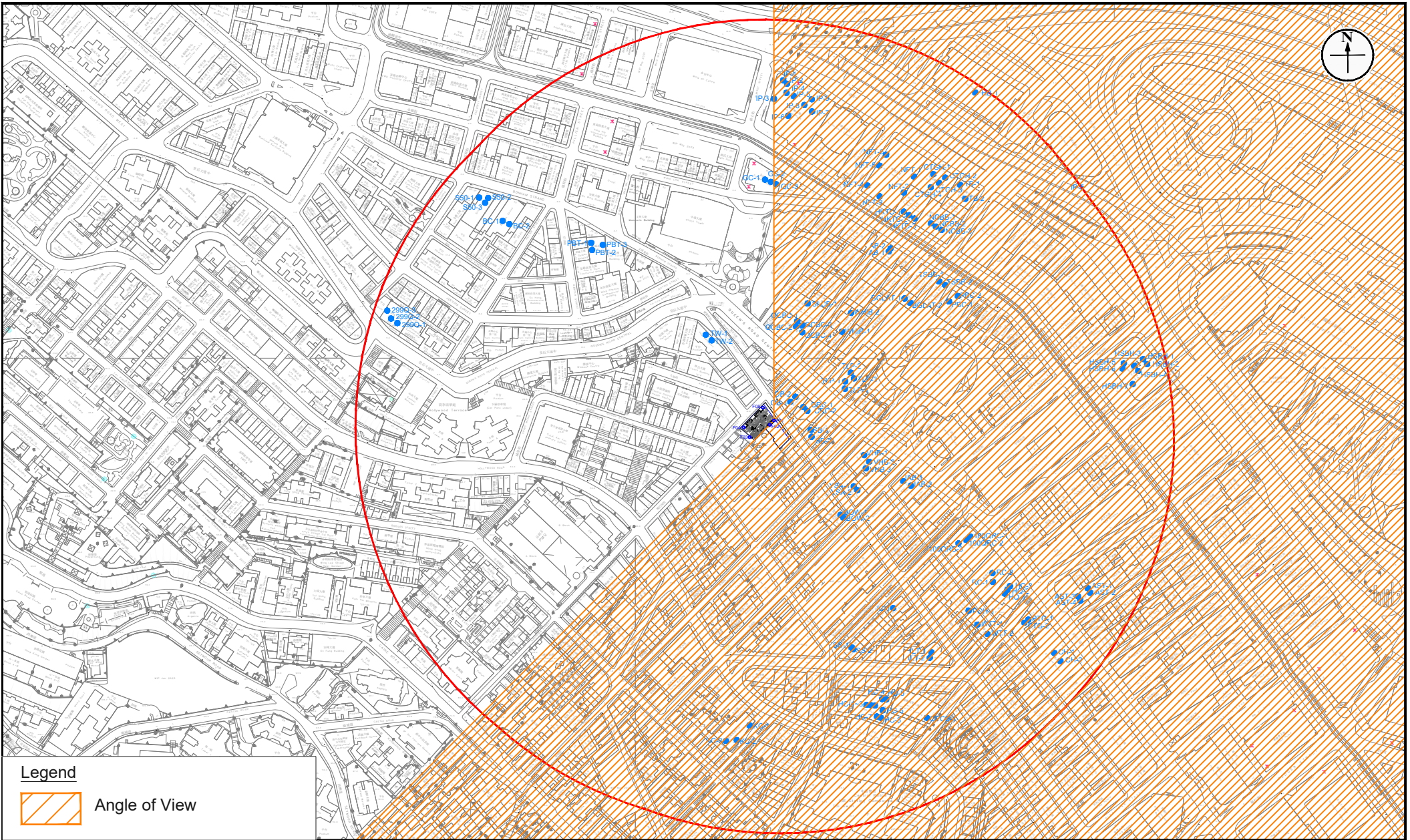
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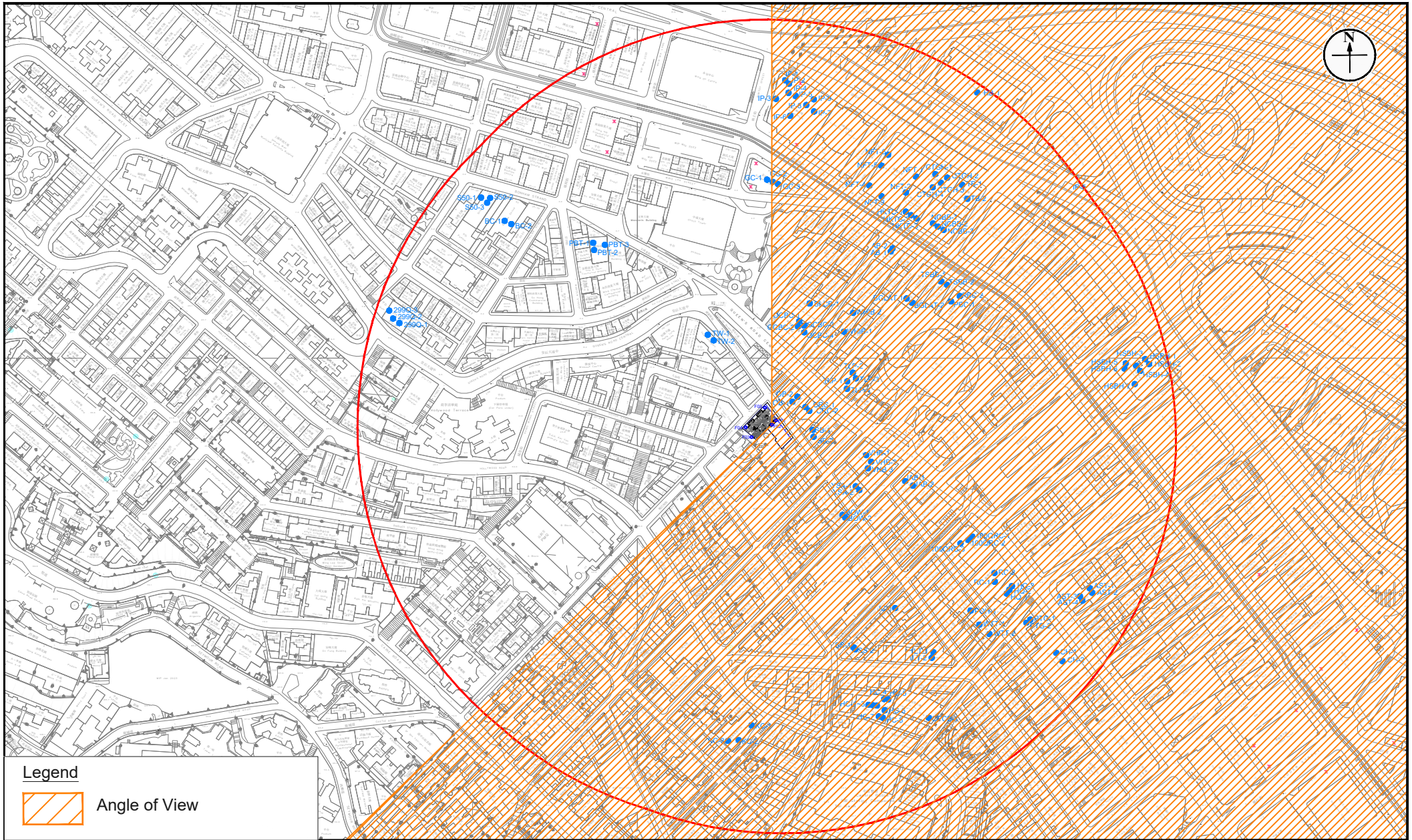
Source ID	Description	Industrial Noise		SPL	Ref dist.	SWL	Slant distance from source	Distance Corr.	Façade Corr.	Barrier Corr.	Tonality Corr.	Impulsive Corr.	ANL	
		x	y											
YSA-1	Chiller (Ref - Daikin: EWAD-D-SX 210)	833920.2	816100.0	96.8	--	--	84.0	96.1	-47.7	3.0	-10.0	3.0	0.0	32.3
YSA-2	Chiller (Ref - Daikin: EWAD-D-SX 210)	833923.0	816097.1	96.8	--	--	84.0	100.0	-48.0	3.0	-10.0	3.0	0.0	32.0
BOW-1	Chiller (Ref - Daikin: EWAD-D-SX 410)	833909.9	816077.7	91.4	--	--	85.0	106.6	-48.6	3.0	-10.0	3.0	0.0	32.4
BOW-2	Chiller (Ref - Daikin: EWAD-D-SX 410)	833912.2	816075.5	91.4	--	--	85.0	109.6	-48.8	3.0	-10.0	3.0	0.0	32.2
PTG-1	Cooling Tower (Ref - ryowo: FC/LN 200)	834056.3	815996.1	87.1	64.0	3.8	83.6	266.7	-56.5	3.0	-10.0	3.0	0.0	23.1
PTG-2	Cooling Tower (Ref - ryowo: FC/LN 200)	834053.2	815993.6	87.1	64.0	3.8	83.6	265.8	-56.5	3.0	-10.0	3.0	0.0	23.2
<b>Noise standard:</b>											<b>55</b>	<b>Overall</b>	<b>39</b>	

**Appendix 3-2 Line of Sight for Selected NSRs**




**Legend**  
 Angle of View

<b>Appendix : 3.2a</b>		
<b>Title:</b> Angle of View for F01		
<b>Project:</b> S16 Planning Application For Proposed Composite Redevelopment at 152-164 Wellington Street, Central		Drawn by: DC
		Checked by: CC
		Rev.: 1.0
		Date: Dec 2023

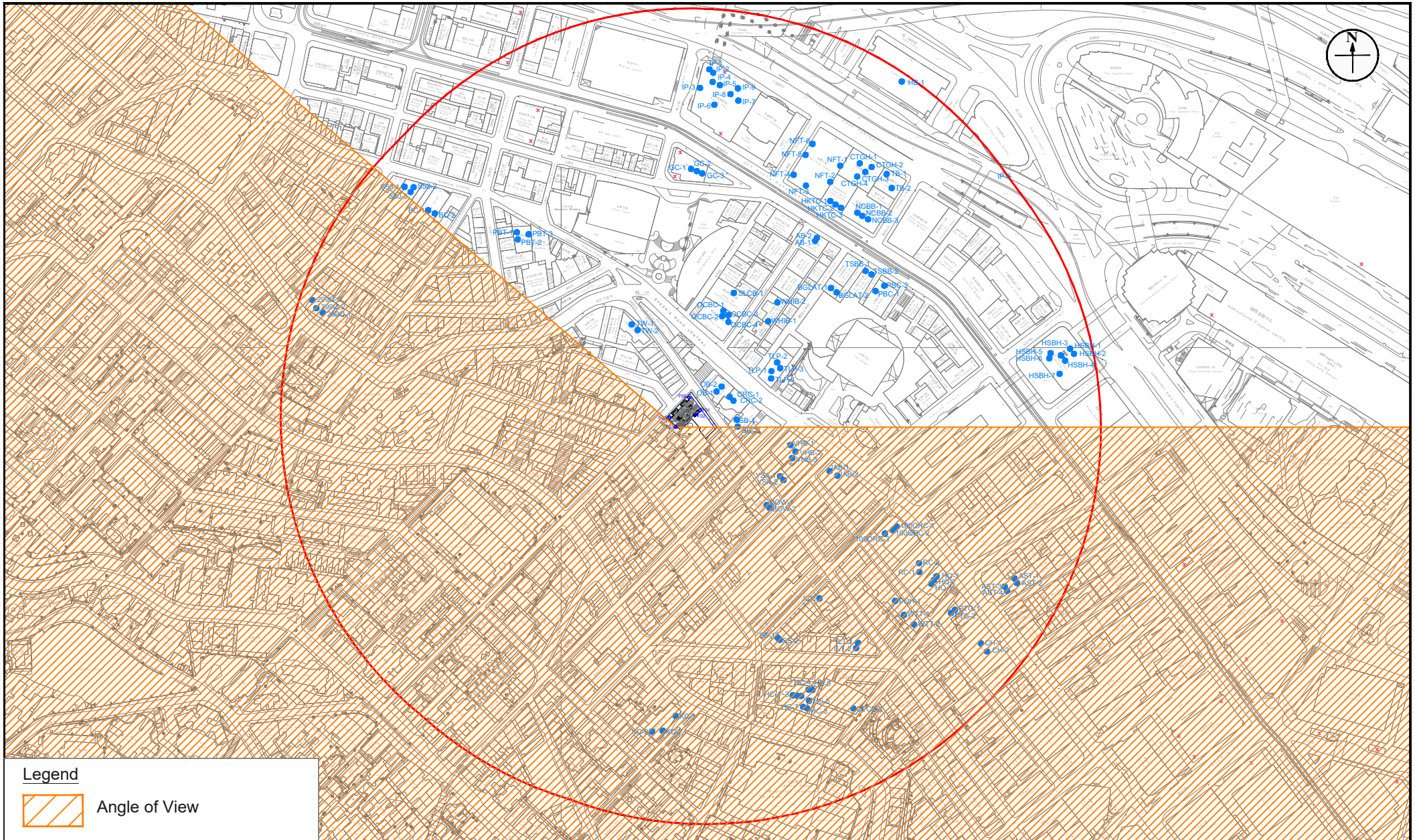


**Legend**


 Angle of View

<b>Appendix : 3.2b</b>		<b>RAMBOLL</b>
<b>Title:</b> Angle of View for F02		
<b>Project:</b> S16 Planning Application For Proposed Composite Redevelopment at 152-164 Wellington Street, Central		Drawn by: DC
		Checked by: CC
		Rev.: 1.0
		Date: Dec 2023





**Legend**

 Angle of View

**Appendix : 3.2c**

**Title:** Angle of View for F03

**Project:** S16 Planning Application For Proposed Composite Redevelopment at 152-164 Wellington Street, Central

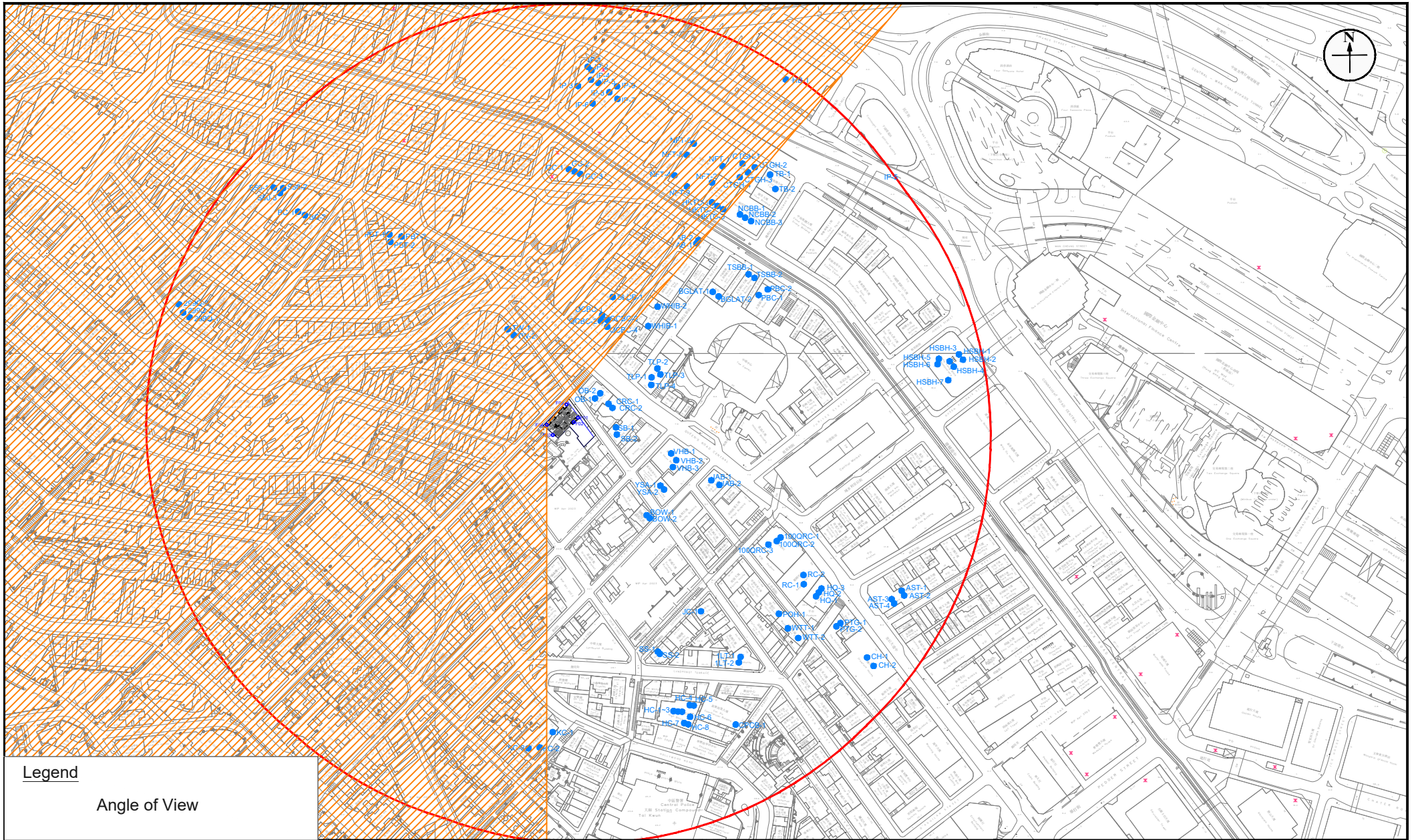
**RAMBOLL**

Drawn by: DC

Checked by: CC

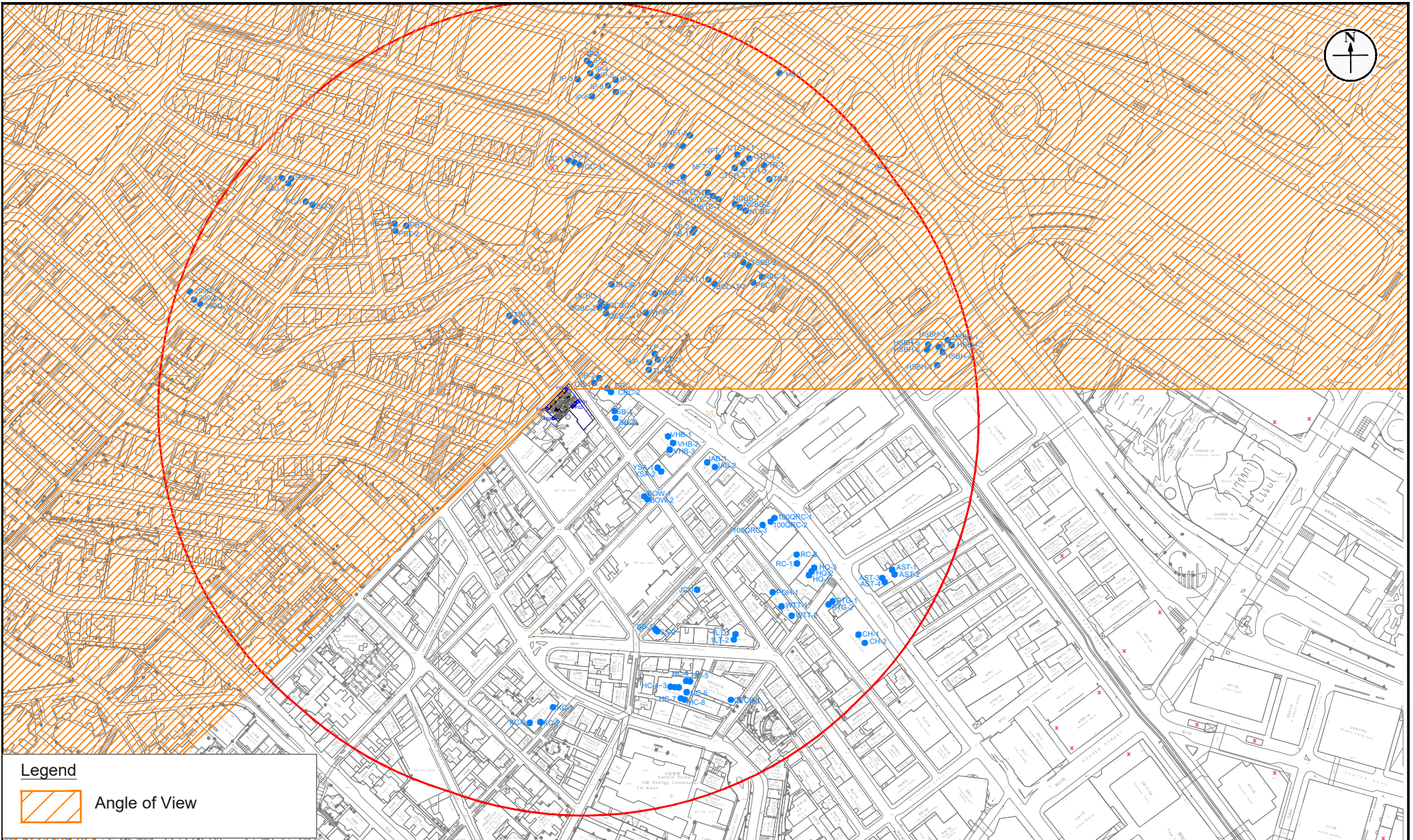
Rev.: 1.0

Date: Dec 2023



**Legend**  
 Angle of View

<b>Appendix : 3.2d</b>		<b>RAMBOLL</b>
<b>Title:</b> Angle of View for F04		
<b>Project:</b> S16 Planning Application For Proposed Composite Redevelopment at 152-164 Wellington Street, Central		Drawn by: DC
		Checked by: CC
		Rev.: 1.0
		Date: Dec 2023



**Legend**

 Angle of View

**Appendix : 3.2e**

**Title:** Angle of View for F05

**Project:** S16 Planning Application For Proposed Composite Redevelopment at 152-164 Wellington Street, Central

<b>RAMBOLL</b>	
Drawn by:	DC
Checked by:	CC
Rev.:	1.0
Date:	Dec 2023

**Appendix 3-3 Reference Equipment Catalogue**

# Air cooled screw chiller

## Standard efficiency

## Extra low sound



<b>Cooling only</b>				<b>EWAD-D-SX</b>	<b>210</b>	<b>230</b>	<b>250</b>	<b>270</b>	<b>290</b>	<b>300</b>	<b>310</b>	<b>370</b>	<b>410</b>	<b>450</b>	<b>490</b>
Cooling capacity	Nom.		kW	202	230	252	270	285	298	308	369	412	449	490	
Power input	Cooling	Nom.	kW	80.8	86.0	94.4	105	115	127	137	150	171	175	189	
Capacity control	Method			Stepless											
	Minimum capacity		%	12.5											
EER				2.50	2.68	2.67	2.56	2.47	2.35	2.25	2.46	2.41	2.56	2.60	
ESEER				3.29	3.52	3.41	3.44	3.34	3.29	3.15	3.14	3.39	3.50	3.47	
Dimensions	Unit	Height	mm	2,420											
		Width	mm	2,234											
		Depth	mm	3,139	4,040								4,940		
Weight	Unit		kg	3,110	3,475		3,425	3,430			3,560	4,302	4,506	4,581	
	Operation weight		kg	3,200	3,590						3,735	4,472	4,676	4,746	
Water heat exchanger	Type			Single pass shell & tube											
	Water volume		l	90	115		165	160			175	170		165	
	Water flow rate	Cooling	Nom.	l/s	9.7	11.0	12.1	12.9	13.7	14.3	14.7	17.7	19.7	21.5	23.5
	Water pressure drop	Cooling	Nom.	kPa	45	34	38		35	38	41	45	44	50	45
Air heat exchanger	Type			High efficiency fin and tube type with integral subcooler											
Compressor	Type			Single screw compressor										Asymmetric single screw compressor	
	Quantity			2											
Fan	Type			Direct propeller											
	Quantity			6	8						9		10		
	Air flow rate	Nom.	l/s	12,876	17,892	17,169				26,496		28,982	33,120		
	Speed		rpm	500											
Sound power level	Cooling	Nom.	dBA	84	85						86				
Sound pressure level	Cooling	Nom.	dBA	65								66			
Operation range	Water side	Cooling	Min.-Max.	-15~-15											
	Air side	Cooling	Min.-Max.	-18~-48											
Refrigerant	Type / GWP			R-134a / 1,430											
	Circuits	Quantity		2											
Refrigerant charge	Per circuit		kg/TCO,Eq	21.0 / 30.0	24.0 / 34.3	26.0 / 37.2	32.0 / 45.8	33.0 / 47.2	34.0 / 48.6			35.0 / 50.1	38.0 / 54.3	40.0 / 57.2	
Piping connections	Evaporator water inlet/outlet (OD)			4"											
Unit	Maximum starting current		A	218	232		276	284	296			406	457	475	
	Nominal running current (RLA)	Cooling	A	135	143	157	173	188	204	220	231	272	280	298	
	Maximum running current		A	164	183	199	210	221	235	250	291	316	338	360	
Power supply	Phase/Frequency/Voltage		Hz/V	3~/50/400											

# Air cooled screw chiller with free cooling

## High efficiency

## Reduced sound



Cooling only		EWAD-CFXR		600	740	820	870	980	C10	C11	C12	C13	C14	C15		
Cooling capacity	Nom.	kW		602 (1)	739 (1)	821 (1)	866 (1)	981 (1)	1,034 (1)	1,229 (1)	1,302 (1)	1,374 (1)	1,424 (1)	1,476 (1)		
Free cooling capacity	Nom.	kW		374 (2)	468 (2)	539 (2)	562 (2)	644 (2)	670 (2)	825 (2)	866 (2)	889 (2)	909 (2)	929 (2)		
Mechanical capacity		kW		228 (2)	271 (2)	282 (2)	304 (2)	337 (2)	364 (2)	404 (2)	435 (2)	486 (2)	515 (2)	547 (2)		
Air temperature for free cooling 100%		°C		-2.3	-1.9	-0.6	-1.5	-0.9	-1.7	0.7	-0.2	-1.1	-1.6	-2.3		
Power input	Cooling	Nom.	kW		263 (1) / 46.6 (2)	278 (1) / 56.2 (2)	299 (1) / 58.5 (2)	334 (1) / 63.1 (2)	368 (1) / 68.5 (2)	412 (1) / 74.4 (2)	403 (1) / 80.0 (2)	450 (1) / 87.5 (2)	466 (1) / 93.4 (2)	511 (1) / 103 (2)	556 (1) / 109 (2)	
Capacity control	Method			Stepless												
	Minimum capacity			12.5												
EER				2.29 (1) / 12.91 (2)	2.66 (1) / 13.17 (2)	2.75 (1) / 14.04 (2)	2.59 (1) / 13.71 (2)	2.67 (1) / 14.33 (2)	2.51 (1) / 13.89 (2)	3.05 (1) / 15.36 (2)	2.90 (1) / 14.87 (2)	2.95 (1) / 14.7 (2)	2.79 (1) / 13.85 (2)	2.66 (1) / 13.56 (2)		
ESEER				3.59	3.66	3.89	3.62	3.83	3.63	4.13	3.89	4.09	4.02	3.92		
Dimensions	Unit	Height	mm		2,565											
		Width	mm		2,480											
		Depth	mm		6,300	7,200	8,100	9,000	9,000	10,800	10,800	12,910	12,910	12,960		
Weight	Unit	kg		8,050	8,620	9,190	10,450	10,710	12,190	12,830	12,910	14,886	14,936			
		Operation weight		kg	8,795	9,390	9,995	11,459	11,719	13,566	14,806	14,886	14,936			
Water heat exchanger	Type			Single pass shell & tube												
		Water volume	l		741	771	808	9,000	9,000	1,012	1,372	1,372	1,965	1,965		
		Water flow rate	Cooling	Nom.	l/s		26.2 (1) / 26.2 (2)	32.1 (1) / 32.1 (2)	35.7 (1) / 35.7 (2)	37.6 (1) / 37.6 (2)	42.6 (1) / 42.6 (2)	44.9 (1) / 44.9 (2)	53.4 (1) / 53.4 (2)	56.6 (1) / 56.6 (2)	59.7 (1) / 59.7 (2)	61.9 (1) / 61.9 (2)
	Water pressure drop	Cooling	Nom.	kPa		76 (1) / 115 (2)	97 (1) / 159 (2)	84 (1) / 167 (2)	93 (1) / 184 (2)	102 (1) / 225 (2)	113 (1) / 248 (2)	92 (1) / 219 (2)	103 (1) / 243 (2)	128 (1) / 282 (2)	137 (1) / 301 (2)	146 (1) / 321 (2)
Air heat exchanger	Type	High efficiency fin and tube type with integral subcooler														
Compressor	Type	Asymm single screw														
	Quantity	2														
Fan	Type	Direct propeller														
		Quantity	20													
		Air flow rate	Nom.	l/s		38,935	46,722	54,508	62,295	62,295	73,011	73,011	73,011	73,011		
	Speed	rpm		715												
Sound power level	Cooling	Nom.	dBA		92		72		94		72		95			
Sound pressure level	Cooling	Nom.	dBA		71	72		73		72		73				
Operation range	Water side	Cooling	Min.~Max.	°CDB		-8~15										
	Air side	Cooling	Min.~Max.	°CDB		-20~45										
Refrigerant	Type / GWP	R-134a / 1,430														
	Circuits	Quantity		2												
Refrigerant charge	Per circuit	kg/TCO <sub>Eq</sub>		640/915	730/1044	810/1158	910/1301	910/1301	1070/1530	1070/1530	1125/1609	1125/1609	1240/1773	1240/1773		
Piping connections	Evaporator water inlet/outlet (OD)	DN150PN16(168.3mm) DN200PN16(219.1mm) DN250PN16(273mm)														
Unit	Maximum starting current	A		598	611	648	912	960	1,016	1,016	1,059	1,059	1,072			
	Nominal running current (RLA)	Cooling	A		411	439	473	526	580	647	645	717	738	800	862	
	Maximum running current	A		462	493	542	585	649	708	783	847	847	901	954		
Power supply	Phase/Frequency/Voltage	Hz/V		3~/50/400												

(1) Cooling: entering evaporator water temp. 16°C; leaving evaporator water temp. 10°C; ambient air temp. 35°C; full load operation. (2) Data is calculated at ambient air temperature 5°C, inlet water temperature 16°C.

# Air cooled multi-scroll chiller

High efficiency  
Reduced sound



EWAQ-F-XS/XL/XR

MicroTech III

Cooling only				EWAQ-F-XR														
				170	190	210	240	300	310	330	340	390	410	430	500	580	650	
Cooling capacity	Nom.	kW		165	188	211	236	304		340		385	407	433	502	579	645	
Power input	Cooling	Nom.	kW	53.0	61.2	68.7	77.3	101		117		128	136	146	170	200	219	
Capacity control	Method			Step														
	Minimum capacity	%		25.0	21.0	25.0	22.0	23.0		25.0		21.0	20.0	25.0	17.0	14.0	17.0	
EER				3.12	3.07	3.08	3.05	3.00		2.92		3.01	2.99	2.96		2.90	2.95	
ESEER				4.53	4.64	4.51	4.60	4.53	4.68	4.44	4.63	4.68	4.64	4.54	4.82	4.69	4.65	
Dimensions	Unit	Height	mm	2,271				2,221		2,271		2,221						
		Width	mm	1,224				2,258		1,224		2,258						
		Depth	mm	4,413		5,313		6,213		3,210		3,210		4,110		5,010		5,910
Weight	Unit	kg	2,004	2,303	2,580	2,722	2,900	3,000	3,045	3,145	3,168	3,280	3,298	4,120	4,228	4,655		
	Operation weight	kg	2,017	2,317	2,594	2,736	2,914	3,014	3,085	3,185	3,208	3,326	3,344	4,166	4,288	4,716		
Water heat exchanger	Type			Plate heat exchanger														
	Water volume	l		12	14				40				46				60	
	Water flow rate	Cooling	Nom.	l/s	7.9	9.0	10.1	11.3	14.5		16.3		18.4	19.5	20.7	24.0	27.7	30.9
	Water pressure drop	Cooling	Nom.	kPa	24	25	31	39	21				28	26	27	38	40	51
Air heat exchanger	Type			High efficiency fin and tube type with integral subcooler														
Compressor	Type			Scroll compressor														
	Quantity			4										6				
Fan	Type			Direct propeller														
	Quantity			4		5		6				8		10		12		
	Air flow rate	Nom.	l/s	16,743	16,285	20,618	19,522	24,428		23,426		32,570	31,235		39,044		46,852	
	Speed	rpm		705														
Sound power level	Cooling	Nom.	dB(A)	83	84	85	86	87				89		90	89	90	92	
Sound pressure level	Cooling	Nom.	dB(A)	64	65	66	67		68	67	68	69	70		69	70	71	
Operation range	Water side	Cooling	Min.~Max.	-13~-18														
	Air side	Cooling	Min.~Max.	-18~-52														
Refrigerant	Type / GWP			R-410A / 2,087.5														
	Circuits	Quantity		2														
Refrigerant charge	Per circuit	kg/TCO,Eq		14.0/29.2	15.5/32.4	16.5/34.4	20.0/41.8	24.0/50.1	26.0/54.3			31.0/64.7		35.0/73.1	36.0/75.2	41.5/86.6		
Piping connections	Evaporator water inlet/outlet (OD)			3"														
Unit	Maximum starting current	A		276	332	346	401	472		501		618	632	646	628	754	801	
	Nominal running current (RLA)	Cooling	A	107	116	125	139	180		204		226	239	255	300	347	380	
	Maximum running current	A		132	143	157	173	220		249		283	296	310	377	419	465	
Power supply	Phase/Frequency/Voltage	Hz/V		3~/50/400														

# Air cooled screw chiller

## Standard efficiency

## Reduced sound



EWAD-C-SS/SL/SR

MicroTech III

Cooling only				EWAD-C-SR	620	720	790	880	920	C10	C11	C12	H14	C13	C14	C15	C16	C17	C18	C19												
Cooling capacity	Nom.		kW	616	712	786	872	918	1,016	1,107	1,266	1,316	1,363	1,465	1,550	1,616	1,710	1,790	1,828													
Power input	Cooling	Nom.	kW	226	276	317	334	373	398	422	461	499	522	582	609	654	706	722	762													
Capacity control	Method			Stepless																												
	Minimum capacity		%	12.5												7.0																
EER				2.74	2.59	2.48	2.61	2.46	2.55	2.63	2.75	2.63	2.61	2.52	2.54	2.47	2.42	2.48	2.40													
ESEER				3.91	3.78	3.81	3.79	3.98	3.76	3.95	3.92	3.81	3.78	3.70	3.72	3.66	3.70	3.71	3.66													
Dimensions	Unit	Height	mm	2,540																												
		Width	mm	2,285																												
		Depth	mm	6,285				7,185		8,085		10,285			11,185			12,085														
Weight	Unit		kg	5,920	6,030	6,050	6,570	6,850	7,300	7,570	8,190		10,750		10,770		11,150	11,210	11,680	12,040												
	Operation weight		kg	6,200	6,280	6,300	6,820	7,100	7,540	7,810	8,570		11,170		11,550		11,700	12,560	12,920													
Water heat exchanger	Type			Single pass shell & tube																												
	Water flow rate	Cooling	Nom.	l/s	29.5	34.1	37.6	41.8	44.0	48.7	53.1	60.6	63.0	65.2	70.2	74.2	77.3	81.8	85.6	87.5												
	Water pressure drop	Cooling	Nom.	kPa	43	50	48	58	63	60	69	50	54	45	57	63	46	33	36	37												
	Water volume		l	266		251		243		386		421		408		474		850														
Air heat exchanger	Type			High efficiency fin and tube type																												
Compressor	Type			Asymmetric single screw compressor																												
	Quantity			2						3																						
Fan	Type			Direct propeller																												
	Quantity			10		12		14		16		18		20		22		24														
	Air flow rate	Nom.	l/s	41,007		49,208		57,410		65,611		73,812		82,014		90,215		98,417														
	Speed		rpm	700																												
Sound power level	Cooling	Nom.	dB(A)	92		93		94				95				96																
Sound pressure level	Cooling	Nom.	dB(A)	71	72			73						74																		
Operation range	Air side	Cooling	Min.~Max.	°CDB			-18~46																									
	Water side	Cooling	Min.~Max.	°CDB			-8~15																									
Refrigerant	Type / GWP			R-134a / 1,430																												
	Circuits	Quantity		2						3																						
Refrigerant charge	Per circuit		kg/TCO <sub>2</sub> Eq	64.0/91.5		76.5/109.4		80.0/114.4		91.0/130.1		94.0/134.4		110.0/157.3				86.7/123.9		91.7/131.1		101.7/145.4										
Piping connections	Evaporator water inlet/outlet (OD)			168.3mm						219.1mm						273mm																
Unit	Starting current	Max	A	597	642		906		953		1,007		1,010		1,055		1,068		1,241		1,292		1,344		1,346		1,389		1,434		1,447	
	Running current	Cooling	Nom.	A	371	450	518	548	609	654	694	755	811	857	954	1,002	1,075	1,158	1,179	1,238												
		Max	A	462	531	575	639	698	767	837	895	949	1,052	1,116	1,186	1,250	1,303	1,362	1,415													
Power supply	Phase/Frequency/Voltage		Hz/V	3~/50/400																												



# Air cooled multi-scroll chiller

High efficiency  
Reduced sound



EWAQ-F-XS/XL/XR

MicroTech III

Cooling only				EWAQ-F-XR														
				170	190	210	240	300	310	330	340	390	410	430	500	580	650	
Cooling capacity	Nom.	kW		165	188	211	236	304		340		385	407	433	502	579	645	
Power input	Cooling	Nom.	kW	53.0	61.2	68.7	77.3	101		117		128	136	146	170	200	219	
Capacity control	Method	Step																
	Minimum capacity	%		25.0	21.0	25.0	22.0	23.0		25.0		21.0	20.0	25.0	17.0	14.0	17.0	
EER				3.12	3.07	3.08	3.05	3.00		2.92		3.01	2.99	2.96		2.90	2.95	
ESEER				4.53	4.64	4.51	4.60	4.53	4.68	4.44	4.63	4.68	4.64	4.54	4.82	4.69	4.65	
Dimensions	Unit	Height	mm	2,271				2,221		2,271		2,221						
		Width	mm	1,224				2,258		1,224		2,258						
		Depth	mm	4,413		5,313		6,213		3,210		3,210		4,110		5,010		5,910
Weight	Unit	kg	2,004	2,303	2,580	2,722	2,900	3,000	3,045	3,145	3,168	3,280	3,298	4,120	4,228	4,655		
	Operation weight	kg	2,017	2,317	2,594	2,736	2,914	3,014	3,085	3,185	3,208	3,326	3,344	4,166	4,288	4,716		
Water heat exchanger	Type	Plate heat exchanger																
	Water volume	l	12		14				40				46		60			
	Water flow rate	Cooling	Nom.	l/s	7.9	9.0	10.1	11.3	14.5		16.3		18.4	19.5	20.7	24.0	27.7	30.9
	Water pressure drop	Cooling	Nom.	kPa	24	25	31	39	21				28	26	27	38	40	51
Air heat exchanger	Type	High efficiency fin and tube type with integral subcooler																
Compressor	Type	Scroll compressor																
	Quantity	4												6				
Fan	Type	Direct propeller																
	Quantity	4				5				6				8		10		12
	Air flow rate	Nom.	l/s	16,743	16,285	20,618	19,522	24,428		23,426		32,570	31,235		39,044		46,852	
	Speed	rpm	705															
Sound power level	Cooling	Nom.	dB(A)	83	84	85	86	87				89		90	89	90	92	
Sound pressure level	Cooling	Nom.	dB(A)	64	65	66	67		68	67	68	69	70		69	70	71	
Operation range	Water side	Cooling	Min.~Max.	-13~-18														
	Air side	Cooling	Min.~Max.	-18~-52														
Refrigerant	Type / GWP	R-410A / 2,087.5																
	Circuits	Quantity	2															
Refrigerant charge	Per circuit	kg/TCO,Eq	14.0/29.2	15.5/32.4	16.5/34.4	20.0/41.8	24.0/50.1	26.0/54.3				31.0/64.7		35.0/73.1	36.0/75.2	41.5/86.6		
Piping connections	Evaporator water inlet/outlet (OD)	3"																
Unit	Maximum starting current	A	276	332	346	401	472		501		618	632	646	628	754	801		
	Nominal running current (RLA)	Cooling	A	107	116	125	139	180		204		226	239	255	300	347	380	
	Maximum running current	A	132	143	157	173	220		249		283	296	310	377	419	465		
Power supply	Phase/Frequency/Voltage	Hz/V	3~/50/400															

# Air cooled multi-scroll chiller

## High efficiency

## Reduced sound



EWAQ-G-XS/XR

<b>Cooling only</b>					<b>EWAQ-G-XR</b>	<b>080</b>	<b>090</b>	<b>105</b>	<b>130</b>	<b>115</b>	<b>150</b>
Cooling capacity	Nom.			kW	76.0	86.0	100	125	110	141	
Power input	Cooling	Nom.		kW	26.4	29.9	34.7	43.3	39.0	49.8	
Capacity control	Method				Step						
	Minimum capacity			%	50	44	50		44	43	
EER					2.88		2.89	2.88	2.83		
ESEER					4.18	4.29	4.27	4.21	4.31	4.33	
Dimensions	Unit	Height		mm	1,800			1,820	1,800	1,820	
		Width		mm	1,195						
		Depth		mm	2,680	3,200		3,800	3,200	3,800	
Weight	Unit				kg	764	880	1,021	1,116	1,050	1,153
	Operation weight				kg	774	890	1,037	1,132	1,065	1,174
Water heat exchanger	Type				Braze plate						
	Water flow rate	Cooling	Nom.	l/s	3.6	4.1	4.8	6.0	5.3	6.7	
	Water pressure drop	Cooling	Nom.	kPa	23.3	29.6	18.4	23.0	17.8	18.4	
	Water volume			l	5.58	4.86		5.60		8.10	
Air heat exchanger	Type				Microchannel						
Compressor	Type				Scroll compressor						
	Quantity				2						
Fan	Type				Direct propeller						
	Quantity				6		8	10	8	10	
	Air flow rate	Nom.		l/s	6,787	7,356	9,023	11,309	9,023	11,309	
	Speed			rpm	1,108						
Sound power level	Cooling	Nom.		dB(A)	80	82	84		86		
Sound pressure level	Cooling	Nom.		dB(A)	62	65	66	67	68	67	
Operation range	Air side	Cooling	Min.~Max.	°CDB	-10~45						
	Water side	Cooling	Min.~Max.	°CDB	-10~15						
Refrigerant	Type / GWP				R-410A / 2,087.5						
	Circuits			Quantity	1						
Refrigerant charge	Per circuit			kg/TCO,Eq	8.0 / 16.7			10.0 / 20.9		12.0 / 25.1	
Piping connections	Evaporator water inlet/outlet (OD)				2" 1/2						
Unit	Starting current			A	209	260	267	324	314	362	
	Running current	Cooling	Nom.	A	54	58	63	78	71	90	
		Max			A	65	71	78	95	85	109
Power supply	Phase/Frequency/Voltage			Hz/V	3~/50/400						

# Air cooled screw chiller

## High efficiency

## Reduced sound



EWAD-C-XS/XL/XR

MicroTech III

Cooling only		EWAD-C-XR		740	810	870	970	C10	C11	C12	C13	H14	H15	C16	C17	C18	C19	C20	C21	C22				
Cooling capacity	Nom.	kW		732	808	862	970	1,036	1,164	1,243	1,297	1,360	1,460	1,544	1,632	1,715	1,805	1,849	1,897	1,947				
Power input	Cooling	Nom. kW		238	257	285	313	348	369	409	420	460	498	518	548	574	604	629	662	696				
Capacity control	Method	Stepless																						
	Minimum capacity	%		12.5									7.0											
EER				3.07	3.15	3.03	3.10	2.98	3.16	3.04	3.09	2.96	2.93	2.98		2.99		2.94	2.87	2.80				
ESEER				4.01	4.16	4.01	4.12	4.01	4.21	4.07	4.10	4.12	4.08	4.00	4.05	4.00	4.05	4.00	4.09	3.96	3.94			
Dimensions	Unit	Height	mm		2,540																			
		Width	mm		2,285																			
		Depth	mm		6,285	7,185	8,085			9,885				12,085	12,985	13,885	14,785							
Weight	Unit	kg		6,280	6,630	6,650	7,480	7,760	8,510	8,530	9,190		12,010	12,350	12,700	13,040								
	Operation weight	kg		6,520	6,870	6,890	7,880	8,160	8,900	8,920	10,180		12,870	13,200	13,580	13,910								
Water heat exchanger	Type	Single pass shell & tube																						
	Water flow rate	Cooling	Nom.	l/s		35.1	38.7	41.3	46.5	49.7	55.7	59.5	62.1	65.2	70.0	74.0	78.2	82.2	86.5	88.5	90.7	93.1		
	Water pressure drop	Cooling	Nom.	kPa		77	54	61	58	65	43	49	64	73	79	59	65	71	37	39	41			
	Water volume	l		251	243		403		386			979		850	871	850								
Air heat exchanger	Type	High efficiency fin and tube type																						
	Compressor	Type	Asymmetric single screw compressor																					
	Quantity	2																3						
Fan	Type	Direct propeller																						
	Quantity	12		14		16		20				24	26	28	30									
	Air flow rate	Cooling	Nom.	l/s		49,208	57,410		65,611		82,014				98,417	106,618	114,819	123,021						
	Speed	rpm		700																				
Sound power level	Cooling	Nom.	dBA		92		94		95				96		97									
Sound pressure level	Cooling	Nom.	dBA		72		73		72				73		74									
Operation range	Air side	Cooling	Min.~Max.	°CDB		-18~50																		
	Water side	Cooling	Min.~Max.	°CDB		-8~15																		
Refrigerant	Type / GWP	R-134a / 1,430																						
	Circuits	2																3						
Refrigerant charge	Per circuit	kg/TCO <sub>Eq</sub>		750/1073	810/1158		910/v	1000/1430	1150/1645	1175/1680	1250/1788	1240/1773	1033/1478	1090/1559	1133/1621	1200/1716			1250/1788					
Piping connections	Evaporator water inlet/outlet (OD)	168.3mm																219.1mm				273mm		
	Unit	Starting current	Max	A		610	647		911	959	1,015		1,058	1,071	1,246	1,303	1,359	1,402	1,444	1,458				
	Running current	Cooling	Nom.	A		392	426	470	518	572	613	679	699	753	807	854	903	951	1,000	1,040	1,087	1,136		
Power supply	Phase/Frequency/Voltage	Hz/V		3~/50/400																				

# SPECIFICATION



ITEM	MODER			ONE CELL					TWO CELLS					THREE CELLS					FOUR CELLS					ONE CELL					TWO CELLS					THREE CELLS					FOUR CELLS					FIVE CELLS																																							
				FC-100	FC-125	FC-150	FC-175	FC-200	FC-225	FC-250	FC-300	FC-350	FC-400	FC-450	FC-500	FC-600	FC-675	FC-750	FC-800	FC-900	FC-1000	FC/LN-100	FC/LN-125	FC/LN-150	FC/LN-175	FC/LN-200	FC/LN-250	FC/LN-300	FC/LN-350	FC/LN-400	FC/LN-450	FC/LN-500	FC/LN-600	FC/LN-700	FC/LN-800	FC/LN-900	FC/LN-1000																																														
CAPACITY	27°C WB	circulating water flow rate	m <sup>3</sup> /hr	78.0	97.5	117.0	136.5	156.0	175.5	195.0	234.0	273.0	312.0	351.0	390.0	468.0	526.5	585.0	624.0	702.0	780.0	78.0	97.5	117.0	136.5	156.0	195.0	234.0	273.0	312.0	351.0	390.0	468.0	546.0	624.0	702.0	780.0																																														
		make-up water(approx.)	m <sup>3</sup> /hr	1.1	1.4	1.7	2.0	2.2	2.5	2.8	3.3	3.9	4.5	5.0	5.6	6.7	7.5	8.4	8.9	10.0	11.2	1.1	1.4	1.7	2.0	2.2	2.8	3.3	3.9	4.5	5.0	5.6	6.7	7.8	8.9	10.0	11.2																																														
	28°C WB	circulating water flow rate	m <sup>3</sup> /hr	70	88	105	123	140	158	175	210	245	280	315	350	420	473	525	560	630	700	70	88	105	123	140	175	210	245	280	315	350	420	490	560	630	700																																														
		make-up water(approx.)	m <sup>3</sup> /hr	1.0	1.3	1.5	1.8	2.0	2.3	2.5	3.0	3.5	4.0	4.5	5.0	6.0	6.8	7.5	8.0	9.0	10.0	1.0	1.3	1.5	1.8	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.0	8.0	9.0	10.0																																														
	Air flow rate(Approx.)	m <sup>3</sup> /min	630	800	960	1135	1285	1460	1660	1920	2270	2570	2920	3320	3855	4380	4950	5140	5840	6640	530	680	830	980	1100	1360	1660	1960	2200	2490	2940	3300	3920	4400	4900	5500																																															
	Hot water temperature	°C	37																																																																																
Cold water temperature	°C	32																																																																																	
OVERALL DIMENSION	Width	mm	1650					2000					2300					2600					4000					4600					5200					6900					7800					9200					10400																														
	Length	mm	3650					4000					4300					4400					4000					4300					4400					4300					4400					4000					4300					4400					4000					4300					4400										
	Height	mm	3400																																																																																
MATERIAL	Casing	FRP																																																																																	
	Steel structure	Steel ( hot-dip galvanized )																																																																																	
	Filler	PVC																																																																																	
	Distribution tray	FRP																																																																																	
	Cold water basin	FRP																																																																																	
	Sump tank	FRP																																																																																	
	Fan	Blade : FRP , Hub : Aluminum Cast alloy																																																																																	
	Fan stack	FRP																																																																																	
FAN ASSEMBLY	Fan	TYPE	Axial-flow																																																																																
		Diameter X Nos.	∅ mm	1400 x 1					1600 x 1					1800 x 1					2000 x 1					1600 x 2					1800 x 2					2000 x 2					1600 x 3					1800 x 3					2000 x 3					1600 x 4					1800 x 4					2000 x 4					1600 x 5					1800 x 5					2000 x 5				
		Number of blades	4																																																																																
	Fan speed(Approx.)	rpm	470	540	375	420	420	335	370	375	420	420	335	370	420	335	370	420	335	370	270	340	300	360	310	340	300	360	310	300	360	310	360	310	360	310	360	310																																													
	Drive system	V-belt drive																																																																																	
	TYPE	Totally enclosed fan cooled outdoor 3 phase induction motor 4 poles																																																																																	
	Power source	380V / 3 / 50Hz																																																																																	
	Rated output	Kw	2.2 x 1	3.7 x 1	5.5 x 1	7.5 x 1	3.7 x 2	5.5 x 2	7.5 x 2	5.5 x 3	7.5 x 3	5.5 x 4	7.5 x 4	1.5 x 1	2.2 x 1	3.7 x 1	2.2 x 2	3.7 x 2	2.2 x 3	3.7 x 3	3.7 x 4	3.7 x 5																																																													
	Quantity	1					2					3					4					1					2					3					4					5																																									
DISTRIBUTION SYSTEM	Open gravity + redistribution layer																																																																																		
PIPING DIMENSION	Hot water inlet pipe	mm	∅ 100 x 2					∅ 125 x 2					∅ 100 x 4					∅ 125 x 4					∅ 125 x 6					∅ 125 x 8					∅ 100 x 2					∅ 125 x 2					∅ 100 x 4					∅ 125 x 4					∅ 100 x 6					∅ 125 x 6					∅ 100 x 8					∅ 125 x 8					∅ 125 x 10										
	Cold water outlet pipe	mm	∅ 125 x 1					∅ 150 x 1					∅ 200 x 1					∅ 250 x 1					∅ 200 x 2					∅ 250 x 2					∅ 125 x 1					∅ 150 x 1					∅ 200 x 1					∅ 250 x 1					∅ 200 x 2					∅ 250 x 2					∅ 200 x 3																				
	Drain pipe	mm	∅ 50 x 1					∅ 50 x 1					∅ 50 x 1					∅ 50 x 2					∅ 50 x 1					∅ 50 x 1					∅ 50 x 1					∅ 50 x 2																																													
	Overflow pipe	mm	∅ 50 x 1					∅ 50 x 1					∅ 80 x 1					∅ 80 x 2					∅ 50 x 1					∅ 50 x 1					∅ 80 x 1					∅ 80 x 2																																													
	Float valve	mm	∅ 25 x 1					∅ 40 x 1					∅ 40 x 1					∅ 40 x 2					∅ 40 x 2					∅ 25 x 1					∅ 40 x 1					∅ 40 x 2					∅ 40 x 2					∅ 40 x 2																																			
	Manual make-up	mm	∅ 25 x 1					∅ 40 x 1					∅ 40 x 1					∅ 40 x 2					∅ 40 x 2					∅ 25 x 1					∅ 40 x 1					∅ 40 x 2					∅ 40 x 2					∅ 40 x 2																																			
MAKE-UP	Evaporation loss(Approx.)	%	Approx 0.83																																																																																
	Drift loss	%	Less than 0.005																																																																																
WEIGHT	Net weight	kg	970	985	1160	1205	1345	1390	1450	2270	2360	2640	2730	2850	3985	4120	4300	5280	5460	5700	1080	1120	1240	1260	1530	2230	2450	2470	2880	3700	3800	4550	5000	6050	6100	7550																																															
	Operating weight	kg	2475	2490	2975	3020	3450	3750	3810	5455	5545	6400	7000	7120	9850	10755	10935	12800	14005	14245	2250	2340	2640	2730	3170	4340	4920	5090	5910	7560	7820	9080	10180	11820	12910	14990																																															
NOISE LEVEL	Measuring point D=1.13√LxW	dB(A)	64	65	65	66	66	66	67	67	68	68	69	70	70	71	71	72	73	73	60	61	62	63	64	65	65	66	66	67	68	68	69	70	71	71																																															

**Note:** Nominal cooling capacity is based on 131 / min/ RT (IRT=3,900 Kcal /hr) at 37 °C hot water in, 32°C cold water out 27°C ambient wet bulb. The SPLs are measured 1.13√LxW horizontally away from air intake side of the tower at 1.5m above the foundation level. Pump head of the cooling tower is approximate equal to the height of tower(H). Dimension shown in this catalogue is metric sized and specifications are subject to change without further notice for technical improvement of our products.

## GUARANTEE:

All components are guaranteed against defective material for a period of one(1) year. When return to RYOWO with transportation prepaid, all parts found by factory inspection to be defective will be repaired or replaced without charge, FOB Hong Kong or FOB ShenZhen, PRC. No liability will be assumed for loss or damage resulting from misuse of our products.

**Appendix 3-4 Letters of Request Information of the Fixed Noise Source to the Operator/Owner**

Ref.: CHPWELTNEI00\_0\_0002L.23

By Post

11 October 2023

Management Office  
Hang Sang Bank Headquarters  
83 Des Voeux Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Hang Sang Bank Headquarters**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Hang Sang Bank Headquarters. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0003L.23

By Post

11 October 2023

Management Office  
Dah Sing Life Building  
99 Des Voeux Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Dah Sing Life Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Dah Sing Life Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0004L.23

By Post

11 October 2023

Management Office  
Far East Consortium Building  
113-125A Des Voeux Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Far East Consortium Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Far East Consortium Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development



Ref.: CHPWELTNEI00\_0\_0005L.23

By Post

11 October 2023

Management Office  
Unicorn Trade Centre  
127-131 Des Voeux Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Unicorn Trade Centre**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Unicorn Trade Centre. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure: Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0006L.23

By Post

11 October 2023

Management Office  
CMA Building  
64-66 Connaught Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at CMA Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of CMA Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure: Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0007L.23

By Post

11 October 2023

Management Office  
Two Chinachem Plaza  
68 Connaught Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Two Chinachem Plaza**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Two Chinachem Plaza. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0008L.23

By Post

11 October 2023

Management Office  
China Insurance Group Building  
141 Des Voeux Road Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at China Insurance Group Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of China Insurance Group Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure: Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0009L.23

By Post

11 October 2023

Management Office  
Beautiful Group Tower  
74-77 Connaught Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Beautiful Group Tower**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Beautiful Group Tower. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0010L.23

By Post

11 October 2023

Management Office  
Nanyang Commercial Bank Building  
151 Des Voeux Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Nanyang Commercial Bank Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Nanyang Commercial Bank Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0011L.23

By Post

11 October 2023

Management Office  
CTG House  
78-83 Connaught Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at CTG House**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of CTG House. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0012L.23

By Post

11 October 2023

Management Office  
Hong Kong Trade Centre  
161-167 Des Voeux Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Hong Kong Trade Centre**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Hong Kong Trade Centre. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development



Ref.: CHPWELTNEI00\_0\_0013L.23

By Post

11 October 2023

Management Office  
Nan Fung Tower  
88 Connaught Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Nan Fung Tower**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Nan Fung Tower. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0014L.23

By Post

11 October 2023

Management Office  
Sun House  
181 Des Voeux Road Central, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Sun House**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Sun House. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0015L.23

By Post

11 October 2023

Management Office  
Li Po Chun Chambers  
189-195 Des Voeux Road Central, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Li Po Chun Chambers**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Li Po Chun Chambers. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0016L.23

By Post

11 October 2023

Management Office  
Infinitus Plaza  
199 Des Voeux Road Central, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Infinitus Plaza**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Infinitus Plaza. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0017L.23

By Post

11 October 2023

Management Office  
Wing On Centre  
110-114 Des Voeux Road Central, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Wing On Centre**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Wing On Centre. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0018L.23

By Post

11 October 2023

Management Office  
The Bauhinia Serviced Apartments  
119-121 Connaught Road Central, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at the Bauhinia Serviced Apartments**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of the Bauhinia Serviced Apartments. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0019L.23

By Post

11 October 2023

Management Office  
Tung Ning Building  
2 Hillier Street, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Tung Ning Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Tung Ning Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0020L.23

By Post

11 October 2023

Management Office  
Lansing House  
41-47 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Lansing House**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Lansing House. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development



Ref.: CHPWELTNEI00\_0\_0021L.23

By Post

11 October 2023

Management Office  
Asia Standard Tower  
59-65 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Asia Standard Tower**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Asia Standard Tower. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0022L.23

By Post

11 October 2023

Management Office  
Che San Building  
10-12 Pottinger Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Che San Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Che San Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0023L.23

By Post

11 October 2023

Management Office  
Lee Kum Kee Central  
54-58 Des Voeux Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Lee Kum Kee Central**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Lee Kum Kee Central. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0024L.23

By Post

11 October 2023

Management Office  
Prosperous Building  
48-52 Des Voeux Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Prosperous Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Prosperous Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0025L.23

By Post

11 October 2023

Management Office  
Man Yee Building  
68 Des Voeux Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Man Yee Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Man Yee Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0026L.23

By Post

11 October 2023

Management Office  
Hung Kei Mansion  
5-8 Queen Victoria Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Hung Kei Mansion**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Hung Kei Mansion. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0027L.23

By Post

11 October 2023

Management Office  
Chiyu Bank Building  
74-78 Des Voeux Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Chiyu Bank Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Chiyu Bank Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0028L.23

By Post

11 October 2023

Management Office  
Central Market  
93 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Central Market**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Central Market. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development



Ref.: CHPWELTNEI00\_0\_0029L.23

By Post

11 October 2023

Management Office  
Haleson Building  
1-3 Jubilee Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Haleson Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Haleson Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0030L.23

By Post

11 October 2023

Management Office  
Central 88  
88-98 Des Voeux Road Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Central 88**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Central 88. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0031L.23

By Post

11 October 2023

Management Office  
Public Bank Centre  
120 Des Voeux Road Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Public Bank Centre**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Public Bank Centre. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure: Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0032L.23

By Post

11 October 2023

Management Office  
Tai Sang Bank Building  
130-132 Des Voeux Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Tai Sang Bank Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Tai Sang Bank Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0033L.23

By Post

11 October 2023

Management Office  
BOC Group Life Assurance Tower  
136 Des Voeux Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at BOC Group Life Assurance Tower**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of BOC Group Life Assurance Tower. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0034L.23

By Post

11 October 2023

Management Office  
The L.place  
139 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at The L.place**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of The L.place. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0035L.23

By Post

11 October 2023

Management Office  
Amte1 Building  
144-148 Des Voeux Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Amtel Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Amtel Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure: Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0036L.23

By Post

11 October 2023

Management Office  
Wing Hang Insurance Building  
9-17 Wing Kut Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Wing Hang Insurance Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Wing Hang Insurance Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development



Ref.: CHPWELTNEI00\_0\_0037L.23

By Post

11 October 2023

Management Office  
OCBC Wing Hang Tower  
161-169 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at OCBC Wing Hang Tower**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of OCBC Wing Hang Tower. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0038L.23

By Post

11 October 2023

Management Office  
Shing Lee Commercial Building  
6-12 Wing Kut Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Shing Lee Commercial Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Shing Lee Commercial Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0039L.23

By Post

11 October 2023

Management Office  
Grand Millennium Plaza  
181 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Grand Millennium Plaza**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Grand Millennium Plaza. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0040L.23

By Post

11 October 2023

Management Office  
Wing On Cheong Building  
5 Wing Lok Street, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Wing On Cheong Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Wing On Cheong Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0041L.23

By Post

11 October 2023

Management Office  
Cheung's Building  
1-3 Wing Lok Street, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Cheung's Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Cheung's Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0042L.23

By Post

11 October 2023

Owners' Corporation  
Tams Wan Yeung Building  
63-65 Wing Lok Street, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Tams Wan Yeung Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Tams Wan Yeung Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0043L.23

By Post

11 October 2023

Owners' Corporation  
On Wing Building  
51-59 Bonham Strand, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at On Wing Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of On Wing Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure: Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0044L.23

By Post

11 October 2023

Owners' Corporation  
69 Bonham Strand  
69 Bonham Strand, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at 69 Bonham Strand**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of 69 Bonham Strand. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development



Ref.: CHPWELTNEI00\_0\_0045L.23

By Post

11 October 2023

Management Office  
Officeplus Sheung Wan  
71-75 Bonham Strand, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Officeplus Sheung Wan**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Officeplus Sheung Wan. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0046L.23

By Post

11 October 2023

Management Office  
Golden Centre  
188 Des Voeux Road Central, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Golden Centre**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Golden Centre. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0047L.23

By Post

11 October 2023

Management Office  
Tung Hip Commercial Building  
244-248 Des Voeux Road Central, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Tung Hip Commercial Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Tung Hip Commercial Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0048L.23

By Post

11 October 2023

Management Office  
Hing Yip Commercial Centre  
272-284 Des Voeux Road Central, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Hing Yip Commercial Centre**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Hing Yip Commercial Centre. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0049L.23

By Post

11 October 2023

Management Office  
10 Bonham Strand  
10 Bonham Strand, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at 10 Bonham Strand**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of 10 Bonham Strand. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure: Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0050L.23

By Post

11 October 2023

Management Office  
The Pemberton  
22-26 Bonham Strand, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at The Pemberton**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of The Pemberton. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0051L.23

By Post

11 October 2023

Management Office  
Gold & Silver Commercial Building  
12-18 Mercer Street, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Gold & Silver Commercial Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Gold & Silver Commercial Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure: Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0052L.23

By Post

11 October 2023

Management Office  
Bonham Circus  
40-44 Bonham Strand, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Bonham Circus**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Bonham Circus. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development



Ref.: CHPWELTNEI00\_0\_0053L.23

By Post

11 October 2023

Management Office  
Strand 50  
50 Bonham Strand, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Strand 50**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Strand 50. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0054L.23

By Post

11 October 2023

Management Office  
Tern Centre Tower II  
251 Queen's Road Central, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Tern Centre Tower II**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Tern Centre Tower II. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0055L.23

By Post

11 October 2023

Management Office  
299 QRC  
287-299 Queen's Road Central, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central – Request Information of the Chillers, Cooling Towers and VRV at 299 QRC**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of 299 QRC. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0056L.23

By Post

11 October 2023

Management Office  
Hong Kong Jewellery Building  
178-180 Queen's Road Central, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central – Request Information of the Chillers, Cooling Towers and VRV at Hong Kong Jewellery Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Hong Kong Jewellery Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0057L.23

By Post

11 October 2023

Management Office  
Kam On Building  
176A-176F Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Kam On Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Kam On Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0058L.23

By Post

11 October 2023

Management Office  
On Building  
158-164 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central – Request Information of the Chillers, Cooling Towers and VRV at On Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of On Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0059L.23

By Post

11 October 2023

Management Office  
Queen's Road Centre  
152 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Queen's Road Centre**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Queen's Road Centre. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0060L.23

By Post

11 October 2023

Management Office  
Stag Building  
148 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Stag Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Stag Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development



Ref.: CHPWELTNEI00\_0\_0061L.23

By Post

11 October 2023

Management Office  
V Heun Building  
138 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at V Heun Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of V Heun Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure: Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0062L.23

By Post

11 October 2023

Management Office  
Yin Serviced Apartments  
97A Wellington Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Yin Serviced Apartments**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Yin Serviced Apartments. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure: Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0063L.23

By Post

11 October 2023

Management Office  
ICBC Asia Building  
122-126 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at ICBC Asia Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of ICBC Asia Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure: Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0064L.23

By Post

11 October 2023

Management Office  
Wings Building  
110-116 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Wings Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Wings Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0065L.23

By Post

11 October 2023

Management Office  
100QRC  
100 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at 100QRC**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of 100QRC. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0066L.23

By Post

11 October 2023

Management Office  
Regent Centre  
88 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Regent Centre**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Regent Centre. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure: Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0067L.23

By Post

11 October 2023

Management Office  
H Queen's  
80 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at H Queen's**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of H Queen's. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0068L.23

By Post

11 October 2023

Management Office  
The Pottinger  
21 Stanley Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central – Request Information of the Chillers, Cooling Towers and VRV at The Pottinger**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of The Pottinger. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development



Ref.: CHPWELTNEI00\_0\_0069L.23

By Post

11 October 2023

Management Office  
Crawford House  
70 Queen's Road Central, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Crawford House**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Crawford House. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0070L.23

By Post

11 October 2023

Management Office  
Pearl Oriental House  
58-64 Stanley Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Pearl Oriental House**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Pearl Oriental House. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0071L.23

By Post

11 October 2023

Management Office  
World Trust Tower  
50 Stanley Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at World Trust Tower**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of World Trust Tower. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0072L.23

By Post

11 October 2023

Management Office  
The Loop  
33 Wellington Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at The Loop**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of The Loop. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure: Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0073L.23

By Post

11 October 2023

Management Office  
PMQ  
35 Aberdeen Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at PMQ**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of PMQ. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure: Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0074L.23

By Post

11 October 2023

Management Office  
Kinwick Centre  
32 Hollywood Road, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Kinwick Centre**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Kinwick Centre. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0075L.23

By Post

11 October 2023

Management Office  
Oriental Crystal Commercial Building  
46 Lyndhurst Terrace, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Oriental Crystal Commercial Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Oriental Crystal Commercial Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0076L.23

By Post

11 October 2023

Management Office  
Car Po Commercial Building  
18-20 Lyndhurst Terrace, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Car Po Commercial Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Car Po Commercial Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development



Ref.: CHPWELTNEI00\_0\_0077L.23

By Post

11 October 2023

Management Office  
H Code  
45 Pottinger Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at H Code**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of H Code. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0078L.23

By Post

11 October 2023

Management Office  
Soho Square  
21 Lyndhurst Terrace, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Soho Square**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Soho Square. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0079L.23

By Post

11 October 2023

Management Office  
Jade Centre  
98 Wellington Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central – Request Information of the Chillers, Cooling Towers and VRV at Jade Centre**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Jade Centre. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0080L.23

By Post

11 October 2023

Management Office  
1 Lyndhurst Tower  
1 Lyndhurst Terrace, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at 1 Lyndhurst Tower**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of 1 Lyndhurst Tower. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0081L.23

By Post

11 October 2023

Management Office  
Butterfly on Wellington  
122 Wellington Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at Butterfly on Wellington**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Butterfly on Wellington. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0082L.23

By Post

11 October 2023

Management Office  
The Mercer Hong Kong  
29 Jervois Street, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at The Mercer Hong Kong**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of The Mercer Hong Kong. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0083L.23

By Post

11 October 2023

Management Office  
The Wellington  
184-198 Wellington Street, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at The Wellington**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of The Wellington. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0084L.23

By Post

11 October 2023

Management Office  
CentreStage  
108 Hollywood Road, Sheung Wan  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central– Request Information of the Chillers, Cooling Towers and VRV at CentreStage**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of CentreStage. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development



Ref.: CHPWELTNEI00\_0\_0085L.23

By Post

11 October 2023

Management Office  
Luk Yu Building  
24-26 Stanley Street, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Luk Yu Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Luk Yu Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

Ref.: CHPWELTNEI00\_0\_0086L.23

By Post

11 October 2023

Management Office  
Harbour Building  
38 Pier Road, Central  
Hong Kong Island, Hong Kong

Dear Sir/Madam,

**S16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street, Central- Request Information of the Chillers, Cooling Towers and VRV at Harbour Building**

We are commissioned by the applicant of the captioned lot to assess environmental noise impact on the proposed composite redevelopment at the captioned site. The location plan of the Proposed Development with 300m noise impact study area is attached for your reference.

