Relevant Revised Interim Criteria for Consideration of Application for New Territories Exempted House (NTEH)/Small House in New Territories
(promulgated on 7.9.2007)

(a) sympathetic consideration may be given if not less than 50% of the proposed NTEH/Small House footprint falls within the village 'environs' ('VE') of a recognized village and there is a general shortage of land in meeting the demand for Small House development in the "Village Type Development" ("V") zone of the village;

(b) if more than 50% of the proposed NTEH/Small House footprint is located outside the 'VE', favourable consideration could be given if not less than 50% of the proposed NTEH/Small House footprint falls within the "V" zone, provided that there is a general shortage of land in meeting the demand for Small House development in the "V" zone and the other criteria can be satisfied;

(c) development of NTEH/Small House with more than 50% of the footprint outside both the 'VE' and the "V" zone would normally not be approved unless under very exceptional circumstances (e.g. the application site has a building status under the lease, or approving the application could help achieve certain planning objectives such as phasing out of obnoxious but legal existing uses);

(d) application for NTEH/Small House with previous planning permission lapsed will be considered on its own merits. In general, proposed development which is not in line with the criteria would normally not be allowed. However, sympathetic consideration may be given if there are specific circumstances to justify the cases, such as the site is an infill site among existing NTEHs/Small Houses, the processing of the Small House grant is already at an advance stage;

(e) an application site involves more than one NTEH/Small House, application of the above criteria would be on individual NTEH/Small House basis;

(f) the proposed development should not frustrate the planning intention of the particular zone in which the application site is located;

(g) the proposed development should be compatible in terms of land use, scale, design and layout, with the surrounding area/development;

(h) the proposed development should not encroach onto the planned road network and should not cause adverse traffic, environmental, landscape, drainage, sewerage and geotechnical impacts on the surrounding areas. Any such potential impacts should be mitigated to the satisfaction of relevant Government departments;

(i) the proposed development, if located within water gathering grounds, should be able to be connected to existing or planned sewerage system in the area except under very special circumstances (e.g. the application site has a building status under the lease or the applicant can demonstrate that the water quality within water gathering grounds will not be affected by the proposed development^);

(j) the provision of fire service installations and emergency vehicular access, if required, should be appropriate with the scale of the development and in compliance with relevant standards; and

(k) all other statutory or non-statutory requirements of relevant Government departments must be met. Depending on the specific land use zoning of the application site, other Town Planning Board guidelines should be observed, as appropriate.

^i.e. the applicant can demonstrate that effluent discharge from the proposed development will be in compliance with the effluent standards as stipulated in the Water Pollution Control Ordinance Technical Memorandum.

Appendix III of RNTPC
Paper No. A/NE-KLH/635

Pervious Application

Approved Application

Application No.	Use/Development	Date of Consideration
A/NE-KLH/92	New Territories Exempted House (NTEH) (Small House)	20.9.1996

Detailed Comments from Relevant Government Departments

1. Land Administration

Comments of the District Lands Officer/Tai Po, Lands Department (DLO/TP, LandsD):

- the applicant is an indigenous villager of Tai Wo of Tai Po Heung, as confirmed by the Indigenous Inhabitant Representative of Tai Wo. However, his eligibility for a Small House grant has yet to be ascertained;

- the application site (the Site) is held under Block Government Lease demised for agricultural use and is not covered by Modification of Tenancy or Building Licence, and it does not encroach on any existing or planned emergency vehicular access (EVA) under application;

- Small House grant application submitted by the applicant for the Site is still under processing; and

- the Site falls wholly within the village 'environs' ('VE') of Tai Wo which overlap with the 'VE' of Kau Lung Hang and Yuen Leng.

2. Agriculture

Comments of the Director of Agriculture, Fisheries and Conservation (DAFC):

- the proposed development is not supported from agricultural perspective; and

- the Site falls within "Agriculture" zone and is generally abandoned. The agricultural activities are active in the vicinity and agricultural infrastructure such as road access and water source is also available. The Site can be used for agricultural activities such as open-field cultivation, greenhouses, plant nurseries etc. The Site possesses potential for agricultural rehabilitation.

3. Traffic

Comments of the Commissioner for Transport (C for T):

- Small House development should be confined within the "Village Type Development" ("V") zone as far as possible. Although additional traffic generated by the proposed development is not expected to be significant, such type of development outside the "V" zone, if permitted, will set an undesirable precedent case for similar applications in the future. The resulting cumulative adverse traffic impact could be substantial; and

- notwithstanding the above, the application only involves development of one Small House and can be tolerated on traffic grounds.

4. Environment

Comments of the Director of Environmental Protection (DEP):

- no in-principle objection to the application provided that the applicant will provide adequate sewer connection for disposal of sewage from the Small House to the existing public sewer at his own costs and reserve adequate land for the sewer connection work; and

- the noise impact assessment submitted by the applicant (**Appendix Ia**) is generally acceptable.

5. Water Supplies

Comments of the Chief Engineer/Construction, Water Supplies Department (CE/C, WSD):

- no objection to the application;

- the Site is within upper indirect gathering grounds and is more than 30m away from the nearest watercourse;

- the applicant should comply with paragraph (d) in **Appendix VI**.

6. Landscape

Comments of the Chief Town Planner/Urban Design and Landscape, Planning Department (CTP/UD&L, PlanD):

- no objection to the application from landscape planning perspective;

- the Site is located in an area of settled valleys landscape character comprising small houses, farmland, vegetated area, clusters of tree groups and woodland to the further east within the "Green Belt" zone; and

- the Site is vacant and surrounded by hoardings. Significant adverse impact on existing landscape resources within the Site and the landscape character arising from the proposed use is not anticipated.

7. Fire Safety

Comments of the Director of Fire Services (D of FS):

- no in-principle objection to the application provided that the proposed house would not encroach on any existing EVA or planned EVA under application in accordance with LandsD's record.

8. Demand and Supply of Small House Sites

According to DLO/TP, LandsD's record, the total number of outstanding Small House applications for Kau Lung Hang, Yuen Leng and Tai Wo Villages is 113, while the 10-year Small House demand forecast for concerned villages is 830. Based on the latest

estimate by PlanD, about 8.3ha (or equivalent to about 332 Small House sites) of land is available within the "V" zones of Kau Lung Hang, Yuen Leng and Tai Wo Villages. Therefore, the land available cannot fully meet the future demand of 943 Small Houses (or equivalent to about 23.58ha of land).

1

A/NE-KLH/635

☐ Urgent ☐ Return Receipt Requested ☐ Sign ☐ Encrypt ☐ Mark Subject Restricted ☐ Expand personal&publi

A/NE-KLH/535 DD 7 Tai Wo
27/09/2023 01:47

From:
To: tpbpd <tpbpd@pland.gov.hk>
File Ref:

Dear TPB Members,

620 withdrawn. Objections valid and upheld.

Mary Mulvihill

From:
To: tpbpd <tpbpd@pland.gov.hk>
Date: Tuesday, 28 February 2023 2:00 AM CST
Subject: A/NE-KLH/620 DD 7 Tai Wo

A/NE-KLH/620

Lot 111 S.B ss.2 in D.D. 7, Tai Wo, Tai Po

Site area: About 153.4sq.m

Zoning: "Agriculture"

Applied development : NET House

Dear TPB Members,

Strong objections. There is sufficient land within the "V' zone to accommodate a considerable number of small houses.

No justification to extend the village into the AG zoning.

Mary Mulvihill

Recommended Advisory Clauses

(a) to note the comments of the District Lands Officer/Tai Po, Lands Department (DLO/TP, LandsD) that should the application be approved, LandsD will process the Small House grant application. However, there is no guarantee that the Small House grant application would be approved. If the Small House grant application is approved by LandsD acting in the capacity as landlord at its sole discretion, such approval will be subject to such terms and conditions as may be imposed by LandsD. There is no guarantee to the grant of a right of way to the Small House concerned or approval of the emergency vehicular access (EVA) thereto;

(b) note the comments of the Director of Environmental Protection (DEP) that:

(i) the applicant should provide adequate sewer connection for disposal of sewage from the Small House to the existing public sewer at his own costs and reserve adequate land for the sewer work; and

(ii) the applicant should rectify the station number of the counting station and its annual average daily traffic flow stated in section 7 of the noise impact assessment report;

(c) to note the comments of the Chief Engineer/Mainland North, Drainage Services Department (CE/MN, DSD) that:

(i) there is no existing public drain maintained by DSD available for connection in the area. The applicant should have its own stormwater collection and discharge system to cater for the runoff generated within the Site and overland flow from surrounding of the Site, e.g. surface channel of sufficient size along the perimeter of the Site; sufficient openings should be provided at the bottom of the boundary wall/fence to allow surface runoff to pass through the Site if any boundary wall/fence are to be erected. Any existing flow path affected should be re-provided. The applicant should neither obstruct overland flow nor adversely affect the existing natural streams, village drains, ditches and the adjacent areas. The applicant is required to maintain the drainage systems properly and rectify the systems if they are found to be inadequate or ineffective during operation. The applicant shall also be liable for and shall indemnify claims and demands arising out of damage or nuisance caused by failure of the systems;

(ii) there is existing public sewers in the vicinity of the Site; and

(iii) for works to be undertaken outside the lot boundary, prior consent and agreement from LandsD and/or relevant private lot owners should be sought;

(d) to note the comments of the Chief Engineer/Construction, Water Supplies Department (CE/C, WSD) that:

(i) the foul water drainage system of the proposed New Territories Exempted House (NTEH)/Small House can be connected to the public sewerage system in the area and the applicant shall connect the whole of the foul water drainage system to the public sewerage system;

(ii) adequate protective measures shall be taken to ensure that no pollution or siltation occurs to the water gathering grounds;

(iii) the applicant shall submit an executed Deed of Grant of Easement for each private lot through which the sewer connection pipes are proposed to pass to demonstrate that it is both technically and legally feasible to install sewerage pipes from the proposed NTEH/Small House to the sewerage system via relevant private lot; and

(iv) for provision of water supply to the development, the applicant may need to extend his inside services to the nearest suitable government water mains for connection. The applicant shall resolve any land matter (such as private lots) associated with the provision of water supply and shall be responsible for the construction, operation and maintenance of the inside services within the private lots to WSD's standards;

(e) to note the comments of the Director of Fire Services (D of FS) that the applicant is advised to observe 'New Territories Exempted Houses – A Guide to Fire Safety Requirements' published by LandsD. Detailed fire safety requirements will be formulated upon receipt of formal application referred by LandsD; and

(f) to note that the permission is only given to the development under application. If provision of an access road is required for the proposed development, the applicant should ensure that such access road (including any necessary filling/excavation of land) complies with the provisions of the relevant statutory plan and obtain planning permission from Town Planning Board where required before carrying out the road work.

2023年 8月 30日

此文件在_____收到。城市規劃委員會只會在收到所有必要的資料及文件後才正式確認收到申請的日期。

This document is received on 30 AUG 2023. The Town Planning Board will formally acknowledge the date of receipt of the application only upon receipt of all the required information and documents.

Form No. S16-II
表格第 S16-II 號

APPLICATION FOR PERMISSION UNDER SECTION 16 OF THE TOWN PLANNING ORDINANCE (CAP.131)

根據《城市規劃條例》(第131章)第16條遞交的許可申請

Applicable to Proposal Only Involving Construction of "New Territories Exempted House(s)"

適用於只涉及興建「新界豁免管制屋宇」的建議

Applicant who would like to publish the notice of application in local newspapers to meet one of the Town Planning Board's requirements of taking reasonable steps to obtain consent of or give notification to the current land owner, please refer to the following link regarding publishing the notice in the designated newspapers: https://www.info.gov.hk/tpb/en/plan_application/apply.html

申請人如欲在本地報章刊登申請通知，以採取城市規劃委員會就取得現行土地擁有人的同意或通知現行土地擁有人所指定的其中一項合理步驟，請瀏覽以下網址有關在指定的報章刊登通知：https://www.info.gov.hk/tpb/tc/plan_application/apply.html

General Note and Annotation for the Form
填寫表格的一般指引及註解

\# "Current land owner" means any person whose name is registered in the Land Registry as that of an owner of the land to which the application relates, as at 6 weeks before the application is made
「現行土地擁有人」指在提出申請前六星期，其姓名或名稱已在土地註冊處註冊為該申請所關乎的土地的擁有人的人

& Please attach documentary proof 請夾附證明文件

^ Please insert number where appropriate 請在適當地方註明編號

Please fill "NA" for inapplicable item 請在不適用的項目填寫「不適用」

Please use separate sheets if the space provided is insufficient 如所提供的空間不足，請另頁說明

Please insert a「✔」at the appropriate box 請在適當的方格內上加上「✔」號

2302218 14/8 by hand

Form No. S16-II 表格第 S16-II 號

For Official Use Only 請勿填寫此欄	Application No. 申請編號	A/NE-KLH/635
	Date Received 收到日期	30 AUG 2023

1. The completed form and supporting documents (if any) should be sent to the Secretary, Town Planning Board (the Board), 15/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong.
申請人須把填妥的申請表格及其他支持申請的文件（倘有），送交香港北角渣華道 333 號北角政府合署 15 樓城市規劃委員會(下稱「委員會」)秘書收。

2. Please read the "Guidance Notes" carefully before you fill in this form. The document can be downloaded from the Board's website at http://www.info.gov.hk/tpb/. It can also be obtained from the Secretariat of the Board at 15/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong (Tel: 2231 4810 or 2231 4835), and the Planning Enquiry Counters of the Planning Department (Hotline: 2231 5000) (17/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong and 14/F, Sha Tin Government Offices, 1 Sheung Wo Che Road, Sha Tin, New Territories).
請先細閱《申請須知》的資料單張，然後填寫此表格。該份文件可從委員會的網頁下載（網址：http://www.info.gov.hk/tpb/)，亦可向委員會秘書處（香港北角渣華道 333 號北角政府合署 15 樓 – 電話：2231 4810 或 2231 4835)及規劃署的規劃資料查詢處(熱線：2231 5000)(香港北角渣華道 333 號北角政府合署 17 樓及新界沙田上禾輋路 1 號沙田政府合署 14 樓)索取。

3. This form can be downloaded from the Board's website, and obtained from the Secretariat of the Board and the Planning Enquiry Counters of the Planning Department. The form should be typed or completed in block letters. The processing of the application may be refused if the required information or the required copies are incomplete.
此表格可從委員會的網頁下載，亦可向委員會秘書處及規劃署的規劃資料查詢處索取。申請人須以打印方式或以正楷填寫表格。如果申請人所提交的資料或文件副本不齊全，委員會可拒絕處理有關申請。

---

1. Name of Applicant 申請人姓名/名稱

(☑Mr. 先生 /☐Mrs. 夫人 /☐Miss 小姐 /☐Ms. 女士 /☐Company 公司 /☐Organisation 機構)

WONG KAI FAN Gavin 黃嘉宏

2. Name of Authorised Agent (if applicable) 獲授權代理人姓名/名稱（如適用）

(☐Mr. 先生 /☐Mrs. 夫人 /☐Miss 小姐 /☐Ms. 女士 /☑Company 公司 /☐Organisation 機構)

T.H. & ASSOCIATES LIMITED 陳德慶測量有限公司

3. Application Site 申請地點

(a) Full address / location / demarcation district and lot number (if applicable) 詳細地址／地點／丈量約份及地段號碼（如適用）	Tai Wo, Tai Po, New Territories. Lot No. 111 S.B ss.2, in D.D. 7 新界，大埔，大窩. 大埔丈量約份第 7 約 地段 111 號 B 分段 第 2 小分段 (Appendix A & Appendix B)
(b) Site area and/or gross floor area involved 涉及的地盤面積及／或總樓面面積	☑Site area 地盤面積 153.4 sq.m 平方米☑About 約 ☑Gross floor area 總樓面面積 195.09 sq.m 平方米☐About 約
(c) Area of Government land included (if any) 所包括的政府土地面積（倘有）	N A sq.m 平方米 ☐About 約

(d)	Name and number of the related statutory plan(s) 有關法定圖則的名稱及編號	Kau Lung Hang Outline Zoning Plan 九龍坑分區計劃大綱圖 S/NE-KLH/11 (Appendix C)
(e)	Land use zone(s) involved 涉及的土地用途地帶	AGR Zone 農業 (Appendix B)
(f)	Current use(s) 現時用途	Vacant Land 土地空置 (Appendix D) (If there are any Government, institution or community facilities, please illustrate on plan and specify the use and gross floor area) (如有任何政府、機構或社區設施，請在圖則上顯示，並註明用途及總樓面面積)

4. "Current Land Owner" of Application Site 申請地點的「現行土地擁有人」

The applicant 申請人 –

☑ is the sole "current land owner"#& (please proceed to Part 6 and attach documentary proof of ownership).
是唯一的「現行土地擁有人」#& (請繼續填寫第 6 部分，並夾附業權證明文件)。

☐ is one of the "current land owners"#& (please attach documentary proof of ownership).
是其中一名「現行土地擁有人」#& (請夾附業權證明文件)。

☐ is not a "current land owner"#.
並不是「現行土地擁有人」#。
(Appendix E)

☐ The application site is entirely on Government land (please proceed to Part 6).
申請地點完全位於政府土地上（請繼續填寫第 6 部分）。

5. Statement on Owner's Consent/Notification 就土地擁有人的同意/通知土地擁有人的陳述

NA

(a) According to the record(s) of the Land Registry as at ..... (DD/MM/YYYY), this application involves a total of ..... "current land owner(s) "#.
根據土地註冊處截至 ..... 年 ..... 月 ..... 日的記錄，這宗申請共牽涉 ..... 名「現行土地擁有人」#。

(b) The applicant 申請人 –

☐ has obtained consent(s) of ..... "current land owner(s)"#.
已取得 ..... 名「現行土地擁有人」#的同意。

Details of consent of "current land owner(s)"# obtained 取得「現行土地擁有人」#同意的詳情		
No. of 'Current Land Owner(s)' 「現行土地擁有人」數目	Lot number/address of premises as shown in the record of the Land Registry where consent(s) has/have been obtained 根據土地註冊處記錄已獲得同意的地段號碼／處所地址	Date of consent obtained (DD/MM/YYYY) 取得同意的日期 (日/月/年)

(Please use separate sheets if the space of any box above is insufficient. 如上列任何方格的空間不足，請另頁說明)

☐ has notified ..... "current land owner(s)"#
已通知 ..... 名「現行土地擁有人」#。 NA

Details of the "current land owner(s)" # notified 已獲通知「現行土地擁有人」#的詳細資料		
No. of 'Current Land Owner(s)' 「現行土地擁有人」數目	Lot number/address of premises as shown in the record of the Land Registry where notification(s) has/have been given 根據土地註冊處記錄已發出通知的地段號碼／處所地址	Date of notification given (DD/MM/YYYY) 通知日期(日/月/年)

(Please use separate sheets if the space of any box above is insufficient. 如上列任何方格的空間不足，請另頁說明)

☐ has taken reasonable steps to obtain consent of or give notification to owner(s):
已採取合理步驟以取得土地擁有人的同意或向該人發給通知。詳情如下： NA

Reasonable Steps to Obtain Consent of Owner(s) 取得土地擁有人的同意所採取的合理步驟

☐ sent request for consent to the "current land owner(s)" on _____ (DD/MM/YYYY)#&
於_____(日/月/年)向每一名「現行土地擁有人」#郵遞要求同意書&

Reasonable Steps to Give Notification to Owner(s) 向土地擁有人發出通知所採取的合理步驟

☐ published notices in local newspapers on _____ (DD/MM/YYYY)&
於_____(日/月/年)在指定報章就申請刊登一次通知&

☐ posted notice in a prominent position on or near application site/premises on _____ (DD/MM/YYYY)&
於_____(日/月/年)在申請地點／申請處所或附近的顯明位置貼出關於該申請的通知&

☐ sent notice to relevant owners' corporation(s)/owners' committee(s)/mutual aid committee(s)/management office(s) or rural committee on _____ (DD/MM/YYYY)&
於_____(日/月/年)把通知寄往相關的業主立案法團/業主委員會/互助委員會或管理處，或有關的鄉事委員會&

Others 其他

☐ others (please specify)
其他（請指明）

NA

Note: May insert more than one「✔」.
Information should be provided on the basis of each and every lot (if applicable) and premises (if any) in respect of the application.
註: 可在多於一個方格內加上「✔」號
申請人須就申請涉及的每一地段（倘適用）及處所（倘有）分別提供資料

6. Development Proposal 擬議發展計劃

(a) Name(s) of indigenous villager(s) (if applicable) 原居民姓名（如適用）	WONG KAI FAN Gavin 黃嘉宏		
(b) 原居民所屬的原居鄉村（如適用） The related indigenous village of the indigenous villager(s) (if applicable)	Villager of Tai Wo 大窩村原居村民		
(c) Proposed gross floor area 擬議總樓面面積	195.09 sq.m 平方米 ☐About 約		
(d) Proposed number of house(s) 擬議房屋幢數	ONE	Proposed number of storeys of each house 每幢房屋的擬議層數	3
(e) Proposed roofed over area of each house 每幢房屋的擬議上蓋面積	65.03 sq.m 平方米	Proposed building height of each house 每幢房屋的擬議高度	8.23 m 米
(f) Proposed use(s) of uncovered area (if any) 露天地方（倘有）的擬議用途	Garden 花園 (Please illustrate on plan the total number and dimension of each car parking space, and/or location of septic tank, where applicable) (請在圖則上顯示，並註明車位總數，以及每個車位的長度和寬度及/或化糞池的位置 (如適用))		
(g) Any vehicular access to the site/subject building? 是否有車路通往地盤／有關建築物？	Yes 是	☐ There is an existing access. (please indicate the street name, where appropriate) 有一條現有車路。(請註明車路名稱(如適用)) ..... ☐ There is a proposed access. (please illustrate on plan and specify the width) 有一條擬議車路。（請在圖則顯示，並註明車路的闊度）	
	No 否	☑ (Appendix F)	
(h) Can the proposed house(s) be connected to public sewer? 擬議的屋宇發展能否接駁至公共污水渠?	Yes 是☑	(Please indicate on plan the sewerage connection proposal. 請用圖則顯示接駁公共污水渠的路線) (Appendix H)	
	No 否☐	(Please indicate on plan the location of the proposed septic tank. 請用圖則顯示化糞池的位置)	

7. Impacts of Development Proposal 擬議發展計劃的影響

If necessary, please use separate sheets to indicate the proposed measures to minimise possible adverse impacts or give justifications/reasons for not providing such measures.
如需要的話，請另頁註明可盡量減少可能出現不良影響的措施，否則請提供理據/理由。

Does the development proposal involve alteration of existing building? 擬議發展計劃是否包括現有建築物的改動?	Yes 是 ☐ Please provide details 請提供詳情 .... No 否 ☑
Does the development proposal involve the operation on the right? 擬議發展是否涉及右列的工程?	Yes 是 ☐ (Please indicate on site plan the boundary of concerned land/pond(s), and particulars of stream diversion, the extent of filling of land/pond(s) and/or excavation of land) (請用地盤平面圖顯示有關土地／池塘界線，以及河道改道、填塘、填土及／或挖土的細節及/或範圍) ☐ Diversion of stream 河道改道 ☐ Filling of pond 填塘 Area of filling 填塘面積 ..... sq.m 平方米 ☐About 約 Depth of filling 填塘深度 ..... m 米 ☐About 約 ☐ Filling of land 填土 Area of filling 填土面積 ..... sq.m 平方米 ☐About 約 Depth of filling 填土厚度 ..... m 米 ☐About 約 ☐ Excavation of land 挖土 Area of excavation 挖土面積 ..... sq.m 平方米☐About 約 Depth of excavation 挖土深度 .....m 米 ☐About 約 No 否 ☑
Would the development proposal cause any adverse impacts? 擬議發展計劃會否造成不良影響？	On environment 對環境 Yes 會 ☐ No 不會 ☑ On traffic 對交通 Yes 會 ☐ No 不會 ☑ On water supply 對供水 Yes 會 ☐ No 不會 ☑ On drainage 對排水 Yes 會 ☐ No 不會 ☑ On slopes 對斜坡 Yes 會 ☐ No 不會 ☑ Affected by slopes 受斜坡影響 Yes 會 ☐ No 不會 ☑ Landscape Impact 構成景觀影響 Yes 會 ☐ No 不會 ☑ Tree Felling 砍伐樹木 Yes 會 ☐ No 不會 ☑ Visual Impact 構成視覺影響 Yes 會 ☐ No 不會 ☑ Others (Please Specify) 其他 (請列明) Yes 會 ☐ No 不會 ☑ _____ _____ (Appendix D)
	Please state measure(s) to minimise the impact(s). For tree felling, please state the number, diameter at breast height and species of the affected trees (if possible) 請註明盡量減少影響的措施。如涉及砍伐樹木，請說明受影響樹木的數目、及胸高度的樹幹直徑及品種(倘可) N A ....

8. Justifications 理由

The applicant is invited to provide justifications in support of the application. Use separate sheets if necessary.
現請申請人提供申請理由及支持其申請的資料。如有需要，請另頁說明。

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Appendix G

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Plans to be Submitted

Appendix	A	Lot Index Plan—Lot No. 111 S.B ss.2 in D.D. 7
Appendix	B	Proposed Small House Plan
Appendix	C	Kau Lung Hang Outline Zoning Plan—S/NE-KLH/11
Appendix	D	Aerial Photo of the Subject Site
Appendix	E	Ownership of the Lot
Appendix	F	Location Plan
Appendix	G	Justification
Appendix	H	Sewage Proposal Plan
Appendix	I	Letter of Consent

9. Declaration 聲明

I hereby declare that the particulars given in this application are correct and true to the best of my knowledge and belief.
本人謹此聲明，本人就這宗申請提交的資料，據本人所知及所信，均屬真實無誤。

I hereby grant a permission to the Board to copy all the materials submitted in this application and/or to upload such materials to the Board's website for browsing and downloading by the public free-of-charge at the Board's discretion.
本人現准許委員會酌情將本人就此申請所提交的所有資料複製及/或上載至委員會網站，供公眾免費瀏覽或下載。

Signature 簽署 ..... ☐ Applicant 申請人 / ☑ Authorised Agent 獲授權代理人

MR CHAN TAK HING
Name in Block Letters 姓名（請以正楷填寫）

Managing Director
Position (if applicable) 職位 （如適用）

Professional Qualification(s) 專業資格
☑ Member 會員 / ☐ Fellow of 資深會員
☐ HKIP 香港規劃師學會 / ☐ HKIA 香港建築師學會 /
☑ HKIS 香港測量師學會 / ☐ HKIE 香港工程師學會 /
☐ HKILA 香港園境師學會/ ☐ HKIUD 香港城市設計學會
☐ RPP 註冊專業規劃師
Others 其他 MRICS, RPS (LS) & ALS

on behalf of 代表 T.H. & ASSOCIATES LIMITED 陳德慶測量有限公司
☑ Company 公司 / ☐ Organisation Name and Chop (if applicable) 機構名稱及蓋章（如適用）

Date 日期 10 AUG 2023 (DD/MM/YYYY 日/月/年)

Remark 備註

The materials submitted in this application and the Board's decision on the application would be disclosed to the public. Such materials would also be uploaded to the Board's website for browsing and free downloading by the public where the Board considers appropriate.
委員會會向公眾披露申請人所遞交的申請資料和委員會對申請所作的決定。在委員會認為合適的情況下，有關申請資料亦會上載至委員會網頁供公眾免費瀏覽及下載。

Warning 警告

Any person who knowingly or wilfully makes any statement or furnish any information in connection with this application, which is false in any material particular, shall be liable to an offence under the Crimes Ordinance.
任何人在明知或故意的情況下，就這宗申請提出在任何要項上是虛假的陳述或資料，即屬違反《刑事罪行條例》。

Statement on Personal Data 個人資料的聲明

1. The personal data submitted to the Board in this application will be used by the Secretary of the Board and Government departments for the following purposes:
委員會就這宗申請所收到的個人資料會交給委員會秘書及政府部門，以根據《城市規劃條例》及相關的城市規劃委員會規劃指引的規定作以下用途：
   (a) the processing of this application which includes making available the name of the applicant for public inspection when making available this application for public inspection; and
處理這宗申請，包括公布這宗申請供公眾查閱，同時公布申請人的姓名供公眾查閱；以及
   (b) facilitating communication between the applicant and the Secretary of the Board/Government departments.
方便申請人與委員會秘書及政府部門之間進行聯絡。

2. The personal data provided by the applicant in this application may also be disclosed to other persons for the purposes mentioned in paragraph 1 above.
申請人就這宗申請提供的個人資料，或亦會向其他人士披露，以作上述第 1 段提及的用途。

3. An applicant has a right of access and correction with respect to his/her personal data as provided under the Personal Data (Privacy) Ordinance (Cap. 486). Request for personal data access and correction should be addressed to the Secretary of the Board at 15/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong.
根據《個人資料(私隱)條例》(第 486 章)的規定，申請人有權查閱及更正其個人資料。如欲查閱及更正個人資料，應向委員會秘書提出有關要求，其地址為香港北角渣華道 333 號北角政府合署 15 樓。

Gist of Application 申請摘要

(Please provide details in both English and Chinese as far as possible. This part will be circulated to relevant consultees, uploaded to the Town Planning Board's Website for browsing and free downloading by the public and available at the Planning Enquiry Counters of the Planning Department for general information.)
(請盡量以英文及中文填寫。此部分將會發送予相關諮詢人士、上載至城市規劃委員會網頁供公眾免費瀏覽及下載及於規劃署規劃資料查詢處供一般參閱。)

Application No. 申請編號	(For Official Use Only) (請勿填寫此欄) N A
Location/address 位置／地址	Tai Wo, Tai Po, New Territories. Lot No. 111 S.B ss.2, in D.D. 7 新界，大埔，大窩. 大埔丈量約份 第 7 約 地段 111 號 B 分段第 2 小分段 (Appendix A)
Site area 地盤面積	153.4 sq. m 平方米 ☑ About 約 (includes Government land of 包括政府土地 N A sq. m 平方米 ☐ About 約)
Plan 圖則	O.Z.P. S/NE-KLH/11 (Appendix C)
Zoning 地帶	AGR Zone 農業 (Appendix B)
Applied use/ development 申請用途/發展	New Territories Exempted House 新界豁免管制屋宇 ☑ Small House 小型屋宇
(i) Proposed Gross floor area 擬議總樓面面積	195.09 sq.m 平方米 ☐ About 約
(ii) Proposed No. of house(s) 擬議房屋幢數	ONE
(iii) Proposed building height/No. of storeys 建築物高度／層數	8.23 m 米 ☑ (Not more than 不多於)
	Three Storeys(s) 層

Submitted Plans, Drawings and Documents 提交的圖則、繪圖及文件

	Chinese 中文	English 英文
Plans and Drawings 圖則及繪圖		
Master layout plan(s)/Layout plan(s) 總綱發展藍圖／布局設計圖	☐	☐
Block plan(s) 樓宇位置圖	☐	☐
Floor plan(s) 樓宇平面圖	☐	☐
Sectional plan(s) 截視圖	☐	☐
Elevation(s) 立視圖	☐	☐
Photomontage(s) showing the proposed development 顯示擬議發展的合成照片	☐	☐
Master landscape plan(s)/Landscape plan(s) 園境設計總圖／園境設計圖	☐	☐
Others (please specify) 其他（請註明）	☐	☐
Lot Index Plan of Lot 111 S.B ss.2 in D.D. 7, Proposed Small House Plan, O.Z.P—S/NE-KLH/11, Photo of the Subject Site, Location Plan & Sewage Proposal Plan		
Reports 報告書		
Planning Statement/Justifications 規劃綱領/理據	☐	☐
Environmental assessment (noise, air and/or water pollutions) 環境評估（噪音、空氣及／或水的污染）	☐	☐
Traffic impact assessment (on vehicles) 就車輛的交通影響評估	☐	☐
Traffic impact assessment (on pedestrians) 就行人的交通影響評估	☐	☐
Visual impact assessment 視覺影響評估	☐	☐
Landscape impact assessment 景觀影響評估 N A	☐	☐
Tree Survey 樹木調查	☐	☐
Geotechnical impact assessment 土力影響評估	☐	☐
Drainage impact assessment 排水影響評估	☐	☐
Sewerage impact assessment 排污影響評估	☐	☐
Risk Assessment 風險評估	☐	☐
Others (please specify) 其他（請註明）	☐	☑
Noise Impact Assessment (NIA) Report		

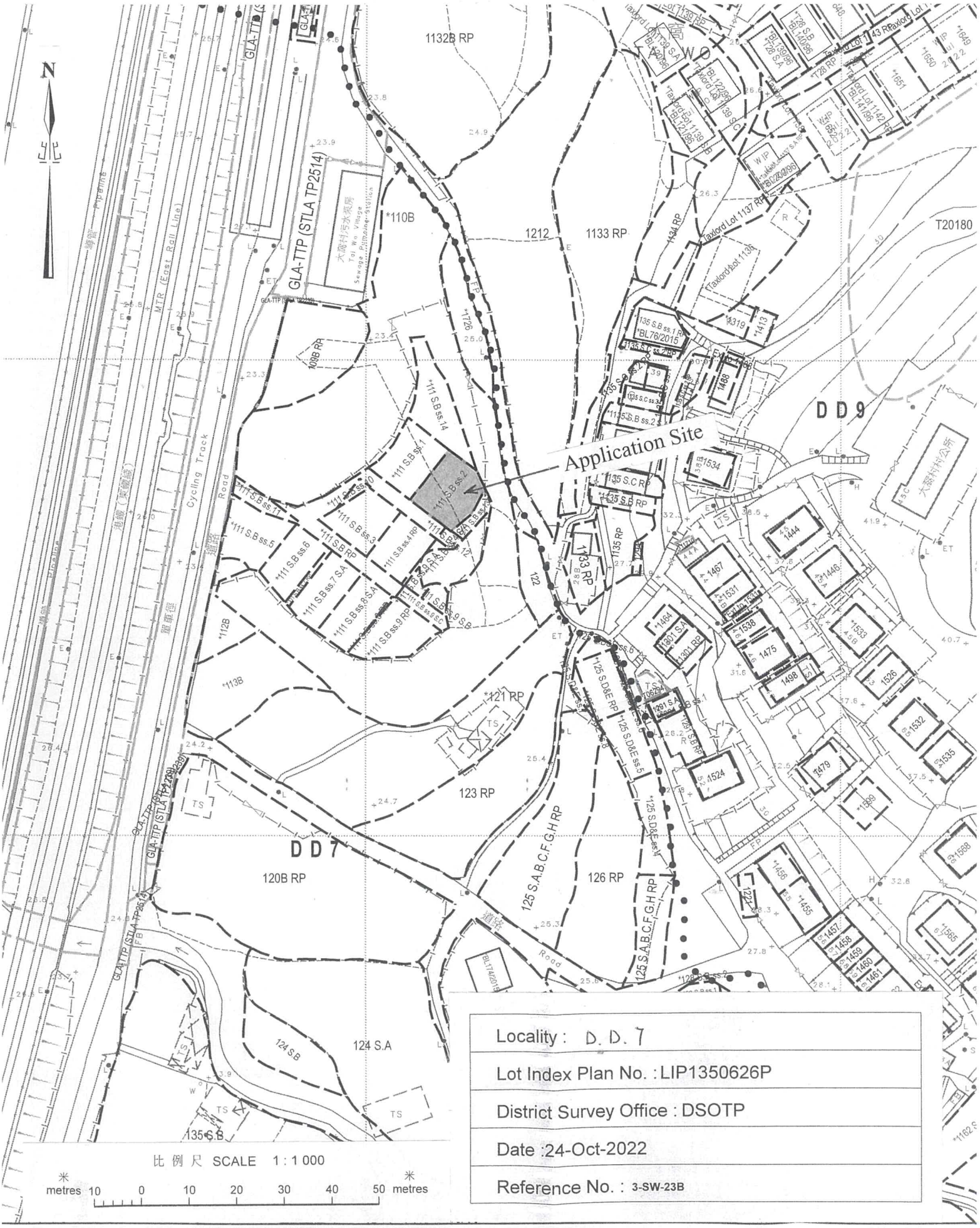
Note: May insert more than one「✔」. 註：可在多於一個方格內加上「✔」號

Note: The information in the Gist of Application above is provided by the applicant for easy reference of the general public. Under no circumstances will the Town Planning Board accept any liabilities for the use of the information nor any inaccuracies or discrepancies of the information provided. In case of doubt, reference should always be made to the submission of the applicant.

註： 上述申請摘要的資料是由申請人提供以方便市民大眾參考。對於所載資料在使用上的問題及文義上的歧異，城市規劃委員會概不負責。若有任何疑問，應查閱申請人提交的文件。

地段索引圖
LOT INDEX PLAN

Appendix A

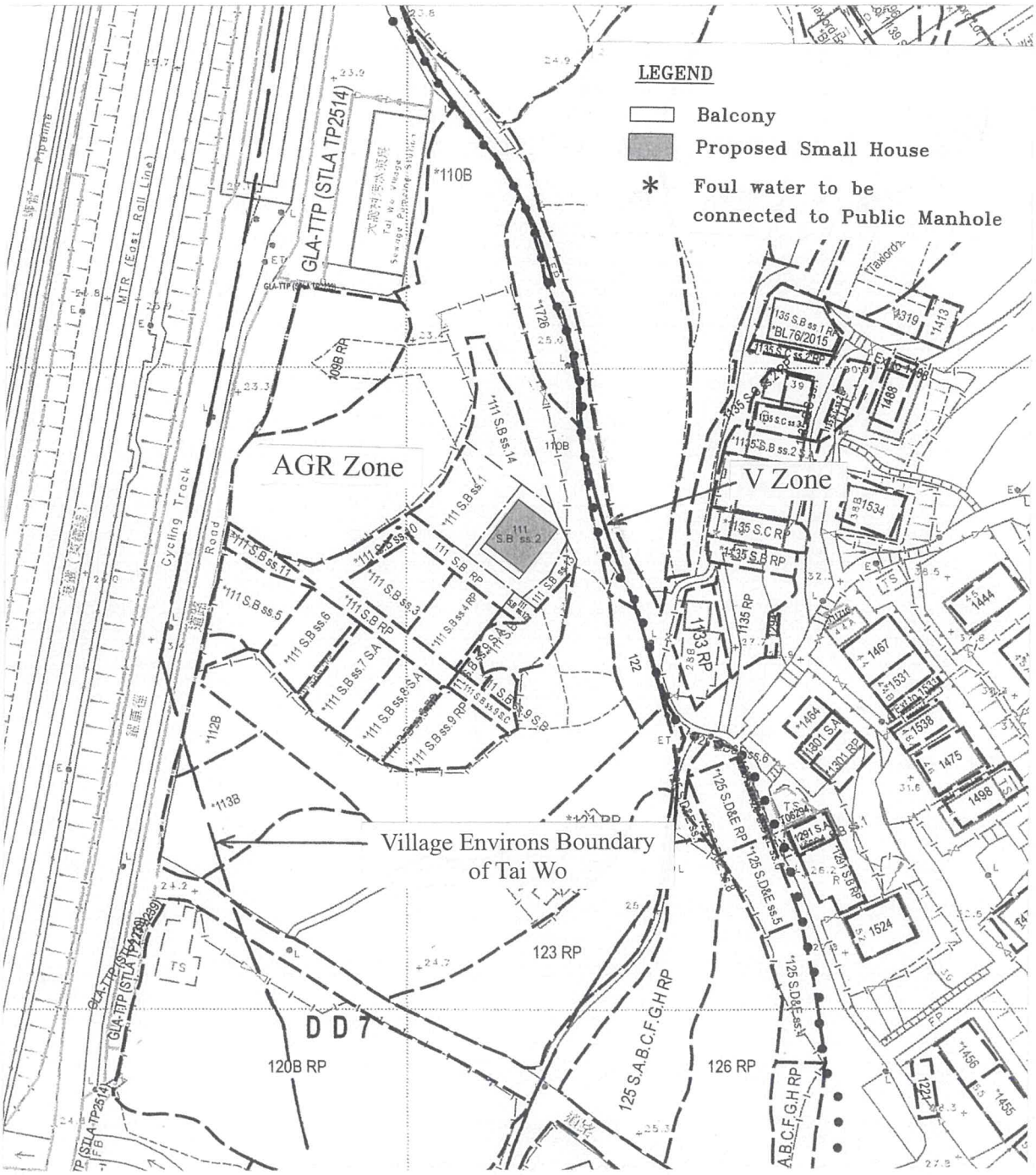


比 例 尺 SCALE 1 : 1 000

metres 10 0 10 20 30 40 50 metres

Locality :	D. D. 7
Lot Index Plan No. :	LIP1350626P
District Survey Office :	DSOTP
Date :	24-Oct-2022
Reference No. :	3-SW-23B

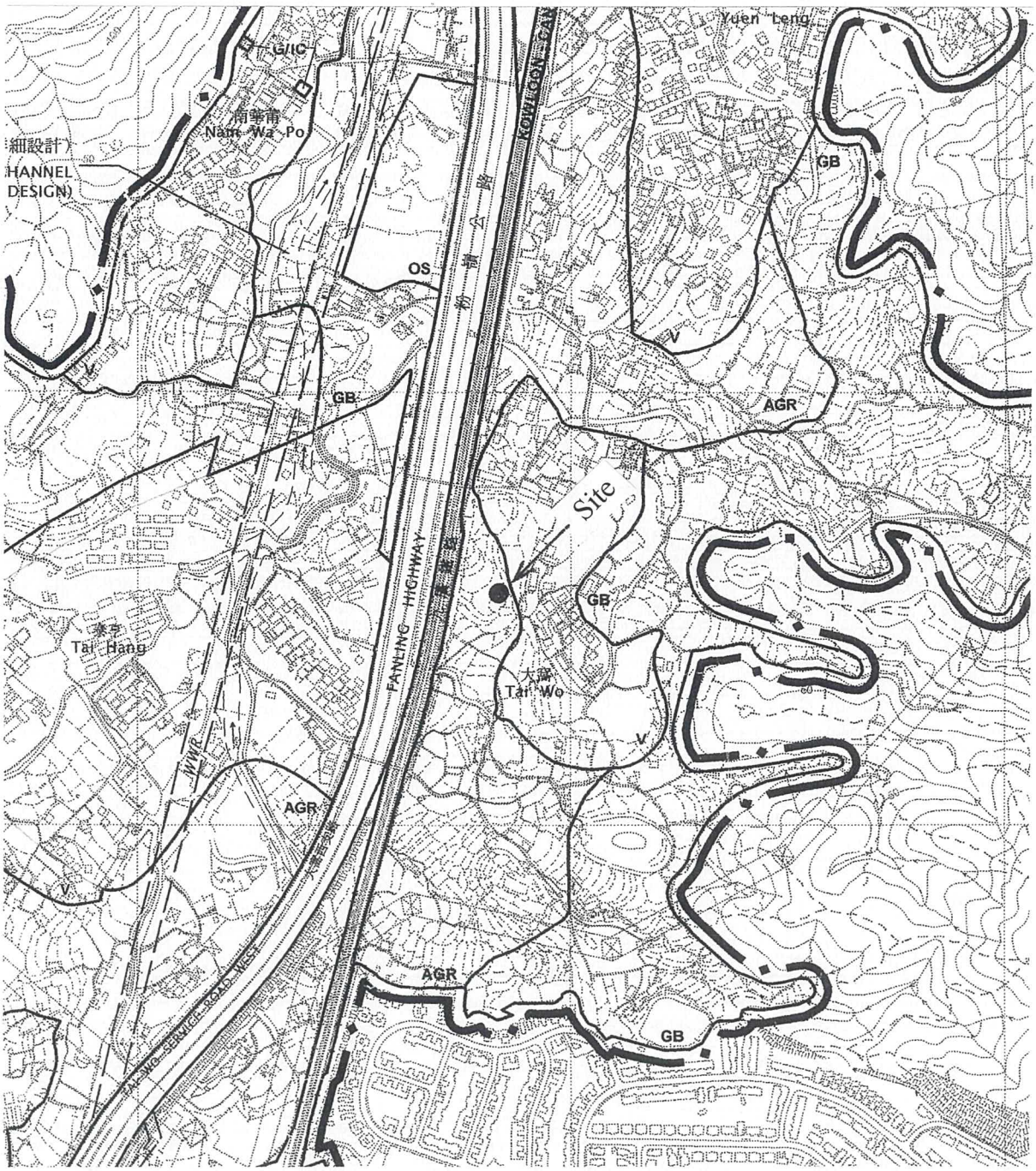
Proposed Small House Plan of Lot No. 111 S.B ss.2 in D.D. 7



SCALE 1:1000

EXTRACT PLAN

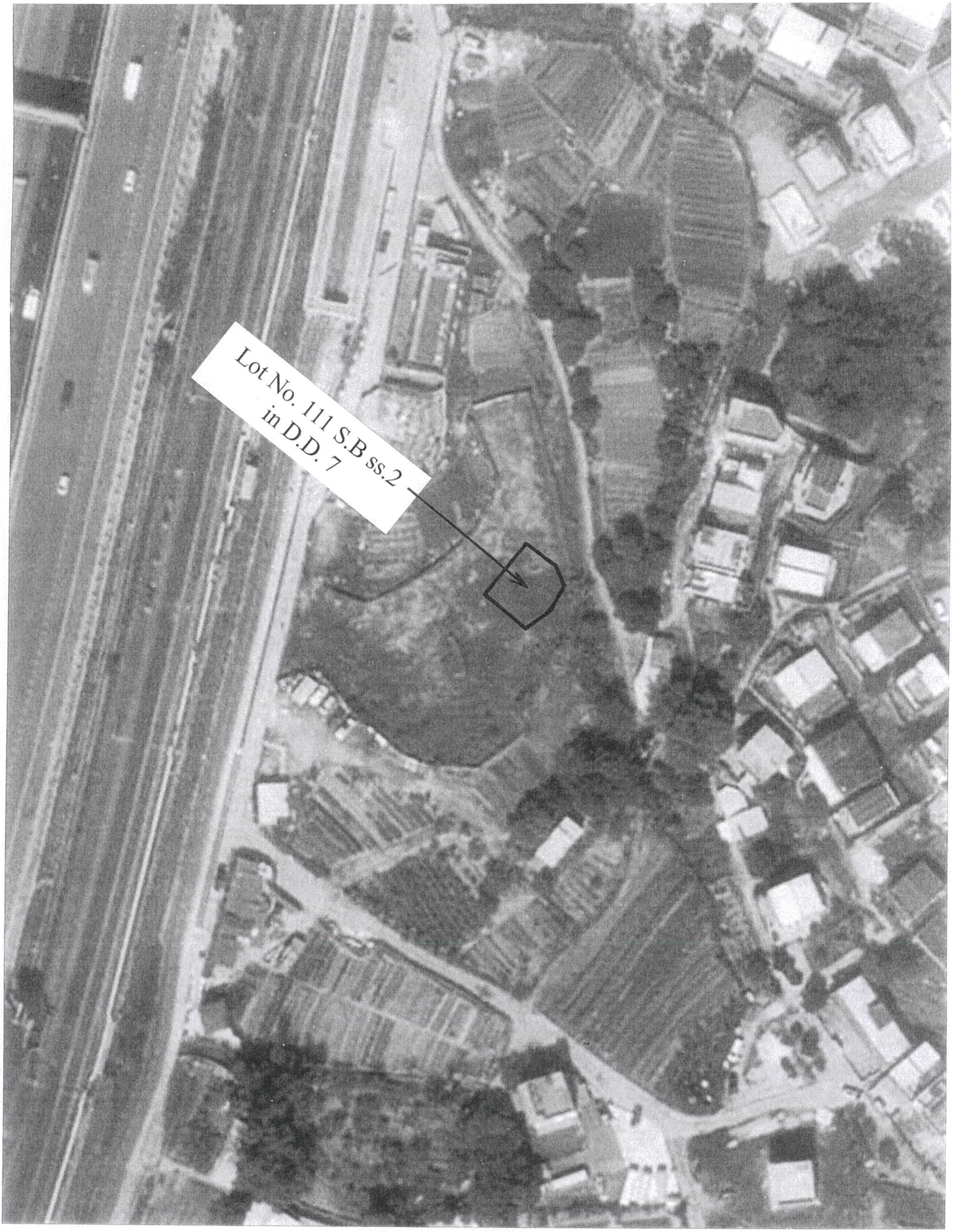
From O.Z.P. S/NE-KLH/11



SCALE 1:5000

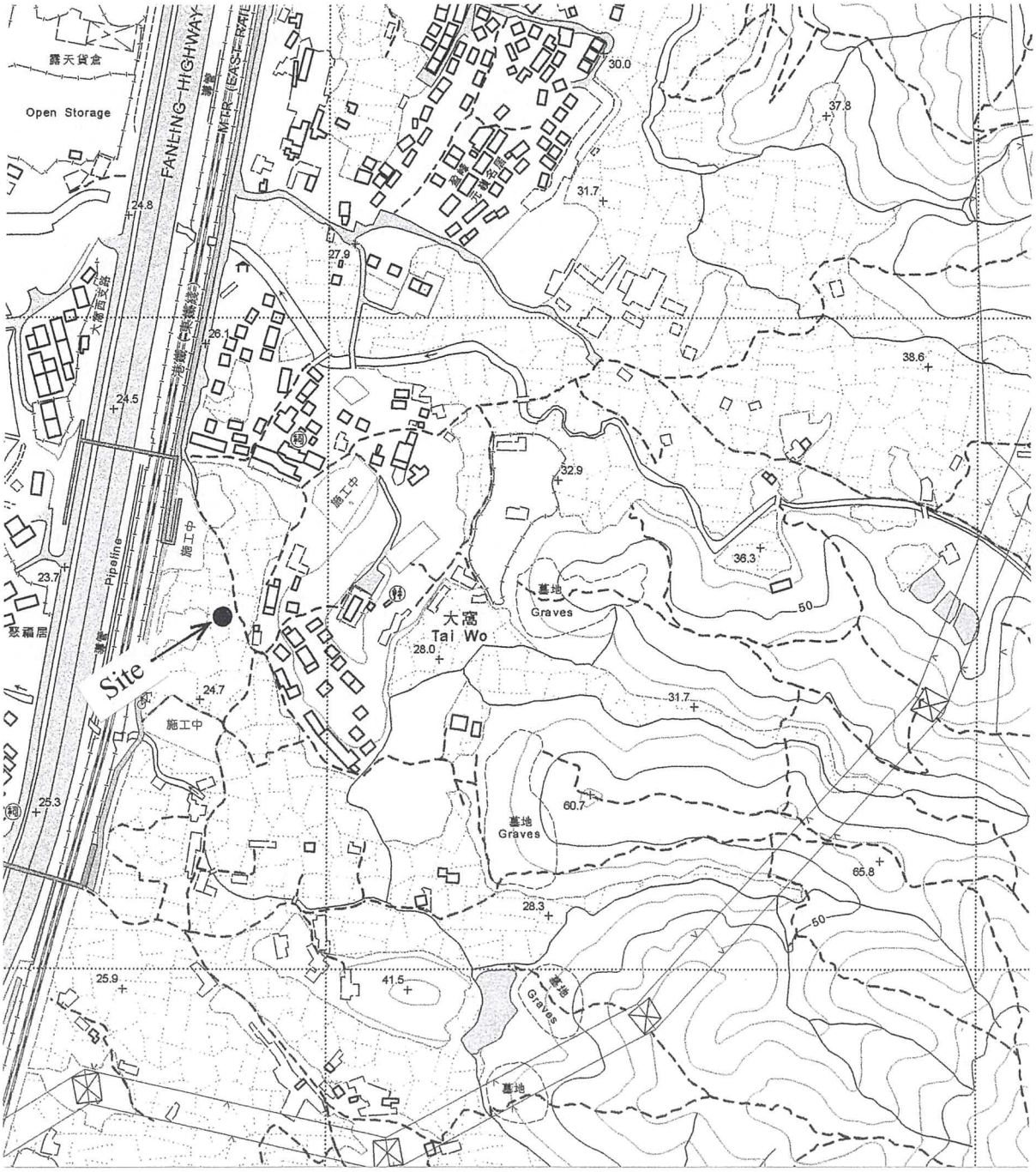
Aerial Photo No. E148800C dated 14/ 2/ 2022

Appendix D



EXTRACT PLAN

From Survey Sheet No. 3-SW-D



SCALE 1:7500

Appendix G

Justifications

Lot No. 111 S.B ss2 in D.D. 7

1. The applicant Mr. Wong Kai Fan Gavin (黃嘉宏) is an indigenous villager of Tai Wo, Tai Po who wishes to apply permission to build a small house under S.16-2 of the Town Planning Ordinance;

2. The application site is 100% within the Village Environs Boundary of Tai Wo, centre of the proposed house site is about 12 metres in average away from the village type development "V" zone on the Kau Lung Hang outline zoning plan S/NE-KLH/11;

3. Land Supply within the "V" zone of Tai Wo is very limited and there is a high demand of small house application, it is impossible to purchase land such that the foot-print of the proposed small house completely falling inside the "V" zone;

4. The proposed small house development is considered compatible with the rural environment and will be visually un-intrusive to the surrounding;

5. No tree felling is required in this proposed small house site development;

6. No ditch or stream course is within 30 metres of the application site;

7. The foul water of the proposed Small House can be connected to Public Manhole FMH1043442, there would NOT cause any contamination impacts in the vicinity;

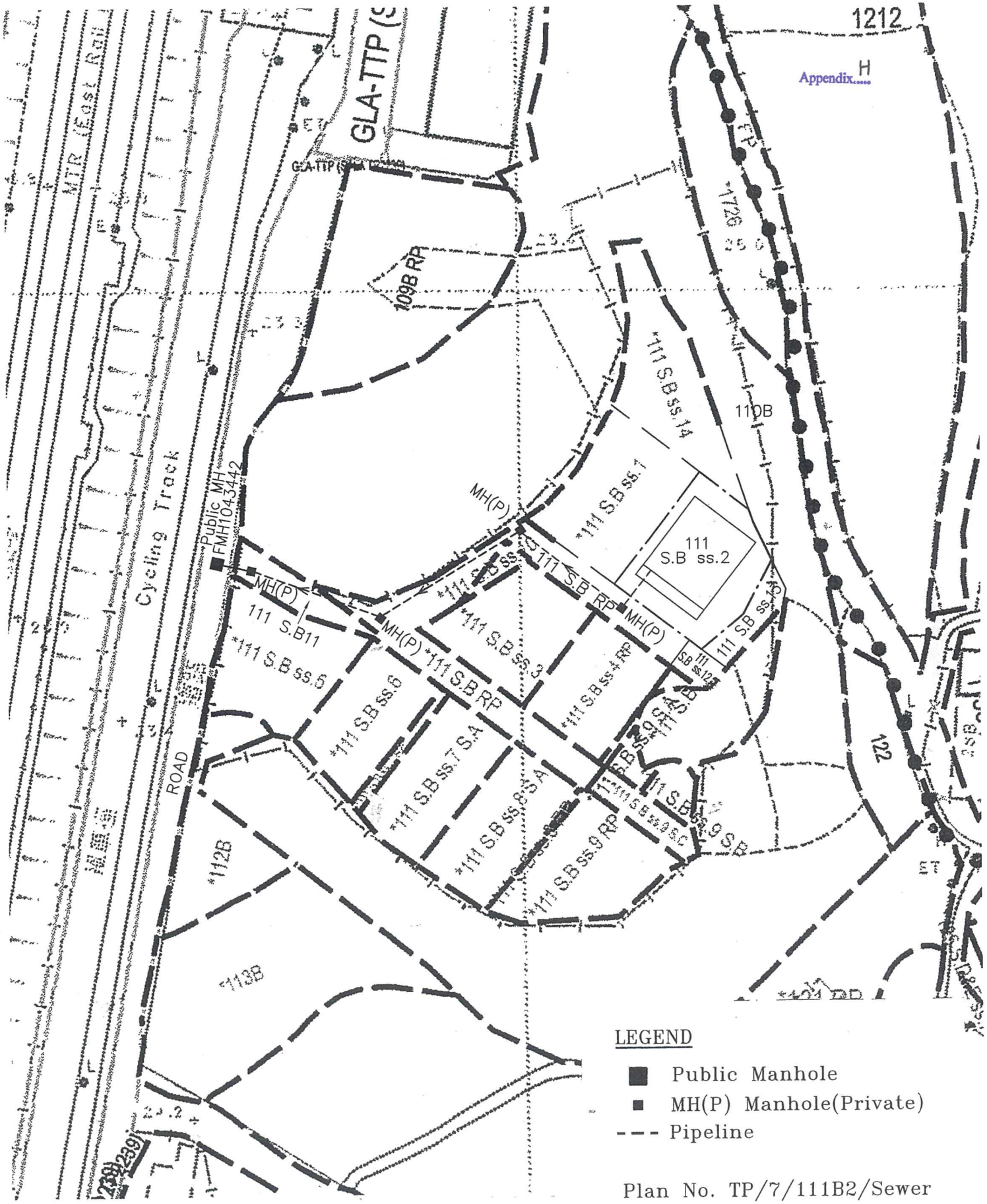
8. Letter Consent is given to applicant for his drains laying (App. I refers);

9. The permission under S.16 of the subject site had been approved by the Town Planning Board to Mr. Wong Choi (A/NE-KLH/92-1 refers), but the small house grant has NOT been approved by DLO/TP and was beyond the control of Mr. Wong Choi, unfortunately he died on 26/4/2011, his once a life time small house dream ended.

10. Applicant Mr. Wong Kai Fan Gavin is the heir of Mr. Wong Choi, Mr. K F Gavin Wong wishes a sympathetic consideration would be given to his application;

11. Similar application (application No. A/DPA/NE-KLH/22) for small house development within "GB" zone of Tai Wo was approved by the "Board" in the past, besides B/L 91/93 of Lot 1161 S.B1, B/L 101/93 of Lot 1161 S.B RP & B/L 3/75 of Lot 1174 RP were approved without planning references, all are in D.D. 9 Tai Wo.

Plan showing the Proposed Pipeline & Its connection to the Public Manhole FMH1043442



SCALE 1:500

Plan No. TP/7/111B2/Sewer
Date 8/Dec./2022

Wilson Ho and Associates Limited

Unit 601, Block A, Shatin Industrial Centre,
5 - 7 Yuen Shun Circuit, Shatin, NT
Tel: (852) 3188-1170, Fax: (852) 3422-8117
E-mail: info@wal.hk
Web: www.wal.hk

Proposed House (New Territories Exempted House-Small House) at Lot111 SB. ss2 in D.D.7, Tai Wo, Tai Po, New Territories
Noise Impact Assessment (NIA) Report

Report No.: 23223-2

For

Mr. Gavin Wong

Approved by:



Mr. Morgan Cheng
CEng, MHKIOA, MIOA, MHKIQEP, BEAM Pro (NB), MIMechE

Prepared by: PW

14 July 2023

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1 Introduction

Wilson Ho and Associates Limited (Consultant) has been invited by Mr. Gavin Wong (Client) to conduct Noise Impact Assessment (NIA) for a proposed house at Lot111 SB. ss2 in D.D.7 Tai Wo, Tai Po for small house grant application (Application No: A/NE-KLH/620).

2 Site Location

The development site is planned and sited in a rural area as shown in **Appendix A**. Next to the MTR East Rail Line (EAL), Fanling Highway (with roadside barrier) is located in parallel with the EAL. Road traffic noise from Fanling Highway is not noticeable. The site is mainly subjected to railway noise.

3 Application Background

In Year 2021, a noise assessment report (ref number: 18346-12) for "Fame Best Development Limited" (Fame Best) has been submitted to EPD for 10 proposed houses in the same location. At that time, Fame Best has represented the Client and other land owners to file a pre-submission of small house grant application. The House no. 2 in the previous assessment was the same as the one that the Client intends to apply for small house grant application individually this time.

In the pre-submission, the noise assessment report has been approved. The report hereinafter refer to as "Approved Report". However, due to difficulties in getting approval for issues other than noise, no formal application has been filed eventually.

As the Client decides to file small house grant application individually, a NIA is required for the application of his own accord.

The noise assessment in this report will be based on the content of the Approved Report. By providing justifications, the appropriateness of adopting assumptions and results from the approved report will be explained. The consent of using the Approved Report from Fame Best for this application is attached in **Appendix B** for reference.

4 Latest Site Condition

A site visit was conducted on 20 June 2023 to understand the latest environment of the development site. Photos are shown in **Figure 4.1** and **Figure 4.2.** The nearby region to the concern site contains rural houses and agriculture land. East Rail Line (EAL) and Fanling Highway is located beside the site. The overall noise environment remains same as that in the approved report.

Figure 4.1 Environment of Site Area Photo 1 (20 June 2023)



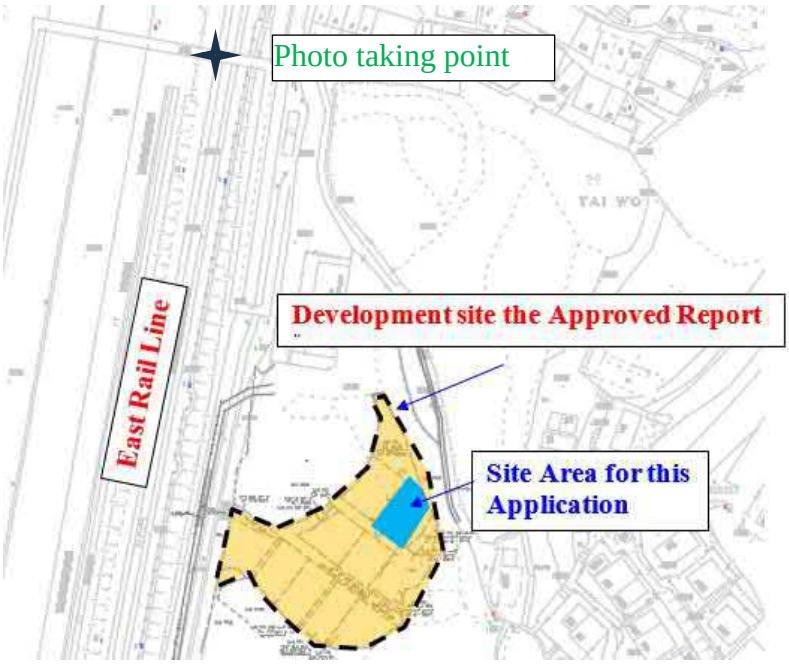
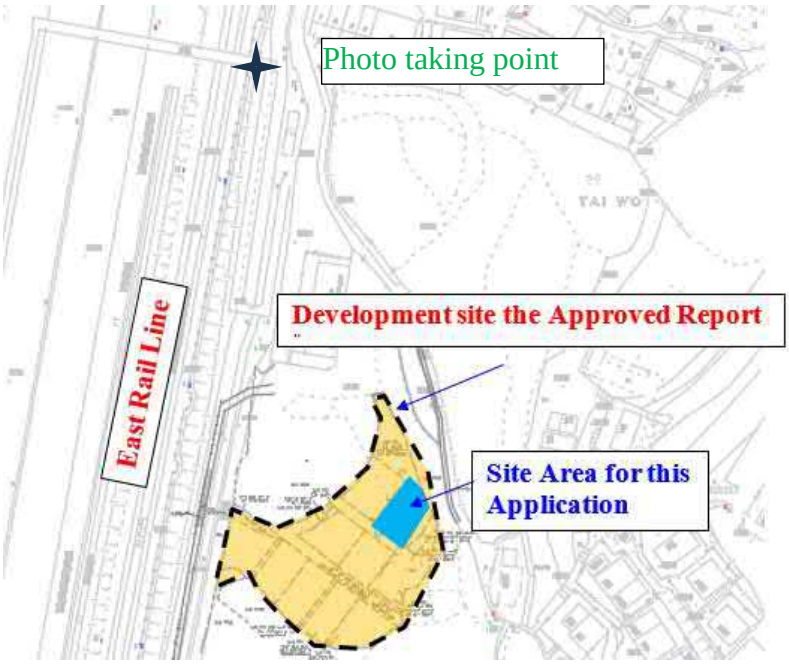


Figure 4.2 Environment of Site Area Photo 2 (20 June 2023)





5 Planned Occupation Year

The planned occupation year will be no later than year 2030 which is in line with that in the approved report.

6 Justifications of Adopting Assumptions & Parameters in the Last Assessment

This section provides justifications to explain the appropriateness of adopting assumptions and parameters in the last approved noise assessment report.

6.1 Railway Noise Aspect

6.1.1 Electric Motor Unit (EMU) Source Term

In previous assessment, source term measurement was conducted to assessment the noise strength of train. At that time, 2 types of EMU (i.e. MLR and SP1900) were operating. The source term obtained for MLR was noisier than SP1900. The higher averaged SEL obtained in the measurement for MLR between Northbound and Southbound was finally adopted for noise assessment.

Currently, only R-Train is in service. Based on Environmental Permit (EP) condition in Environmental Permit for Shatin to Central Link (SCL) Mong Kok East to Hung Hom Section **EP-437/2012/A,** the permit holder shall operate train with equivalent or better noise performance to SP1900. As MLR source term obtained at that time found noisier than SP1900. Adopting the MLR source term in this study for railway noise assessment would be on conservative side. Source term measurement details in last approved assessment report is extracted in **Appendix C** for reference.

6.1.2 Intercity Through train (ITT)

At the time of source term measurement, Intercity Through train (ITT) has been included. From the latest information in MTR website, the passenger services are currently suspended until further notice. To pay safe, the study will also consider the ITT noise contribution by adopt the same train frequency and source term as the last approved report.

6.2 Traffic Noise Aspect

As confirmed by the Client, the planned occupation year will be no later than year 2030 which is in line with Approved Report assumption. The consultant considers that the traffic noise prediction result in the Approved Report still applicable.

7 Noise Assessment Criteria

According to the Traffic Census (2021), the nearest counting stations St No. 5467 have Annual Average Daily Traffic Flow (A.A.D.T) of 16,740 as reported in *Annual Traffic Census 2021*, which are more than 30,000 and therefore Fanling Highway (from Lam Kam Road Interchange to Kau Lung Hang Lo Wai) is considered as an Influencing Factor (IF) according to *IND-TM*. As roadside noise barrier are built between Fanling Highway and MTR EAL, the road traffic noise from Fanling Highway is not noticeable at the NSR and the NSR is noted affected by the IF, while railway noise would be the dominant noise source.

Therefore, the Area Sensitive Ratings (ASR) of "A" is adopted in this noise assessment. The noise criteria is summarised in **Table 7.1.**

Table 7.1 Noise Assessment Criteria

Period	Noise Criteria		
	Railway Noise		Road Traffic Noise
	NCO	HKPSG	
Day and Evening	$L_{Aeq,30min}$ = 60 dB(A)	N/A	N/A
Night	$L_{Aeq,30min}$ = 50 dB(A)	L_{Amax} = 85 dB(A)	N/A
Full Day	N/A	$L_{Aeq,24hr}$ = 65 dB(A)	Peak $L_{10,1hr}$ = 70 dB(A)

8 Railway Noise Assessment

8.1 Assessment Approach

The railway noise levels are assessed using the noise prediction calculation methodology under Calculation of Railway Noise (CRN) by Department of Transport UK, to determine the compliance with the noise limits at NSRs. The noise parameters, correction factors, and assumptions are the same as previous approved noise assessment report and summarized as below:

Table 8.1 Air-borne Rail Noise Parameters, Correction Factors, and Assumptions

Parameters	Approach
Train Type	EMU (Using MLR for conservative), Intercity Through train (ITT)
Source Term SEL_{ref} (25m 120kph)	89.0 dB(A) for EMU 97.0 dB(A) for ITT (from Measurement Results in the Approved Report (**Appendix C**)
Distance Correction for Wheel/Rail Noise	-10 log(d'/25), where d' = Slant Distance to NSR (d'>=10m)
Train Frequency Effect	+10 log(N), where N = Train Frequency per 30 min per Direction
Ground Effect	Hard Ground, no absorption
Air Absorption Effect	Nil (Close proximity with NSR in HK environment)
Trackside Barrier Height	2.1m[1]
Barrier Effect	Shadow Zone: -21dB(A) for $\delta \geq 2.5$m where δ is the Path Difference in meter $-7.75 \log(5.2 + 203\,\delta)$ dB(A) for $0 \leq \delta < 2.5$m Illuminated Zone: 0dB(A) for $\delta \geq 0.4$m $0.88 + 2.14 \log(10^{-3} + \delta)$dB(A) for $0 \leq \delta < 0.4$m
Reflection Effect	Standard +1.5dB(A) adopted
Speed Effect	+20 log(V/120), where V = Train Speed
Angle of View Effect	$+10 \log(\pi\theta/180 - \cos 2\alpha \sin\theta) - 5$ where θ= Angle of View and α= Acute angle between a line drawn through the NSR, parallel to the track, and the line bisecting the angle of view, θ
Façade Effect	+2.5dB(A)

Parameters	Approach
Track Wear Correction	+3.0dB(A)
Joint/Turnout Correction	As a very conservative assumption, +7.0dB(A) for a representative 20m segment[2]
Train Frequency	EMU 30/24 trains per hour in each direction during daytime/nighttime [3]
	ITT 1 per half hour in each direction and daytime[1], no ITT during night time period [4]
Train Frequency per 24hrs both directions	EMU 850 trains[3], ITT 18 trains[4]

Remark:

[1] From the Approved Report based on MTR's reply.

[2] The correction is refer to "Section 4.5.5 of the Approved Tai Wai to Ma On Shan EIA Report, KCRC East Rail Extension, Oct 1999". All the rail joint/crossing locations is extracted from the Approved Report which has been checked with MTRC at Headquarter on 21 Nov 2019. The locations of rail crossings/ joints are marked extracted in **Figure E.1** to **Figure E.6** (i.e. angle of view for assessment points).

[3] From the Approved Report based on EIA Report (AEIAR-165/2012) - Shatin to Central Link - Mong Kok East to Hung Hom Section, Table 6.13

[4] From the Approved Report, based on the train frequency extracted from MTR web link**.(Appendix D)**

8.2 Assessment Point

All noise levels at 1m from exterior façade of the noise sensitive uses (i.e. bedrooms, living/dining rooms) which rely on opened windows for ventilation were assessed. All prescribed windows for ventilation and noise assessment points are shown in **Appendix A**.

9 Results

The assessment results for selected assessment points are presented in table in **Appendix E** and summarized as below. All predicted noise levels are in compliance with the noise criteria in **Table 9.1**.

Drawings for checking angle-of-view correction are also provided in **Appendix E**.

Table 9.1 Railway Noise Assessment Results against NCO Criteria, dB(A)

Assessment Point	Day and Evening				Night			
	Criteria, $L_{Aeq,30min}$	Prediction, $L_{Aeq,30min}$			Criteria, $L_{Aeq,30min}$	Prediction, $L_{Aeq,30min}$		
		G/F	1/F	2/F		G/F	1/F	2/F
H2P1	60	46.2	47.2	48.4	50	43.7	44.7	45.9
H2P2		47.2	48.3	49.6		44.7	45.8	47.0
H2P3		33.9	34.8	35.9		31.4	32.3	33.4

Table 9.2 Railway Noise Assessment Results against HKPSG Criteria, dB(A)

Assessment Point	Night				Full Day			
	Criteria, L_{Amax}	Prediction, L_{Amax}			Criteria, $L_{Aeq,24hr}$	Prediction, $L_{Aeq,24hr}$		
		G/F	1/F	2/F		G/F	1/F	2/F
H2P1	85	53.5	54.7	56.1	65	42.9	43.9	45.1
H2P2		54.6	55.9	57.4		44.0	45.0	46.3
H2P3		41.4	42.1	42.9		30.6	31.6	32.6

10 Road Traffic Noise Assessment

Fanling Highway is the major road next to the development site. Roadside noise barrier are built between Fanling Highway and MTR East Rail Line under the "Widening of Tolo Highway / Fanling Highway" project. Although road traffic noise from Fanling Highway is not noticeable to the NSR, considering future traffic flow after completion of the road widening project, the potential noise impacts due to road traffic are reviewed and assessed.

10.1 Assessment Model & Methodology

In road traffic noise assessment, Fanling Highway would be the major noise source. As Fanling Highway and MTR East Rail Line are in parallel, the selected assessment points are same as railway noise assessment.

The road traffic noise levels at selected assessment points were assessed by using NoiseMap Enterprise-RoadNoise which is a computing software developed based on the Calculation of Road Traffic Noise (CRTN) published in 1988 and adopted by many projects in Hong Kong. The graphics of the noise model are shown in **Appendix F** for reference.

Assumptions is for this road traffic noise assessment are summarize below:

- The target occupation year will be no later than Year 2030.
- Forecasts of traffic flow in terms of vehicle per hour (veh/hr) and percentage of heavy vehicles (% of HV) in Year 2045 which are the maximum forecasts within 15 years after occupation of the site are adopted.
- Traffic forecasts conducted for the Approved Report of the roads within 300m from the site are provided by the Traffic Consultant as extracted in **Appendix G**. Correspondence from Transport Department indicated that they had no comment on those traffic data appended in **Appendix G** as well.
- Input for heights of the roadside noise barrier were based on the layout in drawing no. 798/GA/T/13001 under Contract no. HY/2012/06 (**Figure H.1**), layout of noise barrier in EP-324/2008/E (**Figure H.2**), and verified by site visit.
- All the input parameters in RoadNoise are in 1 decimal place as required in CRTN.

10.2 Assessment Result

The predicted road traffic noise levels at selected assessment points are summarized as below:

Table 10.1 Road Traffic Noise Assessment Results against HKPSG Criteria, dB(A)

Assessment Point	Full Day			
	Criteria, Peak $L_{10,1hr}$	Prediction, Peak $L_{10,1hr}$		
		G/F	1/F	2/F
H2P1	70	47.6	48.4	49.2
H2P2		54.1	54.9	55.8
H2P3		39.0	39.6	40.4

11 Conclusion

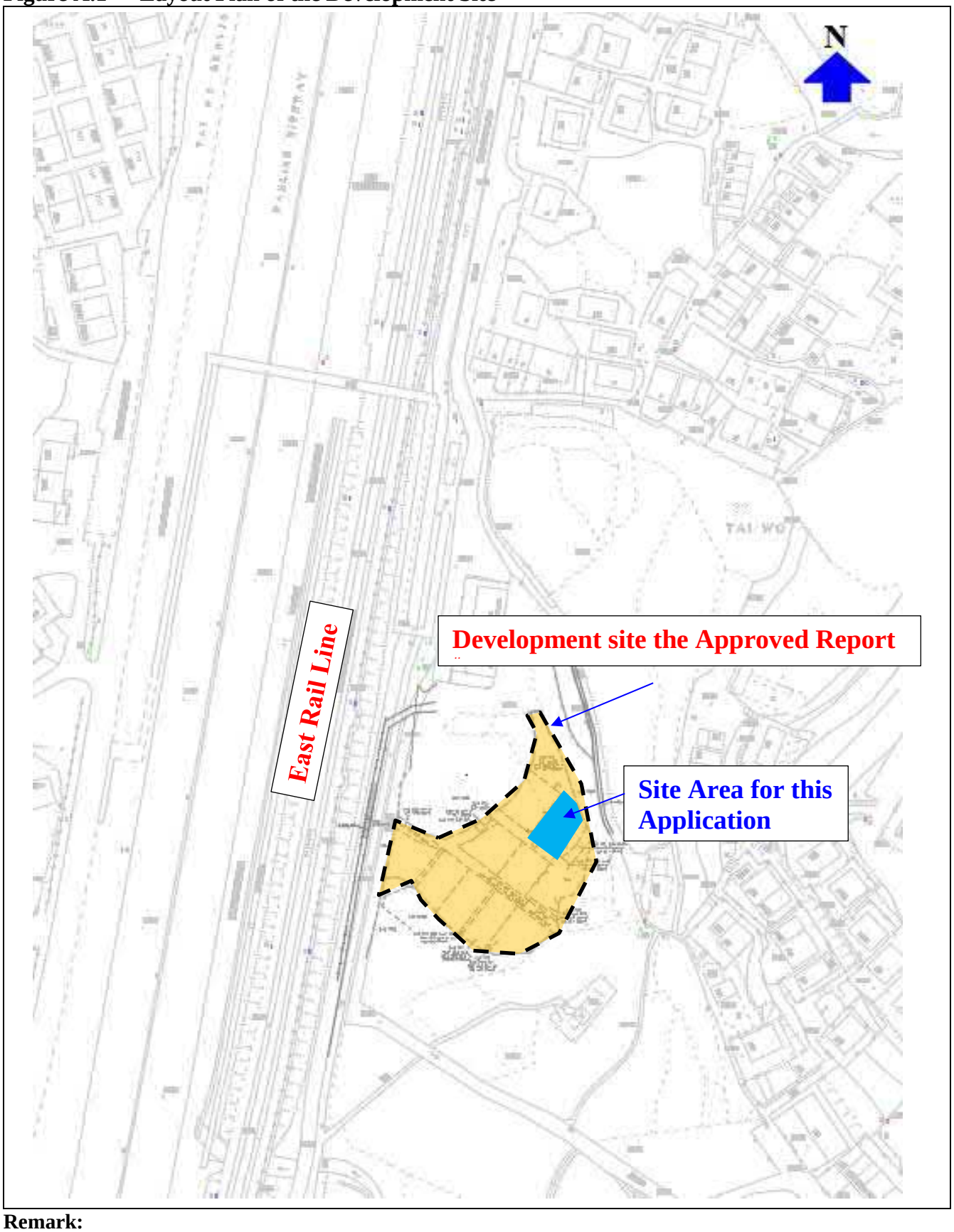
Noise Impact Assessment (NIA) is conducted for a small house grant application (New Territories Exempted House-Small House) at Lot111 SB. ss2 in D.D.7, Tai Wo, Tai Po, New Territories (Application No: A/NE-KLH/620). Noise assessment for railway noise and road traffic noise were conducted.

The assessment results show that railway noise and road traffic noise levels at 1m façade to opened window for ventilation of bedroom, living dining room are within NCO and HKPSG criteria.

Appendix A.

Site Layout Plan

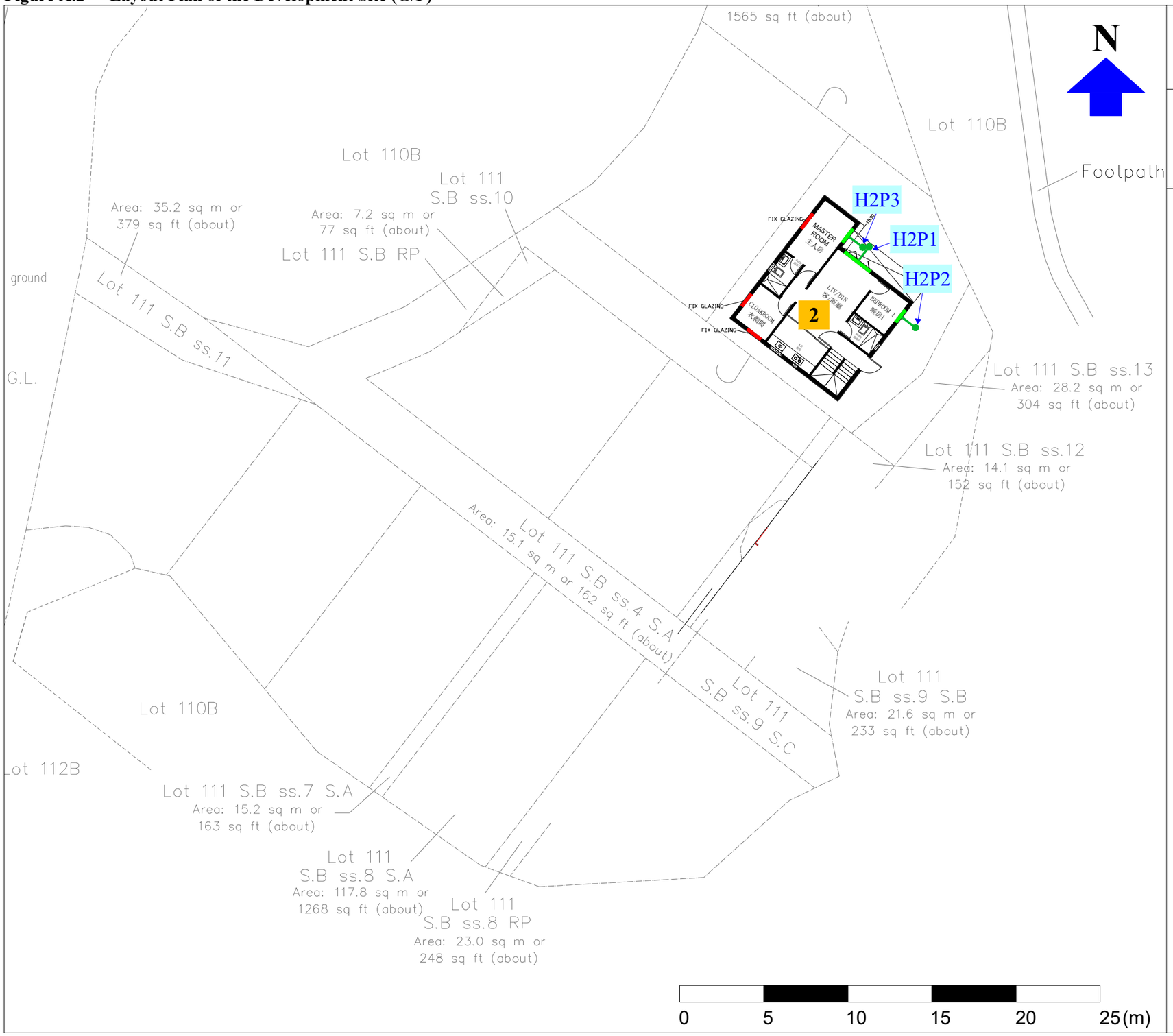
Figure A.1 Layout Plan of the Development Site



Remark:

In Year 2021, "Fame Best Development Limited" has represented the Client and other land owners to file a pre-submission for small house grant application for a 10 proposed houses development application in the same location. A noise assessment report has been submitted to EPD and approved.

Figure A.2 Layout Plan of the Development Site (G/F)



G/F, +23.3 mPD level

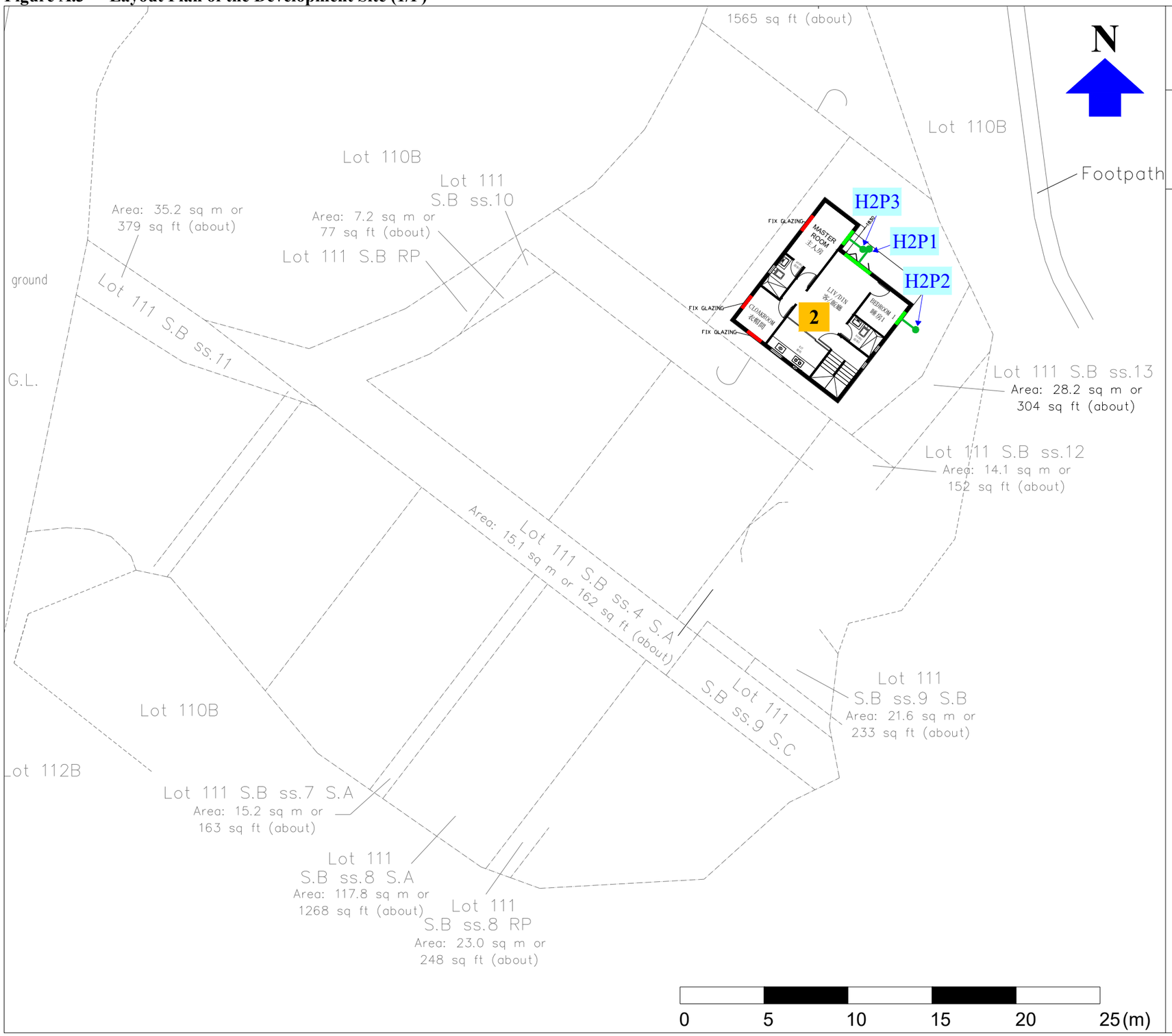
Legend:
- Fixed Glazing
- Opened Window for Ventilation

Scale:
1:250
A3 Paper

Remark:

- **Entrance door of each flat will be made of solid wooden door with 45mm-50mm thick.**
- **Cloak Room: Storage for clothing and shoes, dehumidifier, air freshener machine, bedclothes, bedding, bath towel, etc. (Not for use as bedroom / other noise sensitive uses)**
- **Fixed glazing with at least 10mm thick laminated glass or other acoustically equivalent configuration**

Figure A.3 Layout Plan of the Development Site (1/F)



1/F, +26.0 mPD level

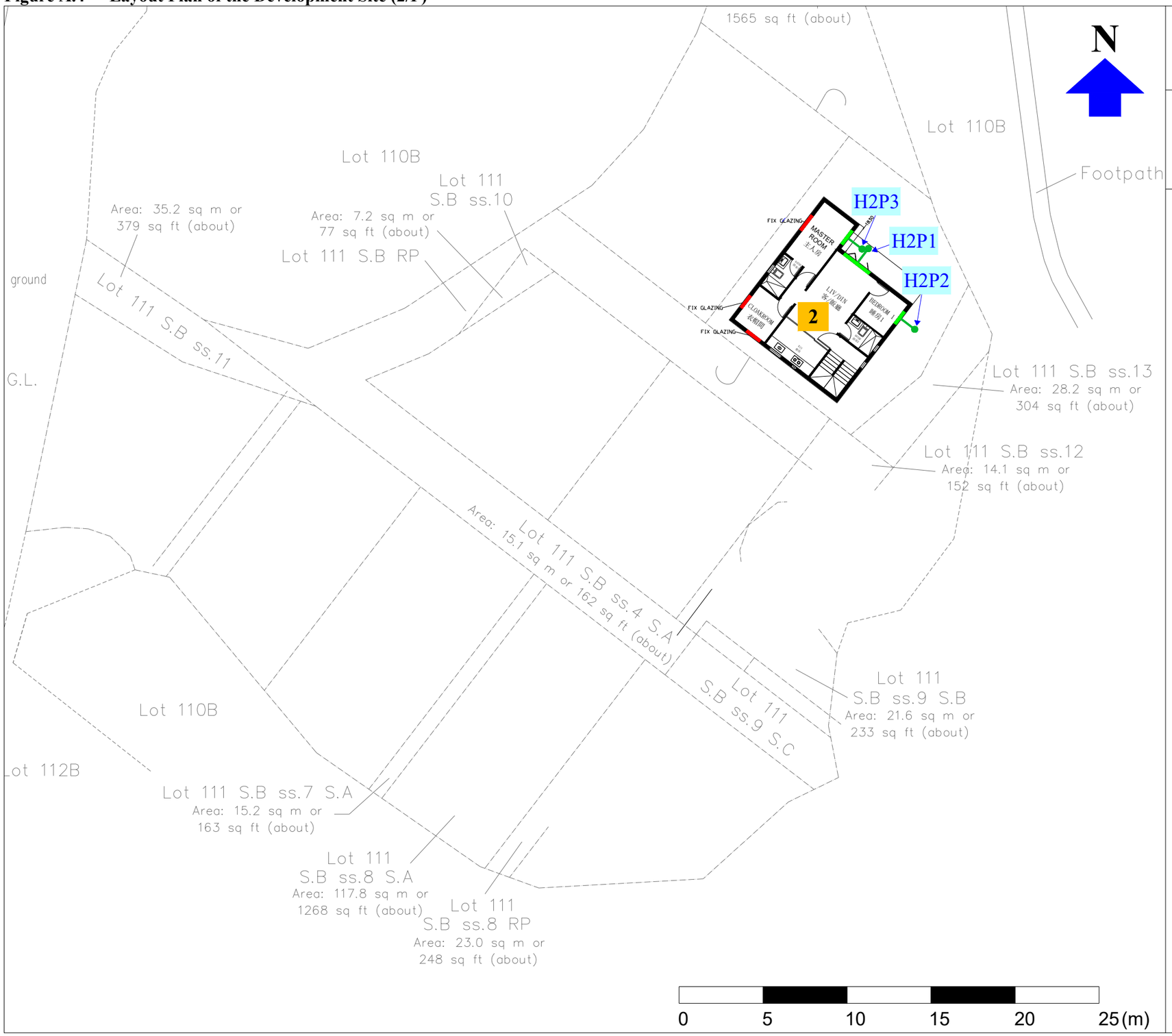
Legend:
- Fixed Glazing
- Opened Window for Ventilation

Scale:
1:250
A3 Paper

Remark:

- **Entrance door of each flat will be made of solid wooden door with 45mm-50mm thick.**
- **Cloak Room: Storage for clothing and shoes, dehumidifier, air freshener machine, bedclothes, bedding, bath towel, etc. (Not for use as bedroom / other noise sensitive uses)**
- **Fixed glazing with at least 10mm thick laminated glass or other acoustically equivalent configuration**

Figure A.4 Layout Plan of the Development Site (2/F)



2/F, +28.7 mPD level

Legend:
- Fixed Glazing
- Opened Window for Ventilation

Scale:
1:250
A3 Paper

Remark:

- **Entrance door of each flat will be made of solid wooden door with 45mm-50mm thick.**
- **Cloak Room: Storage for clothing and shoes, dehumidifier, air freshener machine, bedclothes, bedding, bath towel, etc. (Not for use as bedroom / other noise sensitive uses)**
- **Fixed glazing with at least 10mm thick laminated glass or other acoustically equivalent configuration**

Appendix B.

