

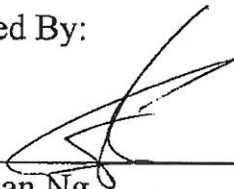
MTR Corporation Limited

Tsim Sha Tsui Station Northern Subway

Baseline Monitoring Report (Revised)

May 2013

Verified By:



Coleman Ng
Independent Environmental Checker

Date:

- 7 AUG 2013

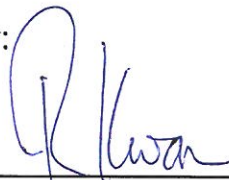
MTR Corporation Limited

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May 2013

Certified By:



Richard Kwan
Environmental Team Leader

Date:

- 6 AUG 2013

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EXECUTIVE SUMMARY

Background

MTR Corporation Limited (MTRCL) proposes to construct the Tsim Sha Tsui Northern Subway, otherwise referred to as ‘TNS’. The objectives of TNS are to provide passengers with a direct and accessible safe pedestrian subway in addition to the existing entrances and to relieve the existing busy northern concourse and platform areas of Tsim Sha Tsui (TST) Station by providing a new direct high-capacity corridor for effective passenger access. The location of the proposed Project is shown in Figure 1.

The Project involves construction and operation of (i) An underground pedestrian subway link that connects the north end of the TST Station platform with integrated entrances in the basements of The One, Miramar Hotel and Miramar Shopping Centre; (ii) An underground satellite concourse underneath Nathan Road located adjacent to The One and the Miramar Hotel; (iii) A new plant basement near existing Entrance A1 to house the station equipment relocated from the north end of TST Station for accommodating the TNS connection; and (iv) the upgrade of existing TST Entrance A1.

MTRCL is currently coordinating with the developers of the redevelopment projects at north Tsim Sha Tsui and to review the future arrangements of TNS. MTRCL also understands that there has been public request on a new disabled lift and the upgrading of Entrance A1. As a responsible organization, MTRCL responds to the public request on upgrading the TST station accessibility. MTRCL decided to separate the construction of TNS into different phases. The phase 1 is the upgrading of TST Entrance A1. The scope of this phase 1 work is to replace the existing entrance concrete structure with a new transparent box entrance on the same site. The access to the station will be improved with new disabled lift serving Tsim Sha Tsui Station concourse level, street level and Kowloon Park level; and escalators serving street level and the existing Entrance A1 Adit level. The construction of (i) An underground pedestrian subway link that connects the north end of the TST Station platform with integrated entrances in the basements of The One, Miramar Hotel and Miramar Shopping Centre; (ii) An underground satellite concourse underneath Nathan Road located adjacent to The One and the Miramar Hotel; (iii) A new plant basement near existing Entrance A1 to house the station equipment relocated from the north end of TST Station for accommodating the TNS connection will be constructed in other phases. The coordination work and separating the TNS project into phases have deferred the original construction program from 2009 to 2013. The phase 1 construction work will be commenced on 8 Feb 2013 and the construction work of other phases is still under the planning stage.

Impact Assessment and Baseline Monitoring

With the development of the Environmental Monitoring and Audit Manual (EM&A Manual) in accordance with the guideline set out in the Environmental Impact Assessment (EIA) report prepared by ENSR Asia (HK) Limited in September 2008.

The baseline monitoring has been conducted at the agreed monitoring locations to establish action and target levels for both construction dust and noise for the civil construction work of the Project.

Results and Conclusions

Baseline monitoring has been carried out in accordance with the recommendations contained in the Technical Memoranda associated with EIAO, Air Pollution Control Ordinance and Noise Control Ordinance, where applicable. Results and Conclusions are presented in the subsequent sections of this report.

1. INTRODUCTION

1.1 BACKGROUND

MTR Corporation Limited (MTRCL) proposes to construct the Tsim Sha Tsui Northern Subway, otherwise referred to as 'TNS'. The objectives of TNS are to provide passengers with a direct and accessible safe pedestrian subway in addition to the existing entrances and to relieve the existing busy northern concourse and platform areas of Tsim Sha Tsui (TST) Station by providing a new direct high-capacity corridor for effective passenger access. The location of the proposed Project is shown in Figure 1

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The tentative program for phase 1 construction work is shown as follows:

The boundary of phase 1 construction and other phases are shown in the Figure 1.1, 1.1(a), Section drawing 1.2, 1.3 and 1.4.

- 1.1.1. This Baseline Monitoring Report will review the landscape & visual, noise, construction air and built heritage.
- 1.1.2. An EIA study (refer to EIA Report dated September 2008) has been conducted by ENSR Asia (HK) Limited for the Project. An EM&A Manual has provided guidelines in the preparation of this baseline monitoring report.
- 1.1.3. Baseline levels have been established for both dust and noise, by which the performance of the construction contractors may be measured in meeting the required environmental protection standards and requirements under the Environmental Permit, during the course of the construction work. These are presented in subsequent sections of this report.
- 1.1.4. Monitoring points for both dust and noise have been identified in the EM&A Manual. The location of the monitoring points are shown in the Annex A.
- 1.1.5. This Baseline Monitoring Report presents the results for the baseline monitoring conducted for both dust and noise at the agreed monitoring locations and establishes action and target levels for both construction dust and noise for the civil construction work of the Project.

1.2 ORGANISATION OF THE REPORT

Following the introduction, the remainder of this Report is arranged as follows:

- Section 2 Reviews on the surrounding environment, including ASR(s), NSR(s), landscape & visual, noise, construction dust and built heritage
- Section 3 Describes the air quality monitoring methodology and analyses the monitoring results;
- Section 4 Describes the noise monitoring methodology and analyses the monitoring results.
- Section 5 Conclusion

2 REVIEW ON THE SURROUNDING ENVIRONMENT

2.1 Review on NSR(s)

Along the site boundary of the TNS project, there is no new residential building was built after the TNS EIA has been completed. Only one new commercial building “The One”, which is the redevelopment of Tung Ying Building, was built. There is no new NSR.

The Haiphong Mansion, Comfort Building and Burlington Arcade are currently for residential use and the Milton Mansion is currently still in commercial use. The NSRs selected in the EIA report for construction noise monitoring, i.e. Haiphong Mansion, Comfort Building and Burlington Arcade are still representative. Although the construction of TNS is split into different phases, these NSRs still expose to the residual construction noise from the TST Entrance A1 site. Therefore these NSRs are representative for noise monitoring.

2.2 Review on ASR

The surrounding area along the TNS site boundary a recommended in TNS EM&A manual, the Hai Phong Mansion is recommended for dust monitoring. However, during the discussion with the Management Office, the access to the roof top of Hai Phong Mansion was refused. MTRCL has to propose alternative monitoring location. Then the site boundary of TST Entrance A1 upgrade at Hai Phong Road was selected as an alternative dust monitoring location. This location fulfills the requirements listed in the EM&A manual:

- Close to the dust emission source
- Close to the air sensitive receivers
- Taken into account the prevailing meteorological conditions; and
- Proper position and orientation of monitoring equipment

Discussion with IEC regarding the proposed alternative monitoring location was conducted and no adverse comment was received.

2.3 Review on the Landscape and Visual Impact

Based on the TNS EIA report table 7.4, a review on the following landscape resources have been conducted and the current conditions are as follows:

Table 2.3 Review on Conditions of Landscape Resources

| Id No. | Landscape Resources | Current Conditions |
|--------|---|---|
| LR01 | Existing Planting Strip along central median of Nathan Road | No significant change in the condition of the planting strip exception some trees have grown taller. |
| LR02 | Roadside planting in front of Miramar shopping centre | No significant change in the planting. The OVT T22, T23 and T29 are normal. |
| LR03 | Roadside planting in front of Park Lane Shopper's Boulevard | The OVT T30 and T31 were felled during the typhoon Vicente in July 2012 |
| LR04 | Street planting along Haiphong Road | No significant change in the trees in the planter |
| LR05 | Entrance of Kowloon Park | No significant change in the planting at Kowloon Park Entrance |
| LCA | Tsim Sha Tsui Organic Mixed Urban Development Landscape | There is no significant change in the Tsim Sha Tsui Organic Mixed Urban Development Landscape except there is a construction site inside the St. Andrew Church premise. |

The Figure 1.1 of the EIA Report with the mark up showing the OVT T30 & T31 were felled is attached for reference.

3 AIR QUALITY

3.1 MONITORING METHODOLOGY

Monitoring was undertaken to establish baseline levels for both 1-hour and 24-hour Total Suspended Particulates (TSP) at the proposed monitoring locations. This provides data against which any environmental impacts due to construction activities can be compared. During the construction period impact monitoring will only be conducted for 24-hour TSP, although 1-hour TSP monitoring may also be conducted and used in following up on complaints or exceedances, in order to provide a more rapid indication of the source of the problem at hand.

Since the Hai Phong Mansion refused the setting up the dust monitoring station at Hai Phong Mansion, the baseline monitoring stations for both 1-hour and 24-hour TSP measurements have been established at the site boundary. As explained in section 2.2 above, the alternative location fulfills the requirements of EM&A manual and can effectively represent the baseline conditions at the impact monitoring location. As per the requirements of the EM&A Manual, three 1-hour TSP measurements daily for a period of at least 14 days were made at the monitoring stations to establish the ambient 1-hour TSP levels.

24-hour TSP measurements were carried out over a continuous period of at least 14 days at the monitoring stations to establish the ambient 24-hour TSP levels.

24-hour samples were collected by High Volume Sampler (Graseby-Andersen) following United States Environmental Protection Agency regulations and 1-hour TSP levels were measured by real time dust monitor (Haz-Dust). Haz-Dust monitoring is a real time direct reading equipment. It has been reviewed by IEC that this method could be used to measure 1-hour average TSP level to indicate short-term impacts.

3.2 CALIBRATION REQUIREMENTS

The flow rate of the high volume sampler with mass flow controller will be calibrated using an orifice calibrator. Initial calibration (five points) will be conducted upon installation and prior to commissioning. Calibration will be carried out every six months. Calibration certificate is attached in Annex D.

The sensing system of Haz-Dust is calibrated by clean filtered air passing through the flow-sensing system, providing a controlled check of the zero-concentration condition. Calibration of the Haz-Dust by certified laboratory or manufacturer shall be carried out every two years and properly documented. The calibration certificate is attached in Annex D.

The samplers shall be properly maintained. Prior to dust monitoring commencing, appropriate checks shall be made to ensure that all equipment and necessary power supply are in good working condition.

3.3 MONITORING PROCEDURES

1-hour TSP Levels Monitoring

TSP is sampled by drawing air into the Haz-Dust where particulate concentrations are measured instantaneously with an in-built silicon detector sensing light scattered by the particles in the sampled air (optical sensing stage). Continuous TSP levels are indicated on the Haz-Dust along with a 'Time Weighted Average' value.

24-hour TSP Levels Monitoring

The sampling procedure follows to that described in the App. B of Pt 50 in 40CFR Ch.1 (U.S. Environmental Protection Agency). TSP is sampled by drawing air through a conditioned, pre-weighed filter paper inside the high volume sampler at a controlled rate. After 24-hour sampling the filter paper with retained particles shall be collected and returned to the laboratory for drying in a desiccator followed by accurate weighing. TSP levels are calculated from the ratio of the mass of particulate retained on the filter paper to the total volume of air sampled.

3.4 MONITORING RESULTS

3.4.1 1-hour TSP

1-hour TSP baseline monitoring was conducted at the monitoring stations from 8th to 21st Oct 2012. Weather conditions throughout the monitoring period were mild and relatively dry. Some rainy periods were recorded in the monitoring period.

The average 1-hour TSP baseline level has been established from the baseline data and is shown in *Table 2.4a* below.