We would like to have some enquires regarding the fixed noise sources (e.g. chillers, water-cooling towers or varied refrigerant volume system (VRV)) of Harbour Building. We would be grateful if you could provide following information for the purpose of Environmental Assessment:

Chillers / Cooling Towers / VRV

1. The locations and numbers of chillers / cooling towers / VRV, their sound data (noise level), model and cooling capacity, if available
2. Operation hours of these equipment
3. Number of operating equipment between 23:00 and 07:00 hours
4. Noise Mitigation Measures for the chillers / cooling towers / VRV (e.g. noise enclosure, silencer, etc.)

In addition, it would be grateful if we could have your permission in carrying out on-site noise measurement at the rooftop of the building. Due to the tight programme of this project, your prompt response on or before 18 October 2023 would be very much appreciated.

Should you have any questions on this submission, please do not hesitate to contact the undersigned at 3465 2828 (email: bfan@ramboll.com) or our Coco Ma at 3465 2807 (email: cocoma@ramboll.com).

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited



Billy Fan  
Principal Consultant

Enclosure:      Location Plan of the Proposed Development

**Appendix 4-1 Land Use Implications on Albedo Value, Bowen Ratio and Surface Roughness**

## Land Use Implications on Albedo Value, Bowen Ratio and Surface Roughness

### PATH v3.0 Grid 38,29

Code	Co	Hong Kong Planning Department Classification	Roughness	Albedo	Bowen Ratio	Grid Count	Percent	Albedo x Perce	b^An/Sn
1		Private Residential	1	0.18	1.5	75872	7.59%	0.01365696	1.031241533
2		Public Residential	1	0.18	1.5	12791	1.28%	0.00230238	1.005199776
3		Rural Settlement	0.375	0.165	0.9	869	0.09%	0.000143385	0.999908446
11		Commercial/Business and Office	1	0.18	1.5	18193	1.82%	0.00327474	1.007403901
21		Industrial Land	0.7	0.18	1.5	3995	0.40%	0.0007191	1.001621146
22		Industrial Estates/Science and Technology Parks	0.7	0.18	1.5	906	0.09%	0.00016308	1.000367419
23		Warehouse and Open Storage	0.7	0.18	1.5	1958	0.20%	0.00035244	1.000794216
31		Government, Institutional and Community Facilities	0.7	0.18	1.5	43891	4.39%	0.00790038	1.017955566
32		Open Space and Recreation	0.04	0.15	1	35951	3.60%	0.00539265	1
41		Roads and Transport Facilities	0.7	0.18	1.5	88131	8.81%	0.01586358	1.03638018
42		Railways	0.7	0.18	1.5	3473	0.35%	0.00062514	1.001409172
43		Airport	0.07	0.18	1.5	0	0.00%	0	1
44		Port Facilities	0.7	0.18	1.5	8727	0.87%	0.00157086	1.003544762
51		Cemeteries/Funeral Facilities	0.7	0.18	1.5	3444	0.34%	0.00061992	1.001397397
52		Utilities	0.7	0.18	1.5	7816	0.78%	0.00140688	1.003174142
53		Vacant Land/Construction in Progress	0.2	0.18	1	19417	1.94%	0.00349506	1
54		Others	0.2	0.18	1	14025	1.40%	0.0025245	1
61		Agricultural Land	0.1575	0.18	0.55	1601	0.16%	0.00028818	0.999043321
62		Fish Ponds/Gei Wais	0.001	0.1	0.1	0	0.00%	0	1
71		Woodland	1.05	0.1625	0.75	136624	13.66%	0.0222014	0.961458117
72		Shrubland	0.3	0.18	1.25	49429	4.94%	0.00889722	1.011090815
73		Grassland	0.065	0.185	0.8	29071	2.91%	0.005378135	0.993533989
74		Mangrove/Swamp	0.065	0.14	0.225	6	0.00%	0.00000084	0.99999105
81		Badland	0.15	0.1625	0.75	0	0.00%	0	1
83		Rocky Shore	0.05	0.2	4.75	204	0.02%	0.0000408	1.000317912
91		Reservoirs	0.001	0.1	0.1	2010	0.20%	0.000201	0.995382498
92		Streams and Nullahs	0.001	0.1	0.1	512	0.05%	0.0000512	0.998821771
99		SZ Residential *	1	0.18	1.5	0	0.00%	0	1
0		Open Sea *	0.001	0.1	0.1	441084	44.11%	0.0441084	0.362172941
				<b>0.141178</b>	<b>0.387596</b>	1000000			

\* Outside Hong Kong border, not belong to PlanD categories.

Center: X=833855, Y=816145, Z=16.0; Met Year=2019;

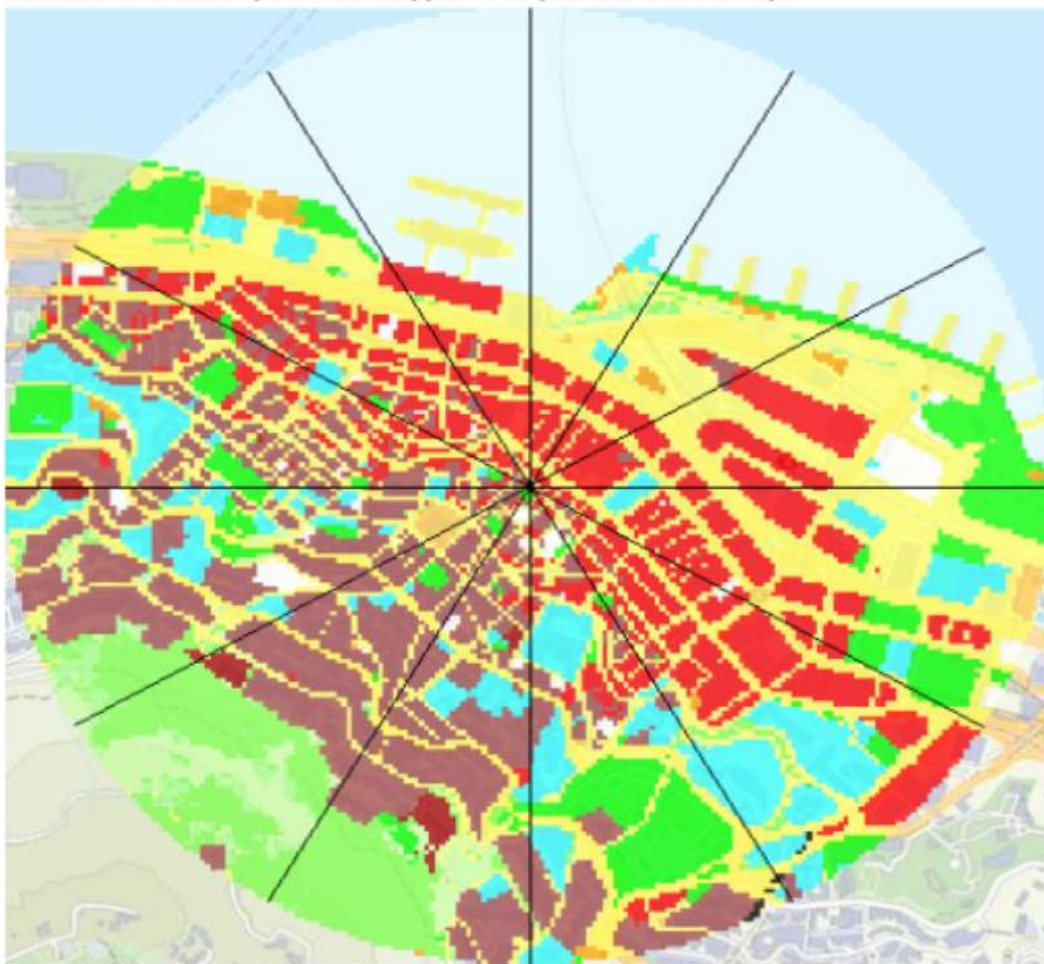


Land Utilization in Hong Kong 2022

PATH v3.0 Grid 38,29

Angle	Group	Inverse-distance	Roughness
0	0 - 30	5.176452751	0.018186
30	30 - 60	5.31768931	0.057408
60	60 - 90	5.176452751	0.301222
90	90 - 120	5.176452751	0.565839
120	120 - 150	5.31768931	0.760186
150	150 - 180	5.176452751	0.437468
180	180 - 210	5.176452751	0.693164
210	210 - 240	5.31768931	0.561454
240	240 - 270	5.176452751	0.612122
270	270 - 300	5.176452751	0.635443
300	300 - 330	5.31768931	0.305864
330	330 - 360	5.176452751	0.030902

Center: X=833855, Y=816145, , Z=16.0; Met Year=2019;



Land Utilization in Hong Kong 2022

**Appendix 4-2 Ferry Schedule at HKMFT Available at Marine Department's Website**

Ferry Schedule at the HKMFT Available at Marine Department's Website

Berth No.	1-4		1-4		Maximum
	Depature Date	Depature	Depature Date	Depature	
00:00-01:00	Aug19	1	Aug20	1	1
01:00-02:00	Aug19	0	Aug20	0	0
02:00-03:00	Aug19	0	Aug20	0	0
03:00-04:00	Aug19	0	Aug20	0	0
04:00-05:00	Aug19	0	Aug20	0	0
05:00-06:00	Aug19	0	Aug20	0	0
06:00-07:00	Aug19	0	Aug20	0	0
07:00-08:00	Aug19	1	Aug20	1	1
08:00-09:00	Aug19	3	Aug20	2	3
09:00-10:00	Aug19	2	Aug20	2	2
10:00-11:00	Aug19	4	Aug20	4	4
11:00-12:00	Aug19	3	Aug20	3	3
12:00-13:00	Aug19	2	Aug20	2	2
13:00-14:00	Aug19	3	Aug20	3	3
14:00-15:00	Aug19	3	Aug20	3	3
15:00-16:00	Aug19	3	Aug20	3	3
16:00-17:00	Aug19	2	Aug20	2	2
17:00-18:00	Aug19	3	Aug20	3	3
18:00-19:00	Aug19	1	Aug20	1	1
19:00-20:00	Aug19	1	Aug20	1	1
20:00-21:00	Aug19	2	Aug20	2	2
21:00-22:00	Aug19	2	Aug20	2	2
22:00-23:00	Aug19	0	Aug20	0	0
23:00-00:00	Aug19	1	Aug20	2	2

Berth No.	5-8		5-8		Maximum
	Depature Date	Depature	Depature Date	Depature	
00:00-01:00	Aug19	0	Aug20	0	0
01:00-02:00	Aug19	0	Aug20	0	0
02:00-03:00	Aug19	0	Aug20	0	0
03:00-04:00	Aug19	0	Aug20	0	0
04:00-05:00	Aug19	0	Aug20	0	0
05:00-06:00	Aug19	0	Aug20	0	0
06:00-07:00	Aug19	0	Aug20	0	0
07:00-08:00	Aug19	1	Aug20	1	1
08:00-09:00	Aug19	1	Aug20	1	1
09:00-10:00	Aug19	2	Aug20	2	2
10:00-11:00	Aug19	0	Aug20	0	0
11:00-12:00	Aug19	1	Aug20	1	1
12:00-13:00	Aug19	2	Aug20	2	2
13:00-14:00	Aug19	2	Aug20	2	2
14:00-15:00	Aug19	1	Aug20	1	1
15:00-16:00	Aug19	1	Aug20	1	1
16:00-17:00	Aug19	1	Aug20	1	1
17:00-18:00	Aug19	1	Aug20	1	1
18:00-19:00	Aug19	2	Aug20	2	2
19:00-20:00	Aug19	1	Aug20	0	1
20:00-21:00	Aug19	0	Aug20	0	0
21:00-22:00	Aug19	1	Aug20	1	1
22:00-23:00	Aug19	1	Aug20	1	1
23:00-00:00	Aug19	1	Aug20	0	1

**Appendix 4-3 Input Parameters of Fast Ferry Services at HKMFT in AERMOD**



Emission Inventory of Marine Emissions

Emission Point ID <sup>(1)</sup>	Source Description	Source Type	Coordinates of Sources <sup>(2)</sup>		Maximum Emission Rate						Base Height <sup>(3)</sup>	Emission Height <sup>(3)</sup>	Exhaust Temperature <sup>(3)</sup>		Exit Velocity <sup>(3)</sup>	Exhaust dia. <sup>(3)</sup>	Operating Period with Emissions	No. of Operating Days per Year
					NO <sub>x</sub>	NO <sub>2</sub>	NO	RSP	FSP	SO <sub>2</sub>			°C	K				
					g/s	g/s	g/s	g/s	g/s	g/s			mPD	mAG				
B2	Idling Emissions HKMFT to Macau	Point	833693.2	816638.9	1.13E+00	2.27E-01	9.07E-01	4.04E-02	3.69E-02	1.70E-02	0	6	499.8	773	0.001	0.7	0000-0100 (1 Ferry/100%) 0100-0700 (0 Ferry/0%) 0700-1900 (1 Ferries/100%) 1900-0000 (1 Ferries/100%)	365
B3	Idling Emissions HKMFT to Macau	Point	833731.9	816628.2	1.13E+00	2.27E-01	9.07E-01	4.04E-02	3.69E-02	1.70E-02	0	6	499.8	773	0.001	0.7	0000-0100 (1 Ferry/100%) 0100-0700 (0 Ferry/0%) 0700-1900 (1 Ferries/100%) 1900-0000 (1 Ferries/100%)	365
B4	Idling Emissions HKMFT to Macau	Point	833769.9	816618.1	1.13E+00	2.27E-01	9.07E-01	4.04E-02	3.69E-02	1.70E-02	0	6	499.8	773	0.001	0.7	0000-0100 (1 Ferry/100%) 0100-0700 (0 Ferry/0%) 0700-1900 (1 Ferries/100%) 1900-0000 (1 Ferries/100%)	365
M36	R1 Travelling (Macau)	Point	833829.5	816658.6	1.49E-02	1.19E-02	2.99E-03	2.13E-03	1.95E-03	3.58E-03	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365
M37	R1 Travelling (Macau)	Point	833853.3	816652.5	1.49E-02	1.19E-02	2.99E-03	2.13E-03	1.95E-03	8.96E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365
M38	R1 Travelling (Macau)	Point	833877.7	816658.5	1.49E-02	1.19E-02	2.99E-03	2.13E-03	1.95E-03	8.96E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365
M39	R1 Travelling (Macau)	Point	833902.4	816664.6	1.49E-02	1.19E-02	2.99E-03	2.13E-03	1.95E-03	8.96E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365
M95	R2 Travelling (Taipa, Macau)	Point	833694.1	816640.1	1.49E-02	1.19E-02	2.98E-03	2.12E-03	1.94E-03	8.93E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365
M96	R2 Travelling (Taipa, Macau)	Point	833717.9	816633.6	1.49E-02	1.19E-02	2.98E-03	2.12E-03	1.94E-03	8.93E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365
M97	R2 Travelling (Taipa, Macau)	Point	833742.0	816627.2	1.49E-02	1.19E-02	2.98E-03	2.12E-03	1.94E-03	8.93E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365
M98	R2 Travelling (Taipa, Macau)	Point	833766.1	816620.4	1.49E-02	1.19E-02	2.98E-03	2.12E-03	1.94E-03	8.93E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365
M99	R2 Travelling (Taipa, Macau)	Point	833790.2	816613.4	1.49E-02	1.19E-02	2.98E-03	2.12E-03	1.94E-03	8.93E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365
M100	R2 Travelling (Taipa, Macau)	Point	833814.4	816606.9	1.49E-02	1.19E-02	2.98E-03	2.12E-03	1.94E-03	8.93E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365
M101	R2 Travelling (Taipa, Macau)	Point	833837.9	816600.2	1.49E-02	1.19E-02	2.98E-03	2.12E-03	1.94E-03	8.93E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365
M102	R2 Travelling (Taipa, Macau)	Point	833860.9	816610.6	1.49E-02	1.19E-02	2.98E-03	2.12E-03	1.94E-03	8.93E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365

**Emission Inventory of Marine Emissions**

Emission Point ID <sup>(1)</sup>	Source Description	Source Type	Coordinates of Sources <sup>(2)</sup>		Maximum Emission Rate						Base Height <sup>(3)</sup>	Emission Height <sup>(3)</sup>	Exhaust Temperature <sup>(3)</sup>		Exit Velocity <sup>(3)</sup>	Exhaust dia. <sup>(3)</sup>	Operating Period with Emissions	No. of Operating Days per Year
					NO <sub>x</sub>	NO <sub>2</sub>	NO	RSP	FSP	SO <sub>2</sub>			°C	K				
					g/s	g/s	g/s	g/s	g/s	g/s			mPD	mAG				
M103	R2 Travelling (Taipa, Macau)	Point	833883.9	816620.7	1.49E-02	1.19E-02	2.98E-03	2.12E-03	1.94E-03	8.93E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365
M104	R2 Travelling (Taipa, Macau)	Point	833907.5	816631.0	1.49E-02	1.19E-02	2.98E-03	2.12E-03	1.94E-03	8.93E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365
M105	R2 Travelling (Taipa, Macau)	Point	833929.8	816641.3	1.49E-02	1.19E-02	2.98E-03	2.12E-03	1.94E-03	8.93E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365
M106	R2 Travelling (Taipa, Macau)	Point	833945.8	816659.5	1.49E-02	1.19E-02	2.98E-03	2.12E-03	1.94E-03	8.93E-04	0	6.2	499.8	773	0.001	0.7	0000-0100 (2 Ferries/50%) 0100-0700 (0 Ferry/0%) 0700-1900 (4 Ferries/100%) 1900-0000 (2 Ferries/50%)	365

Notes:

- (1) Ferry would be arriving to the terminal from west of the terminal and departing from the terminal from east of the terminal. Therefore, M36 to M39, M95 to M106 is a one-way cruising/manoeuvring for departure.
- (2) The Coordinates of Sources are defined based on the information in Appendix 5.1 of the approved EIA report for Expansion of Heliport Facilities at Macau Ferry Terminal (AEIAR-095/2006), the observation of on-site survey and desktop review.
- (3) The information of Base Height, Emission Height, Exhaust Temperature, Exit Velocity and Exhaust Diameter is made reference to Appendix 5.1 of the approved EIA report for Expansion of Heliport Facilities at Macau Ferry Terminal (AEIAR-095/2006).

**Appendix 4-4 (Not Used)**

**Appendix 4-5 Input Parameters of Helicopter Emission Sources in AERMOD**

**Emission Inventory of Helicopter Emissions**

Emission Point ID	Source Description	Type of Fuel	Width (m) <sup>(1)</sup>	Total Path Length (m)	Area of Path	Source Type	Coordinates of Area source				Emission Rate						Base Height <sup>(2)</sup> (mPD)	Emission Height <sup>(2)</sup> (mAG)	Operating Period with Emissions	No. of Operating Days per Year
							Start		End		NOx	NO <sub>2</sub>	NO	RSP	FSP	SO <sub>2</sub>				
							X	Y	X	Y	g/s	(g/m <sup>2</sup> s)	(g/m <sup>2</sup> s)	(g/m <sup>2</sup> s)	(g/m <sup>2</sup> s)	(g/m <sup>2</sup> s)				
H1_4	Helipad 1 (Approach)	Diesel	3.04	99.7	303.0	Line	833774.0	816645.6	833782.7	816646.5	1.04E-01	6.85E-05	2.74E-04	8.64E-06	8.64E-06	6.90E-05	37.7	9	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_5		Diesel	3.04	99.7	303.0	Line	833782.7	816646.5	833789.7	816646.8	1.04E-01	6.85E-05	2.74E-04	8.64E-06	8.64E-06	6.90E-05	37.7	9.8	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_6		Diesel	3.04	99.7	303.0	Line	833789.7	816646.8	833796.7	816647.2	1.04E-01	6.85E-05	2.74E-04	8.64E-06	8.64E-06	6.90E-05	4	44.2	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_7		Diesel	3.04	99.7	303.0	Line	833796.7	816647.2	833803.7	816647.6	1.04E-01	6.85E-05	2.74E-04	8.64E-06	8.64E-06	6.90E-05	4	44.9	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_8		Diesel	3.04	99.7	303.0	Line	833803.7	816647.6	833810.6	816648.0	1.04E-01	6.85E-05	2.74E-04	8.64E-06	8.64E-06	6.90E-05	4	45.7	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_9		Diesel	3.04	99.7	303.0	Line	833810.6	816648.0	833817.6	816648.4	1.04E-01	6.85E-05	2.74E-04	8.64E-06	8.64E-06	6.90E-05	4	46.4	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_10		Diesel	3.04	99.7	303.0	Line	833817.6	816648.4	833824.6	816648.8	1.04E-01	6.85E-05	2.74E-04	8.64E-06	8.64E-06	6.90E-05	4	47.2	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_11		Diesel	3.04	99.7	303.0	Line	833824.6	816648.8	833831.6	816649.2	1.04E-01	6.85E-05	2.74E-04	8.64E-06	8.64E-06	6.90E-05	0	51.9	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_12		Diesel	3.04	99.7	303.0	Line	833831.6	816649.2	833838.6	816649.5	1.04E-01	6.85E-05	2.74E-04	8.64E-06	8.64E-06	6.90E-05	0	52.6	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_13		Diesel	3.04	99.7	303.0	Line	833838.6	816649.5	833846.6	816649.9	1.04E-01	6.85E-05	2.74E-04	8.64E-06	8.64E-06	6.90E-05	0	53.4	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_14		Diesel	3.04	99.7	303.0	Line	833846.6	816649.9	833852.6	816650.3	1.04E-01	6.85E-05	2.74E-04	8.64E-06	8.64E-06	6.90E-05	0	54.1	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_15		Diesel	3.04	99.7	303.0	Line	833852.6	816650.3	833859.6	816650.7	1.04E-01	6.85E-05	2.74E-04	8.64E-06	8.64E-06	6.90E-05	0	54.8	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_16		Diesel	3.04	99.7	303.0	Line	833859.6	816650.7	833866.6	816651.1	1.04E-01	6.85E-05	2.74E-04	8.64E-06	8.64E-06	6.90E-05	0	55.6	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_17		Diesel	3.04	99.7	303.0	Line	833866.6	816651.1	833873.5	816651.5	1.04E-01	6.85E-05	2.74E-04	8.64E-06	8.64E-06	6.90E-05	0	55.6	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_18	Helipad 1 (Takeoff)	Diesel	3.04	96.8	294.3	Line	833774.0	816645.6	833769.4	816649.2	4.42E-02	3.00E-05	1.20E-04	3.79E-06	3.79E-06	3.03E-05	37.7	9	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_19		Diesel	3.04	96.8	294.3	Line	833769.4	816649.2	833763.1	816652.3	4.42E-02	3.00E-05	1.20E-04	3.79E-06	3.79E-06	3.03E-05	37.7	9.8	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_20		Diesel	3.04	96.8	294.3	Line	833763.1	816652.3	833756.9	816655.4	4.42E-02	3.00E-05	1.20E-04	3.79E-06	3.79E-06	3.03E-05	37.7	10.5	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_21		Diesel	3.04	96.8	294.3	Line	833756.9	816655.4	833750.6	816658.4	4.42E-02	3.00E-05	1.20E-04	3.79E-06	3.79E-06	3.03E-05	37.7	11.2	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_22		Diesel	3.04	96.8	294.3	Line	833750.6	816658.4	833744.3	816661.5	4.42E-02	3.00E-05	1.20E-04	3.79E-06	3.79E-06	3.03E-05	37.7	12	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_23		Diesel	3.04	96.8	294.3	Line	833744.3	816661.5	833738.0	816664.6	4.42E-02	3.00E-05	1.20E-04	3.79E-06	3.79E-06	3.03E-05	37.7	12.7	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_24		Diesel	3.04	96.8	294.3	Line	833738.0	816664.6	833731.7	816667.7	4.42E-02	3.00E-05	1.20E-04	3.79E-06	3.79E-06	3.03E-05	37.7	13.5	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_25		Diesel	3.04	96.8	294.3	Line	833731.7	816667.7	833725.5	816670.8	4.42E-02	3.00E-05	1.20E-04	3.79E-06	3.79E-06	3.03E-05	37.7	14.2	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_26		Diesel	3.04	96.8	294.3	Line	833725.5	816670.8	833719.2	816673.9	4.42E-02	3.00E-05	1.20E-04	3.79E-06	3.79E-06	3.03E-05	37.7	14.9	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_27		Diesel	3.04	96.8	294.3	Line	833719.2	816673.9	833712.9	816677.0	4.42E-02	3.00E-05	1.20E-04	3.79E-06	3.79E-06	3.03E-05	37.7	15.7	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365

**Emission Inventory of Helicopter Emissions**

Emission Point ID	Source Description	Type of Fuel	Width (m) <sup>(1)</sup>	Total Path Length (m)	Area of Path	Source Type	Coordinates of Area source				Emission Rate						Base Height <sup>(2)</sup> (mPD)	Emission Height <sup>(2)</sup> (mAG)	Operating Period with Emissions	No. of Operating Days per Year
							Start		End		NOx	NO <sub>2</sub>	NO	RSP	FSP	SO <sub>2</sub>				
							X	Y	X	Y	g/s	(g/m <sup>2</sup> s)	(g/m <sup>2</sup> s)	(g/m <sup>2</sup> s)	(g/m <sup>2</sup> s)	(g/m <sup>2</sup> s)				
H1_28		Diesel	3.04	96.8	294.3	Line	833712.9	816677.0	833706.6	816680.1	4.42E-02	3.00E-05	1.20E-04	3.79E-06	3.79E-06	3.03E-05	37.7	16.4	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_29		Diesel	3.04	96.8	294.3	Line	833706.6	816680.1	833700.3	816683.2	4.42E-02	3.00E-05	1.20E-04	3.79E-06	3.79E-06	3.03E-05	0	54.8	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_30		Diesel	3.04	96.8	294.3	Line	833700.3	816683.2	833694.1	816686.3	4.42E-02	3.00E-05	1.20E-04	3.79E-06	3.79E-06	3.03E-05	0	55.6	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365
H1_31		Diesel	3.04	96.8	294.3	Line	833694.1	816686.3	833687.8	816689.4	4.42E-02	3.00E-05	1.20E-04	3.79E-06	3.79E-06	3.03E-05	0	55.6	0800-1800 (100%) 1801-2259 (75%) 2300-0759 (0%)	365

Notes:

(1) The width of the line sources is assumed to be the same as the width of AgustaWestland AW139, which is 3.04m (<http://www.skyshuttlehk.com/?pid=our-heli-fleet>). This assumption is made reference to the methodology adopted in the approved EIA for A Rooftop Helipad at New Acute Hospital at Kai Tak Development Area (AEIAR-224/2020) (Appendix 3O).

(2) The information of Base Height and Emission Height is made reference to Appendix 5.1 of the approved EIA report for Expansion of Heliport Facilities at Macau Ferry Terminal (AEIAR-095/2006).

(3) The detailed calculations of emission rates of helicopter are shown in Appendix 4.10.

**Emission Inventory of Helicopter Emissions**

Emission Point ID <sup>(1)</sup>	Source Description	Source Type	Coordinates of Sources <sup>(2)</sup>		Maximum Emission Rate						Base Height <sup>(2)</sup>	Emission Height <sup>(2)</sup>	Exhaust Temperature <sup>(3)</sup>		Exit Velocity <sup>(3)</sup>	Exhaust dia. <sup>(3)</sup>	Operating Period with Emissions	No. of Operating Days per Year
					NO <sub>x</sub>	NO <sub>2</sub>	NO	RSP	FSP	SO <sub>2</sub>			°C	K				
			X	Y	g/s	g/s	g/s	g/s	g/s	g/s	mPD	mAG	m/s	m				
H1_1	Hovering (Approach) + Touchdown (first helipad)	Point	833774.0	816645.6	1.06E-01	2.12E-02	8.49E-02	2.68E-03	2.68E-03	2.14E-02	37.70	3.05	100.0	373.2	6.0	0.3	0800-1800 (100%) 1800-2300 (75%) 2300-0800 (0%)	365
H1_2	Helicopter idling emission (first helipad)	Point	833774.0	816645.6	1.07E-01	2.13E-02	8.54E-02	4.62E-03	4.62E-03	1.06E-01	37.70	2.21	100.0	373.2	6.0	0.3	0800-1800 (100%) 1800-2300 (75%) 2300-0800 (0%)	365
H1_3	Hovering (Take-off) and Lift-off (first helipad)	Point	833774.0	816645.6	1.97E-01	3.95E-02	1.58E-01	4.99E-03	4.99E-03	3.98E-02	37.70	3.05	100.0	373.2	6.0	0.3	0800-1800 (100%) 1800-2300 (75%) 2300-0800 (0%)	365

Notes:

(1) Only the helipad within 500m Assessment Area is included for the assessment.

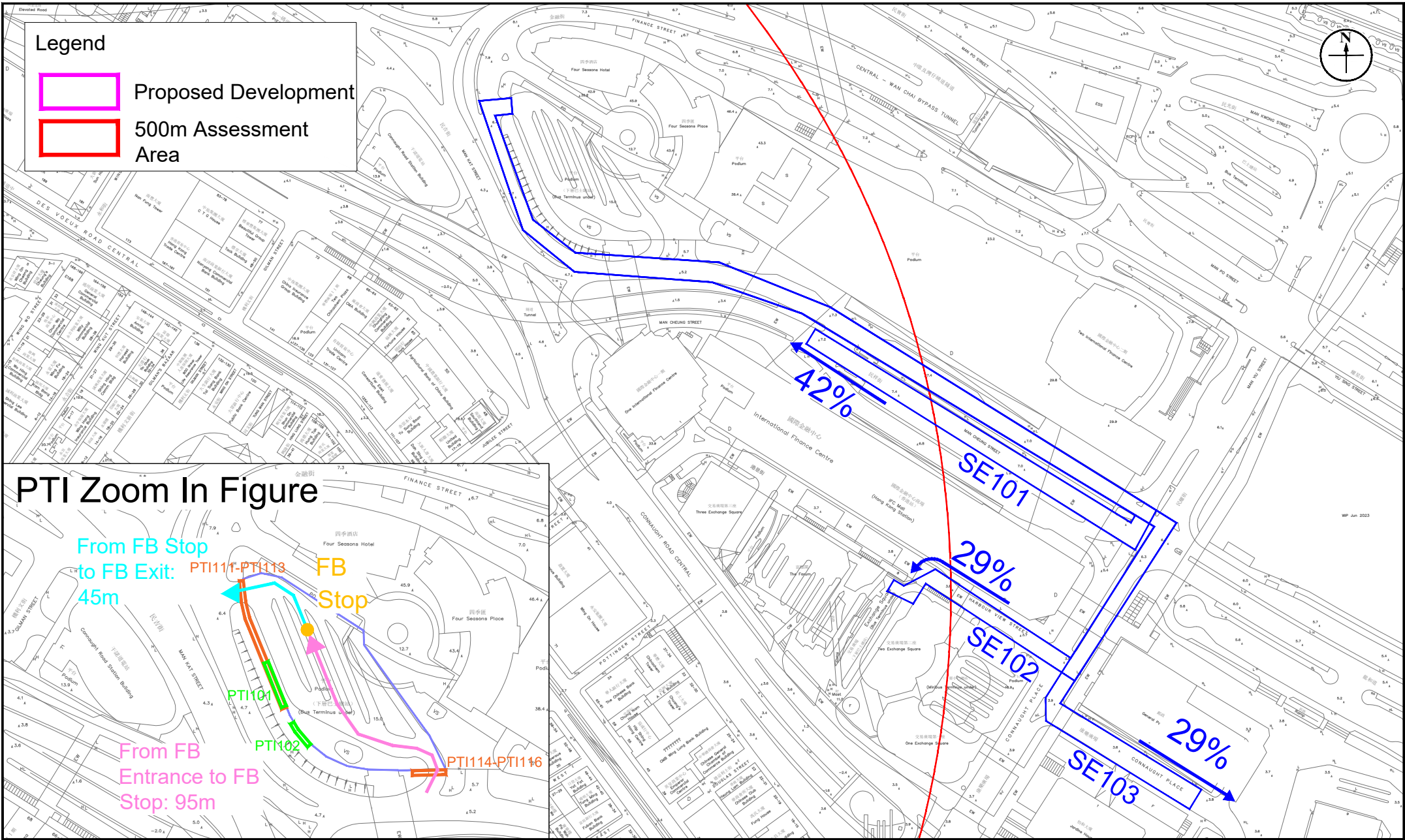
(2) The information of Coordinates of Sources, Base Height and Emission Height is made reference to Appendix 5.1 of the approved EIA report for Expansion of Heliport Facilities at Macau Ferry Terminal (AEIAR-095/2006).

(3) The information of Exhaust Temperature, Exit Velocity and Exhaust Diameter is made reference to Appendix 3.2 of the Approved EIA report for A Rooftop Helipad at the Proposed New Block of Queen Mary Hospital (AEIAR-208/2017).

(4) The detailed calculations of emission rates of helicopter are shown in Appendix 4.10.

**Appendix 4-6    Input Parameters of Public Transport Interchanges and Bus  
Terminus in AERMOD**

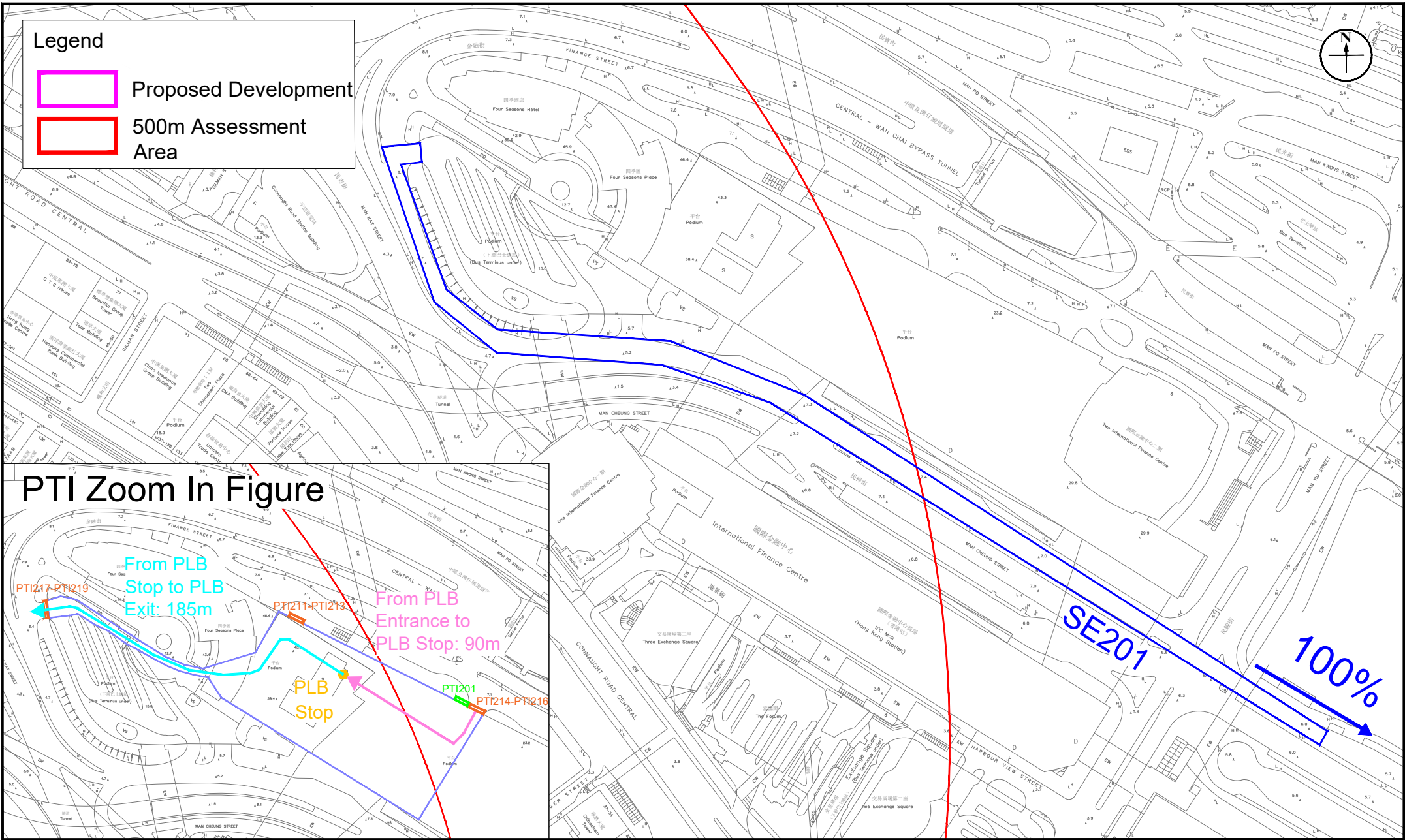




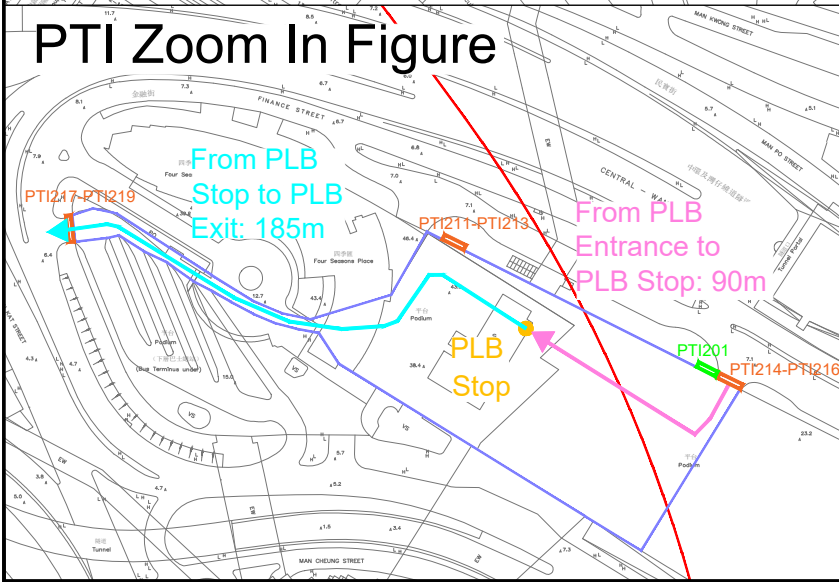
<b>Appendix:</b> 4.6		
<b>Title:</b>	Public Transport Interchange Emission Sources - Hong Kong Station Bus Terminus	Drawn by: AW
<b>Project:</b>	Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan	Checked by: CC
		Rev.: 1.1
		Date: Feb 2024

**Legend**

- Proposed Development
- 500m Assessment Area



**PTI Zoom In Figure**



**Appendix: 4.6**

**Title:** Public Transport Interchange Emission Sources - Hong Kong Station Public Light Bus Terminus (Diesel)

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

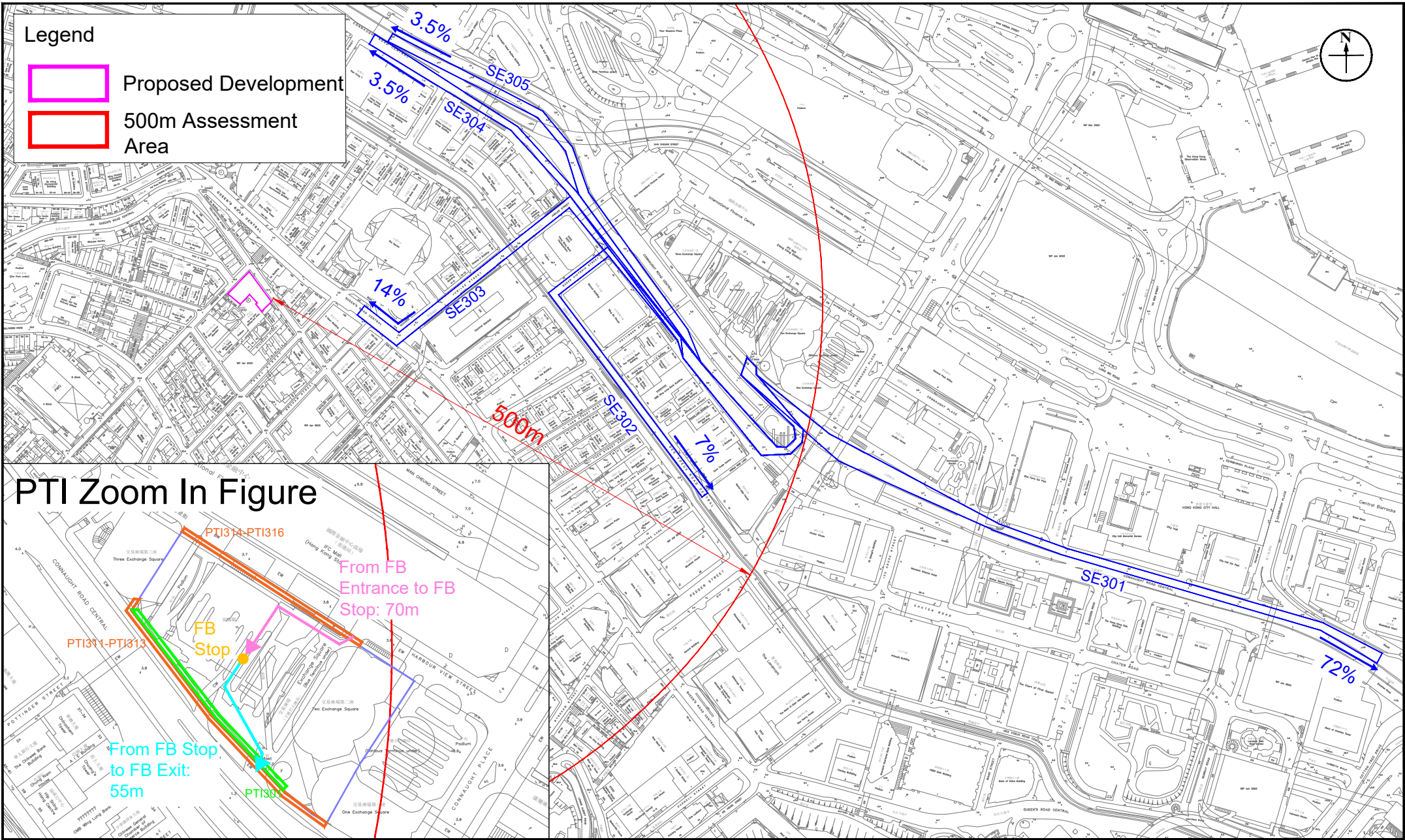


Drawn by: AW

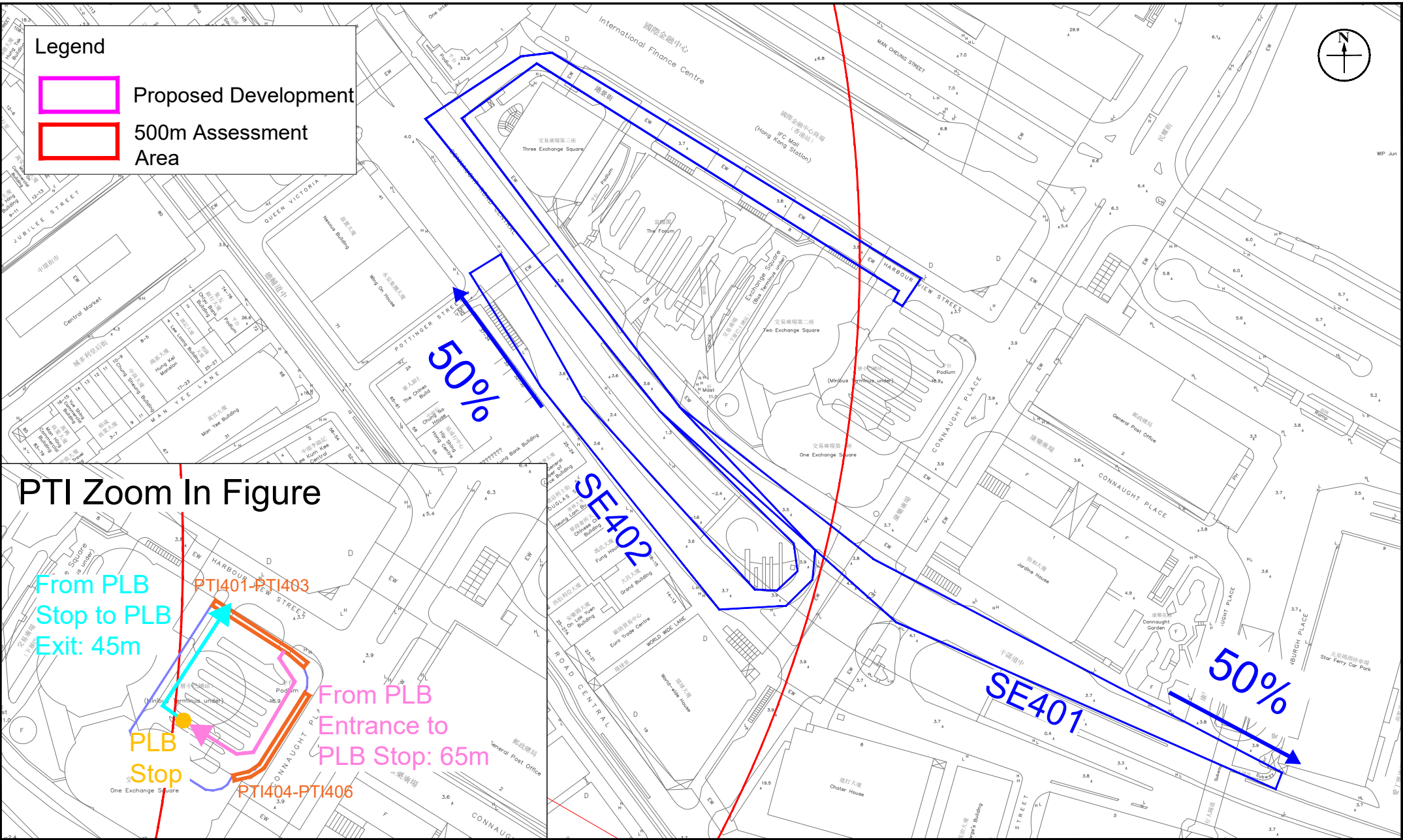
Checked by: CC

Rev.: 1.1

Date: Feb 2024



<b>Appendix:</b> 4.6		<b>RAMBOLL</b>	
<b>Title:</b> Public Transport Interchange Emission Sources - Exchange Square Bus Terminus		Drawn by: AW	
<b>Project:</b> Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan		Checked by: CC	
		Rev.: 1.1	
		Date: Feb 2024	



**Appendix:** 4.6

**Title:** Public Transport Interchange Emission Sources - Exchange Square Public Light Bus Terminus (Diesel)

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

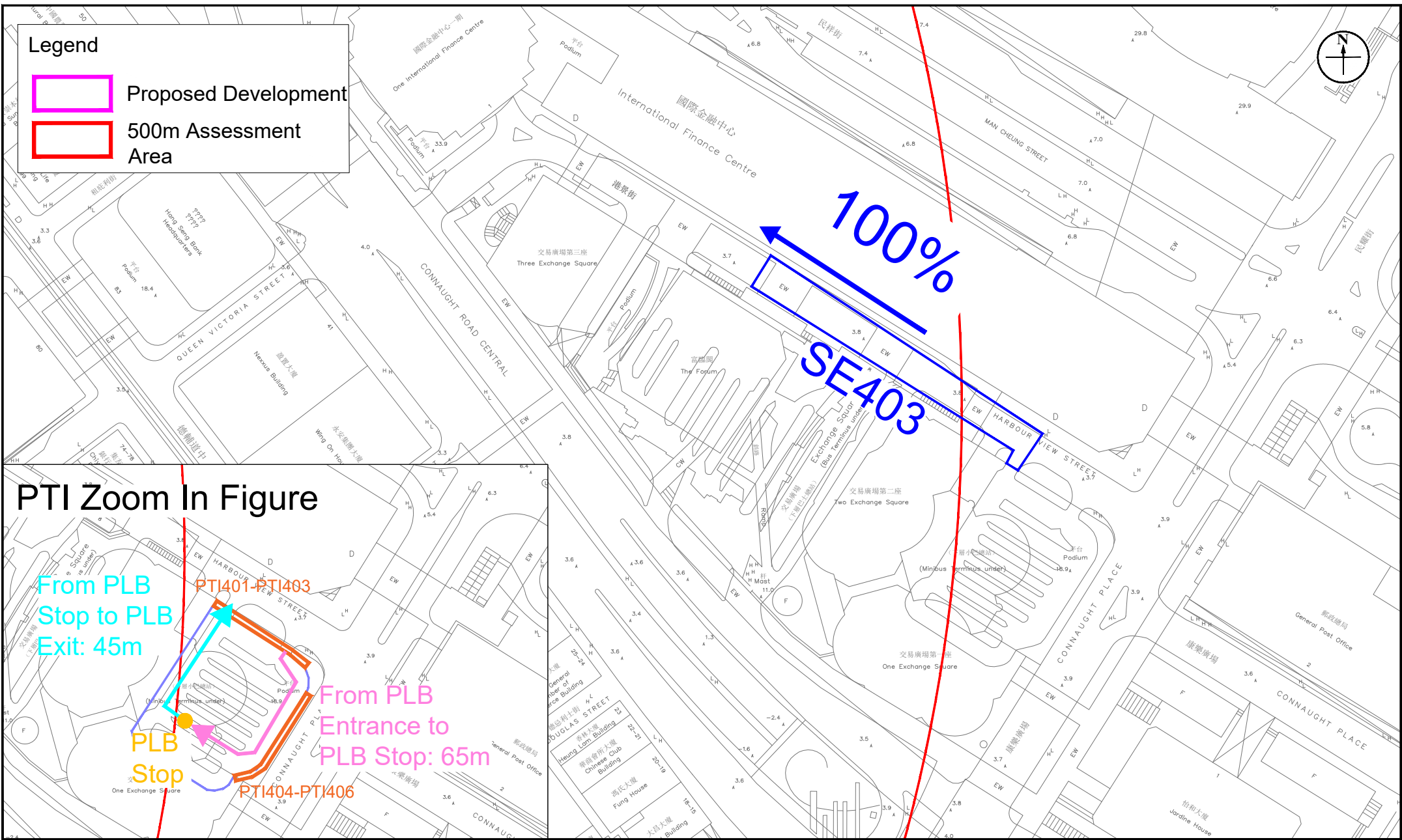


Drawn by: AW

Checked by: CC

Rev.: 1.1

Date: Feb 2024



**Appendix: 4.6**



**Title:** Public Transport Interchange Emission Sources - Exchange Square Public Light Bus Terminus (LPG)

Drawn by: AW

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

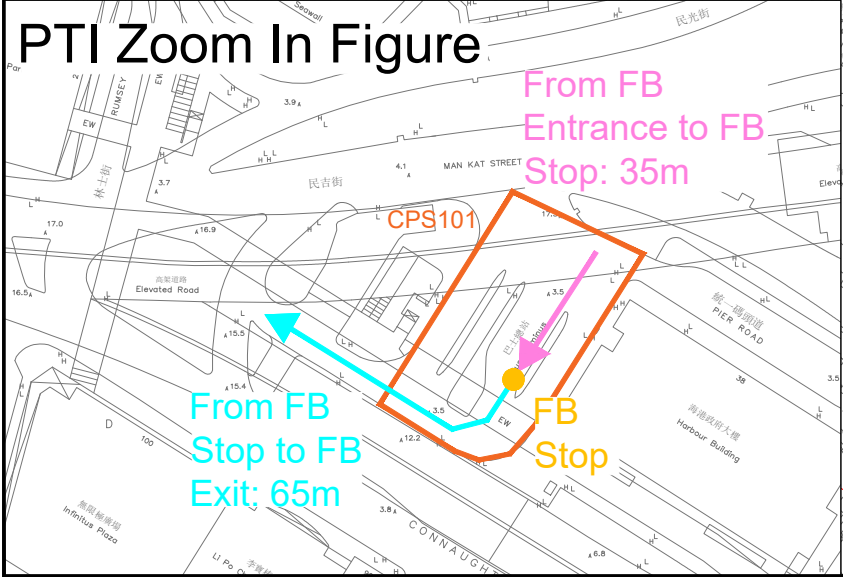
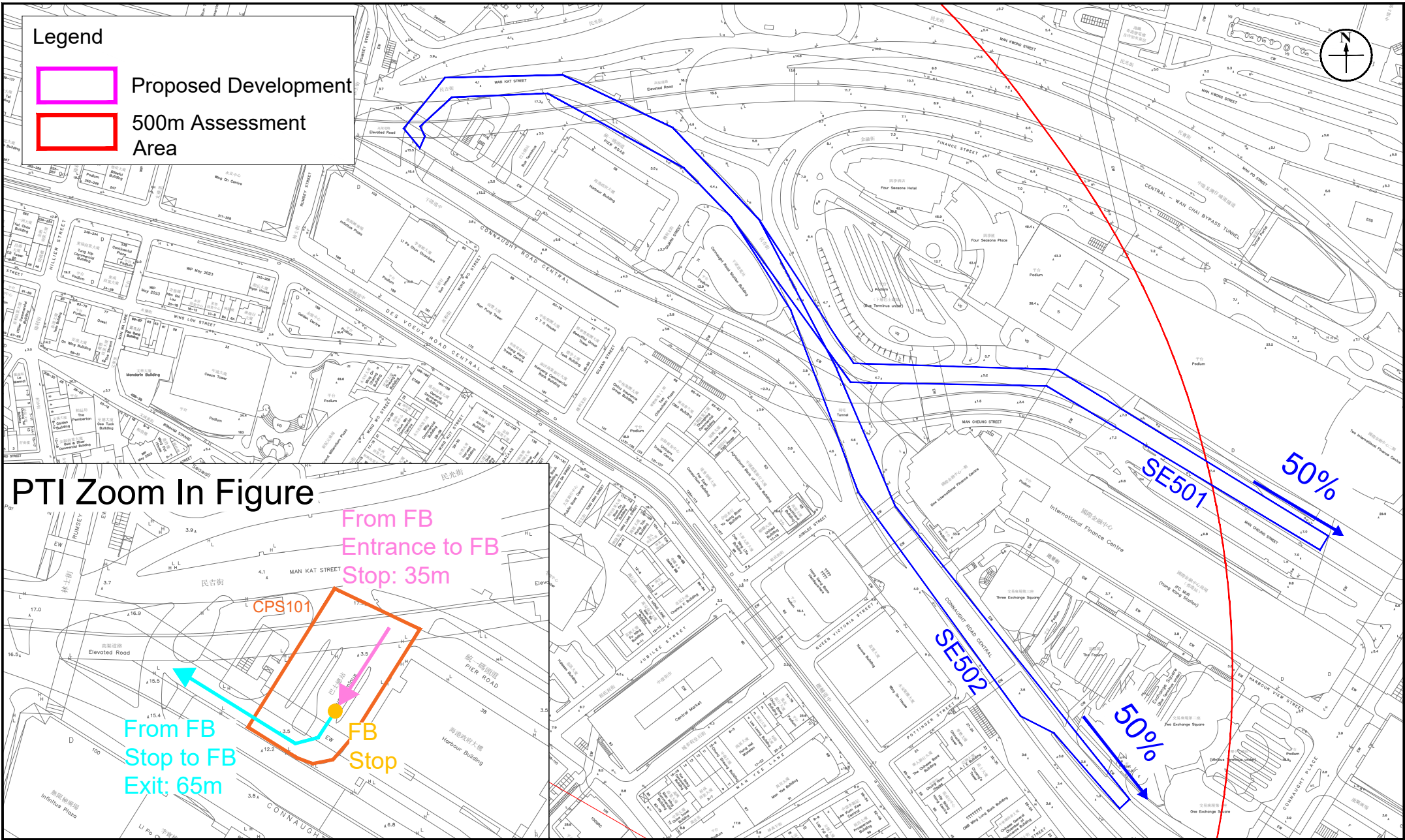
Checked by: CC

Rev.: 1.1

Date: Feb 2024

**Legend**

- Proposed Development
- 500m Assessment Area



<b>Appendix:</b> 4.6		<b>RAMBOLL</b>
<b>Title:</b> Public Transport Interchange Emission Sources - Man Kat Street Bus Terminus		Drawn by: AW
<b>Project:</b> Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan		Checked by: CC
		Rev.: 1.1
		Date: Feb 2024

**Emission Inventory for AERMOD Model - Start Emission Outside Bus Terminus (Year 2030 - Q1)**

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate	
	ID		(m)	(m)			NO	NO2
Emission Outside Terminus								
Hong Kong Station Bus Terminus - Franchised Bus	SE101	AREAPOLY	834123.9	816397.2	6.4	3.9	8.75E-07	6.92E-08
			834140.7	816398.7				
			834141.3	816390.5				
			834132.2	816389.5				
			834152.1	816334.9				
			834174.2	816317.6				
			834249.9	816312.4				
			834308.3	816288.8				
			834479.1	816182.3				
			834467.8	816161.6				
			834295.4	816269.7				
			834300.3	816277.5				
			834465.7	816175.8				
			834468.0	816179.7				
			834293.4	816285.5				
	834246.2	816302.0						
	834173.8	816307.5						
	834146.7	816329.5						
	SE102	AREAPOLY	834123.9	816397.2	5.6	3.9	6.34E-07	5.02E-08
			834140.7	816398.7				
			834141.3	816390.5				
			834132.2	816389.5				
			834152.1	816334.9				
			834174.2	816317.6				
			834249.9	816312.4				
			834308.2	816288.9				
			834489.6	816175.7				
			834436.2	816092.8				
			834358.1	816143.9				
			834351.4	816133.3				
			834337.9	816140.0				
			834341.4	816145.8				
			834346.5	816142.7				
	834363.3	816151.5						
	834434.1	816104.8						
	834478.0	816173.7						
	834293.4	816285.5						
	834246.2	816302.0						
	834173.8	816307.5						
	834146.7	816329.5						
	SE103	AREAPOLY	834123.9	816397.2	5.5	3.9	6.05E-07	4.79E-08
			834140.7	816398.7				
834141.3			816390.5					
834132.2			816389.5					
834152.1			816334.9					
834174.2			816317.6					
834249.9			816312.4					
834308.2			816288.9					
834489.6			816175.7					
834428.7			816081.2					
834502.7			816035.7					
834496.4			816025.5					
834421.1			816071.9					
834421.0			816084.2					
834478.0			816173.7					
834293.4	816285.5							
834246.2	816302.0							
834173.8	816307.5							
834146.7	816329.5							
Hong Kong Station Bus Terminus - Public Light Bus (Diesel)	SE201	AREAPOLY	834140.7	816398.7	6	2.6	6.97E-07	2.71E-07
			834141.3	816390.5				
			834132.2	816389.5				
			834152.1	816334.9				
			834174.2	816317.6				
			834249.9	816312.4				
			834308.3	816288.8				
			834535.9	816142.4				
			834532.5	816136.4				
			834293.4	816285.5				
			834246.2	816302.0				
			834173.8	816307.5				
834146.7	816329.5							
834123.9	816397.2							