Consent from “Fame Best Development Ltd” for using Approved Noise Assessment Report

Figure B.1 Consent Letter from "Fame Best Development Ltd"

Peter WONG

From: Majestic <majesticbdhk@yahoo.com.hk>
Sent: Monday, 29 May 2023 12:30
To: Peter WONG
Subject: Re: Request for consent of using approved noise assessment report for small house application of "Proposed 10 Houses (Exempted House-Small House) in D.D.7, Tai Wo, Tai Po."

Dear Peter,

OK, no problem.

Clara

譽銘發展有限公司
Fame Best Development Limited
新界元朗教育路18-24號元朗商業中心906室
Room 906, Yuen Long Commercial Centre,
18-24 Kau Yuk Road, Yuen Long, N.T.
電話: (852) 2442 2312
傳真: (852) 2442 2368
Think Before You Print. Use Paper Wisely.
打印此電子郵件前, 請為我們環境設想, 珍惜紙張。

Peter WONG (<peter.wong@wal.hk>) 在 2023年5月23日星期二 下午02:43:42 [GMT+8] 寫道：

Dear Clara,

I hope you still remember a case for small house application of "10 Proposed 10 Houses (Exempted House-Small House) in D.D.7, Tai Wo, Tai Po."

At that time(in year 2021), your side has represented my Client Mr. Gavin Wong (House 2 landlord) and other land owners to file a pre-submission of small house grant application. We have prepared a noise assessment report for the pre-submission.

The noise assessment report (Our ref.18346-12) was finally approved by EPD. However, due to difficulties in issues other than noise, no formal application has been filed eventually.

This time, my client want to file a separate application on his own. As there is no change in his house layout (i.e. House 2 in previous noise assessment), we would like to seek consent from your side for us to use the report and any other relevant information regarding noise assessment.

Figure B.2 Consent Letter from "Fame Best Development Ltd" (Cont)

Thank you for your kind attention and support.

Best Regards,
Peter Wong
Senior Consultant
Wilson Acoustics Limited/ Wilson Ho & Associates Limited

Unit 601, Block A, Shatin Industrial Centre,
5-7 Yuen Shun Circuit, Shatin, N.T., Hong Kong.
Office: (852) 3421 1533, Fax: (852) 3422 8117

Appendix C.

Source Term Measurement Report Extracted from Previous Approved Report

B.1. Measurement Location

The track section at the side of the proposed small houses development site was installed with trackside barriers which is not appropriate for source term measurement. On the opposite side (northbound), although without trackside barriers, it belongs to a highway construction site region which was not accessible.

Considering practicability and appropriateness, a location at northbound side near Hon Lok Yuen was chosen for noise measurement, as shown in **Figure B.1**.

The measurement method is making reference to CRN Calculation of Railway Noise 1995.

B.1.1 Measurement Location Justification

The measurement location and Tai Wo has similar properties in below aspect.

Similar Train Speed

The average train speed at the measurement location is similar to that at Tai Wo, (i.e. both are at 95 +/- 5 kph).

Trackform

Both trackform are ballast track.

Track Alignment

Track alignment at the measurement location and that at Tai Wo are both straight track.

With above similarity and common points, the source terms measurement results obtained is considered suitable to be adopted in this railway noise assessment

In addition, although the source term of northbound and southbound may be different, the higher averaged value amongst northbound and southbound train noise will be adopted as the source term for noise prediction which is on conservative side.

B.1.2 Microphone Position

The microphone was set at 1.2m above rail top level.

Figure B.1 Measurement Location



Figure B.2 Microphone Setup Photos





B.2. Measurement Schedule

The source term measurement conducted in two separate days are summarized as below:

Table B.1 Measurement Schedule

Date	Time	Weather Condition	Wind speed	Remark
09 Aug 19	1330-1530 hrs	Fine	<5 m/s	To obtain EMU and ITT noise data
27 Aug 19	2000-2215 hrs	Fine	<5 m/s	To capture more ITT noise data

B.3. Measurement Results

The measured average SEL is summarized in **Table B.2**. The details of measurement results are shown in **Table B.4**.

Table B.2 Summary of Averaged SEL

Type	Northbound			Southbound		
	SEL	Avg. Speed	Dist. to Mic (m)	SEL	Avg. Speed	Dist. to Mic (m)
MLR	89.7	91	12	81.9	90	16
SP1900	84.8	92	12	75.9	82	16
ITT	91.3	52	12	89.6[1]	41	16

Remark:
[1] As single passby events of ITT were not available during 27 Aug 2019 measurement, the value here is the logarithmic average of SELs of 1 Southbound ITT event on 09 Aug 2019 and 2 double passby events of Southbound ITT on 27 Aug 2019 (refer to Table B.4 for details). By adopting the double passby events in evaluation of the averaged SEL will only make the value on high and conservative side.

The SELs normalized to a distance of 25m and speed of 120 kph for assessment are summarized in **Table B.3**:

Table B.3 Normalized SEL (120 kph, at 25m for different Train Type)

Train Type	Northbound	Southbound	SEL, adopted in Railway Assessment[1]
MLR	89.0	82.5	89.0
SP1900	83.9	77.2	
Intercity Through Train (ITT)	95.4	97.0	97.0

Remark:
[1] For a conservative approach, higher averaged SEL between Northbound and Southbound was adopted.

Table B.4 Detailed Source Team Measurement Results

Time	Time Period	Event Time	Train Type	Train Direction	Time Speed, kph	No. of Train Pass-by Events					Measured Noise Level (MNL) , dB(A)					
						Subtotal	Total				Elapsed Time, sec	Leq	Leq_{RO}[1]	$L_{eq,RG}$ corrected	SEL	Average SEL[2]
							EMU		ITT							
							Northbound	Southbound	Northbound	Southbound						
		13:37:29	EMU (Twins)	Southbound + Northbound	93	2					31	75.4	59.3	75.3	90.2	-
		15:20:45	EMU (Twins)	Northbound + Southbound	85	2					28	74.0	59.0	73.9	88.3	-
		13:32:28	MLR	Northbound	103	26					23	76.5	59.3	76.4	90.0	89.7
		13:44:28			103						20	73.6	59.3	73.4	86.5	
		13:46:51			103						21	75.3	59.3	75.2	88.5	
		13:50:56			103						20	75.4	59.3	75.3	88.3	
		13:55:58			93						20	75.7	59.3	75.6	88.6	
		13:59:44			93						20	77.3	59.3	77.3	90.3	
		14:02:25			103						21	76.2	58.1	76.1	89.4	
		14:04:43			79						21	79.1	58.1	79.1	92.3	
		14:09:05			103						20	76.2	58.1	76.1	89.1	
		14:11:22			85						20	79.7	58.1	79.7	92.7	
		14:13:47			103						20	77.5	58.1	77.4	90.4	
		14:21:47			103						20	77.7	58.1	77.7	90.7	
		14:29:28			93						20	76.3	58.1	76.2	89.2	
		14:34:42			93						20	77.7	65.1	77.5	90.5	
		14:37:22			86						19	76.9	65.1	76.6	89.4	
		14:42:26			85						19	76.9	65.1	76.6	89.4	
		14:46:20			93						17	76.6	65.1	76.3	88.6	
		14:48:46			85						16	78.7	65.1	78.5	90.5	
		14:54:01			85						19	76.8	65.1	76.5	89.2	
		14:56:57			85						18	77.5	65.1	77.2	89.8	
		15:00:58			79						19	77.5	59.0	77.4	90.2	
		15:04:18			79						18	76.4	59.0	76.4	88.9	
		15:08:47			73						19	76.6	59.0	76.5	89.3	
		15:12:31			79						19	77.5	59.0	77.4	90.2	
		15:17:01			79						19	73.6	59.0	73.4	86.2	
		15:23:28			85						18	76.2	59.0	76.1	88.7	
Daytime on 09 Aug 19	13:30 to 15:30	14:16:08	SP1900	Northbound	103	3	31	31	-	-	18	71.7	58.1	71.5	84.1	84.8
		14:26:06			93						19	72.7	58.1	72.5	85.3	
		14:51:11			79						19	72.8	65.1	72.0	84.8	
		13:31:10	MLR	Southbound	93	27					19	68.4	59.3	67.9	80.7	81.9
		13:34:57			103						20	69.4	59.3	69.0	82.0	
		13:40:20			93						20	67.9	59.3	67.3	80.3	
		13:43:28			103						20	67.7	59.3	67.0	80.1	
		13:47:08			103						15	72.1	59.3	71.9	83.6	
		13:49:48			93						19	68.6	59.3	68.0	80.8	
		13:52:47			103						20	71.2	59.3	71.0	84.0	
		13:56:25			93						20	67.9	59.3	67.3	80.3	
		14:01:00			93						21	69.1	58.1	68.8	82.0	
		14:03:49			93						19	69.9	58.1	69.6	82.4	
		14:13:26			79						20	67.4	58.1	66.8	79.8	
		14:16:53			103						19	67.6	58.1	67.1	79.9	
		14:20:04			93						18	69.2	58.1	68.9	81.4	
		14:24:43			103						19	68.3	58.1	67.9	80.7	
		14:27:43			93						19	70.4	58.1	70.2	82.9	
		14:31:33			93						20	70.1	65.1	68.4	81.4	
		14:36:06			85						18	69.8	65.1	68.0	80.6	
		14:39:39			79						15	75.5	65.1	75.1	86.9	
		14:52:19			85						19	69.5	65.1	67.6	80.3	
		14:54:52			79						19	67.4	65.1	64.4	77.2	
		14:58:01			79						19	68.4	65.1	65.6	78.4	
		15:04:37			85						16	69.3	59.0	68.8	80.9	
		15:10:04			73						19	68.2	59.0	67.7	80.5	
		15:12:54			93						17	69.6	59.0	69.2	81.5	
		15:15:50			73						19	67.7	59.0	67.1	79.9	
		15:23:07			79						18	69.9	59.0	69.5	82.1	
		15:25:33			85						17	74.1	59.0	74.0	86.3	
		14:10:53	SP1900	Southbound	79	2					20	64.5	58.1	63.3	76.3	75.9
		14:41:55			85						15	66.6	65.1	63.6	75.4	
		14:07:29	Intercity Through Train (ITT)	Southbound	37	1	-	-	-	1	34	71.1	58.1	70.9	86.2	86.2
Evening Time on 27 Aug 19 (Aim for obtain more ITT train pairs)	20:00 to 22:15	20:53:19	Intercity Through Train (ITT), Twin with EMU	Northbound (ITT) + Southbound (EMU)	52	2	2	1	1	2	37	75.6	56.9	75.6	91.3	91.3
		21:28:48		Southbound (ITT) + Northbound (EMU)	41	2					34	75.8	56.7	75.7	91.0	90.6
		22:09:09		Southbound (ITT) + Northbound (EMU)	44	2					30	75.6	60.4	75.5	90.2	
	Average :		EMU	Northbound	91											
				Southbound	90											

Notes :
1. Train pass-by event noise has been excluded in sampling the background noise level
2. Logarithmic average
3. Normalized SEL = Average SEL + 20 log (120/average train speed)

Appendix D.

ITT Train Schedule on 02 Jun 20

Figure D.1 ITT Train Schedule Extracted from MTRC Webpage Captured on 02 Jun 20

(2019.07.10)

MTR

廣東綫直通車行車時間表
Schedules for Guangdong Line Through Train

紅磡 → 常平 / 廣州東 Hung Hom → Changping / Guangzhoudong			
北行車次 Northbound Train No.	紅磡開 Depart Hung Hom	到常平 Arrive Changping	到廣州東 Arrive Guangzhoudong
Z814 *(Ktt九廣通)*	08:00	09:10	09:57
Z806	09:24	10:36	11:23
Z802	10:52	12:04	12:51
Z812	12:23	-	14:17
Z816 *(Ktt九廣通)*	13:11	14:21	15:08
Z808	14:32	15:44	16:31
Z804	16:35	17:47	18:34
Z818 *(Ktt九廣通)*	18:05	19:15	20:02
Z810	20:01	21:13	22:00

廣州東 / 常平 → 紅磡 Guangzhoudong / Changping → Hung Hom			
南行車次 Southbound Train No.	廣州東開 Depart Guangzhoudong	常平開 Depart Changping	到紅磡 Arrive Hung Hom
Z801	08:19	09:03	10:17
Z811	09:30	10:14	11:28
Z815 *(Ktt九廣通)*	10:37	11:21	12:33
Z807	12:03	-	13:56
Z803	14:04	14:48	16:02
Z817 *(Ktt九廣通)*	15:38	16:22	17:34
Z809	17:33	18:17	19:31
Z805	19:33	20:18	21:33
Z819 *(Ktt九廣通)*	20:40	21:24	22:36

Appendix E.

Railway Noise Assessment

Table E.1 Air-borne Rail Noise Calculation for Assessment Point H2P1 (Daytime)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	150.0	150.0	150.0	166.5	150.0	166.5
Angle End	165.8	165.8	166.5	166.7	166.5	166.7
Speed, kph	120	120	120	120	120	120
Slant Distance, m	69.8	69.8	65.9	65.9	65.9	65.9
Angle of View, θ^o	15.8	15.8	16.5	0.2	16.5	0.2
Angle of Orientation of the Segment, α^o	22.1	22.1	21.8	13.4	21.8	13.4
Receiver to Source Distance, m	69.8	69.8	65.9	65.9	65.9	65.9
Path Length Difference, m	0.183	0.183	0.306	0.306	0.306	0.306
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.5	-4.5	-4.2	-4.2	-4.2	-4.2
Angle of View Correction, dB(A)	-15.9	-15.9	-15.9	-39.3	-15.9	-39.3
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.6	-12.6	-14.2	-14.2	-14.2	-14.2
SEL of the Segment, dB(A)	63.0	71.0	61.7	45.3	69.8	53.4
SEL of Single PassBy, dB(A)	63.0	71.0	61.8		69.9	
Train Frequency, No. of Train per 30min	15	1	15		1	
Leq,30min of the Track, dB(A)	42.2	38.5	41.0		37.3	
Leq,30min, dB(A)	**46.2**					
1/F, +	**2.70**					
Path Length Difference, m	0.120	0.120	0.243	0.243	0.243	0.243
Slant Distance, m	69.8	69.8	65.9	65.9	65.9	65.9
Distance Correction, dB(A)	-4.5	-4.5	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-11.4	-11.4	-13.5	-13.5	-13.5	-13.5
SEL of the Segment, dB(A)	64.2	72.2	62.4	46.0	70.5	54.1
SEL of Single PassBy, dB(A)	64.2	72.2	62.5		70.6	
Leq,30min of the Track, dB(A)	43.4	39.7	41.7		38.0	
Leq,30min, dB(A)	**47.2**					
2/F, +	**5.40**					
Path Length Difference, m	0.069	0.069	0.186	0.186	0.186	0.186
Slant Distance, m	69.9	69.9	66.0	66.0	66.0	66.0
Distance Correction, dB(A)	-4.5	-4.5	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-10.0	-10.0	-12.7	-12.7	-12.7	-12.7
SEL of the Segment, dB(A)	65.6	73.7	63.2	46.8	71.3	54.9
SEL of Single PassBy, dB(A)	65.6	73.7	63.3		71.4	
Leq,30min of the Track, dB(A)	44.8	41.1	42.5		38.8	
Leq,30min, dB(A)	**48.4**					

Table E.2 Air-borne Rail Noise Calculation for Assessment Point H2P1 (Night-time)

Track	Northbound	Southbound	
Segment	CD	CD	DE
Train Type	EMU	EMU	
Angle Start	150.0	150.0	166.5
Angle End	165.8	166.5	166.7
Speed, kph	120	120	120
Slant Distance, m	69.8	65.9	65.9
Angle of View, θ^o	15.8	16.5	0.2
Angle of Orientation of the Segment, α^o	22.1	21.8	13.4
Receiver to Source Distance, m	69.8	65.9	65.9
Path Length Difference, m	0.183	0.306	0.306
Wheel/Rail Noise Contribution			
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0
Distance Correction, dB(A)	-4.5	-4.2	-4.2
Angle of View Correction, dB(A)	-15.9	-15.9	-39.3
Façade Correction, dB(A)	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5
Screening Correction, dB(A)	-12.6	-14.2	-14.2
SEL of the Segment, dB(A)	63.0	61.7	45.3
SEL of Single PassBy, dB(A)	63.0	61.8	
Lmax of Single PassBy, dB(A)	53.5	52.4	
Train Frequency, No. of Train per 30min	12	12	
Leq,30min of the Track, dB(A)	41.2	40.1	
Leq,30min, dB(A)	**43.7**		
1/F, +	**2.70**		
Path Length Difference, m	0.120	0.243	0.243
Slant Distance, m	69.8	65.9	65.9
Distance Correction, dB(A)	-4.5	-4.2	-4.2
Screening Correction, dB(A)	-11.4	-13.5	-13.5
SEL of the Segment, dB(A)	64.2	62.4	46.0
SEL of Single PassBy, dB(A)	64.2	62.5	
Lmax of Single PassBy, dB(A)	54.7	53.1	
Leq,30min of the Track, dB(A)	42.4	40.8	
Leq,30min, dB(A)	**44.7**		
2/F, +	**5.40**		
Path Length Difference, m	0.069	0.186	0.186
Slant Distance, m	69.9	66.0	66.0
Distance Correction, dB(A)	-4.5	-4.2	-4.2
Screening Correction, dB(A)	-10.0	-12.7	-12.7
SEL of the Segment, dB(A)	65.6	63.2	46.8
SEL of Single PassBy, dB(A)	65.6	63.3	
Lmax of Single PassBy, dB(A)	56.1	53.9	
Leq,30min of the Track, dB(A)	43.8	41.6	
Leq,30min, dB(A)	**45.9**		

Table E.3 Air-borne Rail Noise Calculation for Assessment Point H2P1 (Full Day)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	150.0	150.0	150.0	166.5	150.0	166.5
Angle End	165.8	165.8	166.5	166.7	166.5	166.7
Speed, kph	120	120	120	120	120	120
Slant Distance, m	69.8	69.8	65.9	65.9	65.9	65.9
Angle of View, θ^o	15.8	15.8	16.5	0.2	16.5	0.2
Angle of Orientation of the Segment, α^o	22.1	22.1	21.8	13.4	21.8	13.4
Receiver to Source Distance, m	69.8	69.8	65.9	65.9	65.9	65.9
Path Length Difference, m	0.183	0.183	0.306	0.306	0.306	0.306
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.5	-4.5	-4.2	-4.2	-4.2	-4.2
Angle of View Correction, dB(A)	-15.9	-15.9	-15.9	-39.3	-15.9	-39.3
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.6	-12.6	-14.2	-14.2	-14.2	-14.2
SEL of the Segment, dB(A)	63.0	71.0	61.7	45.3	69.8	53.4
SEL of Single PassBy, dB(A)	63.0	71.0	61.8		69.9	
Train Frequency, No. of Train per day	425	9	425		9	
Leq,24hr of the Track, dB(A)	39.9	31.2	38.7		30.1	
Leq,24hr, dB(A)	**42.9**					
1/F, +	**2.70**					
Path Length Difference, m	0.120	0.120	0.243	0.243	0.243	0.243
Slant Distance, m	69.8	69.8	65.9	65.9	65.9	65.9
Distance Correction, dB(A)	-4.5	-4.5	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-11.4	-11.4	-13.5	-13.5	-13.5	-13.5
SEL of the Segment, dB(A)	64.2	72.2	62.4	46.0	70.5	54.1
SEL of Single PassBy, dB(A)	64.2	72.2	62.5		70.6	
Leq,24hr of the Track, dB(A)	41.1	32.4	39.5		30.8	
Leq,24hr, dB(A)	**43.9**					
2/F, +	**5.40**					
Path Length Difference, m	0.069	0.069	0.186	0.186	0.186	0.186
Slant Distance, m	69.9	69.9	66.0	66.0	66.0	66.0
Distance Correction, dB(A)	-4.5	-4.5	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-10.0	-10.0	-12.7	-12.7	-12.7	-12.7
SEL of the Segment, dB(A)	65.6	73.7	63.2	46.8	71.3	54.9
SEL of Single PassBy, dB(A)	65.6	73.7	63.3		71.4	
Leq,24hr of the Track, dB(A)	42.5	33.8	40.2		31.6	
Leq,24hr, dB(A)	**45.1**					

Figure E.1 Angle of View for Assessment Point H2P1 DT (2/F)

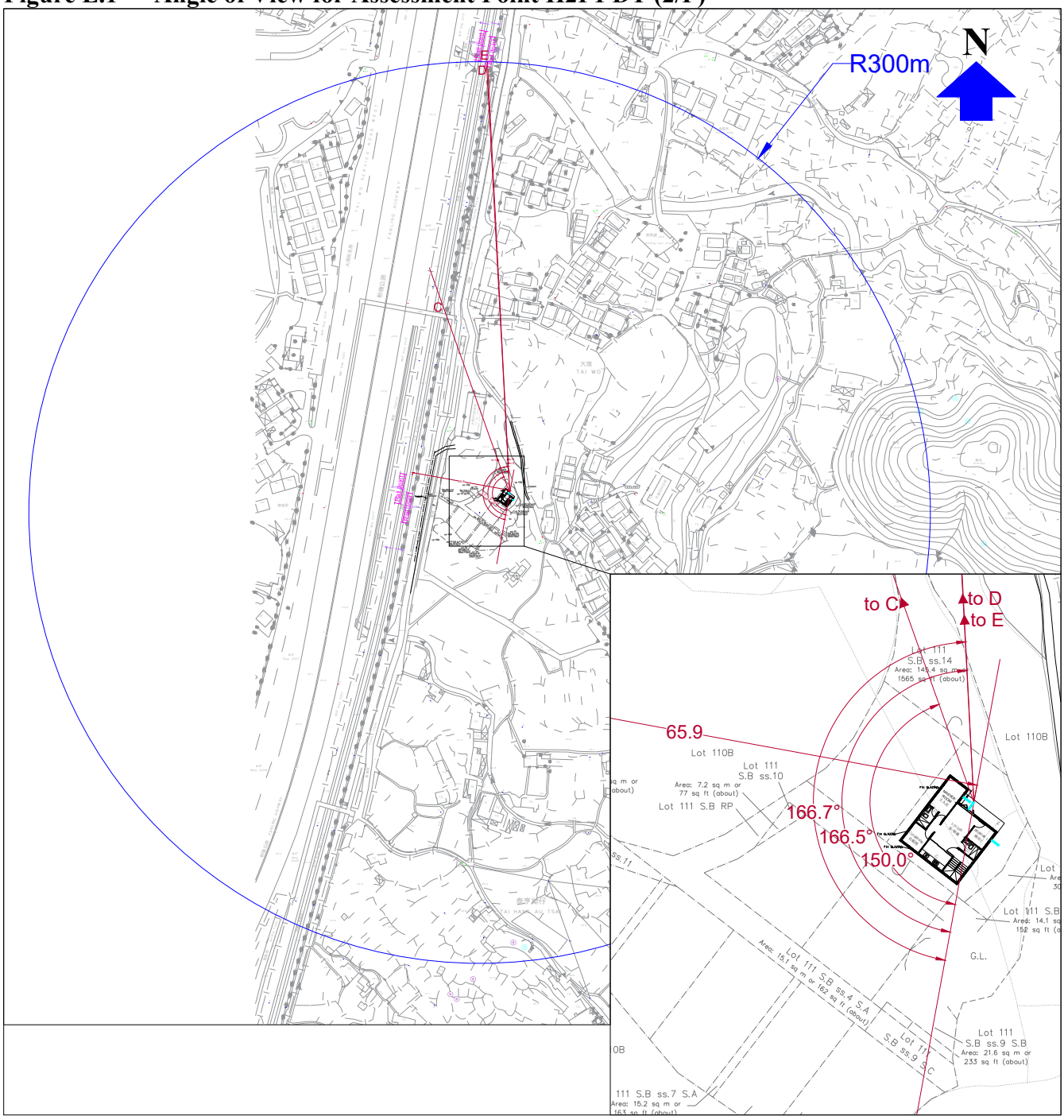


Figure E.2 Angle of View for Assessment Point H2P1 UT (2/F)

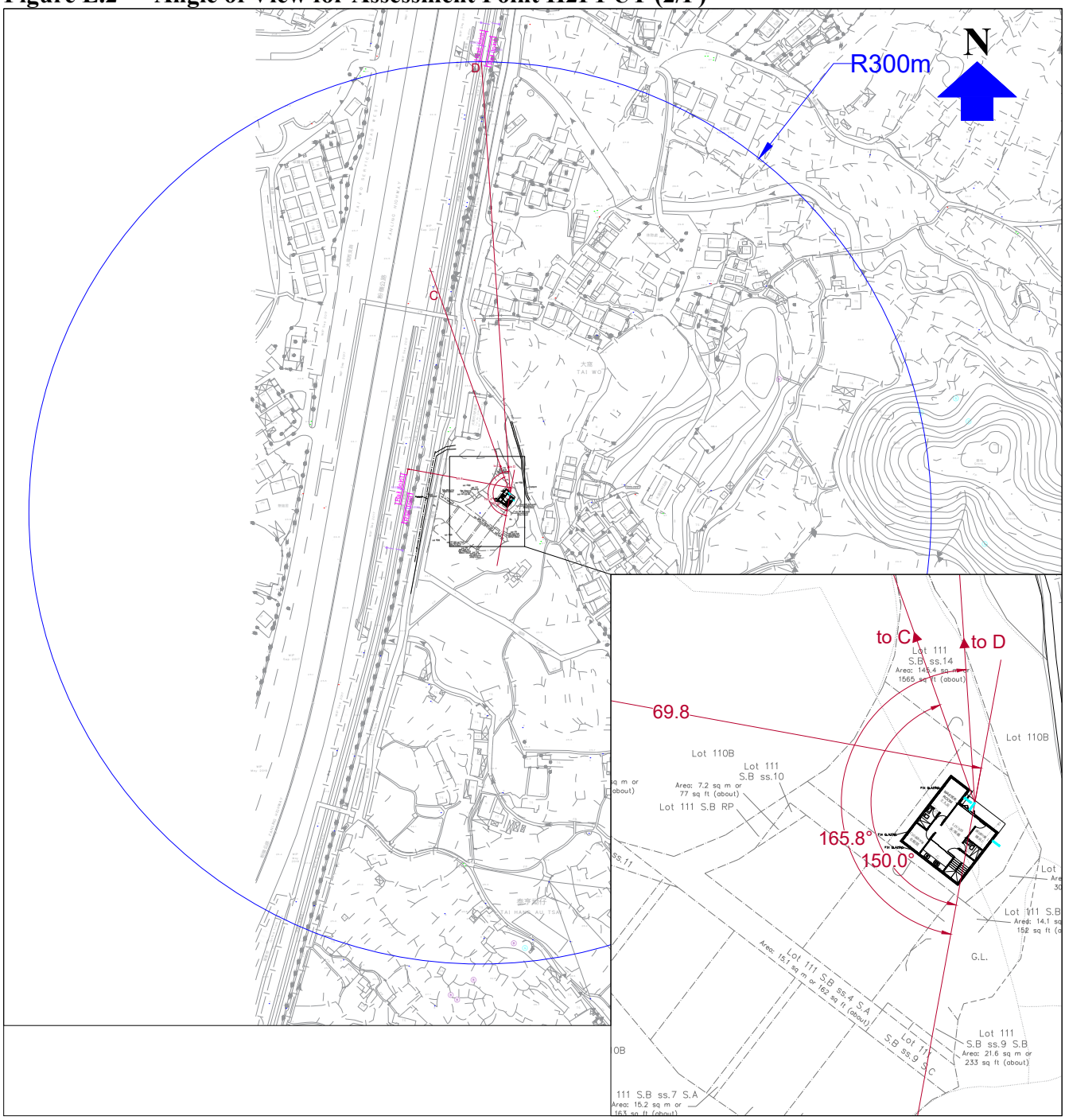


Table E.4 Air-borne Rail Noise Calculation for Assessment Point H2P2 (Daytime)

Track	Northbound		Southbound					
Segment	AB		AB	CD	DE	AB	CD	DE
Train Type	EMU	ITT	EMU			ITT		
Angle Start	12.1	12.1	11.4	165.6	166.0	11.4	165.6	166.0
Angle End	31.6	31.6	31.6	166.0	166.2	31.6	166.0	166.2
Speed, kph	120	120	120	120	120	120	120	120
Slant Distance, m	66.4	66.4	62.8	69.5	69.5	62.8	69.5	69.5
Angle of View, θ^o	19.5	19.5	20.2	0.4	0.2	20.2	0.4	0.2
Angle of Orientation of the Segment, α^o	21.9	21.9	21.5	14.2	13.9	21.5	14.2	13.9
Receiver to Source Distance, m	66.4	66.4	62.8	69.5	69.5	62.8	69.5	69.5
Path Length Difference, m	0.187	0.187	0.309	0.303	0.303	0.309	0.303	0.303
Wheel/Rail Noise Contribution								
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	89.0	97.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.2	-4.2	-4.0	-4.4	-4.4	-4.0	-4.4	-4.4
Angle of View Correction, dB(A)	-15.0	-15.0	-15.0	-35.8	-38.9	-15.0	-35.8	-38.9
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)					7.0			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.1	-14.1	-14.2	-14.1	-14.1
SEL of the Segment, dB(A)	64.0	72.1	62.8	41.6	45.4	70.8	49.7	53.5
SEL of Single PassBy, dB(A)	64.0	72.1	62.9			70.9		
Train Frequency, No. of Train per 30min	15	1	15			1		
Leq,30min of the Track, dB(A)	43.2	39.5	42.1			38.4		
Leq,30min, dB(A)	**47.2**							
1/F, +	**2.70**							
Path Length Difference, m	0.119	0.119	0.242	0.243	0.243	0.242	0.243	0.243
Slant Distance, m	66.4	66.4	62.8	69.5	69.5	62.8	69.5	69.5
Distance Correction, dB(A)	-4.2	-4.2	-4.0	-4.4	-4.4	-4.0	-4.4	-4.4
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.5	-13.5	-13.4	-13.5	-13.5
SEL of the Segment, dB(A)	65.3	73.4	63.5	42.3	46.1	71.6	50.4	54.2
SEL of Single PassBy, dB(A)	65.3	73.4	63.6			71.7		
Leq,30min of the Track, dB(A)	44.5	40.8	42.8			39.1		
Leq,30min, dB(A)	**48.3**							
2/F, +	**5.40**							
Path Length Difference, m	0.067	0.067	0.183	0.190	0.190	0.183	0.190	0.190
Slant Distance, m	66.5	66.5	62.9	69.6	69.6	62.9	69.6	69.6
Distance Correction, dB(A)	-4.2	-4.2	-4.0	-4.4	-4.4	-4.0	-4.4	-4.4
Screening Correction, dB(A)	-9.9	-9.9	-12.6	-12.7	-12.7	-12.6	-12.7	-12.7
SEL of the Segment, dB(A)	66.8	74.9	64.3	43.1	46.9	72.4	51.1	54.9
SEL of Single PassBy, dB(A)	66.8	74.9	64.5			72.5		
Leq,30min of the Track, dB(A)	46.0	42.3	43.7			40.0		
Leq,30min, dB(A)	**49.6**							

Table E.5 Air-borne Rail Noise Calculation for Assessment Point H2P2 (Night-time)

Track	Northbound	Southbound		
Segment	AB	AB	CD	DE
Train Type	EMU	EMU		
Angle Start	12.1	11.4	165.6	166.0
Angle End	31.6	31.6	166.0	166.2
Speed, kph	120	120	120	120
Slant Distance, m	66.4	62.8	69.5	69.5
Angle of View, θ^o	19.5	20.2	0.4	0.2
Angle of Orientation of the Segment, α^o	21.9	21.5	14.2	13.9
Receiver to Source Distance, m	66.4	62.8	69.5	69.5
Path Length Difference, m	0.187	0.309	0.303	0.303
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.2	-4.0	-4.4	-4.4
Angle of View Correction, dB(A)	-15.0	-15.0	-35.8	-38.9
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-14.2	-14.1	-14.1
SEL of the Segment, dB(A)	64.0	62.8	41.6	45.4
SEL of Single PassBy, dB(A)	64.0	62.9		
Lmax of Single PassBy, dB(A)	54.6	53.5		
Train Frequency, No. of Train per 30min	12	12		
Leq,30min of the Track, dB(A)	42.3	41.1		
Leq,30min, dB(A)	**44.7**			
1/F, +	**2.70**			
Path Length Difference, m	0.119	0.242	0.243	0.243
Slant Distance, m	66.4	62.8	69.5	69.5
Distance Correction, dB(A)	-4.2	-4.0	-4.4	-4.4
Screening Correction, dB(A)	-11.4	-13.4	-13.5	-13.5
SEL of the Segment, dB(A)	65.3	63.5	42.3	46.1
SEL of Single PassBy, dB(A)	65.3	63.6		
Lmax of Single PassBy, dB(A)	55.9	54.2		
Leq,30min of the Track, dB(A)	43.5	41.9		
Leq,30min, dB(A)	**45.8**			
2/F, +	**5.40**			
Path Length Difference, m	0.067	0.183	0.190	0.190
Slant Distance, m	66.5	62.9	69.6	69.6
Distance Correction, dB(A)	-4.2	-4.0	-4.4	-4.4
Screening Correction, dB(A)	-9.9	-12.6	-12.7	-12.7
SEL of the Segment, dB(A)	66.8	64.3	43.1	46.9
SEL of Single PassBy, dB(A)	66.8	64.5		
Lmax of Single PassBy, dB(A)	57.4	55.0		
Leq,30min of the Track, dB(A)	45.1	42.7		
Leq,30min, dB(A)	**47.0**			

Table E.6 Air-borne Rail Noise Calculation for Assessment Point H2P2 (Full Day)

Track	Northbound		Southbound					
Segment	AB		AB	CD	DE	AB	CD	DE
Train Type	EMU	ITT	EMU			ITT		
Angle Start	12.1	12.1	11.4	165.6	166.0	11.4	165.6	166.0
Angle End	31.6	31.6	31.6	166.0	166.2	31.6	166.0	166.2
Speed, kph	120	120	120	120	120	120	120	120
Slant Distance, m	66.4	66.4	62.8	69.5	69.5	62.8	69.5	69.5
Angle of View, θ^o	19.5	19.5	20.2	0.4	0.2	20.2	0.4	0.2
Angle of Orientation of the Segment, α^o	21.9	21.9	21.5	14.2	13.9	21.5	14.2	13.9
Receiver to Source Distance, m	66.4	66.4	62.8	69.5	69.5	62.8	69.5	69.5
Path Length Difference, m	0.187	0.187	0.309	0.303	0.303	0.309	0.303	0.303
Wheel/Rail Noise Contribution								
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	89.0	97.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.2	-4.2	-4.0	-4.4	-4.4	-4.0	-4.4	-4.4
Angle of View Correction, dB(A)	-15.0	-15.0	-15.0	-35.8	-38.9	-15.0	-35.8	-38.9
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)					7.0			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.1	-14.1	-14.2	-14.1	-14.1
SEL of the Segment, dB(A)	64.0	72.1	62.8	41.6	45.4	70.8	49.7	53.5
SEL of Single PassBy, dB(A)	64.0	72.1	62.9			70.9		
Train Frequency, No. of Train per day	425	9	425			9		
Leq,24hr of the Track, dB(A)	40.9	32.3	39.8			31.1		
Leq,24hr, dB(A)	44.0							
1/F, +	2.70							
Path Length Difference, m	0.119	0.119	0.242	0.243	0.243	0.242	0.243	0.243
Slant Distance, m	66.4	66.4	62.8	69.5	69.5	62.8	69.5	69.5
Distance Correction, dB(A)	-4.2	-4.2	-4.0	-4.4	-4.4	-4.0	-4.4	-4.4
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.5	-13.5	-13.4	-13.5	-13.5
SEL of the Segment, dB(A)	65.3	73.4	63.5	42.3	46.1	71.6	50.4	54.2
SEL of Single PassBy, dB(A)	65.3	73.4	63.6			71.7		
Leq,24hr of the Track, dB(A)	42.2	33.5	40.6			31.9		
Leq,24hr, dB(A)	45.0							
2/F, +	5.40							
Path Length Difference, m	0.067	0.067	0.183	0.190	0.190	0.183	0.190	0.190
Slant Distance, m	66.5	66.5	62.9	69.6	69.6	62.9	69.6	69.6
Distance Correction, dB(A)	-4.2	-4.2	-4.0	-4.4	-4.4	-4.0	-4.4	-4.4
Screening Correction, dB(A)	-9.9	-9.9	-12.6	-12.7	-12.7	-12.6	-12.7	-12.7
SEL of the Segment, dB(A)	66.8	74.9	64.3	43.1	46.9	72.4	51.1	54.9
SEL of Single PassBy, dB(A)	66.8	74.9	64.5			72.5		
Leq,24hr of the Track, dB(A)	43.7	35.1	41.4			32.7		
Leq,24hr, dB(A)	46.3							

Figure E.3 Angle of View for Assessment Point H2P2 DT (2/F)

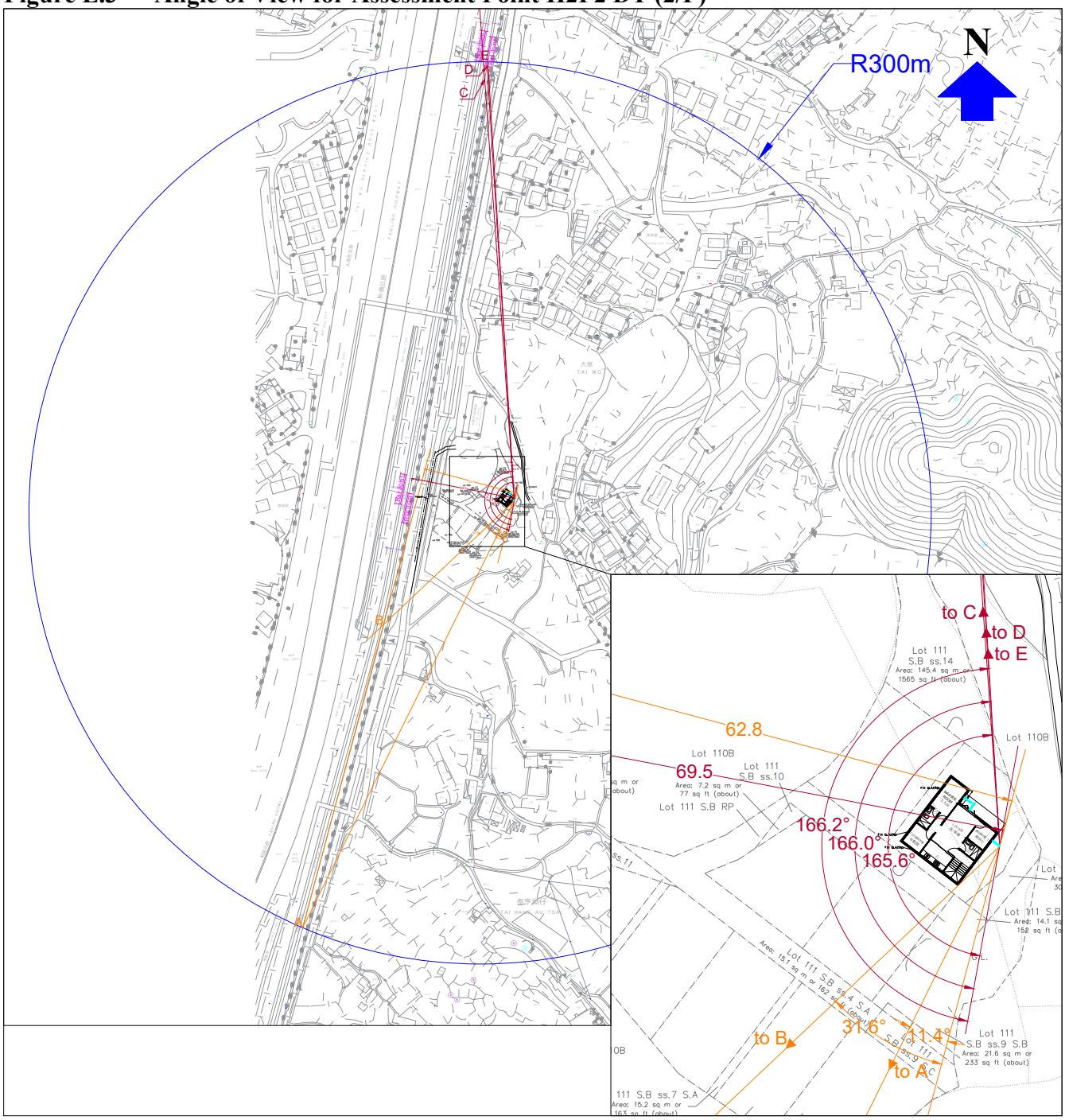


Figure E.4 Angle of View for Assessment Point H2P2 UT (2/F)

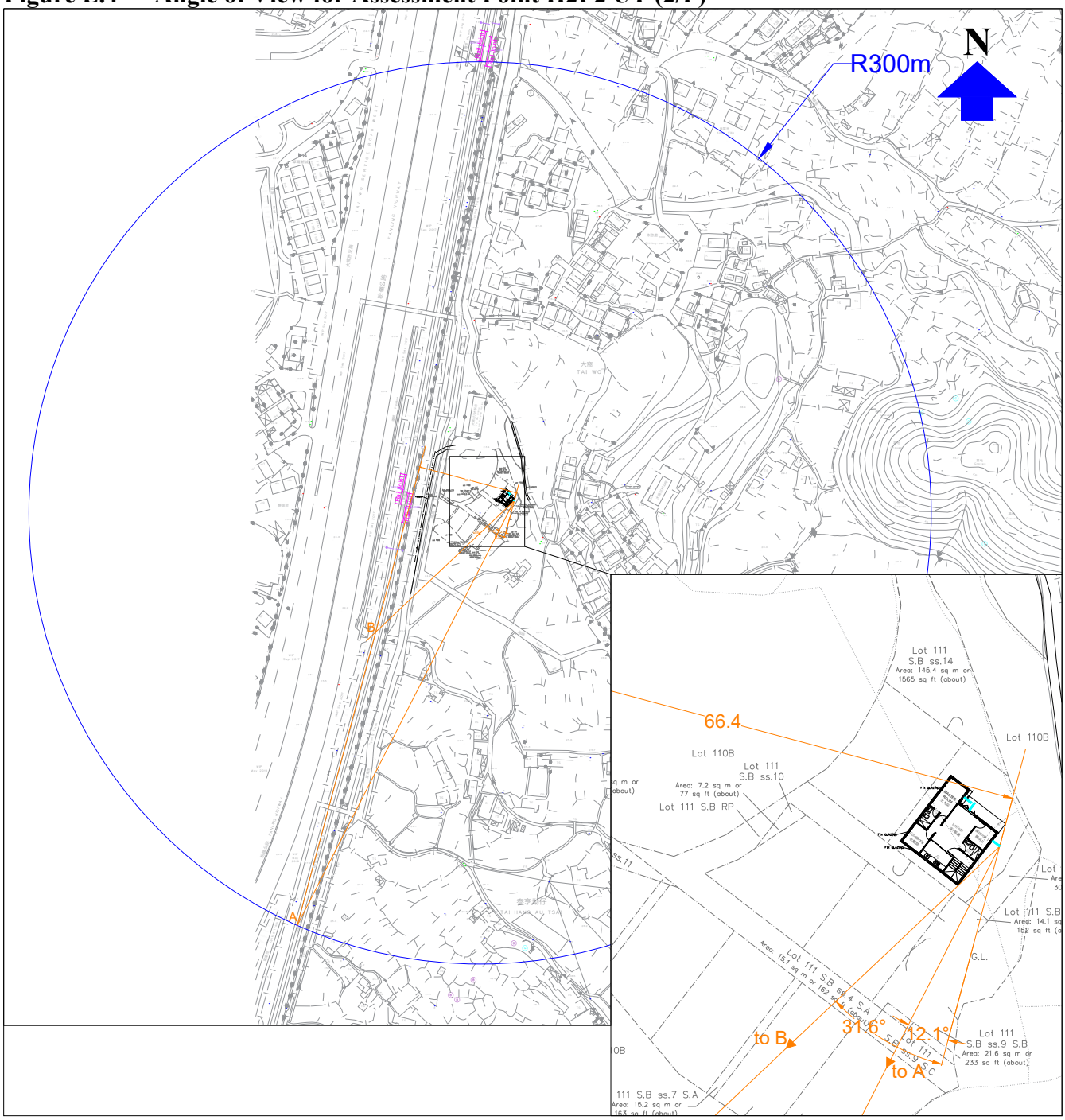


Table E.7 Air-borne Rail Noise Calculation for Assessment Point H2P3 (Daytime)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	164.4	164.4	164.4	166.6	164.4	166.6
Angle End	165.9	165.9	166.6	166.8	166.6	166.8
Speed, kph	120	120	120	120	120	120
Slant Distance, m	69.4	69.4	65.6	65.6	65.6	65.6
Angle of View, θ^o	1.5	1.5	2.2	0.2	2.2	0.2
Angle of Orientation of the Segment, α^o	14.9	14.9	14.5	13.3	14.5	13.3
Receiver to Source Distance, m	69.4	69.4	65.6	65.6	65.6	65.6
Path Length Difference, m	0.184	0.184	0.306	0.306	0.306	0.306
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.4	-4.4	-4.2	-4.2	-4.2	-4.2
Angle of View Correction, dB(A)	-29.6	-29.6	-28.2	-39.3	-28.2	-39.3
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.6	-12.6	-14.2	-14.2	-14.2	-14.2
SEL of the Segment, dB(A)	49.3	57.3	49.4	45.3	57.5	53.3
SEL of Single PassBy, dB(A)	49.3	57.3	50.9		58.9	
Train Frequency, No. of Train per 30min	15	1	15		1	
Leq,30min of the Track, dB(A)	28.5	24.8	30.1		26.4	
Leq,30min, dB(A)	**33.9**					
1/F, +	**2.70**					
Path Length Difference, m	0.120	0.120	0.243	0.243	0.243	0.243
Slant Distance, m	69.4	69.4	65.6	65.6	65.6	65.6
Distance Correction, dB(A)	-4.4	-4.4	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-11.4	-11.4	-13.5	-13.5	-13.5	-13.5
SEL of the Segment, dB(A)	50.5	58.6	50.2	46.0	58.2	54.1
SEL of Single PassBy, dB(A)	50.5	58.6	51.6		59.6	
Leq,30min of the Track, dB(A)	29.7	26.0	30.8		27.1	
Leq,30min, dB(A)	**34.8**					
2/F, +	**5.40**					
Path Length Difference, m	0.069	0.069	0.186	0.186	0.186	0.186
Slant Distance, m	69.5	69.5	65.7	65.7	65.7	65.7
Distance Correction, dB(A)	-4.4	-4.4	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-9.9	-9.9	-12.7	-12.7	-12.7	-12.7
SEL of the Segment, dB(A)	51.9	60.0	50.9	46.8	59.0	54.9
SEL of Single PassBy, dB(A)	51.9	60.0	52.4		60.4	
Leq,30min of the Track, dB(A)	31.2	27.5	31.6		27.9	
Leq,30min, dB(A)	**35.9**					

Table E.8 Air-borne Rail Noise Calculation for Assessment Point H2P3 (Night-time)

Track	Northbound	Southbound	
Segment	CD	CD	DE
Train Type	EMU	EMU	
Angle Start	164.4	164.4	166.6
Angle End	165.9	166.6	166.8
Speed, kph	120	120	120
Slant Distance, m	69.4	65.6	65.6
Angle of View, θ^o	1.5	2.2	0.2
Angle of Orientation of the Segment, α^o	14.9	14.5	13.3
Receiver to Source Distance, m	69.4	65.6	65.6
Path Length Difference, m	0.184	0.306	0.306
Wheel/Rail Noise Contribution			
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0
Distance Correction, dB(A)	-4.4	-4.2	-4.2
Angle of View Correction, dB(A)	-29.6	-28.2	-39.3
Façade Correction, dB(A)	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5
Screening Correction, dB(A)	-12.6	-14.2	-14.2
SEL of the Segment, dB(A)	49.3	49.4	45.3
SEL of Single PassBy, dB(A)	49.3	50.9	
Lmax of Single PassBy, dB(A)	39.8	41.4	
Train Frequency, No. of Train per 30min	12	12	
Leq,30min of the Track, dB(A)	27.5	29.1	
Leq,30min, dB(A)	**31.4**		
1/F, +	**2.70**		
Path Length Difference, m	0.120	0.243	0.243
Slant Distance, m	69.4	65.6	65.6
Distance Correction, dB(A)	-4.4	-4.2	-4.2
Screening Correction, dB(A)	-11.4	-13.5	-13.5
SEL of the Segment, dB(A)	50.5	50.2	46.0
SEL of Single PassBy, dB(A)	50.5	51.6	
Lmax of Single PassBy, dB(A)	41.1	42.1	
Leq,30min of the Track, dB(A)	28.8	29.8	
Leq,30min, dB(A)	**32.3**		
2/F, +	**5.40**		
Path Length Difference, m	0.069	0.186	0.186
Slant Distance, m	69.5	65.7	65.7
Distance Correction, dB(A)	-4.4	-4.2	-4.2
Screening Correction, dB(A)	-9.9	-12.7	-12.7
SEL of the Segment, dB(A)	51.9	50.9	46.8
SEL of Single PassBy, dB(A)	51.9	52.4	
Lmax of Single PassBy, dB(A)	42.5	42.9	
Leq,30min of the Track, dB(A)	30.2	30.6	
Leq,30min, dB(A)	**33.4**		

Table E.9 Air-borne Rail Noise Calculation for Assessment Point H2P3 (Full Day)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	164.4	164.4	164.4	166.6	164.4	166.6
Angle End	165.9	165.9	166.6	166.8	166.6	166.8
Speed, kph	120	120	120	120	120	120
Slant Distance, m	69.4	69.4	65.6	65.6	65.6	65.6
Angle of View, θ^o	1.5	1.5	2.2	0.2	2.2	0.2
Angle of Orientation of the Segment, α^o	14.9	14.9	14.5	13.3	14.5	13.3
Receiver to Source Distance, m	69.4	69.4	65.6	65.6	65.6	65.6
Path Length Difference, m	0.184	0.184	0.306	0.306	0.306	0.306
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.4	-4.4	-4.2	-4.2	-4.2	-4.2
Angle of View Correction, dB(A)	-29.6	-29.6	-28.2	-39.3	-28.2	-39.3
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.6	-12.6	-14.2	-14.2	-14.2	-14.2
SEL of the Segment, dB(A)	49.3	57.3	49.4	45.3	57.5	53.3
SEL of Single PassBy, dB(A)	49.3	57.3	50.9		58.9	
Train Frequency, No. of Train per day	425	9	425		9	
Leq,24hr of the Track, dB(A)	26.2	17.5	27.8		19.1	
Leq,24hr, dB(A)	**30.6**					
1/F, +	**2.70**					
Path Length Difference, m	0.120	0.120	0.243	0.243	0.243	0.243
Slant Distance, m	69.4	69.4	65.6	65.6	65.6	65.6
Distance Correction, dB(A)	-4.4	-4.4	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-11.4	-11.4	-13.5	-13.5	-13.5	-13.5
SEL of the Segment, dB(A)	50.5	58.6	50.2	46.0	58.2	54.1
SEL of Single PassBy, dB(A)	50.5	58.6	51.6		59.6	
Leq,24hr of the Track, dB(A)	27.4	18.8	28.5		19.8	
Leq,24hr, dB(A)	**31.6**					
2/F, +	**5.40**					
Path Length Difference, m	0.069	0.069	0.186	0.186	0.186	0.186
Slant Distance, m	69.5	69.5	65.7	65.7	65.7	65.7
Distance Correction, dB(A)	-4.4	-4.4	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-9.9	-9.9	-12.7	-12.7	-12.7	-12.7
SEL of the Segment, dB(A)	51.9	60.0	50.9	46.8	59.0	54.9
SEL of Single PassBy, dB(A)	51.9	60.0	52.4		60.4	
Leq,24hr of the Track, dB(A)	28.9	20.2	29.3		20.6	
Leq,24hr, dB(A)	**32.6**					

Figure E.5 Angle of View for Assessment Point H2P3 DT (2/F)

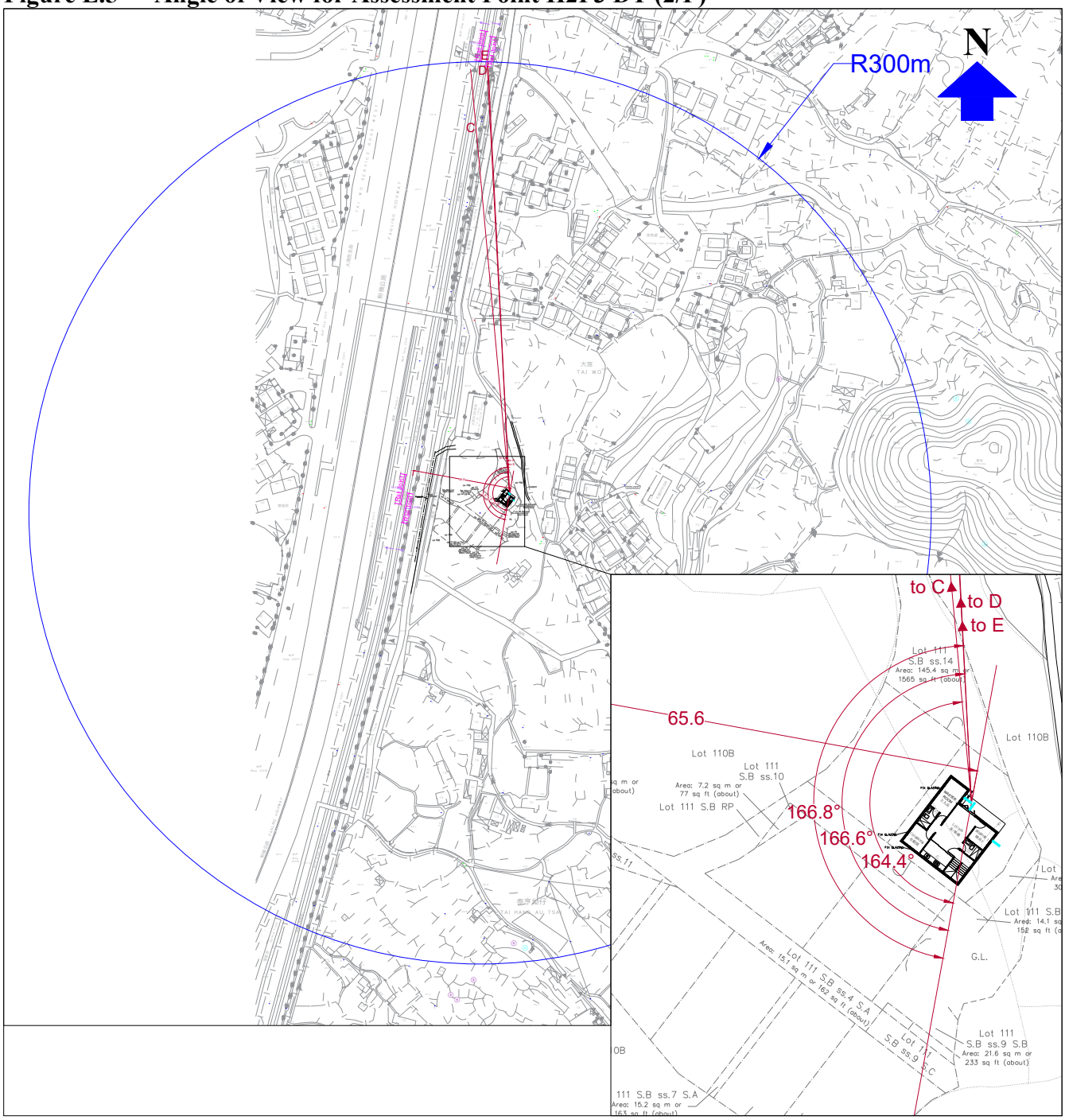
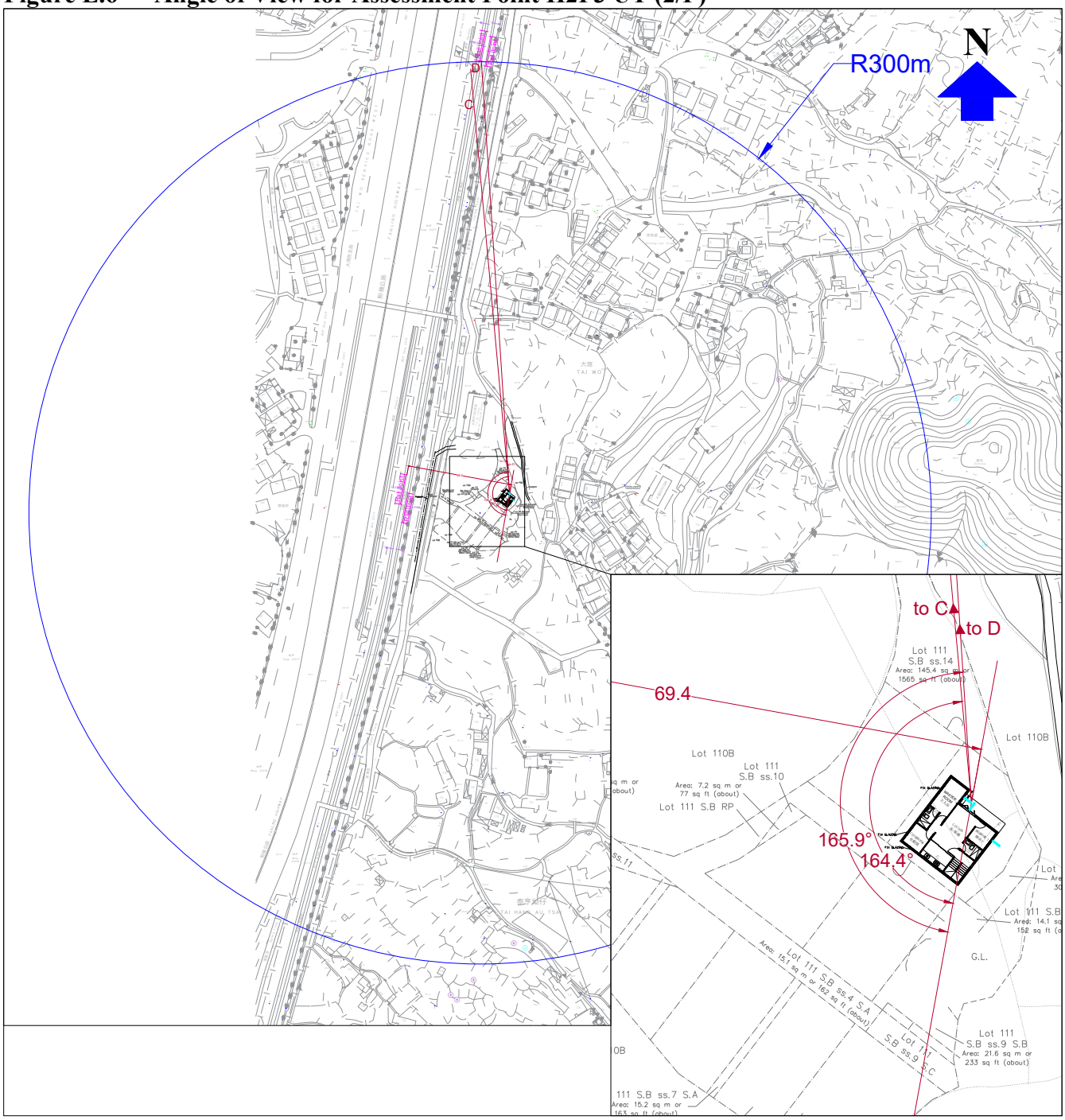


Figure E.6 Angle of View for Assessment Point H2P3 UT (2/F)



Appendix F.

Graphics of the RoadNoise Model

Figure F.1 Road Noise Model

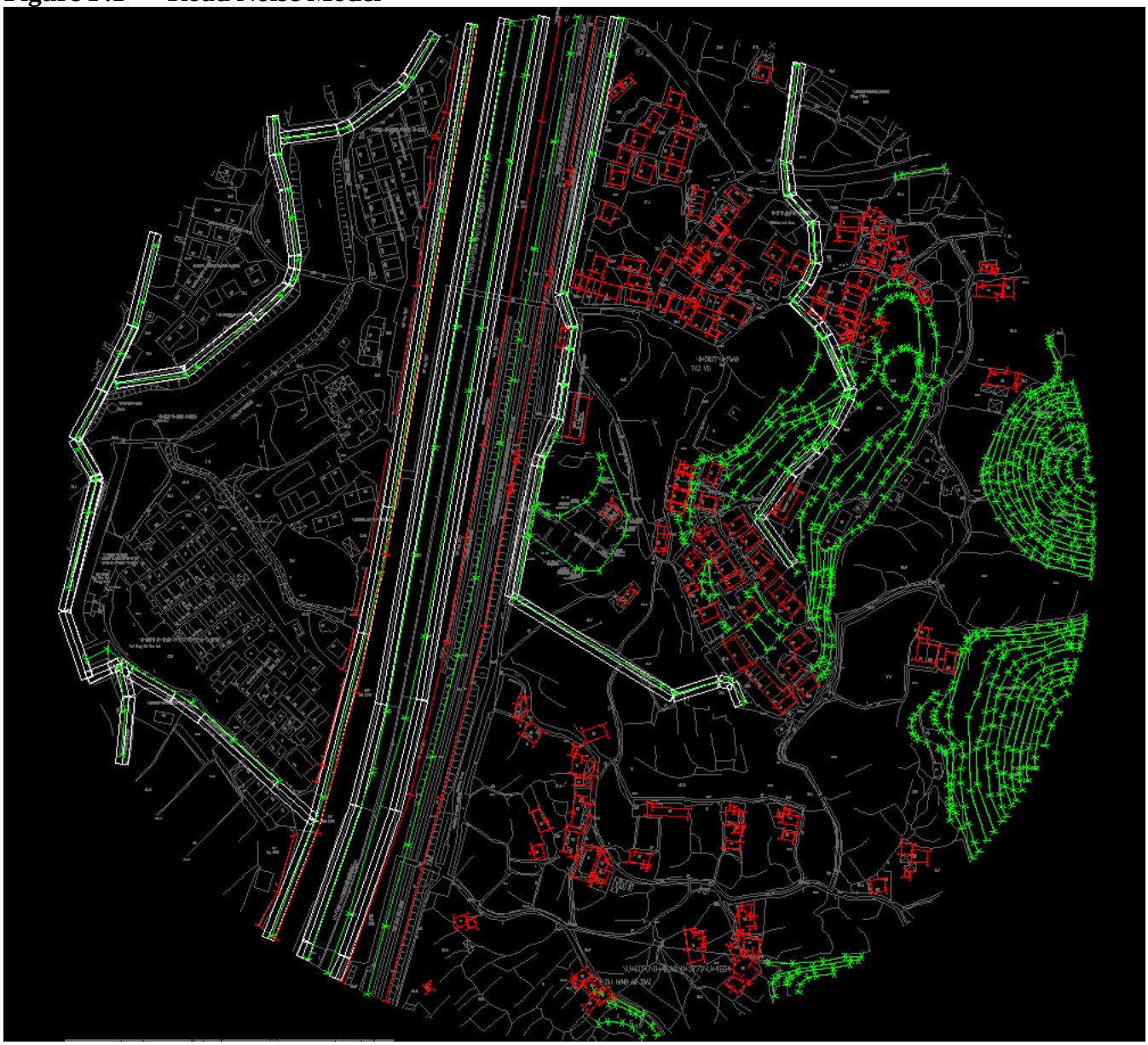
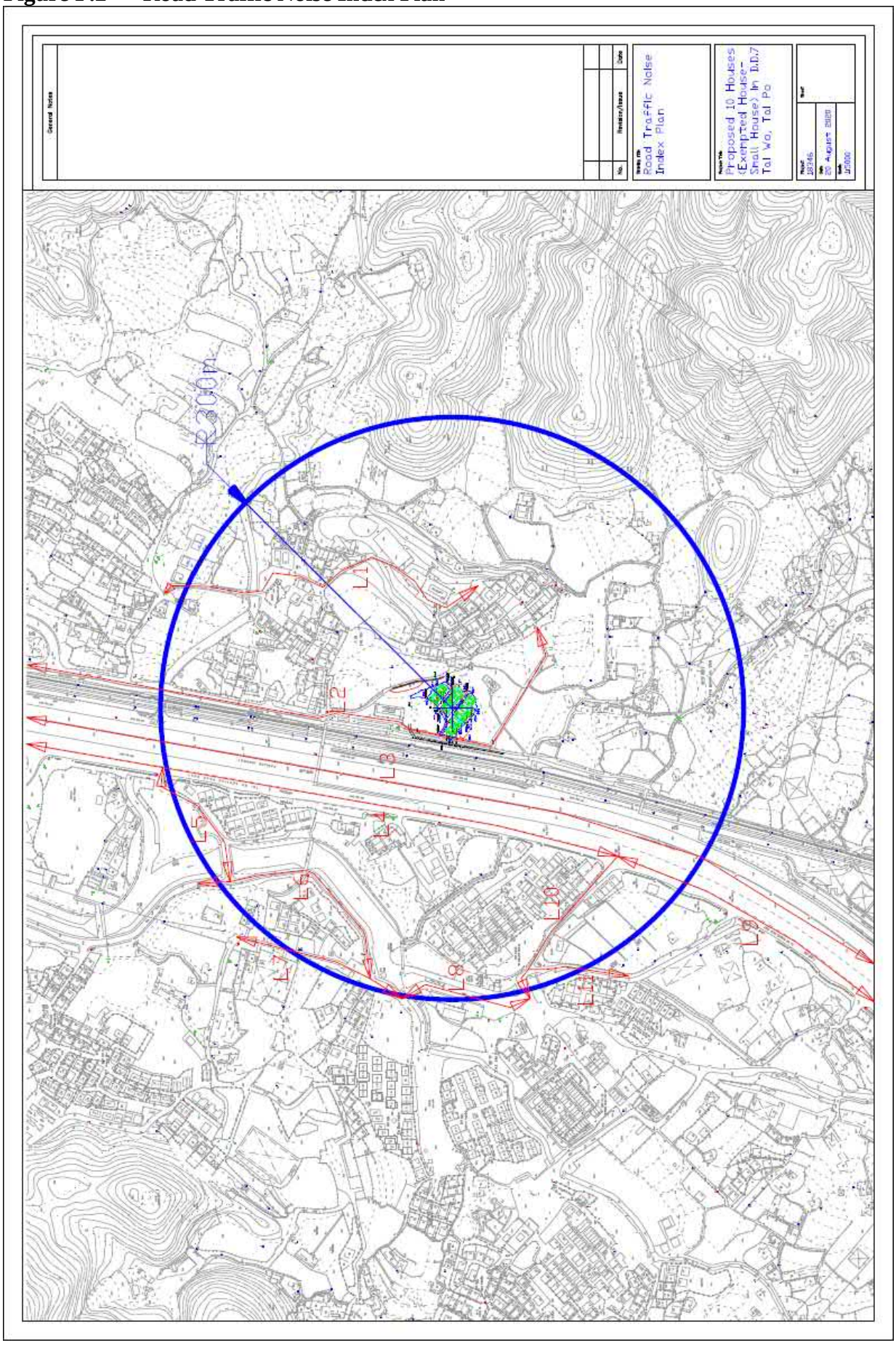


Figure F.2 Road Traffic Noise Index Plan



Appendix G.

Traffic Forecast (Extracted from Previous Approved Report)

Figure G.1 Traffic Forecast (Extracted from Previous Approved Report)

Figure H.1 1st Submission of Traffic Forecast to Transport Department

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- Transport Modelling
- Pedestrian Modelling
- Traffic Engineering
- Transportation Planning
- Traffic Impact Assessment
- Temporary Traffic Management
- Geographical Analysis System

07 August 2019
Our Ref: 30839-0001
Your ref:

Transport Department
NT Regional Office
Traffic Engineering (NTE) Division
Project & Tai Po Section
9/F, Mongkok Government Offices
30 Luen Wan Street, Mongkok
Kowloon

By Hand & Email
(alexthlam@td.gov.hk)

Attn: Mr. LAM Tack Ho, Alex (Engr (Tai Po 3)

Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po
Traffic Forecast in Year 2045 for the Noise Impact Assessment Purpose

Dear Mr. LAM,

Regarding the captioned subject, in order to obtain the approval written response from your office regarding the traffic forecast in Year 2045 for the traffic noise impact assessment purpose only, the methodology and the assumptions for the traffic forecast of the proposed development is shown as follows.

- A growth factor is derived based on the following method:

1. References were made to the historical records of Annual Traffic Census Reports from 2008 to 2017, on the annual average daily traffic (AADT) flows to derive the average growth of the annual traffic volume. It is noted that an average positive growth of 1.4% is observed over the past 10 years as shown in the table below:

Station No.	2008	2009	2010	2011	2012
5507/ Tai Wo Service Rd W	5740	5010 (-12.7%)	5230 (4.4%)	5360 (2.5%)	5330 (-0.6%)
6097/ Tai Wo Service Rd E	1790	1750 (-2.2%)	1770 (1.1%)	1810 (2.3%)	1960 (8.3%)
5461/ Fanling Highway	80920	77660 (-4%)	79110 (1.9%)	80260 (1.5%)	79490 (-1%)

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	2013	2014	2015	2016	2017	Average Growth p.a.
5507/ Tai Wo Service Rd W	5370 (0.8%)	5090 (-5.2%)	5400 (6.1%)	5620 (4.1%)	5540 (-1.4%)	-0.4%
6097/ Tai Wo Service Rd E	2270 (15.8%)	2240 (-1.3%)	2230 (-0.4%)	2320 (4%)	2270 (-2.2%)	2.7%
5461/ Fanling Highway	82840 (4.2%)	87120 (5.2%)	87930 (0.9%)	92890 (5.6%)	92220 (-0.7%)	1.5%
					Overall Average	1.4%

Notes: 1. Figures in bracket indicated the % increase between two years.
2. Source: Annual Traffic Census, Transport Department

2. Meanwhile, according to 2014-based Territorial Population and Employment Data Matrix (TPEDM) issued by Planning Department on March 2017, the projected population growth by District Council District in 2014 and 2024 is 2.2% p.a., as shown below and in **Appendix A**.

District Council District	Year 2014	Year 2024	Growth Rate p.a. (%)
Tai Po	305800	381000	2.2%

3. After considering the historical data and future planning data, for the purpose of conservative assessment, the annual growth rate of +2.2% was applied. The future traffic flows of road links up to Year 2045 per annum were hence obtained. The anticipated traffic flows for Year 2045 are tabulated as follows. Locations for the traffic forecast are shown in **Appendix B**.

ID	ROAD	Peak Hour Traffic Flow in Year 2045, veh/hr	% of Heavy Vehicles	Speed, km/hr
L1	Access Road A_NB	42	5%	50
	Access Road A_SB	40	0%	50
L2	Tai Wo Service Road East_NB	18	0%	50
	Tai Wo Service Road East_SB	31	7%	50
L3	Fanling Highway_NB	4499	15%	80
	Fanling Highway_SB	4231	15%	80
L4	Tai Wo Service Road West_NB	433	12%	50
	Tai Wo Service Road West_SB	411	12%	50

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ID	ROAD	Peak Hour Traffic Flow in Year 2045, veh/hr	% of Heavy Vehicles	Speed, km/hr
L5	Access Road B_EB	90	2%	50
	Access Road B_WB	74	3%	50
L6	Access Road C_NB	87	5%	50
	Access Road C_SB	72	6%	50
L7	Access Road D_NB	61	12%	50
	Access Road D_SB	32	6%	50
L8	Access Road E_NB	111	8%	50
	Access Road E_SB	33	6%	50
L9	Tai Wo Service Road West _NB	542	11%	50
	Tai Wo Service Road West _SB	386	12%	50
L10	Access Road F	134	7%	50
L11	Access Road G	14	0%	50

Should you have any queries, please do not hesitate to contact the undersigned at 2258 6392.

Yours sincerely,

Sam Fung

Encl.
cc: Wilson Acoustics Limited (Attn: Peter Wong (by email: peter.wong@wal.hk))

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30839-0001
Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po - Traffic Forecast in Year 2045 for the Noise Impact Assessment Purpose

Appendix A

Planning Data from
Planning Department

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表 1：二零一五年至二零二四年按區議會分區劃分的人口推算數字

Table 1 : Projected Population by District Council District, 2015-2024

(按年中計算 as at mid-year)

區議會分區 主要地區	District Council District/ *Broad Area*	2014 #	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
中西區	Central and Western	251 900	249 400	248 200	248 900	250 200	248 700	246 400	243 400	238 800	236 800	233 900
灣仔	Wan Chai	180 700	179 700	180 200	181 600	182 000	180 300	178 200	175 400	169 500	166 100	162 500
東區	Eastern	556 000	551 400	547 900	545 400	542 400	538 400	536 700	533 100	521 800	519 400	513 200
南區	Southern	277 500	276 000	273 700	272 300	270 900	269 000	267 100	268 800	267 000	270 600	281 500
深水埗	Sham Shui Po	394 800	396 000	400 800	403 800	406 800	429 200	450 900	462 200	464 400	464 900	459 700
九龍城	Kowloon City	408 600	411 900	409 200	411 700	417 000	422 500	426 000	432 900	438 500	441 000	454 200
黃大仙	Wong Tai Sin	428 900	430 000	426 900	425 400	423 000	423 100	424 800	422 800	423 200	427 800	426 000
觀塘	Kwun Tong	645 400	645 000	657 100	665 100	680 900	681 200	676 800	678 300	675 600	683 600	686 800
油尖旺	Yau Tsim Mong	317 100	323 500	320 700	322 600	323 600	322 400	321 700	316 900	309 200	306 000	300 500
荃灣	Kwai Tsing	510 500	514 900	513 500	510 900	509 000	504 800	501 600	503 900	505 900	502 300	496 900
葵青	Tsuen Wan	305 100	306 600	308 600	312 200	311 100	312 500	315 200	313 600	305 800	302 800	299 700
屯門	Tuen Mun	497 600	504 300	504 100	507 000	519 500	520 900	528 600	537 800	550 100	551 400	556 100
元朗	Yuen Long	601 100	612 600	632 300	643 300	650 800	661 800	665 900	676 100	671 000	680 100	685 200
北區	North	308 300	315 200	315 600	315 600	315 800	314 300	320 000	318 300	350 800	352 300	378 500
大埔	Tai Po	365 800	370 500	374 800	378 900	320 500	320 800	327 600	340 600	353 300	376 700	381 000
沙田	Sha Tin	652 600	664 600	684 800	693 500	694 100	704 600	715 800	721 600	724 000	722 100	721 100
西貢	Sai Kung	451 600	460 100	465 200	473 000	481 600	485 500	490 200	506 000	519 300	527 800	534 700
離島	Islands	147 400	148 800	149 900	160 400	164 500	178 600	180 500	179 400	185 300	183 800	185 500
香港島	*Hong Kong Island*	*1 266 100*	*1 256 400*	*1 250 300*	*1 248 100*	*1 245 500*	*1 236 400*	*1 228 700*	*1 220 800*	*1 197 700*	*1 192 900*	*1 194 200*
九龍	*Kowloon*	*2 104 800*	*2 104 600*	*2 214 700*	*2 237 600*	*2 250 900*	*2 278 500*	*2 309 300*	*2 313 100*	*2 310 400*	*2 323 300*	*2 327 200*
新界	*New Territories*	*3 980 200*	*3 837 400*	*3 888 900*	*3 934 200*	*3 966 400*	*4 005 300*	*4 045 300*	*4 097 300*	*4 165 600*	*4 199 500*	*4 236 600*
新市鎮	*New Towns*	*3 389 800*	*3 439 600*	*3 471 700*	*3 505 400*	*3 527 800*	*3 552 700*	*3 589 300*	*3 629 200*	*3 668 200*	*3 687 400*	*3 689 600*
其他地區	*Other Areas*	*590 500*	*398 400*	*417 300*	*429 400*	*438 600*	*452 800*	*456 000*	*468 100*	*497 400*	*511 900*	*547 600*
總上總計	Land Total	7 241 000	7 297 800	7 353 800	7 410 500	7 462 800	7 518 200	7 574 300	7 625 200	7 673 100	7 715 600	7 755 200
加：水上人口	Plus : Marine Population	700	800	800	800	700	700	700	700	700	700	700
合計	Whole Territory	7 241 700	7 298 600	7 354 500	7 411 300	7 463 500	7 518 900	7 575 000	7 625 900	7 673 700	7 716 100	7 755 800

基年估計 Base year estimates.

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30839-0001
Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po - Traffic Forecast in Year 2045 for the Noise Impact Assessment Purpose

Appendix B

Locations for Traffic Forecast

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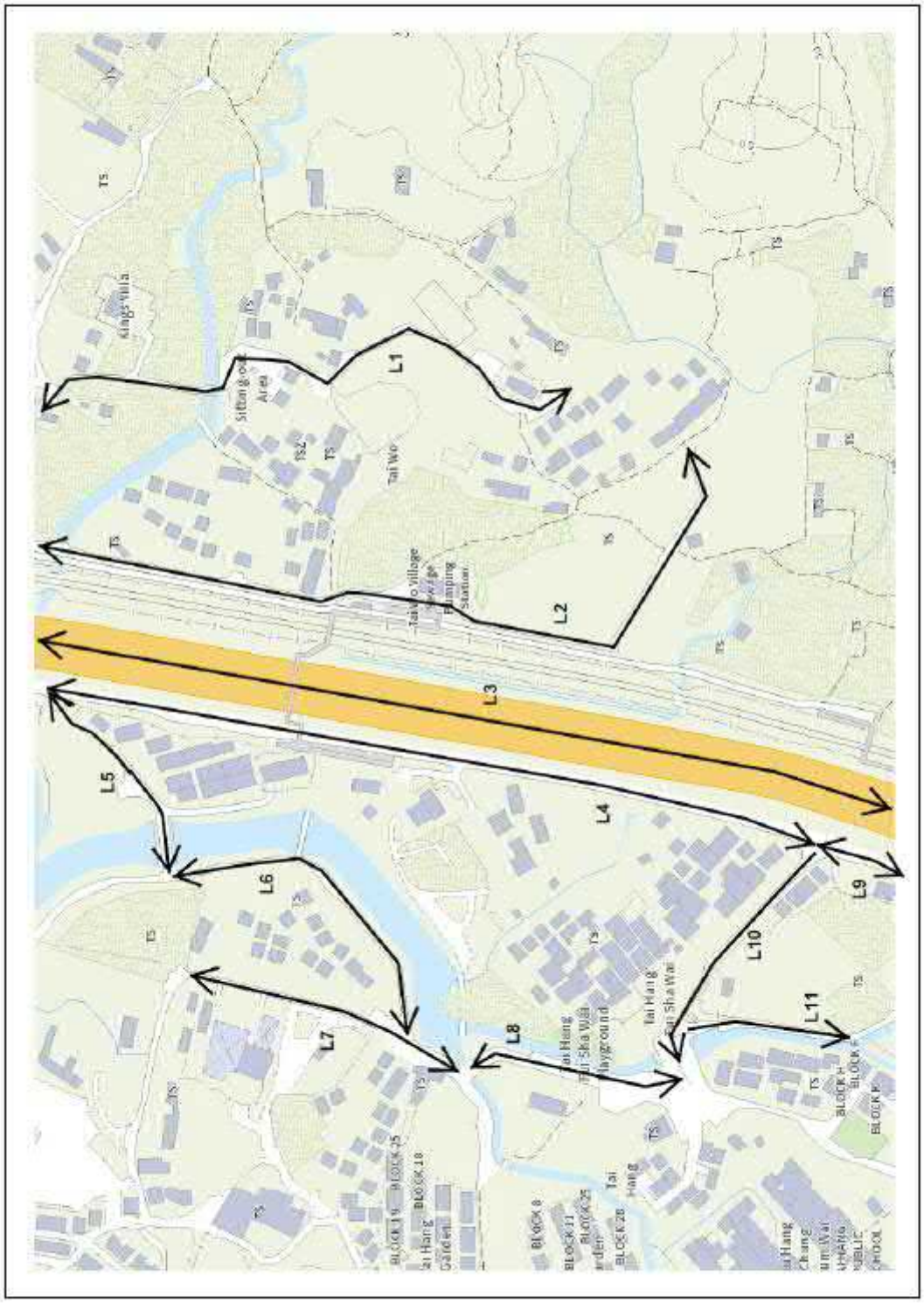

L1
L2
L3
L4
L5
L6
L7
L8
L9
L10
L11
Tai Wo
Tai Wo Village
Tai Hang
Tai Sha Wan
Playground
BLOCK 19
BLOCK 25
BLOCK 18
BLOCK 8
BLOCK 11
BLOCK 28
BLOCK H
BLOCK K

Figure H.2 2nd Submission of Traffic Forecast to Transport Department

AXON CONSULTANCY

- Transport Modelling
- Pedestrian Modelling
- Traffic Engineering
- Transportation Planning
- Traffic Impact Assessment
- Temporary Traffic Management
- Geographical Analysis System

05 September 2019
Our Ref: 30839-0002
Your ref: (NC1E5) in TD NR157/161/TPDD-7

Transport Department
NT Regional Office
Traffic Engineering (NTE) Division
Project & Tai Po Section
9/F, Mongkok Government Offices
30 Luen Wan Street, Mongkok
Kowloon

By Hand & Email
(alexthlam@td.gov.hk)

Attn: Mr. LAM Tack Ho, Alex (Engr /Tai Po 3)

RE: Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po
Traffic Forecast in Year 2045 for the Noise Impact Assessment Purpose – Responses to Departmental Comments

Dear Mr. LAM,

With reference to the comments from the Transport Department dated 21 August 2019, the responses to departmental comments are enclosed herewith for your satisfaction and obtaining your approval.

Should you have any queries, please do not hesitate to contact the undersigned at 2258 6392.

Yours sincerely,

Sam Fung

Encl.
cc: Wilson Acoustics Limited (Attn: Peter Wong (by email: peter.wong@wal.hk))

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http://www.axonhk.com

Page 1 of 1

Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po
Responses to TD Comments

Departmental Comments Dated 21 August 2019 (via Transport Department)	Responses
a. Table in paragraph 1 shows 3 stations in the Annual Traffic Census Reports. Please explain the rationale of choosing these 3 stations.	Noted. With reference to EIAO Guidance Note No. 12/2010, a spatial study scope of 300m is commonly used in Road Traffic Noise Impact Assessment. The submitted traffic forecast considered all counting stations which encompass the 300m spatial study scope, i.e. Station no. 5507 and 5461. An indicative figure is enclosed herewith as **Annex A** for your reference.
b. Please explain the reason for using an average growth rate of the 3 selected stations instead of using the highest and growth rate 2.7% of station no. 6097 at Tai Wo Service Road East.	Noted. As mentioned in comment (a), the 2 selected stations cover the road link sections of the spatial study scope. Due to the updates on station selection, Station no. 6097 would not be considered. Instead of using the highest growth rate of a station, the overall average growth rate of 1.3% appraised the traffic volume observed by the 2 selected stations. The updated traffic data is enclosed herewith for your review.
c. Please advise the source of the planning data as shown in Appendix A, as it is different from the data available on the Planning Department website.	Noted. The updated planning data is sourced from the report "Projections of Population Distribution 2019-2028", publicized by Planning Department on July 2019. The population growth from "Projected Population by District Council District, 2019-2028" is enclosed as **Annex B** for your review.
d. Please review the figure in the table in paragraph 2.	Noted. The mentioned table is updated for your review and approval.

Station No.	2009	2009	2010	2011	2012
5507/ Tai Wo Service Rd W	5740	5010 (-12.7%)	5230 (4.4%)	5360 (2.5%)	5330 (-0.6%)
5461/ Fanling Highway	80920	77680 (-4%)	78110 (1.9%)	80280 (1.5%)	79490 (-1%)

Station No.	2013	2014	2015	2016	2017	Average growth p.a.
5507/ Tai Wo Service Rd W	5370 (0.8%)	5090 (-5.2%)	5400 (6.1%)	5620 (4.1%)	5540 (-1.4%)	-0.4%
5461/ Fanling Highway	82840 (4.2%)	87120 (5.2%)	87930 (0.9%)	92880 (5.6%)	92220 (-0.7%)	1.5%
					Overall Average	1.3%

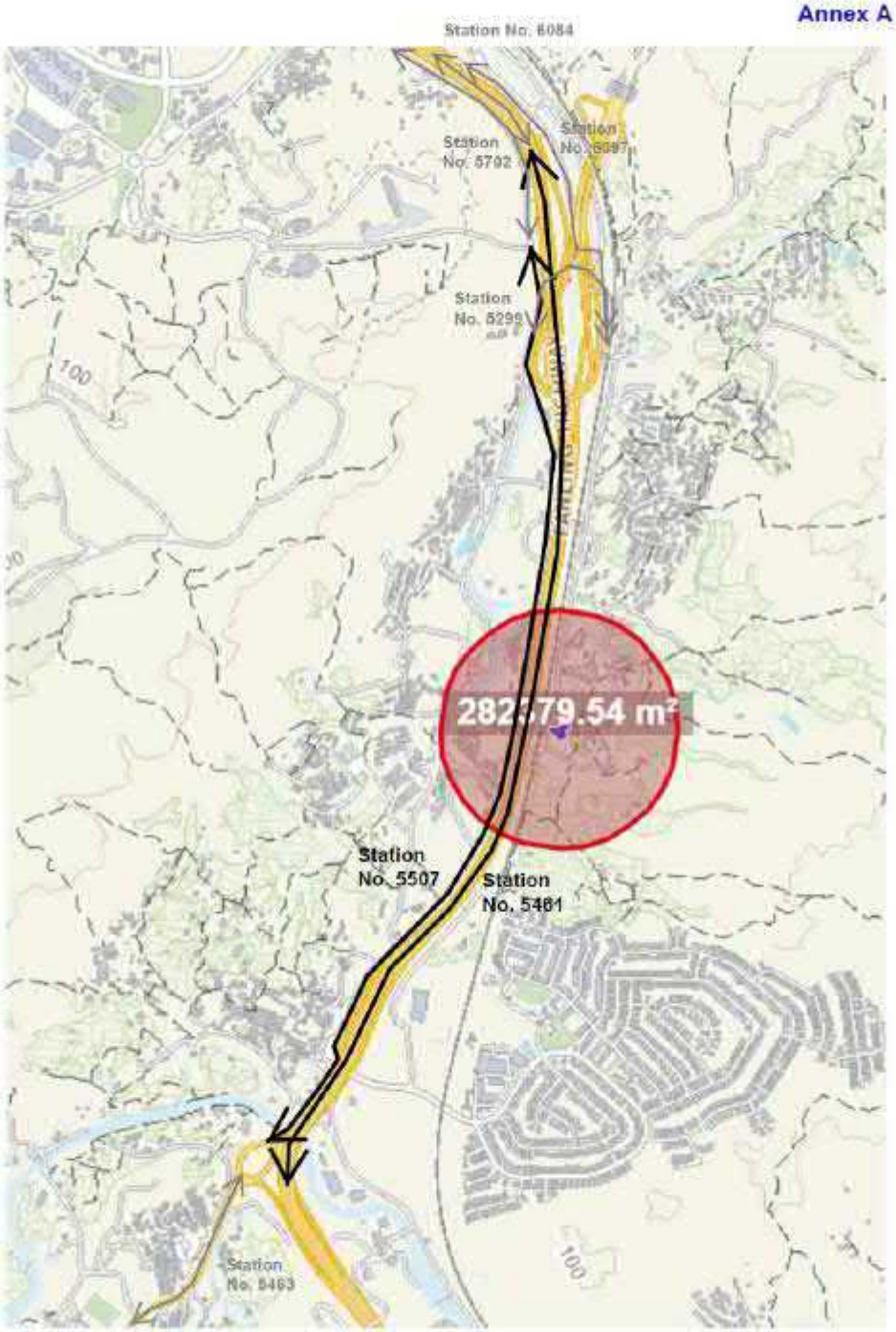
Planning Data District	Year 2016#	Year 2028	Growth Rate p.a. (%)
Tai Po	310500	357300	1.4%

base year estimation

Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po
Responses to TD Comments

e. Table in paragraph 3, please review the speed limit of Fanling Highway (both bounds).	Noted. As the maximum speed limit of Fanling Highway (road section between Tai Hang and Wo Hop Shek Interchange) is 100km/h, for conservative approach, the maximum speed would be considered for the noise impact assessment.
f. Table in paragraph 3 only show the peak hour traffic flow in year 2045, data of traffic flow of existing scenario should be included for information.	Noted. The observed peak hour traffic flow and the updated design peak hour traffic flows are enclosed herewith as Annex C for your review and approval.

