



Culture, Sports and Tourism Bureau
The Government of the Hong Kong Special Administrative Region
of the People's Republic of China



Environmental Permit No. EP- 544/2017

Kai Tak Sports Park – Investigation

Environmental Team Leader Certification

Reference Document /Plan

Document/Plan to be Certified:	Noise Mitigation Plan
Date of Report:	September 2023 (Rev.4)
Date received by ETL:	27 September 2023

Reference EP Condition

Environmental Permit Condition:	2.20
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If there are any change(s) to the noise mitigation measures in the NMP, the Permit Holder shall, no later than one month before the implementation of such change(s), deposit with the Director three hard copies and one electronic copy of an update to the NMP (the Updated NMP). The Updated NMP shall show clearly the proposed change(s). Before submission to the Director, the NMP or any Updated NMP shall be certified by the ET Leader and verified by the IEC as conforming to the relevant information and recommendations on noise mitigation measures contained in the approved EIA report (Register No. AEIAR-204/2017), or otherwise approved by the Director. All noise mitigation measures recommended in the NMP or any Updated NMP shall be fully implemented. The Permit Holder shall make available additional copies of the NMP or any Updated NMP to the Director upon his request.

ETL Certification

I hereby certify that the above reference plan complies with the above referenced condition of EP-544/2017.

Mr Sunny Chan
Environmental Team Leader

Date: 27 September 2023



Environmental Permit No. EP-544/2017

Kai Tak Sports Park - Investigation

Independent Environmental Checker Verification


Reference Document/Plan

Document/Plan to be Certified / Verified:	Noise Mitigation Plan
Date of Report:	September 2023 (Rev. 4)
Date received by IEC:	26 September 2023

Reference EP Condition

Environmental Permit Condition:	2.19 & 2.20
<p>The Permit Holder shall, no later than one month before the commencement of construction of the Project or otherwise approved by the Director, deposit with the Director three hard copies and one electronic copy of Noise Mitigation Plan(s) (the NMP). The NMP shall include details, implementation programme, maintenance and management schedules of the required noise mitigation measures for the Project.</p> <p>If there are any change(s) to the noise mitigation measures in the NMP, the Permit Holder shall, no later than one month before the implementation of such change(s), deposit with the Director three hard copies and one electronic copy of an update to the NMP (the Updated NMP). The Updated NMP shall show clearly the proposed change(s). Before submission to the Director, the NMP or any Updated NMP shall be certified by the ET Leader and verified by the IEC as conforming to the relevant information and recommendations on noise mitigation measures contained in the approved EIA report (Register No. AEIAR-204/2017), or otherwise approved by the Director. All noise mitigation measures recommended in the NMP or any Updated NMP shall be fully implemented. The Permit Holder shall make available additional copies of the NMP or any Updated NMP to the Director upon his request.</p>	

IEC Verification

I hereby verify that the above referenced document / plan complies with the above referenced condition of EP-544/2017.	
	
Ms Mandy To Independent Environmental Checker	Date: 27 September 2023

Kai Tak Sports Park Ltd.

**Design, Construction and
Operation of the Kai Tak Sports
Park**

Updated Noise Mitigation Plan

OAP-GEN-SW-EN-00-EMT-NMP-00003

Rev. 04 | September 2023

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 266006-70

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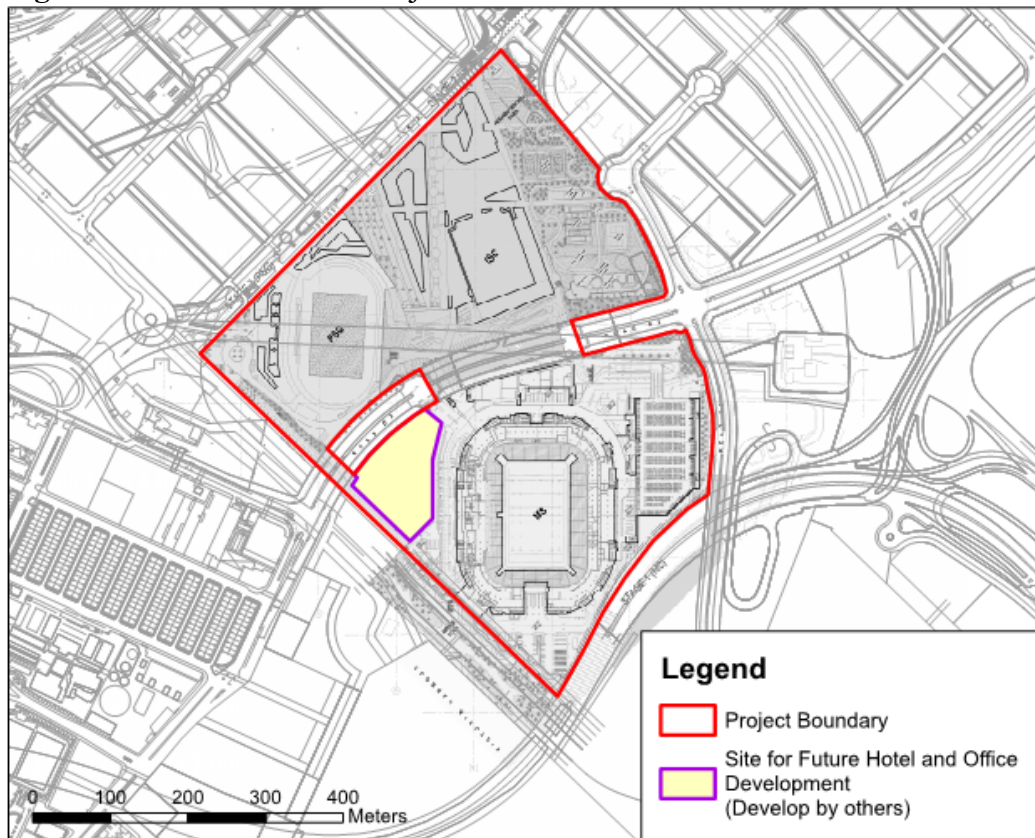
Figure 1.1	Location of the Project
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Figure 2.1	Typical design of movable noise barrier

1 Introduction

1.1 Background

1.1.1.1 The Environmental Permit (EP) (i.e. EP-544/2017) for the approved Environmental Impact Assessment Report (EIA) for Kai Tak Multi-purpose Sports Complex (Former name of Kai Tak Sports Park) was issued on 8th September 2017. The location of the Project according to the EP is shown in **Figure 1.1**.

Figure 1.1: Location of the Project in EP



1.1.1.2 As stipulated in Condition 2.19 of the EP, the Permit Holder shall, no later than one month before the commencement of construction of the Project or otherwise approved by Director of Environmental Protection (DEP), deposit with the DEP with three hard copies and one electronic copy of the Noise Mitigation Plan (NMP).

1.1.1.3 For the Kai Tak Sports Park project, Home Affairs Bureau is the Project Proponent and acts as Permit Holder. Kai Tak Sports Park Limited is nominated as the Contactor Party (CP). Hip Hing Engineering Co. Ltd. (HHE), as nominated first tier subcontractor under Kai Tak Sports Park Limited (KTSPL), will be responsible for carrying out construction works for whole development as well as associated environmental impact mitigation measures.

1.1.1.4 The first NMP was submitted on 8th March 2019 to outline the noise mitigation measures adopted. The second NMP was submitted on 3rd

September 2019 to provide the design of mitigation measures for the building envelope of the Main Stadium and the Public Sports Ground.

1.1.1.5 The third NMP submission mainly contains updated information on the design of the night time crowd dispersal routes.

1.1.1.6 The NMP was approved by EPD on 20 March 2020.

1.1.1.7 Subsequent to the approved NMP by EPD, the project design has been progressing and the management structure has changed. There are also changes to the future hotel and office development to the west of the Stadium. This updated NMP is prepared as a result of this design development mainly on fixed roof, entrance doors and south façade glazing of the Main Stadium.

1.2 Purpose of the updated NMP

1.2.1.1 The updated NMP is prepared to comply with Condition 2.19 and Condition 2.20 of the EP. This updated NMP contains details, implementation programme, maintenance and management schedules of the required noise mitigation measures for the Project.

1.3 Scale and Scope of Kai Tak Sports Park

1.3.1.1 The Project comprises the following elements which are considered as a Designated Project (DP) as per Schedule 2, Part I of the EIA Ordinance:

- O.6 – An open air concert venue with a capacity to accommodate more than 10,000 persons; and
- O.7. – An outdoor sporting facility with a capacity to accommodate more than 10,000 persons.

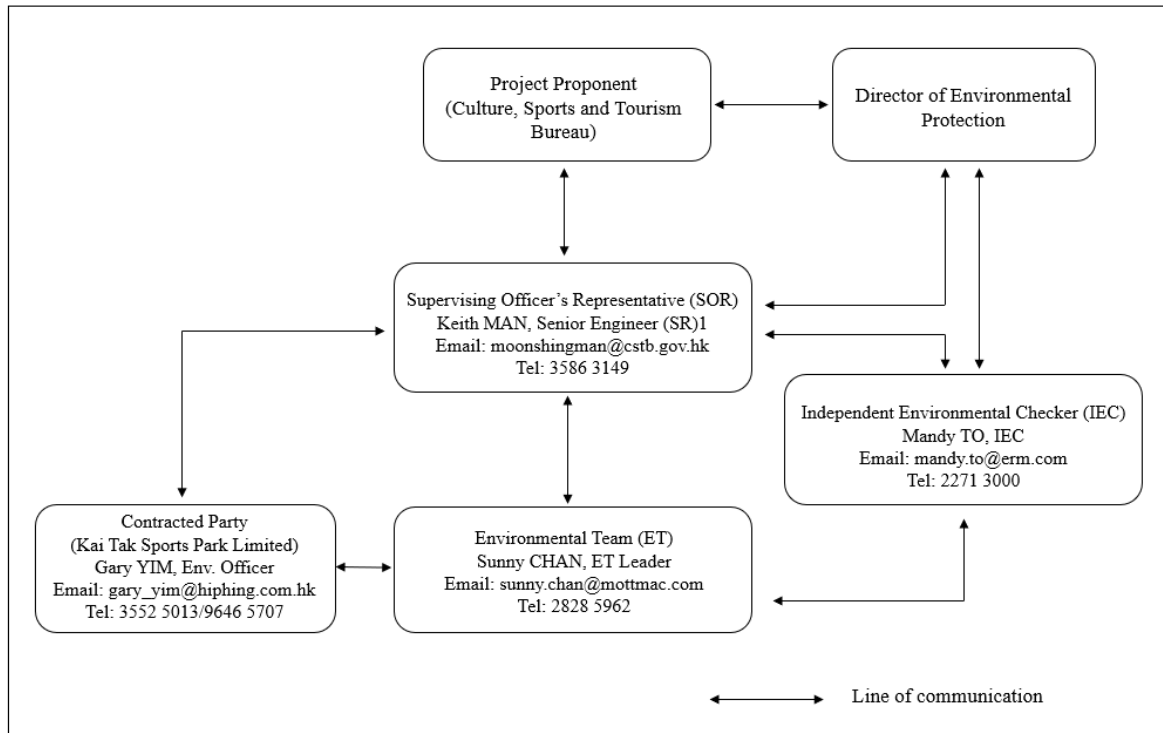
1.3.1.2 The Project comprises the construction and operation of the following key elements:

- A Main Stadium (MS);
- A Public Sports Ground (PSG);
- An Indoor Sports Centre (ISC); and
- Other ancillary/supporting facilities such as car parks, retail, food and beverage outlets; an office building and a hotel (provided by other).

1.4 Management Structure

1.4.1.1 The management structure for the environmental works of the Project is indicated in **Figure 1.2**.

Figure 1.2: Management structure for environmental works of the Project



1.5 Structure of Updated NMP

1.5.1.1 The structure of this updated NMP is as follows:

Chapter	Title	Aims
1	Introduction	Provides project background, purpose of the updated NMP, project scale and scope, management structure, and structure of this NMP.
2	Construction Phase	Presents the implementation details of mitigation measures during the construction phase.
3	Operational Phase	Presents the implementation details of mitigation measures during the operational phase.
4	Conclusion	Provides a summary of the updated NMP.

2 Construction Phase

2.1 Major Construction Activities

2.1.1.1 The Project will involve the following major construction activities which may induce noise impacts to nearby Noise Sensitive Receivers (NSRs):

- Piling works;
- Pile cap construction;
- Foundation works including excavations, site preparation and plants mobilizations;
- Superstructure including steel fixings, temporary formworks and scaffoldings;
- Builder works including materials transportation and interior works; and
- External works including loading/ unloading materials and road works.

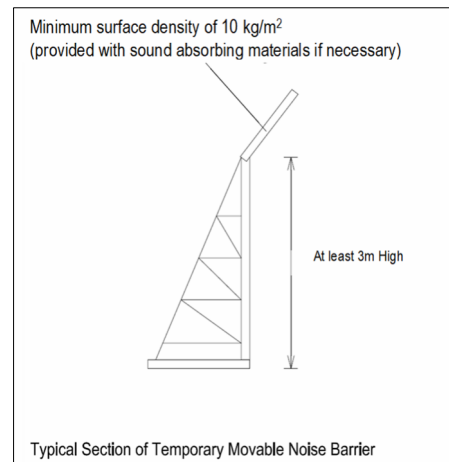
2.2 Noise Mitigation Measures

2.2.1.1 All the associated noise mitigation measures as stated in the approved EIA report for Kai Tak Multi-purpose Sports Complex (AEIAR-204/2017) are adopted in the updated NMP unless otherwise stipulated as a result of design development. Mitigation measures with implementation programme, maintenance and management schedules are provided as follows.

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Programme ^[1]	Maintenance and Management Parties	Maintenance and Management Schedule
<i>(a) Piling works</i>							
5.9	N1	Adopt good site practice, such as throttle down or switch off equipment unused or intermittently used between works;	Noisy equipment, including cranes, trucks and excavators etc. will be shut down between work periods or will be throttled down to a minimum.	HHE	Q2/2019 – Q1/2020	KT SPL, HHE	As required
5.9	N2	Regular maintenance of equipment to prevent noise emission due to impair;	Maintenance checking will be conducted during the site inspection at least once a week. In case abnormal noise is generated by the PME, site personnel will stop using the equipment, carry out maintenance check and repair the PME item.	HHE	Q2/2019 – Q1/2020	KT SPL, HHE	As required
5.9	N5	Make good use of structures for noise screening;	Material stockpiles and site office can be placed as structures in between the NSRs and the PME item/noisy construction activities for noise screening.	HHE	Q2/2019 – Q1/2020	KT SPL, HHE	As required
5.9	N6	Use Quality Powered Mechanical Equipment (QPME) and quiet equipment which produces low noise level;	QPME will be used for construction works.	HHE	Q2/2019 – Q1/2020	KT SPL, HHE	As required

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Programme ^[1]	Maintenance and Management Parties	Maintenance and Management Schedule
5.9	N7	Erect movable noise barriers of 3m height to shed large plant equipment;	Movable noise barriers of at least 3m height will be provided at the site to shed noisy plant equipment and noisy activities. Movable noise barriers will be made of steel with a minimum surface density of 10 kg/m ² . They will be provided with absorbing materials and bend top if necessary. When fabricating the noise barrier, the length will be at least five times greater than its height, or as otherwise justifiable to achieve 5dB(A) noise reduction. A sketch of movable noise barrier is provided in Figure 2.1 .	HHE	Q2/2019 – Q1/2020	KT SPL, HHE	As required

Figure 2.1: Typical design of movable noise barrier



EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Programme^[1]	Maintenance and Management Parties	Maintenance and Management Schedule
5.9	N3	Position mobile noisy equipment in locations away from NSRs and point the noise sources to direction away from NSRs;	For mobile noisy equipment, such as air compressors, generators and trucks etc., they will be sited away from NSRs as far as practicable. If the plant is known to emit noise strongly in one direction, they will, where possible, be oriented away from nearby NSRs. Otherwise, movable noise barriers will be provided to prevent the direct line of sight from the NSRs to the noise sources.	HHE	Q2/2019 – Q1/2020	KT SPL, HHE	As required
5.9	N4	Use of silencer or muffler for equipment;	Mufflers with sound absorbing materials will be used for noise reduction. In addition, regular inspection and maintenance would also be provided by the site personnel to ensure effective noise mitigation by mufflers.	HHE	Q2/2019 – Q1/2020	KT SPL, HHE	As required
5.9	N8	Carry out regular site inspection to audit the implementation of mitigation measures; and	Regular site inspection will be carried out by ET and HHE's representatives once a week to audit the implementation of mitigation measures. Site audit will be carried out by IEC at least once a month to verify the conditions.	HHE, ET, IEC	Q2/2019 – Q1/2020	CSTB, SO, EPD	As required
5.9	N9	Carry out noise monitoring and audit throughout the construction period.	Noise monitoring will be carried out by ET once a week during the construction period according to EM&A manual, subject to further	ET, IEC	Q2/2019 – Q1/2020	CSTB, SO, EPD	As required

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Programme ^[1]	Maintenance and Management Parties	Maintenance and Management Schedule
			agreement with IEC and EPD. Monitoring results will be verified by IEC.				
<i>(b) Pile cap construction</i>							
5.9	N1	Adopt good site practice, such as throttle down or switch off equipment unused or intermittently used between works;	Noisy equipment, including cranes, trucks, excavators and breakers etc. will be shut down between work periods or will be throttled down to a minimum.	HHE	Q4/2019 – Q4/2020	KTSP, HHE	As required
5.9	N2	Regular maintenance of equipment to prevent noise emission due to impair;	Maintenance checking will be conducted during the site inspection at least once a week. In case abnormal noise is generated by the PME, site personnel will stop using the equipment, carry out maintenance check and repair the PME item.	HHE	Q4/2019 – Q4/2020	KTSP, HHE	As required
5.9	N5	Make good use of structures for noise screening;	Material stockpiles and site office can be placed in between the NSRs and the PME item/noisy construction activities as structures for noise screening.	HHE	Q4/2019 – Q4/2020	KTSP, HHE	As required

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Programme ^[1]	Maintenance and Management Parties	Maintenance and Management Schedule
5.9	N6	Use Quality Powered Mechanical Equipment (QPME) and quiet equipment which produces low noise level;	QPME will be used for construction works.	HHE	Q4/2019 – Q4/2020	KTSP, HHE	As required
5.9	N7	Erect movable noise barriers of 3m height to shed large plant equipment;	Movable noise barriers of at least 3m height will be provided at the site to shed noisy plant equipment and noisy activities. Movable noise barriers will be made of steel with a minimum surface density of 10 kg/m ² . They will be provided with absorbing materials and bend top if necessary. When fabricating the noise barrier, the length will be at least five times greater than its height, or as otherwise justifiable to achieve 5dB(A) noise reduction. A sketch of movable noise barrier is provided in Figure 2.1 .	HHE	Q4/2019 – Q4/2020	KTSP, HHE	As required
5.9	N3	Position mobile noisy equipment in locations away from NSRs and point the noise sources to direction away from NSRs;	For mobile noisy equipment, such as air compressors, generators and trucks etc., they will be sited away from NSRs as far as practicable. If the plant is known to emit noise strongly in one direction, they will, where possible, be oriented away from nearby NSRs. Otherwise, movable noise barriers will be	HHE	Q4/2019 – Q4/2020	KTSP, HHE	As required

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Programme ^[1]	Maintenance and Management Parties	Maintenance and Management Schedule
			provided to prevent the direct line of sight from the NSRs to the noise sources.				
5.9	N8	Carry out regular site inspection to audit the implementation of mitigation measures; and	Regular site inspection will be carried out by ET and HHE's representatives once a week to audit the implementation of mitigation measures. Site audit will be carried out by IEC at least once a month to verify the conditions.	HHE, ET, IEC	Q4/2019 – Q4/2020	CSTB, SO, EPD	As required
5.9	N9	Carry out noise monitoring and audit throughout the construction period.	Noise monitoring will be carried out by ET once a week during the construction period according to EM&A manual, subject to further agreement with IEC and EPD. Monitoring results will be verified by IEC.	ET, IEC	Q4/2019 – Q4/2020	CSTB, SO, EPD	As required
<i>(c) Foundation works</i>							
5.9	N1	Adopt good site practice, such as throttle down or switch off equipment unused or intermittently used between works;	Noisy equipment, including cranes, trucks and excavators etc. will be shut down between work periods or will be throttled down to a minimum.	HHE	Q2/2019 – Q2/2020	KTSP, HHE	As required
5.9	N2	Regular maintenance of equipment to prevent noise emission due to impair;	Maintenance checking will be conducted during the site inspection at least once a week. In case abnormal noise is generated by the PME, site personnel will stop using the	HHE	Q2/2019 – Q2/2020	KTSP, HHE	As required

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Programme ^[1]	Maintenance and Management Parties	Maintenance and Management Schedule
			equipment, carry out maintenance check and repair the PME item.				
5.9	N5	Make good use of structures for noise screening;	Material stockpiles and site office can be placed as structures in between the NSRs and the PME item/noisy construction activities for noise screening.	HHE	Q2/2019 – Q2/2020	KT SPL, HHE	As required
5.9	N6	Use Quality Powered Mechanical Equipment (QPME) and quiet equipment which produces low noise level;	QPME will be used for construction works.	HHE	Q2/2019 – Q2/2020	KT SPL, HHE	As required
5.9	N7	Erect movable noise barriers of 3m height to shed large plant equipment;	Movable noise barriers of at least 3m height will be provided at the site to shed noisy plant equipment and noisy activities. Movable noise barriers will be made of steel with a minimum surface density of 10 kg/m ² . They will be provided with absorbing materials and bend top if necessary. When fabricating the noise barrier, the length will be at least five times greater than its height, or as otherwise justifiable to achieve 5dB(A) noise reduction. A sketch of movable noise barrier is provided in Figure 2.1 .	HHE	Q2/2019 – Q2/2020	KT SPL, HHE	As required

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Programme^[1]	Maintenance and Management Parties	Maintenance and Management Schedule
5.9	N3	Position mobile noisy equipment in locations away from NSRs and point the noise sources to direction away from NSRs;	For mobile noisy equipment, such as generators, cranes, trucks and concrete pumps etc., they will be sited away from NSRs as far as practicable. If the plant is known to emit noise strongly in one direction, they will, where possible, be oriented away from nearby NSRs. Otherwise, movable noise barriers will be provided to prevent the direct line of sight from the NSRs to the noise sources.	HHE	Q2/2019 – Q2/2020	KTSP, HHE	As required
5.9	N8	Carry out regular site inspection to audit the implementation of mitigation measures; and	Regular site inspection will be carried out by ET and HHE's representatives once a week to audit the implementation of mitigation measures. Site audit will be carried out by IEC at least once a month to verify the conditions.	HHE, ET, IEC	Q2/2019 – Q2/2020	CSTB, SO, EPD	As required
5.9	N9	Carry out noise monitoring and audit throughout the construction period.	Noise monitoring will be carried out by ET once a week during the construction period according to EM&A manual, subject to further agreement with IEC and EPD. Monitoring results will be verified by IEC.	ET, IEC	Q2/2019 – Q2/2020	CSTB, SO, EPD	As required

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Programme ^[1]	Maintenance and Management Parties	Maintenance and Management Schedule
<i>(d) Superstructure</i>							
5.9	N1	Adopt good site practice, such as throttle down or switch off equipment unused or intermittently used between works;	Noisy equipment, including cranes, trucks and excavators etc. will be shut down between work periods or will be throttled down to a minimum.	HHE	Q4/2019 – Q4/2022	KT SPL, HHE	As required
5.9	N2	Regular maintenance of equipment to prevent noise emission due to impair;	Maintenance checking will be conducted during the site inspection at least once a week. In case abnormal noise is generated by the PME, site personnel will stop using the equipment, carry out maintenance check and repair the PME item.	HHE	Q4/2019 – Q4/2022	KT SPL, HHE	As required
5.9	N6	Use Quality Powered Mechanical Equipment (QPME) and quiet equipment which produces low noise level;	QPME will be used for construction works.	HHE	Q4/2019 – Q4/2022	KT SPL, HHE	As required
5.9	N3	Position mobile noisy equipment in locations away from NSRs and point the noise sources to direction away from NSRs;	For mobile noisy equipment, such as air compressors, generators and saws etc., they will be sited away from NSRs as far as practicable. If the plant is known to emit noise strongly in one direction, they will, where	HHE	Q4/2019 – Q4/2022	KT SPL, HHE	As required

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Programme ^[1]	Maintenance and Management Parties	Maintenance and Management Schedule
			possible, be oriented away from nearby NSRs. Otherwise, movable noise barriers will be provided to prevent the direct line of sight from the NSRs to the noise sources.				
5.9	N8	Carry out regular site inspection to audit the implementation of mitigation measures; and	Regular site inspection will be carried out by ET and HHE's representatives once a week to audit the implementation of mitigation measures. Site audit will be carried out by IEC at least once a month to verify the conditions.	HHE, ET, IEC	Q4/2019 – Q4/2022	CSTB, SO, EPD	As required
5.9	N9	Carry out noise monitoring and audit throughout the construction period.	Noise monitoring will be carried out by ET once a week during the construction period according to EM&A manual, subject to further agreement with IEC and EPD. Monitoring results will be verified by IEC.	ET, IEC	Q4/2019 – Q4/2022	CSTB, SO, EPD	As required
<i>(e) Builder works</i>							
5.9	N1	Adopt good site practice, such as throttle down or switch off equipment unused or intermittently used between works;	Noisy equipment, including welders, drills/grinders and hoists etc. will be shut down between work periods or will be throttled down to a minimum.	HHE	Q1/2021 – Q4/2022	KTSP, HHE	As required

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Programme^[1]	Maintenance and Management Parties	Maintenance and Management Schedule
5.9	N2	Regular maintenance of equipment to prevent noise emission due to impair;	Maintenance checking will be conducted during the site inspection at least once a week. In case abnormal noise is generated by the PME, site personnel will stop using the equipment, carry out maintenance check and repair the PME item.	HHE	Q1/2021 – Q4/2022	KTSP, HHE	As required
5.9	N8	Carry out regular site inspection to audit the implementation of mitigation measures; and	Regular site inspection will be carried out by ET and HHE's representatives once a week to audit the implementation of mitigation measures. Site audit will be carried out by IEC at least once a month to verify the conditions.	HHE, ET, IEC	Q1/2021 – Q4/2022	CSTB, SO, EPD	As required
5.9	N9	Carry out noise monitoring and audit throughout the construction period.	Noise monitoring will be carried out by ET once a week during the construction period according to EM&A manual, subject to further agreement with IEC and EPD. Monitoring results will be verified by IEC.	ET, IEC	Q1/2021 – Q4/2022	CSTB, SO, EPD	As required
<i>(f) External works</i>							
5.9	N1	Adopt good site practice, such as throttle down or switch off equipment unused or intermittently used between works;	Noisy equipment, including welders, drills/grinders and hoists etc. will be shut down between work periods or will be throttled down to a minimum.	HHE	Q2/2020 – Q1/2023	KTSP, HHE	As required

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Programme^[1]	Maintenance and Management Parties	Maintenance and Management Schedule
5.9	N2	Regular maintenance of equipment to prevent noise emission due to impair;	Maintenance checking will be conducted during the site inspection at least once a week. In case abnormal noise is generated by the PME, site personnel will stop using the equipment, carry out maintenance check and repair the PME item.	HHE	Q2/2020 – Q1/2023	KTSP, HHE	As required
5.9	N8	Carry out regular site inspection to audit the implementation of mitigation measures; and	Regular site inspection will be carried out by ET and HHE's representatives once a week to audit the implementation of mitigation measures. Site audit will be carried out by IEC at least once a month to verify the conditions.	HHE, ET, IEC	Q2/2020 – Q1/2023	CSTB, SO, EPD	As required
5.9	N9	Carry out noise monitoring and audit throughout the construction period.	Noise monitoring will be carried out by ET once a week during the construction period according to EM&A manual, subject to further agreement with IEC and EPD. Monitoring results will be verified by IEC.	ET, IEC	Q2/2020 – Q1/2023	CSTB, SO, EPD	As required

Note:

[1] Construction works will be carried out between Q2 2019 and Q1 2023.