Table 3.4a 1-hour TSP Baseline Levels

| Monitoring Station | Monitoring Period | Baseline Level ($\mu\text{g}/\text{m}^3$) |
|--------------------------------------|--|---|
| Site Boundary at Hai Phong Road (D1) | 08 Oct – 21 Oct 2012 | 221 |
| Remarks: | | |
| Influencing Factors: | The background ambient dust from Nathan Road and Hai Phong Road was the main influencing factor affecting the dust level in the 1-hr TSP baseline level measurement. Although there is a construction site at St Andrew Church. Since it is 390m away from the TST Entrance A1 site, it does not affect the baseline dust level measurement. | |
| Weather Condition: | Basically the weather was dry with few days of trace rainfall during the measurement period | |
| Ambient Condition: | Ambient condition was not varied seasonally during the measurement period because the major influencing factor is the ambient dust from the traffic of Nathan Road and Hai Phong Road. The ambient dust level does not vary seasonally. | |

Note: TSP levels are to the nearest whole number, with values of 0.5 rounded up

Action and Limit Levels

To provide an early indication of any deterioration in the Contractor's environmental performance, Action Levels were derived based on the measured baseline levels. Limit Level is set at $500\mu\text{g}/\text{m}^3$ for the 1-hour TSP level as recommended in the EIAO-TM.

For 1-hour TSP the Action Level for baseline smaller than or equal to $384\mu\text{g}/\text{m}^3$ is the average of 130% of the baseline and the Limit Level. For baseline greater than $384\mu\text{g}/\text{m}^3$ the Action Level is $500\mu\text{g}/\text{m}^3$. The derived levels for the monitoring stations are shown in *Table 2.4b* below.

Table 3.4b Baseline, Action and Limit Levels for 1-hour TSP

| Monitoring Station | Action Level ($\mu\text{g}/\text{m}^3$) | Limit Level ($\mu\text{g}/\text{m}^3$) |
|--------------------------------------|---|--|
| Site Boundary at Hai Phong Road (D1) | 394 | $500^{(1)}$ |

⁽¹⁾ - 1-hour TSP criterion recommended in the EIAO-TM

Note: TSP levels are to the nearest whole number, with values of 0.5 rounded up

3.4.2 24-hour TSP

24-hour TSP baseline monitoring was conducted at the monitoring stations between 8 Oct 2012 and 21 Oct 2012. Weather conditions throughout the monitoring period were mild and relatively dry. Some rainy periods were recorded in the monitoring period

The averaged 24-hour TSP baseline levels have been established from the baseline data and are shown in *Table 2.4c* below.

Table 3.4c 24-hour TSP Baseline Levels

| Monitoring Station | Monitoring Period | Baseline Level ($\mu\text{g}/\text{m}^3$) |
|--------------------------------------|--|---|
| Site Boundary at Hai Phong Road (D1) | 08 Oct – 21 Oct 2012 | 147 |
| Remark: | | |
| Influencing Factors: | The background ambient dust from Nathan Road and Hai Phong Road was the main influencing factor affecting the dust level in the 1-hr TSP baseline level measurement. Although there is a construction site at St Andrew Church. Since it is 390m away from the TST Entrance A1 site, it does not affect the baseline dust level measurement. | |
| Weather Condition: | Basically the weather was dry with few days of trace rainfall during the measurement period | |
| Ambient Condition: | Ambient condition was not varied seasonally during the measurement period because the major influencing factor is the ambient dust from the traffic of Nathan Road and Hai Phong Road. The ambient dust level does not vary seasonally. | |

Note: TSP levels are to the nearest whole number, with values of 0.5 rounded up

Action and Limit Levels

To provide an early indication of any deterioration in the Contractor's environmental performance, Action Levels were derived based on the measured baseline levels. Limit Level is set at $260\mu\text{g}/\text{m}^3$ for the 24-hour TSP level as stipulated in the statutory Air Quality Objectives (AQOs) under the Air Pollution Control Ordinance.

For 24-hour TSP the Action Level for baseline smaller than or equal to $200\mu\text{g}/\text{m}^3$ is the average of 130% of the baseline and the Limit Level. For baseline greater than $200\mu\text{g}/\text{m}^3$ the Action Level is $260\mu\text{g}/\text{m}^3$. The derived levels for the monitoring stations are shown in *Table 2.4d* below.

Table 3.4d Baseline, Action and Limit Levels for 24-hour TSP

| Monitoring Station | Action Level ($\mu\text{g}/\text{m}^3$) | Limit Level ($\mu\text{g}/\text{m}^3$) |
|--------------------------------------|---|--|
| Site Boundary at Hai Phong Road (D1) | 226 | $260^{(1)}$ |

⁽¹⁾ - 24-hour TSP criterion stipulated in the AQOs

Note: TSP levels are to the nearest whole number, with values of 0.5 rounded up

4 NOISE

4.1 MONITORING METHODOLOGY

Monitoring was undertaken to establish baseline levels at the proposed monitoring locations. This provides data against which any environmental impacts due to construction activities can be compared.

Baseline monitoring stations have been established at the following locations, see *Figures 3.1*:

| | |
|----|---------------------|
| M1 | Hai Phong Mansion |
| M2 | Comfort Building |
| M3 | Burlington Building |

Consecutive noise measurements were undertaken over a period of at least 14 days at the monitoring stations between Sept and Oct 2012 to establish the ambient noise levels at representative nearest sensitive receivers. Continuous 5 minute A-weighted noise levels were recorded throughout the monitoring period and the noise levels were then averaged over each 30 minute period to produce the baseline conditions.

Monitoring was conducted using B&K sound analysis equipment – B&K 2250 sound level meters. Microphones were extended 1 metre from building facades and oriented towards the future works sites.

Weather conditions throughout the monitoring period were mild and relatively dry. Some rainy periods were recorded in the monitoring period, and the baseline monitoring period had to be extended.

4.2 CALIBRATION REQUIREMENTS

B&K 2250 sound level meters and B&K 4231 calibrator which complied with the International Electrotechnical Commission Publication 651:1979 (Type 1) and 804:1985 (Type 1), specification as referred to in the Technical Memoranda to the NCO were used for the baseline monitoring. The sound level meters and calibrator are verified by the certified laboratory or manufacturer once every two years to ensure they perform to the same level of accuracy as stated in the manufacturer's specifications. Calibration certificates are attached in Annex D.

Immediately prior to and following each set of measurements at any NSR, the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. If the calibration levels before and after the measurement differs by more than 1.0dB the measurement shall be repeated to obtain a reliable result. Periods of prolonged or repeated overloading of the sound level meter detector were avoided by setting the meter with adequate headroom prior to commencing

measurements. Measurements were recorded to the nearest 0.1 dB, with values of 0.05 being rounded up.

4.3 MONITORING RESULTS

5-minute, "fast" detector response, levels were recorded in the following indices, L_{Aeq} , L_{A10} , L_{A90} . The baseline data was initially downloaded into a spreadsheet, directly from the noise loggers in ASCII format for checking, and then imported into the database. The data were then averaged for each 30-minute period between 0700 and 1900 hours of 14 consecutive days (with rainy days excluded) to give the 'Time Slot Averaged' baseline levels for each 30-minute interval, and an 'Overall Baseline Level' for each monitoring station is established by averaging all the 'Time Slot Averaged' baseline levels between 0700 and 1900 hours of the 14 days. The 'Overall Baseline Level' for each monitoring station is also given in *Table 3.3a* below.

Table 4.3a Overall Baseline Noise Level

| Monitoring Station | Monitoring Period Daytime (0700-1900) | Overall Baseline Level (dB(A), $L_{Aeq(30min)}$) |
|------------------------|--|---|
| Hai Phong Mansion (M1) | Weekdays | 71 |
| | Sundays / General Holidays | 69 |
| Comfort Building (M2) | Weekdays | 70 |
| | Sundays / General Holidays | 68 |
| Burlington Arcade (M3) | Weekdays | 68 |
| | Sundays / General Holidays | 66 |

Note: Noise levels are to the nearest whole number, with values of 0.5 rounded up

Busy road traffic was observed along Nathan Road and Hi Phong Mansion near M1, Nathan Road near M2 and M3. It was noted that the background noise levels were mainly attributed to the road traffic.

Action and Limit Levels

The Action Level is set on occurrence when one documented complaint is received while the Limit Levels are set at specific levels with reference to the uses of the sensitive receivers as recommended in EIAO-TM. The Action Level and Limit Level are shown in *Table 4.3b*. The actions and requirements for all evening (1900-2300), general holidays (including all Sundays) during the daytime and evening (0700-2300) and all night time periods (2300-0700) are subject to control under Noise Control Ordinance.

Table 4.3b Action Level and Limit Level for Construction Noise

| Time Period | Action Level | Limit Level |
|---|---|---------------------|
| Daytime (0700-1900), Monday through Saturday excluding Public Holidays | When one documented complaint is received. | Leq 30mins 75 dB(A) |

Note: - Noise levels are to the nearest whole number, with values of 0.5 rounded up

5 CONCLUSION

5.1 The locations of air sensitive receiver and noise sensitive receivers proposed in the EIA report and EM&A manual are still representative for the dust and noise monitoring. The landscape resources do not have significant change except 2 OVTs were felled during the typhoon Vicente in July 2012.

5.2 BASELINE LEVEL

5.2.1 Air Quality

1-hour TSP

1-hour TSP baseline monitoring was conducted at the proposed monitoring stations between 8 and 21 Oct 2012. The measured 1-hour TSP levels were in the range of 159-299 $\mu\text{g}/\text{m}^3$.

24-hour TSP

24-hour TSP baseline monitoring was conducted at the proposed monitoring stations between 8 and 21 Oct 2012. The measured 24-hour TSP levels were in the range of 106-200 $\mu\text{g}/\text{m}^3$.

5.2.2 Noise

Baseline monitoring was conducted at the proposed monitoring stations between 10 Sept 2012 and 28 Oct 2012. The overall baseline noise levels ($L_{Aeq(30min)}$) at the monitoring stations were in the range of 64-72 dB(A). The daytime baseline noise levels at all sensitive receivers were below 75 dB(A).

5.3 ACTION AND TARGET LEVELS

5.3.1 Air

1-hour TSP

The 1-hour TSP Action Levels have been calculated from baseline levels and are presented in *Table 2.4b*. Limit Level at 500 $\mu\text{g}/\text{m}^3$ is recommended in the EIAO-TM. The 1-hour TSP monitoring is intended to use in following up on complaints or exceedances, in order to provide a more rapid indication of the source of the problem at hand.

24-hour TSP

The 24-hour TSP Action Levels have been calculated from baseline levels and are presented in *Table 2.4d*. Limit Level set at 260 $\mu\text{g}/\text{m}^3$ as stipulated in the AQOs.

5.3.2 Noise

Construction noise Action Level is set on occurrence when one documented complaint is received. Limit Level is set at 75 dB(A) for domestic premises between 0700 and 1900 hours on normal weekday as recommended in EIAO-TM. The actions and requirements for the restricted hours, i.e. all evening (1900-2300), general holidays (including all Sundays) during the daytime and evening (0700-2300) and all night time periods (2300-0700) are subject to control under Noise Control Ordinance.