**Emission Inventory for AERMOD Model - Start Emission Outside Bus Terminus (Year 2030 - Q2)**

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate	
	ID		(m)	(m)			NO	NO2
Emission Outside Terminus								
Hong Kong Station Bus Terminus - Franchised Bus	SE101	AREAPOLY	834123.9	816397.2	6.4	3.9	8.75E-07	6.92E-08
			834140.7	816398.7				
			834141.3	816390.5				
			834132.2	816389.5				
			834152.1	816334.9				
			834174.2	816317.6				
			834249.9	816312.4				
			834308.3	816288.8				
			834479.1	816182.3				
			834467.8	816161.6				
			834295.4	816269.7				
			834300.3	816277.5				
			834465.7	816175.8				
			834468.0	816179.7				
			834293.4	816285.5				
	834246.2	816302.0						
	834173.8	816307.5						
	834146.7	816329.5						
	SE102	AREAPOLY	834123.9	816397.2	5.6	3.9	6.34E-07	5.02E-08
			834140.7	816398.7				
			834141.3	816390.5				
			834132.2	816389.5				
			834152.1	816334.9				
			834174.2	816317.6				
			834249.9	816312.4				
			834308.2	816288.9				
			834489.6	816175.7				
			834436.2	816092.8				
			834358.1	816143.9				
			834351.4	816133.3				
			834337.9	816140.0				
			834341.4	816145.8				
			834346.5	816142.7				
	834363.3	816151.5						
	834434.1	816104.8						
	834478.0	816173.7						
	834293.4	816285.5						
	834246.2	816302.0						
	834173.8	816307.5						
	834146.7	816329.5						
	SE103	AREAPOLY	834123.9	816397.2	5.5	3.9	6.05E-07	4.79E-08
			834140.7	816398.7				
834141.3			816390.5					
834132.2			816389.5					
834152.1			816334.9					
834174.2			816317.6					
834249.9			816312.4					
834308.2			816288.9					
834489.6			816175.7					
834428.7			816081.2					
834502.7			816035.7					
834496.4			816025.5					
834421.1			816071.9					
834421.0			816084.2					
834478.0			816173.7					
834293.4	816285.5							
834246.2	816302.0							
834173.8	816307.5							
834146.7	816329.5							
Hong Kong Station Bus Terminus - Public Light Bus (Diesel)	SE201	AREAPOLY	834140.7	816398.7	6	2.6	6.97E-07	2.71E-07
			834141.3	816390.5				
			834132.2	816389.5				
			834152.1	816334.9				
			834174.2	816317.6				
			834249.9	816312.4				
			834308.3	816288.8				
			834535.9	816142.4				
			834532.5	816136.4				
			834293.4	816285.5				
			834246.2	816302.0				
			834173.8	816307.5				
834146.7	816329.5							
834123.9	816397.2							



**Emission Inventory for AERMOD Model - Start Emission Outside Bus Terminus (Year 2030 - Q3)**

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate	
	ID		(m)	(m)			NO	NO2
Emission Outside Terminus								
Hong Kong Station Bus Terminus - Franchised Bus	SE101	AREAPOLY	834123.9	816397.2	6.4	3.9	8.75E-07	6.92E-08
			834140.7	816398.7				
			834141.3	816390.5				
			834132.2	816389.5				
			834152.1	816334.9				
			834174.2	816317.6				
			834249.9	816312.4				
			834308.3	816288.8				
			834479.1	816182.3				
			834467.8	816161.6				
			834295.4	816269.7				
			834300.3	816277.5				
			834465.7	816175.8				
			834468.0	816179.7				
			834293.4	816285.5				
	834246.2	816302.0						
	834173.8	816307.5						
	834146.7	816329.5						
	SE102	AREAPOLY	834123.9	816397.2	5.6	3.9	6.34E-07	5.02E-08
			834140.7	816398.7				
			834141.3	816390.5				
			834132.2	816389.5				
			834152.1	816334.9				
			834174.2	816317.6				
			834249.9	816312.4				
			834308.2	816288.9				
			834489.6	816175.7				
			834436.2	816092.8				
			834358.1	816143.9				
			834351.4	816133.3				
			834337.9	816140.0				
			834341.4	816145.8				
			834346.5	816142.7				
	834363.3	816151.5						
	834434.1	816104.8						
	834478.0	816173.7						
	834293.4	816285.5						
	834246.2	816302.0						
	834173.8	816307.5						
	834146.7	816329.5						
	SE103	AREAPOLY	834123.9	816397.2	5.5	3.9	6.05E-07	4.79E-08
			834140.7	816398.7				
834141.3			816390.5					
834132.2			816389.5					
834152.1			816334.9					
834174.2			816317.6					
834249.9			816312.4					
834308.2			816288.9					
834489.6			816175.7					
834428.7			816081.2					
834502.7			816035.7					
834496.4			816025.5					
834421.1			816071.9					
834421.0			816084.2					
834478.0			816173.7					
834293.4	816285.5							
834246.2	816302.0							
834173.8	816307.5							
834146.7	816329.5							
Hong Kong Station Bus Terminus - Public Light Bus (Diesel)	SE201	AREAPOLY	834140.7	816398.7	6	2.6	6.96E-07	2.71E-07
			834141.3	816390.5				
			834132.2	816389.5				
			834152.1	816334.9				
			834174.2	816317.6				
			834249.9	816312.4				
			834308.3	816288.8				
			834535.9	816142.4				
			834532.5	816136.4				
			834293.4	816285.5				
			834246.2	816302.0				
			834173.8	816307.5				
834146.7	816329.5							
834123.9	816397.2							

**Emission Inventory for AERMOD Model - Start Emission Outside Bus Terminus (Year 2030 - Q4)**

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate	
	ID		(m)	(m)			NO	NO2
Emission Outside Terminus								
Hong Kong Station Bus Terminus - Franchised Bus	SE101	AREAPOLY	834123.9	816397.2	6.4	3.9	8.75E-07	6.92E-08
			834140.7	816398.7				
			834141.3	816390.5				
			834132.2	816389.5				
			834152.1	816334.9				
			834174.2	816317.6				
			834249.9	816312.4				
			834308.3	816288.8				
			834479.1	816182.3				
			834467.8	816161.6				
			834295.4	816269.7				
			834300.3	816277.5				
			834465.7	816175.8				
			834468.0	816179.7				
			834293.4	816285.5				
	834246.2	816302.0						
	834173.8	816307.5						
	834146.7	816329.5						
	SE102	AREAPOLY	834123.9	816397.2	5.6	3.9	6.34E-07	5.02E-08
			834140.7	816398.7				
			834141.3	816390.5				
			834132.2	816389.5				
			834152.1	816334.9				
			834174.2	816317.6				
			834249.9	816312.4				
			834308.2	816288.9				
			834489.6	816175.7				
			834436.2	816092.8				
			834358.1	816143.9				
			834351.4	816133.3				
			834337.9	816140.0				
			834341.4	816145.8				
			834346.5	816142.7				
	834363.3	816151.5						
	834434.1	816104.8						
	834478.0	816173.7						
	834293.4	816285.5						
	834246.2	816302.0						
	834173.8	816307.5						
	834146.7	816329.5						
	SE103	AREAPOLY	834123.9	816397.2	5.5	3.9	6.05E-07	4.79E-08
			834140.7	816398.7				
834141.3			816390.5					
834132.2			816389.5					
834152.1			816334.9					
834174.2			816317.6					
834249.9			816312.4					
834308.2			816288.9					
834489.6			816175.7					
834428.7			816081.2					
834502.7			816035.7					
834496.4			816025.5					
834421.1			816071.9					
834421.0			816084.2					
834478.0			816173.7					
834293.4	816285.5							
834246.2	816302.0							
834173.8	816307.5							
834146.7	816329.5							
Hong Kong Station Bus Terminus - Public Light Bus (Diesel)	SE201	AREAPOLY	834140.7	816398.7	6	2.6	6.97E-07	2.71E-07
			834141.3	816390.5				
			834132.2	816389.5				
			834152.1	816334.9				
			834174.2	816317.6				
			834249.9	816312.4				
			834308.3	816288.8				
			834535.9	816142.4				
			834532.5	816136.4				
			834293.4	816285.5				
			834246.2	816302.0				
			834173.8	816307.5				
834146.7	816329.5							
834123.9	816397.2							

Emission Inventory for AERMOD Model - Start Emission Outside Bus Terminus (Year 2030 - Q1)

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate	
	ID		(m)	(m)			NO	NO2
Emission Outside Terminus								
Exchange Square Bus Terminus - Franchised Bus								
SE301	AREAPOLY	834302.7	816087.6	4.1	3.9	3.54E-06	2.89E-07	
		834311.0	816078.9					
		834311.1	816072.3					
		834376.6	816018.9					
		834530.5	815937.0					
		834591.4	815914.9					
		834825.4	815846.8					
		834878.7	815819.2					
		834873.7	815810.2					
		834823.5	815839.9					
		834585.8	815909.4					
		834524.5	815931.6					
		834385.6	815993.8					
		834297.2	816071.8					
		834302.7	816087.6					
SE302	AREAPOLY	834311.0	816078.9	4	3.9	4.40E-07	3.59E-08	
		834311.1	816072.3					
		834353.7	816022.2					
		834352.5	816010.5					
		834342.0	816000.2					
		834315.5	815998.8					
		834244.6	816087.4					
		834239.8	816102.9					
		834177.3	816179.5					
		834131.7	816144.6					
		834267.0	815964.6					
		834261.8	815961.0					
		834122.5	816146.3					
		834176.2	816187.7					
		834261.2	816082.4					
SE303	AREAPOLY	834329.6	816006.7	7.9	3.9	7.79E-07	6.35E-08	
		834338.4	816006.2					
		834346.6	816013.9					
		834345.1	816024.8					
		834297.2	816071.8					
		834302.7	816087.6					
		834311.0	816078.9					
		834311.1	816072.3					
		834353.7	816022.2					
		834352.5	816010.5					
		834342.0	816000.2					
		834315.5	815998.8					
		834244.6	816087.4					
		834239.8	816102.9					
		834141.6	816223.4					
833984.6	816098.4							
SE304	AREAPOLY	833949.2	816126.3	3.9	3.9	1.98E-07	1.61E-08	
		833955.8	816134.6					
		833986.9	816110.3					
		834142.4	816233.8					
		834261.2	816082.4					
		834329.6	816006.7					
		834338.4	816006.2					
		834346.6	816013.9					
		834345.1	816024.8					
		834297.2	816071.8					
		834302.7	816087.6					
		834311.0	816078.9					
		834311.1	816072.3					
		834353.7	816022.2					
		834352.5	816010.5					
SE305	AREAPOLY	834342.0	816000.2	6.9	3.9	1.84E-07	1.50E-08	
		834315.5	815998.8					
		834244.6	816087.4					
		834239.8	816102.9					
		834140.5	816236.4					
		834089.1	816293.4					
		833977.0	816374.4					
		833981.4	816381.4					
		834117.7	816310.9					
		834144.6	816278.0					
		834159.0	816237.6					
		834249.0	816112.8					
		834261.2	816082.4					
		834329.6	816006.7					
		834338.4	816006.2					
834346.6	816013.9							
834345.1	816024.8							
834297.2	816071.8							
834302.7	816087.6							
834311.0	816078.9							
834311.1	816072.3							
834353.7	816022.2							
834352.5	816010.5							
834342.0	816000.2							
834315.5	815998.8							
834244.6	816087.4							
834242.6	816108.0							
834150.0	816235.9							
834138.2	816274.6							
834113.2	816305.0							

Exchange Square Bus Terminus - Public Light Bus (Diesel)	SE401	AREAPOLY	834538.8	815934.0	3.7	2.6	1.00E-07	3.90E-08							
			834376.6	816018.9											
			834299.8	816079.2											
			834213.5	816193.6											
			834243.3	816215.4											
			834386.8	816125.1											
			834384.8	816121.3											
			834388.2	816119.1											
			834395.6	816130.2											
			834249.3	816219.6											
			834237.0	816218.2											
			834199.1	816193.4											
			834291.8	816077.7											
			834385.6	815993.8											
			834536.2	815927.5											
			Exchange Square Bus Terminus - Public Light Bus (Diesel)	SE402					AREAPOLY	834395.6	816130.2	3.8	2.6	1.08E-07	4.21E-08
										834388.2	816119.1				
834384.8	816121.3														
834386.8	816125.1														
834243.3	816215.4														
834213.5	816193.6														
834299.8	816079.2														
834353.7	816022.2														
834352.5	816010.5														
834342.0	816000.2														
834315.5	815998.8														
834244.6	816087.4														
834216.8	816132.2														
834229.0	816139.7														
834261.2	816082.4														
834329.6	816006.7														
834338.4	816006.2														
834346.6	816013.9														
834345.1	816024.8														
834291.8	816077.7														
834199.1	816193.4														
834237.0	816218.2														
834249.3	816219.6														
Exchange Square Bus Terminus - Public Light Bus (LPG)	SE403	AREAPOLY	834313.9	816183.8	3.8	2.6	2.70E-06	1.36E-08							
			834308.1	816174.5											
			834386.8	816125.1											
			834384.8	816121.3											
			834388.2	816119.1											
			834395.6	816130.2											

Emission Inventory for AERMOD Model - Start Emission Outside Bus Terminus (Year 2030 - Q2)

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate	
	ID		(m)	(m)			NO	NO2
Emission Outside Terminus								
Exchange Square Bus Terminus - Franchised Bus								
SE301	AREAPOLY	834302.7	816087.6	4.1	3.9	3.54E-06	2.89E-07	
		834311.0	816078.9					
		834311.1	816072.3					
		834376.6	816018.9					
		834530.5	815937.0					
		834591.4	815914.9					
		834825.4	815846.8					
		834878.7	815819.2					
		834873.7	815810.2					
		834823.5	815839.9					
		834585.8	815909.4					
		834524.5	815931.6					
		834385.6	815993.8					
		834297.2	816071.8					
		834302.7	816087.6					
SE302	AREAPOLY	834311.0	816078.9	4	3.9	4.40E-07	3.59E-08	
		834311.1	816072.3					
		834353.7	816022.2					
		834352.5	816010.5					
		834342.0	816000.2					
		834315.5	815998.8					
		834244.6	816087.4					
		834239.8	816102.9					
		834177.3	816179.5					
		834131.7	816144.6					
		834267.0	815964.6					
		834261.8	815961.0					
		834122.5	816146.3					
		834176.2	816187.7					
		834261.2	816082.4					
SE303	AREAPOLY	834329.6	816006.7	7.9	3.9	7.79E-07	6.35E-08	
		834338.4	816006.2					
		834346.6	816013.9					
		834345.1	816024.8					
		834297.2	816071.8					
		834302.7	816087.6					
		834311.0	816078.9					
		834311.1	816072.3					
		834353.7	816022.2					
		834352.5	816010.5					
		834342.0	816000.2					
		834315.5	815998.8					
		834244.6	816087.4					
		834239.8	816102.9					
		834141.6	816223.4					
833984.6	816098.4							
SE304	AREAPOLY	833949.2	816126.3	3.9	3.9	1.98E-07	1.61E-08	
		833955.8	816134.6					
		833986.9	816110.3					
		834142.4	816233.8					
		834261.2	816082.4					
		834329.6	816006.7					
		834338.4	816006.2					
		834346.6	816013.9					
		834345.1	816024.8					
		834297.2	816071.8					
		834302.7	816087.6					
		834311.0	816078.9					
		834311.1	816072.3					
		834353.7	816022.2					
		834352.5	816010.5					
SE305	AREAPOLY	834342.0	816000.2	6.9	3.9	1.84E-07	1.50E-08	
		834315.5	815998.8					
		834244.6	816087.4					
		834239.8	816102.9					
		834140.5	816236.4					
		834089.1	816293.4					
		833977.0	816374.4					
		833981.4	816381.4					
		834117.7	816310.9					
		834144.6	816278.0					
		834159.0	816237.6					
		834249.0	816112.8					
		834261.2	816082.4					
		834329.6	816006.7					
		834338.4	816006.2					
834346.6	816013.9							
834345.1	816024.8							
834297.2	816071.8							
834302.7	816087.6							
834311.0	816078.9							
834311.1	816072.3							
834353.7	816022.2							
834352.5	816010.5							
834342.0	816000.2							
834315.5	815998.8							
834244.6	816087.4							
834242.6	816108.0							
834150.0	816235.9							
834138.2	816274.6							
834113.2	816305.0							

Exchange Square Bus Terminus - Public Light Bus (Diesel)	SE401	AREAPOLY	834538.8	815934.0	3.7	2.6	1.00E-07	3.90E-08	
			834376.6	816018.9					
			834299.8	816079.2					
			834213.5	816193.6					
			834243.3	816215.4					
			834386.8	816125.1					
			834384.8	816121.3					
			834388.2	816119.1					
			834395.6	816130.2					
			834249.3	816219.6					
			834237.0	816218.2					
			834199.1	816193.4					
			834291.8	816077.7					
	834385.6	815993.8							
	834536.2	815927.5							
	Exchange Square Bus Terminus - Public Light Bus (Diesel)	SE402	AREAPOLY	834395.6	816130.2	3.8	2.6	1.08E-07	4.21E-08
				834388.2	816119.1				
				834384.8	816121.3				
				834386.8	816125.1				
				834243.3	816215.4				
834213.5				816193.6					
834299.8				816079.2					
834353.7				816022.2					
834352.5				816010.5					
834342.0				816000.2					
834315.5				815998.8					
834244.6				816087.4					
834216.8				816132.2					
834229.0				816139.7					
834261.2				816082.4					
834329.6				816006.7					
834338.4				816006.2					
834346.6				816013.9					
834345.1				816024.8					
834291.8				816077.7					
834199.1	816193.4								
Exchange Square Bus Terminus - Public Light Bus (LPG)	SE403	AREAPOLY	834313.9	816183.8	3.8	2.6	2.44E-06	1.23E-08	
			834308.1	816174.5					
			834386.8	816125.1					
			834384.8	816121.3					
			834388.2	816119.1					
834395.6	816130.2								

Emission Inventory for AERMOD Model - Start Emission Outside Bus Terminus (Year 2030 - Q3)

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate	
	ID		(m)	(m)			NO	NO2
Emission Outside Terminus								
Exchange Square Bus Terminus - Franchised Bus								
SE301	AREAPOLY	834302.7	816087.6	4.1	3.9	3.54E-06	2.89E-07	
		834311.0	816078.9					
		834311.1	816072.3					
		834376.6	816018.9					
		834530.5	815937.0					
		834591.4	815914.9					
		834825.4	815846.8					
		834878.7	815819.2					
		834873.7	815810.2					
		834823.5	815839.9					
		834585.8	815909.4					
		834524.5	815931.6					
		834385.6	815993.8					
		834297.2	816071.8					
		834302.7	816087.6					
SE302	AREAPOLY	834311.0	816078.9	4	3.9	4.40E-07	3.59E-08	
		834311.1	816072.3					
		834353.7	816022.2					
		834352.5	816010.5					
		834342.0	816000.2					
		834315.5	815998.8					
		834244.6	816087.4					
		834239.8	816102.9					
		834177.3	816179.5					
		834131.7	816144.6					
		834267.0	815964.6					
		834261.8	815961.0					
		834122.5	816146.3					
		834176.2	816187.7					
		834261.2	816082.4					
SE303	AREAPOLY	834329.6	816006.7	7.9	3.9	7.79E-07	6.35E-08	
		834338.4	816006.2					
		834346.6	816013.9					
		834345.1	816024.8					
		834297.2	816071.8					
		834302.7	816087.6					
		834311.0	816078.9					
		834311.1	816072.3					
		834353.7	816022.2					
		834352.5	816010.5					
		834342.0	816000.2					
		834315.5	815998.8					
		834244.6	816087.4					
		834239.8	816102.9					
		834141.6	816223.4					
833984.6	816098.4							
SE304	AREAPOLY	833949.2	816126.3	3.9	3.9	1.98E-07	1.61E-08	
		833955.8	816134.6					
		833986.9	816110.3					
		834142.4	816233.8					
		834261.2	816082.4					
		834329.6	816006.7					
		834338.4	816006.2					
		834346.6	816013.9					
		834345.1	816024.8					
		834297.2	816071.8					
		834302.7	816087.6					
		834311.0	816078.9					
		834311.1	816072.3					
		834353.7	816022.2					
		834352.5	816010.5					
SE305	AREAPOLY	834342.0	816000.2	6.9	3.9	1.84E-07	1.50E-08	
		834315.5	815998.8					
		834244.6	816087.4					
		834239.8	816102.9					
		834140.5	816236.4					
		834089.1	816293.4					
		833977.0	816374.4					
		833981.4	816381.4					
		834117.7	816310.9					
		834144.6	816278.0					
		834159.0	816237.6					
		834249.0	816112.8					
		834261.2	816082.4					
		834329.6	816006.7					
		834338.4	816006.2					
834346.6	816013.9							
834345.1	816024.8							
834297.2	816071.8							
834302.7	816087.6							
834311.0	816078.9							
834311.1	816072.3							
834353.7	816022.2							
834352.5	816010.5							
834342.0	816000.2							
834315.5	815998.8							
834244.6	816087.4							
834242.6	816108.0							
834150.0	816235.9							
834138.2	816274.6							
834113.2	816305.0							

Exchange Square Bus Terminus - Public Light Bus (Diesel)	SE401	AREAPOLY	834538.8	815934.0	3.7	2.6	1.00E-07	3.90E-08							
			834376.6	816018.9											
			834299.8	816079.2											
			834213.5	816193.6											
			834243.3	816215.4											
			834386.8	816125.1											
			834384.8	816121.3											
			834388.2	816119.1											
			834395.6	816130.2											
			834249.3	816219.6											
			834237.0	816218.2											
			834199.1	816193.4											
			834291.8	816077.7											
			834385.6	815993.8											
			834536.2	815927.5											
			Exchange Square Bus Terminus - Public Light Bus (Diesel)	SE402					AREAPOLY	834395.6	816130.2	3.8	2.6	1.08E-07	4.21E-08
										834388.2	816119.1				
834384.8	816121.3														
834386.8	816125.1														
834243.3	816215.4														
834213.5	816193.6														
834299.8	816079.2														
834353.7	816022.2														
834352.5	816010.5														
834342.0	816000.2														
834315.5	815998.8														
834244.6	816087.4														
834216.8	816132.2														
834229.0	816139.7														
834261.2	816082.4														
834329.6	816006.7														
834338.4	816006.2														
834346.6	816013.9														
834345.1	816024.8														
834291.8	816077.7														
834199.1	816193.4														
834237.0	816218.2														
834249.3	816219.6														
Exchange Square Bus Terminus - Public Light Bus (LPG)	SE403	AREAPOLY	834313.9	816183.8	3.8	2.6	2.38E-06	1.20E-08							
			834308.1	816174.5											
			834386.8	816125.1											
			834384.8	816121.3											
			834388.2	816119.1											
834395.6	816130.2														



Emission Inventory for AERMOD Model - Start Emission Outside Bus Terminus (Year 2030 - Q4)

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate	
	ID		(m)	(m)			NO	NO2
Emission Outside Terminus								
Exchange Square Bus Terminus - Franchised Bus								
SE301	AREAPOLY	834302.7	816087.6	4.1	3.9	3.54E-06	2.89E-07	
		834311.0	816078.9					
		834311.1	816072.3					
		834376.6	816018.9					
		834530.5	815937.0					
		834591.4	815914.9					
		834825.4	815846.8					
		834878.7	815819.2					
		834873.7	815810.2					
		834823.5	815839.9					
		834585.8	815909.4					
		834524.5	815931.6					
		834385.6	815993.8					
		834297.2	816071.8					
		834302.7	816087.6					
SE302	AREAPOLY	834311.0	816078.9	4	3.9	4.40E-07	3.59E-08	
		834311.1	816072.3					
		834353.7	816022.2					
		834352.5	816010.5					
		834342.0	816000.2					
		834315.5	815998.8					
		834244.6	816087.4					
		834239.8	816102.9					
		834177.3	816179.5					
		834131.7	816144.6					
		834267.0	815964.6					
		834261.8	815961.0					
		834122.5	816146.3					
		834176.2	816187.7					
		834261.2	816082.4					
SE303	AREAPOLY	834329.6	816006.7	7.9	3.9	7.79E-07	6.35E-08	
		834338.4	816006.2					
		834346.6	816013.9					
		834345.1	816024.8					
		834297.2	816071.8					
		834302.7	816087.6					
		834311.0	816078.9					
		834311.1	816072.3					
		834353.7	816022.2					
		834352.5	816010.5					
		834342.0	816000.2					
		834315.5	815998.8					
		834244.6	816087.4					
		834239.8	816102.9					
		834141.6	816223.4					
833984.6	816098.4							
SE304	AREAPOLY	833949.2	816126.3	3.9	3.9	1.98E-07	1.61E-08	
		833955.8	816134.6					
		833986.9	816110.3					
		834142.4	816233.8					
		834261.2	816082.4					
		834329.6	816006.7					
		834338.4	816006.2					
		834346.6	816013.9					
		834345.1	816024.8					
		834297.2	816071.8					
		834302.7	816087.6					
		834311.0	816078.9					
		834311.1	816072.3					
		834353.7	816022.2					
		834352.5	816010.5					
834342.0	816000.2							
SE305	AREAPOLY	834315.5	815998.8	6.9	3.9	1.84E-07	1.50E-08	
		834244.6	816087.4					
		834239.8	816102.9					
		834140.5	816236.4					
		834089.1	816293.4					
		833977.0	816374.4					
		833960.1	816372.1					
		833965.3	816380.9					
		834095.1	816296.7					
		834150.0	816235.9					
		834261.2	816082.4					
		834329.6	816006.7					
		834338.4	816006.2					
		834346.6	816013.9					
		834345.1	816024.8					
834302.7	816087.6							
SE305	AREAPOLY	834311.0	816078.9	6.9	3.9	1.84E-07	1.50E-08	
		834311.1	816072.3					
		834353.7	816022.2					
		834352.5	816010.5					
		834342.0	816000.2					
		834315.5	815998.8					
		834244.6	816087.4					
		834242.6	816108.0					
		834150.0	816235.9					
		834138.2	816274.6					
		834113.2	816305.0					

Exchange Square Bus Terminus - Public Light Bus (Diesel)	SE401	AREAPOLY	834538.8	815934.0	3.7	2.6	1.00E-07	3.90E-08	
			834376.6	816018.9					
			834299.8	816079.2					
			834213.5	816193.6					
			834243.3	816215.4					
			834386.8	816125.1					
			834384.8	816121.3					
			834388.2	816119.1					
			834395.6	816130.2					
			834249.3	816219.6					
			834237.0	816218.2					
			834199.1	816193.4					
			834291.8	816077.7					
	834385.6	815993.8							
	834536.2	815927.5							
	Exchange Square Bus Terminus - Public Light Bus (Diesel)	SE402	AREAPOLY	834395.6	816130.2	3.8	2.6	1.08E-07	4.21E-08
				834388.2	816119.1				
				834384.8	816121.3				
				834386.8	816125.1				
				834243.3	816215.4				
834213.5				816193.6					
834299.8				816079.2					
834353.7				816022.2					
834352.5				816010.5					
834342.0				816000.2					
834315.5				815998.8					
834244.6				816087.4					
834216.8				816132.2					
834229.0				816139.7					
834261.2				816082.4					
834329.6				816006.7					
834338.4				816006.2					
834346.6				816013.9					
834345.1				816024.8					
834291.8				816077.7					
834199.1	816193.4								
Exchange Square Bus Terminus - Public Light Bus (LPG)	SE403	AREAPOLY	834313.9	816183.8	3.8	2.6	2.84E-06	1.43E-08	
			834308.1	816174.5					
			834386.8	816125.1					
			834384.8	816121.3					
			834388.2	816119.1					
834395.6	816130.2								

**Emission Inventory for AERMOD Model - Start Emission Outside Bus Terminus (Year 2030 - Q1)**

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate	
	ID		(m)	(m)			NO	NO2
Emission Outside Terminus								
Man Kat Street Bus Terminus - Franchised Bus	SE501	AREAPOLY	833911.0	816436.2	5.8	3.9	1.02E-06	8.04E-08
			833913.9	816442.7				
833911.2			816448.4					
833929.2			816464.9					
833983.4			816467.1					
834060.6			816424.8					
834087.5			816396.8					
834155.0			816303.4					
834266.2			816301.3					
834420.8			816208.3					
834425.6			816216.2					
834272.2			816310.5					
834156.6			816314.2					
834103.4			816395.3					
834054.4			816447.6					
833992.0			816477.6					
833925.3			816476.1					
833901.9	816447.3							
	SE502	AREAPOLY	833911.0	816436.2	4.1	3.9	8.73E-07	6.86E-08
			833913.9	816442.7				
			833911.2	816448.4				
			833929.2	816464.9				
			833983.4	816467.1				
			834060.6	816424.8				
			834087.5	816396.8				
			834121.2	816344.1				
			834159.2	816241.5				
			834251.2	816114.3				
			834270.4	816104.4				
			834307.4	816061.8				
			834313.0	816067.0				
			834180.0	816233.7				
			834147.1	816311.0				
			834103.4	816395.3				
			834054.4	816447.6				
833992.0	816477.6							
833925.3	816476.1							
833901.9	816447.3							

**Emission Inventory for AERMOD Model - Start Emission Outside Bus Terminus (Year 2030 - Q2)**

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate	
	ID		(m)	(m)			NO	NO2
Emission Outside Terminus								
Man Kat Street Bus Terminus - Franchised Bus	SE501	AREAPOLY	833911.0	816436.2	5.8	3.9	1.02E-06	8.04E-08
			833913.9	816442.7				
833911.2			816448.4					
833929.2			816464.9					
833983.4			816467.1					
834060.6			816424.8					
834087.5			816396.8					
834155.0			816303.4					
834266.2			816301.3					
834420.8			816208.3					
834425.6			816216.2					
834272.2			816310.5					
834156.6			816314.2					
834103.4			816395.3					
834054.4			816447.6					
833992.0			816477.6					
833925.3	816476.1							
833901.9	816447.3							
	SE502	AREAPOLY	833911.0	816436.2	4.1	3.9	8.73E-07	6.86E-08
			833913.9	816442.7				
			833911.2	816448.4				
			833929.2	816464.9				
			833983.4	816467.1				
			834060.6	816424.8				
			834087.5	816396.8				
			834121.2	816344.1				
			834159.2	816241.5				
			834251.2	816114.3				
			834270.4	816104.4				
			834307.4	816061.8				
			834313.0	816067.0				
			834180.0	816233.7				
			834147.1	816311.0				
			834103.4	816395.3				
834054.4	816447.6							
833992.0	816477.6							
833925.3	816476.1							
833901.9	816447.3							

**Emission Inventory for AERMOD Model - Start Emission Outside Bus Terminus (Year 2030 - Q3)**

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate	
	ID		(m)	(m)			NO	NO2
Emission Outside Terminus								
Man Kat Street Bus Terminus - Franchised Bus	SE501	AREAPOLY	833911.0	816436.2	5.8	3.9	1.02E-06	8.04E-08
			833913.9	816442.7				
833911.2			816448.4					
833929.2			816464.9					
833983.4			816467.1					
834060.6			816424.8					
834087.5			816396.8					
834155.0			816303.4					
834266.2			816301.3					
834420.8			816208.3					
834425.6			816216.2					
834272.2			816310.5					
834156.6			816314.2					
834103.4			816395.3					
834054.4			816447.6					
833992.0			816477.6					
833925.3			816476.1					
833901.9	816447.3							
	SE502	AREAPOLY	833911.0	816436.2	4.1	3.9	8.73E-07	6.86E-08
			833913.9	816442.7				
			833911.2	816448.4				
			833929.2	816464.9				
			833983.4	816467.1				
			834060.6	816424.8				
			834087.5	816396.8				
			834121.2	816344.1				
			834159.2	816241.5				
			834251.2	816114.3				
			834270.4	816104.4				
			834307.4	816061.8				
			834313.0	816067.0				
			834180.0	816233.7				
			834147.1	816311.0				
			834103.4	816395.3				
			834054.4	816447.6				
833992.0	816477.6							
833925.3	816476.1							
833901.9	816447.3							

**Emission Inventory for AERMOD Model - Start Emission Outside Bus Terminus (Year 2030 - Q4)**

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate	
	ID		(m)	(m)			NO	NO2
Emission Outside Terminus								
Man Kat Street Bus Terminus - Franchised Bus	SE501	AREAPOLY	833911.0	816436.2	5.8	3.9	1.02E-06	8.04E-08
			833913.9	816442.7				
833911.2			816448.4					
833929.2			816464.9					
833983.4			816467.1					
834060.6			816424.8					
834087.5			816396.8					
834155.0			816303.4					
834266.2			816301.3					
834420.8			816208.3					
834425.6			816216.2					
834272.2			816310.5					
834156.6			816314.2					
834103.4			816395.3					
834054.4			816447.6					
833992.0			816477.6					
833925.3	816476.1							
833901.9	816447.3							
Man Kat Street Bus Terminus - Franchised Bus	SE502	AREAPOLY	833911.0	816436.2	4.1	3.9	8.73E-07	6.86E-08
			833913.9	816442.7				
			833911.2	816448.4				
			833929.2	816464.9				
			833983.4	816467.1				
			834060.6	816424.8				
			834087.5	816396.8				
			834121.2	816344.1				
			834159.2	816241.5				
			834251.2	816114.3				
			834270.4	816104.4				
			834307.4	816061.8				
			834313.0	816067.0				
			834180.0	816233.7				
			834147.1	816311.0				
			834103.4	816395.3				
834054.4	816447.6							
833992.0	816477.6							
833925.3	816476.1							
833901.9	816447.3							

**Emission Inventory for AERMOD Model - Emission from Nearby Bus Terminus (Year 2030 - Q1)**

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate			
	ID		(m)	(m)			NO	NO2	RSP	FSP
Emission inside Terminus										
(g/m2/s)										
Hong Kong Station Bus Terminus - Franchised Bus (Ventilation Exhaust) [1]	PTI101	AREAPOLY	834155.7	816348.6	6.1	5	5.37E-05	3.63E-06	9.44E-07	8.73E-07
			834157.5	816349.4						
			834150.4	816366.9						
			834148.7	816366.2						
			834160.5	816342.9						
	PTI102	AREAPOLY	834162.2	816340.0	6	5	5.37E-05	3.63E-06	9.44E-07	8.73E-07
			834167.3	816334.1						
			834165.9	816332.9						
			834160.9	816339.0						
			834159.1	816342.1						
Hong Kong Station Bus Terminus - Franchised Bus (Ingress, Egress and Side Openings) [1]	PTI111	AREAPOLY	834140.5	816399.0	6.4	0	5.37E-05	3.63E-06	9.44E-07	8.73E-07
			834141.5	816390.5						
			834142.9	816384.4						
			834157.5	816348.7						
			834155.7	816347.9						
			834141.1	816384.0						
			834139.7	816390.3						
	PTI112	AREAPOLY	834139.0	816398.9	6.4	2	5.37E-05	3.63E-06	9.44E-07	8.73E-07
			834140.5	816399.0						
			834141.5	816390.5						
			834142.9	816384.4						
			834157.5	816348.7						
			834155.7	816347.9						
			834141.1	816384.0						
	PTI113	AREAPOLY	834139.7	816390.3	6.4	4	5.37E-05	3.63E-06	9.44E-07	8.73E-07
			834139.0	816398.9						
			834140.5	816399.0						
			834141.5	816390.5						
			834142.9	816384.4						
			834157.5	816348.7						
			834155.7	816347.9						
	PTI114	AREAPOLY	834141.1	816384.0	5.7	0	5.37E-05	3.63E-06	9.44E-07	8.73E-07
			834139.7	816390.3						
			834220.8	816323.9						
	PTI115	AREAPOLY	834220.8	816322.0	5.7	2	5.37E-05	3.63E-06	9.44E-07	8.73E-07
			834207.5	816321.7						
			834207.5	816323.6						
	PTI116	AREAPOLY	834207.5	816323.6	5.7	4	5.37E-05	3.63E-06	9.44E-07	8.73E-07
			834220.8	816323.9						
			834220.8	816322.0						
Hong Kong Station Bus Terminus - Public Light Bus (Ventilation Exhaust) [1]	PTI201	AREAPOLY	834355.5	816349.2	7.1	4	9.10E-05	1.05E-05	1.41E-06	1.30E-06
			834361.8	816345.9						
			834361.0	816344.3						
			834354.6	816347.6						
Hong Kong Station Bus Terminus - Public Light Bus (Ingress, Egress and Side Openings) [1]	PTI211	AREAPOLY	834275.6	816389.3	7.1	0	9.10E-05	1.05E-05	1.41E-06	1.30E-06
			834274.7	816387.6						
			834267.4	816391.3						
			834268.2	816393.0						
	PTI212	AREAPOLY	834275.6	816389.3	7.1	2	9.10E-05	1.05E-05	1.41E-06	1.30E-06
			834274.7	816387.6						
			834267.4	816391.3						
			834268.2	816393.0						
	PTI213	AREAPOLY	834275.6	816389.3	7.1	4	9.10E-05	1.05E-05	1.41E-06	1.30E-06
			834274.7	816387.6						
			834267.4	816391.3						
			834268.2	816393.0						
	PTI214	AREAPOLY	834370.5	816341.6	7.1	0	9.10E-05	1.05E-05	1.41E-06	1.30E-06
			834369.6	816339.9						
			834361.8	816343.8						
			834362.6	816345.5						
	PTI215	AREAPOLY	834370.5	816341.6	7.1	2	9.10E-05	1.05E-05	1.41E-06	1.30E-06
			834369.6	816339.9						
			834361.8	816343.8						
			834362.6	816345.5						
	PTI216	AREAPOLY	834370.5	816341.6	7.1	4	9.10E-05	1.05E-05	1.41E-06	1.30E-06
			834369.6	816339.9						
			834361.8	816343.8						
			834362.6	816345.5						
PTI217	AREAPOLY	834138.3	816399.5	6.4	0	9.10E-05	1.05E-05	1.41E-06	1.30E-06	
		834140.0	816399.7							
		834141.0	816390.5							
		834139.2	816390.4							
PTI218	AREAPOLY	834138.3	816399.5	6.4	2	9.10E-05	1.05E-05	1.41E-06	1.30E-06	
		834140.0	816399.7							
		834141.0	816390.5							
		834139.2	816390.4							
PTI219	AREAPOLY	834138.3	816399.5	6.4	4	9.10E-05	1.05E-05	1.41E-06	1.30E-06	
		834140.0	816399.7							
		834141.0	816390.5							
			834139.2	816390.4						

Exchange Square Bus Terminus - Franchised Bus (Ventilation Exhaust) [1]	PTI301	AREAPOLY	834249.6	816157.2	3.7	6	6.36E-05	4.30E-06	9.46E-07	8.75E-07
			834246.9	816157.1						
			834286.3	816106.1						
			834319.3	816071.0						
			834320.8	816072.5						
			834288.2	816107.2						
Exchange Square Bus Terminus - Franchised Bus (Ingress, Egress and Side Openings) [1]	PTI311	AREAPOLY	834340.0	816055.0	3.7	0	6.36E-05	4.30E-06	9.46E-07	8.75E-07
			834338.9	816053.1						
			834318.5	816067.8						
			834283.1	816105.5						
			834243.9	816156.8						
			834247.7	816162.4						
	834250.1	816162.1								
	834246.5	816156.9								
	834284.7	816106.6								
	834319.9	816069.5								
	PTI312	AREAPOLY	834340.0	816055.0	3.7	2	6.36E-05	4.30E-06	9.46E-07	8.75E-07
			834338.9	816053.1						
			834318.5	816067.8						
			834283.1	816105.5						
			834243.9	816156.8						
			834247.7	816162.4						
	834250.1	816162.1								
	834246.5	816156.9								
	834284.7	816106.6								
	834319.9	816069.5								
	PTI313	AREAPOLY	834340.0	816055.0	3.7	4	6.36E-05	4.30E-06	9.46E-07	8.75E-07
			834338.9	816053.1						
			834318.5	816067.8						
			834283.1	816105.5						
			834243.9	816156.8						
			834247.7	816162.4						
	834250.1	816162.1								
	834246.5	816156.9								
	834284.7	816106.6								
	834319.9	816069.5								
	PTI314	AREAPOLY	834356.9	816141.7	3.8	0	6.36E-05	4.30E-06	9.46E-07	8.75E-07
			834355.8	816139.9						
			834270.7	816194.8						
	PTI315	AREAPOLY	834271.9	816196.4	3.8	2	6.36E-05	4.30E-06	9.46E-07	8.75E-07
			834356.9	816141.7						
	PTI316	AREAPOLY	834355.8	816139.9	3.8	4	6.36E-05	4.30E-06	9.46E-07	8.75E-07
834270.7			816194.8							
834271.9			816196.4							
Exchange Square Bus Terminus - Public Light Bus (Ingress, Egress and Side Openings) [1]	PTI401	AREAPOLY	834380.9	816120.8	3.7	0	1.10E-05	1.41E-06	1.73E-07	1.63E-07
			834406.0	816104.8						
			834410.9	816100.5						
			834412.2	816102.1						
			834406.9	816106.2						
	834382.0	816122.5								
	PTI402	AREAPOLY	834380.9	816120.8	3.7	2	1.10E-05	1.41E-06	1.73E-07	1.63E-07
			834406.0	816104.8						
			834410.9	816100.5						
			834412.2	816102.1						
			834406.9	816106.2						
	834382.0	816122.5								
	PTI403	AREAPOLY	834380.9	816120.8	3.7	4	1.10E-05	1.41E-06	1.73E-07	1.63E-07
			834406.0	816104.8						
			834410.9	816100.5						
			834412.2	816102.1						
			834406.9	816106.2						
	834382.0	816122.5								
	PTI404	AREAPOLY	834411.3	816092.2	3.9	0	1.10E-05	1.41E-06	1.73E-07	1.63E-07
			834396.3	816068.6						
			834393.0	816066.4						
			834387.7	816065.1						
			834388.1	816063.3						
			834393.6	816064.6						
834397.8	816067.3									
PTI405	AREAPOLY	834412.9	816091.2	3.9	2	1.10E-05	1.41E-06	1.73E-07	1.63E-07	
		834411.3	816092.2							
		834396.3	816068.6							
		834393.0	816066.4							
		834387.7	816065.1							
		834388.1	816063.3							
834393.6	816064.6									
PTI406	AREAPOLY	834397.8	816067.3	3.9	4	1.10E-05	1.41E-06	1.73E-07	1.63E-07	
		834412.9	816091.2							
		834411.3	816092.2							
		834396.3	816068.6							
		834393.0	816066.4							
		834387.7	816065.1							
834388.1	816063.3									
Man Kat Street Bus Terminus	CPS101	AREAPOLY	833955.9	816407.9	3.5	0	7.6E-06	5.1E-07	1.1E-07	1.1E-07
			833961.5	816405.8						
			833968.6	816407.2						
			833975.0	816414.6						
			833999.3	816453.2						
			833969.3	816467.5						
833938.7	816418.7									

Remark:

[1] Since the HK Station and Exchange Square bus terminus are located relatively far from the Application Site, the potential impacts from PTIs are relatively minor. The emissions are assumed to be evenly distributed via each opening/ingress/egress/exhaust point.



**Emission Inventory for AERMOD Model - Emission from Nearby Bus Terminus (Year 2030 - Q2)**

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate			
	ID		(m)	(m)			NO	NO2	RSP	FSP
Emission inside Terminus										
(g/m2/s)										
Hong Kong Station Bus Terminus - Franchised Bus (Ventilation Exhaust) [1]	PTI101	AREAPOLY	834155.7	816348.6	6.1	5	5.27E-05	3.57E-06	9.44E-07	8.73E-07
			834157.5	816349.4						
			834150.4	816366.9						
			834148.7	816366.2						
			834160.5	816342.9						
	PTI102	AREAPOLY	834162.2	816340.0	6	5	5.27E-05	3.57E-06	9.44E-07	8.73E-07
			834167.3	816334.1						
			834165.9	816332.9						
			834160.9	816339.0						
			834159.1	816342.1						
Hong Kong Station Bus Terminus - Franchised Bus (Ingress, Egress and Side Openings) [1]	PTI111	AREAPOLY	834140.5	816399.0	6.4	0	5.27E-05	3.57E-06	9.44E-07	8.73E-07
			834141.5	816390.5						
			834142.9	816384.4						
			834157.5	816348.7						
			834155.7	816347.9						
			834141.1	816384.0						
			834139.7	816390.3						
	PTI112	AREAPOLY	834139.0	816398.9	6.4	2	5.27E-05	3.57E-06	9.44E-07	8.73E-07
			834140.5	816399.0						
			834141.5	816390.5						
			834142.9	816384.4						
			834157.5	816348.7						
			834155.7	816347.9						
			834141.1	816384.0						
	PTI113	AREAPOLY	834139.7	816390.3	6.4	4	5.27E-05	3.57E-06	9.44E-07	8.73E-07
			834139.0	816398.9						
			834140.5	816399.0						
			834141.5	816390.5						
			834142.9	816384.4						
			834157.5	816348.7						
			834155.7	816347.9						
	PTI114	AREAPOLY	834141.1	816384.0	5.7	0	5.27E-05	3.57E-06	9.44E-07	8.73E-07
			834220.8	816323.9						
			834220.8	816322.0						
	PTI115	AREAPOLY	834207.5	816321.7	5.7	2	5.27E-05	3.57E-06	9.44E-07	8.73E-07
			834207.5	816323.6						
			834207.5	816323.9						
	PTI116	AREAPOLY	834220.8	816322.0	5.7	4	5.27E-05	3.57E-06	9.44E-07	8.73E-07
			834207.5	816321.7						
			834207.5	816323.6						
Hong Kong Station Bus Terminus - Public Light Bus (Ventilation Exhaust) [1]	PTI201	AREAPOLY	834355.5	816349.2	7.1	4	8.43E-05	1.01E-05	1.41E-06	1.30E-06
			834361.8	816345.9						
			834361.0	816344.3						
			834354.6	816347.6						
Hong Kong Station Bus Terminus - Public Light Bus (Ingress, Egress and Side Openings) [1]	PTI211	AREAPOLY	834275.6	816389.3	7.1	0	8.43E-05	1.01E-05	1.41E-06	1.30E-06
			834274.7	816387.6						
			834267.4	816391.3						
			834268.2	816393.0						
	PTI212	AREAPOLY	834275.6	816389.3	7.1	2	8.43E-05	1.01E-05	1.41E-06	1.30E-06
			834274.7	816387.6						
			834267.4	816391.3						
			834268.2	816393.0						
	PTI213	AREAPOLY	834275.6	816389.3	7.1	4	8.43E-05	1.01E-05	1.41E-06	1.30E-06
			834274.7	816387.6						
			834267.4	816391.3						
			834268.2	816393.0						
	PTI214	AREAPOLY	834370.5	816341.6	7.1	0	8.43E-05	1.01E-05	1.41E-06	1.30E-06
			834369.6	816339.9						
			834361.8	816343.8						
			834362.6	816345.5						
	PTI215	AREAPOLY	834370.5	816341.6	7.1	2	8.43E-05	1.01E-05	1.41E-06	1.30E-06
			834369.6	816339.9						
			834361.8	816343.8						
			834362.6	816345.5						
	PTI216	AREAPOLY	834370.5	816341.6	7.1	4	8.43E-05	1.01E-05	1.41E-06	1.30E-06
			834369.6	816339.9						
			834361.8	816343.8						
			834362.6	816345.5						
PTI217	AREAPOLY	834138.3	816399.5	6.4	0	8.43E-05	1.01E-05	1.41E-06	1.30E-06	
		834140.0	816399.7							
		834141.0	816390.5							
		834139.2	816390.4							
PTI218	AREAPOLY	834138.3	816399.5	6.4	2	8.43E-05	1.01E-05	1.41E-06	1.30E-06	
		834140.0	816399.7							
		834141.0	816390.5							
		834139.2	816390.4							
PTI219	AREAPOLY	834138.3	816399.5	6.4	4	8.43E-05	1.01E-05	1.41E-06	1.30E-06	
		834140.0	816399.7							
		834141.0	816390.5							
			834139.2	816390.4						

Exchange Square Bus Terminus - Franchised Bus (Ventilation Exhaust) [1]	PTI301	AREAPOLY	834249.6	816157.2	3.7	6	6.27E-05	4.24E-06	9.46E-07	8.75E-07
			834246.9	816157.1						
			834286.3	816106.1						
			834319.3	816071.0						
			834320.8	816072.5						
			834288.2	816107.2						
Exchange Square Bus Terminus - Franchised Bus (Ingress, Egress and Side Openings) [1]	PTI311	AREAPOLY	834340.0	816055.0	3.7	0	6.27E-05	4.24E-06	9.46E-07	8.75E-07
			834338.9	816053.1						
			834318.5	816067.8						
			834283.1	816105.5						
			834243.9	816156.8						
			834247.7	816162.4						
	834250.1	816162.1								
	834246.5	816156.9								
	834284.7	816106.6								
	834319.9	816069.5								
	PTI312	AREAPOLY	834340.0	816055.0	3.7	2	6.27E-05	4.24E-06	9.46E-07	8.75E-07
			834338.9	816053.1						
			834318.5	816067.8						
			834283.1	816105.5						
			834243.9	816156.8						
			834247.7	816162.4						
	834250.1	816162.1								
	834246.5	816156.9								
	834284.7	816106.6								
	834319.9	816069.5								
	PTI313	AREAPOLY	834340.0	816055.0	3.7	4	6.27E-05	4.24E-06	9.46E-07	8.75E-07
			834338.9	816053.1						
			834318.5	816067.8						
			834283.1	816105.5						
			834243.9	816156.8						
			834247.7	816162.4						
	834250.1	816162.1								
	834246.5	816156.9								
	834284.7	816106.6								
	834319.9	816069.5								
	PTI314	AREAPOLY	834356.9	816141.7	3.8	0	6.27E-05	4.24E-06	9.46E-07	8.75E-07
			834355.8	816139.9						
			834270.7	816194.8						
	PTI315	AREAPOLY	834271.9	816196.4	3.8	2	6.27E-05	4.24E-06	9.46E-07	8.75E-07
			834356.9	816141.7						
	PTI316	AREAPOLY	834355.8	816139.9	3.8	4	6.27E-05	4.24E-06	9.46E-07	8.75E-07
834270.7			816194.8							
834271.9			816196.4							
Exchange Square Bus Terminus - Public Light Bus (Ingress, Egress and Side Openings) [1]	PTI401	AREAPOLY	834380.9	816120.8	3.7	0	1.08E-05	1.38E-06	1.73E-07	1.63E-07
			834406.0	816104.8						
			834410.9	816100.5						
			834412.2	816102.1						
			834406.9	816106.2						
	834382.0	816122.5								
	PTI402	AREAPOLY	834380.9	816120.8	3.7	2	1.08E-05	1.38E-06	1.73E-07	1.63E-07
			834406.0	816104.8						
			834410.9	816100.5						
			834412.2	816102.1						
			834406.9	816106.2						
	834382.0	816122.5								
	PTI403	AREAPOLY	834380.9	816120.8	3.7	4	1.08E-05	1.38E-06	1.73E-07	1.63E-07
			834406.0	816104.8						
			834410.9	816100.5						
			834412.2	816102.1						
			834406.9	816106.2						
	834382.0	816122.5								
	PTI404	AREAPOLY	834411.3	816092.2	3.9	0	1.08E-05	1.38E-06	1.73E-07	1.63E-07
			834396.3	816068.6						
			834393.0	816066.4						
			834387.7	816065.1						
			834388.1	816063.3						
			834393.6	816064.6						
834397.8	816067.3									
PTI405	AREAPOLY	834412.9	816091.2	3.9	2	1.08E-05	1.38E-06	1.73E-07	1.63E-07	
		834411.3	816092.2							
		834396.3	816068.6							
		834393.0	816066.4							
		834387.7	816065.1							
		834388.1	816063.3							
834393.6	816064.6									
PTI406	AREAPOLY	834397.8	816067.3	3.9	4	1.08E-05	1.38E-06	1.73E-07	1.63E-07	
		834412.9	816091.2							
		834411.3	816092.2							
		834396.3	816068.6							
		834393.0	816066.4							
		834387.7	816065.1							
834388.1	816063.3									
Man Kat Street Bus Terminus	CPS101	AREAPOLY	833955.9	816407.9	3.5	0	7.5E-06	5.1E-07	1.1E-07	1.1E-07
			833961.5	816405.8						
			833968.6	816407.2						
			833975.0	816414.6						
			833999.3	816453.2						
			833969.3	816467.5						
833938.7	816418.7									

Remark:

[1] Since the HK Station and Exchange Square bus terminus are located relatively far from the Application Site, the potential impacts from PTIs are relatively minor. The emissions are assumed to be evenly distributed via each opening/ingress/egress/exhaust point.

**Emission Inventory for AERMOD Model - Emission from Nearby Bus Terminus (Year 2030 - Q3)**

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate			
	ID		(m)	(m)			NO	NO2	RSP	FSP
Emission inside Terminus										
(g/m2/s)										
Hong Kong Station Bus Terminus - Franchised Bus (Ventilation Exhaust) [1]	PTI101	AREAPOLY	834155.7	816348.6	6.1	5	5.34E-05	3.61E-06	9.44E-07	8.73E-07
			834157.5	816349.4						
			834150.4	816366.9						
			834148.7	816366.2						
			834160.5	816342.9						
	PTI102	AREAPOLY	834162.2	816340.0	6	5	5.34E-05	3.61E-06	9.44E-07	8.73E-07
			834167.3	816334.1						
			834165.9	816332.9						
			834160.9	816339.0						
			834159.1	816342.1						
Hong Kong Station Bus Terminus - Franchised Bus (Ingress, Egress and Side Openings) [1]	PTI111	AREAPOLY	834140.5	816399.0	6.4	0	5.34E-05	3.61E-06	9.44E-07	8.73E-07
			834141.5	816390.5						
			834142.9	816384.4						
			834157.5	816348.7						
			834155.7	816347.9						
			834141.1	816384.0						
			834139.7	816390.3						
	PTI112	AREAPOLY	834139.0	816398.9	6.4	2	5.34E-05	3.61E-06	9.44E-07	8.73E-07
			834140.5	816399.0						
			834141.5	816390.5						
			834142.9	816384.4						
			834157.5	816348.7						
			834155.7	816347.9						
			834141.1	816384.0						
	PTI113	AREAPOLY	834139.7	816390.3	6.4	4	5.34E-05	3.61E-06	9.44E-07	8.73E-07
			834139.0	816398.9						
			834140.5	816399.0						
			834141.5	816390.5						
			834142.9	816384.4						
			834157.5	816348.7						
			834155.7	816347.9						
	PTI114	AREAPOLY	834141.1	816384.0	5.7	0	5.34E-05	3.61E-06	9.44E-07	8.73E-07
			834139.7	816390.3						
			834220.8	816323.9						
	PTI115	AREAPOLY	834220.8	816322.0	5.7	2	5.34E-05	3.61E-06	9.44E-07	8.73E-07
			834207.5	816321.7						
			834207.5	816323.6						
	PTI116	AREAPOLY	834207.5	816323.6	5.7	4	5.34E-05	3.61E-06	9.44E-07	8.73E-07
			834220.8	816323.9						
			834207.5	816322.0						
Hong Kong Station Bus Terminus - Public Light Bus (Ventilation Exhaust) [1]	PTI201	AREAPOLY	834355.5	816349.2	7.1	4	8.45E-05	1.04E-05	1.41E-06	1.30E-06
			834361.8	816345.9						
			834361.0	816344.3						
			834354.6	816347.6						
Hong Kong Station Bus Terminus - Public Light Bus (Ingress, Egress and Side Openings) [1]	PTI211	AREAPOLY	834275.6	816389.3	7.1	0	8.45E-05	1.04E-05	1.41E-06	1.30E-06
			834274.7	816387.6						
			834267.4	816391.3						
			834268.2	816393.0						
	PTI212	AREAPOLY	834275.6	816389.3	7.1	2	8.45E-05	1.04E-05	1.41E-06	1.30E-06
			834274.7	816387.6						
			834267.4	816391.3						
			834268.2	816393.0						
	PTI213	AREAPOLY	834275.6	816389.3	7.1	4	8.45E-05	1.04E-05	1.41E-06	1.30E-06
			834274.7	816387.6						
			834267.4	816391.3						
			834268.2	816393.0						
	PTI214	AREAPOLY	834370.5	816341.6	7.1	0	8.45E-05	1.04E-05	1.41E-06	1.30E-06
			834369.6	816339.9						
			834361.8	816343.8						
			834362.6	816345.5						
	PTI215	AREAPOLY	834370.5	816341.6	7.1	2	8.45E-05	1.04E-05	1.41E-06	1.30E-06
			834369.6	816339.9						
			834361.8	816343.8						
			834362.6	816345.5						
	PTI216	AREAPOLY	834370.5	816341.6	7.1	4	8.45E-05	1.04E-05	1.41E-06	1.30E-06
			834369.6	816339.9						
			834361.8	816343.8						
			834362.6	816345.5						
PTI217	AREAPOLY	834138.3	816399.5	6.4	0	8.45E-05	1.04E-05	1.41E-06	1.30E-06	
		834140.0	816399.7							
		834141.0	816390.5							
		834139.2	816390.4							
PTI218	AREAPOLY	834138.3	816399.5	6.4	2	8.45E-05	1.04E-05	1.41E-06	1.30E-06	
		834140.0	816399.7							
		834141.0	816390.5							
		834139.2	816390.4							
PTI219	AREAPOLY	834138.3	816399.5	6.4	4	8.45E-05	1.04E-05	1.41E-06	1.30E-06	
		834140.0	816399.7							
		834141.0	816390.5							
			834139.2	816390.4						

Exchange Square Bus Terminus - Franchised Bus (Ventilation Exhaust) [1]	PTI301	AREAPOLY	834249.6	816157.2	3.7	6	6.34E-05	4.28E-06	9.46E-07	8.75E-07	
			834246.9	816157.1							
			834286.3	816106.1							
			834319.3	816071.0							
			834320.8	816072.5							
			834288.2	816107.2							
Exchange Square Bus Terminus - Franchised Bus (Ingress, Egress and Side Openings) [1]	PTI311	AREAPOLY	834340.0	816055.0	3.7	0	6.34E-05	4.28E-06	9.46E-07	8.75E-07	
			834338.9	816053.1							
			834318.5	816067.8							
			834283.1	816105.5							
			834243.9	816156.8							
			834247.7	816162.4							
			834250.1	816162.1							
			834246.5	816156.9							
			834284.7	816106.6							
			834319.9	816069.5							
	PTI312	AREAPOLY	834340.0	816055.0	3.7	2	6.34E-05	4.28E-06	9.46E-07	8.75E-07	
			834338.9	816053.1							
			834318.5	816067.8							
			834283.1	816105.5							
			834243.9	816156.8							
			834247.7	816162.4							
			834250.1	816162.1							
			834246.5	816156.9							
			834284.7	816106.6							
			834319.9	816069.5							
	PTI313	AREAPOLY	834340.0	816055.0	3.7	4	6.34E-05	4.28E-06	9.46E-07	8.75E-07	
			834338.9	816053.1							
			834318.5	816067.8							
			834283.1	816105.5							
			834243.9	816156.8							
			834247.7	816162.4							
			834250.1	816162.1							
			834246.5	816156.9							
			834284.7	816106.6							
			834319.9	816069.5							
	PTI314	AREAPOLY	834356.9	816141.7	3.8	0	6.34E-05	4.28E-06	9.46E-07	8.75E-07	
			834355.8	816139.9							
			834270.7	816194.8							
			834271.9	816196.4							
	PTI315	AREAPOLY	834356.9	816141.7	3.8	2	6.34E-05	4.28E-06	9.46E-07	8.75E-07	
			834355.8	816139.9							
			834270.7	816194.8							
			834271.9	816196.4							
	PTI316	AREAPOLY	834356.9	816141.7	3.8	4	6.34E-05	4.28E-06	9.46E-07	8.75E-07	
			834355.8	816139.9							
			834270.7	816194.8							
			834271.9	816196.4							
Exchange Square Bus Terminus - Public Light Bus (Ingress, Egress and Side Openings) [1]	PTI401	AREAPOLY	834380.9	816120.8	3.7	0	1.09E-05	1.40E-06	1.73E-07	1.63E-07	
			834406.0	816104.8							
			834410.9	816100.5							
			834412.2	816102.1							
			834406.9	816106.2							
			834382.0	816122.5							
	PTI402	AREAPOLY	834380.9	816120.8	3.7	2	1.09E-05	1.40E-06	1.73E-07	1.63E-07	
			834406.0	816104.8							
			834410.9	816100.5							
			834412.2	816102.1							
			834406.9	816106.2							
			834382.0	816122.5							
	PTI403	AREAPOLY	834380.9	816120.8	3.7	4	1.09E-05	1.40E-06	1.73E-07	1.63E-07	
			834406.0	816104.8							
			834410.9	816100.5							
			834412.2	816102.1							
			834406.9	816106.2							
			834382.0	816122.5							
	PTI404	AREAPOLY	834411.3	816092.2	3.9	0	1.09E-05	1.40E-06	1.73E-07	1.63E-07	
			834396.3	816068.6							
			834393.0	816066.4							
			834387.7	816065.1							
			834388.1	816063.3							
			834393.6	816064.6							
			834397.8	816067.3							
			834412.9	816091.2							
			834411.3	816092.2							
			834396.3	816068.6							
	PTI405	AREAPOLY	834393.0	816066.4	3.9	2	1.09E-05	1.40E-06	1.73E-07	1.63E-07	
			834387.7	816065.1							
			834388.1	816063.3							
			834393.6	816064.6							
			834397.8	816067.3							
			834412.9	816091.2							
	PTI406	AREAPOLY	834411.3	816092.2	3.9	4	1.09E-05	1.40E-06	1.73E-07	1.63E-07	
			834396.3	816068.6							
			834393.0	816066.4							
			834387.7	816065.1							
			834388.1	816063.3							
			834393.6	816064.6							
	Man Kat Street Bus Terminus	CPS101	AREAPOLY	833955.9	816407.9	3.5	0	7.5E-06	5.1E-07	1.1E-07	1.1E-07
				833961.5	816405.8						
833968.6				816407.2							
833975.0				816414.6							
833999.3				816453.2							
833969.3				816467.5							
			833938.7	816418.7							

Remark:

[1] Since the HK Station and Exchange Square bus terminus are located relatively far from the Application Site, the potential impacts from PTIs are relatively minor. The emissions are assumed to be evenly distributed via each opening/ingress/egress/exhaust point.