3 Operational Phase

3.1 Overview

3.1.1.1 All the associated noise mitigation measures as stated in the approved EIA report for Kai Tak Multi-purpose Sports Complex (AEIAR-204/2017) are adopted in the updated NMP unless otherwise stipulated as a result of design development.

3.2 Road Traffic Noise

3.2.1.1 No mitigation measures for road traffic noise are required by the Contracted Party within the Project Boundary according to the approved EIA and EP.

3.3 Noise from Sports Events

3.3.1.1 For the Main Stadium (MS), the following design basis has been adopted:

- The structure still comprises multiple layers of concrete walls, corridors and function rooms surrounding the stadium field, except for a glazed South Façade to connect with the harbour view, and entrance doors for safe ingress/egress.
- The sound transmission losses of the south façade glazing/cladding system are given in **Table 3.1** below.

Table 3.1: Sound transmission loss of the south façade glazing/cladding system adopted in the Odeon Model

Frequency, Hz	80	100	125	160	200	250	315	400	500	630
Transmission loss	28	30	25	26	31	33	35	37	38	39
Frequency, Hz	800	1000	1250	1600	2000	2500	3150	4000	5000	6300
Transmission loss	39	40	41	42	43	43	44	45	46	46

- The loudspeakers of public address system are suspended in two rows of line array formats over the MS and directed towards the spectator stands.
- Acoustic absorption panels will be provided underneath the fixed and retractable roofs of the MS to control reverberation.
- While a retractable roof system will be provided, the noise assessment is prepared for the updated design scheme with open roof. The noise assessment of the updated design scheme is detailed in **Appendix A**. Adverse noise impact on the representative NSRs is not anticipated.

3.3.1.2 For the Public Sports Ground (PSG), the following design basis have been adopted:

- The structure still comprises multiple layers of concrete walls, corridors and function rooms behind the seating area, except for glazing façade at the two back ends.

- The sound transmission losses of the end glazing façade systems are given in **Table 3.2** below.

Table 3.2: Sound transmission loss of the end glazing façade system adopted in the Odeon Model

Frequency, Hz	80	100	125	160	200	250	315	400	500	630
Transmission loss	28	30	25	26	31	33	35	37	38	39
Frequency, Hz	800	1000	1250	1600	2000	2500	3150	4000	5000	6300
Transmission loss	39	40	41	42	43	43	44	45	46	46

- The extent of the roof is updated to reflect the latest design.
- The loudspeakers of public address system are ceiling mounted on the underside of grandstand roof in two rows and directed towards the spectators.
- With a distributed loudspeakers system replacing the array speakers along the roof canopy front edge, the barrier screen dropped down from the roof canopy front edge is omitted.
- Acoustic absorption panels will be provided on the underside of the roof of the spectator stand.
- The noise assessment of the updated design is detailed in **Appendix B**. Adverse noise impact on the representative NSRs is not anticipated.

3.3.1.3 The above design updates for the MS and PSG would be adopted to comply with the EP conditions.

3.3.1.4 During the operational phase, there would be no major separately organised events to be held concurrently in the MS and the PSG. If an organized event is being held at the MS, community activities such as jogging, training, amateur ball games, and activities supporting the organized event in the MS such as warm up, hospitality, etc. may be held at the PSG.

3.4 Fixed Plant Noise

3.4.1.1 The noise impact for fixed plant will be determined by cumulative assessment with noise from sports events.

3.4.1.2 According to “Good Practices on Ventilation System Noise Control” issued by EPD, noisy equipment would be placed, wherever practicable, at a greater distance from receivers and behind some large enough obstruction (e.g. a building or a barrier) to avoid any direct line of sight between the receivers and noisy equipment. Silencers will be used to reduce noises from the air intakes and exhausts, whilst major fixed noise plants will be adequately screened or housed in plant rooms to comply with the noise criteria. The noise assessment of the updated design scheme was detailed in **Appendix A** and **B** for Main Stadium and Public Sports Ground respectively in the second NMP. Adverse noise impact on the representative NSRs is not anticipated.

3.5 Noise from Music, Singing and Instrument Performance Activities

- 3.5.1.1** Similarly, the structure of the MS will be soundproofing and completed with multiple layers of concrete walls, corridors and functional rooms surrounding the stadium field, except for the glazed South Façade to connect with the harbour view and entrance doors for safe ingress/egress. The noise assessment of the updated design scheme is detailed in **Appendix A** of this NMP. Adverse noise impact on the representative NSRs is not anticipated.
- 3.5.1.2** Noise monitoring will be provided by the event organisers for music, singing and instrument performance activities. The event organisers will appoint appropriate persons to monitor the noise level at the most affected receiver during both the rehearsal/system check and main event. The appropriate person should also measure the background noise levels and monitor closely the noise levels during the activity. The appropriate person should provide feedback to the organizer for immediate action, such as adjustment of the speaker output level, whenever necessary for avoidance of any non-compliance with the above noise control requirements.
- 3.5.1.3** Real-time noise monitoring at selected locations will be conducted for any musical event held in the MS during daytime or evening time periods for the first 3 years of operation. After the 3-year monitoring period, a review of the findings of the monitoring will be conducted to determine whether further monitoring will be required. The corresponding actions will follow the Event and Action Plan in the Environmental Monitoring and Audit (EM&A) Manual.
- 3.5.1.4** In addition, the operator will provide a manned complaint hotline to respond to any complaints by the nearby NSRs. The complaint hotline will be operated during major organised events with advance notice displayed on the KTSP website. The organizer should arrange to distribute advance notices to nearby residential buildings, hospitals or other noise sensitive used to alert the people of the date, time, venue and programme of the activity, and the complaint hotline.

3.6 Night-time Crowd Dispersion

- 3.6.1.1** Crowd management measures would be adopted by the operator for major events with more than 20,000 participants finished at or later than 2230 hours. The operator would arrange staff members to marshal the dispersion of crowds in an orderly manner from the MS all the way to the future Kai Tak Station and Sung Wong Toi Station. Placards will be used to advise attendees of the events to keep the noise down. No loudspeakers will be used. If any attendees are found to raise the voice or make any noise beyond control even after verbal advice by the marshalling staff, the Police will be called in to restore the situation.
- 3.6.1.2** Traffic Department (TD) and Hong Kong Police Force (HKPF) endorsement of the night time crowd dispersal routes has been obtained. They are attached in **Appendix C**.

3.7 Noise Mitigation Measures

3.7.1.1 All the associated noise mitigation measures as stated in the approved EIA report for Kai Tak Multi-purpose Sports Complex (AEIAR-204/2017) are adopted in the updated NMP unless otherwise stipulated as a result of design development. Mitigation measures with implementation programme, maintenance and management schedules are provided as follows.

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Stage
5.7	N10	No organized events should be held concurrently in the Main Stadium and the Public Sports Ground.	During the operational phase, there would be no major separately organised events to be held concurrently in the MS and the PSG. If an organized event is being held at the Main Stadium, community activities such as jogging, training, amateur ball games, and activities supporting the organized event in the Main Stadium such as warm up, hospitality, etc. may be held at the Public Sports Ground.	CP	Operation
5.6.1-5.6.4 and 5.9	N11	<p><u>Operational Fixed Noise from Main Stadium</u></p> <ul style="list-style-type: none"> The structure of the stadium shall be soundproofing and complete. The entrances of the stadium shall have special acoustic design (e.g. double acoustic door) such that the soundproofing performance of the structure is not compromised. There should be no air-gap between the base structure of the stadium and the fixed roof to avoid noise leakage. A retractable roof, which forms part of the design of the Main Stadium, will be closed when needed. Rubber bearing or other devices with similar function shall be used to avoid the noise leakage between the fixed roof and the retractable roof. A distributed public address system shall be adopted with the loudspeakers directed towards spectator stand. 	<p>The structure still comprises multiple layers of concrete walls, corridors and function rooms surrounding the stadium field, except for a glazed South Façade to connect with the harbour view.</p> <p>The loudspeakers of public address system are suspended in two rows of line array formats over the MS and directed towards the spectator stands.</p> <p>Acoustic absorption panels will be provided underneath the fixed and retractable roofs of the Main Stadium to control reverberation.</p>	CP	Design

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Stage
		<ul style="list-style-type: none"> Acoustic panels shall be attached underneath the fixed roof of the main stadium. 			
5.9	N12	<p><u>Operational Fixed Noise from Public Sports Ground</u></p> <ul style="list-style-type: none"> A cover shall be built over the spectator stand. Sound absorption panels shall be attached underneath the entire cover. 	<p>The structure still comprises multiple layers of concrete walls, corridors and function rooms behind the seating area, except for glazing façade at the two back ends.</p> <p>The extent of the roof is updated to reflect the latest design.</p> <p>The loudspeakers of public address system are ceiling mounted on the underside of grandstand roof in two rows and directed towards the spectators.</p> <p>With a distributed loudspeakers system replacing the array speakers along the roof canopy front edge, the barrier screen dropped down from the roof canopy front edge is omitted.</p> <p>Acoustic absorption panels will be provided on the underside of the roof of the spectator stand.</p>	CP	Design
5.9	N13	<p><u>Operation Noise from Fixed Plants</u></p> <ul style="list-style-type: none"> Partial enclosures and silencers should be installed at the building services and ventilation systems. 	<p>The noise impact for fixed plant will be determined by cumulative assessment with noise from sports events.</p>	CP	Design

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Stage
5.9	N14	<p data-bbox="423 791 745 815"><u>Crowd Noise from Dispersion</u></p> <ul data-bbox="423 847 1003 1246" style="list-style-type: none"> <li data-bbox="423 847 1003 943">• Crowd management measures should be adopted for major events (i.e. more than 20,000 persons) which finish at or later than 2230 hours. <li data-bbox="423 975 1003 1246">• Crowd shall be managed and confined to pre-determined routes, which lead the crowd towards the future Kai Tak Station & To Kwa Wan Station. For the crowd moving toward the Kai Tak Station, people will be directed to leave through or along the ISCB. For the dispersal routes toward To Kwa Wan Station, the exit from the Project site is designed near the Sung Wong Toi Park. 	<p data-bbox="1028 363 1592 735">According to “Good Practices on Ventilation System Noise Control” issued by EPD, noisy equipment would be placed, wherever practicable, at a greater distance from receivers and behind some large enough obstruction (e.g. a building or a barrier) to avoid any direct line of sight between the receivers and noisy equipment. Silencers will be used to reduce noises from the air intakes and exhausts, whilst major fixed noise plants will be adequately screened or housed in plant rooms to comply with the noise criteria.</p> <p data-bbox="1028 791 1592 1233">Crowd management measures would be adopted by the operator for major events with more than 20,000 participants finished at or later than 2230 hours. The operator would arrange staff members to marshal the dispersion of crowds in an orderly manner from the MS all the way to the future Kai Tak Station and Sung Wong Toi Station. Placards will be used to advise attendees of the events to keep the noise down. No loudspeakers will be used. If any attendees are found to raise the voice or make any noise beyond control even after verbal advice by the marshalling staff, the Police will be called in to restore the situation.</p>	CP	Operation

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Stage
5.11	N15	<p data-bbox="423 756 745 777"><u>Operational Noise Monitoring</u></p> <ul data-bbox="423 815 1003 1337" style="list-style-type: none"> <li data-bbox="423 815 1003 873">• The operator should appoint an appropriate person to monitor the noise situation during the activities. <li data-bbox="423 906 1003 995">• The organiser should provide a manned complaint hotline to respond to complaints from nearby NSRs immediately. <li data-bbox="423 1029 1003 1337">• Real time noise monitoring at selected locations shall be conducted for any music event held in the Main Stadium during daytime or evening time periods for the first 3 years of operation. After the 3-year monitoring period, a review of the findings of the monitoring will be conducted to determine whether further monitoring will be required. The corresponding actions shall follow the Event and Action Plan in the EM&A Manual. 	<p data-bbox="1032 756 1590 916">Noise monitoring will be provided by the event organisers for music, singing and instrument performance activities. The event organisers will appoint appropriate persons to monitor the noise level during the activities.</p> <p data-bbox="1032 949 1590 1289">Real-time noise monitoring at selected locations will be conducted for any musical event held in the MS during daytime or evening time periods for the first 3 years of operation. After the 3-year monitoring period, a review of the findings of the monitoring will be conducted to determine whether further monitoring will be required. The corresponding actions will follow the Event and Action Plan in the Environmental Monitoring and Audit (EM&A) Manual.</p>	CP	Operation

EIA Ref.	EM&A Log Ref.	Mitigation Measures	Implementation Details	Implementation Agent	Implementation Stage
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In addition, the operator will provide a manned complaint hotline to respond to any complaints by the nearby NSRs. The complaint hotline will be operated during major organised events with advance notice displayed on the KTSP website.

4 Conclusion

- 4.1.1.1** According to Condition 2.19 and Condition 2.20 of EP-544/2017, the first NMP including details, implementation programme, maintenance and management schedules of the required mitigation measures for the Project has been submitted no later than one month before the commencement of construction.
- 4.1.1.2** The second NMP submission with updated noise assessment of MS and PSG based on the latest design has been endorsed by EPD with their letter ref: in EP2/K19/O/28 Pt.5 dated 24 September 2019. The second NMP included sports and musical events of open roof MS operations and sports events of PSG operations in the day /evening time period. Adverse noise impact to the identified NSRs is not anticipated.
- 4.1.1.3** The third NMP submission was prepared to provide the night time crowd dispersal routes based on the latest design for EPD approval. The proposed routes include:
- (1) There are two walkways through Main Plaza at podium level leading to Kai Tak Station and one walkway at podium level leading to Sung Wong Toi Station as in **Figure C1.1** of **Appendix C**:
 - Walkways through Main Plaza at podium level and the central ramp / Sports Avenue leading to Kai Tak Station Square: At Main Plaza, it is provided with canopy cover in accordance with guidelines for ACABAS submissions. The route is then divided into 2 ways with one directed to the central ramp and the other to the Sports Avenue. At the central ramp, it is an uncovered walkway leading to Kai Tak Station. At the Sports Avenue, it is covered by an Ethylene-Tetra-Fluoro-Ethylene (ETFE) canopy erected at the roof level between the ISC buildings.
 - Walkways at podium level and the Western Ramp leading to MTR Sung Wong Toi Station: These routes are provided with canopy cover in accordance with guidelines for ACABAS submissions.
 - (2) There are one walkway at sub-podium level leading to Kai Tak Station and one walkway at sub podium level leading to Sung Wong Toi Station as in **Figures C1.2 and C1.3** of **Appendix C**:
 - Passageway at sub-podium level and walkway leading to Kai Tak Station Square: It is an enclosed route within the sub-podium level. At the sub podium exit, it is connected to an uncovered walkway leading to Kai Tak Station.
 - Passageway at sub-podium level and walkway leading to MTR Sung Wong Toi Station: It is an enclosed route within the Project boundary.
- 4.1.1.4** The NMP was approved by EPD on 20 March 2020.
- 4.1.1.5** Subsequent to the approved NMP by EPD, the project design has been progressing and the management structure has changed. This updated NMP is prepared as a result of this design development mainly on fixed roof, entrance doors and south façade glazing of the Main Stadium.

- 4.1.1.6** Pursuant to Condition 2.20 of the EP-544/2017, if there are further change(s) to the NMP, the Permit Holder shall, at no later than one month before implementation of such change(s), deposit with the DEP three hard copies and one electronic copy of an update to the NMP.

Appendix A

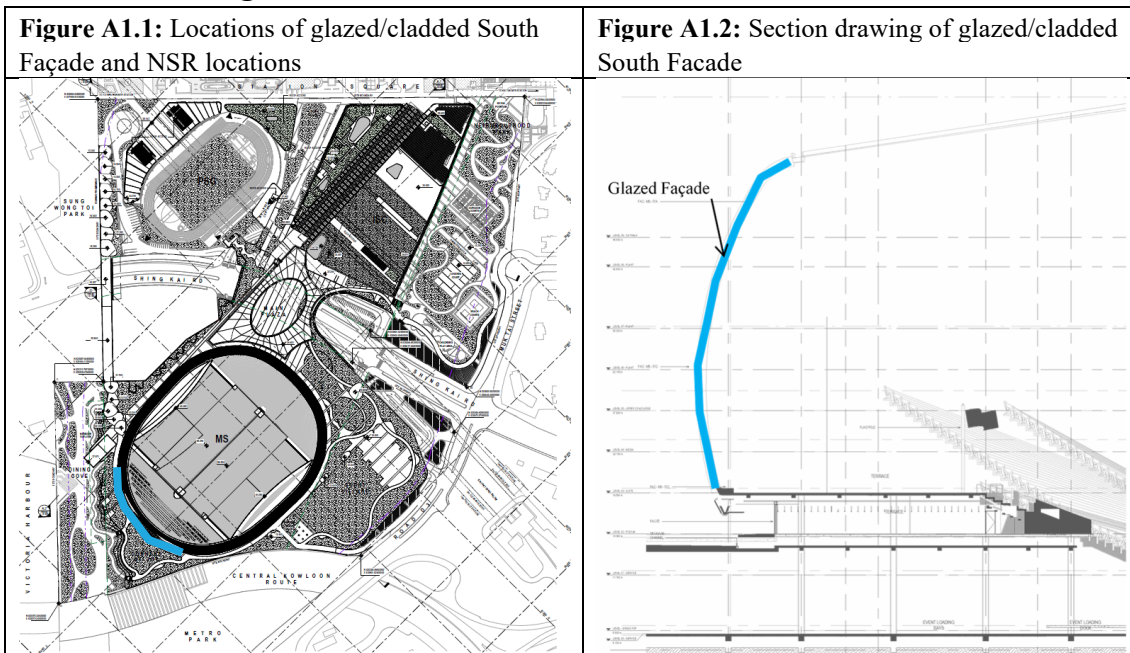
Noise Assessment for Main Stadium

A1 Introduction

In the approved EIA study for Kai Tak Sports Park (KTSP, formerly Kai Tak Multi-purpose Sports Complex) (AEIAR-204/2017), the Main Stadium (MS) design was assumed with multiple layers of concrete walls, corridors and functional rooms surrounding the stadium field of play as the basis of noise mitigation for compliance with the noise criteria.

In the updated design scheme of MS changes are made to:

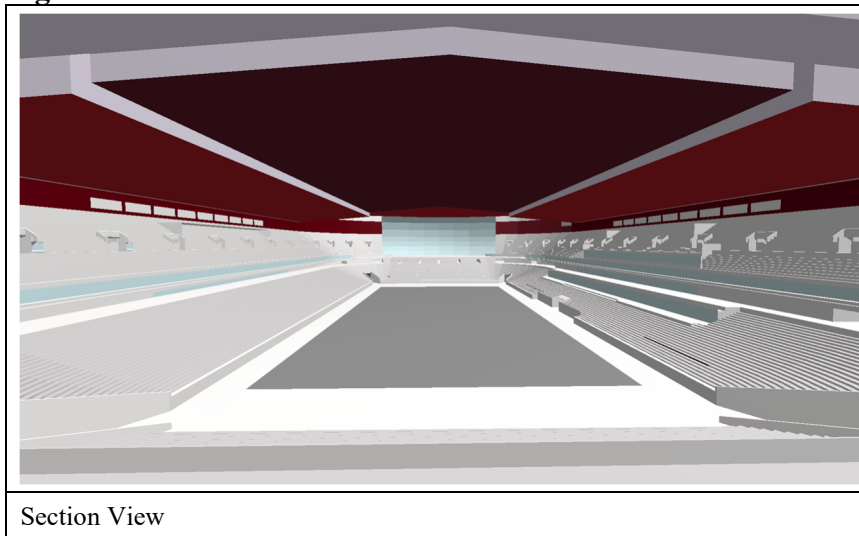
- Glazing/cladding façade at the south stand to connect with the Victoria Harbour View as shown in **Figure A1.1** and **A1.2**;



- Array loudspeakers instead of distributed speaker for the PA system according to the Employer Requirement (ER); and
- The internal finishes of MS are also updated as follows:

Location	Finishes	Colour Code in Figure A1.3
Fixed Roof Underside	Minimum 50mm rockwool material	Brown
Southern Façade	Glazing/cladding	Light blue
Seating Bowl	Audiences on Plastic Chair	Pink
Upper Tier Partition	Acoustic wall panel	Purple
Pitch	Turf	Light coral
Opening to Circulation	50% opening absorption	Grey

Figure A1.3: 3D Odeon model for the MS

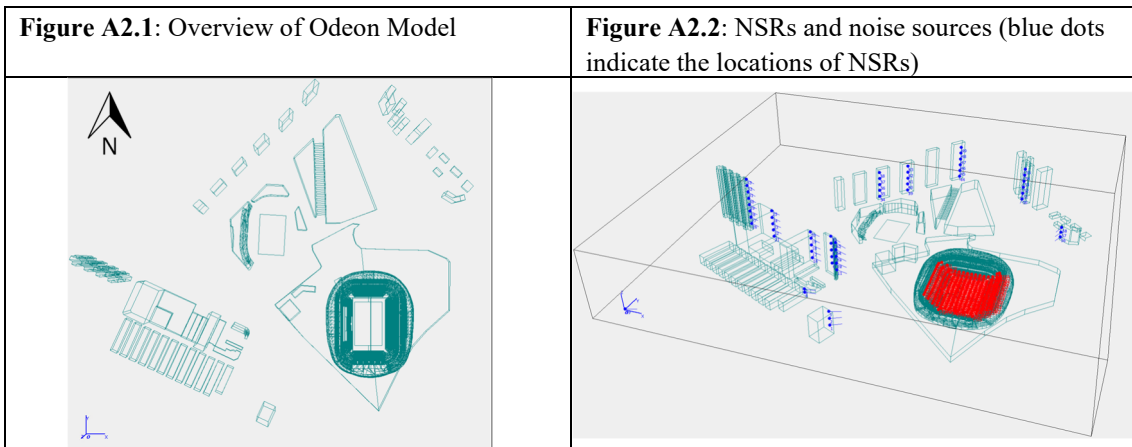


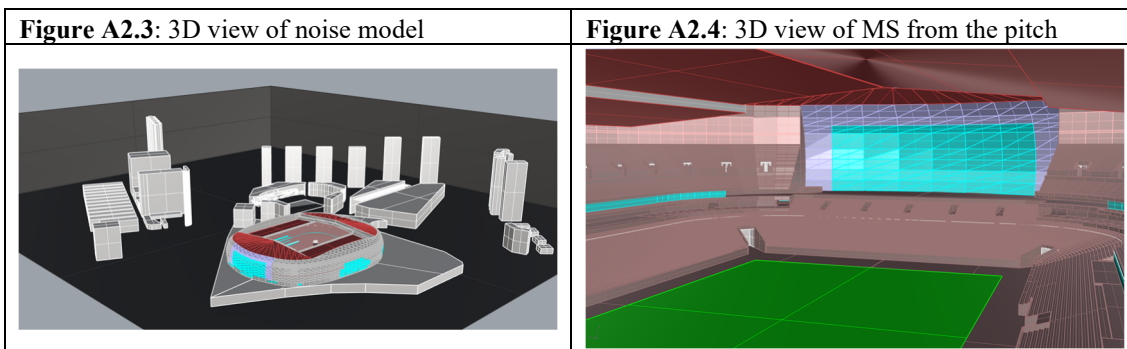
This noise assessment is undertaken for sports and music events to demonstrate that the proposed changes would not cause adverse noise impact to nearby noise sensitive receivers (NSRs).