ANNEX A

Figures

Figure 1 – Layout Plan of TNS Project

Figure 1.1 – Different phases of TNS Project

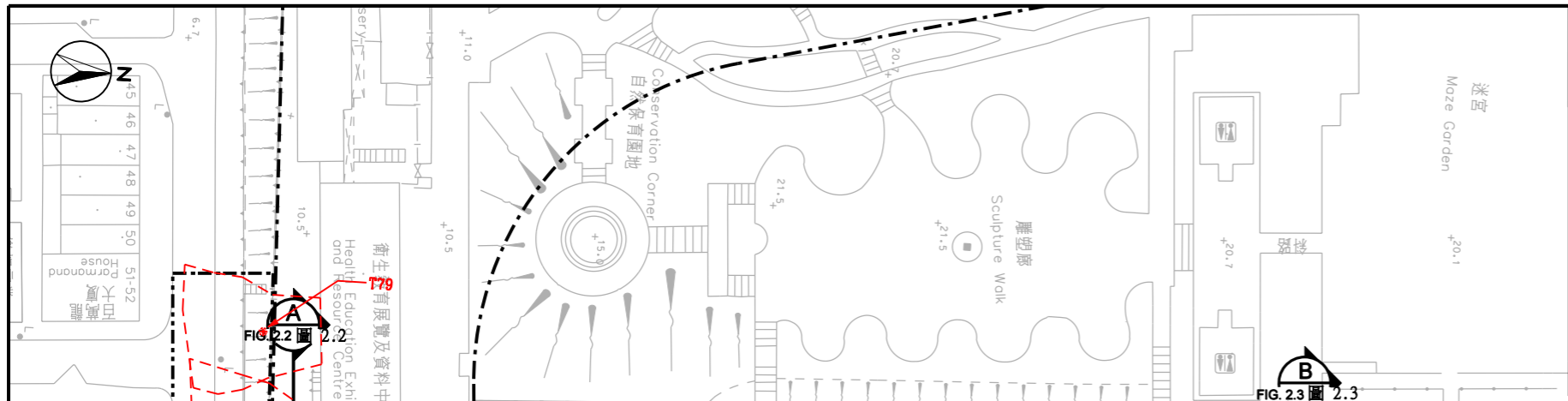
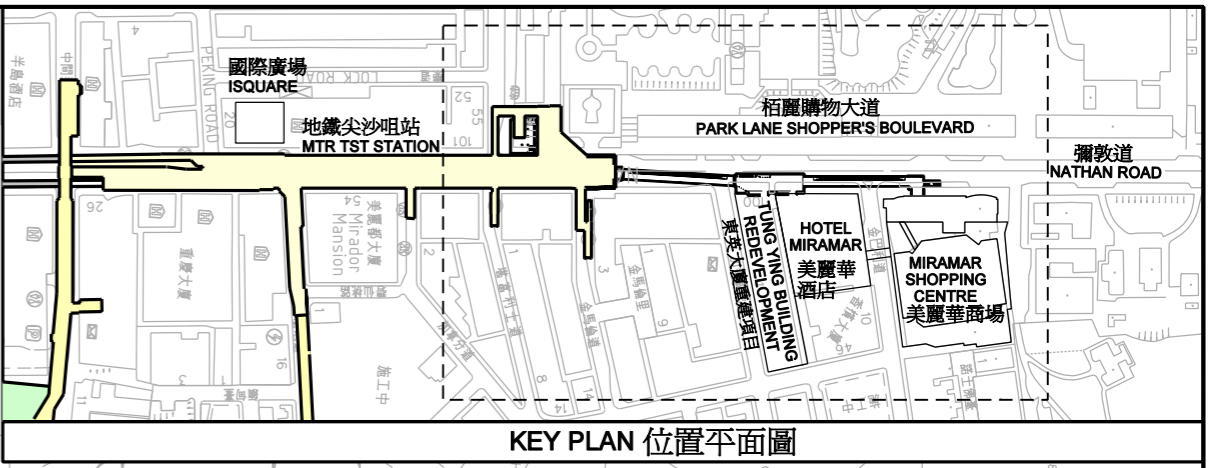
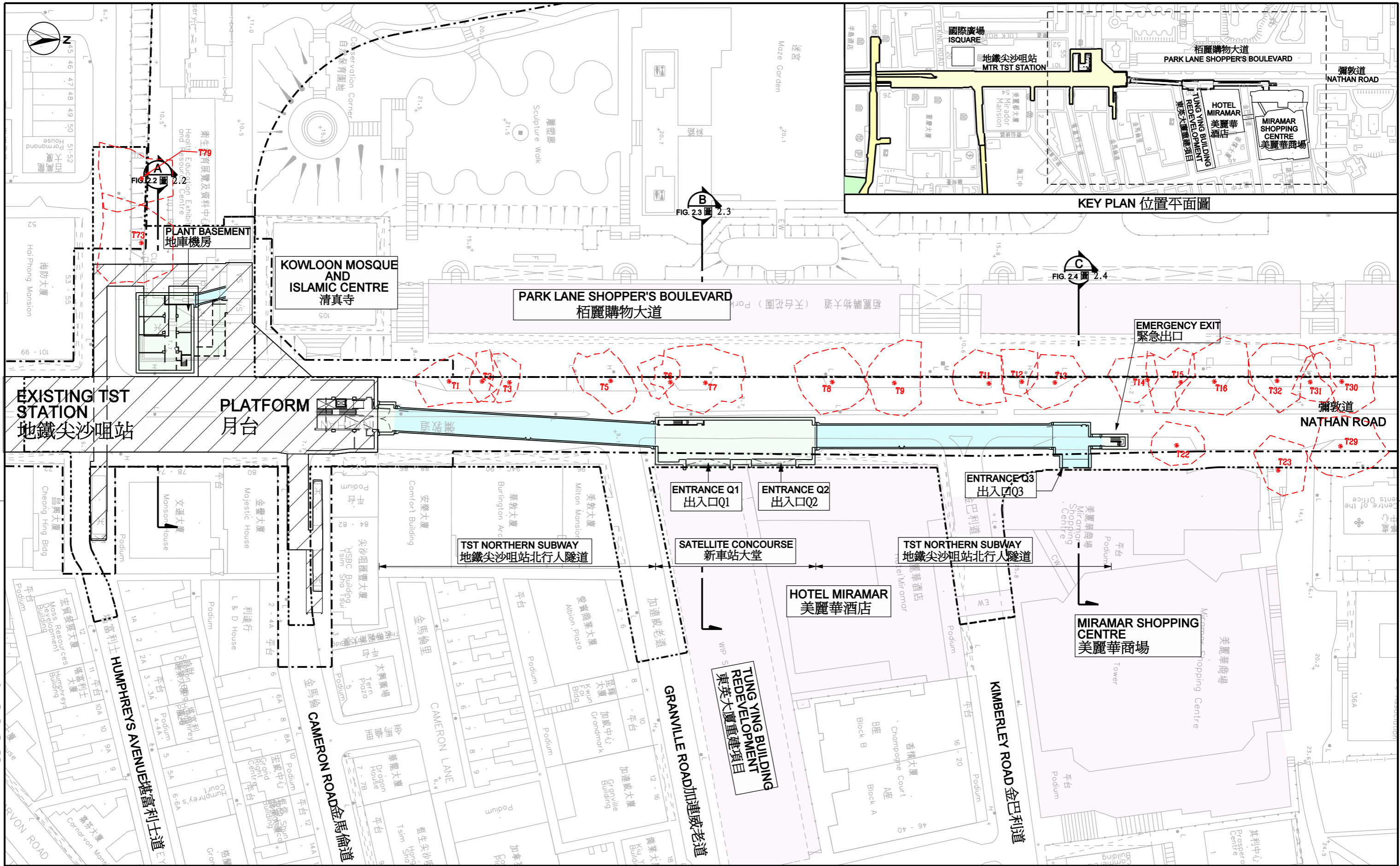
Figure 1.1(a) –TNS Phase 1 Boundary

Figure 1.2 Section A-A – Entrance A1 Upgrade
and New Plant Basement

Figure 1.3 Section B-B – Pedestrian Subway

Figure 1.4 Section C-C – Satellite Concourse

Figure 2.1 The Location Plan of Monitoring Points



LEGEND:
 圖例: CUT-AND-COVER EXCAVATION 明挖回填
 TUNNELING BY MINING METHOD 鑽挖式隧道挖掘法
 OVT 古樹名木
 RAILWAY AREA PLAN BOUNDARY 地鐵範圍圖則界線
 WORKS BOUNDARY 工程界線

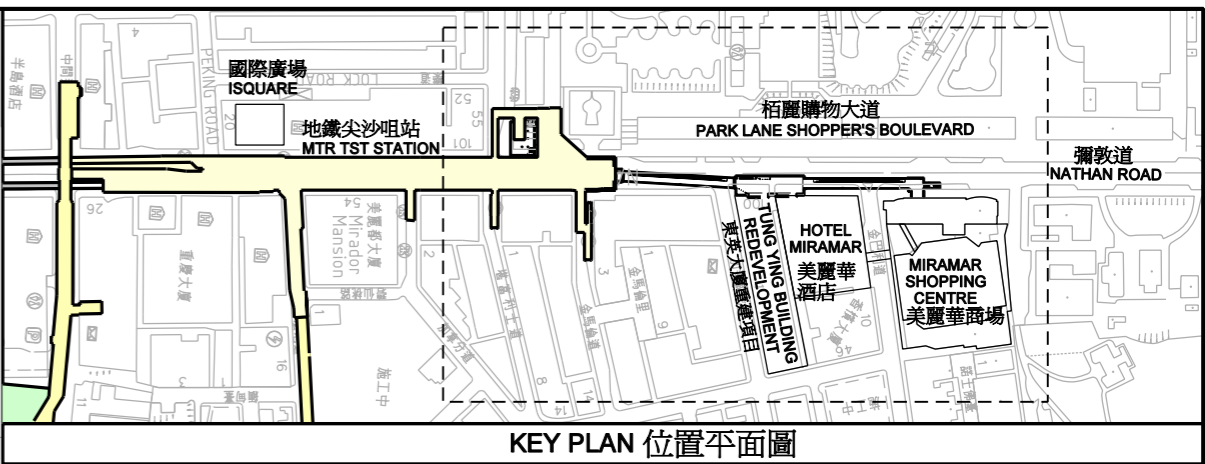
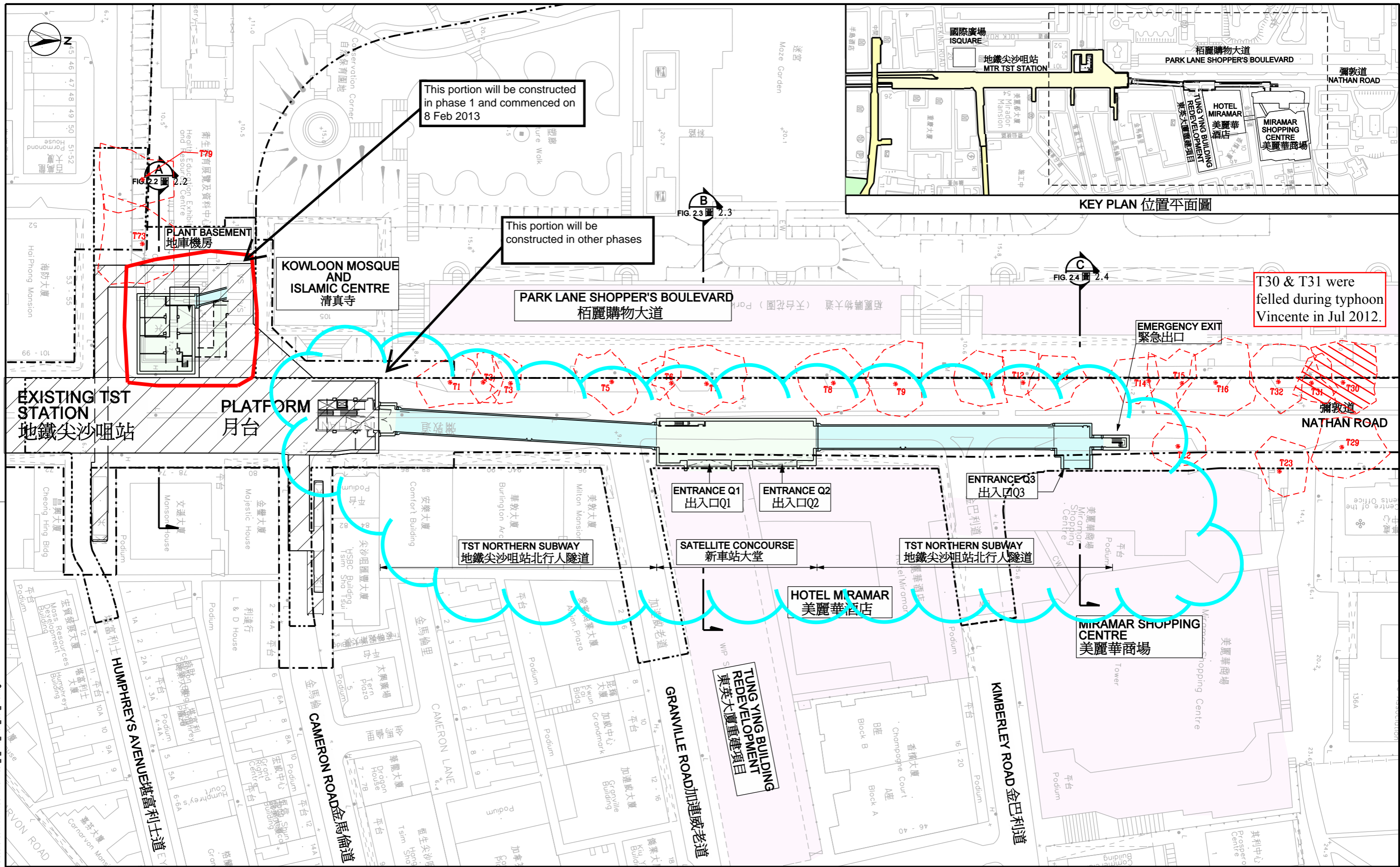
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MAUNSELL AECOM in association with
 Maunsell Consultants Asia Ltd.
 茂盛(亞洲)工程顧問有限公司