**Emission Inventory for AERMOD Model - Emission from Nearby Bus Terminus (Year 2030 - Q4)**

Bus Terminus	Source	Type	X	Y	Base Elevation (mPD)	Release Height (mAG)	Max. Hourly Emission Rate			
	ID		(m)	(m)			NO	NO2	RSP	FSP
Emission inside Terminus										
(g/m2/s)										
Hong Kong Station Bus Terminus - Franchised Bus (Ventilation Exhaust) [1]	PTI101	AREAPOLY	834155.7	816348.6	6.1	5	5.41E-05	3.66E-06	9.44E-07	8.73E-07
			834157.5	816349.4						
			834150.4	816366.9						
			834148.7	816366.2						
			834160.5	816342.9						
	PTI102	AREAPOLY	834162.2	816340.0	6	5	5.41E-05	3.66E-06	9.44E-07	8.73E-07
			834167.3	816334.1						
			834165.9	816332.9						
			834160.9	816339.0						
			834159.1	816342.1						
Hong Kong Station Bus Terminus - Franchised Bus (Ingress, Egress and Side Openings) [1]	PTI111	AREAPOLY	834140.5	816399.0	6.4	0	5.41E-05	3.66E-06	9.44E-07	8.73E-07
			834141.5	816390.5						
			834142.9	816384.4						
			834157.5	816348.7						
			834155.7	816347.9						
			834141.1	816384.0						
			834139.7	816390.3						
	PTI112	AREAPOLY	834139.0	816398.9	6.4	2	5.41E-05	3.66E-06	9.44E-07	8.73E-07
			834140.5	816399.0						
			834141.5	816390.5						
			834142.9	816384.4						
			834157.5	816348.7						
			834155.7	816347.9						
			834141.1	816384.0						
	PTI113	AREAPOLY	834139.7	816390.3	6.4	4	5.41E-05	3.66E-06	9.44E-07	8.73E-07
			834139.0	816398.9						
			834140.5	816399.0						
			834141.5	816390.5						
			834142.9	816384.4						
			834157.5	816348.7						
			834155.7	816347.9						
	PTI114	AREAPOLY	834141.1	816384.0	5.7	0	5.41E-05	3.66E-06	9.44E-07	8.73E-07
			834220.8	816323.9						
			834207.5	816321.7						
	PTI115	AREAPOLY	834207.5	816323.6	5.7	2	5.41E-05	3.66E-06	9.44E-07	8.73E-07
			834220.8	816323.9						
			834220.8	816322.0						
	PTI116	AREAPOLY	834207.5	816321.7	5.7	4	5.41E-05	3.66E-06	9.44E-07	8.73E-07
			834207.5	816323.6						
			834207.5	816323.6						
Hong Kong Station Bus Terminus - Public Light Bus (Ventilation Exhaust) [1]	PTI201	AREAPOLY	834355.5	816349.2	7.1	4	9.44E-05	1.06E-05	1.41E-06	1.30E-06
			834361.8	816345.9						
			834361.0	816344.3						
			834354.6	816347.6						
Hong Kong Station Bus Terminus - Public Light Bus (Ingress, Egress and Side Openings) [1]	PTI211	AREAPOLY	834275.6	816389.3	7.1	0	9.44E-05	1.06E-05	1.41E-06	1.30E-06
			834274.7	816387.6						
			834267.4	816391.3						
			834268.2	816393.0						
	PTI212	AREAPOLY	834275.6	816389.3	7.1	2	9.44E-05	1.06E-05	1.41E-06	1.30E-06
			834274.7	816387.6						
			834267.4	816391.3						
			834268.2	816393.0						
	PTI213	AREAPOLY	834275.6	816389.3	7.1	4	9.44E-05	1.06E-05	1.41E-06	1.30E-06
			834274.7	816387.6						
			834267.4	816391.3						
			834268.2	816393.0						
	PTI214	AREAPOLY	834370.5	816341.6	7.1	0	9.44E-05	1.06E-05	1.41E-06	1.30E-06
			834369.6	816339.9						
			834361.8	816343.8						
			834362.6	816345.5						
	PTI215	AREAPOLY	834370.5	816341.6	7.1	2	9.44E-05	1.06E-05	1.41E-06	1.30E-06
			834369.6	816339.9						
			834361.8	816343.8						
			834362.6	816345.5						
	PTI216	AREAPOLY	834370.5	816341.6	7.1	4	9.44E-05	1.06E-05	1.41E-06	1.30E-06
			834369.6	816339.9						
			834361.8	816343.8						
			834362.6	816345.5						
PTI217	AREAPOLY	834138.3	816399.5	6.4	0	9.44E-05	1.06E-05	1.41E-06	1.30E-06	
		834140.0	816399.7							
		834141.0	816390.5							
		834139.2	816390.4							
PTI218	AREAPOLY	834138.3	816399.5	6.4	2	9.44E-05	1.06E-05	1.41E-06	1.30E-06	
		834140.0	816399.7							
		834141.0	816390.5							
		834139.2	816390.4							
PTI219	AREAPOLY	834138.3	816399.5	6.4	4	9.44E-05	1.06E-05	1.41E-06	1.30E-06	
		834140.0	816399.7							
		834141.0	816390.5							
			834139.2	816390.4						

Exchange Square Bus Terminus - Franchised Bus (Ventilation Exhaust) [1]	PTI301	AREAPOLY	834249.6	816157.2	3.7	6	6.40E-05	4.32E-06	9.46E-07	8.75E-07	
			834246.9	816157.1							
			834286.3	816106.1							
			834319.3	816071.0							
			834320.8	816072.5							
			834288.2	816107.2							
Exchange Square Bus Terminus - Franchised Bus (Ingress, Egress and Side Openings) [1]	PTI311	AREAPOLY	834340.0	816055.0	3.7	0	6.40E-05	4.32E-06	9.46E-07	8.75E-07	
			834338.9	816053.1							
			834318.5	816067.8							
			834283.1	816105.5							
			834243.9	816156.8							
			834247.7	816162.4							
			834250.1	816162.1							
			834246.5	816156.9							
			834284.7	816106.6							
			834319.9	816069.5							
	PTI312	AREAPOLY	834340.0	816055.0	3.7	2	6.40E-05	4.32E-06	9.46E-07	8.75E-07	
			834338.9	816053.1							
			834318.5	816067.8							
			834283.1	816105.5							
			834243.9	816156.8							
			834247.7	816162.4							
			834250.1	816162.1							
			834246.5	816156.9							
			834284.7	816106.6							
			834319.9	816069.5							
	PTI313	AREAPOLY	834340.0	816055.0	3.7	4	6.40E-05	4.32E-06	9.46E-07	8.75E-07	
			834338.9	816053.1							
			834318.5	816067.8							
			834283.1	816105.5							
			834243.9	816156.8							
			834247.7	816162.4							
			834250.1	816162.1							
			834246.5	816156.9							
			834284.7	816106.6							
			834319.9	816069.5							
	PTI314	AREAPOLY	834356.9	816141.7	3.8	0	6.40E-05	4.32E-06	9.46E-07	8.75E-07	
			834355.8	816139.9							
			834270.7	816194.8							
			834271.9	816196.4							
	PTI315	AREAPOLY	834356.9	816141.7	3.8	2	6.40E-05	4.32E-06	9.46E-07	8.75E-07	
			834355.8	816139.9							
			834270.7	816194.8							
			834271.9	816196.4							
	PTI316	AREAPOLY	834356.9	816141.7	3.8	4	6.40E-05	4.32E-06	9.46E-07	8.75E-07	
			834355.8	816139.9							
			834270.7	816194.8							
			834271.9	816196.4							
Exchange Square Bus Terminus - Public Light Bus (Ingress, Egress and Side Openings) [1]	PTI401	AREAPOLY	834380.9	816120.8	3.7	0	1.11E-05	1.42E-06	1.73E-07	1.63E-07	
			834406.0	816104.8							
			834410.9	816100.5							
			834412.2	816102.1							
			834406.9	816106.2							
			834382.0	816122.5							
	PTI402	AREAPOLY	834380.9	816120.8	3.7	2	1.11E-05	1.42E-06	1.73E-07	1.63E-07	
			834406.0	816104.8							
			834410.9	816100.5							
			834412.2	816102.1							
			834406.9	816106.2							
			834382.0	816122.5							
	PTI403	AREAPOLY	834380.9	816120.8	3.7	4	1.11E-05	1.42E-06	1.73E-07	1.63E-07	
			834406.0	816104.8							
			834410.9	816100.5							
			834412.2	816102.1							
			834406.9	816106.2							
			834382.0	816122.5							
	PTI404	AREAPOLY	834411.3	816092.2	3.9	0	1.11E-05	1.42E-06	1.73E-07	1.63E-07	
			834396.3	816068.6							
			834393.0	816066.4							
			834387.7	816065.1							
			834388.1	816063.3							
			834393.6	816064.6							
			834397.8	816067.3							
			834412.9	816091.2							
			834411.3	816092.2							
			834396.3	816068.6							
	PTI405	AREAPOLY	834393.0	816066.4	3.9	2	1.11E-05	1.42E-06	1.73E-07	1.63E-07	
			834387.7	816065.1							
			834388.1	816063.3							
			834393.6	816064.6							
			834397.8	816067.3							
			834412.9	816091.2							
	PTI406	AREAPOLY	834411.3	816092.2	3.9	4	1.11E-05	1.42E-06	1.73E-07	1.63E-07	
			834396.3	816068.6							
			834393.0	816066.4							
			834387.7	816065.1							
			834388.1	816063.3							
			834393.6	816064.6							
	Man Kat Street Bus Terminus	CPS101	AREAPOLY	833955.9	816407.9	3.5	0	7.6E-06	5.2E-07	1.1E-07	1.1E-07
				833961.5	816405.8						
833968.6				816407.2							
833975.0				816414.6							
833999.3				816453.2							
833969.3				816467.5							
833938.7	816418.7										

Remark:

[1] Since the HK Station and Exchange Square bus terminus are located relatively far from the Application Site, the potential impacts from PTIs are relatively minor. The emissions are assumed to be evenly distributed via each opening/ingress/egress/exhaust point.

**Appendix 4-7 Input Parameters of Portals in AERMOD**

Emission Inventory for Portals - 1st Quarter

Road No.	Portal Description	Emission Source ID	Source Type	x-coordinate	y-coordinate	Release Height	Initial Lateral Dimension	Initial Vertical Dimension	Maximum Hourly Emission Rate of Each Bound (g/s)				
						(m)	(m)	(m)	NO <sub>x</sub>	NO	RSP	FSP	
L1D	Man Cheung Street (WB)	1 <sup>st</sup> 50m	MCSWB01	Volume	834106.6	816299.2	2.75	3.92	2.56	6.65E-05	7.63E-04	3.04E-05	2.80E-05
			MCSWB02	Volume	834099.2	816303.0	2.75	3.92	2.56	6.65E-05	7.63E-04	3.04E-05	2.80E-05
			MCSWB03	Volume	834091.8	816306.9	2.75	3.92	2.56	6.65E-05	7.63E-04	3.04E-05	2.80E-05
			MCSWB04	Volume	834084.4	816310.7	2.75	3.92	2.56	6.65E-05	7.63E-04	3.04E-05	2.80E-05
			MCSWB05	Volume	834077.0	816314.5	2.75	3.92	2.56	6.65E-05	7.63E-04	3.04E-05	2.80E-05
			MCSWB06	Volume	834069.6	816318.3	2.75	3.92	2.56	6.65E-05	7.63E-04	3.04E-05	2.80E-05
		2 <sup>nd</sup> 50m	MCSWB07	Volume	834062.2	816322.2	2.75	3.92	2.56	3.32E-05	3.82E-04	1.52E-05	1.40E-05
			MCSWB08	Volume	834054.8	816326.0	2.75	3.92	2.56	3.32E-05	3.82E-04	1.52E-05	1.40E-05
			MCSWB09	Volume	834047.4	816329.8	2.75	3.92	2.56	3.32E-05	3.82E-04	1.52E-05	1.40E-05
			MCSWB10	Volume	834040.0	816333.6	2.75	3.92	2.56	3.32E-05	3.82E-04	1.52E-05	1.40E-05
			MCSWB11	Volume	834032.5	816337.4	2.75	3.92	2.56	3.32E-05	3.82E-04	1.52E-05	1.40E-05
			MCSWB12	Volume	834025.1	816341.3	2.75	3.92	2.56	3.32E-05	3.82E-04	1.52E-05	1.40E-05
L42J	Connaught Road Central Underpass (WB)	1 <sup>st</sup> 50m	CRCUWB01	Volume	834308.6	816036.4	2.75	3.61	2.56	2.93E-04	2.74E-03	7.80E-05	7.18E-05
			CRCUWB02	Volume	834302.5	816042.0	2.75	3.61	2.56	2.93E-04	2.74E-03	7.80E-05	7.18E-05
			CRCUWB03	Volume	834296.4	816047.7	2.75	3.61	2.56	2.93E-04	2.74E-03	7.80E-05	7.18E-05
			CRCUWB04	Volume	834290.3	816053.4	2.75	3.61	2.56	2.93E-04	2.74E-03	7.80E-05	7.18E-05
			CRCUWB05	Volume	834284.2	816059.1	2.75	3.61	2.56	2.93E-04	2.74E-03	7.80E-05	7.18E-05
			CRCUWB06	Volume	834278.1	816064.8	2.75	3.61	2.56	2.93E-04	2.74E-03	7.80E-05	7.18E-05
		2 <sup>nd</sup> 50m	CRCUWB07	Volume	834272.0	816070.5	2.75	3.61	2.56	1.47E-04	1.37E-03	3.90E-05	3.59E-05
			CRCUWB08	Volume	834265.9	816076.1	2.75	3.61	2.56	1.47E-04	1.37E-03	3.90E-05	3.59E-05
			CRCUWB09	Volume	834259.8	816081.8	2.75	3.61	2.56	1.47E-04	1.37E-03	3.90E-05	3.59E-05
			CRCUWB10	Volume	834253.8	816087.5	2.75	3.61	2.56	1.47E-04	1.37E-03	3.90E-05	3.59E-05
			CRCUWB11	Volume	834247.7	816093.2	2.75	3.61	2.56	1.47E-04	1.37E-03	3.90E-05	3.59E-05
			CRCUWB12	Volume	834241.6	816098.9	2.75	3.61	2.56	1.47E-04	1.37E-03	3.90E-05	3.59E-05



Emission Inventory for Portals - 2nd Quarter

Road No.	Portal Description	Emission Source ID	Source Type	x-coordinate	y-coordinate	Release Height	Initial Lateral Dimension	Initial Vertical Dimension	Maximum Hourly Emission Rate of Each Bound (g/s)				
						(m)	(m)	(m)	NO <sub>x</sub>	NO	RSP	FSP	
L1D	Man Cheung Street (WB)	1 <sup>st</sup> 50m	MCSWB01	Volume	834106.6	816299.2	2.75	3.92	2.56	6.17E-05	6.79E-04	3.04E-05	2.80E-05
			MCSWB02	Volume	834099.2	816303.0	2.75	3.92	2.56	6.17E-05	6.79E-04	3.04E-05	2.80E-05
			MCSWB03	Volume	834091.8	816306.9	2.75	3.92	2.56	6.17E-05	6.79E-04	3.04E-05	2.80E-05
			MCSWB04	Volume	834084.4	816310.7	2.75	3.92	2.56	6.17E-05	6.79E-04	3.04E-05	2.80E-05
			MCSWB05	Volume	834077.0	816314.5	2.75	3.92	2.56	6.17E-05	6.79E-04	3.04E-05	2.80E-05
			MCSWB06	Volume	834069.6	816318.3	2.75	3.92	2.56	6.17E-05	6.79E-04	3.04E-05	2.80E-05
		2 <sup>nd</sup> 50m	MCSWB07	Volume	834062.2	816322.2	2.75	3.92	2.56	3.08E-05	3.40E-04	1.52E-05	1.40E-05
			MCSWB08	Volume	834054.8	816326.0	2.75	3.92	2.56	3.08E-05	3.40E-04	1.52E-05	1.40E-05
			MCSWB09	Volume	834047.4	816329.8	2.75	3.92	2.56	3.08E-05	3.40E-04	1.52E-05	1.40E-05
			MCSWB10	Volume	834040.0	816333.6	2.75	3.92	2.56	3.08E-05	3.40E-04	1.52E-05	1.40E-05
			MCSWB11	Volume	834032.5	816337.4	2.75	3.92	2.56	3.08E-05	3.40E-04	1.52E-05	1.40E-05
			MCSWB12	Volume	834025.1	816341.3	2.75	3.92	2.56	3.08E-05	3.40E-04	1.52E-05	1.40E-05
L42J	Connaught Road Central Underpass (WB)	1 <sup>st</sup> 50m	CRCUWB01	Volume	834308.6	816036.4	2.75	3.61	2.56	2.73E-04	2.39E-03	7.80E-05	7.18E-05
			CRCUWB02	Volume	834302.5	816042.0	2.75	3.61	2.56	2.73E-04	2.39E-03	7.80E-05	7.18E-05
			CRCUWB03	Volume	834296.4	816047.7	2.75	3.61	2.56	2.73E-04	2.39E-03	7.80E-05	7.18E-05
			CRCUWB04	Volume	834290.3	816053.4	2.75	3.61	2.56	2.73E-04	2.39E-03	7.80E-05	7.18E-05
			CRCUWB05	Volume	834284.2	816059.1	2.75	3.61	2.56	2.73E-04	2.39E-03	7.80E-05	7.18E-05
			CRCUWB06	Volume	834278.1	816064.8	2.75	3.61	2.56	2.73E-04	2.39E-03	7.80E-05	7.18E-05
		2 <sup>nd</sup> 50m	CRCUWB07	Volume	834272.0	816070.5	2.75	3.61	2.56	1.37E-04	1.19E-03	3.90E-05	3.59E-05
			CRCUWB08	Volume	834265.9	816076.1	2.75	3.61	2.56	1.37E-04	1.19E-03	3.90E-05	3.59E-05
			CRCUWB09	Volume	834259.8	816081.8	2.75	3.61	2.56	1.37E-04	1.19E-03	3.90E-05	3.59E-05
			CRCUWB10	Volume	834253.8	816087.5	2.75	3.61	2.56	1.37E-04	1.19E-03	3.90E-05	3.59E-05
			CRCUWB11	Volume	834247.7	816093.2	2.75	3.61	2.56	1.37E-04	1.19E-03	3.90E-05	3.59E-05
			CRCUWB12	Volume	834241.6	816098.9	2.75	3.61	2.56	1.37E-04	1.19E-03	3.90E-05	3.59E-05

Emission Inventory for Portals - 3rd Quarter

Road No.	Portal Description	Emission Source ID	Source Type	x-coordinate	y-coordinate	Release Height	Initial Lateral Dimension	Initial Vertical Dimension	Maximum Hourly Emission Rate of Each Bound (g/s)				
						(m)	(m)	(m)	NO <sub>x</sub>	NO	RSP	FSP	
L1D	Man Cheung Street (WB)	1 <sup>st</sup> 50m	MCSWB01	Volume	834106.6	816299.2	2.75	3.92	2.56	6.43E-05	7.08E-04	3.04E-05	2.80E-05
			MCSWB02	Volume	834099.2	816303.0	2.75	3.92	2.56	6.43E-05	7.08E-04	3.04E-05	2.80E-05
			MCSWB03	Volume	834091.8	816306.9	2.75	3.92	2.56	6.43E-05	7.08E-04	3.04E-05	2.80E-05
			MCSWB04	Volume	834084.4	816310.7	2.75	3.92	2.56	6.43E-05	7.08E-04	3.04E-05	2.80E-05
			MCSWB05	Volume	834077.0	816314.5	2.75	3.92	2.56	6.43E-05	7.08E-04	3.04E-05	2.80E-05
			MCSWB06	Volume	834069.6	816318.3	2.75	3.92	2.56	6.43E-05	7.08E-04	3.04E-05	2.80E-05
		2 <sup>nd</sup> 50m	MCSWB07	Volume	834062.2	816322.2	2.75	3.92	2.56	3.22E-05	3.54E-04	1.52E-05	1.40E-05
			MCSWB08	Volume	834054.8	816326.0	2.75	3.92	2.56	3.22E-05	3.54E-04	1.52E-05	1.40E-05
			MCSWB09	Volume	834047.4	816329.8	2.75	3.92	2.56	3.22E-05	3.54E-04	1.52E-05	1.40E-05
			MCSWB10	Volume	834040.0	816333.6	2.75	3.92	2.56	3.22E-05	3.54E-04	1.52E-05	1.40E-05
			MCSWB11	Volume	834032.5	816337.4	2.75	3.92	2.56	3.22E-05	3.54E-04	1.52E-05	1.40E-05
			MCSWB12	Volume	834025.1	816341.3	2.75	3.92	2.56	3.22E-05	3.54E-04	1.52E-05	1.40E-05
L42J	Connaught Road Central Underpass (WB)	1 <sup>st</sup> 50m	CRCUWB01	Volume	834308.6	816036.4	2.75	3.61	2.56	2.85E-04	2.49E-03	7.80E-05	7.18E-05
			CRCUWB02	Volume	834302.5	816042.0	2.75	3.61	2.56	2.85E-04	2.49E-03	7.80E-05	7.18E-05
			CRCUWB03	Volume	834296.4	816047.7	2.75	3.61	2.56	2.85E-04	2.49E-03	7.80E-05	7.18E-05
			CRCUWB04	Volume	834290.3	816053.4	2.75	3.61	2.56	2.85E-04	2.49E-03	7.80E-05	7.18E-05
			CRCUWB05	Volume	834284.2	816059.1	2.75	3.61	2.56	2.85E-04	2.49E-03	7.80E-05	7.18E-05
			CRCUWB06	Volume	834278.1	816064.8	2.75	3.61	2.56	2.85E-04	2.49E-03	7.80E-05	7.18E-05
		2 <sup>nd</sup> 50m	CRCUWB07	Volume	834272.0	816070.5	2.75	3.61	2.56	1.42E-04	1.24E-03	3.90E-05	3.59E-05
			CRCUWB08	Volume	834265.9	816076.1	2.75	3.61	2.56	1.42E-04	1.24E-03	3.90E-05	3.59E-05
			CRCUWB09	Volume	834259.8	816081.8	2.75	3.61	2.56	1.42E-04	1.24E-03	3.90E-05	3.59E-05
			CRCUWB10	Volume	834253.8	816087.5	2.75	3.61	2.56	1.42E-04	1.24E-03	3.90E-05	3.59E-05
			CRCUWB11	Volume	834247.7	816093.2	2.75	3.61	2.56	1.42E-04	1.24E-03	3.90E-05	3.59E-05
			CRCUWB12	Volume	834241.6	816098.9	2.75	3.61	2.56	1.42E-04	1.24E-03	3.90E-05	3.59E-05

Emission Inventory for Portals - 4th Quarter

Road No.	Portal Description	Emission Source ID	Source Type	x-coordinate	y-coordinate	Release Height	Initial Lateral Dimension	Initial Vertical Dimension	Maximum Hourly Emission Rate of Each Bound (g/s)				
						(m)	(m)	(m)	NO <sub>x</sub>	NO	RSP	FSP	
L1D	Man Cheung Street (WB)	1 <sup>st</sup> 50m	MCSWB01	Volume	834106.6	816299.2	2.75	3.92	2.56	6.88E-05	8.06E-04	3.04E-05	2.80E-05
			MCSWB02	Volume	834099.2	816303.0	2.75	3.92	2.56	6.88E-05	8.06E-04	3.04E-05	2.80E-05
			MCSWB03	Volume	834091.8	816306.9	2.75	3.92	2.56	6.88E-05	8.06E-04	3.04E-05	2.80E-05
			MCSWB04	Volume	834084.4	816310.7	2.75	3.92	2.56	6.88E-05	8.06E-04	3.04E-05	2.80E-05
			MCSWB05	Volume	834077.0	816314.5	2.75	3.92	2.56	6.88E-05	8.06E-04	3.04E-05	2.80E-05
			MCSWB06	Volume	834069.6	816318.3	2.75	3.92	2.56	6.88E-05	8.06E-04	3.04E-05	2.80E-05
		2 <sup>nd</sup> 50m	MCSWB07	Volume	834062.2	816322.2	2.75	3.92	2.56	3.44E-05	4.03E-04	1.52E-05	1.40E-05
			MCSWB08	Volume	834054.8	816326.0	2.75	3.92	2.56	3.44E-05	4.03E-04	1.52E-05	1.40E-05
			MCSWB09	Volume	834047.4	816329.8	2.75	3.92	2.56	3.44E-05	4.03E-04	1.52E-05	1.40E-05
			MCSWB10	Volume	834040.0	816333.6	2.75	3.92	2.56	3.44E-05	4.03E-04	1.52E-05	1.40E-05
			MCSWB11	Volume	834032.5	816337.4	2.75	3.92	2.56	3.44E-05	4.03E-04	1.52E-05	1.40E-05
			MCSWB12	Volume	834025.1	816341.3	2.75	3.92	2.56	3.44E-05	4.03E-04	1.52E-05	1.40E-05
L42J	Connaught Road Central Underpass (WB)	1 <sup>st</sup> 50m	CRCUWB01	Volume	834308.6	816036.4	2.75	3.61	2.56	3.04E-04	2.91E-03	7.80E-05	7.18E-05
			CRCUWB02	Volume	834302.5	816042.0	2.75	3.61	2.56	3.04E-04	2.91E-03	7.80E-05	7.18E-05
			CRCUWB03	Volume	834296.4	816047.7	2.75	3.61	2.56	3.04E-04	2.91E-03	7.80E-05	7.18E-05
			CRCUWB04	Volume	834290.3	816053.4	2.75	3.61	2.56	3.04E-04	2.91E-03	7.80E-05	7.18E-05
			CRCUWB05	Volume	834284.2	816059.1	2.75	3.61	2.56	3.04E-04	2.91E-03	7.80E-05	7.18E-05
			CRCUWB06	Volume	834278.1	816064.8	2.75	3.61	2.56	3.04E-04	2.91E-03	7.80E-05	7.18E-05
		2 <sup>nd</sup> 50m	CRCUWB07	Volume	834272.0	816070.5	2.75	3.61	2.56	1.52E-04	1.46E-03	3.90E-05	3.59E-05
			CRCUWB08	Volume	834265.9	816076.1	2.75	3.61	2.56	1.52E-04	1.46E-03	3.90E-05	3.59E-05
			CRCUWB09	Volume	834259.8	816081.8	2.75	3.61	2.56	1.52E-04	1.46E-03	3.90E-05	3.59E-05
			CRCUWB10	Volume	834253.8	816087.5	2.75	3.61	2.56	1.52E-04	1.46E-03	3.90E-05	3.59E-05
			CRCUWB11	Volume	834247.7	816093.2	2.75	3.61	2.56	1.52E-04	1.46E-03	3.90E-05	3.59E-05
			CRCUWB12	Volume	834241.6	816098.9	2.75	3.61	2.56	1.52E-04	1.46E-03	3.90E-05	3.59E-05

**Appendix 4-8 Derivation of Emission Rate of Fast Ferry Services at HKMFT**

**Marine Emission Rate at Hong Kong Macau Ferry Terminal**

Operation Mode		Remark
Schedule - Arriving to/ Departing from:	07:00-02:00	Referenced from Marine Department's website for Ferry Schedule at HKMFT ( <a href="https://crossboundaryferryservices.mardep.gov.hk/en/index.php">https://crossboundaryferryservices.mardep.gov.hk/en/index.php</a> )
Vessel Information		
Vessel Name:	Austal Cat	Vessel with highest energy consumption found at company website ( <a href="https://www.turbojet.com.hk/en/vessel-information/austal-cat.aspx">https://www.turbojet.com.hk/en/vessel-information/austal-cat.aspx</a> )
Engine:	MTU 16V 4000 M70	
Passenger Carry Capacity (PAX)	= 410-427	
Engine Power:	= 4 x 2320 kW	Engine power referenced from another ferry with same engine <a href="http://www.barcaferry.com/photo/photo_shipyards/lbm/52mtricat_date.html">http://www.barcaferry.com/photo/photo_shipyards/lbm/52mtricat_date.html</a>
	= 9280 kW	
Fuel Emission Factors		
SO <sub>2</sub> (0.05% Sulphur Content)	= 0.20 g/kWh	Values of emission factors are referred to Table 3-27 of the Study on Marine Vessels Emissions Inventory, Feb 2012. Engine type of Medium Speed Diesel (MSD) and use of marine diesel oil with 0.5% sulphur content are made reference to and the values of RSP, FSP and NOx emission factors from Table 3-27 are adopted. According to the Air Pollution Control (Marine Light Diesel) Regulation introduced on 1 April 2014, the sulphur content of locally supplied marine light diesel is capped at 0.05%. Therefore, the value of SO <sub>2</sub> emission factor from Table 3-27 is divided by 10.
RSP	= 0.47 g/kWh	
FSP	= 0.43 g/kWh	
NOx	= 13.20 g/kWh	
Emission Rate (100% Loading Factor, 4 Engines)		
SO <sub>2</sub>	= 1.84 kg/hr = 0.51 g/s	Number of idling ferries at HKMFT, conversion factor from NOx to NO <sub>2</sub> (20%) follows the approved EIA report "Expansion of Heliport Facilities at Macau Ferry Terminal" (AEIAR-095/2006)
RSP	= 4.36 kg/hr = 1.21 g/s	
FSP	= 3.99 kg/hr = 1.11 g/s	
NOx	= 122.50 kg/hr = 34.03 g/s	
NO	= 27.22 g/s	
NO <sub>2</sub>	= 6.81 g/s	
Emission Rate Accounting for Operation Modes		
Emission Rate = Engine Power x Loading Factor x Emission Factor		
Engine Load Factor (Travelling)	= 36.6%	Loading factor is referred to Table 3-18 of Study on Marine Vessels Emissions Inventory, February 2012. Cruise/Ferry type with PAX range 300 - 699 is assumed as referred to the information of the website of Hong Kong Macau Ferry Terminal ( <a href="https://www.turbojet.com.hk/en/vessel-information/austal-cat.aspx">https://www.turbojet.com.hk/en/vessel-information/austal-cat.aspx</a> ), the total capacity of Austal Cat is 410 to 427 passengers.
Engine Load Factor (Idling)	= 10%	
Emission Factor - Idling (g/s/ferry)	=	
Emission Factor - Travelling (g/s/ferry)	=	

**Idling Emissions**

Type of Ferry	No. of Ferries per hour at 1 Berth (daytime) <sup>(i)</sup>	No. of Ferries per hour at 1 Berth (night time) <sup>(i)</sup>	Time <sub>(idling)</sub> (min per ferry) <sup>(ii)</sup>	Maximum Emission Rate (g/s)					Maximum Emission Rate (g/s)				
				NO (daytime)	NO <sub>2</sub> (daytime)	SO <sub>2</sub> (daytime)	RSP (daytime)	FSP (daytime)	NO (nighttime)	NO <sub>2</sub> (nighttime)	SO <sub>2</sub> (nighttime)	RSP (nighttime)	FSP (nighttime)
A	1	1	20	9.07E-01	2.27E-01	1.70E-02	4.04E-02	3.69E-02	9.07E-01	2.27E-01	1.70E-02	4.04E-02	3.69E-02

Remarks:

- (i) For daytime, the frequency of 4 ferries per hour would be adopted for departure. Therefore, 1 ferry idling at each berth is assumed for each hour (i.e. 4 ferries are in idling mode in the same hour). For nighttime, although the frequency of 2 ferries per hour would be adopted for departure, 1 ferry idling at each berth is assumed for each hour (i.e. 4 ferries are in idling mode in the same hour).  
(ii) Idling time is referenced from the approved EIA for Expansion of Heliport Facilities at Macau Ferry Terminal (AEIAR-095/2006), which is the best available information to be adopted.

**Cruising Emissions**

Route	Speed (kt) <sup>(1)</sup>	Speed (m/s)	Distance Travel (m) <sup>(2)</sup>	Travelling Time per Ferry (s) <sup>(3)</sup>	Frequency (daytime) (ferry/hr) <sup>(4)</sup>	Frequency (night time) (ferry/hr) <sup>(4)</sup>	Maximum Emission Rate (g/s) <sup>(5)</sup>					Maximum Emission Rate (g/s) <sup>(5)</sup>				
							NO (daytime)	NO <sub>2</sub> (daytime)	SO <sub>2</sub> (daytime)	RSP (daytime)	FSP (daytime)	NO (nighttime)	NO <sub>2</sub> (nighttime)	SO <sub>2</sub> (nighttime)	RSP (nighttime)	FSP (nighttime)
MFT <-> Macau Route 1	45	23.15	1575	68	4	2	7.53E-01	1.88E-01	1.41E-02	3.35E-02	3.07E-02	3.76E-01	9.41E-02	7.06E-03	1.68E-02	1.53E-02
MFT <-> Macau Route 2	45	23.15	1650	71	4	2	7.86E-01	1.96E-01	1.47E-02	3.50E-02	3.20E-02	3.93E-01	9.82E-02	7.37E-03	1.75E-02	1.60E-02

Remarks:

- (1) Speed for the ferry is made reference from the approved EIA for Expansion of Heliport Facilities at Macau Ferry Terminal (AEIAR-095/2006), which is the best available information to be adopted.  
(2) Distance Travel is made reference from the approved EIA for Expansion of Heliport Facilities at Macau Ferry Terminal (AEIAR-095/2006), which is the total distance for the ferries arriving to and departing from the terminal identified for Route 1 and Route 2 (ferry would be arriving to the terminal from west of the terminal and departing from the terminal from east of the terminal).  
(3) Travelling Time per Ferry is made reference from the approved EIA for Expansion of Heliport Facilities at Macau Ferry Terminal (AEIAR-095/2006), which is the travelling time calculated by the speed of the ferry and for the total distance travel of each route.  
(4) Frequency is assumed based on the information collected at Marine Department's website.  
(5) Emission Rate = Emission Factor x Travelling Time per Ferry x Frequency/3600. Sample Calculation: 9.96 x 68 x 4/3600 = 7.53E-01 g/s

**Appendix 4-9 (Not Used)**

**Appendix 4-10 Derivation of Emission Rate of Helicopter**

**Helicopter Emission Rate at Hong Kong Macau Ferry Terminal**

**Operation Mode**

Time: 0800 – 18:00 (daytime) 18:01 – 22:59 (nighttime)<sup>(a)</sup>  
 Flight frequency: Max 8 landing and taking off cycles (LTO) per hour (daytime, 2 helipads, 4 LTO per helipad per hour), Max 6 LTO per hour (nighttime, 2 helipads, 3 LTO per helipad per hour)<sup>(a)</sup>

**Helicopter Information**

Helicopter Model: AgustaWestland AW139<sup>(b)</sup>  
 Engine: 2 x Pratt & Whitney Canada PT6C-67C turboshaft engine<sup>(c)</sup>  
 Max. Shaft Horsepower (SHP) per Engine: 1800 SHP

Event	Average Time (s) <sup>(a)</sup>	% of SHP per Engine <sup>(d)</sup>	Estimated SHP per Engine	Fuel Flow per Engine (kg/s) <sup>(e)</sup>	NOx Emission Factor (g/kg) <sup>(e)</sup>	NOx Emission Rate per Helicopter (g/s) <sup>(g)</sup>	NOx Emission Rate per Helipad- Daytime (g/s) <sup>(h)</sup>	NOx Emission Rate per Helipad- Nighttime (g/s) <sup>(i)</sup>
<b>Approach</b>	29.33	100%	1800	1.07E-01	1.49E+01	3.18E+00	1.04E-01	7.78E-02
<b>Hovering (Approach)</b>	30	100%	1800	1.07E-01	1.49E+01	3.18E+00	1.06E-01	7.96E-02
<b>Idling</b>	673.5	6%	108	2.36E-02	3.01E+00	1.43E-01	1.07E-01	8.00E-02
<b>Hovering (Take-off)</b>	55.83	100%	1800	1.07E-01	1.49E+01	3.18E+00	1.97E-01	1.48E-01
<b>Take-off</b>	12.5	100%	1800	1.07E-01	1.49E+01	3.18E+00	4.42E-02	3.32E-02

Event	Average Time (s) <sup>(a)</sup>	% of SHP per Engine <sup>(d)</sup>	Estimated SHP per Engine	Fuel Flow per Engine (kg/s) <sup>(e)</sup>	PM Emission Factor (g/kg) <sup>(e)</sup>	RSP Emission Factor (g/kg) <sup>(f)</sup>	FSP Emission Factor (g/kg) <sup>(f)</sup>	RSP Emission Rate per Helicopter (g/s) <sup>(g)</sup>	FSP Emission Rate per Helicopter (g/s) <sup>(g)</sup>	RSP Emission Rate per Helipad- Daytime (g/s) <sup>(h)</sup>	RSP Emission Rate per Helipad- Nighttime (g/s) <sup>(i)</sup>	FSP Emission Rate per Helipad- Daytime (g/s) <sup>(h)</sup>	FSP Emission Rate per Helipad- Nighttime (g/s) <sup>(i)</sup>
<b>Approach</b>	29.33	100%	1800	1.07E-01	3.76E-01	3.76E-01	3.76E-01	8.04E-02	8.04E-02	2.62E-03	1.96E-03	2.62E-03	1.96E-03
<b>Hovering (Approach)</b>	30	100%	1800	1.07E-01	3.76E-01	3.76E-01	3.76E-01	8.04E-02	8.04E-02	2.68E-03	2.01E-03	2.68E-03	2.01E-03
<b>Idling</b>	673.5	6%	108	2.36E-02	1.31E-01	1.31E-01	1.31E-01	6.18E-03	6.18E-03	4.62E-03	3.47E-03	4.62E-03	3.47E-03
<b>Hovering (Take-off)</b>	55.83	100%	1800	1.07E-01	3.76E-01	3.76E-01	3.76E-01	8.04E-02	8.04E-02	4.99E-03	3.74E-03	4.99E-03	3.74E-03
<b>Take-off</b>	12.5	100%	1800	1.07E-01	3.76E-01	3.76E-01	3.76E-01	8.04E-02	8.04E-02	1.12E-03	8.37E-04	1.12E-03	8.37E-04

Event	Average Time (s) <sup>(a)</sup>	% of SHP per Engine <sup>(d)</sup>	Estimated SHP per Engine	Fuel Flow per Engine (kg/s) <sup>(e)</sup>	SO <sub>2</sub> Emission Rate per Helicopter (g/s) <sup>(j)</sup>	SO <sub>2</sub> Emission Rate per Helipad- Daytime (g/s) <sup>(h)</sup>	SO <sub>2</sub> Emission Rate per Helipad- Nighttime (g/s) <sup>(i)</sup>
<b>Approach</b>	29.33	100%	1800	1.07E-01	6.41E-01	2.09E-02	1.57E-02
<b>Hovering (Approach)</b>	30	100%	1800	1.07E-01	6.41E-01	2.14E-02	1.60E-02
<b>Idling</b>	673.5	6%	108	2.36E-02	1.42E-01	1.06E-01	7.96E-02
<b>Hovering (Take-off)</b>	55.83	100%	1800	1.07E-01	6.41E-01	3.98E-02	2.98E-02
<b>Take-off</b>	12.5	100%	1800	1.07E-01	6.41E-01	8.91E-03	6.68E-03

- Notes: (a) Referenced from Table 5.4 and Appendix 5.1a of the approved EIA report "Expansion of Heliport Facilities at Macau Ferry Terminal" (AEIAR-095/2006).  
 (b) Helicopter model used by the operator referenced from company website (<http://www.skyshuttlehk.com/?pid=our-heli-fleet>).  
 (c) Typical engine used by the helicopter model referenced from Type Certificate Data Sheets (European Aviation Safety Agency, 2020).  
 (d) Power for take-off per engine assumed as 100% of maximum power per engine while 6% of maximum power per engine is used for idling with reference to Table 4 of Guidance on the Determination of Helicopter Emission (GDHE) (Swiss Confederation 2015).  
 (e) Fuel flow per engine, NOx and PM emission factor is based on the empirical formulas listed in Section 3.2, Fuel Flow for Engines above 1000 SHP and Emission Factors for NOx and PM for Engines above 1000 SHP respectively (GDHE, 2015).  
 (f) RSP and FSP Emission Conversion Factor is assumed as 1 as a conservative approach.  
 (g) Emission Rate per Helicopter = Fuel Flow per Engine x Emission Factor x 2  
 (h) Emission Rate per Helipad (Daytime) = Emission Rate per Helicopter x Average Time x 4 LTO/hour /3600  
 (i) Emission Rate per Helipad (Nighttime) = Emission Rate per Helicopter x Average Time x 3 LTO/hour /3600  
 (j) Emission Rate per Helicopter = Fuel Flow per Engine x sulphur content for SO<sub>2</sub> (0.3%) x 2. The sulphur content for the fuel of helicopter is assumed as 0.3% because (i) referring to the information provided in Appendix 3.1 of the Approved EIA report for A Rooftop Helipad at the Proposed New Block of Queen Mary Hospital (AEIAR-208/2017), the sulphur content of jet fuel is 0.3%; (ii) as stated in Section 5.3.4.8 of the approved EIA report for Expansion of Hong Kong International Airport into a Three-Runway System (AEIAR-185/2014), according to International Civil Aviation Organisation Air Quality Manual 2011, a conservative fuel sulphur content is 0.068%. Therefore, adoption of 0.3% of sulphur content is considered as a conservation approach and the amount of the emission of SO<sub>2</sub> would not be underestimated.



**Appendix 4-11 Derivation of Emission Rates of Public Transport Interchanges  
and Bus**



**Running Emission - Terminating and Bypass Buses**

Average Travelling Distance within bus terminus =	140	m
Average Travelling Speed =	10	km/h

Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)						Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	11	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.70E+01	1.59E+01	1.07E+00	5.87E-01	5.40E-01
0100 - 0200	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.08E+01	1.01E+01	6.82E-01	3.73E-01	3.43E-01	3.43E-01
0700 - 0800	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.39E+01	1.30E+01	8.77E-01	4.80E-01	4.42E-01	4.42E-01
0800 - 0900	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.86E+01	1.74E+01	1.17E+00	6.40E-01	5.89E-01	5.89E-01
0900 - 1000	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	2.63E+01	2.46E+01	1.66E+00	9.07E-01	8.34E-01	8.34E-01
1000 - 1100	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	19	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	2.94E+01	2.75E+01	1.85E+00	1.01E+00	9.32E-01	9.32E-01
1100 - 1200	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.86E+01	1.74E+01	1.17E+00	6.40E-01	5.89E-01	5.89E-01
1200 - 1300	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.24E+01	1.16E+01	7.79E-01	4.27E-01	3.92E-01	3.92E-01
1300 - 1400	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.39E+01	1.30E+01	8.77E-01	4.80E-01	4.42E-01	4.42E-01
1400 - 1500	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.86E+01	1.74E+01	1.17E+00	6.40E-01	5.89E-01	5.89E-01
1500 - 1600	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	10	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.55E+01	1.45E+01	9.74E-01	5.33E-01	4.91E-01	4.91E-01
1600 - 1700	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	16	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	2.47E+01	2.32E+01	1.56E+00	8.53E-01	7.85E-01	7.85E-01
1700 - 1800	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	26	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	4.02E+01	3.77E+01	2.53E+00	1.39E+00	1.28E+00	1.28E+00
1800 - 1900	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	18	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	2.78E+01	2.61E+01	1.75E+00	9.60E-01	8.83E-01	8.83E-01
1900 - 2000	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	22	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	3.40E+01	3.19E+01	2.14E+00	1.17E+00	1.08E+00	1.08E+00
2000 - 2100	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	18	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	2.78E+01	2.61E+01	1.75E+00	9.60E-01	8.83E-01	8.83E-01
2100 - 2200	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	16	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	2.47E+01	2.32E+01	1.56E+00	8.53E-01	7.85E-01	7.85E-01
2200 - 2300	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	6.19E+00	5.80E+00	3.90E-01	2.13E-01	1.96E-01	1.96E-01
2300 - 2400	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	14	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	2.17E+01	2.03E+01	1.36E+00	7.47E-01	6.87E-01	6.87E-01
Daily Total	0										260											

**Idling Emission - Bypass Buses**

Idling Time for Bypass Buses	2	min
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Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)						Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02
0100 - 0200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.70E+00	1.59E+00	1.07E-01	1.41E-02	1.41E-02	1.41E-02
0700 - 0800	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	1.77E-02
0800 - 0900	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	3.40E+00	3.18E+00	2.14E-01	2.83E-02	2.83E-02	2.83E-02
0900 - 1000	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	11	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	4.67E+00	4.38E+00	2.94E-01	3.89E-02	3.89E-02	3.89E-02
1000 - 1100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	10	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	4.25E+00	3.96E+00	2.67E-01	3.53E-02	3.53E-02	3.53E-02
1100 - 1200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	2.12E-02
1200 - 1300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	2.12E-02
1300 - 1400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	1.77E-02
1400 - 1500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-0								



**Running Emission - Terminating and Bypass Buses**

Average Travelling Distance within bus terminus =	140	m
Average Travelling Speed =	10	km/h

Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)						Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	11	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.61E+01	1.51E+01	1.01E+00	5.87E-01	5.40E-01
0100 - 0200	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0200 - 0300	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0500 - 0600	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0600 - 0700	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.03E+01	9.60E+00	6.46E-01	3.73E-01	3.43E-01	
0700 - 0800	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.32E+01	1.23E+01	8.30E-01	4.80E-01	4.42E-01	
0800 - 0900	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.76E+01	1.65E+01	1.11E+00	6.40E-01	5.89E-01	
0900 - 1000	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	2.49E+01	2.33E+01	1.57E+00	9.07E-01	8.34E-01	
1000 - 1100	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	19	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	2.78E+01	2.61E+01	1.75E+00	1.01E+00	9.32E-01	
1100 - 1200	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.70E+01	1.65E+01	1.11E+00	6.40E-01	5.89E-01	
1200 - 1300	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.17E+01	1.10E+01	7.38E-01	4.27E-01	3.92E-01	
1300 - 1400	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.32E+01	1.23E+01	8.30E-01	4.80E-01	4.42E-01	
1400 - 1500	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.76E+01	1.65E+01	1.11E+00	6.40E-01	5.89E-01	
1500 - 1600	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	10	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.46E+01	1.37E+01	9.22E-01	5.33E-01	4.91E-01	
1600 - 1700	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	16	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	2.34E+01	2.20E+01	1.48E+00	8.53E-01	7.85E-01	
1700 - 1800	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	26	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	3.81E+01	3.57E+01	2.40E+00	1.39E+00	1.28E+00	
1800 - 1900	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	18	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	2.64E+01	2.47E+01	1.66E+00	9.60E-01	8.83E-01	
1900 - 2000	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	22	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	3.22E+01	3.02E+01	2.03E+00	1.17E+00	1.08E+00	
2000 - 2100	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	18	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	2.64E+01	2.47E+01	1.66E+00	9.60E-01	8.83E-01	
2100 - 2200	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	16	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	2.34E+01	2.20E+01	1.48E+00	8.53E-01	7.85E-01	
2200 - 2300	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	5.86E+00	5.49E+00	3.69E-01	2.13E-01	1.96E-01	
2300 - 2400	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	14	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	2.05E+01	1.92E+01	1.29E+00	7.47E-01	6.87E-01	
Daily Total	0										260											

**Idling Emission - Bypass Buses**

Idling Time for Bypass Buses	2	min
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Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)						Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02
0100 - 0200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0200 - 0300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0500 - 0600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0600 - 0700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.70E+00	1.59E+00	1.07E-01	1.41E-02	1.41E-02	
0700 - 0800	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
0800 - 0900	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	3.40E+00	3.18E+00	2.14E-01	2.83E-02	2.83E-02	
0900 - 1000	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	11	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	4.67E+00	4.38E+00	2.94E-01	3.89E-02	3.89E-02	
1000 - 1100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	10	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	4.25E+00	3.96E+00	2.67E-01	3.53E-02	3.53E-02	
1100 - 1200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	
1200 - 1300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	
1300 - 1400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
1400 - 1500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	
1500 - 1600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
1600 - 1700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E															



**Running Emission - Terminating and Bypass Buses**

Average Travelling Distance within bus terminus =	140	m
Average Travelling Speed =	10	km/h

Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)						Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	11	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.68E+01	1.57E+01	1.06E+00	5.87E-01	5.40E-01
0100 - 0200	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0200 - 0300	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0500 - 0600	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0600 - 0700	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.07E+01	1.00E+01	6.73E-01	3.73E-01	3.43E-01	
0700 - 0800	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.37E+01	1.29E+01	8.65E-01	4.80E-01	4.42E-01	
0800 - 0900	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.83E+01	1.72E+01	1.15E+00	6.40E-01	5.89E-01	
0900 - 1000	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	2.60E+01	2.43E+01	1.63E+00	9.07E-01	8.34E-01	
1000 - 1100	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	19	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	2.90E+01	2.72E+01	1.83E+00	1.01E+00	9.32E-01	
1100 - 1200	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.83E+01	1.72E+01	1.15E+00	6.40E-01	5.89E-01	
1200 - 1300	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.22E+01	1.14E+01	7.69E-01	4.27E-01	3.92E-01	
1300 - 1400	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.37E+01	1.29E+01	8.65E-01	4.80E-01	4.42E-01	
1400 - 1500	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.83E+01	1.72E+01	1.15E+00	6.40E-01	5.89E-01	
1500 - 1600	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	10	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.53E+01	1.43E+01	9.62E-01	5.33E-01	4.91E-01	
1600 - 1700	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	16	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	2.44E+01	2.29E+01	1.54E+00	8.53E-01	7.85E-01	
1700 - 1800	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	26	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	3.97E+01	3.72E+01	2.50E+00	1.39E+00	1.28E+00	
1800 - 1900	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	18	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	2.75E+01	2.57E+01	1.73E+00	9.60E-01	8.83E-01	
1900 - 2000	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	22	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	3.36E+01	3.15E+01	2.12E+00	1.17E+00	1.08E+00	
2000 - 2100	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	18	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	2.75E+01	2.57E+01	1.73E+00	9.60E-01	8.83E-01	
2100 - 2200	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	16	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	2.44E+01	2.29E+01	1.54E+00	8.53E-01	7.85E-01	
2200 - 2300	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	6.11E+00	5.72E+00	3.85E-01	2.13E-01	1.96E-01	
2300 - 2400	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	14	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	2.14E+01	2.00E+01	1.35E+00	7.47E-01	6.87E-01	
<b>Daily Total</b>	<b>0</b>										<b>260</b>											

**Idling Emission - Bypass Buses**

Idling Time for Bypass Buses	2	min
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Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)						Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02
0100 - 0200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0200 - 0300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0500 - 0600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0600 - 0700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.70E+00	1.59E+00	1.07E-01	1.41E-02	1.41E-02	
0700 - 0800	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
0800 - 0900	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	3.40E+00	3.18E+00	2.14E-01	2.83E-02	2.83E-02	
0900 - 1000	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	11	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	4.67E+00	4.38E+00	2.94E-01	3.89E-02	3.89E-02	
1000 - 1100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	10	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	4.25E+00	3.98E+00	2.67E-01	3.53E-02	3.53E-02	
1100 - 1200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	
1200 - 1300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	
1300 - 1400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
1400 - 1500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	
1500 - 1600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
1600 - 1700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-																





**Running Emission - Terminating and Bypass Buses**

Average Travelling Distance within bus terminus =	140	m
Average Travelling Speed =	10	km/h

Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)						Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	11	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.74E+01	1.63E+01	1.10E+00	5.87E-01	5.40E-01
0100 - 0200	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0200 - 0300	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0500 - 0600	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0600 - 0700	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.11E+01	1.04E+01	6.98E-01	3.73E-01	3.43E-01	
0700 - 0800	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.43E+01	1.34E+01	8.98E-01	4.80E-01	4.42E-01	
0800 - 0900	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.90E+01	1.78E+01	1.20E+00	6.40E-01	5.89E-01	
0900 - 1000	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	2.69E+01	2.52E+01	1.70E+00	9.07E-01	8.34E-01	
1000 - 1100	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	19	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	3.01E+01	2.82E+01	1.90E+00	1.01E+00	9.32E-01	
1100 - 1200	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.90E+01	1.78E+01	1.20E+00	6.40E-01	5.89E-01	
1200 - 1300	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.27E+01	1.19E+01	7.98E-01	4.27E-01	3.92E-01	
1300 - 1400	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.43E+01	1.34E+01	8.98E-01	4.80E-01	4.42E-01	
1400 - 1500	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.90E+01	1.78E+01	1.20E+00	6.40E-01	5.89E-01	
1500 - 1600	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	10	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.58E+01	1.48E+01	9.98E-01	5.33E-01	4.91E-01	
1600 - 1700	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	16	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	2.53E+01	2.37E+01	1.60E+00	8.53E-01	7.85E-01	
1700 - 1800	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	26	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	4.12E+01	3.86E+01	2.59E+00	1.39E+00	1.28E+00	
1800 - 1900	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	18	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	2.85E+01	2.67E+01	1.80E+00	9.60E-01	8.83E-01	
1900 - 2000	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	22	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	3.48E+01	3.27E+01	2.19E+00	1.17E+00	1.08E+00	
2000 - 2100	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	18	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	2.85E+01	2.67E+01	1.80E+00	9.60E-01	8.83E-01	
2100 - 2200	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	16	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	2.53E+01	2.37E+01	1.60E+00	8.53E-01	7.85E-01	
2200 - 2300	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	6.34E+00	5.94E+00	3.99E-01	2.13E-01	1.96E-01	
2300 - 2400	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	14	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	2.22E+01	2.08E+01	1.40E+00	7.47E-01	6.87E-01	
Daily Total	0										260											

**Idling Emission - Bypass Buses**

Idling Time for Bypass Buses	2	min
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Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)						Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02
0100 - 0200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0200 - 0300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0500 - 0600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0600 - 0700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.70E+00	1.59E+00	1.07E-01	1.41E-02	1.41E-02	
0700 - 0800	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
0800 - 0900	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	3.40E+00	3.18E+00	2.14E-01	2.83E-02	2.83E-02	
0900 - 1000	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	11	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	4.67E+00	4.38E+00	2.94E-01	3.89E-02	3.89E-02	
1000 - 1100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	10	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	4.25E+00	3.98E+00	2.67E-01	3.53E-02	3.53E-02	
1100 - 1200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	
1200 - 1300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	
1300 - 1400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
1400 - 1500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	
1500 - 1600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
1600 - 1700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E															





**Running Emission - Terminating and Bypass Public Light Buses**

Average Travelling Distance within bus terminus =	275	m
Average Travelling Speed =	10	km/h

Hour	Frequency	PLB (Diesel + LPG)									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	10	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	3.43E+00	2.80E+00	6.28E-01	1.38E-01	1.27E-01
0100 - 0200	0	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	0	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	0	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	9	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	3.09E+00	2.52E+00	5.65E-01	1.24E-01	1.14E-01
0700 - 0800	18	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	6.17E+00	5.04E+00	1.13E+00	2.48E-01	2.28E-01
0800 - 0900	23	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	7.89E+00	6.44E+00	1.44E+00	3.16E-01	2.91E-01
0900 - 1000	18	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	6.17E+00	5.04E+00	1.13E+00	2.48E-01	2.28E-01
1000 - 1100	27	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	9.26E+00	7.57E+00	1.69E+00	3.71E-01	3.42E-01
1100 - 1200	30	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	1.03E+01	8.41E+00	1.88E+00	4.13E-01	3.80E-01
1200 - 1300	21	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	7.20E+00	5.88E+00	1.32E+00	2.89E-01	2.66E-01
1300 - 1400	23	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	7.89E+00	6.44E+00	1.44E+00	3.16E-01	2.91E-01
1400 - 1500	24	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	8.23E+00	6.72E+00	1.51E+00	3.30E-01	3.04E-01
1500 - 1600	23	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	7.89E+00	6.44E+00	1.44E+00	3.16E-01	2.91E-01
1600 - 1700	13	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	4.46E+00	3.64E+00	8.16E-01	1.79E-01	1.64E-01
1700 - 1800	18	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	6.17E+00	5.04E+00	1.13E+00	2.48E-01	2.28E-01
1800 - 1900	18	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	6.17E+00	5.04E+00	1.13E+00	2.48E-01	2.28E-01
1900 - 2000	21	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	7.20E+00	5.88E+00	1.32E+00	2.89E-01	2.66E-01
2000 - 2100	16	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	5.49E+00	4.48E+00	1.00E+00	2.20E-01	2.02E-01
2100 - 2200	17	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	5.83E+00	4.78E+00	1.07E+00	2.34E-01	2.15E-01
2200 - 2300	11	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	3.77E+00	3.08E+00	6.90E-01	1.51E-01	1.39E-01
2300 - 2400	54	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	1.85E+01	1.51E+01	3.39E+00	7.43E-01	6.83E-01
<b>Daily Total</b>	<b>394</b>										

**Idling Emission - Bypass Public Light Buses**

No. of PLB (Diesel) to No. of PLB (LPG) Ratio	3.2
Idling Time for Bypass Public Light Buses	2 min

Hour	Frequency	PLB (Diesel)										PLB (LPG)										
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)					Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)					
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	
0000 - 0100	4	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.78E-01	2.00E-01	7.78E-02	3.47E-03	3.47E-03	1	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	4.87E-01	4.85E-01	2.46E-03	1.19E-03	1.19E-03
0100 - 0200	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	5	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	3.47E-01	2.50E-01	9.72E-02	4.33E-03	4.33E-03	1	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	4.87E-01	4.85E-01	2.46E-03	1.19E-03	1.19E-03
0700 - 0800	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.72E-01	7.00E-01	2.72E-01	1.21E-02	1.21E-02	4	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.83E-03	4.77E-03	4.77E-03
0800 - 0900	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.72E-01	7.00E-01	2.72E-01	1.21E-02	1.21E-02	4	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.83E-03	4.77E-03	4.77E-03
0900 - 1000	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	7.64E-01	5.50E-01	2.14E-01	9.53E-03	9.53E-03	4	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.83E-03	4.77E-03	4.77E-03
1000 - 1100	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.72E-01	7.00E-01	2.72E-01	1.21E-02	1.21E-02	4	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.83E-03	4.77E-03	4.77E-03
1100 - 1200	18	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.25E+00	9.00E-01	3.50E-01	1.56E-02	1.56E-02	5	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	2.44E+00	2.42E+00	1.23E-02	5.96E-03	5.96E-03
1200 - 1300	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.83E-03	4.77E-03	4.77E-03
1300 - 1400	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.83E-03	4.77E-03	4.77E-03
1400 - 1500	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.83E-03	4.77E-03	4.77E-03
1500 - 1600	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.83E-03	4.77E-03	4.77E-03
1600 - 1700	8	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	5.56E-01	4.00E-01	1.56E-01	6.93E-03	6.93E-03	3	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.38E-03	3.58E-03	3.58E-03
1700 - 1800	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	7.64E-01	5.50E-01	2.14E-01	9.53E-03	9.53E-03	3	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.38E-03	3.58E-03	3.58E-03
1800 - 1900	12	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	8.33E-01	6.00E-01	2.33E-01	1.04E-02	1.04E-02	4	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.83E-03	4.77E-03	4.77E-03
1900 - 2000	10	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.94E-01	5.00E-01	1.94E-01	8.67E-03	8.67E-03	3	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.38E-03	3.58E-03	3.58E-03
2000 - 2100	9	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.25E-01	4.50E-01	1.75E-01	7.80E-03	7.80E-03	3	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.38E-03	3.58E-03	3.58E-03
2100 - 2200	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	7.64E-01	5.50E-01	2.14E-01	9.53E-03	9.53E-03	3	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.38E-03	3.58E-03	3.58E-03
2200 - 2300	7	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	4.86E-01	3.50E-01	1.36E-01	6.07E-03	6.07E-03	2	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	9.74E-01	9.69E-01	4.92E-03	2.38E-03	2.38E-03
2300 - 2400	2																					





**Running Emission - Terminating and Bypass Public Light Buses**

Average Travelling Distance within bus terminus =	275	m
Average Travelling Speed =	10	km/h

Hour	Frequency	PLB (Diesel + LPG)									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP
0000 - 0100	10	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	3.14E+00	2.55E+00	5.94E-01	1.38E-01	1.27E-01
0100 - 0200	0	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	0	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	0	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	9	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	2.83E+00	2.29E+00	5.34E-01	1.24E-01	1.14E-01
0700 - 0800	18	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	5.65E+00	4.58E+00	1.07E+00	2.48E-01	2.28E-01
0800 - 0900	23	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	7.22E+00	5.86E+00	1.37E+00	3.16E-01	2.91E-01
0900 - 1000	18	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	5.65E+00	4.58E+00	1.07E+00	2.48E-01	2.28E-01
1000 - 1100	27	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	8.48E+00	6.88E+00	1.60E+00	3.71E-01	3.42E-01
1100 - 1200	30	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	9.42E+00	7.64E+00	1.78E+00	4.13E-01	3.80E-01
1200 - 1300	21	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	6.59E+00	5.35E+00	1.25E+00	2.89E-01	2.66E-01
1300 - 1400	23	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	7.22E+00	5.86E+00	1.37E+00	3.16E-01	2.91E-01
1400 - 1500	24	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	7.54E+00	6.11E+00	1.42E+00	3.30E-01	3.04E-01
1500 - 1600	23	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	7.22E+00	5.86E+00	1.37E+00	3.16E-01	2.91E-01
1600 - 1700	13	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	4.08E+00	3.31E+00	7.72E-01	1.79E-01	1.64E-01
1700 - 1800	18	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	5.65E+00	4.58E+00	1.07E+00	2.48E-01	2.28E-01
1800 - 1900	18	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	5.65E+00	4.58E+00	1.07E+00	2.48E-01	2.28E-01
1900 - 2000	21	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	6.59E+00	5.35E+00	1.25E+00	2.89E-01	2.66E-01
2000 - 2100	16	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	5.02E+00	4.07E+00	9.50E-01	2.20E-01	2.02E-01
2100 - 2200	17	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	5.34E+00	4.33E+00	1.01E+00	2.34E-01	2.15E-01
2200 - 2300	11	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	3.45E+00	2.80E+00	6.53E-01	1.51E-01	1.39E-01
2300 - 2400	54	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	1.70E+01	1.38E+01	3.21E+00	7.43E-01	6.83E-01
<b>Daily Total</b>	<b>394</b>										

**Idling Emission - Bypass Public Light Buses**

No. of PLB (Diesel) to No. of PLB (LPG) Ratio	3.2
Idling Time for Bypass Public Light Buses	2 min

Hour	Frequency	PLB (Diesel)										PLB (LPG)										
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)					Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)					
		NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP	
0000 - 0100	4	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.78E-01	2.00E-01	7.78E-02	3.47E-03	3.47E-03	1	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	4.87E-01	4.85E-01	2.43E-03	1.19E-03	1.19E-03
0100 - 0200	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	5	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	3.47E-01	2.50E-01	9.72E-02	4.33E-03	4.33E-03	1	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	4.87E-01	4.85E-01	2.43E-03	1.19E-03	1.19E-03
0700 - 0800	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.72E-01	7.00E-01	2.72E-01	1.21E-02	1.21E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.73E-03	4.77E-03	4.77E-03
0800 - 0900	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.72E-01	7.00E-01	2.72E-01	1.21E-02	1.21E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.73E-03	4.77E-03	4.77E-03
0900 - 1000	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	7.64E-01	5.50E-01	2.14E-01	9.53E-03	9.53E-03	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.73E-03	4.77E-03	4.77E-03
1000 - 1100	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.72E-01	7.00E-01	2.72E-01	1.21E-02	1.21E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.73E-03	4.77E-03	4.77E-03
1100 - 1200	18	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.25E+00	9.00E-01	3.50E-01	1.56E-02	1.56E-02	5	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	2.44E+00	2.42E+00	1.22E-02	5.96E-03	5.96E-03
1200 - 1300	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.73E-03	4.77E-03	4.77E-03
1300 - 1400	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.73E-03	4.77E-03	4.77E-03
1400 - 1500	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.73E-03	4.77E-03	4.77E-03
1500 - 1600	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.73E-03	4.77E-03	4.77E-03
1600 - 1700	8	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	5.56E-01	4.00E-01	1.56E-01	6.93E-03	6.93E-03	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.30E-03	3.58E-03	3.58E-03
1700 - 1800	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	7.64E-01	5.50E-01	2.14E-01	9.53E-03	9.53E-03	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.30E-03	3.58E-03	3.58E-03
1800 - 1900	12	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	8.33E-01	6.00E-01	2.33E-01	1.04E-02	1.04E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.73E-03	4.77E-03	4.77E-03
1900 - 2000	10	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.94E-01	5.00E-01	1.94E-01	8.67E-03	8.67E-03	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.30E-03	3.58E-03	3.58E-03
2000 - 2100	9	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.25E-01	4.50E-01	1.75E-01	7.80E-03	7.80E-03	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.30E-03	3.58E-03	3.58E-03
2100 - 2200	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	7.64E-01	5.50E-01	2.14E-01	9.53E-03	9.53E-03	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.30E-03	3.58E-03	3.58E-03
2200 - 2300	7	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	4.86E-01	3.50E-01	1.36E-01	6.07E-03	6.07E-03	2	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	9.74E-01	9.69E-01	4.87E-02	2.38E-03	2.38E-03







**Running Emission - Terminating and Bypass Public Light Buses**

Average Travelling Distance within bus terminus =	275	m
Average Travelling Speed =	10	km/h

Hour	Frequency	PLB (Diesel + LPG)									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	10	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	3.29E+00	2.67E+00	6.19E-01	1.38E-01	1.27E-01
0100 - 0200	0	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	0	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	0	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	9	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	2.96E+00	2.40E+00	5.57E-01	1.24E-01	1.14E-01
0700 - 0800	18	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	5.92E+00	4.80E+00	1.11E+00	2.48E-01	2.28E-01
0800 - 0900	23	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	7.56E+00	6.14E+00	1.42E+00	3.16E-01	2.91E-01
0900 - 1000	18	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	5.92E+00	4.80E+00	1.11E+00	2.48E-01	2.28E-01
1000 - 1100	27	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	8.88E+00	7.21E+00	1.67E+00	3.71E-01	3.42E-01
1100 - 1200	30	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	9.86E+00	8.01E+00	1.86E+00	4.13E-01	3.80E-01
1200 - 1300	21	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	6.90E+00	5.60E+00	1.30E+00	2.89E-01	2.66E-01
1300 - 1400	23	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	7.56E+00	6.14E+00	1.42E+00	3.16E-01	2.91E-01
1400 - 1500	24	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	7.89E+00	6.40E+00	1.49E+00	3.30E-01	3.04E-01
1500 - 1600	23	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	7.56E+00	6.14E+00	1.42E+00	3.16E-01	2.91E-01
1600 - 1700	13	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	4.27E+00	3.47E+00	8.05E-01	1.79E-01	1.64E-01
1700 - 1800	18	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	5.92E+00	4.80E+00	1.11E+00	2.48E-01	2.28E-01
1800 - 1900	18	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	5.92E+00	4.80E+00	1.11E+00	2.48E-01	2.28E-01
1900 - 2000	21	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	6.90E+00	5.60E+00	1.30E+00	2.89E-01	2.66E-01
2000 - 2100	16	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	5.26E+00	4.27E+00	9.90E-01	2.20E-01	2.02E-01
2100 - 2200	17	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	5.59E+00	4.54E+00	1.05E+00	2.34E-01	2.15E-01
2200 - 2300	11	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	3.62E+00	2.94E+00	6.81E-01	1.51E-01	1.39E-01
2300 - 2400	54	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	1.78E+01	1.44E+01	3.34E+00	7.43E-01	6.83E-01
<b>Daily Total</b>	<b>394</b>										

**Idling Emission - Bypass Public Light Buses**

No. of PLB (Diesel) to No. of PLB (LPG) Ratio	3.2
Idling Time for Bypass Public Light Buses	2 min

Hour	Frequency	PLB (Diesel)										PLB (LPG)										
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)					Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)					
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	
0000 - 0100	4	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.78E-01	2.00E-01	7.78E-02	3.47E-03	3.47E-03	1	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	4.87E-01	4.85E-01	2.45E-03	1.19E-03	1.19E-03
0100 - 0200	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	5	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	3.47E-01	2.50E-01	9.72E-02	4.33E-03	4.33E-03	1	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	4.87E-01	4.85E-01	2.45E-03	1.19E-03	1.19E-03
0700 - 0800	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.72E-01	7.00E-01	2.72E-01	1.21E-02	1.21E-02	4	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.80E-03	4.77E-03	4.77E-03
0800 - 0900	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.72E-01	7.00E-01	2.72E-01	1.21E-02	1.21E-02	4	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.80E-03	4.77E-03	4.77E-03
0900 - 1000	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	7.64E-01	5.50E-01	2.14E-01	9.53E-03	9.53E-03	4	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.80E-03	4.77E-03	4.77E-03
1000 - 1100	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.72E-01	7.00E-01	2.72E-01	1.21E-02	1.21E-02	4	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.80E-03	4.77E-03	4.77E-03
1100 - 1200	18	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.25E+00	9.00E-01	3.50E-01	1.56E-02	1.56E-02	5	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	2.44E+00	2.42E+00	1.22E-02	5.96E-03	5.96E-03
1200 - 1300	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.80E-03	4.77E-03	4.77E-03
1300 - 1400	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.80E-03	4.77E-03	4.77E-03
1400 - 1500	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.80E-03	4.77E-03	4.77E-03
1500 - 1600	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.80E-03	4.77E-03	4.77E-03
1600 - 1700	8	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	5.56E-01	4.00E-01	1.56E-01	6.93E-03	6.93E-03	3	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.35E-03	3.58E-03	3.58E-03
1700 - 1800	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	7.64E-01	5.50E-01	2.14E-01	9.53E-03	9.53E-03	3	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.35E-03	3.58E-03	3.58E-03
1800 - 1900	12	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	8.33E-01	6.00E-01	2.33E-01	1.04E-02	1.04E-02	4	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.80E-03	4.77E-03	4.77E-03
1900 - 2000	10	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.94E-01	5.00E-01	1.94E-01	8.67E-03	8.67E-03	3	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.35E-03	3.58E-03	3.58E-03
2000 - 2100	9	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.25E-01	4.50E-01	1.75E-01	7.80E-03	7.80E-03	3	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.35E-03	3.58E-03	3.58E-03
2100 - 2200	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	7.64E-01	5.50E-01	2.14E-01	9.53E-03	9.53E-03	3	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.35E-03	3.58E-03	3.58E-03
2200 - 2300	7	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	4.86E-01	3.50E-01	1.36E-01	6.07E-03	6.07E-03	2	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	9.74E-01	9.69E-01	4.90E-03	2.38E-03	2.38E-03
2300 - 2400	2																					

**Hong Kong Station Bus Terminus (PLB)**

Minimum Hourly Temperature and Relative Humidity for 4th Quarter

Temperature: 6 °C  
Relative Humidity: 18 %

**Start Emission**

No. of PLB (Diesel) to No. of PLB (LPG) Ratio	3.2
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	Public Light Buses (PLB) (Diesel) Start Emission Factor (g/trip)																	
NOx	5.90E-02	1.06E-01	1.42E-01	2.01E-01	2.48E-01	3.30E-01	4.84E-01	6.02E-01	8.85E-01	1.16E+00	1.30E+00	1.53E+00	1.69E+00	1.77E+00	1.82E+00	1.86E+00	1.89E+00	1.89E+00
NO	4.25E-02	7.85E-02	1.02E-01	1.44E-01	1.78E-01	2.38E-01	3.48E-01	4.33E-01	6.37E-01	8.32E-01	9.34E-01	1.10E+00	1.21E+00	1.27E+00	1.31E+00	1.34E+00	1.36E+00	1.36E+00
NO2	1.65E-02	2.97E-02	3.96E-02	5.62E-02	6.94E-02	9.25E-02	1.35E-01	1.69E-01	2.48E-01	3.24E-01	3.63E-01	4.29E-01	4.72E-01	4.96E-01	5.09E-01	5.22E-01	5.29E-01	5.29E-01
RSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Soaking Time (min)	No. of Trips of PLB (Diesel) [9]																	
	5	10	20	30	40	50	60	120	180	240	300	360	420	480	540	600	660	720
0000 - 0100	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
0100 - 0200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200 - 0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300 - 0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400 - 0500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0500 - 0600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0600 - 0700	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
0700 - 0800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0800 - 0900	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
0900 - 1000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000 - 1100	3	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1100 - 1200	1	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1200 - 1300	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
1300 - 1400	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400 - 1500	3	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1500 - 1600	1	0	1	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0
1600 - 1700	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700 - 1800	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800 - 1900	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1900 - 2000	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0
2000 - 2100	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2100 - 2200	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200 - 2300	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300 - 2400	2	2	0	0	0	0	0	1	0	0	0	0	0	1	9	1	0	0
<b>Daily Total</b>																		<b>76</b>

Total Start Emission of PLB (Diesel) (g)				
NOx	NO	NO2	RSP	FSP
5.46E+00	3.93E+00	1.53E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7.08E-01	5.10E-01	1.98E-01	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7.67E-01	5.52E-01	2.15E-01	0.00E+00	0.00E+00
1.18E-01	8.50E-02	3.30E-02	0.00E+00	0.00E+00
7.31E-01	5.27E-01	2.05E-01	0.00E+00	0.00E+00
8.14E-01	5.86E-01	2.28E-01	0.00E+00	0.00E+00
1.84E+00	1.33E+00	5.15E-01	0.00E+00	0.00E+00
3.78E-01	2.72E-01	1.06E-01	0.00E+00	0.00E+00
7.55E-01	5.44E-01	2.11E-01	0.00E+00	0.00E+00
4.67E+00	3.36E+00	1.31E+00	0.00E+00	0.00E+00
5.90E-02	4.25E-02	1.65E-02	0.00E+00	0.00E+00
1.77E-01	1.28E-01	4.95E-02	0.00E+00	0.00E+00
3.07E-01	2.21E-01	8.59E-02	0.00E+00	0.00E+00
1.64E+00	1.18E+00	4.59E-01	0.00E+00	0.00E+00
4.13E-01	2.97E-01	1.16E-01	0.00E+00	0.00E+00
2.83E-01	2.04E-01	7.82E-02	0.00E+00	0.00E+00
1.42E-01	1.02E-01	3.96E-02	0.00E+00	0.00E+00
2.22E+01	1.60E+01	6.23E+00	0.00E+00	0.00E+00

Remark:

- [1] Number of cold starts were derived based on on-site observations at the PTIs and operators' published schedules, while sitting time were obtained based on on-site observations at PTIs.
- [2] Population ratio of PLB (Diesel) to PLB (LPG) was extracted from Year 2030 data of EMFAC-HK.