A2 Assessment Methodology

A2.1 Overview

Odeon model as used in the approved EIA study is adopted for the MS noise modelling of the updated design scheme. The 3D model images are shown in **Figure A2.1** to **Figure A2.4**.





A2.2 Sound Transmission Losses and Absorption

Sound transmission losses of envelope structures including wall, fixed roof and South Façade glazing for noise modelling are summarised in **Table A2.1**.

Table A2.1: Sound transmission losses of envelope structures

Frequency, Hz	80	100	125	160	200	250	315	400	500	630
Wall	49.3	52.5	57.4	59.1	63.8	66.5	73.1	75.8	78.4	80.7
Fixed roof	34.0	50.2	46.1	45.9	47.7	48.3	51.0	55.7	60.3	67.2
South Façade Glazing (18mm + AS12 + 18mm)	28.0	30.0	25.0	26.0	31.0	33.0	35.0	37.0	38.0	39.0
Entrance doors	29.5	23.1	26.6	32.9	34.8	36.1	36.8	37.4	36.3	35.7
Frequency, Hz	800	1000	1250	1600	2000	2500	3150	4000	5000	6300
Wall	83.6	84.4	84.3	84.1	86.6	86.4	86.9	82.9	82.7	80.5
Fixed roof	73.3	76.4	78.7	80.1	79.9	82.4	81.5	80.9	80.3	77.2
South Façade Glazing (18mm + AS12 + 18mm)	39.0	40.0	41.0	42.0	43.0	43.0	44.0	45.0	46.0	46.0
Entrance doors	32.4	32.3	32.8	35.4	34.0	33.0	36.8	42.3	42.4	44.0

Sound absorption of the acoustic panels underneath the fixed roofs of the Main Stadium is summarised in **Table A2.2**.

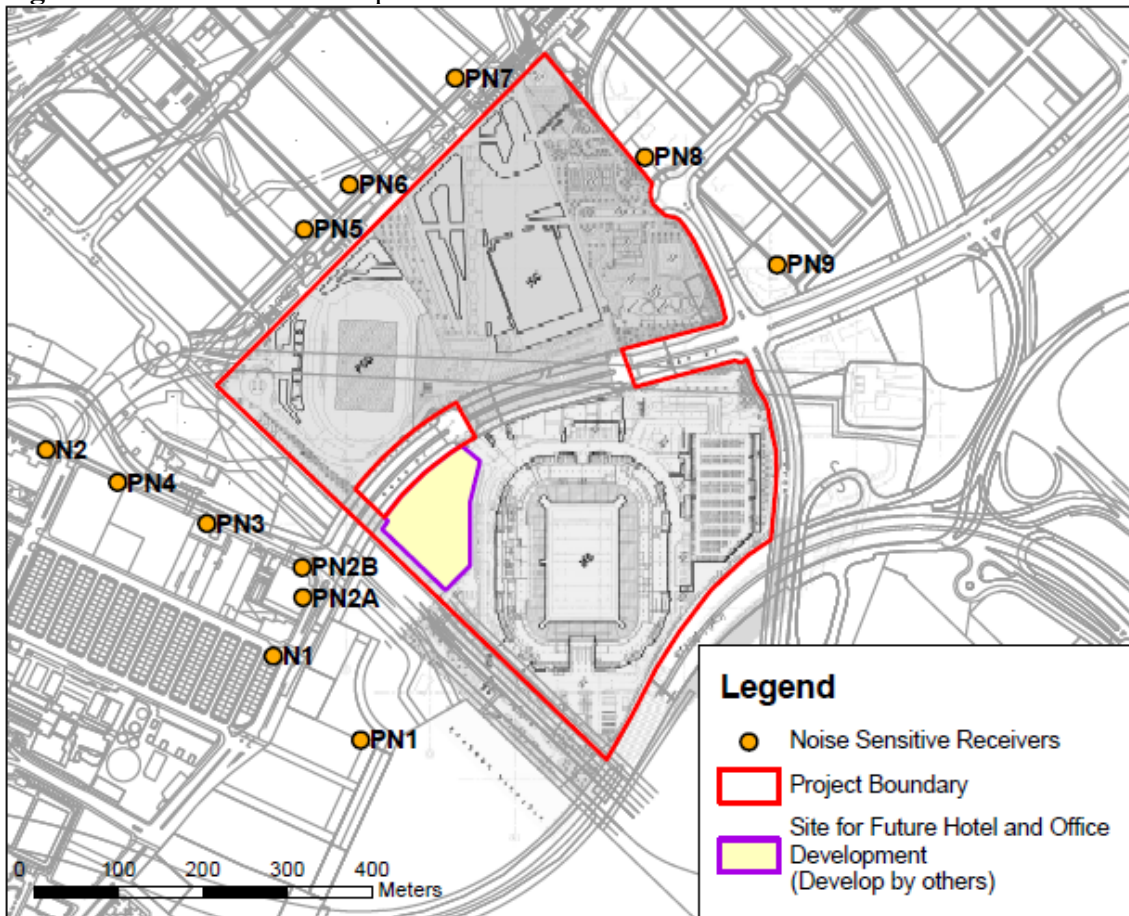
Table A2.2: Sound absorption of acoustic panels

Frequency, Hz	63	125	250	500	1000	2000	4000	8000	α
Absorption coefficient	0.25	0.25	0.65	0.85	0.83	0.75	0.55	0.55	0.75

A2.3 NSRs and Assessment Criteria

Representative NSRs identified in the approved EIA study are included in the assessment. NSR locations are shown in **Figure A2.5**.

Figure A2.5: Locations of representative NSR locations



EIA assessment criteria and results at NSRs for music and sports events combined with noise in the EIA study are shown in **Table A2.3** and **Table A2.4** respectively.

Table A2.3: Assessment criteria for music events

NSR ID	Assessment Criteria for Music Noise, Leq (15 mins), dB(A)		EIA Result (Daytime and Evening), dB(A)	
	Daytime and Evening (0700 to 2300)	Night time (2300 to 0700)	Concert Setting 1	Concert Setting 2
N1	75	Not Audible	36 – 37	33 – 34
N2	77		43 – 59	37 – 60
PN1	75		37 – 56	38 – 55
PN2A	75		41 – 66	41 – 66
PN2B	75		40 – 67	41 – 66
PN3	77		38 – 60	36 – 59
PN4	77		38 – 57	36 – 57
PN5	73		36 – 59	35 – 58
PN6	73		36 – 62	37 – 62
PN7	73		35 – 60	41 – 60
PN8	73		43 – 63	45 – 61
PN9	73		36 – 38	38 – 41

Table A2.4: Assessment criteria for sports event and fixed noise

NSR ID	Assessment Criteria for Sports event and fixed noise, Leq (30 mins), dB(A)	EIA Result (Daytime and Evening), dB(A)
	Daytime and Evening (0700 to 2300)	Sports event and fixed noise
N1	60	47
N2	65	51
PN1	60	48
PN2A	60	56
PN2B	60	
PN3	65	51
PN4	65	49
PN5	60	49
PN6	60	51
PN7	60	50
PN8	60	54
PN9	60	44

A2.4 Noise Sources

Major noise sources in sports event are the spectator crowd noise and the operation of public-address (PA) system. In music events, the noise activities are dominated by the on-stage loudspeakers. Spectra of on-stage loudspeakers for music events and PA system are referenced from the EIA report and given in **Table A2.5**.

Table A2.5: Loudspeaker spectra for noise modelling

Frequency, Hz	63	125	250	500	1000	2000	4000	8000	A-weighted
Sports Event									
Arrays with 10 speakers	93.2	101.9	102.4	99.1	94.2	90.1	84.2	79.2	100.4
Arrays with 8 speakers	91.3	100.0	100.4	97.1	91.8	88	83.4	79.4	98.4
Concert Setting 1 – End Stage									
Loudspeakers (Higher power)	143.6	135.6	135.6	132.6	127.6	123.6	119.6	116.6	134.1
Loudspeakers (Lower power)	140.6	132.6	132.6	129.6	124.6	120.6	116.6	113.6	131.1
Concert Setting 2 – Centre Stage									
Loudspeakers	140.1	132.1	132.1	129.1	124.1	120.1	116.1	113.1	130.6

A2.4.1 Sports Events at Main Stadium

Noise from the spectators and public address system were assessed. The spectators were modelled as 272 point sources located on the spectator stands. They represented a full-house event of 50,000 persons in total. The sound power level per person was 85.4 dB(A) as per the EIA assessment.

In accordance with the requirement of ER, array loudspeakers design was adopted for the public-address system. It consists of 23 arrays with 10 loudspeakers plus 13 arrays with 8 loudspeakers in 2 rows directed towards the spectator stands. The sound power levels of these arrays are tuned as shown in **Table A2.5** to produce a sound level of 70-75 dB(A) at the spectator stands. Comparison of the sports event mode for the updated design and

that in EIA is given in **Table A2.6**. The settings are shown in **Figure A2.6** to **Figure A2.9** to illustrate the layout arrangement.

Table A2.6: Comparison of EIA and the updated design scheme for sports event

Parameters	EIA	The updated design scheme
No. of Loudspeakers	60 distributed speakers	26 arrays with total 334 speakers
Sound Power Level per Loudspeaker	104.2 dB(A)	100.4 dB(A) for arrays with 10 speakers 98.4 dB(A) for arrays with 8 speakers
Sound Level at Spectator Stand		70 – 75 dB(A)
No. of spectator		50,000
No. of modelling source		272
Sound power level per person		85.4 dB(A)

Figure A2.6: Array Speaker layout for in the updated design scheme

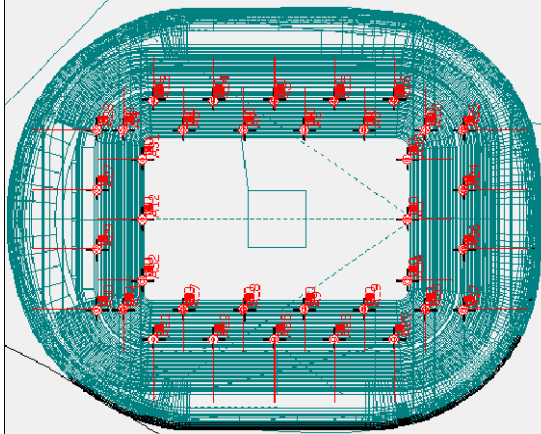


Figure A2.7: Audience Setting in the updated design scheme

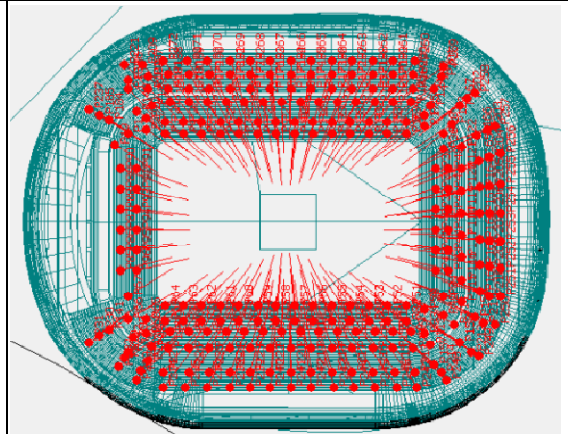


Figure A2.8: Speaker layout in EIA

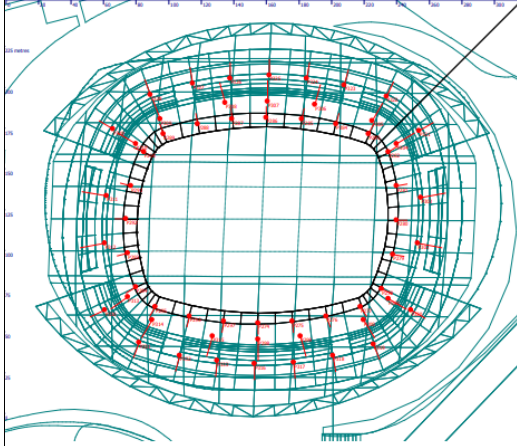
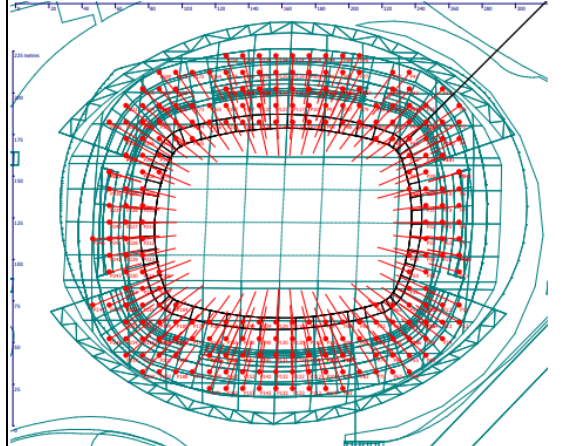


Figure A2.9: Audience setting in EIA



A2.4.2 Music Events at Main Stadium

Music events may be held in 2 different settings. In Concert Setting 1 (End Stage), a 3-sided stage is located at the southern end of the stadium field. In Concert Setting 2 (Centre Stage), a 4-sided stage is set up at the centre of the field. Noise assessments for both settings have been carried out for the updated design scheme.

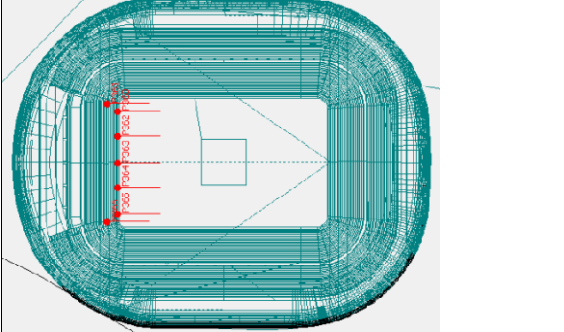
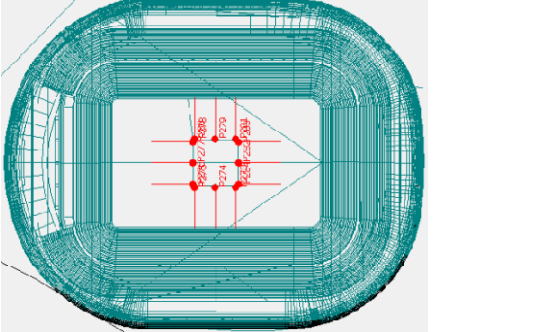
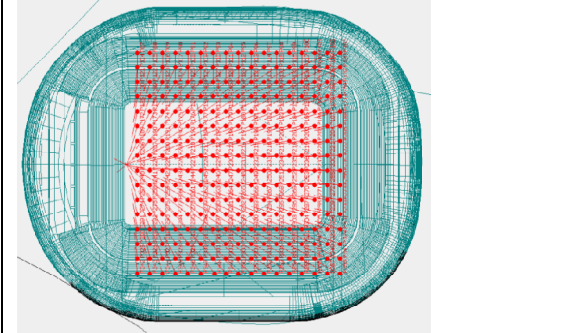
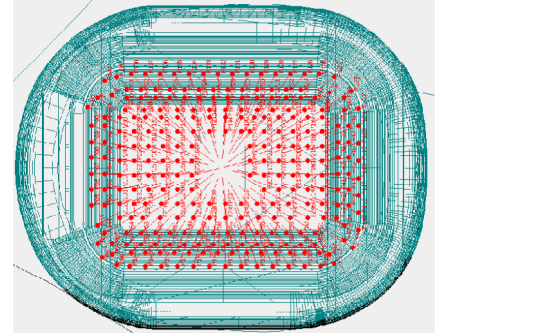
Noise from the loudspeakers and the audience were assessed. The audience was modelled as 272 point sources distributed on the seating area according to the 2 different concert

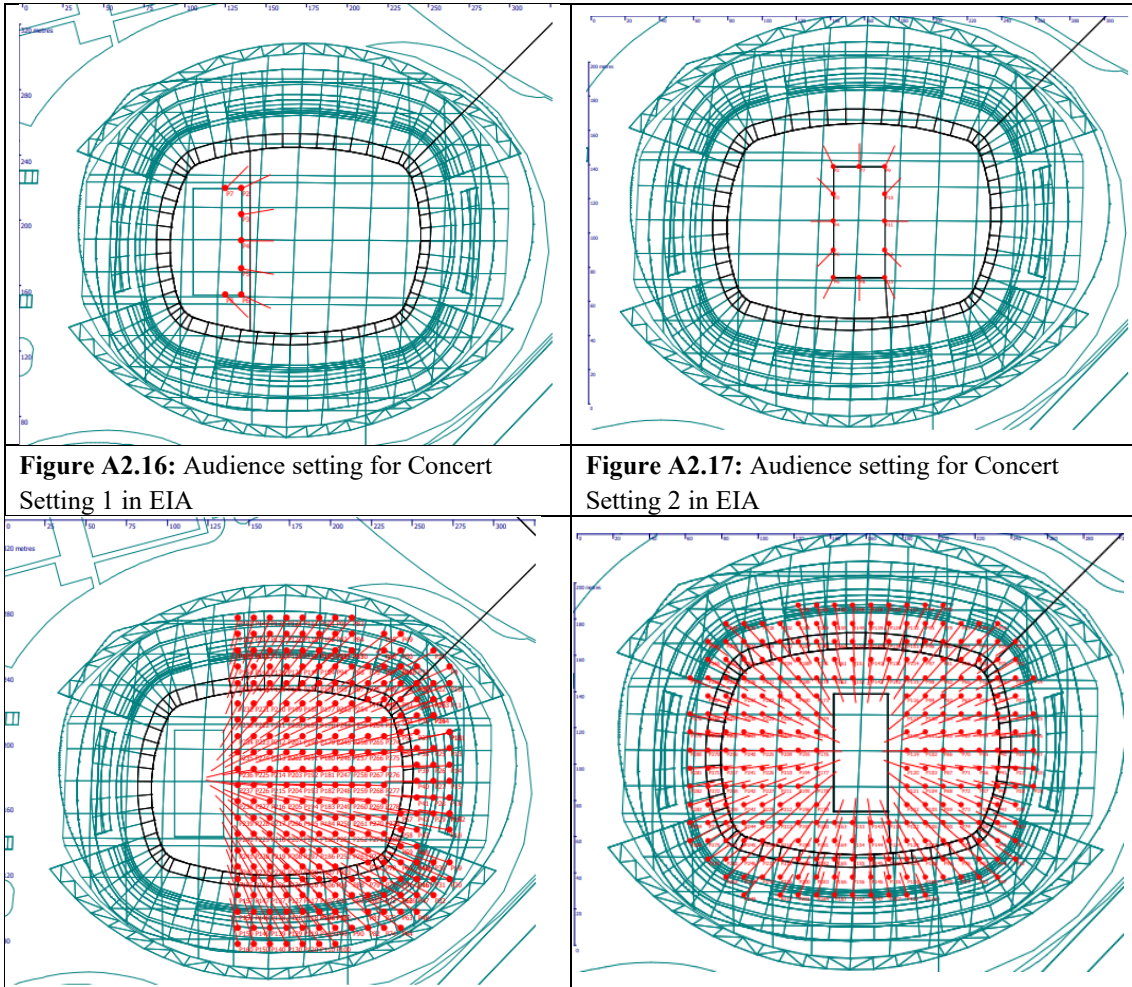
settings, as shown in **Figure A2.10 to 2.13** and **Figure A2.14 to 2.17**. Audience sizes are 50,000 persons in both setting in accordance with EIA report. The sound power frequency spectra of the specified concert setting were adopted to operate at 93dB(A) or above at the spectator stands.

The parameters of music event loudspeakers for the 2 concert settings in the Main Stadium are summarized in **Table A2.7**.

Table A2.7: Comparison of EIA and the updated design scheme for sports event

Parameters	EIA	The updated design scheme
No. of Loudspeakers	Refer to Table A2.5	
Sound Power Level per Loudspeaker	Refer to Table A2.5	
Sound Level at Spectator Stand	Concert Setting 1: 93 – 110 Concert Setting 2: 92 – 113	Concert Setting 1: 95 – 110 Concert Setting 2: 93 – 115
No. of spectator	50,000	
No. of modelling source	272	
Sound power level per person	85.4 dB(A)	

<p>Figure A2.10: Speaker layout for Concert Setting 1 in the updated design scheme</p>	<p>Figure A2.11: Speaker layout for Concert Setting 2 in the updated design scheme</p>
 <p>A top-down view of the stadium showing a speaker layout for Concert Setting 1. The layout consists of several red dots representing speakers, primarily located along the side walls and the front edge of the seating bowl.</p>	 <p>A top-down view of the stadium showing a speaker layout for Concert Setting 2. The layout features a more central arrangement of red dots, with some speakers positioned closer to the center of the stage area.</p>
<p>Figure A2.12: Audience setting for Concert Setting 1 in the updated design scheme</p>	<p>Figure A2.13: Audience setting for Concert Setting 2 in the updated design scheme</p>
 <p>A top-down view of the stadium showing the audience seating for Concert Setting 1. Red dots are distributed across the seating bowl, indicating the positions of individual audience members.</p>	 <p>A top-down view of the stadium showing the audience seating for Concert Setting 2. The distribution of red dots is similar to Setting 1 but may reflect differences in seating arrangement or density.</p>
<p>Figure A2.14: Speaker layout for Concert Setting 1 in EIA</p>	<p>Figure A2.15: Speaker layout for Concert Setting 2 in EIA</p>



A3 Assessment Scenario

Day and evening open roof scenario has been adopted for the sports and music event assessment in accordance with the EIA assumptions.

As the updated design scheme is in variation with the reference design in the EIA report, there will be changes in the noise levels predicted at some of the NSRs as shown in **Figure A2.5**.

A4 Results

The predicted noise levels at the representative NSRs for sports events and music events are presented in **Table A4.1** and **Table A4.2** respectively. Detailed results are shown in **Annex A**.

Table A4.1: Predicted noise levels for sports event and fixed noise

NSR ID	Assessment Criteria, dB(A)	EIA Result, dB(A)	Model Result of Updated Design Scheme, dB(A)		
	Sports event and fixed noise	Sports event and fixed noise	Sports event and fixed noise		
			Sports Event	M&E Noise Design Level	Max. cumulative
N1	60	47	36 - 44	44	47

NSR ID	Assessment Criteria, dB(A)	EIA Result, dB(A)	Model Result of Updated Design Scheme, dB(A)		
	Sports event and fixed noise	Sports event and fixed noise	Sports event and fixed noise		
			Sports Event	M&E Noise Design Level	Max. cumulative
N2	65	51	27 - 48	48	52
PN1	60	48	30 - 30	48	48
PN2A	60	56	34 - 57	46	60
PN2B	60		29 - 58		
PN3	65	51	32 - 49	47	51
PN4	65	49	28 - 43	48	49
PN5	60	49	27 - 44	47	49
PN6	60	51	26 - 46	50	51
PN7	60	50	27 - 45	48	50
PN8	60	54	31 - 49	52	54
PN9	60	44	25 - 41	41	44

Table A4.2: Predicted noise levels for music events

NSR ID	Assessment Criteria, dB(A)	EIA Result, dB(A)		Model Result, dB(A)	
	Music Noise	Concert Setting 1	Concert Setting 2	Concert Setting 1	Concert Setting 2
N1	75	36 – 37	33 – 34	49 – 49	46 – 47
N2	77	43 – 59	37 – 60	43 – 60	41 – 61
PN1	75	37 – 56	38 – 55	48 – 51	47 – 48
PN2A	75	41 – 66	41 – 66	51 – 74	49 – 73
PN2B	75	40 – 67	41 – 66	45 – 73	43 – 71
PN3	77	38 – 60	36 – 59	49 – 66	47 – 65
PN4	77	38 – 57	36 – 57	44 – 57	43 – 55
PN5	73	36 – 59	35 – 58	41 – 60	42 – 58
PN6	73	36 – 62	37 – 62	42 – 59	41 – 62
PN7	73	35 – 60	41 – 60	44 – 64	43 – 63
PN8	73	43 – 63	45 – 61	44 – 67	42 – 69
PN9	73	36 – 38	38 – 41	41 – 42	40 – 40

The results show that the noise levels of the updated design scheme are comparable with EIA assessment results except at higher level assessment point of NSRs as result of adopting a more realistic assumption of the internal finishes and the changes to the future hotel and office development to the west of the Stadium. Overall, the predicted noise levels are in compliance with the EIA assessment criteria and no adverse noise impact to NSRs.