Annex A


Station No. 6084
Station No. 5792
Station No. 5097
Station No. 5299
100
282579.54 m²
Station No. 5507
Station No. 5461
Station No. 5463
100

Annex B

表 1：二零一九年至二零二八年按區議會分區劃分的人口推算數字

Table 1 : Projected Population by District Council District, 2019-2028

(位年中計算 as at mid-year)

區議會分區/主要發展區 District Council District/ Broad Area	2018 a	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
中西區 Central and Western	245 600	242 200	239 500	236 000	231 400	228 700	226 100	223 000	219 600	216 500	212 200
灣仔 Wan Chai	182 100	178 600	175 700	173 400	167 800	166 700	164 400	161 500	156 600	153 700	150 600
東區 Eastern	551 300	548 500	547 800	546 000	536 100	532 200	530 600	524 400	517 700	512 500	503 500
南區 Southern	273 100	270 700	269 500	267 800	266 100	266 300	268 300	268 400	271 000	280 500	290 500
深水埗 Sham Shui Po	403 500	428 800	447 800	458 300	460 400	463 100	470 800	469 500	469 300	466 500	462 300
九龍城 Kowloon City	420 300	424 800	429 400	427 800	427 700	431 200	446 000	452 600	452 400	460 900	457 100
黃大仙 Wong Tai Sin	423 100	420 300	425 300	427 100	426 700	427 600	431 800	430 000	429 500	427 500	429 300
觀塘 Kwun Tong	682 800	695 300	695 600	698 200	700 600	703 900	705 300	718 200	722 400	725 300	730 400
油尖旺 Yau Tsim Mong	335 500	329 700	328 100	324 700	318 400	315 300	313 700	309 300	303 900	300 900	295 500
葵青 Kwai Tsing	514 800	510 800	509 900	508 200	506 000	512 900	518 300	516 600	512 400	508 300	506 800
荃灣 Tsuen Wan	314 700	314 700	316 800	315 700	310 800	307 300	305 900	302 500	297 700	296 800	294 700
屯門 Tuen Mun	502 700	504 600	508 600	513 600	525 800	549 700	559 700	571 700	578 300	578 800	581 700
元朗 Yuen Long	641 000	650 800	650 700	656 600	662 300	664 300	665 000	684 300	710 700	716 500	718 600
北區 North	318 400	317 600	325 100	326 000	360 400	364 400	368 200	369 900	372 600	388 200	421 500
大埔 Tai Po	310 500	308 600	312 200	325 500	333 000	349 100	352 900	352 400	353 600	359 700	357 300
沙田 Sha Tin	685 500	692 500	700 000	717 800	716 400	721 000	717 700	718 300	713 500	711 000	704 700
西貢 Sai Kung	471 900	474 100	481 100	495 400	501 500	505 000	508 800	521 000	523 500	526 700	543 100
離島 Islands	172 200	188 600	188 000	189 200	196 300	195 500	194 300	193 900	217 700	228 600	235 100
香港島 *Hong Kong Island*	*1 252 100*	*1 240 700*	*1 232 500*	*1 223 200*	*1 201 400*	*1 194 100*	*1 189 400*	*1 177 400*	*1 163 000*	*1 163 100*	*1 156 700*
九龍 *Kowloon*	2 265 100	2 299 000	2 326 100	2 346 000	2 333 300	2 341 000	2 367 500	2 379 600	2 377 500	2 384 000	2 374 700
新界 *New Territories*	3 932 700	3 962 400	3 998 400	4 048 300	4 121 400	4 169 200	4 190 500	4 230 700	4 281 800	4 314 500	4 362 900
新市鎮 *New Towns*	3 495 600	3 511 500	3 546 000	3 595 000	3 639 500	3 684 900	3 697 400	3 709 700	3 725 900	3 747 600	3 763 300
其他地區* *Other Areas**	437 000	450 900	452 400	453 100	481 900	484 400	493 100	521 000	555 800	566 900	599 600
陸上總計 Land Total	7 449 800	7 501 400	7 557 000	7 607 300	7 656 600	7 704 400	7 747 400	7 787 700	7 824 200	7 858 600	7 894 200
加：水上人口 Plus : Marine Population	1 200	1 100	1 100	1 100	1 100	1 100	1 100	1 100	1 000	1 000	1 000
全港 Whole Territory	7 451 000	7 502 600	7 558 100	7 608 400	7 657 700	7 705 400	7 748 400	7 788 700	7 825 200	7 859 600	7 895 200

基年估計 Base year estimates.

* 「其他地區」的數字亦包括新市鎮擴展區及主要新發展區以外的人口。

Figures for "Other Areas" also include the projected population for New Town Extension and major New Development Areas up to relevant years.

Annex C

Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po
Responses to TD Comments

After considering the historical data and future planning data, for the purpose of conservative assessment, the annual growth rate of +1.4% was applied. The future traffic flows of road links up to Year 2045 per annum were hence obtained. The anticipated traffic flows for Year 2045 are tabulated as follows.

	ID	Year 2019		Year 2045		Speed, km/hr
		Observed Peak Hour Traffic Flow, veh/hr	% of Heavy Vehicles	Design Peak Hour Traffic Flow, veh/hr	% of Heavy Vehicles	
L1	Access Road A_NB	24	4%	34	3%	50
	Access Road A_SB	23	0%	33	0%	50
L2	Tai Wo Service Road East_NB	9	0%	15	0%	50
	Tai Wo Service Road East_SB	16	6%	26	4%	50
L3	Fanling Highway_NB	3055	15%	4499	15%	100
	Fanling Highway_SB	2873	15%	4231	15%	100
L4	Tai Wo Service Road West_NB	244	12%	353	12%	50
	Tai Wo Service Road West_SB	232	12%	335	12%	50
L5	Access Road B_EB	51	2%	73	1%	50
	Access Road B_WB	42	2%	60	2%	50
L6	Access Road C_NB	49	4%	70	4%	50
	Access Road C_SB	41	5%	59	3%	50
L7	Access Road D_NB	35	11%	51	12%	50
	Access Road D_SB	18	6%	26	4%	50
L8	Access Road E_NB	63	8%	90	8%	50
	Access Road E_SB	19	5%	28	4%	50
L9	Tai Wo Service Road West_NB	306	11%	442	11%	50
	Tai Wo Service Road West_SB	218	12%	315	12%	50
L10	Access Road F	76	7%	109	6%	50
L11	Access Road G	8	0%	11	0%	50

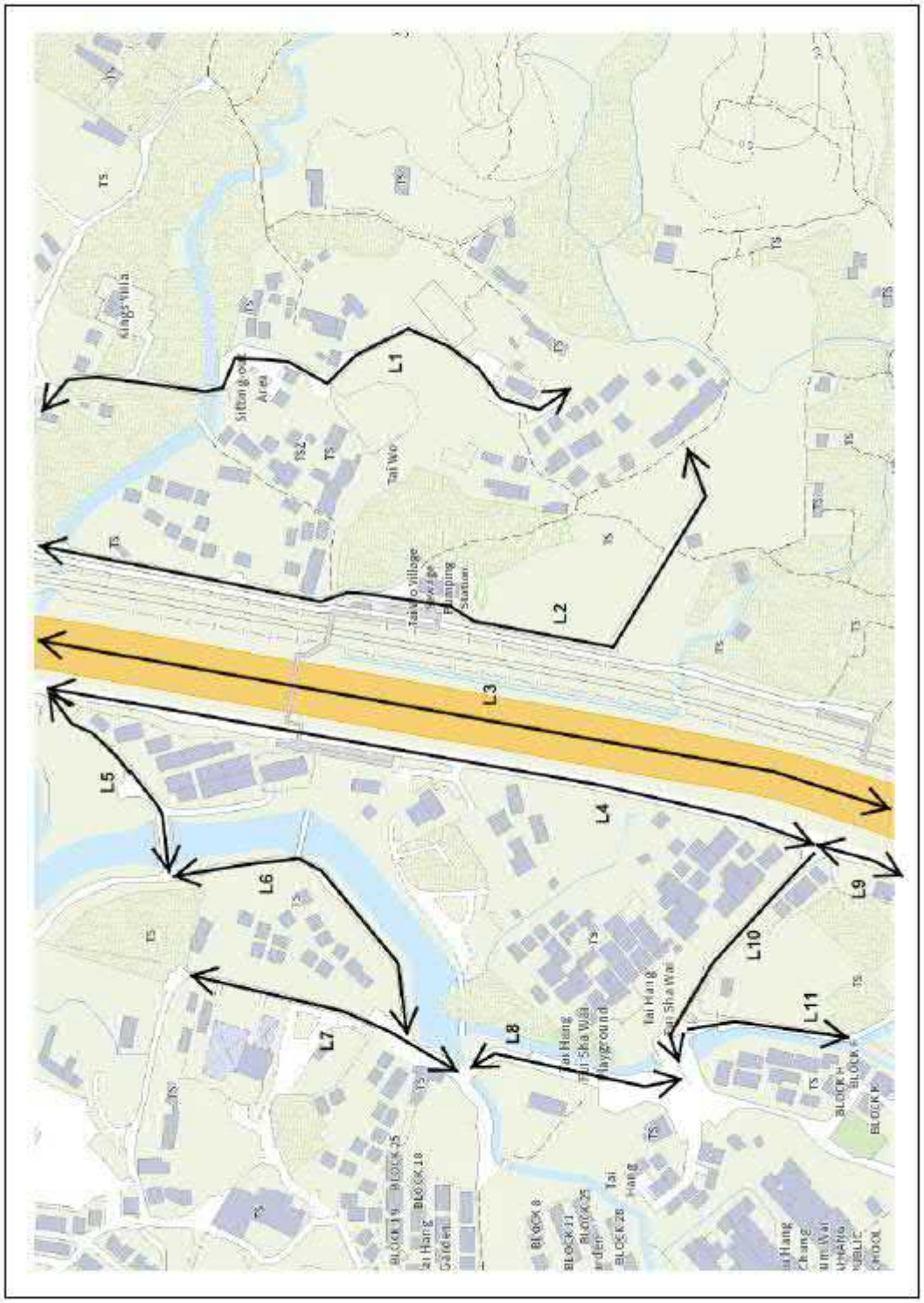

L1
L2
L3
L4
L5
L6
L7
L8
L9
L10
L11
Tai Wo
Tai Wo Village
Tai Wo Playground
Tai Hang
Tai Sha Wan
Tai Hang Playground
Tai Hang Garden
BLOCK 19
BLOCK 25
BLOCK 18
BLOCK 8
BLOCK 11
BLOCK 28
BLOCK H
BLOCK J
BLOCK K

Figure H.3 Response from Transport Department

By Fax and by Post
3020 0321

運輸署
Transport Department

本署檔案	Our Ref.	: (NCBE3) in TD NR137/161/TPDD-7
來函檔號	Your Ref.	: 30839-0002
電話	Tel.	: 2399 2731
圖文傳真	Fax	: 2381 3799
電郵	Email	: alexthlam@td.gov.hk

24 September 2019

AXON Consultancy Limited
Unit 503, 5/F, Tower 2
Lippo Centre, Admiralty, Hong Kong
(Attn.: Mr. Sam FUNG)

Dear Mr. FUNG,

Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po
Traffic Forecast in Year 2045 for the Noise Impact Assessment Purpose –
Responses to Departmental Comments

We refer to your above letter dated 5 September 2019, please note that we have no further comments from traffic engineering viewpoint.

Yours faithfully,

(LAM Tack-ho)
for Commissioner for Transport

新界分區運輸處
NT Regional Office
九龍旺角聯合道三十號旺角政府合署七樓
7th Floor, Mong Kok Government Offices, 30 Luen Wan Street, Kowloon.
圖文傳真 Fax No.: 2381 3799 (新界署) (NTRO)
網址 Web Site: http://www.td.gov.hk

Appendix H.

Layout of Road Noise Barrier

Figure H.1 Layout in Drawing no. 798/GA/T/13001 under Contract no. HY/2012/06

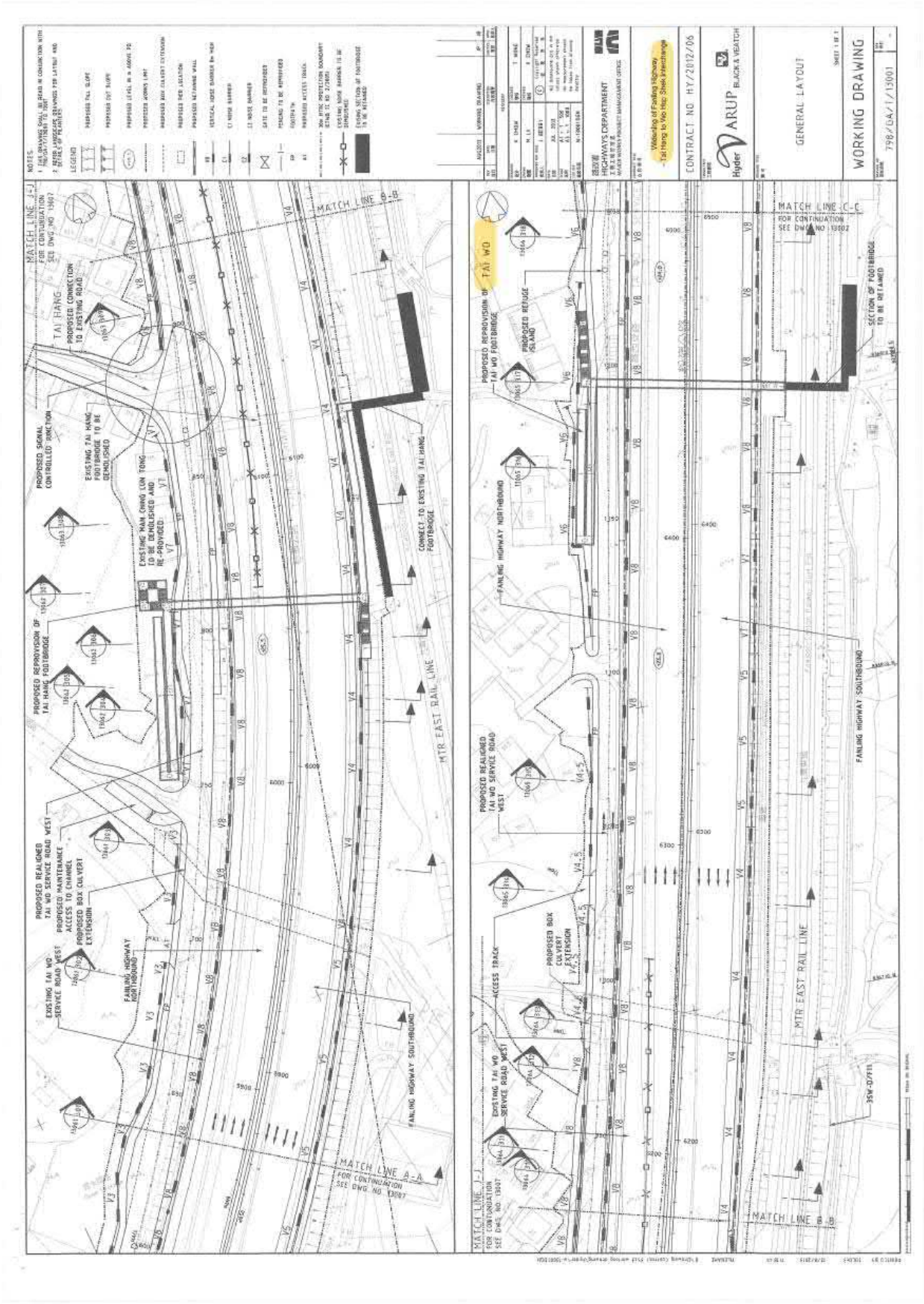
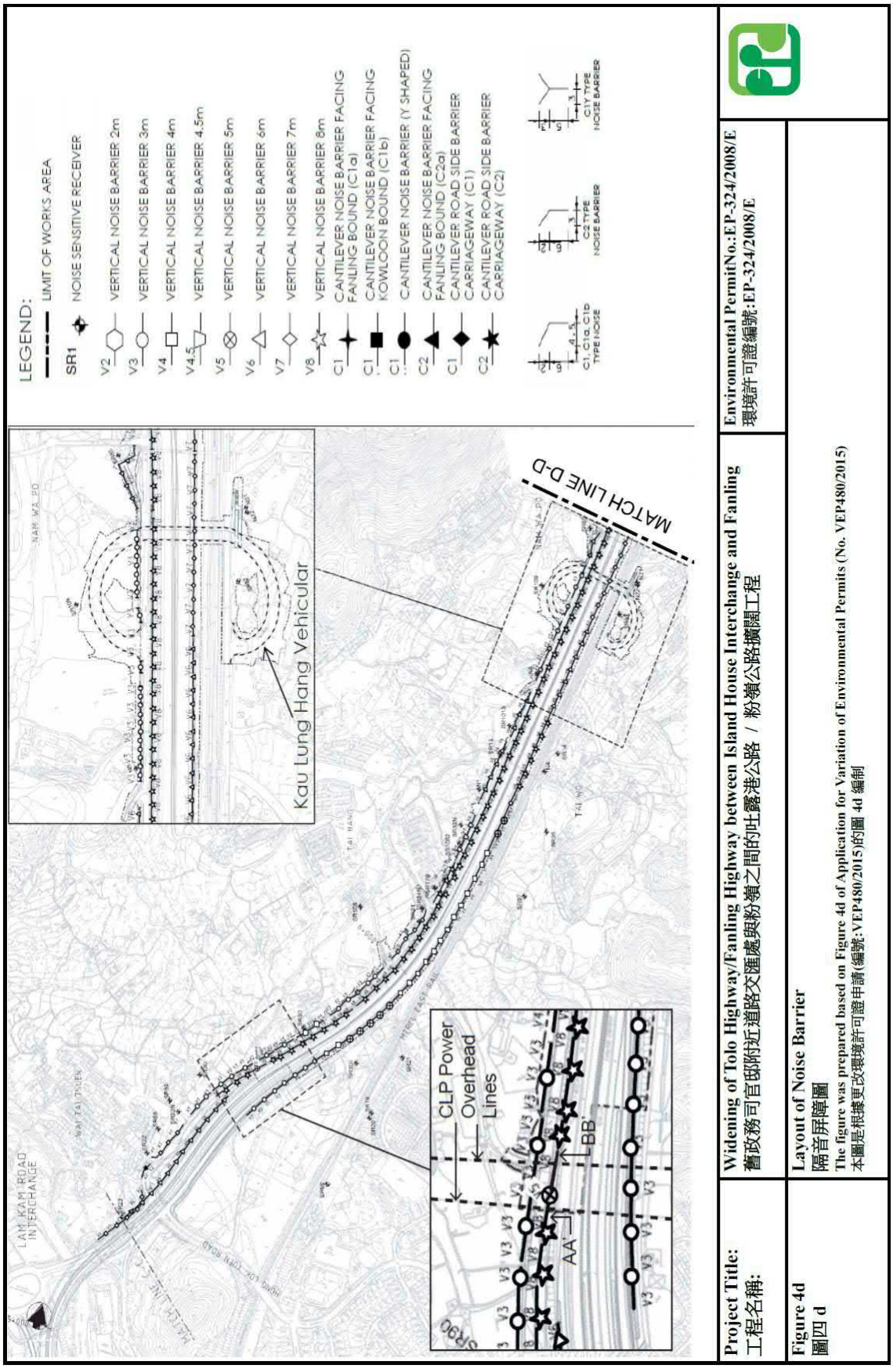


Figure H.2 Layout of Noise Barrier in EP-324/2008/E



Wilson Acoustics Limited

Unit 601, Block A, Shatin Industrial Centre,
5 - 7 Yuen Shun Circuit, Shatin, NT
Tel: (852) 3188-1170, Fax: (852) 3422-8117
E-mail: who@wal.hk
Web: www.wal.hk

Proposed 10 Houses (Exempted House-Small House) in D.D.7, Tai Wo, Tai Po
Noise Assessment Report

Report No.: 18346-12

For

Fame Best Development Limited
Room 906, Yuen Long Commercial Centre, 18-24 Kau Yuk Road
Yuen Long, New Territories
Hong Kong

Approved by:



Ir. Morgan Cheng
CEng, MHKIOA, MIOA, MHKIQEP, BEAM Pro (NB), MIMechE

Prepared by: PW

29 Jun 2021

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1. Introduction

Wilson Acoustics Limited (WAL) was commissioned by Fame Best Development Limited (Client) to prepare a noise impact assessment report as supplementing information to support town planning application. This report presents the evaluation of noise impacts from both railway noise and road traffic noise to the noise sensitive receivers (NSRs) at the proposed 10 Houses (Exempted House-Small House) in D.D.7, Tai Wo, Tai Po.

2. Site Location

The development site is planned and sited next to the MTR East Rail Line. Also, Fanling Highway is located in parallel with and next to the MTR East Rail Line. The site is located in a rural area and is mainly subjected to railway noise. The site plan is shown in **Appendix A.**

3. Noise Assessment Criteria

According to Traffic Census 2018, Fanling Highway (from Lam Kam Road Interchange to Kau Lung Hang Lo Wai) would be the major road (IF). As roadside noise barrier are built between Fanling Highway and MTR East Rail Line, the road traffic noise from Fanling Highway is not noticeable to the NSR, and railway noise would be the dominant noise source. Therefore, the Area Sensitive Ratings (ASR) of "A" is adopted in this noise assessment.

Table 3.1 Noise Assessment Criteria

Period	Noise Criteria		
	Railway Noise		Road Traffic Noise
	NCO	HKPSG	
Day and Evening	$L_{Aeq,30min}$ = 60 dB(A)	N/A	N/A
Night	$L_{Aeq,30min}$ = 50 dB(A)	L_{Amax} = 85 dB(A)	N/A
Full Day	N/A	$L_{Aeq,24hr}$ = 65 dB(A)	Peak $L_{10,1hr}$ = 70 dB(A)

4. Railway Noise Assessment

4.1. Railway Noise Assessment Methodology

4.1.1. Assessment Approach

The railway noise levels are assessed using the noise prediction calculation methodology under Calculation of Railway Noise (CRN) by Department of Transport UK, to determine the compliance with the noise limits at NSRs.

4.1.2. Source Term Noise Data

Noise measurement were conducted to obtain updated passenger trains noise as source term for railway noise assessment associated with the development site town planning application. Details and results are shown in **Appendix B**.

4.1.3. Train Operation Parameters

Train operation parameters for railway noise have been provided to the previous acoustic consultant from the MTRC in 2016. To confirm whether there is any update to the parameters, a letter was sent to the MTRC for clarification in Jul 2019, the letter was attached in **Appendix C** for reference. The reply was showed in **Appendix D.**

In the reply, the only thing mentioned for update was the operation parameters for Intercity Through Train (ITT), which should be referred to the MTRC webpage (https://www.it3.mtr.com.hk/b2c/frmScheduleGuangdong.asp?strLang=Eng) as captured in **Appendix E**. There is no scheduled ITT during the night-time assessment period, i.e. 2300 to 0700 hrs.

Other assessment assumptions for air-borne railway noise parameters and correction factors are listed in **Appendix F**.

4.1.4. Construction/Occupation Sequences

It is advised that House no.10 will be built/occupied after construction of House no.9. The noise shielding effect can be considered in the noise assessment. For other houses, in order to allow more flexibility in construction/occupation sequence, no shielding effect of other houses is considered in the noise assessment.

4.1.5. Planned Completion Year(s)

Based on the assumption that Client could get all necessary authorities' permissions and start construction of the houses on year 2025. The planned completion year(s) for House no. 1 to 9 will be in year 2028 - 2029, and for House no.10 will be in year 2030.

4.1.6. Assessment Points

All noise levels at 1m from exterior façade of the noise sensitive uses(i.e bedrooms, living/dining rooms) which rely on opened windows for ventilation were assessed. All prescribed windows for ventilation and noise assessment points are shown in **Appendix A.**

4.2. Railway Noise Assessment Results

4.2.1. Assessment Results

The assessment results for selected assessment points are presented in **Appendix F** and summarized as below. All predicted noise levels are in compliance with the noise criteria in **Table 3.1**.

Drawings for checking angle-of-view correction are also provided in **Appendix F**.

Table 4.1 Railway Noise Assessment Results against NCO Criteria, dB(A)

Assessment Point	Day and Evening				Night			
	Criteria, $L_{Aeq,30min}$	Prediction, $L_{Aeq,30min}$			Criteria, $L_{Aeq,30min}$	Prediction, $L_{Aeq,30min}$		
		G/F	1/F	2/F		G/F	1/F	2/F
H1P1	60	46.9	48.1	49.5	50	44.4	45.6	46.9
H1P2		48.0	49.2	50.7		45.5	46.7	48.1
H1P3		36.5	37.7	39.0		34.0	35.2	36.5
H2P1		46.2	47.2	48.4		43.7	44.7	45.9
H2P2		47.2	48.3	49.6		44.7	45.8	47.0
H2P3		33.9	34.8	35.9		31.4	32.3	33.4
H3P1		47.5	48.8	50.4		45.0	46.3	47.9
H3P2		48.5	49.9	51.5		46.0	47.3	49.0
H3P3		38.0	39.3	40.9		35.5	36.8	38.4
H4P1		46.9	48.0	49.3		44.3	45.5	46.8
H4P2		47.8	48.9	50.4		45.3	46.4	47.8
H4P3		36.7	37.8	39.1		34.2	35.3	36.6
H5P1		43.4	45.7	49.0		40.9	43.2	46.5
H5P2		37.3	39.6	42.9		34.8	37.1	40.3
H5P3		- [1]				- [1]		
H6P1		- [1]				- [1]		
H6P2		41.9	43.9	46.7		39.4	41.4	44.1
H6P3		43.6	45.6	48.3		41.1	43.1	45.8
H6P4		- [1]				- [1]		
H7P1		- [1]				- [1]		
H7P2		41.0	42.7	44.8		38.5	40.2	42.3
H7P3		42.8	44.5	46.6		40.3	42.0	44.0
H7P4		- [1]				- [1]		
H8P1		- [1]				- [1]		
H8P2		40.0	41.3	43.0		37.5	38.8	40.5
H8P3		42.0	43.3	45.0		39.5	40.8	42.5
H8P4		- [1]				- [1]		
H9P1		43.9	45.0	46.3		41.4	42.5	43.8
H9P2		43.7	44.8	46.1		41.2	42.3	43.6
H9P3		46.4	47.6	49.1		43.9	45.1	46.6
H9P4		43.1	44.3	45.8		40.6	41.8	43.3
H9P5		- [1]				- [1]		
H10P1		34.5	35.5	36.7		32.0	33.0	34.2
H10P2		35.6	36.7	37.9		33.1	34.2	35.4
H10P3		32.2	33.2	34.4		29.7	30.7	31.9
H10P4		- [1]				- [1]		

Remark: [1] No Direct line of sight to train segments.

Table 4.2 Railway Noise Assessment Results against HKPSG Criteria, dB(A)

Assessment Point	Night				Full Day			
	Criteria, L_{Amax}	Prediction, L_{Amax}			Criteria, $L_{Aeq,24hr}$	Prediction, $L_{Aeq,24hr}$		
		G/F	1/F	2/F		G/F	1/F	2/F
H1P1	85	54.3	55.7	57.3	65	43.6	44.8	46.2
H1P2		55.3	56.8	58.6		44.7	45.9	47.4
H1P3		43.5	44.7	46.4		33.3	34.4	35.7
H2P1		53.5	54.7	56.1		42.9	43.9	45.1
H2P2		54.6	55.9	57.4		44.0	45.0	46.3
H2P3		41.4	42.1	42.9		30.6	31.6	32.6
H3P1		54.8	56.4	58.4		44.2	45.5	47.1
H3P2		55.8	57.5	59.5		45.2	46.6	48.3
H3P3		45.1	46.7	48.7		34.8	36.1	37.7
H4P1		54.2	55.6	57.2		43.6	44.7	46.1
H4P2		55.1	56.5	58.2		44.5	45.7	47.1
H4P3		43.7	45.1	46.7		33.4	34.5	35.9
H5P1		50.5	53.4	57.3		40.1	42.5	45.8
H5P2		44.3	47.1	51.0		34.0	36.3	39.6
H5P3		- [1]				- [1]		
H6P1		- [1]				- [1]		
H6P2		49.1	51.5	54.8		38.6	40.6	43.4
H6P3		50.9	53.3	56.5		40.4	42.3	45.0
H6P4		- [1]				- [1]		
H7P1		- [1]				- [1]		
H7P2		48.3	50.3	52.9		37.8	39.4	41.5
H7P3		50.1	52.1	54.6		39.6	41.2	43.3
H7P4		- [1]				- [1]		
H8P1		- [1]				- [1]		
H8P2		47.2	48.9	50.9		36.7	38.0	39.7
H8P3		49.3	50.9	52.9		38.7	40.0	41.7
H8P4		- [1]				- [1]		
H9P1		51.3	52.6	54.2		40.7	41.8	43.0
H9P2		51.0	52.4	54.0		40.4	41.5	42.9
H9P3		53.8	55.3	57.1		43.1	44.4	45.8
H9P4		50.4	51.9	53.7		39.8	41.0	42.5
H9P5		- [1]				- [1]		
H10P1		41.4	42.7	44.2		31.2	32.2	33.4
H10P2		42.7	44.0	45.5		32.4	33.4	34.6
H10P3		39.1	40.2	41.7		28.9	29.9	31.1
H10P4		- [1]				- [1]		

Remark: [1] No Direct line of sight to train segments.

5. Road Traffic Noise Assessment

Fanling Highway is the major road next to the development site. Roadside noise barrier are built between Fanling Highway and MTR East Rail Line under the "Widening of Tolo Highway / Fanling Highway" project. Although road traffic noise from Fanling Highway is not noticeable to the NSR in 2018, considering future traffic flow after completion of the road widening project, the potential noise impacts due to road traffic are reviewed and assessed.

5.1.1. Assessment Model & Methodology

In road traffic noise assessment, Fanling Highway would be the major noise source. As Fanling Highway and MTR East Rail Line are in parallel, the selected assessment points are same as railway noise assessment.

The road traffic noise levels at selected assessment points were assessed by using NoiseMap Enterprise-RoadNoise which is a computing software developed based on the *Calculation of Road Traffic Noise* (CRTN) published in 1988 and adopted by many projects in Hong Kong. The graphics of the noise model are shown in **Appendix G** for reference.

Assumptions of this road traffic noise assessment are as below:

- Shielding effect of Houses due to occupation sequences are same as **Section 4.1.4**.
- The target latest occupation year will be Year 2030.
- Forecasts of traffic flow in terms of vehicle per hour (veh/hr) and percentage of heavy vehicles (% of HV) in Year 2045 which are the maximum forecasts within 15 years after occupation of the site are adopted.
- Traffic forecasts of the roads within 300m from the site are provided by the Traffic Consultant as summarized in **Appendix H**. Correspondence from Transport Department indicated that they had no comment on those traffic data appended in **Appendix H** as well.
- Input for heights of the roadside noise barrier were based on the layout in drawing no. 798/GA/T/13001 under Contract no. HY/2012/06 (**Figure I.1**), layout of noise barrier in EP-324/2008/E (**Figure I.2**), and verified by site visit.
- All the input parameters in RoadNoise are in 1 decimal place as required in CRTN.

5.1.2. Assessment Results

The predicted road traffic noise levels at selected assessment points are summarized as below:

Table 5.1 Road Traffic Noise Assessment Results against HKPSG Criteria, dB(A)

Assessment Point	Full Day			
	Criteria, Peak $L_{10,1hr}$	Prediction, Peak $L_{10,1hr}$		
		G/F	1/F	2/F
H1P1	70	48.5	49.6	50.7
H1P2		54.9	55.9	57.0
H1P3		39.8	40.6	41.4
H2P1		47.6	48.4	49.2
H2P2		54.1	54.9	55.8
H2P3		39.0	39.6	40.4
H3P1		50.7	51.7	52.6
H3P2		55.0	56.0	57.3
H3P3		39.0	39.6	40.3
H4P1		49.9	51.0	52.2
H4P2		54.5	55.3	56.4
H4P3		38.4	38.9	39.6
H5P1		46.8	47.7	48.2
H5P2		42.3	43.3	44.0
H5P3		45.5	46.3	46.9
H6P1		45.4	46.3	46.9
H6P2		48.1	49.0	49.6
H6P3		51.5	52.5	53.6
H6P4		44.8	45.6	46.4
H7P1		45.0	45.9	46.6
H7P2		47.3	48.2	48.8
H7P3		49.5	50.4	51.1
H7P4		44.7	45.6	46.4
H8P1		45.1	46.1	46.9
H8P2		47.2	48.2	48.9
H8P3		48.7	49.5	50.3
H8P4		44.2	45.2	46.2
H9P1		39.3	40.4	42.1
H9P2		32.0	32.2	33.1
H9P3		52.6	53.6	54.6
H9P4		46.0	47.1	48.0
H9P5		43.7	44.9	46.5
H10P1		52.4	55.0	58.0
H10P2		50.6	53.0	55.8
H10P3		47.4	49.3	51.9
H10P4		50.5	53.2	56.7

6. Conclusions

Noise impacts from both railway and road traffic to the noise sensitive receivers (NSRs) at the proposed 10 Houses (Exempted House-Small House) in D.D.7, Tai Wo, Tai Po were assessed in accordance with CRN and CRTN methodology respectively and compared to NCO and HKPSG criteria.

All noise levels at 1m façade to openable windows of bedroom, living /dinning room were assessed.

The target latest occupation year will be Year 2030. To allow flexibility in construction/occupation sequence, the NSRs are assessed based on the assumption of no shielding effect of other houses except for House no. 10 which requires shielding effect from House no. 9 and the occupation date will be later than that of House no. 9. Based on the assumption that Client could get all necessary authorities' permissions and start construction of the houses on year 2025. The planned completion year(s) for House no. 1 to 9 will be in year 2028 -2029, and for House no.10 will be in year 2030

Assessment results shows that both railway noise and road traffic noise are in compliance with NCO and HKPSG criteria.

Appendix A.

Site Layout Plan

Figure A.1 Layout Plan of the Development Site

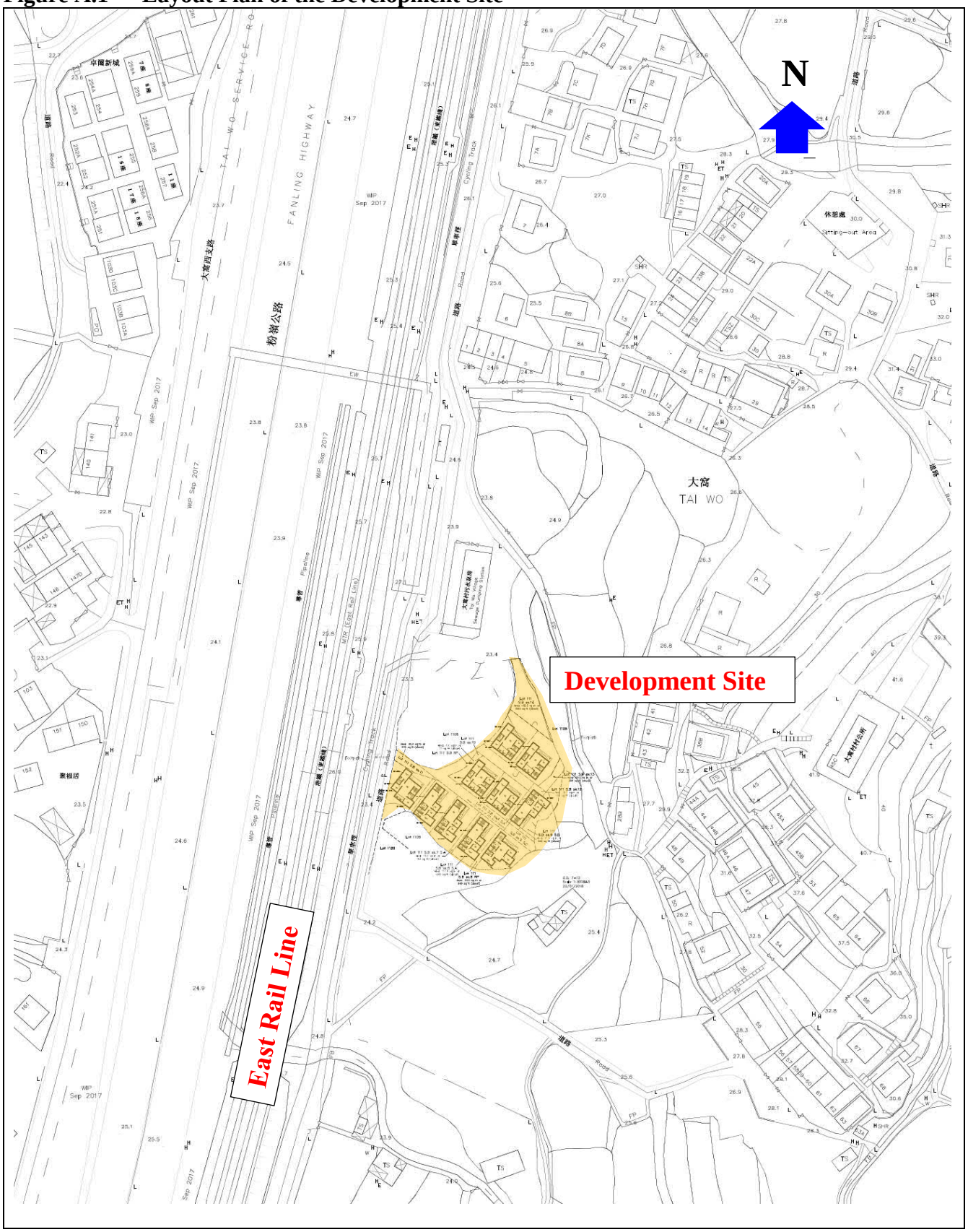
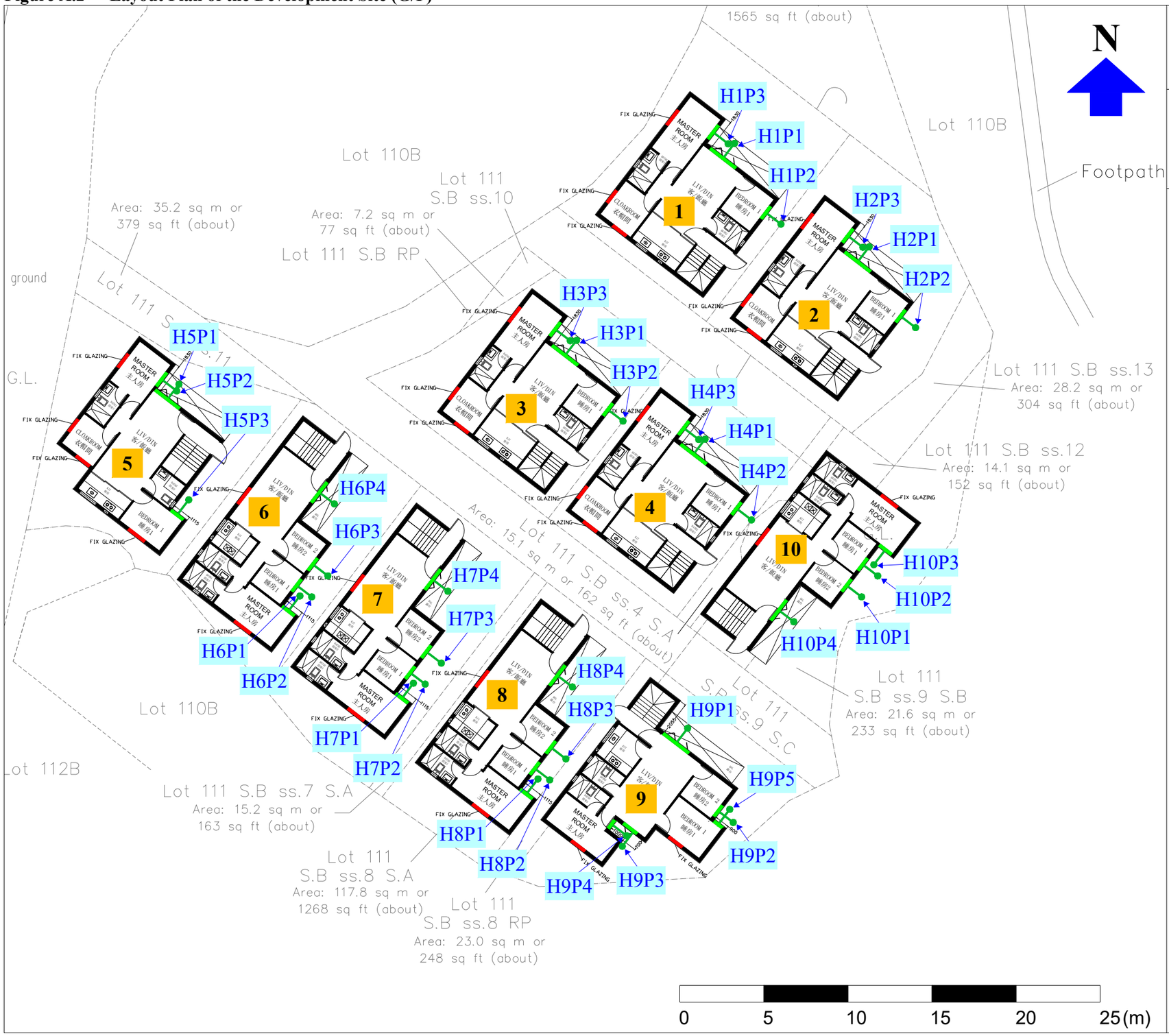


Figure A.2 Layout Plan of the Development Site (G/F)



G/F, +23.3 mPD level

Legend:
- Fixed Glazing
- Opened Window for Ventilation

Scale:
1:250
A3 Paper

Remark:

- **Entrance door of each flat will be made of solid wooden door with 45mm-50mm thick.**
- **Cloak Room: Storage for clothing and shoes, dehumidifier, air freshener machine, bedclothes, bedding, bath towel, etc. (Not for use as bedroom / other noise sensitive uses)**
- **Fixed glazing with at least 10mm thick laminated glass or other acoustically equivalent configuration**

Figure A.3 Layout Plan of the Development Site (1/F)



1/F, +26.0 mPD level

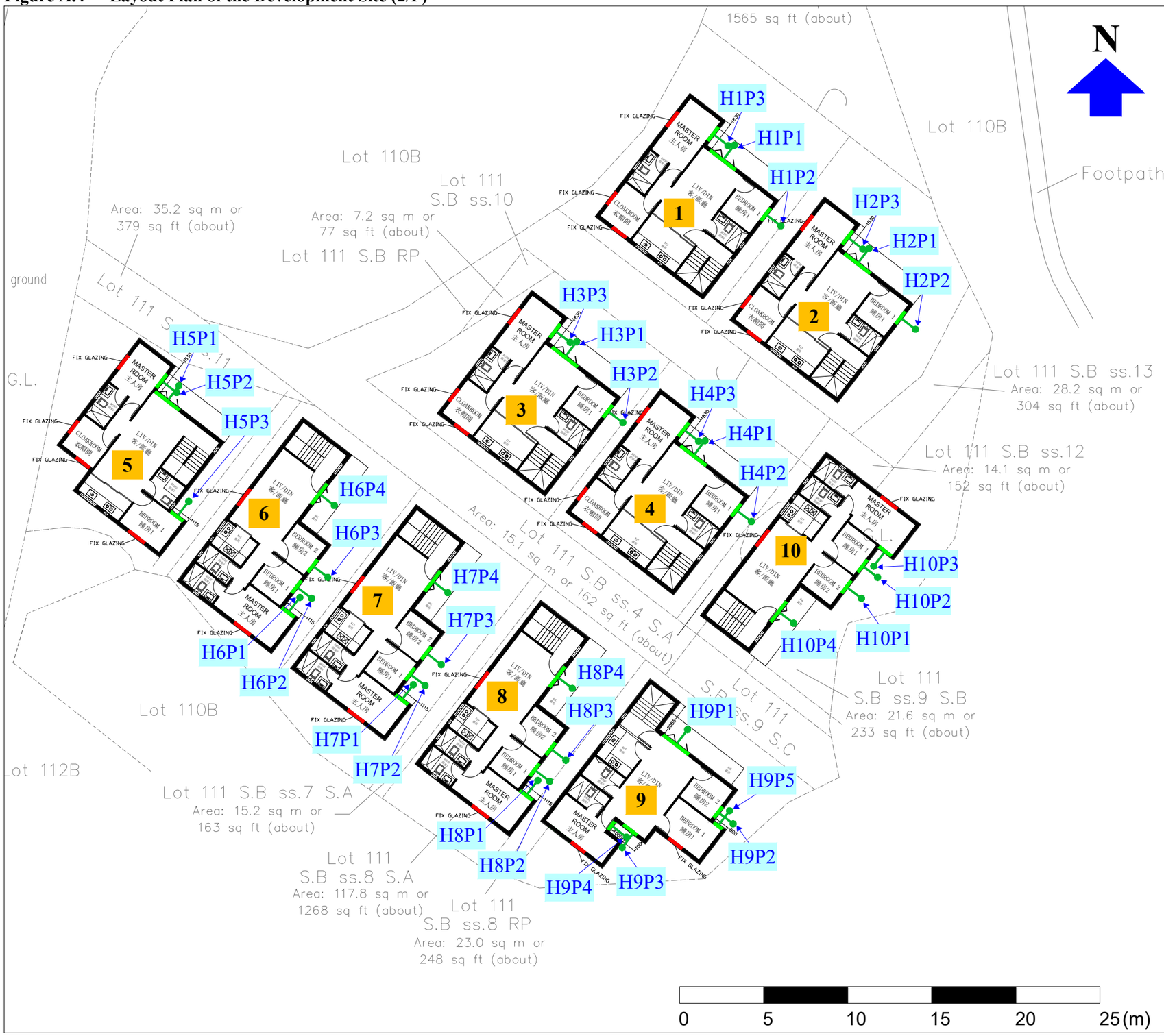
Legend:
- Fixed Glazing
- Opened Window for Ventilation

Scale:
1:250
A3 Paper

Remark:

- **Entrance door of each flat will be made of solid wooden door with 45mm-50mm thick.**
- **Cloak Room: Storage for clothing and shoes, dehumidifier, air freshener machine, bedclothes, bedding, bath towel, etc. (Not for use as bedroom / other noise sensitive uses)**
- **Fixed glazing with at least 10mm thick laminated glass or other acoustically equivalent configuration**

Figure A.4 Layout Plan of the Development Site (2/F)



2/F, +28.7 mPD level

Legend:
- Fixed Glazing
- Opened Window for Ventilation

Scale:
1:250
A3 Paper

Remark:

- **Entrance door of each flat will be made of solid wooden door with 45mm-50mm thick.**
- **Cloak Room: Storage for clothing and shoes, dehumidifier, air freshener machine, bedclothes, bedding, bath towel, etc. (Not for use as bedroom / other noise sensitive uses)**
- **Fixed glazing with at least 10mm thick laminated glass or other acoustically equivalent configuration**

Appendix B.

Source Term Measurement

B.1. Measurement Location

The track section at the side of the proposed small houses development site was installed with trackside barriers which is not appropriate for source term measurement. On the opposite side (northbound), although without trackside barriers, it belongs to a highway construction site region which was not accessible.

Considering practicability and appropriateness, a location at northbound side near Hon Lok Yuen was chosen for noise measurement, as shown in **Figure B.1**.

The measurement method is making reference to CRN Calculation of Railway Noise 1995.

B.1.1 Measurement Location Justification

The measurement location and Tai Wo has similar properties in below aspect.

Similar Train Speed

The average train speed at the measurement location is similar to that at Tai Wo, (i.e. both are at 95 +/- 5 kph).

Trackform

Both trackform are ballast track.

Track Alignment

Track alignment at the measurement location and that at Tai Wo are both straight track.

With above similarity and common points, the source terms measurement results obtained is considered suitable to be adopted in this railway noise assessment

In addition, although the source term of northbound and southbound may be different, the higher averaged value amongst northbound and southbound train noise will be adopted as the source term for noise prediction which is on conservative side.

B.1.2 Microphone Position

The microphone was set at 1.2m above rail top level.

Figure B.1 Measurement Location



Figure B.2 Microphone Setup Photos





B.2. Measurement Schedule

The source term measurement conducted in two separate days are summarized as below:

Table B.1 Measurement Schedule

Date	Time	Weather Condition	Wind speed	Remark
09 Aug 19	1330-1530 hrs	Fine	<5 m/s	To obtain EMU and ITT noise data
27 Aug 19	2000-2215 hrs	Fine	<5 m/s	To capture more ITT noise data

B.3. Measurement Results

The measured average SEL is summarized in **Table B.2**. The details of measurement results are shown in **Table B.4**.

Table B.2 Summary of Averaged SEL

Type	Northbound			Southbound		
	SEL	Avg. Speed	Dist. to Mic (m)	SEL	Avg. Speed	Dist. to Mic (m)
MLR	89.7	91	12	81.9	90	16
SP1900	84.8	92	12	75.9	82	16
ITT	91.3	52	12	89.6[1]	41	16

Remark:
[1] As single passby events of ITT were not available during 27 Aug 2019 measurement, the value here is the logarithmic average of SELs of 1 Southbound ITT event on 09 Aug 2019 and 2 double passby events of Southbound ITT on 27 Aug 2019 (refer to Table B.4 for details). By adopting the double passby events in evaluation of the averaged SEL will only make the value on high and conservative side.

The SELs normalized to a distance of 25m and speed of 120 kph for assessment are summarized in **Table B.3**:

Table B.3 Normalized SEL (120 kph, at 25m for different Train Type)

Train Type	Northbound	Southbound	SEL, adopted in Railway Assessment[1]
MLR	89.0	82.5	89.0
SP1900	83.9	77.2	
Intercity Through Train (ITT)	95.4	97.0	97.0

Remark:
[1] For a conservative approach, higher averaged SEL between Northbound and Southbound was adopted.

Table B.4 Detailed Source Team Measurement Results

Time	Time Period	Event Time	Train Type	Train Direction	Time Speed, kph	No. of Train Pass-by Events					Measured Noise Level (MNL) , dB(A)					
						Subtotal	Total				Elapsed Time, sec	Leq	Leq_{BG} [1]	$L_{eq,BG}$ corrected	SEL	Average SEL [2]
							EMU		ITT							
							Northbound	Southbound	Northbound	Southbound						
Daytime on 09 Aug 19	13:30 to 15:30	13:37:29	EMU (Twins)	Southbound + Northbound	93	2	31	31	-	-	31	75.4	59.3	75.3	90.2	-
		15:20:45	EMU (Twins)	Northbound + Southbound	85	2					28	74.0	59.0	73.9	88.3	-
		13:32:28	MLR	Northbound	103	26					23	76.5	59.3	76.4	90.0	89.7
		13:44:28			103						20	73.6	59.3	73.4	86.5	
		13:46:51			103						21	75.3	59.3	75.2	88.5	
		13:50:56			103						20	75.4	59.3	75.3	88.3	
		13:55:58			93						20	75.7	59.3	75.6	88.6	
		13:59:44			93						20	77.3	59.3	77.3	90.3	
		14:02:25			103						21	76.2	58.1	76.1	89.4	
		14:04:43			79						21	79.1	58.1	79.1	92.3	
		14:09:05			103						20	76.2	58.1	76.1	89.1	
		14:11:22			85						20	79.7	58.1	79.7	92.7	
		14:13:47			103						20	77.5	58.1	77.4	90.4	
		14:21:47			103						20	77.7	58.1	77.7	90.7	
		14:29:28			93						20	76.3	58.1	76.2	89.2	
		14:34:42			93						20	77.7	65.1	77.5	90.5	
		14:37:22			86						19	76.9	65.1	76.6	89.4	
		14:42:26			85						19	76.9	65.1	76.6	89.4	
		14:46:20			93						17	76.6	65.1	76.3	88.6	
		14:48:46			85						16	78.7	65.1	78.5	90.5	
		14:54:01			85						19	76.8	65.1	76.5	89.2	
		14:56:57			85						18	77.5	65.1	77.2	89.8	
		15:00:58			79						19	77.5	59.0	77.4	90.2	
		15:04:18			79						18	76.4	59.0	76.4	88.9	
		15:08:47			73						19	76.6	59.0	76.5	89.3	
		15:12:31			79						19	77.5	59.0	77.4	90.2	
		15:17:01			79						19	73.6	59.0	73.4	86.2	
		15:23:28			85						18	76.2	59.0	76.1	88.7	
		14:16:08	SP1900	Northbound	103	3					18	71.7	58.1	71.5	84.1	84.8
		14:26:06			93						19	72.7	58.1	72.5	85.3	
		14:51:11			79						19	72.8	65.1	72.0	84.8	
		13:31:10	MLR	Southbound	93	27					19	68.4	59.3	67.9	80.7	81.9
		13:34:57			103						20	69.4	59.3	69.0	82.0	
		13:40:20			93						20	67.9	59.3	67.3	80.3	
		13:43:28			103						20	67.7	59.3	67.0	80.1	
		13:47:08			103						15	72.1	59.3	71.9	83.6	
		13:49:48			93						19	68.6	59.3	68.0	80.8	
		13:52:47			103						20	71.2	59.3	71.0	84.0	
		13:56:25			93						20	67.9	59.3	67.3	80.3	
		14:01:00			93						21	69.1	58.1	68.8	82.0	
		14:03:49			93						19	69.9	58.1	69.6	82.4	
		14:13:26			79						20	67.4	58.1	66.8	79.8	
		14:16:53			103						19	67.6	58.1	67.1	79.9	
		14:20:04			93						18	69.2	58.1	68.9	81.4	
		14:24:43			103						19	68.3	58.1	67.9	80.7	
		14:27:43			93						19	70.4	58.1	70.2	82.9	
		14:31:33			93						20	70.1	65.1	68.4	81.4	
		14:36:06			85						18	69.8	65.1	68.0	80.6	
		14:39:39			79						15	75.5	65.1	75.1	86.9	
		14:52:19			85						19	69.5	65.1	67.6	80.3	
		14:54:52			79						19	67.4	65.1	64.4	77.2	
		14:58:01			79						19	68.4	65.1	65.6	78.4	
		15:04:37			85						16	69.3	59.0	68.8	80.9	
		15:10:04			73						19	68.2	59.0	67.7	80.5	
		15:12:54			93						17	69.6	59.0	69.2	81.5	
		15:15:50			73						19	67.7	59.0	67.1	79.9	
		15:23:07			79						18	69.9	59.0	69.5	82.1	
		15:25:33			85						17	74.1	59.0	74.0	86.3	
		14:10:53	SP1900	Southbound	79	2					20	64.5	58.1	63.3	76.3	75.9
		14:41:55			85						15	66.6	65.1	63.6	75.4	
		14:07:29	Intercity Through Train (ITT)	Southbound	37	1	-	-	-	1	34	71.1	58.1	70.9	86.2	86.2
Evening Time on 27 Aug 19 (Aim for obtin more ITT train passby .	20:00 to 22:15	20:53:19	Intercity Through Train (ITT), Twin with EMU	Northbound (ITT) + Southbound (EMU)	52	2	2	1	1	2	37	75.6	56.9	75.6	91.3	91.3
		21:28:48		Southbound (ITT) + Northbound (EMU)	41	2					34	75.8	56.7	75.7	91.0	90.6
		22:09:09		Southbound (ITT) + Northbound (EMU)	44	2					30	75.6	60.4	75.5	90.2	
	Average :		EMU	Northbound	91											
				Southbound	90											

Notes :
1. Train pass-by event noise has been excluded in sampling the background noise level
2. Logarithmic average
3. Normalized SEL = Average SEL + 20 log (120/average train speed)

Appendix C.

Letter to MTRC

Figure C.1 Letter to MTRC for Obtaining Updated Train Parameters

Wilson Acoustics Limited

Unit 601, Block A, Shatin Industrial Centre,
5 - 7 Yuen Shun Circuit, Shatin, NT
Tel: (852) 3188-1170, Fax: (852) 3422-8117
E-mail: who@wal.hk
Web: www.wal.hk

Ref: 18346-MTR-Q1

By Post

10 Jul 2019

MTR Corporation Limited,
MTR Headquarter Building, Telford Plaza, Kowloon Bay,
GPO Box 9916, Hong Kong.

Attention: Ms. Catherine Leung

Subject: Town Planning Ordinance Section 16 Planning Application for Proposed 10 Houses (New Territories Exempted House-Small House) at Various Lots in D.D.7, Tai Wo, Tai Po, New Territories
Information Request for Railway Noise Assessment

Dear Ms. Leung,

We are currently acting as a new environmental noise consultant for the captioned planning application. Regarding the latest railway noise comment from the Environmental Protection Department (EPD), they required us to further verify the validness of operational parameters of East Rail Line (EAL). Our questions are as below:

1) Are the operational parameters stipulated in the previous reply letter (Ref: T&ESD/TS&SE/EnvE/L809, as enclosed) to Aeolian View Consultant still valid? If not, could you please update us the relevant items?

2) Would the future passenager train (except the Intercity Through Trains) have equivalent or better noise performance compared to 9-car SP1900 train?

3) When would be the expected year for all the existing Mid-Life Refurbishment (MLR) train to be phased out?

We do appreciate your reply and your highest scrutiny in considering our request in this respect.

Note that all the requested information shall be restricted solely to our report and submission to EPD for the captioned planning application.

Should you have quires, please do not hesitate to contact the undersigned.

Yours sincerely,

PLWong

Peter Wong
Consultant, Wilson Acoustics Limited
Enclosure. (Ref: T&ESD/TS&SE/EnvE/L809)

Town Planning Ordinance Section 16 Planning Application for Proposed 10 Houses (New Territories Exempted House- Small House) at Various Lots in D.D.7, Tai Wo, Tai Po, New Territories. Information Request for Railway Noise Assessment Submission 18346-MTR-Q1

MTR Corporation Limited
香港鐵路有限公司
www.mtr.com.hk

MTR

Aeolian View Consultants
Room 1907, Tung Che Commercial Centre,
246 Des Voeux Road West,
Hong Kong

Our ref: T&ESD/TS&SE/EnvE/L809

16 December 2016

Attention: Mr. K.W. Cheng

By Post and Fax
(Fax no.: 3753 3199)

Dear Mr. Cheng,

Re: Town Planning Ordinance Section 16 Planning Application No. A/NE-KLH/510, A/NE-KLH/511, A/NE-KLH/512, A/NE-KLH/513, A/NE-KLH/514, A/NE-KLH/515, A/NE-KLH/516, A/NE-KLH/517, A/NE-KLH/518 for the Proposed 9 Houses (New Territories Exempted House – Small House) at Various Lots in D.D.7, Tai Wo, Tai Po, New Territories
Information Request for "Railway Noise Assessment Report" Resubmission

We refer to your letter dated 17 November 2016 (ref.: 15L/022/002) requesting information regarding the operational parameters of East Rail Line (EAL).

Operating Hours
The daily operating hours of the EAL are from approximately 05:00 to 01:30 hours, while the daily operating hours of Intercity Through Train are approximately from 07:00 to 23:30 hours.

Locomotives Maintenance Schedules
Locomotives will run outside of operational hours for various maintenance works. Please carry out your own observations to determine implications, if necessary.

Train Frequency

- The current peak EAL passenger train frequency during the period of 07:00 to 23:00 hours is about 12 trains per 30 minutes per direction; while the current peak EAL passenger train frequency during the period of 23:00 to 07:00 hours is about 9 trains per 30 minutes per direction.
- For Intercity Through Trains, the current daily frequency includes 13 up-bound and 13 down-bound trains for a total of 26 trains per day. For noise calculation purposes, the Intercity Through Trains can be assumed to be at 1 train per 30 minutes per direction.
- For possible maximum future passenger train frequencies of the EAL, please refer to the *Shatin to Central Link – Mong Kok East to Hung Hom Section* Environmental Impact Assessment Report, (AEIAR: 165/2012), available via the EPD website.

Train Speed
The current maximum train speed for the section of track between Tai Wo Station and Fanling Station is 120km/h for both directions.

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MTR Headquarters Building, Telford Plaza, Kowloon Bay, Kowloon, Hong Kong. GPO Box 9916, Hong Kong
Tel (852) 2993 2111 Fax (852) 2798 6832
香港九龍灣德福廣場鐵路大廈
香港郵政總局信箱9916號
電話 (852) 2993 2111 傳真 (852) 2798 6832

MTR

Our ref: T&ESD/TS&SE/EnvE/L809
16 December 2016

Rail Alignment, Datum Level and Locations of Rail Crossings
Please refer to the website below for the concerned EAL alignments and the location of rail crossings.
http://www.mtr.com.hk/en/corporate/operations/protection_boundary_map.html

We suggest that your organization conduct your own survey for the concerned track datum levels to suit the individual needs of your study, if necessary.

Existing Trackside Noise Barrier
Please note that there is an existing 2.1m high vertical noise barrier along the down track of the concerned rail segments.

Rail Maintenance Records
Please note that rail maintenance records are considered as internal information and will not be provided to outside or third party organizations. Nevertheless, you may want to consider allowing appropriate additional correction factors within your calculations based on your organization's professional judgment to cater for any possible rail condition variations.

Note that the above information, which is sensitive in nature, shall only be used solely as reference for the captioned project. Further distribution and/or publication of the above information for purposes not connected with the captioned project are strictly prohibited without the prior consent of MTR Corporation Ltd. The above information is subject to change without prior notification.

Should you have any additional enquiries, please feel free to contact our Environmental Engineering Manager, Ms. Catherine Leung at 2993 4127.

Yours sincerely,

J W Manho
Deputy General Manager – Train Services & Systems Engineering

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Appendix D.

Reply Letter from MTRC

Figure D.1 Reply Letter from MTRC for Updated Train Parameters

02-AUG-2019 05:31 T&ESD +852 2993 7728 P.01

MTR Corporation Limited
香港鐵路有限公司
www.mtr.com.hk

MTR

Wilson Acoustics Limited,
Unit 601, Block A, Shatin Industrial Centre,
5-7 Yuen Shun Circuit,
Shatin, N.T.

Attention: Mr. Peter Wong

Our ref: T&ESD/TS&SE/EnvF/L999

Date: -1 AUG 2019

By Post and Fax
(Fax no.: 3422 8117)

Dear Mr. Wong,

Re: Town Planning Ordinance Section 16 Planning Application for Proposed 10 Houses (New Territories Exempted House-Small House) at Various Lots in D.D.7, Tai Wo, Tai Po, New Territories

Information Request for Railway Noise Assessment

We refer to your letter (ref.: 18346-MTR-Q1) dated 10 July 2019 requesting operational information regarding East Rail Line (EAL).

Operation Parameters for EAL

- Please refer to the link below for the updated schedule of Intercity Through Trains: *https://www.it3.mtr.com.hk/b2c/frmScheduleGuangdong.asp?strLang=Eng*
- We wish to caution that the proposed development can be sensitive to air-borne noise, especially the noise emitted from the nearby rail crossings/joints at the concerned track sections of EAL. We suggest that you attend our office to check the respective drawings for the latest information for your study.

Future Passenger Trains and MLR Trains

For noise calculation purpose, please assume the future new trains will have similar noise emission level to that of the existing SP1900 trains. Besides, the phase-out programme of MLR trains is not yet confirmed and still subject to change. We suggest your organization conduct your own noise measurement for the existing trains to suit the individual needs of your study, if necessary.

Please be reminded that any information that may come to your knowledge or come into your possession from MTR Corporation Limited shall only be used solely as reference for this captioned project. Further distribution and/or publication of the above information for purposes not connected with the captioned project are strictly prohibited without the prior consent of MTR Corporation Limited. Please also note that any such information is subject to change without prior notification.

Page 1 of 2

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香港九龍灣德福廣場港鐵總部大樓
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電話 (852) 2993 2111 傳真 (852) 2798 8822

02-AUG-2019 05:31 T&ESD +852 2993 7728 P.02

MTR

Our ref: T&ESD/TS&SE/EnvE/L999
Date : - 1 AUG 2019

Should you have any additional enquiries, please feel free to contact our Environmental Engineering Manager, Ms. Catherine Leung at 2993 4127.

Yours sincerely,

HK Chan
Deputy General Manager – Train Services & Systems Engineering

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TOTAL P.02

Appendix E.

Updated ITT Train Schedule

Figure E.1 Latest ITT Train Schedule Extracted from MTRC Webpage Capture on 02 Jun 20

(2019.07.10)

MTR

廣東綫直通車行車時間表
Schedules for Guangdong Line Through Train

紅磡 → 常平 / 廣州東 Hung Hom → Changping / Guangzhoudong			
北行車次 Northbound Train No.	紅磡開 Depart Hung Hom	到常平 Arrive Changping	到廣州東 Arrive Guangzhoudong
Z814 *(Ktt九廣通)*	08:00	09:10	09:57
Z806	09:24	10:36	11:23
Z802	10:52	12:04	12:51
Z812	12:23	-	14:17
Z816 *(Ktt九廣通)*	13:11	14:21	15:08
Z808	14:32	15:44	16:31
Z804	16:35	17:47	18:34
Z818 *(Ktt九廣通)*	18:05	19:15	20:02
Z810	20:01	21:13	22:00

廣州東 / 常平 → 紅磡 Guangzhoudong / Changping → Hung Hom			
南行車次 Southbound Train No.	廣州東開 Depart Guangzhoudong	常平開 Depart Changping	到紅磡 Arrive Hung Hom
Z801	08:19	09:03	10:17
Z811	09:30	10:14	11:28
Z815 *(Ktt九廣通)*	10:37	11:21	12:33
Z807	12:03	-	13:56
Z803	14:04	14:48	16:02
Z817 *(Ktt九廣通)*	15:38	16:22	17:34
Z809	17:33	18:17	19:31
Z805	19:33	20:18	21:33
Z819 *(Ktt九廣通)*	20:40	21:24	22:36

Appendix F.

Railway Noise Assessment

F.1. Train Operation Parameters Adopted for Assessment, CRN Method

Table F.1 Air-borne Rail Noise Parameters, Correction Factors, and Assumptions

Parameters	Approach
Train Type	EMU (Using MLR for conservative), Intercity Through train (ITT)
Source Term SEL_{ref} (25m 120kph)	89.0 dB(A) for EMU 97.0 dB(A) for ITT (from Measurement Results in **Appendix B**)
Distance Correction for Wheel/Rail Noise	-10 log(d'/25), where d' = Slant Distance to NSR (d'>=10m)
Train Frequency Effect	+10 log(N), where N = Train Frequency per 30 min per Direction
Ground Effect	Hard Ground, no absorption
Air Absorption Effect	Nil (Close proximity with NSR in HK environment)
Trackside Barrier Height	2.1m[1]
Barrier Effect	Shadow Zone: -21dB(A) for $\delta \geq 2.5$m where δ is the Path Difference in meter $-7.75 \log(5.2 + 203\,\delta)$ dB(A) for $0 \leq \delta < 2.5$m Illuminated Zone: 0dB(A) for $\delta \geq 0.4$m $0.88 + 2.14 \log(10^{-3} + \delta)$dB(A) for $0 \leq \delta < 0.4$m
Reflection Effect	Standard +1.5dB(A) adopted
Speed Effect	+20 log(V/120), where V = Train Speed
Angle of View Effect	$+10 \log(\pi\theta/180 - \cos2\alpha\sin\theta) - 5$ where θ= Angle of View and α= Acute angle between a line drawn through the NSR, parallel to the track, and the line bisecting the angle of view, θ
Façade Effect	+2.5dB(A)
Track Wear Correction	+3.0dB(A)
Joint/Turnout Correction	As a very conservative assumption, +7.0dB(A) for a representative 20m segment[2]
Train Frequency	EMU 30/24 trains per hour in each direction during daytime/nighttime [3]
	ITT 1 per half hour in each direction and daytime[1], no ITT during night time period [4]
Train Frequency per 24hrs both directions	EMU 850 trains[3], ITT 18 trains[4]

Remark:

[1] MTRC response letter (Ref.: T&ESD/TS&SE/EnvE/L809) to the information requested from the Applicant's previous Acoustic Consultant

[2] The correction is refer to "Section 4.5.5 of the Approved Tai Wai to Ma On Shan EIA Report, KCRC East Rail Extension, Oct 1999". All the rail joint/crossing locations has been checked with MTRC at Headquarter on 21 Nov 2019. Due to confidential reason, no copied was allowed to taken away. The locations of rail crossings/ joints are marked in **Figure F1** to **Figure F54** (i.e. Angle of View for Assessment Points)

[3] EIA Report (AEIAR-165/2012) - Shatin to Central Link - Mong Kok East to Hung Hom Section, Table 6.13

[4] From web link specified in MTRC recent reply letter (**Appendix C**)

Table F.2 Air-borne Rail Noise Calculation for Assessment Point H1P1 (Daytime)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	149.7	149.7	149.7	167.8	149.7	167.8
Angle End	167.0	167.0	167.8	167.9	167.8	167.9
Speed, kph	120	120	120	120	120	120
Slant Distance, m	60.8	60.8	56.9	56.9	56.9	56.9
Angle of View, θ^o	17.3	17.3	18.1	0.1	18.1	0.1
Angle of Orientation of the Segment, α^o	21.7	21.7	21.3	12.2	21.3	12.2
Receiver to Source Distance, m	60.8	60.8	56.9	56.9	56.9	56.9
Path Length Difference, m	0.193	0.193	0.315	0.315	0.315	0.315
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.9	-3.9	-3.6	-3.6	-3.6	-3.6
Angle of View Correction, dB(A)	-15.7	-15.7	-15.6	-43.1	-15.6	-43.1
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-12.8	-14.3	-14.3	-14.3	-14.3
SEL of the Segment, dB(A)	63.7	71.7	62.5	42.0	70.6	50.1
SEL of Single PassBy, dB(A)	63.7	71.7	62.6		70.6	
Train Frequency, No. of Train per 30min	15	1	15		1	
Leq,30min of the Track, dB(A)	42.9	39.2	41.8		38.1	
Leq,30min, dB(A)	**46.9**					
1/F, +	**2.70**					
Path Length Difference, m	0.118	0.118	0.241	0.241	0.241	0.241
Slant Distance, m	60.8	60.8	56.9	56.9	56.9	56.9
Distance Correction, dB(A)	-3.9	-3.9	-3.6	-3.6	-3.6	-3.6
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	65.1	73.1	63.4	42.9	71.4	50.9
SEL of Single PassBy, dB(A)	65.1	73.1	63.4		71.5	
Leq,30min of the Track, dB(A)	44.3	40.6	42.6		38.9	
Leq,30min, dB(A)	**48.1**					
2/F, +	**5.40**					
Path Length Difference, m	0.062	0.062	0.176	0.176	0.176	0.176
Slant Distance, m	60.9	60.9	57.0	57.0	57.0	57.0
Distance Correction, dB(A)	-3.9	-3.9	-3.6	-3.6	-3.6	-3.6
Screening Correction, dB(A)	-9.7	-9.7	-12.5	-12.5	-12.5	-12.5
SEL of the Segment, dB(A)	66.7	74.8	64.3	43.8	72.3	51.8
SEL of Single PassBy, dB(A)	66.7	74.8	64.3		72.4	
Leq,30min of the Track, dB(A)	46.0	42.3	43.5		39.8	
Leq,30min, dB(A)	**49.5**					

Table F.3 Air-borne Rail Noise Calculation for Assessment Point H1P1 (Night-time)

Track	Northbound	Southbound	
Segment	CD	CD	DE
Train Type	EMU	EMU	
Angle Start	149.7	149.7	167.8
Angle End	167.0	167.8	167.9
Speed, kph	120	120	120
Slant Distance, m	60.8	56.9	56.9
Angle of View, θ^o	17.3	18.1	0.1
Angle of Orientation of the Segment, α^o	21.7	21.3	12.2
Receiver to Source Distance, m	60.8	56.9	56.9
Path Length Difference, m	0.193	0.315	0.315
Wheel/Rail Noise Contribution			
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0
Distance Correction, dB(A)	-3.9	-3.6	-3.6
Angle of View Correction, dB(A)	-15.7	-15.6	-43.1
Façade Correction, dB(A)	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-14.3	-14.3
SEL of the Segment, dB(A)	63.7	62.5	42.0
SEL of Single PassBy, dB(A)	63.7	62.6	
Lmax of Single PassBy, dB(A)	54.3	53.2	
Train Frequency, No. of Train per 30min	12	12	
Leq,30min of the Track, dB(A)	41.9	40.8	
Leq,30min, dB(A)	**44.4**		
1/F, +	**2.70**		
Path Length Difference, m	0.118	0.241	0.241
Slant Distance, m	60.8	56.9	56.9
Distance Correction, dB(A)	-3.9	-3.6	-3.6
Screening Correction, dB(A)	-11.4	-13.4	-13.4
SEL of the Segment, dB(A)	65.1	63.4	42.9
SEL of Single PassBy, dB(A)	65.1	63.4	
Lmax of Single PassBy, dB(A)	55.7	54.0	
Leq,30min of the Track, dB(A)	43.3	41.6	
Leq,30min, dB(A)	**45.6**		
2/F, +	**5.40**		
Path Length Difference, m	0.062	0.176	0.176
Slant Distance, m	60.9	57.0	57.0
Distance Correction, dB(A)	-3.9	-3.6	-3.6
Screening Correction, dB(A)	-9.7	-12.5	-12.5
SEL of the Segment, dB(A)	66.7	64.3	43.8
SEL of Single PassBy, dB(A)	66.7	64.3	
Lmax of Single PassBy, dB(A)	57.3	54.9	
Leq,30min of the Track, dB(A)	45.0	42.6	
Leq,30min, dB(A)	**46.9**		

Table F.4 Air-borne Rail Noise Calculation for Assessment Point H1P1 (Full Day)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	149.7	149.7	149.7	167.8	149.7	167.8
Angle End	167.0	167.0	167.8	167.9	167.8	167.9
Speed, kph	120	120	120	120	120	120
Slant Distance, m	60.8	60.8	56.9	56.9	56.9	56.9
Angle of View, θ^o	17.3	17.3	18.1	0.1	18.1	0.1
Angle of Orientation of the Segment, α^o	21.7	21.7	21.3	12.2	21.3	12.2
Receiver to Source Distance, m	60.8	60.8	56.9	56.9	56.9	56.9
Path Length Difference, m	0.193	0.193	0.315	0.315	0.315	0.315
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.9	-3.9	-3.6	-3.6	-3.6	-3.6
Angle of View Correction, dB(A)	-15.7	-15.7	-15.6	-43.1	-15.6	-43.1
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-12.8	-14.3	-14.3	-14.3	-14.3
SEL of the Segment, dB(A)	63.7	71.7	62.5	42.0	70.6	50.1
SEL of Single PassBy, dB(A)	63.7	71.7	62.6		70.6	
Train Frequency, No. of Train per day	425	9	425		9	
Leq,24hr of the Track, dB(A)	40.6	31.9	39.5		30.8	
Leq,24hr, dB(A)	**43.6**					
1/F, +	**2.70**					
Path Length Difference, m	0.118	0.118	0.241	0.241	0.241	0.241
Slant Distance, m	60.8	60.8	56.9	56.9	56.9	56.9
Distance Correction, dB(A)	-3.9	-3.9	-3.6	-3.6	-3.6	-3.6
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	65.1	73.1	63.4	42.9	71.4	50.9
SEL of Single PassBy, dB(A)	65.1	73.1	63.4		71.5	
Leq,24hr of the Track, dB(A)	42.0	33.3	40.3		31.6	
Leq,24hr, dB(A)	**44.8**					
2/F, +	**5.40**					
Path Length Difference, m	0.062	0.062	0.176	0.176	0.176	0.176
Slant Distance, m	60.9	60.9	57.0	57.0	57.0	57.0
Distance Correction, dB(A)	-3.9	-3.9	-3.6	-3.6	-3.6	-3.6
Screening Correction, dB(A)	-9.7	-9.7	-12.5	-12.5	-12.5	-12.5
SEL of the Segment, dB(A)	66.7	74.8	64.3	43.8	72.3	51.8
SEL of Single PassBy, dB(A)	66.7	74.8	64.3		72.4	
Leq,24hr of the Track, dB(A)	43.7	35.0	41.2		32.6	
Leq,24hr, dB(A)	**46.2**					

Figure F.1 Angle of View for Assessment Point H1P1 DT (2/F)

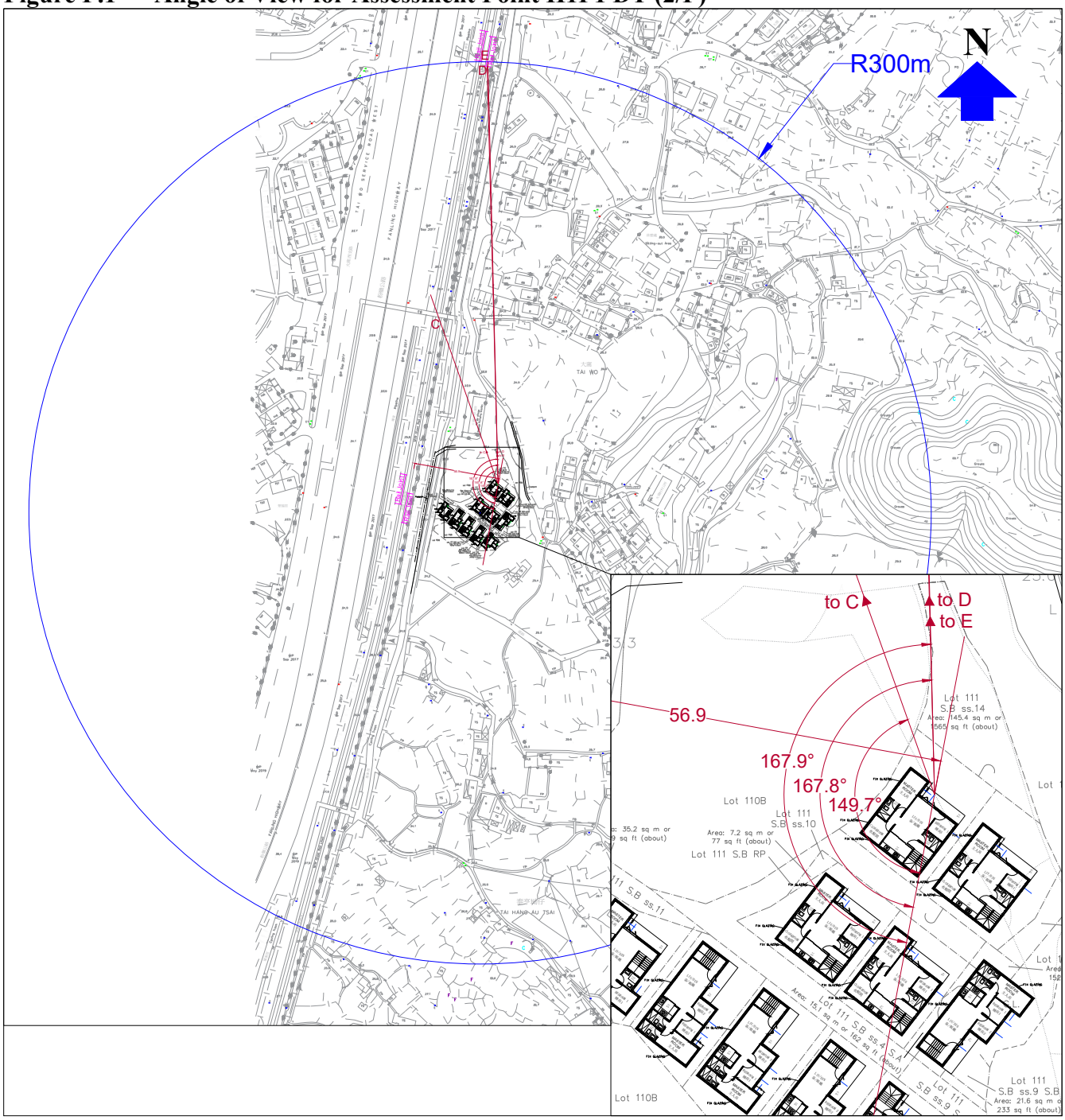


Figure F.2 Angle of View for Assessment Point H1P1 UT (2/F)

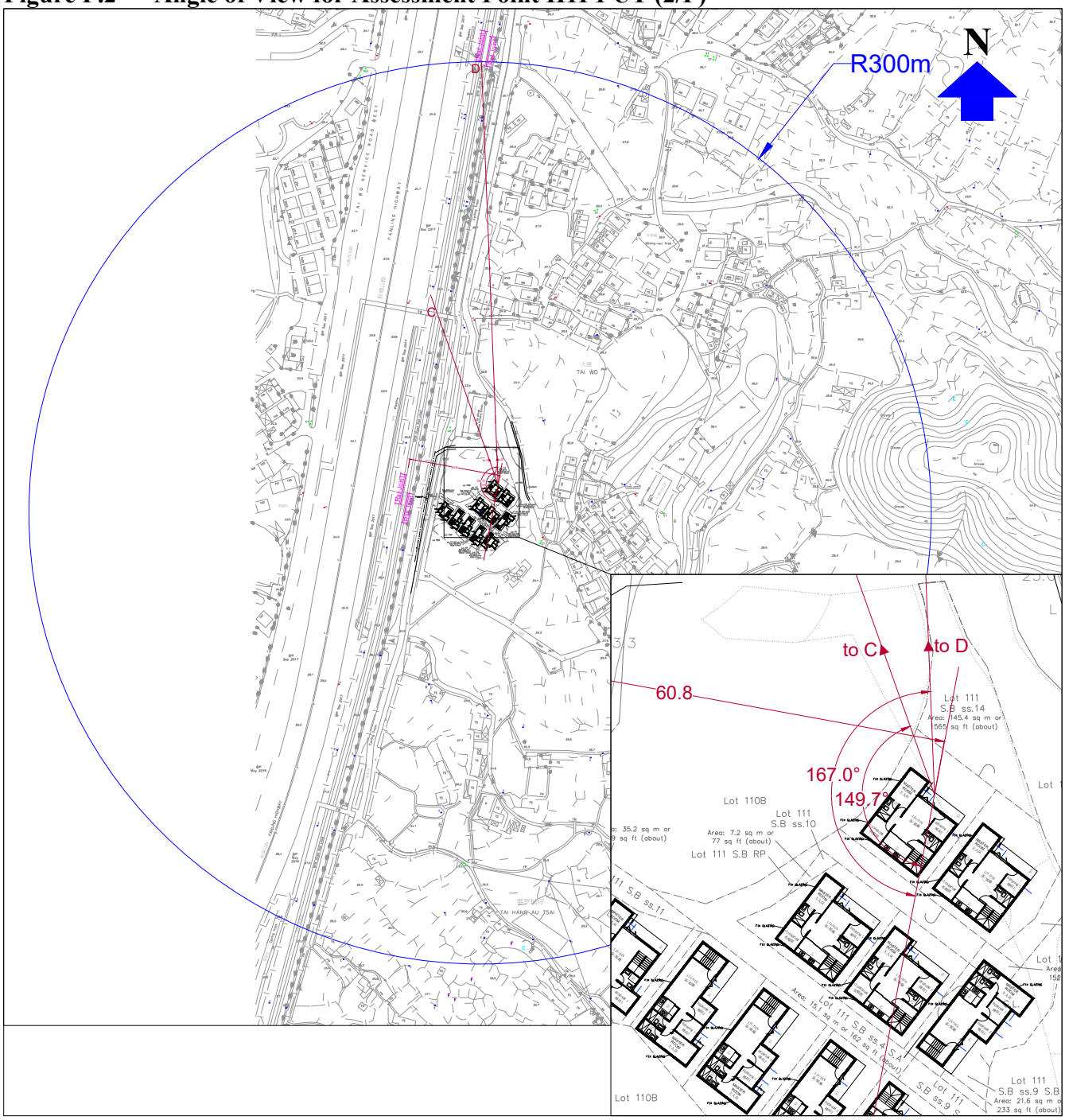


Table F.5 Air-borne Rail Noise Calculation for Assessment Point H1P2 (Daytime)

Track	Northbound				Southbound					
Segment	AB	CD	AB	CD	AB	CD	DE	AB	CD	DE
Train Type	EMU		ITT		EMU			ITT		
Angle Start	10.5	165.3	10.5	165.3	9.8	165.3	167.2	9.8	165.3	167.2
Angle End	31.8	166.5	31.8	166.5	31.8	167.2	167.4	31.8	167.2	167.4
Speed, kph	120	120	120	120	120	120	120	120	120	120
Slant Distance, m	58.1	64.4	58.1	64.4	54.4	60.5	60.5	54.4	60.5	60.5
Angle of View, θ°	21.3	1.2	21.3	1.2	22.0	1.9	0.2	22.0	1.9	0.2
Angle of Orientation of the Segment, α°	21.2	14.1	21.2	14.1	20.8	13.8	12.7	20.8	13.8	12.7
Receiver to Source Distance, m	58.1	64.4	58.1	64.4	54.4	60.5	60.5	54.4	60.5	60.5
Path Length Difference, m	0.197	0.189	0.197	0.189	0.318	0.311	0.311	0.318	0.311	0.311
Wheel/Rail Noise Contribution										
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	97.0	97.0	89.0	89.0	89.0	97.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.7	-4.1	-3.7	-4.1	-3.4	-3.8	-3.8	-3.4	-3.8	-3.8
Angle of View Correction, dB(A)	-14.9	-31.0	-14.9	-31.0	-14.8	-29.3	-39.7	-14.8	-29.3	-39.7
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)							7.0			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-12.7	-12.8	-12.7	-14.3	-14.2	-14.2	-14.3	-14.2	-14.2
SEL of the Segment, dB(A)	64.6	48.1	72.7	56.2	63.5	48.7	45.2	71.5	56.7	53.3
SEL of Single PassBy, dB(A)	64.7		72.8		63.7			71.7		
Train Frequency, No. of Train per 30min	15		1		15			1		
Leq,30min of the Track, dB(A)	43.9		40.2		42.9			39.2		
Leq,30min, dB(A)	**48.0**									
1/F, +	**2.70**									
Path Length Difference, m	0.118	0.119	0.118	0.119	0.240	0.242	0.242	0.240	0.242	0.242
Slant Distance, m	58.1	64.4	58.1	64.4	54.4	60.5	60.5	54.4	60.5	60.5
Distance Correction, dB(A)	-3.7	-4.1	-3.7	-4.1	-3.4	-3.8	-3.8	-3.4	-3.8	-3.8
Screening Correction, dB(A)	-11.3	-11.4	-11.3	-11.4	-13.4	-13.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	66.1	49.4	74.2	57.5	64.3	49.4	46.0	72.4	57.5	54.0
SEL of Single PassBy, dB(A)	66.2		74.2		64.5			72.6		
Leq,30min of the Track, dB(A)	45.4		41.7		43.7			40.0		
Leq,30min, dB(A)	**49.2**									
2/F, +	**5.40**									
Path Length Difference, m	0.059	0.065	0.059	0.065	0.173	0.181	0.181	0.173	0.181	0.181
Slant Distance, m	58.2	64.5	58.2	64.5	54.5	60.6	60.6	54.5	60.6	60.6
Distance Correction, dB(A)	-3.7	-4.1	-3.7	-4.1	-3.4	-3.8	-3.8	-3.4	-3.8	-3.8
Screening Correction, dB(A)	-9.6	-9.8	-9.6	-9.8	-12.4	-12.6	-12.6	-12.4	-12.6	-12.6
SEL of the Segment, dB(A)	67.9	51.0	75.9	59.1	65.3	50.3	46.8	73.4	58.4	54.9
SEL of Single PassBy, dB(A)	68.0		76.0		65.5			73.6		
Leq,30min of the Track, dB(A)	47.2		43.5		44.7			41.0		
Leq,30min, dB(A)	**50.7**									

Table F.6 Air-borne Rail Noise Calculation for Assessment Point H1P2 (Night-time)

Track	Northbound		Southbound		
Segment	AB	CD	AB	CD	DE
Train Type	EMU		EMU		
Angle Start	10.5	165.3	9.8	165.3	167.2
Angle End	31.8	166.5	31.8	167.2	167.4
Speed, kph	120	120	120	120	120
Slant Distance, m	58.1	64.4	54.4	60.5	60.5
Angle of View, θ^o	21.3	1.2	22.0	1.9	0.2
Angle of Orientation of the Segment, α^o	21.2	14.1	20.8	13.8	12.7
Receiver to Source Distance, m	58.1	64.4	54.4	60.5	60.5
Path Length Difference, m	0.197	0.189	0.318	0.311	0.311
Wheel/Rail Noise Contribution					
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.7	-4.1	-3.4	-3.8	-3.8
Angle of View Correction, dB(A)	-14.9	-31.0	-14.8	-29.3	-39.7
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)					7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-12.7	-14.3	-14.2	-14.2
SEL of the Segment, dB(A)	64.6	48.1	63.5	48.7	45.2
SEL of Single PassBy, dB(A)	64.7		63.7		
Lmax of Single PassBy, dB(A)	55.3		54.3		
Train Frequency, No. of Train per 30min	12		12		
Leq,30min of the Track, dB(A)	43.0		41.9		
Leq,30min, dB(A)	**45.5**				
1/F, +	**2.70**				
Path Length Difference, m	0.118	0.119	0.240	0.242	0.242
Slant Distance, m	58.1	64.4	54.4	60.5	60.5
Distance Correction, dB(A)	-3.7	-4.1	-3.4	-3.8	-3.8
Screening Correction, dB(A)	-11.3	-11.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	66.1	49.4	64.3	49.4	46.0
SEL of Single PassBy, dB(A)	66.2		64.5		
Lmax of Single PassBy, dB(A)	56.8		55.2		
Leq,30min of the Track, dB(A)	44.4		42.8		
Leq,30min, dB(A)	**46.7**				
2/F, +	**5.40**				
Path Length Difference, m	0.059	0.065	0.173	0.181	0.181
Slant Distance, m	58.2	64.5	54.5	60.6	60.6
Distance Correction, dB(A)	-3.7	-4.1	-3.4	-3.8	-3.8
Screening Correction, dB(A)	-9.6	-9.8	-12.4	-12.6	-12.6
SEL of the Segment, dB(A)	67.9	51.0	65.3	50.3	46.8
SEL of Single PassBy, dB(A)	68.0		65.5		
Lmax of Single PassBy, dB(A)	58.6		56.1		
Leq,30min of the Track, dB(A)	46.2		43.7		
Leq,30min, dB(A)	**48.1**				

Table F.7 Air-borne Rail Noise Calculation for Assessment Point H1P2 (Full Day)