**Idling Emission - Terminating Public Light Buses**

Idling Time for Terminating Public Light Buses [10]	1	min
Max. Idling Time for Adjusting Start Emission =	1	min

Hour	Frequency	PLB (Diesel)										PLB (Diesel)										
		Cold Idling Emission Factor (g/s)					Cold Idling Emission (g) [1]					Hot Idling Emission Factor (g/s)					Hot Idling Emission (g) [1]					
	y	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	y	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	3	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	1.80E-01	1.30E-01	5.04E-02	1.30E-03	1.30E-03	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0100 - 0200	0	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	0	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	0	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	1	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	6.00E-02	4.32E-02	1.68E-02	4.33E-04	4.33E-04	1	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	3.47E-02	2.50E-02	9.72E-03	4.33E-04	4.33E-04
0700 - 0800	0	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0800 - 0900	1	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	6.00E-02	4.32E-02	1.68E-02	4.33E-04	4.33E-04	2	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.94E-02	5.00E-02	1.94E-02	8.67E-04	8.67E-04
0900 - 1000	0	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.94E-02	5.00E-02	1.94E-02	8.67E-04	8.67E-04
1000 - 1100	0	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.08E-01	1.50E-01	5.83E-02	2.60E-03	2.60E-03
1100 - 1200	0	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E-01	1.25E-01	4.86E-02	2.17E-03	2.17E-03
1200 - 1300	1	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	6.00E-02	4.32E-02	1.68E-02	4.33E-04	4.33E-04	3	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.04E-01	7.50E-02	2.92E-02	1.30E-03	1.30E-03
1300 - 1400	0	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.39E-01	1.00E-01	3.89E-02	1.73E-03	1.73E-03
1400 - 1500	0	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.08E-01	1.50E-01	5.83E-02	2.60E-03	2.60E-03
1500 - 1600	4	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	2.40E-01	1.73E-01	6.72E-02	1.73E-03	1.73E-03	2	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.94E-02	5.00E-02	1.94E-02	8.67E-04	8.67E-04
1600 - 1700	0	1.00E-03	7.20E-04	2.80E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7					



**Running Emission - Terminating and Bypass Public Light Buses**

Average Travelling Distance within bus terminus =	275	m
Average Travelling Speed =	10	km/h

Hour	Frequency	PLB (Diesel + LPG)									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	10	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	3.57E+00	2.93E+00	6.43E-01	1.38E-01	1.27E-01
0100 - 0200	0	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	0	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	0	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	9	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	3.21E+00	2.63E+00	5.79E-01	1.24E-01	1.14E-01
0700 - 0800	18	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	6.43E+00	5.27E+00	1.16E+00	2.48E-01	2.28E-01
0800 - 0900	23	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	8.21E+00	6.73E+00	1.48E+00	3.16E-01	2.91E-01
0900 - 1000	18	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	6.43E+00	5.27E+00	1.16E+00	2.48E-01	2.28E-01
1000 - 1100	27	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	9.64E+00	7.90E+00	1.74E+00	3.71E-01	3.42E-01
1100 - 1200	30	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	1.07E+01	8.78E+00	1.93E+00	4.13E-01	3.80E-01
1200 - 1300	21	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	7.50E+00	6.15E+00	1.35E+00	2.89E-01	2.66E-01
1300 - 1400	23	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	8.21E+00	6.73E+00	1.48E+00	3.16E-01	2.91E-01
1400 - 1500	24	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	8.57E+00	7.03E+00	1.54E+00	3.30E-01	3.04E-01
1500 - 1600	23	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	8.21E+00	6.73E+00	1.48E+00	3.16E-01	2.91E-01
1600 - 1700	13	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	4.64E+00	3.81E+00	8.36E-01	1.79E-01	1.64E-01
1700 - 1800	18	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	6.43E+00	5.27E+00	1.16E+00	2.48E-01	2.28E-01
1800 - 1900	18	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	6.43E+00	5.27E+00	1.16E+00	2.48E-01	2.28E-01
1900 - 2000	21	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	7.50E+00	6.15E+00	1.35E+00	2.89E-01	2.66E-01
2000 - 2100	16	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	5.71E+00	4.68E+00	1.03E+00	2.20E-01	2.02E-01
2100 - 2200	17	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	6.07E+00	4.98E+00	1.09E+00	2.34E-01	2.15E-01
2200 - 2300	11	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	3.93E+00	3.22E+00	7.07E-01	1.51E-01	1.39E-01
2300 - 2400	54	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	1.93E+01	1.58E+01	3.47E+00	7.43E-01	6.83E-01
<b>Daily Total</b>	<b>394</b>										

**Idling Emission - Bypass Public Light Buses**

No. of PLB (Diesel) to No. of PLB (LPG) Ratio	3.2
Idling Time for Bypass Public Light Buses	2 min

Hour	Frequency	PLB (Diesel)										PLB (LPG)										
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)					Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)					
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	
0000 - 0100	4	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.78E-01	2.00E-01	7.78E-02	3.47E-03	3.47E-03	1	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	4.87E-01	4.85E-01	2.44E-03	1.19E-03	1.19E-03
0100 - 0200	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	5	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	3.47E-01	2.50E-01	9.72E-02	4.33E-03	4.33E-03	1	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	4.87E-01	4.85E-01	2.44E-03	1.19E-03	1.19E-03
0700 - 0800	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.72E-01	7.00E-01	2.72E-01	1.21E-02	1.21E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.76E-03	4.77E-03	4.77E-03
0800 - 0900	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.72E-01	7.00E-01	2.72E-01	1.21E-02	1.21E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.76E-03	4.77E-03	4.77E-03
0900 - 1000	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	7.64E-01	5.50E-01	2.14E-01	9.53E-03	9.53E-03	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.76E-03	4.77E-03	4.77E-03
1000 - 1100	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.72E-01	7.00E-01	2.72E-01	1.21E-02	1.21E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.76E-03	4.77E-03	4.77E-03
1100 - 1200	18	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.25E+00	9.00E-01	3.50E-01	1.56E-02	1.56E-02	5	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	2.44E+00	2.42E+00	1.22E-02	5.96E-03	5.96E-03
1200 - 1300	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.76E-03	4.77E-03	4.77E-03
1300 - 1400	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.76E-03	4.77E-03	4.77E-03
1400 - 1500	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.76E-03	4.77E-03	4.77E-03
1500 - 1600	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	9.03E-01	6.50E-01	2.53E-01	1.13E-02	1.13E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.76E-03	4.77E-03	4.77E-03
1600 - 1700	8	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	5.56E-01	4.00E-01	1.56E-01	6.93E-03	6.93E-03	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.32E-03	3.58E-03	3.58E-03
1700 - 1800	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	7.64E-01	5.50E-01	2.14E-01	9.53E-03	9.53E-03	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.32E-03	3.58E-03	3.58E-03
1800 - 1900	12	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	8.33E-01	6.00E-01	2.33E-01	1.04E-02	1.04E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.95E+00	1.94E+00	9.76E-03	4.77E-03	4.77E-03
1900 - 2000	10	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.94E-01	5.00E-01	1.94E-01	8.67E-03	8.67E-03	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.32E-03	3.58E-03	3.58E-03
2000 - 2100	9	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.25E-01	4.50E-01	1.75E-01	7.80E-03	7.80E-03	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.32E-03	3.58E-03	3.58E-03
2100 - 2200	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	7.64E-01	5.50E-01	2.14E-01	9.53E-03	9.53E-03	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.46E+00	1.45E+00	7.32E-03	3.58E-03	3.58E-03
2200 - 2300	7	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	4.86E-01	3.50E-01	1.36E-01	6.07E-03	6.07E-03	2	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	9.74E-01	9.69E-01	4.88E-03	2.38E-03	2.38E-03
2300 - 2400	2																					

**Exchange Square Bus Terminus**

Minimum Hourly Temperature and Relative Humidity for 1st Quarter

Temperature: 10 °C  
Relative Humidity: 34 %

**Start Emission**

Nox	Single-Deck Franchised Bus (FBSB) Start Emission Factor (g/trip)																	
	2.01E-01	3.62E-01	4.82E-01	6.83E-01	8.44E-01	1.13E+00	1.65E+00	2.05E+00	3.01E+00	3.94E+00	4.42E+00	5.22E+00	6.75E+00	6.03E+00	6.19E+00	6.35E+00	6.43E+00	6.43E+00
NO	1.69E-01	3.05E-01	4.06E-01	5.76E-01	7.11E-01	9.48E-01	1.39E+00	1.73E+00	2.54E+00	3.32E+00	3.73E+00	4.40E+00	5.08E+00	5.42E+00	5.52E+00	5.35E+00	5.42E+00	5.42E+00
NO2	3.16E-02	5.69E-02	7.58E-02	1.07E-01	1.33E-01	1.77E-01	2.59E-01	3.22E-01	4.74E-01	6.19E-01	6.95E-01	8.21E-01	9.03E-01	9.48E-01	9.73E-01	9.98E-01	1.01E+00	1.01E+00
RSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Nox	Double-Deck Franchised Bus (FBDD) Start Emission Factor (g/trip)																	
	7.19E-01	1.29E+00	1.73E+00	2.44E+00	3.02E+00	4.03E+00	5.89E+00	7.33E+00	1.08E+01	1.41E+01	1.88E+01	1.87E+01	2.06E+01	2.16E+01	2.21E+01	2.27E+01	2.30E+01	2.30E+01
NO	6.69E-01	1.20E+00	1.60E+00	2.27E+00	2.81E+00	3.74E+00	5.48E+00	6.82E+00	1.00E+01	1.31E+01	1.47E+01	1.74E+01	1.91E+01	2.01E+01	2.11E+01	2.14E+01	2.14E+01	2.14E+01
NO2	5.03E-02	9.05E-02	1.21E-01	1.71E-01	2.11E-01	2.81E-01	4.12E-01	5.13E-01	7.54E-01	9.85E-01	1.11E+00	1.31E+00	1.44E+00	1.51E+00	1.55E+00	1.59E+00	1.61E+00	1.61E+00
RSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Hour	No. of Trips of FBSB [7]																	
	5	10	20	30	40	50	60	120	180	240	300	360	420	480	540	600	660	720
0000 - 0100																		
0100 - 0200																		
0200 - 0300																		
0300 - 0400																		
0400 - 0500																		
0500 - 0600																		
0600 - 0700																		
0700 - 0800																		
0800 - 0900																		
0900 - 1000																		
1000 - 1100																		
1100 - 1200																		
1200 - 1300																		
1300 - 1400																		
1400 - 1500																		
1500 - 1600																		
1600 - 1700																		
1700 - 1800																		
1800 - 1900																		
1900 - 2000																		
2000 - 2100																		
2100 - 2200																		
2200 - 2300																		
2300 - 2400																		
<b>Daily Total</b>																		0

Hour	No. of Trips of FBDD [7]																	
	5	10	20	30	40	50	60	120	180	240	300	360	420	480	540	600	660	720
0000 - 0100	2	1	2	5	0	1	0	0	0	0	0	2	2	2	0	0	0	0
0100 - 0200	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
0200 - 0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300 - 0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400 - 0500	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
0500 - 0600	1	2	1	0	3	2	0	2	0	0	0	0	0	0	0	0	0	0
0600 - 0700	3	4	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0700 - 0800	7	12	7	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0800 - 0900	5	11	9	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0900 - 1000	14	6	8	5	0	0	0	2	1	0	0	0	1	1	0	0	0	0
1000 - 1100	3	4	15	5	1	0	0	0	0	1	0	0	0	0	0	0	0	0
1100 - 1200	2	5	14	3	1	0	0	0	0	1	0	0	1	0	0	0	0	0
1200 - 1300	2	10	12	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0
1300 - 1400	6	7	6	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0
1400 - 1500	3	5	16	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1500 - 1600	1	6	9	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1600 - 1700	10	5	16	4	0	2	1	0	0	0	0	0	0	0	0	0	0	0
1700 - 1800	1	10	18	8	1	1	0	0	0	0	0	0	0	0	0	0	0	0
1800 - 1900	2	8	16	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0
1900 - 2000	4	6	15	5	1	0	0	1	1	0	0	0	0	0	0	0	0	0
2000 - 2100	1	4	16	3	1	1	0	2	1	0	0	0	0	0	0	0	0	0
2100 - 2200	2	3	11	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
2200 - 2300	2	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300 - 2400	4	7	4	5	0	1	0	9	0	0	0	0	0	4	1	1	0	0
<b>Daily Total</b>																		537

Total Start Emission of FBSB & FBDD (g)					
Nox	NO	NO2	RSP	FSP	
1.33E+02	1.23E+02	9.27E+00	0.00E+00	0.00E+00	
3.45E+01	3.21E+01	2.41E+00	0.00E+00	0.00E+00	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
7.33E+00	6.82E+00	5.13E-01	0.00E+00	0.00E+00	
3.68E+01	3.42E+01	2.57E+00	0.00E+00	0.00E+00	
2.60E+01	2.42E+01	1.82E+00	0.00E+00	0.00E+00	
4.49E+01	4.17E+01	3.14E+00	0.00E+00	0.00E+00	
4.17E+01	3.88E+01	2.92E+00	0.00E+00	0.00E+00	
1.22E+02	1.13E+02	8.50E+00	0.00E+00	0.00E+00	
6.25E+01	5.82E+01	4.37E+00	0.00E+00	0.00E+00	
7.71E+01	7.17E+01	5.39E+00	0.00E+00	0.00E+00	
5.52E+01	5.14E+01	3.89E+00	0.00E+00	0.00E+00	
4.00E+01	3.72E+01	2.79E+00	0.00E+00	0.00E+00	
5.09E+01	4.73E+01	3.56E+00	0.00E+00	0.00E+00	
4.41E+01	4.11E+01	3.09E+00	0.00E+00	0.00E+00	
6.50E+01	6.04E+01	4.54E+00	0.00E+00	0.00E+00	
7.72E+01	7.18E+01	5.40E+00	0.00E+00	0.00E+00	
6.48E+01	6.03E+01	4.53E+00	0.00E+00	0.00E+00	
6.99E+01	6.50E+01	4.89E+00	0.00E+00	0.00E+00	
7.33E+01	6.82E+01	5.13E+00	0.00E+00	0.00E+00	
3.16E+01	2.94E+01	2.21E+00	0.00E+00	0.00E+00	
1.50E+01	1.39E+01	1.05E+00	0.00E+00	0.00E+00	
2.27E+02	2.11E+02	1.59E+01	0.00E+00	0.00E+00	

**Idling Emission - Terminating Buses**

Idling Time for Terminating Buses [8]	3 min
Max. Idling Time for Adjusting Start Emission =	1 min

Hour	FBSB																FBDD															
	Frequenc y	Cold Idling Emission Factor (g/s)					Cold Idling Emission (g) [1]					Frequenc y	Cold Idling Emission Factor (g/s)					Cold Idling Emission (g) [1]														
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP										
0000 - 0100	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	1.15E+02	1.08E+02	7.27E+00	3.18E-02	3.18E-02											
0100 - 0200	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	2	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	3.85E+01	3.60E+01	2.42E+00	1.06E-02	1.06E-02												
0200 - 0300	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00												
0300 - 0400	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00												
0400 - 0500	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.0																									

**Running Emission - Terminating and Bypass Buses**

Average Travelling Distance within bus terminus =	125	m
Average Travelling Speed =	10	km/h

Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)						Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	39	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	5.39E+01	5.05E+01	3.39E+00	1.86E+00	1.71E+00
0100 - 0200	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	6.90E+00	6.47E+00	4.35E-01	2.38E-01	2.19E-01	
0200 - 0300	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	2.76E+00	2.59E+00	1.74E-01	9.52E-02	8.78E-02	
0500 - 0600	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	23	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	3.18E+01	2.98E+01	2.00E+00	1.10E+00	1.01E+00	
0600 - 0700	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	47	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	6.49E+01	6.08E+01	4.09E+00	2.24E+00	2.06E+00	
0700 - 0800	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	99	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.37E+02	1.28E+02	8.81E+00	4.71E+00	4.34E+00	
0800 - 0900	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	97	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.34E+02	1.26E+02	8.44E+00	4.62E+00	4.25E+00	
0900 - 1000	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	120	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.66E+02	1.55E+02	1.04E+01	5.71E+00	5.26E+00	
1000 - 1100	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	89	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.23E+02	1.15E+02	7.74E+00	4.24E+00	3.90E+00	
1100 - 1200	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	84	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.16E+02	1.09E+02	7.31E+00	4.00E+00	3.68E+00	
1200 - 1300	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.13E+02	1.06E+02	7.13E+00	3.90E+00	3.59E+00	
1300 - 1400	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	71	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	9.80E+01	9.19E+01	6.18E+00	3.38E+00	3.11E+00	
1400 - 1500	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.13E+02	1.06E+02	7.13E+00	3.90E+00	3.59E+00	
1500 - 1600	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	80	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.10E+02	1.04E+02	6.96E+00	3.81E+00	3.50E+00	
1600 - 1700	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	102	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.41E+02	1.32E+02	8.87E+00	4.86E+00	4.47E+00	
1700 - 1800	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	111	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.53E+02	1.44E+02	9.65E+00	5.28E+00	4.86E+00	
1800 - 1900	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	97	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.34E+02	1.26E+02	8.44E+00	4.62E+00	4.25E+00	
1900 - 2000	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	99	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.37E+02	1.29E+02	8.81E+00	4.71E+00	4.34E+00	
2000 - 2100	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	90	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.24E+02	1.16E+02	7.83E+00	4.29E+00	3.94E+00	
2100 - 2200	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	59	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	8.15E+01	7.63E+01	5.13E+00	2.81E+00	2.58E+00	
2200 - 2300	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	5.52E+01	5.18E+01	3.48E+00	1.90E+00	1.75E+00	
2300 - 2400	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.13E+02	1.06E+02	7.13E+00	3.90E+00	3.59E+00	
<b>Daily Total</b>	<b>0</b>											<b>1600</b>										

**Idling Emission - Bypass Buses**

Idling Time for Bypass Buses	1	min
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Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)						Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	22	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	4.67E+00	4.38E+00	2.94E-01	3.89E-02	3.89E-02
0100 - 0200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	6.37E-01	5.97E-01	4.01E-02	5.30E-03	5.30E-03	
0200 - 0300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E-01	1.99E-01	1.34E-02	1.77E-03	1.77E-03	
0400 - 0500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	
0600 - 0700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	30	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	6.37E+00	5.97E+00	4.01E-01	5.30E-02	5.30E-02	
0700 - 0800	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	68	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.44E+01	1.35E+01	9.09E-01	1.20E-01	1.20E-01	
0800 - 0900	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	70	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.49E+01	1.39E+01	9.36E-01	1.24E-01	1.24E-01	
0900 - 1000	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.74E+01	1.63E+01	1.10E+00	1.45E-01	1.45E-01	
1000 - 1100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	60	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.27E+01	1.19E+01	8.02E-01	1.06E-01	1.06E-01	
1100 - 1200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	57	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.21E+01	1.13E+01	7.62E-01	1.01E-01	1.01E-01	
1200 - 1300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	54	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.15E+01	1.07E+01	7.22E-01	9.54E-02	9.54E-02	
1300 - 1400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	48	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.02E+01	9.55E+00	6.42E-01	8.48E-02	8.48E-02	
1400 - 1500	0	1.33E-03	1.12E-03	2.03E-04</																		

**Exchange Square Bus Terminus**

Minimum Hourly Temperature and Relative Humidity for 2nd Quarter

Temperature: 18 °C  
Relative Humidity: 46 %

**Start Emission**

Nox	Single-Deck Franchised Bus (FBSB) Start Emission Factor (g/trip)																	
	2.01E-01	3.62E-01	4.82E-01	6.30E-01	8.44E-01	1.13E+00	1.65E+00	2.05E+00	3.01E+00	3.94E+00	4.42E+00	5.22E+00	6.75E+00	6.03E+00	6.19E+00	6.35E+00	6.43E+00	6.43E+00
NO	1.69E-01	3.05E-01	4.06E-01	5.26E-01	7.11E-01	9.48E-01	1.39E+00	1.73E+00	2.54E+00	3.32E+00	3.73E+00	4.40E+00	5.08E+00	5.42E+00	5.52E+00	5.35E+00	5.42E+00	5.42E+00
NO2	3.16E-02	5.69E-02	7.58E-02	1.07E-01	1.33E-01	1.77E-01	2.59E-01	3.22E-01	4.74E-01	6.19E-01	6.95E-01	8.21E-01	9.03E-01	9.48E-01	9.73E-01	9.98E-01	1.01E+00	1.01E+00
RSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Nox	Double-Deck Franchised Bus (FBDD) Start Emission Factor (g/trip)																	
	7.19E-01	1.29E+00	1.73E+00	2.44E+00	3.02E+00	4.03E+00	5.89E+00	7.33E+00	1.08E+01	1.41E+01	1.88E+01	1.87E+01	2.06E+01	2.16E+01	2.21E+01	2.27E+01	2.30E+01	2.30E+01
NO	6.69E-01	1.20E+00	1.60E+00	2.27E+00	2.81E+00	3.74E+00	5.48E+00	6.82E+00	1.00E+01	1.31E+01	1.47E+01	1.74E+01	1.91E+01	2.01E+01	2.11E+01	2.14E+01	2.14E+01	2.14E+01
NO2	5.03E-02	9.05E-02	1.21E-01	1.71E-01	2.11E-01	2.81E-01	4.12E-01	5.13E-01	7.54E-01	9.85E-01	1.11E+00	1.31E+00	1.44E+00	1.51E+00	1.55E+00	1.59E+00	1.61E+00	1.61E+00
RSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Hour	No. of Trips of FBSB [7]																	
	5	10	20	30	40	50	60	120	180	240	300	360	420	480	540	600	660	720
0000 - 0100																		
0100 - 0200																		
0200 - 0300																		
0300 - 0400																		
0400 - 0500																		
0500 - 0600																		
0600 - 0700																		
0700 - 0800																		
0800 - 0900																		
0900 - 1000																		
1000 - 1100																		
1100 - 1200																		
1200 - 1300																		
1300 - 1400																		
1400 - 1500																		
1500 - 1600																		
1600 - 1700																		
1700 - 1800																		
1800 - 1900																		
1900 - 2000																		
2000 - 2100																		
2100 - 2200																		
2200 - 2300																		
2300 - 2400																		
<b>Daily Total</b>																		0

Hour	No. of Trips of FBDD [7]																	
	5	10	20	30	40	50	60	120	180	240	300	360	420	480	540	600	660	720
0000 - 0100	2	1	2	5	0	1	0	0	0	0	2	2	2	0	0	0	0	0
0100 - 0200	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
0200 - 0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300 - 0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400 - 0500	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
0500 - 0600	1	2	1	0	3	2	0	2	0	0	0	0	0	0	0	0	0	0
0600 - 0700	3	4	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0700 - 0800	7	12	7	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0800 - 0900	5	11	9	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0900 - 1000	14	6	8	5	0	0	0	2	1	0	0	1	1	0	0	0	0	0
1000 - 1100	3	4	15	5	1	0	0	0	0	1	0	0	0	0	0	0	0	0
1100 - 1200	2	5	14	3	1	0	0	0	0	1	0	0	1	0	0	0	0	0
1200 - 1300	2	10	12	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0
1300 - 1400	6	7	6	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0
1400 - 1500	3	5	16	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1500 - 1600	1	6	9	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1600 - 1700	10	5	16	4	0	2	1	0	0	0	0	0	0	0	0	0	0	0
1700 - 1800	1	10	18	8	1	1	0	0	0	0	0	0	0	0	0	0	0	0
1800 - 1900	2	8	16	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0
1900 - 2000	4	6	15	5	1	0	0	1	1	0	0	0	0	0	0	0	0	0
2000 - 2100	1	4	16	3	1	1	0	2	1	0	0	0	0	0	0	0	0	0
2100 - 2200	2	3	11	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
2200 - 2300	2	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300 - 2400	4	7	4	5	0	1	0	9	0	0	0	0	0	4	1	1	0	0
<b>Daily Total</b>																		537

Total Start Emission of FBSB & FBDD (g)					
Nox	NO	NO2	RSP	FSP	
1.33E+02	1.23E+02	9.27E+00	0.00E+00	0.00E+00	
3.45E+01	3.21E+01	2.41E+00	0.00E+00	0.00E+00	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
7.33E+00	6.82E+00	5.13E-01	0.00E+00	0.00E+00	
3.68E+01	3.42E+01	2.57E+00	0.00E+00	0.00E+00	
2.60E+01	2.42E+01	1.82E+00	0.00E+00	0.00E+00	
4.49E+01	4.17E+01	3.14E+00	0.00E+00	0.00E+00	
4.17E+01	3.88E+01	2.92E+00	0.00E+00	0.00E+00	
1.22E+02	1.13E+02	8.50E+00	0.00E+00	0.00E+00	
6.25E+01	5.82E+01	4.37E+00	0.00E+00	0.00E+00	
7.71E+01	7.17E+01	5.39E+00	0.00E+00	0.00E+00	
5.52E+01	5.14E+01	3.89E+00	0.00E+00	0.00E+00	
4.00E+01	3.72E+01	2.79E+00	0.00E+00	0.00E+00	
5.09E+01	4.73E+01	3.56E+00	0.00E+00	0.00E+00	
4.41E+01	4.11E+01	3.09E+00	0.00E+00	0.00E+00	
6.50E+01	6.04E+01	4.54E+00	0.00E+00	0.00E+00	
7.72E+01	7.18E+01	5.40E+00	0.00E+00	0.00E+00	
6.48E+01	6.03E+01	4.53E+00	0.00E+00	0.00E+00	
6.99E+01	6.50E+01	4.89E+00	0.00E+00	0.00E+00	
7.33E+01	6.82E+01	5.13E+00	0.00E+00	0.00E+00	
3.16E+01	2.94E+01	2.21E+00	0.00E+00	0.00E+00	
1.50E+01	1.39E+01	1.05E+00	0.00E+00	0.00E+00	
2.27E+02	2.11E+02	1.59E+01	0.00E+00	0.00E+00	

**Idling Emission - Terminating Buses**

Idling Time for Terminating Buses [8]	3 min
Max. Idling Time for Adjusting Start Emission =	1 min

Hour	FBSB																FBDD															
	Frequenc y	Cold Idling Emission Factor (g/s)					Cold Idling Emission (g) [1]					Frequenc y	Cold Idling Emission Factor (g/s)					Cold Idling Emission (g) [1]														
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP										
0000 - 0100	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	1.15E+02	1.08E+02	7.27E+00	3.18E-02	3.18E-02											
0100 - 0200	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	2	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	3.85E+01	3.60E+01	2.42E+00	1.06E-02	1.06E-02												
0200 - 0300	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00												
0300 - 0400	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00												
0400 - 0500	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.0																									



**Running Emission - Terminating and Bypass Buses**

Average Travelling Distance within bus terminus =	125	m
Average Travelling Speed =	10	km/h

Hour	Freque nc y	FBSD										Freque nc y	FBDD									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)						Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	39	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	5.10E+01	4.78E+01	3.21E+00	1.86E+00	1.71E+00
0100 - 0200	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	6.54E+00	6.13E+00	4.12E-01	2.38E-01	2.19E-01	
0200 - 0300	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	2.81E+00	2.45E+00	1.65E-01	9.52E-02	8.78E-02	
0500 - 0600	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	23	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	3.01E+01	2.82E+01	1.89E+00	1.10E+00	1.01E+00	
0600 - 0700	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	47	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	6.15E+01	5.76E+01	3.87E+00	2.24E+00	2.06E+00	
0700 - 0800	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	99	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.29E+02	1.21E+02	8.15E+00	4.71E+00	4.34E+00	
0800 - 0900	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	97	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.27E+02	1.19E+02	7.99E+00	4.62E+00	4.25E+00	
0900 - 1000	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	120	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.57E+02	1.47E+02	9.88E+00	5.71E+00	5.26E+00	
1000 - 1100	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	89	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.16E+02	1.09E+02	7.33E+00	4.24E+00	3.90E+00	
1100 - 1200	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	84	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.10E+02	1.03E+02	6.92E+00	4.00E+00	3.68E+00	
1200 - 1300	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.07E+02	1.00E+02	6.75E+00	3.90E+00	3.59E+00	
1300 - 1400	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	71	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	9.28E+01	8.70E+01	5.85E+00	3.38E+00	3.11E+00	
1400 - 1500	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.07E+02	1.00E+02	6.75E+00	3.90E+00	3.59E+00	
1500 - 1600	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	80	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.05E+02	9.80E+01	6.99E+00	3.81E+00	3.50E+00	
1600 - 1700	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	102	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.33E+02	1.25E+02	8.40E+00	4.86E+00	4.47E+00	
1700 - 1800	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	111	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.45E+02	1.36E+02	9.14E+00	5.28E+00	4.86E+00	
1800 - 1900	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	97	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.27E+02	1.19E+02	7.99E+00	4.62E+00	4.25E+00	
1900 - 2000	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	99	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.29E+02	1.21E+02	8.15E+00	4.71E+00	4.34E+00	
2000 - 2100	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	90	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.18E+02	1.10E+02	7.41E+00	4.28E+00	3.94E+00	
2100 - 2200	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	59	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	7.71E+01	7.23E+01	4.86E+00	2.81E+00	2.58E+00	
2200 - 2300	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	5.23E+01	4.90E+01	3.29E+00	1.90E+00	1.75E+00	
2300 - 2400	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.07E+02	1.00E+02	6.75E+00	3.90E+00	3.59E+00	
<b>Daily Total</b>	<b>0</b>											<b>1600</b>										

**Idling Emission - Bypass Buses**

Idling Time for Bypass Buses	1	min
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Hour	Freque nc y	FBSD										Freque nc y	FBDD									
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)						Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	22	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	4.67E+00	4.38E+00	2.94E-01	3.89E-02	3.89E-02
0100 - 0200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	6.37E-01	5.97E-01	4.01E-02	5.30E-03	5.30E-03	
0200 - 0300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E-01	1.99E-01	1.34E-02	1.77E-03	1.77E-03	
0500 - 0600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	
0600 - 0700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	30	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	6.37E+00	5.97E+00	4.01E-01	5.30E-02	5.30E-02	
0700 - 0800	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	68	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.44E+01	1.35E+01	9.09E-01	1.20E-01	1.20E-01	
0800 - 0900	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	70	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.49E+01	1.39E+01	9.36E-01	1.24E-01	1.24E-01	
0900 - 1000	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.74E+01	1.63E+01	1.10E+00	1.45E-01	1.45E-01	
1000 - 1100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	60	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.27E+01	1.19E+01	8.02E-01	1.06E-01	1.06E-01	
1100 - 1200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	57	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.21E+01	1.13E+01	7.62E-01	1.01E-01	1.01E-01	
1200 - 1300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	54	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.15E+01	1.07E+01	7.22E-01	9.54E-02	9.54E-02	
1300 - 1400	0	1.33E-03	1.12E-03	2.																		

**Exchange Square Bus Terminus**

Minimum Hourly Temperature and Relative Humidity for 3rd Quarter

Temperature: 20 °C

Relative Humidity: 23 %

**Start Emission**

Nox	Single-Deck Franchised Bus (FBSB) Start Emission Factor (g/trip)																	
	2.01E-01	3.62E-01	4.82E-01	6.30E-01	8.44E-01	1.13E+00	1.65E+00	2.05E+00	3.01E+00	3.94E+00	4.42E+00	5.22E+00	6.75E+00	6.03E+00	6.19E+00	6.35E+00	6.43E+00	6.43E+00
NO	1.69E-01	3.05E-01	4.06E-01	5.26E-01	7.11E-01	9.48E-01	1.39E+00	1.73E+00	2.54E+00	3.32E+00	3.73E+00	4.40E+00	5.08E+00	5.22E+00	5.35E+00	5.42E+00	5.42E+00	5.42E+00
NO2	3.16E-02	5.69E-02	7.58E-02	1.07E-01	1.33E-01	1.77E-01	2.59E-01	3.22E-01	4.74E-01	6.19E-01	6.95E-01	8.21E-01	9.03E-01	9.48E-01	9.73E-01	9.98E-01	1.01E+00	1.01E+00
RSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Nox	Double-Deck Franchised Bus (FBDD) Start Emission Factor (g/trip)																	
	7.19E-01	1.29E+00	1.73E+00	2.44E+00	3.02E+00	4.03E+00	5.89E+00	7.33E+00	1.08E+01	1.41E+01	1.88E+01	1.87E+01	2.06E+01	2.16E+01	2.21E+01	2.27E+01	2.30E+01	2.30E+01
NO	6.69E-01	1.20E+00	1.60E+00	2.27E+00	2.81E+00	3.74E+00	5.48E+00	6.82E+00	1.00E+01	1.31E+01	1.47E+01	1.74E+01	1.91E+01	2.01E+01	2.11E+01	2.14E+01	2.14E+01	2.14E+01
NO2	5.03E-02	9.05E-02	1.21E-01	1.71E-01	2.11E-01	2.81E-01	4.12E-01	5.13E-01	7.54E-01	9.85E-01	1.11E+00	1.31E+00	1.44E+00	1.51E+00	1.55E+00	1.59E+00	1.61E+00	1.61E+00
RSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Hour	No. of Trips of FBSB [7]																	
	5	10	20	30	40	50	60	120	180	240	300	360	420	480	540	600	660	720
0000 - 0100																		
0100 - 0200																		
0200 - 0300																		
0300 - 0400																		
0400 - 0500																		
0500 - 0600																		
0600 - 0700																		
0700 - 0800																		
0800 - 0900																		
0900 - 1000																		
1000 - 1100																		
1100 - 1200																		
1200 - 1300																		
1300 - 1400																		
1400 - 1500																		
1500 - 1600																		
1600 - 1700																		
1700 - 1800																		
1800 - 1900																		
1900 - 2000																		
2000 - 2100																		
2100 - 2200																		
2200 - 2300																		
2300 - 2400																		
<b>Daily Total</b>																		0

Hour	No. of Trips of FBDD [7]																	
	5	10	20	30	40	50	60	120	180	240	300	360	420	480	540	600	660	720
0000 - 0100	2	1	2	5	0	1	0	0	0	0	2	2	2	0	0	0	0	0
0100 - 0200	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
0200 - 0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300 - 0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400 - 0500	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
0500 - 0600	1	2	1	0	3	2	0	2	0	0	0	0	0	0	0	0	0	0
0600 - 0700	3	4	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0700 - 0800	7	12	7	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0800 - 0900	5	11	9	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0900 - 1000	14	6	8	5	0	0	0	0	2	1	0	0	1	1	0	0	0	0
1000 - 1100	3	4	15	5	1	0	0	0	0	1	0	0	0	0	0	0	0	0
1100 - 1200	2	5	14	3	1	0	0	0	0	1	0	0	1	0	0	0	0	0
1200 - 1300	2	10	12	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0
1300 - 1400	6	7	6	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0
1400 - 1500	3	5	16	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1500 - 1600	1	6	9	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1600 - 1700	10	5	16	4	0	2	1	0	0	0	0	0	0	0	0	0	0	0
1700 - 1800	1	10	18	8	1	1	0	0	0	0	0	0	0	0	0	0	0	0
1800 - 1900	2	8	16	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0
1900 - 2000	4	6	15	5	1	0	0	1	1	0	0	0	0	0	0	0	0	0
2000 - 2100	1	4	16	3	1	1	0	2	1	0	0	0	0	0	0	0	0	0
2100 - 2200	2	3	11	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
2200 - 2300	2	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300 - 2400	4	7	4	5	0	1	0	9	0	0	0	0	4	1	1	0	0	0
<b>Daily Total</b>																		537

Total Start Emission of FBSB & FBDD (g)					
Nox	NO	NO2	RSP	FSP	
1.33E+02	1.23E+02	9.27E+00	0.00E+00	0.00E+00	
3.45E+01	3.21E+01	2.41E+00	0.00E+00	0.00E+00	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
7.33E+00	6.82E+00	5.13E-01	0.00E+00	0.00E+00	
3.68E+01	3.42E+01	2.57E+00	0.00E+00	0.00E+00	
2.60E+01	2.42E+01	1.82E+00	0.00E+00	0.00E+00	
4.49E+01	4.17E+01	3.14E+00	0.00E+00	0.00E+00	
4.17E+01	3.88E+01	2.92E+00	0.00E+00	0.00E+00	
1.22E+02	1.13E+02	8.50E+00	0.00E+00	0.00E+00	
6.25E+01	5.82E+01	4.37E+00	0.00E+00	0.00E+00	
7.71E+01	7.17E+01	5.39E+00	0.00E+00	0.00E+00	
5.52E+01	5.14E+01	3.89E+00	0.00E+00	0.00E+00	
4.00E+01	3.72E+01	2.79E+00	0.00E+00	0.00E+00	
5.09E+01	4.73E+01	3.56E+00	0.00E+00	0.00E+00	
4.41E+01	4.11E+01	3.09E+00	0.00E+00	0.00E+00	
6.50E+01	6.04E+01	4.54E+00	0.00E+00	0.00E+00	
7.72E+01	7.18E+01	5.40E+00	0.00E+00	0.00E+00	
6.48E+01	6.03E+01	4.53E+00	0.00E+00	0.00E+00	
6.99E+01	6.50E+01	4.89E+00	0.00E+00	0.00E+00	
7.33E+01	6.82E+01	5.13E+00	0.00E+00	0.00E+00	
3.16E+01	2.94E+01	2.21E+00	0.00E+00	0.00E+00	
1.50E+01	1.39E+01	1.05E+00	0.00E+00	0.00E+00	
2.27E+02	2.11E+02	1.59E+01	0.00E+00	0.00E+00	

**Idling Emission - Terminating Buses**

Idling Time for Terminating Buses [8]	3 min
Max. Idling Time for Adjusting Start Emission =	1 min

Hour	FBSB										FBDD												
	Freque	y	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	Freque	y	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP
0000 - 0100	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	1.15E+02	1.08E+02	7.27E+00	3.18E-02	3.18E-02
0100 - 0200	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	3.85E+01	3.60E+01	2.42E+00	1.06E-02	1.06E-02
0200 - 0300	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

**Running Emission - Terminating and Bypass Buses**

Average Travelling Distance within bus terminus =	125	m
Average Travelling Speed =	10	km/h

Hour	Freque nc y	FBSD										Freque nc y	FBDD									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)						Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	39	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	5.32E+01	4.98E+01	3.35E+00	1.86E+00	1.71E+00
0100 - 0200	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	6.82E+00	6.39E+00	4.29E-01	2.38E-01	2.19E-01	
0200 - 0300	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	2.73E+00	2.55E+00	1.72E-01	9.52E-02	8.78E-02	
0500 - 0600	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	23	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	3.14E+01	2.94E+01	1.97E+00	1.10E+00	1.01E+00	
0600 - 0700	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	47	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	6.41E+01	6.00E+01	4.04E+00	2.24E+00	2.06E+00	
0700 - 0800	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	99	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.35E+02	1.26E+02	8.50E+00	4.71E+00	4.34E+00	
0800 - 0900	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	97	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.32E+02	1.24E+02	8.33E+00	4.62E+00	4.25E+00	
0900 - 1000	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	120	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.64E+02	1.53E+02	1.03E+01	5.71E+00	5.26E+00	
1000 - 1100	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	89	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.21E+02	1.14E+02	7.64E+00	4.24E+00	3.90E+00	
1100 - 1200	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	84	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.15E+02	1.07E+02	7.21E+00	4.00E+00	3.68E+00	
1200 - 1300	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.12E+02	1.05E+02	7.04E+00	3.90E+00	3.59E+00	
1300 - 1400	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	71	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	9.68E+01	9.07E+01	6.10E+00	3.38E+00	3.11E+00	
1400 - 1500	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.12E+02	1.05E+02	7.04E+00	3.90E+00	3.59E+00	
1500 - 1600	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	80	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.09E+02	1.02E+02	6.87E+00	3.81E+00	3.50E+00	
1600 - 1700	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	102	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.39E+02	1.30E+02	8.78E+00	4.86E+00	4.47E+00	
1700 - 1800	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	111	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.51E+02	1.42E+02	9.53E+00	5.28E+00	4.86E+00	
1800 - 1900	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	97	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.32E+02	1.24E+02	8.33E+00	4.62E+00	4.25E+00	
1900 - 2000	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	99	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.35E+02	1.26E+02	8.50E+00	4.71E+00	4.34E+00	
2000 - 2100	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	90	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.23E+02	1.15E+02	7.73E+00	4.29E+00	3.94E+00	
2100 - 2200	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	59	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	8.04E+01	7.54E+01	5.07E+00	2.81E+00	2.58E+00	
2200 - 2300	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	5.45E+01	5.11E+01	3.43E+00	1.90E+00	1.75E+00	
2300 - 2400	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.12E+02	1.05E+02	7.04E+00	3.90E+00	3.59E+00	
<b>Daily Total</b>	<b>0</b>											<b>1600</b>										

**Idling Emission - Bypass Buses**

Idling Time for Bypass Buses	1	min
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Hour	Freque nc y	FBSD										Freque nc y	FBDD									
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)						Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	22	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	4.67E+00	4.38E+00	2.94E-01	3.89E-02	3.89E-02
0100 - 0200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	6.37E-01	5.97E-01	4.01E-02	5.30E-03	5.30E-03	
0200 - 0300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E-01	1.99E-01	1.34E-02	1.77E-03	1.77E-03	
0400 - 0500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	
0500 - 0600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	30	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	6.37E+00	5.97E+00	4.01E-01	5.30E-02	5.30E-02	
0600 - 0700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	68	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.44E+01	1.35E+01	9.09E-01	1.20E-01	1.20E-01	
0700 - 0800	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	70	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.49E+01	1.39E+01	9.36E-01	1.24E-01	1.24E-01	
0800 - 0900	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	60	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.74E+01	1.63E+01	1.10E+00	1.45E-01	1.45E-01	
0900 - 1000	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.27E+01	1.19E+01	8.02E-01	1.06E-01	1.06E-01	
1000 - 1100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	57	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.21E+01	1.13E+01	7.62E-01	1.01E-01	1.01E-01	
1100 - 1200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	54	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.15E+01	1.07E+01	7.22E-01	9.54E-02	9.54E-02	
1200 - 1300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	48	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.02E+01	9.55E+00	6.42E-01	8.48E-02	8.48E-02	
1300 - 1400	0	1.33E-03	1.12E-03	2																		

**Exchange Square Bus Terminus**

Minimum Hourly Temperature and Relative Humidity for 4th Quarter

Temperature: 6 °C  
Relative Humidity: 18 %

**Start Emission**

Nox	Single-Deck Franchised Bus (FBS) Start Emission Factor (g/trip)																	
	2.01E-01	3.62E-01	4.82E-01	6.83E-01	8.44E-01	1.13E+00	1.65E+00	2.05E+00	3.01E+00	3.94E+00	4.42E+00	5.22E+00	6.75E+00	6.03E+00	6.19E+00	6.35E+00	6.43E+00	6.43E+00
NO	1.69E-01	3.05E-01	4.06E-01	4.76E-01	7.11E-01	9.48E-01	1.39E+00	1.73E+00	2.54E+00	3.32E+00	3.73E+00	4.40E+00	5.08E+00	5.42E+00	5.52E+00	5.35E+00	5.42E+00	5.42E+00
NO2	3.16E-02	5.69E-02	7.68E-02	1.07E-01	1.33E-01	1.77E-01	2.59E-01	3.22E-01	4.74E-01	6.19E-01	6.95E-01	8.21E-01	9.03E-01	9.48E-01	9.73E-01	9.98E-01	1.01E+00	1.01E+00
RSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Nox	Double-Deck Franchised Bus (FBD) Start Emission Factor (g/trip)																	
	7.19E-01	1.29E+00	1.73E+00	2.44E+00	3.02E+00	4.03E+00	5.89E+00	7.33E+00	1.08E+01	1.41E+01	1.88E+01	1.87E+01	2.06E+01	2.16E+01	2.21E+01	2.27E+01	2.30E+01	2.30E+01
NO	6.69E-01	1.20E+00	1.60E+00	2.27E+00	2.81E+00	3.74E+00	5.48E+00	6.82E+00	1.00E+01	1.31E+01	1.47E+01	1.74E+01	1.91E+01	2.01E+01	2.11E+01	2.14E+01	2.14E+01	2.14E+01
NO2	5.03E-02	9.05E-02	1.21E-01	1.71E-01	2.11E-01	2.81E-01	4.12E-01	5.13E-01	7.54E-01	9.85E-01	1.11E+00	1.31E+00	1.44E+00	1.51E+00	1.55E+00	1.59E+00	1.61E+00	1.61E+00
RSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Hour	No. of Trips of FBS [7]																	
	5	10	20	30	40	50	60	120	180	240	300	360	420	480	540	600	660	720
0000 - 0100																		
0100 - 0200																		
0200 - 0300																		
0300 - 0400																		
0400 - 0500																		
0500 - 0600																		
0600 - 0700																		
0700 - 0800																		
0800 - 0900																		
0900 - 1000																		
1000 - 1100																		
1100 - 1200																		
1200 - 1300																		
1300 - 1400																		
1400 - 1500																		
1500 - 1600																		
1600 - 1700																		
1700 - 1800																		
1800 - 1900																		
1900 - 2000																		
2000 - 2100																		
2100 - 2200																		
2200 - 2300																		
2300 - 2400																		
<b>Daily Total</b>																		0

Hour	No. of Trips of FBD [7]																	
	5	10	20	30	40	50	60	120	180	240	300	360	420	480	540	600	660	720
0000 - 0100	2	1	2	5	0	1	0	0	0	0	0	2	2	2	0	0	0	0
0100 - 0200	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
0200 - 0300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0300 - 0400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0400 - 0500	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
0500 - 0600	1	2	1	0	3	2	0	2	0	0	0	0	0	0	0	0	0	0
0600 - 0700	3	4	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0700 - 0800	7	12	7	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0800 - 0900	5	11	9	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0900 - 1000	14	6	8	5	0	0	0	0	2	1	0	0	1	1	0	0	0	0
1000 - 1100	3	4	15	5	1	0	0	0	0	1	0	0	0	0	0	0	0	0
1100 - 1200	2	5	14	3	1	0	0	0	0	1	0	0	1	0	0	0	0	0
1200 - 1300	2	10	12	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0
1300 - 1400	6	7	6	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0
1400 - 1500	3	5	16	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1500 - 1600	1	6	9	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1600 - 1700	10	5	16	4	0	2	1	0	0	0	0	0	0	0	0	0	0	0
1700 - 1800	1	10	18	8	1	1	1	0	0	0	0	0	0	0	0	0	0	0
1800 - 1900	2	8	16	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0
1900 - 2000	4	6	15	5	1	0	0	1	1	1	0	0	0	0	0	0	0	0
2000 - 2100	1	4	16	3	1	1	0	2	1	0	0	0	0	0	0	0	0	0
2100 - 2200	2	3	11	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
2200 - 2300	2	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300 - 2400	4	7	4	5	0	1	0	9	0	0	0	0	0	4	1	1	0	0
<b>Daily Total</b>																		537

Total Start Emission of FBS & FBD (g)					
Nox	NO	NO2	RSP	FSP	
1.33E+02	1.23E+02	9.27E+00	0.00E+00	0.00E+00	
3.45E+01	3.21E+01	2.41E+00	0.00E+00	0.00E+00	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
7.33E+00	6.82E+00	5.13E-01	0.00E+00	0.00E+00	
3.68E+01	3.42E+01	2.57E+00	0.00E+00	0.00E+00	
2.60E+01	2.42E+01	1.82E+00	0.00E+00	0.00E+00	
4.49E+01	4.17E+01	3.14E+00	0.00E+00	0.00E+00	
4.17E+01	3.88E+01	2.92E+00	0.00E+00	0.00E+00	
1.22E+02	1.13E+02	8.50E+00	0.00E+00	0.00E+00	
6.25E+01	5.82E+01	4.37E+00	0.00E+00	0.00E+00	
7.71E+01	7.17E+01	5.39E+00	0.00E+00	0.00E+00	
5.52E+01	5.14E+01	3.89E+00	0.00E+00	0.00E+00	
4.00E+01	3.72E+01	2.79E+00	0.00E+00	0.00E+00	
5.09E+01	4.73E+01	3.56E+00	0.00E+00	0.00E+00	
4.41E+01	4.11E+01	3.09E+00	0.00E+00	0.00E+00	
6.50E+01	6.04E+01	4.54E+00	0.00E+00	0.00E+00	
7.72E+01	7.18E+01	5.40E+00	0.00E+00	0.00E+00	
6.48E+01	6.03E+01	4.53E+00	0.00E+00	0.00E+00	
6.99E+01	6.50E+01	4.89E+00	0.00E+00	0.00E+00	
7.33E+01	6.82E+01	5.13E+00	0.00E+00	0.00E+00	
3.16E+01	2.94E+01	2.21E+00	0.00E+00	0.00E+00	
1.50E+01	1.39E+01	1.05E+00	0.00E+00	0.00E+00	
2.27E+02	2.11E+02	1.59E+01	0.00E+00	0.00E+00	

**Idling Emission - Terminating Buses**

Idling Time for Terminating Buses [8]	3 min
Max. Idling Time for Adjusting Start Emission =	1 min

Hour	FBS										FBD											
	Frequenc y	Cold Idling Emission Factor (g/s)					Cold Idling Emission (g) [1]					Frequenc y	Cold Idling Emission Factor (g/s)					Cold Idling Emission (g) [1]				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	1.15E+02	1.08E+02	7.27E+00	3.18E-02	3.18E-02	
0100 - 0200	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	3.85E+01	3.60E+01	2.42E+00	1.06E-02	1.06E-02	
0200 - 0300	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	1.54E-02	1.30E-02	2.36E-03																		

**Running Emission - Terminating and Bypass Buses**

Average Travelling Distance within bus terminus =	125	m
Average Travelling Speed =	10	km/h

Hour	Freque <sup>y</sup>	FBSD										Freque <sup>y</sup>	FBDD									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)						Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP		NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP
0000 - 0100	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	39	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	5.52E+01	5.17E+01	3.47E+00	1.86E+00	1.71E+00
0100 - 0200	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	7.07E+00	6.63E+00	4.45E-01	2.38E-01	2.19E-01	
0200 - 0300	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	2.83E+00	2.65E+00	1.78E-01	9.52E-02	8.78E-02	
0500 - 0600	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	23	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	3.25E+01	3.05E+01	2.05E+00	1.10E+00	1.01E+00	
0600 - 0700	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	47	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	6.65E+01	6.23E+01	4.19E+00	2.24E+00	2.06E+00	
0700 - 0800	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	99	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.40E+02	1.31E+02	8.82E+00	4.71E+00	4.34E+00	
0800 - 0900	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	97	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.37E+02	1.29E+02	8.64E+00	4.62E+00	4.25E+00	
0900 - 1000	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	120	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.70E+02	1.59E+02	1.07E+01	5.71E+00	5.26E+00	
1000 - 1100	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	89	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.26E+02	1.18E+02	7.93E+00	4.24E+00	3.90E+00	
1100 - 1200	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	84	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.19E+02	1.11E+02	7.48E+00	4.00E+00	3.68E+00	
1200 - 1300	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.16E+02	1.08E+02	7.30E+00	3.90E+00	3.59E+00	
1300 - 1400	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	71	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.00E+02	9.41E+01	6.32E+00	3.38E+00	3.11E+00	
1400 - 1500	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.16E+02	1.09E+02	7.30E+00	3.90E+00	3.59E+00	
1500 - 1600	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	80	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.13E+02	1.06E+02	7.13E+00	3.81E+00	3.50E+00	
1600 - 1700	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	102	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.44E+02	1.35E+02	9.09E+00	4.86E+00	4.47E+00	
1700 - 1800	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	111	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.57E+02	1.47E+02	9.89E+00	5.28E+00	4.86E+00	
1800 - 1900	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	97	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.37E+02	1.29E+02	8.64E+00	4.62E+00	4.25E+00	
1900 - 2000	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	99	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.40E+02	1.31E+02	8.82E+00	4.71E+00	4.34E+00	
2000 - 2100	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	90	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.27E+02	1.19E+02	8.02E+00	4.28E+00	3.94E+00	
2100 - 2200	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	59	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	8.34E+01	7.82E+01	5.28E+00	2.81E+00	2.58E+00	
2200 - 2300	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	5.66E+01	5.30E+01	3.56E+00	1.90E+00	1.75E+00	
2300 - 2400	0	3.49E+00	2.96E+00	5.36E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	1.13E+01	1.06E+01	7.13E-01	3.81E-01	3.50E-01	1.16E+02	1.09E+02	7.30E+00	3.90E+00	3.59E+00	
<b>Daily Total</b>	0										1600											

**Idling Emission - Bypass Buses**

Idling Time for Bypass Buses	1	min
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Hour	Freque <sup>y</sup>	FBSD										Freque <sup>y</sup>	FBDD									
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)						Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)				
		NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP		NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP
0000 - 0100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	22	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	4.67E+00	4.38E+00	2.94E-01	3.89E-02	3.89E-02
0100 - 0200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	6.37E-01	5.97E-01	4.01E-02	5.30E-03	5.30E-03	
0200 - 0300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E-01	1.99E-01	1.34E-02	1.77E-03	1.77E-03	
0400 - 0500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.55E+00	2.39E+00	1.60E-01	2.12E-02	2.12E-02	
0500 - 0600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	30	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	6.37E+00	5.97E+00	4.01E-01	5.30E-02	5.30E-02	
0600 - 0700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	68	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.44E+01	1.35E+01	9.09E-01	1.20E-01	1.20E-01	
0700 - 0800	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	70	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.49E+01	1.39E+01	9.36E-01	1.24E-01	1.24E-01	
0800 - 0900	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	60	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.74E+01	1.63E+01	1.10E+00	1.45E-01	1.45E-01	
0900 - 1000	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	82	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.27E+01	1.19E+01	8.02E-01	1.06E-01	1.06E-01	
1000 - 1100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	57	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.21E+01	1.13E+01	7.62E-01	1.01E-01	1.01E-01	
1100 - 1200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	54	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.15E+01	1.07E+01	7.22E-01	9.54E-02	9.54E-02	
1200 - 1300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	48	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.02E+01	9.55E+00				





**Running Emission - Terminating and Bypass Public Light Buses**

Average Travelling Distance within bus terminus =	110	m
Average Travelling Speed =	10	km/h

Hour	Frequency	PLB (Diesel + LPG)									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	2	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	2.74E-01	2.24E-01	5.02E-02	1.10E-02	1.01E-02
0100 - 0200	0	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	2	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	2.74E-01	2.24E-01	5.02E-02	1.10E-02	1.01E-02
0500 - 0600	2	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	2.74E-01	2.24E-01	5.02E-02	1.10E-02	1.01E-02
0600 - 0700	19	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	2.61E+00	2.13E+00	4.77E-01	1.05E-01	9.61E-02
0700 - 0800	33	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	4.53E+00	3.70E+00	8.28E-01	1.82E-01	1.67E-01
0800 - 0900	32	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	4.39E+00	3.59E+00	8.03E-01	1.76E-01	1.62E-01
0900 - 1000	26	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	3.57E+00	2.91E+00	6.53E-01	1.43E-01	1.32E-01
1000 - 1100	17	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	2.33E+00	1.91E+00	4.27E-01	9.35E-02	8.60E-02
1100 - 1200	19	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	2.61E+00	2.13E+00	4.77E-01	1.05E-01	9.61E-02
1200 - 1300	13	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	1.78E+00	1.46E+00	3.26E-01	7.15E-02	6.58E-02
1300 - 1400	24	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	3.29E+00	2.69E+00	6.02E-01	1.32E-01	1.21E-01
1400 - 1500	18	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	2.47E+00	2.02E+00	4.52E-01	9.90E-02	9.11E-02
1500 - 1600	23	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	3.16E+00	2.58E+00	5.77E-01	1.27E-01	1.16E-01
1600 - 1700	22	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	3.02E+00	2.47E+00	5.52E-01	1.21E-01	1.11E-01
1700 - 1800	21	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	2.88E+00	2.35E+00	5.27E-01	1.16E-01	1.06E-01
1800 - 1900	17	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	2.33E+00	1.91E+00	4.27E-01	9.35E-02	8.60E-02
1900 - 2000	14	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	1.92E+00	1.57E+00	3.51E-01	7.70E-02	7.08E-02
2000 - 2100	8	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	8.23E-01	6.72E-01	1.51E-01	3.30E-02	3.04E-02
2100 - 2200	5	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	6.86E-01	5.60E-01	1.26E-01	2.75E-02	2.53E-02
2200 - 2300	3	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	4.12E-01	3.36E-01	7.53E-02	1.65E-02	1.52E-02
2300 - 2400	15	1.25E+00	1.02E+00	2.28E-01	5.00E-02	4.60E-02	2.06E+00	1.68E+00	3.77E-01	8.25E-02	7.59E-02
Daily Total	333										