Annex A**Detailed Noise Assessment Results for Sports**

NSR ID	Level, mPD	Criterion for Sports Event, dB(A)	Predicted Noise Level, dB(A)	Comply [Y/N]
N1	10	60	36	Y
N1	20	60	44	Y
N2	10	65	27	Y
N2	30	65	30	Y
N2	50	65	37	Y
N2	70	65	38	Y
N2	90	65	38	Y
N2	110	65	42	Y
N2	130	65	46	Y
N2	150	65	49	Y
PN1	15	60	30	Y
PN1	35	60	30	Y
PN1	55	60	30	Y
PN2A	30	60	34	Y
PN2A	50	60	37	Y
PN2A	70	60	48	Y
PN2A	90	60	55	Y
PN2A	110	60	57	Y
PN2B	30	60	29	Y
PN2B	50	60	32	Y
PN2B	70	60	43	Y
PN2B	90	60	54	Y
PN2B	110	60	58	Y
PN3	10	65	32	Y
PN3	30	65	36	Y
PN3	50	65	42	Y
PN3	70	65	42	Y
PN3	90	65	49	Y
PN4	10	65	28	Y
PN4	30	65	28	Y
PN4	50	65	28	Y
PN4	70	65	33	Y
PN4	90	65	43	Y
PN5	10	60	27	Y
PN5	30	60	27	Y

NSR ID	Level, mPD	Criterion for Sports Event, dB(A)	Predicted Noise Level, dB(A)	Comply [Y/N]
PN5	50	60	41	Y
PN5	70	60	41	Y
PN5	90	60	44	Y
PN6	10	60	26	Y
PN6	30	60	27	Y
PN6	50	60	31	Y
PN6	70	60	40	Y
PN6	90	60	46	Y
PN7	10	60	27	Y
PN7	30	60	28	Y
PN7	50	60	31	Y
PN7	70	60	38	Y
PN7	90	60	45	Y
PN7	110	60	45	Y
PN8	10	60	38	Y
PN8	30	60	31	Y
PN8	50	60	34	Y
PN8	70	60	45	Y
PN8	90	60	46	Y
PN8	110	60	49	Y
PN9	10	60	25	Y
PN9	25	60	29	Y
PN9	40	60	41	Y

Detailed Noise Assessment Results for Concert

NSR ID	Level, mPD	Criterion for Music Events, dB(A)	Predicted Noise Level, dB(A)		Comply [Y/N]
			Concert Setting 1	Concert Setting 2	
N1	10	75	49	46	Y
N1	20	75	49	47	Y
N2	10	77	43	41	Y
N2	30	77	44	42	Y
N2	50	77	46	44	Y
N2	70	77	51	47	Y
N2	90	77	56	54	Y
N2	110	77	58	55	Y
N2	130	77	60	61	Y
N2	150	77	60	61	Y
PN1	15	75	48	47	Y
PN1	35	75	50	47	Y
PN1	55	75	51	48	Y
PN2A	30	75	51	49	Y
PN2A	50	75	55	54	Y
PN2A	70	75	65	62	Y
PN2A	90	75	73	72	Y
PN2A	110	75	74	73	Y
PN2B	30	75	45	43	Y
PN2B	50	75	50	48	Y
PN2B	70	75	61	60	Y
PN2B	90	75	71	69	Y
PN2B	110	75	73	71	Y
PN3	10	77	49	47	Y
PN3	30	77	51	49	Y
PN3	50	77	54	52	Y
PN3	70	77	60	60	Y
PN3	90	77	66	65	Y
PN4	10	77	44	43	Y
PN4	30	77	45	44	Y
PN4	50	77	46	45	Y
PN4	70	77	50	51	Y
PN4	90	77	57	55	Y
PN5	10	73	41	42	Y
PN5	30	73	43	42	Y

NSR ID	Level, mPD	Criterion for Music Events, dB(A)	Predicted Noise Level, dB(A)		Comply [Y/N]
			Concert Setting 1	Concert Setting 2	
PN5	50	73	45	46	Y
PN5	70	73	54	53	Y
PN5	90	73	60	58	Y
PN6	10	73	42	41	Y
PN6	30	73	45	46	Y
PN6	50	73	49	48	Y
PN6	70	73	55	60	Y
PN6	90	73	59	62	Y
PN7	10	73	44	43	Y
PN7	30	73	47	45	Y
PN7	50	73	50	47	Y
PN7	70	73	55	53	Y
PN7	90	73	61	61	Y
PN7	110	73	64	63	Y
PN8	10	73	44	42	Y
PN8	30	73	46	43	Y
PN8	50	73	49	47	Y
PN8	70	73	57	57	Y
PN8	90	73	61	62	Y
PN8	110	73	67	69	Y
PN9	10	73	41	40	Y
PN9	25	73	42	40	Y
PN9	40	73	42	40	Y

Appendix B

Noise Assessment for Public Sports Ground

B1 Introduction

In the approved EIA study for Kai Tak Sports Park (KTSP, formerly Kai Tak Multi-purpose Sports Complex) (AEIAR-204/2017), the Public Sports Ground (PSG) design was assumed with multiple layers of internal walls, corridors and function rooms at the back of the grandstand as the basis of noise mitigation for compliance with the noise criteria.

In the updated design scheme of PSG changes are made to:

- Glazing façades at 2 back ends as shown in **Figure B1.1** and **1.2**;

Figure B1.1: Locations of glazed façade

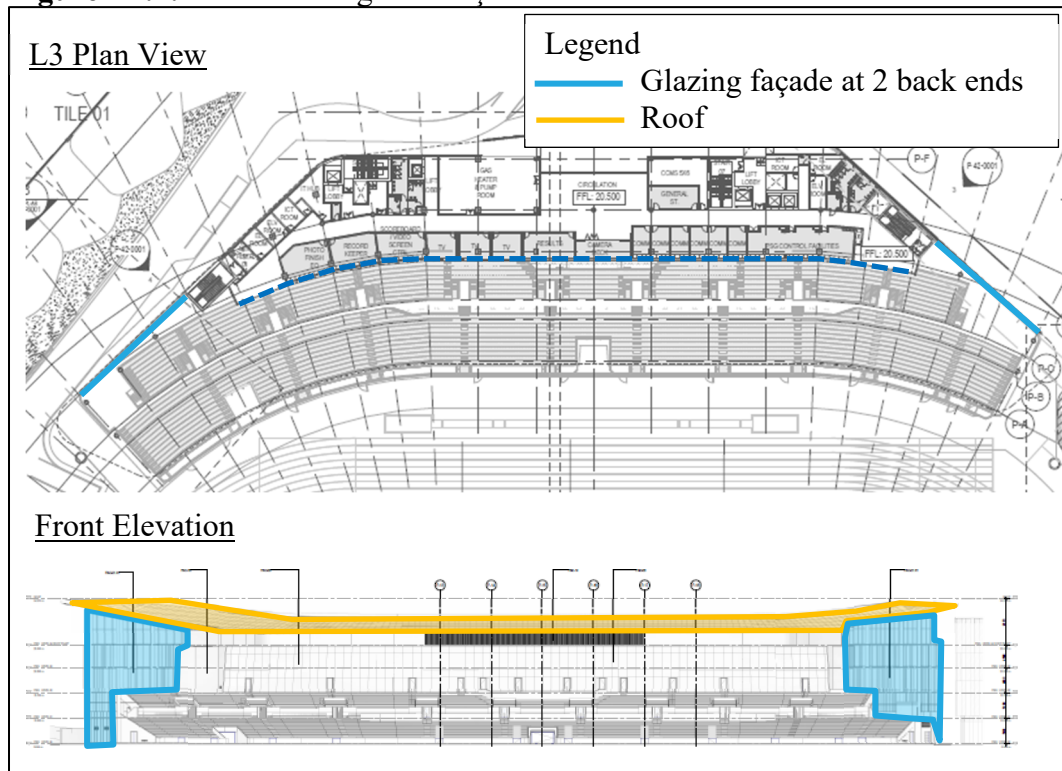
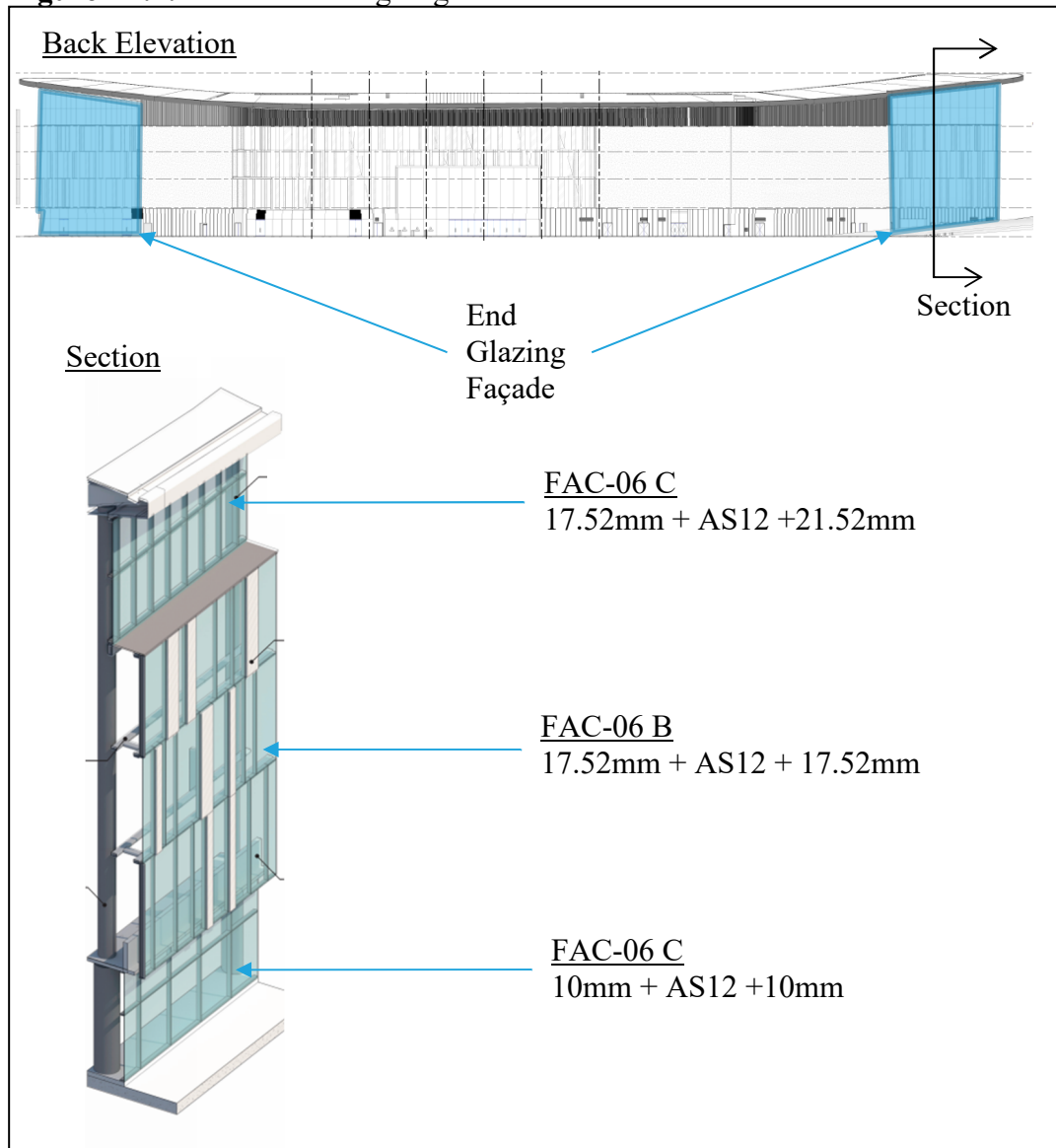


Figure B1.2: Section drawing of glazed facade

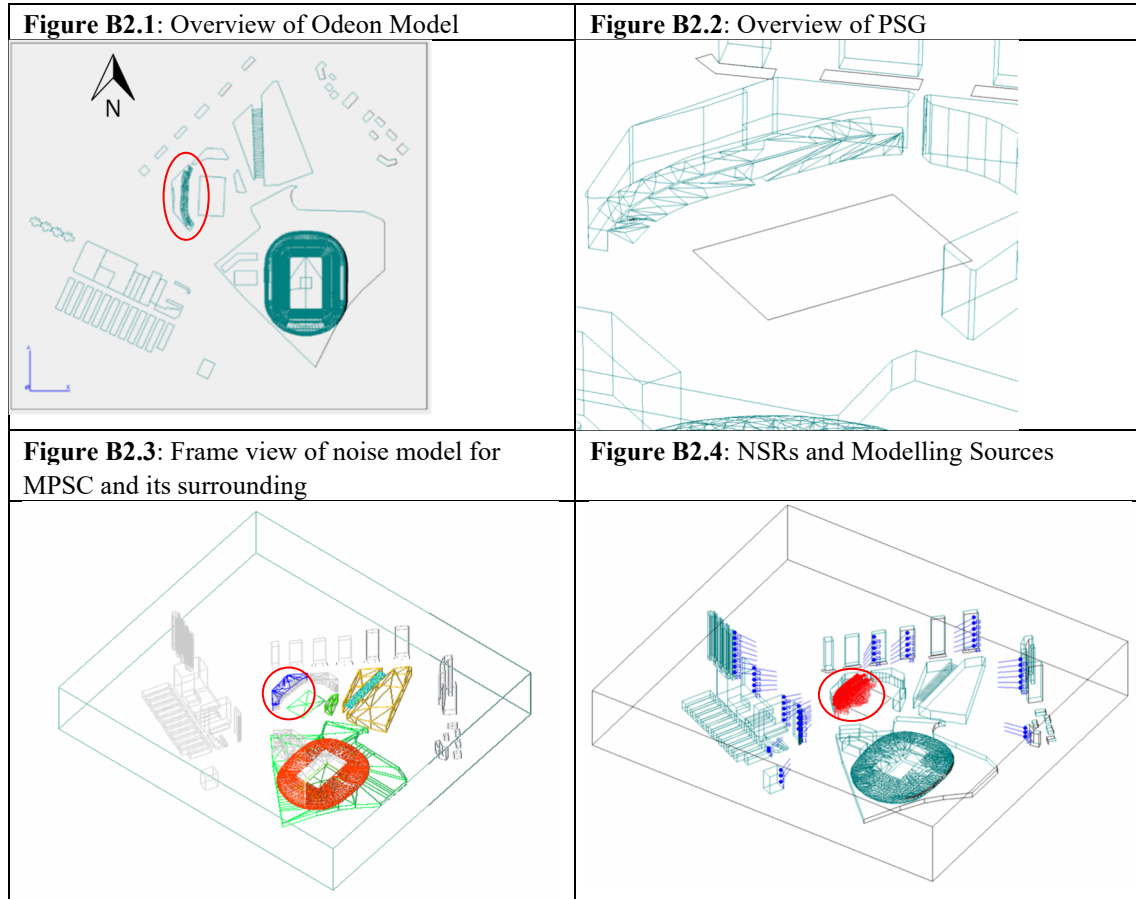
- The loudspeakers of public address system are ceiling mounted on the underside of grandstand roof in two rows and directed towards the spectators; and
- With a distributed loudspeakers system replacing the array speakers along the roof canopy front edge, the barrier screen dropped down from the roof canopy front edge is omitted.

This noise assessment is undertaken for sports events to demonstrate that the proposed changes would not cause adverse noise impact to nearby noise sensitive receivers (NSRs).

B2 Assessment Methodology

B2.1 Overview

Odeon model as used in the approved EIA study is adopted for the PSG noise modelling of the updated design scheme. The 3D model images are shown in **Figure B2.1** to **Figure B2.4**.



B2.2 Sound Transmission Losses and Absorption

Sound transmission losses of wall and roof for noise modelling are summarised in **Table B2.1**.

Table B2.1: Sound transmission losses of structures

Frequency, Hz	80	100	125	160	200	250	315	400	500	630
Structure	49.3	52.5	57.4	59.1	63.8	66.5	73.1	75.8	78.4	80.7
Glazing façade at 2 back ends	28	30	25	26	31	33	35	37	38	39
Roof	35.7	38.8	44.3	46.0	47.2	48.0	52.4	56.4	58.0	60.3
Frequency, Hz	800	1000	1250	1600	2000	2500	3150	4000	5000	6300
Structure	83.6	84.4	84.3	84.1	86.6	86.4	86.9	82.9	82.7	80.5
Glazing façade at 2 back ends	39	40	41	42	43	43	44	45	46	46
Roof	62.7	64.7	66.2	65.7	67.2	69.2	73.0	76.2	80.1	81.0

Sound absorption of the acoustic panels underneath the roofs of PSG is summarised in **Table B2.2**.

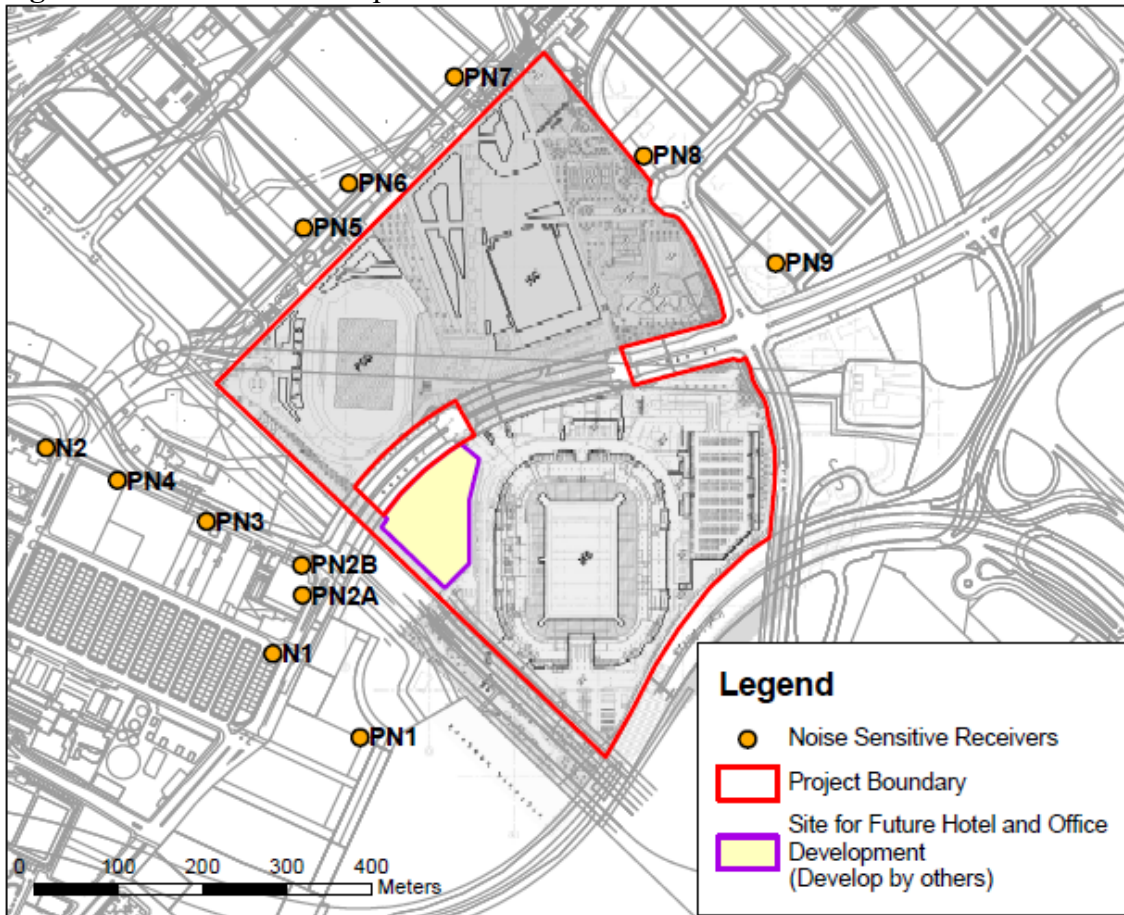
Table B2.2: Sound absorption of acoustic panels

Frequency, Hz	63	125	250	500	1000	2000	4000	8000	α
Absorption coefficient	0.25	0.25	0.65	0.85	0.83	0.75	0.55	0.55	0.75

B2.3 NSRs and Assessment Criteria

Representative NSRs identified in the approved EIA study are included in the assessment. NSR locations are shown in **Figure B2.5**.

Figure B2.5: Locations of representative NSR locations



Assessment criteria adopted for sports event combined with fixed noise in the EIA study are shown in **Table B2.3**.

Table B2.3: Assessment criteria for sports event and fixed noise

NSR ID	Assessment Criteria for sports event and fixed noise, Leq (30 mins), dB(A)	EIA Result, dB(A)
	Daytime and Evening (0700 to 2300)	Sports event and fixed noise
N1	60	52
N2	65	56
PN1	60	54
PN2A	60	60
PN2B	60	
PN3	65	58

NSR ID	Assessment Criteria for sports event and fixed noise, Leq (30 mins), dB(A)	EIA Result, dB(A)
	Daytime and Evening (0700 to 2300)	Sports event and fixed noise
PN4	65	56
PN5	60	59
PN6	60	60
PN7	60	57
PN8	60	59
PN9	60	52

B2.4 Noise Sources

The 5,000 spectators were modelled as 42 point sources located in the spectator stand. In line with the EIA report, a sound power level per person of 85.4dB(A) is adopted and shown in **Table B2.4**.

Distributed loudspeakers are adopted for the public-address system. It consists of 30 loudspeakers which are ceiling mounted on the underside of grandstand roof in two rows and directed towards the spectators. The sound power levels of these ceiling mounted loudspeakers are tuned as are shown in **Table B2.4** in order to produce a sound level of 70-75 dB(A) at the spectator stands. Comparison of the sports event mode for the updated design and that in EIA is given in **Table B2.5**. The settings are shown in **Figure B2.6** to **Figure B2.9** to illustrate the layout arrangement.

Table B2.4: Loudspeaker spectra for noise modelling

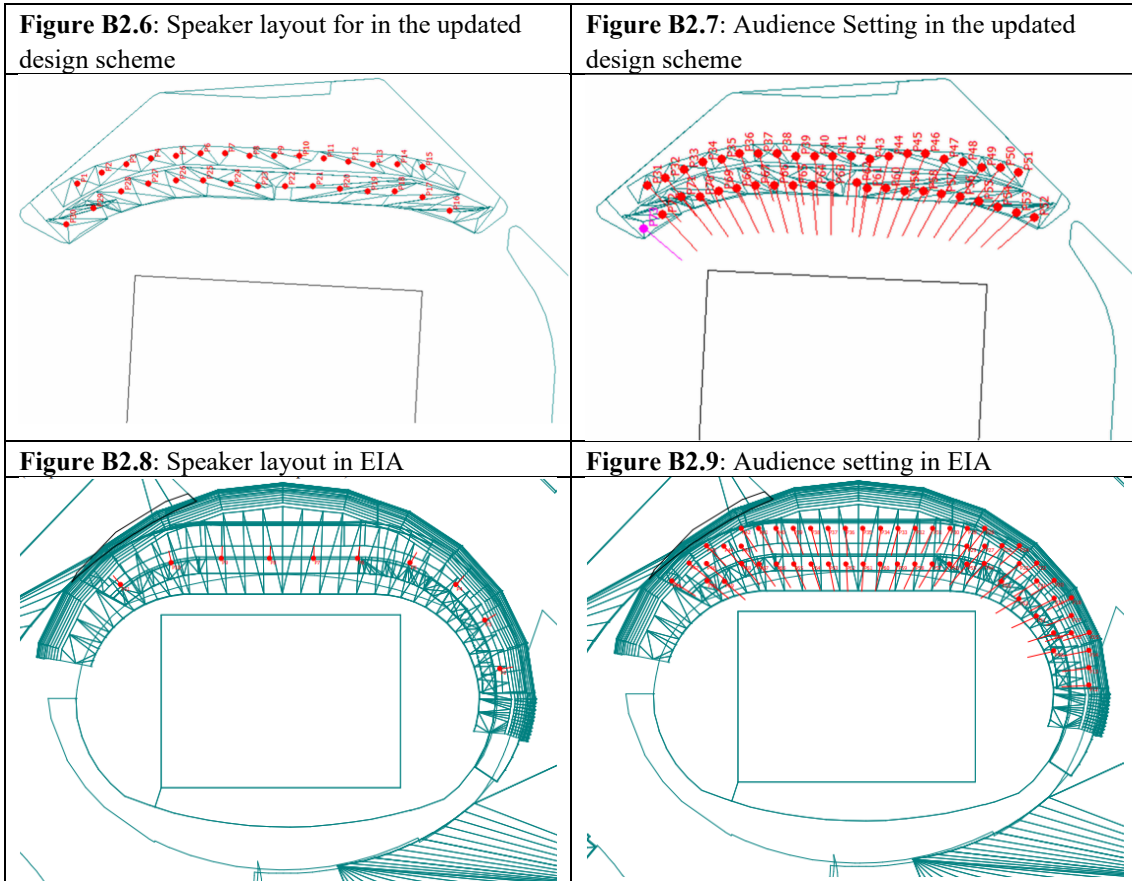
Frequency, Hz	63	125	250	500	1000	2000	4000	8000	A-weighted
SWL adopted for spectator	70.4	73.4	78.4	81.4	81.4	76.4	77.4	-	85.4
SWL adopted for loudspeaker	-	104	102	100	98	97	96	96	104.5

Table B2.5: Comparison of calculation parameter in EIA and current design development

Item	EIA	Updated design scheme
No. of Loudspeakers	10	30
No. of Spectators	7,500	5,000
Sound Power Level of Each Loudspeakers, dB(A)	104.2	104.5
Sound Level at Spectator Stand	70 – 75 dB(A)	80 – 85 dB(A) ^[1]
Sound Power Level of Each Spectators, dB(A)	85.4	85.4

Note:

[1] The sound level at spectator stand in updated design scheme is higher than that of EIA. A conservative assessments is adopted.