Track	Northbound				Southbound					
Segment	AB	CD	AB	CD	AB	CD	DE	AB	CD	DE
Train Type	EMU		ITT		EMU			ITT		
Angle Start	10.5	165.3	10.5	165.3	9.8	165.3	167.2	9.8	165.3	167.2
Angle End	31.8	166.5	31.8	166.5	31.8	167.2	167.4	31.8	167.2	167.4
Speed, kph	120	120	120	120	120	120	120	120	120	120
Slant Distance, m	58.1	64.4	58.1	64.4	54.4	60.5	60.5	54.4	60.5	60.5
Angle of View, θ°	21.3	1.2	21.3	1.2	22.0	1.9	0.2	22.0	1.9	0.2
Angle of Orientation of the Segment, α°	21.2	14.1	21.2	14.1	20.8	13.8	12.7	20.8	13.8	12.7
Receiver to Source Distance, m	58.1	64.4	58.1	64.4	54.4	60.5	60.5	54.4	60.5	60.5
Path Length Difference, m	0.197	0.189	0.197	0.189	0.318	0.311	0.311	0.318	0.311	0.311
Wheel/Rail Noise Contribution										
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	97.0	97.0	89.0	89.0	89.0	97.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.7	-4.1	-3.7	-4.1	-3.4	-3.8	-3.8	-3.4	-3.8	-3.8
Angle of View Correction, dB(A)	-14.9	-31.0	-14.9	-31.0	-14.8	-29.3	-39.7	-14.8	-29.3	-39.7
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)							7.0			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-12.7	-12.8	-12.7	-14.3	-14.2	-14.2	-14.3	-14.2	-14.2
SEL of the Segment, dB(A)	64.6	48.1	72.7	56.2	63.5	48.7	45.2	71.5	56.7	53.3
SEL of Single PassBy, dB(A)	64.7		72.8		63.7			71.7		
Train Frequency, No. of Train per day	425		9		425			9		
Leq,24hr of the Track, dB(A)	41.6		33.0		40.6			31.9		
Leq,24hr, dB(A)	**44.7**									
1/F, +	**2.70**									
Path Length Difference, m	0.118	0.119	0.118	0.119	0.240	0.242	0.242	0.240	0.242	0.242
Slant Distance, m	58.1	64.4	58.1	64.4	54.4	60.5	60.5	54.4	60.5	60.5
Distance Correction, dB(A)	-3.7	-4.1	-3.7	-4.1	-3.4	-3.8	-3.8	-3.4	-3.8	-3.8
Screening Correction, dB(A)	-11.3	-11.4	-11.3	-11.4	-13.4	-13.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	66.1	49.4	74.2	57.5	64.3	49.4	46.0	72.4	57.5	54.0
SEL of Single PassBy, dB(A)	66.2		74.2		64.5			72.6		
Leq,24hr of the Track, dB(A)	43.1		34.4		41.4			32.8		
Leq,24hr, dB(A)	**45.9**									
2/F, +	**5.40**									
Path Length Difference, m	0.059	0.065	0.059	0.065	0.173	0.181	0.181	0.173	0.181	0.181
Slant Distance, m	58.2	64.5	58.2	64.5	54.5	60.6	60.6	54.5	60.6	60.6
Distance Correction, dB(A)	-3.7	-4.1	-3.7	-4.1	-3.4	-3.8	-3.8	-3.4	-3.8	-3.8
Screening Correction, dB(A)	-9.6	-9.8	-9.6	-9.8	-12.4	-12.6	-12.6	-12.4	-12.6	-12.6
SEL of the Segment, dB(A)	67.9	51.0	75.9	59.1	65.3	50.3	46.8	73.4	58.4	54.9
SEL of Single PassBy, dB(A)	68.0		76.0		65.5			73.6		
Leq,24hr of the Track, dB(A)	44.9		36.2		42.4			33.7		
Leq,24hr, dB(A)	**47.4**									

Figure F.3 Angle of View for Assessment Point H1P2 DT (2/F)

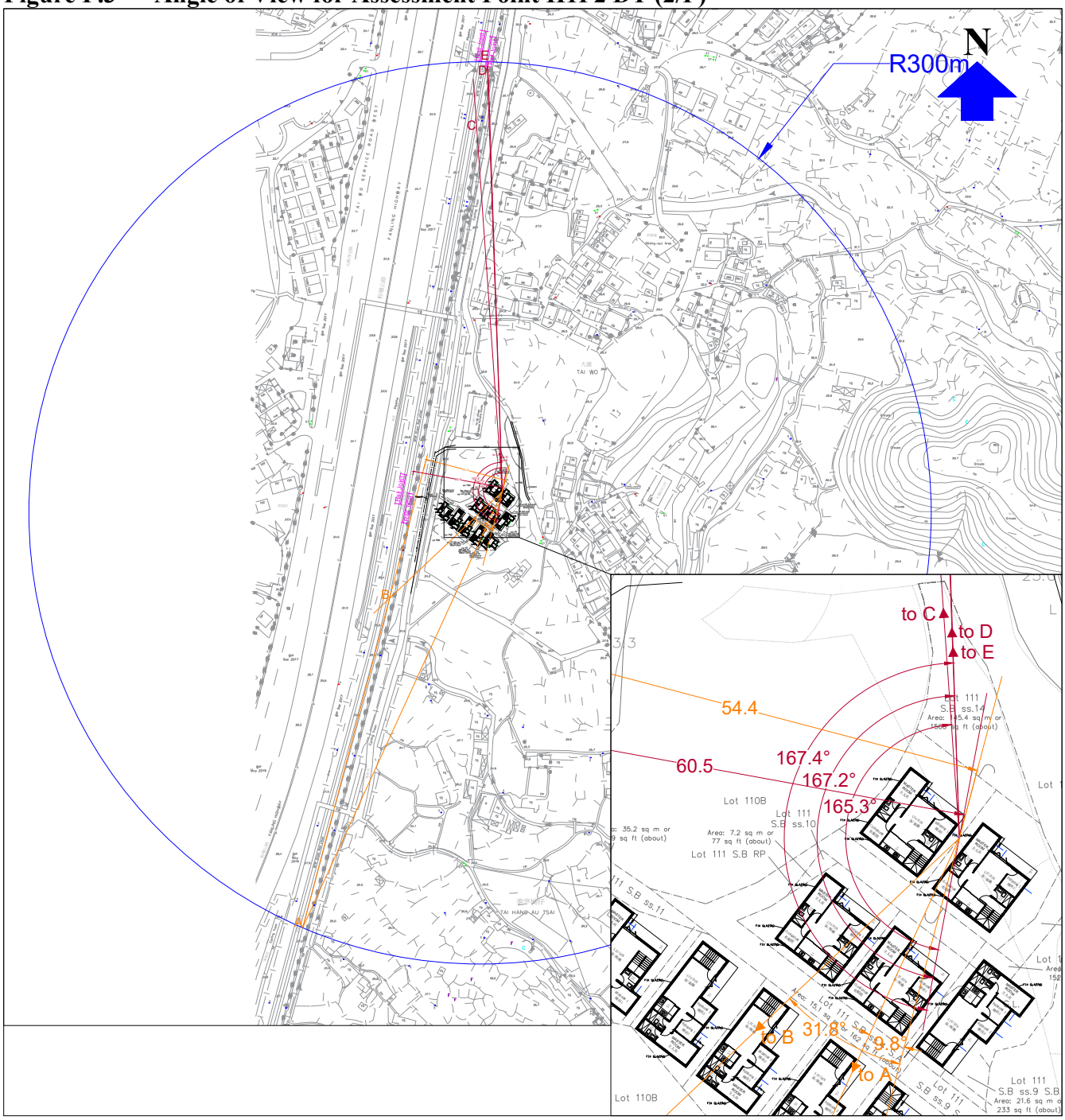


Figure F.4 Angle of View for Assessment Point H1P2 UT (2/F)

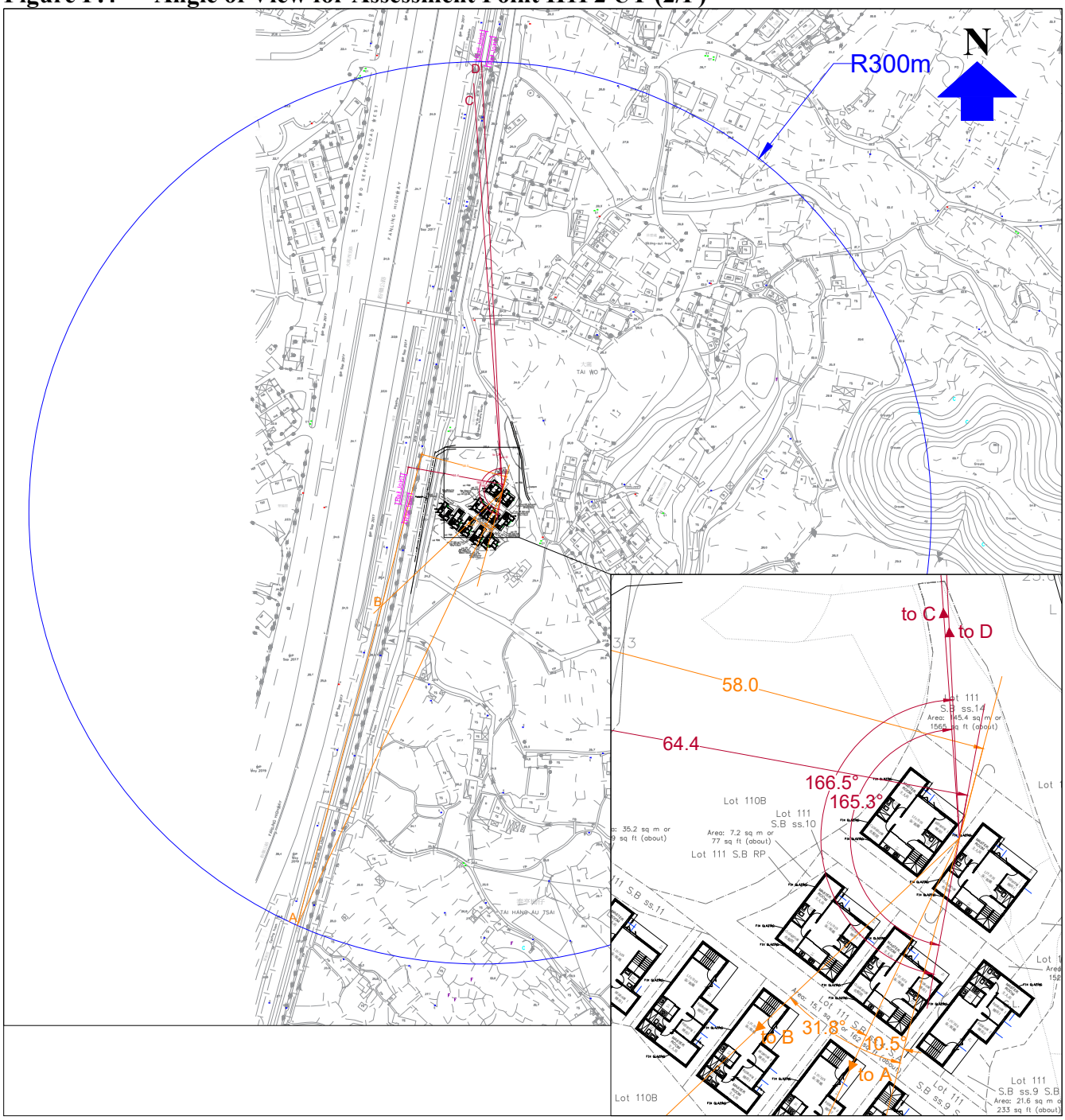


Table F.8 Air-borne Rail Noise Calculation for Assessment Point H1P3 (Daytime)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	164.0	164.0	164.0	167.8	164.0	167.8
Angle End	167.1	167.1	167.8	168.0	167.8	168.0
Speed, kph	120	120	120	120	120	120
Slant Distance, m	60.4	60.4	56.6	56.6	56.6	56.6
Angle of View, θ^o	3.1	3.1	3.8	0.2	3.8	0.2
Angle of Orientation of the Segment, α^o	14.5	14.5	14.1	12.1	14.1	12.1
Receiver to Source Distance, m	60.4	60.4	56.6	56.6	56.6	56.6
Path Length Difference, m	0.194	0.194	0.316	0.316	0.316	0.316
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.8	-3.8	-3.6	-3.6	-3.6	-3.6
Angle of View Correction, dB(A)	-26.7	-26.7	-26.0	-40.1	-26.0	-40.1
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-12.8	-14.3	-14.3	-14.3	-14.3
SEL of the Segment, dB(A)	52.7	60.7	52.1	45.0	60.2	53.1
SEL of Single PassBy, dB(A)	52.7	60.7	52.9		61.0	
Train Frequency, No. of Train per 30min	15	1	15		1	
Leq,30min of the Track, dB(A)	31.9	28.2	32.1		28.4	
Leq,30min, dB(A)	**36.5**					
1/F, +	**2.70**					
Path Length Difference, m	0.118	0.118	0.241	0.241	0.241	0.241
Slant Distance, m	60.4	60.4	56.6	56.6	56.6	56.6
Distance Correction, dB(A)	-3.8	-3.8	-3.5	-3.5	-3.5	-3.5
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	54.1	62.1	53.0	45.9	61.0	53.9
SEL of Single PassBy, dB(A)	54.1	62.1	53.7		61.8	
Leq,30min of the Track, dB(A)	33.3	29.6	32.9		29.3	
Leq,30min, dB(A)	**37.7**					
2/F, +	**5.40**					
Path Length Difference, m	0.061	0.061	0.176	0.176	0.176	0.176
Slant Distance, m	60.5	60.5	56.7	56.7	56.7	56.7
Distance Correction, dB(A)	-3.8	-3.8	-3.6	-3.6	-3.6	-3.6
Screening Correction, dB(A)	-9.7	-9.7	-12.5	-12.5	-12.5	-12.5
SEL of the Segment, dB(A)	55.8	63.8	53.9	46.8	62.0	54.8
SEL of Single PassBy, dB(A)	55.8	63.8	54.7		62.7	
Leq,30min of the Track, dB(A)	35.0	31.3	33.9		30.2	
Leq,30min, dB(A)	**39.0**					

Table F.9 Air-borne Rail Noise Calculation for Assessment Point H1P3 (Night-time)

Track	Northbound	Southbound	
Segment	CD	CD	DE
Train Type	EMU	EMU	
Angle Start	164.0	164.0	167.8
Angle End	167.1	167.8	168.0
Speed, kph	120	120	120
Slant Distance, m	60.4	56.6	56.6
Angle of View, θ^o	3.1	3.8	0.2
Angle of Orientation of the Segment, α^o	14.5	14.1	12.1
Receiver to Source Distance, m	60.4	56.6	56.6
Path Length Difference, m	0.194	0.316	0.316
Wheel/Rail Noise Contribution			
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0
Distance Correction, dB(A)	-3.8	-3.6	-3.6
Angle of View Correction, dB(A)	-26.7	-26.0	-40.1
Façade Correction, dB(A)	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-14.3	-14.3
SEL of the Segment, dB(A)	52.7	52.1	45.0
SEL of Single PassBy, dB(A)	52.7	52.9	
Lmax of Single PassBy, dB(A)	43.3	43.5	
Train Frequency, No. of Train per 30min	12	12	
Leq,30min of the Track, dB(A)	30.9	31.1	
Leq,30min, dB(A)	**34.0**		
1/F, +	**2.70**		
Path Length Difference, m	0.118	0.241	0.241
Slant Distance, m	60.4	56.6	56.6
Distance Correction, dB(A)	-3.8	-3.5	-3.5
Screening Correction, dB(A)	-11.4	-13.4	-13.4
SEL of the Segment, dB(A)	54.1	53.0	45.9
SEL of Single PassBy, dB(A)	54.1	53.7	
Lmax of Single PassBy, dB(A)	44.7	44.4	
Leq,30min of the Track, dB(A)	32.3	32.0	
Leq,30min, dB(A)	**35.2**		
2/F, +	**5.40**		
Path Length Difference, m	0.061	0.176	0.176
Slant Distance, m	60.5	56.7	56.7
Distance Correction, dB(A)	-3.8	-3.6	-3.6
Screening Correction, dB(A)	-9.7	-12.5	-12.5
SEL of the Segment, dB(A)	55.8	53.9	46.8
SEL of Single PassBy, dB(A)	55.8	54.7	
Lmax of Single PassBy, dB(A)	46.4	45.3	
Leq,30min of the Track, dB(A)	34.0	32.9	
Leq,30min, dB(A)	**36.5**		

Table F.10 Air-borne Rail Noise Calculation for Assessment Point H1P3 (Full Day)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	164.0	164.0	164.0	167.8	164.0	167.8
Angle End	167.1	167.1	167.8	168.0	167.8	168.0
Speed, kph	120	120	120	120	120	120
Slant Distance, m	60.4	60.4	56.6	56.6	56.6	56.6
Angle of View, θ^o	3.1	3.1	3.8	0.2	3.8	0.2
Angle of Orientation of the Segment, α^o	14.5	14.5	14.1	12.1	14.1	12.1
Receiver to Source Distance, m	60.4	60.4	56.6	56.6	56.6	56.6
Path Length Difference, m	0.194	0.194	0.316	0.316	0.316	0.316
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.8	-3.8	-3.6	-3.6	-3.6	-3.6
Angle of View Correction, dB(A)	-26.7	-26.7	-26.0	-40.1	-26.0	-40.1
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-12.8	-14.3	-14.3	-14.3	-14.3
SEL of the Segment, dB(A)	52.7	60.7	52.1	45.0	60.2	53.1
SEL of Single PassBy, dB(A)	52.7	60.7	52.9		61.0	
Train Frequency, No. of Train per day	425	9	425		9	
Leq,24hr of the Track, dB(A)	29.6	20.9	29.8		21.1	
Leq,24hr, dB(A)	**33.3**					
1/F, +	**2.70**					
Path Length Difference, m	0.118	0.118	0.241	0.241	0.241	0.241
Slant Distance, m	60.4	60.4	56.6	56.6	56.6	56.6
Distance Correction, dB(A)	-3.8	-3.8	-3.5	-3.5	-3.5	-3.5
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	54.1	62.1	53.0	45.9	61.0	53.9
SEL of Single PassBy, dB(A)	54.1	62.1	53.7		61.8	
Leq,24hr of the Track, dB(A)	31.0	22.3	30.7		22.0	
Leq,24hr, dB(A)	**34.4**					
2/F, +	**5.40**					
Path Length Difference, m	0.061	0.061	0.176	0.176	0.176	0.176
Slant Distance, m	60.5	60.5	56.7	56.7	56.7	56.7
Distance Correction, dB(A)	-3.8	-3.8	-3.6	-3.6	-3.6	-3.6
Screening Correction, dB(A)	-9.7	-9.7	-12.5	-12.5	-12.5	-12.5
SEL of the Segment, dB(A)	55.8	63.8	53.9	46.8	62.0	54.8
SEL of Single PassBy, dB(A)	55.8	63.8	54.7		62.7	
Leq,24hr of the Track, dB(A)	32.7	24.0	31.6		22.9	
Leq,24hr, dB(A)	**35.7**					

Figure F.5 Angle of View for Assessment Point H1P3 DT (2/F)

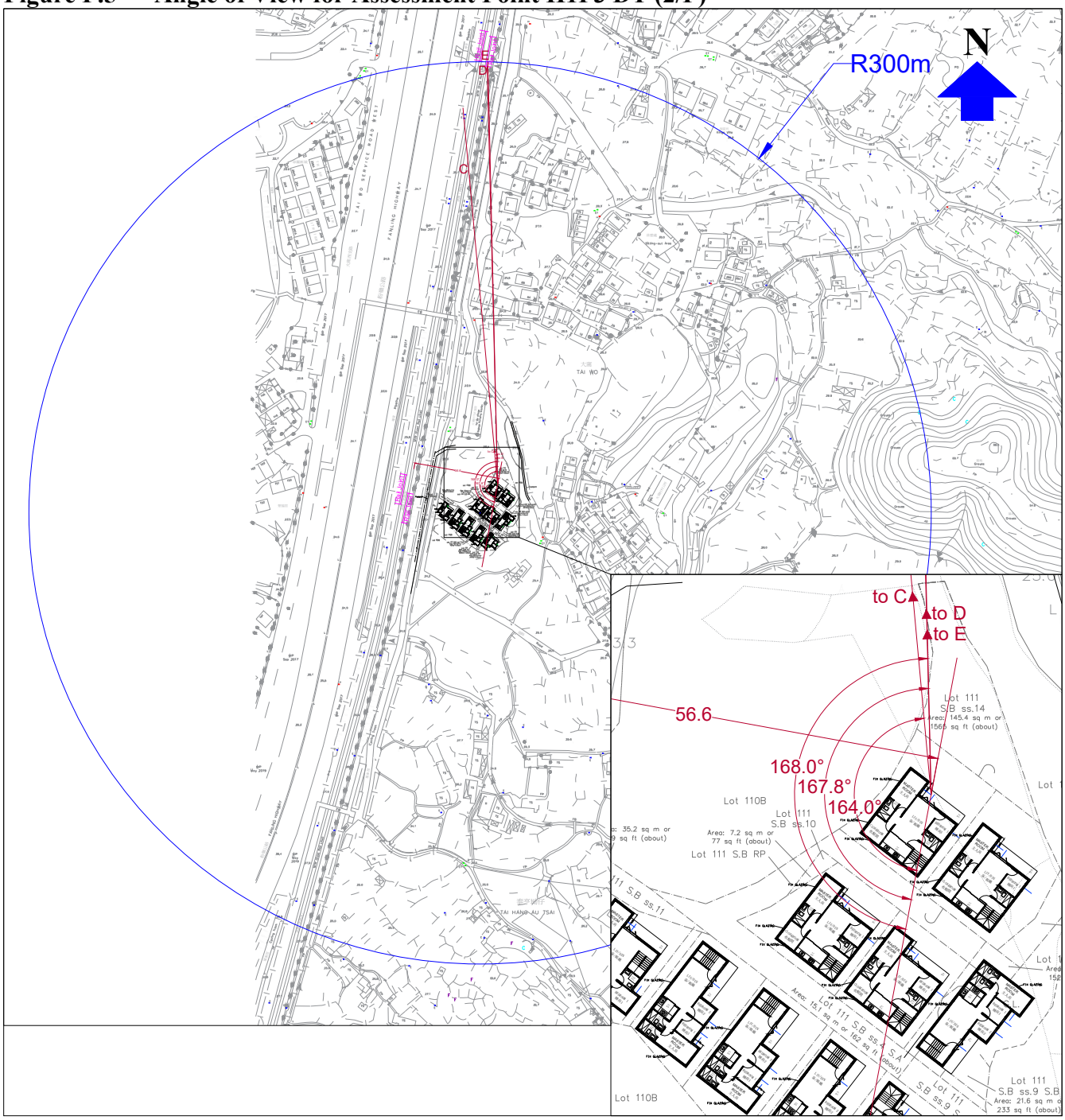


Figure F.6 Angle of View for Assessment Point H1P3 UT (2/F)

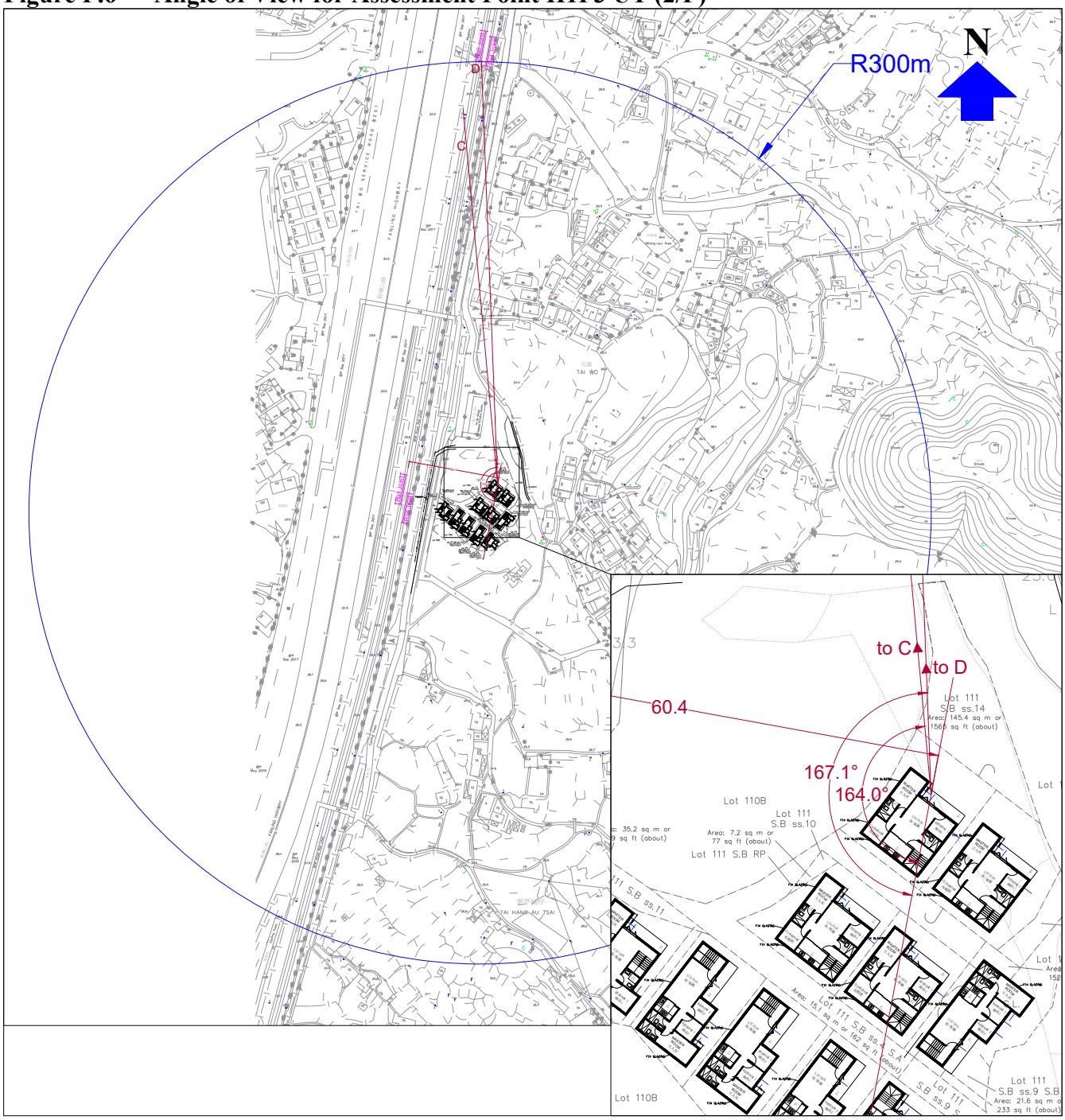


Table F.11 Air-borne Rail Noise Calculation for Assessment Point H2P1 (Daytime)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	150.0	150.0	150.0	166.5	150.0	166.5
Angle End	165.8	165.8	166.5	166.7	166.5	166.7
Speed, kph	120	120	120	120	120	120
Slant Distance, m	69.8	69.8	65.9	65.9	65.9	65.9
Angle of View, θ^o	15.8	15.8	16.5	0.2	16.5	0.2
Angle of Orientation of the Segment, α^o	22.1	22.1	21.8	13.4	21.8	13.4
Receiver to Source Distance, m	69.8	69.8	65.9	65.9	65.9	65.9
Path Length Difference, m	0.183	0.183	0.306	0.306	0.306	0.306
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.5	-4.5	-4.2	-4.2	-4.2	-4.2
Angle of View Correction, dB(A)	-15.9	-15.9	-15.9	-39.3	-15.9	-39.3
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.6	-12.6	-14.2	-14.2	-14.2	-14.2
SEL of the Segment, dB(A)	63.0	71.0	61.7	45.3	69.8	53.4
SEL of Single PassBy, dB(A)	63.0	71.0	61.8		69.9	
Train Frequency, No. of Train per 30min	15	1	15		1	
Leq,30min of the Track, dB(A)	42.2	38.5	41.0		37.3	
Leq,30min, dB(A)	**46.2**					
1/F, +	**2.70**					
Path Length Difference, m	0.120	0.120	0.243	0.243	0.243	0.243
Slant Distance, m	69.8	69.8	65.9	65.9	65.9	65.9
Distance Correction, dB(A)	-4.5	-4.5	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-11.4	-11.4	-13.5	-13.5	-13.5	-13.5
SEL of the Segment, dB(A)	64.2	72.2	62.4	46.0	70.5	54.1
SEL of Single PassBy, dB(A)	64.2	72.2	62.5		70.6	
Leq,30min of the Track, dB(A)	43.4	39.7	41.7		38.0	
Leq,30min, dB(A)	**47.2**					
2/F, +	**5.40**					
Path Length Difference, m	0.069	0.069	0.186	0.186	0.186	0.186
Slant Distance, m	69.9	69.9	66.0	66.0	66.0	66.0
Distance Correction, dB(A)	-4.5	-4.5	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-10.0	-10.0	-12.7	-12.7	-12.7	-12.7
SEL of the Segment, dB(A)	65.6	73.7	63.2	46.8	71.3	54.9
SEL of Single PassBy, dB(A)	65.6	73.7	63.3		71.4	
Leq,30min of the Track, dB(A)	44.8	41.1	42.5		38.8	
Leq,30min, dB(A)	**48.4**					

Table F.12 Air-borne Rail Noise Calculation for Assessment Point H2P1 (Night-time)

Track	Northbound	Southbound	
Segment	CD	CD	DE
Train Type	EMU	EMU	
Angle Start	150.0	150.0	166.5
Angle End	165.8	166.5	166.7
Speed, kph	120	120	120
Slant Distance, m	69.8	65.9	65.9
Angle of View, θ^o	15.8	16.5	0.2
Angle of Orientation of the Segment, α^o	22.1	21.8	13.4
Receiver to Source Distance, m	69.8	65.9	65.9
Path Length Difference, m	0.183	0.306	0.306
Wheel/Rail Noise Contribution			
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0
Distance Correction, dB(A)	-4.5	-4.2	-4.2
Angle of View Correction, dB(A)	-15.9	-15.9	-39.3
Façade Correction, dB(A)	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5
Screening Correction, dB(A)	-12.6	-14.2	-14.2
SEL of the Segment, dB(A)	63.0	61.7	45.3
SEL of Single PassBy, dB(A)	63.0	61.8	
Lmax of Single PassBy, dB(A)	53.5	52.4	
Train Frequency, No. of Train per 30min	12	12	
Leq,30min of the Track, dB(A)	41.2	40.1	
Leq,30min, dB(A)	**43.7**		
1/F, +	**2.70**		
Path Length Difference, m	0.120	0.243	0.243
Slant Distance, m	69.8	65.9	65.9
Distance Correction, dB(A)	-4.5	-4.2	-4.2
Screening Correction, dB(A)	-11.4	-13.5	-13.5
SEL of the Segment, dB(A)	64.2	62.4	46.0
SEL of Single PassBy, dB(A)	64.2	62.5	
Lmax of Single PassBy, dB(A)	54.7	53.1	
Leq,30min of the Track, dB(A)	42.4	40.8	
Leq,30min, dB(A)	**44.7**		
2/F, +	**5.40**		
Path Length Difference, m	0.069	0.186	0.186
Slant Distance, m	69.9	66.0	66.0
Distance Correction, dB(A)	-4.5	-4.2	-4.2
Screening Correction, dB(A)	-10.0	-12.7	-12.7
SEL of the Segment, dB(A)	65.6	63.2	46.8
SEL of Single PassBy, dB(A)	65.6	63.3	
Lmax of Single PassBy, dB(A)	56.1	53.9	
Leq,30min of the Track, dB(A)	43.8	41.6	
Leq,30min, dB(A)	**45.9**		

Table F.13 Air-borne Rail Noise Calculation for Assessment Point H2P1 (Full Day)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	150.0	150.0	150.0	166.5	150.0	166.5
Angle End	165.8	165.8	166.5	166.7	166.5	166.7
Speed, kph	120	120	120	120	120	120
Slant Distance, m	69.8	69.8	65.9	65.9	65.9	65.9
Angle of View, θ^o	15.8	15.8	16.5	0.2	16.5	0.2
Angle of Orientation of the Segment, α^o	22.1	22.1	21.8	13.4	21.8	13.4
Receiver to Source Distance, m	69.8	69.8	65.9	65.9	65.9	65.9
Path Length Difference, m	0.183	0.183	0.306	0.306	0.306	0.306
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.5	-4.5	-4.2	-4.2	-4.2	-4.2
Angle of View Correction, dB(A)	-15.9	-15.9	-15.9	-39.3	-15.9	-39.3
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.6	-12.6	-14.2	-14.2	-14.2	-14.2
SEL of the Segment, dB(A)	63.0	71.0	61.7	45.3	69.8	53.4
SEL of Single PassBy, dB(A)	63.0	71.0	61.8		69.9	
Train Frequency, No. of Train per day	425	9	425		9	
Leq,24hr of the Track, dB(A)	39.9	31.2	38.7		30.1	
Leq,24hr, dB(A)	**42.9**					
1/F, +	**2.70**					
Path Length Difference, m	0.120	0.120	0.243	0.243	0.243	0.243
Slant Distance, m	69.8	69.8	65.9	65.9	65.9	65.9
Distance Correction, dB(A)	-4.5	-4.5	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-11.4	-11.4	-13.5	-13.5	-13.5	-13.5
SEL of the Segment, dB(A)	64.2	72.2	62.4	46.0	70.5	54.1
SEL of Single PassBy, dB(A)	64.2	72.2	62.5		70.6	
Leq,24hr of the Track, dB(A)	41.1	32.4	39.5		30.8	
Leq,24hr, dB(A)	**43.9**					
2/F, +	**5.40**					
Path Length Difference, m	0.069	0.069	0.186	0.186	0.186	0.186
Slant Distance, m	69.9	69.9	66.0	66.0	66.0	66.0
Distance Correction, dB(A)	-4.5	-4.5	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-10.0	-10.0	-12.7	-12.7	-12.7	-12.7
SEL of the Segment, dB(A)	65.6	73.7	63.2	46.8	71.3	54.9
SEL of Single PassBy, dB(A)	65.6	73.7	63.3		71.4	
Leq,24hr of the Track, dB(A)	42.5	33.8	40.2		31.6	
Leq,24hr, dB(A)	**45.1**					

Figure F.7 Angle of View for Assessment Point H2P1 DT (2/F)

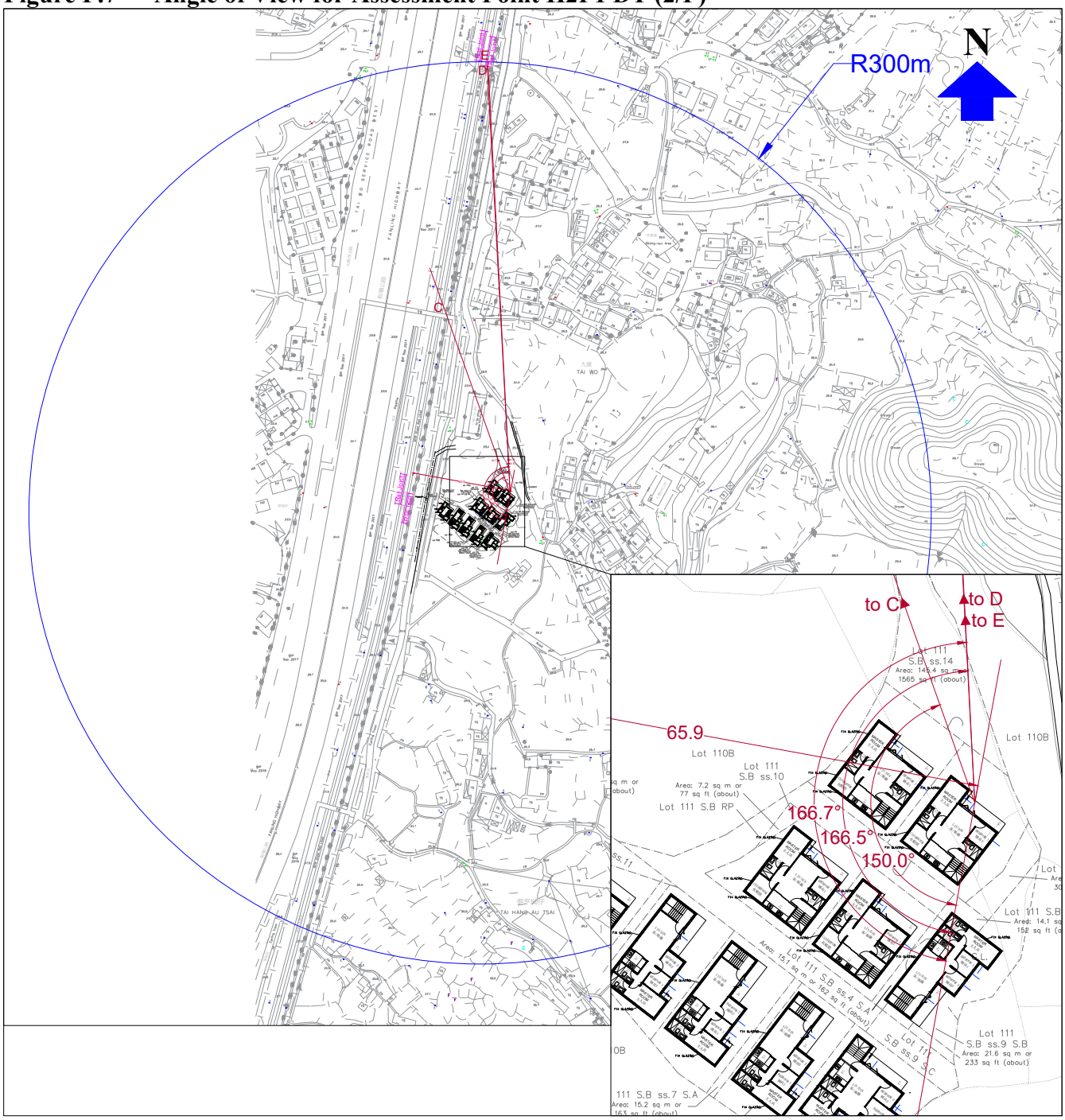


Figure F.8 Angle of View for Assessment Point H2P1 UT (2/F)

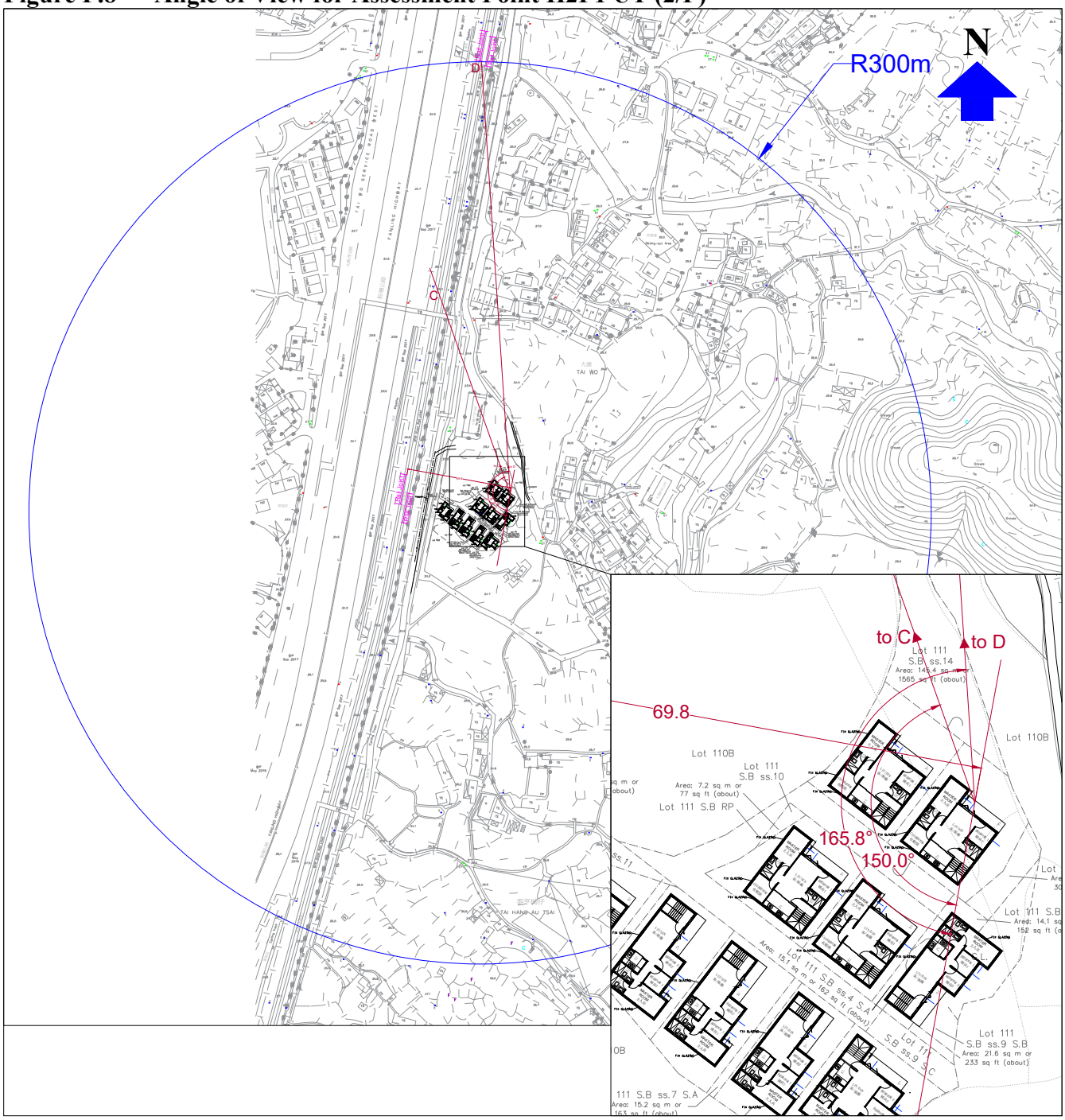


Table F.14 Air-borne Rail Noise Calculation for Assessment Point H2P2 (Daytime)

Track	Northbound		Southbound					
Segment	AB		AB	CD	DE	AB	CD	DE
Train Type	EMU	ITT	EMU			ITT		
Angle Start	12.1	12.1	11.4	165.6	166.0	11.4	165.6	166.0
Angle End	31.6	31.6	31.6	166.0	166.2	31.6	166.0	166.2
Speed, kph	120	120	120	120	120	120	120	120
Slant Distance, m	66.4	66.4	62.8	69.5	69.5	62.8	69.5	69.5
Angle of View, θ^o	19.5	19.5	20.2	0.4	0.2	20.2	0.4	0.2
Angle of Orientation of the Segment, α^o	21.9	21.9	21.5	14.2	13.9	21.5	14.2	13.9
Receiver to Source Distance, m	66.4	66.4	62.8	69.5	69.5	62.8	69.5	69.5
Path Length Difference, m	0.187	0.187	0.309	0.303	0.303	0.309	0.303	0.303
Wheel/Rail Noise Contribution								
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	89.0	97.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.2	-4.2	-4.0	-4.4	-4.4	-4.0	-4.4	-4.4
Angle of View Correction, dB(A)	-15.0	-15.0	-15.0	-35.8	-38.9	-15.0	-35.8	-38.9
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)					7.0			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.1	-14.1	-14.2	-14.1	-14.1
SEL of the Segment, dB(A)	64.0	72.1	62.8	41.6	45.4	70.8	49.7	53.5
SEL of Single PassBy, dB(A)	64.0	72.1	62.9			70.9		
Train Frequency, No. of Train per 30min	15	1	15			1		
Leq,30min of the Track, dB(A)	43.2	39.5	42.1			38.4		
Leq,30min, dB(A)	47.2							
1/F, +	2.70							
Path Length Difference, m	0.119	0.119	0.242	0.243	0.243	0.242	0.243	0.243
Slant Distance, m	66.4	66.4	62.8	69.5	69.5	62.8	69.5	69.5
Distance Correction, dB(A)	-4.2	-4.2	-4.0	-4.4	-4.4	-4.0	-4.4	-4.4
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.5	-13.5	-13.4	-13.5	-13.5
SEL of the Segment, dB(A)	65.3	73.4	63.5	42.3	46.1	71.6	50.4	54.2
SEL of Single PassBy, dB(A)	65.3	73.4	63.6			71.7		
Leq,30min of the Track, dB(A)	44.5	40.8	42.8			39.1		
Leq,30min, dB(A)	48.3							
2/F, +	5.40							
Path Length Difference, m	0.067	0.067	0.183	0.190	0.190	0.183	0.190	0.190
Slant Distance, m	66.5	66.5	62.9	69.6	69.6	62.9	69.6	69.6
Distance Correction, dB(A)	-4.2	-4.2	-4.0	-4.4	-4.4	-4.0	-4.4	-4.4
Screening Correction, dB(A)	-9.9	-9.9	-12.6	-12.7	-12.7	-12.6	-12.7	-12.7
SEL of the Segment, dB(A)	66.8	74.9	64.3	43.1	46.9	72.4	51.1	54.9
SEL of Single PassBy, dB(A)	66.8	74.9	64.5			72.5		
Leq,30min of the Track, dB(A)	46.0	42.3	43.7			40.0		
Leq,30min, dB(A)	49.6							

Table F.15 Air-borne Rail Noise Calculation for Assessment Point H2P2 (Night-time)

Track	Northbound	Southbound		
Segment	AB	AB	CD	DE
Train Type	EMU	EMU		
Angle Start	12.1	11.4	165.6	166.0
Angle End	31.6	31.6	166.0	166.2
Speed, kph	120	120	120	120
Slant Distance, m	66.4	62.8	69.5	69.5
Angle of View, θ^o	19.5	20.2	0.4	0.2
Angle of Orientation of the Segment, α^o	21.9	21.5	14.2	13.9
Receiver to Source Distance, m	66.4	62.8	69.5	69.5
Path Length Difference, m	0.187	0.309	0.303	0.303
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.2	-4.0	-4.4	-4.4
Angle of View Correction, dB(A)	-15.0	-15.0	-35.8	-38.9
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-14.2	-14.1	-14.1
SEL of the Segment, dB(A)	64.0	62.8	41.6	45.4
SEL of Single PassBy, dB(A)	64.0	62.9		
Lmax of Single PassBy, dB(A)	54.6	53.5		
Train Frequency, No. of Train per 30min	12	12		
Leq,30min of the Track, dB(A)	42.3	41.1		
Leq,30min, dB(A)	**44.7**			
1/F, +	**2.70**			
Path Length Difference, m	0.119	0.242	0.243	0.243
Slant Distance, m	66.4	62.8	69.5	69.5
Distance Correction, dB(A)	-4.2	-4.0	-4.4	-4.4
Screening Correction, dB(A)	-11.4	-13.4	-13.5	-13.5
SEL of the Segment, dB(A)	65.3	63.5	42.3	46.1
SEL of Single PassBy, dB(A)	65.3	63.6		
Lmax of Single PassBy, dB(A)	55.9	54.2		
Leq,30min of the Track, dB(A)	43.5	41.9		
Leq,30min, dB(A)	**45.8**			
2/F, +	**5.40**			
Path Length Difference, m	0.067	0.183	0.190	0.190
Slant Distance, m	66.5	62.9	69.6	69.6
Distance Correction, dB(A)	-4.2	-4.0	-4.4	-4.4
Screening Correction, dB(A)	-9.9	-12.6	-12.7	-12.7
SEL of the Segment, dB(A)	66.8	64.3	43.1	46.9
SEL of Single PassBy, dB(A)	66.8	64.5		
Lmax of Single PassBy, dB(A)	57.4	55.0		
Leq,30min of the Track, dB(A)	45.1	42.7		
Leq,30min, dB(A)	**47.0**			

Table F.16 Air-borne Rail Noise Calculation for Assessment Point H2P2 (Full Day)

Track	Northbound		Southbound					
Segment	AB		AB	CD	DE	AB	CD	DE
Train Type	EMU	ITT	EMU			ITT		
Angle Start	12.1	12.1	11.4	165.6	166.0	11.4	165.6	166.0
Angle End	31.6	31.6	31.6	166.0	166.2	31.6	166.0	166.2
Speed, kph	120	120	120	120	120	120	120	120
Slant Distance, m	66.4	66.4	62.8	69.5	69.5	62.8	69.5	69.5
Angle of View, θ^o	19.5	19.5	20.2	0.4	0.2	20.2	0.4	0.2
Angle of Orientation of the Segment, α^o	21.9	21.9	21.5	14.2	13.9	21.5	14.2	13.9
Receiver to Source Distance, m	66.4	66.4	62.8	69.5	69.5	62.8	69.5	69.5
Path Length Difference, m	0.187	0.187	0.309	0.303	0.303	0.309	0.303	0.303
Wheel/Rail Noise Contribution								
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	89.0	97.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.2	-4.2	-4.0	-4.4	-4.4	-4.0	-4.4	-4.4
Angle of View Correction, dB(A)	-15.0	-15.0	-15.0	-35.8	-38.9	-15.0	-35.8	-38.9
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)					7.0			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.1	-14.1	-14.2	-14.1	-14.1
SEL of the Segment, dB(A)	64.0	72.1	62.8	41.6	45.4	70.8	49.7	53.5
SEL of Single PassBy, dB(A)	64.0	72.1	62.9			70.9		
Train Frequency, No. of Train per day	425	9	425			9		
Leq,24hr of the Track, dB(A)	40.9	32.3	39.8			31.1		
Leq,24hr, dB(A)	44.0							
1/F, +	2.70							
Path Length Difference, m	0.119	0.119	0.242	0.243	0.243	0.242	0.243	0.243
Slant Distance, m	66.4	66.4	62.8	69.5	69.5	62.8	69.5	69.5
Distance Correction, dB(A)	-4.2	-4.2	-4.0	-4.4	-4.4	-4.0	-4.4	-4.4
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.5	-13.5	-13.4	-13.5	-13.5
SEL of the Segment, dB(A)	65.3	73.4	63.5	42.3	46.1	71.6	50.4	54.2
SEL of Single PassBy, dB(A)	65.3	73.4	63.6			71.7		
Leq,24hr of the Track, dB(A)	42.2	33.5	40.6			31.9		
Leq,24hr, dB(A)	45.0							
2/F, +	5.40							
Path Length Difference, m	0.067	0.067	0.183	0.190	0.190	0.183	0.190	0.190
Slant Distance, m	66.5	66.5	62.9	69.6	69.6	62.9	69.6	69.6
Distance Correction, dB(A)	-4.2	-4.2	-4.0	-4.4	-4.4	-4.0	-4.4	-4.4
Screening Correction, dB(A)	-9.9	-9.9	-12.6	-12.7	-12.7	-12.6	-12.7	-12.7
SEL of the Segment, dB(A)	66.8	74.9	64.3	43.1	46.9	72.4	51.1	54.9
SEL of Single PassBy, dB(A)	66.8	74.9	64.5			72.5		
Leq,24hr of the Track, dB(A)	43.7	35.1	41.4			32.7		
Leq,24hr, dB(A)	46.3							

Figure F.9 Angle of View for Assessment Point H2P2 DT (2/F)

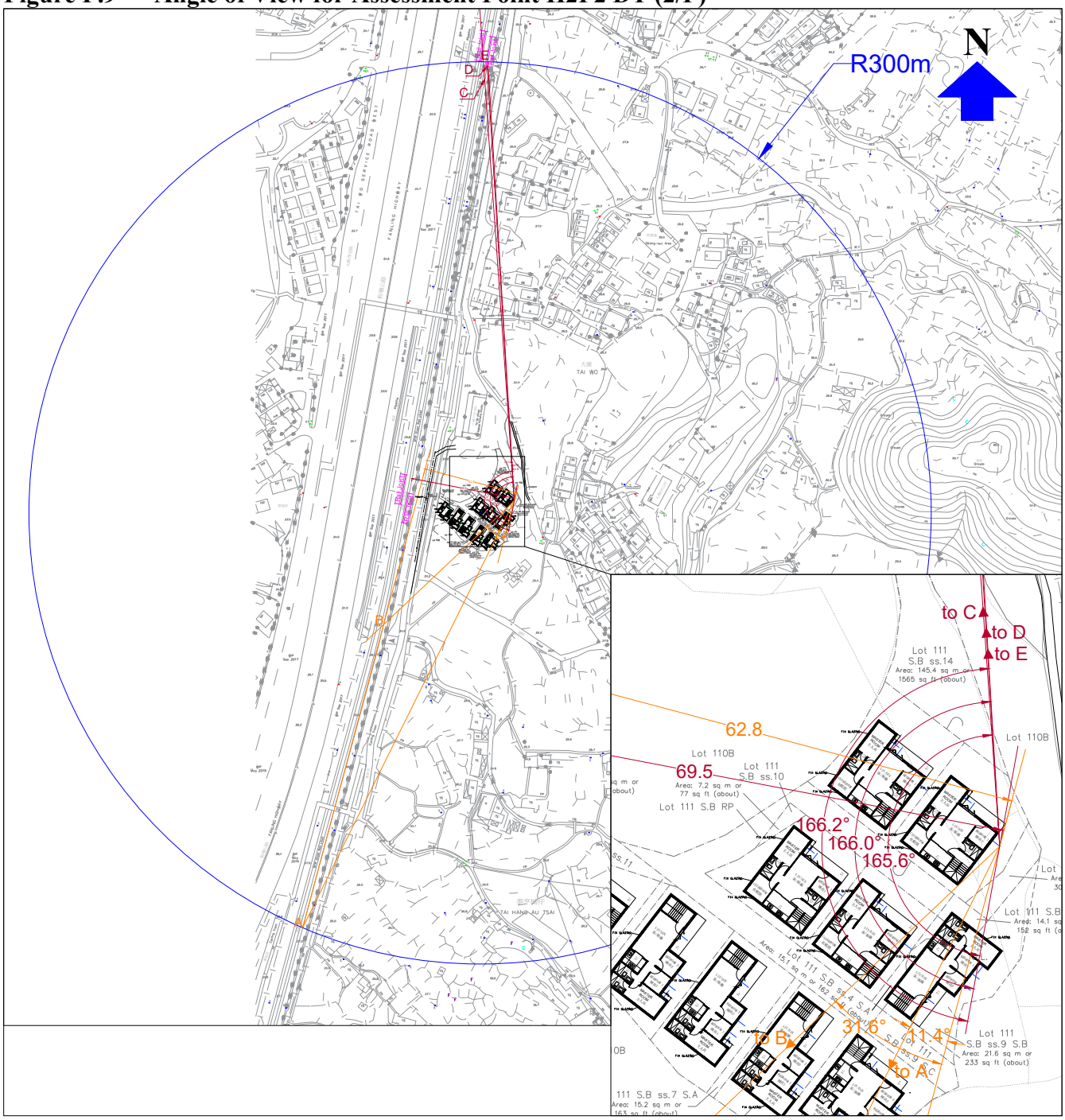


Figure F.10 Angle of View for Assessment Point H2P2 UT (2/F)

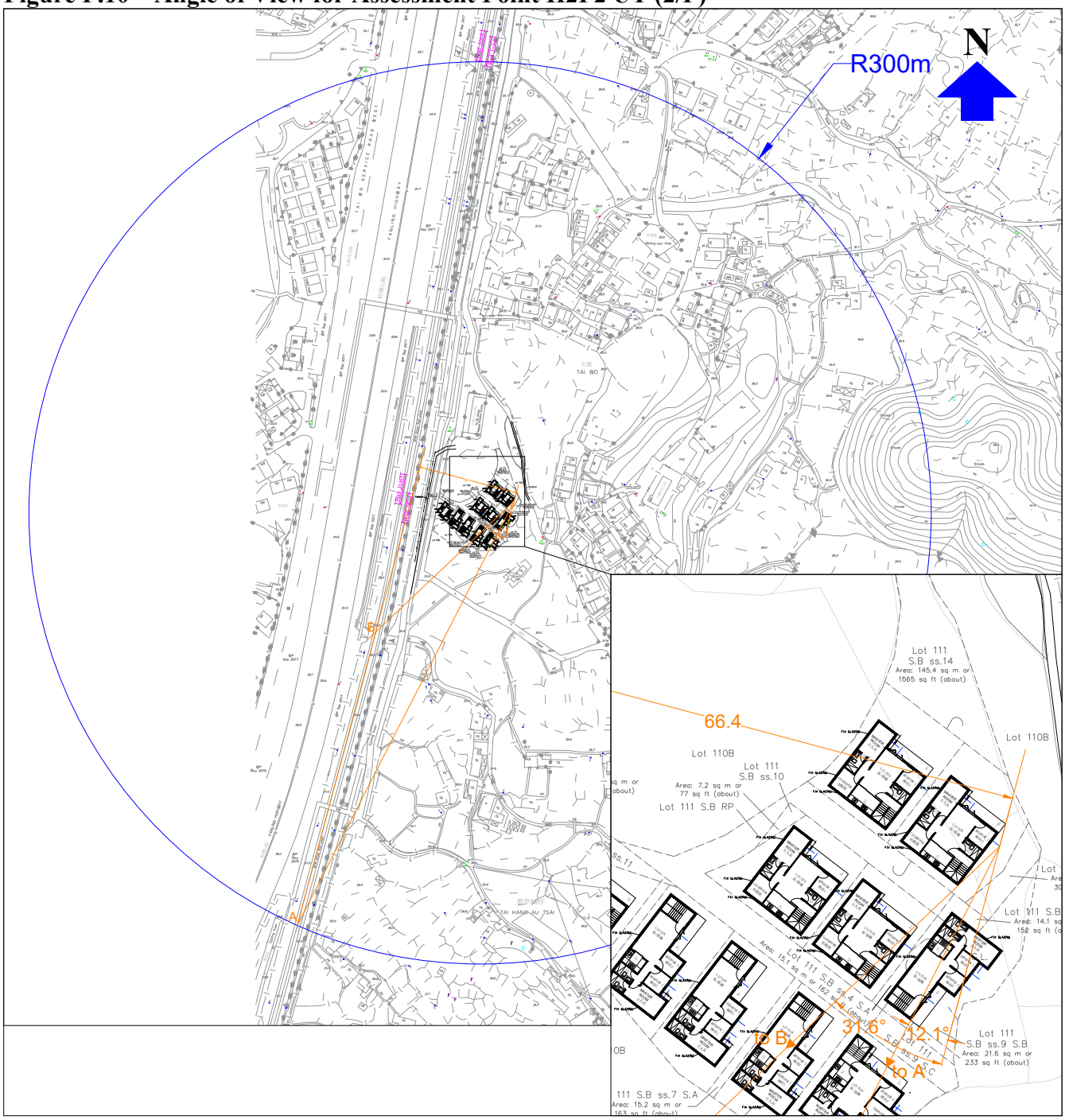


Table F.17 Air-borne Rail Noise Calculation for Assessment Point H2P3 (Daytime)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	164.4	164.4	164.4	166.6	164.4	166.6
Angle End	165.9	165.9	166.6	166.8	166.6	166.8
Speed, kph	120	120	120	120	120	120
Slant Distance, m	69.4	69.4	65.6	65.6	65.6	65.6
Angle of View, θ^o	1.5	1.5	2.2	0.2	2.2	0.2
Angle of Orientation of the Segment, α^o	14.9	14.9	14.5	13.3	14.5	13.3
Receiver to Source Distance, m	69.4	69.4	65.6	65.6	65.6	65.6
Path Length Difference, m	0.184	0.184	0.306	0.306	0.306	0.306
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.4	-4.4	-4.2	-4.2	-4.2	-4.2
Angle of View Correction, dB(A)	-29.6	-29.6	-28.2	-39.3	-28.2	-39.3
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.6	-12.6	-14.2	-14.2	-14.2	-14.2
SEL of the Segment, dB(A)	49.3	57.3	49.4	45.3	57.5	53.3
SEL of Single PassBy, dB(A)	49.3	57.3	50.9		58.9	
Train Frequency, No. of Train per 30min	15	1	15		1	
Leq,30min of the Track, dB(A)	28.5	24.8	30.1		26.4	
Leq,30min, dB(A)	**33.9**					
1/F, +	**2.70**					
Path Length Difference, m	0.120	0.120	0.243	0.243	0.243	0.243
Slant Distance, m	69.4	69.4	65.6	65.6	65.6	65.6
Distance Correction, dB(A)	-4.4	-4.4	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-11.4	-11.4	-13.5	-13.5	-13.5	-13.5
SEL of the Segment, dB(A)	50.5	58.6	50.2	46.0	58.2	54.1
SEL of Single PassBy, dB(A)	50.5	58.6	51.6		59.6	
Leq,30min of the Track, dB(A)	29.7	26.0	30.8		27.1	
Leq,30min, dB(A)	**34.8**					
2/F, +	**5.40**					
Path Length Difference, m	0.069	0.069	0.186	0.186	0.186	0.186
Slant Distance, m	69.5	69.5	65.7	65.7	65.7	65.7
Distance Correction, dB(A)	-4.4	-4.4	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-9.9	-9.9	-12.7	-12.7	-12.7	-12.7
SEL of the Segment, dB(A)	51.9	60.0	50.9	46.8	59.0	54.9
SEL of Single PassBy, dB(A)	51.9	60.0	52.4		60.4	
Leq,30min of the Track, dB(A)	31.2	27.5	31.6		27.9	
Leq,30min, dB(A)	**35.9**					

Table F.18 Air-borne Rail Noise Calculation for Assessment Point H2P3 (Night-time)

Track	Northbound	Southbound	
Segment	CD	CD	DE
Train Type	EMU	EMU	
Angle Start	164.4	164.4	166.6
Angle End	165.9	166.6	166.8
Speed, kph	120	120	120
Slant Distance, m	69.4	65.6	65.6
Angle of View, θ^o	1.5	2.2	0.2
Angle of Orientation of the Segment, α^o	14.9	14.5	13.3
Receiver to Source Distance, m	69.4	65.6	65.6
Path Length Difference, m	0.184	0.306	0.306
Wheel/Rail Noise Contribution			
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0
Distance Correction, dB(A)	-4.4	-4.2	-4.2
Angle of View Correction, dB(A)	-29.6	-28.2	-39.3
Façade Correction, dB(A)	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5
Screening Correction, dB(A)	-12.6	-14.2	-14.2
SEL of the Segment, dB(A)	49.3	49.4	45.3
SEL of Single PassBy, dB(A)	49.3	50.9	
Lmax of Single PassBy, dB(A)	39.8	41.4	
Train Frequency, No. of Train per 30min	12	12	
Leq,30min of the Track, dB(A)	27.5	29.1	
Leq,30min, dB(A)	**31.4**		
1/F, +	**2.70**		
Path Length Difference, m	0.120	0.243	0.243
Slant Distance, m	69.4	65.6	65.6
Distance Correction, dB(A)	-4.4	-4.2	-4.2
Screening Correction, dB(A)	-11.4	-13.5	-13.5
SEL of the Segment, dB(A)	50.5	50.2	46.0
SEL of Single PassBy, dB(A)	50.5	51.6	
Lmax of Single PassBy, dB(A)	41.1	42.1	
Leq,30min of the Track, dB(A)	28.8	29.8	
Leq,30min, dB(A)	**32.3**		
2/F, +	**5.40**		
Path Length Difference, m	0.069	0.186	0.186
Slant Distance, m	69.5	65.7	65.7
Distance Correction, dB(A)	-4.4	-4.2	-4.2
Screening Correction, dB(A)	-9.9	-12.7	-12.7
SEL of the Segment, dB(A)	51.9	50.9	46.8
SEL of Single PassBy, dB(A)	51.9	52.4	
Lmax of Single PassBy, dB(A)	42.5	42.9	
Leq,30min of the Track, dB(A)	30.2	30.6	
Leq,30min, dB(A)	**33.4**		

Table F.19 Air-borne Rail Noise Calculation for Assessment Point H2P3 (Full Day)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	164.4	164.4	164.4	166.6	164.4	166.6
Angle End	165.9	165.9	166.6	166.8	166.6	166.8
Speed, kph	120	120	120	120	120	120
Slant Distance, m	69.4	69.4	65.6	65.6	65.6	65.6
Angle of View, θ^o	1.5	1.5	2.2	0.2	2.2	0.2
Angle of Orientation of the Segment, α^o	14.9	14.9	14.5	13.3	14.5	13.3
Receiver to Source Distance, m	69.4	69.4	65.6	65.6	65.6	65.6
Path Length Difference, m	0.184	0.184	0.306	0.306	0.306	0.306
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.4	-4.4	-4.2	-4.2	-4.2	-4.2
Angle of View Correction, dB(A)	-29.6	-29.6	-28.2	-39.3	-28.2	-39.3
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.6	-12.6	-14.2	-14.2	-14.2	-14.2
SEL of the Segment, dB(A)	49.3	57.3	49.4	45.3	57.5	53.3
SEL of Single PassBy, dB(A)	49.3	57.3	50.9		58.9	
Train Frequency, No. of Train per day	425	9	425		9	
Leq,24hr of the Track, dB(A)	26.2	17.5	27.8		19.1	
Leq,24hr, dB(A)	**30.6**					
1/F, +	**2.70**					
Path Length Difference, m	0.120	0.120	0.243	0.243	0.243	0.243
Slant Distance, m	69.4	69.4	65.6	65.6	65.6	65.6
Distance Correction, dB(A)	-4.4	-4.4	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-11.4	-11.4	-13.5	-13.5	-13.5	-13.5
SEL of the Segment, dB(A)	50.5	58.6	50.2	46.0	58.2	54.1
SEL of Single PassBy, dB(A)	50.5	58.6	51.6		59.6	
Leq,24hr of the Track, dB(A)	27.4	18.8	28.5		19.8	
Leq,24hr, dB(A)	**31.6**					
2/F, +	**5.40**					
Path Length Difference, m	0.069	0.069	0.186	0.186	0.186	0.186
Slant Distance, m	69.5	69.5	65.7	65.7	65.7	65.7
Distance Correction, dB(A)	-4.4	-4.4	-4.2	-4.2	-4.2	-4.2
Screening Correction, dB(A)	-9.9	-9.9	-12.7	-12.7	-12.7	-12.7
SEL of the Segment, dB(A)	51.9	60.0	50.9	46.8	59.0	54.9
SEL of Single PassBy, dB(A)	51.9	60.0	52.4		60.4	
Leq,24hr of the Track, dB(A)	28.9	20.2	29.3		20.6	
Leq,24hr, dB(A)	**32.6**					

Figure F.11 Angle of View for Assessment Point H2P3 DT (2/F)

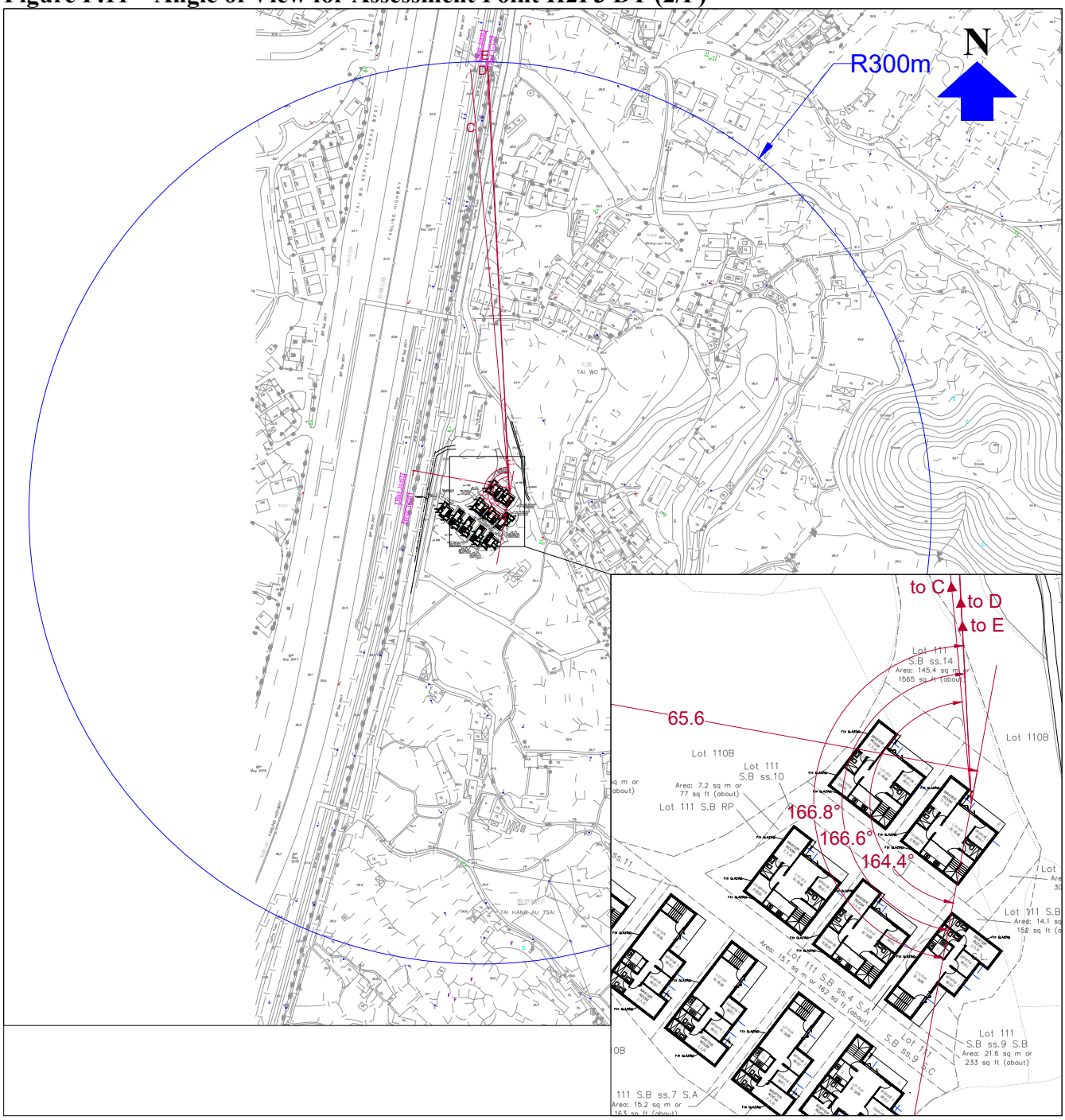


Figure F.12 Angle of View for Assessment Point H2P3 UT (2/F)

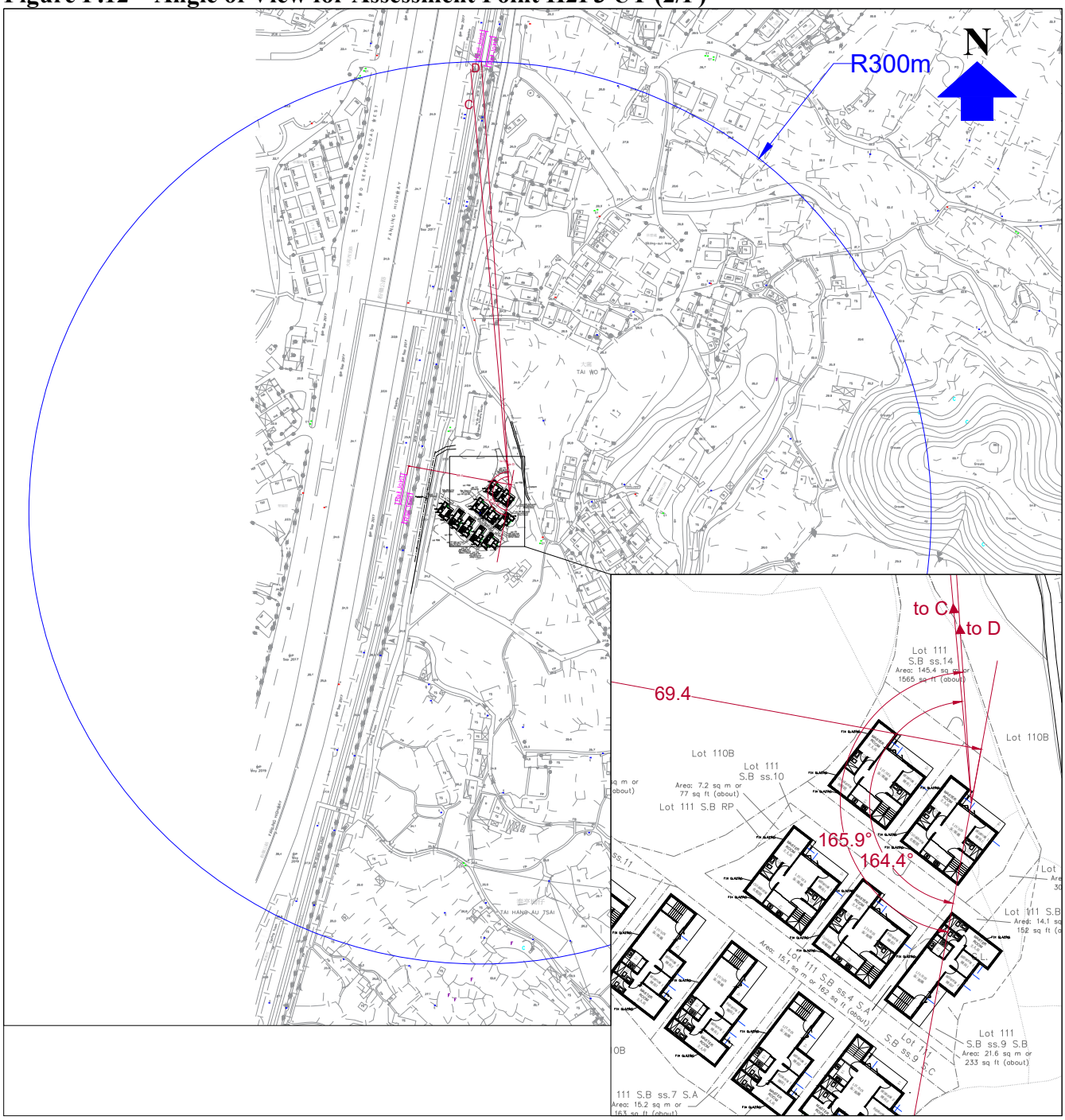


Table F.20 Air-borne Rail Noise Calculation for Assessment Point H3P1 (Daytime)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	149.7	149.7	149.7	169.7	149.7	169.7
Angle End	168.9	168.9	169.7	169.8	169.7	169.8
Speed, kph	120	120	120	120	120	120
Slant Distance, m	53.7	53.7	49.9	49.9	49.9	49.9
Angle of View, θ^o	19.2	19.2	20.0	0.1	20.0	0.1
Angle of Orientation of the Segment, α^o	20.7	20.7	20.3	10.3	20.3	10.3
Receiver to Source Distance, m	53.7	53.7	49.9	49.9	49.9	49.9
Path Length Difference, m	0.203	0.203	0.325	0.325	0.325	0.325
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.3	-3.3	-3.0	-3.0	-3.0	-3.0
Angle of View Correction, dB(A)	-15.5	-15.5	-15.5	-44.6	-15.5	-44.6
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.9	-12.9	-14.4	-14.4	-14.4	-14.4
SEL of the Segment, dB(A)	64.2	72.3	63.1	41.0	71.2	49.1
SEL of Single PassBy, dB(A)	64.2	72.3	63.1		71.2	
Train Frequency, No. of Train per 30min	15	1	15		1	
Leq,30min of the Track, dB(A)	43.4	39.7	42.4		38.7	
Leq,30min, dB(A)	**47.5**					
1/F, +	**2.70**					
Path Length Difference, m	0.117	0.117	0.239	0.239	0.239	0.239
Slant Distance, m	53.7	53.7	49.9	49.9	49.9	49.9
Distance Correction, dB(A)	-3.3	-3.3	-3.0	-3.0	-3.0	-3.0
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	65.8	73.9	64.1	42.0	72.1	50.1
SEL of Single PassBy, dB(A)	65.8	73.9	64.1		72.2	
Leq,30min of the Track, dB(A)	45.0	41.3	43.3		39.6	
Leq,30min, dB(A)	**48.8**					
2/F, +	**5.40**					
Path Length Difference, m	0.054	0.054	0.166	0.166	0.166	0.166
Slant Distance, m	53.8	53.8	50.1	50.1	50.1	50.1
Distance Correction, dB(A)	-3.3	-3.3	-3.0	-3.0	-3.0	-3.0
Screening Correction, dB(A)	-9.4	-9.4	-12.3	-12.3	-12.3	-12.3
SEL of the Segment, dB(A)	67.7	75.8	65.1	43.1	73.2	51.1
SEL of Single PassBy, dB(A)	67.7	75.8	65.2		73.2	
Leq,30min of the Track, dB(A)	46.9	43.2	44.4		40.7	
Leq,30min, dB(A)	**50.4**					

Table F.21 Air-borne Rail Noise Calculation for Assessment Point H3P1 (Night-time)

Track	Northbound	Southbound	
Segment	CD	CD	DE
Train Type	EMU	EMU	
Angle Start	149.7	149.7	169.7
Angle End	168.9	169.7	169.8
Speed, kph	120	120	120
Slant Distance, m	53.7	49.9	49.9
Angle of View, θ^o	19.2	20.0	0.1
Angle of Orientation of the Segment, α^o	20.7	20.3	10.3
Receiver to Source Distance, m	53.7	49.9	49.9
Path Length Difference, m	0.203	0.325	0.325
Wheel/Rail Noise Contribution			
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0
Distance Correction, dB(A)	-3.3	-3.0	-3.0
Angle of View Correction, dB(A)	-15.5	-15.5	-44.6
Façade Correction, dB(A)	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5
Screening Correction, dB(A)	-12.9	-14.4	-14.4
SEL of the Segment, dB(A)	64.2	63.1	41.0
SEL of Single PassBy, dB(A)	64.2	63.1	
Lmax of Single PassBy, dB(A)	54.8	53.8	
Train Frequency, No. of Train per 30min	12	12	
Leq,30min of the Track, dB(A)	42.4	41.4	
Leq,30min, dB(A)	**45.0**		
1/F, +	**2.70**		
Path Length Difference, m	0.117	0.239	0.239
Slant Distance, m	53.7	49.9	49.9
Distance Correction, dB(A)	-3.3	-3.0	-3.0
Screening Correction, dB(A)	-11.3	-13.4	-13.4
SEL of the Segment, dB(A)	65.8	64.1	42.0
SEL of Single PassBy, dB(A)	65.8	64.1	
Lmax of Single PassBy, dB(A)	56.4	54.7	
Leq,30min of the Track, dB(A)	44.0	42.3	
Leq,30min, dB(A)	**46.3**		
2/F, +	**5.40**		
Path Length Difference, m	0.054	0.166	0.166
Slant Distance, m	53.8	50.1	50.1
Distance Correction, dB(A)	-3.3	-3.0	-3.0
Screening Correction, dB(A)	-9.4	-12.3	-12.3
SEL of the Segment, dB(A)	67.7	65.1	43.1
SEL of Single PassBy, dB(A)	67.7	65.2	
Lmax of Single PassBy, dB(A)	58.4	55.8	
Leq,30min of the Track, dB(A)	46.0	43.4	
Leq,30min, dB(A)	**47.9**		

Table F.22 Air-borne Rail Noise Calculation for Assessment Point H3P1 (Full Day)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	149.7	149.7	149.7	169.7	149.7	169.7
Angle End	168.9	168.9	169.7	169.8	169.7	169.8
Speed, kph	120	120	120	120	120	120
Slant Distance, m	53.7	53.7	49.9	49.9	49.9	49.9
Angle of View, θ^o	19.2	19.2	20.0	0.1	20.0	0.1
Angle of Orientation of the Segment, α^o	20.7	20.7	20.3	10.3	20.3	10.3
Receiver to Source Distance, m	53.7	53.7	49.9	49.9	49.9	49.9
Path Length Difference, m	0.203	0.203	0.325	0.325	0.325	0.325
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.3	-3.3	-3.0	-3.0	-3.0	-3.0
Angle of View Correction, dB(A)	-15.5	-15.5	-15.5	-44.6	-15.5	-44.6
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.9	-12.9	-14.4	-14.4	-14.4	-14.4
SEL of the Segment, dB(A)	64.2	72.3	63.1	41.0	71.2	49.1
SEL of Single PassBy, dB(A)	64.2	72.3	63.1		71.2	
Train Frequency, No. of Train per day	425	9	425		9	
Leq,24hr of the Track, dB(A)	41.1	32.4	40.1		31.4	
Leq,24hr, dB(A)	**44.2**					
1/F, +	**2.70**					
Path Length Difference, m	0.117	0.117	0.239	0.239	0.239	0.239
Slant Distance, m	53.7	53.7	49.9	49.9	49.9	49.9
Distance Correction, dB(A)	-3.3	-3.3	-3.0	-3.0	-3.0	-3.0
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	65.8	73.9	64.1	42.0	72.1	50.1
SEL of Single PassBy, dB(A)	65.8	73.9	64.1		72.2	
Leq,24hr of the Track, dB(A)	42.7	34.0	41.0		32.3	
Leq,24hr, dB(A)	**45.5**					
2/F, +	**5.40**					
Path Length Difference, m	0.054	0.054	0.166	0.166	0.166	0.166
Slant Distance, m	53.8	53.8	50.1	50.1	50.1	50.1
Distance Correction, dB(A)	-3.3	-3.3	-3.0	-3.0	-3.0	-3.0
Screening Correction, dB(A)	-9.4	-9.4	-12.3	-12.3	-12.3	-12.3
SEL of the Segment, dB(A)	67.7	75.8	65.1	43.1	73.2	51.1
SEL of Single PassBy, dB(A)	67.7	75.8	65.2		73.2	
Leq,24hr of the Track, dB(A)	44.7	36.0	42.1		33.4	
Leq,24hr, dB(A)	**47.1**					

Figure F.13 Angle of View for Assessment Point H3P1 DT (2/F)

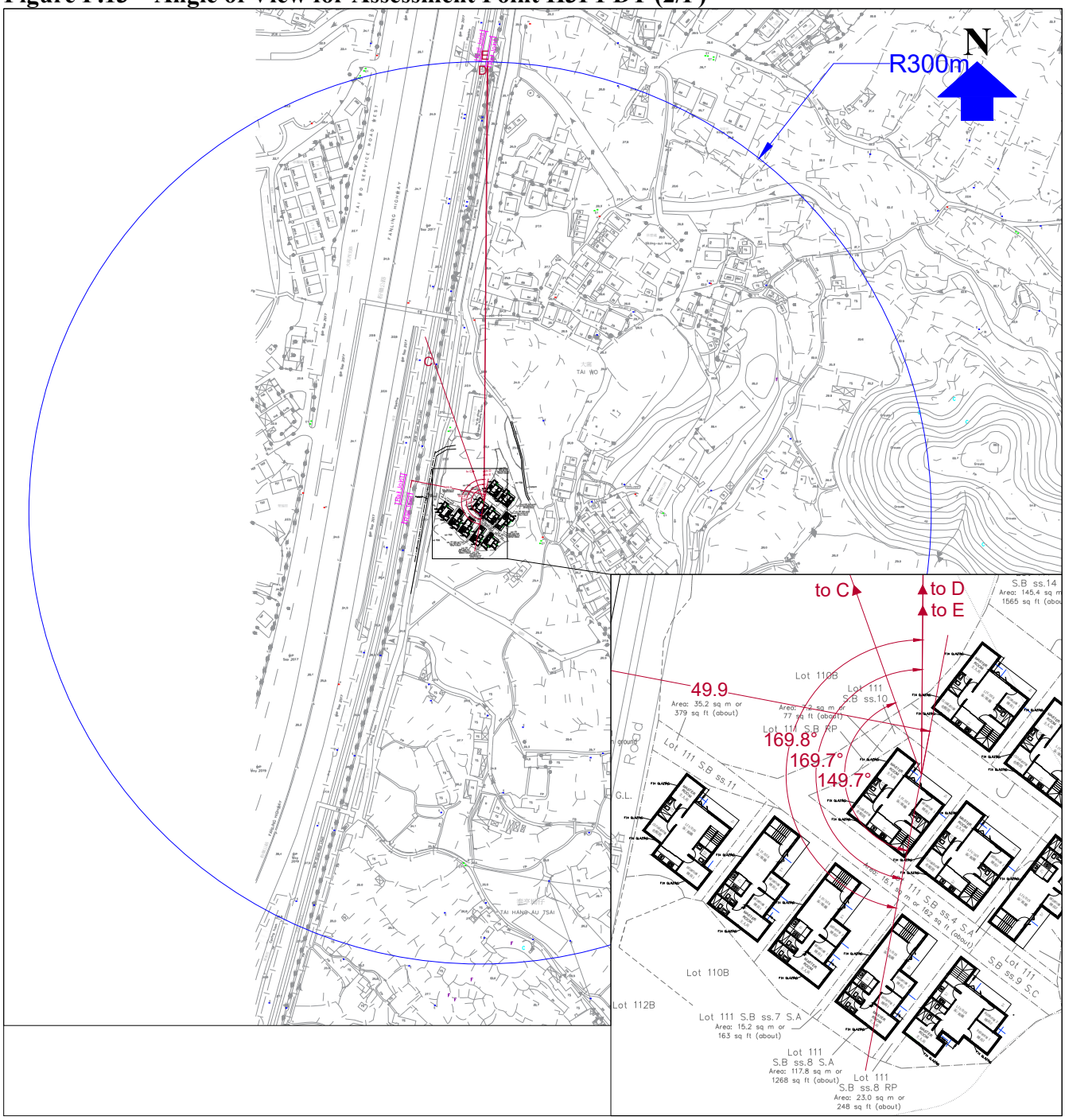


Figure F.14 Angle of View for Assessment Point H3P1 UT (2/F)

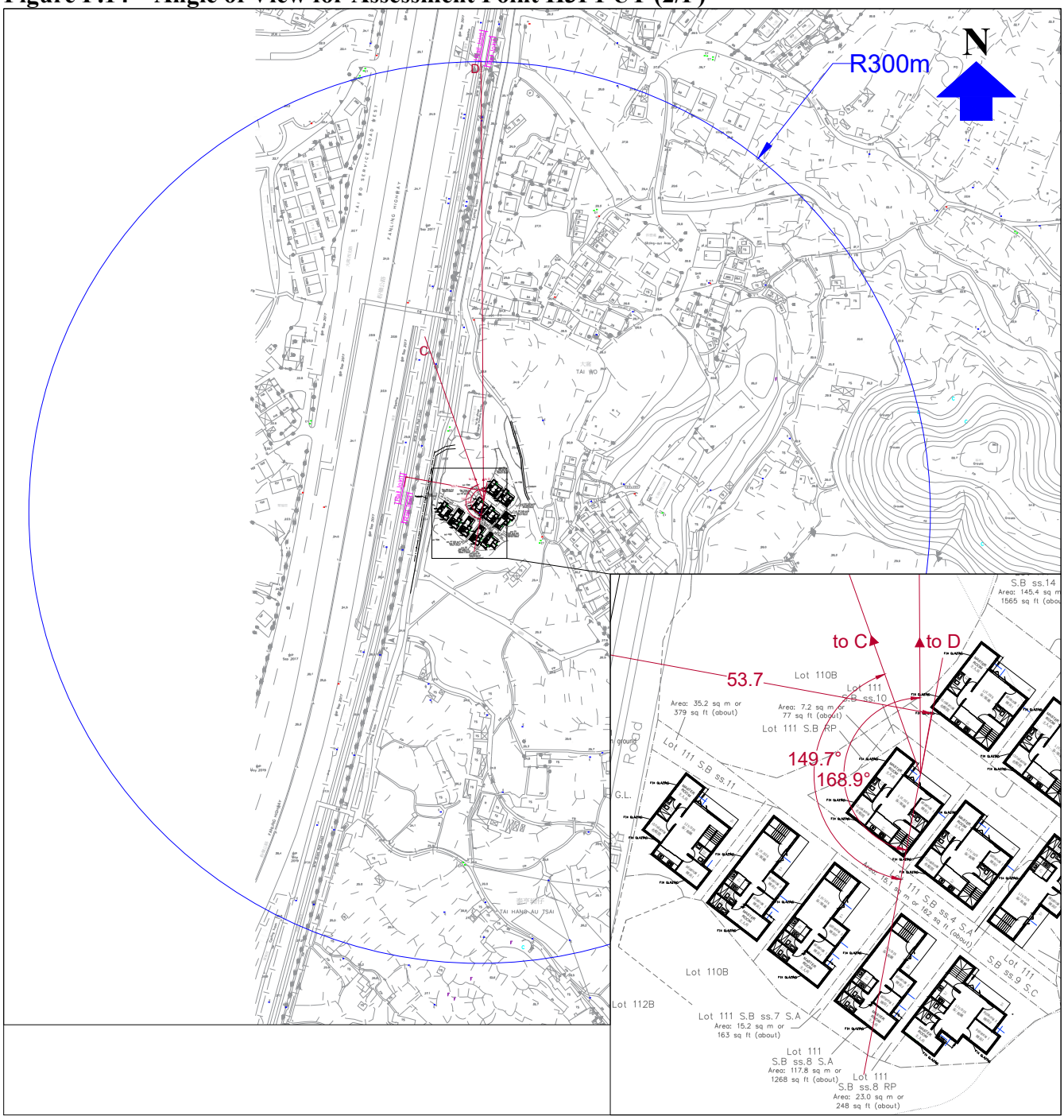


Table F.23 Air-borne Rail Noise Calculation for Assessment Point H3P2 (Daytime)

Track	Northbound				Southbound					
Segment	AB	CD	AB	CD	AB	CD	DE	AB	CD	DE
Train Type	EMU		ITT		EMU			ITT		
Angle Start	9.8	165.3	9.8	165.3	9.1	165.3	169.1	9.1	165.3	169.1
Angle End	31.8	168.4	31.8	168.4	31.8	169.1	169.2	31.8	169.1	169.2
Speed, kph	120	120	120	120	120	120	120	120	120	120
Slant Distance, m	51.8	57.3	51.8	57.3	48.1	53.5	53.5	48.1	53.5	53.5
Angle of View, θ^o	22.0	3.1	22.0	3.1	22.7	3.8	0.1	22.7	3.8	0.1
Angle of Orientation of the Segment, α^o	20.8	13.2	20.8	13.2	20.5	12.8	10.9	20.5	12.8	10.9
Receiver to Source Distance, m	51.8	57.3	51.8	57.3	48.1	53.5	53.5	48.1	53.5	53.5
Path Length Difference, m	0.207	0.198	0.207	0.198	0.328	0.320	0.320	0.328	0.320	0.320
Wheel/Rail Noise Contribution										
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	97.0	97.0	89.0	89.0	89.0	97.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.2	-3.6	-3.2	-3.6	-2.8	-3.3	-3.3	-2.8	-3.3	-3.3
Angle of View Correction, dB(A)	-14.8	-27.5	-14.8	-27.5	-14.8	-26.8	-44.1	-14.8	-26.8	-44.1
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)							7.0			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.0	-12.8	-13.0	-12.8	-14.4	-14.3	-14.3	-14.4	-14.3	-14.3
SEL of the Segment, dB(A)	65.0	52.0	73.1	60.1	63.9	51.5	41.3	72.0	59.6	49.3
SEL of Single PassBy, dB(A)	65.2		73.3		64.2			72.3		
Train Frequency, No. of Train per 30min	15		1		15			1		
Leq,30min of the Track, dB(A)	44.4		40.7		43.4			39.7		
Leq,30min, dB(A)	**48.5**									
1/F, +	**2.70**									
Path Length Difference, m	0.116	0.117	0.116	0.117	0.239	0.240	0.240	0.239	0.240	0.240
Slant Distance, m	51.8	57.3	51.8	57.3	48.1	53.5	53.5	48.1	53.5	53.5
Distance Correction, dB(A)	-3.2	-3.6	-3.2	-3.6	-2.8	-3.3	-3.3	-2.8	-3.3	-3.3
Screening Correction, dB(A)	-11.3	-11.3	-11.3	-11.3	-13.4	-13.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	66.7	53.5	74.7	61.6	64.9	52.4	42.2	73.0	60.5	50.2
SEL of Single PassBy, dB(A)	66.9		74.9		65.2			73.2		
Leq,30min of the Track, dB(A)	46.1		42.4		44.4			40.7		
Leq,30min, dB(A)	**49.9**									
2/F, +	**5.40**									
Path Length Difference, m	0.052	0.058	0.052	0.058	0.163	0.172	0.172	0.163	0.172	0.172
Slant Distance, m	51.9	57.4	51.9	57.4	48.3	53.6	53.6	48.3	53.6	53.6
Distance Correction, dB(A)	-3.2	-3.6	-3.2	-3.6	-2.9	-3.3	-3.3	-2.9	-3.3	-3.3
Screening Correction, dB(A)	-9.3	-9.5	-9.3	-9.5	-12.3	-12.4	-12.4	-12.3	-12.4	-12.4
SEL of the Segment, dB(A)	68.7	55.3	76.8	63.4	66.0	53.4	43.2	74.1	61.5	51.2
SEL of Single PassBy, dB(A)	68.9		77.0		66.3			74.3		
Leq,30min of the Track, dB(A)	48.1		44.4		45.5			41.8		
Leq,30min, dB(A)	**51.5**									