**Idling Emission - Bypass Public Light Buses**

No. of PLB (Diesel) to No. of PLB (LPG) Ratio	3.2
Idling Time for Bypass Public Light Buses	5 min

Hour	Frequency	PLB (Diesel)										PLB (LPG)											
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)					Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)						
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		
0000 - 0100	1	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E-01	1.25E-01	4.86E-02	2.17E-03	2.17E-03	0	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0100 - 0200	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	1	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E-01	1.25E-01	4.86E-02	2.17E-03	2.17E-03	0	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	1	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E-01	1.25E-01	4.86E-02	2.17E-03	2.17E-03	0	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	12	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.08E+00	1.50E+00	5.83E-01	2.60E-02	2.60E-02	4	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	4.87E+00	4.85E+00	2.46E-02	1.19E-02	1.19E-02	1.19E-02
0700 - 0800	24	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	4.17E+00	3.00E+00	1.17E+00	5.20E-02	5.20E-02	8	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	9.74E+00	9.69E+00	4.92E-02	2.38E-02	2.38E-02	2.38E-02
0800 - 0900	24	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	4.17E+00	3.00E+00	1.17E+00	5.20E-02	5.20E-02	7	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	8.53E+00	8.48E+00	4.30E-02	2.09E-02	2.09E-02	2.09E-02
0900 - 1000	17	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.95E+00	2.12E+00	8.26E-01	3.68E-02	3.68E-02	5	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.07E-02	1.49E-02	1.49E-02	1.49E-02
1000 - 1100	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.91E+00	1.37E+00	5.35E-01	2.38E-02	2.38E-02	3	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.84E-02	8.94E-03	8.94E-03	8.94E-03
1100 - 1200	12	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.08E+00	1.50E+00	5.83E-01	2.60E-02	2.60E-02	4	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	4.87E+00	4.85E+00	2.46E-02	1.19E-02	1.19E-02	1.19E-02
1200 - 1300	9	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.56E+00	1.12E+00	4.38E-01	1.95E-02	1.95E-02	3	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.84E-02	8.94E-03	8.94E-03	8.94E-03
1300 - 1400	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.43E+00	1.75E+00	6.81E-01	3.03E-02	3.03E-02	5	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.07E-02	1.49E-02	1.49E-02	1.49E-02
1400 - 1500	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.91E+00	1.37E+00	5.35E-01	2.38E-02	2.38E-02	3	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.84E-02	8.94E-03	8.94E-03	8.94E-03
1500 - 1600	15	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.60E+00	1.87E+00	7.29E-01	3.25E-02	3.25E-02	5	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.07E-02	1.49E-02	1.49E-02	1.49E-02
1600 - 1700	16	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.78E+00	2.00E+00	7.78E-01	3.47E-02	3.47E-02	5	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.07E-02	1.49E-02	1.49E-02	1.49E-02
1700 - 1800	15	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.60E+00	1.87E+00	7.29E-01	3.25E-02	3.25E-02	5	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.07E-02	1.49E-02	1.49E-02	1.49E-02
1800 - 1900	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.26E+00	1.62E+00	6.32E-01	2.82E-02	2.82E-02	4	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	4.87E+00	4.85E+00	2.46E-02	1.19E-02	1.19E-02	1.19E-02
1900 - 2000	10	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E+00	1.25E+00	4.86E-01	2.17E-02	2.17E-02	3	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.84E-02	8.94E-03	8.94E-03	8.94E-03
2000 - 2100	5	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	8.68E-01	6.25E-01	2.43E-01	1.08E-02	1.08E-02	1	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.22E+00	1.21E+00	6.15E-03	2.98E-03	2.98E-03	2.98E-03
2100 - 2200	4	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.94E-01	5.00E-01	1.94E-01	8.67E-03	8.67E-03	1	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.22E+00	1.21E+00	6.15E-03	2.98E-03	2.98E-03	2.98E-03
2200 - 2300	2	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	3.47E-01	2.50E-01	9.72E-02	4.33E-03	4.33E-03	1	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	1.22E+00	1.21E+00	6.15E-03	2.98E-03	2.98E-03	2.98E-03
2300 - 2400	6	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.04E+00	7.50E-01	2.92E-01	1.30E-02	1.30E-02	2	4.06E-03	4.04E-03	2.05E-05	9.94E-06	9.94E-06	2.44E+00	2.42E+00	1.23E-02	5.96E-03	5.96E-03	5.96E-03
Daily Total	223											69											

**Total Hourly Emission**

Hour	Total Emission inside bus terminus (g) (Running + Idling + Start) [8]					Total Emission Rate (g/s)				
	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP







**Running Emission - Terminating and Bypass Public Light Buses**

Average Travelling Distance within bus terminus =	110	m
Average Travelling Speed =	10	km/h

Hour	Frequency	PLB (Diesel + LPG)									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	2	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	2.51E-01	2.04E-01	4.75E-02	1.10E-02	1.01E-02
0100 - 0200	0	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	2	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	2.51E-01	2.04E-01	4.75E-02	1.10E-02	1.01E-02
0500 - 0600	2	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	2.51E-01	2.04E-01	4.75E-02	1.10E-02	1.01E-02
0600 - 0700	19	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	2.39E+00	1.94E+00	4.51E-01	1.05E-01	9.61E-02
0700 - 0800	33	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	4.15E+00	3.36E+00	7.84E-01	1.82E-01	1.67E-01
0800 - 0900	32	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	4.02E+00	3.26E+00	7.60E-01	1.76E-01	1.62E-01
0900 - 1000	26	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	3.27E+00	2.65E+00	6.17E-01	1.43E-01	1.32E-01
1000 - 1100	17	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	2.14E+00	1.73E+00	4.04E-01	9.35E-02	8.60E-02
1100 - 1200	19	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	2.39E+00	1.94E+00	4.51E-01	1.05E-01	9.61E-02
1200 - 1300	13	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	1.63E+00	1.32E+00	3.09E-01	7.15E-02	6.58E-02
1300 - 1400	24	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	3.01E+00	2.44E+00	5.70E-01	1.32E-01	1.21E-01
1400 - 1500	18	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	2.26E+00	1.83E+00	4.27E-01	9.90E-02	9.11E-02
1500 - 1600	23	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	2.89E+00	2.34E+00	5.46E-01	1.27E-01	1.16E-01
1600 - 1700	22	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	2.76E+00	2.24E+00	5.22E-01	1.21E-01	1.11E-01
1700 - 1800	21	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	2.64E+00	2.14E+00	4.99E-01	1.16E-01	1.06E-01
1800 - 1900	17	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	2.14E+00	1.73E+00	4.04E-01	9.35E-02	8.60E-02
1900 - 2000	14	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	1.76E+00	1.43E+00	3.32E-01	7.70E-02	7.08E-02
2000 - 2100	8	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	7.54E-01	6.11E-01	1.42E-01	3.30E-02	3.04E-02
2100 - 2200	5	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	6.28E-01	5.09E-01	1.19E-01	2.75E-02	2.53E-02
2200 - 2300	3	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	3.77E-01	3.06E-01	7.12E-02	1.65E-02	1.52E-02
2300 - 2400	15	1.14E+00	9.26E-01	2.16E-01	5.00E-02	4.60E-02	1.88E+00	1.53E+00	3.56E-01	8.25E-02	7.59E-02
Daily Total	333										

**Idling Emission - Bypass Public Light Buses**

No. of PLB (Diesel) to No. of PLB (LPG) Ratio	3.2
Idling Time for Bypass Public Light Buses	5 min

Hour	Frequency	PLB (Diesel)										PLB (LPG)										
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)					Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)					
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	
0000 - 0100	1	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E-01	1.25E-01	4.86E-02	2.17E-03	2.17E-03	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0100 - 0200	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	1	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E-01	1.25E-01	4.86E-02	2.17E-03	2.17E-03	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	1	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E-01	1.25E-01	4.86E-02	2.17E-03	2.17E-03	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	12	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.08E+00	1.50E+00	5.83E-01	2.60E-02	2.60E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	4.87E+00	4.85E+00	2.43E-02	1.19E-02	1.19E-02
0700 - 0800	24	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	4.17E+00	3.00E+00	1.17E+00	5.20E-02	5.20E-02	8	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	9.74E+00	9.69E+00	4.87E-02	2.38E-02	2.38E-02
0800 - 0900	24	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	4.17E+00	3.00E+00	1.17E+00	5.20E-02	5.20E-02	7	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	8.53E+00	8.48E+00	4.26E-02	2.09E-02	2.09E-02
0900 - 1000	17	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.95E+00	2.12E+00	8.26E-01	3.68E-02	3.68E-02	5	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.04E-02	1.49E-02	1.49E-02
1000 - 1100	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.91E+00	1.37E+00	5.35E-01	2.38E-02	2.38E-02	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.82E-02	8.94E-03	8.94E-03
1100 - 1200	12	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.08E+00	1.50E+00	5.83E-01	2.60E-02	2.60E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	4.87E+00	4.85E+00	2.43E-02	1.19E-02	1.19E-02
1200 - 1300	9	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.56E+00	1.12E+00	4.37E-01	1.95E-02	1.95E-02	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.82E-02	8.94E-03	8.94E-03
1300 - 1400	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.43E+00	1.75E+00	6.81E-01	3.03E-02	3.03E-02	5	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.04E-02	1.49E-02	1.49E-02
1400 - 1500	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.91E+00	1.37E+00	5.35E-01	2.38E-02	2.38E-02	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.82E-02	8.94E-03	8.94E-03
1500 - 1600	15	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.60E+00	1.87E+00	7.29E-01	3.25E-02	3.25E-02	5	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.04E-02	1.49E-02	1.49E-02
1600 - 1700	16	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.78E+00	2.00E+00	7.78E-01	3.47E-02	3.47E-02	5	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.04E-02	1.49E-02	1.49E-02
1700 - 1800	15	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.60E+00	1.87E+00	7.29E-01	3.25E-02	3.25E-02	5	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.04E-02	1.49E-02	1.49E-02
1800 - 1900	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.26E+00	1.62E+00	6.32E-01	2.82E-02	2.82E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	4.87E+00	4.85E+00	2.43E-02	1.19E-02	1.19E-02
1900 - 2000	10	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E+00	1.25E+00	4.86E-01	2.17E-02	2.17E-02	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.82E-02	8.94E-03	8.94E-03
2000 - 2100	5	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	8.68E-01	6.25E-01	2.43E-01	1.08E-02	1.08E-02	1	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.22E+00	1.21E+00	6.08E-03	2.98E-03	2.98E-03
2100 - 2200	4	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.94E-01	5.00E-01	1.94E-01	8.67E-03	8.67E-03	1	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.22E+00	1.21E+00	6.08E-03	2.98E-03	2.98E-03
2200 - 2300	2	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	3.47E-01	2.50E-01	9.72E-02	4.33E-03	4.33E-03	1	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.22E+00	1.21E+00	6.08E-03	2.98E-03	2.98E-03
2300 - 2400	6	5.79E																				





**Running Emission - Terminating and Bypass Public Light Buses**

Average Travelling Distance within bus terminus =	110	m
Average Travelling Speed =	10	km/h

Hour	Frequency	PLB (Diesel + LPG)									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	2	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	2.63E-01	2.13E-01	4.95E-02	1.10E-02	1.01E-02
0100 - 0200	0	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	2	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	2.63E-01	2.13E-01	4.95E-02	1.10E-02	1.01E-02
0500 - 0600	2	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	2.63E-01	2.13E-01	4.95E-02	1.10E-02	1.01E-02
0600 - 0700	19	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	2.50E+00	2.03E+00	4.70E-01	1.05E-01	9.61E-02
0700 - 0800	33	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	4.34E+00	3.52E+00	8.17E-01	1.82E-01	1.67E-01
0800 - 0900	32	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	4.21E+00	3.42E+00	7.92E-01	1.76E-01	1.62E-01
0900 - 1000	26	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	3.42E+00	2.78E+00	6.44E-01	1.43E-01	1.32E-01
1000 - 1100	17	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	2.24E+00	1.81E+00	4.21E-01	9.35E-02	8.60E-02
1100 - 1200	19	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	2.50E+00	2.03E+00	4.70E-01	1.05E-01	9.61E-02
1200 - 1300	13	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	1.71E+00	1.39E+00	3.22E-01	7.15E-02	6.58E-02
1300 - 1400	24	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	3.16E+00	2.56E+00	5.94E-01	1.32E-01	1.21E-01
1400 - 1500	18	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	2.37E+00	1.92E+00	4.46E-01	9.90E-02	9.11E-02
1500 - 1600	23	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	3.02E+00	2.48E+00	5.70E-01	1.27E-01	1.16E-01
1600 - 1700	22	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	2.89E+00	2.35E+00	5.45E-01	1.21E-01	1.11E-01
1700 - 1800	21	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	2.76E+00	2.24E+00	5.20E-01	1.16E-01	1.06E-01
1800 - 1900	17	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	2.24E+00	1.81E+00	4.21E-01	9.35E-02	8.60E-02
1900 - 2000	14	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	1.84E+00	1.49E+00	3.47E-01	7.70E-02	7.08E-02
2000 - 2100	8	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	7.89E-01	6.40E-01	1.49E-01	3.30E-02	3.04E-02
2100 - 2200	5	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	6.58E-01	5.34E-01	1.24E-01	2.75E-02	2.53E-02
2200 - 2300	3	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	3.95E-01	3.20E-01	7.43E-02	1.65E-02	1.52E-02
2300 - 2400	15	1.20E+00	9.70E-01	2.25E-01	5.00E-02	4.60E-02	1.97E+00	1.60E+00	3.71E-01	8.25E-02	7.59E-02
Daily Total	333										

**Idling Emission - Bypass Public Light Buses**

No. of PLB (Diesel) to No. of PLB (LPG) Ratio	3.2
Idling Time for Bypass Public Light Buses	5 min

Hour	Frequency	PLB (Diesel)										PLB (LPG)											
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)					Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)						
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		
0000 - 0100	1	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E-01	1.25E-01	4.86E-02	2.17E-03	2.17E-03	0	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0100 - 0200	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	1	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E-01	1.25E-01	4.86E-02	2.17E-03	2.17E-03	0	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	1	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E-01	1.25E-01	4.86E-02	2.17E-03	2.17E-03	0	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	12	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.08E+00	1.50E+00	5.83E-01	2.60E-02	2.60E-02	4	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	4.87E+00	4.85E+00	2.45E-02	1.19E-02	1.19E-02	1.19E-02
0700 - 0800	24	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	4.17E+00	3.00E+00	1.17E+00	5.20E-02	5.20E-02	7	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	9.74E+00	9.69E+00	4.90E-02	2.38E-02	2.38E-02	2.38E-02
0800 - 0900	24	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	4.17E+00	3.00E+00	1.17E+00	5.20E-02	5.20E-02	7	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	8.53E+00	8.48E+00	4.29E-02	2.09E-02	2.09E-02	2.09E-02
0900 - 1000	17	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.95E+00	2.12E+00	8.26E-01	3.68E-02	3.68E-02	5	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.06E-02	1.49E-02	1.49E-02	1.49E-02
1000 - 1100	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.91E+00	1.37E+00	5.35E-01	2.38E-02	2.38E-02	3	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.84E-02	8.94E-03	8.94E-03	8.94E-03
1100 - 1200	12	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.08E+00	1.50E+00	5.83E-01	2.60E-02	2.60E-02	4	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	4.87E+00	4.85E+00	2.45E-02	1.19E-02	1.19E-02	1.19E-02
1200 - 1300	9	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.56E+00	1.12E+00	4.37E-01	1.95E-02	1.95E-02	3	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.84E-02	8.94E-03	8.94E-03	8.94E-03
1300 - 1400	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.43E+00	1.75E+00	6.80E-01	3.03E-02	3.03E-02	5	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.06E-02	1.49E-02	1.49E-02	1.49E-02
1400 - 1500	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.91E+00	1.37E+00	5.35E-01	2.38E-02	2.38E-02	3	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.84E-02	8.94E-03	8.94E-03	8.94E-03
1500 - 1600	15	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.60E+00	1.87E+00	7.29E-01	3.25E-02	3.25E-02	5	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.06E-02	1.49E-02	1.49E-02	1.49E-02
1600 - 1700	16	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.78E+00	2.00E+00	7.78E-01	3.47E-02	3.47E-02	5	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.06E-02	1.49E-02	1.49E-02	1.49E-02
1700 - 1800	15	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.60E+00	1.87E+00	7.29E-01	3.25E-02	3.25E-02	5	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.06E-02	1.49E-02	1.49E-02	1.49E-02
1800 - 1900	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.26E+00	1.62E+00	6.32E-01	2.82E-02	2.82E-02	4	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	4.87E+00	4.85E+00	2.45E-02	1.19E-02	1.19E-02	1.19E-02
1900 - 2000	10	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E+00	1.25E+00	4.86E-01	2.17E-02	2.17E-02	3	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.84E-02	8.94E-03	8.94E-03	8.94E-03
2000 - 2100	5	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	8.68E-01	6.25E-01	2.43E-01	1.08E-02	1.08E-02	1	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.22E+00	1.21E+00	6.12E-03	2.98E-03	2.98E-03	2.98E-03
2100 - 2200	4	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.94E-01	5.00E-01	1.94E-01	8.67E-03	8.67E-03	1	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.22E+00	1.21E+00	6.12E-03	2.98E-03	2.98E-03	2.98E-03
2200 - 2300	2	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	3.47E-01	2.50E-01	9.72E-02	4.33E-03	4.33E-03	1	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	1.22E+00	1.21E+00	6.12E-03	2.98E-03	2.98E-03	2.98E-03
2300 - 2400	6	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.04E+00	7.50E-01	2.92E-01	1.30E-02	1.30E-02	2	4.06E-03	4.04E-03	2.04E-05	9.94E-06	9.94E-06	2.44E+00	2.42E+00	1.22E-02	5.96E-03	5.96E-03	5.96E-03
Daily Total	223																						

**Total Hourly Emission**

Hour	Total Emission inside bus terminus (g) (Running + Idling + Start) [8]					Total Emission Rate (g/s)				
	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP







**Running Emission - Terminating and Bypass Public Light Buses**

Average Travelling Distance within bus terminus =	110	m
Average Travelling Speed =	10	km/h

Hour	Frequency	PLB (Diesel + LPG)									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	2	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	2.86E-01	2.34E-01	5.14E-02	1.10E-02	1.01E-02
0100 - 0200	0	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	2	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	2.86E-01	2.34E-01	5.14E-02	1.10E-02	1.01E-02
0500 - 0600	2	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	2.86E-01	2.34E-01	5.14E-02	1.10E-02	1.01E-02
0600 - 0700	19	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	2.71E+00	2.22E+00	4.89E-01	1.05E-01	9.61E-02
0700 - 0800	33	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	4.71E+00	3.86E+00	8.49E-01	1.82E-01	1.67E-01
0800 - 0900	32	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	4.57E+00	3.75E+00	8.23E-01	1.76E-01	1.62E-01
0900 - 1000	26	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	3.71E+00	3.04E+00	6.69E-01	1.43E-01	1.32E-01
1000 - 1100	17	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	2.43E+00	1.99E+00	4.37E-01	9.35E-02	8.60E-02
1100 - 1200	19	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	2.71E+00	2.22E+00	4.89E-01	1.05E-01	9.61E-02
1200 - 1300	13	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	1.86E+00	1.52E+00	3.34E-01	7.15E-02	6.58E-02
1300 - 1400	24	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	3.43E+00	2.81E+00	6.17E-01	1.32E-01	1.21E-01
1400 - 1500	18	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	2.57E+00	2.11E+00	4.63E-01	9.90E-02	9.11E-02
1500 - 1600	23	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	3.28E+00	2.69E+00	5.92E-01	1.27E-01	1.16E-01
1600 - 1700	22	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	3.14E+00	2.58E+00	5.66E-01	1.21E-01	1.11E-01
1700 - 1800	21	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	3.00E+00	2.46E+00	5.40E-01	1.16E-01	1.06E-01
1800 - 1900	17	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	2.43E+00	1.99E+00	4.37E-01	9.35E-02	8.60E-02
1900 - 2000	14	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	2.00E+00	1.64E+00	3.60E-01	7.70E-02	7.08E-02
2000 - 2100	8	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	8.57E-01	7.03E-01	1.54E-01	3.30E-02	3.04E-02
2100 - 2200	5	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	7.14E-01	5.85E-01	1.29E-01	2.75E-02	2.53E-02
2200 - 2300	3	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	4.28E-01	3.51E-01	7.72E-02	1.65E-02	1.52E-02
2300 - 2400	15	1.30E+00	1.06E+00	2.34E-01	5.00E-02	4.60E-02	2.14E+00	1.78E+00	3.86E-01	8.25E-02	7.59E-02
Daily Total	333										

**Idling Emission - Bypass Public Light Buses**

No. of PLB (Diesel) to No. of PLB (LPG) Ratio	3.2
Idling Time for Bypass Public Light Buses	5 min

Hour	Frequency	PLB (Diesel)										PLB (LPG)											
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)					Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)						
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		
0000 - 0100	1	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E-01	1.25E-01	4.86E-02	2.17E-03	2.17E-03	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0100 - 0200	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0200 - 0300	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	1	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E-01	1.25E-01	4.86E-02	2.17E-03	2.17E-03	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	1	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E-01	1.25E-01	4.86E-02	2.17E-03	2.17E-03	0	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	12	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.08E+00	1.50E+00	5.83E-01	2.60E-02	2.60E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	4.87E+00	4.85E+00	2.44E-02	1.19E-02	1.19E-02	1.19E-02
0700 - 0800	24	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	4.17E+00	3.00E+00	1.17E+00	5.20E-02	5.20E-02	8	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	9.74E+00	9.69E+00	4.88E-02	2.38E-02	2.38E-02	2.38E-02
0800 - 0900	24	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	4.17E+00	3.00E+00	1.17E+00	5.20E-02	5.20E-02	7	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	8.53E+00	8.48E+00	4.27E-02	2.09E-02	2.09E-02	2.09E-02
0900 - 1000	17	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.95E+00	2.12E+00	8.26E-01	3.68E-02	3.68E-02	5	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.05E-02	1.49E-02	1.49E-02	1.49E-02
1000 - 1100	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.91E+00	1.37E+00	5.35E-01	2.38E-02	2.38E-02	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.83E-02	8.94E-03	8.94E-03	8.94E-03
1100 - 1200	12	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.08E+00	1.50E+00	5.83E-01	2.60E-02	2.60E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	4.87E+00	4.85E+00	2.44E-02	1.19E-02	1.19E-02	1.19E-02
1200 - 1300	9	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.56E+00	1.12E+00	4.37E-01	1.95E-02	1.95E-02	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.83E-02	8.94E-03	8.94E-03	8.94E-03
1300 - 1400	14	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.43E+00	1.75E+00	6.80E-01	3.03E-02	3.03E-02	5	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.05E-02	1.49E-02	1.49E-02	1.49E-02
1400 - 1500	11	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.91E+00	1.37E+00	5.35E-01	2.38E-02	2.38E-02	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.83E-02	8.94E-03	8.94E-03	8.94E-03
1500 - 1600	15	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.60E+00	1.87E+00	7.29E-01	3.25E-02	3.25E-02	5	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.05E-02	1.49E-02	1.49E-02	1.49E-02
1600 - 1700	16	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.78E+00	2.00E+00	7.78E-01	3.47E-02	3.47E-02	5	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.05E-02	1.49E-02	1.49E-02	1.49E-02
1700 - 1800	15	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.60E+00	1.87E+00	7.29E-01	3.25E-02	3.25E-02	5	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	6.09E+00	6.06E+00	3.05E-02	1.49E-02	1.49E-02	1.49E-02
1800 - 1900	13	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	2.26E+00	1.62E+00	6.32E-01	2.82E-02	2.82E-02	4	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	4.87E+00	4.85E+00	2.44E-02	1.19E-02	1.19E-02	1.19E-02
1900 - 2000	10	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.74E+00	1.25E+00	4.86E-01	2.17E-02	2.17E-02	3	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	3.65E+00	3.64E+00	1.83E-02	8.94E-03	8.94E-03	8.94E-03
2000 - 2100	5	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	8.68E-01	6.25E-01	2.43E-01	1.08E-02	1.08E-02	1	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.22E+00	1.21E+00	6.10E-03	2.98E-03	2.98E-03	2.98E-03
2100 - 2200	4	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	6.94E-01	5.00E-01	1.94E-01	8.67E-03	8.67E-03	1	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.22E+00	1.21E+00	6.10E-03	2.98E-03	2.98E-03	2.98E-03
2200 - 2300	2	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	3.47E-01	2.50E-01	9.72E-02	4.33E-03	4.33E-03	1	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	1.22E+00	1.21E+00	6.10E-03	2.98E-03	2.98E-03	2.98E-03
2300 - 2400	6	5.79E-04	4.17E-04	1.62E-04	7.22E-06	7.22E-06	1.04E+00	7.50E-01	2.92E-01	1.30E-02	1.30E-02	2	4.06E-03	4.04E-03	2.03E-05	9.94E-06	9.94E-06	2.44E+00	2.42E+00	1.22E-02	5.96E-03	5.96E-03	5.96E-03
Daily Total	223											69											

**Total Hourly Emission**

Hour	Total Emission inside bus terminus (g) (Running + Idling + Start) [8]					Total Emission Rate (g/s)				
	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP

**Man Kat Street Bus Terminus**

Minimum Hourly Temperature and Relative Humidity for 1st Quarter

Temperature: 10 °C  
Relative Humidity: 34 %

**Start Emission**

NOx	Single-Deck Franchised Bus (FBSB) Start Emission Factor (g/trip)																	
	2.01E-01	3.62E-01	4.82E-01	6.30E-01	8.44E-01	1.13E+00	1.65E+00	2.05E+00	3.01E+00	3.94E+00	4.42E+00	5.22E+00	6.75E+00	6.03E+00	6.19E+00	6.35E+00	6.43E+00	6.43E+00
NO	1.69E-01	3.05E-01	4.06E-01	5.26E-01	7.11E-01	9.48E-01	1.39E+00	1.73E+00	2.54E+00	3.32E+00	3.73E+00	4.40E+00	5.08E+00	5.42E+00	5.35E+00	5.42E+00	5.42E+00	5.42E+00
NO2	3.16E-02	5.69E-02	7.58E-02	1.07E-01	1.33E-01	1.77E-01	2.59E-01	3.22E-01	4.74E-01	6.19E-01	6.95E-01	8.21E-01	9.03E-01	9.48E-01	9.73E-01	9.98E-01	1.01E+00	1.01E+00
RSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Hour	No. of Trips of FBSB [7]																	
	5	10	20	30	40	50	60	120	180	240	300	360	420	480	540	600	660	720
0000 - 0100																		
0100 - 0200																		
0200 - 0300																		
0300 - 0400																		
0400 - 0500																		
0500 - 0600																		
0600 - 0700																		
0700 - 0800																		
0800 - 0900																		
0900 - 1000																		
1000 - 1100																		
1100 - 1200																		
1200 - 1300																		
1300 - 1400																		
1400 - 1500																		
1500 - 1600																		
1600 - 1700																		
1700 - 1800																		
1800 - 1900																		
1900 - 2000																		
2000 - 2100																		
2100 - 2200																		
2200 - 2300																		
2300 - 2400																		
<b>Daily Total</b>																		0

**Idling Emission - Terminating Buses**

Idling Time for Terminating Buses [8]	1	min
Max. Idling Time for Adjusting Start Emission =	1	min

Hour	Frequenc y	FBSB										FBDD										
		Cold Idling Emission Factor (g/s)					Cold Idling Emission (g) [1]					Cold Idling Emission Factor (g/s)					Cold Idling Emission (g) [1]					
		NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP	
0000 - 0100	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	2.56E+01	2.40E+01	1.62E+00	7.07E-03	7.07E-03
0100 - 0200	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	6.41E+01	6.01E+01	4.04E-01	1.77E-03	1.77E-03
0200 - 0300	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0300 - 0400	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0400 - 0500	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0500 - 0600	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0600 - 0700	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0700 - 0800	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0800 - 0900	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0900 - 1000	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	1.82E+01	1.20E+01	8.08E-01	3.53E-03	3.53E-03
1000 - 1100	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	1.28E+01	1.20E+01	8.08E-01	3.53E-03	3.53E-03
1100 - 1200	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1200 - 1300	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	1.28E+01	1.20E+01	8.08E-01	3.53E-03	3.53E-03
1300 - 1400	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	6.41E+01	6.01E+01	4.04E-01	1.77E-03	1.77E-03
1400 - 1500	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	2.56E+01	2.40E+01	1.62E+00	7.07E-03	7.07E-03
1500 - 1600	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	3.85E+01	3.60E+01	2.42E+00	1.06E-02	1.06E-02
1600 - 1700	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1700 - 1800	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1800 - 1900	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1900 - 2000	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2000 - 2100	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2100 - 2200	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2200 - 2300	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2300 - 2400	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	2.56E+01	2.40E+01	1.62E+00	7.07E-03	7.07E-03
<b>Daily Total</b>	0											28										

Average Distance from Starting Place to Egress =	65	m
Average Distance from PTI Egress to Open Road Network	0	m
Average Spread Distance outside bus terminus =	635	m

Hour	Total Idling Emission (g) [2]					Idling Emission for Start Emission Adjustment (g) [3]					Adjusted Start Emission within bus terminus (g) [4]					Adjusted Start Emission outside bus terminus (g) [5]					Start Emission Rate outside bus terminus (g/s)				
	NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP	NOx	NO	NO <sub>2</sub>	RSP	FSP
0000 - 0100	2.56E+01	2.40E+01	1.62E+00	7.07E-03	7.07E-03	2.56E+01	2.40E+01	1.62E+00	7.07E-03	7.07E-03	4.73E+00														

**Running Emission - Terminating and Bypass Buses**

Average Travelling Distance within bus terminus =	100	m
Average Travelling Speed =	10	km/h

Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)						Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	8.84E+00	8.28E+00	5.57E-01	3.05E-01	2.80E-01
0100 - 0200	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	2.21E+00	2.07E+00	1.39E-01	7.62E-02	7.01E-02	
0200 - 0300	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0500 - 0600	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.10E+00	1.04E+00	6.96E-02	3.81E-02	3.50E-02	
0600 - 0700	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	8.84E+00	8.28E+00	5.57E-01	3.05E-01	2.80E-01	
0700 - 0800	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.33E+01	1.24E+01	8.35E-01	4.57E-01	4.20E-01	
0800 - 0900	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.33E+01	1.24E+01	8.35E-01	4.57E-01	4.20E-01	
0900 - 1000	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	2.21E+01	2.07E+01	1.39E+00	7.62E-01	7.01E-01	
1000 - 1100	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	9.94E+00	9.32E+00	6.26E-01	3.43E-01	3.15E-01	
1100 - 1200	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	6.63E+00	6.21E+00	4.17E-01	2.29E-01	2.10E-01	
1200 - 1300	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	8.84E+00	8.28E+00	5.57E-01	3.05E-01	2.80E-01	
1300 - 1400	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	6.63E+00	6.21E+00	4.17E-01	2.29E-01	2.10E-01	
1400 - 1500	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	4.42E+00	4.14E+00	2.78E-01	1.52E-01	1.40E-01	
1500 - 1600	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	11	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.22E+01	1.14E+01	7.65E-01	4.19E-01	3.85E-01	
1600 - 1700	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	14	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.55E+01	1.45E+01	9.74E-01	5.33E-01	4.91E-01	
1700 - 1800	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	3.31E+00	3.11E+00	2.09E-01	1.14E-01	1.05E-01	
1800 - 1900	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	4.42E+00	4.14E+00	2.78E-01	1.52E-01	1.40E-01	
1900 - 2000	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	1.10E+00	1.04E+00	6.96E-02	3.81E-02	3.50E-02	
2000 - 2100	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	5.52E+00	5.18E+00	3.48E-01	1.98E-01	1.75E-01	
2100 - 2200	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	2.21E+00	2.07E+00	1.39E-01	7.62E-02	7.01E-02	
2200 - 2300	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	3.31E+00	3.11E+00	2.09E-01	1.14E-01	1.05E-01	
2300 - 2400	0	3.41E+00	2.89E+00	5.24E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.10E+01	1.04E+01	6.96E-01	3.81E-01	3.50E-01	8.84E+00	8.28E+00	5.57E-01	3.05E-01	2.80E-01	
Daily Total	0										147											

**Idling Emission - Bypass Buses**

Idling Time for Bypass Buses	1	min
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Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)						Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	8.49E-01	7.96E-01	5.35E-02	7.07E-03	7.07E-03
0100 - 0200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E-01	1.99E-01	1.34E-02	1.77E-03	1.77E-03	
0200 - 0300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0500 - 0600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E-01	1.99E-01	1.34E-02	1.77E-03	1.77E-03	
0600 - 0700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.49E+00	1.39E+00	9.36E-02	1.24E-02	1.24E-02	
0700 - 0800	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	10	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
0800 - 0900	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	10	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
0900 - 1000	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	13	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.76E+00	2.59E+00	1.74E-01	2.30E-02	2.30E-02	
1000 - 1100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.49E+00	1.39E+00	9.36E-02	1.24E-02	1.24E-02	
1100 - 1200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.06E+00	9.95E-01	6.69E-02	8.84E-03	8.84E-03	
1200 - 1300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.27E+00	1.19E+00	8.02E-02	1.06E-02	1.06E-02	
1300 - 1400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.06E+00	9.95E-01	6.69E-02	8.84E-03	8.84E-03	
1400 - 1500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	8.49E-01	7.96E-01	5.35E-02	7.07E-03	7.07E-03	
1500 - 1600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.49E+00	1.39E+00	9.36E-02	1.24E-02	1.24E-02	
1600 - 1700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00															

**Man Kat Street Bus Terminus**

Minimum Hourly Temperature and Relative Humidity for 2nd Quarter

Temperature: 18 °C

Relative Humidity: 46 %

**Start Emission**

NOx	Single-Deck Franchised Bus (FBSB) Start Emission Factor (g/trip)																	
	2.01E-01	3.62E-01	4.82E-01	6.83E-01	8.44E-01	1.13E+00	1.65E+00	2.05E+00	3.01E+00	3.94E+00	4.42E+00	5.22E+00	6.75E+00	6.03E+00	6.19E+00	6.35E+00	6.43E+00	6.43E+00
NO	1.69E-01	3.05E-01	4.06E-01	5.76E-01	7.11E-01	9.48E-01	1.39E+00	1.73E+00	2.54E+00	3.32E+00	3.73E+00	4.40E+00	5.08E+00	5.22E+00	5.35E+00	5.42E+00	5.42E+00	5.42E+00
NO2	3.16E-02	5.69E-02	7.58E-02	1.07E-01	1.33E-01	1.77E-01	2.59E-01	3.22E-01	4.74E-01	6.19E-01	6.95E-01	8.21E-01	9.03E-01	9.48E-01	9.73E-01	9.98E-01	1.01E+00	1.01E+00
RSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Hour	No. of Trips of FBSB [7]																	
	5	10	20	30	40	50	60	120	180	240	300	360	420	480	540	600	660	720
0000 - 0100																		
0100 - 0200																		
0200 - 0300																		
0300 - 0400																		
0400 - 0500																		
0500 - 0600																		
0600 - 0700																		
0700 - 0800																		
0800 - 0900																		
0900 - 1000																		
1000 - 1100																		
1100 - 1200																		
1200 - 1300																		
1300 - 1400																		
1400 - 1500																		
1500 - 1600																		
1600 - 1700																		
1700 - 1800																		
1800 - 1900																		
1900 - 2000																		
2000 - 2100																		
2100 - 2200																		
2200 - 2300																		
2300 - 2400																		
<b>Daily Total</b>																		0

**Idling Emission - Terminating Buses**

Idling Time for Terminating Buses [8]	1	min
Max. Idling Time for Adjusting Start Emission =	1	min

Hour	FBSB										FBDD													
	Freque	y	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	Freque	y	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	2.56E+01	2.40E+01	1.62E+00	7.07E-03	7.07E-03	
0100 - 0200	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	6.41E+01	6.01E+01	4.04E-01	1.77E-03	1.77E-03	
0200 - 0300	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0500 - 0600	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0600 - 0700	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0700 - 0800	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0800 - 0900	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0900 - 1000	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	1.80E+01	1.21E+01	5.30E-03	5.30E-03	5.30E-03	
1000 - 1100	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	1.28E+01	8.08E-01	3.53E-03	3.53E-03	3.53E-03	
1100 - 1200	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1200 - 1300	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	1.28E+01	1.20E+01	8.08E-01	3.53E-03	3.53E-03	
1300 - 1400	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	6.41E+01	6.01E+01	4.04E-01	1.77E-03	1.77E-03	
1400 - 1500	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1500 - 1600	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	2.56E+01	2.40E+01	1.62E+00	7.07E-03	7.07E-03	
1600 - 1700	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	3.85E+01	3.60E+01	2.42E+00	1.06E-02	1.06E-02	
1700 - 1800	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1800 - 1900	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1900 - 2000	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2000 - 2100	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2100 - 2200	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2200 - 2300	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2300 - 2400	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	2.56E+01	2.40E+01	1.62E+00	7.07E-03	7.07E-03	
<b>Daily Total</b>	0												28											

Average Distance from Starting Place to Egress =	65	m
Average Distance from PTI Egress to Open Road Network	0	m
Average Spread Distance outside bus terminus =	635	m

Hour	Total Idling Emission (g) [2]					Idling Emission for Start Emission Adjustment (g) [3]					Adjusted Start Emission within bus terminus (g) [4]					Adjusted Start Emission outside bus terminus (g) [5]					Start Emission Rate outside bus terminus (g/s)				
	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2</							

**Running Emission - Terminating and Bypass Buses**

Average Travelling Distance within bus terminus =	100	m
Average Travelling Speed =	10	km/h

Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)						Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	8.37E+00	7.84E+00	5.27E-01	3.05E-01	2.80E-01
0100 - 0200	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	2.09E+00	1.96E+00	1.32E-01	7.62E-02	7.01E-02	
0200 - 0300	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0500 - 0600	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.05E+00	9.80E-01	6.59E-02	3.81E-02	3.50E-02	
0600 - 0700	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	8.37E+00	7.84E+00	5.27E-01	3.05E-01	2.80E-01	
0700 - 0800	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.26E+01	1.18E+01	7.91E-01	4.57E-01	4.20E-01	
0800 - 0900	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.26E+01	1.18E+01	7.91E-01	4.57E-01	4.20E-01	
0900 - 1000	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	2.09E+01	1.96E+01	1.32E+00	7.62E-01	7.01E-01	
1000 - 1100	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	9.41E+00	8.82E+00	5.93E-01	3.43E-01	3.15E-01	
1100 - 1200	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	6.28E+00	5.88E+00	3.95E-01	2.29E-01	2.10E-01	
1200 - 1300	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	8.37E+00	7.84E+00	5.27E-01	3.05E-01	2.80E-01	
1300 - 1400	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	6.28E+00	5.88E+00	3.95E-01	2.29E-01	2.10E-01	
1400 - 1500	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	4.18E+00	3.92E+00	2.64E-01	1.52E-01	1.40E-01	
1500 - 1600	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	11	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.15E+01	1.08E+01	7.25E-01	4.19E-01	3.85E-01	
1600 - 1700	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	14	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.46E+01	1.37E+01	9.22E-01	5.33E-01	4.91E-01	
1700 - 1800	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	3.14E+00	2.94E+00	1.98E-01	1.14E-01	1.05E-01	
1800 - 1900	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	4.18E+00	3.92E+00	2.64E-01	1.52E-01	1.40E-01	
1900 - 2000	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	1.05E+00	9.80E-01	6.59E-02	3.81E-02	3.50E-02	
2000 - 2100	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	5.23E+00	4.90E+00	3.29E-01	1.90E-01	1.75E-01	
2100 - 2200	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	2.09E+00	1.96E+00	1.32E-01	7.62E-02	7.01E-02	
2200 - 2300	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	3.14E+00	2.94E+00	1.98E-01	1.14E-01	1.05E-01	
2300 - 2400	0	3.23E+00	2.74E+00	4.96E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.05E+01	9.80E+00	6.59E-01	3.81E-01	3.50E-01	8.37E+00	7.84E+00	5.27E-01	3.05E-01	2.80E-01	
Daily Total	0										147											

**Idling Emission - Bypass Buses**

Idling Time for Bypass Buses	1	min
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Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)						Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	8.49E-01	7.96E-01	5.35E-02	7.07E-03	7.07E-03
0100 - 0200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E-01	1.99E-01	1.34E-02	1.77E-03	1.77E-03	
0200 - 0300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0500 - 0600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E-01	1.99E-01	1.34E-02	1.77E-03	1.77E-03	
0600 - 0700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.49E+00	1.39E+00	9.36E-02	1.24E-02	1.24E-02	
0700 - 0800	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	10	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
0800 - 0900	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	10	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
0900 - 1000	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	13	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.76E+00	2.59E+00	1.74E-01	2.30E-02	2.30E-02	
1000 - 1100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.49E+00	1.39E+00	9.36E-02	1.24E-02	1.24E-02	
1100 - 1200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.06E+00	9.95E-01	6.69E-02	8.84E-03	8.84E-03	
1200 - 1300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.27E+00	1.19E+00	8.02E-02	1.06E-02	1.06E-02	
1300 - 1400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.06E+00	9.95E-01	6.69E-02	8.84E-03	8.84E-03	
1400 - 1500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	8.49E-01	7.96E-01	5.35E-02	7.07E-03	7.07E-03	
1500 - 1600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.49E+00	1.39E+00	9.36E-02	1.24E-02	1.24E-02	
1600 - 1700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00															

**Man Kat Street Bus Terminus**

Minimum Hourly Temperature and Relative Humidity for 3rd Quarter

Temperature: 20 °C  
Relative Humidity: 23 %

**Start Emission**

NOx	Single-Deck Franchised Bus (FBSB) Start Emission Factor (g/trip)																	
	2.01E-01	3.62E-01	4.82E-01	6.83E-01	8.44E-01	1.13E+00	1.65E+00	2.05E+00	3.01E+00	3.94E+00	4.42E+00	5.22E+00	6.75E+00	6.03E+00	6.19E+00	6.35E+00	6.43E+00	6.43E+00
NO	1.69E-01	3.05E-01	4.06E-01	5.76E-01	7.11E-01	9.48E-01	1.39E+00	1.73E+00	2.54E+00	3.32E+00	3.73E+00	4.40E+00	5.08E+00	5.42E+00	5.35E+00	5.42E+00	5.42E+00	5.42E+00
NO2	3.16E-02	5.69E-02	7.58E-02	1.07E-01	1.33E-01	1.77E-01	2.59E-01	3.22E-01	4.74E-01	6.19E-01	6.95E-01	8.21E-01	9.03E-01	9.48E-01	9.73E-01	9.98E-01	1.01E+00	1.01E+00
RSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FSP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Hour	No. of Trips of FBSB [7]																	
	5	10	20	30	40	50	60	120	180	240	300	360	420	480	540	600	660	720
0000 - 0100																		
0100 - 0200																		
0200 - 0300																		
0300 - 0400																		
0400 - 0500																		
0500 - 0600																		
0600 - 0700																		
0700 - 0800																		
0800 - 0900																		
0900 - 1000																		
1000 - 1100																		
1100 - 1200																		
1200 - 1300																		
1300 - 1400																		
1400 - 1500																		
1500 - 1600																		
1600 - 1700																		
1700 - 1800																		
1800 - 1900																		
1900 - 2000																		
2000 - 2100																		
2100 - 2200																		
2200 - 2300																		
2300 - 2400																		
<b>Daily Total</b>																		0

**Idling Emission - Terminating Buses**

Idling Time for Terminating Buses [8]	1	min
Max. Idling Time for Adjusting Start Emission =	1	min

Hour	FBSB										FBDD													
	Freque	y	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	Freque	y	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	2.56E+01	2.40E+01	1.62E+00	7.07E-03	7.07E-03	
0100 - 0200	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	6.41E+01	6.01E+01	4.04E-01	1.77E-03	1.77E-03	
0200 - 0300	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0500 - 0600	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0600 - 0700	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0700 - 0800	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0800 - 0900	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0900 - 1000	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	1.28E+01	1.20E+01	8.08E-01	3.53E-03	3.53E-03	
1000 - 1100	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	1.28E+01	1.20E+01	8.08E-01	3.53E-03	3.53E-03	
1100 - 1200	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1200 - 1300	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	1.28E+01	1.20E+01	8.08E-01	3.53E-03	3.53E-03	
1300 - 1400	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	1.28E+01	1.20E+01	8.08E-01	3.53E-03	3.53E-03	
1400 - 1500	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	2.56E+01	2.40E+01	1.62E+00	7.07E-03	7.07E-03	
1500 - 1600	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	3.85E+01	3.60E+01	2.42E+00	1.06E-02	1.06E-02	
1600 - 1700	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1700 - 1800	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1800 - 1900	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1900 - 2000	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2000 - 2100	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2100 - 2200	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2200 - 2300	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2300 - 2400	0	1.54E-02	1.30E-02	2.36E-03	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.07E-01	1.00E-01	6.73E-03	2.95E-05	2.95E-05	2.56E+01	2.40E+01	1.62E+00	7.07E-03	7.07E-03	
<b>Daily Total</b>	0												28											

Average Distance from Starting Place to Egress =	65	m
Average Distance from PTI Egress to Open Road Network	0	m
Average Spread Distance outside bus terminus =	635	m

Hour	Total Idling Emission (g) [2]					Idling Emission for Start Emission Adjustment (g) [3]					Adjusted Start Emission within bus terminus (g) [4]					Adjusted Start Emission outside bus terminus (g) [5]					Start Emission Rate outside bus terminus (g/s)				
	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP	NOx	NO	NO2</		

**Running Emission - Terminating and Bypass Buses**

Average Travelling Distance within bus terminus =	100	m
Average Travelling Speed =	10	km/h

Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Running Emission Factor (g/km-vehicle)					Running Emission (g)						Running Emission Factor (g/km-vehicle)					Running Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	8.72E+00	8.17E+00	5.50E-01	3.05E-01	2.80E-01
0100 - 0200	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	2.18E+00	2.04E+00	1.37E-01	7.62E-02	7.01E-02	
0200 - 0300	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0500 - 0600	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.09E+00	1.02E+00	6.87E-02	3.81E-02	3.50E-02	
0600 - 0700	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	8.72E+00	8.17E+00	5.50E-01	3.05E-01	2.80E-01	
0700 - 0800	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.31E+01	1.23E+01	8.24E-01	4.57E-01	4.20E-01	
0800 - 0900	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.31E+01	1.23E+01	8.24E-01	4.57E-01	4.20E-01	
0900 - 1000	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	2.18E+01	2.04E+01	1.37E+00	7.62E-01	7.01E-01	
1000 - 1100	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	9.81E+00	9.20E+00	6.18E-01	3.43E-01	3.15E-01	
1100 - 1200	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	6.94E+00	6.13E+00	4.12E-01	2.29E-01	2.10E-01	
1200 - 1300	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	8.72E+00	8.17E+00	5.50E-01	3.05E-01	2.80E-01	
1300 - 1400	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	6.54E+00	6.13E+00	4.12E-01	2.29E-01	2.10E-01	
1400 - 1500	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	4.36E+00	4.09E+00	2.75E-01	1.52E-01	1.40E-01	
1500 - 1600	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	11	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.20E+01	1.12E+01	7.56E-01	4.19E-01	3.85E-01	
1600 - 1700	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	14	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.53E+01	1.43E+01	9.62E-01	5.33E-01	4.91E-01	
1700 - 1800	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	3.27E+00	3.07E+00	2.06E-01	1.14E-01	1.05E-01	
1800 - 1900	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	4.36E+00	4.09E+00	2.75E-01	1.52E-01	1.40E-01	
1900 - 2000	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	1.09E+00	1.02E+00	6.87E-02	3.81E-02	3.50E-02	
2000 - 2100	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	5.45E+00	5.11E+00	3.43E-01	1.95E-01	1.75E-01	
2100 - 2200	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	2.18E+00	2.04E+00	1.37E-01	7.62E-02	7.01E-02	
2200 - 2300	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	3.27E+00	3.07E+00	2.06E-01	1.14E-01	1.05E-01	
2300 - 2400	0	3.37E+00	2.85E+00	5.17E-01	8.34E-02	7.68E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8	1.09E+01	1.02E+01	6.87E-01	3.81E-01	3.50E-01	8.72E+00	8.17E+00	5.50E-01	3.05E-01	2.80E-01	
Daily Total	0										147											

**Idling Emission - Bypass Buses**

Idling Time for Bypass Buses	1	min
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Hour	Frequenc y	FBSD										Frequenc y	FBDD									
		Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)						Hot Idling Emission Factor (g/s)					Hot Idling Emission (g)				
		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP		NOx	NO	NO2	RSP	FSP	NOx	NO	NO2	RSP	FSP
0000 - 0100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	8.49E-01	7.96E-01	5.35E-02	7.07E-03	7.07E-03
0100 - 0200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E-01	1.99E-01	1.34E-02	1.77E-03	1.77E-03	
0200 - 0300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0300 - 0400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0400 - 0500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0500 - 0600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E-01	1.99E-01	1.34E-02	1.77E-03	1.77E-03	
0600 - 0700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.49E+00	1.39E+00	9.36E-02	1.24E-02	1.24E-02	
0700 - 0800	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	10	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
0800 - 0900	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	10	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.12E+00	1.99E+00	1.34E-01	1.77E-02	1.77E-02	
0900 - 1000	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	13	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	2.76E+00	2.59E+00	1.74E-01	2.30E-02	2.30E-02	
1000 - 1100	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.49E+00	1.39E+00	9.36E-02	1.24E-02	1.24E-02	
1100 - 1200	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.06E+00	9.95E-01	6.69E-02	8.84E-03	8.84E-03	
1200 - 1300	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.27E+00	1.19E+00	8.02E-02	1.06E-02	1.06E-02	
1300 - 1400	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.06E+00	9.95E-01	6.69E-02	8.84E-03	8.84E-03	
1400 - 1500	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	8.49E-01	7.96E-01	5.35E-02	7.07E-03	7.07E-03	
1500 - 1600	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7	3.54E-03	3.32E-03	2.23E-04	2.95E-05	2.95E-05	1.49E+00	1.39E+00	9.36E-02	1.24E-02	1.24E-02	
1600 - 1700	0	1.33E-03	1.12E-03	2.03E-04	9.88E-06	9.88E-06	0.00E+00															







### Idling Emission Factors

Minimum Hourly Temperature and Relative Humidity for 1st Quarter

Temperature: 10 °C  
Relative Humidity: 34 %

#### FBSD

NO<sub>2</sub>/NO<sub>x</sub> Ratio <sup>(1)</sup> = 0.15 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)(5)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(2)</sup>	PM (g/s) <sup>(4)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro III	0%	1.17E-02	3.98E-04	1.17E-02	3.98E-04	1.0	1.3	1.535E-02	1.300E-02	2.356E-03	9.875E-06	1.325E-03	1.122E-03	2.034E-04	9.875E-06
Euro IV	0%	5.73E-02	5.56E-05	2.09E-03	5.56E-05										
Euro V	19%	4.74E-02	2.78E-05	3.25E-03	2.78E-05										
Euro VI	81%	7.70E-03	2.78E-06	4.86E-04	2.78E-06										

#### FBDD

NO<sub>2</sub>/NO<sub>x</sub> Ratio <sup>(1)</sup> = 0.06 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(2)</sup>	PM (g/s) <sup>(4)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro III	0%	7.37E-02	3.58E-04	1.17E-02	3.58E-04	1.2	1.3	1.069E-01	1.001E-01	6.731E-03	2.945E-05	3.538E-03	3.315E-03	2.228E-04	2.945E-05
Euro IV	0%	1.54E-01	5.56E-05	2.09E-03	5.56E-05										
Euro V	64%	1.54E-01	2.78E-05	3.25E-03	2.78E-05										
Euro VI	36%	2.25E-02	2.78E-06	4.86E-04	2.78E-06										

#### PLB (Diesel)

NO<sub>2</sub>/NO<sub>x</sub> Ratio <sup>(1)</sup> = 0.28 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)(5)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(11)</sup>	PM (g/s) <sup>(12)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro IV	0%	1.01E-03	4.44E-05	1.01E-03	4.44E-05	-	1.3	1.000E-03	7.200E-04	2.800E-04	7.222E-06	5.786E-04	4.166E-04	1.620E-04	7.222E-06
Euro V	14%	1.00E-03	5.56E-06	1.00E-03	5.56E-06										
Euro VI	86%	1.00E-03	5.56E-06	3.56E-04	5.56E-06										

#### PLB (LPG)

NO<sub>2</sub>/NO<sub>x</sub> Ratio <sup>(1)</sup> = 0.01 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(13)</sup>	PM (g/s) <sup>(14)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro III	3%	9.20E-03	2.78E-05	9.20E-03	2.78E-05	-	1.3	4.060E-03	4.039E-03	2.049E-05	9.936E-06	4.060E-03	4.039E-03	2.049E-05	9.936E-06
Euro IV	4%	3.90E-03	4.44E-05	3.90E-03	4.44E-05										
Euro V	93%	3.90E-03	5.56E-06	3.90E-03	5.56E-06										

#### Remarks:

- (1) NO<sub>2</sub>/NO<sub>x</sub> ratio, at the respective running speed, was calculated based on emission factors extracted from EMFAC-HK.
- (2) NO<sub>x</sub> cold idling emission factors were referenced to Calculation of Start Emissions in Air Quality Impact Assessment published by EPD.
- (3) Reference made to Table 45 of Road Tunnels: Vehicles Emissions and Air Demand for Ventilation (VEADV) published by World Road Association.
- (4) Reference made to Table 46 of VEADV.
- (5) Due to lack of information, NO<sub>x</sub> cold idling emission factor for Euro III FBSD was referenced to the corresponding hot idling emission factor.
- (6) Due to lack of information, PM cold idling emission factor were referenced to the corresponding hot idling emission factor.
- (7) Reference made to Table 27 of VEADV.
- (8) Reference made to the approved Lamanga / Heung Yuen Wai Boundary Control Point and Associated Works EIA Report.
- (9) All RSP emissions were assumed for FSP as a conservative approach.
- (10) Due to lack of information, NO<sub>x</sub> cold idling emission factor for Euro IV to Euro V PLB (Diesel) was referenced to the corresponding hot idling emission factor.
- (11) Reference made to Table 42 of VEADV.
- (12) Reference made to Table 43 of VEADV.
- (13) Due to lack of information, NO<sub>x</sub> hot idling emission factor was referenced to the corresponding cold idling emission factor from Calculation of Start Emissions in Air Quality Impact Assessment published by EPD.
- (14) Due to lack of information, RSP hot idling emission factor for PLB (LPG) was referenced to hot idling emission factor for PLB (Diesel).

### Idling Emission Factors

Minimum Hourly Temperature and Relative Humidity for 2nd Quarter

Temperature: 18 °C  
Relative Humidity: 46 %

#### FBSD

NO<sub>2</sub>/NO<sub>x</sub> Ratio (1) = 0.15 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)(5)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(3)</sup>	PM (g/s) <sup>(4)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro III	0%	1.17E-02	3.58E-04	1.17E-02	3.58E-04	1.0	1.3	1.535E-02	1.300E-02	2.356E-03	9.875E-06	1.325E-03	1.122E-03	2.034E-04	9.875E-06
Euro IV	0%	5.73E-02	5.56E-05	2.09E-03	5.56E-05			1.069E-01	1.001E-01	6.732E-03	2.945E-05	3.538E-03	3.315E-03	2.229E-04	2.945E-05
Euro V	19%	4.74E-02	2.78E-05	3.25E-03	2.78E-05			1.00E-03	7.200E-04	2.800E-04	7.222E-06	5.786E-04	4.168E-04	1.620E-04	7.222E-06
Euro VI	81%	7.70E-03	2.78E-06	4.86E-04	2.78E-06			4.060E-03	4.040E-03	2.027E-05	9.936E-06	4.060E-03	4.040E-03	2.027E-05	9.936E-06

#### FBDD

NO<sub>2</sub>/NO<sub>x</sub> Ratio (1) = 0.06 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(3)</sup>	PM (g/s) <sup>(4)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro III	0%	7.37E-02	3.58E-04	1.17E-02	3.58E-04	1.2	1.3	1.069E-01	1.001E-01	6.732E-03	2.945E-05	3.538E-03	3.315E-03	2.229E-04	2.945E-05
Euro IV	0%	1.54E-01	5.56E-05	2.09E-03	5.56E-05			1.00E-03	7.200E-04	2.800E-04	7.222E-06	5.786E-04	4.168E-04	1.620E-04	7.222E-06
Euro V	64%	1.54E-01	2.78E-05	3.25E-03	2.78E-05			4.060E-03	4.040E-03	2.027E-05	9.936E-06	4.060E-03	4.040E-03	2.027E-05	9.936E-06
Euro VI	36%	2.25E-02	2.78E-06	4.86E-04	2.78E-06			1.00E-03	7.200E-04	2.800E-04	7.222E-06	5.786E-04	4.168E-04	1.620E-04	7.222E-06

#### PLB (Diesel)

NO<sub>2</sub>/NO<sub>x</sub> Ratio (1) = 0.28 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)(10)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(11)</sup>	PM (g/s) <sup>(12)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro IV	0%	1.01E-03	4.44E-05	1.01E-03	4.44E-05	-	1.3	1.00E-03	7.200E-04	2.800E-04	7.222E-06	5.786E-04	4.168E-04	1.620E-04	7.222E-06
Euro V	14%	1.00E-03	5.56E-06	1.00E-03	5.56E-06			4.060E-03	4.040E-03	2.027E-05	9.936E-06	4.060E-03	4.040E-03	2.027E-05	9.936E-06
Euro VI	86%	1.00E-03	5.56E-06	3.56E-04	5.56E-06			1.00E-03	7.200E-04	2.800E-04	7.222E-06	5.786E-04	4.168E-04	1.620E-04	7.222E-06

#### PLB (LPG)

NO<sub>2</sub>/NO<sub>x</sub> Ratio (1) = 0.00 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(13)</sup>	PM (g/s) <sup>(14)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro III	3%	9.20E-03	2.78E-05	9.20E-03	2.78E-05	-	1.3	4.060E-03	4.040E-03	2.027E-05	9.936E-06	4.060E-03	4.040E-03	2.027E-05	9.936E-06
Euro IV	4%	3.90E-03	4.44E-05	3.90E-03	4.44E-05			1.00E-03	7.200E-04	2.800E-04	7.222E-06	5.786E-04	4.168E-04	1.620E-04	7.222E-06
Euro V	93%	3.90E-03	5.56E-06	3.90E-03	5.56E-06			4.060E-03	4.040E-03	2.027E-05	9.936E-06	4.060E-03	4.040E-03	2.027E-05	9.936E-06

#### Remarks:

- (1) NO<sub>2</sub>/NO<sub>x</sub> ratio, at the respective running speed, was calculated based on emission factors extracted from EMFAC-HK.
- (2) NO<sub>x</sub> cold idling emission factors were referenced to Calculation of Start Emissions in Air Quality Impact Assessment published by EPD.
- (3) Reference made to Table 45 of Road Tunnels: Vehicles Emissions and Air Demand for Ventilation (VEADV) published by World Road Association.
- (4) Reference made to Table 46 of VEADV.
- (5) Due to lack of information, NO<sub>x</sub> cold idling emission factor for Euro III FBSD was referenced to the corresponding hot idling emission factor.
- (6) Due to lack of information, PM cold idling emission factor was referenced to the corresponding hot idling emission factor.
- (7) Reference made to Table 27 of VEADV.
- (8) Reference made to the approved *Liantang / Heung Yuen Wai Boundary Control Point and Associated Works EIA Report*.
- (9) All RSP emissions were assumed for FSP as a conservative approach.
- (10) Due to lack of information, NO<sub>x</sub> cold idling emission factor for Euro IV to Euro V PLB (Diesel) was referenced to the corresponding hot idling emission factor.
- (11) Reference made to Table 42 of VEADV.
- (12) Reference made to Table 43 of VEADV.
- (13) Due to lack of information, NO<sub>x</sub> hot idling emission factor was referenced to the corresponding cold idling emission factor from Calculation of Start Emissions in Air Quality Impact Assessment published by EPD.
- (14) Due to lack of information, RSP hot idling emission factor for PLB (LPG) was referenced to hot idling emission factor for PLB (Diesel).

### Idling Emission Factors

Minimum Hourly Temperature and Relative Humidity for 3rd Quarter

Temperature: 20 °C  
Relative Humidity: 23 %

#### FBSD

NO<sub>2</sub>/NO<sub>x</sub> Ratio (1) = 0.15 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)(5)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(3)</sup>	PM (g/s) <sup>(4)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro III	0%	1.17E-02	3.58E-04	1.17E-02	3.58E-04	1.0	1.3	1.535E-02	1.300E-02	2.356E-03	9.875E-06	1.325E-03	1.122E-03	2.034E-04	9.875E-06
Euro IV	0%	5.73E-02	5.56E-05	2.09E-03	5.56E-05										
Euro V	19%	4.74E-02	2.78E-05	3.25E-03	2.78E-05										
Euro VI	81%	7.70E-03	2.78E-06	4.86E-04	2.78E-06										

#### FBDD

NO<sub>2</sub>/NO<sub>x</sub> Ratio (1) = 0.06 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(3)</sup>	PM (g/s) <sup>(4)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro III	0%	7.37E-02	3.58E-04	1.17E-02	3.58E-04	1.2	1.3	1.069E-01	1.001E-01	6.732E-03	2.945E-05	3.538E-03	3.315E-03	2.229E-04	2.945E-05
Euro IV	0%	1.54E-01	5.56E-05	2.09E-03	5.56E-05										
Euro V	64%	1.54E-01	2.78E-05	3.25E-03	2.78E-05										
Euro VI	36%	2.25E-02	2.78E-06	4.86E-04	2.78E-06										

#### PLB (Diesel)

NO<sub>2</sub>/NO<sub>x</sub> Ratio (1) = 0.28 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)(10)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(11)</sup>	PM (g/s) <sup>(12)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro IV	0%	1.01E-03	4.44E-05	1.01E-03	4.44E-05	-	1.3	1.000E-03	7.200E-04	2.800E-04	7.222E-06	5.786E-04	4.167E-04	1.620E-04	7.222E-06
Euro V	14%	1.00E-03	5.56E-06	1.00E-03	5.56E-06										
Euro VI	86%	1.00E-03	5.56E-06	3.56E-04	5.56E-06										

#### PLB (LPG)

NO<sub>2</sub>/NO<sub>x</sub> Ratio (1) = 0.01 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(13)</sup>	PM (g/s) <sup>(14)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro III	3%	9.20E-03	2.78E-05	9.20E-03	2.78E-05	-	1.3	4.060E-03	4.039E-03	2.041E-05	9.936E-06	4.060E-03	4.039E-03	2.041E-05	9.936E-06
Euro IV	4%	3.90E-03	4.44E-05	3.90E-03	4.44E-05										
Euro V	93%	3.90E-03	5.56E-06	3.90E-03	5.56E-06										

#### Remarks:

- (1) NO<sub>2</sub>/NO<sub>x</sub> ratio, at the respective running speed, was calculated based on emission factors extracted from EMFAC-HK.
- (2) NO<sub>x</sub> cold idling emission factors were referenced to Calculation of Start Emissions in Air Quality Impact Assessment published by EPD.
- (3) Reference made to Table 45 of Road Tunnels: Vehicles Emissions and Air Demand for Ventilation (VEADV) published by World Road Association.
- (4) Reference made to Table 46 of VEADV.
- (5) Due to lack of information, NO<sub>x</sub> cold idling emission factor for Euro III FBSD was referenced to the corresponding hot idling emission factor.
- (6) Due to lack of information, PM cold idling emission factor was referenced to the corresponding hot idling emission factor.
- (7) Reference made to Table 27 of VEADV.
- (8) Reference made to the approved *Liantang / Heung Yuen Wai Boundary Control Point and Associated Works EIA Report*.
- (9) All RSP emissions were assumed for FSP as a conservative approach.
- (10) Due to lack of information, NO<sub>x</sub> cold idling emission factor for Euro IV to Euro V PLB (Diesel) was referenced to the corresponding hot idling emission factor.
- (11) Reference made to Table 42 of VEADV.
- (12) Reference made to Table 43 of VEADV.
- (13) Due to lack of information, NO<sub>x</sub> hot idling emission factor was referenced to the corresponding cold idling emission factor from Calculation of Start Emissions in Air Quality Impact Assessment published by EPD.
- (14) Due to lack of information, RSP hot idling emission factor for PLB (LPG) was referenced to hot idling emission factor for PLB (Diesel).