B3 Assessment Scenario

Day and evening scenario has been adopted for sports events the spectator stands in accordance with the EIA assumption except those as given in **Table B2.5**.

As the updated design scheme is in variation with the reference design for EIA report, there will be changes in the noise levels predicted at the NSRs in **Figure B2.5**.

B4 Results

The predicted noise levels at the representative NSRs for sports events combined with fixed noise are presented in **Table B4.1**. Detailed results are shown in **Annex B**.

Table B4.1: Predicted noise levels for sports event and fixed noise

NSR ID	Assessment Criteria, dB(A)	EIA Result, dB(A)	Model Result, dB(A)		
	Sports event and fixed noise	Sports event and fixed noise	Sports event and fixed noise		
			Sports Event	M&E Noise Design Level	Max. cumulative
N1	60	52	< 40	52	52
N2	65	56	<40	56	56
PN1	60	54	51– 53	44	54
PN2A	60	60	53 – 54	57	60
PN2B	60		52 – 54		

NSR ID	Assessment Criteria, dB(A)	EIA Result, dB(A)	Model Result, dB(A)		
	Sports event and fixed noise	Sports event and fixed noise	Sports event and fixed noise		
			Sports Event	M&E Noise Design Level	Max. cumulative
PN3	65	58	46 – 50	57	58
PN4	65	56	< 40 – 40	56	56
PN5	60	59	48 – 58	49	59
PN6	60	60	59 – 60	50	60
PN7	60	57	47 – 54	53	57
PN8	60	59	<40 – 53	56	59
PN9	60	52	46 – 48	49	52

Overall, the predicted noise levels are in compliance with the EIA assessment criteria and no adverse noise impact to NSRs.

Annex B Detailed Noise Assessment Results

NSR ID	Level, mPD	Criterion, dB(A)	Predicted Noise Level, dB(A)	Comply [Y/N]
N1	10	60	<40	Y
N1	20	60	<40	Y
N2	10	65	<40	Y
N2	30	65	<40	Y
N2	50	65	<40	Y
N2	70	65	<40	Y
N2	90	65	<40	Y
N2	110	65	<40	Y
N2	130	65	<40	Y
N2	150	65	<40	Y
PN1	15	60	51	Y
PN1	35	60	52	Y
PN1	55	60	53	Y
PN2A	30	60	53	Y
PN2A	50	60	54	Y
PN2A	70	60	53	Y
PN2A	90	60	53	Y
PN2A	110	60	53	Y
PN2B	30	60	52	Y
PN2B	50	60	54	Y
PN2B	70	60	54	Y
PN2B	90	60	54	Y
PN2B	110	60	54	Y
PN3	10	65	46	Y
PN3	30	65	44	Y
PN3	50	65	45	Y
PN3	70	65	50	Y
PN3	90	65	49	Y
PN4	10	65	<40	Y
PN4	30	65	<40	Y
PN4	50	65	<40	Y
PN4	70	65	40	Y
PN4	90	65	40	Y
PN5	10	60	48	Y
PN5	30	60	56	Y
PN5	50	60	58	Y
PN5	70	60	56	Y
PN5	90	60	55	Y
PN6	10	60	59	Y
PN6	30	60	60	Y

NSR ID	Level, mPD	Criterion, dB(A)	Predicted Noise Level, dB(A)	Comply [Y/N]
PN6	50	60	60	Y
PN6	70	60	59	Y
PN6	90	60	59	Y
PN7	10	60	47	Y
PN7	30	60	47	Y
PN7	50	60	49	Y
PN7	70	60	52	Y
PN7	90	60	54	Y
PN7	110	60	54	Y
PN8	10	60	<40	Y
PN8	30	60	<40	Y
PN8	50	60	45	Y
PN8	70	60	50	Y
PN8	90	60	53	Y
PN8	110	60	53	Y
PN9	10	60	46	Y
PN9	25	60	48	Y
PN9	40	60	48	Y

Appendix C

Night-time Crowd Dispersal Routes

C1 Night time Crowd Dispersal

Traffic Department (TD) and Hong Kong Police Force (HKPF) endorsed the night-time crowd dispersal routes and the proposed arrangements presented during the meeting on 12 September 2019. Details including the presentation material, agreed meeting minutes, TD and HKPF's confirmation are enclosed in **Annex C** of **Appendix C**.

The dispersal route as presented in the approved EIA report for the Project was through at-grade passage which will require temporary closure of Shing Kai Road. It is anticipated that such arrangement would induce a number of operational deficiencies and potential safety issues. Therefore, a new crowd dispersal scheme has been developed to mitigate these concerns, especially for night-time crowd dispersal with large mass spectators' departure at close of event.

A crowd dispersal strategy with the use of podium level walkways cum sub-podium level linkages will be adopted. All spectators will disperse through these two segregated levels of podium and sub-podium walkways without interfering with the vehicular traffic at Shing Kai Road.

Figure C1.1 shows the different crowd dispersal routes on the podium level, **Figure C1.2** and **C1.3** provide the route at the sub-podium level.

Figure C1.1: Night-time crowd dispersal routes – podium level

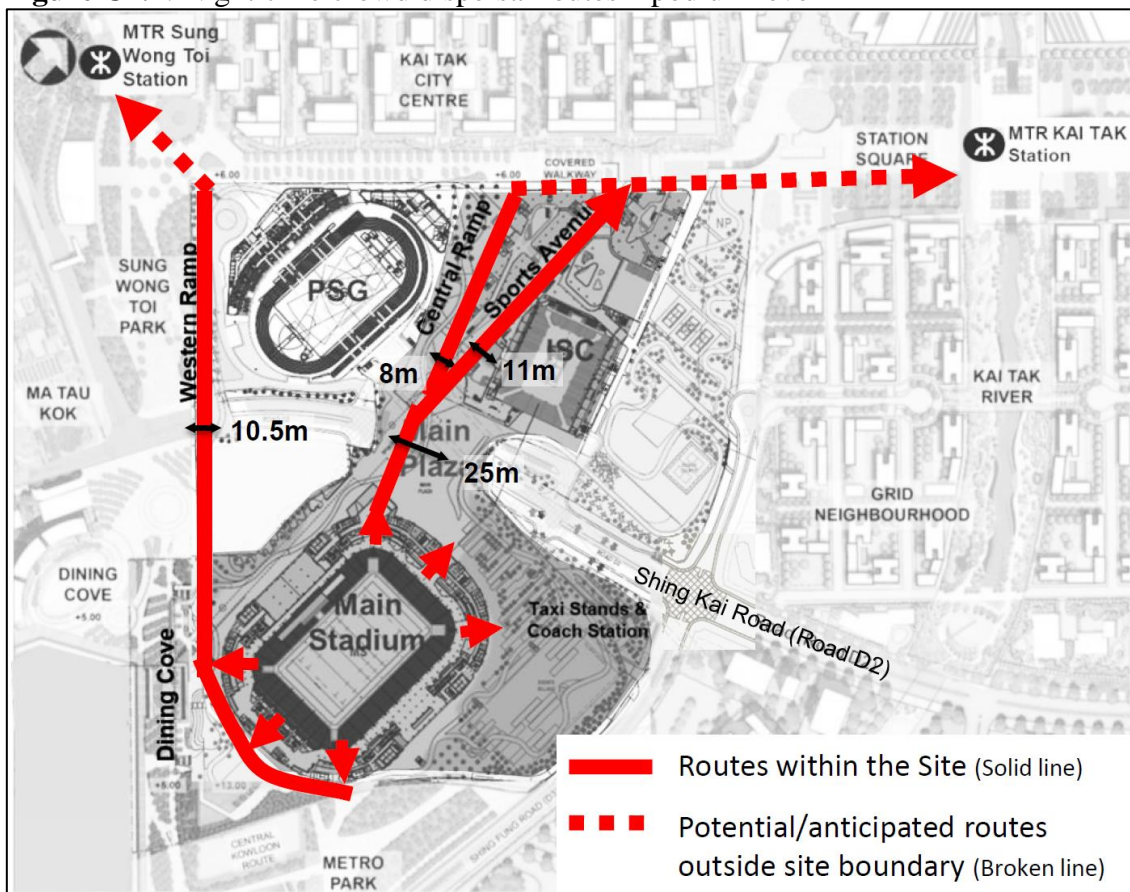


Figure C1.2 Night-time crowd dispersal routes – sub-podium level

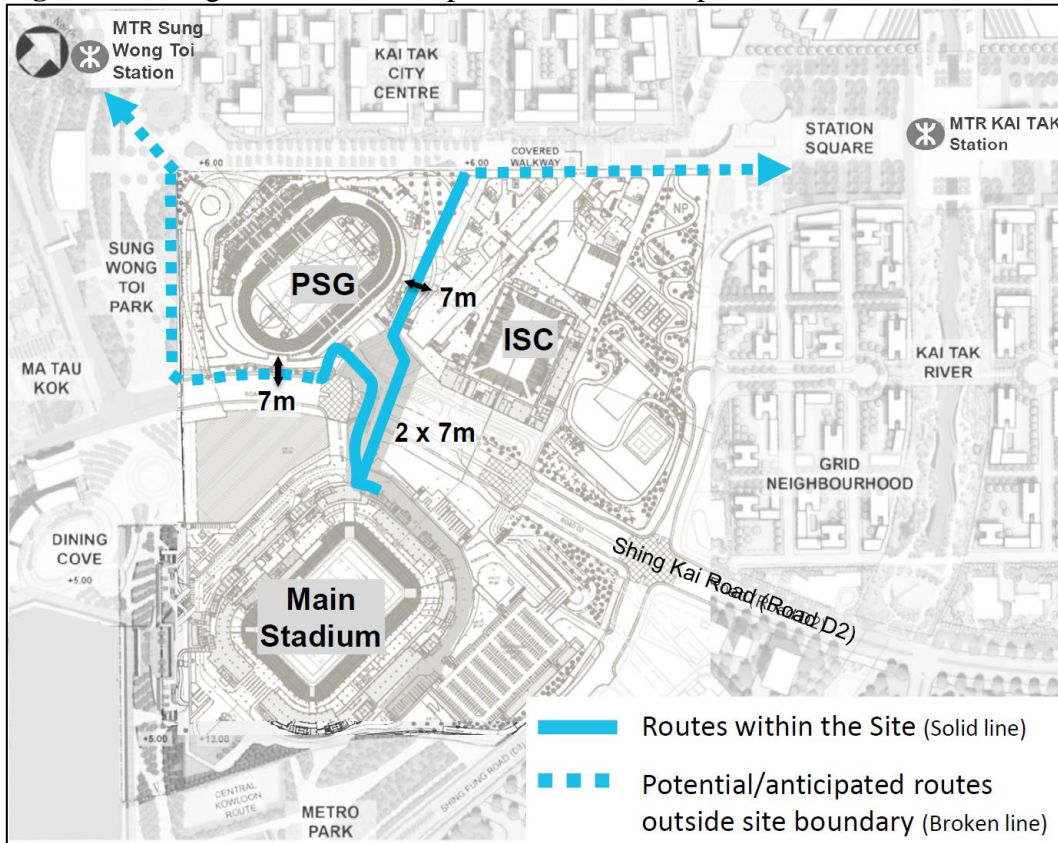
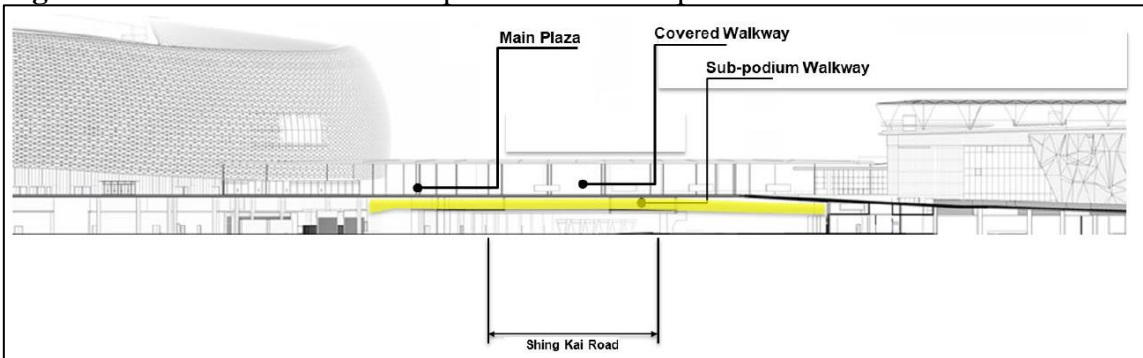


Figure C1.3 Cross section of sub-podium route and podium level



The spectators’ crowd dispersal routes between the Main Stadium and transport nodes are summarised below:

(1) There are two walkways through Main Plaza at podium level leading to Kai Tak Station and one walkway at podium level leading to Sung Wong Toi Station as in **Figure C1.1** of **Appendix C**:

- Walkways through Main Plaza at podium level and the central ramp / Sports Avenue leading to Kai Tak Station Square: At Main Plaza, it is provided with canopy cover in accordance with guidelines for ACABAS submissions. The route is then divided into 2 ways with one directed to the central ramp and the other to the Sports Avenue. At the central ramp, it is an uncovered walkway leading to Kai Tak Station. At the Sports Avenue, it is covered by an Ethylene-

Tetra-Fluoro-Ethylene (ETFE) canopy erected at the roof level between the ISC buildings.

- Walkways at podium level and the Western Ramp leading to MTR Sung Wong Toi Station: These routes are provided with canopy cover in accordance with guidelines for ACABAS submissions.
- (2) There are one walkway at sub-podium level leading to Kai Tak Station and one walkway at sub podium level leading to Sung Wong Toi Station as in **Figures C1.2** and **C1.3** of **Appendix C**:
- Passageway at sub-podium level and walkway leading to Kai Tak Station Square: It is an enclosed route within the sub-podium level. At the sub podium exit, it is connected to an uncovered walkway leading to Kai Tak Station.
 - Passageway at sub-podium level and walkway leading to MTR Sung Wong Toi Station: It is an enclosed route within the Project boundary.

Along the crowd dispersal routes, crowd management measures would be adopted by the operator for major events with more than 20,000 participants finished at or later than 2230 hours. The operator would arrange staff members to marshal the dispersion of crowds in an orderly manner from the MS all the way to the future Kai Tak Station and Sung Wong Toi Station. Placards will be used to advise attendees of the events to keep the noise down. No loudspeakers will be used for nighttime crowd dispersal after 10:30pm. If any attendees are found to raise the voice or make any noise beyond control even after verbal advice by the marshalling staff, the Police will be called in to restore the situation.

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**Re: KTSP - Crowd dispersal proposal from Kai Tak Sports Park,
Sung Wong Toi Park, Station Square and MTR Stations (12/9 pm)
(draft meeting minutes for comments)** 📎

16/10/2019 14:15

From: CW CHENG/TD/HKSARG@TD
To: Vivian WY HO/HAB/HKSARG@HAB,
Cc: Ka Ka YUE/TD/HKSARG@TD, Chung Hin CHAN/TD/HKSARG@TD

History: This message has been forwarded.

Dear Ms HO,

TD submits a nil return.
Thanks

CW CHENG
E/HP3, TEK, TD
Tel. 2399 2767

Vivian WY HO	Dear all, Further to the meeting on 12 S...	10/10/2019 10:31:52 AM
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From: Vivian WY HO/HAB/HKSARG@HAB
To: eo-1-p-d/P&D/STATION/POLICE/HKSARG@HPF, Brenda YN YEUNG/LCSD/HKSARG@LCSD, CW CHENG/TD/HKSARG@TD, Donald Kin Hong LEUNG/ARCHSD/HKSARG@ARCHSD, Eva YW YIP/LCSD/HKSARG@LCSD, Raymond LAU/ARCHSD/HKSARG@ARCHSD, Tsz Fung CHAN/LCSD/HKSARG@LCSD, Tuesday Pak Yee LI/ARCHSD/HKSARG@ARCHSD, Vicky Wai Ki LAM/ARCHSD/HKSARG@ARCHSD, CHUNG Dominic Ka Leung (鍾家亮) <CKALEUNG@mtr.com.hk>, CHAN Mark Tat Tai (陳達大) <MARKCHAN@mtr.com.hk>, Ka Ka YUE/TD/HKSARG@TD, advc-adm-ntkdiv/ntkdiv/STATION/POLICE/HKSARG@HPF, cip-ops-ke/ke/STATION/POLICE/HKSARG@HPF, assuc-ntkdiv/ntkdiv/STATION/POLICE/HKSARG@HPF, ip-sip-rmo-e-c-ke/T-KE/STATION/POLICE/HKSARG@HPF, FUNG Alex Kwok Cheung (馮國章) <akcfung@mtr.com.hk>, KIANG Kevin Yee Wing (姜宜榮) <KKIANG@mtr.com.hk>, WONG Anthony Cheung Chu (黃祥柱) <AWONG@mtr.com.hk>, WONG Celia Tsz Ying (王子英) <WCELIA@mtr.com.hk>
Cc: Helen HL TSANG/HAB/HKSARG@HAB, Hing Keung YUEN/HAB/HKSARG@HAB, Stanley LH HO/HAB/HKSARG@HAB, Moon Shing MAN/HAB/HKSARG@HAB, Kitty YM CHEUNG/HAB/HKSARG@HAB, Michael BK CHU/HAB/HKSARG@HAB
Date: 10/10/2019 10:31 AM
Subject: KTSP - Crowd dispersal proposal from Kai Tak Sports Park, Sung Wong Toi Park, Station Square and MTR Stations (12/9 pm) (draft meeting minutes for comments)

Dear all,

Further to the meeting on 12 September 2019, please find the draft meeting minutes and presentation materials for your review and comment.

I would be grateful if you can furnish us your comments by **25 October 2019 (Fri)** for our further issuance. Please assist forward to those who are not on the email list. Many

thanks.



20190912 draft Gist of Meeting between KTSP and MTRCL, Police, TD, LCSD and ArchSD_clean.doc



Attachment 1_KTSP_20190912_Crowd_Dispersal_v6e (low res).pdf

Also, the crowd dispersal analysis report for KTSP is now ready and I attached herewith for your comments and review by 31 Oct 2019 (Thu). Nil return will be assumed if i do not hear from you.



201909 KTSP TN_Crowd Dispersal_Issue 5a.pdf

For any questions, please do not hesitate to contact me, or Mr. Keith Man at 3586 3149.
Thanks.

Regards,
Vivian HO
A(RS)1, HAB
Tel: 3586 3478

Urgent Return receipt Sign Encrypt Mark Subject Restricted Expand personal&public gr

**Re: KTSP - Crowd dispersal proposal from Kai Tak Sports Park,
Sung Wong Toi Park, Station Square and MTR Stations (12/9 pm)
(draft meeting minutes for comments) 📎**

23/10/2019 15:41

From: eo-1-p-d/P&D/STATION/POLICE/HKSARG@HPF
To: Vivian WY HO/HAB/HKSARG@HAB,
Cc: Hing Keung YUEN/HAB/HKSARG@HAB, cip-ops-ke/ke/STATION/POLICE/HKSARG@HPF,
advc-adm-ntkdiv/ntkdiv/STATION/POLICE/HKSARG@HPF,
assuc-ntkdiv/ntkdiv/STATION/POLICE/HKSARG@HPF,

Follow Up: Normal Priority.

Dear Vivian,

Please note a NIL return from HKPF on the captioned subject with my input on Attendees from HKPF as follows:



20190912 draft Gist of Meeting between KTSP and MTRCL, Police, TD, LCSD and ArchSD_clean (P&D).doc

Thank you.

Regards,

Wendy LI
EO 1 P&D, HKPF
Tel: 2860 2719
Fax: 2200 4374

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Vivian WY HO

Dear all, Further to the meeting on 12 Sept...

2019/10/10 10:32:12



Vivian WY HO/HAB/HKSARG@HAB To:

eo-1-p-d/P&D/STATION/POLICE/HKSARG@HPF
CW CHENG/TD/HKSARG@TD, Donald Kin Hong
YIP/LCSD/HKSARG@LCSD, Raymond LAU/ARCH
CHAN/LCSD/HKSARG@LCSD, Tuesday Pak Yee
LAM/ARCHSD/HKSARG@ARCHSD, CHUNG Dor
<CKALEUNG@mtr.com.hk>, CHAN Mark Tat Tai
YUE/TD/HKSARG@TD, advc-adm-ntkdiv/ntkdiv/S
cip-ops-ke/ke/STATION/POLICE/HKSARG@HPF
assuc-ntkdiv/ntkdiv/STATION/POLICE/HKSARG@



2019/10/10 10:32

w/ CONFIDENTIAL Attachment
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 Unclassified

ip-sip-rmo-e-c-ke/T-KE/STATION/POLICE/HKSAF
<akcfung@mtr.com.hk>, KIANG Kevin Yee Wing |
Anthony Cheung Chu (黃祥柱) <AWONG@mtr.cc
<WCELIA@mtr.com.hk>
Cc: Helen HL TSANG/HAB/HKSARG@HAB, Hing Ke
HOI/HAB/HKSARG@HAB, Moon Shing MAN/HAI
CHEUNG/HAB/HKSARG@HAB, Michael BK CHU
Subject: KTSP - Crowd dispersal proposal from Kai Tak Sp
and MTR Stations (12/9 pm) (draft meeting minute
Reference: GR to file

Dear all,

Further to the meeting on 12 September 2019, please find the draft meeting minutes and presentation materials for your review and comment.

I would be grateful if you can furnish us your comments by **25 October 2019 (Fri)** for our further issuance. Please assist forward to those who are not on the email list. Many thanks.

[attachment "20190912 draft Gist of Meeting between KTSP and MTRCL, Police, TD, LCSD and ArchSD_clean.doc" deleted by eo-1-p-d/P&D/STATION/POLICE/HKSARG]
[attachment "Attachment 1_KTSP_20190912_Crowd_Dispersal_v6e (low res).pdf" deleted by eo-1-p-d/P&D/STATION/POLICE/HKSARG]

Also, the crowd dispersal analysis report for KTSP is now ready and I attached herewith for your comments and review by 31 Oct 2019 (Thu). Nil return will be assumed if i do not hear from you.

[attachment "201909 KTSP TN_Crowd Dispersal_Issue 5a.pdf" deleted by eo-1-p-d/P&D/STATION/POLICE/HKSARG]

For any questions, please do not hesitate to contact me, or Mr. Keith Man at 3586 3149. Thanks.

Regards,
Vivian HO
A(RS)1, HAB
Tel: 3586 3478

Project Title:	Design, Construction and Operation of the Kai Tak Sports Park		
Meeting Title:	KTSP Crowd Dispersal review with MTRCL, HKPF, TD, LCSD, ArchSD		
Date of Meeting:	12 September 2019	Time:	16:00 to 17:30
Venue:	Police Duty Room of Hong Kong Stadium		

Attendees**Kai Tak Sports Park (KTSP)**

HAB:	HK Yuen Keith Man Kitty Cheung	<i>SOR/CLM</i> <i>SOR/SE1</i> <i>SOR/SLM</i>	Michael Chu Vivian Ho	<i>SOR/SE2</i> <i>SOR/A1</i>
L&O:	Jolly Wang	<i>Associate</i>	Lima Hui	<i>Associate</i>
Contracted Party (CP)'s team:				
POP:	James Pearce	<i>Principal</i>		
Arup:	Ray Tang	<i>Associate Director</i>	Henry Yeung	<i>Transport Planner</i>
SKA:	Esther Wong	<i>Chief Architect</i>	Choy Chun Yit	<i>Senior Project Design</i>
SMG:	Darren Burden	<i>Project Executive Director</i>	Melvin Byres	<i>Project Operation Manager</i>
ADI:	Graham Johwstove	<i>Project Manager (PM)</i>	Kiny Lin	<i>Project Manager (PM)</i>
Hip Hing:	Billy Man	<i>Assistant Manager (AM)</i>	Gemma Chow	<i>Design Manager (DM)</i>
	Albert Lau	<i>Design Manager (DM)</i>	Philip Cheung	<i>Assistant Project Manager (APM)</i>
	Candy Lee	<i>Engineer (E)</i>		

Station Square

ArchSD:	Raymond Lau Tuesday Li	<i>SPM332</i> <i>SA/25</i>	Vicky Lam Donald Leung	<i>PM376</i> <i>A/205</i>
LCSD:	Brenda Yeung Jacqueline Lau Eva Yip	<i>DLM (KC)</i> <i>Mgr(KTCTP&RP)</i> <i>EO(Planning)6/2</i>	Judith Chan Chan Tsz Fung	<i>DDL (KC) 2</i> <i>SEO (Planning) 6</i>

Other Departments/ Company

MTRCL:	Dominic Chung Alex Fung	<i>Acting Operations</i> <i>Planning Manager</i> <i>Senior Project Architect – SCL Design Mgt</i>	Kevin Kiang	<i>Operations Manager –</i> <i>WRL & MOL</i>
Police:	Wendy Li Ngan Ka-yan	<i>EO 1 P&D</i> <i>SIP OPS E&C KE</i>	Amy Yeung James Lam	<i>CIP OPS KE</i> <i>ASSUC NTKDIV</i>
TD:	Raymond Cheng	<i>E/HP3, TEK</i>	Yue Ka Ka	<i>S/HP of TOU</i>

Encl.