NEX/1034 TSIM SHA TSUI NORTHERN SUBWAY
SITE LAYOUT PLAN
 地鐵尖沙咀站北行人隧道位置圖

MTR

| | | | | |
|-------------|-----------------------------|------|------------|---|
| SCALE | 1:1000 | (A3) | FIGURE No. | 1 |
| CAD REF. | 1034_K_TNS_MCA_C01_143B.dgn | | | |
| DRAWING No. | | REV. | | |



This portion will be constructed in phase 1 and commenced on 8 Feb 2013

This portion will be constructed in other phases

T30 & T31 were felled during typhoon Vicente in Jul 2012.

LEGEND:
 圖例: CUT-AND-COVER EXCAVATION 明挖回填
 TUNNELING BY MINING METHOD 鑽挖式隧道挖掘法
 OVT 古樹名木
 - - - - - RAILWAY AREA PLAN BOUNDARY 地鐵範圍圖則界線
 - - - - - WORKS BOUNDARY 工程界線

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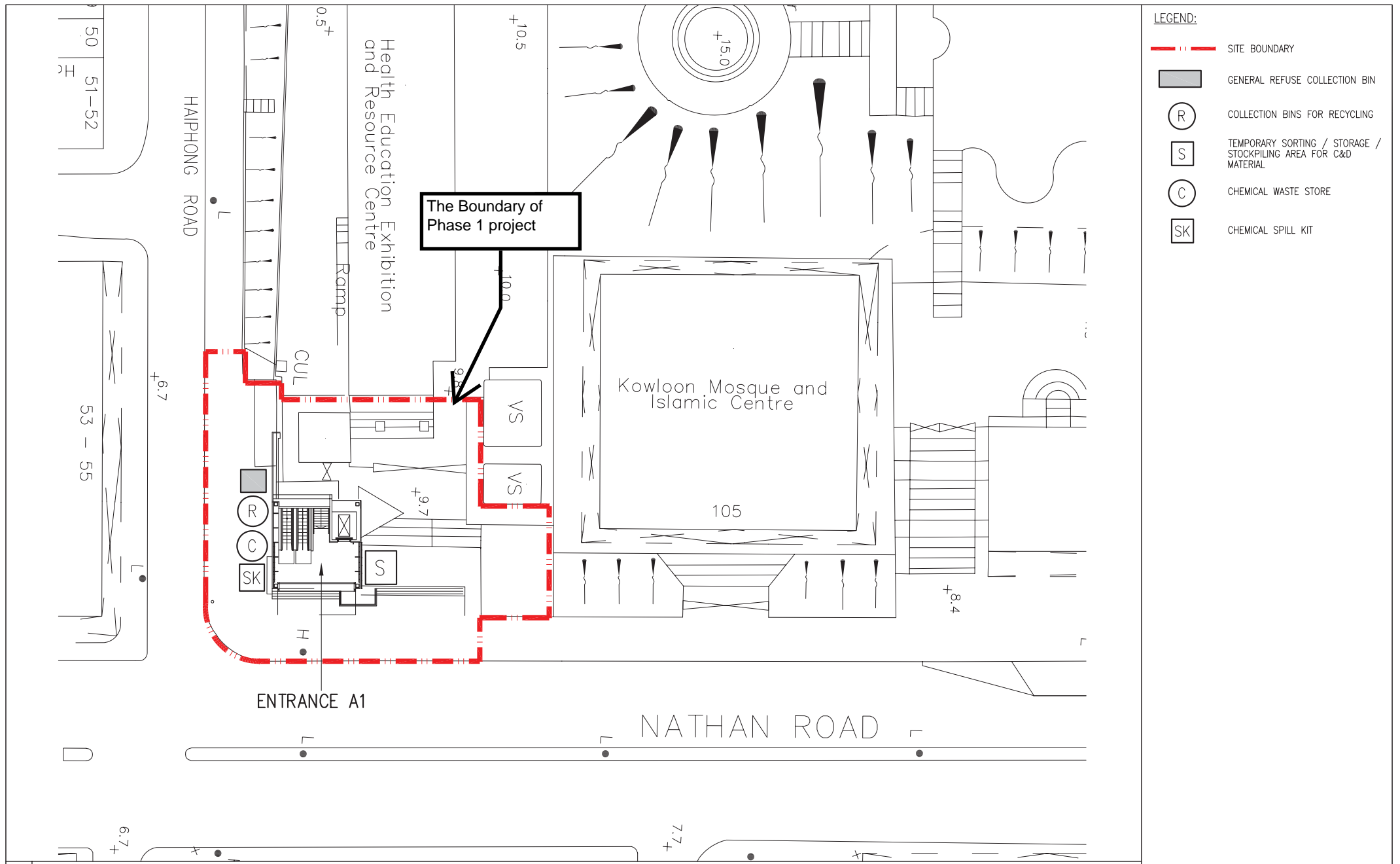
MAUNSELL AECOM in association with MTRC, Aedas, MVA
 Maunsell Consultants Asia Ltd.
 茂盛(亞洲)工程顧問有限公司

NEX/1034 TSIM SHA TSUI NORTHERN SUBWAY
 Different Phases of TNS Project

MTR

| | | | |
|-------------|-----------------------------|------------|-----|
| SCALE | 1:1000 (A3) | FIGURE No. | 1.1 |
| CAD REF. | 1034_K_TNS_MCA_C01_143B.dgn | | |
| DRAWING NO. | | REV. | |

P:\PROJECTS\1034\1034\DRAWINGS\KVC\1034_K_TNS_MCA_C01_143B.dgn 15/10/2008 15:47:14



01 FIGURE 1 - SITE LAYOUT PLAN

N.T.S. (A1)

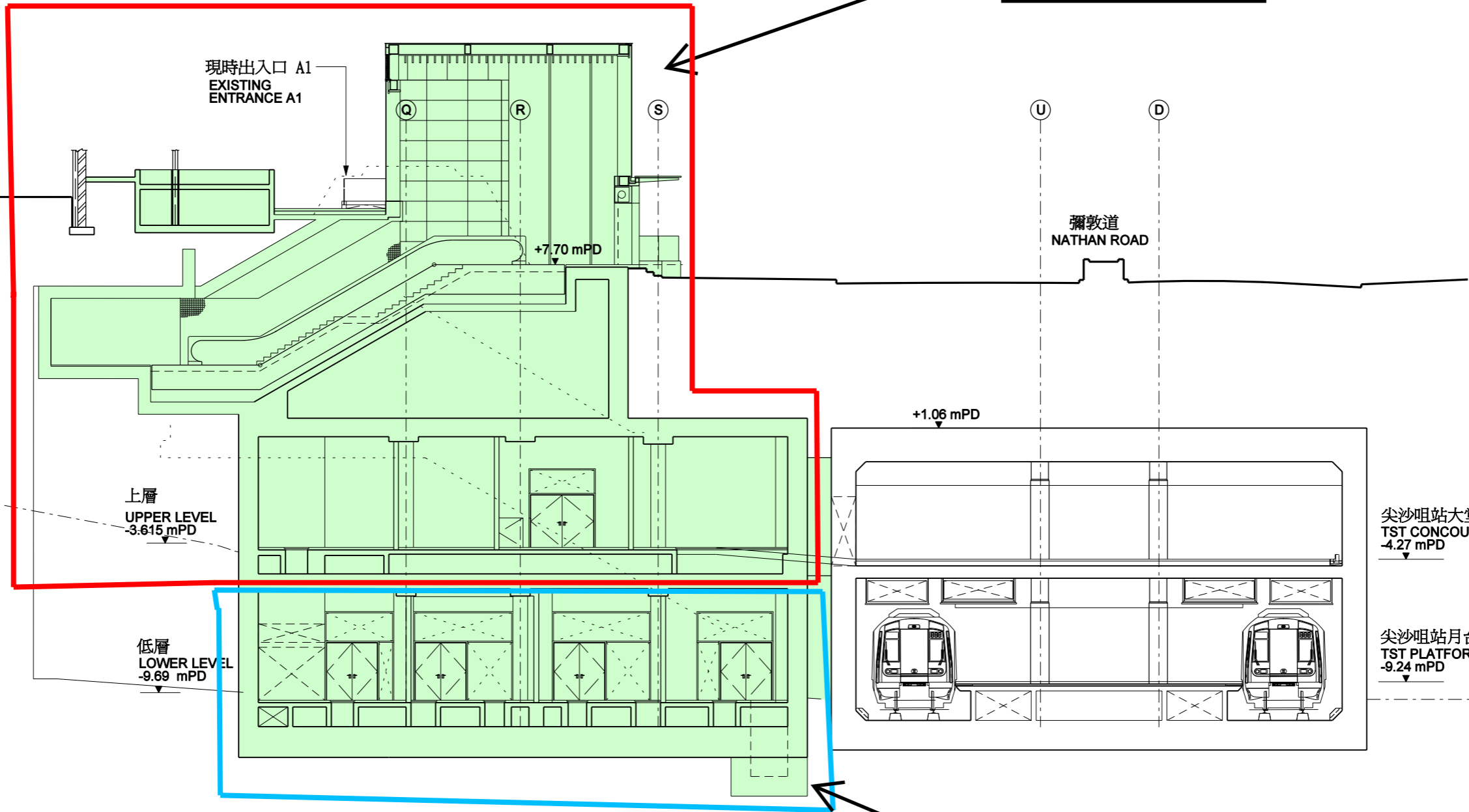
| REV | FRIST ISSUED | REVISION DESCRIPTION | REVISED/DATE | CHECKED/DATE | APPROVED/DATE |
|---------|--------------|----------------------|--------------|--------------|---------------|
| 02JAN13 | | | | | |

聯合金輝建築工程有限公司
Goldfield N&W Construction Company Limited



| | | | | | |
|---|---------------|-------------------------------|-----------|-----------------------------------|---------------|
| DO NOT SCALE DRAWINGS, VERIFY ALL DIMENSIONS ON SITE. | | | | MTR | |
| MTRC REFERENCE NO. | INITIAL | DESIGNATION | DATE | TITLE | |
| C6564-11C | SK | | 02JAN2013 | CONTRACT C6564-11C | |
| DESIGN TEAM REFERENCE NO. | DESIGNED | | 02JAN2013 | TST ENTRANCE A1 ENHANCEMENT WORKS | |
| | CHECKED | DC | 02JAN2013 | SITE LAYOUT PLAN | |
| CONTRACTOR REFERENCE NO. | APPROVED | DC | 02JAN2013 | SCALE | OED |
| G1241-TEA | | | | N.T.S. (A1) | DRAWING NO. |
| | CAD FILE NAME | C6564_W_TST_GNW_A11_023-1.DWG | | | Figure 1.1(a) |

The Entrance A1 will be upgraded in this Phase 1 project



New Plant Basement will be constructed in other phases.