### Idling Emission Factors

Minimum Hourly Temperature and Relative Humidity for 4th Quarter

Temperature: 6 °C  
Relative Humidity: 18 %

#### FBSD

NO<sub>2</sub>/NO<sub>x</sub> Ratio (1) = 0.15 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)(5)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(3)</sup>	PM (g/s) <sup>(4)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro III	0%	1.17E-02	3.58E-04	1.17E-02	3.58E-04	1.0	1.3	1.535E-02	1.300E-02	2.356E-03	9.875E-06	1.325E-03	1.122E-03	2.034E-04	9.875E-06
Euro IV	0%	5.73E-02	5.56E-05	2.09E-03	5.56E-05										
Euro V	19%	4.74E-02	2.78E-05	3.25E-03	2.78E-05										
Euro VI	81%	7.70E-03	2.78E-06	4.86E-04	2.78E-06										

#### FBDD

NO<sub>2</sub>/NO<sub>x</sub> Ratio (1) = 0.06 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(3)</sup>	PM (g/s) <sup>(4)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro III	0%	7.37E-02	3.58E-04	1.17E-02	3.58E-04	1.2	1.3	1.069E-01	1.001E-01	6.731E-03	2.945E-05	3.538E-03	3.315E-03	2.228E-04	2.945E-05
Euro IV	0%	1.54E-01	5.56E-05	2.09E-03	5.56E-05										
Euro V	64%	1.54E-01	2.78E-05	3.25E-03	2.78E-05										
Euro VI	36%	2.25E-02	2.78E-06	4.86E-04	2.78E-06										

#### PLB (Diesel)

NO<sub>2</sub>/NO<sub>x</sub> Ratio (1) = 0.28 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)(10)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(11)</sup>	PM (g/s) <sup>(12)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro IV	0%	1.01E-03	4.44E-05	1.01E-03	4.44E-05	-	1.3	1.000E-03	7.200E-04	2.800E-04	7.222E-06	5.786E-04	4.166E-04	1.620E-04	7.222E-06
Euro V	14%	1.00E-03	5.56E-06	1.00E-03	5.56E-06										
Euro VI	86%	1.00E-03	5.56E-06	3.56E-04	5.56E-06										

#### PLB (LPG)

NO<sub>2</sub>/NO<sub>x</sub> Ratio (1) = 0.01 From EMFAC

Vehicle Emission Standard	Population %	Idling Emission Factor				Mass Factor <sup>(7)</sup>	AC Factor <sup>(8)</sup>	Average Idling Emission Factor (g/s)							
		Cold Idling		Hot Idling				Cold Idling				Hot Idling			
		NO <sub>x</sub> (g/s) <sup>(2)</sup>	PM (g/s) <sup>(6)</sup>	NO <sub>x</sub> (g/s) <sup>(13)</sup>	PM (g/s) <sup>(14)</sup>			NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>	NO <sub>x</sub>	NO	NO <sub>2</sub>	RSP & FSP <sup>(9)</sup>
Euro III	3%	9.20E-03	2.78E-05	9.20E-03	2.78E-05	-	1.3	4.060E-03	4.039E-03	2.034E-05	9.936E-06	4.060E-03	4.039E-03	2.034E-05	9.936E-06
Euro IV	4%	3.90E-03	4.44E-05	3.90E-03	4.44E-05										
Euro V	93%	3.90E-03	5.56E-06	3.90E-03	5.56E-06										

#### Remarks:

- (1) NO<sub>2</sub>/NO<sub>x</sub> ratio, at the respective running speed, was calculated based on emission factors extracted from EMFAC-HK.
- (2) NO<sub>x</sub> cold idling emission factors were referenced to Calculation of Start Emissions in Air Quality Impact Assessment published by EPD.
- (3) Reference made to Table 45 of Road Tunnels: Vehicles Emissions and Air Demand for Ventilation (VEADV) published by World Road Association.
- (4) Reference made to Table 46 of VEADV.
- (5) Due to lack of information, NO<sub>x</sub> cold idling emission factor for Euro III FBSD was referenced to the corresponding hot idling emission factor.
- (6) Due to lack of information, PM cold idling emission factor was referenced to the corresponding hot idling emission factor.
- (7) Reference made to Table 27 of VEADV.
- (8) Reference made to the approved *Liantang / Heung Yuen Wai Boundary Control Point and Associated Works EIA Report*.
- (9) All RSP emissions were assumed for FSP as a conservative approach.
- (10) Due to lack of information, NO<sub>x</sub> cold idling emission factor for Euro IV to Euro V PLB (Diesel) was referenced to the corresponding hot idling emission factor.
- (11) Reference made to Table 42 of VEADV.
- (12) Reference made to Table 43 of VEADV.
- (13) Due to lack of information, NO<sub>x</sub> hot idling emission factor was referenced to the corresponding cold idling emission factor from Calculation of Start Emissions in Air Quality Impact Assessment published by EPD.
- (14) Due to lack of information, RSP hot idling emission factor for PLB (LPG) was referenced to hot idling emission factor for PLB (Diesel).

**Appendix 4-12 Derivation of Emission Rates of Portals**



Calculation of Portal Emission - 2nd Quarter

Road No.	Portal Description	Portal ID	Tunnel Length (km)	Hour	Total Vehicle (veh/hr)	NO <sub>2</sub>				NO				RSP				FSP							
						Composite Emission Factors <sup>[1]</sup> (g/veh/km)	Total Emission Rate (g/s)	% of the maximum emission rate <sup>[2]</sup>	1 <sup>st</sup> 50m - 2/3 emission rate for each emission source (g/s)	2 <sup>nd</sup> 50m - 1/3 emission rate for each emission source (g/s)	Composite Emission Factors <sup>[1]</sup> (g/veh/km)	Total Emission Rate (g/s)	% of the maximum emission rate <sup>[2]</sup>	1 <sup>st</sup> 50m - 2/3 emission rate for each emission source (g/s)	2 <sup>nd</sup> 50m - 1/3 emission rate for each emission source (g/s)	Composite Emission Factors <sup>[1]</sup> (g/veh/km)	Total Emission Rate (g/s)	% of the maximum emission rate <sup>[2]</sup>	1 <sup>st</sup> 50m - 2/3 emission rate for each emission source (g/s)	2 <sup>nd</sup> 50m - 1/3 emission rate for each emission source (g/s)	Composite Emission Factors <sup>[1]</sup> (g/veh/km)	Total Emission Rate (g/s)	% of the maximum emission rate <sup>[2]</sup>	1 <sup>st</sup> 50m - 2/3 emission rate for each emission source (g/s)	2 <sup>nd</sup> 50m - 1/3 emission rate for each emission source (g/s)
L1D	Man Cheung Street (WB)	MCSWB01-12	0.090	1	250	2.29E-02	1.43E-04	26%	1.59E-05	7.95E-06	2.55E-01	1.60E-03	26%	1.77E-04	8.86E-05	1.05E-02	6.55E-05	24%	7.28E-06	3.64E-06	9.65E-03	6.03E-05	24%	6.70E-06	3.35E-06
				2	150	2.28E-02	8.55E-05	15%	9.49E-06	4.75E-06	2.46E-01	9.21E-04	15%	1.02E-04	5.12E-05	9.53E-03	3.57E-05	13%	3.97E-06	1.98E-06	8.77E-03	3.29E-05	13%	3.65E-06	1.83E-06
				3	110	2.44E-02	6.72E-05	12%	7.47E-06	3.73E-06	2.56E-01	7.05E-04	12%	7.83E-05	3.91E-05	1.01E-02	2.78E-05	10%	3.08E-06	1.54E-06	9.29E-03	2.55E-05	10%	2.84E-06	1.42E-06
				4	90	2.23E-02	5.02E-05	9%	5.58E-06	2.79E-06	2.73E-01	6.14E-04	10%	6.83E-05	3.41E-05	1.09E-02	2.44E-05	9%	2.71E-06	1.36E-06	9.99E-03	2.25E-05	9%	2.50E-06	1.25E-06
				5	90	2.03E-02	4.57E-05	8%	5.07E-06	2.54E-06	2.48E-01	5.58E-04	9%	6.20E-05	3.10E-05	8.84E-03	1.99E-05	7%	2.21E-06	1.11E-06	8.14E-03	1.83E-05	7%	2.03E-06	1.02E-06
				6	130	2.56E-02	8.32E-05	15%	9.24E-06	4.62E-06	2.60E-01	8.45E-04	14%	9.39E-05	4.70E-05	9.19E-03	2.99E-05	11%	3.32E-06	1.66E-06	8.46E-03	2.75E-05	11%	3.05E-06	1.53E-06
				7	270	2.41E-02	1.63E-04	29%	1.81E-05	9.04E-06	2.69E-01	1.81E-03	30%	2.01E-04	1.01E-04	9.44E-03	6.37E-05	23%	7.08E-06	3.54E-06	8.69E-03	5.86E-05	23%	6.52E-06	3.26E-06
				8	470	2.52E-02	2.96E-04	53%	3.29E-05	1.65E-05	2.75E-01	3.24E-03	53%	3.60E-04	1.80E-04	9.46E-03	1.11E-04	41%	1.24E-05	6.18E-06	8.71E-03	1.02E-04	41%	1.14E-05	5.69E-06
				9	700	2.54E-02	4.45E-04	80%	4.94E-05	2.47E-05	2.80E-01	4.89E-03	80%	5.43E-04	2.72E-04	9.51E-03	1.66E-04	61%	1.85E-05	9.25E-06	8.75E-03	1.53E-04	61%	1.70E-05	8.51E-06
				10	1010	<b>2.20E-02</b>	<b>5.55E-04</b>	<b>100%</b>	<b>6.17E-05</b>	<b>3.08E-05</b>	<b>2.42E-01</b>	<b>6.12E-03</b>	<b>100%</b>	<b>6.79E-04</b>	<b>3.40E-04</b>	<b>1.08E-02</b>	<b>2.73E-04</b>	<b>100%</b>	<b>3.03E-05</b>	<b>1.52E-05</b>	<b>9.96E-03</b>	<b>2.51E-04</b>	<b>100%</b>	<b>2.79E-05</b>	<b>1.40E-05</b>
				11	960	2.27E-02	5.44E-04	98%	6.05E-05	3.02E-05	2.48E-01	5.96E-03	97%	6.62E-04	3.31E-04	1.08E-02	2.59E-04	95%	2.88E-05	1.44E-05	9.94E-03	2.39E-04	95%	2.65E-05	1.33E-05
				12	930	2.31E-02	5.38E-04	97%	5.98E-05	2.99E-05	2.52E-01	5.85E-03	96%	6.50E-04	3.25E-04	1.06E-02	2.47E-04	90%	2.75E-05	1.37E-05	9.79E-03	2.28E-04	90%	2.53E-05	1.26E-05
				13	870	2.31E-02	5.04E-04	91%	5.59E-05	2.80E-05	2.51E-01	5.45E-03	89%	6.05E-04	3.03E-04	1.03E-02	2.23E-04	82%	2.48E-05	1.24E-05	9.45E-03	2.05E-04	82%	2.28E-05	1.14E-05
				14	730	2.38E-02	4.34E-04	78%	4.82E-05	2.41E-05	2.59E-01	4.72E-03	77%	5.24E-04	2.62E-04	1.03E-02	1.88E-04	69%	2.09E-05	1.04E-05	9.47E-03	1.73E-04	69%	1.92E-05	9.60E-06
				15	770	2.35E-02	4.53E-04	82%	5.03E-05	2.52E-05	2.61E-01	5.02E-03	82%	5.57E-04	2.79E-04	9.90E-03	1.90E-04	70%	2.12E-05	1.06E-05	9.11E-03	1.75E-04	70%	1.95E-05	9.74E-06
				16	690	2.47E-02	4.25E-04	77%	4.73E-05	2.36E-05	2.69E-01	4.63E-03	76%	5.15E-04	2.57E-04	9.86E-03	1.70E-04	62%	1.89E-05	9.45E-06	9.07E-03	1.57E-04	62%	1.74E-05	8.70E-06
				17	640	2.55E-02	4.08E-04	73%	4.53E-05	2.26E-05	2.77E-01	4.42E-03	72%	4.92E-04	2.46E-04	9.67E-03	1.55E-04	57%	1.72E-05	8.60E-06	8.90E-03	1.42E-04	57%	1.58E-05	7.91E-06
				18	630	2.59E-02	4.08E-04	74%	4.54E-05	2.27E-05	2.85E-01	4.48E-03	73%	4.98E-04	2.49E-04	9.46E-03	1.49E-04	54%	1.65E-05	8.27E-06	8.70E-03	1.37E-04	54%	1.52E-05	7.62E-06
				19	1000	2.20E-02	5.50E-04	99%	6.11E-05	3.06E-05	2.40E-01	5.99E-03	98%	6.66E-04	3.33E-04	<b>1.09E-02</b>	<b>2.74E-04</b>	<b>100%</b>	<b>3.04E-05</b>	<b>1.52E-05</b>	<b>1.01E-02</b>	<b>2.52E-04</b>	<b>100%</b>	<b>2.80E-05</b>	<b>1.40E-05</b>
				20	880	2.20E-02	4.84E-04	87%	5.38E-05	2.69E-05	2.39E-01	5.26E-03	86%	5.85E-04	2.92E-04	1.08E-02	2.37E-04	87%	2.63E-05	1.32E-05	9.90E-03	2.18E-04	87%	2.42E-05	1.21E-05
				21	770	2.19E-02	4.22E-04	76%	4.69E-05	2.35E-05	2.41E-01	4.64E-03	76%	5.15E-04	2.58E-04	1.07E-02	2.06E-04	75%	2.28E-05	1.14E-05	9.83E-03	1.89E-04	75%	2.10E-05	1.05E-05
				22	540	2.15E-02	2.91E-04	52%	3.23E-05	1.61E-05	2.40E-01	3.25E-03	53%	3.61E-04	1.80E-04	1.04E-02	1.40E-04	51%	1.56E-05	7.80E-06	9.57E-03	1.29E-04	51%	1.43E-05	7.17E-06
				23	480	2.24E-02	2.69E-04	48%	2.98E-05	1.49E-05	2.46E-01	2.95E-03	48%	3.28E-04	1.64E-04	1.05E-02	1.26E-04	46%	1.40E-05	7.02E-06	9.68E-03	1.16E-04	46%	1.29E-05	6.46E-06
				24	390	2.29E-02	2.24E-04	40%	2.49E-05	1.24E-05	2.48E-01	2.42E-03	40%	2.69E-04	1.35E-04	1.04E-02	1.01E-04	37%	1.12E-05	5.62E-06	9.55E-03	9.31E-05	37%	1.03E-05	5.17E-06
L42J	Connaught Road Central Underpass (WB)	CRUWB01-12	0.130	1	680	2.07E-02	5.09E-04	21%	5.65E-05	2.83E-05	1.98E-01	4.87E-03	23%	5.41E-04	2.70E-04	6.71E-03	1.65E-04	23%	1.83E-05	9.16E-06	6.18E-03	1.52E-04	23%	1.69E-05	8.43E-06
				2	400	2.13E-02	3.07E-04	13%	3.41E-05	1.71E-05	2.00E-01	2.89E-03	13%	3.21E-04	1.60E-04	6.77E-03	9.78E-05	14%	1.09E-05	5.43E-06	6.23E-03	9.00E-05	14%	1.00E-05	5.00E-06
				3	290	2.16E-02	2.26E-04	9%	2.51E-05	1.26E-05	2.03E-01	2.12E-03	10%	2.36E-04	1.18E-04	6.84E-03	7.17E-05	10%	7.96E-06	3.98E-06	6.30E-03	6.60E-05	10%	7.33E-06	3.67E-06
				4	250	2.36E-02	2.13E-04	9%	2.36E-05	1.18E-05	2.13E-01	1.92E-03	9%	2.13E-04	1.07E-04	7.51E-03	6.78E-05	10%	7.54E-06	3.77E-06	6.91E-03	6.24E-05	10%	6.94E-06	3.47E-06
				5	240	2.37E-02	2.05E-04	8%	2.28E-05	1.14E-05	2.05E-01	1.78E-03	8%	1.98E-04	9.88E-05	6.94E-03	6.02E-05	9%	6.69E-06	3.34E-06	6.39E-03	5.54E-05	9%	6.15E-06	3.08E-06
				6	360	2.46E-02	3.20E-04	13%	3.55E-05	1.78E-05	2.16E-01	2.80E-03	13%	3.11E-04	1.56E-04	7.62E-03	9.91E-05	14%	1.10E-05	5.50E-06	7.01E-03	9.12E-05	14%	1.01E-05	5.07E-06
				7	810	2.46E-02	7.20E-04	29%	8.00E-05	4.00E-05	2.13E-01	6.23E-03	29%	6.93E-04	3.46E-04	7.35E-03	2.15E-04	31%	2.39E-05	1.19E-05	6.77E-03	1.98E-04	31%	2.20E-05	1.10E-05
				8	1420	2.72E-02	1.40E-03	57%	1.55E-04	7.76E-05	2.32E-01	1.19E-02	55%	1.32E-03	6.60E-04	8.03E-03	4.12E-04	59%	4.58E-05	2.29E-05	7.41E-03	3.80E-04	59%	4.22E-05	2.11E-05
				9	2150	<b>3.17E-02</b>	<b>2.46E-03</b>	<b>100%</b>	<b>2.73E-04</b>	<b>1.37E-04</b>	<b>2.63E-01</b>	<b>2.04E-02</b>	<b>95%</b>	<b>2.27E-03</b>	<b>1.13E-03</b>	<b>9.01E-03</b>	<b>6.99E-04</b>	<b>100%</b>	<b>7.77E-05</b>	<b>3.89E-05</b>	<b>8.28E-03</b>	<b>6.43E-04</b>	<b>100%</b>	<b>7.14E-05</b>	<b>3.57E-05</b>
				10	2530	2.40E-02	2.19E-03	89%	2.43E-04	1.22E-04	2.32E-01	2.12E-02	99%	2.35E-03	1.18E-03	7.58E-03	6.92E-04	99%	7.69E-05	3.84E-05	6.97E-03	6.37E-04	99%	7.08E-05	3.54E-05
				11	2460	2.52E-02	2.24E-03	91%	2.48E-04	1.24E-04	2.38E-01	2.12E-02	99%	2.35E-03	1.18E-03	7.77E-03	6.91E-04	98%	7.67E-05	3.84E-05	7.16E-03	6.36E-04	98%	7.06E-05	3.53E-05
				12	2440	2.63E-02	2.32E-03	94%	2.58E-04	1.29E-04	<b>2.44E-01</b>	<b>2.15E-02</b>	<b>100%</b>	<b>2.39E-03</b>	<b>1.19E-03</b>	<b>7.97E-03</b>	<b>7.02E-04</b>	<b>100%</b>	<b>7.80E-05</b>	<b>3.90E-05</b>	<b>7.33E-03</b>	<b>6.46E-04</b>	<b>100%</b>	<b>7.18E-05</b>	<b>3.59E-05</b>
				13	2330	2.65E-02	2.23E-03	91%	2.47E-04	1.24E-04	2.41E-01	2.03E-02	94%	2.25E-03	1.13E-03	8.06E-03	6.78E-04	97%	7.53E-05	3.77E-05	7.41E-03	6.23E-04	96%	6.92E-05	3.46E-05
				14	2010	2.62E-02	1.90E-03	77%	2.12E-04	1.06E-04	2.35E-01	1.71E-02	79%	1.89E-03	9.47E-04	7.90E-03	5.73E-04	82%	6.37E-05	3.19E-05	7.31E-03	5.30E-04	82%	5.89E-05	2.95E-05
				15	2180	2.81E-02	2.21E-03	90%	2.46E-04	1.23E-04	2.46E-01	1.94E-02	90%	2.15E-03	1.08E-03	8.32E-03	6.55E-04	93%	7.28E-05	3.64E-05	7.65E-03	6.02E-04	93%	6.69E-05	3.35E-05
				16	2010	2.87E-02	2.09E-03	85%	2.32E-04	1.16E-04	2.47E-01	1.79E-02	83%	1.99E-03	9.95E-04	8.39E-03	6.09E-04	87%	6.76E-05	3.38E-05	7.75E-03				



Calculation of Portal Emission - 3rd Quarter

Road No.	Portal Description	Portal ID	Tunnel Length (km)	Hour	Total Vehicle (veh/hr)	NO <sub>2</sub>				NO				RSP				FSP							
						Composite Emission Factors <sup>[1]</sup> (g/veh/km)	Total Emission Rate (g/s)	% of the maximum emission rate <sup>[2]</sup>	1 <sup>st</sup> 50m - 2/3 emission rate for each emission source (g/s)	2 <sup>nd</sup> 50m - 1/3 emission rate for each emission source (g/s)	Composite Emission Factors <sup>[1]</sup> (g/veh/km)	Total Emission Rate (g/s)	% of the maximum emission rate <sup>[2]</sup>	1 <sup>st</sup> 50m - 2/3 emission rate for each emission source (g/s)	2 <sup>nd</sup> 50m - 1/3 emission rate for each emission source (g/s)	Composite Emission Factors <sup>[1]</sup> (g/veh/km)	Total Emission Rate (g/s)	% of the maximum emission rate <sup>[2]</sup>	1 <sup>st</sup> 50m - 2/3 emission rate for each emission source (g/s)	2 <sup>nd</sup> 50m - 1/3 emission rate for each emission source (g/s)	Composite Emission Factors <sup>[1]</sup> (g/veh/km)	Total Emission Rate (g/s)	% of the maximum emission rate <sup>[2]</sup>	1 <sup>st</sup> 50m - 2/3 emission rate for each emission source (g/s)	2 <sup>nd</sup> 50m - 1/3 emission rate for each emission source (g/s)
L1D	Man Cheung Street (WB)	MCSWB01-12	0.090	1	250	2.39E-02	1.49E-04	26%	1.66E-05	8.29E-06	2.66E-01	1.66E-03	26%	1.85E-04	9.24E-05	1.05E-02	6.55E-05	24%	7.28E-06	3.64E-06	9.65E-03	6.03E-05	24%	6.70E-06	3.35E-06
				2	150	2.37E-02	8.90E-05	15%	9.89E-06	4.95E-06	2.56E-01	9.61E-04	15%	1.07E-04	5.34E-05	9.53E-03	3.57E-05	13%	3.97E-06	1.98E-06	8.77E-03	3.29E-05	13%	3.65E-06	1.83E-06
				3	110	2.55E-02	7.00E-05	12%	7.78E-06	3.89E-06	2.67E-01	7.35E-04	12%	8.16E-05	4.08E-05	1.01E-02	2.78E-05	10%	3.08E-06	1.54E-06	9.29E-03	2.55E-05	10%	2.84E-06	1.42E-06
				4	90	2.33E-02	5.24E-05	9%	5.82E-06	2.91E-06	2.85E-01	6.41E-04	10%	7.12E-05	3.56E-05	1.09E-02	2.44E-05	9%	2.71E-06	1.36E-06	9.99E-03	2.25E-05	9%	2.50E-06	1.25E-06
				5	90	2.11E-02	4.76E-05	8%	5.29E-06	2.64E-06	2.59E-01	5.82E-04	9%	6.46E-05	3.23E-05	8.84E-03	1.99E-05	7%	2.21E-06	1.11E-06	8.14E-03	1.83E-05	7%	2.03E-06	1.02E-06
				6	130	2.67E-02	8.67E-05	15%	9.63E-06	4.82E-06	2.71E-01	8.81E-04	14%	9.79E-05	4.90E-05	9.19E-03	2.99E-05	11%	3.32E-06	1.66E-06	8.46E-03	2.75E-05	11%	3.05E-06	1.53E-06
				7	270	2.51E-02	1.70E-04	29%	1.88E-05	9.42E-06	2.80E-01	1.89E-03	30%	2.10E-04	1.05E-04	9.44E-03	6.37E-05	23%	7.08E-06	3.54E-06	8.69E-03	5.86E-05	23%	6.52E-06	3.26E-06
				8	470	2.63E-02	3.09E-04	53%	3.43E-05	1.71E-05	2.87E-01	3.37E-03	53%	3.75E-04	1.87E-04	9.46E-03	1.11E-04	41%	1.24E-05	6.18E-06	8.71E-03	1.02E-04	41%	1.14E-05	5.69E-06
				9	700	2.65E-02	4.63E-04	80%	5.15E-05	2.57E-05	2.91E-01	5.10E-03	80%	5.67E-04	2.83E-04	9.51E-03	1.66E-04	61%	1.85E-05	9.25E-06	8.75E-03	1.53E-04	61%	1.70E-05	8.51E-06
				10	1010	<b>2.29E-02</b>	<b>5.79E-04</b>	<b>100%</b>	<b>6.43E-05</b>	<b>3.22E-05</b>	<b>2.53E-01</b>	<b>6.38E-03</b>	<b>100%</b>	<b>7.08E-04</b>	<b>3.54E-04</b>	<b>1.08E-02</b>	<b>2.73E-04</b>	<b>100%</b>	<b>3.03E-05</b>	<b>1.52E-05</b>	<b>9.96E-03</b>	<b>2.51E-04</b>	<b>100%</b>	<b>2.79E-05</b>	<b>1.40E-05</b>
				11	960	2.36E-02	5.68E-04	98%	6.31E-05	3.15E-05	2.59E-01	6.21E-03	97%	6.90E-04	3.45E-04	1.08E-02	2.59E-04	95%	2.88E-05	1.44E-05	9.94E-03	2.39E-04	95%	2.65E-05	1.33E-05
				12	930	2.41E-02	5.61E-04	97%	6.24E-05	3.12E-05	2.62E-01	6.10E-03	96%	6.78E-04	3.39E-04	1.06E-02	2.47E-04	90%	2.75E-05	1.37E-05	9.79E-03	2.28E-04	90%	2.53E-05	1.26E-05
				13	870	2.41E-02	5.25E-04	91%	5.83E-05	2.91E-05	2.61E-01	5.68E-03	89%	6.31E-04	3.16E-04	1.03E-02	2.23E-04	82%	2.48E-05	1.24E-05	9.45E-03	2.05E-04	82%	2.28E-05	1.14E-05
				14	730	2.48E-02	4.52E-04	78%	5.02E-05	2.51E-05	2.70E-01	4.92E-03	77%	5.47E-04	2.73E-04	1.03E-02	1.88E-04	69%	2.09E-05	1.04E-05	9.47E-03	1.73E-04	69%	1.92E-05	9.60E-06
				15	770	2.45E-02	4.72E-04	82%	5.24E-05	2.62E-05	2.72E-01	5.23E-03	82%	5.81E-04	2.91E-04	9.90E-03	1.90E-04	70%	2.12E-05	1.06E-05	9.11E-03	1.75E-04	70%	1.95E-05	9.74E-06
				16	690	2.57E-02	4.43E-04	77%	4.93E-05	2.46E-05	2.80E-01	4.83E-03	76%	5.37E-04	2.68E-04	9.86E-03	1.70E-04	62%	1.89E-05	9.45E-06	9.07E-03	1.57E-04	62%	1.74E-05	8.70E-06
				17	640	2.66E-02	4.25E-04	73%	4.72E-05	2.36E-05	2.88E-01	4.61E-03	72%	5.13E-04	2.56E-04	9.67E-03	1.55E-04	57%	1.72E-05	8.60E-06	8.90E-03	1.42E-04	57%	1.58E-05	7.91E-06
				18	630	2.70E-02	4.26E-04	74%	4.73E-05	2.36E-05	2.97E-01	4.67E-03	73%	5.19E-04	2.60E-04	9.46E-03	1.49E-04	54%	1.65E-05	8.27E-06	8.70E-03	1.37E-04	54%	1.52E-05	7.62E-06
				19	1000	2.30E-02	5.74E-04	99%	6.38E-05	3.19E-05	2.50E-01	6.25E-03	98%	6.94E-04	3.47E-04	<b>1.09E-02</b>	<b>2.74E-04</b>	<b>100%</b>	<b>3.04E-05</b>	<b>1.52E-05</b>	<b>1.01E-02</b>	<b>2.52E-04</b>	<b>100%</b>	<b>2.80E-05</b>	<b>1.40E-05</b>
				20	880	2.29E-02	5.04E-04	87%	5.61E-05	2.80E-05	2.49E-01	5.49E-03	86%	6.10E-04	3.05E-04	1.08E-02	2.37E-04	87%	2.63E-05	1.32E-05	9.90E-03	2.18E-04	87%	2.42E-05	1.21E-05
				21	770	2.29E-02	4.40E-04	76%	4.89E-05	2.44E-05	2.51E-01	4.84E-03	76%	5.37E-04	2.69E-04	1.07E-02	2.06E-04	75%	2.28E-05	1.14E-05	9.83E-03	1.89E-04	75%	2.10E-05	1.05E-05
				22	540	2.24E-02	3.03E-04	52%	3.36E-05	1.68E-05	2.51E-01	3.38E-03	53%	3.76E-04	1.88E-04	1.04E-02	1.40E-04	51%	1.56E-05	7.80E-06	9.57E-03	1.29E-04	51%	1.43E-05	7.17E-06
				23	480	2.33E-02	2.80E-04	48%	3.11E-05	1.55E-05	2.57E-01	3.08E-03	48%	3.42E-04	1.71E-04	1.05E-02	1.26E-04	46%	1.40E-05	7.02E-06	9.68E-03	1.16E-04	46%	1.29E-05	6.46E-06
				24	390	2.39E-02	2.33E-04	40%	2.59E-05	1.30E-05	2.59E-01	2.53E-03	40%	2.81E-04	1.40E-04	1.04E-02	1.01E-04	37%	1.12E-05	5.62E-06	9.55E-03	9.31E-05	37%	1.03E-05	5.17E-06
L42J	Connaught Road Central Underpass (WB)	CRUWB01-12	0.130	1	680	2.16E-02	5.30E-04	21%	5.89E-05	2.94E-05	2.07E-01	5.08E-03	23%	5.64E-04	2.82E-04	6.71E-03	1.65E-04	23%	1.83E-05	9.16E-06	6.18E-03	1.52E-04	23%	1.69E-05	8.43E-06
				2	400	2.22E-02	3.20E-04	12%	3.56E-05	1.78E-05	2.08E-01	3.01E-03	13%	3.34E-04	1.67E-04	6.77E-03	9.78E-05	14%	1.09E-05	5.43E-06	6.23E-03	9.00E-05	14%	1.00E-05	5.00E-06
				3	290	2.25E-02	2.36E-04	9%	2.62E-05	1.31E-05	2.11E-01	2.21E-03	10%	2.46E-04	1.23E-04	6.84E-03	7.17E-05	10%	7.96E-06	3.98E-06	6.30E-03	6.60E-05	10%	7.33E-06	3.67E-06
				4	250	2.45E-02	2.21E-04	9%	2.46E-05	1.23E-05	2.22E-01	2.00E-03	9%	2.22E-04	1.11E-04	7.51E-03	6.78E-05	10%	7.54E-06	3.77E-06	6.91E-03	6.24E-05	10%	6.94E-06	3.47E-06
				5	240	2.47E-02	2.14E-04	8%	2.38E-05	1.19E-05	2.14E-01	1.85E-03	8%	2.06E-04	1.03E-04	6.94E-03	6.02E-05	9%	6.69E-06	3.34E-06	6.39E-03	5.54E-05	9%	6.15E-06	3.08E-06
				6	360	2.56E-02	3.33E-04	13%	3.70E-05	1.85E-05	2.25E-01	2.92E-03	13%	3.25E-04	1.62E-04	7.62E-03	9.91E-05	14%	1.10E-05	5.50E-06	7.01E-03	9.12E-05	14%	1.01E-05	5.07E-06
				7	810	2.56E-02	7.50E-04	29%	8.33E-05	4.17E-05	2.22E-01	6.50E-03	29%	7.22E-04	3.61E-04	7.35E-03	2.15E-04	31%	2.39E-05	1.19E-05	6.77E-03	1.98E-04	31%	2.20E-05	1.10E-05
				8	1420	2.84E-02	1.46E-03	57%	1.62E-04	8.09E-05	2.42E-01	1.24E-02	55%	1.38E-03	6.88E-04	8.03E-03	4.12E-04	59%	4.58E-05	2.29E-05	7.41E-03	3.80E-04	59%	4.22E-05	2.11E-05
				9	2150	<b>3.30E-02</b>	<b>2.56E-03</b>	<b>100%</b>	<b>2.85E-04</b>	<b>1.42E-04</b>	<b>2.74E-01</b>	<b>2.13E-02</b>	<b>95%</b>	<b>2.36E-03</b>	<b>1.18E-03</b>	<b>9.01E-03</b>	<b>6.99E-04</b>	<b>100%</b>	<b>7.77E-05</b>	<b>3.89E-05</b>	<b>8.28E-03</b>	<b>6.43E-04</b>	<b>100%</b>	<b>7.14E-05</b>	<b>3.57E-05</b>
				10	2530	2.50E-02	2.29E-03	89%	2.54E-04	1.27E-04	2.42E-01	2.21E-02	99%	2.45E-03	1.23E-03	7.58E-03	6.92E-04	99%	7.69E-05	3.84E-05	6.97E-03	6.37E-04	99%	7.08E-05	3.54E-05
				11	2460	2.63E-02	2.33E-03	91%	2.59E-04	1.30E-04	2.49E-01	2.21E-02	99%	2.45E-03	1.23E-03	7.77E-03	6.91E-04	98%	7.67E-05	3.84E-05	7.16E-03	6.36E-04	98%	7.06E-05	3.53E-05
				12	2440	2.75E-02	2.42E-03	94%	2.69E-04	1.35E-04	<b>2.54E-01</b>	<b>2.24E-02</b>	<b>100%</b>	<b>2.49E-03</b>	<b>1.24E-03</b>	<b>7.97E-03</b>	<b>7.02E-04</b>	<b>100%</b>	<b>7.80E-05</b>	<b>3.90E-05</b>	<b>7.33E-03</b>	<b>6.46E-04</b>	<b>100%</b>	<b>7.18E-05</b>	<b>3.59E-05</b>
				13	2330	2.76E-02	2.32E-03	91%	2.58E-04	1.29E-04	2.51E-01	2.12E-02	94%	2.35E-03	1.18E-03	8.06E-03	6.78E-04	97%	7.53E-05	3.77E-05	7.41E-03	6.23E-04	96%	6.92E-05	3.46E-05
				14	2010	2.73E-02	1.98E-03	77%	2.20E-04	1.10E-04	2.45E-01	1.78E-02	79%	1.98E-03	9.88E-04	7.90E-03	5.73E-04	82%	6.37E-05	3.19E-05	7.31E-03	5.30E-04	82%	5.89E-05	2.95E-05
				15	2180	2.93E-02	2.31E-03	90%	2.57E-04	1.28E-04	2.57E-01	2.02E-02	90%	2.25E-03	1.12E-03	8.32E-03	6.55E-04	93%	7.28E-05	3.64E-05	7.65E-03	6.02E-04	93%	6.69E-05	3.35E-05
				16	2010	2.99E-02	2.17E-03	85%	2.41E-04	1.21E-04	2.57E-01	1.87E-02	83%	2.08E-03	1.04E-03	8.39E-03	6.09E-04	87%	6.76E-05	3.38E-05	7.75E-03				

Calculation of Portal Emission - 4th Quarter

Road No.	Portal Description	Portal ID	Tunnel Length (km)	Hour	Total Vehicle (veh/hr)	NO <sub>2</sub>				NO				RSP				FSP							
						Composite Emission Factors <sup>[1]</sup> (g/veh/km)	Total Emission Rate (g/s)	% of the maximum emission rate <sup>[2]</sup>	1 <sup>st</sup> 50m - 2/3 emission rate for each emission source (g/s)	2 <sup>nd</sup> 50m - 1/3 emission rate for each emission source (g/s)	Composite Emission Factors <sup>[1]</sup> (g/veh/km)	Total Emission Rate (g/s)	% of the maximum emission rate <sup>[2]</sup>	1 <sup>st</sup> 50m - 2/3 emission rate for each emission source (g/s)	2 <sup>nd</sup> 50m - 1/3 emission rate for each emission source (g/s)	Composite Emission Factors <sup>[1]</sup> (g/veh/km)	Total Emission Rate (g/s)	% of the maximum emission rate <sup>[2]</sup>	1 <sup>st</sup> 50m - 2/3 emission rate for each emission source (g/s)	2 <sup>nd</sup> 50m - 1/3 emission rate for each emission source (g/s)	Composite Emission Factors <sup>[1]</sup> (g/veh/km)	Total Emission Rate (g/s)	% of the maximum emission rate <sup>[2]</sup>	1 <sup>st</sup> 50m - 2/3 emission rate for each emission source (g/s)	2 <sup>nd</sup> 50m - 1/3 emission rate for each emission source (g/s)
L1D	Man Cheung Street (WB)	MCSWB01-12	0.090	1	250	2.56E-02	1.60E-04	26%	1.78E-05	8.91E-06	3.05E-01	1.91E-03	26%	2.12E-04	1.06E-04	1.05E-02	6.55E-05	24%	7.28E-06	3.64E-06	9.65E-03	6.03E-05	24%	6.70E-06	3.35E-06
				2	150	2.56E-02	9.58E-05	15%	1.06E-05	5.32E-06	2.96E-01	1.11E-03	15%	1.23E-04	6.17E-05	9.53E-03	3.57E-05	13%	3.97E-06	1.98E-06	8.77E-03	3.29E-05	13%	3.65E-06	1.83E-06
				3	110	2.74E-02	7.52E-05	12%	8.36E-06	4.18E-06	3.08E-01	8.48E-04	12%	9.42E-05	4.71E-05	1.01E-02	2.78E-05	10%	3.08E-06	1.54E-06	9.29E-03	2.55E-05	10%	2.84E-06	1.42E-06
				4	90	2.51E-02	5.65E-05	9%	6.28E-06	3.14E-06	3.28E-01	7.37E-04	10%	8.19E-05	4.10E-05	1.09E-02	2.44E-05	9%	2.71E-06	1.36E-06	9.99E-03	2.25E-05	9%	2.50E-06	1.25E-06
				5	90	2.29E-02	5.16E-05	8%	5.74E-06	2.87E-06	3.02E-01	6.80E-04	9%	7.56E-05	3.78E-05	8.84E-03	1.99E-05	7%	2.21E-06	1.11E-06	8.14E-03	1.83E-05	7%	2.03E-06	1.02E-06
				6	130	2.87E-02	9.32E-05	15%	1.04E-05	5.18E-06	3.16E-01	1.03E-03	14%	1.14E-04	5.71E-05	9.19E-03	2.99E-05	11%	3.32E-06	1.66E-06	8.46E-03	2.75E-05	11%	3.05E-06	1.53E-06
				7	270	2.71E-02	1.83E-04	30%	2.03E-05	1.02E-05	3.27E-01	2.21E-03	30%	2.45E-04	1.23E-04	9.44E-03	6.37E-05	23%	7.08E-06	3.54E-06	8.69E-03	5.86E-05	23%	6.52E-06	3.26E-06
				8	470	2.83E-02	3.33E-04	54%	3.70E-05	1.85E-05	3.36E-01	3.94E-03	54%	4.38E-04	2.19E-04	9.46E-03	1.11E-04	41%	1.24E-05	6.18E-06	8.71E-03	1.02E-04	41%	1.14E-05	5.69E-06
				9	700	2.86E-02	5.00E-04	81%	5.56E-05	2.78E-05	3.41E-01	5.96E-03	82%	6.63E-04	3.31E-04	9.51E-03	1.66E-04	61%	1.85E-05	9.25E-06	8.75E-03	1.53E-04	61%	1.70E-05	8.51E-06
				10	1010	<b>2.45E-02</b>	<b>6.19E-04</b>	<b>100%</b>	<b>6.88E-05</b>	<b>3.44E-05</b>	<b>2.87E-01</b>	<b>7.25E-03</b>	<b>100%</b>	<b>8.06E-04</b>	<b>4.03E-04</b>	<b>1.08E-02</b>	<b>2.73E-04</b>	<b>100%</b>	<b>3.03E-05</b>	<b>1.52E-05</b>	<b>9.96E-03</b>	<b>2.51E-04</b>	<b>100%</b>	<b>2.79E-05</b>	<b>1.40E-05</b>
				11	960	2.53E-02	6.07E-04	98%	6.75E-05	3.37E-05	2.95E-01	7.08E-03	98%	7.87E-04	3.93E-04	1.08E-02	2.59E-04	95%	2.88E-05	1.44E-05	9.94E-03	2.39E-04	95%	2.65E-05	1.33E-05
				12	930	2.59E-02	6.01E-04	97%	6.68E-05	3.34E-05	3.00E-01	6.98E-03	96%	7.76E-04	3.88E-04	1.06E-02	2.47E-04	90%	2.75E-05	1.37E-05	9.79E-03	2.28E-04	90%	2.53E-05	1.26E-05
				13	870	2.59E-02	5.64E-04	91%	6.26E-05	3.13E-05	3.00E-01	6.53E-03	90%	7.25E-04	3.63E-04	1.03E-02	2.23E-04	82%	2.48E-05	1.24E-05	9.45E-03	2.05E-04	82%	2.28E-05	1.14E-05
				14	730	2.66E-02	4.86E-04	78%	5.40E-05	2.70E-05	3.11E-01	5.67E-03	78%	6.30E-04	3.15E-04	1.03E-02	1.88E-04	69%	2.09E-05	1.04E-05	9.47E-03	1.73E-04	69%	1.92E-05	9.60E-06
				15	770	2.64E-02	5.08E-04	82%	5.65E-05	2.82E-05	3.15E-01	6.06E-03	84%	6.73E-04	3.37E-04	9.90E-03	1.90E-04	70%	2.12E-05	1.06E-05	9.11E-03	1.75E-04	70%	1.95E-05	9.74E-06
				16	690	2.77E-02	4.78E-04	77%	5.31E-05	2.65E-05	3.25E-01	5.61E-03	77%	6.24E-04	3.12E-04	9.86E-03	1.70E-04	62%	1.89E-05	9.45E-06	9.07E-03	1.57E-04	62%	1.74E-05	8.70E-06
				17	640	2.86E-02	4.58E-04	74%	5.09E-05	2.55E-05	3.36E-01	5.38E-03	74%	5.98E-04	2.99E-04	9.67E-03	1.55E-04	57%	1.72E-05	8.60E-06	8.90E-03	1.42E-04	57%	1.58E-05	7.91E-06
				18	630	2.92E-02	4.60E-04	74%	5.11E-05	2.55E-05	3.48E-01	5.48E-03	76%	6.09E-04	3.04E-04	9.46E-03	1.49E-04	54%	1.65E-05	8.27E-06	8.70E-03	1.37E-04	54%	1.52E-05	7.62E-06
				19	1000	2.45E-02	6.13E-04	99%	6.81E-05	3.41E-05	2.83E-01	7.09E-03	98%	7.87E-04	3.94E-04	<b>1.09E-02</b>	<b>2.74E-04</b>	<b>100%</b>	<b>3.04E-05</b>	<b>1.52E-05</b>	<b>1.01E-02</b>	<b>2.52E-04</b>	<b>100%</b>	<b>2.80E-05</b>	<b>1.40E-05</b>
				20	880	2.46E-02	5.40E-04	87%	6.00E-05	3.00E-05	2.83E-01	6.23E-03	86%	6.92E-04	3.46E-04	1.08E-02	2.37E-04	87%	2.63E-05	1.32E-05	9.90E-03	2.18E-04	87%	2.42E-05	1.21E-05
				21	770	2.45E-02	4.72E-04	76%	5.24E-05	2.62E-05	2.86E-01	5.51E-03	76%	6.12E-04	3.06E-04	1.07E-02	2.06E-04	75%	2.28E-05	1.14E-05	9.83E-03	1.89E-04	75%	2.10E-05	1.05E-05
				22	540	2.41E-02	3.25E-04	53%	3.61E-05	1.81E-05	2.86E-01	3.87E-03	53%	4.30E-04	2.15E-04	1.04E-02	1.40E-04	51%	1.56E-05	7.80E-06	9.57E-03	1.29E-04	51%	1.43E-05	7.17E-06
				23	480	2.50E-02	3.00E-04	49%	3.34E-05	1.67E-05	2.93E-01	3.52E-03	49%	3.91E-04	1.96E-04	1.05E-02	1.26E-04	46%	1.40E-05	7.02E-06	9.68E-03	1.16E-04	46%	1.29E-05	6.46E-06
				24	390	2.57E-02	2.50E-04	40%	2.78E-05	1.39E-05	2.97E-01	2.90E-03	40%	3.22E-04	1.61E-04	1.04E-02	1.01E-04	37%	1.12E-05	5.62E-06	9.55E-03	9.31E-05	37%	1.03E-05	5.17E-06
L42J	Connaught Road Central Underpass (WB)	CRCUWB01-12	0.130	1	680	2.32E-02	5.71E-04	21%	6.34E-05	3.17E-05	2.43E-01	5.96E-03	23%	6.62E-04	3.31E-04	6.71E-03	1.65E-04	23%	1.83E-05	9.16E-06	6.18E-03	1.52E-04	23%	1.69E-05	8.43E-06
				2	400	2.38E-02	3.44E-04	13%	3.83E-05	1.91E-05	2.44E-01	3.53E-03	13%	3.92E-04	1.96E-04	6.77E-03	9.78E-05	14%	1.09E-05	5.43E-06	6.23E-03	9.00E-05	14%	1.00E-05	5.00E-06
				3	290	2.42E-02	2.53E-04	9%	2.81E-05	1.41E-05	2.47E-01	2.59E-03	10%	2.88E-04	1.44E-04	6.84E-03	7.17E-05	10%	7.96E-06	3.98E-06	6.30E-03	6.60E-05	10%	7.33E-06	3.67E-06
				4	250	2.63E-02	2.37E-04	9%	2.64E-05	1.32E-05	2.58E-01	2.33E-03	9%	2.59E-04	1.29E-04	7.51E-03	6.78E-05	10%	7.54E-06	3.77E-06	6.91E-03	6.24E-05	10%	6.94E-06	3.47E-06
				5	240	2.64E-02	2.29E-04	8%	2.55E-05	1.27E-05	2.50E-01	2.17E-03	8%	2.41E-04	1.20E-04	6.94E-03	6.02E-05	9%	6.69E-06	3.34E-06	6.39E-03	5.54E-05	9%	6.15E-06	3.08E-06
				6	360	2.74E-02	3.56E-04	13%	3.96E-05	1.98E-05	2.61E-01	3.39E-03	13%	3.77E-04	1.89E-04	7.62E-03	9.91E-05	14%	1.10E-05	5.50E-06	7.01E-03	9.12E-05	14%	1.01E-05	5.07E-06
				7	810	2.74E-02	8.02E-04	29%	8.91E-05	4.46E-05	2.58E-01	7.55E-03	29%	8.39E-04	4.20E-04	7.35E-03	2.15E-04	31%	2.39E-05	1.19E-05	6.77E-03	1.98E-04	31%	2.20E-05	1.10E-05
				8	1420	3.03E-02	1.55E-03	57%	1.73E-04	8.64E-05	2.80E-01	1.43E-02	55%	1.59E-03	7.97E-04	8.03E-03	4.12E-04	59%	4.58E-05	2.29E-05	7.41E-03	3.80E-04	59%	4.22E-05	2.11E-05
				9	2150	<b>3.52E-02</b>	<b>2.73E-03</b>	<b>100%</b>	<b>3.04E-04</b>	<b>1.52E-04</b>	<b>3.16E-01</b>	<b>2.45E-02</b>	<b>94%</b>	<b>2.72E-03</b>	<b>1.36E-03</b>	<b>9.01E-03</b>	<b>6.99E-04</b>	<b>100%</b>	<b>7.77E-05</b>	<b>3.89E-05</b>	<b>8.28E-03</b>	<b>6.43E-04</b>	<b>100%</b>	<b>7.14E-05</b>	<b>3.57E-05</b>
				10	2530	2.70E-02	2.47E-03	90%	2.74E-04	1.37E-04	2.85E-01	2.60E-02	99%	2.89E-03	1.44E-03	7.58E-03	6.92E-04	99%	7.69E-05	3.84E-05	6.97E-03	6.37E-04	99%	7.08E-05	3.54E-05
				11	2460	2.83E-02	2.51E-03	92%	2.79E-04	1.40E-04	2.92E-01	2.59E-02	99%	2.88E-03	1.44E-03	7.77E-03	6.91E-04	98%	7.67E-05	3.84E-05	7.16E-03	6.36E-04	98%	7.06E-05	3.53E-05
				12	2440	2.95E-02	2.60E-03	95%	2.89E-04	1.45E-04	<b>2.97E-01</b>	<b>2.62E-02</b>	<b>100%</b>	<b>2.91E-03</b>	<b>1.46E-03</b>	<b>7.97E-03</b>	<b>7.02E-04</b>	<b>100%</b>	<b>7.80E-05</b>	<b>3.90E-05</b>	<b>7.33E-03</b>	<b>6.46E-04</b>	<b>100%</b>	<b>7.18E-05</b>	<b>3.59E-05</b>
				13	2330	2.96E-02	2.49E-03	91%	2.77E-04	1.38E-04	2.94E-01	2.47E-02	94%	2.75E-03	1.37E-03	8.06E-03	6.78E-04	97%	7.53E-05	3.77E-05	7.41E-03	6.23E-04	96%	6.92E-05	3.46E-05
				14	2010	2.93E-02	2.13E-03	78%	2.36E-04	1.18E-04	2.86E-01	2.07E-02	79%	2.30E-03	1.15E-03	7.90E-03	5.73E-04	82%	6.37E-05	3.19E-05	7.31E-03	5.30E-04	82%	5.89E-05	2.95E-05
				15	2180	3.14E-02	2.47E-03	90%	2.75E-04	1.37E-04	2.98E-01	2.35E-02	90%	2.61E-03	1.30E-03	8.32E-03	6.55E-04	93%	7.28E-05	3.64E-05	7.65E-03	6.02E-04	93%	6.69E-05	3.35E-05
				16	2010	3.20E-02	2.32E-03	85%	2.58E-04	1.29E-04	2.98E-01	2.16E-02	83%	2.40E-03	1.20E-03	8.39E-03	6.09E-04	87%	6.76E-05	3.38E-05	7.75E-03				

**Appendix 4-13 Traffic Forecast for Air Quality Impact Assessment (Traffic Forecast for Years 2030, 2037 and 2045) (provided in CD)**

## Billy Fan

---

**From:** Alice Ping Wai LUK <pingwailuk@td.gov.hk>  
**Sent:** 04 June 2024 12:17  
**To:** MUI Ray  
**Cc:** Kit CHOW; cknwong@pland.gov.hk; hhcchan@pland.gov.hk  
**Subject:** RE: S16 Application for Proposed Development at No.152 -164 Wellington Street (Application No. A/H3/449) - TD's comments  
**Attachments:** RtoC Table.pdf; 20240603\_Revised Road Profile.pdf

Dear Ray,

I refer to your revised submission via e-mail @ 03/06/2024 06:24 PM and the R-to-C table submitted under FI3 of the captioned planning application as attached regarding Traffic Noise Impact Assessment (TNIA) and Air Quality Impact Assessment (AQIA):

We have no particular comment from the traffic engineering viewpoint on your proposed methodology for traffic forecasting for TNIA and AQIA presented under the captioned submission.

Regards,  
Alice LUK  
E/C&W2, Traffic Engineering (HK) Division  
Transport Department  
Tel: 2829 5426  
Fax: 2824 0399

From: MUI Ray <rmui@systra.com>  
To: "pingwailuk@td.gov.hk" <pingwailuk@td.gov.hk>  
Cc: "kitchow@td.gov.hk" <kitchow@td.gov.hk>, CHAN Rebecca <rchan@systra.com>, YAM Henry <hyam@systra.com>  
Date: 03/06/2024 06:24 PM  
Subject: RE: S16 Application for Proposed Development at No.152 -164 Wellington Street (Application No. A/H3/449) - TD's comments

---

Dear Alice,

As discussed this afternoon, please find attached the revised road type (yellow highlighted) as supplementary information of the FI submission for your kind reference. Thanks.

Best Regards,

**Ray Mui**  
Associate  
Tel: +852 2864 6480 (Direct Line) ?Gen: +852 2529 7037 ?Fax: +852 2527 8490



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As part of Systra on-going corporate initiative, our email address will be switched to systra.com.  
Please use this email ([rmui@systra.com](mailto:rmui@systra.com)) for any further correspondence. Thank you for attention.

**From:** MUI Ray

**Sent:** Tuesday, May 28, 2024 12:14 PM

**To:** pingwailuk@td.gov.hk

**Cc:** kitchow@td.gov.hk; Fiona NG <[fiona.ng@couturehomes.hk](mailto:fiona.ng@couturehomes.hk)>; jacky@couturehomes.hk; Gladys Ng <[gladysng@ktaPlanning.com](mailto:gladysng@ktaPlanning.com)>; Calvin Chiu <[cchiu@ramboll.com](mailto:cchiu@ramboll.com)>; Billy Fan <[bfan@ramboll.com](mailto:bfan@ramboll.com)>; CHAN Rebecca <[rchan@systra.com](mailto:rchan@systra.com)>; YAM Henry <[hyam@systra.com](mailto:hyam@systra.com)>

**Subject:** RE: S16 Application for Proposed Development at No.152 -164 Wellington Street (Application No. A/H3/449) - TD's comments

Dear Alice,

Further to our tele-conversation yesterday, please find attached the updated road types (yellow highlighted) for Air Quality Impact Assessment (AQIA) as supplementary information of the FI submission for your kind reference.

Appreciated very much if endorsement of the methodology of traffic forecast for environmental assessment and no further comment on the TIA could be granted. Many thanks!

Best Regards,

**Ray Mui**

Associate

Tel: +852 2864 6480 (Direct Line) ?Gen: +852 2529 7037 ?Fax: +852 2527 8490



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Please use this email ([rmui@systra.com](mailto:rmui@systra.com)) for any further correspondence. Thank you for attention.

**From:** MUI Ray

**Sent:** Wednesday, May 22, 2024 1:50 PM

**To:** [pingwailuk@td.gov.hk](mailto:pingwailuk@td.gov.hk)

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**Subject:** S16 Application for Proposed Development at No.152 -164 Wellington Street (Application No. A/H3/449) - TD's comments

Dear Alice,

Referring to our tele-conversation earlier this week regarding the captioned, FI submission including the traffic responses to TD's comments and Appendix II (revised TIA pages) were formally submitted to TPB via the letter from the Planning Consultant dated 14<sup>th</sup> May 2024 (cover letter attached).

In addition, as discussed, we would like to supplement the information of construction traffic as below for your kind consideration.

**Peak Hour Construction Traffic**

The peak hour construction traffic of the proposed development is preliminary estimated with reference to the construction traffic activities of similar construction site.

	<b>Preliminary Estimated Construction Traffic of the Proposed Development</b>
<b>Estimated Peak Daily construction traffic</b>	22 vehicles per day
<b>Working hours of construction traffic</b>	10 hours (8 am to 6 pm)
<b>Peak-hour construction traffic</b>	2.2 vehicles per hour (i.e about 6 pcu/hr)

It is revealed that the peak hour construction traffic volume is not significant and is also less than the development trip generations (Table 4.7 of the submitted TIA), it is considered the construction traffic impact to the adjacent road network due to the construction traffic is not significant.

Should you have any queries, please feel free to contact us. Thanks.

Best Regards,

**Ray Mui**

Associate

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**Appendix 4-14 EMFAC-HK Information (EMFAC-HK Information for Years 2030,  
2037 and 2045) (provided in CD)**



**Appendix 4-15 Summary of Total Pollutant Emission (from EMFAC-HK)**

**Summary of Total Pollutant Emissions (from SAMP)**

Temperature and RH assumptions: AnnualHourMin

**Total Emission per year**

	NO <sub>2</sub> (tonnes)	NO (tonnes)	NO <sub>x</sub> (tonnes)	RSP (tonnes)	FSP (tonnes)
Year 2030	4.13	45.01	<b>49.14</b>	<b>1.28</b>	<b>1.18</b>
Year 2037	4.53	24.66	29.19	0.61	0.56
Year 2045	4.87	26.19	31.06	0.63	0.58

**Appendix 4-16 (Not Used)**

**Appendix 4-17 Derivation of Cumulative Annual Average NO<sub>x</sub> to NO<sub>2</sub>  
Conversion Equation Using Jenkin Method**

# DERIVATION OF CUMULATIVE ANNUAL AVERAGE NO<sub>x</sub> TO NO<sub>2</sub> CONVERSION EQUATION USING JENKIN METHOD

## Introduction

In order not to overestimate the NO<sub>2</sub> emissions during the conversion of NO<sub>x</sub> to NO<sub>2</sub>, besides Ozone Limiting Method (OLM) and Discrete Parcel Method (DPM), an alternative method using the Jenkin Method<sup>1</sup> is proposed. This method can estimate annual NO<sub>2</sub> based on a project-specific empirical relationship of NO<sub>x</sub> to NO<sub>2</sub> derived from a fitted curve by making reference to the monitoring data of annual NO<sub>2</sub> and NO<sub>x</sub>.

## Jenkin Method

With reference to "Review of Methods for NO to NO<sub>2</sub> Conversion in Plumes at Short Ranges" published by Environment Agency of UK in 2007<sup>2</sup>, the annual NO<sub>2</sub> concentrations can be estimated by adopting Jenkin Method with the derived project-specific empirical relationship of NO<sub>x</sub> to NO<sub>2</sub> and the latest available and representative data from EPD's air quality monitoring stations (AQMSs). The empirical relationship can be described by selected monitoring data of annual average NO<sub>2</sub> & NO<sub>x</sub> concentrations and fitted curve<sup>1</sup>. The annual average NO<sub>2</sub> concentrations can then be determined from the functional form curve by using the total annual average NO<sub>x</sub> concentrations. The functional form is presented as below<sup>1</sup>:

$$[NO_2] = \frac{\left([NO_x] + [O_x] + \frac{J}{k}\right) - \sqrt{\left([NO_x] + [O_x] + \frac{J}{k}\right)^2 - 4 \times [NO_x] \times [O_x]}}{2}$$

where

[NO<sub>2</sub>] is Annual Average NO<sub>2</sub> Concentration;

[NO<sub>x</sub>] is Annual Average NO<sub>x</sub> Concentration;

[O<sub>x</sub>] is the Sum of Annual Average NO<sub>2</sub> Concentration and Annual Average O<sub>3</sub> Concentration (i.e. [O<sub>x</sub>] = [NO<sub>2</sub>] + [O<sub>3</sub>]);

J is the Photolysis Rate of NO<sub>2</sub>;

k is the Rate Coefficient for the Reaction between NO and O<sub>3</sub>.

## Derivation Process

### Adoption of Representative Data from EPD's AQMSs

Three AQMSs are selected to analyse the relationship between the annual average NO<sub>x</sub> and NO<sub>2</sub> concentrations, including Central/Western & Tap Mun General Stations, and Central Roadside Stations. The latest five years (i.e. 2018 to 2022) annual average data of NO<sub>2</sub> and NO<sub>x</sub> are extracted from "Annual Quality in Hong Kong" published by EPD and presented in **Table 1** below. Besides, the annual average O<sub>x</sub> (i.e. [NO<sub>2</sub>] + [O<sub>3</sub>]) is also presented in **Table 1**.

---

<sup>1</sup> J. M. E., "Analysis of Sources and Partitioning of Oxidant in the UK – Part 1: The NO<sub>x</sub>-dependence of Annual Mean Concentrations of Nitrogen Dioxide and Ozone", Atmospheric Environment, 2004.

<sup>2</sup> "Review of Methods for NO to NO<sub>2</sub> Conversion in Plumes at Short Ranges", Environment Agent of UK, UK, 2007.

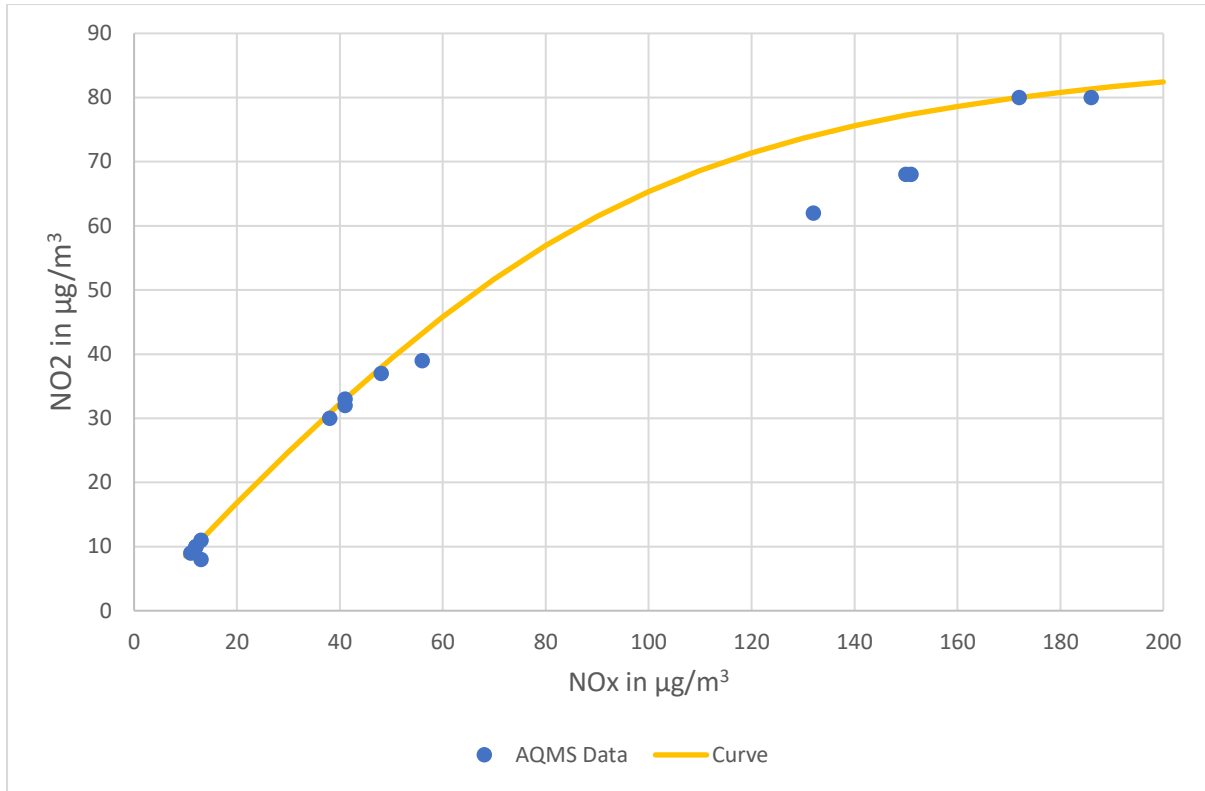
**Table 1 Annual Average of NO<sub>2</sub>, NO<sub>x</sub> and O<sub>3</sub> Concentrations in Latest Five Years at Selected EPD's AQMSs**

Year	Location	Annual Average NO <sub>2</sub>	Annual Average NO <sub>x</sub>
2018	CENTRAL/WESTERN	39	56
2019	CENTRAL/WESTERN	37	48
2020	CENTRAL/WESTERN	32	41
2021	CENTRAL/WESTERN	33	41
2022	CENTRAL/WESTERN	30	38
2018	TAP MUN	11	13
2019	TAP MUN	10	12
2020	TAP MUN	9	11
2021	TAP MUN	10	12
2022	TAP MUN	8	13
2018	CENTRAL	80	186
2019	CENTRAL	80	172
2020	CENTRAL	68	151
2021	CENTRAL	68	150
2022	CENTRAL	62	132

Plotting and Fitting Functional Form Curve

With the use of  $[O_x] = 92.6 \mu\text{g}/\text{m}^3$  and  $J/k = 14.44 \mu\text{g}/\text{m}^3$ , annual average NO<sub>2</sub> concentrations can be calculated from the functional form based on the measured annual average NO<sub>x</sub> concentrations shown in **Table 1** above.