Table F.24 Air-borne Rail Noise Calculation for Assessment Point H3P2 (Night-time)

Track	Northbound		Southbound		
Segment	AB	CD	AB	CD	DE
Train Type	EMU		EMU		
Angle Start	9.8	165.3	9.1	165.3	169.1
Angle End	31.8	168.4	31.8	169.1	169.2
Speed, kph	120	120	120	120	120
Slant Distance, m	51.8	57.3	48.1	53.5	53.5
Angle of View, θ^o	22.0	3.1	22.7	3.8	0.1
Angle of Orientation of the Segment, α^o	20.8	13.2	20.5	12.8	10.9
Receiver to Source Distance, m	51.8	57.3	48.1	53.5	53.5
Path Length Difference, m	0.207	0.198	0.328	0.320	0.320
Wheel/Rail Noise Contribution					
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.2	-3.6	-2.8	-3.3	-3.3
Angle of View Correction, dB(A)	-14.8	-27.5	-14.8	-26.8	-44.1
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)					7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.0	-12.8	-14.4	-14.3	-14.3
SEL of the Segment, dB(A)	65.0	52.0	63.9	51.5	41.3
SEL of Single PassBy, dB(A)	65.2		64.2		
Lmax of Single PassBy, dB(A)	55.8		54.8		
Train Frequency, No. of Train per 30min	12		12		
Leq,30min of the Track, dB(A)	43.4		42.4		
Leq,30min, dB(A)	**46.0**				
1/F, +	**2.70**				
Path Length Difference, m	0.116	0.117	0.239	0.240	0.240
Slant Distance, m	51.8	57.3	48.1	53.5	53.5
Distance Correction, dB(A)	-3.2	-3.6	-2.8	-3.3	-3.3
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	66.7	53.5	64.9	52.4	42.2
SEL of Single PassBy, dB(A)	66.9		65.2		
Lmax of Single PassBy, dB(A)	57.5		55.8		
Leq,30min of the Track, dB(A)	45.1		43.4		
Leq,30min, dB(A)	**47.3**				
2/F, +	**5.40**				
Path Length Difference, m	0.052	0.058	0.163	0.172	0.172
Slant Distance, m	51.9	57.4	48.3	53.6	53.6
Distance Correction, dB(A)	-3.2	-3.6	-2.9	-3.3	-3.3
Screening Correction, dB(A)	-9.3	-9.5	-12.3	-12.4	-12.4
SEL of the Segment, dB(A)	68.7	55.3	66.0	53.4	43.2
SEL of Single PassBy, dB(A)	68.9		66.3		
Lmax of Single PassBy, dB(A)	59.5		56.9		
Leq,30min of the Track, dB(A)	47.1		44.5		
Leq,30min, dB(A)	**49.0**				

Table F.25 Air-borne Rail Noise Calculation for Assessment Point H3P2 (Full Day)

Track	Northbound				Southbound					
Segment	AB	CD	AB	CD	AB	CD	DE	AB	CD	DE
Train Type	EMU		ITT		EMU			ITT		
Angle Start	9.8	165.3	9.8	165.3	9.1	165.3	169.1	9.1	165.3	169.1
Angle End	31.8	168.4	31.8	168.4	31.8	169.1	169.2	31.8	169.1	169.2
Speed, kph	120	120	120	120	120	120	120	120	120	120
Slant Distance, m	51.8	57.3	51.8	57.3	48.1	53.5	53.5	48.1	53.5	53.5
Angle of View, θ°	22.0	3.1	22.0	3.1	22.7	3.8	0.1	22.7	3.8	0.1
Angle of Orientation of the Segment, α°	20.8	13.2	20.8	13.2	20.5	12.8	10.9	20.5	12.8	10.9
Receiver to Source Distance, m	51.8	57.3	51.8	57.3	48.1	53.5	53.5	48.1	53.5	53.5
Path Length Difference, m	0.207	0.198	0.207	0.198	0.328	0.320	0.320	0.328	0.320	0.320
Wheel/Rail Noise Contribution										
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	97.0	97.0	89.0	89.0	89.0	97.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.2	-3.6	-3.2	-3.6	-2.8	-3.3	-3.3	-2.8	-3.3	-3.3
Angle of View Correction, dB(A)	-14.8	-27.5	-14.8	-27.5	-14.8	-26.8	-44.1	-14.8	-26.8	-44.1
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)							7.0			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.0	-12.8	-13.0	-12.8	-14.4	-14.3	-14.3	-14.4	-14.3	-14.3
SEL of the Segment, dB(A)	65.0	52.0	73.1	60.1	63.9	51.5	41.3	72.0	59.6	49.3
SEL of Single PassBy, dB(A)	65.2		73.3		64.2			72.3		
Train Frequency, No. of Train per day	425		9		425			9		
Leq,24hr of the Track, dB(A)	42.1		33.4		41.1			32.4		
Leq,24hr, dB(A)	**45.2**									
1/F, +	**2.70**									
Path Length Difference, m	0.116	0.117	0.116	0.117	0.239	0.240	0.240	0.239	0.240	0.240
Slant Distance, m	51.8	57.3	51.8	57.3	48.1	53.5	53.5	48.1	53.5	53.5
Distance Correction, dB(A)	-3.2	-3.6	-3.2	-3.6	-2.8	-3.3	-3.3	-2.8	-3.3	-3.3
Screening Correction, dB(A)	-11.3	-11.3	-11.3	-11.3	-13.4	-13.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	66.7	53.5	74.7	61.6	64.9	52.4	42.2	73.0	60.5	50.2
SEL of Single PassBy, dB(A)	66.9		74.9		65.2			73.2		
Leq,24hr of the Track, dB(A)	43.8		35.1		42.1			33.4		
Leq,24hr, dB(A)	**46.6**									
2/F, +	**5.40**									
Path Length Difference, m	0.052	0.058	0.052	0.058	0.163	0.172	0.172	0.163	0.172	0.172
Slant Distance, m	51.9	57.4	51.9	57.4	48.3	53.6	53.6	48.3	53.6	53.6
Distance Correction, dB(A)	-3.2	-3.6	-3.2	-3.6	-2.9	-3.3	-3.3	-2.9	-3.3	-3.3
Screening Correction, dB(A)	-9.3	-9.5	-9.3	-9.5	-12.3	-12.4	-12.4	-12.3	-12.4	-12.4
SEL of the Segment, dB(A)	68.7	55.3	76.8	63.4	66.0	53.4	43.2	74.1	61.5	51.2
SEL of Single PassBy, dB(A)	68.9		77.0		66.3			74.3		
Leq,24hr of the Track, dB(A)	45.8		37.1		43.2			34.5		
Leq,24hr, dB(A)	**48.3**									

Figure F.15 Angle of View for Assessment Point H3P2 DT (2/F)

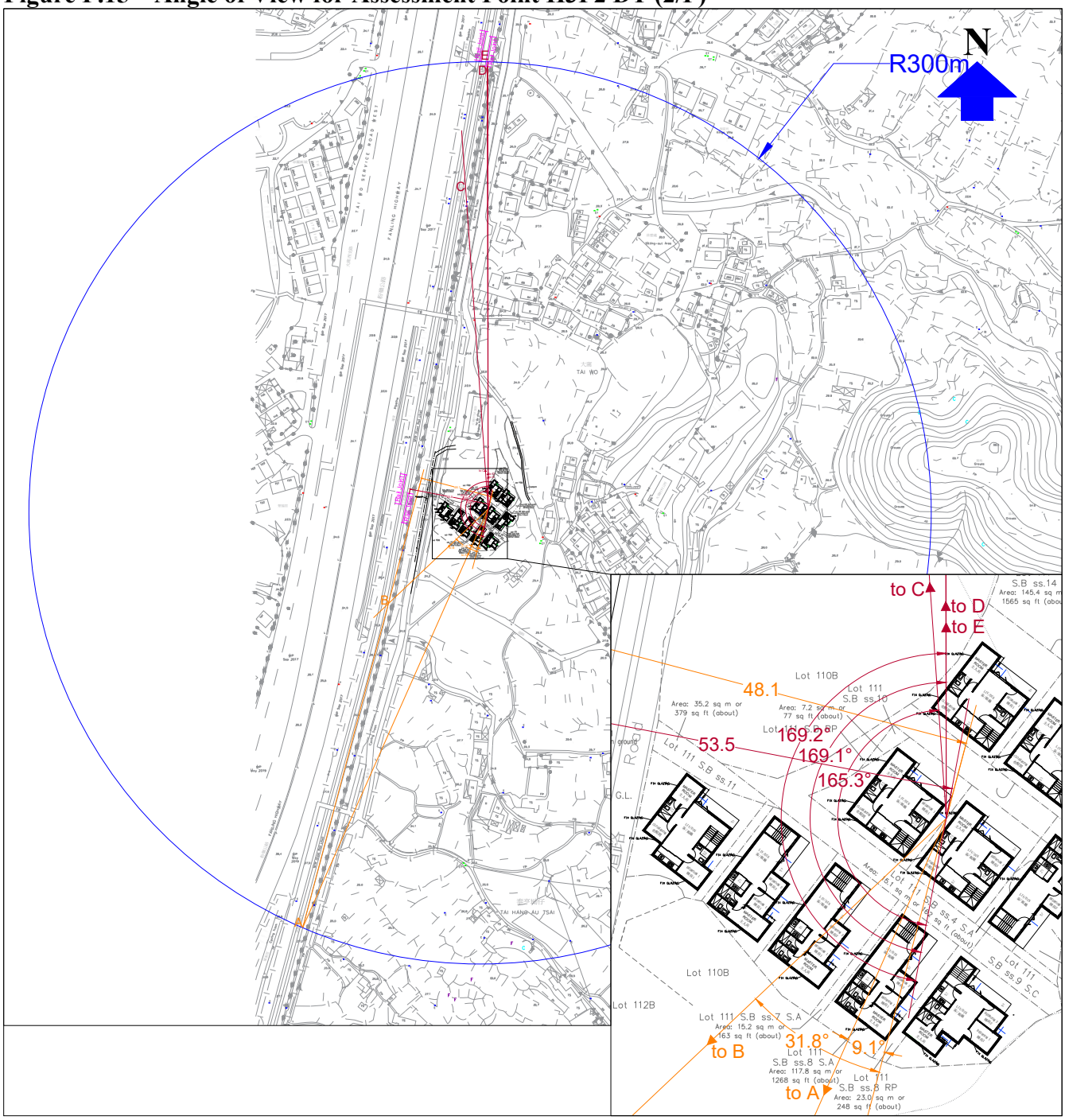


Figure F.16 Angle of View for Assessment Point H3P2 UT (2/F)

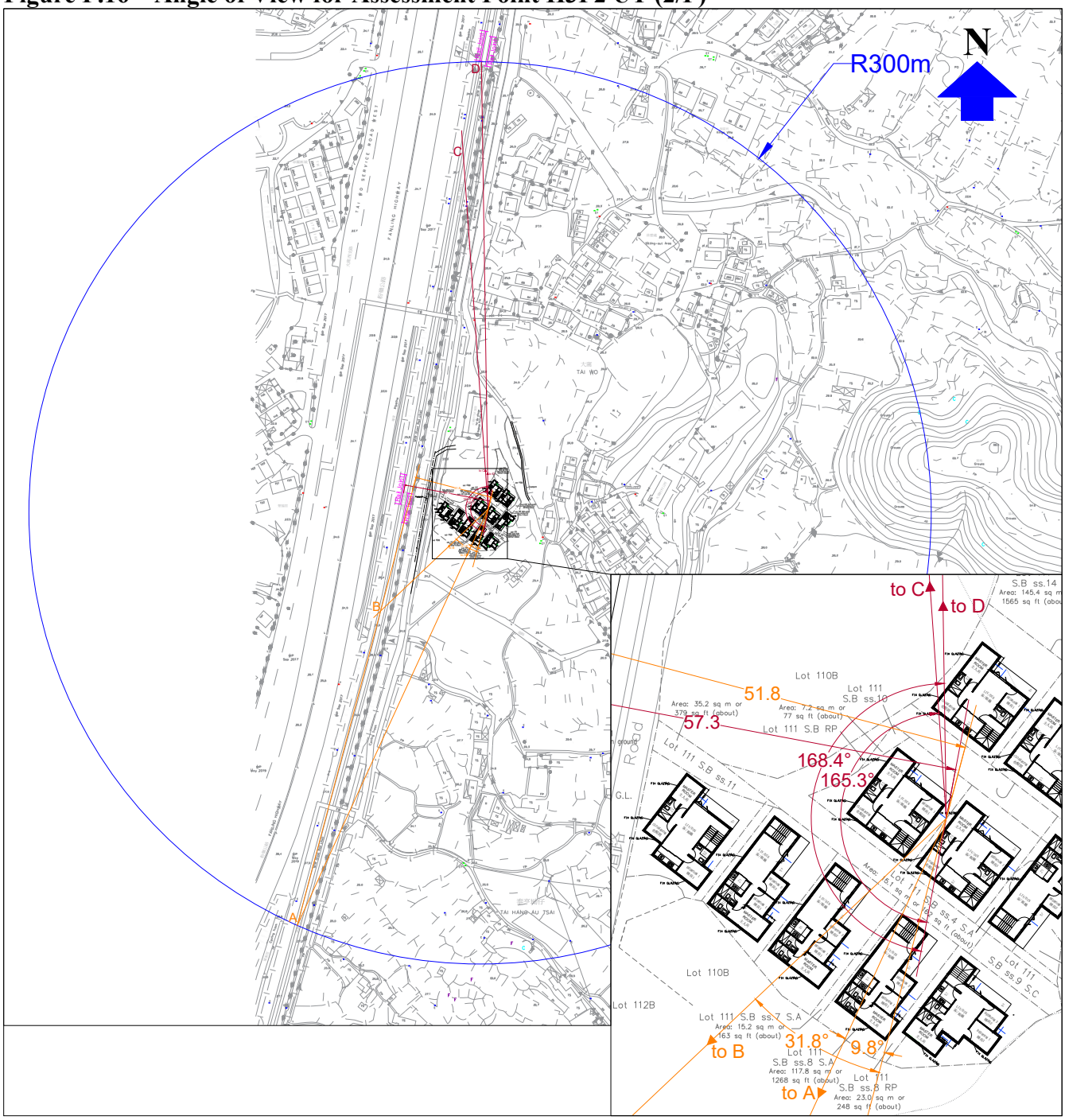


Table F.26 Air-borne Rail Noise Calculation for Assessment Point H3P3 (Daytime)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	164.2	164.2	164.0	169.8	164.0	169.8
Angle End	169.2	169.2	169.8	169.9	169.8	169.9
Speed, kph	120	120	120	120	120	120
Slant Distance, m	53.3	53.3	49.5	49.5	49.5	49.5
Angle of View, θ^o	5.0	5.0	5.8	0.1	5.8	0.1
Angle of Orientation of the Segment, α^o	13.3	13.3	13.1	10.2	13.1	10.2
Receiver to Source Distance, m	53.3	53.3	49.5	49.5	49.5	49.5
Path Length Difference, m	0.204	0.204	0.325	0.325	0.325	0.325
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.3	-3.3	-3.0	-3.0	-3.0	-3.0
Angle of View Correction, dB(A)	-25.3	-25.3	-24.8	-44.6	-24.8	-44.6
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.9	-12.9	-14.4	-14.4	-14.4	-14.4
SEL of the Segment, dB(A)	54.4	62.5	53.9	41.0	61.9	49.1
SEL of Single PassBy, dB(A)	54.4	62.5	54.1		62.2	
Train Frequency, No. of Train per 30min	15	1	15		1	
Leq,30min of the Track, dB(A)	33.7	30.0	33.3		29.6	
Leq,30min, dB(A)	**38.0**					
1/F, +	**2.70**					
Path Length Difference, m	0.117	0.117	0.239	0.239	0.239	0.239
Slant Distance, m	53.3	53.3	49.5	49.5	49.5	49.5
Distance Correction, dB(A)	-3.3	-3.3	-3.0	-3.0	-3.0	-3.0
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	56.1	64.1	54.8	41.9	62.9	50.0
SEL of Single PassBy, dB(A)	56.1	64.1	55.0		63.1	
Leq,30min of the Track, dB(A)	35.3	31.6	34.3		30.6	
Leq,30min, dB(A)	**39.3**					
2/F, +	**5.40**					
Path Length Difference, m	0.053	0.053	0.166	0.166	0.166	0.166
Slant Distance, m	53.4	53.4	49.7	49.7	49.7	49.7
Distance Correction, dB(A)	-3.3	-3.3	-3.0	-3.0	-3.0	-3.0
Screening Correction, dB(A)	-9.3	-9.3	-12.3	-12.3	-12.3	-12.3
SEL of the Segment, dB(A)	58.0	66.1	55.9	43.0	64.0	51.1
SEL of Single PassBy, dB(A)	58.0	66.1	56.1		64.2	
Leq,30min of the Track, dB(A)	37.2	33.5	35.3		31.6	
Leq,30min, dB(A)	**40.9**					

Table F.27 Air-borne Rail Noise Calculation for Assessment Point H3P3 (Night-time)

Track	Northbound	Southbound	
Segment	CD	CD	DE
Train Type	EMU	EMU	
Angle Start	164.2	164.0	169.8
Angle End	169.2	169.8	169.9
Speed, kph	120	120	120
Slant Distance, m	53.3	49.5	49.5
Angle of View, θ^o	5.0	5.8	0.1
Angle of Orientation of the Segment, α^o	13.3	13.1	10.2
Receiver to Source Distance, m	53.3	49.5	49.5
Path Length Difference, m	0.204	0.325	0.325
Wheel/Rail Noise Contribution			
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0
Distance Correction, dB(A)	-3.3	-3.0	-3.0
Angle of View Correction, dB(A)	-25.3	-24.8	-44.6
Façade Correction, dB(A)	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5
Screening Correction, dB(A)	-12.9	-14.4	-14.4
SEL of the Segment, dB(A)	54.4	53.9	41.0
SEL of Single PassBy, dB(A)	54.4	54.1	
Lmax of Single PassBy, dB(A)	45.1	44.7	
Train Frequency, No. of Train per 30min	12	12	
Leq,30min of the Track, dB(A)	32.7	32.3	
Leq,30min, dB(A)	**35.5**		
1/F, +	**2.70**		
Path Length Difference, m	0.117	0.239	0.239
Slant Distance, m	53.3	49.5	49.5
Distance Correction, dB(A)	-3.3	-3.0	-3.0
Screening Correction, dB(A)	-11.3	-13.4	-13.4
SEL of the Segment, dB(A)	56.1	54.8	41.9
SEL of Single PassBy, dB(A)	56.1	55.0	
Lmax of Single PassBy, dB(A)	46.7	45.7	
Leq,30min of the Track, dB(A)	34.3	33.3	
Leq,30min, dB(A)	**36.8**		
2/F, +	**5.40**		
Path Length Difference, m	0.053	0.166	0.166
Slant Distance, m	53.4	49.7	49.7
Distance Correction, dB(A)	-3.3	-3.0	-3.0
Screening Correction, dB(A)	-9.3	-12.3	-12.3
SEL of the Segment, dB(A)	58.0	55.9	43.0
SEL of Single PassBy, dB(A)	58.0	56.1	
Lmax of Single PassBy, dB(A)	48.7	46.8	
Leq,30min of the Track, dB(A)	36.3	34.4	
Leq,30min, dB(A)	**38.4**		

Table F.28 Air-borne Rail Noise Calculation for Assessment Point H3P3 (Full Day)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	164.2	164.2	164.0	169.8	164.0	169.8
Angle End	169.2	169.2	169.8	169.9	169.8	169.9
Speed, kph	120	120	120	120	120	120
Slant Distance, m	53.3	53.3	49.5	49.5	49.5	49.5
Angle of View, θ^o	5.0	5.0	5.8	0.1	5.8	0.1
Angle of Orientation of the Segment, α^o	13.3	13.3	13.1	10.2	13.1	10.2
Receiver to Source Distance, m	53.3	53.3	49.5	49.5	49.5	49.5
Path Length Difference, m	0.204	0.204	0.325	0.325	0.325	0.325
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.3	-3.3	-3.0	-3.0	-3.0	-3.0
Angle of View Correction, dB(A)	-25.3	-25.3	-24.8	-44.6	-24.8	-44.6
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.9	-12.9	-14.4	-14.4	-14.4	-14.4
SEL of the Segment, dB(A)	54.4	62.5	53.9	41.0	61.9	49.1
SEL of Single PassBy, dB(A)	54.4	62.5	54.1		62.2	
Train Frequency, No. of Train per day	425	9	425		9	
Leq,24hr of the Track, dB(A)	31.4	22.7	31.0		22.3	
Leq,24hr, dB(A)	**34.8**					
1/F, +	**2.70**					
Path Length Difference, m	0.117	0.117	0.239	0.239	0.239	0.239
Slant Distance, m	53.3	53.3	49.5	49.5	49.5	49.5
Distance Correction, dB(A)	-3.3	-3.3	-3.0	-3.0	-3.0	-3.0
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	56.1	64.1	54.8	41.9	62.9	50.0
SEL of Single PassBy, dB(A)	56.1	64.1	55.0		63.1	
Leq,24hr of the Track, dB(A)	33.0	24.3	32.0		23.3	
Leq,24hr, dB(A)	**36.1**					
2/F, +	**5.40**					
Path Length Difference, m	0.053	0.053	0.166	0.166	0.166	0.166
Slant Distance, m	53.4	53.4	49.7	49.7	49.7	49.7
Distance Correction, dB(A)	-3.3	-3.3	-3.0	-3.0	-3.0	-3.0
Screening Correction, dB(A)	-9.3	-9.3	-12.3	-12.3	-12.3	-12.3
SEL of the Segment, dB(A)	58.0	66.1	55.9	43.0	64.0	51.1
SEL of Single PassBy, dB(A)	58.0	66.1	56.1		64.2	
Leq,24hr of the Track, dB(A)	34.9	26.3	33.0		24.4	
Leq,24hr, dB(A)	**37.7**					

Figure F.17 Angle of View for Assessment Point H3P3 DT (2/F)

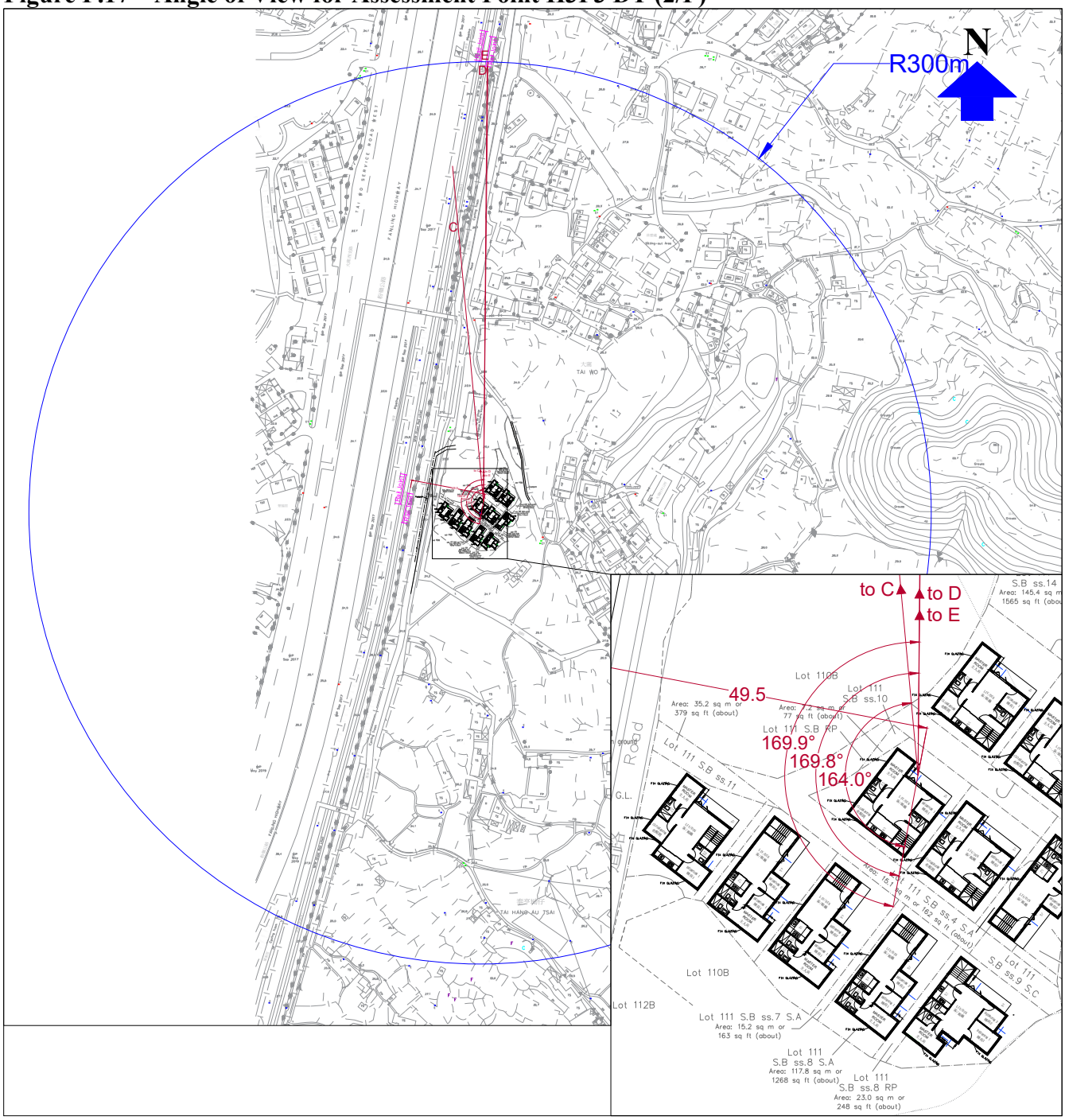


Figure F.18 Angle of View for Assessment Point H3P3 UT (2/F)

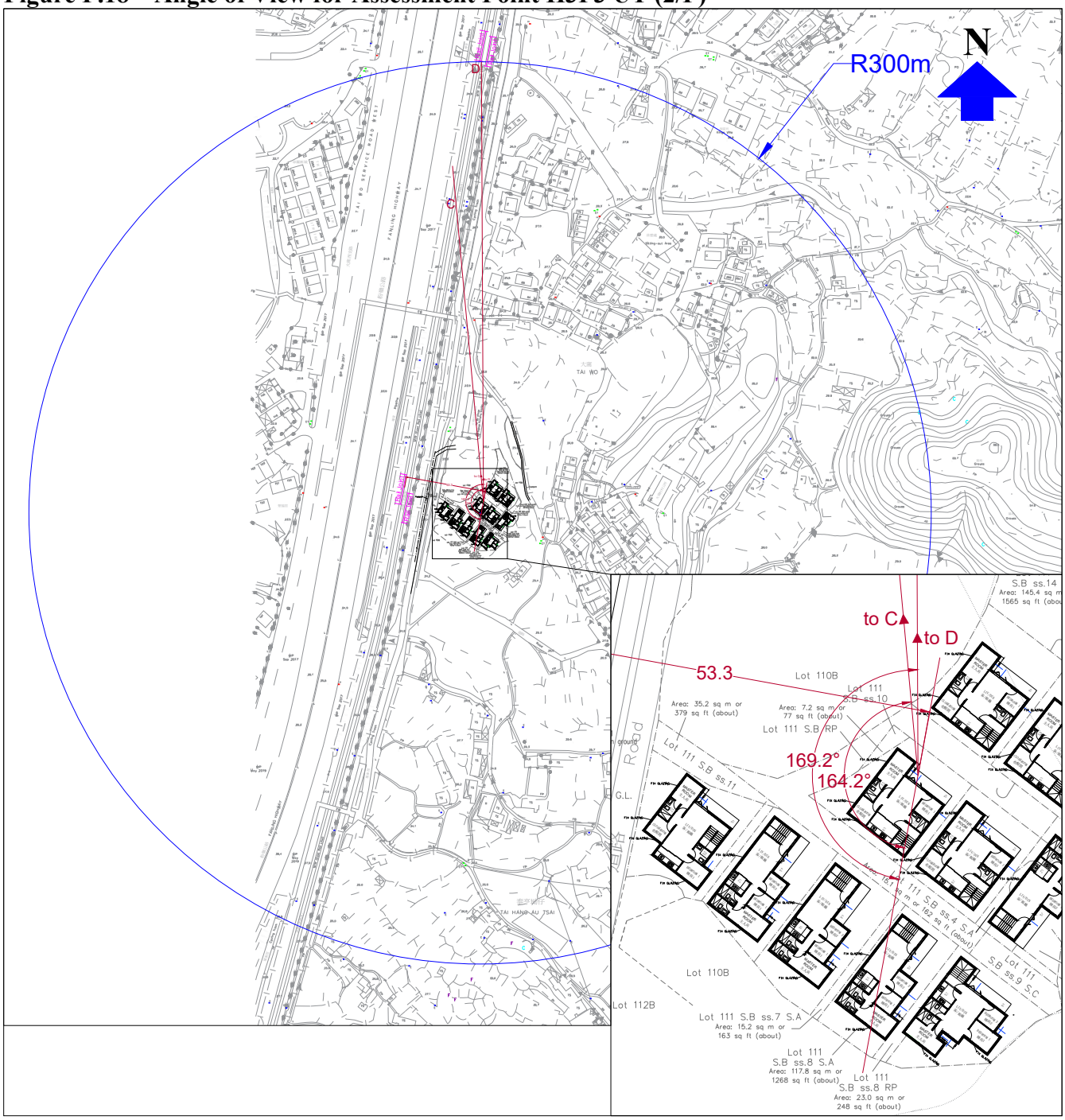


Table F.29 Air-borne Rail Noise Calculation for Assessment Point H4P1 (Daytime)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	149.7	149.7	149.7	168.2	149.7	168.2
Angle End	167.5	167.5	168.2	168.3	168.2	168.3
Speed, kph	120	120	120	120	120	120
Slant Distance, m	62.3	62.3	58.5	58.5	58.5	58.5
Angle of View, θ^o	17.8	17.8	18.5	0.1	18.5	0.1
Angle of Orientation of the Segment, α^o	21.4	21.4	21.1	11.8	21.1	11.8
Receiver to Source Distance, m	62.3	62.3	58.5	58.5	58.5	58.5
Path Length Difference, m	0.191	0.191	0.313	0.313	0.313	0.313
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.0	-4.0	-3.7	-3.7	-3.7	-3.7
Angle of View Correction, dB(A)	-15.6	-15.6	-15.6	-43.4	-15.6	-43.4
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.2	-14.2	-14.2
SEL of the Segment, dB(A)	63.6	71.7	62.5	41.6	70.5	49.7
SEL of Single PassBy, dB(A)	63.6	71.7	62.5		70.5	
Train Frequency, No. of Train per 30min	15	1	15		1	
Leq,30min of the Track, dB(A)	42.8	39.1	41.7		38.0	
Leq,30min, dB(A)	**46.9**					
1/F, +	**2.70**					
Path Length Difference, m	0.118	0.118	0.241	0.241	0.241	0.241
Slant Distance, m	62.3	62.3	58.5	58.5	58.5	58.5
Distance Correction, dB(A)	-4.0	-4.0	-3.7	-3.7	-3.7	-3.7
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	65.0	73.1	63.3	42.4	71.3	50.5
SEL of Single PassBy, dB(A)	65.0	73.1	63.3		71.4	
Leq,30min of the Track, dB(A)	44.2	40.5	42.5		38.8	
Leq,30min, dB(A)	**48.0**					
2/F, +	**5.40**					
Path Length Difference, m	0.063	0.063	0.178	0.178	0.178	0.178
Slant Distance, m	62.4	62.4	58.6	58.6	58.6	58.6
Distance Correction, dB(A)	-4.0	-4.0	-3.7	-3.7	-3.7	-3.7
Screening Correction, dB(A)	-9.7	-9.7	-12.5	-12.5	-12.5	-12.5
SEL of the Segment, dB(A)	66.6	74.7	64.2	43.3	72.2	51.4
SEL of Single PassBy, dB(A)	66.6	74.7	64.2		72.2	
Leq,30min of the Track, dB(A)	45.8	42.1	43.4		39.7	
Leq,30min, dB(A)	**49.3**					

Table F.30 Air-borne Rail Noise Calculation for Assessment Point H4P1 (Night-time)

Track	Northbound	Southbound	
Segment	CD	CD	DE
Train Type	EMU	EMU	
Angle Start	149.7	149.7	168.2
Angle End	167.5	168.2	168.3
Speed, kph	120	120	120
Slant Distance, m	62.3	58.5	58.5
Angle of View, θ^o	17.8	18.5	0.1
Angle of Orientation of the Segment, α^o	21.4	21.1	11.8
Receiver to Source Distance, m	62.3	58.5	58.5
Path Length Difference, m	0.191	0.313	0.313
Wheel/Rail Noise Contribution			
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0
Distance Correction, dB(A)	-4.0	-3.7	-3.7
Angle of View Correction, dB(A)	-15.6	-15.6	-43.4
Façade Correction, dB(A)	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-14.2	-14.2
SEL of the Segment, dB(A)	63.6	62.5	41.6
SEL of Single PassBy, dB(A)	63.6	62.5	
Lmax of Single PassBy, dB(A)	54.2	53.1	
Train Frequency, No. of Train per 30min	12	12	
Leq,30min of the Track, dB(A)	41.9	40.7	
Leq,30min, dB(A)	**44.3**		
1/F, +	**2.70**		
Path Length Difference, m	0.118	0.241	0.241
Slant Distance, m	62.3	58.5	58.5
Distance Correction, dB(A)	-4.0	-3.7	-3.7
Screening Correction, dB(A)	-11.4	-13.4	-13.4
SEL of the Segment, dB(A)	65.0	63.3	42.4
SEL of Single PassBy, dB(A)	65.0	63.3	
Lmax of Single PassBy, dB(A)	55.6	53.9	
Leq,30min of the Track, dB(A)	43.2	41.5	
Leq,30min, dB(A)	**45.5**		
2/F, +	**5.40**		
Path Length Difference, m	0.063	0.178	0.178
Slant Distance, m	62.4	58.6	58.6
Distance Correction, dB(A)	-4.0	-3.7	-3.7
Screening Correction, dB(A)	-9.7	-12.5	-12.5
SEL of the Segment, dB(A)	66.6	64.2	43.3
SEL of Single PassBy, dB(A)	66.6	64.2	
Lmax of Single PassBy, dB(A)	57.2	54.8	
Leq,30min of the Track, dB(A)	44.9	42.4	
Leq,30min, dB(A)	**46.8**		

Table F.31 Air-borne Rail Noise Calculation for Assessment Point H4P1 (Full Day)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	149.7	149.7	149.7	168.2	149.7	168.2
Angle End	167.5	167.5	168.2	168.3	168.2	168.3
Speed, kph	120	120	120	120	120	120
Slant Distance, m	62.3	62.3	58.5	58.5	58.5	58.5
Angle of View, θ^o	17.8	17.8	18.5	0.1	18.5	0.1
Angle of Orientation of the Segment, α^o	21.4	21.4	21.1	11.8	21.1	11.8
Receiver to Source Distance, m	62.3	62.3	58.5	58.5	58.5	58.5
Path Length Difference, m	0.191	0.191	0.313	0.313	0.313	0.313
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.0	-4.0	-3.7	-3.7	-3.7	-3.7
Angle of View Correction, dB(A)	-15.6	-15.6	-15.6	-43.4	-15.6	-43.4
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.2	-14.2	-14.2
SEL of the Segment, dB(A)	63.6	71.7	62.5	41.6	70.5	49.7
SEL of Single PassBy, dB(A)	63.6	71.7	62.5		70.5	
Train Frequency, No. of Train per day	425	9	425		9	
Leq,24hr of the Track, dB(A)	40.5	31.9	39.4		30.7	
Leq,24hr, dB(A)	**43.6**					
1/F, +	**2.70**					
Path Length Difference, m	0.118	0.118	0.241	0.241	0.241	0.241
Slant Distance, m	62.3	62.3	58.5	58.5	58.5	58.5
Distance Correction, dB(A)	-4.0	-4.0	-3.7	-3.7	-3.7	-3.7
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	65.0	73.1	63.3	42.4	71.3	50.5
SEL of Single PassBy, dB(A)	65.0	73.1	63.3		71.4	
Leq,24hr of the Track, dB(A)	41.9	33.2	40.2		31.5	
Leq,24hr, dB(A)	**44.7**					
2/F, +	**5.40**					
Path Length Difference, m	0.063	0.063	0.178	0.178	0.178	0.178
Slant Distance, m	62.4	62.4	58.6	58.6	58.6	58.6
Distance Correction, dB(A)	-4.0	-4.0	-3.7	-3.7	-3.7	-3.7
Screening Correction, dB(A)	-9.7	-9.7	-12.5	-12.5	-12.5	-12.5
SEL of the Segment, dB(A)	66.6	74.7	64.2	43.3	72.2	51.4
SEL of Single PassBy, dB(A)	66.6	74.7	64.2		72.2	
Leq,24hr of the Track, dB(A)	43.6	34.9	41.1		32.4	
Leq,24hr, dB(A)	**46.1**					

Figure F.19 Angle of View for Assessment Point H4P1 DT (2/F)

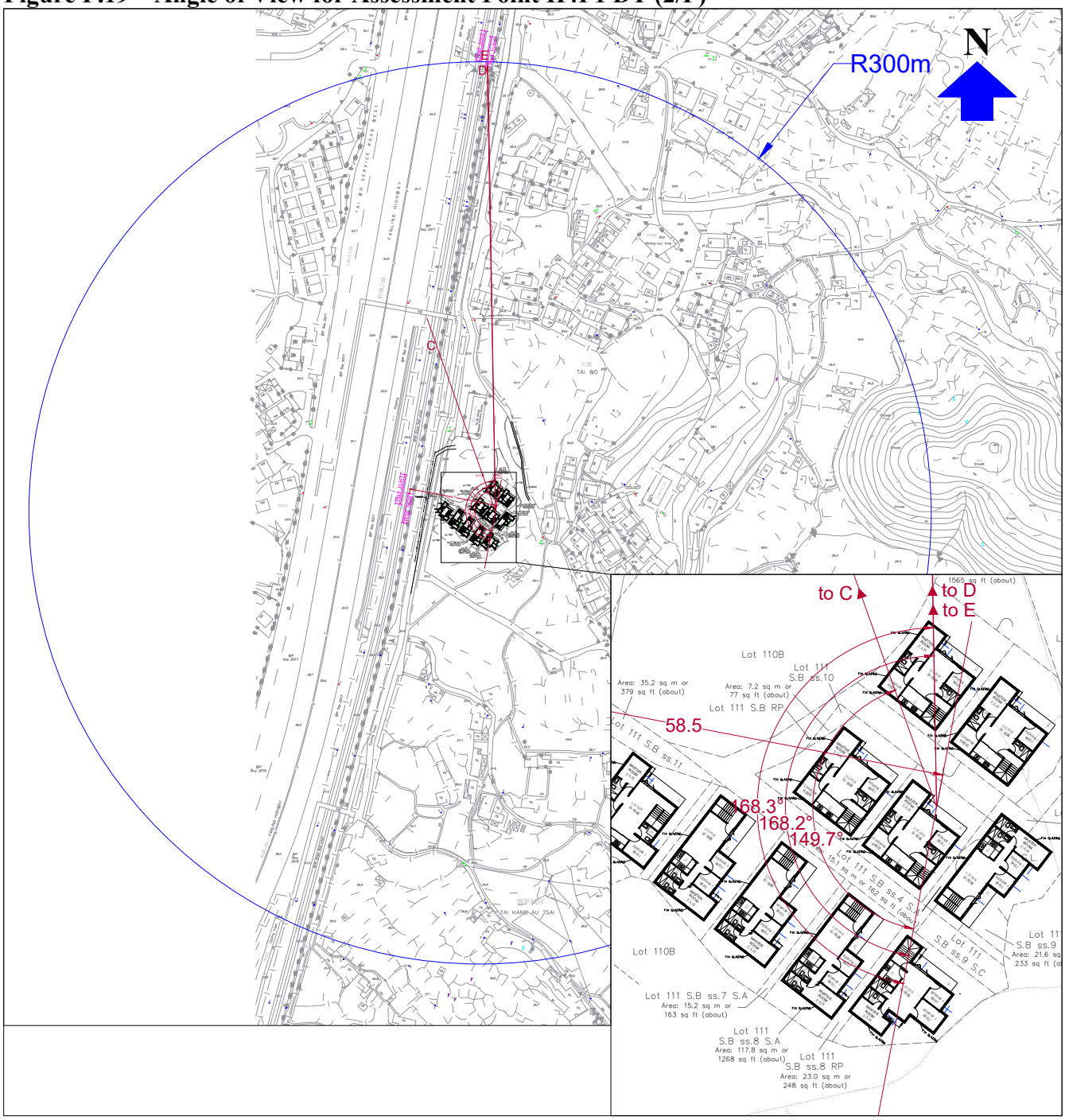


Figure F.20 Angle of View for Assessment Point H4P1 UT (2/F)

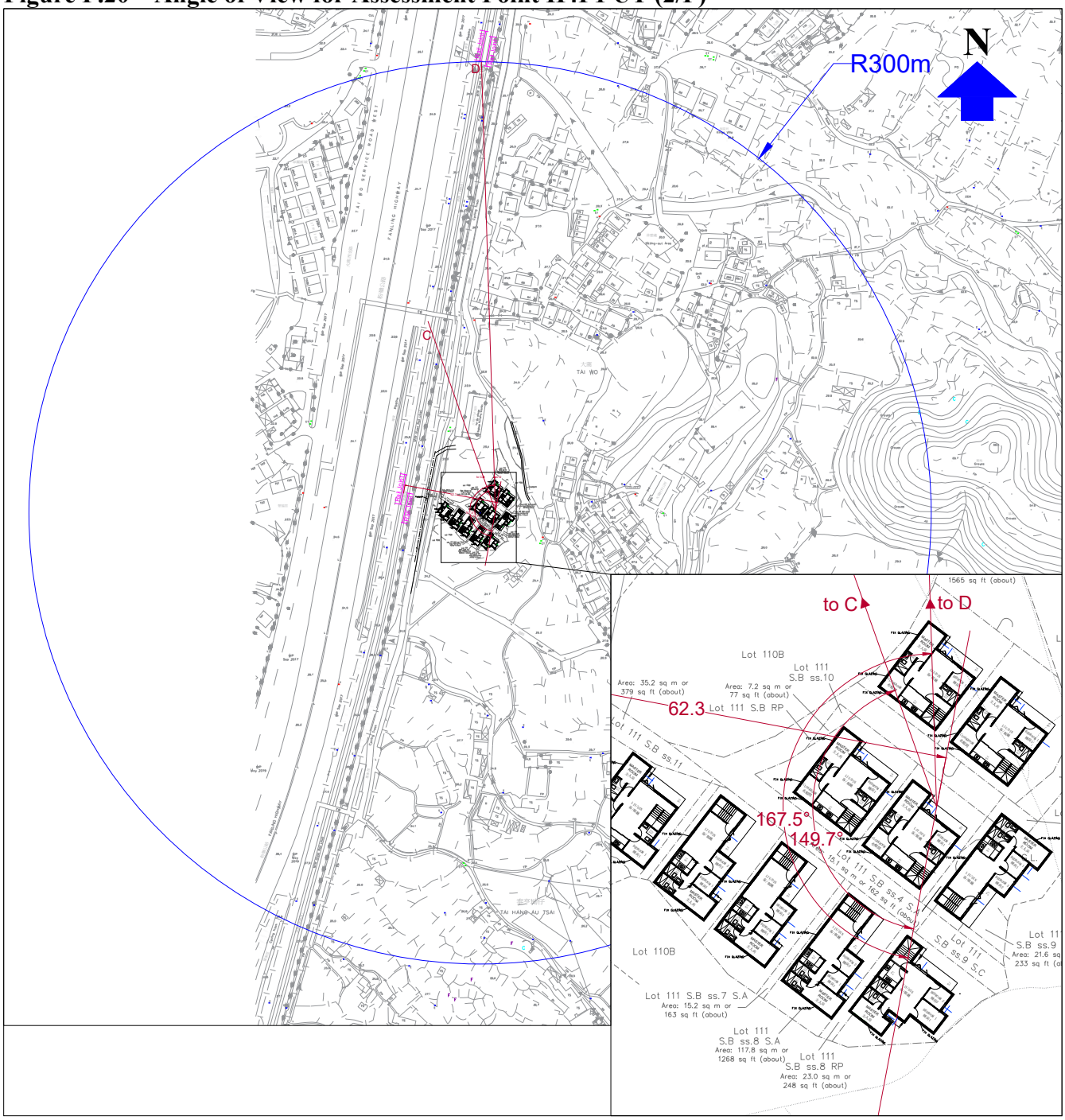


Table F.32 Air-borne Rail Noise Calculation for Assessment Point H4P2 (Daytime)

Track	Northbound				Southbound					
Segment	AB	CD	AB	CD	AB	CD	DE	AB	CD	DE
Train Type	EMU		ITT		EMU			ITT		
Angle Start	11.5	165.3	11.5	165.3	10.7	165.3	167.7	10.7	165.3	167.7
Angle End	31.6	167.0	31.6	167.0	31.6	167.7	167.8	31.6	167.7	167.8
Speed, kph	120	120	120	120	120	120	120	120	120	120
Slant Distance, m	59.9	65.9	59.9	65.9	56.2	62.1	62.1	56.2	62.1	62.1
Angle of View, θ^o	20.1	1.7	20.1	1.7	20.9	2.4	0.1	20.9	2.4	0.1
Angle of Orientation of the Segment, α^o	21.6	13.9	21.6	13.9	21.2	13.5	12.3	21.2	13.5	12.3
Receiver to Source Distance, m	59.9	65.9	59.9	65.9	56.2	62.1	62.1	56.2	62.1	62.1
Path Length Difference, m	0.194	0.187	0.194	0.187	0.316	0.309	0.309	0.316	0.309	0.309
Wheel/Rail Noise Contribution										
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	97.0	97.0	89.0	89.0	89.0	97.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.8	-4.2	-3.8	-4.2	-3.5	-4.0	-4.0	-3.5	-4.0	-4.0
Angle of View Correction, dB(A)	-15.0	-29.7	-15.0	-29.7	-15.0	-28.4	-43.0	-15.0	-28.4	-43.0
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)							7.0			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-12.7	-12.8	-12.7	-14.3	-14.2	-14.2	-14.3	-14.2	-14.2
SEL of the Segment, dB(A)	64.4	49.4	72.4	57.5	63.2	49.4	41.8	71.3	57.5	49.8
SEL of Single PassBy, dB(A)	64.5		72.6		63.4			71.5		
Train Frequency, No. of Train per 30min	15		1		15			1		
Leq,30min of the Track, dB(A)	43.7		40.0		42.6			38.9		
Leq,30min, dB(A)	**47.8**									
1/F, +	**2.70**									
Path Length Difference, m	0.118	0.119	0.118	0.119	0.241	0.242	0.242	0.241	0.242	0.242
Slant Distance, m	59.9	65.9	59.9	65.9	56.2	62.1	62.1	56.2	62.1	62.1
Distance Correction, dB(A)	-3.8	-4.2	-3.8	-4.2	-3.5	-4.0	-4.0	-3.5	-4.0	-4.0
Screening Correction, dB(A)	-11.4	-11.4	-11.4	-11.4	-13.4	-13.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	65.8	50.7	73.9	58.8	64.1	50.2	42.5	72.1	58.2	50.6
SEL of Single PassBy, dB(A)	65.9		74.0		64.3			72.3		
Leq,30min of the Track, dB(A)	45.2		41.5		43.5			39.8		
Leq,30min, dB(A)	**48.9**									
2/F, +	**5.40**									
Path Length Difference, m	0.061	0.066	0.061	0.066	0.176	0.183	0.183	0.176	0.183	0.183
Slant Distance, m	60.0	66.0	60.0	66.0	56.3	62.2	62.2	56.3	62.2	62.2
Distance Correction, dB(A)	-3.8	-4.2	-3.8	-4.2	-3.5	-4.0	-4.0	-3.5	-4.0	-4.0
Screening Correction, dB(A)	-9.6	-9.8	-9.6	-9.8	-12.5	-12.6	-12.6	-12.5	-12.6	-12.6
SEL of the Segment, dB(A)	67.5	52.2	75.6	60.3	65.0	51.0	43.4	73.1	59.1	51.4
SEL of Single PassBy, dB(A)	67.6		75.7		65.2			73.3		
Leq,30min of the Track, dB(A)	46.9		43.2		44.4			40.7		
Leq,30min, dB(A)	**50.4**									

Table F.33 Air-borne Rail Noise Calculation for Assessment Point H4P2 (Night-time)

Track	Northbound		Southbound		
Segment	AB	CD	AB	CD	DE
Train Type	EMU		EMU		
Angle Start	11.5	165.3	10.7	165.3	167.7
Angle End	31.6	167.0	31.6	167.7	167.8
Speed, kph	120	120	120	120	120
Slant Distance, m	59.9	65.9	56.2	62.1	62.1
Angle of View, θ^o	20.1	1.7	20.9	2.4	0.1
Angle of Orientation of the Segment, α^o	21.6	13.9	21.2	13.5	12.3
Receiver to Source Distance, m	59.9	65.9	56.2	62.1	62.1
Path Length Difference, m	0.194	0.187	0.316	0.309	0.309
Wheel/Rail Noise Contribution					
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.8	-4.2	-3.5	-4.0	-4.0
Angle of View Correction, dB(A)	-15.0	-29.7	-15.0	-28.4	-43.0
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)					7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-12.7	-14.3	-14.2	-14.2
SEL of the Segment, dB(A)	64.4	49.4	63.2	49.4	41.8
SEL of Single PassBy, dB(A)	64.5		63.4		
Lmax of Single PassBy, dB(A)	55.1		54.0		
Train Frequency, No. of Train per 30min	12		12		
Leq,30min of the Track, dB(A)	42.8		41.7		
Leq,30min, dB(A)	**45.3**				
1/F, +	**2.70**				
Path Length Difference, m	0.118	0.119	0.241	0.242	0.242
Slant Distance, m	59.9	65.9	56.2	62.1	62.1
Distance Correction, dB(A)	-3.8	-4.2	-3.5	-4.0	-4.0
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	65.8	50.7	64.1	50.2	42.5
SEL of Single PassBy, dB(A)	65.9		64.3		
Lmax of Single PassBy, dB(A)	56.5		54.9		
Leq,30min of the Track, dB(A)	44.2		42.5		
Leq,30min, dB(A)	**46.4**				
2/F, +	**5.40**				
Path Length Difference, m	0.061	0.066	0.176	0.183	0.183
Slant Distance, m	60.0	66.0	56.3	62.2	62.2
Distance Correction, dB(A)	-3.8	-4.2	-3.5	-4.0	-4.0
Screening Correction, dB(A)	-9.6	-9.8	-12.5	-12.6	-12.6
SEL of the Segment, dB(A)	67.5	52.2	65.0	51.0	43.4
SEL of Single PassBy, dB(A)	67.6		65.2		
Lmax of Single PassBy, dB(A)	58.2		55.8		
Leq,30min of the Track, dB(A)	45.9		43.4		
Leq,30min, dB(A)	**47.8**				

Table F.34 Air-borne Rail Noise Calculation for Assessment Point H4P2 (Full Day)

Track	Northbound				Southbound					
Segment	AB	CD	AB	CD	AB	CD	DE	AB	CD	DE
Train Type	EMU		ITT		EMU			ITT		
Angle Start	11.5	165.3	11.5	165.3	10.7	165.3	167.7	10.7	165.3	167.7
Angle End	31.6	167.0	31.6	167.0	31.6	167.7	167.8	31.6	167.7	167.8
Speed, kph	120	120	120	120	120	120	120	120	120	120
Slant Distance, m	59.9	65.9	59.9	65.9	56.2	62.1	62.1	56.2	62.1	62.1
Angle of View, θ°	20.1	1.7	20.1	1.7	20.9	2.4	0.1	20.9	2.4	0.1
Angle of Orientation of the Segment, α°	21.6	13.9	21.6	13.9	21.2	13.5	12.3	21.2	13.5	12.3
Receiver to Source Distance, m	59.9	65.9	59.9	65.9	56.2	62.1	62.1	56.2	62.1	62.1
Path Length Difference, m	0.194	0.187	0.194	0.187	0.316	0.309	0.309	0.316	0.309	0.309
Wheel/Rail Noise Contribution										
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	97.0	97.0	89.0	89.0	89.0	97.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.8	-4.2	-3.8	-4.2	-3.5	-4.0	-4.0	-3.5	-4.0	-4.0
Angle of View Correction, dB(A)	-15.0	-29.7	-15.0	-29.7	-15.0	-28.4	-43.0	-15.0	-28.4	-43.0
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)							7.0			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-12.7	-12.8	-12.7	-14.3	-14.2	-14.2	-14.3	-14.2	-14.2
SEL of the Segment, dB(A)	64.4	49.4	72.4	57.5	63.2	49.4	41.8	71.3	57.5	49.8
SEL of Single PassBy, dB(A)	64.5		72.6		63.4			71.5		
Train Frequency, No. of Train per day	425		9		425			9		
Leq,24hr of the Track, dB(A)	41.4		32.8		40.3			31.7		
Leq,24hr, dB(A)	**44.5**									
1/F, +	**2.70**									
Path Length Difference, m	0.118	0.119	0.118	0.119	0.241	0.242	0.242	0.241	0.242	0.242
Slant Distance, m	59.9	65.9	59.9	65.9	56.2	62.1	62.1	56.2	62.1	62.1
Distance Correction, dB(A)	-3.8	-4.2	-3.8	-4.2	-3.5	-4.0	-4.0	-3.5	-4.0	-4.0
Screening Correction, dB(A)	-11.4	-11.4	-11.4	-11.4	-13.4	-13.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	65.8	50.7	73.9	58.8	64.1	50.2	42.5	72.1	58.2	50.6
SEL of Single PassBy, dB(A)	65.9		74.0		64.3			72.3		
Leq,24hr of the Track, dB(A)	42.9		34.2		41.2			32.5		
Leq,24hr, dB(A)	**45.7**									
2/F, +	**5.40**									
Path Length Difference, m	0.061	0.066	0.061	0.066	0.176	0.183	0.183	0.176	0.183	0.183
Slant Distance, m	60.0	66.0	60.0	66.0	56.3	62.2	62.2	56.3	62.2	62.2
Distance Correction, dB(A)	-3.8	-4.2	-3.8	-4.2	-3.5	-4.0	-4.0	-3.5	-4.0	-4.0
Screening Correction, dB(A)	-9.6	-9.8	-9.6	-9.8	-12.5	-12.6	-12.6	-12.5	-12.6	-12.6
SEL of the Segment, dB(A)	67.5	52.2	75.6	60.3	65.0	51.0	43.4	73.1	59.1	51.4
SEL of Single PassBy, dB(A)	67.6		75.7		65.2			73.3		
Leq,24hr of the Track, dB(A)	44.6		35.9		42.1			33.4		
Leq,24hr, dB(A)	**47.1**									

Figure F.21 Angle of View for Assessment Point H4P2 DT (2/F)

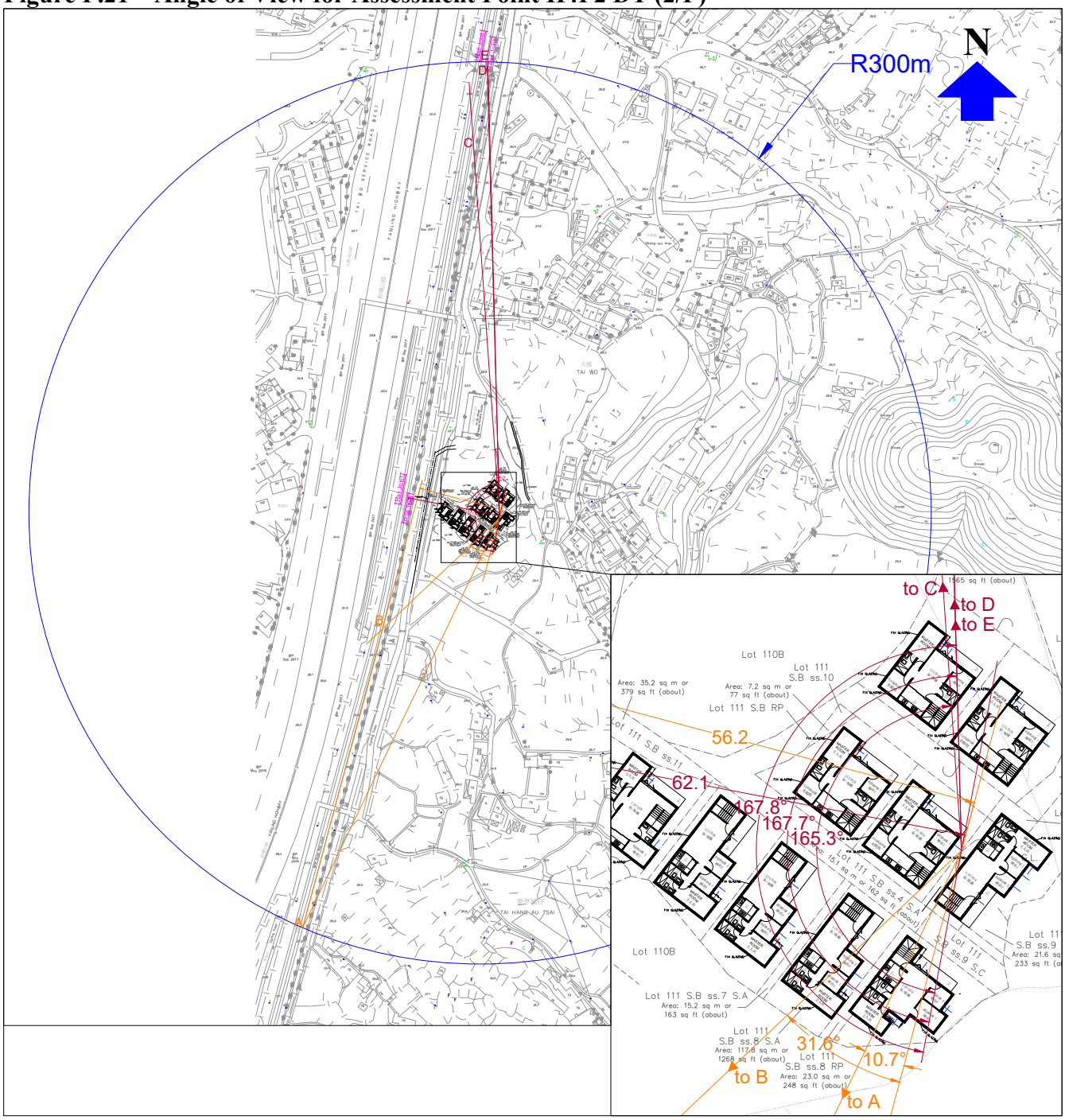


Figure F.22 Angle of View for Assessment Point H4P2 UT (2/F)

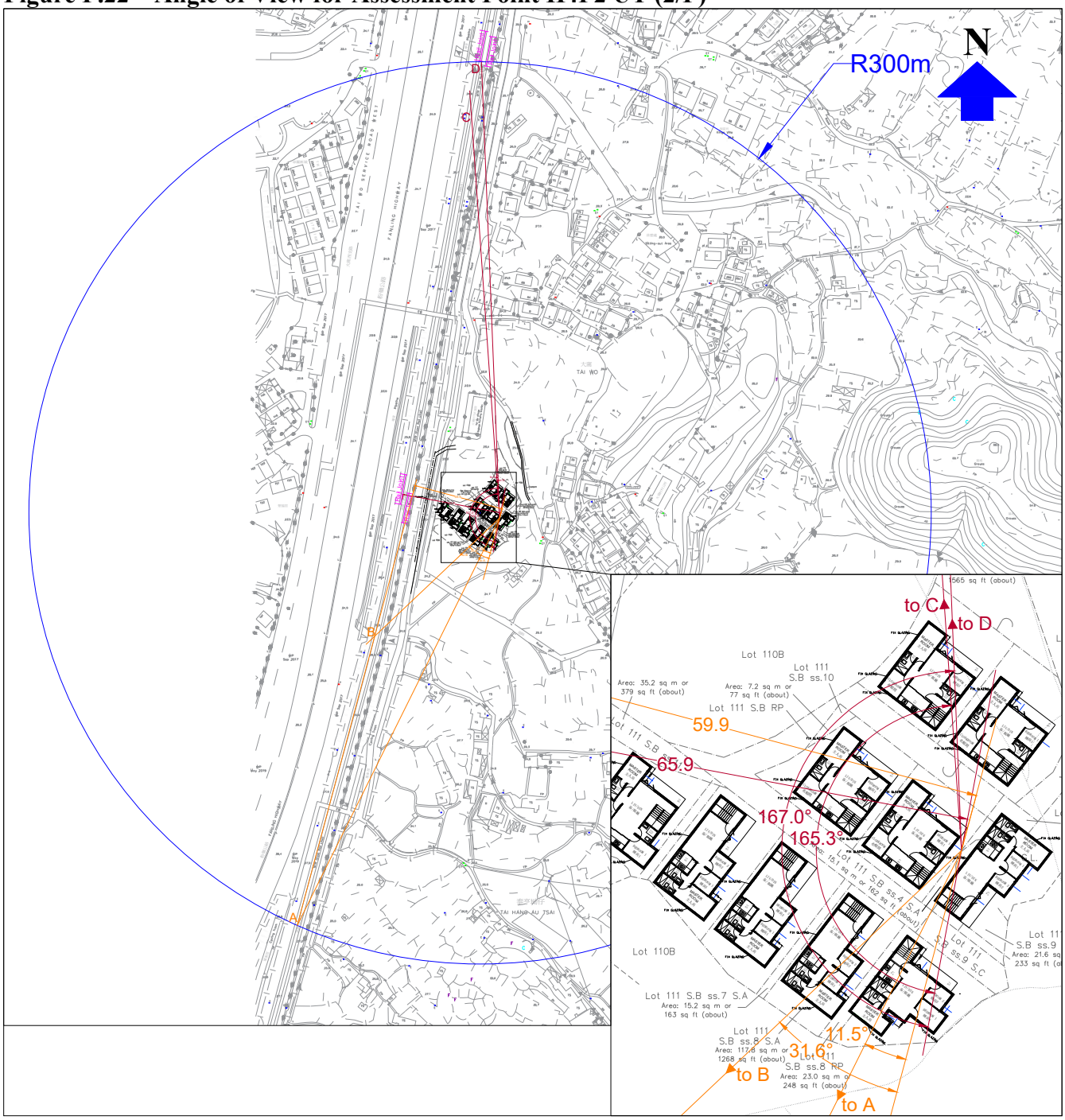


Table F.35 Air-borne Rail Noise Calculation for Assessment Point H4P3 (Daytime)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	164.0	164.0	164.0	168.3	164.0	168.3
Angle End	167.6	167.6	168.3	168.4	168.3	168.4
Speed, kph	120	120	120	120	120	120
Slant Distance, m	61.9	61.9	58.1	58.1	58.1	58.1
Angle of View, θ^o	3.6	3.6	4.3	0.1	4.3	0.1
Angle of Orientation of the Segment, α^o	14.2	14.2	13.9	11.7	13.9	11.7
Receiver to Source Distance, m	61.9	61.9	58.1	58.1	58.1	58.1
Path Length Difference, m	0.192	0.192	0.314	0.314	0.314	0.314
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.9	-3.9	-3.7	-3.7	-3.7	-3.7
Angle of View Correction, dB(A)	-26.2	-26.2	-25.6	-43.5	-25.6	-43.5
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.2	-14.2	-14.2
SEL of the Segment, dB(A)	53.1	61.2	52.4	41.6	60.5	49.7
SEL of Single PassBy, dB(A)	53.1	61.2	52.8		60.8	
Train Frequency, No. of Train per 30min	15	1	15		1	
Leq,30min of the Track, dB(A)	32.3	28.6	32.0		28.3	
Leq,30min, dB(A)	**36.7**					
1/F, +	**2.70**					
Path Length Difference, m	0.118	0.118	0.241	0.241	0.241	0.241
Slant Distance, m	61.9	61.9	58.1	58.1	58.1	58.1
Distance Correction, dB(A)	-3.9	-3.9	-3.7	-3.7	-3.7	-3.7
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	54.5	62.5	53.2	42.4	61.3	50.5
SEL of Single PassBy, dB(A)	54.5	62.5	53.6		61.7	
Leq,30min of the Track, dB(A)	33.7	30.0	32.8		29.1	
Leq,30min, dB(A)	**37.8**					
2/F, +	**5.40**					
Path Length Difference, m	0.063	0.063	0.178	0.178	0.178	0.178
Slant Distance, m	62.0	62.0	58.2	58.2	58.2	58.2
Distance Correction, dB(A)	-3.9	-3.9	-3.7	-3.7	-3.7	-3.7
Screening Correction, dB(A)	-9.7	-9.7	-12.5	-12.5	-12.5	-12.5
SEL of the Segment, dB(A)	56.1	64.2	54.1	43.3	62.2	51.4
SEL of Single PassBy, dB(A)	56.1	64.2	54.5		62.6	
Leq,30min of the Track, dB(A)	35.3	31.6	33.7		30.0	
Leq,30min, dB(A)	**39.1**					

Table F.36 Air-borne Rail Noise Calculation for Assessment Point H4P3 (Night-time)

Track	Northbound	Southbound	
Segment	CD	CD	DE
Train Type	EMU	EMU	
Angle Start	164.0	164.0	168.3
Angle End	167.6	168.3	168.4
Speed, kph	120	120	120
Slant Distance, m	61.9	58.1	58.1
Angle of View, θ^o	3.6	4.3	0.1
Angle of Orientation of the Segment, α^o	14.2	13.9	11.7
Receiver to Source Distance, m	61.9	58.1	58.1
Path Length Difference, m	0.192	0.314	0.314
Wheel/Rail Noise Contribution			
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0
Distance Correction, dB(A)	-3.9	-3.7	-3.7
Angle of View Correction, dB(A)	-26.2	-25.6	-43.5
Façade Correction, dB(A)	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-14.2	-14.2
SEL of the Segment, dB(A)	53.1	52.4	41.6
SEL of Single PassBy, dB(A)	53.1	52.8	
Lmax of Single PassBy, dB(A)	43.7	43.4	
Train Frequency, No. of Train per 30min	12	12	
Leq,30min of the Track, dB(A)	31.3	31.0	
Leq,30min, dB(A)	**34.2**		
1/F, +	**2.70**		
Path Length Difference, m	0.118	0.241	0.241
Slant Distance, m	61.9	58.1	58.1
Distance Correction, dB(A)	-3.9	-3.7	-3.7
Screening Correction, dB(A)	-11.4	-13.4	-13.4
SEL of the Segment, dB(A)	54.5	53.2	42.4
SEL of Single PassBy, dB(A)	54.5	53.6	
Lmax of Single PassBy, dB(A)	45.1	44.2	
Leq,30min of the Track, dB(A)	32.7	31.8	
Leq,30min, dB(A)	**35.3**		
2/F, +	**5.40**		
Path Length Difference, m	0.063	0.178	0.178
Slant Distance, m	62.0	58.2	58.2
Distance Correction, dB(A)	-3.9	-3.7	-3.7
Screening Correction, dB(A)	-9.7	-12.5	-12.5
SEL of the Segment, dB(A)	56.1	54.1	43.3
SEL of Single PassBy, dB(A)	56.1	54.5	
Lmax of Single PassBy, dB(A)	46.7	45.1	
Leq,30min of the Track, dB(A)	34.4	32.7	
Leq,30min, dB(A)	**36.6**		

Table F.37 Air-borne Rail Noise Calculation for Assessment Point H4P3 (Full Day)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	164.0	164.0	164.0	168.3	164.0	168.3
Angle End	167.6	167.6	168.3	168.4	168.3	168.4
Speed, kph	120	120	120	120	120	120
Slant Distance, m	61.9	61.9	58.1	58.1	58.1	58.1
Angle of View, θ^o	3.6	3.6	4.3	0.1	4.3	0.1
Angle of Orientation of the Segment, α^o	14.2	14.2	13.9	11.7	13.9	11.7
Receiver to Source Distance, m	61.9	61.9	58.1	58.1	58.1	58.1
Path Length Difference, m	0.192	0.192	0.314	0.314	0.314	0.314
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.9	-3.9	-3.7	-3.7	-3.7	-3.7
Angle of View Correction, dB(A)	-26.2	-26.2	-25.6	-43.5	-25.6	-43.5
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.2	-14.2	-14.2
SEL of the Segment, dB(A)	53.1	61.2	52.4	41.6	60.5	49.7
SEL of Single PassBy, dB(A)	53.1	61.2	52.8		60.8	
Train Frequency, No. of Train per day	425	9	425		9	
Leq,24hr of the Track, dB(A)	30.0	21.3	29.7		21.0	
Leq,24hr, dB(A)	**33.4**					
1/F, +	**2.70**					
Path Length Difference, m	0.118	0.118	0.241	0.241	0.241	0.241
Slant Distance, m	61.9	61.9	58.1	58.1	58.1	58.1
Distance Correction, dB(A)	-3.9	-3.9	-3.7	-3.7	-3.7	-3.7
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	54.5	62.5	53.2	42.4	61.3	50.5
SEL of Single PassBy, dB(A)	54.5	62.5	53.6		61.7	
Leq,24hr of the Track, dB(A)	31.4	22.7	30.5		21.8	
Leq,24hr, dB(A)	**34.5**					
2/F, +	**5.40**					
Path Length Difference, m	0.063	0.063	0.178	0.178	0.178	0.178
Slant Distance, m	62.0	62.0	58.2	58.2	58.2	58.2
Distance Correction, dB(A)	-3.9	-3.9	-3.7	-3.7	-3.7	-3.7
Screening Correction, dB(A)	-9.7	-9.7	-12.5	-12.5	-12.5	-12.5
SEL of the Segment, dB(A)	56.1	64.2	54.1	43.3	62.2	51.4
SEL of Single PassBy, dB(A)	56.1	64.2	54.5		62.6	
Leq,24hr of the Track, dB(A)	33.0	24.4	31.4		22.7	
Leq,24hr, dB(A)	**35.9**					

Figure F.23 Angle of View for Assessment Point H4P3 DT (2/F)

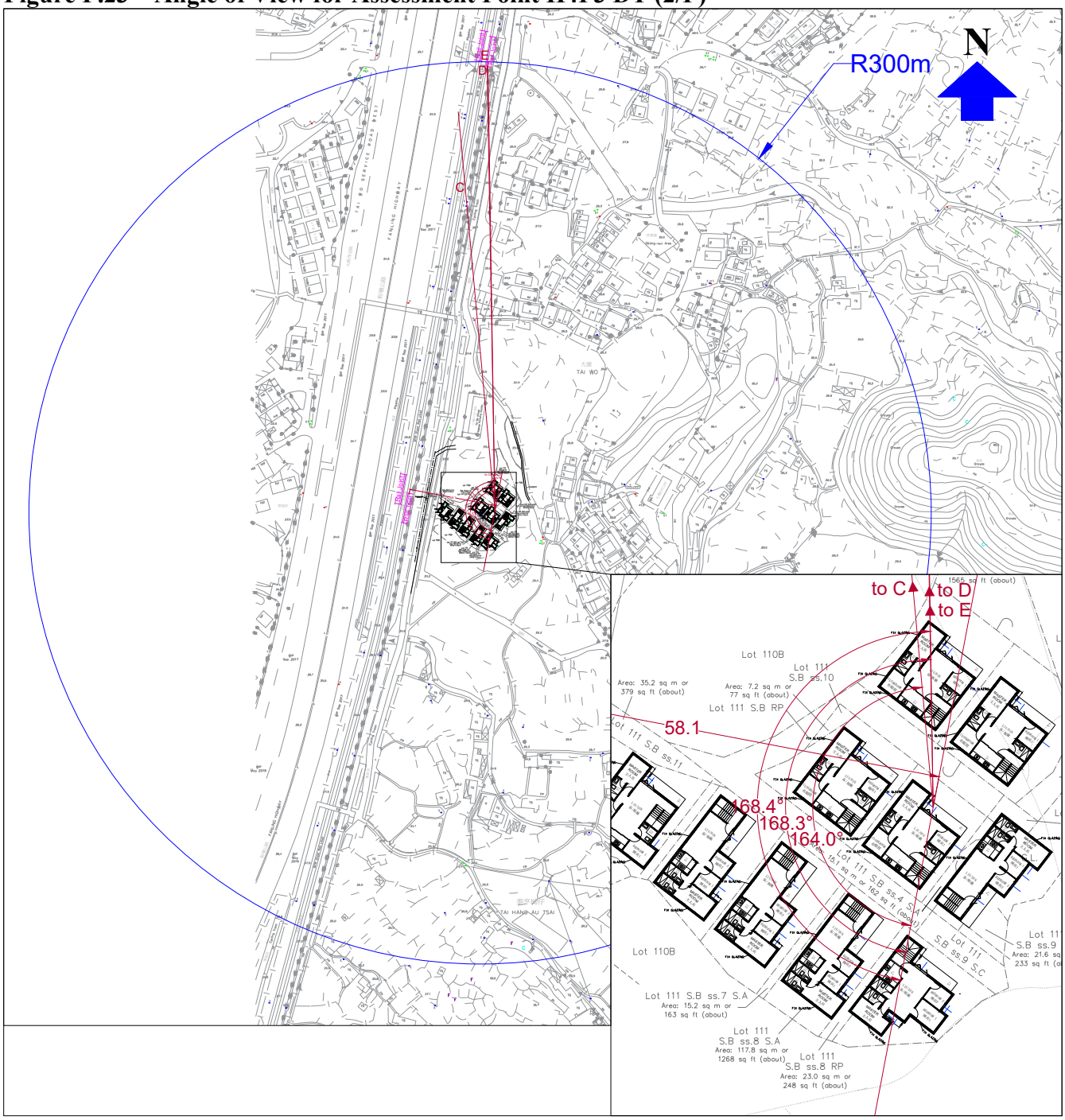


Figure F.24 Angle of View for Assessment Point H4P3 UT (2/F)

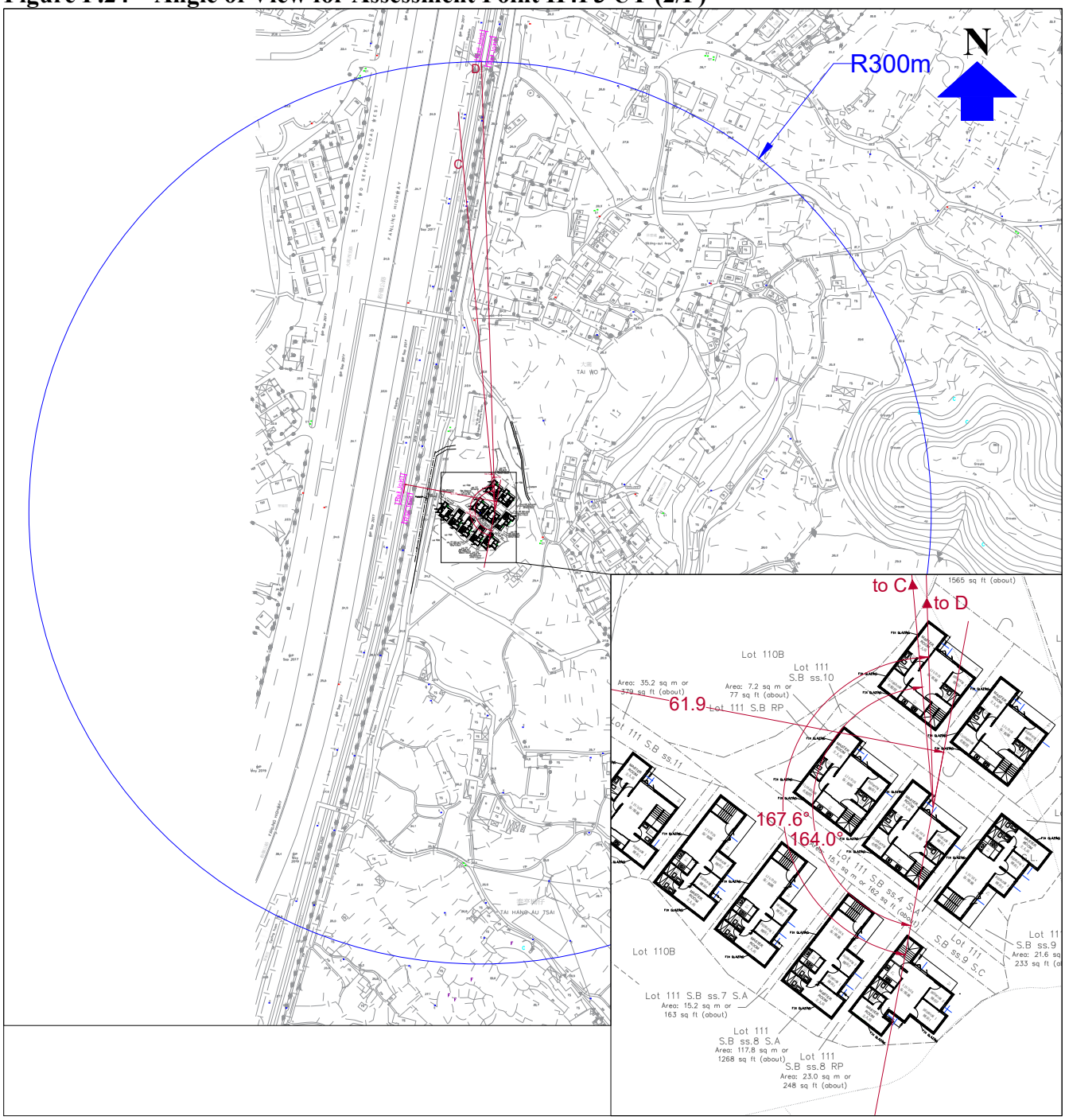


Table F.38 Air-borne Rail Noise Calculation for Assessment Point H5P1 (Daytime)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	160.8	160.8	160.8	174.3	160.8	174.3
Angle End	173.5	173.5	174.3	174.4	174.3	174.4
Speed, kph	120	120	120	120	120	120
Slant Distance, m	30.9	30.9	27.1	27.1	27.1	27.1
Angle of View, θ^o	12.7	12.7	13.5	0.1	13.5	0.1
Angle of Orientation of the Segment, α^o	12.9	12.9	12.5	5.6	12.5	5.6
Receiver to Source Distance, m	30.9	30.9	27.1	27.1	27.1	27.1
Path Length Difference, m	0.282	0.282	0.398	0.398	0.398	0.398
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-0.9	-0.9	-0.4	-0.4	-0.4	-0.4
Angle of View Correction, dB(A)	-21.3	-21.3	-21.2	-49.7	-21.2	-49.7
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.9	-13.9	-15.0	-15.0	-15.0	-15.0
SEL of the Segment, dB(A)	59.9	67.9	59.4	37.9	67.5	46.0
SEL of Single PassBy, dB(A)	59.9	67.9	59.4		67.5	
Train Frequency, No. of Train per 30min	15	1	15		1	
Leq,30min of the Track, dB(A)	39.1	35.4	38.6		34.9	
Leq,30min, dB(A)	**43.4**					
1/F, +	**2.70**					
Path Length Difference, m	0.107	0.107	0.228	0.228	0.228	0.228
Slant Distance, m	30.9	30.9	27.1	27.1	27.1	27.1
Distance Correction, dB(A)	-0.9	-0.9	-0.4	-0.4	-0.4	-0.4
Screening Correction, dB(A)	-11.1	-11.1	-13.3	-13.3	-13.3	-13.3
SEL of the Segment, dB(A)	62.7	70.7	61.1	39.6	69.2	47.7
SEL of Single PassBy, dB(A)	62.7	70.7	61.2		69.2	
Leq,30min of the Track, dB(A)	41.9	38.2	40.4		36.7	
Leq,30min, dB(A)	**45.7**					
2/F, +	**5.40**					
Path Length Difference, m	0.016	0.016	0.104	0.104	0.104	0.104
Slant Distance, m	31.1	31.1	27.4	27.4	27.4	27.4
Distance Correction, dB(A)	-1.0	-1.0	-0.4	-0.4	-0.4	-0.4
Screening Correction, dB(A)	-7.1	-7.1	-11.0	-11.0	-11.0	-11.0
SEL of the Segment, dB(A)	66.6	74.7	63.3	41.9	71.4	49.9
SEL of Single PassBy, dB(A)	66.6	74.7	63.4		71.4	
Leq,30min of the Track, dB(A)	45.8	42.1	42.6		38.9	
Leq,30min, dB(A)	**49.0**					

Table F.39 Air-borne Rail Noise Calculation for Assessment Point H5P1 (Night-time)

Track	Northbound	Southbound	
Segment	CD	CD	DE
Train Type	EMU	EMU	
Angle Start	160.8	160.8	174.3
Angle End	173.5	174.3	174.4
Speed, kph	120	120	120
Slant Distance, m	30.9	27.1	27.1
Angle of View, θ^o	12.7	13.5	0.1
Angle of Orientation of the Segment, α^o	12.9	12.5	5.6
Receiver to Source Distance, m	30.9	27.1	27.1
Path Length Difference, m	0.282	0.398	0.398
Wheel/Rail Noise Contribution			
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0
Distance Correction, dB(A)	-0.9	-0.4	-0.4
Angle of View Correction, dB(A)	-21.3	-21.2	-49.7
Façade Correction, dB(A)	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5
Screening Correction, dB(A)	-13.9	-15.0	-15.0
SEL of the Segment, dB(A)	59.9	59.4	37.9
SEL of Single PassBy, dB(A)	59.9	59.4	
Lmax of Single PassBy, dB(A)	50.5	50.1	
Train Frequency, No. of Train per 30min	12	12	
Leq,30min of the Track, dB(A)	38.1	37.7	
Leq,30min, dB(A)	**40.9**		
1/F, +	**2.70**		
Path Length Difference, m	0.107	0.228	0.228
Slant Distance, m	30.9	27.1	27.1
Distance Correction, dB(A)	-0.9	-0.4	-0.4
Screening Correction, dB(A)	-11.1	-13.3	-13.3
SEL of the Segment, dB(A)	62.7	61.1	39.6
SEL of Single PassBy, dB(A)	62.7	61.2	
Lmax of Single PassBy, dB(A)	53.4	51.9	
Leq,30min of the Track, dB(A)	40.9	39.4	
Leq,30min, dB(A)	**43.2**		
2/F, +	**5.40**		
Path Length Difference, m	0.016	0.104	0.104
Slant Distance, m	31.1	27.4	27.4
Distance Correction, dB(A)	-1.0	-0.4	-0.4
Screening Correction, dB(A)	-7.1	-11.0	-11.0
SEL of the Segment, dB(A)	66.6	63.3	41.9
SEL of Single PassBy, dB(A)	66.6	63.4	
Lmax of Single PassBy, dB(A)	57.3	54.1	
Leq,30min of the Track, dB(A)	44.8	41.6	
Leq,30min, dB(A)	**46.5**		

Table F.40 Air-borne Rail Noise Calculation for Assessment Point H5P1 (Full Day)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	160.8	160.8	160.8	174.3	160.8	174.3
Angle End	173.5	173.5	174.3	174.4	174.3	174.4
Speed, kph	120	120	120	120	120	120
Slant Distance, m	30.9	30.9	27.1	27.1	27.1	27.1
Angle of View, θ^o	12.7	12.7	13.5	0.1	13.5	0.1
Angle of Orientation of the Segment, α^o	12.9	12.9	12.5	5.6	12.5	5.6
Receiver to Source Distance, m	30.9	30.9	27.1	27.1	27.1	27.1
Path Length Difference, m	0.282	0.282	0.398	0.398	0.398	0.398
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-0.9	-0.9	-0.4	-0.4	-0.4	-0.4
Angle of View Correction, dB(A)	-21.3	-21.3	-21.2	-49.7	-21.2	-49.7
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.9	-13.9	-15.0	-15.0	-15.0	-15.0
SEL of the Segment, dB(A)	59.9	67.9	59.4	37.9	67.5	46.0
SEL of Single PassBy, dB(A)	59.9	67.9	59.4		67.5	
Train Frequency, No. of Train per day	425	9	425		9	
Leq,24hr of the Track, dB(A)	36.8	28.1	36.3		27.7	
Leq,24hr, dB(A)	**40.1**					
1/F, +	**2.70**					
Path Length Difference, m	0.107	0.107	0.228	0.228	0.228	0.228
Slant Distance, m	30.9	30.9	27.1	27.1	27.1	27.1
Distance Correction, dB(A)	-0.9	-0.9	-0.4	-0.4	-0.4	-0.4
Screening Correction, dB(A)	-11.1	-11.1	-13.3	-13.3	-13.3	-13.3
SEL of the Segment, dB(A)	62.7	70.7	61.1	39.6	69.2	47.7
SEL of Single PassBy, dB(A)	62.7	70.7	61.2		69.2	
Leq,24hr of the Track, dB(A)	39.6	30.9	38.1		29.4	
Leq,24hr, dB(A)	**42.5**					
2/F, +	**5.40**					
Path Length Difference, m	0.016	0.016	0.104	0.104	0.104	0.104
Slant Distance, m	31.1	31.1	27.4	27.4	27.4	27.4
Distance Correction, dB(A)	-1.0	-1.0	-0.4	-0.4	-0.4	-0.4
Screening Correction, dB(A)	-7.1	-7.1	-11.0	-11.0	-11.0	-11.0
SEL of the Segment, dB(A)	66.6	74.7	63.3	41.9	71.4	49.9
SEL of Single PassBy, dB(A)	66.6	74.7	63.4		71.4	
Leq,24hr of the Track, dB(A)	43.5	34.8	40.3		31.6	
Leq,24hr, dB(A)	**45.8**					

Figure F.25 Angle of View for Assessment Point H5P1 DT (2/F)

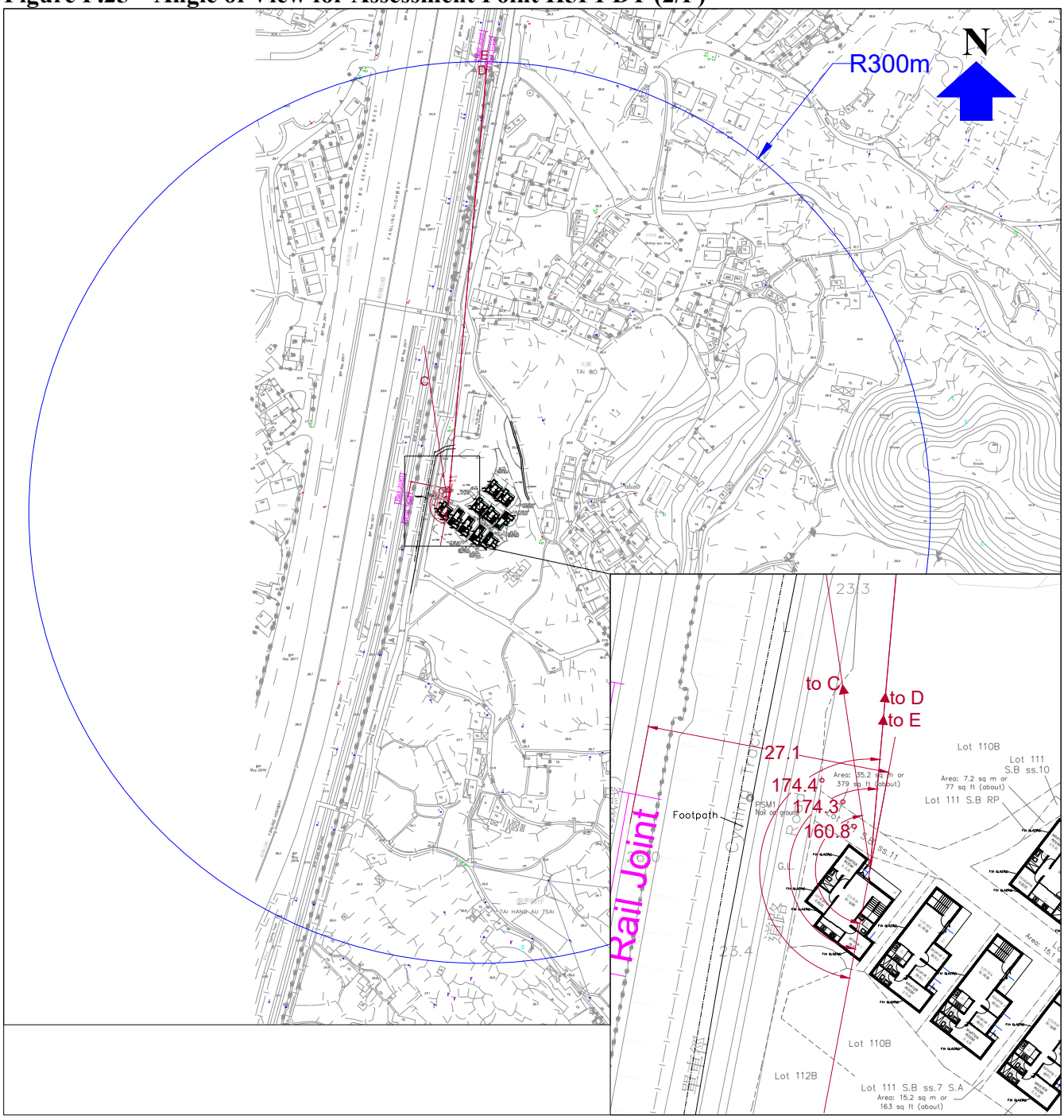


Figure F.26 Angle of View for Assessment Point H5P1 UT (2/F)