切面圖
Section
1:200 FIG. 2.1 圖 2.1

LEGEND :
 PROPOSED TST STATION NORTHERN SUBWAY

P:\PROJECTS\1034\DRAWINGS\MCA\1034_K_TNS_MCA_C01_147A.dgn 11:20:26 04/09/2008

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NEX/1034 TSIM SHA TSUI NORTHERN SUBWAY
SECTION A-A
 切面圖 A-A



| | | | | |
|-------------|-----------------------------|------|------------|-----|
| SCALE | 1:200 | (A3) | FIGURE No. | 1.2 |
| CAD REF. | 1034_K_TNS_MCA_C01_147A.dgn | | | |
| DRAWING NO. | | REV. | | |

栢麗購物大道
PARK LANE
SHOPPER'S
BOULEVARD

彌敦道
NATHAN ROAD

The underground
pedestrian subway
link will be
constructed in other
phases

東英大廈重建項目
TUNG YING
BUILDING DEVELOPMENT

現時荃灣綫隧道
EXISTING TWL RUNNING TUNNELS



LEGEND :

PROPOSED TST STATION SOUTHERN SUBWAY

切面圖
Section
1:200 FIG. 2.1 圖 2.1

NEX/1034 TSIM SHA TSUI NORTHERN SUBWAY

SECTION B-B
切面圖B-B



| | | | |
|-------------|-----------------------------|------|------------|
| SCALE | 1:200 | (A3) | FIGURE No. |
| CAD REF. | 1034_K_TNS_MCA_C01_148B.dgn | | |
| DRAWING NO. | | REV. | |

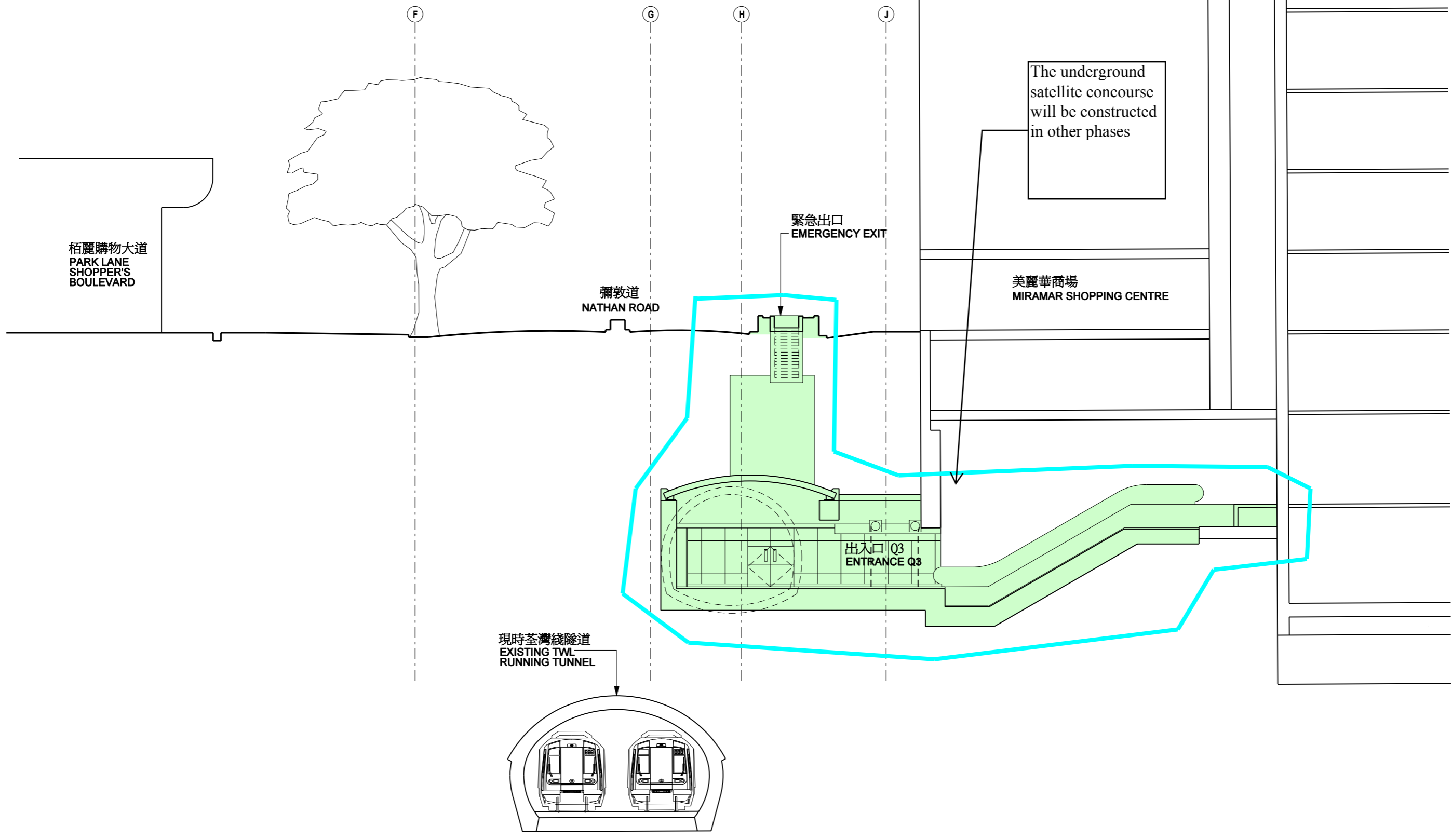
1.3

P:\PROJECTS\1034\DRAWINGS\MCA\1034_K_TNS_MCA_C01_148B.dgn

04/09/2008 11:21:08

MAUNSELL | AECOM in association with
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Maunsell Consultants Asia Ltd.
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P:\PROJECTS\0023130\DRAWINGS\MCA\1034_K_TNS_MCA_C01_149B.dgn
11:21:54
04/09/2008



LEGEND :
 PROPOSED TST STATION NORTHERN SUBWAY

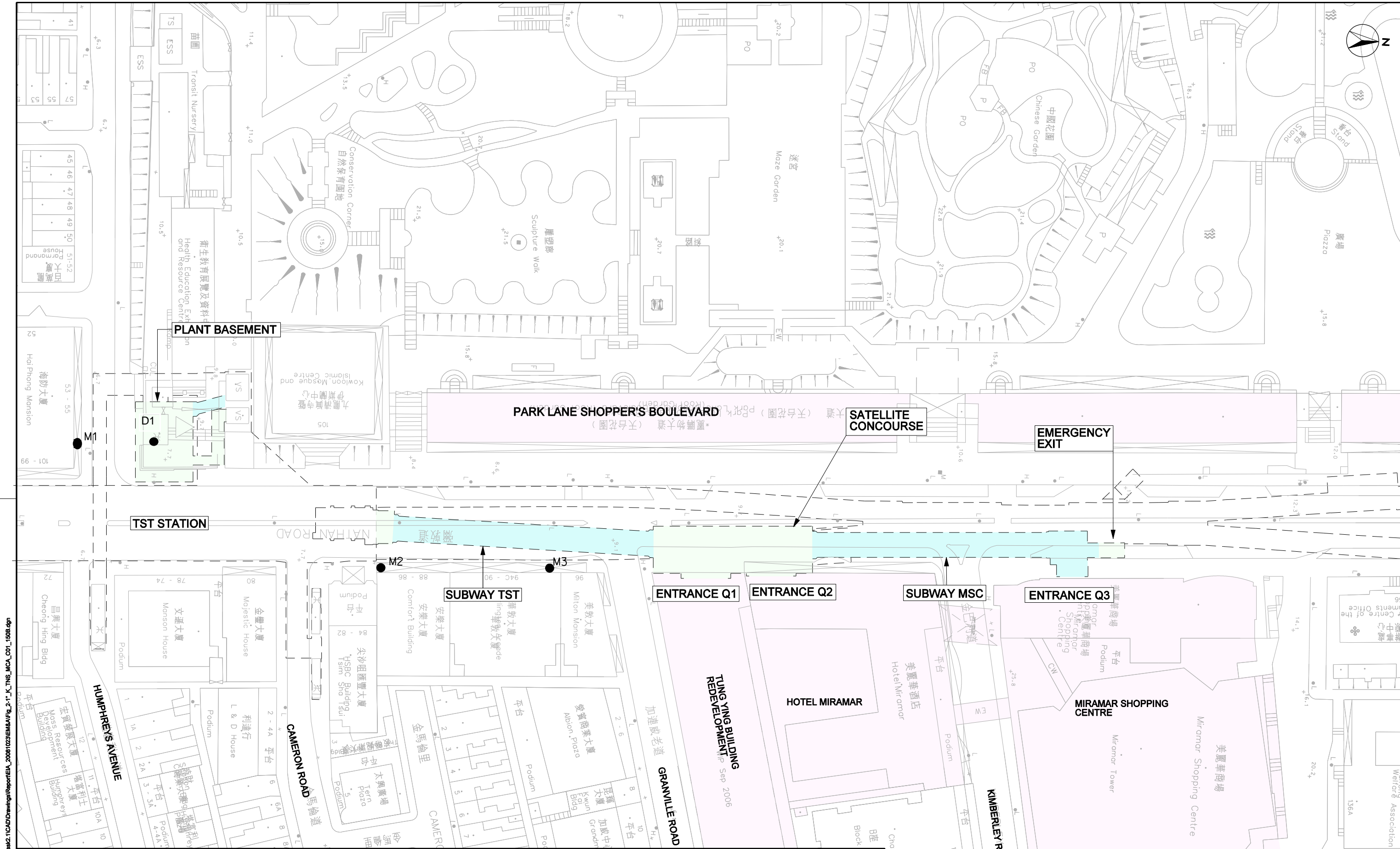
切面圖
 Section C
 1:200 FIG. 2.1 圖 2.1

MAUNSELL | **AECOM** in association with
 Maunsell Consultants Asia Ltd. MTRC, Aedas, MVA
 茂盛(亞洲)工程顧問有限公司

NEX/1034 TSIM SHA TSUI NORTHERN SUBWAY
SECTION C-C
 切面圖 C-C



| | | | | |
|-------------|-----------------------------|------|------------|-----|
| SCALE | 1:200 | (A3) | FIGURE No. | 1.4 |
| CAD REF. | 1034_K_TNS_MCA_C01_149B.dgn | | | |
| DRAWING NO. | | REV. | | |