1. Attachment 1 – PowerPoint Presentation by CP

Gist of Meeting

Action

1. Objective of the Meeting

- 1.1 The coordination meeting was to seek comments from the relevant parties on the assessment results of different crowd dispersal proposals during event days in Kai Tak Sports Park (KTSP).

Noted

2. Introduction of the KTSP Project

- 2.1 CP's designers (POP/Arup) briefly presented the master layout plan and the connectivity of KTSP.

Noted

3. Crowd Dispersal Proposals

- 3.1 HAB remarked that the design and management of crowd dispersal routes within KTSP site (e.g. signage, crowd diversion strategy etc.) would be the responsibility of CP. Those outside KTSP site (of about 20,000 spectators heading to each MTR Kai Tak and Sung Wong Toi Stations) would involve interfacing issues with Station Square and Sung Wong Toi Park as well as the future operation of MTR stations. Hence, the crowd dispersal analysis only covered the routes along KTSP, Station Square and Sung Wong Toi Park and up to the entrances of the MTR stations. The results were considered on conservative side as compared to MTR's previous assessment for stations design (conducted in Jan 2014)

Noted

- 3.2 CP's designer (Arup) presented the proposal on different crowd dispersal routes for day-time and night-time based on the current design of KTSP and the latest available information of Station Square and Sung Wong Toi Park. Regarding the latest layout of Station Square, CP had conducted technical analysis based on different options of crowd dispersal routes to the MTR stations via Station Square (i) using the lawn area as part of crowd dispersal route; and (ii) diverting part of crowd to hard paved area without using the lawn area.

Noted

- 3.3 LCSD enquired the requirement of the 13m clear path within Sung Wong Toi Park for crowd dispersal: (i) whether the pedestrian street abutting the housing site 2B6, to be constructed by CEDD, could be included as part of crowd dispersal routes; and (ii) whether the required width could be provided by several footpaths and integrated into the Sung-Yuan theme of the park as previously requested by HAB, or must be a straight clear width as previously requested by HKPF and TD. TD advised a total of 13m continuous and direct walkway was preferable in view of the purpose for crowd dispersal. In previous meeting discussion between HAB and LCSD in 2016, the ArchSD project team of Sung Wong Toi Park should have the flexibility to design the crowd dispersal routes and integrate with the park design.

Noted

- 3.4 LCSD remarked that people are generally allowed to walk on the lawn in parks of Hong Kong and reminded ArchSD project team of Station Square that the design of walkway in parks should not have raised kerb along edges of lawn area for safety consideration. LCSD had no adverse comment on the crowd dispersal route using the lawn area of Station Square and agreed to adopt separate arrangement during the time the lawn was required to be closed for maintenance or any other reasons. The CP agreed to maintain close liaison with LCSD during the operation phase on the event schedule over the Precinct.

Noted

Gist of Meeting

Action

3. Crowd Dispersal Proposal

- | | |
|---|-------|
| <p>3.5 HAB advised that the study/ analysis prepared by CP was primarily for technical assessment purpose and MTRCL was invited to further review in details including but not limited to crowd flowing into the stations, modal split between two MTR stations, etc.</p> <p>(PMN; MTRCL acknowledged the proposed analysis of crowd flowing into the station, modal split between two MTR stations are in line with MTR station design assumptions.)</p> | MTRCL |
| <p>3.6 Police expressed their concern on the large crowd walking on the lawn, especially on rainy day, people would avoid passing through the wet lawn surface at Station Square thus creating potential bottom-necks. Police questioned whether more hard-paved walkway could be provided. ArchSD responded that high greenery provision was one of the planning intentions for Kai Tak Development (KTD), and plant species of lawn would be selected carefully so as to allow convenient access by the crowd.</p> | Noted |
| <p>3.7 MTRCL asked about the programme of construction of KTSP and TD enquired the types of events to be held. CP remarked that the construction works was targeted for completion in 2022. CP's designers (POP/SMG) responded that there would be different types of test events in the following 12 months after construction until its full operation in 2023. The programme/ types of test events were still under development.</p> | Noted |
| <p>3.8 MTRCL questioned whether there were any way-finding design or methods in guiding spectators to MTR stations (e.g. whether there would be any signage indicating the travelling time/ distance to each MTR stations). CP's designers (POP/SMG) responded that a number of staff would be arranged for managing the crowd within KTSP site and supported by public address (PA) system and signage during events. HAB remarked that CP would coordinate with relevant parties on the signage arrangement outside KTSP site when way-finding designers were on board. For those signage outside KTSP site, CP would coordinate with LCSD and MTRCL.</p> | CP |
| <p>3.9 MTRCL asked whether there would be concurrent events held at MS and other venues in the Precinct. CP's designer (Arup) responded that there could be concurrent events at MS and ISC provided that the timing for crowd dispersal for these events at these venues would not be overlapping.</p> | Noted |
| <p>3.10 MTRCL asked the possibility of increasing the capacity of Main Stadium in future. HAB remarked that 50,000 spectators was adopted in the current design of MS and no planning in increase in capacity. CP's designers (SMG/POP) supplemented that dispersing about 20,000 spectators to each MTR station was the worst scenario for night-time crowd dispersal assessment. From stadium operator's perspective, a number of measures could be implemented to attract spectators staying behind the Precinct such as drinks and socialise with friends, etc. MTRCL was of view that the assessment of MTR Kai Tak and Sung Wong Toi Stations for mega event were based on 20,000 spectators to each stations only.</p> | Noted |
| <p>3.11 TD, HKPF, LCSD and ArchSD had no objection to crowd dispersal proposals proposed by CP and would further review upon receiving further information from CP.</p> | Noted |
| <p>3.12 CP of KTSP agreed to submit a crowd dispersal report to all relevant parties for comment by a target of the third week of September 2019.</p> | CP |

End

Attachment 1

Kai Tak Sports Park

Meeting with TD, Police, LCSD, ArchSD & MTR on Crowd Dispersal

12 Sep 2019

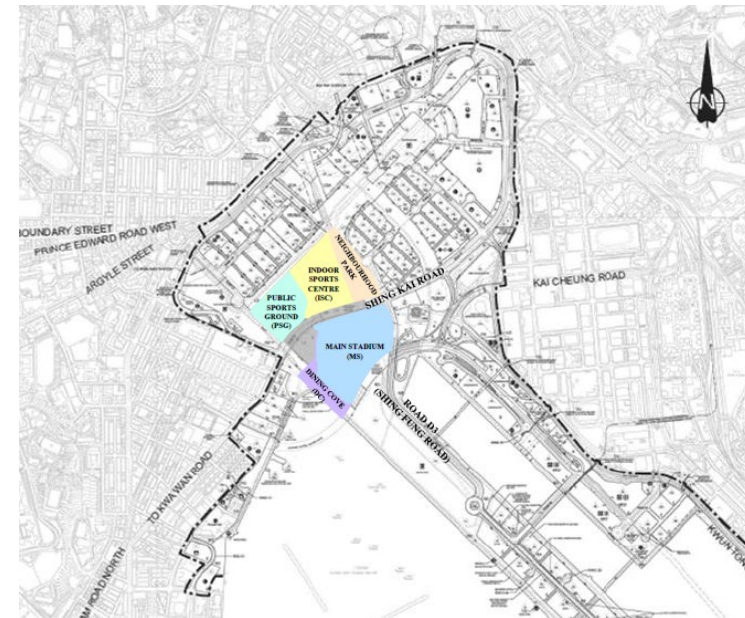
Contract No. HAB/KTSP/01
Design, Construction and Operation of the Kai Tak Sports Park
Kai Tak Kowloon City District (Programme No.3272RS)

Meeting with TD, Police, LCSD,
ArchSD & MTR on Crowd Dispersal
12 Sep 2019

Kai Tak Sports Park

Objectives

- To present crowd dispersal routes within precinct under different scenarios;
- To compare crowd dispersal strategy against Reference Design; and
- To discuss key issues of crowd dispersal routes outside site boundary



Agenda

1. Introduction of Kai Tak Sports Park
 - (i) Master Layout Plan
 - (ii) Connectivity

2. Crowd Dispersal Analysis/ Flow of spectators
 - (i) Software used
 - (ii) Modal split of spectators
 - (iii) Crowd arrival/dispersal routes
 - (iv) Results

3. Crowd Management Responsibilities
 - (i) Within the precinct
 - (ii) Outside the precinct

4. Any Other Business



Meeting with TD, Police, LCSD,
ArchSD & MTR on Crowd Dispersal
12 Sep 2019
Kai Tak Sports Park

Key Precinct Features

Station Square

Sung Wong
Toi Station
MTR

Sung Wong
Toi Park

Harbour
Promenade

Central
Kowloon
Route

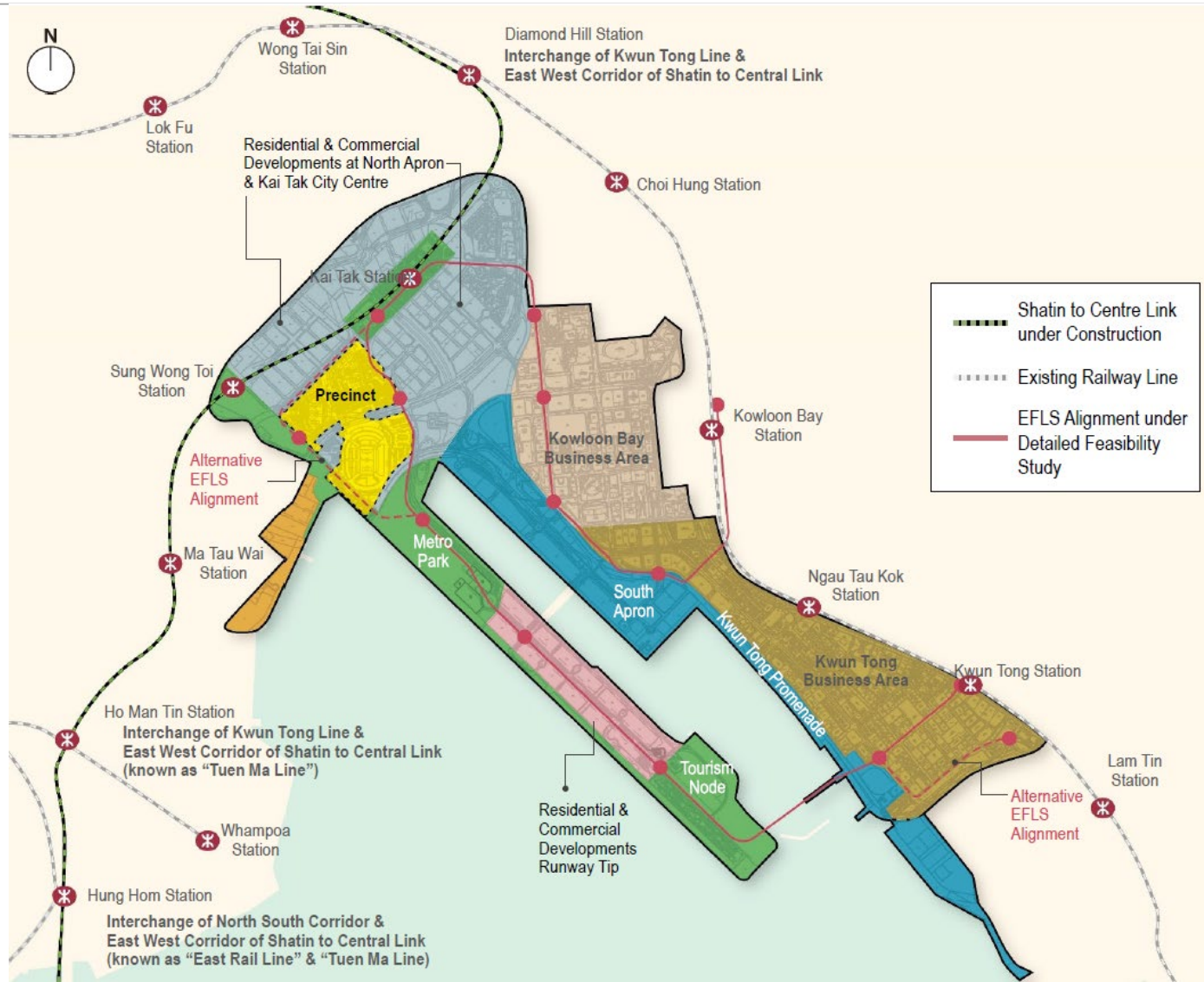
Kai Tak
Station
MTR

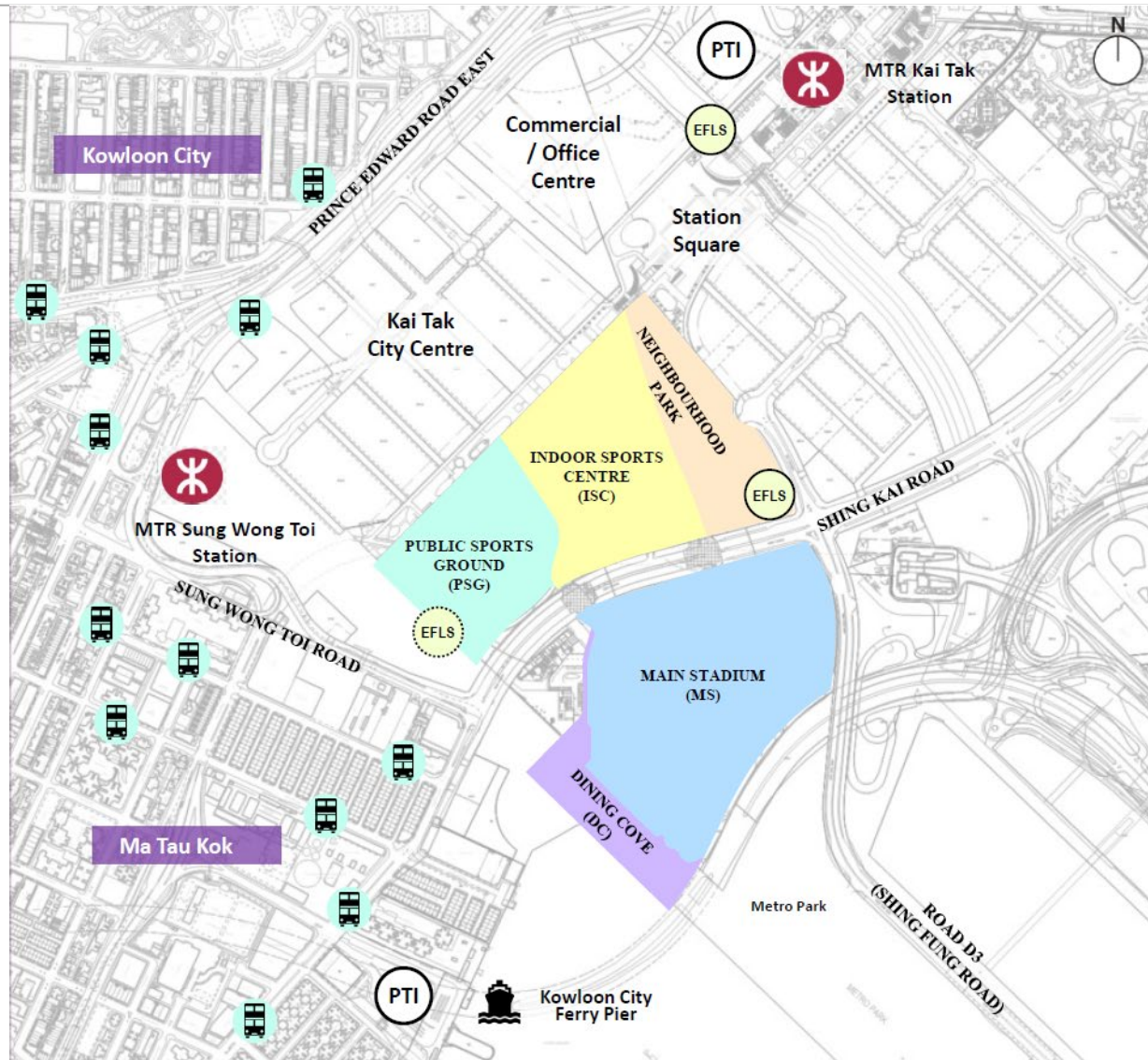
Shing Kai
Road

Road D3






Metro Park







LEGEND

-  Public Transport Interchange
-  Bus Stop
-  Ferry Pier
-  Potential EFLS Station
-  Potential EFLS Station (under alternative alignment)



Project Facilities

Public Sports Ground
5 000-seat

Main Stadium
50 000-seat

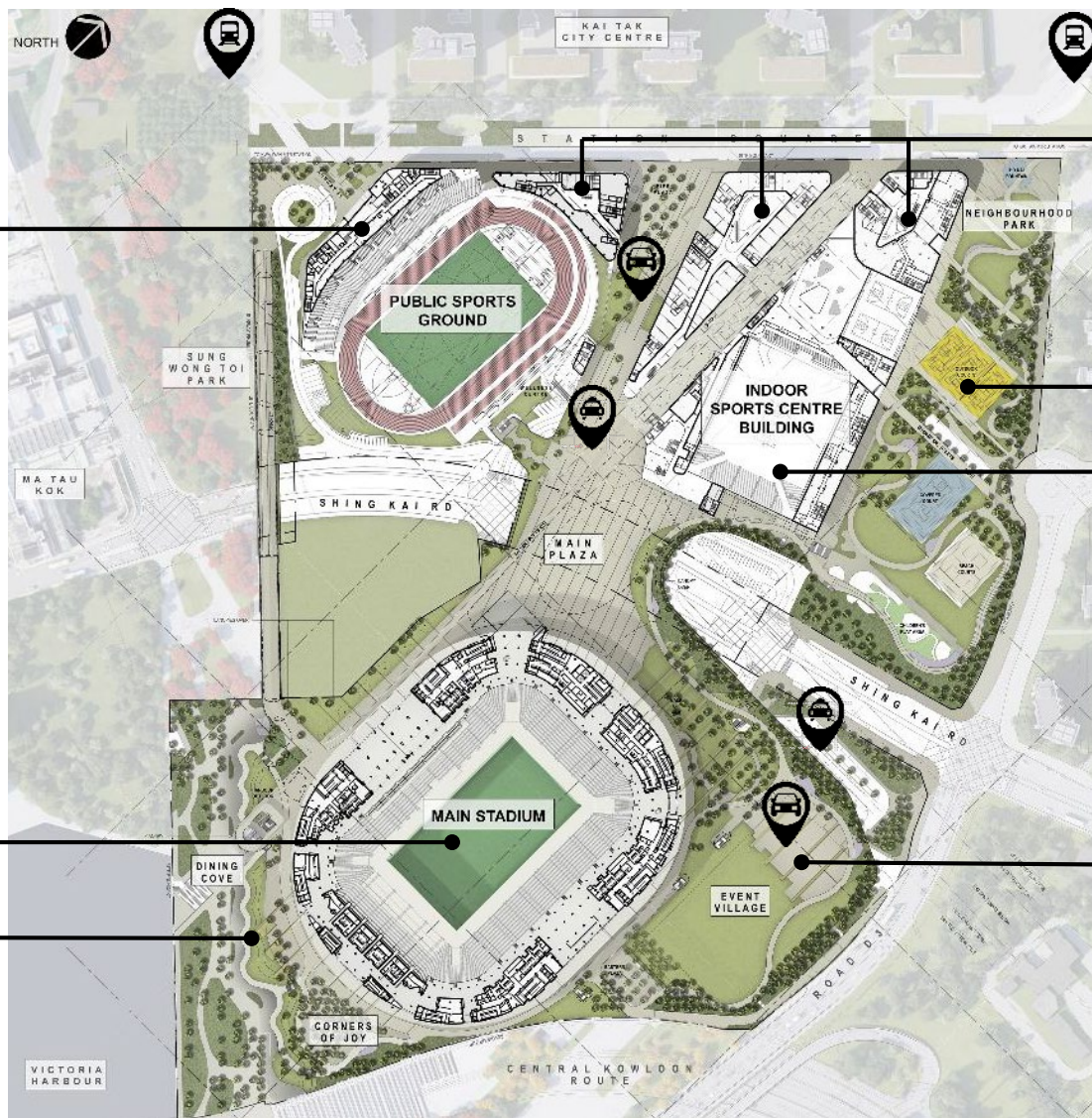
Dining Cove

Retail Shops / F&B
Bowling Centre – 40 Lanes
Sports Health & Wellness Centre

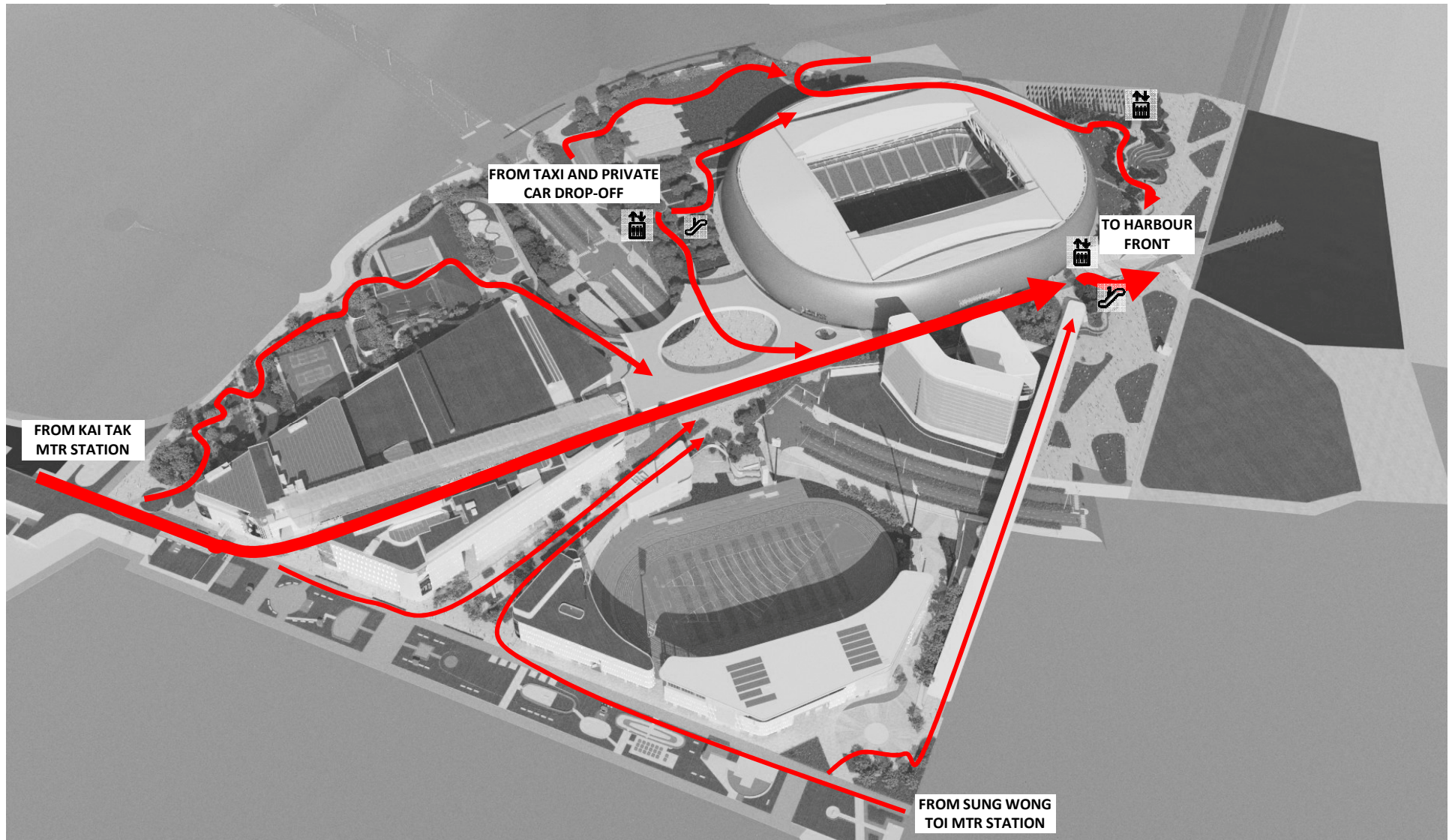
Neighbourhood Park

Indoor Sports Centre
10 000-seat Main Arena +
500-seat Ancillary Sports Hall

Event Village



Meeting with TD, Police, LCSD,
ArchSD & MTR on Crowd Dispersal
12 Sep 2019
Kai Tak Sports Park



Meeting with TD, Police, LCSD,
ArchSD & MTR on Crowd Dispersal
12 Sep 2019
Kai Tak Sports Park



Meeting with TD, Police, LCSD,
ArchSD & MTR on Crowd Dispersal
12 Sep 2019
Kai Tak Sports Park

Use of Software for Crowd Dispersal

MassMotion

- 3D pedestrian simulation software
- Widely used to assist the development of large stadia & sport venues
- Agreed to adopt in this assignment by HAB/TSC in Mar 2019

Modal Split of KTSP Spectators

Transport Mode	Modal Split ⁽³⁾	Number of Spectators for MS
Rail ⁽¹⁾	81%	40,500
Franchised Bus/ GMB ⁽²⁾	8%	4,000
Private Car	6%	3,000
Coach	3%	1,500
Taxi	2%	1,000
Overall	100%	50,000

Note:

- (1) It is assumed that MTR Kai Tak and Sung Wong Toi stations have equal share (40.5% of each).
- (2) It is assumed that Franchised Bus/ GMB stops along Prince Edward Road East near Kai Tak and Sung Wong Toi stations and at Kowloon City Ferry Pier PTI have an equal share (2.67% of each).
- (3) The modal split figures were adopted in (i) "Traffic and Transport Study Final Report" under Consultancy of Kai Tak Development Engineering Study cum Design and Construction of Advance Works; (ii) Traffic Impact Assessment Report under the Consultancy of Multi-Purpose Sport Complex at Kai Tak Area in 2016.