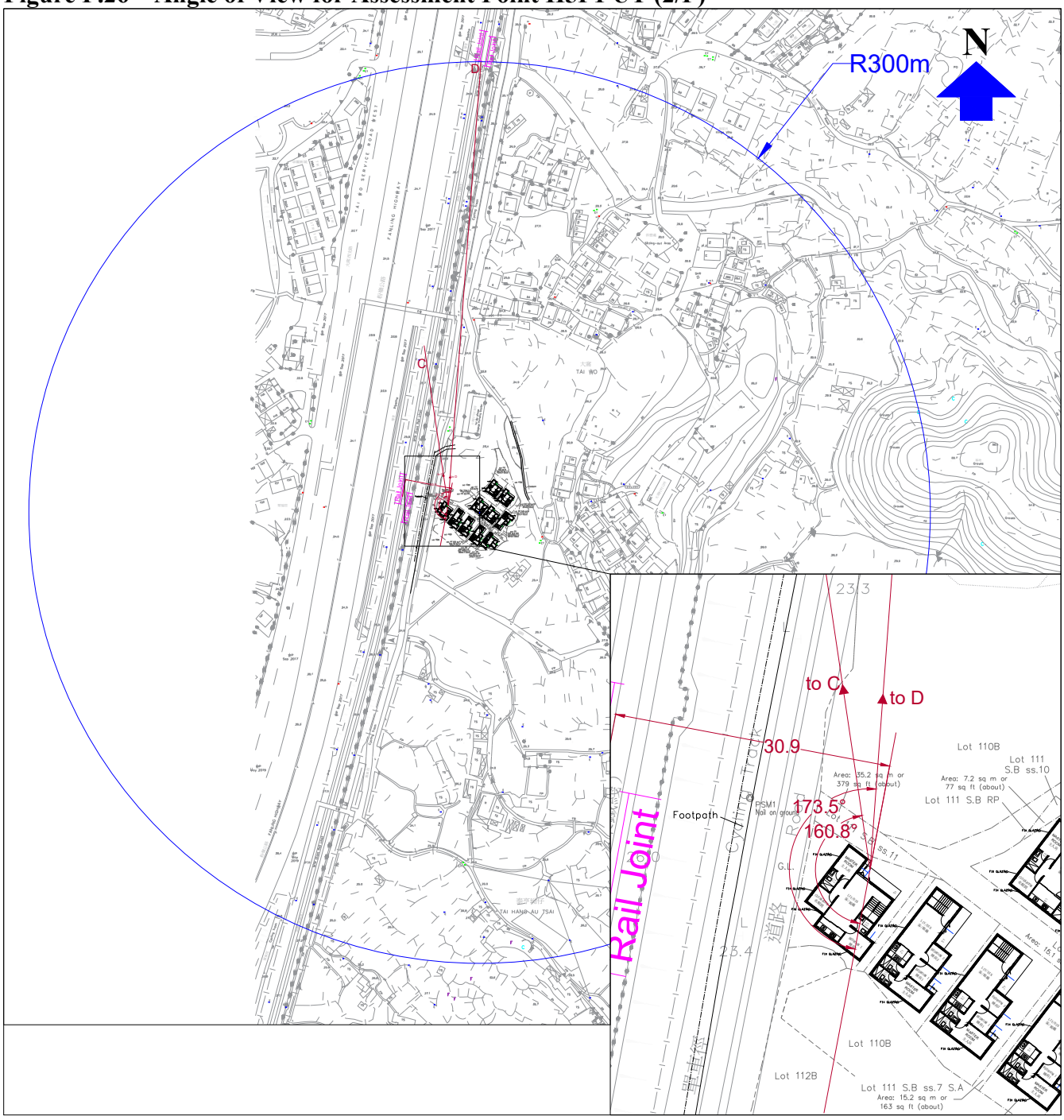


Table F.41 Air-borne Rail Noise Calculation for Assessment Point H5P2 (Daytime)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	167.7	167.7	167.7	174.3	167.7	174.3
Angle End	173.5	173.5	174.3	174.4	174.3	174.4
Speed, kph	120	120	120	120	120	120
Slant Distance, m	30.9	30.9	27.1	27.1	27.1	27.1
Angle of View, θ^o	5.8	5.8	6.6	0.1	6.6	0.1
Angle of Orientation of the Segment, α^o	9.4	9.4	9.0	5.6	9.0	5.6
Receiver to Source Distance, m	30.9	30.9	27.1	27.1	27.1	27.1
Path Length Difference, m	0.282	0.282	0.398	0.398	0.398	0.398
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-0.9	-0.9	-0.4	-0.4	-0.4	-0.4
Angle of View Correction, dB(A)	-27.5	-27.5	-27.3	-49.7	-27.3	-49.7
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.9	-13.9	-15.0	-15.0	-15.0	-15.0
SEL of the Segment, dB(A)	53.6	61.6	53.3	37.9	61.4	46.0
SEL of Single PassBy, dB(A)	53.6	61.6	53.4		61.5	
Train Frequency, No. of Train per 30min	15	1	15		1	
Leq,30min of the Track, dB(A)	32.8	29.1	32.6		28.9	
Leq,30min, dB(A)	**37.3**					
1/F, +	**2.70**					
Path Length Difference, m	0.107	0.107	0.228	0.228	0.228	0.228
Slant Distance, m	30.9	30.9	27.1	27.1	27.1	27.1
Distance Correction, dB(A)	-0.9	-0.9	-0.4	-0.4	-0.4	-0.4
Screening Correction, dB(A)	-11.1	-11.1	-13.3	-13.3	-13.3	-13.3
SEL of the Segment, dB(A)	56.4	64.5	55.0	39.6	63.1	47.7
SEL of Single PassBy, dB(A)	56.4	64.5	55.2		63.2	
Leq,30min of the Track, dB(A)	35.6	31.9	34.4		30.7	
Leq,30min, dB(A)	**39.6**					
2/F, +	**5.40**					
Path Length Difference, m	0.016	0.016	0.104	0.104	0.104	0.104
Slant Distance, m	31.1	31.1	27.4	27.4	27.4	27.4
Distance Correction, dB(A)	-1.0	-1.0	-0.4	-0.4	-0.4	-0.4
Screening Correction, dB(A)	-7.1	-7.1	-11.0	-11.0	-11.0	-11.0
SEL of the Segment, dB(A)	60.3	68.4	57.3	41.9	65.3	49.9
SEL of Single PassBy, dB(A)	60.3	68.4	57.4		65.4	
Leq,30min of the Track, dB(A)	39.5	35.8	36.6		32.9	
Leq,30min, dB(A)	**42.9**					

Table F.42 Air-borne Rail Noise Calculation for Assessment Point H5P2 (Night-time)

Track	Northbound	Southbound	
Segment	CD	CD	DE
Train Type	EMU	EMU	
Angle Start	167.7	167.7	174.3
Angle End	173.5	174.3	174.4
Speed, kph	120	120	120
Slant Distance, m	30.9	27.1	27.1
Angle of View, θ^o	5.8	6.6	0.1
Angle of Orientation of the Segment, α^o	9.4	9.0	5.6
Receiver to Source Distance, m	30.9	27.1	27.1
Path Length Difference, m	0.282	0.398	0.398
Wheel/Rail Noise Contribution			
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0
Distance Correction, dB(A)	-0.9	-0.4	-0.4
Angle of View Correction, dB(A)	-27.5	-27.3	-49.7
Façade Correction, dB(A)	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5
Screening Correction, dB(A)	-13.9	-15.0	-15.0
SEL of the Segment, dB(A)	53.6	53.3	37.9
SEL of Single PassBy, dB(A)	53.6	53.4	
Lmax of Single PassBy, dB(A)	44.3	44.1	
Train Frequency, No. of Train per 30min	12	12	
Leq,30min of the Track, dB(A)	31.8	31.7	
Leq,30min, dB(A)	**34.8**		
1/F, +	**2.70**		
Path Length Difference, m	0.107	0.228	0.228
Slant Distance, m	30.9	27.1	27.1
Distance Correction, dB(A)	-0.9	-0.4	-0.4
Screening Correction, dB(A)	-11.1	-13.3	-13.3
SEL of the Segment, dB(A)	56.4	55.0	39.6
SEL of Single PassBy, dB(A)	56.4	55.2	
Lmax of Single PassBy, dB(A)	47.1	45.9	
Leq,30min of the Track, dB(A)	34.6	33.4	
Leq,30min, dB(A)	**37.1**		
2/F, +	**5.40**		
Path Length Difference, m	0.016	0.104	0.104
Slant Distance, m	31.1	27.4	27.4
Distance Correction, dB(A)	-1.0	-0.4	-0.4
Screening Correction, dB(A)	-7.1	-11.0	-11.0
SEL of the Segment, dB(A)	60.3	57.3	41.9
SEL of Single PassBy, dB(A)	60.3	57.4	
Lmax of Single PassBy, dB(A)	51.0	48.1	
Leq,30min of the Track, dB(A)	38.6	35.6	
Leq,30min, dB(A)	**40.3**		

Table F.43 Air-borne Rail Noise Calculation for Assessment Point H5P2 (Full Day)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	167.7	167.7	167.7	174.3	167.7	174.3
Angle End	173.5	173.5	174.3	174.4	174.3	174.4
Speed, kph	120	120	120	120	120	120
Slant Distance, m	30.9	30.9	27.1	27.1	27.1	27.1
Angle of View, θ^o	5.8	5.8	6.6	0.1	6.6	0.1
Angle of Orientation of the Segment, α^o	9.4	9.4	9.0	5.6	9.0	5.6
Receiver to Source Distance, m	30.9	30.9	27.1	27.1	27.1	27.1
Path Length Difference, m	0.282	0.282	0.398	0.398	0.398	0.398
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-0.9	-0.9	-0.4	-0.4	-0.4	-0.4
Angle of View Correction, dB(A)	-27.5	-27.5	-27.3	-49.7	-27.3	-49.7
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.9	-13.9	-15.0	-15.0	-15.0	-15.0
SEL of the Segment, dB(A)	53.6	61.6	53.3	37.9	61.4	46.0
SEL of Single PassBy, dB(A)	53.6	61.6	53.4		61.5	
Train Frequency, No. of Train per day	425	9	425		9	
Leq,24hr of the Track, dB(A)	30.5	21.8	30.4		21.7	
Leq,24hr, dB(A)	**34.0**					
1/F, +	**2.70**					
Path Length Difference, m	0.107	0.107	0.228	0.228	0.228	0.228
Slant Distance, m	30.9	30.9	27.1	27.1	27.1	27.1
Distance Correction, dB(A)	-0.9	-0.9	-0.4	-0.4	-0.4	-0.4
Screening Correction, dB(A)	-11.1	-11.1	-13.3	-13.3	-13.3	-13.3
SEL of the Segment, dB(A)	56.4	64.5	55.0	39.6	63.1	47.7
SEL of Single PassBy, dB(A)	56.4	64.5	55.2		63.2	
Leq,24hr of the Track, dB(A)	33.3	24.6	32.1		23.4	
Leq,24hr, dB(A)	**36.3**					
2/F, +	**5.40**					
Path Length Difference, m	0.016	0.016	0.104	0.104	0.104	0.104
Slant Distance, m	31.1	31.1	27.4	27.4	27.4	27.4
Distance Correction, dB(A)	-1.0	-1.0	-0.4	-0.4	-0.4	-0.4
Screening Correction, dB(A)	-7.1	-7.1	-11.0	-11.0	-11.0	-11.0
SEL of the Segment, dB(A)	60.3	68.4	57.3	41.9	65.3	49.9
SEL of Single PassBy, dB(A)	60.3	68.4	57.4		65.4	
Leq,24hr of the Track, dB(A)	37.2	28.6	34.3		25.6	
Leq,24hr, dB(A)	**39.6**					

Figure F.27 Angle of View for Assessment Point H5P2 DT (2/F)

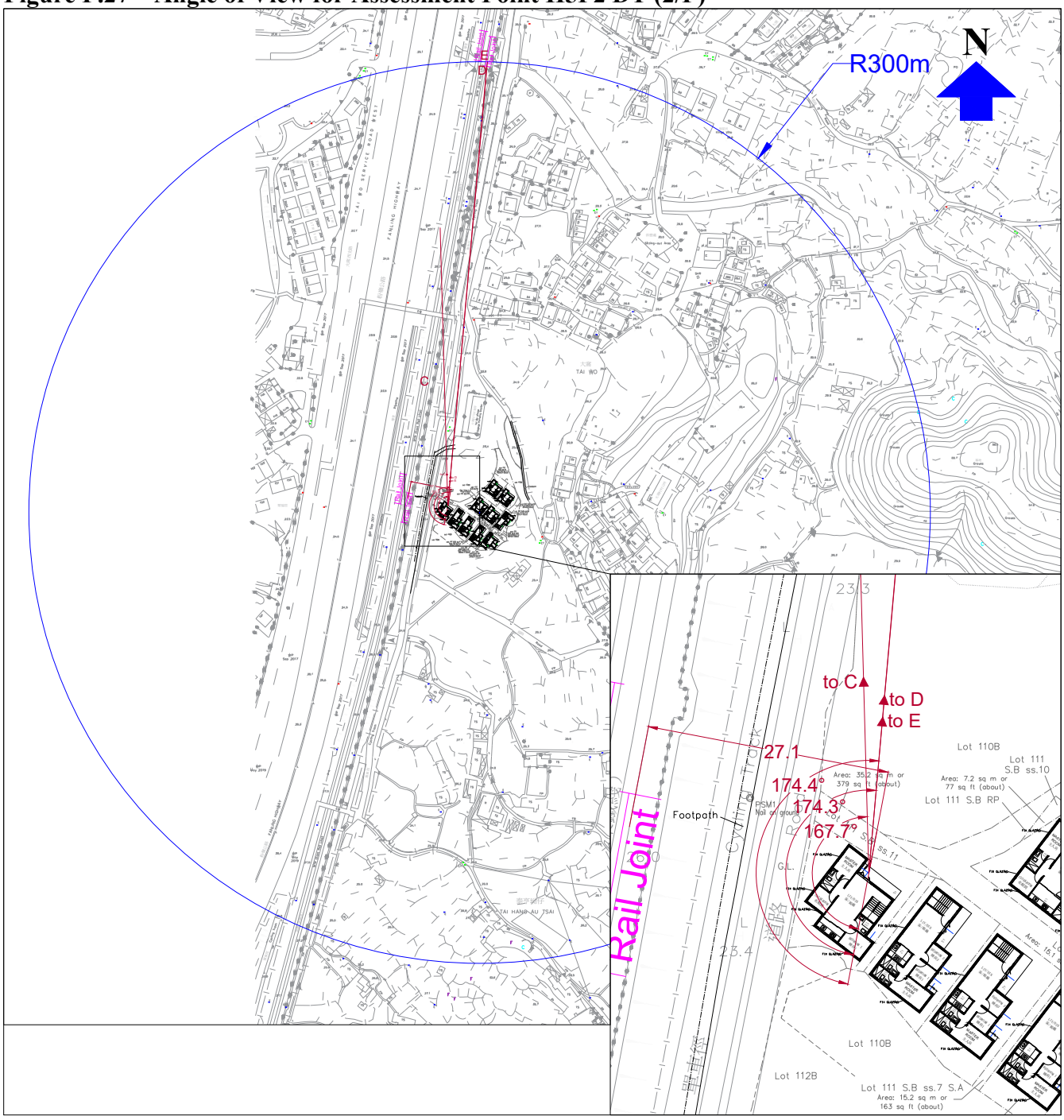


Figure F.28 Angle of View for Assessment Point H5P2 UT (2/F)

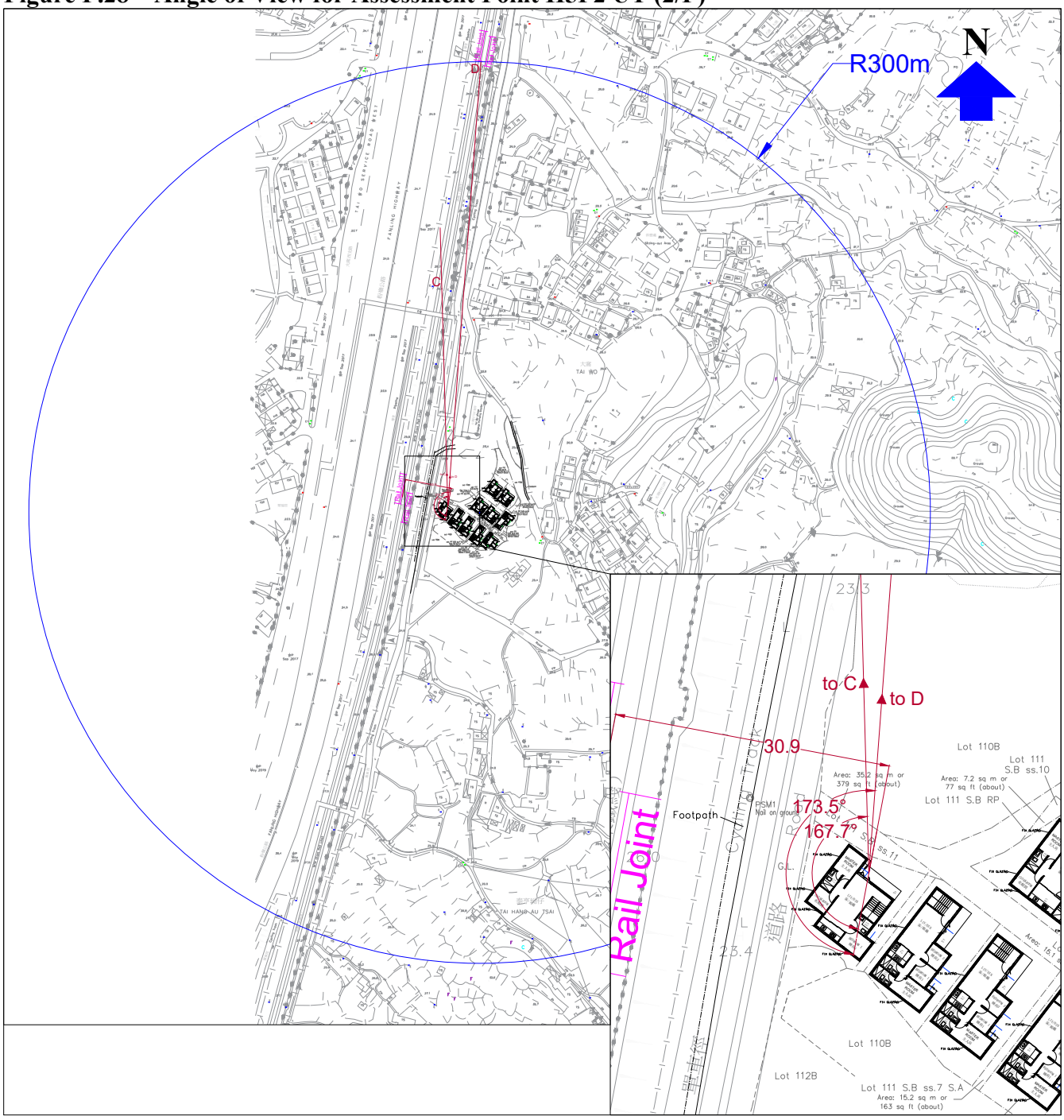


Table F.44 Air-borne Rail Noise Calculation for Assessment Point H6P2 (Daytime)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	7.1	7.1	6.3	6.3
Angle End	17.7	17.7	17.7	17.7
Speed, kph	120	120	120	120
Slant Distance, m	35.4	35.4	31.5	31.5
Angle of View, θ^o	10.6	10.6	11.4	11.4
Angle of Orientation of the Segment, α^o	12.4	12.4	12.0	12.0
Receiver to Source Distance, m	35.4	35.4	31.5	31.5
Path Length Difference, m	0.256	0.256	0.375	0.375
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-1.5	-1.5	-1.0	-1.0
Angle of View Correction, dB(A)	-22.4	-22.4	-22.4	-22.4
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.6	-13.6	-14.8	-14.8
SEL of the Segment, dB(A)	58.4	66.5	57.8	65.9
SEL of Single PassBy, dB(A)	58.4	66.5	57.8	65.9
Train Frequency, No. of Train per 30min	15	1	15	1
Leq,30min of the Track, dB(A)	37.6	33.9	37.0	33.3
Leq,30min, dB(A)	41.9			
1/F, +	2.70			
Path Length Difference, m	0.110	0.110	0.231	0.231
Slant Distance, m	35.4	35.4	31.5	31.5
Distance Correction, dB(A)	-1.5	-1.5	-1.0	-1.0
Screening Correction, dB(A)	-11.2	-11.2	-13.3	-13.3
SEL of the Segment, dB(A)	60.8	68.9	59.3	67.4
SEL of Single PassBy, dB(A)	60.8	68.9	59.3	67.4
Leq,30min of the Track, dB(A)	40.1	36.4	38.5	34.8
Leq,30min, dB(A)	43.9			
2/F, +	5.40			
Path Length Difference, m	0.025	0.025	0.122	0.122
Slant Distance, m	35.6	35.6	31.7	31.7
Distance Correction, dB(A)	-1.5	-1.5	-1.0	-1.0
Screening Correction, dB(A)	-7.8	-7.8	-11.4	-11.4
SEL of the Segment, dB(A)	64.1	72.2	61.1	69.2
SEL of Single PassBy, dB(A)	64.1	72.2	61.1	69.2
Leq,30min of the Track, dB(A)	43.4	39.7	40.3	36.6
Leq,30min, dB(A)	46.7			

Table F.45 Air-borne Rail Noise Calculation for Assessment Point H6P2 (Night-time)

Track	Northbound	Southbound
Segment	AB	AB
Train Type	EMU	EMU
Angle Start	7.1	6.3
Angle End	17.7	17.7
Speed, kph	120	120
Slant Distance, m	35.4	31.5
Angle of View, θ^o	10.6	11.4
Angle of Orientation of the Segment, α^o	12.4	12.0
Receiver to Source Distance, m	35.4	31.5
Path Length Difference, m	0.256	0.375
Wheel/Rail Noise Contribution		
Reference SEL (25m, 120kph), dB(A)	89.0	89.0
Speed Correction, dB(A)	0.0	0.0
Distance Correction, dB(A)	-1.5	-1.0
Angle of View Correction, dB(A)	-22.4	-22.4
Façade Correction, dB(A)	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0
Joint / Turnout Correction, dB(A)		
Opposite Barrier Correction, dB(A)	1.5	1.5
Screening Correction, dB(A)	-13.6	-14.8
SEL of the Segment, dB(A)	58.4	57.8
SEL of Single PassBy, dB(A)	58.4	57.8
Lmax of Single PassBy, dB(A)	49.1	48.5
Train Frequency, No. of Train per 30min	12	12
Leq,30min of the Track, dB(A)	36.6	36.0
Leq,30min, dB(A)	**39.4**	
1/F, +	**2.70**	
Path Length Difference, m	0.110	0.231
Slant Distance, m	35.4	31.5
Distance Correction, dB(A)	-1.5	-1.0
Screening Correction, dB(A)	-11.2	-13.3
SEL of the Segment, dB(A)	60.8	59.3
SEL of Single PassBy, dB(A)	60.8	59.3
Lmax of Single PassBy, dB(A)	51.5	50.0
Leq,30min of the Track, dB(A)	39.1	37.5
Leq,30min, dB(A)	**41.4**	
2/F, +	**5.40**	
Path Length Difference, m	0.025	0.122
Slant Distance, m	35.6	31.7
Distance Correction, dB(A)	-1.5	-1.0
Screening Correction, dB(A)	-7.8	-11.4
SEL of the Segment, dB(A)	64.1	61.1
SEL of Single PassBy, dB(A)	64.1	61.1
Lmax of Single PassBy, dB(A)	54.8	51.8
Leq,30min of the Track, dB(A)	42.4	39.4
Leq,30min, dB(A)	**44.1**	

Table F.46 Air-borne Rail Noise Calculation for Assessment Point H6P2 (Full Day)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	7.1	7.1	6.3	6.3
Angle End	17.7	17.7	17.7	17.7
Speed, kph	120	120	120	120
Slant Distance, m	35.4	35.4	31.5	31.5
Angle of View, θ^o	10.6	10.6	11.4	11.4
Angle of Orientation of the Segment, α^o	12.4	12.4	12.0	12.0
Receiver to Source Distance, m	35.4	35.4	31.5	31.5
Path Length Difference, m	0.256	0.256	0.375	0.375
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-1.5	-1.5	-1.0	-1.0
Angle of View Correction, dB(A)	-22.4	-22.4	-22.4	-22.4
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.6	-13.6	-14.8	-14.8
SEL of the Segment, dB(A)	58.4	66.5	57.8	65.9
SEL of Single PassBy, dB(A)	58.4	66.5	57.8	65.9
Train Frequency, No. of Train per day	425	9	425	9
Leq,24hr of the Track, dB(A)	35.3	26.6	34.7	26.0
Leq,24hr, dB(A)	**38.6**			
1/F, +	**2.70**			
Path Length Difference, m	0.110	0.110	0.231	0.231
Slant Distance, m	35.4	35.4	31.5	31.5
Distance Correction, dB(A)	-1.5	-1.5	-1.0	-1.0
Screening Correction, dB(A)	-11.2	-11.2	-13.3	-13.3
SEL of the Segment, dB(A)	60.8	68.9	59.3	67.4
SEL of Single PassBy, dB(A)	60.8	68.9	59.3	67.4
Leq,24hr of the Track, dB(A)	37.8	29.1	36.2	27.5
Leq,24hr, dB(A)	**40.6**			
2/F, +	**5.40**			
Path Length Difference, m	0.025	0.025	0.122	0.122
Slant Distance, m	35.6	35.6	31.7	31.7
Distance Correction, dB(A)	-1.5	-1.5	-1.0	-1.0
Screening Correction, dB(A)	-7.8	-7.8	-11.4	-11.4
SEL of the Segment, dB(A)	64.1	72.2	61.1	69.2
SEL of Single PassBy, dB(A)	64.1	72.2	61.1	69.2
Leq,24hr of the Track, dB(A)	41.1	32.4	38.1	29.4
Leq,24hr, dB(A)	**43.4**			

Figure F.29 Angle of View for Assessment Point H6P2 DT (2/F)

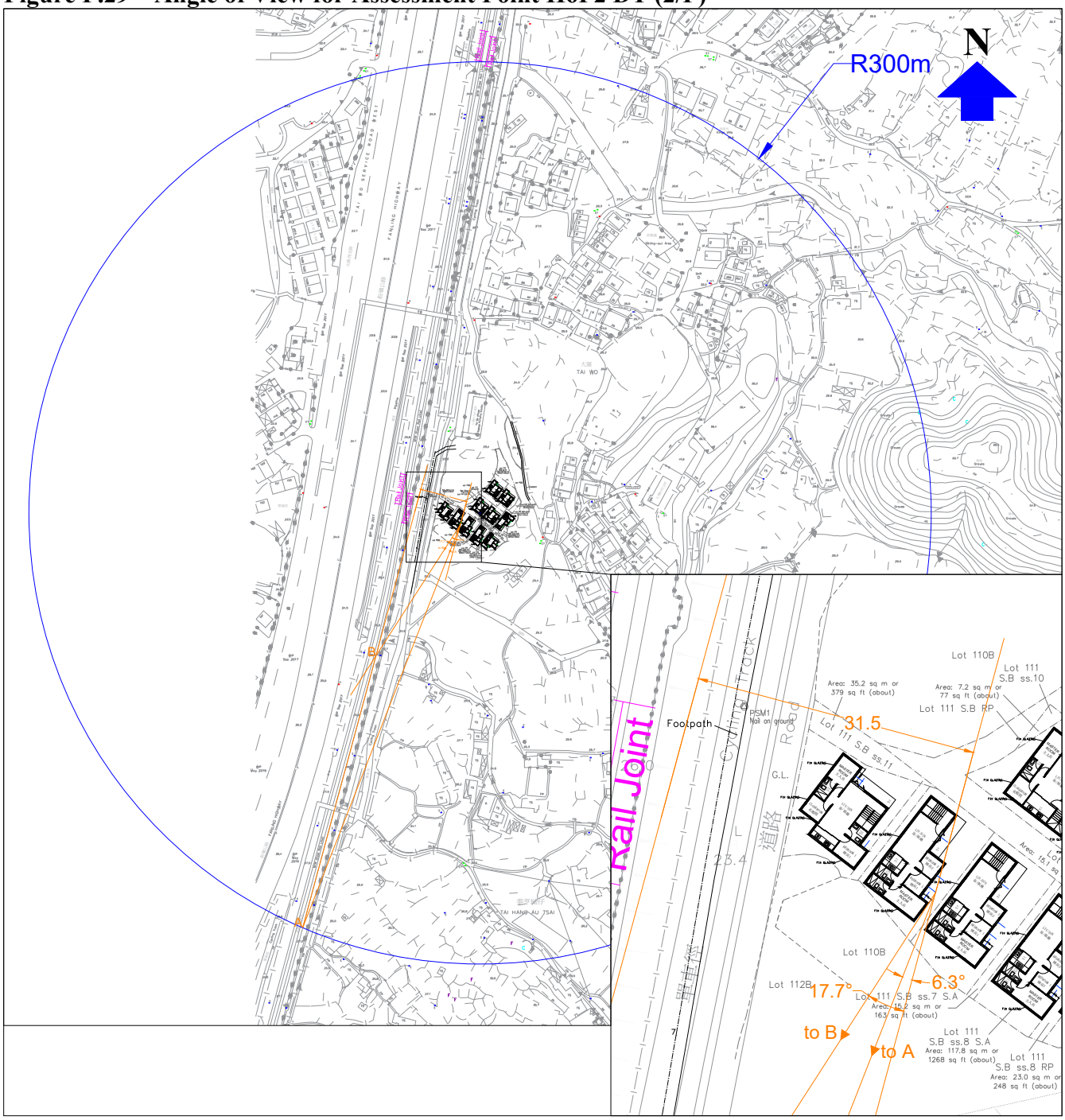


Figure F.30 Angle of View for Assessment Point H6P2 UT (2/F)

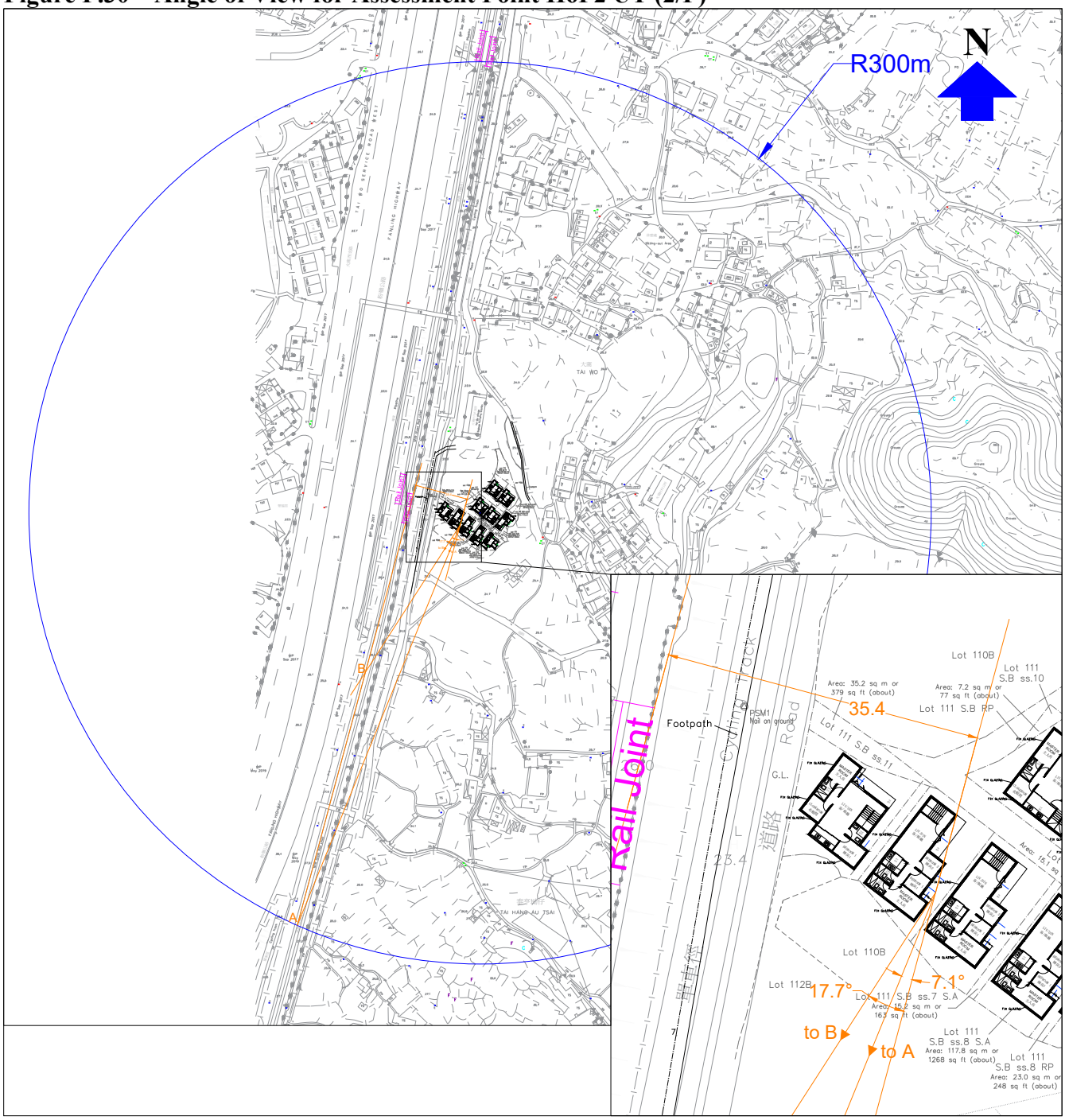


Table F.47 Air-borne Rail Noise Calculation for Assessment Point H6P3 (Daytime)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	7.3	7.3	6.5	6.5
Angle End	20.3	20.3	20.3	20.3
Speed, kph	120	120	120	120
Slant Distance, m	36.2	36.2	32.5	32.5
Angle of View, θ^o	13.0	13.0	13.8	13.8
Angle of Orientation of the Segment, α^o	13.8	13.8	13.4	13.4
Receiver to Source Distance, m	36.2	36.2	32.5	32.5
Path Length Difference, m	0.252	0.252	0.370	0.370
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-1.6	-1.6	-1.1	-1.1
Angle of View Correction, dB(A)	-20.6	-20.6	-20.5	-20.5
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.6	-13.6	-14.8	-14.8
SEL of the Segment, dB(A)	60.2	68.3	59.5	67.6
SEL of Single PassBy, dB(A)	60.2	68.3	59.5	67.6
Train Frequency, No. of Train per 30min	15	1	15	1
Leq,30min of the Track, dB(A)	39.4	35.7	38.7	35.0
Leq,30min, dB(A)	43.6			
1/F, +	2.70			
Path Length Difference, m	0.111	0.111	0.232	0.232
Slant Distance, m	36.2	36.2	32.5	32.5
Distance Correction, dB(A)	-1.6	-1.6	-1.1	-1.1
Screening Correction, dB(A)	-11.2	-11.2	-13.3	-13.3
SEL of the Segment, dB(A)	62.6	70.6	61.0	69.0
SEL of Single PassBy, dB(A)	62.6	70.6	61.0	69.0
Leq,30min of the Track, dB(A)	41.8	38.1	40.2	36.5
Leq,30min, dB(A)	45.6			
2/F, +	5.40			
Path Length Difference, m	0.027	0.027	0.125	0.125
Slant Distance, m	36.4	36.4	32.7	32.7
Distance Correction, dB(A)	-1.6	-1.6	-1.2	-1.2
Screening Correction, dB(A)	-7.9	-7.9	-11.5	-11.5
SEL of the Segment, dB(A)	65.8	73.8	62.7	70.8
SEL of Single PassBy, dB(A)	65.8	73.8	62.7	70.8
Leq,30min of the Track, dB(A)	45.0	41.3	41.9	38.2
Leq,30min, dB(A)	48.3			

Table F.48 Air-borne Rail Noise Calculation for Assessment Point H6P3 (Night-time)

Track	Northbound	Southbound
Segment	AB	AB
Train Type	EMU	EMU
Angle Start	7.3	6.5
Angle End	20.3	20.3
Speed, kph	120	120
Slant Distance, m	36.2	32.5
Angle of View, θ^o	13.0	13.8
Angle of Orientation of the Segment, α^o	13.8	13.4
Receiver to Source Distance, m	36.2	32.5
Path Length Difference, m	0.252	0.370
Wheel/Rail Noise Contribution		
Reference SEL (25m, 120kph), dB(A)	89.0	89.0
Speed Correction, dB(A)	0.0	0.0
Distance Correction, dB(A)	-1.6	-1.1
Angle of View Correction, dB(A)	-20.6	-20.5
Façade Correction, dB(A)	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0
Joint / Turnout Correction, dB(A)		
Opposite Barrier Correction, dB(A)	1.5	1.5
Screening Correction, dB(A)	-13.6	-14.8
SEL of the Segment, dB(A)	60.2	59.5
SEL of Single PassBy, dB(A)	60.2	59.5
Lmax of Single PassBy, dB(A)	50.9	50.2
Train Frequency, No. of Train per 30min	12	12
Leq,30min of the Track, dB(A)	38.4	37.8
Leq,30min, dB(A)	**41.1**	
1/F, +	**2.70**	
Path Length Difference, m	0.111	0.232
Slant Distance, m	36.2	32.5
Distance Correction, dB(A)	-1.6	-1.1
Screening Correction, dB(A)	-11.2	-13.3
SEL of the Segment, dB(A)	62.6	61.0
SEL of Single PassBy, dB(A)	62.6	61.0
Lmax of Single PassBy, dB(A)	53.3	51.7
Leq,30min of the Track, dB(A)	40.8	39.2
Leq,30min, dB(A)	**43.1**	
2/F, +	**5.40**	
Path Length Difference, m	0.027	0.125
Slant Distance, m	36.4	32.7
Distance Correction, dB(A)	-1.6	-1.2
Screening Correction, dB(A)	-7.9	-11.5
SEL of the Segment, dB(A)	65.8	62.7
SEL of Single PassBy, dB(A)	65.8	62.7
Lmax of Single PassBy, dB(A)	56.5	53.4
Leq,30min of the Track, dB(A)	44.0	41.0
Leq,30min, dB(A)	**45.8**	

Table F.49 Air-borne Rail Noise Calculation for Assessment Point H6P3 (Full Day)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	7.3	7.3	6.5	6.5
Angle End	20.3	20.3	20.3	20.3
Speed, kph	120	120	120	120
Slant Distance, m	36.2	36.2	32.5	32.5
Angle of View, θ^o	13.0	13.0	13.8	13.8
Angle of Orientation of the Segment, α^o	13.8	13.8	13.4	13.4
Receiver to Source Distance, m	36.2	36.2	32.5	32.5
Path Length Difference, m	0.252	0.252	0.370	0.370
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-1.6	-1.6	-1.1	-1.1
Angle of View Correction, dB(A)	-20.6	-20.6	-20.5	-20.5
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.6	-13.6	-14.8	-14.8
SEL of the Segment, dB(A)	60.2	68.3	59.5	67.6
SEL of Single PassBy, dB(A)	60.2	68.3	59.5	67.6
Train Frequency, No. of Train per day	425	9	425	9
Leq,24hr of the Track, dB(A)	37.1	28.4	36.4	27.8
Leq,24hr, dB(A)	40.4			
1/F, +	2.70			
Path Length Difference, m	0.111	0.111	0.232	0.232
Slant Distance, m	36.2	36.2	32.5	32.5
Distance Correction, dB(A)	-1.6	-1.6	-1.1	-1.1
Screening Correction, dB(A)	-11.2	-11.2	-13.3	-13.3
SEL of the Segment, dB(A)	62.6	70.6	61.0	69.0
SEL of Single PassBy, dB(A)	62.6	70.6	61.0	69.0
Leq,24hr of the Track, dB(A)	39.5	30.8	37.9	29.2
Leq,24hr, dB(A)	42.3			
2/F, +	5.40			
Path Length Difference, m	0.027	0.027	0.125	0.125
Slant Distance, m	36.4	36.4	32.7	32.7
Distance Correction, dB(A)	-1.6	-1.6	-1.2	-1.2
Screening Correction, dB(A)	-7.9	-7.9	-11.5	-11.5
SEL of the Segment, dB(A)	65.8	73.8	62.7	70.8
SEL of Single PassBy, dB(A)	65.8	73.8	62.7	70.8
Leq,24hr of the Track, dB(A)	42.7	34.0	39.7	31.0
Leq,24hr, dB(A)	45.0			

Figure F.31 Angle of View for Assessment Point H6P3 DT (2/F)

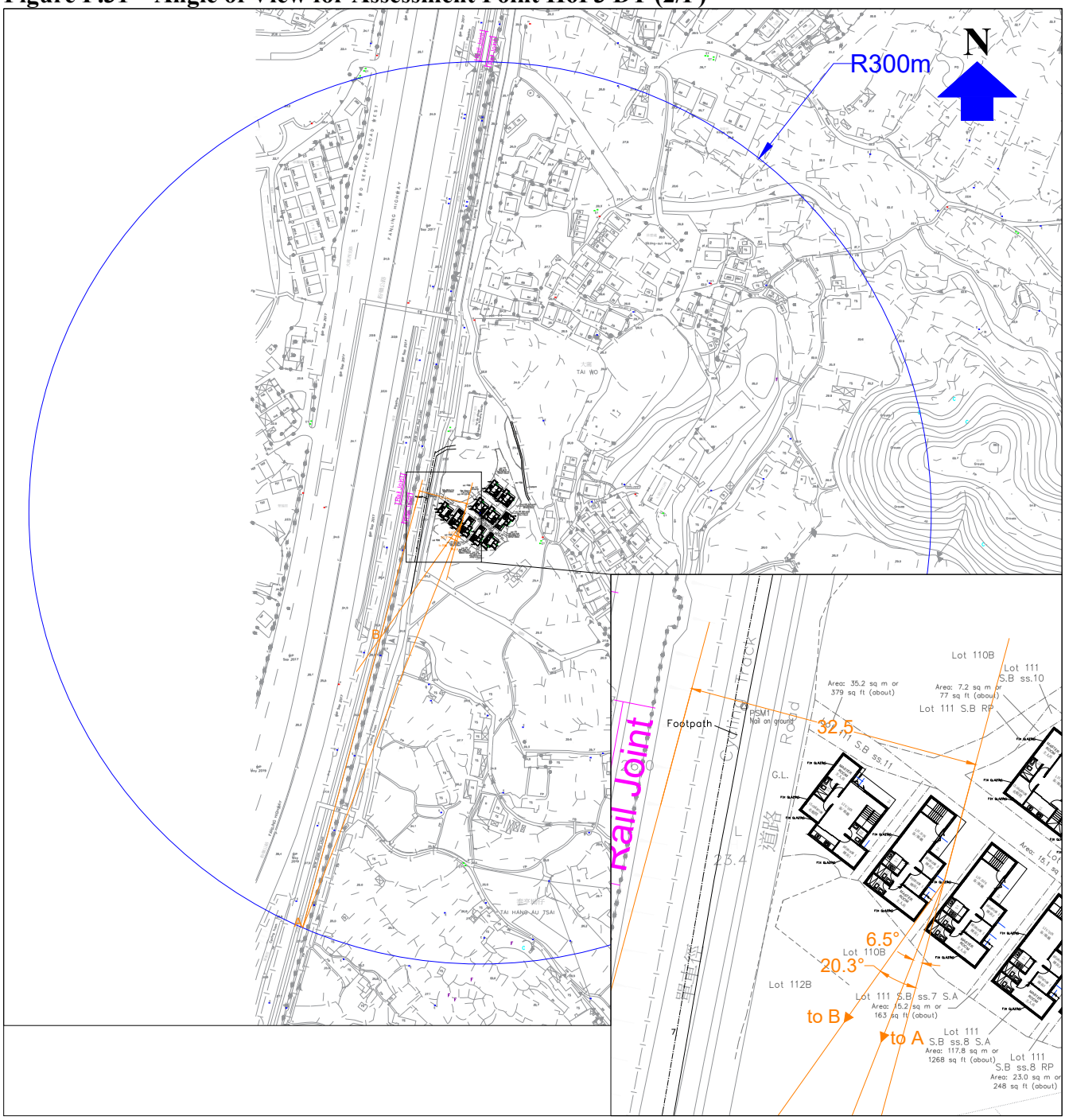


Figure F.32 Angle of View for Assessment Point H6P3 UT (2/F)

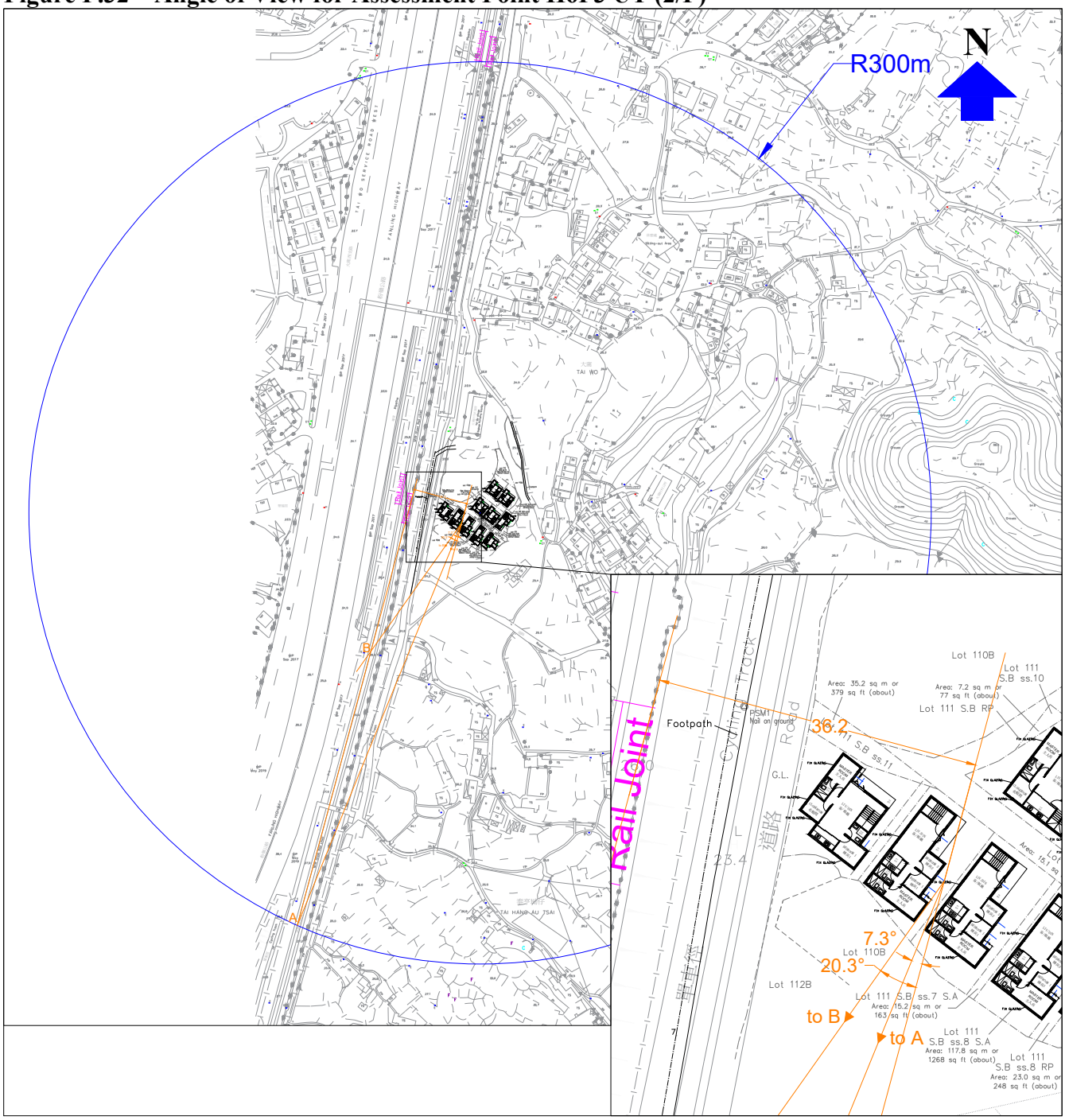


Table F.50 Air-borne Rail Noise Calculation for Assessment Point H7P2 (Daytime)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	8.7	8.7	7.9	7.9
Angle End	17.7	17.7	17.7	17.7
Speed, kph	120	120	120	120
Slant Distance, m	43.1	43.1	39.3	39.3
Angle of View, θ^o	9.0	9.0	9.8	9.8
Angle of Orientation of the Segment, α^o	13.2	13.2	12.8	12.8
Receiver to Source Distance, m	43.1	43.1	39.3	39.3
Path Length Difference, m	0.227	0.227	0.347	0.347
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-2.4	-2.4	-2.0	-2.0
Angle of View Correction, dB(A)	-22.7	-22.7	-22.6	-22.6
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.2	-13.2	-14.6	-14.6
SEL of the Segment, dB(A)	57.6	65.7	56.9	64.9
SEL of Single PassBy, dB(A)	57.6	65.7	56.9	64.9
Train Frequency, No. of Train per 30min	15	1	15	1
Leq,30min of the Track, dB(A)	36.9	33.2	36.1	32.4
Leq,30min, dB(A)	41.0			
1/F, +	2.70			
Path Length Difference, m	0.114	0.114	0.236	0.236
Slant Distance, m	43.1	43.1	39.3	39.3
Distance Correction, dB(A)	-2.4	-2.4	-2.0	-2.0
Screening Correction, dB(A)	-11.2	-11.2	-13.4	-13.4
SEL of the Segment, dB(A)	59.6	67.7	58.1	66.1
SEL of Single PassBy, dB(A)	59.6	67.7	58.1	66.1
Leq,30min of the Track, dB(A)	38.9	35.2	37.3	33.6
Leq,30min, dB(A)	42.7			
2/F, +	5.40			
Path Length Difference, m	0.039	0.039	0.145	0.145
Slant Distance, m	43.3	43.3	39.5	39.5
Distance Correction, dB(A)	-2.4	-2.4	-2.0	-2.0
Screening Correction, dB(A)	-8.7	-8.7	-11.9	-11.9
SEL of the Segment, dB(A)	62.2	70.3	59.5	67.5
SEL of Single PassBy, dB(A)	62.2	70.3	59.5	67.5
Leq,30min of the Track, dB(A)	41.4	37.7	38.7	35.0
Leq,30min, dB(A)	44.8			

Table F.51 Air-borne Rail Noise Calculation for Assessment Point H7P2 (Night-time)

Track	Northbound	Southbound
Segment	AB	AB
Train Type	EMU	EMU
Angle Start	8.7	7.9
Angle End	17.7	17.7
Speed, kph	120	120
Slant Distance, m	43.1	39.3
Angle of View, θ^o	9.0	9.8
Angle of Orientation of the Segment, α^o	13.2	12.8
Receiver to Source Distance, m	43.1	39.3
Path Length Difference, m	0.227	0.347
Wheel/Rail Noise Contribution		
Reference SEL (25m, 120kph), dB(A)	89.0	89.0
Speed Correction, dB(A)	0.0	0.0
Distance Correction, dB(A)	-2.4	-2.0
Angle of View Correction, dB(A)	-22.7	-22.6
Façade Correction, dB(A)	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0
Joint / Turnout Correction, dB(A)		
Opposite Barrier Correction, dB(A)	1.5	1.5
Screening Correction, dB(A)	-13.2	-14.6
SEL of the Segment, dB(A)	57.6	56.9
SEL of Single PassBy, dB(A)	57.6	56.9
Lmax of Single PassBy, dB(A)	48.3	47.6
Train Frequency, No. of Train per 30min	12	12
Leq,30min of the Track, dB(A)	35.9	35.1
Leq,30min, dB(A)	**38.5**	
1/F, +	**2.70**	
Path Length Difference, m	0.114	0.236
Slant Distance, m	43.1	39.3
Distance Correction, dB(A)	-2.4	-2.0
Screening Correction, dB(A)	-11.2	-13.4
SEL of the Segment, dB(A)	59.6	58.1
SEL of Single PassBy, dB(A)	59.6	58.1
Lmax of Single PassBy, dB(A)	50.3	48.8
Leq,30min of the Track, dB(A)	37.9	36.3
Leq,30min, dB(A)	**40.2**	
2/F, +	**5.40**	
Path Length Difference, m	0.039	0.145
Slant Distance, m	43.3	39.5
Distance Correction, dB(A)	-2.4	-2.0
Screening Correction, dB(A)	-8.7	-11.9
SEL of the Segment, dB(A)	62.2	59.5
SEL of Single PassBy, dB(A)	62.2	59.5
Lmax of Single PassBy, dB(A)	52.9	50.2
Leq,30min of the Track, dB(A)	40.4	37.7
Leq,30min, dB(A)	**42.3**	

Table F.52 Air-borne Rail Noise Calculation for Assessment Point H7P2 (Full Day)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	8.7	8.7	7.9	7.9
Angle End	17.7	17.7	17.7	17.7
Speed, kph	120	120	120	120
Slant Distance, m	43.1	43.1	39.3	39.3
Angle of View, θ^o	9.0	9.0	9.8	9.8
Angle of Orientation of the Segment, α^o	13.2	13.2	12.8	12.8
Receiver to Source Distance, m	43.1	43.1	39.3	39.3
Path Length Difference, m	0.227	0.227	0.347	0.347
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-2.4	-2.4	-2.0	-2.0
Angle of View Correction, dB(A)	-22.7	-22.7	-22.6	-22.6
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.2	-13.2	-14.6	-14.6
SEL of the Segment, dB(A)	57.6	65.7	56.9	64.9
SEL of Single PassBy, dB(A)	57.6	65.7	56.9	64.9
Train Frequency, No. of Train per day	425	9	425	9
Leq,24hr of the Track, dB(A)	34.6	25.9	33.8	25.1
Leq,24hr, dB(A)	**37.8**			
1/F, +	**2.70**			
Path Length Difference, m	0.114	0.114	0.236	0.236
Slant Distance, m	43.1	43.1	39.3	39.3
Distance Correction, dB(A)	-2.4	-2.4	-2.0	-2.0
Screening Correction, dB(A)	-11.2	-11.2	-13.4	-13.4
SEL of the Segment, dB(A)	59.6	67.7	58.1	66.1
SEL of Single PassBy, dB(A)	59.6	67.7	58.1	66.1
Leq,24hr of the Track, dB(A)	36.6	27.9	35.0	26.3
Leq,24hr, dB(A)	**39.4**			
2/F, +	**5.40**			
Path Length Difference, m	0.039	0.039	0.145	0.145
Slant Distance, m	43.3	43.3	39.5	39.5
Distance Correction, dB(A)	-2.4	-2.4	-2.0	-2.0
Screening Correction, dB(A)	-8.7	-8.7	-11.9	-11.9
SEL of the Segment, dB(A)	62.2	70.3	59.5	67.5
SEL of Single PassBy, dB(A)	62.2	70.3	59.5	67.5
Leq,24hr of the Track, dB(A)	39.1	30.4	36.4	27.7
Leq,24hr, dB(A)	**41.5**			

Figure F.33 Angle of View for Assessment Point H7P2 DT (2/F)

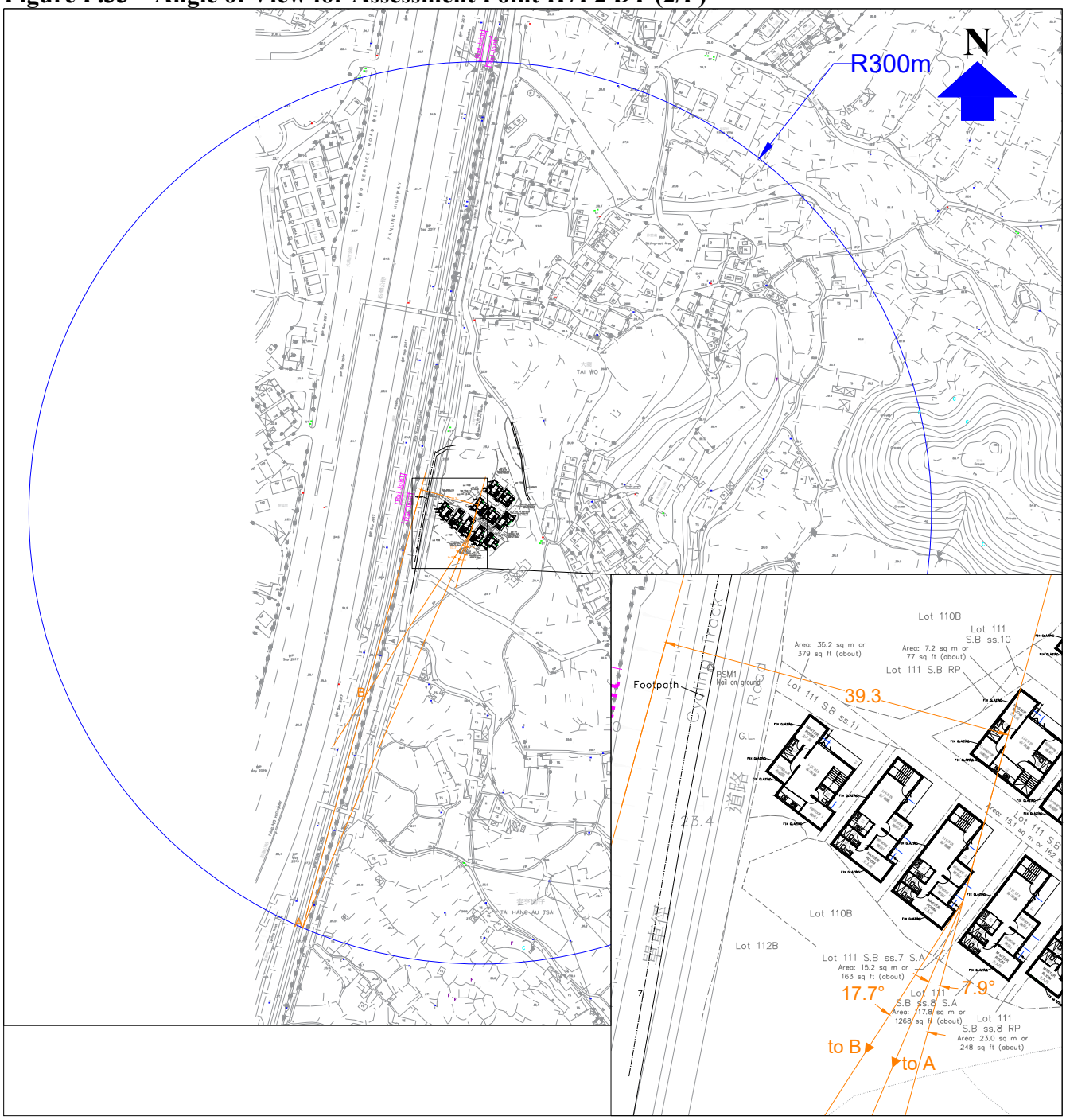


Figure F.34 Angle of View for Assessment Point H7P2 UT (2/F)

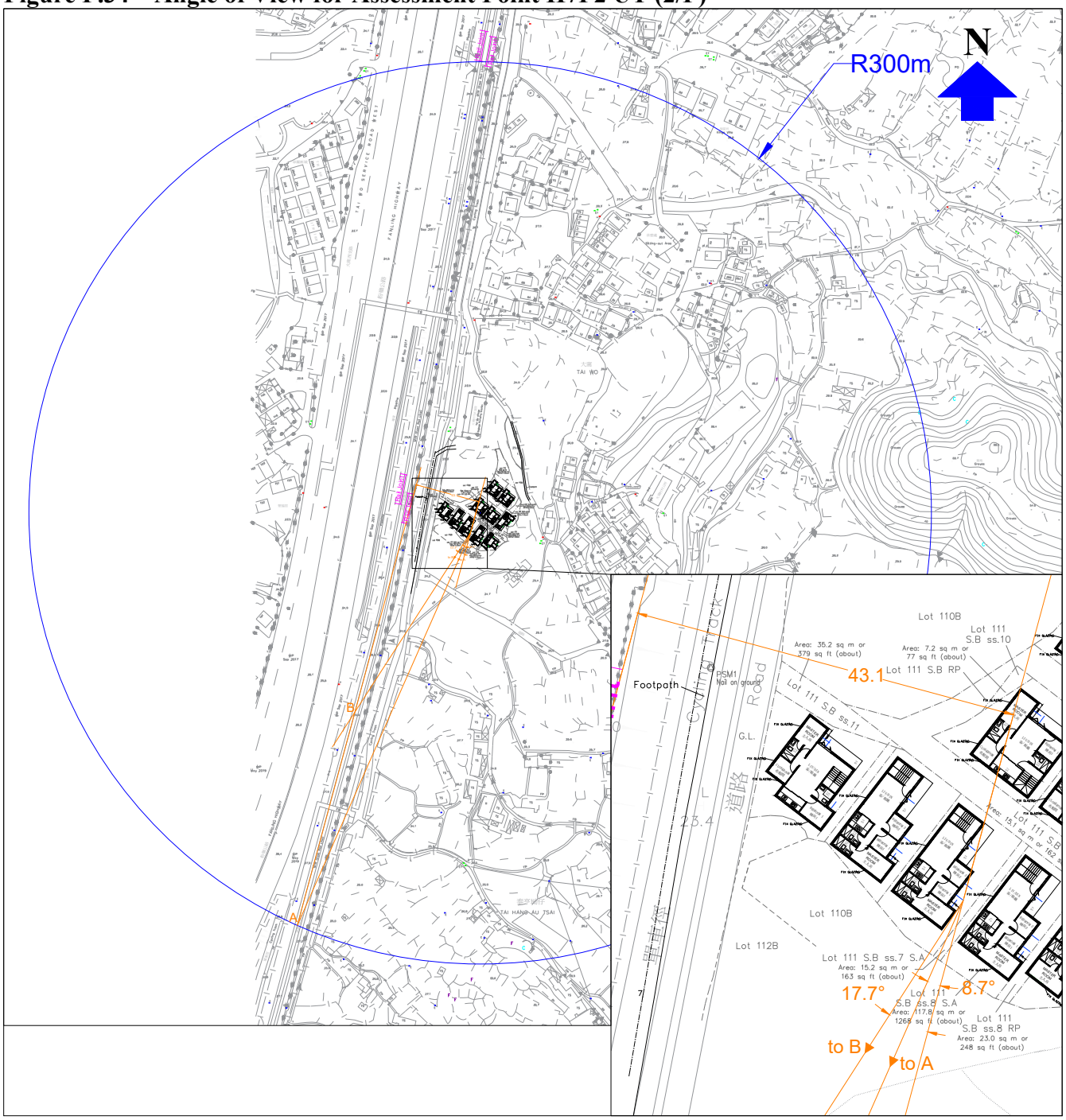


Table F.53 Air-borne Rail Noise Calculation for Assessment Point H7P3 (Daytime)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	8.8	8.8	8.0	8.0
Angle End	20.2	20.2	20.2	20.2
Speed, kph	120	120	120	120
Slant Distance, m	43.8	43.8	39.9	39.9
Angle of View, θ^o	11.4	11.4	12.2	12.2
Angle of Orientation of the Segment, α^o	14.5	14.5	14.1	14.1
Receiver to Source Distance, m	43.8	43.8	39.9	39.9
Path Length Difference, m	0.225	0.225	0.345	0.345
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-2.4	-2.4	-2.0	-2.0
Angle of View Correction, dB(A)	-20.8	-20.8	-20.7	-20.7
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.2	-13.2	-14.5	-14.5
SEL of the Segment, dB(A)	59.5	67.5	58.7	66.7
SEL of Single PassBy, dB(A)	59.5	67.5	58.7	66.7
Train Frequency, No. of Train per 30min	15	1	15	1
Leq,30min of the Track, dB(A)	38.7	35.0	37.9	34.2
Leq,30min, dB(A)	42.8			
1/F, +	2.70			
Path Length Difference, m	0.114	0.114	0.236	0.236
Slant Distance, m	43.8	43.8	39.9	39.9
Distance Correction, dB(A)	-2.4	-2.4	-2.0	-2.0
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4
SEL of the Segment, dB(A)	61.4	69.5	59.8	67.9
SEL of Single PassBy, dB(A)	61.4	69.5	59.8	67.9
Leq,30min of the Track, dB(A)	40.7	37.0	39.0	35.3
Leq,30min, dB(A)	44.5			
2/F, +	5.40			
Path Length Difference, m	0.040	0.040	0.147	0.147
Slant Distance, m	44.0	44.0	40.1	40.1
Distance Correction, dB(A)	-2.5	-2.5	-2.1	-2.1
Screening Correction, dB(A)	-8.7	-8.7	-12.0	-12.0
SEL of the Segment, dB(A)	64.0	72.0	61.2	69.3
SEL of Single PassBy, dB(A)	64.0	72.0	61.2	69.3
Leq,30min of the Track, dB(A)	43.2	39.5	40.4	36.7
Leq,30min, dB(A)	46.6			

Table F.54 Air-borne Rail Noise Calculation for Assessment Point H7P3 (Night-time)

Track	Northbound	Southbound
Segment	AB	AB
Train Type	EMU	EMU
Angle Start	8.8	8.0
Angle End	20.2	20.2
Speed, kph	120	120
Slant Distance, m	43.8	39.9
Angle of View, θ^o	11.4	12.2
Angle of Orientation of the Segment, α^o	14.5	14.1
Receiver to Source Distance, m	43.8	39.9
Path Length Difference, m	0.225	0.345
Wheel/Rail Noise Contribution		
Reference SEL (25m, 120kph), dB(A)	89.0	89.0
Speed Correction, dB(A)	0.0	0.0
Distance Correction, dB(A)	-2.4	-2.0
Angle of View Correction, dB(A)	-20.8	-20.7
Façade Correction, dB(A)	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0
Joint / Turnout Correction, dB(A)		
Opposite Barrier Correction, dB(A)	1.5	1.5
Screening Correction, dB(A)	-13.2	-14.5
SEL of the Segment, dB(A)	59.5	58.7
SEL of Single PassBy, dB(A)	59.5	58.7
Lmax of Single PassBy, dB(A)	50.1	49.3
Train Frequency, No. of Train per 30min	12	12
Leq,30min of the Track, dB(A)	37.7	36.9
Leq,30min, dB(A)	**40.3**	
1/F, +	**2.70**	
Path Length Difference, m	0.114	0.236
Slant Distance, m	43.8	39.9
Distance Correction, dB(A)	-2.4	-2.0
Screening Correction, dB(A)	-11.3	-13.4
SEL of the Segment, dB(A)	61.4	59.8
SEL of Single PassBy, dB(A)	61.4	59.8
Lmax of Single PassBy, dB(A)	52.1	50.5
Leq,30min of the Track, dB(A)	39.7	38.1
Leq,30min, dB(A)	**42.0**	
2/F, +	**5.40**	
Path Length Difference, m	0.040	0.147
Slant Distance, m	44.0	40.1
Distance Correction, dB(A)	-2.5	-2.1
Screening Correction, dB(A)	-8.7	-12.0
SEL of the Segment, dB(A)	64.0	61.2
SEL of Single PassBy, dB(A)	64.0	61.2
Lmax of Single PassBy, dB(A)	54.6	51.9
Leq,30min of the Track, dB(A)	42.2	39.5
Leq,30min, dB(A)	**44.0**	

Table F.55 Air-borne Rail Noise Calculation for Assessment Point H7P3 (Full Day)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	8.8	8.8	8.0	8.0
Angle End	20.2	20.2	20.2	20.2
Speed, kph	120	120	120	120
Slant Distance, m	43.8	43.8	39.9	39.9
Angle of View, θ^o	11.4	11.4	12.2	12.2
Angle of Orientation of the Segment, α^o	14.5	14.5	14.1	14.1
Receiver to Source Distance, m	43.8	43.8	39.9	39.9
Path Length Difference, m	0.225	0.225	0.345	0.345
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-2.4	-2.4	-2.0	-2.0
Angle of View Correction, dB(A)	-20.8	-20.8	-20.7	-20.7
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.2	-13.2	-14.5	-14.5
SEL of the Segment, dB(A)	59.5	67.5	58.7	66.7
SEL of Single PassBy, dB(A)	59.5	67.5	58.7	66.7
Train Frequency, No. of Train per day	425	9	425	9
Leq,24hr of the Track, dB(A)	36.4	27.7	35.6	26.9
Leq,24hr, dB(A)	39.6			
1/F, +	2.70			
Path Length Difference, m	0.114	0.114	0.236	0.236
Slant Distance, m	43.8	43.8	39.9	39.9
Distance Correction, dB(A)	-2.4	-2.4	-2.0	-2.0
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4
SEL of the Segment, dB(A)	61.4	69.5	59.8	67.9
SEL of Single PassBy, dB(A)	61.4	69.5	59.8	67.9
Leq,24hr of the Track, dB(A)	38.4	29.7	36.8	28.1
Leq,24hr, dB(A)	41.2			
2/F, +	5.40			
Path Length Difference, m	0.040	0.040	0.147	0.147
Slant Distance, m	44.0	44.0	40.1	40.1
Distance Correction, dB(A)	-2.5	-2.5	-2.1	-2.1
Screening Correction, dB(A)	-8.7	-8.7	-12.0	-12.0
SEL of the Segment, dB(A)	64.0	72.0	61.2	69.3
SEL of Single PassBy, dB(A)	64.0	72.0	61.2	69.3
Leq,24hr of the Track, dB(A)	40.9	32.2	38.1	29.5
Leq,24hr, dB(A)	43.3			

Figure F.35 Angle of View for Assessment Point H7P3 DT (2/F)

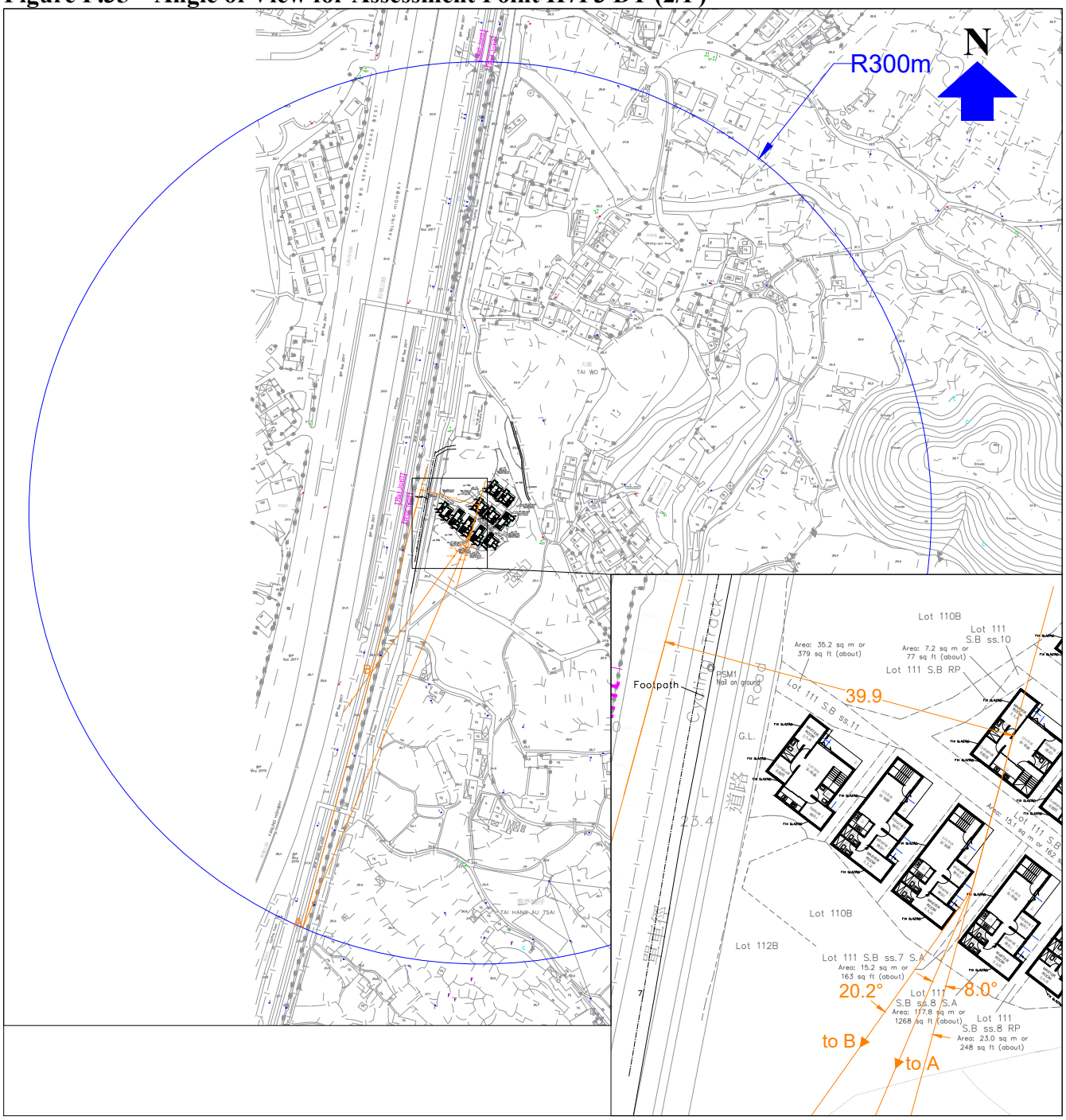


Figure F.36 Angle of View for Assessment Point H7P3 UT (2/F)

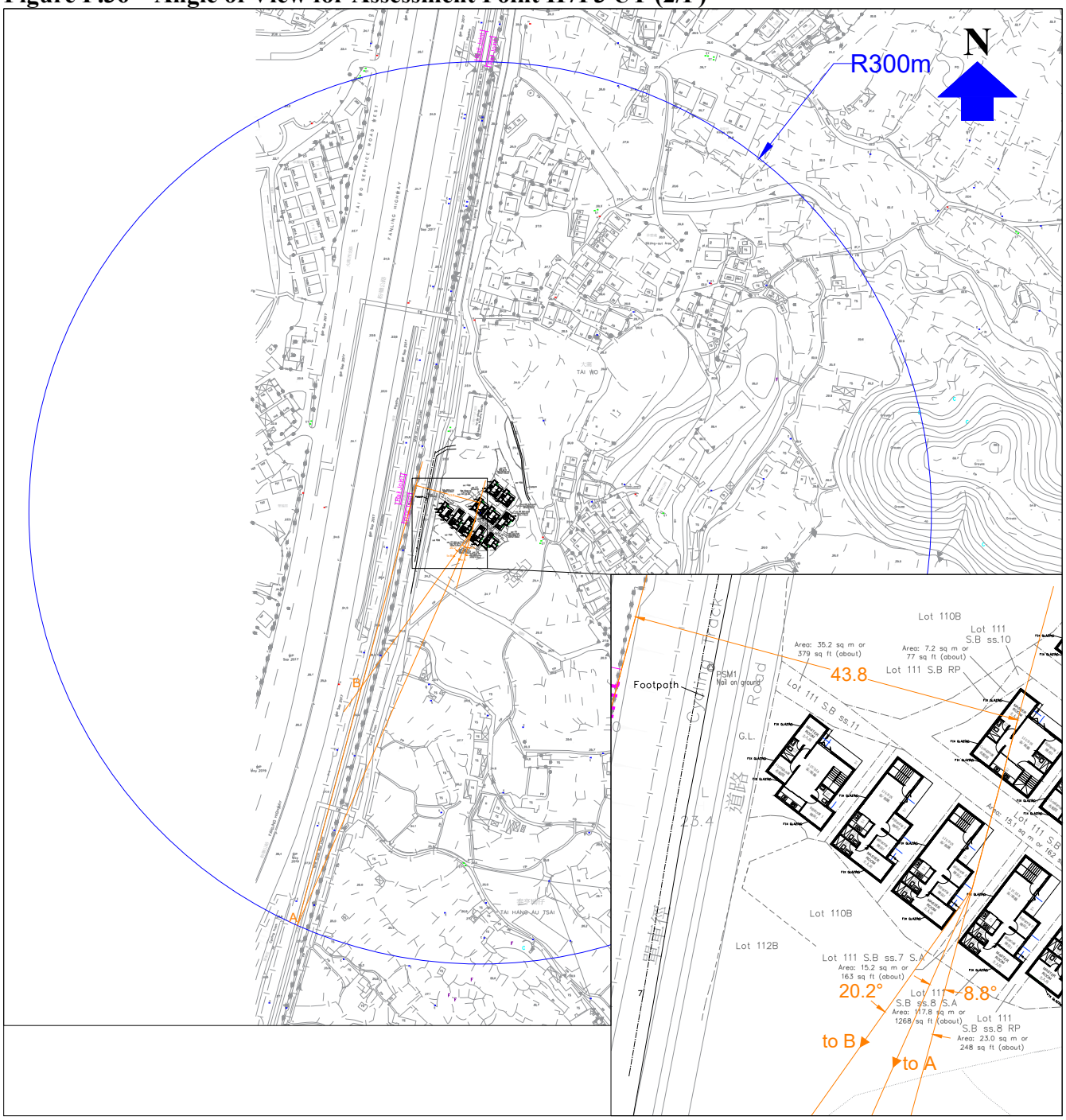


Table F.56 Air-borne Rail Noise Calculation for Assessment Point H8P2 (Daytime)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	10.6	10.6	9.8	9.8
Angle End	17.7	17.7	17.7	17.7
Speed, kph	120	120	120	120
Slant Distance, m	52.1	52.1	48.1	48.1
Angle of View, θ^o	7.1	7.1	7.9	7.9
Angle of Orientation of the Segment, α^o	14.2	14.2	13.8	13.8
Receiver to Source Distance, m	52.1	52.1	48.1	48.1
Path Length Difference, m	0.206	0.206	0.328	0.328
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.2	-3.2	-2.8	-2.8
Angle of View Correction, dB(A)	-23.2	-23.2	-23.0	-23.0
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.0	-13.0	-14.4	-14.4
SEL of the Segment, dB(A)	56.6	64.7	55.8	63.8
SEL of Single PassBy, dB(A)	56.6	64.7	55.8	63.8
Train Frequency, No. of Train per 30min	15	1	15	1
Leq,30min of the Track, dB(A)	35.8	32.1	35.0	31.3
Leq,30min, dB(A)	40.0			
1/F, +	2.70			
Path Length Difference, m	0.116	0.116	0.239	0.239
Slant Distance, m	52.1	52.1	48.1	48.1
Distance Correction, dB(A)	-3.2	-3.2	-2.8	-2.8
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4
SEL of the Segment, dB(A)	58.3	66.3	56.8	64.8
SEL of Single PassBy, dB(A)	58.3	66.3	56.8	64.8
Leq,30min of the Track, dB(A)	37.5	33.8	36.0	32.3
Leq,30min, dB(A)	41.3			
2/F, +	5.40			
Path Length Difference, m	0.052	0.052	0.163	0.163
Slant Distance, m	52.2	52.2	48.3	48.3
Distance Correction, dB(A)	-3.2	-3.2	-2.9	-2.9
Screening Correction, dB(A)	-9.3	-9.3	-12.3	-12.3
SEL of the Segment, dB(A)	60.3	68.3	57.9	65.9
SEL of Single PassBy, dB(A)	60.3	68.3	57.9	65.9
Leq,30min of the Track, dB(A)	39.5	35.8	37.1	33.4
Leq,30min, dB(A)	43.0			

Table F.57 Air-borne Rail Noise Calculation for Assessment Point H8P2 (Night-time)

Track	Northbound	Southbound
Segment	AB	AB
Train Type	EMU	EMU
Angle Start	10.6	9.8
Angle End	17.7	17.7
Speed, kph	120	120
Slant Distance, m	52.1	48.1
Angle of View, θ^o	7.1	7.9
Angle of Orientation of the Segment, α^o	14.2	13.8
Receiver to Source Distance, m	52.1	48.1
Path Length Difference, m	0.206	0.328
Wheel/Rail Noise Contribution		
Reference SEL (25m, 120kph), dB(A)	89.0	89.0
Speed Correction, dB(A)	0.0	0.0
Distance Correction, dB(A)	-3.2	-2.8
Angle of View Correction, dB(A)	-23.2	-23.0
Façade Correction, dB(A)	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0
Joint / Turnout Correction, dB(A)		
Opposite Barrier Correction, dB(A)	1.5	1.5
Screening Correction, dB(A)	-13.0	-14.4
SEL of the Segment, dB(A)	56.6	55.8
SEL of Single PassBy, dB(A)	56.6	55.8
Lmax of Single PassBy, dB(A)	47.2	46.4
Train Frequency, No. of Train per 30min	12	12
Leq,30min of the Track, dB(A)	34.8	34.0
Leq,30min, dB(A)	**37.5**	
1/F, +	**2.70**	
Path Length Difference, m	0.116	0.239
Slant Distance, m	52.1	48.1
Distance Correction, dB(A)	-3.2	-2.8
Screening Correction, dB(A)	-11.3	-13.4
SEL of the Segment, dB(A)	58.3	56.8
SEL of Single PassBy, dB(A)	58.3	56.8
Lmax of Single PassBy, dB(A)	48.9	47.4
Leq,30min of the Track, dB(A)	36.5	35.0
Leq,30min, dB(A)	**38.8**	
2/F, +	**5.40**	
Path Length Difference, m	0.052	0.163
Slant Distance, m	52.2	48.3
Distance Correction, dB(A)	-3.2	-2.9
Screening Correction, dB(A)	-9.3	-12.3
SEL of the Segment, dB(A)	60.3	57.9
SEL of Single PassBy, dB(A)	60.3	57.9
Lmax of Single PassBy, dB(A)	50.9	48.5
Leq,30min of the Track, dB(A)	38.5	36.1
Leq,30min, dB(A)	**40.5**	

Table F.58 Air-borne Rail Noise Calculation for Assessment Point H8P2 (Full Day)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	10.6	10.6	9.8	9.8
Angle End	17.7	17.7	17.7	17.7
Speed, kph	120	120	120	120
Slant Distance, m	52.1	52.1	48.1	48.1
Angle of View, θ^o	7.1	7.1	7.9	7.9
Angle of Orientation of the Segment, α^o	14.2	14.2	13.8	13.8
Receiver to Source Distance, m	52.1	52.1	48.1	48.1
Path Length Difference, m	0.206	0.206	0.328	0.328
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.2	-3.2	-2.8	-2.8
Angle of View Correction, dB(A)	-23.2	-23.2	-23.0	-23.0
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.0	-13.0	-14.4	-14.4
SEL of the Segment, dB(A)	56.6	64.7	55.8	63.8
SEL of Single PassBy, dB(A)	56.6	64.7	55.8	63.8
Train Frequency, No. of Train per day	425	9	425	9
Leq,24hr of the Track, dB(A)	33.5	24.8	32.7	24.0
Leq,24hr, dB(A)	36.7			
1/F, +	2.70			
Path Length Difference, m	0.116	0.116	0.239	0.239
Slant Distance, m	52.1	52.1	48.1	48.1
Distance Correction, dB(A)	-3.2	-3.2	-2.8	-2.8
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4
SEL of the Segment, dB(A)	58.3	66.3	56.8	64.8
SEL of Single PassBy, dB(A)	58.3	66.3	56.8	64.8
Leq,24hr of the Track, dB(A)	35.2	26.5	33.7	25.0
Leq,24hr, dB(A)	38.0			
2/F, +	5.40			
Path Length Difference, m	0.052	0.052	0.163	0.163
Slant Distance, m	52.2	52.2	48.3	48.3
Distance Correction, dB(A)	-3.2	-3.2	-2.9	-2.9
Screening Correction, dB(A)	-9.3	-9.3	-12.3	-12.3
SEL of the Segment, dB(A)	60.3	68.3	57.9	65.9
SEL of Single PassBy, dB(A)	60.3	68.3	57.9	65.9
Leq,24hr of the Track, dB(A)	37.2	28.5	34.8	26.1
Leq,24hr, dB(A)	39.7			

Figure F.37 Angle of View for Assessment Point H8P2 DT (2/F)

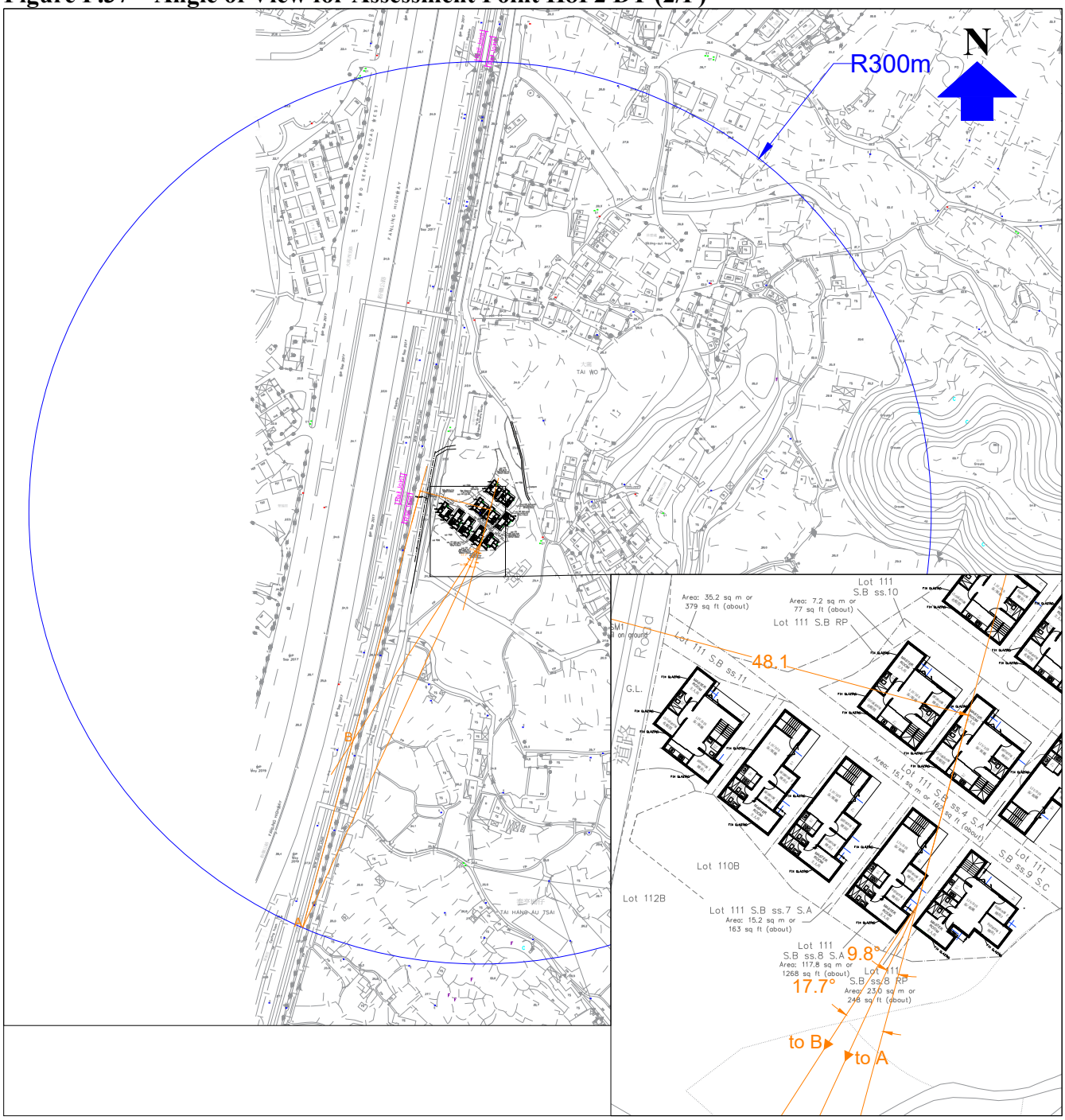


Figure F.38 Angle of View for Assessment Point H8P2 UT (2/F)