- LEGEND :**
- D1 CONSTRUCTION DUST MONITORING STATION
 - M1 CONSTRUCTION NOISE MONITORING STATIONS
 - M2 CONSTRUCTION NOISE MONITORING STATIONS
 - M3 CONSTRUCTION NOISE MONITORING STATIONS
 - CUT AND COVER EXCAVATION
 - TUNNELING BY MINING METHOD

NEX/1034 TSM SHA TSUI NORTHERN SUBWAY
LOCATIONS OF DUST/CONSTRUCTION NOISE MONITORING STATIONS

P:\60022669\Subbank2_1\CAD\Drawings\Report\EA_2008\1023\EM&E\Fig-2-1_K_TNS_MCA_C01_150B.dgn

ANNEX B

TSP Baseline Measurement

1-hr TSP Monitoring Log Sheet

Project: Tsim Sha Tsui Station Northern Subway (TNS)

Monitoring Location: Site Boundary (Tsim Sha Tsui Station Entrance A1)

Baseline Period: 8 – 21 / 10/ 2012

| Date | Start Time | Measured TSP Level (ug/m ³) |
|------------|------------|---|
| 8-10-2012 | 10:00 Hrs | 231 |
| | 11:00 Hrs | 231 |
| | 12:00 Hrs | 232 |
| | Average | 231 |
| 9-10-2012 | 10:00 Hrs | 239 |
| | 11:00 Hrs | 238 |
| | 12:00 Hrs | 239 |
| | Average | 239 |
| 10-10-2012 | 10:00 Hrs | 269 |
| | 11:00 Hrs | 271 |
| | 12:00 Hrs | 271 |
| | Average | 270 |
| 11-10-2012 | 10:00 Hrs | 299 |
| | 11:00 Hrs | 299 |
| | 12:00 Hrs | 298 |
| | Average | 299 |
| 12-10-2012 | 11:00 Hrs | 222 |
| | 12:00 Hrs | 223 |
| | 13:00 Hrs | 222 |
| | Average | 222 |
| 13-10-2012 | 11:00 Hrs | 254 |
| | 12:00 Hrs | 255 |
| | 13:00 Hrs | 256 |
| | Average | 255 |
| 14-10-2012 | 11:00 Hrs | 180 |
| | 12:00 Hrs | 181 |
| | 13:00 Hrs | 181 |
| | Average | 181 |

| Date | Start Time | Measured TSP Level (ug/m ³) |
|------------|------------|---|
| 15-10-2012 | 11:00 Hrs | 186 |
| | 12:00 Hrs | 185 |
| | 13:00 Hrs | 184 |
| | Average | 185 |
| 16-10-2012 | 11:00 Hrs | 260 |
| | 12:00 Hrs | 260 |
| | 13:00 Hrs | 260 |
| | Average | 260 |
| 17-10-2012 | 11:00 Hrs | 201 |
| | 12:00 Hrs | 202 |
| | 13:00 Hrs | 200 |
| | Average | 201 |
| 18-10-2012 | 11:00 Hrs | 240 |
| | 12:00 Hrs | 241 |
| | 13:00 Hrs | 239 |
| | Average | 240 |
| 19-10-2012 | 11:00 Hrs | 181 |
| | 12:00 Hrs | 181 |
| | 13:00 Hrs | 180 |
| | Average | 181 |
| 20-10-2012 | 11:00 Hrs | 160 |
| | 12:00 Hrs | 160 |
| | 13:00 Hrs | 158 |
| | Average | 159 |
| 21-10-2012 | 10:00 Hrs | 166 |
| | 11:00 Hrs | 167 |
| | 12:00 Hrs | 168 |
| | Average | 167 |

24-hr TSP Monitoring Log Sheet

Project: Tsim Sha Tsui Station Northern Subway (TNS)

Monitoring Location: Site Boundary (Tsim Sha Tsui Station Entrance A1)

Baseline Period: 8 – 21 / 10/ 2012

| Date | Start Time | Measured TSP Level ($\mu\text{g}/\text{m}^3$) |
|------------|------------|---|
| 8-10-2012 | 09:00 Hrs | 154 |
| 9-10-2012 | 09:00 Hrs | 159 |
| 10-10-2012 | 13:00 Hrs | 180 |
| 11-10-2012 | 14:00 Hrs | 200 |
| 12-10-2012 | 14:00 Hrs | 148 |
| 13-10-2012 | 14:00 Hrs | 170 |
| 14-10-2012 | 15:00 Hrs | 121 |
| 15-10-2012 | 16:00 Hrs | 123 |
| 16-10-2012 | 17:00 Hrs | 173 |
| 17-10-2012 | 17:00 Hrs | 134 |
| 18-10-2012 | 17:00 Hrs | 160 |
| 19-10-2012 | 18:00 Hrs | 121 |
| 20-10-2012 | 18:00 Hrs | 106 |
| 21-10-2012 | 18:00 Hrs | 111 |

ANNEX C

Noise Baseline Measurements

Noise Baseline Report

Project: TNS

Report for Location: Hai Phong Mansion

Baseline period 25 Sept to 8 Oct 2012

Weather: Fine, no rainfall during the measurement period

Report date: 01/11/2012

Parameter: Leq, L10, L90

Time Slot Averaged Baselines

| | LAeq(30min) | LAF10(30min) | LAF90(30min) |
|---------------|-------------|--------------|--------------|
| 07:00 - 07:30 | 71 | 74.4 | 66.2 |
| 07:30 - 08:00 | 71.2 | 73.4 | 66.2 |
| 08:00 - 08:30 | 71.5 | 74 | 66.9 |
| 08:30 - 09:00 | 71.3 | 75 | 67.3 |
| 09:00 - 09:30 | 71.2 | 75.0 | 67.2 |
| 09:30 - 10:00 | 71.3 | 74.4 | 66.9 |
| 10:00 - 10:30 | 71.2 | 73.4 | 66.8 |
| 10:30 - 11:00 | 70.5 | 74.2 | 65.3 |
| 11:00 - 11:30 | 70.9 | 74.6 | 65.3 |
| 11:30 - 12:00 | 70.3 | 73 | 65.9 |
| 12:00 - 12:30 | 70.2 | 74.4 | 66.2 |
| 12:30 - 13:00 | 70.9 | 74.4 | 66.2 |
| 13:00 - 13:30 | 70.2 | 73.5 | 66.3 |
| 13:30 - 14:00 | 70.9 | 72.6 | 66.2 |
| 14:00 - 14:30 | 71.1 | 73.3 | 66.1 |
| 14:30 - 15:00 | 71.1 | 73.3 | 66.2 |
| 15:00 - 15:30 | 71.2 | 74.5 | 66.1 |
| 15:30 - 16:00 | 71.2 | 74.6 | 66 |
| 16:00 - 16:30 | 71.3 | 75.2 | 66.5 |
| 16:30 - 17:00 | 71.5 | 74.4 | 66.4 |
| 17:00 - 17:30 | 71.6 | 75.8 | 67.2 |
| 17:30 - 18:00 | 71.4 | 75.8 | 67.4 |
| 18:00 - 18:30 | 71.3 | 76.8 | 67.2 |
| 18:30 - 19:00 | 70 | 77.4 | 67.4 |

Noise Control Period Average Baselines

Weekdays Noise Levels, dB(A)

| | LAeq(30min) | LAF10(30min) | LAF90(30min) |
|---------------|-------------|--------------|--------------|
| 07:00 - 19:00 | 71.1 | 74.9 | 67.1 |

Sundays / General Holidays Noise Levels, dB(A)

| | LAeq(30min) | LAF10(30min) | LAF90(30min) |
|---------------|-------------|--------------|--------------|
| 07:00 - 19:00 | 68.5 | 71.3 | 65.0 |

Logarithmic Averaging is being used.

Noise Baseline Report

Project: TNS

Report for Location: Comfort Building

Baseline period 9 Oct to 22 Oct 2012

Weather Fine, no rainfall during the measurement period

Report date: 01/11/2012

Parameter: Leq, L10, L90

Time Slot Averaged Baselines

| | LAeq(30min) | LAF10(30min) | LAF90(30min) |
|---------------|-------------|--------------|--------------|
| 07:00 - 07:30 | 69.6 | 71.5 | 67.4 |
| 07:30 - 08:00 | 69.5 | 71.8 | 67.5 |
| 08:00 - 08:30 | 69.3 | 72.1 | 67.8 |
| 08:30 - 09:00 | 70.2 | 72.4 | 67.2 |
| 09:00 - 09:30 | 70.4 | 72.6 | 67.8 |
| 09:30 - 10:00 | 70.3 | 72.4 | 67.3 |
| 10:00 - 10:30 | 69.4 | 72.1 | 67.1 |
| 10:30 - 11:00 | 69.4 | 71.3 | 66.9 |
| 11:00 - 11:30 | 69.5 | 71.1 | 66.5 |
| 11:30 - 12:00 | 69.5 | 71.2 | 66.4 |
| 12:00 - 12:30 | 69.6 | 71.3 | 66.7 |
| 12:30 - 13:00 | 69.7 | 71.5 | 66.7 |
| 13:00 - 13:30 | 70.1 | 71.1 | 66.9 |
| 13:30 - 14:00 | 70.2 | 71.4 | 66.7 |
| 14:00 - 14:30 | 69.2 | 71.2 | 66.3 |
| 14:30 - 15:00 | 70.4 | 71.8 | 66.2 |
| 15:00 - 15:30 | 70.4 | 72.1 | 66.8 |
| 15:30 - 16:00 | 70.3 | 72.1 | 66.5 |
| 16:00 - 16:30 | 70.6 | 71.8 | 66.7 |
| 16:30 - 17:00 | 71.3 | 71.9 | 66.5 |
| 17:00 - 17:30 | 71.5 | 72.6 | 67.7 |
| 17:30 - 18:00 | 71.6 | 72.8 | 67.8 |
| 18:00 - 18:30 | 71.2 | 72.9 | 68.2 |
| 18:30 - 19:00 | 71 | 72.9 | 68.3 |

Noise Control Period Average Baselines

Weekdays Noise Levels, dB(A)

| | LAeq(30min) | LAF10(30min) | LAF90(30min) |
|---------------|-------------|--------------|--------------|
| 07:00 - 19:00 | 70.4 | 72.3 | 67.5 |

Sundays / General Holidays Noise Levels, dB(A)

| | LAeq(30min) | LAF10(30min) | LAF90(30min) |
|---------------|-------------|--------------|--------------|
| 07:00 - 19:00 | 68.4 | 70.9 | 65.3 |

Logarithmic Averaging is being used.