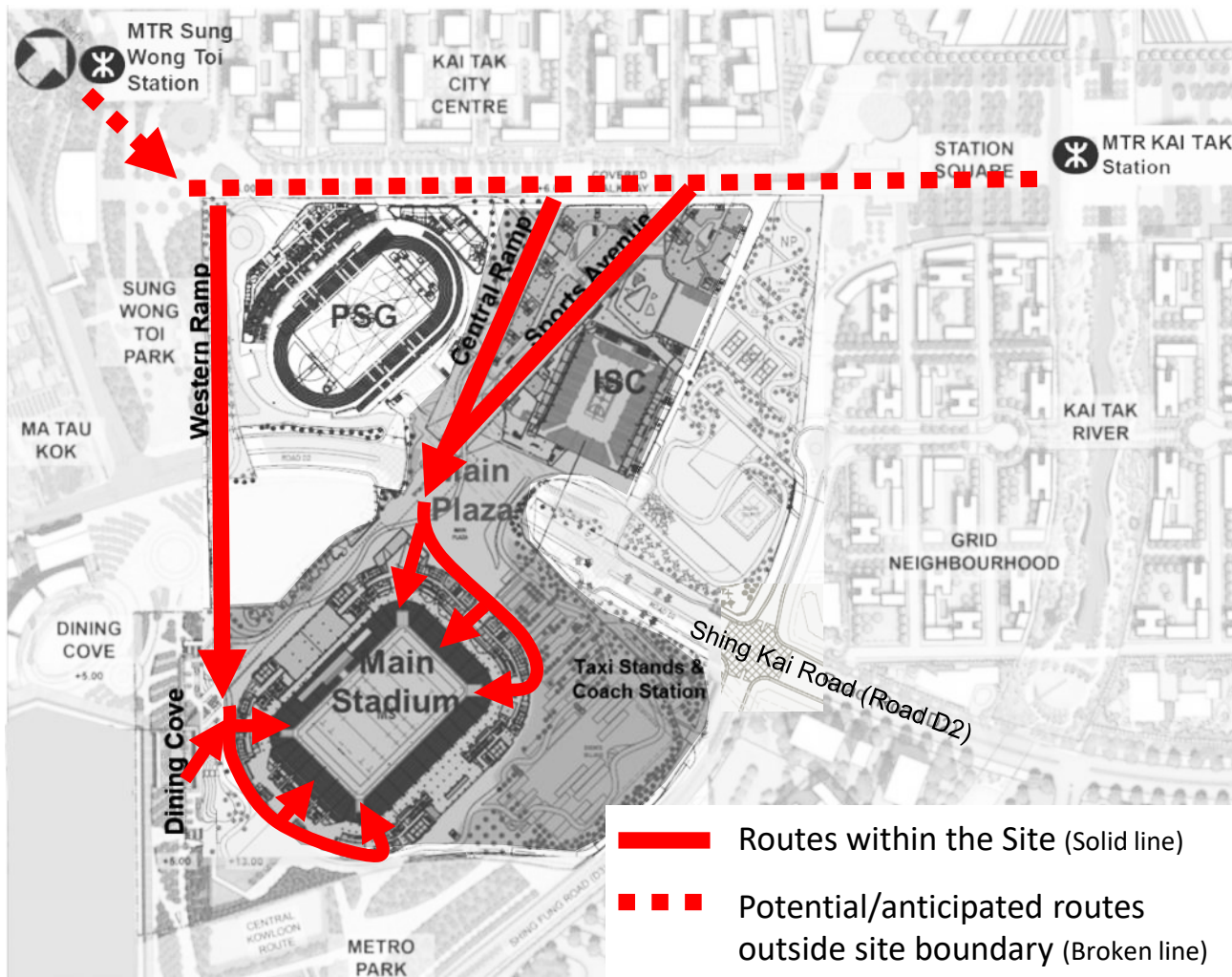
Same as
Reference Design

Comparison of Night-time Crowd Dispersal Strategy

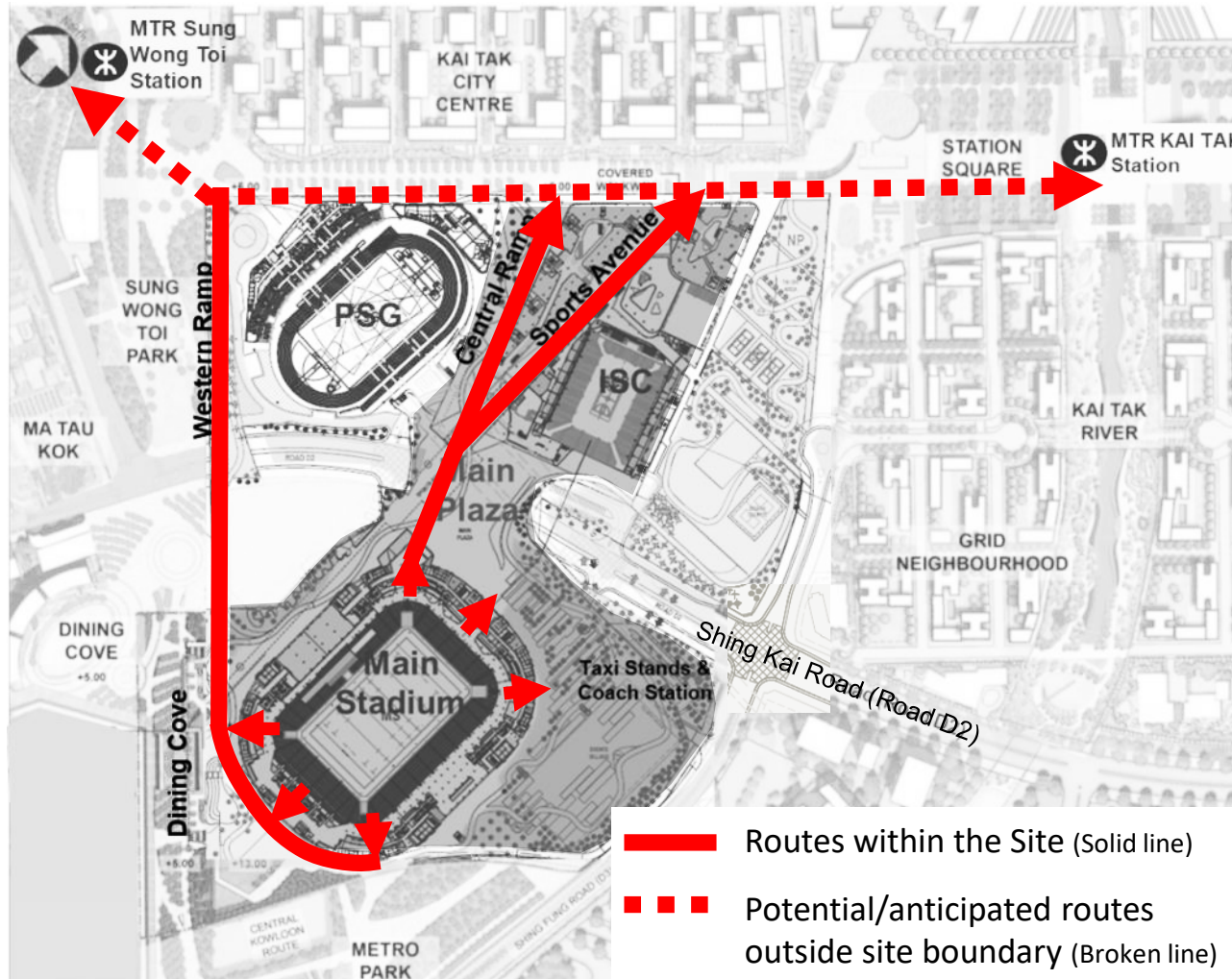
	Reference Design	Current Design
Number of spectators	50,000	50,000
Modal split of rail	81%	81%
Crowd dispersal routes	At-grade routings across Shing Kai Road	Podium and sub-podium passageways
Temporary closure of Shing Kai Road	Required	Not required
Temporary closure of vehicle parking spaces	Required	Not required

Under the current design, the conflicts between spectators and vehicular traffic are minimised. Traffic management measures after event for temporary closure of Shing Kai Road is not required

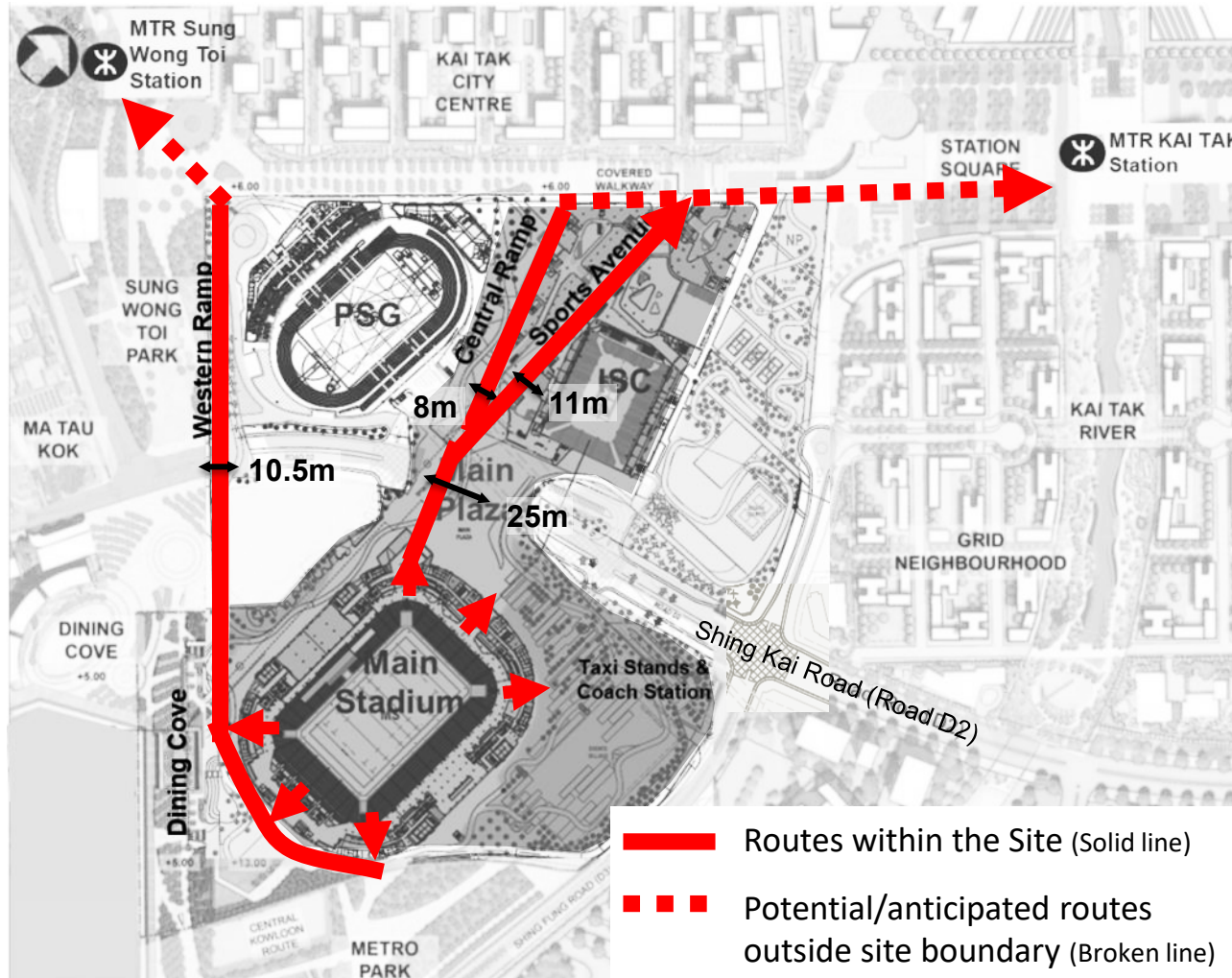
Crowd Dispersal Routes



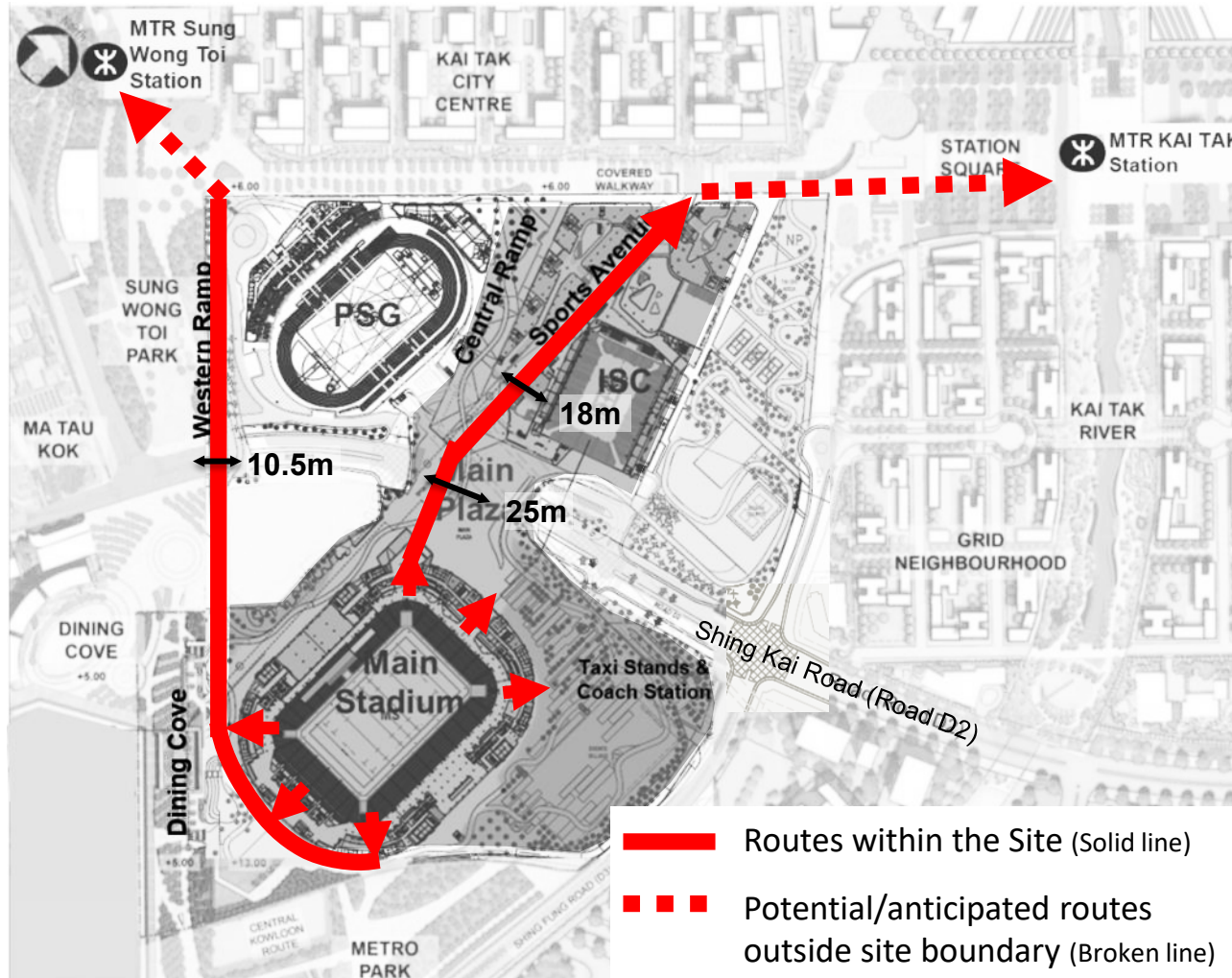
Arrival Scenario



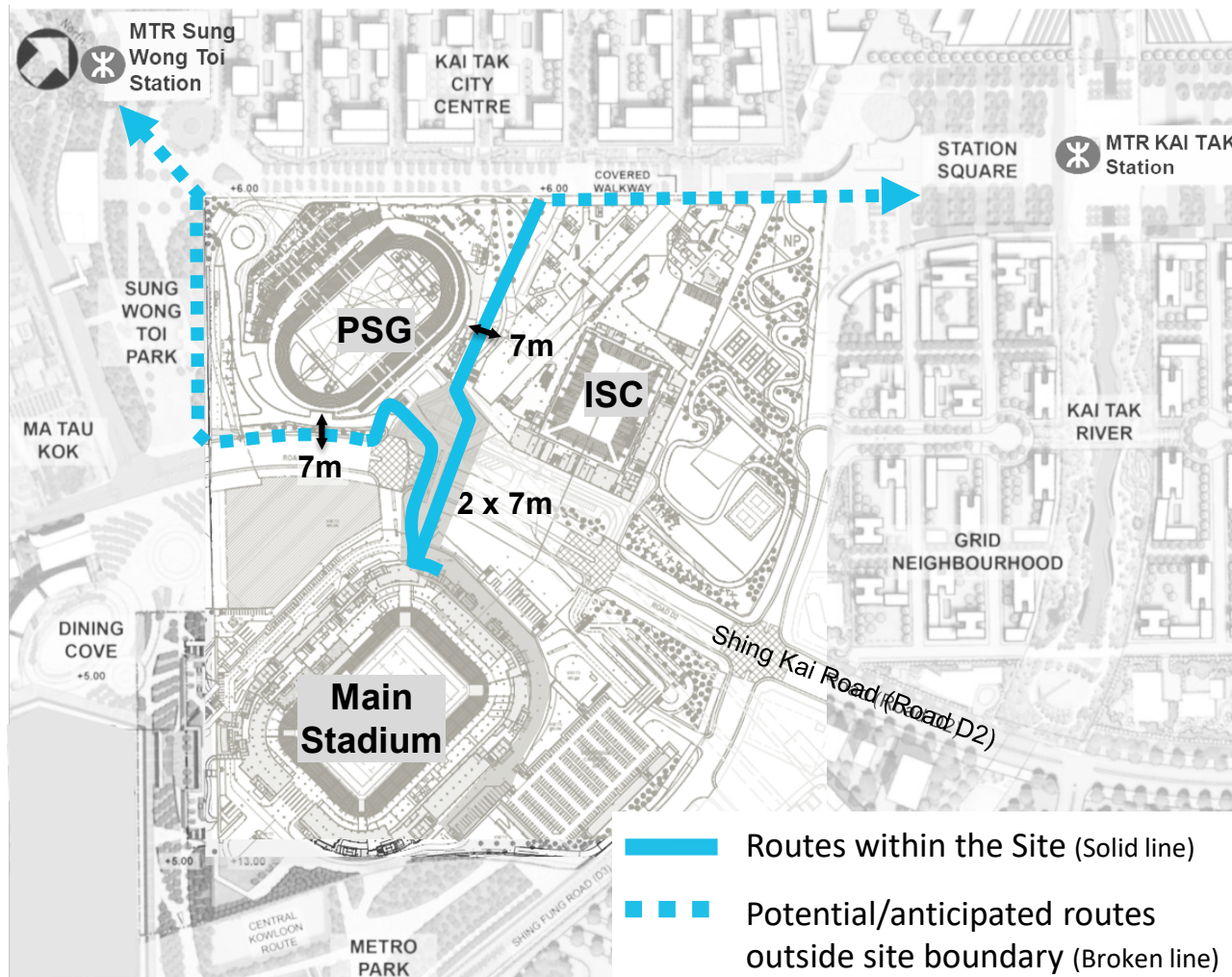
Daytime Dispersal Scenario (Podium)



Night-time Dispersal Route (Podium) – Option A



Night-time Dispersal Route (Podium) – Option B



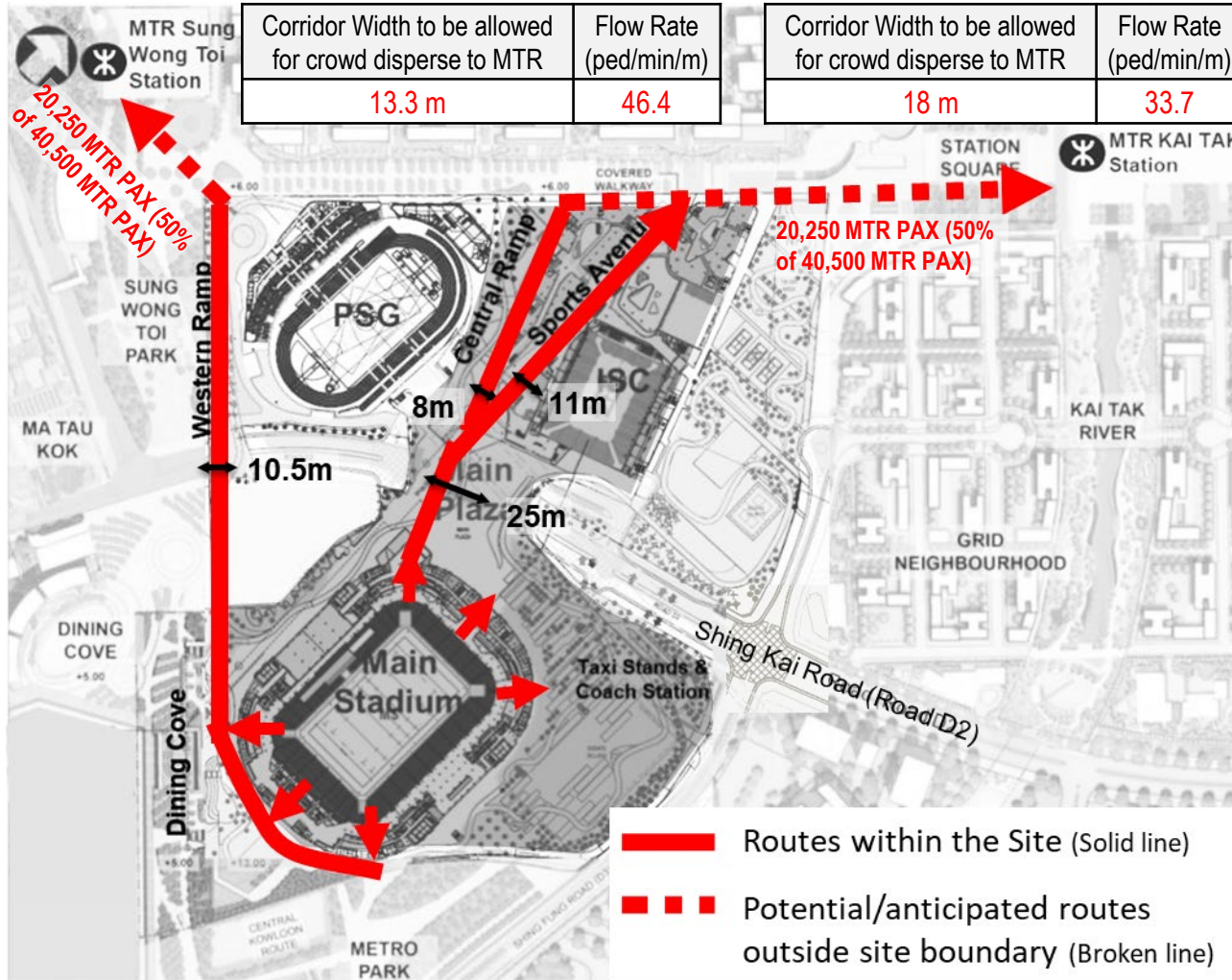
Night-time Dispersal Route (Sub-Podium)

Crowd Dispersal Analysis Results

Compliance to ER

Criteria	ER Req.	Proposed Scheme	Compliance
Dispersal Time for 80% Spectators (Total 50,000)	45 mins	44 mins	Yes
Dispersal Time for 100% Spectators (Total 50,000)	60mins	58 mins	Yes
Level of Service (LoS) HK TPDM Standard	Los D or above	Los D or above	Yes

Flow Rates of Corridors Heading to MTR Stations (Night-time Crowd Dispersal)