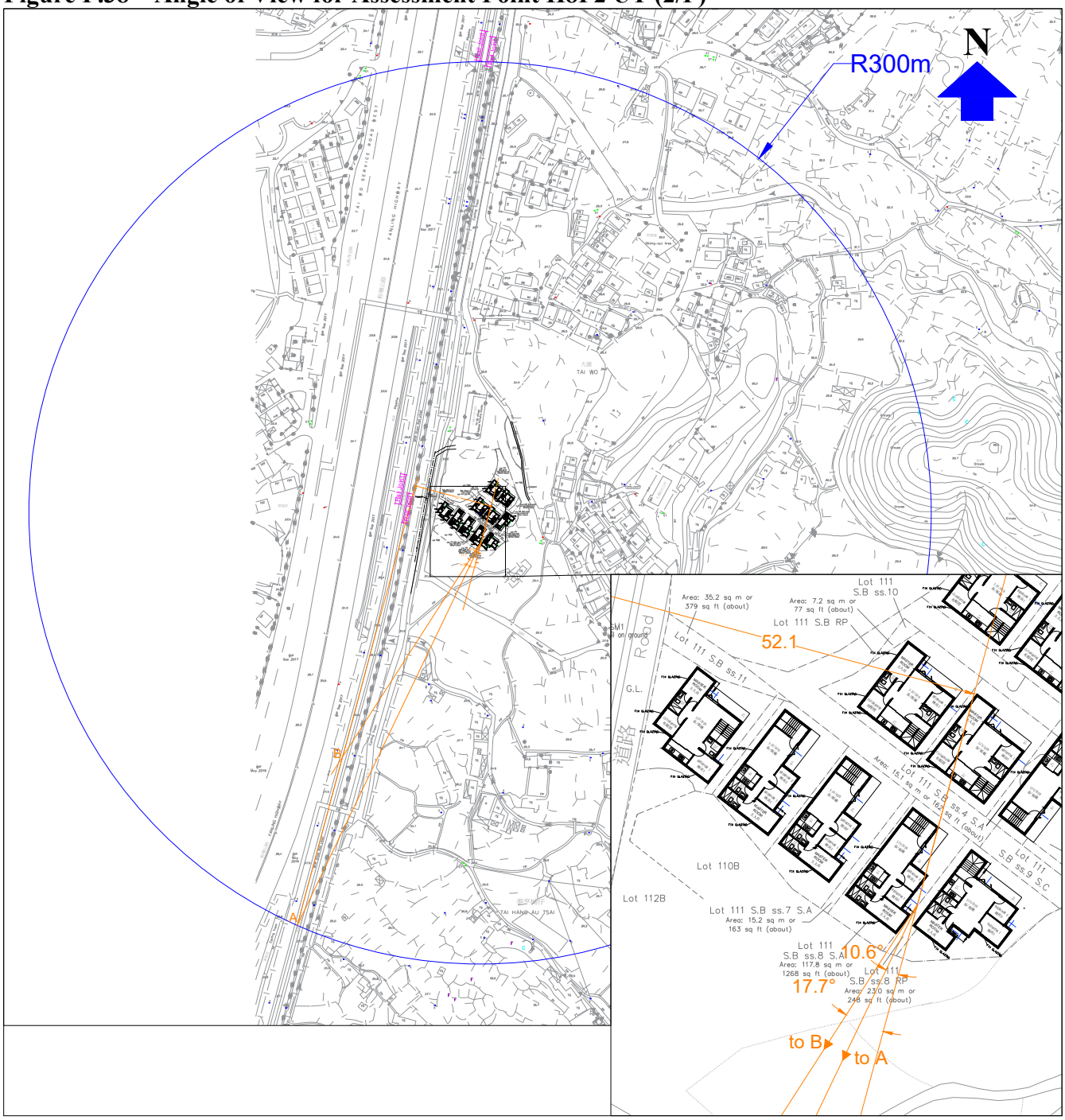


Table F.59 Air-borne Rail Noise Calculation for Assessment Point H8P3 (Daytime)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	10.6	10.6	9.8	9.8
Angle End	20.2	20.2	20.2	20.2
Speed, kph	120	120	120	120
Slant Distance, m	52.4	52.4	48.5	48.5
Angle of View, θ^o	9.6	9.6	10.4	10.4
Angle of Orientation of the Segment, α^o	15.4	15.4	15.0	15.0
Receiver to Source Distance, m	52.4	52.4	48.5	48.5
Path Length Difference, m	0.206	0.206	0.327	0.327
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.2	-3.2	-2.9	-2.9
Angle of View Correction, dB(A)	-21.1	-21.1	-21.0	-21.0
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.0	-13.0	-14.4	-14.4
SEL of the Segment, dB(A)	58.7	66.7	57.7	65.8
SEL of Single PassBy, dB(A)	58.7	66.7	57.7	65.8
Train Frequency, No. of Train per 30min	15	1	15	1
Leq,30min of the Track, dB(A)	37.9	34.2	36.9	33.2
Leq,30min, dB(A)	42.0			
1/F, +	2.70			
Path Length Difference, m	0.116	0.116	0.239	0.239
Slant Distance, m	52.4	52.4	48.5	48.5
Distance Correction, dB(A)	-3.2	-3.2	-2.9	-2.9
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4
SEL of the Segment, dB(A)	60.3	68.4	58.7	66.8
SEL of Single PassBy, dB(A)	60.3	68.4	58.7	66.8
Leq,30min of the Track, dB(A)	39.5	35.8	37.9	34.2
Leq,30min, dB(A)	43.3			
2/F, +	5.40			
Path Length Difference, m	0.052	0.052	0.164	0.164
Slant Distance, m	52.5	52.5	48.7	48.7
Distance Correction, dB(A)	-3.2	-3.2	-2.9	-2.9
Screening Correction, dB(A)	-9.3	-9.3	-12.3	-12.3
SEL of the Segment, dB(A)	62.3	70.4	59.8	67.9
SEL of Single PassBy, dB(A)	62.3	70.4	59.8	67.9
Leq,30min of the Track, dB(A)	41.5	37.8	39.0	35.3
Leq,30min, dB(A)	45.0			

Table F.60 Air-borne Rail Noise Calculation for Assessment Point H8P3 (Night-time)

Track	Northbound	Southbound
Segment	AB	AB
Train Type	EMU	EMU
Angle Start	10.6	9.8
Angle End	20.2	20.2
Speed, kph	120	120
Slant Distance, m	52.4	48.5
Angle of View, θ^o	9.6	10.4
Angle of Orientation of the Segment, α^o	15.4	15.0
Receiver to Source Distance, m	52.4	48.5
Path Length Difference, m	0.206	0.327
Wheel/Rail Noise Contribution		
Reference SEL (25m, 120kph), dB(A)	89.0	89.0
Speed Correction, dB(A)	0.0	0.0
Distance Correction, dB(A)	-3.2	-2.9
Angle of View Correction, dB(A)	-21.1	-21.0
Façade Correction, dB(A)	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0
Joint / Turnout Correction, dB(A)		
Opposite Barrier Correction, dB(A)	1.5	1.5
Screening Correction, dB(A)	-13.0	-14.4
SEL of the Segment, dB(A)	58.7	57.7
SEL of Single PassBy, dB(A)	58.7	57.7
Lmax of Single PassBy, dB(A)	49.3	48.4
Train Frequency, No. of Train per 30min	12	12
Leq,30min of the Track, dB(A)	36.9	36.0
Leq,30min, dB(A)	**39.5**	
1/F, +	**2.70**	
Path Length Difference, m	0.116	0.239
Slant Distance, m	52.4	48.5
Distance Correction, dB(A)	-3.2	-2.9
Screening Correction, dB(A)	-11.3	-13.4
SEL of the Segment, dB(A)	60.3	58.7
SEL of Single PassBy, dB(A)	60.3	58.7
Lmax of Single PassBy, dB(A)	50.9	49.3
Leq,30min of the Track, dB(A)	38.5	36.9
Leq,30min, dB(A)	**40.8**	
2/F, +	**5.40**	
Path Length Difference, m	0.052	0.164
Slant Distance, m	52.5	48.7
Distance Correction, dB(A)	-3.2	-2.9
Screening Correction, dB(A)	-9.3	-12.3
SEL of the Segment, dB(A)	62.3	59.8
SEL of Single PassBy, dB(A)	62.3	59.8
Lmax of Single PassBy, dB(A)	52.9	50.4
Leq,30min of the Track, dB(A)	40.5	38.0
Leq,30min, dB(A)	**42.5**	

Table F.61 Air-borne Rail Noise Calculation for Assessment Point H8P3 (Full Day)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	10.6	10.6	9.8	9.8
Angle End	20.2	20.2	20.2	20.2
Speed, kph	120	120	120	120
Slant Distance, m	52.4	52.4	48.5	48.5
Angle of View, θ^o	9.6	9.6	10.4	10.4
Angle of Orientation of the Segment, α^o	15.4	15.4	15.0	15.0
Receiver to Source Distance, m	52.4	52.4	48.5	48.5
Path Length Difference, m	0.206	0.206	0.327	0.327
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.2	-3.2	-2.9	-2.9
Angle of View Correction, dB(A)	-21.1	-21.1	-21.0	-21.0
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-13.0	-13.0	-14.4	-14.4
SEL of the Segment, dB(A)	58.7	66.7	57.7	65.8
SEL of Single PassBy, dB(A)	58.7	66.7	57.7	65.8
Train Frequency, No. of Train per day	425	9	425	9
Leq,24hr of the Track, dB(A)	35.6	26.9	34.6	26.0
Leq,24hr, dB(A)	38.7			
1/F, +	2.70			
Path Length Difference, m	0.116	0.116	0.239	0.239
Slant Distance, m	52.4	52.4	48.5	48.5
Distance Correction, dB(A)	-3.2	-3.2	-2.9	-2.9
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4
SEL of the Segment, dB(A)	60.3	68.4	58.7	66.8
SEL of Single PassBy, dB(A)	60.3	68.4	58.7	66.8
Leq,24hr of the Track, dB(A)	37.2	28.5	35.6	26.9
Leq,24hr, dB(A)	40.0			
2/F, +	5.40			
Path Length Difference, m	0.052	0.052	0.164	0.164
Slant Distance, m	52.5	52.5	48.7	48.7
Distance Correction, dB(A)	-3.2	-3.2	-2.9	-2.9
Screening Correction, dB(A)	-9.3	-9.3	-12.3	-12.3
SEL of the Segment, dB(A)	62.3	70.4	59.8	67.9
SEL of Single PassBy, dB(A)	62.3	70.4	59.8	67.9
Leq,24hr of the Track, dB(A)	39.2	30.5	36.7	28.0
Leq,24hr, dB(A)	41.7			

Figure F.39 Angle of View for Assessment Point H8P3 DT (2/F)

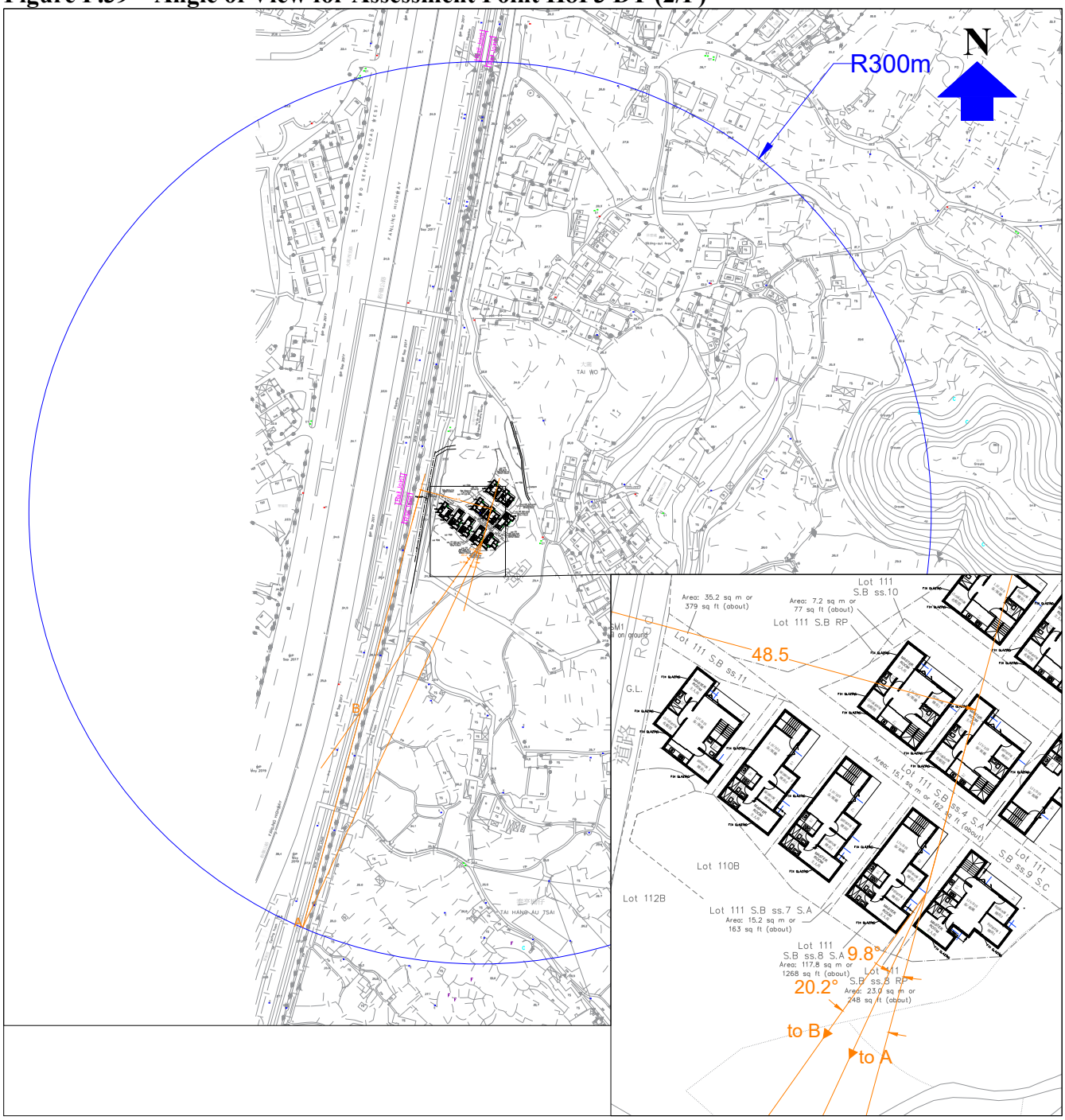


Figure F.40 Angle of View for Assessment Point H8P3 UT (2/F)

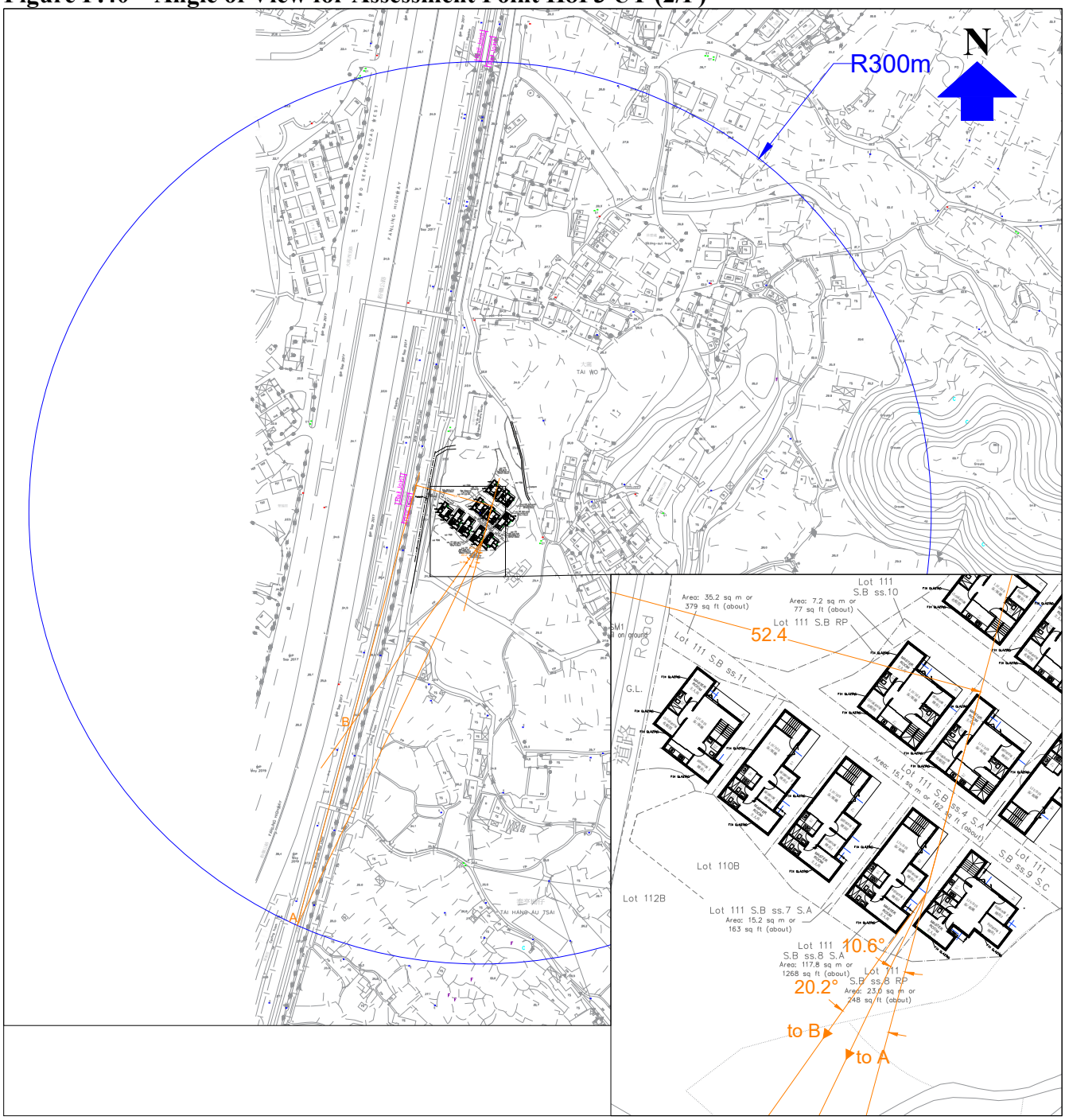


Table F.62 Air-borne Rail Noise Calculation for Assessment Point H9P1 (Daytime)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	155.3	155.3	155.3	168.4	155.3	168.4
Angle End	167.8	167.8	168.4	168.5	168.4	168.5
Speed, kph	120	120	120	120	120	120
Slant Distance, m	64.5	64.5	60.6	60.6	60.6	60.6
Angle of View, θ^o	12.5	12.5	13.1	0.1	13.1	0.1
Angle of Orientation of the Segment, α^o	18.5	18.5	18.2	11.6	18.2	11.6
Receiver to Source Distance, m	64.5	64.5	60.6	60.6	60.6	60.6
Path Length Difference, m	0.189	0.189	0.311	0.311	0.311	0.311
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.1	-4.1	-3.8	-3.8	-3.8	-3.8
Angle of View Correction, dB(A)	-18.5	-18.5	-18.4	-43.5	-18.4	-43.5
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.2	-14.2	-14.2
SEL of the Segment, dB(A)	60.7	68.8	59.5	41.4	67.6	49.4
SEL of Single PassBy, dB(A)	60.7	68.8	59.6		67.7	
Train Frequency, No. of Train per 30min	15	1	15		1	
Leq,30min of the Track, dB(A)	39.9	36.2	38.8		35.1	
Leq,30min, dB(A)	**43.9**					
1/F, +	**2.70**					
Path Length Difference, m	0.119	0.119	0.242	0.242	0.242	0.242
Slant Distance, m	64.5	64.5	60.6	60.6	60.6	60.6
Distance Correction, dB(A)	-4.1	-4.1	-3.8	-3.8	-3.8	-3.8
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	62.0	70.1	60.3	42.1	68.4	50.2
SEL of Single PassBy, dB(A)	62.0	70.1	60.4		68.4	
Leq,30min of the Track, dB(A)	41.2	37.5	39.6		35.9	
Leq,30min, dB(A)	**45.0**					
2/F, +	**5.40**					
Path Length Difference, m	0.065	0.065	0.181	0.181	0.181	0.181
Slant Distance, m	64.6	64.6	60.7	60.7	60.7	60.7
Distance Correction, dB(A)	-4.1	-4.1	-3.9	-3.9	-3.9	-3.9
Screening Correction, dB(A)	-9.8	-9.8	-12.6	-12.6	-12.6	-12.6
SEL of the Segment, dB(A)	63.6	71.6	61.2	43.0	69.2	51.1
SEL of Single PassBy, dB(A)	63.6	71.6	61.2		69.3	
Leq,30min of the Track, dB(A)	42.8	39.1	40.4		36.7	
Leq,30min, dB(A)	**46.3**					

Table F.63 Air-borne Rail Noise Calculation for Assessment Point H9P1 (Night-time)

Track	Northbound	Southbound	
Segment	CD	CD	DE
Train Type	EMU	EMU	
Angle Start	155.3	155.3	168.4
Angle End	167.8	168.4	168.5
Speed, kph	120	120	120
Slant Distance, m	64.5	60.6	60.6
Angle of View, θ^o	12.5	13.1	0.1
Angle of Orientation of the Segment, α^o	18.5	18.2	11.6
Receiver to Source Distance, m	64.5	60.6	60.6
Path Length Difference, m	0.189	0.311	0.311
Wheel/Rail Noise Contribution			
Reference SEL (25m, 120kph), dB(A)	89.0	89.0	89.0
Speed Correction, dB(A)	0.0	0.0	0.0
Distance Correction, dB(A)	-4.1	-3.8	-3.8
Angle of View Correction, dB(A)	-18.5	-18.4	-43.5
Façade Correction, dB(A)	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)			7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-14.2	-14.2
SEL of the Segment, dB(A)	60.7	59.5	41.4
SEL of Single PassBy, dB(A)	60.7	59.6	
Lmax of Single PassBy, dB(A)	51.3	50.2	
Train Frequency, No. of Train per 30min	12	12	
Leq,30min of the Track, dB(A)	38.9	37.8	
Leq,30min, dB(A)	**41.4**		
1/F, +	**2.70**		
Path Length Difference, m	0.119	0.242	0.242
Slant Distance, m	64.5	60.6	60.6
Distance Correction, dB(A)	-4.1	-3.8	-3.8
Screening Correction, dB(A)	-11.4	-13.4	-13.4
SEL of the Segment, dB(A)	62.0	60.3	42.1
SEL of Single PassBy, dB(A)	62.0	60.4	
Lmax of Single PassBy, dB(A)	52.6	51.0	
Leq,30min of the Track, dB(A)	40.3	38.6	
Leq,30min, dB(A)	**42.5**		
2/F, +	**5.40**		
Path Length Difference, m	0.065	0.181	0.181
Slant Distance, m	64.6	60.7	60.7
Distance Correction, dB(A)	-4.1	-3.9	-3.9
Screening Correction, dB(A)	-9.8	-12.6	-12.6
SEL of the Segment, dB(A)	63.6	61.2	43.0
SEL of Single PassBy, dB(A)	63.6	61.2	
Lmax of Single PassBy, dB(A)	54.2	51.8	
Leq,30min of the Track, dB(A)	41.8	39.5	
Leq,30min, dB(A)	**43.8**		

Table F.64 Air-borne Rail Noise Calculation for Assessment Point H9P1 (Full Day)

Track	Northbound		Southbound			
Segment	CD		CD	DE	CD	DE
Train Type	EMU	ITT	EMU		ITT	
Angle Start	155.3	155.3	155.3	168.4	155.3	168.4
Angle End	167.8	167.8	168.4	168.5	168.4	168.5
Speed, kph	120	120	120	120	120	120
Slant Distance, m	64.5	64.5	60.6	60.6	60.6	60.6
Angle of View, θ^o	12.5	12.5	13.1	0.1	13.1	0.1
Angle of Orientation of the Segment, α^o	18.5	18.5	18.2	11.6	18.2	11.6
Receiver to Source Distance, m	64.5	64.5	60.6	60.6	60.6	60.6
Path Length Difference, m	0.189	0.189	0.311	0.311	0.311	0.311
Wheel/Rail Noise Contribution						
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	89.0	97.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.1	-4.1	-3.8	-3.8	-3.8	-3.8
Angle of View Correction, dB(A)	-18.5	-18.5	-18.4	-43.5	-18.4	-43.5
Façade Correction, dB(A)	2.5	2.5	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				7.0		7.0
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.2	-14.2	-14.2
SEL of the Segment, dB(A)	60.7	68.8	59.5	41.4	67.6	49.4
SEL of Single PassBy, dB(A)	60.7	68.8	59.6		67.7	
Train Frequency, No. of Train per day	425	9	425		9	
Leq,24hr of the Track, dB(A)	37.6	28.9	36.5		27.8	
Leq,24hr, dB(A)	**40.7**					
1/F, +	**2.70**					
Path Length Difference, m	0.119	0.119	0.242	0.242	0.242	0.242
Slant Distance, m	64.5	64.5	60.6	60.6	60.6	60.6
Distance Correction, dB(A)	-4.1	-4.1	-3.8	-3.8	-3.8	-3.8
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4	-13.4	-13.4
SEL of the Segment, dB(A)	62.0	70.1	60.3	42.1	68.4	50.2
SEL of Single PassBy, dB(A)	62.0	70.1	60.4		68.4	
Leq,24hr of the Track, dB(A)	38.9	30.3	37.3		28.6	
Leq,24hr, dB(A)	**41.8**					
2/F, +	**5.40**					
Path Length Difference, m	0.065	0.065	0.181	0.181	0.181	0.181
Slant Distance, m	64.6	64.6	60.7	60.7	60.7	60.7
Distance Correction, dB(A)	-4.1	-4.1	-3.9	-3.9	-3.9	-3.9
Screening Correction, dB(A)	-9.8	-9.8	-12.6	-12.6	-12.6	-12.6
SEL of the Segment, dB(A)	63.6	71.6	61.2	43.0	69.2	51.1
SEL of Single PassBy, dB(A)	63.6	71.6	61.2		69.3	
Leq,24hr of the Track, dB(A)	40.5	31.8	38.1		29.5	
Leq,24hr, dB(A)	**43.0**					

Figure F.41 Angle of View for Assessment Point H9P1 DT (2/F)

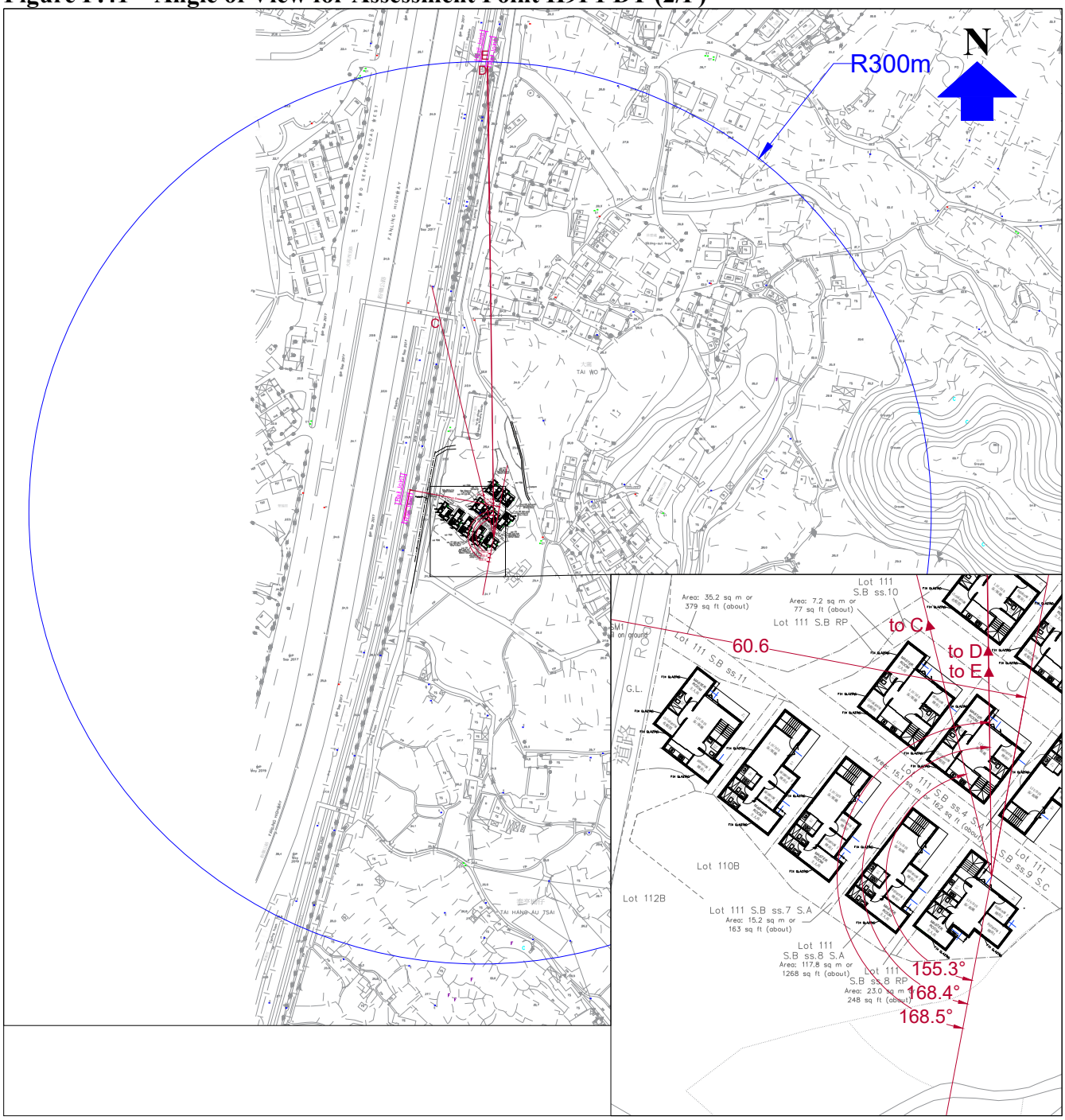


Figure F.42 Angle of View for Assessment Point H9P1 UT (2/F)

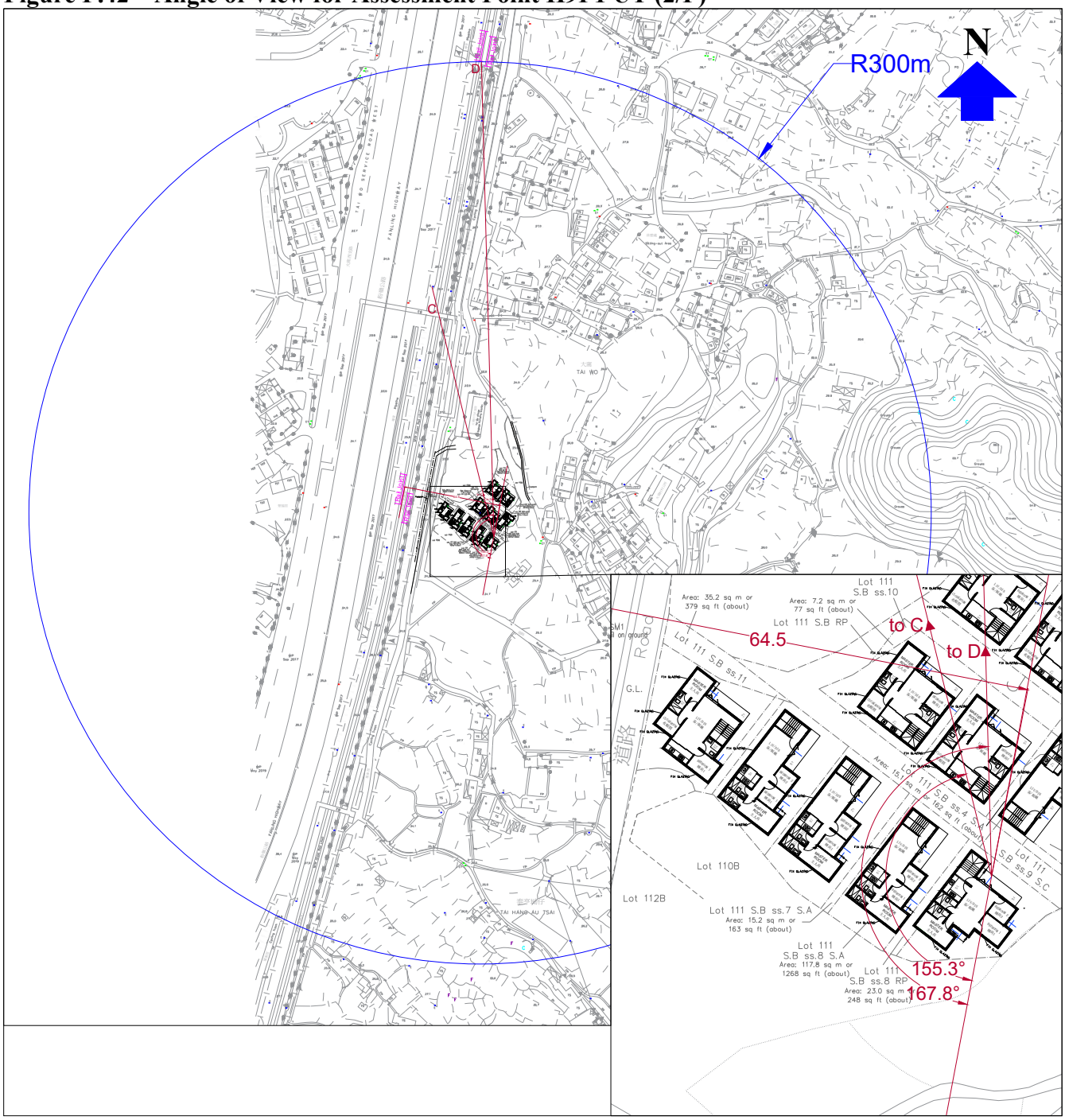


Table F.65 Air-borne Rail Noise Calculation for Assessment Point H9P2 (Daytime)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	12.7	12.7	11.9	11.9
Angle End	24.3	24.3	24.3	24.3
Speed, kph	120	120	120	120
Slant Distance, m	63.0	63.0	59.1	59.1
Angle of View, θ^o	11.6	11.6	12.4	12.4
Angle of Orientation of the Segment, α^o	18.5	18.5	18.1	18.1
Receiver to Source Distance, m	63.0	63.0	59.1	59.1
Path Length Difference, m	0.190	0.190	0.313	0.313
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.0	-4.0	-3.7	-3.7
Angle of View Correction, dB(A)	-18.8	-18.8	-18.7	-18.7
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.2
SEL of the Segment, dB(A)	60.4	68.5	59.3	67.4
SEL of Single PassBy, dB(A)	60.4	68.5	59.3	67.4
Train Frequency, No. of Train per 30min	15	1	15	1
Leq,30min of the Track, dB(A)	39.7	36.0	38.6	34.9
Leq,30min, dB(A)	43.7			
1/F, +	2.70			
Path Length Difference, m	0.119	0.119	0.241	0.241
Slant Distance, m	63.0	63.0	59.1	59.1
Distance Correction, dB(A)	-4.0	-4.0	-3.7	-3.7
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4
SEL of the Segment, dB(A)	61.8	69.9	60.1	68.2
SEL of Single PassBy, dB(A)	61.8	69.9	60.1	68.2
Leq,30min of the Track, dB(A)	41.0	37.3	39.3	35.7
Leq,30min, dB(A)	44.8			
2/F, +	5.40			
Path Length Difference, m	0.064	0.064	0.179	0.179
Slant Distance, m	63.1	63.1	59.2	59.2
Distance Correction, dB(A)	-4.0	-4.0	-3.7	-3.7
Screening Correction, dB(A)	-9.7	-9.7	-12.5	-12.5
SEL of the Segment, dB(A)	63.4	71.5	61.0	69.1
SEL of Single PassBy, dB(A)	63.4	71.5	61.0	69.1
Leq,30min of the Track, dB(A)	42.6	38.9	40.2	36.5
Leq,30min, dB(A)	46.1			

Table F.66 Air-borne Rail Noise Calculation for Assessment Point H9P2 (Night-time)

Track	Northbound	Southbound
Segment	AB	AB
Train Type	EMU	EMU
Angle Start	12.7	11.9
Angle End	24.3	24.3
Speed, kph	120	120
Slant Distance, m	63.0	59.1
Angle of View, θ^o	11.6	12.4
Angle of Orientation of the Segment, α^o	18.5	18.1
Receiver to Source Distance, m	63.0	59.1
Path Length Difference, m	0.190	0.313
Wheel/Rail Noise Contribution		
Reference SEL (25m, 120kph), dB(A)	89.0	89.0
Speed Correction, dB(A)	0.0	0.0
Distance Correction, dB(A)	-4.0	-3.7
Angle of View Correction, dB(A)	-18.8	-18.7
Façade Correction, dB(A)	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0
Joint / Turnout Correction, dB(A)		
Opposite Barrier Correction, dB(A)	1.5	1.5
Screening Correction, dB(A)	-12.7	-14.2
SEL of the Segment, dB(A)	60.4	59.3
SEL of Single PassBy, dB(A)	60.4	59.3
Lmax of Single PassBy, dB(A)	51.0	49.9
Train Frequency, No. of Train per 30min	12	12
Leq,30min of the Track, dB(A)	38.7	37.6
Leq,30min, dB(A)	**41.2**	
1/F, +	**2.70**	
Path Length Difference, m	0.119	0.241
Slant Distance, m	63.0	59.1
Distance Correction, dB(A)	-4.0	-3.7
Screening Correction, dB(A)	-11.4	-13.4
SEL of the Segment, dB(A)	61.8	60.1
SEL of Single PassBy, dB(A)	61.8	60.1
Lmax of Single PassBy, dB(A)	52.4	50.7
Leq,30min of the Track, dB(A)	40.0	38.4
Leq,30min, dB(A)	**42.3**	
2/F, +	**5.40**	
Path Length Difference, m	0.064	0.179
Slant Distance, m	63.1	59.2
Distance Correction, dB(A)	-4.0	-3.7
Screening Correction, dB(A)	-9.7	-12.5
SEL of the Segment, dB(A)	63.4	61.0
SEL of Single PassBy, dB(A)	63.4	61.0
Lmax of Single PassBy, dB(A)	54.0	51.6
Leq,30min of the Track, dB(A)	41.7	39.3
Leq,30min, dB(A)	**43.6**	

Table F.67 Air-borne Rail Noise Calculation for Assessment Point H9P2 (Full Day)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	12.7	12.7	11.9	11.9
Angle End	24.3	24.3	24.3	24.3
Speed, kph	120	120	120	120
Slant Distance, m	63.0	63.0	59.1	59.1
Angle of View, θ^o	11.6	11.6	12.4	12.4
Angle of Orientation of the Segment, α^o	18.5	18.5	18.1	18.1
Receiver to Source Distance, m	63.0	63.0	59.1	59.1
Path Length Difference, m	0.190	0.190	0.313	0.313
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.0	-4.0	-3.7	-3.7
Angle of View Correction, dB(A)	-18.8	-18.8	-18.7	-18.7
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.2
SEL of the Segment, dB(A)	60.4	68.5	59.3	67.4
SEL of Single PassBy, dB(A)	60.4	68.5	59.3	67.4
Train Frequency, No. of Train per day	425	9	425	9
Leq,24hr of the Track, dB(A)	37.4	28.7	36.3	27.6
Leq,24hr, dB(A)	40.4			
1/F, +	2.70			
Path Length Difference, m	0.119	0.119	0.241	0.241
Slant Distance, m	63.0	63.0	59.1	59.1
Distance Correction, dB(A)	-4.0	-4.0	-3.7	-3.7
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4
SEL of the Segment, dB(A)	61.8	69.9	60.1	68.2
SEL of Single PassBy, dB(A)	61.8	69.9	60.1	68.2
Leq,24hr of the Track, dB(A)	38.7	30.0	37.1	28.4
Leq,24hr, dB(A)	41.5			
2/F, +	5.40			
Path Length Difference, m	0.064	0.064	0.179	0.179
Slant Distance, m	63.1	63.1	59.2	59.2
Distance Correction, dB(A)	-4.0	-4.0	-3.7	-3.7
Screening Correction, dB(A)	-9.7	-9.7	-12.5	-12.5
SEL of the Segment, dB(A)	63.4	71.5	61.0	69.1
SEL of Single PassBy, dB(A)	63.4	71.5	61.0	69.1
Leq,24hr of the Track, dB(A)	40.3	31.7	37.9	29.3
Leq,24hr, dB(A)	42.9			

Figure F.43 Angle of View for Assessment Point H9P2 DT (2/F)

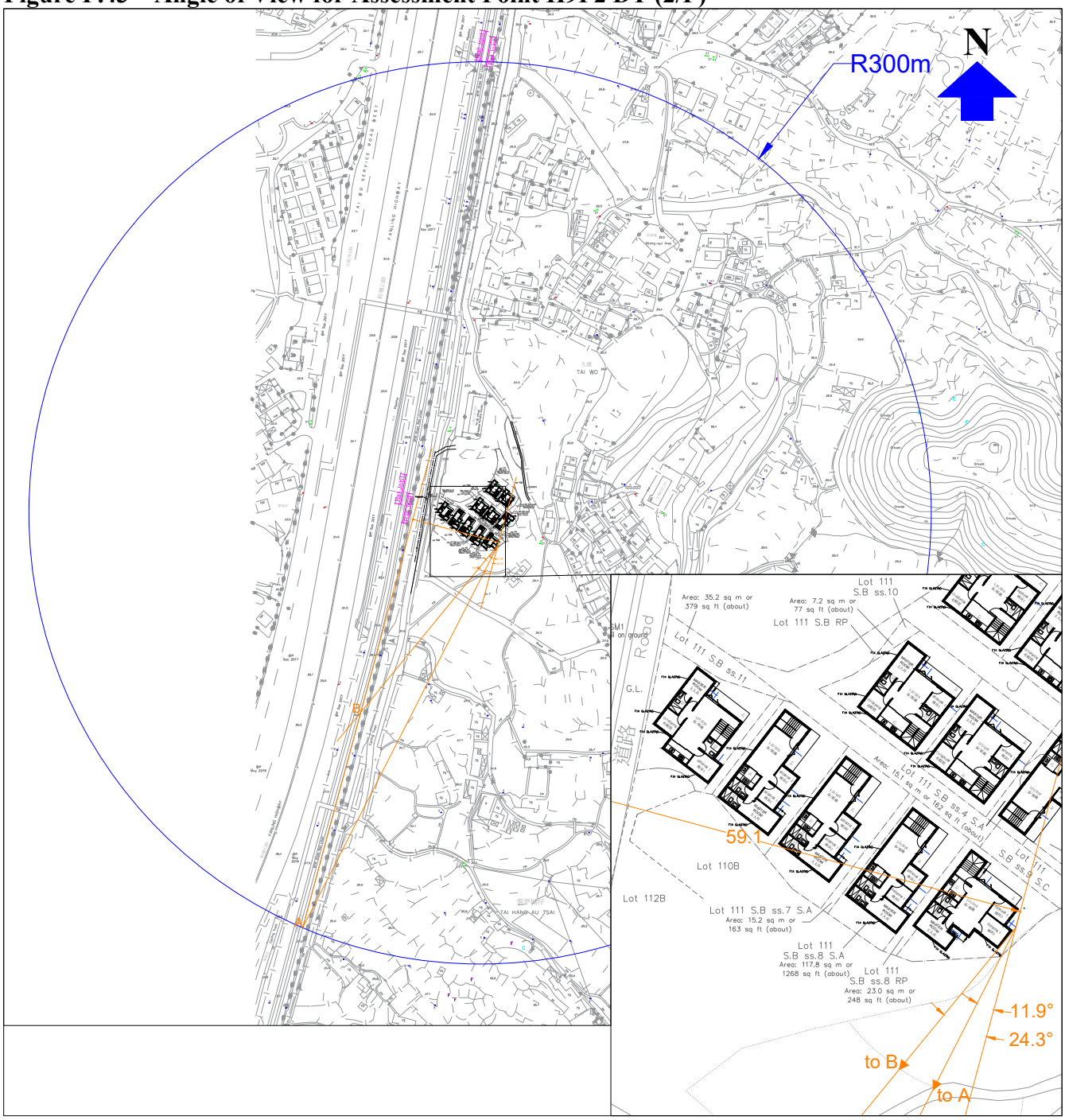


Figure F.44 Angle of View for Assessment Point H9P2 UT (2/F)

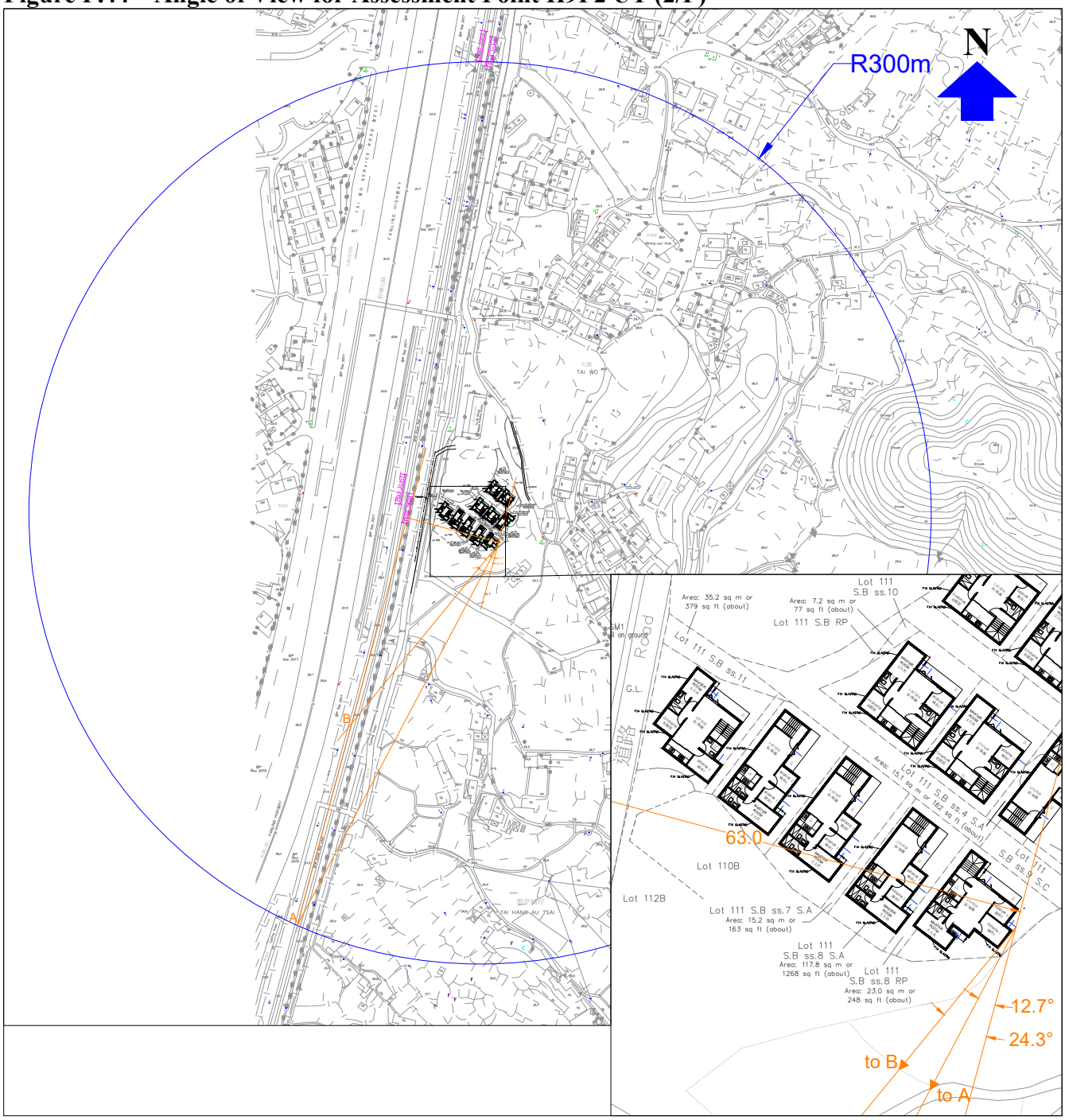


Table F.68 Air-borne Rail Noise Calculation for Assessment Point H9P3 (Daytime)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	11.7	11.7	10.9	10.9
Angle End	28.5	28.5	28.5	28.5
Speed, kph	120	120	120	120
Slant Distance, m	57.1	57.1	53.2	53.2
Angle of View, θ^o	16.8	16.8	17.6	17.6
Angle of Orientation of the Segment, α^o	20.1	20.1	19.7	19.7
Receiver to Source Distance, m	57.1	57.1	53.2	53.2
Path Length Difference, m	0.198	0.198	0.320	0.320
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.6	-3.6	-3.3	-3.3
Angle of View Correction, dB(A)	-16.4	-16.4	-16.3	-16.3
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-12.8	-14.3	-14.3
SEL of the Segment, dB(A)	63.1	71.2	62.0	70.1
SEL of Single PassBy, dB(A)	63.1	71.2	62.0	70.1
Train Frequency, No. of Train per 30min	15	1	15	1
Leq,30min of the Track, dB(A)	42.3	38.6	41.3	37.6
Leq,30min, dB(A)	46.4			
1/F, +	2.70			
Path Length Difference, m	0.117	0.117	0.240	0.240
Slant Distance, m	57.1	57.1	53.2	53.2
Distance Correction, dB(A)	-3.6	-3.6	-3.3	-3.3
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4
SEL of the Segment, dB(A)	64.6	72.7	62.9	71.0
SEL of Single PassBy, dB(A)	64.6	72.7	62.9	71.0
Leq,30min of the Track, dB(A)	43.9	40.2	42.1	38.4
Leq,30min, dB(A)	47.6			
2/F, +	5.40			
Path Length Difference, m	0.058	0.058	0.171	0.171
Slant Distance, m	57.2	57.2	53.3	53.3
Distance Correction, dB(A)	-3.6	-3.6	-3.3	-3.3
Screening Correction, dB(A)	-9.5	-9.5	-12.4	-12.4
SEL of the Segment, dB(A)	66.5	74.5	63.9	72.0
SEL of Single PassBy, dB(A)	66.5	74.5	63.9	72.0
Leq,30min of the Track, dB(A)	45.7	42.0	43.1	39.4
Leq,30min, dB(A)	49.1			

Table F.69 Air-borne Rail Noise Calculation for Assessment Point H9P3 (Night-time)

Track	Northbound	Southbound
Segment	AB	AB
Train Type	EMU	EMU
Angle Start	11.7	10.9
Angle End	28.5	28.5
Speed, kph	120	120
Slant Distance, m	57.1	53.2
Angle of View, θ^o	16.8	17.6
Angle of Orientation of the Segment, α^o	20.1	19.7
Receiver to Source Distance, m	57.1	53.2
Path Length Difference, m	0.198	0.320
Wheel/Rail Noise Contribution		
Reference SEL (25m, 120kph), dB(A)	89.0	89.0
Speed Correction, dB(A)	0.0	0.0
Distance Correction, dB(A)	-3.6	-3.3
Angle of View Correction, dB(A)	-16.4	-16.3
Façade Correction, dB(A)	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0
Joint / Turnout Correction, dB(A)		
Opposite Barrier Correction, dB(A)	1.5	1.5
Screening Correction, dB(A)	-12.8	-14.3
SEL of the Segment, dB(A)	63.1	62.0
SEL of Single PassBy, dB(A)	63.1	62.0
Lmax of Single PassBy, dB(A)	53.8	52.7
Train Frequency, No. of Train per 30min	12	12
Leq,30min of the Track, dB(A)	41.4	40.3
Leq,30min, dB(A)	**43.9**	
1/F, +	**2.70**	
Path Length Difference, m	0.117	0.240
Slant Distance, m	57.1	53.2
Distance Correction, dB(A)	-3.6	-3.3
Screening Correction, dB(A)	-11.3	-13.4
SEL of the Segment, dB(A)	64.6	62.9
SEL of Single PassBy, dB(A)	64.6	62.9
Lmax of Single PassBy, dB(A)	55.3	53.6
Leq,30min of the Track, dB(A)	42.9	41.2
Leq,30min, dB(A)	**45.1**	
2/F, +	**5.40**	
Path Length Difference, m	0.058	0.171
Slant Distance, m	57.2	53.3
Distance Correction, dB(A)	-3.6	-3.3
Screening Correction, dB(A)	-9.5	-12.4
SEL of the Segment, dB(A)	66.5	63.9
SEL of Single PassBy, dB(A)	66.5	63.9
Lmax of Single PassBy, dB(A)	57.1	54.6
Leq,30min of the Track, dB(A)	44.7	42.2
Leq,30min, dB(A)	**46.6**	

Table F.70 Air-borne Rail Noise Calculation for Assessment Point H9P3 (Full Day)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	11.7	11.7	10.9	10.9
Angle End	28.5	28.5	28.5	28.5
Speed, kph	120	120	120	120
Slant Distance, m	57.1	57.1	53.2	53.2
Angle of View, θ^o	16.8	16.8	17.6	17.6
Angle of Orientation of the Segment, α^o	20.1	20.1	19.7	19.7
Receiver to Source Distance, m	57.1	57.1	53.2	53.2
Path Length Difference, m	0.198	0.198	0.320	0.320
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.6	-3.6	-3.3	-3.3
Angle of View Correction, dB(A)	-16.4	-16.4	-16.3	-16.3
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-12.8	-14.3	-14.3
SEL of the Segment, dB(A)	63.1	71.2	62.0	70.1
SEL of Single PassBy, dB(A)	63.1	71.2	62.0	70.1
Train Frequency, No. of Train per day	425	9	425	9
Leq,24hr of the Track, dB(A)	40.1	31.4	39.0	30.3
Leq,24hr, dB(A)	43.1			
1/F, +	2.70			
Path Length Difference, m	0.117	0.117	0.240	0.240
Slant Distance, m	57.1	57.1	53.2	53.2
Distance Correction, dB(A)	-3.6	-3.6	-3.3	-3.3
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4
SEL of the Segment, dB(A)	64.6	72.7	62.9	71.0
SEL of Single PassBy, dB(A)	64.6	72.7	62.9	71.0
Leq,24hr of the Track, dB(A)	41.6	32.9	39.8	31.2
Leq,24hr, dB(A)	44.4			
2/F, +	5.40			
Path Length Difference, m	0.058	0.058	0.171	0.171
Slant Distance, m	57.2	57.2	53.3	53.3
Distance Correction, dB(A)	-3.6	-3.6	-3.3	-3.3
Screening Correction, dB(A)	-9.5	-9.5	-12.4	-12.4
SEL of the Segment, dB(A)	66.5	74.5	63.9	72.0
SEL of Single PassBy, dB(A)	66.5	74.5	63.9	72.0
Leq,24hr of the Track, dB(A)	43.4	34.7	40.8	32.2
Leq,24hr, dB(A)	45.8			

Figure F.45 Angle of View for Assessment Point H9P3 DT (2/F)

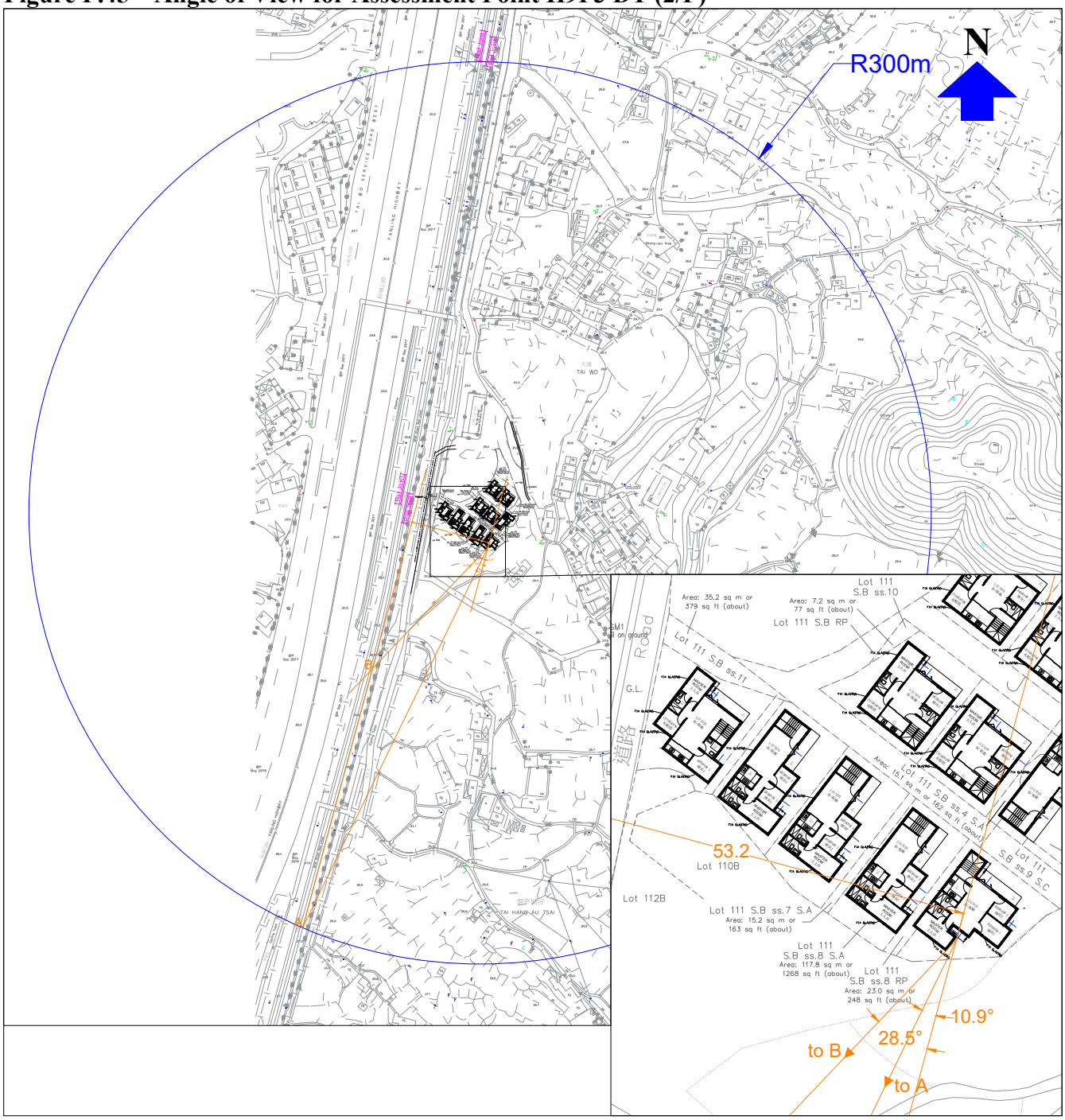


Figure F.46 Angle of View for Assessment Point H9P3 UT (2/F)

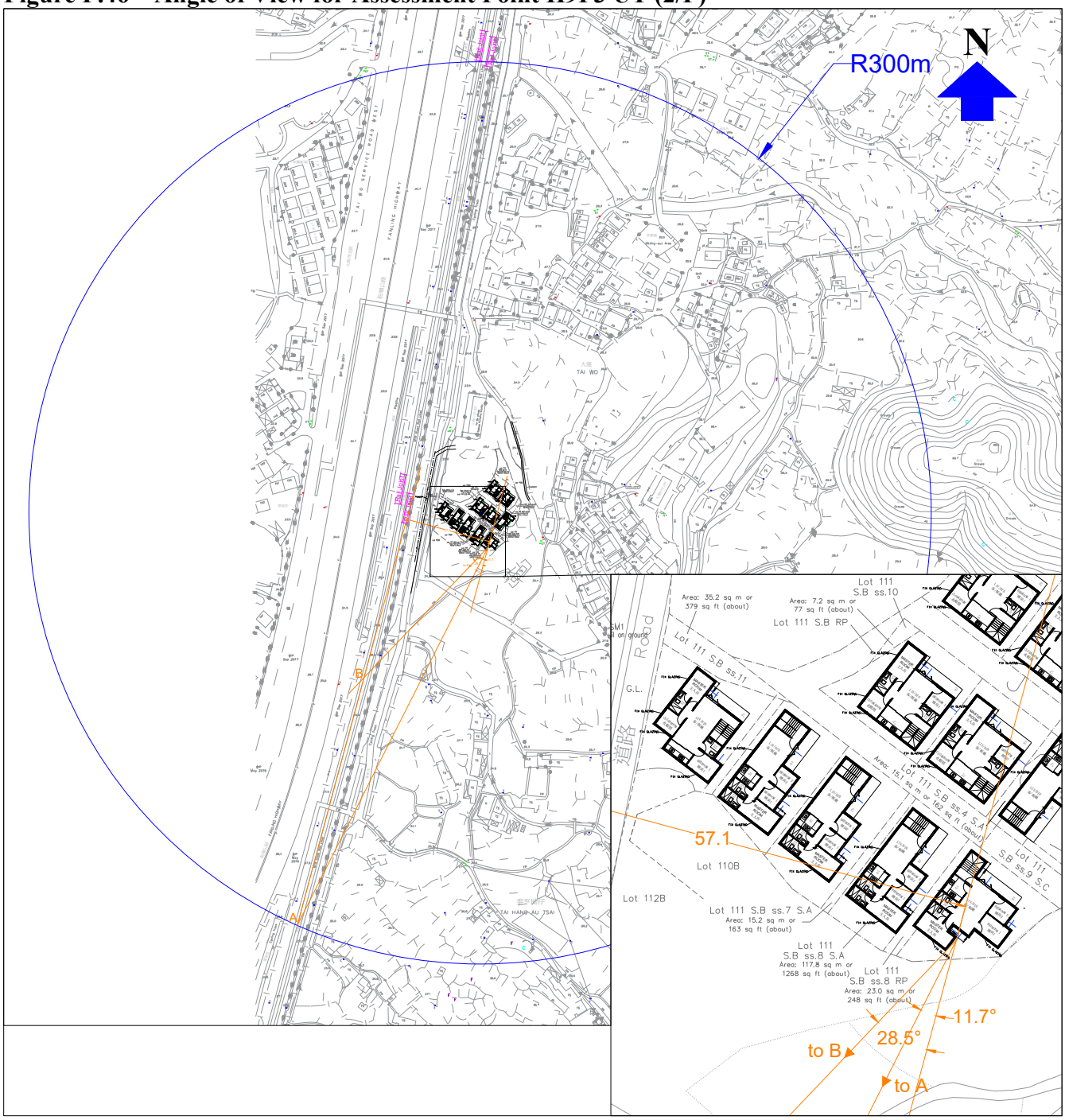


Table F.71 Air-borne Rail Noise Calculation for Assessment Point H9P4 (Daytime)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	11.7	11.7	10.9	10.9
Angle End	22.5	22.5	22.5	22.5
Speed, kph	120	120	120	120
Slant Distance, m	57.1	57.1	53.2	53.2
Angle of View, θ^o	10.8	10.8	11.6	11.6
Angle of Orientation of the Segment, α^o	17.1	17.1	16.7	16.7
Receiver to Source Distance, m	57.1	57.1	53.2	53.2
Path Length Difference, m	0.198	0.198	0.320	0.320
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.6	-3.6	-3.3	-3.3
Angle of View Correction, dB(A)	-19.7	-19.7	-19.6	-19.6
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-12.8	-14.3	-14.3
SEL of the Segment, dB(A)	59.8	67.9	58.8	66.8
SEL of Single PassBy, dB(A)	59.8	67.9	58.8	66.8
Train Frequency, No. of Train per 30min	15	1	15	1
Leq,30min of the Track, dB(A)	39.0	35.3	38.0	34.3
Leq,30min, dB(A)	43.1			
1/F, +	2.70			
Path Length Difference, m	0.117	0.117	0.240	0.240
Slant Distance, m	57.1	57.1	53.2	53.2
Distance Correction, dB(A)	-3.6	-3.6	-3.3	-3.3
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4
SEL of the Segment, dB(A)	61.3	69.4	59.7	67.7
SEL of Single PassBy, dB(A)	61.3	69.4	59.7	67.7
Leq,30min of the Track, dB(A)	40.5	36.8	38.9	35.2
Leq,30min, dB(A)	44.3			
2/F, +	5.40			
Path Length Difference, m	0.058	0.058	0.171	0.171
Slant Distance, m	57.2	57.2	53.3	53.3
Distance Correction, dB(A)	-3.6	-3.6	-3.3	-3.3
Screening Correction, dB(A)	-9.5	-9.5	-12.4	-12.4
SEL of the Segment, dB(A)	63.1	71.2	60.6	68.7
SEL of Single PassBy, dB(A)	63.1	71.2	60.6	68.7
Leq,30min of the Track, dB(A)	42.3	38.6	39.9	36.2
Leq,30min, dB(A)	45.8			

Table F.72 Air-borne Rail Noise Calculation for Assessment Point H9P4 (Night-time)

Track	Northbound	Southbound
Segment	AB	AB
Train Type	EMU	EMU
Angle Start	11.7	10.9
Angle End	22.5	22.5
Speed, kph	120	120
Slant Distance, m	57.1	53.2
Angle of View, θ^o	10.8	11.6
Angle of Orientation of the Segment, α^o	17.1	16.7
Receiver to Source Distance, m	57.1	53.2
Path Length Difference, m	0.198	0.320
Wheel/Rail Noise Contribution		
Reference SEL (25m, 120kph), dB(A)	89.0	89.0
Speed Correction, dB(A)	0.0	0.0
Distance Correction, dB(A)	-3.6	-3.3
Angle of View Correction, dB(A)	-19.7	-19.6
Façade Correction, dB(A)	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0
Joint / Turnout Correction, dB(A)		
Opposite Barrier Correction, dB(A)	1.5	1.5
Screening Correction, dB(A)	-12.8	-14.3
SEL of the Segment, dB(A)	59.8	58.8
SEL of Single PassBy, dB(A)	59.8	58.8
Lmax of Single PassBy, dB(A)	50.4	49.4
Train Frequency, No. of Train per 30min	12	12
Leq,30min of the Track, dB(A)	38.0	37.0
Leq,30min, dB(A)	**40.6**	
1/F, +	**2.70**	
Path Length Difference, m	0.117	0.240
Slant Distance, m	57.1	53.2
Distance Correction, dB(A)	-3.6	-3.3
Screening Correction, dB(A)	-11.3	-13.4
SEL of the Segment, dB(A)	61.3	59.7
SEL of Single PassBy, dB(A)	61.3	59.7
Lmax of Single PassBy, dB(A)	51.9	50.3
Leq,30min of the Track, dB(A)	39.5	37.9
Leq,30min, dB(A)	**41.8**	
2/F, +	**5.40**	
Path Length Difference, m	0.058	0.171
Slant Distance, m	57.2	53.3
Distance Correction, dB(A)	-3.6	-3.3
Screening Correction, dB(A)	-9.5	-12.4
SEL of the Segment, dB(A)	63.1	60.6
SEL of Single PassBy, dB(A)	63.1	60.6
Lmax of Single PassBy, dB(A)	53.7	51.3
Leq,30min of the Track, dB(A)	41.3	38.9
Leq,30min, dB(A)	**43.3**	

Table F.73 Air-borne Rail Noise Calculation for Assessment Point H9P4 (Full Day)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	11.7	11.7	10.9	10.9
Angle End	22.5	22.5	22.5	22.5
Speed, kph	120	120	120	120
Slant Distance, m	57.1	57.1	53.2	53.2
Angle of View, θ^o	10.8	10.8	11.6	11.6
Angle of Orientation of the Segment, α^o	17.1	17.1	16.7	16.7
Receiver to Source Distance, m	57.1	57.1	53.2	53.2
Path Length Difference, m	0.198	0.198	0.320	0.320
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-3.6	-3.6	-3.3	-3.3
Angle of View Correction, dB(A)	-19.7	-19.7	-19.6	-19.6
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.8	-12.8	-14.3	-14.3
SEL of the Segment, dB(A)	59.8	67.9	58.8	66.8
SEL of Single PassBy, dB(A)	59.8	67.9	58.8	66.8
Train Frequency, No. of Train per day	425	9	425	9
Leq,24hr of the Track, dB(A)	36.7	28.0	35.7	27.0
Leq,24hr, dB(A)	**39.8**			
1/F, +	**2.70**			
Path Length Difference, m	0.117	0.117	0.240	0.240
Slant Distance, m	57.1	57.1	53.2	53.2
Distance Correction, dB(A)	-3.6	-3.6	-3.3	-3.3
Screening Correction, dB(A)	-11.3	-11.3	-13.4	-13.4
SEL of the Segment, dB(A)	61.3	69.4	59.7	67.7
SEL of Single PassBy, dB(A)	61.3	69.4	59.7	67.7
Leq,24hr of the Track, dB(A)	38.2	29.5	36.6	27.9
Leq,24hr, dB(A)	**41.0**			
2/F, +	**5.40**			
Path Length Difference, m	0.058	0.058	0.171	0.171
Slant Distance, m	57.2	57.2	53.3	53.3
Distance Correction, dB(A)	-3.6	-3.6	-3.3	-3.3
Screening Correction, dB(A)	-9.5	-9.5	-12.4	-12.4
SEL of the Segment, dB(A)	63.1	71.2	60.6	68.7
SEL of Single PassBy, dB(A)	63.1	71.2	60.6	68.7
Leq,24hr of the Track, dB(A)	40.0	31.3	37.6	28.9
Leq,24hr, dB(A)	**42.5**			

Figure F.47 Angle of View for Assessment Point H9P4 DT (2/F)

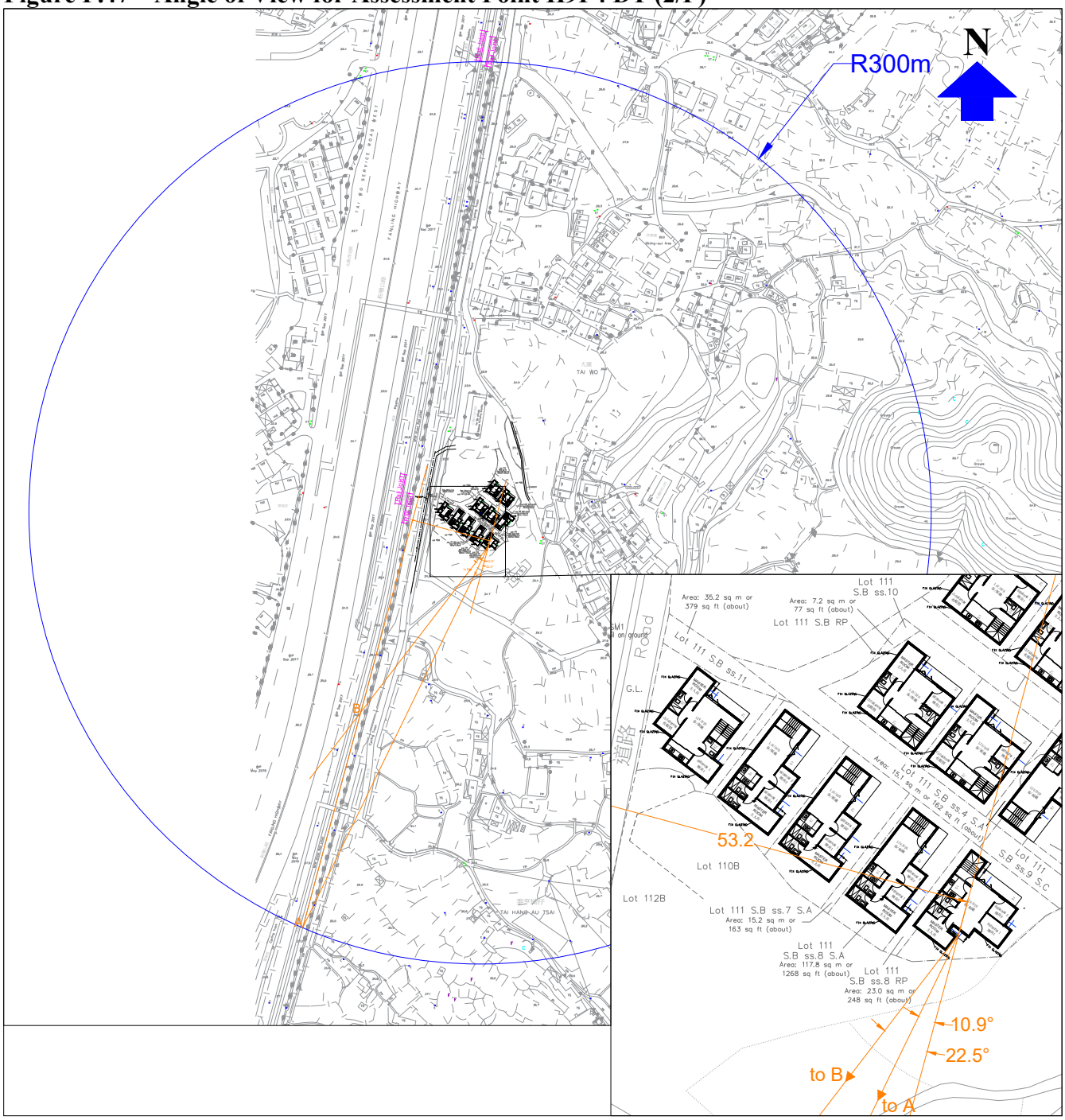


Figure F.48 Angle of View for Assessment Point H9P4 UT (2/F)

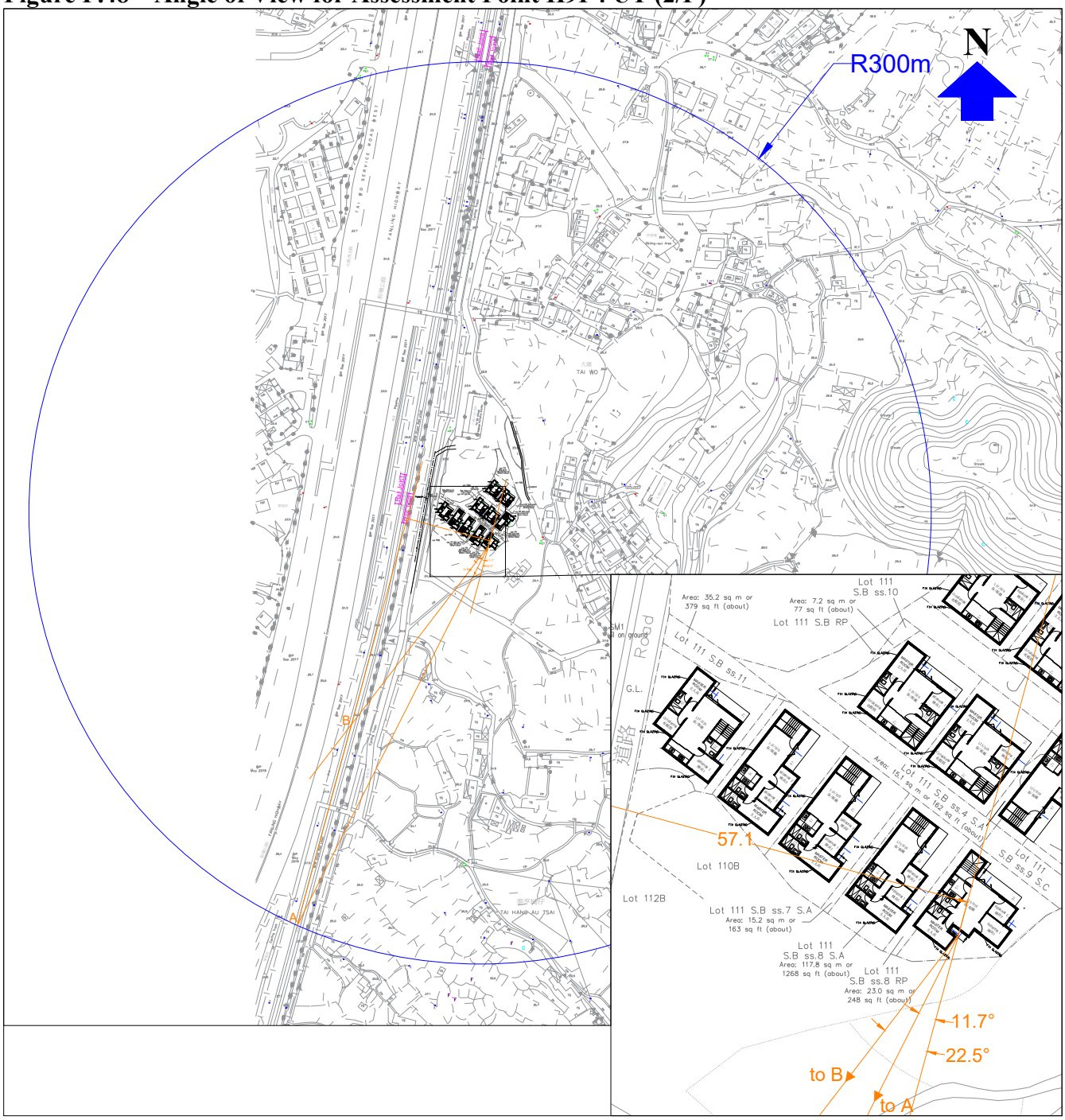


Table F.74 Air-borne Rail Noise Calculation for Assessment Point H10P1 (Daytime)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	13.0	13.0	12.2	12.2
Angle End	15.3	15.3	15.3	15.3
Speed, kph	120	120	120	120
Slant Distance, m	67.1	67.1	63.8	63.8
Angle of View, θ^o	2.3	2.3	3.1	3.1
Angle of Orientation of the Segment, α^o	14.2	14.2	13.8	13.8
Receiver to Source Distance, m	67.1	67.1	63.8	63.8
Path Length Difference, m	0.186	0.186	0.308	0.308
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Angle of View Correction, dB(A)	-28.2	-28.2	-27.1	-27.1
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.2
SEL of the Segment, dB(A)	50.8	58.9	50.6	58.7
SEL of Single PassBy, dB(A)	50.8	58.9	50.6	58.7
Train Frequency, No. of Train per 30min	15	1	15	1
Leq,30min of the Track, dB(A)	30.0	26.4	29.8	26.1
Leq,30min, dB(A)	**34.5**			
1/F, +	**2.70**			
Path Length Difference, m	0.119	0.119	0.242	0.242
Slant Distance, m	67.1	67.1	63.8	63.8
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4
SEL of the Segment, dB(A)	52.1	60.2	51.3	59.4
SEL of Single PassBy, dB(A)	52.1	60.2	51.3	59.4
Leq,30min of the Track, dB(A)	31.3	27.6	30.5	26.8
Leq,30min, dB(A)	**35.5**			
2/F, +	**5.40**			
Path Length Difference, m	0.067	0.067	0.184	0.184
Slant Distance, m	67.2	67.2	63.9	63.9
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Screening Correction, dB(A)	-9.9	-9.9	-12.6	-12.6
SEL of the Segment, dB(A)	53.6	61.7	52.1	60.2
SEL of Single PassBy, dB(A)	53.6	61.7	52.1	60.2
Leq,30min of the Track, dB(A)	32.8	29.1	31.3	27.7
Leq,30min, dB(A)	**36.7**			

Table F.75 Air-borne Rail Noise Calculation for Assessment Point H10P1 (Night-time)

Track	Northbound	Southbound
Segment	AB	AB
Train Type	EMU	EMU
Angle Start	13.0	12.2
Angle End	15.3	15.3
Speed, kph	120	120
Slant Distance, m	67.1	63.8
Angle of View, θ^o	2.3	3.1
Angle of Orientation of the Segment, α^o	14.2	13.8
Receiver to Source Distance, m	67.1	63.8
Path Length Difference, m	0.186	0.308
Wheel/Rail Noise Contribution		
Reference SEL (25m, 120kph), dB(A)	89.0	89.0
Speed Correction, dB(A)	0.0	0.0
Distance Correction, dB(A)	-4.3	-4.1
Angle of View Correction, dB(A)	-28.2	-27.1
Façade Correction, dB(A)	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0
Joint / Turnout Correction, dB(A)		
Opposite Barrier Correction, dB(A)	1.5	1.5
Screening Correction, dB(A)	-12.7	-14.2
SEL of the Segment, dB(A)	50.8	50.6
SEL of Single PassBy, dB(A)	50.8	50.6
Lmax of Single PassBy, dB(A)	41.4	41.2
Train Frequency, No. of Train per 30min	12	12
Leq,30min of the Track, dB(A)	29.1	28.8
Leq,30min, dB(A)	**32.0**	
1/F, +	**2.70**	
Path Length Difference, m	0.119	0.242
Slant Distance, m	67.1	63.8
Distance Correction, dB(A)	-4.3	-4.1
Screening Correction, dB(A)	-11.4	-13.4
SEL of the Segment, dB(A)	52.1	51.3
SEL of Single PassBy, dB(A)	52.1	51.3
Lmax of Single PassBy, dB(A)	42.7	41.9
Leq,30min of the Track, dB(A)	30.4	29.6
Leq,30min, dB(A)	**33.0**	
2/F, +	**5.40**	
Path Length Difference, m	0.067	0.184
Slant Distance, m	67.2	63.9
Distance Correction, dB(A)	-4.3	-4.1
Screening Correction, dB(A)	-9.9	-12.6
SEL of the Segment, dB(A)	53.6	52.1
SEL of Single PassBy, dB(A)	53.6	52.1
Lmax of Single PassBy, dB(A)	44.2	42.7
Leq,30min of the Track, dB(A)	31.8	30.4
Leq,30min, dB(A)	**34.2**	

Table F.76 Air-borne Rail Noise Calculation for Assessment Point H10P1 (Full Day)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	13.0	13.0	12.2	12.2
Angle End	15.3	15.3	15.3	15.3
Speed, kph	120	120	120	120
Slant Distance, m	67.1	67.1	63.8	63.8
Angle of View, θ^o	2.3	2.3	3.1	3.1
Angle of Orientation of the Segment, α^o	14.2	14.2	13.8	13.8
Receiver to Source Distance, m	67.1	67.1	63.8	63.8
Path Length Difference, m	0.186	0.186	0.308	0.308
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Angle of View Correction, dB(A)	-28.2	-28.2	-27.1	-27.1
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.2
SEL of the Segment, dB(A)	50.8	58.9	50.6	58.7
SEL of Single PassBy, dB(A)	50.8	58.9	50.6	58.7
Train Frequency, No. of Train per day	425	9	425	9
Leq,24hr of the Track, dB(A)	27.8	19.1	27.5	18.8
Leq,24hr, dB(A)	31.2			
1/F, +	2.70			
Path Length Difference, m	0.119	0.119	0.242	0.242
Slant Distance, m	67.1	67.1	63.8	63.8
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4
SEL of the Segment, dB(A)	52.1	60.2	51.3	59.4
SEL of Single PassBy, dB(A)	52.1	60.2	51.3	59.4
Leq,24hr of the Track, dB(A)	29.0	20.4	28.2	19.6
Leq,24hr, dB(A)	32.2			
2/F, +	5.40			
Path Length Difference, m	0.067	0.067	0.184	0.184
Slant Distance, m	67.2	67.2	63.9	63.9
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Screening Correction, dB(A)	-9.9	-9.9	-12.6	-12.6
SEL of the Segment, dB(A)	53.6	61.7	52.1	60.2
SEL of Single PassBy, dB(A)	53.6	61.7	52.1	60.2
Leq,24hr of the Track, dB(A)	30.5	21.8	29.1	20.4
Leq,24hr, dB(A)	33.4			

Figure F.49 Angle of View for Assessment Point H10P1 DT (2/F)

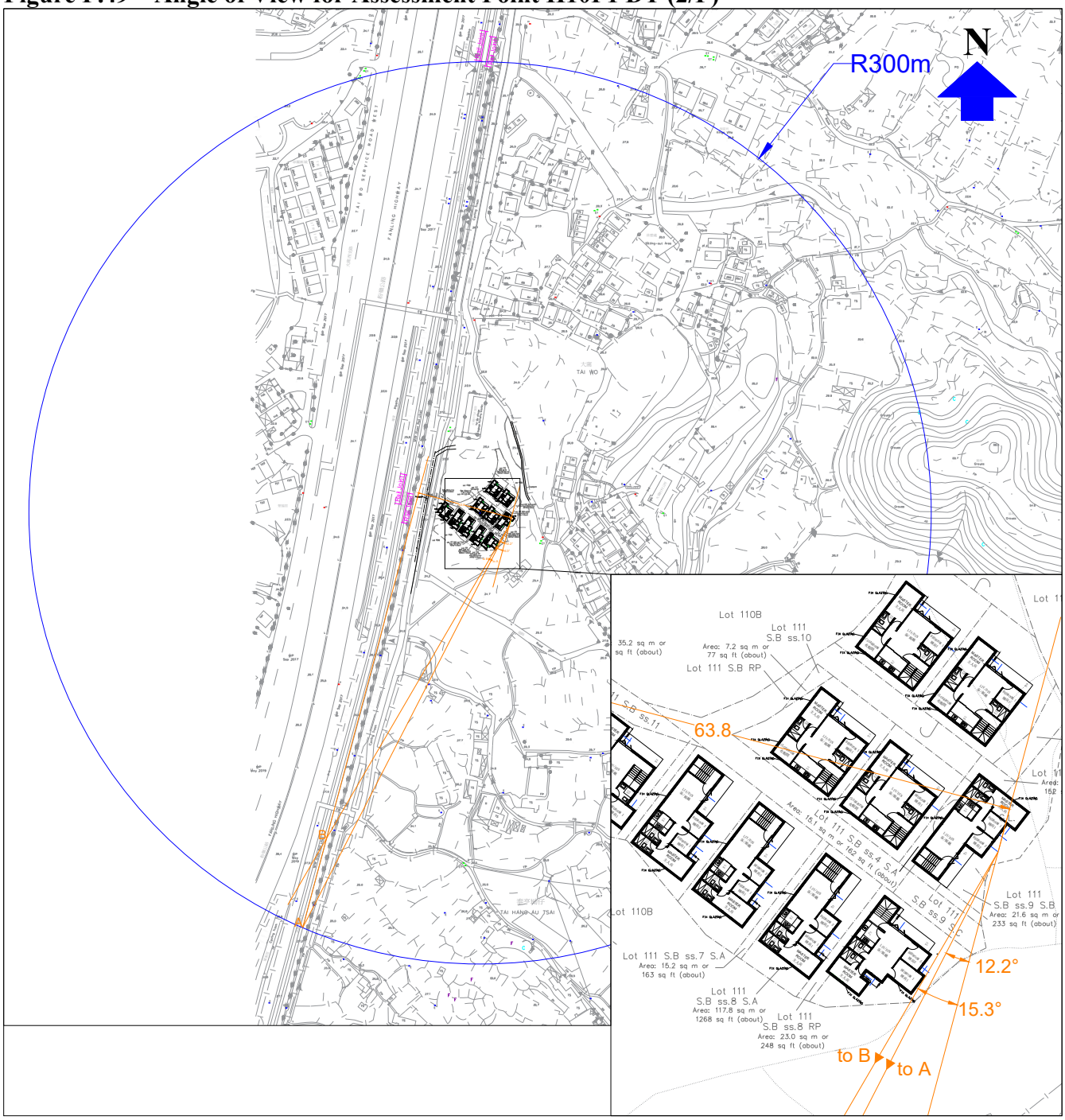


Figure F.50 Angle of View for Assessment Point H10P1 UT (2/F)

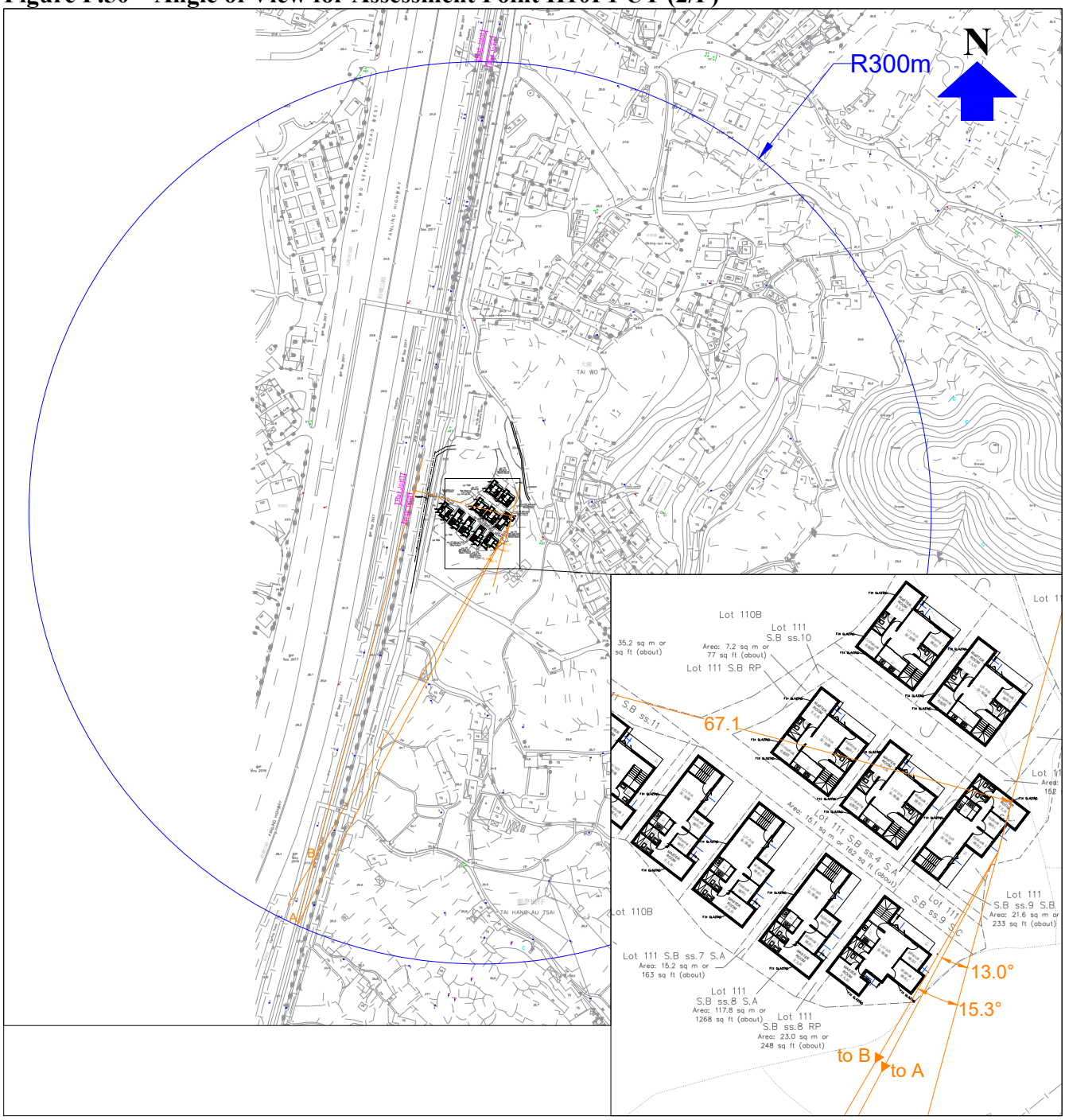


Table F.77 Air-borne Rail Noise Calculation for Assessment Point H10P2 (Daytime)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	13.0	13.0	12.3	12.3
Angle End	16.0	16.0	16.0	16.0
Speed, kph	120	120	120	120
Slant Distance, m	67.7	67.7	64.4	64.4
Angle of View, θ^o	3.0	3.0	3.7	3.7
Angle of Orientation of the Segment, α^o	14.5	14.5	14.2	14.2
Receiver to Source Distance, m	67.7	67.7	64.4	64.4
Path Length Difference, m	0.185	0.185	0.307	0.307
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Angle of View Correction, dB(A)	-26.8	-26.8	-26.1	-26.1
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.6	-12.6	-14.2	-14.2
SEL of the Segment, dB(A)	52.2	60.2	51.6	59.6
SEL of Single PassBy, dB(A)	52.2	60.2	51.6	59.6
Train Frequency, No. of Train per 30min	15	1	15	1
Leq,30min of the Track, dB(A)	31.4	27.7	30.8	27.1
Leq,30min, dB(A)	**35.6**			
1/F, +	**2.70**			
Path Length Difference, m	0.119	0.119	0.242	0.242
Slant Distance, m	67.7	67.7	64.4	64.4
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Screening Correction, dB(A)	-11.4	-11.4	-13.5	-13.5
SEL of the Segment, dB(A)	53.4	61.5	52.3	60.4
SEL of Single PassBy, dB(A)	53.4	61.5	52.3	60.4
Leq,30min of the Track, dB(A)	32.7	29.0	31.5	27.8
Leq,30min, dB(A)	**36.7**			
2/F, +	**5.40**			
Path Length Difference, m	0.068	0.068	0.185	0.185
Slant Distance, m	67.8	67.8	64.5	64.5
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Screening Correction, dB(A)	-9.9	-9.9	-12.6	-12.6
SEL of the Segment, dB(A)	54.9	63.0	53.1	61.2
SEL of Single PassBy, dB(A)	54.9	63.0	53.1	61.2
Leq,30min of the Track, dB(A)	34.1	30.4	32.3	28.6
Leq,30min, dB(A)	**37.9**			