A plot for annual average NO<sub>2</sub> versus annual average NO<sub>x</sub> obtained from selected EPD's AQMSs from the latest 5 years is plotted in **Graph 1** below. The functional form curve, adopting  $[O_x]$  of  $92.6 \mu\text{g}/\text{m}^3$  and  $J/k$  of  $14.44 \mu\text{g}/\text{m}^3$  provided by SAMP, would fit with all annual average data from the selected EPD's AQMSs. Underestimation of the annual average NO<sub>2</sub> concentration is not expected.



**Graph 1 AQMS NO<sub>2</sub> vs NO<sub>x</sub> Concentration and Functional Form Curve by Jenkin Method**

Conversion of Predicted Cumulative Annual Average NO<sub>x</sub> results to Cumulative Annual Average NO<sub>2</sub> Results

The functional form curve would be adopted for NO<sub>x</sub> to NO<sub>2</sub> conversion, where the predicted cumulative annual average NO<sub>x</sub> results could be converted to the predicted cumulative annual average NO<sub>2</sub> results. The equation for the conversion is as below:

$$[NO_2]_p = \frac{([NO_x]_p + 92.6 + 14.44) - \sqrt{([NO_x]_p + 92.6 + 14.44)^2 - 4 \times [NO_x]_p \times 92.6}}{2}$$

where

- [NO<sub>2</sub>]<sub>p</sub> is the Predicted Cumulative Annual Average NO<sub>2</sub> Concentration;
- [NO<sub>x</sub>]<sub>p</sub> is the Predicted Cumulative Annual Average NO<sub>x</sub> Concentration.

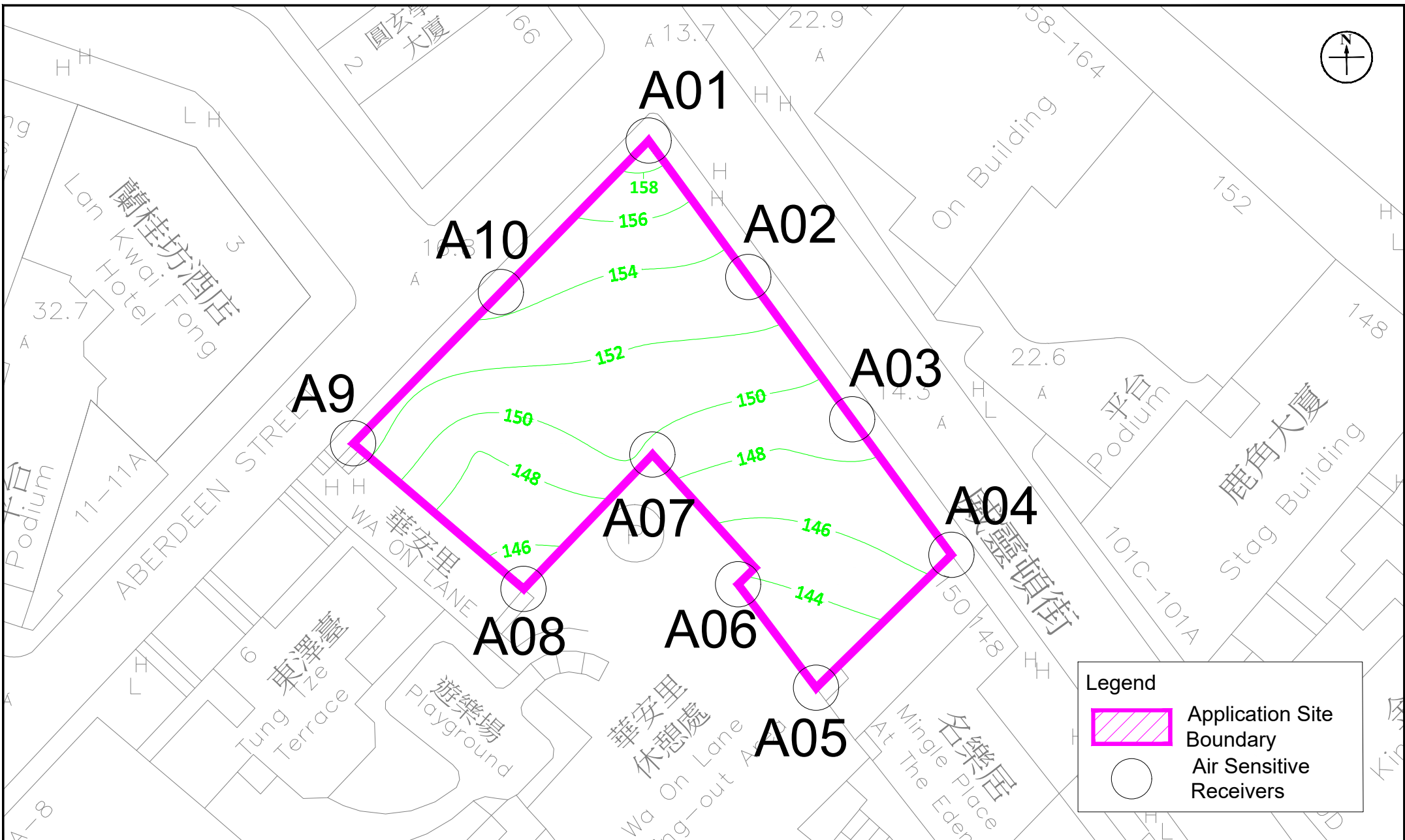
**Appendix 4-18 Predicted Air Quality Impact Assessment Results**



ASRs ID	PATH Grid	ASR Coordinates		Floor	Flag Pole Receiver Height, mPD	Flag Pole Receiver Height, mAG	Predicted Cumulative Impacts (µg/m <sup>3</sup> ) in Year 2030							
		x	y				NO <sub>2</sub>		RSP		FSP		SO <sub>2</sub>	
							1-h (AQO=200)	Annual (AQO=40)	24-h (AQO=100)	Annual (AQO=50)	24-h (AQO=50)	Annual (AQO=25)	10-min (AQO=500)	24-h (AQO=50)
		Easting	Northing				19 <sup>th</sup> highest	Annual (AQO=40)	10 <sup>th</sup> highest	Annual (AQO=50)	36 <sup>th</sup> highest	Annual (AQO=25)	4 <sup>th</sup> highest	4 <sup>th</sup> highest
A1-1	38.29	833851	816166	GF	13.90	1.50	159.4	35.1	54.5	21.3	13.6	21.6	6.8	
A1-2	38.29	833851	816166	1F	20.30	6.40	140.2	28.8	54.0	21.1	27.0	21.6	6.8	
A1-3	38.29	833851	816166	Clubhouse_1F	25.15	11.25	130.8	26.6	53.7	21.0	27.0	21.6	6.8	
A1-4	38.29	833851	816166	Clubhouse_2F	30.15	16.25	119.5	25.1	53.5	20.9	26.9	21.6	6.8	
A1-5	38.29	833851	816166	Transfer Plate	35.15	21.25	109.5	24.1	53.0	20.9	26.9	21.6	6.8	
A1-6	38.29	833851	816166	R_1F	38.15	24.25	104.5	23.6	53.4	20.9	26.9	21.6	6.8	
A1-7	38.29	833851	816166	R_2F	41.40	27.50	101.2	23.1	53.4	20.8	26.9	21.6	6.7	
A1-8	38.29	833851	816166	R_3F	44.65	30.75	98.3	22.6	53.4	20.8	26.8	21.6	6.7	
A1-9	38.29	833851	816166	R_4F	47.90	34.00	95.6	22.3	53.4	20.8	26.8	21.6	6.7	
A1-10	38.29	833851	816166	R_5F	51.15	37.25	92.6	22.0	53.4	20.8	26.8	21.6	6.7	
A1-11	38.29	833851	816166	R_6F	54.40	40.50	92.6	21.7	53.4	20.8	26.8	21.6	6.7	
A1-12	38.29	833851	816166	R_7F	57.65	43.75	90.8	21.5	53.3	20.8	26.8	21.6	6.7	
A1-13	38.29	833851	816166	R_8F	60.90	47.00	90.5	21.3	53.3	20.8	26.8	21.6	6.7	
A1-14	38.29	833851	816166	R_11F	70.65	56.75	88.8	20.9	53.3	20.8	26.8	21.6	6.7	
A1-15	38.29	833851	816166	R_14F	80.40	66.50	88.6	20.6	53.3	20.7	26.8	21.6	6.7	
A1-16	38.29	833851	816166	R_17F	90.15	76.25	88.5	20.4	53.3	20.7	26.8	21.6	6.7	
A1-17	38.29	833851	816166	R_20F	99.90	86.00	88.4	20.2	53.3	20.7	26.7	21.6	6.7	
A1-18	38.29	833851	816166	R_23F	109.65	95.75	88.4	20.1	53.3	20.7	26.7	21.6	6.7	
A1-19	38.29	833851	816166	RF	119.90	106.00	88.4	20.0	53.3	20.7	26.7	21.6	6.7	
A2-1	38.29	833858	816157	GF	13.90	1.50	153.2	32.8	54.4	21.2	27.3	21.6	6.8	
A2-2	38.29	833858	816157	1F	20.30	6.40	139.9	28.4	54.0	21.0	27.0	21.6	6.8	
A2-3	38.29	833858	816157	Clubhouse_1F	25.15	11.25	130.6	26.5	53.7	21.0	26.9	21.6	6.8	
A2-4	38.29	833858	816157	Clubhouse_2F	30.15	16.25	120.1	25.0	53.5	20.9	26.9	21.6	6.8	
A2-5	38.29	833858	816157	Transfer Plate	35.15	21.25	109.7	24.0	53.4	20.9	26.9	21.6	6.8	
A2-6	38.29	833858	816157	R_1F	38.15	24.25	104.4	23.5	53.4	20.9	26.9	21.6	6.8	
A2-7	38.29	833858	816157	R_2F	41.40	27.50	100.6	23.0	53.4	20.8	26.9	21.6	6.7	
A2-8	38.29	833858	816157	R_3F	44.65	30.75	97.9	22.6	53.4	20.8	26.8	21.6	6.7	
A2-9	38.29	833858	816157	R_4F	47.90	34.00	94.5	22.2	53.4	20.8	26.8	21.6	6.7	
A2-10	38.29	833858	816157	R_5F	51.15	37.25	92.6	21.9	53.4	20.8	26.8	21.6	6.7	
A2-11	38.29	833858	816157	R_6F	54.40	40.50	92.6	21.7	53.4	20.8	26.8	21.6	6.7	
A2-12	38.29	833858	816157	R_7F	57.65	43.75	91.3	21.4	53.3	20.8	26.8	21.6	6.7	
A2-13	38.29	833858	816157	R_8F	60.90	47.00	90.5	21.2	53.3	20.8	26.8	21.6	6.7	
A2-14	38.29	833858	816157	R_11F	70.65	56.75	88.8	20.8	53.3	20.8	26.8	21.6	6.7	
A2-15	38.29	833858	816157	R_14F	80.40	66.50	88.5	20.6	53.3	20.7	26.8	21.6	6.7	
A2-16	38.29	833858	816157	R_17F	90.15	76.25	88.5	20.4	53.3	20.7	26.8	21.6	6.7	
A2-17	38.29	833858	816157	R_20F	99.90	86.00	88.4	20.2	53.3	20.7	26.7	21.6	6.7	
A2-18	38.29	833858	816157	R_23F	109.65	95.75	88.4	20.1	53.3	20.7	26.7	21.6	6.7	
A2-19	38.29	833858	816157	RF	119.90	106.00	88.4	20.0	53.3	20.7	26.7	21.6	6.7	
A3-1	38.29	833865	816147	GF	13.90	1.50	149.3	32.1	54.4	21.2	27.3	21.6	6.8	
A3-2	38.29	833865	816147	1F	20.30	6.40	138.0	28.1	54.0	21.0	27.0	21.6	6.8	
A3-3	38.29	833865	816147	Clubhouse_1F	25.15	11.25	129.7	26.3	53.6	21.0	26.9	21.6	6.8	
A3-4	38.29	833865	816147	Clubhouse_2F	30.15	16.25	120.8	24.9	53.5	20.9	26.9	21.6	6.8	
A3-5	38.29	833865	816147	Transfer Plate	35.15	21.25	110.2	23.9	53.4	20.9	26.9	21.6	6.8	
A3-6	38.29	833865	816147	R_1F	38.15	24.25	104.7	23.4	53.4	20.9	26.9	21.6	6.8	
A3-7	38.29	833865	816147	R_2F	41.40	27.50	100.1	22.9	53.4	20.8	26.9	21.6	6.7	
A3-8	38.29	833865	816147	R_3F	44.65	30.75	97.5	22.5	53.4	20.8	26.8	21.6	6.7	
A3-9	38.29	833865	816147	R_4F	47.90	34.00	95.4	22.2	53.4	20.8	26.8	21.6	6.7	
A3-10	38.29	833865	816147	R_5F	51.15	37.25	92.6	21.9	53.4	20.8	26.8	21.6	6.7	
A3-11	38.29	833865	816147	R_6F	54.40	40.50	92.5	21.6	53.4	20.8	26.8	21.6	6.7	
A3-12	38.29	833865	816147	R_7F	57.65	43.75	91.5	21.4	53.3	20.8	26.8	21.6	6.7	
A3-13	38.29	833865	816147	R_8F	60.90	47.00	90.5	21.2	53.3	20.8	26.8	21.6	6.7	
A3-14	38.29	833865	816147	R_11F	70.65	56.75	88.8	20.8	53.3	20.8	26.8	21.6	6.7	
A3-15	38.29	833865	816147	R_14F	80.40	66.50	88.5	20.5	53.3	20.7	26.8	21.6	6.7	
A3-16	38.29	833865	816147	R_17F	90.15	76.25	88.5	20.3	53.3	20.7	26.7	21.6	6.7	
A3-17	38.29	833865	816147	R_20F	99.90	86.00	88.4	20.2	53.3	20.7	26.7	21.6	6.7	
A3-18	38.29	833865	816147	R_23F	109.65	95.75	88.4	20.1	53.3	20.7	26.7	21.6	6.7	
A3-19	38.29	833865	816147	RF	119.90	106.00	88.4	20.0	53.3	20.7	26.7	21.6	6.7	
A4-1	38.29	833871	816138	GF	13.90	1.50	147.4	31.7	54.4	21.2	27.2	21.6	6.8	
A4-2	38.29	833871	816138	1F	20.30	6.40	136.9	27.9	53.9	21.0	27.0	21.6	6.8	
A4-3	38.29	833871	816138	Clubhouse_1F	25.15	11.25	128.8	26.1	53.6	21.0	26.9	21.6	6.8	
A4-4	38.29	833871	816138	Clubhouse_2F	30.15	16.25	121.2	24.8	53.5	20.9	26.9	21.6	6.8	
A4-5	38.29	833871	816138	Transfer Plate	35.15	21.25	110.6	23.8	53.4	20.9	26.9	21.6	6.8	
A4-6	38.29	833871	816138	R_1F	38.15	24.25	105.7	23.3	53.4	20.8	26.9	21.6	6.8	
A4-7	38.29	833871	816138	R_2F	41.40	27.50	102.7	22.9	53.4	20.8	26.8	21.6	6.7	
A4-8	38.29	833871	816138	R_3F	44.65	30.75	97.5	22.5	53.4	20.8	26.8	21.6	6.7	
A4-9	38.29	833871	816138	R_4F	47.90	34.00	95.1	22.1	53.4	20.8	26.8	21.6	6.7	
A4-10	38.29	833871	816138	R_5F	51.15	37.25	92.7	21.8	53.4	20.8	26.8	21.6	6.7	
A4-11	38.29	833871	816138	R_6F	54.40	40.50	92.4	21.6	53.3	20.8	26.8	21.6	6.7	
A4-12	38.29	833871	816138	R_7F	57.65	43.75	91.4	21.4	53.3	20.8	26.8	21.6	6.7	
A4-13	38.29	833871	816138	R_8F	60.90	47.00	90.6	21.2	53.3	20.8	26.8	21.6	6.7	
A4-14	38.29	833871	816138	R_11F	70.65	56.75	88.8	20.8	53.3	20.8	26.8	21.6	6.7	
A4-15	38.29	833871	816138	R_14F	80.40	66.50	88.5	20.5	53.3	20.7	26.8	21.6	6.7	
A4-16	38.29	833871	816138	R_17F	90.15	76.25	88.5	20.3	53.3	20.7	26.7	21.6	6.7	
A4-17	38.29	833871	816138	R_20F	99.90	86.00	88.4	20.2	53.3	20.7	26.7	21.6	6.7	
A4-18	38.29	833871	816138	R_23F	109.65	95.75	88.4	20.1	53.3	20.7	26.7	21.6	6.7	
A4-19	38.29	833871	816138	RF	119.90	106.00	88.4	20.0	53.3	20.7	26.7	21.6	6.7	
A5-1	38.29	833862	816129	GF	13.90	1.50	142.1	29.7	54.3	21.1	27.2	21.6	6.8	
A5-2	38.29	833862	816129	1F	20.30	6.40	137.4	27.7	53.9	21.0	27.0	21.6	6.8	
A5-3	38.29	833862	816129	Clubhouse_1F	25.15	11.25	129.6	26.1	53.6	21.0	26.9	21.6	6.8	
A5-4	38.29	833862	816129	Clubhouse_2F	30.15	16.25	120.1	24.8	53.5	20.9	26.9	21.6	6.8	
A5-5	38.29	833862	816129	Transfer Plate	35.15	21.25	110.9	23.8	53.4	20.9	26.9	21.6	6.8	
A5-6	38.29	833862	816129	R_1F	38.15	24.25	104.3	23.3	53.4	20.8	26.9	21.6	6.8	
A5-7	38.29	833862	816129	R_2F	41.40	27.50	99.9	22.9	53.4	20.8	26.8	21.6	6.7	
A5-8	38.29	833862	816129	R_3F	44.65	30.75	97.5	22.5	53.4	20.8	26.8	21.6	6.7	
A5-9	38.29	833862	816129	R_4F	47.90	34.00	95.1	22.1	53.4	20.8	26.8	21.6	6.7	
A5-10	38.29	833862	816129	R_5F	51.15	37.25	92.7	21.8	53.4	20.8	26.8	21.6	6.7	
A5-11	38.29	833862	816129	R_6F	54.40	40.50	92.4	21.6	53.3	20.8	26.8	21.6	6.7	
A														

ASRs ID	PATH Grid	ASR Coordinates		Floor	Flag Pole Receiver Height, mPD	Flag Pole Receiver Height, mAG	Predicted Cumulative Impacts (µg/m <sup>3</sup> ) in Year 2030							
		x	y				NO <sub>2</sub>		RSP		FSP		SO <sub>2</sub>	
							1-h (AQO=200)	Annual (AQO=40)	24-h (AQO=100)	Annual (AQO=50)	24-h (AQO=50)	Annual (AQO=25)	10-min (AQO=500)	24-h (AQO=50)
		Easting	Northing				19 <sup>th</sup> highest	Annual (AQO=40)	10 <sup>th</sup> highest	Annual (AQO=50)	36 <sup>th</sup> highest	Annual (AQO=25)	4 <sup>th</sup> highest	4 <sup>th</sup> highest
A7-1	38.29	833852	816145	GF	13.90	1.50	149.2	30.6	54.3	21.1	27.2	13.4	21.6	6.8
A7-2	38.29	833852	816145	1F	20.30	6.40	139.3	28.2	54.0	21.0	27.0	13.4	21.6	6.8
A7-3	38.29	833852	816145	Clubhouse_1F	25.15	11.25	130.9	26.4	53.7	21.0	26.9	13.3	21.6	6.8
A7-4	38.29	833852	816145	Clubhouse_2F	30.15	16.25	120.6	25.0	53.5	20.9	26.9	13.2	21.6	6.8
A7-5	38.29	833852	816145	Transfer Plate	35.15	21.25	110.0	23.9	53.4	20.9	26.9	13.2	21.6	6.8
A7-6	38.29	833852	816145	R_1F	38.15	24.25	103.9	23.5	53.4	20.9	26.9	13.2	21.6	6.8
A7-7	38.29	833852	816145	R_2F	41.40	27.50	100.6	23.0	53.4	20.8	26.8	13.2	21.6	6.7
A7-8	38.29	833852	816145	R_3F	44.65	30.75	97.8	22.5	53.4	20.8	26.8	13.2	21.6	6.7
A7-9	38.29	833852	816145	R_4F	47.90	34.00	95.7	22.2	53.4	20.8	26.8	13.1	21.6	6.7
A7-10	38.29	833852	816145	R_5F	51.15	37.25	92.6	21.9	53.4	20.8	26.8	13.1	21.6	6.7
A7-11	38.29	833852	816145	R_6F	54.40	40.50	92.6	21.6	53.4	20.8	26.8	13.1	21.6	6.7
A7-12	38.29	833852	816145	R_7F	57.65	43.75	90.8	21.4	53.3	20.8	26.8	13.1	21.6	6.7
A7-13	38.29	833852	816145	R_8F	60.90	47.00	90.5	21.2	53.3	20.8	26.8	13.1	21.6	6.7
A7-14	38.29	833852	816145	R_11F	70.65	56.75	88.8	20.8	53.3	20.8	26.8	13.1	21.6	6.7
A7-15	38.29	833852	816145	R_14F	80.40	66.50	88.5	20.6	53.3	20.7	26.8	13.1	21.6	6.7
A7-16	38.29	833852	816145	R_17F	90.15	76.25	88.5	20.4	53.3	20.7	26.8	13.1	21.6	6.7
A7-17	38.29	833852	816145	R_20F	99.90	86.00	88.4	20.2	53.3	20.7	26.7	13.1	21.6	6.7
A7-18	38.29	833852	816145	R_23F	109.65	95.75	88.4	20.1	53.3	20.7	26.7	13.1	21.6	6.7
A7-19	38.29	833852	816145	RF	119.90	106.00	88.4	20.0	53.3	20.7	26.7	13.1	21.5	6.7
A8-1	38.29	833843	816136	GF	13.90	1.50	144.7	29.6	54.2	21.1	27.1	13.4	21.6	6.8
A8-2	38.29	833843	816136	1F	20.30	6.40	139.3	28.0	54.0	21.0	27.0	13.3	21.6	6.8
A8-3	38.29	833843	816136	Clubhouse_1F	25.15	11.25	129.0	26.4	53.7	21.0	26.9	13.3	21.6	6.8
A8-4	38.29	833843	816136	Clubhouse_2F	30.15	16.25	121.0	25.0	53.5	20.9	26.9	13.2	21.6	6.8
A8-5	38.29	833843	816136	Transfer Plate	35.15	21.25	110.4	23.9	53.4	20.9	26.9	13.2	21.6	6.8
A8-6	38.29	833843	816136	R_1F	38.15	24.25	103.5	23.4	53.4	20.9	26.9	13.2	21.6	6.8
A8-7	38.29	833843	816136	R_2F	41.40	27.50	100.1	23.0	53.4	20.8	26.8	13.2	21.6	6.7
A8-8	38.29	833843	816136	R_3F	44.65	30.75	97.4	22.5	53.4	20.8	26.8	13.2	21.6	6.7
A8-9	38.29	833843	816136	R_4F	47.90	34.00	96.2	22.2	53.4	20.8	26.8	13.1	21.6	6.7
A8-10	38.29	833843	816136	R_5F	51.15	37.25	92.9	21.9	53.4	20.8	26.8	13.1	21.6	6.7
A8-11	38.29	833843	816136	R_6F	54.40	40.50	92.5	21.6	53.3	20.8	26.8	13.1	21.6	6.7
A8-12	38.29	833843	816136	R_7F	57.65	43.75	90.8	21.4	53.3	20.8	26.8	13.1	21.6	6.7
A8-13	38.29	833843	816136	R_8F	60.90	47.00	90.5	21.2	53.3	20.8	26.8	13.1	21.6	6.7
A8-14	38.29	833843	816136	R_11F	70.65	56.75	88.8	20.8	53.3	20.8	26.8	13.1	21.6	6.7
A8-15	38.29	833843	816136	R_14F	80.40	66.50	88.5	20.6	53.3	20.7	26.8	13.1	21.6	6.7
A8-16	38.29	833843	816136	R_17F	90.15	76.25	88.5	20.4	53.3	20.7	26.8	13.1	21.6	6.7
A8-17	38.29	833843	816136	R_20F	99.90	86.00	88.4	20.2	53.3	20.7	26.7	13.1	21.6	6.7
A8-18	38.29	833843	816136	R_23F	109.65	95.75	88.4	20.1	53.3	20.7	26.7	13.1	21.6	6.7
A8-19	38.29	833843	816136	RF	119.90	106.00	88.4	20.0	53.3	20.7	26.7	13.1	21.5	6.7
A9-1	38.29	833832	816146	GF	13.90	1.50	153.2	32.2	54.3	21.2	27.3	13.5	21.6	6.8
A9-2	38.29	833832	816146	1F	20.30	6.40	142.2	29.4	54.1	21.1	27.1	13.4	21.6	6.8
A9-3	38.29	833832	816146	Clubhouse_1F	25.15	11.25	132.3	26.9	53.7	21.0	26.9	13.3	21.6	6.8
A9-4	38.29	833832	816146	Clubhouse_2F	30.15	16.25	117.8	25.1	53.5	20.9	26.9	13.2	21.6	6.8
A9-5	38.29	833832	816146	Transfer Plate	35.15	21.25	109.5	24.1	53.4	20.9	26.9	13.2	21.6	6.8
A9-6	38.29	833832	816146	R_1F	38.15	24.25	104.9	23.5	53.4	20.9	26.9	13.2	21.6	6.8
A9-7	38.29	833832	816146	R_2F	41.40	27.50	99.6	23.0	53.4	20.8	26.8	13.2	21.6	6.7
A9-8	38.29	833832	816146	R_3F	44.65	30.75	97.4	22.6	53.4	20.8	26.8	13.2	21.6	6.7
A9-9	38.29	833832	816146	R_4F	47.90	34.00	96.8	22.2	53.4	20.8	26.8	13.1	21.6	6.7
A9-10	38.29	833832	816146	R_5F	51.15	37.25	94.3	21.9	53.4	20.8	26.8	13.1	21.6	6.7
A9-11	38.29	833832	816146	R_6F	54.40	40.50	92.4	21.7	53.4	20.8	26.8	13.1	21.6	6.7
A9-12	38.29	833832	816146	R_7F	57.65	43.75	90.8	21.5	53.3	20.8	26.8	13.1	21.6	6.7
A9-13	38.29	833832	816146	R_8F	60.90	47.00	90.5	21.3	53.3	20.8	26.8	13.1	21.6	6.7
A9-14	38.29	833832	816146	R_11F	70.65	56.75	88.8	20.9	53.3	20.8	26.8	13.1	21.6	6.7
A9-15	38.29	833832	816146	R_14F	80.40	66.50	88.7	20.6	53.3	20.7	26.8	13.1	21.6	6.7
A9-16	38.29	833832	816146	R_17F	90.15	76.25	88.5	20.4	53.3	20.7	26.8	13.1	21.6	6.7
A9-17	38.29	833832	816146	R_20F	99.90	86.00	88.4	20.3	53.3	20.7	26.7	13.1	21.6	6.7
A9-18	38.29	833832	816146	R_23F	109.65	95.75	88.4	20.1	53.3	20.7	26.7	13.1	21.6	6.7
A9-19	38.29	833832	816146	RF	119.90	106.00	88.4	20.0	53.3	20.7	26.7	13.1	21.5	6.7
A10-1	38.29	833842	816156	GF	13.90	1.50	154.7	33.5	54.4	21.3	27.3	13.6	21.6	6.8
A10-2	38.29	833842	816156	1F	20.30	6.40	141.2	28.9	54.0	21.1	27.1	13.4	21.6	6.8
A10-3	38.29	833842	816156	Clubhouse_1F	25.15	11.25	130.8	26.8	53.7	21.0	26.9	13.3	21.6	6.8
A10-4	38.29	833842	816156	Clubhouse_2F	30.15	16.25	118.5	25.1	53.5	20.9	26.9	13.2	21.6	6.8
A10-5	38.29	833842	816156	Transfer Plate	35.15	21.25	109.4	24.0	53.4	20.9	26.9	13.2	21.6	6.8
A10-6	38.29	833842	816156	R_1F	38.15	24.25	104.1	23.5	53.4	20.9	26.9	13.2	21.6	6.8
A10-7	38.29	833842	816156	R_2F	41.40	27.50	100.9	23.0	53.4	20.8	26.9	13.2	21.6	6.7
A10-8	38.29	833842	816156	R_3F	44.65	30.75	97.4	22.6	53.4	20.8	26.8	13.2	21.6	6.7
A10-9	38.29	833842	816156	R_4F	47.90	34.00	96.1	22.2	53.4	20.8	26.8	13.1	21.6	6.7
A10-10	38.29	833842	816156	R_5F	51.15	37.25	93.0	21.9	53.4	20.8	26.8	13.1	21.6	6.7
A10-11	38.29	833842	816156	R_6F	54.40	40.50	92.5	21.7	53.4	20.8	26.8	13.1	21.6	6.7
A10-12	38.29	833842	816156	R_7F	57.65	43.75	90.8	21.5	53.3	20.8	26.8	13.1	21.6	6.7
A10-13	38.29	833842	816156	R_8F	60.90	47.00	90.5	21.3	53.3	20.8	26.8	13.1	21.6	6.7
A10-14	38.29	833842	816156	R_11F	70.65	56.75	88.8	20.9	53.3	20.8	26.8	13.1	21.6	6.7
A10-15	38.29	833842	816156	R_14F	80.40	66.50	88.6	20.6	53.3	20.7	26.8	13.1	21.6	6.7
A10-16	38.29	833842	816156	R_17F	90.15	76.25	88.5	20.4	53.3	20.7	26.8	13.1	21.6	6.7
A10-17	38.29	833842	816156	R_20F	99.90	86.00	88.4	20.2	53.3	20.7	26.7	13.1	21.6	6.7
A10-18	38.29	833842	816156	R_23F	109.65	95.75	88.4	20.1	53.3	20.7	26.7	13.1	21.6	6.7
A10-19	38.29	833842	816156	RF	119.90	106.00	88.4	20.0	53.3	20.7	26.7	13.1	21.5	6.7

**Appendix 4-19 Contour Map of NO<sub>2</sub>, RSP, FSP**



**Appendix: 4.19**

**Title:** Contour Map of the 19th Highest Hourly Average Concentration of NO<sub>2</sub> in µgm<sup>-3</sup>  
(Assessment Level: 1.5m Above Ground) (AQO standard: 200µgm<sup>-3</sup>)

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

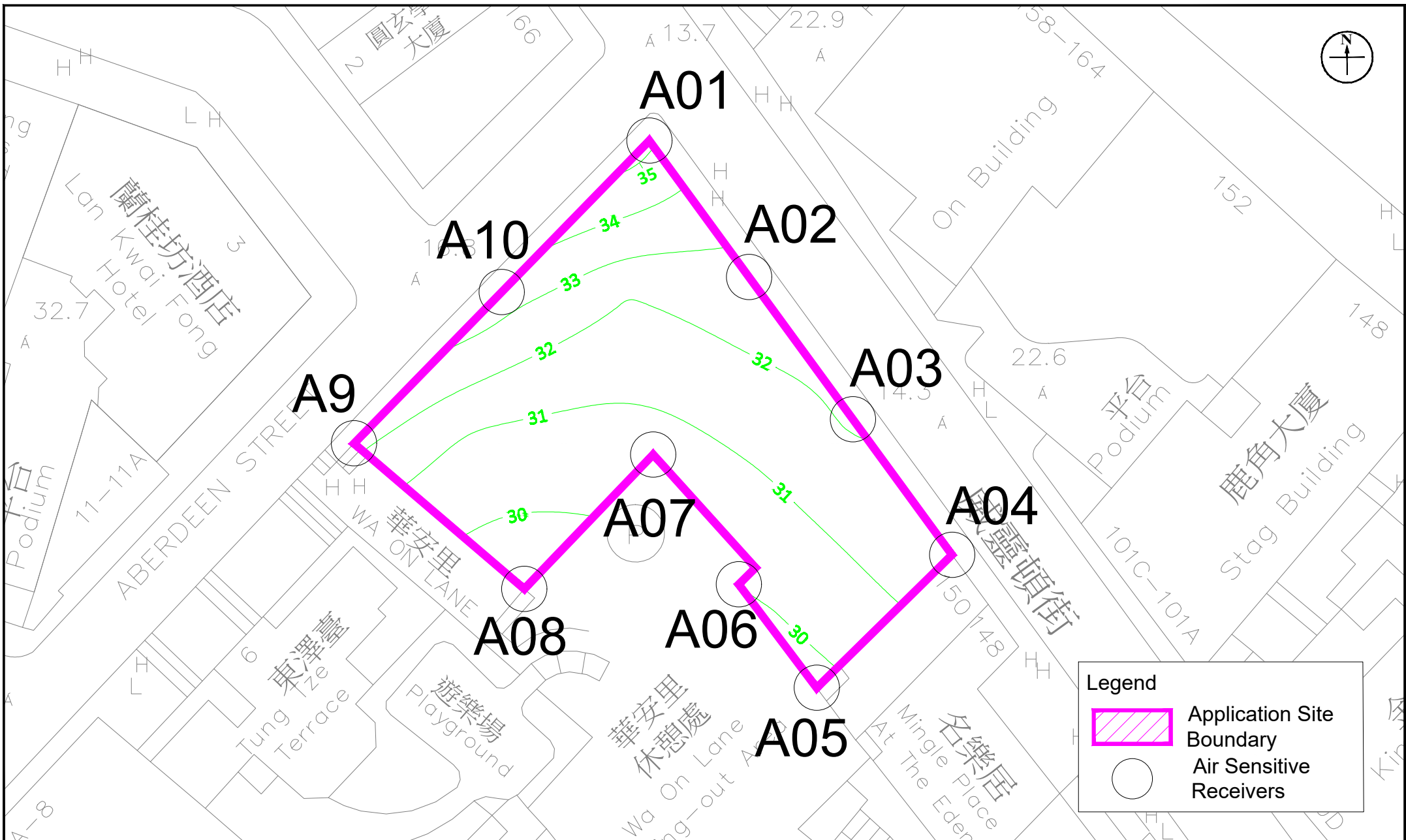


Drawn by: SC

Checked by: CC

Rev.: 1.2

Date: Jun 2024



**Appendix: 4.19**

**Title:** Contour Map of Annual Average Concentration of NO<sub>2</sub> in µgm<sup>-3</sup>  
(Assessment Level: 1.5m Above Ground) (AQO standard: 40µgm<sup>-3</sup>)

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

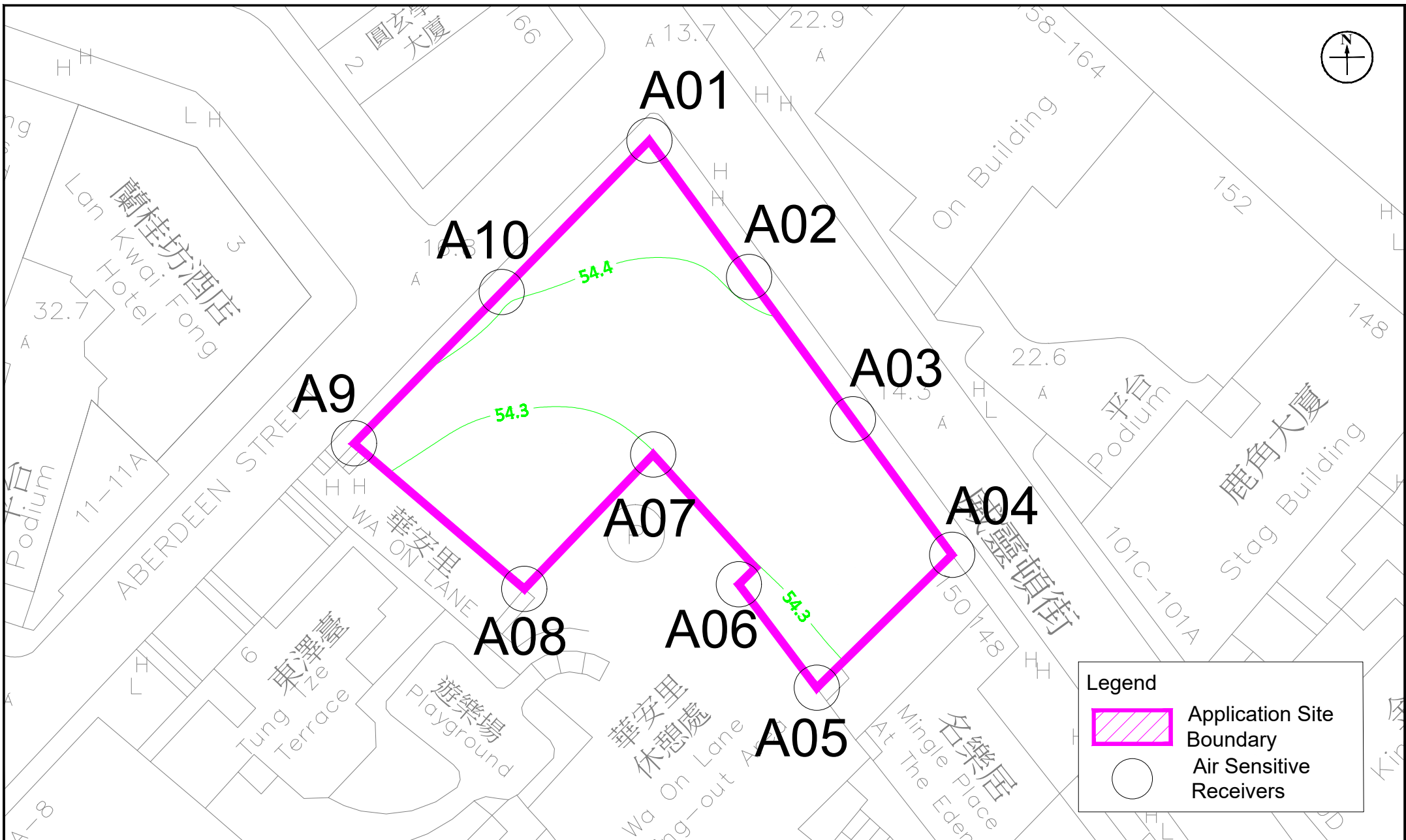


Drawn by: SC

Checked by: CC

Rev.: 1.2

Date: Jun 2024

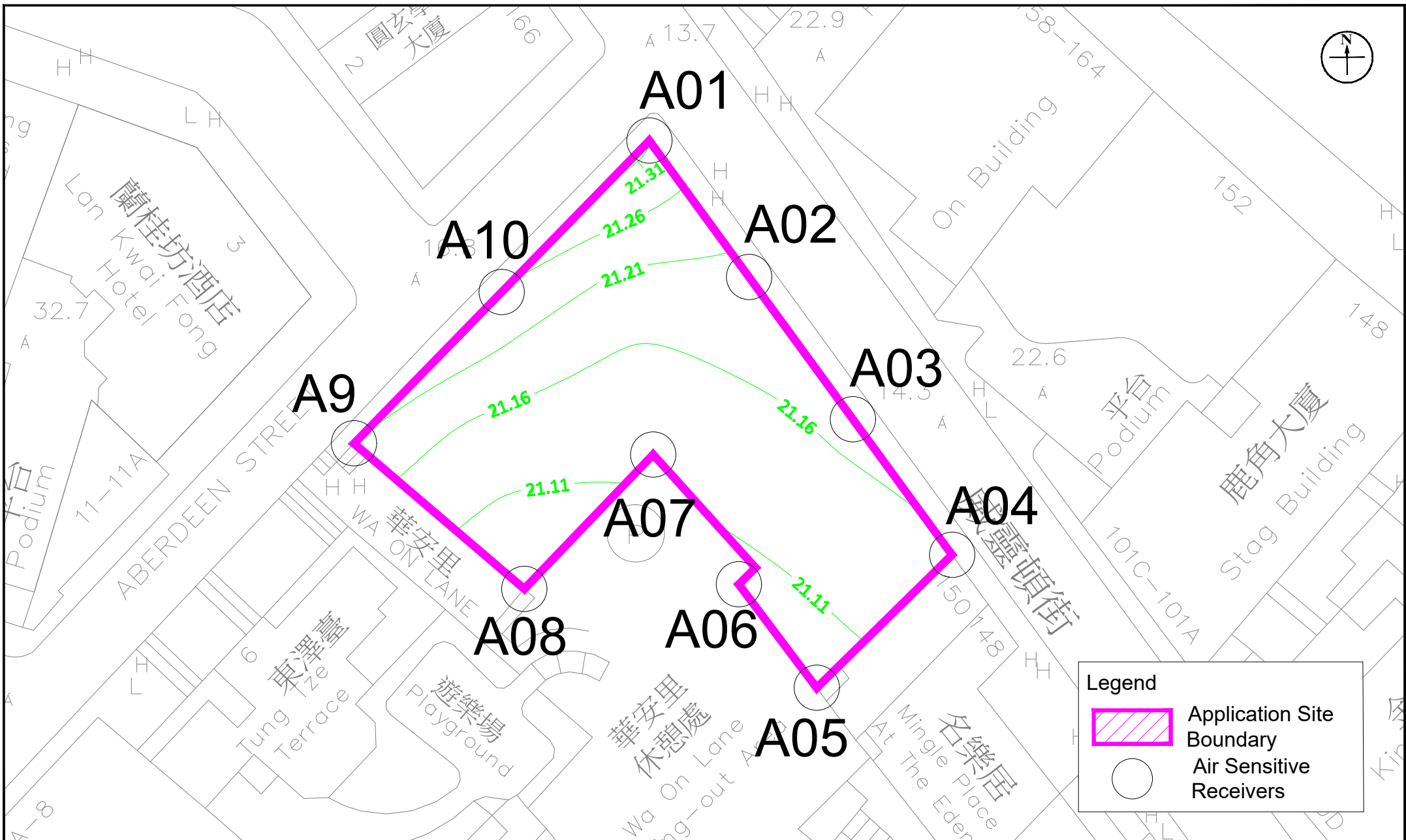


**Appendix: 4.19**

**Title:** Contour Map of the 10th Highest Daily Average Concentration of RSP in  $\mu\text{gm}^{-3}$   
 (Assessment Level: 1.5m Above Ground) (AQO standard:  $100\mu\text{gm}^{-3}$ )

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

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Checked by:	CC
Rev.:	1.2
Date:	Jun 2024



**Appendix: 4.19**

**Title:** Contour Map of the Annual Average Concentration of RSP in  $\mu\text{gm}^{-3}$   
 (Assessment Level: 1.5m Above Ground) (AQO standard:  $50\mu\text{gm}^{-3}$ )

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan

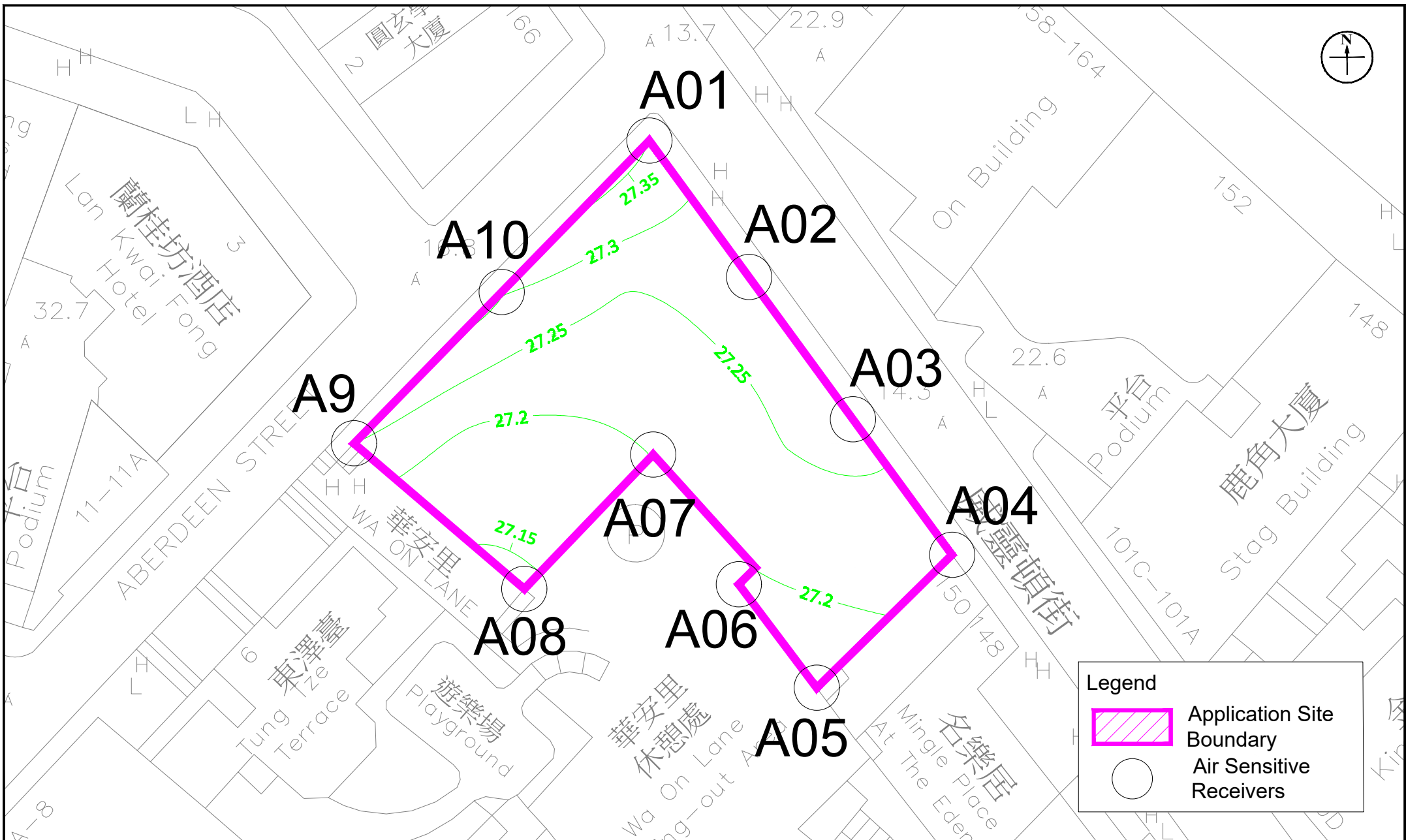


Drawn by: SC

Checked by: CC

Rev.: 1.2

Date: Jun 2024



**Appendix: 4.19**

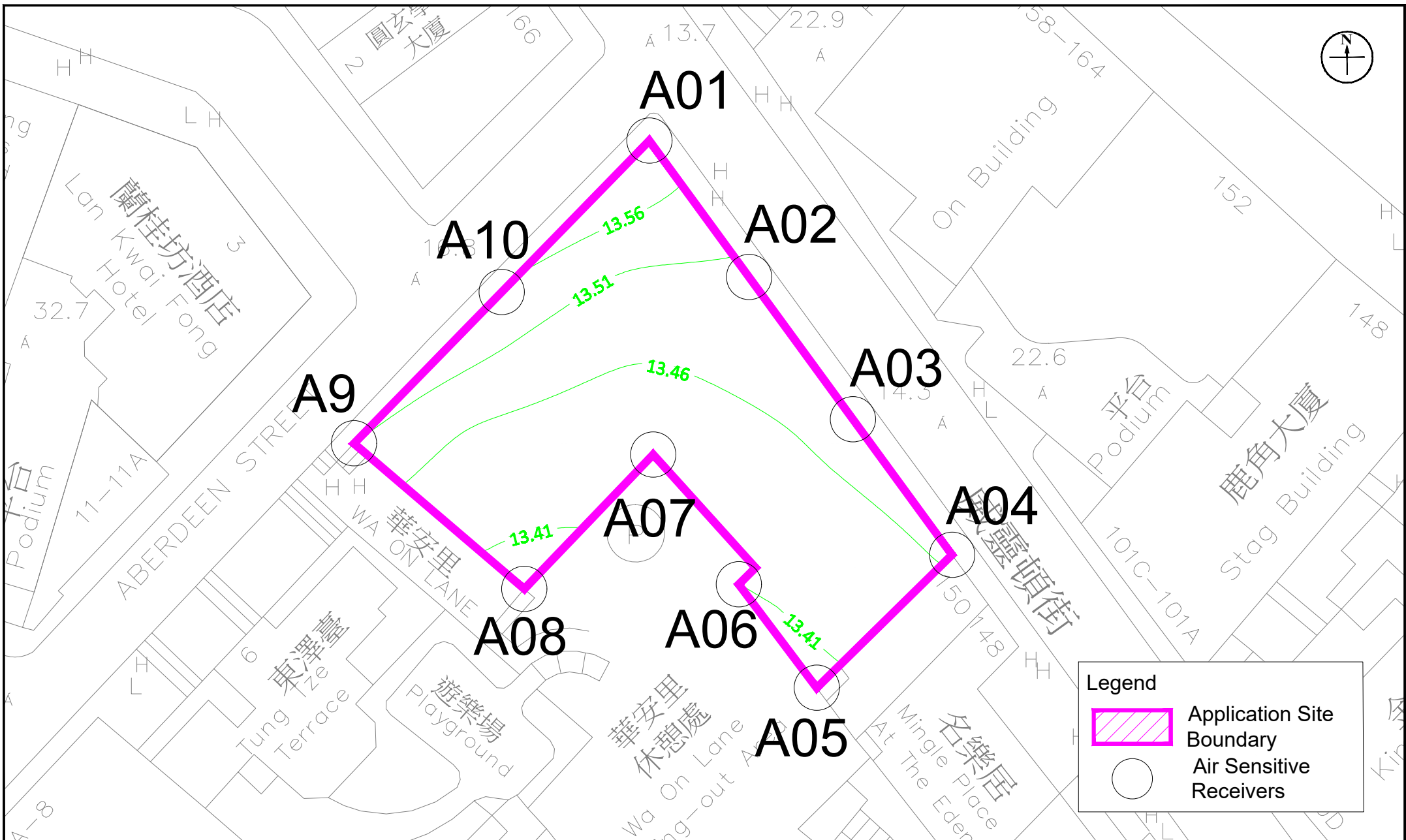
**Title:** Contour Map of the 36th Highest Daily Average Concentration of FSP in  $\mu\text{gm}^{-3}$   
(Assessment Level: 1.5m Above Ground) (AQO standard:  $50\mu\text{gm}^{-3}$ )

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan



Drawn by:	SC
Checked by:	CC
Rev.:	1.2
Date:	Jun 2024





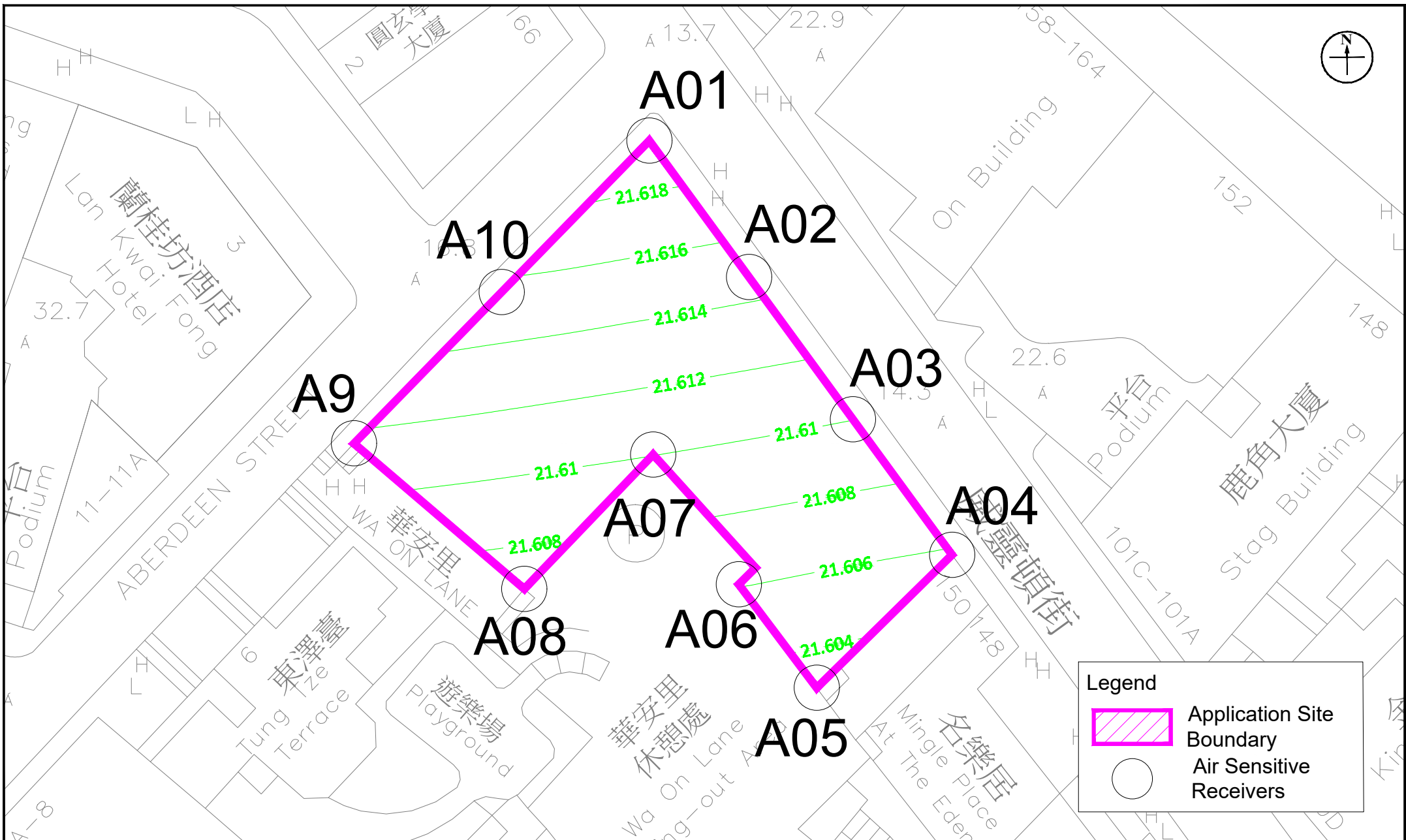
**Appendix: 4.19**

**Title:** Contour Map of the Annual Average Concentration of FSP in  $\mu\text{g}/\text{m}^3$   
(Assessment Level: 1.5m Above Ground) (AQO standard:  $25\mu\text{g}/\text{m}^3$ )

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan



Drawn by:	SC
Checked by:	CC
Rev.:	1.2
Date:	Jun 2024



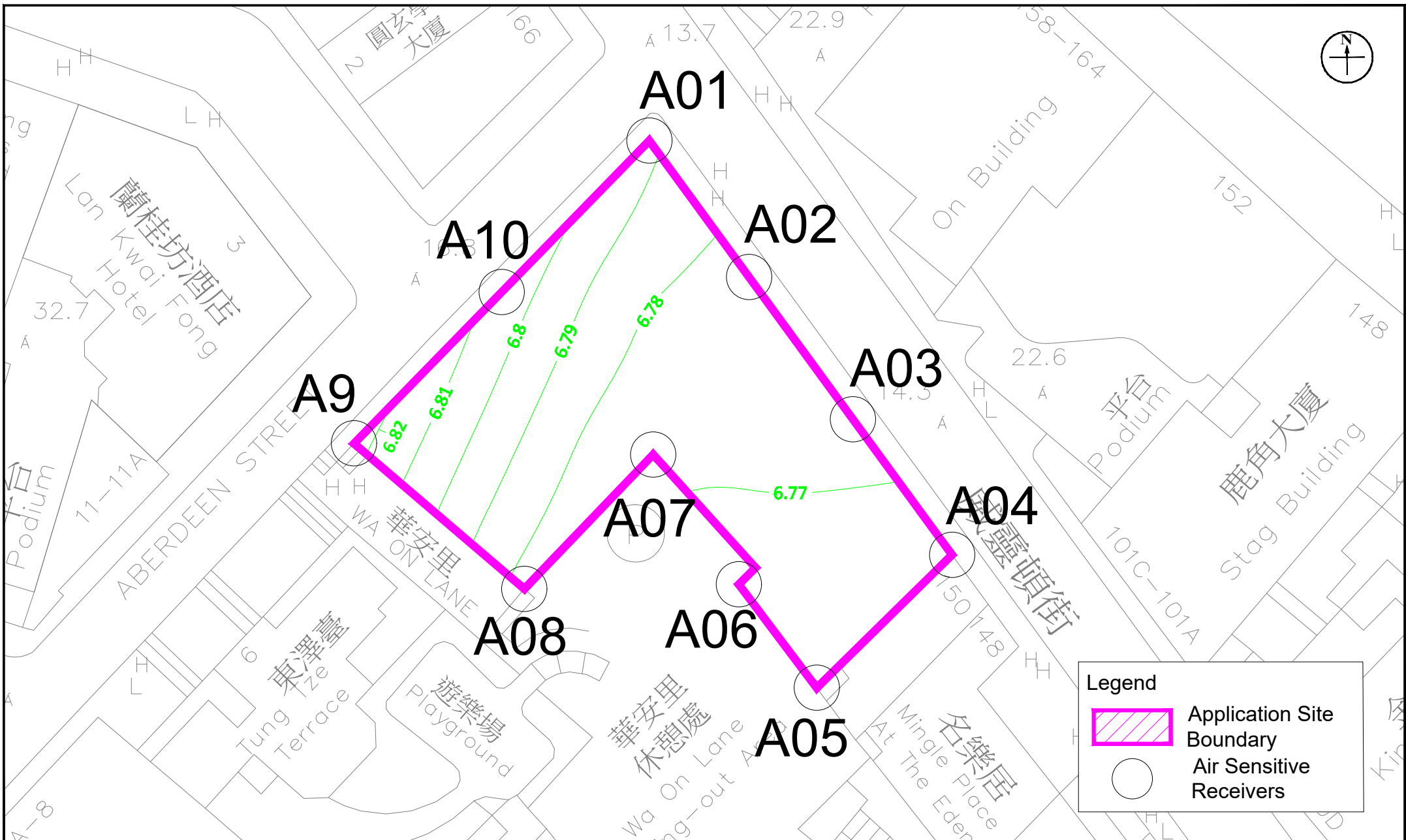
**Appendix: 4.19**

**Title:** Contour Map of the 4th Highest 10-minute Average Concentration of SO<sub>2</sub> in  $\mu\text{g}\text{m}^{-3}$   
 (Assessment Level: 1.5m Above Ground) (AQO standard:  $500\mu\text{g}\text{m}^{-3}$ )

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan



Drawn by:	SC
Checked by:	CC
Rev.:	1.2
Date:	Jun 2024



**Appendix: 4.19**

**Title:** Contour Map of the 4th Highest Daily Average Concentration of SO<sub>2</sub> in  $\mu\text{gm}^{-3}$   
 (Assessment Level: 1.5m Above Ground) (AQO standard:  $50\mu\text{gm}^{-3}$ )

**Project:** Proposed Flat with Shop and Services/Eating Places at Nos. 152 – 164 Wellington Street in Sheung Wan



Drawn by: SC

Checked by: CC

Rev.: 1.2

Date: Jun 2024

**Appendix 4-20 Correspondences to Operators**

## Billy Fan

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**From:** Susan Chan  
**Sent:** Wednesday, November 1, 2023 9:36 AM  
**To:** enquiry@turbojet.com.hk  
**Cc:** Billy Fan  
**Subject:** Enquiry for Vessel Engine Information at Hong Kong Macau Ferry Terminal

Dear Sir or Madam,

We (Ramboll Hong Kong Limited, an environmental consultant company) are commissioned by the project proponent to assess air quality impact on the proposed residential-commercial mixed development at Wellington Street.

In order to prepare for air quality impact assessment, we would be grateful if you can provide the below information of the ferries operated at Hong Kong Macau Ferry Terminal by our company:

1. Engine powers,
2. Engine load factors (travelling),
3. Engine load factors (idling), and
4. Time-in-modes

Should you have any questions on this enquiry, please do not hesitate to contact me, or our Billy Fan at 3465 2828 (email: [bfan@ramboll.com](mailto:bfan@ramboll.com)).

Kind regards

**Susan Chan**

Assistant Environmental Consultant

D +852 3465 2848

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21st Floor  
BEA Harbour View Centre  
56 Gloucester Road  
Wan Chai  
Hong Kong  
<https://ramboll.com>

Ramboll Hong Kong Limited

Classification: Confidential

## Billy Fan

---

**From:** Susan Chan  
**Sent:** Wednesday, November 1, 2023 9:36 AM  
**To:** customer@cotaiwaterjet.com  
**Cc:** Billy Fan  
**Subject:** Enquiry for Vessel Engine Information at Hong Kong Macau Ferry Terminal

Dear Sir or Madam,

We (Ramboll Hong Kong Limited, an environmental consultant company) are commissioned by the project proponent to assess air quality impact on the proposed residential-commercial mixed development at Wellington Street.

In order to prepare for air quality impact assessment, we would be grateful if you can provide the below information of the ferries operated at Hong Kong Macau Ferry Terminal by our company:

1. Engine powers,
2. Engine load factors (travelling),
3. Engine load factors (idling), and
4. Time-in-modes

Should you have any questions on this enquiry, please do not hesitate to contact me, or our Billy Fan at 3465 2828 (email: [bfan@ramboll.com](mailto:bfan@ramboll.com)).

Kind regards

**Susan Chan**

Assistant Environmental Consultant

D +852 3465 2848

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Wan Chai  
Hong Kong  
<https://ramboll.com>

Ramboll Hong Kong Limited

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## Billy Fan

---

**From:** Anna Wu  
**Sent:** Thursday, February 22, 2024 11:10 AM  
**To:** info@skyshuttlehk.com  
**Cc:** Billy Fan; Susan Chan  
**Subject:** Request for Information of Helicopter Flight Schedule and Helicopter information

Dear Sir/Madam,

**Environmental Assessment for Section 16 Planning Application for Proposed Composite Redevelopment at 152-164 Wellington Street**  
**Request for Information of Helicopter Flight Schedule and Helicopter information**

We are the environmental consultant employed by the project proponent for conducting an Environmental Assessment for Section 16 Planning Application for proposed composite redevelopment at 152-164 Wellington Street, Central.

We would like to have some enquires regarding the helicopter emission. We would be grateful if you could provide the following information for the purpose of Environmental Assessment:

Operation Mode

1. Operation Time
2. Operation Frequency of helicopter

Helicopter information

1. Helicopter Model
2. Engine used by the helicopter
3. Maximum Shaft Horsepower per Engine

Due to the urgency of the project, we would be much appreciated if you could provide the requested information by **5 March 2024**.

Should you have any queries, please do not hesitate to contact the undersigned or our Susan Chan at 3465 2848. We sincerely seek your feedback on this matter. Thank you in advance for any assistance you can provide.

Yours faithfully,  
For and on behalf of  
Ramboll Hong Kong Limited

Kind regards  
**Anna Wu**

Assistant Environmental Consultant

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