Noise Baseline Report

Project: TNS
Report for Location: Burlington Arcade
Baseline period: 9 Oct to 22 Oct 2012
Weather: Fine, No rainfall during the measurement period
Report date: 01/11/2012
Parameter: Leq, L10, L90

Time Slot Averaged Baselines

| | LAeq(30min) | LAF10(30min) | LAF90(30min) |
|---------------|-------------|--------------|--------------|
| 07:00 - 07:30 | 67.8 | 71.0 | 64.7 |
| 07:30 - 08:00 | 67.4 | 71.4 | 64.8 |
| 08:00 - 08:30 | 67.9 | 71.6 | 65.2 |
| 08:30 - 09:00 | 68.0 | 71.9 | 65.3 |
| 09:00 - 09:30 | 68.4 | 71.5 | 65.4 |
| 09:30 - 10:00 | 68.4 | 71.4 | 65.5 |
| 10:00 - 10:30 | 68.2 | 71.2 | 65.3 |
| 10:30 - 11:00 | 67.7 | 70.5 | 64.9 |
| 11:00 - 11:30 | 67.6 | 70.7 | 64.8 |
| 11:30 - 12:00 | 67.5 | 70.3 | 64.5 |
| 12:00 - 12:30 | 67.9 | 70.2 | 64.5 |
| 12:30 - 13:00 | 67.7 | 70.9 | 64.3 |
| 13:00 - 13:30 | 67.5 | 70.2 | 64.2 |
| 13:30 - 14:00 | 67.2 | 70.9 | 64.1 |
| 14:00 - 14:30 | 67.3 | 71.4 | 64.2 |
| 14:30 - 15:00 | 67.5 | 71.5 | 64.3 |
| 15:00 - 15:30 | 67.3 | 71.2 | 64.1 |
| 15:30 - 16:00 | 67.5 | 71.2 | 64.2 |
| 16:00 - 16:30 | 67.5 | 71.8 | 64.7 |
| 16:30 - 17:00 | 68.4 | 71.4 | 64.8 |
| 17:00 - 17:30 | 68.8 | 72 | 65.3 |
| 17:30 - 18:00 | 69 | 71.1 | 65.5 |
| 18:00 - 18:30 | 69.6 | 70.9 | 65.4 |
| 18:30 - 19:00 | 69.2 | 70.6 | 65.6 |

Noise Control Period Average Baselines

Weekdays Noise Levels, dB(A)

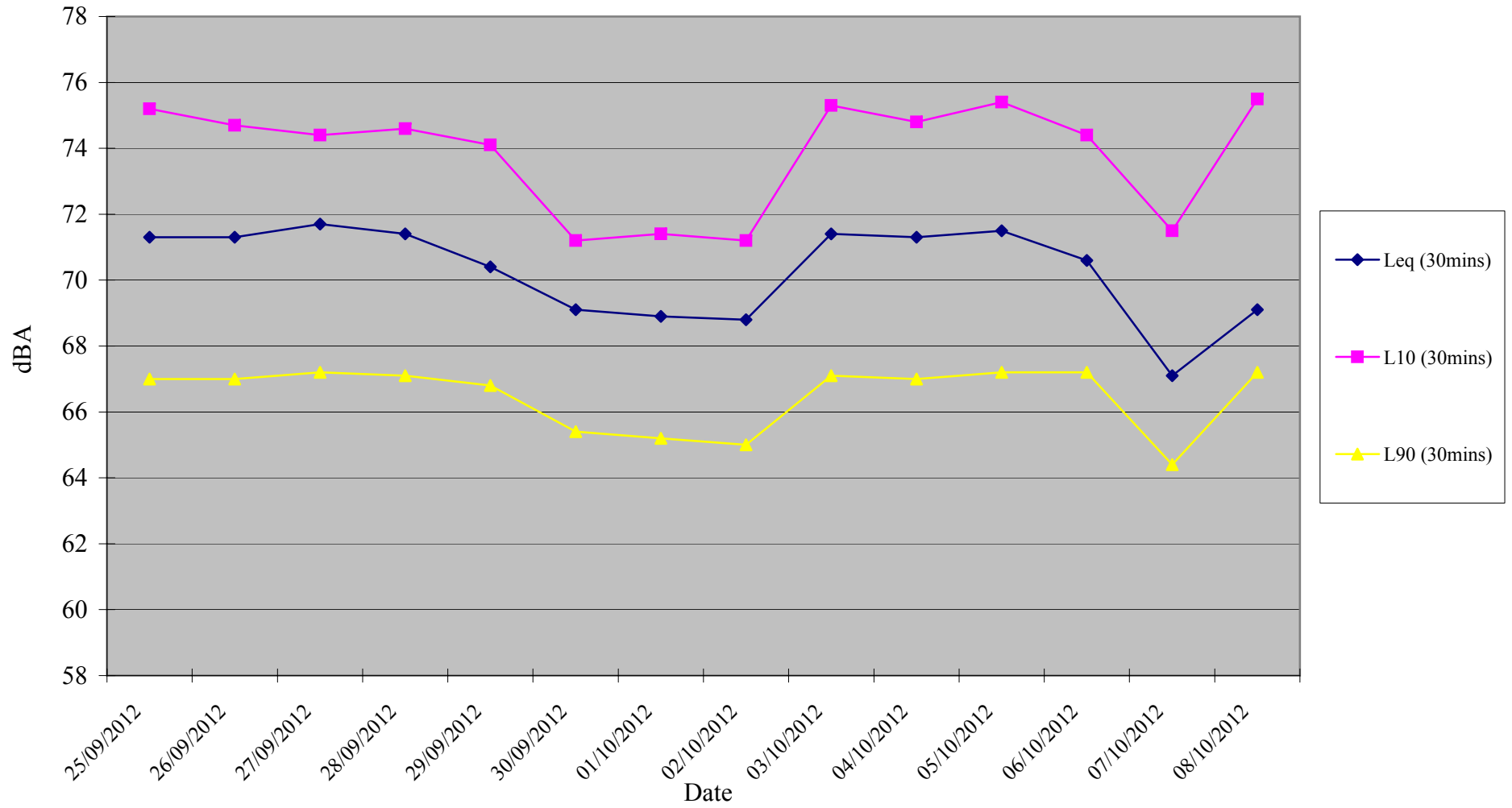
| | LAeq(30min) | LAF10(30min) | LAF90(30min) |
|---------------|-------------|--------------|--------------|
| 07:00 - 19:00 | 68.2 | 71.3 | 65.2 |

Sundays / General Holidays Noise Levels, dB(A)

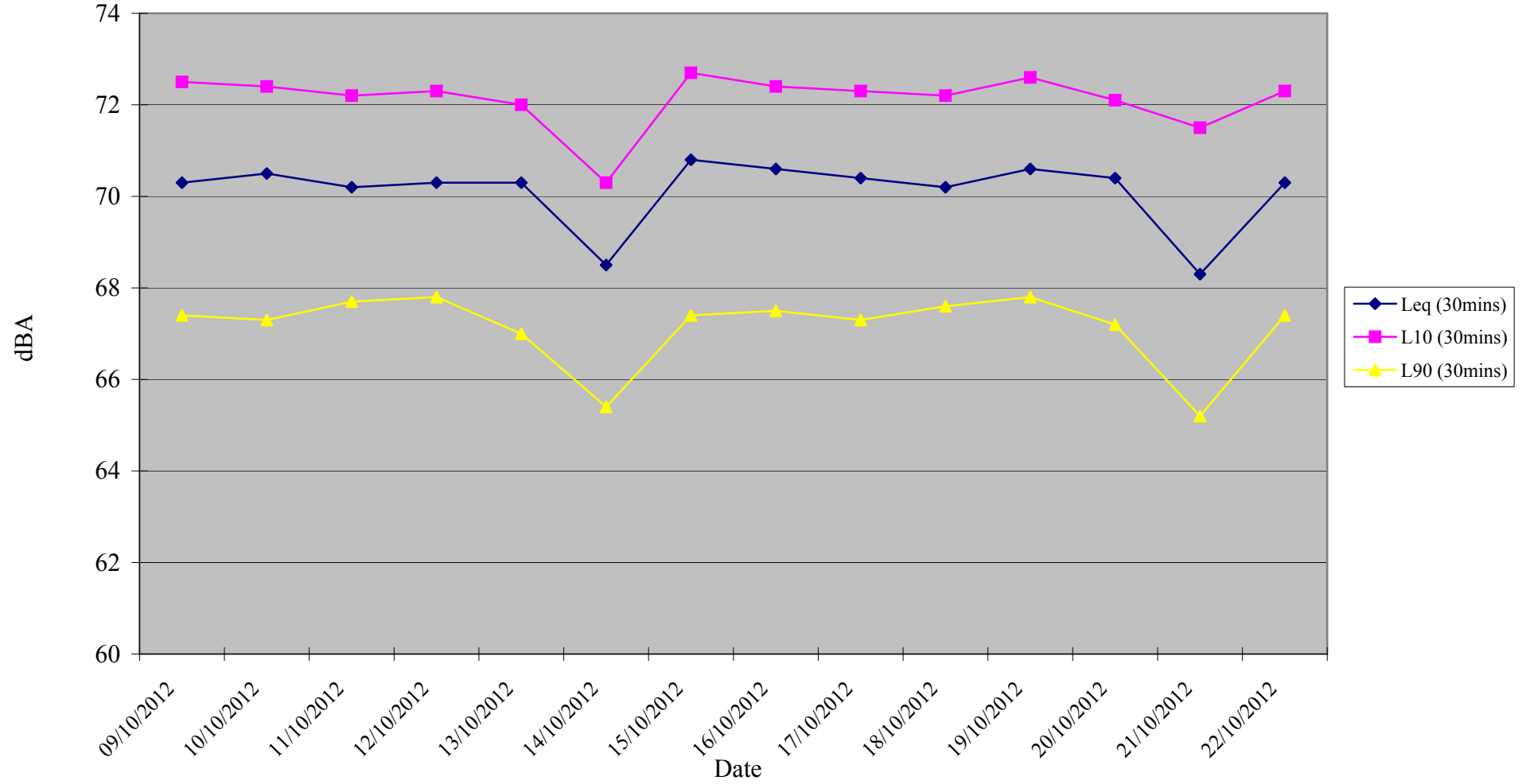
| | LAeq(30min) | LAF10(30min) | LAF90(30min) |
|---------------|-------------|--------------|--------------|
| 07:00 - 19:00 | 66.3 | 68.4 | 63.5 |

Logarithmic Averaging is being used.

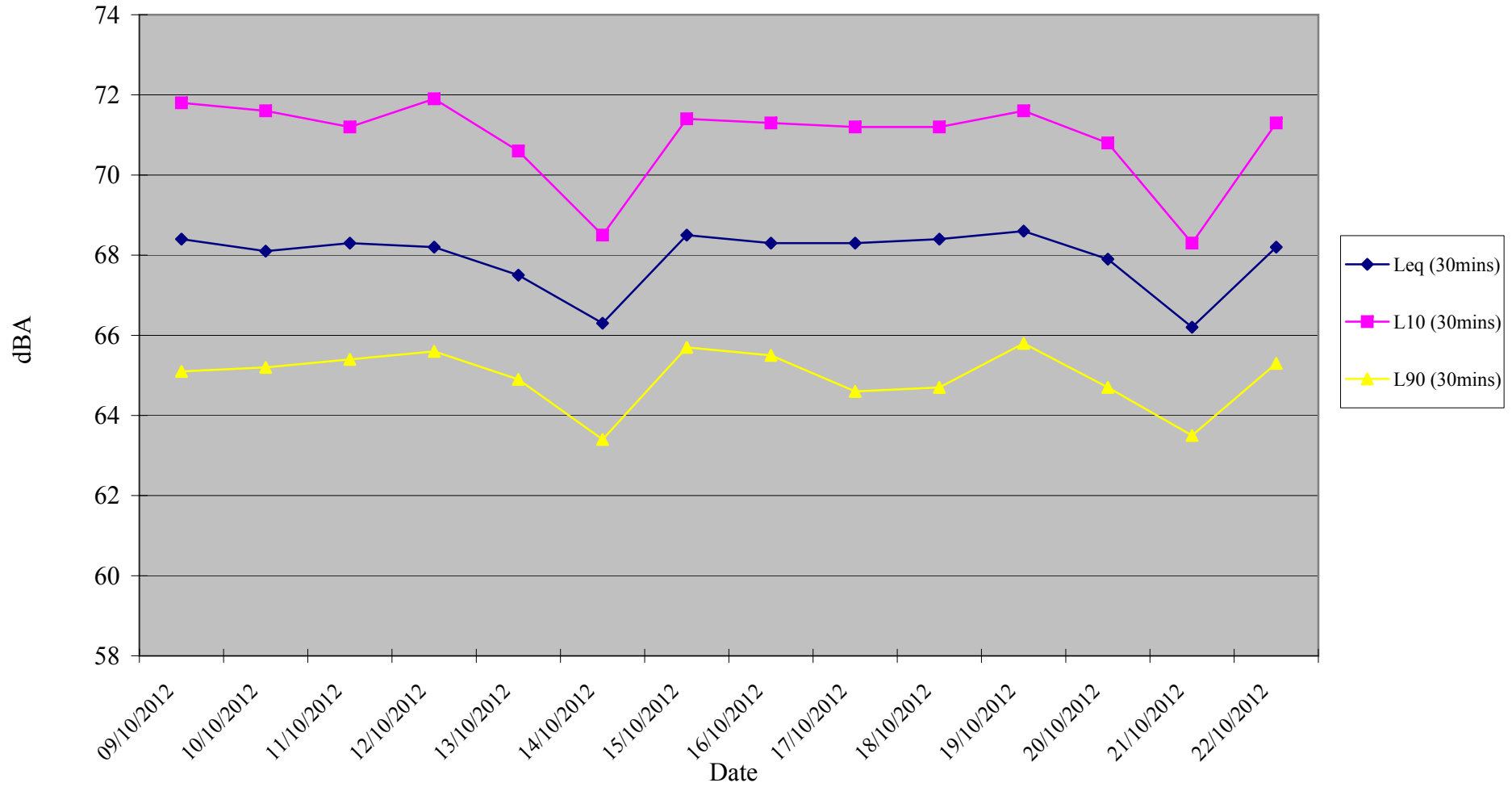
Daily Average Noise Levels from 0700Hrs to 1900Hrs at Hai Phong Mansion