Table F.78 Air-borne Rail Noise Calculation for Assessment Point H10P2 (Night-time)

Track	Northbound	Southbound
Segment	AB	AB
Train Type	EMU	EMU
Angle Start	13.0	12.3
Angle End	16.0	16.0
Speed, kph	120	120
Slant Distance, m	67.7	64.4
Angle of View, θ^o	3.0	3.7
Angle of Orientation of the Segment, α^o	14.5	14.2
Receiver to Source Distance, m	67.7	64.4
Path Length Difference, m	0.185	0.307
Wheel/Rail Noise Contribution		
Reference SEL (25m, 120kph), dB(A)	89.0	89.0
Speed Correction, dB(A)	0.0	0.0
Distance Correction, dB(A)	-4.3	-4.1
Angle of View Correction, dB(A)	-26.8	-26.1
Façade Correction, dB(A)	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0
Joint / Turnout Correction, dB(A)		
Opposite Barrier Correction, dB(A)	1.5	1.5
Screening Correction, dB(A)	-12.6	-14.2
SEL of the Segment, dB(A)	52.2	51.6
SEL of Single PassBy, dB(A)	52.2	51.6
Lmax of Single PassBy, dB(A)	42.7	42.2
Train Frequency, No. of Train per 30min	12	12
Leq,30min of the Track, dB(A)	30.4	29.8
Leq,30min, dB(A)	**33.1**	
1/F, +	**2.70**	
Path Length Difference, m	0.119	0.242
Slant Distance, m	67.7	64.4
Distance Correction, dB(A)	-4.3	-4.1
Screening Correction, dB(A)	-11.4	-13.5
SEL of the Segment, dB(A)	53.4	52.3
SEL of Single PassBy, dB(A)	53.4	52.3
Lmax of Single PassBy, dB(A)	44.0	42.9
Leq,30min of the Track, dB(A)	31.7	30.5
Leq,30min, dB(A)	**34.2**	
2/F, +	**5.40**	
Path Length Difference, m	0.068	0.185
Slant Distance, m	67.8	64.5
Distance Correction, dB(A)	-4.3	-4.1
Screening Correction, dB(A)	-9.9	-12.6
SEL of the Segment, dB(A)	54.9	53.1
SEL of Single PassBy, dB(A)	54.9	53.1
Lmax of Single PassBy, dB(A)	45.5	43.7
Leq,30min of the Track, dB(A)	33.2	31.3
Leq,30min, dB(A)	**35.4**	

Table F.79 Air-borne Rail Noise Calculation for Assessment Point H10P2 (Full Day)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	13.0	13.0	12.3	12.3
Angle End	16.0	16.0	16.0	16.0
Speed, kph	120	120	120	120
Slant Distance, m	67.7	67.7	64.4	64.4
Angle of View, θ^o	3.0	3.0	3.7	3.7
Angle of Orientation of the Segment, α^o	14.5	14.5	14.2	14.2
Receiver to Source Distance, m	67.7	67.7	64.4	64.4
Path Length Difference, m	0.185	0.185	0.307	0.307
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Angle of View Correction, dB(A)	-26.8	-26.8	-26.1	-26.1
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.6	-12.6	-14.2	-14.2
SEL of the Segment, dB(A)	52.2	60.2	51.6	59.6
SEL of Single PassBy, dB(A)	52.2	60.2	51.6	59.6
Train Frequency, No. of Train per day	425	9	425	9
Leq,24hr of the Track, dB(A)	29.1	20.4	28.5	19.8
Leq,24hr, dB(A)	32.4			
1/F, +	2.70			
Path Length Difference, m	0.119	0.119	0.242	0.242
Slant Distance, m	67.7	67.7	64.4	64.4
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Screening Correction, dB(A)	-11.4	-11.4	-13.5	-13.5
SEL of the Segment, dB(A)	53.4	61.5	52.3	60.4
SEL of Single PassBy, dB(A)	53.4	61.5	52.3	60.4
Leq,24hr of the Track, dB(A)	30.4	21.7	29.2	20.5
Leq,24hr, dB(A)	33.4			
2/F, +	5.40			
Path Length Difference, m	0.068	0.068	0.185	0.185
Slant Distance, m	67.8	67.8	64.5	64.5
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Screening Correction, dB(A)	-9.9	-9.9	-12.6	-12.6
SEL of the Segment, dB(A)	54.9	63.0	53.1	61.2
SEL of Single PassBy, dB(A)	54.9	63.0	53.1	61.2
Leq,24hr of the Track, dB(A)	31.8	23.2	30.0	21.3
Leq,24hr, dB(A)	34.6			

Figure F.51 Angle of View for Assessment Point H10P2 DT (2/F)

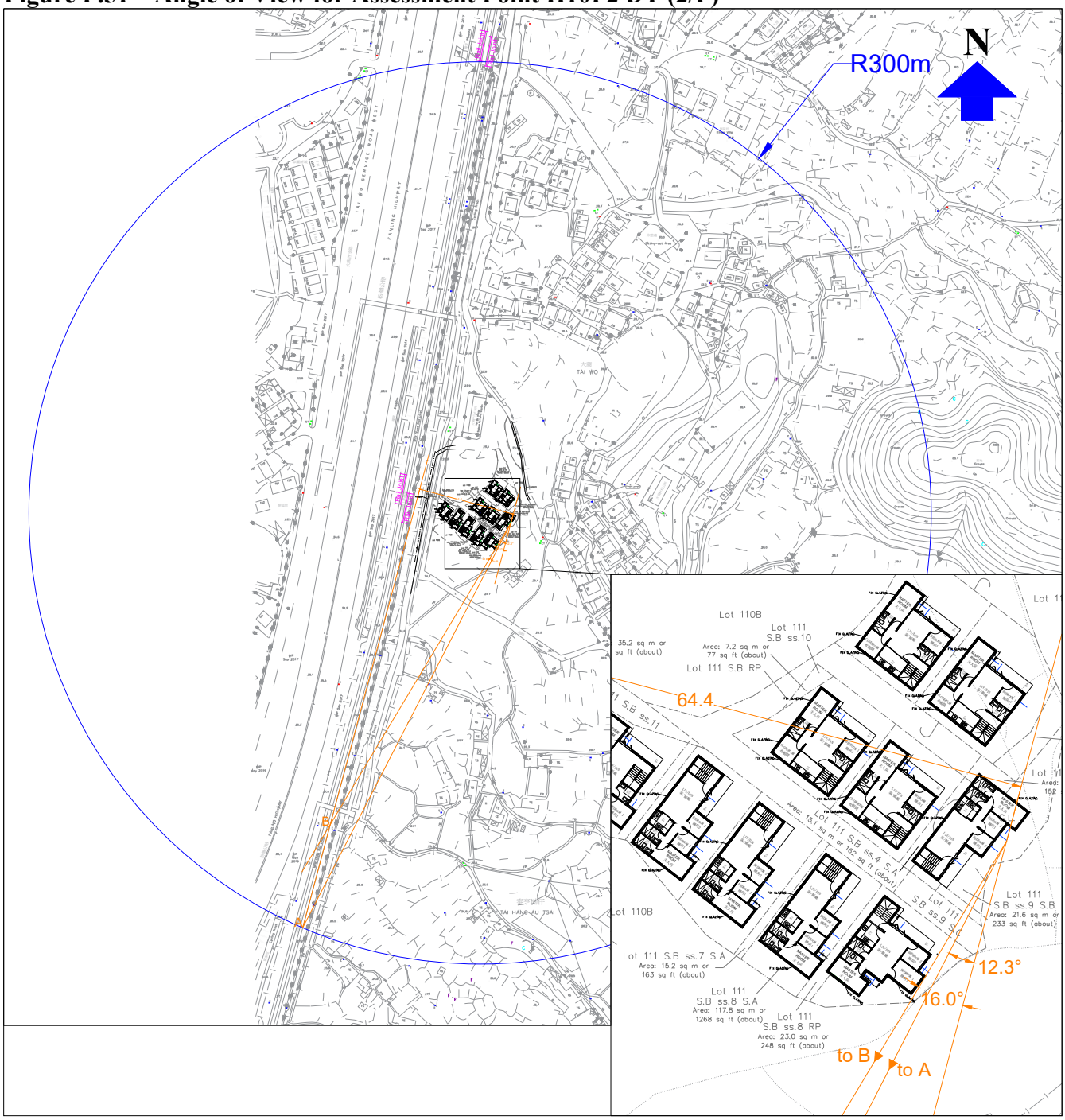


Figure F.52 Angle of View for Assessment Point H10P2 UT (2/F)

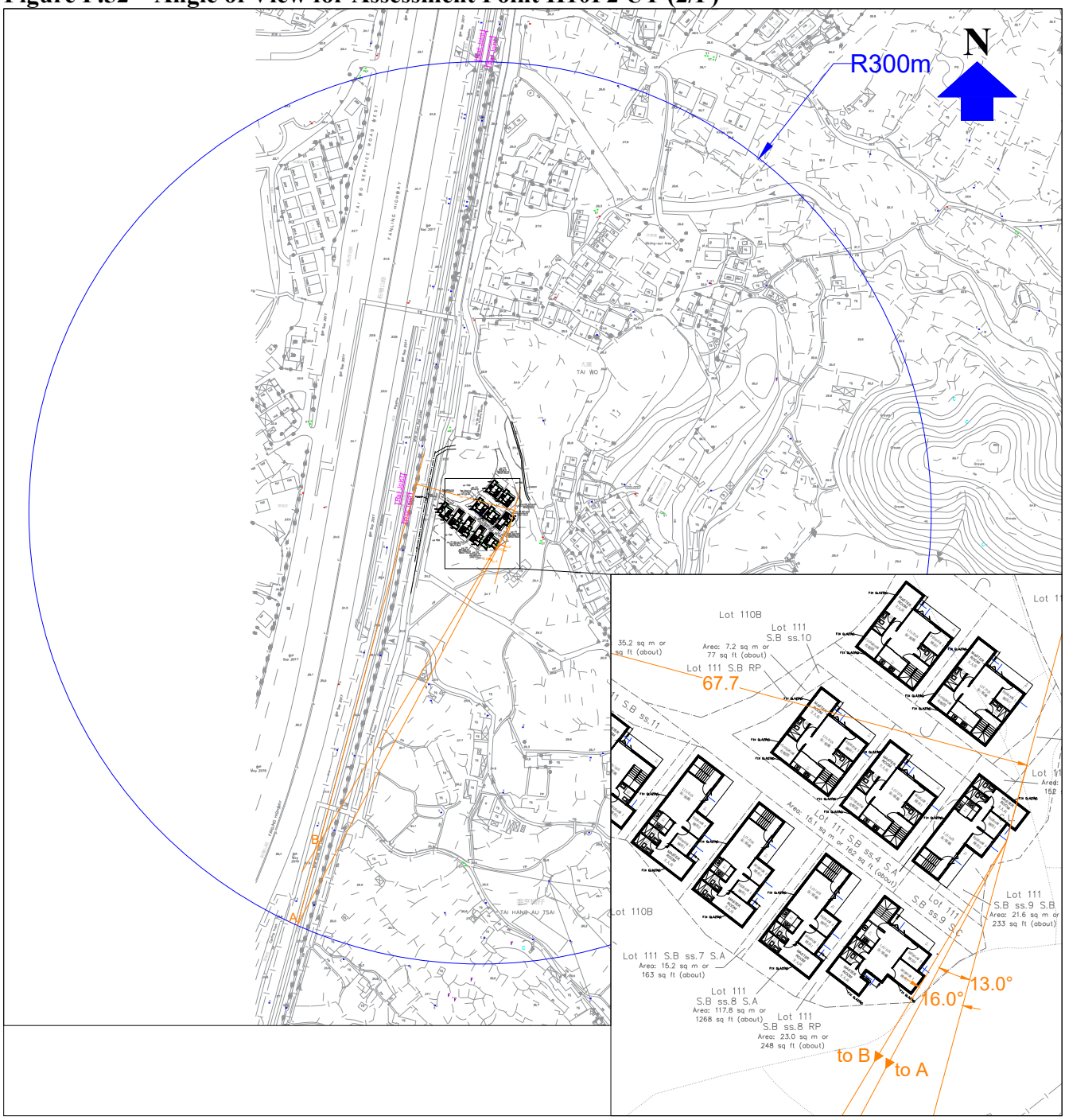


Table F.80 Air-borne Rail Noise Calculation for Assessment Point H10P3 (Daytime)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	12.9	12.9	12.2	12.2
Angle End	14.3	14.3	14.3	14.3
Speed, kph	120	120	120	120
Slant Distance, m	67.3	67.3	64.0	64.0
Angle of View, θ^o	1.4	1.4	2.1	2.1
Angle of Orientation of the Segment, α^o	13.6	13.6	13.3	13.3
Receiver to Source Distance, m	67.3	67.3	64.0	64.0
Path Length Difference, m	0.186	0.186	0.308	0.308
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Angle of View Correction, dB(A)	-30.7	-30.7	-29.1	-29.1
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.2
SEL of the Segment, dB(A)	48.3	56.4	48.6	56.6
SEL of Single PassBy, dB(A)	48.3	56.4	48.6	56.6
Train Frequency, No. of Train per 30min	15	1	15	1
Leq,30min of the Track, dB(A)	27.5	23.8	27.8	24.1
Leq,30min, dB(A)	32.2			
1/F, +	2.70			
Path Length Difference, m	0.119	0.119	0.242	0.242
Slant Distance, m	67.3	67.3	64.0	64.0
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4
SEL of the Segment, dB(A)	49.6	57.7	49.3	57.4
SEL of Single PassBy, dB(A)	49.6	57.7	49.3	57.4
Leq,30min of the Track, dB(A)	28.8	25.1	28.5	24.8
Leq,30min, dB(A)	33.2			
2/F, +	5.40			
Path Length Difference, m	0.067	0.067	0.184	0.184
Slant Distance, m	67.4	67.4	64.1	64.1
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Screening Correction, dB(A)	-9.9	-9.9	-12.6	-12.6
SEL of the Segment, dB(A)	51.1	59.2	50.1	58.2
SEL of Single PassBy, dB(A)	51.1	59.2	50.1	58.2
Leq,30min of the Track, dB(A)	30.3	26.6	29.3	25.6
Leq,30min, dB(A)	34.4			

Table F.81 Air-borne Rail Noise Calculation for Assessment Point H10P3 (Night-time)

Track	Northbound	Southbound
Segment	AB	AB
Train Type	EMU	EMU
Angle Start	12.9	12.2
Angle End	14.3	14.3
Speed, kph	120	120
Slant Distance, m	67.3	64.0
Angle of View, θ^o	1.4	2.1
Angle of Orientation of the Segment, α^o	13.6	13.3
Receiver to Source Distance, m	67.3	64.0
Path Length Difference, m	0.186	0.308
Wheel/Rail Noise Contribution		
Reference SEL (25m, 120kph), dB(A)	89.0	89.0
Speed Correction, dB(A)	0.0	0.0
Distance Correction, dB(A)	-4.3	-4.1
Angle of View Correction, dB(A)	-30.7	-29.1
Façade Correction, dB(A)	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0
Joint / Turnout Correction, dB(A)		
Opposite Barrier Correction, dB(A)	1.5	1.5
Screening Correction, dB(A)	-12.7	-14.2
SEL of the Segment, dB(A)	48.3	48.6
SEL of Single PassBy, dB(A)	48.3	48.6
Lmax of Single PassBy, dB(A)	38.9	39.1
Train Frequency, No. of Train per 30min	12	12
Leq,30min of the Track, dB(A)	26.6	26.8
Leq,30min, dB(A)	**29.7**	
1/F, +	**2.70**	
Path Length Difference, m	0.119	0.242
Slant Distance, m	67.3	64.0
Distance Correction, dB(A)	-4.3	-4.1
Screening Correction, dB(A)	-11.4	-13.4
SEL of the Segment, dB(A)	49.6	49.3
SEL of Single PassBy, dB(A)	49.6	49.3
Lmax of Single PassBy, dB(A)	40.2	39.9
Leq,30min of the Track, dB(A)	27.8	27.5
Leq,30min, dB(A)	**30.7**	
2/F, +	**5.40**	
Path Length Difference, m	0.067	0.184
Slant Distance, m	67.4	64.1
Distance Correction, dB(A)	-4.3	-4.1
Screening Correction, dB(A)	-9.9	-12.6
SEL of the Segment, dB(A)	51.1	50.1
SEL of Single PassBy, dB(A)	51.1	50.1
Lmax of Single PassBy, dB(A)	41.7	40.7
Leq,30min of the Track, dB(A)	29.3	28.3
Leq,30min, dB(A)	**31.9**	

Table F.82 Air-borne Rail Noise Calculation for Assessment Point H10P3 (Full Day)

Track	Northbound		Southbound	
Segment	AB		AB	
Train Type	EMU	ITT	EMU	ITT
Angle Start	12.9	12.9	12.2	12.2
Angle End	14.3	14.3	14.3	14.3
Speed, kph	120	120	120	120
Slant Distance, m	67.3	67.3	64.0	64.0
Angle of View, θ^o	1.4	1.4	2.1	2.1
Angle of Orientation of the Segment, α^o	13.6	13.6	13.3	13.3
Receiver to Source Distance, m	67.3	67.3	64.0	64.0
Path Length Difference, m	0.186	0.186	0.308	0.308
Wheel/Rail Noise Contribution				
Reference SEL (25m, 120kph), dB(A)	89.0	97.0	89.0	97.0
Speed Correction, dB(A)	0.0	0.0	0.0	0.0
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Angle of View Correction, dB(A)	-30.7	-30.7	-29.1	-29.1
Façade Correction, dB(A)	2.5	2.5	2.5	2.5
Track Wear Correction, dB(A)	3.0	3.0	3.0	3.0
Joint / Turnout Correction, dB(A)				
Opposite Barrier Correction, dB(A)	1.5	1.5	1.5	1.5
Screening Correction, dB(A)	-12.7	-12.7	-14.2	-14.2
SEL of the Segment, dB(A)	48.3	56.4	48.6	56.6
SEL of Single PassBy, dB(A)	48.3	56.4	48.6	56.6
Train Frequency, No. of Train per day	425	9	425	9
Leq,24hr of the Track, dB(A)	25.3	16.6	25.5	16.8
Leq,24hr, dB(A)	**28.9**			
1/F, +	**2.70**			
Path Length Difference, m	0.119	0.119	0.242	0.242
Slant Distance, m	67.3	67.3	64.0	64.0
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Screening Correction, dB(A)	-11.4	-11.4	-13.4	-13.4
SEL of the Segment, dB(A)	49.6	57.7	49.3	57.4
SEL of Single PassBy, dB(A)	49.6	57.7	49.3	57.4
Leq,24hr of the Track, dB(A)	26.5	17.8	26.2	17.5
Leq,24hr, dB(A)	**29.9**			
2/F, +	**5.40**			
Path Length Difference, m	0.067	0.067	0.184	0.184
Slant Distance, m	67.4	67.4	64.1	64.1
Distance Correction, dB(A)	-4.3	-4.3	-4.1	-4.1
Screening Correction, dB(A)	-9.9	-9.9	-12.6	-12.6
SEL of the Segment, dB(A)	51.1	59.2	50.1	58.2
SEL of Single PassBy, dB(A)	51.1	59.2	50.1	58.2
Leq,24hr of the Track, dB(A)	28.0	19.3	27.0	18.3
Leq,24hr, dB(A)	**31.1**			

Figure F.53 Angle of View for Assessment Point H10P3 DT (2/F)

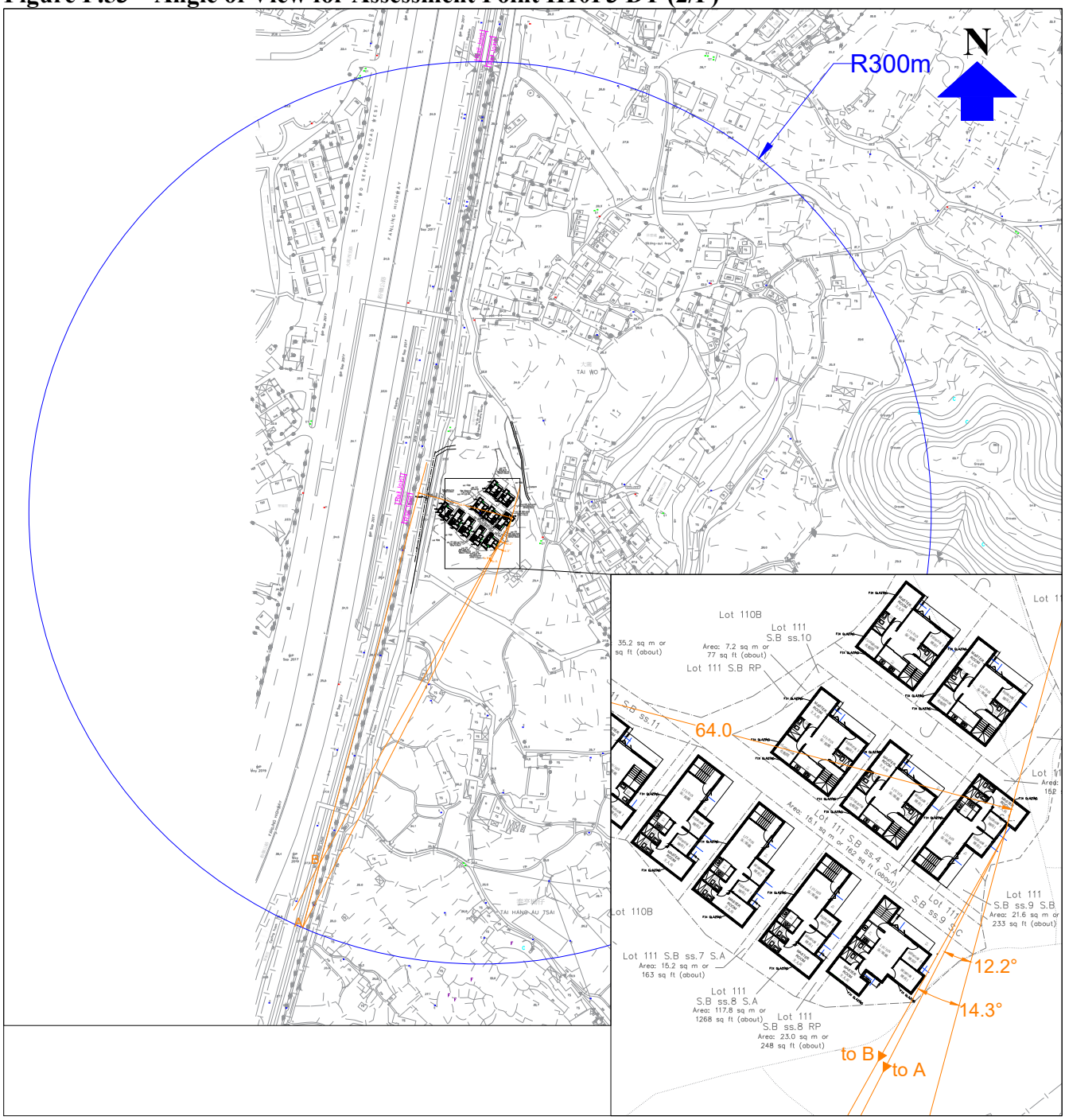
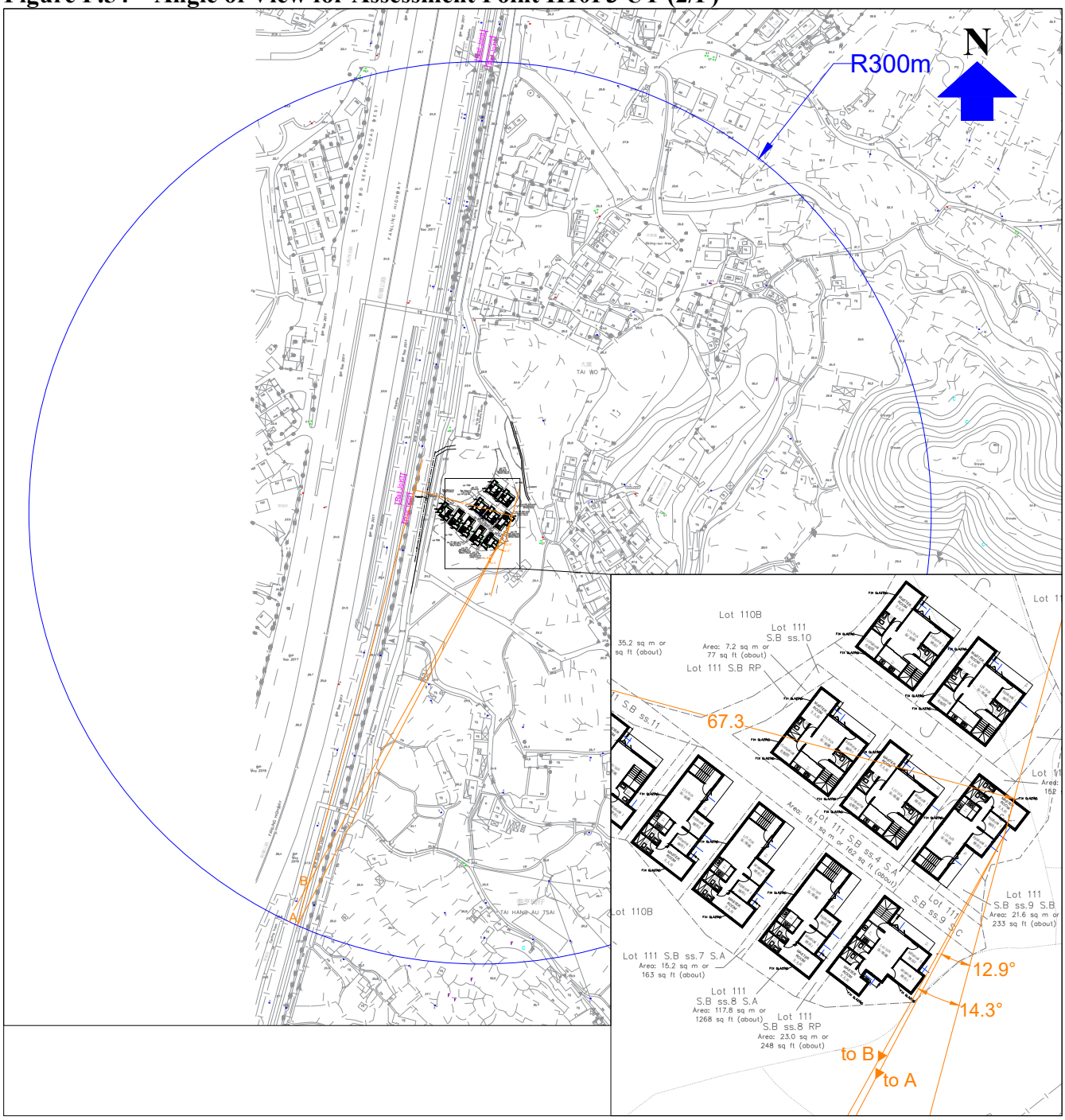


Figure F.54 Angle of View for Assessment Point H10P3 UT (2/F)



Appendix G.

Graphics of the RoadNoise Model

Figure G.1 Road Noise Model

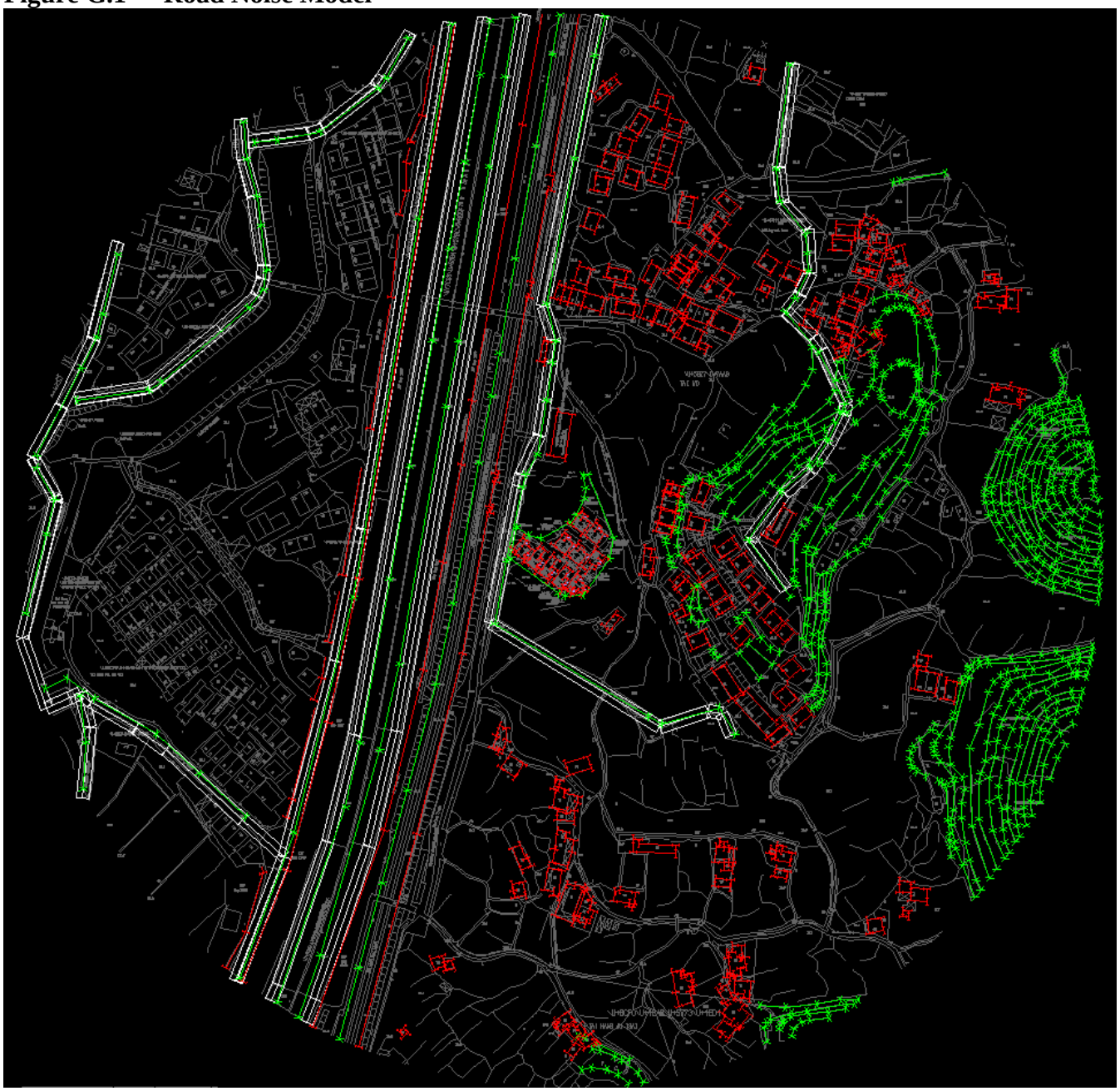
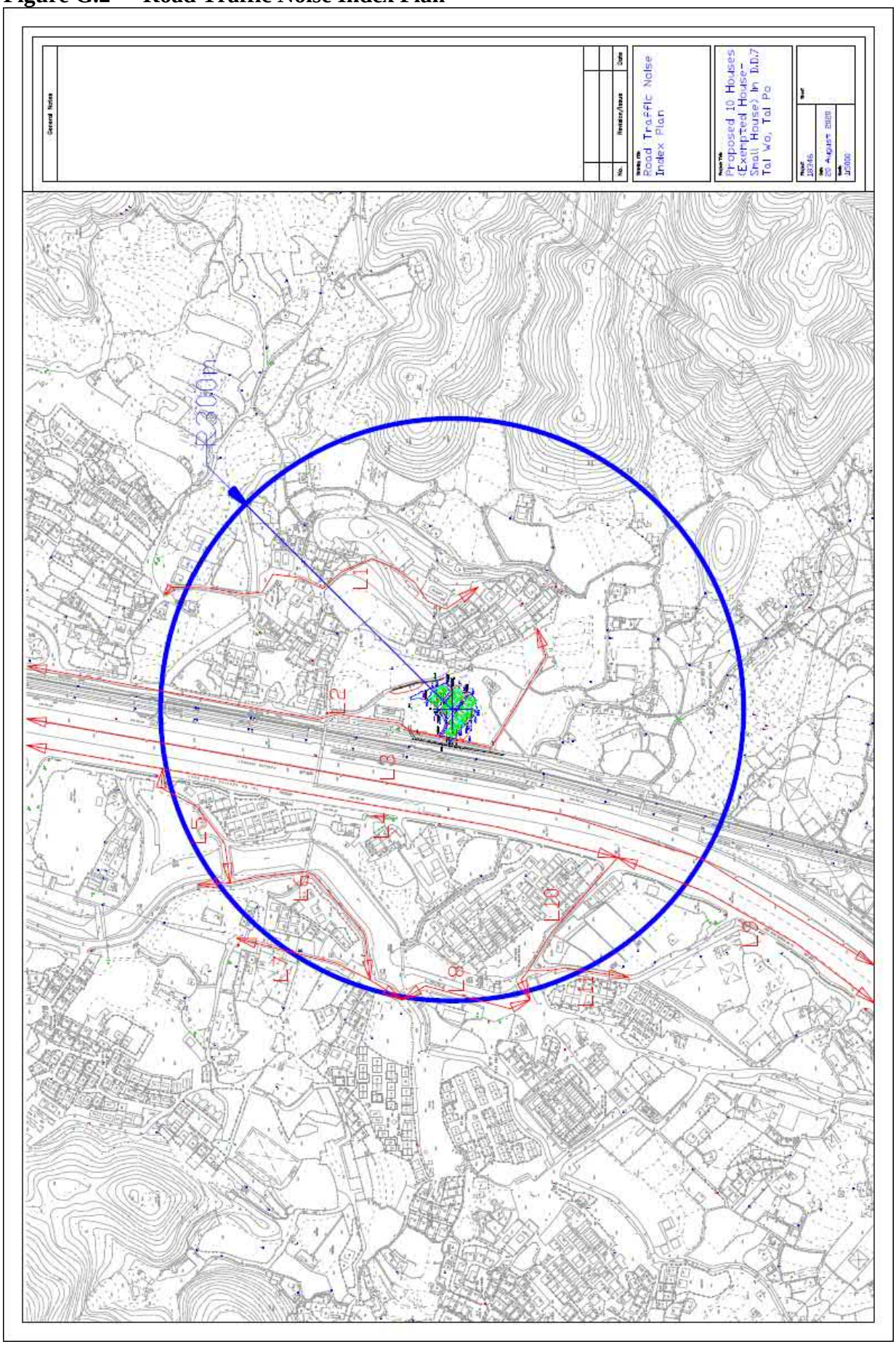


Figure G.2 Road Traffic Noise Index Plan



Appendix H.

Traffic Forecast

Figure H.1 1st Submission of Traffic Forecast to Transport Department

AXON CONSULTANCY

- Transport Modelling
- Pedestrian Modelling
- Traffic Engineering
- Transportation Planning
- Traffic Impact Assessment
- Temporary Traffic Management
- Geographical Analysis System

07 August 2019
Our Ref: 30839-0001
Your ref:

Transport Department
NT Regional Office
Traffic Engineering (NTE) Division
Project & Tai Po Section
9/F, Mongkok Government Offices
30 Luen Wan Street, Mongkok
Kowloon

By Hand & Email
(alexthlam@td.gov.hk)

Attn: Mr. LAM Tack Ho, Alex (Engr /Tai Po 3)

Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po
Traffic Forecast in Year 2045 for the Noise Impact Assessment Purpose

Dear Mr. LAM,

Regarding the captioned subject, in order to obtain the approval written response from your office regarding the traffic forecast in Year 2045 for the traffic noise impact assessment purpose only, the methodology and the assumptions for the traffic forecast of the proposed development is shown as follows.

- A growth factor is derived based on the following method:

1. References were made to the historical records of Annual Traffic Census Reports from 2008 to 2017, on the annual average daily traffic (AADT) flows to derive the average growth of the annual traffic volume. It is noted that an average positive growth of 1.4% is observed over the past 10 years as shown in the table below:

Station No.	2008	2009	2010	2011	2012
5507/ Tai Wo Service Rd W	5740	5010 (-12.7%)	5230 (4.4%)	5360 (2.5%)	5330 (-0.6%)
6097/ Tai Wo Service Rd E	1790	1750 (-2.2%)	1770 (1.1%)	1810 (2.3%)	1960 (8.3%)
5461/ Fanling Highway	80920	77660 (-4%)	79110 (1.9%)	80260 (1.5%)	79490 (-1%)

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TEL 2258 6392 FAX 3020 0321
http://www.axonhk.com

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	2013	2014	2015	2016	2017	Average Growth p.a.
5507/ Tai Wo Service Rd W	5370 (0.8%)	5090 (-5.2%)	5400 (6.1%)	5620 (4.1%)	5540 (-1.4%)	-0.4%
6097/ Tai Wo Service Rd E	2270 (15.8%)	2240 (-1.3%)	2230 (-0.4%)	2320 (4%)	2270 (-2.2%)	2.7%
5461/ Fanling Highway	82840 (4.2%)	87120 (5.2%)	87930 (0.9%)	92890 (5.6%)	92220 (-0.7%)	1.5%
					Overall Average	1.4%

Notes *1. Figures in bracket indicated the % increase between two years.*
2. Source: Annual Traffic Census, Transport Department

2. Meanwhile, according to 2014-based Territorial Population and Employment Data Matrix (TPEDM) issued by Planning Department on March 2017, the projected population growth by District Council District in 2014 and 2024 is 2.2% p.a., as shown below and in **Appendix A**.

District Council District	Year 2014	Year 2024	Growth Rate p.a. (%)
Tai Po	305800	381000	2.2%

3. After considering the historical data and future planning data, for the purpose of conservative assessment, the annual growth rate of +2.2% was applied. The future traffic flows of road links up to Year 2045 per annum were hence obtained. The anticipated traffic flows for Year 2045 are tabulated as follows. Locations for the traffic forecast are shown in **Appendix B**.

ID	ROAD	Peak Hour Traffic Flow in Year 2045, veh/hr	% of Heavy Vehicles	Speed, km/hr
L1	Access Road A_NB	42	5%	50
	Access Road A_SB	40	0%	50
L2	Tai Wo Service Road East_NB	18	0%	50
	Tai Wo Service Road East_SB	31	7%	50
L3	Fanling Highway_NB	4499	15%	80
	Fanling Highway_SB	4231	15%	80
L4	Tai Wo Service Road West_NB	433	12%	50
	Tai Wo Service Road West_SB	411	12%	50

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Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po - Traffic Forecast in Year 2045 for the Noise Impact Assessment Purpose

ID	ROAD	Peak Hour Traffic Flow in Year 2045, veh/hr	% of Heavy Vehicles	Speed, km/hr
L5	Access Road B_EB	90	2%	50
	Access Road B_WB	74	3%	50
L6	Access Road C_NB	87	5%	50
	Access Road C_SB	72	6%	50
L7	Access Road D_NB	61	12%	50
	Access Road D_SB	32	6%	50
L8	Access Road E_NB	111	8%	50
	Access Road E_SB	33	6%	50
L9	Tai Wo Service Road West _NB	542	11%	50
	Tai Wo Service Road West _SB	386	12%	50
L10	Access Road F	134	7%	50
L11	Access Road G	14	0%	50

Should you have any queries, please do not hesitate to contact the undersigned at 2258 6392.

Yours sincerely,

Sam Fung

Encl.
cc: Wilson Acoustics Limited (Attn: Peter Wong (by email: peter.wong@wal.hk))

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Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po - Traffic Forecast in Year 2045 for the Noise Impact Assessment Purpose

Appendix A

Planning Data from
Planning Department

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表 1：二零一五年至二零二四年按區議會分區劃分的人口推算數字
Table 1 : Projected Population by District Council District, 2015-2024

(以年中計算 as at mid year)

區議會分區/ *主要區域*	District Council District/ *Broad Area*	2014 #	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
中西區	Central and Western	251 900	249 400	248 200	248 900	250 200	248 700	246 800	243 400	238 800	236 800	233 900
灣仔	Wan Chai	180 700	179 700	180 200	181 600	182 000	180 300	178 200	175 400	169 500	166 100	162 500
東區	Eastern	556 000	551 400	547 900	545 400	542 400	538 400	536 700	533 100	521 800	519 400	513 200
南區	Southern	277 500	276 000	273 700	272 300	270 900	269 000	267 100	268 800	267 000	270 600	281 500
深水埗	Sham Shui Po	394 800	396 000	400 800	402 800	406 300	429 200	450 900	462 200	464 400	464 900	459 700
九龍城	Kowloon City	408 600	411 500	409 200	411 700	417 000	422 500	426 000	432 900	438 500	441 000	454 200
黃大仙	Wong Tai Sin	428 900	430 000	426 900	425 400	423 000	423 100	424 800	422 800	423 200	427 800	426 000
觀塘	Kwun Tong	645 400	645 000	657 100	665 100	680 900	681 200	676 800	678 300	675 000	683 600	686 800
油尖旺	Yau Tsim Mong	317 100	321 500	320 700	322 600	323 600	322 400	321 700	316 900	309 200	306 000	300 500
葵青	Kwai Tsing	510 500	514 900	513 500	510 900	509 000	504 800	501 600	503 900	505 900	502 300	496 900
荃灣	Tsuen Wan	305 100	306 600	308 600	312 200	311 100	312 500	315 200	313 600	305 800	302 800	299 700
屯門	Tuen Mun	497 600	504 100	504 100	507 000	519 500	520 900	528 600	537 800	550 100	551 400	556 100
元朗	Yuen Long	601 100	612 600	632 300	643 300	650 800	661 800	665 900	670 100	671 000	680 100	685 200
北區	North	308 300	315 200	315 600	315 600	315 300	314 300	320 000	318 300	350 800	352 300	378 500
大埔	Tai Po	305 800	310 500	314 800	318 900	320 500	320 800	327 600	340 600	353 300	376 700	381 000
沙田	Sha Tin	652 600	664 600	684 800	693 500	694 100	704 600	715 800	721 600	724 000	722 100	721 100
西貢	Sai Kung	451 600	460 100	465 200	473 000	481 600	485 500	490 200	506 000	519 300	527 800	534 700
離島	Islands	147 400	148 800	149 900	160 400	164 500	178 000	180 500	179 400	185 300	183 800	183 500
香港島	*Hong Kong Island*	*1 266 100*	*1 256 400*	*1 250 100*	*1 248 100*	*1 245 500*	*1 236 400*	*1 228 700*	*1 220 800*	*1 197 100*	*1 192 900*	*1 191 200*
九龍	*Kowloon*	*2 194 800*	*2 204 000*	*2 214 700*	*2 227 600*	*2 250 900*	*2 278 500*	*2 300 300*	*2 313 100*	*2 310 400*	*2 323 300*	*2 327 200*
新界	*New Territories*	*3 780 200*	*3 837 400*	*3 888 900*	*3 934 700*	*3 966 400*	*4 003 300*	*4 045 300*	*4 091 300*	*4 165 600*	*4 199 300*	*4 236 800*
新市鎮	*New Towns*	*3 389 800*	*3 439 000*	*3 471 700*	*3 505 400*	*3 527 800*	*3 552 700*	*3 589 300*	*3 629 200*	*3 668 100*	*3 687 400*	*3 689 000*
其他地區	*Other Areas*	*390 300*	*398 400*	*417 300*	*429 400*	*438 600*	*450 600*	*456 000*	*462 100*	*497 400*	*511 900*	*547 800*
陸上總計	**Land Total**	**7 241 000**	**7 297 800**	**7 353 800**	**7 410 500**	**7 462 800**	**7 518 200**	**7 574 300**	**7 625 200**	**7 673 100**	**7 715 500**	**7 755 200**
加：水上人口	**Plus : Marine Population**	**700**	**800**	**800**	**800**	**700**	**700**	**700**	**700**	**700**	**700**	**700**
全港	**Whole Territory**	**7 241 700**	**7 298 600**	**7 354 500**	**7 411 300**	**7 463 500**	**7 518 900**	**7 575 000**	**7 625 900**	**7 673 700**	**7 716 100**	**7 755 800**

基年估計 Base year estimates.

30839-0001
Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po - Traffic Forecast in Year 2045 for the Noise Impact Assessment Purpose

Appendix B

Locations for Traffic Forecast

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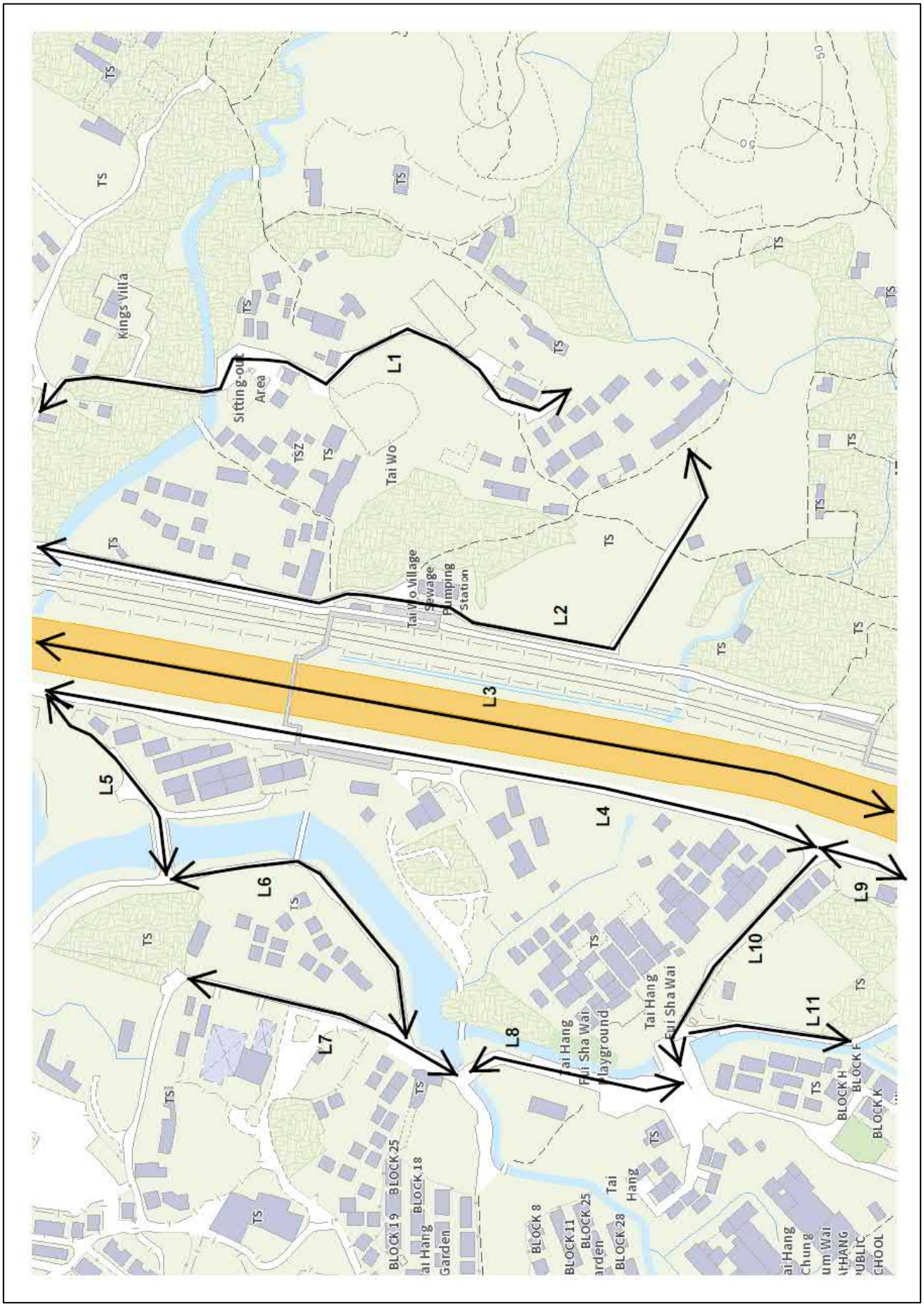

L1
L2
L3
L4
L5
L6
L7
L8
L9
L10
L11
Kings Villa
Sitting-out Area
TSZ
Tai Wo
Tai Wo Village Sewage Pumping Station
Tai Hang Fui Sha Wai Playground
BLOCK 19
BLOCK 25
BLOCK 18
BLOCK 8
BLOCK 11
BLOCK 28
BLOCK H
BLOCK K
TS

Figure H.2 2nd Submission of Traffic Forecast to Transport Department

AXON CONSULTANCY

- Transport Modelling
- Pedestrian Modelling
- Traffic Engineering
- Transportation Planning
- Traffic Impact Assessment
- Temporary Traffic Management
- Geographical Analysis System

05 September 2019
Our Ref: 30839-0002
Your ref: (NC1E5) in TD NR157/161/TPDD-7

Transport Department
NT Regional Office
Traffic Engineering (NTE) Division
Project & Tai Po Section
9/F, Mongkok Government Offices
30 Luen Wan Street, Mongkok
Kowloon

By Hand & Email
(alexthlam@td.gov.hk)

Attn: Mr. LAM Tack Ho, Alex (Engr /Tai Po 3)

RE: Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po
Traffic Forecast in Year 2045 for the Noise Impact Assessment Purpose – Responses to Departmental Comments

Dear Mr. LAM,

With reference to the comments from the Transport Department dated 21 August 2019, the responses to departmental comments are enclosed herewith for your satisfaction and obtaining your approval.

Should you have any queries, please do not hesitate to contact the undersigned at 2258 6392.

Yours sincerely,

Sam Fung

Encl.
cc: Wilson Acoustics Limited (Attn: Peter Wong (by email: peter.wong@wal.hk))

AXON CONSULTANCY LIMITED
Unit 503, 5/F, Tower 2
Lippo Centre, Admiralty, Hong Kong
TEL 2258 6392 FAX 3020 0321
http://www.axonhk.com

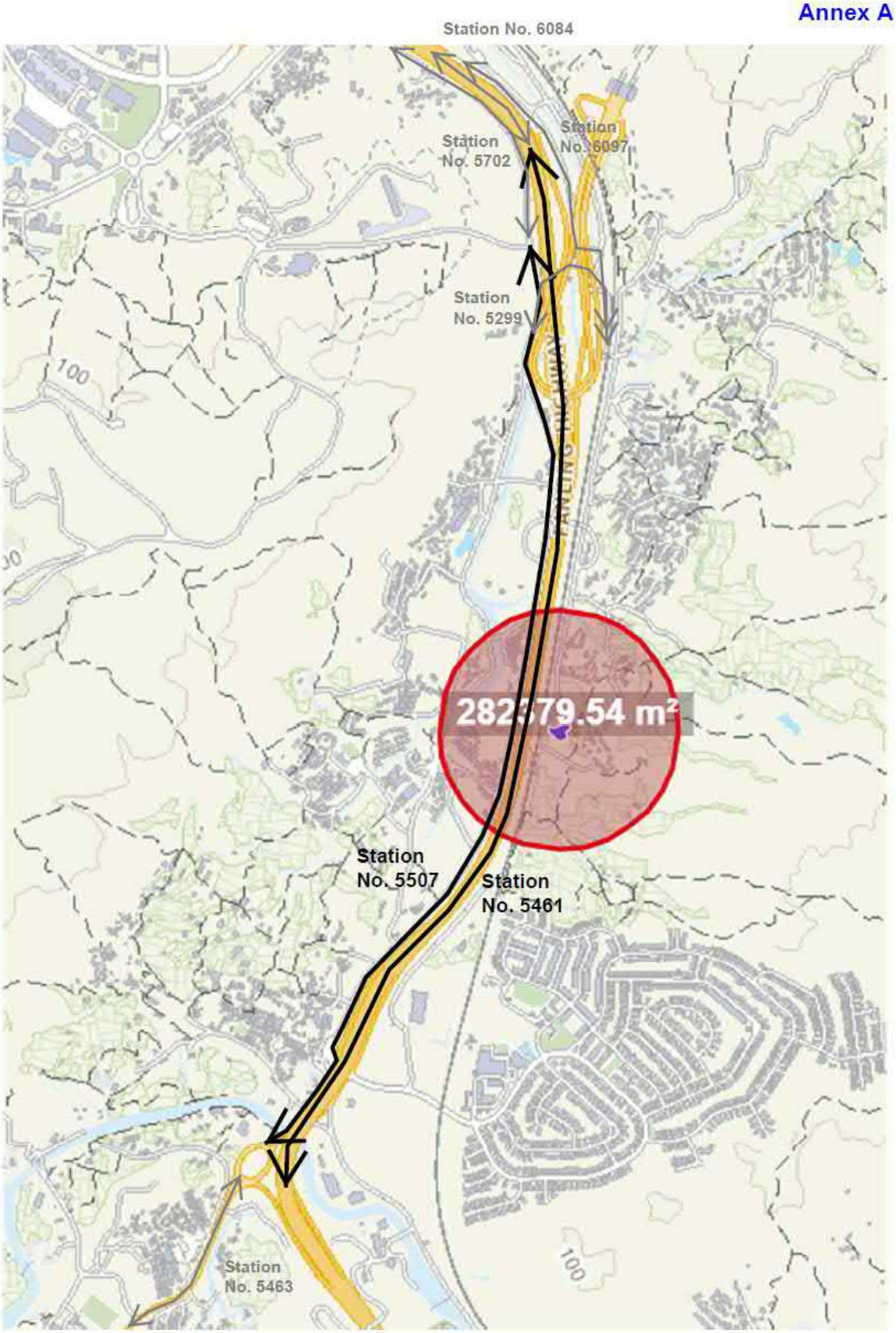
Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po
Responses to TD Comments

<table>
<tr><th>Departmental Comments
Dated 21 August 2019 (via Transport Department)</th><th>Responses</th></tr>
<tr><td>a. Table in paragraph 1 shows 3 stations in the Annual Traffic Census Reports. Please explain the rationale of choosing these 3 stations.</td><td>Noted. With reference to EIAO Guidance Note No. 12/2010, a spatial study scope of 300m is commonly used in Road Traffic Noise Impact Assessment. The submitted traffic forecast considered all counting stations which encompass the 300m spatial study scope, i.e. Station no. 5507 and 5461. An indicative figure is enclosed herewith as Annex A for your reference.</td></tr>
<tr><td>b. Please explain the reason for using an average growth rate of the 3 selected stations instead of using the highest and growth rate 2.7% of station no. 6097 at Tai Wo Service Road East.</td><td>Noted. As mentioned in comment (a), the 2 selected stations cover the road link sections of the spatial study scope. Due to the updates on station selection, Station no. 6097 would not be considered. Instead of using the highest growth rate of a station, the overall average growth rate of 1.3% appraised the traffic volume observed by the 2 selected stations. The updated traffic data is enclosed herewith for your review.
<table>
<tr><th>Station No.</th><th>2008</th><th>2009</th><th>2010</th><th>2011</th><th>2012</th><th></th></tr>
<tr><td>5507/ Tai Wo Service Rd W</td><td>5740</td><td>5010
(-12.7%)</td><td>5230
(4.4%)</td><td>5360
(2.5%)</td><td>5330
(-0.6%)</td><td></td></tr>
<tr><td>5461/ Fanling Highway</td><td>80920</td><td>77660
(-4%)</td><td>79110
(1.9%)</td><td>80260
(1.5%)</td><td>79490
(-1%)</td><td></td></tr>
<tr><th></th><th>2013</th><th>2014</th><th>2015</th><th>2016</th><th>2017</th><th>Average Growth p.a.</th></tr>
<tr><td>5507/ Tai Wo Service Rd W</td><td>5370
(0.8%)</td><td>5090
(-5.2%)</td><td>5400
(6.1%)</td><td>5620
(4.1%)</td><td>5540
(-1.4%)</td><td>-0.4%</td></tr>
<tr><td>5461/ Fanling Highway</td><td>82840
(4.2%)</td><td>87120
(5.2%)</td><td>87930
(0.9%)</td><td>92890
(5.6%)</td><td>92220
(-0.7%)</td><td>1.5%</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Overall Average</td><td>1.3%</td></tr>
</table></td></tr>
<tr><td>c. Please advise the source of the planning data as shown in Appendix A, as it is different from the data available on the Planning Department website.</td><td>Noted. The updated planning data is sourced from the report “Projections of Population Distribution 2019-2028”, publicized by Planning Department on July 2019. The population growth from “Projected Population by District Council District, 2019-2028” is enclosed as Annex B for your review.</td></tr>
<tr><td>d. Please review the figure in the table in paragraph 2.</td><td>Noted. The mentioned table is updated for your review and approval.
<table>
<tr><th>Planning Data District</th><th>Year 2018#</th><th>Year 2028</th><th>Growth Rate p.a. (%)</th></tr>
<tr><td>Tai Po</td><td>310500</td><td>357300</td><td>1.4%</td></tr>
</table>
base year estimation</td></tr>
</table>

Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po
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e. Table in paragraph 3, please review the speed limit of Fanling Highway (both bounds).	Noted. As the maximum speed limit of Fanling Highway (road section between Tai Hang and Wo Hop Shek Interchange) is 100km/h, for conservative approach, the maximum speed would be considered for the noise impact assessment.
f. Table in paragraph 3 only show the peak hour traffic flow in year 2045, data of traffic flow of existing scenario should be included for information.	Noted. The observed peak hour traffic flow and the updated design peak hour traffic flows are enclosed herewith as **Annex C** for your review and approval.

Annex A


Station No. 6084
Station No. 5702
Station No. 6097
Station No. 5299
100
282379.54 m²
Station No. 5507
Station No. 5461
Station No. 5463
100

Annex B

表 1：二零一九年至二零二八年按區議會分區劃分的人口推算數字
Table 1 : Projected Population by District Council District, 2019-2028

(以年中計算 as at mid year)

區議會分區/ *主要區域*	District Council District/ *Broad Area*	2018 #	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
中西區	Central and Western	245 600	242 200	239 500	236 000	231 400	228 700	226 100	223 000	219 600	216 500	212 200
灣仔	Wan Chai	182 000	178 600	175 700	173 400	167 800	166 700	164 400	161 500	156 600	153 700	150 600
東區	Eastern	551 300	548 500	547 800	546 000	536 100	532 200	530 600	524 400	517 700	512 500	503 500
南區	Southern	273 100	270 700	269 500	267 800	266 100	266 500	268 300	268 400	271 000	280 500	290 500
深水埗	Sham Shui Po	403 500	428 800	447 800	458 300	460 400	463 100	470 800	469 500	469 300	466 500	462 300
九龍城	Kowloon City	420 300	424 800	429 400	427 800	427 700	431 200	446 000	452 600	452 400	460 900	457 100
黃大仙	Wong Tai Sin	423 100	420 300	425 300	427 100	426 700	427 600	431 800	430 000	429 500	427 500	429 300
觀塘	Kwun Tong	682 800	695 300	695 600	698 200	700 600	703 900	705 300	718 200	722 400	725 300	730 400
油尖旺	Yau Tsim Mong	335 500	329 700	328 100	324 700	318 400	315 300	313 700	309 300	303 900	300 900	295 500
葵青	Kwai Tsing	514 800	510 800	509 900	508 200	506 000	512 900	518 300	516 600	512 100	508 300	506 800
荃灣	Tsuen Wan	314 700	314 700	316 800	315 700	310 800	307 300	305 500	302 500	297 700	296 800	294 700
屯門	Tuen Mun	502 700	504 600	508 600	513 600	535 800	549 700	559 700	571 700	578 300	578 800	581 700
元朗	Yuen Long	641 000	650 800	650 700	656 600	662 300	664 500	665 000	684 300	710 700	716 500	718 000
北區	North	318 400	317 600	325 100	326 000	360 400	364 400	368 200	369 900	372 600	388 200	421 500
大埔	Tai Po	310 500	308 600	312 200	325 500	332 000	349 100	352 900	352 400	355 600	359 700	357 300
沙田	Sha Tin	685 500	692 500	706 000	717 800	716 400	721 000	717 700	718 300	713 500	711 000	704 700
西貢	Sai Kung	471 900	474 100	481 100	495 400	501 500	505 000	508 800	521 000	523 500	526 700	543 100
離島	Islands	173 200	188 600	188 000	189 200	196 300	195 500	194 300	193 900	217 700	228 600	235 100
香港島	*Hong Kong Island*	*1 252 100*	*1 240 100*	*1 232 500*	*1 223 200*	*1 201 400*	*1 194 100*	*1 189 400*	*1 177 400*	*1 165 000*	*1 163 100*	*1 156 700*
九龍	*Kowloon*	*2 265 100*	*2 299 000*	*2 326 100*	*2 336 000*	*2 333 800*	*2 341 000*	*2 367 500*	*2 379 600*	*2 377 500*	*2 381 000*	*2 374 700*
新界	*New Territories*	*3 932 700*	*3 962 400*	*3 998 400*	*4 048 100*	*4 121 400*	*4 169 300*	*4 190 500*	*4 230 700*	*4 281 800*	*4 314 500*	*4 362 900*
新市鎮	*New Towns*	*3 495 600*	*3 511 500*	*3 546 000*	*3 595 000*	*3 639 800*	*3 684 900*	*3 697 400*	*3 709 700*	*3 725 900*	*3 747 600*	*3 763 300*
其他地區†	*Other Areas †*	*437 000*	*450 900*	*452 400*	*453 100*	*481 600*	*484 400*	*493 100*	*521 000*	*555 800*	*566 900*	*599 600*
陸上總計	**Land Total**	**7 449 800**	**7 501 400**	**7 557 000**	**7 607 300**	**7 656 600**	**7 704 400**	**7 747 400**	**7 787 700**	**7 824 200**	**7 858 600**	**7 894 200**
加：水上人口	**Plus : Marine Population**	**1 200**	**1 100**	**1 100**	**1 100**	**1 100**	**1 100**	**1 100**	**1 100**	**1 000**	**1 000**	**1 000**
全港	**Whole Territory**	**7 451 000**	**7 502 600**	**7 558 100**	**7 608 400**	**7 657 700**	**7 705 400**	**7 748 400**	**7 788 700**	**7 825 200**	**7 859 600**	**7 895 200**

基年估計 Base year estimates.

†「其他地區」的數字亦包括新市鎮擴展區及主要新發展區截至有關年份的推算人口。
Figures for "Other Areas" also include the projected population for New Town Extension and major New Development Areas up to relevant years.

Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po
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After considering the historical data and future planning data, for the purpose of conservative assessment, the annual growth rate of +1.4% was applied. The future traffic flows of road links up to Year 2045 per annum were hence obtained. The anticipated traffic flows for Year 2045 are tabulated as follows.

ID		Year 2019		Year 2045		Speed, km/hr
		Observed Peak Hour Traffic Flow, veh/hr	% of Heavy Vehicles	Design Peak Hour Traffic Flow, veh/hr	% of Heavy Vehicles	
L1	Access Road A_NB	24	4%	34	3%	50
	Access Road A_SB	23	0%	33	0%	50
L2	Tai Wo Service Road East_NB	9	0%	15	0%	50
	Tai Wo Service Road East_SB	16	6%	26	4%	50
L3	Fanling Highway_NB	3055	15%	4499	15%	100
	Fanling Highway_SB	2873	15%	4231	15%	100
L4	Tai Wo Service Road West_NB	244	12%	353	12%	50
	Tai Wo Service Road West_SB	232	12%	335	12%	50
L5	Access Road B_EB	51	2%	73	1%	50
	Access Road B_WB	42	2%	60	2%	50
L6	Access Road C_NB	49	4%	70	4%	50
	Access Road C_SB	41	5%	59	3%	50
L7	Access Road D_NB	35	11%	51	12%	50
	Access Road D_SB	18	6%	26	4%	50
L8	Access Road E_NB	63	8%	90	8%	50
	Access Road E_SB	19	5%	28	4%	50
L9	Tai Wo Service Road West _NB	306	11%	442	11%	50
	Tai Wo Service Road West _SB	218	12%	315	12%	50
L10	Access Road F	76	7%	109	6%	50
L11	Access Road G	8	0%	11	0%	50

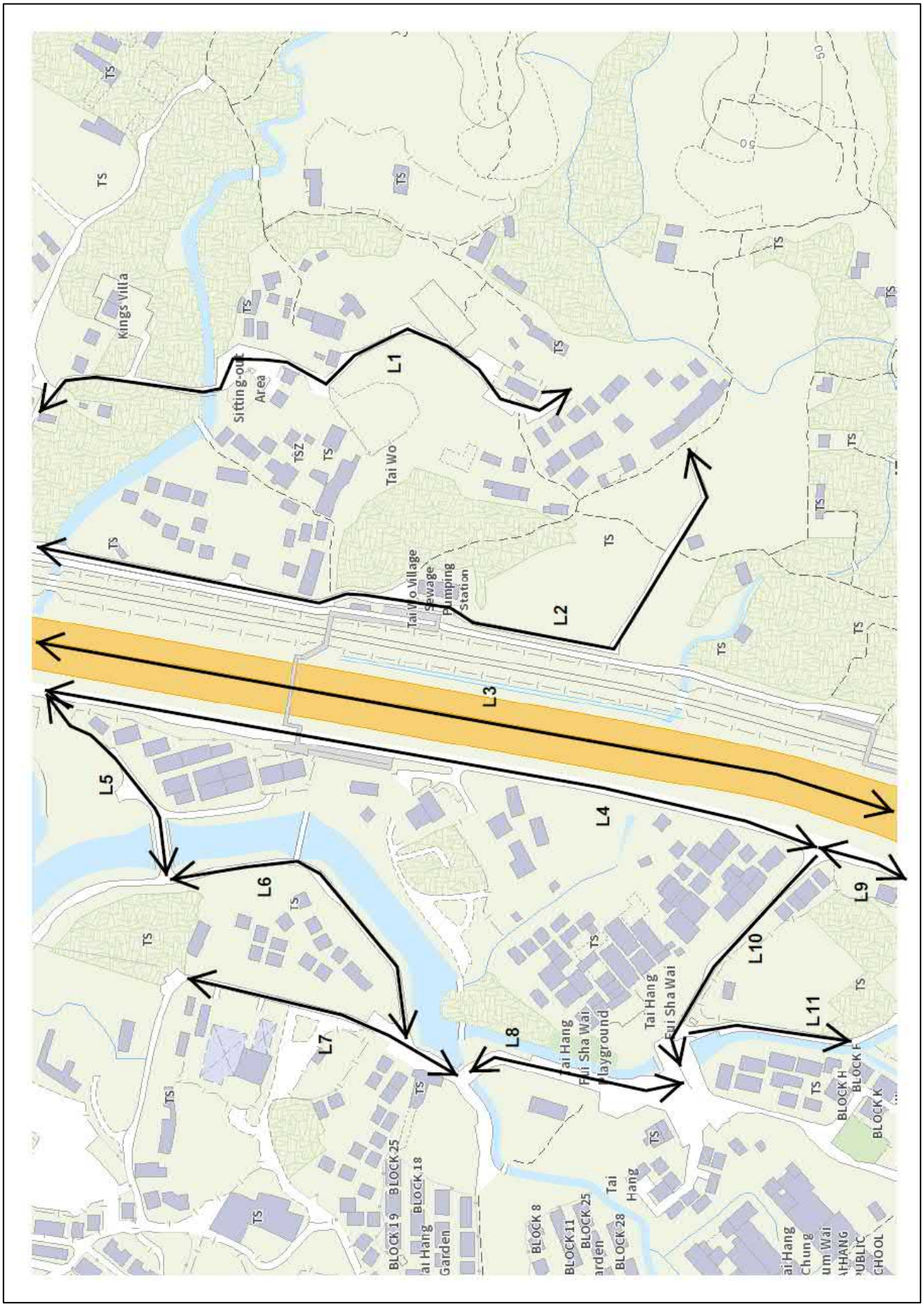

L1
L2
L3
L4
L5
L6
L7
L8
L9
L10
L11
Kings Villa
Sitting-out Area
Tai Wo
Tai Wo Village Sewage Pumping Station
Tai Hang Fui Sha Wai Playground
BLOCK 19
BLOCK 25
BLOCK 18
BLOCK 8
BLOCK 11
BLOCK 28
BLOCK H
BLOCK K
TS
TSZ

Figure H.3 Response from Transport Department

TOTAL P.001

By Fax and by Post
3020 0321

運輸署
Transport Department

本署檔案 Our Ref. : (NCBE3) in TD NR157/161/TPDD-7
來函檔號 Your Ref. : 30839-0002
電 話 Tel. : 2399 2731
圖文傳真 Fax : 2381 3799
電 郵 Email : alexthlam@td.gov.hk

24 September 2019

AXON Consultancy Limited
Unit 503, 5/F, Tower 2
Lippo Centre, Admiralty, Hong Kong
(Attn.: Mr. Sam FUNG)

Dear Mr. FUNG,

Proposed Residential Development at Lot 111 in DD7, Tai Wo Tsuen, Tai Po
Traffic Forecast in Year 2045 for the Noise Impact Assessment Purpose –
Responses to Departmental Comments

We refer to your above letter dated 5 September 2019, please note that we have no further comments from traffic engineering viewpoint.

Yours faithfully,

(LAM Tack-ho)
for Commissioner for Transport

新界分區辦事處
NT Regional Office
九龍聯運街三十號旺角政府合署七樓
7th Floor, Mong Kok Government Offices, 30 Luen Wan Street, Kowloon.
圖文傳真 Fax No.: 2381 3799 (新界區) (NTRO)
網址 Web Site: http://www.td.gov.hk

25-SEP-2019 15:45 FROM TO 30200321 P.001/001

Appendix I.

Layout of Road Noise Barrier

Figure I.1 Layout in Drawing no. 798/GA/T/13001 under Contract no. HY/2012/06

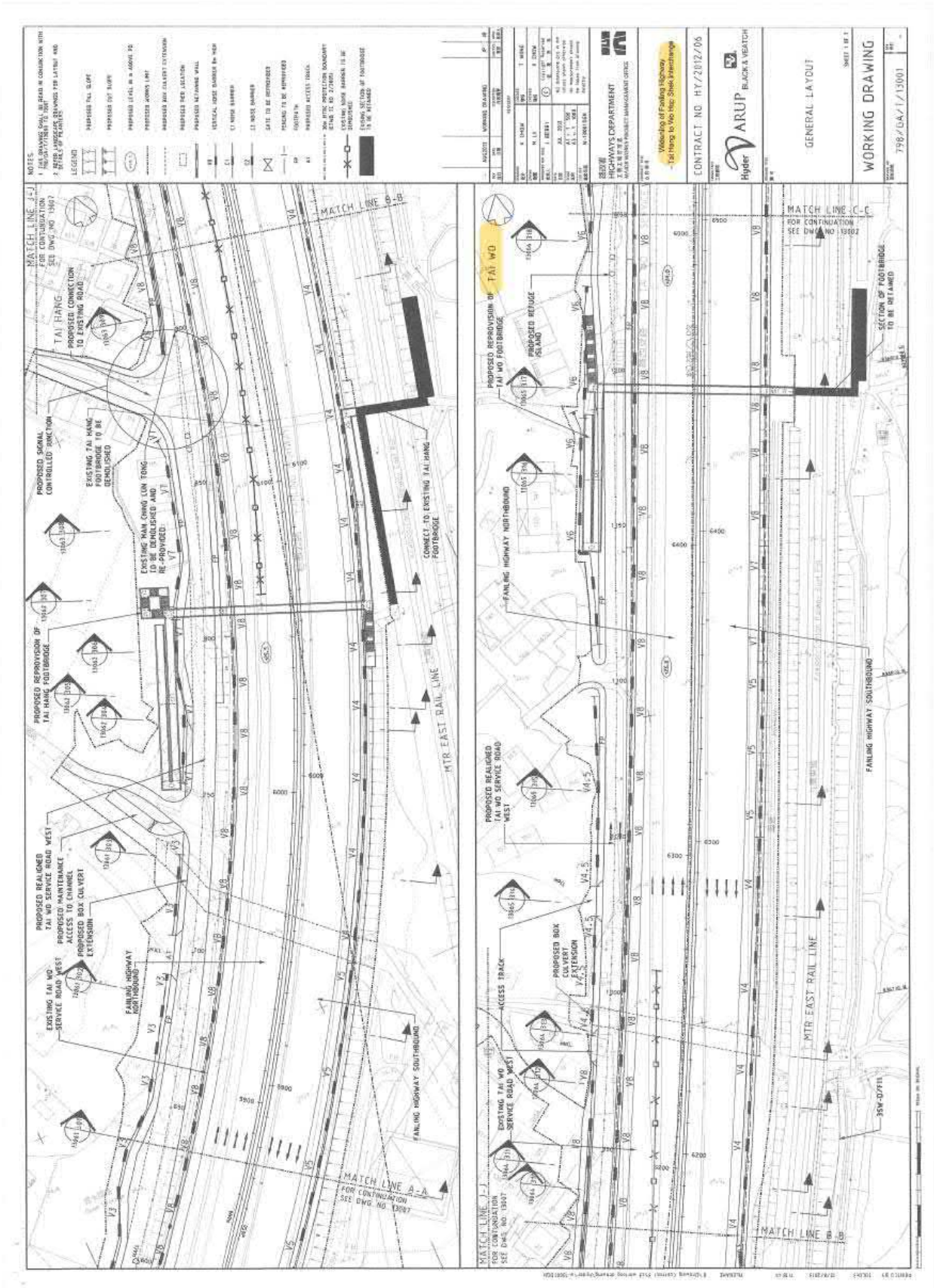
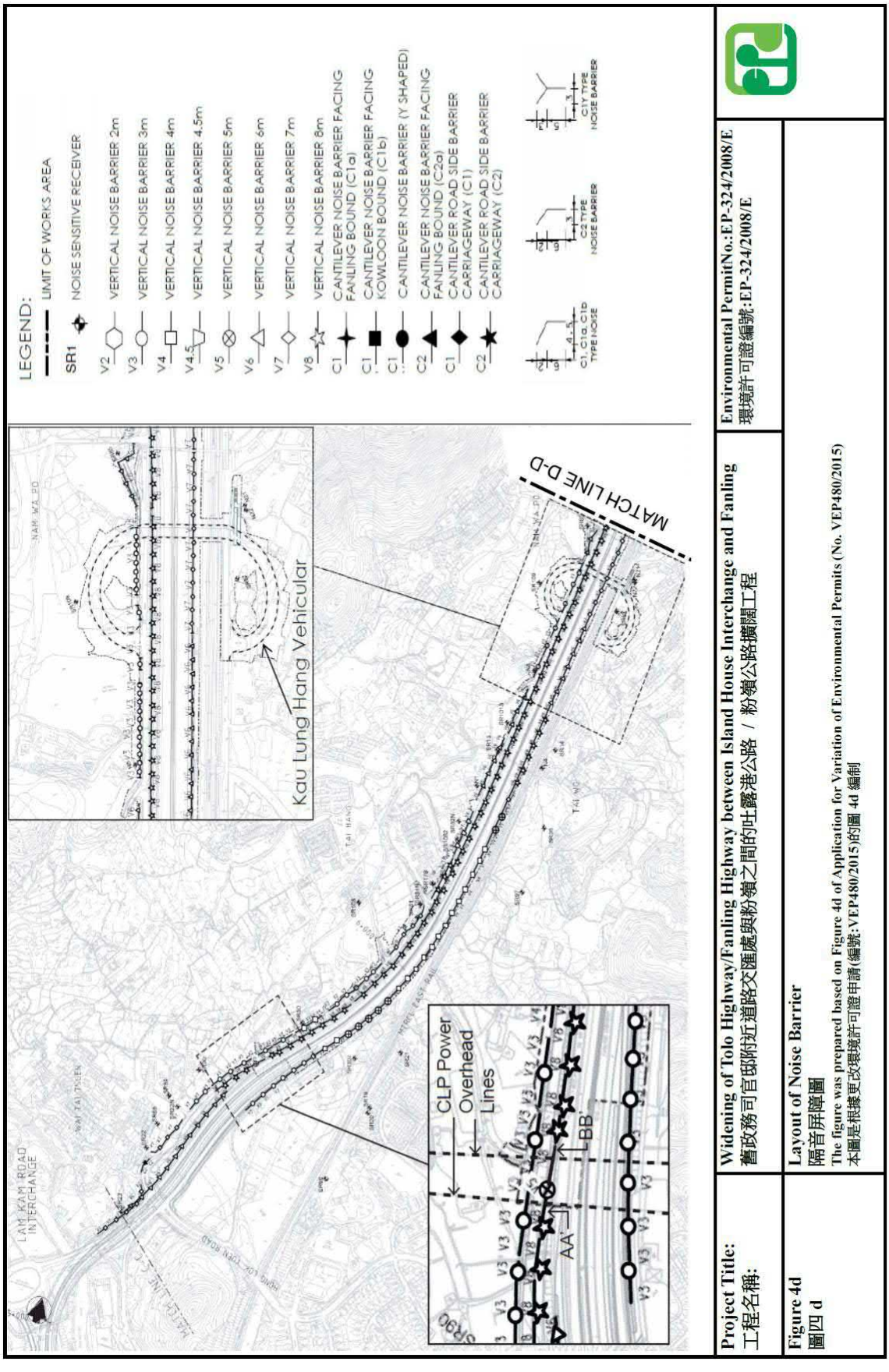


Figure I.2 Layout of Noise Barrier in EP-324/2008/E



Appendix J.

Calibration Certificates

Cert. J.1 Sound Level Meter SVAN977A-69787

SVANTEK ISO9001 certified

FACTORY CALIBRATION DATA OF THE *SVAN 977A No. 69787*

with preamplifier SVANTEK type SV12L No. 77858 and microphone ACO PACIFIC type 7052E No. 72289

SOUND LEVEL METER

1. CALIBRATION (electrical)

LEVEL METER function; Characteristic: A; f_{sin}=1 kHz; Input signal =110.9 dB;

Range	Low (120dB)	High (137dB)
Indication [dB]	114.0	114.0
Error [dB]	0.0	0.0

2. CALIBRATION* (acoustical)

LEVEL METER function; Range: High; Reference frequency: 1000 Hz; Sound Pressure Level: **113.97** dB

Characteristic	Correct value [dB]	Indication [dB]	Error [dB]
Z	113.97	113.98	0.01
A	113.97	113.98	0.01
C	113.97	113.98	0.01

Calibration measured with the microphone ACO PACIFIC type 7052E No. 72289. Calibration factor: -0.13 dB.

3. LINEARITY TEST* (electrical)

LEVEL METER function; Range: Low; Characteristic: A; f_{sin}= 31.5 Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0
Error [dB]	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0

LEVEL METER function; Range: Low; Characteristic: A; f_{sin}= 1000 Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0	100.0	120.0
Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.0

LEVEL METER function; Range: Low; Characteristic: A; f_{sin}= 8000 Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0	100.0	119.0
Error [dB]	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.0

LEVEL METER function; Range: High; Characteristic: A; f_{sin}= 31.5 Hz

Nominal result LEQ [dB]	35.0	36.0	37.0	38.0	40.0	60.0	80.0	97.0
Error [dB]	0.1	0.0	0.0	0.0	0.0	0.0	-0.0	0.0

LEVEL METER function; Range: High; Characteristic: A; f_{sin}= 1000 Hz

Nominal result LEQ [dB]	35.0	36.0	37.0	38.0	40.0	60.0	80.0	100.0	120.0	137.0
Error [dB]	0.1	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.0	-0.0

LEVEL METER function; Range: High; Characteristic: A; f_{sin}= 8000 Hz

Nominal result LEQ [dB]	35.0	36.0	37.0	38.0	40.0	60.0	80.0	100.0	120.0	136.0
Error [dB]	0.1	0.0	0.0	-0.0	0.0	-0.0	-0.0	0.0	-0.0	-0.0

4. TONE BURST RESPONSE*

LEVEL METER function; Characteristic: A; f_{sin}= 4000 Hz; Burst duration: 2 s

Range: **Low**; Steady level nominal result = 117dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
MAX	Fast	Indication [dB]	117.0	116.9	116.0	114.4	112.2	108.7	105.8	102.9	99.0	95.9	92.9	89.9
		Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0	-0.0	-0.0	-0.1	-0.1
	Slow	Indication [dB]	115.0	112.9	109.6	106.8	103.9	100.0	97.0	94.0	90.0	-	-	-
		Error [dB]	0.0	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
SEL	-	Indication [dB]	117.0	114.0	110.0	107.0	104.0	100.0	97.0	94.0	90.0	86.9	83.9	80.9
		Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.1

Range: **Low**; Steady level nominal result = 57dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1
MAX	Fast	Indication [dB]	56.9	56.9	56.0	54.4	52.1	48.6	45.8	42.9	38.9	35.9
		Error [dB]	-0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.1	0.0	-0.0	-0.0
	Slow	Indication [dB]	55.0	52.9	49.5	46.7	43.8	39.9	36.9	33.9	29.9	-
		Error [dB]	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-
SEL	-	Indication [dB]	57.0	53.9	50.0	47.0	43.9	40.0	37.0	33.9	30.0	27.0
		Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	0.0	-0.0	0.0	0.1

Range: **Low**; Steady level nominal result = 35dB

Result	Detector	Duration [ms]	1000	500	200
MAX	Fast	Indication [dB]	35.0	34.9	34.0
		Error [dB]	0.0	0.0	0.0
	Slow	Indication [dB]	33.0	30.9	27.6
		Error [dB]	0.0	0.1	0.0
SEL	-	Indication [dB]	35.0	32.0	28.0
		Error [dB]	0.0	0.0	0.1

Range: **High**; Steady level nominal result = 134dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
MAX	Fast	Indication [dB]	134.0	133.9	133.0	131.4	129.2	125.7	122.8	119.9	115.9	112.9	109.9	106.8
		Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0	-0.0	-0.1	-0.1	-0.1
	Slow	Indication [dB]	132.0	129.9	126.6	123.8	120.9	116.9	114.0	111.0	107.0	-	-	-
		Error [dB]	0.0	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-	-	-
SEL	-	Indication [dB]	134.0	131.0	127.0	124.0	121.0	117.0	114.0	111.0	107.0	103.9	100.9	97.8
		Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.1	-0.1

Range: **High**; Steady level nominal result = 54dB

Result	Detector	Duration [ms]	1000	500	200	100	50
MAX	Fast	Indication [dB]	54.0	53.9	53.0	51.4	49.1
		Error [dB]	-0.0	0.0	0.0	0.0	-0.0
	Slow	Indication [dB]	52.0	49.9	46.6	43.8	40.8
		Error [dB]	0.0	0.0	-0.0	-0.0	-0.0
SEL	-	Indication [dB]	54.0	51.0	47.0	44.0	41.0
		Error [dB]	-0.0	-0.0	0.0	0.0	0.0

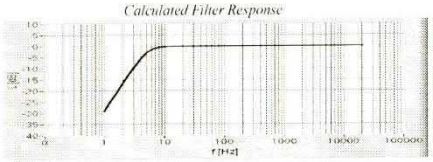
Range: **High**; Steady level nominal result = 46dB

Result	Detector	Duration [ms]	1000	500	200
MAX	Fast	Indication [dB]	46.0	45.9	45.1
		Error [dB]	0.1	0.1	0.1
	Slow	Indication [dB]	44.0	41.9	38.6
		Error [dB]	0.1	0.0	-0.0
SEL	-	Indication [dB]	46.0	43.0	39.1
		Error [dB]	0.1	0.0	0.1

5. FREQUENCY RESPONSE – BAND AUDIO* (electrical)

LEVEL METER function; Characteristic: Z; Range: High; Input signal =135 dB:

Calculated Filter Response



Measured Filter Response with Preamplifier SV12L
(f - frequency, L - level)

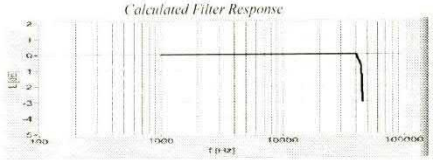
f [Hz]	L [dB]	f [Hz]	L [dB]	f [Hz]	L [dB]	f [Hz]	L [dB]	f [Hz]	L [dB]
1	-29.7	4	-6.0	16	0.0	250	0.0	16000	-0.0
1.25	-25.6	5	-3.2	20	0.0	500	0.0	20000	-0.0
1.6	-21.4	6.3	-1.5	25	0.0	1000	0.0		
2	-17.3	8	-0.5	31.5	0.0	2000	0.0		
2.5	-13.3	10	-0.2	63	0.0	4000	0.0		
3.15	-9.5	12.5	-0.0	125	0.0	8000	0.0		

All frequencies are nominal center values for the 1/3 octave bands

6. FREQUENCY RESPONSE – BAND ULTRA* (electrical)

LEVEL METER function; Characteristic: HPE; Range: High; Input signal =135 dB:

Calculated Filter Response



Measured Filter Response with Preamplifier SV12L
(f - frequency, L - level)

f [Hz]	L [dB]	f [Hz]	L [dB]	f [Hz]	L [dB]
1000	0.0	16000	-0.0	40000	-0.1
2000	0.0	20000	-0.0	43856*	-0.4
4000	0.0	25000	-0.0	45255*	-2.6
8000	-0.0	32000	-0.1		

All frequencies not marked by * are nominal center values for the 1/3 octave bands

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7. INTERNAL NOISE LEVEL* (electrical - compensated)

LEVEL METER function ; Calibration factor: 0 dB

	Characteristic	Z	A	C
Range Low	**Level** [dB]	≤20	≤11	≤10
Range High	**Level** [dB]	≤40	≤23	≤22

* measured with preamplifier SVANTEK type SV12L No. 77858.

8. INTERNAL NOISE LEVEL (acoustical - compensated)

LEVEL METER function; Characteristic: A; (Backlight – off)

Range	Low	High
Indication [dB]	12.1	19.3

Noise measured in special chamber, with reference microphone G.R.A.S type 40AN No. 73421

VIBRATION LEVEL METER

1. CALIBRATION (electrical)

LEVEL METER function; Characteristic: HP10; f=79.58 Hz; Input signal =140 dB;

Range	**Low**	**High**
Indication [dB]	140.0	140.0
Error [dB]	0.0	0.0

2. CALIBRATION (vibrational)

LEVEL METER function; Range: High; Input signal: 140dB;

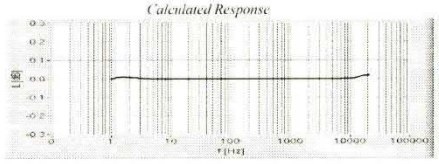
Characteristic	**Reference frequency** [Hz]	**Correct value** [dB]	**Indication** [dB]	**Error** [dB]
HP1	79.58	140.0	140.1	0.1

Calibration measured with the accelerometer SVANTEK type SV80 No. D5669. Calibration factor: -0.24dB

3. FREQUENCY RESPONSE (electrical)

LEVEL METER function; Characteristic: HP; Range: High; input=175 dB;

Calculated Response



Measured Response (f-frequency, L-level)

f [Hz]	L [dB]
1	-0.0
1000	-0.0
20000	-0.0

All frequencies are nominal center values for the 1/3 octave bands

4. INTERNAL NOISE LEVEL (electrical)

LEVEL METER function; Range: Low;

Characteristic	HP1
Indication [dB]	35.4

ENVIRONMENTAL CONDITIONS

Temperature	Relative humidity	Ambient pressure
23 °C	22%	1024 hPa

TEST EQUIPMENT

Item	Manufacturer	Model	Serial no.	Description
1.	SVANTEK	SVAN 401	87	Signal generator
2.	SVANTEK	SVAN 912A	6120	Sound & Vibration Analyser
3.	RIGOL	DM3068	DM30155100773	Digital multimeter
4.	SVANTEK	SV33	48878	Acoustic calibrator
5.	SVANTEK	ST02	-	Microphone equivalent electrical impedance (18pF)
6.	DYTRAN	3233A	1375	Reference accelerometer

CONFORMITY & TEST DECLARATION

1. Herewith Svantek company declares that this instrument has been calibrated and tested in compliance with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass them.
2. The acoustic calibration was performed using the Sound Calibrator and is traceable to the GUM (Central Office of Measures) reference standard - sound level calibrator type 4231 No 2292773.
3. The vibrational calibration was performed using the Back-to-Back Comparison method and is traceable to the GUM (Central Office of Measures) reference standard - accelerometer type 8305 No 1435233.
4. The information appearing on this sheet has been compiled specifically for this instrument. This form is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
5. This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: Krzysztof Czachor ..... Test date: 2018-11-29

Cert. J.2 Acoustic Calibrator SV35-44797

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CALIBRATION CERTIFICATE

Certificate Information

Date of Issue	7-Nov-2018	**Certificate Number**	MLCN182745S

Customer Information

Company Name	Wilson Accoustics Limited
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong

Equipment-under-Test (EUT)

Description	Acoustic Calibrator
Manufacturer	Svantek
Model Number	SV 35
Serial Number	44797
Equipment Number	--

Calibration Particular

Date of Calibration	7-Nov-2018		
Calibration Equipment	4231(MLTE008) / AV180068 / 13-May-20 1357(MLTE190) / MLEC18/05/02 / 25-May-19		
Calibration Procedure	MLCG00, MLCG15		
Calibration Conditions	Laboratory	Temperature	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	EUT	Stabilizing Time	Over 3 hours
		Warm-up Time	Not applicable
		Power Supply	Internal battery
Calibration Results	Calibration data were detailed in the continuation pages. All calibration results were within EUT specification.		

Approved By & Date

K.O. Lo 7-Nov-2018

Statements

* 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 EUT 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 EUT.
* 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.

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Certificate No. MLCN182745S

Calibration Data

EUT Setting	Standard Reading	EUT Error	Calibration Uncertainty	EUT Specification
94 dB	93.7 dB	0.3 dB	0.15 dB	± 0.3 dB
114 dB	113.8 dB	0.2 dB	0.15 dB	± 0.3 dB

- END -

Calibrated By : Dan
Date : 7-Nov-18

Checked By : K.O. Lo
Date : 7-Nov-18

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