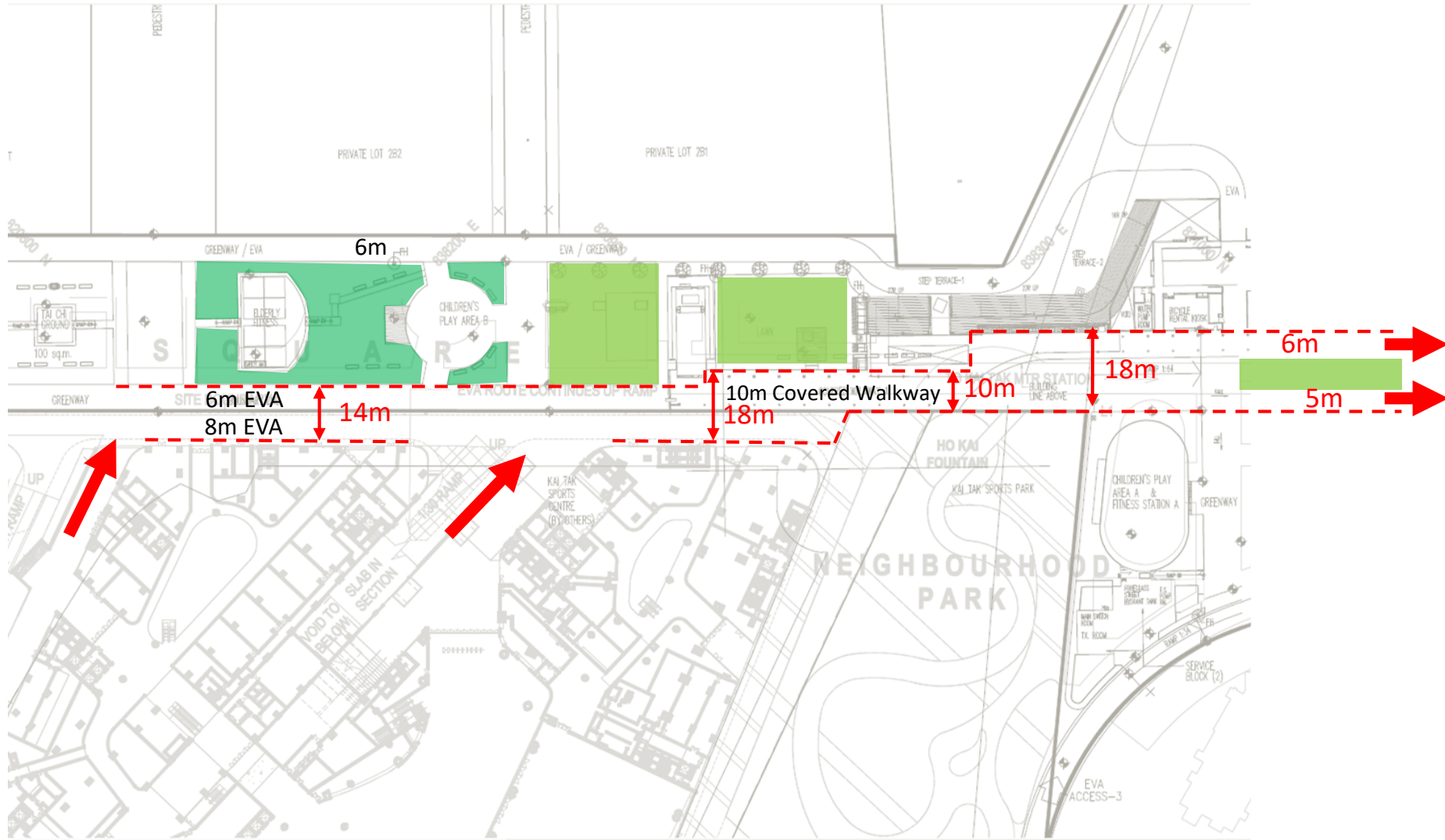


Comparison against MTR's assessment Result

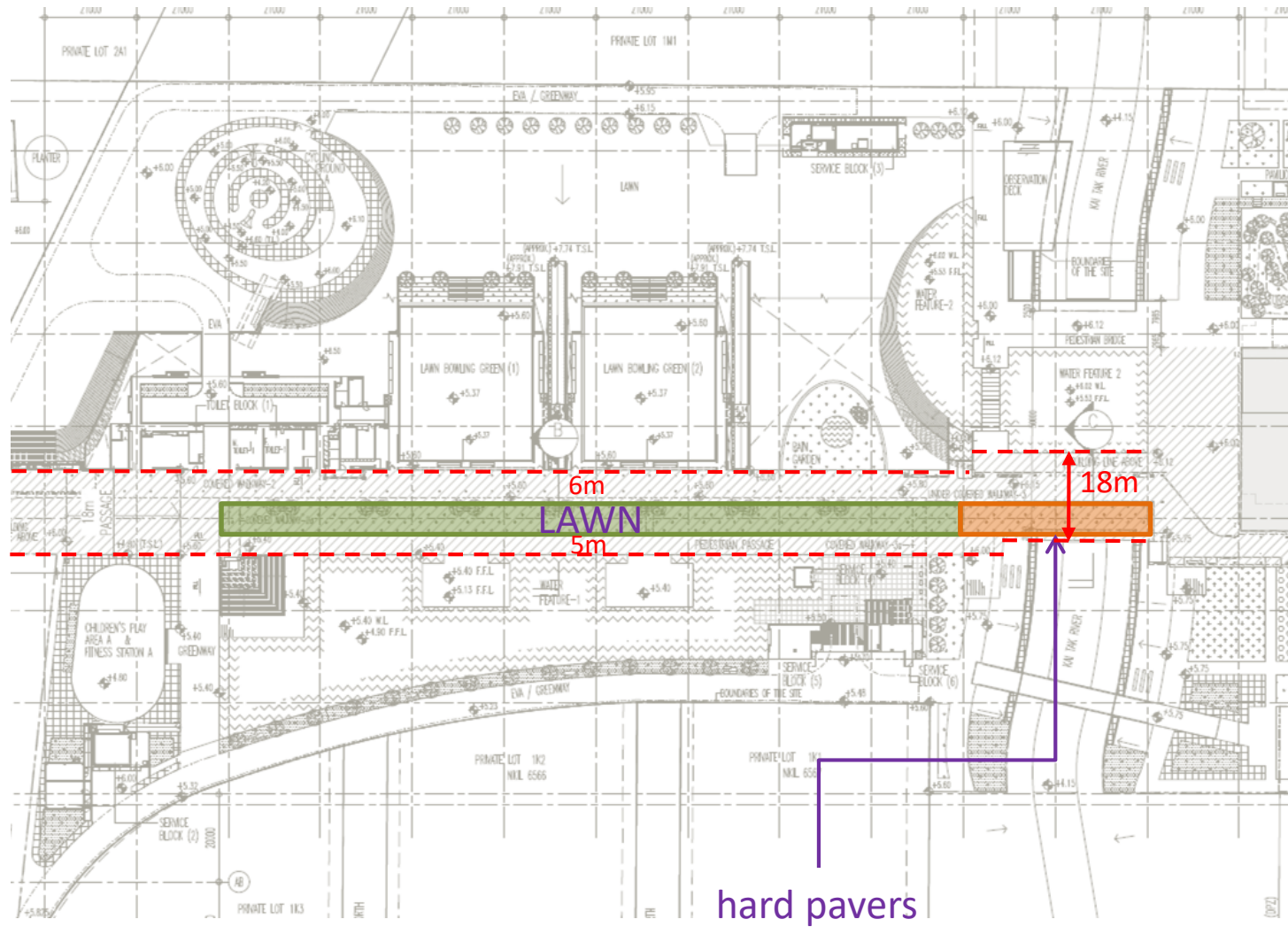
Criteria	KTSP Design	MTR 's assessment (Jan 2014)
Stadium Crowd	50,000	50,000
Event Rail Passengers (81% of crowd)	50,000 x 81% = 40,500	50,000 x 81% = 40,500
Split between Kai Tak (KAT) and Sung Wong Toi (SUW) Stations	20,250 ped (50:50)	20,250 ped (50:50)
Arrival Period (Fr Station to Stadium)	90 mins (with profiles)	90 mins (with profiles)
Dispersal Period (Fr Stadium to Station)	58 mins (maintaining LOS D)	30 mins (without profiles)
Peak Crowd Dispersal Patronage per minute	KAT: 33.7 ped/min/m * 18m = 607 ped/min SUW: 46.4 ped/min/m * 13.3m = 617 ped/min	KAT/SUW: 20,250 * 100% / 30 = 675 ped/min
Additional background in-coming patronage allowed	Nil	KAT: 104 ppm SUW: 32 ppm (5% of daily patronage)
Total Incoming Passengers during Event Crowd Dispersal	KAT: 607 ped/min SUW: 617 ped/min	KAT: 779 ped/min SUW: 707 ped/min

Potential/ Anticipated Crowd Dispersal Routes outside KTSP Site Boundary

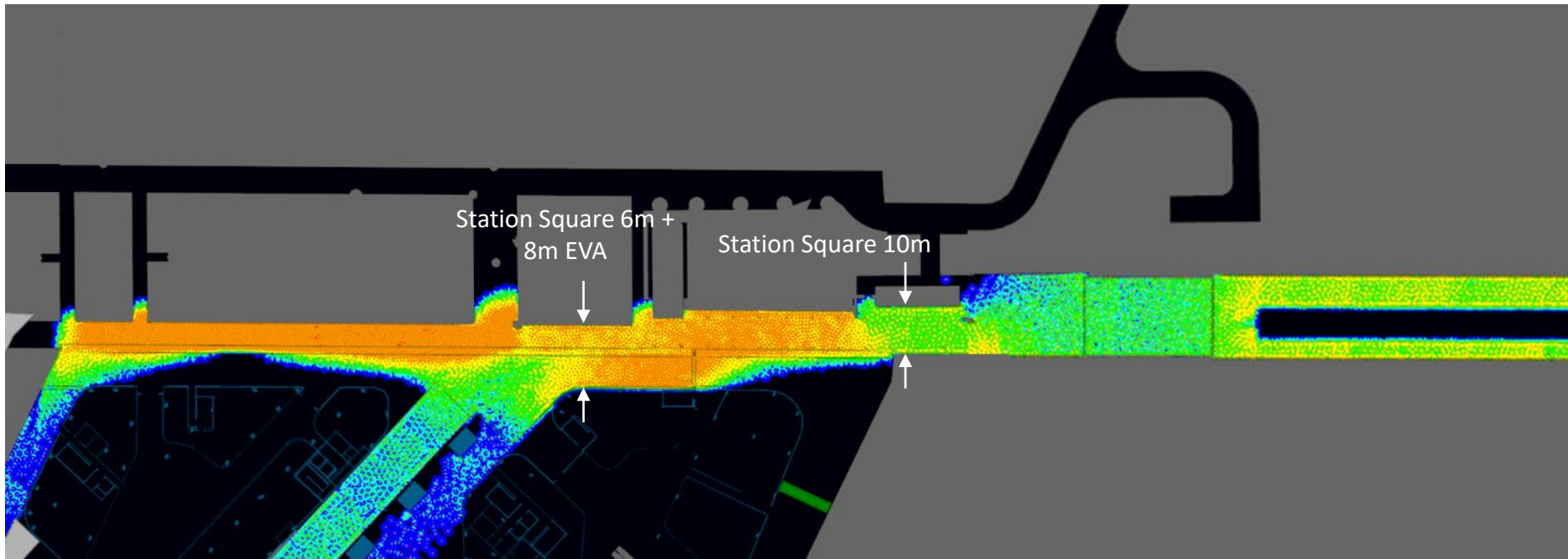
Interface with Kai Tak Station Square



Meeting with TD, Police, LCSD,
ArchSD & MTR on Crowd Dispersal
12 Sep 2019
Kai Tak Sports Park

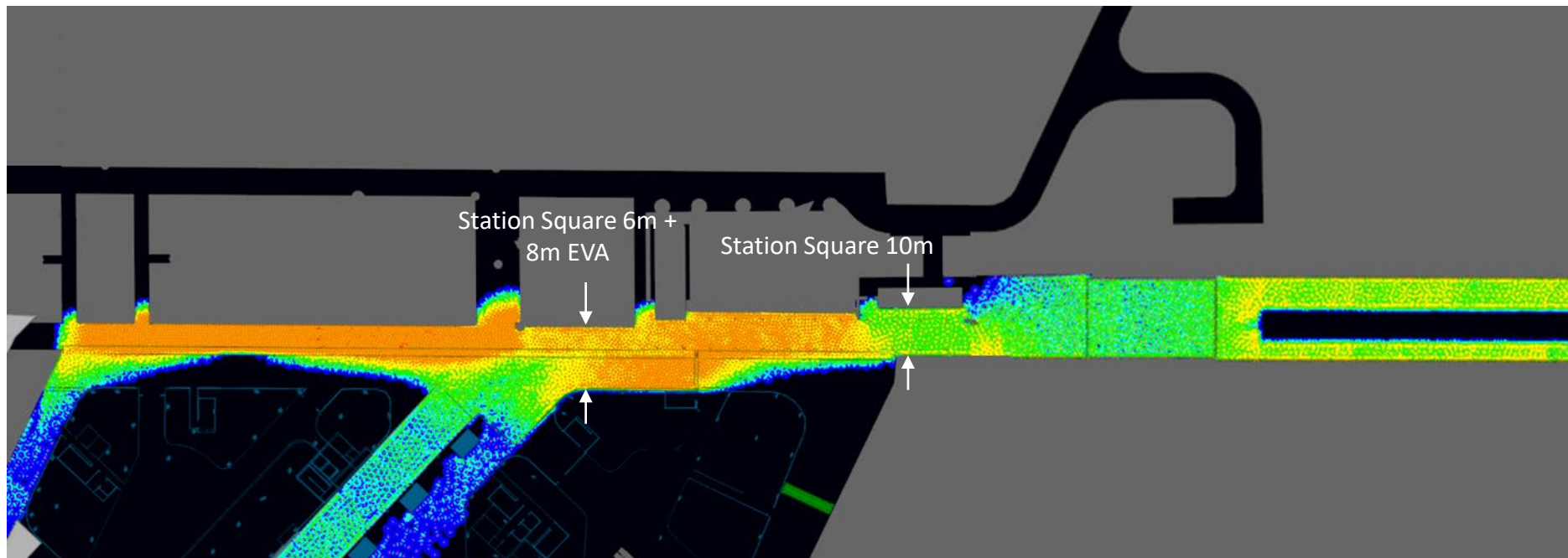


Meeting with TD, Police, LCSD,
ArchSD & MTR on Crowd Dispersal
12 Sep 2019
Kai Tak Sports Park

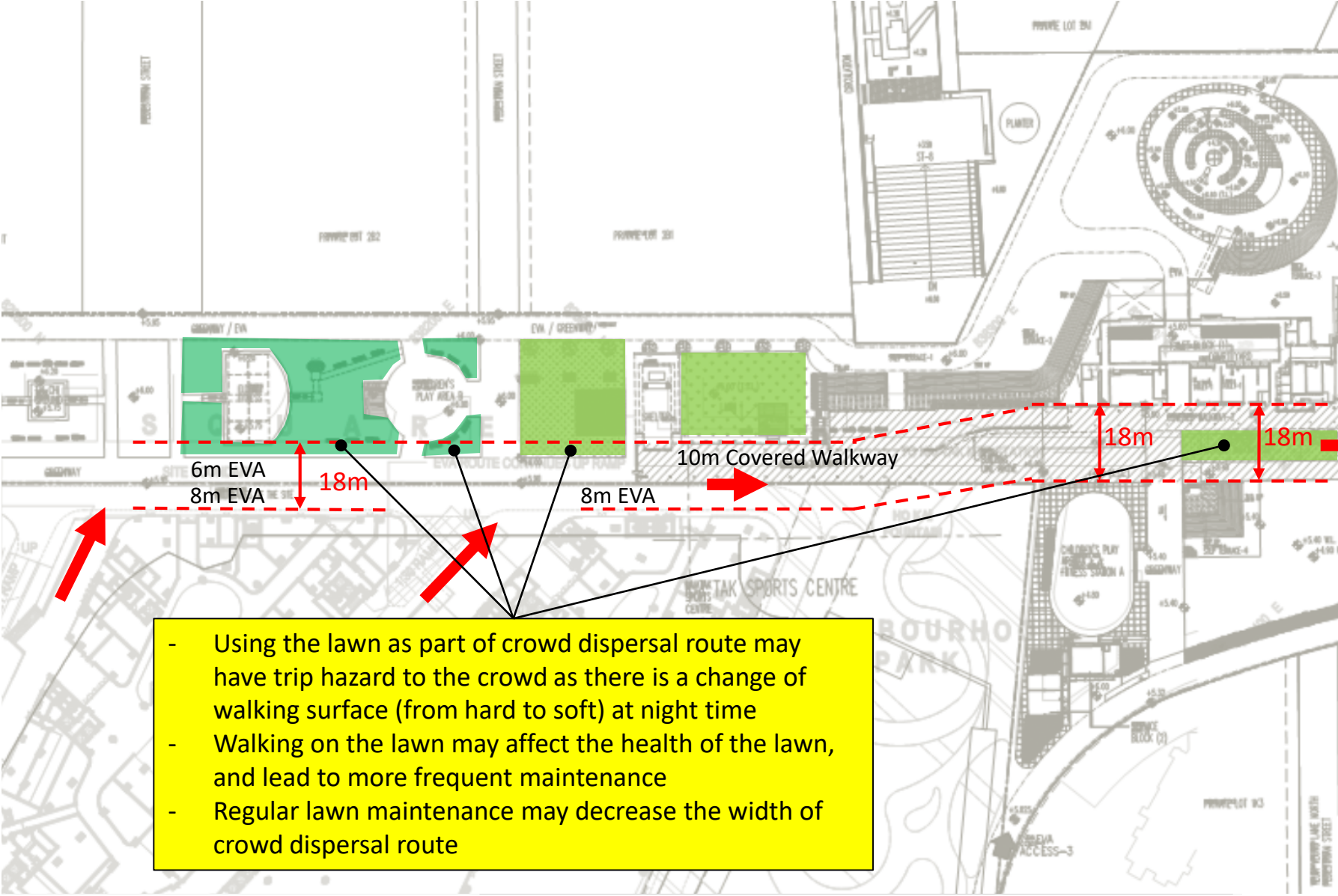


Potential night-time crowd dispersal routes at Station Square (with corresponding remarks)

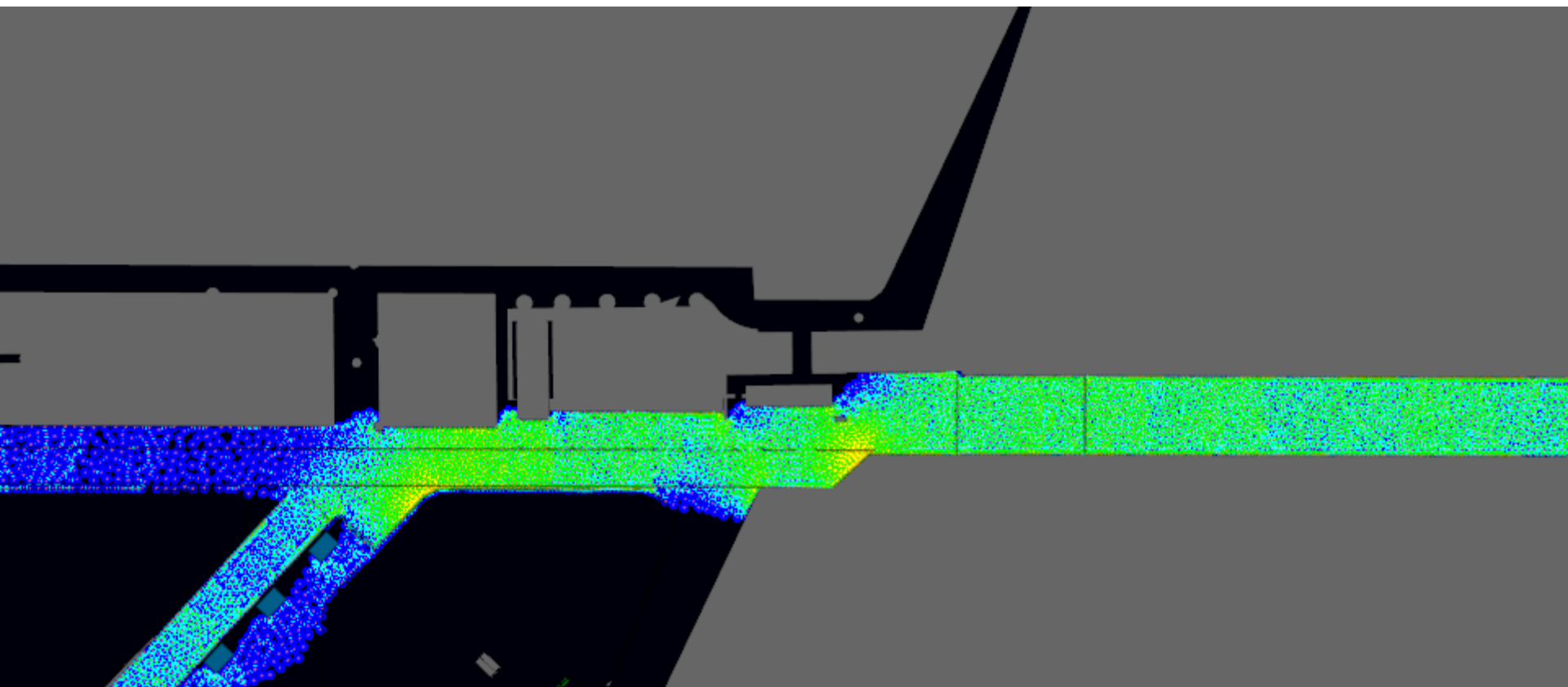
Situation during night time crowd dispersal using the original proposed route



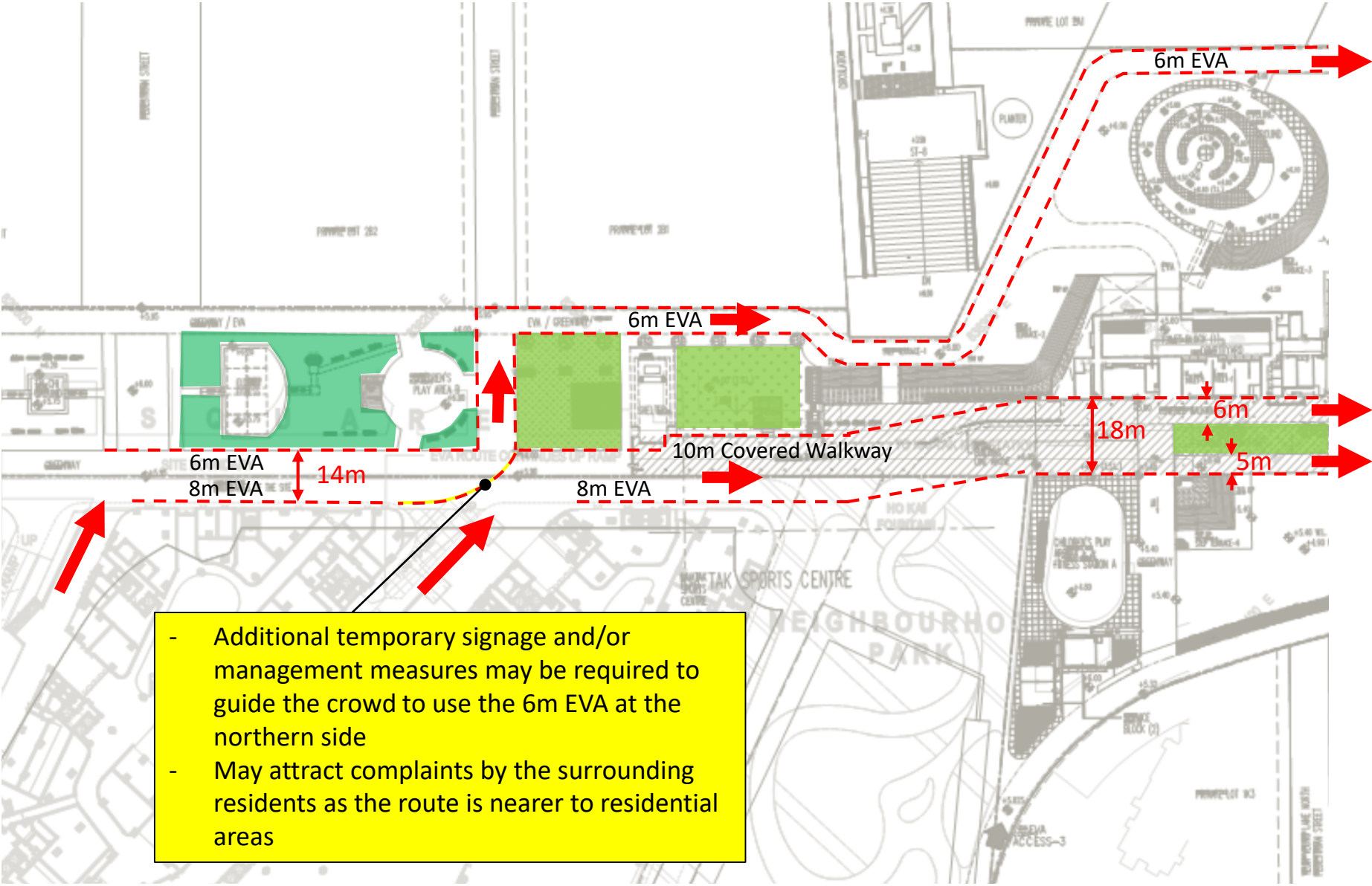
Option 1. Using the lawn as part of the crowd dispersal route



- Using the lawn as part of crowd dispersal route may have trip hazard to the crowd as there is a change of walking surface (from hard to soft) at night time
- Walking on the lawn may affect the health of the lawn, and lead to more frequent maintenance
- Regular lawn maintenance may decrease the width of crowd dispersal route



Option 2. Divert part of the crowd to use the EVA at Station Square north side



- Additional temporary signage and/or management measures may be required to guide the crowd to use the 6m EVA at the northern side
- May attract complaints by the surrounding residents as the route is nearer to residential areas

Meeting with TD, Police, LCSD,
ArchSD & MTR on Crowd Dispersal
12 Sep 2019
Kai Tak Sports Park