Daily Average Noise Level from 0700Hrs and 1900Hrs at Comfort Building



Daily Average Noise Level from 0700Hrs to 1900Hrs at Burlington Arcade



ANNEX D

Calibration Certificates for Monitoring Equipment

ANDERSEN INSTRUMENTS INC.

GS2310 Series Sampler Calibration

(Dickson Recorder)

Customer -> MTRC

SITE Certificate -> 20121001

Location -> TNS

Date -> 6-Oct-12

Sampler -> 1294-1096

Tech -> Chan Kin Fung

CONDITIONS

| | | | | | |
|----------------------|---------|-------------|----------------------|---------|-----------|
| Sea Level Pressure | (hpa) | 1002 | Sampler Elevation | (feet) | 50 |
| Sea Level Pressure | (in Hg) | 29.59 | Corrected Pressure | (mm Hg) | 750.24 |
| Temperature | (deg C) | 27 | Temperature | (deg K) | 300.00 |
| Seasonal SL Pressure | (in Hg) | 29.59 | Corrected Seasonal | (mm Hg) | 750.24 |
| Seasonal Temperature | (deg C) | 27.00 | Seasonal Temperature | (deg K) | 300.00 |

CALIBRATION ORIFICE

Make -> Andersen Instruments Inc.

Qstd Slope -> **2.0075**

Model -> **G25A**

Qstd Intercept -> **-0.038138**

Serial# -> **157N**

Date Certified ->

CALIBRATION

| | Plate or | H ₂ O | Qstd | I | IC | LINEAR | |
|---|----------|------------------|-----------------------|-----------|-------------|----------------|---------|
| | Test # | (in) | (M ³ /min) | (chart) | (corrected) | REGRESSION | |
| 1 | 18 | 13.6 | 1.838 | 60 | 59.414 | Slope = | 30.6202 |
| 2 | 13 | 11.2 | 1.670 | 56 | 55.453 | Intercept = | 4.2499 |
| 3 | 10 | 8.2 | 1.432 | 50 | 49.512 | Corr. Coeff. = | 0.9936 |
| 4 | 7 | 5.6 | 1.186 | 42 | 41.590 | | |
| 5 | 5 | 3.5 | 0.942 | 32 | 31.688 | | |

Calculations

$$Qstd = 1/m [\text{Sqrt} (H_2O (Pa/Pstd) (Tstd/Ta)) - b]$$

$$IC = I [\text{Sqrt} (Pa/Pstd) (Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$$1/m ((I) [\text{Sqrt} (298/Tav) (Pav/760)] - b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



This is to certify that the above equipment has been calibrated in accordance with manufacturer's procedure.

Certificate of Calibration

Certificate Number: EDCQP200-4.11.5

Environmental Devices Corporation certifies the Haz-Dust Particulate Monitors are calibrated gravimetrically against the specifications and protocols set forth in NIOSH method 0600 & 0500 and are NIST traceable and conforms to original specifications of +/- 10%.

Calibration Dust Specifications using NIST traceable Coulter Mutisizer II e. ISO12103 -1 A2 Fine Test Dust.

NIST primary Flow Standard: LFE774300.

Quality system standard to meet the requirements of ANSI/ASQC standard Q9000-1994 (ISO 9001), MIL-STD 45662A, and customer's specification if required.

Particulate Cumulative Volume Numeric Data

| <u>Micron Size</u> | <u>% Less Than</u> |
|--------------------|--------------------|
| 1 | 2.9 |
| 2 | 11.0 |
| 3 | 19.6 |
| 4 | 27.7 |
| 5 | 34.6 |
| 7 | 43.6 |
| 10 | 52.1 |
| 20 | 70.7 |
| 40 | 89.2 |
| 80 | 99.8 |
| 120 | 100.0 |

Temperature = 22°C

Relative Humidity = 30%

Atmospheric Pressure = 760 mmHg

Measurement Uncertainty Estimated @ 95% Confidence Level (k=2)

| Technician | Model | Serial Number | Date |
|-------------------------------|---------------------------|-----------------|--------------------|
| <i>M. B.</i> | <i>E-PAM-500</i> | <i>01113294</i> | <i>Jan 27 2011</i> |
| Checked By <i>[Signature]</i> | Next Calibration Due Date | | <i>Jan 27 2013</i> |

Calibration Span Accessory K= *10.9 mg/m³* Model: *CS-105*

Environmental Devices Corporation
4 Wilder Drive Building #15
Plaistow, NH 03865
ISO-9001 Certified



MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 25th January, 2011

Certificate Number MLCN110186S

Customer Information

Company Name MTR Corporation Limited
Address MTR Tower, Telford Plaza,
33 Wai Yip St., Kowloon Bay,
Kowloon,
Hong Kong

Unit Under Test (UUT)

Description Handheld Analyzer
Manufacturer Brüel & Kjær
Model Number Type 2250
Serial Number 2551244
Equipment Number -

Calibration Result

- * The exact manufacturer's specification is not available from the customer.
- * Calibration data are detailed on the attached sheet(s).

Approved By

Laboratory Manager

- * Calibration equipment used for this calibration are traceable to national / international standards.
- * The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the UUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
- * MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the UUT.
- * The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.



MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 25th January, 2011

Certificate Number MLCN110186S

Calibration Status

Date of Calibration 25th January, 2011
 Calibration Equipment Used 4231 (MLTE008)/ C1002184/ 8th Mar 2012
 Calibration Procedure MLCG00 & MLCG15.
 Calibration Uncertainty ± 0.2 dB

| | | | |
|-----------------------|-----|-------------------|------------------|
| Calibration Condition | Lab | Temperature | 23 °C \pm 5 °C |
| | | Relative Humidity | 55% \pm 25% |
| | UUT | Stabilizing Time | Over 3 hours |
| | | Warm-up Time | 10 minutes |
| | | Supply Voltage | Internal Battery |

Calibration Data

| Frequency Weighted | UUT Setting | | | UUT Rdg | Std Rdg | UUT Error |
|--------------------|-------------|----------|------------|----------|---------|-----------|
| | Parameter | Response | Range (dB) | | | |
| A (1 kHz Input) | SPL | F | Auto | 93.8 dB | 94 dB | -0.2 dB |
| | | S | | 93.8 dB | 94 dB | -0.2 dB |
| | | I | | 93.8 dB | 94 dB | -0.2 dB |
| C (1 kHz Input) | | F | | 93.8 dB | 94 dB | -0.2 dB |
| | | S | | 93.8 dB | 94 dB | -0.2 dB |
| | | I | | 93.8 dB | 94 dB | -0.2 dB |
| A (1 kHz Input) | | F | | 113.8 dB | 114 dB | -0.2 dB |
| | | S | | 113.8 dB | 114 dB | -0.2 dB |
| | | I | | 113.8 dB | 114 dB | -0.2 dB |
| C (1 kHz Input) | F | 113.8 dB | 114 dB | -0.2 dB | | |
| | S | 113.8 dB | 114 dB | -0.2 dB | | |
| | I | 113.8 dB | 114 dB | -0.2 dB | | |

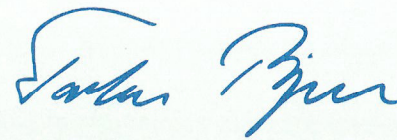
MANUFACTURER'S CERTIFICATE OF CONFORMANCE

We certify that Brüel & Kjær **-2250-L--** Serial No. **2741137**
has been tested and passed all production tests, confirming compliance with
the manufacturer's published specification at the date of the test.

The final test has been performed using calibrated equipment, traceable to
National or International Standards or by ratio measurements.

Brüel & Kjær is certified under ISO 9001:2008 assuring that all test data is
retained on file and is available for inspection upon request.

Nærum 21-jan-2011



Torben Bjørn
Vice President, Operations

Please note that this document is not a calibration certificate.
For information on our calibration services please contact your nearest Brüel & Kjær office.

HEADQUARTERS: Brüel & Kjær Sound & Vibration Measurement A/S · DK-2850 Nærum · Denmark
Telephone: +45 7741 2000 · Fax: +45 4580 1405 · www.bksv.com · info@bksv.com
Local representatives and service organisations worldwide

Brüel & Kjær 
Incorporating LDS and Lochard



MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 8th December, 2010

Certificate Number MLCN101529S

Customer Information

Company Name MTR Corporation Limited
Address MTR Tower, Telford Plaza,
33 Wai Yip St., Kowloon Bay,
Kowloon,
Hong Kong

Unit Under Test (UUT)

Description Sound Level Calibrator
Manufacturer Brüel & Kjær
Model Number 4231
Serial Number 2415903
Equipment Number -

Calibration Result

- * All calibration results within the manufacturer's specification.
- * Calibration data are detailed on the attached sheet(s).

Approved By

Laboratory Manager

- * Calibration equipment used for this calibration are traceable to national / international standards.
- * The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the UUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
- * MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the UUT.
- * The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.



MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue 8th December, 2010

Certificate Number MLCN101529S

Calibration Status

Date of Calibration 8th December, 2010
Calibration Equipment Used 4231 (Spec) (MLTE008)/ CA1002184/ 8th Mar 2012
1351 (MLTE049)/ MLEC10/06/04/ 15th Jun 2011
Calibration Procedure MLCG00 & MLCG15.
Calibration Uncertainty ± 0.1 dB

| | | | |
|-----------------------|-----|-------------------|------------------|
| Calibration Condition | Lab | Temperature | 23 °C \pm 5 °C |
| | | Relative Humidity | 55% \pm 25% |
| | UUT | Stabilizing Time | Over 3 hours |
| | | Warm-up Time | Not applicable |
| | | Supply Voltage | Internal battery |

Calibration Data

| UUT Setting | STD Rdg | UUT Error | UUT Error Limit |
|-------------|----------|-----------|-----------------|
| 94 dB | 93.9 dB | -0.1 dB | 0.2 dB |
| 114 dB | 114.0 dB | 0.0 dB | 0.2 dB |